LITTLE
DIVERSIFIED ARCHITECTURAL CONSULTING

ADDENDUM NO. #2

OXNARD HIGH SCHOOL - TENNIS COURTS IMPROVEMENTS

(Bid 613 Tennis Courts Replacement – Oxnard High School)

LITTLE JOB #612-12353-06

DSA: A# 03-120419 File #56-H4

Oxnard High School
3400 West Gonzales Road
Oxnard, CA 93036

February 12, 2020

LITTLE
1300 Dove Street, Suite 100
Newport Beach, CA 92660

Architect- Jay R. Tittle, C- 12955

1. PART 1 - GENERAL

1.1. The following revisions and/or clarifications shall be made to the Bidding Requirements and Contract Documents. Revise and amend the Documents for the above named project in accordance with this Addendum. The bid shall reflect these addendum changes and each bidder shall make reference in their bid to this addendum.

1.2. All Bidding Requirements and Contract Documents shall apply to this addendum as originally indicated in the applicable portions of the contract documents, unless otherwise modified by this addendum.

1.2.1. Previous Addendum #1 issued January 22, 2020, directly by OUHSD.

1.3. GENERAL CLARIFICATIONS

1.3.1. The following clarifications are issued to all bidders as information for use in preparing bids:

1.3.1.1. Responses to 'LITTLE Pre-Bid RFI's 1 thru 7', attached.

2. PART 2 - PROJECT MANUAL

2.1. CHANGES TO PROJECT MANUAL TABLE OF CONTENTS

2.1.1. Division 00, PROCUREMENT AND CONTRACTING REQUIREMENTS

2.1.1.1. Replace **Section 00 01 10, Table of Contents** with attached **Section 00 01 10**.

2.2. SPECIFICATIONS ISSUED

2.2.1. Section '**26 05 19 - Low-Voltage Electrical Power Conductors and Cables**' - Add new Section **26 05 19** (attached).

2.2.2. Section '**26 05 26 - Grounding and Bonding for Electrical Systems**' - Add new Section **26 05 26** (attached).

2.2.3. Section '**26 05 33_13 - Conduit for Electrical Systems**' - Add new Section **26 05 33_13** (attached).

2.2.4. Section '**26 05 33_16 - Boxes for Electrical Systems**' - Add new Section **26 05 33_16** (attached).

2.2.5. Section '**26 05 53 - Identification for Electrical Systems**' - Add new Section **26 05 53** (attached).

2.2.6. Section **'26 05 83 - Wiring Connections**' - Add new Section **26 05 83** (attached).

2.2.7. Section '**26 27 26 - Wiring Devices**' - Add new Section **26 27 26** (attached).

2.2.8. Section '**32 31 13 - Chain Link Fences and Gates**' - Delete Section **32 31 13** originally issued and replace with revised Section **32 31 13** (attached).

2.3. NARRATIVE CHANGES TO SPECIFICATIONS

2.3.1. Section 31 23 16, Excavation - Modify this Section as follows:

2.3.1.1. Revise paragraph 3.04, 6a – add the following:

'**4) Onsite soil may be used for fill once they are cleaned of all organic material, rock, debris, and irreducible material larger than 6 inches. Import soil shall be equal to, or better than on-site soils in strength, expansion, and compressibility characteristics. All onsite and import soil material shall evaluate and test the import soils in order to confirm the quality of the material. Also, fill and backfill should be placed at, or slightly above optimum moisture in layers with loose thickness not greater than 6 inches. Each layer should be compacted to a minimum of 90% of the maximum dry density obtainable by the ASTM D 1557 test method. The upper one foot of subgrade below areas to be paved should be compacted to minimum of 95% of the maximum dry density.'**

2.3.2. Section 31 23 23, Fill - Modify this Section as follows:

2.3.2.1. Revise paragraph 2.01, E – **Delete E (not applicable)**

2.3.2.2. Revise paragraph 2.01, F – **Delete F (not applicable)**

2.3.3. Section 32 11 23, Aggregate Base Courses- Modify this Section as follows:

2.3.3.1. Revise paragraph 3.03, A to read as follow – **'A) Place and compact aggregate base material in accordance with ASTM D3763, Subsection 301-2. Place aggregate base below curbs and gutters and paving also, compacted to 95 percent at vehicular traffic and at pedestrian-only traffic.'**

2.3.3.2. Revise paragraph 3.03, D.1 to read as follow – **'1) Compact to 95 percent of maximum dry density.'**

2.3.4. Section 32 12 16, Asphalt Paving - Modify this Section as follows:

2.3.4.1. Revise paragraph 2.03, G – **Delete G (not applicable)**

2.3.5. Section 32 13 13, Concrete Paving - Modify this Section as follows:

2.3.5.1. Revise paragraph 2.01, B to read as follow – **'B. Concrete Sidewalks: 3,500 psi 28 day concrete, thickness as indicated on Drawings, minimum 4.5 inches, natural grey color Portland cement.'**

2.3.5.2. Revise paragraph 2.01, C to read as follow – **'C. Curbing, gutters, related drainage components: 3,500 psi, 28 day concrete.'**

2.3.5.3. Revise paragraph 2.01, D to read as follow – **'D. Tennis court Pavement: 3,500 psi 28 day concrete, thickness as indicated on Civil Drawings thick, reinforcing as indicated on Civil Drawings, finish as indicated on Drawings & specification for tennis court surfacing.'**

2.3.5.4. Revise paragraph 2.07, B to read as follow – **'B. Concrete Mix for Pedestrian (Sidewalk) Pavements and exterior Slab on Grade, Natural Color, unless indicated otherwise: ASTM D3763, Section 201-1.1.2, minimum compressive strength of 3500 psi at 28 days, with slump of 4 inches.'**

2.3.5.5. Revise paragraph 2.07, C – **Delete C (not applicable)**

2.3.5.6. Revise paragraph 2.07, F.2 to read as follow – **'F.2 Water-Cement Ratio: Maximum 0.5 at point of placement, or according to indicated concrete strength.'**

2.3.5.7. Revise paragraph 3.02, C to read as follow – **'C. Aggregate base is required under Portland cement concrete paving subject to pedestrian traffic in normal use. See civil plans for details.'**

2.3.5.8. Revise paragraph 3.06, G.1 to read as follow – **'1. Secure tie dowels in place before depositing concrete. Provide No. 4 bars, 18 inch long at 24 inches O.C. for securing dowels.'**

2.3.5.9. Revise paragraph 3.09, B to read as follow – **'B. Place 1/2 inch wide expansion joints as indicated on Drawings and to separate paving from vertical surfaces and other components and in pattern indicated.'**

2.3.5.10. Revise paragraph 3.09, B.5 to read as follow – **'5. Coordinate locations joints for walkways to align expansion joints in adjoining concrete walks, curbs, gutters and other exterior flatwork.'**

2.3.5.11. Revise paragraph 3.09, B.6 to read as follow – **'6. Provide expansion joints also at beginning and end of all curved segments at sidewalks.'**

3. PART 3 - DRAWINGS

3.1. CIVIL DRAWINGS ISSUED

3.1.1. The following Addendum ("AD") Drawings, marked Delta 2, are issued:

3.1.1.1. Drawing C1.1, Detail '6': Revise currently issued Detail per AD2-C1.

3.1.1.2. Drawing C1.1, Detail '4': Revise currently issued Detail per AD2-C2.

3.1.1.3. Drawing C1.1, Detail '11': Revise currently issued Detail per AD2-C3.

3.1.1.4. Drawing C1.1, Detail '12': Revise currently issued Detail per AD2-C4.

3.1.1.5. Drawing C2.0: Replace with Drawing AD2-C5.

3.1.1.6. Drawing C3.0: Replace with Drawing AD2-C6.

3.1.1.7. Drawing C4.0, Detail 'ZZ': Revise currently issued Detail per AD2-C7.

3.1.2. Narrative changes to Civil Drawings are issued as follows:

3.1.2.1. Drawing C1.1, Detail 2 - Modify as follows:

3.1.2.1.1. Delete note #1 from 'NOTES'

3.1.2.2. Drawing C1.1, Detail 10 - Modify as follows:

3.1.2.2.1. Revise callout #1 to read as follow: **'Truncated domes per detail 5 and detail 7 on sheet C1.1'**

3.1.2.3. Drawing C4.0, Detail 2 – General Clarification:

3.1.2.3.1. **All the spot elevations shown within and along the perimeter of tennis court area that are tagged as 'TC/FS' are revised to read 'FS' only given that mow curbs have been deleted from tennis court area. Elevation values remain the same.**

3.2. ARCHITECTURAL DRAWINGS ISSUED

3.2.1. The following Addendum ("AD") Drawings, marked Delta 2, are issued:

3.2.1.1. Drawing 3/A1.1.1: Revise currently issued Detail per AD2-A1.

3.2.1.2. Drawing 1/A1.3.1: Revise currently issued Detail per AD2-A2.

3.2.1.3. Drawing 2/A1.3.1: Revise currently issued Detail per AD2-A3.

3.2.2. Narrative changes to Architectural Drawings are issued as follows:

3.2.2.1. Drawing G0.1.1, TITLE SHEET/SHEET INDEX - Modify as follows:

3.2.2.1.1. ADD the following ELECTRICAL sheets to the SHEET INDEX:

- **AD2-E1, SYMBOLS AND NOTES**
- **AD2-E2, ELECTRICAL OVERALL SITE PLAN**
- **AD2-E3, ENLARGED ELECTRICAL SITE PLAN**

3.2.2.2. Drawing A1.3.1, Detail 9 - Modify as follows:

3.2.2.2.1. Revise note '14'-0" HIGH EQUALLY SPACED' to read '**12'-0" HIGH EQUALLY SPACED**'.

3.2.2.2.2. Revise note 'STEEL WIRE FABRIC – SEE SPECS' to read **', 12'-0" HIGH CONTINUOUS STEEL WIRE FABRIC – SEE SPECS FOR ADDITIONAL INFORMATION'.**

3.2.2.3. Drawing A1.3.2 - Modify as follows:

3.2.2.3.1. Delete details 2, 4, & 5 and refer to details on C1.1

3.3. ELECTRICAL DRAWINGS ISSUED

3.3.1. The following Addendum ("AD") Drawings, marked Delta 2, are issued:

3.3.1.1. ADD new Drawing AD2-E1.

3.3.1.2. ADD new Drawing AD2-E2.

3.3.1.3. ADD new Drawing AD2-E3.

END OF ADDENDUM #2

Enclosures:

I) New Project Manual Documents Issued:
   a) Section **00 01 10**
   b) Section **26 05 19**
   c) Section **26 05 26**
   d) Section **26 05 33 _13**
   e) Section **26 05 33 _16**
   f) Section **26 05 53**
   g) Section **26 05 83**
   h) Section **26 27 26**
   i) Section **32 31 13**

II) New full-size Drawings Issued:
   a) Drawings AD2-C5 and AD2-C6, Delta 2.
   b) Drawings AD2-E1 through AD2-E3, Delta 2

III) New 8-1/2 x 11 & 11 x 17 Drawings Issued:
   a) Drawings AD2-C1 through AD2-C4, & AD2-C7, Delta 2.
   b) Drawings AD2-A1 through AD-A3, Delta 2.

IV) Pre-bid RFIs

SECTION 00 01 10

TABLE OF CONTENTS

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Single conductor building wire.

B. Underground feeder and branch-circuit cable.

C. Metal-clad cable.

D. Wiring connectors.

E. Electrical tape.

F. Heat shrink tubing.

G. Oxide inhibiting compound.

H. Wire pulling lubricant.

I. Cable ties.

1.02 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.

B. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

C. Section 31 23 16.13 - Trenching: Excavating, bedding, and backfilling.

1.03 REFERENCE STANDARDS

A. 12-7-4 CA Ref Stds - California Referenced Standards Code Chapter 12-7-4 Fire Resistive Standards; 2016.

B. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013 (Reapproved 2018).

C. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2011 (Reapproved 2017).

D. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010 (Reapproved 2014).

E. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2014).

F. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2017.

G. ASTM D4388 - Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes; 2013.

H. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

I. NECA 120 - Standard for Installing Armored Cable (AC) and Metal-Clad Cable (MC); 2012.

J. NECA 121 - Standard for Installing Nonmetallic-Sheathed Cable (Type NM-B) and Underground Feeder and Branch-Circuit Cable (Type UF); 2007.

K. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2009.

L. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2017.

M. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

N. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.

O. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.

P. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.

Q. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.

R. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.

S. UL 493 - Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables; Current Edition, Including All Revisions.

T. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.

U. UL 1569 - Metal-Clad Cables; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.

2. Coordinate the installation of direct burial cable with other trades to avoid conflicts with piping or other potential conflicts.

3. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.

4. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.

C. Manufactured Wiring System Shop Drawings: Provide plan views indicating proposed system layout with components identified; indicate branch circuit connections.

D. Field Quality Control Test Reports.

E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

F. Project Record Documents: Record actual installed circuiting arrangements. Record actual routing for underground circuits.

G. Maintenance Materials: Furnish the following for District's use in maintenance of project.

1. See Section 01 60 00 - Product Requirements, for additional provisions.

2. Extra Manufactured Wiring Systems Cable Assemblies: One of each configuration, 6 feet length.

1.06 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F, unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Architect and obtain direction before proceeding with work.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

C. Nonmetallic-sheathed cable is not permitted.

D. Underground feeder and branch-circuit cable is permitted only as follows:

1. Where not otherwise restricted, may be used:

a. For damp, wet, or corrosive locations as a substitute for NFPA 70, Type NMC nonmetallic-sheathed cable, when nonmetallic-sheathed cable is permitted.

2. In addition to other applicable restrictions, may not be used:

a. Where exposed to view.

b. Where exposed to damage.

E. Armored cable is not permitted.

F. Metal-clad cable is permitted only as follows:

1. Where not otherwise restricted, may be used:
    a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.
    b. Where concealed in hollow stud walls, above accessible ceilings, and under raised floors for branch circuits up to 20 A.
        1) Exception: Provide single conductor building wire in raceway for circuit homerun from first outlet to panelboard.
2. In addition to other applicable restrictions, may not be used:
    a. Unless approved by District.
    b. Where not approved for use by the authority having jurisdiction.
    c. Where exposed to view.
    d. Where exposed to damage.
    e. For damp, wet, or corrosive locations, unless provided with a PVC jacket listed as suitable for those locations.
    f. For isolated ground circuits, unless provided with an additional isolated/insulated grounding conductor.

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Provide new conductors and cables manufactured not more than one year prior to installation.

D. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

E. Comply with NEMA WC 70.

F. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

G. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

H. Conductors for Grounding and Bonding: Also comply with Section 26 05 26.

I. Conductors and Cables Installed in Cable Tray: Listed and labeled as suitable for cable tray use.

J. Conductors and Cables Installed Where Exposed to Direct Rays of Sun: Listed and labeled as sunlight resistant.

K. Conductors and Cables Installed Exposed in Spaces Used for Environmental Air (only where specifically permitted): Plenum rated, listed and labeled as suitable for use in return air plenums.

L. Conductor Material:

1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.

2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
3. Tinned Copper Conductors: Comply with ASTM B33.

M. Minimum Conductor Size:
1. Branch Circuits: 12 AWG.
a. Exceptions:
1) 20 A, 120 V circuits longer than 125 feet: 10 AWG, for voltage drop.
2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.
3) 20 A, 277 V circuits longer than 150 feet: 10 AWG, for voltage drop.
2. Control Circuits: 14 AWG.

N. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

O. Conductor Color Coding:
1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
2. Color Coding Method: Integrally colored insulation.
3. Color Code:
a. 480Y/277 V, 3 Phase, 4 Wire System:
1) Phase A: Brown.
2) Phase B: Orange.
3) Phase C: Yellow.
4) Neutral/Grounded: Gray.
b. 208Y/120 V, 3 Phase, 4 Wire System:
1) Phase A: Black.
2) Phase B: Red.
3) Phase C: Blue.
4) Neutral/Grounded: White.
c. 240/120 V High-Leg Delta, 3 Phase, 4 Wire System:
1) Phase A: Black.
2) Phase B (High-Leg): Orange.
3) Phase C: Blue.
4) Neutral/Grounded: White.
d. 240/120 V, 1 Phase, 3 Wire System:
1) Phase A: Black.
2) Phase B: Red.
3) Neutral/Grounded: White.
e. Equipment Ground, All Systems: Green.
f. Isolated Ground, All Systems: Green with yellow stripe.
g. Travelers for 3-Way and 4-Way Switching: Pink.
h. For control circuits, comply with manufacturer's recommended color code.

2.03 SINGLE CONDUCTOR BUILDING WIRE

A. Manufacturers:

1. Copper Building Wire:
    a. Cerro Wire LLC: www.cerrowire.com/#sle.
    b. Encore Wire Corporation: www.encorewire.com/#sle.
    c. Southwire Company: www.southwire.com/#sle.
    d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Description: Single conductor insulated wire.

C. Conductor Stranding:

1. Feeders and Branch Circuits:
    a. Size 10 AWG and Smaller: Solid.
    b. Size 8 AWG and Larger: Stranded.
2. Control Circuits: Stranded.

D. Insulation Voltage Rating: 600 V.

E. Insulation:

1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
    a. Size 4 AWG and Larger: Type XHHW-2.
    b. Installed Underground: Type XHHW-2.
    c. Fixture Wiring Within Luminaires: Type TFFN/TFN for luminaires with labeled maximum temperature of 90 degrees C; Approved suitable type for luminaires with labeled maximum temperature greater than 90 degrees C.

2.04 UNDERGROUND FEEDER AND BRANCH-CIRCUIT CABLE

A. Manufacturers:

1. Cerro Wire LLC: www.cerrowire.com/#sle.
2. Encore Wire Corporation: www.encorewire.com/#sle.
3. Southwire Company: www.southwire.com/#sle.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Description: NFPA 70, Type UF multiple-conductor cable listed and labeled as complying with UL 493, Type UF-B.

C. Provide equipment grounding conductor unless otherwise indicated.

D. Conductor Stranding:

1. Size 10 AWG and Smaller: Solid.
2. Size 8 AWG and Larger: Stranded.

E. Insulation Voltage Rating: 600 V.

2.05 METAL-CLAD CABLE

A. Manufacturers:

1. AFC Cable Systems Inc: www.afcweb.com/#sle.

2. Encore Wire Corporation: www.encorewire.com/#sle.
3. Southwire Company: www.southwire.com/#sle.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.

C. Conductor Stranding:
1. Size 10 AWG and Smaller: Solid.
2. Size 8 AWG and Larger: Stranded.

D. Insulation Voltage Rating: 600 V.

E. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.

F. Provide oversized neutral conductors where indicated or required.

G. Provide dedicated neutral conductor for each phase conductor where indicated or required.

H. Grounding: Full-size integral equipment grounding conductor.
1. Provide additional isolated/insulated grounding conductor where indicated or required.

I. Armor: Steel, interlocked tape.

J. Provide PVC jacket applied over cable armor where indicated or required for environment of installed location.

2.06 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

B. Connectors for Grounding and Bonding: Comply with Section 26 05 26.

C. Wiring Connectors for Splices and Taps:
1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.

D. Wiring Connectors for Terminations:
1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.
4. Provide motor pigtail connectors for connecting motor leads in order to facilitate disconnection.
5. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.

6. Stranded Conductors Size 10 AWG and Smaller: Use crimped terminals for connections to terminal screws.
7. Conductors for Control Circuits: Use crimped terminals for all connections.

E. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.

F. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
1. Manufacturers:
a. 3M: www.3m.com/#sle.
b. Ideal Industries, Inc: www.idealindustries.com/#sle.
c. NSI Industries LLC: www.nsiindustries.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.

G. Push-in Wire Connectors: Rated 600 V, 221 degrees F.
1. Manufacturers:
a. Ideal Industries, Inc: www.idealindustries.com/#sle.
b. NSI Industries LLC: www.nsiindustries.com/#sle.
c. Wago Corporation: www.wago.us/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.

H. Mechanical Connectors: Provide bolted type or set-screw type.
1. Manufacturers:
a. Burndy LLC: www.burndy.com.
b. Ilsco: www.ilsco.com/#sle.
c. Thomas & Betts Corporation: www.tnb.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.

I. Compression Connectors: Provide circumferential type or hex type crimp configuration.
1. Manufacturers:
a. Burndy LLC: www.burndy.com.
b. Ilsco: www.ilsco.com/#sle.
c. Thomas & Betts Corporation: www.tnb.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.

J. Crimped Terminals: Nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.
1. Manufacturers:
a. Burndy LLC: www.burndy.com.
b. Ilsco: www.ilsco.com/#sle.
c. Thomas & Betts Corporation: www.tnb.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.

2.07 ACCESSORIES

A. Electrical Tape:

1. Manufacturers:
    a. 3M: www.3m.com/#sle.
    b. Plymouth Rubber Europa: www.plymouthrubber.com/#sle.
    c. Substitutions: See Section 01 60 00 - Product Requirements.
2. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.
3. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.
4. Rubber Splicing Electrical Tape: Ethylene Propylene Rubber (EPR) tape, complying with ASTM D4388; minimum thickness of 30 mil; suitable for continuous temperature environment up to 194 degrees F and short-term 266 degrees F overload service.
5. Electrical Filler Tape: Rubber-based insulating moldable putty, minimum thickness of 125 mil; suitable for continuous temperature environment up to 176 degrees F.
6. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil.

B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.

1. Manufacturers:
    a. 3M: www.3m.com/#sle.
    b. Burndy LLC: www.burndy.com.
    c. Thomas & Betts Corporation: www.tnb.com/#sle.
    d. Substitutions: See Section 01 60 00 - Product Requirements.

C. Oxide Inhibiting Compound: Listed; suitable for use with the conductors or cables to be installed.

1. Manufacturers:
    a. Burndy LLC: www.burndy.com.
    b. Ideal Industries, Inc: www.idealindustries.com/#sle.
    c. Ilsco: www.ilsco.com/#sle.
    d. Substitutions: See Section 01 60 00 - Product Requirements.

D. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.

1. Manufacturers:
    a. 3M: www.3m.com/#sle.
    b. American Polywater Corporation: www.polywater.com/#sle.
    c. Ideal Industries, Inc: www.idealindustries.com/#sle.

d. Substitutions: See Section 01 60 00 - Product Requirements.

E. Cable Ties: Material and tensile strength rating suitable for application.

1. Manufacturers:

a. Burndy LLC: www.burndy.com.

b. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that work likely to damage wire and cable has been completed.

C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.

D. Verify that field measurements are as indicated.

E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.03 INSTALLATION

A. Circuiting Requirements:

1. Unless dimensioned, circuit routing indicated is diagrammatic.

2. When circuit destination is indicated without specific routing, determine exact routing required.

3. Arrange circuiting to minimize splices.

4. Include circuit lengths required to install connected devices within 10 ft of location indicated.

5. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.

6. Maintain separation of wiring for emergency systems in accordance with NFPA 70.

7. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is not permitted.

8. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three single phase branch circuits of different phases installed in the same raceway is permitted where not otherwise prohibited, except for the following:

a. Branch circuits fed from ground fault circuit interrupter (GFCI) circuit breakers.

b. Branch circuits fed from feed-through protection of GFI receptacles.

c. Branch circuits with dimming controls.

d. Branch circuits with isolated grounding conductor.

9. Provide oversized neutral/grounded conductors where indicated and as specified below.

a. Provide 200 percent rated neutral for feeders fed from K-rated transformers.
b. Provide 200 percent rated neutral for feeders serving panelboards with 200 percent rated neutral bus.

B. Install products in accordance with manufacturer's instructions.

C. Perform work in accordance with NECA 1 (general workmanship).

D. Install underground feeder and branch-circuit cable (Type UF-B) in accordance with NECA 121.

E. Install metal-clad cable (Type MC) in accordance with NECA 120.

F. Installation in Raceway:

1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
2. Pull all conductors and cables together into raceway at same time.
3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

G. Exposed Cable Installation (only where specifically permitted):

1. Route cables parallel or perpendicular to building structural members and surfaces.
2. Protect cables from physical damage.

H. Direct Burial Cable Installation:

1. Provide trenching and backfilling in accordance with Section 31 23 16.13 - Trenching.
2. Install cable with minimum cover of 24 inches unless otherwise indicated or required.
3. Protect cables from damage in accordance with NFPA 70.
4. Provide underground warning tape in accordance with Section 26 05 53 along entire cable length.

I. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

J. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.

1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.
2. Installation in Vertical Raceways: Provide supports where vertical rise exceeds permissible limits.

K. Terminate cables using suitable fittings.

1. Metal-Clad Cable (Type MC):
   a. Use listed fittings.
   b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.

L. Install conductors with a minimum of 12 inches of slack at each outlet.

M. Where conductors are installed in enclosures for future termination by others, provide a minimum of 5 feet of slack.

N. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

O. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

P. Make wiring connections using specified wiring connectors.

1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.

2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.

3. Do not remove conductor strands to facilitate insertion into connector.

4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.

5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.

6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

Q. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.

1. Dry Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.

a. For taped connections, first apply adequate amount of rubber splicing electrical tape or electrical filler tape, followed by outer covering of vinyl insulating electrical tape.

2. Damp Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.

a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.

b. For taped connections, follow same procedure as for dry locations but apply outer covering of moisture sealing electrical tape.

3. Wet Locations: Use heat shrink tubing.

R. Insulate ends of spare conductors using vinyl insulating electrical tape.

S. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.

T. Identify conductors and cables in accordance with Section 26 05 53.

U. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.

1. Disconnect surge protective devices (SPDs) prior to performing any high potential testing. Replace SPDs damaged by performing high potential testing with SPDs connected.

D. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Grounding and bonding requirements.

B. Conductors for grounding and bonding.

1.02 RELATED REQUIREMENTS

A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.

1. Includes oxide inhibiting compound.

B. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

B. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2017.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittals procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.

1.06 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

D. Installer Qualifications for Signal Reference Grids: Company with minimum five years documented experience with high frequency grounding systems.

E. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS

A. Do not use products for applications other than as permitted by NFPA 70 and product listing.

B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:

1. Provide products listed, classified, and labeled as suitable for the purpose intended.
2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 05 26:

1. Use insulated copper conductors unless otherwise indicated.
    a. Exceptions:
        1) Use bare copper conductors where installed underground in direct contact with earth.
        2) Use bare copper conductors where directly encased in concrete (not in raceway).
2. Factory Pre-fabricated Bonding Jumpers: Furnished with factory-installed ferrules; size braided cables to provide equivalent gage of specified conductors.

C. Connectors for Grounding and Bonding:

1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.
4. Manufacturers - Mechanical and Compression Connectors:
    a. Advanced Lightning Technology (ALT): www.altfab.com/#sle.
    b. Burndy LLC: www.burndy.com.
    c. Harger Lightning & Grounding: www.harger.com/#sle.
    d. Thomas & Betts Corporation: www.tnb.com/#sle.

e. Substitutions: See Section 01 60 00 - Product Requirements.

5. Manufacturers - Exothermic Welded Connections:
   a. Burndy LLC: www.burndy.com.
   b. Cadweld, a brand of Erico International Corporation: www.erico.com/#sle.
   c. thermOweld, subsidiary of Continental Industries; division of Burndy LLC: www.thermoweld.com/#sle.
   d. Substitutions: See Section 01 60 00 - Product Requirements.

D. Oxide Inhibiting Compound: Comply with Section 26 05 19.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that work likely to damage grounding and bonding system components has been completed.

B. Verify that field measurements are as indicated.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Identify grounding and bonding system components in accordance with Section 26 05 53.

3.03 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.13.

D. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.

E. Submit detailed reports indicating inspection and testing results and corrective actions taken.

END OF SECTION

SECTION 26 05 33.13
CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Galvanized steel rigid metal conduit (RMC).

B. Intermediate metal conduit (IMC).

C. PVC-coated galvanized steel rigid metal conduit (RMC).

D. Flexible metal conduit (FMC).

E. Liquidtight flexible metal conduit (LFMC).

F. Electrical metallic tubing (EMT).

G. Rigid polyvinyl chloride (PVC) conduit.

H. Conduit fittings.

I. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete encasement of conduits.

B. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.

C. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

1. Includes additional requirements for fittings for grounding and bonding.

D. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

E. Section 31 23 16 - Excavation.

F. Section 31 23 23 - Fill: Bedding and backfilling.

1.03 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2015.

B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S); 2015.

C. ANSI C80.6 - American National Standard for Electrical Intermediate Metal Conduit (EIMC); 2005.

D. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

E. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2013.

F. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2003.

G. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.

H. NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit; 2018.

I. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2013.

J. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2016.

K. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

L. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.

M. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.

N. UL 360 - Liquid-Tight Flexible Steel Conduit; Current Edition, Including All Revisions.

O. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.

P. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

Q. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.

R. UL 1242 - Electrical Intermediate Metal Conduit-Steel; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.

2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.

3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.

4. Coordinate the work with other trades to provide roof penetrations that preserve the integrity of the roofing system and do not void the roof warranty.

5. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:

1. Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittals procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.

C. Shop Drawings:

1. Indicate proposed arrangement for conduits to be installed within structural concrete slabs, where permitted.

2. Include proposed locations of roof penetrations and proposed methods for sealing.

D. Project Record Documents: Record actual routing for conduits installed underground, conduits embedded within concrete slabs, and conduits 2 inch (53 mm) trade size and larger.

1.06 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.

B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.

C. Underground:

1. Under Slab on Grade: Use rigid PVC conduit.
2. Exterior, Direct-Buried: Use rigid PVC conduit.
3. Exterior, Embedded Within Concrete: Use PVC-coated galvanized steel rigid metal conduit.
4. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit where emerging from underground.
5. Where rigid polyvinyl (PVC) conduit larger than 2 inch (53 mm) trade size is provided, use PVC-coated galvanized steel rigid metal conduit elbows for bends.
6. Where steel conduit is installed in direct contact with earth where soil has a resistivity of less than 2000 ohm-centimeters or is characterized as severely corrosive based on soils report or local experience, use corrosion protection tape to provide supplementary corrosion protection or use PVC-coated galvanized steel rigid metal conduit.
7. Where steel conduit emerges from concrete into soil, use corrosion protection tape to provide supplementary corrosion protection for a minimum of 4 inches on either side of where conduit emerges or use PVC-coated galvanized steel rigid metal conduit.

D. Embedded Within Concrete:

1. Within Slab on Grade: Not permitted.
2. Within Slab Above Ground: Not permitted.

3. Within Concrete Walls Above Ground: Use electrical metallic tubing (EMT) or rigid PVC conduit.
4. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit where emerging from concrete.
5. Where electrical metallic tubing (EMT) emerges from concrete into salt air, use corrosion protection tape to provide supplementary corrosion protection for a minimum of 4 inches on either side of where conduit emerges or use PVC-coated galvanized steel rigid metal conduit.

E. Concealed Within Masonry Walls: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).

F. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit.

G. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit.

H. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit.
1. Locations subject to physical damage include, but are not limited to:
a. Where exposed below 8 feet, except within electrical and communication rooms or closets.

I. Exposed, Exterior: Use galvanized steel rigid metal conduit or PVC-coated galvanized steel rigid metal conduit.

J. Concealed, Exterior, Not Embedded in Concrete or in Contact With Earth: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).

K. Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit.
1. Maximum Length: 6 feet.

L. Connections to Vibrating Equipment:
1. Dry Locations: Use flexible metal conduit.
2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.
3. Maximum Length: 6 feet unless otherwise indicated.
4. Vibrating equipment includes, but is not limited to:
a. Transformers.
b. Motors.

2.02 CONDUIT REQUIREMENTS

A. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling a mandrel through them.

B. Fittings for Grounding and Bonding: Also comply with Section 26 05 26.

C. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.

D. Provide products listed, classified, and labeled as suitable for the purpose intended.

E. Minimum Conduit Size, Unless Otherwise Indicated:
1. Branch Circuits: 1/2 inch (16 mm) trade size.

2. Branch Circuit Homeruns: 3/4 inch (21 mm) trade size.
3. Control Circuits: 1/2 inch (16 mm) trade size.
4. Flexible Connections to Luminaires: 3/8 inch (12 mm) trade size.
5. Underground, Interior: 1 inch (27 mm) trade size.
6. Underground, Exterior: 1 inch (27 mm) trade size.

F. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Manufacturers:
1. Allied Tube & Conduit: www.alliedeg.com/#sle.
2. Republic Conduit: www.republic-conduit.com/#sle.
3. Wheatland Tube, a Division of Zekelman Industries: www.wheatland.com/#sle.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

C. Fittings:
1. Manufacturers:
a. Bridgeport Fittings Inc: www.bptfittings.com/#sle.
b. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com/#sle.
c. Thomas & Betts Corporation: www.tnb.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.
2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Material: Use steel or malleable iron.
a. Do not use die cast zinc fittings.
4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 INTERMEDIATE METAL CONDUIT (IMC)

A. Manufacturers:
1. Allied Tube & Conduit: www.alliedeg.com/#sle.
2. Republic Conduit: www.republic-conduit.com/#sle.
3. Wheatland Tube, a Division of Zekelman Industries: www.wheatland.com/#sle.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.

C. Fittings:
1. Manufacturers:

a. Bridgeport Fittings Inc: www.bptfittings.com/#sle.
b. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com/#sle.
c. Thomas & Betts Corporation: www.tnb.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.

2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Material: Use steel or malleable iron.
   a. Do not use die cast zinc fittings.
4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.05 PVC-COATED GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Manufacturers:
   1. Thomas & Betts Corporation: www.tnb.com.
   2. Robroy Industries: www.robroy.com.
   3. Substitutions: See Section 01 60 00 - Product Requirements.
B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit with external polyvinyl chloride (PVC) coating complying with NEMA RN 1 and listed and labeled as complying with UL 6.
C. Exterior Coating: Polyvinyl chloride (PVC), nominal thickness of 40 mil.
D. PVC-Coated Fittings:
   1. Manufacturer: Same as manufacturer of PVC-coated conduit to be installed.
   2. Non-Hazardous Locations: Use fittings listed and labeled as complying with UL 514B.
   3. Material: Use steel or malleable iron.
   4. Exterior Coating: Polyvinyl chloride (PVC), minimum thickness of 40 mil.
E. PVC-Coated Supports: Furnish with exterior coating of polyvinyl chloride (PVC), minimum thickness of 15 mil.

2.06 FLEXIBLE METAL CONDUIT (FMC)

A. Manufacturers:
   1. AFC Cable Systems, Inc: www.afcweb.com.
   2. Electri-Flex Company: www.electriflex.com.
   3. International Metal Hose: www.metalhose.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.
B. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.
C. Fittings:
   1. Manufacturers:
      a. Bridgeport Fittings Inc: www.bptfittings.com/#sle.
      b. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com/#sle.

c. Thomas & Betts Corporation: www.tnb.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.

2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

3. Material: Use steel or malleable iron.
   a. Do not use die cast zinc fittings.

2.07 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Manufacturers:
   1. AFC Cable Systems, Inc: www.afcweb.com.
   2. Electri-Flex Company: www.electriflex.com.
   3. International Metal Hose: www.metalhose.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

C. Fittings:
   1. Manufacturers:
      a. Bridgeport Fittings Inc: www.bptfittings.com/#sle.
      b. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com/#sle.
      c. Thomas & Betts Corporation: www.tnb.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   3. Material: Use steel or malleable iron.
      a. Do not use die cast zinc fittings.

2.08 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:
   1. Allied Tube & Conduit: www.alliedeg.com.
   2. Republic Conduit: www.republic-conduit.com/#sle.
   3. Wheatland Tube Company: www.wheatland.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

C. Fittings:
   1. Manufacturers:
      a. Bridgeport Fittings Inc: www.bptfittings.com/#sle.
      b. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com/#sle.
      c. Thomas & Betts Corporation: www.tnb.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Material: Use steel or malleable iron.
    a. Do not use die cast zinc fittings.
4. Connectors and Couplings: Use compression (gland) or set-screw type.
    a. Do not use indenter type connectors and couplings.
5. Damp or Wet Locations (where permitted): Use fittings listed for use in wet locations.
6. Embedded Within Concrete (where permitted): Use fittings listed as concrete-tight. Fittings that require taping to be concrete-tight are acceptable.

2.09 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. Manufacturers:
    1. Cantex Inc: www.cantexinc.com/#sle.
    2. Carlon, a brand of Thomas & Betts Corporation: www.carlon.com/#sle.
    3. JM Eagle: www.jmeagle.com/#sle.
    4. Substitutions: See Section 01 60 00 - Product Requirements.
B. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.
C. Fittings:
    1. Manufacturer: Same as manufacturer of conduit to be connected.
    2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.10 ACCESSORIES

A. Corrosion Protection Tape: PVC-based, minimum thickness of 20 mil.
B. Conduit Joint Compound: Corrosion-resistant, electrically conductive; suitable for use with the conduit to be installed.
C. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.
D. Pull Strings: Use nylon cord with average breaking strength of not less than 200 pound-force.
E. Sealing Compound for Sealing Fittings: Listed for use with the particular fittings to be installed.
F. Modular Seals for Conduit Penetrations: Rated for minimum of 40 psig; Suitable for the conduits to be installed.
G. Sealing Systems for Roof Penetrations: Premanufactured components and accessories as required to preserve integrity of roofing system and maintain roof warranty; suitable for conduits and roofing system to be installed; designed to accommodate existing penetrations where applicable.
    1. Products:

a. Menzies Metal Products; Electrical Roof Stack and Cap: www.menzies-metal.com/#sle.
b. Menzies Metal Products; Electrical Retro Box: www.menzies-metal.com/#sle.
c. Substitutions: See Section 01 60 00 - Product Requirements.

H. Duct Bank Spacers: Nonmetallic; designed for maintaining conduit/duct spacing for concrete encasement in open trench installation; suitable for the conduit/duct arrangement to be installed.
1. Products:
a. Advance Products & Systems, LLC; Duct Bank Spacers: www.apsonline.com/#sle.
b. Substitutions: See Section 01 60 00 - Product Requirements.

I. Bore Spacers: Nonmetallic; designed for maintaining conduit/duct spacing for installation within casing; furnished with roller wheels to facilitate installation, openings to facilitate grout flow, and holes for stabilization cable; suitable for the casing and conduit/duct arrangement to be installed.
1. Products:
a. Advance Products & Systems, LLC; Bore Spacers: www.apsonline.com/#sle.
b. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that mounting surfaces are ready to receive conduits.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.
D. Install intermediate metal conduit (IMC) in accordance with NECA 101.
E. Install PVC-coated galvanized steel rigid metal conduit (RMC) using only tools approved by the manufacturer.
F. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.
G. Conduit Routing:
1. Unless dimensioned, conduit routing indicated is diagrammatic.
2. When conduit destination is indicated without specific routing, determine exact routing required.
3. Conceal all conduits unless specifically indicated to be exposed.
4. Conduits in the following areas may be exposed, unless otherwise indicated:
a. Electrical rooms.
b. Mechanical equipment rooms.

5. Unless otherwise approved, do not route conduits exposed:
    a. Across floors.
    b. Across roofs.
    c. Across top of parapet walls.
6. Conduits installed underground or embedded in concrete may be routed in the shortest possible manner unless otherwise indicated. Route all other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
7. Arrange conduit to maintain adequate headroom, clearances, and access.
8. Arrange conduit to provide no more than the equivalent of four 90 degree bends between pull points.
9. Arrange conduit to provide no more than 150 feet between pull points.
10. Route conduits above water and drain piping where possible.
11. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
12. Maintain minimum clearance of 6 inches between conduits and piping for other systems.
13. Maintain minimum clearance of 12 inches between conduits and hot surfaces. This includes, but is not limited to:
    a. Heaters.
    b. Hot water piping.
14. Group parallel conduits in the same area together on a common rack.

H. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
4. Use conduit strap to support single surface-mounted conduit.
    a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
5. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
6. Use conduit clamp to support single conduit from beam clamp or threaded rod.
7. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.
8. Use non-penetrating rooftop supports to support conduits routed across rooftops (only where approved).
9. Use of spring steel conduit clips for support of conduits is not permitted.
10. Use of wire for support of conduits is not permitted.

11. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with the most stringent requirements.

I. Connections and Terminations:

1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
3. Use suitable adapters where required to transition from one type of conduit to another.
4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
6. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
7. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

J. Penetrations:

1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
4. Conceal bends for conduit risers emerging above ground.
5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
6. Provide suitable modular seal where conduits penetrate exterior wall below grade.
7. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
8. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.
9. Provide metal escutcheon plates for conduit penetrations exposed to public view.

K. Underground Installation:

1. Provide trenching and backfilling in accordance with Section 31 23 16 and Section 31 23 23.
2. Minimum Cover, Unless Otherwise Indicated or Required:
   a. Underground, Exterior: 24 inches.
   b. Under Slab on Grade: 12 inches to bottom of slab.

3. Provide underground warning tape in accordance with Section 26 05 53 along entire conduit length for service entrance where not concrete-encased.

L. Embedment Within Structural Concrete Slabs (only where approved by Structural Engineer):

1. Include proposed conduit arrangement with submittals.
2. Maximum Conduit Size: 1 inch (27 mm) unless otherwise approved.
3. Install conduits within middle one third of slab thickness.
4. Secure conduits to prevent floating or movement during pouring of concrete.

M. Concrete Encasement: Where conduits not otherwise embedded within concrete are indicated to be concrete-encased, provide concrete in accordance with Section 03 30 00 with minimum concrete cover of 3 inches on all sides unless otherwise indicated.

N. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:

1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
3. Where conduits are subject to earth movement by settlement or frost.

O. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:

1. Where conduits pass from outdoors into conditioned interior spaces.
2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

P. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches at each end.

Q. Provide grounding and bonding in accordance with Section 26 05 26.

R. Identify conduits in accordance with Section 26 05 53.

3.03 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

C. Where coating of PVC-coated galvanized steel rigid metal conduit (RMC) contains cuts or abrasions, repair in accordance with manufacturer's instructions.

D. Correct deficiencies and replace damaged or defective conduits.

3.04 CLEANING

A. Clean interior of conduits to remove moisture and foreign matter.

3.05 PROTECTION

A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION

SECTION 26 05 33.16
BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.

B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.

C. Underground boxes/enclosures.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

C. Section 26 05 33.13 - Conduit for Electrical Systems:

1. Conduit bodies and other fittings.
2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.

D. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

E. Section 26 27 26 - Wiring Devices:

1. Wall plates.
2. Poke-through assemblies.
3. Access floor boxes.
4. Additional requirements for locating boxes for wiring devices.

1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.

C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.

D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013.

E. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports; 2013.

F. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2018.

G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. SCTE 77 - Specification for Underground Enclosure Integrity; 2017.

I. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

J. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

K. UL 508A - Industrial Control Panels; 2013.

L. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

M. UL 514C - Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.

2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.

3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.

4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.

5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.

6. Coordinate the work with other trades to preserve insulation integrity.

7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.

8. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for outlet and device boxes, junction and pull boxes, cabinets and enclosures, boxes for hazardous (classified) locations, and underground boxes/enclosures.

1. Underground Boxes/Enclosures: Include reports for load testing in accordance with SCTE 77 certified by a professional engineer or an independent testing agency upon request.

C. Samples:

1. Floor Boxes: Provide one sample(s) of each floor box proposed for substitution upon request.

D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

E. Project Record Documents: Record actual locations for outlet and device boxes, junction boxes, pull boxes, and underground boxes/enclosures.

F. Maintenance Materials: Furnish the following for District's use in maintenance of project.

1. See Section 01 60 00 - Product Requirements, for additional provisions.
2. Keys for Lockable Enclosures: Two of each different key.

1.06 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 BOXES

A. General Requirements:

1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
3. Provide products listed, classified, and labeled as suitable for the purpose intended.
4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
5. Provide grounding terminals within boxes where equipment grounding conductors terminate.

B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:

1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
3. Use cast iron boxes or cast aluminum boxes where exposed galvanized steel rigid metal conduit or exposed intermediate metal conduit (IMC) is used.
4. Use nonmetallic boxes where exposed rigid PVC conduit is used.
5. Use suitable concrete type boxes where flush-mounted in concrete.
6. Use suitable masonry type boxes where flush-mounted in masonry walls.
7. Use raised covers suitable for the type of wall construction and device configuration where required.
8. Use shallow boxes where required by the type of wall construction.
9. Do not use "through-wall" boxes designed for access from both sides of wall.

10. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
11. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
12. Nonmetallic Boxes: Comply with NEMA OS 2, and list and label as complying with UL 514C.
13. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
14. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
15. Minimum Box Size, Unless Otherwise Indicated:
    a. Wiring Devices (Other Than Communications Systems Outlets): 4 inch square by 1-1/2 inch deep (100 by 38 mm) trade size.
    b. Communications Systems Outlets: 4 inch square by 2-1/8 inch (100 by 54 mm) trade size.
    c. Ceiling Outlets: 4 inch octagonal or square by 1-1/2 inch deep (100 by 38 mm) trade size.
16. Wall Plates: Comply with Section 26 27 26.
17. Manufacturers:
    a. Cooper Crouse-Hinds, a division of Eaton Corporation: www.cooperindustries.com.
    b. Hubbell Incorporated; Bell Products: www.hubbell-rtb.com.
    c. Hubbell Incorporated; RACO Products: www.hubbell-rtb.com.
    d. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
    e. Thomas & Betts Corporation: www.tnb.com.
    f. Substitutions: See Section 01 60 00 - Product Requirements.

C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
2. NEMA 250 Environment Type, Unless Otherwise Indicated:
    a. Indoor Clean, Dry Locations: Type 1, painted steel.
    b. Outdoor Locations: Type 3R, painted steel.
3. Junction and Pull Boxes Larger Than 100 cubic inches:
    a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
    b. Boxes 6 square feet and Larger: Provide sectionalized screw-cover or hinged-cover enclosures.
4. Cabinets and Hinged-Cover Enclosures, Other Than Junction and Pull Boxes:
    a. Provide lockable hinged covers, all locks keyed alike unless otherwise indicated.
    b. Back Panels: Painted steel, removable.

c. Terminal Blocks: Provide voltage/current ratings and terminal quantity suitable for purpose indicated, with 25 percent spare terminal capacity.

5. Finish for Painted Steel Enclosures: Manufacturer's standard grey unless otherwise indicated.

6. Manufacturers:
   a. Cooper B-Line, a division of Eaton Corporation: www.cooperindustries.com.
   b. Hoffman, a brand of Pentair Technical Products: www.hoffmanonline.com.
   c. Hubbell Incorporated; Wiegmann Products: www.hubbell-wiegmann.com.
   d. Substitutions: See Section 01 60 00 - Product Requirements.

D. Underground Boxes/Enclosures:

1. Description: In-ground, open bottom boxes furnished with flush, non-skid covers with legend indicating type of service and stainless steel tamper resistant cover bolts.

2. Size: As indicated on drawings.

3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 12 inches.

4. Provide logo on cover to indicate type of service.

5. Applications:
   a. Sidewalks and Landscaped Areas Subject Only to Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77, Tier 8 load rating.
   b. Parking Lots, in Areas Subject Only To Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77, Tier 15 load rating.
   c. Do not use polymer concrete enclosures in areas subject to deliberate vehicular traffic.

6. Polymer Concrete Underground Boxes/Enclosures: Comply with SCTE 77.
   a. Manufacturers:
      1) Hubbell Incorporated; Quazite Products: www.hubbellpowersystems.com.
      2) MacLean Highline: www.macleanhighline.com.
      3) Oldcastle Precast, Inc: www.oldcastleprecast.com.
      4) Substitutions: See Section 01 60 00 - Product Requirements.
   b. Combination fiberglass/polymer concrete boxes/enclosures are acceptable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive boxes.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Provide separate boxes for emergency power and normal power systems.

E. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.

F. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.

G. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.

H. Box Locations:

1. Unless dimensioned, box locations indicated are approximate.
2. Locate boxes as required for devices installed under other sections or by others.
    a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 26 27 26.
3. Locate boxes so that wall plates do not span different building finishes.
4. Locate boxes so that wall plates do not cross masonry joints.
5. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
6. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches horizontal separation unless otherwise indicated.
7. Acoustic-Rated Walls: Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches horizontal separation.
8. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.
    a. Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads.
    b. Do not install flush-mounted boxes with area larger than 16 square inches or such that the total aggregate area of openings exceeds 100 square inches for any 100 square feet of wall area.
9. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 05 33.13.
10. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:
    a. Concealed above accessible suspended ceilings.
    b. Within joists in areas with no ceiling.
    c. Electrical rooms.
    d. Mechanical equipment rooms.

I. Box Supports:

1. Secure and support boxes in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
3. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.
4. Use far-side support to secure flush-mounted boxes supported from single stud in hollow stud walls. Repair or replace supports for boxes that permit excessive movement.

J. Install boxes plumb and level.

K. Flush-Mounted Boxes:
1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.
2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.

L. Floor-Mounted Cabinets: Mount on properly sized 3 inch high concrete pad constructed in accordance with Section 03 30 00.

M. Install boxes as required to preserve insulation integrity.

N. Nonmetallic Floor Boxes: Cut box flush with finished floor after concrete pour.

O. Underground Boxes/Enclosures:
1. Install enclosure on gravel base, minimum 6 inches deep.
2. Flush-mount enclosures located in concrete or paved areas.
3. Mount enclosures located in landscaped areas with top at 1 inch above finished grade.
4. Provide cast-in-place concrete collar constructed in accordance with Section 03 30 00, minimum 10 inches wide by 12 inches deep, around enclosures that are not located in concrete areas.
5. Install additional bracing inside enclosures in accordance with manufacturer's instructions to minimize box sidewall deflections during backfilling. Backfill with cover bolted in place.

P. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

Q. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.

R. Close unused box openings.

S. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.

T. Provide grounding and bonding in accordance with Section 26 05 26.

U. Identify boxes in accordance with Section 26 05 53.

3.03 CLEANING

A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.04 PROTECTION

A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION

SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical identification requirements.

B. Identification nameplates and labels.

C. Wire and cable markers.

D. Voltage markers.

E. Underground warning tape.

F. Floor marking tape.

G. Warning signs and labels.

1.02 RELATED REQUIREMENTS

A. Section 09 91 13 - Exterior Painting.

B. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.

C. Section 26 27 26 - Wiring Devices - Lutron: Device and wallplate finishes; factory pre-marked wallplates.

1.03 REFERENCE STANDARDS

A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2011.

B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2011.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.

B. Sequencing:

1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.

2. Do not install identification products until final surface finishes and painting are complete.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittals procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.

C. Shop Drawings: Provide schedule of items to be identified indicating proposed designations, materials, legends, and formats.

D. Samples:

1. Identification Nameplates: One of each type and color specified.

2. Warning Signs and Labels: One of each type and legend specified.

E. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation and installation of product.

1.06 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

1.07 FIELD CONDITIONS

A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

PART 2 PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS

A. Identification for Equipment:

1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.

a. Switchgear:

1) Identify ampere rating.

2) Identify voltage and phase.

3) Identify power source and circuit number. Include location when not within sight of equipment.

4) Use identification nameplate to identify main and tie devices.

5) Use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.

b. Switchboards:

1) Identify ampere rating.

2) Identify voltage and phase.

3) Identify power source and circuit number. Include location when not within sight of equipment.

4) Use identification nameplate to identify main overcurrent protective device.

5) Use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.

c. Motor Control Centers:

1) Identify ampere rating.

2) Identify voltage and phase.

3) Identify power source and circuit number. Include location when not within sight of equipment.
4) Use identification nameplate to identify main overcurrent protective device.
5) Use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.

d. Panelboards:
1) Identify ampere rating.
2) Identify voltage and phase.
3) Identify power source and circuit number. Include location when not within sight of equipment.
4) Identify main overcurrent protective device. Use identification label for panelboards with a door. For power distribution panelboards without a door, use identification nameplate.
5) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
6) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.

e. Transformers:
1) Identify kVA rating.
2) Identify voltage and phase for primary and secondary.
3) Identify power source and circuit number. Include location when not within sight of equipment.
4) Identify load(s) served. Include location when not within sight of equipment.

f. Enclosed switches, circuit breakers, and motor controllers:
1) Identify voltage and phase.
2) Identify power source and circuit number. Include location when not within sight of equipment.

g. Busway:
1) Identify ampere rating.
2) Identify voltage and phase.
3) Identify power source and circuit number. Include location when not within sight of equipment.
4) Provide identification at maximum intervals of 40 feet.
5) Use identification nameplate to identify load(s) served for each plug-in unit. Include location when not within sight of equipment.

h. Time Switches:
1) Identify load(s) served and associated circuits controlled. Include location.

i. Enclosed Contactors:
1) Identify ampere rating.
2) Identify voltage and phase.
3) Identify configuration, e.g., E.O.E.H. (electrically operated, electrically held) or E.O.M.H. (electrically operated, mechanically held).
4) Identify coil voltage.
5) Identify load(s) and associated circuits controlled. Include location.

j. Transfer Switches:
1) Identify voltage and phase.

2) Identify power source and circuit number for both normal power source and standby power source. Include location when not within sight of equipment.
3) Identify load(s) served. Include location when not within sight of equipment.
4) Identify short circuit current rating based on the specific overcurrent protective device type and settings protecting the transfer switch.

k. Electricity Meters:
1) Identify load(s) metered.

2. Service Equipment:
a. Use identification nameplate to identify each service disconnecting means.
b. For buildings or structures supplied by more than one service, or any combination of branch circuits, feeders, and services, use identification nameplate or means of identification acceptable to authority having jurisdiction at each service disconnecting means to identify all other services, feeders, and branch circuits supplying that building or structure. Verify format and descriptions with authority having jurisdiction.

3. Emergency System Equipment:
a. Use identification nameplate or voltage marker to identify emergency system equipment in accordance with NFPA 70.
b. Use identification nameplate at each piece of service equipment to identify type and location of on-site emergency power sources.
c. Use identification nameplate to identify emergency operating instructions for emergency system equipment.

4. Use voltage marker to identify highest voltage present for each piece of electrical equipment.

5. Use identification nameplate to identify equipment utilizing series ratings, where permitted, in accordance with NFPA 70.

6. Use identification nameplate to identify switchboards and panelboards utilizing a high leg delta system in accordance with NFPA 70.

7. Use identification nameplate to identify disconnect location for equipment with remote disconnecting means.

8. Use identification label on inside of door at each fused switch to identify required NEMA fuse class and size.

9. Use identification label on inside of door at each motor controller to identify nameplate horsepower, full load amperes, code letter, service factor, voltage, and phase of motor(s) controlled.

10. Use identification label to identify overcurrent protective devices for branch circuits serving fire alarm circuits. Identify with text "FIRE ALARM CIRCUIT".

11. Use field-painted floor markings, floor marking tape, or warning labels to identify required equipment working clearances where indicated or where required by the authority having jurisdiction.
a. Field-Painted Floor Markings: Alternating black and white stripes, 3 inches wide, painted in accordance with Section 09 91 23 and 09 91 13.

12. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70, including but not limited to the following.
    a. Service equipment.
    b. Industrial control panels.
    c. Motor control centers.
    d. Elevator control panels.
    e. Industrial machinery.
13. Use warning signs to identify electrical hazards for entrances to all rooms and other guarded locations that contain exposed live parts operating at 600 V nominal or less with the word message "DANGER; Electrical hazard; Authorized personnel only" or approved equivalent.
14. Use warning signs to identify electrical hazards for entrances to all buildings, vaults, rooms, or enclosures containing exposed live parts or exposed conductors operating at over 600 V nominal with the word message "DANGER; HIGH VOLTAGE; KEEP OUT".
15. Use warning labels to identify electrical hazards for equipment, compartments, and enclosures containing exposed live parts or exposed conductors operating at over 600 V nominal with the word message "DANGER; HIGH VOLTAGE; KEEP OUT".
16. Use warning labels, identification nameplates, or identification labels to identify electrical hazards for equipment where multiple power sources are present with the word message "DANGER; Hazardous voltage; Multiple power sources may be present; Disconnect all electric power including remote disconnects before servicing" or approved equivalent.

B. Identification for Conductors and Cables:
    1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 05 19.
    2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
    3. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
        a. At each source and load connection.
        b. Within boxes when more than one circuit is present.
        c. Within equipment enclosures when conductors and cables enter or leave the enclosure.
        d. In cable tray, at maximum intervals of 20 feet.
    4. Use wire and cable markers to identify connected grounding electrode system components for grounding electrode conductors.
    5. Use underground warning tape to identify direct buried cables.

C. Identification for Raceways:
    1. Use voltage markers to identify highest voltage present for accessible conduits at maximum intervals of 20 feet.

2. Use voltage markers or color-coded bands to identify systems other than normal power system for accessible conduits at maximum intervals of 20 feet.
    a. Color-Coded Bands: Use field-painting or vinyl color coding electrical tape to mark bands 3 inches wide.
        1) Color Code:
            (a) Emergency Power System: Red.
        2) Vinyl Color Coding Electrical Tape: Comply with Section 26 05 19.
3. Use identification labels or plastic marker tags to identify circuits enclosed for accessible conduits at wall penetrations, at floor penetrations, at roof penetrations, and at equipment terminations when source is not within sight.
4. Use identification labels or plastic marker tags to identify spare conduits at each end. Identify purpose and termination location.
5. Use underground warning tape to identify underground raceways.
6. Use voltage markers to identify highest voltage present for wireways at maximum intervals of 20 feet.

D. Identification for Boxes:
1. Use voltage markers to identify highest voltage present.
2. Use voltage markers or color coded boxes to identify systems other than normal power system.
    a. For exposed boxes in public areas, do not color code.
3. Use identification labels to identify circuits enclosed.
    a. For exposed boxes in public areas, provide identification on inside face of cover.
    b. Accessible but concealed: Provide identification on outside surface of cover plate.
4. Use warning labels to identify electrical hazards for boxes containing exposed live parts or exposed conductors operating at over 600 V nominal with the word message "DANGER; HIGH VOLTAGE; KEEP OUT".

E. Identification for Devices:
1. Wiring Device and Wallplate Finishes: Comply with Section 26 27 26.
2. Factory Pre-Marked Wallplates: Comply with Section 26 27 26.
3. Use identification label or engraved wallplate to identify serving branch circuit for all receptacles.
    a. For receptacles in public areas or in areas as directed by Architect, provide identification on outside surface of cover plate.
4. Use identification label or engraved wallplate to identify load controlled for wall-mounted control devices controlling loads that are not visible from the control location and for multiple wall-mounted control devices installed at one location.
5. Use identification label to identify receptacles protected by upstream GFI protection, where permitted.

F. Identification for Luminaires:
1. Use permanent red dot on luminaire frame to identify luminaires connected to emergency power system.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:

1. Manufacturers:
    a. Brimar Industries, Inc: www.brimar.com/#sle.
    b. Kolbi Pipe Marker Co: www.kolbipipemarkers.com.
    c. Seton Identification Products: www.seton.com.
    d. Substitutions: See Section 01 60 00 - Product Requirements.
2. Materials:
    a. Indoor Clean, Dry Locations: Use plastic nameplates.
    b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.
3. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.
    a. Exception: Provide minimum thickness of 1/8 inch when any dimension is greater than 4 inches.
4. Stainless Steel Nameplates: Minimum thickness of 1/32 inch; engraved or laser-etched text.
5. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch; engraved or laser-etched text.
6. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.

B. Identification Labels:

1. Manufacturers:
    a. Brady Corporation: www.bradyid.com.
    b. Brother International Corporation: www.brother-usa.com/#sle.
    c. Panduit Corp: www.panduit.com/#sle.
    d. Substitutions: See Section 01 60 00 - Product Requirements.
2. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
    a. Use only for indoor locations.
3. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

C. Format for Equipment Identification:

1. Minimum Size: 1 inch by 2.5 inches.
2. Legend:
    a. System designation where applicable:
        1) Emergency Power System: Identify with text "EMERGENCY".
        2) Fire Alarm System: Identify with text "FIRE ALARM".
    b. Equipment designation or other approved description.

c. Other information as indicated.

3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height:
   a. System Designation: 1 inch.
   b. Equipment Designation: 1/2 inch.
   c. Other Information: 1/4 inch.
   d. Exception: Provide minimum text height of 1 inch for equipment located more than 10 feet above floor or working platform.
5. Color:
   a. Normal Power System: White text on black background.
   b. Emergency Power System: White text on red background.
   c. Fire Alarm System: White text on red background.

D. Format for General Information and Operating Instructions:
1. Minimum Size: 1 inch by 2.5 inches.
2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 1/4 inch.
5. Color: Black text on white background unless otherwise indicated.
   a. Exceptions:
      1) Provide white text on red background for general information or operational instructions for emergency systems.
      2) Provide white text on red background for general information or operational instructions for fire alarm systems.

E. Format for Caution and Warning Messages:
1. Minimum Size: 2 inches by 4 inches.
2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 1/2 inch.
5. Color: Black text on yellow background unless otherwise indicated.

F. Format for Receptacle Identification:
1. Minimum Size: 3/8 inch by 1.5 inches.
2. Legend: Power source and circuit number or other designation indicated.
   a. Include voltage and phase for other than 120 V, single phase circuits.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 3/16 inch.
5. Color: Black text on clear background.

G. Format for Control Device Identification:

1. Minimum Size: 3/8 inch by 1.5 inches.
2. Legend: Load controlled or other designation indicated.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 3/16 inch.
5. Color: Black text on clear background.

H. Format for Fire Alarm Device Identification:

1. Minimum Size: 3/8 inch by 1.5 inches.
2. Legend: Designation indicated and device zone or address.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 3/16 inch.
5. Color: Red text on white background.

2.03 WIRE AND CABLE MARKERS

A. Manufacturers:

1. Brady Corporation: www.bradyid.com.
2. HellermannTyton: www.hellermanntyton.com.
3. Panduit Corp: www.panduit.com/#sle.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.

C. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.

D. Legend: Power source and circuit number or other designation indicated.

E. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.

1. Do not use handwritten text.

F. Minimum Text Height: 1/8 inch.

G. Color: Black text on white background unless otherwise indicated.

2.04 VOLTAGE MARKERS

A. Manufacturers:

1. Brady Corporation: www.bradyid.com.
2. Brimar Industries, Inc: www.brimar.com/#sle.
3. Seton Identification Products: www.seton.com.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Markers for Conduits: Use factory pre-printed self-adhesive vinyl, self-adhesive vinyl cloth, or vinyl snap-around type markers.

C. Markers for Boxes and Equipment Enclosures: Use factory pre-printed self-adhesive vinyl or self-adhesive vinyl cloth type markers.

D. Minimum Size:

1. Markers for Equipment: 1 1/8 by 4 1/2 inches.
2. Markers for Conduits: As recommended by manufacturer for conduit size to be identified.
3. Markers for Pull Boxes: 1 1/8 by 4 1/2 inches.
4. Markers for Junction Boxes: 1/2 by 2 1/4 inches.

E. Legend:

1. Markers for Voltage Identification: Highest voltage present.
2. Markers for System Identification:
   a. Emergency Power System: Text "EMERGENCY".

F. Color: Black text on orange background unless otherwise indicated.

2.05 UNDERGROUND WARNING TAPE

A. Manufacturers:

1. Brady Corporation: www.bradyid.com.
2. Brimar Industries, Inc: www.brimar.com/#sle.
3. Seton Identification Products: www.seton.com.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Materials: Use foil-backed detectable type polyethylene tape suitable for direct burial, unless otherwise indicated.

C. Non-detectable Type Tape: 6 inches wide, with minimum thickness of 4 mil.

D. Foil-backed Detectable Type Tape: 3 inches wide, with minimum thickness of 5 mil, unless otherwise required for proper detection.

E. Legend: Type of service, continuously repeated over full length of tape.

F. Color:

1. Tape for Buried Power Lines: Black text on red background.
2. Tape for Buried Communication, Alarm, and Signal Lines: Black text on orange background.

2.06 FLOOR MARKING TAPE

A. Manufacturers:

1. Brady Corporation: www.bradyid.com.
2. Brimar Industries, Inc: www.brimar.com/#sle.
3. Seton Identification Products: www.seton.com.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Floor Marking Tape for Equipment Working Clearance Identification: Self-adhesive vinyl or polyester tape with overlaminate, 3 inches wide, with alternating black and white stripes.

2.07 WARNING SIGNS AND LABELS

A. Manufacturers:

1. Brimar Industries, Inc: www.brimar.com/#sle.
2. Clarion Safety Systems, LLC: www.clarionsafety.com.
3. Seton Identification Products: www.seton.com.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.

C. Warning Signs:

1. Materials:
   a. Indoor Dry, Clean Locations: Use factory pre-printed rigid plastic or self-adhesive vinyl signs.
   b. Outdoor Locations: Use factory pre-printed rigid aluminum signs.
2. Rigid Signs: Provide four mounting holes at corners for mechanical fasteners.
3. Minimum Size: 7 by 10 inches unless otherwise indicated.

D. Warning Labels:

1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
   a. Do not use labels designed to be completed using handwritten text.
2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
3. Minimum Size: 2 by 4 inches unless otherwise indicated.

PART 3 EXECUTION

3.01 PREPARATION

A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:

1. Surface-Mounted Equipment: Enclosure front.
2. Flush-Mounted Equipment: Inside of equipment door.
3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
4. Elevated Equipment: Legible from the floor or working platform.
5. Branch Devices: Adjacent to device.
6. Interior Components: Legible from the point of access.

7. Conduits: Legible from the floor.
8. Boxes: Outside face of cover.
9. Conductors and Cables: Legible from the point of access.
10. Devices: Outside face of cover.

C. Install identification products centered, level, and parallel with lines of item being identified.

D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.

1. Do not use adhesives on exterior surfaces except where substrate cannot be penetrated.

E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

F. Install underground warning tape above buried lines with one tape per trench at 3 inches below finished grade.

G. Secure rigid signs using stainless steel screws.

H. Mark all handwritten text, where permitted, to be neat and legible.

3.03 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

END OF SECTION

SECTION 26 05 83
WIRING CONNECTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical connections to equipment.

1.02 RELATED REQUIREMENTS

A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.

B. Section 26 05 33.13 - Conduit for Electrical Systems.

C. Section 26 05 33.16 - Boxes for Electrical Systems.

D. Section 26 27 26 - Wiring Devices.

1.03 REFERENCE STANDARDS

A. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2015).

B. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2016.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.

2. Determine connection locations and requirements.

B. Sequencing:

1. Install rough-in of electrical connections before installation of equipment is required.

2. Make electrical connections before required start-up of equipment.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide wiring device manufacturer’s catalog information showing dimensions, configurations, and construction.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.06 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Products: Listed, classified, and labeled as suitable for the purpose intended.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.01 MATERIALS

A. Cords and Caps: NEMA WD 6; match receptacle configuration at outlet provided for equipment.
   1. Colors: Comply with NEMA WD 1.
   2. Cord Construction: NFPA 70, Type SO, multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
   3. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Wiring Devices: As specified in Section 26 27 26.

C. Flexible Conduit: As specified in Section 26 05 33.13.

D. Wire and Cable: As specified in Section 26 05 19.

E. Boxes: As specified in Section 26 05 33.16.

2.02 EQUIPMENT CONNECTIONS

A. As indicated:
   1. Electrical Connection: Flexible conduit.
   2. Electrical Connection: Cord and plug (NEMA 6-20R).
   3. Provide field-installed disconnect switch.
   4. Voltage: 120 volts, 3 phase, 60 Hz.
   5. Load rating: 19 kW plus 7.5 hp.
   6. FLA: 31.6 amperes.
   7. WSA: 38.3 amperes.
   8. Branch Circuit: 80 ampere fuse, maximum.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.02 ELECTRICAL CONNECTIONS

A. Make electrical connections in accordance with equipment manufacturer's instructions.

B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.

C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.

D. Provide receptacle outlet to accommodate connection with attachment plug.

E. Provide cord and cap where field-supplied attachment plug is required.

F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.

H. Install terminal block jumpers to complete equipment wiring requirements.

I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

END OF SECTION

SECTION 26 27 26
WIRING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall switches.

B. Receptacles.

C. Wall plates.

1.02 RELATED REQUIREMENTS

A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Manufactured wiring systems for use with access floor boxes with compatible pre-wired connectors.

B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

C. Section 26 05 33.16 - Boxes for Electrical Systems.

D. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

A. FS W-C-596 - Connector, Electrical, Power, General Specification for; 2017h.

B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification); 2017g.

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

D. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.

E. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2015).

F. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2016.

G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. UL 20 - General-Use Snap Switches; Current Edition, Including All Revisions.

I. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.

J. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.

K. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

L. UL 1310 - Class 2 Power Units; Current Edition, Including All Revisions.

M. UL 1449 - Standard for Surge Protective Devices; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.

2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
3. Coordinate the placement of outlet boxes for wall switches with actual installed door swings.
4. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
5. Coordinate the core drilling of holes for poke-through assemblies with the work covered under other sections.
6. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

B. Sequencing:
1. Do not install wiring devices until final surface finishes and painting are complete.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.
1. Wall Dimmers: Include derating information for ganged multiple devices.
2. Surge Protection Receptacles: Include surge current rating, voltage protection rating (VPR) for each protection mode, and diagnostics information.

C. Samples: One for each type and color of device and wall plate specified.

D. Certificates for Surge Protection Receptacles: Manufacturer's documentation of listing for compliance with UL 1449.

E. Field Quality Control Test Reports.

F. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

G. Operation and Maintenance Data:
1. Wall Dimmers: Include information on operation and setting of presets.
2. GFCI Receptacles: Include information on status indicators.
3. Surge Protection Receptacles: Include information on status indicators.

H. Project Record Documents: Record actual installed locations of wiring devices.

I. Maintenance Materials: Furnish the following for District's use in maintenance of project.
1. See Section 01 60 00 - Product Requirements, for additional provisions.
2. Screwdrivers for Tamper-Resistant Screws: Two for each type of screw.
3. Extra Keys for Locking Switches: Two of each type.
4. Extra Surge Protection Receptacles: Two of each type.
5. Extra Wall Plates: One of each style, size, and finish.
6. Extra Flush Floor Service Fittings: Two of each type.

7. Extra Poke-Through Core Hole Closure Plugs: Two for each core size.

1.06 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

D. Products: Listed, classified, and labeled as suitable for the purpose intended.

E. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND PROTECTION

A. Store in a clean, dry space in original manufacturer's packaging until ready for installation.

PART 2 PRODUCTS

2.01 WIRING DEVICE APPLICATIONS

A. Provide wiring devices suitable for intended use and with ratings adequate for load served.

B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.

C. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.

D. Provide tamper resistant receptacles for receptacles installed in dwelling units.

E. Provide GFCI protection for receptacles installed within 6 feet of sinks.

F. Provide GFCI protection for receptacles installed in kitchens.

G. Provide GFCI protection for receptacles serving electric drinking fountains.

H. Provide isolated ground receptacles for receptacles serving computers.

I. Unless noted otherwise, do not use combination switch/receptacle devices.

J. For flush floor service fittings, use tile rings for installations in tile floors.

K. For flush floor service fittings, use carpet flanges for installations in carpeted floors.

2.02 WIRING DEVICE FINISHES

A. Provide wiring device finishes as described below unless otherwise indicated.

B. Wiring Devices Installed in Wet or Damp Locations: White with specified weatherproof cover.

C. Isolated Ground Convenience Receptacles: Orange.

D. Surge Protection Receptacles: Blue.

E. Wiring Devices Connected to Emergency Power: Red with red nylon wall plate.

F. Above-Floor Service Fittings: Gray wiring devices with satin aluminum housing.

2.03 WALL SWITCHES

A. Manufacturers:

1. Hubbell Incorporated: www.hubbell.com/#sle.
2. Leviton Manufacturing Company, Inc: www.leviton.com.
3. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.

1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.

C. Standard Wall Switches: Industrial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

D. Locking Wall Switches: Industrial specification grade, 20 A, 120/277 V with lever type keyed switch actuator and maintained contacts; switches keyed alike; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

E. Momentary Contact Wall Switches: Industrial specification grade, 20 A, 120/277 V with toggle type three position switch actuator and momentary contacts; single pole double throw, off with switch actuator in center position.

F. Locking Momentary Contact Wall Switches: Industrial specification grade, 20 A, 120/277 V with lever type keyed three position switch actuator and momentary contacts; switches keyed alike; single pole double throw, off with switch actuator in center position.

2.04 RECEPTACLES

A. Manufacturers:

1. Hubbell Incorporated: www.hubbell.com/#sle.
2. Leviton Manufacturing Company, Inc: www.leviton.com.
3. Lutron Electronics Company, Inc; Designer Style: www.lutron.com.
4. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us
5. Source Limitations: Where wall controls are furnished as part of lighting control system, provide accessory matching receptacles and wallplates by the same manufacturer in locations indicated.

B. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.

1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
2. NEMA configurations specified are according to NEMA WD 6.

C. Convenience Receptacles:

1. Standard Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.
2. Automatically Controlled Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; controlled receptacle marking on device face per NFPA 70; single or duplex as indicated on the drawings.
3. Isolated Ground Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R, with ground contacts isolated from mounting strap; isolated ground triangle mark on device face; single or duplex as indicated on the drawings.
4. Weather Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations; single or duplex as indicated on the drawings.
5. Tamper Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as tamper resistant type; single or duplex as indicated on the drawings.
6. Tamper Resistant and Weather Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as tamper resistant type and as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations; single or duplex as indicated on the drawings.
7. Illuminated Convenience Receptacles: Commercial specification grade, 20A, 125V, NEMA 5-20R; illuminated face or indicator light to indicate power is being supplied to receptacle; single or duplex as indicated on the drawings.

D. GFCI Receptacles:
1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
2. Standard GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style.
3. Weather Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.
4. Tamper Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as tamper resistant type.
5. Tamper Resistant and Weather Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as tamper resistant type and as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.

E. USB Charging Devices:
1. USB Charging Devices - General Requirements: Listed as complying with UL 1310.
   a. Charging Capacity - Two-Port Devices: 2.1 A, minimum.
   b. Charging Capacity - Four-Port Devices: 4.2 A, minimum.

2. USB Charging/Tamper Resistant Receptacle Combination Devices: Two-port (Type A) USB charging device and receptacle, commercial specification grade, duplex, 20A, 125V, NEMA 5-20R, listed and labeled as tamper resistant type; rectangular decorator style.
3. USB Charging Noncombination Devices: Four-port (Type A); rectangular decorator style.

F. Surge Protection Receptacles:
1. Surge Protection Receptacles - General Requirements: Listed and labeled as complying with UL 1449, Type 2 or 3.
a. Energy Dissipation: Not less than 240 J per mode.
b. Protected Modes: L-N, L-G, N-G.
c. UL 1449 Voltage Protection Rating (VPR): Not more than 700 V for L-N, L-G modes and 1200 V for N-G mode.
d. Diagnostics:
1) Visual Notification: Provide indicator light to report functional status of surge protection.
2) Audible Notification: Provide switchable audible alarm to report that surge protection is not functional.
2. Standard Surge Protection Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style.
3. Isolated Ground Surge Protection Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, with ground contacts isolated from mounting strap.

G. Locking Receptacles: Industrial specification grade, configuration as indicated on the drawings.
1. Standard Locking Convenience Receptacles: Single, 20A, 125V, NEMA L5-20R.

H. Clock Hanger Receptacles: Single, 15A, 125V, NEMA 5-15R.

2.05 WALL PLATES

A. Manufacturers:
1. Hubbell Incorporated: www.hubbell-wiring.com.
2. Leviton Manufacturing Company, Inc: www.leviton.com.
3. Lutron Electronics Company, Inc: www.lutron.com/sle.
4. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us
5. Substitutions: See Section 01 60 00 - Product Requirements.
6. Source Limitations: Where wall controls are furnished as part of lighting control system, provide accessory matching receptacles and wallplates by the same manufacturer in locations indicated.

B. Wall Plates: Comply with UL 514D.
1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
2. Size: Standard.
3. Screws: Metal with slotted heads finished to match wall plate finish.

4. Provide screwless wallplates with concealed mounting hardware where indicated.

C. Nylon Wall Plates: Smooth finish, high-impact thermoplastic.

D. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.

E. Premarked Wall Plates: Factory labeled as indicated; hot stamped for nylon wall plates and engraved for metal wall plates.

F. Weatherproof Covers for Damp Locations: Gasketed, cast aluminum, with self-closing hinged cover and corrosion-resistant screws; listed as suitable for use in wet locations with cover closed.

G. Weatherproof Covers for Wet Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected and identified as extra-duty type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.

C. Verify that wall openings are neatly cut and will be completely covered by wall plates.

D. Verify that final surface finishes are complete, including painting.

E. Verify that floor boxes are adjusted properly.

F. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

G. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.

B. Perform work in a neat and workmanlike manner in accordance with NECA 1, including mounting heights specified in that standard unless otherwise indicated.

C. Coordinate locations of outlet boxes provided under Section 26 05 33.16 as required for installation of wiring devices provided under this section.

1. Mounting Heights: Unless otherwise indicated, as follows:
   a. Wall Switches: 48 inches above finished floor to top of device.
   b. Wall Dimmers: 48 inches above finished floor to top of device.
   c. Fan Speed Controllers: 48 inches above finished floor to top of device.
   d. Receptacles: Minimum 18 inches above finished floor or 6 inches above counter.

2. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.
3. Where multiple receptacles, wall switches, or wall dimmers are installed at the same location and at the same mounting height, gang devices together under a common wall plate.
4. Locate wall switches on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Architect to obtain direction prior to proceeding with work.
5. Locate receptacles for electric drinking fountains concealed behind drinking fountain according to manufacturer's instructions.

D. Install wiring devices in accordance with manufacturer's instructions.

E. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

F. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.

G. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.

H. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

I. For isolated ground receptacles, connect wiring device grounding terminal only to identified branch circuit isolated equipment grounding conductor. Do not connect grounding terminal to outlet box or normal branch circuit equipment grounding conductor.

J. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.

K. Where split-wired duplex receptacles are indicated, remove tabs connecting top and bottom receptacles.

L. Install wiring devices plumb and level with mounting yoke held rigidly in place.

M. Install wall switches with OFF position down.

N. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.

O. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.

P. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

Q. Identify wiring devices in accordance with Section 26 05 53.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Inspect each wiring device for damage and defects.

C. Operate each wall switch, wall dimmer, and fan speed controller with circuit energized to verify proper operation.

D. Test each receptacle to verify operation and proper polarity.

E. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.

F. Inspect each surge protection receptacle to verify surge protection is active.

G. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.05 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

B. Adjust presets for wall dimmers according to manufacturer's instructions as directed by Architect.

3.06 CLEANING

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION

SECTION 32 31 13

CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Posts, rails, and frames.

B. Wire fabric and windscreen fabric.

C. Concrete.

D. Manual gates with related hardware.

E. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete anchorage for posts.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

D. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric; 2011a (Reapproved 2017).

E. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.

F. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2009 (Reapproved 2015).

G. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2018.

H. ASTM F567 - Standard Practice for Installation of Chain-Link Fence; 2014a.

I. ASTM F626 - Standard Specification for Fence Fittings; 2014.

J. ASTM F1043 - Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework; 2017a.

K. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures; 2016.

L. CLFMI CLF 2445 - Product Manual - Drawings; 2012.

M. ASTM F900 - Standard Specification for Industrial and Commercial Swing Gates; 2011.

N. CLFMI CLF-FIG0111 - Field Inspection Guide; 2014.

O. CLFMI CLF-PM0610 - Product Manual; 2017.

P. CLFMI CLF-SFR0111 - Security Fencing Recommendations; 2014.

Q. CLFMI WLG 2445 - Chain Link Fence Wind Load Guide for the Selection of Line Post and Line Post Spacing; June 2016.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.

C. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components. See CLFMI CLF-SFR0111 for planning and design recommendations.

D. Samples: Submit two samples of fence fabric, 12 inch by 12 inch in size illustrating construction and colored finish.

E. Manufacturer's Installation Instructions: Indicate installation requirements and accessories.

F. Manufacturer's Qualification Statement.

G. Fence Installer Qualification Statement.

H. Project Record Documents: Accurately record actual locations of property perimeter posts relative to property lines.

I. Field Inspection Records: Provide installation inspection records that include post settings, framework, fabric, barbed wire, fittings and accessories, gates, and workmanship.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Fence Installer: Company with demonstrated successful experience installing similar projects and products, with not less than five years of documented experience.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty for gate hardware.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Chain Link Fences and Gates, or equal:

1. Allied Tube and Conduit Corp.: www.atcfence.com
2. Anchor Fence, Inc.: www.anchorfenceinc.com.
3. Master-Halco, Inc: www.masterhalco.com/#sle.
4. Merchants Metals: www.merchantsmetals.com/#sle.
5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 REGULATORY REQUIREMENTS

A. Provide fences and gates meeting life safety and accessibility requirements of California Building Code (CBC) Title 24, Part 2, Chapters 10 and 11B; and ADA Standards, per latest amendments.

1. Gates that are part of the accessible route shall meet all the requirements of an accessible door in compliance with CBC Section 11B-404 and 11B-206.5.
2. Gate Hardware: Meet the requirements of CBC 11B-206.5 and 11B-404.2.9.
    a. Latch: Latch, including padlock eye as integral part of latch, mounted 40 inches above finish grade. Comply with California Fire Code.
    b. Hardware shall comply with local Fire Authority, California Building Code (CBC) Title 24, Section 1010.2, and California Fire Code (CFC) Section 503.5.2.
    c. The lever of lever actuated latches or locks for an accessible gate shall be curved with a return to within 1/2 inch of the (face of) gate to prevent catching on the clothing or persons. California Referenced Standards Code T-24 Part 12, Section 12-10-202, Item (F).
    d. Hand activated opening hardware, handles, pulls, latches, locks, and other operating devices for and accessible gate shall have a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist to operate. CBC Section 11B-404.2.7 and 11B-309.4.
3. Swing doors and gate surfaces within 10 inches of the finish floor or ground shall have a smooth surface on the push side extending the full width of the door or gate. Parts creating horizontal or vertical joints in these surfaces shall be within 1/16 inch of the same plane as the other and be free of sharp or abrasive edges. Cavities created by added kick plates shall be capped. CBC Section 11B·404.2.10
4. The bottom of the gate shall be within 3 inches of the finish surface of the path of travel. The maximum effort to operate a gate shall not exceed 5 lbf. CBC Section 11B-404.2.9.

2.03 MATERIALS

A. Posts, Rails, and Frames:

1. ASTM A1011/A1011M, Designation SS; hot-rolled steel strip, cold formed to pipe configuration, longitudinally welded construction, minimum yield strength of 50 ksi; zinc coating complying with ASTM F1043 and**/or** ASTM F1083.
    a. Alternate minimum yield strengths based on application and load calculations:
        1) Intermediate grade: 50,000 psi (344 MPa).
        2) High Strength 83000 Grade: 83,000 psi (572 MPa).
2. Line Posts: Type I round.
3. Terminal, Corner, Rail, Brace, and Gate Posts: Type I round.
4. Comply with CLFMI CLF-PM0610.

B. Wire Fabric:

1. ASTM A392 zinc coated steel chain link fabric.
2. Comply with CLFMI CLF-PM0610.

C. Concrete:

1. Ready-mixed, complying with ASTM C94/C94M; normal Portland cement; 2,500 psi strength at 28 days, 3 inch slump; 3/4 inch nominal size aggregate.

2.04 COMPONENTS

A. Sizes to be determined by fencing manufacturer for wind load of fencing with "tennis court" windscreen and design wind speed of 110 mph. Comply with CLFMI WLG 2445.

B. Line Posts: 2.38 inch diameter. Unless indicated larger on Drawings.

C. Corner and Terminal Posts: 2.88 inch diameter. Unless indicated larger on Drawings.

D. Gate Posts: 3-1/2 inch diameter. Unless indicated larger on Drawings.

1. Provide posts for supporting single gate leaf, or one leaf of a double gate installation, for nominal gate widths.
   a. Comply with CLFMI CLF 2445 published standards.

E. Top and Brace Rail: 1.66 inch diameter, plain end, sleeve coupled. Unless indicated larger on Drawings.

F. Bottom Rail: 1.66 inch diameter, plain end, sleeve coupled. Unless indicated larger on Drawings.

G. Gate Frame: 1.90 inch diameter for welded fabrication.

1. Fabricate perimeter frames of gates from metal and finish to match fence framework. Provide horizontal and vertical members to ensure proper gate operation and attachment of fabric, hardware, and accessories with additional horizontal and vertical members to insure proper gate operation.

2. Use same fabric as for fence, installed with stretcher bars and bands at vertical edges and at top and bottom edges.

3. Install diagonal cross bracing consisting of 5/16 inch diameter truss rods with drop forged steel turnbuckles, per ASTM F626, where necessary to insure frame rigidity without sag or twist.

4. Meet the requirements of ASTM F900. Maximum gate leaf width 4'-0" and minimum gate width of 36 inches along path of travel and means of egress.
   a. Gate frame to be of welded construction.
      1) Weld areas to be protected with zinc-rich paint per ASTM A780/A780M.
   b. The gate frame members are to be spaced no greater than 8'-0" (2.44 m) apart horizontally or vertically.

H. Fabric: 1**-3/4** inch diamond mesh interwoven wire, ~~11~~ **9** gage, ~~0.1205~~**0.1483** inch thick, top selvage knuckle end closed, bottom selvage knuckle end closed.

I. Tension Wire: 6 gage, 0.1920 inch thick steel, single strand.

J. Tension Band: 3/4 by 3/16 inch thick steel.

K. Tension Strap: 3/4 by 3/16 inch thick steel.

L. Tie Wire: Aluminum alloy steel wire.

2.05 MANUAL GATES AND RELATED HARDWARE

A. Hardware for Single Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; fork latch with gravity drop and padlock hasp.

B. Hardware for Double Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; drop bolt on inactive leaf engaging socket stop set in concrete, active leaf latched to inactive leaf preventing raising of drop bolt, padlock hasp; keepers to hold gate in fully open position.

1. Drop bolt is not to be provided or installed on exit gates.
2. Provide galvanized pressed steel locking latch, requiring one padlock for locking both gate leaves, accessible from either side.

C. Hinges: Finished to match fence components.

1. Hinges: Hot dip galvanized pressed steel or malleable iron, structurally capable of supporting gate leaf and allow opening and closing without binding.
2. Non-lift-off type hinge design to permit gate to swing 180 degrees.
3. Closing: Manual.

D. Latches: Finished to match fence components.

1. Galvanized forked type with welded U-bracket on both sides. Capable of retaining gate in closed position and have provision for padlock.
   a. Latch shall permit operation from either side of gate.

E. Gate Holdback: Provide galvanized gate hold back keeper for each gate leaf over 5 feet wide.

1. Gate keeper shall consist of mechanical device for securing free end of gate when in full open position.

F. HARDWARE SET # 01: "GATE"

1. For use on Gates where exit devices are indicated.
2. Provide for each Single (SGL) Gate/door(s).

QTY.	ITEM	DESCRIPTION	FINISH	MFR
1 EA	Hinge	#1479A52	628	IVE
1 EA	Exit Device	AX-PA-CD-99NL-OP x 110NL	626	VON
1 EA	Core Only	23-030	626	SCH
1 EA	Armor Collar	K-24	626	KEE
1 EA	Anti-Vandal Pull	1097HA-SP	630	TRM
1 EA	Surface Closer	4040XP-SCUSH x 4040XP-18PA/61/30	689	LCN

2.06 ACCESSORIES

A. Caps: Cast steel galvanized; sized to post diameter, set screw retainer.

B. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; steel.

C. Windscreen Fabric:

1. Basis of Design: Permascreen 70 manufacured by All Court Fabrics, Inc.; allcourtfabrics.com, or approved equal.
   a. Acceptable Manufacturers:
      1) Aer-Flo, Inc.: aerflo.com.
      2) Collins Company, Fullerton, CA (714) 870-9779.
      3) Fence Screen: www.fencescreen.com.

b. Substitutions: See Section 01 60 00 - Product Requirements.

2. Warranty: 3 Year Limited Warranty.

3. Windscreen Fabric: Vinyl Coated Polyester.
   a. Weave: Open, 9 x 12.
   b. Opacity: 70 percent.
   c. Weight: 9.0 ounce per square yard.
   d. Tensile strength:
      1) Grab: 230 lbs. x 200 lbs.
      2) Strip: 200 lbs. x 140 lbs.

4. Color: To be selected by Architect from full range.

5. Fabric fabrication:
   a. Reinforce sewn hems and seams with folded binding tape.
   b. Provide center reinforcing tape in addition to reinforced perimeter hems and panel seams.
   c. Sew hems and seams with UV light resistant polyester thread.
   d. Provide brass grommets spaced at 12 inches on center in perimeter hems and center reinforcing tape.

D. Other Fencing Accessories: Provide other pressed steel or cast iron accessories and fencing items necessary for a complete installation as required by Project conditions and as recommended by fencing manufacturer.

2.07 FINISHES

A. Components (Other than Fabric): Galvanized in accordance with ASTM A123/A123M, at 1.7 ounces per square foot.

B. Hardware: Hot-dip galvanized to weight required by ASTM A153/A153M.

C. Accessories: Same finish as framing.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify that areas are clear of obstructions or debris.

3.02 PREPARATION

A. Removal: Obstructions or debris.

B. Fence Layout: Lay out fencing in advance of installation, noting locations for posts, gates, operators and accessories applicable to the installation.

1. Space line posts maximum 10 feet o.c., unless otherwise indicated.

2. Straight runs between braced posts shall not exceed 500 feet.

C. Excavation: Excavate line post holes as indicated on Drawings~~, minimum 10 inch diameter and to a depth of not less than 30 inches for post plus 3 inches below bottom of post.~~**.**

~~1. Excavate corner end, pull and gate posts minimum 12 inch diameter and to a depth of not less than 36 inches for post plus 3 inches below bottom of post.~~

~~2~~**1**. Provide footing depths **as indicated on Drawings and** conforming to CLFMI published standards, based on fabric height, wind pressure and soil types.

3.03 INSTALLATION

A. Install framework, fabric, accessories and gates in accordance with ASTM F567.

B. Place fabric on outside of posts and rails.

C. Set intermediate posts plumb, in concrete footings with top of footing 2 inches above finish grade. Slope top of concrete for water runoff.

D. Line Post Footing Depth Below Finish Grade: ASTM F567.

E. Corner, Gate and Terminal Post Footing Depth Below Finish Grade: ASTM F567.

F. Gates: Install gates plumb, level and secure. Install as recommended by fence manufacturer. Adjust hardware for smooth operation and lubricate as required.

G. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail one bay from end and gate posts.

H. Provide top rail through line post tops and splice with 6 inch long rail sleeves.

1. Connect ends with sleeves forming a rigid connection, allow for expansion and contraction.

I. Install center brace rail on corner gate leaves.

1. Center Rails: Install mid rails between line posts and attach to post using rail end or line rail clamps.

J. Bottom Rails: Install bottom rails between posts and attach to post using rail end or line rail clamps

K. Do not stretch fabric until concrete foundation has cured 28 days.

L. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less.

1. Adjust fabric for rigid installation.

2. Tighten hardware, fasteners, and accessories.

3. Bend ends of tie wires to preclude snagging.

M. Position bottom of fabric 2 inches above finished grade.

N. Fastening: Fasten all fence and gate hardware secured in place by peening or welding to allow proper operation of components, but to prevent disassembly of fencing or removal of gates.

1. Fastenings, hardware, and all other connections, which have been peened or welded, shall be covered with a heated re-galvanizing alloy.

O. Fasten fabric to top rail, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers.

P. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.

Q. Do not attach the hinged side of gate to building wall; provide gate posts.

R. Install gate locking device specified in Section 08 71 00.

S. Peen all bolts upon installation.

1. Fasten all fence and gate hardware secured in place by peening or welding to allow proper operation of components, but to prevent disassembly of fencing or removal of gates.
2. Cover fastenings, hardware, and all other connections, which have been peened or welded, with a heated re-galvanizing alloy.

T. Perform three random field inspections confirming proper installation.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch.

B. Maximum Offset From True Position: 1 inch.

C. Do not infringe on adjacent property lines.

3.05 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Layout: Verify that fence installation markings are accurate to design, paying attention to gate locations, underground utilities, and property lines.

C. Post Settings: Randomly inspect three locations against design for:

1. Hole diameter.
2. Hole depth.
3. Hole spacing.

D. Fence Height: Randomly measure fence height at three locations or at areas that appear out of compliance with design.

E. Gates: Inspect for level, plumb, and alignment.

F. Workmanship: Verify neat installation free of defects. See CLFMI CLF-FIG0111 for field inspection guidance.

3.06 CLEANING

A. Leave immediate work area neat at end of each work day.

B. Clean jobsite of excess materials; scatter excess material from post hole excavations uniformly away from posts. Remove excess material if required.

C. Clean fence with mild household detergent and clean water rinse well.

D. Remove mortar from exposed posts and other fencing material using a 10 percent solution of muriatic acid followed immediately by several rinses with clean water.

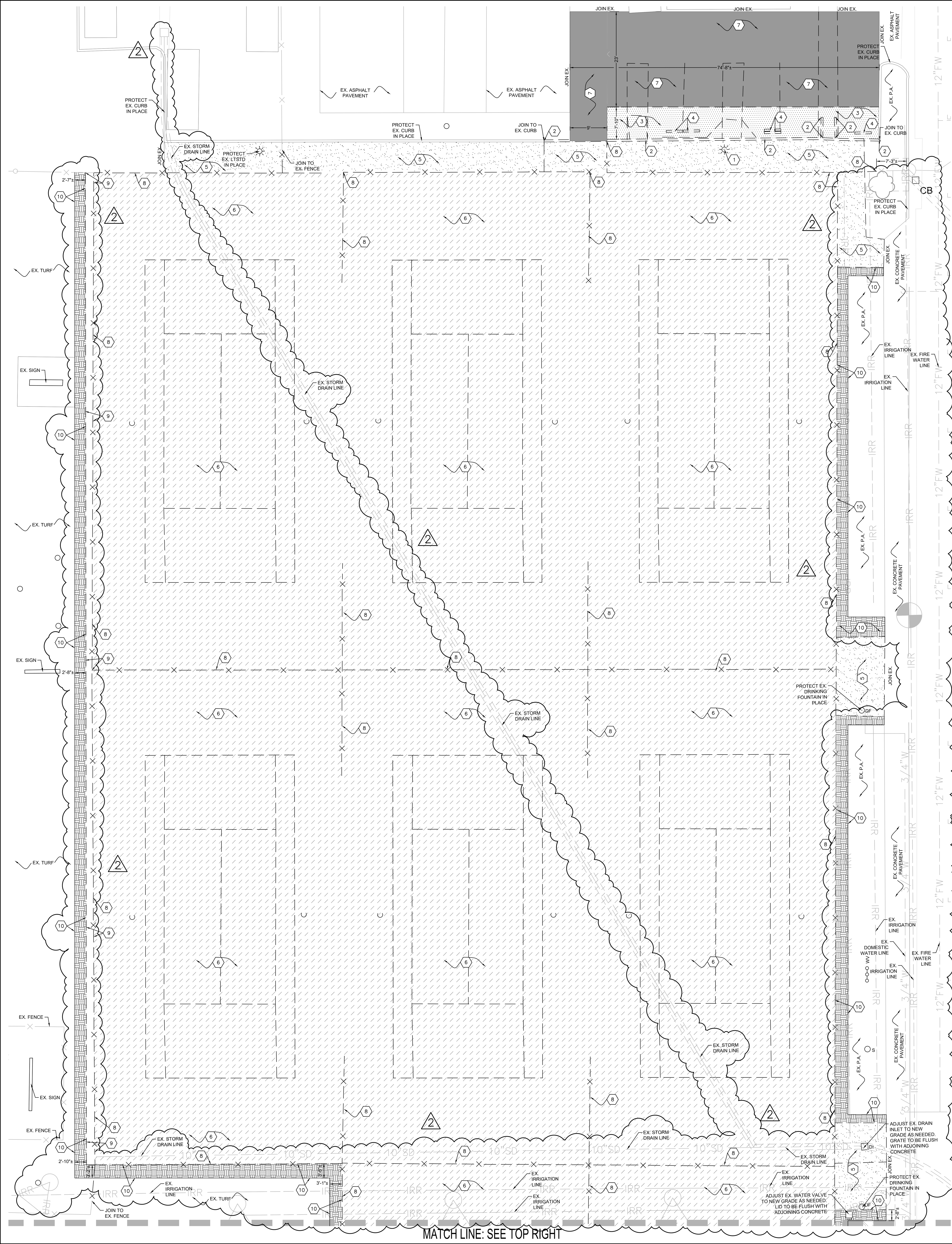
E. Touch up scratched surfaces using materials recommended by manufacturer. Match touched-up paint color to factory-applied finish.

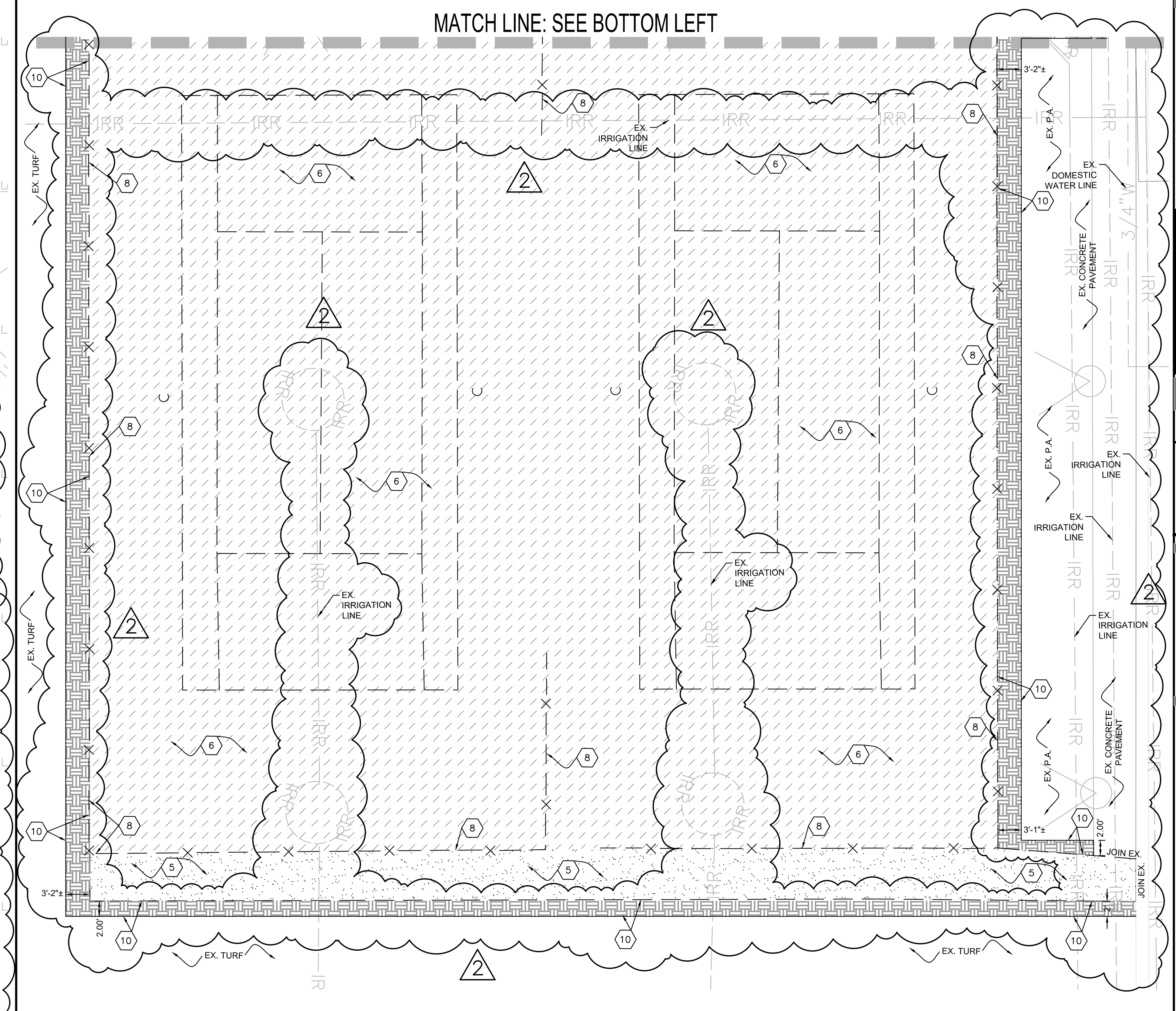
F. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

3.07 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

END OF SECTION



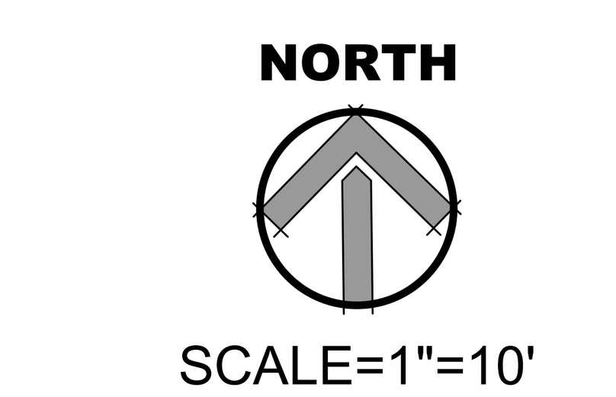


DEMOLITION KEYNOTES:

1	SALVAGE EXISTING LIGHTPOST.	7	COLDMILL EXISTING A.C. PAVEMENT (1.5" THICK), PER DETAIL '3/C1.1.'
2	REMOVE EXISTING P.C.C. CURB.	8	REMOVE EXISTING FENCE INCLUDING POSTS AND ASSOCIATED FOOTING, GATES AND FABRIC WHERE OCCURS.
3	REMOVE EXISTING FULL DEPTH ASPHALT, BASE, AND SUBGRADE INCLUDING A.C. RAMPS.	9	REMOVE EXISTING P.C.C. GUTTER, INCLUDING BASE AND SUBGRADE.
4	DETACH AND REMOVE EXISTING WHEELSTOP.	10	ANTICIPATED WORK AREA AT EXISTING PLANTER AREA. CONTRACTOR SHALL REMOVE AND REPLACE LIKE FOR LIKE. PROTECT EXISTING IRRIGATION SYSTEM IN PLACE.
5	SAWCUT AND REMOVE EXISTING CONCRETE PAVEMENT, BASE & SUBGRADE AS NEEDED TO CONSTRUCT THE NEW IMPROVEMENTS AS SHOWN ON SHEET C3.0.		
6	REMOVE EXISTING FULL DEPTH ASPHALT TENNIS COURT PAVING, BASE, AND SUBGRADE INCLUDING ALL INTERIOR NETS, POSTS AND ASSOCIATED FOOTINGS.		

NOTE:

CONTRACTOR SHALL LOCATE AND FIELD VERIFY ALL EXISTING UTILITIES IN THE WORK AREA. IN CASE OF CONFLICT WITH OVEREXCAVCATION AND FENCE FOOTING, NOTIFY THE ARCHITECT MINIMUM 72 HOURS PRIOR TO COMMENCING THE WORK.



AGENCY REVIEW

LITTLE™
DIVERSIFIED ARCHITECTURAL CONSULTING

1300 Dove Street, Suite 100
Newport Beach, CA. 92660
T: 949.698.1400
www.littleonline.com

CLIENT NAME

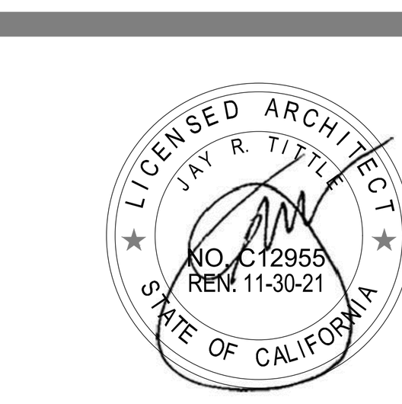
OXNARD UNION HIGH SCHOOL DISTRICT

PROJECT NAME

OXNARD HIGH SCHOOL TENNIS COURT IMPROVEMENTS
3400 W GONZALES RD, OXNARD, CA. 93036

CONSULTANT

SEAL



ISSUE FOR
DSA SUBMITTAL SET

ISSUE DATE
11/26/19

REVISIONS

NO.	REASON	DATE
2	ADDENDUM#2	2/12/20

PROJECT TEAM
PRINCIPAL IN CHARGE
BB
PROJECT MANAGER
AT
DESIGN TEAM
ML, VS

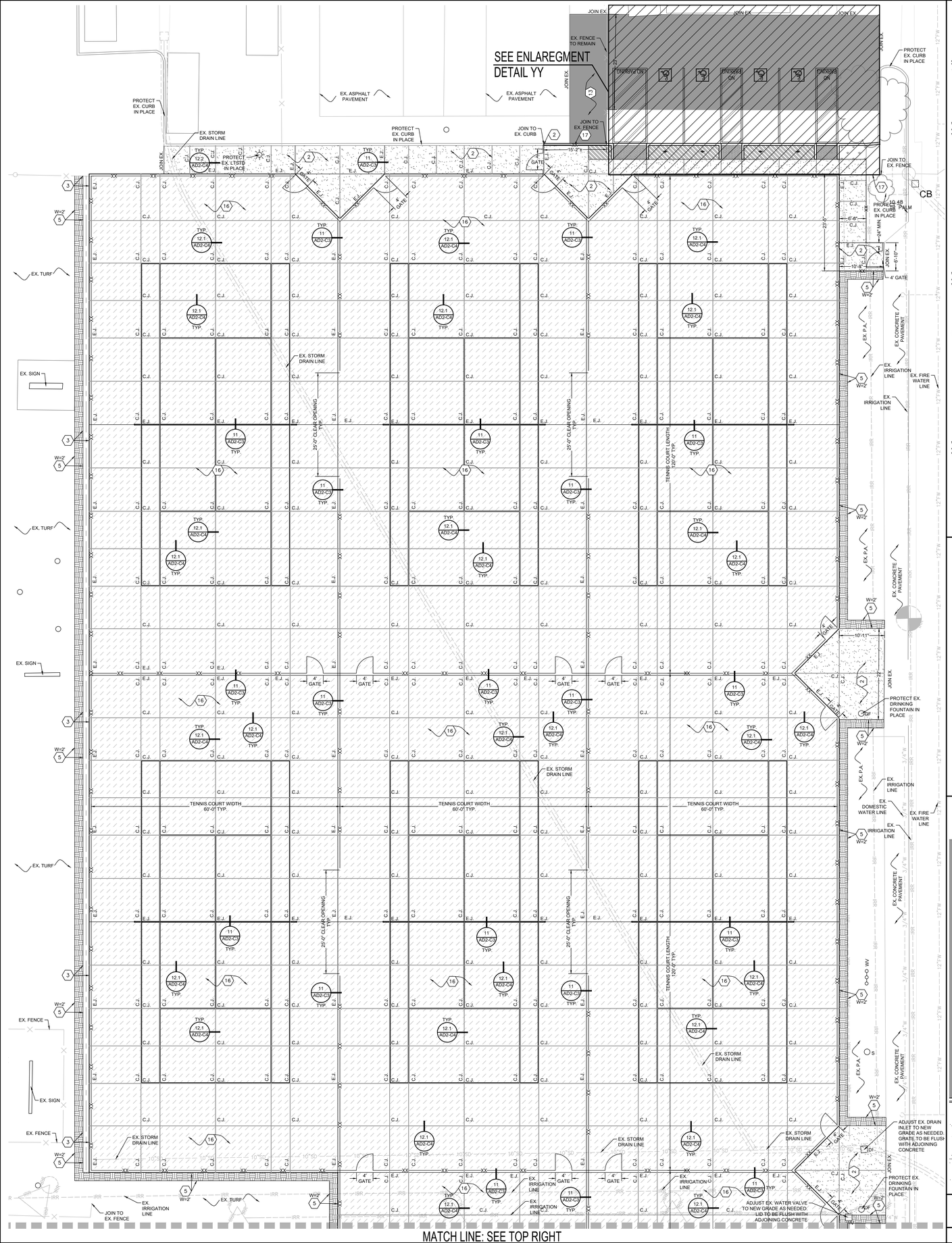
PROJECT NAME
OXNARD HIGH SCHOOL
TENNIS COURT IMPROVEMENTS

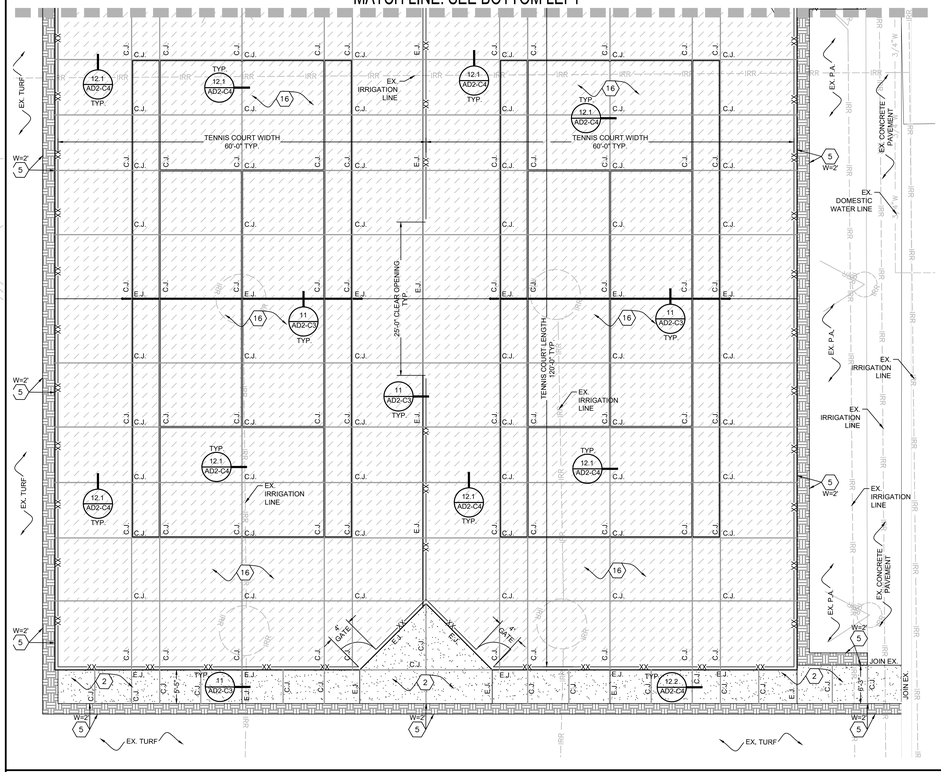
PROJECT NO.
6121235306

SHEET TITLE
DEMOLITION PLAN

SHEET NUMBER
C2.0

AD2-C5





CONSTRUCTION KEYNOTES (FURNISH & INSTALL):

1	NEW FULL DEPTH A.C. PAVEMENT TO MATCH ADJOINING SECTION, LIKE-FOR-LIKE.		10	NEW LOADING/UNLOADING AISLE WITH BLUE BORDERLINE AROUND THE PERIMETER. THE AREA WITHIN THE BLUE BORDERLINES SHALL BE MARKED WITH 45° HATCHED LINES A MAX. F 36" O.C. IN A BLUE COLOR. BLUE COLOR SHALL BE APPROXIMATELY 'F'S 15090' IN FEDERAL STANDARD 595C.	
2	NEW CONCRETE PAVEMENT, SEE DETAIL FOR MORE INFORMATION.	2 / D1.1	11	NEW ACCESSIBLE PARKING SIGN WITH BOLLARD AND POST	6 / D1.1
3	NEW 2' WIDE P.C.C. V-GUTTER, SEE DETAIL FOR MORE INFORMATION.	8 / D1.1	12	NEW 6" WIDE P.C.C. CURB	9 / D1.1
4	NOT USED.	4 / D1.1	13	1.5" ASPHALT OVERLAY, SEE DETAIL FOR MORE INFORMATION.	2 / D1.1
5	RE-GRADE EXISTING TURF AREA, DAYLIGHT AT 5% MAX. SLOPE.		14	NEW PERPENDICULAR CURB RAMP, SEE DETAIL FOR MORE INFORMATION.	10 / D1.1
6	NEW SURFACE MOUNTED DETECTABLE WARNING SURFACE (TRUNCATED DOMES) FEDERAL YELLOW IN COLOR PER ARCHITECTURAL DRAWINGS.	5 / D1.1 7 / D1.1	15	NOT USED.	
7	NEW 36" X 36" INTERNATIONAL SYMBOL OF ACCESSIBILITY.	1 / D1.1	16	NEW TENNIS COURT CONCRETE – SHALL BE 3500 PSI, 4.5" THICK W/ #4 @ 18" O.C. EA. WAY PLACED AT MID-HEIGHT OVER 4" COMPACTED AGGREGATE BASE @ 95% MAX. DRY DENSITY OVER MIN. 12" COMPACTED SUBGRADE @ 95% MAX. DRY DENSITY.	2 / D1.1
8	NEW 4" WIDE BLUE PAINT (2 COATS). BLUE COLOR SHALL BE APPROXIMATELY 'F'S 15090' IN FEDERAL STANDARD 595C.		17	NEW CHAINLINK FENCE AND GATE (WHERE OCCURS), SEE ARCHITECTURAL PLANS FOR DETAILS.	
9	NEW 'NO PARKING' WORDS IN 12" HIGH WHITE LETTERS.		18	NEW LANDSCAPE AND PLANTING MATCHING ADJOINING SITE PLANTING. CONTRACTOR SHALL EXTEND EXISTING IRRIGATION SYSTEM TO NEW PLANTER IF NEEDED.	
			19	INSTALL NEW BROWN MULCH.	

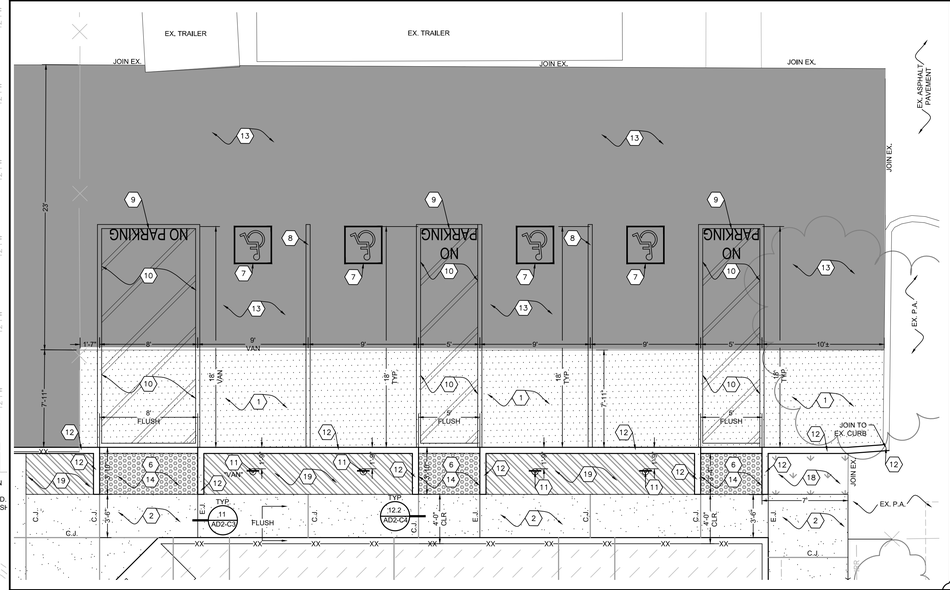
NOTE:

1. SEE ARCHITECTURAL PLANS FOR FENCE, POSTS, FOOTINGS AND GATES RELATED SCOPE.
2. SEE PROJECT MANUAL SPECIFICATION SECTION '32 18 23.53' FOR TENNIS COURT SURFACING AND FINISH.
3. SEE ARCHITECTURAL PLANS FOR TENNIS COURT STRIPING.
4. SEE DETAIL '4/AD-C2' FOR NEW CONCRETE EDGE OF TENNIS COURT AT PLANTER AREA.
5. ANY DAMAGED PLANTER AREA, IRRIGATION AND CONCRETE ADJACENT TO TENNIS COURT WORK AREA SHALL BE REPLACED LIKE FOR LIKE.
6. CONTRACTOR SHALL LOCATE AND FIELD VERIFY ALL EXISTING UTILITIES IN THE WORK AREA. IN CASE OF CONFLICT WITH OVEREXCAVCATION AND FENCE FOOTING, NOTIFY THE ARCHITECT MINIMUM 72 HOURS PRIOR TO COMMENCING THE WORK.

NORTH

SCALE=1"=10'

0 5 10 20 30



ENLARGEMENT (DETAIL YY)

SCALE 1"=5'

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AGENCY REVIEW

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OXNARD UNION HIGH SCHOOL DISTRICT

PROJECT NAME

OXNARD HIGH SCHOOL
TENNIS COURT IMPROVEMENTS

3400 W GONZALES RD, OXNARD, CA. 93036

CONSULTANT

SEAL

LICENSED ARCHITECT
JAY R. TISTEL
NO. C-12955
REN 11-30-21
STATE OF CALIFORNIA

ISSUE FOR
DSA SUBMITTAL
SET

ISSUE DATE
11/26/19

REVISIONS

NO.	REASON	DATE
2	ADDENDUM#2	2/12/20

PROJECT TEAM

PRINCIPAL IN CHARGE
BB

PROJECT MANAGER
AT

DESIGN TEAM
ML, VS

PROJECT NAME
OXNARD HIGH SCHOOL
TENNIS COURT IMPROVEMENTS

PROJECT NO.
6121235306

SHEET TITLE
CONSTRUCTION PLAN

2

SHEET NUMBER
C3.0

AD2-C6

SYMBOLS

	SWITCHES & CONTROLS		POWER		LIGHTING/CEILING
$	SWITCH, SINGLE POLE +48" ✖		SERVICE DISCONNECT, FUSED OR NON FUSED PER DRAWING		LIGHT, WALL MOUNTED, HEIGHT PER DRAWING, DETAILS PER FIXTURE SCHEDULE,
$D	SWITCH, DIMMER, SIZE PER LOAD OR SPECIFICATION +48" ✖		SERVICE DISCONNECT, MAGNETIC STARTER		LIGHT, WALL MOUNTED, HEIGHT PER DRAWING, DETAILS PER FIXTURE SCHEDULE, EMERGENCY LIGHT IF FILLED CENTER
$D0	SWITCH, DIMMER 0-10V +48" ✖	VFD	SERVICE DISCONNECT, VFD		LIGHT, CEILING MOUNTED, DETAILS PER FIXTURE SCHEDULE
$3	SWITCH, 3 WAY, SINGLE POLE +48" ✖		OUTLET, SINGLE, 120V +18" ✖ SIZE PER CIRCUIT AND LOCATION REQUIREMENTS		LIGHT, CEILING MOUNTED, DETAILS PER FIXTURE SCHEDULE EMERGENCY LIGHT IF FILLED CENTER
$4	SWITCH, 4 WAY +48" ✖		OUTLET, DUPLEX, 120V +18" ✖ SIZE PER CIRCUIT AND LOCATION REQUIREMENTS		LIGHT, CEILING MOUNTED, PENDANT, DETAILS PER FIXTURE SCHEDULE
$K	SWITCH, KEY +48" ✖		OUTLET, HALF HOT, HALF SWITCHED, 120V +18" ✖ SIZE PER CIRCUIT AND LOCATION REQUIREMENTS		LIGHT, CEILING MOUNTED, PENDANT, DETAILS PER FIXTURE SCHEDULE EMERGENCY LIGHT IF FILLED CENTER
$P	SWITCH, PILOT LIGHT, SINGLE POLE +48" ✖		OUTLET, DOUBLE DUPLEX, 120V +18" ✖ SIZE PER CIRCUIT AND LOCATION REQUIREMENTS		FLUSH MOUNTED DOWN LIGHT, DETAILS PER FIXTURE SCHEDULE
$T	SWITCH, TIMER, 2 HR. NO HOLD MANUEL TYPE UNLESS NOTED OTHERWISE +48" ✖		OUTLET, DOUBLE DUPLEX, HALF HOT, HALF SWITCHED, 120V +18" ✖ SIZE PER CIRCUIT AND LOCATION REQUIREMENTS		FLUSH MOUNTED WALL WASH/ADJUSTABLE, DETAILS PER FIXTURE SCHEDULE
V	SWITCH, VACANCY DETECTOR +48" ✖		OUTLET, SINGLE, 240V SIZE PER CIRCUIT AND LOCATION REQUIREMENTS		IN-GRADE RECESSED UP-LIGHT, DETAILS PER FIXTURE SCHEDULE
W11	OCCUPANCY SENSOR SINGLE CIRCUIT WALL SWITCH +48" ✖		OUTLET, SINGLE, 120/240V SIZE PER CIRCUIT AND LOCATION REQUIREMENTS		FLUSH MOUNTED DOWN LIGHT, SQUARE CAN, DETAILS PER FIXTURE SCHEDULE
W12	OCCUPANCY SENSOR DUAL CIRCUIT WALL SWITCH +48" ✖		OUTLET, SINGLE, 3 PHASE SIZE AND TYPE PER CIRCUIT REQUIREMENTS OR SPECIFICATION		FLUSH MOUNTED WALL WASH/ADJUSTABLE, SQUARE CAN, DETAILS PER FIXTURE SCHEDULE
WDH	OCCUPANCY SENSOR SINGLE CIRCUIT DIMMER 120V WALL SWITCH - LIKE LUTRON +48" ✖		OUTLET, DUPLEX, 120V, GFCI +18" ✖ SIZE PER CIRCUIT AND LOCATION REQUIREMENTS		LIGHT, xxxxx, DETAILS PER FIXTURE SCHEDULE
WDL	OCCUPANCY SENSOR SINGLE CIRCUIT DIMMER 0-10V WALL SWITCH - LIKE LUTRON +48" ✖		OUTLET, DOUBLE DUPLEX, 120V, GFCI +18" ✖ SIZE AND TYPE PER CIRCUIT REQUIREMENTS OR SPECIFICATION		LIGHT, xxxxx, DETAILS PER FIXTURE SCHEDULE
U	CEILING MOUNTED MOTION SENSOR, ULTRA SOUND		OUTLET, DUPLEX, 120V, FLOOR MOUNT SIZE PER CIRCUIT AND LOCATION REQUIREMENTS		LIGHT, xxxxx, DETAILS PER FIXTURE SCHEDULE
I	CEILING MOUNTED MOTION SENSOR, INFRARED		OUTLET, DOUBLE DUPLEX, 120V, FLOOR MOUNT SIZE PER CIRCUIT AND LOCATION REQUIREMENTS		LIGHT, xxxxx, DETAILS PER FIXTURE SCHEDULE
UI	CEILING MOUNTED MOTION SENSOR, COMBINATION ULTRA SOUND / INFRARED		OUTLET, PEDOC, DUPLEX, 120V, GFCI ✖ SIZE PER CIRCUIT AND LOCATION REQUIREMENTS		VANITY WALL LIGHT, DETAILS PER FIXTURE SCHEDULE
R	CEILING MOUNTED RELAY / POWER PACK FOR LOW VOLTAGE MOTION SENSORS, SIZE PER CIRCUIT AND SENSOR REQUIREMENTS		OUTLET, PEDOC, DOUBLE DUPLEX, 120V, GFCI ✖ SIZE AND TYPE PER CIRCUIT REQUIREMENTS OR SPECIFICATION		TRACK LIGHT, DETAILS PER FIXTURE SCHEDULE
SR	CEILING MOUNTED RELAY SLAVE PACK FOR LOW VOLTAGE MOTION SENSOR, SIZE PER CIRCUIT AND SENSOR REQUIREMENTS		OUTLET, PEDOC, SINGLE, 120/240V, GFCI ✖ SIZE PER CIRCUIT AND LOCATION REQUIREMENTS	XX	COVE LIGHT, DETAILS PER FIXTURE SCHEDULE
T	THERMOSTAT, +48" ✖		OUTLET, SINGLE/2-PORT USB COMBO, 120V ✖ SIZE PER CIRCUIT AND LOCATION REQUIREMENTS		LIGHT, POLE-ARM, DETAILS PER FIXTURE SCHEDULE
TC	TIME CLOCK, POLES AND VOLTAGE AS NEEDED OR SPECIFIED		OUTLET, 4-PORT USB ✖ SIZE PER CIRCUIT AND LOCATION REQUIREMENTS		LIGHT, POLE-CENTER, DETAILS PER FIXTURE SCHEDULE
P	EXTERIOR=PHOTO CELL, SIZE AND VOLTAGE PER CIRCUIT OR AS SPECIFIED INTERIOR=0-10V PHOTO SENSOR RE. DAYLIGHT CONTROLLER		OUTLET, DUPLEX EM CIRCUIT, 120V +18" ✖ SIZE PER CIRCUIT AND LOCATION REQUIREMENTS		LIGHT, BOLLARD SQUARE, DETAILS PER FIXTURE SCHEDULE
		J	JUNCTION BOX		LIGHT, BOLLARD ROUND, DETAILS PER FIXTURE SCHEDULE
					LANDSCAPE UP OR DOWN LIGHT, DETAILS PER FIXTURE SCHEDULE
			COMMUNICATIONS/CONTROLS		EXIT SIGN, DARK SPOT INDICATES DIRECTION THE LIGHTED FACE IS TO BE VISIBLE FROM, ARROWS INDICATE DIRECTION OF ARROWS ON THE SIGN FACE
	NOTES & MISC.	T	THERMOSTAT, +48" ✖		EXIT SIGN, DARK SPOTS INDICATE DIRECTION THE LIGHTED FACES ARE TO BE VISIBLE FROM, ARROWS INDICATE DIRECTION OF ARROWS ON THE SIGN FACE
?	INDICATES PLAN KEYED NOTE	H	HUMIDITY SENSOR		COMBINATION EXIT SIGN, EMERGENCY LIGHT WITH BATTERY BACK UP
?	INDICATES PLAN KEYED NOTE	S	SPEAKER AND BOX PROVIDED BY OTHERS, BOX PIPED AND INSTALLED BY E. C.		EMERGENCY LIGHT, BATTERY POWERED
?	INDICATES PLAN KEYED NOTE		TELEPHONE OUTLET, +18" ✖		STEP/NICHE LIGHT, DETAILS PER FIXTURE SCHEDULE
?	INDICATES REVISION		COMPUTOR OUTLET, +18" ✖		LIGHT, WALL SMALL UP/DN-LIGHT, HEIGHT PER DRAWING, DETAILS PER FIXTURE SCHEDULE
?	INDICATES FIXTURE TYPE		CABLE OUTLET, +18" ✖		ALL LIGHT FIXTURES ABOVE ARE EMERGENCY LIGHT IF FILLED CENTER
FC ?	INDICATES MECHANICAL FIXTURE TYPE		TELEPHONE OUTLET, FLOOR		FIRE
E0.1 1	INDICATES DETAIL		COMPUTOR OUTLET, FLOOR	SD	FIRE DUCT SMOKE DETECTOR
A	PANEL, MOUNTING ACCORDING TO PLACEMENT ON PLANS		CABLE OUTLET, FLOOR	DD	FIRE DUCT DAMPENER
Z	PANEL, CONTROL-LRG, MOUNTING ACCORDING TO PLACEMENT ON PLANS		COMBINATION TELEPHONE & COMPUTER OUTLET, +18" ✖		FIRE MINI STROBE
1	PANEL, CONTROL-SML, MOUNTING ACCORDING TO PLACEMENT ON PLANS	V	TELEVISION OUTLET, +18" ✖	C	FIRE ALARM CHIME
	VALVE, ALARM CONTACT OR SOLENOID OPERATOR DEPENDING ON APPLICATION	B	DOOR BELL PUSH BUTTON	S	FIRE STROBE & HORN
	EYS FITTING. SIZE PER CONDUIT, LOCATE PER N.E.C.	B	DOOR BELL CHIME	F	FIRE ALARM PULL BOX
	SMOKE DETECTOR, CEILING OR WALL MOUNTED PER PLANS	T	DOOR BELL TRANSFORMER		WIRE TYPES
SCD	COMBINATION SMOKE DETECTOR AND CO SENSOR	NC	NURSES CALL LIGHT		HOME RUN IN CABLE OR CONDUIT (PER SPECIS AND CODE), CIRCUIT AND CIRCUIT & CONDUCTOR SIZE AS NOTED, CONDUIT PER NEC OR AS NOTED
	EXHAUST FAN	N	NURSES CALL SWITCH WITH PULL CORD		EXISTING WIRING TO REMAIN
	CEILING FAN	E	ELECTRIC DOOR STRIKE RELEASE		EXISTING WIRING TO BE REMOVED
	MOTOR	AP	WIRELESS ACCESS POINT		NEW ABOVE FLOOR WIRING
PS	POWER SUPPLY	IC	INTERCOM		NEW UNDER FLOOR WIRING
PC 1	POWER CENTER	KEY	KEY PAD		STUB UP TO OR DOWN FROM NEXT FLOOR LEVEL
CL	CURRENT LIMITER				STUB DOWN TO OR UP FROM THE NEXT FLOOR LEVEL

✖ STANDARD HEIGHT TO MEET STATE ACCESSIBILITY REQUIREMENTS AND PROVISIONS OF THE ADA IS 36" - 48" AFF FOR SWITCHES AND THERMOSTATS, 15" - 48" FOR OUTLETS. HEIGHT SHOWN IN SYMBOL LIST IS PREFERRED HEIGHT TO BE CHANGED ONLY IF PHYSICAL REQUIREMENTS OF THE STRUCTURE OR CASEWORK REQUIRE. CHANGES MUST MEET STANDARDS IF OUTLET OR SWITCH IS FOR GENERAL USAGE. OUTLET TO BE MOUNTED AT HEIGHT SHOWN ON PLAN WHEN SPECIAL PURPOSE.

SYMBOLS | SCALE: NONE

FIRE ALARM SYSTEM IF REQUIRED SHALL BE UNDER SEPARATE PERMIT. SEPARATE PLANS SHALL BE SUBMITTED FOR APPROVAL AND ALL REQUIRED PERMITS, INSPECTIONS AND APPROVALS SHALL BE OBTAINED FROM THE CITY OF LONG BEACH.

GENERAL

1. ALL WORK IS TO BE PERFORMED PER THE 2016 ISSUE OF THE CALIFORNIA ELECTRICAL CODE AND THE 2016 CALIFORNIA ENERGY CODE AS ACCEPTED BY THE CITY OF OXNARD AND ALL OTHER APPLICABLE NATIONAL, STATE AND LOCAL CODES AND LAWS PERTAINING TO ELECTRICAL WORK.
2. ALL WORK IN HAZARDOUS LOCATIONS SHALL COMPLY WITH CEC ART. 500 THROUGH 516 AS APPLICABLE.
3. NOTHING IN THESE NOTES SHALL BE CONSTRUED AS CIRCUMVENTING ANY MORE STRINGENT SPECIFICATION OR REQUIREMENT OF THE CONTRACT DOCUMENTS.
4. ELECTRICAL CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO BIDDING WORK AND INCLUDE IN HIS BID THE NECESSARY COSTS REQUIRED TO COMPLETE THIS PROJECT ACCORDING TO THE INTENT OF THE DRAWINGS.
5. ANY DISCREPANCIES BETWEEN SITE CONDITIONS AND DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT COORDINATOR OR ARCHITECT PRIOR TO BID IF POSSIBLE.
6. ELECTRICAL WORK UNDER THIS CONTRACT SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THE INSTALLATION COVERED UNDER THE CONTRACT INCLUDING CONTROL CONDUIT AND WIRING AS DOCUMENTED OR INFERRED IN THE MECHANICAL DRAWINGS.
7. ALL MATERIAL AND EQUIPMENT FURNISHED AND OR INSTALLED UNDER THIS CONTRACT SHALL BE NEW, FREE FROM DEFECTS, AND SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY OWNER OR HIS REPRESENTATIVE. SHOULD ANY PROBLEMS DEVELOP DURING THIS WARRANTY PERIOD DUE TO FAULTY WORKMANSHIP, MATERIAL DEFECTS OR EQUIPMENT DEFECTS OR FAILURE, THE ELECTRICAL CONTRACTOR SHALL CORRECT THE PROBLEM AND REPAIR OR REPLACE EQUIPMENT OR MATERIAL WITHOUT COST TO THE OWNERS. ALL WORK SHALL BE EXECUTED IN A WORKMANLIKE MANNER AND SHALL BE NEAT IN APPEARANCE AS WELL AS FUNCTIONAL WHEN COMPLETED.
8. UNLESS NOTED OTHERWISE OR COORDINATED WITH THE GENERAL CONTRACTOR, THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION, CUTTING, AND PATCHING RELATING TO ELECTRICAL WORK.
9. STATE HANDICAP REQUIREMENTS ARE TO BE MET PER STANDARDS LISTED IN 'SYMBOL LIST'.
10. CUT SHEETS SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR FOR ALL EQUIPMENT PROVIDED WITHIN CONTRACT SCOPE OF WORK.

MATERIAL AND INSTALLATION

1. ALL ELECTRICAL MATERIALS AND EQUIPMENT ARE TO BE UNDERWRITER'S LABORATORY LISTED OR LISTED BY AN EQUIVALENT NATIONALLY RECOGNIZED TESTING LABORATORY ACCEPTED BY THE CITY OF OXNARD. ALL MATERIALS SHALL BE APPROVED FOR THE INTENDED PURPOSE AND USED FOR SUCH PURPOSE.
2. ALL 600-VOLT INSULATED WIRE IN CONDUITS SHALL BE COPPER TYPE THHN/THWN-2 UNLESS NOTED OTHERWISE.
3. ALL CONDUCTORS SIZE AWG #12 AND SMALLER SHALL BE SOLID, ALL CONDUCTORS SIZE #10 AND LARGER SHALL BE STRANDED.
4. ALL JUNCTION BOXES SHALL BE MARKED (IN INK) WITH THE PANEL NUMBER, CIRCUIT NUMBERS, AND SYSTEM VOLTAGE CONTAIN WITHIN, ('MAGIC MARKERS' ARE ACCEPTABLE). I.E. 'LA'-1,3,5 277/480V OR 'RA'-2,4,6 120/208V ETC.
5. ALL RACEWAYS SHALL CONTAIN SECONDARY GROUNDING CONDUCTORS PER THE CEC AND NEC. CIRCUITS FEEDING PATIENT CARE AND TREATMENT AREAS SHALL BE GROUNDED IN ACCORDANCE WITH CEC 517.
6. ALL RACEWAYS ABOVE GRADE LEVEL SHALL BE EMT OR RIGID STEEL CONDUIT. ALL RACEWAYS BELOW GRADE LEVEL SHALL BE PVC (SCH 40 OR SCH OR RIGID STEEL CONDUIT.
7. TYPE AC AND MC CABLES MAY BE USED FOR GENERAL WIRING WHERE ENCLOSED BY WALLS OR CEILING SYSTEMS. WHERE WIRING IS REQUIRED TO BE INSTALLED PER CEC 517 CABLES SHALL BE TYPE ACH AND MCH WHEN USED.
8. WHERE APPLICABLE FOR ACCOMMODATING SEISMIC JOINTS IN BUILDING, CONDUITS PASSING THROUGH THESE AREAS WILL CONTAIN AT LEAST 24" OF LIQUID TIGHT SPIRAL STEEL CORE FLEXIBLE CONDUIT WITH ROUND WIRE AS REQUIRED BY CODE OR ADDITIONAL NOTES AND SPECIFICATIONS. FLEXIBLE CONDUIT SHALL CONTAIN A DROP LOOP TO ALLOW JOINT TO STRETCH OR SHIFT WITHOUT BREAKING THE CONDUIT. SEISMIC AREAS SHOULD BE AVOIDED AS MUCH AS IS POSSIBLE BY ROUTING UNDERGROUND OR AROUND THE STRUCTURE.
9. FLEXIBLE CONDUITS AND OR CABLE SYSTEMS (TYPE AC-90 OR MC) MAY BE USED FOR THE INTERCONNECTION OF LIGHTING FIXTURES INSTALLED IN ALL AREAS WHERE A FINISHED TYPE CEILING IS INSTALLED. WHERE CEILING IS OPEN TO STRUCTURE, FLEXIBLE CONDUITS AND OR CABLES ARE ALLOWED ONLY WHERE NEEDED TO CONNECT HANGING FIXTURES WHICH MAY BE ALLOWED TO MOVE IN A SEISMIC EVENT.
10. ALL SITE PVC CONDUIT SHALL BE A MINIMUM OF 24" BELOW GRADE LEVEL. HIGH VOLTAGE CONDUITS SHALL MAINTAIN 30" MINIMUM COVERAGE OR DISTANCE NEEDED TO PROPERLY INSTALL SWEEP STUB UPS,WHICHEVER IS GREATER.
11. WHEN CONDUIT MUST CROSS TRAFFIC AREAS, THE CONDUIT SHALL CROSS PERPENDICULAR TO THE NORMAL TRAFFIC PATTERN.
12. ALL BALLASTS ARE TO BE CEC LISTED.
13. ALL OUTDOOR LIGHTING FIXTURES ARE TO BE LISTED FOR WET OR DAMP LOCATION DEPENDING ON TYPE OF EXPOSURE.
14. LIGHTING FIXTURES MUST NOT BE RECESSED IN FIRE RATED ASSEMBLIES UNLESS BOXED WITH EQUIVALENT CONSTRUCTION.
15. ALL LIGHT FIXTURES ARE MOUNTED IN CONTACT WITH INSULATION SHALL BE U.L. LISTED FOR THERMAL BARRIER OR BE PROVIDED WITH MINIMUM OF 3" CLEARANCE FROM INSULATION.
16. ALL 2'X4' AND 2'X2' DROP IN FIXTURES SHALL BE SUPPORTED BY MEANS OF 2 #12 AWG STEEL WIRES CONNECTED BETWEEN THE PERMANENT STRUCTURE AND 2 OPPOSITE CORNERS OF THE FIXTURE. IN ADDITION TO THESE WIRES THE FIXTURE SHALL BE SECURELY ATTACHED TO THE T-BAR MAIN RUNNERS BY SCREWS OR OTHER APPROVED MEANS AT CORNERS ADJACENT TO THE WIRES. T-BAR MAIN RUNNERS SHALL BE SUPPORTED WITHIN 3" OF EACH CORNER OF THE FIXTURE.
17. SINGLE FLUSH FIXTURES SHALL BE SUPPORTED BY MEANS OF 1 #12 AWG STEEL WIRE CONNECTED BETWEEN THE PERMANENT STRUCTURE AND THE FRAME OF THE FIXTURE. IN ADDITION TO THIS WIRE THE FIXTURE SHALL BE SECURELY ATTACHED TO THE T-BAR RUNNERS BY SCREWS OR OTHER FACTORY APPROVED MEANS.
18. WHEN LIGHT FIXTURES REQUIRE MOUNTING SUPPORTS IN ADDITION TO NORMAL MOUNTING BOX, LIGHT FIXTURES SHALL BE MOUNTED WITH 1/4" TOGGLE BOLTS OR 1/4" METAL EXPANSION TYPE BOLTS, NO VINYL ANCHORS WILL BE ACCEPTED.
19. ALL EQUIPMENT LOCATIONS ARE TO BE VERIFIED AND COORDINATED WITH THE SUITE OCCUPANTS.
20. ALL DEVICES INSTALLED SHALL BE SPECIFICATION GRADE IVORY COLOR. WHERE INSTALLED IN PATIENT CARE OR TREATMENT AREAS, DEVICES SHALL BE 'HOSPITAL' RATED.
21. ALL DEVICES SHALL BE GROUNDED BY MEANS OF A SEPARATE GROUNDING CONDUCTOR AND EITHER A WIRE BOND FROM THE DEVICE STRAP TO THE BOX OR A SELF-GROUNDING SCREW.
22. ALL PENETRATIONS THROUGH FIRE RATED ASSEMBLIES SHALL BE RESTORED TO THEIR ORIGINAL RATING BY METHODS APPROVED FOR THE PURPOSE. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF FIRE RATED ASSEMBLIES AND DETAILS OF APPROVED PENETRATION METHODS. COMPLETE NRTL CLASSIFICATION SHEETS SHALL BE PROVIDED TO THE INSPECTOR AT TIME OF INSPECTION.
23. ALL CIRCUIT BREAKERS USED AS SWITCHES IN 120 AND 277 VOLT FLUORESCENT LIGHTING CIRCUITS SHALL BE LISTED AND MARKED 'SWD' OR 'HID'. (CEC 240.83(D))
24. EACH MULTIWIRE BRANCH CIRCUIT SHALL BE PROVIDED WITH A MEANS THAT WILL SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES. (CEC 210.4(B))
25. THE UNGROUNDED AND GROUNDED CONDUCTORS OF EACH MULTIWIRE BRANCH CIRCUIT SHALL BE GROUPED BY WIRE TIES OR SIMILAR MEANS IN AT LEAST ONE LOCATION WITHIN THE PANELBOARD OR OTHER POINT OF ORIGINATION. (CEC 210.4(D))
26. ALL NEW OVERCURRENT DEVICES INSTALLED IN EXISTING PANELS/SWITCHBOARDS SHALL MATCH OR EXCEED THE MAKE, MODEL AND INTERRUPTING CAPACITY OF THE EXISTING OVERCURRENT DEVICES.

COMPLETION

1. UPON COMPLETION OF WORK, ELECTRICAL CONTRACTOR SHALL INSURE THE INSTALLATION TO BE FREE FROM SHORT CIRCUITS, PHASE GROUNDS AND NEUTRAL GROUNDS.
2. ALL FEEDERS SHALL HAVE INSULATION TESTED PRIOR TO ENERGIZATION.
3. ALL PANELS, TRANSFORMERS, DISTRIBUTION BOARDS, SWITCHES, ETC. SHALL BE LABELED PER SINGLE LINE DIAGRAM USING PLASTIC PLATES WITH 3/8" HIGH WHITE LETTERS ON BLACK BACKGROUNDS. LABEL SHALL INCLUDE ITEM NAME AND VOLTAGE PRESENT. TRANSFORMER LABEL SHALL INCLUDE BOTH PRIMARY AND SECONDARY VOLTAGES. LABEL SHALL BE PERMANENTLY ATTACHED USING AT LEAST (2) ROUND HEAD STAINLESS STEEL MACHINE SCREWS WITH MINIMUM THREAD SIZE 8-32.
4. ELECTRICAL CONTRACTOR SHALL FURNISH AS-BUILT DRAWINGS TO ARCHITECT UPON COMPLETION OF WORK.
5. ELECTRICAL CONTRACTOR SHALL BE AVAILABLE FOR NIGHT INSPECTION AND APPROVAL OF COMPLETED WORK.
6. PRIOR TO FINAL ENERGIZATION, NEUTRAL FEED SHALL BE DISCONNECTED FROM THE PANEL AND BUS WITH ALL LOAD NEUTRALS CONNECTED SHALL BE TESTED IN THE PRESENCE OF THE ELECTRICAL ENGINEER FOR FAULTS TO GROUND.

NOTES | SCALE: NONE

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OXNARD UNION HIGH SCHOOL DISTRICT

OXNARD HIGH SCHOOL TENNIS COURTS IMPROVEMENTS

3400 W GONZALES ROAD, OXNARD, CA. 93036

Engineous Group, Inc.
751 N. Fair Oaks Ave., Suite 201
Pasadena, CA 91103
Phone: (626) 696-3850

LICENSED ARCHITECT — JAY R. TITTLE — NO. C-12955 — REN 11-30-21 — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — ARTIN OSHAN — NO. E-21460 — EXP. 3-31-2020 — ELECTRICAL — STATE OF CALIFORNIA

DSA SUBMITTAL

02/12/20

NO.	REASON	DATE

PRINCIPAL IN CHARGE
A.O.

PROJECT MANAGER
A.O.

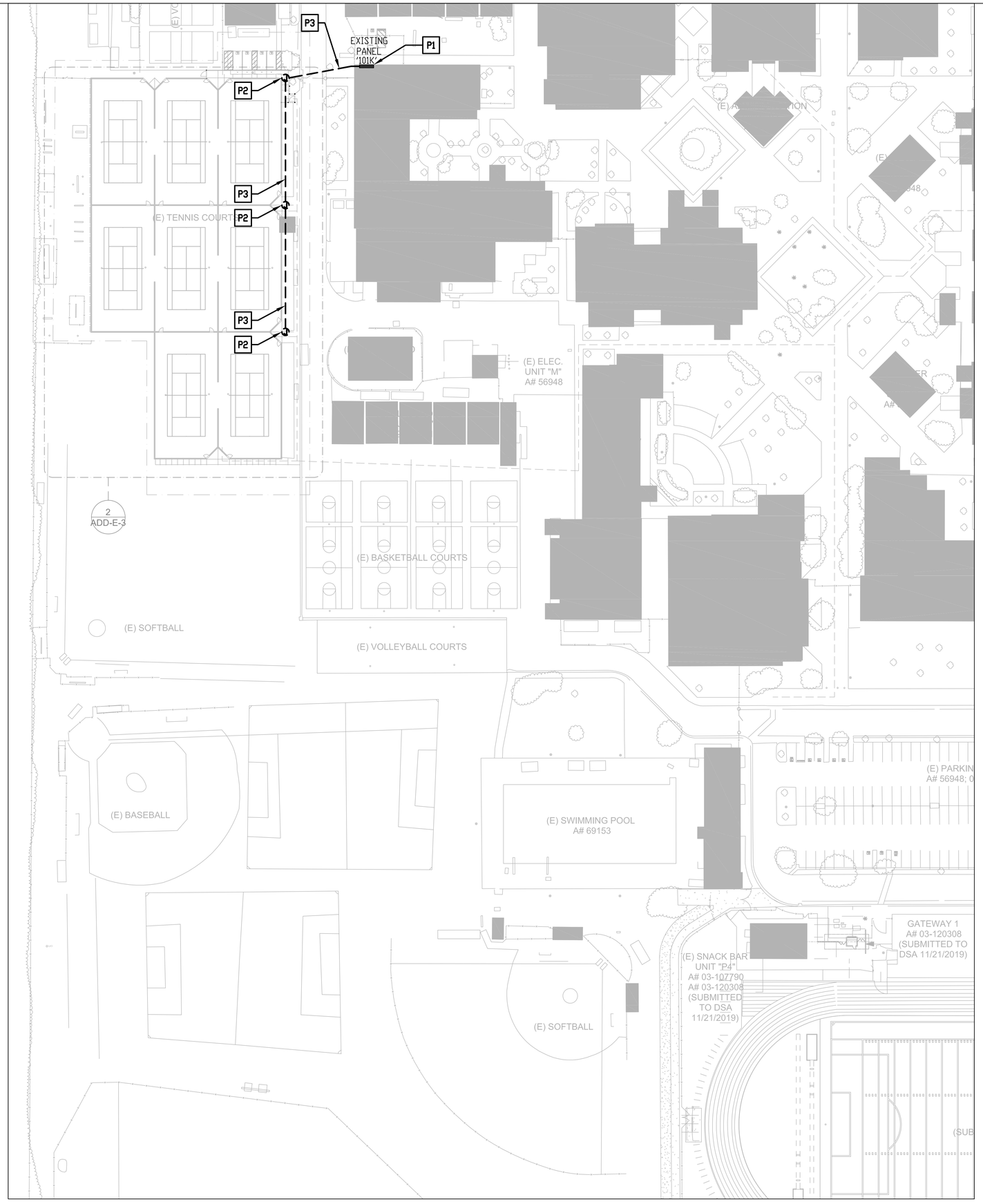
DESIGN TEAM
J.H.

OXNARD HIGH SCHOOL
TENNIS COURTS
IMPROVEMENTS

6121235306

SYMBOLS AND NOTES

AD2-E1 2



OVERALL ELECTRICAL SITE PLAN 2
1/64" = 1'-0" AD2-E2

POWER GENERAL NOTES

1. ALL CONDUITS SHALL BE RUN NEATLY AND PARALLEL OR PERPENDICULAR TO STRUCTURAL MEMBERS. CONDUIT ROUTING SHOWN ON PLAN IS DIAGRAMMATIC AND IS INTENDED TO SHOW POSSIBLE FUNCTIONAL ROUTE OF CONDUITS AND CONDUCTORS. IN SOME CASES THE DRAWING SHOWS ROUTING WHICH MAY NOT BE PARALLEL OR PERPENDICULAR TO BUILDING STRUCTURAL MEMBERS, THIS IS FOR CLARITY OF CIRCUITING AND NOT INTENDED TO APPROVE ANY DEVIATION FROM NEAT WORKMANSHIP.
2. COMBINING OF HOMERUNS AND OTHER CIRCUITS OTHER THAN WHAT IS SHOWN ON PLAN WILL NOT BE APPROVED.
3. CONDUITS AND ROUTING FOUND OBJECTIONABLE BY THE ARCHITECT WILL BE REWORKED AT ELECTRICAL CONTRACTORS EXPENSE.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE APPROVED SEISMIC STRUCTURAL SUPPORTS AS CURRENTLY ADOPTED BY IBC OR CBC WHERE APPLICABLE FOR ALL FIXTURES, BOXES AND OTHER ELECTRICAL EQUIPMENT.
5. ELECTRICAL CONTRACTOR SHALL VERIFY LOCATIONS AND MOUNTING HEIGHTS OF ALL OUTLETS AND EQUIPMENT WITH ARCHITECTURAL PLANS, ELEVATIONS AND DETAILS.

POWER PLAN KEYED NOTES (NOT ALL MAY APPLY)

P1 EXISTING ELECTRICAL PANEL "101K", LOCATED IN BUILDING K - ROOM 101. REFER TO PANEL SCHEDULE FOR RATINGS.

P2 NEW JUNCTION BOXES (18"X18") FOR POWER TO BE INSTALLED BELOW GRADE OUTDOOR RATED MATCHING EXISTING TYPE AND COLOR OF THE SURFACE. CONTRACTOR SHALL VERIFY DISTRICT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

P3 (2) 1 1/2"C-8#2+3#10GND THWN CU TO NEAREST POWER PANEL. CONDUITS SHALL BE BURIED 24" BELOW GRADE ENCASED IN CONCRETE.

NOTES 1
N.T.S. AD2-E2

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OXNARD UNION HIGH SCHOOL DISTRICT

OXNARD HIGH SCHOOL TENNIS COURTS IMPROVEMENTS

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Pasadena, CA 91103
Phone: (626) 696-3850

LICENSED ARCHITECT ARTIN OSHTAN NO. C-12956 REN. 11-30-21 STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER ARTIN OSHTAN NO. E-21460 EXP. 3-31-2020 ELECTRICAL STATE OF CALIFORNIA

DSA SUBMITTAL

02/12/20

NO.	REASON	DATE

PRINCIPAL IN CHARGE
A.O.

PROJECT MANAGER
A.O.

DESIGN TEAM
J.H.

OXNARD HIGH SCHOOL
TENNIS COURTS
IMPROVEMENTS

6121235306

ELECTRICAL OVERALL SITE PLAN

AD2-E2 2

PANELBOARD: 101K (EXISTING)

BUS AMPS: 100A
MAIN SIZE/TYPE: MLO
VOLTS/PHASE: 208Y/120V, 3PH, 4W
SECTION: 1

FAULT CURRENT: REFER TO ONE-LINE DIAGRAM
AIC RATING: N/A
SERVES: BLDG 'K' & TENNIS COURT
MOUNTING: SURFACE
LOCATION: RM 101 BLDG 'K'

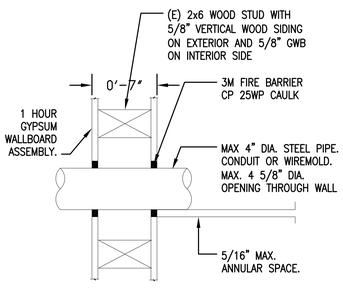
CKT NO.	DESCRIPTION	VOLTAMPS/PHASE A	B	C	WIRE NO.	BKR AMP	P	P	BKR AMP	WIRE NO.	VOLTAMPS/PHASE A	B	C	DESCRIPTION	CKT NO.
1	STPECER .VNOC GNITSIXE	027				02	1	1	02		009			STPECER YAWECAR GNITSIXE	2
3	EXISTING CONV. RECEPTS		720			20	1	1	20			720		EXISTING RACEWAY RECEPTS	4
5	EXISTING CONV. RECEPTS			540		20	1	1	20				720	EXISTING RACEWAY RECEPTS	6
7	EXISTING CONV. RECEPTS	540				20	1	1	30		2,500			DEDICATED TENNIS MACHINE	8
9							1	1	30			2,500		DEDICATED TENNIS MACHINE	10
11							1	1	30				2,500	DEDICATED TENNIS MACHINE	12
13							1	1							14
15							1	1							16
17							1	1							18
19							1	1							20
21							1	1							22
23							1	1							24
25							1	1							26
27							1	1							28
29							1	1							30
31							1	1							32
33							1	1							34
35							1	1							36
37							1	1							38
39							1	1							40
41							1	1							42
SUBTOTAL		1,260	720	540							3,400	3,220	3,220	SUBTOTAL	

		LOAD	CONN. VA	DF	LOAD	CONN. VA	DF	
TOTAL PHASE A - VA	4,660	COOLING		1.00	REFRIGERATION		1.00	
AMPS	39	HEATING		0	SIGN/DISPLAY		1.25	
TOTAL PHASE B - VA	3,940	LIGHTING		1.25	KITCHEN		1.00	
AMPS	33	RECEPTACLES		1.0/.5	EXISTING		1.00	
TOTAL PHASE C - VA	3,760	MOTORS		1.00	LARGE MOTOR		1.25	TOTAL DEMAND
AMPS	31	SUPP HEAT		1.00	SHOW WINDOW		1.25	12,360 VA
TOTAL PNLBD - VA	12,360	MISC EQUIP	12,360	1.00	LTG TRACK		1.00	34 A
AMPS	34							

PANELBOARD NOTES

LTG TRACK - TRACK LENGTH
SIGN/DISPLAY - SIGNAGE & DISPLAY CASE

EXISTING PANEL SCHEDULE '101K' 3
N.T.S. AD2-E3



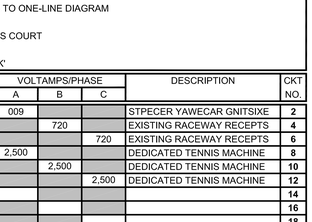
U.L. #W-L-1001

PENETRATION THRU (E) GYPSUM BOARD
NOT TO SCALE

NOTE 1: DETAILS HERE ARE ALL 2016 EDITION OF THE UL FIRE RESISTANCE DIRECTORY

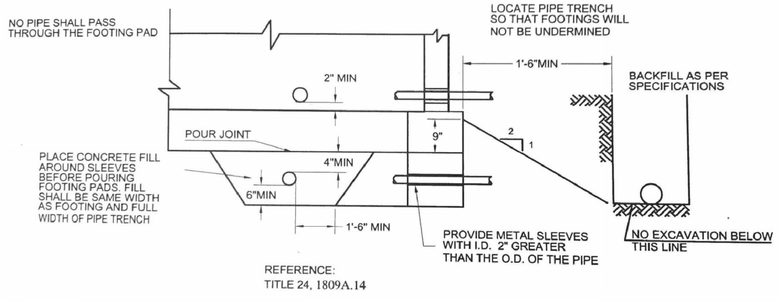
NOTE 2: DO NOT CUT (E) WOOD STUDS. GC TO LOCATE STUDS BY NON-DESTRUCTIVE MEANS PRIOR TO CUTTING OPENING IN (E) WALL

PENETRATION DETAILS 5
N.T.S. AD2-E3



SEE DETAIL 6/AD2-E3
FOR TRENCHING DETAIL

CONCRETE DUCT BANK DETAILS 4
N.T.S. AD2-E3



REFERENCE:
TITLE 24, 1809A.14

TYPICAL TRENCHING DETAILS 6
N.T.S. AD2-E3

POWER GENERAL NOTES

1. ALL CONDUITS SHALL BE RUN NEATLY AND PARALLEL OR PERPENDICULAR TO STRUCTURAL MEMBERS. CONDUIT ROUTING SHOWN ON PLAN IS DIAGRAMMATIC AND IS INTENDED TO SHOW POSSIBLE FUNCTIONAL ROUTE OF CONDUITS AND CONDUCTORS. IN SOME CASES THE DRAWING SHOWS ROUTING WHICH MAY NOT BE PARALLEL OR PERPENDICULAR TO BUILDING STRUCTURAL MEMBERS, THIS IS FOR CLARITY OF CIRCUITING AND NOT INTENDED TO APPROVE ANY DEVIATION FROM NEAT WORKMANSHIP.
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5. ELECTRICAL CONTRACTOR SHALL VERIFY LOCATIONS AND MOUNTING HEIGHTS OF ALL OUTLETS AND EQUIPMENT WITH ARCHITECTURAL PLANS, ELEVATIONS AND DETAILS.

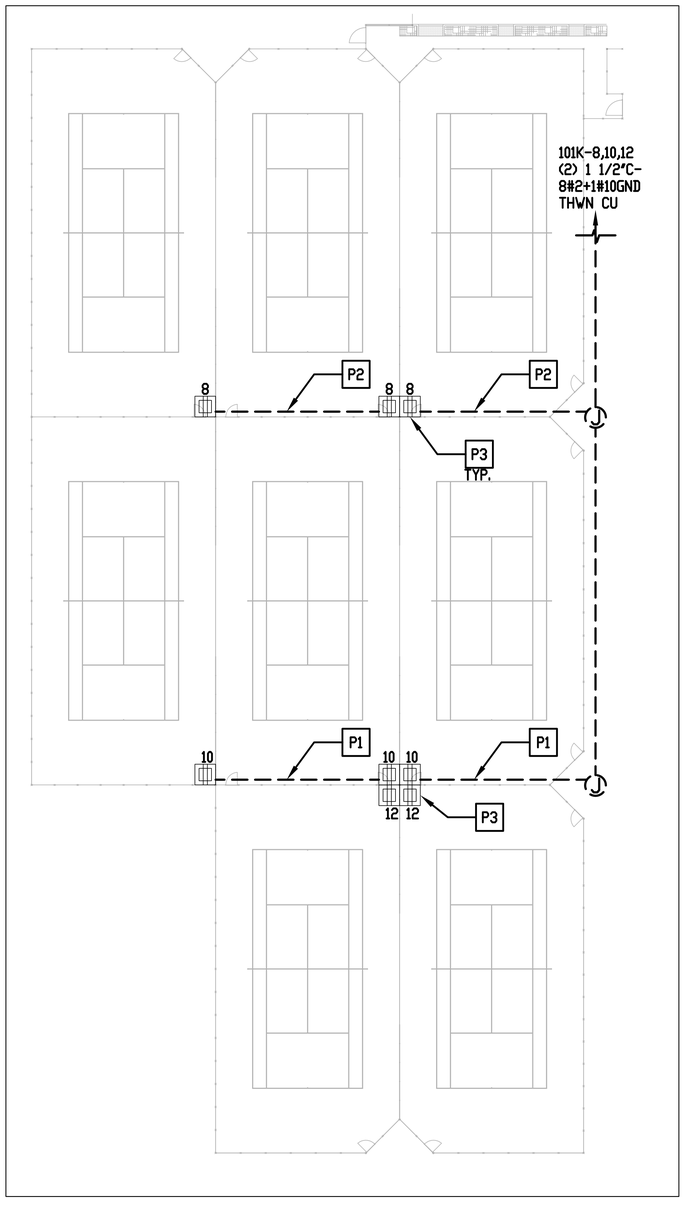
POWER PLAN KEYED NOTES (NOT ALL MAY APPLY)

P1 1"C-4#10+2#10GND THWN CU TO NEAREST POWER PANEL. CONDUITS SHALL BE BURIED 24" BELOW GRADE ENCASED IN CONCRETE.

P2 1"C-2#10+1#10GND THWN CU TO NEAREST POWER PANEL. CONDUITS SHALL BE BURIED 24" BELOW GRADE ENCASED IN CONCRETE.

P3 NEMA-3R RATED PEDESTAL MOUNTED GFCI RECEPTACLES, 18" HEIGHT 1P18-C-HT OR EQUAL. CONTRACTOR SHALL CONFIRM WITH DISTRICT/ARCHITECT PRIOR BID/INSTALLATION.

NOTES 1
N.T.S. AD2-E3



ENLARGED ELECTRICAL SITE PLAN - TENNIS COURTS 2
1" = 20'-0" AD2-E3

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OXNARD UNION HIGH SCHOOL DISTRICT

OXNARD HIGH SCHOOL TENNIS COURTS IMPROVEMENTS
3400 W GONZALES ROAD, OXNARD, CA. 93036

Engineous Group, Inc.
751 N. Fair Oaks Ave., Suite 201
Pasadena, CA 91103
Phone: (626) 696-3850

LICENSED ARCHITECT ART R. TITTMANN NO. C-12955 REN.11-30-21 STATE OF CALIFORNIA
REGISTERED PROFESSIONAL ENGINEER ART IN. OSHTAN NO. E-21460 EXP. 3-31-2020 ELECTRICAL STATE OF CALIFORNIA

DSA SUBMITTAL

02/12/20

NO.	REASON	DATE

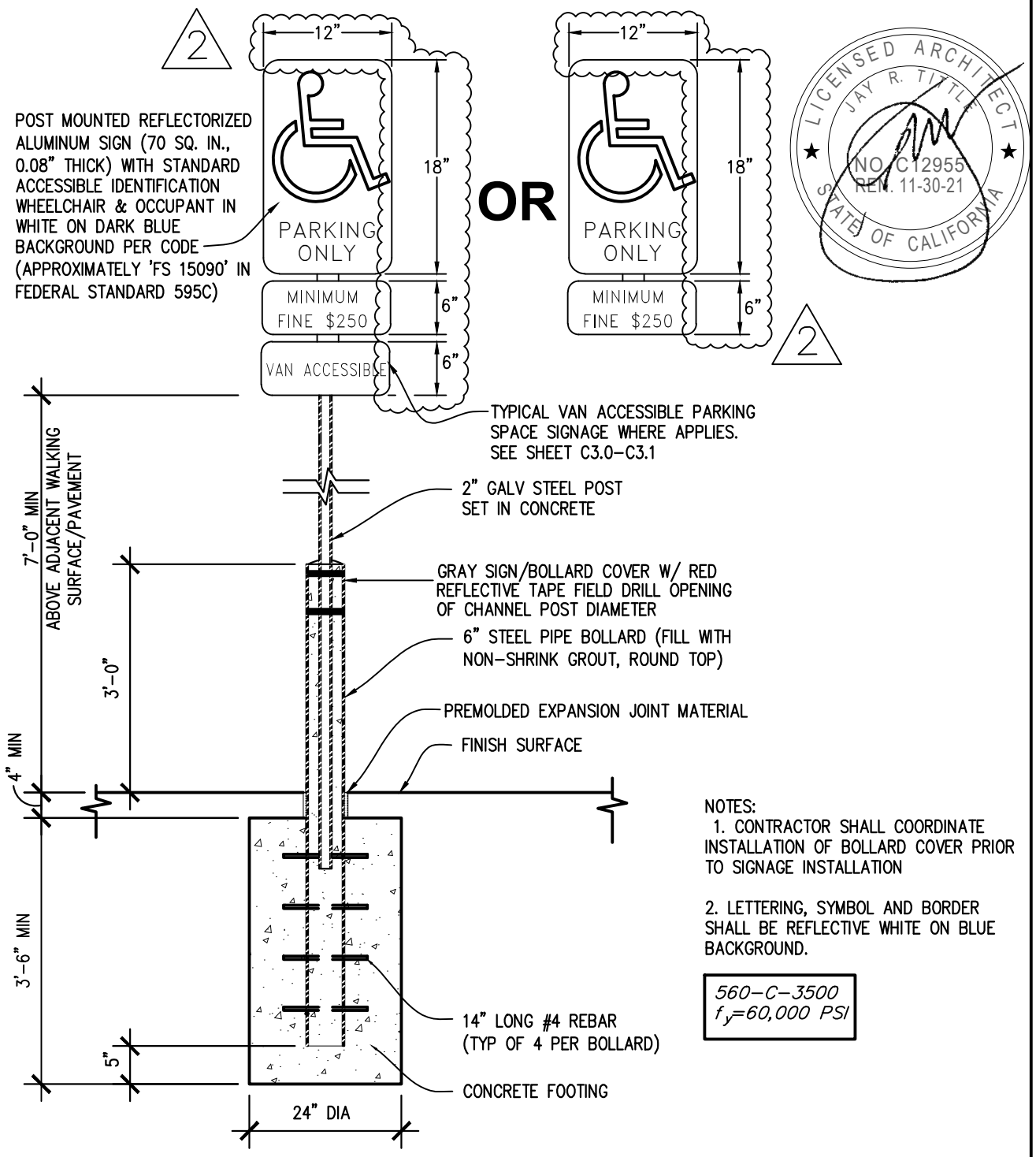
PRINCIPAL IN CHARGE
A.O.
PROJECT MANAGER
A.O.
DESIGN TEAM
J.H.

OXNARD HIGH SCHOOL
TENNIS COURTS
IMPROVEMENTS

6121235306

ENLARGED ELECTRICAL SITE PLAN

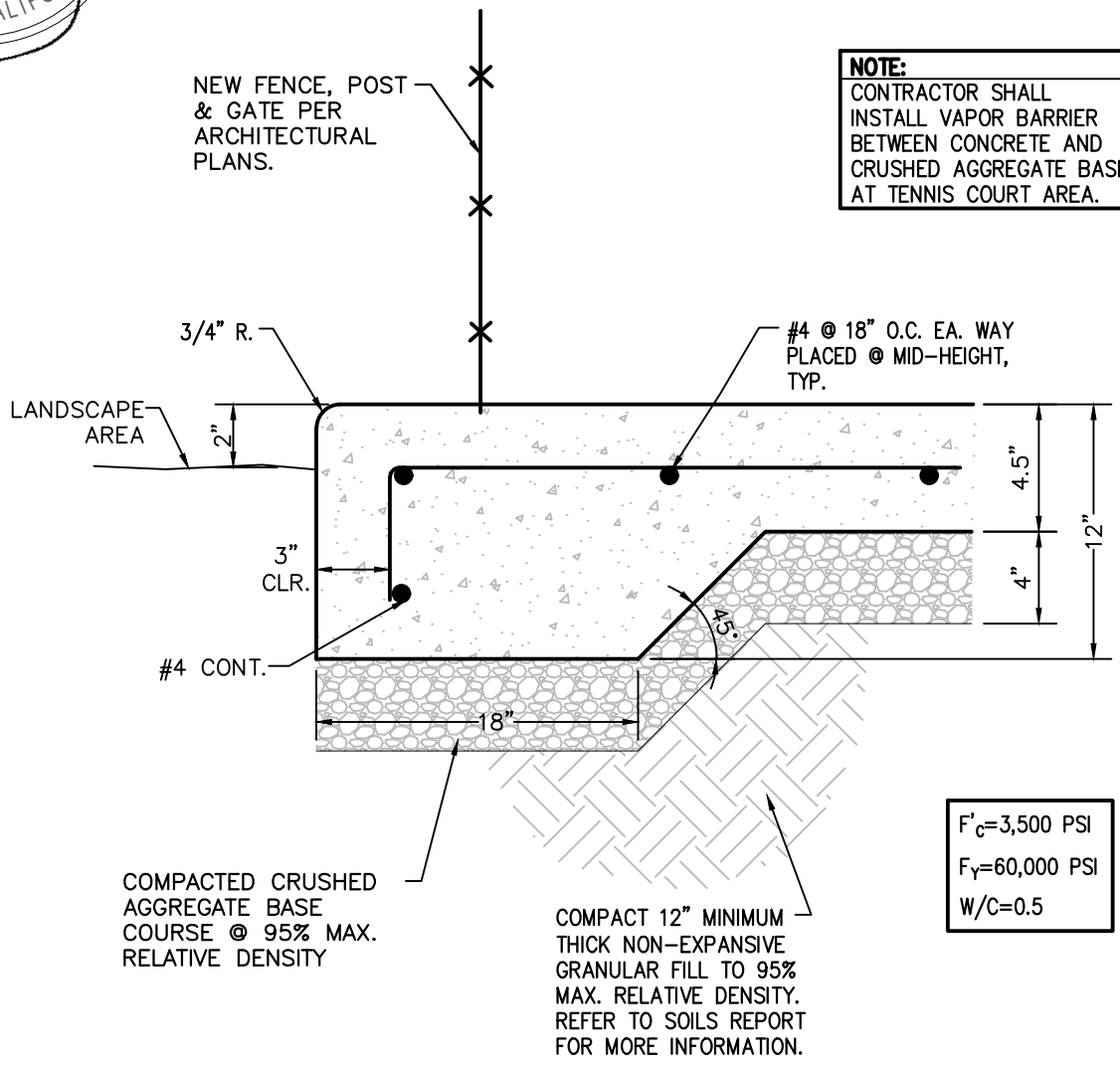
AD2-E3 2



6 ACCESSIBLE PARKING SIGNAGE N.T.S

OXNARD HIGH SCHOOL
APP. 03-120419
ADDENDUM #2
SHEET NO.: AD2-C1
REF. DWG.: C1.1
ISSUE DATE: 02/12/20

LICENSED ARCHITECT
JAY R. TITTLE
NO. C12955
REN. 11-30-21
STATE OF CALIFORNIA



NOTE:
CONTRACTOR SHALL INSTALL VAPOR BARRIER BETWEEN CONCRETE AND CRUSHED AGGREGATE BASE AT TENNIS COURT AREA.

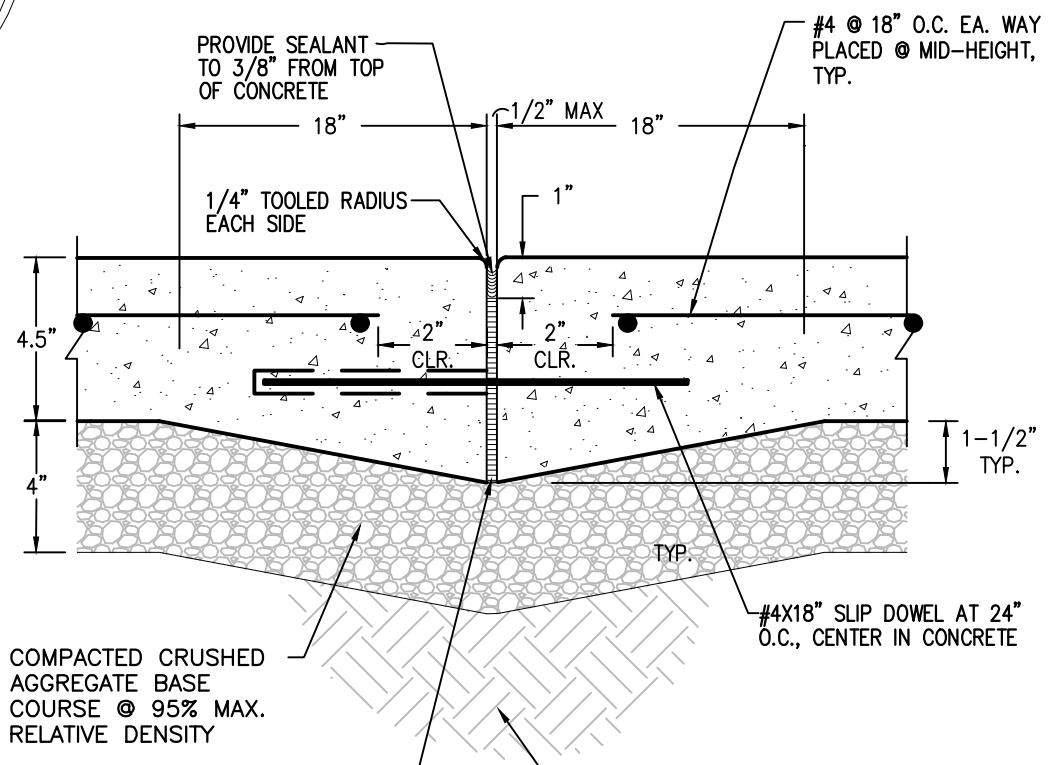
F'_C=3,500 PSI
F_Y=60,000 PSI
W/C=0.5

2

4 EDGE OF TENNIS COURT CONCRETE PAVEMENT AT PLANTER N.T.S

OXNARD HIGH SCHOOL
APP. 03-120419
ADDENDUM #2
SHEET NO.: AD2-C2
REF. DWG.: C1.1
ISSUE DATE: 02/12/20

REGISTERED PROFESSIONAL ENGINEER
BARSIN BET GOVARGEZ
C 81751
EXP 03/31/20
CIVIL
STATE OF CALIFORNIA



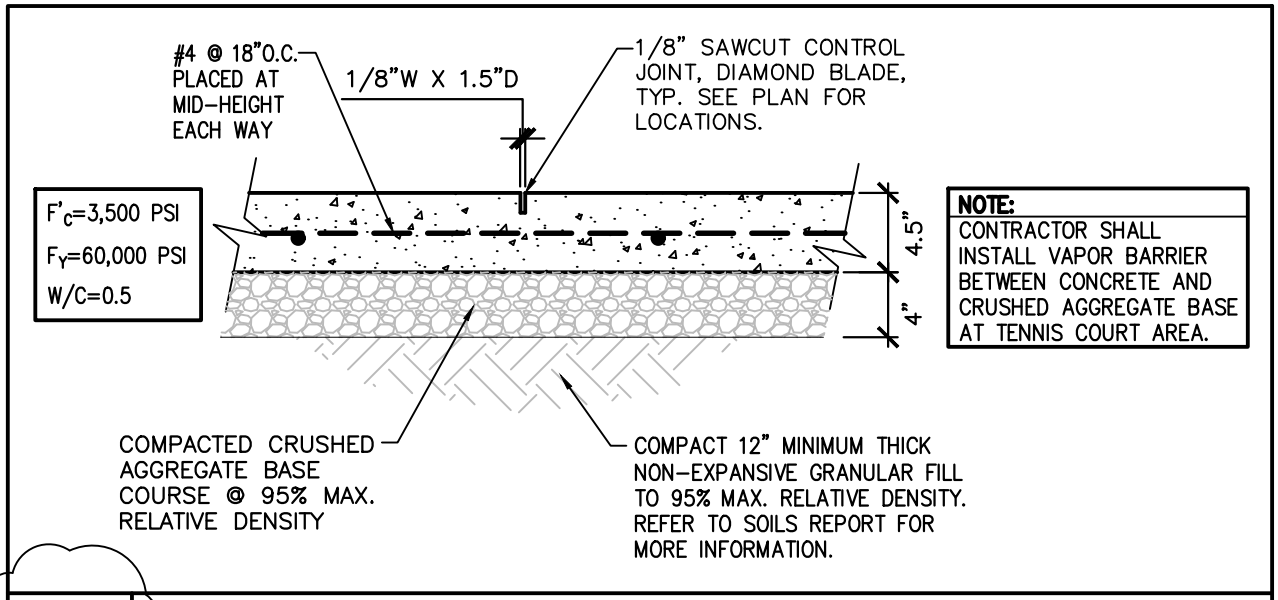
NOTE:
CONTRACTOR SHALL INSTALL VAPOR BARRIER BETWEEN CONCRETE AND CRUSHED AGGREGATE BASE AT TENNIS COURT AREA.

F'_C=3,500 PSI
F_Y=60,000 PSI
W/C=0.5

2

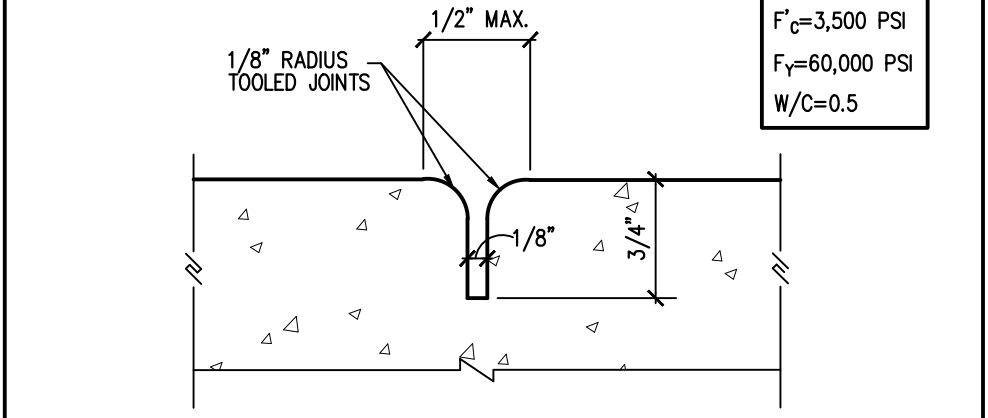
11 EXPANSION JOINT AT CONCRETE PAVEMENT N.T.S

OXNARD HIGH SCHOOL
APP. 03-120419
ADDENDUM #2
SHEET NO.: AD2-C3
REF. DWG.: C1.1
ISSUE DATE: 02/12/20



2

12.1 SAWCUT JOINT AT TENNIS COURT N.T.S



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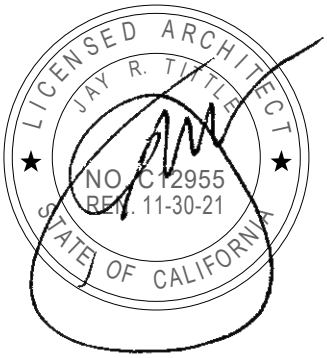
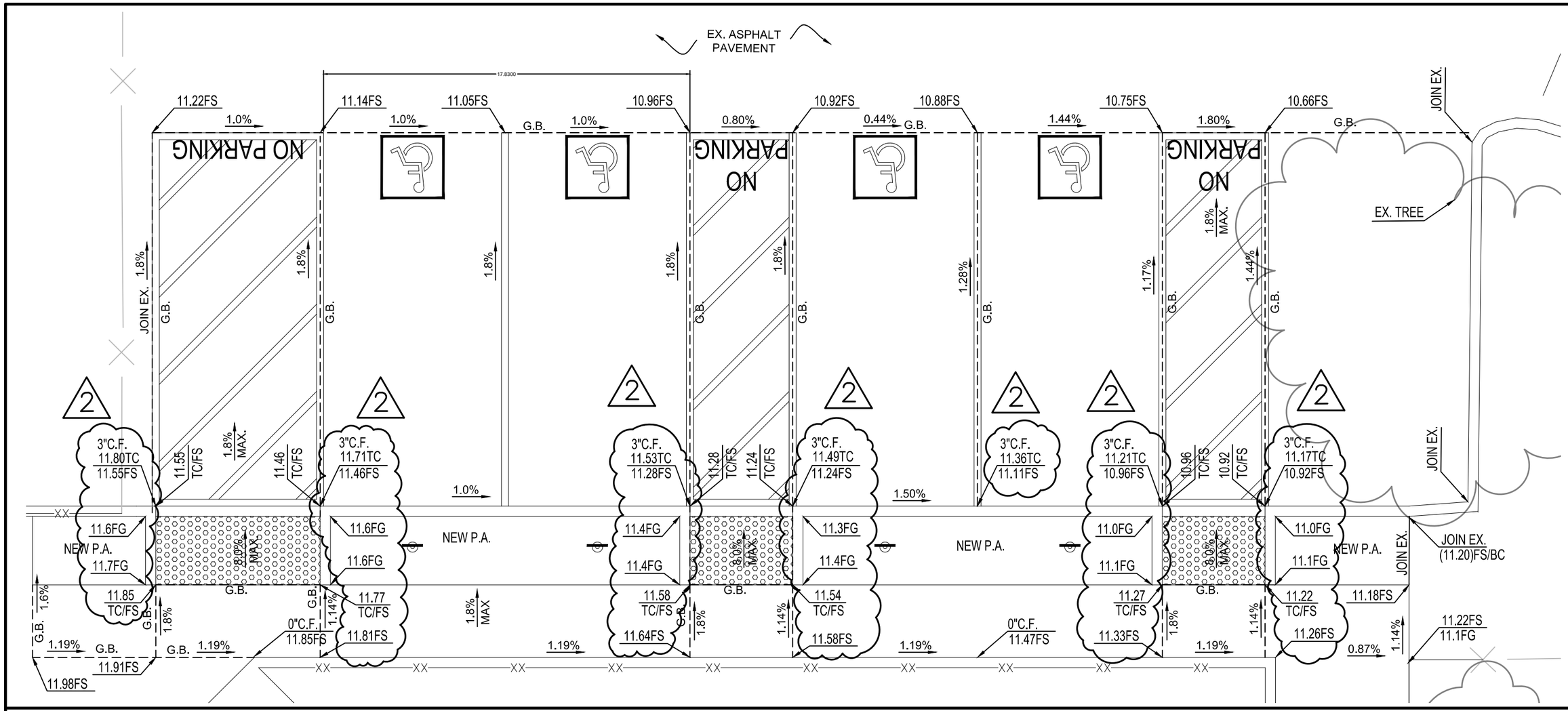
12.2 CONTROL JOINT AT SIDEWALK N.T.S



OXNARD HIGH SCHOOL
APP. 03-120419
ADDENDUM #2
SHEET NO.: AD2-C4
REF. DWG.: C1.1
ISSUE DATE: 02/12/20



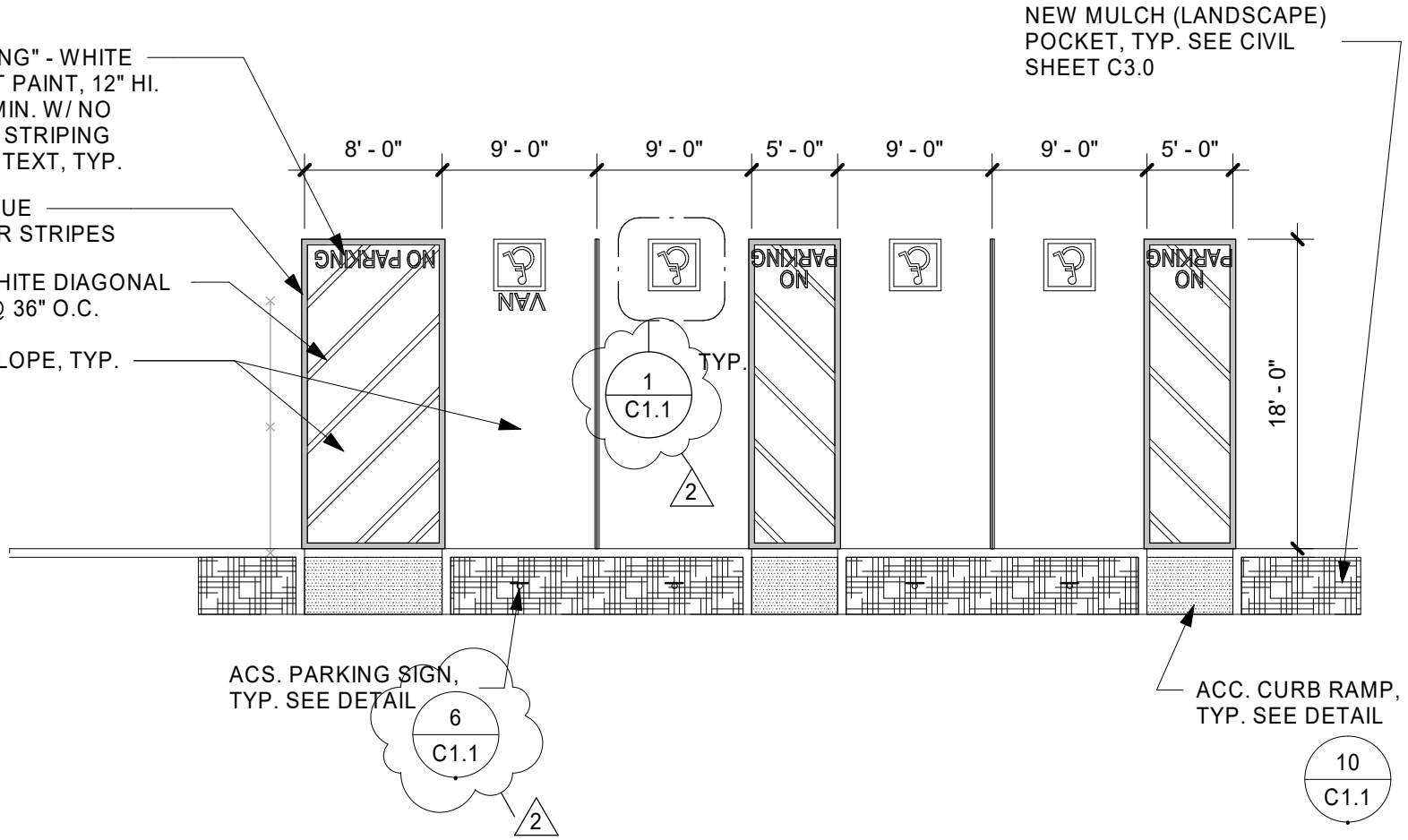
ENLARGEMENT - DETAIL 'ZZ'

SCALE 1"=5'

OXNARD HIGH SCHOOL
APP. 03-120419
ADDENDUM #2
SHEET NO.: AD2-C7
REF. DWG.: C4.0
ISSUE DATE: 02/12/20

REGISTERED PROFESSIONAL ENGINEER
BARSIN BET GOVARGEZ
C 81751
EXP 3,31,20
CIVIL
STATE OF CALIFORNIA

LICENSED ARCHITECT
JAY R. TITTL
NO. C12955
REN. 11-30-21
STATE OF CALIFORNIA



NOTE:
FOR TYPICAL ACC. PARKING STALL AISLE COLORS AND TEXT, SEE DETAIL 3 / A1.3.2

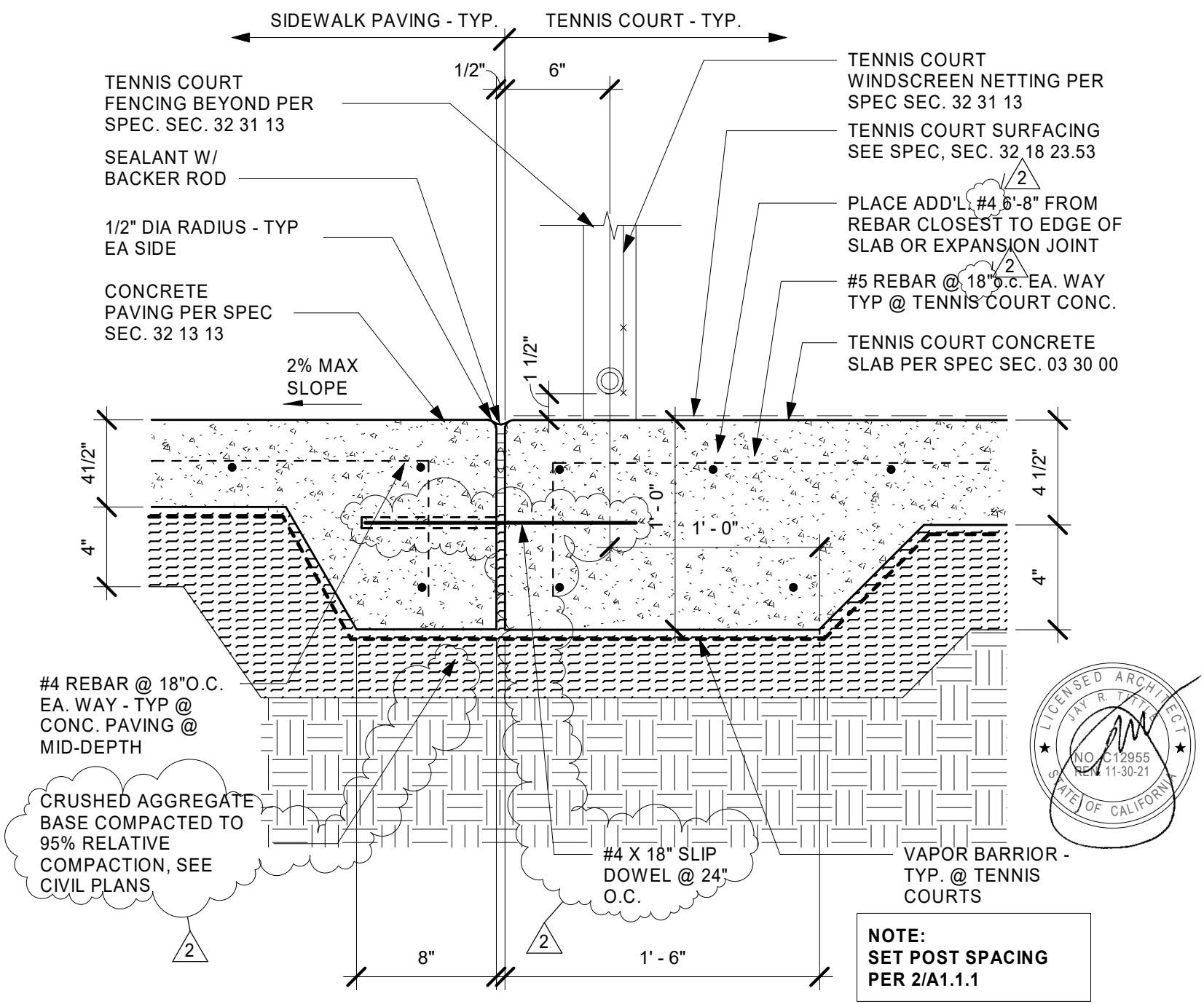
PROJECT NO.	6121235306
ISSUE DATE	02/12/2020
REFERENCE	3/A1.1.1
DRAWING #	AD2-A1

PROJECT NAME: OXNARD HIGH SCHOOL TENNIS COURTS IMPROVEMENTS

DESCRIPTION

PRINCIPAL IN CHARGE:
PROJECT MANAGER:
DESIGN TEAM: Designer

LITTLE
DIVERSIFIED ARCHITECTURAL CONSULTING
1300 Dove Street
Newport Beach, CA 92660
T: 949.698.1400
www.littleonline.com



PROJECT NO. 6121235306

ISSUE DATE 02/11/20

REFERENCE 1/A1.3.1

DRAWING # AD2-A2

PROJECT NAME
OXNARD HIGH SCHOOL TENNIS COURTS IMPROVEMENTS

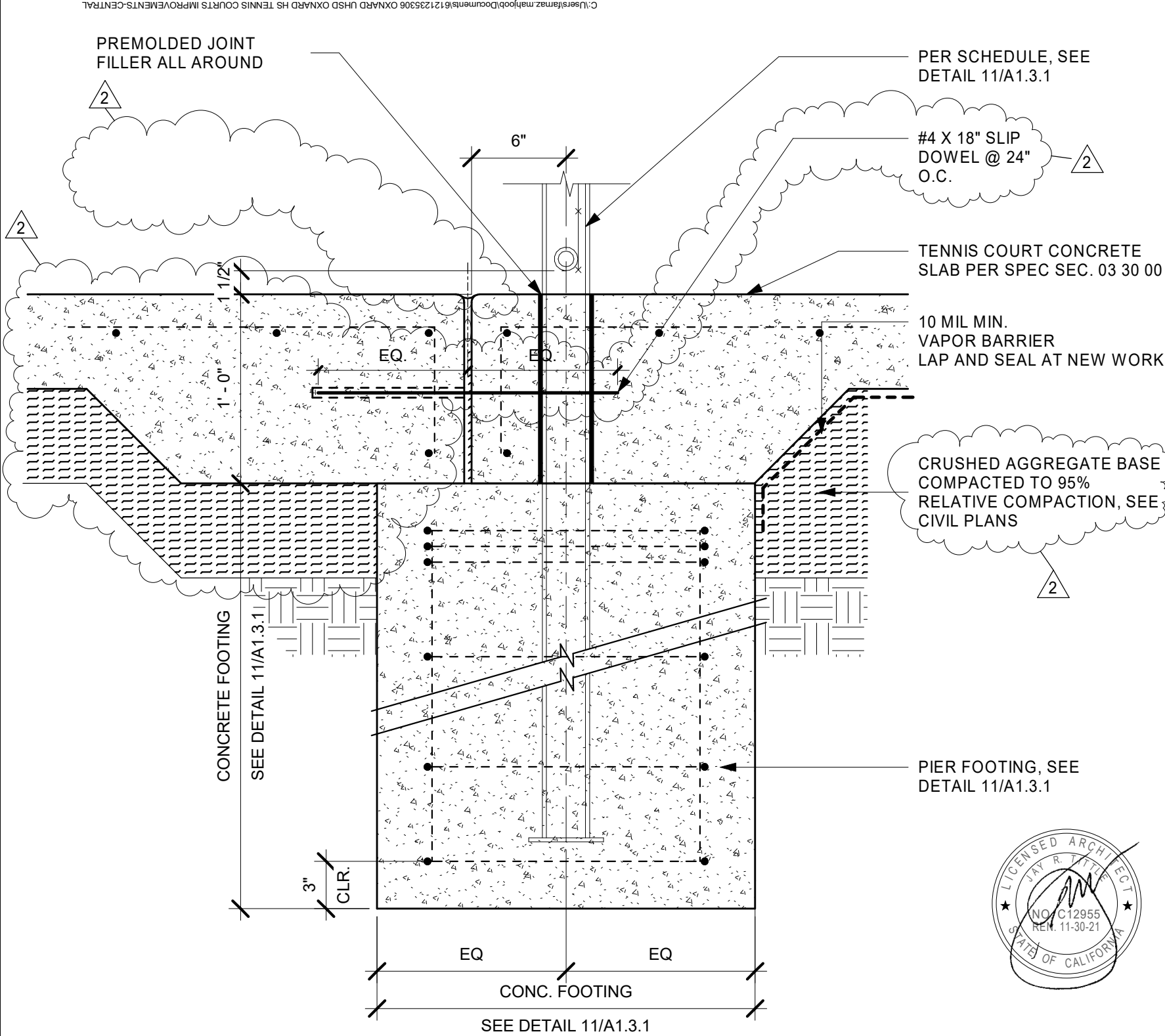
DESCRIPTION
TENNIS COURT / CONC. PAVING DETAIL - TYP.

PRINCIPAL IN CHARGE:

PROJECT MANAGER:

DESIGN TEAM: Designer

LITTLE
DIVERSIFIED ARCHITECTURAL CONSULTING
1300 Dove Street
Newport Beach, CA 92660
T: 949.698.1400
www.littleonline.com



LICENSED ARCHITECT
JAY R. LITTLE
NO. C12955
REN. 11-30-21
STATE OF CALIFORNIA

PROJECT NO.	6121235306
ISSUE DATE	02/11/20
REFERENCE	2/A1.3.1
DRAWING #	AD2-A3

PROJECT NAME: OXNARD HIGH SCHOOL TENNIS COURTS IMPROVEMENTS

DESCRIPTION: TENNIS COURT POST FOOTING

PRINCIPAL IN CHARGE:

PROJECT MANAGER:

DESIGN TEAM: Designer

LITTLE
DIVERSIFIED ARCHITECTURAL CONSULTING
1300 Dove Street
Newport Beach, CA 92660
T: 949.698.1400
www.littleonline.com

PACIFIC TENNIS COURTS, INC.

Little
Pre-Bid RFI #01

530 Los Angeles Ave., Suite 115-320
Moorpark, CA 93021
www.pacifictenniscourts.com
818.991.7445
818.706.1951 fax

Request for Information

Project Reference: Tennis Court Replacement - Oxnard High School
Project No.: 613
To: Deanna Rantz
Date: 2/5/2020
Phone:
RFI No.: 1
Fax:
No. of Pages: 1
Contact: Deanna.Rantz@oxnardunion.org

Requested By: Phil Carter

Submitted By: Phil Carter

Drawing No./Detail _____ Spec Section: _____ Page: _____

Requested Information/Clarification:

The soils report that was included in the bid packet doesn't pertain to the tennis courts. Is there a soils report specifically for the tennis court project?
The question is, how much over excavation is required?

Date Response Needed By: ASAP

Response:

Recent exploration indicates that the tennis court surface consists of approximately 5.5 inches of asphalt supported by 3 inches of aggregate base on compacted silty sand. However, because the existing tennis courts will be demolished, which will disturb near-surface soils, the grading recommendations provided in soils report (pages 8 & 9) for flatwork should be performed within the new tennis court facility. please use soils report included in bid package for this project

Date: 2/5/2020

Signed: Barsin Bet Govargez

Little
Pre-Bid RFI #02

SECTION 00 40 25
REQUEST FOR INFORMATION

RFI NUMBER: C W - 01 DATE: 02/05/2020

PROJECT NAME: OXNARD HS TENNIS COURT IMPROVEMENTS PROJECT NO.: 612-12353-06

TO: LITTLE DIVERSIFIED ARCHITECTURAL CONSULTING
1300 Dove Street, Suite 100, Newport Beach CA 92660
Attention:
Contractor: C&W CONSTRUCTION SPECIALTIES INC.
Address: 2419 PALMA DRIVE
VENTURA, CA 93003
Request By: ERIC E. MARKSBERRY Date: 02/05/2020

BRIEF SUMMARY OF RFI: PLEASE CLARIFY THE FENCE LINE POST AND TERMINAL POST FOOTING DEPTH AND SIZE REQUIREMENT. THE PLAN DETAIL CALLS OUR FOR 11' & 10'6" EMBEDMENT WITH A 24" DIAMETER FOOTING.

Drawing No. A1.3.1 Detail No. 11
Specification Section 32 31 13 Title CHAIN LINK FENCES AND GATES
Page 6 Paragraph SEC. 3.02 - C

DETAILS OF THIS RFI:

Requirements are shown on detail 11/A1.3.1, as you have noted. Not understanding your question. Bid per plans and specs.

Attachments:

RESPONSE WILL BE INCLUDED IN AN ADDENDUM

END OF RFI

Little
Pre-Bid RFI #03

SECTION 00 40 25
REQUEST FOR INFORMATION

RFI NUMBER: CW-02 DATE: 02/05/2020

PROJECT NAME: OXNARD HS TENNIS COURT IMPROVEMENTS PROJECT NO.: 612-12353-06

TO: LITTLE DIVERSIFIED ARCHITECTURAL CONSULTING
1300 Dove Street, Suite 100, Newport Beach CA 92660
Attention:
Contractor: C&W CONSTRUCTION SPECIALTIES INC.
Address: 2419 PALMA DRIVE
VENTURA, CA 93003
Request By: ERIC E. MARKSBERRY Date: 02/05/2020

BRIEF SUMMARY OF RFI: PLEASE CONFIRM THAT ALL FENCE FABRIC IS TO BE 1" DIAMOND MESH INTERWOVEN WIRE,11 GA, 0.125 INCH THICK,TOP AND BOTTOM SELVAGE KNUCKLE END CLOSED

Drawing No. A 1.3.1 Detail No. 9
Specification Section 32 31 13 Title CHAIN LINK FENCES AND GATES
Page 4 Paragraph SEC. 2.04 - H

DETAILS OF THIS RFI:

Refer to revised specs.
'All fence fabric in to be 1 3/4" diamond mesh interwoven wire, 9 ga, 0.1483 inch thick'.

Attachments:

RESPONSE WILL BE INCLUDED IN AN ADDENDUM

END OF RFI

Little
Pre-Bid RFI #04

SECTION 00 40 25

REQUEST FOR INFORMATION

RFI NUMBER: CW-03 DATE: 02/05/2020

PROJECT NAME: OXNARD HS TENNIS COURT IMPROVEMENTS PROJECT NO.: 612-12353-06

TO: LITTLE DIVERSIFIED ARCHITECTURAL CONSULTING

1300 Dove Street, Suite 100, Newport Beach CA 92660

Attention: _____

Contractor: C&W CONSTRUCTION SPECIALTIES INC.

Address: 2419 PALMA DRIVE

VENTURA, CA 93003

Request By: ERIC E. MARKSBERRY Date: 02/05/2020

BRIEF SUMMARY OF RFI: PLEASE CLARIFY FENCE LINE POST, TERMINAL POST, AND GATE POST SIZE REQUIREMENTS. PROJECT SPECIAL PROVISIONS CALL OUT FOR LINE POSTS @ 2.38 INCH DIAMETER AND CORNER AND TERMINAL POSTS @ 2.88 INCH DIAMETER. GATE POST @ 3-12"

Drawing No. A 1.3.1 Detail No. 9

Specification Section 32 31 13 Title CHAIN LINK FENCES AND GATES

Page 4 Paragraph SEC. 2.04- B,C,D,

DETAILS OF THIS RFI: FENCE POST SIZES ARE NOT CALLED OUT ON THE PLAN SHEETS

Correct. Detail 9/A1.3.1 refers to the specification. Spec. 32 31 13 section 2.04 B, C & D as you noted.

Attachments: _____

RESPONSE WILL BE INCLUDED IN AN ADDENDUM

END OF RFI

Little
Pre-Bid RFI #05

SECTION 00 40 25

REQUEST FOR INFORMATION

RFI NUMBER: CW-04 DATE: 02/05/2020

PROJECT NAME: OXNARD HS TENNIS COURT IMPROVEMENTS PROJECT NO.: 612-12353-06

TO: LITTLE DIVERSIFIED ARCHITECTURAL CONSULTING

1300 Dove Street, Suite 100, Newport Beach CA 92660

Attention: _____

Contractor: C&W CONSTRUCTION SPECIALTIES INC.

Address: 2419 PALMA DRIVE
VENTURA, CA 93003

Request By: ERIC E. MARKSBERRY Date: 02/05/2020

BRIEF SUMMARY OF RFI: POSTS, RAILS, AND FRAMES - SPECIAL PROVISIONS CALL OUT FOR ZINC COATING COMPLYING WITH ASTM F1043 AND ASTM F1083. THESE ARE TWO SEPARATE COATING REQUIREMENTS. PLEASE CLARIFY WHICH ONE APPLIES TO THIS PROJECT.

Drawing No. A 1.3.1 Detail No. 9

Specification Section 32 31 13 Title CHAIN LINK FENCES AND GATES

Page 3 (6) Paragraph SEC. 2.03 - A (SEC. 2.07 - A)

DETAILS OF THIS RFI:

Depending on the manufacturer and application either ASTM can apply. 2.03 applies to fabricated steel brackets and other items. Not the standard fencing fabric and posts. Some posts can be steel tube not normal to chain link systems.

Attachments: _____

RESPONSE WILL BE INCLUDED IN AN ADDENDUM

END OF RFI

Little
Pre-Bid RFI #06

SECTION 00 40 25
REQUEST FOR INFORMATION

RFI NUMBER: CW-05 DATE: 02/05/2020

PROJECT NAME: OXNARD HS TENNIS COURT IMPROVEMENTS PROJECT NO.: 612-12353-06

TO: LITTLE DIVERSIFIED ARCHITECTURAL CONSULTING
1300 Dove Street, Suite 100, Newport Beach CA 92660
Attention:
Contractor: C&W CONSTRUCTION SPECIALTIES INC.
Address: 2419 PALMA DRIVE
VENTURA, CA 93003
Request By: ERIC E. MARKSBERRY Date: 02/05/2020

BRIEF SUMMARY OF RFI: PLEASE CONFIRM THAT THE THREE (3) HORIZONTAL BRACE RAILS CALLED OUT ON THE PLAN DETAIL ARE IN ADDITION TO THE TOP AND BOTTOM RAILS CALLED OUT IN THE SAME DETAIL

Drawing No. A 1.3.1 Detail No. 9
Specification Section 32 31 13 Title CHAIN LINK FENCES AND GATES
Page 7 Paragraph SEC. 3-03. - A

DETAILS OF THIS RFI:

Confirmed.

Attachments:

RESPONSE WILL BE INCLUDED IN AN ADDENDUM

END OF RFI

Little
Pre-Bid RFI #07

SECTION 00 40 25
REQUEST FOR INFORMATION

RFI NUMBER: CW-06 DATE: 02/05/2020

PROJECT NAME: OXNARD HS TENNIS COURT IMPROVEMENTS PROJECT NO.: 612-12353-06

TO: LITTLE DIVERSIFIED ARCHITECTURAL CONSULTING
1300 Dove Street, Suite 100, Newport Beach CA 92660
Attention:
Contractor: C&W CONSTRUCTION SPECIALTIES INC.
Address: 2419 PALMA DRIVE
VENTURA, CA 93003
Request By: ERIC E. MARKSBERRY Date: 02/05/2020

BRIEF SUMMARY OF RFI: IS THE FENCE POST SPACING TO BE AS CALLED OUT ON PLAN SHEET A1.1.1, DETAIL 2 (8' MAX ON CENTER)? , OR 10' MAX POST SPACING AS CALLED ON PLAN SHEET A1.3.1, DETAIL 9?

Drawing No. A1.1.1 Detail No. 2
Specification Section 32 31 13 Title CHAIN LINK FENCES AND GATES
Page 6 Paragraph SEC. 3.02 - B

DETAILS OF THIS RFI:

The plan calls out for equal spacing and the spec calls out for no more than 10' max. Follow the plans (which also complies with the specs as written).

Attachments:

RESPONSE WILL BE INCLUDED IN AN ADDENDUM

END OF RFI