

#### **ADDENDUM NO. 1**

#### TRACK & FIELD IMPROVEMENTS

LITTLE JOB #612-12353-07 DSA: A# 03-120293 File #56-H4

#### **Rio Mesa High School**

545 Central Avenue Oxnard, CA 93036

April 24, 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 #0 issued April 10, 2020; clarifying the bid scope for all bidders.

#### 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.** ACAD files will be provided to successful Bidder.
  - **1.3.1.2.** Specification section 11 68 33.43 Track and Field Equipment The following equipment are excluded from the scope of work for this bid:
    - **1.3.1.2.1.** Pole Vault landing system and standards.

- **1.3.1.2.2.** Pole Vault Box with cover plug.
- **1.3.1.2.3.** Discus / Shot Put.
- 1.3.1.3. Add 'Partial Underground Utility Map' (sheets 1 3), for reference noting the following: 'DSA approved construction documents were prepared using Armstrong & Brooks Consulting Engineers, Inc. survey files where majority of the existing utilities were mapped using available records and some were verified at field. Recently, 'C-below' was contracted to perform Underground Utility survey and they have provided us with their maps for Contractor's reference. For bidding purposes, Contractor shall consider information shown on these maps in addition to what is shown on DSA approved plans as some of the existing utilities within work area will be impacted by proposed improvements.'
- 1.3.1.4. Add 'TOPOGRAPHIC SITE PLAN' (sheets 1 6), for reference noting the following: 'DSA approved construction documents were prepared using Armstrong & Brooks Consulting Engineers, Inc. topo survey files where the linework on their survey files were mostly from aerial survey. Recently, surveyor was tasked to update their topographic survey files to include linework on their survey maps where detailed foot survey was performed at field. Attached are updated topographic survey files for reference. For bidding purposes, contractor shall consider information shown on these maps in addition to what is shown on DSA approved plans.'

#### 2. PART 2 - PROJECT MANUAL

- 2.1. CHANGES TO PROJECT MANUAL TABLE OF CONTENTS
  - **2.1.1.** Division 00 01 10, TABLE OF CONTENTS
    - **2.1.1.1.** Delete in its entirety and replace with the attached Table of Contents.
- 2.2. SPECIFICATIONS ISSUED
  - **2.2.1.** Section 11 68 43.13, Outdoor Scoreboard Delete Section 11 68 43.13 originally issued, in its entirety.
  - **2.2.2.** Section 11 68 43.15, Video Display Scoreboard Add new Section 11 68 43.15 (attached).
  - **2.2.3.** Section 26 56 68, Exterior Athletic Lighting Add new Section 26 56 68 (attached).
  - **2.2.4.** Section 27 41 16, Integrated Audio Systems and Equipment Add new Section 27 41 16 (attached).

#### 3. PART 3 - DRAWINGS

- 3.1. GENERAL DRAWINGS ISSUED
  - **3.1.1.** Narrative changes to General Drawings are issued as follows:

- **3.1.1.1.** Drawing G0.1.1 Modify as follows:
  - 3.1.1.1.1. Sheet Index Field Scoreboard; Modify 'FIELD SCOREBOARD PER PC#04-116017' to read as 'FIELD SCOREBOARD PER PC#02-116492'
  - **3.1.1.1.2.** Sheet Index Field Scoreboard; Delete sheets 1, 2, and 6.
  - **3.1.1.1.3.** Sheet Index Field Scoreboard; Add the following sheets:
    - **3.1.1.3.1.** SB0.1 COVER SHEET
    - **3.1.1.1.3.2.** SB0.2 EXAMPLE SCOREBOARD WORKSHEET & NEVCO PART NUMBERS
    - **3.1.1.1.3.3.** SB0.3 STRUCTURAL NOTES & SPECIAL INSPECTIONS
    - **3.1.1.3.4.** SB2.3 TWO COLUMN MAT FOOTING
    - **3.1.1.3.5.** SB5.1 ATTACHMENT DETAILS
  - **3.1.1.1.4.** Sheet Index Musco Stadium Lighting; Add the following sheets:
    - **3.1.1.4.1.** MT2 NOTES, RETROFIT CONFIGURATION
    - **3.1.1.4.2.** MS3 POLE DETAIL
    - **3.1.1.4.3.** MS4 POLE DETAIL
    - 3.1.1.1.4.4. MD1 ATTACHMENT DETAILS
    - **3.1.1.4.5.** MD2 ATTACHMENT DETAILS
  - **3.1.1.1.5.** Sheet Index Audio Visual; Add the following sheets:
    - 3.1.1.5.1. AV0.1 GENERAL NOTES AND SHEET INDEX
    - **3.1.1.1.5.2.** AV0.2 ABBREVIATIONS NOTES AND SYMBOLS
    - **3.1.1.1.5.3.** AV1.1 ENLARGED AV SITE PLAN
    - **3.1.1.1.5.4.** AV1.2 AV SPEAKER COVERAGE PLAN
    - **3.1.1.1.5.5.** AV1.5 AV ENLARGED LAYOUTS
    - **3.1.1.1.5.6.** AV2.1 AV ENLARGED PLANS
    - **3.1.1.1.5.7.** AV2.2 AV ENLARGED PLANS
    - **3.1.1.1.5.8.** AV3.1 AV RISER DIAGRAM
    - 3.1.1.1.5.9. AV4.0 WIRING SCHEME AND SYMBOL KEY
    - **3.1.1.1.5.10.** AV4.1 AV ONELINE DIAGRAM

- **3.1.1.1.5.11.** AV5.0 AV TYPICAL SEISMIC AND GROUNDING DETAILS
- **3.1.1.5.12.** AV6.1 AV DETAILS
- **3.1.1.5.13.** AV6.2 AV DETAILS
- **3.1.1.5.14.** AV6.3 AV DETAILS

#### 3.2. CIVIL DRAWINGS ISSUED

- **3.2.1.** The following Addendum ("AD") Drawings, marked Delta 1, are issued:
  - **3.2.1.1.** Drawing C1.0: Revise currently issued Drawing per AD1-C1.
  - **3.2.1.2.** Drawing C1.1: Replace with Drawing AD1-C2.
  - **3.2.1.3.** Drawing C1.2: Revise currently issued Drawing per AD1-C3.
  - **3.2.1.4.** Drawing C2.0: Revise currently issued Drawing per AD1-C4 and AD1-C5.
  - **3.2.1.5.** Drawing C3.1: Revise currently issued Drawing per AD1-C6.
  - **3.2.1.6.** Drawing C3.3: Revise currently issued Drawing per AD1-C7.
  - **3.2.1.7.** Drawing C4.2: Revise currently issued Drawing per AD1-C8.
  - **3.2.1.8.** Drawing C4.6: Revise currently issued Drawing per AD1-C9 and AD1-C10.
  - **3.2.1.9.** Drawing C5.1: Revise currently issued Drawing per AD1-C11.
  - **3.2.1.10.** Drawing C5.2: Replace with Drawing AD1-C12.

#### 3.3. ARCHITECTURAL DRAWINGS ISSUED

- **3.3.1.** The following Addendum ("AD") Drawings, marked Delta 1, are issued:
  - **3.3.1.1.** Drawing A1.0.1: Replace with Drawing AD1-A1.
  - **3.3.1.2.** Drawing A1.1.1: Replace with Drawing AD1-A2.
  - **3.3.1.3.** Drawing A9.0.2: Replace with Drawing AD1-A3.
  - **3.3.1.4.** Drawing AD1-A4: New Details/Sheet.

#### 3.4. ELECTRICAL DRAWINGS ISSUED

- **3.4.1.** The following Addendum ("AD") Drawings, marked Delta 1, are issued:
  - **3.4.1.1.** Drawing E-001: Replace with Drawing AD1-E1.
  - **3.4.1.2.** Drawing E-200: Replace with Drawing AD1-E2.

#### 3.5. MUSCO STADIUM LIGHTING DRAWINGS ISSUED

**3.5.1.** The following Addendum ("AD") Drawings, marked Delta 1, are issued:

- **3.5.1.1.** Drawing MT1: Replace with Drawing AD1-MT1.
- 3.5.1.2. Drawing (MT2) AD1-MT2: New Sheet.
- **3.5.1.3.** Drawing MS1: Replace with Drawing AD1-MS1.
- **3.5.1.4.** Drawing MS2: Replace with Drawing AD1-MS2.
- **3.5.1.5.** Drawing (MS3) AD1-MS3: New Sheet.
- **3.5.1.6.** Drawing (MS4) AD1-MS4: New Sheet.
- **3.5.1.7.** Drawing (MD1) AD1-MD1: New Sheet.
- 3.5.1.8. Drawing (MD2) AD1-MD2: New Sheet.

#### 3.6. FIELD SCOREBOARD DRAWINGS ISSUED

- **3.6.1.** The following Addendum ("AD") Drawings, marked Delta 1, are issued:
  - **3.6.1.1.** Drawing (SB0.1) AD1-SB1: New Sheet.
  - **3.6.1.2.** Drawing (SB0.2) AD1-SB2: New Sheet.
  - **3.6.1.3.** Drawing (SB0.3) AD1-SB3: New Sheet.
  - **3.6.1.4.** Drawing (SB2.3) AD1-SB4: New Sheet.
  - **3.6.1.5.** Drawing (SB5.1) AD1-SB5: New Sheet.

#### 3.7. AUDIO VISUAL DRAWINGS ISSUED

- **3.7.1.** The following Addendum ("AD") Drawings, marked Delta 1, are issued:
  - **3.7.1.1.** Drawing (AV0.1) AD1-AV1: New Sheet.
  - **3.7.1.2.** Drawing (AV0.2) AD1-AV2: New Sheet.
  - **3.7.1.3.** Drawing (AV1.1) AD1-AV3: New Sheet.
  - **3.7.1.4.** Drawing (AV1.2) AD1-AV4: New Sheet.
  - **3.7.1.5.** Drawing (AV1.5) AD1-AV5: New Sheet.
  - **3.7.1.6.** Drawing (AV2.1) AD1-AV6: New Sheet.
  - **3.7.1.7.** Drawing (AV2.2) AD1-AV7: New Sheet.
  - **3.7.1.8.** Drawing (AV3.1) AD1-AV8: New Sheet.
  - **3.7.1.9.** Drawing (AV4.0) AD1-AV9: New Sheet.
  - **3.7.1.10.** Drawing (AV4.1) AD1-AV10: New Sheet.
  - **3.7.1.11.** Drawing (AV5.0) AD1-AV11: New Sheet.
  - **3.7.1.12.** Drawing (AV6.1) AD1-AV12: New Sheet.

- **3.7.1.13.** Drawing (AV6.2) AD1-AV13: New Sheet.
- **3.7.1.14.** Drawing (AV6.3) AD1-AV14: New Sheet.

#### **END OF ADDENDUM NO. 1**

#### **Enclosures:**

- I) Reference Plans Issued:
  - a) 'Partial Underground Utility Map' (sheets 1-3)
  - b) 'TOPOGRAPHIC SITE PLAN' (sheets 1 6)
- II) New Project Manual Documents Issued:
  - a) Section 00 01 10
  - b) Section 11 68 43.15
  - c) Section 26 56 68
  - d) Section 27 41 16
- III) New full-size Drawings Issued:
  - a) Drawings AD1-C2 and AD1-C12, Delta 1.
  - b) Drawings AD1-A1 through AD1-A3, Delta 1.
  - c) Drawings AD1-E1 and AD1-E2, Delta 1.
  - d) Drawings AD1-MT1 and AD1-MT2, Delta 1.
  - e) Drawings AD1-MS1 through AD1-MS4, Delta 1.
  - f) Drawings AD1-MD1 and AD1-MD2, Delta 1.
  - g) Drawings AD1-SB1 through AD1-SB5, Delta 1.
  - h) Drawings AD1-AV1 through AD1-AV14, Delta 1.
- IV) New 11 x 17 Drawings Issued:
  - a) Drawings AD1-C4 through AD1-C7 and AD1-C9, Delta 1.
  - b) Drawing AD1-A4, Delta 1.
- V) New 8-1/2 x 11 Drawings Issued:
  - a) Drawings AD1-C1, AD1-C3, AD1-C8, AD1-C10, and AD1-C11, Delta 1.

DRAWING SHEETS		
SHEET NO.	SHEET TITLE	
1	COVER SHEET	
2-3	UTILITY MAP	

## UTILITY QUALITY LEVELS NOTES

INFORMATION PROVIDED FROM AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) CI/ASCE 38-02 MANUAL.

#### <u>utility quality level a</u>

PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE (OR VERIFICATION OF PREVIOUSLY EXPOSED AND SURVEYED UTILITIES) AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT. MINIMALLY INTRUSIVE EXCAVATION EQUIPMENT IS TYPICALLY USED TO MINIMIZE THE POTENTIAL FOR UTILITY DAMAGE. A PRECISE HORIZONTAL AND VERTICAL LOCATION, AS WELL AS OTHER UTILITY ATTRIBUTES, IS SHOWN ON PLAN DOCUMENTS. ACCURACY IS TYPICALLY SET TO 15-MM VERTICAL AND TO APPLICABLE HORIZONTAL SURVEY AND MAPPING ACCURACY AS DEFINED OR EXPECTED BY THE PROJECT OWNER.

## UTILITY QUALITY LEVEL B

INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. QUALITY LEVEL B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. THIS INFORMATION IS SURVEYED TO APPLICABLE TOLERANCES DEFINED BY THE PROJECT AND REDUCED ONTO PLAN DOCUMENTS.

### UTILITY QUALITY LEVEL C

INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

### UTILITY QUALITY LEVEL D

INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

## UTILITY NOTES

- 1 FACILITIES (UTILITY LINES) SHALL BE LOCATED AND MARKÈD PRIOR TO ÉXCAVATION. CALL (800) 90-BELOW.
- (2) CONTRACTOR SHALL HAND-EXPOSE TO A POINT OF NO CONFLICT 24" ON EITHER SIDE OF THE UNDERGROUND FACILITY, REGARDLESS OF THE ESTIMATED DEPTH.
- (3) DEPTHS SHOWN ARE APPROXIMATE. ESTIMATED DEPTHS ARE FROM THE GROUND SURFACE TO THE CENTER OF THE FACILITY, INVERT OF WASTE LINES, OR TO THE FACILITY TRACER WIRE. DEPTH ESTIMATES SHOULD BE USED WITH CAUTION AND MAY VARY ALONG THE LENGTH OF THE FACILITY.
- (4) UTILITY BRACKETS ARE SHOWN TO DEMONSTRATE MULTIPLE LINES TRAVELING TOGETHER IN EITHER A DUCTBANK OR BUNDLE.
- (5) THE SCOPE OF THIS SURVEY DOES NOT INCLUDE FACILITY SIZE OR NUMBER OF CONDUIT IN MULTIPLE CONDUIT RUNS. IRRIGATION LINES ARE NOT INCLUDED IN THIS SURVEY.
- (6) THE BACKGROUND SITE PLAN USED IN PREPARING THIS MAP WAS PREPARED BY OTHERS AND PROVIDED TO C BELOW BY THE CLIENT. C BELOW MAKES NO REPRESENTATION AS TO THE ACCURACY OF THE PLAN.
- (7) IN THE EVENT THE INFORMATION SHOWN IN THIS PLAN VARIES FROM THE ACTUAL SITE CONDITIONS, C BELOW SHALL BE NOTIFIED WITHIN 24 HOURS AFTER DISCOVERY OF THE CONFLICT.

: 909-606-6555

www.cbelow.com

# UNDERGROUND UTILITY MAP

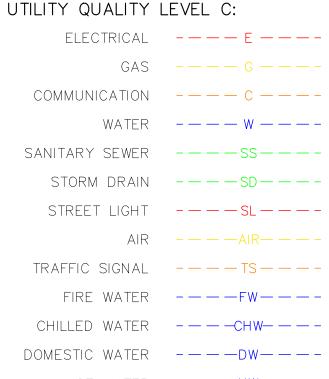
WITHIN THE CITY OF OXNARD, COUNTY OF VENTURA, CALIFORNIA PREPARED FOR:

# OXNARD UNION HIGH SCHOOL DISTRICT



# **NOT TO SCALE**

# ELECTRICAL — E — — —

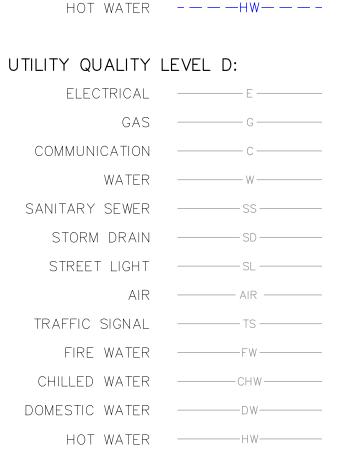


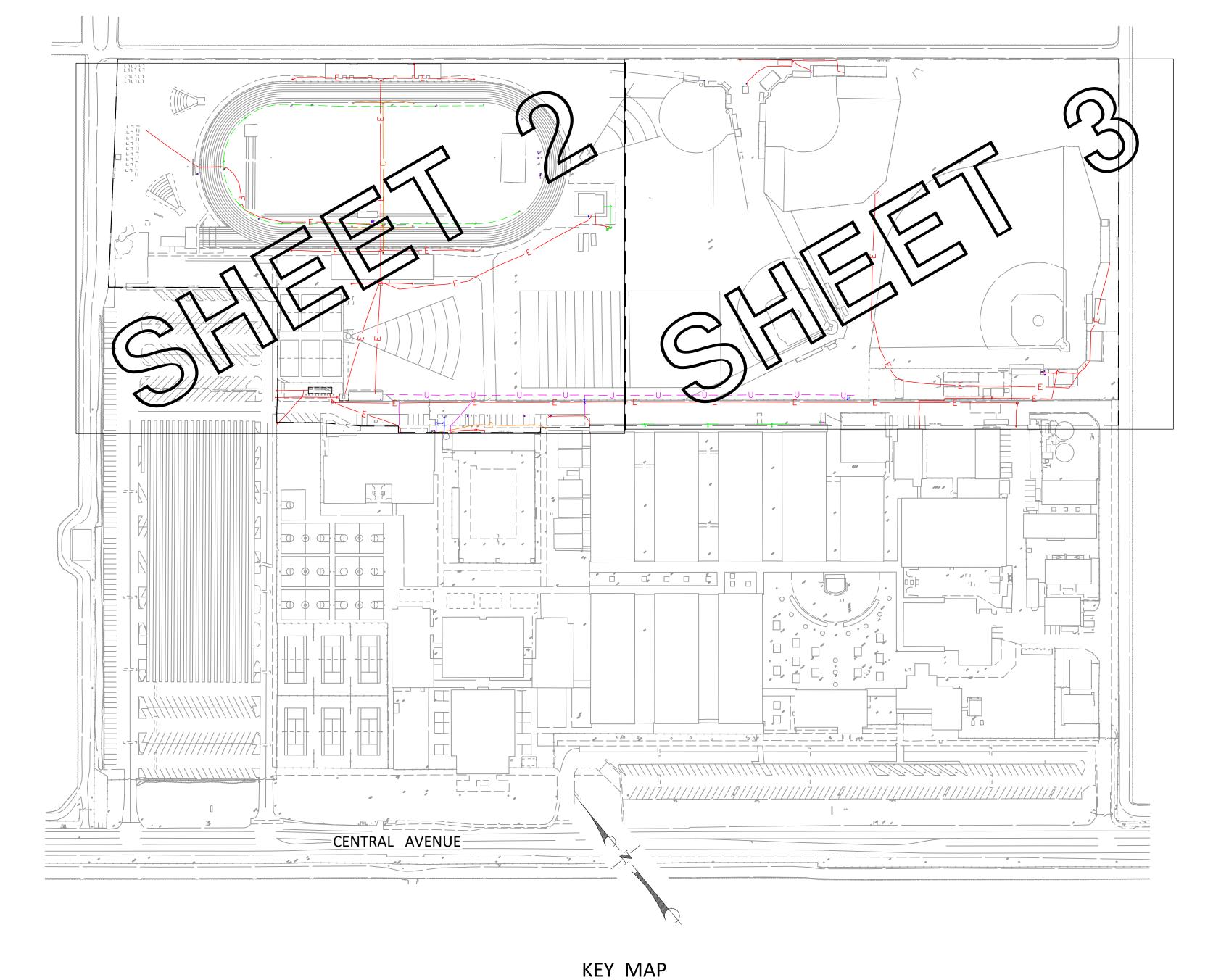
UNDERGROUND LINE LEGEND

UTILITY QUALITY LEVEL B:

POSSIBLE LINE LOCATION, BASED

ON GPR DETECTION





KEY NOTES

NON-CONDUCTIVE, UNABLE TO LOCATE PAST THIS POINT.

NO ACCESS, UNABLE TO LOCATE PAST THIS POINT.

(3) BLOCKED

4 AT BUILDING

5 AT DROP

6 AT RISER

**ABBREVIATIONS** 

BACKFLOW PREVENTER CAB CABINET

CLEAN OUT

ELECTRIC GROUND

ELECTRIC

ICV IRRIGATION CONTROL

MANHOLE

PULL BOX

STORM DRAIN SANITARY SEWER

UNK UNKNOWN

WATER VALVE

LEGEND/SYMBOL

BACKFLOW PREVENTER

CLEAN OUT √1'-6" DEPTH FROM SURFACE

FIRE HYDRANT

LIGHT POLE MANHOLE

PULL BOX

VALVE

VAULT

UTILITY DEPICTION

UNDERGROUND UTILITY DEPICTION SHOWN HEREON IS BASED ON LOCAL CONTROL AND/OR ON THE SMARTNET RTK NETWORK, UNLESS STATED OTHERWISE.



BELOW SUBSURFACE IMAGING 14280 EUCLID AVE CHINO, CA 91710 / GROUND PENETRATING RADAR (GPR) UTILITY LOCATING RADIOGRAPHY P: 888-902-3569

POTHOLING

MAPPING

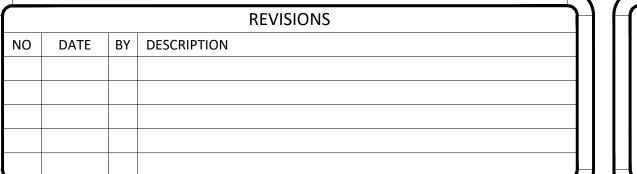
NOTES: The services provided by C Below, Inc. do not relieve the Client and/or property owner of the responsibility of having to comply with California Government Code §§4216-4216.9. It is expressly understood by the Client and/or owner that CBSI services are not a substitute for compliance with California Code §§4216-4216.9.

PARTIAL UNDERGROUND UTILITY MAP FOR: RIO MESA HIGH SCHOOL **545 CENTRAL AVENUE** OXNARD, CA 93036

OXNARD UNION HIGH SCHOOL DISTRICT 309 S. "K" STREET OXNARD, CA 93030

NOT TO SCALE

CLIENT:

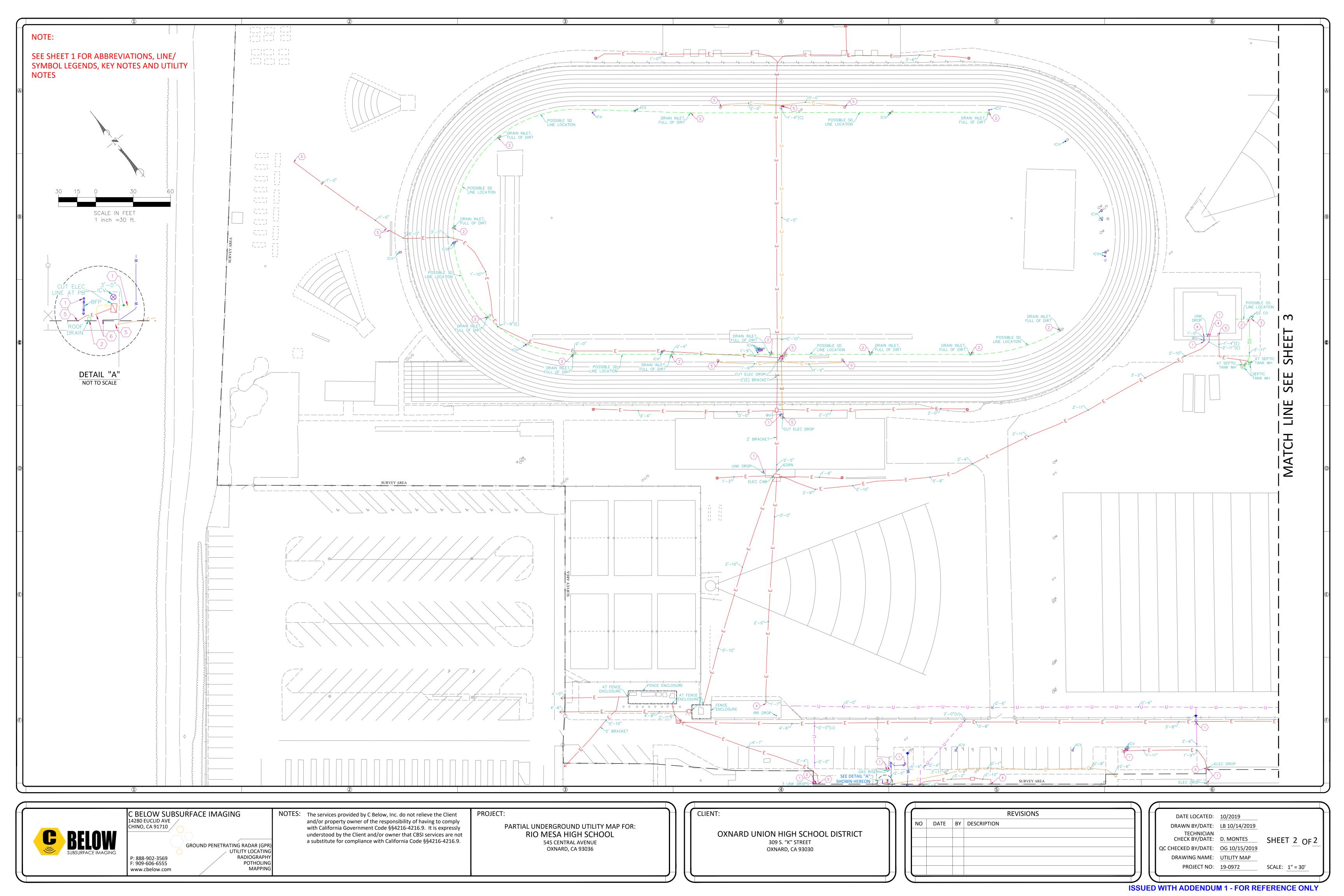


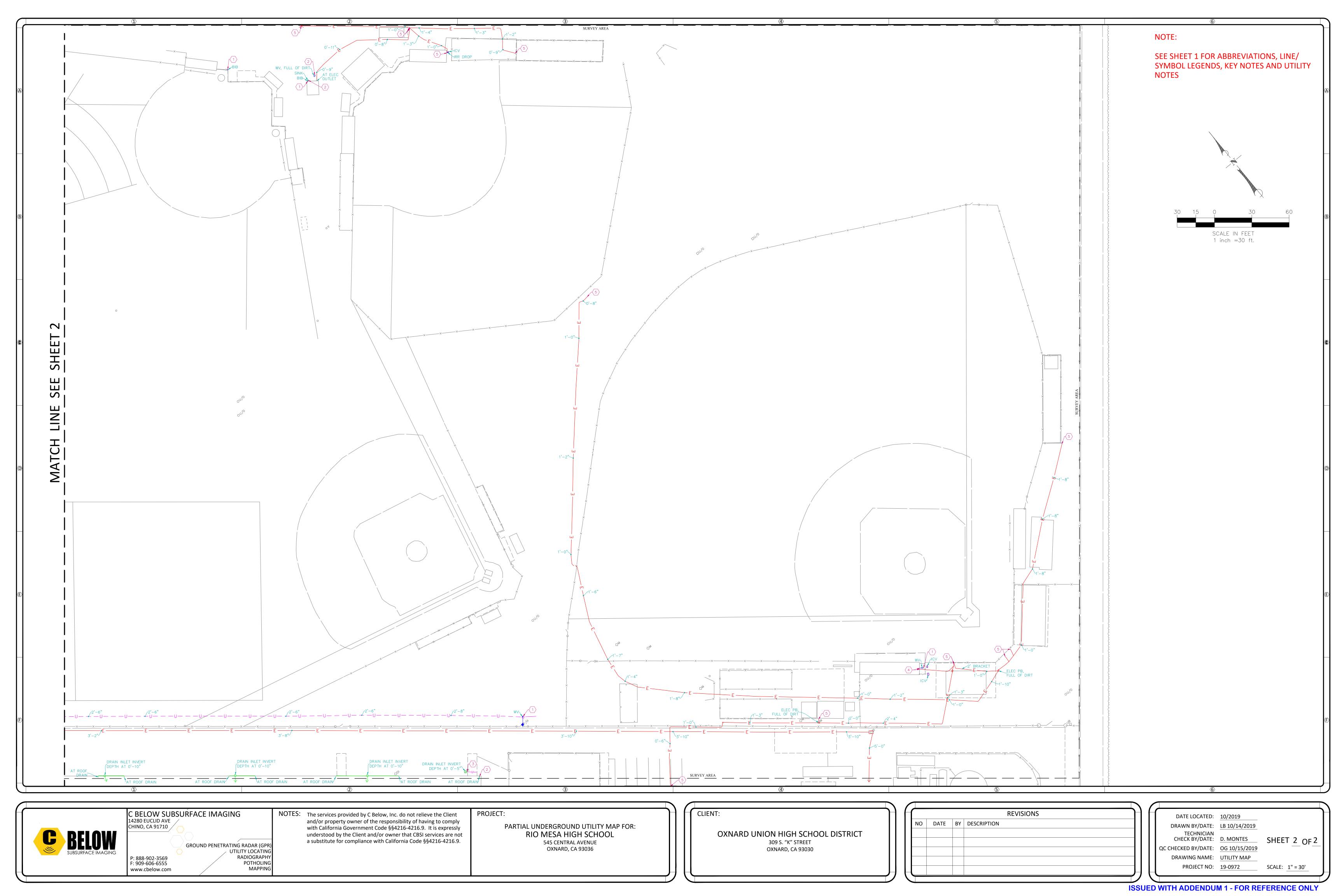
DATE LOCATED: 10/2019 TECHNICIAN QC CHECKED BY/DATE: OG 10/15/2019

DRAWN BY/DATE: LB 10/14/2019 CHECK BY/DATE: D. MONTES SHEET 1 OF 2 DRAWING NAME: COVER SHEET

SCALE: N.T.S.

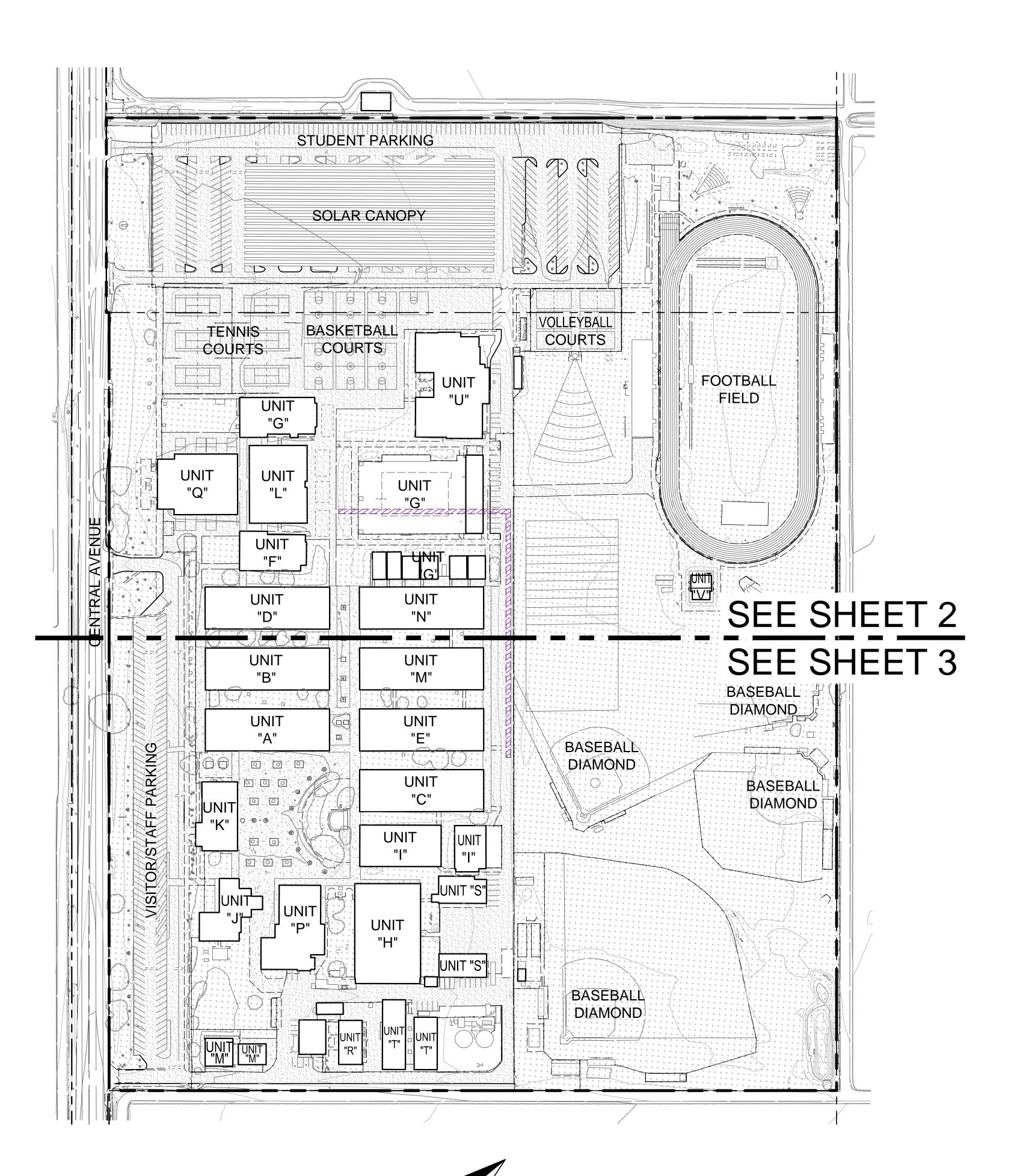
PROJECT NO: 19-0972

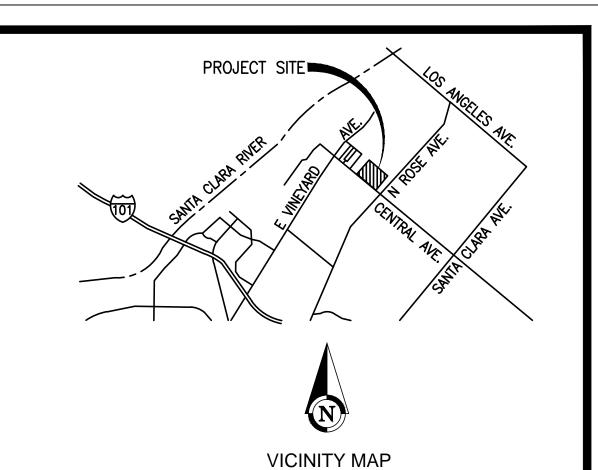




# TOPOGRAPHIC SITEPLAN

RIO MESA HIGH SCHOOL OXNARD, CA





LEGAL DESCRIPTION (FROM TITLE REPORT) ALL THAT CERTAIN REAL PROPERTY SITUATED IN THE COUNTY OF VENTURA, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

THAT PORTION OF LOT 98, RANCHO SANTA CLARA DEL NORTE, IN THE COUNTY OF VENTURA, STATE OF CALIFORNIA, ACCORDING TO THE MAP THEREOF RECORDED IN BOOK 3 PAGE 26 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHEASTERLY LINE OF CENTRAL AVENUE, 60 FEET WIDE, DISTANT ALONG SAID NORTHEASTERLY LINE SOUTH 50° 20' EAST 3336.96 FEET FROM THE INTERSECTION OF SAID NORTHEASTERLY LINE WITH THE SOUTHEASTERLY LINE OF VINEYARD AVENUE, 50 FEET WIDE, AT THE MOST WESTERLY CORNER OF THE LAND DESCRIBED IN THE DEED TO JOHN A. LAGOMARSINO AND WIFE, RECORDED JANUARY 13, 1937 IN BOOK 514 PAGE 323 OF OFFICIAL RECORDS; THENCE CONTINUING ALONG SAID NORTHEASTERLY LINE,

1ST: — SOUTH 50° 20' EAST 346 FEET; THENCE PARALLEL WITH THE NORTHWESTERLY LINE OF SAID LAND OF JOHN A. LAGOMARSINO, 2ND: — NORTH 39° 40' EAST 1259.94 FEET TO THE NORTHEASTERLY LINE OF SAID LOT 98; THENCE ALONG SAID NORTHEASTERLY LINE, 3RD: - NORTH 50° 20' WEST 346 FEET TO THE MOST NORTHERLY CORNER OF SAID LAND OF JOHN A. LAGOMARSINO; THENCE ALONG THE NORTHWESTERLY LINE THEREOF,

4TH: - SOUTH 39' 40' WEST 1259.94 FEET TO THE POINT OF EXCEPT ALL OIL AND MINERAL RIGHTS BELOW 500 FEET FROM THE PRESENT SURFACE BUT WITHOUT RIGHT OF SURFACE ENTRY THEREIN, AS RESERVED BY JOHN A. LAGOMARSINO AND IDA CLAIRE LAGOMARSINO, HUSBAND AND WIFE, IN DEED RECORDED NOVEMBER 4, 1960 AS INSTRUMENT NO. 44425, OF OFFICIAL RECORDS.

PART OF LOT 98, RANCHO SANTA CLARA DEL NORTE, IN THE COUNTY OF VENTURA, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 3 PAGE 26 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT IN THE NORTHEASTERLY LINE OF CENTRAL AVENUE, AT THE SOUTHEAST CORNER OF THAT CERTAIN TRACT OF LAND CONVEYED TO OXNARD CITRUS ASSOCIATION IN DEED RECORDED IN BOOK 511 PAGE 283 OF OFFICIAL RECORDS, SAID POINT BEING DISTANT SOUTH 50° 20' EAST 1066.07 FEET FROM A 6" X 6" REDWOOD POST MARKED "LOT 98" AND "G.C.P." AT THE POINT O INTERSECTION OF SAID NORTHEASTERLY LINE OF CENTRAL AVENUE WITH THE SOUTHEASTERLY LINE OF VINEYARD AVENUE; THENCE FROM SAID POINT OF BEGINNING,

1ST: — NORTH 39° 40' EAST 1264.50 FEET, ALONG THE EASTERLY LINE OF THE LAND DESCRIBED IN SAID DEED TO A POINT IN THE NORTHEASTERLY LINE OF SAID LOT 98; THENCE,

2ND: - SOUTH 50° 20' EAST 2270.89 FEET, MORE OR LESS, ALONG THE NORTHEASTERLY LINE OF SAID LOT 98, TO THE MOST NORTHERLY CORNER OF THE PARCEL OF LAND CONVEYED TO JOHNA. LAGOMARSINO AND WIFE, IN DEED RECORDED IN BOOK 514 PAGE 323, OF OFFICIAL

3RD: — SOUTH 39° 40' WEST 1264.50 FEET, ALONG THE NORTHWESTERLY LINE OF THE LAND DESCRIBED IN SAID LAST-MENTIONED DEED, TO A POINT IN THE NORTHEASTERLY LINE OF SAID CENTRAL AVENUE; THENCE, 4TH: - NORTH 50° 20' WEST 2270.89 FEET, MORE OR LESS, ALONG SAID NORTHEASTERLY LINE, TO THE POINT OF BEGINNING. EXCEPT THAT PORTION THEREOF DESCRIBED IN THE DEED TO W. ROY GUYER AND WIFE, RECORDED IN BOOK 606 PAGE 279 OF OFFICIAL

ALSO EXCEPT THAT PORTION THEREOF CONVEYED TO BRYAN K. COMPTON AND FAYNELL COMPTON IN DEED RECORDED FEBRUARY 4, 1948 AS DOCUMENT NO. 2020 IN BOOK 819 PAGE 137 OF OFFICIAL

ALSO EXCEPT ALL OIL AND MINERAL RIGHTS BELOW 500 FEET FROM THE PRESENT SURFACE BUT WITHOUT THE RIGHT OF SURFACE ENTRY THEREIN AS RESERVED BY JAMES R. LAGOMARSINO AND FLORENCE LAGOMARSINO, HUSBAND AND WIFE, IN DEED RECORDED NOVEMBER 4 1960 AS INSTRUMENT NO. 44424, OF OFFICIAL RECORDS. APN: 147-0-060-325

**TOPOGRAPHY** 

EXISTING SITE TOPOGRAPHY HAS BEEN GENERATED FROM FROM AN AERIAL SURVEY COMPILED FROM PHOTOGRAPHY BY ARROWHEAD MAPPING CORPORATION DATED MARCH 29, 2019 AND FIELD TOPOGRAPHIC SURVEY PERFORMED BY ARMSTRONG & BROOKS CONSULTING ENGINEERS, INC. DATED MAY 30, 2019.

**BENCHMARK** 

CITY OF OXNARD 110-4 ELEVATION: 113.962

DESCRIPTION: BRASS DISK STAMPED "110-4 1977"

LOCATION: BRASS DISK STAMPED "110-4 1985" SET FLUSH IN TOP AND MIDDLE OF CONCRETE CURB RETURN AT NORTHEASTERLY CORNER OF THE INTERSECTION OF VINEYARD AVENUE AND CENTRAL AVENUE.

BASIS OF BEARING

N50°24'28"W BEING THE CENTERLINE OF CENTRAL AVENUE PER EASEMENT DEED RECORDED AS INSTRUMENT NUMBER 03-337299 OF OFFICIAL RECORDS, IN THE OFFICE OF THE COUNTY RECORDER OF VENTURA COUNTY, STATE OF CALIFORNIA.

**EXISTING UTILITIES NOTE** 

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES, CONDUITS, OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. IN ORDER TO TAKE PRECAUTIONARY MEASURES TO PROTECT ALL UTILITY LINES SHOWN AND NOT SHOWN ON THESE DRAWINGS, IT IS RECOMMENDED TO CALL IN A LOCATION REQUEST TO UNDERGROUND SERVICE ALERT (USA) PH. 811, TWO (2) WORKING DAYS PRIOR TO ANY DIGGING.

		NTS
SITE	ADDR	ESS

3400 OXNARD ROAD OXNARD, CA 93036

**LEGEND** — E — EXISTING ELECTRICAL EXISTING COMMUNICATION EXISTING GAS (SIZE PER PLAN) EXISTING SEWER (<12"-SIZE PER PLAN) EXISTING SEWER (>12"-SIZE PER PLAN)

> EXISTING WATER (<12"-SIZE PER PLAN) EXISTING WATER (>12"-SIZE PER PLAN) EXISTING FIRE WATER (SIZE PER PLAN) EXISTING STORM DRAIN (<12"-SIZE PER PLAN) EXISTING STORM DRAIN (>12"-SIZE PER PLAN) EXISTING C.L. FENCE

EXISTING W.I. FENCE EASEMENT (TYPE PER PLAN)

ASPHALT CONCRETE ANGLE POINT AERIAL TARGET BEGIN CURVE BEGINNING BUILDING BENCHMARK

**BOTTOM** X CENTER LINE CONCRETE CORNER CONTROL POINT END CURVE EDGE OF GUTTER

> ELECTRIC EDGE OF PAVEMENT FINISH FLOOR FINISH GRADE FENCE FINISH SURFACE

IRRIGATION CONTROL BOX

IRRIGATION MONUMENT NORTH EAST

> NORTH WEST PEDESTAL PARALLEL POINT ON LINE SOUTH WEST

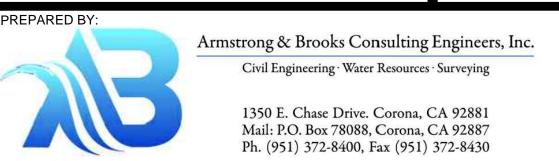
STORM DRAIN STREET LIGHT SIDEWALK TOP OF CURB VERIZON

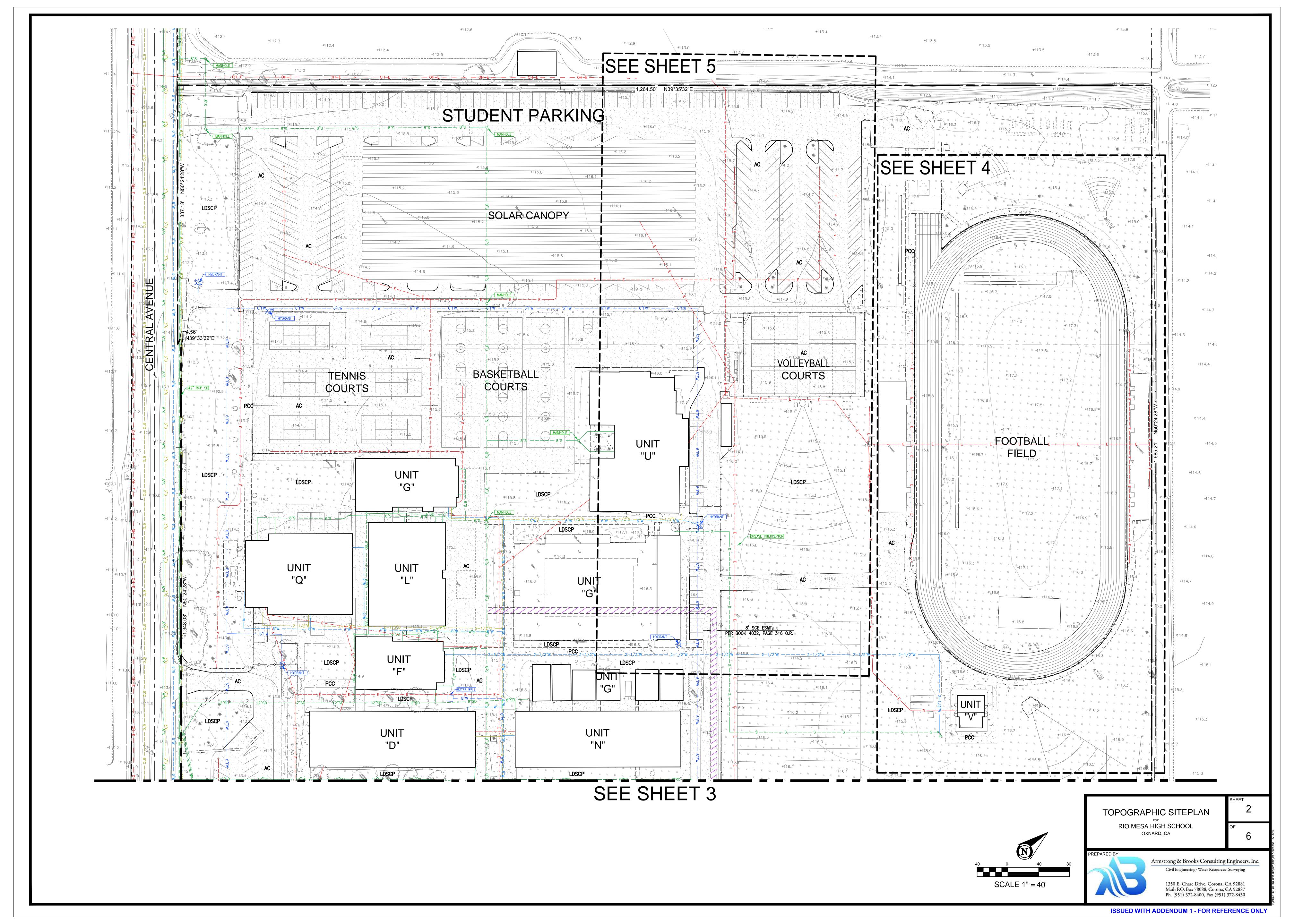
WATER METER WATER VALVE

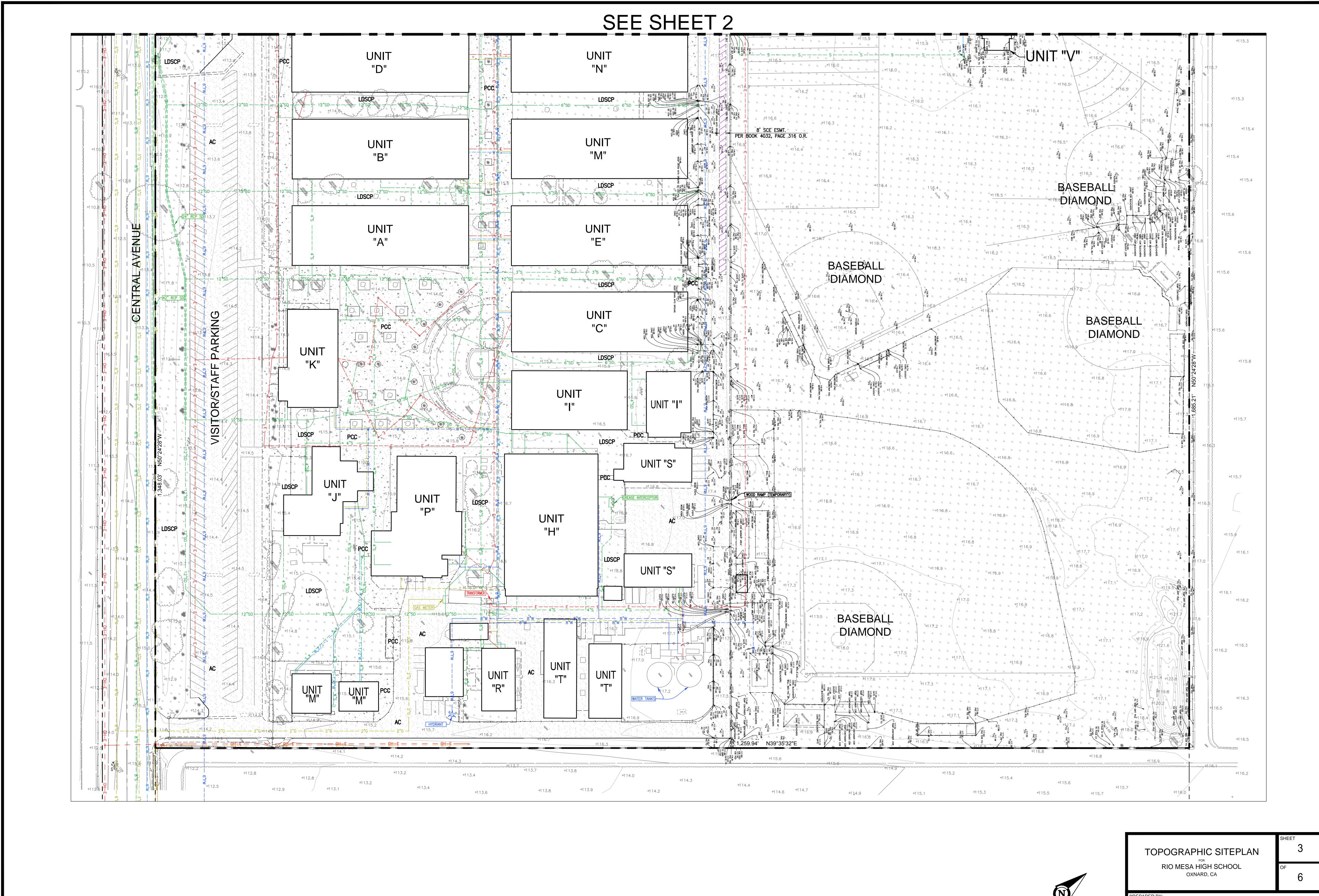
LANDSCAPED AREA

TOPOGRAPHIC SITEPLAN RIO MESA HIGH SCHOOL

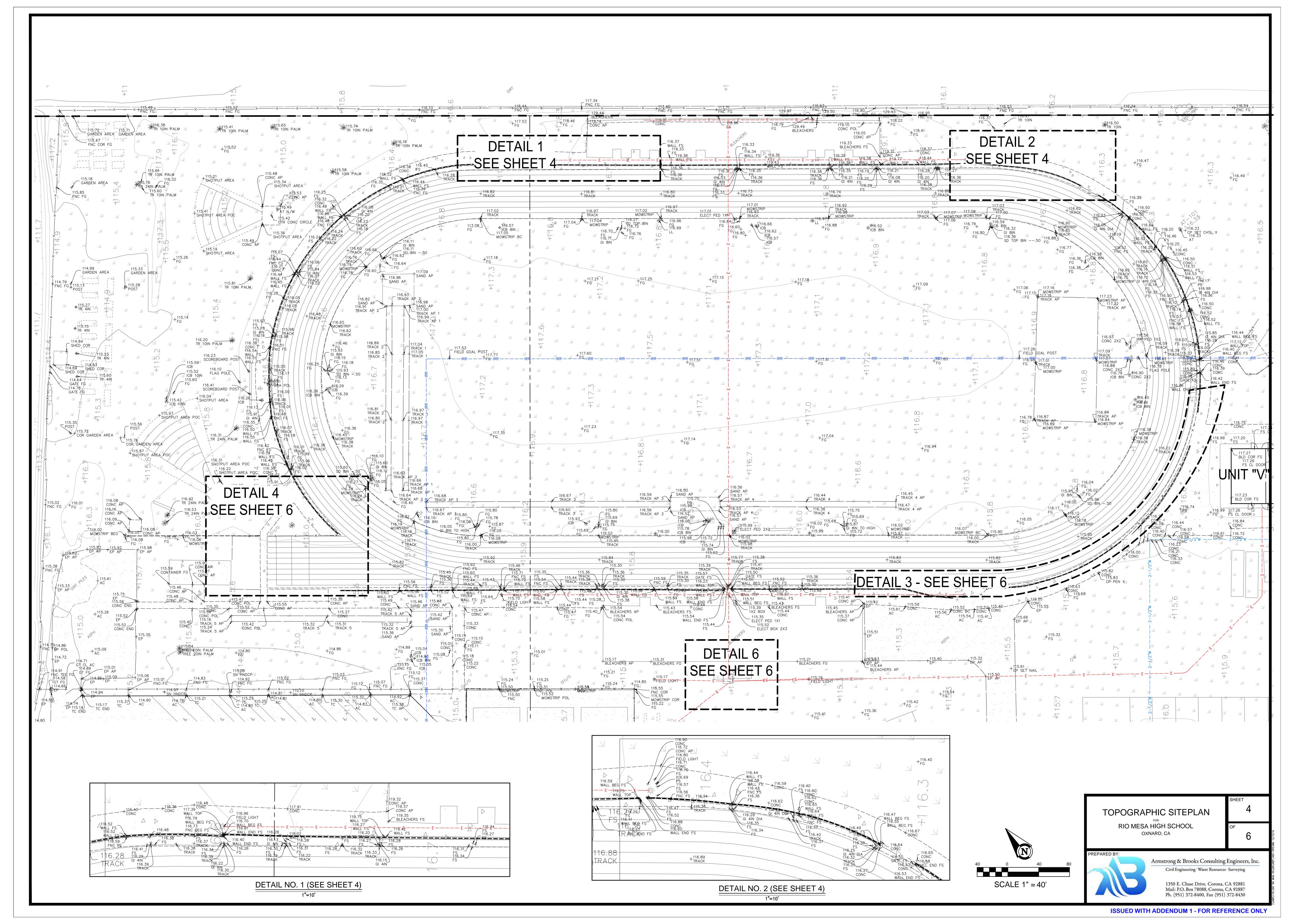
OXNARD, CA

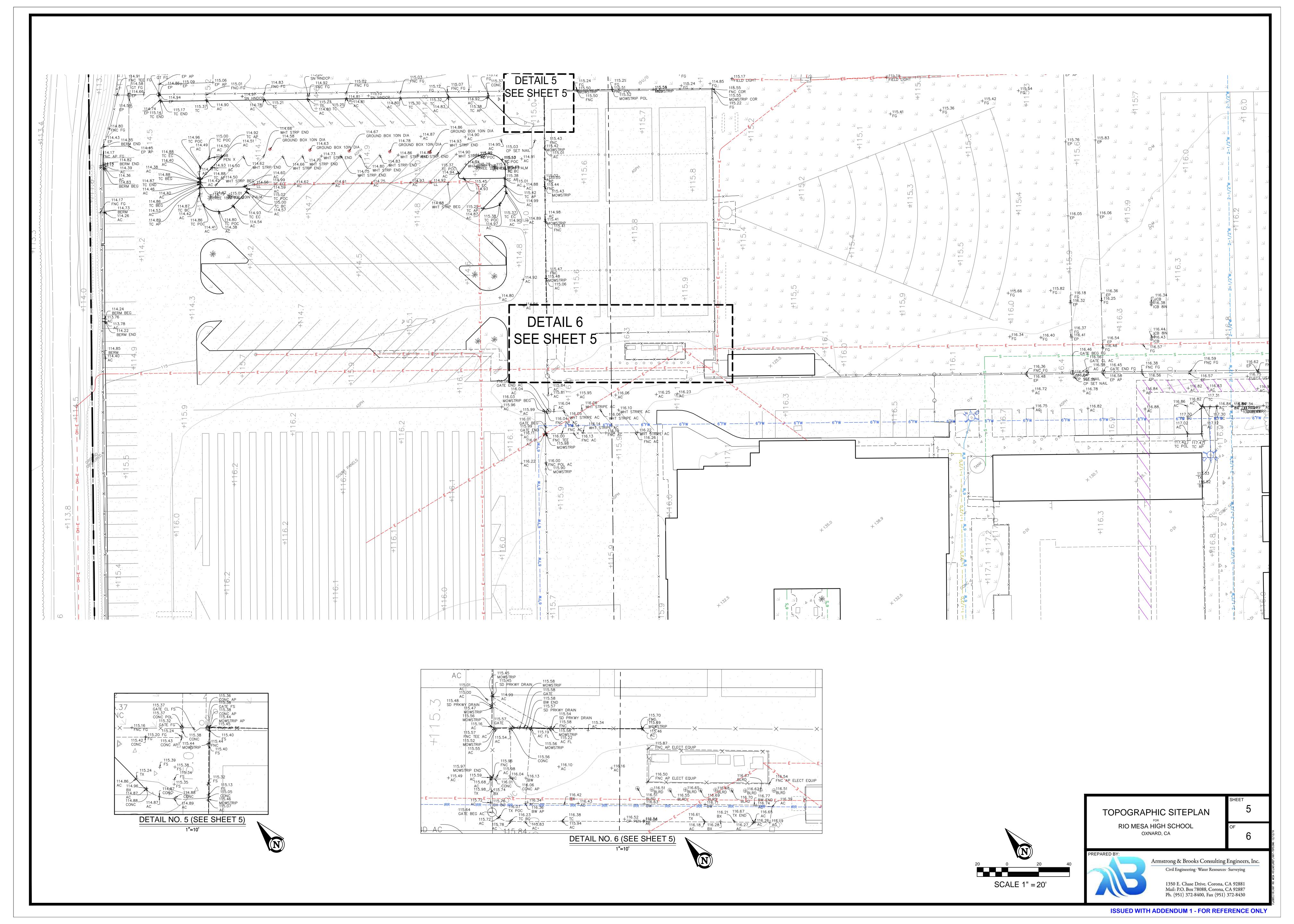


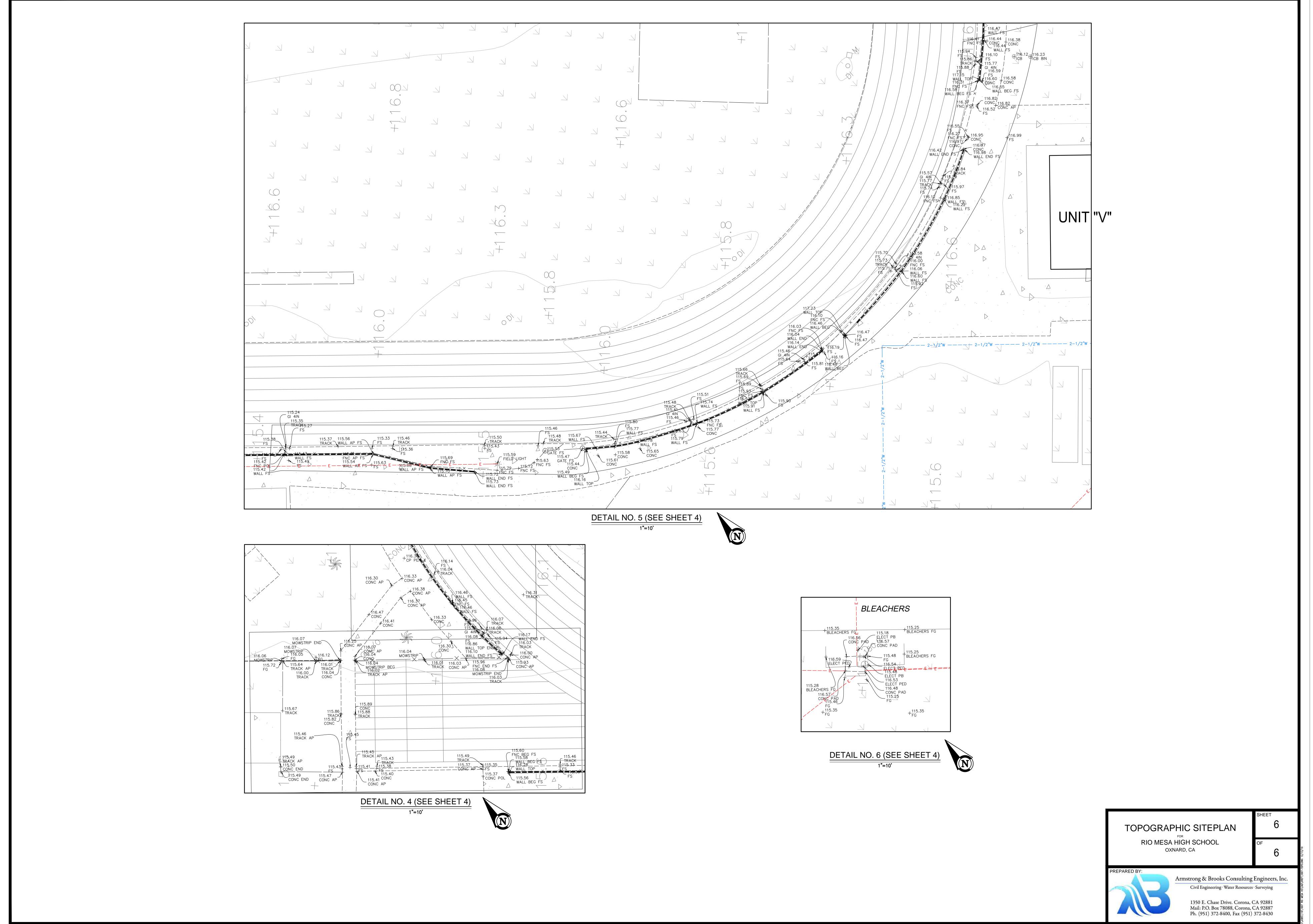












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## SECTION 11 68 43.15 VIDEO DISPLAY SCOREBOARD

#### **PART 1 - GENERAL**

#### 1.01 SECTION INCLUDES

- A. Sports Video Scoreboard
- B. Control System.
- C. Identification and Sponsor Signage.
- D. Service and support.

#### 1.02 RELATED SECTIONS

- A. Section 03 10 00 Concrete Forming and Accessories.
- B. Section 03 20 00 Concrete Reinforcing.
- C. Section 03 30 00 Cast-in-Place Concrete: Footings and placement.
- D. Section 05 12 00 Structural Steel Framing.
- E. Section 05 50 00 Metal Fabrications.
- F. Section 06 10 00 Rough Carpentry.
- G. Section 09 96 00 High-Performance Coatings.
- H. Divsion 26 Electrical: Electrical conduits, boxes, wiring, devices, and connections.
- I. Divsion 27 Communications: Cables, devices, and connections other than supplied by signage supplier.

#### 1.03 REFERENCE STANDARDS

- A. ASCE 7 Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
- B. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- C. ASTM A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
- D. ASTM A36/A36M Standard Specification for Carbon Structural Steel.
  - 1. Use 2008 as indicated in 2016 CBC Ch. 35 Referenced Standards.
- E. ASTM A500/A500M Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- F. ASTM A53/A53M Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- G. ASTM A992/A992M Standard Specification for Structural Steel Shapes.
- H. ASTM F1554 Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
- ASTM A572/A572M Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.

- J. AWS D1.1/D1.1M Structural Welding Code Steel.
- K. SSPC-PA 1 Shop, Field, and Maintenance Painting of Steel.
- L. SSPC-Paint 15 Steel Joist Shop Primer/Metal Building Primer.
- M. UL (DIR) Online Certifications Directory.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
  - 4. Operation and maintenance data.
  - 5. Product data for scoreboards, controls, displays and accessories.
- C. Shop Drawings: Submit plan, section, elevation, and perspective view details as necessary to depict proper field fabrication and installation, and provide details on connections, terminations and joints.
- D. Finish Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors.
- E. Design Data: Supply DSA Pre-Approved Structural Plans and Calculations (PC Plans) designed with both pier and spread footings and stamped by a Licensed California Structural Engineer ready for DSA over the counter submittal and review.
- 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. Spare Parts
    - a. Supply a parts inventory containing no less than of 3% spare parts for LED modules, cables and power supplies. Note: All LED modules must come from the same BIN Code as the equipment supplied.
    - b. Manufacturer of the LED display components shall continue to make all parts necessary for the continued functioning of the system for a minimum of ten (10) years after acceptance of this project.

#### 1.05 QUALITY ASSURANCE

- A. Confirm all specifications with the factory prior to order.
- B. Single Source Responsibility: Single supplier shall provide all components required to install the products specified in this section.
- C. Manufacturers Qualifications: Company specializing in manufacturing electronic scoreboards and video display systems with 10 years minimum successful experience and maintaining a factory authorized service office/warehouse within 20 miles of the stadium.
- D. Installer Qualifications: Specializing in installing and adjusting equipment with a minimum of five years of DSA experience approved by the manufacturer. Contractor shall provide at least one person who will act in the capacity as the Project Construction Manager and who shall be

present at all times during execution of this portion of the Work, who shall be thoroughly familiar with the type of materials being installed and the proper materials and methods.

E. Welders: AWS certified.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Physical inspection of items required at time of delivery; any shipping damages must be reported at delivery prior to storage.
- C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

#### 1.07 PROJECT CONDITIONS

- A. Work shall commence only after associated trade work has been sufficiently completed and will not interfere with the installation of the equipment specified in this section.
- B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- C. Do not install when threatening weather conditions exist.
- D. Owner shall furnish soil tests as necessary to determine suitability for installation.
- E. Owner shall clearly mark all underground utilities and notify the appropriate parties prior to work commencement.

#### 1.08 WARRANTY

- A. Provide manufacturer's standard warranty affirming that products specified in this section shall be free from defects in material and workmanship under normal use provided they are installed in accordance with all current application requirements.
  - 1. Duration and scope: Five (5) years.
- B. Provide installer warranty providing assurances that all installation work be free from defects in installation materials, processes and workmanship.
  - 1. Duration and scope: One (1) years.
- C. Provide on-site service warranty covering parts and labor.
  - 1. Duration and scope: One (5) years.
- D. Service Support Requirement:
  - Include a manufacturer's warranty including 5 years factory-exchange and Help Desk support.
  - Include one on-site project manager at all times during installation and 1 on-site supervisor for final hook-ups.
  - 3. Include five (5) years on-site service.

#### **PART 2 - PRODUCTS**

#### 2.01 MANUFACTURERS

- A. Basis of Design: Nevco Sports; Pre-Approved Model SA PC-90 02-116492: www.nevco.com; or approved equal.
  - 1. Local Sales Representation and Service Provider: CSM Sales LLC and ABV Scoreboard Services Inc., (805) 389-3403.
- B. Substitutions: See Section 01 60 00 Product Requirements.
  - The Bidder shall provide a complete, workable and operational system including all labor, equipment, tools, materials, engineering, supervision, licenses and bonds to design manufacture and install fully functional scoring system.

#### 2.02 EQUIPMENT

- A. Contractor is responsible for:
  - Demolition and disposal of the existing scoreboard, provision and installation of all structural steel required for accommodation of the new system.
  - 2. Providing all display equipment shown on noted drawings and all architectural treatment required to give the entire video scoreboard the general appearance as shown on drawings.
  - Assembly and mounting of all display components onto Bidder supplied structure. The Bidder will provide all for data distribution and final terminations for both electrical and data.
  - 4. Provide for all data distribution and final terminations for both electrical and data.

#### 2.03 PERFORMANCE REQUIREMENTS

- A. Comply with or exceed CBC 2016 115 MPH exposure C requirements and ASCE 7.
- B. Scoreboard, display and other electrical components shall be certified for use in the United States and Canada to the UL (DIR) standards.

#### 2.04 SPORTS VIDEO SCOREBOARD

A. Wide-angle, Full-Color Sports Displays:

Pixel resolution: 16mm physical pixel resolution.

a. No less than 270 pixels in height and 420 pixels in length.

2. Minimum Active Display Area: 22.05 feet wide by 14.62 feet tall.

3. Color capability: Minimum 550 billion colors.

4. Frame speed: At or greater than 60 frames per second.

5. Display intensity: Adjustable to 32 levels).

6. Minimum brightness: 7000 nits.

7. Operating temperature: -40 degrees F – 150 degrees F

8. Viewing angle: 140 Horizontal, 60 Vertical

9. Contrast ratio: Minimum 2000: 1

10. Refresh rate: Greater than 2400+Hz.

11. LED life expectancy: Minimum of 100,000 hours.

- 12. Provide front service accessibility for all components.
- 13. Provide redundant power and signal capability.

14. Display face: Low-glare features to optimize display contrast.

#### 2.05 CONTROL ROOM EQUIPMENT

- A. Model HS-1300 Mobile Studio:
  - 1. 6-input mobile studio with built-in HD switcher that accepts choices of input boards for HDMI and HD-SDI.
    - a. Includes built-in 17.3" monitor.
    - b. 2 each remote control PTZ cameras.
    - c. Instant Replay with dual monitors.
    - d. Live streaming and recording.
    - e. Built-in transitions and animations.
    - f. Picture-In-Picture capability.
    - g. Hard plastic protective mobile cases.
    - h. All equipment to be portable and light enough to be hand-carried in and out on game day.

#### 2.06 DISPLAY DIRECTOR CONTROL SOFTWARE

- A. WINDOWS® based video control software and laptop PC for creating and modifying messages, animations, photos, pre-recorded video and live content on large full color video displays. Nevco Display Director.
  - 1. Functionality:
    - a. Animate at up to 60 frames per second.
    - b. Supports most standard computer graphics file types (.bmp, .jpeg, .gif, .avi, mpg, mov, etc).
    - c. Message scheduling.
    - d. Include ability to control, prioritize and change graphic layouts and messages on multiple signs while allowing the user to toggle between tasks.
    - e. Include ability to allow broadcasting of live or recorded video feeds in real time.
    - f. Split displays into multiple zones for simultaneous messaging and scoring.
    - g. Sports templates for Football, Soccer, Track and Lacrosse.
    - h. Includes FinishLynx track timing interface.
    - Includes 15 hours of custom animation creative services provided by Hype Creative Services.
    - j. Includes standard library of animations and graphics.

#### 2.07 SCORING CONSOLE

A. Nevco MPCW-7 Controller:

- 1. Capable of scoring multiple sports including football, soccer and lacrosse.
- 2. Include remote hand switch for game clock control.
- 3. Integrates with Display Director Software and PC.

#### 2.08 IDENTIFICATION SIGNAGE

- Field Identification Signage.
  - 1. Sign Type: Internally Illuminated.
    - a. Internally illuminated with LED lighting.
  - 2. Dimensions: Not to exceed 25.05 feet wide by 2 feet tall.
  - Qty: 1.
- B. Architectural Elements and Decorative Work.
  - 1. Provide decorative arched truss sign mounted on top of the scoring system as shown on drawings. Dimensions shall be up to 4' high total and 22.05 feet wide and include internally illuminated center mount mascot logo.

#### 2.09 MATERIALS

- A. Column Structural Shapes: ASTM A992/A992M, 50 ksi.
- B. Structural steel components: in accordance with ASTM A36/A36M or ASTM A572/A572M.
- C. Steel Tubing (Bracing): ASTM A500/A500M, Grade B cold-formed structural tubing.
  - 1. Cover all tube ends with light gauge end caps.
- D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black and hot-dip galvanized finish, as indicated.
- E. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
  - 1. Weld steel using E70XX electrodes. Prime and paint all welds following installation.
  - 2. Welds: Continuous 1/4 inch fillet welds; unless otherwise specified in the drawings, .
- F. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.
- G. Bolts, Nuts, and Washers: ASTM A307, Grade A, galvanized to ASTM A153/A153M where connecting galvanized components; minimum.
- H. Anchor Bolts: ASTM F1554, Grade 105.
- I. Formwork: Comply with requirements of Section 03 10 00.
- J. Reinforcement Materials: Comply with requirements of Section 03 20 00.
- K. Concrete: Type specified in Section 03 30 00.
- L. Non-Shrink Cementitious Grout: See Section 03 30 00 Cast-in-Place Concrete.
- M. All new steel shall be primed and painted with a color selected by the Architect.
- N. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
  - 1. Comply with SSPC-PA 1. Coordinate with requirements specified in Section 09 96 00 High-Performance Coatings .

- a. Coordinate primer with finish paint and coating, as applicable, to provide sound foundation for field-applied topcoats despite prolonged exposure during construction.
  - 1) Shop primer for ferrous metal at exposed exterior locations: Tnemec 90E-92, ethyl silicate zinc primer, or equal.
- b. Apply primer immediately following surface preparation.
- c. Spray apply shop prime without holidays, drips, runs.
- d. Provide two coats where product is not to be finish painted or is to be concealed in completed work.
- e. Apply an additional coat to corners, welds, edges, and fasteners.
- f. Allow primer to dry and cure before handling.

#### 2.10 EXTRA MATERIALS

- A. Provide other materials as necessary for complete installation, as recommended by manufacturer and selected by Contractor, subject to approval of Architect.
- B. Contractor is responsible for providing all hardware, sealants, welding materials and other secondary installation products required for installation. Architect shall approve each product before or during the pre-installation conference.

#### **PART 3 - EXECUTION**

#### 3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Examine all soils and footings to ensure solid and secure footings.

#### 3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Install concrete footings at all locations noted on the drawings.
- C. No chlorides shall be added to the concrete mixture. Grade surrounding landscape prior to installation of scoreboards.
- D. Prepare surfaces using the methods recommended to achieve the best result based on project conditions.

#### 3.03 INSTALLATION

- A. Follow manufacturer's current application requirements for installation under conditions specific to the project.
- B. Install all structural steel components in accordance with manufacturers application instructions where specified on the drawings.
- C. Install all electrical equipment in accordance with all federal, state and local building codes.
- D. Where manufacturer's requirements and building codes are in direct conflict, the more restrictive method of application shall prevail.

#### 3.04 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

#### **END OF SECTION**

#### **SECTION 26 56 68**

#### **EXTERIOR ATHLETIC LIGHTING**

#### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Lighting System with LED Light Source
- B. Work covered by this section of the specifications shall conform to the contract documents, engineering plans as well as state and local codes.
- C. The purpose of these specifications is to define the lighting system performance and design standards for Rio Mesa High School Football Retrofit in Oxnard, CA using an LED Lighting source. The manufacturer / contractor shall supply lighting equipment to meet or exceed the standards set forth in these specifications.
- D. The sports lighting will be for the following venues:
  - 1. Football/Soccer Field
  - 2. Track
  - 3. South/North Seating
  - 4. Path of Egress
- E. The primary goals of this sports lighting project are:
  - Guaranteed Light Levels: Selection of appropriate light levels impact the safety of the players and the enjoyment of spectators. Therefore light levels are guaranteed to not drop below specified target values for a period of 25 years.
  - 2. Environmental Light Control: It is the primary goal of this project to minimize spill light to adjoining properties and glare to the players, spectators and neighbors.
  - 3. Cost of Ownership: In order to reduce the operating budget, the preferred lighting system shall be energy efficient and cost effective to operate. All maintenance costs shall be eliminated for the duration of the warranty.
  - 4. Control and Monitoring: To allow for optimized use of labor resources and avoid unneeded operation of the facility, customer requires a remote on/off control system for the lighting system. Fields should be proactively monitored to detect luminaire outages over a 25-year life cycle. All communication and monitoring costs for 25-year period shall be included in the bid.

#### 1.02 RELATED REQUIREMENTS

- A. Section 02 41 00 Demolition: Selective demolition, site demolition, structure removal.
- B. Division 26 Electrical: Wiring and control devices.

#### 1.03 REFERENCE STANDARDS

- A. AASHTO LTS Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signal.
- B. ASCE 7-10 Minimum Design Loads and Associated Criteria for Buildings and Other Structures.

- C. ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- D. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- E. IEEE C62.41.2 IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits.
- F. IES LM-80 Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules.
- G. IES LM-79 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products.
- H. IES LM-63 IESNA Standard File Format for Electronic Transfer of Photometric Data and Related Information.
- I. IES RP-6 Recommended Practice for Sports and Recreational Area Lighting.
- J. IESNA LM-5 Photometric Measurements of Area and Sports Lighting Installations.
- K. NFPA 780 Standard for the Installation of Lightning Protection Systems.
- L. UL 96 Lightning Protection Components.
- M. UL 96A Standard for Installation Requirements for Lightning Protection Systems.

#### 1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate the installation of athletic lighting with size, location and installation of service utilities.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.
- C. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

#### 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 including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.
  - 1. LED Luminaires:
    - a. Include estimated useful life, calculated based on IES LM-80 test data.
    - b. Include IES LM-79 test report upon request.
  - 2. Provide electronic files of photometric data certified by a National Voluntary Laboratory Accreditation Program (NVLAP) lab or independent testing agency in IES LM-63 standard format upon request.
  - 3. Lamps: Include rated life and initial and mean lumen output.
  - 4. Poles: Include information on maximum supported effective projected area (EPA) and weight for the design wind speed.

#### C. Shop Drawings:

- 1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
- 2. Provide photometric calculations where luminaires are proposed for substitution upon request.
- 3. Provide structural calculations for each pole proposed for substitution.
- D. Field Test Reports: Indicate Light levels.
- E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in District's name and registered with manufacturer.
- F. Project Record Documents: Record actual locations of connections and poles.
- G. Cost of Ownership
  - Manufacturer shall submit a 25 year Cost of Ownership summary that includes energy consumption, anticipated maintenance costs, and control costs. All costs associated with faulty luminaire replacement - equipment rentals, removal and installation labor, and shipping - are to be included in the maintenance costs.

#### 1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least ten years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
- D. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

#### 1.07 WARRANTY

- A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
- B. 25-Year Warranty: Each manufacturer shall supply a signed warranty covering the entire system for 25 years from the date of shipment. Warranty shall guarantee specified light levels. Manufacturer shall maintain specifically-funded financial reserves to assure fulfillment of the warranty for the full term. Warranty does not cover weather conditions events such as lightning or hail damage, improper installation, vandalism or abuse, unauthorized repairs or alterations, or product made by other manufacturers. The owner of the field is responsible of the structural integrity of the existing poles on site (existing poles: F1,F4,F6)
- C. Maintenance: Manufacturer shall monitor the performance of the lighting system, including on/off status, hours of usage and luminaire outage for 25 years from the date of equipment shipment. Parts and labor shall be covered such that individual luminaire outages will be repaired when the usage of any field is materially impacted. Manufacturer is responsible for removal and replacement of failed luminaires, including all parts, labor, shipping, and equipment rental associated with maintenance. Owner agrees to check fuses in the event of a luminaire outage.

#### **PART 2 PRODUCTS**

#### 2.01 SYSTEM

A. Basis of Design Manufacturer: Musco Lighting.

#### B. Design Criteria:

- 1. Wind Loads: Wind loads shall be based on the 2016 California Building Code. Wind loads to be calculated using ASCE 7-10, a design wind speed of 115 mph.
- Pole Structural Design: The stress analysis and safety factor of the poles shall conform to 2009 AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (AASHTO LTS).
- 3. Foundation Design: The foundation design shall be based on soils that meet or exceed those of a Class 5 material as defined by 2016 CBC Table 1806A.2.

#### C. Lighting Performance:

Illumination Levels and Design Factors: Playing surfaces shall be lit to an average target illumination level and uniformity as specified in the chart below. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified below. Appropriate light loss factors shall be applied and submitted for the basis of design. Average illumination level shall be measured in accordance with the IESNA LM-5-04 (IESNA Guide for Photometric Measurements of Area and Sports Lighting Installations). Illumination levels shall not to drop below desired target values in accordance to IES RP-6-15, Page 2, Maintained Average Illuminance and shall be guaranteed for the full warranty period.

Area of Lighting	Average Target Illumination Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
Football Field	50 footcandles	2:1	72	30'x30'
Soccer Field	50 footcandles	2:1	60	30'x30'
Track	19 footcandles		47	30'x30'
South Seating	9 footcandles		68	10'x10'
North Seating	9 footcandles		57	10'x10'
Path of Egress	2.5 footcandles		56	30'x30'

- Color: The lighting system shall have a minimum color temperature of 5700K and a CRI of 75.
- 3. Mounting Heights: To ensure proper aiming angles for reduced glare and to provide better playability, minimum mounting heights shall be as described below. Higher mounting heights may be required based on photometric report and ability to ensure the top of the field angle is a minimum of 10 degrees below horizontal.

# of Poles	Pole Designation	Pole Height
2	F5, F7 (New Musco LSS 70 ft. Poles)	70 ft.

2	F2, F3 (New Musco LSS 90 ft. Poles)	90 ft.
2	F1,F4 (existing poles)	70 ft.
1	F6 (existing pole)	90 ft.

#### D. Environmental Light Control

- Light Control Luminaires: All luminaires shall utilize spill light and glare control devices including, but not limited to, internal shields, louvers and external shields. No symmetrical beam patterns are accepted.
- 2. Spill Light and Glare Control: To minimize impact on adjacent properties, spill light and candela values must not exceed the following levels taken at 3 feet above grade.
- 3. Glare Control: Maximum candela viewed from any one luminaire shall not exceed 30,000 candela at a distance of 150' from the playing field. Environmental glare impact scans must be submitted showing the maximum candela from the field edge on a map of the surrounding area until 30,000 candela or less is achieved at 150'.
- 4. Spill Scans: Spill scans must be submitted indicating the amount of horizontal and vertical footcandles along the specified lines. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights. Illumination level shall be measured in accordance with the IESNA LM-5-04 after 1 hour warm up.
- 5. The first page of a photometric report for all luminaire types proposed showing horizontal and vertical axial candle power shall be provided to demonstrate the capability of achieving the specified performance. Reports shall be certified by a qualified testing laboratory with a minimum of five years experience or by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products. A summary of the horizontal and vertical aiming angles for each luminaire shall be included with the photometric report.

#### 2.02 SPORTS LIGHTING SYSTEM CONSTRUCTION

- A. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, drivers and other enclosures shall be factory assembled, aimed, wired and tested.
- B. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123/A123M. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153/A153M and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the cross-arms, pole, or electrical components enclosure.
- C. System Description: Lighting system shall consist of the following:

- 1. Galvanized steel poles and cross-arm assemblies for the new Musco LSS Poles: F2,F3,F5 and F7. Poles F1,F4 and F6 are existing Non-Musco poles.
- 2. Non-approved pole technology:
  - a. Square static cast concrete poles will not be accepted.
  - b. Direct bury steel poles which utilize the extended portion of the steel shaft for their foundation will not be accepted due to potential for internal and external corrosive reaction to the soils and long term performance concerns.
- 3. Lighting systems shall use concrete foundations. See "Design Criteria" Article for details.
  - a. For a foundation using a pre-stressed concrete base embedded in concrete backfill the concrete shall be air-entrained and have a minimum compressive design strength at 28 days of 3,000 PSI. 3,000 PSI concrete specified for early pole erection, actual required minimum allowable concrete strength is 1,000 PSI. All piers and concrete backfill must bear on and against firm undisturbed soil.
  - b. For anchor bolt foundations or foundations using a pre-stressed concrete base in a suspended pier or re-inforced pier design pole erection may occur after 7 days. Or after a concrete sample from the same batch achieves a certain strength.
- 4. Manufacturer will supply all drivers and supporting electrical equipment
  - a. Remote drivers and supporting electrical equipment shall be mounted approximately 10 feet above grade in aluminum enclosures. The enclosures shall be touch-safe and include drivers and fusing with indicator lights on fuses to notify when a fuse is to be replaced for each luminaire. Disconnect per circuit for each pole structure will be located in the enclosure. Integral drivers are not allowed.
  - Manufacturer shall provide surge protection at the pole equal to or greater than 40 kA for each line to ground (Common Mode) as recommended by IEEE C62.41.2-2002.
- 5. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.
- 6. All luminaires, visors, and cross-arm assemblies shall withstand 150 mi/h winds and maintain luminaire aiming alignment.
- 7. Contactor cabinet to provide on-off control.
- 8. Manufacturer shall provide lightning grounding as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.
  - a. Integrated grounding via concrete encased electrode grounding system.
  - b. If grounding is not integrated into the structure, the manufacturer shall supply grounding electrodes, copper down conductors, and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780. The grounding electrode shall be minimum size of 5/8 inch diameter and 8 feet long, with a minimum of 10 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2 AWG for poles with 75 feet mounting height or less, and 2/0 AWG for poles with more than 75 feet mounting height.
    - 1) All system components shall be UL listed for the appropriate application.

#### 2.03 ELECTRICAL

- A. Electric Power Requirements for the Sports Lighting Equipment:
  - 1. Electric Power: As indicated on Drawings.
  - 2. Maximum total voltage drop: Voltage drop to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.
- B. Energy Consumption: The kW consumption for the field lighting system shall be 51.79kW for Football/Soccer, 56.97kW for Track, 5.18 kW for South and North Seating and 5.18 kW for Path of Egress.

#### 2.04 CONTROL

- A. Instant On/Off Capabilities: System shall provide for instant on/off of luminaires.
- B. Lighting contactor cabinet(s) constructed of NEMA Type 4 aluminum, designed for easy installation with contactors, labeled to match field diagrams and electrical design. Manual off-on-auto selector switches shall be provided.
- C. Dimming: System shall provide for 3-stage dimming (high-medium-low). Dimming will be set via scheduling options (Website, app, phone, fax, email) or via an onsite user interface tablet or device.
- D. Remote Lighting Control System: System shall allow owner and users with a security code to schedule on/off system operation via a web site, phone, fax or email up to ten years in advance. Manufacturer shall provide and maintain a two-way TCP/IP communication link. Trained staff shall be available 24/7 to provide scheduling support and assist with reporting needs.
  - 1. The owner may assign various security levels to schedulers by function and/or fields. This function must be flexible to allow a range of privileges such as full scheduling capabilities for all fields to only having permission to execute "early off" commands by phone. Scheduling tool shall be capable of setting curfew limits.
  - 2. Controller shall accept and store 7-day schedules, be protected against memory loss during power outages, and shall reboot once power is regained and execute any commands that would have occurred during outage.
- E. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The controller shall determine switch position (manual or auto) and contactor status (open or closed).
- F. Management Tools: Manufacturer shall provide a web-based database and dashboard tool of actual field usage and provide reports by facility and user group. Dashboard shall also show current status of luminaire outages, control operation and service. Mobile application will be provided suitable for IOS, Android and Blackberry devices.
  - 1. Hours of Usage: Manufacturer shall provide a means of tracking actual hours of usage for the field lighting system that is readily accessible to the owner.
    - a. Cumulative hours: shall be tracked to show the total hours used by the facility
  - 2. Report hours saved by using early off and push buttons by users.

- G. Communication Costs: Manufacturer shall include communication costs for operating the control and monitoring system for a period of 25 years.
- H. Communication with luminaire drivers: Control system shall interface with drivers in electrical components enclosures by means of powerline communication

#### **PART 3 EXECUTION**

## 3.01 EXAMINATION

- A. Soil Quality Control:
  - It shall be the Contractor's responsibility to notify the Owner if soil conditions exist other
    than those on which the foundation design is based, or if the soil cannot be readily
    excavated. Contractor may issue a change order request / estimate for the Owner's
    approval / payment for additional costs associated with:
    - a. Providing engineered foundation embedment design by a registered engineer in the State of CA for soils other than specified soil conditions;
    - b. Additional materials required to achieve alternate foundation;
    - c. Excavation and removal of materials other than normal soils, such as rock, caliche, etc.

# 3.02 PREPARATION

- A. Delivery Timing:
  - 1. Delivery Timing Equipment On-Site: The equipment must be on-site 6-8 weeks from receipt of approved submittals and receipt of complete order information.

#### 3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

# 3.04 FIELD QUALITY CONTROL

- A. See Section 01 40 00 Quality Requirements, for additional requirements.
- B. Provide manufacturer's field representative to test:
  - Illumination Measurements: Upon substantial completion of the project and in the presence of the Contractor, Project Engineer, Owner's Representative, and Manufacturer's Representative, illumination measurements shall be taken and verified. The illumination measurements shall be conducted in accordance with IESNA LM-5-04.
- C. Field Light Level Accountability
  - Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period of 25 years. These levels will be specifically stated as "guaranteed" on the illumination summary provided by the manufacturer.
  - The contractor/manufacturer shall be responsible for conducting initial light level testing and an additional inspection of the system, in the presence of the owner, one year from the date of commissioning of the lighting.
  - 3. The contractor/manufacturer will be held responsible for any and all changes needed to bring these fields back to compliance for light levels and uniformities.

Contractor/Manufacturer will be held responsible for any damage to the fields during these repairs.

D. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including foot candles and uniformity ratios are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be required to make adjustments to meet specifications and satisfy Owner.

# 3.05 PRE-BID SUBMITTAL REQUIREMENTS (NON-MUSCO)

- A. Design Approval: The owner / engineer will review pre-bid submittals per paragraph B from all the manufacturers to ensure compliance to the specification prior to bid. If the design meets the design requirements of the specifications, a letter and/or addendum will be issued to the manufacturer indicating approval for the specific design submitted.
- B. Approved Product: Musco's Light-Structure SystemTM (poles F2,F3,F5,F7) and Sports-Cluster System (existing poles F1,F4,F6) with TLC for LEDTM is the approved product. All substitutions must provide a complete submittal package for approval as outlined in Submittal Information at the end of this section prior to bid. Special manufacturing to meet the standards of this specification may be required. An addendum will be issued prior to bid listing any other approved lighting manufacturers and designs.
- C. All listed manufacturers not pre-approved shall submit the information at the end of this section prior to bid. An addendum will be issued prior to bid; listing approved lighting manufacturers and the design method to be used.
- D. Bidders are required to bid only products that have been approved by this specification or addendum by the owner or owner's representative. Bids received that do not utilize an approved system/design, will be rejected.

#### 3.06 ATTACHMENTS

A. Substitution Checklist.

**END OF SECTION** 

# REQUIRED SUBMITTAL INFORMATION FOR ALL MANUFACTURERS (NOT PRE-APPROVED) PRIOR TO BID

All items listed below are mandatory, shall comply with the specification and be submitted according to pre-bid submittal requirements. Complete the Yes/No column to indicate compliance (Y) or noncompliance (N) for each item. **Submit this checklist with substitution submittal.** 

Yes/ No	Tab	Item	Description		
110	A	Letter/ Checklist	Listing of all information being submitted must be included on the table of contents. List the name of the manufacturer's local representative and his/her phone number. Signed submittal checklist to be included.		
	В	Equipment Layout	Drawing(s) showing field layouts with pole locations		
	С	On Field Lighting Design	<ul> <li>Lighting design drawing(s) showing:</li> <li>a. Field Name, date, file number, prepared by</li> <li>b. Outline of field(s) being lighted, as well as pole locations referenced to the center of the field (x &amp; y), Illuminance levels at grid spacing specified</li> <li>c. Pole height, number of fixtures per pole, horizontal and vertical aiming angles, as well as luminaire information including wattage, lumens and optics</li> <li>d. Height of light test meter above field surface.</li> <li>e. Summary table showing the number and spacing of grid points; average, minimum and maximum illuminance levels in foot candles (fc); uniformity including maximum to minimum ratio, coefficient of variance (CV), coefficient of utilization (CU) uniformity gradient; number of luminaries, total kilowatts, average tilt factor; light loss factor.</li> </ul>		
	D	Off Field Lighting Design	Lighting design drawing showing initial spill light levels along the boundary line (defined on bid drawings) in footcandles. Lighting design showing glare along the boundary line in candela. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights.		
	E	Photometric Report	Provide first page of photometric report for all luminaire types being proposed showing candela tabulations as defined by IESNA Publication LM-35-02. Photometric data shall be certified by laboratory with current National Voluntary Laboratory Accreditation Program or an independent testing facility with over 5 years experience.		
	F	Performance Guarantee	Provide performance guarantee including a written commitment to undertake all corrections required to meet the performance requirements noted in these specifications at no expense to the owner. Light levels must be guaranteed to not fall below target levels for warranty period.		
	G	Structural Calculations	Pole structural calculations and foundation design showing foundation shape, depth backfill requirements, rebar and anchor bolts (if required). Pole base reaction forces shall be shown on the foundation drawing along with soil bearing pressures. Design must be stamped by a structural engineer in the state of CA, if required by owner.		
	н	Control & Monitoring System	Manufacturer of the control and monitoring system shall provide written definition and schematics for automated control system. They will also provide ten (10) references of customers currently using proposed system in the state of CA.		

Yes/ No	Tab	Item	Description	
	I	Electrical Distribution Plans	Manufacturer bidding an alternate product must include a revised electrical distribution plan including changes to service entrance, panels and wire sizing, signed by a licensed Electrical Engineer in the state of CA.	
	J	Warranty	Provide written warranty information including all terms and conditions. Provide ten (10) references of customers currently under specified warranty in the state of CA.	
	К	Project References	Manufacturer to provide a list of ten (10) projects where the technology and specific fixture proposed for this project has been installed in the state of CA. Reference list will include project name, project city, installation date, and if requested, contact name and contact phone number.	
	L	Product Information	Complete bill of material and current brochures/cut sheets for all product being provided.	
	M	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.	
	N	Non- Compliance	Manufacturer shall list all items that do not comply with the specifications. If in full compliance, tab may be omitted.	
	0	Cost of Ownership	Document cost of ownership as defined in the specification. Identify energy costs for operating the luminaires. Maintenance cost for the system must be included. All costs should be based on 25 Years	
	Р	Environmental Light Control Design	Environmental glare impact scans must be submitted showing the maximum candela from the field edge on a map of the surrounding area until 30,000 candela or less is achieved at 150'.	

The information supplied herein shall be used for the purpose of complying with the specifications for Rio Mesa High School Football in Oxnard, CA. By signing below I agree that all requirements of the specifications have been met and that the manufacturer will be responsible for any future costs incurred to bring their equipment into compliance for all items not meeting specifications and not listed in the Non-Compliance section.

Manufacturer:	Signature:
Contact Name:	Date:/
Contractor:	Signature:

## **SECTION 27 41 16**

# INTEGRATED AUDIO SYSTEMS AND EQUIPMENT

#### PART 1 GENERAL

#### 1.01 Summary

- A. Provisions of Division 1 apply to this section.
- B. Section Includes
  - 1. Provide all labor, materials, transportation and equipment to complete the furnishing, installation, assembly, set up, and testing of the Audio and Control Systems work indicated on the drawings and specified herein. Notwithstanding any detailed information in this Section, provide complete, working systems. General design intent for this project is shown on the drawings and described in the specification.
  - 2. All equipment requiring coordination with other trades must be tested and verified for proper operation. Contractor is fully responsible for the coordination and must resolve all conflicts with AV equipment that connect or interact with other systems.
  - 3. Design, engineer and provide complete means of support, suspension, attachment, fastening, bracing, and seismic restraints (hereinafter "support") of the Work of this Section, including future installed equipment, in accordance with local building codes and regulations. Provide engineering of such support by parties licensed to perform work of this type in the Project jurisdiction. Contractor shall obtain the services of an engineer licensed to perform this work within the state or jurisdiction it is to be performed.
  - 4. The Contractor shall include all costs associated with structural engineering required by code for work in this section.
  - 5. Use skilled mechanics that can return surfaces to the appearance of new work when modifying millwork.
  - 6. Conduit and common back boxes including four square, pull boxes, junction boxes, etc. are supplied and installed by Division 26 Electrical Contractor. Connection panels that install in these boxes are supplied by AV Contractor.
  - 7. Provide all cable and wire associated with this specification section and related documents.
  - 8. All systems shall be completely installed with all the necessary interconnection, power supplies, patch cords, snakes, portable equipment cables and wiring to provide a fully functioning system.
  - 9. The governing overall requirement for this project is a complete and functional system.
  - 10. Include work not usually shown or specified, but necessary for proper installation and operation of the system or piece of equipment.
- C. Products Supplied But Not Installed Under This Section

- Loose equipment or products supplied but not installed shall be turned-over to the Owner immediately upon delivery. Contractor is to supply a signed statement of transfer of this equipment to the consultant for record. Client must sign this statement acknowledging receipt of this equipment.
- 2. Specialty back boxes including but not limited to FSR, Steel City and speaker back boxes shall be provided to the General Contractor for installation.

#### D. Related Sections

- 1. Division 1.
- 2. Division 9.
- 3. Division 10.
- 4. Division 11.
- 5. Division 26.

#### E. Allowances

- 1. Refer to section 2.1.E for related requirements.
- 2. Ensure that the statements used complement Division 1, Section 01210-Allowances.

# F. Measurement Procedures

1. Product quantity is as required. If a quantity is given, the Contractor will provide at least the given amount. Some products listed under this section may not be required to fulfill the obligations of the work.

## 1.02 References

- A. Comply with all applicable governing codes.
- B. Comply with the following applicable organizations and standards:

1.	AES	Audio Engineering Society
2.	ANSI	American National Standards Institute
3.	ASTM	American Society for Testing and Materials
4.	BICSI	Building Industry Consulting Service International, Inc.
5.	BTSC	Broadcast Television Stereo Committee
6.	CBC	California Building Code
7.	CEDIA	Custom Electronic Design and Installation Association
0	FIA Flactronic In	dustrias Allianas

- 8. EIA Electronic Industries Alliance
  - a. RS-310-C: (ANSI C83.9) Racks, Panels, and Associated Equipment
  - b. RS-453: Dimensional, Mechanical, and Electrical Characteristics Defining Phone Plugs and Jacks

9.	ETL	Electrical Testing Laboratories, Inc.
10.	FCC	Federal Communications Commission
11.	ICIA	International Communications Industries Association
12.	IEC	International Electrotechnical Commission
13.	IEEE	Institute of Electrical and Electronic Engineers

14.	INCITS	International Committee for Information Technology Standards
15.	ISO	International Organization for Standardization
16.	ITU	International Telecommunications Union
17.	NAB	National Association of Broadcasters
18.	NCTA	National Cable and Telecommunications Association
19.	NEC	National Electrical Code
20.	NEMA	National Electrical Manufacturers Association
21.	NFPA	National Fire Protection Association
22.	NSCA	National Systems Contractors Association
23.	OSHA	Occupational Safety and Health Administration
24.	SMPTE	Society of Motion Picture and Television Engineers
25.	TIA	Telecommunications Industry Association
26.	UL	Underwriters Laboratories Inc.

## 1.03 Definitions

- A. Definitions of Terms: The following definitions and conditions apply to each of the respective parameters and the measurements of those parameters, unless specifically stated otherwise:
  - 1. Frequency Response: The minimum acceptable frequency band over which the amplitude response is within 3 dB (or any specified range), or the specified limits of the response relative to the reference frequency (1 kHz for audio) under design load conditions, at any operating level up to and including the specified maximum output while fully in compliance with all other performance specifications.
  - 2. Maximum Output Level: The minimum acceptable maximum signal output level (voltage, current or power) attained under design load conditions attained while fully in compliance with all other performance specifications.
  - 3. Harmonic Distortion: The maximum acceptable harmonic distortion measured at any operating level, up to and including the specified maximum output, with an applied sine wave signal of any frequency in the range of the specified frequency response.
  - 4. Audio Intermodulation Distortion: The maximum acceptable intermodulation distortion resulting from the introduction of 60 Hz and 7 kHz signals in a ratio of 4:1 under design load conditions at any operating level up to and including the specified maximum output level.
  - 5. Signal to Noise Ratio: The minimum acceptable ratio of signal to noise levels derived from broadband measurements under design load at maximum output over the entire range of the specified frequency response.
  - 6. Clipping Level: The minimum acceptable maximum level of signal applied to the device under design load conditions while fully in compliance with all other performance specifications.

- 7. Sensitivity: The maximum acceptable level of input signal applied to the device that is necessary to provide the maximum output under design load conditions.
- 8. Design Load: The load (in ohms) specified by usage of the particular device input or output.
- B. Signal Levels: The following voltage levels shall be considered the standard operating levels for the particular circuitry, unless specifically noted otherwise (0.775 Volt = O dBu = O dBm for a 600 ohms terminated circuit):
  - 1. Microphone Circuits: -30 dBu or less.
  - 2. Audio Line Level Circuits: -30 dBu to +24 dBu; equivalent to -30 dBm to +24 dBm for a 600 ohms terminated circuit.
  - 3. Loudspeaker Level Circuits: More than +24 dBu.
- C. Characteristic Impedances: The following operating impedances shall be considered to be the standard operating impedances for the particular circuitry, unless specifically noted otherwise:
  - 1. Microphone Circuits: 50-250 ohms source, 150-1500 ohms terminating, electrostatically and electromagnetically balanced to ground.
  - 2. Audio Line Level Circuits: 600 ohms maximum source, 600 ohms minimum. terminating, line to line, electrostatically and electromagnetically balanced to ground.

# 1.04 System Description

- A. Design Requirements
  - 1. General
    - a. All audio processing functions for the system shall be implemented with Digital Signal Processing equipment (DSP). Functions provided by this system include but are not limited level control, equalization, delay, routing, dynamics, filters, processors, presets, etc.
    - 2. Stadium Seating Area
      - a. General
        - The system shall provide audio reinforcement for announcements and sporting events.
        - 2) The system shall allow for local control of functions, including but not limited to volume adjustment and source selection.
        - 3) A wall mounted keyed controller shall be provided in the Press Box to control the startup and shutdown of the Public Address system.
      - b. Sound Reinforcement System
        - 1) The sound system shall utilize a distributed network of pole mounted loudspeakers.
        - 2) A facility panel shall be provided for the connectivity of microphone and line level inputs.
        - 3) Both a push-to-talk & a handheld wireless microphones shall be provided for voice reinforcement.
      - c. Assistive Listening

- 1) An assistive listening system shall be provided per ADA requirements. The system will consist of an RF transmitter, remote antennas and headsets to allow personal monitoring of the audio program.
- B. Digital Signal Processor (DSP) Programming
  - 1. DSP programming outlined below:
    - a. All audio processing functions for the system shall be implemented with Digital Signal Processing equipment (DSP). Functions provided by this system include but are not limited to level control, equalization, delay, routing, dynamics, filters, processors, presets, etc.
    - b. Sensitivity and gain controls must be applied to each input to allow level balancing.
    - c. The mixer shall allow for the level control of each input and routed to each output's composite mix.
    - d. The DSP system shall include password protection for system operation and maintenance privileges.
    - e. The Contractor shall allot 2 hours for on-site digital signal processor programming with the client's representative.
- C. System Performance Standards and Requirements (meet or exceed)
  - 1. Audio Systems:
    - a. Electrical Performance; Source Input to Power Amplifier Output:
      - 1) Frequency Response (Equalizer flat): +/- 0.2 dB 20 Hz to 20 kHz.
      - 2) Total Harmonic Distortion (THD): Less than 0.05%, 20 Hz to 20 kHz, 4 ohms.
      - 3) Noise: At least -105 dB, 20 Hz to 20 kHz, referenced to input of +4 dBm.
      - 4) Crosstalk: At least -60 dB, 20 Hz to 20 kHz.
      - 5) Damping Factor: Greater than 500 (below 1 kHz)
    - b. Electro/Acoustic Performance; Distributed Systems: 103 dB Consistent with devices specified herein.
      - 1) Equipment: Specified individually.
      - 2) Audio signal paths: Shall not degrade performance of connected equipment.
    - c. NEC Article 640: Audio Signal Processing, Amplification and Reproduction Equipment.
  - 2. Data and Communications Systems:
    - a. TIA/EIA 568-C series: Commercial Building Telecommunications Cabling Standard.
    - b. ANSI J-STD-607-A: Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.

#### 1.05 Submittals

#### A. General

- 1. In addition to the requirements of Division 1, submit all materials for review arranged in the same order as the Specification, individually referenced to the Specification paragraph and Contract Drawing number. Submit 8 1/2" x 11" items bound in volumes and drawings in edge-bound sets. Submit all drawings on sheets of the same size.
- 2. The Contractor is to provide two copies of each hardcopy submittal and an electronic format copy (Shop drawings must be submitted as .DWF. All other submittals shall be provided as .PDF). All submittals must be original files or documents, scanned copies will not be accepted.
- 3. Make each specified submittal as a coordinated package complete with all information specified herein. Incomplete or uncoordinated submittals will be returned with no review action.
- 4. Should the Contractor proceed with the Work of this Section in the absence of submittals for such work submitted and returned with action "No Exception Taken" or "Make Corrections As Noted", the Contractor proceeds at the Contractor's sole risk.
- 5. If the Contractor deviates from the design shown on the Contract Documents when preparing their shop drawings, the Contractor shall indicate with architectural style clouding, those deviations. The Contractor shall also submit with the Shop Drawings, a list of those deviations and substitutions, including the following:
  - a. The deviation item number which shall also correspond to a number designation applied to each cloud on the shop drawings.
  - b. Section of the specification that applies to these changes.
  - c. The applicable shop drawing sheet number for each item.
  - d. The corresponding audio-visual Contract Document sheet number for each item.
  - e. A clear description of the deviation.
  - f. The Contractor's rational for the deviation (i.e. what benefit the deviation provides, why it is required, any cost impact, etc.).

#### B. Infrastructure

1. Provide drawings indicating boxes conforming and non-conforming to Consultant's AV drawings.

# C. Product Data

- 1. Manufacturer's Product Data
  - a. Contractor is to submit submittal in electronic format (i.e. PDF)
  - b. List of materials (i.e. Table of Contents) categorized by room type: For each item specified in PART 2, include:
    - 1) Drawing device ID code.
    - 2) Manufacturer.
    - 3) Model number.
    - 4) Listing: UL or other lab.

- 5) Quantity.
- c. In sequence of List of Materials, provide a data sheet for each item, including all accessories marked for the proposed product.
- D. Shop Drawings
  - 1. Field (Installation) Drawings: Collate in sequence:
    - a. Contractor is to submit shop drawings in .DWF format.
    - b. Drawing index/symbol sheet.
    - c. Floor plans. At scale of Contract Documents. Show:
      - 1) Device rough-in boxes with ID number.
      - 2) Mounting height.
      - 3) Conduit size.
      - 4) Wire type.
      - 5) Wire fill.
    - d. Sections/Elevations. At scale of Contract Documents:
      - 1) Mounting location reference to nearest gridline.
        - a) Provide sections for each room containing AV equipment.
        - b) Provide elevations for each wall in rooms containing AV equipment.
        - c) Show all equipment, including speakers, monitors, projectors, podium, floor boxes, facility boxes, etc.
        - d) Provide vertical dimensions referenced above finished floor to each piece of equipment.
        - e) Provide horizontal dimensions reference to gridlines.
    - e. Enlarged Plans. At scale of Contract Documents or larger as required for trade coordination. Show:
      - 1) Items indicated in "floor plans" above.
      - 2) Architectural features.
      - 3) Rack cabinets.
        - a) Ventilation details.
        - b) Power distribution detail.
      - 4) System furniture.
      - 5) Clearances required by applicable Code.
    - f. System Conduit Riser Drawing, Show:
      - 1) Terminal cabinets.
      - 2) Coordination with floor plans.
      - 3) Wire runs not shown on floor plans.
      - 4) Wire type.
      - 5) Wire fill.
    - g. Mounting details:

- 1) Stamped and signed by an Engineer licensed in the Project jurisdiction for work of this type, where required by code.
- 2) Show loads, type and strength of connections, sizes, dimensions, materials, etc.
- 3) Show calculations on drawings or in bound volume for review by Authorities having jurisdiction.
- 4) Provide details for:
  - a) Equipment rack anchorage.
  - b) Loudspeaker mounts.
  - c) Attachment to building structure.
- h. Installation details as required:
  - 1) Terminal cabinets: Terminations.
  - 2) Audio-Visual panel details.
- i. Wire run sheets. Show:
  - 1) Wire number.
  - 2) Source.
  - 3) Designation.
  - 4) Signal type.
  - 5) Wire type.
  - 6) Operating level or voltage.
  - 7) Timing reference, where applicable.
  - 8) Physical length.
- 2. Shop (Fabrication) Drawings: Collate in sequence:
  - a. Contractor is to submit shop drawings in .DWF format.
  - b. Drawing index/symbol sheet (if separate set from Field Drawings).
  - c. System functional drawings. Submit separate drawings for each system/subsystem. Show at least:
    - 1) Equipment:
      - a) Function, make, model.
      - b) Rack number, module frame and slot number.
    - 2) Field device information
      - a) Terminal cabinets.
      - b) Pull boxes.
      - c) Audio-visual panel connector designations.
    - 3) Wiring
      - a) Wire number.
      - b) Wire type.
    - 4) Shield condition at both ends (float, ground, location of ground).

- 5) Connector wiring details, each type.
- 6) Audio: Nominal operating level, Polarity. Note deliberate polarity inversions where required to maintain absolute polarity.
- 7) Twisted pair, transmit and received devices: Transmission range at 60 Hz., cable length and signal quality.
- d. Provide drawings for the following systems, if applicable:
  - 1) Audio.
  - 2) Data transmission.
  - 3) Coordinated grounding scheme.
- e. Equipment rack elevations: Show:
  - 1) All racks scaled at 1 1/2" equals 1 foot, or larger.
  - 2) Rack: Make, model.
  - 3) Equipment: Function, make, model.
- f. Rack wiring drawings: For each rack, show:
  - 1) Power strip: Receptacles, circuiting.
  - 2) Sequencing power and surge suppression systems.
  - 3) Equipment.
  - 4) Grounding.
  - 5) Wiring, all systems.
  - 6) Wiring harness scheme.
  - 7) Ventilation detail.
- g. Fabrication details: Submit for:
  - 1) Receptacles.
  - 2) Panels.
  - 3) Special mounting provisions.
- h. Legends/engraving details. Half or full size:
  - 1) Receptacles.
  - 2) Audio-visual panels.
  - Equipment designations.
- E. Samples
  - 1. Of all finishes/materials that will be visible to the public, including but not limited to:
    - a. Receptacles and controls with associated trim plate.
    - b. Each type of loudspeaker baffle and/or grille.
    - c. All audio-visual panels.
    - d. Audio-visual devices in public areas.
- F. Shop and Project Site Test Reports
  - 1. Contractor is to provide submittal in electronic format (i.e. PDF)

- 2. Schedule: Submit test reports in a timely manner relative to the Project schedule such that the representative of the Owner may conduct Verification of Submitted Test Data without delay of progress.
  - a. Shop test report: Submit prior to shipping completed equipment racks to Project Site.
  - b. Project Site test report: Submit project site test report for this section after system completion and prior to Acceptance Review and Testing.
- 3. Content: Include at least:
  - a. Time and date of start of burn-in.
  - b. Time and date of test.
  - c. Personnel conducting test.
  - d. Test equipment, including serial and date of calibration.
  - e. Procedures used.
  - f. Results of test numerical or graphical presentation.
- G. Close Out Submittal
  - 1. Contractor is to provide submittals in electronic format (i.e. PDF)
  - 2. Operation and Maintenance Manuals
    - a. Index.
    - b. Systems operating instructions.
    - Reduced set of system Record Drawings.
    - d. Key schedule.
    - e. Maintenance and spare parts schedules.
    - f. Shop and Field Test Reports.
    - g. Equipment manuals. Collate alphabetically by manufacturer. Provide manufacturer's original operation, instruction and service manuals in color for each equipment item. Provide tabbed dividers between each product.

      Manuals provided by the Manufacturer in an individual binder may be submitted in that form.
  - 3. Framed Operating and Maintenance Instructions: Provide adjacent to each ensemble of equipment racks. Provide sturdy frame with clear glass or non-scratching plastic cover. Provide permanent, non-fading media. Blueprints shall not be acceptable. Include:
    - a. Sequence for system start-up and shutdown.
    - b. System Functional Diagrams.
    - c. Signal levels and impedance at accessible system signal and test ports, where applicable.
  - 4. Record Drawings

- a. As work progresses, maintain records of "as installed" conditions. Update the set at least weekly. After successful completion of Project Site testing specified herein, and after completion of Punch List corrections, copy all records of "as installed" conditions on to final Record Document drawings, as specified in Division 1.
- Content: All drawings required under "Field and Shop Drawings". Show "as installed" condition. Where room designations according to Project permanent signage differ from construction designations in the Contract Documents, show both designations.
- 5. Provide four copies on SD card containing the "as built" drawings, all manuals, training manual and programming code.
  - a. Submit un-compiled programming code.
- 6. Training Submittal
  - a. Provide all training materials for review prior to scheduling training sessions.
    - 1) Training manual.
    - 2) Agenda for the training session.
    - 3) The final punch list, indicating that all equipment is fully functional.
  - b. See the section under Owner's Instructions for training manual requirements.
  - c. No training session will be scheduled until final punch list is completed and submitted.
- 7. Warranty Certificates
  - a. Comply with Division 1.

# 1.06 Quality Assurance

- A. Qualifications
  - 1. The bidder shall, prior to the bid, in accordance with the Instruction to Bidders, submit at least the following information to verify that the bidder has the necessary experience and qualifications to perform the specified work:
    - a. A detailed brochure describing the bidder's capabilities in terms of facilities, personnel (include a personnel organization chart followed by resumes), experience, background, examples of similar installations (at least two projects within the past two years), distribution arrangements with manufacturers and financial capability, including certificates of insurance and satisfaction of the project bonding requirements.
    - b. Contractor must, at the time of this bid submittal, have distribution or a dealership agreement with all manufactures whose products are specified in the bid documents. Contractor must also have completed manufactures training and certification before bids are submitted.
    - c. AIA Document A305 "Contractor's Qualification Statement".
    - d. Information identifying any and all local agents and/or subcontractors that will assist in the work and their role in the project.

- e. Identification of sources of labor for all fabrication and installation throughout the duration of the project.
- f. Evidence that he has acquired all necessary licenses, certificates and approvals to perform the specified work within the state or jurisdiction the work is to be performed.
- 2. Projects that include Digital Signal Processing (DSP) equipment will require the Contractor to submit evidence of qualification from the manufacturer of said equipment. This would include completion of manufacturer's training courses, the name of the person or persons who completed said training and prior projects completed using DSP technology. If the Contractor is not approved for the DSP programming, they may hire a qualified programmer approved by the consultant.
- 3. The Contractor shall provide information on how and by whom the requirements of the warranty period will be fulfilled.
- 4. The submittal must justify, in the judgment of the Consultant, the Architect, and the Owner, that the Contractor has the capability to manage and install a project of this size and scope and that he is capable of the necessary business and technical arrangements for this installation and the pursuant warranty service. Contractor may be disqualified as a bidder if all of the submittal does not meet the approval of the Owner and his/her representative.
- 5. Company: Work of this Section shall be performed by a Sound or Audio-Visual Systems Contractor who has at least five years direct experience with the devices, equipment and systems of the type and scope specified herein, and who has a fully staffed and equipped maintenance and repair facility, and who is licensed to perform work of this type in the Project jurisdiction.
- 6. Personnel: Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section. Supervisors shall have at least five years direct experience in similar work. Installation and maintenance personnel shall have at least three years direct experience in similar work.
- 7. Designated Supervisor: Provide a designated supervisor present and in responsible charge in the fabrication shop and on the Project Site during all phases of installation and testing of the Work of this Section. This supervisor shall be the same individual throughout the execution of the Work unless illness, loss of personnel, or other circumstances reasonably beyond the control of the Contractor intervene.
- 8. Staff Engineer: The Contractor shall have on his full-time payroll at least one staff engineer having five years minimum experience as an electronics engineer covering systems and projects comparable in substance and complexity to the project described herein. The staff engineer shall have NICET certification in Electrical/Electronics Engineering Technology and Audio Systems or equivalent. The signature of that engineer shall appear on all shop drawings and submittals.
- 9. Coordination: Coordinate the Work of this Section with the Work of all other Separate Contracts. Comply with Division 1.
- B. Cutting and Patching

- 1. Cut, patch and extend existing work using skilled mechanics that are capable of matching existing quality of workmanship.
- 2. Assign work of moving, removal, cutting and patching, to trades qualified to perform the work in a manner to cause least damage to each type of work, and provide means of returning surfaces to appearance of new work.
- 3. Perform cutting and removal work to remove minimum necessary, and in a manner to avoid damage to adjacent work. Cut finish surfaces such as masonry, tile, plaster or metals, by methods to terminate surfaces in a straight line at a natural point of division.
- 4. When new work abuts or finishes flush with existing work, make a smooth and workmanlike transition. Patched work shall match existing adjacent work in texture and appearance so that the patch or transition is invisible.
- 5. Protect existing finishes, equipment, and adjacent work that are scheduled to remain, from damage.
- 6. Promptly repair damages caused to adjacent facilities by demolition operations, at no change in Contract Amount.

# C. Painting

1. Use skilled mechanics that are capable of painting audio-visual equipment and hardware to match architectural surroundings, where applicable.

# D. Regulatory Requirements

- 1. Regulations Applicable: including but not limited to those defined in Division 1.
- 2. Comply with all applicable federal, state, and local labor regulations, and applicable local union and trade regulations.
- 3. Installation practices shall be in accordance to industry-accepted standards (ANSI, Cal-OSHA, IEC, IEEE, FCC, NEC, NFPA, ICIA, NSCA, CEDIA, BICSI) or local acts, codes and standards enforced at the place of work, whichever is most stringent.
- 4. Procure and pay for all necessary permits, licenses, inspections, and observe any requirements stipulated therein.
- 5. Provide UL/ULC fire rated enclosures around all audio-visual floor and back boxes where required by code.

## E. Programming

- 1. User Group Interview:
  - a. Conduct interviews with the end-users to acquire programming requirements. Submit written results of the interview and the requirements set forth by the user group. Associate the user group requirements into the programming of each sub system. Submit to the Consultant a report that outlines the interviews conducted.

## F. Pre-installation Meetings

1. Attend a pre-installation meeting at the project site with the Owner and his representatives in order to coordinate related work and scheduling issues.

#### G. Verification

1. Verify dimensions and conditions at the Project Site. Submit any conflicts in timely manner for resolution.

## H. Shop Fabrication and Testing

1. Assemble and fully wire equipment racks at a fabrication shop off the Project Site. Burn-in for not less than 120 hours. Following burn-in, perform specified adjustment procedures. Provide test equipment and test according to procedures specified herein. Submit verification of shop test in timely manner. Following verification of shop test and when installation locations are ready as specified herein, deliver equipment racks and equipment to the Project Site and install.

# I. Project Site Installation and Testing

- 1. Install as specified herein.
  - a. Perform specified adjustment procedures. Provide test equipment and test according to procedures specified herein. Request verification of Project Site test in timely manner.

## J. Verification of Submitted Test Data

 Re-test in presence of designated representative(s) of the Owner at reasonable mutual convenience. Provide services of the designated supervisor and an additional technician familiar with work of this Section. Provide all test equipment. Provide complete set of latest stamped submittals of record for reference. Provide complete set of Shop and Project Site Test Reports, as applies. Provide a complete set of manufacturer's original operation, instruction and service manuals for each equipment item for reference.

# K. Reference/Project Record Documents

 At all times when the work is in progress, maintain at the workplace, fabrication shop or Project Site as applies, a complete set of the latest stamped, action submittals of record for reference. Also maintain a separate, clean, undamaged set for preparation of Project Record Documents. Also maintain at the workplace a complete set of manufacturer's original operation, instruction and service manuals for each equipment item for reference.

## 1.07 Delivery, Storage and Handling

- A. Packing, Shipping, Handling and Unloading
  - 1. Deliver materials in manufacturer's original undamaged packages or in bulk packing which provides equivalent protection from rough handling, dust and dirt.
  - 2. Deliver all assembled equipment racks in custom manufactured wood crates to avoid damage during shipping.
  - 3. All packing, shipping, insurance, handling and storage costs of equipment and materials shall be the responsibility of the Contractor.
  - 4. The Contractor shall be responsible for insuring all equipment and installation materials stored in their shop facilities until it is delivered to the Project Site and a delivery acknowledgement is received from the Owner or its authorized representative.
  - 5. Equipment unpacked for inspection but not ready for permanent installation must be returned into its protective packing.

- 6. The Contractor shall be responsible for furnishing a temporary substitute for equipment that could not be delivered in time for system operation. All costs associated for renting, shipping and handling temporary substitute equipment shall be the responsibility of the Contractor.
- 7. In the event the equipment or installation material delivery is delayed, the Contractor must employ the fastest means of delivery service available to deliver the equipment on time. All costs for expediting the delivery of equipment shall be the responsibility of the Contractor.
- 8. Store packaged materials off of the ground or slab in a manner to protect them from elements, especially moisture damage.
- 9. Deliver completed, wired, tested equipment racks to associated equipment rooms at the Project Site when major work of all other separate contracts is complete, equipment room ventilation is operating with clean filters in place, the area is clean and free from airborne contaminates, and continuing work of other trades will not produce airborne contaminates or permit transport of such airborne contaminates to the equipment rooms.

## B. Acceptance at Site

- 1. All equipment and installation material delivered to the Owner shall be properly documented in the form of delivery receipts.
- 2. Equipment delivered to the Project Site must include a delivery acknowledgement receipt signed by the Owner or its representative. Issue a signed copy of the delivery receipt to the Owner and file the signed copy for future reference.
- 3. The Contractor shall be responsible for the insurance coverage and security of equipment delivered to the Project Site until it receives an acknowledgement of delivery from the Owner or its authorized representative.

# C. Storage and Protection

- 1. The Contractor shall provide a safe and secure storage location for all equipment and installation materials until they are delivered to the Project Site and it receives an acknowledgement of delivery from the Owner or its authorized representative.
- 2. For equipment assembled and tested at the Contractor's shop facility and delivered to the Project Site, ensure that the equipment is properly protected from improper handling, rain, water, humidity, moisture, heat, direct exposure to sunlight, dust and dirt during delivery and storage on or off the Project Site.
- 3. Do not remove protective packing from equipment until they are ready to be installed.
- 4. If, after equipment is installed, the Project Site cannot be cleaned or is still not clean because of on-going work by others, provide protective covering and protection to prevent airborne dust and dirt originating from damaging equipment.

## 1.08 Project Site Conditions

- A. Environment Requirements
  - 1. The spaces where audio-visual system assemblies are installed shall meet the following requirements:

- a. Free from dust generated from construction.
- b. The room temperature shall be within the specified operating temperature recommended by the manufacturer.

# B. Existing Conditions

1. Contractor is to visit the job site to access existing conditions. All cutting, patching and painting are the responsibility of the Contractor. Contractor must work around owners work schedule and submit a schedule of projected work hours with this proposal. Contractor must thoroughly inspect existing job site conditions for acceptable wire ways and ability to install equipment in proposed location per plans and allow sufficient labor hours to complete project. All new cable and wire ways will be recessed into walls or ceiling area. No cable or conduit will be run exposed to public view. Contractor must report, to the owner, the feasibility of cable runs as laid out in these contract documents. Contractor will in no way claim additional fees for items related to existing condition assessment.

## 1.09 Sequencing

- A. Submit all testing documentation to the Owner's Representative for review prior to requesting the Fabrication Inspection and Substantial Completion inspections.
- B. Allow adequate time for corrections to be made after inspections to maintain the Project Schedule.

## 1.10 Scheduling

- A. Comply with the Project schedule.
- B. Make all Submittals specified herein in a timely manner. Failure to make timely submittals complete as specified herein is considered to be lack of substantial progress of the Work of this Section. Contractor is to work around client schedule throughout the duration of the project.
- C. Deliver all equipment, devices and materials required for the Work of this Section and install, test and ready all work for Acceptance Testing at least fourteen days prior to the completion date for the associated area of the Project, unless specifically instructed otherwise by the Owner.
- D. Temporary Equipment: Provide and operate, without claim for additional cost or time, temporary equipment and/or systems to provide reasonably equivalent function, as determined by the Owner, in lieu of the Work of this Section which is incomplete or found not in conformance with the Contract Documents as of seven days prior to the completion date. Provide such temporary equipment until Acceptance of the Work of this Section. Thereafter, remove such temporary equipment.
- E. It shall be a common understanding that there is a time constraint when executing this work. The Contractor shall use all means and resources to complete this project on or before the specified schedule at no additional cost to the Owner. This includes working beyond normal business hours and days, additional manpower, additional tools, etc.

## 1.11 Warranty Service

- A. Warrant all Work of this Section to be free from defects in materials and workmanship for a minimum of 1 year from the date of Owner acceptance of the Work of this Section.
- B. All manufacturers' equipment warranties shall be activated in the Owner's name and shall commence on the date of system acceptance. In the case of Contractor modified equipment, the manufacturer's warranty may be voided. In such cases, provide a warranty equivalent to that of the original manufacturer.
- C. All high-level software shall follow the warranty conditions specified by the manufacturer. Immediately update or upgrade the Owner's installed software as soon as new versions, updates or patches become available from the manufacturer at no additional cost to the Owner within this warranty period.
- D. Response Time: Provide a qualified technician familiar with the work at the Project Site within 12 hours after receipt of a notice of malfunction. Provide the Owner with the telephone number attended 8 hours a day, 5 days a week, and an answering service or equivalent facility attended 24 hours a day, 7 days a week, to be called in the event of a malfunction. Provide repairs at no expense to the Owner and at the Owner's request, alternate facilities, services and systems for the duration of the repairs to any defective work of this Section. Provide a complete and operational System, within 48 hours after notification of a malfunction.
- E. All work requested due to warranty issues shall be performed during regular working hours unless the Owner agrees to pay the difference in labor rates for overtime or night time work.
- F. The Contractor shall use qualified service personnel to respond to all warranty issues or calls.
- G. Off Site Service: Conduct all warranty repairs and services at the Project Site, unless in violation of manufacturer's standard product warranty. Provide substitute systems, equipment, and/or devices acceptable to the Owner for the duration of off-site repairs. Provide transportation for substitute and/or test systems, equipment, devices, materials, parts and personnel to and from the Project Site.

#### 1.12 Owner's Instructions

#### A. General

- Conduct training on the completed system at a reasonable convenience of the Owner during normal Owner business hours. Contractor is to assess the complexity of the system and shall fully train the operation and maintenance staff named by the Owner.
- 2. Do not start training until all systems have been commissioned, training manuals are approved and an agenda along with schedule of each departmental training session has been submitted to the owner.
- 3. Training shall be conducted in the actual room that is the topic of the training session.
- 4. The client asserts legal and beneficial ownership of all training materials which are specifically commissioned for this project.
- B. Operator Training Do not start training before system is in full operation and all components have been signed off by owner's representative. Use the items covered in the commissioning portion of this specification as a basis for the training curriculum.

1. At least two 2-hour sessions of instruction will be given in order to familiarize the Owner with the operation of the system.

# C. Maintenance Training

- 1. At least two 2-hour sessions of instruction will be given in order to learn how to maintain and troubleshoot the system. A maintenance binder shall be provided by the Contractor with all manufacturer-specific operating and maintenance information for each piece of equipment used. On large jobs, the binders will be subdivided into individual audio, and control binders. Provide training on at least the following system features:
  - a. Firmware upgrades
  - b. Complete use of system as outlined in the Commissioning section plus advanced troubleshooting.

# D. Training Video

- 1. A training video shall be produced and cover all aspects of the systems operation.
- 2. Each page of all user interfaces shall be explained and recorded while gestures are made on the screen. Each button on the user interface shall be explained and demonstrated.
- 3. All portable equipment that connects to the system shall be demonstrated both in their physical connection and routing method at the user interface.
- 4. All source equipment shall be explained in both physical loading of media and transport control as well as user interface control.
- 5. Demonstrate on basic troubleshooting.
- 6. Provide training on items as outlined in the Commissioning section of this document.
- 7. Demonstrate system start up and shut down.
- 8. Audio and video files shall be combined and burned to DVD for distribution to each department.
- 9. Provide professional MP4 with searchable index of topics covered.
- 10. Provide label with client's logo, room name/number, title, length and topics covered.
- E. A training manual specific to this system will be written covering the basic and advanced functional techniques necessary to operate the system in a reliable and fully-functional condition. The Contractor shall submit hard color copies of the training manual as well as a soft copy in PDF or DOC format. Provide a hard copy of the training manual for each person to be trained. This manual shall include:
  - 1. All contact information, including emergency and after hours phone and pager numbers, for requesting service assistance from the Contractor.
  - 2. A 11x17 set of as-built drawings of the completed project (a full-sized set will be issued to the client for their use, a half-size set will be attached to the inside back door of the main equipment rack).
  - 3. A table of contents at the beginning of the manual.
    - a. The manual will begin by explaining basic information such as manual references, abbreviations, any assumptions made by the author, prerequisites required, numbering convection, etc.

- b. It will then proceed to the manual objectives.
- c. Explain what the end user should understand after reading the manual.
- d. It will cover the basics of the user interface including start up and shut down procedures, log on procedures, access privileges, operator password, levels of security, file structure, etc.
- e. The manual shall proceed to describe each user interface and its function. It will cover every layer of the interface and how to navigate through them.
- f. Each of the system presets shall be explained and the physical setup of the equipment and floor plan during presets shall be illustrated. Source equipment shall have their routing scheme explained and illustrated. Portable equipment and its connection to the system shall be explained and illustrated.
- g. The manual will end by explaining basic troubleshooting procedures and equipment care instruction.
- 4. The Contractor's maintenance instructions, which will include the manufacturer's maintenance instructions found on the factory manuals to keep the manufacturer's warranty in force.
- 5. A list of consumables (batteries, etc.) required to keep the system operating over time, along with sources of supply (if not readily available).
- 6. The Contractor shall compile and submit all factory warranty registration forms or cards for each piece of equipment furnished for this project.
- 7. A form requesting feedback from the end user as to how the manual can be improved and a section to report errors discovered.
  - The Contractor shall make the corrections and improvement suggestions after receiving feedback from the users. This will be completed at no charge to the client. The manual will contain a date stamp and version number. Each feedback and error correction manual reissue will include a new version number.

## F. Initial Use Support

1. Provide standby trainer/system engineer during the first two public events.

#### 1.13 Maintenance

- A. The Contractor shall, within the warranty period, schedule two visits to inspect and perform preventive maintenance on the system. The first visit shall be six months after the commencement of the warranty period. The last visit shall be just prior to the end of the warranty period.
- B. The Contractor shall use qualified service personnel to conduct all maintenance work.
- C. All maintenance work shall be performed during regular working hours unless the Owner agrees to pay the difference in labor rates for overtime or night time work.

#### **PART 2 - PRODUCTS**

#### 2.01 General

## A. Quality of Products

- Materials and equipment specified herein have been selected as the basis of acceptable quality and performance and have been coordinated to function as components of the specified systems.
- 2. Where a particular material, device, piece of equipment or system is specified directly, the current manufacturer's specification for the same shall be considered to be a part of these specifications, as if completely contained herein in every detail.
- 3. Each material, device or piece of equipment provided herein shall comply with all of the manufacturer's published specifications for that item.
- 4. Equipment shall be from the manufacturers' current stock and shall not be stored longer than 1 year prior to installation, unless written approval to do otherwise is provided by the manufacturer and submitted for review by the Owner.
- 5. All products shall be a product of firms regularly engaged in the manufacturing of electrical, electronic or optical equipment. The equipment shall be the latest model or type offered which meets the applicable specifications at the time of the submittal. Discontinued items replaced by newer models or versions are prohibited and should not be submitted for review.
- 6. Quality of workmanship and fabrication of all equipment and components, which are custom fabricated, shall be comparable to professional equipment produced by specialized manufacturers of the trade involved and will be verified by inspection. Only firms having 5 years of experience in all aspects of the fabrication and installation of similar systems will be allowed to perform the work.
- 7. All materials and products shall be new and of professional quality. Unless specifically stated in the drawings or specifications, no existing or used materials will be installed.

# B. Quantity

- 1. Provide the quantity of products as shown on the Contract Drawings, or as otherwise indicated herein.
- 2. The equipment listed in section 2.02 consists of all major equipment for the project. The Contractor shall integrate into the system design and provide any additional components, wiring, programming, etc., to complete a functional system operating as described within the specifications and the for construction drawings.
- Components or equipment not specified or indicated on the drawings that are required to make a fully functional systems per the Owner's requirements and the design intent, shall be furnished and installed by the Contractor, and shall be submitted for Owner review.

## C. Preference

1. Where more than one manufacturer is listed herein as acceptable or equivalent, no preference is intended or implied by the order of listing.

D. In the event that a specified piece of equipment or product has been superseded, discontinued or is no longer available from the manufacturer, the Contractor shall submit a request for substitution of the originally specified product. The substitute product shall be the manufacturer's most current model of the specified product, or if the line has been discontinued, a product by the same manufacturer with specifications meeting or exceeding, and as close as possible to those of the originally specified product. Refer to Alternatives and Substitutes section for clarification.

## E. Provide Complete

1. Provide all auxiliary and incidental materials and equipment necessary for the operation and protection of the Work of this Section as if specified in full herein.

#### F. Provide New

- 1. All materials provided under the Work of this Section shall be new, shall be the manufacturer's latest design/model, and shall be permanently labeled with the manufacturer's name, model number and serial number.
- 2. Products and materials shall be clean, free of defects, damage and corrosion.

#### G. Similar

1. Similar devices shall be of the same manufacturer, unless specifically noted otherwise in these specifications.

## H. Safety Agency Listing

1. All devices provided under the Work of this Section that are connected to the Project electrical system shall be listed by Underwriters Laboratories (UL) or other Nationally Recognized Electrical Testing Laboratory acceptable to the Authorities having jurisdiction at the Project site, and shall be so labeled. Absent such listing, comply with Regulatory Requirements applicable to Unlisted Equipment.

# I. Power Rating

 All devices provided under the Work of this Section that are connected to the Project electrical system shall provide stable performance in full accordance with these specifications when operated on main service which complies with ANSI standard tolerances for voltage, frequency, transients and related parameters.

# J. Circuit Protection

- 1. All active devices shall include integral fuse or circuit breaker protection.
- 2. All circuit breakers shall be fully magnetic.
- 3. Protection devices shall be located to facilitate examination, resetting and/or replacement without the need to disassemble or demount the associated device.
- 4. Contractor-fabricated items shall be provided with either indicating type circuit breakers or fuses of the clear glass cartridge type, mounted in fuse holders which will indicate a blown or defective fuse.

#### K. Continuous Use

 All active circuitry shall be solid state and shall be rated for continuous use. All circuit components shall be operated in full compliance with the manufacturer's recommendations and shall contain sufficient permanent identification to facilitate replacement.

#### L. Construction

- 1. All electronic equipment shall be of the "dead-front" type and shall be designed for standard 19" EIA rack mounting, unless otherwise indicated.
- 2. Steel frames and enclosures shall be designed and wired to eliminate all induced currents within both the units and the systems.
- 3. All bolted connections shall be made with self-locking devices.
- 4. Coordinate all consoles and panels so that the general appearance is similar, or as directed by the Owner.
- 5. All operating panels shall be at least 1/8" thick aluminum.
- 6. Provide locking panel covers on all recessed, semi-recessed or surface mounted control panels not located in the equipment rooms, unless specifically noted otherwise. Panel locks shall be flush with no protrusions beyond the panel face when the door is closed. Recessed control panels shall be recessed within the back box to a depth sufficient to permit a locking hinged panel cover to completely close without affecting any device within the enclosed area.

## M. Identification

1. Provide permanent intelligible identification on, or adjacent to, all connectors, receptacles, controls, fuses, circuit breakers, patching jacks, and the like. This identification shall clearly and distinctly indicate the function of the item and shall be numbered or lettered to correspond with the function, circuit and location consistent with field and shop drawings.

## N. Keys

- 1. Key all boxes, cabinets, enclosures, panels, controls, doors and related provided for similar usage within a system identically. For each unique key type, provide a quantity of ten. Stamp each key with a reference designation.
- 2. Submit a schedule of keying to the Owner. Where so noted, provide Project Standard lock cylinders and keys; coordinate with the work of other Sections.

# O. Assistive Listening System (RF)

1. An assistive listening system using wireless radio frequency (RF) transmitter and headsets will allow personal monitoring of the audio program for the hearing impaired. The transmitter will be a frequency agile unit with no less than 30-channel capability and will broadcast the main audio program to personal headsets used by hearing impaired audience members. The system and quantity of headsets supplied shall conform to the ADA requirements (section 219 and 706) for the space. Stereo headset type and hearing aid compatible (T-Coil) listening devices are required; ear-bud type devices are not acceptable. Supply a drop-in type battery charging system capable of servicing multiple receivers, with sufficient charging capacity to charge each receiver simultaneously. Follow the table below for quantity requirements.

Capacity of Seating in Assembly Area	Minimum Number of Required Receivers	Minimum Number of Required Hearing Aid Compatible Receivers
50 or Less	2	2

51 to 200	2, plus 1 per 25 seats over 50 Seats *1	2
201 to 500	2, plus 1 per 25 seats over 50 Seats *1	1 per 4 Receivers *1
501 to 1000	20, plus 1 per 33 seats over 500 *1	1 per 4 Receivers *1
1001 to 2000	35, plus 1 per 50 seats over 1000 seats *1	1 per 4 Receivers *1
2001 and over	55, plus 1 per 100 seats over 2000 seats *1	1 per 4 Receivers *1

<sup>\*1</sup> Or fraction thereof

- P. Provide enclosure systems including, but not limited to racks, cabinets, cases and related panels and accessories as specified herein, or approved equivalent. Provide size and quantity as shown on drawings. Provide color as specified by Architect. If no color is shown on drawings, submit manufacturer's standard color chips for selection.
- Q. Cable Tray: Provide aluminum ladder style cable tray with flange in side rails where called out in drawings. Size the cable tray to accommodate all wire that must pass through it. Provide all supporting hardware and accessories.
  - 1. Ladder Style Cable Tray
    - a. P-W Industries.
    - b. Equal by Hubbell.
    - c. Approved equal.
- R. Floor Mounted Equipment Racks: Provide each bay with basic frame, vented locking rear door, top panel with single 10" fan, certified seismic floor anchor kit, ganging hardware, except where otherwise indicated, at each ensemble of bays, provide end (side) panels to provide complete enclosure.
  - 1. Rack cabinet, heavy duty welded 14ga. CRS, single bay of maximum dimensions 83-1/8"(H) x 24"(W) x 32.5"(D); floor supported with accessory louvered side rack side panel.
    - a. Mid Atlantic WRK Series.
    - b. Equal by Atlas/Soundolier.
    - c. Approved equal.
  - 2. Turret cabinet:
    - a. Mid Atlantic Slim 2 Series.
    - b. Equal by Atlas/Soundolier.
    - c. Equal by Hammond Manufacturing.
  - 3. Wall Mounted cabinet:
    - a. Atlas/Soundolier 300 Series.
    - b. Mid Atlantic DWR Series.
    - c. Equal by Hammond Manufacturing.

- S. Rack Panels and Accessories: Rack Mounting Screws: Screws 10-32; length as required for at least 1/4" excess when fully seated; oval head with black plastic non marring cup washer or equivalent ornamental head; nickel, cadmium or black plated; Phillips, Allen Hex, Square-Tip or Torx drive. Slotted screws are not acceptable.
  - 1. Blank Panels:
    - a. Atlas/Soundolier S19 Series.
    - b. Zero ZP112000 Series.
    - c. House of Metal Enclosures (HOME) Series PM.
    - d. Middle Atlantic Products BL, SB or HBL Series.
  - Vent Panels:
    - a. Middle Atlantic ETF Series.
    - b. Equal by Atlas/Soundolier.
    - c. Equal by Zero.
    - d. Equal by House of Metal Enclosures (HOME).
  - 3. Shelf:
    - a. Middle Atlantic Products U Series.
    - b. Atlas/Soundolier SH19 Series.
    - c. Zero A52 Series.
  - 4. Drawer:
    - a. Atlas/Soundolier SD Series.
    - b. Middle Atlantic Products UD Series.
    - c. House of Metal Enclosures (HOME) SD Series.
    - d. Zero A43/A36 Series.
  - 5. Equipment Custom Rackmount Shelf: Middle Atlantic Products Model RSH-4A Series.
    - a. Mid Atlantic LBP-IR4, LBP-1S, LBP-1P.
    - b. Equal by Atlas/Soundolier.
- T. Equipment Enclosure Ventilation: Provide UL Recognized devices. Connect to enclosure power, comply with applicable Codes.
  - 1. Fan panel, 5 1/4" high painted steel rack panel with 4" diameter fans, each fan with chrome plated finger guard, low speed air flow, two fans per panel, total 120 CFM:
    - a. Mid Atlantic QFP-2 Series.
    - b. Atlas/Soundolier ES/IS Series.
    - c. BGW Systems.
  - 2. Thermostatic Fan control module, user definable temperature range with status LED's, temperature sensing probe.
    - a. Middle Atlantic FC Series.
    - b. Atlas/Soundolier CFT Series.

- U. Equipment Enclosure Power and Signal Grounding: Comply with applicable Codes and applicable portions of Division 26. Provide UL Listed devices, Specification or Hospital Grade. Provide all junction boxes, raceway, fittings, wire, supports and fastenings as required for complete installation. Unless otherwise noted, provide receptacles of NEMA 5-15R configuration.
  - 1. Full height receptacle strip, Isolated Ground:
    - a. Wiremold 3000 Plugmold IG Series.
    - b. Middle Atlantic PD series vertical power strips.
  - 2. Full height receptacle strip, three or more circuits, Isolated Ground:
    - a. Wiremold 3000 Series with Specification Grade IG 5262 Series receptacles.
    - b. Middle Atlantic PD series vertical power strip.
  - 3. Wireway, lay in, NEMA 1: Any meeting NEMA 1 and UL870. Size as required.
  - 4. Flexible metal conduit: Comply with Division 26.
  - 5. Sequencing Power System:
    - The Contractor is to design and build power sequencing and surge suppression systems that will control and distribute power in the equipment racks. The system will be designed to sequentially connect power to all of the audio-visual equipment in the equipment racks. Outlets are mounted to the unit's back plate or on a remote strip. If the project utilizes a control system, the sequencing power system will be controlled by the software configurable control system. The touch panel's shut down button will prompt a second time asking "Are you sure you want to shut the system down?" A positive response will activate system shut down. A push button control station's shut down button will be pressed twice to shut down the system. If the project does not include a control system, the Contractor is to provide a dedicated sequential controller in the equipment racks.
      - 1) 15 amp or greater power capacity.
      - 2) 3-prong 15 amp 120VAC isolated ground outlets (provide required amount).
      - 3) Individual sequencing steps for each outlet.
      - 4) Adjustable power-up time delay and outlet sequencing intervals.
      - 5) Modular power raceway systems shall be constructed of 18-gauge minspangle galvanized steel.
      - 6) Remote controllable via contact closures (if applicable).
      - 7) Status indicator on touch panel (if applicable).
    - b. Approved subject to above:
      - Middle Atlantic RLM-XX, RM-XX, R-XX or M-XX Modular Power Raceway Series.
      - 2) Middle Atlantic USC-6R Universal Sequencing Controller.
      - 3) Equal by Atlas Soundolier.
  - 6. Signal Grounding bus bar, insulated from enclosure frame:

- a. Atlas/Soundolier BBG Series mounted on standoff insulators.
- b. Zero A32 Series.
- c. Middle Atlantic.
- d. Panelboard Isolated Ground bus kit by manufacturer of Project Panelboards specified in Division 26.
- 7. Multi-Outlet Assembly, Surge Suppressing, UL Listed. Comply with ANSI/IEEE C62.41-1980. Provide at least six receptacles. Provide equivalent to:
  - a. Surgex SX RT series.
  - b. EFI Electronics Corporation Model 153.
  - c. MCG Electronics, Inc. Model 296 (subject to UL Listing).

#### 2.02 Products

A. Major System Components

DEVICE ID	DESCRIPTION	MANUFACTURER	MODEL	ACCESSORIES
AIU1	AUDIO INTERFVACE UNIT (BLUETOOTH)	ATTEROTECH OR EQUAL	unBT2A	
AIU2	AUDIO INTERFVACE UNIT	ATTEROTECH OR EQUAL	AXIOM ML1	
ALA	ASSISTIVE LISTENING ANTENNA	LISTEN TECH OR EQUAL	LA-122	
ALR	ASSISTIVE LISTENING RECEIVER	LISTEN TECH OR EQUAL	LA-4200-216	LA-402 HEADPHONE
ALT	ASSISTIVE LISTENING TRANSMITTER	LISTEN TECH OR EQUAL	LT-800-216-01	LA-326 RACK MOUNTING KIT, LA- 381 CHARGING STATION
BOB1	BREAK OUT BOX	ATTEROTECH OR EQUAL	AXIOM AXP20	
ERK1	EQUIPMENT RACK	MIDDLE ATLANTIC OR EQUAL	SR-24-28	PLEXI DOOR AND LOCK
GNM1	GOOSENECK MICROPHONE	AKG OR EQUAL	DST99 S	
MIX1	MIXER	SHURE OR EQUAL	SCM262	
NL	NECK LOOP	LISTEN TECH OR EQUAL	LA-430	
PA1000/4V	POWER AMPLIFIER	QSC OR EQUAL	CXD4.5	
PEC	PORTABLE EQUIPMENT CASE	PELICAN CASE OR EQUAL	iM2400	
PSQ	POWER SEQUENCER	FURMAN OR EQUAL	CN-2400S	

DEVICE ID	DESCRIPTION	MANUFACTURER	MODEL	ACCESSORIES
RC1	REMOTE CONTROL	FURMAN OR EQUAL	RS-2	
SP1	SPEAKER	JBL OR EQUAL	AWC129	MOUNTING BRACKETS & MOUNTS AS NECESSARY
SP2	SPEAKER	JBL OR EQUAL	AW295	MOUNTING BRACKETS & MOUNTS AS NECESSARY
SP3	SPEAKER	JBL OR EQUAL	AW266	MOUNTING BRACKETS & MOUNTS AS NECESSARY
WLM	WIRELESS MICROPHONE	AUDIO-TECHNICA OR EQUAL	ATW- T3202/C710	
WMA	WIRELESS MIC ANT	AUDIO-TECHNICA OR EQUAL	DFINB	MOUNTING BRACKET
WMR	WIRELESS MIC RECEIVER	AUDIO-TECHNICA OR EQUAL	ATW-R3210	

- B. The above list of Major System Components only outlines the major items necessary to allow the system to function as designed. It lists no power supplies, balancing transformers, power splitters, modular cards or other auxiliary components required to achieve a functioning system. Contractor is required to supply all components needed to provide a complete and operable system as outlined in the contract documents. The full set of construction documents are to be used when preparing a bid. This list is not intended to provide a full bill of materials.
- C. Patch bays shown on plans and elevations are for placeholder information only. Contractor is to determine the exact amount of patch needed as per single line diagrams.

## 2.03 Finishes

- A. Any item or component of the Work of this Section which is visible shall comply with the following. Finishes noted or scheduled on the Contract Drawings shall take precedence. Submit all color samples of all items visible to public for approval.
  - 1. Where finishes are not noted or otherwise defined in the Contract Documents, submit manufacturer's standard finish samples for selection by the Owner.
  - 2. Paint loudspeaker cabinets to match exactly the surrounding and adjacent surfaces. Submit paint sample to Owner's representative for approval.

- 3. Unless otherwise noted, receptacle or device plates subject to connection or operating force shall be stainless steel or hard anodized aluminum. Provide plates which generally match the appearance of project standard receptacle or device plates in view in the same area. For anodized aluminum, submit samples of standard colors for selection by Owner.
- 4. Operating panels shall be steel, primed, painted with thermosetting epoxy paint, with legends silk-screened in contrasting color, and coated with clear epoxy thermosetting coating; or aluminum, hard anodized, with legends engraved and filled with contrasting color, all coated with clear epoxy thermosetting coating.
- 5. All steel surfaces shall be treated with primer equivalent to zinc phosphate and finish painted with baked enamel or painted with a thermo setting epoxy paint.
- 6. All aluminum surfaces, except those used as operating surfaces, shall be anodized and then painted with a thermo setting epoxy paint.
- B. Custom Fabricated Plate Screws
  - 1. Match the finish of the screws used to mount the custom fabricated plates with the finish of the custom fabricated plate.
- C. Equipment or Cover Plates
  - 1. Paint equipment or cover plate to match exactly the surrounding and adjacent surfaces when require by architect.
- D. Manufacturer's logos
  - 1. Remove all manufacturers' names, logos, or other symbols from speakers or other objects placed in view of the public.

## 2.04 Alternatives and Substitutes

- A. Substitutions of equal equipment beyond the alternatives listed will be permitted only in accordance with Division 1. If a requested substitution requires a change in any of the contract drawings, a revised drawing must be submitted as part of the substitution request. The Owner's Representative shall be the final judge of the acceptability of substitutions. The burden of proof of equivalence is the responsibility of the Contractor.
- B. Acceptance of a product shall not, in any form or manner, relax the system performance requirements of this Specification and the performance characteristics of the product.
- C. The Contractor shall submit for review a complete list of proposed substitutions for approved equipment listed in Part 2.
- D. For all substitutions, the Contractor shall provide the manufacturer's independent test data to demonstrate that the proposed alternatives to the approved equipment comply with the specifications. Specifications shall contain at least all information available for the specified product.
- E. The Contractor shall submit a description and drawings showing all changes to the Contract Documents that the proposed substitution will require for proper functionality and operation.
- F. Proposed substitutions shall not affect dimensions shown on the Contract Document except as submitted for review and approved by the Owner.

- G. Any redesign or construction costs required to integrate the proposed substitution shall be the responsibility of the Contractor. Any costs incurred by the Owner, Owner's representatives, Architect, Engineers or Consultants attributable to the integration of a proposed substitution shall be borne by the Contractor.
- H. Any proposed substitution shall have no adverse effect on other trades, the construction schedule or specified warranty requirements.
- I. The functionality, performance, general appearance and quality of the proposed substitution shall be equivalent to or superior to those of the specified item.
- J. Any change to the Contract (deductive or additive cost) associated with a proposed substitution shall be submitted to the Owner for review at the time the substitution is proposed and accompanying a substitution request documentation.
- K. The Contractor shall provide the same warranty for the substitution that the Contractor would for the specified product.
- L. The Contractor shall coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects equal to the designed system before the substitution was made. In the event that the substituted material or equipment fails to meet performance testing standards after installed, the Contractor shall replace substituted material or equipment with those initially specified.

#### PART 3 - EXECUTION

## 3.01 General

- A. Perform the Work of this Section in accordance with acknowledged industry and professional standards and practices, and the procedures specified herein.
- B. Furnish and install (herein, "provide") all materials, devices, components, and equipment required for complete, operational systems.
- C. Contractor is to supervise the installation of back boxes and terminal cabinets installed by the Division 26 Contractor. Contractor is to verify that correct boxes are installed in their proper locations before any drywall has been installed.

#### 3.02 Examination

- A. Immediately report to the Consultant any discrepancies between the specifications and drawings. This includes discrepancies between the technical specification documents and actual field dimensions or findings that may hinder installation work, conflict with other trades, or cause delays.
- B. Carefully examine all details that affect all aspects of the systems described in the specifications and drawings.
  - 1. Examine, coordinate and confirm all drawings and details.
  - 2. Examine, coordinate and confirm all electrical power requirements, conduits, raceways, boxes, and etc.
  - 3. Examine, coordinate and confirm work of other trades that may influence the outcome of the design, specification, and performance of the systems.

## 3.03 Preparation

- A. This installation section is only meant as a guideline for the Contractor. The Contractor shall be responsible for executing all installation work in a manner that is in accordance to industry-accepted standards or governing codes, whichever is more stringent. Installation activities shall be executed in an organized and orderly manner. These steps include, but are not limited to, pre-delivery testing, delivery, unloading, installation, equipment / cable labeling, programming, set-up / calibration / alignment / adjustment, testing, commissioning, training, and documentation.
- B. Protect all existing work surfaces, furniture, equipment, fixtures and etc. before commencing installation work. Any damage to the existing physical and electrical property due to installation work shall be the responsibility of the Contractor.
- C. Immediately hand over any de-installed equipment to the Owner for safe-keeping if equipment is to be reused.
- D. Carefully remove any obstructions such as fixed seating, ceiling tiles, furniture, equipment and etc. that would obstruct or hinder the installation work. Damage caused by undue care in moving these items shall be responsibility of the Contractor.
- E. Examine, coordinate, and confirm the cleanliness of the work site before commencing the portion the installation work that involves dust-sensitive electronic or electrical equipment such as audio mixers, switchers, etc. Dust-sensitive equipment that is installed in a work site with air borne dust and dirt shall be properly protected. For example, a video camera on a wall-mounted bracket is protected by a clean plastic bag to prevent dust from contaminating it. Seal the bag's opening using adhesive tape.
- F. Prior to commencing installation work, ensure that the surrounding areas are clean and promote ease of installation work.
- G. Ensure that all equipment rack and equipment locations are clean before commencing installation work.
- H. Unless specified otherwise, furnished products / equipment shall be tested, delivered and installed. And, all systems shall be tested and commissioned to fully operational and properly configured condition.
- I. All electrical equipment shall be burned-in or tested at the Contractor's shop before delivery. This pre-installation test shall reveal any equipment that is faulty, malfunctioning or dead out of the box ahead of time.
- J. All radio frequency (RF) operated devices shall be tested on-site prior to installation to determine blind spots, RF interference, or any other transmission / reception problems. The Contractor shall be responsible for costs associated with providing additional support or accessory equipment (antennas, amplifiers, cables, etc.) and / or services to improve signal transmission / reception.
- K. Provide all support equipment (ladders, man-lifts, tools, etc.) required to complete the installation work in a safe and expeditious manner.
- L. Obtain any plan approvals, permits and licenses required by inspection authorities prior to execution of any installation work. The Contractor shall be responsible for all associated fees and costs incurred while fulfilling this requirement.

- M. Ensure that all equipment is accessible for operation and maintenance work. Under no circumstance shall equipment be inaccessible or inconveniently located.
- N. Aside from the systems' operational features, provide equal attention to the overall aesthetics of the installed equipment and cabling. Special attention to aesthetics shall be extended to equipment or cabling in public spaces.
- O. Firmly secure all fixed equipment and hardware in place and ensure that they are plumb and / or square. An exception to this shall be portable or movable equipment.
- P. Structurally mounted equipment: All equipment shall be mounted in accordance to all applicable safety codes, standards and practices. The one that provides for the most stringent rule shall prevail. All mounting hardware shall have a load rating by, at least, a factor of 5 (500% or greater) in reference to the weight of the equipment to be mounted or suspended. An exception to the rule shall be existing local safety codes or standards requiring greater load capacities.
- Q. Seismic restraints: Abide by all the seismic restraint requirements described in all applicable building codes in force at the work site. If no provisions exist for a particular situation, follow these minimal recommendations.
  - 1. Fixed equipment: Mount and brace to the building structure to minimize potential hazards to personnel and damage to property during any kind of seismic event.
  - 2. Floor mounted equipment: Bolt equipment securely to the floor to prevent from toppling during any kind of seismic event
  - 3. Vertical-mounted columns: Apply braces to the vertical column in four opposing directions back to the mounting surface. This will minimize sway in any direction. Provide a separate, flexible restraint (e.g. aluminum braided aircraft cable) with a capacity of 5 times the weight of the total mounting system. The same applies to the anchor to which the flexible restraint is attached and the method of attachment to the structure.
  - 4. No equipment, equipment supports, or mounts must fail before the structure fails.
  - 5. Seismic restraint measure must not interfere with fire stopping.
  - 6. Notwithstanding compliance with these minimum recommendations, it is the Contractor's responsibility to ensure that the seismic restraint measures taken are adequate for the circumstances, including, if required, verification by an independent structural engineer. The cost of all such engineering shall be the responsibility of the Contractor.
  - 7. Penetration of the Slab: Verify that any mounting or restraint work that requires deep or thorough penetration of the slab shall not damage embedded materials including, but not limited to, slab tensioning devices or conduit. Verify the slab by X-ray or other method before proceeding. The Contractor shall be responsible for all costs associated with this investigation.

## 3.04 Installation

A. Follow manufacturer's instructions for installing, operating, configuring, and programming their equipment. Do not perform modifications to equipment that would void its warranty.

- B. Pull and terminate all cables, and interconnect all equipment and components in accordance with approved drawings. Install audio-visual cover plates and faceplates onto all boxes.
- C. Loudspeaker Assembly Installation
  - 1. Loudspeakers:
    - a. Verify proper installation of loudspeaker enclosures and related support.
    - b. Verify that no loudspeaker assembly is subjected to stresses or loading effects in any way contributing to possible extraordinary failure.
    - c. Connect loudspeaker assemblies to the appropriate 70 volt-line transformer tap as applies. Verify specified polarity. Use insulated crimp connectors or insulated "bobtail" splices applied with manufacturer's recommended ratchet tooling. Wago Wall-Nuts 773 Series or equal are acceptable. Wire nuts or "Scotchlock" connectors shall not be acceptable.
    - d. Verify that loudspeaker grille openings and loudspeaker components are clear of paint after finishing.
    - e. Perform preliminary loudspeaker tests specified herein. Correct non-conforming conditions
    - f. Adjust 70 volt-line transformer taps as required to realize uniform sound pressure level as specified herein. Document final 70 volt-line transformer taps on the Record Drawings.
    - g. Correct all conditions giving rise to noise, rattle or other extraneous sounds owing to operation of a loudspeaker assembly under any specified operating condition.

#### 2. Packaged Loudspeakers:

- a. Design, engineer and provide complete, all means of support, suspension, attachment, fastening, bracing, and restraint (hereinafter "support") of packaged loudspeakers. Provide engineering of such support by parties licensed to perform work of this type in the Project jurisdiction. Submit in timely manner.
  - 1) Comply with applicable Code and the requirements of the Authorities having jurisdiction.
  - 2) Provide safety factor greater than six or as required by Code, whichever is greater.

#### b. Mounting shall:

- 1) Permit each packaged loudspeaker to be re-oriented at least plus or minus 5° from angles shown on the Contract Drawings for optimum coverage.
- 2) Maintain precise location and orientation of each packaged loudspeaker component after such adjustment when subject to vibration of loudspeaker components due to operation at full specified system output level, and when subject to normal building motion and Code defined seismic induced building motion.
- 3) Use rigid metal support members, such as threaded rod with locking nuts.

- c. Test each packaged loudspeaker prior to installation at design locations. Test at least polarity and freedom from buzzes, rattles and objectionable distortion, using procedures specified herein. Correct non-conforming conditions.
- d. Do not apply any load to building structure without first obtaining written approval of the Owner. Obtain per Project procedures.
- e. During Acceptance Testing, adjust orientation of packaged loudspeakers as directed to achieve optimum coverage. Provide workers and ladders as required. Perform such adjustment with no claim for additional cost or time.
- f. Do not suspend or orient the loudspeaker cluster prior to verification by the Owner or Owner's representative, that the intended location is correct with respect to as-built conditions such as the final dimensions of the space.

#### 3.05 Labeling and Identification

- A. All cables and connecting blocks shall be clearly, logically and permanently marked and identified by the following means:
  - 1. Use cable labels similar to the Panduit Polyolefin Self-laminating Labels for inkjet or LaserJet printers or any other means acceptable to the Consultant. Cable labels should be machine printed and not handwritten.
  - 2. Cable labels should be placed approximately 12 cm. from each end of the cable.
  - 3. Labeling conventions shall be clear, logical, and must be acceptable to the Consultant.
  - 4. Include all cable identification numbers on all wiring diagrams and cable schedules.
  - 5. For fiber optic cables, use cable identification products such as the Panduit Label Core series or any other means acceptable to the Consultant.
  - 6. For connector and terminal blocks, label using Wago, Phoenix or any means acceptable to the Consultant.
- B. All cover plate, switches, panels, outlets, etc. labeling shall be engraved and filled, or silk-screened or by any other means acceptable to the Consultant. Do not use Dymo, Brother Ptouch, or other similar labeling products.
- C. Protective Devices
  - 1. Identification of fuses and circuit breakers shall indicate protected circuitry, rating of protective device and voltage across open circuited protected device.
- D. Panels and Receptacles
  - 1. Panel surfaces shall be engraved and filled or silk screened with identification, or shall be provided with 1/16 inch (minimum) thick laminated plastic labels with engraved block characters at least 1/8 inch high fastened to the equipment by stainless steel screws or rivets. Provide white characters on black background unless otherwise noted. Do not use Dymo, Brother Ptouch, or other similar labeling products.
- E. All equipment shall be labeled in a clear, logical manner or by any other means acceptable to the Consultant.

1. For equipment identification, use 'badges' made of aluminum or plastic or any other acceptable material with engraved and filled, or silk-screened labeling. Stick these badges using industrial-strength doubled-sided 3M adhesive tape. Label schemes should be clear, logical, and simple or by any other means acceptable to the Consultant. Indicate equipment labeling schemes on all elevation and plan drawings showing the front and / or rear of the equipment racks. The reader should be able to easily reference the label description to specific equipment in the Operation and / or Maintenance Manuals. Do not use Dymo, Brother Ptouch, or other similar labeling products.

#### 3.06 Wiring

- A. General
  - 1. This section does not apply if the drawings incorporate a wire schedule.
- B. Audio Signal Wiring Classification:
  - 1. Type A-I: Microphone level wiring less than -30 dBu, 20 Hz to 20 kHz.
  - 2. Type A-2: Line level wiring -30 dBu to +24 dBu, 20 Hz to 20 kHz.
  - 3. Type A-3: Loudspeaker level or circuit wiring greater than +24 dBu, from 20 Hz to 20 kHz.
- C. Control Signal Wiring Classifications:
  - 1. Type C-1: DC control wiring 0 to 50 volts.
  - 2. Type C-2: Synchronous control or data wiring 0 to 40 volts, peak-to-peak.
  - 3. Type C-3: AC control wiring 0 to 48 volts, 60 Hz.
- D. Additional Wiring Classifications:
  - 1. Type M-1: DC power wiring 0 to 48 volts.
  - 2. Type M-2: AC power wiring greater than 50 volts, 60 Hz.
- E. Wiring Combinations: Except as indicated herein, conduit, wire ways and cable bundles shall contain only wiring of a single classification. The following combinations are acceptable in conduit, or cable harnesses. Additional acceptable combinations may be indicated on the Contract Drawings.
  - 1. Types A-1, C-1, and M-1.
  - 2. Types A-2, C-l, C-2, and M-l, runs less than 20 feet.
  - 3. Types A-2, C-1, and M-1.
  - 4. Types A-3, C-1, C-2, and M-1.
  - 5. Types A-2, V-1, and V-3.
  - 6. Types V-1, V-2, V-3, and C-1.
  - 7. Types M-2 and C-3.

#### 3.07 Wire and Cable Installation

A. Provide permanent identification of run destination at all raceway terminations.

- B. All wire and cable shall be continuous and splice-free for the entire length of run between designated connections or terminations.
- C. All shielded cables shall be insulated. Do not permit shields to contact conduit, raceway, boxes, panels, connector shell or equipment enclosures.
- D. Within buildings, make splices only in designated terminal cabinets and/or on designated equipment backboards. Outside buildings, make splices only in designated manholes and/or hand holes. Protect splices outside of buildings with splicing kits equivalent to Scotch-cast Re-enterable. Make splices only with connectors or terminal devices specified herein. Document all splices on Record Drawings.
- E. Verify that all raceway has been de-burred and properly joined, coupled, and terminated prior to installation of cables. Verify that all raceway is clear of foreign matter and substances prior to installation of wire or cable.
- F. Inspect all conduit bends to verify proper radius. Comply with Code for minimum permissible radius and maximum permissible deformation.
- G. Apply a chemically inert lubricant to all wire and cable prior to pulling in conduit. Do not subject wire and cable to tension greater than that recommended by the manufacturer. Use multi-spool rollers where cable is pulled in place around bends. Do not pull reverse bends.
- H. Provide a box loop for all wire and cable routed through junction boxes or distribution panels. Provide tool formed thermal expansion loops at cable at manholes, handholes and at both sides of all fixed mounted equipment. Cable loops and bends shall not be bent at a radius greater than that recommended by the manufacturer.
- I. Secure all wire and cable run vertically for continuous distances greater than 30 feet. Secure robust non-coaxial cables with screw-flange nylon cable ties or similar approved devices appropriate to weight of cable. For all other cables, provide symmetrical conforming nonmetallic bushings or woven cable grips appropriate to weight of cable.
- J. All Category type cable, connectors and plugs shall be color coded for easy visual distinction. Color coded insert type boots shall be installed on all Category type plugs. A colored coded ring will be provided on all chassis connectors (i.e. Neutrik ACRF-#). Cable connecters shall be equipped with Neutrik BSE-# color coded bushings. The Color code shall be as follows:

LAN = Yellow
 Audio Network = Red
 AV Local Area Network = Orange
 Computer Training KVM = Grey
 AV UTP = White

#### 3.08 Connector and Signal Polarity Convention

A. Maintain consistent absolute signal polarity at all connectors, patch points and connection points accessible in the system. Where applicable, a positive polarity electrical signal shall yield positive acoustic pressure from the loudspeakers.

B. Audio signal connector convention: AES14-1992 (ANSI S4.48-1992) AES standard for professional audio equipment - Application of connectors, Part 1, XLR-type polarity and gender.

Signal Connector Wire

Signal Phase Pin 2 Red or White

Signal Anti-Phase Pin 3 Black

Signal Ground Pin 1 Drain Wire

C. RF Connector Convention:

<u>Signal</u> <u>Connector</u> <u>Wire</u>

Signal Phase Center Pin Center conductor

Signal Anti-Phase Shell Shield

Signal Ground Shell Shield

D. Voice/Data Connector Convention: Comply with EIA/TIA-568C.

#### 3.09 Wiring Practice

- A. Land all non-coaxial field wiring entering each equipment rack at specified terminal devices prior to connection to any equipment or devices within racks. At Contractor's option, such terminals may be located in the equipment racks or at backboards provided. Coordinate such selection with Project construction sequence and test procedures specified herein.
- B. Identify all wire and cable clearly with permanent labels wrapped about the full circumference within one inch of each connection. Indicate the number designated on the associated field or shop drawing or run sheet, as applies. Assign wire or cable designations consistently throughout a given system. Each wire or cable shall carry the same labeled designation over its entire run, regardless of intermediate terminations. Provide any of the following:
  - Continuous permanent imprint; equivalent to Clifford of Vermont, Inc. "Quik-Pull".
  - 2. Direct hot stamp.
  - 3. Heat shrinkable factory hot stamped; equivalent to Brady sleeve Heat shrink.
  - 4. Adhesive strip printed labels wrapped the full circumference of the wire and sealed with clear heat shrink tubing; equivalent to Thomas and Betts or Panduit Insta-code with clear heat-shrunk tubing equivalent to Alpha.
- C. Apply all crimp connectors only with manufacturer's recommended ratchet type tooling and correct crimp dies for connector and wire size. Plier type crimp tooling shall not be acceptable.

- D. Coordinate insulation displacement (quick connect) terminal devices with wire size and type. Comply with manufacturer's recommendations. Make connections with automatic impact type tooling set to recommended force.
- E. Make all connections to screw-type barrier blocks with insulated crimp-type spade lugs. Lugs are not required at captive compression terminal type blocks. Provide permanent designation strips designed for use with the terminal blocks provided. Make neat, intelligible markings with indelible markers equivalent to "Sharpie".
- F. Tin terminated shield drain wires and insulate with heat shrinkable tubing.
- G. Use only rosin core 60/40 tin/lead solder for all solder connections.
- H. Dress, lace or harness all wire and cable to prevent mechanical stress on electrical connections. No wire or cable shall be supported by a connection point. Provide service loops where harnesses of different classes cross, or where hinged panels are to be interconnected.
- I. Termination and build out resistors and related circuit correction components shall be visible. Do not install in connector shells or internally modify equipment. Show locations on Record Drawings.
- J. Correct any and all of the following unacceptable wiring conditions:
  - 1. Deformed, brittle or cracked insulation.
  - 2. Insulation shrunken or stripped further than 1/8-inch away from the actual point of connection within a connector, or on a punch block.
  - 3. Cold solder joints.
  - 4. Flux joints.
  - 5. Solder splatter.
  - 6. Non-grommet, non-bushed, or non-insulated wire or cable entries.
  - 7. Deformation or improper radius of wire or cable

#### 3.10 Signal Grounding Procedures

- A. Comply with National Electrical Code.
- B. Unless otherwise noted maintain a unipoint ground scheme.
- C. Signal and electrical system grounds shall be isolated except at the Project ground field connection.
- D. Equipment enclosures shall not be permitted to touch each other unless bolted together and electrically bonded.
- E. Ground and bond equipment racks and similar equipment enclosures containing powered equipment exclusively via the Isolated Ground conductors provided under Division 26. INSULATE RACK MOUNTING, ANCHORAGE, AND RACEWAY CONNECTIONS.
- F. At each rack, provide an Isolated Ground bus within the rack. At each rack, provide a lug bonded to the rack frame with a #8 TW stranded wire to the rack Isolated Ground bus.
- G. At each ensemble of racks, provide a single labeled Isolated Ground tubular-clamp bus bar terminal strip to land the individual rack Isolated Ground bus ground conductors. Connect the main Isolated Ground conductor from the Technical Power panel board at this point.

- H. Equipment signal ground shall be to the Isolated Ground System via the green wire of the equipment power cord. Where equipment uses two wire power cord, provide #12 green bond wire to rack IG bus bar. At equipment, provide crimp lug and suitable hardware for bonding.
- I. Shielded cables of this section shall be grounded exclusively to Isolated Ground by a single path. Shield shall be tied to Isolated Ground at one end only, i.e., at the low potential (receiving) end of run, unless otherwise noted.
- J. Unless otherwise noted, at audio jackfields, tie source shield at jackbay frame. Float shields at connections to output jacks. Bus each row of jack frames and run individual #12 green ground wire for each row to rack IG bus bar.
- K. Signal Ground provisions shall realize less than 0.15 ohms to the primary ground connection.

#### 3.11 Equipment Enclosure (Rack) and Equipment Backboard Fabrication

- A. Combustible material, other than incidental trim of indicated equipment, is prohibited within equipment racks.
- B. Within each equipment enclosure, provide a full-height multi-circuit ISOLATED GROUND outlet strip with branch circuit count as shown on drawings; locate on the left side of the equipment enclosure, as viewed from the rear. In each enclosure provide number of receptacles required by present and future equipment indicated on drawings, plus at least two spare receptacles. Provide flexible steel raceway and junction box for connection of power service. Bond internal raceway to rack frame.
- C. Provide a permanent label on the front of each equipment rack including the rack designation, and the circuit breaker number and associated electrical distribution panel designation servicing same.
- D. Maintain separation of wiring classifications as specified herein. Separately dress, route and land microphone and line level cables and related on the right side of the equipment enclosure, as viewed from the rear; dress, route, and land loudspeaker level and control cables on the left side of the equipment enclosure, as viewed from the rear.
- E. Access shall not require demounting or de-energizing of equipment. Install access covers, hinged panels, or pull-out drawers to insure complete access to terminals and interior components.
- F. Fasten removable covers containing any wired component with a continuous hinge along one side, with associated wiring secured and dressed to provide an adequate service loop. Provide an appropriate stop locks to hold all hinged panels and drawers in a serviceable position.
- G. Provide permanent labels for all equipment and devices. Where possible, fasten such labels to the rack frame or to blank or vent panels which will remain in place when active equipment is removed for possible service.

- H. At jackfields, provide service loop to permit removal of jackfields from rack sufficient to conveniently access all jack contacts for routine cleaning and maintenance. Organize the service loop and harness such that reasonable reconnection of jacks and jack normals is possible without cutting apart the harness.
- I. Coordinate the design and execution of wire harnessing of multi-bay rack ensembles with conditions of delivery to installation locations at Project Site, and with the requirement herein for test of the completely wired system in the shop prior to delivery to the Project Site. Organize the wiring harnesses such that they will fold within one shippable unit without risk of damage, or provide polarized multipin connectors and related interconnect systems as specified elsewhere herein.
- J. At each equipment backboard, provide UL Listed surge suppressing multi-outlet assembly with at least six receptacles.

#### 3.12 Adjusting and Testing

#### A. Test Equipment

1. Furnish, store and maintain test equipment at the fabrication shop and the job site for both routine and Acceptance Testing of the Work of this Section. Maintain all test equipment at the job site while work is in progress from installation of equipment racks until Owner Acceptance of this Work; thereafter remove all of this test equipment from the job site. Provide all required test cables, jigs and adapters. Provide at least one of the following items or approved functional equivalents:

#### 2. Audio Systems:

- a. Wide Band Oscilloscope (Tektronix THS700 Series).
- b. True RMS Analog / Digital Volt-Ohm Multimeter (Fluke 187 Series or equal).
- c. Low Distortion Audio Frequency Sine Wave Oscillator (Gold Line TS1).
- d. Measurement Microphones (Earthworks M30, Bruel & Kjaer 4007, Josephson 550).
- e. Sound System Optimization and Acoustic Measurement Analyzer (Goldline TEF, Meyers SIM, SIA Smaart, WinMLS, EASERA).
- f. Harmonic Distortion Analyzer (Sound Technology or Tektronix AA 501A) or Swept Spectrum Analyzer, HP 3580A, or Swept Test System, Audio Precision or Neutrik).

#### 3. Communications and Related:

- a. Level II, Cat5e Cable Pair Tester (Microtest, HP, Scope, Fluke or Siemons set up to meet Category 5e parameters).
- b. Outside Plant Voice Cabling Plant Tester capable of detecting shorts, opens, reversals, mis-wiring and crosstwists (Siemon STM-8 or equal by Mod-Tap).
- c. Metallic cable pair tester (Wavetek Corporation, Instruments Division, model LANTech 100).
- d. Tone Test Set.
- e. Optical Time Domain Reflectometer (OTDR) for fiber optics.
- f. Any other items of equipment or materials required to demonstrate conformance with the Contract Documents.

- B. System Performance Testing and Adjusting Procedures
  - 1. Upon completion of the installation of all equipment in an area, perform the following tests and record results. Verify safe and proper operation of all components, devices, or equipment, establish nominal signal levels within the systems and verify the absence of extraneous or degrading signals. Make all preliminary adjustments and document the setting of all controls, parameters of all corrective networks, voltages at key system interconnection points, gains and losses, as applicable. Submit test report. Correct all non-conforming conditions prior to requesting Acceptance Review and Testing. Perform at least the following procedures:
  - 2. Mechanical: Verify:
    - a. Integrity of all support provisions.
    - b. Absence of debris of any kind, tools, etc.
  - 3. Power and Isolated Ground: Verify:
    - a. Isolation of Isolated Ground system from raceway and related ground.
    - b. Grounding of devices and equipment. Integrity of signal and technical power system ground connections.
    - c. Proper provision of power to devices and equipment.
  - 4. Signal Wiring: Verify:
    - a. Integrity of all insulation, shield terminations and connections.
    - b. Integrity of soldered connections. Absence of solder splatter, solder bridges.
    - c. Routing and dressing of wire and cable.
    - d. Continuity, including conformance with wire designations on running sheets, field and shop drawings.
    - e. Absence of ground faults.
    - f. Polarity.
  - 5. Use the proper sequence of energizing systems to minimize the risk of damage.
  - 6. Audio Systems:
    - a. Electronic Tests; confirm:
      - 1) Gain at 1 kHz.
      - 2) Maximum output.
      - 3) Input clipping level.
      - 4) Frequency response.
      - 5) Total harmonic distortion.
      - 6) Signal-to-Noise ratio.
      - 7) Signal-to-Crosstalk ratio.
    - b. Electro/Acoustic Tests:
      - 1) Uniformity of coverage.

- Electronic and acoustic frequency response/one-third octave equalization. Transfer function measurement shall be as close to flat as possible. Measure at ear level. Representative of the Owner will direct final adjustment.
- 3) Maximum continuous sound pressure level (in the reverberant field). Drive systems with broadband pink noise. Sustain for at least five minutes with no system damage. Measure for "A" and "C" weightings at ear level on loudspeaker axis. Turn off noise.
- 4) Acoustic signal-to-noise ratio referenced to the specified maximum continuous sound pressure level in the reverberant field. Measure for "A" and "C" weightings at ear level on loudspeaker axis with mechanical systems operating. Present comparison with previous measurement.
- 5) Acoustic gain before feedback. Locate acoustic source (4 inch loudspeaker/pink noise generator) two feet from system microphone. Measure at system microphone position and at most distant listener position at ear level. Present comparison.
- 7. Diagnostic Monitoring System:
  - a. Demonstrate complete operation.
- 8. System Overall:
  - a. Verify levels.
  - b. Provide permanent "wedge" type labels on all controls, as applies, to indicate correct settings after systems performance testing and adjustment procedures have been successfully completed.
- C. Loudspeaker Assembly Testing and Adjusting Procedures
  - 1. Upon completion of the installation of all loudspeakers in an area, perform the following tests and record results. Correct non-conforming conditions, unless the cause is clearly outside the Work of this Section, in which case submit the apparent cause to the Owner.
  - 2. Loudspeaker Line Impedance: At terminal cabinets at equipment rooms, measure the impedance of each loudspeaker line. Sweep from at least 20 Hz to at least 16 kHz.
  - 3. Loudspeaker Polarity: Test the acoustic polarity of all loudspeakers using an Acoustic Polarity Tester.
  - 4. Freedom From Buzzes, Rattles and Objectionable Distortion: Individually apply to each loudspeaker line a slow sine wave sweep from 50 Hz to 5 kHz at a level of 6 dB below rated power amplifier output voltage. Listen carefully for buzzes, rattles and objectionable distortion.
  - 5. Uniformity of Coverage: Apply broadband Pink Noise. Adjust level to approximately 70-80 dBA at measurement locations. Measure in 4 kHz octave band at ear level. Adjust loudspeaker aiming and 70 Volt loudspeaker taps for uniformity of coverage.
- D. Equipment Rack and Equipment Testing and Adjusting Procedures

1. Conduct procedures in fabrication shop. Verify safe and proper operation of all components, devices, or equipment, establish nominal signal levels within the systems and verify the absence of extraneous or degrading signals. Make all preliminary adjustments and document the setting of all controls, parameters of all corrective networks, voltages at key system interconnection points, gains and losses, as applicable. Submit test report with color photographs of each equipment rack, front and back. Perform at least the following procedures:

#### 2. Preliminary: Verify:

- a. Grounding of devices and equipment. Integrity of signal and electrical system ground connections.
- b. Proper provision of power to devices and equipment.
- c. Integrity of all insulation, shield terminations and connections.
- d. Integrity of soldered connections. Absence of solder splatter, solder bridges.
- e. Absence of debris of any kind, tools, etc.
- f. Routing and dressing of wire and cable.
- g. All wiring, including polarity and continuity, including conformance with wire designations on running sheets, field and shop drawings.
- h. Mechanical integrity of all support provisions.
- 3. Rig temporary power and grounding: Comply with all applicable Codes, regulations and ordinances.
- 4. Determine the proper sequence of energizing systems to minimize the risk of damage. Energize. Burn in for at least 120 hours.

#### E. Telecommunications Cabling Testing

- 1. Perform telecommunications cabling inspection, verification, and performance tests in accordance with TIA-568-C.1, TIA-568-C.2 and TIA-568-C.3. Perform optical fiber field inspection tests via attenuation measurements on factory reels and provide results along with manufacturer certification for factory reel tests. Remove failed cable reels from project site upon attenuation test failure.
- Visually inspect UTP and optical fiber jacket materials for UL or third party certification markings. Inspect cabling terminations in telecommunications rooms and at workstations to confirm color code for T568A or T568B pin assignments, and inspect cabling connections to confirm compliance with TIA-568-C.1, TIA-568-C.2 and TIA-568-C.3. Visually confirm Category 6 marking of outlets, cover plates, outlet/connectors, and patch panels.
- 3. Perform testing for each outlet as follows:
  - a. Perform Category 6 link tests in accordance with TIA-568-C.1 and TIA/EIA-568-B.2. Tests shall include wire map, length, insertion loss, NEXT, PSNEXT, ELFEXT, PSELFEXT, return loss, propagation delay, and delay skew.
  - b. Optical fiber Links. Perform optical fiber end-to-end link tests in accordance with TIA-568-C.3. E. Final Verification Tests
  - c. Perform verification tests for UTP and optical fiber systems after the complete telecommunications cabling and workstation outlet/connectors are installed.

#### 3.13 Cleaning

- A. Clean each section or area of where the work was conducted after completion to permit immediate use of the area. Remove and discard all refuse, rubbish, and debris.
- B. The Contractor shall ensure that all recyclable and environmentally-hazardous waste materials are disposed properly.
- C. Make good all existing structures, surfaces, and utilities affected by cutting, coring, mounting, drilling, or other new work.
- D. Clean all furnished equipment of dust, dirt, finger prints, smudge, and other material prior to calling for a Substantial Performance of Work Review or Completion of Work Review.

#### 3.14 Protection

A. During the installation phase and up to the date of achieving Substantial Performance of Work, protect finished or unfinished work against damage or loss. In the event of such damage or loss, immediately replace or repair such work or equipment at no cost to the Owner.

#### 3.15 Acceptance Review, Testing Procedures and Commissioning

- A. Complete all Work of this Section. Submit Test Report. Submit review copies of Operating and Maintenance Manuals, less reduced set of Record Drawings. Notify the Owner in writing that the Work of this Section is complete and fully complies with the Contract Documents. Request Acceptance Review and Testing by returning Attachment "A" to the Design Consultant. The representative of the Owner will conduct Verification of Submitted Test Data, and otherwise direct testing and adjustment of this Work. These Procedures may be performed at any hour of the day or night as required by the representative of the Owner to comply with the Project Schedule and avoid conflict with these procedures from possible ongoing work of other Separate Contracts and/or the Owner's operations. Provide all specified personnel and equipment at any time without claim for additional cost or time.
- B. Personnel: Provide services of the designated supervisor and additional technicians familiar with work of this Section. Provide quantity of technicians as required to comply with Project Schedule.
- C. In Addition, Provide:
  - 1. Set of hand and power tools appropriate for performance of adjustment of and corrections to this Work.
  - 2. Include spare wire and connectors and specified tooling for application.
  - 3. Ladders, scaffolding and/or lifts as required to access loudspeakers and other high devices.
  - 4. Test equipment to include but not limited to:
    - a. Dual channel FFT-based audio analyzer
    - b. Category cable tester, cable length, short, open and miswire test.
  - 5. Complete set of latest stamped, actioned submittals of record for reference.

- 6. Complete set of Shop and Project Site Test Reports.
- 7. Complete set of manufacturer's original operation, instruction and service manuals for each equipment item for reference.
- D. Demonstrate: Complete operation of all systems and equipment, including Portable Equipment.
  - General
    - a. Configure room for each type of event and demonstrate audio-visual system.
    - b. Connection of portable equipment. (Laptop, document camera, etc.)
    - c. Demonstrate to the Consultant that all functions and equipment for the system work properly when installed as a complete system.
    - d. The Contractor shall demonstrate the satisfactory operation of all controls and adjustment circuits of the system.
    - e. Demonstrate system startup and shut down procedures.
  - 2. Audio
    - a. Route audio to program speakers.
    - b. Connect microphone to each panel input and route through system.
    - c. Demonstrate and document gain structure through the system.
    - d. Demonstrate and document with a dual channel FFT-based audio meter the following:
      - 1) Polarity of each driver in each cabinet.
      - 2) Crossover point of high, mid and low section of each loudspeaker.
      - 3) dB SPL levels from 1-4 kHz at various position in the audience area.
      - 4) dB SPL level of high, mid, low and sub frequency bandwidth at crossover.
    - e. Wireless microphones.
    - f. Demonstrate that the audio system is properly time aligned and equalized.
    - g. Assistive listening system.
  - 3. The Contractor 's personnel and test equipment shall be made available to the Consultant in order that:
    - a. Selected tests and measurements previously made by the Contractor can re-run.
    - b. Other tests may be made at Consultant's discretion.
    - c. Additional tests or measurements may be made due to changes in field conditions.
  - 4. It is estimated that the acceptance tests and demonstrations will require approximately *two hours*, unless construction or installation problems or deviations from the specifications are discovered.
- E. Adjust: As directed by the representative of the Owner.
- F. Correct: In timely manner, failure to comply with the Contract Documents, as reasonably determined by the representative of the Owner.

#### G. Acceptance Documentation

- 1. Official acceptance of the system covered by this specification will occur when the Design-Builder receives the following written documents:
  - a. A letter from the Consultant to the Architect acknowledging Final Acceptance of the system stating compliance with all articles of the specifications.
  - b. A letter from the Architect to the Contractor stating that all related work has been completed to his satisfaction. Until these documents are received, the installation is not formally complete. The official date of acceptance shall be the date of the letter from the Architect to the Contractor described above.

#### 3.16 Closeout

- A. Punch List: Perform any and all remedial work, at no claim for additional cost or time.

  Where required, retest and submit Test Report. Notify Owner of completion of Punch List.
- B. Portable Equipment: Furnish all portable equipment and spares to the designated representative of the Owner, along with complete documentation of the materials presented. Where applicable, furnish portable equipment in the original manufacturer's packing.
- C. Operating and Maintenance Data: Install framed operating and maintenance instructions. Submit Manuals.
- D. Project Record Documents: Submit.
- E. Keys: If applicable, replace construction locks with permanent locks. Transmit keys to Owner.
- F. Training: Conduct specified training and submit training manuals.
- G. Warranty: Submit Warranty dated to run from date of Acceptance of the Work of this Section.

#### 3.17 Owner's Right to Use Equipment

A. Acceptance of the Work of this Section will be after completion of corrections and adjustments required by the "Punch List" which results from Acceptance Review and Testing of the completed installation. The Owner reserves the right to use equipment, material and services provided as part of the Work of this Section prior to Acceptance without incurring any obligation to Accept any equipment or completed systems until all Punch List work is complete and all systems comply with the Contract Documents; or accept any claim for additional cost or time.

#### Attachment "A"

#### **NOTICE OF COMPLETION**

&

#### **REQUEST FOR FINAL INSPECTION**

We hereby give notice that the work associated with the Audio-Visual system, at the project named below, is completed and fully complies with the contract documents issued to the Contractor. The required submittals below have been marked as completed.

	Programming		Training Manual					
	Test Reports		Training					
	Operation Manual		Warranty Certificates					
	☐ Maintenance Manual ☐ Record Drawings We request commissioning and verification testing be scheduled with the Owner's Representative for final system sign off. Attached is a list of test equipment for review and acceptance.							
PRO	DJECT INFORMATION							
Pro	oject Name:							
Pro	oject Phase:							
CO	NTRACTOR INFORMATION							
Na	me:		Company:					
Ad	dress:							

Note to Contractor: Provide all test equipment for final inspection as described in the specification.

Please complete and fax or email this form to Veneklasen Associates attention AV Department

Fax (310) 396-3424

Email dyoung@veneklasen.com

#### **END OF SECTION**

## GENERAL NOTES

12. NEW CONCRETE WILL BE CONFORMING WITH REQUIREMENTS OUTLINED IN THESE PLANS AND THE PROJECT MANUAL.

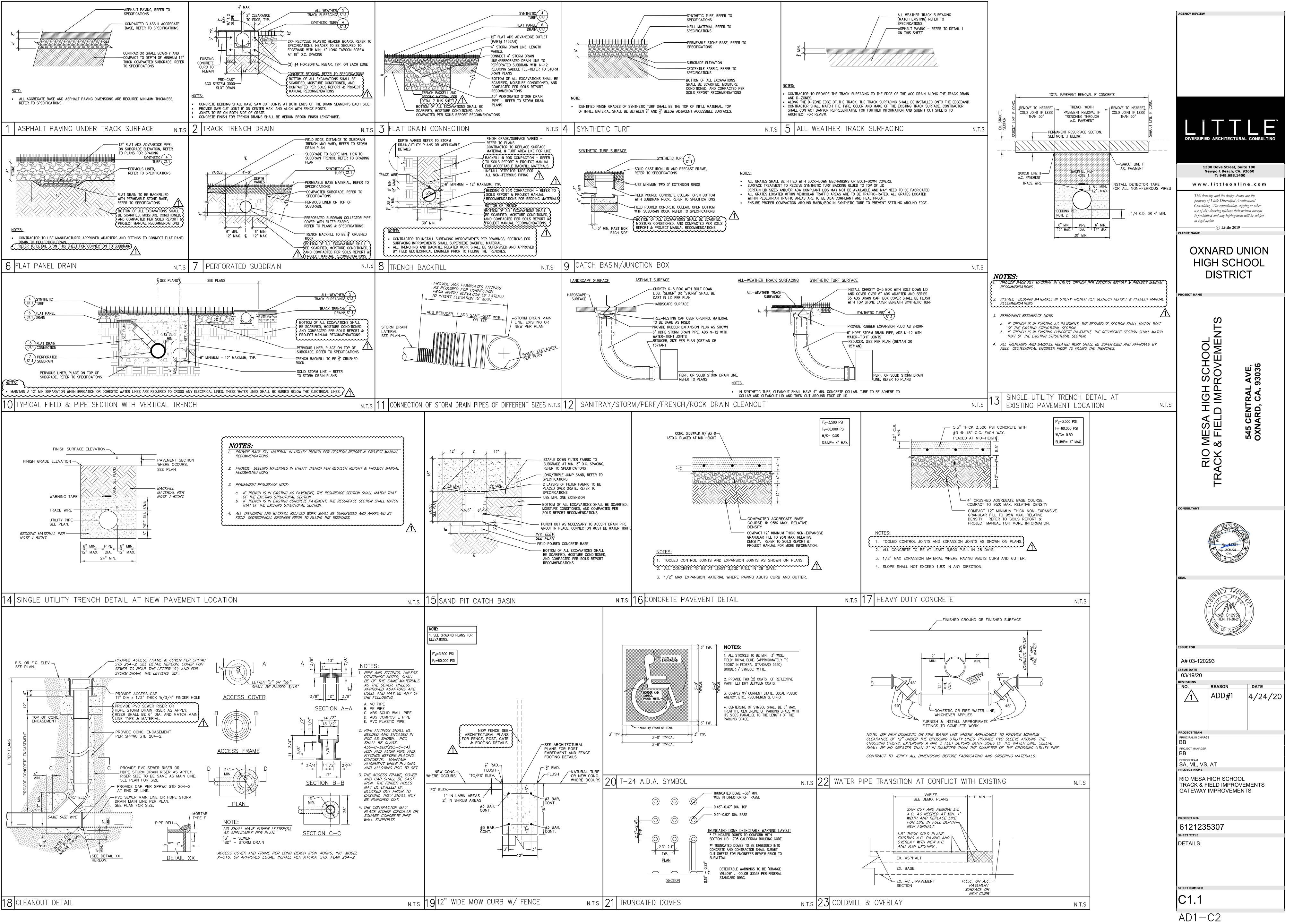




A#03-120293 RIO MESA HIGH SCHOOL ADDENDUM#1

SHEET NO.: AD1-C1

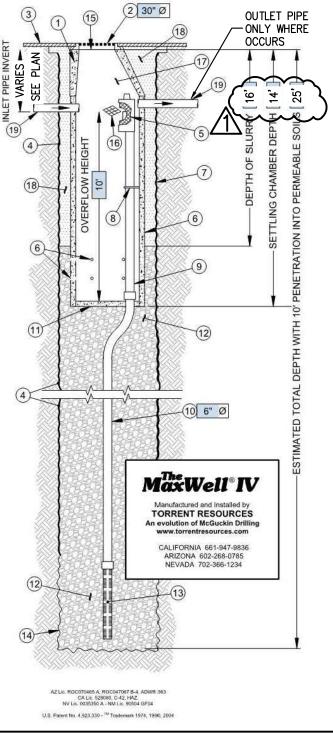
REF. DWG.: C1.0 DATE: 4/24/20



## The MaxWell® IV Drainage System Detail And Specifications

#### ) ITEM NUMBERS

- 1. MANHOLE CONE MODIFIED FLAT BOTTOM.
- 2. BOLTED RING & GRATE DIAMETER AS SHOWN.
  CLEAN CAST IRON WITH WORDING "STORM WATER
  ONLY" IN RAISED LETTERS. BOLTED IN 2 LOCATIONS
  AND SECURED TO CONE WITH MORTAR. RIM
  ELEVATION ±0.02" OF PLANS.
- 3. GRADED BASIN OR PAVING (BY OTHERS)
- NON-WOVEN GEOTEXTILE SLEEVE, MIRAFITM/ 140 NL. HELD APPROX. 10 FEET OFF THE BOTTOM OF EXCAVATION.
- PUREFLO® DEBRIS SHIELD ROLLED 16 GA. STEEL X 24" LENGTH WITH VENTED ANTI-SIPHON AND INTERNAL .265" MAX. SWO FLATTENED EXPANDED STEEL SCREEN X 12" LENGTH. FUSION BONDED EPOXY COATED.
- PRE-CAST LINER 4000 PSI CONCRETE 48" ID. X 54" OD. CENTER IN HOLE AND ALIGN SECTIONS TO MAXIMIZE BEARING SURFACE. EIGHT (8) PERFORATIONS PER FOOT, 2 ROWS MINIMUM.
- 7. MIN. 6' Ø DRILLED SHAFT.
- SUPPORT BRACKET FORMED 12 GA. STEEL. FUSION BONDED EPOXY COATED.
- OVERFLOW PIPE SCH. 40 PVC MATED TO DRAINAGE PIPE AT BASE SEAL.
- DRAINAGE PIPE ADS HIGHWAY GRADE WITH TRI-A COUPLER. SUSPEND PIPE DURING BACKFILL OPERATIONS TO PREVENT BUCKLING OR BREAKAGE. DIAMETER AS NOTED.
- 11. BASE SEAL GEOTEXTILE OR CONCRETE SLURRY.
- ROCK WASHED, SIZED BETWEEN 3/8" AND 1-1/2" TO BEST COMPLEMENT SOIL CONDITIONS.
- 13. FLOFAST® DRAINAGE SCREEN SCH. 40 PVC 0.120" SLOTTED WELL SCREEN WITH 32 SLOTS PER ROW/FT. 120" OVERALL LENGTH WITH TRI-B COUPLER
- MIN. 6' Ø SHAFT DRILLED TO MAINTAIN PERMEABILITY OF DRAINAGE SOILS.
- FABRIC SEAL U.V. RESISTANT GEOTEXTILE TO BE REMOVED BY CUSTOMER AT PROJECT COMPLETION.
- 16. ABSORBENT HYDROPHOBIC PETROCHEMICAL SPONGE. MIN. 128 OZ. CAPACITY. TYPICAL, TWO PER CHAMBER.
- 17. FREEBOARD DEPTH VARIES WITH INLET PIPE ELEVATION. INCREASE SETTLING CHAMBER DEPTH AS NEEDED TO MAINTAIN ALL INLET PIPE ELEVATIONS ABOVE OVERFLOW PIPE INLET.
- 18. STABILIZED BACKFILL TWO-SACK SLURRY MIX.
- INLET PIPE/OUTLET PIPE (BY OTHERS). SEE CIVIL PLANS FOR INVERT ELEVATIONS.



## **31 |**maxwell iv drainage drywell

N.T.S



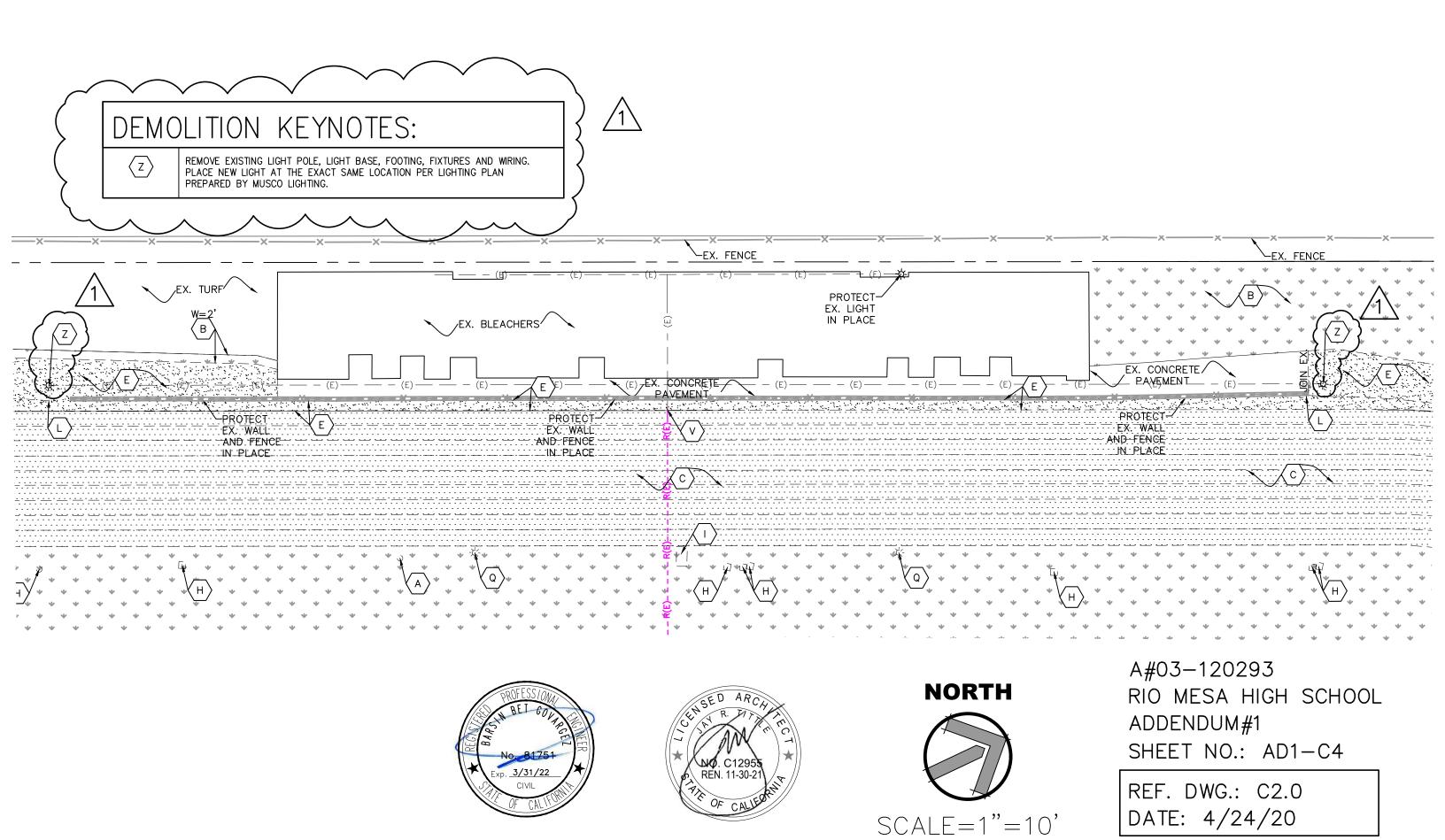


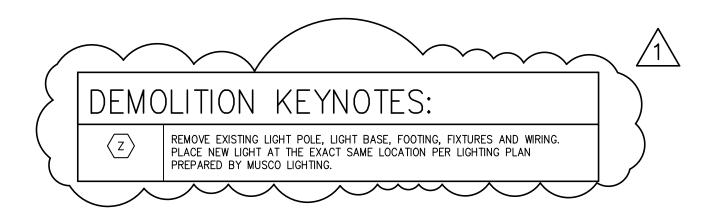
A#03-120293 RIO MESA HIGH SCHOOL ADDENDUM#1

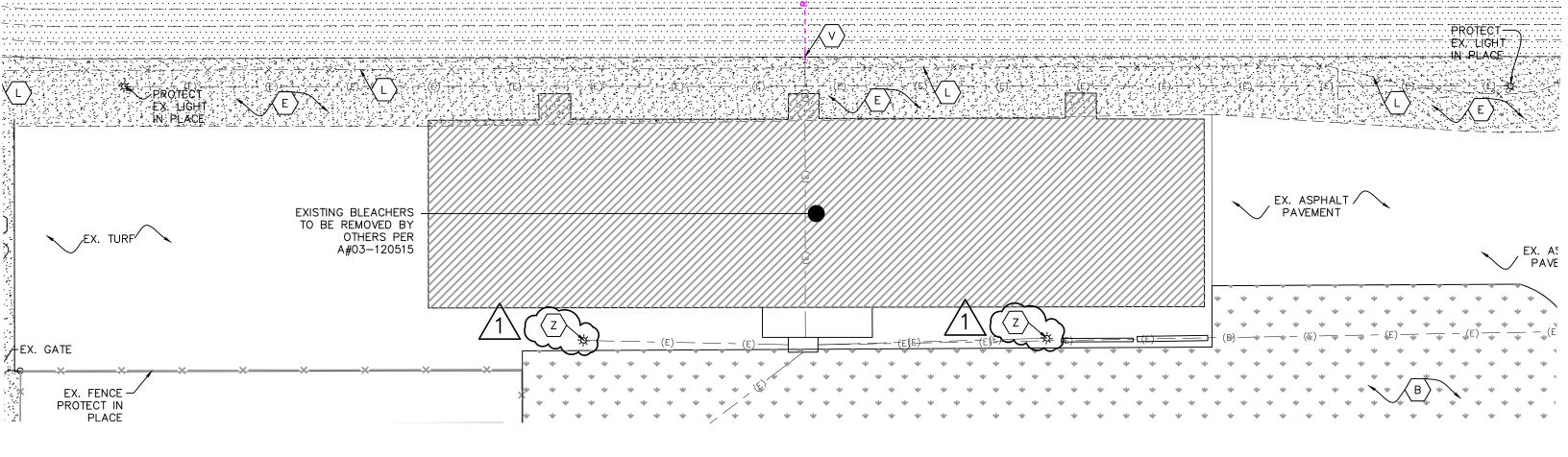
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REF. DWG.: C1.2

DATE: 4/24/20











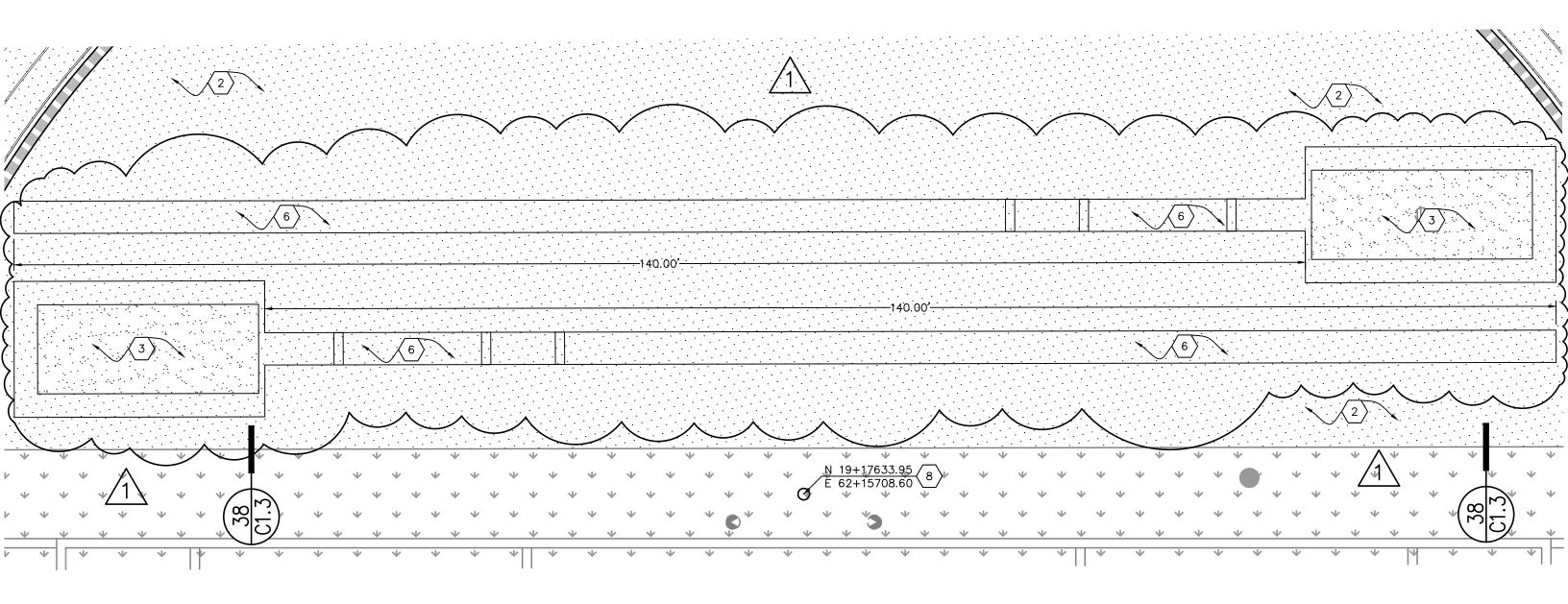


DATE: 4/24/20 SCALE=1"=10'

A#03-120293 RIO MESA HIGH SCHOOL ADDENDUM#1

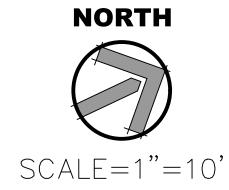
SHEET NO.: AD1-C5

REF. DWG.: C2.0





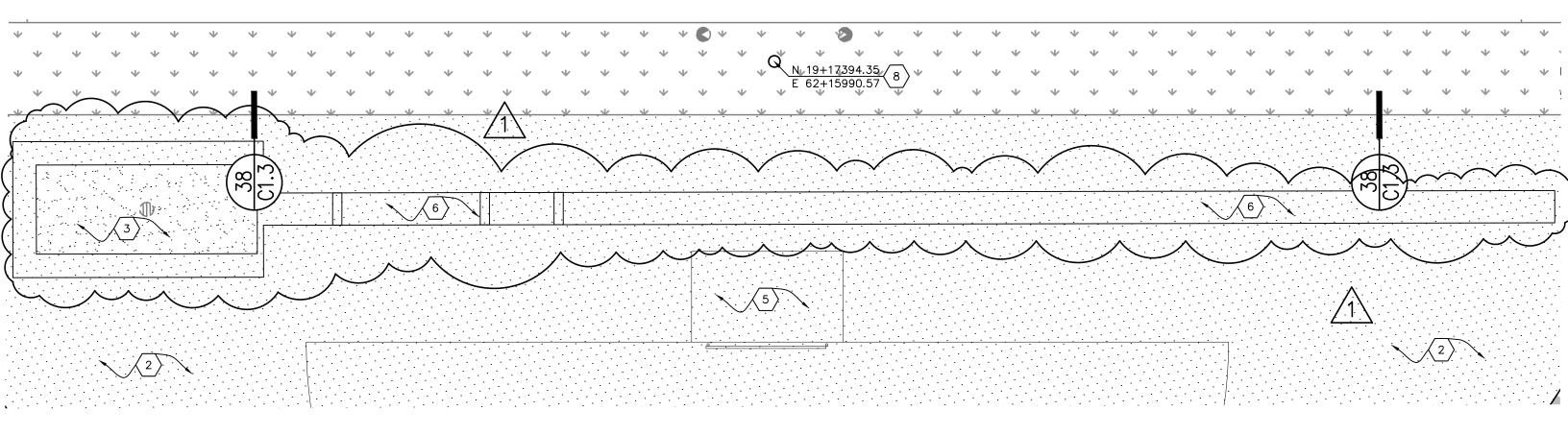




A#03-120293 RIO MESA HIGH SCHOOL ADDENDUM#1

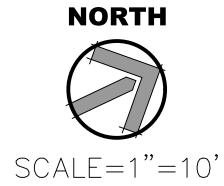
SHEET NO.: AD1-C6

REF. DWG.: C3.1 DATE: 4/24/20





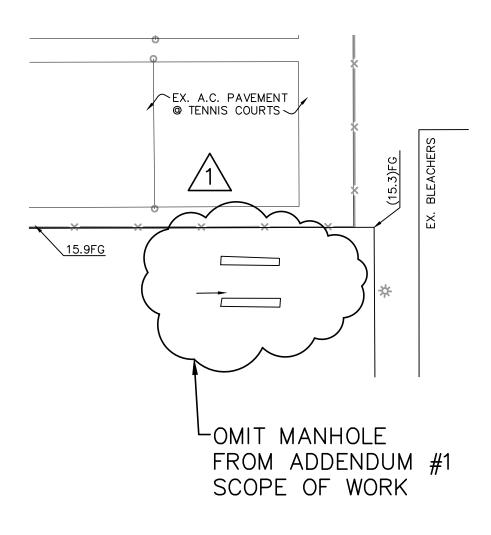




A#03-120293 RIO MESA HIGH SCHOOL ADDENDUM#1

SHEET NO.: AD1-C7

REF. DWG.: C3.3 DATE: 4/24/20





SCALE=1"=20'



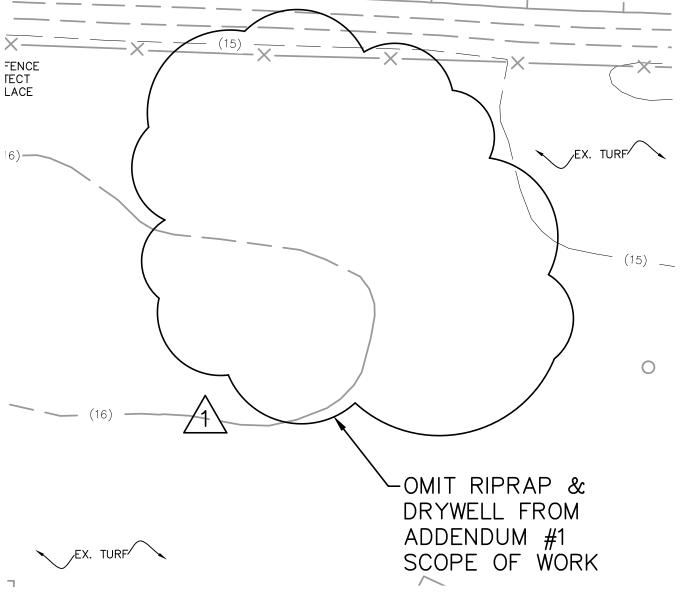


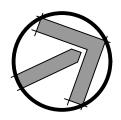
A#03-120293 RIO MESA HIGH SCHOOL ADDENDUM#1

SHEET NO .: AD1-C8

REF. DWG.: C4.2

DATE: 4/24/20





SCALE=1"=10'



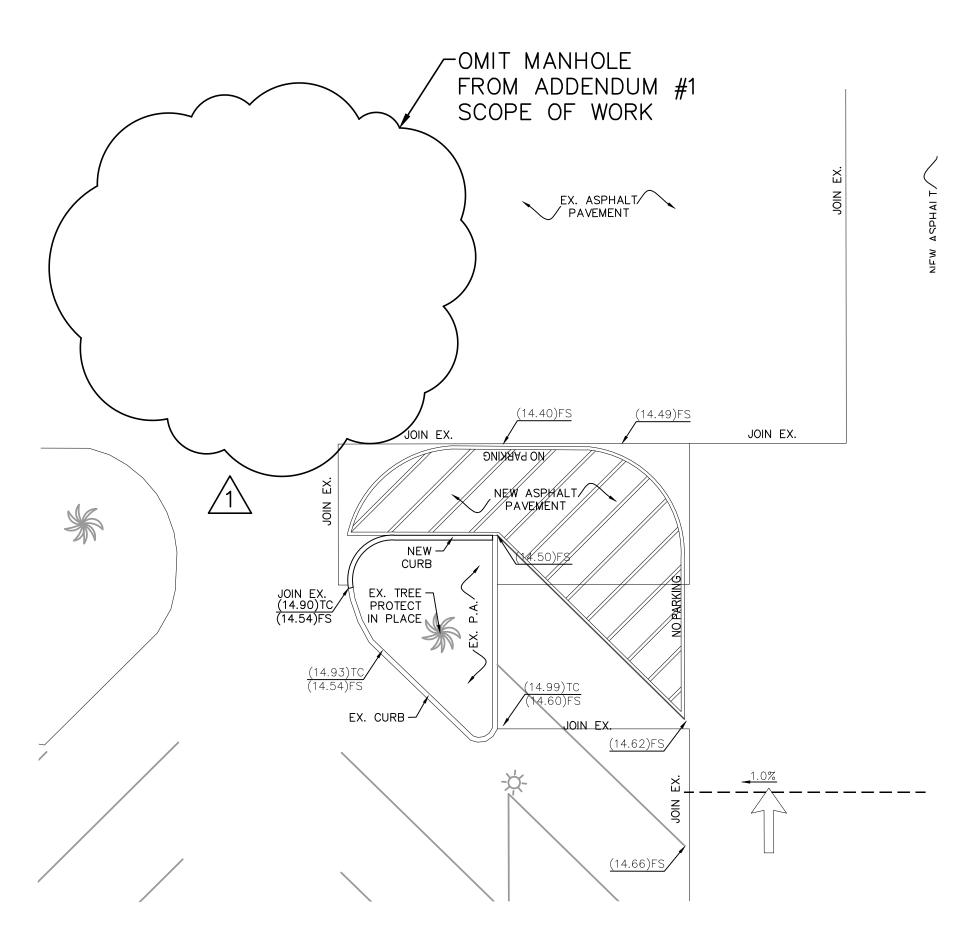


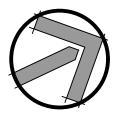
A#03-120293 RIO MESA HIGH SCHOOL ADDENDUM#1

SHEET NO .: AD1-C10

REF. DWG.: C4.6

DATE: 4/24/20





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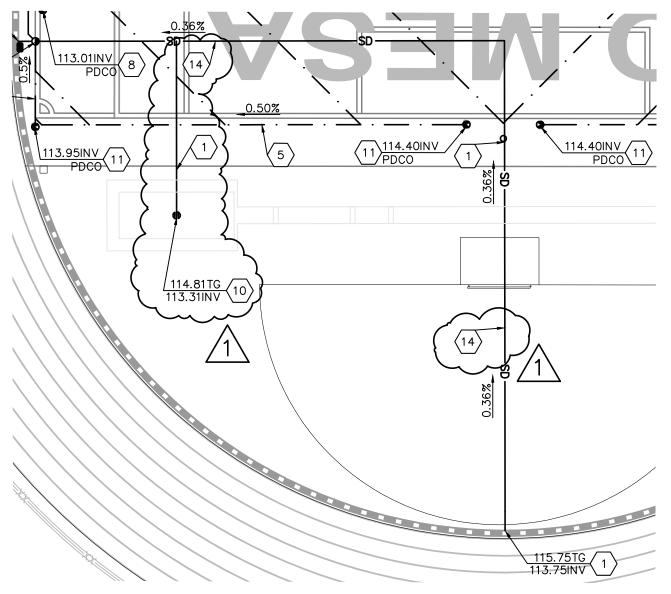




A#03-120293 RIO MESA HIGH SCHOOL ADDENDUM#1

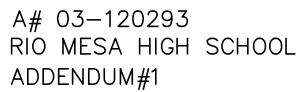
SHEET NO.: AD1-C9

REF. DWG.: C4.6 DATE: 4/24/20





SCALE=1"=20'

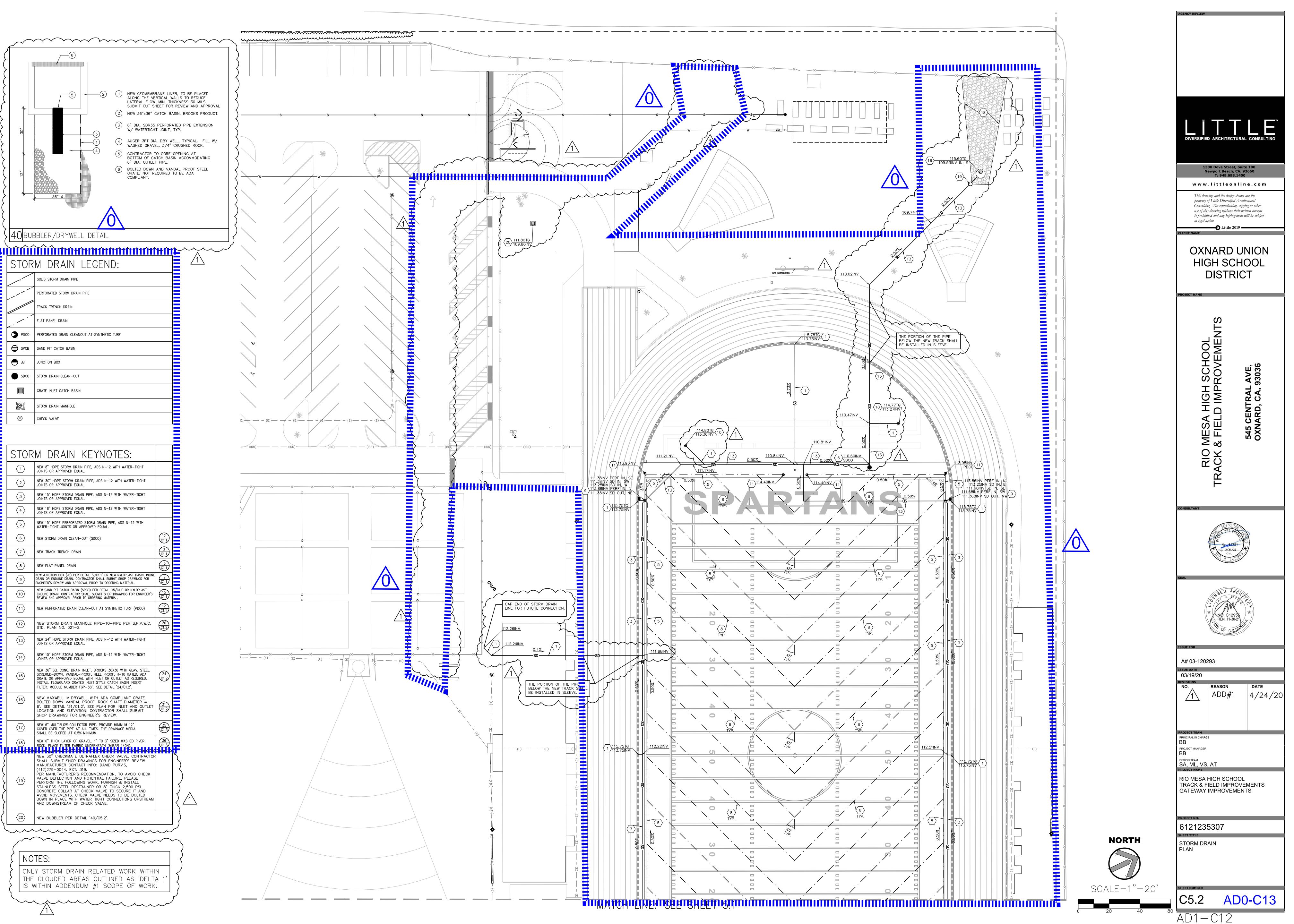


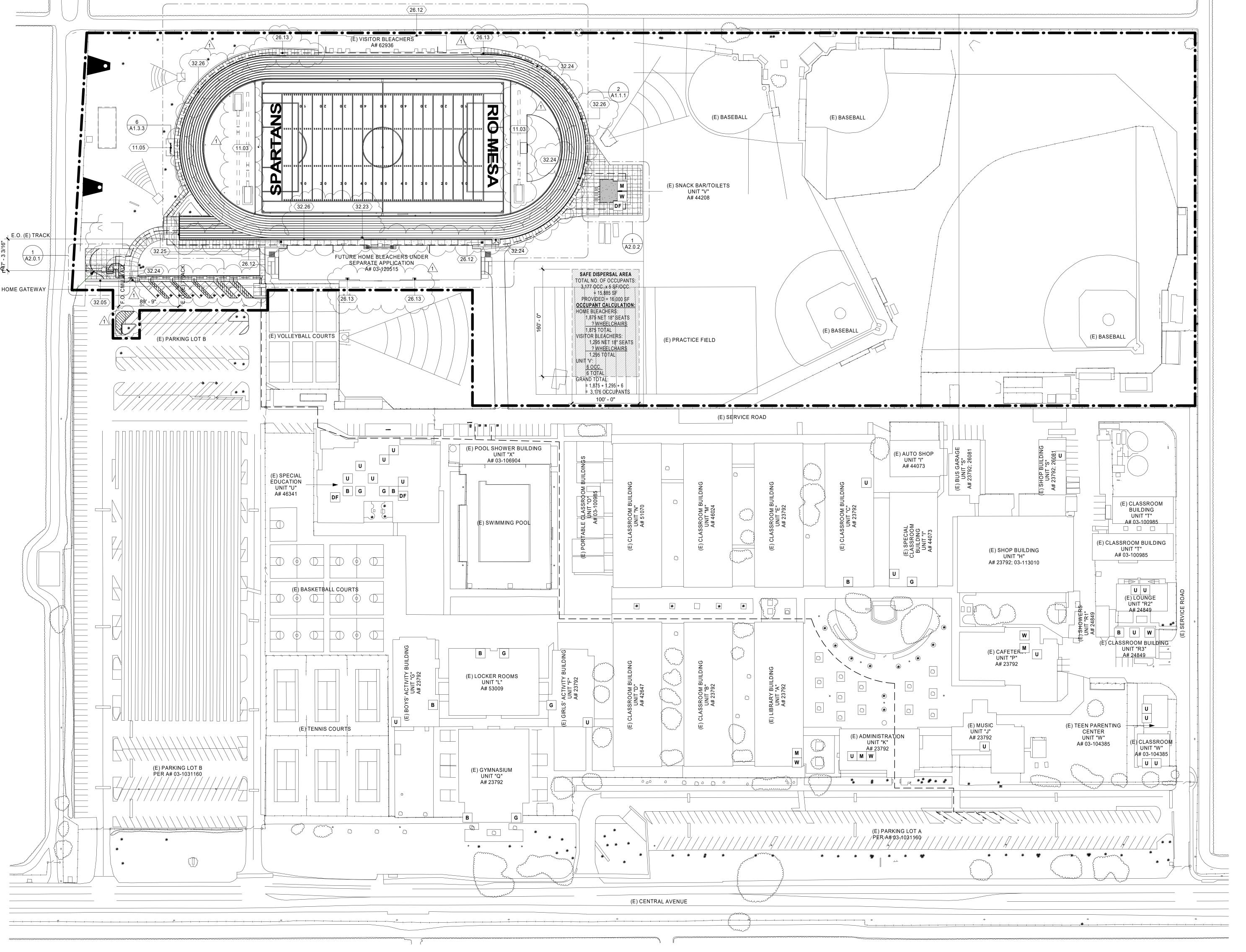
SHEET NO.: AD1-C11

REF. DWG.: C5.1 DATE: 4/24/20

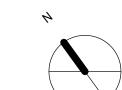


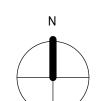






OVERALL SITE PLAN





TRUE NORTH PROJECT NORTH

11.03 (N) LONG/TRIPLE JUMP, 140' MIN. RUNWAY LENGTH - 11 68 11.05 (N) SCOREBOARD, SEE DETAIL 6/A1.3.3 AND APPROVED

DSA PC# 04-116017 DRAWINGS - 11 68 43.13 26.12 (N) STADIUM LIGHTING FIXTURES ON (E) STADIUM

LIGHTING POLES. SEE SHEETS MS1 AND MS2 OF MUSCO STADIUM LIGHTING SHEETS. 26.13 (N) STADIUM LIGHTING FIXTURES ON (N) STADIUM

LIGHTING POLES. SEE SHEETS MS1 AND MS2 OF MUSCO STADIUM LIGHTING SHEETS. 32.05 DETECTABLE WARNING SURFACE PANEL - 32 13 13 32.23 CHAIN LINK SINGLE PEDESTRIAN GATE - 32 31 13. SEE **DETAIL 9/A9.0.2** 

32.24 CHAIN LINK DOUBLE GATE - 32 31 13. SEE DETAIL 4/A9.0.2 32.25 CHAIN LINK SLIDING GATE - 32 31 13. SEE DETAIL 6/A1.3.1 32,26 CHAIN LINK FENCE - 32 31 13, SEE DETAIL 4/A9.0.2

## ACCESSIBILITY NOTES

. ARCHITECT TO VERIFY PATH OF TRAVEL REQUIREMENTS ARE MET FOR P.O.T. FROM ACCESSIBLE PARKING AND PUBLIC WAY TO RESTROOMS, DRINKING FOUNTAINS, SCHOOL ADMINISTRATION BUILDING, ACCESIBLE SEATING AND INSIDE TRACK AS INDICATED. ANY DEVIATION FROM P.O.T. DEFINITION LISTED BELOW SHALL BE BROUGHT INTO COMPLIANCE BY THE ARCHITECT PREPARING A C.C.D. AND SUBMITTING IT TO DSA FOR APPROVAL.

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OXNARD UNION

HIGH SCHOOL

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TRACI ITS

OOL EMEI

MESA HIGH SCH FIELD IMPROV

03/23/2020

PRINCIPAL IN CHARGE

PROJECT MANAGER

DESIGN TEAM FM /RG /JR /CL

TRACK & FIELD

IMPROVEMENTS

RIO MESA HIGH SCHOOL

1 ADDENDUM 1

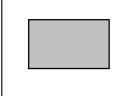
Z036

2. PATH OF TRAVEL (P.O.T.) AS INDICATED IS A BARRIER-FREE ACCESS WITHOUT ANY ABRUPT VERTICAL CHANGES EXCEEDING 1/2" BEVELED AT 1:2 MAXIMUM SLOPE, EXCEPT THAT LEVEL CHANGES DO NOT EXCEED 1/4" VERTICAL AND IS AT LEAST 48" WIDE. SURFACE IS SLIP-RESISTANT, STABLE, FIRM, AND SMOOTH. CROSS-SLOPE DOES NOT EXCEED 2% AND SLOPE IN THE DIRECTION OF TRAVEL IS LESS THAN 5%, UNLESS OTHERWISE INDICATED. P.O.T. SHALL MAINTAIN FREE OF OVERHANGING OBSTRUCTIONS TO 80" MINIMUM (CBC 11B-307.4) AND PROTRUDING OBJECTS GREATER THAN 4" PROJECTION FROM THE WALL AND ABOVE 27" AND LESS THAN 80" (CBC 11B-307). ARCHITECT TO VERIFY THAT ALL BARRIERS IN THE PATH OF TRAVEL HAVE BEEN REMOVED OR WILL BE REMOVED UNDER THIS PROJECT, AND PATH OF TRAVEL COMPLIES WITH CHAPTER 11 DIVISION 4 OF THE 2016 CBC.

3. ALL NEW PAVING AND SURFACING TO BE FLUSH TO EXISTING PAVING EDGE.

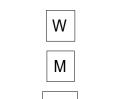
- 4. FOR GRADE ELEVATIONS, SEE CIVIL DRAWINGS.
- 5. FOR DEMOLITION WORK, SEE CIVIL DRAWINGS.
- 6. DIMENSIONS ARE TO BE FIELD VERIFIED.
- 7. ALL EXISTING ELEMENTS TO REMAIN SHALL BE PROTECTED IN PROJECT NAME

LEGEND



(E) BUILDING TO REMAIN

EXTENT OF SCOPE OF WORK ACCESSIBLE PATH OF TRAVEL 4'-0" WIDE MIN. CONCRETE OR A.C. PAVED. SEE



\_ \_ \_

WOMEN'S RESTROOM MEN'S RESTROOM

DRINKING FOUNTAIN

CIVIL DRAWINGS

FOR ADDITIONAL INFORMATION ON MATERIAL, SLOPES AND ELEVATIONS.

> REQUIRED: PROVIDED:

# PARKING ANALYSIS

TOTAL SPACES PROVIDED:	592	
(E) PARKING LOT A:	119	
ACCESSIBLE SPACES:		BEOLUBE
VAN ACCESSIBLE SPACES:		REQUIRED PROVIDED

(E) PARKING LOT B: ACCESSIBLE SPACES:

REQUIRED: PROVIDED: 17 VAN ACCESSIBLE SPACES: REQUIRED: PROVIDED:

473

#### STATEMENT BY DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE

THE P.O.T. IDENTIFIED IN THESE CONSTRUCTION DOCUMENTS IS COMPLIANT WITH THE CURRENT APPLICABLE CALIFORNIA BUILDING CODE ACCESSIBILITY PROVISIONS FOR PATH OF TRAVEL REQUIREMENTS FOR ALTERATIONS, ADDITIONS AND STRUCTURAL REPAIRS. AS PART OF THE DESIGN OF THIS PROJECT, THE P.O.T. WAS EXAMINED AND ANY ELEMENTS, COMPONENTS OR PORTIONS OF THE P.O.T THAT WERE DETERMINED TO BE NONCOMPLIANT 1) HAVE BEEN IDENTIFIED AND 2) THE CORRECTIVE WORK NECESSARY TO BRING THEM INTO COMPLIANCE HAS BEEN INCLUDED WITHIN THE SCOPE OF THIS PROJECT'S WORK THROUGH DETAILS, DRAWINGS AND SPECIFICATIONS INCORPORATED INTO THESE CONSTRUCTION DOCUMENTS. ANY NONCOMPLIANT ELEMENTS, COMPONENTS OR PORTIONS OF THE P.O.T. THAT WILL NOT BE CORRECTED BY THIS PROJECT BASED ON VALUATION THRESHOLD LIMITATIONS OR A FINDING OF UNREASONABLE HARDSHIP ARE SO

INDICATED IN THESE CONSTRUCTION DOCUMENTS. DURING CONSTRUCTION, IF P.O.T. ITEMS WITHIN THE SCOPE OF THE PROJECT REPRESENTED AS CODE COMPLIANT ARE FOUND TO BE NONCONFORMING BEYOND REASONABLE CONSTRUCTION TOLERANCES, THEY SHALL BE BROUGHT INTO COMPLIANCE WITH THE 2016 CBC AS A PART OF THIS PROJECT BY MEANS OF A CONSTRUCTION CHANGE DOCUMENT."

# DSA CERTIFICATIONS

03-113010

44208	CERTIFICATION AND CLOSE OF FILE LETTER TYPE #1, 09/07/1986
03 105667	CERTIFICATION AND CLOSE OF FILE LETTER TYPE #1, 04/30/2002
03 104385	CERTIFICATION AND CLOSE OF FILE LETTER TYPE #1, 07/26/2001
03 106904	CERTIFICATION AND CLOSE OF FILE LETTER TYPE #3, 10/11/2007
03 103034	CERTIFICATION AND CLOSE OF FILE LETTER TYPE #2, 04/08/2014
03 103160	CERTIFICATION AND CLOSE OF FILE LETTER TYPE #.1, 02/09/2009
03-113746	CERTIFICATION AND CLOSE OF FILE

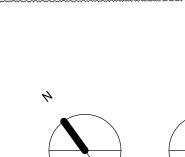
6121235307 LETTER TYPE #1, 02/27/2013 OVERALL SITE PLAN

LETTER TYPE #2, 10/30/2013 03-103019 CERTIFICATION AND CLOSE OF FILE, LETTER TYPE #2, 02/02/2017 03-120515 UNDER DSA REVIEW. APPLICATION SUBMITTED 03/03/2020

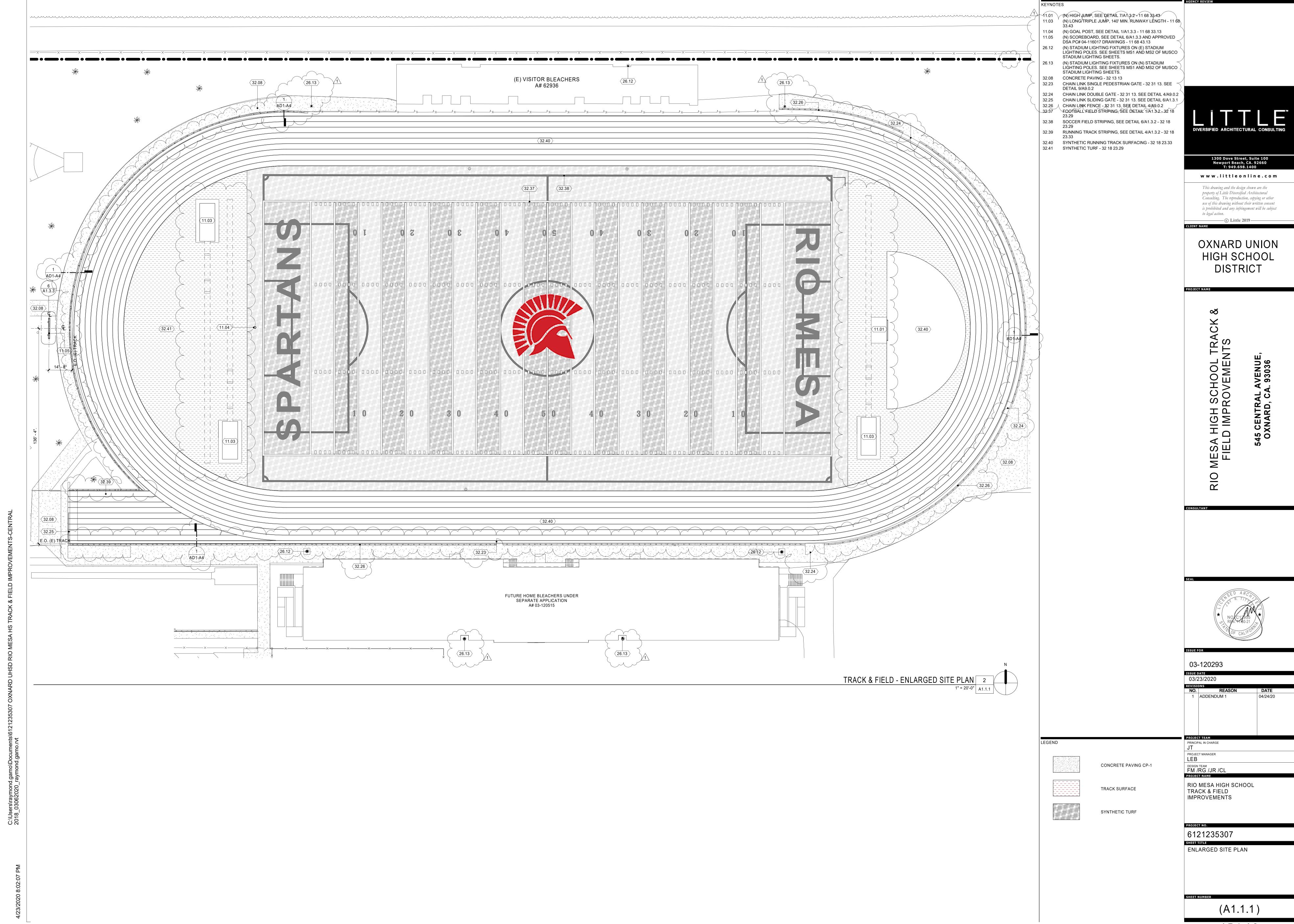
CERTIFICATION AND CLOSE OF FILE,

(A1.0.1)

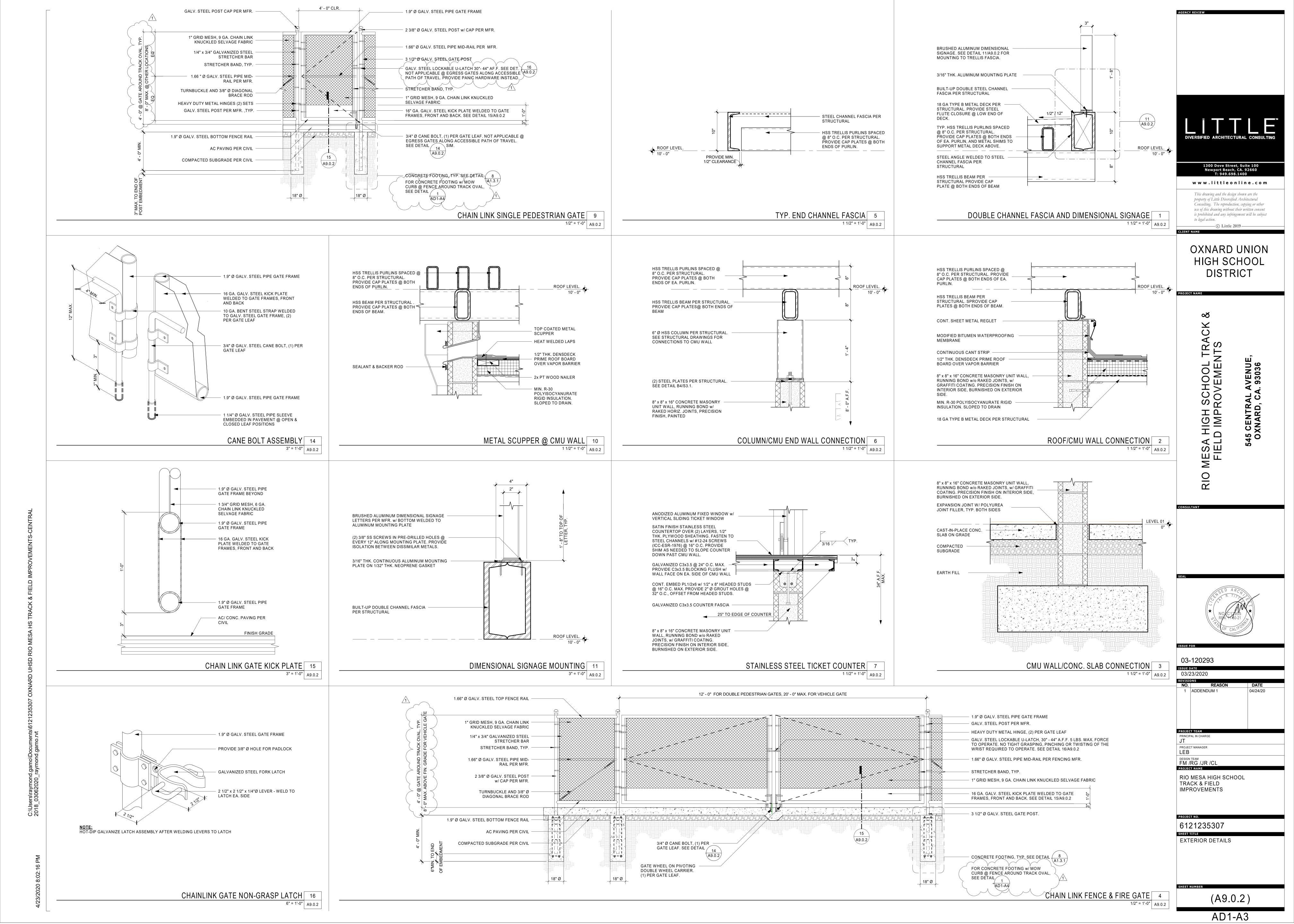
AD1-A1

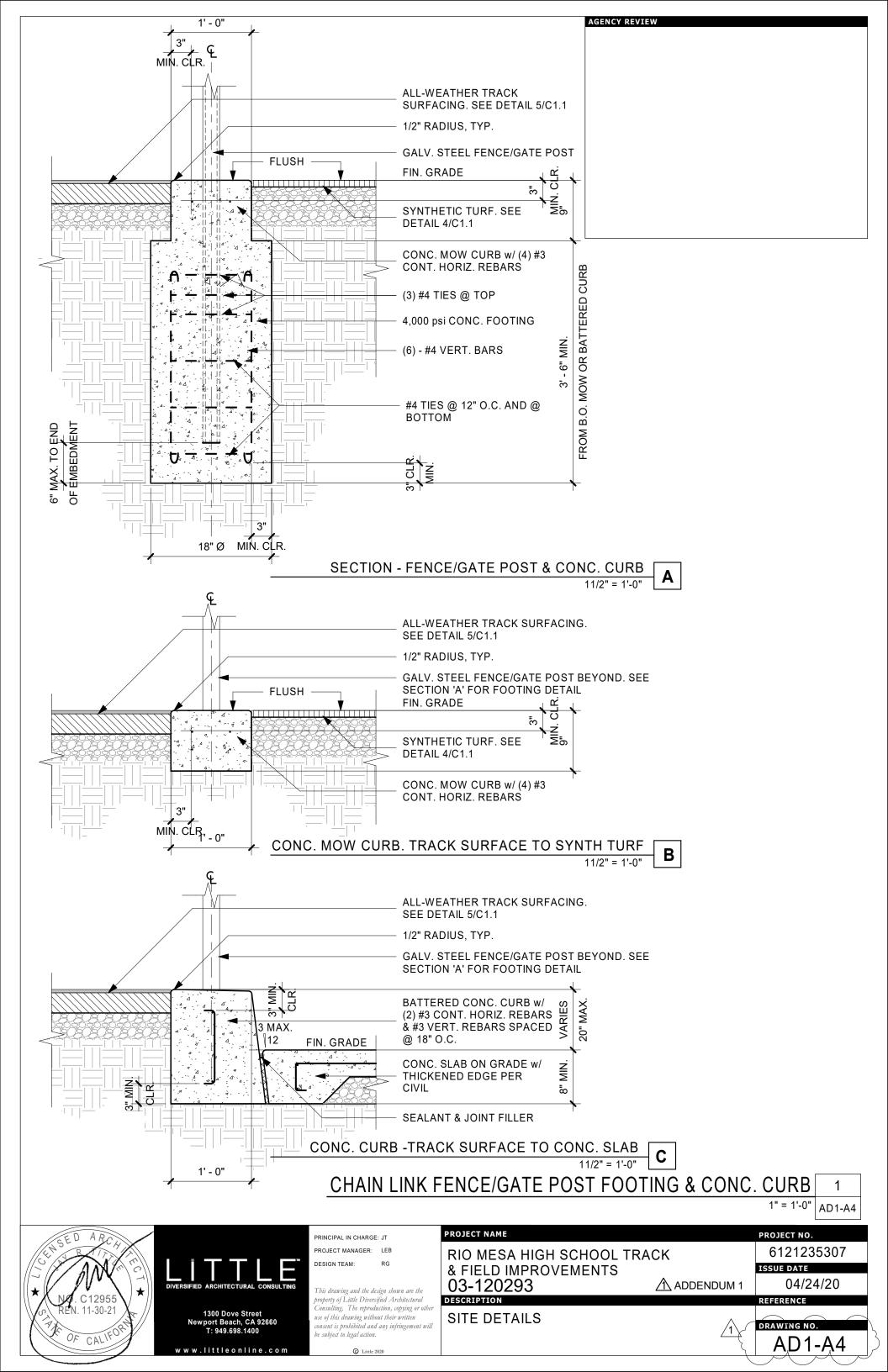


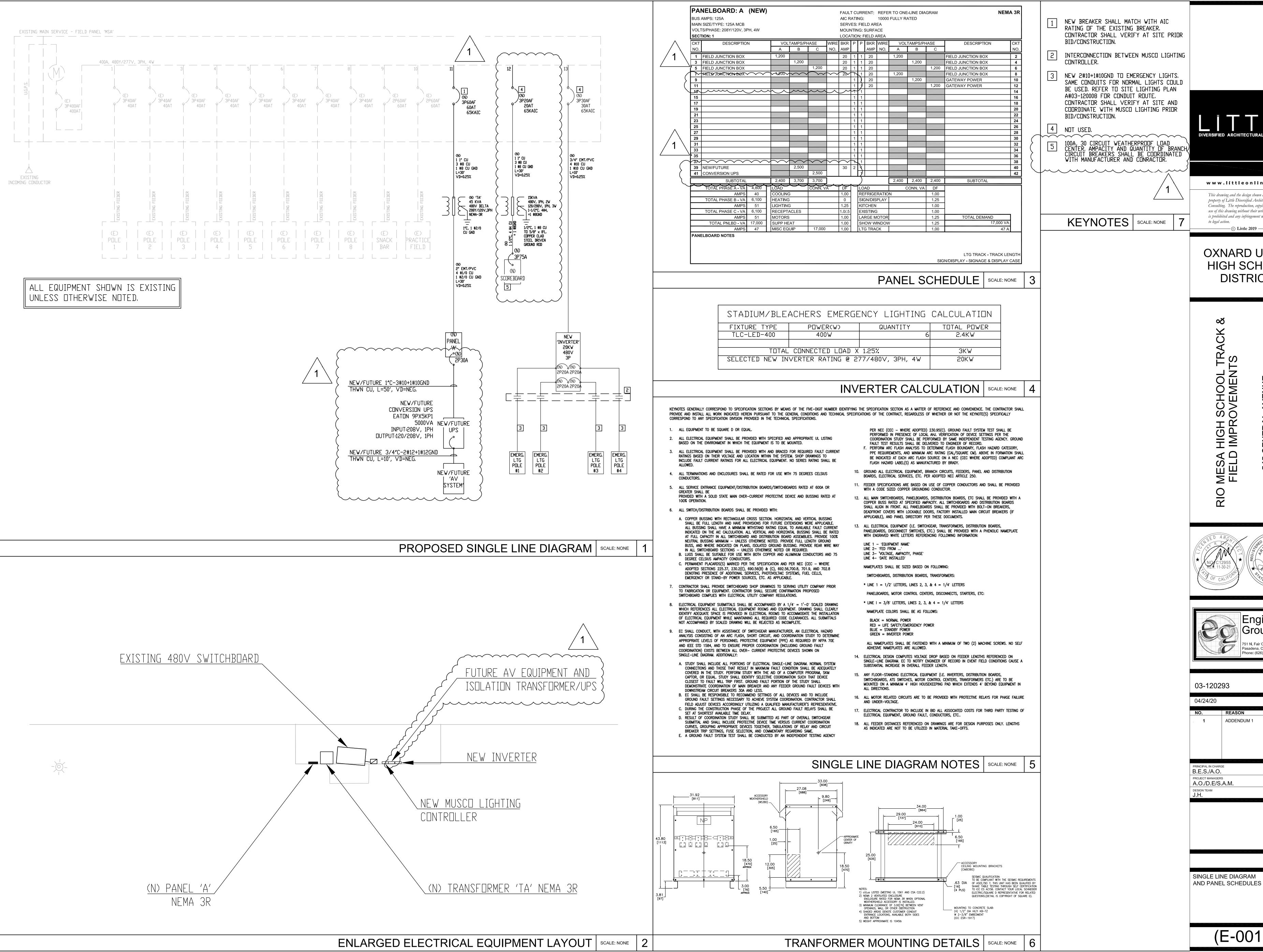




AD1-A2







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**OXNARD UNION** HIGH SCHOOL DISTRICT

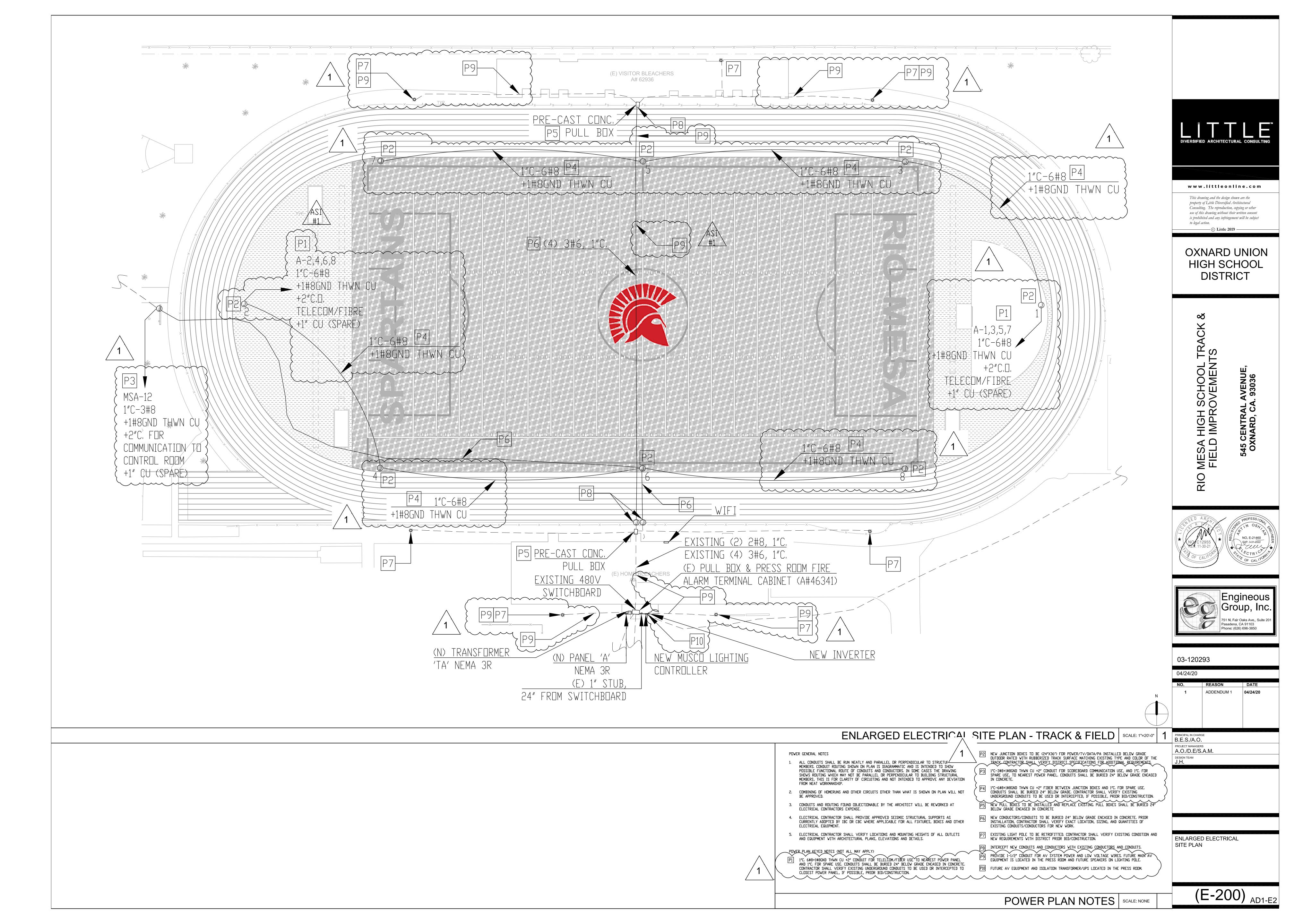
OOL MEN



03-120293

04/24/20 ADDENDUM 1 PRINCIPAL IN CHARGE B.E.S./A.O. PROJECT MANAGERS

(E-001) AD1-E1



### SCOPE OF WORK

Remove all existing light fixtures & cross—arm support from top of (7) existing poles and replace with new light fixtures, new cross—arm supports as indicated. Remove existing ballast boxes & add ballast boxes as indicated.

## APPLICABLE BUILDING CODE

All construction and workmanship shall conform to the 2016 California Building Code, California Code of Regulations — Title 24, Parts 1 & 2. This pole and foundation standard has been designed for lateral loads on the completed structure as

Wind Design Data: Vult = 110 MPH (Exposure C); Vasd = 85 MPH (Exposure C)

Risk Category =

Risk Category = II (Self Supporting Poles)

Ss = 2.813
 S<sub>1</sub> = 1.081

Site Class = D
Sos = 1.875
Soi = 1.081

Seismic Design Category = E
 Basic Seismic-Force-Resisting System = Non-Building Structure, not similar to buildings

• Cs = 0.577 (STRENGTH LEVEL)

Analysis Procedure = Equivalent Lateral Force Procedure
 See Pole Foundation Schedule for maximum pole seismic forces.

LIGHT POLE FOUNDATIONS

Reference geotechnical report prepared by Earth Systems Pacific, Dated February 20, 2020; Project no.: 303280-002; Report no.: 20-2-63. Allowable Skin friction Capacity for 3 ft diameter pier is 30 Kips.

Ultimate Lateral Bearing capacity: 350 PSF/FT acting over 3 times the pier diameter. The maximum passive pressure should not exceed 5,000 PSF. Factor of safety of 2 was used.

A representative of Earth Systems Pacific, should be available at the time of the foundation installation to verify the soil design parameters and to provide assistance if any problems arise in foundation installation. The Contractor must familiarize himself with the complete geotechnical report, and borings and contact the above firm to understand the soil conditions and the possibility of ground water pumping and excavation stabilization or bracing during the foundation installation and placement of concrete.

Soil formations that will require special design considerations or excavation procedures may exist. Pole foundations may need to be reanalyzed according to the soil conditions that exist.

If any discrepancies or inconsistencies arise, notify the RDP in Responsible Charge of such discrepancies. All concrete must bear on and against firm undisturbed soil as determined by the Geotechnical Engineer. Place plywood collar around perimeter at the top of foundation excavation to prevent soil from entering. All excavations must be free of loose soil, and debris prior to foundation installation and placement of concrete. Casing or drilling slurry may be required if caving occurs. Review and approval of the Geotechnical Engineer and DSA is required.

All excavations must be free of water or concrete shall be placed by the Tremie Method in accordance with ACI standard 336. Concrete placed by the Tremie Method shall have a minimum ultimate strength of 1,000 PSI greater than required under "Concrete Cast-In-Place' and a maximum slump of 8". PRECAST BASE

The precast concrete base conforms to California Code of Regulations, T.24, part 2, Chapter 19A and to Building Code Requirements for Reinforced Concrete, ACI 318-14.

See detail "A" on "MS3 & MS4" sheets for material strengths and specifications.  GENERAL CONSTRUCTION

These notes shall be used in conjunction with the plans and any discrepancies shall be brought to the attention of the Engineer.

Contractor must check all dimensions, clearances and job conditions before starting work. Engineer shall be notified immediately of any discrepancies or possible deficiencies.

The drawings and specifications represent the finished structure. All bracing, temporary supports, shoring, etc., is the sole responsibility of the Contractor. Observation visits to the job site by the Engineer do not include inspection of construction procedures. The Contractor is solely responsible for all construction methods and for safety conditions at the worksite. These visits shall not be construed as continuous and

Design, material, equipment, and products other than those described below or indicated on the drawings may be considered for use, provided prior approval is obtained from the School District, Engineer, and the

All changes In approved plans shall be made by means of construction change documents (CCD) approved by the Division of State Architect, as required by Section 4—338, Part 1, Title 24, CCR. All CCD documents shall be signed by the Architect and Owner. Addenda shall be signed by the design professional in general responsible charge.

Substitutions shall be considered as a CCD and shall be approved by DSA prior to fabrication or use.

A Class 1 or Class 2 Project Inspector employed by the District (Owner) and approved by the Division of State Architect shall provide continuous inspection of the work, the duties of the Inspector are defined In Section 4—342, Part 1, Title 24, CCR.

All Tests And Inspections shall be performed by an Independent lab employed by the School District and Reference pole location drawings provided by the Architect, Structural Engineer, or Electrical Engineer for

CONCRETE (CAST-IN-PLACE)

actual pole placement and site location.

Concrete backfill without steel reinforcement shall attain a minimum ultimate compressive strength at 28 day test of 3,000 psi (2,500psi used for structural design). Batch plant inspection not required.

All concrete shall attain a minimum strength of 2,500 psi prior to steel pole erection.

Use Type II/V Portland cement or as directed by the Geotechnical Engineer. Portland Cement ASTM C-150.

Aggregate ASTM C—33. 1" maximum aggregate size. 3%" max agg. size acceptable where pump mixes are used at unreinforced concrete backfill.

Mix in conformance with ASTM C-94, ACI 318 SECTIONS 19.2 and 26.4. Place concrete immediately after completion of excavation and inspection by the Geotechnical Engineer and

the DSA Inspector. Under no circumstances shall piers be allowed to remain open for more than 12 hours without the approval of the Geotechnical Engineer. Excavations shall be covered and protected until filled

Concrete shall be placed in one continuous operation (no construction joint) with special equipment to assure a maximum freefall of 5 ft and to prevent concrete from striking the sides of the excavation. Freefall of concrete is unacceptable through water or drilling slurry.

Vibrate concrete full depth, except for concrete with slump greater than 6", then vibrate only upper 10'-0". Concrete placed under water shall have a slump of 6"-8"

STEEL POLE

All miscellaneous structural steel items confrom to AISC 360-10.

All weldment conforms with AWS D1.1 specification for GMAW fillet utilizing E70S—X filler metal or SAW fillet utilizing F7XX—EXXX or F8XX—EXXX filler metal. GMAW procedure conforms to AWS A5.18. SAW procedure conforms to AWS A5.23.

All field welding shall be in compliance with AWS D1.1 specification.

All welding shall be continously inspected by an AWS CWI certified inspector approved by DSA.

All exposed steel shall be hot dipped galvanized to ASTM A123 latest standards. Steel pole sections conform to the California Code of Regulations T.24, Part 2, Chapter 22A.

All steel conforms to referenced ASTM specifications. (See Pole Data Table for each pole type). Longitudinal seam welds for pole sections shall have 60% minimum penetration; Except longitudinal seam welds on the female section of telescopic field splices shall be full penetration groove welds for a length equal to the minimum splice length plus 6 inches. See drawing number MD1 for seam weld details.

Steel pole sections shall be assembled in the field by attaching two 1.5 ton "come alongs" to jacking ears, using full effort on each simultaneously, to ensure minimum overlaps as indicated on the "MS3'& MS4" sheets and detail G/MD1.

TESTING AND INSPECTION Testing and inspection in accordance with Title 24, Part 1 & Part 2.

STEEL MATERIALS: Structural steel — 2203A.1 & 2205A.1 Cold formed steel — 2210A.1

Identification - 2203A1
High strength bolt identification - table 1705A.2.1 & DSA IR 17-9 STEEL QUALITY: Tests of structural steel & cold formed steel — 2203A.´ Non-destructive weld tests - 1705A 2.5 & DSA IR-17-2 Tests of high strength bolts, nuts, & washers - 2213A.1 & DSA IR 17-8

STRUCTURAL STEEL INSPECTIONS: Table 1705A.2.1 Shop fabrication inspection — 1704A2.5
Welding — 1705A.2.5, DSA IR 17—3 and AWS D1.1.
High strength bolt installation — Table 1705A.2.1 & DSA IR 17—9 (Including Skidmore-Wilhelm bolt tension pre-installation verification testing) (NOTE: ALL WELDING SHALL BE CONTINUOU'SLY INSPECTED BY AN AWS CWI CÉRTIFIED INSPECTOR APPROVED BY DSA)

NOTE: Field verify existing pole conditions & repair any defects, if found. Repair procedures and details to be reviewed and approved by Structural Engineer of Record and DSA.

EXCAVATIONS & FOUNDATIONS: Inspection of cast—in—place deep foundations — 1705A.8 & Table 1705A.8

Number

fixtures

CONCRETE MATERIALS: 1903A.1 Portland cement - 1910A.1 Concrete aggregates — 1903A.5

Existing Pole |

(As-Built)

Prestressing steel and anchorages — 1910A.3

Туре

Fixtures

Proportions of concrete — Reference ACI 318 Section 26.4.3.1 Through 26.4.4.1. Strength tests of concrete — 1905A.1.16 and ACI 318 Section 26.12 & 26.5.3.2. CONCRETE INSPECTION: 1705A.3 & Table 1705A.3

Job site - Reference ACI 318 Section 26.5.1,26.5.2.1(a) & (b),26.6.1.2(d), 26.11.1.1(a). Batch Plant Inspection Not Required — 1705A.3.3.2 Prestressed concrete — 1704A.2.5, 1705A.3.4

EPA/Fixture

sq

Total EPA|Weight/fixture

sq ft

These plans are for construction approval. An application number and approval of these drawings by the Division of The State Architect of California must be secured to build from these plans.

## INDEX OF SHEETS

NOTES, RETROFIT	CONFIGURATION
NEW FOUNDATION	<b>\</b>
70' POLE DETAILS	

90' POLE DETAILS 70D POLE DETAILS

90B POLE DETAILS ATTACHMENT DETAILS

Elect.

Ballast Per

Fixture

Pole

weight

lbs

ballast

Weight

lbs

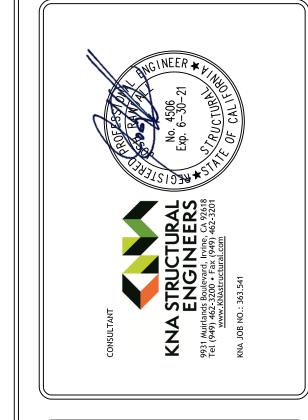
Total

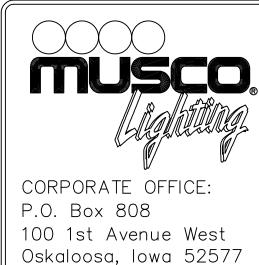
weight

lbs

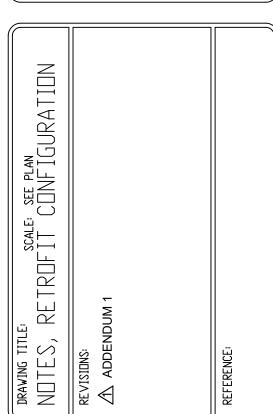
ATTACHMENT DETAILS

H • 🖂 





800/825-6020



PROJECT NO. 201831

04/24/2020

DRAWN BY:

I OF 8

154'

						lbs	lbs	lbs					
F1, F4, F5, F7	Light Fixtures	12	2.3	27.3	33	400	_	_	4,375	4,775	Max. %	Max. %	
F2, F3, F6	Light Fixtures	12	2.3	27.3	33	400	_	_	5,625	6,025	Weight Difference	EPA Difference	
Existing Pole (As—Modified)	Type Fixtures	Number fixtures	EPA/ Fixtures sq ft	Total EPA sq ft	Weight/fixture lbs	Total Fixtures Weight Ibs	Weight Elect. Driver Per Fixture Ibs	Total Elect. Driver Weight Ibs	Pole weight Ibs	Total weight Ibs		$\triangle$	
	LED1500	5	3.4	16.9	92.8	464	20	140					)
F1, F4 <del>, F5,</del>	) LED575	2	2.3	4.5	54.5	109	20	140	4,375	5 <del>,161</del> 5,088	<del>8.1</del> 6.6	<del>-9.8</del> -21.4	)   '
	Speaker	1	<del>3.2</del>	3.2	73.0	73	_	-				<u> </u>	)
	LED1500	⚠ <sub>5</sub>	3.5	17.4	92.8	464	20	160					)
F6	LED600	2	2.0	3.9	60.5	121	20	160	5,625	6,443 6,350	6.9 5.4	<del>-10.1</del> -21.8	) )
$\triangle$	Speaker	1	3.2	3.2	73.0	73	_	_					)
	LED1500	5	3.5	17.4	92.8	464			<b>\\\\\</b>				$\left\  \  ight\ $
F2, F3	LED600	1	2.7	2.7	71.0	71	20	140	5,625	6,373	5.8	_14.5	) )
}													$) \parallel$

Fixtures

lbs

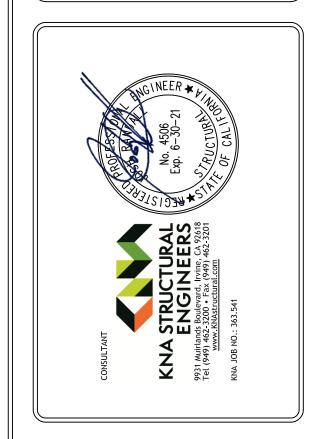
1. EPA & WEIGHTS OF EXISTING FIXTURES WERE TAKEN FROM ORIGINAL CALCULATIONS (A#35186).

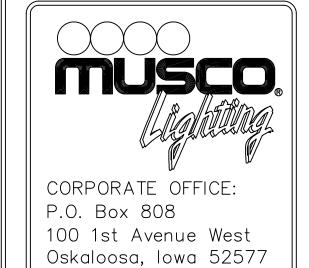
POLE ORIENTATION PLAN

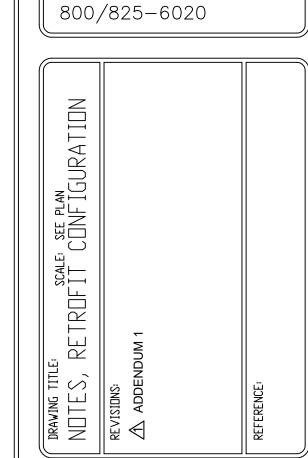
N.T.S. NOTE: THIS PLAN IS A PICTORAL REPRESENTATION OF THE SITE LAYOUT. REFERENCE APPROPRIATE ARCHITECTURAL SITE PLAN FOR ALL

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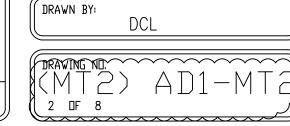
Musco products referenced or shown are protected by one or more of the following patents. U.S. Patents: 4947303; 4994718; 5075828; 5161883; 5211473; 5229681; 5377611; 5398478; 5856721; 6036338; 6203176; 6250596; 6340790; 6398392; 6681110; 6833675; 6929385; 6969034; 6988697; 7059572; D3537168; D353797; D353911; D411096. Other patents pending

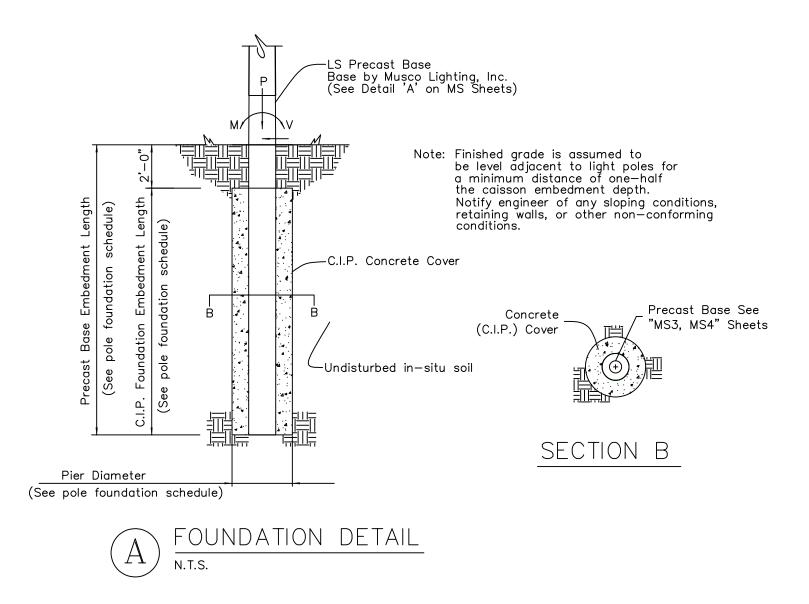






PROJECT NO. 201831





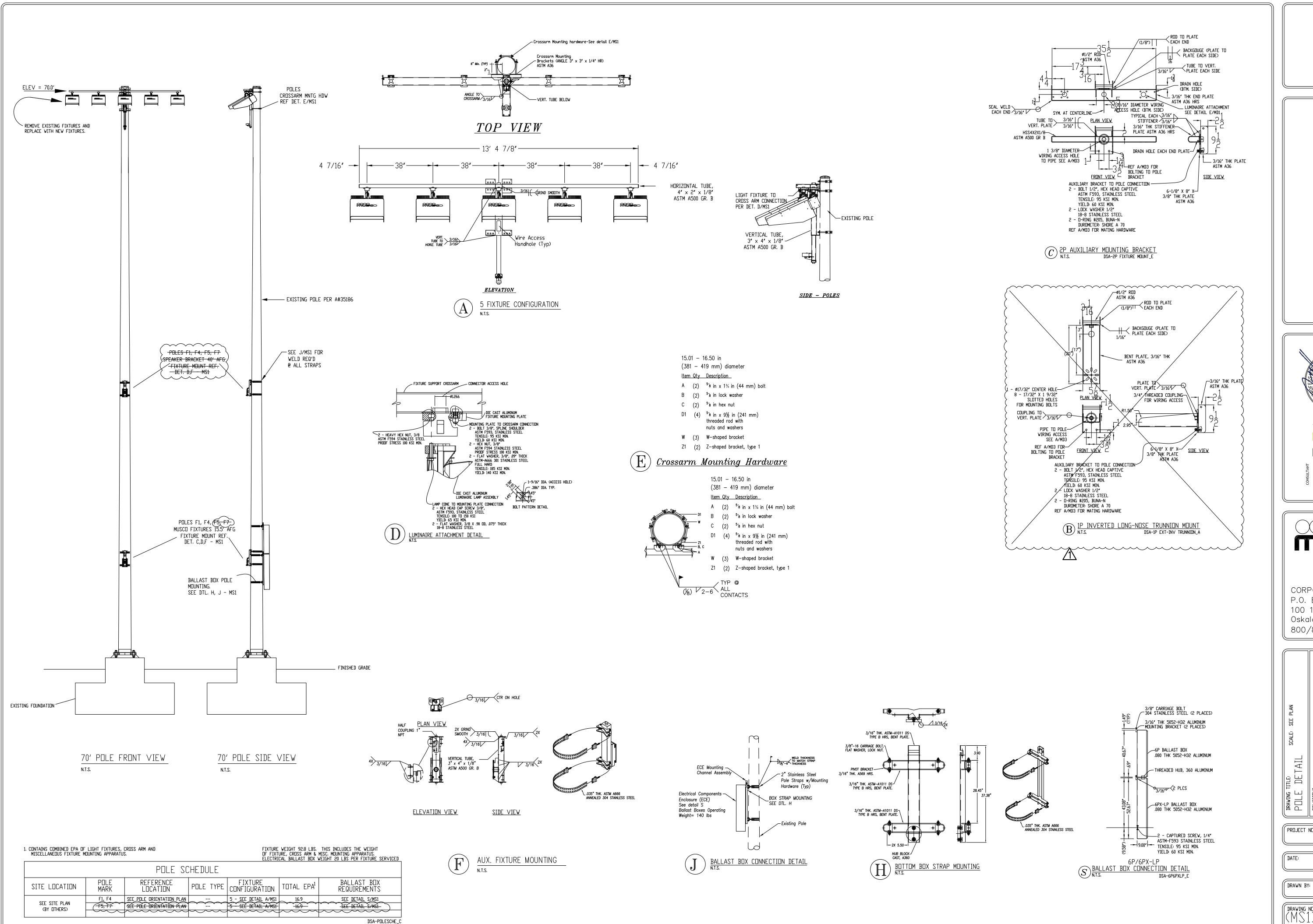
POLE FOUNDATION SCHEDULE									
POLE TYPE-# OF FIXTURES	MARK	WIND OR SEISMIC (SEISMIC FORCE	ASD L	EVEL FORCES	(MAX)	C.I.P. DEEP	PRECAST BASE		
(MAX) (LSS=LIGHT STRUCTURE)	(SEE POLE ORIENTATION PLAN)	`INCLUDES OVERSTRENGTH FACTOR=1.5)	MOMENT (M) FT-LBS*	SHEAR (V) LBS	VERTICAL (P) LBS**	DIAMETER INCHES	EMBEDMENT FEET	EMBEDMENT LENGTH	
LSS70D-5	F5, F7	SEISMIC	139,100	2,963	4,895	70"	14'-0"	16'-0"	
L3370D=3	F5, F7	WIND	89,600	2,015	3,133	36"			
LSS90B-5	F2, F3	SEISMIC	226,200	3,941	6,510	36"	16'-0"	18'-0"	
L2230B-2	FZ, FJ	WIND	138,800	2,495	3,863			10 -0	

\*Moment (M) computed below grade at Shear (V) = 0.

\*\*Vertical (P) load includes steel pole, light fixtures, and attachments. Vertical (P) load for wind is the dressed pole weight for erection

purposes. Vertical (P) load for seismic also includes weight of precast base above groundline. Reference Detail "A" on MS3 & MS4 Sheets for

precast base weight.

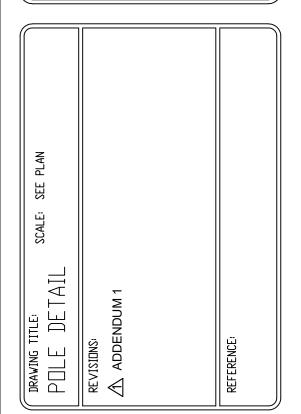


Rio Mesa HS FB FIELD LIGHTING

KNA STRUCTURAL
ENGINEERS
9931 Muirlands Boulevard, Irvine, CA 92618
Tel (949) 462-3200 - Fax (949) 462-3201

KNA JOB NO.: 363.541





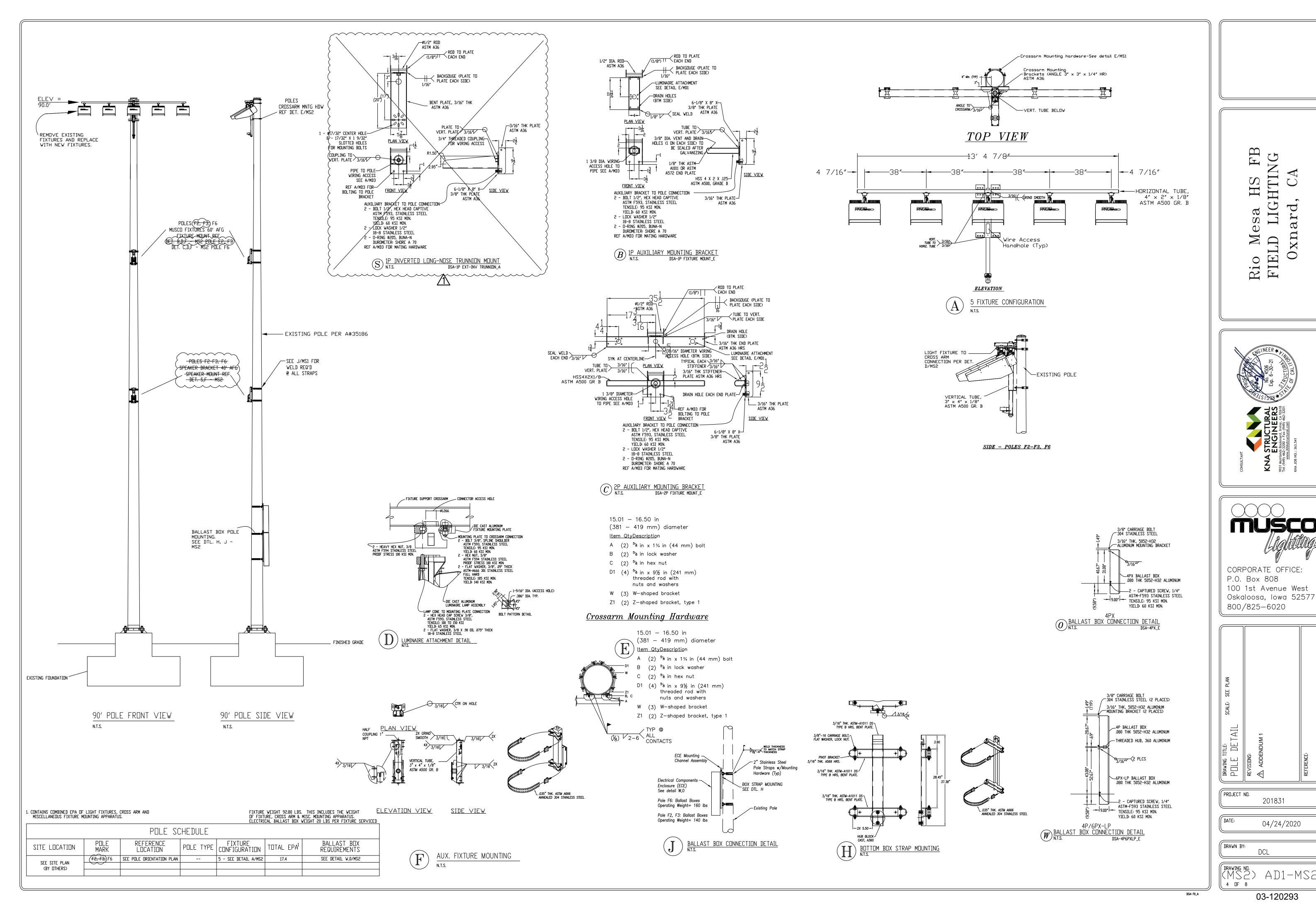
PROJECT NO. 201831

DATE: 04/24/2020

DCL

DRAWING NO.

(MS1)
3 DF 8



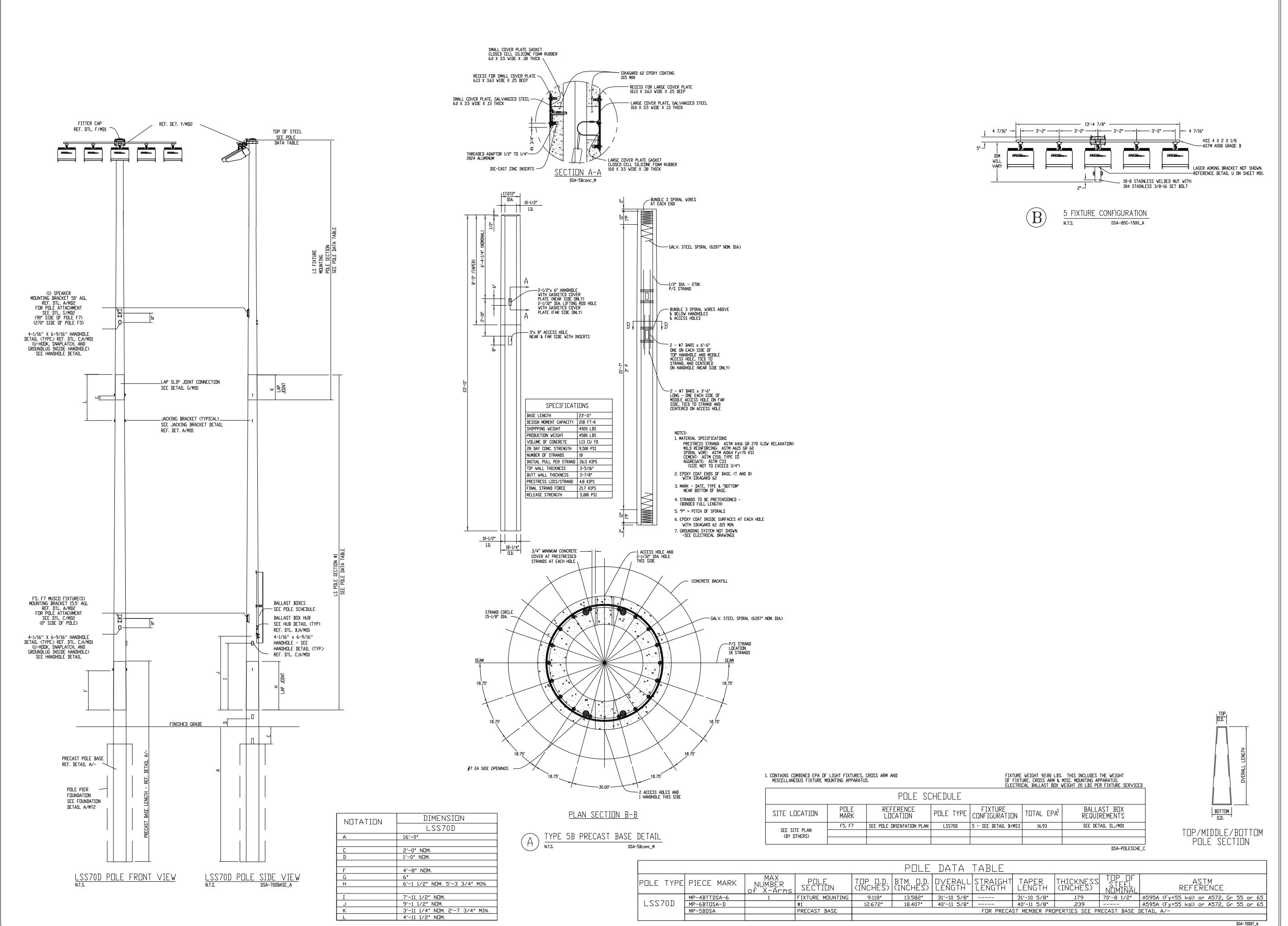
201831

DCL

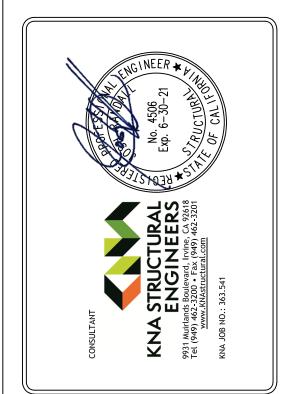
04/24/2020

LIGH

rd

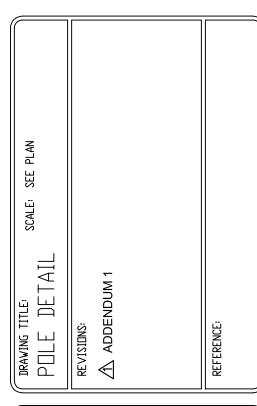


Rio Mesa HS FB FIELD LIGHTING





P.O. Box 808 100 1st Avenue West Oskaloosa, lowa 52577 800/825-6020



PROJECT NO. 201831

DATE: 04/24/2020

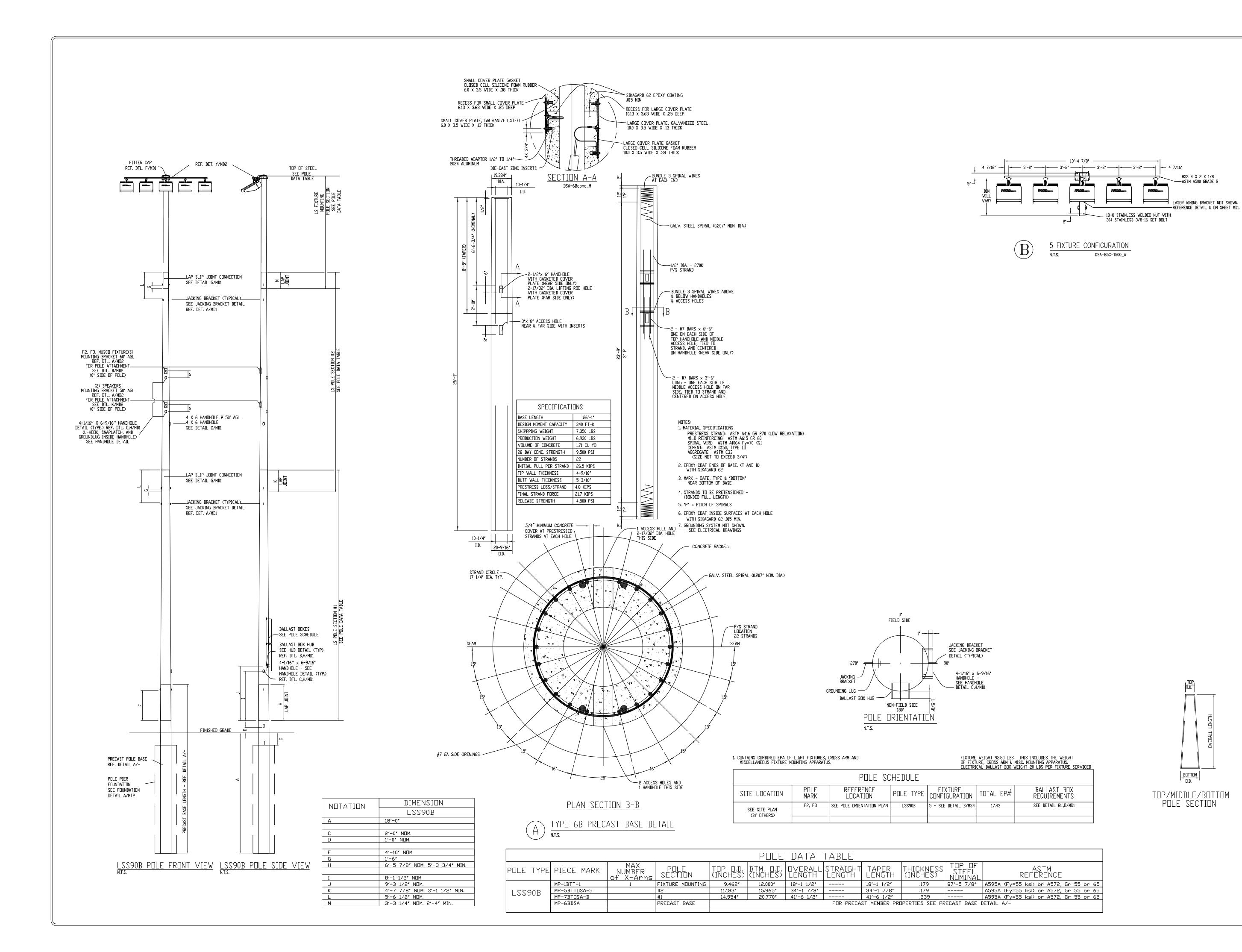
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DCL

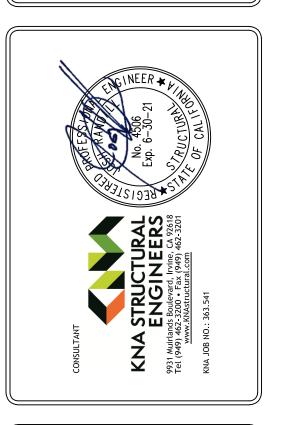
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AD1-MS3

DSA-70\_A

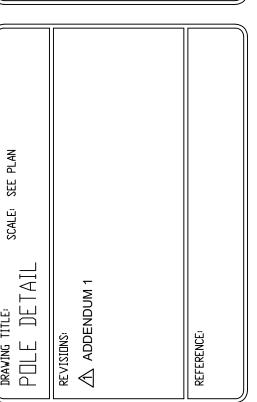








800/825-6020

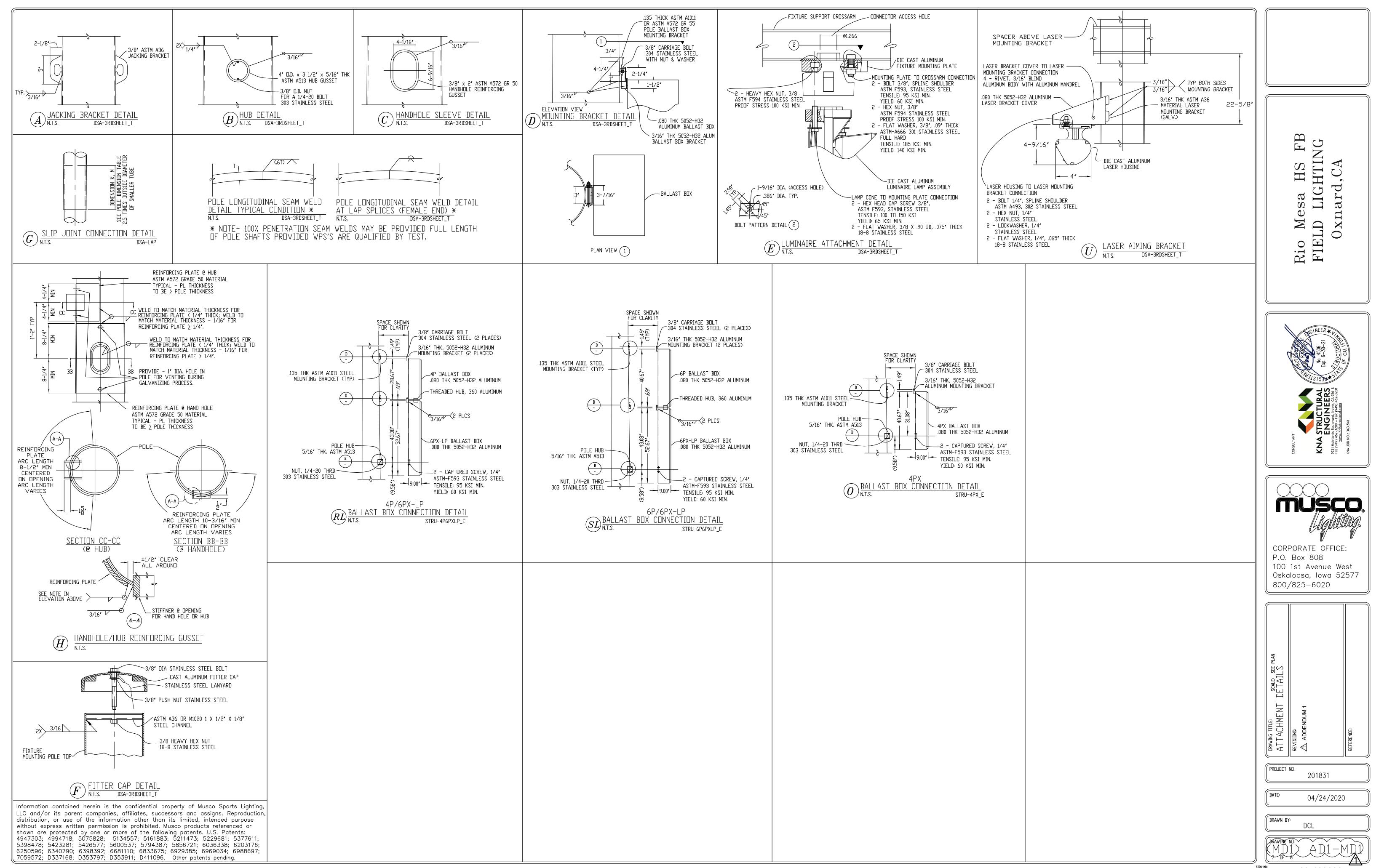


PROJECT NO. 201831

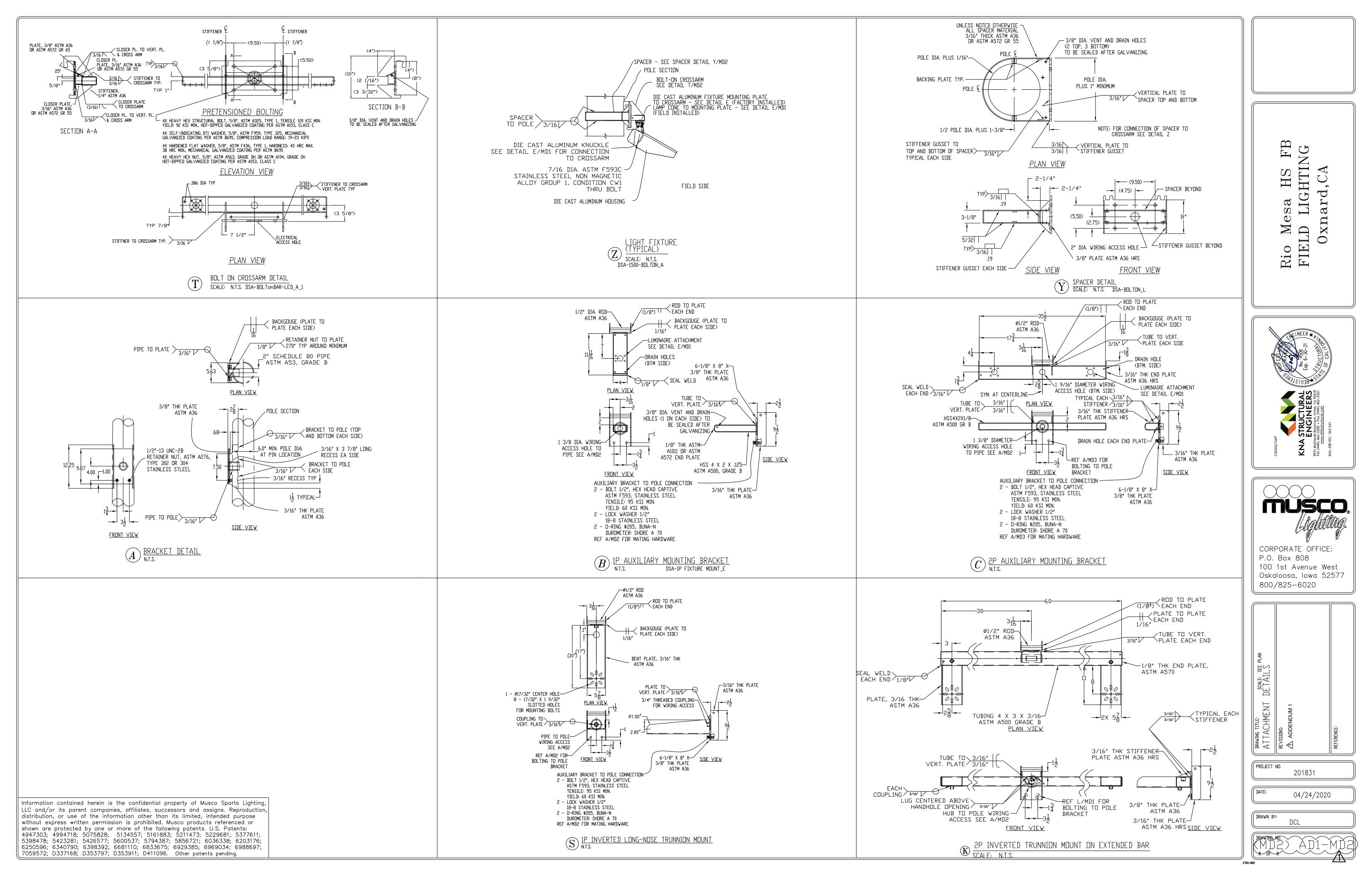
DATE: 04/24/2020

DRAWN BY:

03-120293



03-120293





## STATEMENT OF GENERAL CONFORMANCE

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

> The drawings or sheets listed on the sheet index under: 'FIELD SCOREBOARD PER PC#02-116492'

have been prepared by other design professionals or consultants who are licensed and/or authorized to prepare such drawings in this state. It has been examined by me for: 1) design intent and appears to meet the appropriate requirements of Title 24, California Code of Regulations and the project specifications prepared by me, and

2) coordination with my plans and is acceptable for incorporation into the construction of this project. The Statement of General Conformance "shall not be construed as relieving me of my rights, duties, and responsibilities under Sections 17302 and 81138 of the Education Code and Sections 4-336, 4-341 and 4-344" of Title 24, Part 1. (Title 24, Part 1, Section 4-317 (b))

> 'FIELD SCOREBOARD PER PC#02-116492' are in general conformance with the project design, and have been coordinated

> > Expiration Date

I certify that all drawings listed on the sheet index under:

with the project plans.

4/13/2020 Signature Architect or Engineer designated to be in responsible charge JAY R. TITTLE, AIA Print Name 11-30-21 C 12955

License Number

TABLE C - SITE SPECIFIC SEISMIC AND

TABLE D - SITE SPECIFIC SOIL EXPOSURE CLASS

THIS SECTION NOT REQUIRED IF CONCRETE f'c = 4500psi, w/c = 0.45

S<sub>DS</sub>= \_\_\_\_ g S<sub>D1</sub>= \_\_\_ g

Value

\_\_ mph

Geotechnical Design Based on:

Design Skin Friction, fa

Allowable Soil Bearing Pressure (DL + LL)

2016 California Building Code, Chapter 18A, Table 1806.A.2 (Class 5 Material)

Design Passive Pressure, Pp (Tabular value has been increased per CBC Section 1806A.3.4 for pier design)

WIND VALUES

Wind Design Data

Exposure Category

Geotechnical Engineer:

Geotechnical Enginee

Letter Dated:

Letter Dated:

Design Wind Speed (3-sec gust), V<sub>ULT</sub>

EARTHQUAKE DESIGN DATA

Spectral Response Coefficients (Maximum)

Circle exposure class applicable: F0, S0, W0, C0, C1

TABLE E - SITE FLOOD ZONE

THIS SECTION NOT REQUIRED IF SITE IS IN FLOOD ZONE X

Mapped Spectral Response Accelerations (Maximum)

## TESTS AND INSPECTION (DSA 103)

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

Signature of Architect or Structural Engineer

	Note: References are to the 2016 ed	dition of the Ca		Building Code (CBC) unless otherwise noted.  CODE REFERENCE AND NOTES
/	gio de la companya della companya de	- Age	OF BE	<del>\$</del> /
-	SOILS			
	1. GENERAL:	Table 1705A	1.6	
x	a. Verify that:     • site has been prepared properly prior to placement of controlled fill and/or excavations for foundations,     • foundation excavations are extended to proper depth and have reached proper material, and     • materials below footings are adequate to achieve the design bearing capacity.	Periodic	GE*	* By geotechnical engineer or his or her qualified representative. (See Appendix for exemptions.)
	2. COMPACTED FILLS:	Table 1705A	.6	
x	b. Verify use of proper materials, densities and inspect lift	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
X	thicknesses, placement, and compaction during placement of fill.  c. Test compaction of fill.	Test	LOR*	
	4. CAST-IN-PLACE DEEP FOUNDATIONS (PIER			1705A.8
x	Inspect drilling operations and maintain complete and accurate	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. (See Appendix for exemptions.)
x	records for each pier.  c. Verify pier locations, diameters, plumbness, bell diameters (if applicable), lengths, and embedment into bedrock (if applicable).  Record concrete or grout volumes.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. (See Appendix for exemptions.)
	d. Confirm adequate end strata bearing capacity.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. (See Appendix for exemptions.)
X	Concrete piers.			by geotechnical engineer of his of her qualified representative. (See Appendix for exemptions.) ections per CONCRETE section below.
	CONCRETE			8-14 Sections 26.12 & 26.13
	7. CAST IN PLACE CONCRETE			
	Material Verification and Testing:			
X	a. Verify use of required design mix.	Periodic	SI*	Table 1705A.3 Item 5, 1910A.1 (1909.2.3*). * To be performed by qualified batch-plant inspector concrete sampling technician
x	b. Identifiy, sample, and test reinforcing steel.	Test	LOR	1910A.2 (1909.2.4*); ACI 318-14 Section 26.6.1.2. DSA IR 17-10.16
x	During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 item 6; ACI 318-14 Sections 26.5 & 26.12
x	d. Test concrete (f'c).	Test	LOR	1905A.1.16 (1909.3.7*); ACI 318-14 Section 26.12.
	Inspection:			
x	e. Batch plant inspection   Continuous   Periodic	See Notes	SI	Default of 'Continuous' per 1705A.3.3; If approved by DSA, batch plant inspection may be redu to 'Periodic' subject to requirements in Section 1705A.3.3.1 or eliminated per 1705A.3.3.2. (See Appendix for exemptions.)
+	MASONRY	TMS 402-13/A	CI 530-1	3/ASCE 5-13 Table 3.1.3 & TMS 602-13/ACI 530.1-13/ASCE 6-13 Table 5
-	STEEL, ALUMINUM	Table 1705A.2	.1, AISC	303-10, AISC 360-10, AISC 341-10, AISC 358-10, AISI S100-07/S2-10
•	17. STRUCTURAL STEEL, COLD-FORMED STEE  Material Verification:  a. Verify identification of all materials and:	L, AND AL	UMIN	UM USED FOR STRUCTURAL PURPOSES
x	• Mill certificates indicate material properties that comply with requirements,     • Material sizes, types and grades comply with requirements.	Periodic		2203A.1 (2203.1*), Table 1705A.2.1 Item 3a-3c; AISI S100-07/S2-10 Section A2.1 & A2.2, AISI S200-12 Section A3, AISI S220-11 Section A4. * By special inspector or qualified technician whe performed off-site.
X	b. Test unidentified materials	Test	LOR	2203A.1 (2203.1 <sup>+</sup> ).
x	Inspection:  e. Verify and document steel fabrication per DSA approved	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).
	construction documents.  19. WELDING:			1705A.2.5, Table 1705A.2.1 Items 4 & 5; DSA IR 17-3, AWS D1.1 and AWS D1.8 for structural steel, AWS D1.2 for Aluminum, AWS D1.3 for cold-formed steel, AWS D1.4 for reinforcing steel.
	Verification of Materials, Equipment, Welders, etc:			(See Appendix for exemptions.)
x	Verify weld filler material identification markings per AWS     designation listed on the DSA approved documents and the WPS.	Periodic	SI	DSA IR 17-3.
x	b. Verify weld filler material manufacturer's certificate of	Periodic	SI	DSA IR 17-3.
X	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.
•	19.1 SHOP WELDING:		-	
x	Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds	Continuous	SI	Table 1705A.2.1 Item 5a1-4. Per AISC 360-10 (and AISC 341-10 as applicable). DSA IR 17-3.
x	b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.5 & 5a.6. Per AISC 360-10 (and AISC 341-10 as applicable
	19.2 FIELD WELDING:			DSA IR 17-3.
X	<ul> <li>b. Inspect single-pass fillet welds ≤ 5/16"</li> <li>23. ANCHOR BOLTS, ANCHOR RODS, &amp; OTHER</li> </ul>	Periodic STEEL:	SI	Table 1705A.2.1 Item 5a.5. Per AISC 360-10 (and AISC 341-10 as applicable). DSA IR 17-3.
-	a. Anchor Bolts and Anchor Rods	Test	LOR	IR 17-11 Sample and test anchor bolts and anchor rods not readily identifiable.
· x	WOOD			
· X +	IVOOD			
- X +				
- X + - X	OTHER	Test	LOR	
+		Test Periodic	LOR	

1 Type -	2 Performed By -		
Continuous – Indicates that a continuous special inspection is required	GE – Indicates that the special inspection is to be performed by a registered geotechnical engineer or his of her authorized representative		
Periodic – Indicates that a periodic special inspection is required	LOR – Indicates that the test or inspection is to be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See section 4-335, 2013 CCR Title 24, Part 1.		
Test – Indicates that a test is required	SI – Indicates that the special inspection is to be performed by a special inspector		

AC N/A F/LS N/A SS

1,500 psf

100 pcf

100 psf

Shop Welding Inspection: Laboratory Verified Report - Form DSA-291, or, for independently contracting SI, Special Inspection Verified Report - Form DSA-292

All values reported are unfactored and stre	ngth level, unless noted otherwise			
Gravity Design Da	ta	Value		
Dead Loads:				
Sign Dead Load		PER SCHEDULE		
Snow Loads:		T		
Ground Snow Load, P <sub>e</sub> (Maxir	num)	30 psf		
Deflection Criteria:		Luiaca		
Sign, Wind Load		H/360		
Wind Design Data		Value		
Design Wind Speed (3-sec gust), \	V <sub>ULT</sub>	115 mph		
Design Wind Speed (3-sec gust), \	$V_{ASD}$	90 mph		
Risk Category		П		
Exposure Category		С		
Applicable Internal Pressure Coef	Applicable Internal Pressure Coefficient			
Design Wind Pressure(s) for Com (Not specifically designed by the Register	ponents & Cladding ered Design Professional, and to be modified by applicable factors per ASCE 7)	q <sub>z</sub> =28.8xK <sub>z</sub> ps K <sub>z</sub> VARIES		
Earthquake Design	n Data	Value		
Risk Category		П		
Importance Factor, le		1.0		
Mapped Spectral Response Accel	erations (Maximum)	S <sub>5</sub> = 3.73 g S <sub>1</sub> = 1.0 g		
Site Class		A through E		
Spectral Response Coefficients (N	Aaximum)	S <sub>DS</sub> = 2.49 g S <sub>D1</sub> = 1.0 g		
Seismic Design Category		E		
Analysis Procedure Used	Equivalent Lateral Force Procedure (ASCE 7, 12.8)			
Basic Seismic-Force Resisting Syst	tem Non-Building Structure, ASCE 7-10 Chapter 15			
Response Modification Facto	r, Signs and Billboards Table 15.4-2	R= 3.0		
Seismic Response Coefficient		Cs= 0.83		
Design Base Shear		$V = C_S w_D$		
Flood Design		Value		
When the scoreboard is located i	n a flood zone other than Zone X, a letter stamped and signed from a GeotechnicalEngineer is needed to validate allowable			
soil values specified in the PC are	still applicable.			

## SCOREBOARD ASSEMBLY WORKSHEET INSTRUCTIONS

- DETERMINE DESIRED SCOREBOARD ASSEMBLY. FILL OUT SCOREBOARD ASSEMBLY TABLE (TABLE A BELOW). PROVIDE NEVCO PART NUMBERS, PART HEIGHT, PART WIDTH, AND PART WEIGHTS.
- DETERMINE TOTAL ASSEMBLY HEIGHT, WIDTH, AND WEIGHT
- STEP 3: BASED ON TOTAL ASSEMBLY WIDTH, DETERMINE THE NUMBER OF REQUIRED COLUMNS.

SEE SHEETS SB1.X FOR 1 COLUMN ASSEMBLY OPTIONS SB2.X FOR 2 COLUMN ASSEMBLY OPTIONS SB3.X FOR 3 COLUMN ASSEMBLY OPTIONS

PICK FOUNDATION TYPE (CAISSON WITH EMBEDDED COLUMN, CAISSON WITH BOLTED COLUMN, OR MAT FOOTING) AND BRACED OR UNBRACED COLUMN OPTION. MARK APPLICABLE SHEET ON SHEET INDEX, SB0.1

SB4.X FOR 4 COLUMN ASSEMBLY OPTIONS

- MARK APPLICABLE CHECK BOX ON DETAIL 'A' OF SELECTED COLUMN/FOUNDATION OPTION
- FILL IN SITE SPECIFIC SEISMIC AND WIND VALUES TABLE C ON SB0.1
- STEP 7: FILL IN SITE SPECIFIC SOIL EXPOSURE CLASS TABLE D ON SB0.1 (OPTIONAL)
- FILL IN SITE SPECIFIC FLOOD ZONE AS REQUIRED, TABLE E ON SB0.1
- VERIFY ALL APPLICABLE SHEETS ARE MARKED ON SHEET INDEX, SB0.1. INCLUDE ALL MARKED SHEETS AS PART OF DSA SUBMITTAL

### TABLE A - SCOREBOARD ASSEMBLY WORKSHEET (1)

Nevco Part No.or Descrip	otion	Part Height [ft	.] Part Width [ft]	Part Weight	[lb]
ARCHED TRUSS		4	22.05	203	
ADL SIGN		2	22.05	180	
16MM VIDEO DISI	PLAY	14.62	22.05	3,063	
Total					
TOTAL ASSEMBLY DIMENSIONS	& WEIGHT (2)				
Total Assembly Height =	_20ft.	7 5/8 in.			
Total Assembly Width =	_22ft.	<u>.05</u> in.			
Total Assembly Weight =	3,4	146 lbs.			
istance from Finish Grade to Bottom of Sign =	_10ft.	in.	Total Height = Total Assembly Height + from Finish Grade to Bottom of Si		ft7_5/8ir

## SITE SPECIFIC SUBMITTAL REQUIREMENTS

- SEE DSA POLICY PL 07-02 FOR ADDITIONAL INSTRUCTIONS REGARDING USE AND APPLICATION OF THIS PRE-CHECK DOCUMENT. ALL SITE SPECIFIC SUBMITTALS SHALL INCLUDE:
- COMPLETED DSA 1 APPLICATION AND FILING FEE AND COPY OF THE PRE-CHECK DOCUMENT WITH APPLICABLE DESIGN OPTION MARKED ON THE MARQUEE, TWO COLUMN, THREE COLUMN OR FOUR COLUMN ASSEMBLY SCHEDULES.
- 2. SITE PLAN OF FACILITY IDENTIFYING ALL STRUCTURES BY DSA APPLICATION NUMBER. LOCATION OF SCOREBOARD SHALL BE IDENTIFIED. ELECTRICAL PANEL SERVING THE SCOREBOARD SHALL BE LOCATED AND IDENTIFIED.
- WHERE WIRELESS CONTROLLERS ARE NOT SPECIFIED, AN ACCESSIBLE PATH OF TRAVEL AND ACCESSIBLE SEATING FOR THE SCOREBOARD OPERATOR SHALL BE IDENTIFIED AND PROVIDED.
- 4. PROVIDE AN ELEVATION OF PROPOSED SCOREBOARD IDENTIFYING ALL INSTALLED DISPLAY COMPONENTS, SIGNAGE, TRUSSES, AND ADDITIONAL COMPONENTS IN THE PRE-CHECK DOCUMENT. ALL ELEMENT WEIGHTS SHALL BE SPECIFIED.
- 5. THE APPLICABLE SHEETS SHALL BE IDENTIFIED BY MARKING APPROPRIATE CHECK BOX ON THIS SHEET.
- 6. THE APPLICABLE CONFIGURATION SHALL BE IDENTIFIED BY MARKING APPROPRIATE CHECK BOX ON THE 'A' DETAILS ON THE APPLICABLE SHEET.
- 7. PROVIDE CUT SHEETS OF THE BOARDS, BOXES, AND EQUIPMENT TO BE MOUNTED ON THE STRUCTURE. CUT SHEETS SHALL INCLUDE WEIGHTS AND DIMENSIONS
- 8. SITE SPECIFIC SEISMIC DESIGN CRITERIA SHALL BE PROVIDED IN THE DRAWINGS.
- 9. SITE SPECIFIC BASIC DESIGN WINDSPEED AND SITE EXPOSURE SHALL BE PROVIDED ON THE DRAWINGS.
- 10. STEEL COATING SPECIFICATIONS FOR WEATHER PROTECTION IF DIFFERENT THAN NOTED ON SB0.3
- 11. A GEOHAZARD REPORT IS NOT REQUIRED PER IR A-4.13. IF A SCOREBOARD IS LOCATED IN A FLOOD ZONE OTHER THAN ZONE X, A LETTER STAMPED AND SIGNED BY A GEOTECHNICALENGINEER IS REQUIRED VALIDATING THE ALLOWABLE SOIL VALUES. IF THE CONCRETE COMPRESSIVE STRENGTH OPTION OF f'c = 3000psi IS USED, A GEOTECHNICALENGINEER SHALL PROVIDE A STAMPED AND SIGNED LETTER CONFIRMING THE SOIL EXPOSURE CLASS.
- 12. PROVIDE A SITE SPECIFIC DESIGN FOR STRUCTURES THAT DO NOT MEET THE MINIMUM SETBACK REQUIREMENTS.
- 13. PROVIDE A SITE SPECIFIC DESIGN FOR STRUCTURES LOCATED IN AN AREA WITH LIQUEFIABLE SOIL OR SITE CLASS F.

CHECK ALL THAT APPLY	SHEET IN FIELD SC	IDEX OREBOARD PER PC# 02-116492
(REQ'D)	SB0.1	COVER SHEET
(REQ'D)	SB0.2	EXAMPLE SCOREBOARD WORKSHEET & PART NUMBERS
(REQ'D)	SB0.1	STRUCTURAL NOTES & SPECIAL INSPECTION
	SB1.1	MARQUEE CAISSON - EMBEDDED
	SB1.2	MARQUEE CAISSON - BOLTED
	SB1.3	MARQUEE MAT FOOTING
	SB2.1	TWO COLUMN CAISSON - EMBEDDED
	SB2.1b	TWO COLUMN, BRACED, CAISSON - EMBEDDED
	SB2.2	TWO COLUMN CAISSON - BOLTED
	SB2.2b	TWO COLUMN, BRACED, CAISSON - BOLTED
	SB2.3	TWO COLUMN MAT FOOTING
	SB2.3b	TWO COLUMN, BRACED, MAT FOOTING
	SB3.1	THREE COLUMN CAISSON - EMBEDDED
	SB3.1b	THREE COLUMN, BRACED, CAISSON - EMBEDDED
	SB3.2	THREE COLUMN CAISSON - BOLTED
	SB3.2b	THREE COLUMN, BRACED, CAISSON - BOLTED
	SB3.3	THREE COLUMN MAT FOOTING
	SB3.3b	THREE COLUMN, BRACED, MAT FOOTING
	SB4.1	FOUR COLUMN CAISSON - EMBEDDED
	SB4.1b	FOUR COLUMN, BRACED, CAISSON - EMBEDDED
	SB4.2	FOUR COLUMN CAISSON - BOLTED
	SB4.2b	FOUR COLUMN, BRACED, CAISSON - BOLTED
	SB4.3	FOUR COLUMN MAT FOOTING
	SB4.3b	FOUR COLUMN, BRACED, MAT FOOTING
(REQ'D)	SB5.1	ATTACHMENT DETAILS

## CODE INFORMATION

## 2016 CALIFORNIA BUILDING STANDARDS CODE (TITLE 24, CCR):

2016 CALIFORNIA BUILDING CODE VOLUMES 1 & 2, PART 2, TITLE 24 CCR 2016 CALIFORNIA ELECTRICAL CODE, PART 3, TITLE 24 CCR 2016 CALIFORNIA MECHANICAL CODE, PART 4, TITLE 24 CCR 2016 CALIFORNIA PLUMBING CODE, PART 5, TITLE 24 CCR 2016 CALIFORNIA ENERGY CODE, PART 6, TITLE 24 CCR 2016 CALIFORNIA FIRE CODE, PART 9, TITLE 24 CCR 2016 CALIFORNIA GREEN BUILDING STANDARDS CODE, PART 11, TITLE 24 CCR 2016 CALIFORNIA REFERENCED STANDARDS CODE, PART 12, TITLE 24 CCR

2016 ADMINISTRATIVE CODE, PART 1, TITLE 24 CODE OF REGULATIONS (CCR)

REFERENCED CODE SECTIONS FOR APPLICABLE STANDARDS: 2016 CALIFORNIA BUILDING CODE, CHAPTER 35 2016 CALIFORNIA FIRE CODE, CHAPTER 80

## GENERAL REQUIREMENTS

- . THE ARCHITECT OR PROFESSIONAL ENGINEER IN GENERAL RESPONSIBLE CHARGE SHALL SIGN AND SEAL ALL DRAWINGS AND SPECIFICATIONS PER TITLE 24, PART 1, SECTIONS 4-316(E) AND 4-317 (H).
- 2. CHANGES TO THE APPROVED DRAWINGS AND SPECIFICATIONS SHALL BE MADE BY ADDENDA, OR CONSTRUCTION CHANGE DOCUMENTS APPROVED BY THE DIVISION OF THE STATE ARCHITECT (DSA), AS REQUIRED BY TITLE 24, PART 1, SECTION 4-338.
- THE DISTRICT SHALL EMPLOY A CLASS 2 PROJECT INSPECTOR WHEN OVERALL STRUCTURE HEIGHT IS 35 FEET OR GREATER, OTHERWISE A CLASS 3 PROJECT INSPECTOR MAY BE USED. THE PROJECT INSPECTOR SHALL PROVIDE CONTINUOUS INSPECTION OF THE WORK , AND SHALL SUBMIT VERIFIED REPORTS ON A DSA-6 FORM. THE DUTIES OF THE PROJECT INSPECTION ARE DEFINED IN TITLE 24, PART 1, SECTION 4-342.
- 4. ALL SCOREBOARD CONTROLS SHALL BE FULLY ACCESSIBLE VIA WIRELESS CONTROL OR AS DEMONSTRATED IN THE SITE-SPECIFIC APPLICATION.
- 5. ALL ASSEMBLIES SHALL HAVE ELECTRICAL DISCONNECT PER CEC 600.6 AND BE ELECTRICALLY GROUNDED PER CEC 600.7, SEE DETAIL B/SB5.1
- 6. IN FLOOD ZONES, LOCATION OF ELECTRICAL ELEMENTS SHALL CONFORM TO ASCE 24, SECTION 7.2 PER DSA PR-14-01 SECTION 1.2.1.

## **GENERAL NOTES AND MATERIAL SPECIFICATIONS**

SEE FOLLOWING PAGE, SB0.3, FOR ALL MATERIAL SPECIFICATIONS AND NOTES.



THAN THE SPECIFIC PROJECT FOR WHICH THEY HAVE BEEN PREPARED AND DEVEL WITHOUT THE EXPRESSED WRITTEN CONSENT OF THE ENGINEER. COPYRIGHT 2018. THANK YOU FOR YOUR INTEREST IN NEVCO SCOREBOARD PRODUCTS



PRE-CHECK (PC) DOCUMENT

A separate project application

SA FILE NUMBER: PC-90

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT

AN FLS 482 PLS: Grig Cobabe ASTAMP ACS: ALX Ellescas

COVER

10.16.18

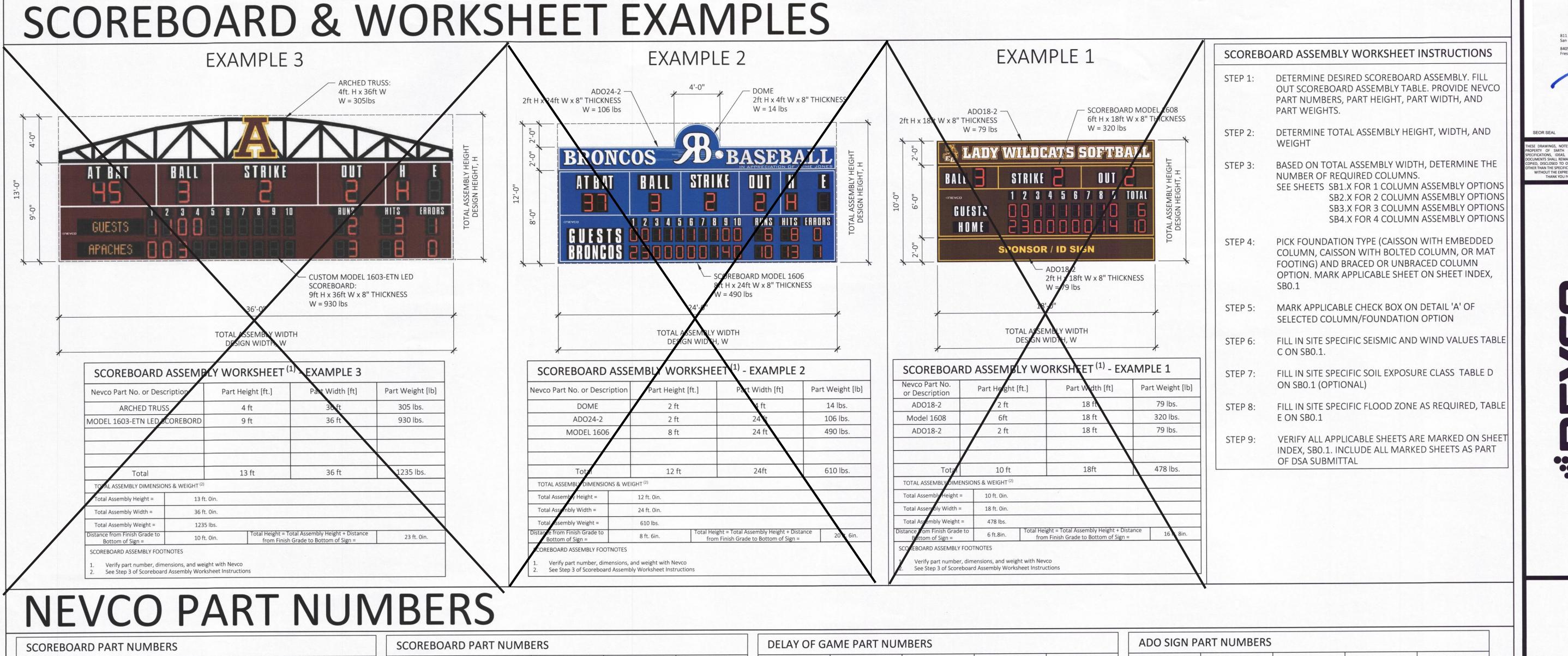
SHEET

↑ ADDENDUM 1 03-120293

JMK / JMM

JMM / MEP S17015

Verify part number, dimensions, and weight with Nevco See Step 3 of Scoreboard Assembly Worksheet Instructions



levco Model No.	Part Height [ft.]	Part Width [ft]	Part Depth [in]	Part Weight [lb]
1600	5 ft	16 ft	8 in	260 lbs.
1603	9 ft	36 ft	8 in	930 lbs.
1604	8 ft	28 ft	8 in	570 lbs.
1606	8 ft	24 ft	8 in	490 lbs.
1608	6 ft	18 ft	8 in	320 lbs.
1609	6 ft	16 ft	8 in	290 lbs.
1610	4 ft	10 ft	8 in	130 lbs.
1612	5 ft	10 ft	8 in	160 lbs.
1615	7 ft	16 ft	8 in	350 lbs.
1617	7 ft	16 ft	8 in	350 lbs.
1620	4 ft	10 ft	8 in	130 lbs.
1625	5 ft	10 ft	8 in	160 lbs.
1630	8 ft	18 ft	8 in	410 lbs.
1632	5 ft	12 ft	8 in	180 lbs.
1635	6 ft	16 ft	8 in	290 lbs.
1640	8 ft	18 ft	8 in	410 lbs.
1650	3 ft	8 ft	8 in	90 lbs.
3600	8 ft	18 ft	8 in	420 lbs.
3602	5 ft	12 ft	8 in	150 lbs.
3604	10 ft	30 ft	8 in	535 lbs.
3614	8 ft	18 ft	8 in	420 lbs.
3615	8 ft	24 ft	8 in	570 lbs.
3616	10 ft	36 ft	8 in	1020 lbs.
3617	8 ft	24 ft	8 in	570 lbs.
3618	8 ft	24 ft	8 in	570 lbs.
3619	8 ft	24 ft	8 in	270 lbs.
3620	8 ft	32 ft	8 in	760 lbs.
3621	8 ft	20 ft	8 in	585 lbs.
3625	9 ft	18 ft	8 in	460 lbs.
3634	8 ft	18 ft	8 in	420 lbs.
3650	4 ft	10 ft	8 in	130 lbs.
3655	5 ft	16 ft	8 in	250 lbs.
3656	8 ft	18 ft	8 in	420 lbs.

Nevco Model No.	Part Height [ft.]	Part Width [ft]	Part Depth [in]	Part Weight [lb]
3657	10 ft	32 ft	8 in	665 lbs.
3658	5 ft	16 ft	8 in	250 lbs.
3680	8 ft	18 ft	8 in	555 lbs.
3682	8 ft	20 ft	8 in	690 lbs.
3685	8 ft	24 ft	8 in	640 lbs.
3688	8 ft	32 ft	8 in	830 lbs.
5625	8 ft	12 ft	8 in	280 lbs.
5632	4 ft	18 ft	8 in	240 lbs.
5633	2 ft	18 ft	8 in	150 lbs.
5634	6 ft	18 ft	8 in	405 lbs.
5635	8 ft	18 ft	8 in	555 lbs.
5642	3 ft	24 ft	8 in	200 lbs.
5643	5 ft	24 ft	8 in	350 lbs.
7604	10.5 ft	18 ft	8 in	590 lbs.
7605	10.5 ft	24 ft	8 in	790 lbs.
7614	10.5 ft	18 ft	8 in	590 lbs.
7615	10.5 ft	24 ft	8 in	790 lbs.
7616	10 ft	36 ft	8 in	1220 lbs.
7620	8 ft	32 ft	8 in	820 lbs.
7624	10.5 ft	18 ft	8 in	590 lbs.
7625	10.5 ft	24 ft	8 in	790 lbs.
7630	8 ft	24 ft	8 in	650 lbs.
7631	8 ft	24 ft	8 in	650 lbs.
7632	8 ft	24 ft	8 in	650 lbs.
7680	10.5 ft	18 ft	8 in	610 lbs.
7685	8 ft	24 ft	8 in	670 lbs.
7688	8 ft	32 ft	8 in	930 lbs.
9605	3 ft	6 ft	8 in	60 lbs.
9620	3.5 ft	4 ft	8 in	45 lbs.
9650	10 ft	16 ft	8 in	430 lbs.
9651	4 ft	5 ft	8 in	60 lbs.
9652	4 ft	9 ft	8 in	110 lbs.
9660	6 ft	10 ft	8 in	235 lbs.

	USER					
Nevco Model No.	Part H	eight, t.]	Part Width, w [ft]	Part Depth [in]	Part Weight [lbs/s.f.]	Part Weight [lbs] = Part Weight lb/s.f. x h x w
ARCHED TRUSS	4	ft	_22.05_ ft	4 in	2.5 lbs./s.f.	1bs.
		ft	ft	4 in	2.5 lbs./s.f.	lbs.

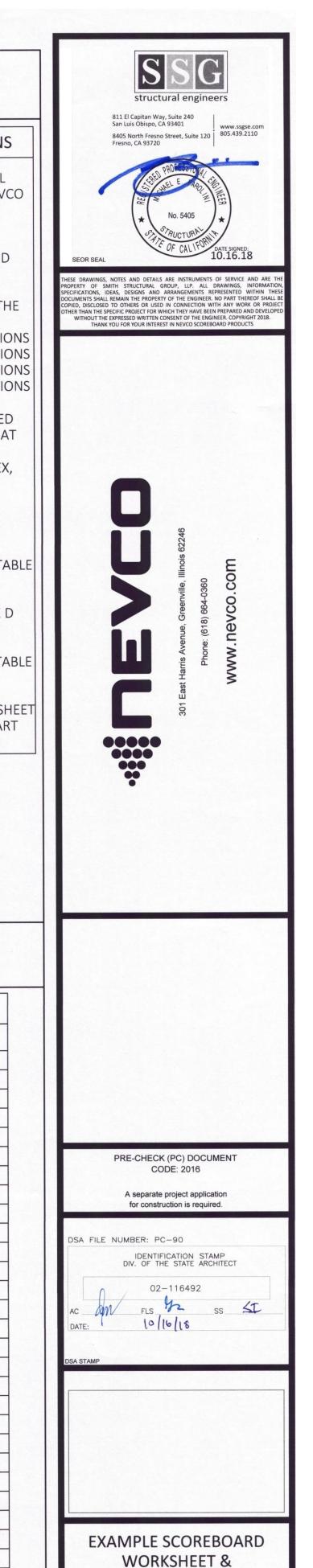
levco Model No.	Part Height [ft.]	Part Width [ft]	Part Depth [in]	Part Weight [lb]
DGT	4 ft	4 ft	8 in	50 lbs.
DGT-T14	5 ft	4 ft	8 in	60 lbs.
FIELD TIMER	PART NUMBE	RS		
Nevco Model No.	Part Height [ft.]	Part Width [ft]	Part Depth [in]	Part Weight [lb]
FT-24	4 ft	4 ft	8 in	55 lbs.
FT-30	4 ft	4 ft	8 in	55 lbs.
FT-T14	5 ft	4 ft	8 in	65 lbs.
PITCH COUN	T PART NUMB	ERS		
Nevco Model No.	Part Height [ft.]	Part Width [ft]	Part Depth [in]	Part Weight [lb]
PCD-1	3 ft	5 ft	8 in	50 lbs.
PCD-08-1	1.5 ft	8 ft	8 in	50 lbs.
PCD-10-1	2 ft	10 ft	8 in	80 lbs.
PCD-16-1	2 ft	16 ft	8 in	130 lbs.
PCD-18-1	2 ft	18 ft	8 in	150 lbs.
PITCH SPEED	PART NUMBE	RS		
Nevco Model No.	Part Height [ft.]	Part Width [ft]	Part Depth [in]	Part Weight [lb]
PSD	4 ft	4 ft	8 in	50 lbs.
SOUND SYST	EM PART NUM	1BERS		
Nevco Model No.	Part Height [ft.]	Part Width [ft]	Part Depth [in]	Part Weight [lb
SP-1000	4 ft	9 ft	43 in	710 lbs.
SP-2000	4 ft	19 ft	43 in	1420 lbs.
CUSTOM PA	RT			
Nevco Model No.	Part Height [ft.]	Part Width [ft]	Part Depth [in]	Part Weight [lb]

SIGNS - HEIGHT AND WIDTH TO BE SPECIFIED BY USER

2 ft 22.05 ft

Nevco Part Height, Part Width, Part Depth [in] Part Weight [lbs/s.f.] Part Weight [lbs] = Part Weight lb/s.f. x h x w

Nevco Mod	el No. P	art Height [ft.]	Part Width	[ft]	Part Depth	[in] Part Weight [lb]
ADO8-	1	1 ft	8 ft		8 in	18 lbs.
ADO6-	2	2 ft	6 ft		8 in	26 lbs.
ADO8-	2	2 ft	8 ft		8 in	35 lbs.
ADO10	-2	2 ft	10 ft		8 in	44 lbs.
ADO12	-2	. 2 ft	12 ft		8 in	53 lbs.
ADO14	-2	2 ft	14 ft		8 in	62 lbs.
ADO16	-2	2 ft	16 ft	3 15 1	8 in	70 lbs.
ADO18	-2	2 ft	18 ft		8 in	79 lbs.
ADO20	-2	2 ft	20 ft		8 in	88 lbs.
ADO22	-2	2 ft	22 ft		8 in	97 lbs.
ADO24	-2	2 ft	24 ft		8 in	106 lbs.
ADO28	-2	2 ft	28 ft		8 in	123 lbs.
ADO30	-2	2 ft	30 ft		8 in	132 lbs.
ADO32	-2	2 ft	32 ft		8 in	140 lbs.
AD06-	3	3 ft	6 ft		8 in	40 lbs.
AD08-	3	3 ft	8 ft		8 in	53 lbs.
ADO10	-3	3 ft	10 ft		8 in	66 lbs.
ADO12	-3	3 ft	12 ft		8 in	80 lbs.
ADO14	-3	3 ft	14 ft		8 in	93 lbs.
ADO16	-3	3 ft	16 ft		8 in	106 lbs.
ADO18	-3	3 ft	18 ft		8 in	120 lbs.
ADO20	-3	3 ft	20 ft		8 in	132 lbs.
ADO22	-3	3 ft	22 ft		8 in	146 lbs.
ADO24	-3	3 ft	24 ft		8 in	160 lbs.
ADO28	-3	3 ft	28 ft		8 in	185 lbs.
ADO30	-3	3 ft	30 ft		8 in	200 lbs.
ADO32	-3	3 ft	32 ft		8 in	212 lbs.
ADO36	-3	3 ft	36 ft		8 in	239 lbs.
MESSA	GE CENT	ERS - HEIGI	HT AND W	IDTH	TO BE SP	ECIFIED BY USER
Nevco Model No.	Part Height h [ft.]	t, Part Width, w [ft]	Part Depth [in]	Part We	ight [lbs/s.f.]	Part Weight [lbs] = Part Weight lb/s.f. x h x w
	f		8 in	8.5	lbs./s.f.	lbs.
	f	tft	8 in	8.5	lbs./s.f.	lbs.
VIDEO	BOARDS	- HEIGHT A	ND WIDT	н то і	BE SPECIF	FIED BY USER
Nevco Model No.	Part Height h [ft.]	t, Part Width, w [ft]	Part Depth [in]	Part We	eight [lbs/s.f.]	Part Weight [lbs] = Part Weight lb/s.f. x h x w
16MM	_14.62f		8 in	9.5	lbs./s.f.	_3063lbs.
			8 in		lbs./s.f.	lbs.



**NEVCO PART NUMBERS** 

10.16.18

JMK / JMM

JMM / MEP

⚠ ADDENDUM 1 03-120293

## STRUCTURAL NOTES

procedures.

- 1. The following notes, typical details and schedules shall apply to all phases of this project unless otherwise shown or noted.
- 2. Specific notes and details shall take precedence over general notes and typical details.
- 3. All materials and workmanship shall conform to the minimum standards of the 2016 edition Title 24 of the California Building Code (CBC) and such other regulating agencies exercising authority over any portion of the work. The contractor shall have a current copy of the CBC
- plans, and drawings, as well as attached specifications.
- 5. All specifications, including but not limited to materials and products, shall be those put forth in the "Contract or Construction Documents". No substitutions shall be permitted to be used or assumed to be used in the bidding or construction process without written approval by the Structural Engineer of Record.
- 6. The contractor shall examine the "Contract or Construction Documents" and shall notify the 6. Cement shall be portland cement Type V and shall conform to ASTM C150. Architect or Structural Engineer of Record of any discrepancies he may find before proceeding with the work.
- 7. All information on existing conditions shown on drawings are based on best present 8. Water shall conform to ASTM C94 and be potable. knowledge available, but without guarantee of accuracy. The Contractor shall verify and be responsible for all dimensions and conditions at the site and shall notify the Architect or 9. All splices are to be Class B unless specifically noted otherwise. Structural Engineer of Record of any discrepancies between actual site conditions and information shown on or in the "Contract or Construction Documents" before proceeding 10. Where not specifically detailed, the minimum concrete cover on reinforcing steel shall be: with work.
- 8. The Contractor shall immediately notify the Architect or Structural Engineer of Record of any condition which in his opinion might endanger the stability of the structure or cause distress of the structure.
- 9. All work shall conform to the best practice prevailing in the various trades comprising work. The Contractor shall be responsible for coordinating the work of all trades.
- 10. These "Contract or Construction Documents" represent the finished structure, and do not indicate the method of construction. The Contractor shall supervise and direct the work and shall be solely responsible for construction means, methods, techniques, sequences and
- 11. Inspection and approval for fabricator's shops used for fabrication of structural load bearing members, components, materials or assemblies shall conform to CBC Section 1704A.2.5.
- B. Evaluation and follow-up inspection services (as required or specified), shall conform to CBC Section 1703A.6.
- 12. The Contractor shall refer to the specifications for information not covered by these drawings and General Notes.
- 13. The Contractor shall provide temporary bracing and shoring for all structural members as required for structural stability of the structure during all phases of construction.
- after the installation of all structural and finish materials. This shall include any necessary preloading of the structure to determine final position of the completed work.
- Engineer of Record (support services) shall not include inspections of safety or protective measures, nor construction procedures, techniques or methods. Any support services performed by Architect or Structural Engineer of Record during any phase of construction, shall be distinguished from continuous and detailed inspection services (as required by any 19. Only one grade of concrete shall be allowed on project site at any one time regulating governmental agency, e.g. the Authority Having Jurisdiction) provided by others. these support services, whether of material or work, are performed solely for the purpose of 20. Concrete strength shall be verified by standard cylinder tests (in accordance with CBC assisting in quality control and in achieving conformance with contract documents, but do

  Section 1905A.1.16) made by an approved testing laboratory. not guarantee Contractor's performance and shall not be construed as supervision of
- 16. Provide openings and supports as required per typical details and notes for mechanical, electrical equipment shall be properly "sway braced" against lateral forces.
- not carry necessary provisions for construction safety. These documents and all phases of construction hereby contemplated are to be governed, at all times, by applicable provisions of the current California Occupational Safety and Health Act.
- 18. Where any conflict occurs between the requirements of federal, state and local laws, codes, ordinances, rules and regulations, the most stringent shall govern.
- 19. Written dimensions shall have precedence over scaled dimensions.
- 20. Drawings (notes, schedules, details and plans) shall have precedence over Structural 21. In the event that certain features of the construction are not fully shown on the drawings or
- called for in the General Notes or Specifications, then their construction shall be of the same 3. Excavations for all drilled caissons/piers shall be approved by the Project Geotechnical character as for similar conditions that are shown or called for.
- 22. ASTM designation and all standards refer to the latest amendments.
- 23. These structural "Contract or Construction Documents" shall not be modified without prior written approval of the Structural Engineer of Record. 24. Only structural working drawings approved by the Authority Having Jurisdiction are
- permitted to be used for construction on this project. All other drawings or documents are 6. Caisson/piers are to be poured by end of day after completion of drilling operation. All obsolete and are not permitted on the job site, nor shall they be used for any construction purposes. Contractors using unapproved drawings or documents are solely responsible for all work not performed in accordance with the "approved" drawings.
- 25. A Division of the State Architect certified project inspector employed by the District (Owner) and approved by the Division of the State Architect shall provide continuous inspection of Code of Regulations.

## **FOUNDATION NOTES**

- 1. Basis: See Structural Design Values Chart, Sheet SB0.1 Table B
- 2. Unexpected soil conditions: Allowable values and foundation design are based upon the minimum values provided in Table 1806A.2 of the 2016 California Building Code. See SB0.1
- 3. Excavate to required depths and dimensions (as indicated in drawings), cut square and smooth with firm level bottoms. Care shall be taken not to over-excavate foundation at lower elevation and prevent disturbing of soils around higher elevation.
- Footings shall be poured in neat excavations, without side forms whenever possible.
- 5. Carry all foundations to required depths into compacted fill or natural soil (as per Structural 2. All structural steel shall conform to the following specifications: Plans and Details).
- 6. All foundation excavations shall be inspected and approved by the Inspector of Record or Geotechnical Engineer prior to forming and placement of reinforcing or concrete.
- 7. Foundations shall not be poured until all required reinforcing steel, sleeves, inserts, conduits, pipes, etc. and formwork is properly placed and inspected by the Authority having 3. All structural steel fasteners shall conform to the following specifications:
- 8. The sides and bottoms of excavations which are to have concrete contact must be moistened
- several times just prior to pouring upon them. De-water footings, as required, to maintain dry working conditions.

- 1. All reinforcing steel shall be deformed intermediate grade bars conforming to ASTM A615, Grade 60 ( $f_v = 60 \text{ ksi}$ ) unless noted otherwise. A. Grade 40 ( $f_v = 40$  ksi) may be used for #3 bars and smaller.
- 2. Reinforcing steel shall not be welded, unless specifically noted otherwise.
- 3. Welding of reinforcing steel (where specifically noted or detailed) shall conform to ACI
- 4. To hold reinforcing bars in their true position and prevent displacement, standard tie and
- submitted to Project Specific Architect or Project Specific Structural Engineer of Record, for their review, prior to fabrication.
- 6. Refer to typical details for minimum splice length and minimum radius of bend of reinforcing

7. All reinforcing steel splices shall be staggered 24", unless specifically noted or detailed

- All reinforcing bar bends shall be made cold.
- 9. Fabrication, erection and placement of reinforcing steel shall conform to Concrete 14. Provide 3" minimum concrete cover around all structural steel below grade. Reinforcing Steel Institute of Standard Practice.
- 10. All welded wire mesh shall conform to ASTM A185. Lap all wire mesh two modules.
- 11. Reinforcing steel shall be clean of rust, grease or other material likely to impair bond.

- 1. All concrete shall have a minimum ultimate compressive strength (f'c) as outlined below at 28 days. All concrete shall be regular weight (unless specifically noted otherwise). A. Concrete for footings: 4,500 psi w/c = 0.45 max. (see note 2)
- 2. For sites subject to soil with exposure class F0, S0, W0, C0, and C1 per ACI 138 19.3.1.1, the following design strength is permissible. The Geotechnical Engineer shall provide written verification of the soil exposure class. Provide exposure class in Table D on SB0.1

3,000 psi w/c = 0.45 max.

- 4. The "Contract or Construction Documents" shall consist of these notes, details, schedules,
  3. Maximum Fly Ash content shall be 15%, by weight, of total cementitious materials and shall conform to ASTM C618.
  - 4. All concrete work shall comply with CBC Chapter 19A and ACI 318-14 and latest edition of
  - ACI Manual of Concrete Practice. 5. Special Inspection (as required or specified) shall conform to CBC Chapter 17A.
  - 7. Aggregates shall conform to ASTM C33, provide aggregates from a single source.

A. Concrete for footings:

accordance with the following minimum schedule:

A. Concrete cast against and permanently exposed to earth or weather: 3"

10. Reinforcing bars larger than #8 are not permitted unless specifically detailed or noted

- 11. Location of all construction joints, other than specified, shall be approved by Architect/Structural Engineer of Record prior to pouring. Construction joints shall be thoroughly air and water cleaned and heavily roughened so as to expose coarse aggregates.
- All surfaces to receive concrete shall be maintained continuously wet at least three hours in advance of pouring.
- 12. All reinforcing steel, anchor bolts, dowels, inserts and any other hardware to be set in concrete shall be well secured in position prior to pouring of concrete. 13. Vibrate all concrete as it is placed, with a mechanical vibrator operated by experienced
- personnel. The vibrator shall be used to consolidate the concrete, not transport it. Reinforcing and forms shall not be vibrated. A. Labeling (as required or specified) shall be provided in accordance with CBC Section 14. Formwork design and removal shall conform to ACI 318-14 Section 26.11. Remove forms in
  - A. Side forms of footings: Minimum 48 hours B. Column and pier forms: 72 hours & 70% of design strength

15. Concrete shall not free fall more than six feet. Use tremie, pump or other approved methods.

- 16. Concrete shall be maintained in a moist condition for a minimum of 5 days after placement. 14. The Contractor shall take all steps necessary to ensure proper alignment of the structure 17. The Contractor may use concrete admixtures as a construction means and methods to
- execute "Contract or Construction Documents". Use of admixture is solely the responsibility 15. Observation visits to the project site by field representatives of Architect and/or Structural 18. Mix designs shall be prepared by an approved testing laboratory, signed by a licensed
  - engineer and shall be submitted to the Project Specific Structural Engineer of Record for

  - 21. Concrete placed when the air temperature has fallen to, or is expected to fall below 40° shall
- conform to ACI 318-14 Section 26.5.4, and ACI 306R-16. plumbing, and electrical equipment, vents, ducts, piping, etc. All mechanical, plumbing and 22. Concrete placed during hot weather shall conform to ACI 318-14 Section 26.5.5, and ACI
- 17. These notes, details, drawings and specifications (Contract or Construction Documents) do 23. Conduits and sleeves placed within structural concrete shall not be tied directly to structural
  - A. 1" concrete cover shall be maintained around all reinforcement. 24. No stakes shall be permitted within the footing section.

### DRILLED CAISSON/PIER AND GRADE BEAM NOTES

- 1. Excavations for drilled caissons/pier shall be performed in compliance with local grading codes and ordinances as well as CBC Chapters 18A and 33A.
- 2. Provide Special Inspection in accordance with CBC Section 1705A.8 and Table 1705A.8.
- Engineer prior to placing of concrete.
- 4. Reinforcement for drilled caissons/pier shall be approved by the Structural Engineer of Record prior to placing in caisson/pier excavation.
- 5. De-water caisson/pier footings and building excavation as required to maintain dry working
- concrete for a particular caisson/pier shall be on the job site prior to drilling the pile hole. 7. The Contractor shall be responsible for all shoring, bracing, etc. necessary to support cut and/or fill banks, and existing structures during excavation, and the forming and placement
- the work. The duties of the inspector are defined in Section 4-342, Part 1, Title 24 California 8. Bottom of caissons/piers shall be thoroughly cleaned prior to placement of concrete.
  - 9. Grade beam reinforcement:
  - A. Stagger splices in horizontal reinforcement. B. Locate splices between the  $\frac{1}{4}$  and  $\frac{1}{3}$  spans (between caisson/piers) of grade beams, unless noted otherwise.

1. All structural steel construction shall conform to AISC 360-10 and AISC 341-10. A. Fabrication of all structural steel shall be done in the shop of an approved fabricator. Inspection and approval for fabricator's shops used for fabrication of structural load

bearing members, components, materials or assemblies shall conform to CBC Section

- A. Angles, channels, plates, bars, rounds, and other miscellaneous shapes:
- Shall conform to ASTM A36 and shall have a minimum yield stress (F<sub>v</sub>) of 36 ksi. B. Wide-flange shapes:

Shall conform to ASTM A992 and shall have a minimum yield stress (F<sub>v</sub>) of 50 ksi.

- C. Structural tubes: Shall be ASTM A500, Grade B, and shall have a min. yield stress (F<sub>v</sub>) of 46 ksi.
- A. Bolts shall conform to ASTM A307
- . Anchor Bolts shall conform to ASTM F1554, Grade as noted in drawings Carbon steel nuts shall conform to ASTM A563
- Stainless steel nuts shall conform to ASTM F594 . Washers shall conform to ASTM F436
- 4. Special Inspection shall be provided for all structural steel and welding, in accordance with CBC Chapter 17A. 5. All structural steel shall be fabricated, erected and welded in accordance with AISC Specifications for Structural Steel Buildings (AISC 360-10) and Code of Standard Practice for
- Steel Buildings and Bridges (AISC 303-10). All welding shall be done by qualified and certified welders.
- 7. No field welding permitted, unless specifically noted otherwise.
- 318-14, Section 26.6.4 and AWS D1.4. Welded rebar shall be low-alloy steel conforming to 8. Shop drawings for the fabrication of any structural steel shall be approved by the Contractor and submitted to Project Specific Architect or Project Specific Structural Engineer of Record
- for their review, prior to fabrication. anchorage devices must be provided. Placing of reinforcement shall conform to ACI 318-14 9. No holes other than those specifically detailed shall be allowed through structural steel members. Burning of holes is not permitted.
- 5. Shop drawings for fabrication of any reinforcing steel shall be approved by Contractor and 10. All welding shall conform to 'AWS D1.1' specifications for welding. (E-70XX Electrodes). 11. Where fillet weld size is not indicated, use 'AWS' minimum size based on the thickness of the
  - thinner part being welded, as specified in AISC Specifications for Structural Steel Buildings (AISC 360-10), Section J2.2. 12. All butt welds to be complete joint penetration, unless specifically noted otherwise.

13. Welder qualification requirements, welding procedure and welding electrodes for all

- structural steel (except structural sheet steel, see steel decking) shall conform to CBC Sections 1705A.2.1 and 2204A.1.
- 15. Structural steel embedded into concrete shall be uncoated.
- 16. Structural steel shall be hot-dip galvanized (minimum ASTM A123 or A153 Class D) or painted with zinc-rich primer, undercoat, and finish coat; or equivalent paint system.
- 12. Epoxy-coated reinforcement (where specifically noted or detailed) shall conform to ASTM 17. All exposed steel fasteners, including cast-in-place anchor bolts/rods, shall be stainless steel (Type 304 minimum), hot-dip galvanized (ASTM A153, Class D minimum or ASTM F2329), or protected with corrosion-preventive coating that demonstrated no more than 2% of red rust in minimum 1,000 hours of exposure in salt spray test per ASTM B117. Zinc plated fasteners do not comply with this requirement.

## ARREVIATIONS.

	ABB	REVIATIONS		
	A.B.	Anchor Bolt		
ı	ABV.	Above	HORIZ.	Horizontal
ı	ACI	American Concrete Institute	HSS	Hollow Steel Section
ı	ADJ.	Adjacent	HT.	Height
ı	AHJ	Authority Having Jurisdiction		
ı	AISC	American Institute of Steel	ICC	International Building Code
ı		Construction	ICC	International Code Council
ı	AOR	Architect of Record	ID	Inside Diameter
ı	APPROX.	Approximate(ly)	IN.	Inch, Inches
ı	ASCE	American Society of Civil	INT.	Interior
ı		Engineers		
ı	ARCH.	Architect, Architecture	ksi	Kips per Square Inch
ı	ASTM	American Society of Testing		
ı		and Materials	LL	Live Load
ı	ATR	All Thread Rod		
ı	AWS	American Welding Society	MAX.	Maximum
ı		A DESTRUMENTAL DESTRUMENTA DEST	MB	Machine Bolt
ı	B.O.	Bottom of	MFR.	Manufactured, Manufacture
ı	вот.	Bottom	MIN.	Minimum
ı	b/t	Between	MPH	Miles per Hour
ı				
ı	CAC	California Administrative Code	N/R	Not Required
ı	CBC	California Building Code	N.T.S.	Not to Scale
ı	CIP	Cast-in-place		
ı	CJP	Complete Joint Penetration	o.c.	On Center
ı	Ç	Centerline	0/	Over
ı	CLR.	Clear	OD	Outside Diameter
ı	COL.	Column		
ı	CONC.	Concrete	PEN.	Penetration
ı	CONN.	Connection	PL.	Plate
ı	CONST.	Construction	PJP	Partial Joint Penetration
ı	CONT.	Continue, Continuous	psi	Pounds per Square Inch
ı			PSF	Pounds per Square Foot
ı	Ø	Diameter		
ı	DBL.	Double	REBAR	Reinforcing Bar
l	DET.	Detail	REINF.	Reinforcement
ı	DL	Dead Load	REQ'D	Required
ı	DSA	Division of State Architect		
ı	DWGS.	Drawings	S.F.	Square Feet
ı	DVVO3.	Diawings	SHT.	Sheet
ı	EA.	Each	SIM.	Similar
ı	E.F.	Each Face	SMS	Sheet Metal Screw
ı	ELEC.	Electric, Electrical	SQ.	Square
ı	ELEV.	Elevation	STAGG'D	Staggered
ı	EMBED.		STD.	Standard
ı	EOR	Embedded, Embedment	STL.	Steel
ŀ		Engineer of Record	SEOR	Structural Engineer of Recor
ı	EQ.	Equal	SLOW	Structural Engineer of Necor
ı	EQUIP.	Equipment	T&B	Top and bottom
ŀ	E.S.	Each Side	THR'D	Threaded
ŀ	E.W.	Each Way	T.O.	Top of
١	EXT.	Exterior	TYP.	Typical Typical
	FAR	Fabricated	111.	Турісаі
	FAB.	Fabricated	U.N.O.	Unless Noted Otherwise
	FDN.	Foundation	J.14.U.	Officas Noted Offici wise
-	F.G.	Finish Grade	VERT.	Vertical
	F.O.	Face of	VERT.	Verify in Field
	FRMG.	Framing	VII	verify in rieid
	FT.	Foot,Feet	/	Mith
	FTG.	Footing	w/	With
	CA	6	w/c	Water/Cement Ratio

GALV.

GEOR

Galvanized

Record

Geotechnical Engineer of

Welded Steel Stud

Weight

## SPECIAL INSPECTION GENERAL NOTES All Special Inspection shall be provided in accordance with CBC Section 1704A and Where Special Inspection is required, all inspection or testing shall be provided by

1703A.1 and 1704A.1.

A Division of the State Architect accepted testing laboratory directly employed by the District (Owner) shall conduct all the required tests and inspections for the Special Inspectors shall keep records of inspections. The Special Inspector shall furnish inspection reports to the Division of the State Architect, and to the Architect or Engineer of Record. Reports shall indicate that work inspected was done in conformance to approved construction documents. Discrepancies shall be brought

an approved Special Inspection Agency in accordance with CBC Section 1702A.1

to the immediate attention of the contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the Divisior of the State Architect and to the Architect or Engineer of Record prior to the completion of that phase of work. A final report documenting required Special Inspections and correction of any discrepancies noted in the inspections shall be submitted at a point in time agreed upon by the permit applicant and the Division of the State Architect prior to the start of work.

Special Inspectors shall be approved by the Division of the State Architect in accordance with CBC Section 1704A.2.1 and CAC Section 4-335(f)

CA	ST-IN-PLACE DEEP FOUNDATION	ONS°	
Ver	rification and Inspection	Continuous	Periodic
1.	Inspect drilling operations and maintain complete and accurate records for each element.	✓	
2.	Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end bearing strata capacity. Record concrete or grout volumes.	✓	
3.	For concrete elements, perform additional inspections and see Concrete Construction chart, this sheet, in accordance with CBC Section 1705A.3.		

## Notes: Cast-in-place Deep Foundations a. CBC Section 1705A.8 and Table 1705A.8

Inspection of concrete placement for proper

Inspection for maintenance of specified curing

Inspect formwork for shape, location and

dimensions of the concrete member being

application techniques.

temperature and techniques.<sup>j</sup>

### CONCRETE CONSTRUCTION<sup>30</sup> Verification and Inspection Continuous Periodic Inspection of reinforcing steel including prestressing tendons, and placement.c Inspection of reinforcing steel welding in accordance with Table 1705A.2.2. item 5b.d Inspection of anchors cast in concrete.e Verifying use of required design mix.g At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.h

Batch Plant Inspection.q Where applicable, see also CBC Section 1705A.12, Special Inspections for seismic Specific requirements for Special Inspection shall be included in the research report

- for the anchor issued by an approved source in accordance with ACI 318-14 Section 17.8.2 or other requirements. Where specific requirements are not provided, Special Inspection requirements shall be specified by the Registered Design Professional and shall be approved by the Building Official prior to the commencement of the work. ACI 318: Ch. 20, 25.2, 25.3, 26.5-1-26.5.3, CBC: 1908.4 AWS D1.4, ACI 318: 26.5.4
- ACI 318: 17.8.2 ACI 318: 17.8.2.4, 17.8.2 ACI 318: Ch. 19, 26.4.3, 26.4.4, CBC: 1904.1, 1904.2
- ASTM C172, ASTM C31, ACI 318: 26.4.5, 26.12, CBC: 1908.10, 1908.2, 1908.3 ACI 318: 26.4.5, CBC: 1908.6, 1908.7, 1908.8 ACI 318: 26.4.7-26.4.9, CBC: 1908.9 ACI 318: 26.9.2.1, 26.9.2.3
- ACI 318: Ch. 26.8 ACI 318: 26.10.2 ACI 318: 26.10.1 (b) CBC Section 1705A.3 and Table 1705A.3

daily record as required by enforcement agency.

- See Special Cases Special Inspection for more requirements Continuous batch plant inspection may be waived by the Authority Having Jursidiction, subject to the enforcement agency under the following condition: The concrete plant complies fully with the requirements of ASTM C94, Sections 9 and 10, and has a current certificate from the National Ready Mixed Concrete Association or another agency acceptable to the enforcement agency. The
- certification shall indicate that the plan has automatic batching and recording When continuous batch plant inspection is waived, the following requirements shall
- 1. An approved agency shall check the first batch at the start of the day to verify materials and proportions conform to the approved mix design. A licensed weighmaster shall positively identify quantity of materials and certify
- each load by a batch ticket. Batch tickets, including material quantities and weights shall accompany the load shall be transmitted to the inspector of record by the truck driver with load identified thereon. The load shall not be placed without a batch ticket identifying the mix. The inspector of record shall keep a daily record of placements, identifying each truck, its load, and time of receipt at the jobsite, and approximate location of deposit in the structure and shall maintain a copy of the

S	TEEL CONSTRUCTION <sup>ab</sup>	17	
Ve	rification and Inspection	Continuous	Periodic
Req	uired verification and inspection of steel construc	tion	
1.	Material verification of structural steel, cold-formed steel deck, high-strength bolts, nuts and washers:		
	a. For structural steel, identification markings to conform to AISC 360, or ASTM Standards Specified in approved Construction Documents. Manufacturer's certificate of compliance required.		✓
2.	Material verification of structural steel:		
	Identification markings to conform to     ASTM standards specified in the     approved construction documents.		✓
	b. Manufacturer's certified test reports.		<b>✓</b>
3.	Material verification of weld filler materials:		
	Identification markings to conform to     AWS specification in the approved     Construction Documents		<b>✓</b>
	b. Manufacturer's certificate of compliance required		<b>✓</b>
4.	Inspection of welding:		
	a. Structural steel and cold formed steel deck:		
	Complete and partial joint penetration groove welds	<b>✓</b>	
	2) Multi-pass fillet welds	<b>/</b>	
	3) Single-pass fillet welds > 5/16"	<b>✓</b>	
	5) Single-pass fillet welds < 5/16"		<b>✓</b>
5.	Inspection of steel frame joint details for compliance:		
	a. Details such as bracing and stiffening		<b>✓</b>
	b. Member locations		<b>✓</b>
	<ul> <li>Application of joint details at each connection</li> </ul>		<b>✓</b>
Insp	ection tasks prior to welding		
1.	Welding procedure specifications (WSPs) available	<b>✓</b>	
2.	Manufacturer certifications for welding consumables available	<b>✓</b>	
3.	Material identification (type/grade)		<b>✓</b>
4.	Welder identification system <sup>e</sup>		<b>✓</b>
5.	Fit-up of groove welds (including joint geometry) Joint preparation, dimensions, cleanliness, tacking, backing type and fit		<b>✓</b>
6.	Configuration and finish of access holes		/
7.	Fit-up of fillet welds Dimensions, cleanliness, tacking		/
8.	Check welding equipment		
Insp	ection tasks during welding		
1.	Use of qualified welders		<b>✓</b>
2.	Control and handling of welding consumables Packaging, exposure control		<b>✓</b>
3.	No welding over cracked tack welds		<b>✓</b>
4.	Environmental conditions Wind speed within limits, precipitation and temperature		/
5.	WPS followed Settings on welding equipment, travel speed, selected welding materials, shielding gas type/flow rate, preheat applied, interpass temperature maintained min./max.),proper position (F, V, H, OH)		✓
6.	Welding techniques Interpass and final cleaning, each pass within profile limitations		/
nsp	ection tasks after welding		
1.	Welds cleaned		/
2.	Size, length and location of welds	<b>√</b>	
3.	Welds meet visual acceptance criteria Crack prohibition, weld/base-metal fusion,		

crater cross section, weld profiles, weld

Backing removed and weld tabs removed (if

Document acceptance or rejection of welded

size, undercut, porosity

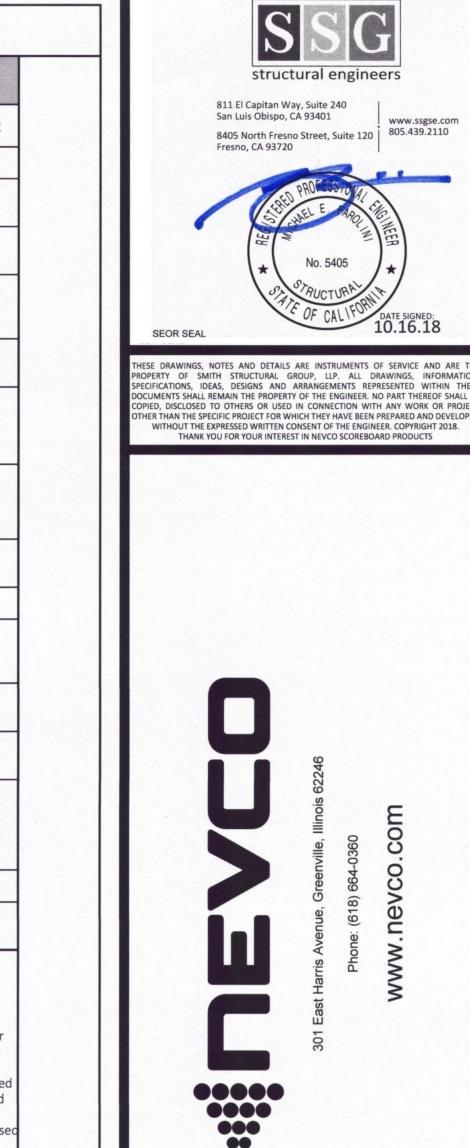
Arc strikes

k-Area<sup>f</sup>

Repair activies

joint or member

S	TEEL CONSTRUCTION, CONTIN	UED			
Ve	rification and Inspection	Continuous	Periodi		
Insp	ection tasks prior to bolting <sup>g</sup>				
1.	Manufacturer's certifications available for fastener materials	<b>✓</b>			
2.	Fasteners marked in accordance with ASTM requirements		/		
3.	Proper fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane)		/		
4.	Proper bolting procedure selected for joint detail		/		
5. Connecting elements, including the appropriate faying surface condition and hole preparation, if specified, meet applicable requirements					
6. Pre-installation certification testing by installation personnel observed and documented for fastener assemblies and methods used					
7. Proper storage provided for bolts, nuts, washer and other fastener components					
Insp	ection tasks during bolting				
1.	Fastener assemblies, of suitable condition, placed in all holes and washers (if required) are positioned as required		/		
2.	Joint brought to the snug-tight condition prior to the pretensioning operation		<b>✓</b>		
3.	Fastener component not turned by the wrench prevented from rotating		/		
4.	Fasteners are pretensioned in accordance with the RCSC specification, progressing systematically from the most rigid point toward the free edges, see Minimum Bolt Pretension table below		<b>/</b>		
Insp	ection tasks after bolting				
1.	Document acceptance or rejection of bolted connections	✓			
No a. b. c. d. e. f.	tes: Steel Construction CBC Section 1705A.2 and Table 1705A.2.2 CBC Section 1707A.11.1 AWS D1.3 AWS D1.4, ACI 318: Section 3.5.2 The fabricator or erector, as applicable, shall m who has welded a joint or member can be iden low-stress type. When welding of doubler plates, continuity plain the k-area, visually inspect the web k-area fo All methods of installation for high strength bol pre-tension by a Skidmore-Welhelm calibrator (see minimum pre-tension chart below).	tified. Stamps, if use tes or stiffeners has r cracks within 3 inc ts shall require verif	been perform hes of the we fication of		
Mini	imum Bolt Pretension (kips)				
Bolt	size , inches	Group A (A325, etc.)	Group B (A490, etc		
	½" Diameter	12	15		
	%" Diameter	19	24		
	¾" Diameter	28	35		
	⅓" Diameter	39	49		
	1" Diameter	51	64		
	1⅓" Diameter	56	80		
	1½" Diameter	71	102		
	1¾" Diameter	85	121		
	278 2141110101				



PRE-CHECK (PC) DOCUMENT CODE: 2016 A separate project application

for construction is required.

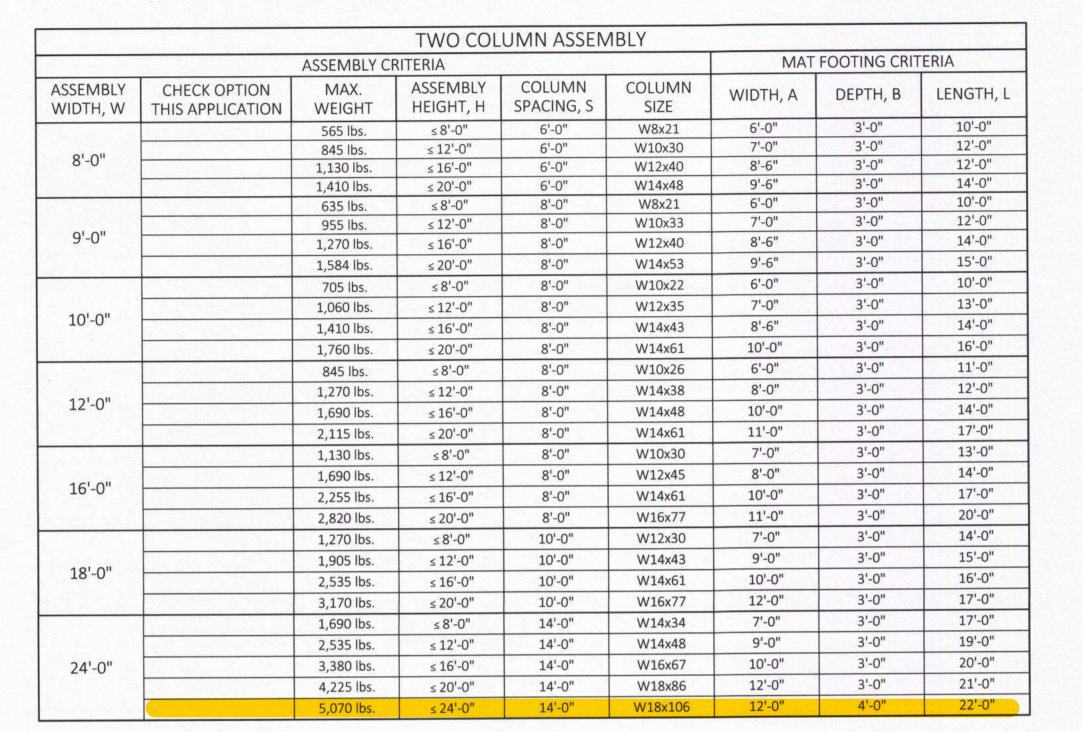
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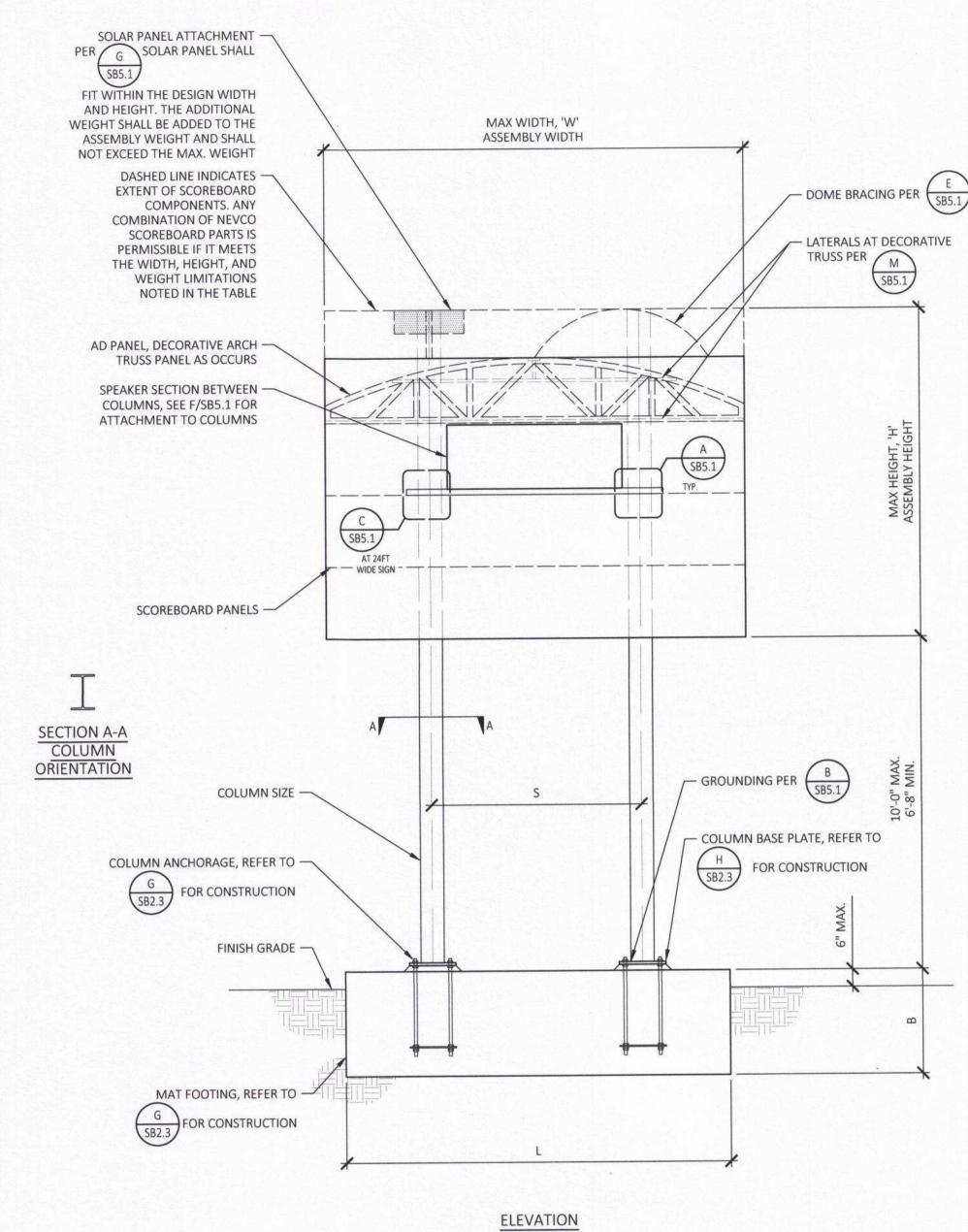
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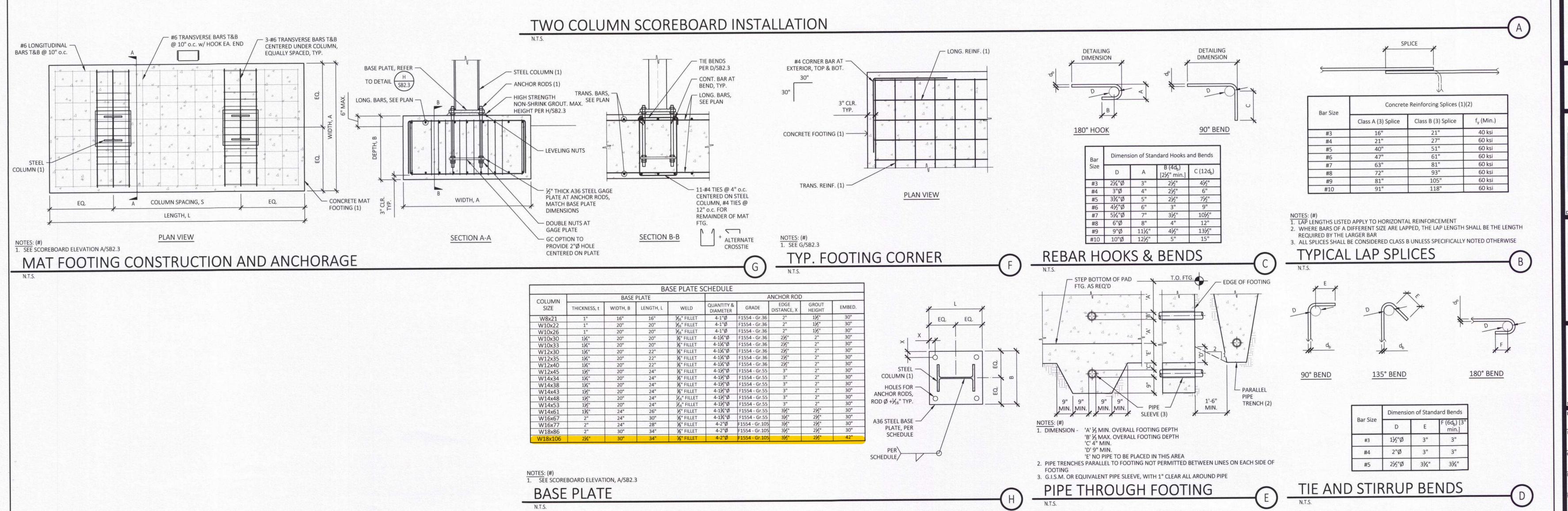
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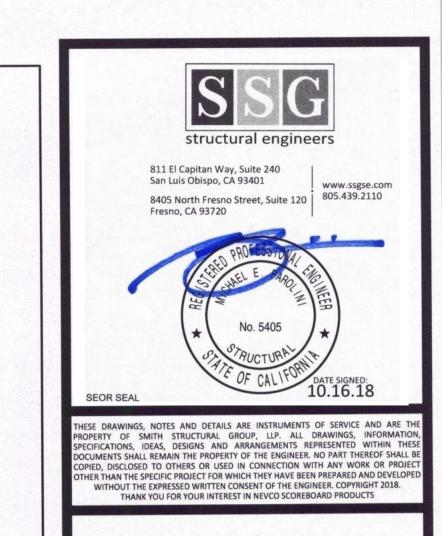
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TWO COLUMN MAT FOOTING

ADDENDUM 1
SHEET INFORMATION

DATE

10.16.18

DRAWN

JMK / JMM

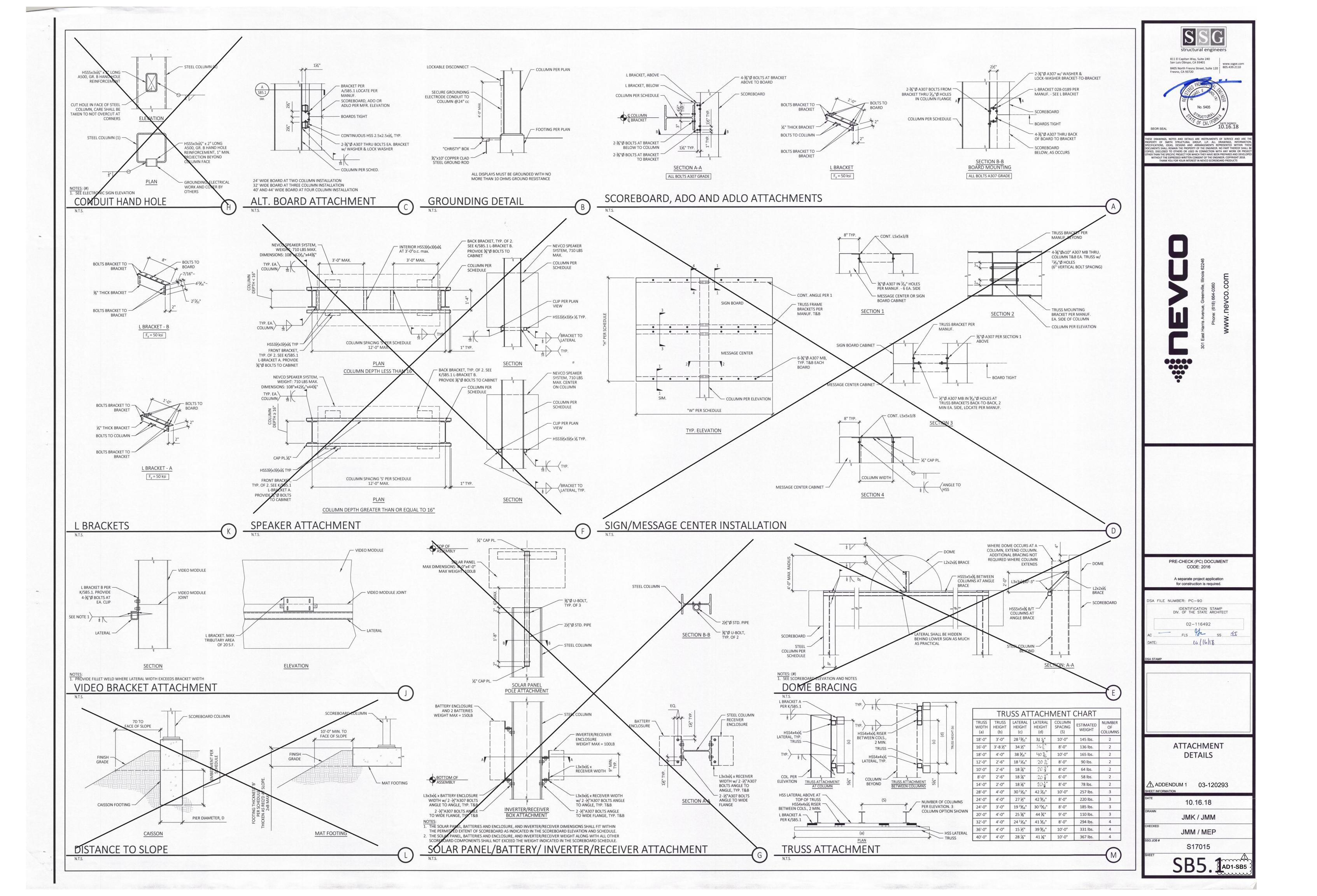
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SSG JOB #

S17015

SB2.3



# RIO MESA HIGH SCHOOL STADIUM SOUND SYSTEM OXNARD UNION HIGH SCHOOL DISTRICT

OXNARD, CA

DEVICE ID

DESCRIPTION

**GENERAL NOTES** REFER TO AUDIO VISUAL SPECIFICATION SECTION FOR COMPLETE REQUIREMENTS

### 1. ELECTRICAL

- A. All conduits, junction boxes, back boxes, pull string and power outlets by Division 26
- B. All power to AV equipment to originate from dedicated audio video load center in accordance with the latest local and national codes referencing "technical power systems". NEC Article 640.
- C. Branch circuits feeding audio-visual equipment must not originate from load centers connected to inductive loads.
- D. Provide all AV circuits with isolated ground, dedicated neutral.

### COORDINATE

- A. Coordinate with the work of all sections. Coordinate the location of blocking and backing required by this section. Make reasonable minor adjustments to preserve architectural symmetry and alignment with adjacent features at no claim for additional cost or time. Present conflicts in timely manner for resolution.
- B. Relocation, revision or correction caused by failure of the contractor to coordinate the
- work shall not be subject to claim for additional cost or time. C. Power receptacles shown on the AV drawings outside of equipment racks are shown for
- coordination information only. Refer to Division 26 documents for construction. D. These drawings show scope. The exact location & elevations of loudspeakers,
- receptacles and devices must be coordinated with the architectural drawings. Conduit, back boxes and pull boxes supplied and installed by electrical contractor under
- F. General contractor shall coordinate the conduit, devices, pathways and junction boxes for the AV system with other trade to avoid any conflicts.

### LOCATIONS AND DIMENSIONS

supervision of AV contractor.

- A. Locations and dimensions shown on architectural drawings take precedence over these AV drawings. In case of apparent conflict or ambiguity, submit to the Architect in timely manner for resolution.
- B. Dimensions take precedence over scale. Large scale drawings take precedence over small. Report all conflicts before installation.
- C. Unless otherwise noted, dimensions are shown height x width x depth.
- D. Verify all dimensions, locations and conditions in the field prior to starting work. Notify Architect of any apparent discrepancies.

## 4. <u>SUPPORT</u>

Provide all blocking, bridging, ties, fasteners and related support provisions for all work of this section. Comply with applicable code requirements for means of support of electrical equipment of the same weight under the same mounting conditions. Do not apply any load to building structure without first obtaining written approval of the project Structural Engineer. Obtain per project procedures. Supports for raceway system by Division 26 contractor.

## BOX, PANEL AND ENCLOSURE INSTALLATION

- A. Coordinate the location of all boxes, panels, enclosures and related raceway with the
- B. Verify access to boxes, panels and enclosures comply with applicable code. C. Coordinate and correct all conditions of occlusion of all loudspeaker assemblies. Where
- more than one (1) flush mounted ceiling loudspeaker has been scheduled, none shall be located closer to any fixed wall than one-half (1/2) of the adjacent clear height, except at ceiling discontinuities, or where specifically shown on the drawings.
- D. Install boxes, panels and enclosures square and plumb. Set flush mounted units so that the face of the cover, Bezel or Escutcheon, is in the same plane as the surrounding finished surface. Mount boxes, panels and trim so that there are no gaps, cracks or obvious lines between the trim and the adjacent finished surface.
- E. Unless otherwise noted, provide steel boxes, panels and enclosures. Comply with Division 26 requirements and applicable code.
- F. Unless otherwise noted, boxes and enclosures shall be not less than 2-1/8 inches deep. Provide the larger of the size required by applicable code or as shown on drawings. Coordinate wire and cable bend radius with box and enclosure size.
- G. Pull boxes: Provide as required by the most restrictive of applicable code or the provisions of Division 26. Coordinate with wire and cable bend radius.
- H. Provide required fire rated junction boxes or fire stop box guards at all fire rated walls.

## 6. RACEWAY

- A. For all work of this section, raceway above ground shall be EMT, raceway below ground shall be PVC.
- B. Raceway shall be <sup>3</sup>/<sub>4</sub> inch diameter trade size unless otherwise noted.
- C. All conduit runs over 100 ft. must have large radius bends.
- D. A maximum of two 90 degree elbows in each conduit run. E. Conduit with fiber optic cable installed, must conform to the minimum bend radius as specified by the manufacturer of the cable. Division 26 contractor is to apply radius bends where needed. Fiber bend radius shall be a minimum long-term low-stress radius
- not less than 20 times the cable diameter. F. Keep a minimum of 12" clear between electrical conduit and low voltage conduit.
- G. Provide fire rated conduit penetration seals at all fire rated walls. H. Conduit and accessories must be installed plumb and true with uniform fastening, fully
- dressed and finished.

### **GROUNDING AND BONDING**

Comply with all applicable codes and ordinances. Refer to National Electrical Code Section 250.

- A. Bond raceway and related boxes, panels, enclosures and cabinets as required by
- applicable code and Division 26. B. Make raceway connections to equipment racks and similar equipment enclosures
- containing powered equipment with isolated fittings. Ground and bond equipment racks and similar equipment enclosures containing powered equipment exclusively via the isolated equipment grounding conductors provided under Division 26. Size such conductors according to applicable code. For each technical branch circuit, the isolated equipment grounding conductor shall be

copper of the same gauge as supply and neutral conductors. Main isolated equipment

grounding conductor to each ensemble of equipment racks shall be copper, sized as

- required by applicable code. D. D.C. resistance between the isolated equipment grounding bus at equipment room
- technical power panels and the main project ground field shall not exceed 0.15 OHMS. E. For community antenna television and master antenna television systems and related provisions, comply with Article 800, National Electrical Code.

### 8. CABLE AND WIRE

- A. All low voltage cable and wire by Audio-Visual Contractor.
- B. Use plenum rated wire where required by code.
- C. Cable splicing not allowed in any pullboxes.

- A. In the event that these plans, notes or details or any part or portion thereof are used by any third-party without the express authorized permission of VENEKLASEN ASSOCIATES, the unauthorized user and anyone benefiting therefrom, shall defend, indemnify and hold harmless VENEKLASEN ASSOCIATES and its Agents, Principals, Employees and Consultants from and against any and all claims, including attorneys' fees arising out of said unauthorized use.
- B. Furthermore, the unauthorized use of these plans, notes, details or any part or portion therefore is expressly prohibited and VENEKLASEN ASSOCIATES retains a copyright over any and all documents prepared by VENEKLASEN ASSOCIATES.
- C. In the event that the installer deviates from the plans and specifications prepared by VENEKLASEN ASSOCIATES which results in damage to persons or property of any kind, Installer hereby agrees to defend, indemnify and hold harmless VENEKLASEN ASSOCIATES, its Agents, Principals, Employees and Consultants from and against any and all claims, including attorneys' fees caused by such failure to follow the plans and specifications prepared by VENEKLASEN ASSOCIATES, excepting only the damages to persons or property which are caused by the sole negligence or willful misconduct of VENEKLASEN ASSOCIATES.
- D. Drawings are diagrammatic and are intended to convey Scope of Work and to indicate general arrangement. There are not intended to show every detail including offset or fitting or every structural difficulty that may be encountered during the work. Except as otherwise indicated, locations of items are approximate only. Exact locations necessary to secure proper conditions and results must be determined at project site and must be approved by the Owner's representative.
- E. Except as otherwise indicated, make reasonable modifications in layout as needed to prevent conflict with other work or proper execution of work.
- Include work not usually shown or specified, but necessary for proper installation and operation of a system or piece of equipment in work.

	BOX TYPE	BOX SIZE	INSTALL METHOD	ELEVATION
SEQUENCER	FSR WB-4G WITH COVER & KEY	8.9 x 8.9 x 3.75	ΙΜΛΙΙ	8" ABOVE COUNTER

AIP/PSQ	AUDIO INPUT PANEL AND POWER SEQUENCER JUNCTION BOX	FSR WB-4G WITH COVER & KEY	8.9 x 8.9 x 3.75	ΙΜΛΙΙ	8" ABOVE COUNTER
ALA	ASSISTIVE LISTENING ANTENNA	N/A	N/A	CEILING	N/A
ERK1	EQUIPMENT RACK	N/A	N/A	WALL	N/A
JB#	JUNCTION BOX	HANDHOLE BUILT INTO POLE BRACKET	I NI/A	INTEGRATED IN POLE BRACKET	SEE DETAIL ON AV6.1 AND AV6.2
WMA	WIRELESS MIC ANTENNA	N/A	N/A	CEILING	N/A

**BOX SCHEDULE** 

NOTE: CONTRACTOR IS TO PROVIDE BLANK PANELS FOR ALL BOXES THAT ARE DESIGNATED FOR FUTURE USE. BOXES THAT ARE ABLE TO ACCEPT STANDARD SIZE BLANK PANELS SHALL BE PROVIDED WITH SAME (SGMR, 2GMR, SWITCH BOXES, ETC). NON STANDARD SIZE BOXES (I.E. TOUCH PANELS) WILL BE PROVIDED WITH ANODIZED ALUMINUM BLANK PANELS. SEE SPECIFICATION FOR REQUIREMENTS (I.E. COLOR COORDINATION). CONTRACTOR TO LABEL ALL CONDUIT STUBS AND FUTURE BACK BOXES WITH PERMANENT MARKER. SEE SPECIFICATION FOR DETAILS.

SHEET INDEX

		FOR REVIEW	ADDENDUM 1
	Sheet Index		
Sheet Number	Sheet Title		 
(AV0.1) - AVD1-AV1	GENERAL NOTES AND SHEET INDEX	X	X
(AV0.2) - AVD1-AV2	ABBREVIATIONS NOTES AND SYMBOLS	X	X
(AV1.1) - AVD1-AV3	ENLARGED AV SITE PLAN	X	X
(AV1.2) - AVD1-AV4 (AV1.5) - AVD1-AV5	AV SPEAKER COVERAGE PLAN	X	X
(AV1.5) - AVD1-AV5 (AV2.1) - AVD1-AV6	AV ENLARGED LAYOUTS  AV ENLARGED PLANS	X	X
(AV2.2) - AVD1-AV7	AV ENLARGED PLANS  AV ENLARGED PLANS	X	X
(AV3.1) - AVD1-AV8	AV RISER DIAGRAM	X	^   X
(AV4.0) - AVD1-AV9	WIRING SCHEME AND SYMBOL KEY	X	X
(AV4.1) - AVD1-AV10	AV ONELINE DIAGRAMS	X	X
(AV5.0) - AVD1-AV11	AV TYPICAL SEISMIC AND GROUNDING DETAILS	X	X
(AV6.1) - AVD1-AV12	AV DETAILS	X	X
(AV6.2) - AVD1-AV13	AV DETAILS	X	X
(AVO.2) - $AVDI-AVIO$			



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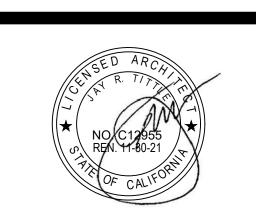
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**OXNARD UNION** HIGH SCHOOL DISTRICT

> TADIUM HIGH SCHO





03-12029	93	
ISSUE DATE		
REVISIONS		
<u> </u>	ADDENDUM 1	
PROJECT TEAM		
PRINCIPAL IN CHARC JACK SHIMIZU	GE:	
PROJECT LEADER: PABLO AMEZQUITA		
DESIGN TEAM:		

RIO MESA HIGH SCHOOL STADIUM SOUND SYSTEM

6121235311

VENEKLASEN ASSOCIATES

GENERAL NOTES AND SHEET INDEX

Device ID	Description	CPP	Central Processing Unit	GEQ	Graphic Equalizer	MPS	Motorized Projection Screen	RSRS	Rotating Sliding Rail System	TRC	Transceiver
GMR	1 Gang Mud Ring	CPU	Central Processing Unit	GNM	Gooseneck Microphone	MR	Message Repeater	RSW	RGB Switcher	TS	Touch Screen
GMR	2 Gang Mud Ring	CRC	Camera Remote Control			MRP	MD Recorder Player	RTP	Remote Truck Panel	TT	Turn Table
DTV	3D Television	CRK	Control Rack	HDTV	High Definition Television	MSC	Main System Controller	RX	Receiver	TTP	Table Top Panel
BGMR	3 Gang Mud Ring	CS	Conference Station	HDW	Hardware	MSF	Master Fader			TV	Television
IGMR	4 Gang Mud Ring	CSF	Call Signal Flasher	HFS	High Frequency Speaker	MSP	Microphone Splitter	S	Speaker Level	TVP	TV Panel
		СТ	Control	ННМ	Hand Held Microphone	MSR	Microphone Splitter Rack	SA	Aquatic Speaker	TVT	TV/RF Tuner
4	Audio	СТМ	Control Module	HPR	Headphone Remote Station	MSV	Media Server	SAN	Storage Area Network	TX	Transmitter
ABA	Audio Buffer Amplifier	CTN	Cable Tuner	HRB	Headset Remote Box	MSW	Matrix Switcher	SAT	Satellite Receiver		
AC	Audio Combiner	CTR	Controller	HS	Headset	MXP	Mixer Pre-Amplifier	SB	Bass Speaker	UBC	Unbalance to Balance Converter
ACM	Audio Card Module	CTS	Computer Training System	HTS	Home Theater System			SC	Ceiling Speaker	UC	Up Converter
ACN	Audio Control Network	CVM	Computer Video Monitor			NADU	Network Audio Distribution Amp	SCB	Cinema Speaker Bass	UCD	Unified Communication Device
ACR	Audio Control Relay			IAA	Integrated Audio Amplifier	NET	Network Outlet	SCD	Speaker Control Distribution	UP	Usher Panel
ACS	Audio Conferencing System	DA	Distribution Amp	IBP	Intercom Belt Pack	NHB	Network Hub	SCF	SC Fiber Connector	UPS	Uninterruptible Power Supply
ADA	Audio Distribution Amplifier	DAB	Digital Audio Bus	IBS	Intercom Base Station	NI	Network Interface	SCN	Cinema Speaker	USB	Univeral Serial Bus
ADB	Audio Distribution Box	DAO	Digital to Analog Output	IC	Intercom	NMCPU	Network Manager CPU	SCP	System Control Pad	USBX	Universal Serial Bus Extender
ADI	Analog to Digital Input	DAR	Digital Audio Recorder	ICS	Intercom Station	NSG	Noise Gate	SDA	SDI Distribution Amplifier		
ADK	Audio Ducker	DAS	Digital Audio Source	ID	Interactive Display	NSS	Network Source Switch	SDB	Speaker Distribution Box	V	Video
ADP	Adaptor	DAT	Digital Audio Tape Unit	IFC	Interface Card	NT	Network Terminator	SDD	Solid State Disk Dock	VC/SS	Volume Control / Selector Switch
AE	Audio Extractor	DB	Direct Box	IH IH	Intercom Handset	NWS	Network Switch	SE	Effects Speaker	VCA	Voltage Controlled Amplifier
AFT	AM/FM Tuner	DC	Document Camera	IHS	Intercom Head Set		Network Switch	SER	Serial	VCC	Video Conference Camera
	Audio Input Module		Digital Controlled Amplifier		Intercom Main Station	OPJ	Optical Projector		Sound Enhancement Speaker	VCM	
AIM	<u>'</u>	DCA		IMS		OPJ	Optical Projector	SES	'		Video Card Module
AIP	Audio Input Panel	DCC	Data Control Card	IOP	Input/Output Panel	<del>_</del>	1_	SFF	Front Fill Speaker	VCR	Video Cassette Recorder
AIU	Analog Interface Unit	DCM	Digital Cart Machine	IPC	IP Camera	<del>-</del> Р	Power	SG	Ground Speaker	VCS	Video Conferencing System
AL	Audio Left	DCN	Divider Combiner Network	IR	Infrared	PA	Power Amplifier	SGEN	Sync Generator	VCU	Video Conferencing Unit
ALA	Assistive Listening Antenna	DCPU	Digital Central Processing Unit	IRB	IR Broadcast	PAD	Pad	SGMR	Single Gang Mud Ring	VD	Video Display
ALR	Assistive Listening Receiver	DCR	Digital Capture Recorder	IRE	IR Emitter	РВ	Push Button	SGP	Signal Processor	VDA	Video Distribution Amplifier
ALS	Assistive Listening System	DD	Dimmer Doubler	IRM	IR Modulator	PBR	Play Back Rack	SGS	Signage Server	VDR	Video Disk Recorder
ALT	Assistive Listening Transmitter	DDL	Digital Delay	IRR	IR Receiver	PC	Personal Computer	SH	Horn Speaker	VE	Video Encoder
AM	Audio Monitor	DEB	De-Embedder	IRS	Intercom Remote Station	PCB	Patch Cable	SHF	Shelf	VEH	Video Encoder Hub
AMS	Audio Monitor Speaker	DEC	Decoder	IRT	IR Transmitter	PCC	Personal Computer Control	SI	Sensor Interface	VF	View Finder
AMX	Auto Mixer	DEQ	Dynamic Equalizer	ISDN	Integrated Service Digital Network	PCD	Power Conditioner	SIS	Set Integrated Speaker	VFX	Video Effects Processor
ANT	Antenna	DFR	Digital File Recorder	ITR	Isolation Transformer	PCLD	Projector Controller With Line Doubler	SIW	In-Wall Speaker	VIC	Visual Concert
AOB	Analog Output Bridge	DIM	Dimmer Module			PCT	Portable Cart	SJB	Speaker Junction Box	VIP	Video Input Panel
AOP	Audio Output Panel	DIU	Digital Interface Unit	JB	Junction Box	PD	Plasma Display	SLA	Speaker Line Array	VL	Voice Lift
AP	Access Point	DJCC	Digital Joystick Camera Control	+		PDL	Plasma Display Lift	SMP	Stage Manager Panel	VLCF	Voice Lift Card Cage Frame
APB	Audio Patch Bay	DM	Digital Mixer	КВ	Keyboard	PEC	Portable Equipment Case	SMR	Stage Manager Rack	VM	Video Monitor
APD	Antenna Power Distribution	DMR	Dimmer Rack	KM	Keyboard & Mouse	PEQ	Parametric Equalizer	SMS	Scaling Matrix Switcher	VMS	Video Matrix Switcher
APM	Audio Program Monitor	DMX	DMX	KMI	Keyboard & Mouse Interface	PGM	Program Monitor	SMSW	Satellite Multiswitch	VOL	Volume Control
	Audio Right		DMX Control Cable		Keyboard & Mouse Kit	PGS	Paging System	SMX	Splitter Mixer	VOP	Voice Over Paging Module
AR	<u> </u>	DMXC		KMK		PGS			'		<u> </u>
ASP	Antenna Splitter	DMXN	DMX Node	KVM	Keyboard, Video & Mouse	PI	Power Injector	SO	Speaker Overhead	VPB	Video Patch Bay
ASV	Audio Server	DPB	Disc Publisher	KVME	Keyboard, Video & Mouse Extender	PJL	Projector Lift	SP	Speaker	VPJ	Video Projector
ASW	Audio Switcher	DRC	Door Control			PJS	Projection Screen	SPCL	Speaker Cluster	VPJRM	Video Projector Rotating Mount
AT	Audio Tie Line	DREC	Digtial Recorder	LAN	Local Area Network	PM	Paging Microphone	SPG	Program Speaker	VPM	Video Program Monitor
ATI	Audio Teleconference Interface	DSD	Data Stroage Device	LC	Lighting Console	PMIC	Presentation Microphone	SPJ	Slide Projector	VPS	Video Production Switcher
ATN	Attenuator	DSP	Digital Signal Processor	LD	Line Doubler	PMP	Podium Microphone Panel	SPL	Splitter	VSC	Video Scan Converter
AV	Audio Video	DSS	Digital Satellite System	LDP	Laser Disc Player	PNWS	Power Network Switch	SPN	Stage Panel	VSL	Video Scaler
AVC	Auto Volume Controller	DTP	Digital Twisted Pair	LDR	Line Driver	POD	Podium	SPP	Speaker Patch Panel	VSP	Video Signal Processor
AVD	Audio Video Distribution	DVC	DVD/VCR Combo	LEC	Lectern	PP	Podium Panel	SPR	Speaker Processor	VSPC	Video Screen Panel Control
AVI	Audio Video Interface	DVD	Digital Versatile Device	LED	Light Emitting Panel	PPS	Phantom Power Supply	SPT	Speaker Portable	VSS	Video System Switcher
AVIM	Audio Video Input Module	DVHS	Digital Cassette Recorder	LFS	Low Frequency Speaker	PRE	Pre Amplifier	SRA	Stereo Receiver Amp	VSV	Video Server
AVN	Audio Video Network	DVP	Digital Video Processor	LI	Lighting Interface	PRK	Portable Rack	SS	Surround Sound Speaker	VSW	Video Switcher
AVP	Audio Video Panel	DVR	Digital Video Recorder	111	Line Level	PS	Power Supply	SSA	Solid State Audio Source	VT	Video Tie Line
AVR	Audio Video Router	DVS	Digital Video Scaler	LM	Line Module		113				
AXF	Auto Transformer		<u> </u>		IT THE MODULE	IPSB	Powered Subwoofer		Sliding Shelf		Video Wall
	Auto Transionnei	III\\\\\\	Drawer	TIP.		PSB PSC	Projection Screen Control	SSF	Sliding Shelf Streaming Server	VW	Video Wall Processor
		DWR	Drawer	LP	Lectern Panel	PSC	Projection Screen Control	SSF SSV	Streaming Server		Video Wall Video Wall Processor
DAT	Rattery			LPM	Lectern Panel Lapel Microphone	PSC PSD	Projection Screen Control Paging Station Desk Mount	SSF SSV SSW	Streaming Server Serve Switch	VW VWP	Video Wall Processor
	Battery Charge	EBD	Embedder	LPM LPT	Lectern Panel Lapel Microphone Laptop	PSC PSD PSLR	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote	SSF SSV SSW STB	Streaming Server Serve Switch Stage Box	VW VWP WAA	Video Wall Processor  Wireless Antenna Amplifier
ВС	Battery Charge	EBD EBF	Embedder Expanded Beam Fiber Connector	LPM LPT LTF	Lectern Panel Lapel Microphone Laptop Line Transformer	PSC PSD PSLR PSP	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker	SSF SSV SSW STB SUM	Streaming Server Serve Switch Stage Box Summing Amplifier	VW VWP WAA WAD	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution
BC BDP	Battery Charge Blu-Ray Disc Player	EBD EBF EC	Embedder Expanded Beam Fiber Connector Expansion Card	LPT LTF LTP	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel	PSC PSD PSLR PSP PSR	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount	SSF SSV SSW STB SUM SV	Streaming Server Serve Switch Stage Box Summing Amplifier S-Video	VW VWP WAA WAD WAS	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter
BC BDP BOB	Battery Charge Blu-Ray Disc Player Break Out Box	EBD EBF EC EDB	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box	LPM LPT LTF	Lectern Panel Lapel Microphone Laptop Line Transformer	PSC PSD PSLR PSP PSR PSW	Projection Screen Control  Paging Station Desk Mount  Program Select & Level Remote  Powered Speaker  Paging Station Rack Mount  Paging Station Wall Mount	SSF SSV SSW STB SUM SV	Streaming Server Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter	VW VWP WAA WAD WAS WB	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board
BC BDP BOB	Battery Charge Blu-Ray Disc Player	EBD EBF EC EDB EFX	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor	LPM LPT LTF LTP LVR	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator	PSC PSD PSLR PSP PSR PSW PT	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through	SSF SSV SSW STB SUM SV SVC	Streaming Server Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display	VW VWP  WAA WAD WAS WB	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control
BC BDP BOB	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack	EBD EBF EC EDB EFX ELTC	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet	LPM LPT LTF LTP LVR MA	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator Mixer Amplifier	PSC PSD PSLR PSP PSR PSW PT PTC	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera	SSF SSV SSW STB SUM SV SVC SVD SVDA	Streaming Server Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp	VW VWP  WAA WAD WAS WB WBC WBP	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack
BC BDP BOB BP	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack Conduit	EBD EBF EC EDB EFX ELTC EN	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet	LPM LPT LTF LTP LVR  MA MAL	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library	PSC PSD PSLR PSP PSR PSW PT PTC PVM	Projection Screen Control  Paging Station Desk Mount  Program Select & Level Remote  Powered Speaker  Paging Station Rack Mount  Paging Station Wall Mount  Poke-Through  Pan & Tilt Camera  Preview Video Monitor	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS	Streaming Server Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder	VW VWP  WAA WAD WAS WB WBC WBP	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock
BC BDP BOB BP	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack	EBD EBF EC EDB EFX ELTC	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder	LPM LPT LTF LTP LVR MA	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television	PSC PSD PSLR PSP PSR PSW PT PTC	Projection Screen Control  Paging Station Desk Mount  Program Select & Level Remote  Powered Speaker  Paging Station Rack Mount  Paging Station Wall Mount  Poke-Through  Pan & Tilt Camera  Preview Video Monitor  Power Strip	SSF SSV SSW STB SUM SV SVC SVD SVDA	Streaming Server Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp	VW VWP  WAA WAD WAS WB WBC WBP	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack
BC BDP BOB BP C CAM CAS	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck	EBD EBF EC EDB EFX ELTC EN ENC ENG	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering	LPM LPT LTF LTP LVR  MA MAL MATV MCS	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS SVS	Streaming Server Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor
BC BDP BOB BP C CAM CAS CASR	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS	Projection Screen Control  Paging Station Desk Mount  Program Select & Level Remote  Powered Speaker  Paging Station Rack Mount  Paging Station Wall Mount  Poke-Through  Pan & Tilt Camera  Preview Video Monitor  Power Strip	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS	Streaming Server Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher S-Video Separator Switcher	VW VWP  WAA WAD WAS WB WBC WBP WC WER	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna
BC BDP BOB BP C CAM CAS CASR	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television	EBD EBF EC EDB EFX ELTC EN ENC ENG	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering	LPM LPT LTF LTP LVR  MA MAL MATV MCS	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS SVS	Streaming Server Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor
BC BDP BOB BP C CAM CAS CASR CATV	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS SVMS SVS	Streaming Server Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher S-Video Separator Switcher	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna
BC BDP BOB BP C CAM CAS CASR CATV CBT	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS SVS SVS SVS	Streaming Server  Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher S-Video Separator Switcher Wall Mounted Speaker	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGA	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Gateway
BC BDP BOB BP C CAM CAS CASR CATV CBT	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV MD	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVHS SVMS SVS SVS SVS SW SWG	Streaming Server Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher S-Video Separator Switcher Wall Mounted Speaker Switch Glass	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGA WIA	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Gateway  Wireless Intercom Antenna
BC BDP BOB BP C CAM CAS CASR CATV CBT CC CCC	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV MD MDCF	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM RAS RC	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVHS SVMS SVS SW SWG SWH	Streaming Server  Serve Switch  Stage Box  Summing Amplifier  S-Video  Slide to Video Converter  Signage Video Display  S-Video Distribution Amp  S-Video Cassette Recorder  S-Video Matrix Switcher  S-Video Switcher  S-Video Separator Switcher  Wall Mounted Speaker  Switch Glass  Sound Web Hub	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGA WGW WIA	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Gateway  Wireless Intercom Antenna  Wireless Microphone
BC BDP BOB BP CC CAM CAS CASR CATV CBT CC CCC	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure Contact Closure Card	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV MD MDCF MDR	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame Motion Detector	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM RAS RC RDA	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control RGB Distribution Amp	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVHS SVMS SVS SW SWG SWH	Streaming Server  Serve Switch  Stage Box  Summing Amplifier  S-Video  Slide to Video Converter  Signage Video Display  S-Video Distribution Amp  S-Video Cassette Recorder  S-Video Matrix Switcher  S-Video Switcher  S-Video Separator Switcher  Wall Mounted Speaker  Switch Glass  Sound Web Hub	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGA WGW WIA WLM	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Gateway  Wireless Intercom Antenna  Wireless Unit
BC BDP BOB BP C CAM CAS CASR CATV CBT CC CCC CCC	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure Contact Closure Card Card Cage Frame	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG EXT	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate Extender	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV MD MDCF MDR MFP	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame Motion Detector Microphone Facility Panel Mid Frequency Speaker	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM  RAS RC RDA REC	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control RGB Distribution Amp Record Reverb	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVHS SVMS SVS SW SWG SWH SYSW	Streaming Server  Serve Switch  Stage Box  Summing Amplifier  S-Video  Slide to Video Converter  Signage Video Display  S-Video Distribution Amp  S-Video Cassette Recorder  S-Video Matrix Switcher  S-Video Separator Switcher  Wall Mounted Speaker  Switch Glass  Sound Web Hub  System Switcher  Telephone Access Module	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGA WGW WIA WLU WM	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Gateway  Wireless Intercom Antenna  Wireless Unit  Wireless Mouse  Wireless Mic Antenna
BC BDP BOB BP CAM CAS CASC CATV CBT CC CCC CCC CCC CCC CCDB	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure Contact Closure Card Card Cage Frame Camera Control Unit Crestron Distribution Block	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG EXT	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate Extender Fiber Floor Box	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV MD MDCF MDR MFP MFS MI	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame Motion Detector Microphone Facility Panel Mid Frequency Speaker Midi Interface	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM  RAS RC RDA REC REV RF	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control RGB Distribution Amp Record Reverb Radio Frequency	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVHS SVMS SVS SW SWG SWH SYSW TAM TB	Streaming Server  Serve Switch  Stage Box  Summing Amplifier  S-Video  Slide to Video Converter  Signage Video Display  S-Video Distribution Amp  S-Video Cassette Recorder  S-Video Matrix Switcher  S-Video Separator Switcher  Wall Mounted Speaker  Switch Glass  Sound Web Hub  System Switcher  Telephone Access Module  Terminal Box	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGA WGW WIA WLM WLU WM WMA	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Gateway  Wireless Intercom Antenna  Wireless Unit  Wireless Mouse  Wireless Mic Antenna  Wireless Mic Antenna  Wireless Mic Antenna
BC BDP BOB BP CC CAM CAS CASR CATV CBT CC CCC CCC CCCF CCCU CDB	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure Contact Closure Card Card Cage Frame Camera Control Unit Crestron Distribution Block Compact Disc Changer	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG EXT F FB FB	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate Extender  Fiber Floor Box Feed Back Suppresser	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV MD MDCF MDR MFP MFS MI MIC	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame Motion Detector Microphone Facility Panel Mid Interface Microphone	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM  RAS RC RDA REC REV RF	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control RGB Distribution Amp Record Reverb Radio Frequency RF Amplifier	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS SVMS SVS SVS SVS TAM TB TBC	Streaming Server  Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher S-Video Separator Switcher Wall Mounted Speaker Switch Glass Sound Web Hub System Switcher  Telephone Access Module Terminal Box Time Base Corrector	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGW WIA WLU WM WMA WMAP WMG	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Intercom Antenna  Wireless Microphone  Wireless Mouse  Wireless Mic Antenna
BC BDP BOB BP CC CAM CAS CASR CATV CBT CCC CCC CCCF CCCU CDB CDC CDP	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure Contact Closure Card Card Cage Frame Camera Control Unit Crestron Distribution Block Compact Disc Player	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG EXT F FB FBS FLM	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate Extender  Fiber Floor Box Feed Back Suppresser Floor Monitor	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV MD MDCF MDR MFP MFS MI MIC MIDI	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame Motion Detector Microphone Facility Panel Mid Interface Microphone MIDI	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM  RAS RC RDA REC REV RF RFA RFAS	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control RGB Distribution Amp Record Reverb Radio Frequency RF Amplifier RF Antenna Splitter	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVHS SVMS SVSS SW SWG SWH SYSW TAM TB TBC TBU	Streaming Server  Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher S-Video Separator Switcher Wall Mounted Speaker Switch Glass Sound Web Hub System Switcher Telephone Access Module Terminal Box Time Base Corrector Tape Backup	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGW WIA WLU WM WMA WMAP WMA WMKA	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Intercom Antenna  Wireless Microphone  Wireless Mouse  Wireless Mic Antenna  Wireless Mic Antenna  Wireless Mic Keyboard Antenna
BC BDP BOB BP CAM CAS CASR CATV CBT CC CCC CCF CCU CDB CDC	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure Contact Closure Card Card Cage Frame Camera Control Unit Crestron Distribution Block Compact Disc Changer Compact Disc Player Character Generator	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG EXT F FB FBS FLM FMA	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate Extender  Fiber Floor Box Feed Back Suppresser Floor Monitor FM Antenna	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV MD MDCF MDR MFP MFS MI MIC MIDI MIX	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame Motion Detector Microphone Facility Panel Mid Frequency Speaker Midl Interface Microphone MIDI Mixer	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM  RAS RC RDA REC REV RF RFA RFAS RFDA	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control RGB Distribution Amp Record Reverb Radio Frequency RF Amplifier RF Antenna Splitter RF Distribution Amplifier	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS SVS SW SWG SWH SYSW TAM TB TBC TBU TC	Streaming Server  Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher S-Video Separator Switcher Wall Mounted Speaker Switch Glass Sound Web Hub System Switcher  Telephone Access Module Terminal Box Time Base Corrector Tape Backup Programmable Time Clock	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGA WUM WIA WLU WM WMA WMAP WMAP WMKA WMKS	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Intercom Antenna  Wireless Microphone  Wireless Mouse  Wireless Mic Antenna  Wireless Mic Antenna  Wireless Mic Antenna  Wireless Mic Keyboard Antenna  Wireless Mouse Keyboard Antenna
BC BDP BOB BP CAM CAS CASR CATV CBT CC CCC CCC CCC CCDB CDC CDDB CDC CDDP CCG CIIM	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure Contact Closure Card Card Cage Frame Camera Control Unit Crestron Distribution Block Compact Disc Changer Contacter Generator Control Interface Module	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG EXT F FB FB FBS FLM FMA FMA	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate Extender  Fiber Floor Box Feed Back Suppresser Floor Monitor FM Antenna FM Receiver	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV MD MDCF MDR MFP MFS MI MIC MIDI MIX MKB	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame Motion Detector Microphone Facility Panel Mid Interface Microphone MIDI Mixer Monitor Keyboard Sliding Shelf	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM  RAS RC RDA REC REV RF RFA RFAS RFDA RFS	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control RGB Distribution Amp Record Reverb Radio Frequency RF Amplifier RF Antenna Splitter RF Splitter	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS SVS SW SWG SWH SYSW TAM TB TBC TBU TC TCB	Streaming Server  Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher S-Video Separator Switcher Wall Mounted Speaker Switch Glass Sound Web Hub System Switcher  Telephone Access Module Terminal Box Time Base Corrector Tape Backup Programmable Time Clock Terminal Cabinet	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGW WIA WLU WM WMA WMAP WMAP WMG WMKA WMKS WMR	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Intercom Antenna  Wireless Microphone  Wireless Mouse  Wireless Mic Antenna  Wireless Mic Antenna  Wireless Mic Keyboard Antenna  Wireless Mouse Keyboard Antenna  Wireless Mic Receiver
BC BDP BOB BP CC CAM CAS CASR CATV CBT CCC CCC CCF CCCU CDB CDC CDP CCG CIM CIU	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure Contact Closure Card Card Cage Frame Camera Control Unit Crestron Distribution Block Compact Disc Changer Control Interface Module Computer Interface Unit	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG EXT F FB FBS FLM FMA FMR FMR	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate Extender  Fiber Floor Box Feed Back Suppresser Floor Monitor FM Antenna FM Receiver FM Tuner	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV MD MDCF MDR MFP MFS MI MIC MIDI MIX MKB MM	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame Motion Detector Microphone Facility Panel Mid Frequency Speaker Midi Interface Microphone MIDI Mixer Monitor Keyboard Sliding Shelf Microphone Module	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM  RAS RC RDA REC REV RF RFA RFAS RFDA RFS RFT	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control RGB Distribution Amp Record Reverb Radio Frequency RF Amplifier RF Antenna Splitter RF Distribution Amplifier RF Splitter RF Transmitter	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS SVSS SW SWG SWH SYSW TAM TB TBC TBU TC TCB TCR	Streaming Server  Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher S-Video Separator Switcher Wall Mounted Speaker Switch Glass Sound Web Hub System Switcher  Telephone Access Module Terminal Box Time Base Corrector Tape Backup Programmable Time Clock Terminal Cabinet Transcoder	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGW WIA WLU WM WMA WMAP WMAP WMG WMKA WMKS WMR	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Intercom Antenna  Wireless Microphone  Wireless Mouse  Wireless Mic Antenna  Wireless Mic Antenna  Wireless Mic Keyboard Antenna  Wireless Mic Receiver  Wall Plate
BC BDP BOB BP CAM CAS CASR CATV CBT CC CCC CCF CCU CDB CDC CDP CG CIM CIU CL	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure Contact Closure Card Card Cage Frame Camera Control Unit Crestron Distribution Block Compact Disc Changer Control Interface Module Computer Interface Unit Camera Lens	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG EXT F FB FB FBS FLM FMA FMR FMT FMTA	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate Extender  Fiber Floor Box Feed Back Suppresser Floor Monitor FM Antenna FM Receiver FM Tuner FM Transmitting Antenna	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV MD MDCF MDR MFP MFS MI MIC MIDI MIX MKB MM MMC	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame Motion Detector Microphone Facility Panel Mid Frequency Speaker Midi Interface Microphone MIDI Mixer Monitor Keyboard Sliding Shelf Microphone Module Media Matrix Computer	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM  RAS RC RDA REC REV RF RFA RFAS RFDA RFS RFT RFTA	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control RGB Distribution Amp Record Reverb Radio Frequency RF Amplifier RF Antenna Splitter RF Splitter RF Transmitter RF Transmitter RF Transmitting Antenna	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS SVS SW SWG SWH SYSW TAM TB TBC TBU TC TCB TCR TCS	Streaming Server  Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Cassette Recorder S-Video Cassette Recorder S-Video Matrix Switcher S-Video Separator Switcher Wall Mounted Speaker Switch Glass Sound Web Hub System Switcher  Telephone Access Module Terminal Box Time Base Corrector Tape Backup Programmable Time Clock Terminal Cabinet Transcoder Teleconferencing System	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGW WIA WLU WM WMA WMAP WMAP WMG WMKS WMR WP	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Distribution  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Intercom Antenna  Wireless Microphone  Wireless Mouse  Wireless Mic Antenna  Wireless Mic Antenna  Wireless Mic Keyboard Antenna  Wireless Mic Receiver  Wall Plate  Wireless Presentation Gateway
BC BDP BOB BP C CAM CAS CASR CATV CBT CC CCC CCF CCU CDB CDC CID CID CIM CIU CL	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure Contact Closure Card Card Cage Frame Camera Control Unit Crestron Distribution Block Compact Disc Changer Control Interface Module Computer Interface Unit Camera Lens Card Module	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG EXT  F FB FB FBS FLM FMA FMR FMT FMTA FMTR	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate Extender  Fiber Floor Box Feed Back Suppresser Floor Monitor FM Antenna FM Receiver FM Transmitting Antenna FM Transmitter	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV MD MDCF MDR MFP MFS MI MIC MIDI MIX MKB MM MMC MMP	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame Motion Detector Microphone Facility Panel Mid Frequency Speaker Midi Interface Microphone MIDI Mixer Monitor Keyboard Sliding Shelf Microphone Module Media Matrix Computer Monitor Mix Panel	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM  RAS RC RDA REC REV RF RFA RFAS RFAS RFDA RFS RFT RFTA RGB	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control RGB Distribution Amp Record Reverb Radio Frequency RF Amplifier RF Antenna Splitter RF Distribution Amplifier RF Splitter RF Transmitter RF Transmitting Antenna RGBHV	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS SVS SW SWG SWH SYSW TAM TB TBC TBU TC TCB TCR TCS TEL	Streaming Server  Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher S-Video Separator Switcher Wall Mounted Speaker Switch Glass Sound Web Hub System Switcher  Telephone Access Module Terminal Box Time Base Corrector Tape Backup Programmable Time Clock Terminal Cabinet Transcoder Teleconferencing System Telephone Output	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGW WIA WLU WM WMA WMAP WMAP WMG WMKS WMR WP	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Intercom Antenna  Wireless Microphone  Wireless Mouse  Wireless Mic Antenna  Wireless Mic Antenna  Wireless Mic Keyboard Antenna  Wireless Mic Receiver  Wall Plate  Wireless Presentation Gateway  Wall Panel
BC BDP BOB BP C CAM CAS CASR CATV CBT CC CCC CCC CCC CCF CCU CDB CDC CDP CG CIM CIU CL CM CME	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure Contact Closure Card Card Cage Frame Camera Control Unit Crestron Distribution Block Compact Disc Changer Control Interface Module Computer Interface Unit Camera Lens Card Module Control Module Extended	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG EXT  F FB FBS FLM FMA FMR FMT FMTA FMTR FOH	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate Extender  Fiber Floor Box Feed Back Suppresser Floor Monitor FM Antenna FM Receiver FM Transmitting Antenna FM Transmitter Front Of House	LPM LPT LTF LTP LVR  MA MAL MATV  MCS MCT MCV  MD MDCF MDR  MFP MFS MI MIC MIDI MIX MKB MM MMC MMP MMPA	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame Motion Detector Microphone Facility Panel Mid Frequency Speaker Midi Interface Microphone MIDI Mixer Monitor Keyboard Sliding Shelf Microphone Module Media Matrix Computer Monitor Mix Panel Measurement Mix Pre Amplifier	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM  RAS RC RDA REC REV RF RFA RFAS RFDA RFS RFT RFTA RGB RIP	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control RGB Distribution Amp Record Reverb Radio Frequency RF Amplifier RF Antenna Splitter RF Distribution Amplifier RF Splitter RF Transmitter RF Transmitter RF Transmitting Antenna RGBHV Rack Input Panel	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS SVS SW SWG SWH SYSW TAM TB TBC TBU TC TCB TCR TCS TEL TI	Streaming Server Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher S-Video Separator Switcher Wall Mounted Speaker Switch Glass Sound Web Hub System Switcher Telephone Access Module Terminal Box Time Base Corrector Tape Backup Programmable Time Clock Terminal Cabinet Transcoder Telephone Output Telephone Interface	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGW WIA WLU WM WMA WMAP WMAP WMG WMKA WMKS WMR WP WPG WWP VWP WWP WWP WWP WWP WWP WWP WWP WWP	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Intercom Antenna  Wireless Microphone  Wireless Mouse  Wireless Mic Antenna  Wireless Mic Antenna  Wireless Mic Keyboard Antenna  Wireless Mouse Keyboard Antenna  Wireless Mic Receiver  Wall Plate  Work Station Interface
BC BDP BOB BP C CAM CAS CASR CATV CBT CC CCC CCF CCU CDB CDC CIU CIU CL CM CME CMIC	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure Contact Closure Card Card Cage Frame Camera Control Unit Crestron Distribution Block Compact Disc Changer Control Interface Module Computer Interface Unit Camera Lens Card Module Control Module Extended Ceiling Microphone	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG EXT  F FB FB FBS FLM FMA FMR FMT FMTA FMTA FMTR FOH FP	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate Extender  Fiber Floor Box Feed Back Suppresser Floor Monitor FM Antenna FM Receiver FM Transmitting Antenna FM Transmitter	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV MD MDCF MDR MFP MFS MI MIC MIDI MIX MKB MM MMC MMP MMPA MMPA	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame Motion Detector Microphone Facility Panel Mid Frequency Speaker Midi Interface Microphone MIDI Mixer Monitor Keyboard Sliding Shelf Microphone Module Media Matrix Computer Monitor Mix Panel Measurement Mix Pre Amplifier Masking Noise Processor	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM  RAS RC RDA REC REV RF RFA RFAS RFDA RFS RFT RFTA RGB RIP RK	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control RGB Distribution Amp Record Reverb Radio Frequency RF Amplifier RF Antenna Splitter RF Distribution Amplifier RF Splitter RF Transmitter RF Transmitter RF Transmitting Antenna RGBHV Rack Input Panel Rack Lights	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS SVS SW SWG SWH SYSW TAM TB TBC TBU TC TCB TCR TCS TEL	Streaming Server Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Cassette Recorder S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher S-Video Separator Switcher Wall Mounted Speaker Switch Glass Sound Web Hub System Switcher  Telephone Access Module Terminal Box Time Base Corrector Tape Backup Programmable Time Clock Terminal Cabinet Transcoder Telephone Output Telephone Interface Transformer Junction Box	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGW WIA WLU WM WMAP WMAP WMAP WMKS WMR WP WPG WTA	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Intercom Antenna  Wireless Microphone  Wireless Mouse  Wireless Mic Antenna  Wireless Mic Antenna  Wireless Mic Keyboard Antenna  Wireless Mic Receiver  Wall Plate  Wireless Presentation Gateway  Wall Panel
BC BDP BOB BP C CAM CAS CASR CATV CBT CC CCC CCF CCU CDB CDP CG CIM CIU CL CM CME CMIC	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure Contact Closure Card Card Cage Frame Camera Control Unit Crestron Distribution Block Compact Disc Changer Control Interface Module Computer Interface Unit Camera Lens Card Module Control Module Extended	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG EXT  F FB FBS FLM FMA FMR FMT FMTA FMTR FOH	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate Extender  Fiber Floor Box Feed Back Suppresser Floor Monitor FM Antenna FM Receiver FM Transmitting Antenna FM Transmitter Front Of House	LPM LPT LTF LTP LVR  MA MAL MATV  MCS MCT MCV  MD MDCF MDR  MFP MFS MI MIC MIDI MIX MKB MM MMC MMP MMPA	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame Motion Detector Microphone Facility Panel Mid Frequency Speaker Midi Interface Microphone MIDI Mixer Monitor Keyboard Sliding Shelf Microphone Module Media Matrix Computer Monitor Mix Panel Measurement Mix Pre Amplifier	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM  RAS RC RDA REC REV RF RFA RFAS RFDA RFS RFT RFTA RGB RIP	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control RGB Distribution Amp Record Reverb Radio Frequency RF Amplifier RF Antenna Splitter RF Distribution Amplifier RF Splitter RF Transmitter RF Transmitter RF Transmitting Antenna RGBHV Rack Input Panel	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS SVS SW SWG SWH SYSW TAM TB TBC TBU TC TCB TCR TCS TEL TI	Streaming Server Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher S-Video Separator Switcher Wall Mounted Speaker Switch Glass Sound Web Hub System Switcher Telephone Access Module Terminal Box Time Base Corrector Tape Backup Programmable Time Clock Terminal Cabinet Transcoder Telephone Output Telephone Interface	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGW WIA WLU WM WMA WMAP WMAP WMG WMKA WMKS WMR WP WPG WWP VWP WWP WWP WWP WWP WWP WWP WWP WWP	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Intercom Antenna  Wireless Microphone  Wireless Mouse  Wireless Mic Antenna  Wireless Mic Antenna  Wireless Mic Keyboard Antenna  Wireless Mouse Keyboard Antenna  Wireless Mic Receiver  Wall Plate  Work Station Interface
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BAT BC BDP BOB BP C CAM CAS CASR CATV CBT CC CCC CCF CCU CDB CDC CIM CIU CL CM CME CMIC CMP CN CO CD CD CO	Battery Charge Blu-Ray Disc Player Break Out Box Belt Pack  Conduit Video Camera Cassette Deck Cassette Deck Recorder Community Antenna Television Cable Tray Contact Closure Contact Closure Card Card Cage Frame Camera Control Unit Crestron Distribution Block Compact Disc Changer Compact Disc Player Character Generator Control Interface Module Computer Interface Unit Camera Lens Card Module Control Module Extended Ceiling Microphone CD/Media Player	EBD EBF EC EDB EFX ELTC EN ENC ENG EQ ERK ERT EXG EXT  F FB FB FBS FLM FMA FMR FMT FMTA FMTA FMTR FOH FP	Embedder Expanded Beam Fiber Connector Expansion Card Electrical Distribution Box Effects Processor Emergency Lighting Transfer Cabinet Ethernet Encoder Electronic News Gathering Equalizer Equipment Rack Ethernet Router Expander/Gate Extender  Fiber Floor Box Feed Back Suppresser Floor Monitor FM Antenna FM Receiver FM Tuner FM Transmitting Antenna FM Transmitter Front Of House Facility Panel Floor Panel	LPM LPT LTF LTP LVR  MA MAL MATV MCS MCT MCV MD MDCF MDR MFP MFS MI MIC MIDI MIX MKB MM MMC MMP MMPA MNP MOB	Lectern Panel Lapel Microphone Laptop Line Transformer LCD Touch Panel Line Voltage Regulator  Mixer Amplifier Media Archive Library Master Antenna Television Media Collaboration System Main Cabler Tray Media Converter Mini Disc Matrix Digital Card Frame Motion Detector Microphone Facility Panel Mid Frequency Speaker Midi Interface Microphone MIDI Mixer Monitor Keyboard Sliding Shelf Microphone Module Media Matrix Computer Monitor Mix Panel Measurement Mix Pre Amplifier Masking Noise Processor Monitor Out Box	PSC PSD PSLR PSP PSR PSW PT PTC PVM PWS PXS PZM  RAS RC RDA REC REV RF RFA RFAS RFA RFAS RFT RFTA RGB RIP RK RKM	Projection Screen Control Paging Station Desk Mount Program Select & Level Remote Powered Speaker Paging Station Rack Mount Paging Station Wall Mount Poke-Through Pan & Tilt Camera Preview Video Monitor Power Strip Proximity Switch Pressure Zone Microphone  RGB Auto Switcher Remote Control RGB Distribution Amp Record Reverb Radio Frequency RF Amplifier RF Antenna Splitter RF Distribution Amplifier RF Splitter RF Transmitter RF Transmitter RF Transmitting Antenna RGBHV Rack Input Panel Rack Lights Rack Mount	SSF SSV SSW STB SUM SV SVC SVD SVDA SVHS SVMS SVS SW SWG SWH SYSW TAM TB TBC TBU TC TCB TCR TCS TEL TI TJB TM	Streaming Server  Serve Switch Stage Box Summing Amplifier S-Video Slide to Video Converter Signage Video Display S-Video Distribution Amp S-Video Cassette Recorder S-Video Matrix Switcher S-Video Switcher S-Video Separator Switcher Wall Mounted Speaker Switch Glass Sound Web Hub System Switcher  Telephone Access Module Terminal Box Time Base Corrector Tape Backup Programmable Time Clock Terminal Cabinet Transcoder Telephone Output Telephone Interface Transformer Junction Box Table Microphone	VW VWP  WAA WAD WAS WB WBC WBP WC WER WFM WGA WGW WIA WLU WM WMA WMAP WMAP WMG WMKS WMKS WMR WP WPG WTA WTP	Video Wall Processor  Wireless Antenna Amplifier  Wireless Antenna Splitter  White Board  Window Blind Control  Wireless Belt Pack  Word Clock  Wireless Ethernet Router  Waveform Monitor  Wireless Gateway Antenna  Wireless Intercom Antenna  Wireless Microphone  Wireless Mouse  Wireless Mic Antenna  Wireless Mic Antenna  Wireless Mic Keyboard Antenna  Wireless Mic Receiver  Wall Plate  Work Station Interface  Wireless Touch Panel Adapter  Wireless Touch Panel

## **ABBREVIATIONS**

Media Panel

Music Player

Microphone Pre-Amplifier

Retractable Projector Mount

RGB System Controller

RGB Switching Interface

Rack Panel

Repeater

Touch Panel Control

Twisted Pair Receiver

Twisted Pair Transmitter

Telepromptor

Transformer

XLR Panel

Extended KVM

XKVM

XLRP

File System Controller

Fiber Tie Line

Fiber Tie Panel

Firewire

Converter

Conduit Pocket

Control Plug In Station

Compressor/Limiter

(E)###	Existing	CLG	Ceiling			NTS	Not To Scale		
(F)	Future	СМ	Construction Manager	GC	General Contractor			SECT	Section
		СО	Conduit Only			ОС	On Center	SHP	Shielded Pair
A 0	Above Zero Floor Level			HR	Home Run	OD	Outer Diameter	SIM	Similar
ACT	Above Counter Top	DIA	Diameter			OFCI	Owner Furnished Contractor Installed	SM	Stage Manager
AFB	Above Floor Below	DR	Door	IW	In Wall	OFE	Owner Furnished Equipment	STD	Standard
AFC	Above Finished Ceiling					OFOI	Owner Furnished Owner Installed		
AFF	Above Finished Floor	E.C.	Empty Conduit	LP	Lightning Protector			TPD	Tripod
AH	Above Header	EC	Electrical Contractor	LRR	Lightning Room Rack	P/O	Part Of	TST	Test Set
AS	Above Slab	EL	Elevation	LTG	Lighting	PF	Press Feed	TYP	Typical
		ELEC	Electrical			POC	Point of Connection		
BFC	Below Finished Ceiling	EOL	End Of Line	MISC	Miscellaneous	PRG	Program	UBC	Uniform Building Code
BGM	Background Music	EQUIP	Equipment	MOM	Momentary	PROJ	Project	UON	Unless Otherwise Noted
вон	Back Of House			MTD	Mounted	PSCH	Project Standard Control Height		
BTU	British Thermal Units	FAN	Fan Panel	MTF	Mounting Termination Fabrication	PSRH	Project Standard Receptacle Height	VIF	Verify In Field
		FBO	Furnished By Owner	MTL	Metal	PSSH	Project Standard Switch Height		
CAB	Cabinet	FCA	Finished Ceiling Above			PST	Pull String	WP	Weather Proof
CATV	Cable TV	FIN	Finished	NC	Normally Closed	PWR	Power		
CBC	California Building Code	FOH	Front Of House	NIC	Not In Contract				
CL	Center Line	FSF	Folding Shelf	NO	Normally Open	RCP	Reflected Ceiling Plan		

FACILITY INPUT SYMBOL SCHEDULE AND DESCRIPTIONS FOR FLOOR AND CEILING PLANS CONDUIT STUB - MOUNTING F FLOOR MOUNTED © CEILING SPEAKER SWING OUT RACK (E) = EXISTING TO REMAIN W WALL MOUNTED (EN) = EXISTING JBOX/BACKCAN WALL MOUNTED RACK © CEILING MOUNTED **NEW SPEAKER** STUB UP/DOWN (F) = FUTURE ■ INTERGRATED IN-WALL RACK (R) = REPLACE EXISTING (MILLWORK, PODIUM, TABLE) Θ------ SYMBOL ID FLOOR STANDING RACK # BOX MOUNTED BELOW BOX MOUNTED ABOVE # DETAIL NUMBER AV SHEET NUMBER **# ■** EXISTING EQUIPMENT

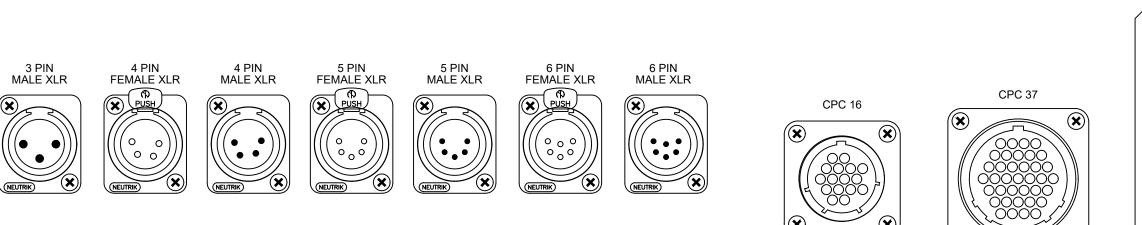
### RISER SYMBOL SCHEDULE AND DESCRIPTIONS

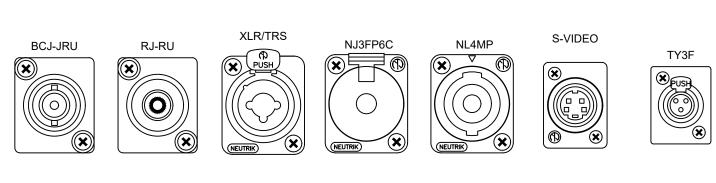
- OBJECT IDENTIFICATION ### - CONDUIT SIZE IN INCHES TOTAL QUANTITY OF DEVICES ON RUN ### AV DEVICE #\*\* (#)## LINE OR SECTION CONTINUE CABLE/ CONDUIT ROUTING
TO LAST DEVICE ### ——— WIRE TYPE \* WIRE QTY.

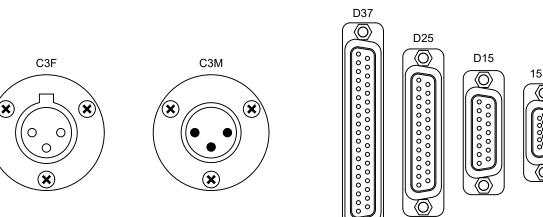
> \* QUANTITY (1) UNLESS OTHERWISE NOTED \*\* ONE CONDUIT PER LINE OR SECTION UNLESS OTHERWISE NOTED

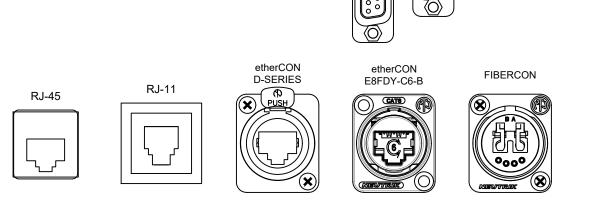
> > WHIRLWIND W-TYPE CONNECTOR

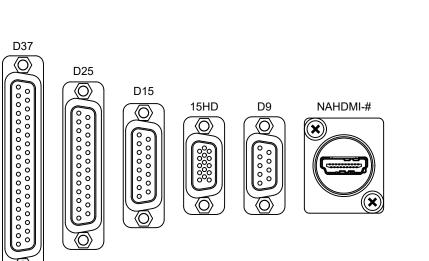
FACILITY PANEL CONNECTOR LEGEND

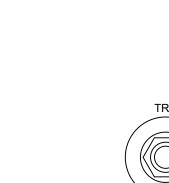


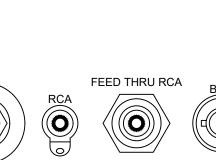


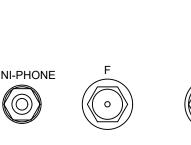




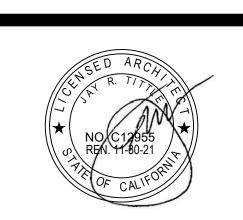












WIRE SCHEDULE
NOTES:  1. CONTRACTOR TO USE PLENUM RATED CABLE WHERE REQUIRED BY CODE.  2. WIRING TO BE INSTALLED BY AV CONTRACTOR

TYPE	APPLICATION	DESCRIPTION (FIXED INSTALL CABLE)	O.D.	MANUF.	PART NO.
A1	AUDIO ANALOG/DIGITAL CABLE	ANALOG/DIGITAL AUDIO CABLE, MICROPHONE AND LINE LEVEL WIRING, LESS THAN +24 dBu, FROM 20Hz TO 20kHz, 24 AWG, IMPEDANCE 110Ω ±20%, CAPACITANCE 26pF/FT, 100% SHIELDED, STRANDED TWISTED PAIR	0.177	BELDEN	1800B
C2	CONTROL/PWR SUPPLY	CONTROL CABLE AC/DC, 22 AWG, 2 PAIR, TWISTED, TINNED COPPER	0.233	BELDEN	9744
D3	CAT 6 DATA NETWORK CABLE	CATEGORY 6 DATA CABLE, 23 AWG, UNBONDED PAIR CABLES, SOLID BARE COPPER, MAX. ATTENUATION 28.3dB/100m @ 200MHz, MAX DELAY SKEW 45ns/100 m , NOM MUTUAL CAPACITANCE @ 1KHz 15pF/FT, MAX DC RESISTANCE 8.2 $\Omega$ /100m	0.220	BELDEN	2412
R1	LOW LOSS 50Ω WIRELESS	RG58C/U, 20 AWG, 50Ω, 95% BRAIDED SHIELD, NOM ATTN -21.5dB/100ft @ 1GHz	0.195	BELDEN	8262
S4	SPEAKER	LOUDSPEAKER LEVEL OR CIRCUIT WIRING GREATER THAN +24dBu, FROM 20Hz TO 20kHz, 10 AWG, STRANDED, TWISTED PAIR WITH PVC JACKET.	0.356	BELDEN	5T00UP



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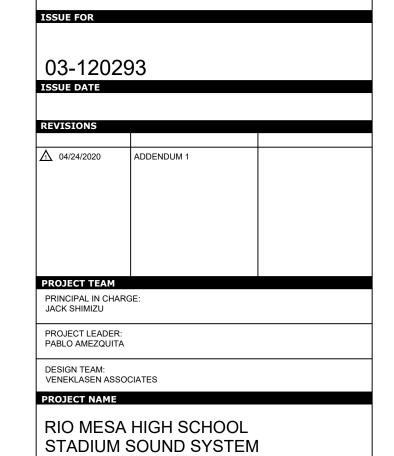
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> TADIUM S. VENUE, 93036 RIO MESA HIGH SCHOOL SOUND SYSTEM 545 CENTRAL AV OXNARD, CA. 9

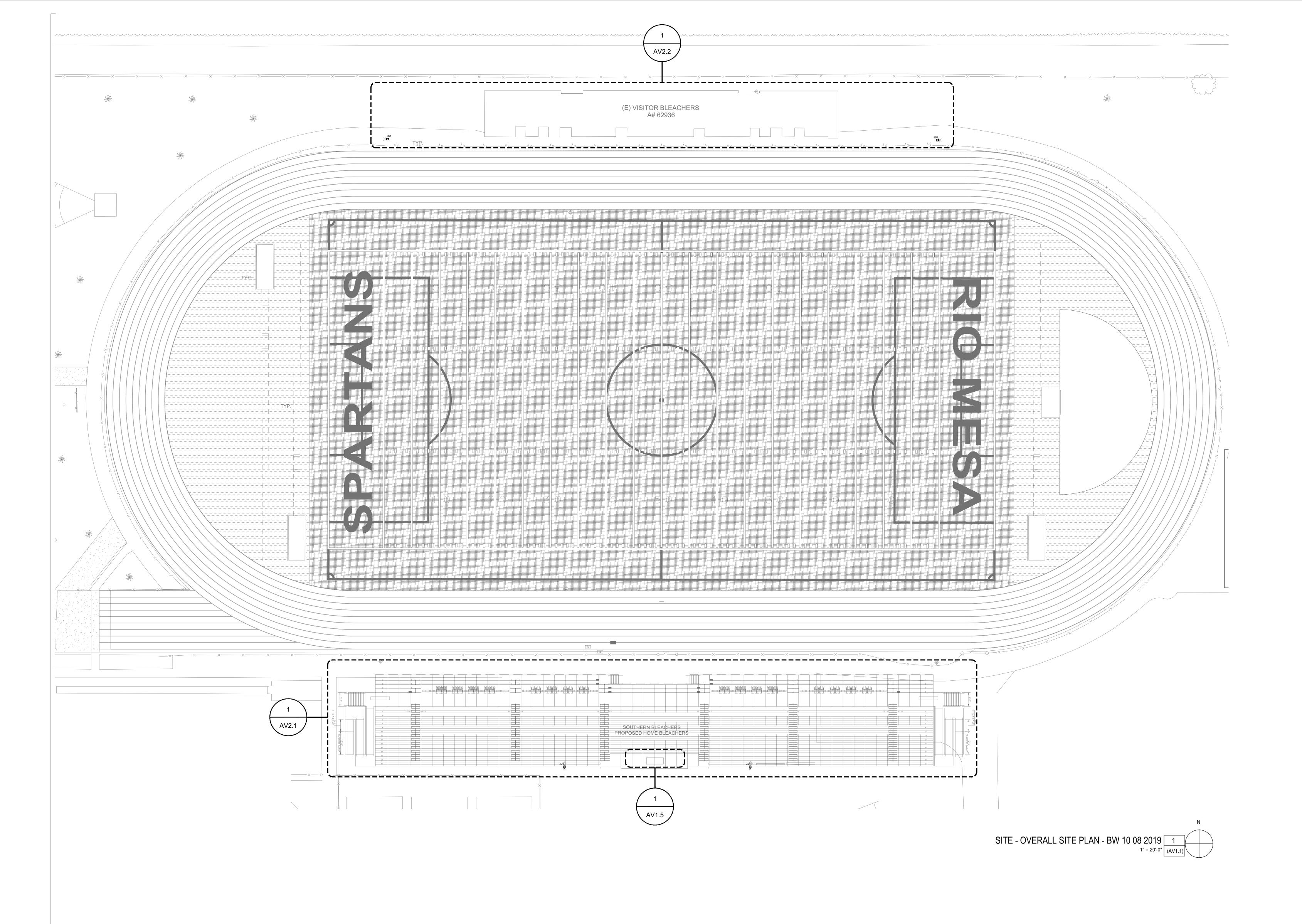
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AV | IT | Security | Low Voltage Department
1711 Sixteenth Street
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(310) 450-1733
www.veneklasen.com



6121235311

ABBREVIATIONS NOTES AND SYMBOLS

PROJECT NO.





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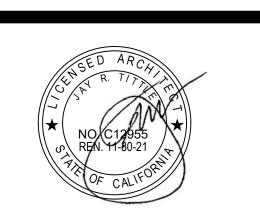
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> O MESA HIGH SCHOOL STADIU SOUND SYSTEM





REVISIONS		
<b>⚠</b> 04/24/2020	ADDENDUM 1	
PROJECT TEAM PRINCIPAL IN CHA		

PROJECT NAME

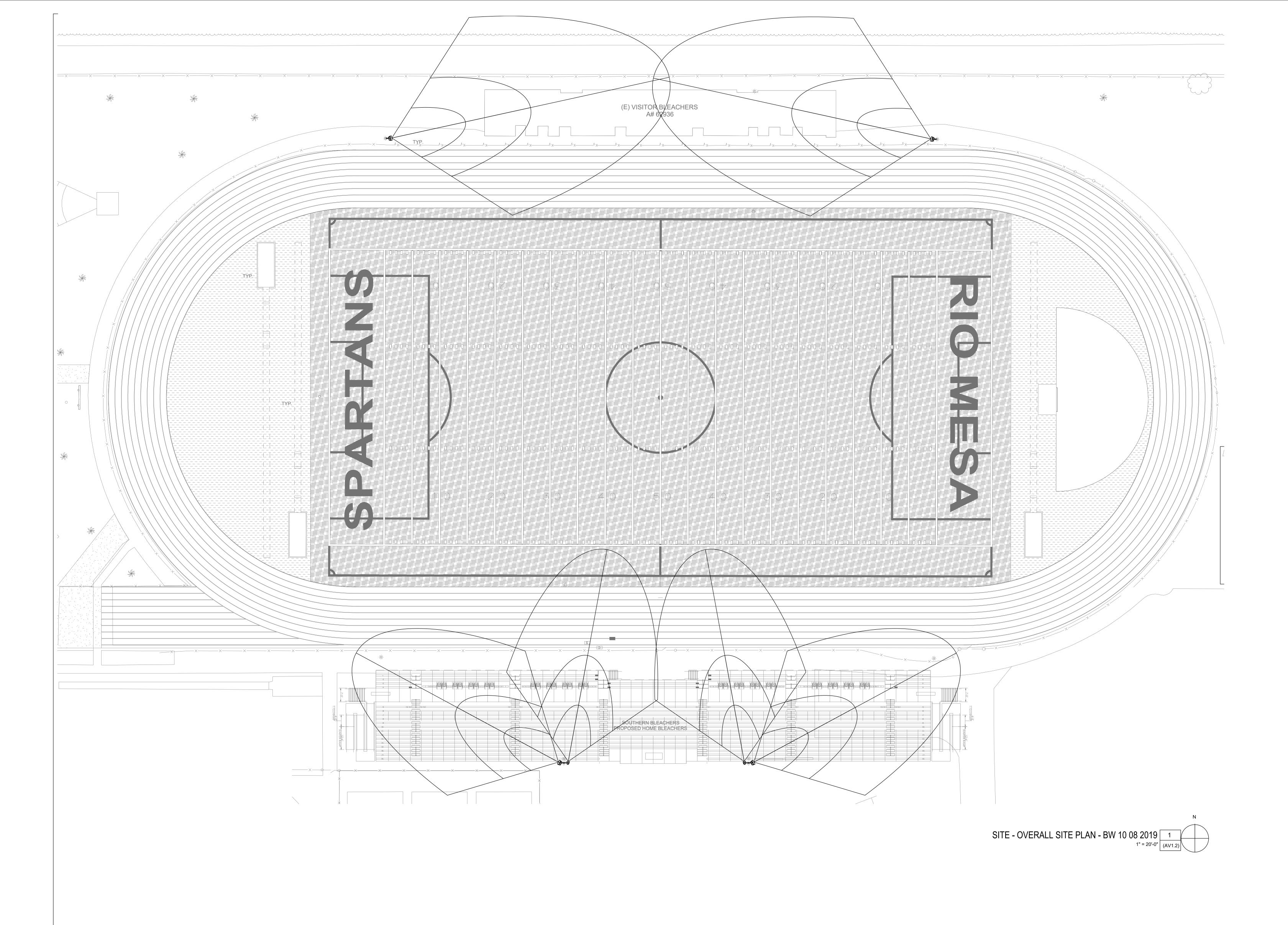
RIO MESA HIGH SCHOOL

RIO MESA HIGH SCHOOL STADIUM SOUND SYSTEM

PROJECT NO. 6121235311

ENLARGED AV SITE PLAN

(AV1.1)



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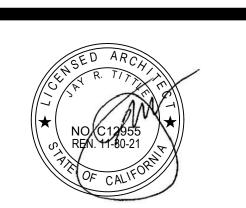
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> ESA HIGH SCHOOL STADIUN SOUND SYSTEM





03-1202 ISSUE DATE	-00	
REVISIONS		
<b>⚠</b> 04/24/2020	ADDENDUM 1	
PROJECT TEAM		

DESIGN TEAM:
VENERLASEN ASSOCIATES

PROJECT NAME

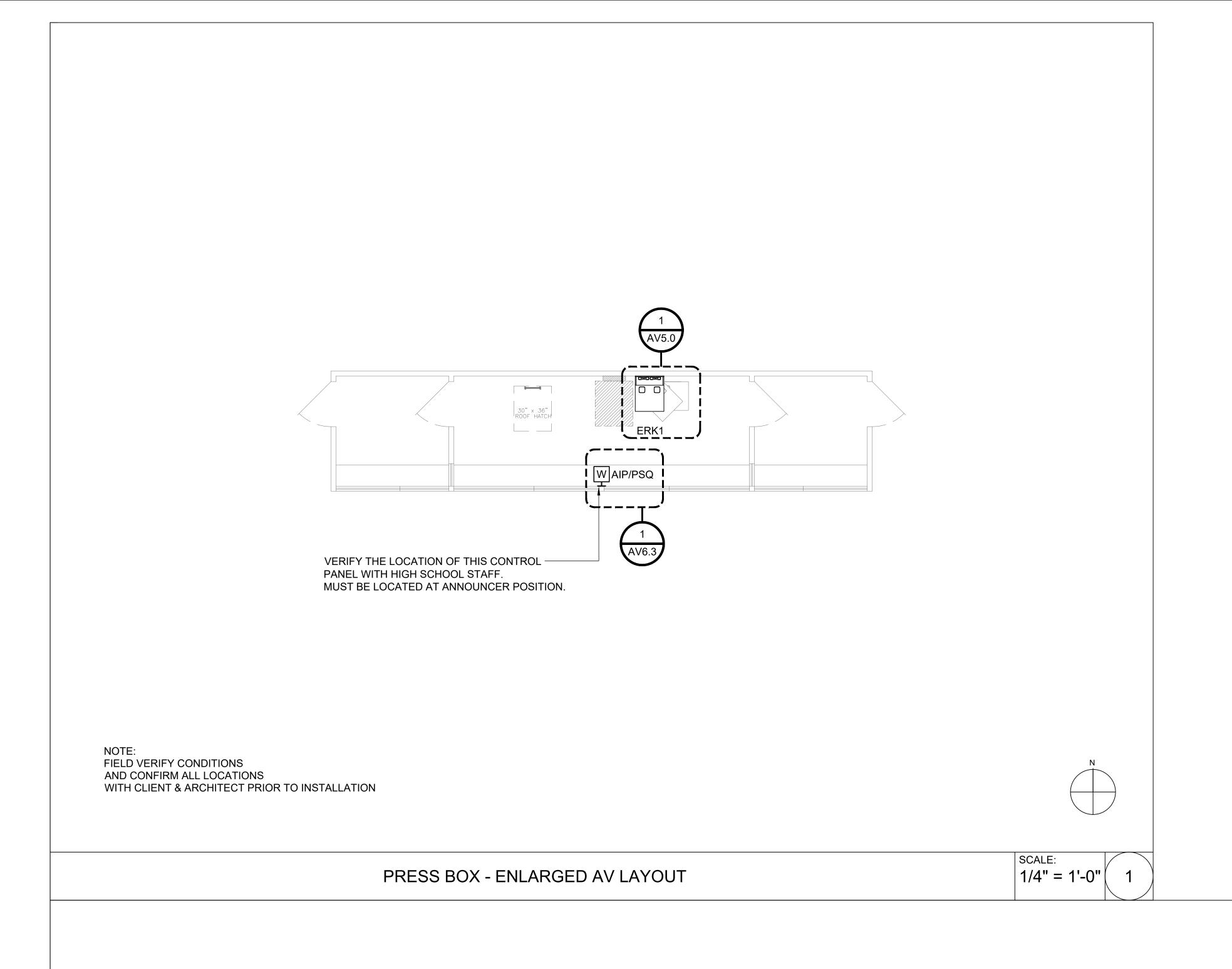
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STADIUM SOUND SYSTEM

PROJECT NO.

6121235311

AV SPEAKER COVERAGE PLAN

(AV1.2)



- ASSISTIVE LISTENING ANTENNA "ALA"

ATTACH TO STRUCTURE ABOVE

WIRELESS MIC ANTENNA "WMA" ATTACH TO STRUCTURE ABOVE

SEE DETAIL 4/AV6.3

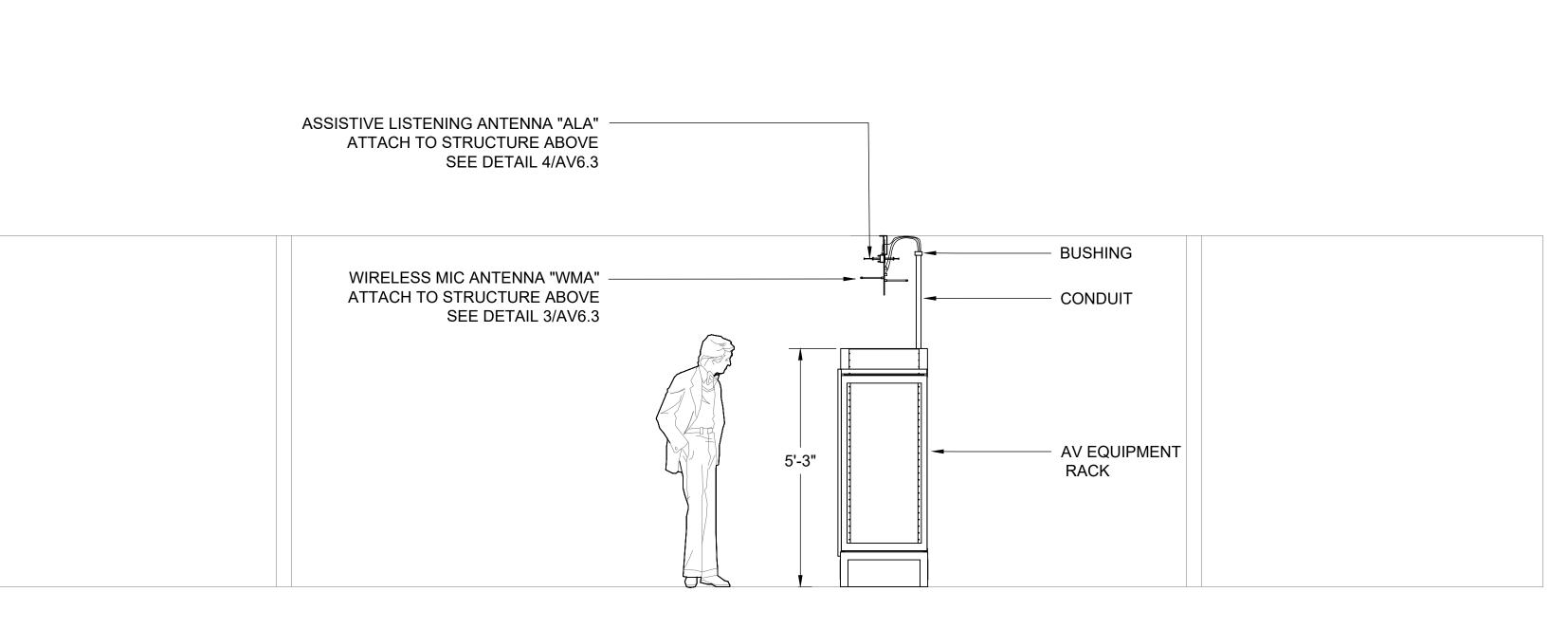
SEE DETAIL 3/AV6.3

- AV EQUIPMENT RACK

- BUSHING

CONDUIT

ASSISTIVE LISTENING ANTENNA "ALA" ATTACH TO STRUCTURE ABOVE SEE DETAIL 4/AV6.3 BUSHING WIRELESS MIC ANTENNA "WMA" ATTACH TO STRUCTURE ABOVE SEE DETAIL 3/AV6.3 - CONDUIT - AV EQUIPMENT 5'-3" RACK FRONT VIEW



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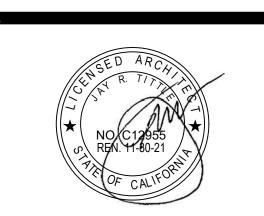
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PROJECT TEAM PRINCIPAL IN CHARGE: JACK SHIMIZU

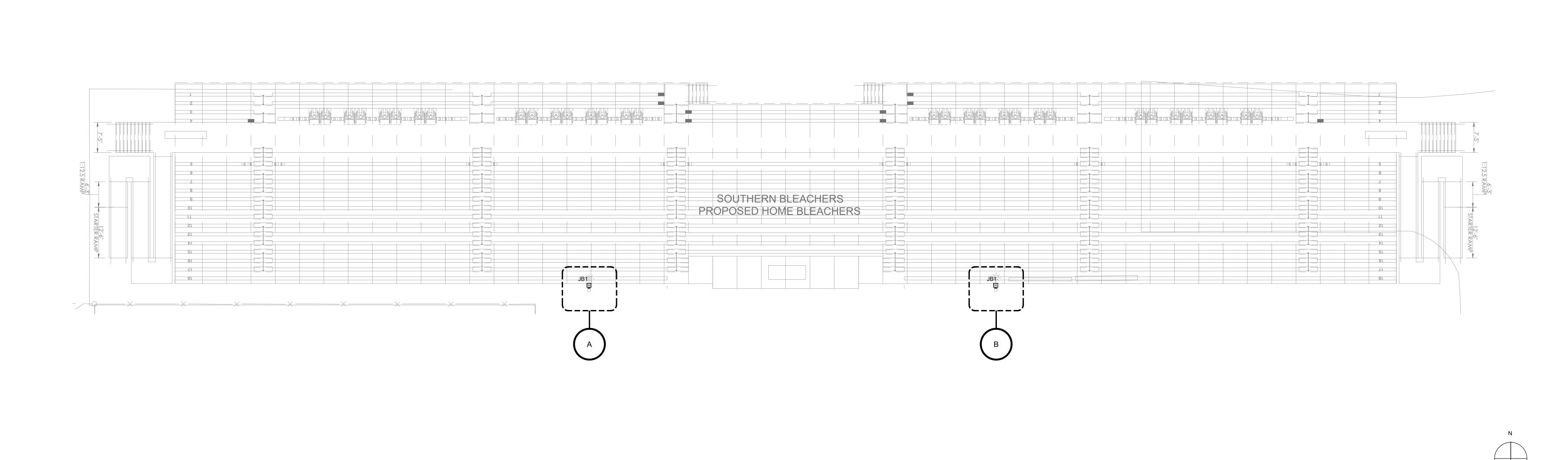
PROJECT LEADER: PABLO AMEZQUITA

DESIGN TEAM: VENEKLASEN ASSOCIATES

RIO MESA HIGH SCHOOL STADIUM SOUND SYSTEM

6121235311

AV ENLARGED LAYOUTS





OXNARD UNION HIGH SCHOOL

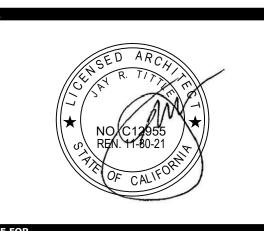
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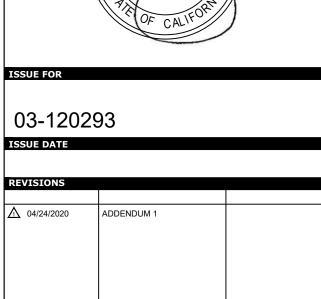
DISTRICT

MESA HIGH SCHOOL SOUND SYSTEM 545 CENTRAL AV OXNARD, CA. 9

HOME BLEACHERS - ENLARGED AV PLAN

SCALE: 3/32" = 1'-0" 1 Veneklasen Associates
AV | IT | Security | Low Voltage Department
1711 Sixteenth Street
Santa Monica, CA 90404
(310) 450-1733
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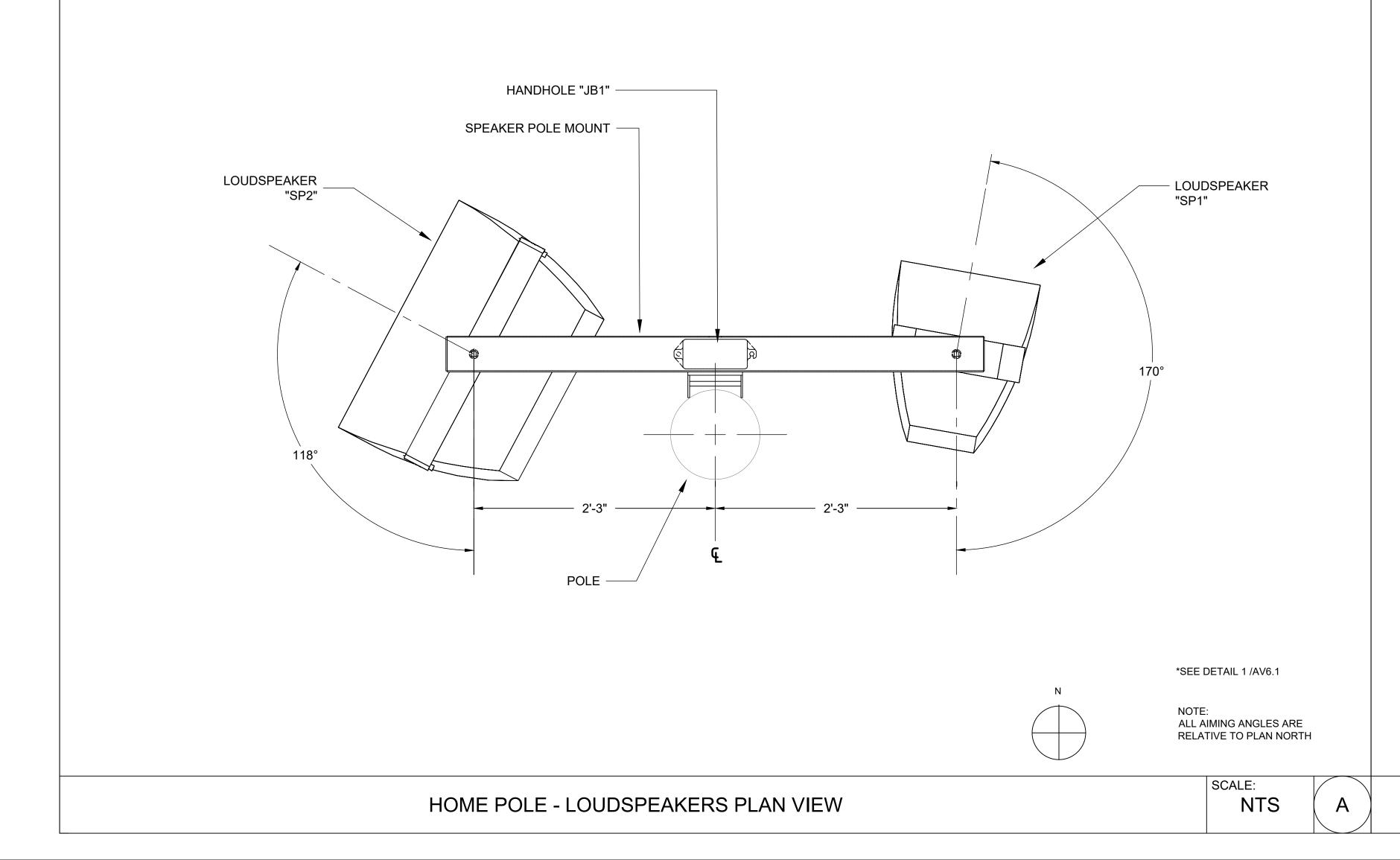
PROJECT TEAM

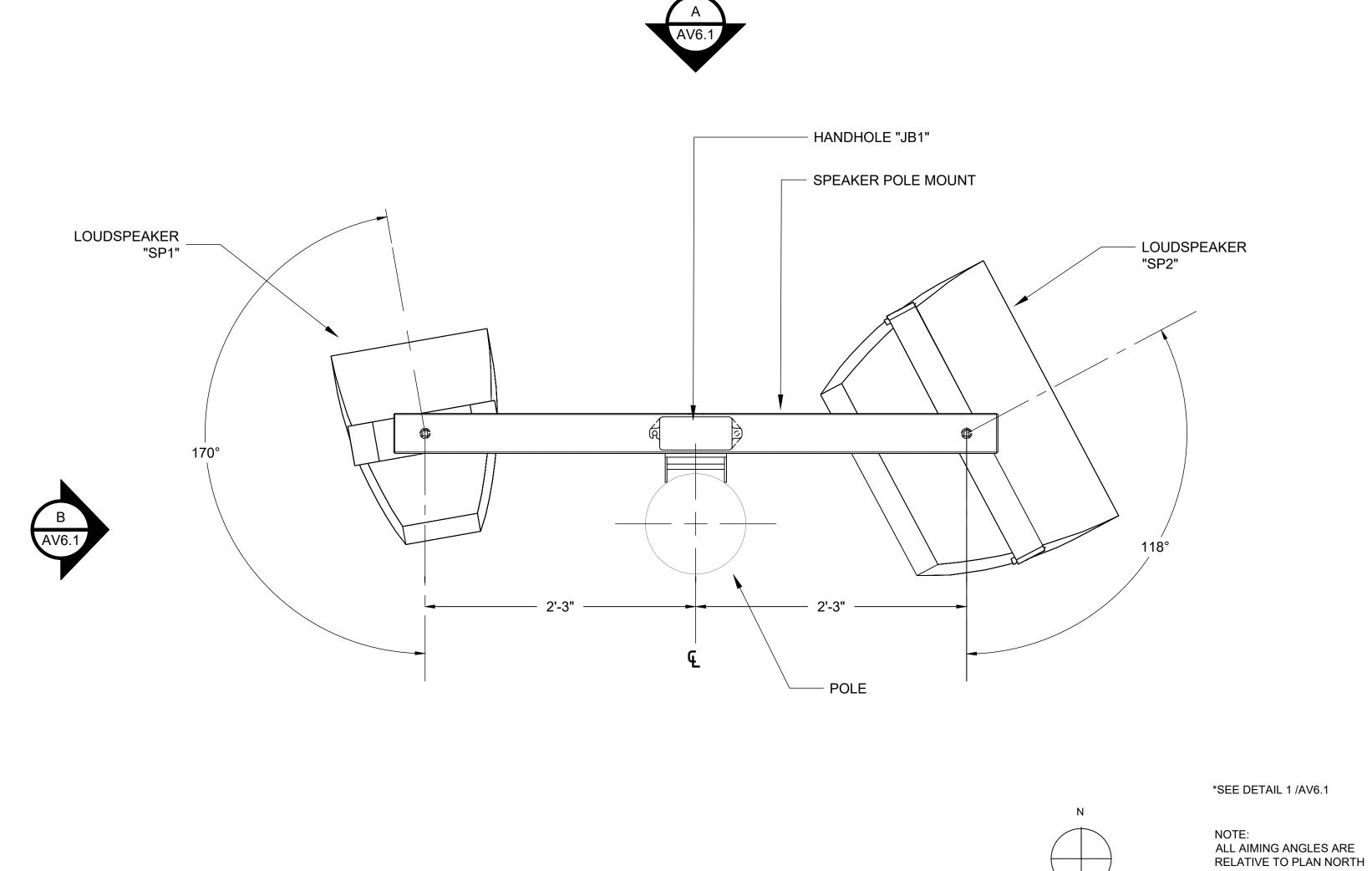
PRINCIPAL IN CHARGE:
JACK SHIMIZU

PROJECT LEADER: PABLO AMEZQUITA DESIGN TEAM: VENEKLASEN ASSOCIATES

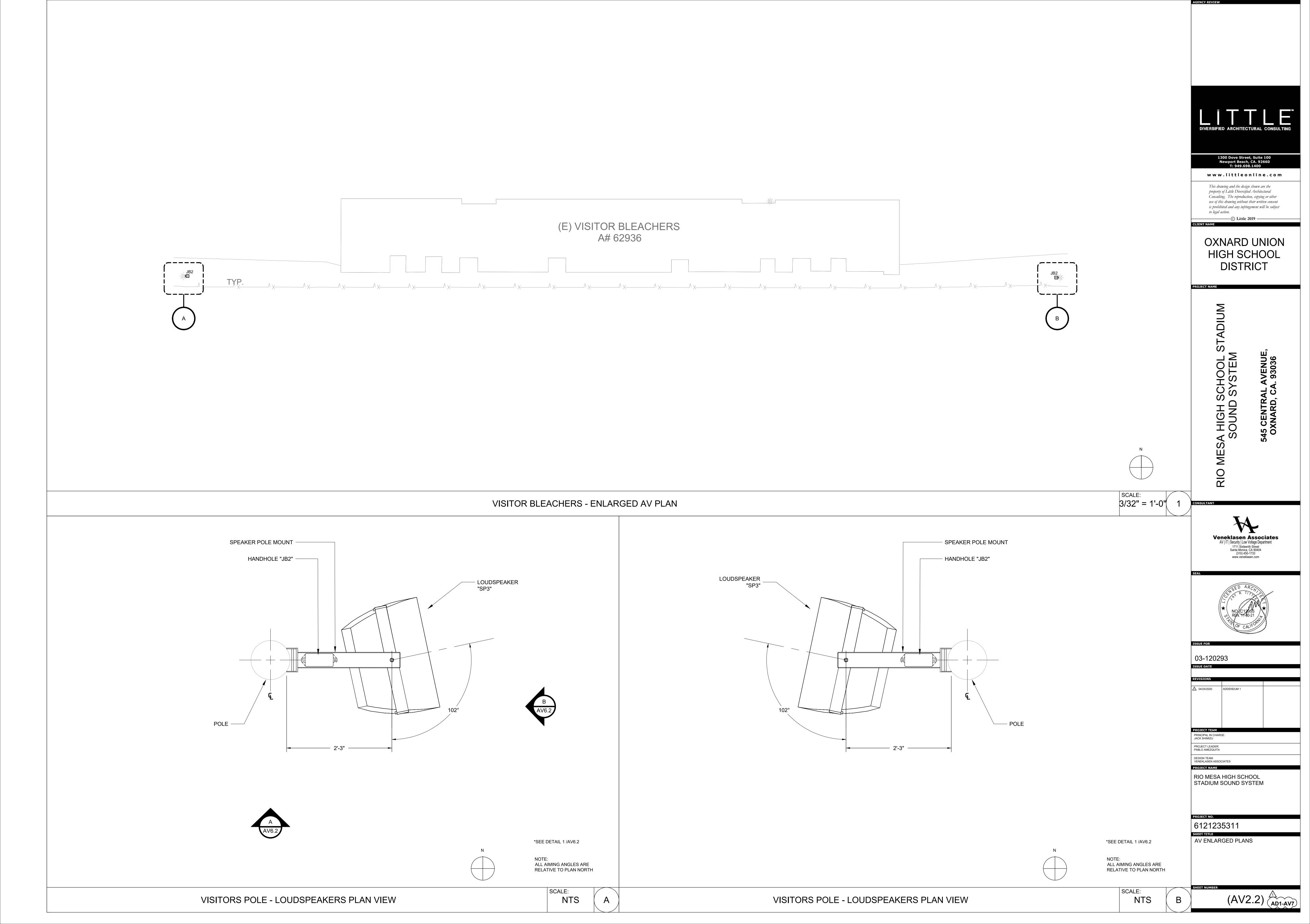
RIO MESA HIGH SCHOOL STADIUM SOUND SYSTEM

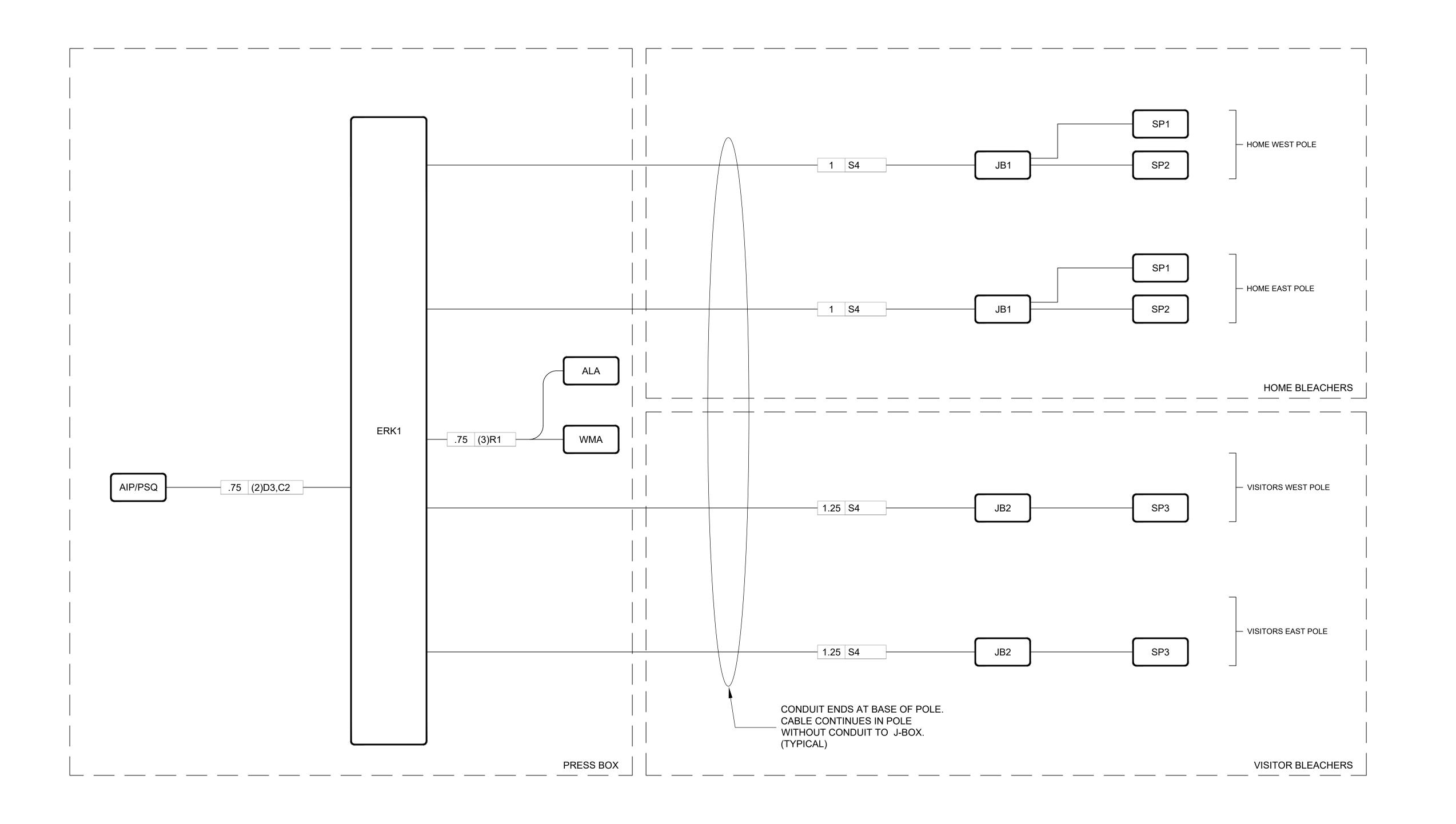
6121235311 AV ENLARGED PLANS





HOME POLE - LOUDSPEAKERS PLAN VIEW





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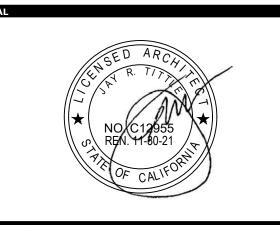
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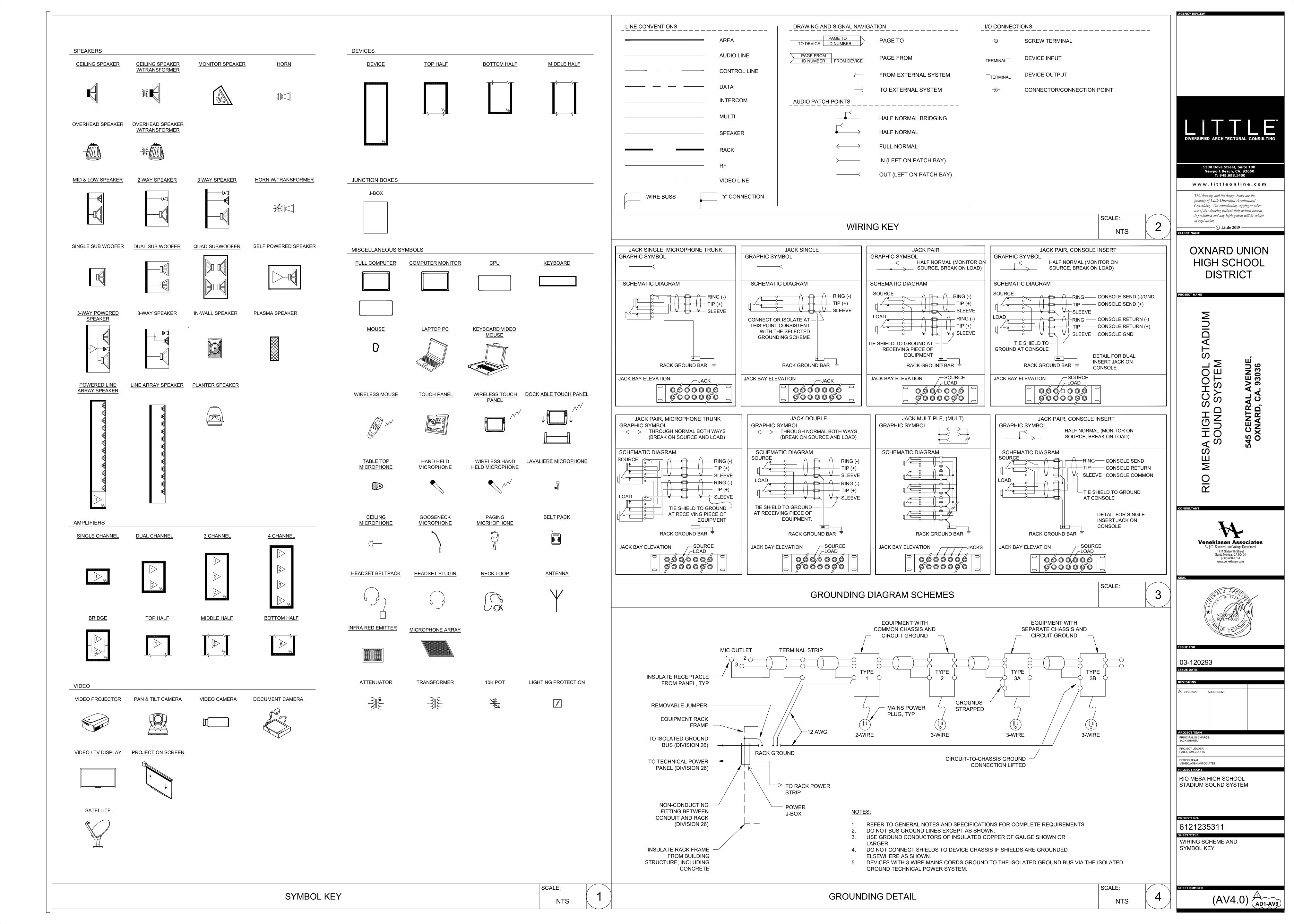
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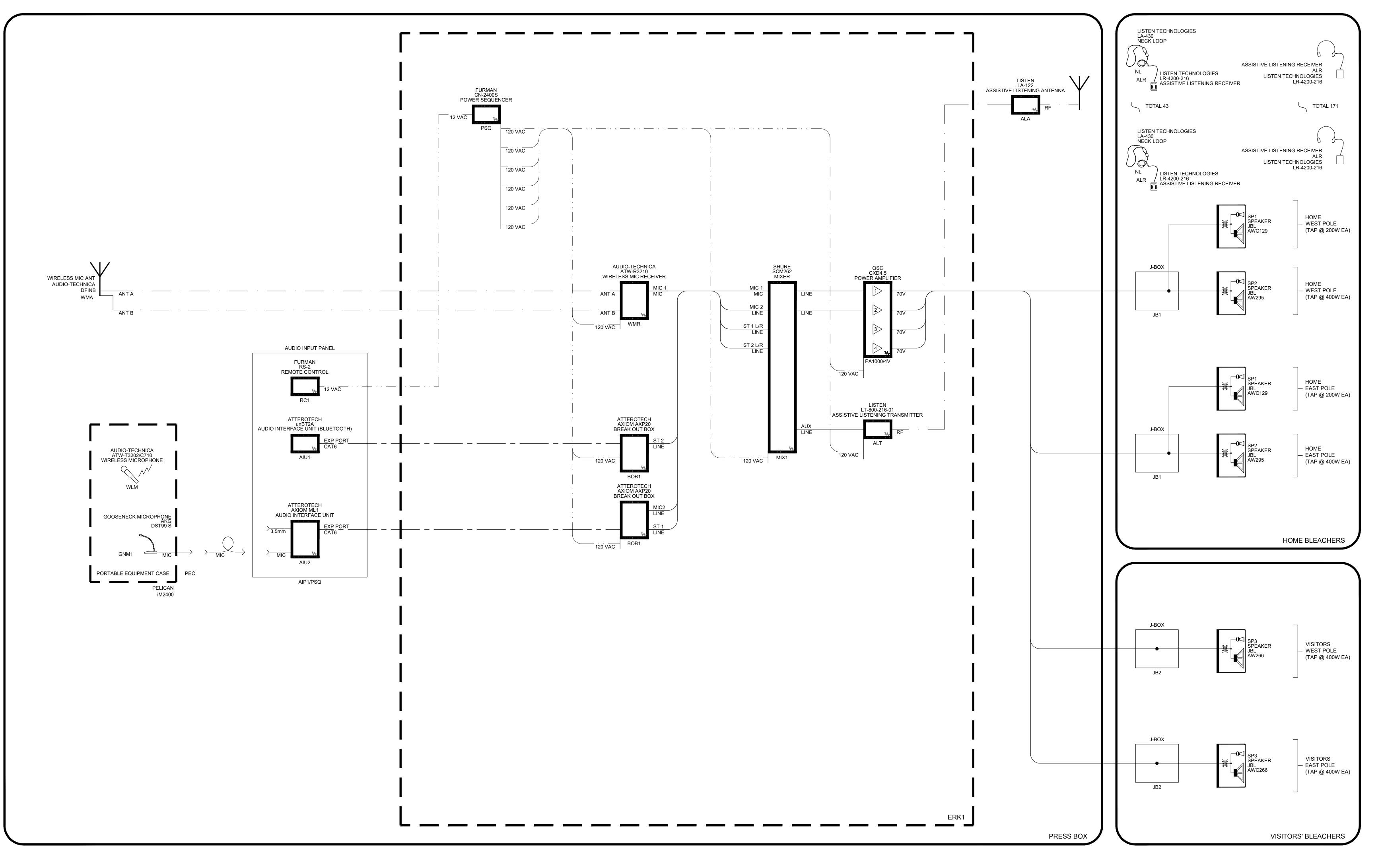
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PROJECT NO. 6121235311

SHEET TITLE
AV RISER DIAGRAM

RISER DIAGRAM







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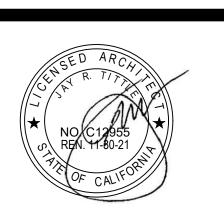
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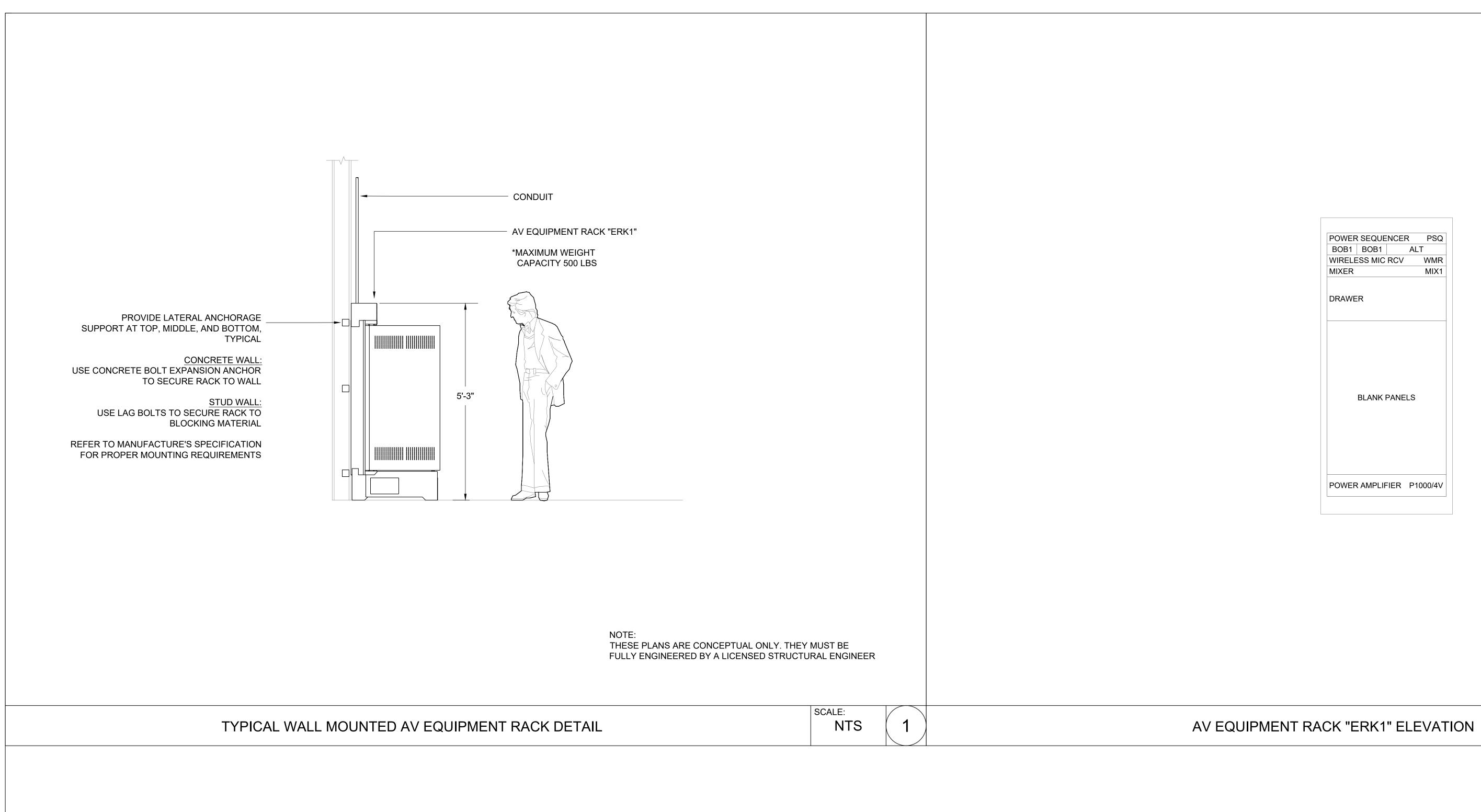
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ROJECT LEADER: ABLO AMEZQUITA		

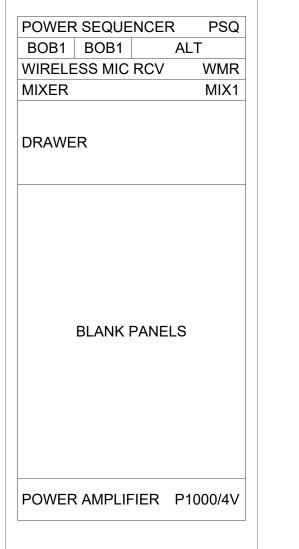
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AV ONELINE DIAGRAMS







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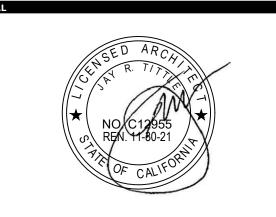
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STADIUM MESA HIGH SCHOOL SOUND SYSTEM

SCALE:





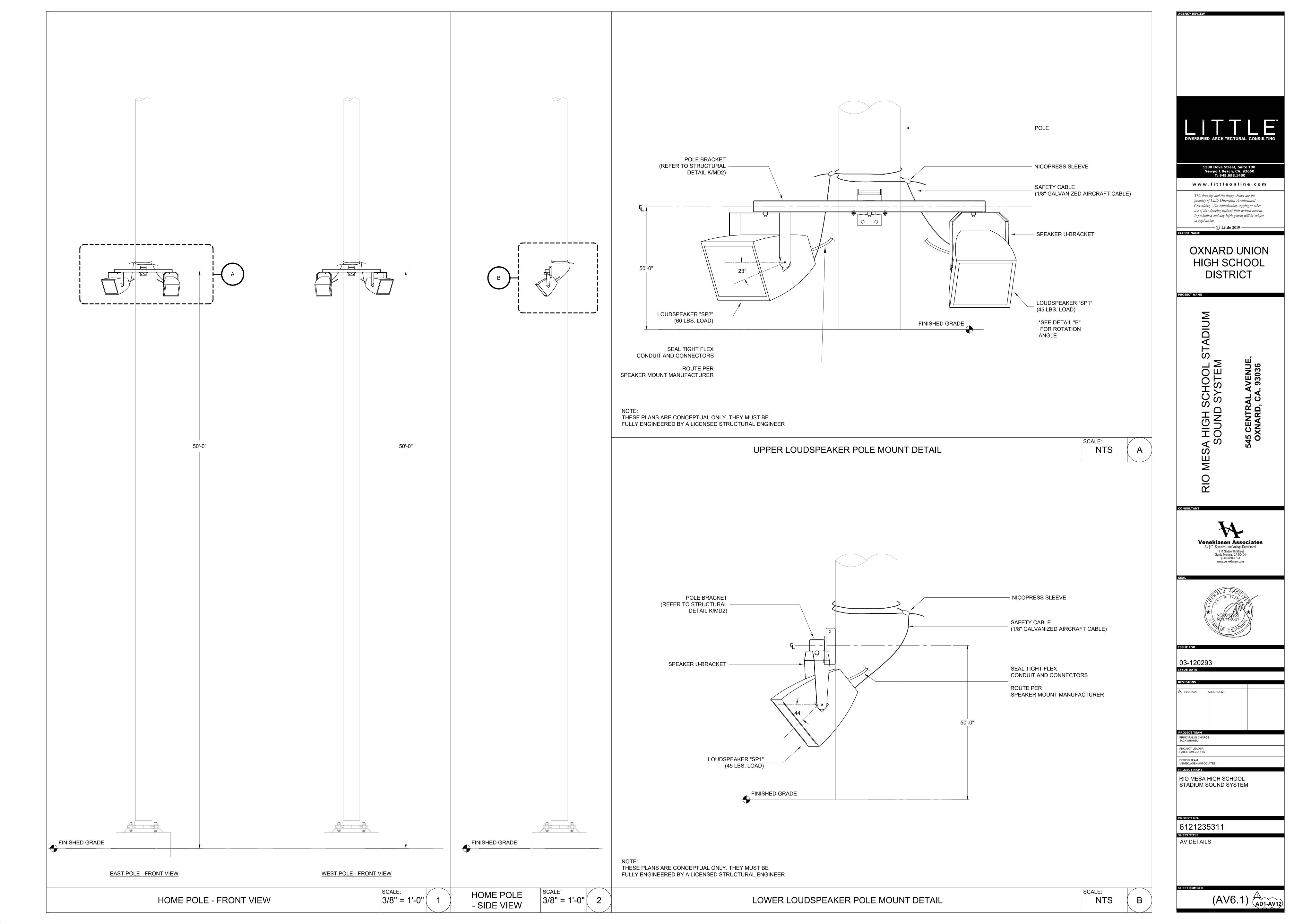
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PROJECT TEAM		
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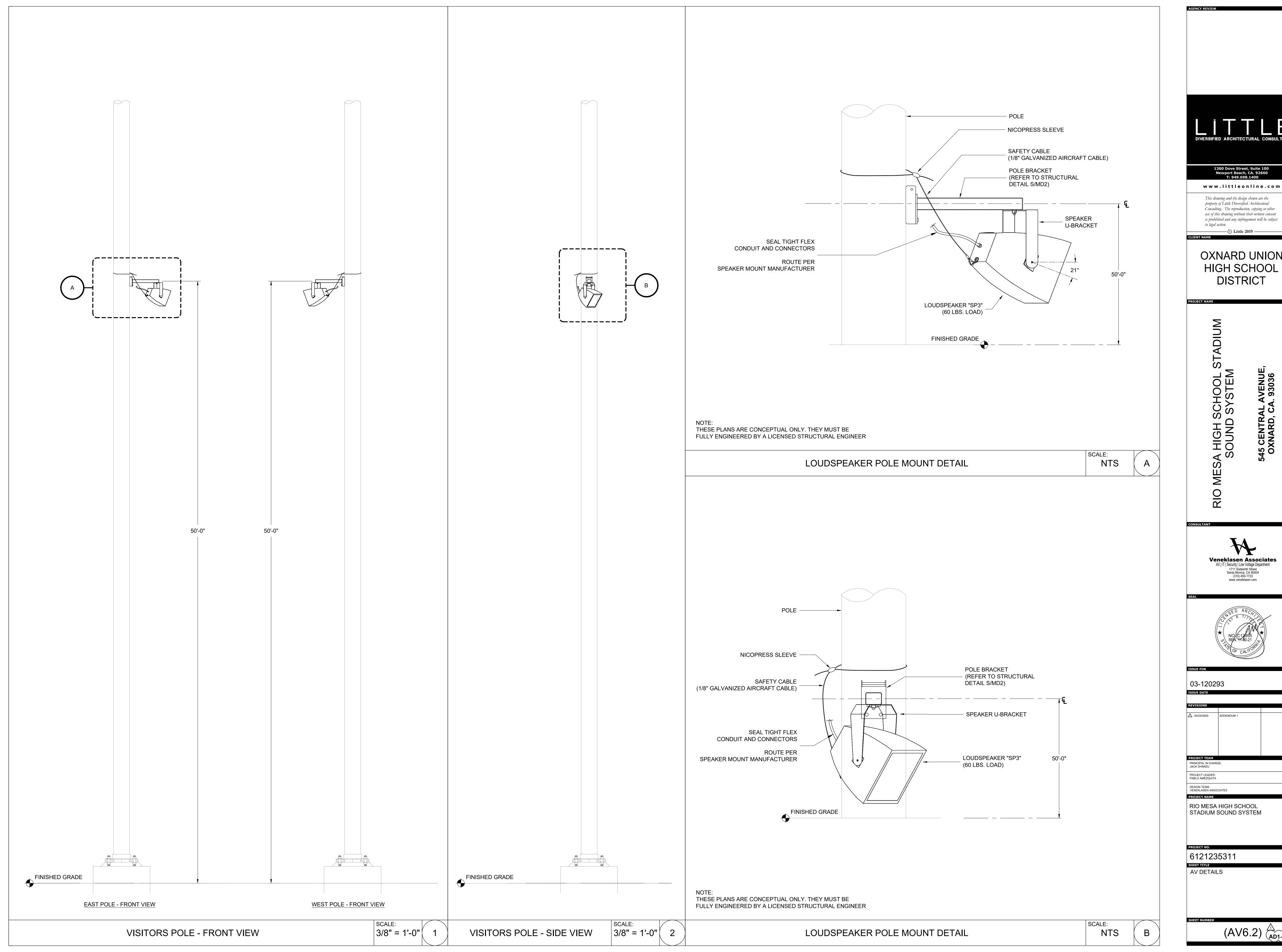
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RIO MESA HIGH SCHOOL STADIUM SOUND SYSTEM

PROJECT NO. 6121235311

AV TYPICAL SEISMIC AND GROUNDING DETAILS





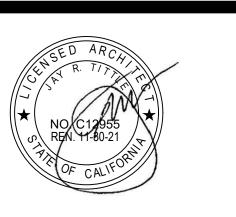


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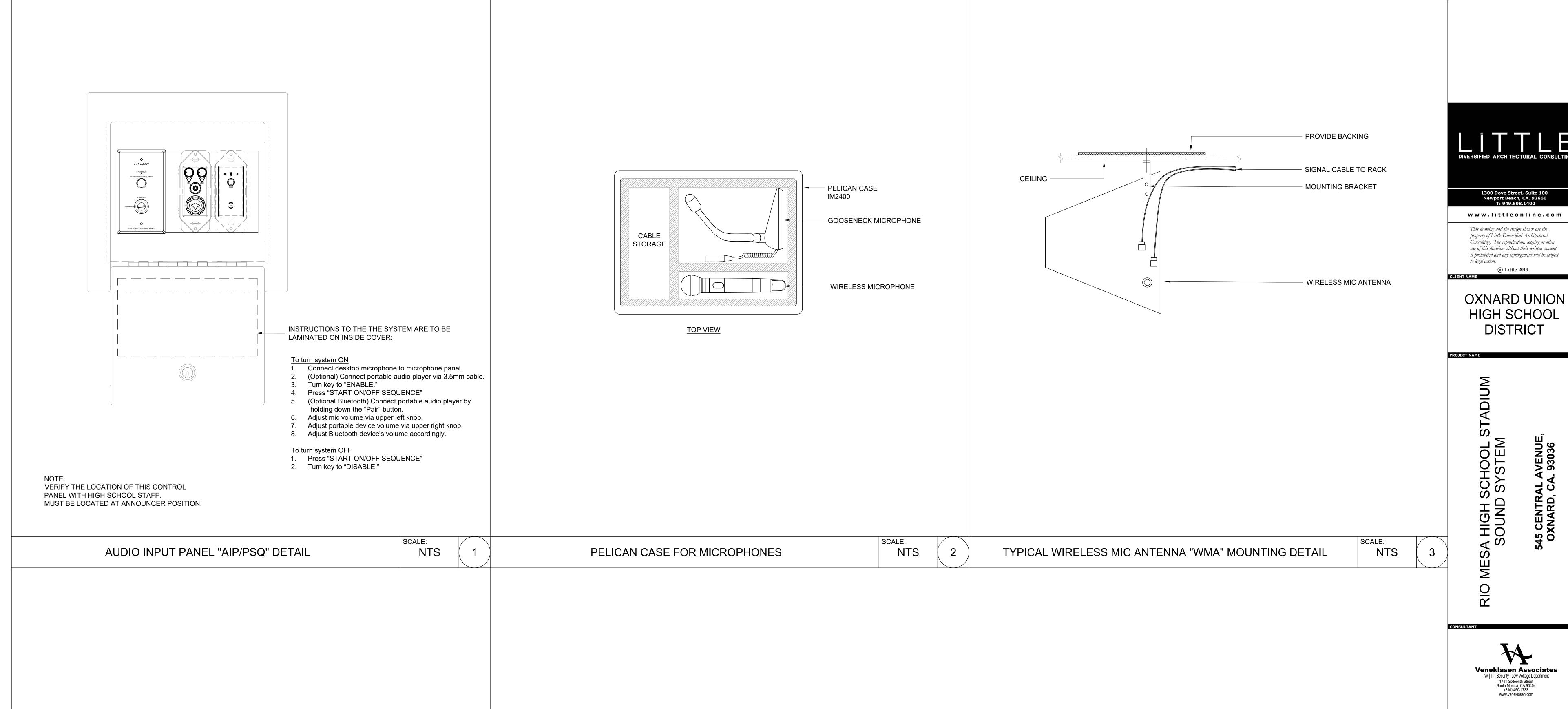
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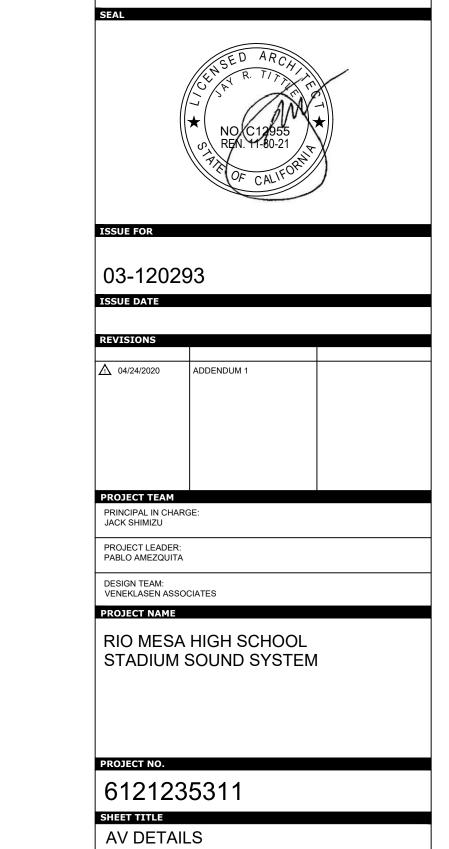




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PROJECT TEAM		
PRINCIPAL IN CHARG	9E:	
JACK SHIMIZU	-	
PROJECT LEADER:		
PABLO AMEZQUITA		

(AV6.2) (AD1-AV13)





TYPICAL ASSISTIVE LISTENING ANTENNA "ALA" MOUNTING DETAIL

SIGNAL CABLE TO RACK

- CEILING

- ANTENNA

PROVIDE BACKING

- ANTENNA MODULE

- MOUNTING BRACKET