



# ELECTRICAL SYMBOL LEGEND

- EVERY SYMBOL SHOWN ON LEGEND MAY NOT APPEAR ON DRAWINGS.
- DASHED ELECTRICAL EQUIPMENT GENERALLY INDICATES EXISTING EQUIPMENT.
- LONG-SHORT-SHORT-DASHING GENERALLY INDICATES MATCH LINE OR DEFINES AREA FOR SPECIAL NOTE.

## CIRCUIT RELATED

- LIGHTING OR POWER CIRCUIT(S). ARROW INDICATES HOME RUN. LONGER TICK(S) INDICATE NEUTRAL WIRE(S), SHORTER STRAIGHT TICK(S) INDICATE PHASE WIRE(S), SLANTED SHORTER TICK(S) INDICATE SWITCH LEG(S), DOT(S) INDICATE GROUNDING CONDUCTOR(S), DASHED WIRING (LONG-SHORT-LONG DASHES) INDICATES WIRING BELOW SLAB OR GRADE, DASHED WIRING (SERIES OF SHORT DASHES) INDICATES EXISTING WIRING, SLASH THROUGH ARROW INDICATES PARTIAL CIRCUIT, "D" ON HOMERUN ARROW INDICATES DEDICATED CIRCUIT. PROVIDE A SEPARATE NEUTRAL FOR EACH PHASE CONDUCTOR FOR ENTIRE LENGTH OF CIRCUIT FROM PANEL TO OUTLET; COUNT EACH NEUTRAL AS CURRENT-CARRYING AND GROUP A MAXIMUM OF SIX THHN/THWN CONDUCTORS IN A SINGLE RACEWAY; GROUNDING CONDUCTOR IS NOT COUNTED.
- TELEPHONE CONDUIT SYSTEM. DASHED WIRING (LONG-SHORT-LONG DASHES) INDICATES WIRING IN OR BELOW SLAB OR GRADE, DASHED WIRING (SERIES OF SHORT DASHES) INDICATES EXISTING WIRING.
- JUNCTION BOX. "J" MAY BE OMITTED IF BOX IS WITHIN OR ATTACHED TO FLUORESCENT LIGHT FIXTURE SYMBOL ON PLANS.
- POINT OF BRANCH CIRCUIT TAP FOR SEPARATELY SWITCHED FIXTURE GROUP. REFERENCE CATEGORY "B" LIGHTING SYMBOLS FOR FURTHER INFORMATION.
- GROUNDING ELECTRODE.

## POWER OUTLETS

- 20A-125V DUPLEX RECEPTACLE. "GF" INDICATES GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE.
- 20A-125V FOURPLEX RECEPTACLE.
- LC1-X CIRCUIT DESIGNATION NEXT TO RECEPTACLE DEVICES INDICATES BRANCH CIRCUIT NUMBER. RE: PANEL SCHEDULES FOR INFORMATION.
- "WP" INDICATES WEATHER PROOF DEVICE.

## EQUIPMENT

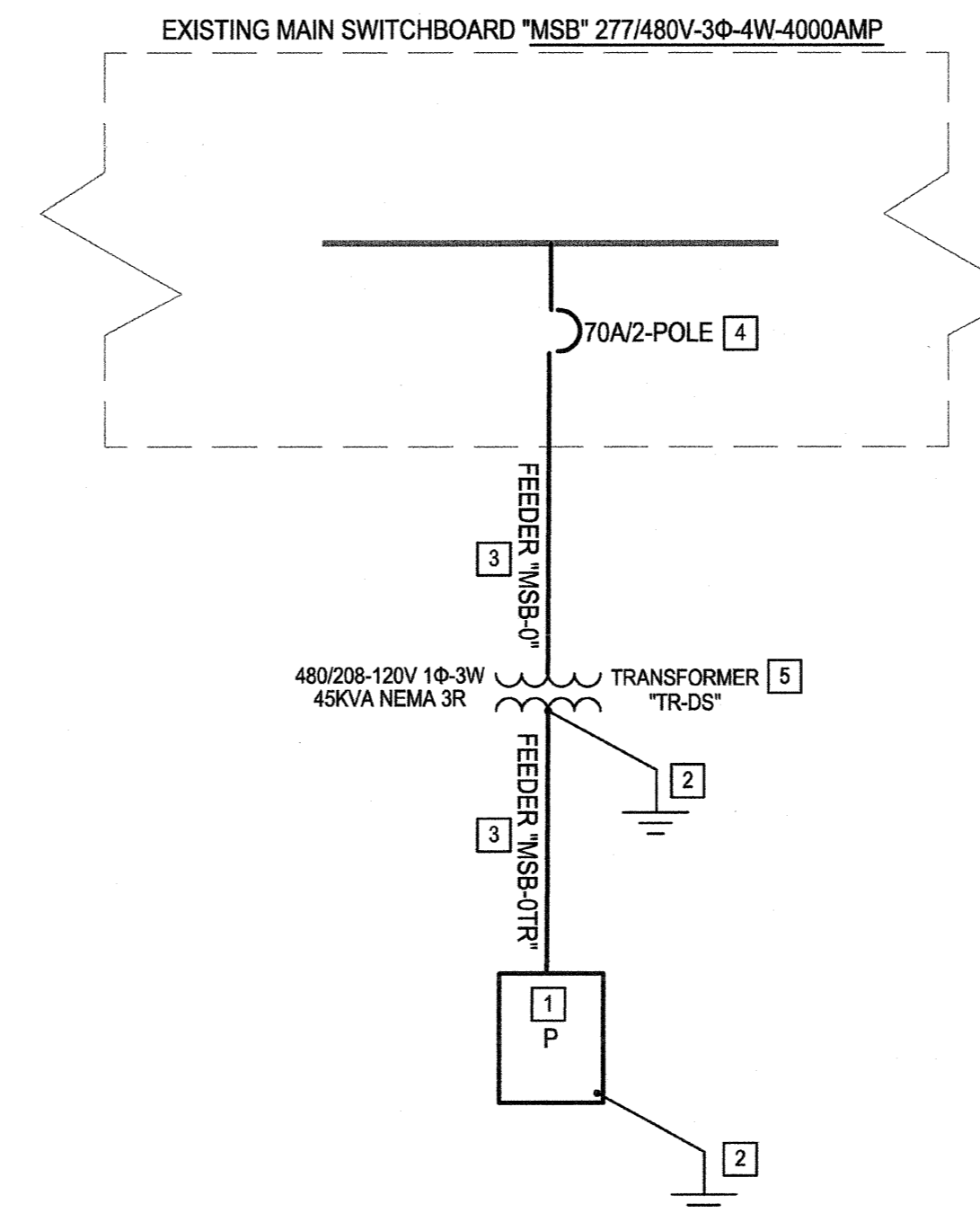
- +42" A NOTATION INDICATING THE MOUNTING HEIGHT OF A DEVICE AS MEASURED FROM FINISHED FLOOR OR GRADE TO CENTER LINE OF DEVICE.
- PANELBOARD
- SWITCHBOARD/DP
- TRANSFORMER
- GROUNDING CONNECTION TO GROUNDING ELECTRODE AS DEFINED IN NEC ARTICLE 250.

## TECHNOLOGY

- INDICATES THE LOCATION OF A NEW TECHNOLOGY OUTLET. CABLING CONTRACTOR TO PROVIDE FACEPLATE WITH A MINIMUM OF 4-PORTS AT EACH LOCATION UNLESS OTHERWISE NOTED. ALL OUTLET CABLING IS TO BE DROPPED DOWN THE INSIDE OF THE WALL INDICATED. ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL RING IN WALL.
- "D#" DESIGNATES NUMBER OF NEW DATA AND VOICE CIRCUITS THAT ARE TO BE INSTALLED AT FACEPLATE LOCATION. CABLING CONTRACTOR TO PROVIDE AND INSTALL CATEGORY 6 UTP CABLING FOR EACH CIRCUIT FROM THE DESIGNATED MDF OR IDF TO THE OUTLET LOCATION. PROVIDE AND INSTALL BLANKS FOR ALL UNUSED DATA PORTS.
- "AP" WIRELESS ACCESS POINTS OUTLET. CONTRACTOR SHALL PROVIDE AND INSTALL A 2-PORT STAINLESS STEEL FACEPLATE AND (2) CATEGORY 6 UTP CABLES FROM DESIGNATED MDF OR IDF AND TO THIS LOCATION WITH A 20' SERVICE LOOP AT THE OUTLET END OF THE CABLE. CONTRACTOR SHALL PROVIDE A SINGLE GANG BACK BOX. BACK BOX SHALL BE SECURELY MOUNTED TO BUILDING STRUCTURE, AT A SERVICEABLE HEIGHT, AND HAVE AN ENTRY POINT WITH A PROTECTIVE CAP TO PREVENT CABLE DAMAGE. CONTRACTOR TO LABEL CEILING GRID AT ALL "AP" LOCATIONS.
- "CS" SPEAKER/ CLOCK, PoE+ INDOOR WALL MOUNT IP & 25V/70V SPEAKER WITH LCD DISPLAY AND TALKBACK MICROPHONE. PROVIDE ATLAS SOUND #IP-SDM-72 WITH WALL/SURFACE ENCLOSURE #IP-SEST-SD. CABLING CONTRACTOR SHALL PROVIDE AND INSTALL (1) (WHITE IN COLOR) CATEGORY 6 NETWORK CABLE FROM THIS LOCATION ROUTED TO IDF FOR TERMINATION.
- "WP" EXTERIOR SPEAKER, PoE+ VANDAL AND WEATHER RESISTANT WALL MOUNT IP SPEAKER. PROVIDE ATLAS SOUND #IP-HVP WITH WALL/SURFACE ENCLOSURE #IP-SEST-HVP. CABLING CONTRACTOR SHALL PROVIDE AND INSTALL (1) (WHITE IN COLOR) CATEGORY 6 NETWORK CABLE FROM THIS LOCATION ROUTED TO IDF FOR TERMINATION.

# PARTIAL SINGLE LINE DIAGRAM

- # INDICATES GENERAL NOTE.
- # INDICATES KEYED PLAN NOTE.
- 1 PANELBOARD BY BUILDING MANUFACTURE.
- 2 PROVIDE 1/4" COPPER EQUIPMENT GROUND IN 1" CONDUIT.
- 3 PROVIDE UNDERGROUND FEEDER AS INDICATED.
- 4 PROVIDE CIRCUIT BREAKER TO MATCH EXISTING TYPE AND A.I.C. RATING.
- 5 PROVIDE TRANSFORMER AS INDICATED. TRANSFORMER SHALL BE UL LISTED AND DESIGNED IN ACCORDANCE WITH CBS 2 AND NEMA ST-20 STANDARDS & SHALL USE UL RECOGNIZED 2000 INSULATION SYSTEM. SHALL BE DRY TYPE, CLASS AA, VENTILATED ENCLOSURE, MEETS DOE-2016 EFFICIENCY 10 CFR PART 431, WITH 150C TEMPERATURE RISE, AND COPPER WINDINGS.

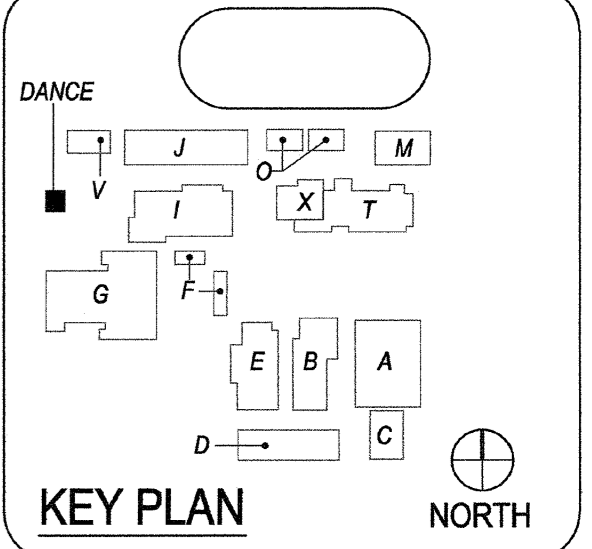
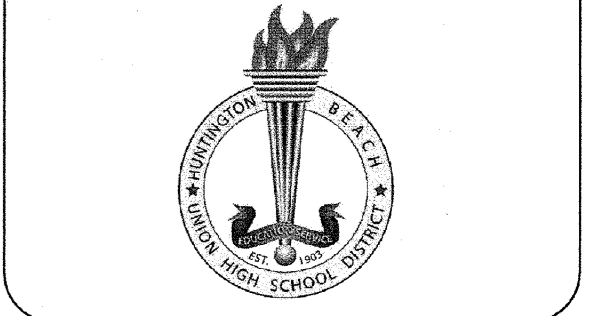


FEEDER SCHEDULE				
TAG NUMBER	CONDUCTOR QUANT. & SIZE	CONDUIT SIZE	SETS	COMMENTS
MSB-0	2#4, 1#8G	1-1/2"	1	-
MSB-OTR	3#1/0, 1#6G	2"	1	-
-	-	-	-	-

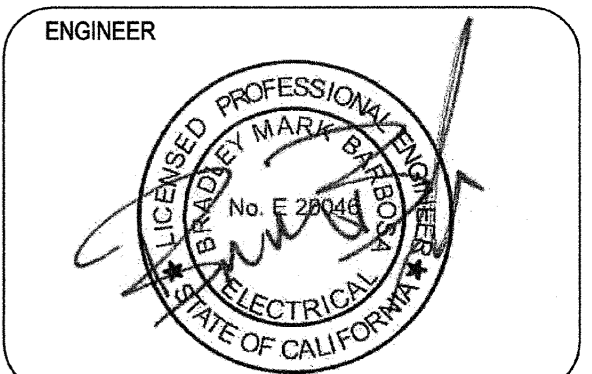


ARCHITECTURE  
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HUNTINGTON BEACH HIGH SCHOOL DANCE STUDIO  
 1905 MAIN ST  
 HUNTINGTON BEACH, CA 92648  
 Construction Documents



FILE NO. 30-H5  
 IDENTIFICATION STAMP  
 DIV. OF THE STATE ARCHITECT  
 APPL 04-118263  
 ACS FLS SS  
 DATE MAY 0 5 2019



ARCHITECT

CLIENT  
 HUNTINGTON BEACH UNION HIGH SCHOOL DISTRICT  
 PROJECT NUMBER  
 18296  
 DATE: 05/09/19  
 DRAWN BY: Author  
 CHECKED BY: Checker

No.	Description	Date

Construction Documents  
**ELECTRICAL SYMBOLS AND SINGLE LINE DIAGRAM**  
**E0.1**

ELECTRICAL GENERAL SPECIFICATIONS

DIVISION 26
GENERAL ELECTRICAL SPECIFICATIONS
1.0 WORK INCLUDED:
A. THIS SPECIFICATION SHALL APPLY TO ALL PHASES OF WORK HEREIN AFTER SPECIFIED...

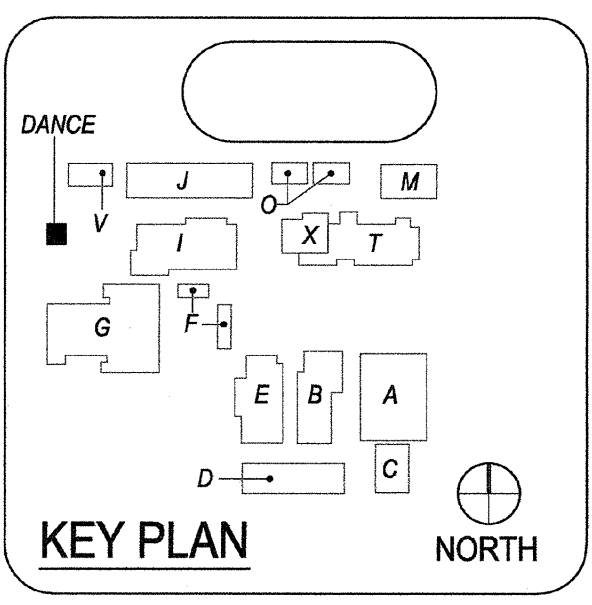
D. ALL TEST REPORTS, INCLUDING COPIES OF ANY REQUIRED ENERGY CODE ACCEPTANCE FORMS (E.G. CA TITLE 24 ACCEPTANCE FOR CODE COMPLIANCE FORMS) SHOULD BE SUBMITTED TO THE ENGINEER AT COMPLETION OF PROJECT.
1.5 IDENTIFICATION
A. NAMEPLATES SHALL BE PROVIDED FOR UNIT SUBSTATIONS, SWITCHGEAR, SWITCHBOARDS, DISTRIBUTION BOARDS, DISTRIBUTION PANELS, PANEL BOARDS, MOTOR CONTROL CENTERS, TRANSFORMERS, TRANSFER SWITCHES, CONTACTORS, STARTERS, DISCONNECT SWITCHES, ENCLOSED CIRCUIT BREAKERS/SWITCHES, INVERTERS, UPSs, PULSES, RODS, CONTROL PANELS, DIMMING PANELS, DOOR RELEASING SYSTEM PANELS, FIRE ALARM/CENTRAL MONITORING TERMINAL CABINETS/POWER SUPPLIES/CONTROL PANELS, AND ALL LOW VOLTAGE SYSTEM TERMINAL & CONTROL CABINETS, NAMEPLATE INSCRIPTIONS SHALL BE IDENTICAL TO THE EQUIPMENT DESIGNATIONS INDICATED IN PLANS AND SPECIFICATIONS...

C. IF THE SHOP DRAWINGS SHOW VARIATIONS FROM THE REQUIREMENTS OF THE CONTRACTOR BECAUSE OF STANDARD SHOP PRACTICE OR OTHER REASONS, THE CONTRACTOR SHALL MAKE SPECIFIC MENTION OF SUCH VARIATIONS IN THE CONTRACTOR'S LETTER OF TRANSMITTAL. IF THE SUBSTITUTION IS ACCEPTED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER ADJUSTMENT THAT MAY BE CAUSED BY THE SUBSTITUTION. SAMPLES SHALL BE SUBMITTED WHEN REQUESTED.
D. ONLY PRODUCTS LISTED AS "EQUAL" WITHIN THE CONTRACT DOCUMENTS, ALONG WITH FORMALLY APPROVED "SUBSTITUTIONS" WILL BE REVIEWED. PRODUCTS NOT CONFORMING TO THESE ITEMS WILL NOT BE REVIEWED AND WILL BE RETURNED TO THE CONTRACTOR FOR RE-SUBMITTAL.
E. SHOP DRAWINGS SHALL BE SUBMITTED ON THE FOLLOWING BUT NOT LIMITED TO:
- SWITCHGEAR, SWITCHBOARDS, DISTRIBUTION BOARDS, MOTOR CONTROL CENTERS, PANELBOARDS, AND BUS DUCTS; COMPLETE WITH OVERCURRENT DEVICE INFORMATION.
- TRANSFORMERS
- FIRE ALARM SYSTEM/CENTRAL MONITORING SYSTEM
- WIRING DEVICES
- PULLBOXES AND UNDERGROUND VAULTS
- TERMINAL CABINETS
- POWER POLES AND FLOOR BOXES
- ARC FLASH, SHORT-CIRCUIT & COORDINATION STUDIES
- ALL OTHER PRODUCTS CALLED OUT ON DRAWINGS THAT CALL FOR SHOP DRAWING SUBMITTAL.
1.10 MAINTENANCE, SERVICING, INSTRUCTION MANUALS AND WIRING DIAGRAMS
A. PRIOR TO FINAL ACCEPTANCE OF THE JOB, THE ELECTRICAL CONTRACTOR SHALL FURNISH TO THE OWNER AT LEAST FOUR (4) COPIES OF OPERATING AND MAINTENANCE AND SERVICING INSTRUCTIONS, AS WELL AS FOUR (4) COMPLETE WIRING DIAGRAMS FOR THE FOLLOWING ITEMS OR EQUIPMENT:
- FIRE ALARM SYSTEM
- TRANSFORMERS
- SWITCHGEAR, SWITCHBOARDS, DISTRIBUTION BOARDS, MOTOR CONTROL CENTERS, PANELBOARDS, AND BUS DUCTS; COMPLETE WITH OVERCURRENT DEVICE INFORMATION.
B. ALL WIRING DIAGRAMS SHALL SPECIFICALLY COVER THE SYSTEM SUPPLIED. TYPICAL DRAWINGS WILL NOT BE ACCEPTED. FOUR (4) COPIES SHALL BE PRESENTED TO THE OWNER.
1.11 INTERRUPTION OF SERVICES/SERVICE SHUTDOWN
A. ANY INTERRUPTION OF ELECTRICAL SERVICES, ELECTRICAL CIRCUITS, ELECTRICAL FEEDERS, SIGNAL SYSTEMS, COMMUNICATION SYSTEMS, FIRE ALARM SYSTEMS, ETC. REQUIRED TO PERFORM WORK SHALL MEET THE SPECIFIC PRIOR-AWARE REQUIREMENTS OF THE OWNER. SUCH WORK SHALL BE SCHEDULED WITH THE OWNER TO BE PERFORMED AT THE OWNER'S CONVENIENCE.
B. INTERRUPTIONS/OUTAGES OF ANY OF THE OWNER'S SYSTEMS AND SERVICES MENTIONED ABOVE SHALL BE SCHEDULED TO OCCUR DURING OTHER THAN THE OWNER'S NORMAL BUSINESS HOURS. ANY OVERTIME COSTS SHALL BE BORNE BY THE CONTRACTOR.
C. SEE DRAWINGS FOR ANY ADDITIONAL REQUIREMENTS REGARDING OUTAGES, INTERRUPTIONS AND ANY TEMPORARY SERVICES REQUIRED.
PART 2 - PRODUCTS
2.1 MATERIALS
A. MATERIALS AND EQUIPMENT: ALL ELECTRICAL MATERIALS AND EQUIPMENT, INCLUDING OWNER-MADE EQUIPMENT, SHALL BE NEW AND LISTED BY UNDERWRITER'S LABORATORIES (UL) AND BEAR THEIR LABEL OR BE LISTED AND CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LAB (NRTL) THAT IS ALSO RECOGNIZED BY THE LOCAL AUTHORITY-HAVING-JURISDICTION (AHJ).
B. SWITCHGEAR/SWITCHBOARDS/DISTRIBUTION BOARDS/MOTOR CONTROL CENTERS:
1. SEE GENERAL SINGLE LINE DIAGRAM NOTES ON DRAWINGS FOR ADDITIONAL INFORMATION.
C. PANELBOARDS - BRANCH CIRCUIT:
1. SEE DRAWINGS FOR PANELBOARD SCHEDULES AND SPECIFICATIONS.
D. TRANSFORMERS:
1. SEE DRAWINGS FOR TRANSFORMER SCHEDULES AND SPECIFICATIONS.
E. WIRING DEVICES:
1. PROVIDE WIRING DEVICES INDICATED PER PLAN. DEVICES SHALL BE SPECIFICATION GRADE. ACCEPTABLE MANUFACTURERS ARE LEVITON, PASS & SEYMOUR AND HUBBELL. PROVIDE ALL SIMILAR DEVICES OF SAME MANUFACTURER, UNLESS INDICATED OTHERWISE. ALL DEVICE COLORS SHALL BE SELECTED FROM THE FULL RANGE OF MANUFACTURER STANDARD COLOR OPTIONS AS SELECTED BY THE ARCHITECT. THIS DIRECTION WILL BE PROVIDED IN THE SHOP DRAWING REVIEW PROCESS.
2. I.G. (ISOLATED GROUND) RECEPTACLE BODIES SHALL BE OF A BASIC COLOR SPECIFIED ABOVE WITH AN ORANGE TRIANGLE TO SYMBOLIZE ISOLATED GROUND.
3. WHEN SHOWN CIRCUITED WITH AN I.G. CONDUCTOR, ALL RECEPTACLES SHALL BE OF THE I.G. TYPE.
4. WIRING DEVICE COVER PLATES LOCATED ON RECESSED BOXES SHALL BE COMMERCIAL GRADE STAINLESS STEEL COVER PLATES UTILIZED ON SURFACE MOUNTED BOXES SHALL BE STAINLESS STEEL. PLASTIC COVER PLATES ARE UNACCEPTABLE.
5. ALL WIRING DEVICE PLATES ON THE PROJECT SHALL BE LABELED WITH PANEL AND CIRCUIT NUMBER(S) UTILIZING A BROTHER P-TOUCH LABELING SYSTEM UTILIZING 1/2" TAPE (YELLOW ON BLACK) OR EQUAL. BY SERVICETELERMAN OR PANOUT. LOCATE LABEL ON THE CONCEALED SIDE OF THE WIRING DEVICE PLATE. HANDWRITTEN LABELS ARE UNACCEPTABLE.
6. THE FOLLOWING WIRING DEVICE PLATES SHALL BE ENGRAVED:
a. KEY OPERATED SWITCHES, SWITCHES WITH PILOT LIGHTS AND SWITCHES FOR THE CONTROL OF MOTORS, HEATERS AND VENTILATORS. ENGRAVING SHALL BE BLACK AND OCCUR ON THE EXPOSED SIDE OF THE PLATE AND INDICATE THE MOTOR, HEATER, OR VENTILATOR CONTROLLED.
b. RECEPTACLES ON GENERATOR AND/OR UPS POWER SHALL HAVE CUSTOM HOT STAMPED PLATES WITH THE WORDS "GENERATOR" OR "UPS" IN BLACK LETTERS.
7. WEATHERPROOF OUTLET COVERS/ASSEMBLIES. ALL RECEPTACLES IDENTIFIED AS WEATHERPROOF ON THE DRAWINGS SHALL BE GFCI TYPE AND EQUIPPED WITH CAST WEATHERPROOF OUTLET BOXES WITH METAL COVERS. PROVIDE LOCKING TYPE WHERE NOTED ON DRAWINGS.
G. MOTOR CONTROLLERS/STARTERS: SEE DRAWINGS FOR MOTORIZED EQUIPMENT SCHEDULES AND SPECIFICATIONS.
H. CIRCUIT BREAKERS:
1. SERVICE ENTRANCE CIRCUIT BREAKERS SMALLER THAN 400 AMP FRAME SHALL BE THERMAL-MAGNETIC TRIP WITH INVERSE TIME CURRENT CHARACTERISTICS UNLESS OTHERWISE INDICATED BELOW. SERVICE ENTRANCE MAIN CIRCUIT BREAKERS, 400 AMP FRAME AND LARGER SHALL BE 100% RATED, SOLID-STATE TYPE AS OUTLINED IN THIS SPECIFICATION. ALL OTHER SERVICE ENTRANCE CIRCUIT BREAKERS, 400 AMP FRAME AND LARGER, SHALL BE 100% RATED, SOLID-STATE TYPE AS OUTLINED IN THIS SPECIFICATION.
2. ALL NON-SERVICE ENTRANCE CIRCUIT BREAKERS 225 AMP AND LARGER SHALL BE THERMAL MAGNETIC TRIP AND HAVE CONTINUOUSLY ADJUSTABLE MAGNETIC PICK-UPS OF APPROXIMATELY 5 TO 10 TIMES TRIP RATING. BREAKERS SHALL HAVE EASILY CHANGED TRIP RATING PLUS WITH TRIP RATINGS AS INDICATED ON THE DRAWINGS. RATING PLUS SHALL BE INTERLOCKED SO THEY ARE NOT INTERCHANGEABLE BETWEEN FRAMES. ADDITIONALLY, ALL NON-SERVICE ENTRANCE CIRCUIT BREAKERS, 600 AMP FRAME AND LARGER, LOCATED IN 480V 3 PHASE, 3-WIRE OR 277/480V 3 PHASE 4-WIRE SWITCHGEAR, DISTRIBUTION BOARDS OR PANEL BOARDS, SHALL BE SOLID STATE, 100% RATED. BREAKER SHALL HAVE BUILT-IN NUMBER AND DATES OF DRAWINGS SUFFIXED. TEST POINTS AND GROUND FAULT FUNCTIONS OF THE BREAKER BY MEANS OF A 120-VOLT OUTLET TEST KIT. CONTRACTOR SHALL UTILIZE A TEST KIT CAPABLE OF TESTING ALL BREAKERS 400 AMP AND ABOVE - AT THE ENGINEER'S REQUEST AT NO ADDITIONAL COST TO THE OWNER.

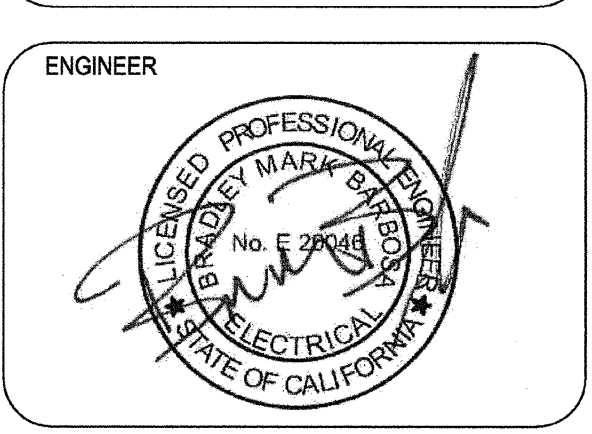
3. ALL NON-SERVICE ENTRANCE CIRCUIT BREAKERS LESS THAN 225 AMP SHALL BE MOLDED PLASTIC CASE, AIR CIRCUIT BREAKERS CONFORMING TO UL 489. PROVIDE BREAKERS WITH THERMAL MAGNETIC TRIP UNITS, AND A COMBINATION TRIP BAR FOR TWO-OR THREE-POLE BREAKERS, CONNECTED TO EACH POLE SO TRIPPING OF ONE POLE WILL AUTOMATICALLY TRIP ALL POLES OF EACH BREAKER. PROVIDE BREAKERS OF TRIP-FREE AND TRIP-INDICATING BOLT-ON TYPE, WITH QUICK-MAKE QUICK-BREAK CONTACTS. PROVIDE SINGLE TWO-OR THREE-POLE BREAKER INTERCHANGEABILITY. PROVIDE PADLOCKING DEVICE FOR CIRCUIT BREAKERS AS SHOWN ON THE DRAWINGS.
4. GROUND FAULT INTERRUPTING DEVICES. PROVIDE WITH MOLDED PLASTIC CASE, AIR CIRCUIT BREAKERS, SIMILAR TO ABOVE WITH GROUND FAULT CIRCUIT INTERRUPT CAPABILITY, CONFORMING TO UL CLASS A, GROUP 1.
5. TANDEN OR HALF-SIZED CIRCUIT BREAKERS ARE NOT PERMITTED.
6. SERIES RATED BREAKERS SHALL NOT BE USED.
7. CIRCUIT BREAKER HANDLE ACCESSORIES SHALL PROVIDE PROVISIONS FOR LOCKING HANDLE IN THE ON OR OFF POSITION.
8. TEMPERATURE COMPENSATING CIRCUIT BREAKER(S) SHALL BE PROVIDED WHEN LOCATED IN OUTDOOR ENCLOSURE(S) OR WHEN LOCATED IN AN ENCLOSURE SUBJECT TO HIGH AMBIENT HEAT, ETC.
9. PROVIDE 75 DEGREE CELSIUS-RATED CONDUCTOR LUGS/LUG KITS AS SPECIFIED ON CIRCUIT BREAKERS TO ACCEPT CONDUCTOR QUANTITIES AND SIZES SHOWN ON DRAWINGS.
10. ALL CIRCUIT BREAKER TERMINATIONS SHALL BE SUITABLE FOR USE WITH 75 DEGREE CELSIUS AMPACITY CONDUCTORS.
I. DISCONNECT SWITCHES:
1. NON-FUSIBLE OR FUSIBLE, SHALL BE HEAVY-DUTY, EXTERNALLY OPERATED HORSEPOWER-RATED, 600V A.C. PROVIDE NEMA 3R, LOCKABLE ENCLOSURES FOR ALL SWITCHES LOCATED ON ROOF TOPS, IN OR NEAR DAMP AREAS AND IN ANY AREA EXPOSED TO THE ELEMENTS.
2. FUSIBLE SWITCHES SHALL BE CLASS "R".
3. AMPERAGE, HORSEPOWER, VOLTAGE AND NUMBER OF POLES PER DRAWING - ALL OF WHICH SHALL BE CLEARLY MARKED ON THE SWITCH NAMEPLATE.
4. PROVIDE THE OWNER'S PROJECT MANAGER WITH ONE (1) SPARE SET OF FUSES AND TWO (2) SETS OF FUSE CLIPS/FUSES FOR EVERY SET OF FUSES ON THE PROJECT.
J. FUSES:
1. PROVIDE FUSES AT ALL LOCATIONS SHOWN ON THE DRAWINGS AND AS REQUIRED FOR SUPPLEMENTAL PROTECTION.
a. FUSES SHALL BE MANUFACTURED BY BUSSMAN, SHAWMUT OR EQUAL.
b. ALL FUSES SHALL BE THE PRODUCT OF A SINGLE MANUFACTURER.
2. MAIN AND FEEDER PROTECTION.
a. WHERE RATING OF PROTECTIVE DEVICE IS GREATER THAN 600A, PROVIDE BUSSMAN HI-CAP FUSES, CLASS L, CURRENT LIMITING, HAVING AN INTERRUPTING RATING OF 200,000 RMS.
b. WHERE RATING OF PROTECTIVE DEVICE IS 600A OR LESS, PROVIDE BUSSMAN CLASS R FUSES, CLASS RK SERIES CURRENT LIMITING FUSES, HAVING AN INTERRUPTING RATING OF 200,000 RMS.
3. MOTOR PROTECTION.
a. WHERE RATING OF PROTECTIVE DEVICE IS GREATER THAN 600A, PROVIDE BUSSMAN HI-CAP FUSES, CLASS L, CURRENT LIMITING, HAVING AN INTERRUPTING RATING OF 200,000 RMS.
b. WHERE RATING OF PROTECTIVE DEVICE IS 600A OR LESS, PROVIDE BUSSMAN CLASS RK SERIES CURRENT LIMITING FUSES, HAVING AN INTERRUPTING RATING OF 200,000 RMS.
c. WHERE FUSES FEEDING MOTORS ARE INDICATED BUT NOT SIZED, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CORRECT THE FUSE SIZE WITH THE MOTOR TO PROVIDE PROPER MOTOR RUNNING PROTECTION.
d. WHEN REJECTION TYPE FUSES ARE SPECIFIED (CLASS RK SERIES) THE FUSE HOLDER OF ALL SWITCHES (SPECIFIED IN OTHER SECTIONS) SHALL BE SUITABLE FOR THE FUSES PROVIDED.
K. FIRE ALARM SYSTEM/CENTRAL MONITORING SYSTEM:
1. SEE DRAWINGS FOR FIRE ALARM SYSTEM OR CENTRAL MONITORING SYSTEM SPECIFICATIONS.
L. TRANSIENT VOLTAGE SUPPRESSION (TVSS):
1. SEE DRAWINGS FOR TVSS SPECIFICATIONS.
M. CONDUIT:
1. GALVANIZED RIGID CONDUIT (GRC) SHALL BE FULL WEIGHT THREADED TYPE STEEL. STEEL CONDUIT SHALL BE PROTECTED BY OVERALL ZINC COATING TO INSIDE AND OUTSIDE SURFACES, APPLIED BY THE HOT DIP, METALLIZING, OR SHERARDIZING PROCESS.
2. INTERMEDIATE METAL CONDUIT (IMC) SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH UL 1242 AND MEETING FEDERAL SPECIFICATION WWC-581 (LATEST REVISION).
3. ELECTRICAL METALLIC TUBING (EMT) SHALL BE ZINC-COATED STEEL WITH BAKED ENAMEL OR PLASTIC FINISH ON INSIDE SURFACES EXCEPT AS NOTED BELOW. EMT SHALL BE DIPPED IN A CHROMIC ACID BATH TO CHEMICALLY FORM A CORROSION-RESISTANT PROTECTIVE COATING OF ZINC CHROMATE OVER GALVANIZED SURFACE.
4. FLEXIBLE METAL CONDUIT SHALL BE CONSTRUCTED OF HOT-DIPPED GALVANIZED STEEL STRIPS WOUND SPIRALLY WITH INTERLOCKING EDGES TO PROVIDE GREATEST FLEXIBILITY WITH MAXIMUM STRENGTH. INTERIOR SURFACES SHALL BE SMOOTH AND OFFER MINIMUM DRAG TO PULLING IN CONDUIT. USED ONLY AS DIRECTED BY WRITING BY THE ENGINEER WITH THE EXCEPTION OF 400 HZ FEEDERS AND 400 HZ BRANCH CIRCUITS WHICH SHALL BE RUN IN FLEXIBLE ALUMINUM CONDUIT.
5. LIQUID-TIGHT CONDUIT (SEAL-TITE) SHALL BE GALVANIZED STEEL FLEXIBLE CONDUIT AS ABOVE EXCEPT WITH MOISTURE AND OIL-PROOF JACKET. PRE-CUT LENGTHS AND FACTORY-INSTALLED FITTINGS. FOR OUTDOOR INSTALLATIONS AND MOTOR CONNECTIONS ONLY UNLESS OTHERWISE NOTED ON DRAWINGS.
6. FACTORY ASSEMBLED, OR OFF-SITE ASSEMBLED WIRING SYSTEMS (SUCH AS METAL CLAD (MC) CABLE, TYPE AC CABLE, TYPE NM CABLE, TYPE BX CABLE, ETC) SHALL NOT BE USED.
7. MINIMUM SIZE CONDUIT ABOVE GRADE SHALL BE 3/4" MINIMUM AND 1" MINIMUM FOR BELOW GRADE.
8. NONMETALLIC FLEXIBLE TUBING (ENT) SHALL NOT BE USED.
9. NON-METALLIC CONDUIT:
a. POLYVINYL CHLORIDE (PVC) RIGID CONDUIT, SCHEDULE 40, TYPE II FOR UNDERGROUND INSTALLATION ONLY WITH SOLVENT WELDED JOINTS, CONFORMING TO UNDERWRITERS LABORATORIES, INC. (U.L.) REQUIREMENTS, LISTED FOR EXPOSED AND DIRECT BURIAL APPLICATION.
b. CONDUIT AND FITTINGS SHALL BE PRODUCED BY THE SAME MANUFACTURER.
N. FITTINGS:
1. CONDULET TYPE FITTINGS SHALL BE SMOOTH INSIDE AND OUT, TAPER THREADED WITH INTEGRAL INSULATING BUSHING AND OF THE SHAPES, SIZES AND TYPES REQUIRED TO FACILITATE INSTALLATION OR REMOVAL OF WIRES AND CABLES FROM THE CONDUIT AND WIRING SYSTEM. THESE FITTINGS SHALL BE OF METAL, SMOOTH INSIDE AND OUT, THOROUGHLY GALVANIZED, AND SHERARDIZED CADMIUM PLATED.
2. METALLIC CONDULET COVERS SHALL HAVE THE SAME FINISH AS THE FITTING AND SHALL BE PROVIDED FOR THE OPENING OF EACH FITTING WHERE CONDUCTORS DO NOT PASS THROUGH THE COVER.
3. CONNECTOR, COUPLING, LOCKNUT, BUSHINGS AND CAPS USED WITH RIGID CONDUIT SHALL BE STEEL, THREADED AND THOROUGHLY GALVANIZED. BUSHINGS SHALL BE INSULATED.
4. U.N.O. ALL INTERIOR EMT FITTINGS, CONNECTORS AND COUPLINGS INSTALLED FOR TESTING LONG DELAY AND INSTANTANEOUS. AND GROUND FAULT LOCATIONS BY THE AHJ, OR AREAS NOT SUBJECT TO PHYSICAL DAMAGE, SHALL BE STEEL, ZINC OR CADMIUM PLATED, THREADED, COMPRESSION, STEEL LOCKING RING TYPE WITH INSULATED THROAT.

5. ALL INTERIOR AND EXTERIOR EMT FITTINGS, CONNECTORS AND COUPLINGS, SHALL BE RAINNITE-LISTED, STEEL, ZINC OR CADMIUM PLATED, THREADED, COMPRESSION, STEEL LOCKING RING TYPE WITH INSULATED THROAT, IF RAINNITE-LISTED. EMT FITTINGS, CONNECTORS AND COUPLINGS ARE UNAVAILABLE FOR EACH POLE SIZE OR IF CONDUIT IS INSTALLED IN AN AREA SUBJECT TO DAMAGE - PROVIDE RIGID METALLIC OR INTERMEDIATE METALLIC CONDUITS, FITTINGS, CONNECTORS AND COUPLINGS AS REQUIRED.
6. FLEXIBLE STEEL CONDUIT CONNECTORS SHALL BE A MALLEABLE IRON CLAMP OR SQUEEZE TYPE OR STEEL TWO-IN-ONE TYPE WITH INSULATED THROAT. THE FINISH SHALL BE ZINC OR CADMIUM PLATING.
7. CONDUIT UNIONS SHALL BE "ERIKSON" COUPLINGS, OR APPROVED EQUAL. THE USE OF RUNNING THREADS WILL NOT BE PERMITTED.
O. 600 VOLT CONDUCTORS - WIRE AND CABLE:
1. ALL CONDUCTORS SHALL BE COPPER. PROVIDE STRANDED CONDUCTOR FOR #10 AWG AND LARGER OR WHEN MAKING FLEXIBLE CONNECTIONS TO VIBRATING MACHINERY. USE COMPRESSION "FORK" TYPE CONNECTORS OR TRANSITION TO SOLID CONDUCTORS WHEN CONNECTING TO SWITCHES, RECEPTACLES, ETC.
2. TYPE THHN/THWN-2 THERMOPLASTIC, 600 VOLT, UL APPROVED, DRY AND WET LOCATIONS RATED AT 90 DEGREES CELSIUS, FOR CONDUCTORS OF ALL SIZES FROM #12 AWG UP TO AND INCLUDING 1000 KCMIL, RHH/RHW INSULATED AND POWERED ONLY TO PROVIDE AN ELECTRICAL CIRCUIT PROTECTIVE SYSTEM TO COMPLY WITH GEC, ARTICLES 695 AND 700.
3. WIRE AND CABLE SHALL BE NEW, MANUFACTURED NOT MORE THAN SIX (6) MONTHS PRIOR TO INSTALLATION. MANUFACTURER'S NAME PERMANENTLY MARKED ON OUTER COVERING AT REGULAR INTERVALS.
4. WIRE AND CABLE SHALL BE FACTORY COLOR-CODED BY INTEGRAL PIGMENTATION WITH A SEPARATE COLOR FOR EACH PHASE AND NEUTRAL. COLORING SHALL BE COLOR-CODED AND IT SHALL BE MAINTAINED THROUGHOUT.
5. SYSTEMS CONDUCTOR COLOR CODING:
a. Power 208/120V, 3PH, 4W:
(1) PHASE A = BLACK
(2) PHASE B = RED
(3) PHASE C = BLUE
(4) NEUTRAL = WHITE
(5) SWITCHLEGS = PURPLE (SWITCHLEGS SHALL ALSO BE IDENTIFIED SEPARATELY BY NUMERICAL TAGS)
(6) TRAVELERS = PURPLE WITH BLACK STRIPE.
b. Power 480/277V, 3PH, 4W:
(1) PHASE A = BROWN
(2) PHASE B = ORANGE
(3) PHASE C = YELLOW
(4) NEUTRAL = GRAY
(5) SWITCHLEGS = PURPLE (SWITCHLEGS SHALL ALSO BE IDENTIFIED SEPARATELY BY NUMERICAL TAGS)
(6) TRAVELERS = PURPLE WITH BLACK STRIPE.
c. GROUND CONDUCTORS: GREEN
d. ISOLATED GROUND CONDUCTORS: GREEN WITH CONTINUOUS YELLOW STRIPE.
e. FIRE ALARM SYSTEM: AS RECOMMENDED BY THE MANUFACTURER.
6. ALL COLOR-CODING FOR #12 THRU #6 AWG CONDUCTOR SHALL BE AS IDENTIFIED ABOVE. CONDUCTORS #4 AWG AND LARGER SHALL BE IDENTIFIED WITH UTILIZING PHASE TAPE AT EACH TERMINATION.
7. NO CONDUCTORS CARRYING 120 VOLT OR MORE SHALL BE SMALLER THAN #12 AWG.
8. ALUMINUM CONDUCTORS SHALL NOT BE USED.
9. WIRE-PULLING COMPOUNDS USED AS LUBRICANTS IN INSTALLING CONDUCTORS IN RACEWAYS SHALL ONLY BE "POLYWATER J". NO OIL, GREASE, GRAPHITE, OR SIMILAR SUBSTANCES MAY BE USED. PULLING OF #1/0 OR LARGER CONDUCTORS SHALL BE DONE WITH AN APPROVED CABLE PULL MACHINE. OTHER METHODS; E.G. USING VEHICLES, AND BLOCK AND TACKLE TO INSTALL CONDUCTORS ARE NOT ACCEPTABLE.

ARCHITECTURE
PRK
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HUNTINGTON BEACH, CA 92648
Construction Documents



FILE NO. 30-45
IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APPL 04-118263
DATE May 9 2019



CLIENT
HUNTINGTON BEACH UNION HIGH SCHOOL DISTRICT
PROJECT NUMBER
18296
DATE: 05/09/19
DRAWN BY: Author
CHECKED BY: Checker

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ELECTRICAL GENERAL SPECIFICATIONS (CONTINUED)

P. JUNCTION AND PULLBOXES: 1. FOR INTERIOR DRY LOCATIONS, BOXES SHALL BE GALVANIZED ONE-PIECE DRAWN STEEL, KNOCKOUT TYPE, WITH REMOVABLE, MACHINE SCREW SECURED COVERS...

PART 3 - EXECUTION

3.1 PREPARATION AND INSTALLATION A. INSTALLATION OF CONDUIT AND OUTLET BOXES: 1. ALL CONDUIT INSTALLED IN THE DRY WALLS OR CEILINGS OF A BUILDING SHALL BE STEEL TUBE (EMT), ALUMINUM TUBE (EMT), OR INTERMEDIATE METAL CONDUIT (IMC). FLEXIBLE CONDUIT SHALL NOT BE USED IN LIEU OF EMT, IMC OR RIGID CONDUIT EXCEPT AS NOTED HEREIN...

13. PVC CONDUIT SHALL NOT BE USED ABOVE GRADE. 14. WHERE CONDUCTORS ENTER A RACEWAY OR A RACEWAY IN A CABINET, PULL BOX, JUNCTION BOX, OR AUXILIARY GUTTER, THE CONDUCTORS SHALL BE PROTECTED BY A PLASTIC BUSHING TYPE FITTING PROVIDING A SMOOTHLY ROUNDED INSULATING SURFACE. 15. WHERE CONDUIT EXTENDS THROUGH ROOF TO EQUIPMENT ON ROOF AREA, THIS CONDUIT SHALL PROVIDED FLASHING MATERIAL COMPATIBLE WITH THE ROOFING SYSTEM AS REQUIRED BY THE ROOFING SPECIFICATIONS OR AS REQUIRED BY THE OWNER'S ROOF WARRANTY. THIS FLASHING SHALL BE DELIVERED TO THE ROOFING CONTRACTOR FOR INSTALLATION...

b. FOR ALL COMMUNICATIONS CONDUITS 2" AND LARGER AND FEEDERS 100 AMPS OR GREATER, PROVIDE WITH A MINIMUM 3" INCH (2.00 INCH) CONCRETE ENVELOPE, 2" INCH MINIMUM SEPARATION BETWEEN CONDUITS, INSTALLED AT DEPTH OF NOT LESS THAN 24" BELOW GRADE. (PROVIDE CONCRETE ENCASUREMENT AND/OR GREATER MINIMUM CONDUIT DEPTH AS REQUIRED BY THE UTILITY COMPANIES.) CONDUIT SEPARATION WITHIN A DUCT BANK SHALL BE MAINTAINED USING PLASTIC SPACERS LOCATED AT 5'-0" INTERVALS, WHERE POWER AND COMMUNICATION CONDUITS ARE RUN IN A COMMON TRENCH, A 12" INCH MINIMUM SEPARATION SHALL BE MAINTAINED BETWEEN POWER AND COMMUNICATION CONDUITS OR AS REQUIRED BY UTILITY COMPANIES...

B. INSTALLATION OF 600-VOLT CONDUCTORS: 1. ALL ELECTRICAL WIRE, INCLUDING SIGNAL CIRCUITS, SHALL BE INSTALLED IN CONDUIT. 2. ALL CIRCUITS AND FEEDER WIRES FOR ALL SYSTEMS SHALL BE CONTINUOUS FROM OVERCURRENT PROTECTIVE DEVICE OR SWITCH TO TERMINAL OR FARTHEST OUTLET. NO JOINTS SHALL BE MADE EXCEPT IN PULL, JUNCTION OR OUTLET BOXES, OR IN PANEL OR SWITCHBOARD GUTTERS. 3. THOROUGHLY CLEAN ALL CONDUIT AND WIRE-WAYS AND SEE THAT ALL PARTS ARE PERFECTLY DRY BEFORE PULLING ANY WIRES...

C. GROUNDING/BONDING: 1. PROVIDE GROUNDING AND BONDING FOR ENTIRE ELECTRICAL INSTALLATION AS SHOWN ON PLANS, AS LISTED HEREIN AND AS REQUIRED BY APPLICABLE CODES. INCLUDE, BUT NOT LIMITED TO, ARE ITEMS THAT REQUIRE GROUNDING/BONDING: a. CONDUIT, RACEWAYS AND CABLE TRAYS. b. NEUTRAL OR IDENTIFIED CONDUCTORS OF INTERIOR WIRING SYSTEM...

3. USE OF GROUND RODS: FURNISH AND INSTALL REQUIRED NUMBER OF 3/4" X 10' COPPER CLAD GROUND RODS TO MEET SPECIFIED RESISTANCE. ALL REQUIRED GROUNDING WIRES, CONDUIT AND CLAMPS, THE SIZE OF THE GROUNDING CONDUCTORS SHALL BE NOT LESS THAN THAT SET FORTH IN THE LATEST EDITION OF THE CALIFORNIA CODE OF REGULATIONS, TITLE 24, STATE OF CALIFORNIA AND NEC (OR CEC WHERE ADOPTED), UNLESS OTHERWISE INDICATED. RODS SHALL BE INSTALLED SUCH THAT AT LEAST 10 FEET OF LENGTH IS IN CONTACT WITH THE SOIL, WHERE ROCK BOTTOM IS ENCOUNTERED, THE ELECTRODE SHALL BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45 DEGREES FROM VERTICAL OR SHALL BE BURIED IN A TRENCH THAT IS AT LEAST 30 INCHES DEEP. THE UPPER END OF THE ELECTRODE SHALL BE FLUSH WITH OR BELOW GROUND LEVEL UNLESS THE ABOVE GROUND END AND THE GROUNDING ELECTRODE CONDUCTOR ATTACHMENTS ARE PROTECTED AGAINST PHYSICAL DAMAGE, UNLESS OTHERWISE NOTED ON THE DRAWINGS. CONNECTION TO THE GROUNDING CONDUCTOR MAY BE BY COMPRESSION TYPE OR EXOTHERMIC PROCESS CONNECTOR. MECHANICAL CONNECTORS SHALL NOT BE USED...

9. MOTORS, CONNECT THE GROUND CONDUCTOR TO THE CONDUIT WITH AN APPROVED GROUNDING BUSHING, AND TO THE METAL FRAME WITH A BOLTED SOLDERLESS LUG. BOLTS, SCREWS AND WASHERS SHALL BE BRONZE OR CADAMIUM PLATED STEEL. 10. BUILDING GROUNDING SYSTEM RESISTANCE TO GROUND SHALL NOT EXCEED 25 OHMS.

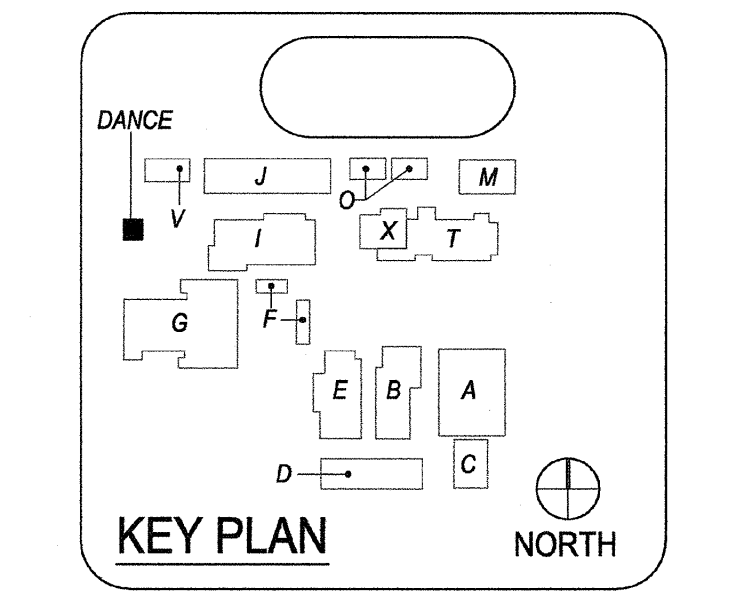
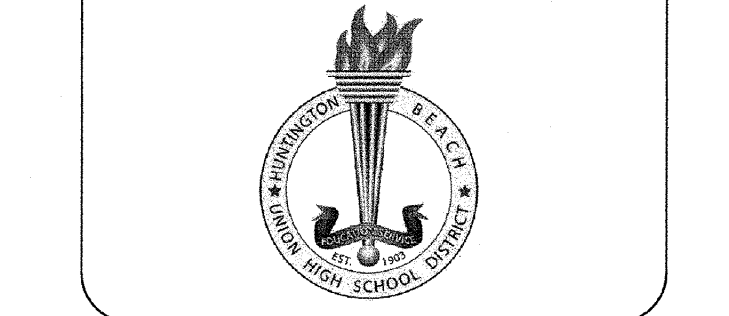
1. AN ELECTRIC POWER SUPPLY, INCLUDING CONDUIT, ANY NECESSARY JUNCTION AND/OR OUTLET BOXES AND CONDUCTORS AND CONNECTION SHALL BE FURNISHED AND INSTALLED BY THIS CONTRACTOR FOR EACH ITEM OR MECHANICAL EQUIPMENT. 2. POWER SUPPLIES TO INDIVIDUAL ITEMS OF EQUIPMENT SHALL BE TERMINATED IN A SUITABLE OUTLET OR JUNCTION BOX ADJACENT TO THE RESPECTIVE ITEM OF EQUIPMENT, OR A JUNCTION BOX PROVIDED BY THE MANUFACTURER OF THE EQUIPMENT AND DIRECTED BY THE MECHANICAL CONTRACTOR. ALLOW SUFFICIENT LENGTHS OF CONDUCTOR AT EACH LOCATION TO PERMIT CONNECTION TO THE INDIVIDUAL EQUIPMENT WITHOUT BREAKING THE WIRE RUN.

3. THE LOCATION OF ALL CONDUIT TERMINATIONS TO THE EQUIPMENT IS APPROXIMATE. THE EXACT LOCATION OF THESE CONDUIT TERMINATIONS SHALL BE LOCATED AND INSTALLED AS DIRECTED BY THE MECHANICAL OR PLUMBING CONTRACTOR. 4. PROVIDE POWER SUPPLIES TO ALL PLUMBING AND MECHANICAL EQUIPMENT, INCLUDING BUT NOT LIMITED TO, EQUIPMENT FURNISHED AND INSTALLED BY OWNER OR CONTRACTOR SUCH AS HEATING AND AIR CONDITIONING EQUIPMENT, PUMPS, BOILERS, AUTO VALVES AND WATER COOLERS, ETC. THE INSTALLATION SHALL PRODUCE A COMPLETE AND OPERABLE SYSTEM.

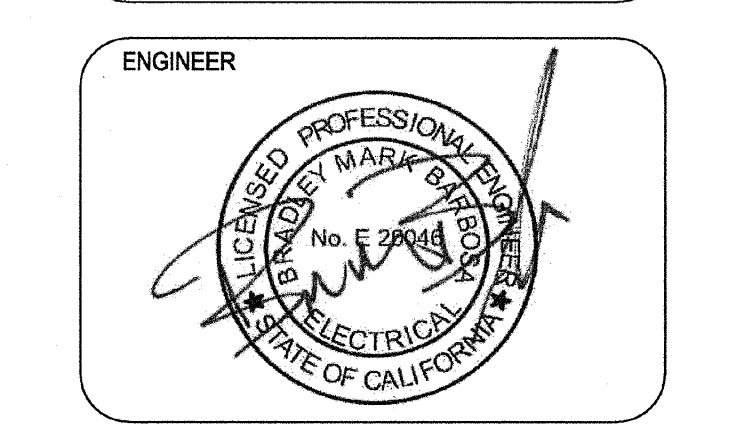
1. PROVIDE A MINIMUM 4" HIGH HOUSEKEEPING PAD ABOVE FINISHED FLOOR/FINISHED GRADE FOR ALL EXTERIOR FLOOR MOUNTED SWITCHGEAR, DISTRIBUTION BOARDS, TRANSFORMERS, MOTOR CONTROL CENTERS ETC. FLUSH WITH THE FACE OF THE EQUIPMENT. PROVIDE A MINIMUM 4" HIGH HOUSEKEEPING PAD FOR ALL FLOOR MOUNTED SWITCHGEAR, DISTRIBUTION BOARDS, TRANSFORMERS, MOTOR CONTROL CENTERS, TRANSFER SWITCHES ETC. LOCATED AT MECHANICAL CENTERS AND OTHER MECHANICAL SPACES FLUSH WITH THE FACE OF THE EQUIPMENT. CONFIRM PAD DIMENSIONS WITH AHJ PRIOR TO FORMING PAD TO ENSURE ANY LOCAL CODE INTERPRETATIONS/CONDITIONS REGARDING HOUSEKEEPING PADS ARE MET.

ARCHITECTURE COSTA MESA 234 EAST 17TH STREET, SUITE 200 COSTA MESA, CA 92627 949-548-5000 P 949-548-5001 F

HUNTINGTON BEACH HIGH SCHOOL DANCE STUDIO 1905 MAIN ST HUNTINGTON BEACH, CA 92648 Construction Documents



FILE NO. 30-HS IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT APRIL 04-118263 ACS FLN 1/14/19 SS DATE MAY 0 9 2019



ARCHITECT HUNTINGTON BEACH UNION HIGH SCHOOL DISTRICT PROJECT NUMBER 18296 DATE: 05/09/19 DRAWN BY: Author CHECKED BY: Checker REVISIONS

ELECTRICAL GENERAL SPECIFICATIONS (CONTINUED) E0.2A

STRUCTURED CABLING SYSTEM SPECIFICATIONS

PART 1 - GENERAL

- 1.1 GENERAL INTRODUCTION
  - A. THE WORK SHALL CONSIST OF THE DESIGN, PROVISION, TERMINATION, TESTING AND DOCUMENTATION OF A COMPLETE AND FULLY FUNCTIONAL STRUCTURED HIGH PERFORMANCE COPPER AND OPTICAL FIBER CONNECTION COMMUNICATIONS CABLING SYSTEM. THE INSTRUCTIONS IN THIS SECTION ARE SPECIFIC TO COMMUNICATIONS INSTALLATIONS AND SHOULD BE READ IN CONJUNCTION WITH OTHER CONTRACT DOCUMENTS AS APPLICABLE. WORK SHALL PROVIDE DATA SYSTEMS COMPLETE TO INCLUDE BUT NOT BE LIMITED TO, JACKS, CABLING, PATHWAYS, EQUIPMENT, WIRELESS ACCESS POINTS (WAP), LABOR, ETC. AS NOTED ON THE DRAWINGS AND INDICATED IN THE BID DOCUMENTS. THE PROJECT REQUIRES THE REWORK OF AN EXISTING IDF TO INSTALL NEW CATEGORY 6 CABLING AND FROM A NEW CATEGORY 6 RATED PATCH PANEL TO EACH WORKSTATION OUTLET INDICATED ON THE PLANS. FIBER OPTIC CABLING INTO THE IDF IS EXISTING AND NO ADDITIONAL FIBER OPTIC EQUIPMENT IS REQUIRED.
- 1.2 QUALIFICATIONS
  - A. THE DATA CABLING SYSTEM INSTALLATION WORK DETAILED IN THIS SECTION SHALL BE CARRIED OUT BY A SPECIALIST INSTALLER COMPANY. THE INSTALLER SHALL BE CERTIFIED BY THE SYSTEM MANUFACTURER (OR MANUFACTURERS) IN THE INSTALLATION AND TESTING OF THE CABLING SYSTEM.
  - B. THE INSTALLER SHALL HAVE A PROVEN TRACK RECORD IN THE FIELD OF TELEPHONE AND DATA (HIGH PERFORMANCE CATEGORY 6 COPPER) CABLING SYSTEM INSTALLATION. THE INSTALLER SHALL HAVE COMPLETED AT LEAST THREE PREVIOUS INSTALLATIONS OF COMPARABLE SIZE, COMPLEXITY AND MANPOWER WITHIN THE LAST THREE YEARS. EACH INSTALLATION SHALL UTILIZE COMPONENTS, INSTALLATION PRACTICES AND TESTING PROCEDURES EQUIVALENT TO THOSE SPECIFIED IN THIS DOCUMENT.
  - C. THE INSTALLER SHALL HOLD A VALID STATE CONTRACTORS LICENSE FOR THE DURATION OF THE PROJECT. THE INSTALLER SHALL BE RESPONSIBLE FOR OBTAINING PERMITS AND OTHER REQUIREMENTS FOR PERFORMING WORK ON THIS PROJECT. ALL COSTS ASSOCIATED WITH OBTAINING PERMITS AND OTHER DOCUMENTATION SHALL BE INCLUDED IN THE BID SUM FOR THE PROJECT.
- 1.3 MANUFACTURER'S COMPLETE SYSTEMS
  - A. THE CABLING SYSTEM SPECIFIED IN THIS DOCUMENT SHALL BE A 'PANOUT' SYSTEMS HARDWARE AND BELDEN UTP COPPER CABLE END-TO-END SOLUTION EXCEPT WHERE STATED OTHERWISE COMPLYING WITH THE DISTRICT STANDARDS FOR VOICE AND DATA CABLING SYSTEM.
- 1.4 JOB CONDITIONS
  - A. PRIOR TO BIDDING, VISIT THE SITE AND DETERMINE ALL EXISTING CONDITIONS AFFECTING WORK. THE BIDDER SHALL EXAMINE ALL DRAWINGS AND SPECIFICATIONS TO FAMILIARIZE THEMSELVES WITH THE TYPE OF CONSTRUCTION TO BE USED, AND THE NATURE AND EXTENT OF WORK PROVIDED BY OTHER TRADES.
  - B. VERIFY DIMENSIONS AND THE CORRECT LOCATION OF HARDWARE BEFORE PROCEEDING WITH THE INSTALLATION OF HARDWARE, CABLING AND/OR CONNECTIONS.
  - C. NOTIFY THE OWNERS' REPRESENTATIVE IN WRITING IMMEDIATELY ON DISCOVERY OF DIMENSIONAL DISCREPANCIES AND OTHER CONDITIONS DETRIMENTAL TO PROPER PERFORMANCE OF THE WORK.
  - D. THE CONTRACTOR SHALL NOTE THAT THE SITE IDF IS AN EXISTING CONDITION AND WILL REQUIRE COMPLETE REWORK TO ALLOW ALL NEW EQUIPMENT AND CABLING TO BE INSTALLED ALONG WITH EXISTING EQUIPMENT. ALL WORK, MATERIALS AND LABOR SHALL BE PART OF THE CONTRACTORS BASE BID.
- 1.5 LABELING AND NUMBERING SCHEME
  - A. LABELING OF THE CABLING SYSTEMS SHALL BE IN ACCORDANCE WITH DISTRICT STANDARDS AS NOTED WITHIN THE CABLING AND PATHWAY PORTION OF THESE SPECIFICATIONS.
- 1.6 WARRANTY
  - A. INSTALLER TO PROVIDE A WARRANTY FOR ONE YEAR FROM NOTICE OF COMPLETION ON ALL MATERIALS AND WORKMANSHIP INSTALLED OR SUPPLIED AS PART OF THE CABLING SYSTEM.
  - B. THE INSTALLER SHALL ALSO SUPPLY AN EXTENDED PERFORMANCE WARRANTY, AS OFFERED BY THE COMPONENTS' MANUFACTURER(S).
- 1.7 QUALITY
  - A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE PROVISION AND INSTALLATION OF ALL COMPONENTS AS SPECIFIED HEREIN. THE CONTRACTOR SHALL PROVIDE ALL TOOLS, EQUIPMENT, FIXTURES, APPLIANCES, ANCHORAGE PIECE PARTS AND HARDWARE AS NECESSARY TO COMPLETE THE ASSEMBLY AND INSTALLATION AS REQUIRED. THE OWNER'S REPRESENTATIVE MAY CONDUCT SCHEDULED OR UNSCHEDULED INSPECTIONS OF THE CONTRACTOR'S WORK AT ANYTIME DURING CONSTRUCTION. ALL WORK INCLUDED IN THE SCOPE ASSIGNED TO THE CONTRACTOR THAT IS ASSOCIATED WITH THIS PROJECT SHALL BE ACCOMPLISHED IN A WORKMANLIKE MANNER, INSTALLED AND ASSEMBLED PLUMB, LEVEL AND SQUARE. THE PRODUCT SHALL BE DELIVERED TO THE OWNER FINISHED, COMPLETE, AND READY TO OPERATE ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.
  - B. ALL INSTALLATION WORK SHALL BE COMPLETED TO THE STANDARD OF THE SAMPLES APPROVED BY THE OWNERS REPRESENTATIVE DURING THE SUBMITTAL PROCESS. ANY PRODUCTS NOT INSTALLED TO THE QUALITY DETAILED IN THESE SPECIFICATIONS AND APPROVED IN THE SUBMITTAL PROCESS SHALL BE REWORKED BY THE INSTALLER TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE AT NO ADDITIONAL COST TO THE OWNER.
- 1.8 STANDARDS
  - A. ALL MATERIALS PROVIDED BY THE INSTALLER SHALL MEET THE REQUIREMENTS OF THE FOLLOWING WHERE APPLICABLE:
    1. NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA)
    2. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
    3. UNDERWRITERS LABORATORIES, INC. (UL)
    4. ETL
  - B. ALL PRODUCTS, SERVICES AND DOCUMENTATION PROVIDED BY THE INSTALLER SHALL MEET THE REQUIREMENTS OF THE FOLLOWING WHERE APPLICABLE:
    1. CALIFORNIA ELECTRIC CODE (CEC)
    2. RELEVANT STATE ELECTRIC AND FIRE CODES
    3. ANSI/EIA/TIA 568-B COMMERCIAL BUILDING TELECOMMUNICATIONS WIRING STANDARD
    4. ANSI/EIA/TIA 569-A COMMERCIAL BUILDING STANDARD FOR TELECOMMUNICATIONS PATHWAYS AND SPACES
    5. ANSI/EIA/TIA 608 THE ADMINISTRATION STANDARD FOR THE TELECOMMUNICATIONS INFRASTRUCTURE OF COMMERCIAL BUILDINGS
    6. ANSI/EIA/TIA 607 COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS - AUGUST 1994
    7. BUILDING INDUSTRY CONSULTING SERVICE INTERNATIONAL (BICSI) PUBLICATIONS
      - a. TELECOMMUNICATIONS DISTRIBUTION METHODS MANUAL
      - b. NETWORK DESIGN REFERENCE MANUAL
      - c. TELECOMMUNICATIONS CABLING INSTALLATION MANUAL (TDDM)
    8. MANUFACTURER'S RECOMMENDATIONS AND INSTALLATION GUIDELINES
    9. ISO/IEC 11801: GENERIC CABLING FOR CUSTOMER PREMISES
  - C. ALL PUBLICATIONS REFERRED TO IN THIS DOCUMENT SHALL BE THE LATEST EDITION
- 1.9 SUBMITTALS
  - A. ALL SUBMITTALS SHALL BE SENT PER DIVISION 01 REQUIREMENTS. EACH SUBMITTAL SHOULD BE PROVIDED NO LATER THAN SIX WEEKS PRIOR TO THE WORK ASSOCIATED WITH THAT SUBMITTAL TO ALLOW TIME FOR SUBMITTAL REVIEW.
  - B. PROJECT REFERENCES:
    1. SUBMIT FOR APPROVAL, REFERENCES FOR A MINIMUM OF THREE SIMILAR PROJECTS SUCCESSFULLY UNDERTAKEN AND COMPLETED WITHIN THE LAST THREE YEARS. THESE PROJECTS SHOULD BE A SIMILAR SCALE, COMPLEXITY AND HAVE SIMILAR TIME SCALES AS THIS PROJECT.

2. PROVIDE PROJECT NAME AND ADDRESS, CLIENT CONTACT NAME AND TELEPHONE NUMBER AND CONSTRUCTION MANAGER NAME AND TELEPHONE NUMBER. PROVIDE A BRIEF DESCRIPTION OF EACH PROJECT INDICATING TYPES OF SYSTEMS INSTALLED, QUANTITIES AND CONFIGURATIONS OF OUTLETS AND PROJECT TIME SCALES.
  3. AT LEAST TWO OF THE REFERENCES SHALL BE LOCATED IN SOUTHERN CALIFORNIA AND SHALL BE AVAILABLE FOR THE OWNERS REPRESENTATIVE AND OTHER MEMBERS OF THE DESIGN TEAM TO VISIT AND INSPECT THE INSTALLATION, SHOULD, IN THE OPINION OF THE OWNERS REPRESENTATIVE, THIS BE NECESSARY.
  4. THESE REFERENCES ARE INTENDED TO SHOW THAT THE INSTALLER HAS SUCCESSFULLY COMPLETED SIMILAR PROJECTS. FAILURE TO PRODUCE SATISFACTORY REFERENCES MAY RESULT IN THE BID BEING DEEMED NON-COMPLIANT.
  - C. PERSONNEL TRAINING:
    1. SUBMIT FOR APPROVAL RECORDS REGARDING THE MANAGEMENT, INSTALLATION AND TESTING PERSONNEL. THESE RECORDS SHALL INCLUDE RESUMES, TRAINING CERTIFICATES, PREVIOUS WORK EXPERIENCE DETAILS (ESPECIALLY ON REFERENCE PROJECTS) AND OTHER RELEVANT INFORMATION.
    2. SUBMIT RECORDS TO CONFIRM THAT THE PERSONNEL WHO WILL BE EMPLOYED IN AN INSTALLATION CAPACITY ARE SUITABLY TRAINED IN THE INSTALLATION AND MAINTENANCE OF EQUIPMENT AND SYSTEMS OF THE TYPE BEING PROVIDED.
    3. SUBMIT RECORDS TO CONFIRM THAT THE PERSONNEL THAT WILL BE RESPONSIBLE FOR TESTING THE SYSTEM ARE SUITABLY TRAINED IN THE OPERATION OF THE TEST EQUIPMENT BEING USED IN THIS PROJECT.
    4. THESE RECORDS ARE REQUIRED TO ENSURE THAT THE INSTALLER IS ABLE TO CARRY OUT ALL WORK IN A COMPETENT MANNER. FAILURE TO PRODUCE SATISFACTORY TRAINING DOCUMENTATION MAY RESULT IN THE BID BEING DEEMED NON-COMPLIANT.
  - D. CABLING DIAGRAM
    1. SUBMIT, FOR APPROVAL, A COMPLETE CABLING DIAGRAM. THE DIAGRAM SHALL BE BASED ON THE SINGLE LINE DRAWING INCLUDED IN THE CONSTRUCTION DOCUMENTS. IT SHALL BE UPDATED TO SHOW QUANTITIES AND PART NUMBERS FOR ALL COMPONENTS INCLUDING PATCH PANELS, CABLE, CONDUIT, ETC. AND ALL OTHER ASSOCIATED COMPONENTS.
  - E. TEST EQUIPMENT
    1. SUBMIT, FOR APPROVAL, DETAILS OF EACH ITEM OF TEST EQUIPMENT TO BE USED TO TEST THE OPTICAL FIBER AND COPPER COMPONENTS. INCLUDE PATCH CORDS AND OTHER SPECIALIZED COMPONENTS.
  - F. PRODUCT LITERATURE/DATA SHEETS:
    1. SUBMIT FOR APPROVAL MANUFACTURER'S PRODUCT DATA SHEETS FOR EACH COMPONENT OF THE TELEPHONE AND DATA CABLING SYSTEMS. CERTIFY THAT THE DATA SHEETS DEPICT THE COMPONENTS TO BE PROVIDED BY THE INSTALLER TO MAKE UP THE COMPLETE SYSTEM AS DESCRIBED IN THIS SPECIFICATION.
- PART 2 - PRODUCTS AND RELATED REQUIREMENTS
- 2.1 HORIZONTAL AND LINK COPPER CABLING
    - A. NON-INCLUSIVE LIST OF KEY DOCUMENTS IS PRESENTED BELOW AS A MINIMUM:
      - ANSI/EIA/TIA-568-B: COMMERCIAL BUILDING TELECOMMUNICATIONS CABLING STANDARD
      - ANSI/EIA/TIA-569-A: COMMERCIAL BUILDING STANDARD FOR TELECOM PATHWAYS AND SPACES
      - ANSI/EIA/TIA-606: ADMINISTRATION STANDARD FOR THE TELECOMMUNICATIONS INFRASTRUCTURE OF COMMERCIAL BUILDINGS
      - ANSI/EIA/TIA-607: COMMERCIAL BUILDING GROUNDING/BONDING REQUIREMENTS
      - NFPA 70: NATIONAL ELECTRICAL CODE
      - ISO/IEC 11801: GENERIC CABLING FOR CUSTOMER PREMISES
      - BICSI: TELECOMMUNICATIONS DISTRIBUTION METHODS MANUAL (TDDM)
    - B. THE LATEST REVISION OF EACH DOCUMENT, AND OTHER RELATED DOCUMENTS, IS TO BE CONSIDERED THE ONE IN FORCE AT THE TIME OF SYSTEM CONSTRUCTION AND DELIVERY TO THE DISTRICT. THE CONTRACTOR IS REQUIRED TO COMPLY WITH THE APPLICABLE DOCUMENTS IN CONTENT AND INTENT AS WELL.
    - C. IF ANY APPLICABLE DOCUMENTS ARE IN CONFLICT, THEN THE MORE STRINGENT REQUIREMENT SHALL APPLY. THE CONTRACTOR IS REQUIRED TO ADVISE THE DISTRICT INFORMATION TECHNOLOGY (IT) REPRESENTATIVE OF ANY CONFLICT THAT COULD RESULT IN WORK DEFICIENCIES.
    - D. CONTRACTOR REQUIREMENTS (MINIMUM)
      - CONTRACTORS BIDDING ON DISTRICT WORK PROJECTS SHALL POSSESS AS A MINIMUM THE FOLLOWING QUALIFICATIONS:
        1. A MANUFACTURER'S CERTIFIED INSTALLER/CONTRACTOR AGREEMENT IN FORCE AT THE TIME OF BID SUBMITTAL AND THROUGHOUT THE ENTIRE CONSTRUCTION PROCESS. A CURRENT SUPPORT DOCUMENT SHALL BE INCLUDED IN THE CONTRACTOR'S BID RESPONSE.
        2. AUTHORIZATION TO FACILITATE THE APPLICABLE MANUFACTURER'S SYSTEM WARRANTY.
        3. THE CONTRACTOR SHALL ENSURE THAT AT LEAST 50% OF ALL TECHNICIANS INSTALLING A COPPER SYSTEM HAVE RECEIVED A MANUFACTURER'S TRAINING CERTIFICATE FOR COPPER SYSTEMS.
        4. THE CONTRACTOR SHALL ENSURE THAT 100% OF THE TECHNICIANS INSTALLING A FIBER OPTIC SYSTEM HAVE RECEIVED A MANUFACTURER'S TRAINING CERTIFICATE FOR FIBER OPTIC SYSTEMS.
        5. THE CONTRACTOR SHALL HAVE COPIES OF THE TECHNICIANS' CERTIFICATES AVAILABLE FOR INSPECTION BY THE DISTRICT IT REPRESENTATIVE UPON REQUEST.
        6. CONTRACTOR SHALL HOLD IN GOOD STANDING A CALIFORNIA C-7 LICENSE. A COPY OF THE LICENSES TO BE INCLUDED IN THE CONTRACTOR'S BID RESPONSE.
        7. THE CONTRACTOR MUST HAVE COMPLETED A MINIMUM OF THREE PROJECTS OF SIMILAR SIZE AND SCOPE FOR PUBLIC ENTITIES WITHIN THE PAST FIVE YEARS.
    - E. CABLING SYSTEM
      1. ALL COPPER COMPONENTS OF THE CABLING SYSTEM ARE EITHER TO BE OF A SINGLE MANUFACTURER, OR OF A MANUFACTURER PARTNERSHIP UNDER A SYSTEM TRADE NAME OFFERING A SINGLE POINT OF CONTACT FOR THE DISTRICT IN THE EVENT OF A WARRANTY CLAIM. THE DISTRICT HAS CHOSEN THE BELDEN 10 GIG UTP COPPER CABLING SOLUTION AS THE BASELINE FOR ALL EQUIVALENTS TO BE MEASURED. CONTRACTORS SUBMITTING OTHER MANUFACTURER SYSTEMS FOR CONSIDERATION MUST MEET THIS SYSTEM IN PHYSICAL AND ELECTRONIC PERFORMANCE AS WELL AS UTILITY AT A MINIMUM.
    - D. CABLE
      1. INSTALLATION OF CABLING SHALL BE OF CONTINUOUS LENGTH FROM EACH TERMINATION POINT.
      2. NO LENGTH OF CABLE SHALL EXCEED 285 FEET (TESTED LENGTH).
      3. THE BEND RADIUS OF ANY CABLE SHALL NOT EXCEED 4 TIMES THE DIAMETER OF THE CABLE.
      4. SHOULD THE CABLE BECOME KINKED WHILE BEING INSTALLED, THE CONTRACTOR SHALL NOT ATTEMPT TO REPAIR THE CABLE, BUT SHALL REMOVE AND REPLACE THE ENTIRE RUN. ALL CABLE RUNS ARE POTENTIAL INSPECTION ITEMS FOR THE DISTRICT IT REPRESENTATIVE.
      5. THE CABLE JACKET SHALL BE MAINTAINED AS CLOSE TO THE POINT OF TERMINATION AS POSSIBLE.
      6. CABLE COLOR PER DISTRICT STANDARDS.
      7. THE CABLE PAIRS SHALL NOT BE UNTWISTED MORE THAN 1/2" FROM THE TERMINATION POINT.
      8. ALL CABLING IS TO BE INSTALLED IN ITS OWN PATHWAY AND FULLY SUPPORTED.

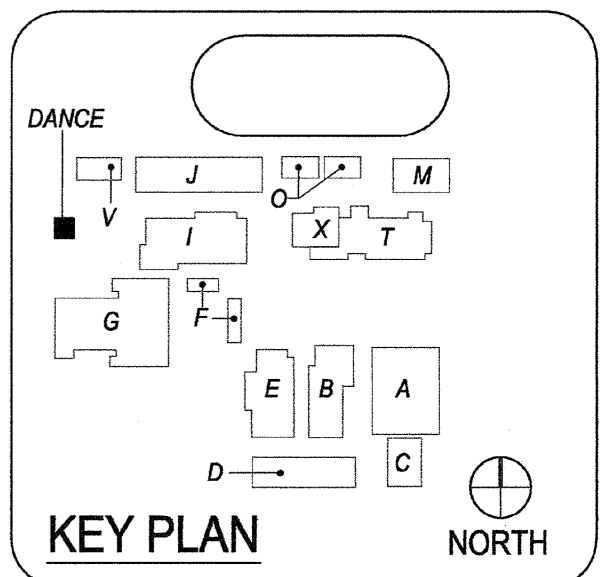
9. CABLING SHALL BE INSTALLED WITH NO MORE THAN A 4-FOOT SPACE BETWEEN SUPPORTS.
10. CABLING CAN BE INSTALLED IN PATHWAYS USING J-HOOKS OR CONDUIT, AS LONG AS THE PATHWAY IS LOW-VOLTAGE CABLING ONLY. THE PATHWAY IS APPROPRIATELY BONDED TO THE BUILDING GROUNDING SYSTEM, AND THE DATA SYSTEM CABLES ARE BUNDLED SEPARATELY FROM OTHER LOW VOLTAGE CABLING.
- E. TERMINATIONS
  1. JACK MODULE COLORS PER DISTRICT STANDARDS. JACK MODULES SHALL BE OF INSULATION-DISPLACEMENT TERMINATION CONSTRUCTION, AND MAY OFFER MASS TERMINATION OF ALL FOUR PAIRS SIMULTANEOUSLY. IN ADDITION, A JACK MODULE MUST BE AVAILABLE AS PART OF THE CABLING SYSTEM, AND FACILITATE THE SAME SYSTEM PERFORMANCE AND WARRANTIES THAT CAN BE UTILIZED IN EXISTING WORKSTATION OUTLET FACEPLATES FROM OTHER MANUFACTURERS.
  2. CABLING SHALL BE DRESSED CLEANLY AND FULLY SUPPORTED VIA VELCRO STRAPS AND CABINET/RACK SUPPORTS. CABLE TIES ARE NOT TO BE UTILIZED.
  3. CABLING SLACK CAN BE PLACED IN THE CABINET/RACK AREA AS WELL AS THE CEILING AREAS IF FULLY SUPPORTED BY THE PROPER PATHWAY DEVICE. NO MORE THAN 4 FEET PER HORIZONTAL RUN SHALL BE STORED.
  4. THE PORTS ARE TO BE POPULATED BEGINNING WITH PORT ONE IN SEQUENCE, LEAVING NO OPEN PORTS.
  5. UNUSED PORTS ARE TO BE FILLED WITH A BLANK MODULE INSERT.
- F. WORKSTATION OUTLETS
  1. FACEPLATES ARE TO BE IN TWO-PORT AND FOUR-PORT SINGLE GANG CONFIGURATIONS. THE FACEPLATES MUST INCLUDE LABELS AND LABEL COVERS. THE DISTRICT HAS STANDARDIZED ON WHITE COLOR FACEPLATES.
  2. THE OUTLET FACEPLATE SHALL BE AFFIXED TO THE WALL OR SURFACE MOUNT TERMINATION BOX WITH TWO COLOR MATCHING SCREWS.
  3. ALL EMPTY PORTS SHALL BE FILLED WITH A COLOR MATCHING BLANK MODULE.
  4. CABLING SHALL BE COILED IN THE WALL OR SURFACE MOUNT BOXES WITH NO LESS THAN 6" AND NO MORE THAN 12" OF SLACK CABLE.
- G. ACCESS POINT CABLES
  1. A SINGLE-PORT SURFACE MOUNT TERMINATION BOX SHALL BE UTILIZED TO HOUSE A SINGLE JACK MODULE FOR ACCESS POINT CONNECTIVITY. THE TERMINATION BOX SHALL BE WHITE.
- H. PATCH CORDS
  1. SMALL DIAMETER CATEGORY 6 PATCH CORDS, AS MANUFACTURED BY SYSTEMAX (OR APPROVED EQUIVALENT) SHALL BE PROVIDED BY THE CONTRACTOR FOR THE OUTLET OR ACCESS POINT TERMINATION END AS WELL AS THE PATCH PANEL TERMINATION END. THE CONTRACTOR SHALL PROVIDE PATCH CORDS AT THE IDF. THESE PATCH CORDS FOR THE MOST PART SHALL BE 24" IN LENGTH OR AS REQUIRED.
  2. SMALL DIAMETER CATEGORY 6 PATCH CORDS, AS MANUFACTURED BY SYSTEMAX (OR APPROVED EQUIVALENT) UTILIZED FOR ACCESS POINT PATCH SHALL BE 12" IN LENGTH AND ENGAGED INTO THE ASSOCIATED TERMINATED JACK, THEN COILED AND LEFT TO BE ENGAGED INTO THE ACCESS POINT.
  3. THE PATCH CORDS SHALL BE THE SAME IN COLOR AND BE OF THE SAME MANUFACTURER AS THE CABLING SYSTEM.
  4. THE CONNECTOR END OF THE PATCH CORD SHALL PROVIDE A TANGLE-FREE LATCH DESIGN.
  5. A CATEGORY 6 SMALL DIAMETER, TANGLE-FREE LATCH DESIGN PATCH CORD FOR WORKSTATIONS IN 5 METER LENGTHS APPROPRIATE FOR THE SPECIFIC WORKSTATION SHALL BE DELIVERED TO THE DISTRICT.
- I. CABLE MANAGEMENT
  1. SEE CABINETS/RACKS REDRESSING REQUIREMENTS.
  2. REAR CABLE MANAGEMENT DEVICES TO SUPPORT CABLES TO THE POINT OF TERMINATION ARE TO BE UTILIZED. A TOWEL BAR STYLE BRACKET IS ACCEPTABLE AS LONG AS THE CABLES ARE NEATLY AND SECURELY ATTACHED VIA VELCRO STRAPS.
- J. LABELING
  1. ALL WORKSTATION OUTLETS, ACCESS POINTS, AND PATCH PANEL TERMINATION PORTS ARE TO BE LABELED WITH THE DISTRICT STANDARD LABELING SYSTEM.
- K. LABELING
  1. A WRAP-AROUND LABEL SHALL BE INSTALLED ON THE JACKET OF THE CABLE NO LESS THAN 4" AND NO MORE THAN 6" OUTSIDE THE ENCLOSURE AT EACH END OF THE CABLES. THE CABLES MUST BE EASILY IDENTIFIABLE BY VISUAL MEAN THE SPECIFIC IDF CABINET.
- L. SYSTEM TESTING AND CERTIFICATION
  1. ALL COMPONENTS SHALL BE INSPECTED BEFORE INSTALLATION TO ENSURE THE CORRECT ITEM IS BEING INSTALLED AND THE COMPONENT APPEARS TO BE WITHOUT FLAWS.
  2. ANY DEFECT OR SYSTEM FAILURE SHALL BE CORRECTED BY THE CONTRACTOR PRIOR TO REQUEST FOR FINAL INSPECTION.
  3. TESTING EQUIPMENT SHALL BE CALIBRATED NO LESS THAN TWELVE MONTHS PRIOR TO THE DATE OF TESTING. PROOF OF CERTIFICATION IS TO BE AVAILABLE TO THE DISTRICT IT REPRESENTATIVE UPON REQUEST.
  4. TEST RESULTS SHALL AUTOMATICALLY BE CALCULATED AND EVALUATED BY THE TESTING EQUIPMENT, UTILIZING THE MOST CURRENT PERFORMANCE AND TESTING STANDARDS AND THE MANUFACTURER'S SYSTEM PERFORMANCE PUBLISHED STATISTICS. TEST RESULTS SHALL BE PROVIDED WITHIN THREE CALENDAR WEEKS OF FINAL INSPECTION COMPLETION IN AN ELECTRONIC FORMAT THAT DOES NOT REQUIRE SPECIAL SOFTWARE TO REVIEW.
  5. COPPER SYSTEM
    - a. TESTING SHALL BE COMPLIANT WITH THE MOST RECENT LEVEL III REQUIREMENT FOR CATEGORY 6 TESTING.
    - b. TESTING SHALL BE DIRECTIONAL, SWEEP-FREQUENCY FOR THE FOLLOWING:
      - b1. ATTENUATION
      - b2. WIRE MAP
      - b3. ATTENTION TO CROSSTALK RADIO
      - b4. PAIR-TO-PAIR NEXT LOSS
      - b5. PSNEXT LOSS
      - b6. RETURN LOSS
      - b7. PAIR-TO-PAIR ELFEXT
      - b8. PSELFEXT
      - b9. PROPAGATION DELAY
      - b10. DELAY SKEW
      - b11. CABLE LENGTH
    - c. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE DISTRICT REPRESENTATIVE IDENTIFYING THE CABLE MANUFACTURER'S PUBLISHED NOMINAL VELOCITY OF PROPAGATION (NVP).
- M. WARRANTY
  1. CONTRACTOR SHALL WARRANT ALL COMPONENTS AND SYSTEMS FOR A MINIMUM OF ONE YEAR AFTER DATE OF FINAL INSPECTION.
  2. CONTRACTOR SHALL ALSO FACILITATE A MANUFACTURER'S SYSTEM WARRANTY CERTIFICATE FOR THE COPPER CABLING SYSTEM AND FIBER OPTIC CABLING SYSTEM FOR A MINIMUM OF 25 YEARS AND PROVIDE DOCUMENTATION IN SUPPORT THEREOF.
  3. THE WARRANTY SHALL APPLY TO ALL CURRENT AND FUTURE APPLICATIONS DESIGNED TO RUN ON THE DESIGNATED LINK OR CHANNEL CLASSIFICATION AS DEFINED IN THE COMMERCIAL BUILDING TELECOMMUNICATIONS CABLING STANDARDS.

4. THE WARRANTY SHALL INCLUDE ALL INDIVIDUAL COMPONENTS AND THE PERFORMANCE THEREOF TO MEET THE MANUFACTURER'S REQUIREMENTS AS A COMPONENT OF THE WARRANTED SYSTEM.
5. THE WARRANTY SHALL GUARANTEE 10GIG ETHERNET SYSTEM PERFORMANCE, PLUS PREVIOUSLY IDENTIFIED HEADROOM.

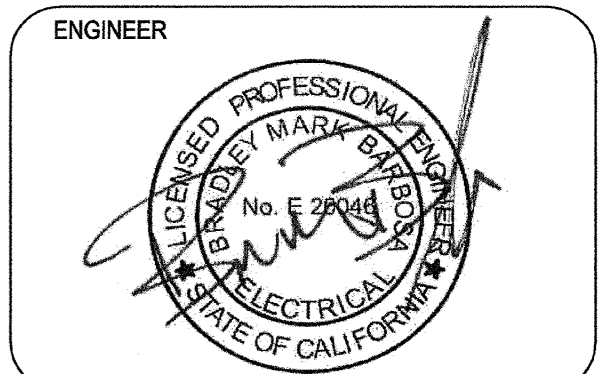


ARCHITECTURE  
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 234 EAST 17TH STREET, SUITE 200  
 COSTA MESA, CA 92627  
 949-548-5001 F  
 949-548-5001 F  
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HUNTINGTON BEACH HIGH SCHOOL DANCE STUDIO  
 1905 MAIN ST  
 HUNTINGTON BEACH, CA 92648  
 Construction Documents



FILE NO. 30-45  
 IDENTIFICATION STAMP  
 DIV. OF THE STATE ARCHITECT  
 APPL 04-118263  
 ACS FLS SS  
 DATE MAY 0 2 2019



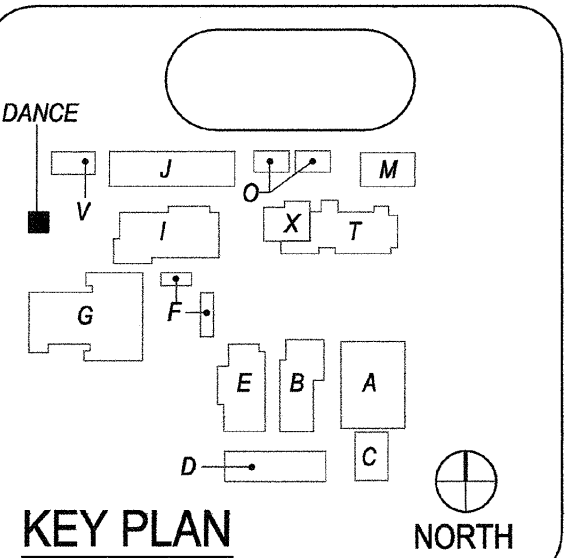
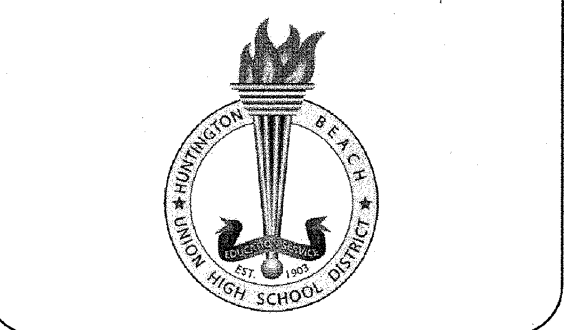
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PROJECT NUMBER 18296		
DATE: 05/09/19		
DRAWN BY: Author		
CHECKED BY: Checker		
REVISIONS		
No.	Description	Date

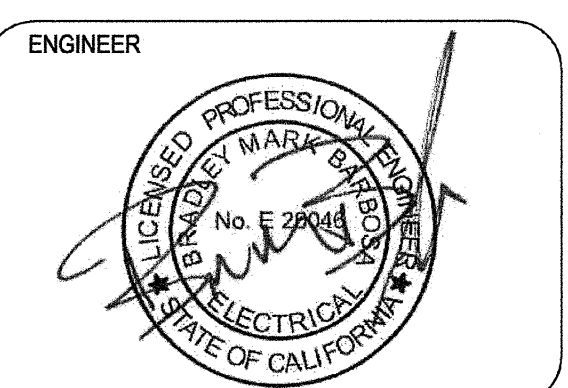
Construction Documents  
**TECHNOLOGY GENERAL SPECIFICATIONS**

**E0.2B**





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 IDENTIFICATION STAMP  
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 APPL 04-118263  
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CLIENT	HUNTINGTON BEACH UNION HIGH SCHOOL DISTRICT	
PROJECT NUMBER	18296	
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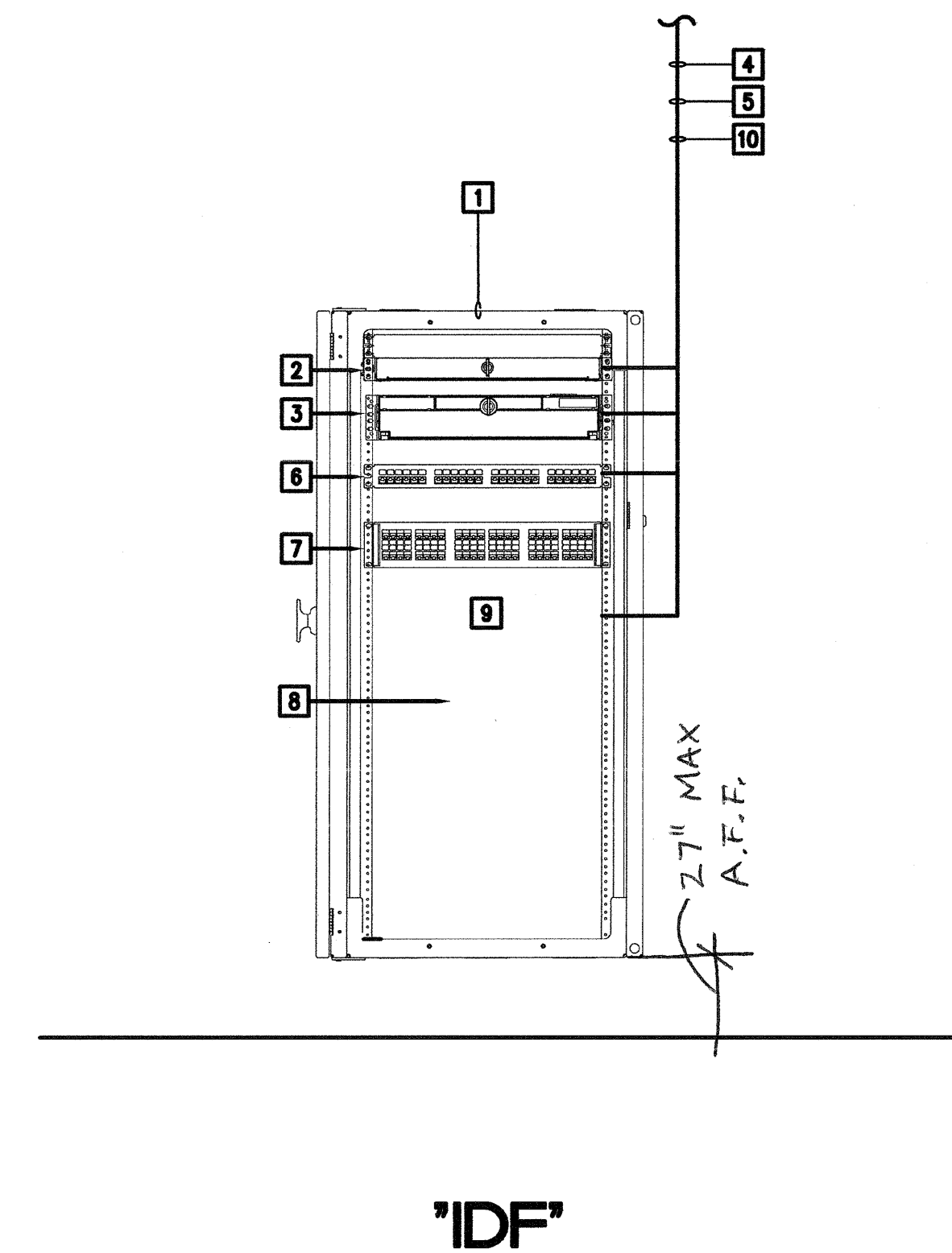
Construction Documents

## ELECTRICAL & TECHNOLOGY FLOOR PLAN

# E2.0

### IDF RISER KEYED NOTES

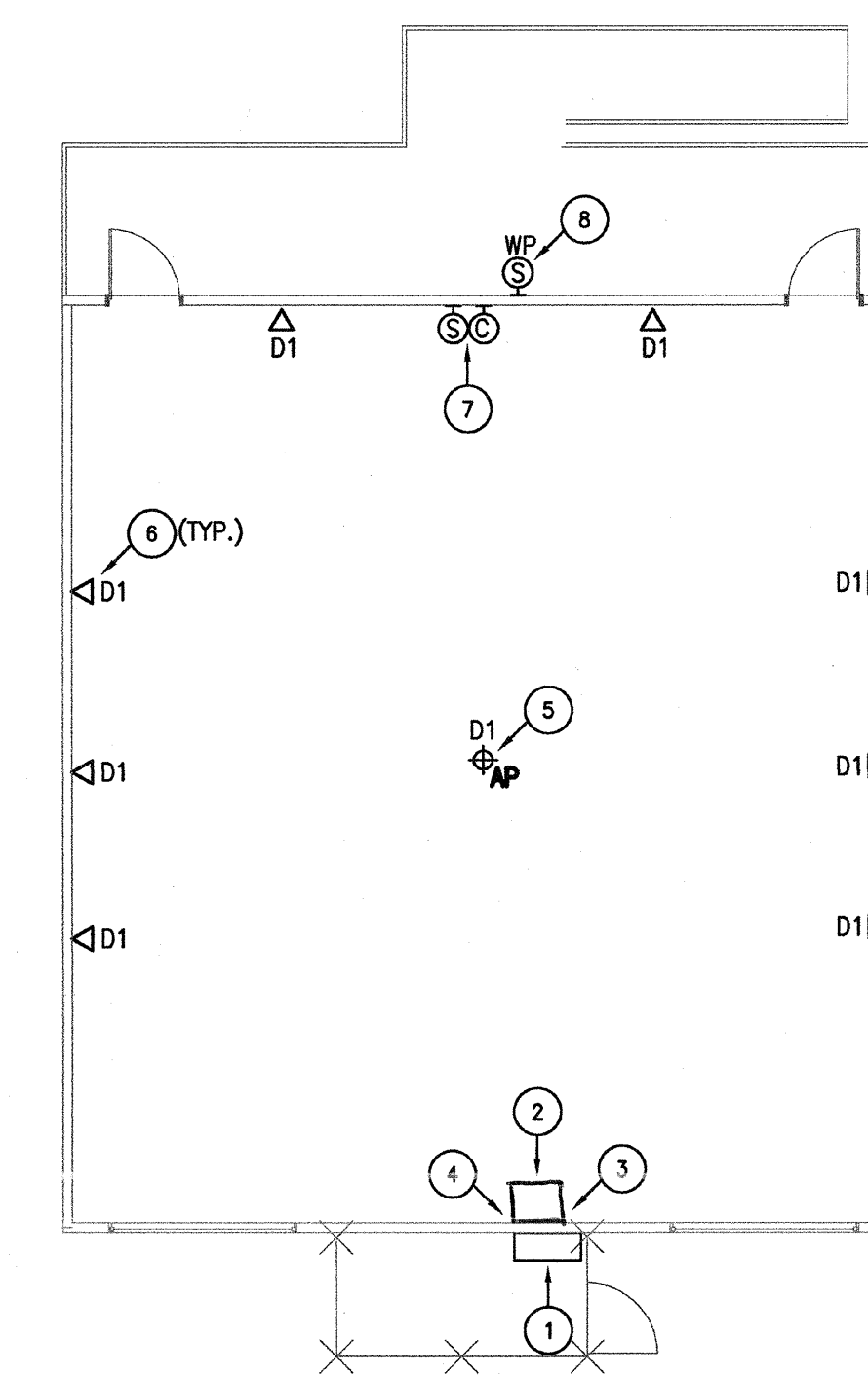
- CONTRACTOR TO PROVIDE AND INSTALL A NEW WALL MOUNTED RACK WITH ALL REQUIRED MOUNTING HARDWARE. REFER TO 9/E3.0 FOR MOUNTING DETAIL.
- INDICATES A LOCATION TO BE DESIGNATED FOR THE INCOMING SERVICE FIBER.
- CONTRACTOR TO PROVIDE AND INSTALL A RACK MOUNTED, 2RU FIBER OPTIC ENCLOSURE. ALL FIBER OPTIC TIE CABLE TO IDFS ARE TO BE TERMINATED IN THIS ENCLOSURE. PROVIDE AND INSTALL THE FIBER OPTIC ADAPTER PLATES REQUIRED TO ACCOMMODATE 110% OF THE INSTALLED FIBER OPTICS.
- CONTRACTOR TO PROVIDE AND INSTALL A 12-STRAND 50/125UM, INTERLOCKING ARMORED FIBER OPTIC CABLE FROM THE (E)IDF BLDG.1 TO THE DANCE STUDIO IDF. CABLE SHALL BE RATED FOR PLENUM SPACE.
- CONTRACTOR TO PROVIDE AND INSTALL A 25-PAIR, CATEGORY 3 UTP COPPER TIE CABLE FROM THE (E)IDF BLDG.1 TO THE DANCE STUDIO IDF. TERMINATE TIE CABLE ONTO DESIGNATED 24-PORT PATCH PANEL, 1-PAIR PER PORT. CABLE SHALL BE RATED FOR PLENUM SPACE.
- CONTRACTOR TO PROVIDE AND INSTALL A 24-PORT PATCH PANEL WITH ALL REQUIRED MOUNTING HARDWARE AND TERMINATION COMPONENTS, FOR THE TERMINATION OF 25-PAIR IDF TO IDF TIE CABLES.
- CONTRACTOR TO PROVIDE AND INSTALL A 48-PORT PATCH PANEL WITH ALL REQUIRED MOUNTING HARDWARE AND TERMINATION COMPONENTS, FOR THE TERMINATION OF ALL DATA CABLES IN THIS COMMUNICATIONS CLOSET. PANELS SHOWN ARE AN ESTIMATE. CONTRACTOR TO PROVIDE THE REQUIRED AMOUNT TO TERMINATE 110% OF THE TOTAL NUMBER OF CABLES TERMINATING IN EACH CLOSET.
- THIS PORTION OF RACK IS RESERVED FOR OWNER PROVIDED SWITCHES.
- CONTRACTOR TO PROVIDE AND INSTALL IP GATEWAY ZONE AMPLIFIERS FOR INTERIOR & EXTERIOR PA SPEAKERS.
- CONTRACTOR TO PROVIDE AND INSTALL INTERIOR & EXTERIOR ZONE SPEAKER WIRES FROM EXISTING PA TERMINAL CABINET IN BUILDING "1".



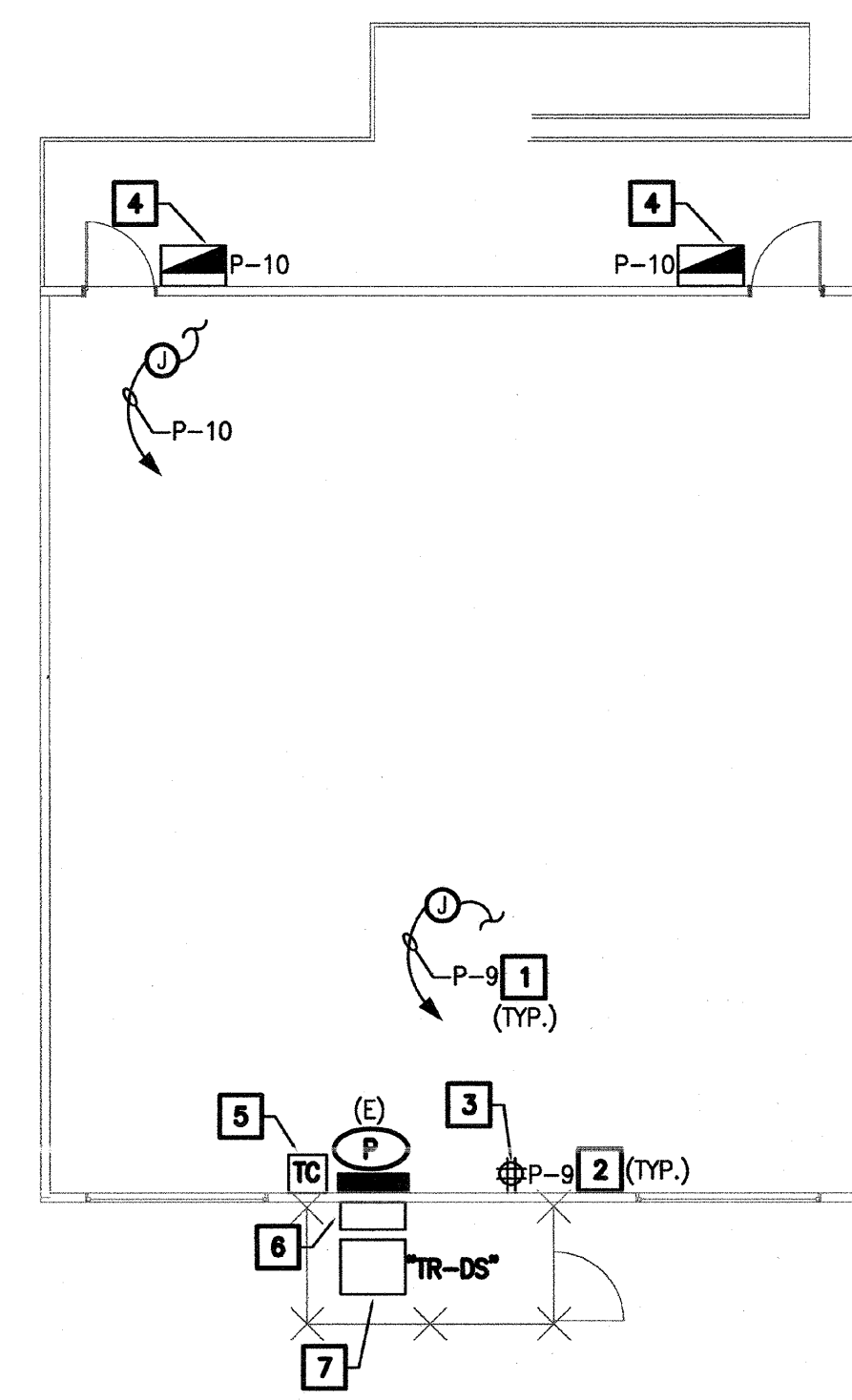
2 IDF RISER DIAGRAM  
 SCALE: NTS

### TECHNOLOGY KEYED NOTES

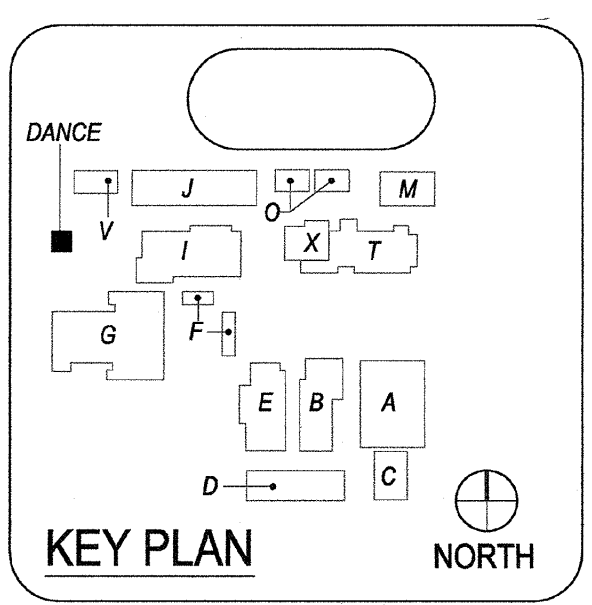
- EXPOSED PULLBOX AT REAR OF BUILDING.
- INDICATES THE LOCATION OF A NEW WALL MOUNTED SWINGING NETWORK RACK. CONTRACTOR TO PROVIDE AND INSTALL RACK AND ALL REQUIRED MATERIALS TO MOUNT THIS RACK AT THE DESIGNATED LOCATION.
- INDICATES THE LOCATION OF A 3/4" FIRE RATED PLYWOOD. CONTRACTOR TO PROVIDE AND INSTALL PLYWOOD AND ALL REQUIRED MOUNTING HARDWARE. PLYWOOD SHALL BE PAINTED WHITE WITH FIRE RATED PAINT. TYPICAL FOR ALL SHOWN.
- INDICATES THE LOCATION OF A NEW WALL MOUNTED GROUND BUS BAR. CONTRACTOR TO PROVIDE BUS BAR AND ALL REQUIRED MATERIAL TO MOUNT AT THE LOCATION SHOWN.
- OWNER PROVIDED CONTRACTOR INSTALLED WIRELESS ACCESS POINT. PROVIDE QUANTITY OF CAT-6 CABLES & CONNECTORS AS INDICATED. ALL CABLES SHALL BE ROUTED IN CONDUIT.
- DATA OUTLET. PROVIDE QUANTITY OF CAT-6 CABLES & JACKS AS INDICATED. ALL CABLES SHALL BE ROUTED IN CONDUIT.
- COMBINATION CLOCK AND PUBLIC ADDRESS SPEAKER WITH CONDUIT & WIRING TO SOURCE.
- EXTERIOR PUBLIC ADDRESS SPEAKER WITH VANDAL GUARD AND CONDUIT & WIRING TO SOURCE.



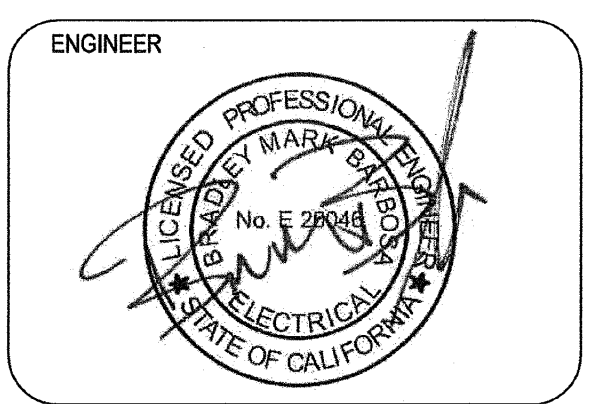
1 TECHNOLOGY FLOOR PLAN  
 SCALE: 1/8"=1'-0"



3 ELECTRICAL FLOOR PLAN  
 SCALE: 1/8"=1'-0"



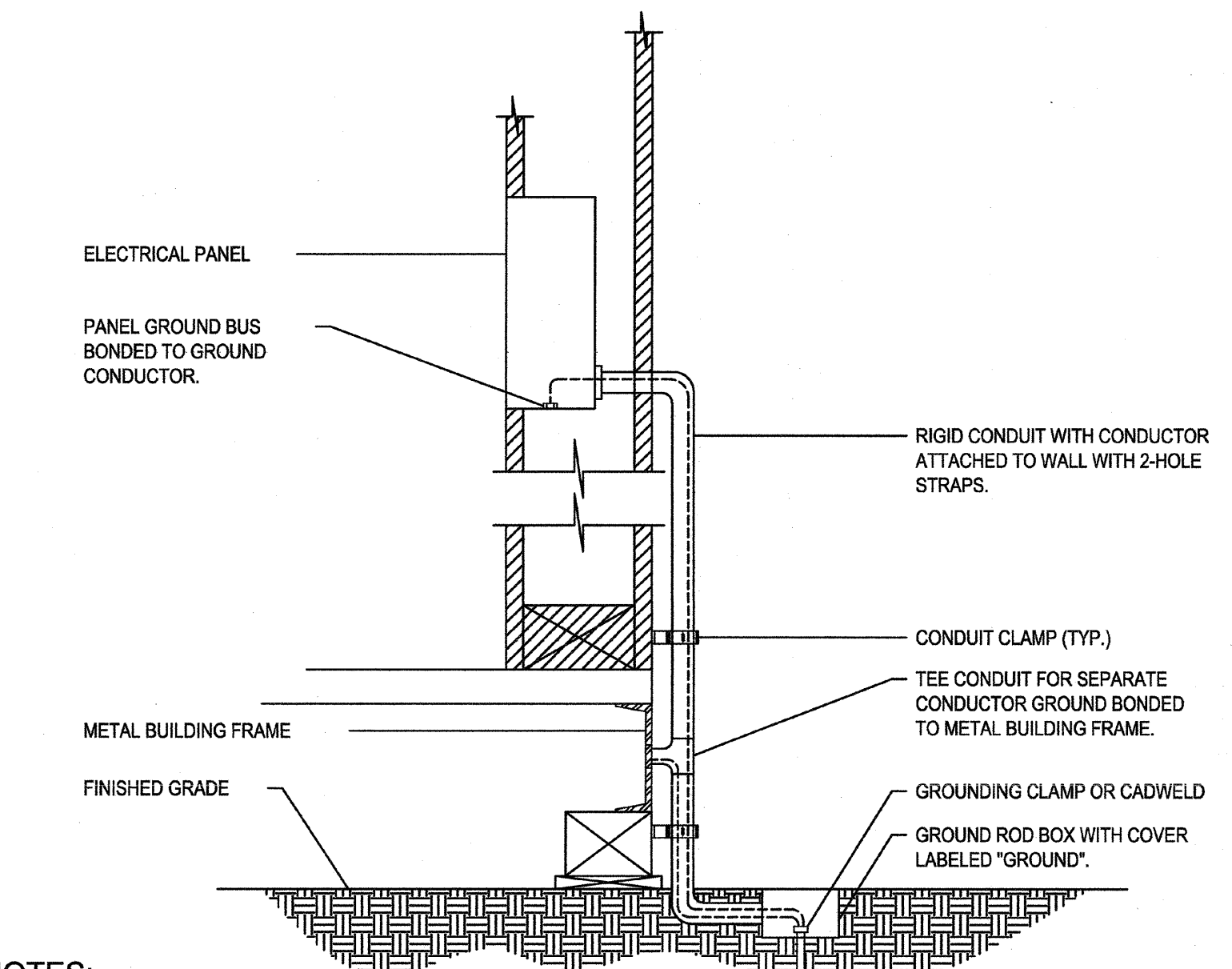
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 APPL 04-118283  
 ACS FL 9/11 SS 1/11  
 DATE MAY 0 7 2013



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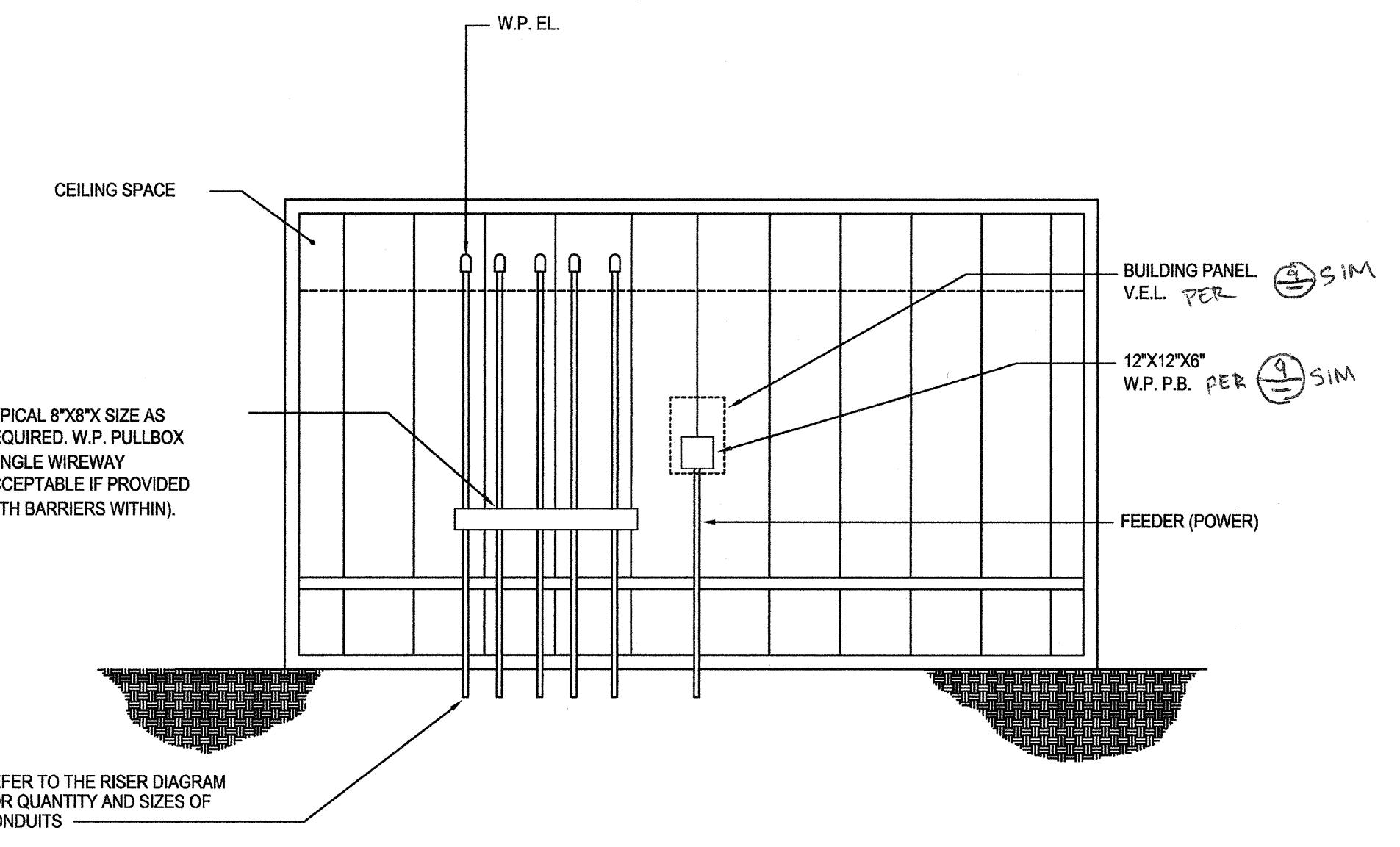
CLIENT  
 HUNTINGTON BEACH UNION HIGH SCHOOL DISTRICT  
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No.	Description	Date



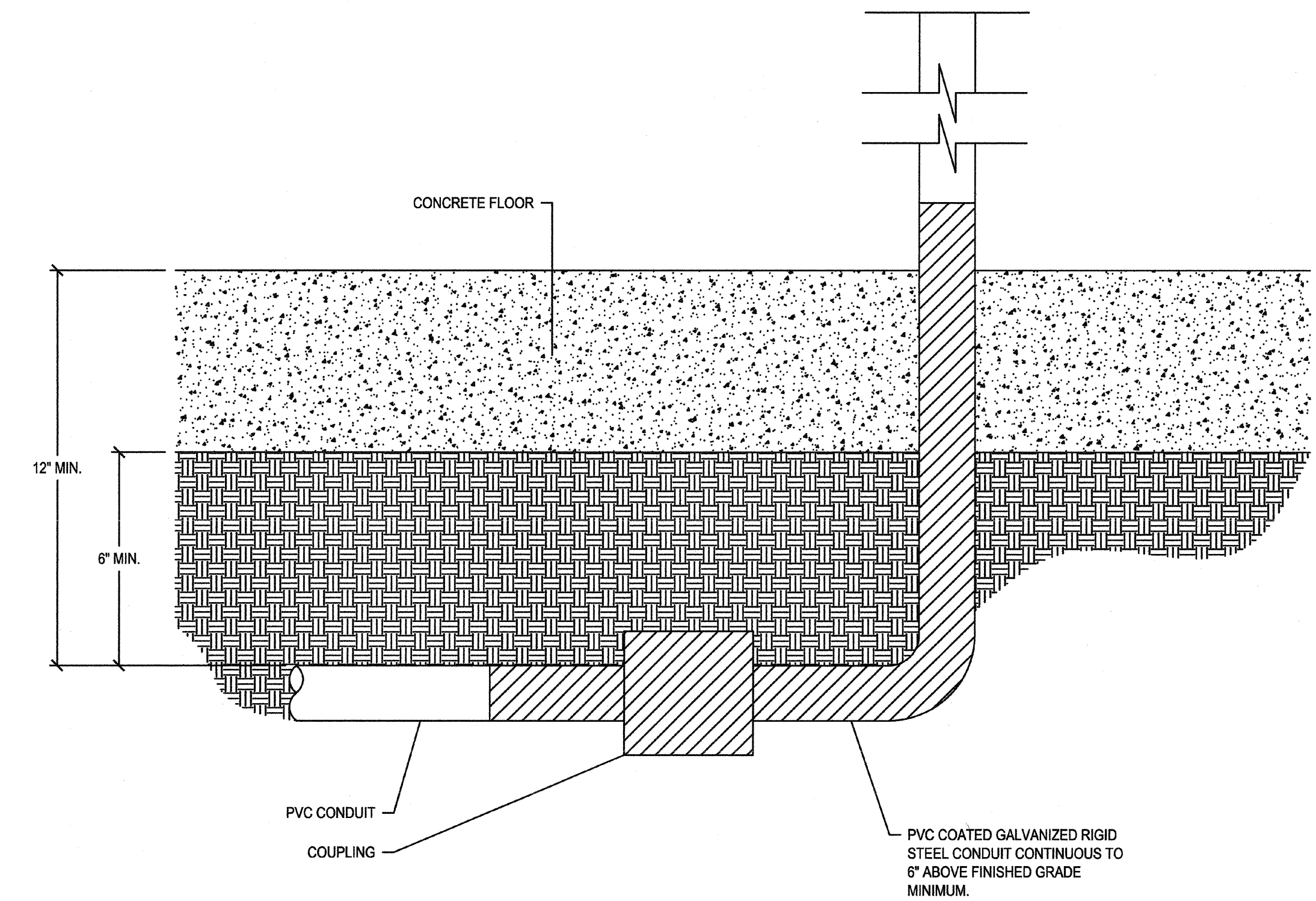
- DETAIL NOTES:**
- SIZE OF CONDUCTOR SHALL BE #6 AWG CU.
  - BOND SEPARATE CONDUCTORS FROM GROUND ROD TO ELECTRICAL PANEL AND TO METAL BUILDING FRAME (CEC 250.41). IN ADDITION TO THE DETAIL SHOWN ABOVE, BOND THE ELECTRICAL GROUND TO METAL WATER PIPE EMBEDDED AT LEAST 10 FT. INTO THE SOIL IF AVAILABLE (CEC 250.81 & 250.83).
  - ALL MODULES OF METAL FRAME BUILDINGS SHALL BE ELECTRICALLY BONDED TOGETHER (BOLTING ONLY IS NOT ACCEPTABLE BONDINGS).
  - CHECK RESISTANCE TO GROUND. IF RESISTANCE EXCEEDS 25 OHMS, INSTALL ADDITIONAL GROUND RODS WITH CONDUCTORS AS SHOWN, SEPARATED AT LEAST 6'-0" UNTIL RESISTANCE IS REDUCED TO 25 OHMS OR LESS (CEC 250.84).
  - GROUND TEST SHALL BE WITNESSED BY PROJECT INSPECTOR, AND RECORDED FOR OWNER MANUAL.

**1 PORTABLE BUILDING GROUNDING DETAIL**  
 SCALE: NONE

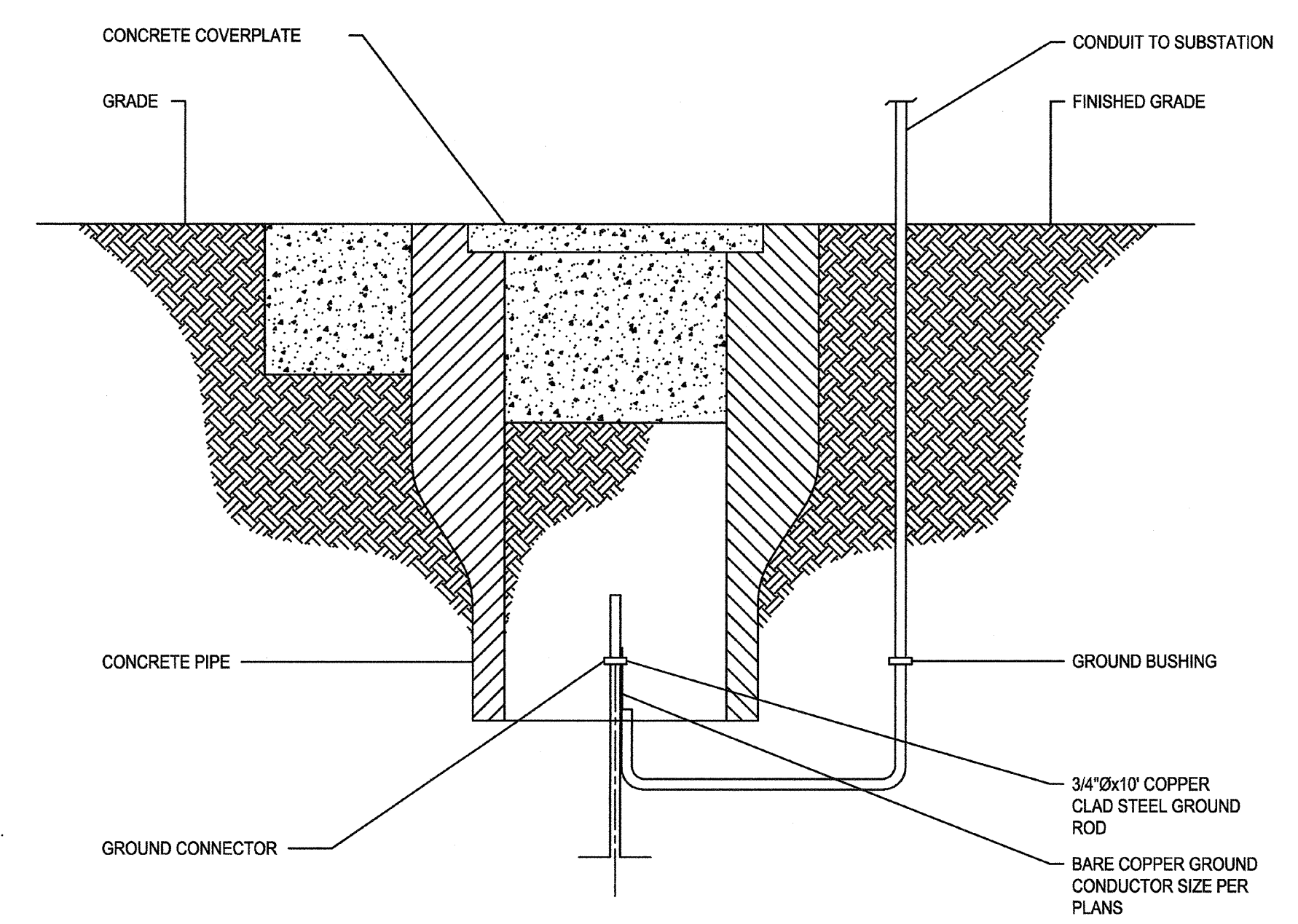


REFER TO THE RISER DIAGRAM FOR QUANTITY AND SIZES OF CONDUITS

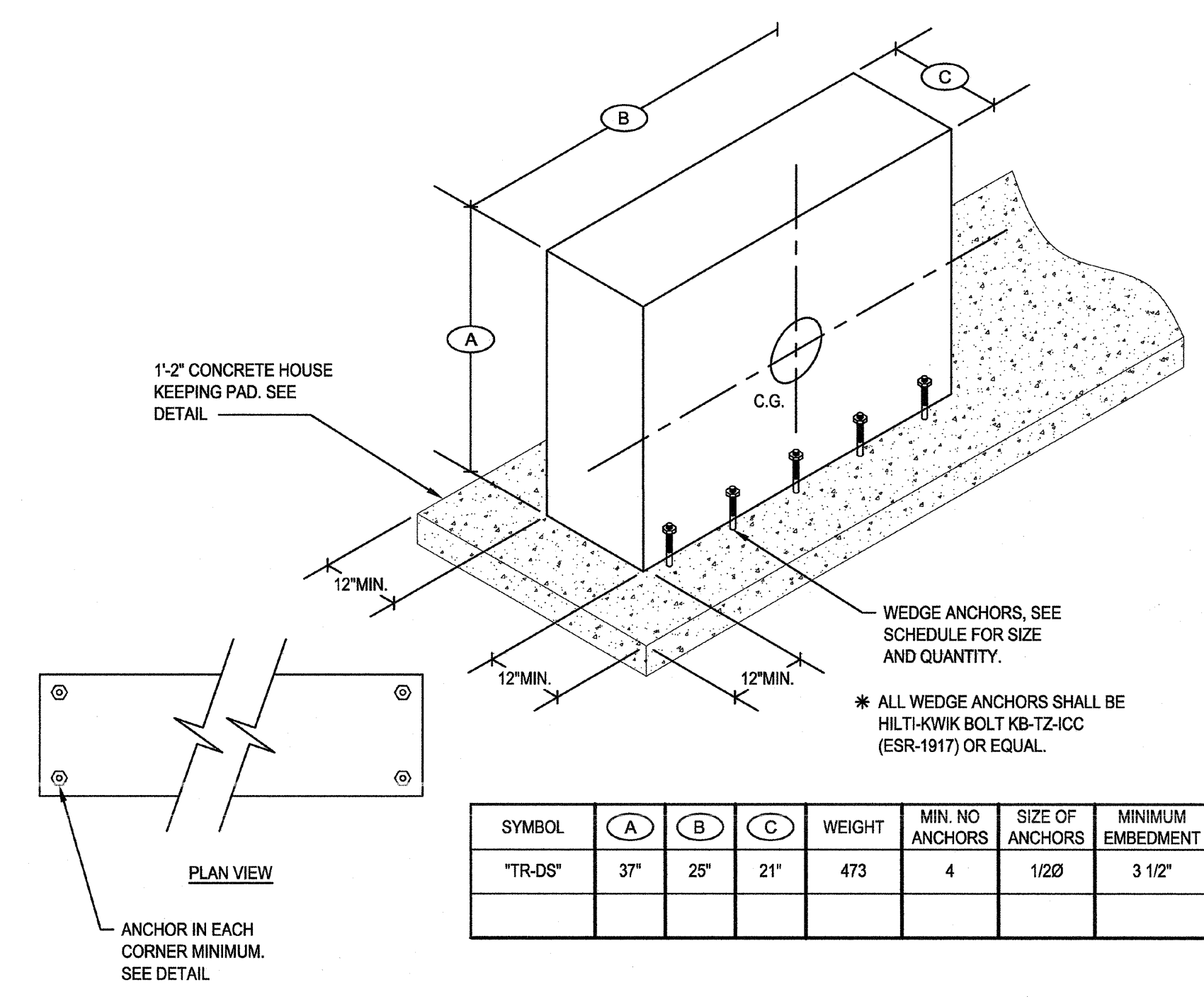
**2 PORTABLE BUILDING ELEVATION DETAIL**  
 SCALE: NONE



**4 CONDUIT INSTALLED BELOW GRADE TO ABOVE GRADE DETAIL**  
 SCALE: NONE

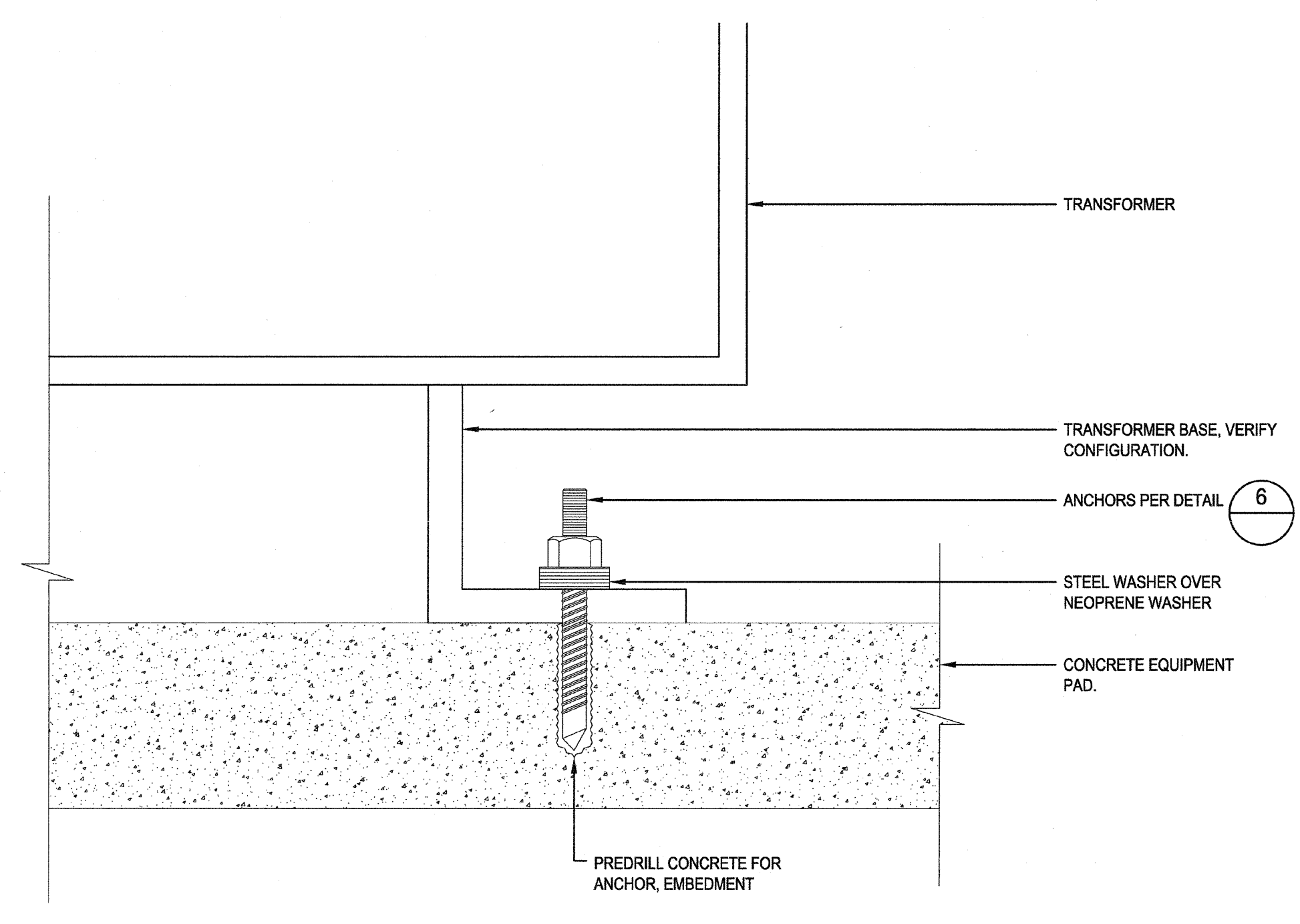


**5 GROUND ROD DETAIL**  
 SCALE: NONE

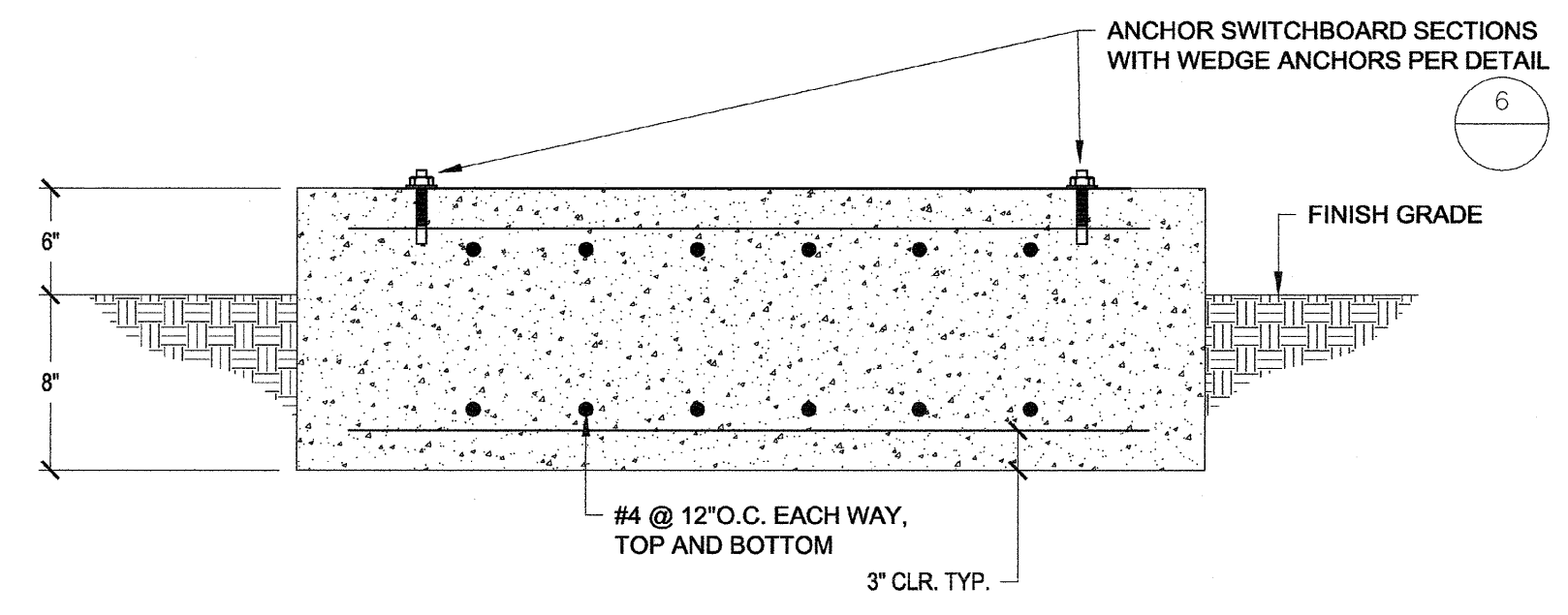


SYMBOL	A	B	C	WEIGHT	MIN. NO. OF ANCHORS	SIZE OF ANCHORS	MINIMUM EMBEDMENT
"TR-OS"	37"	25"	21"	473	4	1/2"	3 1/2"

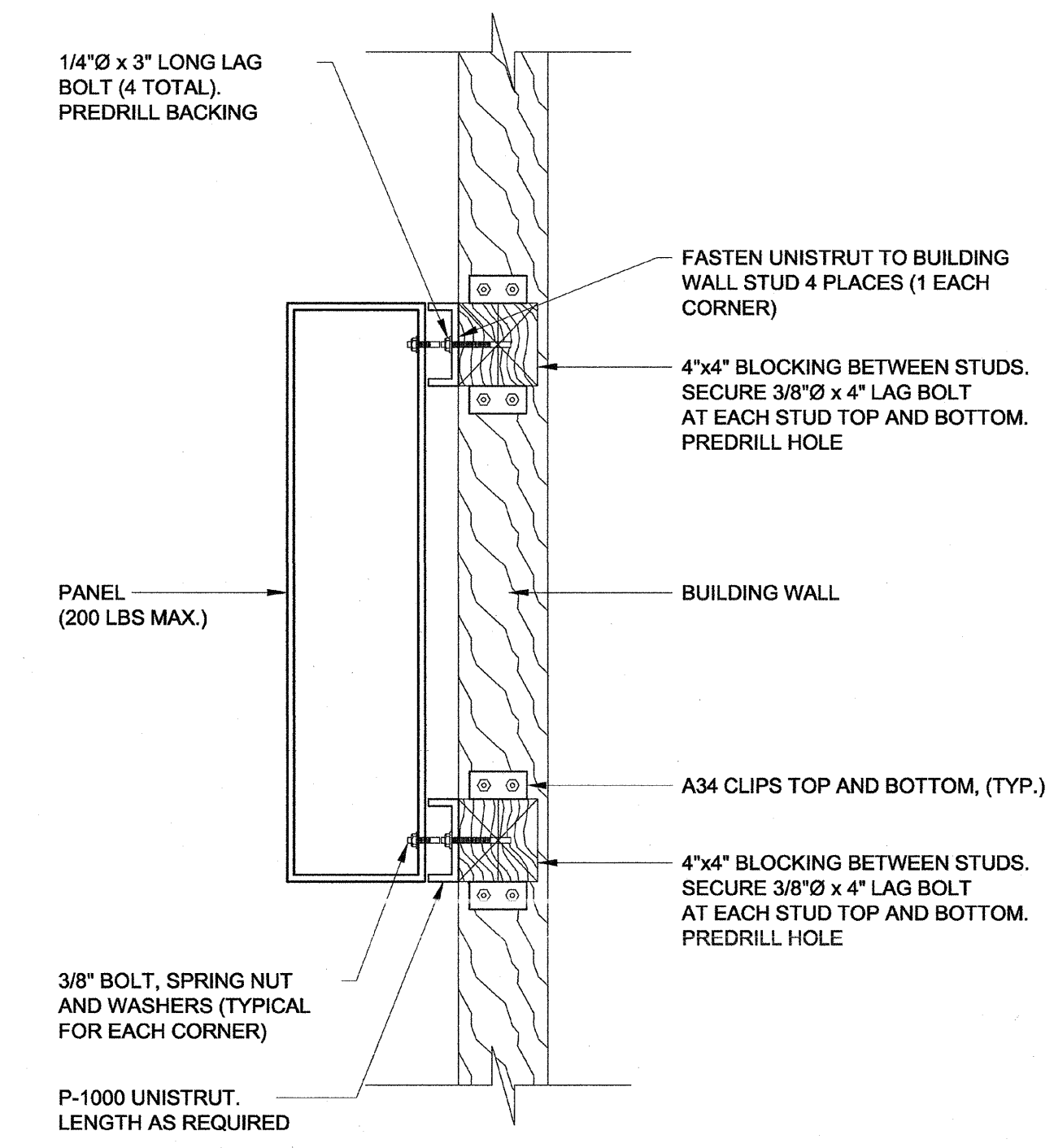
**6 SWITCHBOARD & TRANSFORMER MOUNTING DETAIL**  
 SCALE: NONE



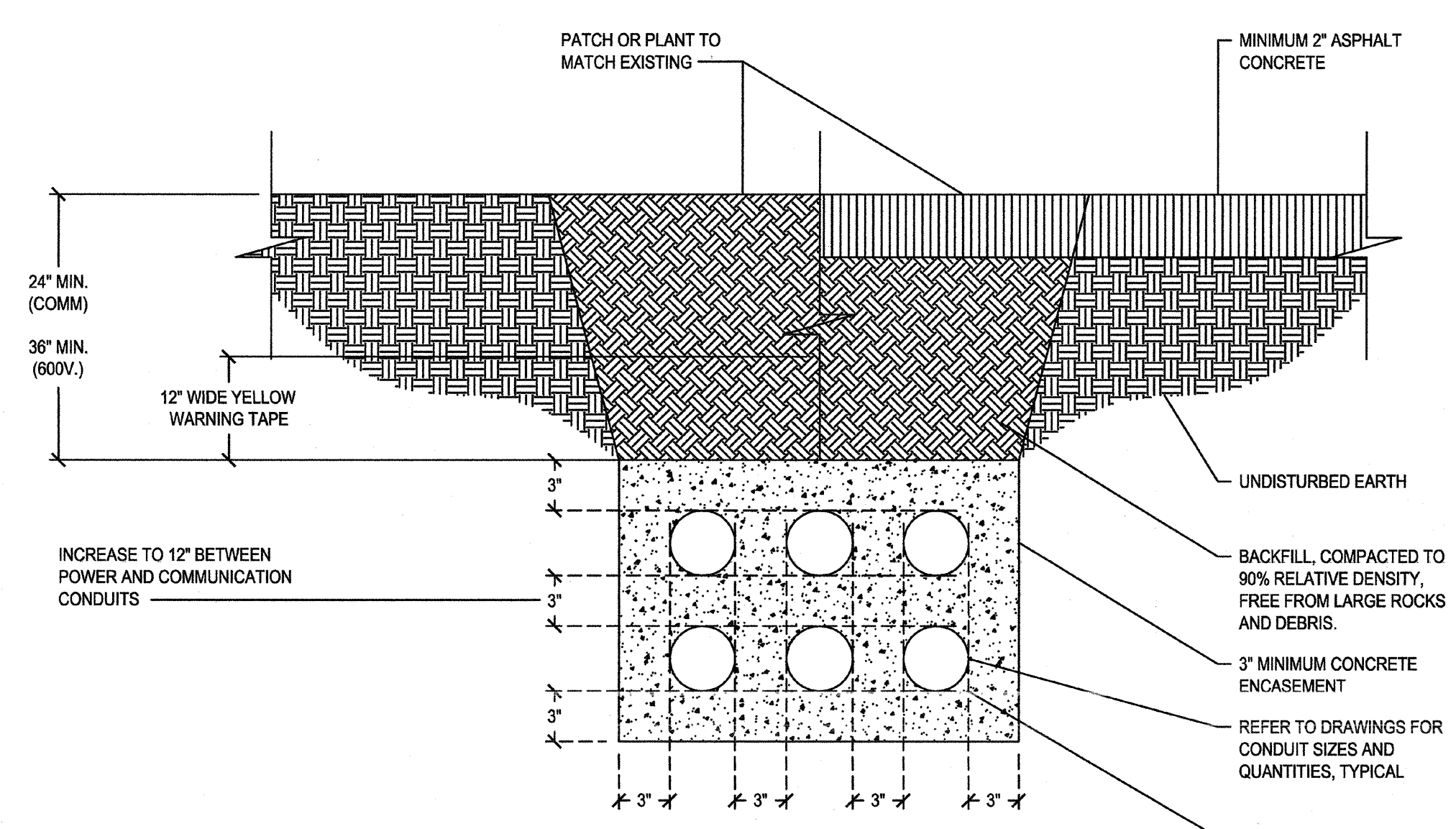
**7 TRANSFORMER MOUNTING DETAIL**  
 SCALE: NONE



**8 HOUSE KEEPING PAD DETAIL**  
 SCALE: NONE



**9 SURFACE MOUNTED PANEL/CABINET AT WOOD FRAMING**  
 SCALE: NONE



**3 TYPICAL MULTI-CONDUIT PLACEMENT DETAIL**  
 SCALE: NONE



### DEVICE SCHEDULE

SYMBOL	DESCRIPTION	MODEL	MANUFACTURER	BACKBOX	MOUNTING HEIGHT	C.S.F.M. NUMBER
FACP	EXISTING FIRE ALARM CONTROL PANEL (AF 04-102053)	IFP-1000	SILENT KNIGHT			7170-0559-0135
FAPS	EXISTING FIRE ALARM POWER SUPPLY PANEL (AF 04-102053)	RPS-1000	SILENT KNIGHT			7170-0559-0135
ANN	EXISTING FIRE ALARM ANNUNCIATOR (AF 04-102053)	RA-1000	SILENT KNIGHT			7170-0559-0135
SD	AREA SMOKE DETECTOR (ADDRESSABLE - PHOTOELECTRIC)	SD505-ADHR	SILENT KNIGHT	4S DEEP BOX W/ 3-0 RING	CEILING	7300-0900-0138
DA	HEAT DETECTOR (ATTIC)	SD505-AHS	SILENT KNIGHT	4S DEEP BOX W/ 3-0 RING	ATTIC SPACE	7300-0900-0138
HA	FIRE ALARM CEILING MOUNTED HORN/STROBE	PC2WL	SYSTEM SENSOR	4S DEEP BOX W/ 4S EXTENSION		7125-1653-0188
WP	FIRE ALARM EXTERIOR WEATHERPROOF HORN	HRK	SYSTEM SENSOR	EWR		7125-1653-0189
EOL	END OF LINE RESISTOR	N/A	N/A	N/A	N/A	N/A

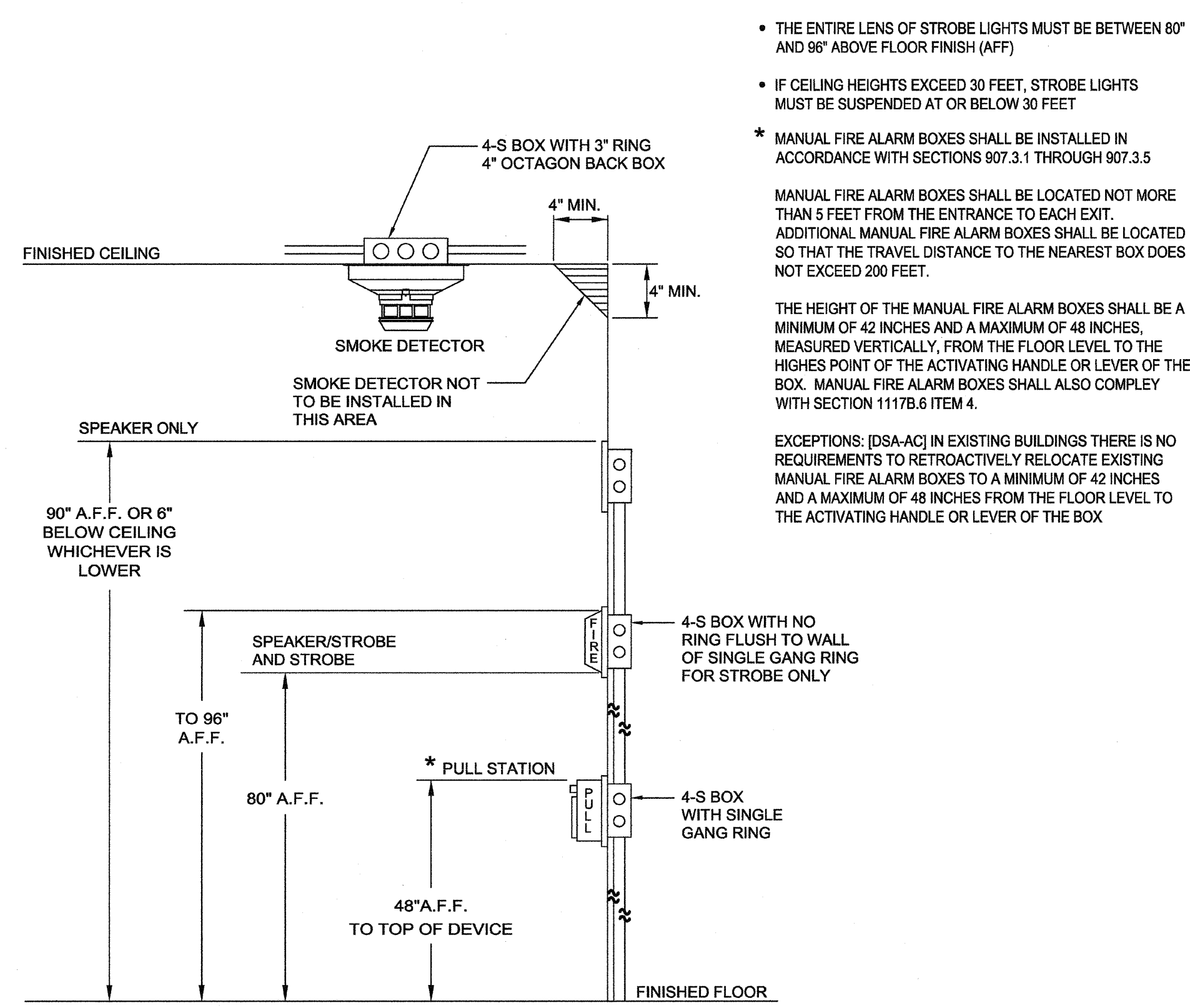
### LEGENDS

ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
A OR AMP	AMPERES	NIC	NOT IN CONTRACT NUMBER
AFF	ABOVE FINISHED FLOOR	NO.	NUMBER
AIC	AMPERES INTERRUPTING CAPACITY	PH. OR Ø	PHASE
ARCH.	ARCHITECT; ARCHITECTURAL	PNL	PANEL
AWG	AMERICAN WIRE GAUGE	PWR	POWER
C	CONDUIT	REC/RECEPT	RECEPTACLE
CKT	CIRCUIT	REQ'D	REQUIRED
CL.	CEILING MOUNTED DEVICE	RM	ROOM
C.O.	CONDUIT ONLY WITH PULL WIRE	SF	SQUARE FEET
CU	COPPER	SHT	SHEET
DWG	DRAWING	SP	SINGLE POLE SPECIFICATIONS
EA	EACH	TYP	TYPICAL
EMT	ELECTRICAL METALLIC TUBING	UG	UNDERGROUND
EQUIP	EQUIPMENT	U.O.N.	UNLESS OTHERWISE NOTED
EXIST / (E)	EXISTING	V	VOLTS
FIN.	FINISH	V-A	VOLT-AMPERES
FLR	FLOOR	W	WATTS
FT	FEET	W/	WITH
GFI	GROUND FAULT INTERRUPTER	W/O	WITHOUT
GND	GROUND	WP	WEATHERPROOF
LTG.	LIGHTING	NEC	NATIONAL ELECTRICAL CODE
MTG	MOUNTING		
N	NORTH		

### GENERAL NOTES

- ALL WALL-MOUNTED AUDIBLE & VISUAL SIGNALING APPLIANCES SHALL HAVE THEIR HEIGHTS ABOVE THE FINISHED FLOOR AT 90" TO BOTTOM. NFPA 72, 1999 EDITION, ALLOWS 80"-86" FOR VISUAL DEVICES (CH. 6-4.4) AND REQUIRES A MINIMUM OF 90" TO TOP FOR AUDIBLE DEVICES (CH. 6-3.7)
- ALL EQUIPMENT SHALL BE U.L. AND C.S.F.M. LISTED.
- ALL WIRING SHALL BE IN ACCORDANCE WITH THE C.E.C. AND AUTHORITIES HAVING JURISDICTION.
- ALL JUNCTION BOXES SHALL BE SIZED IN ACCORDANCE WITH THE C.E.C.
- ELECTRICAL CONTRACTOR SHALL FURNISH ACCESS PANELS TO AREAS THAT REQUIRE SERVICING, TROUBLE SHOOTING, ETC.
- DO NOT DEVIATE FROM CONDUIT RUNS AS SHOWN ON FLOOR PLANS WITHOUT PRIOR APPROVAL FROM SYSTEM SUPPLIER. FACTORS SUCH AS EXCESSIVE VOLTAGE DROP, ADDITIONAL PARTS, ENGINEERING, ETC., THAT ARE A RESULT OF CONDUIT RUN DEVIATIONS SHALL BE THE SOLE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
- DETECTORS SHALL NOT BE LOCATED IN A DIRECT AIR-FLOW, NOR CLOSER THAN 3 FEET (900mm) FROM AN AIR SUPPLY DIFFUSER.
- ALL FAN SHUTDOWN FUNCTIONS, DAMPER CLOSURES, AND ASSOCIATED MECHANICAL SYSTEM FIRE ALARM INTERFACE SHALL BE BY MECHANICAL CONTRACTOR.
- ALL DUCT SMOKE DETECTORS SHALL BE MOUNTED BY THE MECHANICAL CONTRACTOR. DUCT SMOKE DETECTORS EXPOSED TO THE WEATHER SHALL BE WEATHER PROTECTED BY THE MECHANICAL CONTRACTOR. ALL AIR VELOCITY TESTING SHALL BE PERFORMED BY THE MECHANICAL CONTRACTOR.
- ALL 120VAC POWER REQUIREMENTS FOR THE FIRE ALARM SYSTEM SHALL BE FURNISHED BY THE ELECTRICAL CONTRACTOR AND SHALL MEET ALL REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION.
- ALL FIRE ALARM DEVICE BACKBOXES, FIRE ALARM TERMINAL CABINETS, GUTTERS, JUNCTION BOXES, AND ASSOCIATED CONDUITS SHALL BE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED. REFER TO FIRE ALARM SYMBOL LIST AND/OR MOUNTING DETAILS FOR ADDITIONAL INFORMATION. SYSTEM SUPPLIER PROVIDED BACKBOXES SHALL BE INSTALLED BY ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED.
- SMOKE DETECTOR TESTING SHALL BE ACCOMPLISHED PER THE MANUFACTURER'S INSTRUCTIONS.
- ALL WIRING, INITIATING DEVICES AND ANNUNCIATOR PANEL SHALL BE SUPERVISED BY THE PRINCIPAL POINT OF ANNUNCIATION. THE FIRE ALARM CONTROL PANEL TO SUPERVISE THE ANNUNCIATOR PANEL, ALL INITIATING AND INDICATING DEVICE CIRCUITS.
- ALL WIRING SHALL BE CUT FOR IN AND OUT. WIRING SHALL NOT BE LOOPED THROUGH DEVICES.
- POINT AND COMMON ANNUNCIATION AND T-TAPPING ARE PROHIBITED.
- PROVIDE 3/4" CONDUIT FROM FIRE ALARM CONTROL PANEL TO TELEPHONE BACKBOARD FOR OWNER PROVIDED CENTRAL STATION MONITORING.
- THE ALARM SYSTEM SHALL HAVE AN AUDIBILITY OF NOT LESS THAN 15dB ABOVE AMBIENT NOISE LEVELS. TESTING SHALL BE ACCOMPLISHED WITH A dB METER. WHERE APPLICABLE, AUDIBLE TONE SHALL BE TEMPORAL PATTERN.
- ALL CONDUIT SHALL BE 3/4" UNLESS OTHERWISE NOTED.
- ALL FLOW SWITCHES SHALL BE 2 WIRE WITH NON-ELECTRONIC RETARD TYPE SIMILAR TO THE SYSTEM SENSOR MODEL "WFD SERIES" ONLY.
- ALL DEVICES IN THE ALARM SYSTEM SHALL BE COMPATIBLE AND INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
- SYSTEM SHALL BE FURNISHED AND INSTALLED BY A NESCO AFFILIATE AND AUTHORIZED NOTIFIER DISTRIBUTOR.
- FIRE ALARM SYSTEM INSTALLATION COMPANY SHALL BE UL LISTED (LUJIS).

### ELEVATION MOUNTING DETAIL



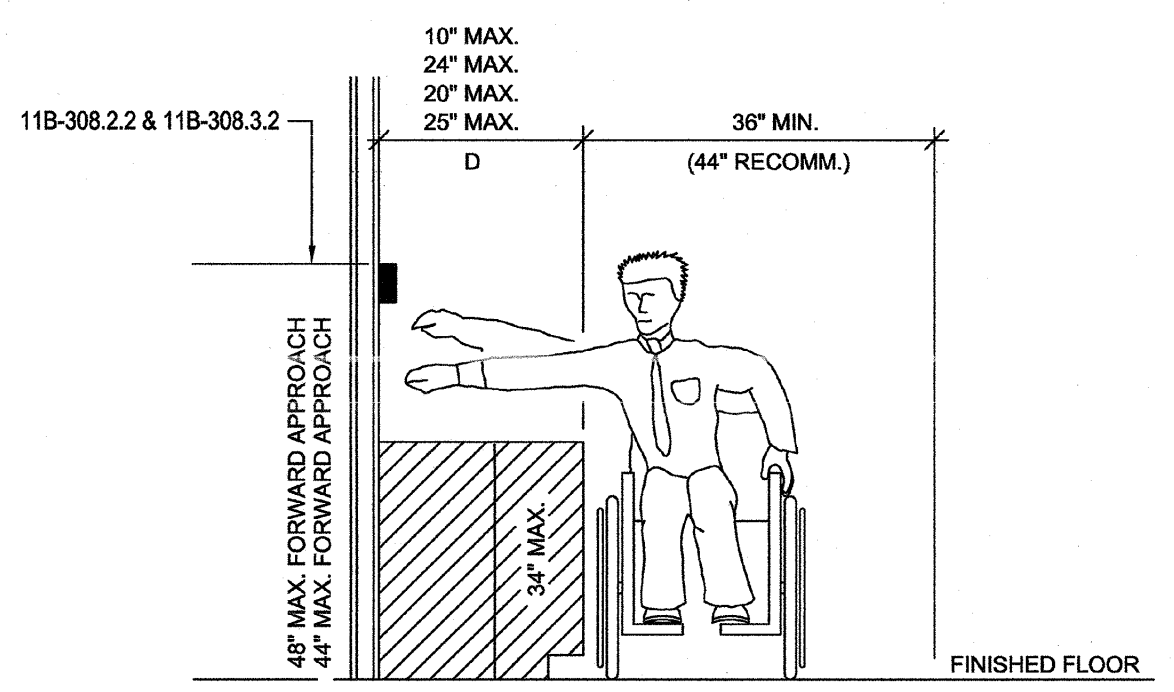
### FIRE ALARM REQUIREMENTS

- THE CONTRACTOR SHALL PROVIDE AND SUBMIT THE FIRE ALARM SHOP DRAWINGS TO THE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION OF THE FIRE ALARM SYSTEM. THE SUBMITTAL SHALL CONTAIN THE FOLLOWING:
  - SHOP DRAWINGS: COMPLETE 1/8" SCALE FLOOR PLANS SHOWING ALL DEVICES, COMPONENTS, CONDUIT AND WIRING INDICATING A COMPLETE AND OPERABLE SYSTEM AS DESIGNED AND SPECIFIED. REPRODUCED COPIES OF BID SET FIRE ALARM PLANS ARE NOT ACCEPTABLE AS SHOP DRAWINGS. SHOP DRAWINGS MUST ALSO INDICATE DEVICE MOUNTING HEIGHTS, ROOM NAMES AND NUMBERS AND THE LOCATION OF ALL FIRE RATED WALLS.
  - ELECTRICAL CONTRACTORS AND FIRE ALARM SYSTEM INSTALLER'S NAME, ADDRESS, PHONE NUMBER AND C-10 LICENSE NUMBER.
  - LIST OF SYSTEM COMPONENTS, EQUIPMENT AND DEVICES, INCLUDING MANUFACTURERS' MODEL NUMBERS AND CALIFORNIA STATE FIRE MARSHAL LISTING NUMBERS.
  - ORIGINAL COPIES OF MANUFACTURERS' SPECIFICATION SHEETS FOR ALL EQUIPMENT AND DEVICES INDICATED.
  - VOLTAGE DROP CALCULATIONS - INCLUDE THE FOLLOWING INFORMATION FOR THE WORST CASE:
    - POINT-TO-POINT OR OHMS LAW CALCULATIONS.
    - IDENTIFICATION OF ZONE USED IN CALCULATIONS.
    - VOLTAGE DROP PERCENT (NOT TO EXCEED MANUFACTURERS' REQUIREMENTS). NOTE: IF VOLTAGE DROP EXCEEDS 10%, INDICATE MANUFACTURERS' LISTED OPERATING RANGES OR EQUIPMENT AND DEVICES.
    - NOTE CIRCUIT NUMBER FOR WORST CASE CALCULATION.
  - BATTERY TYPE(S), AMPS HOURS AND LOAD CALCULATIONS - INCLUDE THE FOLLOWING INFORMATION:
    - NORMAL OPERATION: 100% OF APPLICABLE DEVICES FOR 24 HOURS = CONTROL PANEL
    - STANDBY POWER - I.E.:
      - ZONE MODULES
      - DETECTORS
      - OTHER DEVICES (IDENTIFY)
    - ALARM CONDITION: 100% OF APPLICABLE DEVICES FOR 15 MINUTES = CONTROL PANEL
    - STANDBY POWER - I.E.:
      - ZONE MODULES
      - SIGNAL MODULES
      - DETECTORS
      - SIGNAL DEVICES
      - ANNUNCIATOR
      - OTHER DEVICES (IDENTIFY)
    - NORMAL OPERATION + ALARM OPERATION
      - TOTAL AMP HOURS REQUIRED.
      - TOTAL AMP HOURS PROVIDED.

### SEQUENCE OF OPERATION

ACTION	DEVICE			
	MANUAL PULL STATION	AREA SMOKE DETECTOR	HEAT DETECTOR	120VAC POWER FAILURE
SOUND CONTROL PANEL TROUBLE BUZZER	YES	YES	YES	YES
ANNUNCIATE AT FIRE CONTROL PANEL (ALARM OR TROUBLE)	YES	YES	YES	YES
ANNUNCIATE AT REMOTE FIRE ALARM ANNUNCIATOR (ALARM OR TROUBLE)	YES	YES	YES	YES
ACTIVATE AUDIBLE/ VISUAL ALARM SIGNAL THROUGHOUT BUILDING	YES	YES	YES	NO

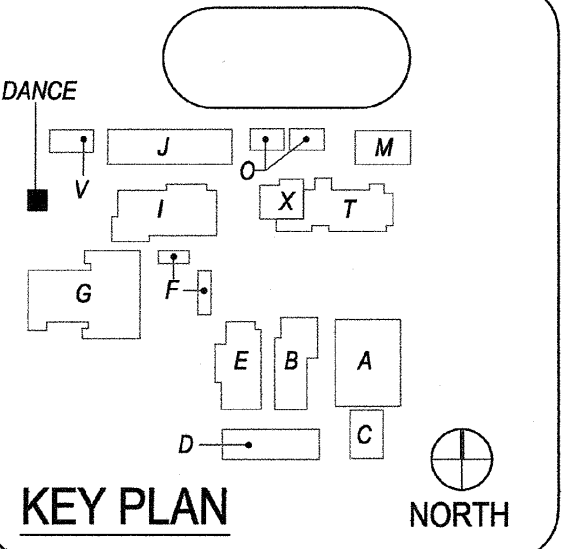
### MOUNTING OVER OBSTRUCTION DETAIL



### WIRE SCHEDULE

WIRE DESIGNATION	WIRE IN CONDUIT	WIRE IN CONDUIT UNDERGROUND/WET LOC.	UNDERGROUND/WET WIRE DESIGNATION
INIT. LOOP	2 CONDUCTOR #16 FPL TWISTED/ SHIELDED WEST PENN #U991	2 CONDUCTOR #16 FPL SHIELDED WEST PENN #AG-294	UM
SPEAKER CKT.	2 CONDUCTOR #14 THINW/WHN STRANDED	2 CONDUCTOR #14 THINW/WHN STRANDED	AUDIBLE CKT. s
VISUAL CKT.	2 CONDUCTOR #12 THINW/WHN STRANDED	2 CONDUCTOR #12 THINW/WHN STRANDED	AUDIBLE CKT. v

NOTE:  
 ALL WIRE MODEL NUMBERS ARE WEST PENN. EQUIVALENT BY OTHER MANUFACTURER IS ACCEPTABLE.



FILE NO. 30-H5  
 IDENTIFICATION STAMP  
 DIV. OF THE STATE ARCHITECT

APPL 04-118283

ACS FLS SS  
 DATE MAY 8 2019

ENGINEER

ARCHITECT

CLIENT: HUNTINGTON BEACH UNION HIGH SCHOOL DISTRICT

PROJECT NUMBER: 18296

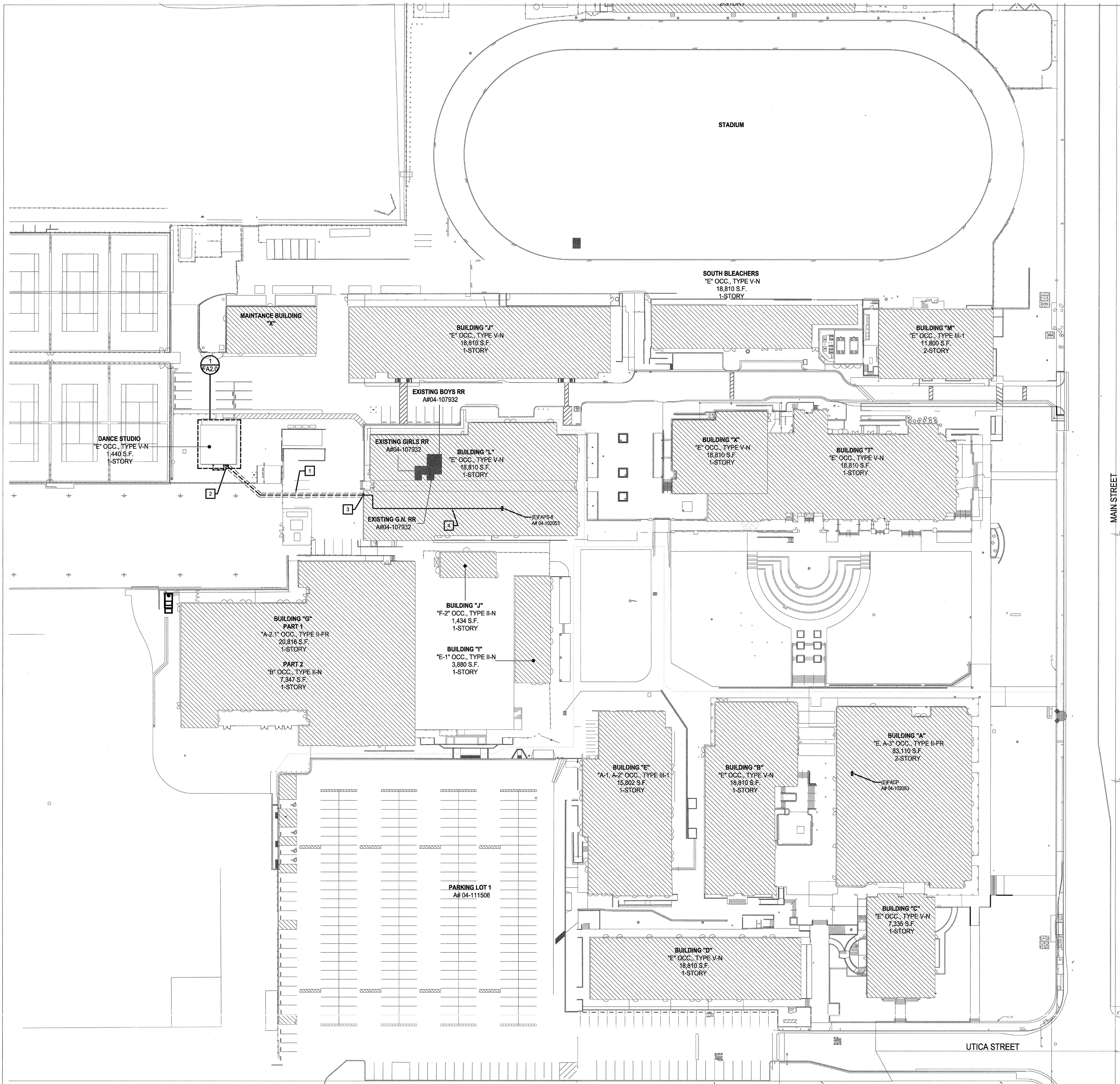
DATE: 05/09/19

DRAWN BY: Author

CHECKED BY: Checker

REVISIONS

No.	Description	Date



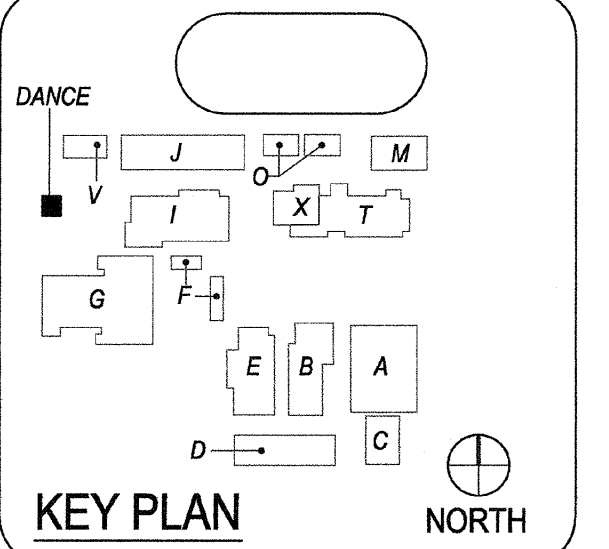
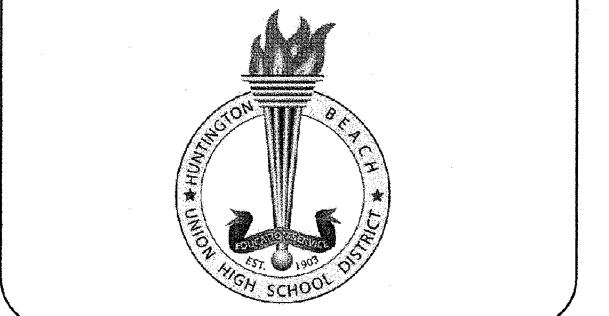
**KEYED NOTES**

- 1 SAW, CUT, & EXCAVATE EXISTING ASPHALT. PROVIDE 1" (PVC, SCHEDULE 40) AND FIRE ALARM CABLES, 24" BELOW GRADE. PATCH AND COMPACT SURFACES TO MATCH EXISTING.
- 2 PROVIDE 12"x12"x6"D NEMA-3R PULL BOX. MOUNT ON BACK OF PORTABLE BUILDING.
- 3 PROVIDE 12"x12"x6"D NEMA-3R PULL BOX. PAINT TO MATCH EXISTING BUILDING.
- 4 RUN CONDUIT IN ATTIC SPACE TO EXISTING EXTENDER PANEL 'FAPS-8'

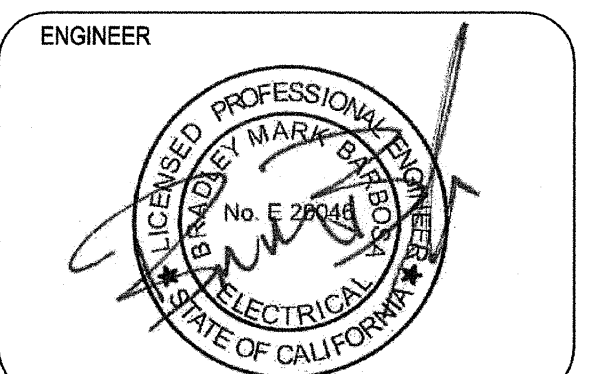


ARCHITECTURE  
 COSTA MESA  
 234 EAST 17TH STREET, SUITE 200  
 COSTA MESA, CA 92627  
 949-548-5000 P  
 949-548-5011 F  
 PBK.com  
 These drawings have been prepared as one coordinated set of drawings and are complimentary. What is required by one drawing is required by all of the drawings, even if a detail or component part is not identified on every sheet. Any user's reliance on a single or select few sheet(s) of the drawings without consideration for the information included in the entire set of drawings will be at the user's sole risk and shall not form the basis for a request for additional compensation or time.

**HUNTINGTON BEACH HIGH SCHOOL DANCE STUDIO**  
 1905 MAIN ST  
 HUNTINGTON BEACH, CA 92648  
 Construction Documents



FILE NO. 30-H5  
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 APPL 04-118263  
 ACS FLS SS  
 DATE MAY 03 2019



ARCHITECT

CLIENT  
 HUNTINGTON BEACH UNION HIGH SCHOOL DISTRICT  
 PROJECT NUMBER  
 18296  
 DATE: 05/09/19  
 DRAWN BY: Author  
 CHECKED BY: Checker

REVISIONS

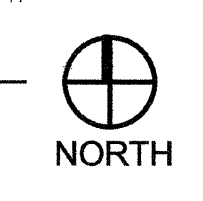
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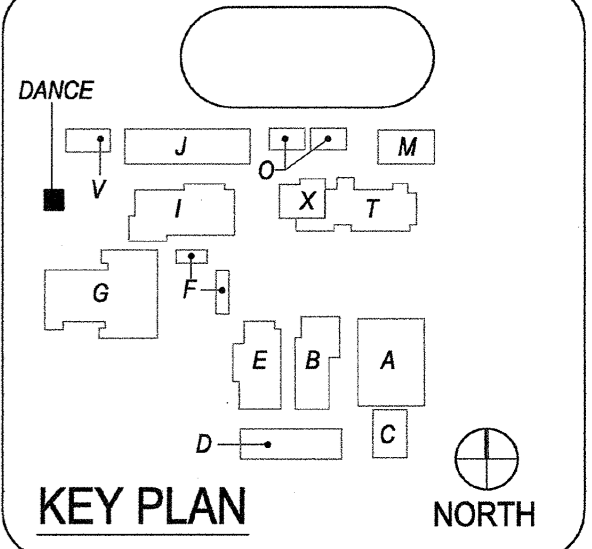
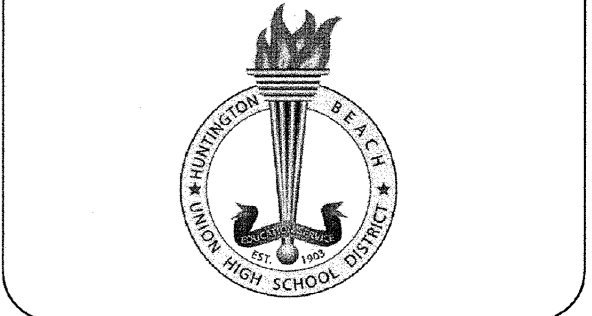
Construction Documents

**FIRE ALARM SITE PLAN**

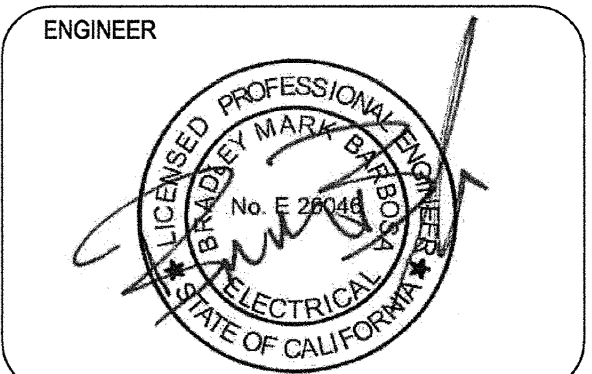
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**1 FIRE ALARM SITE PLAN**  
 SCALE: 1"=40'-0"





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 APPL 04-118283  
 ACS FLS SS  
 DATE MAY 0 2019



ARCHITECT

CLIENT:  
 HUNTINGTON BEACH UNION HIGH SCHOOL DISTRICT

PROJECT NUMBER:  
 18296

DATE: 05/09/19  
 DRAWN BY: Author  
 CHECKED BY: Checker

REVISIONS

No.	Description	Date

FIRE ALARM CONTROL PANEL "FACP"

(E) DEVICES (A# 04-102053)	STAND-BY CURRENT	ALARM CURRENT
CONTROL	0.140	0.260
REMOTE ANNUNCIATOR	0.020	0.025
SIG DEVICES	0.440	0.480
SIG LOOP EXPANDER	0.440	0.440
SERIAL PARALLEL MODULE	0.945	0.945
POWER EXPANDER	0.080	0.080
LED ANNUNCIATOR (AG)	0.035	0.145
LED ANNUNCIATOR (AG)	0.035	0.145
LED DRIVER MODULE	0.035	0.200
SOUNDER BASE	0.001	0.032
RELAY BASE	0.001	0.001
DUCT DETECTOR RELAY	0.070	0.150
	0.960	2.002

NEW DEVICES

(4) SMOKE DETECTOR	0.0003	0.0003
(3) HEAT DETECTOR	0.0003	0.0003
	0.961	2.003

TOTAL STANDBY CURRENT x 60 HOURS = 0.961A x 60 HOURS = 57.06 AMP-HOUR  
 TOTAL ALARM CURRENT x 5 MINUTES = 2.002A x 0.0833 HOURS = 0.167 AMP-HOUR  
 TOTAL MINIMUM AMPERE - HOUR RATING OF BATTERIES = 57.223 AMP-HOUR

FIRE ALARM EXPANDER PANEL "FAPS-8"

(E) DEVICES (A# 04-102053)	STAND-BY CURRENT	ALARM CURRENT
(1) CONTROL	0.060	0.06
(9) 110cd STROBE	---	1.449
(2) 75cd STROBE	---	0.266
(9) 15cd STROBE	---	0.583
(17) HORN	---	0.17
(8) W.P. HORN	---	0.32
	0.060	2.848

NEW DEVICES

(1) 75cd STROBE	---	0.143
(1) HORN	---	0.01
(1) W.P. HORN	---	0.04
	0.060	3.041

TOTAL STANDBY CURRENT x 24 HOURS = 0.06A x 60 HOURS = 3.60 AMP-HOUR  
 TOTAL ALARM CURRENT x 10 MINUTES = 3.041A x 0.167 HOURS = 0.508 AMP-HOUR  
 TOTAL MINIMUM AMPERE - HOUR RATING OF BATTERIES = 4.108 AMP-HOUR  
 EXISTING BATTERY = 7.0 AMP-HOUR

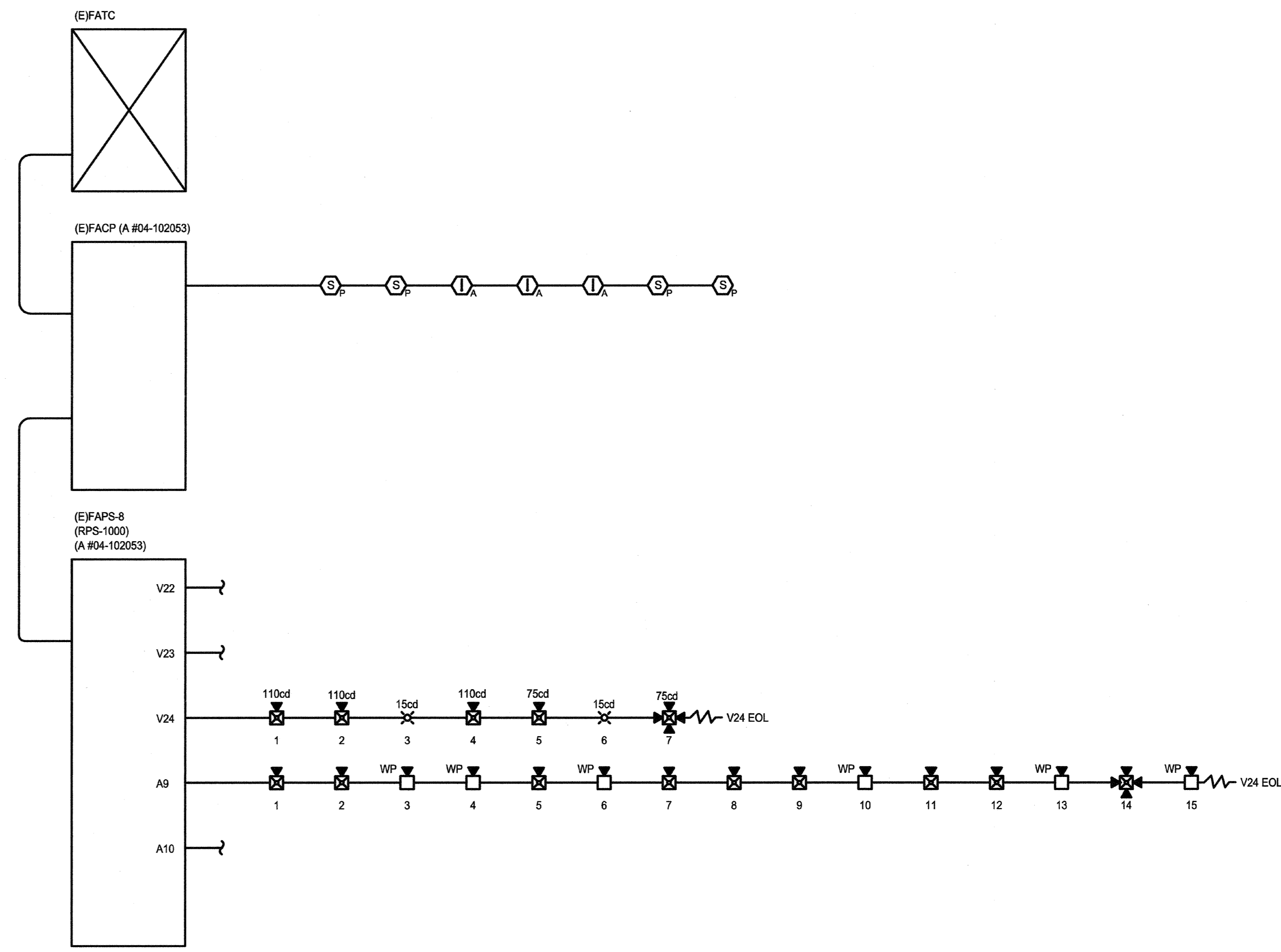
## VOLTAGE DROP FORMULA

AMPS = TOTAL CURRENT OF INDICATING DEVICES IN ALARM CIRCUITS.  
 DISTANCE = LENGTH OF CIRCUIT FROM SUPPLY TO LAST DEVICE (IN FEET).  
 CIRCULAR MILS FOR #12 AWG = 6530  
 RESISTIVITY OF COPPER CONDUCTOR = 21.6  
 SUPPLY VOLTAGE = 24 V

$$\text{PERCENTAGE OF VOLTAGE DROP} = \frac{\text{AMPS} \times \text{DISTANCE} \times 21.6 \times 100\%}{\text{CIRCULAR MILS} \times 24\text{V}}$$

FIRE ALARM VOLTAGE DROP CALCULATIONS

CIRCUIT #	SERVICE TO	CONTROL PANEL TO BUILDING LENGTH FEET	CONTROL PANEL TO BUILDING CONDUCTOR SIZE (AWG)	DEVICE LOAD AMPS	LOAD CURRENT AMPS	VOLTS DROPPED PERCENT
V24	VISUAL DEVICE	740	12	2 @ 0.065 1 @ 0.133 3 @ 0.191 1 @ 0.143	0.889	9.07%
A9	AUDIBLE DEVICE	1100	12	6 @ 0.04 9 @ 0.01	0.330	5.00%

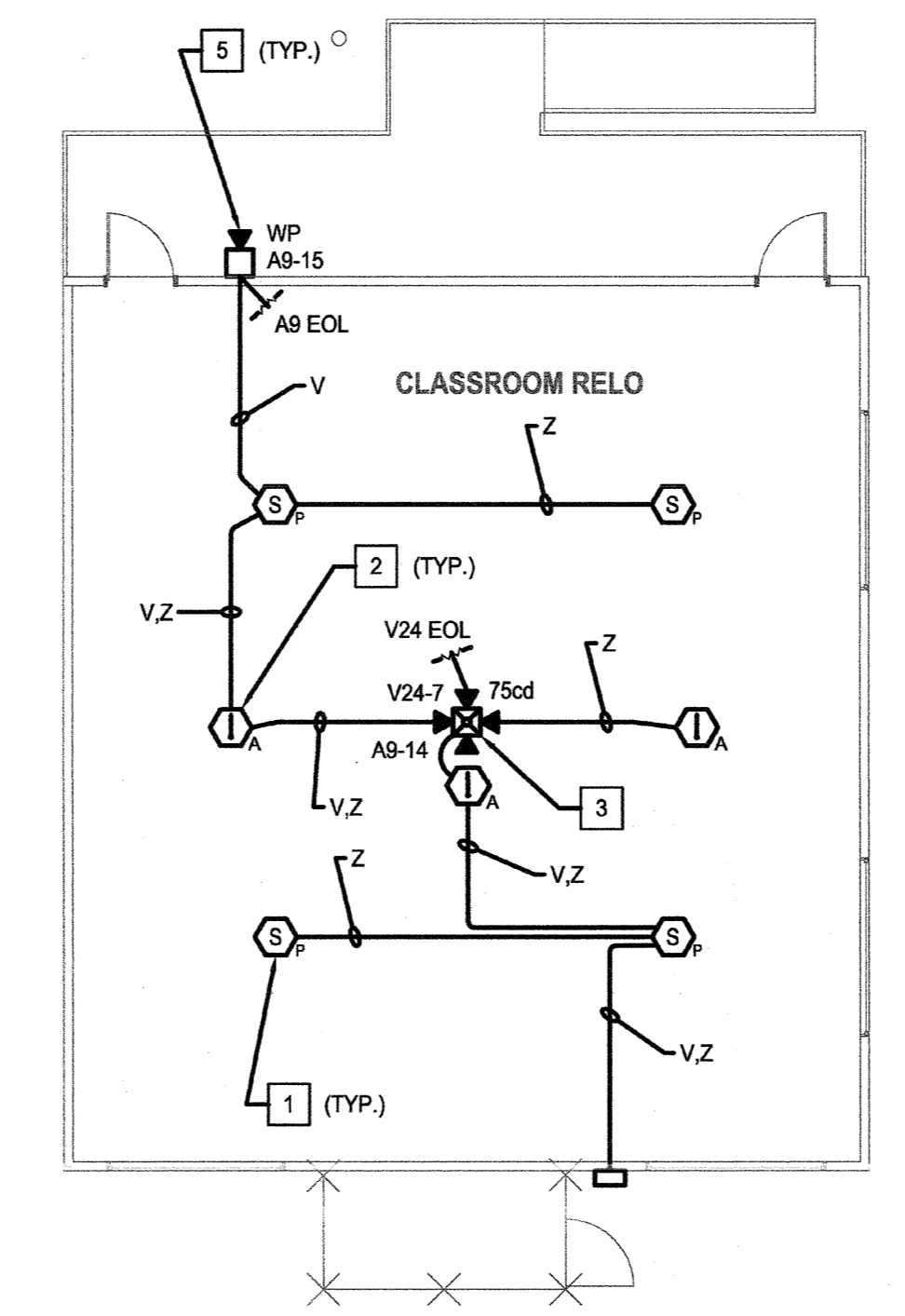


## 2 FIRE ALARM RISER DIAGRAM

SCALE: NONE

## 3 FIRE ALARM VOLTAGE DROP & BATTERY CALCULATIONS

SCALE: NONE



## 1 FIRE ALARM FLOOR PLAN

SCALE: 1"=40'-0"

### KEYED NOTES

- 1 PROVIDE ADDRESSABLE SMOKE DETECTOR AS SHOWN.
- 2 PROVIDE ADDRESSABLE HEAT DETECTOR AS SHOWN.
- 3 PROVIDE CEILING MOUNTED HORN/ STROBE AS SHOWN.
- 4 PROVIDE EXTERIOR HORN AS SHOWN.

