

**LONG BEACH CITY COLLEGE DISTRICT
CONTRACTS MANAGEMENT DEPARTMENT**

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**BID C2295 BUILDING H SWING SPACE PORTABLES PROJECT AT THE
LIBERAL ARTS CAMPUS**

ADDENDUM NO # 1

JULY 22, 2021

This Addendum forms a part of the Contract Documents and modifies the original Contract Documents. Acknowledge receipt of the Addendum on Section 1.2 of the Bid Proposal. Failure to do so may result in the bid being deemed non-responsive.

Note: It is the responsibility of all bidders to notify all subcontractors from whom they request bids and from whom they accept bids of all changes contained in this addendum.

ADDENDUM NO. 1 CONTENTS

- I. QUESTIONS AND ANSWERS**
- II. SPECIFICATION REVISIONS**
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I. QUESTIONS AND ANSWERS

1. Q: Does this project have a PLA requirement or any labor agreement required?

A: No this project does not have any specific PLA or any labor agreement requirement. Refer to General Condition, specifically Section 4.18 for prevailing wage and other wages rates and labor related requirements.

2. Q: Who provides the handrail extensions per detail 8/C2.0?

A: The portable building manufacturer provides a pre-fab metal ramp and handrail. The Contractor shall provide all required extensions to the ramps. The Contractor is responsible to provide the required asphalt paving to provide a flush transition to the metal ramp along with the required handrail extension. The handrail extension

shall be welded, grind/sand smooth and painted to match, in order to provide a smooth seamless transition that matches the handrails provided by the portable building manufacturer. The ramp extension shall also match the finish and texture of the pre-fab ramp provided by the portable building manufacturer. Handrail and ramp extensions shall be provided as required to provide ADA compliant ramps and handrails as part of contract scope.

3. Q: In drawing Sheet C1.30, Notes 7 & 8, please clarify the rail locations in front of Portable H110 to include the “landing wings” area?

A: The Contractor shall provide continuous railing from the portable building manufacturer’s railing to the end of the ramp landing. The railing will be field constructed to be ADA compliant and will match the finish of the manufacture’s rails. The rails will be located on both sides of the path of travel for the length of the ramp. See 8/C2.0 for AC Ramp at Bottom of Modular Ramp detail for additional information.

4. Q: Electrical Drawing and the Transformer detail on 4/E1.1, Note 5 calls for 60-day procurement time. Milestone 2 on Schedule of Milestones – Attachment D to Special Conditions calls for submittal of all the critical submittals including switch gear and transformer within 7-days. Is there any allowance to cover for the additional cost for the expedited delivery?

A: No, the Contractor shall include in the bid cost to provide the expedited submittal and procurement of the electrical transformer and associated electrical equipment that are critical to the completion of the project within the timelines. The procurement time for all the critical submittal shall be part of project schedule, any delays to the procurement would not be considered excusable delays.

II. SPECIFICATION REVISIONS

1. Section 01 21 00 Allowances: Replace this specification section with revised herein.
 - a. Section 3.3 was updated to revise the allowance amounts.
2. Section 26 27 13 – Electricity Metering:
 - a. This specification section removed in its entirety.
3. Section 27 00 00 – General Comm Requirements: Replace this specification section with revised herein.
 - a. Description of change: Revise Category 6A cabling to Category 6 in Section 1.4.L.
4. Section 27 13 00 – Comm Backbone Cabling: Replace this specification section with revised herein.
 - a. Description of change: Add Belden Cabling product brand to voice cabling type in Section 2.1A.
5. Section 27 15 00 – Comm Horizontal Cabling: Replace this specification section with revised herein.
 - a. Description of changes:
 - i. Removed violet cable color references. All Category-6 cabling shall be blue, Section 2.3.B.8.
 - ii. Removed CommScope/Uniprise references. All cabling shall be Belden product brand, Section 2.3.B.9.
 - iii. Removed modular patch panels. All patch panels shall be preloaded, Section 2.5.A.2.e/f.
 - iv. Typical data outlet is (1) Category-6 cable unless noted on plans differently, Section 2.7.B.3.
 - v. Remove references to Category 6A cabling. All cabling shall be Category 6, Section 2.7.B.4.
 - vi. Added Belden faceplate type and color, Section 2.8.A.3.
 - vii. Added premise Category-6 model numbers.
 - viii. Other miscellaneous revisions.

III. DRAWING REVISIONS

1. Sheet E0.1, Electrical Symbols, Abbreviations & Notes:
 - a. Remove and replace Sheet E1.1 attached herein.
 - b. Description of change: Added Pullbox symbol to power legend; and note to scope of work.
2. Sheet E1.1, Electrical Site Plan & Details:
 - a. Remove and replace Sheet E1.1 attached herein.
 - b. Description of change: Revision to details; and Add detail.
3. Sheet E1.1A, Penetration Details:
 - a. Add New Sheet E1.1A attached herein.
4. Sheet E1.2, Enlarged Site Plan:
 - a. Remove and replace Sheet E1.2 attached herein.
 - b. Adjusted handhole location; and electrical panel to coordinate with portable electrical plan; revised keynotes.
5. Sheet E2.1, Electrical Diagrams:
 - a. Remove and replace Sheet E2.1 attached herein.
 - b. Description of change: Revise single line diagram.
6. Sheet T0.0, Technology Symbols List:
 - a. Remove and replace Sheet T0.0 attached herein.
 - b. Description of change: Remove unused symbols; and added symbols.
7. Sheet T1.0, Technology Site Plan:
 - a. Remove and replace Sheet T1.0 attached herein.
 - b. Description of change: Relocate PB-1 pull box westward.
8. Sheet T2.0, Technology Floor Plans:
 - a. Remove and replace Sheet T2.0 attached herein.
 - b. Description of change: Update keynote #10; and relocated PB-1 pull box westward.
9. Sheet T5.0, Technology Details and Block Diagram:
 - a. Remove and replace Sheet T5.0 attached herein.
 - b. Description of change: Rename detail 3.

IV. ATTACHMENTS

1. Addendum No. 1 Specification Sections:
 - a. 01 21 00 – Allowances
 - b. 27 00 00 – Revised General Comm Requirements spec
 - c. 27 13 00 – Revised Comm Backbone Cabling spec
 - d. 27 15 00 – Revised Comm Horizontal Cabling spec
2. Addendum No. 1 Drawings (Revised Sheets):
 - a. E0.1, Electrical Symbols, Abbreviations & Notes
 - b. E1.1, Electrical Site Plan & Details
 - c. E1.1A, Penetration Details
 - d. E1.2, Enlarged Site Plan
 - e. E2.1, Electrical Diagrams

- f. T0.0 - Technology Symbols List
- g. T1.0 – Technology Site Plan
- h. T2.0 – Technology Floor Plans
- i. T5.0 – Technology, Details and Block Diagram

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

LONG BEACH CITY COLLEGE DISTRICT

M. Pardon

Margie Pardon
Interim Deputy Director, Purchasing & Contracts

Jul 22, 2021

Date

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
 - 1. An Allowance has been established for conditions that may be encountered during the course of Construction.
- B. Related Sections:
 - 1. Divisions 2 through 33 Sections for items of Work covered by allowances.

1.3 SUBMITTALS

- A. Submit proposals for proposed changes designated as allowances, in the format specified for Change Orders.
- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.4 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.5 ALLOWANCE COST PROPOSALS

- A. Allowance cost proposals shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's cost proposals shall be inclusive of all material and labor, overhead and profit, and other costs, as included in the General Conditions for Change Orders.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No.1: Lump-Sum Allowance: Include the sum of \$50,000 for unforeseen conditions including, not shown in record drawings. Unforeseen conditions to also include items missing or not included with the portable buildings by the separate portable vendor or schedule delay caused by the portable building vendor or any coordination items. This Allowance is strictly to be used at the Owner discretion and should not be considered part of the Contractors basic services.

- 1. This allowance includes material cost, receiving, handling, and installation, and Contractor overhead and profit.

- B. Allowance No. 2: Include the sum of \$25,000 for unforeseen conditions related to existing utility but not limited to, abandoned or active utility lines, water, sewer, power, hydronic, irrigation lines, etc. This Allowance is strictly to be used at the Owner's discretion and should not be considered part of the Contractors basic services.

- 1. This allowance includes material cost, receiving, handling, and installation, and Contractor overhead and profit.

END OF SECTION 012100

SECTION 270000

GENERAL COMMUNICATIONS REQUIREMENTS

PART 1 - GENERAL

1.1. SUMMARY

- A. The work covered under this Section shall consist of a design, furnishing of all material, labor, and installation for completion of an operable end to end structured cabling system. This includes - but is not limited to - furnishing and installing cable, cable supports, cable ties, innerduct, racks, cabinets, termination components, ancillary equipment, testing, and labeling and documentation of cables and connectors, for a complete end-to-end solution.
- B. Refer to the contract documents for locations of Telecom Rooms (TRs), Equipment Room (ER), IDF cabinets, and telecommunication outlets (TOs). Note that the port and cable count at each TO may vary by location.
- C. Complete installation shall comply with the Owner provided latest telecommunication and IT standards documents.
- D. It shall be the responsibility of the contractor, to work with the Owner and provide the necessary assistance to make any connections from the owners' outside plant, service provider to establish services which shall ride on the new cabling system. These activities include, but are not limited to patch cords, cross connects, general wiring, documentation, and cable pair identification.

1.2. RELATED DOCUMENTS

- A. General and Supplementary Conditions
- B. Long Beach City College District Standards. Liberal Arts Campus / Pacific Coast Campus.

1.3. RELATED SECTIONS

- A. Division 01 – General Conditions
- B. Division 07 – Penetration Firestopping
- C. Division 26 - Grounding and Bonding
- D. Division 26 - Raceway and Boxes
- E. Division 26 - Wiring Devices
- F. Division 27 - Communications

1.4. ACRONYMS AND DEFINITIONS

- A. BICSI: Building Industry Consulting Service International
- B. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection

- C. EMI: Electromagnetic interference
- D. Horizontal Cabling: Cabling between and including the telecommunications outlet/connector and the horizontal cross-connect
- E. IDC: Insulation displacement connector
- F. LAN: Local area network
- G. NRTL: Nationally Recognized Testing Laboratory, an independent agency, with the experience and capability to conduct the testing indicated, as defined by OSHA in 29 CFR 1910.7
- H. RCDD: Registered Communications Distribution Designer, a BICSI-certification
- I. RMC: Rigid metallic conduit
- J. TR: Telecom Room
- K. UTP: Unshielded twisted pair
- L. Category 6 UTP, as defined by TIA standards

1.5. CONTRACTOR QUALIFICATIONS

- A. The contractor shall be a company specializing in the installation of communication cable and accessories with a minimum of five years documented experience on similar systems.
- B. Must be a current certified partner of the solutions being furnished and installed in order to meet the requirements for the extended warranty and service programs.
- C. Must hold a current communications cabling license within the State the project is taking place and must be verifiable for good standing.
- D. Contractor must have a current affiliation with BICSI.
- E. Within the project's onsite team, 15% of installers shall hold a BICSI Installer 1 certification, 15% of installers shall also hold a BICSI Installer 2 certification (Both Optical Fiber and Copper). 10% of the team shall hold a BICSI ITS Technician certification and a minimum of (1) team member shall hold a current and valid BICSI RCDD certification.
- F. All BICSI certified field installers shall take on roles of Foreman or Team Lead to ensure installations are deemed compliant per codes and standards.
- G. Contractor must have satisfactorily completed (3) projects within the past 5 years of similar scope and amount within the same state.
- H. The selected Contractor shall provide a Project Manager to act a single point of contact for all activities performed under this section. The Project Manager shall be a Registered Communications Distribution Designer (RCDD). The RCDD shall have a minimum of 3 years experiences in design and installation. The designer must have sufficient experience in this type project(s) as to be able to lend adequate technical support to the field forces during installation, during the warranty period and during any extended warranty periods or maintenance contracts. The Contractor must attach a resume of the responsible designer to the Contractor's submittal for evaluation.

- I. The Project Manager, or designee thereof, shall be required to attend project meetings as required until project closeout/signoff.
- J. Should the Project Manager assigned to this project change during the installation, the new Project Manager assigned must meet all qualifications stated in this section, and must also submit a resume for review by the Consultant.
- K. If, in the opinion of the Consultant, the Project Manager does not possess adequate qualifications to support the project, the Consultant reserves the right to require the Contractor to assign a designer whom, in the Owner's opinion, possesses the necessary skills and experience required of this project.

1.6. REGULATORY REFERENCES

- A. ANSI/NFPA 70
- B. City of Long Beach Building Code.
- C. Division of the State Architect Compliance Publications.
- D. ANSI/IEEE C2 - National Electrical Safety Code (NESC)
- E. NFPA 70-2011 - National Electrical Code (NEC)
- F. ANSI/TIA-568-C.0 – Generic Telecommunications Cabling for Customer Premises, published February 2009 and all latest addenda derived from ANSI/TIA 568-B.
- G. ANSI/TIA-568-C.1 – Commercial Building Telecommunications Cabling Standard, published February 2009 and all latest addenda derived from ANSI/568-B.
- H. ANSI/TIA-568-C.2 – Balanced Twisted Pair Telecommunication Cabling and Components Standard, published August 2009 and all latest addenda derived from ANSI/TIA 568-B.
- I. ANSI/TIA-568-C.3 – Optical Fiber Cabling Components Standard, published June 2008 and all latest addenda derived from ANSI/TIA 568-B.
- J. ANSI/TIA/EIA 569-B - Commercial Building Standard for Telecommunications Pathways and Spaces.
- K. ANSI/TIA-606-B – Administration Standard for Telecommunications Infrastructure, published June 2012 including all latest addenda derived from TIA-606-A.
- L. ANSI/TIA-607-C – Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises.
- M. ANSI/TIA-758-A Customer Owned Outside Plant Telecommunications Infrastructure Standard.
- N. IEEE 142 “Green Book”- Recommended Practice for Grounding of Industrial and Commercial Power Systems.
- O. UL 444 - Standard for Communications Cable.
- P. Rural Electrification Administration (REA) PE-89 - specification for filled telephone cables with expanded insulation.
- Q. Rural Electrification Administration (REA) PE-39 - specification for filled telephone cables

- R. NEC Article 250 and Article 800.
- S. CEC Article 18-27-300.22©(1)
- T. NEC Article 250 for System Grounding.
- U. NEC Articles 770 and 800 for Cable Listing Requirements.
- V. Work performed should additionally comply with and follow guidelines established in the latest edition/revision, as of the date of the Contract Documents, of the following publications:
 - 1. BICSI Telecommunications Distribution Methods Manual (TDMM)
 - 2. BICSI Outside Plant Design Reference Manual (OSPDRM)
 - 3. National Electrical Contractors Association (NECA)/BICSI ANSI/NECA/BICSI-568-2006 Standard for Installing Commercial Building Telecommunications Cabling
- W. All materials shall be new and listed by UL and shall bear the UL label. If UL has no published standards for a particular item, then other national independent testing standards shall apply and such items shall bear those labels. Where UL has an applicable system listing and label, the entire system shall be so labeled.
- X. Notify Consultant of all material believed to be inadequate, unsuitable, in violation of law, ordinances, rules or regulations of authorities having jurisdiction.

1.7. CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Consultant for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Consultant for a decision before proceeding.

1.8. SUBMITTALS

- A. Submittals shall include complete documentation of the system, products and accessories in a single submittal. Incomplete submittals will be returned unreviewed.
- B. Prior to the start of work the Contractor shall submit shop drawings in an electronic form. Plans shall be fresh designs by the contractor; they cannot be overlays of the Consultant's package which are indicative as the contract documents. Shop drawings shall contain:
 - 1. Full size floor plans showing proposed cable routing, wire basket routes, labeling of all outlets, locations of pullboxes.
 - 2. Full size floor plans and elevations of all telecommunication room racks and cabinets; also include all walls with equipment.
 - 3. Elevations shall indicate part numbers and quantities for all equipment.

4. Elevations of all type of outlet faceplates which shall include the configuration for jacks, blanks and the intended outlet labeling schemes.
 5. Floor plans shall include all ladder rack or overhead cable distribution hardware within the telecommunications rooms to be installed per manufacturer's instructions.
 6. Outside plant manhole and handhole designs coordinated with electrical as well as the site environment.
 7. Outside plant conduit arrangement details within ductbank and within the manholes and handholes as necessary.
 8. Outside plant conduit ductbank overall routing coordinated with electrical as well as the site environment.
 9. All seismic bracing and support details shall be provided in coordination with the general contractor as needed.
- C. Submittals shall include faceplates mockups sent to the Consultant for final review. Mockups shall have the manufacturer's cable markings clearly visible. The following are standard items that are to be submitted.
1. Wall mounted outlet complete with faceplate, terminated jacks, blanks, and labeling for all types of outlets in project. Outlet should also contain 24" minimum of the cable proposed for the project.
 2. Wireless outlet complete with jacks, blanks, and labeling.
 3. Wall phone (stainless steel) outlet.
 4. Modular furniture outlet complete with faceplate, jacks, blanks and labeling.
 5. Raceway outlet complete with faceplate, bezel, jacks, blanks and labeling.
 6. Floorbox outlet complete with faceplate, mounting plate, jacks and labeling.
- D. Where applicable, dimensions should be marked in units to match those specified.
- E. Work shall not proceed without the consultant's "no exception taken" of the submitted items.
- F. Floor plans will be provided to the Contractor in electronic (AutoCAD, ".dwg") formats to be utilized by the contractor in creating complete submittals and as-built documentation. These modified documents shall be provided to the Owner as part of the Record Documents.
- G. Plans shall be fresh designs by the contractor, they cannot be overlays of the consultant's package which is indicative as contract documents.
- H. All submittal documentation shall bear the stamp of a currently verifiable BICSI RCDD.
- I. Contractor must submit documentation to support all Contractor Qualifications and Requirements under Section 1.5 which is to include but not limited to the following:
1. End to end solution and partner documentation indicating contractor's staff has gone through proper channels and training support a minimum 25 year warranty and service program by the manufacturers.
 2. BICSI affiliations by contractor.
 3. BICSI cabling team's RCDD, Installer 1, Installer 2 (Optical Fiber and Copper) and ITS Technician certifications.
 4. Current copy of the State contractor's license for Communications Cabling.
 5. Documentation of (3) similar projects within the past 5 years in the same State.

- J. Contractor shall include data sheets and literature of test equipment to be used for fiber and copper cabling and components.

1.9. MANUFACTURER CERTIFIED WARRANTY

- A. The manufacturer shall be a company specializing in communication cable and/or accessories with a minimum of five years documented experience in producing cable and/or accessories similar to those specified below.
- B. The system shall be comprised of components from a single manufacturer or a combination of manufacturers entering into a partnering agreement that allows for a warranty of the system.
- C. System warranty program documents must be from that of the cabling and component manufacturer and associated partners. Cabling and component warranty programs offered by the contractor alone are not acceptable.
- D. The warranty period shall be for not less than 25 years and warranty the cabling system and components will perform to the stated specifications for the warranty period.

1.10. QUALITY ASSURANCE

- A. **Installer Qualifications:** A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- B. **Specialists:** Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
- C. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- D. **Factory-Authorized Service Representative Qualifications:** An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and

1.11. QUALITY CONTROL

- A. **Contractor Responsibilities:** Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
- B. **Manufacturer's Field Services:** Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.
- C. **Manufacturer's Technical Services:** Where indicated, engage a manufacturer's technical representative to observe and inspect the Work.
- D. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1.12. OWNER STANDARDS

- A. Work performed should additionally comply with Owner Standards.

PART 2 - PRODUCTS

2.1. NOT USED

PART 3 - EXECUTION

3.1. GENERAL

- A. Contractor shall follow standard industry installation practices as described in the latest release of the BICSI TDMM.
- B. Contractor shall be responsible for identifying and reporting to the Site Coordinator(s) any existing damage to walls, flooring, tiles and furnishings in the work area prior to start of work. All damage to interior spaces caused by the installation of cable, pathways or other hardware must be repaired by the Contractor. Repairs must match preexisting color and finish of walls, floors and ceilings. Any contractor-damaged ceiling tiles are to be replaced to match color, size, style and texture.
- C. The installation shall be supervised on site by a BICSI certified installer.
- D. The contractor shall have on staff a BICSI certified RCDD. RCDD certification shall be current and each submittal shall bear the stamp of the RCDD.
- E. Outlets shall be mounted flush on a wall-mounted box, on Surface Raceway and in Modular Furniture. Information Outlet locations are identified on Project Drawings.
- F. Avoid abrasion and other damage to cables during installation. Any cable damaged during installation shall be removed and a new cable installed.
- G. Cables shall be a continuous run. No in-line splices are permitted except were explicitly indicated on the drawings.

3.2. DELIVERY AND STORAGE

- A. Receive, handle, and store telecommunications system items and materials at the project site. Materials and items shall be so placed that they are protected from damage and deterioration.

3.3. INSTALLATION

- A. The drawings for work under Division 27 Sections related to communication systems are diagrammatic and are intended to convey the scope of work and indicate the general arrangement of conduit, boxes, equipment, termination hardware, fixtures and other work included in the Contract.
- B. The Contractor shall verify all dimensions and clearances before procuring any equipment.

- C. Location of items required by the drawings or specifications not definitely fixed by dimensions are approximate only and exact locations necessary to secure the best conditions and results shall be determined at the site and shall be subject to the approval of the Architect/Telecom Design Engineer.
- D. Follow drawings in laying out work, check drawings of other trades to verify spaces in which work will be installed, and maintain maximum headroom and space conditions at all points.
 - 1. Where space conditions appear inadequate, the Architect/Telecom Design Engineer shall be notified before proceeding with installation.
 - 2. Minor conduit and cable tray rerouting and changes shall be made at no additional cost to the Owner.
 - 3. As necessary, adjust elevations of rack-mounted termination hardware and horizontal wire management panels so as to compensate for rack unit sizes of actual hardware used, as compared to hardware rack unit sizes depicted in Contract Drawings.
- E. Perform all work with skilled mechanics of the particular trade involved in a neat and workmanlike manner.
- F. Perform all work in cooperation and coordination with other trades and schedule.
- G. Furnish other trades advance information on locations and sizes of frames, boxes, sleeves and openings needed for the work, routes for conduit and cable tray raceway, and also furnish information and shop drawings necessary to permit trades affected to install their work properly and without delay.
- H. Where there is evidence that work of one trade will interfere with the work of other trades, all trades shall assist in working out space allocations to make satisfactory adjustments and shall be prepared to submit and revise coordinated shop drawings.
- I. With the approval of the Architect/Consultant and without additional cost to the Owner, make minor modifications in the work as required by structural interferences, by interferences with work of other trades or for proper execution of the work.
- J. Work installed before coordinating with other trades so as to cause interference with the work of such other trades shall be changed to correct such condition without additional cost to the Owner and as directed by the Architect.
- K. Minor changes in the locations of outlets, fixtures and equipment shall be made prior to rough in at the direction of the Architect/Consultant and at no additional cost to the Owner.
- L. Contractor shall cooperate with other trades and coordinate work so that conflicts with other work are eliminated.
- M. Equipment shall be installed with adequate space allowed for removal, repair or changes to equipment. Ready accessibility to removable parts of equipment and to wiring shall be provided without moving other equipment which is to be installed or which is in place.

Contractor shall verify measurements. Discrepancies shall be brought to the Architect/Telecom Design Engineer's attention for interpretation.
- N. Determine temporary openings in the buildings that will be required for the admission of apparatus furnished under this Division, and notify the Architect/Consultant

accordingly. In the event of failure to give sufficient notice in time to arrange for these openings during construction, assume all costs of providing such openings thereafter.

- O. Location of telecommunication outlets and raceway pathways are approximate and exact locations shall be determined on site.
- P. Contractor shall refer to contract documents for details, reflected ceiling plans, and large scale drawings.

3.4. COORDINATION

- A. The Contractor shall be responsible for the coordination of telecommunications work with the work of all other trades and shall, in preparing the drawings, check the work of other trades in order to avoid possible installation conflicts arising therefrom. It shall be understood that the work shown on the shop drawings has been so coordinated. In the event of conflicts or interference that cannot be resolved in the field, the Contractor shall request a written clarification from the Architect/Consultant.
- B. Coordinate service entrance arrangement with local exchange carrier(s).
 - 1. Meet jointly with local exchange carrier representatives and Owner to exchange information and agree on details of equipment arrangements and installation interfaces.
 - 2. Record agreements reached in meetings and distribute to other participants.
 - 3. Adjust arrangements and locations of distribution frames and cross-connect and patch panels in equipment rooms and wiring closets to accommodate and optimize arrangement and space requirements of telephone switch and LAN equipment.
- C. Where work covered by this Section connects to equipment furnished under other Sections, verify telecommunications work involved in the field and make proper connection to such equipment.

END OF SECTION 270000

SECTION 271300

COMMUNICATIONS BACKBONE CABLING

PART 1- GENERAL

1.1. SUMMARY

- A. The work covered under this Section shall consist of a design, furnishing of all material, labor, and installation for completion of an operable end to end backbone structured cabling system throughout the campus and premises. This includes - but is not limited to - furnishing and installing cable, cable supports, cable ties, innerduct and termination components, ancillary equipment, testing, labeling and documentation of cables and connectors.
- B. Complete product procurement and installation shall comply with the campus or owner's latest telecommunication and Information Technology standards documents.
- C. Provide 4-pair Cat-6 OSP/Indoor-Outdoor rated copper cable to portable cluster for analog telephone lines,
- D. Provide 12 strand of single mode fiber to portable cluster.
- E. Cross-connect both fiber and copper cabling to MDF room for end-to-end connectivity.

PART 2 - PRODUCTS

2.1. MANUFACTURER(S) AND SOLUTIONS

- A. Acceptable backbone voice copper (interbuilding) manufacturers:
 - 1. Belden. – REVConnect® Cat-6
- B. Acceptable fiber optic (interbuilding) manufacturers:
 - 1. Corning LANscape.

2.2. BASIC ENVIRONMENTAL REQUIREMENTS

- A. Cabling shall be suitable for environment in which they are to be installed.
- B. Cabling shall be plenum-rated within interior premise installations.
- C. Cabling shall be outdoor rated within exterior installations subject to outdoor environmental conditions.

2.3. VOICE TERMINATION FIELD

- A. Voice terminations shall utilize 110 style termination hardware.
- B. The mechanical termination shall be capable of terminating 22 - 26 AWG plastic insulated, solid and stranded copper conductors.

- C. 4-pair connecting blocks shall be utilized to make electrical connection between terminated cables and cross connect wires. The blocks shall be designed to maintain the cable pair twists as closely as possible to the point of mechanical termination.
- D. Base shall employ standoff legs to allow cable routing behind base.
- E. Base shall have integral label holder to identify location of cable.
- F. Horizontal management shall be via jumper troughs furnished with standoff legs.
- G. Vertical cable management shall be via multi pair vertical cable managers designed for use with tower systems.

2.4. INTERBUILDING FIBER OPTIC CABLE

- A. Provide Corning Indoor/Outdoor Freedom Loose Tube Gel-Free.
- B. Cable shall be suitable for direct burial or duct applications.
- C. Cable shall incorporate a corrugated steel armor tape to provide rodent resistance. Other cable materials shall be all dielectric.
- D. Cable shall be constructed with a dry water-blocking material.
- E. Cable shall be of loose tube construction.
- F. Outer sheath shall be polyethylene (PE).
- G. The outer sheath shall be marked with the manufacture name, words identifying the cable as fiber optic cable, and sequential length markings. The marking shall be in a contrasting color to the cable jacket.
- H. Quantity and type of standards shall be as indicated on the drawings.
- I. Single-mode optical fibers in each cable shall meet the following specifications:
 - 1. Transmission Windows 1310nm, 1383nm and 1550nm
 - 2. Core Diameter 8.3µm
 - 3. Maximum Attenuation 0.5 dB/km @ 1310nm
0.5 dB/km @ 1383nm
0.5 dB/km @ 1550nm
 - 4. Fiber Classification OS2

2.5. INDOOR/OUTDOOR FIBER OPTIC CABLE

- A. Cable shall be provided wherever it shall run within a wet environment or where it would be exposed to an outdoor condition.
- B. Cable shall be suitable for installation both indoors and outdoors.
- C. Cable shall retain an OFNP plenum rating to meet the listing requirements per NFPA for use within building premises.
- D. Cable shall be loose tube construction.
- E. Cable shall be constructed with a dry of gel-filled type water blocking material.

2.6. FIBER OPTIC TERMINATION PANELS

- A. All fibers shall be terminated on Corning Cable Systems Unicam LC couplings mounted on enclosed patch panels. Couplers shall be mounted on a panel that snaps into the enclosure.
- B. The enclosure shall be designed to accommodate a changing variety of connector types by changing panels on which connector couplings are mounted.
- C. The panel enclosure shall be sized to accommodate the total quantity of fiber strands as described in the specifications and drawings.
- D. Termination panels shall be enclosed assemblies. The enclosures shall incorporate a hinged or retractable front cover designed to protect the connector couplings and fiber optic jumpers.
- E. The patch panel enclosure shall provide for strain relief of incoming cables and shall incorporate radius control mechanisms to limit bending of the fiber to the manufacturers recommended minimums.
- F. Access to the inside of the patch panel enclosure during installation shall be from the front and rear.
- G. The patch panel enclosure shall be configured to require only front access when patching. The enclosure shall provide a physical barrier to access of backbone cables.
- H. The enclosure shall incorporate a storage cassette, tray, or other mechanism designed to allow identification, access and termination of individual fibers.
- I. The fiber optic patch panel shall be rated to match or exceed the ANSI/TIA/EIA rated wiring terminated on the panel.
- J. Provide: Corning CCH connector panels and CCH splice cassettes.

2.7. FIBER OPTIC CONNECTOR

- A. The Optical Connector shall be Corning Cable Systems Unicam LC type modular jack. Completed cable assembly shall interface with fiber optic terminal bulkhead feed-through receptacle on Fiber Optic Patch Panel. Supply and install dust caps for terminated fibers.
- B. The connector ferrule shall be ceramic. The optical fiber within the connector ferrule shall be secured with an adhesive [or mechanical connection].
- C. Boot colors shall be Blue for Singlemode.
- D. Provide:
 - 1. Singlemode: Corning Unicam LC Connectors 95-200-99.

2.8. FIBER OPTIC PATCH CORDS

- A. The fiber optic patch cables shall match the core size and type of fiber being patched. The fiber optic patch cables shall utilize tight buffer construction.
- B. Fiber Optic jumpers shall incorporate connectors that match the terminations of the fiber being patched. Connector body shall be of materials similar to that used in the proposed couplings.

- C. Provide patch cords with connectors compatible with equipment being patched. Verify connector type of active electronic equipment with owner.
- D. Provide one optical fiber patch cord per optical fiber strand installed.
- E. For the TR patch cords, 80% shall be 3 meters, 10% shall be 4 meters and 10% shall be 7 meters in length from the total number.

2.9. FIBER OPTIC SPLICE ENCLOSURE

- A. Splices shall be allowed where required to transition between different fiber optic cable types.
- B. The splice enclosure shall be designed specifically for use in the splicing of fiber optic cables and incorporate splice trays. One splice tray shall be used for each fiber bundle. The enclosure and the splice trays shall be designed to organize adequate slack to allow for re-splicing. C. The splice enclosure shall incorporate strain relief for the incoming cables.
- D. Splice enclosure shall be re-usable for system expansion or repair.
- E. Provide: Corning CCH-02U connector housing.

PART 3 - EXECUTION

3.1. INTERBUILDING COPPER CABLING (VOICE)

- A. All conductors shall be continuous and splice free.
- B. Bridge taps shall not be allowed.

3.2. VOICE TERMINATION FIELD

- A. Horizontal wiring troughs shall be positioned at the top of each column of termination blocks and between each 100-pair wiring block.
- B. Vertical cable managers incorporating metal distributing rings shall be provided for vertical routing of jumper and/or cross-connect wire.
- C. Utilize multiple 300 or 900 pair tower systems and corresponding vertical cable managers to create termination fields.
- D. Blocks shall identify each pair position by a different color designation. Integral label holders shall allow for easy identification of each location.
- E. The Contractor shall be responsible for the cross connect between the station and backbone cabling.
- F. Cross connect the center two pair of each station cable to the backbone cable. Use single or two pair cross connect wire for this purpose.
- G. Fastening cables directly to support brackets with wire or plastic ties will not be accepted. All cabling shall be neatly laced, dressed and supported. Retainer shall be used on each 110- type block to secure jumper wires on the wiring block(s).
- H. Termination blocks shall have a minimum capacity of 20% spare pairs after all horizontal cabling is terminated.

3.3. FIBER OPTIC CABLE

- A. Cable shall be continuous and free of splices except in specified splice trays in TR or ER locations. Factory optical fiber splices are not allowed.
- B. The fiber manufacturer shall subject all fibers to a minimum tensile proof test equivalent to 100-kpsi. All fibers in each cable shall be guaranteed to meet the stated specifications.
- C. Backbone intra-building fiber optic cabling shall be installed via conduit and/or in innerduct in cable tray as illustrated on the drawings.
- D. Provide 15 feet of slack in each backbone fiber optic cable. The cable slack shall be coiled and stored in a location to protect it from damage in the TR or ER in the case of inter-building cables. The slack shall be stored in a separate enclosure designed for this purpose. Multiple cables may share a common enclosure.
- E. Maintain bending radius of twenty times the outside diameter of the cable during installation and ten times the outside diameter with no load.
- F. Backbone Fiber Optic Cable shall be installed in protective innerduct where cable is susceptible to damage. This includes areas cable tray and transitions between pathways. The innerduct should extend into the termination and/or storage enclosure(s) at system endpoints.

3.4. FIBER OPTIC CONNECTOR

- A. The fiber optic connector shall be installed per manufacturer's written instructions.

3.5. FIBER OPTIC PATCH PANEL

- A. Fiber optic patch panels shall be rack mounted.
- B. Install fiber optic patch panels in topmost rack position.
- C. Transition outdoor to indoor cables either by splicing factory-terminated pigtails or by the use of a "fan-out" kit. Secure individual fibers in an aramid reinforced tube.
- D. Termination hardware shall incorporate a mechanism to secure cable and sub-assemblies and prevent damage.
- E. Splicing shall be by the "fusion" method.
- F. Direct termination of 250 μ m coated fibers shall not be permitted.

3.6. FIBER OPTIC PATCH CORDS

- A. The fiber optic patch cords shall be installed per manufacturer's written instructions.
- B. Contractor must coordinate with the owner for installing all patch cords within the TR.
- C. Any left-over patch cords which are not used for the initial installation shall be placed in a box and handed over to the owner. Patch cords must be new and within the original unopened package.

3.7. FIBER OPTIC SPLICE ENCLOSURE

- A. The fiber optic splice enclosure shall be installed per manufacturer's written instructions.

END OF SECTION 271300

SECTION 27 1500

COMMUNICATIONS HORIZONTAL CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. UTP cabling.
2. Multiuser telecommunications outlet assemblies.
3. Cable connecting hardware, patch panels, and cross-connects.
4. Telecommunications outlet/connectors.
5. Cabling system identification products.
6. Cable management system.
7. Client's (Structured Cabling System) SCS

- B. Related Requirements:

1. Section 271300 "Communications Backbone Cabling" for voice and data cabling associated with system panels and devices.
2. Section 270536 "Cable Trays for Communications Systems" for cable trays and accessories.
3. Section 260533 - Raceways and Boxes for Electrical Systems
4. Section 260543 – Underground Ducts and Raceways for Electrical Systems
5. Section 270544 – Sleeves and Sleeve Seals for Communications Pathways and cabling
6. Section 271100 – Communications Equipment Room Fittings

1.3 DEFINITIONS

- A. BICSI: Building Industry Consulting Service International.
- B. Consolidation Point: A location for interconnection between horizontal cables extending from building pathways and horizontal cables extending into furniture pathways.
- C. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.

- D. EMI: Electromagnetic interference.
- E. IDC: Insulation displacement connector.
- F. LAN: Local area network.
- G. MUTOA: Multiuser telecommunications outlet assembly, a grouping in one location of several telecommunications outlet/connectors.
- H. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.
- I. RCDD: Registered Communications Distribution Designer.
- J. UTP: Unshielded twisted pair.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate layout and installation of telecommunications cabling with Owner's telecommunications and LAN equipment and service suppliers.
- B. Coordinate telecommunications outlet/connector locations with location of power receptacles at each work area.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. For copper, include the following installation data for each type used:
 - a. Nominal OD.
 - b. Minimum bending radius.
 - c. Maximum pulling tension.
- B. Shop Drawings:
 - 1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
 - 2. System Labeling Schedules: Electronic copy of labeling schedules that are part of the cabling and asset identification system of the software.
 - 3. Cabling administration drawings and printouts.
 - 4. Wiring diagrams to show typical wiring schematics, including the following:
 - a. Cross-connects.
 - b. Patch panels.
 - c. Patch cords.

5. Cross-connects and patch panels. Detail mounting assemblies, and show elevations and physical relationship between the installed components.
- C. Samples: For workstation outlets, jacks, jack assemblies, in specified finish, one for each size and outlet configuration and faceplates for color selection and evaluation of technical features.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, qualified layout technician, installation supervisor, and field inspector.
- B. Source quality-control reports.
- C. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For splices and connectors to include in maintenance manuals.
- B. Software and Firmware Operational Documentation:
 1. Software operating and upgrade manuals.
 2. Program Software Backup: On magnetic media or compact disk, complete with data files.
 3. Device address list.
 4. Printout of software application and graphic screens.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Patch-Panel Units: One of each type.
 2. Connecting Blocks: One of each type.
 3. Device Plates: One of each type.
 4. Multiuser Telecommunications Outlet Assemblies: One of each type.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1. Layout Responsibility: Preparation of Shop Drawings and Cabling Administration Drawings, Cabling Administration Drawings, and field testing program development by an RCDD.
2. Installation Supervision: Installation shall be under the direct supervision of a Level 2 Installer, who shall be present at all times when Work of this Section is performed at Project site.
3. Testing Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

B. Testing Agency Qualifications: An NRTL.

1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.

1. Test optical fiber cables to determine the continuity of the strand end to end. Use optical fiber flashlight.
2. Test optical fiber cables while on reels. Use an optical time domain reflectometer to verify the cable length and locate cable defects, splices, and connector; including the loss value of each. Retain test data and include the record in maintenance data.
3. Test each pair of UTP cable for open and short circuits.

PART 2 - PRODUCTS

2.1 HORIZONTAL CABLING DESCRIPTION

A. Horizontal cable and its connecting hardware provide the means of transporting signals between the telecommunications outlet/connector and the horizontal cross-connect located in the communications equipment room. This cabling and its connecting hardware are called a "permanent link," a term that is used in the testing protocols.

1. TIA/EIA-568-C.1 requires that a minimum of two telecommunications outlet/connectors be installed for each work area.
2. Horizontal cabling shall contain no more than one transition point or consolidation point between the horizontal cross-connect and the telecommunications outlet/connector.
3. Bridged taps and splices shall not be installed in the horizontal cabling.
4. Splitters shall not be installed as part of the optical fiber cabling.

B. A work area is approximately 100 sq. ft. and includes the components that extend from the telecommunications outlet/connectors to the station equipment.

- C. The maximum allowable horizontal cable length is 295 feet. This maximum allowable length does not include an allowance for the length of 16 feet to the workstation equipment or in the horizontal cross-connect.
- D. The Contractor shall install materials and equipment as part of the Belden REVconnect® and Corning LANscape® Solutions. Various sections of this specification pertain to specific products and/or installation requirements that must conform to the warranty requirements of these structured cabling systems.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA/EIA-568-C.1 and TIA/EIA-568-C.2 when tested according to test procedures of this standard.
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Grounding: Comply with ANSI/TIA-607-B.

2.3 COPPER STATION CABLE

- A. Manufacturers:
 - 1. Belden REVConnect® Cat-6
- B. Description: Four unshielded twisted pair, solid annealed bare copper conductors insulated with FEP and covered with a flame retardant PVC jacket.
 - 1. Comply with ICEA S-90-661 for mechanical properties.
 - 2. Comply with TIA/EIA-568-C.1 for performance specifications.
 - 3. Comply with TIA/EIA-568-C.2, Category 6
 - 4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444, UL 910 and NFPA 70 for the following types:
 - a. Communications, General Purpose: Type CMP

- b. Communications, Plenum Rated: Type CMP complying with NFPA 262.
 - c. Communications, Riser Rated: Type CMP, complying with UL 1666.
 - d. Communications, Limited Purpose: Type CMP.
5. All copper station cable shall be Category 6, Plenum rated.
 6. All cables installed in outdoor environments shall be OSP and/or indoor-outdoor rated.
 7. All station cables shall have a color jacket of blue.
 8. ~~Video surveillance cables shall have a color jacket of violet.~~
 9. Manufacturers:
 - 1 Belden Indoor UTP CMP Category 6 - #2413
 - 2 Belden Indoor/Outdoor OSP UTP - #2146A

2.4 COPPER CABLE TERMINATION BLOCKS

A. Manufacturers:

1. Belden REVConnect® (College Standard)

B. Materials:

1. Terminate Category 6, station cables designated for non-switched voice services (Non- VOIP) on 10-Pair Series 2 termination blocks. Termination blocks shall be wall mounted adjacent to copper entrance cable, protected terminal with wire management system between terminals.
2. Mount blocks to a Type 85 back mount frame. Blocks shall have transparent label holders.

2.5 DATA NETWORK PATCH PANELS

A. Materials

1. Data jack patch panels shall be rated Category 6 and covered under the Belden structured cabling system extended warranty.
2. Each IDF shall be equipped with a minimum of one, rack mounted, data patch panels in the same rack unless otherwise noted on the drawings. The patch panels shall include the following requirements.
 - a. 19 inch rack mounting.
 - b. Wired to T 568 B wiring scheme.
 - c. UL certified.
 - d. Equipped with wire retention clips as specified in the Belden cabling program.
 - e. At least one 48 port modular M type patch panel shall be for terminating blue data cables. The size of this patch panel shall be 48 port to accommodate

the blue data cables. Provide additional 24 or 48 port patch panels as required. Each port shall be color coded blue.

f. **Belden REVConnect®** Part #s:

- 24 Port **Modular** Patch Panel – RV6PPF1U24BK
- 48 Port **Modular** Patch Panel – RV6PPF2U48BK
- **Cable Management Bar – (Required for Modular Patch Panel)**

B. Manufacturer: Belden (College Standard)

2.6 FIBER TERMINAL UNITS

A. Materials

1. The fiber optic terminals/patch panels shall utilize Corning Cable Systems Closet Connector Housings (CCH).
2. Each CCH shall have the following specifications:
 - a. Suitable for installation in EIA 19” mounting frame.
 - b. Provide cross-connect, inter-connect, and splicing capabilities and contain the proper troughs for supporting and routing the fiber cables/jumpers.
 - c. Consist of a modular enclosure with retainer rings in the slack storage section to limit the bending radius of fibers.
 - d. Equipped with a “window” section to insert connector panels for mounting of connectorized fibers (LC, duplex, style couplers and connectors).
 - e. Provide terminating capability of couplers, in the quantity noted on the contract drawings in panels of 6 or 12 respectively.
 - f. Corning Cable Systems Unicam LC connectors for 50 µm multimode fiber with ceramic ferrule and Unicam LC with ceramic ferrule for singlemode fibers. The connectors shall have composite couplers in all patch bays that meet or exceed the following specifications:
 - 1) Unicam LC Connectors (Singlemode) - Part Number: 95-200-99
 - 2) Unicam LC Connectors (Multimode) - Part Number: 95-050-99-X (50µm Laser Optimized multimode fiber)
 - 3) Interconnect Compatibility: Compatibility with FOICS 10 for LC junior version
 - 4) Operating Temperature: □ 0.3db change -40° to 140°F (-40° to 60°C) in 21 cycles
 - 5) Insertion Loss:
Multimode: 0.2dB average, 0.5 dB max. for laser-optimized multimode fiber
Singlemode: 0.3dB average, 0.77 dB max.
 - 6) Durability: < or = .2 dB change, 500 remateings, FOTP-21
 - 7) Tensile Strength: 10 lb < or + .2dB change, on jacketed cable; 0.5 lb < or =
.2dB change on 900µm cable, FOTP-6

- 8) Reflectance: $\leq -50\text{dB}$ ($+18\text{dB}$ to $+26\text{dB}$)
- 9) Nominal fiber OD: 125 μm
- 10) Housing Color Code:
Single-mode: Ceramic ferrule blue housing
Multimode: Ceramic ferrule black housing
- 11) Boot Color: Single-mode: Blue
Multimode: Aqua
- 12) A common panel shall be used to terminate singlemode and multimode optical fibers.

- B. Manufacturer: Corning Cable Closet Connector Housings (CCH-02U), (College Standard)

2.7 TELECOMMUNICATIONS OUTLET/CONNECTORS

- A. Jacks: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular. Comply with TIA/EIA-568-C.1.
- B. Materials:
1. Metal outlet boxes shall be installed as receptacles for the information outlets in the following locations: new interior wall construction, exterior locations, locations with special vapor proof or explosion proof applications, and floor mounted outlets. Outlet boxes shall be galvanized steel. Boxes installed in any exterior location where exposed to rain or moisture laden atmosphere shall be cast screw hub type with gaskets and weatherproof covers. Boxes for vapor proof or explosion proof applications shall be designed specifically for such use.
 2. In new wall construction, each box shall be flush mounted, *two gang*, metal box. If the outlet is designated for four or less cables, provide a single gang mud ring. If the outlet is designated for more than four cables and less than nine cables, provide a two gang mud ring. Each box shall be equipped with a 1" conduit stubbed into the ceiling area and equipped with a 12 inch radial bend angled toward cable tray or wire pathway.
 3. Standard Data Outlet
 - a. The standard data outlet will be used for all data applications as well as voice services that use VOIP technology over the data network.
 - b. The standard data outlet shall consist of **one (1)** Category 6 four-pair cables, each terminated on a separate Category 6 rated RJ45 8-position jack following T-568 C wiring standards.
 - c. **All** Category 6 copper data cables will be blue in color and terminated on the blue jacks mounted in the outlet. ~~Category 6 copper video surveillance cables will be violet in color and terminated on the violet jacks mounted in the outlet.~~ The other end of the cables will be terminated with matching jacks and mounted into a modular patch panel in the telecom cabinet.
 - d. Provide Belden REVConnect® outlets with the following part numbers:
Item Part #

- Data Jack – CAT 6 – Blue – RV6MJKUBL-S1
- Video Surveillance Jack – CAT 6 – Violet – RV6MJKUTP-S1

- e. The modular jacks shall be rated for Category 6 performance in the configuration installed.
- f. The faceplate will be clearly labeled with outlet number, and each jack will be labeled with jack number. All labels will be typed or preprinted and shall be securely affixed to the faceplate.
- g. Dust covers shall be placed in the vacant slots and the color of the dust covers the same as the faceplates.
- h. Manufacturer: Belden REVConnect® (College Standard)

4. Other Data Outlets

- a. Other data outlets shall consist of one to six RJ45 8-wire modular jacks wired as per EIA/TIA 568B in a white outlet faceplate. The number of terminated cables at each outlet shall be according to floor plan drawings. Jacks shall be blue in color.
- b. ~~Data outlets with one to four cables shall have 4 port faceplates and data outlets with five to six cables shall have 6 port faceplates. Faceplates shall be white.~~
- c. The modular jacks shall be rated for Category 6 performance in the configuration installed.
- d. The faceplate will be clearly labeled with outlet number, and each jack will be labeled with jack number. All labels will be typed or preprinted and shall be securely affixed to the faceplate.
- e. Dust covers shall be placed in the vacant slots and the color of the dust covers the same as the faceplates.
- f. Category 6 copper data cables will be blue in color and terminated on the blue jacks mounted in the outlet. ~~Category 6A copper video surveillance cables will be violet in color and terminated on the violet jacks mounted in the outlet.~~ The other end of the cables will be terminated with matching jacks and mounted into a **Belden** patch panel in the telecom **cabinet**. See paragraph 2.5, A2f for data patch panel.
- g. ~~Data outlets with one or two cables for projectors shall be surface mounted above ceiling.~~ At wireless access points shall be mounted flush to the finished ceiling.
- h. Manufacturer: Belden (College Standard)

5. Surface Mounted Data Outlets

- a. Surface mounted data outlets shall consist of one to six RJ45 8-wire modular jacks wired as per EIA/TIA 568B in a white outlet faceplate. The number of terminated cables at each outlet shall be according to floor plan drawings. Jacks shall be blue in color.
- b. Provide data outlets with the following part numbers: Item Part #

- c. The modular jacks shall be rated for Category 6 performance in the configuration installed.
- d. The faceplate will be clearly labeled with outlet number, and each jack will be labeled with jack number. All labels will be typed or preprinted and shall be securely affixed to the faceplate.
- e. Dust covers shall be placed in the vacant slots and the color of the dust covers the same as the faceplates.
- f. Category 6 copper data cables will be blue in color and terminated on the blue jacks mounted in the outlet. Category 6 copper video surveillance cables will be violet in color and terminated on the violet jacks mounted in the outlet. The other end of the cables will be terminated with matching jacks and mounted into a modular patch panel in the telecom cabinet.
- g. Data outlets with one or two cables for projectors shall be mounted 6 to 12 inches above the dropped ceiling.
- h. Manufacturer: Belden (College Standard)

2.8 FACEPLATES

A. Materials

- 1. Provide Belden flush, wall-mounted faceplate to house work area jacks. The faceplate shall fit over a standard NEMA electrical box fitted with a plaster ring cover and shall be office white in color.
- 2. Provide blanking inserts in all unused faceplate ports. The blanking inserts shall be the same color as the faceplates.
- 3. **Manufacturer: Belden (College Standard)**
 - 1 **KeyConnect SG Faceplate – Electric White.**

2.9 GROUNDING

- A. Comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.
- B. Comply with ANSI/TIA-607-C.

2.10 IDENTIFICATION PRODUCTS

- A. Comply with TIA/EIA-606-B and UL 969 for labeling materials, including label stocks, laminating adhesives, and inks used by label printers.
- B. Comply with requirements in Section 260553 "Identification for Electrical Systems."

2.11 SOURCE QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to evaluate cables.

- B. Factory test UTP and optical fiber cables on reels according to TIA/EIA-568-C.1.
- C. Factory test UTP cables according to TIA/EIA-568-C.2.
- D. Factory test multimode optical fiber cables according to TIA-526-14-A and TIA/EIA-568-C.3.
- E. Cable will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 ENTRANCE FACILITIES

- A. Coordinate backbone cabling with the protectors and demarcation point provided by communications service provider.

3.2 WIRING METHODS

- A. Install cables in pathways and cable trays except within consoles, cabinets, desks, and counters. Conceal pathways and cables in all areas.
 - 1. Install plenum cable in environmental air spaces, including plenum ceilings.
 - 2. Comply with requirements in Section 270528 "Pathways for Communications Systems."
- B. Conceal conductors and cables in accessible ceilings, walls, and floors where possible.
- C. Wiring within Enclosures:
 - 1. Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii.
 - 2. Install lacing bars and distribution spools.
 - 3. Install conductors parallel with or at right angles to sides and back of enclosure.

3.3 INSTALLATION OF CABLES

- A. Comply with NECA 1.
- B. General Requirements for Cabling:
 - 1. Comply with TIA/EIA-568-B.1.

2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
3. Install 110-style IDC termination hardware unless otherwise indicated.
4. MUTOA shall not be used as a cross-connect point.
5. Consolidation points may be used only for making a direct connection to telecommunications outlet/connectors:
 - a. Do not use consolidation point as a cross-connect point, as a patch connection, or for direct connection to workstation equipment.
 - b. Locate consolidation points for UTP at least 49 feet from communications equipment room.
6. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
7. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
8. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
9. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
10. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
11. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
12. In the communications equipment room, install a 10-foot long service loop on each end of cable.
13. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. UTP Cable Installation:

1. Comply with TIA/EIA-568-C.2.
2. Do not untwist UTP cables more than 1/2 inch from the point of termination to maintain cable geometry.

D. Optical Fiber Cable Installation:

1. Comply with TIA/EIA-568-C.3.
2. Cable may be terminated on connecting hardware that is rack or cabinet mounted.

E. Open-Cable Installation:

1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.

2. Suspend UTP cable not in a wireway or pathway a minimum of 8 inches above ceilings by cable supports not more than 60 inches apart.
3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

F. Installation of Cable Routed Exposed under Raised Floors:

1. Install plenum-rated cable only.
2. Install cabling after the flooring system has been installed in raised floor areas.
3. Coil cable 6 feet long not less than 12 inches in diameter below each feed point.

G. Group connecting hardware for cables into separate logical fields.

H. Separation from EMI Sources:

1. Comply with BICSI TDMM and TIA-569-B for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.
3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.
4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.
5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.
6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches.

3.4 FIRESTOPPING

- A. Comply with requirements in Section 078413 "Penetration Firestopping."

- B. Comply with TIA-569-B, Annex A, "Firestopping."
- C. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.5 GROUNDING

- A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.
- B. Comply with ANSI/TIA-607-B.
- C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.
- D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

3.6 IDENTIFICATION

- A. Identify system components, wiring, and cabling complying with TIA/EIA-606-B. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
 - 1. Administration Class: 1 through 4.
 - 2. Color-code cross-connect fields. Apply colors to voice and data service backboards, connections, covers, and labels.
- B. Using cable management system software specified in Part 2, develop Cabling Administration Drawings for system identification, testing, and management. Use unique, alphanumeric designation for each cable and label cable, jacks, connectors, and terminals to which it connects with same designation. At completion, cable and asset management software shall reflect as- built conditions.
- C. Comply with requirements in Section 099123 "Interior Painting" for painting backboards. For fire- resistant plywood, do not paint over manufacturer's label.
- D. Paint and label colors for equipment identification shall comply with TIA/EIA-606-B for Class 2, Class 3 and Class 4 level of administration, including optional identification requirements of this standard.
- E. Cable Schedule: Post in prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.

- F. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, backbone pathways and cables, and entrance pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors. Follow convention of TIA/EIA-606-B. Furnish electronic record of all drawings, in software and format selected by Owner.
- G. Cable and Wire Identification:
1. Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
 2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
 3. Exposed Cables and Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet.
 4. Label each terminal strip and screw terminal in each cabinet, rack, or panel.
 - a. Individually number wiring conductors connected to terminal strips, and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
 - b. Label each unit and field within distribution racks and frames.
 5. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.
 6. Uniquely identify and label work area cables extending from the MUTOA to the work area. These cables may not exceed the length stated on the MUTOA label.
- H. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA-606-B.
1. Cables use flexible vinyl or polyester that flex as cables are bent.

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

- C. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
1. Visually inspect UTP and optical fiber cable jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-C.1.
 2. Visually confirm Specified Category Performance marking of outlets, cover plates, outlet/connectors, and patch panels.
 3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
 4. Test UTP backbone copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.
 - a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-C.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
 5. Optical Fiber Cable Tests:
 - a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-C.1. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
 - b. Link End-to-End Attenuation Tests:
 - 1) Horizontal and multimode backbone link measurements: Test at 850 or 1300 nm in 1 direction according to TIA-526-14-A, Method B, One Reference Jumper.
 - 2) Attenuation test results for backbone links shall be less than 2.0 dB. Attenuation test results shall be less than that calculated according to equation in TIA/EIA-568-C.1.
 6. UTP Performance Tests:
 - a. Test for each outlet and MUTOA. Perform the following tests according to TIA/EIA- 568-B.1 and TIA/EIA-568-C.2:
 - 1) Wire map.
 - 2) Length (physical vs. electrical, and length requirements).
 - 3) Insertion loss.
 - 4) Near-end crosstalk (NEXT) loss.
 - 5) Power sum near-end crosstalk (PSNEXT) loss.
 - 6) Equal-level far-end crosstalk (ELFEXT).
 - 7) Power sum equal-level far-end crosstalk (PSELFEXT).
 - 8) Return loss.

- 9) Propagation delay.
 - 10) Delay skew.
7. Optical Fiber Cable Performance Tests: Perform optical fiber end-to-end link tests according to TIA/EIA-568-C.1 and TIA/EIA-568-C.3.
 8. Final Verification Tests: Perform verification tests for UTP and optical fiber systems after the complete communications cabling and workstation outlet/connectors are installed.
 - a. Voice Tests: These tests assume that dial tone service has been installed. Connect to the network interface device at the demarcation point. Go off-hook and listen and receive a dial tone. If a test number is available, make and receive a local, long distance, and digital subscription line telephone call.
 - b. Data Tests: These tests assume the Information Technology Staff has a network installed and is available to assist with testing. Connect to the network interface device at the demarcation point. Log onto the network to ensure proper connection to the network.
 - D. Document data for each measurement. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.
 - E. End-to-end cabling will be considered defective if it does not pass tests and inspections.
 - F. Prepare test and inspection reports.

3.8 SOFTWARE SERVICE AGREEMENT

- A. Technical Support: Beginning with Substantial Completion, provide software support for two years.
- B. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software.
 1. Provide 30 days' notice to Owner to allow scheduling and access to system and to allow Owner to upgrade computer equipment if necessary.

3.9 DEMONSTRATION

- A. Train Owner's maintenance personnel in cable-plant management operations, including changing signal pathways for different workstations, rerouting signals in failed cables, and keeping records of cabling assignments and revisions when extending wiring to establish new workstation outlets.

END OF SECTION 271500

ABBREVIATIONS

Table of abbreviations including AC (AMPERE), AFF (ABOVE FINISHED FLOOR), AFG (ABOVE FINISHED GRADE), and others.

NOTES

GENERAL NOTES

- 1. DRAWINGS AND SPECIFICATIONS: THE ELECTRICAL DRAWINGS INDICATE THE GENERAL DESIGN AND ARRANGEMENT OF CONDUIT, EQUIPMENT, ETC.

GENERAL POWER NOTES

- 1. VERIFY ANY NEUTRAL WIRES REQUIRED ON 1PH OR 3PH MECHANICAL UNITS FURNISHED UNDER DIVISION 23.

GENERAL WORK EXECUTION NOTES

- 1. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH THE REGULAR OPERATION OF EXISTING UTILITIES.

CODE ANALYSIS

PARTIAL LIST OF APPLICABLE CODES AS OF January 1, 2020: 2019 California Administrative Code (CAC), Part 1, Title 24 CCR.

ELECTRICAL SCOPE OF WORK

THE FOLLOWING IS ELECTRICAL SCOPE OF WORK IN GENERAL. CONTRACTOR SHALL PROVIDE REQUIRED MATERIALS, LABOR, EQUIPMENT, AND ALL APPURTENANCES TO HAVE A COMPLETE OPERATIONAL SYSTEM.

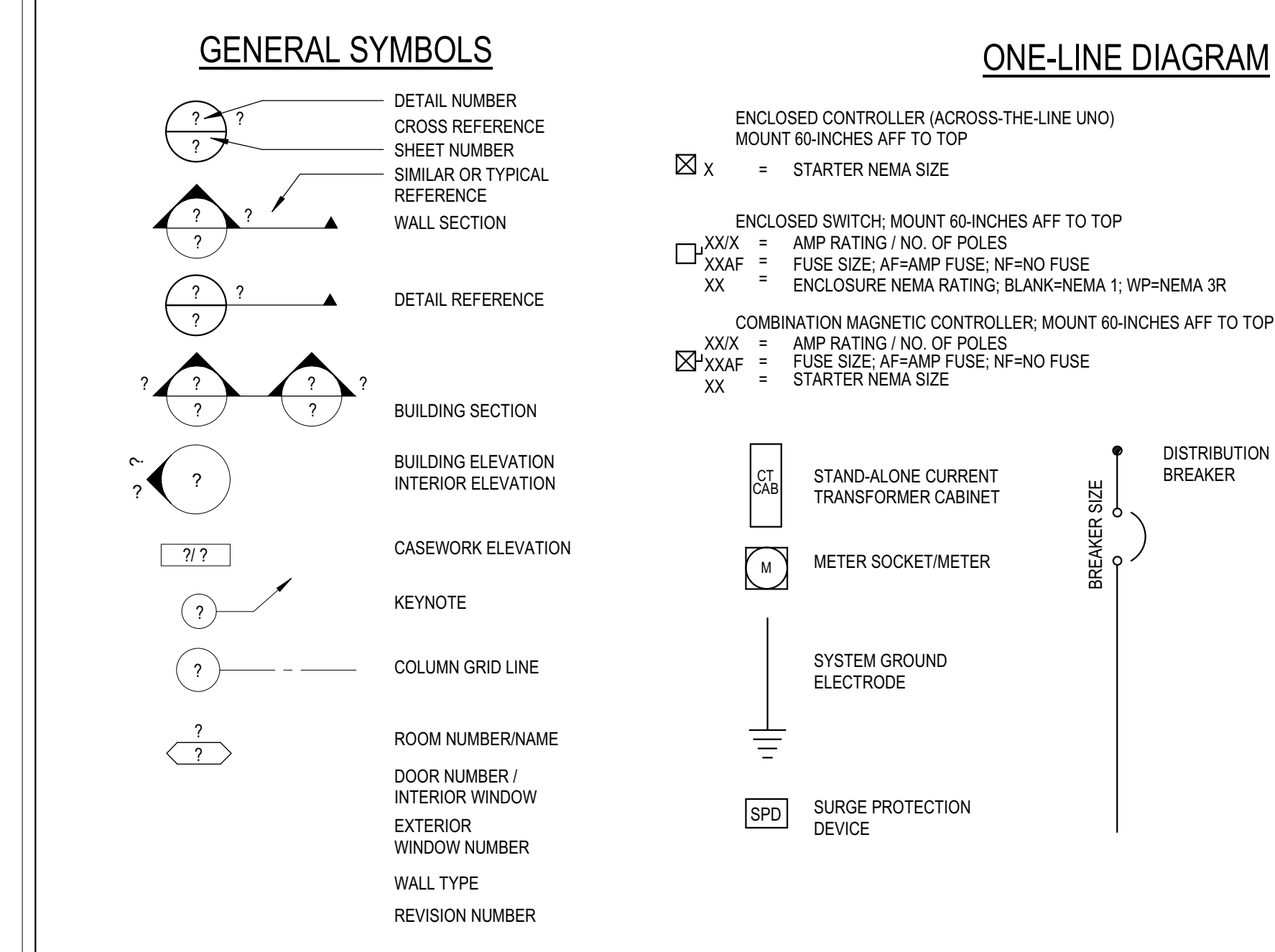
- 1. TO FEED SIX NEW PORTABLE ROOMS AT PARKING LOT FROM THE EXISTING MAIN SWITCHBOARD AT BUILDING J.

MEP Construction Approval Note. All mechanical, plumbing, and electrical components shall be anchored and installed per the details on the DCA approved construction documents.

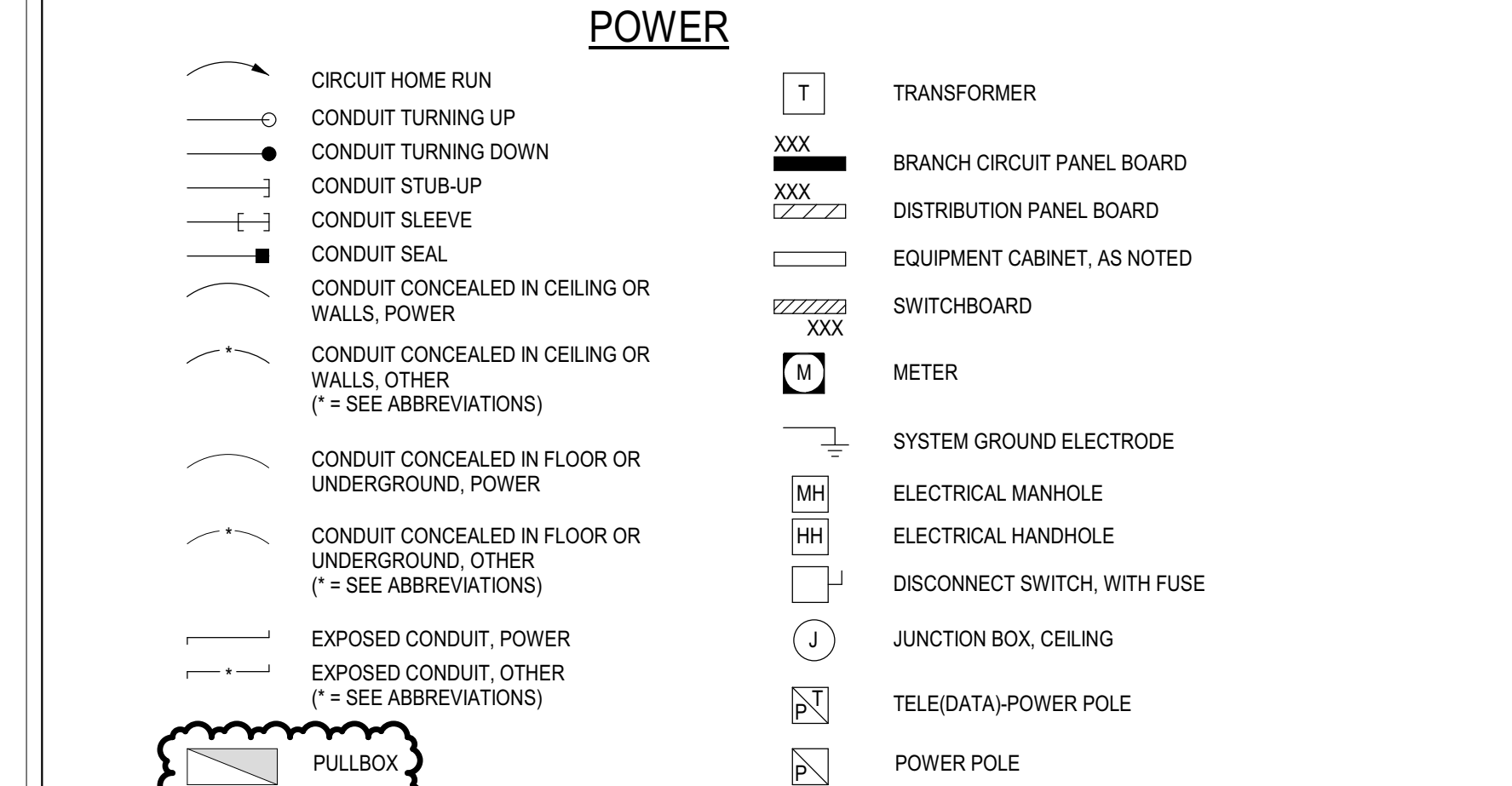
- 1. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH THE REGULAR OPERATION OF EXISTING UTILITIES.

SYMBOLS

GENERAL SYMBOLS



ONE-LINE DIAGRAM



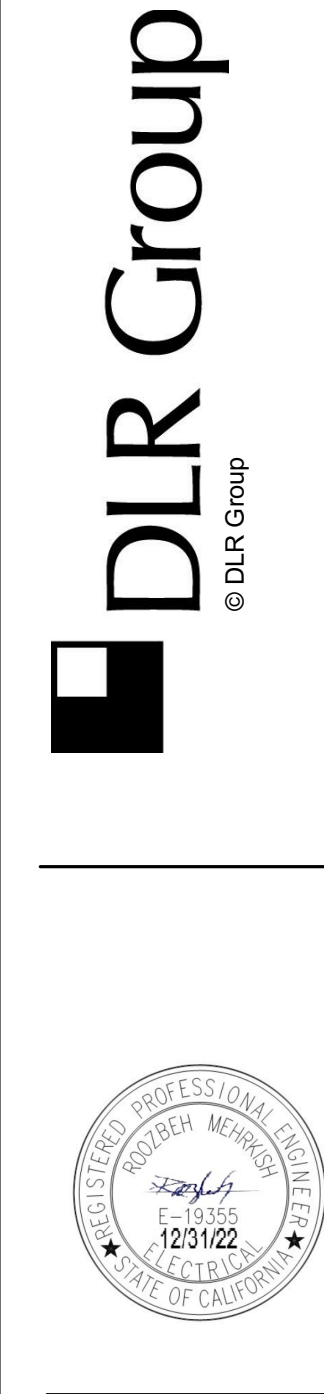
POWER



SHEET INDEX

Table listing sheet numbers and titles: E1.1A PENETRATION DETAIL, E1.2 ENLARGED SITE PLAN, etc.

NOTE: ALL OF NOTES ON THIS SHEET ARE TO BE APPLIED TO ALL OTHER DRAWINGS IN THIS SET.

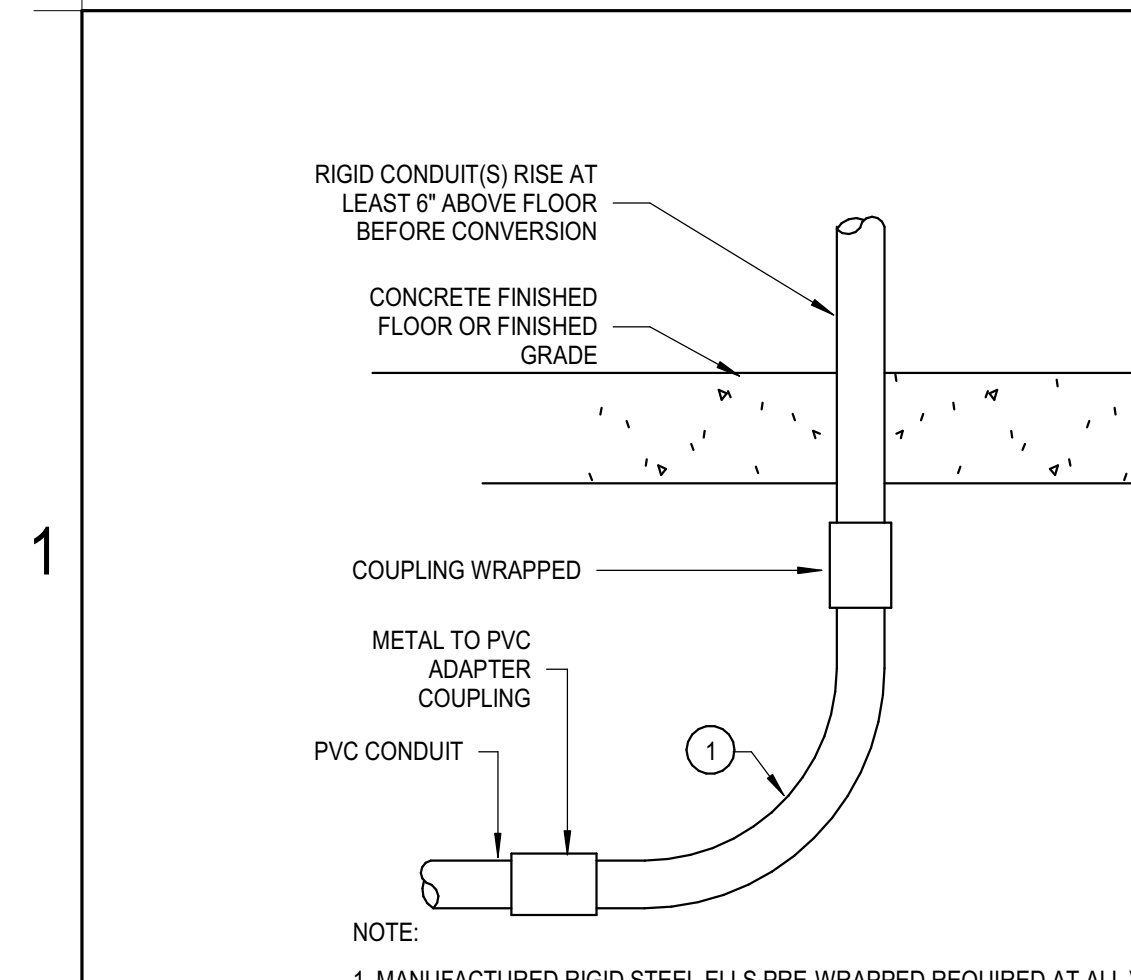


Long Beach Community College - Swing Space

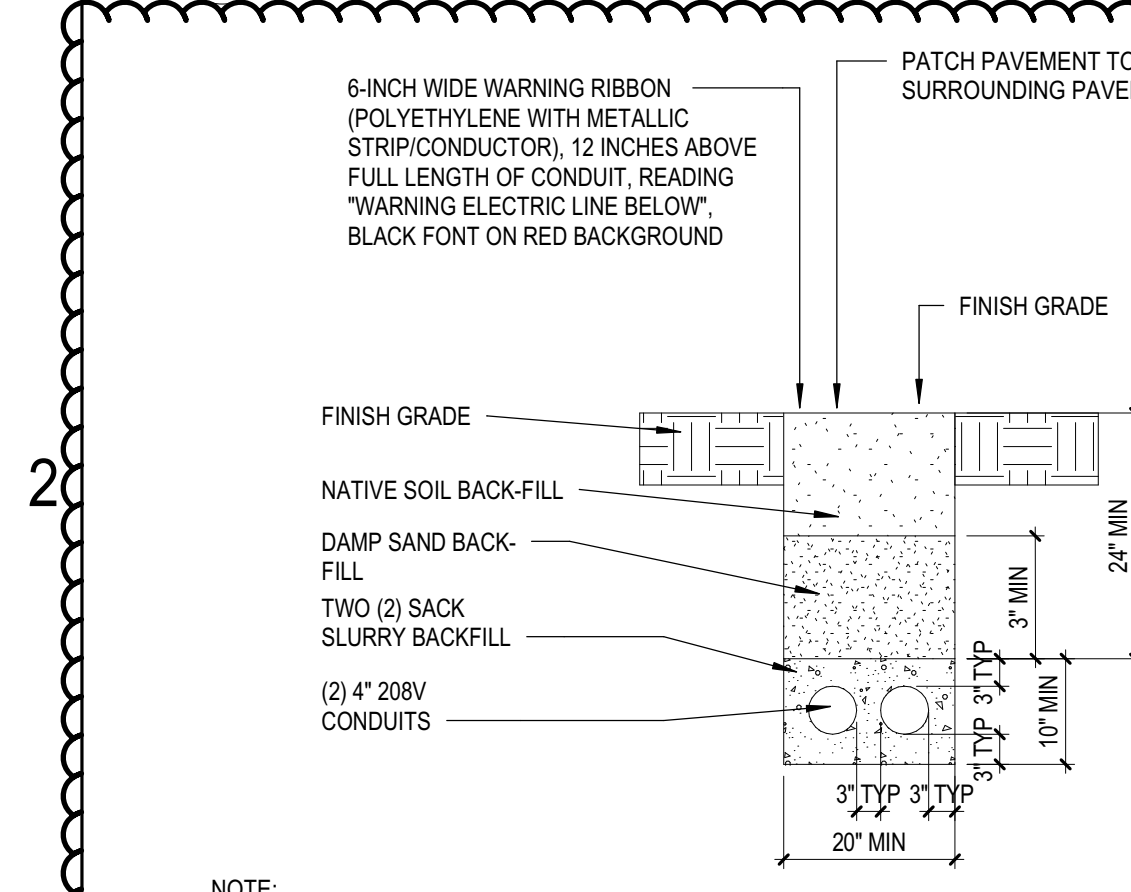
100% CONSTRUCTION DOCUMENTS 04/30/2021 REVISIONS

ELECTRICAL SYMBOLS, ABBREVIATIONS & NOTES

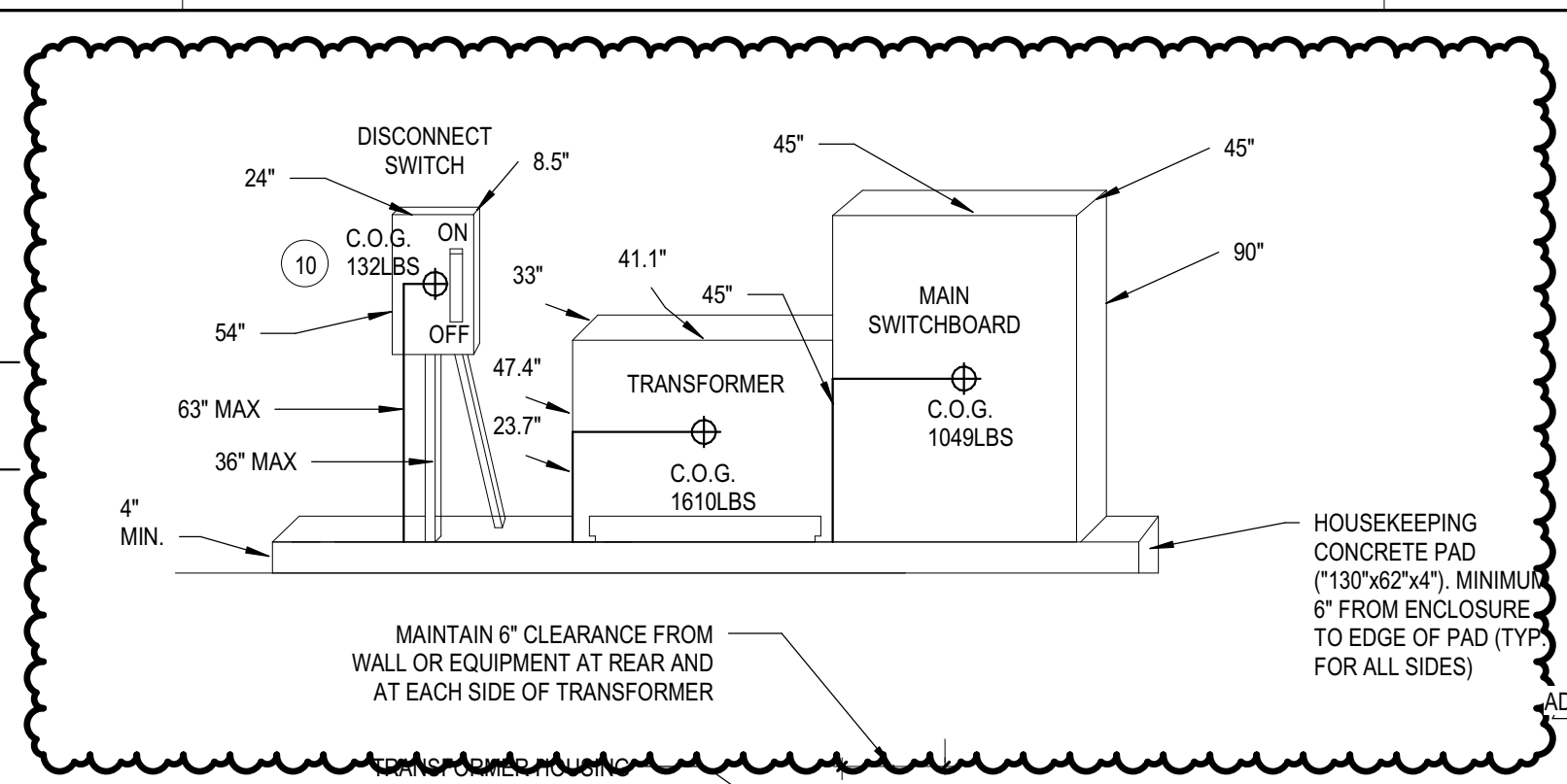
E0.1



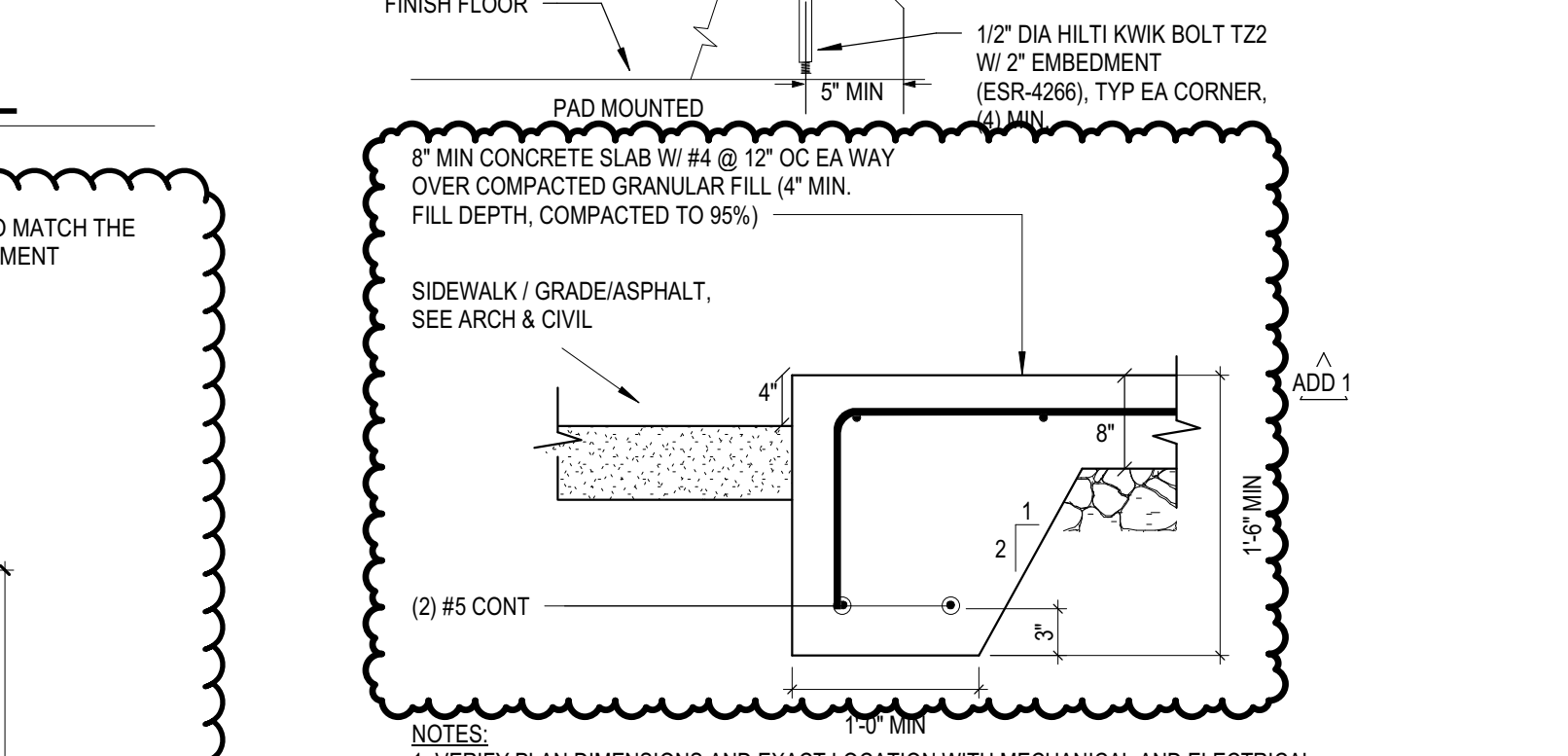
5 CONDUIT (90 DEG) BEND DETAIL
E1.1 NO SCALE



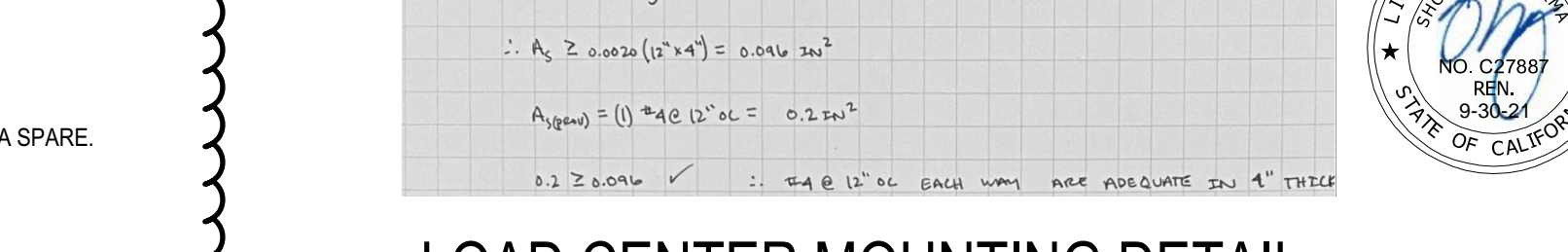
11 CONDUIT DUCT BANK DETAIL
E1.1 NO SCALE



1 LOAD CENTER MOUNTING DETAIL
E1.1 NO SCALE

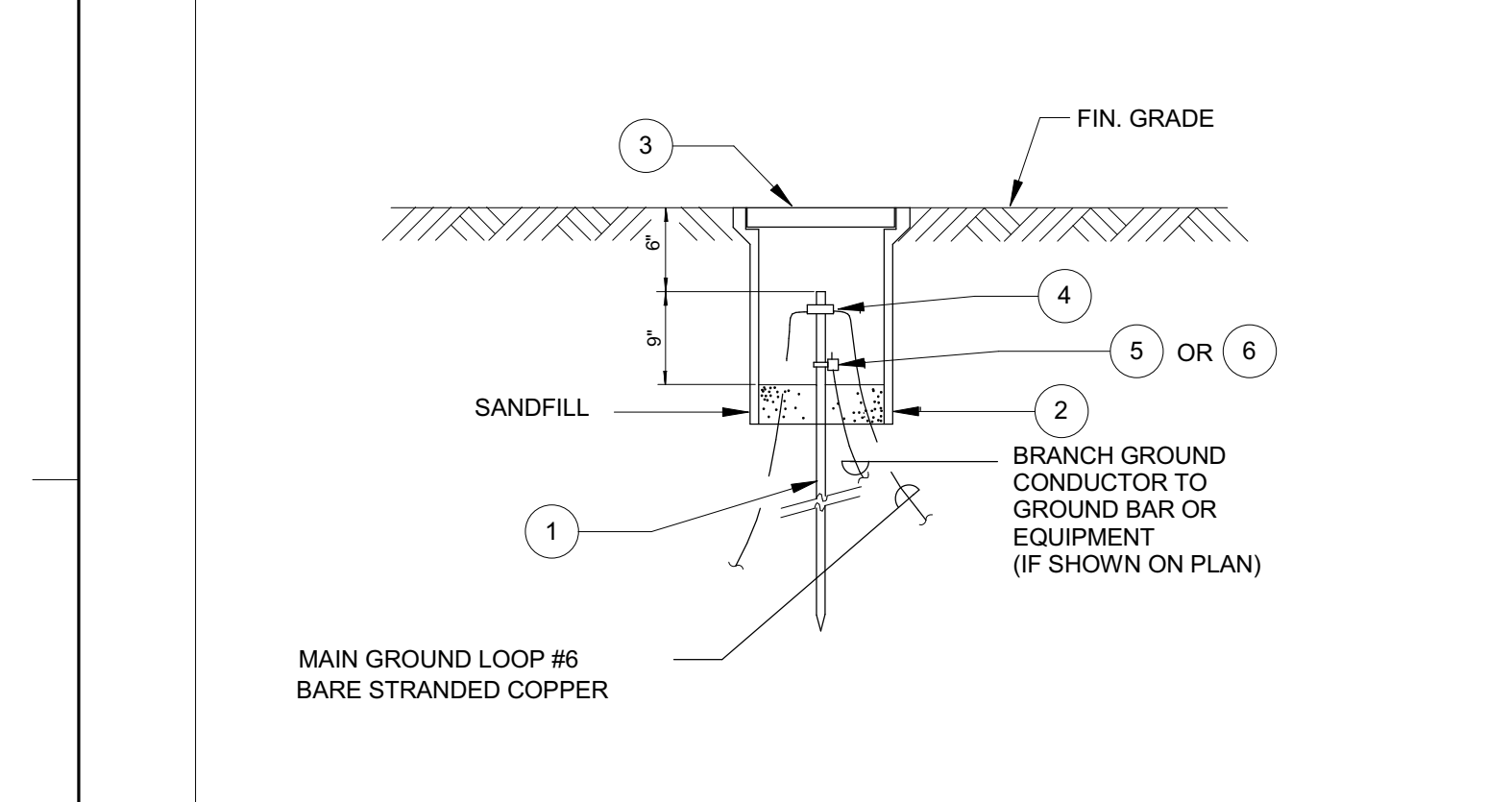


7 ENLARGED ELECTRICAL SITE PLAN
E1.1 SCALE: 3/8" = 1'-0"

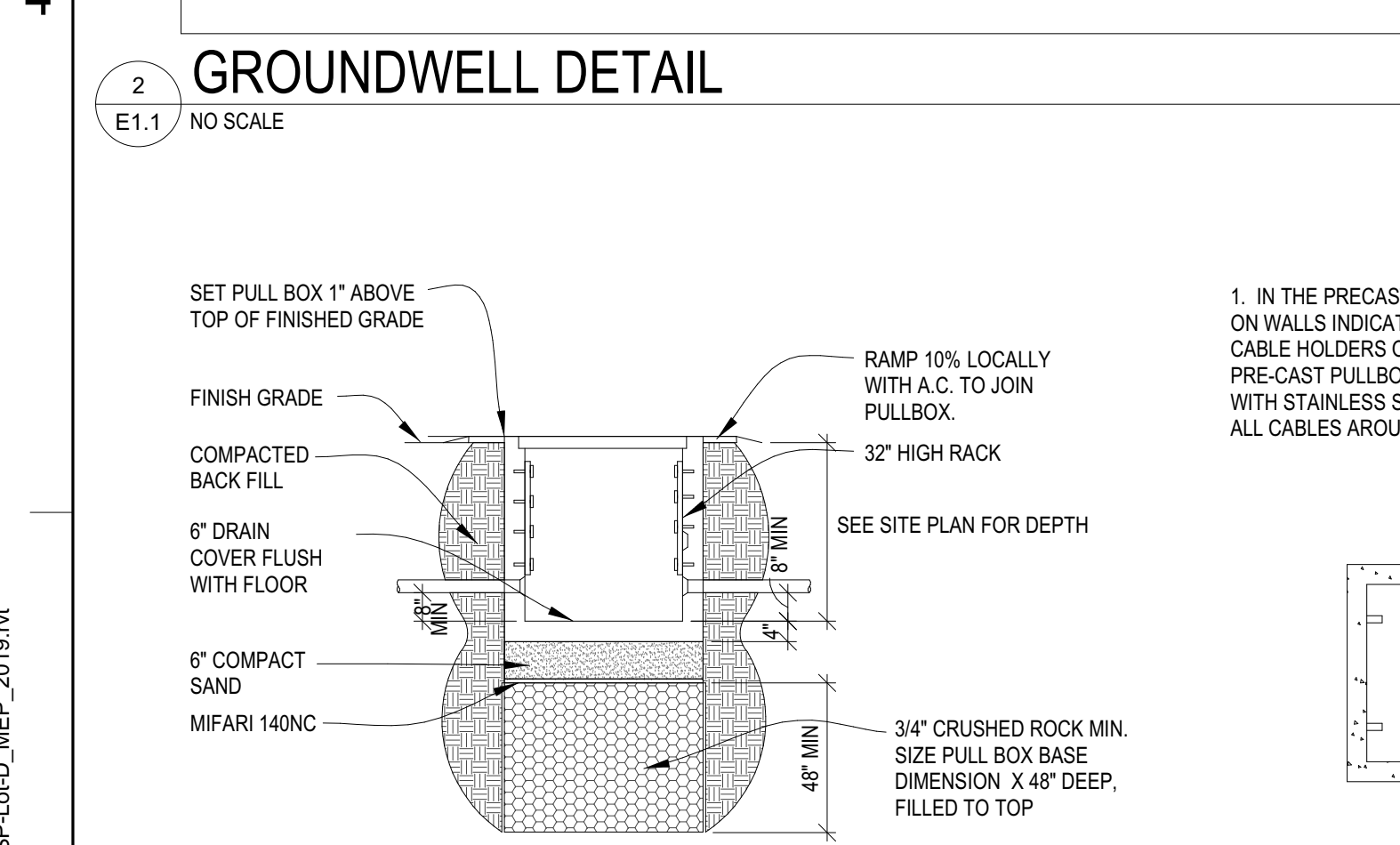


8 TELECOMM CONDUIT DUCT BANK DETAIL
E1.1 NO SCALE

| ITEM | QTY | DESCRIPTION |
|------|----------|---|
| 1 | 1 | 3/4" DIA. X 10 FT. L.G. COPPERCLAD STEEL GROUND ROD |
| 2 | 1 | 9" DIA. X 24" SERIES 9 BROOKS PRODUCT VALVE BOX |
| 3 | 1 | NO. 9 CAST IRON TRAFFIC COVER MARKED "GROUND" - BROOKS PRODUCTS |
| 4 | 1 | GROUNDING MOLD-CADWELD #GTC-182Q |
| 5 | AS REQ'D | GROUND CONNECTOR-BURNDY #GAR 6426 |
| 6 | AS REQ'D | GROUND CONNECTOR-BURNDY #GAR 6429 |



2 GROUNDWELL DETAIL
E1.1 NO SCALE



9 PRECAST CONCRETE PULLBOX DETAIL
E1.1 NO SCALE

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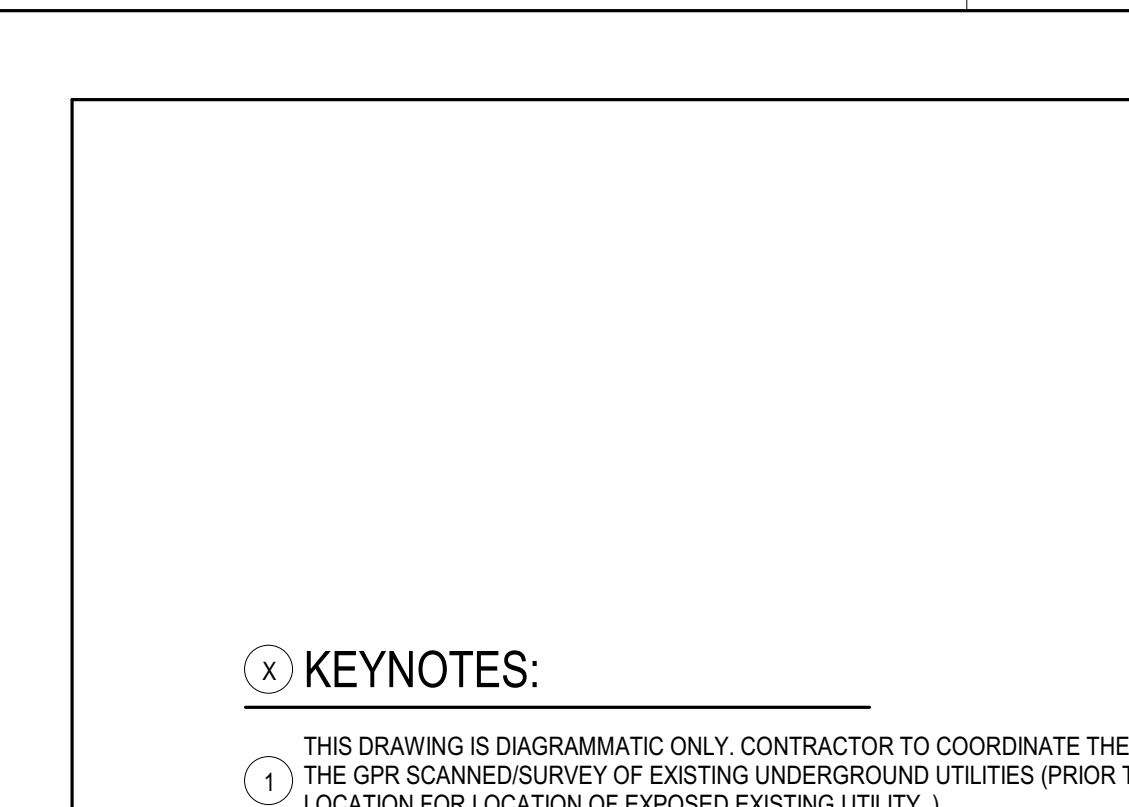
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4 TRANSFORMER GROUNDING
E1.1 SCALE: 1/2" = 1'-0"

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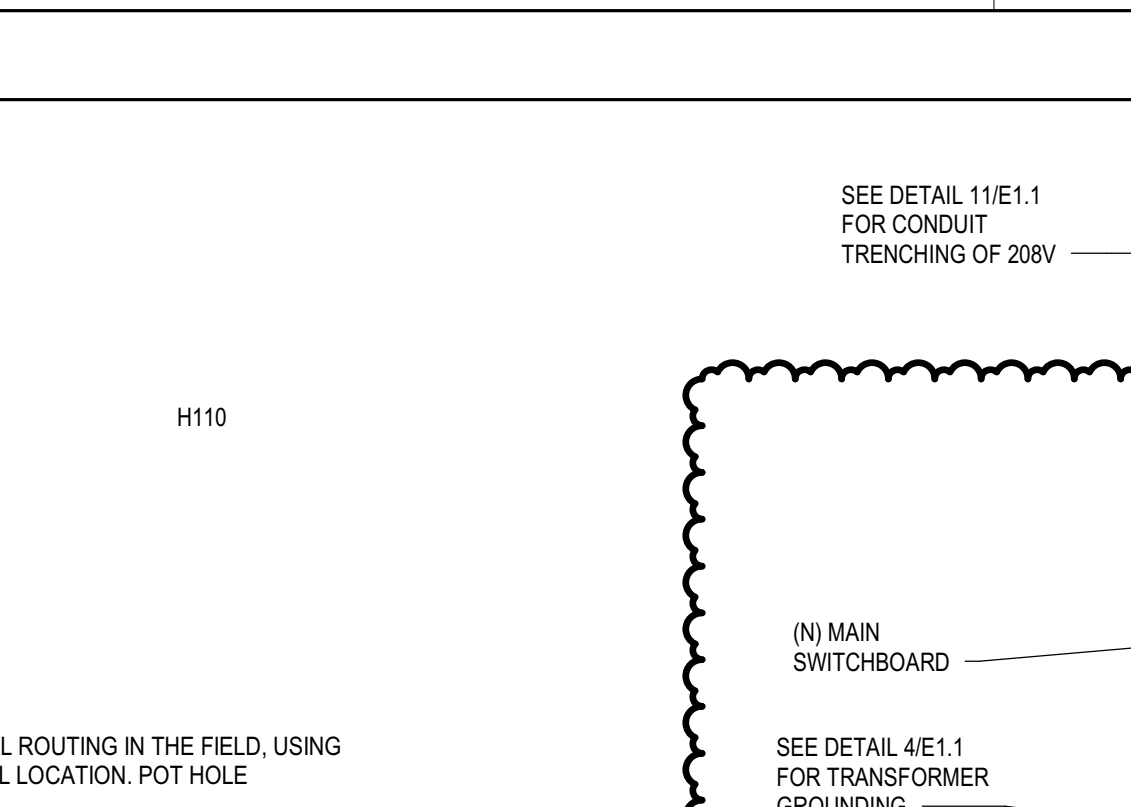
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13 GROUND ELECTRODE CONDUCTOR SIZING TABLE
E1.1

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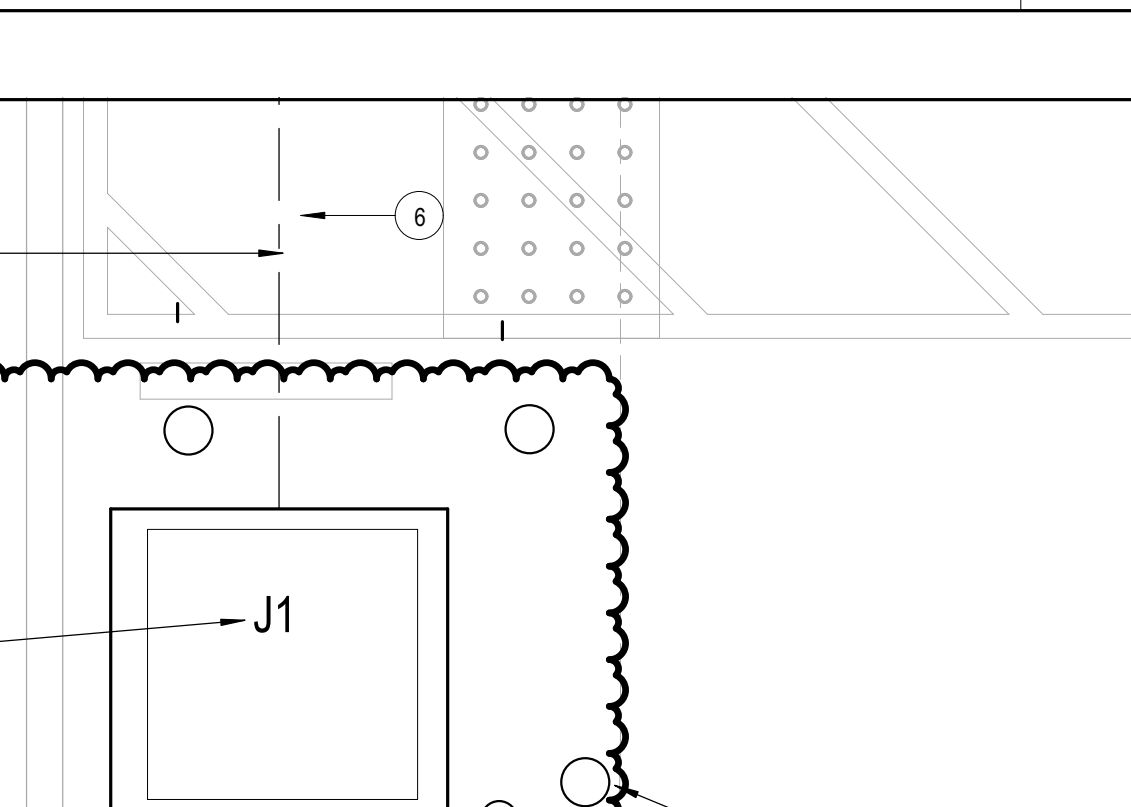
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6 DISCONNECT MOUNTING DETAIL
E1.1 SCALE: 1/4" = 1'-0"

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System No. C-AJ-2630
F Rating — 2 Hr
T Rating — 1-1/2 Hr

SECTION A-A

1. Floor or Wall Assembly — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 8 in. (203 mm).
 See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
 2. Through Penetrants — One nonmetallic pipe to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe and opening shall be min 0 in. (point contact) to max 3-1/2 in. (89 mm). Pipe to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of nonmetallic pipes may be used:
 A. Polyvinyl Chloride (PVC) Pipe — Nom. 4 in. (102 mm) diam (or smaller) Schedule 40 solid-core or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
 B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 4 in. (102 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
 C. Acrylonitrile Butadiene Styrene (ABS) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid-core or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
 D. Flame Retardant Polypropylene (FRPP) Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
 3. Firestop System — The firestop system shall consist of the following:
 A. Fill, Void or Cavity Material* — Mortar — Min 2-1/2 in. (64 mm) thickness of fill material applied within the annulus between penetrant and periphery of opening. Flush with bottom surface of floor or both surfaces of wall.
 HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 637 Firestop Mortar
 B. Firestop Device* — Firestop Collar — Firestop collar to be sized for nom diam of penetrant and to be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to the concrete and mortar (item 3A) at underside of floor or both sides of wall using the anchor hooks provided with the collar. (Minimum 2 anchor hooks for 1-1/2 and 2 in. (38 and 51 mm) diam pipes, 3 anchor hooks for 3 and 4 in. (76 and 102 mm) diam pipes). The anchor hooks are to be secured to CP 637 mortar with min 1/4 in. (6 mm) diam by min 1-1/4 in. (32 mm) long concrete screw anchors or Hilti 1/4 in. (6 mm) diam by 1-1/4 in. (32 mm) long KWIK-CON II+ concrete screw anchors. The anchor hooks are to be secured to concrete floor or wall with min 1/4 in. (6 mm) diam by min 1-1/4 in. (32 mm) long steel expansion bolts or min 0.145 in. (3.7 mm) diam by 1-1/4 in. (32 mm) long powder actuated fasteners utilizing a 1-7/16 in. (36 mm) diam by 1/16 in. (1.6 mm) thick steel washer. As alternatives to the anchors specified above for concrete, Hilti 1/4 in. (6 mm) diam by 1-1/4 in. (32 mm) long KWIK-CON II+ concrete screw anchor, or Hilti 1/4 in. (6 mm) diam by 1-3/4 in. (44 mm) long KWIK-BOUL 1's steel expansion anchor or Hilti X-DN 27 P6 S15 powder actuated fastener with integral nom 9/16 in. (14 mm) diam washer may be used.
 HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 643 501.5"N, CP 643 632"N, CP 643 903"N, CP 643 1104"N Firestop Collar
 *Bearing the UL Classification Mark

Hilti Firestop Systems
 Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. July 13, 2009

System No. C-AJ-5185

3. Firestop System — The firestop system shall consist of the following:
 A. Packing Material* — Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or both surfaces of wall to accommodate the required thickness of fill material.
 B. Fill Void or Cavity Materials* — Sealant — Min 1/4 in. (6 mm) thickness of fill material applied within the annulus. Flush with top surface of floor or both surfaces of wall.
 HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant
 C. Pipe Covering Materials* — Nom 3 in. (76 mm) thick unfaced mineral fiber pipe insulation sized to the outside diam of pipe or tube. When pipe insulation extends the entire length of the pipe or tube, pipe insulation secured with nom 16 AWG steel wire spaced max 12 in. (305 mm) OC. When pipe insulation extends only 12 in. (305 mm) beyond each side of floor or wall, pipe insulation secured with nom 16 AWG steel wire spaced 3 in. (76 mm) and 9 in. (229 mm) beyond each side of floor or wall. When the pipe insulation extends the entire length of the pipe or tube, on each side of floor or wall, the T, FT and FTH Rating is 2 Hr. When the pipe insulation extends only 12 in. (305 mm) beyond each side of floor or wall, the T, FT and FTH Rating is 1 Hr.
 IG MINWOOL L L C — High Temperature Pipe Insulation 1200, High Temperature Pipe Insulation BWT or High Temperature Pipe Insulation Thermaloc
 *Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Hilti Firestop Systems
 Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 13, 2015

System No. C-AJ-5185

| | |
|-------------------------------------|---------------------------------------|
| ANSIUL1479 (ASTM E814) | CANULC S115 |
| F Rating — 3 Hr | F Rating — 3 Hr |
| T Rating — 1 and 2 Hr (See Item 3C) | FT Rating — 1 and 2 Hr (See Item 3C) |
| | FH Rating — 3 Hr |
| | FTH Rating — 1 and 2 Hr (See Item 3C) |

SECTION A-A

1. Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 25-7/8 in. (657 mm).
 See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
 2. Through Penetrants — One metallic pipe or tubing to be installed concentrically or eccentrically within the firestop system. The annular space between the pipe or tube and the opening shall be min 0 in. (point contact) to max 1-7/8 in. (48 mm) Pipe or tubing to be rigidly supported on both sides of the wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
 A. Steel Pipe — Nom 24 in. (610 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
 B. Iron Pipe — Nom 24 in. (610 mm) diam (or smaller) cast or ductile iron pipe.
 C. Copper Tubing — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
 D. Copper Pipe — Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.

Hilti Firestop Systems
 Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 13, 2015

System No. W-L-1054

| | |
|--|--|
| ANSIUL1479 (ASTM E814) | CANULC S115 |
| F Ratings — 1 and 2 Hr (See Items 1 and 3) | F Ratings — 1 and 2 Hr (See Items 1 and 3) |
| T Rating — 0 Hr | FT Rating — 0 Hr |
| L Rating (Without Movement) at Ambient — Less Than 1 CFM/sq ft | FH Ratings — 1 and 2 Hr (See Items 1 and 3) |
| L Rating (Without Movement) at 400°F — Less Than 1 CFM/sq ft | FTH Rating — 0 Hr |
| M Rating (Movement) — See Table 1 | FTH Rating — 0 Hr |
| | L Rating at Ambient — Less Than 5.1 L/s/m ² |
| | L Rating at 204°C — Less Than 5.1 L/s/m ² |

SECTION A-A

1. Wall Assembly — The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
 A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (408 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC. For M Rating, steel studs to be min 3-5/8 in. (92 mm) wide. When steel studs are used and the diam of opening exceeds the width of stud cavity, the opening shall be framed on all sides using lengths of steel stud installed between the vertical studs and screw-attached to the steel studs at each end. The framed opening in the wall shall be 4 to 6 in. (102 to 152 mm) wider and 4 to 6 in. (102 to 152 mm) higher than the diam of the penetrating item such that, when the penetrating item is installed in the opening, a 2 to 3 in. (51 to 76 mm) clearance is present between the penetrating item and the framing on all four sides.
 B. Gypsum Board* — 5/8 in. (16 mm) thick, 4 ft (122 cm) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 32-1/4 in. (819 mm) for steel stud walls. Max diam of opening is 14-1/2 in. (368 mm) for wood stud walls. The F and FH Ratings of the firestop system are equal to the fire rating of the wall assembly. The M Rating is applicable only to 1 hr rated walls.

Hilti Firestop Systems
 Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 21, 2020

System No. W-L-1054

2. Through-Penetrants — One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space shall be min 0 in. to max 2-1/4 in. (57 mm). Pipe may be installed with continuous point contact. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
 A. Steel Pipe — Nom 30 in. (762 mm) diam (or smaller) regular (or heavier) steel pipe.
 B. Iron Pipe — Nom 30 in. (762 mm) diam (or smaller) cast or ductile iron pipe.
 C. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or 6 in. (152 mm) diam steel conduit.
 D. Copper Tubing — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.
 E. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) regular (or heavier) copper pipe.
 3. Fill, Void or Cavity Material* — Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall. At the point or continuous contact locations between pipe and wall, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe wall interface on both surfaces of wall.
 HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE MAX Intumescent Sealant

| Movement Direction | Penetrant Item | Nominal Penetrant Diameter | Annular Space | Movement | Sealant Depth | F-Rating | L Rating with Movement |
|--------------------|----------------|----------------------------|---------------|----------|---------------|----------|------------------------|
| Y | 2A, 2C* | 2 in. | Max 2-1/4 in. | 5% | 5/8 in. | 1 hr | N/A |
| Z | 2A, 2C* | 2 in. | 2-1/4 in. | 0.25 in. | 5/8 in. | 1 hr | N/A |

*Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Hilti Firestop Systems
 Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 21, 2020

PANEL: A

LOCATION: BUS RATING: 225.0 A
 MAIN BREAKER: 225

VOLTS: 208Y/120
 PHASES: 3
 WIRES: 4
 SCCR: 22kAIC

MOUNTING: SURFACE
 FED FROM: SWITCHBOARD J1
 INTEGRAL SPD: Type 1
 LUG ACCESSORIES:

| CKT | CIRCUIT DESCRIPTION | BKR TRIP | P | BKR TYPE | LOAD TYPE | PHASE A (VA) | PHASE B (VA) | PHASE C (VA) | LOAD TYPE | BKR TYPE | P | BKR TRIP | CIRCUIT DESCRIPTION | CKT | |
|-----|----------------------------------|----------|---|----------|-----------|--------------|--------------|--------------|-----------|----------|---|----------|---------------------|----------------------------------|----|
| 1 | (E) RECEPTACLES/CLOCK | 20 | 1 | | | 900 | 6,670 | | | | | 2 | 60 | (E) 4 TON HVAC - WALL MOUNT(4KW) | 2 |
| 3 | (E) RECEPTACLES/ROOF RECEPT GFCI | 20 | 1 | | | | 360 | 6,670 | | | | | | | 4 |
| 5 | (E) INTERIOR LIGHTING | 20 | 1 | | | | | 960 | 7,610 | | | | | | 6 |
| 7 | (E) EXTERIOR LIGHTING | 20 | 1 | | | 40 | 7,030 | | | Power | | 3 | 100 | PANEL B | 8 |
| 9 | | | | | | | | | 826 | | | | | | 10 |
| 11 | (E) DEED - SOLAR READY | 20 | 1 | | | | | 0 | 40 | | | 1 | 20 | (E) FIRE ALARM | 12 |
| 13 | (E) DEED - SOLAR READY | 20 | 1 | | | | | 0 | | | | | | | 14 |
| 15 | | | | | | | | | | | | | | | 16 |
| 17 | | | | | | | | | | | | | | | 18 |
| | | | | | | TOTAL LOAD: | 14640 VA | 7656 VA | 8610 VA | | | | | | |
| | | | | | | TOTAL AMPS: | 122.0 A | 65.5 A | 72.7 A | | | | | | |

PANEL: PANEL B

LOCATION: BUS RATING: 100.0 A
 MAIN BREAKER: 100A

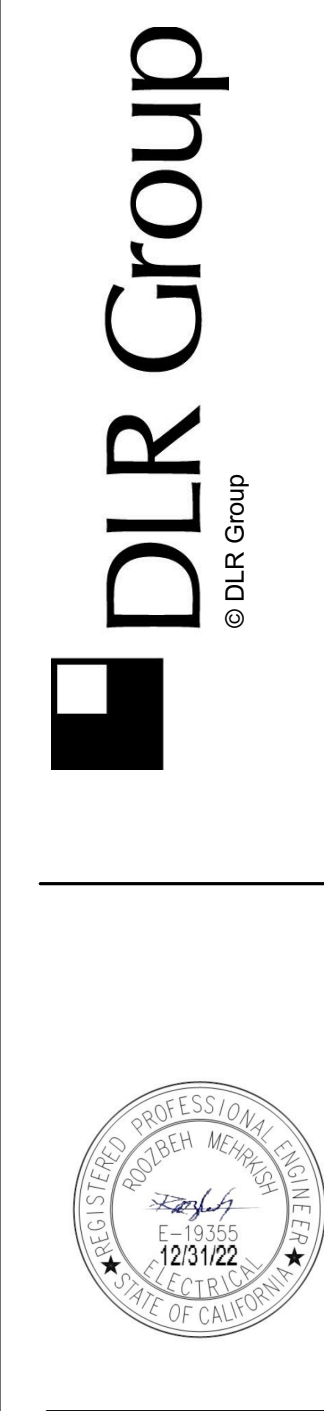
VOLTS: 208Y/120
 PHASES: 3
 WIRES: 4
 SCCR: 22kAIC

MOUNTING: SURFACE
 FED FROM: A
 INTEGRAL SPD: Type 1
 LUG ACCESSORIES:

| CKT | CIRCUIT DESCRIPTION | BKR TRIP | P | BKR TYPE | LOAD TYPE | PHASE A (VA) | PHASE B (VA) | PHASE C (VA) | LOAD TYPE | BKR TYPE | P | BKR TRIP | CIRCUIT DESCRIPTION | CKT | |
|-----|-------------------------------------|----------|---|----------|-----------|--------------|--------------|--------------|-----------|----------|---|----------|---------------------|----------------------------------|----|
| 1 | (E) RECEPTACLES/CLOCK | 20 | 1 | | | 900 | 6,670 | | | | | 2 | 60 | (E) 4 TON HVAC - WALL MOUNT(4KW) | 2 |
| 3 | (E) RECEPTACLES/ROOF RECEPT OR EXT. | 20 | 1 | | | | 360 | 6,670 | | | | | | | 4 |
| 5 | (E) INTERIOR LIGHTING | 20 | 1 | | | | | 786 | | | | | | | 6 |
| 7 | (E) EXTERIOR LIGHTING | 20 | 1 | | | 40 | | | | | | | | | 8 |
| 9 | | | | | | | | | | | | | | | 10 |
| 11 | (E) DEED - SOLAR READY | 20 | 1 | | | | | 0 | 40 | | | 1 | 20 | (E) FIRE ALARM | 12 |
| 13 | (E) DEED - SOLAR READY | 20 | 1 | | | | | 0 | | | | | | | 14 |
| 15 | | | | | | | | | | | | | | | 16 |
| 17 | | | | | | | | | | | | | | | 18 |
| | | | | | | TOTAL LOAD: | 7610 VA | 7030 VA | 826 VA | | | | | | |
| | | | | | | TOTAL AMPS: | 71.4 A | 66.5 A | 6.9 A | | | | | | |

| LOAD TYPE | LOAD DESCRIPTION | CONNECTED LOAD (VA) | DEMAND D. | ESTIMATED DEMAND (VA) | DEMAND FACTOR NOTES | BKR TYPE | PANEL TOTALS |
|-----------|------------------|---------------------|-----------|-----------------------|--|----------|--|
| L | LIGHTING | 0 VA | 0.00% | 0 VA | CONTINUOUS LOAD @ 125% | | G = GFCI (5mA) |
| R | RECEPTACLES | 0 VA | 0.00% | 0 VA | FIRST 10kVA @ 100%, REMAINDER @ 50% | | GP = GFP (30mA) |
| K | KITCHEN | 0 VA | 0.00% | 0 VA | NON-DWELLING KITCHEN LOADS, NEC ART. 220 | | ST = SHUNT TRIP |
| LM | LARGEST MOTOR | 0 VA | 0.00% | 0 VA | LARGEST MOTOR, NEC ART. 430 | | LO = LOCK OUT |
| M | MOTOR | 0 VA | 0.00% | 0 VA | | | |
| C | COOLING | 0 VA | 0.00% | 0 VA | | | |
| H | HEATING | 0 VA | 0.00% | 0 VA | | | |
| O | OTHER | 0 VA | 0.00% | 0 VA | | | |
| Spare | SPARE | 31106 VA | 100.00% | 31106 VA | | | CONNECTED LOAD: 31 kVA ESTIMATED DEMAND: 31 kVA CONNECTED CURRENT: 86.3 A END CURRENT: 86.3 A |

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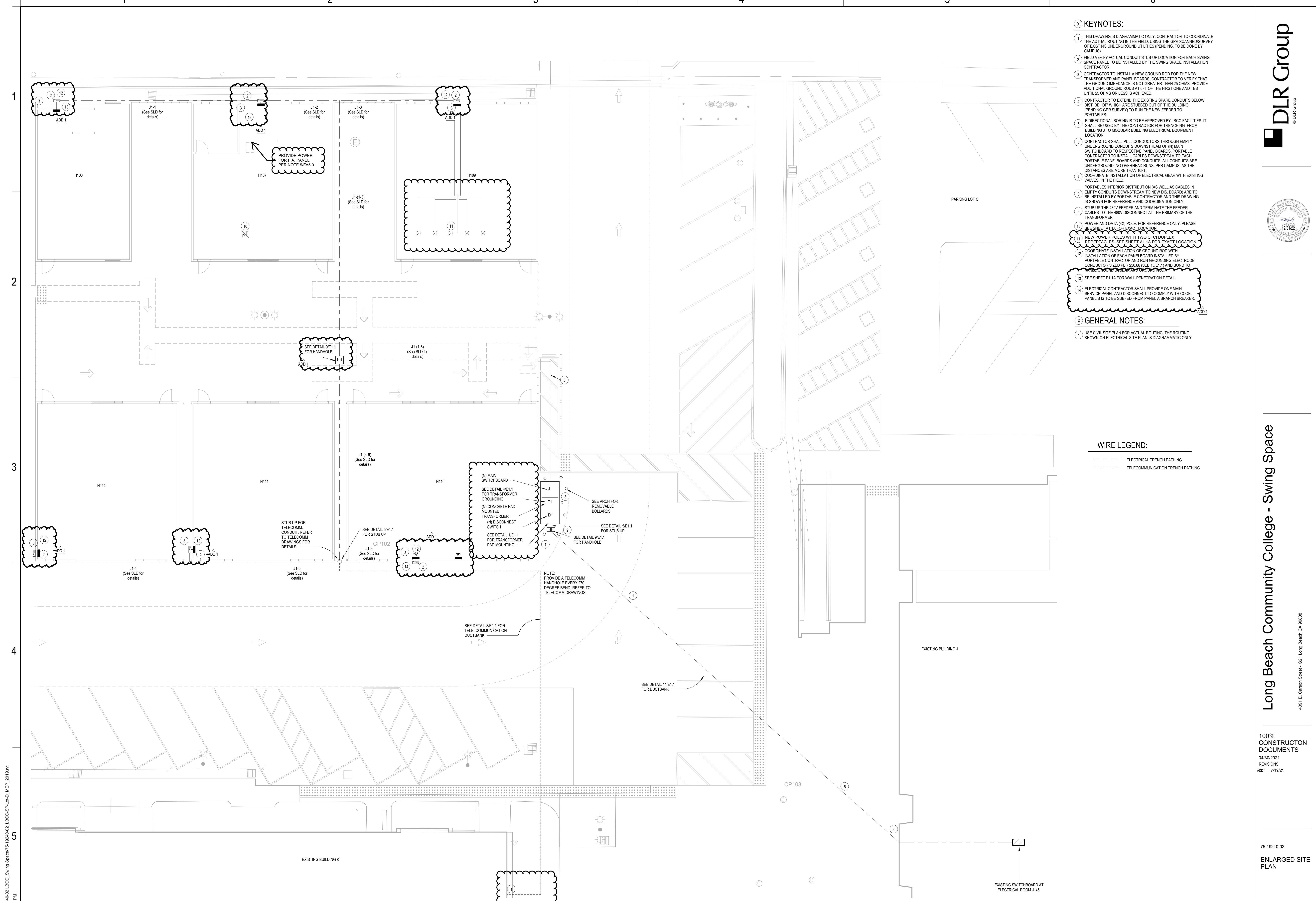


Long Beach Community College - Swing Space

100% CONSTRUCT DOCUMENTS
04/30/2021
REVISIONS
ADD 1 7/19/21

75-19240-02
PENETRATION DETAIL

E1.1A



- (X) KEYNOTES:**
- THIS DRAWING IS DIAGRAMMATIC ONLY. CONTRACTOR TO COORDINATE THE ACTUAL ROUTING IN THE FIELD, USING THE GPR SCANNED/SURVEY OF EXISTING UNDERGROUND UTILITIES (PENDING, TO BE DONE BY CAMPUS)
 - FIELD VERIFY ACTUAL CONDUIT STUB-UP LOCATION FOR EACH SWING SPACE PANEL TO BE INSTALLED BY THE SWING SPACE INSTALLATION CONTRACTOR.
 - CONTRACTOR TO INSTALL A NEW GROUND ROD FOR THE NEW TRANSFORMER AND PANEL BOARDS. CONTRACTOR TO VERIFY THAT THE GROUND IMPEDANCE IS NOT GREATER THAN 25 OHMS. PROVIDE ADDITIONAL GROUND RODS AT 6FT OF THE FIRST ONE AND TEST UNTIL 25 OHMS OR LESS IS ACHIEVED.
 - CONTRACTOR TO EXTEND THE EXISTING SPARE CONDUITS BELOW DIST' 18" 10" WHICH ARE STUBBED OUT OF THE BUILDING (PENDING GPR SURVEY) TO RUN THE NEW FEEDER TO PORTABLES.
 - BIDIRECTIONAL BORING IS TO BE APPROVED BY LBCC FACILITIES. IT SHALL BE USED BY THE CONTRACTOR FOR TRENCHING FROM BUILDING J TO MODULAR BUILDING ELECTRICAL EQUIPMENT LOCATION.
 - CONTRACTOR SHALL PULL CONDUITORS THROUGH EMPTY UNDERGROUND CONDUITS DOWNSTREAM OF (N) MAIN SWITCHBOARD TO RESPECTIVE PANEL BOARDS. PORTABLE CONTRACTOR TO INSTALL CABLES DOWNSTREAM TO EACH PORTABLE PANELBOARDS AND CONDUITS. ALL CONDUITS ARE UNDERGROUND, NO OVERHEAD RUNS, PER CAMPUS, AS THE DISTANCES ARE MORE THAN 10FT.
 - COORDINATE INSTALLATION OF ELECTRICAL GEAR WITH EXISTING VALVES, IN THE FIELD.
 - PORTABLES INTERIOR DISTRIBUTION (AS WELL AS CABLES IN EMPTY CONDUITS DOWNSTREAM TO NEW DIS. BOARD) ARE TO BE INSTALLED BY PORTABLE CONTRACTOR AND THIS DRAWING IS SHOWN FOR REFERENCE AND COORDINATION ONLY.
 - STUB UP THE 480V FEEDER AND TERMINATE THE FEEDER CABLES TO THE 480V DISCONNECT AT THE PRIMARY OF THE TRANSFORMER.
 - POWER AND DATA (4X) POLE. FOR REFERENCE ONLY. PLEASE SEE SHEET A1.1A FOR EXACT LOCATION.
 - NEW POWER POLES WITH TWO CONDUIT DUPLEX RECEPTACLES. SEE SHEET A1.1A FOR EXACT LOCATION.
 - COORDINATE INSTALLATION OF GROUND ROD WITH INSTALLATION OF EACH PANELBOARD INSTALLED BY PORTABLE CONTRACTOR AND RUN GROUNDING ELECTRODE CONDUCTOR SIZED PER 250.66 (SEE 1951.1) AND BOND TO MAIN GROUNDING BUS AT THE GROUNDING POINT.
 - SEE SHEET E1.1A FOR WALL PENETRATION DETAIL.
 - ELECTRICAL CONTRACTOR SHALL PROVIDE ONE MAIN SERVICE PANEL AND DISCONNECT TO COMPLY WITH CODE. PANEL B IS TO BE SUBFD FROM PANEL A BRANCH BREAKER.

- (X) GENERAL NOTES:**
- USE CIVIL SITE PLAN FOR ACTUAL ROUTING. THE ROUTING SHOWN ON ELECTRICAL SITE PLAN IS DIAGRAMMATIC ONLY.



1
E1.2
ELECTRICAL SITE PLAN
SCALE: 1/8" = 1'-0"

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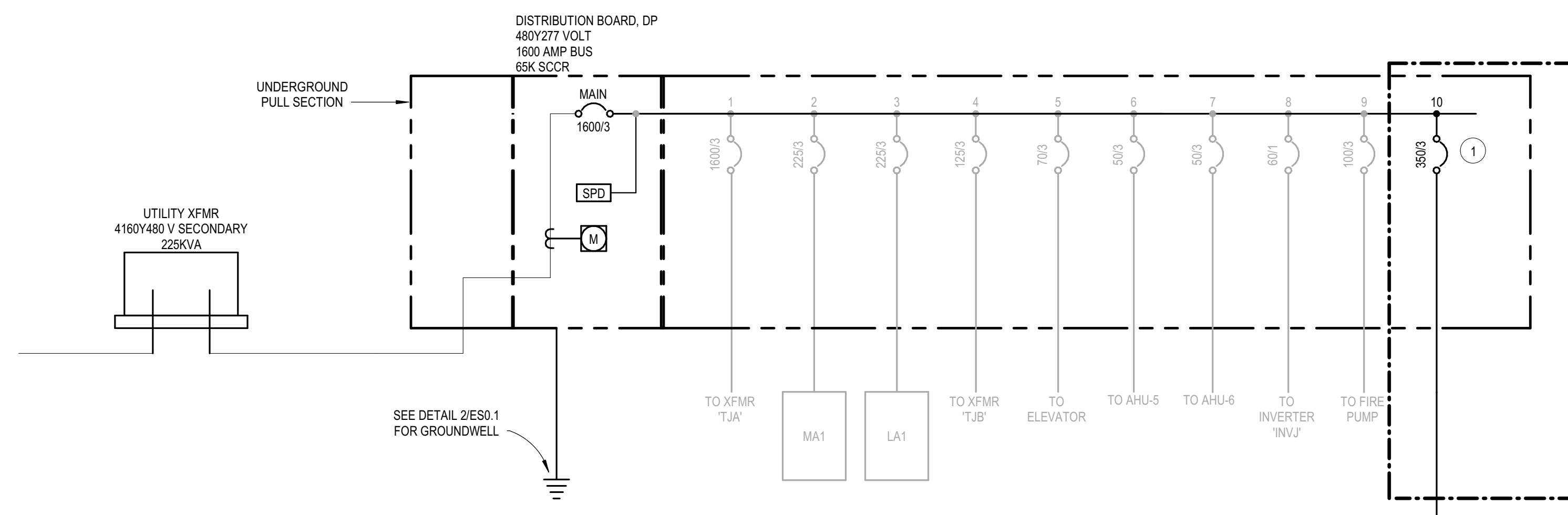


Long Beach Community College - Swing Space
 4091 E. Carson Street - C21, Long Beach CA 90808

100%
 CONSTRUCTION
 DOCUMENTS
 04/30/2021
 REVISIONS
 ADD 1 7/19/21

75-19240-02
 ENLARGED SITE
 PLAN

E1.2



KEYNOTES:
 1 NEW GEH-5663B (SRPG400A300) CB. THE NEW BREAKER SHOULD HAVE THE SAME KAIC RATING AS EXISTING AND BE PROVIDED WITH ALL LUGS AND ACCESSORIES FOR A COMPLETE INSTALLATION, TO MAINTAIN UL-LISTING OF THE SWITCHBOARD.

Transformer TJA(120/208V)

| Panel | Total Amps | Breaker Size |
|-------|------------|--------------|
| PA1 | 100 | 150 |
| PA2 | 96 | 125 |
| PA3 | 83 | 125 |
| PA4 | 99 | 125 |
| PA5 | 138 | 175 |
| PA6 | 72 | 100 |
| PA7 | 90 | 125 |
| DR1 | | |
| DR2 | | |
| DR3 | | |
| DR4 | | |
| CS | | |
| PA8 | 57 | 80 |
| PA9 | 104 | 150 |

| | (120/208V) | (277/480V) |
|------------|------------|------------|
| Total Amps | 1155 | 450.32 |

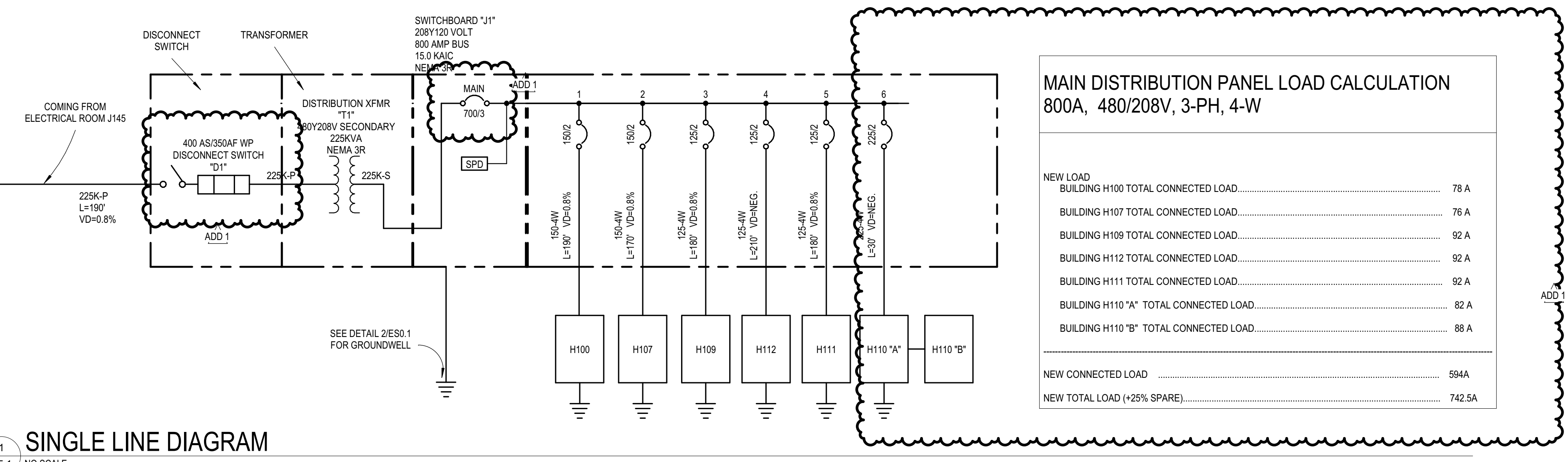
*Note: DR1-DR4 and CS are only active during performances. They can be neglected since they won't be active concurrently with the other loads.

Panel Board "DP"

| Load | Total Amps |
|-----------|------------|
| TJA | 450.32 |
| MA1 | 79 |
| LA1 | 48 |
| XJB | 125 |
| ELEVATOR | 70 |
| AHU-5 | 50 |
| AHU-6 | 50 |
| INVJ | 60 |
| FIRE PUMP | 100 |

| | Total Amps(277/480V) |
|--|----------------------|
| | 741.32 |

4 (EXISTING) BUILDING J LOAD CALCULATIONS
 ES.1 NO SCALE



MAIN DISTRIBUTION PANEL LOAD CALCULATION
 800A, 480/208V, 3-PH, 4-W

| | |
|---|--------|
| NEW LOAD BUILDING H100 TOTAL CONNECTED LOAD | 78 A |
| BUILDING H107 TOTAL CONNECTED LOAD | 78 A |
| BUILDING H109 TOTAL CONNECTED LOAD | 92 A |
| BUILDING H112 TOTAL CONNECTED LOAD | 92 A |
| BUILDING H111 TOTAL CONNECTED LOAD | 92 A |
| BUILDING H110 "A" TOTAL CONNECTED LOAD | 82 A |
| BUILDING H110 "B" TOTAL CONNECTED LOAD | 88 A |
| NEW CONNECTED LOAD | 594A |
| NEW TOTAL LOAD (+25% SPARE) | 742.5A |

1 SINGLE LINE DIAGRAM
 ES.1 NO SCALE

4 (EXISTING) BUILDING J LOAD CALCULATIONS
 ES.1 NO SCALE

3-PHASE TRANSFORMER PRIMARY AND SECONDARY SCHEDULE - COPPER

| XFMR KVA | PRIMARY | | | | | SECONDARY | | | | | | |
|----------|---------|------|--------|-----|-----|-----------|--------|--------|-------|-----|-----|--------|
| | MARK | AMPS | # SETS | Ø | C | MARK | AMPS | # SETS | Ø & N | BJ | C | |
| 15 | 15K-P | 25 | 1 | 10 | 10 | 3/4" | 15K-S | 50 | 1 | 8 | 8 | 1" |
| 30 | 30K-P | 50 | 1 | 6 | 10 | 3/4" | 30K-S | 100 | 1 | 1 | 6 | 1-1/2" |
| 45 | 45K-P | 70 | 1 | 4 | 8 | 1" | 45K-S | 150 | 1 | 1/0 | 6 | 2" |
| 75 | 75K-P | 150 | 1 | 1/0 | 6 | 1-1/2" | 75K-S | 225 | 1 | 4/0 | 2 | 2-1/2" |
| 112.5 | 112K-P | 175 | 1 | 2/0 | 6 | 1-1/2" | 112K-S | 350 | 1 | 5/0 | 1/0 | 3-1/2" |
| 150 | 150K-P | 250 | 1 | 250 | 4 | 2" | 150K-S | 500 | 2 | 250 | 1/0 | 2-1/2" |
| 225 | 225K-P | 350 | 1 | 5/0 | 3 | 3" | 225K-S | 700 | 2 | 5/0 | 2/0 | 3-1/2" |
| 300 | 300K-P | 500 | 2 | 250 | 2 | 3-1/2" | 300K-S | 1000 | 3 | 4/0 | 3/0 | 3" |
| 500 | 500K-P | 800 | 2 | 600 | 1/0 | 3-1/2" | 500K-S | 1200 | 3 | 600 | 3/0 | 3-1/2" |

2 FEEDER AND BRANCH CIRCUIT SCHEDULES - COPPER
 ES.1 NO SCALE

FEEDER SCHEDULE - COPPER

| MARK (AMPS) | # SETS | Ø & N | GND | CONDUIT SIZE | | |
|-------------|--------|-------|-----|--------------|--------|--------|
| | | | | -4W | -3W | -2W |
| 15 | 1 | 12 | 12 | 3/4" | 3/4" | 3/4" |
| 20 | 1 | 12 | 12 | 3/4" | 3/4" | 3/4" |
| 25 | 1 | 10 | 10 | 3/4" | 3/4" | 3/4" |
| 30 | 1 | 10 | 10 | 3/4" | 3/4" | 3/4" |
| 35 | 1 | 8 | 10 | 3/4" | 3/4" | 3/4" |
| 40 | 1 | 8 | 10 | 3/4" | 3/4" | 3/4" |
| 45 | 1 | 6 | 10 | 1" | 3/4" | 3/4" |
| 50 | 1 | 6 | 10 | 1" | 3/4" | 3/4" |
| 60 | 1 | 4 | 10 | 1-1/4" | 1" | 3/4" |
| 70 | 1 | 4 | 8 | 1-1/4" | 1" | 3/4" |
| 80 | 1 | 3 | 8 | 1-1/4" | 1-1/4" | 1" |
| 90 | 1 | 2 | 8 | 1-1/4" | 1-1/4" | 1" |
| 100 | 1 | 1 | 8 | 1-1/2" | 1-1/2" | 1-1/4" |
| 110 | 1 | 1 | 6 | 1-1/2" | 1-1/2" | 1-1/4" |
| 125 | 1 | 1 | 6 | 1-1/2" | 1-1/2" | 1-1/4" |
| 150 | 1 | 1/0 | 6 | 2" | 1-1/2" | 1-1/4" |
| 175 | 1 | 2/0 | 6 | 2" | 1-1/2" | 1-1/4" |
| 200 | 1 | 3/0 | 6 | 2" | 2" | 1-1/2" |
| 225 | 1 | 4/0 | 4 | 2-1/2" | 2" | 1-1/2" |
| 250 | 1 | 250 | 4 | 2-1/2" | 2" | 1-1/2" |
| 300 | 1 | 350 | 4 | 3" | 2-1/2" | 2" |
| 350 | 1 | 500 | 3 | 3-1/2" | 3" | 2-1/2" |
| 400 | 1 | 600 | 3 | 3-1/2" | 3" | 2-1/2" |
| 400 | 2 | 3/0 | 3 | 2" | 2" | 1-1/2" |
| 450 | 2 | 4/0 | 2 | 2-1/2" | 2" | 1-1/2" |
| 500 | 2 | 250 | 2 | 2-1/2" | 2-1/2" | 2" |
| 600 | 2 | 350 | 1 | 3" | 2-1/2" | 2" |
| 700 | 2 | 500 | 1/0 | 3-1/2" | 3" | 2-1/2" |
| 800 | 2 | 600 | 1/0 | 3-1/2" | 3" | 2-1/2" |
| 1000 | 3 | 400 | 2/0 | 3" | 3" | 2-1/2" |
| 1200 | 3 | 600 | 3/0 | 3-1/2" | 3-1/2" | 3" |
| 1600 | 4 | 600 | 4/0 | 3-1/2" | 3-1/2" | 3" |
| 2000 | 5 | 600 | 250 | 4" | 3-1/2" | 3" |
| 2500 | 6 | 600 | 350 | 4" | 3-1/2" | 3" |
| 3000 | 8 | 500 | 400 | 3-1/2" | 3" | 2-1/2" |
| 4000 | 10 | 600 | 500 | 4" | 3-1/2" | 3" |

ABBREVIATIONS:
 Ø PHASE
 N NEUTRAL
 GND EQUIPMENT GROUNDING CONDUCTOR
 -4W FOUR WIRE + GROUND (3Ø N, GND)
 -3W THREE WIRE + GROUND (3Ø GND or 2Ø N, GND)
 -2W TWO WIRE + GROUND

NOTES:
 1. CONDUCTOR AMPACITIES ARE BASED ON NEC TABLE 310.15(B)(16).
 2. CONDUIT SIZES ARE BASED ON A MAXIMUM FILL RATIO OF 40%.
 3. SCHEDULE SHALL BE USED FOR FEEDERS AND BRANCH CIRCUITS WHERE APPLICABLE.
 4. ALL FEEDERS AND BRANCH CIRCUITS SHALL INCLUDE AN EQUIPMENT GROUNDING CONDUCTOR.
 5. SCHEDULE IS VALID FOR TYPE THHN, THWN-2, AND XHHW-2 CONDUCTORS. SEE SPECIFICATIONS FOR CONDUCTOR TYPES REQUIRED.
 6. SCHEDULE IS VALID FOR TYPE EMT, IMC, FMC, LFMC, HDPE, AND RNC-40 RACEWAYS. SEE SPECIFICATIONS FOR RACEWAY APPLICATIONS.
 7. OPTIONAL CONFIGURATIONS (1 OR 2 SETS) ARE GIVEN FOR SOME SIZES.
 8. NOT ALL SIZES USED.

GENERAL SINGLE LINE NOTES

- OVERCURRENT DEVICES OF ENTIRE DISTRIBUTION SYSTEM SHALL MEET STATED FAULT CURRENT VALUES WITH FULLY RATED EQUIPMENT.
- CONDUCTOR LENGTHS INDICATED ON THE SINGLE LINE DIAGRAM ARE FOR FAULT CURRENT CALCULATIONS ONLY. ACTUAL LENGTH SHALL BE DETERMINED BY FIELD CONDITIONS AND ACTUAL ROUTES OF FEEDERS.
- REFER TO SWITCHBOARD SCHEDULES AND DISTRIBUTION PANEL SCHEDULES FOR ADDITIONAL REQUIREMENTS. WHERE A DISCREPANCY EXISTS BETWEEN EQUIPMENT ON THE SINGLE LINE DIAGRAM AND THE DETAILED SCHEDULES, THE ITEM OR ARRANGEMENT WITH BETTER QUALITY, GREATER QUANTITY, OR HIGHER COST SHALL BE USED.
- ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
- GROUNDING ELECTRODE CONDUCTORS SIZES ARE NOT INDICATED ON THE SINGLE LINE DIAGRAM ARE. REFER TO THE GROUNDING DETAIL FOR CONNECTIONS AND CONDUCTOR SIZES.



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ABBREVIATIONS

| | | | | | |
|--|--|---|---|---|--|
| 4S/DP ADA A.F.F. A.F.G. AWG AMP. A A.I.C. or AIC | 4" SQUARE BY 2-1/8" DEEP BOX AMERICAN WITH DISABILITIES ACT ABOVE FINISH FLOOR ABOVE FINISH GRADE AMERICAN WIRE GAUGE AMPERE AMPERES INTERRUPTING CAPACITY (SYMMETRICAL) AVAILABLE FAULT CURRENT AMP FRAME, AMP TRIP AUTHORITY HAVING JURISDICTION AMP SWITCH, AMP FUSE AUTOMATIC TRANSFER SWITCH AVERAGE BONDING JUMPER BUILDING DISTRIBUTION FRAME BRANCH BLDG CBC CEC CIRC., CKT. CB CSFD C C.O. | GFCI GFP GE or GEC HACR HOA HVAC H.W.D.L.L. HID HP HPS IN. or " | GROUND FAULT CIRCUIT INTERRUPTER GROUND FAULT PROTECTION GROUNDING ELECTRODE CONDUCTOR HEATING AIR CONDITIONING REFRIGERATION HAND-OFF-AUTO HEATING, VENTILATING AND AIR CONDITIONING HEIGHT, WIDTH, DEPTH, LENGTH HIGH INTENSITY DISCHARGE HORSEPOWER HIGH PRESSURE SODIUM INCHES ISOLATED GROUND I/G INTERNATIONAL BUILDING CODE INTEGRATED DIMMING CONTROL PANEL INTERMEDIATE DISTRIBUTION FRAME JUNCTION BOX DEGREE KELVIN KILOWATT KILOWATT AMPERES KILOWATT KILOWATT HOUR LONG CONTINUOUS LOAD LINEAR FEET LIGHTING LPS MAX. MBJ MDF MOCP MCB MLO M.C. METER M M/M MV MH MIN. MCA MCC MCM MCP MFR. MTD MW NATS NEC NEMA NC | NO NF NIC NOT TO SCALE NL NIGHT LIGHT NO. or # OFICI OWNER FURNISHED, CONTRACTOR INSTALLED PERCENT IMPEDANCE PH. or ø PC P.C. P PVC PDU OVER 600 VOLTS FURNISH, INSTALL AND CONNECT POTENTIAL TRANSFORMER PUBLIC ADDRESS DENOTES RELOCATED DEVICE LOCATION. RECEPTACLE REFRIGERATOR RGS RMS SCC SCCR SFD SECONDARY SMACNA SQ. SSBJ SBJ TC TEL/DATA TV T.V.S.S. TYP U.G.P.S. U.O.N. U.P.S. or UPS VAV V VA VD WP W XFMR | NORMALLY OPENED NON-FUSED NOT IN CONTRACT NOT TO SCALE NIGHT LIGHT NUMBER OWNER FURNISHED, CONTRACTOR INSTALLED PERCENT IMPEDANCE PHASE PHOTOCELL PLUMBING CONTRACTOR POLE POLY VINYL CHLORIDE POWER DISTRIBUTION UNIT OVER 600 VOLTS FURNISH, INSTALL AND CONNECT POTENTIAL TRANSFORMER PUBLIC ADDRESS DENOTES RELOCATED DEVICE LOCATION. RECEPTACLE REFRIGERATOR RIGID GALVANIZED STEEL ROOT MEAN SQUARE SHORT CIRCUIT CURRENT SHORT CIRCUIT CURRENT RATING STRUCTURED CABLING SYSTEM SMOKE FIRE DAMPER 600 VOLTS AND LESS SHEET METAL AND AIR COND. CONTRACTOR'S NAT'L ASSOC. SQUARE SUPPLY SIDE BONDING JUMPER SYSTEM BONDING JUMPER TIMECLOCK TELEPHONE AND DATA TELEVISION TRANSIENT VOLTAGE SURGE SUPPRESSION TYPICAL UNDERGROUND PULL SECTION UNLESS OTHERWISE NOTED UNINTERRUPTIBLE POWER SYSTEM VARIABLE AIR VOLUME VOLTS VOLT AMPERES VOLTAGE DROP WEATHERPROOF WIRE TRANSFORMER |
|--|--|---|---|---|--|

ANNOTATIONS

- 1 PANEL CALLOUT, "A" INDICATES PANELBOARD OR EQUIPMENT DESIGNATION.
- 2 MECHANICAL EQUIPMENT CALLOUT, "AC" INDICATES UNIT TYPE AND "2" INDICATES UNIT NUMBER. REFER TO MECHANICAL DRAWINGS FOR EXACT LOCATION AND ELECTRICAL REQUIREMENTS.
- 3 E-1 DETAIL CALLOUT, "3" INDICATES DETAIL NUMBER "E-1" INDICATES SHEET NUMBER.
- 2 PLAN NOTE REFERENCE, REFER TO NOTES ON SHEET, OR AS DIRECTED.
- REVISION REFERENCE.
- WYE CONFIGURATION Δ DELTA CONFIGURATION ⏚ GROUND

AUDIOVISUAL SYMBOLS

- AV CFCI PROJECTOR CEILING MOUNT. EXTRON PCM 340 (#70-656-23)

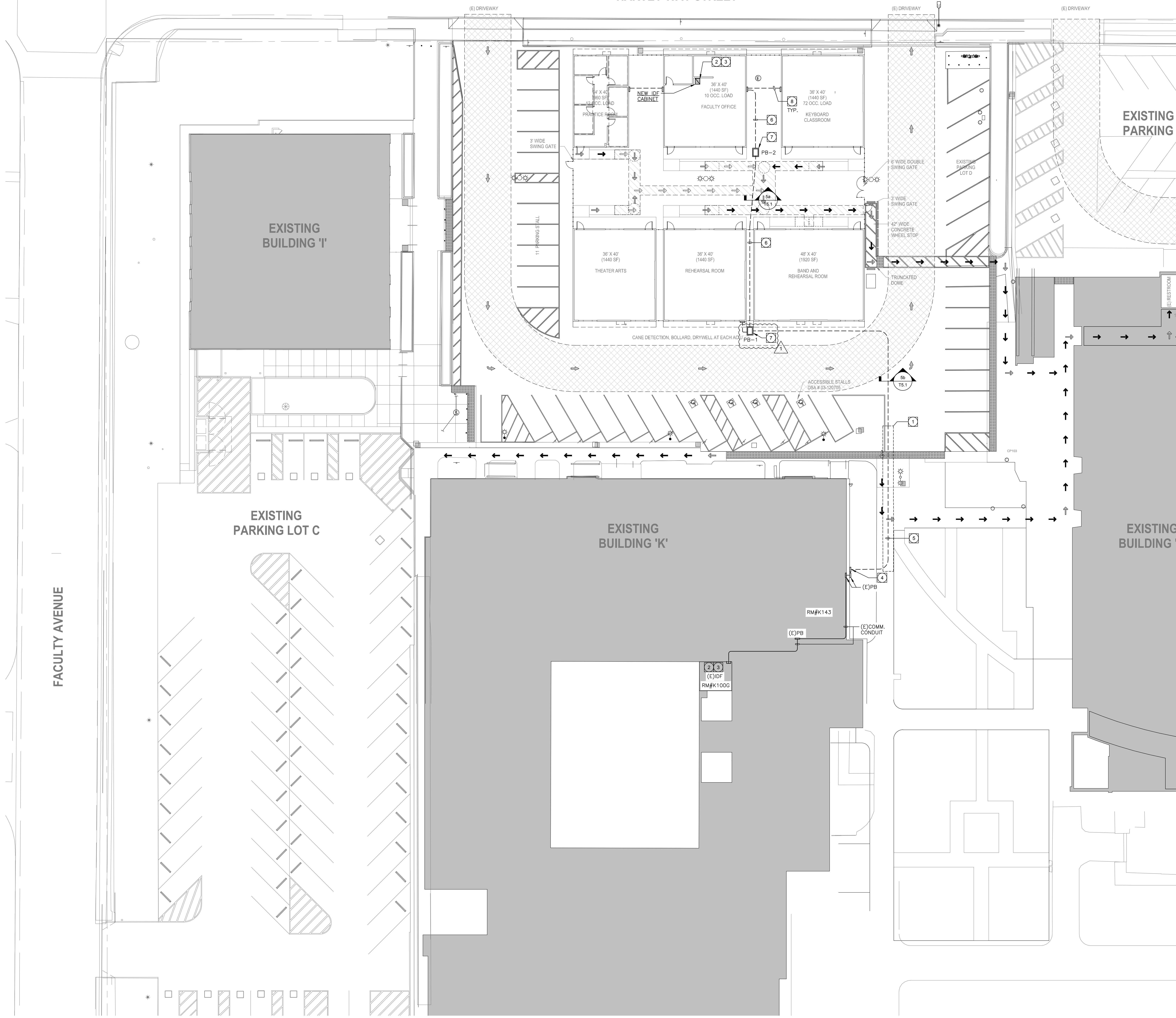
TELEPHONE/DATA SYMBOLS

- ◀ TELEPHONE OUTLET BOX, WALL MOUNTED. STUB A 1" C.O. UP 6" ABOVE THE ACCESSIBLE CEILING AND PROVIDE A BUSHING. 4S/DP MINIMUM WITH SINGLE GANG RING.
"W" = WALL MOUNTED PHONE
- ◀ DATA OUTLET BOX, WALL MOUNTED. STUB A 1" C.O. UP 6-INCHES ABOVE THE ACCESSIBLE CEILING AND PROVIDE A BUSHING. 4S/DP MINIMUM WITH SINGLE GANG RING. PROVIDE DATA CABLE QUANTITY PER PLANS.
- ◀ COMBINATION TELEPHONE AND DATA OUTLET BOX, WALL MOUNTED. STUB A 1" C.O. UP 6-INCHES ABOVE THE ACCESSIBLE CEILING AND PROVIDE A BUSHING. 4S/DP MINIMUM WITH SINGLE GANG RING.
- ◀ TELEPHONE OUTLET BOX, FLUSH MOUNTED IN CEILING - MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL.
- ◀ DATA OUTLET BOX FLUSH MOUNTED IN CEILING - MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL.
- ◀ COMBINATION TELEPHONE AND DATA OUTLET BOX FLUSH MOUNTED IN CEILING - MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL.
- ◀ TELEPHONE OUTLET BOX, WALL MOUNTED 6-INCHES ABOVE COUNTER OR SPLASH. STUB A 1" C.O. UP 6-INCHES ABOVE THE ACCESSIBLE CEILING AND PROVIDE A BUSHING. 4S/DP MINIMUM WITH SINGLE GANG RING.
- ◀ DATA OUTLET BOX, WALL MOUNTED 6-INCHES ABOVE COUNTER OR SPLASH. STUB A 1" C.O. UP 6-INCHES ABOVE THE ACCESSIBLE CEILING AND PROVIDE A BUSHING. 4S/DP MINIMUM WITH SINGLE GANG RING.
- ◀ COMBINATION TELEPHONE AND DATA OUTLET BOX, WALL MOUNTED 6-INCHES ABOVE COUNTER OR SPLASH. STUB A 1" C.O. UP 6-INCHES ABOVE THE ACCESSIBLE CEILING AND PROVIDE A BUSHING. 4S/DP MINIMUM WITH SINGLE GANG RING.
- ◀ COMBINATION TELEPHONE AND DATA OUTLET BOX MOUNTED IN ACCESSIBLE CEILING SPACE OR IN FLOOR BOX PER PLAN FOR FLEXIBLE CONNECTION TO FURNITURE SYSTEM. VERIFY CONNECTION REQUIREMENTS WITH MANUFACTURER PRIOR TO ROUGH-IN - MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL.
- ◀ COMBINATION TELEPHONE AND DATA OUTLET, WALL MOUNTED AT +18-INCHES A.F.F. FOR FLEXIBLE CONNECTION TO FURNITURE SYSTEM. PROVIDE THE FOLLOWING:
- IN A NON-RATED INSULATED WALL, OR NON-RATED UNINSULATED WALL, PROVIDE A 2-GANG MUD RING OR CADDY #RBS SERIES BOX MOUNTING BRACKET (EQUAL BY B-LINE OR RAYCO) WITH (2) 1-1/2" C.O. WITH PULL STRING TO ACCESSIBLE CEILING. PROVIDE 1-1/2" BUSHINGS AT CONDUIT ENDS. REFER TO ARCHITECTURAL PLANS FOR WALL CONSTRUCTION/TYPE AND CEILING CONDITIONS.
- IN A RATED WALL, PROVIDE (1) 4S/DP BOX WITH (2) 1-1/4" C.O. AND (1) 4S/DP BOX WITH (1) 1-1/4" C.O. WITH PULL STRINGS IN EACH CONDUIT TO ACCESSIBLE CEILING. PROVIDE 1-1/4" BUSHINGS AT CONDUIT ENDS. UTILIZE CADDY #RBS SERIES BOX MOUNTING BRACKET TO MAINTAIN BOX ALIGNMENT (EQUAL BY B-LINE OR RAYCO). UTILIZE FIRESTOPPING SYSTEM PADS RATED FOR USE ON THE INSIDE OR OUTSIDE OF THE BOX (SIT OR EQUAL) AS REQUIRED TO MAINTAIN RATING OF WALL OR MEMBRANE. REFER TO ARCHITECTURAL PLANS FOR WALL CONSTRUCTION/TYPE AND CEILING CONDITIONS.
- ◀ CEILING MOUNTED FLUSH 4S BOX WITH SINGLE GANG RING FOR WIRELESS ACCESS POINT. PROVIDE DATA CABLE QUANTITY ONE PER LOCATION.
- T1— CONCEALED TELEPHONE/DATA CONDUIT RUN, 1-INCH CONDUIT ONLY (MIN). SEE TABLE FOR CONDUIT SIZE VARIATIONS.
T2 = 1-1/4" C.O. T3 = 1-1/2" C.O. T4 = 2" C.O.
- ◀ FLUSH MOUNTED, LOCKABLE TERMINAL CABINET WITH TERMINAL STRIPS AS REQUIRED.
- ◀ SURFACE MOUNTED, LOCKABLE TERMINAL CABINET WITH TERMINAL STRIPS AS REQUIRED.
- ◀ TELEPHONE TERMINAL BACKBOARD SIZED AS NOTED, REFER TO SYSTEM GROUND DETAIL.
- ◀ JUNCTION BOX, WALL MOUNTED AT +18-INCHES A.F.F. OR AS NOTED. 4S/DP MINIMUM OR AS REQUIRED BY N.E.C. OR CEC, WHERE ADOPTED.
- ◀ JUNCTION BOX, MOUNTED IN ACCESSIBLE CEILING FOR APPLICATION DENOTED ON PLAN. 4S/DP MINIMUM OR AS REQUIRED BY N.E.C. OR CEC, WHERE ADOPTED.
- ◀ JUNCTION BOX, WALL MOUNTED AT 6-INCHES ABOVE COUNTER OR SPLASH. 4S/DP MINIMUM OR AS REQUIRED BY N.E.C., OR CEC, WHERE ADOPTED.
- ◀ JUNCTION BOX, 4S MINIMUM OR AS REQUIRED BY N.E.C., OR CEC, WHERE ADOPTED. MOUNTED IN ACCESSIBLE CEILING SPACE PER PLAN FOR FLEXIBLE CONNECTION TO PRE-WIRED FURNITURE SYSTEM. MOUNT FLUSH IN FLOOR WHEN INDICATED IN A FLOOR BOX SYMBOL. WHEN SHOWN WITH A DIAGONAL SLASH, THE LAST GENERAL RECEPTACLE CIRCUIT ON THE HOME-RUN CALL OUT SHALL BE CONTROLLED BY THE OCCUPANCY SENSOR. COORDINATE CONTROLLED CIRCUIT CONNECTION REQUIREMENTS WITH FURNITURE SYSTEM MANUFACTURER PRIOR TO ROUGH-IN. SEE DISTRIBUTED LIGHTING CONTROLS FOR ADDITIONAL REQUIREMENTS.
- ◀ JUNCTION BOX, WALL MOUNTED AT +18-INCHES A.F.F., 4S/DP MINIMUM OR AS REQUIRED BY N.E.C., OR CEC, WHERE ADOPTED, FOR FLEXIBLE CONNECTION TO PREWIRED FURNITURE SYSTEM. WHEN SHOWN WITH A DIAGONAL SLASH, THE LAST GENERAL RECEPTACLE CIRCUIT ON THE HOME-RUN CALLOUT SHALL BE CONTROLLED BY THE OCCUPANCY SENSOR. COORDINATE CONTROLLED CIRCUIT CONNECTION REQUIREMENTS WITH FURNITURE SYSTEM MANUFACTURER PRIOR TO ROUGH-IN. SEE DISTRIBUTED LIGHTING CONTROLS FOR ADDITIONAL REQUIREMENTS.
- ◀ PULLBOX, SIZED PER N.E.C. OR AS NOTED.

WALL MOUNTED DEVICE MOUNTING HEIGHT NOTE:

ALL WALL-MOUNTED EQUIPMENT MOUNTING HEIGHTS SHALL BE VERIFIED PRIOR TO ROUGH-IN PER REQUIREMENTS OF THE DEVICE ALIGNMENT AND MOUNTING HEIGHT DETAILS AND SPECIFICATIONS.

HARVEY WAY STREET

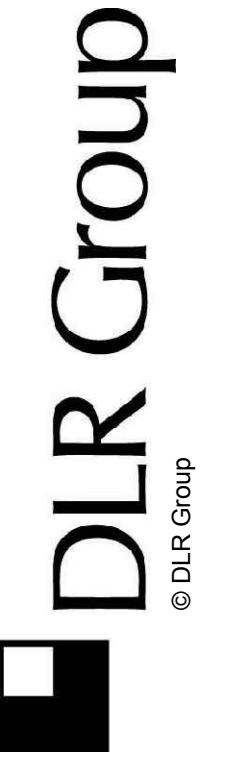


PLAN NOTES:

- UNDERGROUND CONDUIT SHALL BE INSTALLED UTILIZING DIRECTIONAL BORING AT SIDEWALK AND PATH OF TRAVEL AREA.
- PROVIDE OSP-RATED 12-STRAND SINGLEMODE OPTICAL FIBER (DATA) FROM BUILDING 'K' EXISTING IDF ROOM TO IDF CABINET AT PORTABLES. CABLING SHALL BE ROUTED USING EXISTING PATHWAY.
- PROVIDE OSP-RATED (1) CAT-6 CABLE FOR ANALOG TELEPHONE LINE USE FROM EXISTING BUILDING 'K' IDF ROOM TO 110-STYLE PUNCH BLOCK INSTALLED INSIDE PORTABLE IDF CABINET.
- PROVIDE 24"x24"x6" SURFACE MOUNTED NEMA 3R PULLBOX ADJACENT TO EXISTING PULLBOX. PROVIDE CONDUIT STUB INTO EXISTING PULLBOX.
- PROVIDE 2" UNDERGROUND CONDUIT WITH PULLSTRING FOR FIBER AND COPPER CABLING. BOTH ENDS SHALL BE INSTALLED WITH NON-SNAG BUSHINGS.
- PROVIDE 2" UNDERGROUND CONDUIT WITH PULLSTRING FOR BACKBONE FIBER AND COPPER CABLING AND (1)3" FOR OSP RATED CAT-6 CABLING BOTH ENDS SHALL BE INSTALLED WITH NON-SNAG BUSHINGS.
- PROVIDE 2'x3'DEPTH AS REQUIRED UNDERGROUND PULLBOX. PULLBOX SHALL BE PROVIDED WITH TRAFFIC RATED LID.
- REFER TO FLOOR PLANS T2.0 FOR CONDUIT INFRASTRUCTURE INFORMATION AT PORTABLES AREA.

SITE PLAN GENERAL NOTES:

- CONTRACTOR SHALL EXERCISE EXTREME CAUTION IN EXCAVATING AND TRENCHING ON THIS SITE TO AVOID EXISTING DUCTS, PIPING OR CONDUITS, ETC., AND TO PREVENT HAZARDS TO PERSONNEL AND/OR DAMAGE TO EXISTING UNDERGROUND UTILITIES OR STRUCTURES WHETHER OR NOT SHOWN AND INSTALLED BY ANY OTHER CONTRACTS. THE ENGINEER IS NOT RESPONSIBLE FOR THE LOCATION OF UNDERGROUND UTILITIES OR STRUCTURES WHETHER OR NOT SHOWN OR DETAILED AND INSTALLED BY ANY OTHER CONTRACTS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER SHOULD SUCH UNIDENTIFIED CONDITIONS BE DISCOVERED. THESE DRAWINGS AND SPECIFICATIONS DO NOT INCLUDE THE NECESSARY ELEMENTS FOR CONSTRUCTION SAFETY.
- CALL UNDERGROUND SERVICE ALERT (USA) AT 1 (800) 422-4133 OR APPLICABLE STATE AND LOCAL DIG SAFE OR UNDERGROUND ALERT HOTLINES PRIOR TO CONSTRUCTION START.
- ALL SITE BRANCH CIRCUITS SHALL INCLUDE AN EQUIPMENT GROUND CONDUCTOR THAT, AT MINIMUM, MATCHES THE SIZE OF THE ASSOCIATED BRANCH CIRCUIT CONDUCTOR. WHERE MULTIPLE BRANCH CIRCUITS ARE ROUTED/GROUPED TOGETHER, THE EQUIPMENT GROUNDING CONDUCTOR SHALL MATCH THE SIZE OF THE LARGEST BRANCH CIRCUIT CONDUCTOR IN THE GROUP.
- ALL ELECTRICAL EQUIPMENT MOUNTED OUTDOORS SHALL BE WEATHERPROOF (NEMA #3R).
- ALL CONDUIT ONLY SHALL BE PROVIDED WITH A NYLON PULL STRING.
- SEE ARCHITECTURAL/LANDSCAPE ARCHITECTURAL PLANS FOR EXACT LOCATIONS OF FIXTURES, PULLBOXES, MANHOLES, OTHER ELECTRICAL DEVICES, ETC. COORDINATE ALL UNDERGROUND STRUCTURES AND CONDUIT ROUTING WITH LANDSCAPE ARCHITECT PRIOR TO ROUGH-IN TO ENSURE THAT SUCH ITEMS ARE NOT PLACED IN CRITICAL LANDSCAPE PLANTING/HARDSCAPE AREAS.

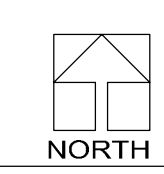


Long Beach City College - Swing Space

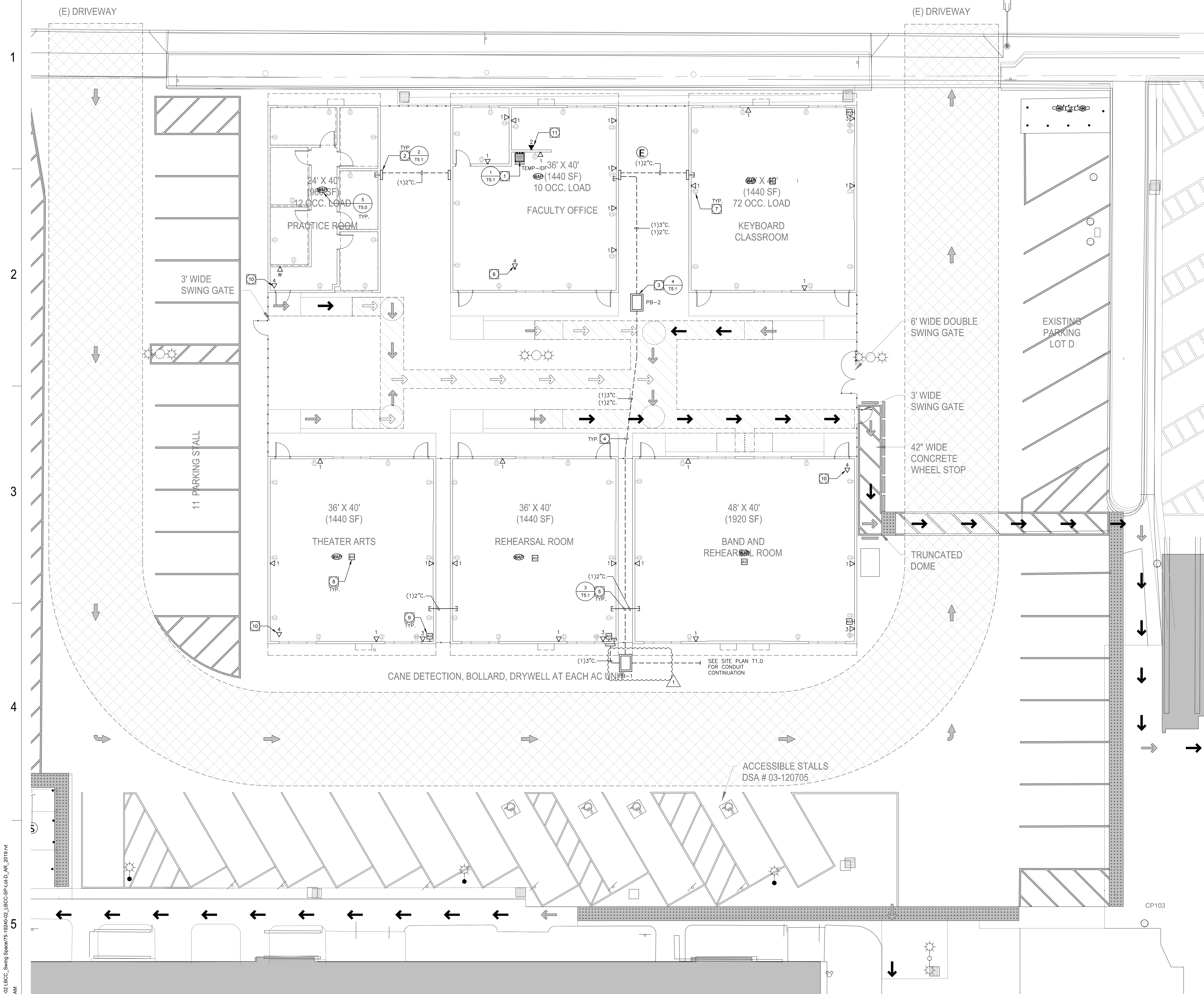
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▲ ADDENDUM 1 - 06/10/2021

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TECHNOLOGY
SITE
PLAN

T1.0



HARVEY WAY STREET



PLAN NOTES:

- 1) OFCI 4FT TALL WALL MOUNTED IDF CABINET, CABINET TO CONTAIN FIBER DISTRIBUTION ENCLOSURE, PATCH PANELS, WIRE MANAGERS, SWITCHES, ETC FOR A COMPLETE STRUCTURED CABLING SYSTEM INSTALLATION. PROVIDE DEDICATED QUAD 120V/20A RECEPTACLE INSIDE IDF CABINET.
- 2) PROVIDE 24"x24"x8" NEMA 3R SURFACE MOUNT PULLBOX. CONDUIT SHALL STUB UP INTO PULLBOX AND ROUTE INTO PORTABLE CEILING SPACE.
- 3) PROVIDE 2"x3" DEPTH AS REQUIRED UNDERGROUND PULLBOX. PULLBOX SHALL BE PROVIDED WITH TRAFFIC RATED LID.
- 4) PROVIDE UNDERGROUND CONDUIT WITH PULL STRING. SIZE AND QUANTITY AS NOTED ON PLANS. CONDUIT BUSHING SHALL BE INSTALLED ON BOTH ENDS OF CONDUIT.
- 5) PROVIDE SEAL-TITE CONDUIT SLEEVES BETWEEN PORTABLES. CONDUIT AND QUANTITY PER PLANS.
- 6) PROVIDE POWER/DATA POLE FOR WORKSTATION CLUSTER.
- 7) ELECTRICAL RECEPTACLES SHOWN FOR REFERENCE ONLY. REFER TO PC APPROVED MODULAR DRAWINGS AND ARCHITECTURAL PLANS FOR MORE INFORMATION.
- 8) PROVIDE PROJECTOR CEILING MOUNT EXTRON PCM 340 (#70-656-23) FOR OWNER FURNISHED AND INSTALLED PROJECTOR. TYPICAL AT ALL PROJECTOR LOCATIONS. MOUNT PER 4/A2.1.
- 9) PROVIDE 3-GANG BACKBOX WITH (2) 1/2" CONDUIT. STUBBED UP TO ACCESSIBLE CEILING SPACE.
- 10) (CFCI) 4-PORT BISCUIT ABOVE T-BAR CEILING FOR OFCI EXTERIOR CAMERAS AND WAPS. SEE DETAIL 3/75.0.
- 11) (2) TELEPHONE LINES FOR FIRE ALARM CONTROL PANEL.

GENERAL NOTE:

1. PORTABLE ASSISTIVE LISTENING SYSTEM PROVIDED BY COMMUNITY COLLEGE DISTRICT ON REQUEST OF USER. REFER TO ARCHITECTURAL PLANS FOR SIGNAGE INFORMATION.

COMMUNICATIONS PATHWAYS

GENERAL NOTES:

1. CONDUITS SHALL (a) CONTAIN NO CONTINUOUS SECTIONS LONGER THAN 30M (98 FT.), AND (b) CONTAIN NO MORE THAN (2) 90° BENDS OR (1) REVERSE BEND WITHOUT INSTALLING A PULL BOX. SPLIT CONDUITS IN PLACE OF PULL BOXES ARE UNACCEPTABLE.
2. CONDUITS SHALL CONTAIN PLASTIC OR NYLON PULL TAPE RATED AT 200 LBS. WITH A MINIMUM OF 5 FEET OF EXTRA PULL TAPE COILED AT EACH END.
3. CONDUIT BEND RADIUS SHALL BE (a) A MINIMUM OF 6 TIMES THE INTERNAL CONDUIT DIAMETER FOR CONDUITS 2-INCHES IN DIAMETER OR LESS, AND (b) 10 TIMES THE INTERNAL CONDUIT DIAMETER FOR CONDUITS MORE THAN 2-INCHES IN DIAMETER.
4. TERMINATE CONDUIT STUBS AND SLEEVES THAT PROTRUDE THROUGH STRUCTURAL FLOORS 2-INCHES TO 3-INCHES ABOVE THE FLOOR SURFACE.
5. INSTALL BUSHINGS OR BELL ENDS AS REQUIRED ON ALL CONDUITS.
6. FLEX CONDUIT IS UNACCEPTABLE FOR USE AS A COMMUNICATIONS CONDUIT EXCEPT AT SEISMIC JOINTS AND/OR IF APPROVED IN WRITING BY THE ENGINEER.
7. ALL UNDER SLAB OR IN-SLAB CONDUITS SHALL BE INSTALLED IN A MANNER THAT PREVENTS WATER INFILTRATION OF THE CONDUIT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE GROUND WATER, RAIN WATER OR CONSTRUCTION WATER IS PREVENTED FROM ENTERING AND/OR REMOVED FROM THE CONDUITS PRIOR TO PLACEMENT OF COMMUNICATIONS CABLES. SEE ELECTRICAL SPECIFICATIONS, DETAILS AND PLANS FOR ADDITIONAL CONDUIT SEALING REQUIREMENTS.
8. ALL PULL BOXES SHALL BE SIZED AND INSTALLED PER ANSI-TIA-569-C. PULL BOXES FOR IN/UNDER SLAB CONDUIT RUNS ARE NOT PERMITTED UNLESS OTHERWISE NOTED. PULL BOXES FOR OVERHEAD CONDUIT RUNS SHALL BE LOCATED ABOVE ACCESSIBLE CEILINGS WITHIN THE ACCESSIBLE CEILING SPACE AND SUPPORTED INDEPENDENTLY FROM THE STRUCTURE AND CONDUIT SUPPORTS. PULL BOXES FOR ROOF MOUNTED OR EXTERIOR ABOVE GRADE APPLICATIONS SHALL BE NEMA 3R RATED. PULL BOXES SHALL BE SIZED ACCORDING TO THE FOLLOWING:

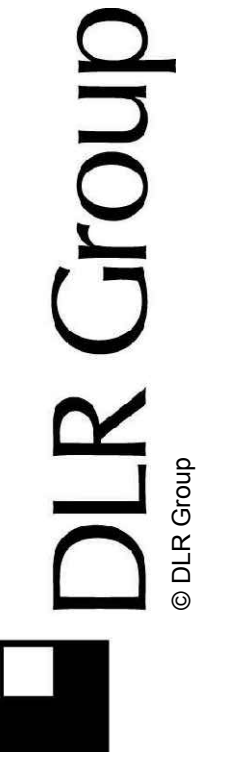
| CONDUIT SIZE | WIDTH | LENGTH | DEPTH | WIDTH INCREASE PER ADDITIONAL CONDUIT |
|--------------|-------|--------|-------|---------------------------------------|
| 1" | 4" | 16" | 3" | 2" |
| 2" | 8" | 36" | 4" | 5" |
| 3" | 12" | 48" | 5" | 8" |
| 4" | 15" | 60" | 8" | 8" |

FOR OTHER CONDUIT SIZES REFER TO ANSI/TIA-569-C TABLE 12. - LATEST PUBLISHED EDITION.

9. CONDUIT(S) SHALL EXIT A PULL BOX ON THE WALL OPPOSITE THE WALL ENTERED.
10. PROVIDE LABELING OF EACH CONDUIT PER GENERAL ELECTRICAL SPECIFICATIONS.
11. PROVIDE INTERNAL/EXTERNAL GAS AND WATER TIGHT MECHANICAL SEALING/PLUGGING OF EACH BUILDING ENTRY CONDUIT AS SPECIFIED ELSEWHERE IN THE DRAWINGS AND SPECIFICATIONS.



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Technology Lead - Jesus Quintero
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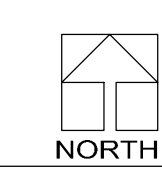
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REVISIONS
▲ ADDENDUM 1 - 06/10/2021

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TECHNOLOGY FLOOR PLANS

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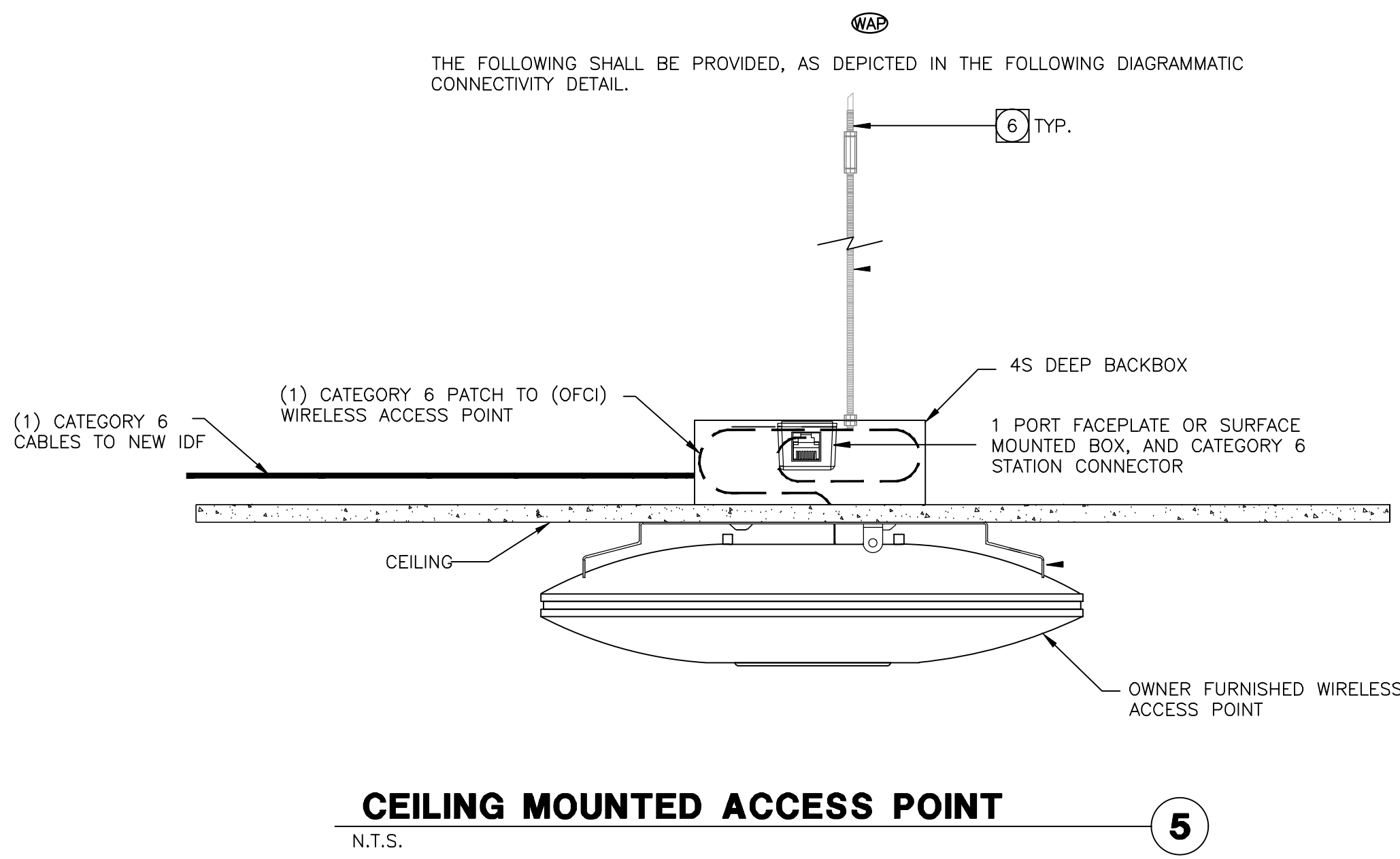
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TECHNOLOGY FLOOR PLANS
SCALE: 1/8" = 1'-0"



WHERE THE FOLLOWING SYMBOLS ARE INDICATED ON THE ELECTRICAL DRAWINGS ARCHITECTURAL DRAWINGS AND/OR STRUCTURED CABLING SYSTEM DRAWINGS:

THE FOLLOWING SHALL BE PROVIDED, AS DEPICTED IN THE FOLLOWING DIAGRAMMATIC CONNECTIVITY DETAIL.

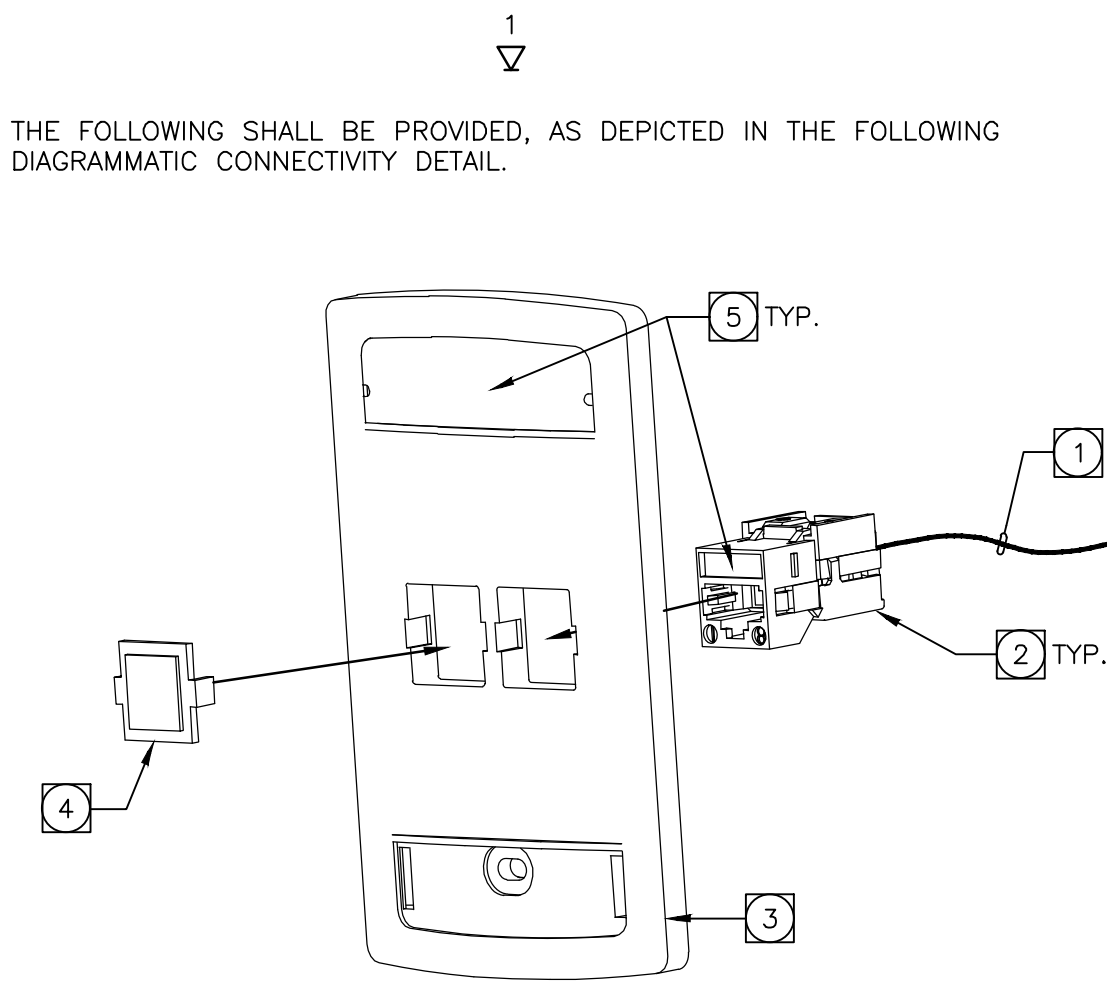


CEILING MOUNTED ACCESS POINT

N.T.S.

WHERE THE FOLLOWING SYMBOLS ARE INDICATED ON THE ELECTRICAL DRAWINGS ARCHITECTURAL DRAWINGS AND/OR STRUCTURED CABLING SYSTEM DRAWINGS:

THE FOLLOWING SHALL BE PROVIDED, AS DEPICTED IN THE FOLLOWING DIAGRAMMATIC CONNECTIVITY DETAIL.

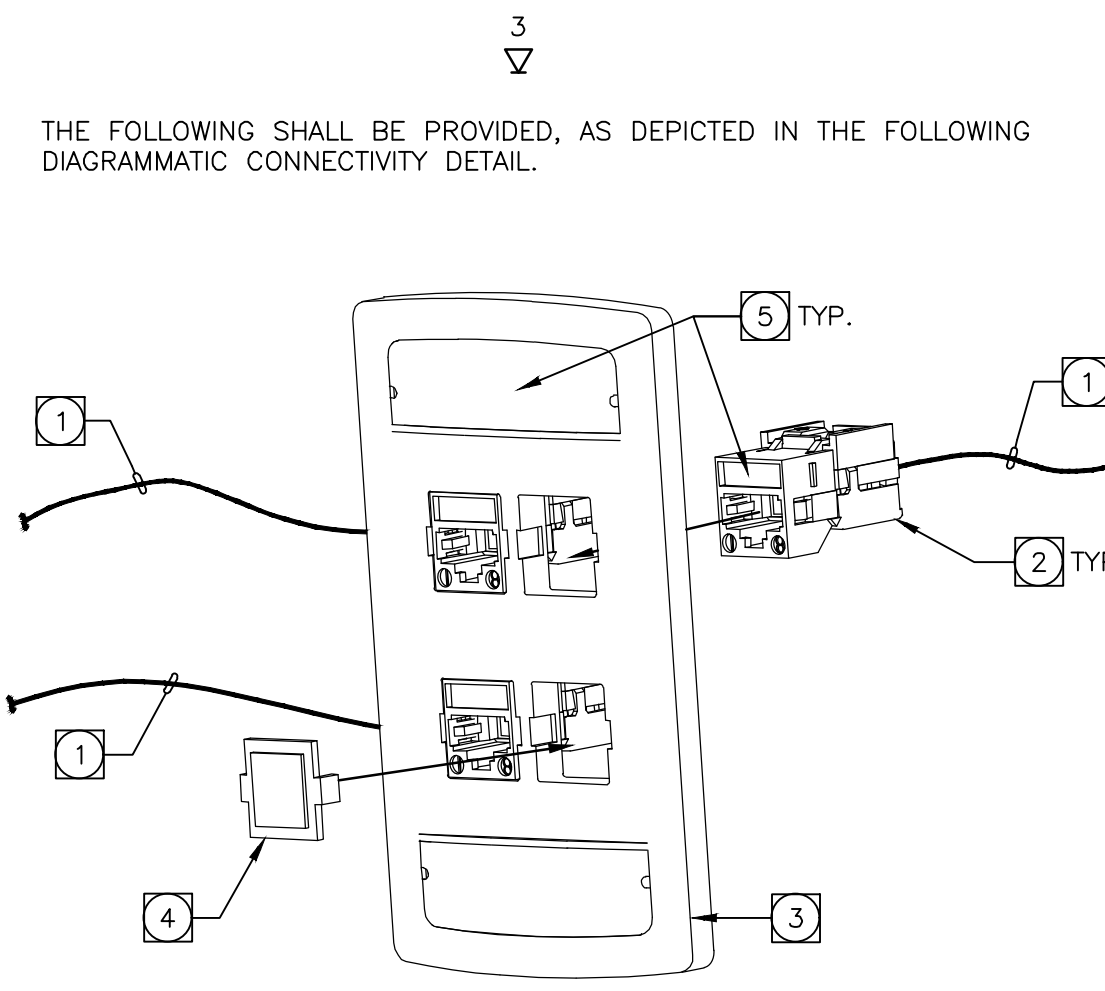


DATA DEVICE

N.T.S.

WHERE THE FOLLOWING SYMBOLS ARE INDICATED ON THE ELECTRICAL DRAWINGS ARCHITECTURAL DRAWINGS AND/OR STRUCTURED CABLING SYSTEM DRAWINGS:

THE FOLLOWING SHALL BE PROVIDED, AS DEPICTED IN THE FOLLOWING DIAGRAMMATIC CONNECTIVITY DETAIL.

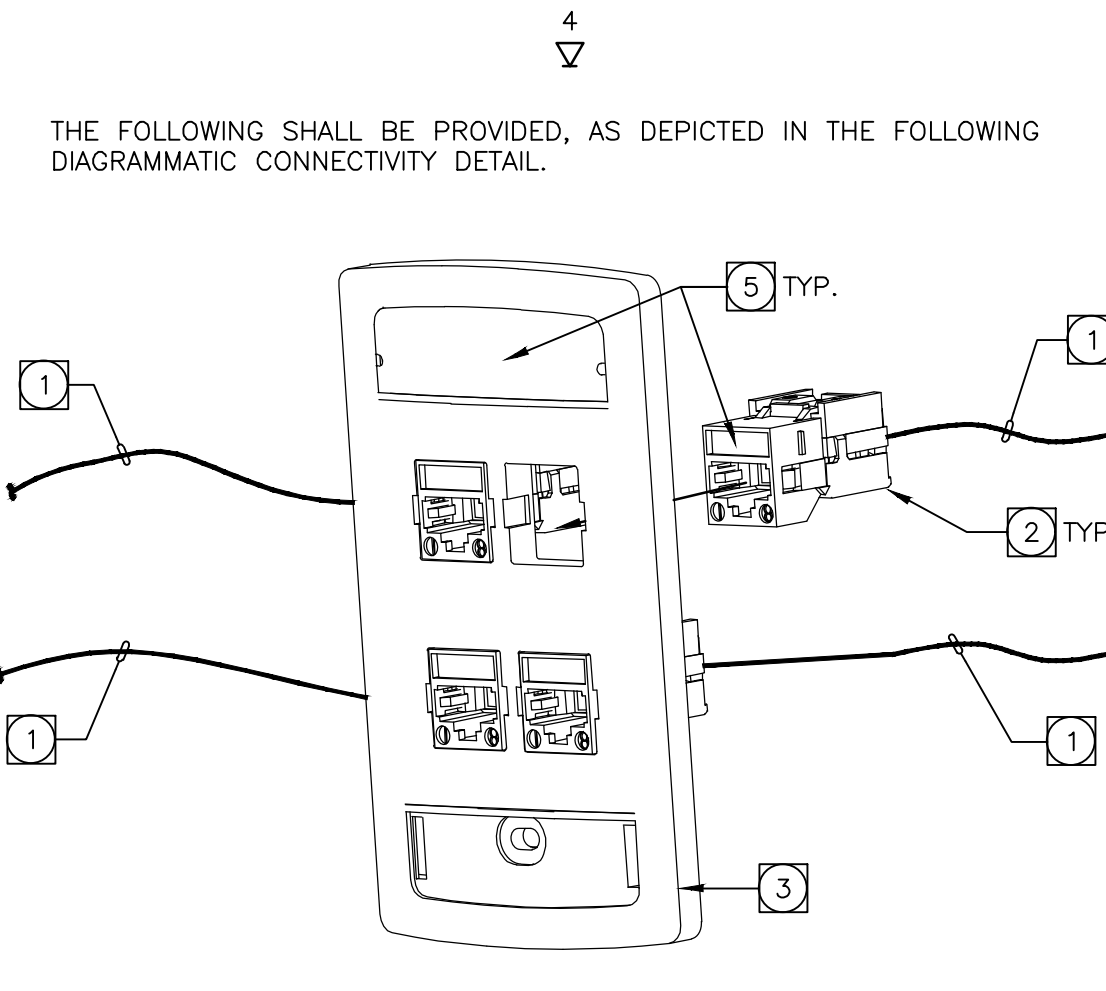


DATA DEVICE

N.T.S.

WHERE THE FOLLOWING SYMBOLS ARE INDICATED ON THE ELECTRICAL DRAWINGS ARCHITECTURAL DRAWINGS AND/OR STRUCTURED CABLING SYSTEM DRAWINGS:

THE FOLLOWING SHALL BE PROVIDED, AS DEPICTED IN THE FOLLOWING DIAGRAMMATIC CONNECTIVITY DETAIL.



DATA DEVICE

N.T.S.

FACEPLATE NOTES:

- 1 PROVIDE (1) CAT-6, 4-PAIR UTP CABLE(S) TO IDF RACK. TERMINATE STATION END(S) IN STATION CONNECTOR(S) PER SPECIFICATIONS. TERMINATE RACK END(S) ON CAT-6 PATCH PANEL(S) PER SPECIFICATIONS. COLOR OF CABLE(S) PER SPECIFICATIONS.
2 PROVIDE CAT-6 STATION CONNECTOR PER SPECIFICATIONS. COLOR PER DISTRICT STANDARDS.
3 PROVIDE FACEPLATE PER SPECIFICATIONS. FACEPLATE MATERIAL AND COLOR SHALL MATCH ADJACENT/NEARBY POWER FACEPLATES, U.O.N. IN SPECIFICATIONS.
4 BLANK INSERT. ALL UNUSED OPENINGS SHALL BE COVERED WITH A BLANK INSERT MATCHING THE COLOR OF THE FACEPLATE.
5 PROVIDE FACEPLATE LABELING PER SPECIFICATIONS. SEE SPECIFICATIONS FOR ALL OTHER LABELING REQUIREMENTS.
6 INSTALL DEDICATED SUSPENDED CEILING WIRE/HANGAR OR SUPPORT ROD/ROD HANGAR DIRECTLY TO STRUCTURAL CEILING ABOVE TO SUPPORT 2-PORT HOUSING AND/OR 4S BOX.
7 PROVIDE (1) SURFACE-MOUNT, PLENUM-RATED FOUR-PORT HOUSING. MOUNT TO CONTRACTOR-PROVIDED IN-CEILING BRACKET WITH MULTI-FUNCTION CLIP FOR ROD OR HANGER WIRE MOUNTING. PROVIDE 10FT SLACK LOOP ON J-HOOK MOUNTED ABOVE HOUSINGS. MOUNT HOUSING 12 INCHES ABOVE ACCESSIBLE CEILING TILE.
8 PROVIDE J-HOOK ABOVE ACCESSIBLE CEILING PER SPECIFICATIONS. J-HOOKS SHALL BE SPACED AT A MAXIMUM OF 5 FEET APART.
9 FOR WALL PHONE DEVICES, PROVIDE A STAINLESS STEEL FACEPLATE WITH STANDARD MOUNTING POSTS TOP AND BOTTOM. MOUNT AT 44" AFF UNLESS OTHERWISE INDICATED ON PLANS.

GENERAL NOTES:

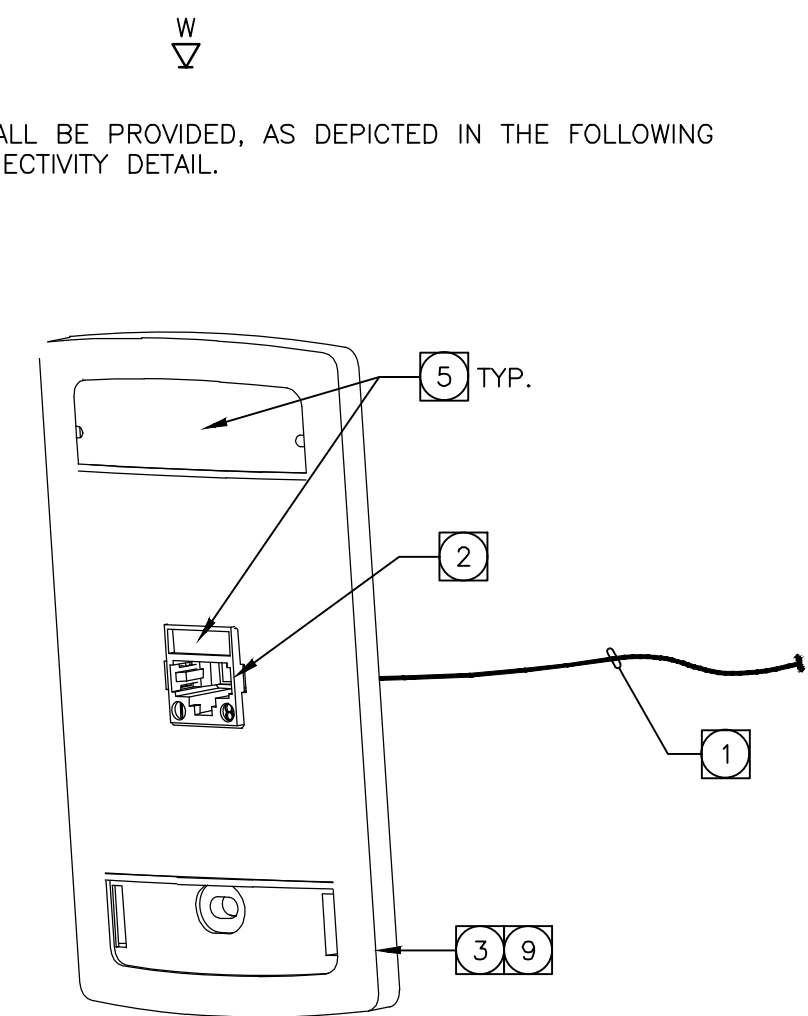
- 1. INSTALLATION OF EQUIPMENT AND WIRING MUST MEET ALL APPLICABLE CODES AND STANDARDS INCLUDING BUT NOT LIMITED TO CEC, NEC, NFPA, ANSI/EIA/TIA AND ISO 9001.
2. EQUIPMENT AND MATERIALS MUST COMPLY WITH UL LISTING AND EACH ITEM STAMPED OR LABELED AS SUCH.
3. COMPLIANCE WITH ANSI/TIA/EIA 569-B, COMMERCIAL BUILDING STANDARDS FOR TELECOMMUNICATIONS PATHWAYS AND SPACES.
4. COMPLIANCE WITH ANSI/TIA/EIA 568-C, COMMERCIAL BUILDING TELECOMMUNICATIONS CABLING STANDARDS.
5. DRAWINGS AND LAYOUTS ARE PRIMARILY DIAGRAMMATIC. CONTRACTOR IS RESPONSIBLE FOR FINAL FOOTAGES AND EXACT LOCATIONS.
6. CONTRACTOR SHALL NOTE IN WRITING, ANY DISCREPANCIES BETWEEN DRAWINGS AND SPECIFICATIONS, AS SUCH DISCREPANCIES ARISE, THE MORE STRINGENT SHALL TAKE PRECEDENCE.
7. REFERENCE ALL ELECTRICAL DRAWINGS.
8. REFERENCE ALL TECHNOLOGY SYSTEM DRAWINGS.
9. REFERENCE ALL ARCHITECTURAL DRAWINGS.
10. REFERENCE ALL ELECTRICAL AND STRUCTURED CABLING SYSTEM SPECIFICATIONS AND DISTRICT STANDARDS.
11. CONTRACTOR SHALL UTILIZE CONDUIT(S)/SLEEVE(S) SEQUENTIALLY, MAXIMIZING THE CABLE FILL IN EACH CONDUIT(S)/SLEEVE(S). MAXIMUM ALLOWABLE CONDUIT FILL SHALL BE BASED ON NEC TABLES FOR CONDUIT FILL.
12. IT IS THE INTENT OF THESE DRAWINGS FOR THE CONTRACTOR TO DESIGN, PROVIDE AND INSTALL A COMPLETE, FULLY OPERATIONAL AND TESTED SYSTEMS.

IDF WALL MOUNTED CABINET NOTES:

- 1 E.C. TO MOUNT 20 AMP DEDICATED CIRCUIT QUAD OUTLET WITH APPROPRIATE CONDUCTORS TO ELEC. PANEL ON THE INSIDE BACK WALL OF CABINET. COORDINATE LOCATION WITH SCS CONTRACTOR.
2 PAINTED A/C GRADE BACKBOARD BY E.C. SEE MOUNTING DETAIL FOR MORE INFORMATION.
3 E.C. PROVIDED 1/2" WITH #6-AWG GREEN GROUND CONDUCTOR EXOTHERMICALLY CONNECTED TO NEAREST BUILDING GROUND. CONNECT TO RACK MOUNTED BUS BAR WITH 2-HOLE COMPRESSION LUG.
4 2U HORIZONTAL WIRE MANAGEMENT. SCS CONTRACTOR TO INSTALL (1) WIRE MANAGER ABOVE AND BELOW EACH PATCH PANEL AND (1) BELOW EACH OWNER SUPPLIED DATA SWITCH.
5 SCS CONTRACTOR TO INSTALL OWNER PROVIDED 48" WALL MOUNTED CABINET. SCS CONTRACTOR TO MOUNT CABINET TO E.C. INSTALLED PLYWOOD.
6 SCS CONTRACTOR TO PATCH IN AND CROSS-CONNECT ALL EQUIPMENT PER OWNERS INSTRUCTIONS.
7 OFCI FIBER OPTIC ENCLOSURE. SCS CONTRACTOR TO TERMINATE OSP BACKBONE FIBER AS SPECIFIED.
8 PATCH PANEL AS REQUIRED PER SPECIFICATION. SCS CONTRACTOR SHALL PROVIDE QUANTITY OF PATCH PANELS AND JACKS NECESSARY TO TERMINATE ALL DATA CABLES.
9 1U HORIZONTAL WIRE MANAGEMENT.
10 CONDUITS FOR HORIZONTAL, RISER AND BACKBONE CABLES. QUANTITY AS REQUIRED.
11 SECURE AND NEATLY DRESS ALL HORIZONTAL, RISER AND BACKBONE CABLES ENTERING CABINET UTILIZING VELCRO. TYE-WRAPS ARE PROHIBITED.

WHERE THE FOLLOWING SYMBOLS ARE INDICATED ON THE ELECTRICAL DRAWINGS ARCHITECTURAL DRAWINGS AND/OR STRUCTURED CABLING SYSTEM DRAWINGS:

THE FOLLOWING SHALL BE PROVIDED, AS DEPICTED IN THE FOLLOWING DIAGRAMMATIC CONNECTIVITY DETAIL.

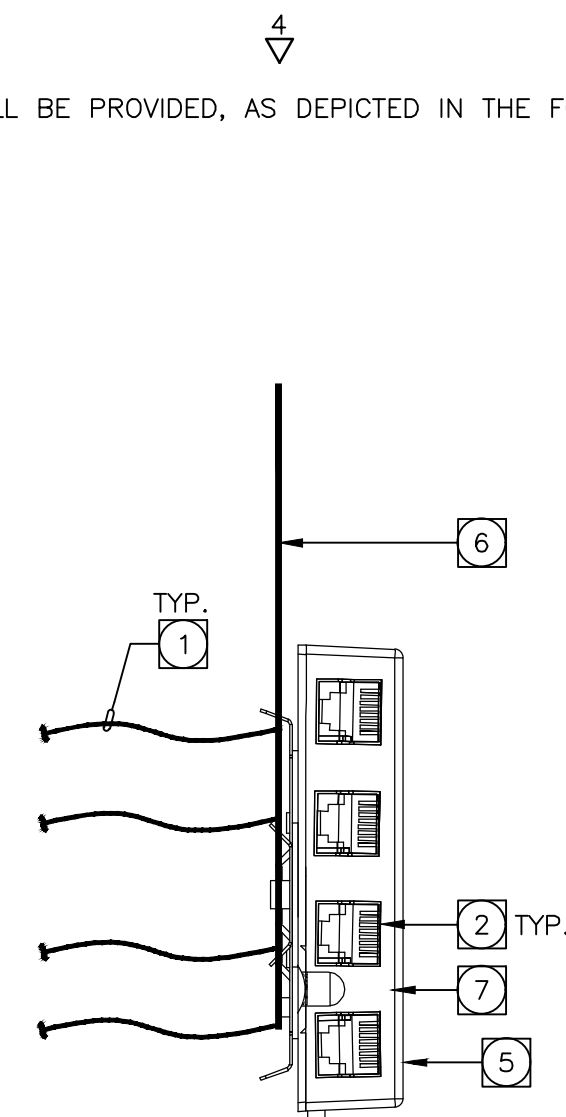


WALL PHONE DATA DEVICE

N.T.S.

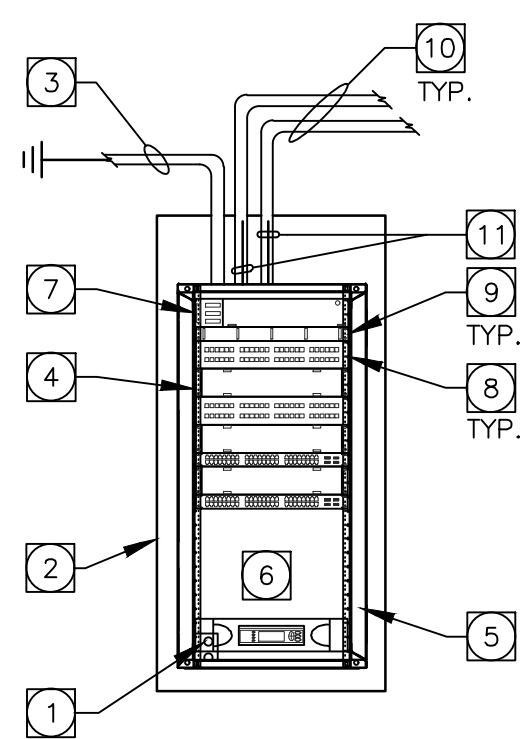
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THE FOLLOWING SHALL BE PROVIDED, AS DEPICTED IN THE FOLLOWING DIAGRAMMATIC CONNECTIVITY DETAIL.



DATA CEILING SURFACE MOUNT 4-PORT BISCUIT (CFCI)

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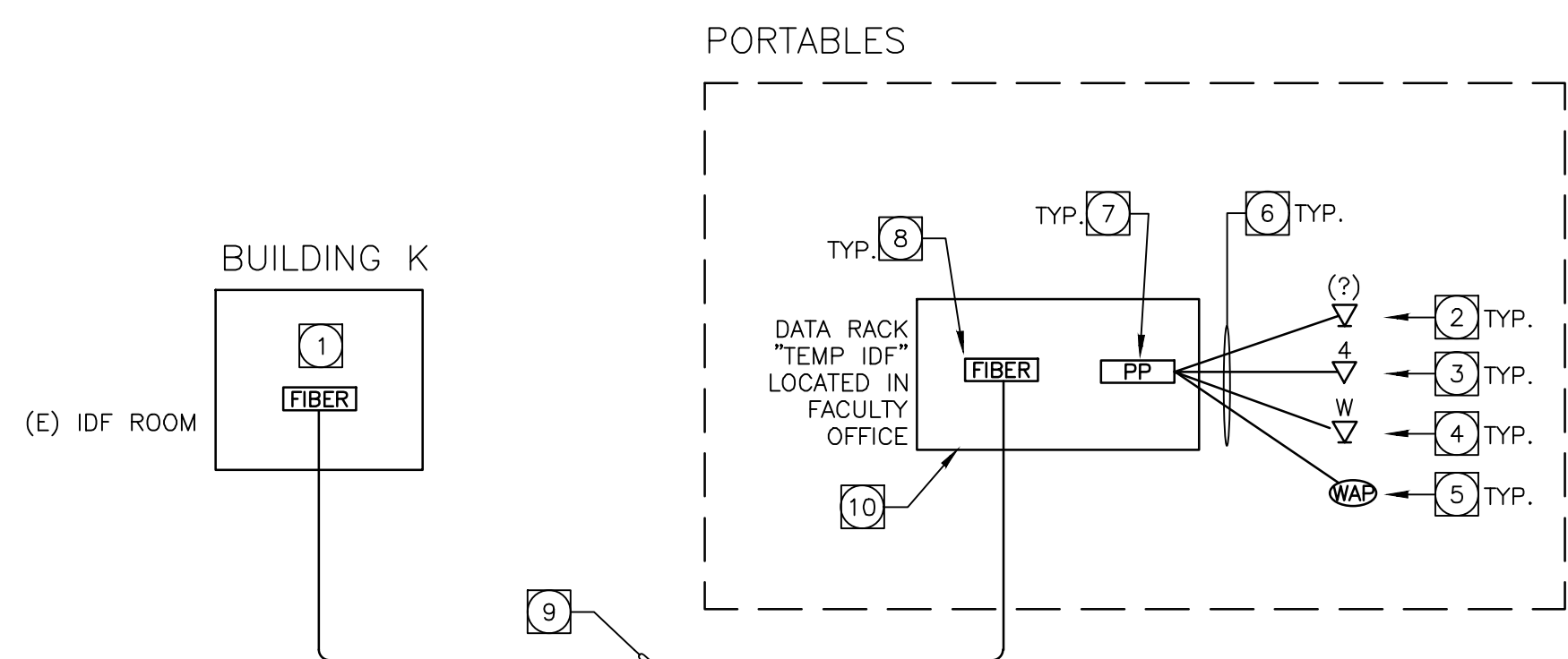


IDF CABINET - EQUIPMENT ELEVATION

N.T.S.

SYSTEM BLOCK DIAGRAM KEY NOTES:

- 1 TERMINATE FIBER OPTIC BACKBONE CABLE AT EXISTING CAMPUS LAN SYSTEM HEADEND. CONTRACTOR SHALL VERIFY LOCATION IN FIELD PRIOR TO ROUGH-IN. PROVIDE NEW RACK MOUNT FIBER OPTIC CONNECTOR PANEL COMPLETE WITH ALL FIBER CONNECTORS, PANELS, ADAPTERS, COUPLERS, FAN OUT KITS, FIBER PATCH CORDS, ETC. PER SPECIFICATIONS. TERMINATE AND LABEL ALL STRANDS. CROSS-CONNECT FIBER BACK TO MDF EQUIPMENT.
2 FLUSH WALL DEVICE. PROVIDE CAT-6 CABLES/JACKS QUANTITY PER PLANS. QUANTITY AND LOCATIONS PER SIGNAL PLAN DRAWINGS. SEE FACEPLATE DETAILS ON SHEET T5.0 FOR MORE INFORMATION.
3 CEILING-MOUNTED DEVICE. PROVIDE (4) CAT-6 CABLE/JACK. QUANTITY AND LOCATIONS PER SIGNAL PLAN DRAWINGS. SEE FACEPLATE DETAILS ON SHEET T5.0 FOR MORE INFORMATION.
4 TELEPHONE WALL DEVICE. PROVIDE (1) CAT-6 CABLE/JACK AT LOCATION PER SIGNAL PLAN. SEE FACEPLATE DETAIL ON SHEET T5.0 FOR MORE INFORMATION.
5 FLUSH CEILING DEVICE FOR WIRELESS ACCESS POINT ELECTRONICS. PROVIDE TWO (1) CAT-6 CABLES/JACKS. QUANTITY AND LOCATIONS PER SIGNAL PLAN DRAWINGS. SEE FACEPLATE DETAILS ON SHEET T5.0 FOR MORE INFORMATION.
6 CATEGORY-6 UTP 4-PAIR CABLE(S). CABLE QUANTITIES AT EACH DEVICE LOCATION AND ON CAT-6 PATCH PANEL AT IDF LOCATION. SEE SIGNAL PLAN DRAWINGS FOR LOCATIONS AND QUANTITIES. SEE SPECIFICATIONS AND BDF/IDF ROOM DETAILS FOR MORE INFORMATION.
7 RACK MOUNT CATEGORY-6 PATCH PANEL(S) PER SPECIFICATIONS. QUANTITY AS REQUIRED TO TERMINATE ALL CAT-6 CABLES.
8 RACK MOUNT FIBER OPTIC CABLE CONNECTOR PANEL COMPLETE WITH ALL FIBER CONNECTORS, PANELS, ADAPTERS, COUPLERS, FAN OUT KITS, FIBER PATCH CORDS, ETC. PER SPECIFICATIONS. TERMINATE AND LABEL ALL STRANDS. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
9 FIBER OPTIC BACKBONE CABLE PER SPECIFICATIONS. REFER TO SITE PLAN FOR UNDERGROUND PATHWAY INFORMATION. PROVIDE 12-STRANDS SINGLEMODE (DATA). TERMINATE ALL STRANDS BOTH ENDS. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
10 OFCI 48" TALL WALL MOUNTED EQUIPMENT CABINET. PROVIDE PATCH PANELS, HORIZONTAL WIRE MANAGERS, PATCH CORDS, ETC. FOR A COMPLETE SYSTEM. SEE DISTRICT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

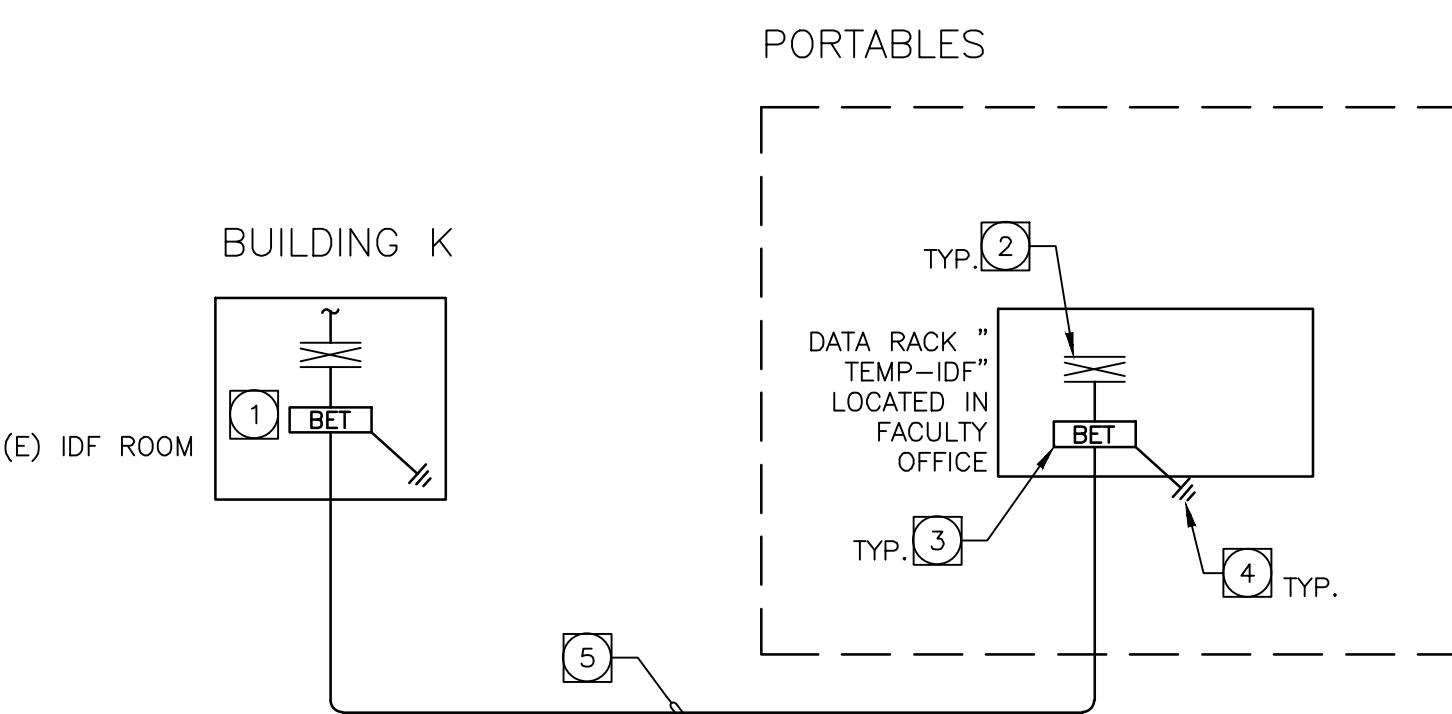


BACKBONE FIBER OPTIC AND STRUCTURED CABLING SYSTEM BLOCK DIAGRAM

SCALE: NTS

COPPER BACKBONE CABLING BLOCK DIAGRAM

SCALE: NTS



LEGEND:

- WALL MOUNT MULTIPAIR CABLE 6MM CROSS CONNECT BLOCKS PER SPECIFICATIONS
BUILDING ENTRANCE PROTECTOR WITH FUSED MODULES PER SPECIFICATIONS

GENERAL NOTES:

- 1. DRAWINGS AND LAYOUTS ARE PRIMARILY DIAGRAMMATIC IN NATURE. CONTRACTOR IS RESPONSIBLE FOR FINAL FOOTAGES AND EXACT LOCATIONS.
2. VERIFY ALL QUANTITIES AND LOCATIONS WITH PLAN DRAWINGS AND PROJECT SPECIFICATIONS.
3. CONTRACTOR'S SHALL PROVIDE ALL COMPONENTS, MATERIAL, LABOR, EQUIPMENT, SUPPLIES, TESTING AND ACCESSORIES REQUIRED FOR A COMPLETE AND OPERABLE SYSTEM.
4. CONTRACTOR SHALL PROVIDE ALL BACKBONE CABLE(S), PROTECTORS, PROTECTOR MODULES, PROTECTOR GROUNDING, CABLES, JACKS, FACEPLATES, CABLE SUPPORTS, TERMINATION BLOCKS, JUMPERS, LABELING, LABOR, AND ANY ADDITIONAL COMPONENTS REQUIRED FOR A COMPLETE SYSTEM, AND PER THE PROJECT SPECIFICATIONS.
5. GROUNDING AND BONDING OF ALL BACKBONE CABLE SHIELDS ARE REQUIRED. FOR CABLES SMALLER THAN 1 INCH IN DIAMETER, CONTRACTOR SHALL USE "STUD-COIN" TYPE BONDING CONNECTORS ON THE CABLES AND THE APPROPRIATE CONNECTOR AT THE GROUND POINT. FOR CABLES LARGER THAN 1.25 INCHES IN DIAMETER, CONTRACTOR SHALL USE (2) "BULLET BOND" CONNECTORS ON OPPOSING SIDES OF THE SHEATH. USE OF "PAIR SAVERS" IS REQUIRED ON ALL CABLES UNDER THE BONDING CLIP.

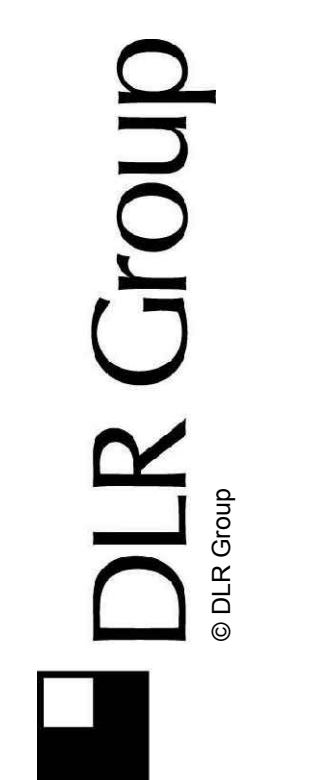
SYSTEM BLOCK DIAGRAM KEY NOTES:

- 1 EXISTING IDF ROOM. CONTRACTOR SHALL VERIFY LOCATION IN FIELD PRIOR TO ROUGH-IN. TERMINATE UNDERGROUND CABLE ON CONTRACTOR-PROVIDED BET. PROVIDE ALL CROSS CONNECT JUMPERS AS REQUIRED TO EXTEND DIAL TONE CIRCUITS TO MAIN TELEPHONE BACKBOARD AT MDF ROOM.
2 WALL MOUNT 10-PAIR SERIES 2 TERMINATION BLOCKS WITH TRANSPARENT LABEL HOLDERS AND MACHINE GENERATED LABELS. PER SPECIFICATIONS. MOUNT BLOCKS ON A TYPE 85 BACK MOUNT FRAME. QUANTITY REQUIRED TO TERMINATE ALL CABLE PAIRS. MOUNT ADJACENT TO BUILDING ENTRANCE PROTECTOR. PROVIDE WIRE MANAGEMENT BETWEEN TERMINALS. PROVIDE 1-PAIR JUMPER(S) FROM CROSS CONNECT BLOCK TO BET TO EXTEND DIAL TONE TO JACK(S).
3 BUILDING ENTRANCE PROTECTOR (BET) WITH FUSED MODULES PER SPECIFICATIONS. QUANTITY AS REQUIRED TO TERMINATE ALL BACKBONE CABLE PAIRS. TYPICAL. PROVIDE CROSS CONNECT JUMPERS FROM ALL PAIRS TO WALL MOUNTED CROSS CONNECTION BLOCK. LABEL ALL PAIRS ON BET AND CROSS CONNECT BLOCK.
4 BOND THE BET GROUND LUG(S) TO BUILDING GROUND USING A #6 AWG GREEN CONDUCTOR. ATTACH CONDUCTOR TO USING A 2-HOLE COMPRESSION LUG.
5 (1) CATEGORY-6 4-PAIR OSP-RATED COPPER BACKBONE CABLE PER SPECIFICATIONS. TERMINATE ALL PAIRS AT BOTH ENDS. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
6 PROVIDE BUILDING ENTRANCE TERMINAL PROTECTORS (BET) ON BOTH ENDS OF BACKBONE CABLE PAIRS. BOND BET'S WITH A #6AWG GREEN CONDUCTOR FROM THE BET GROUND LUG TO BUILDING GROUND. PROVIDE PLUG-IN SURGE PROTECTION 75V SOLID STATE MODULES FOR ALL PAIRS.
7 PROVIDE TEN (10) FEET SLACK LOOP OF OSP-RATED BACKBONE CABLE AT BOTH ENDS. NEATLY COILED, LABELED AND SECURED TO BACKBOARDS.
8 PROVIDE WEATHERPROOF PLASTIC LABELS ON EACH CABLE IDENTIFYING LOCATION OF BOTH ENDS, SYSTEM AND PAIR COUNT, (E.G.: BLDG-100, TEL, 100-PR). PROVIDE WEATHERPROOF PLASTIC LABELS AT END OF EACH CABLE. ON EACH CABLE IN EVERY VAULT, PULLBOX, HANDHOLE, AND AT TWENTY (20) FOOT INTERVALS WHERE CABLE IS VISIBLE AND ACCESSIBLE.
9 CONTRACTOR SHALL TEST ALL CABLE PAIRS PER SPECIFICATIONS. CONTRACTOR SHALL CROSS CONNECT ALL CABLE PAIRS AS REQUIRED SO THAT ALL DEVICES ARE FULLY FUNCTIONAL.



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Long Beach City College - Swing Space

100% CONSTRUCTION DOCUMENTS 02/25/2021 REVISIONS

ADDENDUM 1 - 06/10/2021

75-19240-03 DETAILS AND BLOCK DIAGRAM

T5.0






C2295 Addendum No. 1

Final Audit Report

2021-07-22

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