



CONTRA COSTA COMMUNITY COLLEGE

Contra Costa College
C-587 12kV Utility Upgrade

ADDENDUM #2 Date: June 20, 2011

NOTICE ALL CONTRACTORS SUBMITTING BIDS FOR THIS WORK AND TO ALL PLANHOLDERS:

You are hereby notified of the following changes, clarifications and/or modifications to the original Contract Documents, Project Manual, Drawings, Specifications and/or previous Addenda. This Addendum shall supersede the original Contract Documents and previous Addenda wherein it contradicts the same, and shall take precedence over anything to the contrary therein. All other conditions remain unchanged.

This Addendum forms a part of the Contract Documents and modifies the original Contract Documents dated **February 14, 2011**. Acknowledge receipt of this Addendum in space provided on the Bid Proposal Form. Failure to acknowledge may subject Bidder to disqualification.

The Bid Date remains unchanged by this Addendum.

GENERAL COMMENTS

1. Contractor Construction Staging and Parking: Owner shall provide Contractor Staging and Parking area southeast of Gym Annex (GA) Building, with vehicle access off of Castro Drive. This area has a locked entry gate. The Owner will provide a key for the Contractor during the Project. It is Contractors responsibility to provide security fencing for Contractors area. See attached Campus Map illustrating Contractor Parking area.
2. Vehicular Traffic Flow: Contractor shall maintain one vehicular traffic lane emergency/fire/service vehicles along that portion of Castro Drive and Library Drive, on College, in area of Work. One-way vehicle traffic along Castro Drive shall be combined with one-way vehicular traffic lane in College Parking Lot 6 to provide "vehicle in" and "vehicle out" access from College to Castro Drive. Contractor shall provide flag men as needed to direct vehicles and pedestrians impacted by the Work. See attached Campus Map illustrating Contractor Parking area.
3. Pedestrian Pathways: Contractor shall maintain existing College pedestrian access pathways in area of Work. See attached Campus Map illustrating Contractor Parking area.

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4. Hours of Operation: Work can be completed while College is in session and students and staff are on campus; except Work that interrupts the pedestrian pathways or one-way vehicular traffic lanes shall be completed when College is not in session when students and staff are not on campus (i.e. Sundays, Holidays), or when approved by Owner. See attached Campus Map illustrating Contractor Parking area.

ANSWERS TO BIDDERS QUESTIONS

- Q1. The electrical equipment that would need to be supplied does not seem to be able to be procured to meet the 120 work day time line. It is our experience that it takes 4-6 weeks for submittals and 6-8 weeks for the electrical equipment to actually ship. When you add in submittal review time and shipping time it does not seem like 120 days would be sufficient to receive the equipment. Can more time be allowed?

- A1. It is the responsibility of the Bidder to contact the approved vendors to determine and confirm if there is sufficient time to provide the specified equipment within the Contract Time.

THE FOLLOWING IS INFORMATIONAL ONLY:

“SWITCHGEAR: The approved vendors, Square D, Eaton, Siemens, and GE, have informed the District they will require 6-8 weeks for production time. The submittal review and approval will take 1-2 weeks. Shipping time will require 1-2 weeks.

SECTIONALIZING SWITCH: The approved vendors, G&W, and Cooper Power Systems, have informed the District they will require 4-6 weeks for production time. The submittal review and approval will take 1-2 weeks. Shipping time will require 1-2 weeks.”

- Q2. Drawing E212 shows conduits F1, F2, and a spare as well as a note referencing detail 3 on drawing 511, detail 3 on page 511 shows that there are 4 spare conduits in this run. Is there to be one spare or four spare conduits in this ductbank?

- A2. Drawing E212 does not indicate quantities. Per Detail 3/E511, provide four spare conduits. The intent is to provide one spare conduit for F1, one spare conduit for F2, and two spare conduits for telecommunications.

- Q3. It was referenced in the Pre-bid meeting that where the duct bank goes over the Hayward fault that we need to provide 4ft of expansion & deflection. Will a detail be provided for how to accomplish this or will this be a design build by the contractor?

- A3. TRENCH CROSSING HAYWARD FAULT: The 4ft of expansion and deflection will not be provided. In addition, concrete encasement is no longer required.

Per Detail 5/E511, each conduit shall be 5”C. HDPE with minimum 4-feet of slack for conduit deflection/expansion. The HDPE type conduit can be routed vertically or horizontally between Manhole 3B and 4A. HDPE type conduit provides slack in feet versus the limitation of the expansion and deflection fitting, providing slack for only a few inches. The intent of HDPE type is to provide enough slack that is capable of enduring fault movement for approximately 25-30 years. The adequate amount of expansion/deflection slack will prevent point of failure at the feeders during a

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fault/earthquake event. Expansion and deflection fittings are therefore not appropriate for this application.

CHANGES TO SPECIFICATIONS

1. Attached are the following pages of the Specifications revised by this Addendum to replace pages originally issued. Revisions are noted with an asterisk A2 (*A2) before and after the revised text. The Addendum number and date is at the bottom of the reissued pages.

Document	Title	Page Numbers
Section 16010	Basic Electrical Requirements	Pages 1 through 7
Section 16110	Raceways	Pages 1 through 4
Section 16195	Electrical Identification	Pages 1 through 3
Section 16410	Medium Voltage Metal-Enclosed Load Interrupter Switchgear (Air Interrupter Switches)	Pages 1 through 4
Section 16415	Padmount Sectionalizing Switch Two Position	Pages 1 through 4

CHANGES TO DRAWINGS

1. The following full size drawings are reissued to the Project. Revisions are noted with a "cloud" and a "delta 2" designation.

Drawing No.	Title	Date
E212-A2	Enlarged Partial Site Plan – Electrical	6/20/11
E312-A2	Single Line Diagram – New Work	6/20/11

If you have any questions regarding this Addendum No. 2, please contact the Office of the Facilities Planning & Management in writing, via facsimile or email to Jovan Esprit, Contract Manager jesprit@4cd.edu.

All other terms and conditions of BID are to remain the same.

tBP/Architecture

1000 Burnett Avenue, Suite 320
Concord CA 94520
925.246.641

Architect of Record: Gary Frye

Division of State Architect

END OF ADDENDUM #2

SECTION 16010

BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Electrical systems required for this work includes labor, materials, equipment, and services necessary to complete installation of electrical work shown on Drawings, specified herein or required for a complete operable facility and not specifically described in other Sections of these Specifications. Among the items required are:
 - a. Service and distribution equipment.
 - b. *A2 Feeders to switchgear, sectionalizing switches, Owner provided equipment and other equipment. *A2
 - c. *A2 *A2Low voltage systems.
 2. *A2 Electrical system required for this work also include contracting existing utility routed within the vicinity of work that can be disrupted or damaged. Notification of the existing utility in written form shall be submitted to Owner identifying all parties have been notified and confirmed. Disruption and damage of existing utility shall be the responsibility of the Contractor (including compensational fixing of damages) and not the College.
 3. Connection to Pacific Gas & Electric and campus feeder shall be coordinated with PG&E and the campus. *A2

1.02 DEFINITIONS

- A. Following is a list of abbreviations generally used in Division 16:
1. ADA Americans With Disabilities Act
 2. AHJ Authority Having Jurisdiction
 3. ANSI American National Standards Institute
 4. APWA American Public Works Association
 5. ASTM American Society for Testing and Materials
 6. CEC California Electrical Code
 7. CFC California Fire Code
 8. IEC International Electrotechnical Commission
 9. IEEE Institute of Electrical and Electronics Engineers.
 10. IETA International Electrical Testing Association
 11. FM FM Global
 12. NEMA National Electrical Manufacturers Association
 13. NFPA National Fire Protection Association
 14. OSHA Occupational Safety and Health Administration
 15. UL Underwriters Laboratories Inc.
- B. Provide: To furnish and install, complete and ready for the intended use.
- C. Furnish: Supply and deliver to the project site, ready for unpacking, assembly and installation.

- D. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at the project site to complete items of work furnished by others.

1.03 ADDITIONAL REQUIREMENTS TO DIVISION 01

- A. Product Submittals and Shop Drawings:
 - 1. When requested by individual Sections provide shop drawings which include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and the like. Refer to individual Specification Sections for additional requirements for the shop drawings.
 - 2. Provide product submittals and shop drawings in two formats – electronic (PDF, or portable document format) and paper. Electronic format must be submitted on CD, DVD, portable flash drive, or via e-mail in a zip file. Provide one electronic file for each specification section. When documents are submitted via e-mail, copy architect on all transmissions.
- B. Operation and Maintenance Documentation: Provide copies of certificates of code authority acceptance, test data, product data, guarantees, warranties, and the like.
- C. Shop Drawings: When requested by individual Sections provide shop drawings which include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and the like. Refer to individual Specification Sections for additional requirements for the shop drawings.
- D. Closeout Documentation: Submit electrical code authority certification of inspection. Include documentation of on-site electrical testing that was performed.
- E. Record Drawings:
 - 1. Show changes and deviations from the Drawings. Include written Addendum and change order items.
 - 2. Show exact routes of feeders 100 amp and larger, conduits for signal systems 2 inches in diameter and larger, and service entrance conduits.
 - 3. Show exact location of switchboards, panelboards, safety disconnects, and the like.
 - 4. Make changes to Drawings in a neat, clean, and legible manner. Make changes to drawings in electronic format. Obtain electronic copy from Architect, use the same version of AutoCAD to prepare record drawings as was used by the Architect. Provide electronic copy and hard copy to Architect for review.
 - 5. Provide a full size Record Drawing of the one-line power diagram sealed in a plastic coating. Submit to the Facilities Department for the campus.

1.04 QUALITY ASSURANCE

- A. Conform to the latest adopted version of the California Electric Code (CEC) with state amendments.
- B. Obtain and pay for electrical permits, plan review, and inspections from local AHJs.
- C. Furnish products listed by UL or other testing firm acceptable to AHJ.

- D. ***A2** Conform to requirements of the serving electric.***A2**
- E. Obtain and pay electrical permits and inspection from City of San Pablo for manhole/handhole including duct bank routed in the City of San Pablo property.
- F. ***A2** Coordinate work with the utility companies. Cost incurred relative to power service be paid by the Contractor. ***A2**

1.05 SEQUENCING AND SCHEDULING

- A. For the proper execution of the work cooperate with other crafts and contracts as needed.
- B. To avoid installation conflicts, thoroughly examine the complete set of Contract Documents. Resolve conflicts with Architect prior to installation.
- C. Prior to installation of feeders to equipment requiring electrical connections, examine the manufacturer's shop drawings, wiring diagrams, product data, and installation instructions. Verify that the electrical characteristics detailed in the Contract Documents are consistent with the electrical characteristics of the actual equipment being installed. When inconsistencies occur request clarification from Architect.

1.06 COORDINATION DOCUMENTS

- A. Prepare and submit layout drawings to coordinate installation and location of manholes, handholes and duct bank routing for electrical and signal systems. Prepare composite drawings showing all equipment on a single sheet. The civil plans, landscape plans, existing site plan form the base for the coordination drawings. Prior to completion of Drawings, coordinate proposed installation with the Architect, structural requirements, and other trades (including civil, and landscape), and provide required maintenance access and clearance. Systems include, although not limited to, the following:
 - 1. Luminaires (street and area).
 - 2. Medium voltage switchgear.
 - 3. Electrical equipment enclosures.
 - 4. Medium voltage sectionalizing switch.
 - 5. Route of 15 kV feeders.
 - 6. Manholes.
 - 7. ***A2** Handholes, pullboxes.***A2**
 - 8. ***A2** Existing duct bank, existing electrical routing. ***A2**
 - 9. Pad mounted transformers.
 - 10. Existing sewer lines, water lines, existing manholes.
 - 11. Existing fire hydrant.
 - 12. Existing irrigation, lines.
 - 13. Existing telephone lines and existing telephone manholes.
 - 14. Miscellaneous buried and surface routing that will be impacted by the duct bank routing.
 - 15. ***A2** Existing natural gas lines. ***A2**
- B. Prepare Drawings as follows:
 - 1. Prepare Drawings, to accurate scale, in latest AutoCAD graphics format printed to media as directed by Architect. Obtain construction document drawing files from the Architect, or Engineer, at cost plus. Drawings are to be same size as Contract Drawings and

- indicate location, size and elevation above finished floor of all wall mounted and suspended devices and equipment.
2. Plans are to incorporate all addenda items and change orders.
 3. Distribute plans to all trades and provide additional coordination as needed.
- C. Advise Architect, in event a conflict occurs in location of equipment, manhole, handhole, and duct bank routing. Bear all costs for relocation of equipment, resulting from failure to properly coordinate installation or failure to advise Architect of conflict.
- D. Provide means of access to all manholes and handhole and concealed equipment which may require access, adjustment or servicing.
- E. Final coordination drawings, with as-constructed information added, are to be submitted as record drawings at completion of project.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. *A2 Provide like items from one manufacturer, such as switchgear, sectionalizing switches, breakers, panels, and the like. *A2

2.02 MATERIALS

- A. Provide new electrical materials of the type and quality detailed, listed by UL, bearing their label wherever standards have been established. Indicated brand names and catalog numbers are used to establish standards of performance and quality. The description of materials listed herein governs in the event that catalog numbers do not correspond to materials described herein.
- B. Provide material and equipment that is acceptable to AHJ as suitable for the use indicated. For example, provide wet labeled equipment in locations that are wet.
- C. Include special features, finishes, accessories, and other requirements as described in the Contract Documents regardless of the item's listed catalog number.
- D. Provide incidentals not specifically mentioned herein or noted on Drawings, but needed to complete the system, in a safe and satisfactory working condition.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Construction Documents:
1. Drawings are diagrammatic with symbols representing electrical equipment, outlets, luminaires, and wiring.
 2. Electrical symbols indicating wiring and equipment shown in the Contract Documents are included in the Contract unless specifically noted otherwise.
 3. Examine the entire set of Drawings and Specifications to avoid conflicts with other systems. Determine exact route and installation of electrical wiring and equipment with

conditions of construction.

- B. Clarification:
1. The Drawings govern in matters of quantity, the Specification in matters of quality. In event of conflict on Drawings or in the Specifications, the greater quantity and the higher quality apply.
 2. Should the Electrical Documents indicate a condition conflicting with the governing codes and regulations, refrain from installing that portion of the work until clarified by Architect.

3.02 INSTALLATION

- A. Install electrical equipment complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of the electrical equipment, examine the instructions thoroughly. When requirements of the installation instructions conflict with the Contract Documents, request clarification from Architect prior to proceeding with the installation.
- B. Do not install electrical equipment in obvious passages, doorways, scuttles or crawl spaces which would impede or block the area passage's intended usage.
- C. Earthwork:
1. Refer to Division 02, Section 02200, "Earthwork."
 2. Perform excavation and backfill required for the installation of electrical work.
 3. *A2 Refer to Civil Drawings for additional information and installations. *A2
- D. Noise Control:
1. Do not install outlet boxes back to back. Do not use straight through boxes.
 2. Do not place contactors, transformers, starters and similar noise producing devices on walls which are common to occupied spaces unless specifically called for on Drawings. Where such devices must be mounted on walls common to occupied spaces, mount or isolate in such a manner as to effectively prevent the transmission of their inherent noise to the occupied space.

3.03 FIELD QUALITY CONTROL

- A. Tests:
1. Conduct tests of equipment and systems to demonstrate compliance with requirements specified in Division 16. Refer to individual Specification Sections for required tests. Document tests and include in Closeout Documents.
 2. During site evaluations by Architect, provide an electrician with tools to remove and replace trims, covers, devices, and the like, so that a proper evaluation of the installation can be performed.

3.04 CLEANING

- A. Remove dirt and debris caused by the execution of the electrical work.
- B. Leave the entire electrical system installed under this Contract in clean, dust-free and proper working order.

- C. Vacuum clean interiors of all new and modified electrical signal and communication equipment enclosures.

3.05 DEMOLITION

- A. Coordinate with Owner so that work can be scheduled not to interrupt operations, normal activities, building access, site access to different areas. The Owner will cooperate to the best of their ability to assist in a coordinated schedule, but will remain the final authority as to time of work permitted.
- B. Examination: Determine the exact location of existing utilities and equipment before commencing work, compensate the Owner for damages caused by the failure to locate and preserve existing utilities. Replace damaged items with new material to match existing.
- C. Promptly notify Owner if utilities are found which are not shown on Drawings.
- D. Execution:
 1. Remove existing manholes, duct banks, electrical equipment and devices, and associated wiring and conduits scheduled for remodeling, relocation, or demolition, unless shown as retained or relocated on Drawings.
 2. Maintain electrical continuity of existing systems. Remove or relocate electrical boxes, manhole, handhole, conduit, wiring, equipment, and the like, as encountered in removed or remodeled areas in the existing construction affected by this work. Reroute clear of the construction or demolition and maintain service to the existing load. Avoid existing obstructions to minimize disturbance to existing service.
 3. Where underground existing utilities are routed, provide marker flag and mark street and sidewalks where underground existing utilities are installed to avoid unearthing the buried utilities.
 4. Where the duct bank route crosses and parallel the route of the existing underground utilities provide temporary sharing not to undermine the existing utilities. The use of mechanical backhoe and earth digger may be limited depending on the quantity and closeness of the existing underground utilities that manual digging will be used to route the duct bank.
 5. Verify exact location and number of existing duct banks, manholes and utility routing in the field. Only partial existing electrical shown. Locations of items shown on Drawings as existing are partially based on Record and other Drawings which may contain errors. Verify the accuracy of the information shown prior to bidding and provide such labor and material as is necessary to accomplish the intent of the Contract Documents.
 6. Remove abandoned wiring to leave site clean.
 7. If existing electrical equipment contains PCBs (polychlorinated biphenyl), replace with new. Dispose of material containing PCBs as required by federal and local regulations.
 8. Repair adjacent construction and finishes damaged during demolition work.
 9. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

3.06 CONTINUITY OF SERVICE

- A. No interruption of services to any part of existing facilities will be permitted without express permission in each instance from the Owner. Requests for outages state the specific dates and hours and the maximum durations, with the outages kept to these specific dates and hours and

the maximum durations. Obtain written permission from the Owner for any interruption of power, lighting or signal circuits and systems.

- B. If overtime is necessary, there will be no allowance made by Owner for extra expense for such overtime or shift work, due to maintaining continuity of service herein required.
- C. Organize work to minimize duration of power interruption.

END OF SECTION

SECTION 16110

RACEWAYS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Raceways.
 - 2. Conduit fittings.
 - 3. Sleeves and chases.

1.02 SYSTEM DESCRIPTION

- A. Provide raceways, wires, cables, connector, boxes, devices, finish plates, and the like for a complete and operational electrical system.
- B. Electrical Connections: Connect equipment, whether furnished by Owner or other Divisions of the Contract, electrically complete.
- C. Supporting Devices: Safety factor of 4 required for every fastening device or support for electrical equipment installed. Support to withstand four times weight of equipment it supports. Provide seismic bracing per CBC requirements for this building location.

1.03 SUBMITTALS

- A. Submit For:
 - 1. Raceways.
 - 2. Conduit fittings.

1.04 REGULATORY REQUIREMENTS

- A. Conform to the latest adopted version of the California Electric Code (CEC), with state amendments.
- B. Furnish products listed by UL or other testing firm acceptable to AHJ.

1.05 SEQUENCING AND SCHEDULING

- A. Raceway System is Defined as Consisting of: Conduit, tubing or duct and fittings including but not limited to connectors, couplings, offsets, elbows, bushings, expansion and deflection fittings and other components and accessories. Complete electrical raceway installation before starting the installation of conductors and cables.
- B. Finished Surfaces: Prevent cutting in connection with finished work. Make repairs in a manner approved by Architect.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Raceways: Allied Steel, Certainteed, Jones & Laughlin, Carlon, Kraloy, or approved.
- B. Conduit Fittings: 0-Z Gedney, Thomas & Betts, Crouse & Hinds, or approved.

2.02 CONDUITS

- A. Galvanized Rigid Steel Conduit (RMC):
 - 1. Hot-dip galvanized after thread cutting.
 - 2. Manufacture in conformance with UL 6 and ANSI C80.1.
 - 3. Uniform finish coat with chromate for added protection.
- B. High Density Polyethylene (HDPE) Conduit
 - 1. Schedule 40
 - 2. Manufacture in conformance with UL 651 A&B Standard.
- C. Flexible Conduit, PVC Coated (LFMC):
 - 1. Hot-dip galvanize steel strip prior to forming and joining.
 - 2. PVC chemical resistant jacket extruded to core, up to 1 inch trade size.
 - 3. PVC chemical resistant jacket, tubed over core, up to 4 inch trade size.
- D. PVC (RNC):
 - 1. Schedule 40, heavy wall rigid PVC.
 - 2. Rated for use with 90C conductors.
 - 3. Manufacture in conformance with UL 651.

2.03 CONDUIT FITTINGS

- A. Bushings:
 - 1. ***A2** Insulated Type for Threaded Rigid, or Raceway Connectors without Factory Installed Plastic Throat Conductor Protection: Thomas & Betts 1222 Series or O-Z Gedney B Series. ***A2**
 - 2. ***A2** Insulated Grounding Type for Threaded Rigid, and Conduit Connectors: O-Z Gedney BLG Series. ***A2**
- B. Raceway Connectors and EMT Couplings:
 - 1. Steel conductor and coupling bodies, with zinc electroplate or hot-dip galvanizing.
 - 2. Connector locknuts are steel, with threading meeting ASTM tolerances. Locknuts are zinc electroplated or hot-dip galvanized.
 - 3. Connector throats (flexible conduit, metal clad cable and cordset connectors) have factory installed plastic inserts permanently installed. For normal cable or conductor exiting angles from the raceway (CEC bending radius), the cable jacket or conductor insulation bears only on the plastic throat insert.

4. Steel gland, Tomic or Breagle connectors and couplings are recognized for this Contract as having acceptable raceway to fitting electrical conductance.
5. Set screw connectors and couplings, without integral compression glands, are recognized for this Contract as not having acceptable raceway to fitting electrical conductance. A ground conductor sized per this Specification must be included and bonded within a raceway assembly utilizing this type connector or coupling.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Inserts, Anchors and Sleeves:
1. Coordinate location of inserts and anchor bolts for electrical systems prior to pouring concrete.
 2. Coordinate location of sleeves for electrical systems prior to pouring concrete, with consideration for other building systems.

3.02 INSTALLATION

- A. Conduit:
1. Conduit Joints: Assemble conduits continuous and secure to boxes, panels, luminaires and equipment with fittings to maintain continuity. Provide watertight joints where embedded in concrete, below grade or in damp locations. Seal PVC conduit joints with solvent cement and metal conduit with metal thread primer. Rigid conduit connections to be threaded, clean and tight (metal to metal). Threadless connections are not permitted for RMC.
 2. Conduit Placement:
 - a. Install continuous conduit and raceways for electrical power wiring and signal systems wiring.
 - b. Route raceway at least 6 inches from hot surfaces above 120F, including noninsulated steam lines, heat ducts, and the like.
 3. Below Grade Conduit and Cables:
 - a. Place a minimum 3 inch cover of sand or clean earth fill around the cable or conduit on a leveled trench bottom. Lay conduit on a smooth level trench bottom, so that contact is made for its entire length.
 - b. Remove water from trench before electrical conduit is installed.
 - c. When three or more conduits are in a single trench, use conduit spacers that will maintain 3 inch spacing between the conduits. Provide spacers on 5 foot centers.
 4. Maximum Bends: Install code sized pull boxes to restrict maximum bends in a run of conduit to 270 degrees.
 5. Conduit Terminations: Provide conduits shown on Drawings which terminate without box, panel, cabinet or conduit fitting with not less than five full threads. Bushings and metal washer type sealer between bushing and conduit end.
 6. Flexible Conduit: Install 12 inch minimum slack loop on flexible metallic conduit and PVC coated flexible metallic conduit.
 7. Conduit Size: Size as indicated on Drawings. Where size is not indicated, provide conduit in minimum code permitted size for THW conductors of quantity shown. Minimum trade size 3/4 inch.
 8. Conduit Use Locations:
 - a. Underground: Schedule 40 PVC.

- b. Wet Locations, and Subject to Mechanical Damage: RMC.
 - c. Damp Locations and Locations Exposed to Rain: RMC up to 2 inches in diameter.
 - d. Cast-In-Place Concrete and Masonry: RMC, HDPE, and PVC. Horizontal runs of conduit in poured-in-place concrete slabs, maximum diameter of conduit is 5 inches.
 - e. Dry, Protected: RMC.
 - f. Sharp Bends and Elbows: RMC, use factory elbows and long radius bends.
 - g. Install pull wire or nylon cord in empty raceways provided for other systems. Secure wire or cord at each end. Minimum 200 lbs cord.
 - h. Elbow for Low Energy Signal Systems: Use long radius factory ells where linking sections of raceway for installation of signal cable.
- 9. Branch Circuits: Do not change the intent of the branch circuit or controls without approval. Homeruns for 20 amp branch circuits may be combined to a maximum of six conductors in a homerun. Apply derating factors. Increase conductor size as needed.
 - 10. Feeders: Do not combine or change feeder runs.
 - 11. Unless otherwise indicated, provide raceway systems for conductors.
- B. Conduit Fittings:
- 1. Use threaded type fittings in wet locations, hazardous locations, and damp or rain-exposed locations where conduit size is greater than 2 inches.
 - 2. Use PVC coated rigid steel conduit ells for underground power conduits. Use 36-inch radius ells for power service conduits.
 - 3. Use insulated type bushings with ground provision at switchboards, panelboards, safety disconnect switches, junction boxes and the like that have feeders 60 amperes and greater.

END OF SECTION

SECTION 16195

ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Equipment identification labels.
 - 2. Conductor identification numbers.
 - 3. Underground utility markers.

1.02 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Coordinate names, abbreviations and other designations with equipment specified in this or other Divisions of the Specification or identified on Drawings.
 - 2. Fasten labels to equipment in a secure and permanent manner.
 - 3. Mark underground utilities in conformance with APWA.

1.03 REGULATORY REQUIREMENTS

- A. Conform to the latest adopted version of the California Electric Code (CEC), with state amendments.
- B. Furnish products listed by UL or other testing firm acceptable to AHJ.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Engraved Labels: Lamicoid, or approved.
- B. Conductor Numbers: Brady, or approved.
- C. Underground Utilities Ribbon: Allen Systems, Inc., or approved.

2.02 ENGRAVED LABELS

- A. Melamine plastic laminate, white with black core, 1/16-inch thick.
- B. Engravers standard letter style, minimum 3/16-inch high capital letters.
- C. Drill or punch labels for mechanical fastening except where adhesive mounting is necessary because of substrate. Use self tapping stainless steel screws.
- D. Dymo tape labels are not acceptable.

2.03 CONDUCTOR NUMBERS

- A. Manufacturer's standard vinyl-cloth self-adhesive cable and conductor markers of the wraparound type. Preprinted black numbers on yellow field. ***A2**

2.04 UNDERGROUND UTILITIES MARKERS

- A. Inert polyethylene plastic ribbon, 6-inch wide by 4 mil thick.
- B. Color code as recommended by APWA. Safety Red for electric power distribution. Safety Alert Orange for telephone, signal and data.
- C. Imprint over entire length of ribbon in permanent black letters, the system description, selected from manufacturer's standard legend which most accurately identifies the subgrade system.
***A2**

PART 3 - EXECUTION

3.01 GRAPHICS

- A. Coordinate names, abbreviations and designations used on Drawings with equipment labels.

3.02 UNDERGROUND UTILITIES MARKERS

- A. Install continuous tape, 6 to 8 inches below finish grade, for each exterior underground raceway.
- B. Where multiple small lines are buried in a common trench and do not exceed an overall width of 16 inches, install a single marker. Over 16 inch width of lines, install multiple tapes not over 10 inches apart (edge to edge) over the entire group of lines.

3.03 CONDUCTOR IDENTIFICATION

- A. Apply markers on each conductor for power, control, signaling and communications circuits where wires of more than one circuit are present.
- B. Match conductor identification used in panelboards, shop drawings, Contract Documents and similar previously established identification for Division 16 work.

3.04 EQUIPMENT/SYSTEM IDENTIFICATION

- A. Install an engraved label on each major unit of electrical equipment indicating both equipment name and circuit serving equipment (e.g. "EF-1, CKT. 2P1-1,3,5), including but not limited to the following items:
 - 1. Disconnect switches, identify item of equipment controlled.
 - 2. Service disconnect and distribution switches, identify connected load.

3.05 APPLICATION

- A. Install label on outside of surface panel.

- B. Install signs at locations detailed or, where not otherwise indicated, at location for best convenience of viewing without interference with operation and maintenance of equipment.
- C. Where signs are to be applied to surfaces which require finish, install identification after completion of painting.

END OF SECTION

SECTION 16410

MEDIUM VOLTAGE METAL-ENCLOSED LOAD INTERRUPTER SWITCHGEAR (AIR INTERRUPTER SWITCHES)

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Medium voltage metal-enclosed switchgear with air load interrupter switches.

1.02 REFERENCES

- A. ANSI/IEEE C37.20.3 - Standard for Metal-Enclosed Interrupter Switchgear.
- B. ANSI/IEEE C37.20.4 - Standard for Indoor AC Medium Voltage Switches used in Metal-Enclosed Switchgear.

1.03 SUBMITTALS

- A. The metal-enclosed switchgear assembly shall be in accordance with the contract documents, applicable codes, whichever is the most stringent.
- B. The manufacturer shall furnish a detailed Bill of Material and complete set of drawings.
 - 1. *A2 Single line diagrams.
 - 2. Meter and relay diagrams.
 - 3. Three-line diagrams of required protective devices.
 - 4. Control diagrams including DC tripping circuit.
 - 5. Proposed relay specs and setting.
 - 6. Three hour battery discharge test. *A2
- C. The manufacturer shall furnish comprehensive instruction manuals.

1.04 QUALITY ASSURANCE

- A. Manufacturer: The manufacturer of the switchgear must be the same as the manufacturer of the load interrupter switch.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. The following paragraphs apply only to the installing contractor.
 - 1. Accept equipment on site and inspect for shipping damage.
 - 2. Protect equipment from weather and moisture by covering with heavy plastic or canvas and by maintaining heat within enclosure in accordance with manufacturer's instructions.

PART 2 - PRODUCT

2.01 MANUFACTURERS

- A. ***A2** Switchgear: The metal-enclosed load interrupter switchgear shall be Square D type HVL, GE Breake Master LI Switch, Eaton MVS Medium Voltage Load Interrupter Fusible Switch and Siemens Metal-Enclosed Interrupter Switchgear or equal. ***A2**
- B. Fuses
 - 1. The switchgear shall be equipped with a FuseLogic (fuse tripping) system to provide anti-single-phase protection with the following features:
 - a. Direct acting, (15 kV up to 65 A "E" rated fuses) fuses to automatically open the manually operated load interrupter switch in the event of a blown fuse. For fuses rated higher than those shown, system shall be shunt trip operated directly from blown fuse contacts (control power required). Blocking the closing of the switch shall further prevent potential single-phasing conditions when a fuse is blown or if a fuse is not installed.
 - b. Prevention of potential anti-single-phase conditions by blocking the closing of the manually or motor operated load interrupter switch when a fuse is blown or if a fuse is not installed.
 - c. Three Form C auxiliary switches (1 per phase) for phase blown/missing fuse indication.
 - d. Fuses shall be fixed in position in a non-disconnect fuse mounting.

2.02 LOAD INTERRUPTER SWITCHGEAR ASSEMBLY

- A. ***A2** The metal-enclosed switchgear with load interrupter switches shall consist of a multiple section line-up, and be of outdoor non-walk-in type construction. The sections shall contain the load interrupter switches and the necessary accessory components. The equipment shall be factory-assembled with necessary shipping splits and operationally checked. The assembly shall be a self-supporting, floor mounted bay. ***A2**
- B. The integrated switchgear assembly shall withstand the effects of closing, carrying and interrupting currents up to the assigned maximum short circuit rating.
- C. A viewing window shall be installed in the switch enclosure and located so as to enable visible inspection of the switch blades and blown fuse indicators from outside the enclosure.
- D. System Voltage: 12 kV, 3-phase, solidly grounded, 3-phase, 3-wire without neutral bus.
- E. Operating Frequency: 60 Hz.
- F. Maximum Short Circuit Current: kA rms symmetrical.
- G. Maximum Design Voltage: 15.0 kV.
- H. Basic Impulse Level (BIL): 95 kV.
- I. Power Frequency Withstand: 60 kV.

- J. *A2 Enclosure: NEMA 3R, weatherproofed. *A2
- K. Short-Time Current (two second): 38 kA.
- L. Main Bus Ampacity: 600 amps, continuous.
- M. Integrated Short Circuit Rating: Match existing kA, rms symmetrical.

2.03 COMPONENTS

- A. Load Interrupter Switch
 - 1. Stored-Energy Mechanism
 - a. The load interrupter switch shall be rated at 600 amperes continuous and interrupting; and fixed mounted on glass reinforced polyester standoff insulators. The stored-energy, manually operated mechanism shall be equipped with separate opening and closing springs. Operation of the load interrupter switch shall be by means of a close/open lever. Operation shall be quick-make, quick-break with the speed of operation independent of the operator. The mechanism shall be equipped with FuseLogic.
- B. Switches shall utilize main current carrying paths and arcing interruption path type poles.
- C. The switch operating handle shall be permanently attached to the outside front of the switchgear and ready for immediate use, except for outdoor applications where the front of the switchgear shall be covered by a full-height solid door. The handle must operate in the conventional fashion with the switch closed with the handle in the up position and the switch open with the handle in the down position. Provisions shall be available for padlocking the switch in either the open or closed position.
- D. Voltage and Short Circuit Ratings: Match ratings specified for assembly.
- E. Momentary Rating: 40/61/80 kA, rms asymmetrical.
- F. Fault Closing: 40/61 kA, rms asymmetrical.

2.04 ACCESSORIES

- A. Surge Arresters (metal-oxide type): Distribution/Intermediate/Station class, rated kV, MCOV; one per phase.
- B. Incoming Cable Termination: Cable Lug.
- C. Provide double clamping lugs or compression lugs or mechanical lugs for terminating cables onto the switchgear terminal pads.
- D. Space Heaters: For 120 VAC, sized by the manufacturer, with thermostats. Manufacturer shall provide CPT to power space heaters.
- E. Mechanical Interlocks: The high-voltage compartment door shall be interlocked to prevent opening with the load interrupter in the closed position.

- F. Key Interlocks: 3.

2.05 FABRICATION

- A. Construction: Outdoor, non-walk-in. Each equipment bay shall be a separately constructed cubicle assembled to form a rigid free standing unit. Minimum sheet metal thickness shall be 11 gauge steel on all exterior surfaces. Adjacent bays shall be securely bolted together to form an integrated rigid structure. To assist installation and maintenance of bus and cables, provide split rear doors with a padlockable handle and three-point latching. Each individual unit shall be braced to prevent distortion.
- B. A viewing window shall be installed in a fixed panel of the enclosure to enable visual inspection of the disconnect blades from outside the enclosure.
- C. The high voltage fuses (when required) and non-disconnect type fuse mountings, shall be accessible only through a separate door mechanically interlocked with the load interrupter switch, so the load interrupter switch is opened before the door is opened and that the switch cannot be closed when the door is open.
- D. Main Bus shall be tin-plated copper, non-insulated rated 600 amps, and is to be supported from the top of the enclosure on NEMA class A-20 porcelain standoff insulators.
- E. For multiple bay lineups, include continuous ground bus through the switchgear assembly, securely connected to the steel frame of each cubicle.
- F. Outdoor units shall be designed with a sloped, drip-proof roof. The cubicles must have a door-in-door construction. The outer door shall be a bulkhead type door with three-point latching and vault type handle with provisions for padlocking.

2.06 FACTORY FINISHING

- A. All steel parts, shall be cleaned and a zinc-phosphate (outdoor equipment) pre-treatment applied prior to paint application.
- B. Paint color shall be ANSI-61 (light gray) or ANSI-49 (medium light gray) TGIC polyester powder, applied electrostatically through air. Following paint application, parts shall be baked to produce a hard durable finish. The average thickness of the paint film shall be 2.0 mils. Paint film shall be uniform in color and free from blisters, sags, flaking and peeling.
- C. Damage or scratched paint to be repaired with proper touch-up paint and applicator. If damage during delivery happens, it is to be returned and fixed with no additional cost to the Owner. Touch-up paint is only to be used as a minimum application just for scratched surfaces on both interior and exterior of the gear.

END OF SECTION

SECTION 16415

PADMOUNT SECTIONALIZING SWITCH TWO POSITION

PART 1 - GENERAL

1.01 DESCRIPTION

- A. ***A2** The switch shall be three phase 5-way, with two load breaks and three interrupters, manually operated load interrupting, vacuum interrupter, 600A linear puffer switches (VFI).
***A2**

1.02 QUALITY ASSURANCE

- A. ***A2** Manufacturer Qualifications: The chosen manufacturer shall have at least 20 years' experience in manufacturing vacuum interrupter insulated medium voltage switchgear. The manufacturer of the switches shall be completely and solely responsible for the performance of the load break switch and fault interrupter as well as the complete integrated assembly as rated.
***A2**
- B. ***A2** The manufacturer shall furnish certification of ratings of the load break switch and the integrated switch assembly upon request. The switch shall be a 5-way with two load breaks and three interrupters. ***A2**
- C. The switch shall comply with requirements of the latest revisions of applicable industry standards, including:
 - 1. IEEE C37.72, IEEE C37.74, ANSI/IEEE 386, IEC 60265-1.
- D. The switch manufacturer shall be ISO 9001:2000 and ISO 14001:2004 certified.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Load break switches shall be shipped preassembled at the factory. No field assembly shall be required.
- B. The contractor, if applicable, shall handle, transfer and move the switches in accordance with manufacturer's recommendations.

1.04 ***A2** SUBMITTALS

- A. Manufacturer shall furnish a detailed list of rating and accessories and set of drawings defined as follows:
 - 1. Detailed front elevation with mounting
 - 2. Single line diagram
 - 3. Base plan
 - 4. Schematics
- B. Manufacturer shall furnish instructional manuals covering the installation of the switch and operation of its various components. ***A2**

PART 2 - PRODUCTS

2.01 SWITCH CONFIGURATION

- A. Each switch shall be equipped with 3-phase load switch ways and 3-phase load unswitched ways, as indicated on the one-line diagram.
- B. Switches shall be configured as front access with in-line bushings, as indicated.
- C. *A2 Switch shall be 5-way with two load breaks and three interrupters.
- D. Interrupters shall be resettable with type 3 vacuum interrupter control. *A2

2.02 SWITCH CONSTRUCTION

- A. General: All switch components and entrances shall be assembled in a totally welded mild steel tank. Entrances shall be internally connected by copper conductors capable of handling momentary and continuous current duty. The switch shall contain no electrically floating metallic parts or components. Construction shall be a deadfront design. Switch tanks shall be painted ASA70 light gray using a corrosion-resistant epoxy paint.
- B. *A2 Puffer Vacuum Interrupter: Each switching way is to be equipped with an internally mounted operating mechanism capable of providing quick-make, quick-break operation in either switching direction. The mechanism must be capable of delivering sufficient torque and shall be provided with latches for each position to assure load interrupting, fault closing and momentary ratings. All switch positions are to be clearly identified, padlockable and adaptable to keylock schemes. The operating mechanism shall be actuated from outside the switch tank with an operating handle. The operating shaft shall be made of stainless steel providing maximum corrosion resistance. A double "O" ring type operating shaft seal shall be used for a leak resistant, long life seal. Switch contacts shall be a tulip-bayonet design and made of plated, high-conductivity copper alloy with arcing tips of copper/tungsten alloy to assure permanent low resistance and to avoid sticking during operation. The contacts shall be designed such that arcing does not occur in the area of main current interchange and contact pressure will increase with increased current flow. The stationary contacts shall be supported independent of the cable entrance bushings, eliminating possible misalignment. Contact travel shall be a minimum of 3 inches and have sufficient open contact separation to assure efficient arc extinction and to withstand field DC testing levels and maintain BIL levels. Switch contacts shall be clearly visible in the open position through viewing windows. Auxiliary blades used for load interruption are not acceptable. *A2

2.03 DESIGN RATINGS

- A. Load Break Switches
- B. The switch shall be rated:

SELECTION OF RATINGS	IEEE/IEC
Maximum Design Voltage, kV	15.5
Impulse Level (BIL) Voltage, kV	110

Continuous Current, Amperes	630
Load break Current, Amperes	630
One Minute Withstand (dry), AC kV	35
Production Test Rating	34
15 Minute Withstand, DC kV	53
Momentary Current, kA, ASYM	40
Fault-Close Current, kA, ASYM	40
One Second Current, kA, SYM	25
Mechanical Endurance, Operations	2000
Load Break Operations at 600 Amperes	1200

2.04 CABLE ENTRANCES

- A. Cable entrances shall be tested to IEEE 386 and be, as indicated on the switch drawing:
 1. 600 amp G&W Quik-Change disconnectable apparatus bushing,

2.05 ENCLOSURE

- A. Enclosures shall be made of 12 gauge galvanized steel and manufactured to ANSI C37.72 and C57.12.28 standards. The enclosure shall be mounted independent of the switch allowing removal for ease of cable installation or future replacement if required. Enclosures shall be tamper-resistant incorporating hinged access doors with pentahead locking bolts and provisions for padlocking. The enclosure shall be provided with lifting provisions and painted with a Munsell 7.0GY3.29/1.5 green finish.

2.06 *A2 PRODUCTION TESTING

- A. Continuity test to assure correct internal connection.
- B. Hi-Pot test to determine dielectric strength of the unit.
- C. Pressure test to assure tank is completely sealed.
- D. Electrical TCC trip test. *A2

2.07 STANDARD COMPONENTS

- A. The following shall be included as standard:
 1. Welded steel tank painted light gray with stainless steel and brass fasteners.
 2. Lifting provisions.
 3. Gas pressure gauge and fill valve.
 4. Grounding provisions for switch tank and all cable entrances.
 5. Stainless steel three line diagram and corrosion-resistant nameplates.

6. Parking stands.
7. Switch operating handle(s) with padlock provision and end stops.
8. 12 gauge galvanized steel padmount enclosure painted Munsell green with stainless steel hinges and pentahead locking mechanisms.
9. ***A2** Switch shall have type 3 vacuum interrupter control. ***A2**

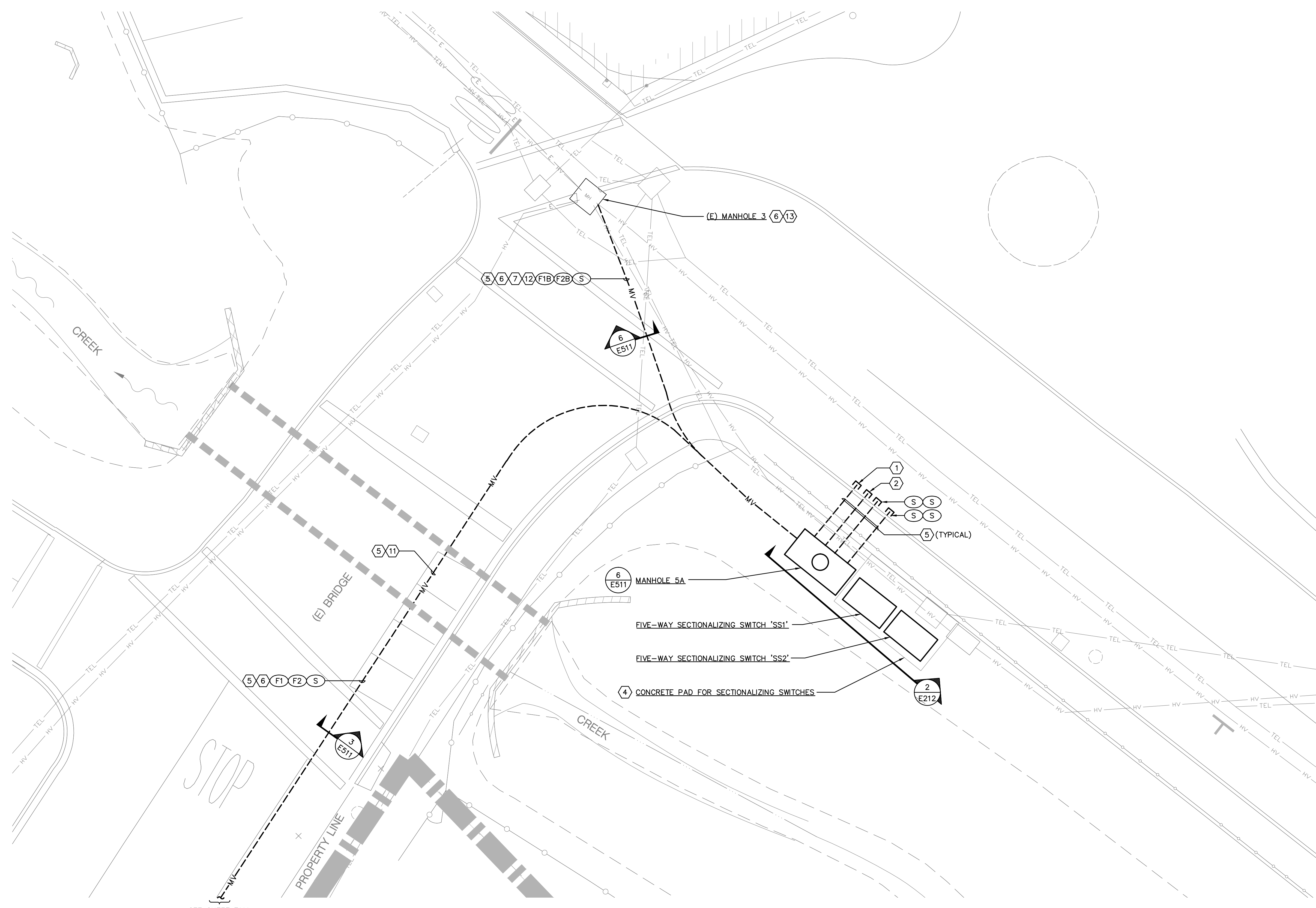
2.08 OPTIONS

- A. ***A2** The following options shall be supplied:
1. 304 stainless steel tank.
 2. Temperature compensated gas density gauge.
 3. Low pressure warning device.
 4. Remote/SCADA and automatic transfer.
 5. 4/0 brass ground lug(s).
 6. Keylocks to lock in open position.
 7. 600 amp Apparatus Bushings.
 8. Current transformers for load break ways.
 9. Potential transformers for voltage monitoring and/or control power.
 10. Auxiliary switches for remote switch position indication.
 11. Digital voltage sensors.
 12. Voltage indication panel(s). ***A2**

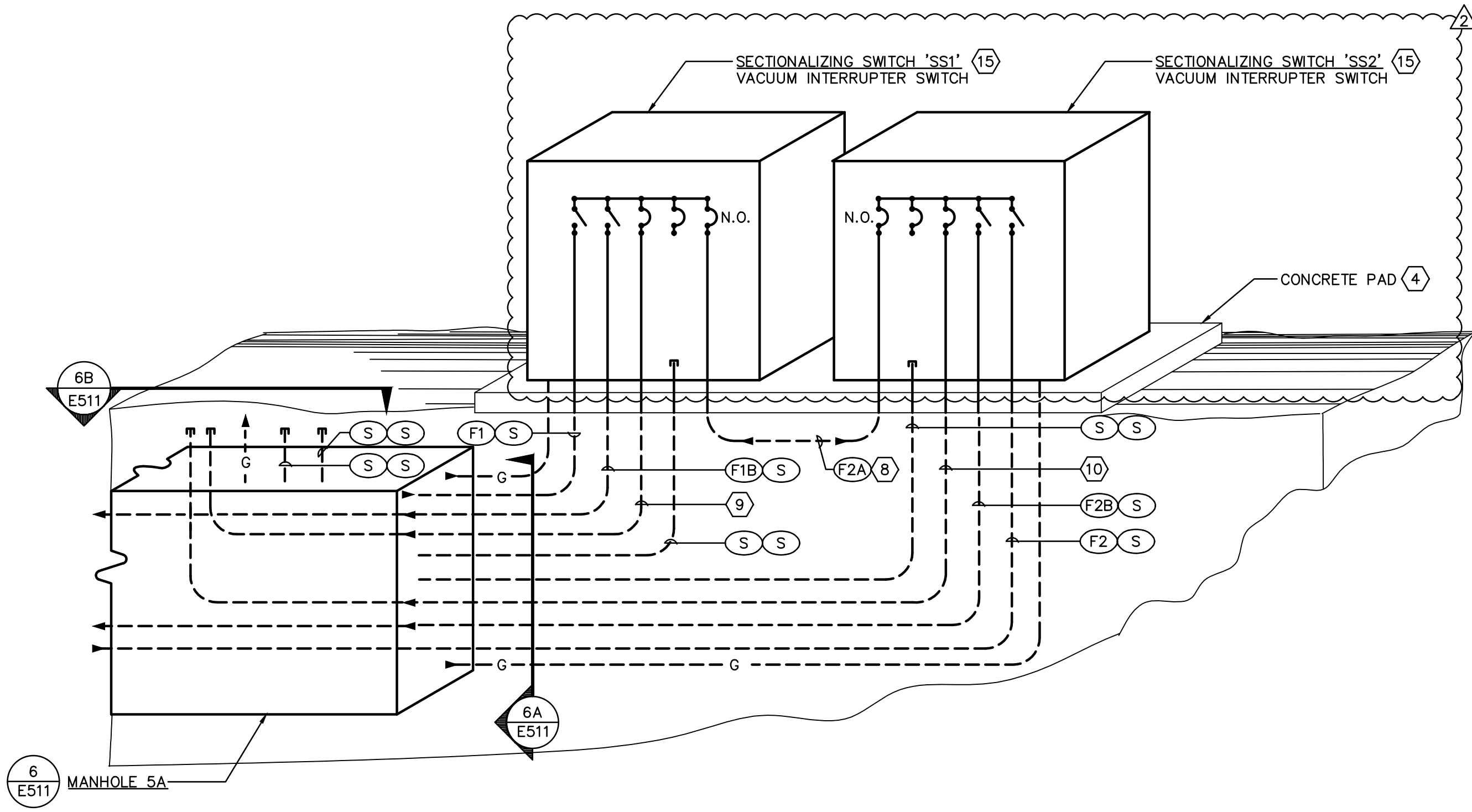
2.09 LABELING

- A. Hazard Alerting Signs: The exterior of the padmounted enclosure (if furnished) shall be provided with "Warning--Keep Out--Hazardous Voltage Inside--Can Shock, Burn, or Cause Death" signs. Each unit of switchgear shall be provided with a "Danger--Hazardous Voltage--Failure to Follow These Instructions Will Likely Cause Shock, Burns, or Death" sign. The text shall further indicate that operating personnel must know and obey the employer's work rules, know the hazards involved, and use proper protective equipment and tools to work on this equipment. Each unit of switchgear shall be provided with a "Danger--Keep Away--Hazardous Voltage--Will Shock, Burn, or Cause Death" sign.
- B. Nameplates, Ratings Labels, and Connection Diagrams: Each unit of switchgear shall be provided with a nameplate indicating the manufacturer's name, catalog number, model number, date of manufacture, and serial number. Each unit of switchgear shall be provided with a ratings label indicating the following: voltage rating; main bus continuous rating; short-circuit rating; fault interrupter ratings including interrupting and duty-cycle fault-closing; and load break switch ratings including duty-cycle fault-closing and short-time.

END OF SECTION



1 ENLARGED PARTIAL SITE PLAN - ELECTRICAL
 SCALE: 1/8"=1'-0"



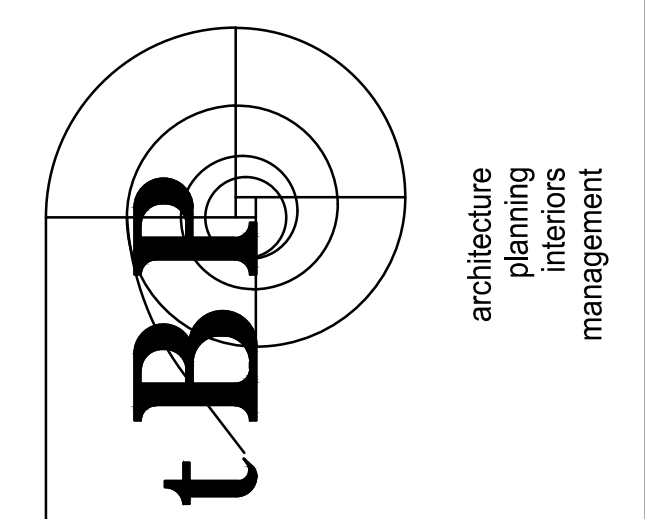
2 ELEVATION - SECTIONALIZING SWITCHES 'SS1' AND 'SS2'
 NO SCALE

GENERAL SHEET NOTES

- A. THE EXISTING SURVEY INFORMATION SHOWN ON THIS DRAWING IS BASED ON THE "TOPOGRAPHIC MAP, PROGRESS SET, NOVEMBER 2, 2010" PREPARED BY LCC, INC. AND PROVIDED BY CONTRA COSTA COMMUNITY COLLEGE DISTRICT.
- B. SEE CIVIL AND ARCHITECTURAL DRAWINGS FOR UTILITY ROUTING OF OTHER TRADES, LANDSCAPING, AND SECTIONALIZING SWITCH PAD INFORMATION.
- C. COORDINATE INSTALLATION AND LOCATION OF SECTIONALIZING SWITCHES AND CONCRETE PAD WITH ARCHITECT, LANDSCAPE, AND CIVIL ENGINEERS PRIOR TO COMMENCEMENT OF WORK.
- D. SEE SHEET E311 FOR SWITCHGEAR SWITCHOVER SCHEDULE IN CONJUNCTION WITH SINGLE LINE DIAGRAMS, SHEETS E311 AND E312.
- E. SEE SHEETS E111 AND E211 FOR ADDITIONAL DETAIL REFERENCES TO MANHOLES AND TRENCHES.
- F. SEE SHEET E312 FOR FEEDER SCHEDULE.
- G. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE NO MORE THAN 500 FEET, ON CENTER.

SHEET KEYNOTES

- 1. RUN (2)-5" PVC CONDUITS FROM MANHOLE '5A', AND ROUTE BEYOND ROADSIDE CURB FOR FUTURE USE. ONE CONDUIT RESERVED FOR FUTURE CLASSROOM BLDG UNDER SEPARATE SCOPE OF WORK. ONE CONDUIT FOR SPARE.
- 2. RUN (2)-5" PVC CONDUITS FROM MANHOLE '5A', AND ROUTE BEYOND ROADSIDE CURB FOR FUTURE USE. ONE CONDUIT RESERVED FOR FUTURE STUDENT ACTIVITIES BLDG UNDER SEPARATE SCOPE OF WORK. ONE CONDUIT FOR SPARE.
- 3. ROUTE FEEDER 1 FROM SECTIONALIZING SWITCH 'SS1' TO EXISTING MANHOLE '3' VIA MANHOLE '5A'. SPLICE FEEDER 1 INSIDE EXISTING MANHOLE '3' TO EXISTING FEEDER 1. EXISTING FEEDER 1 FEEDS EXISTING TRANSFORMER 'T6' (FOR PHYSICS BLDG), EXISTING TRANSFORMER 'T7' (FOR ART BLDG), AND EXISTING TRANSFORMER 'T8' (FOR MUSIC BLDG). SEE SINGLE LINE DIAGRAM, SHEET E312, FOR ADDITIONAL INFORMATION.
- 4. CONCRETE PAD SHOWN ON CIVIL DRAWINGS. CONCRETE PAD SHOWN ON ELECTRICAL DRAWINGS FOR REFERENCE ONLY. SEE CIVIL DRAWINGS FOR EXACT LOCATION AND DIMENSIONS.
- 5. ROUTE FEEDERS TO AVOID EXISTING ROUTING OF OTHER UTILITIES. PROVIDE MINIMUM DISTANCE OF 9" FROM EXISTING UNDERGROUND GAS UTILITY ROUTING, PROVIDE MINIMUM DISTANCE OF 12" FROM EXISTING UNDERGROUND TELEPHONE UTILITY ROUTING. PROVIDE MINIMUM DISTANCE OF 6" FROM ALL OTHER EXISTING UNDERGROUND UTILITY ROUTING. FEEDER ROUTING SHALL BE NO MORE THAN 10 FEET BELOW FINISHED GRADE.
- 6. SEE TRENCH DETAILS, SHEET E511, FOR ADDITIONAL FEEDER INFORMATION.
- 7. FEEDER TAG SHOWN IN CONJUNCTION WITH ASSOCIATED TRENCH DETAIL.
- 8. FOR LOOP FEED CONNECTION.
- 9. RUN (1)-5" PVC CONDUIT AND (1)-5" PVC SPARE CONDUIT FROM SECTIONALIZING SWITCH 'SS1' TO MANHOLE '5A' FOR FUTURE CLASSROOM BLDG. FUTURE CLASSROOM BLDG UNDER SEPARATE SCOPE OF WORK.
- 10. RUN (1)-5" PVC CONDUIT AND (1)-5" PVC SPARE CONDUIT FROM SECTIONALIZING SWITCH 'SS2' TO MANHOLE '5A' FOR FUTURE STUDENT ACTIVITIES BLDG. FUTURE STUDENT ACTIVITIES BLDG UNDER SEPARATE SCOPE OF WORK.
- 11. BASED ON POTHOLING SURVEY CONDUCTED BY LCC, INC. ON JULY 19, 2010, AN EXISTING PIPE WAS LOCATED AT THE (E) BRIDGE LOCATION. POTHOLE P-1 EXHIBITS PIPE LOCATED "4.1- FEET BELOW BK SWK AND 4.4- FEET BELOW HWL". ROUTE FEEDERS TO AVOID EXISTING. PROVIDE MINIMUM DISTANCE OF 6" FROM BOTTOM OF NEW DUCTBANK ROUTING TO TOP OF EXISTING PIPE.
- 12. ROUTE FEEDER 2 FROM SECTIONALIZING SWITCH 'SS2' TO EXISTING MANHOLE '3' VIA MANHOLE '5A'.
- 13. SPLICE FEEDER 2 INSIDE EXISTING MANHOLE '3' TO EXISTING FEEDER 2. EXISTING FEEDER 2 FEEDS EXISTING TRANSFORMER 'T5' (FOR LIBRARY BLDG), EXISTING TRANSFORMER 'T9' (FOR LIBERAL ARTS AND HUMANITIES BLDG), AND EXISTING TRANSFORMER 'T10' (FOR APPLIED ARTS BLDG).
- 14. PROVIDE VACUUM INTERRUPTER SWITCH WITH VACUUM INTERRUPTER CONTROL. APPROVED MANUFACTURERS SHALL BE BY G&W LPFI, AND COOPER POWER SYSTEM VFL. REFER TO SPECIFICATION SECTION 16415.
- 15. SEE SINGLE LINE DIAGRAM, SHEET E312-A2, FOR ADDITIONAL INFORMATION.



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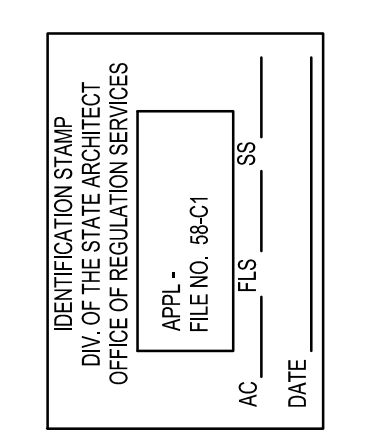
tBP/Architecture
1000 Burnett Avenue, suite 140
Concord, CA 94520-2058
ph: 925.246.6419 fx: 925.246.6495

architect



Date Signed: 6/21/11

consultant



DIVISION OF THE STATE ARCHITECT
5002 STREET 15E 5200
CONCORD, CA 94520
PH: (916) 445-8700

agency

**C-587 12KV UTILITY
UPGRADE**

**CONTRA COSTA COMMUNITY
COLLEGE DISTRICT**

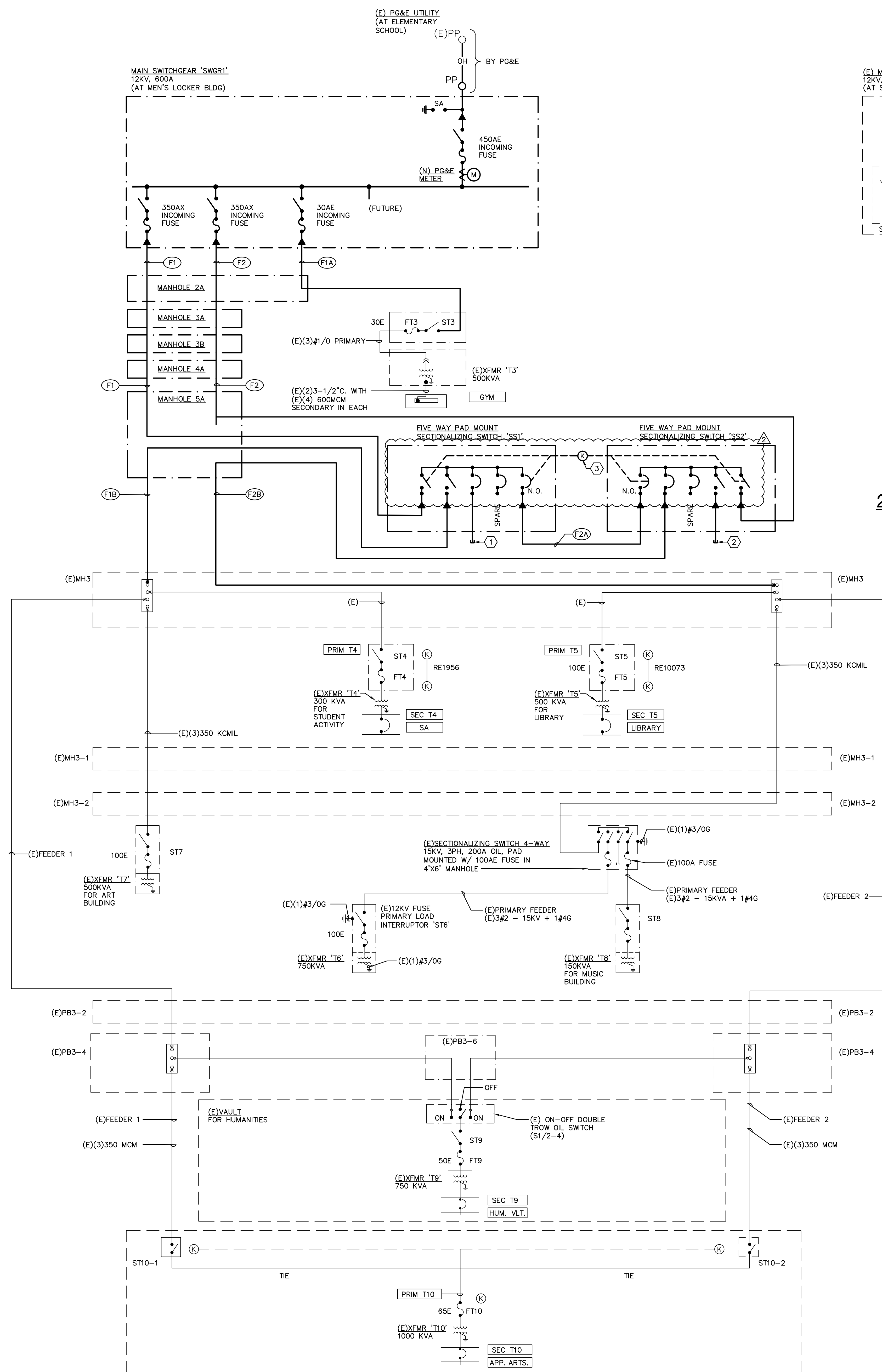
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drawn by:	checked by:	
date:	2/14/2011	
rev:	date:	description:
A2	6/20/11	Addendum No. 2

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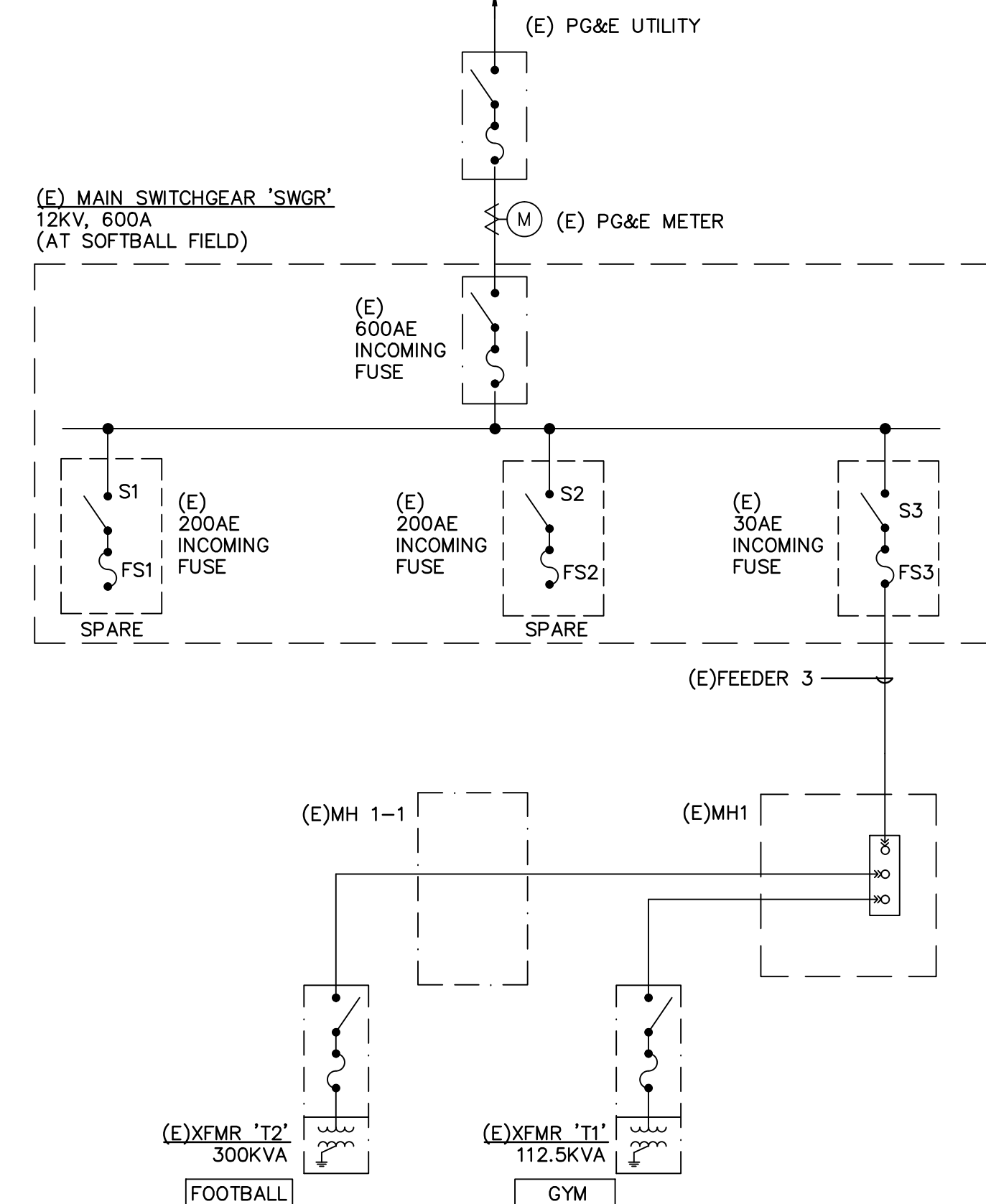
drawing title:
ENLARGED PARTIAL SITE PLAN - ELECTRICAL

drawing no.:
E212-A2

drawing of



1 SINGLE LINE DIAGRAM - NEW WORK
NO SCALE



2 SINGLE LINE DIAGRAM - REVISED
NO SCALE

GENERAL SHEET NOTES

A. SEE SHEET E311 FOR SWITCHGEAR SWITCHOVER SCHEDULE.

SHEET KEYNOTES

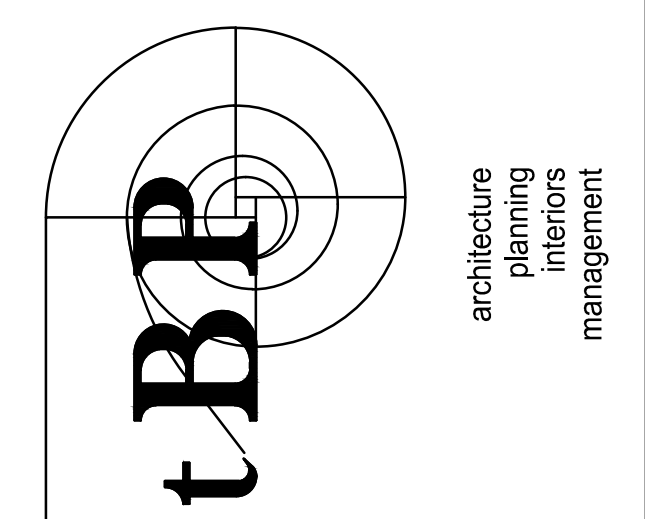
- FEEDER CONNECTION FOR FUTURE CLASSROOM BUILDING.
- FEEDER CONNECTION FOR FUTURE STUDENT ACTIVITY BUILDING.
- PROVIDE KIRK-KEY FOR FEEDER 'F1' AND INTERRUPTER (NORMALLY OPEN) OF SECTIONALIZING SWITCH 'SS2'. PROVIDE KIRK-KEY FOR FEEDER 'F2' AND INTERRUPTER (NORMALLY OPEN) OF SECTIONALIZING SWITCH 'SS1'. PROVIDE KIRK-KEY FOR THE TWO INTERRUPTERS (NORMALLY OPEN) OF SECTIONALIZING SWITCHES 'SS1' AND 'SS2'.

FEEDER SCHEDULE

- P INCOMING PG&E FEEDER: INCOMING CABLES PER PG&E REQUIREMENTS, IN 5" PVC CONDUIT.
- F1 FEEDER #1: (3) 350 KCMIL EPR, 133% 15KV INSULATION, IN 5" PVC CONDUIT.
- F1A FEEDER #1A: (3) 350 KCMIL EPR, 133% 15KV INSULATION, IN 5" PVC CONDUIT.
- F1B FEEDER #1B: (3) 350 KCMIL EPR, 133% 15KV INSULATION, IN 5" PVC CONDUIT.
- F2 FEEDER #2: (3) 350 KCMIL EPR, 133% 15KV INSULATION, IN 5" PVC CONDUIT.
- F2A FEEDER #2A: (3) 350 KCMIL EPR, 133% 15KV INSULATION, IN 5" PVC CONDUIT.
- F2B FEEDER #2B: (3) 350 KCMIL EPR, 133% 15KV INSULATION, IN 5" PVC CONDUIT.
- S SPARE: (1) 5" PVC SPARE CONDUIT.

LINETYPE LEGEND

- EXISTING
- NEW WORK



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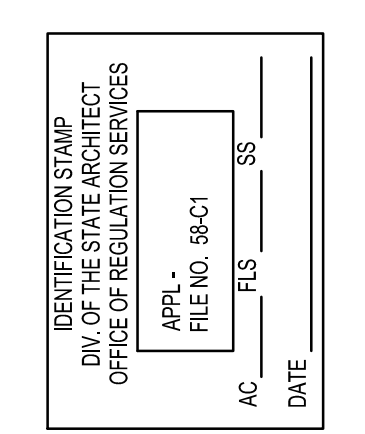
tBP/Architecture
1000 Burnett Avenue, Suite 140
Concord, CA 94520-2058
ph: 925.246.6419 fx: 925.246.6495

architect



Date Signed: 6/21/11

consultant



DIVISION OF THE STATE ARCHITECT
5002 S STREET, STE 5200
CONCORD, CA 94503
ph: (916) 445-8700
agency

C-587 12KV UTILITY
UPGRADE

CONTRA COSTA COMMUNITY
COLLEGE DISTRICT

tBP project number:	20801.01	owner
file name:		
drawn by:	checked by:	
date:	2/14/2011	
rev:	date:	description:

A2	6/20/11	Addendum No. 2
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drawing title:
SINGLE LINE DIAGRAM -
NEW WORK

drawing no.:
E312-A2

drawing of