

SCOPE OF WORK

THE WORK OF THIS SECTION SHALL PROVIDE COMPLETE ELECTRICAL SYSTEMS WHICH SHALL INCLUDE THE PROVIDING OF ALL CONDUCTORS, RACEWAYS, FITTINGS, CIRCUIT PROTECTIVE DEVICES, LIGHT FIXTURES, BOXES, SUPPORTS, AND ALL ASSOCIATED APPURTENANCES AND MISCELLANEOUS EQUIPMENT NECESSARY, ALL OF WHICH SHALL BE COMPLETELY CONNECTED, TESTED, ADJUSTED AND LEFT IN PROPER OPERATING CONDITION. THE ELECTRICAL SYSTEM TO BE PROVIDED SHALL INCLUDE SERVICE AND DISTRIBUTION FACILITIES POWER FOR MOTOR OPERATED EQUIPMENT, LIGHTING SYSTEMS, AND ALL OUTLETS AS COVERED HERENAFTER.

GENERAL NOTES:

- ALL ELECTRICAL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE 2011 NATIONAL ELECTRICAL CODE (NEC), THE 2012 INTERNATIONAL BUILDING CODE (IBC), AND ANY LOCAL CODES, LAWS AND ORDINANCES WHICH MAY APPLY. WHERE DIFFERENCES EXIST BETWEEN THE CODES, THE STRICTER CODE SHALL APPLY.
- ALL CONDUITS SHALL CONTAIN A GROUNDING CONDUCTOR REGARDLESS OF USE.
- THE CONTRACTOR FOR THE WORK UNDER THIS SECTION SHALL OBTAIN AND PAY FOR ALL PERMITS, FEES, AND LICENSES REQUIRED FOR THE EXECUTION OF THIS WORK. SATISFACTORY EVIDENCE OF COMPLIANCE WITH THE REQUIREMENT AND ALL CERTIFICATES OF INSPECTION SHALL BE DELIVERED TO THE OWNER PROMPTLY UPON REQUEST.
- ELECTRICAL METALLIC TUBING AND RIGID GALVANIZED STEEL CONDUIT SHALL BE THE ONLY TYPES OF CONDUIT INSTALLED WITHIN THE BUILDING. PVC IS PERMITTED UNDERGROUND.
- ALL FIRE RATED WALLS, FLOORS, ETC WHICH HAVE A CONDUIT OR OTHER ELECTRICAL PENETRATION SHALL BE SEALED TO EQUAL THE RATING OF THE WALL, FLOOR, ETC. THAT IS PENETRATED. CONTRACTOR SHALL USE A ULL RATED AND LISTED ASSEMBLY FOR THE SEALING MATERIAL AND METHOD. COORDINATE MANUFACTURER WITH THE GENERAL CONTRACTOR SO THAT ALL TRADES ON THE PROJECT USE THE SAME MANUFACTURER.
- REFER TO EXISTING CONDITIONS AND EQUIPMENT SHOP DRAWINGS FOR DIMENSIONS, LOCATIONS, CABINETS, ETC.
- CONCEAL ALL CONDUIT AND FITTINGS EXCEPT WHERE THE OWNER GRANTS SPECIFIC PERMISSION.
- ALL WORK AND MATERIALS SHALL BE GUARANTEED FOR A MINIMUM OF ONE YEAR FROM DATE OF ACCEPTANCE. ADDITIONAL WARRANTY PERIODS FROM THE EQUIPMENT MANUFACTURER EXCEEDING ONE YEAR SHALL ALSO APPLY. PROVIDE ALL WARRANTY INFORMATION TO THE OWNER WITH REQUIRED CLOSEOUT DOCUMENTS.
- PROVIDE ONE COMPLETE SET OF ELECTRICAL DRAWINGS MARKED UP FOR RECORD DRAWINGS. SHOW ALL LOCATIONS OF EQUIPMENT AND MATERIALS.
- INSTALL ALL MATERIALS PER MANUFACTURER'S INSTRUCTIONS.
- IDENTIFY MAJOR EQUIPMENT INSTALLED WITH LAMICOR LABELS. VERIFY WORDING OF EACH LABEL WITH THE OWNER.
- VISIT SITE TO DETERMINE EXISTING CONDITIONS PRIOR TO SUBMITTING BID.
- ALL RACEWAYS, FIXTURES, WIRING, DEVICES, AND EQUIPMENT RENDERED USELESS BY THIS WORK SHALL BE REMOVED AND DELIVERED TO THE OWNER'S STORAGE FACILITY AS DIRECTED. ANY MATERIAL NOT WANTED BY THE OWNER SHALL BE DISPOSED OF BY THE CONTRACTOR. REFER TO SPECIFICATIONS AND DRAWINGS FOR DISPOSAL OF EXISTING PCB-FILLED TRANSFORMER.
- CONTRACTOR SHALL DO ALL CUTTING, PATCHING, AND PAINTING AS REQUIRED TO INSTALL HIS WORK. FINISH PATCHING AND PAINTING TO MATCH EXISTING FINISHES.
- PRIOR TO DIGGING ANY TRENCHES, NOTIFY ALL UTILITIES AND OBTAIN LOCATIONS OF UNDERGROUND UTILITIES. ANY DAMAGES DONE TO UNDERGROUND UTILITIES OR PIPING BY THIS CONTRACTOR WILL BE REPAIRED BY THE OWNER OF THE LINE IN A SATISFACTORY MANNER. THIS CONTRACTOR WILL BEAR ALL COSTS FOR REPAIRS.
- CONDUITS TO BE RUN UNDER WALKWAYS AND PAVINGS SHALL BE INSTALLED BY JACKING OR BORING, UNLESS NOTED. DO NOT CUT WALKWAYS OR PAVEMENTS, UNLESS ACCEPTABLE TO THE ENGINEER. ALLOWED CUTS IN PAVEMENT OR CONCRETE SHALL BE MADE USING A PAVEMENT SAW, AND SHALL BE PATCHED TO MATCH THE EXISTING SURFACE.
- WHERE DISAGREEMENTS EXISTS ON THE DESIGN DOCUMENTS, THE ITEM OR ARRANGEMENTS OF BETTER QUALITY, GREATER QUANTITY, OR HIGHER COST SHALL BE INCLUDED IN THE BASE BID. ANY DISCREPANCIES BETWEEN THE DRAWINGS, SPECIFICATIONS, AND FIELD CONDITIONS SHALL BE RESOLVED WITH THE ENGINEER PRIOR TO COMMENCING WORK. ALL AGREEMENTS SHALL BE VERIFIED IN WRITING.
- ALL WORK UNDER THIS SECTION SHALL BE COORDINATED WITH OTHER TRADES AND EXISTING CONDITIONS TO INSURE PROPER LOCATION OF EQUIPMENT AND EQUIPMENT CONNECTIONS AND TO MINIMIZE CONFLICTS WITH STRUCTURAL MEMBERS, DUCT WORK, PIPING, ETC. CONFLICTS BETWEEN EQUIPMENT AND/OR MATERIAL LOCATIONS SHALL BE CORRECTED AS DIRECTED BY THE ENGINEER AT NO COST TO THE OWNER.

ELECTRICAL DEMOLITION NOTES

- IT IS THE GENERAL INTENTION OF THESE DRAWINGS TO COVER ALL SITUATIONS WHERE AN ITEM IS TO BE REMOVED, WHETHER IT HAPPENS TO BE A SWITCH, TRANSFORMER, OR OTHER ELECTRICAL ITEM.
- PRIOR TO SUBMITTING BID, THE CONTRACTOR SHALL SURVEY THE EXISTING BUILDING AND MAKE NOTE OF ANY ADDITIONAL DEMOLITION AND/OR ANY ADDITIONAL REMOVAL AND RELOCATION WHICH MAY BE REQUIRED IN ORDER TO ACCOMPLISH RENOVATIONS INDICATED IN CONTRACT DOCUMENTS. NO CHANGE ORDER WILL BE ISSUED FOR ADDITIONAL WORK REQUIRED FOR DEMOLITION, REMOVAL, OR RELOCATION WORK NOT INDICATED ON THESE DRAWINGS BUT NECESSARY TO COMPLETE WORK.
- EXISTING CONDUIT RUN CONCEALED IN EXISTING WALLS NOT BEING REMOVED AND/OR REPLACED MAY BE ABANDONED. ALL DEMOLITION MUST BE COORDINATED WITH THE OWNER AND WITH EXISTING CONDITIONS TO AVOID CONFLICTS. DEMOLITION TO BE PHASED TO MINIMIZE DOWN TIME.
- NO EXISTING ELECTRICAL MATERIALS, EQUIPMENT, WIRING, OR CONDUIT BEING REMOVED MAY BE REUSED ON THIS PROJECT UNLESS SPECIFICALLY NOTED OTHERWISE ON THESE DRAWINGS. ALL EXISTING ELECTRICAL MATERIALS AND EQUIPMENT NOT BEING REUSED SHALL BE DISPOSED OF AS INDICATED IN GENERAL NOTES.
- THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE REMOVAL OR REWORKING OF ANY EXISTING ELECTRICAL SERVICES WITH THE OWNER. ALL ASSOCIATED MATERIALS AND EQUIPMENT NOT BEING REUSED OR NOT BEING REMOVED BY THE UTILITIES SHALL BE REMOVED BY THE ELECTRICAL CONTRACTOR. PROVIDE NEW SERVICES AS INDICATED ON THE DRAWINGS.

BASE BID:

EXISTING SWITCHGEAR AND TRANSFORMERS TO BE REPLACED AS INDICATED ON THE CONTRACT DOCUMENTS.

ALL EQUIPMENT TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND ALL APPLICABLE CODES AND REGULATIONS.

EXISTING FEEDERS TO BE REUSED AS INDICATED ON THE CONTRACT DOCUMENTS. DISCONNECT EXISTING FEEDERS, REMOVE EXISTING SWITCHGEAR, AND RECONNECT TO NEW SWITCHGEAR AS REQUIRED UPON COMPLETION OF SWITCHGEAR REPLACEMENT. REDIRECT/EXTEND/CONNECT EXISTING FEEDERS AS REQUIRED.

NOTIFY OWNER AND ENGINEER IMMEDIATELY IF EXISTING MV FEEDER LENGTHS APPEAR TOO SHORT TO MATCH UP TO NEW SWITCHGEAR TERMINALS WITHOUT SPLICING. DO NOT SPLICE EXISTING FEEDERS WITHOUT WRITTEN PERMISSION FROM THE OWNER AND THE ENGINEER.

EXTEND/REROUTE EXISTING CABLE TRAY AS REQUIRED.

ALTERNATE No. 1 (IN LIEU OF REUSING EXISTING FEEDERS):

REMOVE EXISTING 15 KV FEEDER FROM VAULT TO MAIN SECTION OF SWITCHGEAR AND REPLACE WITH NEW 15 KV FEEDER.

REMOVE EXISTING 15 KV FEEDER FROM CHILLER #3 8320 SWITCH TO CHILLER #3 TRANSFORMER AND REPLACE WITH NEW 15 KV FEEDER.

REMOVE EXISTING 15 KV FEEDER FROM CHILLER #2 8320 SWITCH TO CHILLER #2 TRANSFORMER AND REPLACE WITH NEW 15 KV FEEDER.

REMOVE EXISTING 5 KV FEEDER FROM CHILLER #1 4160 SWITCH TO EXISTING CHILLER #1 AND REPLACE WITH NEW 5 KV FEEDER.**

EXTEND/REROUTE EXISTING CABLE TRAY AS REQUIRED.

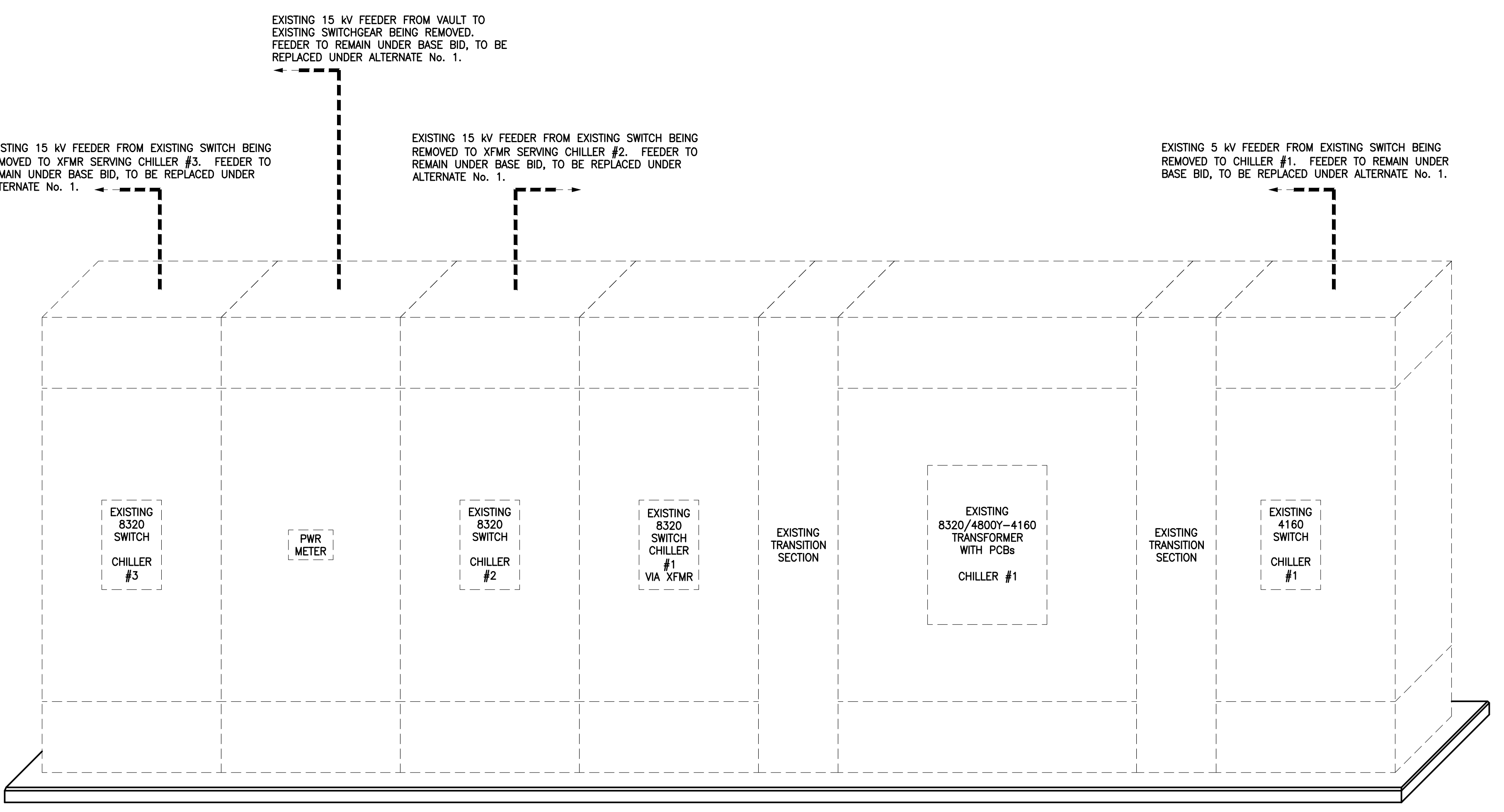
SEE SPECIFICATIONS FOR CABLE TYPE REQUIRED. CABLE TO BE 500CMIL WITH 250KCMIL GROUND, UNLESS NOTED OTHERWISE.

BIDDERS ARE REQUIRED TO FIELD VERIFY DISTANCES AND CABLE TYPES PRIOR TO SUBMITTING BIDS.

** WHERE THERE IS A STARTER OR A DISCONNECT LOCATED BETWEEN THE CHILLER 4160 SWITCH AND THE EXISTING CHILLER, REMOVE AND REPLACE THE FEEDER FROM THE 4160 SWITCH TO THE STARTER OR DISCONNECT.

ELECTRICAL SUBMITTALS

ELECTRICAL SHOP DRAWINGS SHALL BE SUBMITTED IN ONE COMPLETE PACKAGE CONTAINING ALL ITEMS REQUIRED BY THE ELECTRICAL DRAWINGS AND THE DIVISION 26-28 SPECIFICATIONS. PARTIAL SHOP DRAWING SUBMITTALS MAY BE REJECTED BY THE ARCHITECT-ENGINEER. REFER TO SECTION 260500 OF THE ELECTRICAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

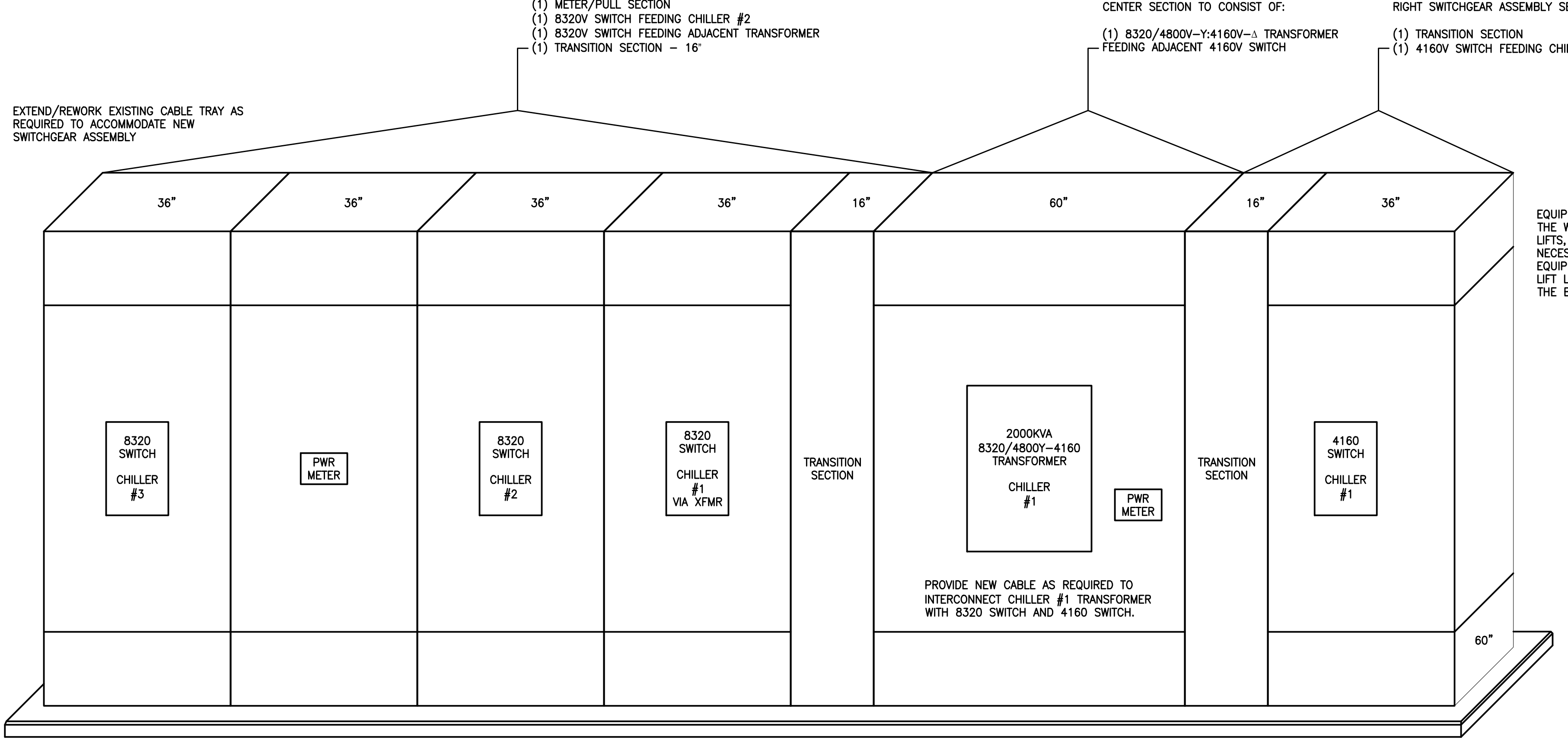


EXISTING MEDIUM-VOLTAGE SWITCHGEAR WITH TRANSFORMER CONTAINING PCB TO BE REMOVED COMPLETE AND REPLACED WITH NEW. EXISTING MEDIUM-VOLTAGE CABLES AND ASSOCIATED CABLE TRAY TO BE REUSED (BASE BID), REPLACED (ALTERNATE No. 1). RECONNECT EXISTING FEEDERS TO NEW SWITCHGEAR AS REQUIRED. REWORK CABLE TRAY AS REQUIRED TO LINE UP WITH NEW SWITCHGEAR. EXISTING PAD TO REMAIN.

1 EXISTING SWITCHGEAR ELEVATION - LOWER LEVEL EQUIPMENT ROOM
NOT TO SCALE

INSTALLATION NOTES:

- HIGH VOLTAGE TERMINATIONS TO BE PERFORMED BY THE CONTRACTOR.
- CONTRACTOR IS RESPONSIBLE FOR TURN ON AND START UP OF SYSTEM.
- CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL WIRING REMOVED AS A RESULT OF THIS WORK.
- CONTRACTOR IS RESPONSIBLE FOR PCB DISPOSAL, REFER TO 264800 OF THE SPECIFICATIONS.



EXTEND EXISTING PAD AS REQUIRED TO ACCOMMODATE NEW SWITCHGEAR ASSEMBLY. EXISTING PAD IS APPROXIMATELY 6'-0" WIDE X 23' LONG. FIELD VERIFY PRIOR TO STARTING WORK.

ACTUAL DIMENSIONS TO BE PROVIDED BY SWITCHBOARD MANUFACTURER - SHOWN FOR INFORMATIONAL PURPOSES ONLY.

REFER TO PROJECT MANUAL FOR SWITCH, TRANSFORMER, AND CABLE SPECIFICATIONS. PROVIDE NAMEPLATES AND WARNING LABELS FOR EQUIPMENT AS INDICATED IN THE SPECIFICATIONS.

2 NEW SWITCHGEAR ELEVATION - LOWER LEVEL EQUIPMENT ROOM
NOT TO SCALE

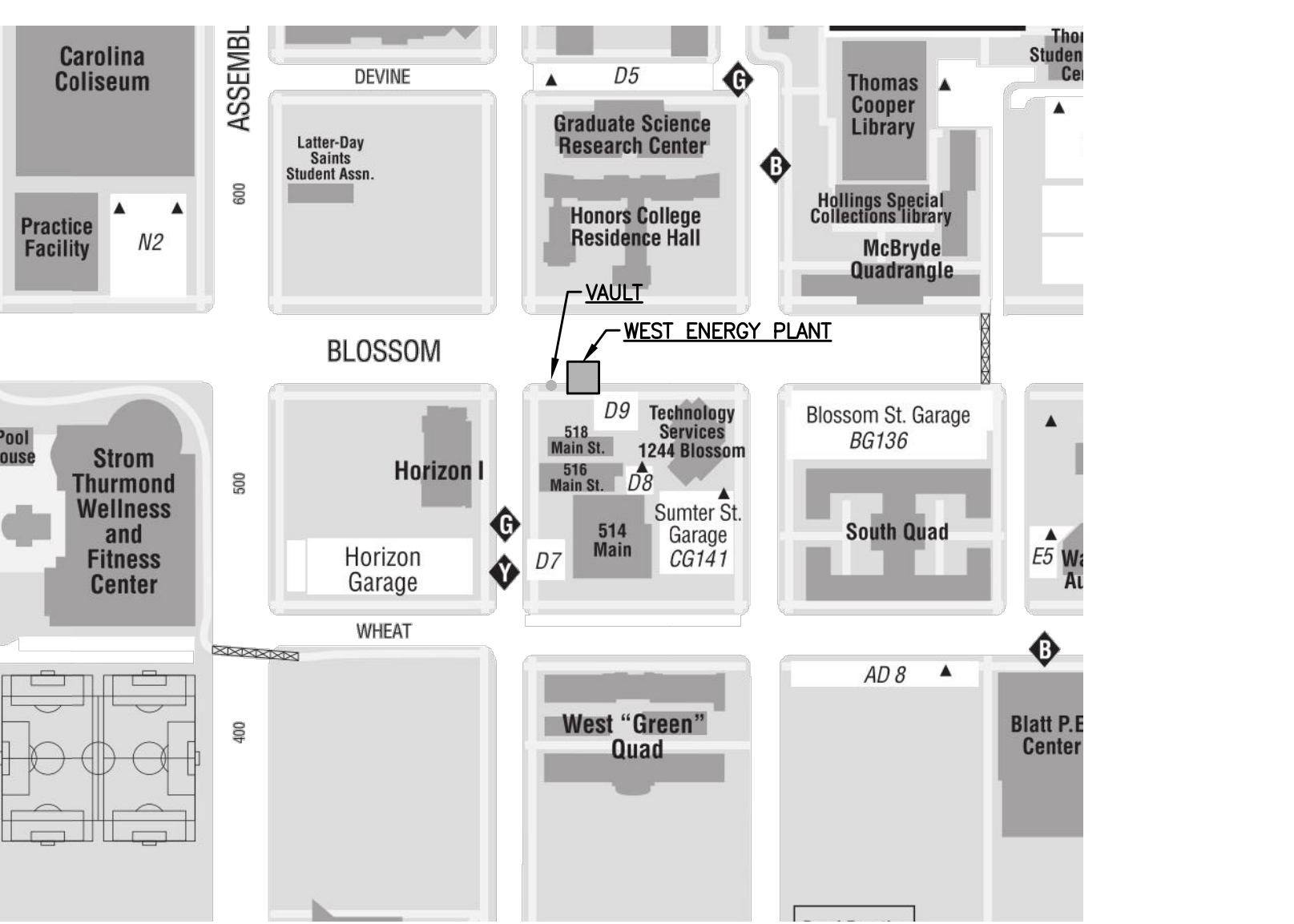
- 8320 SWITCH SUMMARY (TYPICAL FOR 3):**
- MANUFACTURER: EATON MVS SERIES OR GENERAL ELECTRIC BREAKMASTER SERIES
 - CABLE MATERIAL: COPPER
 - BUS MATERIAL: COPPER-SILVER
 - VOLTAGE: 15 KV
 - BIL LEVEL: 95 KV
 - BUS AMPS: 1200 A
 - MOMENTARY AMPS: 40 KA ASYMMETRICAL
 - FAULT CLOSE AMPS: 40 KA ASYMMETRICAL
 - ENCLOSURE: NEMA 1 (INDOOR)
 - LISTING: UL

- TRANSFORMER LOAD SIDE METER SUMMARY (TYPICAL FOR 1):**
- FURNISH & INSTALL (1) ELECTRONIC POWER METER FOR THE LOAD SIDE OF THE TRANSFORMER. METER TO INCLUDE A LOCAL DISPLAY AND REMOTE COMMUNICATIONS TO METASYS. COMMUNICATIONS PROTOCOL TO BE BACnet MSTP or Ethernet WITH BACnet IP. THE METER SHOULD PROVIDE AT A MINIMUM THE FOLLOWING DATA:
- VOLTAGE: ALL 3 PHASES / PEAK
Current: ALL 3 PHASES / PEAK
kVA: NORMAL / PEAK DEMAND
kW: NORMAL / PEAK kW
kWhr: RUNNING TOTAL
PF: NORMAL / MAX/MIN

- TRANSFORMER SUMMARY (TYPICAL FOR 1):**
- MANUFACTURER: EATON OR GENERAL ELECTRIC
 - RATING: 2000 KVA
 - TYPE: SUBSTATION TYPE MINERAL-OIL FILLED
 - PRIMARY: 8320/4800 V
 - SECONDARY: 4160 V
 - CONNECTION: 8320/4800 Y-4160 Δ
 - WINDINGS: COPPER
 - ENCLOSURE: NEMA 1 (INDOOR)
 - LISTING: UL

- 4160 SWITCH SUMMARY (TYPICAL FOR 1):**
- MANUFACTURER: EATON MVS SERIES OR GENERAL ELECTRIC BREAKMASTER SERIES
 - CABLE MATERIAL: COPPER
 - BUS MATERIAL: COPPER-SILVER
 - VOLTAGE: 5 KV
 - BIL LEVEL: 95 KV
 - BUS AMPS: 1200 A
 - MOMENTARY AMPS: 40 KA ASYMMETRICAL
 - FAULT CLOSE AMPS: 40 KA ASYMMETRICAL
 - ENCLOSURE: NEMA 1 (INDOOR)
 - LISTING: UL

EQUIPMENT IS LOCATED IN LOWER LEVEL OF THE WEST ENERGY PLANT. PROVIDE ANY LIFTS, CRANES, MOVERS, DOLLIES, ETC. NECESSARY TO DELIVER AND INSTALL EQUIPMENT. THE EXISTING WEST ENERGY LIFT LOCATED ABOVE THE CARGO ACCESS TO THE BASEMENT MAY NOT BE USED.

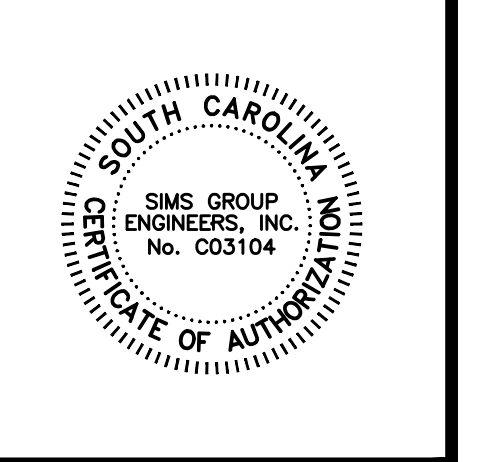


PARTIAL CAMPUS KEY PLAN
NOT TO SCALE

NO.	REVISION	DATE	BY

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PERMIT SET



**RE-BID USC WEST ENERGY PLANT
TRANSFORMER AND SWITCHGEAR
REPLACEMENT UNIVERSITY OF SOUTH
CAROLINA COLUMBIA, SOUTH CAROLINA**

CHILLER TRANSFORMER-SWITCH REPLACEMENT

DRAWN	CLP
CHECKED	CLP
SIMS PROJECT No.	C16021
DATE	APRIL 2017

E-101
DRAWING No. 1 OF 1