

- GENERAL "ELECTRICAL" NOTES
- 1

BRANCH CIRCUIT WIRING SHALL BE NO. 12 AWG UNLESS NOTED OTHERWISE. WHERE CONDUCTOR AND RACEWAY SIZE ARE SHOWN AT HOMERUN, SUCH SIZE SHALL BE USED FOR THE ENTIRE CIRCUIT. EXCEPTION: FINAL CONNECTION TO DEVICES, IN OUTLET BOXES, IS NOT REQUIRED TO BE LARGER THAN NO. 12 AWG.
- 2

20A/120V BRANCH CIRCUITS EXCEEDING 100' IN LENGTH FROM PANEL TO FARTHEST DEVICE OR FIXTURE SHALL USE NO. 10 CONDUCTORS AND 3/4"C.
- 3

RACEWAYS SHALL BE INSTALLED CONCEALED IN WALL, ABOVE CEILINGS, BELOW FLOOR, AND IN OTHER CAVITIES TO THE GREATEST EXTENT POSSIBLE WHERE INSIDE BUILDING. WHERE EXPOSED RACEWAYS MUST BE USED, LAYOUT RACEWAYS TO MINIMIZE THE NUMBER OF VERTICAL RUNS.
- 4

FEEDER CONDUITS, BRANCH CIRCUITS AND CONDUIT ROUTING SHALL COMPLY WITH DETAILS ON DRAWINGS AND SHALL BE COORDINATED WITH THE WORK OF OTHER TRADES BEFORE AND DURING CONSTRUCTION.
- 5

A GROUND CONDUCTOR SHALL BE PROVIDED IN ALL RACEWAYS UNLESS NOTED OTHERWISE.
- 6

COORDINATE THE ROUTING OF UNDERGROUND CONDUCTORS/CONDUIT WITH STRUCTURAL FOOTINGS AND UNDERGROUND UTILITIES.
- 7

THE USE OF MC CABLE IS NOT ALLOWED.
- 8

WHEREVER ON THE ELECTRICAL DRAWINGS THE WORD "PROVIDE" IS USED, IT SHALL BE INFERRED TO MEAN "FURNISH AND INSTALL".
- 9

ELECTRICAL CONTRACTOR SHALL PROVIDE WATER PROOFING FOR ALL CONDUIT ENTERING BUILDING.

- GENERAL "DEMOLITION" NOTES
- 1

ALL ELECTRICAL EQUIPMENT TO BE REMOVED SHALL REMAIN THE PROPERTY OF THE OWNER. THE CONTRACTOR SHALL NOT DISPOSE OF ANY MATERIALS UNTIL RELEASED BY OWNER'S PROJECT MANAGER. MATERIALS THAT OWNER'S PROJECT MANAGER CHOOSES TO RETAIN SHALL BE DELIVERED BY THE CONTRACTOR TO A LOCATION DESIGNATED BY THE PROJECT MANAGER. ALL OTHER MATERIALS SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR.
- 2

ELECTRICAL DEVICES NOT SHOWN ON CEILINGS OR WALLS TO REMAIN SHALL REMAIN IN PLACE. PROTECT FROM DAMAGE DURING CONSTRUCTION

- GENERAL EXISTING CONDITION NOTES
- 1

AREAS OF WORK EXIST FOR THIS PROJECT WHICH ARE NOT ACCESSIBLE OR HAVE LIMITED ACCESS DURING DESIGN. AS SUCH CONTRACTOR SHALL VERIFY ALL UTILITIES IN AREA OF WORK BEFORE DEMOLITION OF ANY SERVICE. ANY ELECTRICAL COMPONENTS NOT SHOWN SHALL BE IDENTIFIED AND THE ARCHITECT AND ENGINEER SHALL BE NOTIFIED AS SOON AS POSSIBLE. NO ELECTRICAL REWORK SHALL BE COMMENCED WITHOUT COORDINATION OF BOTH ARCHITECT AND ENGINEER.
- 2

WHERE INSTALLATION REQUIRES CUTTING OR DRILLING OF THE EXISTING SLAB, THE CONTRACTOR SHALL X-RAY THE EXISTING SLAB PRIOR TO WORK TO ENSURE THAT NO EXISTING UTILITIES OR STRUCTURAL ELEMENTS IN THE SLAB WILL BE COMPROMISED BY THE WORK. NOTIFY THE ARCHITECT/ENGINEER OF ANY CONFLICTS THAT WILL REQUIRE RELOCATING THE PROPOSED SLAB WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY DAMAGED UTILITIES OR STRUCTURAL ELEMENTS CAUSED BY THE SLAB DEMOLITION.
- 3

SUPPORT ALL EXISTING CONDUITS AND JUNCTION BOXES ABOVE THE CEILING PER NEC IN THE CONSTRUCTION AREA.
- 4

REMOVE ALL ABANDONED CONDUIT, WIRE, AND COMMUNICATION CABLES ABOVE THE CEILING IN THE CONSTRUCTION AREA.
- 5

PROVIDE JUNCTION BOX COVER PLATES ON ALL EXISTING JUNCTION BOXES ABOVE THE CEILING IN THE CONSTRUCTION AREA.
- 6

WHERE INFORMATION SHOWN ON THESE DRAWINGS CONFLICTS WITH VERIFIED FIELD CONDITIONS, IT SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER

- GENERAL "POWER" NOTES
- 1

ALL BRANCH CIRCUITS INDICATED ON THESE PLANS TO BE LARGER THAN NO. 12 AWG SHALL BE SIZED AS INDICATED FOR THE ENTIRE LENGTH OF THE CIRCUIT.
- 2

PROVIDE AND INSTALL AN ENGRAVED LAMINATED PLASTIC NAMEPLATE ON EACH ITEM OF ELECTRICAL EQUIPMENT SERVING MECHANICAL EQUIPMENT WHICH MATCH MECHANICAL DESCRIPTIONS, TO INDICATE THE DESIGNATION OF THE UNIT ON THE PLANS & THE BRANCH CIRCUIT SERVING THE EQUIPMENT.

ABBREVIATIONS	
ABR	DESCRIPTION
(E)	EXISTING
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
BFC	BELOW FINISHED CEILING
BFG	BELOW FINISHED GRADE
BOD	BOTTOM OF DEVICE
CLG	CEILING
ECB	ENCLOSED CIRCUIT BREAKER
GFCI	GROUND-FAULT CIRCUIT-INTERRUPTING
GP	GENERAL PURPOSE
J-BOX	JUNCTION BOX
NEC	NATIONAL ELECTRIC CODE
NFDS	NON-FUSED DISCONNECT SWITCH
OC	ON CENTER
SPD	SURGE PROTECTION DEVICE
UNO	UNLESS OTHERWISE NOTED
W/	WITH
WP	WEATHERPROOF
XFMR	TRANSFORMER

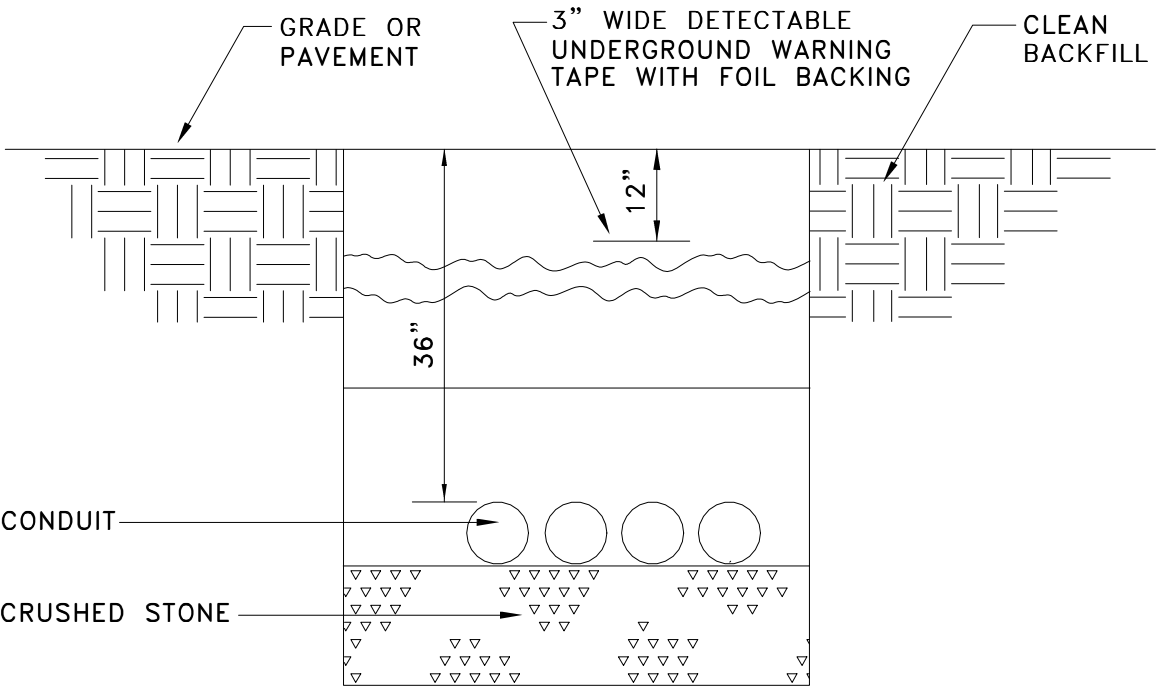
CONDUIT SCHEDULE	
BRANCH CIRCUIT RATING	CONDUIT SIZE
20A-40A	3/4"
45A-55A	1"
60A-110A	1 1/4"
125A-150A	1 1/2"
175A-200A	2"
225A-300A	2 1/2"
350A	3"
400A	3 1/2"

1

E001

UNDERGROUND CONDUIT DETAIL – SINGLE CONDUIT

NOT TO SCALE



3

E001

UNDERGROUND CONDUIT DETAIL – 4 WAY

SCALE: NOT TO SCALE



SITE KEY PLAN

NOT TO SCALE

LOADCENTER: PERIMETER				DISTRIBUTION: 120/240 Single				A.I.C. RATING: 10,000					
				PHASES: 1				MAINS RATING: 50 A					
SUPPLIED FROM: BRINE				WIRES: 3				MCB RATING: MAIN LUGS ONLY					
MOUNTING: SURFACE				ENCLOSURE: NEMA 3R									
WIRE SIZE	NTS	CKT	DESCRIPTION	BKR	P	A	B	P	BKR	DESCRIPTION	CKT	NTS	WIRE SIZE
--	1	1	EXISTING PERIMETER LIGHTING CIRCUIT	20	2	0.0	--		1	--	PREPARED SPACE	2	--
		3						0.0	--	1	--	PREPARED SPACE	4
--		5	GFI RECEPTACLE	20	1	0.2	0.0		1	20	SPARE	6	--
--		7	SPARE	20	1		0.0	0.0	1	20	SPARE	8	--
TOTAL PER PHASE KVA:						0.2	0.0	CONNECTED KVA: 0.2					
TOTAL PER PHASE AMPACITY:						2	0	CONNECTED AMPACITY: 1					
NOTES (NTS COLUMN):													
1) RECONNECT EXISTING PERIMETER LIGHTING CIRCUIT.													

ELECTRICAL SYMBOL LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SINGLE RECEPTACLE (WALL MOUNTED @ 18" AFF)		SURGE PROTECTION DEVICE
	DUPLEX RECEPTACLE (WALL MOUNTED @ 18" AFF)		ELECTRICAL UTILITY METER & C/T CABINET
	DUPLEX RECEPTACLE (GFI TYPE @ 18" AFF)		PANELBOARD (SURFACE MOUNTED)
	QUAD RECEPTACLE (WALL MOUNTED @ 18" AFF)		CONTROL PANEL (SURFACE MOUNTED)
	JUNCTION BOX (WALL MTD)		DISCONNECT SWITCH, (REFER TO EQUIPMENT CONNECTION SCHEDULE)
	JUNCTION BOX (FLOOR MOUNTED)		MOTOR CONNECTION (AS NOTED)
	PHONE OR DATA OUTLET (WALL MOUNTED @ 18" AFF) SEE COMMUNICATIONS RISER FOR ADDITIONAL INFO		HANDHOLE
	LIGHT SWITCH, SINGLE POLE		
	KEY NOTE CALLOUT (REFER TO KEY NOTES ON SHEET)		

- DEMOLITION/RENOVATION NOTATION
- * IF NO ANNOTATION IS SHOWN ASSUME EXISTING TO REMAIN IN PLACE FOR SOLID LINES AND DEMOLISH FOR DASHED LINES.

* DEVICES AND EQUIPMENT NOT SHOWN SHALL BE ASSUMED TO BE EXISTING TO REMAIN IN PLACE.

E EXISTING FIXTURE OR DEVICE TO REMAIN IN PLACE.

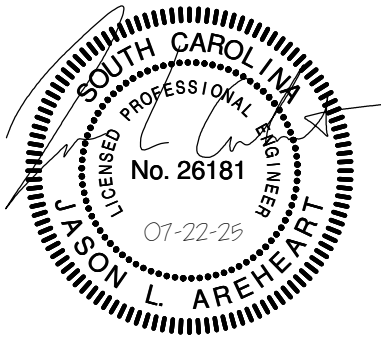
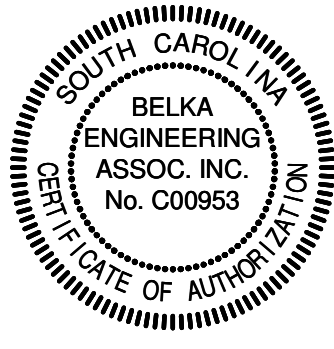
R EXISTING FIXTURE OR DEVICE TO BE REMOVED BY THE ELECTRICAL CONTRACTOR. MAINTAIN CONTINUITY OF REMAINING PORTIONS OF BRANCH CIRCUIT.

RE EXISTING DEVICE TO BE REMOVED BY THE ELECTRICAL CONTRACTOR. EXISTING CIRCUIT SHALL BE RETAINED. PROVIDE NEW DEVICE AS SHOWN ON RENOVATION PLANS.

RN RELOCATED FIXTURE (NEW LOCATION).

RR EXISTING FIXTURE TO BE RELOCATED BY THE ELECTRICAL CONTRACTOR TO NEW LOCATION SHOWN ON RENOVATION PLAN.

ELECTRICAL DRAWING INDEX	
#	SHEET NAME
E001	ELECTRICAL NOTES & LEGENDS
E002	ELECTRICAL ONE-LINE DIAGRAM
E100	ELECTRICAL SITE PLAN
E700	ELECTRICAL SPECIFICATIONS
E701	ELECTRICAL SPECIFICATIONS
E702	ELECTRICAL SPECIFICATIONS
E703	ELECTRICAL SPECIFICATIONS
E704	ELECTRICAL SPECIFICATIONS



BELKA

ENGINEERING ASSOCIATES

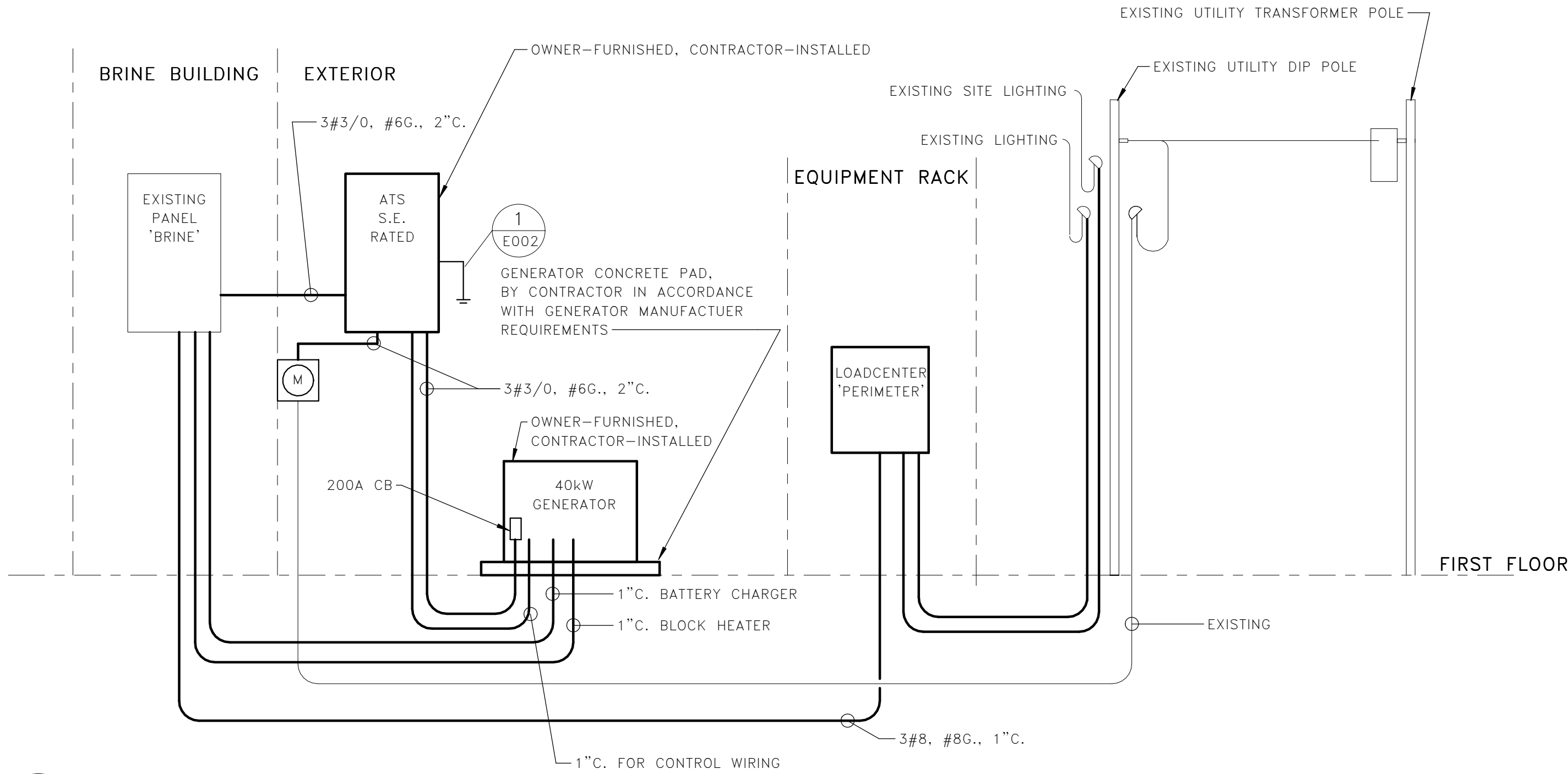
2519A PLATT SPRINGS RD | WEST COLUMBIA, SC
(803) 731-0650 Office | (803) 467-7657 Cell

CONTACT: JASON AREHEART
JAREHEART@BEA-Consulting.com

DT22503

ELECTRICAL SERVICE GENERAL NOTES:

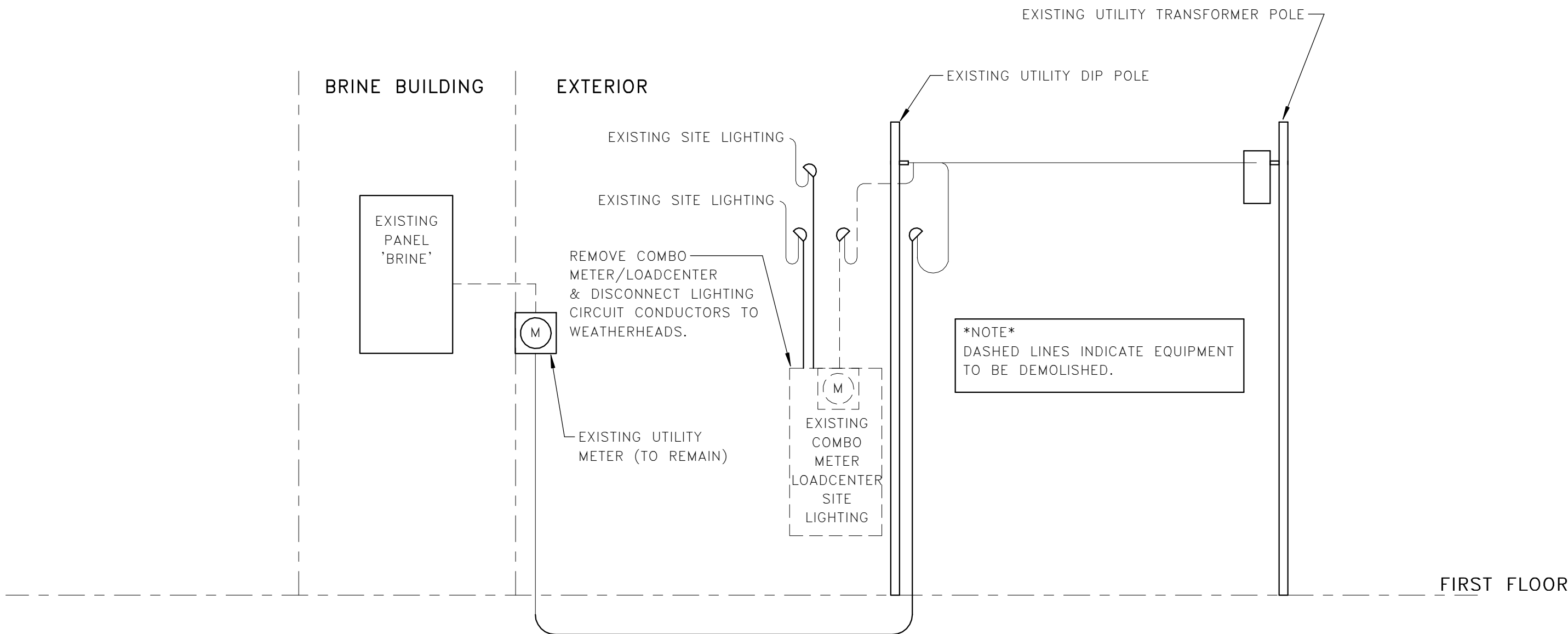
- CONTRACTOR SHALL COORDINATE ALL OUTAGES WITH OWNER AND ENGINEER.
- CONTRACTOR SHALL PROVIDE AND INSTALL ALL REQUIRED ELECTRICAL COMPONENTS TO MAKE UTILITY CONNECTION IN ACCORDANCE WITH UTILITY COMPANY'S REQUIREMENTS.
- PROVIDE 2P, 30A, 240V CIRCUIT BREAKER IN EXISTING PANEL 'BRINE'. PROVIDE CIRCUIT TO LOADCENTER 'PERIMETER LIGHTING'. EXISTING PANEL 'BRINE' IS A SQUARE D HOMELINE MODEL HOMC20UC, 200A MCB, 240/120V, 3W, SINGLE-PHASE LOADCENTER. MATCH AIC RATING TO THAT OF PANEL.
- SERVICE DISCONNECTS SHALL BE PROPERLY LABELED IN ACCORDANCE WITH UTILITY REQUIREMENTS.



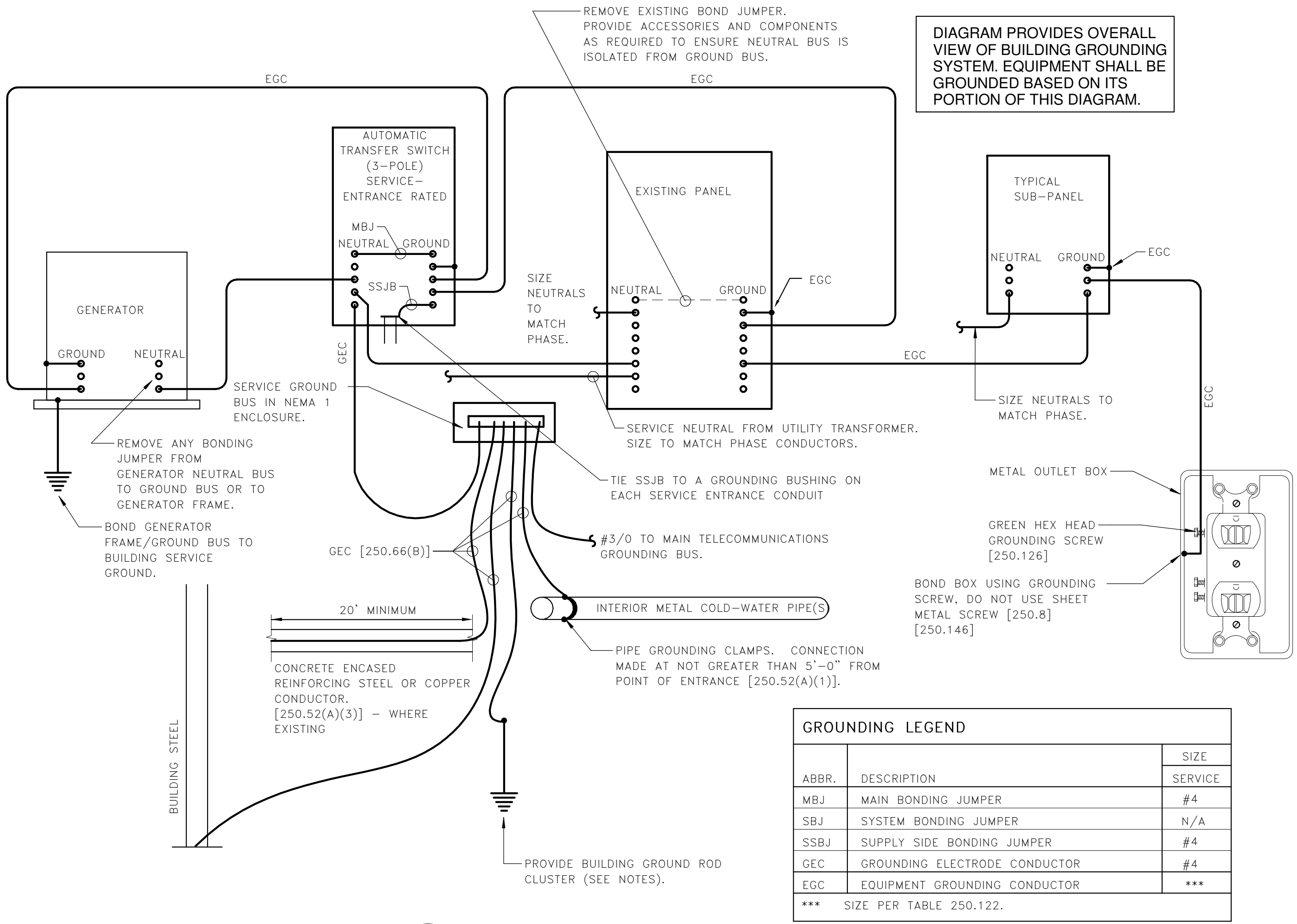
3 ONE-LINE DIAGRAM - RENOVATION
E002 NOT TO SCALE

ELECTRICAL SERVICE GENERAL DEMOLITION NOTES:

- CONTRACTOR SHALL COORDINATE REMOVAL OF EXISTING COMBO METER/LOADCENTER ON POLE WITH UTILITY COMPANY.
- CONTRACTOR SHALL COORDINATE ALL OUTAGES WITH OWNER AND ENGINEER.
- ALL ITEMS INDICATED TO BE REMOVED SHALL BE TURNED OVER TO OWNER AND LEFT AT SCDOT YARD..



2 ONE-LINE DIAGRAM - DEMOLITION
E002 NOT TO SCALE



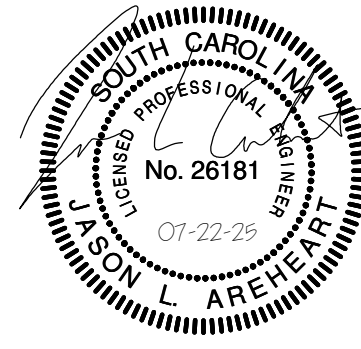
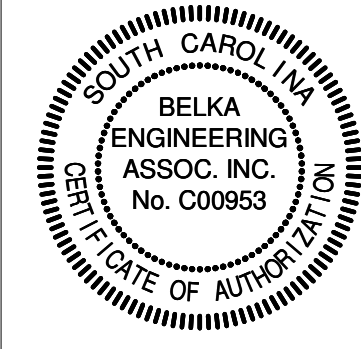
1 GROUNDING DETAIL
E002 NOT TO SCALE

GROUNDING NOTES:

- NUMBERS IN BRACKETS REFER TO SPECIFIC SECTIONS OF THE NATIONAL ELECTRICAL CODE.
- ALL UNDERGROUND OR OTHERWISE INACCESSIBLE GROUND CONNECTIONS AND SPLICES SHALL BE EXOTHERMICALLY WELDED [250.68].
- THE GROUND ROD CLUSTER FOR THE SERVICE GROUND SHALL CONSIST OF THREE 3/4" X 10'-0" COPPER CLAD STEEL GROUND RODS. THEY SHALL BE DRIVEN IN A TRIANGULAR CONFIGURATION APPROXIMATELY 20' APART AND INTER-CONNECTED IN DELTA WITH A NO. 4/0 BARE COPPER CONDUCTOR WELDED TO RODS. TOPS OF THE RODS SHALL BE 12" BFG. CONNECTION TO THE RODS SHALL BE WITH EXOTHERMIC WELDS. PROVIDE TEST WELL COVER AT ALL ROD LOCATIONS.
- PROVIDE A GROUND WIRE IN ALL CONDUITS.
- EARTH SHALL NOT BE USED AS THE SOLE GROUND RETURN PATH FOR ANY EQUIPMENT POWERED UNDER THIS PROJECT.
- NO ALUMINUM SHALL BE USED FOR GROUNDING WORK WITHOUT THE SPECIFIC WRITTEN PERMISSION OF THE ENGINEER. EXCEPTION: ALUMINUM BUILDING STRUCTURAL MATERIALS SHALL BE BONDED WITH LISTED ALUMINUM EQUIPMENT WITH ALUMINUM TO COPPER CONNECTORS FOR ROUTING COPPER EGC'S.
- PROVIDE GROUNDING BUSHING ON BOTH ENDS OF ALL SERVICE ENTRANCE RACEWAYS. SIZE AS A GEC [250.80]. THIS INCLUDES RIGID STEEL ELBOWS ON PVC CONDUIT.
- ALL METAL ENCLOSURES AND RACEWAYS SHALL BE BONDED TO GROUND [250.86]. FOR CIRCUITS OVER 250V PROVIDE BOND PER [250.97]. STANDARD LOCKNUTS ARE NOT ACCEPTABLE.
- PROVIDE EGC CONNECTED TO ANY JUNCTION BOX WHERE SPLICE IS MADE [250.148] OR WHERE A DEVICE IS INSTALLED.
- PROVIDE BOND TO EXPOSED METAL ON ALL MOTORS, PUMPS, AND LIGHTING FIXTURES PER [250.112].
- DRIVE A GROUND ROD AT GENERATOR AND BOND TO THE GENERATOR FRAME. REMOVE STRAP (SYSTEM BONDING JUMPER) BETWEEN GENERATOR NEUTRAL BUS AND GENERATOR FRAME. NEUTRAL BUS AND CONDUCTORS SHALL BE ISOLATED FROM THE GENERATOR FRAME.
- VERIFY ALL NEUTRAL AND GROUND CONNECTIONS IN EXISTING PANELS ARE AS DEPICTED IN GROUNDING DETAIL. VERIFY EXISTING BONDING JUMPERS AND GROUNDING ELECTRODE ARE SIZED PER GROUNDING LEGEND. REPORT ANY DISCREPANCIES TO ENGINEER.

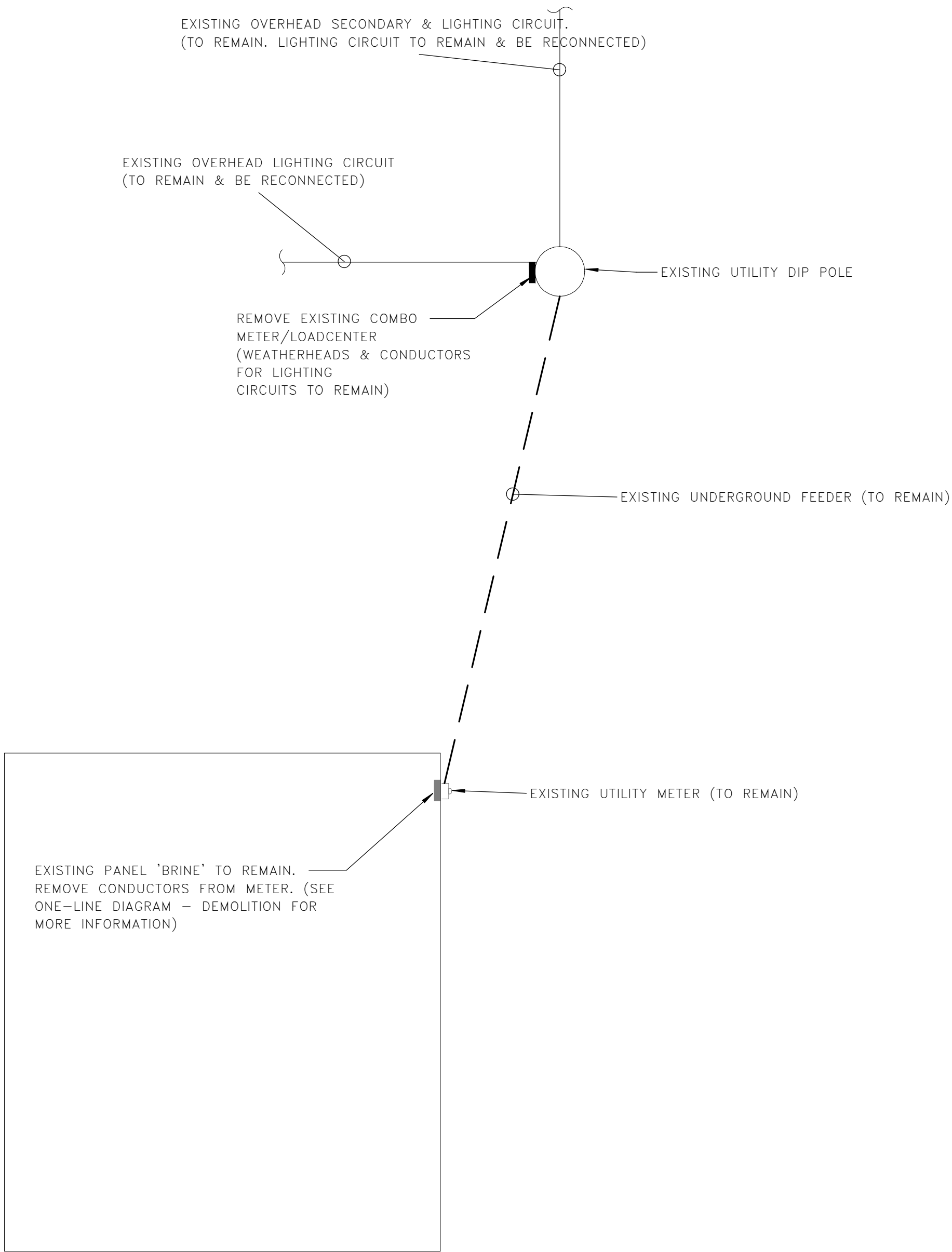
MAIN LUGS DISTRIBUTION SYSTEMS						
PANEL	DISTRIBUTION	PHASE	# OF WIRES	MAINS	SCCR	FED FROM
PERIMETER	240 V/2-0	1	3	50 A	10,000	BRINE
REMARKS						

AVAILABLE FAULT CURRENT
BASED ON A 25 KVA, 1.2 %Z UTILITY TRANSFORMER THE MAXIMUM FAULT CURRENT AVAILABLE AT THE SERVICE ENTRANCE DISCONNECT IS CALCULATED TO BE 8,553 AMPS. LABEL THE SERVICE ENTRANCE DISCONNECT WITH THIS MAXIMUM FAULT CURRENT AND THE DATE OF INSTALLATION. CONTACT ENGINEER 2 WEEKS PRIOR TO SUBSTANTIAL COMPLETION TO CONFIRM THE AVAILABLE FAULT CURRENT PRIOR TO LABELING EQUIPMENT.

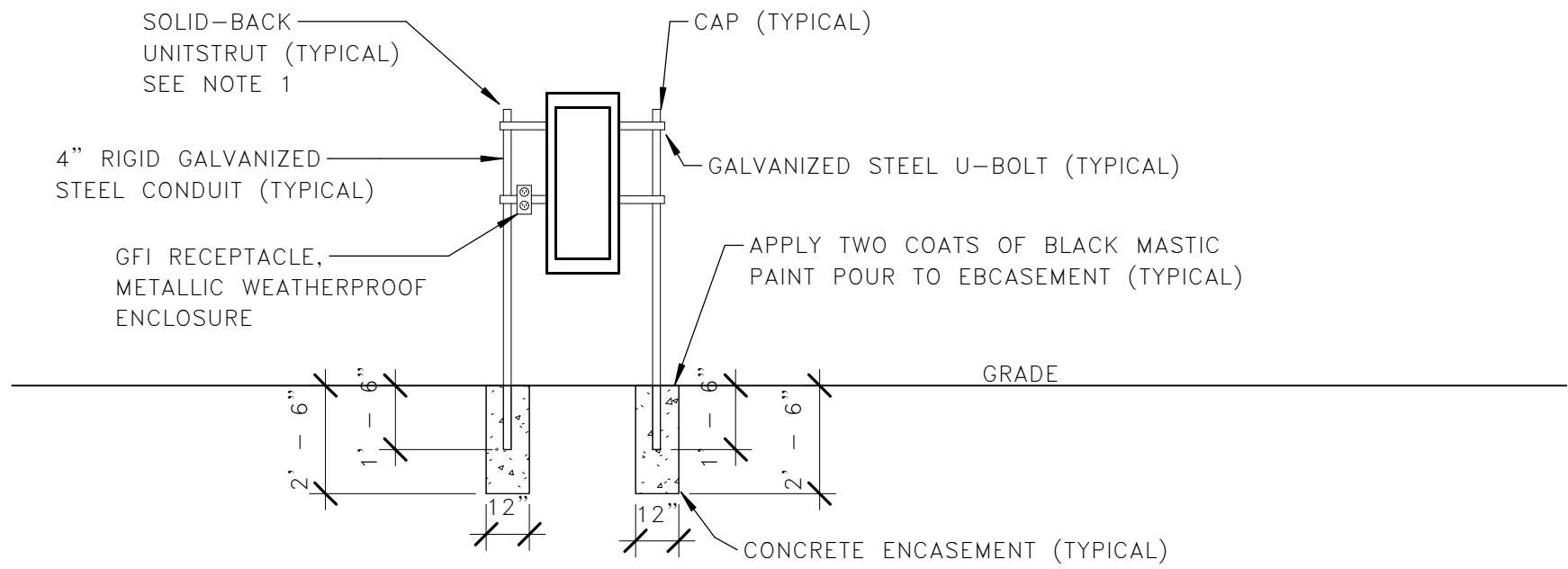


2519A PLATT SPRINGS RD | WEST COLUMBIA, SC
(803) 731-0650 Office | (803) 467-7657 Cell
CONTACT: JASON AREHEART
JAREHEART@BEA-Consulting.com

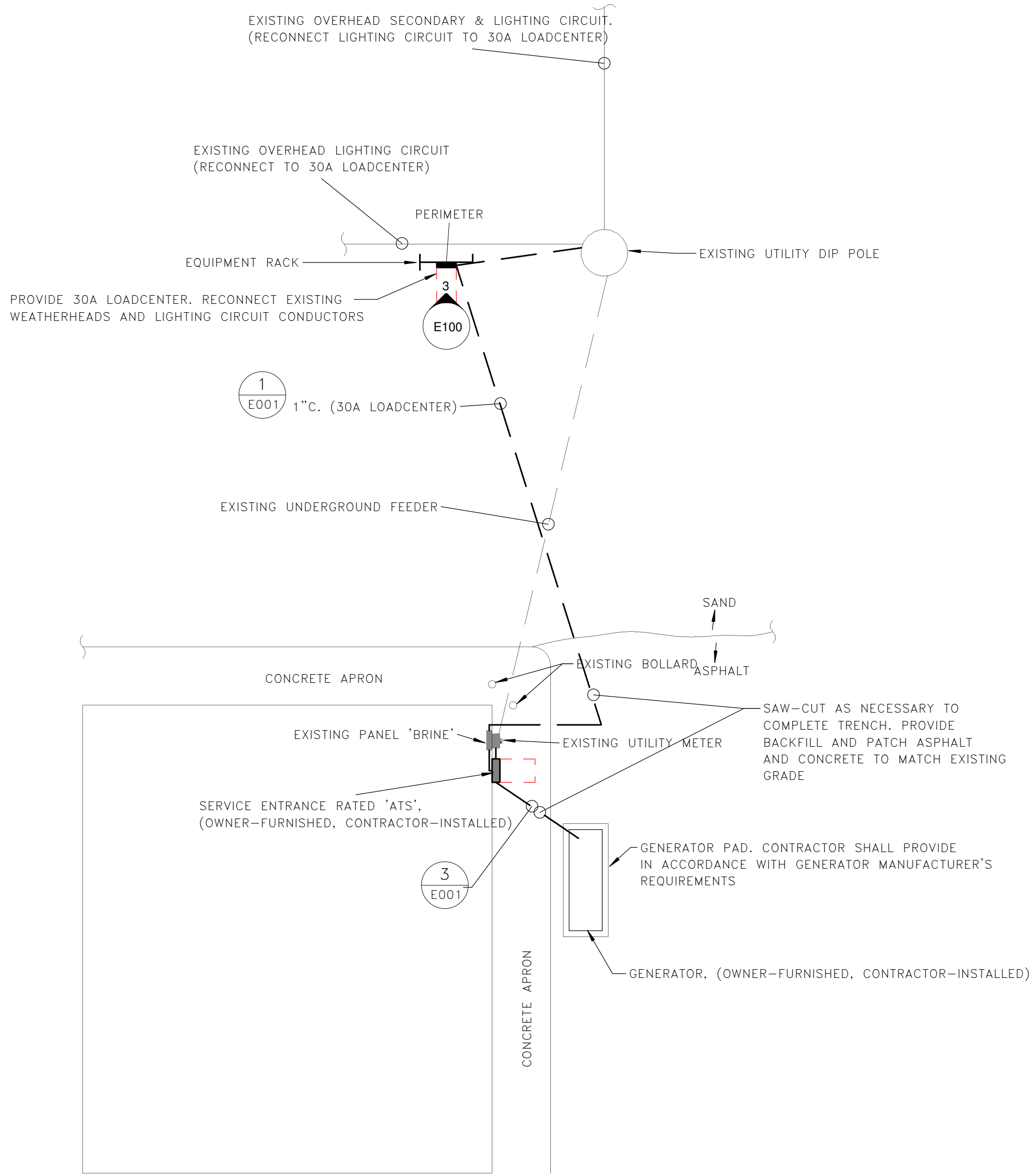
DT22503



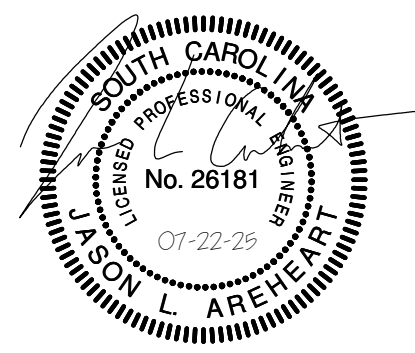
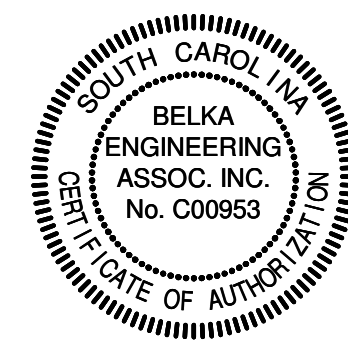
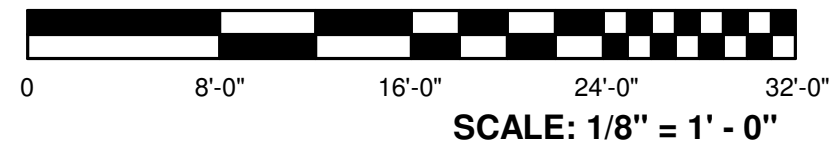
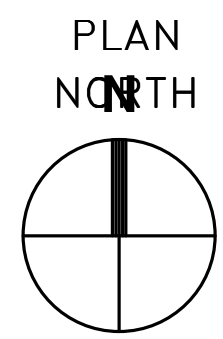
1 ENLARGED SITE PLAN — DEMOLITION
E100 SCALE: 1/8" = 1'-0"



3 EQUIPMENT RACK — ELEVATION
E100 NOT TO SCALE



2 ENLARGED SITE PLAN — RENOVATION
E100 SCALE: 1/8" = 1'-0"



DT22503

DRAWN BY: HTT CHECK BY: JLA

Project No.: DT22503
FILE:

SCDOT CAMDEN GENERATOR REPLACEMENT

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
512 Fair Street
Camden, South Carolina

ELECTRICAL SITE PLAN

E100

07/22/25

SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Provide all labor, materials, equipment and supervision to construct complete and operable electrical systems as indicated on the drawings and specified herein.
- B. All materials and equipment used shall be new, undamaged and free from any defects.

1.2 PRODUCT WARRANTIES

- A. Provide manufacturer's standard printed commitment in reference to a specific product and normal application, stating that certain acts of restitution will be performed for the Purchaser or Owner by the manufacturer, when and if the product fails within certain operational conditions and time limits. Where the warranty requirements of a specific specification section exceeds the manufacturer's standard warranty, the more stringent requirements will apply and modified manufacturer's warranty shall be provided. In no case shall the manufacturer's warranty be less than one (1) year from the date of substantial completion.
1. Where manufacturer's warranty lists a start date of PO or date of ship, contractor shall purchase extended warranty to ensure warranty period extends to a minimum of 1 year after date of substantial completion.

1.3 PRODUCT SUBSTITUTIONS

- A. General: Materials specified by manufacturer's name shall be used unless prior approval of an alternate is given by addenda. Requests for substitutions must be received in the office of the Architect at least 10 days prior to opening of bids.

1.4 SUBMITTAL REQUIREMENTS

- A. Submit for review by the Engineer Architect a schedule with engineering data of materials and equipment to be incorporated in the work. Submittals shall be supported by descriptive materials, i.e., catalog sheets, product data sheets, diagrams, performance curves and charts published by the manufacturer, warranties, etc., to show conformance to Specifications and Plan requirements; model numbers alone shall not be acceptable. Data submitted for review shall contain all information to indicate compliance with Contract Documents. Complete electrical characteristics shall be provided for all equipment. Submittals for lighting fixtures shall include Photometric Data. The Engineer reserves the right to require samples of any equipment to be submitted for review.
- B. The purpose of shop drawing review is to demonstrate to the Architect that the Contractor understands the design concept. The Architect's review of such drawings, schedules, or cuts shall not relieve the Contractor from responsibility for deviations from the drawings or specifications unless he has, in writing, called the Architect's attention to such deviation at the time of submission, and received written permission from the Architect for such deviations.
- C. Where cut sheets include an entire product family, mark all specific items to be utilized for this project on equipment cut sheets. Generic cut sheets with no indication of which items on the cut sheet shall be used will be rejected.
- D. Response to Submittals: Shop drawings shall be noted with the following classifications:
1. "Reviewed": No corrections, no marks. Contractor shall submit copies for distribution.
2. "Provide as Corrected": A few minor corrections. Items may be ordered as marked up without further resubmission. Submit shall submit copies for distribution. Formally correct prior to submitting O&M manuals.
3. "Revise and Resubmit": Minor corrections. Items may be ordered at the Contractor's option. Contractor shall resubmit documents with corrections noted.
4. "Rejected": Major corrections required or not in accordance with the contract documents. Contractor

accordance with NFPA 70E.

3. Before initiating any work, a job specific work plan must be developed by the contractor with a peer review conducted and documented by the Contractor. The work plan must include procedures to be used on and near the live electrical equipment, barriers to be installed, safety equipment to be used and exit pathways.
4. Work on energized circuits or equipment cannot begin until prior written approval is obtained from the Owner/ Architect.

END OF SECTION 260500

shall correct and resubmit documents.

1.5 ELECTRICAL DRAWINGS

- A. Electrical contract drawings are diagrammatic and indicate the general arrangement of electrical equipment. Do not scale electrical plans. Obtain all dimensions from the Architect's dimensioned drawings and field measurements. The Contractor shall review Architectural plans for door swings and built-in equipment; conditions indicated on those plans shall govern for this work.
- B. Coordinate installation of electrical equipment with the structural and mechanical equipment and access thereto. Coordinate exterior electrical work with civil and landscaping work.
- C. Discrepancies shown on different drawings, between drawings and specifications or between documents and field conditions shall be installed to provide the better quality or greater quantity of work; or, comply with the more stringent requirement; either or both in accordance with the A/E's interpretation.

1.6 EXISTING SERVICES AND FACILITIES

- A. Damage to Existing Services: Existing services and facilities damaged by the Contractor through negligence or through use of faulty materials or workmanship shall be promptly repaired, replaced, or otherwise restored to previous conditions by the Contractor without additional cost to the Owner.
- B. Interruption of Services: Interruptions of services necessary for connection to or modification of existing systems or facilities shall occur only at prearranged times approved by the Owner. Interruptions shall only occur after the provision of all temporary work and the availability of adequate labor and materials will assure that the duration of the interruption will not exceed the time agreed upon.
- C. Removed Materials: Existing materials made unnecessary by the new installation shall be stored on site. They shall remain the property of the Owner and shall be stored at a location and in a manner as directed by the Owner. If classified by the Owner's authorized representative as unsuitable for further use, the material shall become the property of the Contractor and shall be removed from the site at no additional cost to the owner.
- D. Contractor shall review drawings for all trades for coordination with existing conditions. Contractor shall be responsible for routing of underground raceways and coordinate with GC and other trades for cutting and repair of existing slabs, parking areas, sidewalks, sheetrock and/or plaster walls, etc.
- E. Contractor shall protect all existing low-voltage cabling from damage. If conflicts arise, contact architect immediately to determine status of cabling. Existing cabling that is damaged during construction shall be replaced by the contractor.

PART 2 - EXECUTION

2.1 PRODUCT INSTALLATION, GENERAL

- A. Except where more stringent requirements are indicated, comply with the product manufacturer's installation instructions and recommendations, including handling, anchorage, assembly, connections, cleaning and testing, charging, lubrication, startup, test operation and shut-down of operating equipment. Consult with manufacturer's technical experts, for specific instructions on unique product conditions and unforeseen problems.
- B. Protection and Identification: Deliver products to project properly identified with names, models numbers, types, grades, compliance labels and similar information needed for distinct identifications; adequately packaged or protected to prevent deterioration during shipment, storage and handling. Store in a dry, well ventilated, indoor space, except where prepared and protected by the manufacturer specifically for exterior storage.
- C. Permits and Tests: Provide labor, material and equipment to perform all tests required by the governing agencies and submit a record of all tests to the Owner or his representative. Notify the Architect five days in advance of any testing.

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes: building wire and cable and wiring connectors and connections.

1.2 SYSTEM DESCRIPTION

- A. Product Requirements: Provide products as follows:
1. Solid conductor for branch circuits 10 AWG and smaller.
2. Stranded conductors for control circuits.
3. Conductor not smaller than 12 AWG for power and lighting circuits.
4. Conductor not smaller than 14 AWG for control circuits.
5. Increase wire size in branch circuits to limit voltage drop to a maximum of 3 percent.
- B. Wiring Methods: Provide the following wiring methods:
1. Use only building wire, Type THHN/THWN-2 insulation, in raceway unless specifically noted otherwise.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Conform to requirements of NFPA 70.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.5 FIELD MEASUREMENTS

- A. Verify field measurements prior to work. Coordinate dimensions with architectural, structural, and civil drawings. Electrical Drawings are diagrammatic only and shall not be scaled.

1.6 COORDINATION

- A. Where wire and cable destination is indicated and routing is not shown, determine routing and lengths required.
- B. Wire and cable routing indicated is approximate unless dimensioned. Include wire and cable lengths within 10 ft of length shown.

PART 2 PRODUCTS

2.1 BUILDING WIRE

- A. Product Description: Single conductor insulated wire.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts.

2.2 TERMINATIONS

- A. Terminal Lugs for Wires 6 AWG and Smaller: Solderless, compression type copper.

- D. Install temporary protective covers over equipment enclosures, outlet boxes and similar items after interiors, conductors, devices, etc. are installed, to prevent the entry of construction debris and to protect the installation during finish work performed by others. Do not install device plates, equipment covers or trims until finish work is complete.
- E. Clean all equipment, inside and out, upon completion of the work. Scratched or marred surfaces shall be touched-up with touch-up paint furnished by the equipment manufacturer.
- F. Replace all equipment and materials that become damaged.
- G. No more than three phase conductors, each of opposite phases for a three phase WYE system, shall be combined in a single raceway unless written approval is granted by the engineer or noted otherwise on the construction documents. 120 volt and 277 volt receptacle and lighting circuits are except from this requirement, but must meet the requirements of the NEC.

- H. Shared neutrals shall not be utilized (including, but not limited to homeruns) unless written permission is obtained from the Engineer for a specific application.

2.2 EQUIPMENT PROTECTION

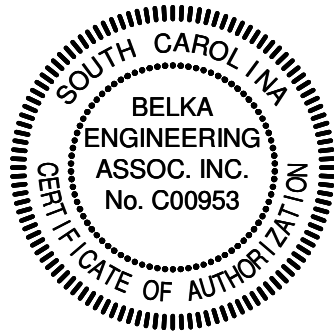
- A. Equipment and materials shall be protected during shipment and storage against physical damage, vermin, dirt, corrosive substances, fumes, moisture, cold and rain.
- B. Store equipment indoors in clean dry space with uniform temperature to prevent condensation. Equipment shall include but not be limited to switchgear, switchboards, panelboards, transformers, motor control centers, motor controllers, uninterruptible power systems, enclosures, controllers, circuit protective devices, cables, wire, light fixtures, electronic equipment, and accessories.
- C. During installation, equipment shall be protected against entry of foreign matter; and be vacuum-cleaned both inside and outside before testing and operating. Compressed air shall not be used to clean equipment. Remove loose packing and flammable materials from inside equipment.
- D. Damaged equipment shall be, as determined by the Engineer, placed in first class operating condition or be returned to the source of supply for repair or replacement.
- E. Painted surfaces shall be protected with factory installed removable heavy kraft paper, sheet vinyl or equal.
- F. Damaged paint on equipment and materials shall be refinished with the same quality of paint and workmanship as used by the manufacturer so repaired areas are not obvious.

2.3 UTILITY CONNECTIONS:

- A. Coordinate the connection of the electrical system with the local power company. Comply with the requirements of governing regulations, franchised service companies and controlling agencies. Pay all utility fees and charges.

2.4 ELECTRICAL WORK:

- A. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished in this manner for the required work, the following requirements are mandatory:
1. Electricians must use full protective equipment (i.e., certified and tested insulating material to cover exposed energized electrical components, certified and tested insulated tools, etc.) while working on energized systems in accordance with NFPA 70E.
2. Electricians must wear personal protective equipment while working on energized systems in



BELKA
ENGINEERING ASSOCIATES

2519A PLATT SPRINGS RD | WEST COLUMBIA, SC
(803) 731-0650 Office | (803) 467-7657 Cell

CONTACT: JASON AREHEART
JAREHEART@BEA-Consulting.com

DT22503

DRAWN BY: HTT CHECK BY: JLA

Project. No.: DT22503

FILE:

ELECTRICAL
SPECIFICATIONS

E700

07/22/25

SCDOT CAMDEN GENERATOR REPLACEMENT

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

512 Fair Street
Camden, South Carolina

SCDOT
FACILITIES PLANNING AND CONSTRUCTION
955 PARK STREET - ROOM 333, P.O. BOX 191
COLUMBIA, SOUTH CAROLINA 29202-0191
(803) 737-1299 (803) 737-1719 (FAX)

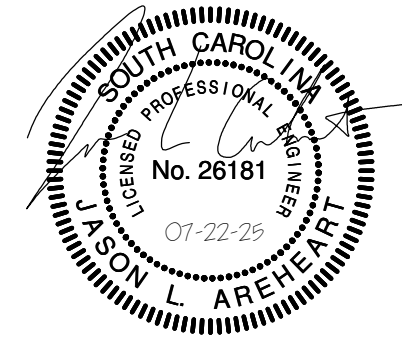
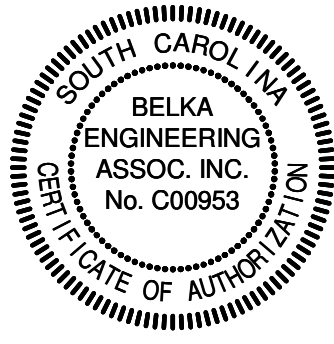
B.	Lugs for Wires 4 AWG and Larger: Color keyed, compression type copper, with insulating sealing collars.
PART 3 EXECUTION	
3.1	EXAMINATION
A.	Verify raceway installation is complete and supported.
3.2	PREPARATION
A.	Completely and thoroughly swab raceway before installing wire.
3.3	EXISTING WORK
A.	Remove exposed abandoned wire and cable, including abandoned wire and cable above accessible ceiling finishes. Patch surfaces where removed cables pass through building finishes.
B.	Disconnect abandoned circuits and remove circuit wire and cable. Remove abandoned boxes when wire and cable servicing boxes is abandoned and removed. Install blank cover for abandoned boxes not removed.
C.	Provide access to existing wiring connections remaining active and requiring access. Modify installation or install access panel.
D.	Extend existing circuits using materials and methods compatible with existing electrical installations, or as specified.
E.	Clean and repair existing wire and cable remaining or wire and cable to be reinstalled.
3.4	INSTALLATION
A.	Route wire and cable to meet Project conditions.
B.	Neatly train and lace wiring inside boxes, equipment, and panelboards.
C.	Identify wire and cable under provisions of Section 260553. Identify each conductor with its circuit number or other designation indicated.
D.	Special Techniques--Building Wire in Raceway: 1. Pull conductors into raceway at same time. 2. Install building wire 4 AWG and larger with pulling equipment.
E.	Special Techniques - Wiring Connections: 1. Clean conductor surfaces before installing lugs and connectors. 2. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise. 3. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor. 4. Install split bolt connectors for copper conductor splices and taps, 6 AWG and larger. 5. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller. 6. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
F.	Install stranded conductors for branch circuits 10 AWG and smaller. Install crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under screws.
G.	Install terminal lugs on ends of 600 volt wires unless lugs are furnished on connected device, such as circuit breakers.

1.	Bonding Jumpers: Compression type connectors, using zinc-plated fasteners and external tooth lock washers.
2.4	EXOTHERMIC CONNECTIONS
A.	Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.
PART 3 EXECUTION	
3.1	EXAMINATION
A.	Verify final backfill and compaction has been completed before driving rod electrodes.
3.2	PREPARATION
A.	Remove paint, rust, mill oils, and other surface contaminants at connection points.
3.3	EXISTING WORK
A.	Modify existing grounding system to maintain continuity to accommodate renovations.
B.	Extend existing grounding system using materials and methods compatible with existing electrical installations, or as specified.
3.4	INSTALLATION
A.	Install in accordance with IEEE 142.
B.	Install rod electrodes at locations as indicated on Drawings. Install additional rod electrodes to achieve specified resistance to ground.
C.	Install grounding and bonding conductors concealed from view.
D.	Equipment Grounding Conductor: Install separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
E.	Accomplish grounding of electrical system by using insulated grounding conductor installed with feeders and branch circuit conductors in conduits. Size grounding conductors in accordance with NEC. Install from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes or metal enclosures of service equipment. Ground conduits by means of grounding bushings on terminations at panelboards with installed number 12 conductor to grounding bus.
F.	Grounding electrical system using continuous metal raceway system enclosing circuit conductors in accordance with NEC.
G.	Permanently attach equipment and grounding conductors prior to energizing equipment.
3.5	FIELD QUALITY CONTROL
A.	Inspect and test in accordance with NETA ATS, except Section 4.
B.	Grounding and Bonding: Perform inspections and tests listed in NETA ATS, Section 7.13.
C.	Perform ground resistance testing in accordance with IEEE 142.
D.	Perform continuity testing in accordance with IEEE 142.
END OF SECTION 260526	

H.	Size lugs in accordance with manufacturer's recommendations terminating wire sizes. Install 2-hole type lugs to connect wires 4 AWG and larger to copper bus bars.
3.5	WIRE COLOR
A.	General: 1. For wire sizes 6 AWG and smaller, install wire with insulation colors as designated below. 2. For wire sizes 4 AWG and larger, identify wire with colored tape at terminals, splices and boxes. Colors are as follows:
B.	120/240-volt, single phase system: Phase A - Black Phase B - Red Neutral - White Ground - Green
	120/240-volt, open delta system: Phase A - Black Phase B - Orange (High-leg) Phase C - Blue Neutral - White Ground - Green
3.6	FIELD QUALITY CONTROL
A.	Inspect and test in accordance with NETA ATS, except Section 4.
B.	Perform inspections and tests listed in NETA ATS, Section 7.3.1.
END OF SECTION 260519	

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS	
PART 1 GENERAL	
1.1	SUMMARY
A.	Section Includes: 1. Conduit and equipment supports. 2. Anchors and fasteners.
1.2	DELIVERY, STORAGE, AND HANDLING
A.	Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.
PART 2 PRODUCTS	
2.1	CONDUIT SUPPORTS
A.	Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.
B.	Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.
C.	Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.
D.	Conduit clamps - general purpose: One hole malleable iron for surface mounted conduits.
E.	Cable Ties: High strength nylon temperature rated to 185 degrees F (85 degrees C). Self locking.
2.2	FORMED STEEL CHANNEL
A.	Product Description: Galvanized 12 gage (2.8 mm) thick steel. With holes 1-1/2 inches (38 mm) on center.
2.3	SPRING STEEL CLIPS
A.	Product Description: Mounting hole and screw closure.
PART 3 EXECUTION	
3.1	PREPARATION
A.	The use of powder-actuated anchors is not allowed.
B.	Do not drill or cut structural members.
3.2	INSTALLATION - HANGERS AND SUPPORTS
A.	Anchors and Fasteners: 1. Steel Structural Elements: Provide beam clamps, spring steel clips, and steel ramset fasteners. 2. Concrete Surfaces: Provide self-drilling anchors and expansion anchors. 3. Hollow Masonry, Plaster, and Gypsum Board Partitions: Provide toggle bolts and hollow wall fasteners. 4. Solid Masonry Walls: Provide expansion anchors and preset inserts. 5. Sheet Metal: Provide sheet metal screws. 6. Wood Elements: Provide wood screws.
B.	Install conduit and raceway support and spacing in accordance with NEC.

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS	
PART 1 GENERAL	
1.1	SUMMARY
A.	Section Includes: 1. Rod electrodes. 2. Wire. 3. Mechanical connectors. 4. Exothermic connections.
1.2	PERFORMANCE REQUIREMENTS
A.	Grounding System Resistance: 25 ohms maximum.
1.3	CLOSEOUT SUBMITTALS
A.	Project Record Documents: Record actual locations of components and grounding electrodes.
1.4	QUALITY ASSURANCE
A.	Provide grounding materials conforming to requirements of NEC, IEEE 142, and UL labeled.
1.5	QUALIFICATIONS
A.	Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.
B.	Installer: Company specializing in performing work of this section with minimum three years experience.
1.6	DELIVERY, STORAGE, AND HANDLING
A.	Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.
PART 2 PRODUCTS	
2.1	ROD ELECTRODES
A.	Product Description: 1. Material: Copper-clad steel. 2. Diameter: 3/4 inch (19 mm). 3. Length: 10 feet (3.0 m).
B.	Connector: Connector for exothermic welded connection.
2.2	WIRE
A.	Material: Stranded copper.
B.	Grounding Electrode Conductor: Copper conductor bare.
C.	Bonding Conductor: Copper conductor insulated.
2.3	MECHANICAL CONNECTORS
A.	Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.



BELKA
ENGINEERING ASSOCIATES
2519A PLATT SPRINGS RD. | WEST COLUMBIA, SC
(803) 731-0650 Office | (803) 467-7657 Cell
CONTACT: JASON AREHEART
JAREHEART@BEA-Consulting.com

DT22503

- C. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
- D. Install multiple conduit runs on common hangers.
- E. Supports:
 - 1. Fabricate supports from structural steel or formed steel channel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
 - 2. Install surface mounted cabinets and panelboards with minimum of four anchors.
 - 3. In wet and damp locations install steel channel supports to stand cabinets and panelboards 1 inch (25 mm) off wall.
 - 4. Support vertical conduit at every other floor.

3.3 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

- A. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.
- B. Construct supports of steel members. Brace and fasten with flanges bolted to structure.

3.4 PROTECTION OF FINISHED WORK

- A. Protect adjacent surfaces from damage by material installation.

END OF SECTION 260529

B. Cast Boxes: NEMA FB 1, Type FD. Furnish gasketed cover by box manufacturer.

2.8 PULL AND JUNCTION BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

B. Hinged Enclosures: As specified in Section 26 27 16.

C. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box:

1. Material: Galvanized cast iron.
2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 EXISTING WORK

A. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces.

B. Remove concealed abandoned raceway to its source.

C. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.

D. Extend existing raceway and box installations using materials and methods compatible with existing electrical installations, or as specified.

E. Clean and repair existing raceway and boxes to remain or to be reinstalled.

3.3 INSTALLATION

A. Ground and bond raceway and boxes in accordance with Section 260526.

B. Fasten raceway and box supports to structure and finishes in accordance with Section 260529.

C. Identify raceway and boxes in accordance with Section 260553.

D. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.4 INSTALLATION - RACEWAY

A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.

B. Arrange raceway supports to prevent misalignment during wiring installation.

C. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

D. Group related raceway; support using conduit rack. Construct rack using steel channel specified in Section 260529; provide space on each for 25 percent additional raceways.

E. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports.

F. Do not attach raceway to ceiling support wires or other piping systems.

G. Construct wireway supports from steel channel specified in Section 260529.

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes conduit and tubing, surface raceways, wireways, outlet boxes, pull and junction boxes, and handholes.

1.2 SYSTEM DESCRIPTION

A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.

B. Underground Raceways: All underground raceways shall be as defined below unless noted otherwise on plans.

1. Service Entrance: Provide nonmetallic conduit (schedule 40 PVC) with galvanized rigid steel long-sweep 90-degree elbows. Where conduits go vertical, they shall be galvanized rigid steel or IMC to above grade.
2. Feeders: Provide nonmetallic conduit (schedule 40 PVC) with galvanized rigid steel long-sweep 90-degree elbows where below grade. Where conduits go vertical, they shall be galvanized rigid steel or IMC to above grade or slab.
3. Branch circuits outside building footprint: Provide nonmetallic conduit (schedule 40 PVC) with galvanized rigid steel long-sweep 90-degree elbows. Where conduits go vertical, they shall be galvanized rigid steel or IMC to above grade.

C. Outdoor Locations, Above Grade: Provide galvanized rigid steel or rigid aluminum conduit. Provide cast metal or nonmetallic outlet, pull, and junction boxes. Provide liquid-tight flexible metal conduit (maximum 6'-0" in length) for connection to vibrating equipment.

D. Interior Wet and Damp Locations: Provide galvanized rigid steel or aluminum conduit. Provide cast metal outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.

E. Concealed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes. Provide flexible metal conduit (maximum 6'-0" in length) for connection to vibrating equipment.

F. Exposed Dry Locations in unfinished spaces: Provide rigid steel or intermediate metal conduit.

G. All raceways shall be hard-piped as described above. Flexible raceways shall be used for the following applications and shall be limited to 6'-0" in length:

1. Whips to light fixtures.
2. Connections to vibrating equipment. Examples of vibrating equipment include, but are not limited to the following:
 - a. Transformers
 - b. Mechanical equipment.
 - c. Pumps.
 - d. Motors.
 - e. Compressors.
3. Other applications that are specifically called out in plans.

1.3 DESIGN REQUIREMENTS

A. Minimum Raceway Size: 3/4 inch (19 mm) unless otherwise specified.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents:

1. Record actual routing of conduits larger than 2 inch (DN50).
2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

- H. Route exposed raceway parallel and perpendicular to walls.
- I. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
- J. Route conduit in and under slab from point-to-point.
- K. Maintain clearance between raceway and piping for maintenance purposes.
- L. Maintain 12 inch (300 mm) clearance between raceway and surfaces with temperatures exceeding 104 degrees F (40 degrees C).
- M. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- N. Bring conduit to shoulder of fittings; fasten securely.
- O. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- P. Install conduit hubs or sealing locknuts to fasten conduit to cast boxes.
- Q. Install no more than equivalent of three 90 degree bends between boxes for power systems. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2 inch (50 mm) size.
- R. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- S. Install fittings to accommodate expansion and deflection where raceway crosses seismic, control and expansion joints.
- T. Install suitable pull string or cord in each empty raceway except sleeves and nipples.
- U. Install suitable caps to protect installed conduit against entrance of dirt and moisture.
- V. Close ends and unused openings in wireways, junction boxes, and pull boxes.

3.5 INSTALLATION - BOXES

- A. Install wall mounted boxes at elevations to accommodate mounting heights as indicated on Drawings.
- B. Adjust box location up to 10 feet (3 m) prior to rough-in to accommodate intended purpose.
- C. Orient boxes to accommodate wiring devices oriented as specified in Section 262726.
- D. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- E. Do not fasten boxes to ceiling support wires or other piping systems.
- F. Support boxes independently of conduit.

3.6 ADJUSTING

- A. Install knockout closures in unused openings in boxes.

3.7 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore finish.

END OF SECTION 260533

1. Record actual routing of conduits larger than 2 inch (DN50).
2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

PART 2 PRODUCTS

2.1 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Rigid Aluminum Conduit: ANSI C80.5.
- C. Intermediate Metal Conduit (IMC): Rigid steel.
- D. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit.

2.2 FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction.
- B. Fittings: NEMA FB 1.

2.3 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction with PVC jacket.
- B. Fittings: NEMA FB 1.

2.4 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3; galvanized tubing.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel compression type.

2.5 NONMETALLIC CONDUIT

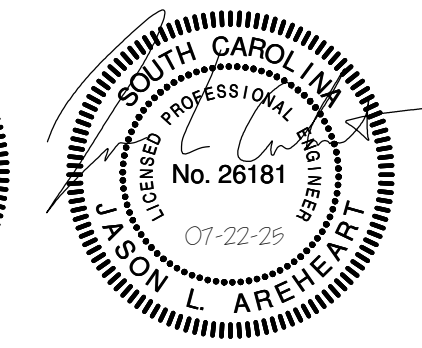
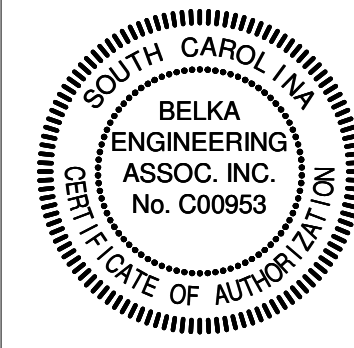
- A. Product Description: NEMA TC 2; Schedule 40 PVC.
- B. Fittings and Conduit Bodies: NEMA TC 3.

2.6 WIREWAY

- A. Product Description: General purpose for interior locations, and Raintight type for exterior locations wireway.
- B. Cover: Hinged cover with full gaskets.
- C. Finish: Rust inhibiting primer coating with gray enamel finish.

2.7 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch (13 mm) male fixture studs where required.
 2. Concrete Ceiling Boxes: Concrete type.



BELKA
ENGINEERING ASSOCIATES

2519A PLATT SPRINGS RD | WEST COLUMBIA, SC
(803) 731-0650 Office | (803) 467-7657 Cell

CONTACT: JASON AREHEART
JAREHEART@BEA-Consulting.com

DT2250E

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:

1. Nameplates.

2. Labels.

3. Wire markers.

4. Panel Schedules

5. Underground Warning Tape.

1.2 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.3 ENVIRONMENTAL REQUIREMENTS

- A. Install nameplates and labels only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

PART 2 PRODUCTS

2.1 NAMEPLATES

- A. Product Description: Laminated three-layer plastic with engraved letters on contrasting background color. See specification sections for specific equipment for nameplate color schemes. If no color scheme is specified for specific equipment, provide black letters on a white background.
- B. Letter Size:

1. 1/8 inch (3 mm) high letters for identifying individual equipment and loads.
- C. Minimum nameplate thickness: 1/8 inch (3 mm).

2.2 LABELS

- A. Labels: Embossed adhesive tape, with 3/16 inch (5 mm) black letters on clear background.

2.3 WIRE MARKERS

- A. Legend:

1. Control Circuits: Control wire number as indicated on shop drawings.

2.4 PANELBOARD SCHEDULES

- A. Provide complete panelboard schedule with all circuits identified and room numbers associated with each branch circuit included. Panel Schedules shall include Panelboard name, Voltage/Phase, Main Bus and/or Main Breaker rating, Date Schedule was completed, Contractor name and phone number.
- B. All panelboard schedules for existing panels where any branch circuit or feeder modification was included in the project scope shall have the a completely new panelboard schedule created. Contractor is responsible for field verifying and circuit tracing of all existing branch circuits associated with the panelboard to ensure accurate descriptions.

2.5 UNDERGROUND WARNING TAPE

- A. Description: 4 inch (100 mm) wide plastic tape, detectable type, colored yellowwith suitable warning legend describing buried electrical lines.

- C. Molded Case Circuit Breakers: NEMA AB 1, plug-on type thermal magnetic trip circuit breakers, with common trip handle for poles, listed as Type SWD for lighting circuits, Class A ground fault interrupter circuit breakers as indicated on Drawings. Do not use tandem circuit breakers.
- D. Enclosure: General Purpose.
- E. Box: Flush or Surface type with door, and latch and lock on door. Finish in manufacturer's standard gray enamel.

2.3 CIRCUIT BREAKERS

- A. For all circuit breakers 200 amps and smaller: Provide Molded Case Thermal Magnetic Trip type Circuit Breakers.

1. Type SWD for lighting circuits.

2. Do not use tandem circuit breakers.

3. GFCI Circuit breakers: Single and two-pole configurations with Class A ground-fault protection (6-mA trip).

2.4 SHORT CIRCUIT CURRENT RATING

- A. Devices which achieve the level of fault protection indicated by means of "series" or "integrated" rating shall not be acceptable unless specifically indicated on the drawings. All panelboards shall be fully rated.
- B. For existing equipment, provide circuit breakers with short circuit current ratings that match ratings indicated on panel, if no markings indicate panelboard rating, then provide ratings that match highest rated circuit breaker in panelboard.

PART 3 EXECUTION

3.1 EXISTING WORK

- A. Disconnect abandoned panelboards. Remove abandoned equipment unless specifically noted otherwise.
- B. Maintain access to existing panelboards remaining active and requiring access. Modify installation or provide access panel.
- C. Clean and repair existing panelboards to remain or to be reinstalled.

3.2 INSTALLATION

- A. Install panelboards in accordance with NEMA PB 1.1.
- B. Install panelboards plumb.
- C. Height: 6 feet (1800 mm) to top of panelboard; install panelboards taller than 6 feet (1800 mm) with bottom no more than 4 inches (100 mm) above floor.
- D. Install filler plates for unused spaces in panelboards.
- E. Ground and bond panelboard enclosure according to Section 260526. Connect equipment ground bars of panels in accordance with NFPA 70.

3.3 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Perform circuit breaker inspections and tests listed in NETA ATS, Section 7.6.

PART 3 EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.2 INSTALLATION

- A. Install identifying devices after completion of painting.
- B. Nameplate Installation:

1. Install nameplate parallel to equipment lines.

2. Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant mechanical fasteners, or adhesive.

3. Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners, or adhesive.

4. Secure nameplate to equipment front using screws, or adhesive.

5. Install nameplates for the following:

a. Panelboards.

b. Transfer Switches.
- C. Label Installation:

1. Install label parallel to equipment lines.

2. Install label for identification of branch circuit and panelboard supporting each wiring devices.

3. Install labels for permanent adhesion and seal with clear lacquer.
- D. Underground Warning Tape Installation:

1. Install underground warning tape along length of each underground conduit, raceway, or cable 6 to 8 inches (150 to 200 mm) below finished grade, directly above buried conduit, raceway, or cable.

END OF SECTION 260553

- C. Perform controller inspections and tests listed in NETA ATS, Section 7.16.1.

3.4 ADJUSTING

- A. Touch-up scratched or marred surfaces to match original finish.
- B. Clean all debris from panel interiors.

3.5 LABELING

- A. Install engraved plastic nameplates in accordance with Section 260553.
- B. Provide nameplates on all new electrical panelboards. Indicate the following information on the nameplate:

1. Panel Name

2. Panel fed from

3. Voltage, Phase, Wire, Short Circuit Current Rating

4. Date Installed
- C. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes to balance phase loads.

3.6 CLEARANCE AND WORKSPACE

- A. Maintain workspace and clearances as required by the NEC for voltages encountered. No pipes or ducts shall pass above the outline of the panelboard. It shall be the responsibility of this Contractor to make sure that other trades do not encroach on this space.

END OF SECTION

SECTION 262416 – PANELBOARDS AND CIRCUIT BREAKERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes circuit breakers and load centers.

1.2 SUBMITTALS

- A. Shop Drawings: Include all of the following information:

1. Indicate outline and support point dimensions.

2. Product data

3. Enclosure type

4. Circuit directory

5. Bussing Diagrams

6. Integrated short circuit ampere rating

7. Device Nameplate Data
- B. Product Data: Submit catalog data showing specified features of standard products.

1.3 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of panelboards and record actual circuiting arrangements.
- B. Operation and Maintenance Data: Submit spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.5 MAINTENANCE MATERIALS

- A. Furnish two of each panelboard key. Panelboards keyed alike to Owner's current keying system.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following manufacturers:

1. GE Electric

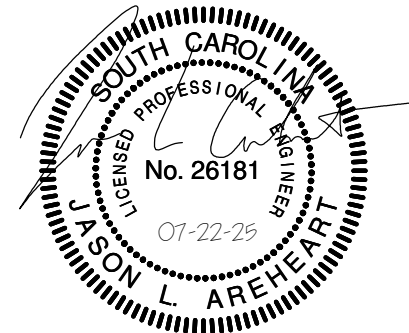
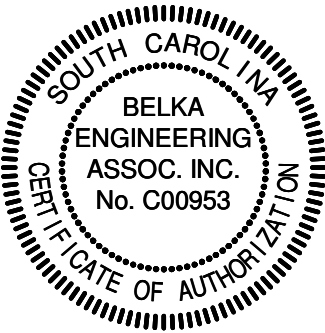
2. Square D

3. Eaton

4. Siemens

2.2 LOAD CENTERS

- A. Product Description: Circuit breaker load center, with bus ratings as indicated on Drawings.
- B. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical.



2519A PLATT SPRINGS RD | WEST COLUMBIA, SC
(803) 731-0650 Office | (803) 467-7657 Cell
CONTACT: JASON AREHEART
JAREHEART@BEA-Consulting.com

DT22503

DRAWN BY: HTT CHECK BY: JLA

Project No.: DT22503

FILE:

ELECTRICAL
SPECIFICATIONS

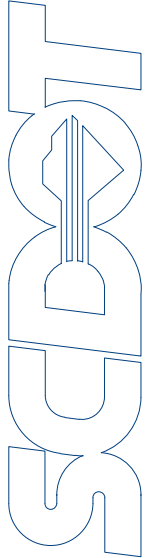
E703

07/22/25

SCDOT CAMDEN GENERATOR REPLACEMENT

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

512 Fair Street
Camden, South Carolina



FACILITIES PLANNING AND CONSTRUCTION
955 PARK STREET - ROOM 333, P.O. BOX 191
COLUMBIA, SOUTH CAROLINA 29202-0191
(803) 737-1299 (803) 737-1719 (FAX)

SECTION 262826 ENCLOSED AUTOMATIC TRANSFER SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes installation of owner-furnished automatic transfer switches in individual enclosure.

1.2 SUBMITTALS

- A. Product Data: Contractor shall request submittal data for automatic transfer switch from Owner/Engineer.

1.3 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of enclosed transfer switches.

1.4 MAINTENANCE SERVICE

- A. Furnish service and maintenance of transfer switches for one year from Date of Substantial Completion.

PART 2 - EXECUTION

2.1 INSTALLATION

- A. Provide seismically braced wall mount installations.
- B. Install engraved plastic nameplates in accordance with Section 26 05 53. Indicate the following information on the nameplate:
- Transfer Switch Name
 - Both Sources
 - Voltage, Phase, Wire, Short Circuit Current Rating
 - Date Installed

2.2 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Perform inspections and tests listed in NETA ATS, Section 7.22.3.

2.3 MANUFACTURER'S FIELD SERVICES

- A. Check out transfer switch connections and operations and place in service.

2.4 ADJUSTING

- A. Adjust control and sensing devices to achieve specified sequence of operation.

2.5 DEMONSTRATION AND TRAINING

- A. Demonstrate operation of transfer switch in normal, and emergency modes.

END OF SECTION 262826

SECTION 263213 - GENERATOR

A. - GENERAL

A.1 SUMMARY

- A. Section includes installation of owner-furnished packaged engine-generator set, exhaust silencer and fittings, fuel tank and fittings, remote control panels, battery, and charger.

A.2 SYSTEM DESCRIPTION

- A. Description: Engine generator assembly and accessories to provide source of standby power for selected loads. The system consists of an owner-furnished diesel-fueled generator set with related component accessories and owner-furnished automatic transfer switch specified under a separate section.
- B. Capacity: 40 kW, 50 kVA standby rating using specified engine cooling scheme.

A.3 WORK INCLUDED

- A. Installation: The work includes installing a complete integrated generator system. The system consists of a diesel generator set with related component accessories.
- B. Fuel System: The contractor shall provide a full tank of diesel fuel after the completion of all testing.
- C. System Test: A complete system load test shall be performed after all equipment is installed. Guidelines in the Start-up Section.
- D. Requirements, Codes and Regulations: The equipment installation shall meet the requirements of the NEC and all applicable local codes and regulations.

A.3 SUBMITTALS

- A. Product Data: Contractor shall request submittal data for engine, generator, control panel, transfer switches, battery, battery rack, battery charger, exhaust silencer, vibration isolators, sub-base fuel tank, enclosure and radiator from Owner/Engineer.
- B. Contractor shall request concrete pad recommendation, layout and stub-up locations of electrical and fuel systems from manufacturer of owner-furnished generator.
- C. Test Reports: Indicate results of performance testing. Report of exhaust emissions and compliance statement certifying compliance with applicable regulations.
- D. Manufacturer's Field Reports: Indicate inspections, findings, and recommendations.

A.4 SYSTEM RESPONSIBILITY

- A. The equipment installation shall meet the requirements of the NEC and all applicable local codes and regulations.

B. EXECUTION

B.1 INSTALLATION

- A. Install engraved plastic nameplates on all transfer switches.
- B. Ground and bond generator and other electrical system components in accordance with Section 260526. At the generator output neutral and ground shall be bonded. Ground shall be connected via a 3/0 conductor to a group of three 10' copper clad steel ground rods spaced at least 20' from each other.
- C. All conductors shall be landed under separate lug barrels.
- D. Fuel System: The contractor shall provide only the diesel fuel required for the completion of all testing + 5% of tank capacity.
- E. System Test: A complete system load test shall be performed after all equipment is installed. Guidelines in the Start-up Section.

B.2 MANUFACTURER'S FIELD SERVICES

- A. Prepare and start up engine-generator assembly.
- B. Coordinate all start-up and testing activities with the Engineer and Owner. After installation is complete and normal power is available, the manufacturer's local dealer shall perform the following:

With resistive Load bank: Perform a 4 hour load bank test at full nameplate rating less applicable derating factors for site conditions. Load bank, cables and other equipment required for this test to be supplied by the genset supplier.

NFPA 110 Load Test Requirements:

- Verify that the equipment is installed properly.
- Check all auxiliary devices for proper operation, including battery charger, jacket water heater(s), generator space heater, remote annunciator, etc.
- Test all alarms and safety shutdown devices for proper operation and annunciation.
- Check all fluid levels.
- Start engine and check for exhaust, oil, fuel leaks, vibrations, etc.
- Verify proper voltage and phase rotation at the transfer switch before connecting to the load.
- Connect the generator to building load and verify that the generator will start and run all designated loads.
- The system shall be tested under full load and monitor the following readings:
 - Oil pressure
 - Coolant temperature
 - Battery charge rate
 - AC volts
 - AC Amperes- all phases

- Frequency
- Kilowatts
- Ambient Temperature

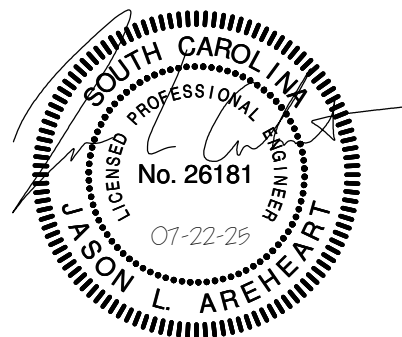
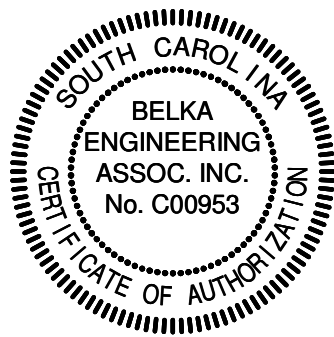
B.3 ADJUSTING

- A. Adjust generator output voltage and engine speed to meet specified ratings.

B.4 CLEANING

- A. Clean engine and generator surfaces.

END OF SECTION 263213



BELKA
ENGINEERING ASSOCIATES

2519A PLATT SPRINGS RD | WEST COLUMBIA, SC
(803) 731-0650 Office | (803) 467-7657 Cell

CONTACT: JASON AREHEART
JAREHEART@BEA-Consulting.com

DT22503

DRAWN BY: HTT CHECK BY: JLA

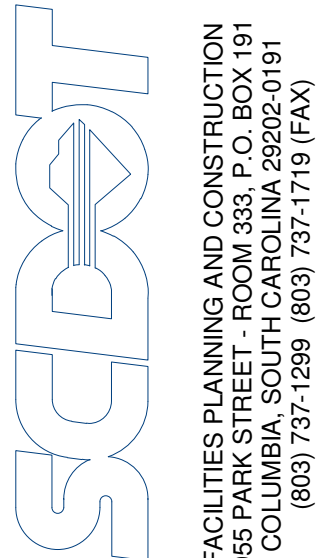
FILE: DT22503 Project No.:

ELECTRICAL
SPECIFICATIONS

SCDOT CAMDEN GENERATOR REPLACEMENT

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

512 Fair Street
Camden, South Carolina



E704