



# **Underground Commercial Electric Service**

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## Underground Commercial Electric Service

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# Section 1: Specifications and Requirements

## A. General

These specifications and requirements for Dominion Energy South Carolina, Inc., and the Developer, which are general in nature, cover the material, construction, workmanship and procedures for the typical installation of underground electrical facilities to new commercial projects. The method of feed shall be at the discretion of the Company. **The Developer/Owner should contact the Company as soon possible in the planning stage of the project to address electrical service issues such as voltage, service point, etc.**

## B. Definition of Terms

- 1) The term “Company” when used herein means Dominion Energy South Carolina, Inc. (“Dominion Energy South Carolina”) (“DESC”).
- 2) The term “Developer” when used herein means the party entering into the agreement with the Company.
- 3) “Radial service” shall mean a cable connected to an overhead line (or other source of electrical energy) extending down the pole and under the ground to one or more transformers together with the necessary accessories to assure proper operation.
- 4) “Loop service” shall mean a cable extending from an overhead line down the pole (or other source of electrical energy) under the ground to a transformer, extended (or looped) to additional transformers one at a time, then extended to and up another pole to an overhead line. Such service may have a normally open point, as Company may deem appropriate.
- 5) “Underground secondary service” shall mean secondary service wires furnished, installed, owned and maintained by the customer which run from transformer (overhead or pad-mount) or other point of service (i.e.; hand-hole, Company owned pole, Customer owned pole, etc.) identified by Company to customer’s load center.
- 6) “Foreign Utility” shall mean any electric, gas, communication, water, sewer, drainage or other utility not owned by the Company.

### **C. Company and Developer's Responsibilities Defined**

- 1) In order to receive electric service, the Developer shall:
  - a) Furnish (at no cost to the Company) an acceptable drawing or plat (electronic format is standard) showing details of property lines, buildings, dedicated easements, sediment and erosion control measures, water lines, sewage, drainage, any other underground facilities and a grading plan showing initial and final contours. Environmentally sensitive areas must be shown on proposed layouts (wetlands, bodies of water, cemeteries, historical sites, etc.)
  - b) Coordinate the approval of governmental agencies required for the development (i.e.; buffer zones, wetlands, zoning, land disturbance, etc.)
  - c) Provide suitable easements for electrical service including restrictions for the elimination of encroachments, which may interfere with the continued operation and maintenance of the underground electric facilities.
  - d) Specify the length of time anticipated for the completion of the project (including each stage or phase of development when known) and provide the date's temporary and permanent electric service is required. Coordinate major schedule changes with the Company. Furnish technical details of electrical service needs including voltages, size and type of connected loads and similar data.
  - e) Install and maintain permanent property corners prior to the start of work by the Company.
  - f) Initiate stabilization measures as required both before and after installation of underground lines and include this activity in sequencing of construction activities in the Storm Water Pollution Prevention Plan. Developer will be responsible for temporary stabilization, if necessary, once final grade is established and prior to Company trenching activities. Do not initiate final stabilization on easement prior to Company installing underground lines. Any inlet protection will be responsibility of the Developer.
  - g) Establish final grade and tamp any required filling or grading before the start of any underground distribution construction. Costs incurred due to changes in earth grades after the start of construction will be borne by the Developer.
  - h) Furnish, install, own and maintain the concrete transformer pad and vehicular

protection bollards (if required) in accordance with Company drawings.

- i) Furnish and install all necessary conduits, pull wire, pull boxes, bends, including necessary trenching and back filling, in accordance with Company drawings and specifications, from the transformer location to the source. This shall include galvanized bends, transformer entrance conduit and the first section of PVC SCH40 conduit up the pole. Installation by the Developer shall comply with Company drawing 06.04-08 and be subject to Company acceptance.
- j) Furnish and install all necessary conduits between source points on Developer's property in accordance with Company drawings to allow for looped service and adequate system reliability and/or to facilitate the extension of underground electric lines across the Developer's property.
- k) Furnish, install, own, and maintain the meter base for services served by a transformer capacity of 150 KVA or less. Transformer capacity will be based on expected load rather than main disconnect size. Services larger than those listed above will generally be metered using current transformers. Note – This is a general guideline only; Company Metering Department should be consulted to confirm proper equipment needed for each situation. These guidelines are subject to change as metering technology changes.
- l) Keep the transformer and primary cable unencumbered and accessible for maintenance and provide suitable vehicular barriers where required per Company drawing 17.02-01D.
- m) Notify Palmetto Utility Protection Service (811) for marking of underground facilities prior to digging. Hand dig foreign utility trenches in areas crossing electrical cables already in place to eliminate contact with electrical cables.
- n) Furnish and install secondary conduit and conductors and notify the Company of the secondary conductor size(s) and total number of secondary runs. Required service conductor sizes are 1/0 through 750 KCMIL stranded copper or 1/0 through 750 KCMIL stranded aluminum cables or multiple conductors of these sizes. Connectors for use in pad mount transformers will be furnished, installed and maintained by the Company (see drawing 14.02-03D).
- o) Take service at the service point identified by the Company. For pad mount transformers, the number of secondary service connections is limited to the maximum as shown on the tables in drawing 17.02-01C. Secondary service

cables shall comply with the National Electrical Code (NEC), current edition, as a minimum when installed. Secondary cables carrying metered energy shall be installed in separate conduit or raceways from all other cables or wires.

- p) Furnish, install, operate and maintain phase converters for three phase loads (where Developer has elected not to utilize single phase) in areas with only single phase available. Developer can elect to pay a difference in cost and monthly operating fee for three phase service in lieu of installing phase converter.
- q) The Developer will be fully responsible for compliance with any tree or buffer ordinances affecting Company easements. Any funding or tree replacement will be the responsibility of the Developer. Buffer requirements are in addition to and separate from Company easements. The Developer shall be fully aware of all appropriate ordinances that can affect the Company's right of way and should take this into account when assigning the easement.
- r) The Developer shall be fully responsible, as required by local ordinances, to establish and maintain tree barricades around all trees required to be preserved. Any required barricades shall be in place prior to Company beginning design or installation of underground facilities. The standard method of construction will be by an open-trench (trencher or back hoe). Any encroachments in barricaded areas will require directional bores to protect trees and shall be considered as non-standard service to the Developer and at the Developer's expense. The Developer shall be solely responsible and liable for any tree damages incurred during the installation of underground electric facilities that are caused by the Developer's failure to properly barricade any significant trees, as prescribed by local ordinances.

The Developer will be responsible for coordination of the approval of governmental agencies required for the development (i.e.; buffer zones, wetlands, storm water permitting, zoning, etc.)

### **Wetlands**

Provide official verification and confirmation of the wetlands and permits that have been issued, as stated in a letter from the U.S. Army Corps of Engineers (USACE). The letter must reference the detailed site plan drawing (same dated version) and include a file number. Stake or mark the wetlands boundaries prior to construction by the Company. If unable to provide the above information, the Company will provide a Wetlands Determination Authorization Form for Developer to sign giving

the Company permission to have the impacted property surveyed for jurisdictional wetlands, which could include the USACE entering the property. Any costs associated with survey and resulting delineation required will be at Developer's expense.

### **Storm Water**

Obtain coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Construction Activities for all easements and areas of electric line construction and provide official verification of this coverage. Provide site maps showing the locations of all sediment and erosion control measures planned for electric line construction and include these areas in the Storm Water Pollution Prevention Plan.

Developer will be responsible for installation, maintenance, and inspection of all sediment and erosion control measures around electric lines. Notice of Termination will not be submitted by Developer prior to Company completing all electric line installation.

2) The Company shall:

- a) Furnish, install, connect, own and maintain all required overhead facilities, primary cables, and the pad mount transformer. Metering facilities will be installed at locations approved by the Company. Connecting these metering facilities shall be handled on an individual basis.
- b) Prepare an electrical distribution layout for Developer's approval prior to construction. The layout will be the Developer's plat, drawing or other information included in paragraph C 1 (a) above. If changes requested by the Developer after approval result in additional expenses, the Developer shall bear these additional expenses, including reimbursement to the Company for all changes.
- c) Supply the Developer a copy of the approved print prior to beginning construction.

### **D. Reimbursement**

The Developer may be required to pay the Company for the cost of facilities installed in excess of standard as determined by the Company. The Developer may also be required to pay a contribution in aid of construction for projects where the construction cost to expected revenue ratio is above a level set by the Company. This will be in addition to

the charge for non-standard service. An estimate of the amount of such reimbursement will be made available to the customer upon request before work begins. All designs must be analyzed by Company engineers. The Developer will be required to reimburse the Company for all costs associated with all changes made at the Developer's request to the electrical distribution layout after it is approved by the Developer and the Company.



## Section 2: Underground Commercial Service

- A) The standard method for providing commercial underground service will be from an overhead transformer bank with an underground service (see drawings 06.04-06 and 06.04-07). Underground secondary service will be furnished, installed, owned and maintained by the customer.
- B) The Company may elect to use underground primary and a pad mount transformer for large loads or in all-underground areas. The maximum length of underground primary from dip pole or switchgear to a pad mount transformer is 300 feet.
- C) Requests for underground primary, pad mount transformers, loop feeds, or other non-standard service will be considered, but the customer will be expected to pay the difference in cost in excess of standard service as well as a monthly operating fee for these facilities.
- D) The customer's request for underground service is subject to Company review and approval.
- E) Some of these conditions may not apply to customers served from a network or totally underground system. These situations will be handled on an individual basis.
- F) These conditions also may not apply when, in the opinion of the Company, the electrical demand exceeds 2500 KVA or other conditions dictate the need for a special design or substation. These situations will also be handled on an individual basis.

## Section 3: Design Considerations

- A) The transformer bank or dip pole shall normally be located on Developer's property; the necessary feed to it will normally be overhead.
- B) Truck access is required for all company facilities. Pad mount transformers will be located such that a 10 foot wide corridor will exist for access by trucks for maintenance of the transformer. A working area of 30 feet by 18 feet shall be available for use by heavy equipment when replacing the transformer. This area shall adjoin the transformer and may include part of the truck access. An additional area 20 feet by 10 feet wide parallel to and on one side of the work area shall be clear of obstructions greater than 8 feet in height. This additional area is to provide space for operating truck-mounted lifting equipment. See drawing 17.02-01D.
- C) Connection of customer's equipment ground to Company ground electrode in transformer will not be allowed and customer's equipment grounding conductor should not be brought out to transformer with service conductors. Equipment ground shall conform to NEC requirements.
- D) The pad mount transformer shall be placed in such a location as to meet Company's permanent clearance requirements of 4 feet from the side and rear and 12 feet clearance from the front. The front clearance may include required space for truck access. See Company's Drawing 17.02-01D.
- E) The distance from the transformer or cable location shall be 20 feet to any fuel storage tank (liquid or gas), fuel dispensing point, and/or customer owned generators.

## **Section 4: Construction Details and Coordination**

Installation of underground electric service facilities shall be performed in accordance with plans and specifications furnished by the Company. The following stipulations are made to clarify certain details of the trenching and backfilling agreements involving the Company and the Developer.

### **1) Foreign Utilities and Obstructions**

Field determination of the locations and elevations of all foreign utilities and obstructions in areas of conflict with primary and secondary cables and transformer pads shall be performed by the Developer. The location of all crossing facilities shall be clearly marked by the Developer. See drawing 16.01-05.

### **2) Right-of-Way**

Construction will not begin until satisfactory rights-of-way (including easements) are made available to Company. Developer is responsible for all stabilization requirements, sediment and erosion control measures, and clean up of debris from right-of-way clearing operations to include but not limited to limbs, trees and stumps. Company will utilize proper installation techniques, but is not responsible for damage to landscape, bodies of water, trees or flora during installation of facilities. Obstructions to the performance of Company work such as construction materials and equipment shall have been cleared away by the Developer prior to the start of Company construction.

### **3) Trench Excavation and Backfill**

Trench excavation and backfill is the responsibility of the Developer. It is the Developer's responsibility to ensure compliance with OSHA and other Federal, State and local requirements while doing this work. Backfill shall be dirt, sand, or soil excavated from the trench, or other suitable soils, free from rock, organic materials, construction materials or other debris.

# Section 5: Construction Drawings

| <u>Drawing</u> | <u>Title</u>   |
|----------------|--|
| 06.04-06.....  | Commercial Hybrid Service on Company Pole                        |
| 06.04-07.....  | Commercial Hybrid Service on Customer Pole                       |
| 06.04-08.....  | Commercial Requirements for Pad Mount Transformer Service        |
| 12.01-04.....  | Pad Mount Switchgear Clearance Requirements                      |
| 14.02-03D..... | Two-Hole Nema ShearBolt Lugs for 3 $\Phi$ Pad Mount Transformers |
| 16.01-04.....  | Joint Use with Communication & Gas at Transformer Locations      |
| 16.01-05.....  | Non-Joint Use Trenching Detail                                   |
| 16.01-06.....  | Road Crossing Detail   |
| 17.02-01A..... | 3 $\Phi$ Pad Mount Transformer Concrete Pad Notes                |
| 17.02-01B..... | 3 $\Phi$ Pad Mount Transformer Concrete Pad Detail               |
| 17.02-01C..... | 3 $\Phi$ Transformer Concrete Pad Supplemental Details           |
| 17.02-01D..... | Guide for Locating/Spotting 3 $\Phi$ Pad Mount Transformer       |
| 19.01-03.....  | Meter Clearance Requirements                                     |
| 19.01-04.....  | Meter Socket Mounting Configurations                             |
| 19.01-05.....  | Modular (Ganged) Meter Assembly                                  |

# COMMERCIAL HYBRID SERVICE ON COMPANY POLE

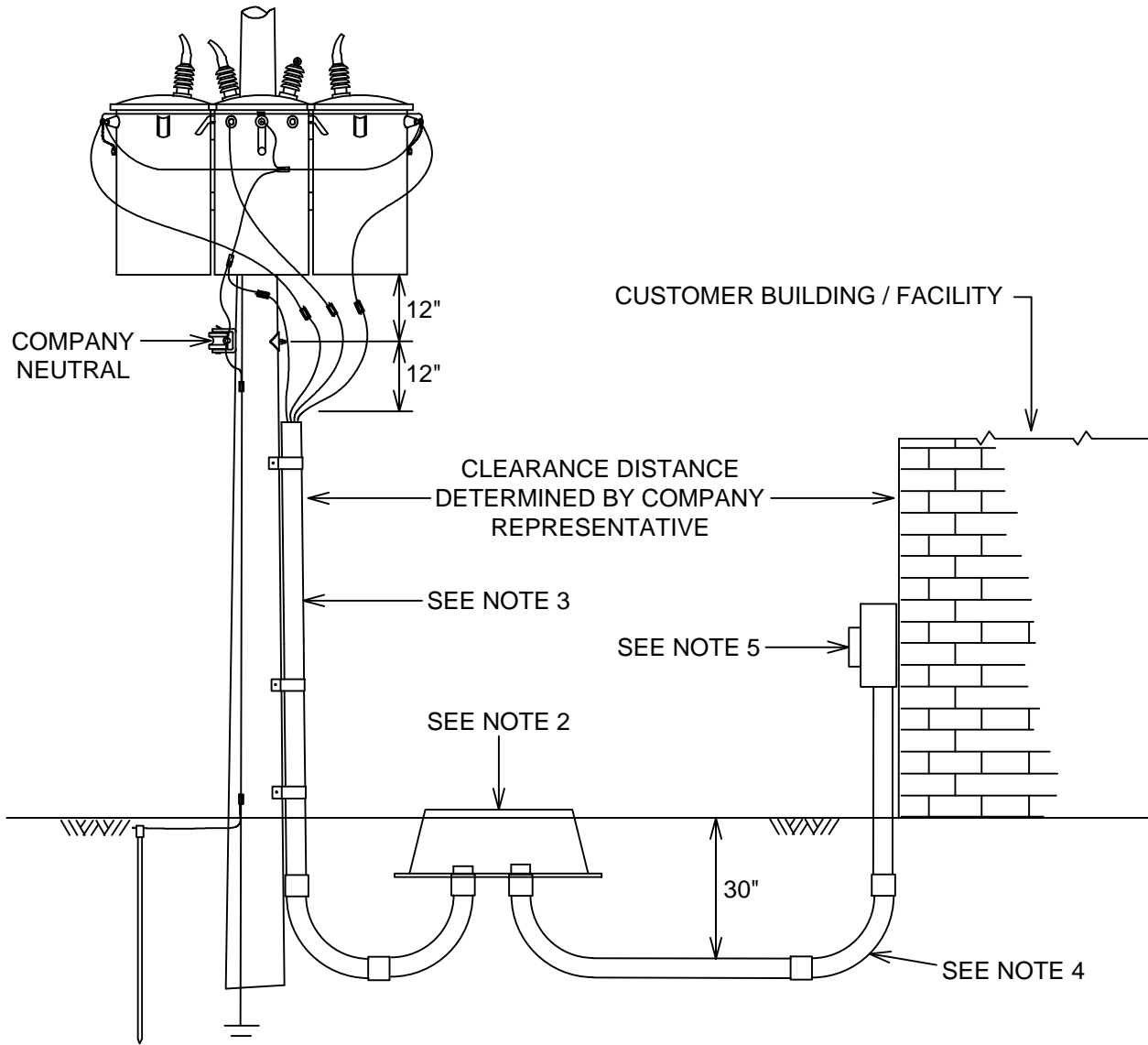
BY JAL

DATE 03-25-19

REV. 2

06.04-06

REV. 2 (03/25/19) - CHANGED DWG TITLE; CHANGED SCE&G TO COMPANY



**NOTES:**

1. SEE DRAWINGS 06.01-01 AND 06.01-02 FOR GENERAL INFORMATION AND NOTES.
2. HANDHOLE OR SECONDARY CABINET LOCATION WILL BE DETERMINED BY COMPANY REPRESENTATIVE. SEE SECTION 13 FOR SECONDARY ENCLOSURES AND HANDHOLES.
3. COMPANY WILL INSTALL CONDUIT AND CONDUCTOR FROM TRANSFORMER TO HANDHOLE OR SECONDARY CABINET.
4. THE CUSTOMER'S POINT OF SERVICE IS THE HANDHOLE OR SECONDARY CABINET. CUSTOMER WILL INSTALL CONDUIT AND CONDUCTOR FROM METER BASE TO THE HANDHOLE OR SECONDARY CABINET.
5. METERING, SELF-CONTAINED OR CT, WILL BE DETERMINED BY COMPANY METERING DEPARTMENT. TYPICALLY ANY DEMAND ABOVE 150 KVA REQUIRES CT METERING. CONTACT METERING DEPARTMENT FOR RECOMMENDATION.
6. SEE DRAWING 07.02-01 FOR REQUIRED FOREIGN ATTACHMENT CLEARANCES.

**EFFECTIVE  
DATE:  
04-29-19**

**DISTRIBUTION CONSTRUCTION STANDARD  
DOMINION ENERGY SOUTH CAROLINA, INC.**

# COMMERCIAL HYBRID SERVICE ON CUSTOMER POLE

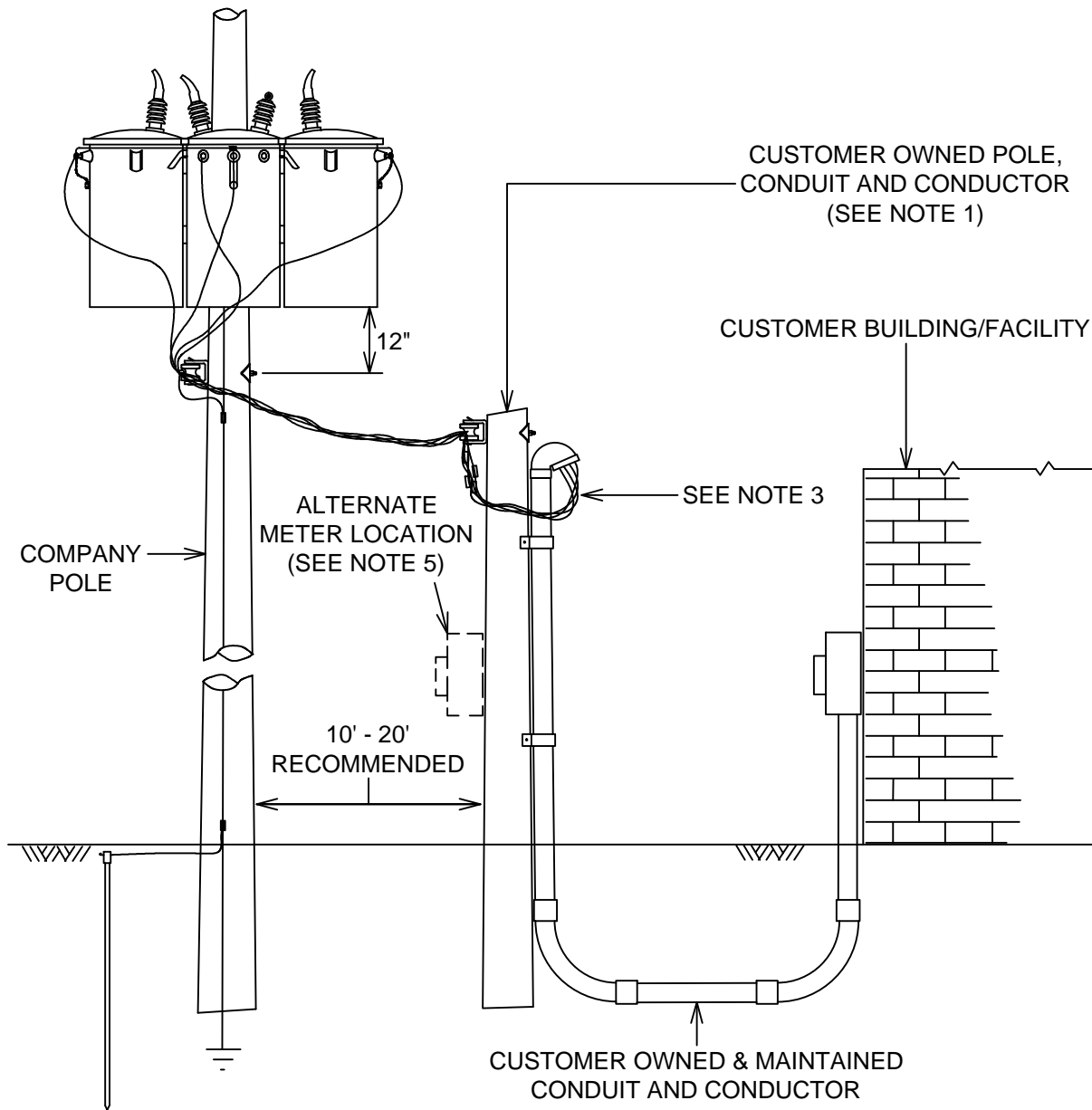
BY     JAL    

DATE   03-25-19  

REV.     1    

06.04-07

REV. 1 (03/25/19) - CHANGED SCE&G TO COMPANY



**NOTES:**

1. CUSTOMER TO INSTALL CUSTOMER OWNED POLE, CONDUIT, WEATHERHEAD AND CONDUCTOR.
2. COMPANY POINT OF SERVICE TO CUSTOMER IS CUSTOMER OWNED POLE.
3. CUSTOMER TO PROVIDE 6 FOOT PIGTAIL AT CONDUIT WEATHERHEAD.
4. COMPANY WILL CONNECT CUSTOMER SERVICE WIRE TO COMPANY SERVICE WIRE.
5. METERING, SELF-CONTAINED OR CT, WILL BE DETERMINED BY COMPANY METERING DEPARTMENT. TYPICALLY ANY DEMAND ABOVE 150 KVA REQUIRES CT METERING. CONTACT METERING DEPARTMENT FOR RECOMMENDATION.
6. SEE DRAWING 07.02-01 FOR REQUIRED FOREIGN ATTACHMENT CLEARANCES.

**EFFECTIVE  
DATE:  
04-29-19**

**DISTRIBUTION CONSTRUCTION STANDARD  
DOMINION ENERGY SOUTH CAROLINA, INC.**

# CUSTOMER REQUIREMENTS FOR PAD MOUNT TRANSFORMER SERVICE

BY JAL  
DATE 12-16-19  
REV. 4

06.04-08

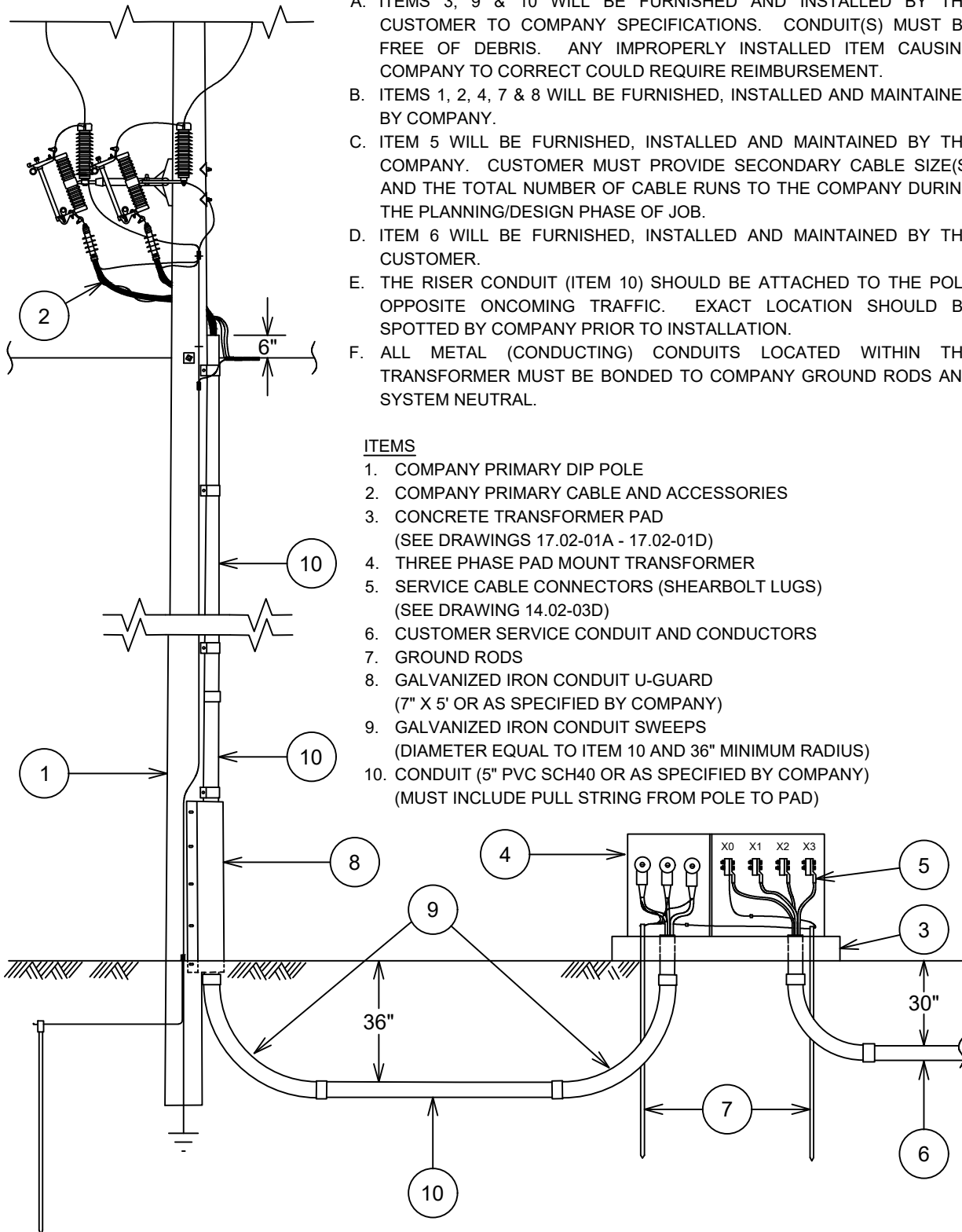
REV. 4 (12/16/19) - UPDATED NOTE C AND ITEM 5 (CONNECTORS NOW COMPANY PROVIDED)

## NOTES

- A. ITEMS 3, 9 & 10 WILL BE FURNISHED AND INSTALLED BY THE CUSTOMER TO COMPANY SPECIFICATIONS. CONDUIT(S) MUST BE FREE OF DEBRIS. ANY IMPROPERLY INSTALLED ITEM CAUSING COMPANY TO CORRECT COULD REQUIRE REIMBURSEMENT.
- B. ITEMS 1, 2, 4, 7 & 8 WILL BE FURNISHED, INSTALLED AND MAINTAINED BY COMPANY.
- C. ITEM 5 WILL BE FURNISHED, INSTALLED AND MAINTAINED BY THE COMPANY. CUSTOMER MUST PROVIDE SECONDARY CABLE SIZE(S) AND THE TOTAL NUMBER OF CABLE RUNS TO THE COMPANY DURING THE PLANNING/DESIGN PHASE OF JOB.
- D. ITEM 6 WILL BE FURNISHED, INSTALLED AND MAINTAINED BY THE CUSTOMER.
- E. THE RISER CONDUIT (ITEM 10) SHOULD BE ATTACHED TO THE POLE OPPOSITE ONCOMING TRAFFIC. EXACT LOCATION SHOULD BE SPOTTED BY COMPANY PRIOR TO INSTALLATION.
- F. ALL METAL (CONDUCTING) CONDUITS LOCATED WITHIN THE TRANSFORMER MUST BE BONDED TO COMPANY GROUND RODS AND SYSTEM NEUTRAL.

## ITEMS

1. COMPANY PRIMARY DIP POLE
2. COMPANY PRIMARY CABLE AND ACCESSORIES
3. CONCRETE TRANSFORMER PAD  
(SEE DRAWINGS 17.02-01A - 17.02-01D)
4. THREE PHASE PAD MOUNT TRANSFORMER
5. SERVICE CABLE CONNECTORS (SHEARBOLT LUGS)  
(SEE DRAWING 14.02-03D)
6. CUSTOMER SERVICE CONDUIT AND CONDUCTORS
7. GROUND RODS
8. GALVANIZED IRON CONDUIT U-GUARD  
(7" X 5' OR AS SPECIFIED BY COMPANY)
9. GALVANIZED IRON CONDUIT SWEEPS  
(DIAMETER EQUAL TO ITEM 10 AND 36" MINIMUM RADIUS)
10. CONDUIT (5" PVC SCH40 OR AS SPECIFIED BY COMPANY)  
(MUST INCLUDE PULL STRING FROM POLE TO PAD)



EFFECTIVE  
DATE:  
02-15-20

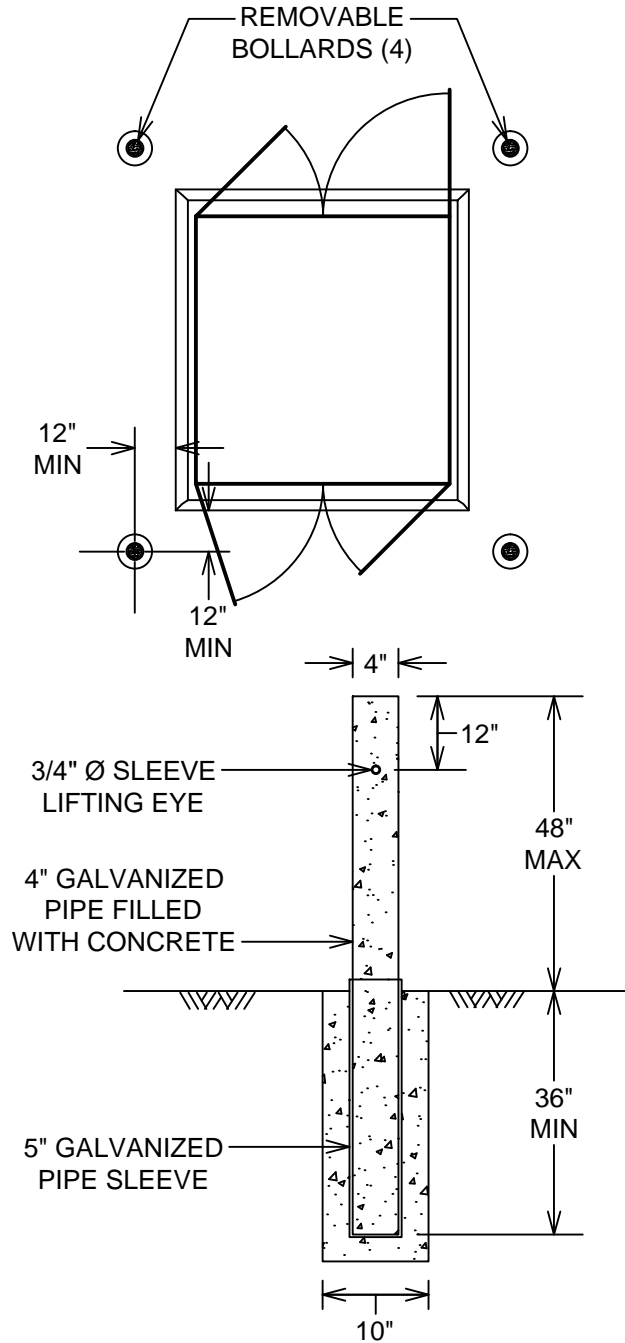
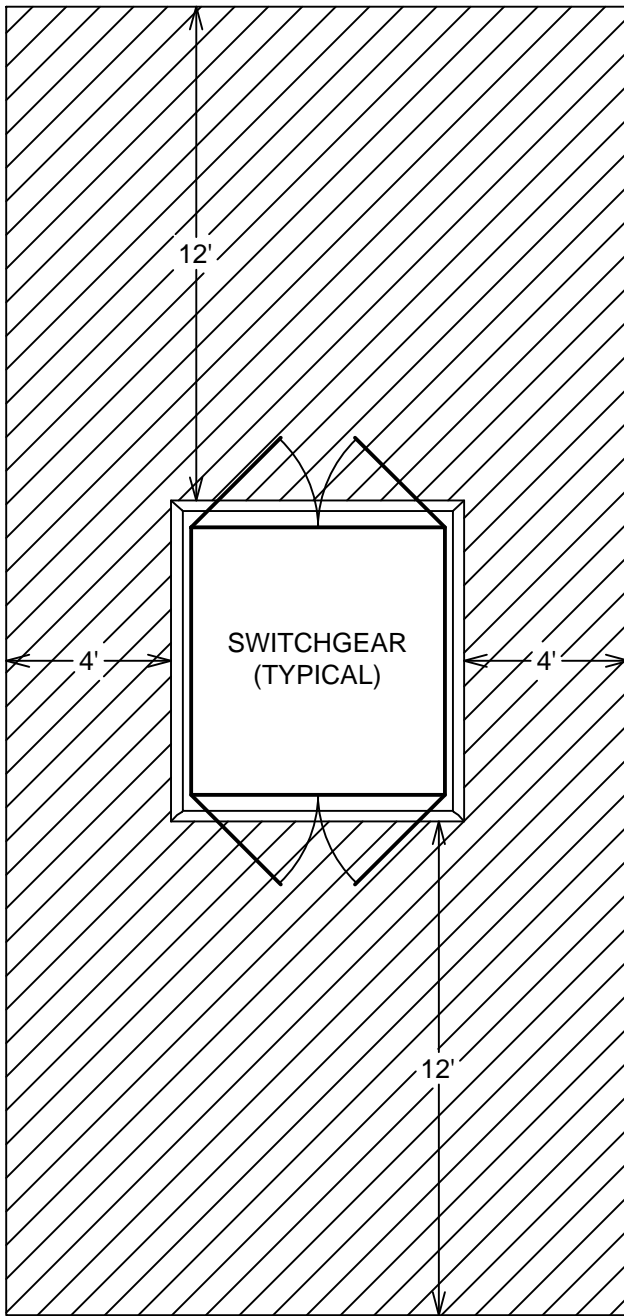
**DISTRIBUTION CONSTRUCTION STANDARD**  
**DOMINION ENERGY SOUTH CAROLINA, INC.**

# PAD MOUNT SWITCHGEAR CLEARANCE REQUIREMENTS

BY JAL  
DATE 05-09-17  
REV. 0

12.01-04

FORMERLY DWG # PMS-3, S3



**NOTES:**

1. SEE DRAWING 12.01-01 FOR GENERAL INFORMATION AND NOTES.
2. PERMANENT AND/OR TEMPORARY OBSTRUCTIONS ARE NOT PERMITTED IN THE HATCHED AREA. OBSTRUCTIONS INCLUDE, BUT ARE NOT LIMITED TO TREES, SHRUBS, HVAC UNITS, GENERATORS, WALLS, FENCES AND/OR BUILDINGS.
3. BOLLARDS ARE REQUIRED WHERE VEHICLE TRAFFIC IS EXPECTED AND ARE INSTALLED AND MAINTAINED BY THE CUSTOMER.

**EFFECTIVE  
DATE:  
08-07-17**

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DOMINION ENERGY SOUTH CAROLINA, INC.**



# TWO-HOLE NEMA SHEARBOLT LUGS FOR USE IN THREE-PHASE PAD MOUNT TRANSFORMERS

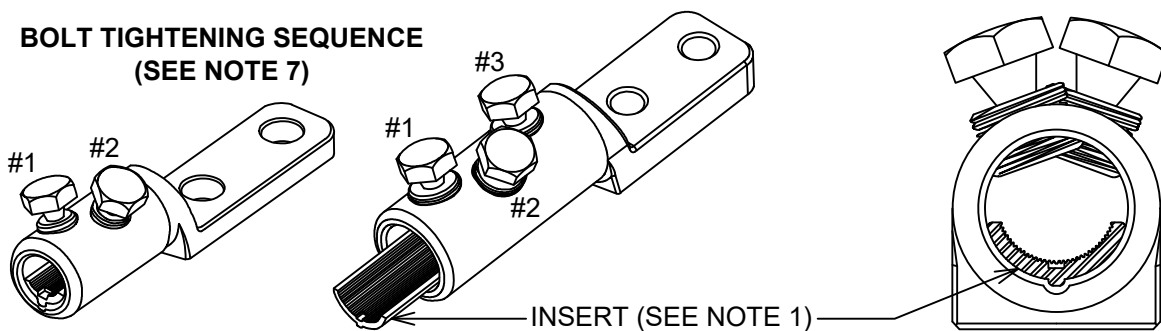
BY JAL  
 DATE 12-10-19  
 REV. 0

14.02-03D

## TWO-HOLE NEMA SHEARBOLT LUGS

| CONNECTOR     |                |           |                     | CONDUCTOR   |              |  |
|---------------|----------------|-----------|---------------------|---|--------------|--|
| STOCK CODE    | CU CODES       | PAD WIDTH | SOCKET SIZE         | CONDUCTOR RANGE (AL/CU)   | STRIP LENGTH | REMOVE INSERT FOR CONDUCTOR SIZE GREATER THAN (SEE NOTE 1) |
| 015.1150.0500 | ULUGS<br>YLUGS | 1.22"     | 1 1/16"<br>(2-BOLT) | 1/0 COMPACT STRANDED TO 350 KCMIL STRANDED (0.268" TO 0.681")       | 1-3/4"       | 4/0 STRANDED (0.528")                                      |
| 015.1150.0510 | ULUGL<br>YLUGL | 1.67"     | 7/8"<br>(3-BOLT)    | 350 KCMIL COMPACT STRANDED TO 750 KCMIL STRANDED (0.616" TO 0.998") | 3-1/8"       | 600 KCMIL COMPACT STR (0.813")                             |

### BOLT TIGHTENING SEQUENCE (SEE NOTE 7)



### INSTALLATION INSTRUCTIONS:

- DETERMINE IF INSERT SHOULD BE REMOVED ACCORDING TO CONDUCTOR SIZE (SEE TABLE ABOVE). IF INSERT REMOVAL IS REQUIRED, USE SCREWDRIVER TO LIFT THE INSERT FROM THE CONNECTOR BODY. IF INSERT IS NOT REMOVED, ENSURE IT IS PROPERLY POSITIONED IN THE CONNECTOR BARREL DURING INSTALLATION (INSERT INDENT SEATED IN CONNECTOR NOTCH). **DO NOT REMOVE THE INHIBITOR CONTAINED INSIDE THE CONNECTOR.**
- BACK OUT ALL BOLTS ONLY FAR ENOUGH TO GIVE CLEARANCE FOR THE CONDUCTOR IN THE CONNECTOR BODY. **DO NOT COMPLETELY REMOVE BOLTS FROM THE CONNECTOR BODY.**
- ENSURE SECONDARY CONDUCTOR END HAS A STRAIGHT (RIGHT ANGLE) CUT.
- STRIP CONDUCTOR END TO THE STRIP LENGTH DIMENSION SHOWN IN TABLE ABOVE.
- USING A WIRE BRUSH DEDICATED FOR USE ON ALUMINUM OR COPPER CONDUCTORS, THOROUGHLY CLEAN THE BARE SURFACE STRANDS OF EACH CONDUCTOR END. CLEANED CONDUCTOR END SHOULD BE INSTALLED IMMEDIATELY TO PREVENT REFORMATION OF FRESH OXIDES.
- INSERT THE CONDUCTOR INTO THE CONNECTOR BODY.
- TIGHTEN BOLTS IN A THREE-STEP PROCESS:
  - HAND-TIGHTEN THE BOLTS TO FIRMLY GRIP CONDUCTOR IN PLACE. FOLLOW THE TIGHTENING SEQUENCE SHOWN ABOVE (#1, #2, #3).
  - USING AN IMPACT WRENCH WITH HEXAGONAL SOCKET, REPEAT THE SEQUENCE IN 7.1 AND TIGHTEN EACH BOLT ONE TO ONE AND A HALF TURNS (TIGHTEN WITH IMPACT WRENCH FOR APPROXIMATELY ONE SECOND). BOLTS SHOULD REMAIN UNSHEARED.
  - REPEAT THE SEQUENCE IN 7.2 AND TIGHTEN EACH BOLT UNTIL THE HEAD OF THE BOLT SHEARS OFF. THE WRENCH SHOULD REMAIN PARALLEL TO THE CONNECTOR BODY WHILE TIGHTENING.
- IF NECESSARY, SMOOTH SHARP EDGES OF PROTRUDING BOLTS USING PROVIDED SANDPAPER.

EFFECTIVE  
 DATE:  
 02-15-20

**DISTRIBUTION CONSTRUCTION STANDARD  
 DOMINION ENERGY SOUTH CAROLINA, INC.**

**JOINT USE WITH COMMUNICATION AND GAS AT TRANSFORMER LOCATIONS TRENCHING DETAIL**

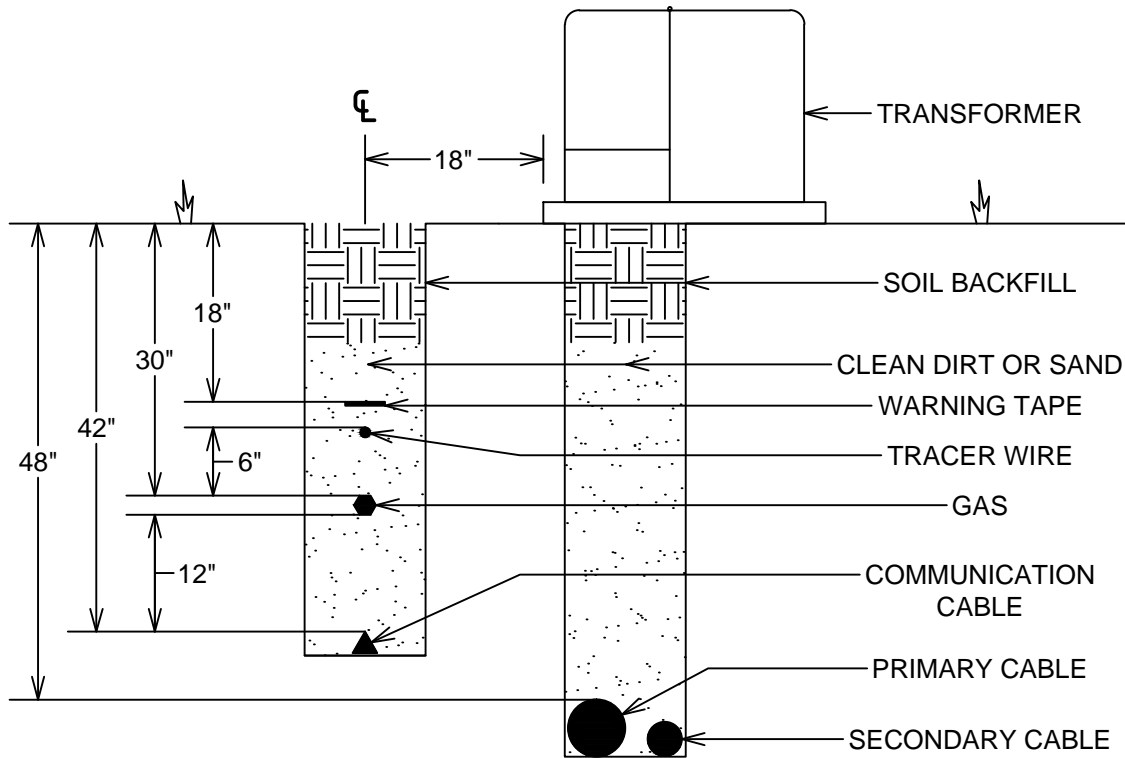
BY JAL

DATE 06-09-17

REV. 0

**16.01-04**

FORMERLY DWG # T-1, S5



**NOTES:**

1. ALL DIMENSIONS ARE MINIMUMS.
2. THE BOTTOM OF THE TRENCH SHALL BE UNDISTURBED, TAMPED, OR RELATIVELY SMOOTH EARTH. WHERE THE EXCAVATION IS IN ROCK, THE CONDUIT/CABLE SHALL BE LAID ON A PROTECTIVE LAYER OF CLEAN WELL-TAMPED BACKFILL.
3. BACKFILL WITHIN SIX INCHES OF THE CONDUIT/CABLE SHALL BE FREE OF MATERIAL WITH SHARP EDGES. BACKFILL SHALL BE ADEQUATELY COMPACTED (MACHINE COMPACTION SHALL NOT BE USED WITHIN SIX INCHES OF THE CABLE/CONDUIT).

**EFFECTIVE DATE:**  
08-07-17

**DISTRIBUTION CONSTRUCTION STANDARD  
DOMINION ENERGY SOUTH CAROLINA, INC.**

# NON-JOINT USE TRENCHING DETAIL

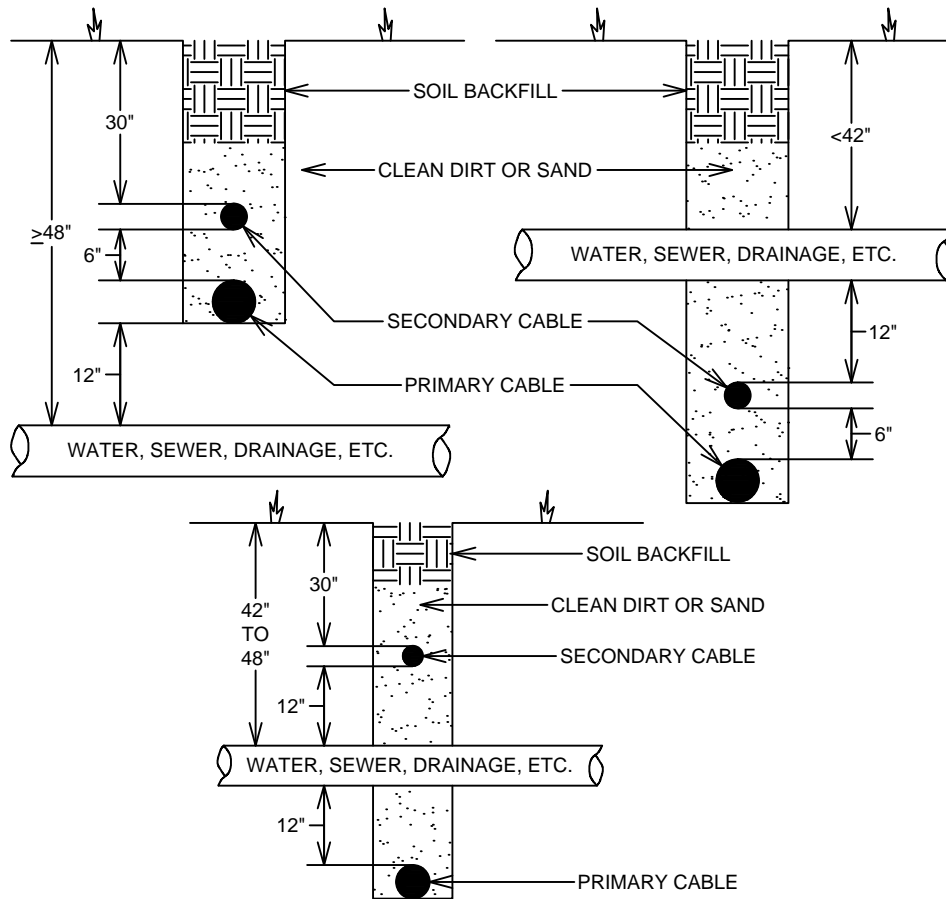
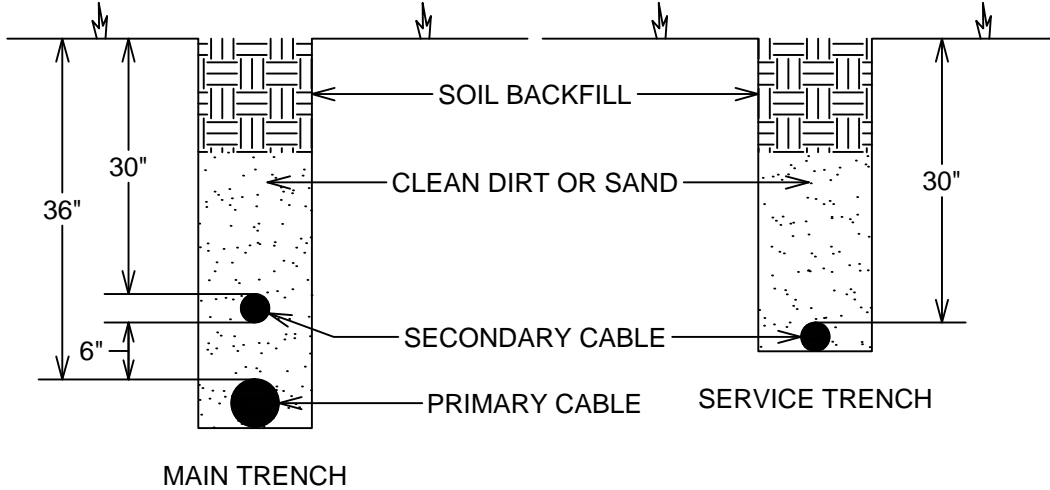
BY JAL

DATE 06-09-17

REV. 0

16.01-05

FORMERLY DWG # T-2



**NOTES:**

1. ALL DIMENSIONS ARE MINIMUMS.
2. THE BOTTOM OF THE TRENCH SHALL BE UNDISTURBED, TAMPED, OR RELATIVELY SMOOTH EARTH. WHERE THE EXCAVATION IS IN ROCK, THE CONDUIT/CABLE SHALL BE LAID ON A PROTECTIVE LAYER OF CLEAN WELL-TAMPED BACKFILL.
3. BACKFILL WITHIN SIX INCHES OF THE CONDUIT/CABLE SHALL BE FREE OF MATERIAL WITH SHARP EDGES. BACKFILL SHALL BE ADEQUATELY COMPACTED (MACHINE COMPACTION SHALL NOT BE USED WITHIN SIX INCHES OF THE CABLE/CONDUIT).

**EFFECTIVE DATE:**  
08-07-17

**DISTRIBUTION CONSTRUCTION STANDARD**  
**DOMINION ENERGY SOUTH CAROLINA, INC.**

# ROAD CROSSING DETAIL

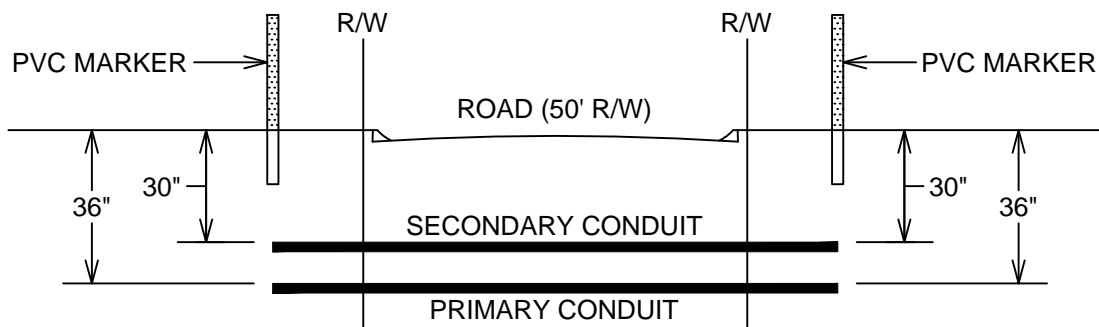
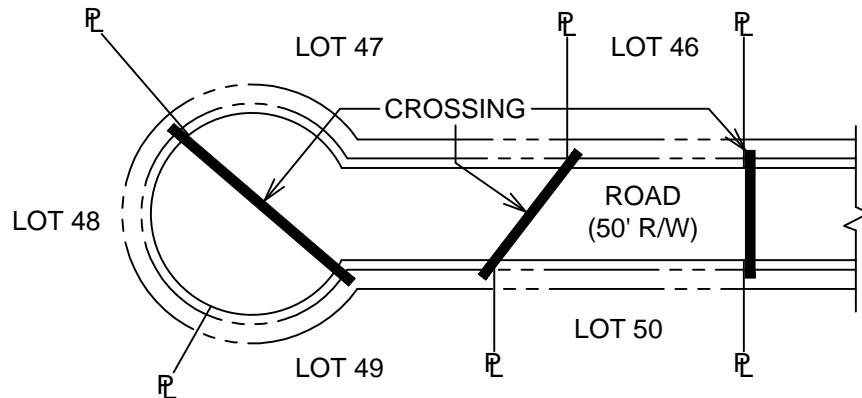
BY JAL

DATE 03-21-19

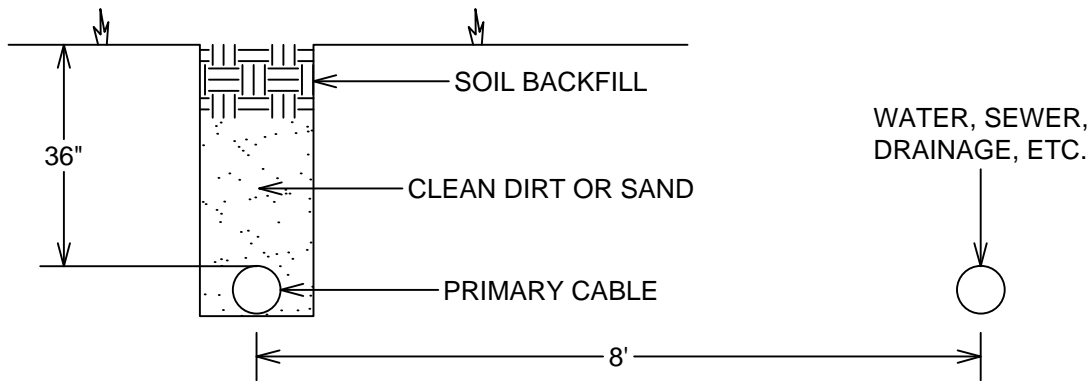
REV. 1

16.01-06

## ROAD CROSSINGS



## PARALLEL CLEARANCE



**NOTES:**

1. ALL DIMENSIONS ARE MINIMUMS.
2. GRAY SCHEDULE 40 ELECTRICAL CONDUIT IS REQUIRED FOR ALL ROAD AND PARKING LOT CROSSINGS. CONDUIT SHALL BE CONTINUOUS WITH GLUED JOINTS, PULL STRING INSTALLED, AND CAPPED AT EACH END. CAPPED END LOCATIONS TO BE IDENTIFIED BY A RED PVC MARKER, I.E., CONDUIT STUB PAINTED RED.
3. CONDUIT MUST TERMINATE WITHIN THE COMPANY'S ELECTRIC EASEMENT ON THE PROPERTY LOT (TERMINATING IN ROAD RIGHT-OF-WAY IS UNACCEPTABLE).
4. SEE DRAWING 16.01-02 FOR VERTICAL CLEARANCES.

**EFFECTIVE DATE:**  
04-29-19

**DISTRIBUTION CONSTRUCTION STANDARD**  
**DOMINION ENERGY SOUTH CAROLINA, INC.**

REV. 1 (03/21/19) - CHANGED SCE&G TO COMPANY

# 3 $\phi$ PAD MOUNT TRANSFORMER CONCRETE PAD NOTES

BY MWCDATE 03-25-19REV. 2

17.02-01A

## NOTES:

1. SEE DRAWING 06.04-08 FOR CUSTOMER REQUIREMENTS.
2. SEE DRAWING 17.02-01B FOR CONCRETE PAD DETAILS.
3. PAD LOCATION IS TO BE SPOTTED BY COMPANY REPRESENTATIVE BEFORE FORMING OR POURING CONCRETE. SEE DRAWING 17.02-01D FOR CLEARANCE AND ACCESS REQUIREMENTS.
4. PAD MUST BE BUILT TO DIMENSIONS GIVEN AND CONDUITS MUST BE INSTALLED CORRECTLY.
5. FOR **RADIAL FEED TRANSFORMERS**, THE CENTER OF THE RADIAL PRIMARY CONDUIT SHALL BE POSITIONED 18" FROM THE LEFT EDGE OF THE CONDUIT WINDOW AND THE FRONT OF THE CONDUIT SHALL BE POSITIONED 6" FROM THE FRONT EDGE OF THE CONDUIT WINDOW AS SHOWN ON DRAWING 17.02-01B.
6. FOR **LOOP FEED TRANSFORMERS**, THE CENTER OF THE LEFT LOOP PRIMARY CONDUIT SHALL BE POSITIONED 9" FROM THE LEFT EDGE OF THE CONDUIT WINDOW; THE CENTER OF THE RIGHT LOOP PRIMARY CONDUIT SHALL BE POSITIONED 27" FROM THE LEFT EDGE OF THE CONDUIT WINDOW; THE FRONT OF BOTH CONDUITS SHALL BE POSITIONED 6" FROM THE FRONT EDGE OF THE CONDUIT WINDOW AS SHOWN ON DRAWING 17.02-01B.
7. PAD FOUNDATION MUST SUPPORT THE WEIGHT OF THE TRANSFORMER (SEE DRAWING 17.02-01C). IF SOIL CONDITION WILL NOT SUPPORT THE WEIGHT (POUNDS PER SQUARE FOOT AS INDICATED ON DRAWING 17.02-01C), THEN THE AREA THE OF PAD MUST BE INCREASED OR PILINGS INSTALLED TO MEET THE WEIGHT REQUIREMENT.
8. STEEL REINFORCING REBAR SHALL BE INTERMEDIATE GRADE BILLET STEEL WITH 40,000 PSI MINIMUM YIELD STRENGTH, CONFORMING TO ASTM A615 GRADE 40.
9. CONCRETE OF PAD TO CONFORM TO CLASS A STRUCTURAL CONCRETE AND SHALL HAVE 28 DAY STRENGTH OF 4000 PSI, CONTAIN NO MORE THAN 6 PERCENT ENTRAINED AIR AND HAVE NO LARGER THAN 1 INCH AGGREGATE MIXTURE.
10. LIMESTONE AGGREGATE IS NOT ACCEPTABLE. ALL OTHER CONCRETE MATERIALS SHALL BE IN ACCORDANCE WITH PORTLAND CEMENT STANDARD ASTM C150.
11. IF PAD IS LOCATED IN AREA SUBJECT TO FLOODING, IT MUST BE ELEVATED ABOVE WATER LINE.
12. ALL CONDUITS MUST BE FLUSH OR UP TO 1 INCH ABOVE FINISHED PAD.
13. SECONDARY CONDUIT(S) MUST NOT BE INSTALLED MORE THAN 20 INCHES FROM RIGHT EDGE OF WINDOW. CONDUIT(S) EDGE SHALL BE MINIMUM OF 2 INCHES FROM EDGE OF WINDOW OPENING.
14. CUSTOMER MUST PROVIDE AND MARK TWO (2) SUITABLE LOCATIONS WITHIN THE CONDUIT WINDOW FOR INSTALLATION OF TWO (2) 10 FOOT GROUND RODS. ONE SHALL BE LOCATED ON THE PRIMARY SIDE AND ONE SHALL BE LOCATED ON THE SECONDARY SIDE.
15. CONDUIT WINDOW MUST BE OPEN (NO REBAR, FORMS OR CONCRETE ALLOWED).
16. SEE DRAWING 17.02-01C FOR MAXIMUM ALLOWABLE SECONDARY RUNS AND OTHER PAD INFORMATION.

REV. 2 (03/25/19) - CHANGED DWG TITLE; CHANGED SCE&amp;G TO COMPANY

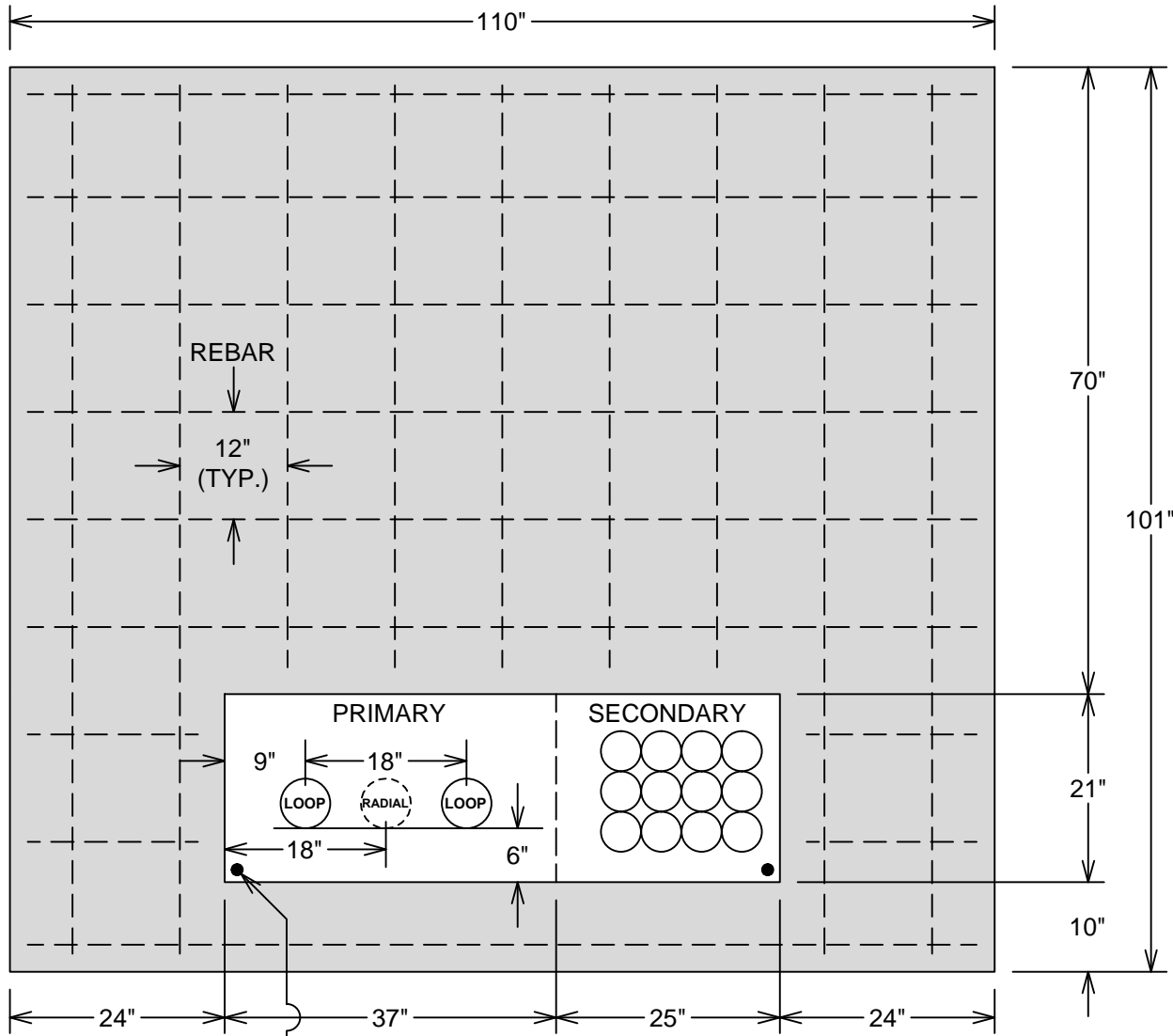
EFFECTIVE  
DATE:  
04-29-19**DISTRIBUTION CONSTRUCTION STANDARD  
DOMINION ENERGY SOUTH CAROLINA, INC.**

# 3 $\phi$ PAD MOUNT TRANSFORMER CONCRETE PAD DETAIL

BY MWC  
DATE 03-26-19  
REV. 2

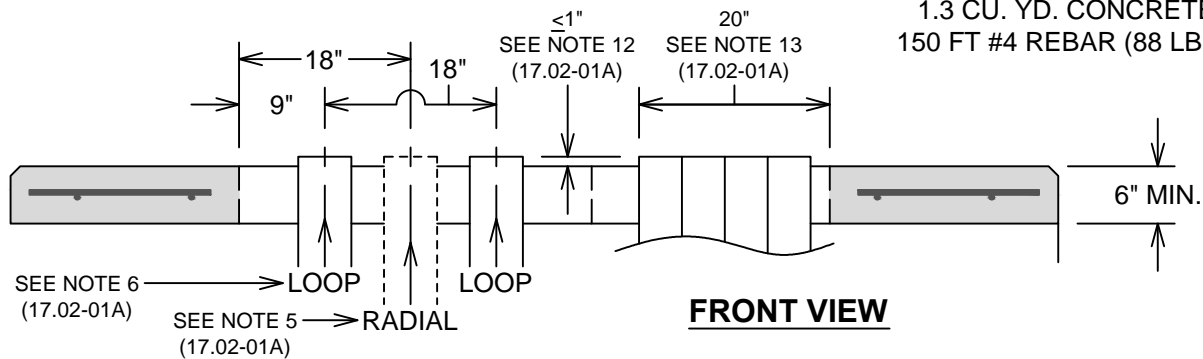
17.02-01B

REV. 2 (03/25/19) - CHANGED DWG TITLE; STANDARDIZED ON LOOP PAD



SEE NOTE 14 (17.02-01A) **TOP VIEW**

**PAD MATERIALS**  
1.3 CU. YD. CONCRETE  
150 FT #4 REBAR (88 LBS.)



SEE NOTE 6 (17.02-01A)

SEE NOTE 5 (17.02-01A)

SEE NOTE 12 (17.02-01A)

SEE NOTE 13 (17.02-01A)

**FRONT VIEW**

**NOTES:**

- SEE DRAWING 17.02-01A FOR GENERAL INFORMATION AND NOTES.

**EFFECTIVE DATE:**  
04-29-19

**DISTRIBUTION CONSTRUCTION STANDARD**  
**DOMINION ENERGY SOUTH CAROLINA, INC.**

# 3 $\phi$ TRANSFORMER CONCRETE PAD SUPPLEMENTAL DETAILS

 BY     MWC    

 DATE     01-07-19    

 REV.     1    

17.02-01C

REV.1 (01/07/19) - INCREASED CONDUCTORS PER PHASE

| <b>TRANSFORMER PROPERTIES</b> |   |                                |                                     |                                 |
|-------------------------------|---|--------------------------------|-------------------------------------|---------------------------------|
| <b>TRANSFORMER<br/>KVA</b>    | <b>MAXIMUM CONDUCTORS<br/>PER PHASE</b> |                                | <b>APPROXIMATE<br/>WEIGHT (LBS)</b> | <b>APPROXIMATE<br/>LBS/FT^2</b> |
|                               | <b>VOLTAGE<br/>120 / 208 Y</b>          | <b>VOLTAGE<br/>277 / 480 Y</b> |                                     |                                 |
| 150                           | 16                                      | 14                             | 4,000                               | 150                             |
| 225                           | 16                                      | 14                             | 4,500                               | 150                             |
| 300                           | 16                                      | 14                             | 5,000                               | 300                             |
| 500                           | 16                                      | 14                             | 6,000                               | 300                             |
| 750                           | 16                                      | 14                             | 10,000                              | 400                             |
| 1000                          | -                                       | 14                             | 10,000                              | 400                             |
| 1500                          | -                                       | 14                             | 12,000                              | 500                             |
| 2000                          | -                                       | 16                             | 14,500                              | 500                             |
| 2500                          | -                                       | 18                             | 15,000                              | 500                             |

**NOTES:**

1. PAD MUST BE DIMENSIONALLY CORRECT, INCLUDING LOCATION OF CONDUITS. FAILURE TO DO SO CAN DELAY SERVICE AND REQUIRE CORRECTIVE ACTION BY THE CUSTOMER.
2. ALLOWABLE NUMBER OF SECONDARY RUNS IS LIMITED BY TRANSFORMER KVA SIZE.
3. SECONDARY CONDUCTOR IS ALLOWED ONLY IN SECONDARY COMPARTMENT.
4. LIMIT CUSTOMER CONDUCTORS PER PHASE TO ENSURE THAT SPACE IS AVAILABLE FOR LIGHTING AND CT METERING WHEN APPLICABLE.

**EFFECTIVE  
DATE:  
02-15-19**

## DISTRIBUTION CONSTRUCTION STANDARD DOMINION ENERGY SOUTH CAROLINA, INC.

# GUIDE FOR LOCATING/SPOTTING 3 $\phi$ PAD-MOUNTED TRANSFORMER

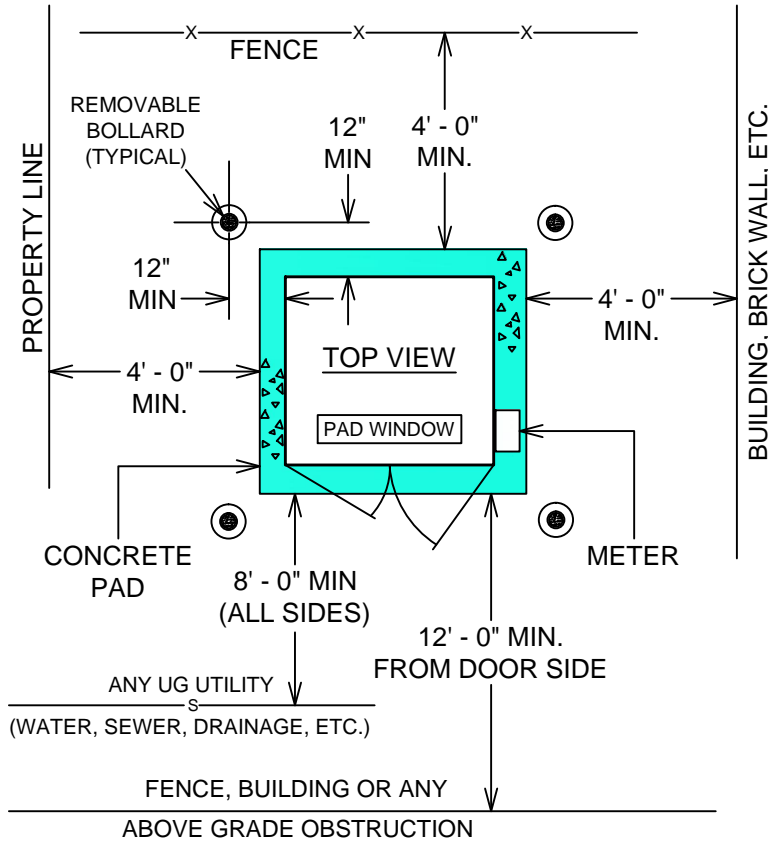
BY MWC

DATE 03-26-19

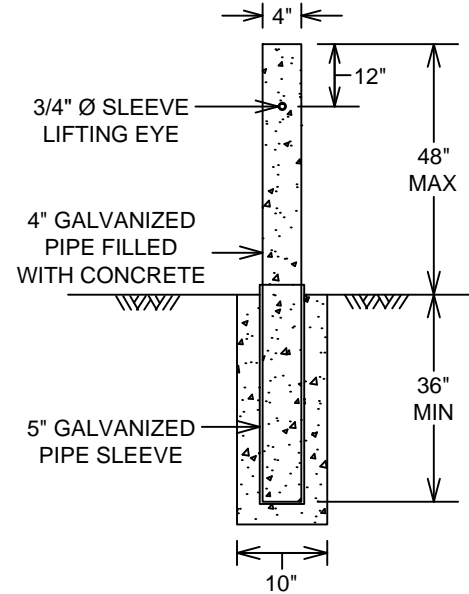
REV. 1

17.02-01D

REV. 1 (03/26/19) - CHANGED SCE&G TO COMPANY



**REMOVABLE BOLLARD**  
4" GALVANIZED PIPE  
FILLED WITH CONCRETE  
WITH 5" GALVANIZED PIPE SLEEVE  
(SEE NOTE 11)



## NOTES:

- PAD LOCATION AND ORIENTATION (DOORS/WINDOWS) MUST BE SPOTTED BY COMPANY REPRESENTATIVE. APPROVAL OF SITE BEFORE POURING CONCRETE IS RECOMMENDED. UNACCEPTABLE CONSTRUCTION WILL BE REJECTED AND CORRECTION REQUIRED BEFORE PLACEMENT OF COMPANY EQUIPMENT.
- TRUCK ACCESS - 10 FEET MINIMUM CORRIDOR IS REQUIRED TO WITHIN 1 FOOT OF PAD FOUNDATION.
- TRUCK WORK AREA - SETTING OR REMOVING TRANSFORMER REQUIRES KNUCKLE BOOM TRUCK AND TRAILER. THEREFORE 30' X 18' CLEAR WORK AREA ADJACENT TO TRANSFORMER PAD IS REQUIRED.
- OVERHANGING VERTICAL CLEARANCE OF 40 FEET IS REQUIRED ABOVE CONCRETE PAD.
- MINIMUM SAFE WORKING ZONE OF 12 FEET IS REQUIRED FROM TRANSFORMER ACCESS DOOR. ONLY EXCEPTION IS EASILY REMOVABLE FENCE/OBJECT.
- IF ALL SIDES ARE SCREENED, AN INSIDE VENTILATION AREA OF 625 SQUARE FEET (25' X 25') MINIMUM MUST BE PROVIDED.
- FUEL STORAGE TANKS, FUEL DISPENSING POINTS, AND CUSTOMER OWNED GENERATORS MUST BE A MINIMUM OF 20 FEET FROM THE PAD EDGE.
- FLAMMABLE WALLS OR FENCING MUST BE MINIMUM OF 10 FEET FROM PAD EDGE.
- NO UNDERGROUND UTILITIES UNDER OR WITHIN 8 FEET OF THE PAD (CONCRETE FOUNDATION).
- MINIMUM "ABOVE GRADE" CLEARANCE ON ALL SIDES IS 4 FEET MINIMUM; EXCEPTION IS FRONT OR DOOR SIDE REQUIRING SAFE WORKING ZONE OF 12 FEET.
- REMOVABLE BOLLARDS ARE REQUIRED WHERE VEHICLE TRAFFIC IS EXPECTED. THESE DEVICES ARE TO PROTECT THE PAD MOUNT TRANSFORMER FROM VEHICLE DAMAGE. REMOVABLE BOLLARDS ARE PROVIDED, INSTALLED AND MAINTAINED BY THE CUSTOMER.

EFFECTIVE  
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04-29-19

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**DOMINION ENERGY SOUTH CAROLINA, INC.**



# METER CLEARANCE REQUIREMENTS

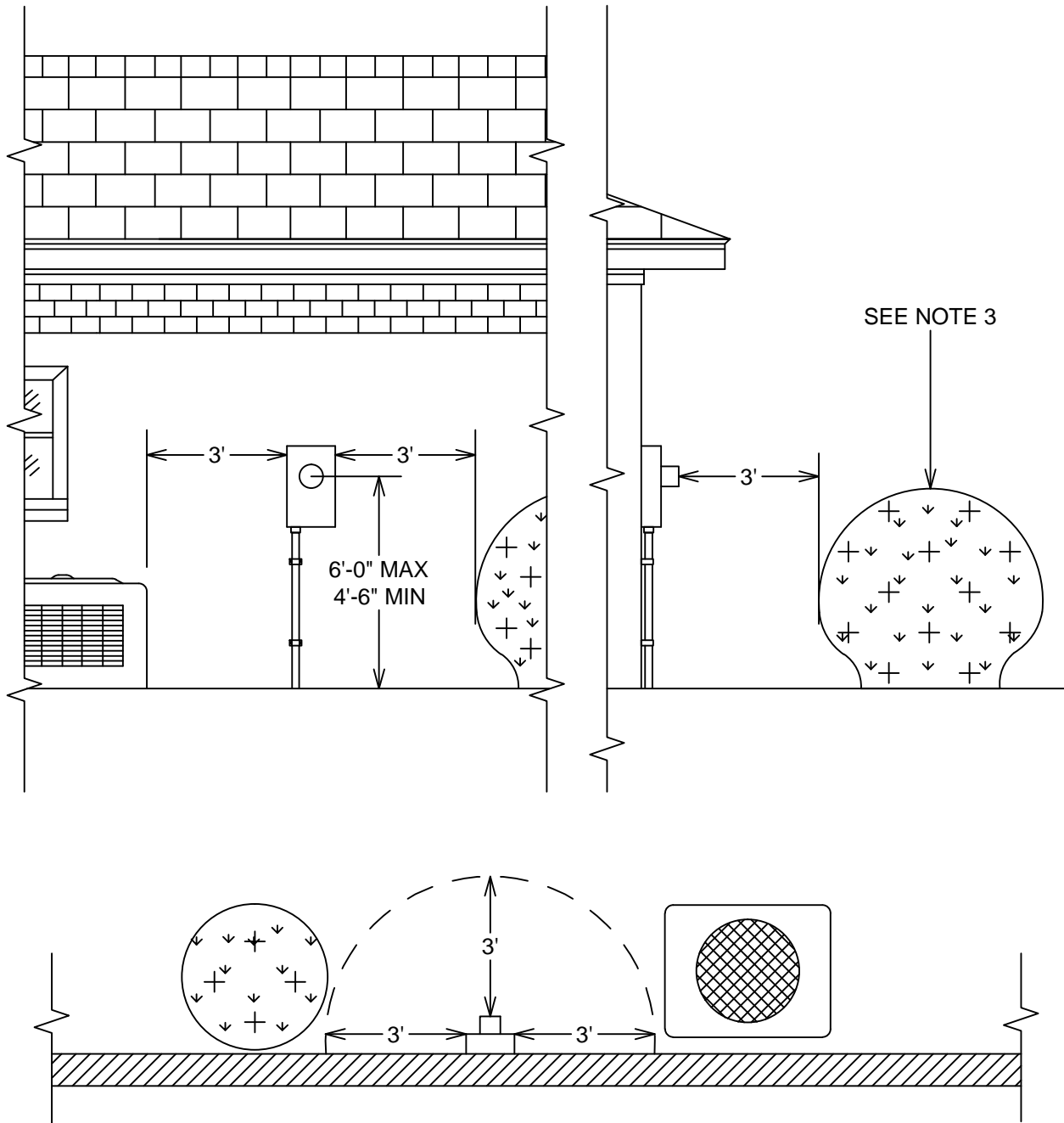
BY JAL

DATE 07-10-17

REV. 1

19.01-03

REV. 1 (07/10/17) - ADDED GAS METERS TO NOTE 3



**NOTES:**

1. SEE DRAWING 19.01-01 FOR GENERAL INFORMATION AND NOTES.
2. PERMANENT AND/OR TEMPORARY OBSTRUCTIONS ARE NOT PERMITTED WITHIN THREE FEET IN ANY DIRECTION OF AN ELECTRIC METER.
3. OBSTRUCTIONS INCLUDE, BUT ARE NOT LIMITED TO TREES, SHRUBS, HVAC UNITS, GENERATORS, WALLS, FENCES, GAS METERS AND/OR BUILDINGS.
4. SEE DRAWING 19.01-05 FOR GANGED METER SOCKETS.

**EFFECTIVE DATE:**  
06-05-17

**DISTRIBUTION CONSTRUCTION STANDARD  
DOMINION ENERGY SOUTH CAROLINA, INC.**

# METER SOCKET MOUNTING CONFIGURATIONS

BY JAL

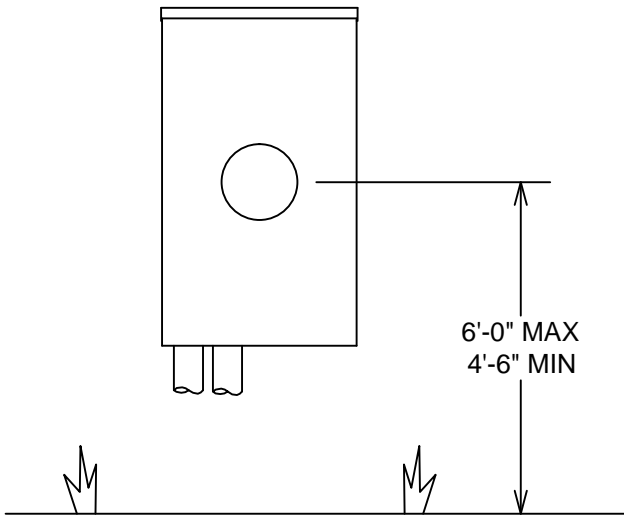
DATE 05-03-17

REV. 0

19.01-04

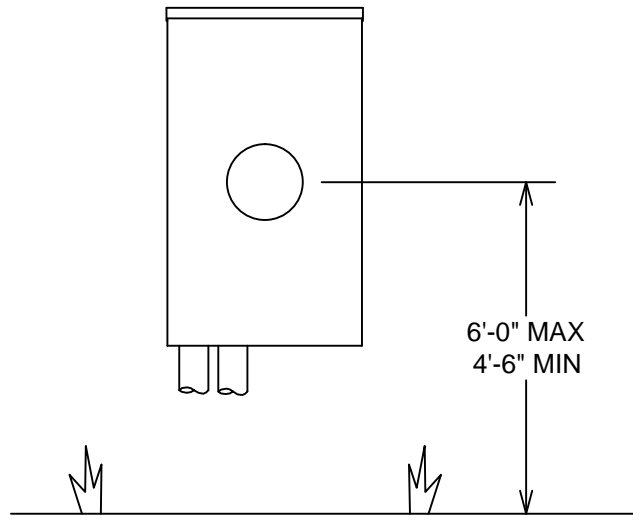
FORMERLY DWG # PMTR-5

## BUILDING



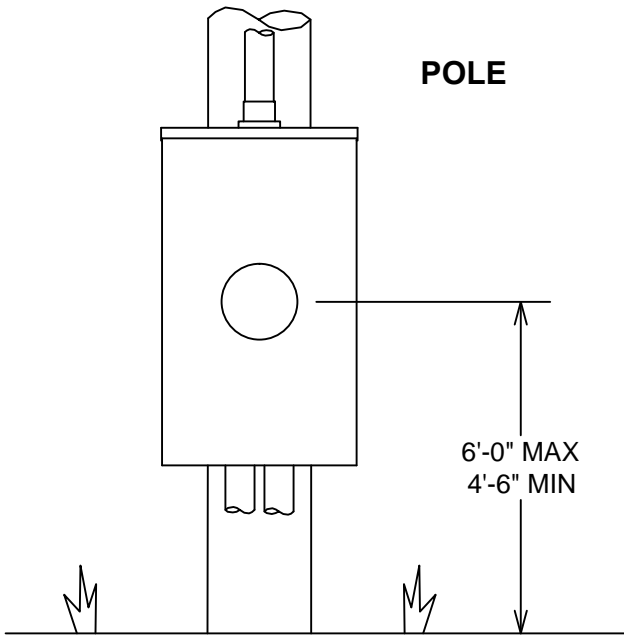
FOR STEEL BUILDINGS, UNISTRUT BRACING ATTACHED TO STRUCTURAL COMPONENT (VERT/HORIZ) IS REQUIRED

## FREE-STANDING MASONRY WALL

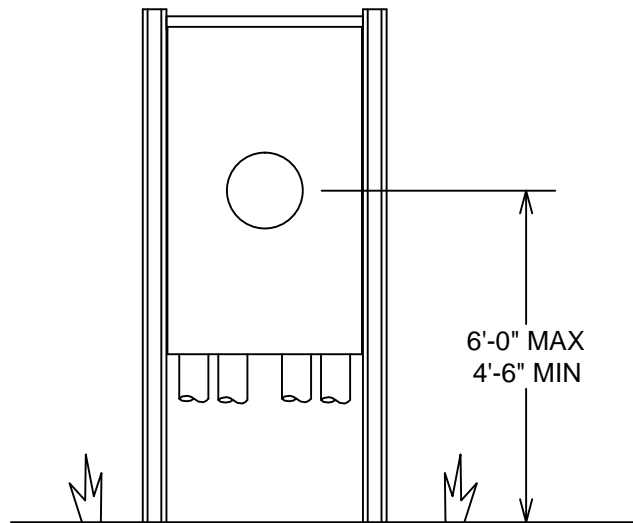


MINIMUM WALL DIMENSIONS:  
HEIGHT = 84"  
WIDTH = 30"  
THICKNESS = 8"

## POLE



## FREE-STANDING ANGLE IRON OR TREATED TIMBERS



MINIMUM 2-1/2" X 2-1/2" X 1/4" ANGLE IRON OR 4" X 4" TREATED TIMBERS

### NOTE:

1. SEE DRAWING 19.01-01 FOR GENERAL INFORMATION AND NOTES.

EFFECTIVE DATE:  
06-05-17

**DISTRIBUTION CONSTRUCTION STANDARD**  
**DOMINION ENERGY SOUTH CAROLINA, INC.**

# MODULAR (GANGED) METER ASSEMBLY

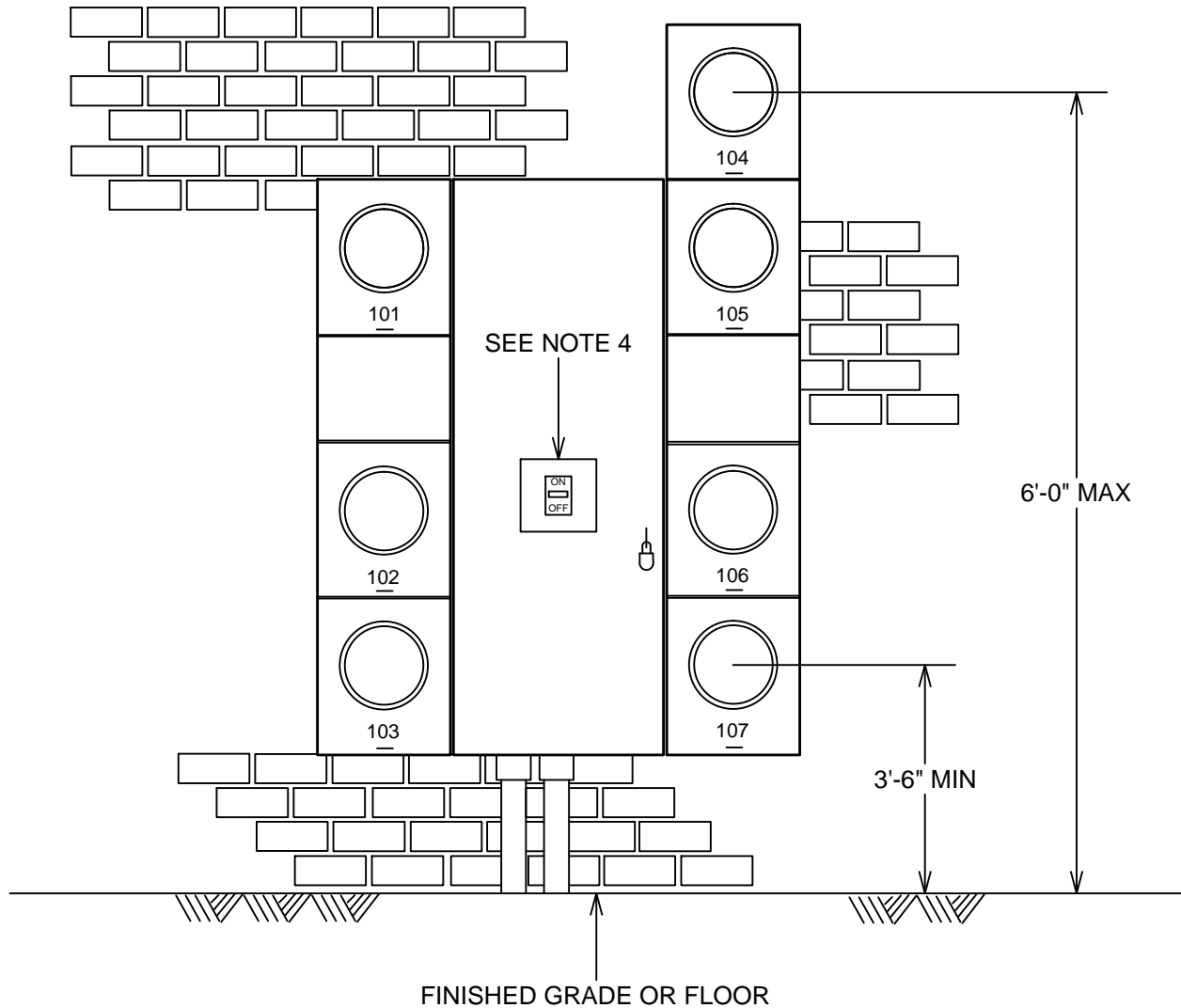
BY JAL

DATE 03-20-19

REV. 1

19.01-05

REV. 1 (03/20/19) - CHANGED SCE&G TO COMPANY



## NOTES:

1. SEE DRAWING 19.01-01 FOR GENERAL INFORMATION AND NOTES.
2. EACH METER SOCKET SHALL BE PLAINLY AND PERMANENTLY MARKED, I.E., STENCILED WITH ENAMEL PAINT, WITH UNIT NUMBER OR OTHER DESCRIPTION ON THE INSIDE OF THE METER SOCKET AND ON THE OUTSIDE OF THE METER SOCKET COVER.
3. COMPANY PERSONNEL SHALL VERIFY THE UNIT NUMBER OR OTHER DESCRIPTION MATCHES WHAT IS STENCILED BEFORE SETTING A METER.
4. COMPANY CANNOT ATTACH TO MAIN BREAKER OR DISCONNECT DEVICE. IF INSTALLED, CUSTOMER CONNECTION POINT WILL BE A HANDHOLE OR OTHER DESIGNATED LOCATION.

EFFECTIVE  
DATE:  
04-29-19

**DISTRIBUTION CONSTRUCTION STANDARD**  
**DOMINION ENERGY SOUTH CAROLINA, INC.**