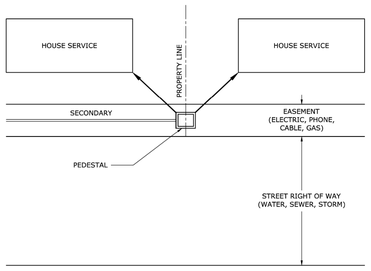
- THERE SHALL BE NO ABOVE-GROUND OBSTRUCTIONS WITHIN TEN (10) FEET OF THE FRONT OF THE TRANSFORMER OR WITHIN THREE (3) FEET OF THE SIDES AND BACK. IF A METER IS INSTALLED ON THE TRANSFORMER, NO OBSTRUCTIONS MAY BE WITHIN FOUR (4) FEET OF THAT SIDE.
- SIDE VENTILATION MAY BE REQUIRED IF A WALL IS TO BE CONSTRUCTED AROUND THE TRANSFORMER. CONTACT DUKE ENERGY TO OBTAIN THE REQUIRED SEPARATION BETWEEN THE TRANSFORMER AND A WALL.
- THE GROUND UNDER THE PAD SHALL BE LEVEL AND THOROUGHLY COMPACTED.
- INSTALL CONDUITS FOR THE PRIMARY CABLE IN THE CENTER OF THE DESIGNATED PRIMARY CABLE AREA AS SHOWN ON DWG. 22.08-101I.
- CONDUITS FOR SECONDARY/SERVICE CABLES ARE TO BE CENTERED IN THE AREA SHOWN ON DWG. 22.08-1011. NO PART OF ANY CONDUIT MAY EXTEND OUTSIDE OF THE DIMENSIONS SHOWN.
- PLACE THREE (3), FORTY (40) POUND BAGS OF CONCRETE AGAINST EACH 90° BEND CONTAINING PRIMARY CABLE AS SHOWN ON DWG. 22.08-101F TO PREVENT MOVEMENT DURING CABLE PULLING. DO NOT OPEN THE BAGS, JUST MAKE THREE CUTS ACROSS THE FRONT OF THE BAG TO ALLOW MOISTURE TO ENTER, AND PLACE THEM AGAINST THE BEND.
- ALL CONDUITS IN A PIT PAD SHALL EXTEND 6" ABOVE THE GRAVEL BED IN THE PIT.
- INSTALL PLUGS IN EACH CONDUIT TO KEEP SAND, RAIN, ETC. OUT OF THE CONDUITS. DO **NOT** GLUE THE PLUGS ONTO THE CONDUIT.

CONDUIT POSITIONING IN ABOVE-GRADE PEDESTALS

LOCATION OF ABOVE-GRADE PEDESTALS



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CUSTOMER GUIDE FOR INSTALLING CONDUIT

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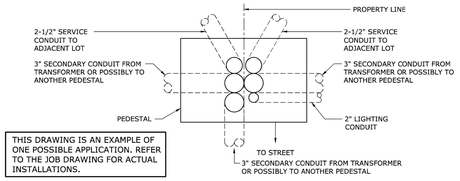
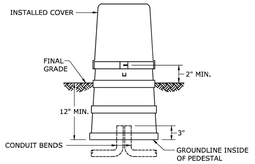
22.08-101J

POSITIONING CONDUIT IN ABOVE-GRADE PEDESTALS



THIS DRAWING IS AN EXAMPLE OF ONE POSSIBLE APPLICATION. REFER TO THE JOB DRAWING FOR ACTUAL INSTALLATIONS.

- SERVICE CONDUIT WILL BE 2-1/2" SCHEDULE 40 PVC OR SDR 13.5 HDPE. SECONDARY CONDUIT WILL BE 3" SCHEDULE 40 PVC OR SDR 13.5 HDPE.
- A MAXIMUM OF FOUR (4) CONDUIT BENDS MAY BE INSTALLED IN THE SMALL PEDESTAL, SIX (6) CONDUIT BENDS MAY BE INSTALLED IN THE MEDIUM PEDESTAL, AND EIGHT (8) CONDUIT BENDS MAY BE INSTALLED IN THE LARGE PEDESTAL. FOR ALL APPLICATIONS, THE TOP OF THE BENDS MUST BE BANDED TOGETHER, POSITIONED IN THE CENTER OF THE PEDESTAL AND ORIENTED AS SHOWN IN THE ABOVE DRAWINGS.
- PLACE TWO (2), FORTY (40) POUND BAGS OF CONCRETE AGAINST EACH BEND AS SHOWN ON DWG. 22.08-101F TO PREVENT MOVEMENT DURING CABLE PULLING. DO NOT OPEN THE BAGS, JUST MAKE THREE CUTS ACROSS THE FRONT OF THE BAG TO ALLOW MOISTURE TO ENTER, AND PLACE THEM AGAINST THE BEND.
- EXTEND CONDUITS THREE (3) INCHES ABOVE THE GROUNDLINE INSIDE THE PEDESTAL BASE. SEE DRAWING BELOW.



- NO ABOVE-GROUND OBSTRUCTION SHALL BE PLACED WITHIN 3 FEET OF A PEDESTAL.
- SOIL BENEATH THE PEDESTAL BASE SHALL BE COMPACTED TO THE FIRMNESS OF UNDISTURBED EARTH AND SHALL BE FREE OF ROOTS AND OTHER ORGANIC MATERIALS.
- INSTALL PLUGS IN EACH CONDUIT TO KEEP SAND, RAIN, ETC. OUT OF THE CONDUITS. DO **NOT** GLUE THE PLUGS ONTO THE CONDUIT.

CONDUIT POSITIONING IN SWITCHGEAR

- THERE ARE TOO MANY DIFFERENT TYPES AND CONFIGURATIONS OF PAD-MOUNTED SWITCHGEAR TO LIST IN THIS DOCUMENT. DUKE ENERGY WILL PROVIDE CONDUIT PLACEMENT INFORMATION FOR THE SPECIFIC SWITCHGEAR THAT IS TO BE INSTALLED WHEN IT IS REQUIRED. NOT ALL SUBDIVISIONS WILL REQUIRE SWITCHGEAR.
- THERE SHALL BE NO ABOVE-GROUND OBSTRUCTIONS WITHIN TEN (10) FEET OF THE FRONT AND BACK OF THE SWITCHGEAR OR WITHIN THREE (3) FEET OF EACH SIDE. IF THE SWITCHGEAR HAS A CONTROL CABINET, FIVE (5) FEET OF SPACE MUST BE PROVIDED ON THE SIDE WHERE THE CABINET IS LOCATED.
- THE GROUND UNDER THE PAD SHALL BE LEVEL AND THOROUGHLY COMPACTED.
- POSITION AND ORIENT ALL CONDUIT BENDS AS DIRECTED BY DUKE ENERGY. PLACE THREE (3), FORTY (40) POUND BAGS OF CONCRETE AGAINST EACH 90° BEND AS SHOWN ON DWG. 22.08-101F TO PREVENT MOVEMENT DURING CABLE PULLING. DO NOT OPEN THE BAGS, JUST MAKE THREE CUTS ACROSS THE FRONT OF THE BAG TO ALLOW MOISTURE TO ENTER, AND PLACE THEM AGAINST THE BEND.
- EXTEND CONDUITS SIX (6) INCHES ABOVE THE LEVEL OF THE SOIL IN THE BOTTOM OF THE PIT PAD.
- INSTALL PLUGS IN EACH CONDUIT TO KEEP SAND, RAIN, ETC. OUT OF THE CONDUITS. DO **NOT** GLUE THE PLUGS ONTO THE CONDUIT.

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2	9/2/22	FLETCHER	EANES	GRAHAM	
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CUSTOMER GUIDE FOR INSTALLING CONDUIT

DEC	DEM	DEP	DEF
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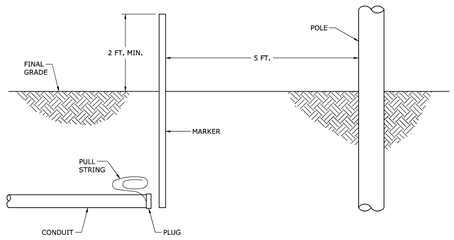
22.08-101K

CONDUIT POSITIONING AT RISERS

- DUKE ENERGY WILL STAKE THE EXACT LOCATION OF THE POLE RISER.
- STOP THE CONDUIT FIVE (5) FEET FROM THE POLE.
- A MINIMUM OF FIVE (5) FEET OF PULL STRING MUST EXTEND OUT OF THE CONDUIT AND BE PLACED IN A COIL AT THE END OF THE CONDUIT.
- PLACE A PLUG ON THE END OF THE CONDUIT BUT DO NOT CEMENT THIS PLUG TO THE BEND.
- PLACE A MARKER (A PIECE OF CONDUIT FOR EXAMPLE) AT THE END OF THE CONDUIT THAT WILL EXTEND ABOVE FINAL GRADE A MINIMUM OF TWO (2) FEET.

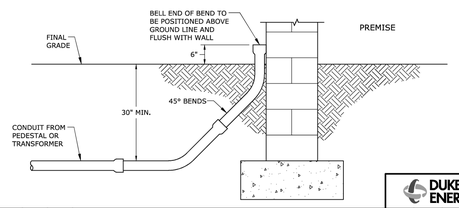
RISER POLE INSTALLATION



CONDUIT POSITIONING AT PREMISE RISERS

- THE TOP OF THE CONDUIT BEND MUST BE IN CONTACT WITH THE PREMISE.
- EXTEND CONDUIT SIX (6) INCHES ABOVE FINAL GRADE OF THE SOIL.
- THE PULL STRING MUST EXTEND A MINIMUM OF FOUR (4) FEET OUTSIDE OF THE CONDUIT.
- INSTALL A PLUG ON THE CONDUIT TO KEEP DIRT, RAIN, ETC. OUT OF THE CONDUIT. DO NOT GLUE THE PLUG ONTO THE CONDUIT.

PREMISE SERVICE RISER



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CUSTOMER GUIDE FOR INSTALLING CONDUIT

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22.08-101L

CONDUIT POSITIONING IN PULLBOXES

PULLBOXES ARE BELOW-GRADE ENCLOSURES USED TO FACILITATE THE INSTALLATION OF CABLE IN CONDUIT SYSTEMS.

DUKE ENERGY WILL:

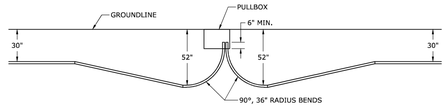
A. PROVIDE AND INSTALL ALL REQUIRED PULLBOXES.
B. STAKE THE LOCATION WHERE ALL PULLBOXES ARE TO BE INSTALLED.
C. PROVIDE THE DIMENSIONS OF ALL PULLBOXES.
D. IDENTIFY THE NUMBER, SIZE, LOCATION AND ORIENTATION OF ALL CONDUIT/BENDS ENTERING OR EXITING EACH PULLBOX.

1. NON-CONCRETE PULLBOXES
DUKE ENERGY USES SEVERAL SIZES OF NON-CONCRETE PULLBOXES AS LISTED IN THE TABLES BELOW. LARGER SIZES, SUCH AS 4' X 8', ARE OCCASIONALLY ORDERED FOR PRIMARY CABLE APPLICATIONS. DUKE ENERGY WILL PROVIDE AND INSTALL ALL NON-CONCRETE PULLBOXES. THE CUSTOMER WILL TERMINATE THE CONDUIT SYSTEM AS REQUIRED BELOW SO DUKE ENERGY WILL BE ABLE TO INSTALL THESE PULLBOXES.

DUKE ENERGY CAROLINAS NON-CONCRETE PULLBOXES		
WIDTH (W)	LENGTH (L)	DEPTH (D)
11" ROUND	-	18"
13"	24"	18"
17"	30"	18"
24"	36"	18"
30"	60"	30"

DUKE ENERGY PROGRESS NON-CONCRETE PULLBOXES		
WIDTH (W)	LENGTH (L)	DEPTH (D)
11" ROUND	-	18"
13"	23"	15"
30"	48"	18"

- DUKE ENERGY WILL STAKE THE LOCATION OF EACH PULLBOX, IDENTIFY THE PULLBOX SIZE THAT WILL BE USED, AND PROVIDE THE NUMBER, SIZE, POSITION AND ORIENTATION OF EACH BEND THAT WILL BE INSTALLED IN THE PULLBOX.
- EXCAVATE AN AREA APPROXIMATELY TEN (10) INCHES GREATER THAN THE OUTSIDE LENGTH AND WIDTH OF THE PULLBOX BEING INSTALLED AND TO THE DEPTH OF THE PULLBOX. THE GROUND UNDER THE PULLBOX SHALL BE PARALLEL TO THE GROUNDLINE OUTSIDE THE PULLBOX AND THOROUGHLY COMPACTED.
- SLOPE THE DEPTH OF EACH CONDUIT CONTAINING SECONDARY/SERVICE CABLE THAT WILL ENTER OR LEAVE THE PULLBOX FROM THE NORMAL BURIAL DEPTH OF 30" TO A DEPTH OF 52" TO ALLOW BENDS TO BE PROPERLY POSITIONED BELOW THE PULLBOX. THIS SLOPE SHOULD BEGIN ABOUT TEN (10) FEET AWAY FROM THE PULLBOX. THE CONDUIT DOES NOT HAVE TO BE SLOPED WHEN INSTALLING PRIMARY CABLE IN THE 30" X 60" X 30" PULLBOX.



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CUSTOMER GUIDE FOR INSTALLING CONDUIT

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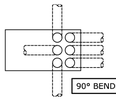
22.08-101M

- INSTALL THE CONDUIT AND ALL REQUIRED BENDS WITH THE BENDS POSITIONED AND ORIENTED AS DESCRIBED BY THE DUKE ENERGY DESIGNER. THE TOP OF ALL BENDS MUST EXTEND SIX (6) INCHES ABOVE THE GROUNDLINE INSIDE THE PULLBOX. BENDS FOR SECONDARY/SERVICE CABLE WILL ALL BE POSITIONED ON ONE END OF THE PULLBOX. BENDS FOR PRIAMRY CABLE WILL BE POSITIONED ON OPPOSITE ENDS OF ONE SIDE OF THE PULLOBOX. 90° BENDS WILL BE USED FOR SECONDARY/SERVICE CABLES AND 45° BENDS WILL BE USED FOR PRIMARY CABLE.

POSITION OF BENDS FOR SECONDARY/SERVICE CABLES



90° BENDS ONLY

PLAN VIEW

BEND POSITION FOR PRIMARY CABLES 30" X 60" PULLBOX ONLY

45° BENDS ONLY

PLAN VIEW

THESE DRAWINGS ARE EXAMPLES OF ONE POSSIBLE APPLICATION. REFER TO THE JOB DRAWING FOR ACTUAL INSTALLATIONS.

- WHEN MULTIPLE BENDS ARE POSITIONED TOGETHER, THEIR TOPS MUST BE FIRMLY BANDED TOGETHER IN THE PROPER CONFIGURATION.
- THE TOP OF EACH BEND IN THE PULLBOX MUST BE COLOR CODED AS DESCRIBED ON DWG. 22.08-101F.
- PLACE TWO, FORTY (40) POUND BAGS OF CONCRETE AGAINST EACH 90° BEND CONTAINING SECONDARY/ SERVICE CABLE AND THREE, FORTY (40) POUND BAGS AGAINST EACH 90° BEND CONTAINING PRIMARY CABLE AS SHOWN ON DWG. 22.08-101F TO PREVENT MOVEMENT DURING CABLE PULLING. DO NOT OPEN THE BAGS, JUST MAKE THREE CUTS ACROSS THE FRONT OF THE BAG TO ALLOW MOISTURE TO ENTER.
- A SHORT PIECE OF CONDUIT, LONG ENOUGH TO REACH ONE (1) FOOT ABOVE GROUND, MUST BE ATTACHED TO EACH BEND IN THE PULLBOX. THESE PIECES OF CONDUIT MUST NOT BE CEMENTED TO THE BENDS. THE PULL STRING FOR EACH CONDUIT SEGMENT (TRANSFORMER TO PEDESTAL, PEDESTAL TO SERVICE RISER, ETC.) MUST PASS THROUGH THESE CONDUIT PIECES AND EXTEND A MINIMUM OF 36" BEYOND THEIR END. INSTALL A PLUG IN EACH CONDUIT TO KEEP SAND, RAIN, ETC. OUT OF THE CONDUIT. DO NOT CEMENT THESE PLUGS INTO THE CONDUIT.
- FILL THE HOLE WITH SOIL TO PREVENT THIS FROM BEING A SAFETY HAZARD. DUKE ENERGY WILL REMOVE THE SOIL WHEN THE PULLBOX IS INSTALLED.

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CUSTOMER GUIDE FOR INSTALLING CONDUIT

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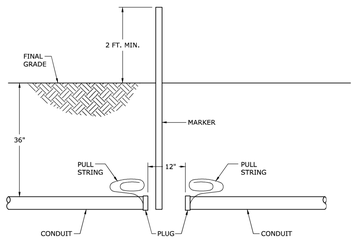
22.08-101N

1. LARGE CONCRETE PULLBOXES

DUKE ENERGY USES A 56" X 96" X 44" CONCRETE PULLBOX.

- DUKE ENERGY WILL STAKE THE EXACT LOCATION OF THE PULLBOX.
- CREATE A ONE (1) FOOT GAP IN THE CONDUIT IN THE CENTER OF THE PULLBOX LOCATION AS SHOWN BELOW.
- A MINIMUM OF FIVE (5) FEET OF PULL STRING MUST EXTEND OUT OF THE CONDUIT AND BE PLACED IN A COIL AT THE END OF THE CONDUIT.
- PLACE A PLUG ON THE END OF THE CONDUIT BUT DO NOT CEMENT THIS PLUG TO THE CONDUIT.
- PLACE A MARKER (A PIECE OF CONDUIT FOR EXAMPLE) AT THE GAP BETWEEN THE ENDS OF THE CONDUIT THAT WILL EXTEND A MINIMUM OF TWO (2) FEET ABOVE GRADE.



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CUSTOMER GUIDE FOR INSTALLING CONDUIT

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22.08-101O

CLEARANCES

SEPARATION MUST BE MAINTAINED BETWEEN CONDUITS INSTALLED FOR DUKE ENERGY AND OTHER CABLES, PIPES OR STRUCTURES AS SHOWN IN THE FOLLOWING TABLE AND DRAWINGS.

PRIMARY OR SECONDARY CABLES IN A CONDUIT SYSTEM			
PARALLELING	HORIZONTAL SEPARATION (IN)	CROSSING	VERTICAL SEPARATION (IN) (SEE NOTE 2)
COMMUNICATION LINES	12	COMMUNICATION LINES	12
WATER LINES	36	WATER LINES	12
SEWER LINES	36	SEWER LINES	12
FUEL LINES	36	FUEL LINES	12
STEAM LINES	60	STEAM LINES	36
CUSTOMER-OWNED CABLES	36	CUSTOMER-OWNED CABLES	12
IN-GROUND SWIMMING POOL	60	IN-GROUND SWIMMING POOL	N/A

NOTES:

1. THE HORIZONTAL AND VERTICAL SEPARATION SHOULD BE ADEQUATE TO PERMIT ACCESS AND MAINTENANCE OF EITHER FACILITY TO LIMIT DAMAGE TO THE OTHER. THE DISTANCES SHOWN IN THE TABLE ABOVE HAVE BEEN FOUND TO MEET THESE CRITERIA.
2. VERTICAL SEPARATION MUST BE SUFFICIENT TO LIMIT THE LIKELIHOOD OF DETRIMENTAL LOAD BEING TRANSFERRED TO EITHER OF THE UTILITIES OR STRUCTURES INVOLVED. THE DISTANCES SHOWN IN THE ABOVE TABLE HAVE BEEN FOUND TO MEET THESE CRITERIA.
3. CONTACT DUKE ENERGY WHEN DIMENSIONAL VARIANCES ARE REQUIRED.

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CUSTOMER GUIDE FOR INSTALLING CONDUIT

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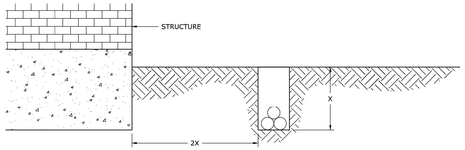
22.08-101P

INSTALLING UNDERGROUND CABLES PARALLEL TO STRUCTURES



NOTES:

1. WHEN INSTALLING UNDERGROUND CABLE PARALLEL TO EXISTING STRUCTURES, OR THOSE THAT ARE UNDER CONSTRUCTION, IT IS NECESSARY TO MAINTAIN ADEQUATE CLEARANCE FROM THOSE STRUCTURES. THIS CLEARANCE IS NECESSARY TO MAINTAIN THE INTEGRITY OF THE SOIL, AND THE SUPPORT PROVIDED BY THE SOIL, UNDER THE FOUNDATION OF THE STRUCTURE.
2. UNDERGROUND FACILITIES INSTALLED PARALLEL TO A STRUCTURE SHOULD BE LOCATED AT LEAST TWICE AS FAR AWAY FROM THE STRUCTURE AS THE DEPTH OF THE TRENCH THAT IS DUG. FOR EXAMPLE, IF A TRENCH IS TO BE TWO (2) FEET DEEP, THEN THE TRENCH MUST BE LOCATED AT LEAST FOUR (4) FEET AWAY FROM THE STRUCTURE.
3. THIS REQUIREMENT DOES NOT APPLY TO CABLE THAT IS NOT INSTALLED PARALLEL TO A STRUCTURE.
4. ON INSTALLATIONS WHERE THE CABLE CANNOT BE INSTALLED TWICE AS FAR FROM THE FOUNDATION AS THE CABLE IS DEEP, THE SOIL MUST BE COMPACTED THROUGHOUT THE ENTIRE TRENCH DEPTH TO 100% OF THE ORIGINAL SOIL DENSITY IN ALL AREAS WHERE ADEQUATE SEPARATION CANNOT BE OBTAINED FROM THE FOUNDATION.

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CUSTOMER GUIDE FOR INSTALLING CONDUIT

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22.08-101Q

HN-0040
2B-6
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION JOHNSTON COUNTY

ROADWAY DESIGN UNIT
ROADWAY DESIGN ENGINEER

HYDRAULIC DESIGN ENGINEER

JMT
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4700 Falls of Neuse Rd, Suite 100,
Raleigh, NC, 27609
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CONDUIT DETAIL SHEET