6-19-134 – Customer Reference Specification

Requirements for Trenching and Backfilling by Customer for 120/240 V Underground Service Laterals Installation in a Trench with only Electric Lines (Non-Joint Trench)

(Replaces CRS-1009)

THIS CUSTOMER REFERENCE SPECIFICATION (CRS) IS PART OF THE RULES FOR ELECTRIC METER AND SERVICE INSTALLATION (REMSI) WEBSITE

Approved: E04591 Jarrah, Bashar S

This CRS contains basic information which defines two possible scenarios for PPL Electric Utilities (PPL EU) requirements for Trenching and Backfilling by Customer for 120/240V Underground Service Laterals Installation in a Trench with only Electric Lines.

Scenario A – pertains to situations when the customer or customers' contractor will be tying pull line and connecting the customer side conduit to the PPL EU conduit stub at a later date.

Scenario B – pertains to situations when the customer or customers' contractor will be laying the customer side conduit side conduit, running pull line and then plugging the customers side conduit end for PPL EU to attach the conduit to the PPL EU conduit stub at a later date.

Page 92 through Page 98 of this CRS covers information that pertains to both scenarios. If information on these pages is specific to one scenario or the other, it is labeled accordingly.

Page 92 through Page 95 covers details for Scenario A only.

Page 96 through Page 98 covers details for Scenario B only.

The PPL EU Technician will tell you which scenario is applicable to your job and when various trench inspections are required.

All details of this specification shall be strictly followed. Any deviation must be approved by the PPL EU designer. Unapproved deviations are usually costly for the customer to correct and can result in delays or possible refusal to connect service.

Requirements for trenching and backfilling by developer/customer for primary and secondary installation in a trench with only electric lines are specified in Customer Reference Specification 6-14-121.

Requirements for trenching and backfilling by customer for 120/240 volt underground service laterals installation in a trench with electric and/or gas telecommunication lines are specified in Customer Reference Specification 6-19-133.

Requirements for trenching and backfilling by developer/customer for primary and secondary installation in a trench with electric and/or gas telecommunication are specified in Customer Reference Specification 6-14-122.

Definitions:

Single Wall Flexible Pipe – Coreflo

Twin Wall Flexible Pipe – Super Coreflo

General Notes:

1. The Pennsylvania Underground Utility Line Protection Act requires any person doing excavation or demolition work to:

   A. Ascertain the location and types of utility lines at each work site.

   B. Request location of lines from utility at least 3 working days before beginning excavation or demolition work by calling PA One Call at 800-242-1776.

   C. Notify PA One Call of any break or damage to its line made or discovered during excavation or demolition.

2. The depth dimension shown on Fig. 6-19-134A is minimum. Deeper trenches may be required due to obstacles or to maintain the following separation from other utilities.

   A. Water, sewer, etc. – 12 inches of earth.

   B. Steam, heat mains – 72 inches of earth.

   C. Propane – 36 inches of earth; never above electric.

   D. Gas, 6 inches minimum, 12 inches preferred: never below electric.

   E. Communication – 6 inches minimum, 12 inches preferred. No deliberate separation is required by agreement between communication company and PPL EU.

   Occupational Safety and Health Administration (OSHA) approved shoring is required for trenches deeper than 60 inches.

3. Do not use power excavating equipment within 24 inches of any existing buried cables or other electrical or communications equipment.

4. **Site Preparation – by Customer:**

   A. Clear ground of trees, stumps, roots, rocks, and other obstructions.

   B. Rough grade trench route to within 6 inches of final grade.

5. **Trench Preparation – by Customer:**

   A. Excavate all service trenches 39 inches deep.

   B. Material excavated from trench must be placed on only one side of trench and far enough away so piles of excavated material pose no danger or obstacle to people working in trench. Keep one side of trench clear so workers have clear access to trench.

C. Provide an adequate supply of bedding material for use as protective backfill over PPL conduits and, if required, to bed the bottom of rough/uneven trenches. Distribute bedding material along trench route on same side of trench as removed trench material.

D. Grade trench free of high spots, rock projections, stones, and depressions. If the bottom of the trench is rough/uneven, the customer must excavate 3 additional inches and bed the trench with stone fines or sand, 3 inches deep.

E. Trench must be clear of standing water before PPL EU crews will install electric facilities.

F. Customer must dig trench on their own property or will be subject to additional charges

6. **Flexible Pipe or Conduit – by Customer:**

A. The customer may install flexible pipe of a twin wall construction with a smooth inside wall and a corrugated outside wall. The flexible pipe must meet the material and performance requirements of NEMA standard TC-5.

For identification purposes, the pipe should be marked with 1 yellow and 2 red stripes equally spaced apart throughout the length of the pipe. In addition, the pipe should be marked at least every 10 feet with the NEMA standard number – TC-5. The pipe must be same diameter as the service lateral conduit.

Scenario B – When PPL EU will be making the connection to the service stub, the pipe must be long enough to extend from the service lateral conduit to 5 feet beyond the PPL EU service stub marker or riser pole.

The pipe must have couplings at both ends. Fasten the coupling at the meter end to the service lateral conduit using PVC conduit adhesive.

IMPORTANT: Install the pulling line from the meter base to the end of the pipe at the service stub marker or pole and seal the pipe end. PPL EU will connect pipe to the PPL EU conduit stub, Fig. 6-19-134H, Fig. 6-19-134I, and Fig. 6-19-134J.

B. The customer may install gray schedule 40 PVC conduit (UL approved). Couplings are preferred to bell ends. All joints must be glued with appropriate PVC conduit cement. The conduit must be the same diameter as the service lateral conduit. All conduit bends must have a minimum 36 inch radius. Per National Electrical Code (NEC) 344-14, there shall not be more than the equivalent of 4 quarter (90 degree) bends in the run (360°).

Scenario B – A pulling line from the meter base to the end of the conduit at the service stub, stub marker or pole must be installed and the conduit end sealed.

C. Any service conduit that is installed in the rear zone of the house must be gray schedule 40 PVC conduit (UL approved) encased in concrete (minimum 3-inch thickness). The rear zone is defined as an area extending 20 feet from rear of the house.

D. Scenario A – Install a flexible pipe or conduit from PPL EU's conduit stub to the service lateral conduit at the meter base. Connect the pipe or conduit to the PPL EU's conduit stub using the PPL EU provided coupling installed at the end of the PPL EU conduit stub. Hand dig near PPL EU's conduit stub to avoid damaging conduit or coupling. Connect the other end of the pipe or conduit to the meter service lateral conduit using an appropriate coupling. Install a pull line from the PPL EU's conduit stub to the meter base. Fasten this pull line to the PPL EU pull line in the PPL EU conduit stub and tie off other end in the meter base. Details are shown on Fig. 6-19-134D, Fig. 6-19-134E, and Fig. 6-19-134F. Backfill trench as specified below remembering that, should PPL EU be unable to pull its conductor through this customer installed conduit system, service will be delayed until the customer makes the conduit system pullable.

E. Scenario B – PPL EU will connect conduit to PPL EU conduit stub Fig. 6-19-134K.

7. **Pulling Line – by Customer:**

A. The only acceptable pulling line is a flat polyester, woven, prelubed tape, ½ inch in width with a minimum breaking strength of 1200 pounds.

B. When installing pulling line in PVC conduit, be sure conduit adhesive is dry before installing the pulling line to avoid gluing the pulling line to joint.

C. Scenario A - When joining flat pulling line to PPL EU's flat pulling line be sure to adequately knot the two pulling lines together. A secure knot is shown at Fig. 6-19-134C.

8. **Backfilling – by Customer**

A. Coordinate installation of communication cables.

B. Once conduit installations are complete, use stone screenings or sand to fill the first 15 inches of trench depth.

C. Backfill trench in layers, thoroughly tamping each layer to eliminate air pockets.

D. Do not run wheels or tracks of equipment along trench to compact the backfill.

E. Scenario B – When the connection is being made at a later time, do not backfill the last 15 feet of the trench until PPL EU has completed connecting the customer provided conduit/pipe to the PPL EU conduit stub.

F. Fill the remainder of the trench depth with select backfill. Select backfill is defined as:

- Earth removed from the trench excavation provided it is mostly soil which contains some round gravel but no stones larger than one inch in diameter.

or

- Material such as: sand, stone screenings or earth meeting definition (A) transported to the site by the customer at his cost. Shaley earth containing sharp angular stones, coal fines, fly ash, and/or cinders are not select backfill.

9. **Installation of Cable – by PPL EU**

A. PPL EU will pull cable into conduit or flexible plastic pipe using customer installed pulling line. If PPL EU is unable to pull cable through the customer-installed conduit system, or finds that PPL EU specifications were not followed, service installation will be delayed until the customer makes the necessary repairs to the conduit system to make it correct and pullable.

From this point forward, this CRS has been split into separate sections:

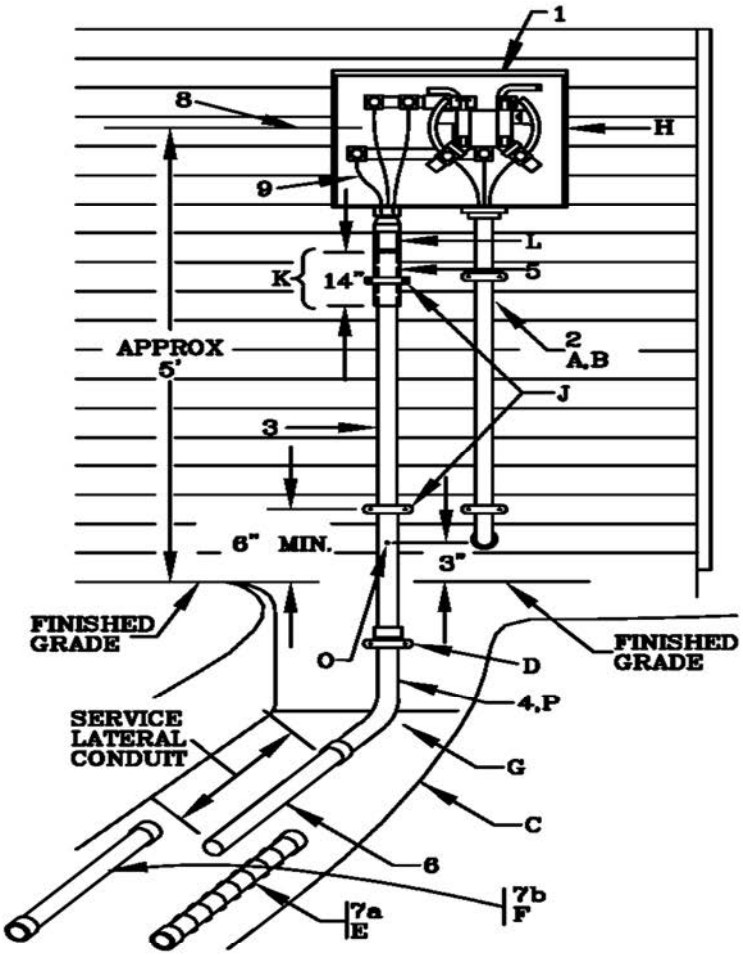
Scenario A – Page 92 through Page 95

Scenario A pertains to situations when the customer or customers' contractor will be tying pull line and connecting the customers' side conduit to the PPL EU conduit stub.

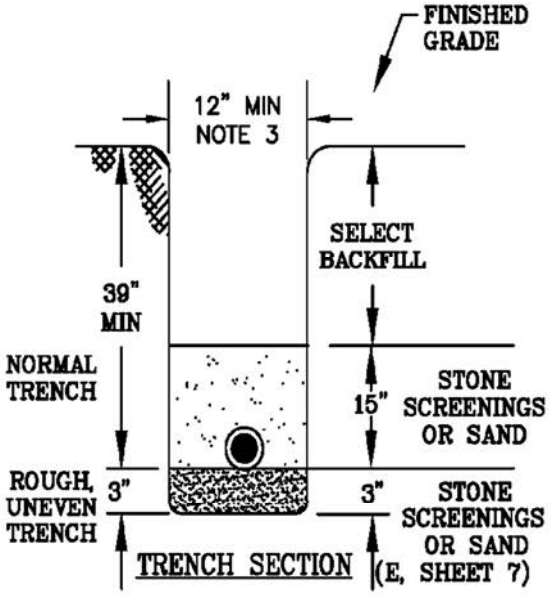
Scenario B – Page 96 through Page 98

Scenario B pertains to situations when the customer or customers' contractor will be laying the customer side conduit, running pull line and then plugging the customers side conduit end for PPL EU to attach the conduit to the PPL EU conduit stub at a later date.

Information Found on This Sheet Refers to the Notes on Pages 89 & 90



6-19-134-A
NOT TO SCALE



6-19-134-B
NOT TO SCALE

Information Found on This Page Refers to the Figures 6-19-134A and 6-19-134B

Customer Furnishes, Installs and Maintains:

1. Meter base approved by PPL EU for aluminum or copper conductor.
2. Service entrance, cable or conductors in conduit (per NEC 300-5, PVC conduit may have to be schedule 80).
3. Meter riser conduit (consult with PPL EU technician for conduit size) – 3 inch min. threaded galvanized rigid or intermediate steel conduit with bushing or gray schedule 40 PVC conduit (UL approved).
4. 90° elbow, 36 inch radius (schedule 40 PVC or galvanized steel). (Consult PPL EU technician for material).
5. Install slip riser on all single phase residential services. See approved slip riser table.

Customer Furnishes, Installs and PPL Maintains:

6. Service lateral conduit – 5' gray schedule 40 PVC conduit 3" min. (UL approved) size to match meter riser conduit.
7. a) Flexible pipe with twin wall construction. Inside smooth, outside corrugated per NEMA TC-5.

   b) Gray schedule 40 PVC conduit 3" min. (UL approved) size to match meter riser conduit.

PPL Furnishes, Installs and Maintains:

8. Meter (not shown).
9. Service lateral conductors installed inside of customer provided conduit terminating on line side terminals in meter base.

Notes:

A. When service entrance conductors are 300 KCMIL or larger, contact PPL EU for specifications of metering equipment and service lateral conduit.

B. Securely fasten together all conduit pieces, (thread steel, solvent weld plastic). Ream ends of conduit to remove any sharp burrs. Secure conduit to house with conduit straps.

C. Contact PPL EU for exact trench location.

D. Secure elbow (Item 4) to foundation with two hole conduit strap installed just below elbow bend coupling.

E. Install flexible pipe from PPL EU's conduit stub to service lateral conduit or from service lateral conduit to the riser pole. Provide pulling line and seal end. (See page 88).

F. If using schedule 40 PVC conduit, see sheet 6 for installation details.

G. Tamp base of trench near house so trench will not settle and pull service conduits off house.

H. See REMSI SKETCH #55 for clearances to gas meters.

I. Gas refers to natural gas. Propane or LP gas is not permitted; 36 inch minimum separation.

J. Conduit straps to be same size to allow lower conduit to move within strap.

K. Extend conduit approximately 14 inches into the slip riser.

L. No attachment sticker – provided by PPL EU (PPL EU CID #943016).

M. Do not install any attachments on conduit or slip riser per NEC & IRC. See SKETCH #55.

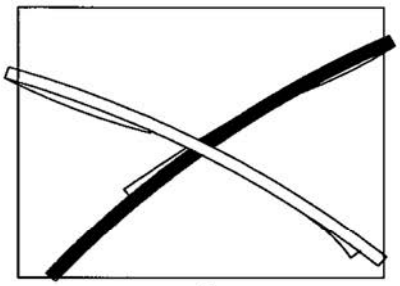
N. 50" minimum clear space in front of meter base. See Rule 13, SKETCH #55 and SKETCH #55A (side view).

O. Drill 2-1/4" holes in back of conduit 3" above ground prior to pulling cable.

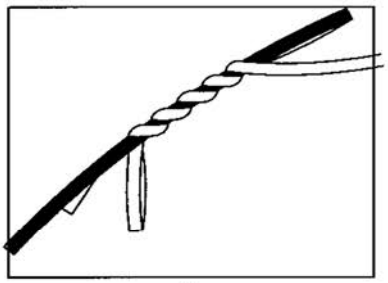
P. Drill 2-1/4" holes in bottom side of elbow prior to pulling cable.

Q. See REMSI SKETCH #7 and SKETCH #7A for more detail.

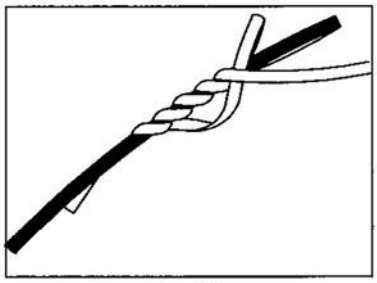
Instructions for Splicing Pulling Rope (MUELTAPE)



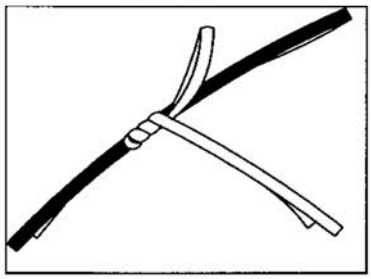
1. Take each end of the flat pulling line to be spliced, and without twisting, fold so that each end is doubled for approximately 18 inches. Take the end on the right and cross it over the end on the left.



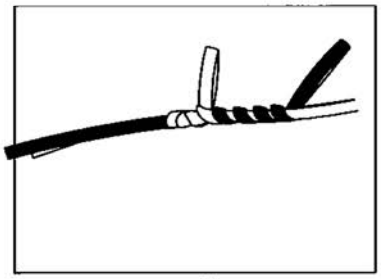
2. Now, take the same end and make four turns around the other line.



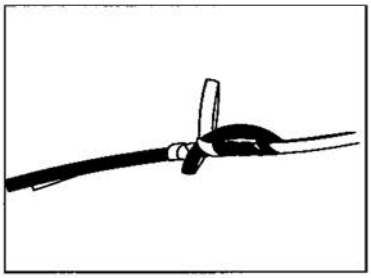
3. Without twisting, bend the wrapped end back and insert it between the looped lines at the point where they crossed initially (in step 1).



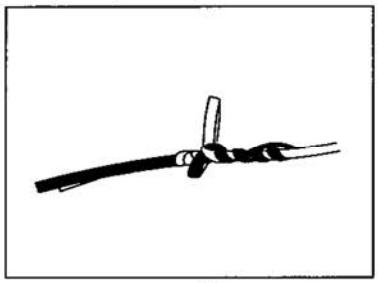
4. Wraps and loops should now be snugged as shown above.



5. Using the other end, repeat the process outlined in step 2. After concluding this process, both ends should be sticking up as shown.



6. Insert the tape end used in step 5 down through the same hole where the looped lines crossed initially, as in step 3.

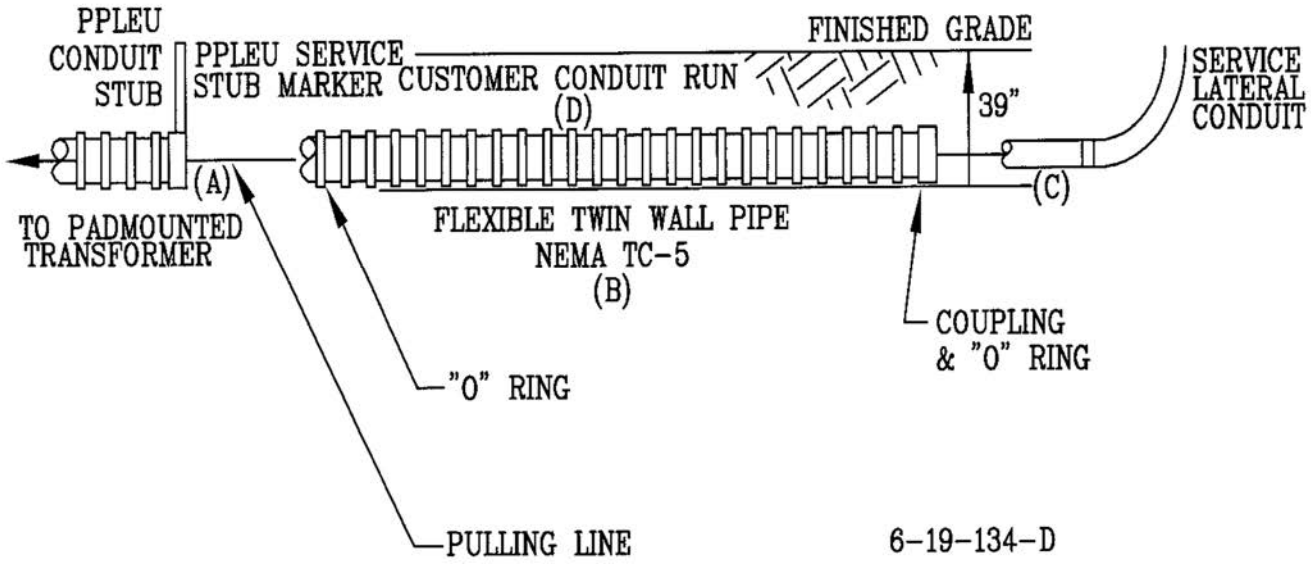


7. The knot is complete but loose. The knot can now be drawn up by grasping the lines on either side of the knot and pulling.

6-19-133-C

Scenario A

Customer Installation of Service Run to PPL EU Conduit Stub Using Twin Wall Flexible Pipe



A. Excavate 39 inch deep trench from PPL EU service stub marker to meter base. Hand dig near service stub marker to expose about 12 inches of the PPL EU conduit stub. Use care not to damage conduit or coupling. The end of the conduit should have been sealed with a plug by PPL EU. Unscrew plug seal. The PPL EU pulling line and a rubber "O" ring should be tied to the plug. Untie pulling line and remove "O" ring. Save plug to install in meter base.

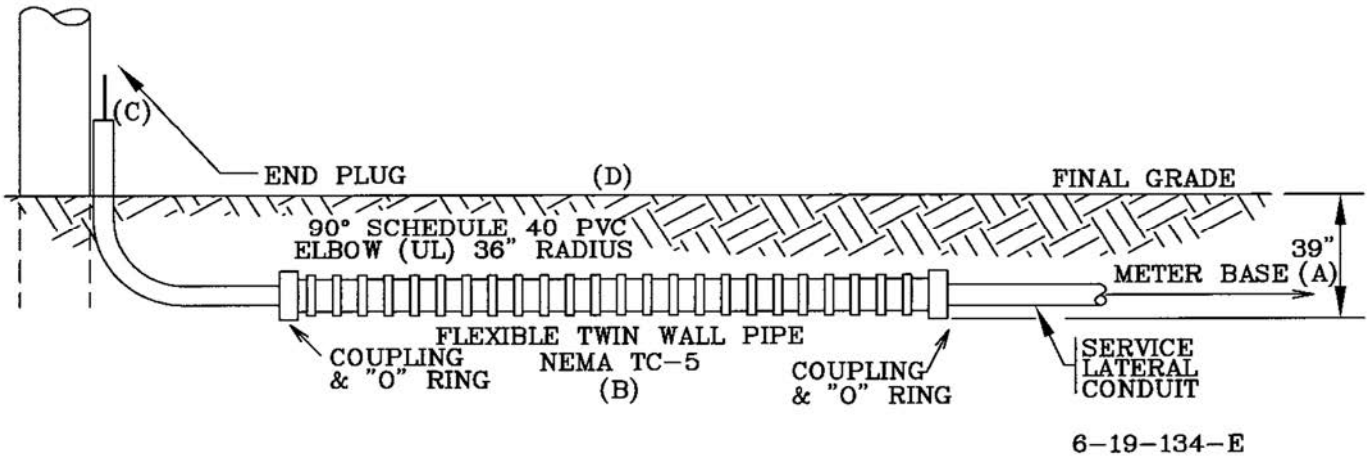
B. Install enough twin wall flexible pipe to reach from PPL EU conduit stub to service lateral conduit. Install the PPL EU supplied "O" ring on the first groove of the twin wall flexible pipe. Install pulling line into twin wall flexible pipe. Securely tie pulling line to the PPL EU pulling line. Coat "O" ring with silicone sealant (GE RTV 102 or PPL EU approved equivalent). Insert pipe with "O" ring into PPLEU coupling until pipe contacts other pipe. Using vinyl tape, tape across the joint.

C. Install customer purchased "O" ring in first groove of service lateral end of twin wall flexible pipe. Coat "O" ring with silicone sealant (GE RTV 102 or PPL EU approved equivalent). Insert twin wall pipe into customer purchased twin wall to PVC coupling. Feed pulling line through service lateral conduit into meter base. Using the plug from PPL conduit stub, tie pulling line to plug and install plug into conduit end in meter base. Coat coupling and service lateral conduit with PVC adhesive and push coupling onto service lateral conduit. Using vinyl tape, tape conduit across the joint.

D. Backfill trench per instructions on page 89.

Scenario A

Customer Installation of Service Run to PPL EU Pole Using Twin Wall Flexible Pipe



A. Excavate 39 inch deep trench from PPL EU pole to meter base.

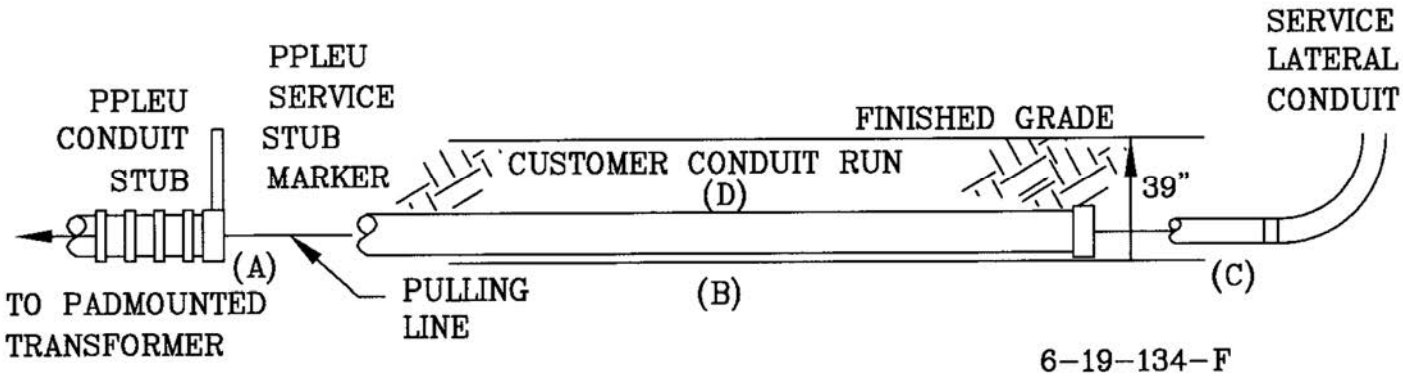
B. Install twin wall flexible plastic pipe from service lateral conduit to pole. Installation will require two twin wall – PVC couplings and two "O" rings. Install "O" rings on first groove on each end of twin wall flexible pipe run. Coat "O" ring with silicone sealant (GE RTV 102 or PPL EU approved equivalent). Push on couplings to center stop. Install 90 degree elbow at location on pole designated by PPL EU technician (all 90 degree elbows must have 36 inch radius sweeps). PPL EU technicians will specify whether the elbow is PVC or steel. Join twin wall flexible pipe to PVC couplings at both ends to PVC fittings using PVC adhesive.

C. Install pulling line from elbow at pole to meter base. Tie pulling line ends to conduit plugs and seal both ends of conduit run with the plugs.

D. Backfill trench per instructions on page 89.

Scenario A

Customer Installation of Service Run to PPL EU
Conduit Stub Using Gray Schedule 40 PVC Conduit



A. Excavate 39 inch deep trench from PPL EU service stub marker to meter base. Hand dig near service stub marker to expose about 12 inches of the PPL EU conduit stub. Use care not to damage conduit or coupling. The end of the conduit should have been sealed with a plug by PPL EU. Unscrew plug seal. The PPL EU pulling line and a rubber "O" ring should be tied to the plug. Untie pulling line and remove "O" ring. Save plug to install in meter base. Carefully cut off PPL provided coupling and discard. Install "O" ring on first groove of twin wall pipe. Coat "O" ring with silicone sealant (GE RTV 102 or PPL EU approved equivalent) and install customer purchased twin wall to PVC coupling.

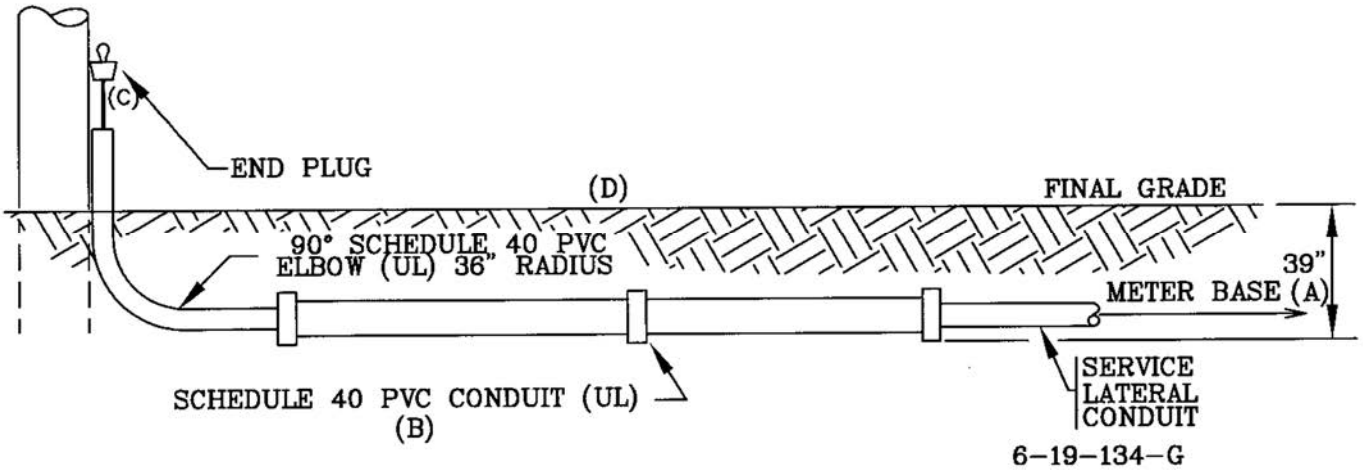
B. Glue together enough gray schedule 40 PVC conduit sections to reach the service lateral conduit. When adhesive is dry, install pulling line. Securely tie this pulling line to PPL EU pulling line and insert PVC conduit into coupling using PVC adhesive. Using vinyl tape, tape across the joint.

C. At service lateral end, install a PVC coupling using PVC adhesive. Feed pulling line through service lateral conduit into meter base. Using the plug from PPL EU conduit stub, tie pulling line to plug and install plug into conduit end in meter base. Using PVC adhesive, connect coupling on conduit run to service lateral conduit.

D. Backfill trench per instructions on page 89.

Scenario A

Customer Installation of Service Run to PPL EU Pole Using Gray Schedule 40 PVC Conduit



A. Excavate 39 inch deep trench from PPL EU pole to meter base.

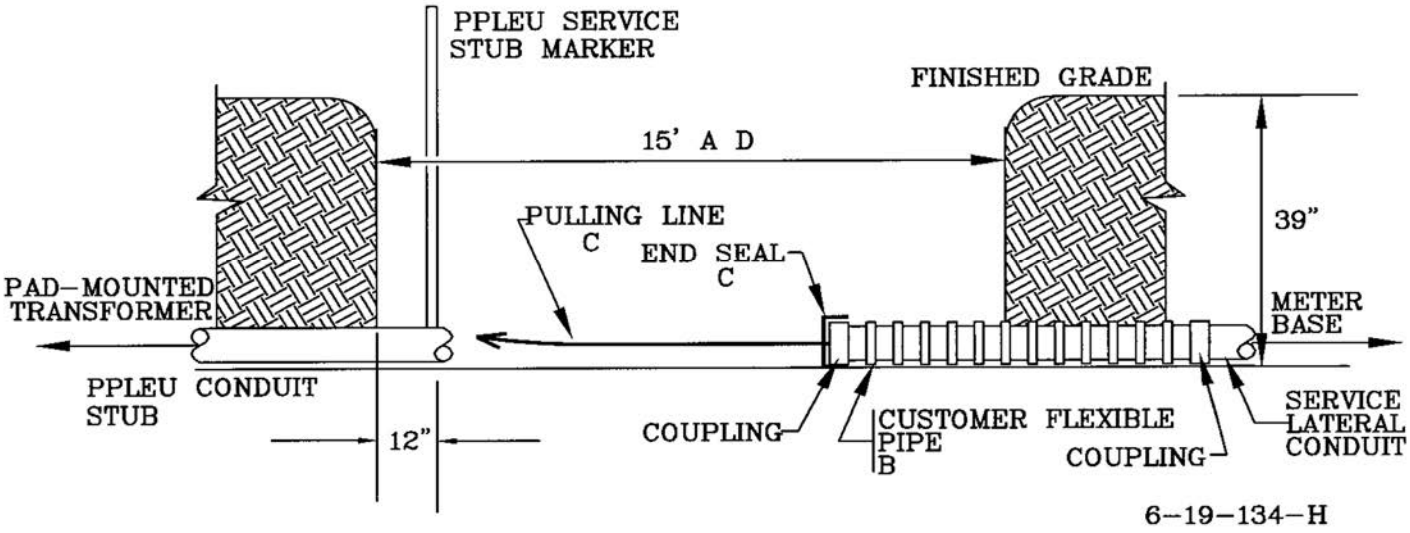
B. Install conduit from service lateral conduit to pole. Install 90 degree elbow at location on pole designated by PPL EU technician. All 90 degree elbows must have 36 inch radius sweeps. Glue all joints using PVC adhesive. PPL EU technicians will specify whether elbow is plastic or steel.

C. Install pulling line from elbow at pole to meter base. Tie pulling line ends to conduit plugs and seal both ends of conduit run with the plugs.

D. Backfill trench per instruction on page 89.

Scenario B

Customer Installation of Service Run to PPL EU
Service Stub Marker Using Twin Wall Flexible Pipe



A. Excavate a 39 inch deep trench to one foot past PPL EU service marker, exposing PPL EU conduit stub while taking care not to damage conduit stub. Leave final 15 feet of trench open for PPL EU. Minimum trench width in this area is 24 inches.

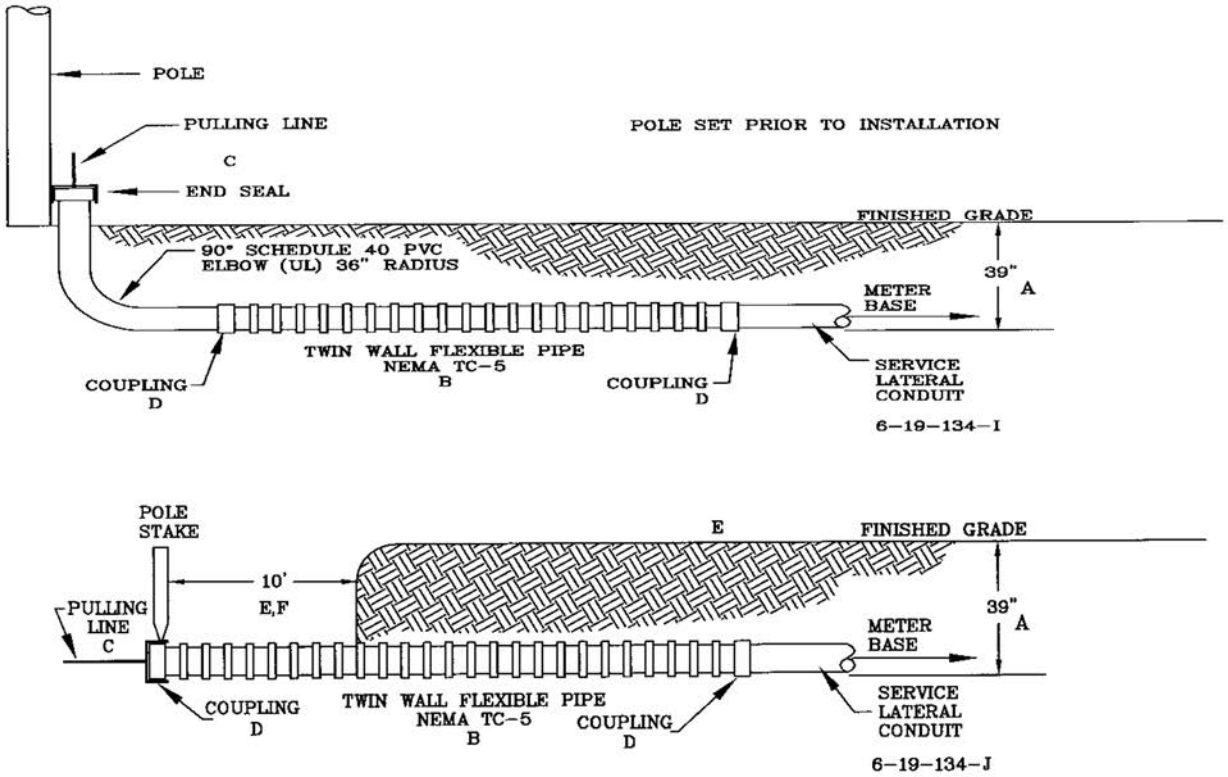
B. Install enough flexible pipe to extend 5 feet past PPL EU service stub marker. Install couplings on both ends of flexible plastic pipe. Fasten coupling at meter end to service lateral conduit using PVC adhesive. PPL EU will fasten coupling at stub end to their conduit stub. If PPL EU cannot pull conductors through the flexible pipe run, the customer must make pipe system pullable.

C. Install pulling line from meter base to pipe end. Install end seal and backfill (see page 89) the entire conduit run except for last 15 feet.

D. After PPL EU completes installation of cable into flexible pipe, backfill the remaining open trench (see page 89).

Scenario B

Customer Installation of Service Run to PPL EU Pole Using Twin Wall Flexible Pipe



A. Excavate 39 inch deep trench to pole or pole stake. Minimum trench width in the area at the pole is 24 inches.

B. Install flexible pipe from service lateral conduit to pole. Install PVC elbow at location on pole designated by PPL EU technician.

C. Seal elbow end. Install pulling line in pipe run. (See page 89). Backfill entire conduit run.

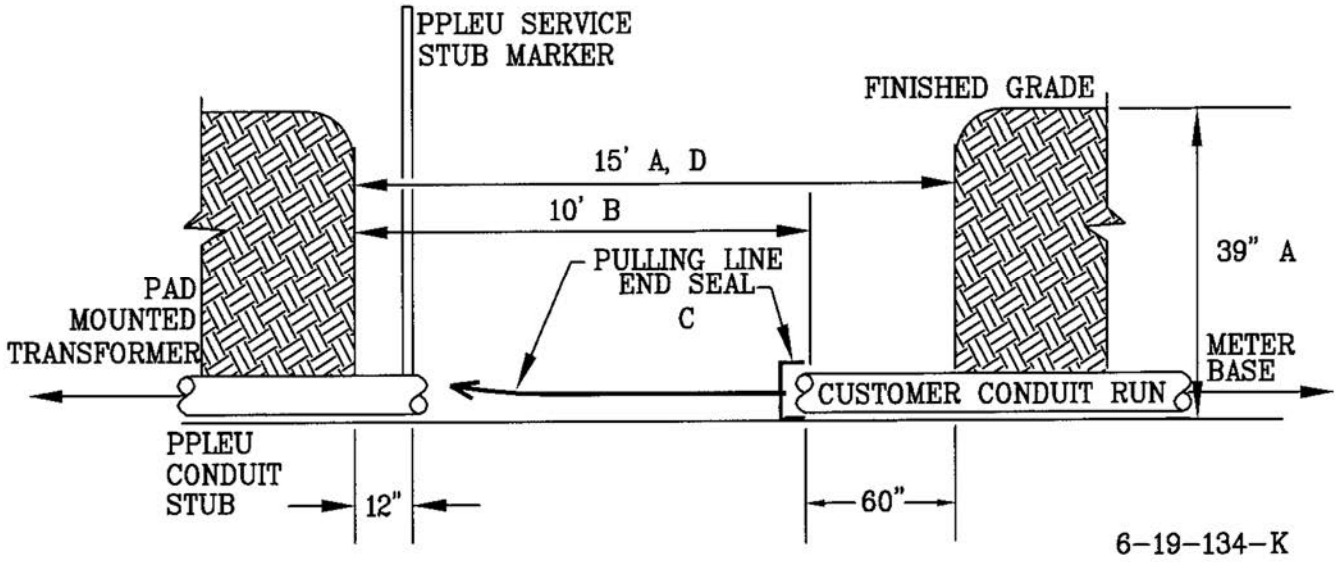
D. Install couplings (twin wall – PVC) on both ends of flexible pipe and fasten to service lateral conduit and elbow conduit using PVC adhesive.

E. If pole is not set yet, install flexible pipe to reach the pole stake. (see page 89) backfill all but last 10' of pipe run. Provide enough flexible pipe, appropriate elbow, and couplings for PPL EU to complete installation.

F. After PPL completes installation of cable into flexible pipe, backfill the remaining open trench (see page 89).

Scenario B

Customer Installation of Service Run to PPL EU
Service Stub Marker Using Gray Schedule 40 PVC Conduit



A .Excavate 39 inch deep trench to one foot past PPL EU service marker, exposing PPL EU conduit stub while taking care not to damage conduit stub. Leave final 15 feet of trench open for PPL EU. Trench should gradually meet depth of PPL EU's conduit stub. Minimum trench width in this area is 24 inches.

B. Provide but do not install final 10 foot piece of conduit. PPL EU completes the conduit connection. If PPL EU cannot pull the conductors through the conduit run, the customer must make the conduit system pullable.

C. Install pulling line from meter base to conduit end, install end seal, and backfill (see page 89) the entire conduit run except for last 15 feet.

D. After PPL EU completes installation of cable into conduit, backfill remaining open trench (see page 89).

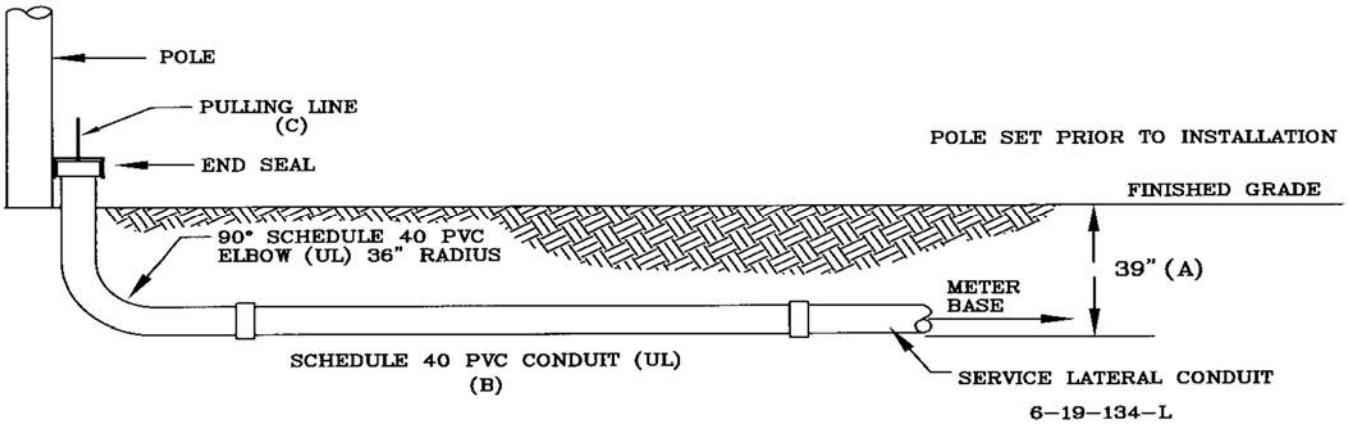
Customer Installation of Service Run to PPL Pole Using PVC Conduit:

A. Excavate 39 inch deep trench to pole or pole stake. Minimum trench width in the area at the pole is24 inches.

B. Install conduit from service lateral conduit to pole. Install PVC elbow at location on pole designated by PPL EU technician.

C. Seal elbow end. Install pulling line in conduit. Backfill entire conduit run per page 85.

All 90 degree elbows must have 36 inch radius sweeps.



D. If pole is not set yet, install conduit to within 10 feet of pole stake. Perpage 85, backfill all but last 10' of conduit run. Provide enough conduit and appropriate elbow for PPLEU to complete installation after pole is set.

E. After PPL EU completes installation of cable into conduit, backfill the remaining open trench per page 85.