



**Outdoor Lighting
Customer Reference Specification
6-10-165**

0000-000-ST-6010
Custom ID: DCS 6-10
Revision: 06
Effective Date: 09/25/2017
Page 95 of 111

6-10-165 – Customer Reference Specification

**Requirements for Service to
Customer-Owned Street Lighting Systems
Served Under Rate Schedule SE**

Replaces A-190555 (6-01-141)
A-197765 (6-10-165)
CRS-1001

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



**Outdoor Lighting
Customer Reference Specification
6-10-165**

0000-000-ST-6010
Custom ID: DCS 6-10
Revision: 06
Effective Date: 09/25/2017
Page 96 of 111

Reference Notes for Drawings

General Notes

1. All work shall be performed in accordance with the practices and specification in this document, the current version of the National Electrical Safety Code (NESC) and all applicable rules and regulations of federal, state and local agencies having jurisdiction over such work. Where conflict arises among such requirements, the more stringent requirements shall be adhered to.
2. Service specified in this document is unmetered according to the terms and conditions of PPL Electric Utilities Corporation (PPL EU) General Tariff, Rules and Rate Schedules for Electric Service, Rate Schedule SE – Energy Only Street Lighting Service.
3. Deviations from this specification must be approved by PPL EU in writing prior to installation.
4. Customer installations of street light attachments to utility poles must obtain approval from the regional PPL EU Distribution Design Department before an attachment is permitted.
5. All customer street light equipment will be installed, owned, operated, and maintained by the customer.
6. Replacement or rearrangement of any and all facilities (make ready work) deemed necessary by PPL EU to accommodate the attachment of customer-owned street lighting facilities must be completed prior to making the attachment.

All costs associated with the replacement or arrangement of those facilities will be paid by the customer owning the lighting facilities.

7. Customer-owned street lights shall be mounted over the roadway at 90 degrees to it. Street lights may be mounted at 45 degrees at an intersection.
8. Customer-owned street light support brackets installed on wood utility poles may be grounded, if the highest attachment point of the street light bracket is below the PPL EU neutral.

A minimum 4 inch clearance shall be maintained between the nearest metallic portion of an ungrounded bracket (or its pole attachment hardware) and any vertical pole ground wire that may be on the surface of the pole.

9. Bolt ends shall not project more than one inch beyond the nut.
10. Installation of customer-owned street lighting facilities on poles with overhead service shall be in accordance with Figures 6-10-165-A or 6-10-165-B and 6-10-165-G/H of this specification.
11. Underground service to customer-owned street lighting on customer-owned poles or customer-owned structures shall be in accordance with Figures 6-10-165-C/D/E/F of this specification.



**Outdoor Lighting
Customer Reference Specification
6-10-165**

0000-000-ST-6010
Custom ID: DCS 6-10
Revision: 06
Effective Date: 09/25/2017
Page 97 of 111

General Notes (cont'd)

12. Compliance with Pennsylvania's One Call System, PA Act 187 for dig in protection is required.
13. Customer-owned street lights must have an accessible fused disconnect installed in the service line to protect against a short circuit and to provide a means of disconnecting the installation for maintenance. Fuse size must conform to ampacity requirements of the National Electrical Code (NEC) or any other applicable code requirements.
14. Luminaires must have an external label for field identification of the luminaires characteristics in accordance with the latest revision of ANSI C136.15.
15. Minimum clearances between power, telephone, CATV, or other communication companies and customer owned street lighting facilities shall be in accordance with the latest revision of the National Electric Safety Code (NESC).
16. Customer's underground cable and conduit systems for street lighting shall conform to the NESC, including grounding and location of facilities.
17. The PPL EU standard electric service for luminaires is 120 or 240V. However, at PPL EU's option, customer-owned luminaries may be served from other available secondary voltages, but it may involve an excess cost payable by the customer.
18. Generators or other means of emergency electric service to customer-owned street lighting facilities are prohibited, unless specifically approved in writing by PPL EU. If approved, the installation of the emergency electric supply shall conform with the latest revision of PPL EU's REMSI Website.
19. Expressed written consent must be obtained from PPL EU for any work being performed above the PPL EU system neutral.

Purchase of Company-Owned Street Lighting Facilities

*Please refer to PPL EU's currently policy on purchase of company-owned street lighting facilities.



**Outdoor Lighting
Customer Reference Specification
6-10-165**

0000-000-ST-6010
Custom ID: DCS 6-10
Revision: 06
Effective Date: 09/25/2017
Page 98 of 111

General Notes – Customer Equipment

Luminaires

The following luminaire characteristics are strongly recommended:

1. A luminaire type designed for roadway lighting with semi-cutoff or cutoff light distribution pattern.
2. Slipfitter that accommodates 1¼ through 2 inch IPS pipe and bird guard protection for bracket assembly.
3. Ballast or driver capable of operation at both 120 and 240V, 60 cycles AC with high power factor.
4. Terminal block to accept 120 and 240V supply.
5. Mogul lamp socket for standard ANSI approved High-Intensity-Discharge (HID) lamps.
6. Igniter (starter) receptacle for ease of igniter replacement (for HID lamps requiring an igniter).

Luminaire Control

A standard locking-type photoelectric control receptacle shall be provided as an integral part of the luminaire housing and shall be fitted with a suitable photoelectric control to individually operate each light. Remote photoelectric control receptacles are not acceptable.

The locking type photocontrol and mating receptacle shall conform to the latest revision of ANSI C136.10. The photocontrol is to be calibrated with a turn ON at 1.5 footcandles (fc) ± 0.5 fc and a maximum turn OFF ratio of 4:1.

A relay system, with photoelectric control or timed on/off operation, can be used to operate a group of street lights. In this case, the photoelectric control at the luminaire must be replaced by a shorting cap.

Support and Support Brackets

The following support and support bracket characteristics are strongly recommended:

1. A minimum Class 3 wood pole. See REMSI Sketch #47 for more detail. Timber option not permitted.
2. All brackets shall meet or exceed the Class D strength requirements of the latest revision of ANSI C136.13 and shall be constructed with a continuous main pipe section.



**Outdoor Lighting
Customer Reference Specification
6-10-165**

0000-000-ST-6010
Custom ID: DCS 6-10
Revision: 06
Effective Date: 09/25/2017
Page 99 of 111

General Notes – Customer Equipment (cont'd)

Identification

Customer-owned street light installations shall be clearly identifiable from the ground.

Each customer-owned luminaire support bracket shall be marked by the customer with two (2) adjacent wraps of 2 inch wide, yellow and black diagonal striped, pressure sensitive adhesive tape (CID 323301)– 2 inches behind the luminaire. PPL EU will provide the customer with sufficient marking tape for each new and purchased installation.

Customer is required to clearly label every pole (PPL EU Wood Pole with ANSI Overhead Light or Customer Owned Underground Feed Light). A permanent weather resistant label shall be located below the PPL EU grid coordinate stencil.

Required information on label shall include but is not limited to the owner of the light, who to call to report a street light outage and that the pole number needs to be provided when an outage call is made.

A sample label would be as follows:

**XYZ Owned Street Light
Call xxx-xxx-xxxx To Report Street Light Problems
Provide The Number On This Pole When You Call**

PPL EU will provide grid coordinates for every customer-owned pole. PPL EU reserves the right to install grid coordinate stencils on each customer-owned pole with PPL EU facilities attached.

Specific Notes: Power Supply & Equipment – Figures 6-10-165-A and 6-10-165-B

The customer shall provide the following for new installations:

1. Street lighting luminaire, lamp (if applicable), control, and bracket.
2. New street light poles or standards as desired. With prior approval from PPL EU and proper clearance, customer owned street light may be attached to existing PPL EU poles.
3. A sufficient length of service leads to allow PPL EU personnel to make all connections to PPL EU's overhead secondary distribution system without splicing in additional wire.

Service leads shall consist of two stranded #10 AWG 600V XLP insulated wires with the neutral lead permanently marked and identifiable throughout its length.

Service leads shall be run from the terminal block connection in the customer-owned luminaire inside the support bracket and exiting out of the bracket at the pole.

The customer shall coil and secure the service leads, after installing the in-line fuse holder and fuse (see #2, "PPL EU Will" below), at the base of the support bracket.



**Outdoor Lighting
Customer Reference Specification
6-10-165**

0000-000-ST-6010
Custom ID: DCS 6-10
Revision: 06
Effective Date: 09/25/2017
Page 100 of 111

Specific Notes: Power Supply & Equipment – Figures 6-10-165-A and 6-10-165-B (cont'd)

4. A waterproof in-line fuse holder (Bussman HEB-AA, or equivalent), waterproof boots and an appropriate time-delay fuse (Bussman FNM, or equivalent) to protect against a short circuit and to provide a means of disconnecting the installation for maintenance.

The fuse holder shall be installed in the phase lead at the point where the service leads exit the support bracket.

5. A sufficient length of non-conductive molding or conduit to cover the service leads from the point where they exit the support bracket to PPL EU's overhead secondary wires. The size of covering shall not be larger than $\frac{3}{4}$ inch. Also, provide staples (24 inches apart) of sufficient size and number to attach the molding or conduit to the pole.

The molding or conduit can be tied to the bracket or temporarily affixed to the pole. Staples can be bagged and attached to the bracket or pole.

6. Customer may ground the luminaire bracket to their neutral leg of the 120 or 240V source which is between the fuse and the luminaire. For the grounding bracket use ILSCO P/N: BGC-2DB or equivalent. A minimum of #6 solid copper is required for grounding.

PPL EU Will

1. Attach molding or conduit and service leads to the pole.
2. Connect customer's service leads to PPL EU's overhead secondary distribution system.

Street Light Facilities Purchased from PPL EU

Electric service equipment specified above are already present in street light facilities to be purchased and PPL EU by the customer. The only exception is that a disconnect point must be established which will be the point of delivery.

PPL EU will install, at the customer's expense, the customer provided in-line fuse holder, fuse and boots in the existing energized service leads. PPL EU can provide the fuse holder, fuse and boots if desired by the customer, at customer's expense. This equipment will be the responsibility of the customer after installation.



**Outdoor Lighting
Customer Reference Specification
6-10-165**

0000-000-ST-6010
Custom ID: DCS 6-10
Revision: 06
Effective Date: 09/25/2017
Page 101 of 111

Specific Notes: Power Supply & Equipment – Figure 6-10-165-C and 6-10-165-D

Figure 6-10-165-C is not for new construction and is shown only as reference for existing installations.

Figure 6-10-165-D shows a method of providing service to a customer owned street light system with the service and disconnecting equipment on a utility pole.

Customer Responsibilities

1. All service equipment is installed, owned, operated and maintained by the street light customer. Customer's equipment includes all service equipment from the service leads weather head and extending through the load side.
2. All customer-owned service equipment must occupy only one side of the pole and is preferred to be installed on the side of the pole to which an installer will face oncoming traffic and will not interfere with traffic.
3. Service entrance equipment and pole-mounted cabinets shall NOT be installed on utility poles that have:
 - Junction poles – a pole where the PPL EU primary line runs in three or more directions.
 - Poles with existing underground riser conduit.
 - Poles with attachments such as PPL EU's capacitor or sectionalizing controlling boxes, line switch operating handles, or other company's control boxes or cabinets (fire alarm, police signal, traffic control, meters, switching and disconnect equipment).
 - Transformer poles that are not accessible to an aerial lift vehicle.
4. The maximum size pole-mounted fused distribution cabinet allowed is 22" wide x 16½" deep x 30" high. All cabinets or disconnecting equipment must be mounted using externally accessible hardware. Do not install more than one distribution cabinet and one disconnect on the same pole.
5. Install and ground the cabinets in accordance with the latest revision of PPL EU's REMSI Website, and any other applicable code.
6. Service disconnecting equipment and fusing must meet installation and ampacity requirements of the NEC and any other applicable code.

PPL EU Responsibilities

1. PPL EU will connect the service leads to the available secondary conductors and energize the customer's street lighting system.



Outdoor Lighting Customer Reference Specification 6-10-165

0000-000-ST-6010
Custom ID: DCS 6-10
Revision: 06
Effective Date: 09/25/2017
Page 102 of 111

Specific Notes: Power Supply & Equipment – Figure 6-10-165-E and 6-10-165-F

Figure 6-10-165-E shows a method of providing service to a customer-owned street light system with the service and disconnecting equipment in an underground served junction box, which will be the point of delivery. This is the preferred method for fusing underground served lighting and is the required method for new installation in which two or more lights are served from a single point of delivery where the junction box will not be surrounded by concrete (i.e. installed in sidewalk, etc.). This fusepoint shall be located as close as possible to PPL EU point of service at a location designated by PPL EU.

Figure 6-10-165-F shows a method of providing service to a customer-owned street light system service and disconnecting equipment in an underground served junction box, which will be the point of delivery. This option is only for use when the junction box shall be surrounded by concrete (i.e. installed in sidewalk, etc.). This fuse point shall be located as close as possible to PPL EU point of service at a location designated by PPL EU.

Customer Responsibilities

1. All street light service equipment is installed, owned, operated, and maintained by the street light customer. This includes the junction box, including excavation, fuse holders, fuses, bar connectors, ground rod, ground wire, conduit and cables extending to the customer-owned lighting structures and luminaires.
2. The customer's junction box and cover shall be non-metallic and sized to minimum dimensions according to Figure 6-10-165-E and 6-10-165-F, or larger to accommodate multiple cables with a minimum bending radius for 600V cables of 8 times the cables outside diameter.

The junction box and cover shall support the minimum vertical test load as recommended by the manufacturer for the installed location. Installations in locations normally considered accessible to vehicles is prohibited.

Figure 6-10-165-F – the cover shall have a skid resistant surface.

3. Wire or cables shall be arranged to provide enough slack to pull the connectors and fuse holders out of the junction box for future maintenance and installations.
4. Bar connectors (Utilco/ILSCO type PED-SS series, Homac RAB or RXL series, or equivalent) shall be fully insulated and watertight, with adequate cable positions.
5. Waterproof in-line fuse holders (Bussman HEB, or equivalent) waterproof boots and appropriate time-delay fuses (Bussman FNM, or equivalent) connected at the load end with customer's street light cables.
6. Provide grounding at the junction box. Provide grounding at other locations along the street lighting system in accordance with the NESC.
7. Customer is responsible for any necessary trenching and back filling in compliance with PA Act 187.



**Outdoor Lighting
Customer Reference Specification
6-10-165**

0000-000-ST-6010
Custom ID: DCS 6-10
Revision: 06
Effective Date: 09/25/2017
Page 103 of 111

Specific Notes: Power Supply & Equipment – Figures 6-10-165-E and 6-10-165-F (cont'd)

PPL EU Responsibilities

1. Provide and connect an underground service lateral, which may include conduit, to the line side of the in-line fuses and neutral bar connector within the junction box, which will be the point of delivery.
2. Install line identification tags on the line side of the fuse holders and neutral bar connectors.
3. Install a PPL EU grid coordinate number on the outside cover of the junction box.
4. Energize the customer's street lighting system.

Specific Notes: Figures 6-10-165-G and 6-10-165-H

Figures 6-10-165-G and 6-10-165-H show the minimum in-span clearances from a customer-owned luminaire to the PPL EU wires attached to the same structure. The figures also show a zone cavity where the wires, of the type and voltage indicated, shall not cross in-span in order to provide room for installation, maintenance and clearances to live wires. The distances are measured at the closest point in the span to the luminaire and its bracket.

The following table shall be used to determine the sag in the wire according to the specific loading conditions with no wind displacement.

Loading Conditions	Sag
32° F, no wind displacement, ½ inch radial thickness of ice	Final
Maximum Conductor Operating Temperature (MCOT) for which the line is designed to operate, no wind displacement	Final
120° F, no wind displacement	Final

The following table only applies to open-wire secondary and open-wire primary conductor for horizontal clearances which must be calculated with wind pressure acting on the conductor, as well as attachment insulator deflection:

60° F, 6 pounds per square foot wind	Final Sag
--------------------------------------	-----------

(SINGLE SUPPORT BRACKET)

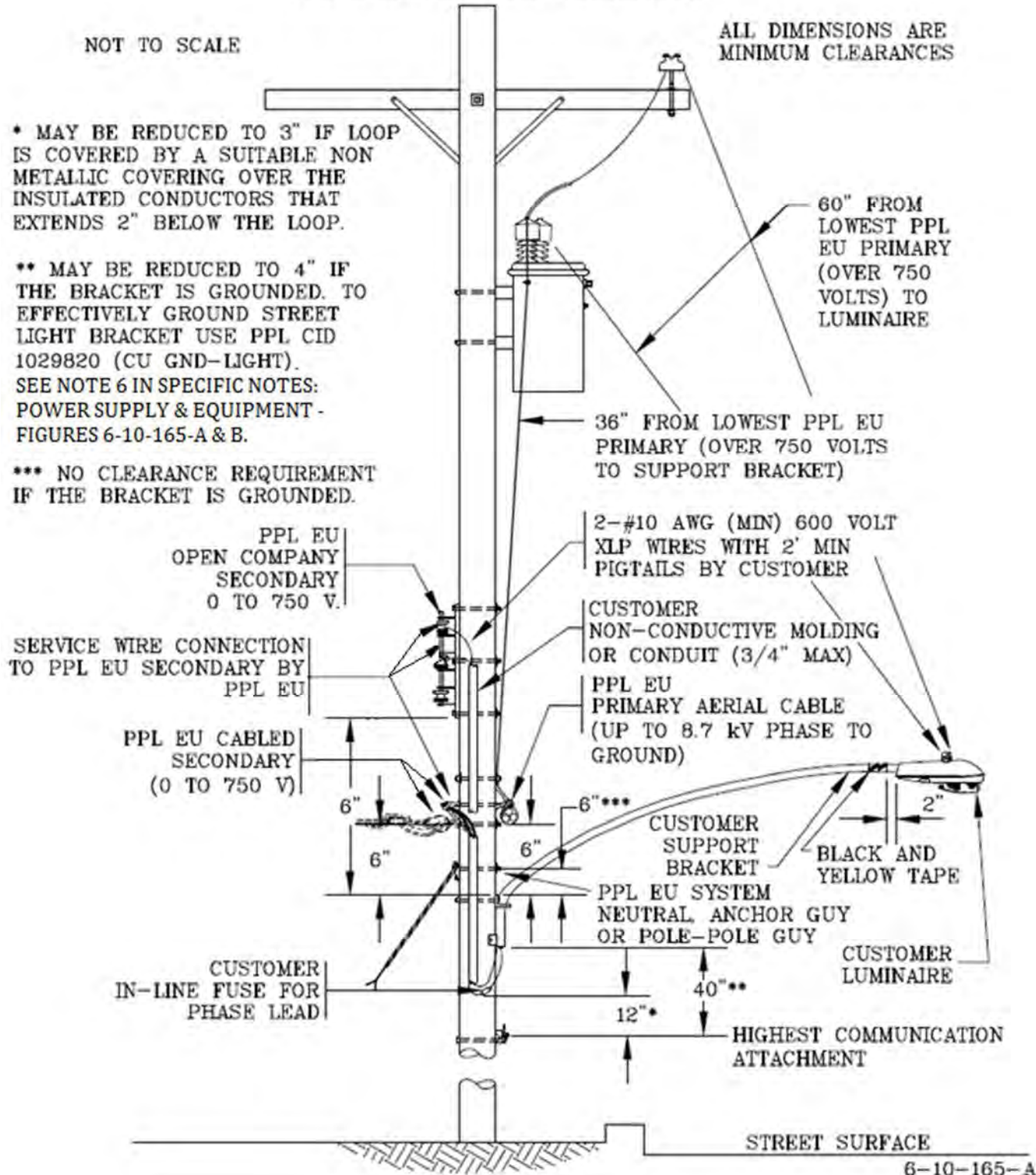
NOT TO SCALE

ALL DIMENSIONS ARE
MINIMUM CLEARANCES

* MAY BE REDUCED TO 3" IF LOOP IS COVERED BY A SUITABLE NON METALLIC COVERING OVER THE INSULATED CONDUCTORS THAT EXTENDS 2" BELOW THE LOOP.

** MAY BE REDUCED TO 4" IF THE BRACKET IS GROUNDED. TO EFFECTIVELY GROUND STREET LIGHT BRACKET USE PPL CID 1029820 (CU GND-LIGHT). SEE NOTE 6 IN SPECIFIC NOTES: POWER SUPPLY & EQUIPMENT - FIGURES 6-10-165-A & B.

*** NO CLEARANCE REQUIREMENT IF THE BRACKET IS GROUNDED.



6-10-165-A

(DOUBLE SUPPORT BRACKET)

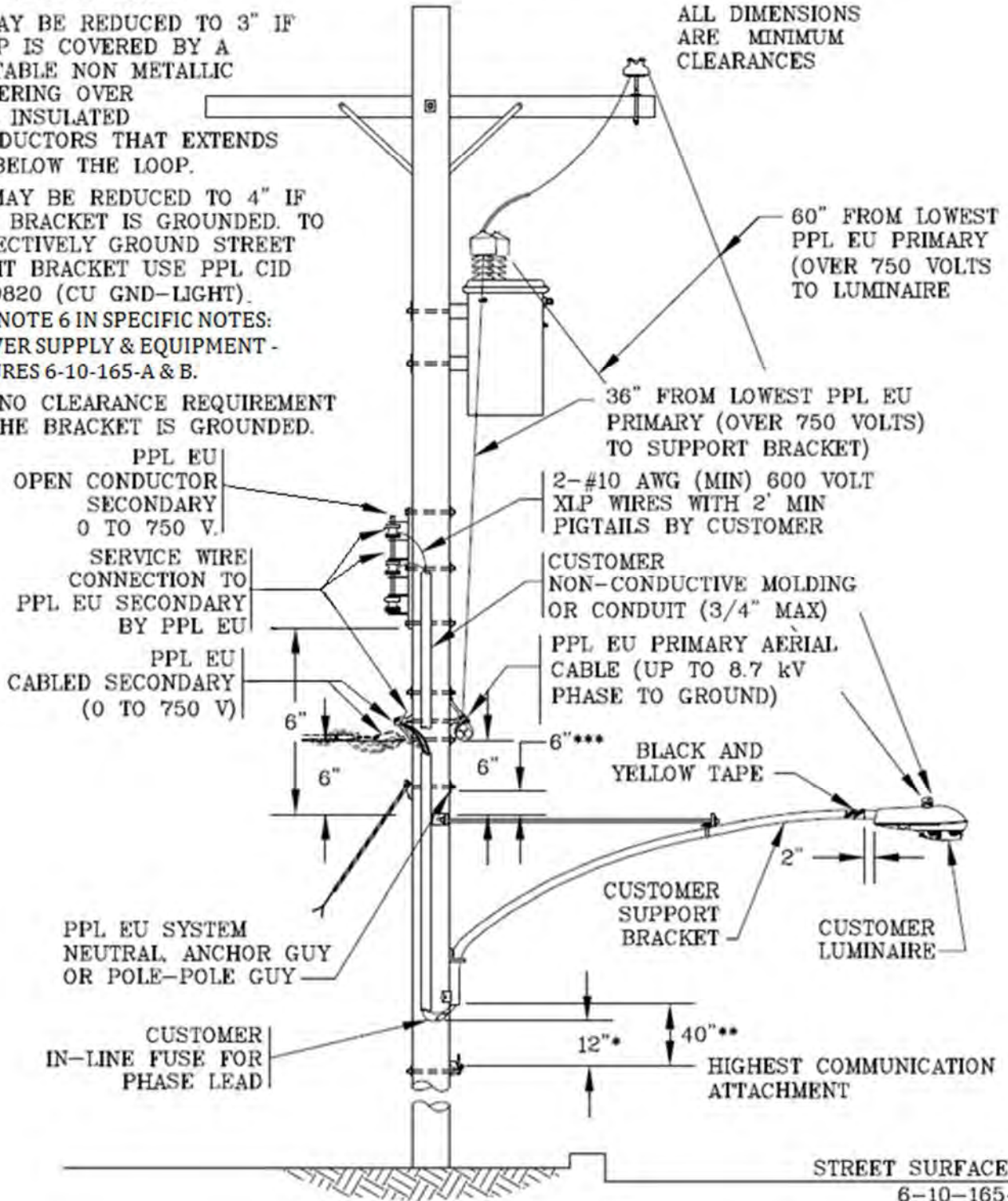
NOT TO SCALE

* MAY BE REDUCED TO 3" IF LOOP IS COVERED BY A SUITABLE NON METALLIC COVERING OVER THE INSULATED CONDUCTORS THAT EXTENDS 2" BELOW THE LOOP.

** MAY BE REDUCED TO 4" IF THE BRACKET IS GROUNDED. TO EFFECTIVELY GROUND STREET LIGHT BRACKET USE PPL CID 1029820 (CU GND-LIGHT). SEE NOTE 6 IN SPECIFIC NOTES: POWER SUPPLY & EQUIPMENT - FIGURES 6-10-165-A & B.

*** NO CLEARANCE REQUIREMENT IF THE BRACKET IS GROUNDED.

ALL DIMENSIONS ARE MINIMUM CLEARANCES

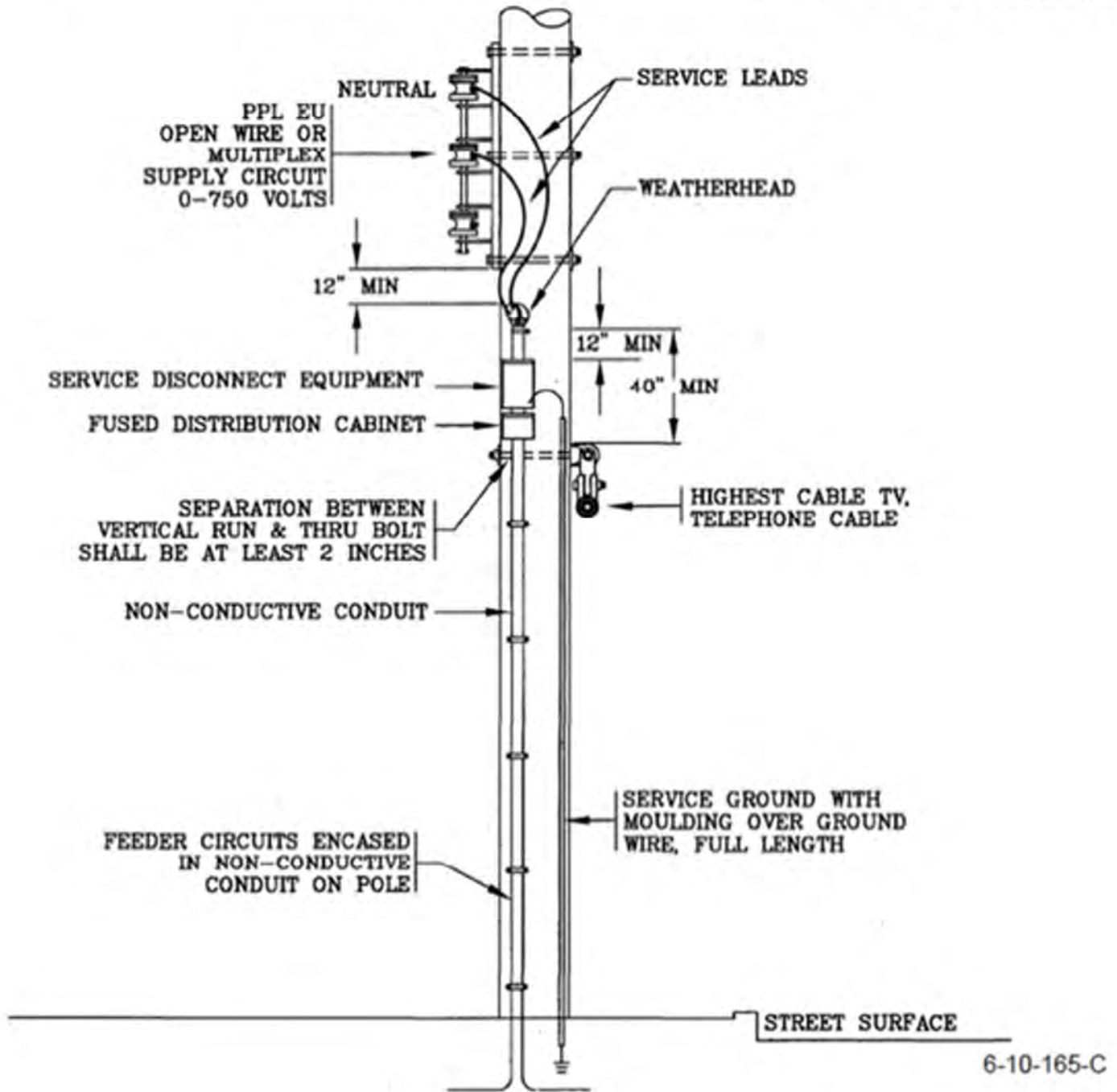


6-10-165-B

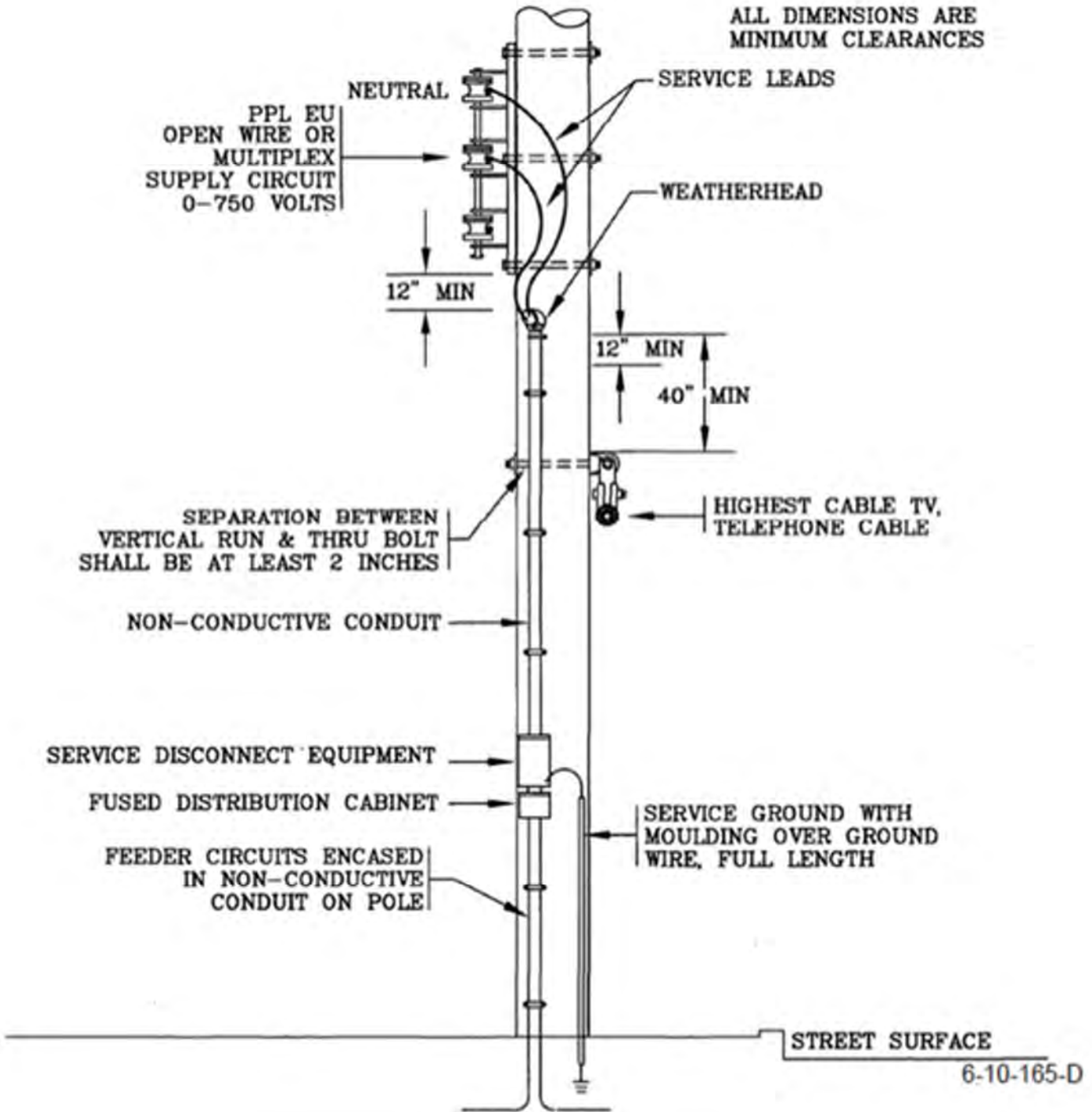
NOT TO SCALE

NOT FOR NEW CONSTRUCTION

ALL DIMENSIONS ARE
MINIMUM CLEARANCES

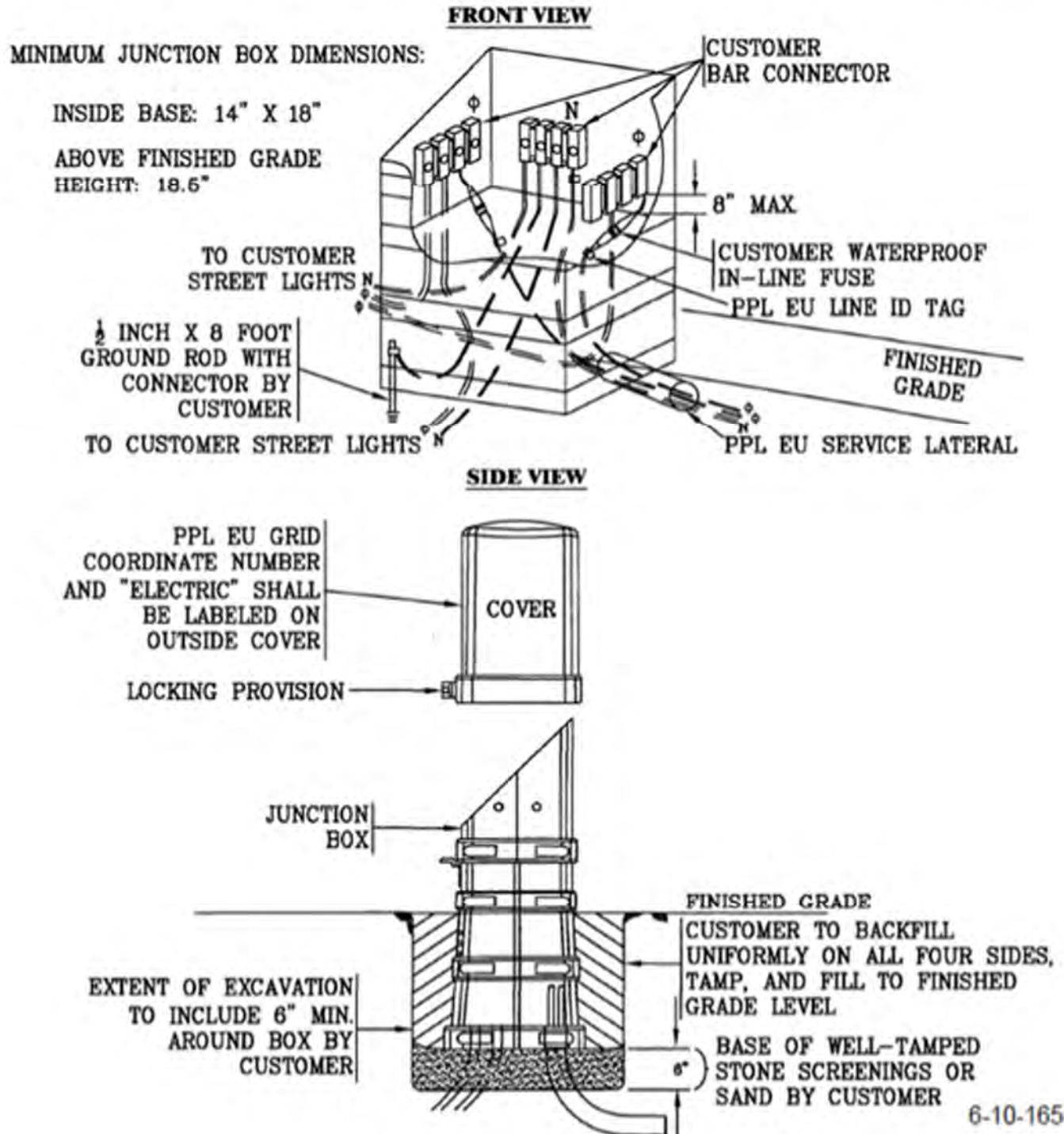


NOT TO SCALE



NOT TO SCALE

FOR NEW CONSTRUCTION

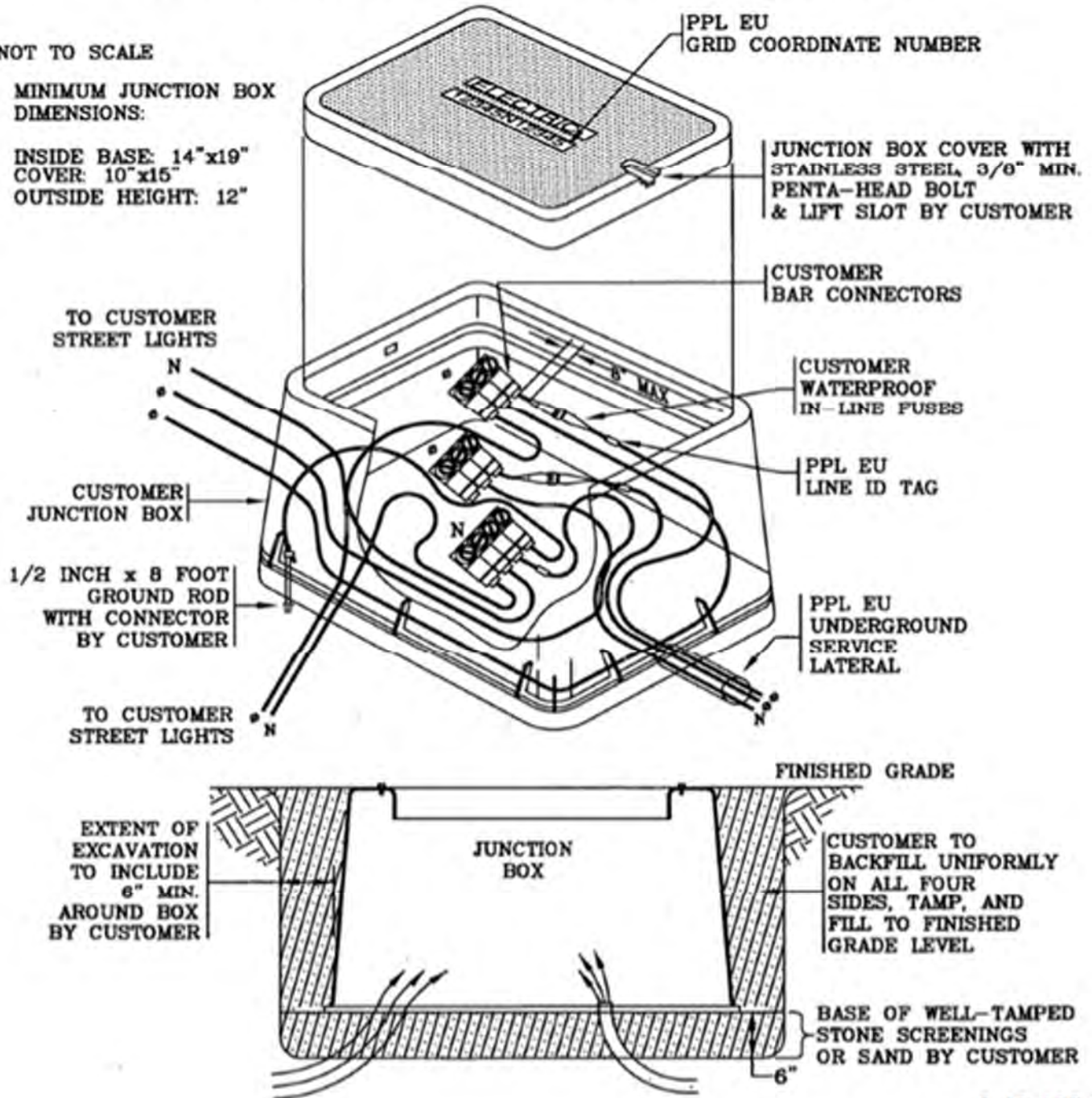


ONLY FOR USE WHEN JUNCTION BOX SHALL BE SURROUNDED BY CONCRETE

NOT TO SCALE

MINIMUM JUNCTION BOX
DIMENSIONS:

INSIDE BASE: 14"x19"
 COVER: 10"x15"
 OUTSIDE HEIGHT: 12"



6-10-165-F

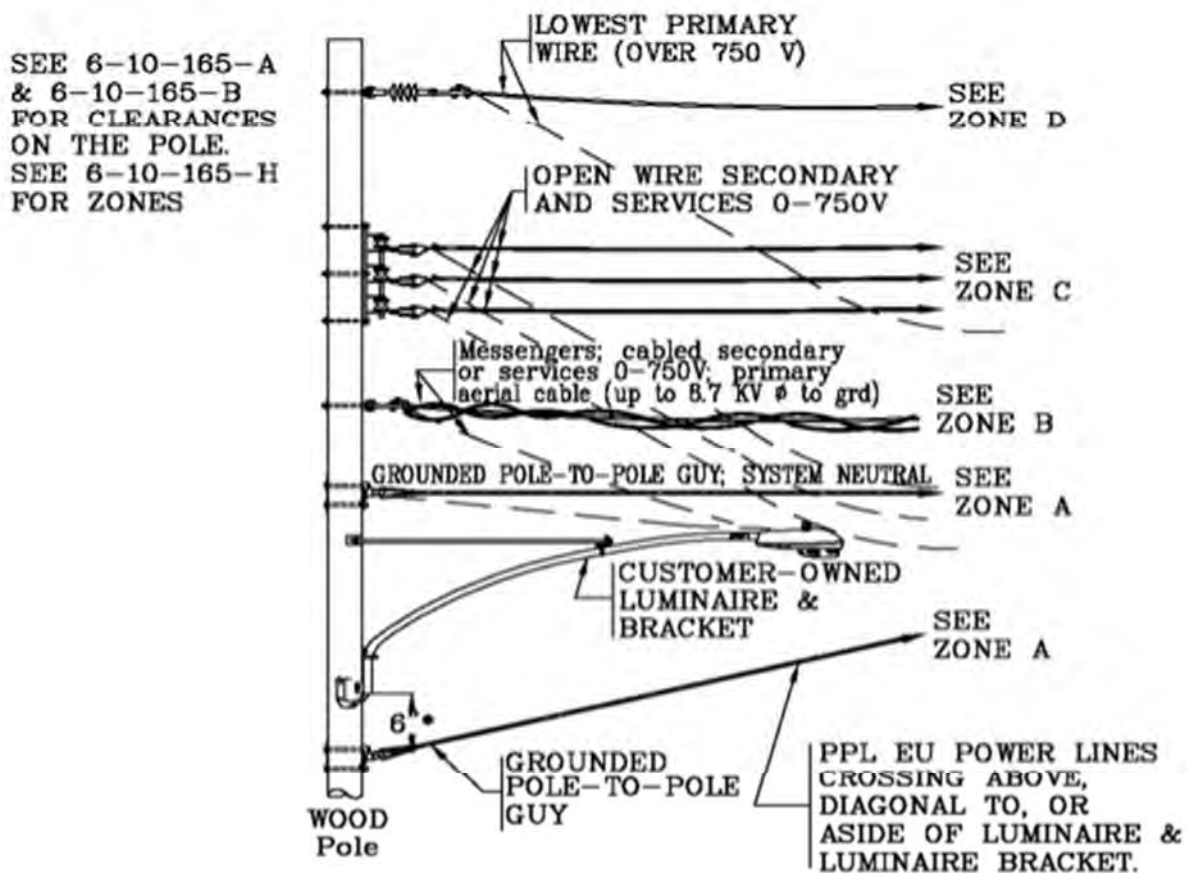
Clearance requirements from PPL EU power lines attached to the same structure and extending above a customer-owned luminaire and luminaire bracket.

Clearances are minimum dimensions and are measured at the closest point in the span to the luminaire or luminaire bracket.

See "Specific Notes: Power Supply & Equipment– Fig. 6-10-165-E and 6-10-165-F" for conductor sag information with respect to loading conditions and wind displacement.

NOT TO SCALE

DIMENSIONS SHOWN ARE MINIMUM DISTANCES.

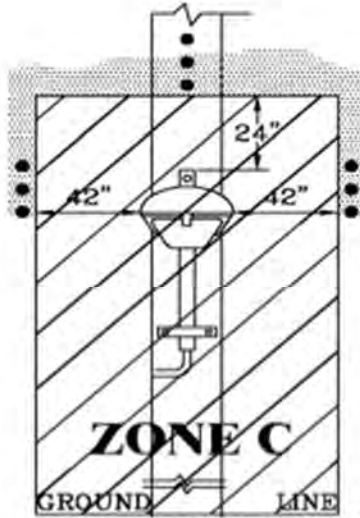


***NO CLEARANCE REQUIREMENT IF THE BRACKET IS GROUNDED.**

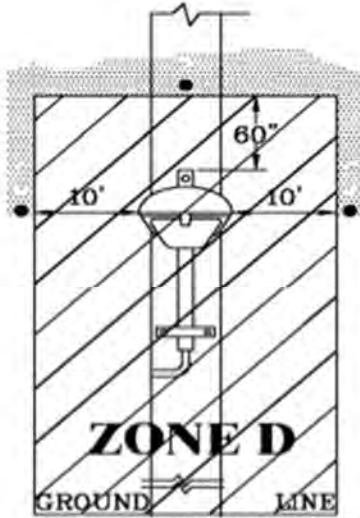
6-10-165-G

NOT TO SCALE

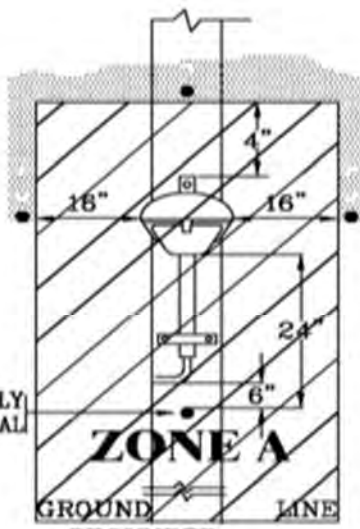
DIMENSIONS
SHOWN ARE
MINIMUM
DISTANCES



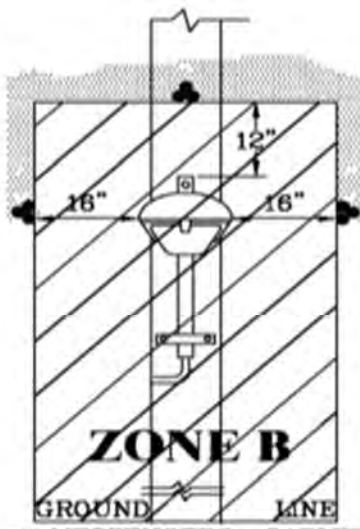
● OPEN WIRE SECONDARY & SERVICES 0-750V



● LOWEST PRIMARY WIRE (OVER 750 V)




● GROUNDED POLE-TO-POLE GUY; SYSTEM NEUTRAL



● MESSENGERS; CABLED SECONDARY OR SERVICES 0-750V; PRIMARY AERIAL CABLE (UP TO 8.7 KV φ TO GRD)

LEGEND:

 ZONE WHICH CAN'T BE OCCUPIED BY POWER LINES REPRESENTED

 AREA OF CLOSEST LOCATION OF POWER LINE REPRESENTED

6-10-165-H