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Installation Instructions For 3-Phase, 4 Wire WYE 7,200/12,470V Service Termination and Metering Compartments In Customer-Owned Switchgear

Underground Supply

Replaces LA-17936

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

DISTRIBUTION CONSTRUCTION SPECIFICATIONS PPL ELECTRIC UTILITIES CORPORATION	Issue Date: <u>2/3/10</u> Typist: <u>SLF</u> Drafter: _____
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This specification details clearance requirements for customer installed 12 kV switchgear with metering to receive 3-phase, 4 wire, WYE 7,200/12,470V underground supplied service.

Prior to manufacture of the switchgear, PPL Electric Utilities (PPL EU) requires:

- A detailed construction drawing of the termination compartment (open front view and side view).
- A detailed construction drawing of the metering compartment (open front view and side view).
- A one-line drawing of the switchgear arrangement (See REMSI Sketch #39).
- A detailed floor plan showing proposed location of the switchgear, incoming service and metering conduit, access to service cables, and distance from switchgear to walls and other obstructions.

Any switchgear and termination compartments not currently listed on the REMSI Website, Table 3, "Approved Switchgear Metering and Termination Compartments" may require up to 90 days for review and approval.

Failure to comply with the above may result in delay of service. Any design, clearance, or access deficiencies must be corrected by the customer before PPL EU facilities are connected.

Notes:

1. Install the service entrance fused disconnect or circuit breaker on the source side of the metering compartment, unless specified otherwise by PPL EU.

Point of Contact (POC) is contained in the PPL EU document "Point of Contact Requirements for High Voltage Customer-Owned Facilities".

2. Minimum acceptable Basic Impulse Level (BIL) rating is 95 kV.
3. Minimum clearance between bare live parts (edge to edge) is:

Phase-to-Phase	7-1/2 inches
Phase-to-Ground	5 inches

All minimum clearances must be maintained (insulating barriers are not permitted).

4. If insulated bus bars are used, provide bare sections at points of connection of current transformers and terminators. All minimum clearances must be maintained as stated in Note 3 above.

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Notes continued:

5. Do not install switchgear heaters, auxiliary load, customer current transformers (CT's) or voltage transformers (VT's) on the source side of the PPL EU metering transformers. For main breakers requiring AC operating voltage, a 1 kVA control power transformer (CPT) will be allowed.
6. Do not install any buswork, other than what is shown, in the termination compartment.
7. The customer provides two 9/16 inch NEMA spaced holes on each bus bar. The 1/2 inch galvanized steel bolts and cable-to-flat connectors by PPL EU.
8. The customer furnishes and installs 1/2 inch diameter rigid metal studs for temporary safety grounding in termination compartment as shown in Detail A, Sheet 6.
9. Termination and metering compartments must have a hinged full length metal screen barrier which must be opened to gain access to PPL EU equipment.
10. PPL EU will furnish and maintain, the customer installs, metering transformers (3 VT's and 3 CT's) and metering panel(s) (not shown, see REMSI Sketch #8C). Install panel where designated by PPL EU. Do not attach panel to the switchgear.

In the metering compartment, customer furnishes, installs, and maintains 2 inch panduit or equivalent plastic wireway between VT's, CT's, and junction box.

From the junction box to the meter panel, the customer furnishes, install and maintains:

- 1.) For installations of 50 feet or less, 1-1/4 inch minimum threaded galvanized or intermediate rigid steel or gray Schedule 40 PVC conduit and fittings, or
- 2.) For installations over 50 feet, approval by metering support is required. 1-1/2 inch minimum threaded galvanized or intermediate rigid steel or gray Schedule 40 PVC conduit (with no more than three 90 degree bends – galvanized rigid or intermediate steel conduit shall be used for all elbows in runs exceeding 50 feet – corner fittings such as LR condulets are not permitted) and fittings.

A pull string is to be provided.

To facilitate installation of jacketed metering cable, conduit run from compartment to metering panel must be continuous. PPL EU will furnish and install 8/C #10 metering cable between instrument transformers and meter panel.

11. PPL EU reserves the right to label exterior of metering compartment.
12. The customer must provide sealable, lockable hasps with 1/2 inch hole on doors of both termination and metering compartments.

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Notes continued:

13. The customer furnishes and installs 1/2 inch diameter rigid metal studs for temporary safety ground in the metering compartment on both the line and load sides of current transformers. See Detail A, Sheet 7.
14. Connect white dot and/or H₁ polarity designation on current transformer toward line side (source).
15. PPL EU phase rotation is C-B-A (counter clockwise) system wide.

The 69-12 kV transformers are connected with A phase-to-bushing H1, B phase-to-bushing H2 and C phase-to-bushing H3, so the low side voltage lags the high side voltage by 30 degrees.

The only exception is the Lancaster region; where the DELTA-WYE are connected with C phase-to-bushing H1, B phase-to-bushing H2 and A phase-to-bushing H3, so the low side voltage lags the high side voltage by 30 degrees.

See pages 8 and 9 of the PPL Electric Utilities Point of Contact (POC) Requirements for High Voltage Customer-Owned Facilities.

16. PPL EU installs arresters on the riser pole and prefers there be no arresters in the termination cabinet. If an arrester is used, it shall be non-porcelain which fails in a safe manner, and shall be installed in a way that permits PPL EU to terminate the cables. The customer must submit the arrester voltage ratings and manufacturer's catalog number to PPL EU for approval.
17. Separate ground and isolated neutral buses are required in both the termination and metering compartments. These buses and grounding bushings must be bonded together only in the termination compartment. Bonding jumper must be sized per the National Electric Code (NEC) Article 250 – Grounding.

The customer should request available interrupting currents from PPL EU prior to sizing the Point of Contact switchgear. At a maximum, the switchgear should withstand the following conditions:

- 1.) PPL EU distribution substation bus is designed to withstand a 20,000 ampere – 18 cycles fault condition. Should a customer install switchgear along side of a PPL EU substation, there is potential that it could be subjected to a 20,000 ampere ground fault.
 - 2.) Most ground faults will be less than 10,000 amperes. With typical relay settings, the maximum clearing time for such a fault would be less than 0.53 seconds.
18. #6 minimum copper wire with 15 kV insulation installed by the customer in three locations.
 19. #6 minimum copper wire with minimum 600V insulation installed by the customer in three locations.

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BILL OF MATERIAL (BOM)			
Item	Qty	Description	Spec or CID No.
1	*	2 inch panduit or equivalent plastic wireway	—
2	*	1-1/4 or 1-1/2 inch rigid conduit – galvanized or gray Schedule 40 PVC (see Note 10).	—
3	1	Uninsulated meter grounding terminal block mounted on neutral bar. Must accommodate 1 – #6 and 5 – #10 stranded copper conductors.	—
4	1	8x8x4 inch junction box	—

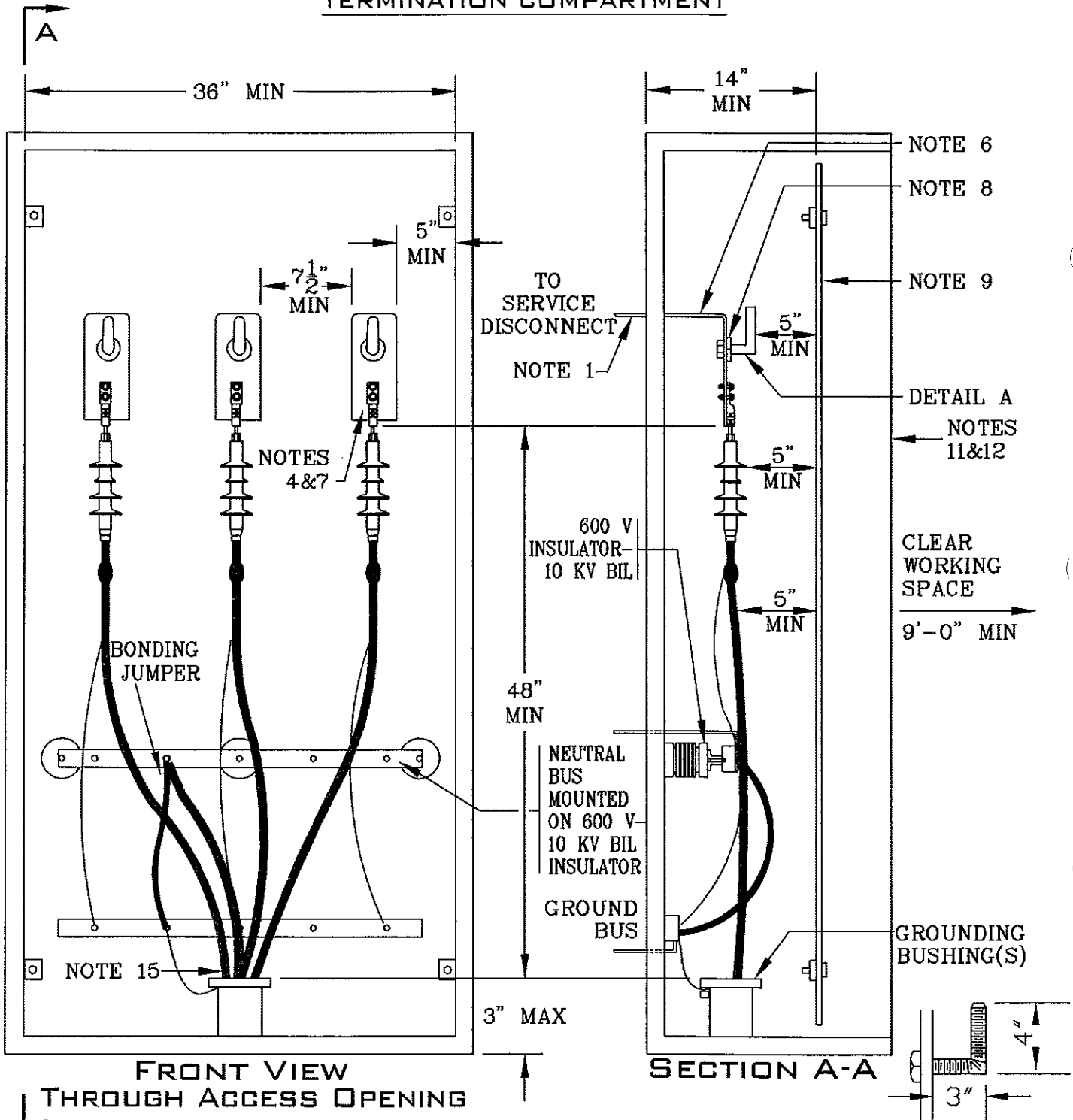
* As required

Reference: REMSI Rule 8, Rule 18 and Sketch #39.

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TERMINATION COMPARTMENT



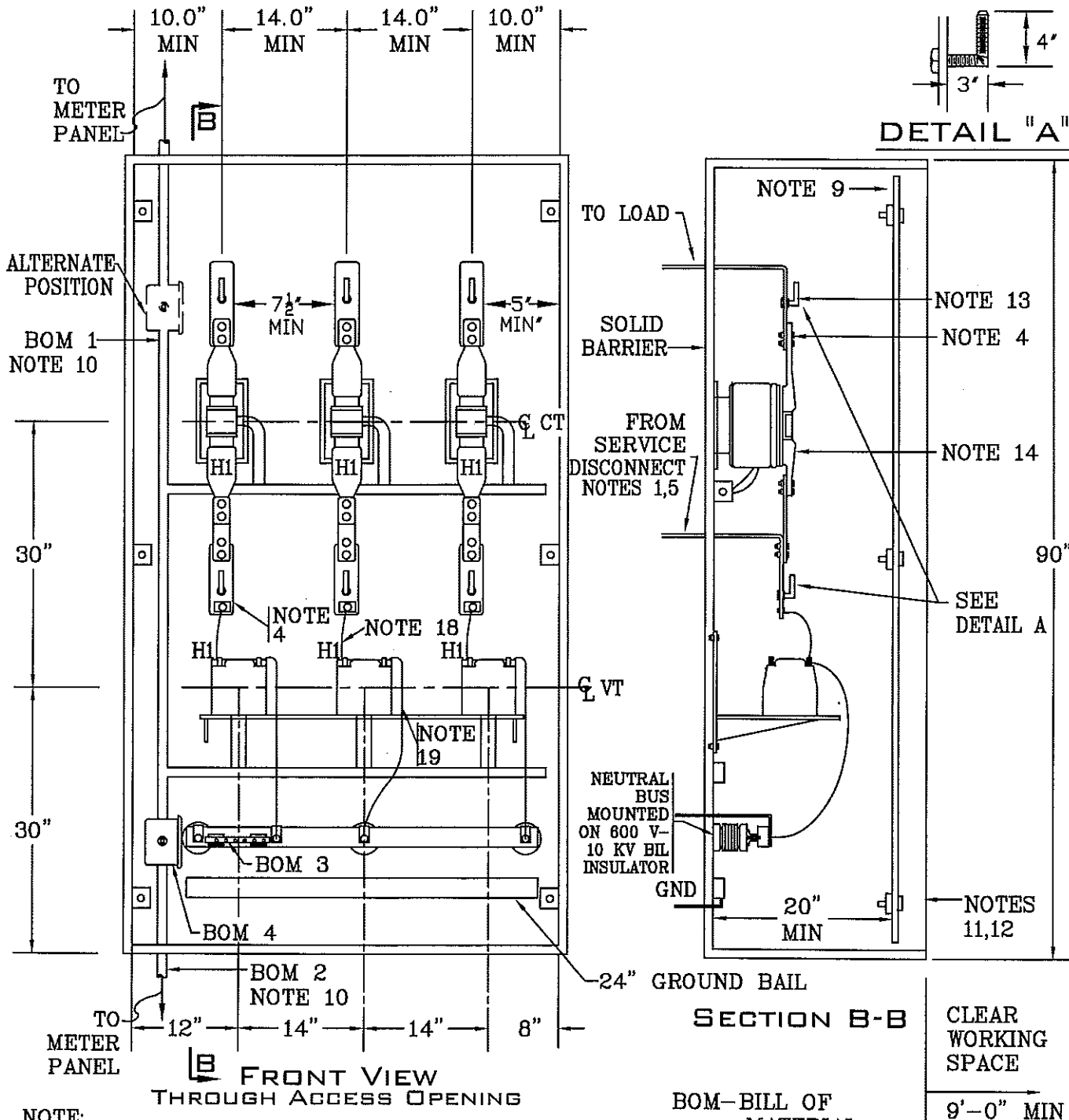
NOTE:
ALL MINIMUM CLEARANCES MUST BE MAINTAINED
(INSULATING BARRIERS ARE NOT PERMITTED).

DETAIL "A"
6-09-199_S006.DWG

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METERING COMPARTMENT



NOTE:
ALL MINIMUM CLEARANCES MUST BE MAINTAINED.

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