



THE POWER OF ACTION

Specifications for Electrical Installations and Supplements

Errata and Revisions

January 2024

for the

Electric System Bulletin 750 Series

Covering National Grid's Service Areas in
Massachusetts, & New York

NOTICE: This publication contains changes and corrections to the Company's **Specifications for Electrical Installations, the "ESB750 - 2024 Book", and its supplements**. This is periodically issued when the need arises. The most current information on a topic will therefore be a combination of the base document listed in this table of contents and the current version of this list. Upon periodic revision of a base document herein referenced, all list items associated with that base document will be removed.

TABLE of CONTENTS

SECTION	PAGE
TABLE of CONTENTS	2
GENERAL NOTICE	3
ESB No. 750-2024 (JANUARY 2024) – SPECIFICATIONS FOR ELECTRICAL INSTALLATIONS (UPSTATE NY, MA)	3
ESB No. 751-2014 (JUNE 2014) “GENERAL REQUIREMENTS FOR SERVICES ABOVE 600 VOLTS”	3
ESB No. 752-1994, 2ND PRINTING APRIL 2002 “SERVICE ABOVE 15,000 VOLTS”	3
ESB No. 753-1993, 2ND PRINTING APRIL 2002 “PRIMARY METER POLE”	4
ESB No. 754A-1992, 2ND PRINTING JUNE 2002 “SINGLE PHASE OUTDOOR PAD MOUNTED TRANSFORMER”	6
ESB No. 754-2007 “OUTDOOR PAD MOUNTED OR VAULT ENCLOSED THREE PHASE TRANSFORMER”	6
ESB No. 755-2003 “OPERATION & MAINTENANCE REQUIREMENTS FOR SERVICES ABOVE 600 VOLTS”	6
ESB No. 756-2021 “GENERAL REQUIREMENTS FOR PARALLEL GENERATION CONNECTED TO A NATIONAL GRID OWNED EPS”, VERSION 7.0	6
ESB No. 756 APPENDIX A; “REQUIREMENTS FOR PARALLEL GENERATION CONNECTED TO NATIONAL GRID FACILITIES IN NEW YORK”, VERSION 6.0	6
ESB No. 756 APPENDIX B; “DISTRIBUTED GENERATION CONNECTED TO NATIONAL GRID DISTRIBUTION FACILITIES PER THE NEW YORK STANDARDIZED INTERCONNECTION REQUIREMENTS”, VERSION 9.0	7
ESB No. 756 APPENDIX C; “DISTRIBUTED GENERATION CONNECTED TO NATIONAL GRID DISTRIBUTION FACILITIES PER THE MASSACHUSETTS STANDARDS FOR INTERCONNECTING DISTRIBUTED GENERATION”, VERSION 10.0”	7
ESB No. 757, APRIL 2018 “REQUIREMENTS FOR SERVICES SUPPLIED FROM NATIONAL GRID’S SECONDARY NETWORKS”	7
ESB No. 758, JAN. 1985 “PRIMARY SERVICE TO METAL ENCLOSED GEAR”	7
ESB No. 759A	14
ESB No. 759B	15
REVISION HISTORY	20

General Notice

N.Y.P.S.C. No. 220: P.S.C. No. 220 *Schedule for Electric Service* ("P.S.C. No. 220 Electricity Tariff") supersedes and replaces former P.S.C. No. 207 *Schedule for Electric Service* ("P.S.C. No. 207 Electricity Tariff") effective April 27, 2009 ("Effective Date"). As of the Effective Date, all references to P.S.C. No. 207 Electricity Tariff in agreements existing as of the Effective Date shall be construed as references to P.S.C. No. 220 Electricity Tariff.

The Rule Numbers, Forms, and Service Classifications in P.S.C. No. 220 Electricity Tariff as of the Effective Date are identical to those of P.S.C. No. 207 Electricity Tariff as of the day immediately prior to the Effective Date, but Leaf Numbers may differ. To avoid any possible ambiguity resulting from this change, references to Leaf Numbers in P.S.C. No. 207 Electricity Tariff in agreements existing as of the Effective Date shall be construed as references to the equivalent Leaf Numbers for the same Rule Numbers, Forms, and Service Classifications in P.S.C. No. 220 Electricity Tariff.

Therefore, all references to N.Y.P.S.C. No. 207 in any of the Company's ESB 750 series bulletins shall be construed as references to N.Y.P.S.C. No. 220 (see: <http://www.nationalgridus.com/Upstate-NY-Business/Rates/Tariff-Provisions>).

In Massachusetts (<https://www.nationalgridus.com/MA-Business/Rates/Tariff-Provisions>).

ESB No. 750-2024 (January 2024) – Specifications for Electrical Installations (Upstate NY, MA)

PAGE	SECTION	EFFECTIVE DATE	CHANGE

ESB No. 751-2014 (June 2014) “General Requirements for Services Above 600 Volts”

No Errata.

ESB No. 752-1994, 2nd Printing April 2002 “Service above 15,000 volts”

PAGE	SECTION	EFFECTIVE DATE	CHANGE
6	I.G.4.b	Jul-2002	Move first sentence of second bullet to Section I.G.4.c.
7	I.G.4.c	Jul-2002	After the second sentence, insert first sentence of I.G.4.b's second bullet.
15	V.F.1	Nov-2002	Add the following before the first sentence in V.F.1: “The Company shall review and accept the protective relay devices provided by the Customer for protection schemes required by the Company to protect its system. The use of utility grade relays and relay redundancy is a normal Company requirement.”
15	V.F.3	Nov-2002	Change V.F.3 to read as follows: “3. <u>Company-designated protective devices</u> The Company will review for acceptance the Customer's proposed settings of those relays that the Company's System Protection Engineering Dept. designates as being

PAGE	SECTION	EFFECTIVE DATE	CHANGE
			required to satisfy the Company's protection practices. Any relay setting accepted by the Company shall not be changed or modified at any time without the prior written consent of the Company."
16	V.F.5	Nov-2002	Change V.F.5 to read as: "The Customer is responsible for specifying the relay settings and performing the calibration, testing, maintenance and trouble-shooting of their entire protective system. The Customer shall provide written notice to the Company prior to energization that these items have been verified."
22	VII.A.1	Jan-2018	Change VII.A.1 to read as: "The Company will furnish all meters, metering instrument transformers, and test devices required for billing purposes at the delivery voltage. The Customer shall supply the fuses and fuse mounting equipment for the metering potential transformer protection. Four spare fuses shall also be provided. Provisions shall be provided for spare fuse storage in a location that is protected from the outdoor environment."
24	New section "VIII. RTU"	July-2020	RTU installations will be required under the following conditions: <ul style="list-style-type: none"> - New customer-owned substations receiving power at 69kV or above. - Existing 69kV or above customer-owned substations undergoing an upgrade in accordance with the criteria outlined in the Electric System Bulletins. RTU's will be designed, furnished and owned by National Grid and installed by the customer at a mutually agreeable location. The customer is responsible to bear the costs associated with this installation. Additionally, all telecommunications per National Grid's specification required for the installation is the responsibility of the customer, along with any associated recurring costs.

ESB No. 753-1993, 2nd Printing April 2002 "Primary Meter Pole"

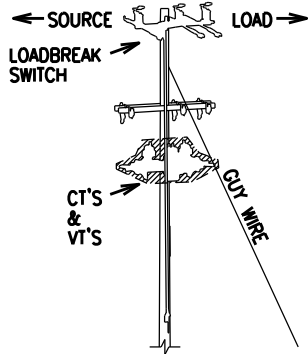
PAGE	SECTION	EFFECTIVE DATE	CHANGE
10	V.B.1.a	Dec-2014	Modify to read: The Pole shall be a Minimum Class 3, full length penta treatment, conforming to the standards of EEI TD-103 and ANSI O5.1
Figures 3 through 4	Note 4	Apr-2009	The "johnny ball" guy insulator is no longer acceptable as they do not meet present insulation requirements for this type of installation. Fiberglass guy strain insulators are now specified. Ensure the guy insulators are placed to prevent the transfer of energy from the Company's wires to (i) the Customer wires, (ii) any communication wires on the pole or (iii) the public on the ground. Depending on spacings on the pole, multiple guy insulators may be needed to meet the multiple requirements. Consult the Company for inquiries regarding the design, equipment, and installation of the pole guy.

PAGE	SECTION	EFFECTIVE DATE	CHANGE
Figures 3a, 4	Figures	Feb-2019	Change the minimum clearance spacing between the Company incoming phase and neutral wires to 72 inches from 20 inches.
Figures 3a, 4	Figures	Jan-2020	The Company and Customer neutral wires shall attach to the meter pole a minimum of 20 inches below the PT/CT mounting bracket. In doing so, all other required ESB 753 and NESC clearances shall be met.
Figures 753ER-1 thru 753ER-9	Figures	Jan-2022	New additional figures have been created to accommodate design and construction questions and problems that have occurred. These new figures are in addition to the existing figures.
Figures 753ER-1 thru 753ER-9	Figures	Nov-2022	Additional figures added to the Jan-2022 set. Physical 3-line, Equipotential Mat details. Revised 'Note 2' on all relevant pages.

PRIMARY METERING APPLICATION GUIDE

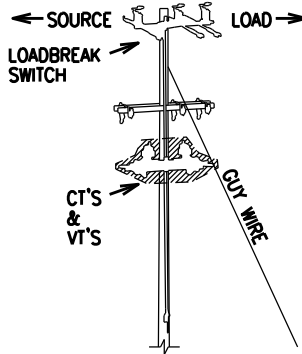
SINGLE POLE ARRANGEMENT

**3 ϕ PRIMARY METERING
GROUNDED WYE**



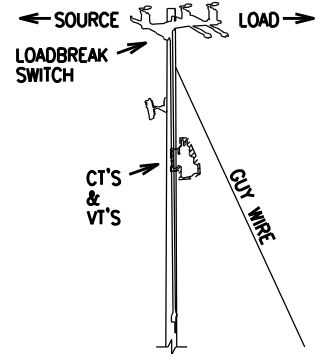
15-500

**3 ϕ PRIMARY METERING
DELTA**



15-501

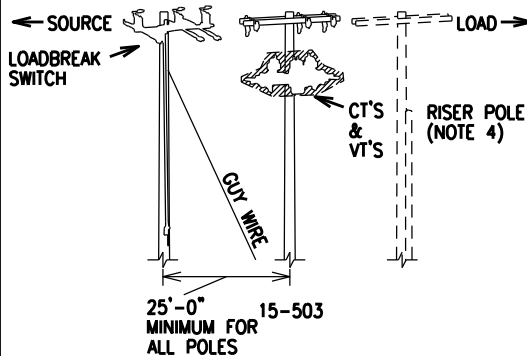
**1 ϕ PRIMARY METERING
(NOTE 1)**



15-502

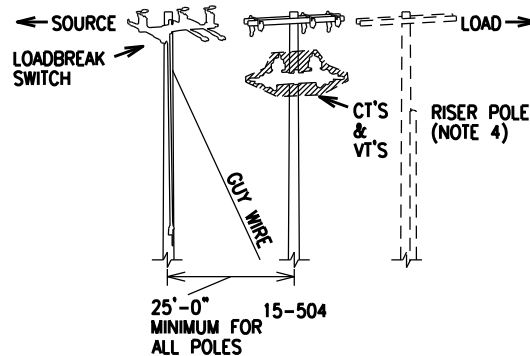
TWO POLE ARRANGEMENT LOAD CONNECTED BY OPEN WIRE OR BY UG RISER POLE

**3 ϕ PRIMARY METERING
GROUNDED WYE**



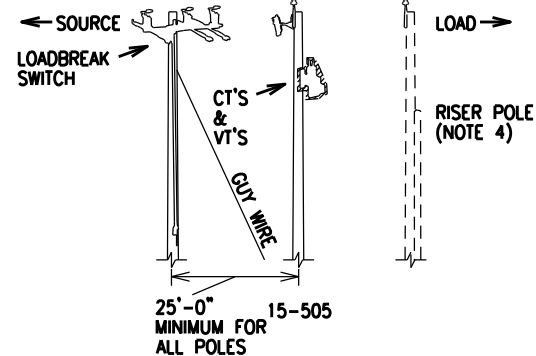
15-503

**3 ϕ PRIMARY METERING
DELTA**



15-504

**1 ϕ PRIMARY METERING
(NOTE 1)**



15-505

NOTES:

1. SINGLE PHASE DELTA TO HAVE 2 WIRES
2. THE CUSTOMER-OWNED PRIMARY SWITCH POLE (AKA RECEIVING STRUCTURE) REQUIRES SUITABLE GUYING. GUYING ARRANGEMENT SHALL BE REVIEWED BY NATIONAL GRID FOR ACCEPTANCE (I.E. SPAN GUY)
3. METERING BRACKET SHOWN ON LOAD SIDE, BUT CAN BE ON LINE SIDE.
4. RISER POLE OPTIONAL, WHERE APPLICABLE
5. EQUIPMENT WITHIN HATCHED AREAS TO BE PROVIDED BY UTILITY AND INSTALLED BY CUSTOMER

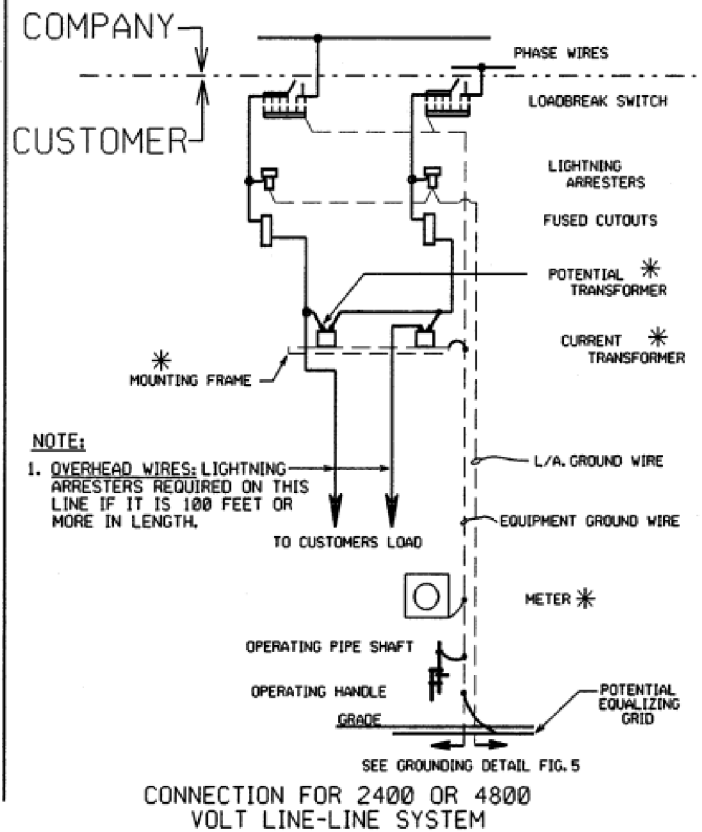
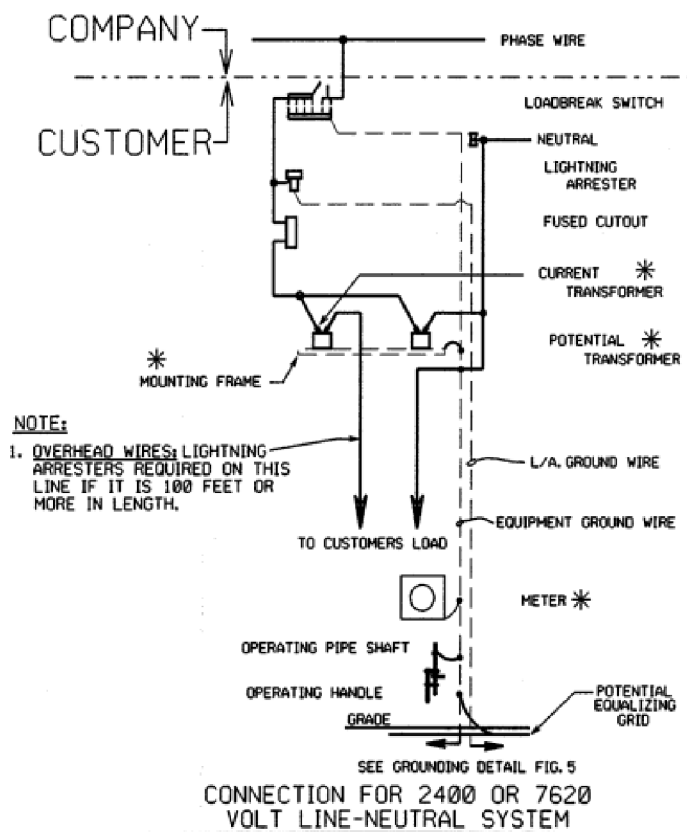


FIG. 1 SCHEMATIC WIRING DIAGRAM SINGLE PHASE

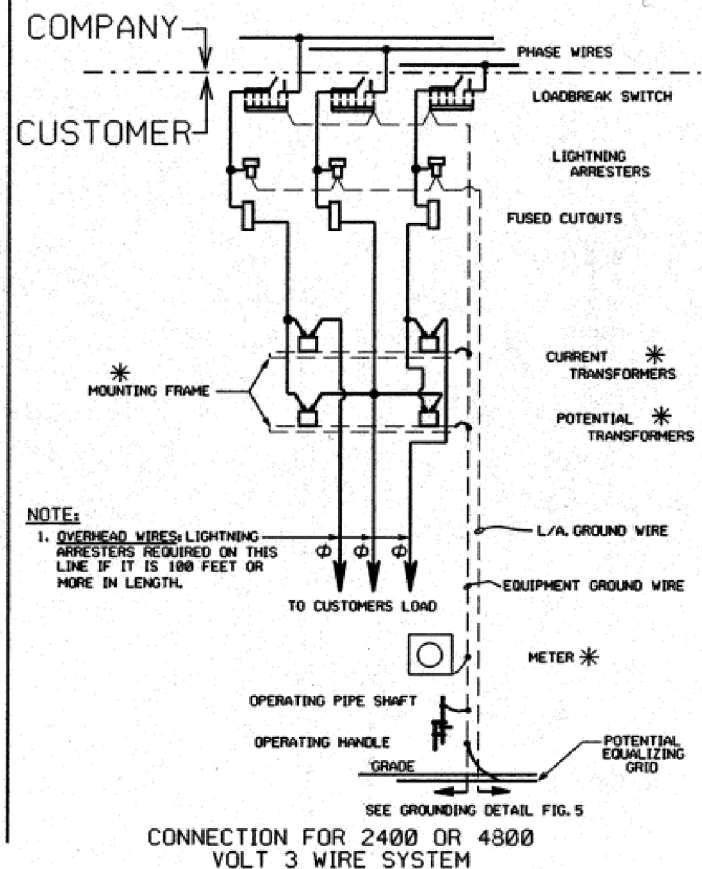
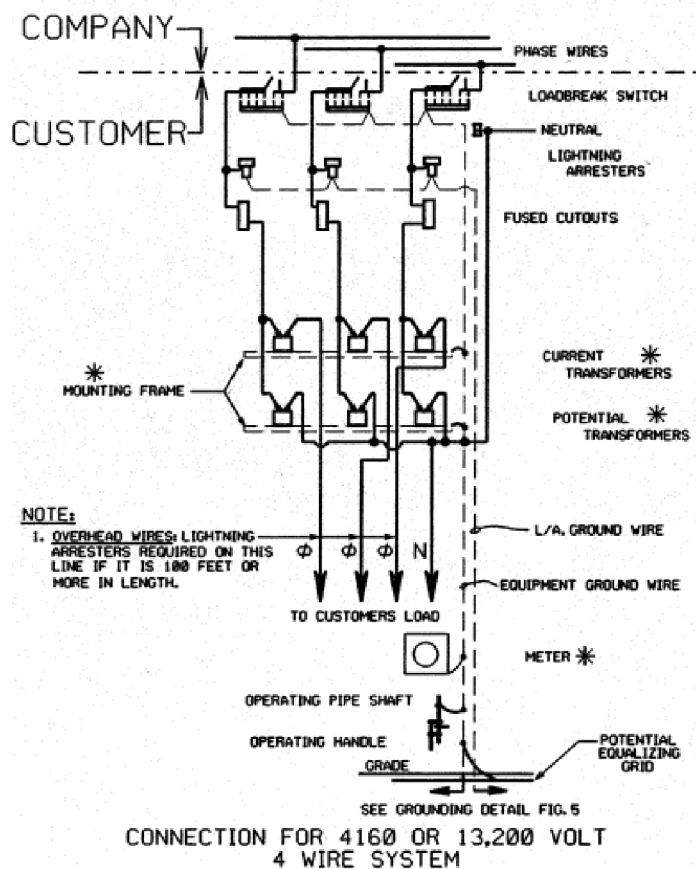
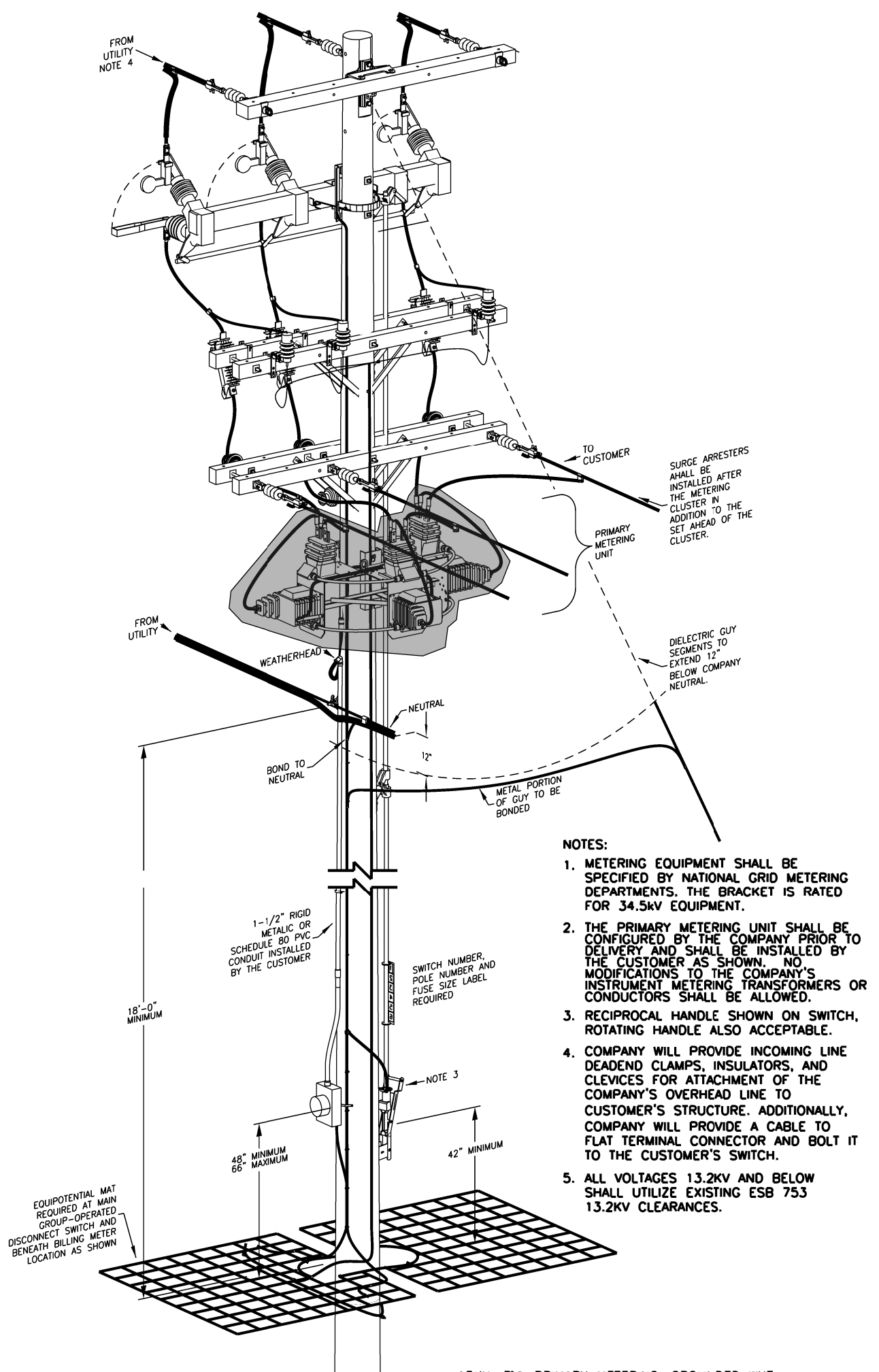
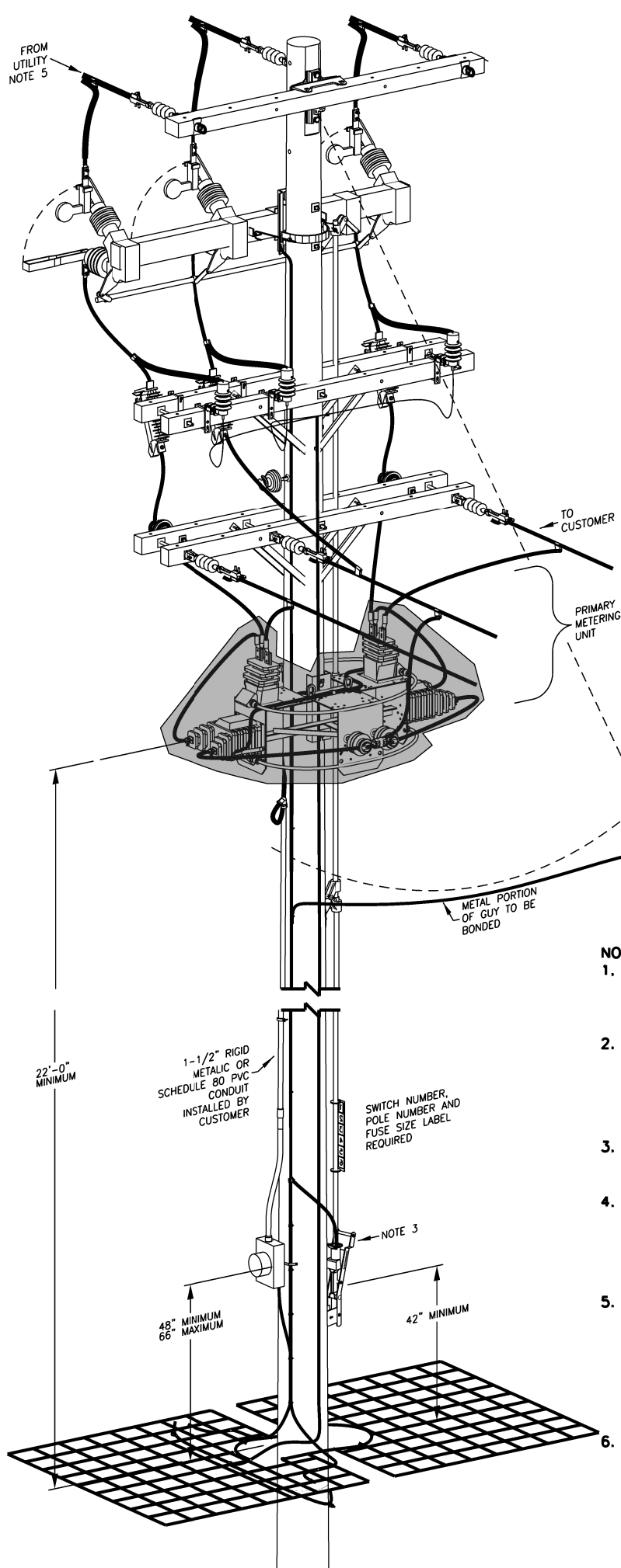


FIG. 2 SCHEMATIC WIRING DIAGRAM THREE PHASE

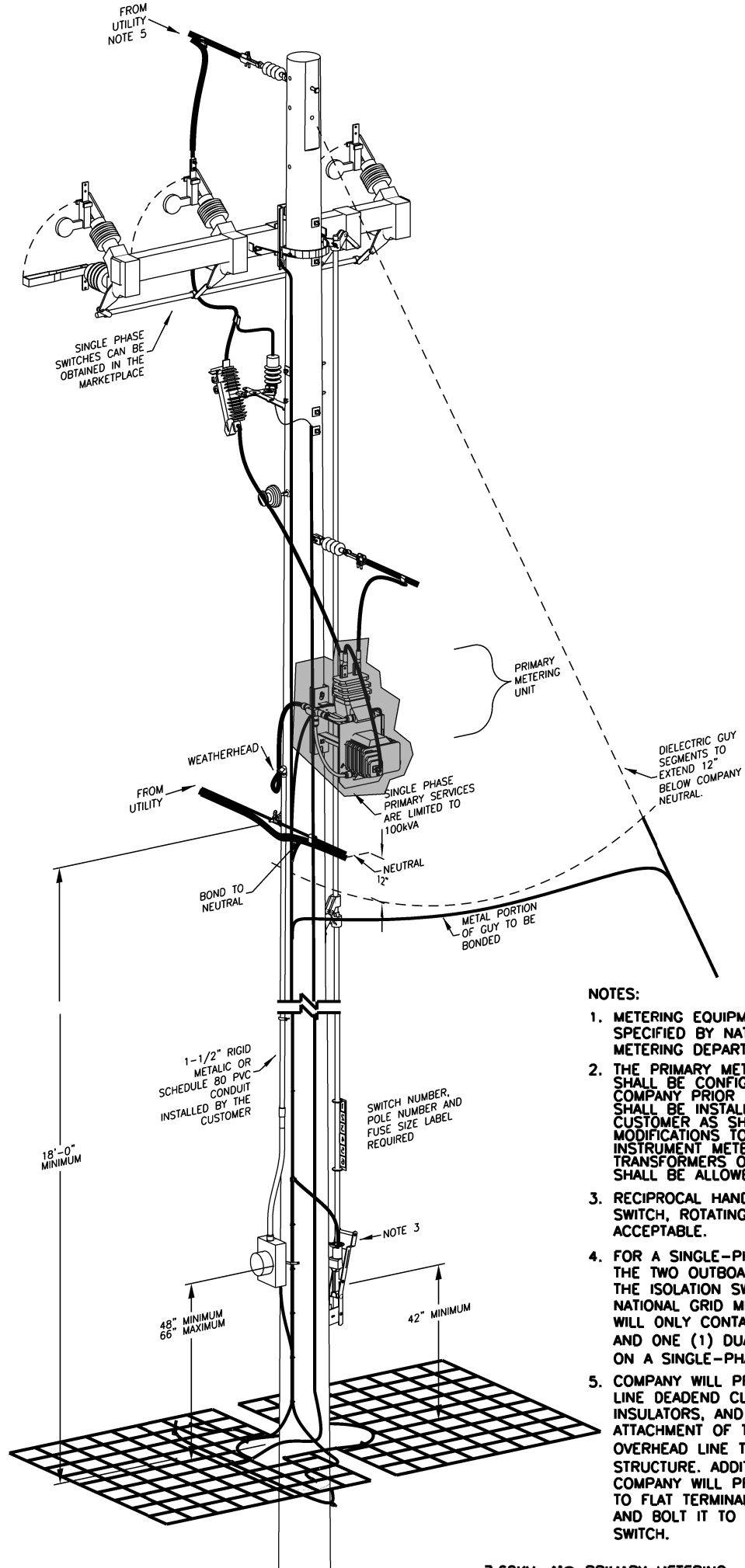




NOTES:

1. METERING EQUIPMENT SHALL BE SPECIFIED BY NATIONAL GRID METERING DEPARTMENTS. THE BRACKET IS RATED FOR 34.5KV EQUIPMENT.
2. THE PRIMARY METERING UNIT SHALL BE CONFIGURED BY THE COMPANY PRIOR TO DELIVERY AND SHALL BE INSTALLED BY THE CUSTOMER AS SHOWN. NO MODIFICATIONS TO THE COMPANY'S INSTRUMENT METERING TRANSFORMERS OR CONDUCTORS SHALL BE ALLOWED.
3. RECIPROCAL HANDLE SHOWN ON SWITCH, ROTATING HANDLE ALSO ACCEPTABLE.
4. FOR A SINGLE-PHASE DELTA, USE THE TWO OUTBOARD POSITIONS OF THE ISOLATION SWITCH. THE NATIONAL GRID METERING BRACKET WILL ONLY CONTAIN ONE (1) CT AND ONE (1) DUAL-BUSHING PT ON A SINGLE-PHASE BRACKET.
5. COMPANY WILL PROVIDE INCOMING LINE DEADEND CLAMPS, INSULATORS, AND CLEVICES FOR ATTACHMENT OF THE COMPANY'S OVERHEAD LINE TO CUSTOMER'S STRUCTURE. ADDITIONALLY, COMPANY WILL PROVIDE A CABLE TO FLAT TERMINAL CONNECTOR AND BOLT IT TO THE CUSTOMER'S SWITCH.
6. BOTH 23KV AND 34.5KV SUB-T INSTALLATIONS SHALL ADHERE TO 34.5KV CLEARANCES AND EQUIPMENT (EXCEPT SA'S) WHILE ALL OTHER VOLTAGES SHALL FOLLOW EXISTING 13.2KV CLEARANCES.

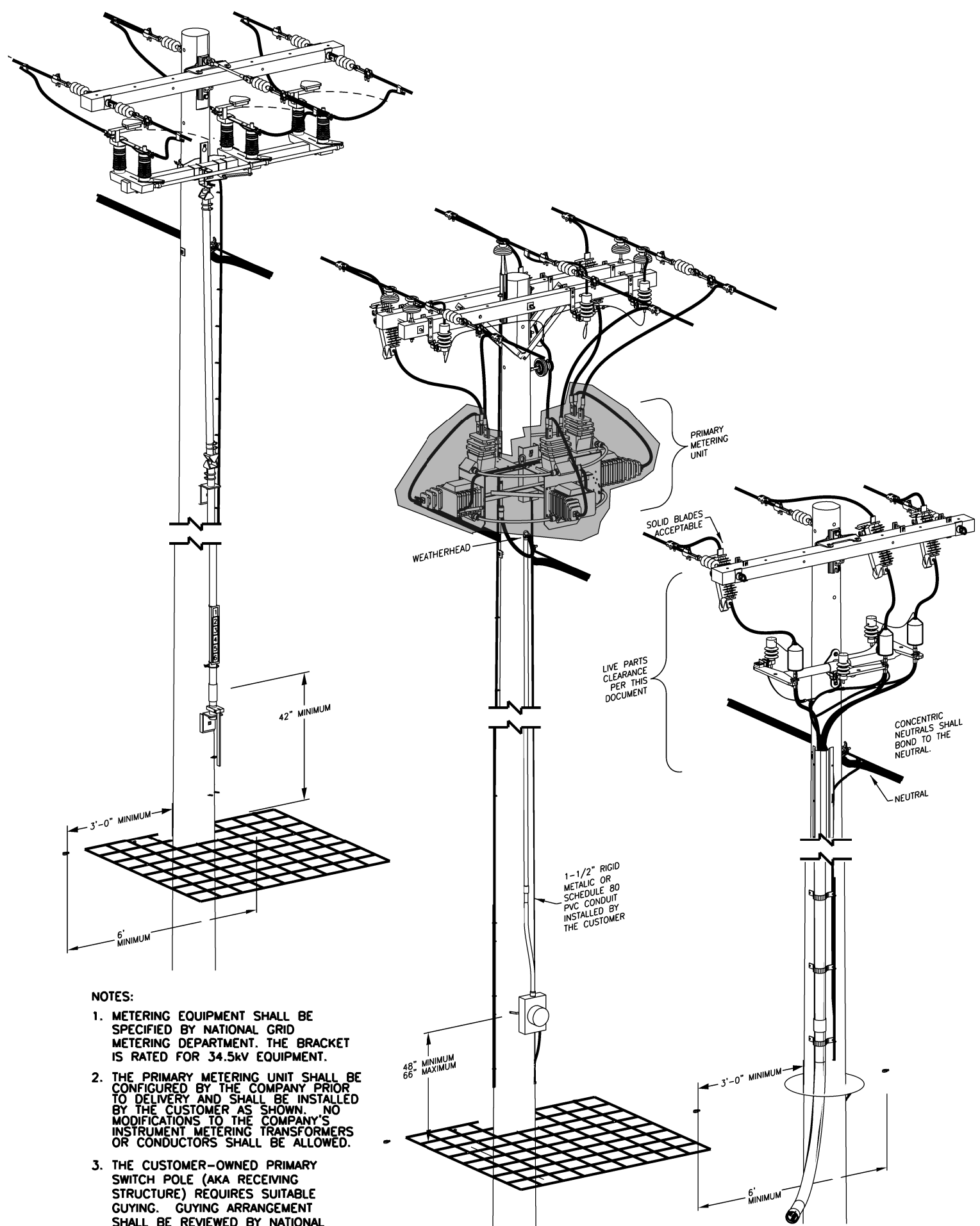
SUB-T (23KV & 34.5KV) AND 4.8KV, 3 ϕ PRIMARY METERING, DELTA



NOTES:

1. METERING EQUIPMENT SHALL BE SPECIFIED BY NATIONAL GRID METERING DEPARTMENTS.
2. THE PRIMARY METERING UNIT SHALL BE CONFIGURED BY THE COMPANY PRIOR TO DELIVERY AND SHALL BE INSTALLED BY THE CUSTOMER AS SHOWN. NO MODIFICATIONS TO THE COMPANY'S INSTRUMENT METERING TRANSFORMERS OR CONDUCTORS SHALL BE ALLOWED.
3. RECIPROCAL HANDLE SHOWN ON SWITCH, ROTATING HANDLE ALSO ACCEPTABLE.
4. FOR A SINGLE-PHASE DELTA, USE THE TWO OUTBOARD POSITIONS OF THE ISOLATION SWITCH. THE NATIONAL GRID METERING BRACKET WILL ONLY CONTAIN ONE (1) CT AND ONE (1) DUAL-BUSHING PT ON A SINGLE-PHASE BRACKET.
5. COMPANY WILL PROVIDE INCOMING LINE DEADEND CLAMPS, INSULATORS, AND CLEAVES FOR ATTACHMENT OF THE COMPANY'S OVERHEAD LINE TO CUSTOMER'S STRUCTURE. ADDITIONALLY, COMPANY WILL PROVIDE A CABLE TO FLAT TERMINAL CONNECTOR AND BOLT IT TO THE CUSTOMER'S SWITCH.

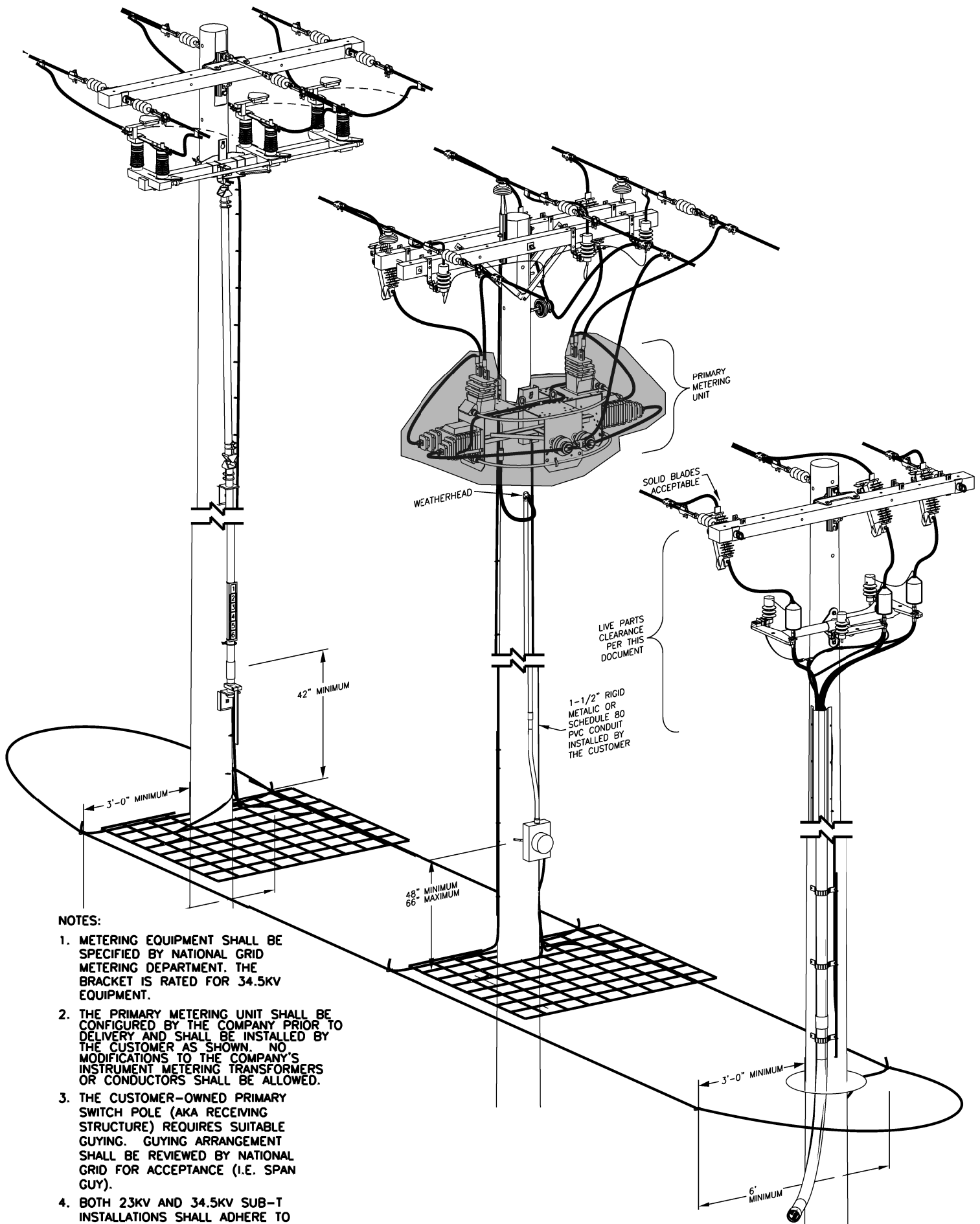
7.62KV, 1"Ø PRIMARY METERING



NOTES:

1. METERING EQUIPMENT SHALL BE SPECIFIED BY NATIONAL GRID METERING DEPARTMENT. THE BRACKET IS RATED FOR 34.5KV EQUIPMENT.
2. THE PRIMARY METERING UNIT SHALL BE CONFIGURED BY THE COMPANY PRIOR TO DELIVERY AND SHALL BE INSTALLED BY THE CUSTOMER AS SHOWN. NO MODIFICATIONS TO THE COMPANY'S INSTRUMENT METERING TRANSFORMERS OR CONDUCTORS SHALL BE ALLOWED.
3. THE CUSTOMER-OWNED PRIMARY SWITCH POLE (AKA RECEIVING STRUCTURE) REQUIRES SUITABLE GUYING. GUYING ARRANGEMENT SHALL BE REVIEWED BY NATIONAL GRID FOR ACCEPTANCE (I.E. SPAN GUY).
4. ALL VOLTAGES 15.2KV AND BELOW SHALL UTILIZE EXISTING ESB 753 15.2KV CLEARANCES.

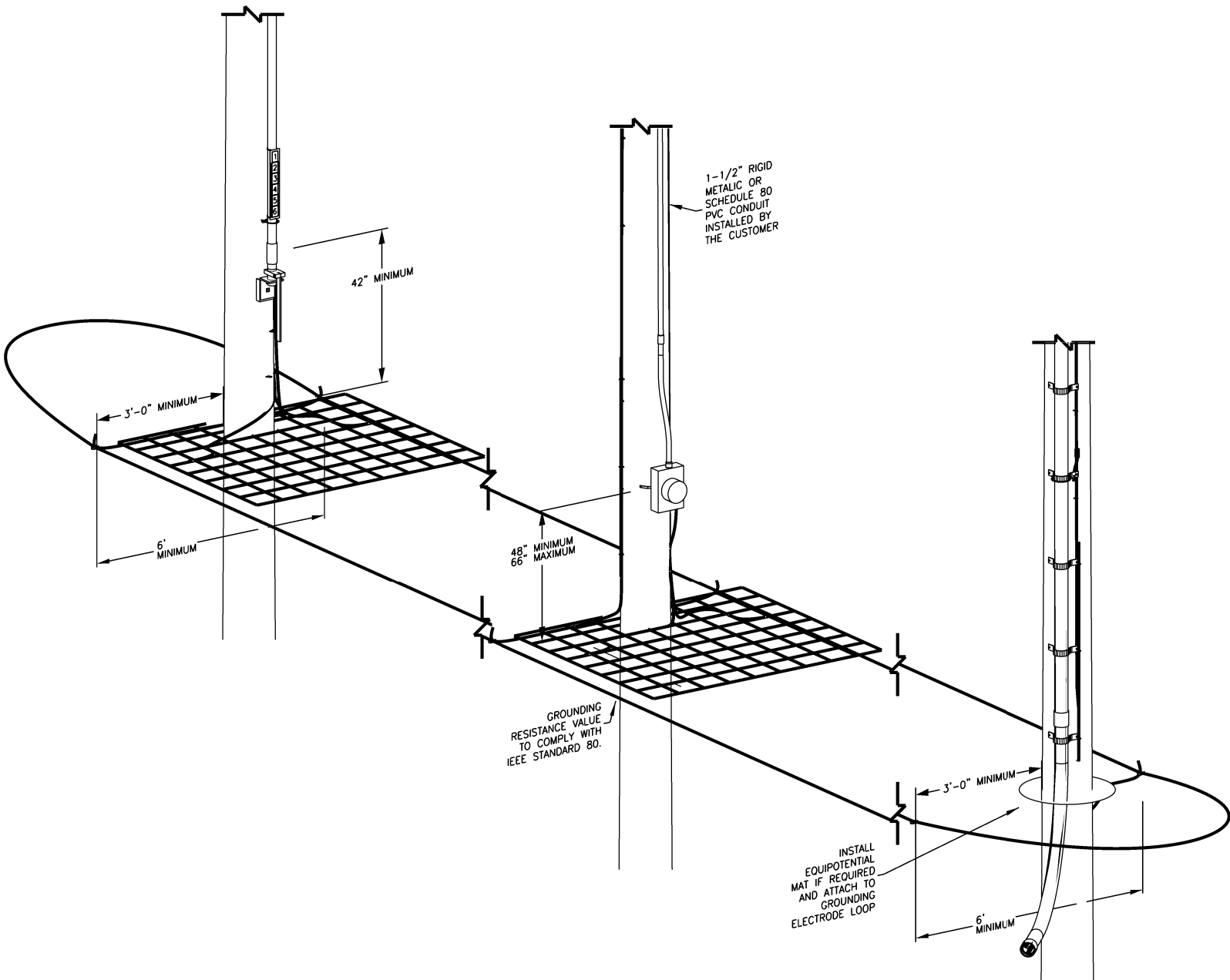
15KV, 3Ø PRIMARY METERING, 3 POLE, GROUNDED WYE



NOTES:

1. METERING EQUIPMENT SHALL BE SPECIFIED BY NATIONAL GRID METERING DEPARTMENT. THE BRACKET IS RATED FOR 34.5KV EQUIPMENT.
2. THE PRIMARY METERING UNIT SHALL BE CONFIGURED BY THE COMPANY PRIOR TO DELIVERY AND SHALL BE INSTALLED BY THE CUSTOMER AS SHOWN. NO MODIFICATIONS TO THE COMPANY'S INSTRUMENT METERING TRANSFORMERS OR CONDUCTORS SHALL BE ALLOWED.
3. THE CUSTOMER-OWNED PRIMARY SWITCH POLE (AKA RECEIVING STRUCTURE) REQUIRES SUITABLE GUYING. GUYING ARRANGEMENT SHALL BE REVIEWED BY NATIONAL GRID FOR ACCEPTANCE (I.E. SPAN GUY).
4. BOTH 23KV AND 34.5KV SUB-T INSTALLATIONS SHALL ADHERE TO 34.5KV CLEARANCES AND EQUIPMENT (EXCEPT SA'S) WHILE ALL OTHER VOLTAGES SHALL FOLLOW EXISTING 13.2KV CLEARANCES.

SUB-T (23KV AND 34.5KV) AND 4.8KV, 3 ϕ PRIMARY METERING, 3 POLE, DELTA



4.8kV Δ AND SUB-T (23kV & 34.5kV) PRIMARY SERVICE GROUNDING REQUIREMENTS.

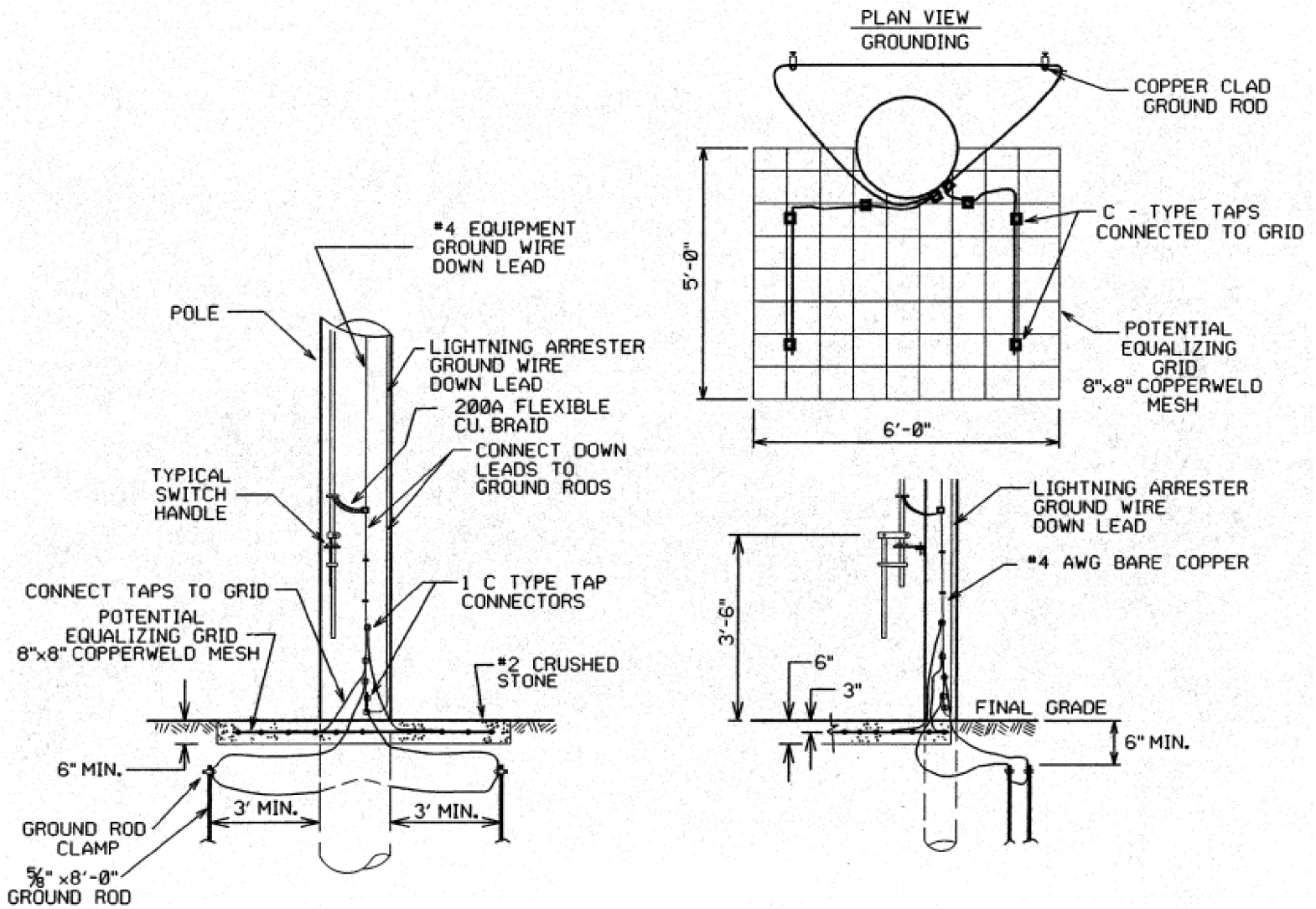
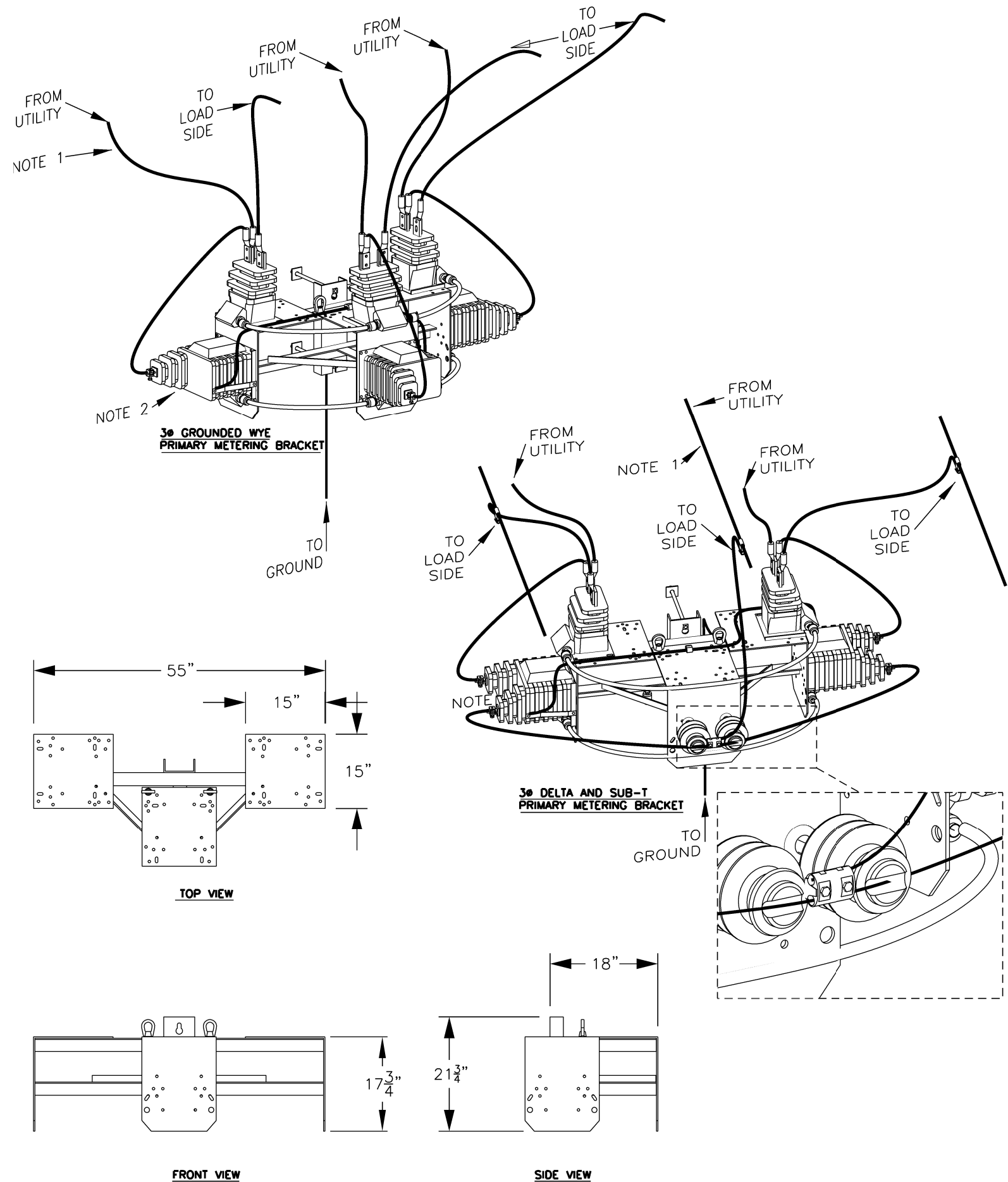
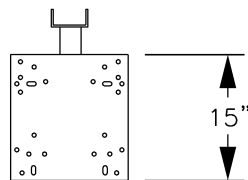
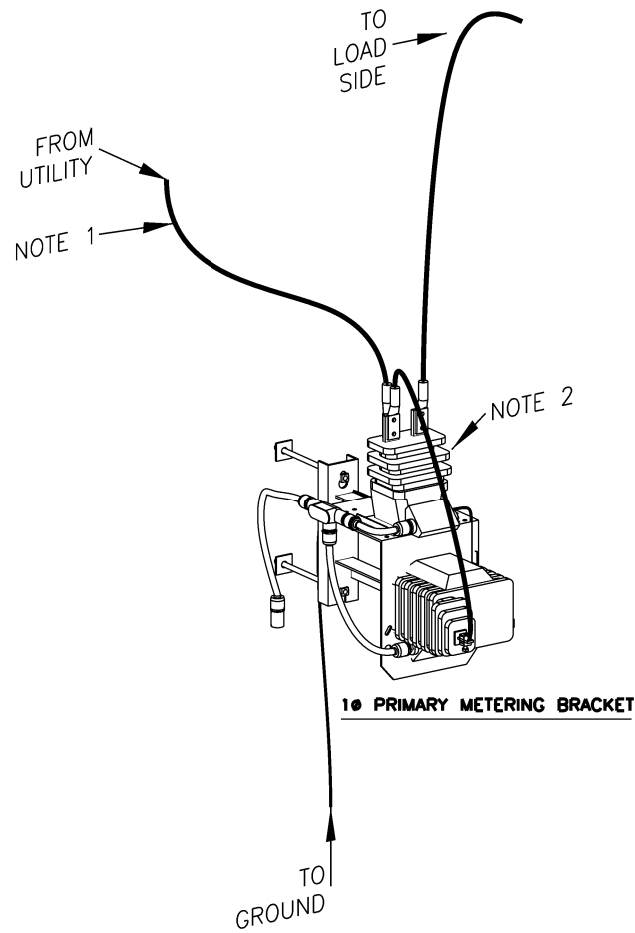


FIG. 5 GROUND GRID AND SWITCH HANDLE GROUNDING

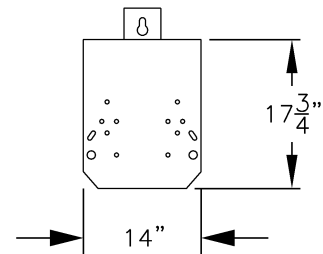


NOTE

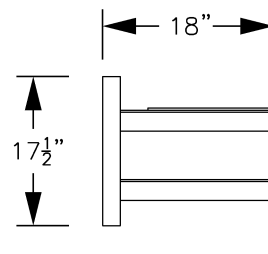
1. CUSTOMER IS RESPONSIBLE FOR PROVIDING ALL PRIMARY CABLES WITH CONNECTORS AND MAKING PRIMARY CONNECTIONS (NY ONLY).
2. METERING BRACKET, METERING TRANSFORMERS AND BILLING METER TO BE PROVIDED BY UTILITY.



TOP VIEW



FRONT VIEW



SIDE VIEW

NOTE

1. CUSTOMER IS RESPONSIBLE FOR PROVIDING ALL PRIMARY CABLES WITH CONNECTORS AND MAKING PRIMARY CONNECTIONS (NY ONLY).
2. METERING BRACKET, METERING TRANSFORMERS AND BILLING METER TO BE PROVIDED BY UTILITY.

ESB No. 754A-1992, 2nd Printing June 2002 “Single Phase Outdoor Pad Mounted Transformer”

Superseded in April 2010, refer to the latest revision of ESB750 and ESB 754. See also ESB 759A and ESB 759B for the Company’s primary cable installation requirements in the Customer’s trench or underground conduit system.

ESB No. 754-2007 “Outdoor Pad Mounted or Vault Enclosed Three Phase Transformer”

Remove all references to ESB 759 effective in April 2010, refer to latest version of ESB750 and new ESB 759A and ESB 759B. See ESB 759A & B for the Company’s primary cable installation requirements in the Customer’s trench or underground conduit system.

ESB No. 755-2003 “Operation & Maintenance Requirements for Services Above 600 volts”

PAGE	SECTION	EFFECTIVE DATE	CHANGE
4	2.1	Nov-2021	As a primary electric service customer, an obligation exists to operate service isolation equipment using a qualified person and within a reasonable timeframe, as determined by the Company. The Company will at times request primary customers to operate their equipment to isolate the service from the system. In situations of duress, life safety, or under the requirement of good utility practice, the Company may cut customer locks and operate customer-owned equipment without responsibility for damage should the customer be unable to provide an appropriate response. It will be the customer’s responsibility to later operate their equipment to restore their service when the Company determines it is safe to do so.
6	4.1(6)	Nov-2022	Create additional bullet on vegetation management to read “The Customer’s electrically qualified personnel shall perform routine vegetation management to prevent electrical contact and degradation of step & touch potential. Complete removal of root systems and a refresh of the stone to maintain the insulative value along with maintaining the erosion control value of the stone is required.”

ESB No. 756-2024 “General Requirements for Parallel Generation Connected to a National Grid Owned EPS”, version 9.0

No errata.

ESB No. 756 Appendix A; “Requirements for Parallel Generation Connected to National Grid Facilities in New York”, version 8.0

No errata.

ESB No. 756 Appendix B; “Distributed Generation Connected to National Grid Distribution Facilities Per The New York Standardized Interconnection Requirements”, version 9.1

PAGE	SECTION	EFFECTIVE DATE	CHANGE

ESB No. 756 Appendix C; “Distributed Generation Connected to National Grid Distribution Facilities Per The Massachusetts Standards for Interconnecting Distributed Generation”, version 10.0”

PAGE	SECTION	EFFECTIVE DATE	CHANGE

ESB No. 757, April 2018 “Requirements for Services Supplied from National Grid’s Secondary Networks”

No Errata.

ESB No. 758, Jan. 1985 “Primary Service to Metal Enclosed Gear”

PAGE	SECTION	EFFECTIVE DATE	CHANGE
2	C Paragraph 11	Nov-1999	Delete the Inspection part in its entirety.
3	H	Nov-1999	Delete Paragraphs 18 through 20 and Paragraph 22.
4 and 5	I	Nov-1999	Delete Paragraphs 23 through 26.
5	J Paragraph 28	Nov-1999	In the first sentence, change “outdoor” to “indoor”.
8 - 10	M	Sep-2010	Change this metering section in its entirety and replace it with the new information ** below.
Fig. 1	Note #3	Apr-2002	In Note 3, change “see Paragraph 18” to “see ESB 750 Section 4”.
Fig. 1	Note #4 (new)	Sep-2010	Add new note: “Note #4: The clearances shown from the front of the service equipment to a building wall and from the rear of the service equipment to a building wall shall be both 10 foot (minimum) if the switchgear is designed with the Company required access to the incoming termination compartment on one side while the metering PT/CT compartment is on the other side; see Figure 1A. Otherwise, if the Company’s access to both compartments is on the same side, then the other side’s clearance can be reduced to the clearances presently shown.” Add new Figure 1A ** below.
6	L.33	July-2020	A draw-out circuit breaker is no longer accepted as the isolating means from the Company’s System. Paragraph L.33 now reads: 33. <u>Isolating Means</u> - All equipment in the Customer’s switchgear shall be so arranged that it can be isolated from the Company’s system by a main disconnecting switch. The switch

PAGE	SECTION	EFFECTIVE DATE	CHANGE
			shall be group operated causing separation by a clearly visible air gap. Where the Customer utilizes fuses as the overcurrent protection, the disconnecting switch shall be of loadbreak design. The switch or breaker compartment shall have provisions for dual locking of the door to allow access by either the Customer or the Company.

** See below.

M. PRIMARY SWITCHGEAR METERING COMPARTMENTS SPECIFICATIONS

M.1 Equipment Furnished by the Company

1. The Company will furnish all meters, metering instrument transformers, potential transformer primary fuses and test devices required for billing purposes at the delivery voltage.
2. The Company will specify the quantity and type, of all current and potential transformers for billing purposes.
3. The current and potential transformers for the Company's billing meters shall normally not be used to operate any other Customer devices, see ESB 750, Section 7.

M.2 Customer's Responsibility

1. Codes, Standards, and Wiring Adequacy:

- a. Components of the primary switchgear metering transformer compartment shall conform to the latest editions of the following national standards and codes:

<u>Component</u>	<u>Applicable National Standard</u>
• Cable	ICEA
• Power Switchgear	ANSI C37.20.2
• Power and Instrument Transformers	ANSI C57
• Surge Arrestors	ANSI C62
• Insulators	ANSI C29
• Apparatus Bushings	ANSI C76

- b. The Company recommends approval certification by a laboratory testing organization acceptable to the authority having jurisdiction according to the National Electrical Code, e.g. UL, ETL, CSA, etc.

2. Metering Transformer Equipment Compartment:

- a. A separate enclosing compartment shall be provided solely for the billing metering transformers. The metering transformer compartment shall be solely accessible by the Company. The Customer shall have provisions for the Company's locking the access door with a 3/8" (10 mm) shank padlock.
- b. The connection of the Customer's auxiliary transformer for heat, light and receptacle(s) installed at the meter panel location and elsewhere within their switchgear, shall be on the load side of the Company's billing metering transformers.
- c. Where the metering transformer compartment is located in an unheated area or building, provisions shall be made for heating the compartment to prevent condensation.

- d. The entire metering compartment shall be designed and constructed with adequate ventilation.
- e. The minimum width of the metering transformer compartment must be based on the electrical clearances of Figure M-1. The Customer shall maintain a minimum 10 ft. (3.0 m) unobstructed clearance in front of the metering transformer compartment access door.
- f. The Customer shall provide space and supports for the Company's current and potential transformers as part of the service entrance equipment. Provisions for mounting shall be designed in a manner that is easily accessible for work. The supports shall be drilled for fixed-in-place mounting hardware (i.e. nuts, bolts, washers) in accordance with dimension information concerning this equipment furnished to the Customer for the design of their installation. Suspending instrument transformers from the roof area of the switchgear shall not be permitted.
In MA, the current transformers shall be in a completely barriered and isolated compartment from the potential transformer compartment; see Figure M-1A. This compartment shall be so designed that, after proper electrical isolation, each of the current transformers can be readily removed or changed without disturbing the others. Company personnel must have access for inspection without interruption of service.
- g. The Company's potential transformers (PTs or VTs) for metering healthcare facilities shall be mounted on drawout carriages to ensure that the equipment will be readily accessible for safe inspection and replacement without causing an outage. Where potential transformers are mounted on a drawout carriage, the front of the carriage shall extend up, to close the section when transformers are in the operating position. Primary contacts for the drawout feature shall be of a design that ensures continued maintenance of the contact pressure. Visible grounding devices shall be provided to make certain that the drawout carriage mounted potential transformer primary terminals are grounded when the carriage is withdrawn. The drawout carriage frame must be grounded to the switchgear ground throughout its travel.
- h. Primary fuses for the Company's potential transformers will be supplied by the Company. The Company will specify if primary fuses shall be separately mounted, in holders supplied by the switchgear manufacturer, and installed in a properly barriered compartment completely isolated from adjoining equipment. Sufficient working space shall be provided to permit fuses to be readily and safely checked or replaced without removing the transformer from its mount. Fuse replacement must be accomplished without interruption of service to the customer.
- i. No instrument transformers shall be installed closer than 6 inches (150 mm) to the ground or floor upon which the switchgear is installed.
- j. Instrument transformers shall be installed in such positions that the rating and polarity marks are readily and safely readable.
- k. The metering transformer compartment shall be solely accessible by the Company. This requires section-to-section openings for through bus to be maintained as small as phase to ground clearances in Figure M-1 will allow.
- l. Where the clearances in Figure M-1 cannot be provided, Glastic (NEMA Type GPO 3 material) barriers are required between potential transformers and between potential transformers and the enclosure walls.

- m. Connections for the Company's potential transformers shall be made on the supply side of the current transformers except for generator producing facilities. A connection shall be made available by the Customer from each phase bus with a #6 AWG copper solid wire including crimped connectors and hardware to connect the Company's metering potential transformers.
- n. The phase bus shall be mechanically independent of the instrument transformers. Company metering transformers are not to be used as part of the bus support system. Removable bus bars shall be furnished by the Customer to permit installation and removal of current transformers. If aluminum bus is used, tin-plated or silver-plated terminals shall be provided by the Customer including silicon-bronze bolts and stainless steel nuts and washers for connection of the Company's metering current transformers.
- o. A grounding stud shall be provided for grounding each phase of the bus on the line side and load side of the metering transformers and mounted such that removal of instrument transformers does not affect the ground provisions. The Company will specify the ground stud to be used.
- p. A 5/8" (16 mm) dia. by 24" (600 mm) long copper ground bail shall be connected to the ground bus at both ends and located 7" (175 mm) behind the door and 5" (125 mm) above the door sill. In MA, ground pads and "jug handles" shall be installed on the equipment ground bus as shown in Figure M-1A.

3. Metering Conduit:

The Customer shall furnish, install and maintain rigid conduit for the wiring from metering transformers to the billing meter panel. The maximum distance between meter and potential transformers shall be 50 feet (15 meters).

a. Internal:

Where the billing meter panel is part of the switchgear and the conduit is internal between sections, this conduit shall be 1-1/2" (41), PVC Sched. 80 with bushings on each end.

b. External:

The rigid conduit shall be at least 1-1/2" (41) galvanized steel. The conduit run is permitted a maximum of two 90 degree conduit bends (condulets shall not be used).

c. A pull line shall be installed in the conduit.

4. Billing Metering Panel:

a. Outdoor Billing Compartment: (where switchgear is located greater than 50 feet (15 meters) from the Customer's building)

Note: *These requirements apply to a compartment of the Customer's primary switchgear or to a separate free-standing outdoor cabinet.*

- (1) The compartment's minimum dimensions shall be 48" (1.2 m) wide x 90" (2.3 m) high x 24" (600 mm) deep. For a separate free-standing outdoor cabinet the minimum dimensions shall be 48" (1.2 m) wide x 60" (1.5 m) high x 24" (600 mm) deep.
- (2) The internal panel shall be 3/4" (19 mm) thick x 44" (1.1 m) wide x 60" (1.5 m) high minimum painted exterior grade plywood.
- (3) The Customer shall install a 1-1/2 inch (41) rigid galvanized steel conduit from the Company's metering transformer compartment to the Company billing meter cabinet.

- (4) The billing metering compartment shall be lighted (75 watt minimum), contain a 20A GFI protected 120/240VAC duplex receptacle, be heated (250 watt minimum, thermostatically controlled), and be ventilated.
- (5) The compartment door shall include a three point latch and provisions for a 3/8" (10 mm) shank padlock by the Company.
- (6) The Customer's switchgear heater control circuitry equipment shall be located in this compartment.
- b. If Utility Meters are being installed inside:
 - (1) The Customer shall install a 1-1/2 inch (41) rigid galvanized steel conduit from the Company's metering transformer compartment to the Company approved meter location.
 - (2) The Customer shall provide and mount a meter board for each indoor installation as illustrated in Section 7 of ESB 750.

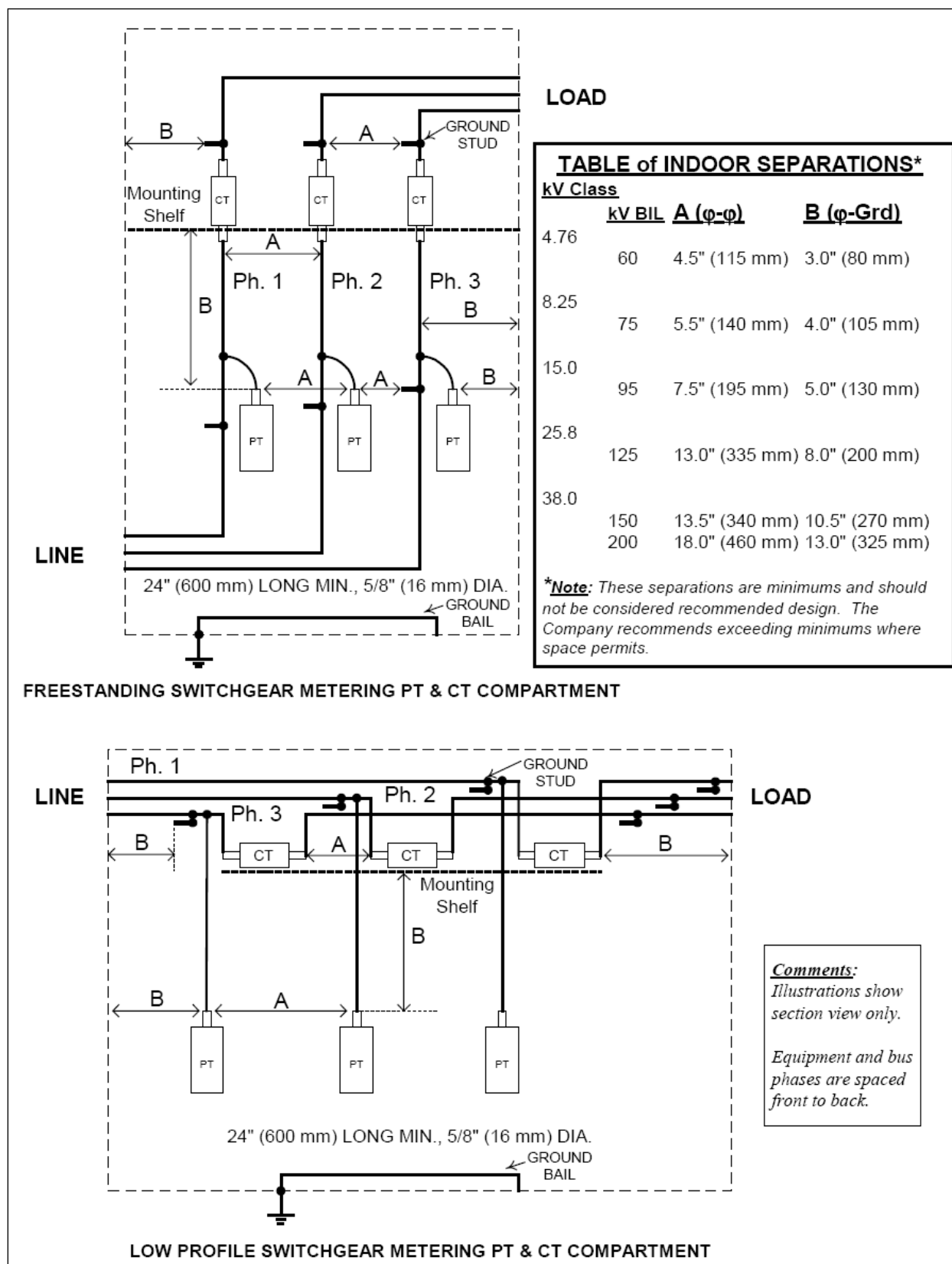


Figure M-1 – Typical Primary Switchgear Metering Transformer Compartment Clearances

For MA:

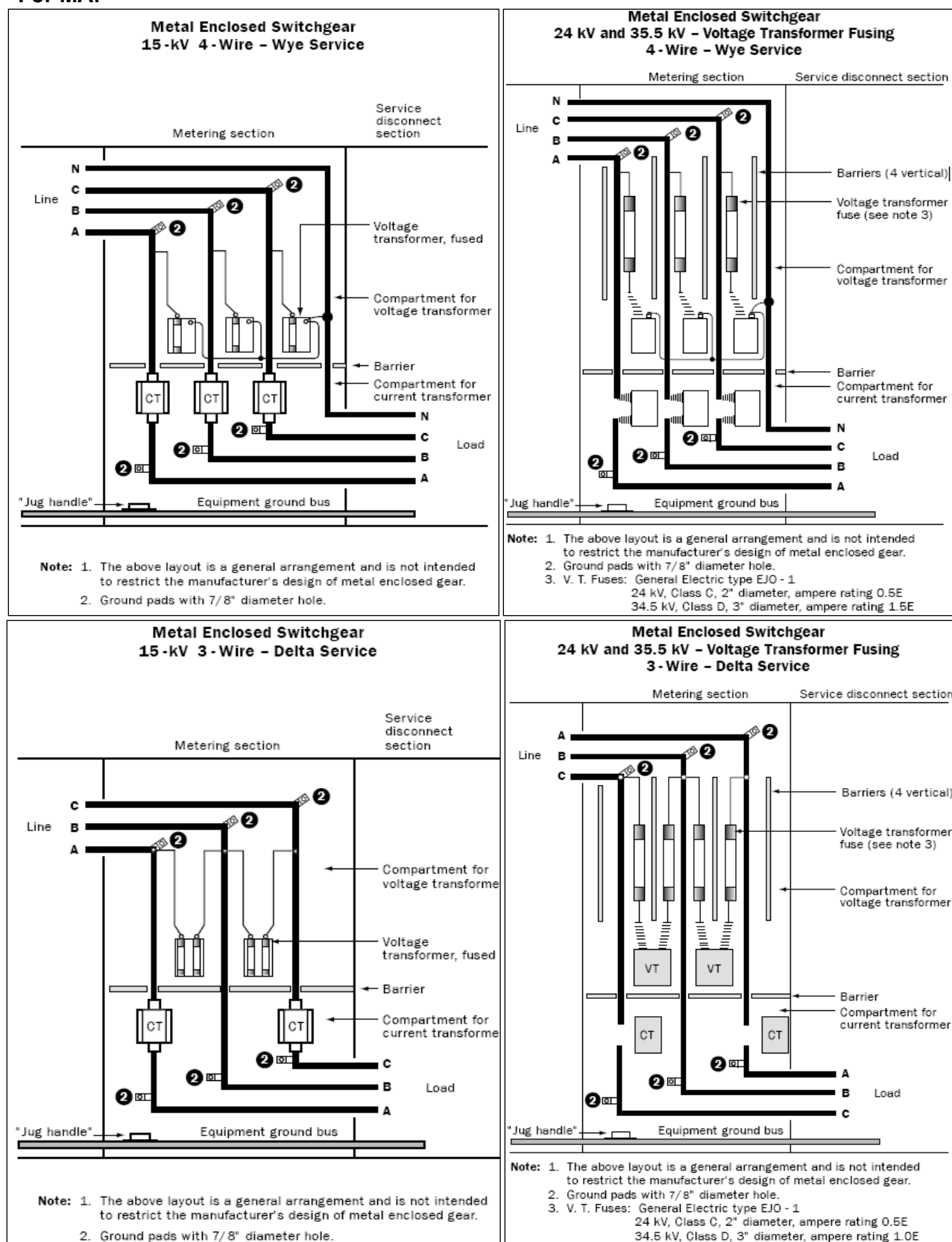


Figure M-1A – Typical Primary Switchgear Metering Transformer Compartments

For the latest authorized version please refer to the Company's website at <http://www.nationalgridus.com/ProNet/Technical-Resources/Electrical-Specifications>

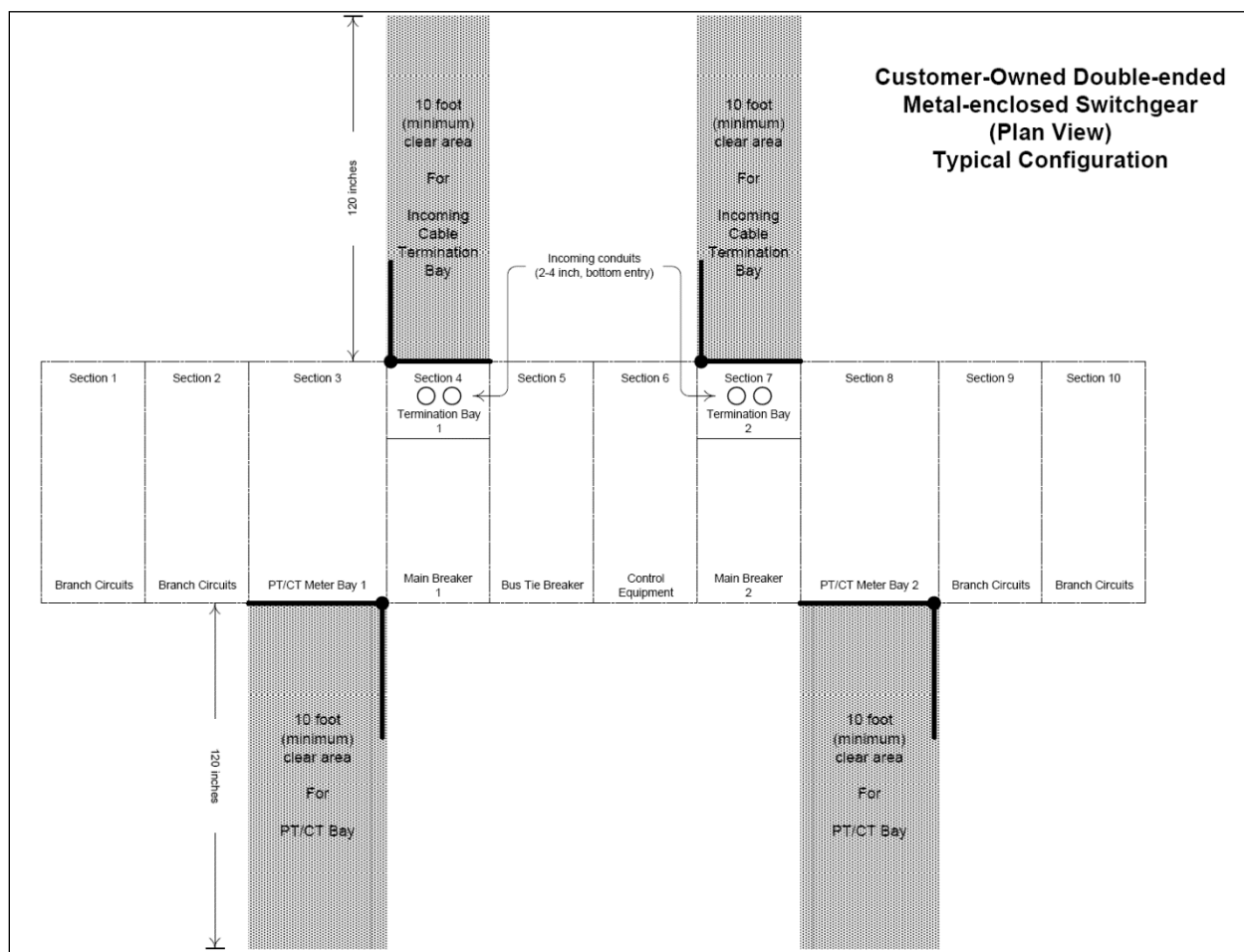


Figure 1A – Clear Area Requirements in Front of Line Termination and Metering Transformer Compartments for 15kV Class Primary Switchgear

ESB No. 759A

PAGE	SECTION	EFFECTIVE DATE	CHANGE
10	8.0 (a)	Jan-2018	Add (ii)

Add to Section 8.0 (a) Trench Construction Requirements, Layout and Grading,

- ii. In the limited instances in New York State when the Company agrees to waive the requirement to install binder coat prior to construction, the Company will require the Developer to execute an Indemnification and Release Agreement. This document shall be furnished by the appropriate Company representative as necessary. This Indemnification and Release Agreement shall confirm the adequacy of the sub-base road construction complies with previously approved

designs (per approval from municipality) and is adequate for truck traffic and heavy equipment.

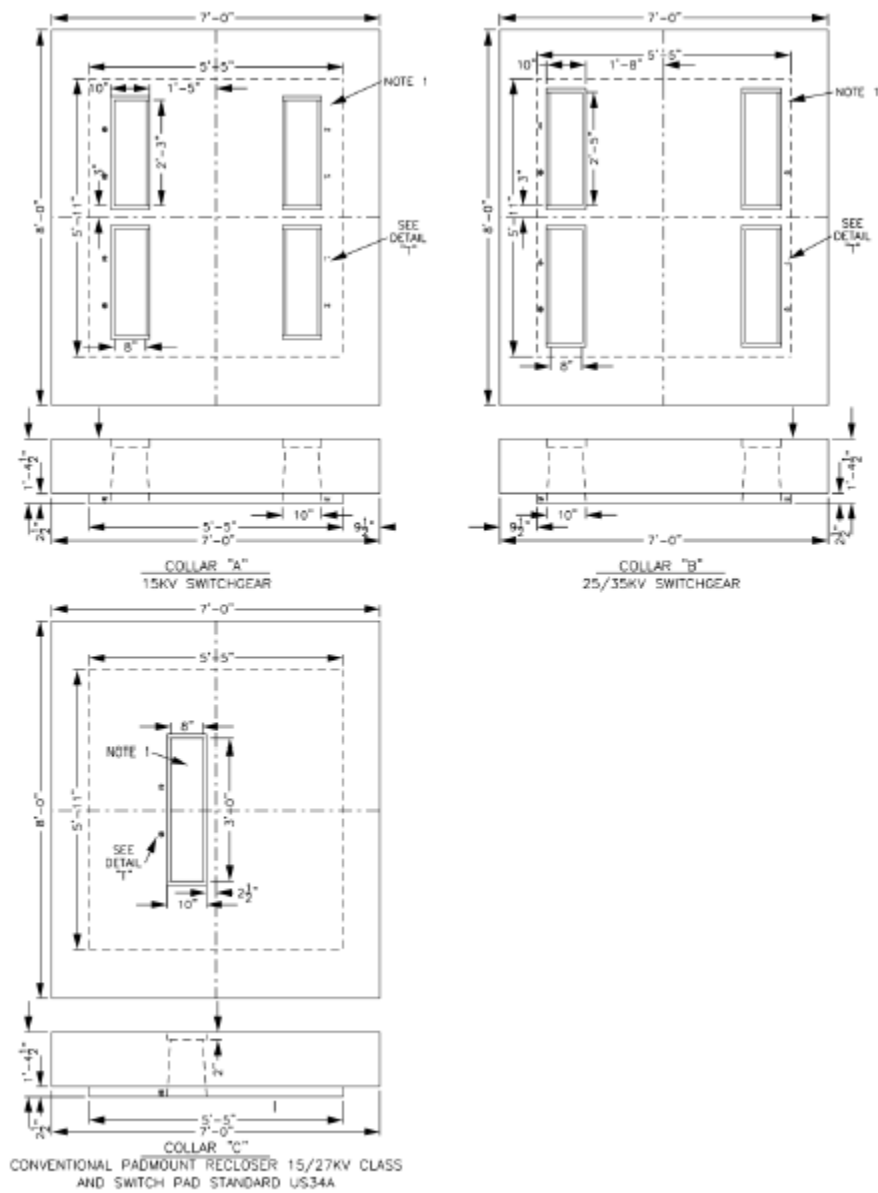
The Developer/Owner shall submit a letter to the Company confirming that (1) the site is completely and accurately staked and (2) existing grades are within six (6) inches of final grade throughout the site. Additionally, all roads within the Subdivision shall be suitable for general and construction traffic, including trucks, heavy equipment and other large machinery, prior to any Company Work. This letter shall be furnished on the letterhead that bears the seal of a New York State Licensed Design Professional or Licensed Land Surveyor. Developer shall install all roads within the Subdivision in accordance with the approved plans for the Subdivision.

ESB No. 759B

PAGE	SECTION	EFFECTIVE DATE	CHANGE
11	9.0 (A)	Feb-2019	The Note in 9.0(A) refers only to the third bullet.
13	12.0	Feb-2019	The transformer pad and oil containment structure is installed, owned and maintained by the Customer. The stability of this structure is critical to the reliability of the Customer's service. Therefore, the Customer shall be responsible for meeting the minimum requirements as outlined by Section 12 and Figure 27.0 of this Bulletin for the installation of these structures. Where existing or sub-surface soils are unstable or non-compressive, they shall be replaced with suitable compressive soils. A soils compression test may be obtained by the Customer to ensure appropriate soil compaction (95%). Where existing soils are replaced, ground rods may require deeper placement for low-resistance earth contact. Deterioration, movement, or damage to the transformer pad and/or oil containment structure shall be repaired by the Customer at the Customer's cost, including any costs incurred by the Company for interruptions, lifting of transformer, adjustment of cables, etc. Electric service may require temporary disconnection where repairs are warranted.
23	20.1	Apr-2022	Add sentences to end of paragraph. "Earth formed concrete encasements are allowed when the soil is sufficiently stable, such that the wall will not collapse prior to and during pouring, and no more than two conduits are to be encased in this manner. Installations with more than two conduits shall be formed per Section 30.05."
9	7.0	Apr-2022	Add to list of The Customer will..."perform insulation resistance tests of the secondary cables."
26	23.0	Apr-2022	Add new sentence to Section 23.0 Secondary Cable and Conduit System..."The customer shall perform insulation resistance test of the secondary cables to assure cable integrity."

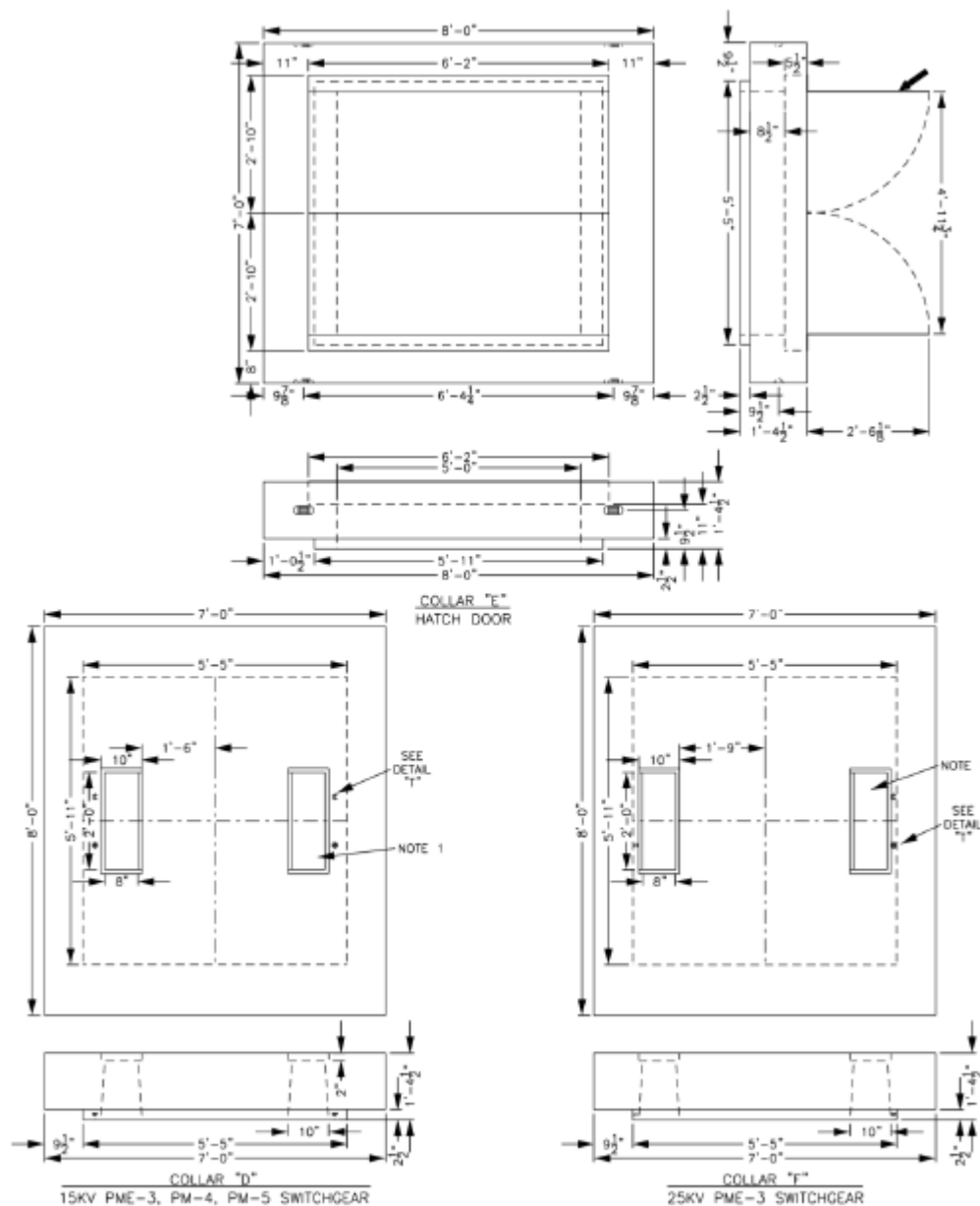
PAGE	SECTION	EFFECTIVE DATE	CHANGE
37	Figure 27.0-1	Apr-2022	Add Note to Figure 27.0-1: "For 500 kVA, 208Y/120V transformers that are allowed eight cables per phase, to use pad UF8B in Figure 27.0-2 may be used."
38	Figure 27.0-2	Apr-2022	Change title of Figure 27.0-2 to "15kV Transformer Pad 750-1500 kVA 44-114 (ref-44-114/UF8B)."
40	Figure 27.0-4	Apr-2022	Change title of Figure 27.0-4 to "15kV Transformer Pad 2000-2500 kVA; 25-35kV Transformer Pad 500-2500 kVA. 44-116 (ref-44-116/UF8D)"
30	25.2	Apr-2022	The Switchgear collars are obsolete; substitute those shown on the next page.
16	13.3	Nov-2022	Replace entire Section 13.3 with new language.
16	13.3	Mar-2023	Replace entire Section 13.3 with revised section (see below).
25	21.0	Mar-2023	Add new sentence to bottom of page 25 "All three-phase primary service laterals to pad mounted equipment shall be concrete-encased conduit with a spare."
23	20.3	Mar-2023	Add new sentence to end of paragraph "Direct Bury cable prohibited for three-phase primary laterals to pad mounted equipment."
16	15.0	Mar-2023	Change the ground grid wire depth from 12 to 18 inches

Switchgear Collars



NOTE:
1. EXTRUDED POLYSTYRENE (XPS) RIGID FOAM INSULATION
RECESSED IN CABLE OPENING WHERE 1" X 1" KEY X 2" DEEP IS
SHOWN. SEE SECTION 3 MATERIALS FOR FURTHER DETAILS.

Switchgear Collars



13.3 Secondary Bus Enclosure

A secondary bus enclosure is defined as a pad-mounted enclosure which houses bus bars, typically rated at greater than 1500A. A secondary bus enclosure may be required where the customer's number of secondary cables exceeds the maximum allowed amount on the transformer, or where secondary cable from the transformer is required to run through the public way. A secondary bus enclosure is not to be confused with a wireway as shown in ESB 750, Figure 7.4.1-2.

- *The secondary bus enclosure is the customers responsibility to supply, install, and maintain.*
- *The secondary bus enclosure shall have provisions for a Company padlock and shall be supplied with penta-head bolts.*
- *The cables from the secondary bus enclosure to the customer's service equipment are the customer's responsibility to supply, install, and maintain.*
- *The conduits from the transformer foundation to the secondary bus enclosure are to follow the Responsibility and Ownership requirements in Section 7.0.*
- *The Company will specify the number and size of conduits from the transformer foundation to the secondary bus enclosure.*
- *The Company will specify the type and number of cables from the transformer foundation to the secondary bus enclosure. The Customer will supply and install said cables from the transformer foundation to the secondary bus enclosure.*
- *The conduits from the secondary bus enclosure to the customer's service equipment are the customer's responsibility to supply, install, and maintain.*
- *The secondary bus enclosure shall contain provisions for cable to bus NEMA Standard 2-hole type connections for both Company owned and customer owned cables.*
- *The Company will review and approve the proposed secondary bus enclosure, the proposed secondary bus enclosure location, and conduit routing.*

A list of Company approved manufacturers that supply the secondary bus enclosure is located on page 56.

Should the customer choose to use a pad-mounted secondary bus enclosure for the purpose of installing a premise DER system and does not need to upgrade the ampacity of the service cables in the transformer, the Company will not take ownership of the cables or conduit (as described in Section 7.0).

REVISION HISTORY

Version	Date	Description of Revision
1.0	09/27/2010	First version of new document superseding all previous issues of the ESB 750 series Errata and Revisions.
2.0	12/31/2014	Various Revisions.
2.1	01/01/2018	Added ESB 752, Section VII.A.1 and ESB 759A, Section 8.0.
2.2	02/01/2019	ESB 759B, Sections 9.0, 12.0. ESB753, Figures 3a & 4.
3.0	01/10/2020	All ESB 750 changes removed as they've been incorporated into new ESB 750-2020 issue. ESB 753 neutral connection location change. ESB 757 changes removed and latest revision referenced. Website revised in Document footer. Added MA and RI tariff website links. Revised all ESB 750—0410 references to ESB 750 – 2020.
3.1	06/2020	Added corrections and revisions to new ESB 750-2020 section. Added RTU language to ESB 752 section. Revised ESB 758 Section L.33.
3.2	01/2021	All ESB 750 changes removed as they've been incorporated into new ESB 750-2021 issue. Removed ESB 754 revisions that have been superseded by ESB 759B.
3.3	10/2021	Added ESB 755 Primary Services customer switching responsibilities language.
3.4	01/2022	Expunged references to NH & RI. Additional ESB 753 Figures.
3.5	04/2022	Revised ESB 759B Figures 27.0-1, 27.0-2 & 27.0-4. Revised the Switchgear Collars in ESB 759B Section 25.2. Added new ESB 759B earth formed concrete language for Section 21.0. Added customer secondary cable testing requirement language to two different locations (Page 9 & Section 23.0). Replaced ESB 753 Figures with latest version. Updated ESB 750-2021 to 2022. Revised 756C & 756D in regard to UL1741-SB adoption.
3.6	11/2022	756C Updated in Oct 2022, eliminated 756C Errata. Retaining 756D Errata to comply with contractual obligations. New vegetation management language for ESB 755. Updated ESB 753 figures. Added ESB 759B new Section 13.3 to replace existing section 13.3.
4.0	03/2022	Revised ESB 759B new Section 13.3 to replace existing Errata & Revision section 13.3, additional language in Sections 15.0, 20.3 and 21.0. ESB 756 Appendix C for Rhode Island has been discontinued. Added new language to ESB750 multiple sections.
4.1	05/2023	Revised 756B, 756C; adding further requirements related to 1741-SB inverters. Revised 750, small change to riser pole language.
4.2	01/2024	All ESB 750 errata incorporated into new ESB 750-2024 issue. ESB 756D references removed. Incorporated errata into ESB 756B Version 9.1 and ESB756C version 10.0.

/END OF DOCUMENT/