PSEG LI

PSEG Long Island LLC.

Three Phase Padmounted Transformer Specifications for Customers & Electrical Contractors

Revised July 2014

Distribution Design
T&D Engineering

THREE PHASE PADMOUNTED TRANSFORMER SPECIFICATIONS

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ILLUSTRATIONS AND CONSTRUCTION STANDARDS (CS)

THREE PHASE PADMOUNTED TRANSFORMER SPECIFICATIONS

Section 1: Introduction

1. This specification covers the material and design requirements of PSEG Long Island (PSEG LI) for "Dead-Front", three phase padmounted transformers ranging in size from 75 kVA to 1,500 kVA.

2. Three phase secondary service supplied from 4kV primary circuits or 13,200GrdY/7,620V primary through padmounted transformers shall not exceed 4,000 amperes at 208Y/120 volts or 2,500 amperes at 480Y/277 volts.

3. The applicant or customer shall consult Distribution Design Department before plans are finalized, equipment or material purchased or construction commenced on facilities to be connected to PSEG Long Island's (PSEG LI) electric distribution system.

4. All installations shall conform to the requirements of the National Electric Code (NEC), National Electric Safety Code (NESC), and the City of New York Electrical Code (where applicable), latest editions.

5. All installations shall conform to LIPA's "Specifications and Requirements for Electric Installations" (Red Book). Specific job details will be outlined in a specification letter provided to the customer's representative/contractor by the Customer Planning Representative.

6. The customer's electrical contractor or consultant shall furnish all information requested by PSEG LI including but not limited to size of present load and expected future load in kW, equipment specifications, and any unusual requirements.

7. The customer or applicant shall be advised of the available service voltage and applicable fees and rates by the Customer Planning Representative.

8. Summary of General Responsibilities:

    a) The customer/contractor is responsible for the procurement and installation of the concrete footing, foundation, and pad as specified in Section II.

    b) In non-CIPUD areas the customer/contractor shall procure and install the primary cable according to the requirements in Section III.

c) PSEG LI shall deliver the transformer and set it onto the concrete pad. The appropriate number of bushings, loadbreak elbow terminators and surge arresters shall be provided as specified in Section IV.

d) The customer/contractor is responsible for the primary and secondary connections to the transformer as specified in Sections IV and V.

Section II: Concrete Footing, Foundation and Pad Installation

1. The customer shall furnish, install, own and maintain the concrete footing, foundation, pad, ground rods and all wiring.

   Reference: Illustration #1 - page 4.

2. Precast footing, foundation and pad shall be obtained only from PSEG LI approved suppliers listed below and shall be manufactured according to Specification, PT14-07-004, "Concrete Pads & Foundations." These specifications are issued to the suppliers below and are available to customers and contractors upon request.

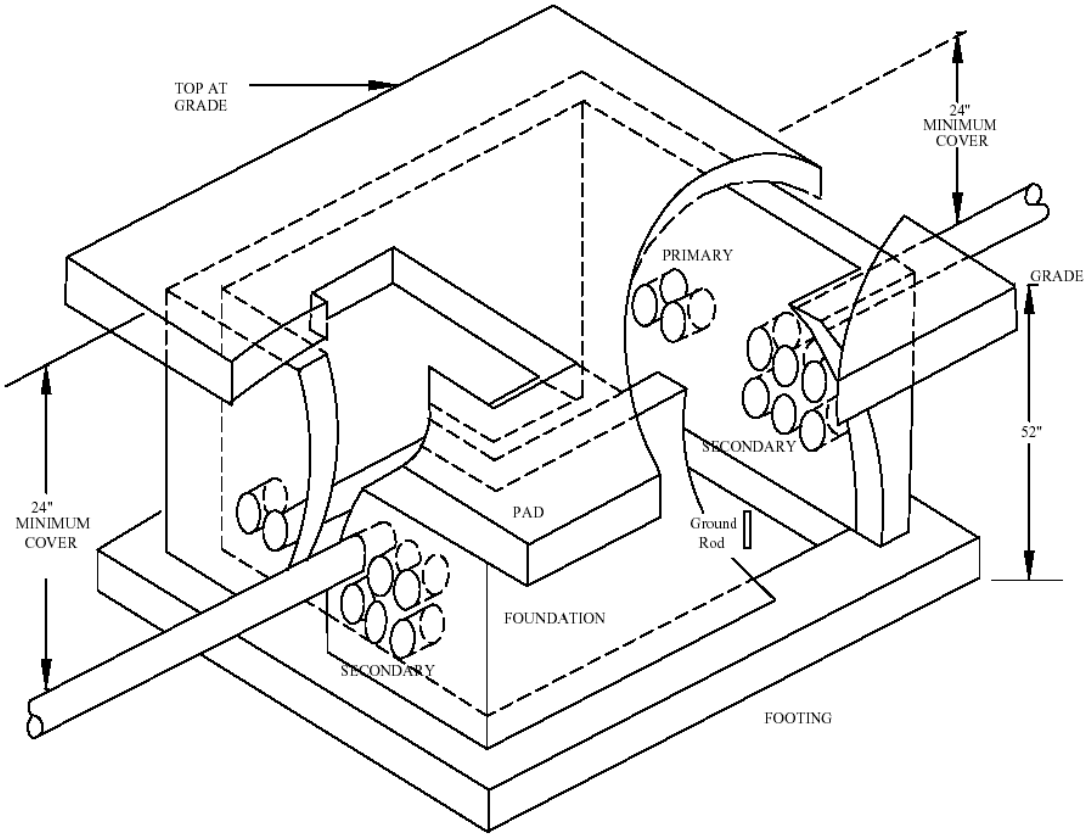
John Potente & Sons
114 Woodbury Road
Hicksville, NY 11801
(516) 935-8585

Roman Stone Construction Co.
85 South 4th Street
Bayshore, NY 11706
(631) 667-0566

AFCO Precast Corp.
114 Rocky Point Road
Middle Island, NY 11953
(631) 924-7400

Coastal Pipeline
55 Twomey Avenue
Calverton, N.Y. 11933
(631) 369-4000

Long Island Precast
20 Stiriz Road
Brookhaven, NY 11719
(631) 286-0240



NOT TO SCALE

Illustration #1
Isometric View of Footing, Foundation and Pad Top

Preparation of sub-grade for footing and foundation.

1. Remove 52” of soil to reach undisturbed earth.
2. Install precast footing and foundation.
3. Install conduits and grout entrances.
4. Install plugs or caps on all unused duct entrances.
5. Backfill outside foundation with clean fill, mechanically compacted every 12”. **DO NOT** backfill inside the foundation.

6. Install two (2)-1/2" x 8' copperweld groundrods driven flush with the top of the footing (6 feet apart).

3. CONCRETE PAD INSTALLATION CLEARANCES:

Reference: CS 5362, CS 5369, CS 5370

a) A clear working space of 10 feet minimum shall be maintained in front of the padmounted transformer doors. The doors shall be kept clear of obstructions and shall face away from all buildings and structures. See above CS's for details.

b) A minimum of 5 feet shall be maintained between padmounted transformer and adjacent structures. See CS 5370 for details.

Section III: Primary Wiring

1. PRIMARY CABLE SPECIFICATION:

2/C (two conductor) - #2 or #1/0 aluminum or copper concentric or compressed round stranded with copper concentric neutrals. #2 conductor shall have 10 - #14 neutral strands and #1/0 conductor shall have 16 - #14 neutral strands.

INSULATION SYSTEM:

Conductor shield: The center conductor shall be covered with a uniform layer of extruded semi-conducting material that is compatible with the conductor and easily removable with conventional stripping tools. The conductor shield minimum thickness shall be 12 mils.

Insulation: 15kV tree-retardant cross linked polyethylene (TR-XLPE) insulation for aluminum conductor or ethylene propylene rubber (EPR) insulation for copper conductor. Insulation thickness shall be 220 mils.

Insulation shield: Extruded over the insulation, there shall be a UV stabilized, weather resistant layer of black semi-conducting material compatible with the insulation and copper neutral strand. The insulation shield shall be easily removable with conventional stripping tools. The insulation shield minimum thickness shall be 30 mils.

Jacket: The cable shall have a 50 mil thick black linear low density polyethylene jacket extruded to fill over the concentric neutrals, yet shall be free stripping from the insulation shielding.

NOTE: Only semi-conducting jacket material may be direct buried with the other facilities (such as communications cables); cables with insulating jacket material must be installed in conduit on public highways and in the presence of direct buried communications facilities.

CABLE IDENTIFICATION:

1. Cable identification shall meet the requirements of ICEA S-94-649.

2. Jacket shall have identification markings along the entire length as follows:

- Three (225 mils wide by 6 mils thick) durable extruded red identification stripes that run longitudinally 120 degrees apart for the entire length of each conductor jacket.

- Permanent printed information markings at maximum intervals of 24 inches apart that state the following:

    - Name of manufacturer.
    - Year of manufacturer.
    - Conductor size and material.
    - Type and thickness of insulation.
    - Type of jacket.
    - Cable voltage rating.
    - NESC "Lightning Bolt" before and after the words "Electric Cable".

2. PSEG LI's Customer Planning Representative may request from the customer or contractor a three foot sample of the cable for inspection.

3. a) Primary cable may be direct buried or installed in schedule 40 PVC conduit from the transformer pad to the base of the pole or termination. Direct buried cable must be a minimum of 30 inches below final grade on private property and 42 inches below final grade in the public right-of-way. Cable installed in schedule 40 conduit must be a minimum of 24 inches below final grade.

   b) A schedule 40 PVC insulating sleeve shall be installed on each primary cable opening in the concrete foundation wall. The sleeve shall be flush with the foundation wall and concreted in place.

Section IV: Padmount Transformer and Associated Equipment

Reference: Illustration #2 – p. 10, CS 3722, CS 3727, CS 4028, CS 5362

1. The padmount transformer is delivered and set onto the concrete pad by PSEG LI. The customer's contractor will be supplied with the appropriate number of bushings, load break elbow terminators and elbow surge arresters.

2. The customer's contractor shall install loadbreak elbow terminators onto the cable according to CS 3722 and in conjunction with the elbow manufacturer's cutback length instructions as explained in step 6 on page 2 of 8 of CS 3722. *For crimping instructions and tool/die requirements, see crimp chart on CS 3722, sheet 8 of 8.*

3. The bushings shall be individually bonded with a #14 AWG bare copper conductor that is attached to the "bonding eye" on the bushing and bonded to the transformer ground lug that is installed by the contractor.

4. The customer's contractor shall install elbow surge arresters onto the transformer as shown on CS 4028. PSEG LI will supply three #2 copper lugs (one per arrester) and one copper hot line clamp. The arresters shall be individually bonded using a #10 AWG bare copper conductor that is attached to the "bonding eye" on the arrester housing, wrapped around itself and secured to the ground stud.

5. Primary and secondary cables shall have a minimum of 5 feet of slack inside the foundation. Maintain as much physical separation between primary and secondary cables as possible inside foundation.

Section V: Services

Reference: Illustration #2 – page 10 and Illustration #3 – page 11.

1. All secondary conductor installations governed by the City of New York Electrical Code – latest edition, regardless of voltage characteristics, must obtain approval from PSEG LI prior to the commencement of work.

2. A maximum of 8 conductors are permitted, per phase, for the connection to 75 – 1,500 kVA padmount transformers.

3. All connections to the transformer secondary terminals shall be made with a 2-hole NEMA terminal lug. See illustration #3 – page 11.

4. Service conductors supplying 480Y/277 volts shall conform to the following specifications:

   a) Radial services shall be limited to supplying one meter or one main disconnect switch.

   b) Conductors shall be of type USE – 2, XHHW – 2, or RHW – 2.

   c) Isolated phase service run shall not exceed 50 feet.

   d) Services *up to 800 amperes* can be installed in metallic or non-metallic conduit in an integrated phase configuration.

   e) For services *above 800 amperes*, all secondary conductor runs between the transformer enclosure and the customer's meter or main disconnect switch shall be run in an isolated phase configuration in non-metallic conduit.

   f) Ground Fault Protection:

      - Services supplying multiple separately metered customers require a single main switch with ground fault protection as per NEC article 230-95.

      - Ground fault protection shall coordinate with PSEG LI's protection scheme and be approved by the Customer Planning Representative.

      - Services with switches sized at 1000 amperes or more shall have ground fault protection on those switches per NEC.

5. Service conductors supplying 208Y/120 volts shall conform to the following specifications:

   a) With the exception of Secondary Network Areas, only the following types of cable will be approved when properly installed in conduit, no exceptions will be allowed.

      - ♦ USE - 2, THW - 2, THWN - 2, XHHW - 2, and RHW - 2.

   b) For integrated phase configuration:

      - ♦ Metallic or non-metallic conduit may be utilized.
      - ♦ There is no limitation on the length of service run. It shall be determined by the customer/contractor with respect to the maximum allowable voltage drop.

   c) For isolated phase configuration:

      - ♦ Non-metallic conduit shall be used.
      - ♦ The service run shall not exceed 30 feet.

THREE PHASE PADMOUNTED TRANSFORMER SPECIFICATIONS

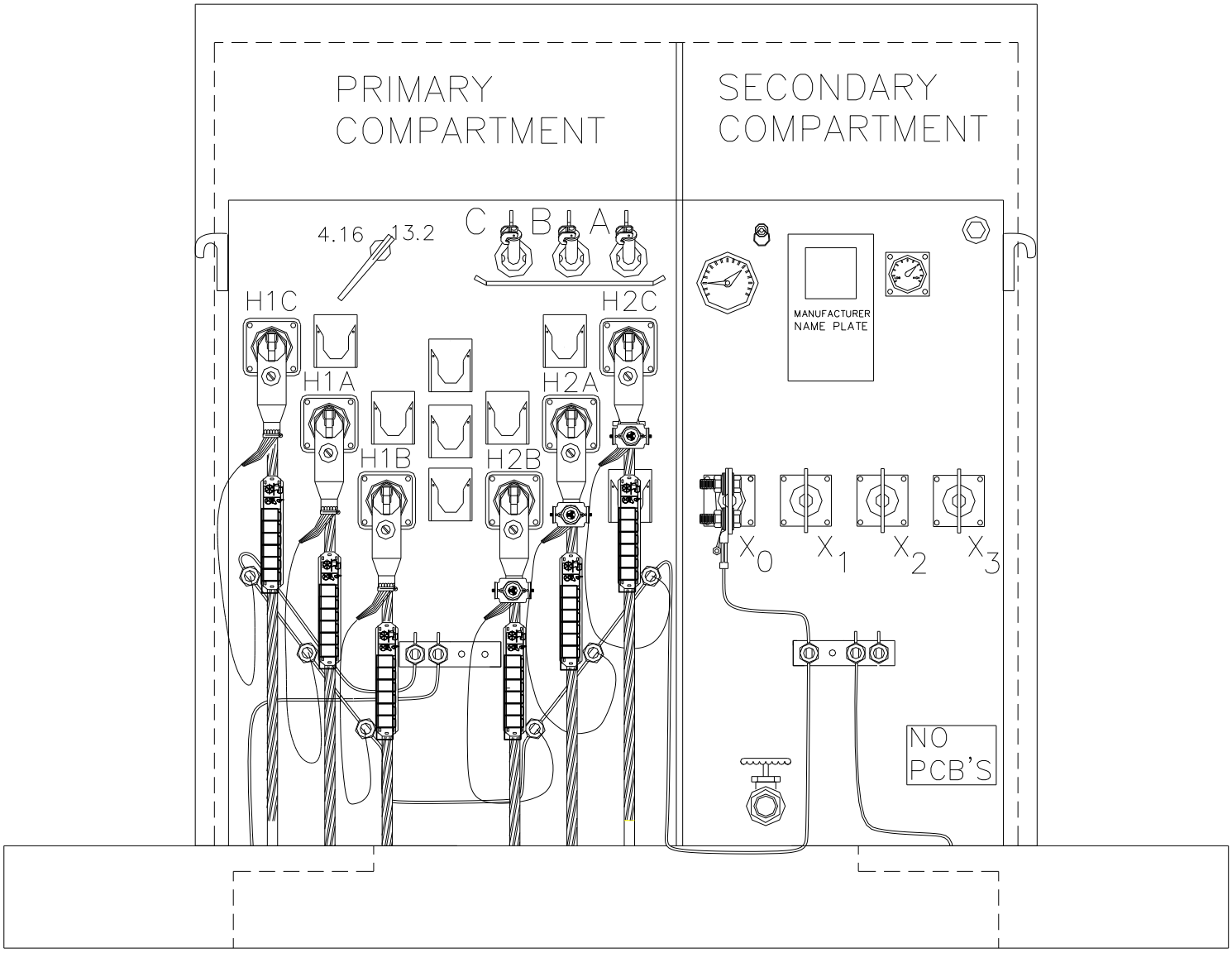


Illustration #2: Primary & Secondary Transformer Compartments

SECONDARY SPADE CONNECTION:

Description: Terminal Lug

1. Terminal Lug – Compression Connector – Tinned Aluminum or Copper. For up to 750 MCM compressed or concentric copper or aluminum secondary cable. NEMA 2-hole pad for ½ inch diameter bolts (stud size). Aluminum lug's bore shall be coated with oxide inhibiting compound and plugged. Connector shall be marked with manufacturer's name, cable size, type of conductor stranding and die index number. Connector barrel shall <u>not</u> have an inspection hole. Connector shall meet or exceed EEI-NEMA Standard TDJ-162, Class A-3.

   Follow manufacturer's compression tool and die recommendations for installing terminal connectors. For aluminum to copper connection, an additional bellville spring washer must be installed on the bolt side of the lug.

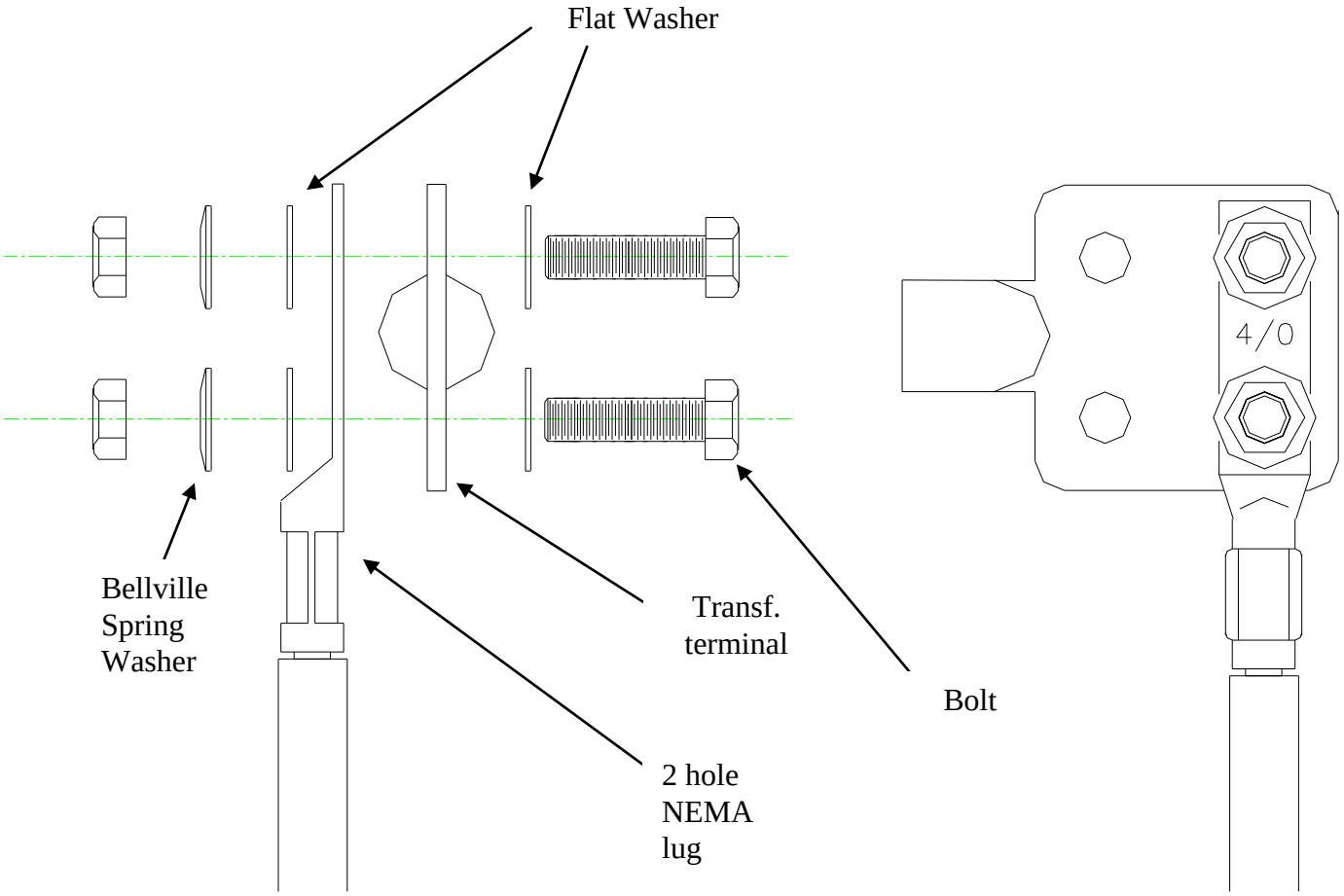


Illustration #3 – Secondary Spade Connection Detail

2. Lug to spade connection shall conform to the following:

   a) All copper components shall be tin or alloy plated.

   b) Wire brush aluminum conductor and apply oxide inhibitor compound to aluminum lug pad prior to connection to transformer spade. All excess compound must be removed after lug is secured. (Not required for tinned copper lugs.)

   c) Connect lug to transformer stud utilizing tinned or cadium plated silicon bronze or stainless steel hardware. Place concave side of bellville washer toward transformer stud. Recommended torque value for bolts: 480 in-lbs. for silicone bronze and 517 in-lbs. for stainless steel.

THREE PHASE PADMOUNTED TRANSFORMER SPECIFICATIONS

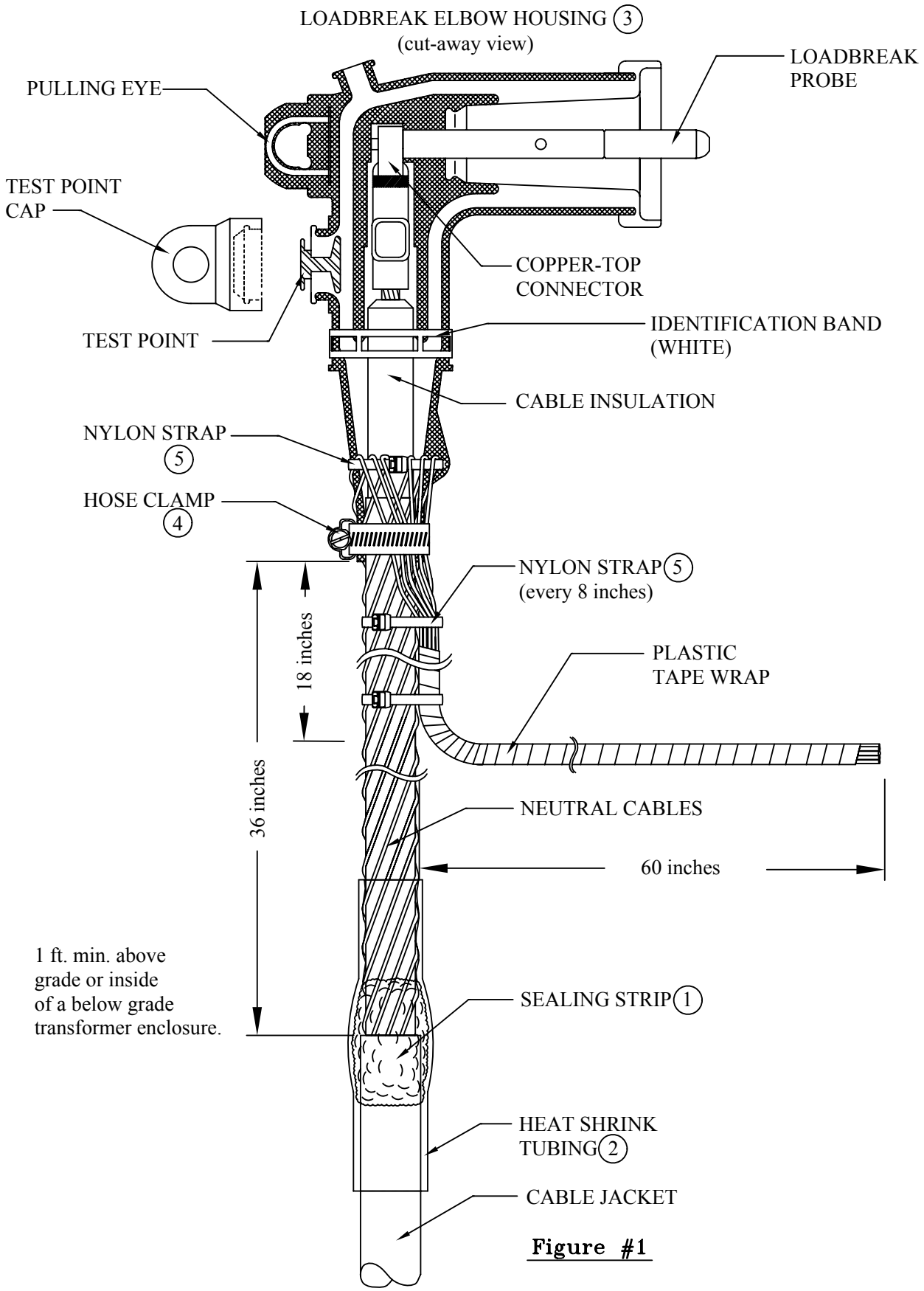


Figure #1

PSEG LONG ISLAND	REVISION	TERMINALS CABLE: PRIMARY	CONSTRUCTION STANDARD	
			DRAWN BY AH	
APPROVED BY / DATE	17. 06/14: REVISED TITLE BLOCK	INSTALLATION AND OPERATING INSTRUCTION 15kV 200 AMP LOADBREAK ELBOW TERMINATION FOR XLPE or EPR INSULATED Cu. OR AL. CABLE	NUMBER: 3722	SHEET No: 1 of 8
Richard Zambetti 7/22/14				REV: 17
		DO NOT REVISE PRINT BY ANY OTHER METHOD THAN AUTO-CAD PREPARED BY: PSEG LONG ISLAND T&D ENGINEERING		

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INSTALLATION INSTRUCTIONS

1. Train the cable to the final assembled position. Six feet of cable should be extended beyond the bushing to provide sufficient system neutral to attach to the system neutral bus. A short length of #2 Cu cable, EPR insulated with a neoprene jacket (ITEM ID. 199428) may be hylinked to the neutral in place of four feet of additional neutral required above. There should also be sufficient cable slack to provide adequate clearance for lifting and placing elbows on operating accessories such as standoffs and feed -thru devices.

2. Slide a 6 inch length of heat shrinkable tubing over the cable.

3. Strip the cable jacket to provide flexibility for elbow operation. In most situations approximately 3 feet of jacket back from the elbow can be removed. The jacket must be retained on all primary cable in contact with soil and for a minimum of 1 foot above finished grade.

4. Install a self locking nylon strap (ITEM ID. 101003) over the neutrals 13 inches below the center of the bushing and fasten securely. Using self locking nylon straps, clamp the neutrals firmly against the insulation shield approximately every 8 inches. Carefully unwind and bend the neutrals back. Do not twist.

5. Cut the cable off 13 inches above the nylon strap.

6. Make the cable cutbacks in accordance with the manufacturers installation instruction sheet included with each kit. See manufacturers instructions for the exact cutback lengths. A brief summary is as follows:

   a. Remove the insulation shield (semiconductor) by making a circumferential cut part way through the shield. Exercise extreme caution to avoid nicking the insulation beneath. Make several longitudinal cuts part way through the shield from the circumferential cut to the end. Again exercise care not to nick the insulation.

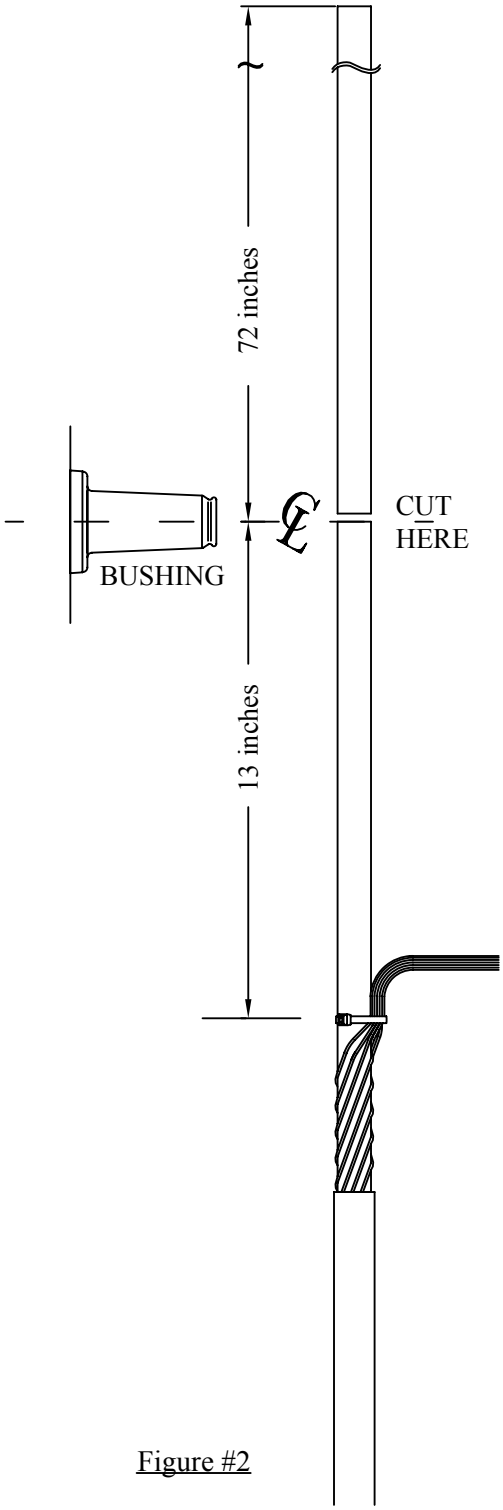


Figure #2

b. Prepare the cable end to accept the coppertop connector. Remove the insulation and conductor shield (semiconductor) from the end of the cable. Cut squarely being careful not to nick the conductor. Do not pencil. Apply a 1/8 inch Bevel to the end of the insulation. Fit the coppertop connector over the conductor. Check to make sure there is a 1/8 inch gap between the connector bottom and the insulation. This space is needed for expansion of the connector when it is crimped. Remove the connector and wipe the inhibitor grease off the conductor.

7. Wire brush (ITEM ID. 519030) the bare aluminum conductors. Immediately place the coppertop connector containing inhibitor grease on the conductor. Make sure the threaded hole in the coppertop connector faces the bushing. Crimp the connector in place using a tool and die combination listed in Table 1. Place one crimp centered between the connector knurl and connector bottom.

8. Clean the excess inhibitor grease from the coppertop connector. Wipe toward the threaded eye with a lint free cloth saturated with safety solvent (ITEM ID. 101374). Inhibitor residue can result in insulation damage and ultimate terminator failure.

Clean the exposed insulation surface with abrasive paper from the cleaning kits. (Item ID 101337) to remove all traces of semiconducting shielding and other foreign matter. Do Not Use Emery Cloth which contains conductive grit. Then wipe all exposed insulation surfaces clean with a lint free cloth saturated with safety solvent. Wipe towards the black semiconductor material without touching it. Be careful not to drag the black semiconductor material onto the clean insulation. In addition, clean the inside of the elbow housing, the cable entrance and the loadbreak bushing. [The solvent must be completely dry before applying any silicon grease.]

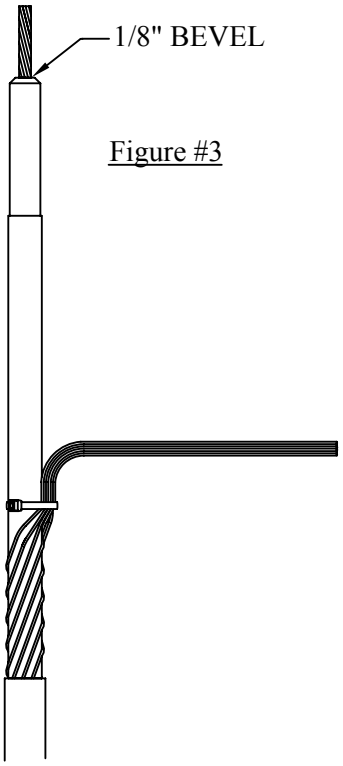


Figure #3

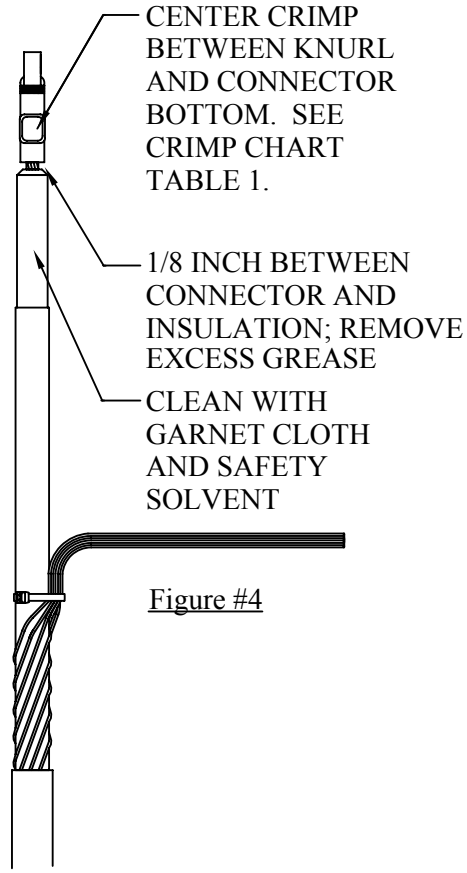


Figure #4

9. Apply a thin coat of silicone grease supplied with the elbow kit to the exposed cable insulation, the elbow housing, the elbow cable entrance and the loadbreak bushing. Place the elbow onto the cable. With a twisting motion, push the elbow onto the cable until the threaded eye of the coppertop connector is visible through the elbow housing.

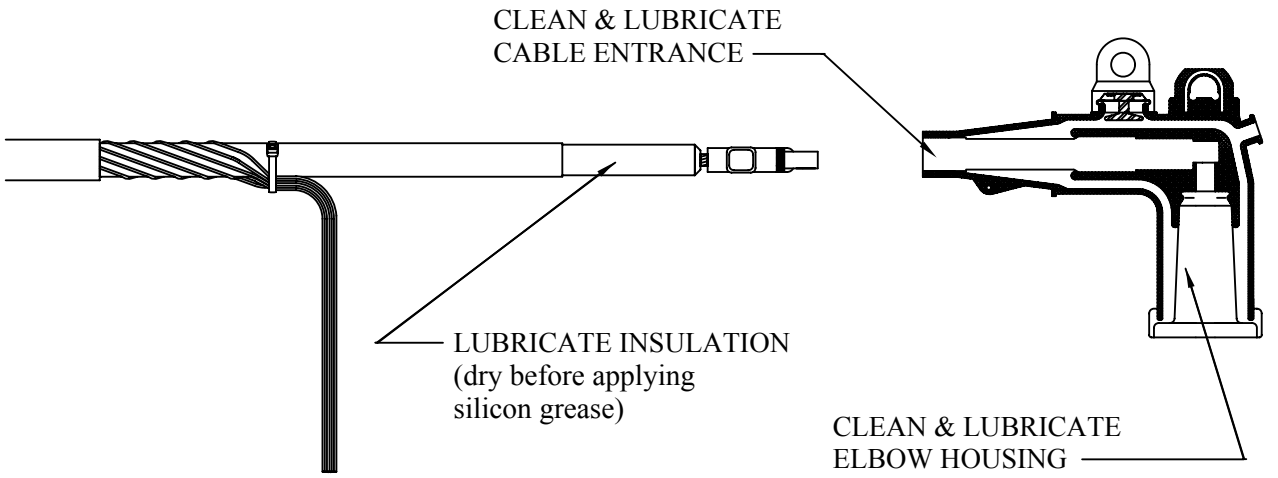
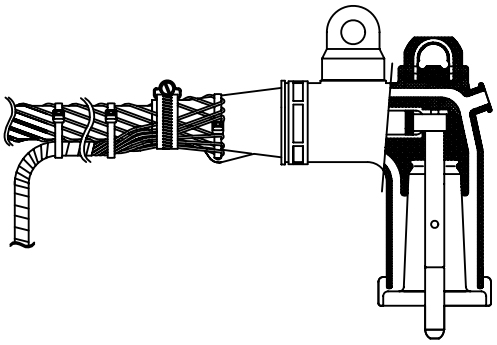
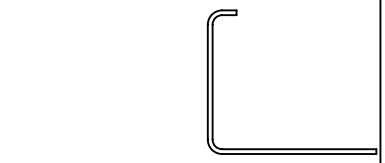


Figure #5

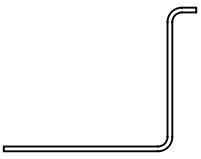
10. Insert the threaded end of the loadbreak probe into the elbow housing being careful not to contaminate the probe with silicone grease. By hand, thread the loadbreak probe into the threaded eye of the coppertop connector. Tighten the loadbreak probe with the torque applicator tool supplied with the elbow kit. Proper torque is applied when the torque applicator bends 180 degrees from its original shape. Discard the torque applicator. Do not reuse. As an alternative, one can use 15/25 kV probe installation tool made by Speed Systems (LPW 1525).

Probe installation tool may also be used to tighten the probe. After threading the probe into the threaded eye by hand, attach the installation tool to the probe and tighten until the tool click once.





TORQUE APPLICATOR
BEFORE TIGHTENING PIN



TORQUE APPLICATOR
AFTER TIGHTENING PIN

Figure #6

11. Bring the neutrals onto the elbow cable entrance. SEE FIGURE 1. Install a locking nylon strap over the neutrals and through the round eyelet at the base of the elbow. Bend the neutrals back over the nylon strap and install a hose clamp (ITEM ID. 121189) over both layers of neutral and the cable entrance. Tighten the hose clamp slowly until it is snug against the neutrals. Do Not Over Tighten. Gather the loose ends of the individual strands and form them into a parallel bundle of wires. Do Not Twist them tightly together; the individual strands will remain more flexible if not twisted together. Apply one half-lap layer of plastic tape to the last five feet of bundled neutral wire strands. Then, connect them to the neutral bus.

12. Apply (2) wraps of the sealing strip (ITEM ID. 185003) over the neutral wires at the point were the neutral wires come out from under the cable jacket.

13. Center the heat shrink tube over the sealing strip. Apply heat to the heat shrink tube evenly until it has fully contracted.

OPERATING INSTRUCTIONS

Before Loadmake or Loadbreak Operation:

Area must be clear of obstructions or contaminants that would interfere with the operation of the loadbreak elbow. This position should allow the operator to establish firm footing and enable the operator to grasp the shotgun stick securely, maintaining positive control over the movement of the loadbreak elbow before, during and directly after the operating sequence. Do not connect two different phases of a multi-phase system. Before closing any RUD loop, use an approved phasing tool to make sure both ends are the same phase. Do not operate a loadbreak elbow on a bushing insert by hand.

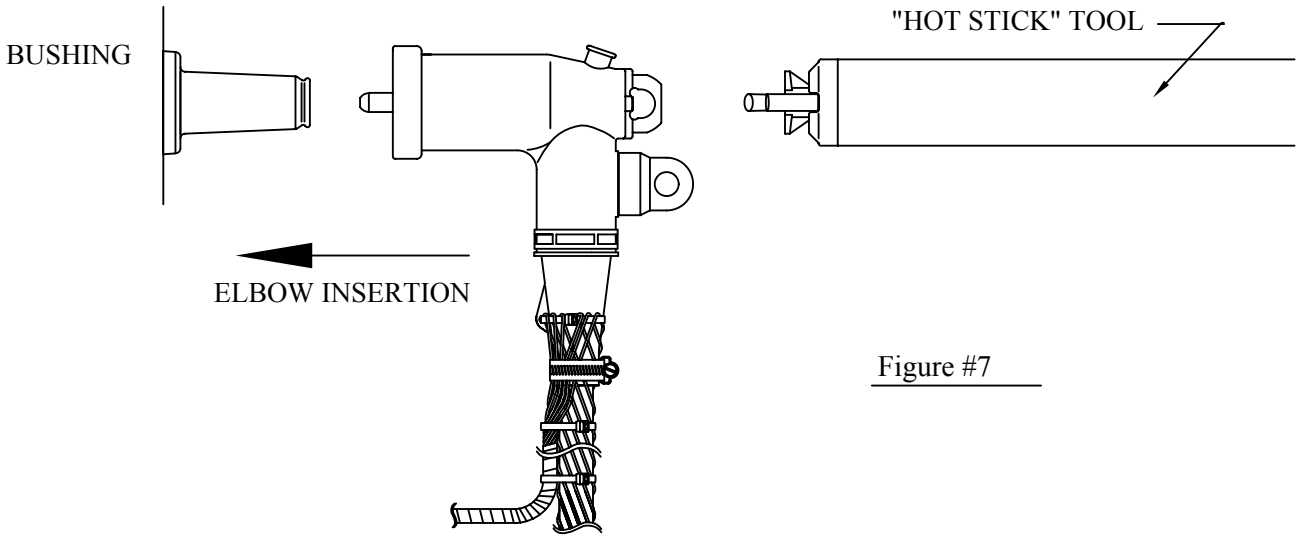


Figure #7

Loadmake Operation

1. Area must be clear of obstructions or contaminants that would interfere with the operation of the loadbreak elbow.
2. Securely fasten a shotgun stick to the pulling eye.
3. Place the loadbreak elbow over the bushing, inserting the load break probe into the bushing until the first slight resistance is felt. Resistance is felt when the arc follower portion of the loadbreak probe first meets the female contact of the bushing.
4. Immediately thrust the elbow onto the bushing with a fast, firm, straight motion, with sufficient force to latch the elbow to the bushing.

Fault Close

1. Do not operate the elbow on known faults.

Loadbreak Operation

1. Securely fasten a shotgun stick to the pulling eye.
2. To break surface friction between the elbow and the bushing, without exerting any pulling force, slightly rotate the loadbreak elbow clockwise while watching the bushing base. (Caution: If the base moves freely, do not turn the loadbreak elbow counterclockwise. The bushing may not be tightly seated.)
3. Withdraw the loadbreak elbow from the bushing with a fast, firm, straight motion, being careful not to place the elbow near a ground plane.
4. Place the loadbreak elbow on an appropriate accessory device.

NOTES:

1. New Construction
   The loadbreak elbow and bushing insert must be installed as a matched set from the same manufacturer.

2. Maintenance
   In existing installations, where routine (non-fault condition / non-loadbreak elbow failure) jobs are in progress, any loadbreak elbow found to be in good condition may be left in service. The existing elbow may be reinstalled into a new loadbreak bushing with no elbow replacement.

For field conditions where a loadbreak elbow experiences a fault or obvious failure, the elbow and bushing must be replaced with new components.

Additional situations where loadbreak elbow connector replacement is recommended:

a. when a faulted elbow is found to have an aluminum compression lug, replace all three phases.

b. when an elbow in an enclosure is found to be damaged, deformed or swollen.

c. when an elbow is not imprinted with the 8.3 / 14.4 kV rating and is not accordingly marked with the white and black bands around the cable entrance portion of the elbow.

2. Refer to CS 3727 for the loadbreak bushing insert installation instructions.

3. DIFFICULT REMOVAL SITUATIONS:
   When difficulty may be expected in the removal of a loadbreak elbow, a twisting movement in conjunction with greater than normal pulling force is often required to break the elbow free. It is imperative that in these removal situations an elbow "clam-shell tool" (ITEM ID. 551308) be used to insure positive leverage on the entire upper elbow body.

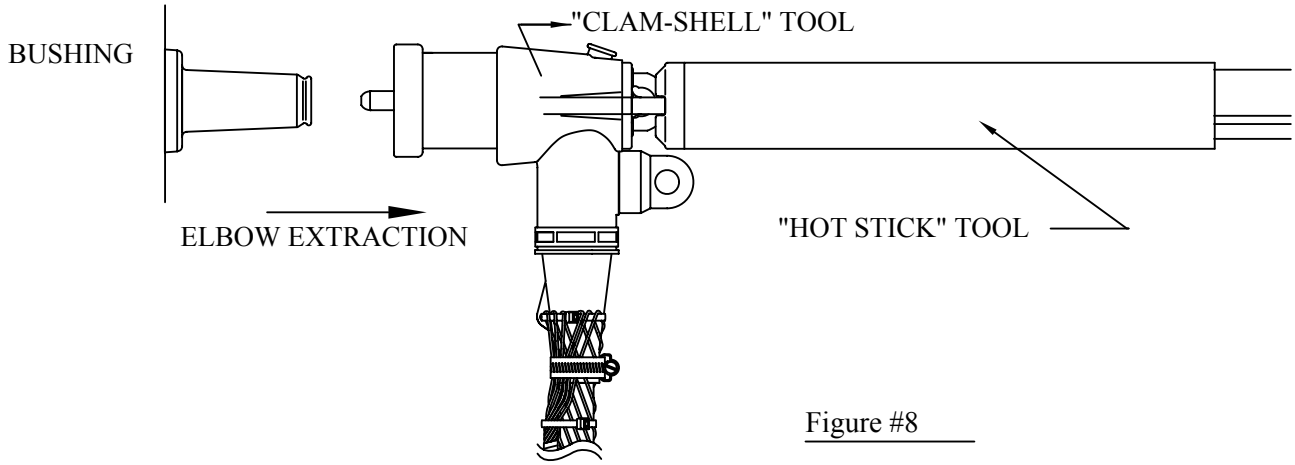


Figure #8

BILL OF MATERIAL

ITEM	DESCRIPTION	QTY.	ITEM ID.
1	SEALANT STRIP	+	185003
2	TUBING, HEAT SHRINKABLE, 1.5 - 0.7" RECOVERED I.D.	+	197304
3	TERMINATOR L/B ELBOW # 2 AWG W/BUSHING INSERT	+	160112
	TERMINATOR L/B ELBOW # 1/0 AWG W/BUSHING INSERT	+	160114
	TERMINATOR L/B ELBOW # 3/0 AWG W/BUSHING INSERT	+	160115
4	HOSE CLAMP, STAINLESS STEEL	+	121189
5	NYLON STRAP, SELF LOCKING	+	101003

TABLE 1
CRIMP CHART

Conductor Size	Insulation Diameter (In.) Min. - Max **	Conn. O.D.	Elbow Term. With Bush. Insert	Tool	Die	No. of Crimps
# 2 Cu. or Alum.	0.755 - 0.815	5/8"	Item I. D. 160112	Y34A Y35 Y46*	A243 U243 U243	1
# 1/0 Cu. or Alum.	0.830 - 0.890	5/8"	Item I. D. 160114	Y34A Y35 Y46*	A243 U243 U243	1
# 3/0 Cu. or Alum.	0.925 - 0.985	5/8"	Item I. D. 160115	Y34A Y35 Y46*	A27AR U27ART U27ART	1

* Use with P - UADP Adapter

** Compressed Conductor with 220 Mil. Insulation

+ AS REQUIRED
* MISSING DIGITS BY TYPE OR SIZE

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Loadbreak Bushing Insert Installation Instructions

Precautions

1) All apparatus must be de-energized during the installation of the loadbreak bushing insert. Inspect the loadbreak bushing insert and bushing well for damage.

2) Read and follow all manufacturers instructions supplied with the loadbreak bushing inserts.

Replacement Requirements

3) For field conditions where a loadbreak elbow experiences a fault or obvious failure, the elbow and bushing must be replaced with new components from the same manufacturer. Bushing inserts and loadbreak elbows are stocked as a set from the same manufacturer.

In existing installations, where routine (non-fault condition / non-Loadbreak elbow failure) jobs are in progress, any loadbreak elbow found to be in good condition may be left in service. The existing elbow may be reinstalled into a new loadbreak bushing with no elbow replacement.

Additional situations where loadbreak elbow connector replacement is recommended:

a. when a faulted elbow is found to have an aluminum compression connector (non-coppertop), replace all three phases.

b. when an elbow in an enclosure is found to be damaged, deformed or swollen.

c. when elbow is not imprinted with the 8.3 / 14.4 kV rating and is not accordingly marked with the white and black bands around the cable entrance portion of the elbow.

d. When the temperature of the elbow terminator is more than 20°C above the ambient temperature of the adjacent cable.

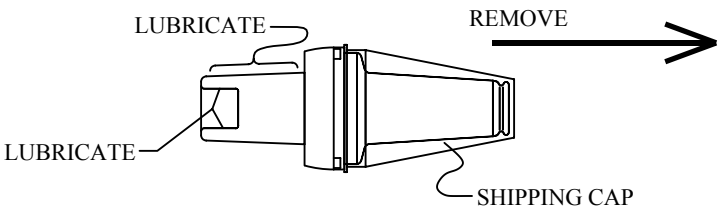
Refer to CS-3722 for the loadbreak elbow installation instructions.

Installation Instructions

Clean and Lubricate

4) Inspect the apparatus bushing well to be sure it is dry and free from all contaminants. Contamination will cause electrical failure.

5) Remove the protective shipping cap from the bushing insert. Lubricate the Bushing well interface area of the bushing insert with the supplied lubricant or using (ITEM ID.101045). Do not use any other greases or silicone products as a substitute.



PSEG LONG ISLAND	REVISION	CABLE JOINTS: PRIMARY	CONSTRUCTION STANDARD		
	6. 06/14: UPDATE NOTES & REVISED TITLE BLOCK	INSTALLATION INSTRUCTIONS 15 kV, 200 AMP LOADBREAK BUSHING INSERT	DRAWN BY AH		
APPROVED BY / DATE			NUMBER	SHEET No	REV
7/22/14			3727	1 of 5	6
		DO NOT REVISE PRINT BY ANY OTHER METHOD THAN AUTO-CAD PREPARED BY: PSEG LONG ISLAND T&D ENGINEERING			

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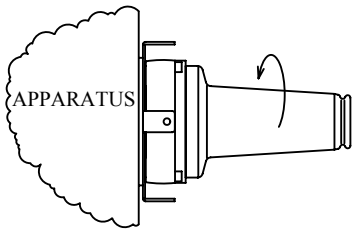
Installing Existing Older Loadbreak Bushing Insert Without an Internal Hex Broach

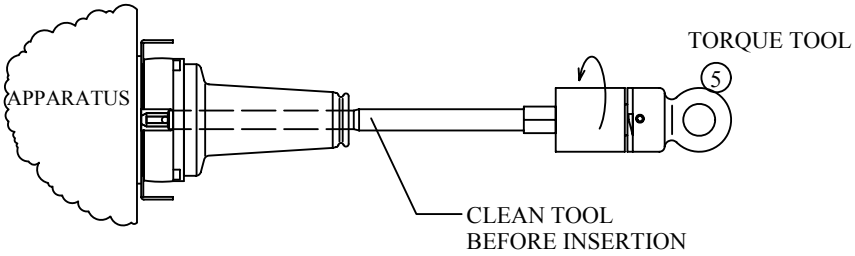
6a) Place the threaded end of the bushing insert in the apparatus bushing well. Hand tighten the bushing insert in a clockwise direction until it bottoms. Do not over tighten. This may cause the bushing well stud to snap off.



NOTE:
De-energized cleaning and lubricating instructions apply to existing bushings as well as newly installed bushing devices. On existing equipment the reuse of 15 kV bushings implies that the bushings be free of contaminants and properly lubricated with silicone grease.

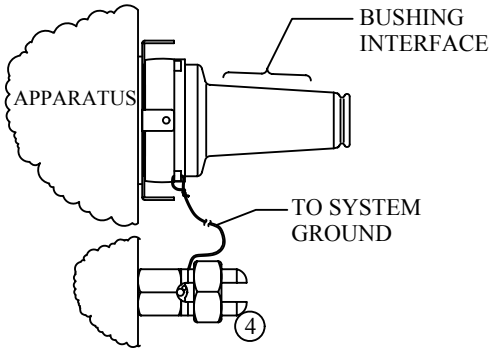
Alternate Method for Installing Newer Style Loadbreak Bushing Insert with an Internal Hex Broach Compatible with the 200 AMP Insert Torque Tool - ITEM ID. 160105

6b) Place the threaded end of the bushing insert into the apparatus bushing well. Insert the torque tool in the bore of the bushing insert. Turn the tool slightly to engage the hex broach. Insert a suitable rod through the eye of the tool and turn in a clockwise direction until the tool begins to ratchet and makes an audible click. Remove the torque tool from the bushing insert. The torque tool tightens the bushing to approximately 10 to 15 FT-LBS.



Connect Drain Wire Between Bushing Body and System Ground

7) Push a length of neutral strand (or a 14 AWG copper wire) through one of the grounding eyes on the bushing insert. Make a small loop and twist tight taking care not to damage the grounding eye. Connect the free end of the grounding wire to the ground pad lug (ITEM ID. 124138) of the apparatus. The grounding wire should be installed in such a manner so as not to contact the bushing interface or adjacent bushing interfaces or interfere with the placement of accessories on nearby parking stands.



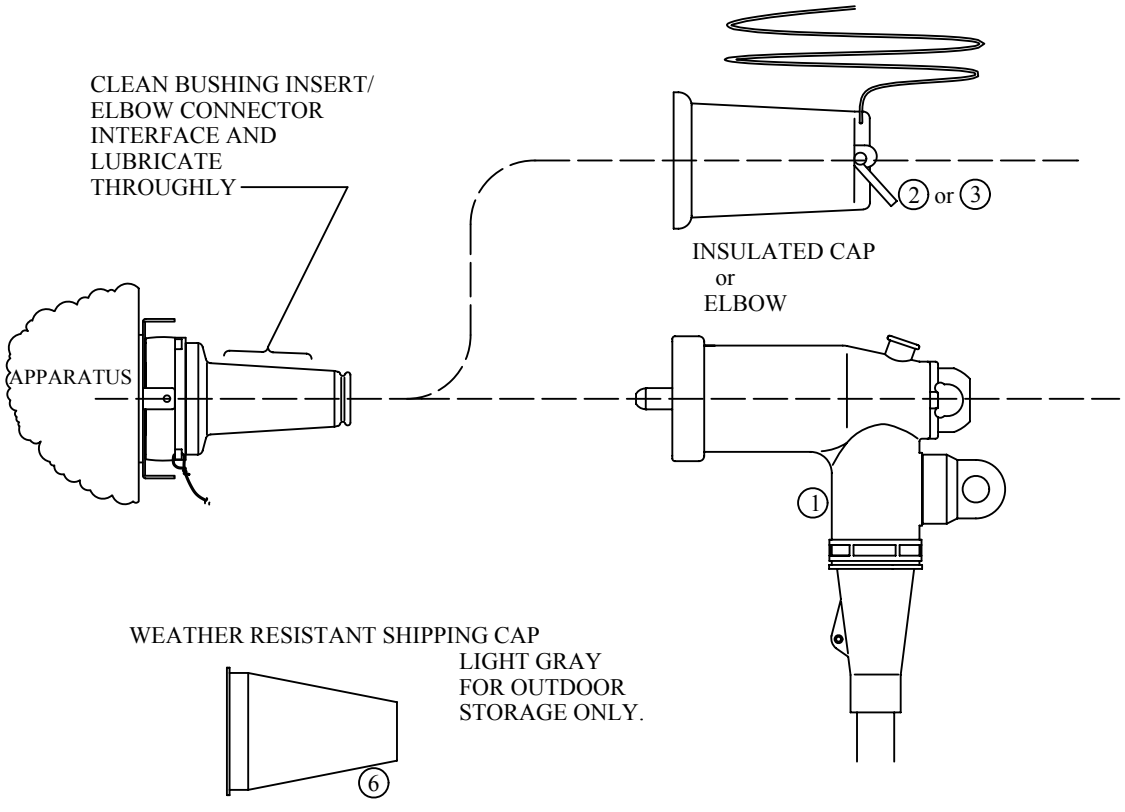
Cover Loadbreak Bushing Insert

8) Do not leave the bushing interface exposed. Cover with the appropriate mating product as follows:

Using a clean cloth, thoroughly wipe the bushing interface clean of contaminants and lubricate with the supplied lubricant. Do not apply lubricant to the arc quenching material inside the bushing insert. Install load break elbow or insulated cap on all bushing inserts left energized. Refer to CS-3722 for the loadbreak elbow installation instructions, loadmake and loadbreak operating instructions. If the bushing insert is not energized and is to be stored outdoors, install a new light gray weather resistant shipping cap ITEM ID 160024. Do not energize or submerge the apparatus with the shipping cap on the bushing insert. This is a protective cap which is not insulated or water tight and only intended to keep the bushing surfaces clean during storage, handling and installation.

Attention: Some newer style load break bushing inserts may be equipped with a latch indicator ring that serves as a visual indicator to verify the mating component is properly seated on the bushing insert. Once the mating component has been properly installed on the bushing insert, the yellow or white ring should be completely covered. If any yellow or white is visible, the load break elbow or protective cap must be completely installed or "latched" before energizing to assure a proper connection.

Also, some new bushing interfaces are red in color. This is to indicate it is a 15KV rated bushing and to distinguish it from bushings rated for higher voltages.



CAUTION: NEVER ENERGIZE WITH SHIPPING CAP INSTALLED !

REVISION		CABLE JOINTS: PRIMARY	CONSTRUCTION STANDARD DRAWN BY AH		
6. 06/14: UPDATE NOTES & REVISED BLOCK			NUMBER	SHEET No	REV
prepared by PSEG LONG ISLAND T&D ENGINEERING		INSTALLATION INSTRUCTIONS 15 kV, 200 AMP LOADBREAK BUSHING INSERT	3727	3 of 5	6

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Bushing Insert Removal

9) De-energize apparatus, verify apparatus is de-energized and install grounds

10) Remove mating product and place in a stand-off device or in a clean, dry location.

11) Remove ground wire.

12) Use a 5/16" inch hex drive tool, torque tool or a strap wrench to remove.

a. If a hex drive tool or torque tool is used, insert the drive into the bushing insert. Turn the tool slightly to engage the hex broach. Turn counter-clockwise to remove.

b. If a strap wrench is used, wrap around the collar of the bushing insert. Turn counter-clockwise to remove. Take care not to damage the bushing insert interface during this procedure.

BILL OF MATERIAL

ITEM	DESCRIPTION	QTY.	ITEM ID.
1	BUSHING INSERT 200A WITH LOAD BREAK ELBOW #2 AWG	+	160112*
	#1/0 AWG	+	160114*
	#3/0 AWG	+	160115*
2	INSULATING CAP WITHOUT BUSHING INSERT	+	160020
3	INSULATING CAP WITH BUSHING INSERT	+	160023
4	GROUND PAD LUG	+	124138
5	TORQUE TOOL LOADBREAK BUSHING INSERT INSTALLATION (200 AMP)	+	160105
6	SHIPPING CAP, WEATHER RESISTANT, LIGHT GRAY	+	160024

* BUSHING & ELBOW ARE PACKAGED AS ONE KIT

+ AS REQUIRED
* MISSING DIGITS BY TYPE OR SIZE

REVISION

CS # 3727 REV. 6
SHEET # 5 of 5

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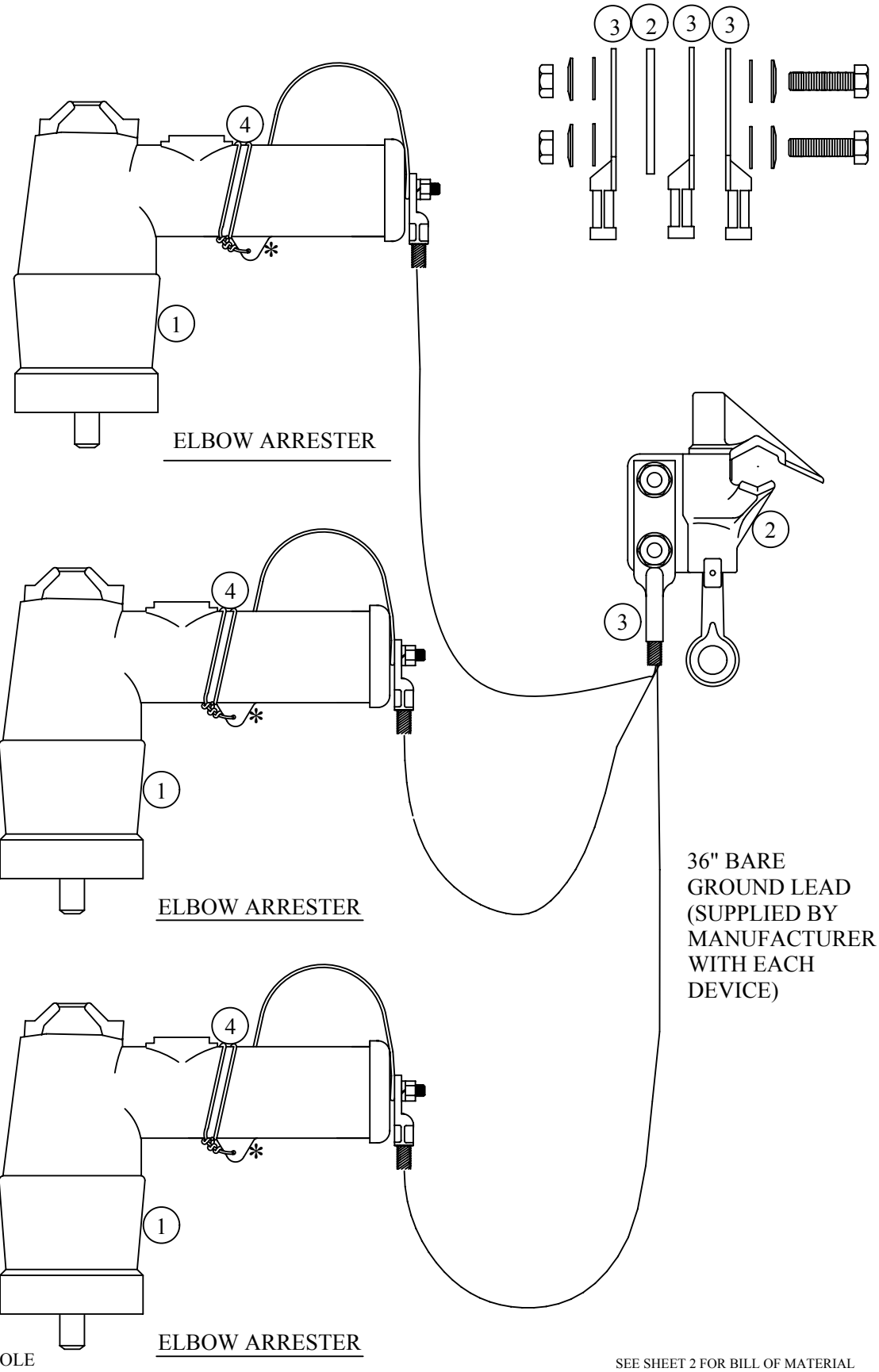

* DRAINWIRE EYEHOLE

SEE SHEET 2 FOR BILL OF MATERIAL

nationalgrid	LIPA Long Island Power Authority	REVISION	TRANSFORMER AND EQUIPMENT: GENERAL	CONSTRUCTION STANDARD DRAWN BY AH		
APPROVED BY / DATE	APPROVED BY / DATE	3. 08/12: REVISED TITLE BLOCK	SURGE PROTECTION 3 PHASE RADIAL ONLY	NUMBER	SHEET No	REV
Richard Zumbo 09/14/12	W Krauch 10/12/12	DO NOT REVISE PRINT BY ANY OTHER METHOD THAN AUTO-CAD PREPARED BY: National Grid Engineering & Survey, Inc.		4028	1 of 5	3

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BILL OF MATERIAL

ITEM	DESCRIPTION	QTY.	ITEM ID.
1	Elbow Arrester with Ground Lead (with bushing*)	3	105214
2	Hot Line Clamp, Copper, (Includes Hardware)	1	121096
3	Lug, #2 Copper (2 Hole) (One Lug for Each Ground Lead)	3	143070
4	Wire, #10 Bare Solid Copper (See DM&S Bulletin 07-05 for Exceptions)	60"	199010

* Use of elbow arrester without bushing (Item ID 105213) implies that arrester will be inserted into an elbow bushing on the transformer.

+ AS REQUIRED
* MISSING DIGITS BY TYPE OR SIZE

REVISION

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http://us2infonet/sites/Procedure

PREPARATION OF DEVICES

A. Triple surge arrester elbows, preparation for open point application.
(See Sheet 1)

1. Remove elbow arresters from packages.
   Each item is packed with 36" length of bare #4 extra-fine stranded copper ground lead. (Equivalent to a #2 19 strand copper wire)

2. Using the 20" lengths of #10 bare solid copper wire secure it to the drain wire eyehole on the body of the surge arrester upper body and secure them by interlocking the last wrap around itself (looping it under and around itself). Leave a short slack section as shown in the diagram on page one. Finally, attach the free end to the surge arrester ground stud together with the ground lead lug. Tighten the ground stud nut to 4 to 8 foot pounds torque.

3. Repeat step 2 for the second and third elbow arrester devices.

4. Hypress the free ends of the 36" lenght(s) of bare #4 extra-fine stranded ground lead to each of the #2 two hole lug(s).

5. Lubricate bushing interface of arrester with lubricant supplied.

6. See DM&S 07-05 or exceptions.

IMPORTANT NOTES FOR RADIAL APPLICATION:

NOTE 1. Use Item ID 105213 single elbow surge arresters without bushing for energized installations, where bushings already exist on the transformer.
Discard existing dead-end caps.

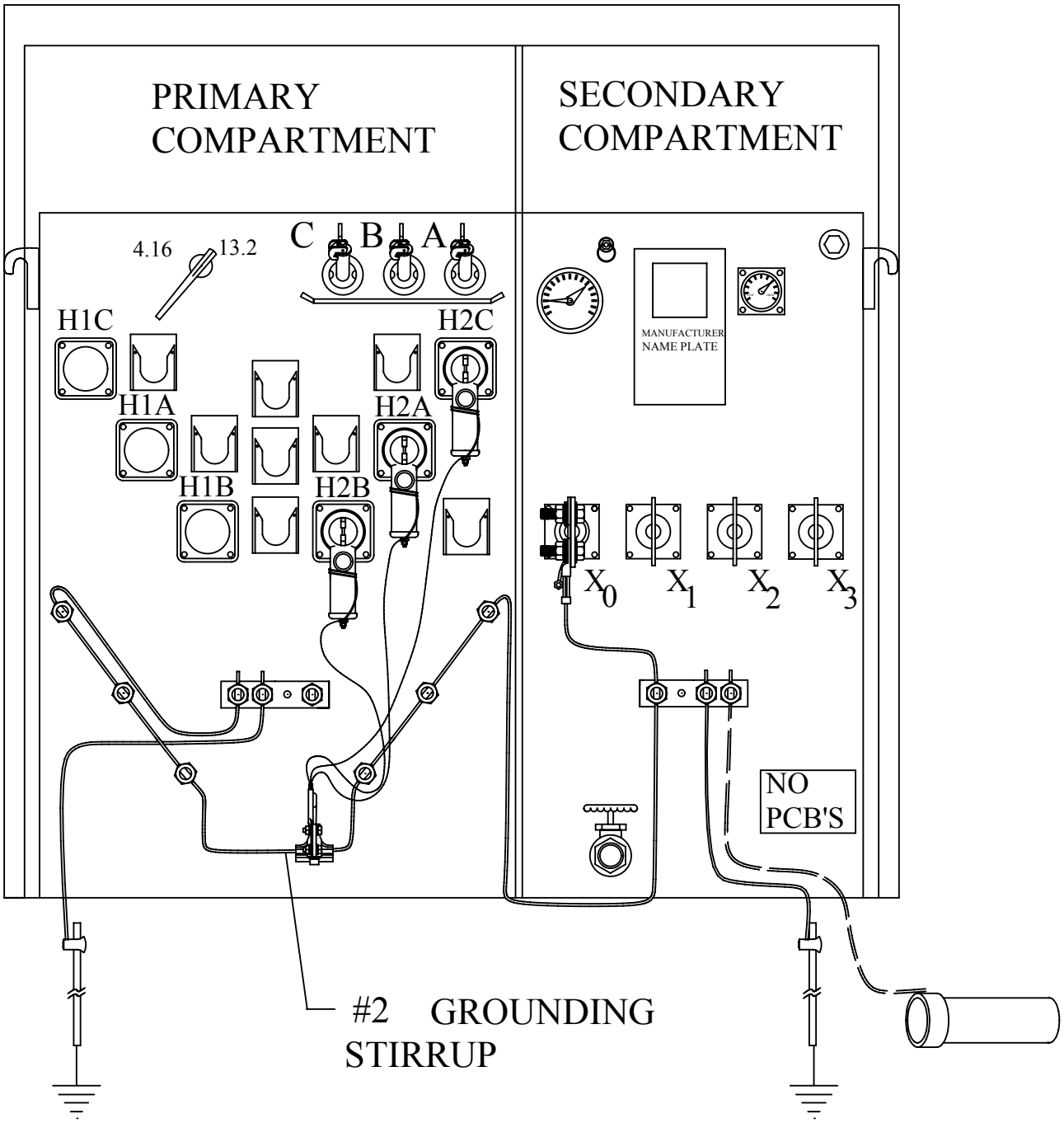
NOTE 2. Use only Item ID 105214 single elbow surge arresters with bushings for new radial installations, where new bushings are required to install surge arresters onto transformer.

INSTALLATION OF DEVICES

A. Elbow Arrester Installation On Energized Radial Feed Transformer (Endpoint).

NOTE: UTILIZE APPROPRIATE ENERGIZED/HOT STICK PROCEDURES FOR ALL INSTALLATION AND REMOVAL OPERATIONS.

1. Open the transformer enclosure and identify visually the location of the transformer enclosure grounding point.
2. Using hot stick tool, install the elbow arrester's hotline clamp at the grounding point.
3. Remove the dead end caps from the transformer bushings. The dead end caps are no longer required.
4. Install the elbow arrester device onto the open bushing.
5. Close and lock the transformer enclosure.



GROUNDING DETAILS

RADIAL FEED TRANSFORMER (END POINT)

REVISION		TRANSFORMER AND EQUIPMENT: GENERAL	CONSTRUCTION STANDARD DRAWN BY AH		
	3. 08/12: REVISED TITLE BLOCK	SURGE PROTECTION 3 PHASE RADIAL ONLY	NUMBER	SHEET No	REV
LONG ISLAND POWER AUTHORITY prepared by National Grid Engineering & Survey, Inc.			4028	5 of 5	3

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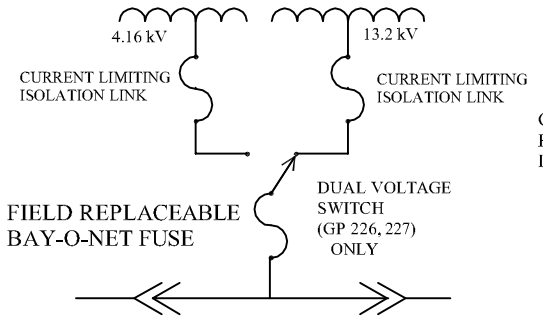
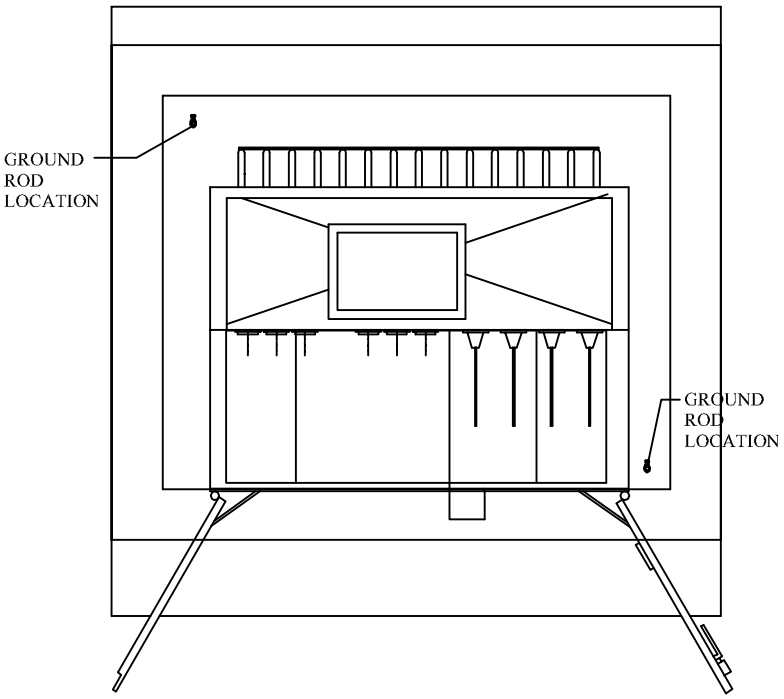
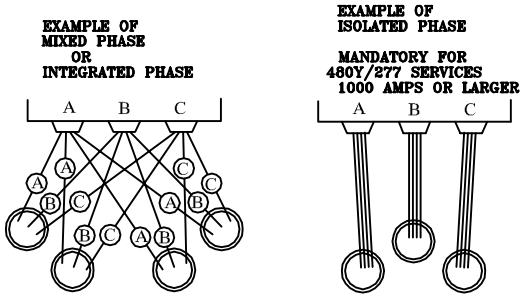
ONE LINE DIAGRAM

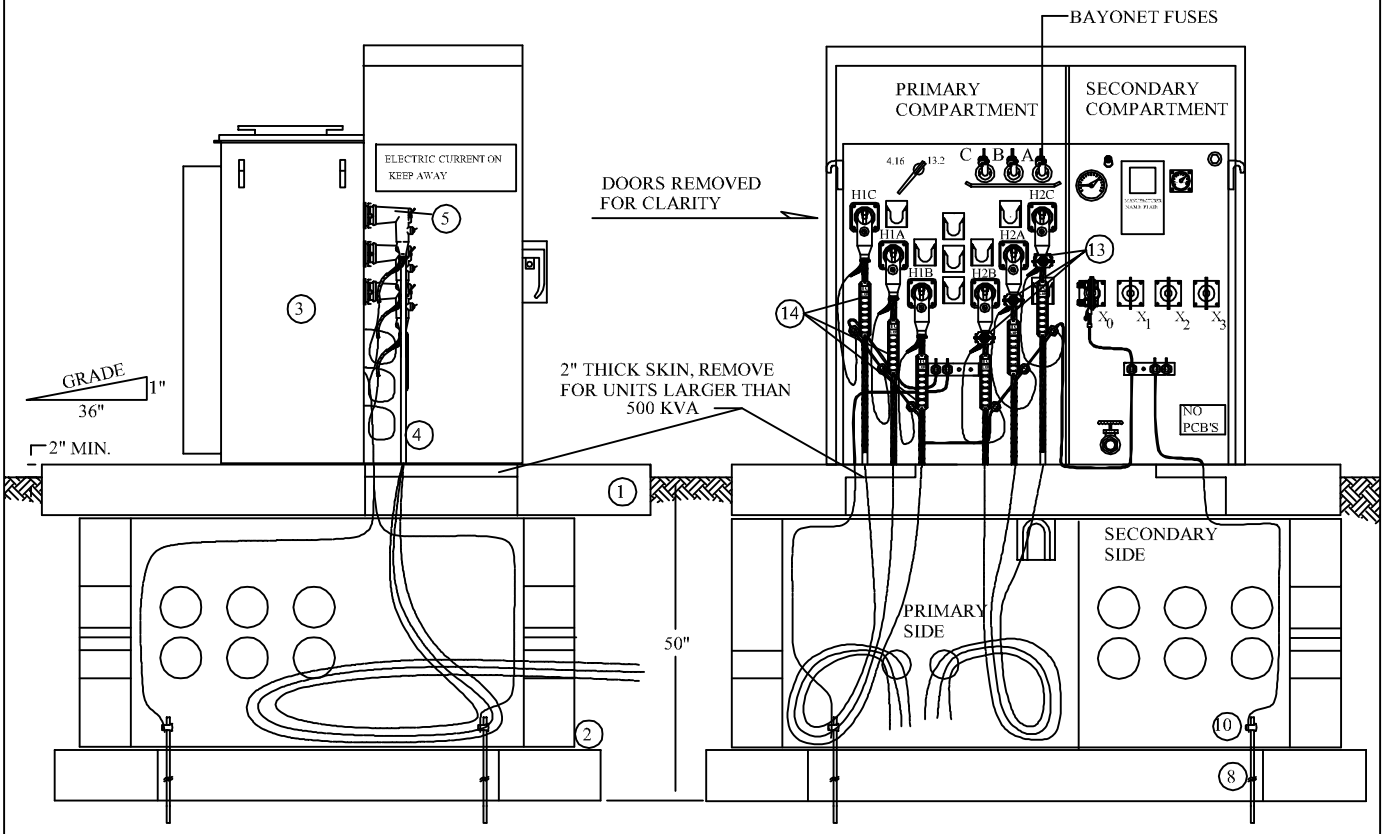




SECONDARY CABLE INSTALLATION



SEE SHEET 5 FOR GROUNDING DETAILS



nationalgrid	LIPA Long Island Power Authority	REVISION	TRANSFORMER INSTALLATION AND HOUSING CONSTRUCTION: PAD AND ENCLOSURE HOUSED	CONSTRUCTION STANDARD DRAWN BY AH	
APPROVED BY / DATE	APPROVED BY / DATE	11.08/11: ADDED ITEM ID	3 PHASE 4kV OR 13kV "DEAD FRONT" METAL CLAD TRANSFORMER 75-1500KVA FOR PRIMARY DISTRIBUTION	NUMBER / SHEET No / REV	
08/10/11	08/18/11	DO NOT REVISE PRINT BY ANY OTHER METHOD THAN AUTO-CAD	PREPARED BY: National Grid Engineering & Survey, Inc.	5362	1 of 6 / 11

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BILL OF MATERIAL

ITEM	DESCRIPTION	QTY.	ITEM ID.
1	CONCRETE PAD, RE-ENFORCED, PRE-CAST (8' X 8' X 8")	1	131117
2	FOUNDATION AND FOOTING, RE-ENFORCED CONCRETE, PRECAST	1	131116
3	TRANSFORMER, THREE PHASE - PAD MOUNTED (SEE DA-50005)	1	922***
4	PRIMARY CABLE, 15kV, 3-2/C 1/0 AL. {LIPA INSTALLATION}	+	199984
5	PRIMARY TERMINATIONS / SURGE PROTECTION " "		
	TERMINATOR, LOADBREAK 1/0 W/BUSHING " "	6	160114
	LOOP INSTALLATIONS WITH FEED-THRU TRANSF. " "		
	TERMINATOR, LOADBREAK 1/0 W/BUSHING " "	6	160114
	STAND OFF BUSHING " "	3	160090
	DEAD END CAPS (WITHOUT BUSHING) " "	3	160020
	OR		
	RADIAL INSTALLATION: {CUSTOMER INSTALLATION}		
	TERMINATOR, LOADBREAK #2 W/BUSHING " "	3	160112
	ELBOW SURGE ARRESTER W/BUSHING (SEE CS-4028) "	3	105214
6	SECONDARY CABLE, COPPER, 600 V EPR:	+	199***
	NOTE: FOR ALL 480 VOLT SECONDARY SERVICES CABLE INSULATION MUST BE TYPE "USE-2" OR "XHHW-2", RHW-2, THWN-2		
7	TERMINAL CONNECTOR, 2-HOLE NEMA:		
	4/0 AWG STRANDED	+	143087
	500 KCM STRANDED	+	143098
8	GROUND ROD, 1/2" X 8'	2	173007
9	TERMINAL LUG, #4 AWG STR., #2 AWG SOL., 2-HOLE NEMA	1	143066
10	CONNECTOR, GROUND ROD	2	121065
11	WIRE SOLID #2 AWG, COPPER TINNED *	30'	199265
12	CONNECTOR, GROUND, THREAD. LUG (#2 TO 2/0 AWG STR.)	10	124138
13	FAULT INDICATOR, 400 AMP, 3 AMP RESET (LOOP FEED ONLY)	+	101400
14	IDENTIFICATION TAGS FOR PRIMARY CABLE (SEE CS-2030)	+	155***
15	NUT, JAM EVERDUR HEX, 1/2" X 13"	10	110198
16	WIRE SOLID #6 AWG, COPPER TINNED	+	199444

* #2 AWG BARE MAY BE SUBSTITUTED ON RADIAL INSTALLATIONS.

+ AS REQUIRED
* MISSING DIGITS BY TYPE OR SIZE

REVISION

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NOTES:

PRIMARY CABLE :

1. CABLES SHOULD HAVE 5 FT. OF SLACK INSIDE FOUNDATION. AS MUCH PHYSICAL SEPARATION AS POSSIBLE SHOULD BE GIVEN BETWEEN THE PRIMARY AND SECONDARY CABLES WITHIN THE FOUNDATION. PRIMARY CABLES SHALL ENTER FOUNDATION UNDER PRIMARY SIDE OF TRANSFORMER. SECONDARY CABLES SHALL ENTER UNDER SECONDARY SIDE OF TRANSFORMER ONLY.

2. INSTALL CURRENT RESET FAULT INDICATORS (ITEM ID 101400) ON OUTGOING CABLES IN LOOP INSTALLATIONS.

3. WHEN TERMINATING CABLE, SIX FEET OF CABLE SHOULD BE EXTENDED BEYOND THE THE BUSHING TO PROVIDE SUFFICIENT SYSTEM NEUTRAL TO ATTACH TO THE SYSTEM NEUTRAL BUS. A SHORT LENGTH OF #2 AWG COPPER CABLE EPR INSULATED WITH A NEOPRENE JACKET (ITEM ID 199428) MAY BE HYLINKED TO THE NEUTRAL IN PLACE OF FOUR FEET OF ADDITIONAL NEUTRAL REQUIRED ABOVE. THERE SHOULD ALSO BE SUFFICIENT CABLE SLACK TO PROVIDE ADEQUATE CLEARANCE FOR LIFTING AND PLACING ELBOWS ON OPERATING ACCESSORIES.

SECONDARY CABLE

4. ISOLATED PHASE CONSTRUCTION SHALL BE USED FOR ALL 480Y/277 VOLT SERVICES LARGER THAN 800 AMPS. FOR 800 AMPS SERVICES AND LESS, EITHER INTEGRATED OR ISOLATED PHASE IS ACCEPTABLE.

5. ISOLATED PHASE CONSTRUCTION SHALL NOT EXCEED 50 FT. FOR 480Y/277. FAILURE TO COMPLY WITH THIS REQUIREMENT WILL RESULT IN LOW VOLTAGE, PARTICULARLY UNDER HIGH LOADS, AND INDUCTIVE HEATING OF NEARBY METALLIC EQUIPMENT.

6. ALL ISOLATED PHASE INSTALLATIONS SHALL BE INSTALLED USING NON-METALLIC CONDUIT.

7. INTEGRATED PHASE CONSTRUCTION IS LIMITED TO ONE SET OF CABLES PER DUCT. (IE. ONLY ONE CABLE PER PHASE IN EACH DUCT)

8. ALL 480Y/277 VOLT SERVICES SHALL BE INSTALLED USING "USE-2", "XHHW-2", RHW-2, THWN-2 TYPE CABLE ONLY.

9. THREE PHASE 208Y/120 VOLT SERVICES SHALL BE INSTALLED USING INTEGRATED PHASE CONSTRUCTION, ONLY. IF ISOLATED PHASE CONSTRUCTION IS UNAVOIDABLE, CABLES MUST NOT EXCEED 30 FEET IN LENGTH AS A MAXIMUM DISTANCE.

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BONDING/GROUNDING: (SEE PAGE 5)

11. WITH #2AWG BARE TINNED COPPER WIRE, CONNECT EACH GROUND LUG LOCATED BELOW EACH PRIMARY BUSHING. CONTINUE THE #2 COPPER TO THE GROUND PAD. SEE GROUNDING DIAGRAM.

12. USING #2 AWG, BTN COPPER WIRE CONNECT THE SECONDARY NEUTRAL BUSHING TO THE RIGHT GROUND PAD, CONNECT THE TWO GROUND PADS TO ONE ANOTHER. SEE GROUNDING DIAGRAM.

13. INSTALL TWO GROUND RODS AND CONNECT ONE TO EACH GROUND PAD USING A MINIMUM OF #6 BARE COPPER WIRE. A #2 BARE COPPER MAY BE SUBSTITUTED FOR THE #6 AWG BARE COPPER WIRE IN SITUATIONS WHERE #6 AWG BARE COPPER WIRE IS NOT READILY AVAILABLE.

14. ATTACH THE CONCENTRIC NEUTRALS OF THE PRIMARY CABLES TO THE #2 AWG BTN COPPER WIRE (GROUND BUS) USING SPLIT BOLT CONNECTORS.

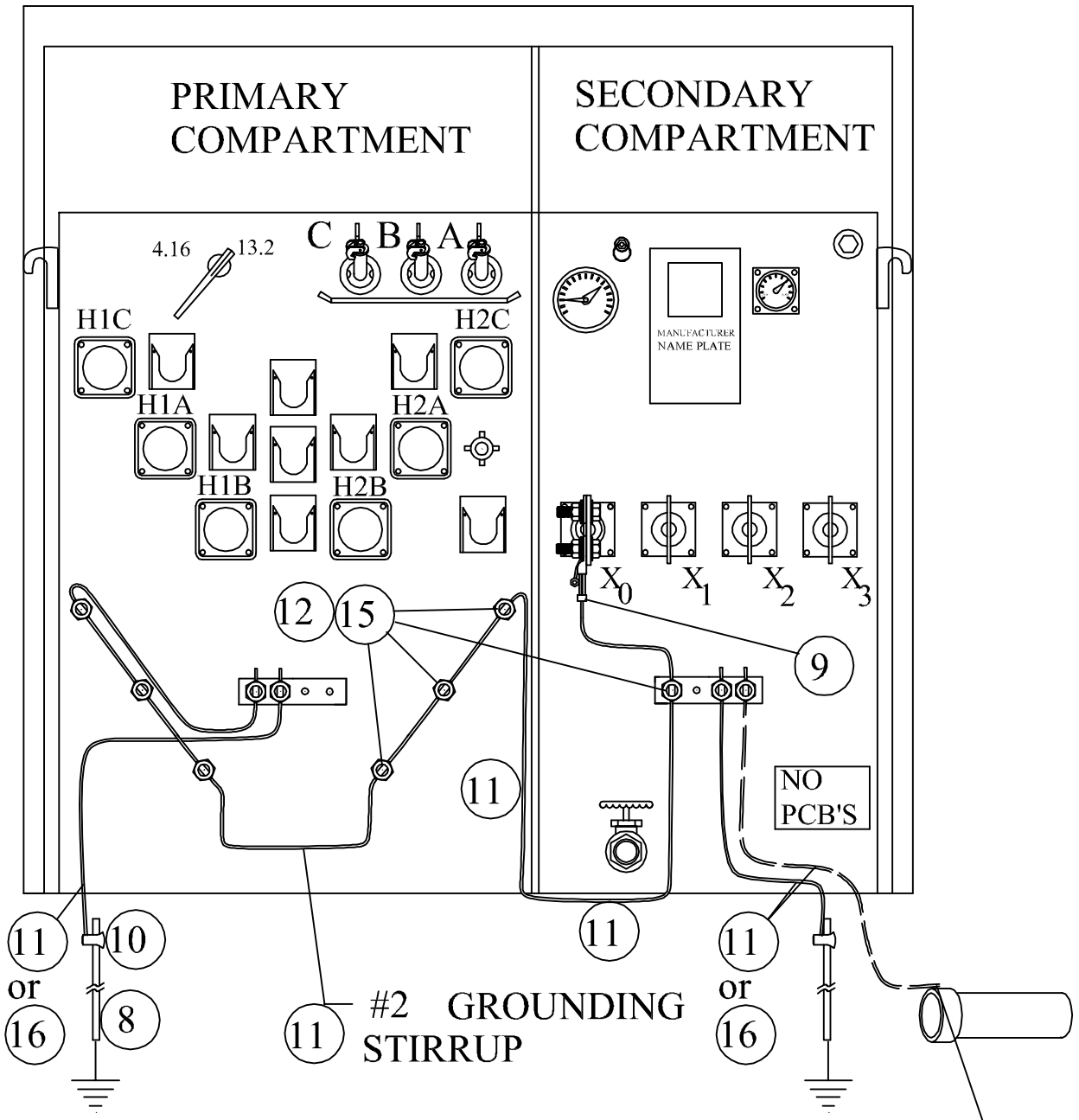
15. GROUND LEADS ASSOCIATED WITH SURGE PROTECTORS SHALL BE BONDED TO THE #2 AWG BTN COPPER WIRE (GROUND BUS) WITH HOT LINE CLAMPS AND LUGS (ITEM ID 121096 AND ITEM ID 143070).

16. BOND ALL METALLIC DUCT TO GROUND PAD.

17. PAD LOCATION SHALL BE IN ACCORDANCE WITH CS-5370 AND CS-5369.

REFERENCE STANDARDS:

D14-07-004	DISTRIBUTION EQUIPMENT DESCRIPTION; CONCRETE PADS & FOUNDATIONS.
CS 2030	UNDERGROUND CABLE TERMINATION IDENTIFICATION
CS 3722	LOADBREAK ELBOW TERMINATOR
CS 3727	INSTALLATION OF LOADBREAK BUSHING INSERT
CS 4020	3-PHASE TRANSFORMER FUSE REPLACEMENT GUIDE
CS 4028	SURGE PROTECTION, THREE PHASE RADIAL
CS 5369	PROTECTION FOR PAD MOUNT EQUIPMENT
CS 5370	TRANSFORMER PAD LOCATION ADJACENT TO BUILDINGS



GROUNDING DETAILS

BOND WIRE FOR METALLIC CONDUIT ONLY

REVISION		TRANSFORMER INSTALLATION AND HOUSING CONSTRUCTION: PAD AND ENCLOSURE HOUSED	CONSTRUCTION STANDARD DRAWN BY AH		
	11.08/11: ADDED ITEM ID	3 PHASE 4kV OR 13kV "DEAD FRONT" METAL CLAD TRANSFORMER 75-1500KVA FOR PRIMARY DISTRIBUTION	NUMBER	SHEET No	REV
LONG ISLAND POWER AUTHORITY prepared by National Grid Engineering & Survey, Inc.			5362	5 of 6	11

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THREE PHASE PADMOUNTED TRANSFORMER SPECIFICATIONS

SECONDARY SPADE CONNECTION:

Description: Terminal Lug

1. Terminal Lug - compression Connector - Tinned Aluminum or Copper. For up to 750 MCM compressed or concentric copper or aluminum secondary cable. NEMA 2 - hole pad for 1/2 inch diameter bolts (stud size). Aluminum lug's bore shall be coated with oxide inhibiting compound and plugged. Connector shall be marked with manufacturer's name, cable size, type of conductor stranding and die index number. Connector barrel shall not have an inspection hole. Connector shall meet or exceed EEI-NEMA Standard TDJ-162, Class A-3.

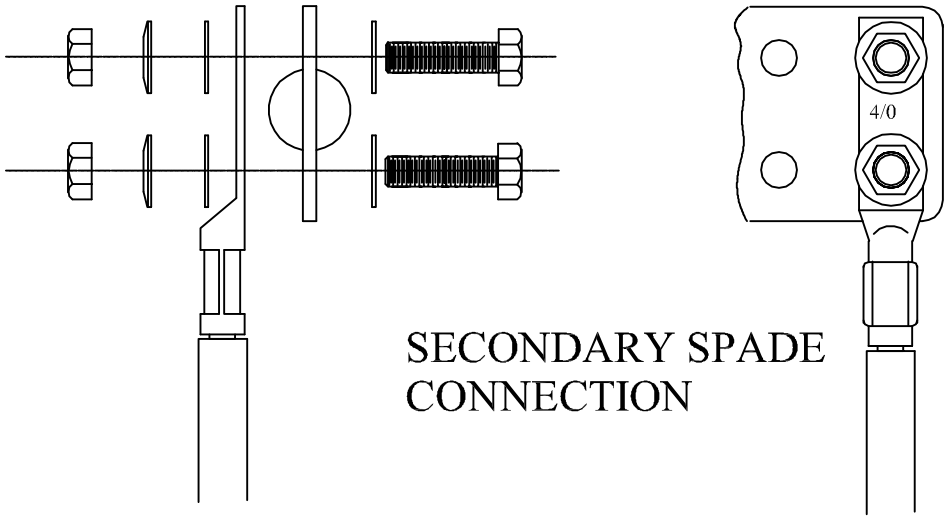
   Follow manufacturer's compression tool and die recommendations for installing terminal connectors. For an aluminum to copper connection, an additional bellville spring washer must be installed on the bolt side of the lug.

2. Lug to spade connection shall conform to the following:

   a) All copper components shall be tin or alloy plated.

   b) Wire brush aluminum conductor and apply oxide inhibitor compound to aluminum lug pad prior to connection to transformer spade. All excess compound must be removed after lug is secured. (Not required for tinned copper lugs).

   c) Connect lug to transformer stud utilizing tinned or cadium plated silicon bronze or stainless steel hardware. Place concave side of bellville washer toward transformer stud. Recommended torque value for bolts: 480 in-lbs. for silicone bronze and 517 in-lbs. for stainless steel.



SECONDARY SPADE CONNECTION

REVISION		TRANSFORMER INSTALLATION AND HOUSING CONSTRUCTION: PAD AND ENCLOSURE HOUSED	CONSTRUCTION STANDARD DRAWN BY AH		
	11.08/11: ADDED ITEM ID	3 PHASE 4kV OR 13kV "DEAD FRONT" METAL CLAD TRANSFORMER 75-1500KVA FOR PRIMARY DISTRIBUTION	NUMBER	SHEET No	REV
LONG ISLAND POWER AUTHORITY prepared by National Grid Engineering & Survey, Inc.			5362	6 of 6	11

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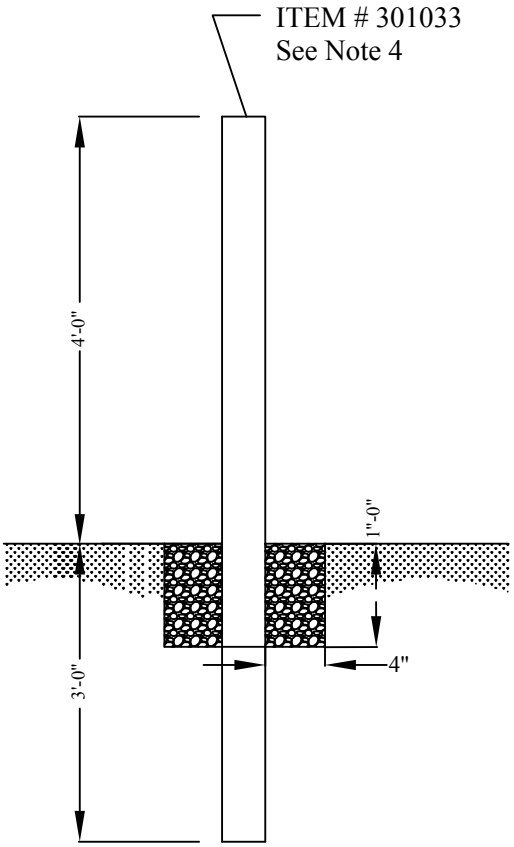
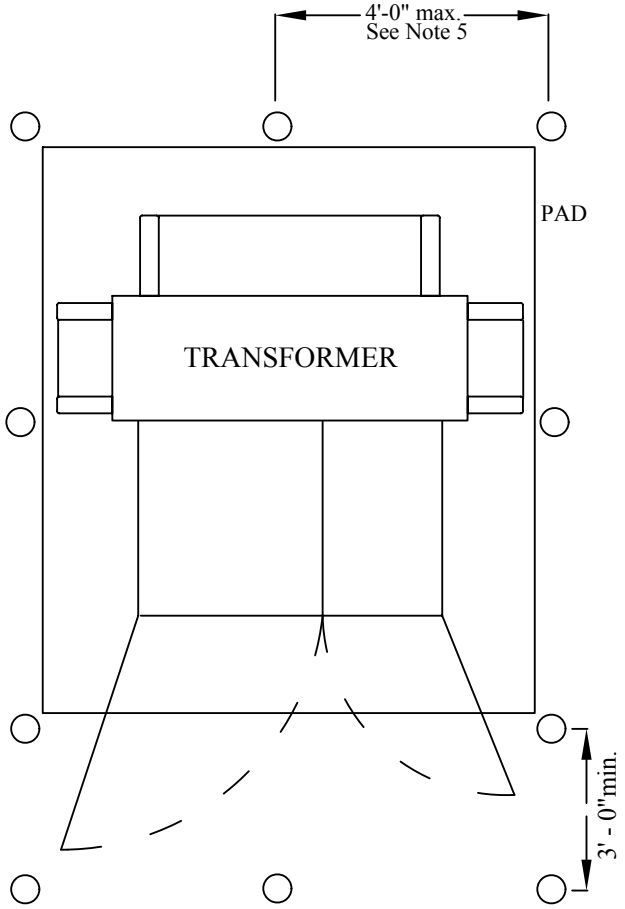


DETAIL "A"



Reference Drawings

CS-5362 Dead Front Transformers

NOTES:

1. This standard provides recommended barrier protection for pad mounted equipment subject to vehicular traffic.
2. Posts may be omitted on side (s) not subject to vehicular traffic.
3. Barriers must not interfere with the operation of pad mount equipment by PSEG Long Island personnel.
4. A 3-1/2" heavy wall steel, concrete filled lally column purchased from local lumber yards is acceptable. Bearing plates must be removed. Set posts in concrete (see detail "A").
5. Install additional posts on sides or back as required to maintain maximum 48" spacing.

PSEG LONG ISLAND	REVISION	TRANSFORMER INSTALLATION AND HOUSING CONSTRUCTION PAD AND ENCLOSURE HOUSED	CONSTRUCTION STANDARD
APPROVED BY / DATE	7.04/14: CHANGED LIPA TO PSEG Long Island	PROTECTION FOR PAD MOUNT TRANSFORMER SUBJECT TO VEHICULAR TRAFFIC	DRAWN BY AH
Richard Zambotti 5/15/14	DO NOT REVISE PRINT BY ANY OTHER METHOD THAN AUTO-CAD PREPARED BY: PSEG LONG ISLAND T&D ENGINEERING		NUMBER: 5369 / SHEET No: 1 of 1 / REV: 7

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FIG 1

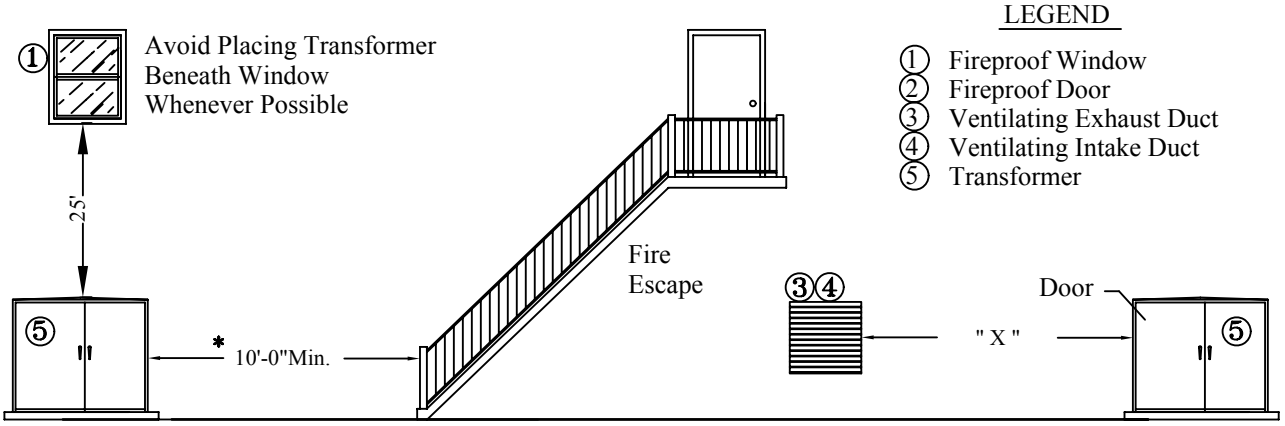


FIG 2

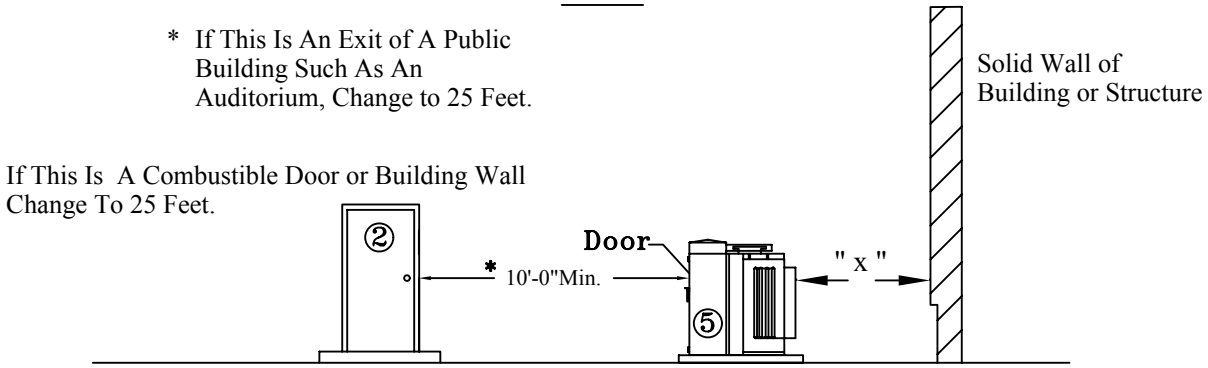


FIG 1 AND 2 SHOW MINIMUM CLEARANCES BETWEEN THE TRANSFORMER PAD AND WINDOWS, DOORS, FIRE ESCAPES, ENTRANCES AND VENTILATING DUCTS.

TABLE 1

Separation Distance	Horizontal Distance		Vertical Distance
	Fire Resistant or Non-Combustible Construction	Combustible Construction	All
X	5'	25'	25'

If the separation distances shown in table 1 cannot be maintained, a fire barrier must be provided to protect the building from exposure to any fire in the transformer. Fabricated barriers must be installed between the transformer and the building a minimum of 1 foot from the transformer pad. Barriers should be constructed of concrete block or reinforced concrete construction with a 2 hr fire rating (as specified by the building architect).

The barriers must extend at least one foot above the height of the transformer. The barrier should break the line of sight from the hightest point on the transformer to any point on the adjacent building (Fig. 3) closer than the distance in table 1.

Likewise, barriers must extend a minimum of 2 feet horizontally beyond the transformer, but be far enough to break the line of sight from the edge of the transformer to any point on the adjacent building (Fig. 4) closer than the distance in table 1.

FIG 3

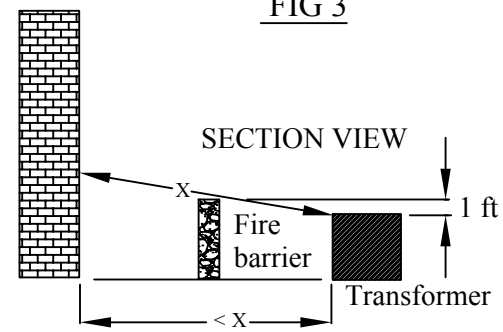
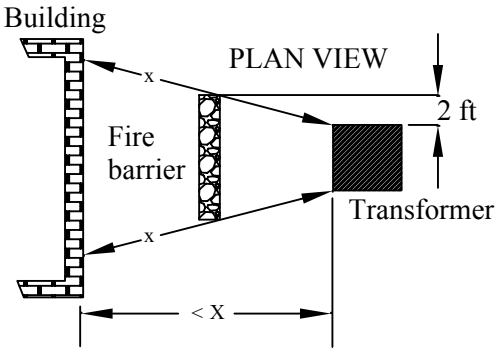


FIG 4



x = Minimum separation distance

NOTES:

1. PLACE TRANSFORMER SO THAT DOORS FACE AWAY FROM WALLS, FENCES OR OTHER FIXED STRUCTURES. 10' CLEARANCE REQUIRED IN FRONT OF THE DOORS

2. NO BUSHES, TREES, OR OTHER OBSTRUCTIONS SHALL BE PLANTED OR INSTALLED IN FRONT OF TRANSFORMER DOORS.

3. THE TRANSFORMER PAD LOCATION MUST BE ACCESSIBLE BY TRUCK AT ALL TIMES. NO PART OF THE BUILDING STRUCTURE SHALL EXTEND DIRECTLY ABOVE THE TRANSFORMER.

4. NO OPENINGS IN BUILDINGS OR STRUCTURE WILL BE PERMITTED WITHIN 10 FEET OF TRANSFORMER. BUILDING MATERIAL, INCLUDING DOOR AND WINDOWS LESS THAN 25 FEET FROM TRANSFORMER SHALL BE FIRE RESISTANT OR NON-COMBUSTIBLE MATERIAL.

5. CLASS 1, DIVISION 1 and 2 LOCATIONS SHALL REQUIRE A MINIMUM OF 25 FEET CLEARANCE (e.g. PROPANE TANKS, GAS PUMPS, ETC. OR ANY PLACE WHERE VOLATILE LIQUID / GAS TRANSFER FILLING OCCURS)
   [SEE NEC ARTICLES 500-5(a) (3) and 450-27]

6. MAINTAIN AT LEAST 1 FOOT SEPARATION BETWEEN PADMOUNT TRANSFORMERS AND A GAS METER HEADER.

7. SUBMERSIBLE TRANSFORMERS IN BELOW GRADE VAULTS ARE NOT REQUIRED TO MEET THE ABOVE CLEARANCES FROM BUILDING WALLS. VAULTS MUST BE INSTALLED A MINIMUM OF 10' FROM ANY BUILDING WALLS TO ALLOW ADEQUATE WORKING SPACE FOR REMOVAL OF GRATES.

REFERENCE DRAWINGS

CS-3960 1Ø PADMOUNT TRANSFORMER 25-167kVA
CS-5315 3Ø 13kVA-4kV 1500kVA STEP- DOWN TRANSFORMER
CS-5320 3Ø PADMOUNT TRANSFORMERS 13kVA DEAD FRONT
CS-5322 500 and 1000kVA NETWORK TRANSFORMERS
CS-5325 1500 and 2000kVA NETWORK TRANSFORMERS
CS-5362 3Ø 4kVA or 13kVA 75 - 1500kVA " DEAD FRONT" TRANSFORMER

REVISION		TRANSFORMER INSTALLATION AND HOUSING CONSTRUCTION: PAD AND ENCLOSURE HOUSED	CONSTRUCTION STANDARD DRAWN BY AH		
	11.02/14: UPDATE TITLE BLOCK & CHANGE CS NUMBER		NUMBER	SHEET No	REV
prepared by PSEG LONG ISLAND T&D ENGINEERING		TRANSFORMER PAD LOCATION ADJACENT TO BUILDINGS	5370	2 of 2	11

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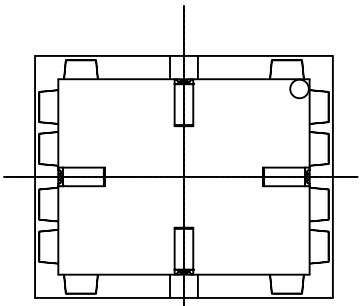
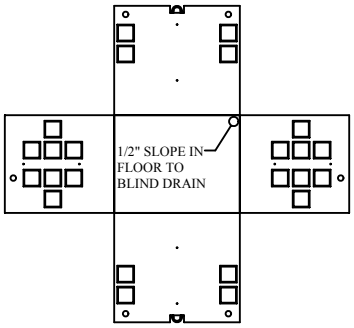
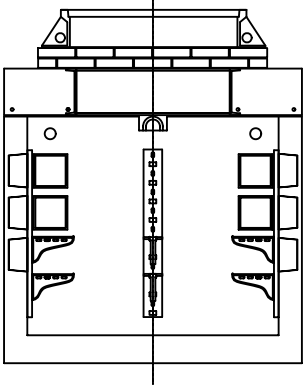
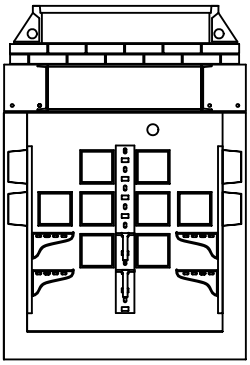




HALF SIZE
EXPLODED VIEW



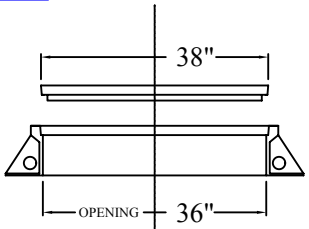


OTHER RELATED ITEMS FOR INSTALLATION

GRADING BLOCK	ITEM ID 101053
COMMON BRICK	ITEM ID 101051
MORTAR READY MIX	ITEM ID 101094
RACK, NON-METALLIC 36" VERT. MEMBER	ITEM ID 174035
RACK, NON-METALLIC 8" HORIZ. ARM	ITEM ID 174046
RACK, NON-MET. INTEGRAL MOUNT 4" ARM	ITEM ID 174045
ANCHOR BOLT, "HILTI" 1/2"x1-1/2"	ITEM ID 103019
WASHER, BELVILLE, SS 1" O.D. W/1/2" HOLE	ITEM ID 198020
NYLON TIES, CABLE STRAPS 14"x1/2"	ITEM ID 101006

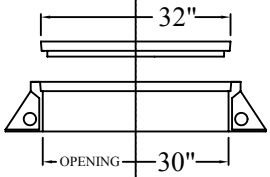
REFERENCE

CS-6533 TYPE TS BOX
PT-14-20-001 STD SPECIFICATION FOR CONCRETE



ITEM ID 131037
CASTIRON
(HIGHWAY RATED)

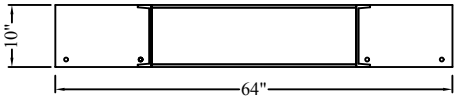
ITEM ID 131055



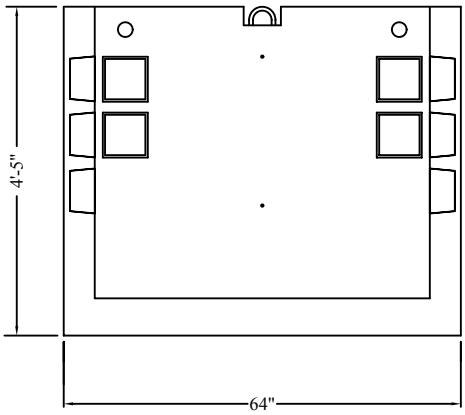
ITEM ID 131058
CASTIRON
(HIGHWAY RATED)

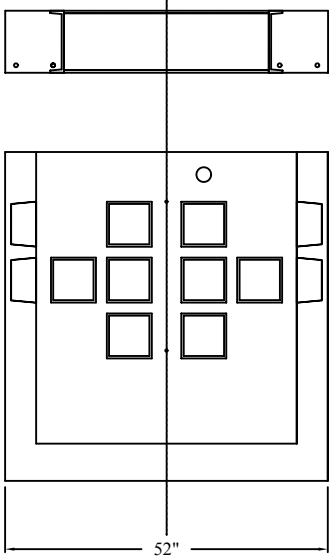
ITEM ID 131057

ITEM ID #131007



ITEM ID #131008





SECTION SIDE VIEW

SECTION END VIEW

PLAN LAYOUT

(WEIGHT OF BOX) less frame and cover
WALLS & FLOOR - 5,300 LBS.
ROOF..... - 3,100 LBS.

nationalgrid	LIPA Long Island Power Authority	REVISION	MANHOLES AND BOXES	CONSTRUCTION STANDARD	
APPROVED BY / DATE	APPROVED BY / DATE	3.02/13: REVISED TITLE BLOCK & ADD ADA NOTE	TYPE TS DISTRIBUTION BOX 4'-6" x 3'-6" x 4'-0" PRECAST CONCRETE COMPONENTS	DRAWN BY AH	
03/22/13	03/31/13	DO NOT REVISE PRINT BY ANY OTHER METHOD THAN AUTO-CAD	PREPARED BY: National Grid Engineering & Survey, Inc.	NUMBER: 6548	SHEET No: 1 of 2 / REV: 3

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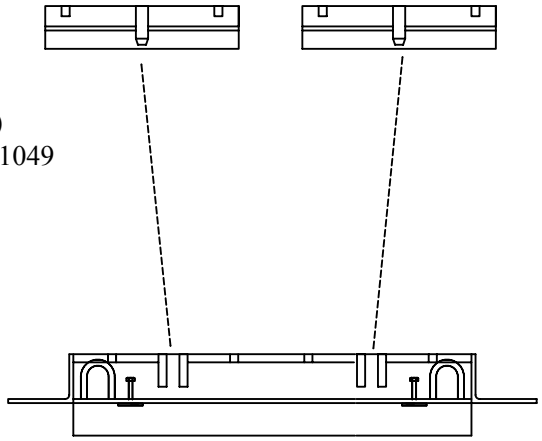
http://us2infonet/sites/Procedure

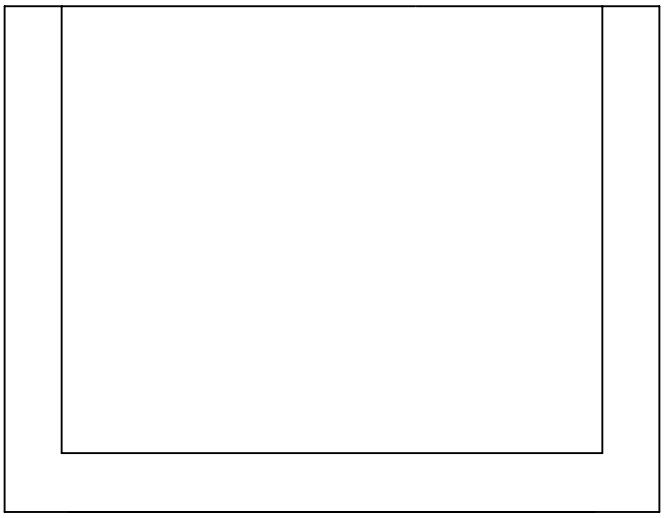
Optional installation with rectangular grates

EPOXY FILLED ROADWAY GRATES (2) ITEM ID 131049

STEEL FRAME (1) ITEM ID 131131



ITEM ID 131008



Reference:

PT-25-10-004 Rectangular gratings for manholes.
PT-25-10-005 Frames for rectangular gratings.

When the MH is installed in walkway, orient gratings with long openings perpendicular to the dominant direction of travel to comply with the Americans with Disabilities Act requirements.

REVISION		MANHOLES AND BOXES	CONSTRUCTION STANDARD		
	3. 02/13: REVISED TITLE BLOCK & ADD ADA NOTE.	TYPE TS DISTRIBUTION BOX 4'-6" x 3'-6" x 4'-0" PRECAST CONCRETE COMPONENTS	DRAWN BY AH		
			NUMBER	SHEET No	REV
LONG ISLAND POWER AUTHORITY prepared by nationalgrid			6548	2 of 2	3

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DISTRIBUTION
MATERIAL & STANDARDS
BULLETIN

DATE: June 14, 2007 DM&S 07-05

TO: Electric Design and Construction Department, Electric Service Department, T&D Project Management Department, Purchasing & Materials Management Department

SUBJECT: **Elastimold** Elbow Lightning Arresters (Item ID: 105213)

DESCRIPTION: Recently, we have received **Elastimold** elbow lightning arresters which have the ground lead of the arrester attached to the semi-con body through an eyehole prepared by the manufacturer. This design allows the ground braid to remain attached to the body if the arrester operates and the "bottom" blows off. This connection will replace the installation of the traditional Bare, Solid #10 Copper wire attached to the eyehole on **Elastimold** arresters only (including **Elastimold** Parking Arresters, Item ID: 105212). Continue to run a solid #10 through the eyehole on all other elbow-type lightning arresters.

Louis M. DeBrino

Louis M. DeBrino, Director
Performance Engineering