LIPA

Long Island Power Authority

Three Phase Padmounted Transformer
Specifications for Customers
&
Electrical Contractors

Revised November 2004

Electric Design
&
Construction Department
# THREE PHASE PADMOUNTED TRANSFORMER SPECIFICATIONS

## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section I</td>
<td>Introduction</td>
<td>2</td>
</tr>
<tr>
<td>Section II</td>
<td>Concrete Footing, Foundation and Pad Installation</td>
<td>3</td>
</tr>
<tr>
<td>Section III</td>
<td>Primary Wiring</td>
<td>5</td>
</tr>
<tr>
<td>Section IV</td>
<td>Padmount Transformer and Associated Equipment</td>
<td>7</td>
</tr>
<tr>
<td>Section V</td>
<td>Services</td>
<td>7</td>
</tr>
</tbody>
</table>

## ILLUSTRATIONS AND CONSTRUCTION STANDARDS (CS)

<table>
<thead>
<tr>
<th>Illustration #1:</th>
<th>Isometric View of Concrete Footing Foundation &amp; Pad Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illustration #2:</td>
<td>Primary &amp; Secondary Transformer Compartments</td>
</tr>
<tr>
<td>Illustration #3:</td>
<td>Secondary Spade Connection Detail</td>
</tr>
<tr>
<td>CS 3722:</td>
<td>Installation Instructions for 200 Amp Loadbreak Elbow Terminator</td>
</tr>
<tr>
<td>CS 3727:</td>
<td>Installation Instructions for Loadbreak Bushing Insert</td>
</tr>
<tr>
<td>CS 4028:</td>
<td>Surge Protection: 3 Phase Radial Only</td>
</tr>
<tr>
<td>CS 5362:</td>
<td>Three Phase, 4kV or 13kV “Dead Front” Metal Clad Transformer 75 - 1500 kVA for Primary Distribution</td>
</tr>
<tr>
<td>CS 5369:</td>
<td>Protection for Padmount Transformer Subject to Vehicular Traffic</td>
</tr>
<tr>
<td>CS 5370:</td>
<td>Transformer Pad Location Adjacent to Buildings</td>
</tr>
<tr>
<td>CS 6548:</td>
<td>Type “TS” Distribution Box – Precast Concrete Components</td>
</tr>
</tbody>
</table>
THREE PHASE PADMOUNTED TRANSFORMER SPECIFICATIONS

Section 1: Introduction

1. This specification covers the material and design requirements of the Long Island Power Authority (LIPA) 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 the Electric Design & Construction (ED&C) Department before plans are finalized, equipment or material purchased or construction commenced on facilities to be connected to the Long Island Power Authority’s (LIPA’s) 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 LIPA 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) LIPA 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 from LIPA approved suppliers listed below and shall be manufactured according to Specification, D14-07-004 Rev. 2, “Concrete Pads & Foundations.” These specifications are issued to the suppliers below and are available to customers and contractors upon request.

   John Potente & Sons                Roman Stone Construction Co.
   114 Woodbury Rd.                   85 South 4th Street
   Hicksville, NY 11801               Bayshore, NY 11706
   (516) 935-8585                     (631) 667-0566

   AFCO Precast Corp.                
   114 Rocky Point Rd.               
   Middle Island, NY 11953           
   (631) 924-7400
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).
THREE PHASE PADMOUNTED TRANSFORMER SPECIFICATIONS

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 AEIC Specification
   No. CS-5.

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. LIPA’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 LIPA. 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. LIPA 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 LIPA 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 LIPA’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.
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 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.

Illustration #3 – Secondary Spade Connection Detail
THREE PHASE PADMOUNTED TRANSFORMER SPECIFICATIONS

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 cadmium 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.
LOADBREAK ELBOW HOUSING

(cut-away view)

LOADBREAK PROBE

COPPER-TOP CONNECTOR

IDENTIFICATION BAND (WHITE)

CABLE INSULATION

TEST POINT

CABLE INSULATION

PLASTIC TAPE WRAP

HEAT SHRINK TUBING

CABLE JACKET

SEALING STRIP

Hose Clamp

Nylon Strap (every 8 inches)

Nylon Strap

1 ft. min. above grade or inside of a below grade transformer enclosure.

TEST POINT CAP

PULLING EYE

Figure #1

SEE SHEET 8 FOR BILL OF MATERIAL
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 hyliinked 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 aluminum oxide abrasive cloth Garnet Cloth (ITEM ID. 501307) 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.]
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.

![Clean & lubricate elbow housing](image1)

![Clean & lubricate cable entrance](image2)

![Lubricate insulation](image3)

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.

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 clicks once.

![Torque applicator before tightening pin](image4)

![Torque applicator after tightening pin](image5)
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 where 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 place a loadbreak elbow on a bushing insert by hand.

Figure #7

"HOT STICK" TOOL
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.

![Diagram of loadbreak elbow and bushing insertion process](image-url)
**BILL OF MATERIAL**

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

**TABLE 1**

**CRIMP CHART**

<table>
<thead>
<tr>
<th>Conductor Size</th>
<th>Insulation Diameter (In.) Min. - Ax **</th>
<th>Conn. O.D.</th>
<th>Elbow Term. With Bush. Insert</th>
<th>Tool</th>
<th>Die</th>
<th>No. of Crimps</th>
</tr>
</thead>
<tbody>
<tr>
<td># 2 Cu. or Alum.</td>
<td>0.755 - 0.815</td>
<td>5/8&quot;</td>
<td>Item I. D. 160112</td>
<td>Y34A Y35 Y46*</td>
<td>A243 U243 U243</td>
<td>1</td>
</tr>
<tr>
<td># 1/0 Cu. or Alum.</td>
<td>0.830 - 0.890</td>
<td>5/8&quot;</td>
<td>Item I. D. 160114</td>
<td>Y34A Y35 Y46*</td>
<td>A243 U243 U243</td>
<td>1</td>
</tr>
<tr>
<td># 3/0 Cu. or Alum.</td>
<td>0.925 - 0.985</td>
<td>5/8&quot;</td>
<td>Item I. D. 160115</td>
<td>Y34A Y35 Y46*</td>
<td>A27AR U27ART U27ART</td>
<td>1</td>
</tr>
</tbody>
</table>

* Use with P - UADP Adapter

** Compressed Conductor with 220 Mil. Insulation
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 ITEM ID. 101045. Do not substitute any other greases or silicone products.

CABLE JOINTS: PRIMARY
INSTALLATION INSTRUCTIONS
15 kV, 200 AMP
LOADBREAK BUSHING INSERT

LUBRICATE
REMOVE
LUBRICATE
SHIPPING CAP
Installing 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.

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.

CAUTION: NEVER ENERGIZE WITH SHIPPING CAP INSTALLED!

APPARATUS

CLEAN BUSHING INSERT/ELBOW CONNECTOR INTERFACE AND LUBRICATE THOROUGHLY

WEATHER RESISTANT SHIPPING CAP LIGHT GRAY FOR OUTDOOR STORAGE ONLY.

INSULATED CAP or ELBOW

1 or 3

2

4 04/04: REVISE NOTES

LONG ISLAND POWER AUTHORITY

KeySpan Energy Corporation

INSTALLATION INSTRUCTIONS

15 kV, 200 AMP
LOADBREAK BUSHING INSERT

CONSTRUCTION STANDARD

DRAWN BY AH

4.0 4.0:  REVISE NOTES

KeySpan Energy Corporation

3727 3 of 5 4
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.
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>QTY.</th>
<th>ITEM ID.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BUSHING INSERT 200A WITH LOAD BREAK ELBOW</td>
<td>+</td>
<td>160112*</td>
</tr>
<tr>
<td></td>
<td>#2 AWG</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>#1/0 AWG</td>
<td>+</td>
<td>160114*</td>
</tr>
<tr>
<td></td>
<td>#3/0 AWG</td>
<td>+</td>
<td>160115*</td>
</tr>
<tr>
<td>2</td>
<td>INSULATING CAP WITHOUT BUSHING INSERT</td>
<td>+</td>
<td>160020</td>
</tr>
<tr>
<td>3</td>
<td>INSULATING CAP WITH BUSHING INSERT</td>
<td>+</td>
<td>160023</td>
</tr>
<tr>
<td>4</td>
<td>GROUND PAD LUG</td>
<td>+</td>
<td>124138</td>
</tr>
<tr>
<td>5</td>
<td>TORQUE TOOL LOADBREAK BUSHING INSERT INSTALLATION (200 AMP)</td>
<td>+</td>
<td>160105</td>
</tr>
<tr>
<td>6</td>
<td>SHIPPING CAP, WEATHER RESISTANT, LIGHT GRAY</td>
<td>+</td>
<td>160024</td>
</tr>
</tbody>
</table>

*BUSHING & ELBOW ARE PACKAGED AS ONE KIT
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>QTY.</th>
<th>M&amp;S No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ELBOW ARRESTER WITH GROUND LEAD (with bushing*)</td>
<td>3</td>
<td>105214</td>
</tr>
<tr>
<td>2</td>
<td>HOT LINE CLAMP, COPPER, (INCLUDES HARDWARE)</td>
<td>1</td>
<td>121096</td>
</tr>
<tr>
<td>3</td>
<td>LUG, #2 COPPER (2 HOLE) (one lug for each ground lead)</td>
<td>3</td>
<td>143070</td>
</tr>
<tr>
<td>4</td>
<td>WIRE, #10 BARE SOLID COPPER</td>
<td>60&quot;</td>
<td>199010</td>
</tr>
</tbody>
</table>

* USE OF ELBOW ARRESTER WITHOUT BUSHING (M&S 105213) IMPLIES THAT ARRESTER WILL BE INSERTED INTO AN ELBOW BUSHING ON THE TRANSFORMER.
PREPARATION OF DEVICES

A. TRIPLE SURGE ARRESTER ELBOWS, PREPARATION FOR OPEN POINT APPLICATION.
   (SEE SHEET 1).

<table>
<thead>
<tr>
<th>MATERIAL REQUIRED</th>
<th>M&amp;S #</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 – ELBOW ARRESTERS WITH GROUND LEADS (WITH BUSHINGS)</td>
<td>105214</td>
</tr>
<tr>
<td>3 – 20” LENGTHS OF #10 BARE SOLID SOLID COPPER WIRE</td>
<td>199010</td>
</tr>
<tr>
<td>1 – HOT LINE CLAMP</td>
<td>121096</td>
</tr>
<tr>
<td>3 – #2 COPPER LUGS (2 HOLE)</td>
<td>143070</td>
</tr>
</tbody>
</table>

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” LENGTH(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.

IMPORTANT NOTES FOR RADIAL APPLICATION:

NOTE 1. USE M&S 105213 SINGLE ELBOW SURGE ARRESTERS WITHOUT BUSHINGS FOR ENERGIZED INSTALLATIONS, WHERE BUSHINGS ALREADY EXIST ON THE TRANSFORMER. DISCARD EXISTING DEAD-END CAPS.

NOTE 2. USE ONLY M&S 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)
SEE SHEET 5 FOR GROUNDING DETAILS
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>QTY.</th>
<th>ITEM ID.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CONCRETE PAD, RE-ENFORCED, PRE-CAST ( 8' X 8' X 8&quot; )</td>
<td>1</td>
<td>131117</td>
</tr>
<tr>
<td>2</td>
<td>FOUNDATION AND FOOTING, RE-ENFORCED CONCRETE, PRECAST</td>
<td>1</td>
<td>131116</td>
</tr>
<tr>
<td>3</td>
<td>TRANSFORMER, THREE PHASE - PAD MOUNTED ( SEE DA-50005 )</td>
<td>1</td>
<td>922***</td>
</tr>
<tr>
<td>4</td>
<td>PRIMARY CABLE, 15kV, 3-2/C 1/0 AL. {KEYSPAN INSTALLATION}</td>
<td>+</td>
<td>199984</td>
</tr>
<tr>
<td>5</td>
<td>PRIMARY TERMINATIONS / SURGE PROTECTION &quot; &quot;</td>
<td>6</td>
<td>160114</td>
</tr>
<tr>
<td></td>
<td>TERMINATOR, LOADBREAK 1/0 W/BUSHING &quot; &quot;</td>
<td>3</td>
<td>160090</td>
</tr>
<tr>
<td></td>
<td>LOOP INSTALLATIONS WITH FEED-THRU TRANSF. &quot; &quot;</td>
<td>3</td>
<td>160020</td>
</tr>
<tr>
<td></td>
<td>TERMINATOR, LOADBREAK 1/0 W/BUSHING &quot; &quot;</td>
<td>170114</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STAND OFF BUSHING &quot; &quot;</td>
<td>1</td>
<td>160114</td>
</tr>
<tr>
<td></td>
<td>DEAD END CAPS ( WITHOUT BUSHING ) &quot; &quot;</td>
<td>3</td>
<td>160020</td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RADIAL INSTALLATION: {CUSTOMER INSTALLATION}</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TERMINATOR, LOADBREAK #2 W/BUSHING &quot; &quot;</td>
<td>3</td>
<td>160112</td>
</tr>
<tr>
<td></td>
<td>ELBOW SURGE ARRESTER W/BUSHING ( SEE CS-4028 )</td>
<td>3</td>
<td>105214</td>
</tr>
<tr>
<td>6</td>
<td>SECONDARY CABLE, COPPER, 600 V EPR:</td>
<td>+</td>
<td>199***</td>
</tr>
<tr>
<td></td>
<td>NOTE: FOR ALL 480 VOLT SECONDARY SERVICES CABLE INSULATION MUST BE TYPE &quot;USE-2&quot; OR &quot;XHHW-2&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>TERMINAL CONNECTOR, 2-HOLE NEMA:</td>
<td>+</td>
<td>143087</td>
</tr>
<tr>
<td></td>
<td>4/0 AWG STRANDED</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>500 KCM STRANDED</td>
<td>+</td>
<td>143098</td>
</tr>
<tr>
<td>8</td>
<td>GROUND ROD, 1/2&quot; X 8'</td>
<td>2</td>
<td>173007</td>
</tr>
<tr>
<td>9</td>
<td>TERMINAL LUG, #4 AWG STR., #2 AWG SOL., 2-HOLE NEMA</td>
<td>1</td>
<td>143066</td>
</tr>
<tr>
<td>10</td>
<td>CONNECTOR, GROUND ROD</td>
<td>2</td>
<td>121065</td>
</tr>
<tr>
<td>11</td>
<td>WIRE SOLID #2 AWG, COPPER TINNED *</td>
<td>30'</td>
<td>199265</td>
</tr>
<tr>
<td>12</td>
<td>CONNECTOR, GROUND, THREAD. LUG ( #2 TO 2/0 AWG STR. )</td>
<td>12</td>
<td>124138</td>
</tr>
<tr>
<td>13</td>
<td>FAULT INDICATOR, 400 AMP, 3 AMP RESET</td>
<td>+</td>
<td>101027</td>
</tr>
<tr>
<td>14</td>
<td>IDENTIFICATION TAGS FOR PRIMARY CABLE ( SEE CS-2030 )</td>
<td>+</td>
<td>155***</td>
</tr>
<tr>
<td>15</td>
<td>NUT, JAM EVERDUR HEX, 1/2&quot; X 13&quot;</td>
<td>12</td>
<td>110198</td>
</tr>
<tr>
<td>16</td>
<td>WIRE SOLID #6 AWG, COPPER TINNED</td>
<td>+</td>
<td>199444</td>
</tr>
</tbody>
</table>

* #2 AWG BARE MAY BE SUBSTITUTED ON RADIAL INSTALLATIONS.
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 101027) 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.

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" TYPE OR "XHHW-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.
BONDING/GROUNDING:

11. WITH #2 AWG 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.

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 4026 SURGE PROTECTION, THREE PHASE C.I.P.U.D.
CS 4028 SURGE PROTECTION, THREE PHASE RADIAL
CS 5369 PROTECTION FOR PAD MOUNT EQUIPMENT
CS 5370 TRANSFORMER PAD LOCATION ADJACENT TO BUILDINGS

LIPA TRANSFORMER REFERENCES:

<table>
<thead>
<tr>
<th>GROUP#</th>
<th>P.T.#</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>224</td>
<td>57-16-073</td>
<td>13kV PRIM.; 208Y/120 V. SECDY.</td>
</tr>
<tr>
<td>225</td>
<td>57-16-073</td>
<td>13kV PRIM.; 480Y/277 V. SECDY.</td>
</tr>
<tr>
<td>226</td>
<td>57-16-073</td>
<td>DUAL VOLT PRIM.; 208Y/120 V. SECDY.</td>
</tr>
<tr>
<td>227</td>
<td>57-16-073</td>
<td>DUAL VOLT PRIM.; 480Y/277 V. SECDY.</td>
</tr>
</tbody>
</table>
GROUNDING DETAILS

BOND WIRE
FOR METALLIC
CONDUIT ONLY

#2 GROUNDING STIRRUP

GROUNDING DETAILS

1. GROUNDING DETAILS
2. BOND WIRE
3. FOR METALLIC
4. CONDUIT ONLY

PRIMARY COMPARTMENT
SECONDARY COMPARTMENT

H1A
H1B
H1C
H2A
H2B
H2C

4.16
13.2

C
B
A

NAMER PLATE
MANUFACTURER

LOW
HIGH

GROUNDING DETAILS

PRIMARY COMPARTMENT
SECONDARY COMPARTMENT

#2 GROUNDING STIRRUP

BOND WIRE
FOR METALLIC
CONDUIT ONLY

3 PHASE 4kV OR 13kV "DEAD FRONT"
METAL CLAD TRANSFORMER 75-1500KVA
FOR PRIMARY DISTRIBUTION

TRANSFORMER INSTALLATION AND HOUSING
CONSTRUCTION: PAD AND ENCLOSURE HOUSED

5362 5 5 10
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 LIPA 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.
NOTES:

1. THE PRECEDING ARE MINIMUM CLEARANCES BETWEEN THE TRANSFORMER AND WINDOWS, DOORS, FIRE ESCAPES, ENTRANCES AND VENTILATING DUCTS.

2. PLACE TRANSFORMER SO THAT DOOR FACES AWAY FROM WALLS, FENCES, OR OTHER FIXED STRUCTURES. ACCESS REQUIRED FOR OPERATING LBTs WITH 8 FOOT HOT STICK HELD HORIZONTALLY.

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

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 FIREPROOF IN ACCORDANCE WITH NATIONAL FIRE CODE.

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]