

TYPICAL SECONDARY EXTENSION BUS ASSEMBLIES

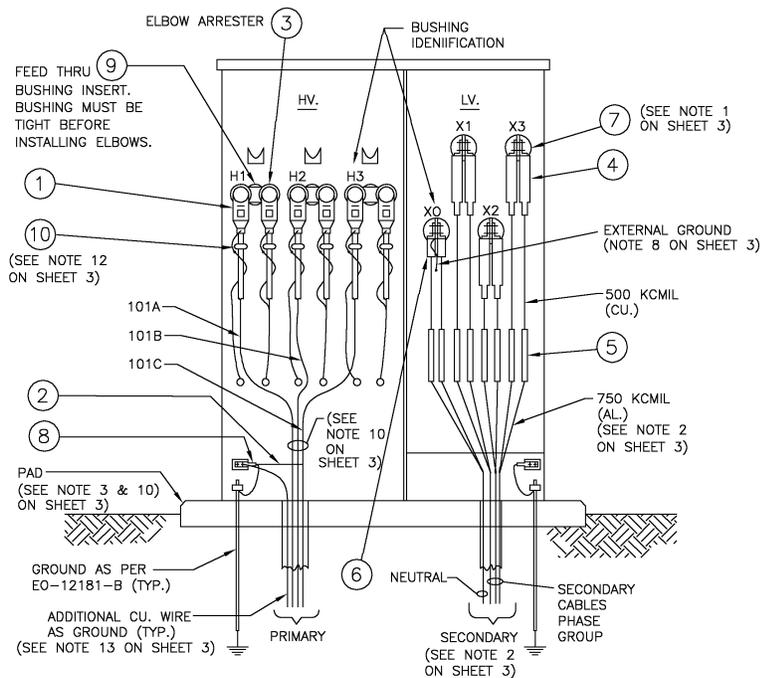
No.	REVISIONS	PROJ ENG'R	DATE
14	<p>CHANGED DWG. FROM 'A' SIZE TO 'B' SIZE. CHANGED FROM ONE SHEET FORMAT TO FOUR SHEET FORMAT. EXTENDED GROUNDING WIRING LENGTHS IN LOOP FEED LAYOUT.</p> <p>MOVED GROUND ROD FROM CENTER OF PAD TO THE RIGHT SIDE OPENING WALL TRANSFORMER PAD.</p>	S. PARASHER	12/1/11
	H.J.M. 12/1/11		

INSTALLATION PROCEDURE FOR 4kV, 13kV & 27kV. LOOP OR RADIAL DEAD FRONT PADMOUNT TRANSFORMER

CONSOLIDATED EDISON COMPANY OF N.Y., INC. DISTRIBUTION ENGINEERING DEPT

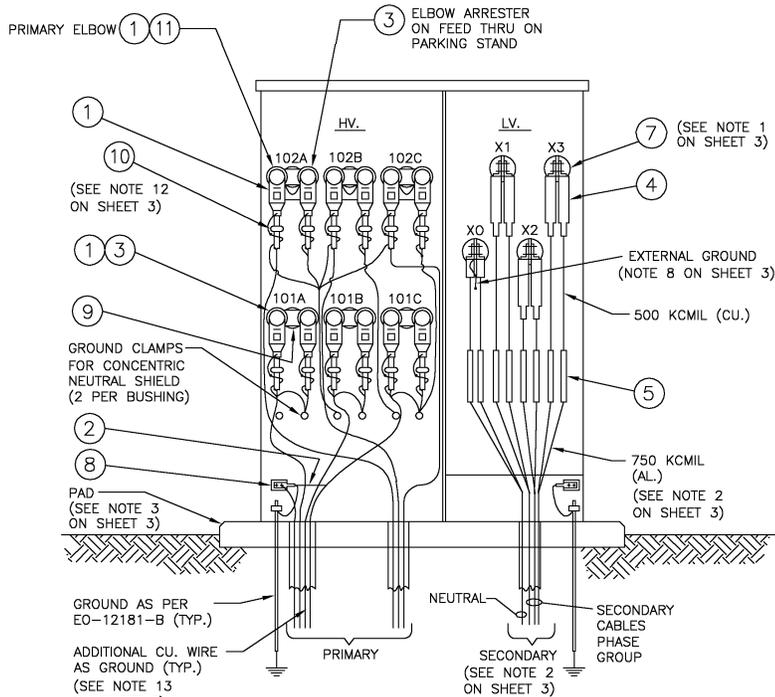
DATE 09/10/70	DWG. NO. EO-13827-B	REV. 14	SH. 1 OF 4
LAST REV. 12/1/11			

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED	No. 14	REVISIONS SEE ABOVE REVISION BOX FOR CHANGES.	PROJ. ENG'R S. PARASHER	DATE 12/1/11	DRAWN BY SEE ABOVE	DATE SEE ABOVE	CHECKED BY REVISION BOX FOR	DATE REVISION BOX FOR	APPROVED MGR. NON-RADIAL SYSTEMS MANAGER	DATE
	DISCIPLINE CODE DE	SCALE NONE	PROJECT ENGINEER	DATE						



ELBOW ARRESTERS ON RADIAL FEED

(SEE NOTE 7 ON SHEET 3)



ELBOW ARRESTERS ON OPEN POINT

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	H.J.M.		12/1/11

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CONSOLIDATED EDISON COMPANY OF N.Y., INC. DISTRIBUTION ENGINEERING DEPT

DATE 4/6/05	DWG. NO. EO-13827-B	REV. 14	SH. 2 OF 4
LAST REV. 12/1/11			

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PROCEDURES

1. CONDUIT: INSTALL CONDUIT FOR PRIMARY CABLE AND SECONDARY CABLE IN ACCORDANCE WITH EO-12482-B. SEAL ALL CONDUITS/DUCTS AS PER EO-1100.
2. PRIMARY CABLE: INSTALL #2 ALUMINUM EPR JACKETED CABLE FOR NEW 4KV AND 13KV UNDERGROUND RESIDENTIAL DISTRIBUTION APPLICATIONS AS A PREFERRED CABLE. IF OTHER THAN #2 ALUMINUM URD CABLE IS REQUIRED, SEE NOTES 4 & 15, AND REFERENCE DRAWINGS.
3. PAD: DETERMINE THE PROPER SIZE PAD TO BE INSTALLED IN ACCORDANCE WITH SPECIFICATION EO-6229. THE SLAB SHALL BE INSTALLED IN ACCORDANCE WITH EO-12482-B.
4. FOR TRANSFORMER SIZES 75-500 KVA AND 1000 KVA-265/460V., SET TRANSFORMER 3" FROM FRONT EDGE OF PAD; KEEPING AN EQUAL DISTANCE BETWEEN THE TRANSFORMER AND RIGHT AND LEFT EDGE OF THE PAD.
5. FOR TRANSFORMER SIZES 1000 KVA-120/208V. AND 2000 KVA-265/460V., SET THE TRANSFORMER 3" FROM FRONT OF PAD; OFFSET THE TRANSFORMER (FROM RIGHT TO LEFT) UNTIL THE LOW VOLTAGE CABLE OPENING OF THE TRANSFORMER LINES UP WITH THE CABLE OPENING IN THE PAD.

PRIMARY COMPARTMENT

6. ALIGN THE PRIMARY CABLE WITH THE HIGH VOLTAGE BUSHINGS; PROVIDE A MINIMUM 36" OF SLACK IN THE CONCENTRIC NEUTRAL. PROVIDE A MINIMUM 12" OF SLACK IN THE PRIMARY CABLE SO THAT LATER ON IN CASE OF PRIMARY CABLE FAULT, THE PRIMARY CABLE IS NOT TOO SHORT FOR LIFTING THE ELBOW TO PARKING POSITION.
7. WHEN A LOOP FEED UNIT IS INSTALLED AS A RADIAL FEED UNIT, THE THREE UNUSED BUSHINGS MUST BE CAPPED, (NOTE 6).
8. DEPENDING UPON SIZE OF CABLE, ATTACH ELBOW TERMINAL TO PRIMARY CABLE IN ACCORDANCE WITH NOTE 4 AND APPROPRIATE REFERENCE DRAWINGS.
9. GROUND ELBOW TERMINALS TO PRIMARY CABLE NEUTRALS AND ATTACH PRIMARY CABLE NEUTRALS TO GROUND PAD ON TRANSFORMER IN ACCORDANCE WITH APPROPRIATE ELBOW DRAWING NUMBERS.
10. ATTACH FAULT INDICATOR TO PRIMARY CABLE IN ACCORDANCE WITH DWG. 335556 OR EO-16888-B, AS APPLICABLE. ALSO SEE NOTE 12.
11. INSTALL TWO GROUND RODS, ONE ON PRIMARY SIDE AND OTHER ON THE SECONDARY SIDE. ATTACH #2 COPPER LEAD TO ONE ROD AND CONNECT COPPER LEAD TO TRANSFORMER GROUND PAD IN ACCORDANCE WITH EO-12181-B. REPEAT THE SAME PROCEDURE FOR THE SECOND GROUND ROD.
12. WRAP NO. 2 BOND RIBBON (2 PER LEG) AROUND PRIMARY CABLE AND SOLDERED SECURELY TO CONCENTRIC NEUTRAL. TWIST ALL BOND RIBBONS TOGETHER AND INSERT INTO COMPRESSION LUG. BOLT LUG TO TRANSFORMER GROUND PAD.
13. ESTABLISH THE TRANSFORMER AS A KNOWN POINT BY RUNNING A TRACING CURRENT CONTINUITY TEST IN ACCORDANCE WITH EO-4039. SECURE FEEDER AND PHASE IDENTIFICATION TAGS TO ELBOW TERMINALS. FOR LOOP FEED UNITS: (LEFT SIDE "IN") 101 USE 101A (H1X.), 101B (H2X.), 101C (H3X), (RIGHT SIDE "OUT") USE 102A (H1Y), 102B (H2Y), 102C (H3Y).
FOR RADIAL FEED UNITS: USE 101A (H1), 101B (H2), 101C (H3)
PHASING SEQUENCE IS: H1 TO A, H2 TO B, H3 TO C.
14. INSTALL PROPERLY RATED ELBOW ARRESTERS ON 4KV AND 13KV INSTALLATIONS (ON LAST TRANSFORMER IN RADIAL FEED AND ON OPEN POINT IN A LOOP).

SECONDARY COMPARTMENT

15. SECONDARY CABLES SHALL BE INSTALLED PHASE GROUPED (PHASE A, B, C AND NEUTRAL IN THE SAME DUCT).
16. INSTALL 750 KCMIL OR 500 KCMIL COPPER LIMITER LUG ON PHASE CABLE (X1, X2, & X3). INSTALL 750 KCMIL OR 500 KCMIL COPPER COMPRESSION LUG ON NEUTRAL CABLE (X0).
17. IN CASE CUSTOMER WANTS ALUMINUM CABLES, CONNECT 500 KCMIL COPPER CABLES FROM LUGS TO 750 KCMIL ALUMINUM CABLE (SEE EO-12858-C), IN RARE CASES WHERE SECONDARY CABLE IS ALUMINUM AS PER ELECTRICAL CODE.
18. INSTALL SECONDARY EXTENSION BUS (SEE NOTE 1) AND ATTACH LIMITER AND COMPRESSION LUGS.
19. INSTALL INSULATING SLEEVE OVER LIMITERS AND EXTENSION BUS. IT SHALL FIT SNUGLY DUE TO ITS TAPERED DESIGN.

NOTES:

1. SECONDARY EXTENSION BUS ASSEMBLY SHALL BE INSTALLED ON UNITS RATED AT 1000 KVA-120/208V AND 2000 KVA-265/460V. INSTALL INSULATING SLEEVE WHENEVER EXTENSION BUS ASSEMBLY IS INSTALLED.
2. SECONDARY CABLE AND CONDUIT (SIZE AND QUANTITY) SHALL BE IN ACCORDANCE WITH SPECIFICATION EO-6229. SLAB AND CONDUITS SHALL BE INSTALLED IN ACCORDANCE WITH EO-12482-B.
3. CONCRETE PAD REQUIREMENTS SHALL BE IN ACCORDANCE WITH SPECIFICATION EO-6229 AND INSTALLED IN ACCORDANCE WITH EO-12482-B
4. FOR 4KV AND 13KV APPLICATIONS INSTALL #2 ALUMINUM URD PRIMARY CABLE-SOLID DIELECTRIC INSULATED AND JACKETED TO SUPPLY DEADFRONT PADMOUNTED TRANSFORMERS (EO-7271 JCN-563-2575). WHEN USE OF #2 ALUMINUM URD CABLE IS NOT POSSIBLE, DUE TO IT'S UNAVAILABILITY OR DUE TO LOAD, THE FOLLOWING CABLES SHALL BE USED:
A) NO. 2 COPPER 5kv. EPR LEADED LLDPE JACKET (EO-7581E-C&S 563-2302).
B) 4/0 ALUMINUM 15kv. URD, JACKETED (EO-7275JCN-C&S 563-2740).
C) 2/0 COPPER 15kv. EPR INSULATED JACKETED, NON/LEADED (EO-7555E-C&S 563-2153) SHALL BE USED IF BOTH #2 ALUMINUM OR 4/0 ALUMINUM ARE NOT AVAILABLE.
5. THESE INSTALLATION PROCEDURES APPLY TO DUAL RATIO 4/13KV UNITS ALSO.
6. ALL PADMOUNTED TRANSFORMERS ARE EITHER LOOP OR RADIAL FEED UNITS. A LOOP FEED UNIT MAY BE USED AS A RADIAL FEED UNIT BY CAPPING THE THREE UNUSED BUSHINGS IN ACCORDANCE WITH EO-13841-B (NOT FOR NEW CONSTRUCTION).
7. A RADIAL FEED UNIT MAY BE USED AS A LOOP FEED UNIT BY INSTALLING A FEED-THRU BUSHING IN ACCORDANCE WITH EO-16248-B.
8. ALL SECONDARY NEUTRALS SHALL BE GROUNDED EXTERNALLY BY A SOLID SPADE WELDED TO THE TANK OR BY A GROUND STRAP. THE EXTERNAL GROUND SHALL NOT BE DISCONNECTED FROM THE TANK WALL FOR ANY REASON.
9. ALL CONCRETE PADS SHALL BE INSTALLED AT LEAST FOUR FEET AWAY FROM ANY BUILDING OR STRUCTURE SUCH AS DRIVEWAYS, ETC.
10. IF A POSSIBILITY EXISTS THAT A RADIAL FEED UNIT MAY BE CONVERTED TO A LOOP FEED UNIT, IT MUST BE INSTALLED ON A PAD DESIGNED FOR LOOP FEED INSTALLATION AND A MINIMUM 36" OF SLACK PROVIDED IN THE PRIMARY CABLES.
11. ELBOW TERMINALS ARE RATED FOR FAULT CURRENTS OF 10,000 AMPS RMS SYMMETRICAL OR LESS.
12. USE COMPANY APPROVED AUTO-RESET FAULT INDICATORS ONLY.
13. ADDITIONAL GROUND WIRE IS NOT REQUIRED IF THE ENTIRE PRIMARY CABLE IS JACKETED TYPE. HOWEVER, IF CABLE IS A MIX OF JACKETED AND NON-JACKETED, IN THAT CASE, INSTALL DIRECT BURIED MIN. #2 COPPER WIRE ALONG PRIMARY CABLE AS AN ADDITIONAL GROUND AND CONNECT AT THE TRANSFORMER GROUND PAD IN ACCORDANCE TO EO-12181-B.
14. INSTALL GAPPED ELBOW ARRESTERS ONLY ON 13KV AND 27KV RATED TRANSFORMERS THAT ARE EQUIPPED WITH 200A RATED ELBOWS IN ACCORDANCE WITH EO-2012. INSTALL 3KV GAPLESS ELBOW ARRESTER FOR 4KV RATED TRANSFORMER AS PER EO-2012. FOR 4KV RATED TRANSFORMERS AND 13KV RATED TRANSFORMERS WITH 600 AMP ELBOWS, INSTALL GAPPED SURGE ARRESTERS ON THE RISER POLE INSTEAD OF THE TRANSFORMERS.
15. FOR 27KV. APPLICATION, INSTALL #2/0 CU. CABLE EPR INSULATED JACKETED (EO-7556E-563-2138).

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ENVIRONMENTAL NOTE:

IN THE EVENT OF A DIELECTRIC FLUID LEAK, TAKE APPROPRIATE ACTIONS TO MINIMIZE ENVIRONMENTAL IMPACTS, AND IMMEDIATELY NOTIFY YOUR SUPERVISOR AND THE REGIONAL EMERGENCY CONTROL CENTER.

**INSTALLATION PROCEDURE FOR 4kv, 13kv & 27kv.
LOOP OR RADIAL DEAD FRONT PADMOUNT
TRANSFORMER**

CONSOLIDATED EDISON COMPANY OF N.Y., INC.
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BILL OF MATERIAL

ITEM NO	DESCRIPTION	DWG. OR SPEC.	CLASS/STOCK	
1	200 AMPS ELBOW TERMINAL	EO-13973-B	571-6527	ONE FOR EACH PRIMARY CABLE
2	NO. 2 BARE BOND WIRE - LENGTH AS REQUIRED	EO-672 & EO-06	564-0073	TWO FOR EACH PRIMARY CABLE
3	3kv, M.O.V., GAPLESS (FOR 4kv ONLY) ELBOW ARRESTER 12kv, M.O.V., GAPPED (FOR 13kv ONLY) 27kv, M.O.V., GAPPED (FOR 27kv ONLY)	EO-5430 EO-5430	592-3685 502-4955 591-9055	ONE FOR EACH PRIMARY. TWO FOR EACH OPEN POINT IN LOOP ONE FOR EACH PRIMARY. TWO FOR EACH OPEN POINT IN LOOP ONE FOR EACH PRIMARY. TWO FOR EACH OPEN POINT IN LOOP
4	HI-CAP LIMITER LUG-500 KCMIL (WITH BOOT)	EO-14160-C	571-7111	ONE FOR EACH SECONDARY PHASE CABLE
5	CONNECTOR (500 KCMIL TO 750 KCMIL) NO. 5	EO-7879-D	571-5735	ONE FOR EACH SECONDARY CABLE
6	500 KCMIL COMPRESSION LUG			ONE FOR EACH SECONDARY NEUTRAL CABLE
7	INSULATING SLEEVE		596-2956	FOUR WHEN REQUIRED
8	4/O COMPRESSION LUG	EO-14929	570-3475	TWO EACH INSTALLATION
9	FEED THRU BUSHING INSERT FOR 13KV TRANSFORMER	EO-16248-B	571-8192	THREE WHEN REQUIRED
10	AUTO-RESET FAULT INDICATOR (SEE NOTE 12)	335556 EO-16888-B	598-4521 504-6073	ONE FOR EACH PRIMARY CABLE ON 101 SIDE ONE FOR EACH PRIMARY CABLE ON 101 SIDE
11	FEED THRU	EO-14933-B	571-6576	THREE WHEN REQUIRED
12	ELBOW TERMINAL (# 2/O CU. EO-7555 E)	322843 322844	571-6352	ONE FOR EACH PRIMARY CABLE, 600 AMPS; 13kv
13	600 AMPS. 13KV ELBOW TERMINAL (350 KCMIL CU EO-7584 E) (500 KCMIL CU EO-7586 E)	322843 322844	571-7368 571-7210	ONE FOR EACH PRIMARY CABLE, 600 AMPS; 4kv
14	200 AMPS. 27kv ELBOW TERMINAL (2/O AL. EO-7556 E)		571-7509	ONE FOR EACH PRIMARY CABLE, 200 AMPS; 27kv
15	FEED THRU BUSHING INSERT FOR 27kv TRANSFORMER		503-3816	THREE WHEN REQUIRED
16	CABLE LIMITER 750 KCMIL #CP750-C3-H #CP750-C3-HS		SPOT BUY FROM MERSEN CO.	ONE FOR EACH PHASE

REFERENCE DWGS. & SPECS.

- BARE BOND WIRE ----- EO-672 & EO-06
- APPLICATION OF SURGE ARRESTERS ON DISTRIBUTION SYSTEM ----- EO-2012
- INSTALLATION OF DIRECT BURIED HDPE CONDUIT ----- EO-3036
- USE OF CERTIFICATION, REGISTERED, DEFECTIVE EQUIPMENT, CABLE INFORMATION AND BLUE TAGS ----- EO-4039
- HIGH CAPACITY LIMITER 600 VOLTS OR LESS AC ----- EO-5212
- PURCHASE RECOMMENDATION FOR DISTRIBUTION SURGE ARRESTERS ----- EO-5430
- REQUIREMENTS FOR THE INSTALLATION OF SINGLE AND THREE PHASE-PAD MOUNTED TRANSFORMER ----- EO-6229
- ALUMINUM CONNECTORS FOR UNDERGROUND MAINS CABLES ----- EO-7879-D
- GROUNDING OF PAD-MOUNTED TRANSFORMERS AND SWITCHES ----- EO-12181-B
- CONDUIT AND PAD INSTALLATION FOR 3 PHASE LOOP AND RADIAL PADMOUNTED TRANSFORMERS ----- EO-12482-B
- STRAIGHT JOINT AL OR CU CONDUCTORS POLY OR RUBBER INSULATED CABLES 600 VOLTS ----- EO-12858-C
- CONCRETE PADS FOR THREE PHASE TRANSFORMERS ----- EO-13775-B
- ASSEMBLY AND INSTALLATION OF 4KV & 13KV LOAD BREAK ELBOW FOR DEAD FRONT PADMOUNTED TRANSFORMERS XLP OR EPR COVERED CABLE ----- EO-13823-B
- INSTALLATION OF INSULATED DEAD END RECEPTACLE CAP ON UN-USED BUSHINGS OF 4KV & 13KV DEAD FRONT PADMOUNTED TRANSFORMERS ----- EO-13841-B
- ASSEMBLY AND INSTALLATION OF LOAD BREAK ELBOW TERMINALS FOR 4KV & 13KV DEADFRONT PADMOUNTED TRANSFORMERS ----- EO-13973-B
- INSTALLATION OF LOAD BREAK ELBOW TERMINAL FOR URD SUBMERSIBLE TRANSFORMERS ----- EO-14602-B
- NEMA - TYPE COMPRESSION LUGS, COPPER & ALUMINUM ----- EO-14929-C
- INSTALLATION OF FEED-THRU BUSHING (RADIAL TO LOOP CONVERSION) ----- EO-16248-B
- INSTALLATION OF AUTOMATIC LOW VOLTAGE RESET - REMOTE INDICATION FAULT INDICATORS ----- EO-16888-B
- INSTALLATION OF AUTO-RESET FAULT INDICATORS FOR 4KV & 13KV URD SYSTEMS ----- 335556
- SEALING OF SERVICE DUCTS, ENTRANCES AND BUS OPENINGS IN ELECTRICAL DISTRIBUTION STRUCTURES ----- EO-1100

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FILING INFORMATION			
FIELD MANUAL No. 24: U.R.D., SECT. 8; TRANSFORMERS			
FIELD MANUAL No. 22: U.R.D., SECT. 8; TRANSFORMERS			
CONSTRUCTION STDS. MANUAL No. 3 SECT. 16: U.R.D.			

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