Approved - Dowling, Rafael 07/15/2015

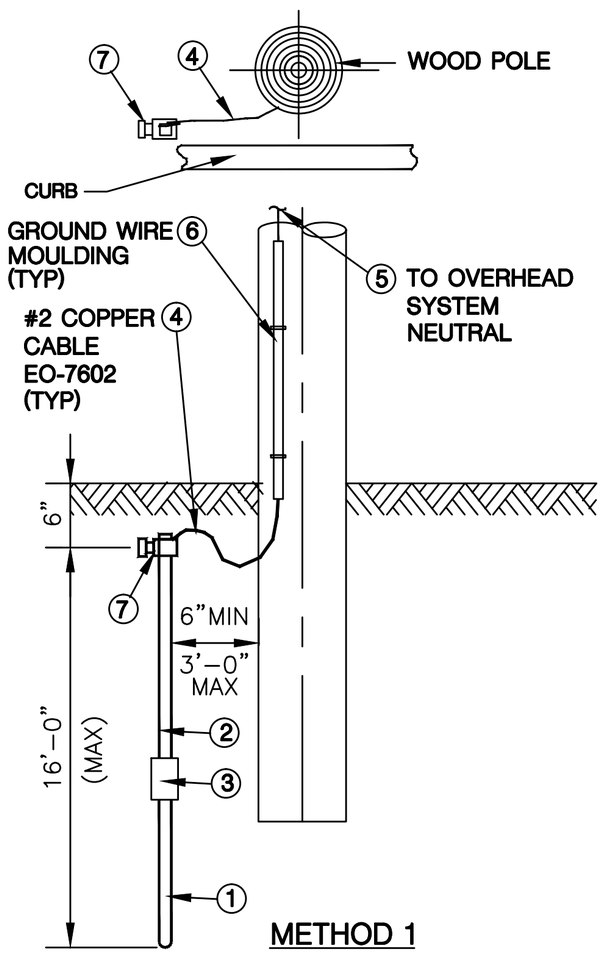
REVISIONS

S. PARASHER 2/24/93 — 2
CONVERTED TO CADAM. CHANGED INSTALLATION PROCEDURE, NOTED. DEPTH OF ROD FROM 20'–0" TO 16'–0" AND TITLE.
VD 2/16/93 JP

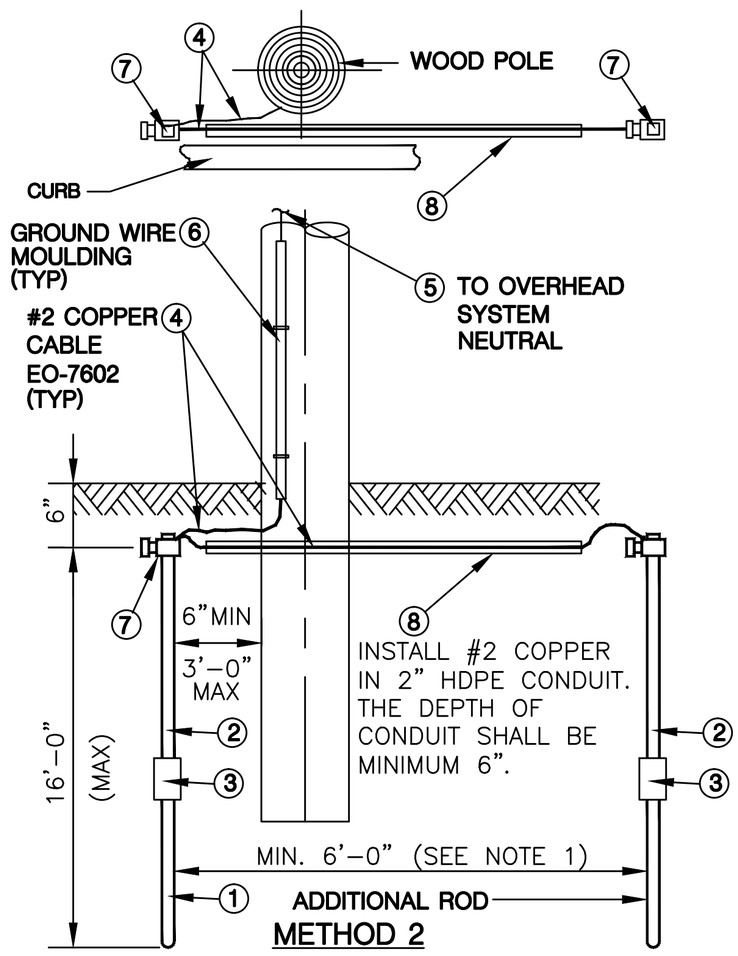
S. PARASHER — 3
MODIFIED PROCEDURE #1. CHANGED PREFERRED METHOD TO ALTERNATE METHOD AND VICE VERSA
JTA 10/22/02

S. PARASHER 09/21/05 — 4
CH'D PREFERRED METHOD TO METHOD#1. ADDED METHOD #2. MODIFIED INSTALLATION PROCEDURE. REMOVED ALTERNATE METHOD DETAIL. ADDED FM#9 & FM #23 TO FILING INFO. CH'D DWG FROM HYBRID14 TO AUTOCAD14. CH'D FORMAT FROM 'C' SIZE TO 'B' SIZE.
H.J.M. 09/21/05

SUSHIL PARASHER 07/15/15 — 5
ADDED NOTE 4 FOR INSTALLATION OF FIVE GROUNDS AND FIVE SURGE ARRESTERS IN EACH MILE. ADDED NOTE 5 FOR AEMC GROUND TESTER. UPDATED METHOD 1, METHOD 2 IN INSTALLATION PROCEDURE. UPDATED NOTES 1, 2 & 3. ADDED LINK FOR MANUFACTURER INSTRUCTIONS OF AEMC METER. MODIFIED NOTE 3 TO INSTALL GROUND ROD ON THE NEXT POLE IF GROUND ROD CANNOT GO DEEP DUE TO ROCKS. CH'D ITEM 3 STOCK# TO 007–9715.
H.J.M. 07/15/15



METHOD 1



METHOD 2

INSTALLATION PROCEDURE:

1. **METHOD 1** – DRIVE A 10–FOOT, 5/8" DIA. GROUND ROD AT A LOCATION AS SHOWN ON THE ABOVE SKETCH. DRIVE AN ADDITIONAL 6–FOOT, 5/8" DIA. GROUND ROD ON TOP OF THE FIRST ROD UTILIZING A CONNECTOR COUPLING MAKING A TOTAL OF 16–FEET. CONNECT THE GROUND CABLE TO THE GROUND ROD AND THEN TO SYSTEM NEUTRAL UP THE POLE UTILIZING #2 COPPER CABLE AND GROUND CLAMP. TAKE RESISTANCE MEASUREMENT UTILIZING COMPANY APPROVED CLAMP TYPE INSTRUMENT (SEE NOTE 5). IF THE RESISTANCE MEASURED IS 25 OHMS OR LESS, DO NOT DRIVE ADDITIONAL GROUND RODS. RECORD THE GROUND RESISTANCE IN YOUR FILE AND DATE OF THE TEST. IF THE RESISTANCE IS MORE THAN 25 OHMS DRIVE ADDITIONAL RODS TO GO DEEPER THAN 16 FEET, BUT NOT TO EXCEED A TOTAL DEPTH OF 32 FEET. TAKE GROUND RESISTANCE MEASUREMENT AGAIN AND RECORD DATA IN YOUR FILE AND DATE. IF THE RESISTANCE STILL EXCEEDS 25 OHMS INFORM THE SPECIFYING ENGINEER AND FOLLOW METHOD 2 OR METHOD 3.
2. **METHOD 2** – IF THE RESISTANCE IS MORE THAN 25 OHMS, DRIVE A SECOND 10–FOOT 5/8" DIA GROUND ROD AND AN ADDITIONAL 6–FOOT 5/8" DIA GROUND ROD ON TOP OF THE SECOND ROD, AS SHOWN ABOVE IN METHOD 2, AT A MINIMUM DISTANCE OF 6 FEET AWAY FROM THE FIRST SET OF RODS, AGAIN MAKING A TOTAL DEPTH OF 16–FEET. CONNECT THE TWO SETS OF RODS UTILIZING #2 EPR COPPER CABLE. TAKE RESISTANCE MEASUREMENT OF THE PARALLEL COMBINATION UTILIZING COMPANY APPROVED CLAMP TYPE INSTRUMENT (SEE NOTE 5). IF THE RESISTANCE STILL EXCEEDS 25 OHMS, GO DEEPER IF POSSIBLE AS PER METHOD 1. TAKE RESISTANCE MEASUREMENT. IF THE RESISTANCE STILL EXCEEDS 25 OHMS, RECORD THE DATA AND DATE IN YOUR FILE AND INFORM THE SPECIFYING ENGINEER. AS AN ALTERNATIVE FOLLOW METHOD 3.

   DO NOT DRIVE ADDITIONAL GROUND RODS .

   REMEMBER , TAKE RESISTANCE MEASUREMENTS ONLY AFTER CONNECTING THE GROUND CABLE OF THE RODS TO THE SYSTEM NEUTRAL UP THE POLE.
3. **METHOD 3** – IF GROUNDING OF THE SECOND SET OF RODS SIX FEET AWAY AS PER METHOD 2 IS NOT PRACTICAL DUE TO FIELD CONDITIONS, THE INSTALLATION OF ADDITIONAL GROUND RODS ON THE NEXT POLE IS ALSO ACCEPTABLE. THE GROUND RODS ON THE NEXT POLE MAY BE UP TO 16–FEET DEEP USING COMBINATION OF RODS OR GO EVEN DEEPER, IF POSSIBLE. MAKE ALL PROPER CONNECTIONS AS MENTIONED IN METHOD 1. IF THE RESISTANCE STILL EXCEEDS 25 OHMS INFORM THE SPECIFYING ENGINEER. **DO NOT DRIVE ADDITIONAL GROUND RODS .**
4. MAKE THE CONNECTION OF #2 COPPER CABLE TO THE GROUND ROD AND THEN TO THE OVERHEAD PRIMARY OR SECONDARY NEUTRAL OR TO THE COMMON PRIMARY AND SECONDARY NEUTRAL. WHICHEVER IS AVAILABLE. UTILIZING THE GROUND WIRE CLAMP.
5. VERIFY ALL THE CONNECTIONS ARE SECURE AND TIGHT.
6. COVER GROUNDING WIRE WITH MOULDING AND STAPLE IN PLACE AS REQUIRED.

NOTES:

1. IN METHOD 2, IF FIELD CONDITIONS PREVENT A HORIZONTAL SEPARATION OF 10 FEET BETWEEN THE FIRST AND SECOND SET OF RODS, FOR EXAMPLE ROCKY AREAS, OR CONCRETE SIDEWALKS, THE SECOND ROD SHALL BE DRIVEN NOT LESS THAN 6 FEET APART AND PROPER PARALLELING CONNECTIONS SHALL BE MADE BETWEEN THEM.
2. THE GROUND RODS MUST BE PROPERLY COVERED SO THAT NO PART OF THE RODS OR CABLE(S) ARE EXPOSED.
3. IN HEAVY ROCK CONCENTRATED AREAS, IF THE GROUND RODS CANNOT BE DRIVEN TO THEIR FULL DEPTH, INSTALL THE GROUNDS ON THE NEXT POLE.
4. GROUND RODS ARE REQUIRED TO BE INSTALLED ON EVERY EQUIPMENT POLE. IN CASE WHERE THERE IS NO EQUIPMENT ON THE POLE AND IT IS AN EXPRESS OVERHEAD LINE, IN THAT CASE, FIVE GROUNDS AND FIVE SURGE ARRESTERS MUST BE INSTALLED ON THAT LINE IN EACH MILE (APPROXIMATELY 1056 FEET APART) AS PER EO–2012. SURGE ARRESTERS MUST BE PROPERLY GROUNDED BY INSTALLING INDIVIDUAL GROUNG RODS.
5. THE APPROVED GROUND TESTER IS AEMC CLAMP TYPE OR EQUAL. REFER TO AEMC MANUFACTURER'S INSTRUCTIONS ON HOW TO USE THE INSTRUMENT. THE WEBSITE IS WRITTEN IN HIGHLIGHTED BOX TO THE RIGHT, ABOVE THE TITLE BOX.

REFERENCE SPECIFICATION:

APPLICATION OF SURGE ARRESTERS ON DISTRIBUTION SYSTEMS _ _ _ _ _ _ _ _ _ _ _ _ _ _ EO–2012

GROUND REQUIREMENTS AND GROUNDING OF SPACER TYPE AND METAL SHEATHED AERIAL CABLE _ EO–2013

REQUIREMENTS FOR NEUTRAL CONDUCTOR ON PRIMARY RADIAL DISTRIBUTION CIRCUITS _ _ _ _ _ EO–2025

FOR MANUFACTURER'S INSTRUCTIONS GO TO WEBSITE:
WWW.AEMC.COM/products/pdf/2117.61.pdf

FIELD MANUAL NO. 23 SECT: 14 GROUNDING

FIELD MANUAL NO. 9 SECT. 2 POLE INSTALL

CONST STD'S MANUAL NO. 3 SECT. 6 PROTECTIVE DEVICES

ITEM	DESCRIPTION	CLASS & STOCK NO.
8	HDPE CONDUIT 2" DIA.	005–2068
7	GROUND WIRE CONNECTOR TO ROD	007–8618
6	GROUND WIRE MOULDING	007–8162
5	GROUND WIRE CLAMP TO SYSTEM NEUTRAL	007–4252
4	#2 EPR COPPER CABLE	561–0936
3	THREADED COPPERWELD COUPLING	007–9715
2	INTERMEDIATE ROD 6'– 0" X 5/8"	007–3718
1	TERMINAL ROD 10'–0" X 5/8"	007–3734

BILL OF MATERIAL

INSTALLATION OF DRIVEN GROUND RODS

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

DATE 4–8–57
LAST REV. 07/15/15

DWG. NO. EO-8265-B REV. 5

COMPUTER GENERATED DRAWING NOT TO BE HAND REVISED

DRAWN BY DIRICO DATE 2–16–93
CHECKED BY DATE
DISCIPLINE CODE
SCALE NONE
APPROVED
MGR. CHIEF DESIGN ENGINEER DATE
MGR. TRANS. & DIST STRUCT ENGR DATE