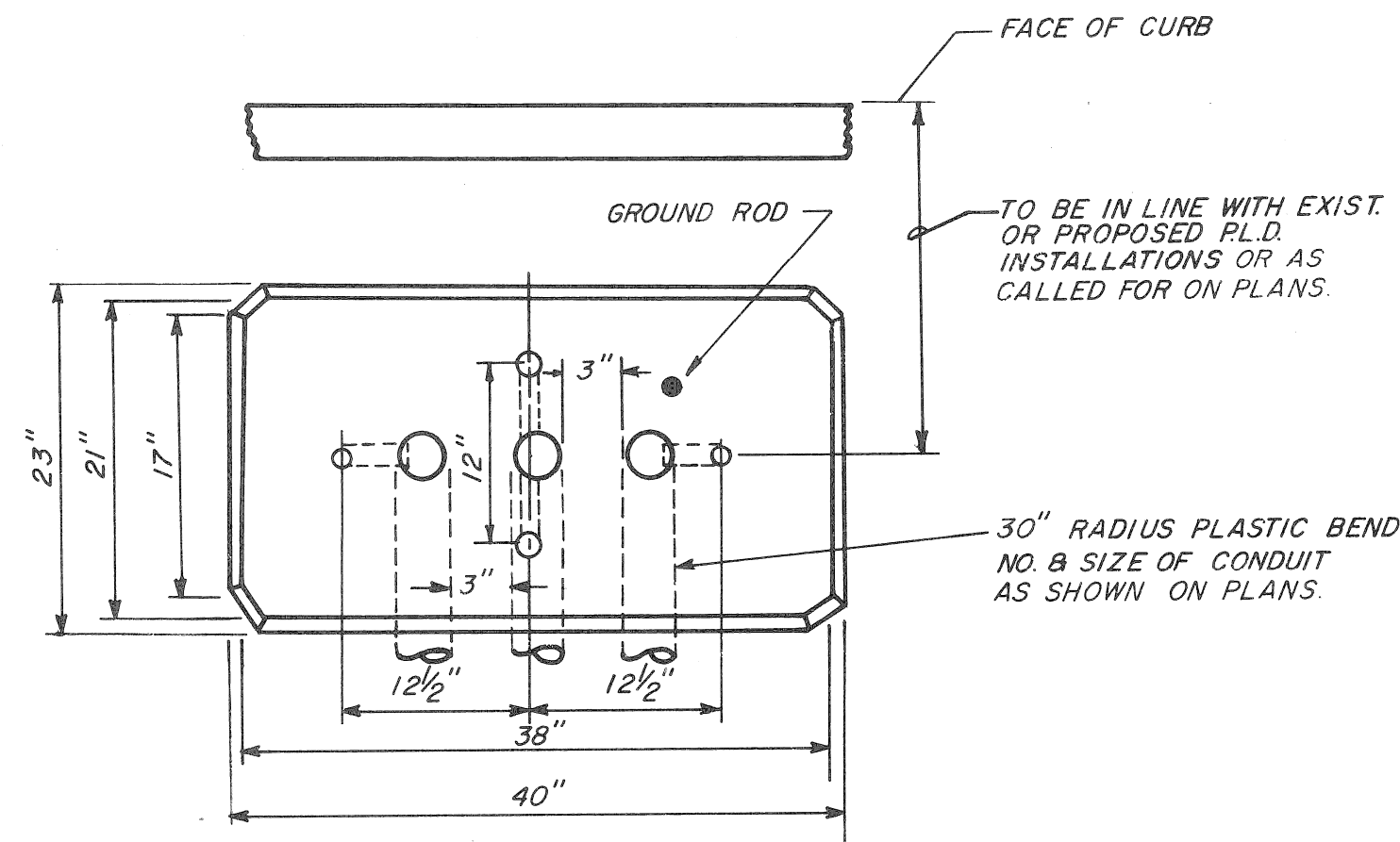
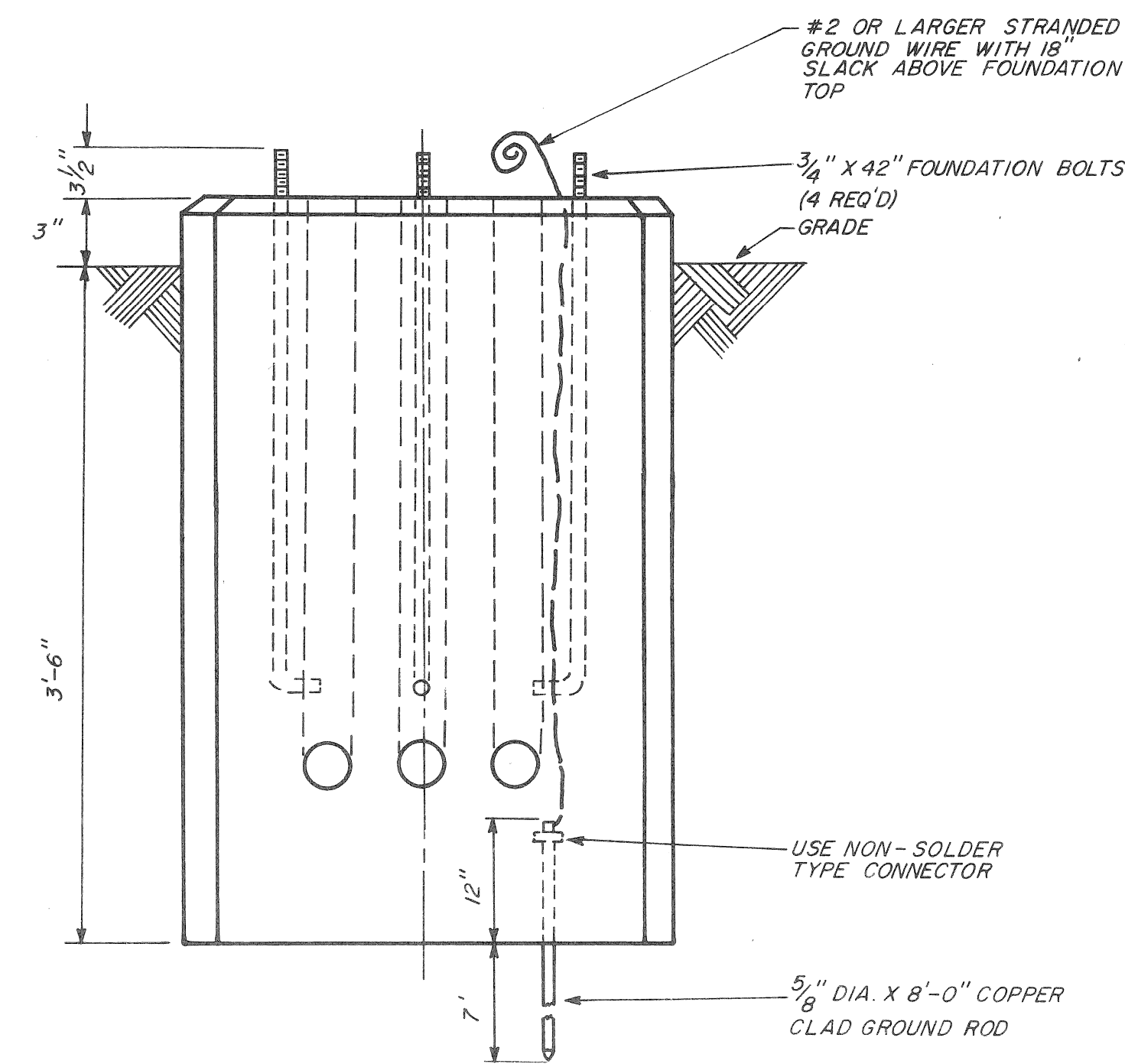


VENTED ALUMINUM CABINET WITH BASE MOUNTING SHALL BE 34" W X 17" D X 48" H. CABINET CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE SPECIFICATION FOR TRAFFIC SIGNAL CONTROLLER CABINET CONSTRUCTION.

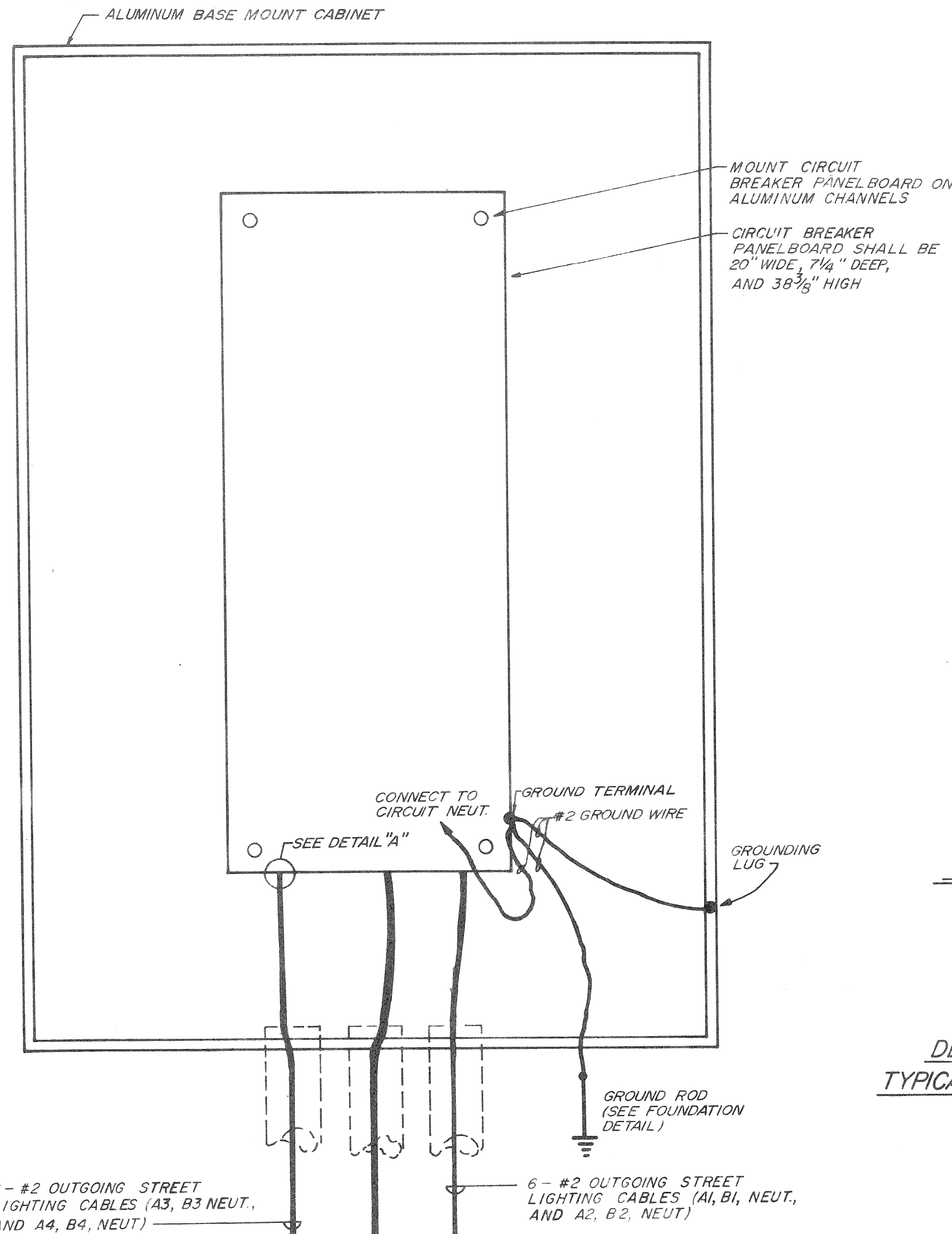
MULT. ST. LTG. CONTROL CABINET
N.T.S.



PLAN



ELEVATION
FOUNDATION FOR MULT. ST. LTG. CONTROL CABINET
N.T.S.



MULT. ST. LTG. DISTRIBUTION PANELS
N.T.S.

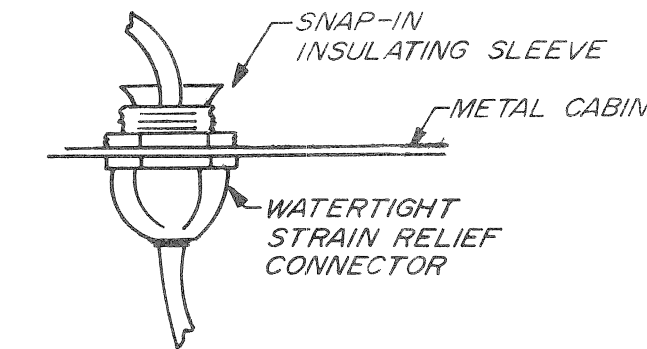
NOTES:

LIGHTING PANEL BOARD SHALL BE CIRCUIT BREAKER TYPE, RATED 480 V.A.C. MINIMUM, 225 AMP MAIN LUGS, SINGLE PHASE, 3-WIRE, SOLID NEUTRAL, NEMA TYPE 3R WEATHERPROOF ENCLOSURE.

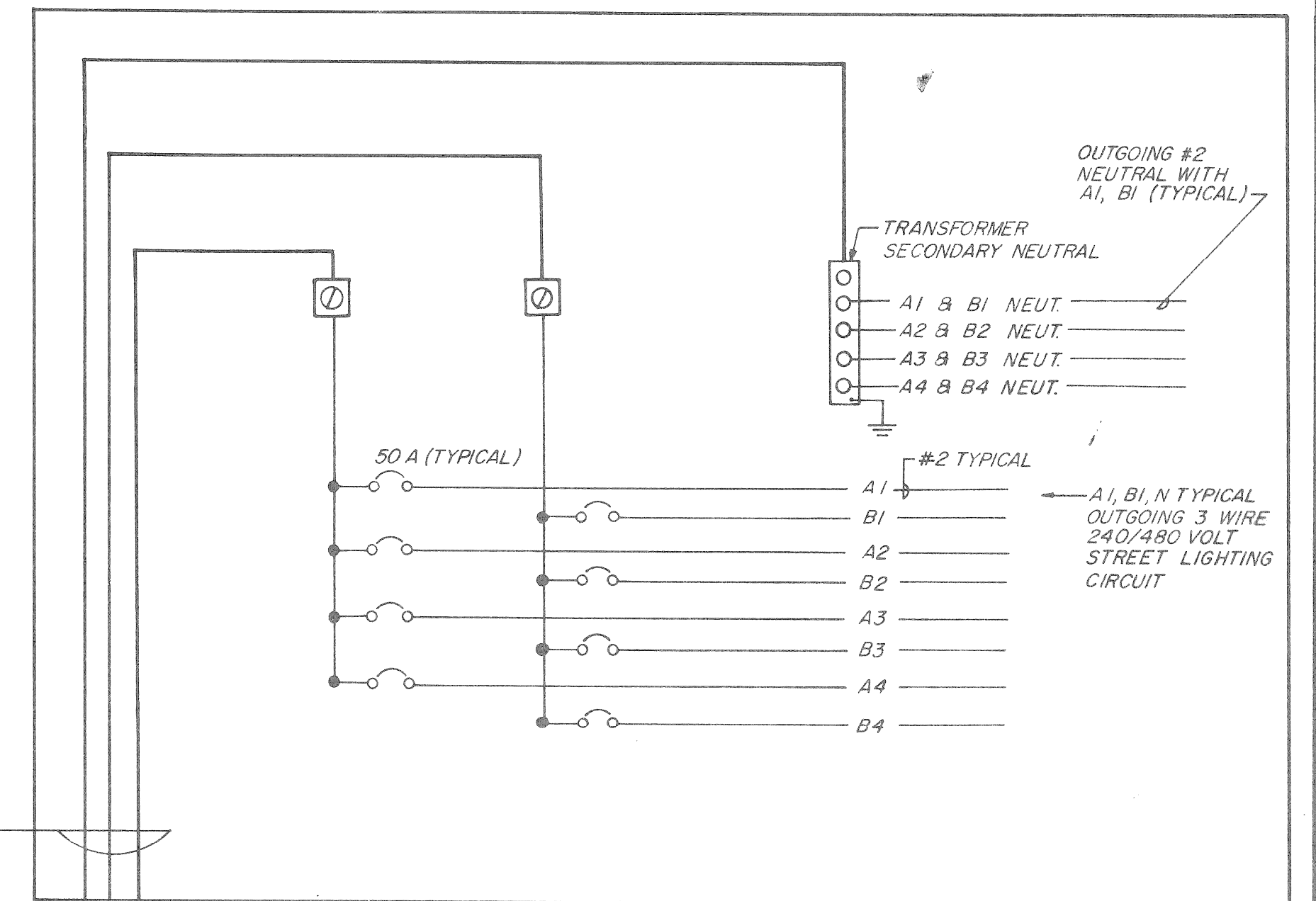
BRANCH CIRCUIT BREAKERS SHALL BE 50 AMP, TYPE NEF THERMAL - MAGNETIC BREAKERS, 1 POLE WITH MINIMUM INTERRUPTING CAPACITY OF 14,000 RMS SYMMETRICAL AMPERES AT 240 VOLTS.

THE CIRCUIT BREAKER BOX SHALL BE MINIMUM 20" WIDE, 7 1/2" DEEP AND 38 3/8" HIGH. THE SIDE AND BOTTOM GUTTERS SHALL BE ADEQUATE TO ACCOMMODATE THE 3-#2/0 INCOMING CABLES AND 12-#2 OUTGOING CIRCUIT CABLES.

PRIOR TO FABRICATING THE CIRCUIT BREAKER PANEL BOARD AND BOX WITH ASSOCIATED LUGS, BREAKERS ETC. SUBMIT TO THE P.L.D. THE DETAILED SHOP DRAWING INDICATING THE TYPE OF ALUMINUM CABINET, INTERIOR MOUNTING CHANNEL, MOUNTING OF CIRCUIT BREAKER BOX, WIRING AND NECESSARY HARDWARE FOR A COMPLETE ASSEMBLY. THE P.L.D. MAY REQUIRE DEVIATIONS TO THE SUBMITTED SHOP DRAWING AND P.L.D. REQUESTED CHANGES SHALL BE DONE WITH NO ADDITIONAL COST TO THE CONTRACT.



DETAIL "A"
TYPICAL - EACH CABLE



STREET LIGHTING PANEL BOARD
WIRING DIAGRAM

DATE	DESCRIPTION	CHKD. BY

JEFFERSON/CONNER INDUSTRIAL REVITALIZATION PROJECT
MACK AVENUE LIGHTING
MULT. ST. LTG. CONTROL CABINET (240/480V.)

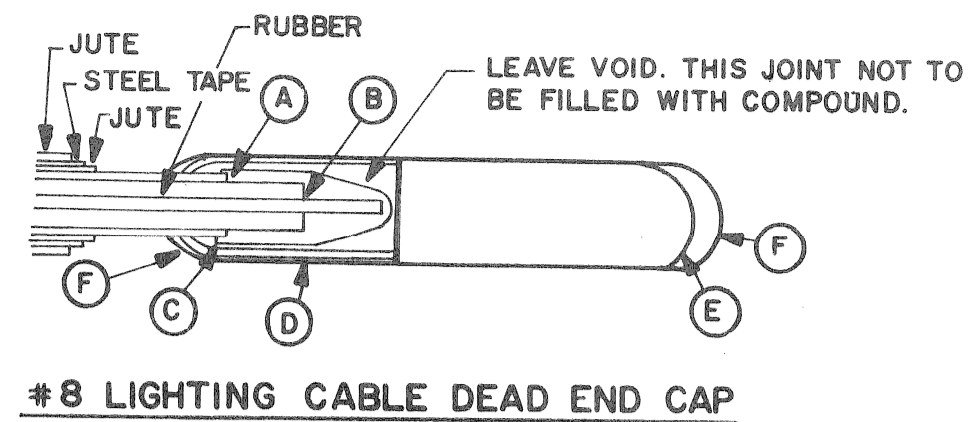
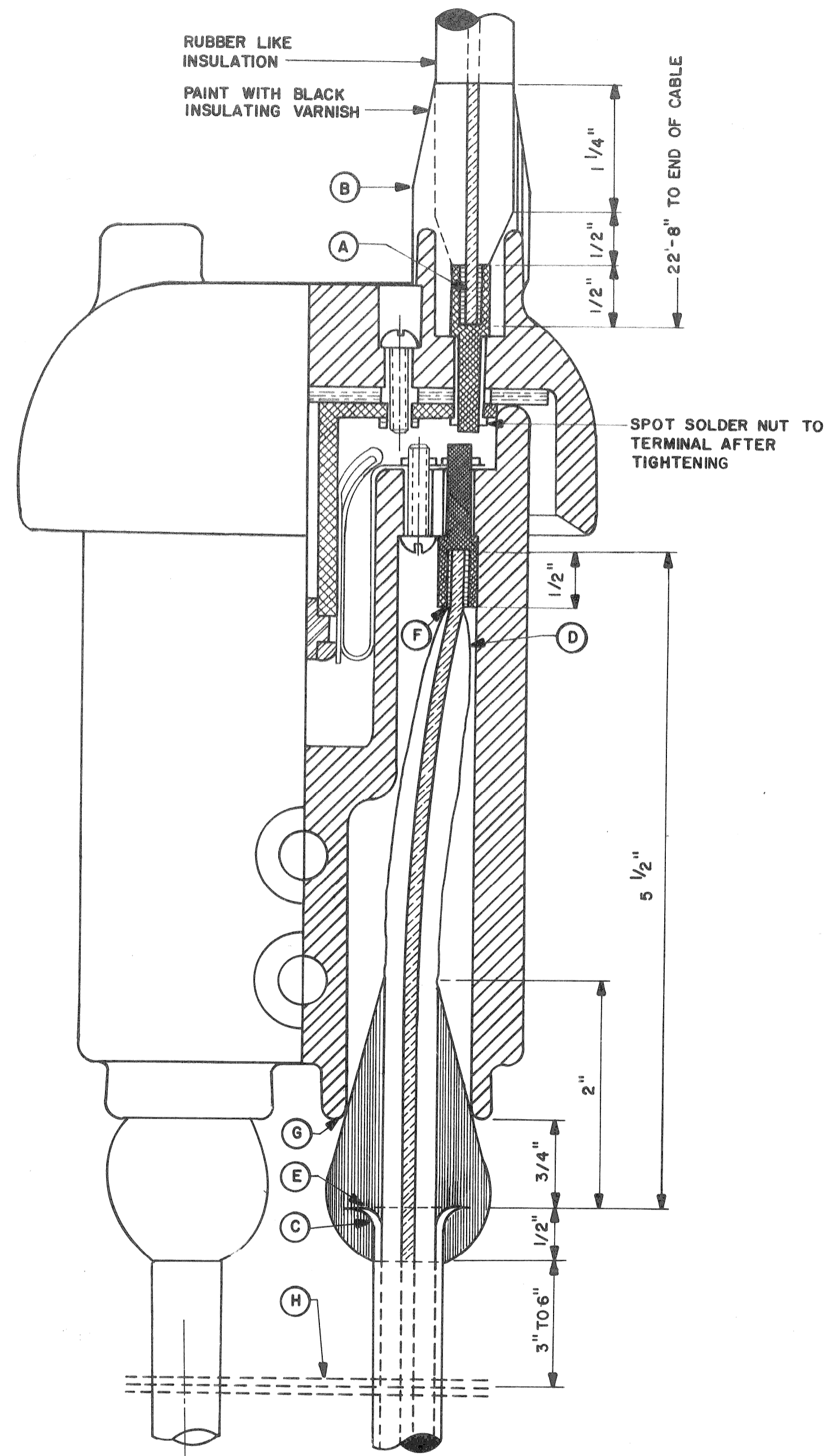
DRAWN **CEA**
CHECKED
APPROVED
DATE

PLAN PREPARED BY
CONSULTING ENGINEERING ASSOCIATES INC.
ENGINEERING CONSULTANTS
16580 WYOMING DETROIT, MICH. 48221
DRWG. NO. **24 OF 40**
FILE NO. **CEA 1137**

CHECKED BY
APPROVED

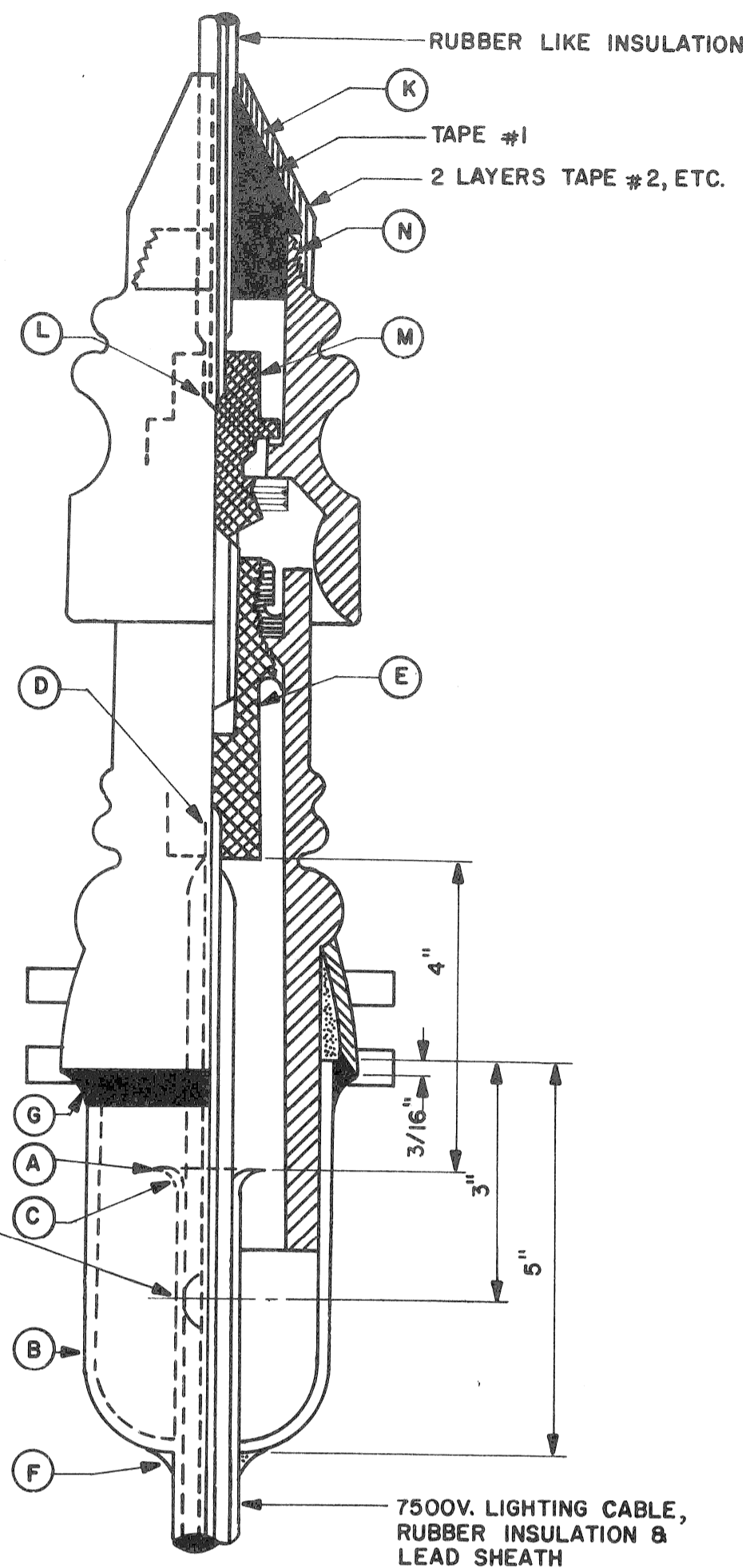
PUBLIC LIGHTING DEPARTMENT
CITY OF DETROIT

126
FILE NO. **51-0606**
SHEET NO. **101 OF 117**
DATE **AUG. 87**

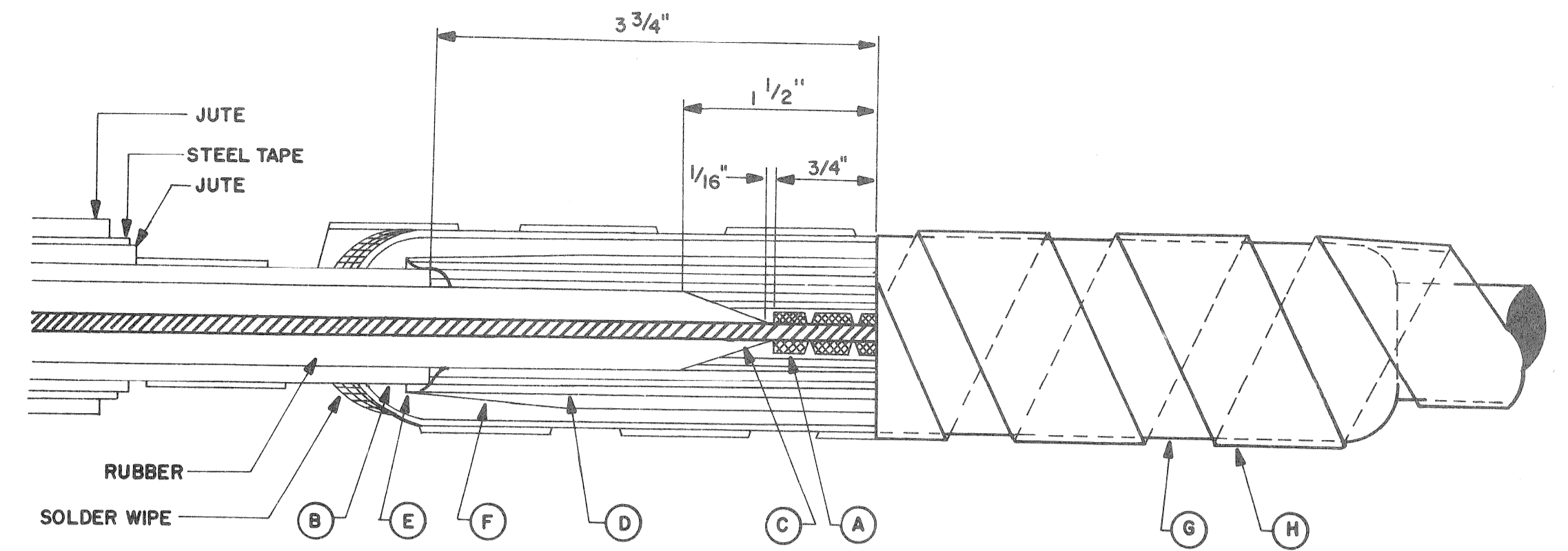


#8 LIGHTING CABLE DEAD END CAP

- A- SCORE LEAD SHEATH WITH TUBE CUTTER & CHIP OFF WITH CHIPPING IRON. DO NOT BREAK OFF BY BENDING.
- B- CUT INSULATION
- C- OVERLAP WITH TAPE #2 APPROXIMATELY 1/4" FROM END OF LEAD OF LEAD SHEATH, AT LEAST 2 LAYERS OF TAPE AT THIS POINT.
- D- 1 1/4" x 8" x 1/8" LEAD SLEEVE
- E- SHAPE AND BEAT LEAD SLEEVE TO FORM A CLOSED END.
- F- CADMIUM ALLOY WIPING METAL. DO NOT POUR METAL FOR WIPE. USE TORCH AND FINGER WIPE WITH MINIMUM OF HEAT.

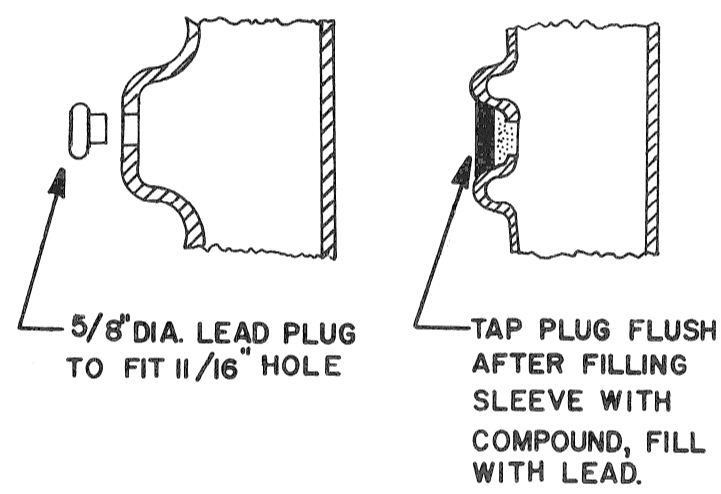


#8 LIGHTING CABLE JOINT
N.T.S.



- A- 1 1/2" #8 TINNED COPPER SLEEVE, 2 CIRCUMFERENTIAL CRIMPS ON EACH END.
- B- SCORE LEAD SHEATH WITH TUBE CUTTER & CHIP OFF WITH CHIPPING IRON. DO NOT BREAK OFF BY BENDING.
- C- CUT INSULATION & PENCIL SMOOTHLY AS SHOWN, AFTER REMOVING TAPE.
- D- APPLY TAPE #1 TO APPROXIMATELY 1" DIAMETER OVERALL.
- E- OVERLAP WITH TAPE #1 APPROXIMATELY 1/4" FROM END OF LEAD OF LEAD SHEATH, AT LEAST 2 LAYERS OF TAPE AT THIS POINT.
- F- 2 LAYERS OF TAPE #2 APPLIED HALF LAP.
- G- 1/4" x 8" x 1/8" LEAD SLEEVE.
- H- TWO LAYERS OF TAPE #2 HALF LAP, ON ARMORED PARKWAY CABLE ONLY.

EMBOSS LEAD SLEEVE WITH 11/16" DIA. HOLE, CENTER AT 3" BELOW TOP OF SLEEVE SEE DETAIL BELOW



CONNECTIONS FOR 1/C 7500V. POTHEAD
N.T.S.

- A- USE TUBE CUTTER TO SCORE LEAD SHEATH AND CHIP OFF WITH CHIPPING IRON. DO NOT BREAK OFF BY BENDING 4" OF INSULATION TO REMAIN, NOT INCLUDING BARED CONDUCTOR.
- B- FORM BOTTOM OF EMBOSSED SLEEVE & SLIP OVER CABLE, HOLE IN FRONT.
- C- BELL LEAD SHEATH, REMOVE TAPE FROM INSULATION, INCLUDING AS MUCH AS POSSIBLE FROM WITHIN BELLED SHEATH.
- D- SWEAT CONDUCTOR INTO TERMINAL & PENCIL INSULATION SMOOTHLY FOR 3/4"
- E- MOUNT TERMINAL FIRMLY INTO PORCELAIN.
- F- PUSH SLEEVE INTO CAST IRON COLLAR AND WIPE SMOOTHLY TO LEAD SHEATH.
- G- INVERT & FILL JOINT BETWEEN IRON COLLAR AND SLEEVE WITH EPOXY RESIN.
- H- LAY POTHEAD HORIZONTAL & FILL COMPLETELY WITH APPROVED COMPOUND.
- I- INSERT LEAD PLUG INTO EMBOSSED HOLE, TAP FLUSH & FILL WITH LEAD.
- J- TRAIN CABLE & MOUNT POTHEAD ON CROSS ARM.
- K- SLIP THE CONE SHAPED RUBBER BUSHING ON THE RUBBER INSULATED CABLE RISER.
- L- SWEAT CONDUCTOR INTO TERMINAL FIRMLY INTO THE POTHEAD CAP.
- M- MOUNT THE TERMINAL FIRMLY INTO THE POTHEAD CAP.
- N- BUILD UP WITH TAPE #1 AND CARRY 2 LAYERS OVER THE CAP TO POINT "N" AS SHOWN. COVER WITH 2 LAYERS TYPE #2- HALF LAP. PAINT WITH BLACK INSULATION VARNISH.

SUBSTATION NAMES ON IDENTIFICATION TAGS SHALL BE SPELLED AS FOLLOWS.

BI.	MCRDY.
BUTZL.	MTRSE.
CNFLD.	PAL.PK.
CONNR.	PHILP.
CUSTER.	PORTER.
GRNFD.	STNTN.
HUDSN.	STONE.
J.CAMP.	TRNTY.
JOY RD.	TURNR.
L.A. BEL.	
LTHRP.	WALTN.
LUDDN.	WARRN.
MAPLE.	WD.TER.

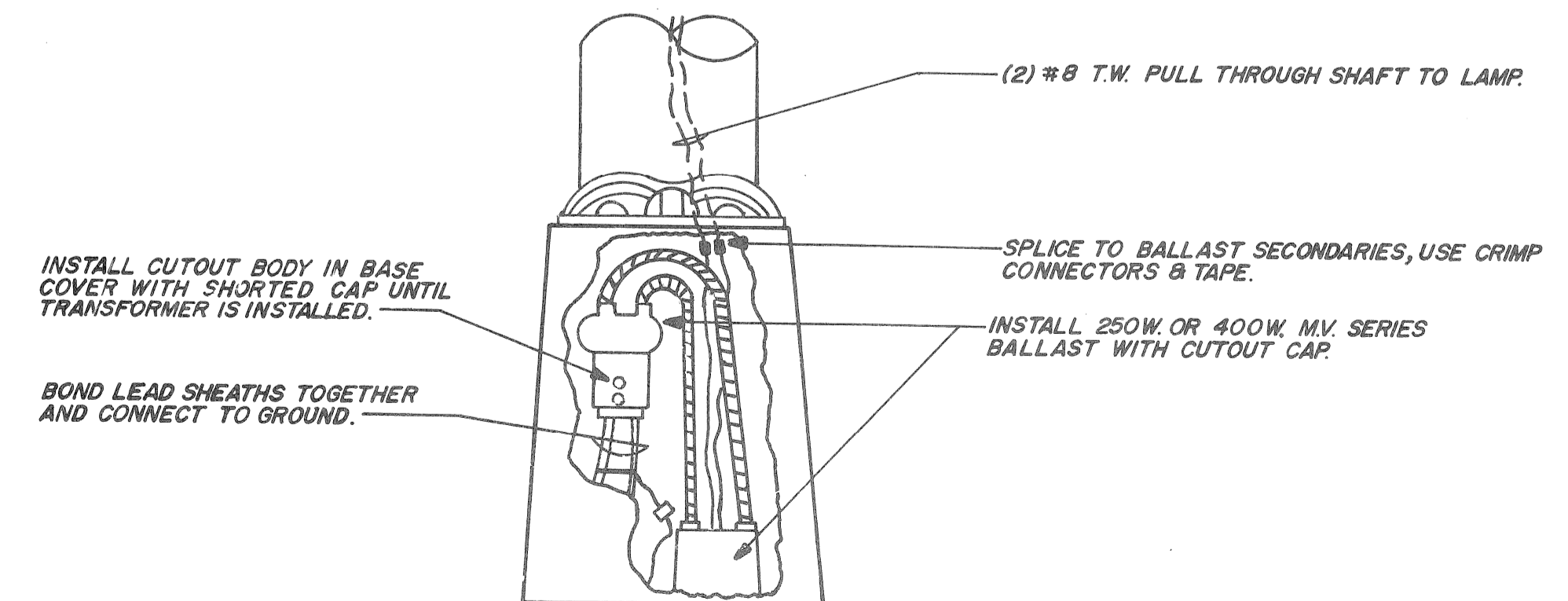
- A- SWEAT TERMINAL & PENCIL RUBBER INSULATION TO FIT SNUGLY IN PORCELAIN CAP OPENING SO THAT THE CONNECTOR NUT IS TIGHTENED, THE OPENING IS COMPLETELY & TIGHTLY FILLED.
- B- BUILD UP WITH #1 TAPE AS SHOWN, & COVER WITH 2 LAYERS, HALF LAP, WITH #2 TAPE. PAINT WITH ONE COAT OF BLACK INSULATING VARNISH.
- C- USE TUBE CUTTER TO SCORE LEAD SHEATH & CHIP OFF WITH CHIPPING IRON. DO NOT BREAK OFF BY BENDING.
- D- CUT INSULATION & PENCIL SMOOTHLY.
- E- BELL LEAD SHEATH, REMOVE TAPE COMPLETELY, INCLUDING AS MUCH AS CAN BE REMOVED INSIDE OF BELL. FILL SHEATH CAVITY WITH RUBBER CEMENT.
- F- SWEAT CONDUCTOR INTO TERMINAL.
- G- APPLY TAPE #1 OVER BELL AS SHOWN TO FORM A TIGHT FIT BETWEEN INSULATION AND PORCELAIN AT "G" WHEN NUT IS TIGHTENED. COVER TAPE #1 WITH 2 LAYERS OF TAPE #2 APPROX. 3/4" FROM END OF TAPE #1.
- H- #18 SERVICE WIRE OR BRAID 4 WRAPS BETWEEN CABLES & SWEATED TO LEAD SHEATH FOR BOND TIE TO GROUND WIRE.

NOTES:

1. FOR PARKWAY CABLE, STRIP JUTE & STEEL TAPE DOWNWARD TO DUCT ENTRANCE.
2. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A LIST OF ALL SPLICING MATERIALS HE PROPOSES TO USE WITH SUPPORTING DATA THAT THE MATERIAL IS SUITABLE FOR THE APPLICATION AS SHOWN ON THE DRAWINGS.

MATERIAL TYPES

- TAPE #1 - CORONA RESISTING HIGH VOLTAGE RUBBER TAPE ONLY.
- TAPE #2 - BLACK PLASTIC ELECTRICAL TAPE.



INCANDESCENT TO MERCURY CONVERSION
N.T.S.

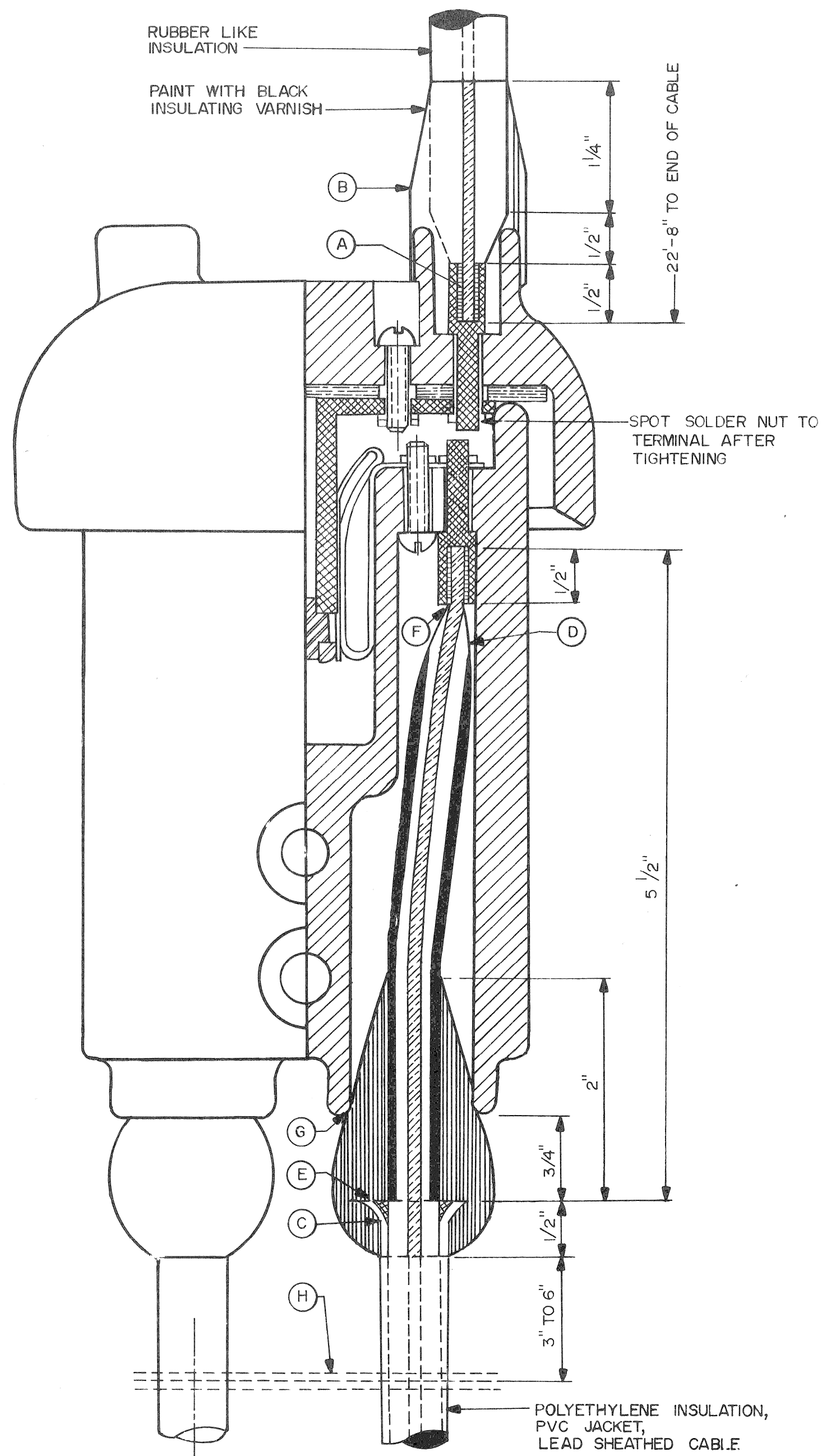
DATE	DESCRIPTION	CHKD BY

JEFFERSON/CONNER INDUSTRIAL REVITALIZATION PROJECT
MACK AVENUE LIGHTING
RUBBER INSULATED LEAD SHEATHED CABLE SPLICE & CONNECTIONS
DETAILS

DRAWN BY CEA	PLAN PREPARED BY CONSULTING ENGINEERING ASSOCIATES INC. ENGINEERING CONSULTANTS 16580 WYOMING DETROIT, MICH 48221
CHECKED BY	CHECKED BY
APPROVED BY <i>[Signature]</i>	APPROVED BY
DATE AUG. 87	DRWG. NO. 25 OF 40
	FILE NO. CEA 1137

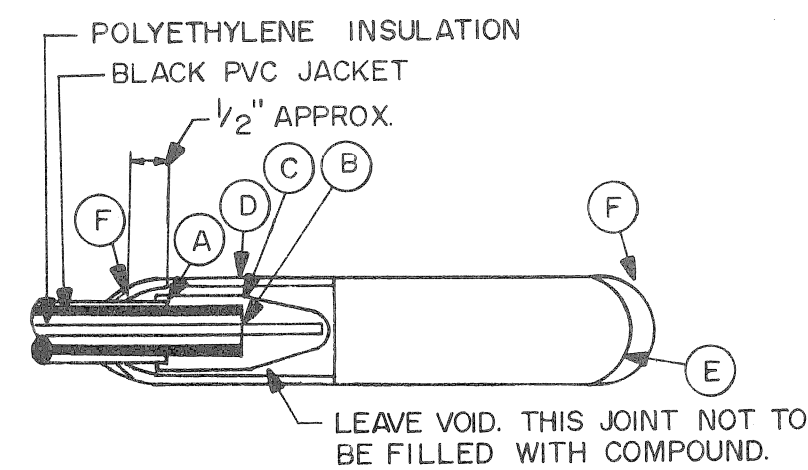
PUBLIC LIGHTING
DEPARTMENT
CITY OF DETROIT

9101
FILE NO.
51-0606
SHEET NO. 102
OF 117
DATE
AUG. 87



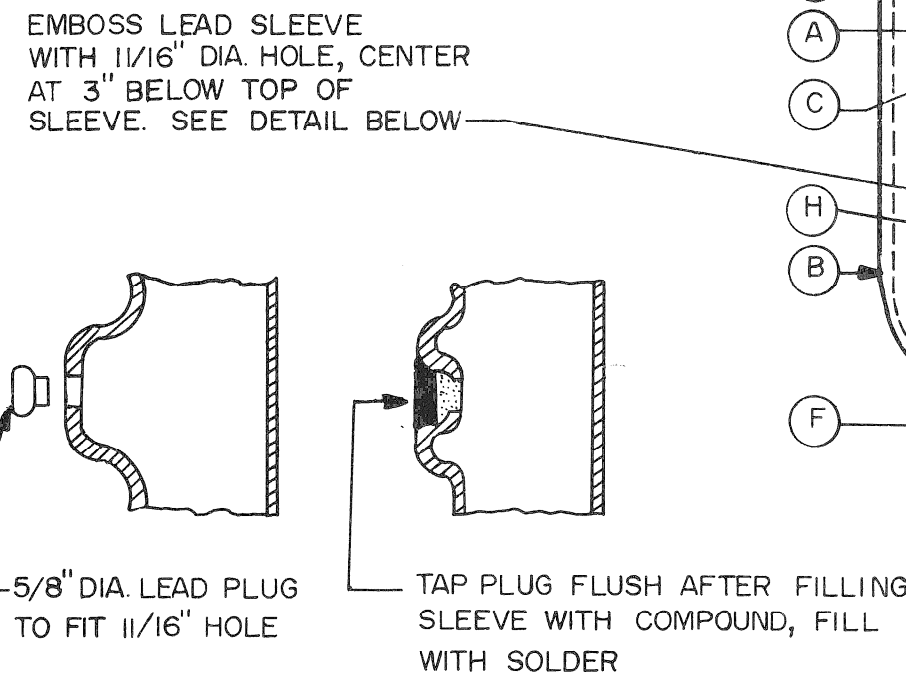
CONNECTION FOR SERIES CUTOFF
N.T.S.

- A- SWEAT TERMINAL & PENCIL INSULATION TO FIT SNUGLY IN PORCELAIN OPENING SO THAT AS NUT IS DRAWN UP TIGHT THE OPENING IS COMPLETELY AND TIGHTLY FILLED.
- B- BUILD UP WITH TAPE #3 AS SHOWN AND COVER WITH 2 LAYERS 1/2" HALF LAP, TAPE #2 PAINT AS NOTED.
- C- USE TUBE CUTTER TO SCORE LEAD SHEATH AND CHIP OFF WITH CHIPPING IRON. DO NOT BREAK OFF BY BENDING.
- D- CUT INSULATION AND PENCIL SMOOTHLY FOR CONNECTION.
- E- BELL LEAD SHEATH AND FILL SHEATH CAVITY WITH APPROVED ADHESIVE.
- F- SWEAT CONDUCTOR INTO TERMINAL.
- G- APPLY TAPE #1 OVER BELL SUFFICIENTLY TO FORM A TIGHT FIT BETWEEN CABLE AND PORCELAIN AT G COVER TAPE #1 WITH 2 LAYERS OF TAPE #2 TO ABOUT 3/4" FROM END OF TAPE #1.
- H- #18 SERVICE WIRE OR BRAID, 4 WRAPS BETWEEN CABLES AND SWEATED TO LEAD SHEATH FOR BOND TIE TO GROUND WIRE.



#8 LIGHTING CABLE DEAD END CAP
N.T.S.

- A- SCORE LEAD SHEATH WITH TUBE CUTTER AND CHIP OFF WITH CHIPPING IRON. DO NOT BREAK OFF BY BENDING.
- B- CUT INSULATION TO EXPOSE 1" OF BARE COPPER.
- C- APPLY 3 LAYERS TAPE #2 OVER PVC JACKET LEAD SHEATH. OVERLAP SHEATH WITH TAPE APPROX. 1/4" & COVER BARE COPPER.
- D- LEAD SLEEVE 8" LONG 1/8" WALL 1 1/4" INSIDE DIAMETER.
- E- SHAPE & BEAT LEAD SLEEVE TO FORM A CLOSED END.
- F- CADMIUM ALLOY WIPING METAL. DO NOT POUR METAL FOR WIPE. USE TORCH & FINGER WIPE WITH MINIMUM OF HEAT.



CONNECTIONS FOR 1/C 7500V. POTHEAD
N.T.S.

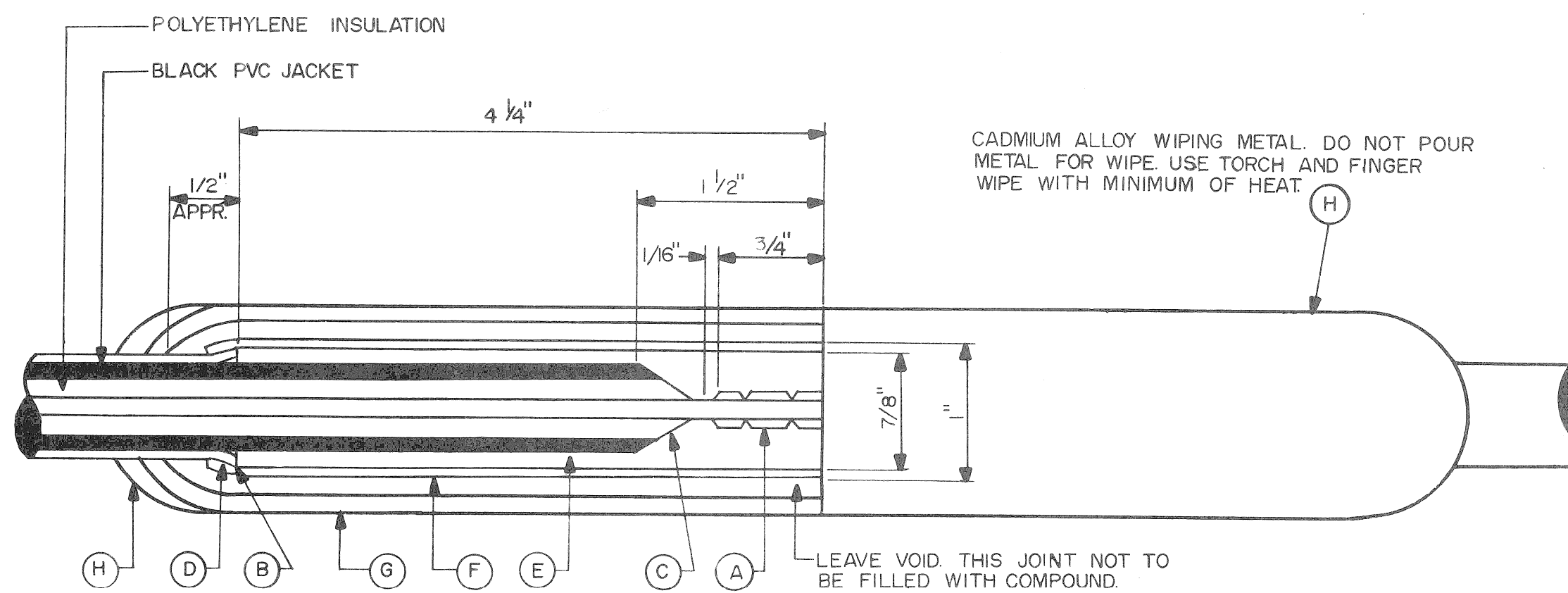
- A- USE TUBE CUTTER TO SCORE LEAD SHEATH AND CHIP OFF WITH CHIPPING IRON. DO NOT BREAK OFF BY BENDING. 4" OF INSULATION TO REMAIN, NOT INCLUDING BARED CONDUCTOR.
- B- FORM BOTTOM OF EMBOSSED LEAD SLEEVE & SLIP OVER CABLE HOLE IN FRONT.
- C- BELL LEAD SHEATH.
- D- SWEAT CONDUCTOR INTO TERMINAL & PENCIL INSULATION SMOOTHLY FOR 3/4".
- E- MOUNT TERMINAL FIRMLY INTO PORCELAIN HOUSING.
- F- PUSH SLEEVE INTO CAST IRON COLLAR AND FINGER WIPE TO CABLE SHEATH WITH LOW TEMPERATURE CADMIUM ALLOY. USE MINIMUM OF HEAT. DO NOT POUR METAL.
- G- INVERT & FILL JOINT BETWEEN IRON COLLAR AND LEAD SLEEVE WITH APPROVED EPOXY RESIN.
- H- LAY POTHEAD HORIZONTAL & FILL WITH APPROVED COMPOUND. DO NOT HEAT COMPOUND MORE THAN NECESSARY FOR POURING.
- I- INSERT 5/8" DIA. LEAD PLUG INTO SLEEVE HOLE, TAP FLUSH AND FILL IN WITH SOLDER.
- J- TRAIN THE CABLE AND MOUNT THE POTHEAD ON CROSSARM.
- K- SLIP THE CONE SHAPED RUBBER BUSHING ON THE RUBBER INSULATED CABLE RISER.
- L- SWEAT CONDUCTOR INTO TERMINAL 'L' AND PENCIL INSULATION AS SHOWN.
- M- MOUNT THE TERMINAL FIRMLY INTO THE POTHEAD CAP.
- N- BUILD UP WITH TAPE #3 AND CARRY 2 LAYERS OVER THE END OF THE CAP TO POINT 'N' AS SHOWN. COVER WITH 2 LAYERS TAPE #2 HALF LAP. PAINT WITH APPROVED BLACK INSULATING VARNISH.

MATERIAL & SPECIAL PRECAUTIONS

- 1. TAPE #1: CLEAR POLYETHYLENE TAPE, 0.02" THICK X 3/4" WIDE. TAPE #2: BLACK PVC PLASTIC ELECTRICAL TAPE. TAPE #3: APPROVED A.S.T.M. RUBBER TAPE. ADHESIVE: APPROVED ADHESIVE. FILLING COMPOUND: APPROVED COMPOUND. WIPING METAL: APPROVED LOW TEMPERATURE CADMIUM ALLOY WIPING METAL.
- 2. USE SMALL HAND TORCH FOR WIPING JOINTS, AT MINIMUM TEMPERATURE.
- 3. WHEN IT IS NECESSARY TO SPLICE POLYETHYLENE INSULATED CABLE TO RUBBER CABLE, USE ABOVE MATERIALS.
- 4. APPLY ADHESIVE INSIDE BELLED SHEATH CAVITY ONLY. APPLY TAPE AFTER ADHESIVE HAS BECOME TACKY.

NOTE:

THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A LIST OF ALL SPLICING MATERIALS HE PROPOSES TO USE WITH SUPPORTING DATA THAT THE MATERIAL IS SUITABLE FOR APPLICATION AS SHOWN ON THE DRAWINGS.

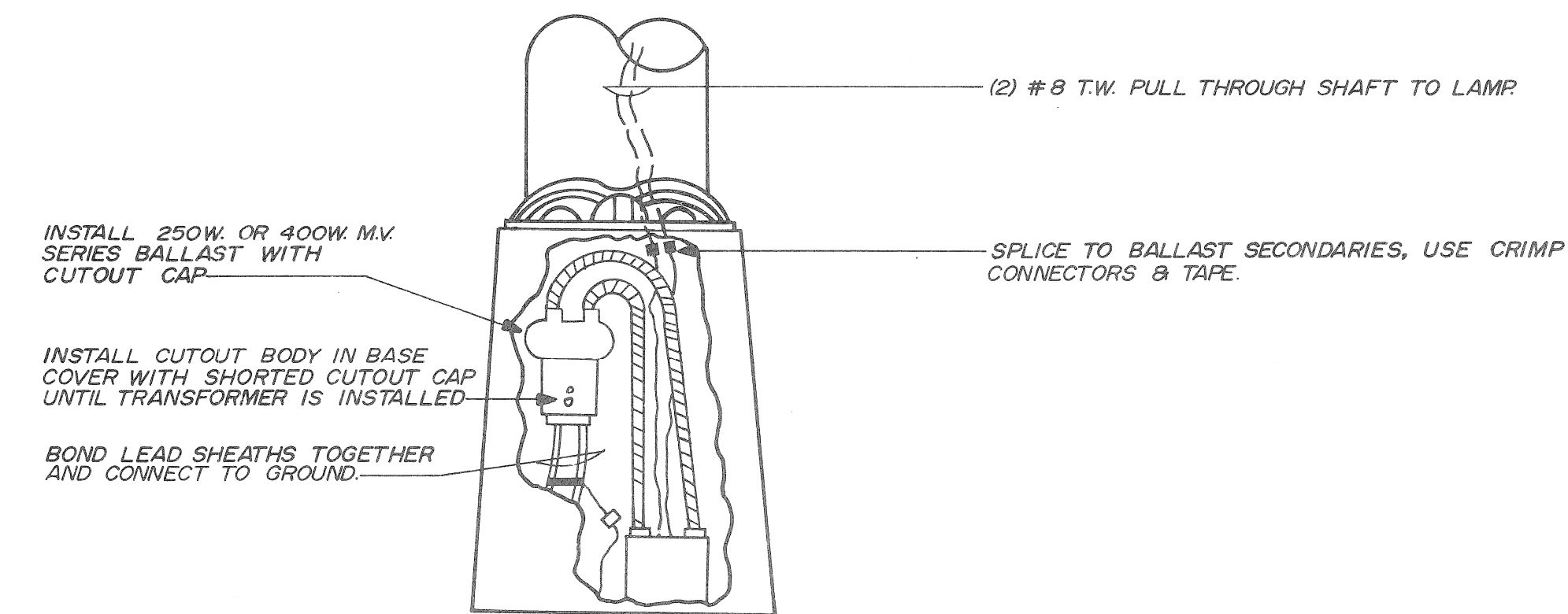


#8 LIGHTING CABLE JOINT
N.T.S.

- A- 1/2" #8 TINNED COPPER SLEEVE, 2 CIRCUMFERENTIAL CRIMPS ON EACH END.
- B- SCORE LEAD SHEATH WITH TUBE CUTTER AND CHIP OFF WITH CHIPPING IRON. DO NOT BREAK OFF BY BENDING.
- C- CUT INSULATION AND PENCIL SMOOTHLY AS SHOWN.
- D- BELL LEAD SHEATH TO DIAMETER SHOWN AND FILL SHEATH CAVITY WITH APPROVED ADHESIVE.
- E- APPLY TAPE #1 OVER PVC JACKET AND BELLED SHEATH TO A DIA. OF 1" OVERLAP BELLED SHEATH WITH TAPE APPROX. 1/4".
- F- 2 LAYERS OF TAPE #2 APPLIED HALF LAP.
- G- LEAD SLEEVE 10" LONG, 1/8" WALL, 1 1/4" INSIDE DIAMETER.
- H- SPECIAL LOW TEMPERATURE CADMIUM ALLOY WIPING METAL.

SUBSTATION NAMES ON IDENTIFICATION TAGS SHALL BE SPELLED AS FOLLOWS

- | | |
|----------|----------|
| BI. | MCRDY. |
| BUTZL. | MTRSE. |
| CNFLD. | PAL. PK. |
| CONNR. | PHLP. |
| CUSTER. | PORTER. |
| GRNFLD. | STNTN. |
| HUDSN. | STONE. |
| J. CAMP. | TRNTY. |
| JOY RD. | TURNR. |
| LA. BEL. | |
| LTHRP. | WALTN. |
| LUDDN. | WARRN. |
| MAPLE. | WD. TER. |



INCANDESCENT TO MERCURY CONVERSION
N.T.S.

DATE	DESCRIPTION	CHKD. BY

JEFFERSON/CONNER INDUSTRIAL REVITALIZATION PROJECT
MACK AVENUE LIGHTING
POLYETHYLENE INSULATED, POLYVINYLCHLORIDE JACKETED, LEAD SHEATHED CABLE CONNECTION SPECIFICATIONS
DETAILS

DRAWN BY CEA	PLAN PREPARED BY CONSULTING ENGINEERING ASSOCIATES INC. ENGINEERING CONSULTANTS	DRAWN BY
CHECKED	16580 WYOMING DETROIT, MICH. 48221	CHECKED BY
APPROVED <i>SJM</i>	DRWG. NO. 26 OF 40	APPROVED
DATE AUG. 87	FILE NO. CEA 1137	

PUBLIC LIGHTING DEPARTMENT
CITY OF DETROIT

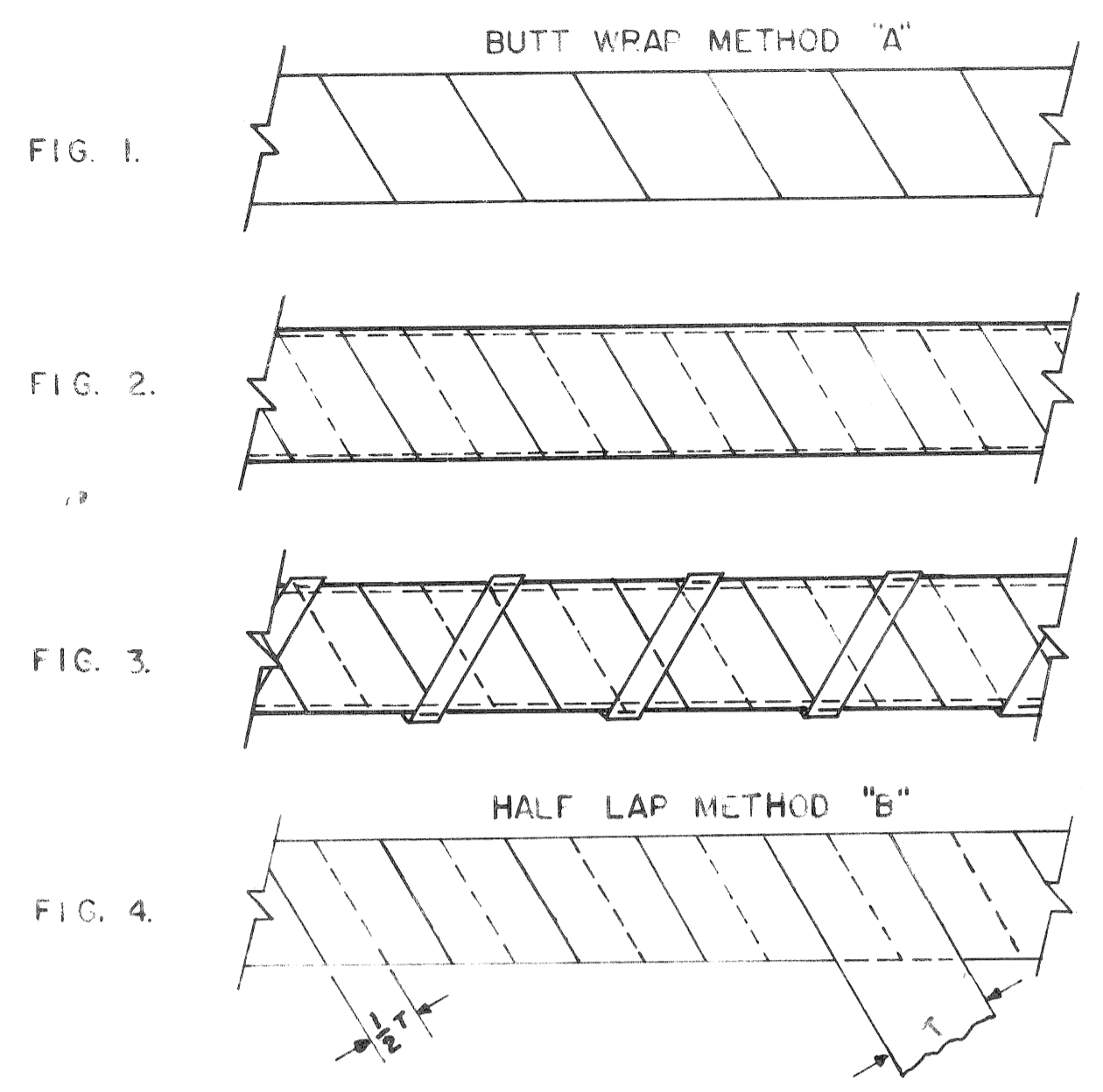
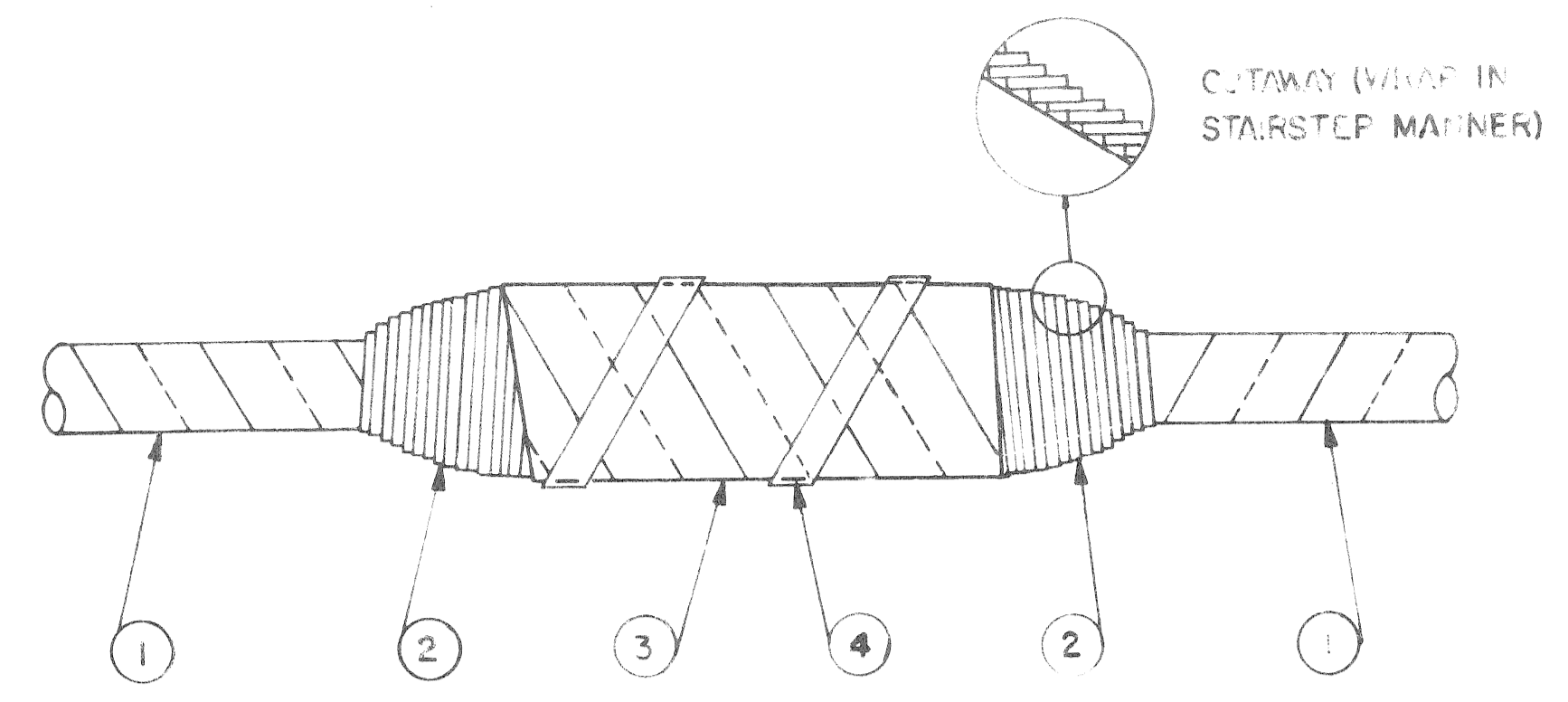


FIGURE 1:
FELTED ASBESTOS INITIAL WRAP BUTT WRAP.

FIGURE 2:
SECOND WRAP FLAME RETARDANT ELASTOMER OFFSET BUTT WRAP

FIGURE 3:
RANDOM WRAP OUTER LAYER WITH A PRESSURE SENSITIVE FIBERGLASS ADHESIVE TAPE TO PREVENT UNRAVELLING

FIGURE 4:
ONE WRAP FLAME RETARDANT ELASTOMER 1/2 OVERLAPPED RANDOM WRAP WITH PRESSURE SENSITIVE FIBERGLASS ADHESIVE TAPE.



- ① WRAP CABLE WITH 3" WIDE TAPE METHOD "A" OR "B".
- ② WRAP WIPE WITH 1 1/2" WIDE ELASTOMER TAPE AS SHOWN (SPLIT 3" TAPE WITH SKINNING KNIFE FOR THIS STEP).
- ③ WRAP SPLICE SLEEVE WITH 3" WIDE TAPE THE SAME AS IN #1 ABOVE.
- ④ RANDOM WRAP FIBERGLASS TAPE TO HOLD IN PLACE.

NOTE: WRAP CABLE ON BOTH SIDES OF SPLICE FIRST. NEXT WRAP BOTH WIPES AND THEN COVER THE SPLICE SLEEVE.

NOTE: ELASTOMER TAPE TO BE APPLIED WITH SMOOTH SIDE ON CABLE (ROUGH OR FABRIC SIDE OUT).

APPROXIMATE QUANTITIES REQUIRED PER MANHOLE

- METHOD "A"**
 5 ROLLS 3"X15'-0" FELTED ASBESTOS TAPE
 4 ROLLS 3"X20'-0" ELASTOMER TAPE
 1 ROLL FIBERGLASS TAPE
- METHOD "B"**
 8 ROLLS 3"X20'-0" ELASTOMER TAPE (FLAME RETARDANT)
 1 ROLL FIBERGLASS TAPE

NO.	DATE	DESCRIPTION	APPROVED BY
24			

JEFFERSON/CONNER INDUSTRIAL REVITALIZATION PROJECT
 MACK AVENUE LIGHTING
 P.L.C. DETAILS CABLE FIREPROOFING

DRAWN BY CEA	PLAN PREPARED BY CONSULTING ENGINEERING ASSOCIATES INC. ENGINEERING CONSULTANTS
CHECKED BY	16580 WYOMING DETROIT, MICH. 48221
APPROVED BY <i>[Signature]</i>	DRWG NO 28 OF 40
DATE AUG. 87	FILE NO CEA 1137

PUBLIC LIGHTING DEPARTMENT
 CITY OF DETROIT

51-0606
 SHEET NO. 05
 OF 117
 DATE
 AUG. 87

1. DISTRIBUTION AND TRANSMISSION CABLES

ALL TRANSMISSION CABLES, (24 KV, ITEMS 11-16 INCLUSIVE) ARE FOR CIRCUITS WITH GROUNDED NEUTRAL, AND SHALL CONFORM STRICTLY WITH THE LATEST REVISION OF THE A.E.I.C. "SPECIFICATION FOR IMPREGNATED PAPER INSULATED, LEAD COVERED SOLID TYPE CABLE", 9TH EDITION, DATED APRIL, 1954, AND CONSTRUCTION OPTIONS AS NOTED IN SHEET 1.

ALL DISTRIBUTION CABLES, (7 & 5 KV, ITEMS 19-21 INCLUSIVE) ARE FOR CIRCUITS WITH UNGROUNDED NEUTRAL AND SHALL ALSO CONFORM WITH THE ABOVE SPECIFICATION, WITH CONSTRUCTION OPTIONS AS NOTED IN TABLE 1.

2. OVERHEAD LINE WIRE

OVERHEAD LINE WIRE SHALL BE IN ACCORDANCE WITH LATEST REVISION OF ASA C8.34 (NEOPRENE COVERING) OR THE LATEST REVISION OF ASA C8.35 (POLYETHYLENE COVERING).

3. 8/C, #8AWG, STREET LIGHTING CABLE, 7500 V.

THIS IS A SPECIAL CONSTRUCTION AND SHALL BE MADE STRICTLY IN ACCORDANCE WITH THE DESCRIPTION IN TABLE 1.

4. OTHER RUBBER OR THERMOPLASTIC INSULATED CABLES, LEADED & NON-LEADED

WIRE SIZE, INSULATION TYPE AND NOMINAL THICKNESSES, OTHER CONSTRUCTION FEATURES SHALL BE AS SHOWN IN TABLE 1, AND APPLICABLE REFERENCE SPECIFICATIONS SHOWN BELOW:

INSULATIONS

THE MINIMUM INSULATION THICKNESS OF ANY OF THESE CABLES SHALL BE LESS THAN 90% OF THE NOMINAL THICKNESS SHOWN ON TABLE 1.

THE PHYSICAL AND AGING PROPERTIES OF THERMOPLASTIC AND RUBBER INSULATIONS SHALL BE AS FOLLOWS:

CONDUCTORS

ALL CONDUCTORS SHALL BE COPPER, COMPLYING WITH THE LATEST REVISIONS OF ASTM SPECIFICATIONS, AS FOLLOWS:

- SOFT OR ANNEALED, BARE COPPER WIRE ASTM B3
- MEDIUM HARD DRAWN COPPER WIRE ASTM B2
- HARD DRAWN COPPER WIRE ASTM B1
- CONCENTRIC-LAY-STRANDED COPPER CONDUCTORS, HARD, MEDIUM HARD OR SOFT, COATED OR UNCOATED, AS REQUIRED. ASTM B8
- RUPE-LAY-STRANDED, SOFT, COPPER CONDUCTORS, COATED OR UNCOATED, AS REQUIRED. ASTM B173
- SOFT, SOLID COPPER CONDUCTORS, TINNED ASTM B33
- SOFT, SOLID COPPER CONDUCTORS, LEAD OR LEAD ALLOY COATED ASTM B183

		POLYVINYL-CHLORIDE 60°C	POLYVINYL-CHLORIDE 75°C	HIGH MOLECULAR WEIGHT NATURAL POLYETHYLENE	SYNTHETIC RUBBER 75°C HEAT & MOISTURE RESISTANT	OZONE RESISTING BUTYL RUBBER
ORIGINAL	TENSILE STRENGTH PSI	2300, MIN.	2300, MIN.	1400, MIN.	700, MIN.	600, MIN.
	ELONGATION AT RUPTURE, PERCENT	250, MIN.	250, MIN.	350, MIN.	300, MIN. AND 1/2" SET, MAX.	350, MIN. AND 1/2" SET MAX.
AIR OVEN TEST, TIME & TEMP AS NOTED	TENSILE STRENGTH % OF ORIGINAL	65, MIN. 168 HRS., 100±1°C	120, MAX. 80, MIN. 168 HRS., 120±1°C	75, MIN. 48 HRS., 100±1°C	—	60, MIN. 168 HRS., 100±1°C
	ELONGATION % OF ORIGINAL	* 65, MIN. 168 HRS., 100±1°C	** 75, MIN. 168 HRS., 120±1°C	75, MIN. 48 HRS., 100±1°C	—	60, MIN. 168 HRS., 100±1°C
OXYGEN PRESSURE TEST	TENSILE STRENGTH % OF ORIGINAL	—	—	—	50, MIN. 168 HRS., 80±1°C	—
	ELONGATION % OF ORIGINAL	—	—	—	50, MIN. 168 HRS., 80±1°C	—
AIR PRESSURE HEAT TEST	TENSILE STRENGTH % OF ORIGINAL	—	—	—	50, MIN. 20 HRS., 127±1°C	50, MIN. 40 HRS., 127±1°C
	ELONGATION % OF ORIGINAL	—	—	—	50, MIN. 20 HRS., 127±1°C	50, MIN. 40 HRS., 127±1°C
HEAT DISTORTION 121±1°C	% OF ORIGINAL	50, MAX.	25, MAX.	—	—	—
OIL IMMERSION 4 HRS., 70±1°C	TENSILE STRENGTH % OF ORIGINAL	* 85, MIN.	** 85, MIN.	—	—	—
	ELONGATION % OF ORIGINAL	* 85, MIN.	** 85, MIN.	—	—	—
HEAT SHOCK 121±1°C	—	NO CRACKS	NO CRACKS	—	—	—
COLD BEND	—	NO CRACKS -30±1°C	NO CRACKS -30±1°C	NO CRACKS -55±1°C	—	—
INSULATION RESISTANCE CONSTANT AT 15.6°C	—	1,000 MIN.	2,000 MIN.	50,000 MIN.	4,000 MIN.	20,000 MIN.
FLAME RESISTING PROPERTIES	—	SECT. 6.5 IPCEA S-61-402	SECT. 6.5 IPCEA S-61-402	—	—	—
ACCELERATED WATER ABSORPTION REQUIREMENT	ELECTRIC-METHOD	DIELECTRIC CONSTANT, 1 DAY	10, MAX.	10, MAX.	—	5, MAX.
		% CAPACITANCE INCREASE	1-14 DAYS -10, MAX. 7-14 DAYS -5, MAX.	1-14 DAYS -4.0, MAX. 7-14 DAYS -2.0, MAX.	—	1-14 DAYS 10.0, MAX. 7-14 DAYS 4.0, MAX.
	OR	TEMP.	50±1°C	75±1°C	—	75±1°C
GRAVIMETRIC METHOD	—	20 MILLIGRAMS PER SQ. INCH MAX.	10 MILLIGRAMS PER SQ. INCH MAX.	—	20 MILLIGRAMS PER SQ. INCH MAX.	15 MILLIGRAMS PER SQ. INCH MAX.
TEST IN ACCORDANCE WITH LATEST REVISION OF	—	IPCEA S-61-402 (EXCEPTIONS ARE NOTED ABOVE)	IPCEA S-61-402	IPCEA S-61-402	IPCEA S-19-81 (EXCEPTIONS ARE NOTED ABOVE)	IPCEA S-19-81

FOR #6 AWG AND LARGER, USING BUFFED DIE-CUT SPECIMENS, THE FOLLOWING VALUES SHALL APPLY:

- * ELONGATION AFTER AIR OVEN TEST 45% MIN.
- ** ELONGATION AFTER AIR OVEN TEST 50% MIN.
- * OR ** TENSILE STRENGTH AFTER OIL IMMERSION 80% MIN.
- * OR ** ELONGATION AFTER OIL IMMERSION 60% MIN.

JACKETS

THE MINIMUM JACKET THICKNESS SHALL NOT BE LESS THAN 80% OF THE NOMINAL THICKNESS SHOWN ON TABLE 1.

		NEOPRENE BLACK, HEAVY DUTY	NEOPRENE BLACK GENERAL PURPOSE	POLYVINYL-CHLORIDE, BLACK	HEAT & LIGHT STABILIZED BLACK POLYETHYLENE COVERG OVER LEAD SHEATH
ORIGINAL	TENSILE STRENGTH PSI	1800, MIN.	1500, MIN.	1500, MIN.	1400, MIN.
	ELONGATION AT RUPTURE, %	300, MIN. & 3/8" MAX. SET	250, MIN. & 3/8" MAX. SET	100, MIN.	350, MIN.
AIR OVEN TEST TIME & TEMP. AS NOTED	TENSILE STRENGTH % OF ORIGINAL	—	—	85, MIN. 120 HRS., 100±1°C	75, MIN.
	ELONGATION % OF ORIGINAL	—	—	60, MIN. 120 HRS., 100±1°C	75, MIN.
OXYGEN PRESSURE TEST 168 HRS. 80±1°C	TENSILE STRENGTH % OF ORIGINAL	50, MIN.	50, MIN.	—	—
	ELONGATION % OF ORIGINAL	50, MIN.	50, MIN.	—	—
AIR PRESSURE HEAT TEST 20 HRS. 127±1°C	TENSILE STRENGTH % OF ORIGINAL	50, MIN.	50, MIN.	—	—
	ELONGATION % OF ORIGINAL	50, MIN.	50, MIN.	—	—
OIL IMMERSION TEST, TIME & TEMP AS NOTED	TENSILE STRENGTH % OF ORIGINAL	60, MIN. 18 HRS. 121±1°C	60, MIN. 18 HRS. 121±1°C	60, MIN. 4 HRS. 70±1°C	—
	ELONGATION % OF ORIGINAL	60, MIN. 18 HRS. 121±1°C	60, MIN. 18 HRS. 121±1°C	60, MIN. 4 HRS. 70±1°C	—
HEAT DISTORTION, PERCENT OF UNAGED VALUE	—	—	—	50, MAX. 121±1°C	25, MAX. 90±1°C
HEAT SHOCK 121±1°C	—	—	—	NO CRACKS	—
COLD BEND TEST -35±1°C	—	—	—	NO CRACKS	NO CRACKS
ENVIRONMENTAL CRACKING	—	—	—	—	NO CRACKS
LIGHT ABSORPTIVITY	—	—	—	—	24,000, MIN.
TEST IN ACCORDANCE WITH LATEST REVISION OF	—	IPCEA S-19-81	IPCEA S-19-81	IPCEA S-61-402	IPCEA INTERIM REVISION #1 PUB. S-54-401 SEPT. 1959

REVISIONS DATE DESCRIPTION CHKD. BY	JEFFERSON/CONNER INDUSTRIAL REVITALIZATION PROJECT MACK AVENUE LIGHTING CABLE & WIRE SPECIFICATIONS DETAILS	DRAWN: CEA CHECKED: APPROVED: <i>[Signature]</i> DATE: AUG. 87	PLAN PREPARED BY CONSULTING ENGINEERING ASSOCIATES INC. ENGINEERING CONSULTANTS 16580 WYOMING DETROIT, MICH. 48221 DRWG. NO. 30 OF 40 FILE NO. CEA 1137	CHECKED BY: APPROVED BY:	PUBLIC LIGHTING DEPARTMENT CITY OF DETROIT	FILE NO. 51-0606 SHEET NO. 107 OF 117 DATE: AUG. 87
--	---	---	--	-----------------------------	---	---

CERTIFIED TEST REPORTS

SHIPMENTS OF WIRE AND CABLE SHALL NOT BE CONSIDERED COMPLETE UNTIL CERTIFIED TEST REPORTS ARE RECEIVED AND APPROVED. TEST REPORTS FOR VARIOUS ITEMS OF WIRE AND CABLE SHOWN ON SHEET I SHALL CONTAIN THE FOLLOWING TEST RESULTS:

ITEMS 1-5 INCLUSIVE - OVERHEAD LINE WIRE

1. CONDUCTOR CONTINUITY, RESISTANCE, TENSILE STRENGTH AND ELONGATION TESTS.
2. COVERING THICKNESS, PHYSICAL AND AGING TESTS.
3. WEIGHT OF FINISHED WIRE.

ALL TESTS IN ACCORDANCE WITH THE LATEST REVISION OF ASA 8.34 (NEOPRENE COVERING) OR ASA 8.35 (POLYETHYLENE COVERING).

ITEMS 6-10 INCLUSIVE

1. CONDUCTOR CONTINUITY, RESISTANCE, TENSILE STRENGTH, AND ELONGATION TESTS IN ACCORDANCE WITH THE LATEST REVISIONS OF ASTM B 8, B 33 OR B 189.
2. THE PHYSICAL AND OTHER TESTS FOR THE SPECIFIED INSULATION SHOWN ON SHEET-2.
3. INSULATION THICKNESS MEASUREMENTS.
4. THE ALTERNATING-CURRENT VOLTAGE TEST IN ACCORDANCE WITH THE LATEST REVISION OF IPCEA S-61-402.
5. INSULATION RESISTANCE TEST. INSULATION RESISTANCE CONSTANT AS SHOWN ON SHEET-2.
6. (CABLE ITEM 8 ONLY) MINIMUM, MAXIMUM AND AVERAGE LEAD THICKNESS MEASUREMENTS SHALL ALSO BE INCLUDED.
7. (CABLE ITEM 10 ONLY) A RIP TEST SHALL ALSO BE INCLUDED AS FOLLOWS:

A SIX-FOOT SAMPLE OF THE COMPLETED 2 CONDUCTOR WIRE WITH CLEANLY CUT ENDS SHALL BE SUBJECTED TO A TEMPERATURE OF -10°F FOR ONE HOUR, WHILE STILL COOL. THE TWO INSULATED CONDUCTORS SHALL BE SEPARATED AT ONE END FOR A DISTANCE OF APPROXIMATELY 3 INCHES AND THEN SHALL BE TORN APART WITH A STEADY PULL AT A RATE OF 33 INCHES IN ONE SECOND OR LESS. THERE SHALL BE NO DAMAGE TO THE INSULATION.

ITEMS 11-16 INCLUSIVE - DISTRIBUTION CABLES UNDER 10 KV. RATING

1. CONDUCTOR RESISTANCE.
2. SHEATH THICKNESS MEASUREMENTS.
3. HIGH VOLTAGE TEST.
4. MECHANICAL INTEGRITY TEST.
5. BENDING TEST.
6. SPARK TEST ON COVERING OVER LEAD SHEATH ON EACH LENGTH IF COVERING IS SPECIFIED.

ALL TESTS SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF "SOLID TYPE IMPREGNATED-PAPER-INSULATED LEAD-COVERED CABLE SPECIFICATIONS" PUBLISHED BY THE ASSOCIATION OF EDISON ILLUMINATING COMPANIES.

ITEMS 17-18 INCLUSIVE - SERIES STREET LIGHTING CABLE

1. CONDUCTOR RESISTANCE AND CONTINUITY, IN ACCORDANCE WITH THE LATEST REVISION OF ASTM B-3.
2. THE PHYSICAL AND OTHER TESTS FOR HIGH MOLECULAR WEIGHT POLYETHYLENE INSULATION AS SHOWN ON SHEET-2.
3. THE PHYSICAL AND OTHER TESTS FOR 60°C POLYVINYL-CHLORIDE INSULATION AS SHOWN ON SHEET-2.
4. THE FOLLOWING TESTS SHALL ALSO BE MADE AND REPORTED:

HIGH VOLTAGE TEST- AFTER NOT LESS THAN SIX (6) HOURS IMMERSION IN WATER AT 60° F. AND WHILE STILL IMMersed, EACH REEL OF INSULATED CABLE WITHOUT LEAD, SHALL WITHSTAND A 60 CYCLE POTENTIAL OF 30,000 VOLTS FOR A PERIOD OF FIVE (5) MINUTES.

INSULATION RESISTANCE TEST- THE INSULATION RESISTANCE SHALL NOT BE LESS THAN 26,500 MEGOHMS PER THOUSAND FEET AT 60° F. THIS TEST SHALL BE CONDUCTED UPON COMPLETION OF THE HIGH VOLTAGE TEST.

SHORT-TIME DIELECTRIC STRENGTH TEST - A TEN (10) FT. SAMPLE OF THE FINISHED CABLE WITH ONLY THE LEAD REMOVED, AFTER TWELVE (12) HOURS SUBMERSION IN WATER AND WHILE STILL IMMersed, SHALL WITHSTAND A VOLTAGE TEST OF 60,000 VOLTS 60 CYCLE A.C. FOR FIVE (5) MINUTES. ON COMPLETION OF THIS TEST, THE VOLTAGE WILL BE GRADUALLY RAISED IN ACCORDANCE WITH I.P.C.E.A. SPECIFICATIONS, UNTIL THE INSULATION IS PUNCTURED. THIS VOLTAGE SHALL BE RECORDED AND SHALL BE NOT LESS THAN 72,000 VOLTS.

EXTERNAL CORONA TEST- THIS TEST SHALL BE CONDUCTED ON ONE (1) SAMPLE PER 10,000 FT. OF COMPLETED CABLE EIGHTEEN (18) INCHES LONG WITH ONLY THE LEAD SHEATH REMOVED, AFTER WHICH IT SHALL BE WIPEd WITH A CLEAN DRY CLOTH. THESE SAMPLES SHALL BE BENT AND MAINTAINED IN A "U-SHAPE" HAVING A BENDING DIAMETER EQUAL TO FIVE TIMES THE INSULATED CABLE DIAMETER. THE BENT SAMPLES SHALL THEN BE PLACED IN A VERTICAL POSITION ON A FLAT METALLIC GROUNDED PLATE AND 60 CYCLE A.C. VOLTAGE SHALL BE GRADUALLY APPLIED WITH A CORONA-LEVEL TEST APPARATUS OF THE FILTER-CIRCUIT TYPE, MAINTAINING SUFFICIENT AMPLIFICATION TO INDICATE THE EXISTENCE OF CORONA DISCHARGE. THIS VOLTAGE SHALL BE RAISED UNTIL CORONA IS INDICATED, AND SHALL NOT BE LESS THAN 8,200 VOLTS RMS.

THE VOLTAGE SHALL THEN BE RAISED TO 25,000 VOLTS AND MAINTAINED FOR SIX (6) HOURS WITHOUT FAILURE OF THE INSULATION. THE VOLTAGE SHALL THEN BE RAISED IN 10% STEPS AT TEN (10) MINUTE INTERVALS UNTIL FAILURE OF THE INSULATION OR FLASHOVER OCCURS.

THESE VOLTAGES SHALL BE RECORDED AND REPORTED.

INTERNAL-CORONAL-LEVEL-EACH LENGTH OF COMPLETED CABLE SHALL BE TESTED IN ACCORDANCE WITH SECTION 6.13 OF THE LATEST REVISION OF I.P.C.E.A. STANDARD S-61-402, EXCEPT THAT THE MINIMUM CORONA LEVEL SHALL BE 8,200 VOLTS.

ITEMS 19-21 INCLUSIVE - TRANSMISSION CABLES.

1. CONDUCTOR RESISTANCE.
2. SHEATH THICKNESS MEASUREMENT.
3. HIGH VOLTAGE TEST.
4. MECHANICAL INTEGRITY TEST.
5. BENDING TEST.
6. IONIZATION TEST. ONE TEST PER ORDER OR THERE IS A QUANTITY LIMITATION OF 25,000 FT. ON THESE TESTS PER AEIC
7. HIGH VOLTAGE-TIME TEST)
8. DIELECTRIC POWER TEST)
9. POWER FACTOR TEST)
10. SPARK TEST ON COVERING OVER LEAD SHEATH ON EACH LENGTH.

ALL TESTS SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF "SOLID-TYPE IMPREGNATED-PAPER-INSULATED LEAD-COVERED CABLE SPECIFICATION," PUBLISHED BY THE ASSOCIATION OF EDISON ILLUMINATING COMPANIES.

ITEMS 22-23 INCLUSIVE - MULTI-CONDUCTOR TRAFFIC SIGNAL CABLE

1. INDIVIDUAL CONDUCTOR RESISTANCE IN ACCORDANCE WITH THE LATEST REVISION OF ASTM B3.
2. INSULATION THICKNESS MEASUREMENTS.
3. INSULATION PHYSICAL AND OTHER TESTS FOR 60°C. POLYVINYLCHLORIDE IS SHOWN ON SHEET-2.
4. ALTERNATING CURRENT VOLTAGE TEST.
5. INSULATION RESISTANCE TEST. INSULATION RESISTANCE CONSTANT AS SHOWN ON SHEET-2.
6. (CABLE ITEM 23 ONLY)
 - a. POLYVINYLCHLORIDE JACKET PHYSICAL AND OTHER TESTS SHOWN ON SHEET-2.
 - b. JACKET THICKNESS MEASUREMENTS.
7. (CABLE ITEM 22 ONLY), LEAD SHEATH THICKNESS MEASUREMENTS.

TESTS NO 4-7, INCLUSIVE, SHALL BE MADE IN ACCORDANCE WITH THE LATEST REVISION OF IPCEA S-61-402, EXCEPT THAT THE INSULATION RESISTANCE CONSTANT SHALL BE 1000 AT 15.6° C.

ITEM 24 - 8/C SERIES STREET LIGHTING CABLE

1. CONDUCTOR CONTINUITY AND RESISTANCE IN ACCORDANCE WITH THE LATEST REVISION OF ASTM B-33.
2. LEAD SHEATH THICKNESS MEASUREMENTS.
3. A HIGH VOLTAGE TEST CONSISTING OF 22,500 VOLTS, 60 CYCLES A.C. FOR A DURATION OF 5 MINUTES, BETWEEN CONDUCTORS AND FROM EACH CONDUCTOR TO THE LEAD SHEATH.

ITEM 25 - FLEXIBLE OVERHEAD TRAINER WIRE

1. CONDUCTOR RESISTANCE, TENSILE STRENGTH AND ELONGATION IN ACCORDANCE WITH THE LATEST REVISION OF ASTM B-173.
2. INSULATION PHYSICAL AND OTHER TESTS SHOWN ON SHEET-2.
3. ADDITIONAL INSULATION TESTS IN ACCORDANCE WITH THE LATEST REVISION OF IPCEA S-19-81 AS FOLLOWS:
 - a. ALTERNATING-CURRENT VOLTAGE TEST.
 - b. INSULATION RESISTANCE TEST.
 - c. DIRECT-CURRENT VOLTAGE TEST.
 - d. CORONA LEVEL TEST.
 - e. SHORT-TIME DIELECTRIC STRENGTH TEST.
 - f. COLD-BENDING AND LONG-TIME DIELECTRIC STRENGTH TEST.
 - g. CAPACITY AND POWER FACTOR TEST.
 - h. OZONE RESISTANCE TEST.
4. PHYSICAL AND OTHER TESTS ON THE NEOPRENE JACKET (GENERAL PURPOSE OR HEAVY DUTY), AS SHOWN ON SHEET-2.
5. JACKET THICKNESS MEASUREMENTS.

ITEM 26 - SUPERVISORY CONTROL CABLE (MULTI-CONDUCTOR)

1. CONDUCTOR RESISTANCE, TENSILE STRENGTH AND ELONGATION, IN ACCORDANCE WITH THE LATEST REVISION OF ASTM B-3.
2. INSULATION PHYSICAL FOR 60°C. PVC INSULATION AND OTHER TESTS SHOWN ON SHEET 2.
3. INSULATION RESISTANCE TESTS.
4. VOLTAGE TESTS PER IPCEA S-61-402.
5. INSULATION THICKNESS.
6. LEAD SHEATH THICKNESS.
7. THICKNESS OF COVERING OVER LEAD SHEATH.
8. SPARK TEST ON COVER OVER LEAD SHEATH ON EACH LENGTH.

ITEM 27 - INTEGRAL MESSENGER COMMUNICATIONS CABLE (MULTI-PAIR)

ITEM 28 - COMMUNICATIONS CABLE

ITEM 29 - COMMUNICATIONS CABLE - LEAD SHEATH

ITEM 30 - COMMUNICATIONS CABLE, LEAD SHEATH, DIRECT BURIAL

MULTI-PAIR COMMUNICATION CABLES (Maximum Mutual Capacitance = 90 nf per mile) (ALSO FOR TRAFFIC SIGNAL CHRONOPLAN.) AND SUPERVISORY

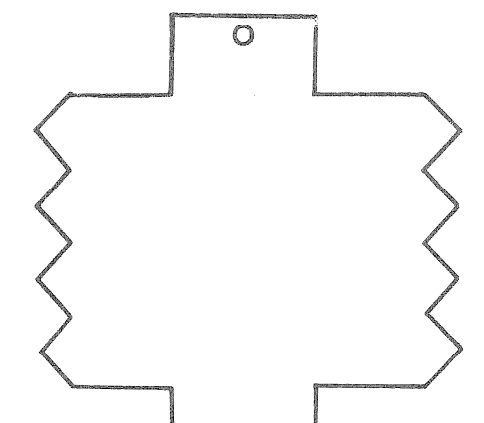
ITEM NO.	USE AND RATING	CONDUCTOR	INSULATION (b)	TAPE OVER INSULATED CONDUCTORS	INNER BELT	SHIELD OVER TAPE OR BELT	JACKET OR SHEATH	COVERING OVER SHEATH
27	AERIAL (a) 600V.						BLACK POLYETHYLENE (ASTM D 2308). THICKNESSES OVER CORE AND MESSENGER AND WEB DIMENSIONS IN ACCORDANCE WITH REA SPECIFICATION PE-38.	
28	IN DUCT 600V.	#16 OR #19 AWG, SOLID, UNCOATED COPPER (ASTM B3) - NUMBER OF PAIRS AS REQUIRED	0.025-IN. (c) CLASS B POLYETHYLENE (ASTM D 1351)	12.5 PERCENT MINIMUM LAR POLYETHYLENE TEREPHTHALATE	BLACK POLY-ETHYLENE (ASTM D 2308) THICKNESS IN ACCORDANCE WITH PARAGRAPH 3.6.7, 3.7 AND TABLE IX OF FED. SPEC. J.C.111.	CORRUGATED, LONGITUDINAL, ANNEALED, (c) 0.004-IN. COPPER	BLACK POLYETHYLENE (ASTM D 2308) THICKNESS IN ACCORDANCE WITH PARAGRAPH 3.6.7, 3.7 AND TABLE IX OF FED. SPEC. J.C.111.	
29	IN DUCT 600V.						LEAD-ANTIMONY THICKNESS PER ITEM 26 EXCEPT 0.063-IN. MIN THICKNESS (c)	
30	DIRECT BURIAL 600V.	#16 OR #19 AWG, SOLID, TINNED COPPER (ASTM B 33), NUMBER OF PAIRS AS REQUIRED	0.031 IN. (c) DIOCTYL PHTHALATE PLASTICIZED PVC (ASTM D 2219)				COMMERCIAL PURE LEAD, THICKNESS PER ITEMS 22 & 23.	ASPHALTUM-SATURATED JUTE STEEL ARMOR PER ITEMS 17 & 18.

TEST REPORTS

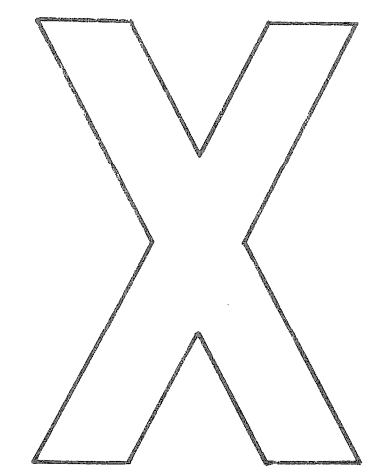
SHIPMENTS OF WIRE AND CABLE SHALL NOT BE CONSIDERED COMPLETE UNTIL CERTIFIED TEST REPORTS ARE RECEIVED AND APPROVED. TEST REPORTS FOR THE VARIOUS ITEMS ABOVE SHALL SHOW COMPLIANCE WITH CITED SPECIFICATIONS, LISTING TEST RESULTS, AS WELL AS THE FOLLOWING TESTS:

1. CONDUCTOR RESISTANCE OF EACH LENGTH OF EACH CONDUCTOR IN OHMS PER 1000 FT.
2. CERTIFICATION OF MUTUAL CAPACITANCE OF ALL CABLES AND OF NON-INJURIOUS EFFECT OF FLOODING COMPOUND ON ITEM 27.
 - (a) FIGURE 8' CONSTRUCTION. MESSENGER SHALL BE 7 STRAND EHS GALVANIZED, CLASS A, 1/4-IN. NOMINAL DIAM. (ASTM A 475) AND SHALL BE FULL FLOODED.
 - (b) COLOR CODED PER FEDERAL SPECIFICATION J-C-111.
 - (c) NOMINAL THICKNESS, INCHES.

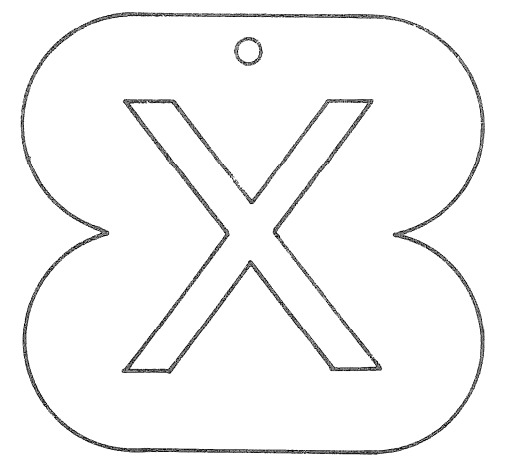
DATE	DESCRIPTION	CHKD. BY	JEFFERSON/CONNER INDUSTRIAL REVITALIZATION PROJECT MACK AVENUE LIGHTING CABLE & WIRE SPECIFICATIONS DETAILS			DRAWN	CEA	PLAN PREPARED BY CONSULTING ENGINEERING ASSOCIATES INC. ENGINEERING CONSULTANTS		FILE NO.	51-0606
						APPROVED	[Signature]	CHECKED BY		16580 WYOMING DETROIT, MICH. 48221	APPROVED BY
						DATE	AUG. 87	DRWG. NO.	31 OF 40	FILE NO.	CEA 1137
								PUBLIC LIGHTING DEPARTMENT CITY OF DETROIT		DATE AUG. 87	



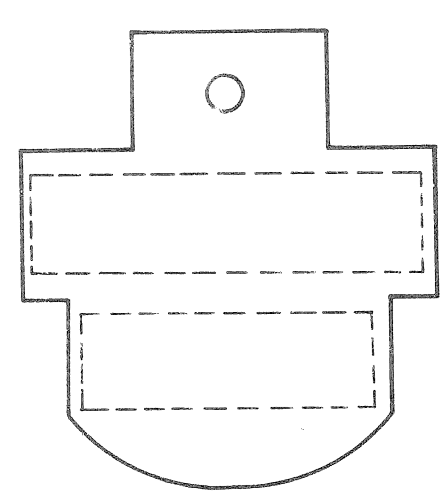
24,000 VOLT TRUNK LINE



O.H. LINE PHASE TAG



O.H. LINE OR POTHEAD PHASE TAG



MULTIPLE STREET LIGHTING
ALL VOLTAGES

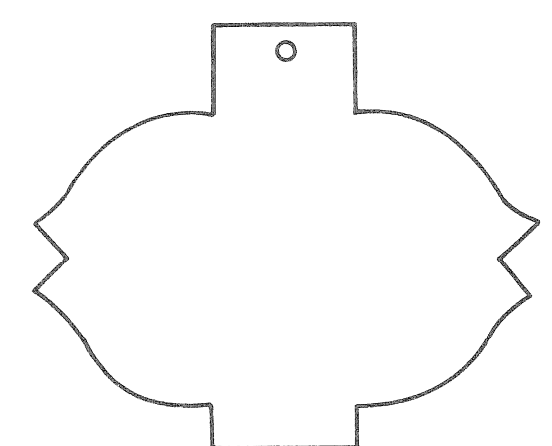


COMMUNICATION

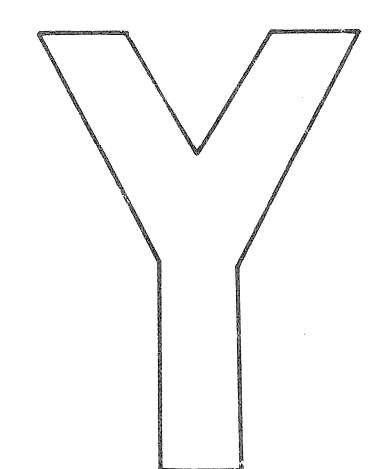
SUBSTATION NAMES ON IDENTIFICATION TAGS SHALL BE SPELLED AS FOLLOWS

- B.I.
- BUTZL.
- CNFLD.
- CONNR
- CUSTR
- GRNFD.
- HUdsn.
- J. CAMP
- JOY RD.
- LA BEL
- LTHRP.
- LUDDN.
- MAPLE
- MCRDY.
- MTRSE
- PAL. PK.
- PHILP.
- PORTR
- RUSSL.
- STNTN.
- STONE
- TRNTY.
- TWNSD
- TURNR.

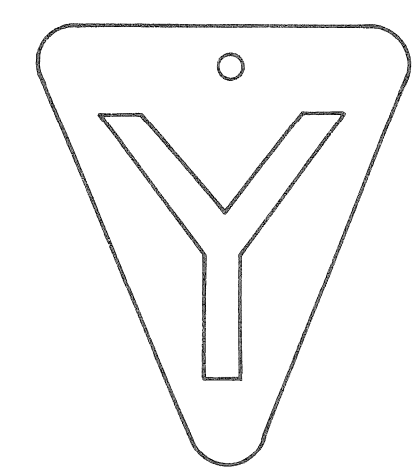
- WALTN.
- WARRN.
- WD. TER.



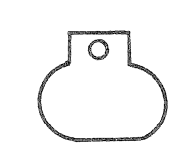
24,000 VOLT FEEDER



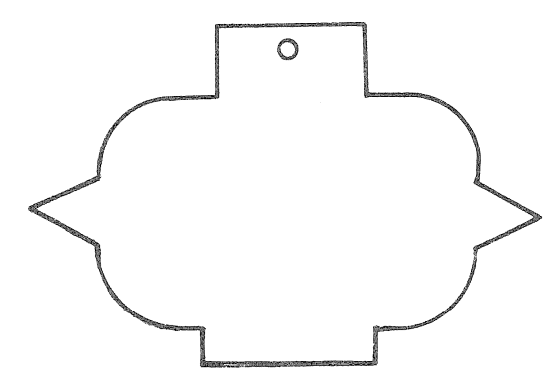
O.H. LINE PHASE TAG



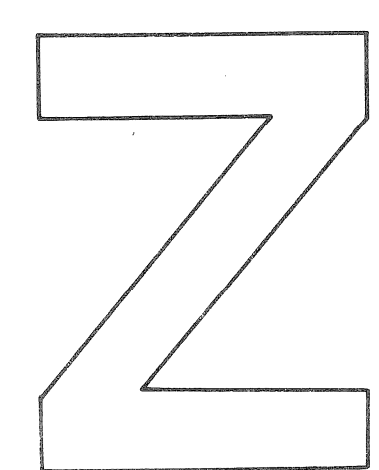
O.H. LINE OR POTHEAD PHASE TAG



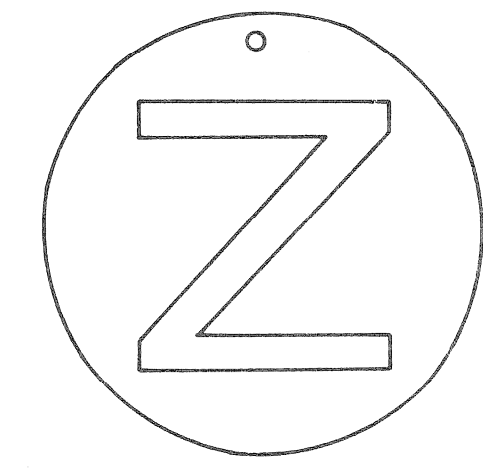
MULTIPLE INC. LTG.



13200 VOLT FEEDER



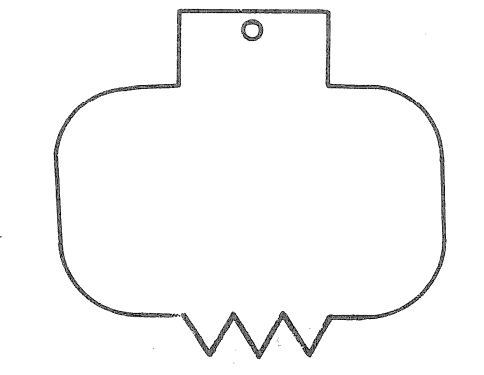
O.H. LINE PHASE TAG



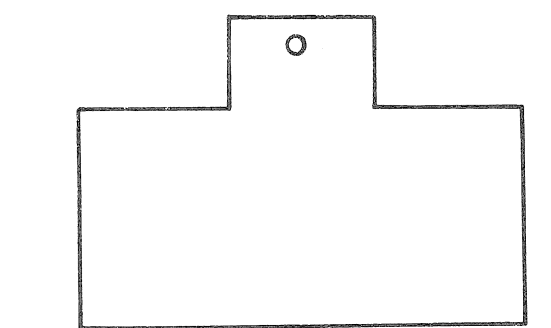
O.H. LINE OR POTHEAD PHASE TAG



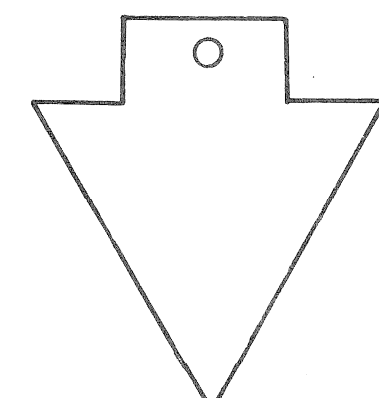
TRAFFIC SIGNALS



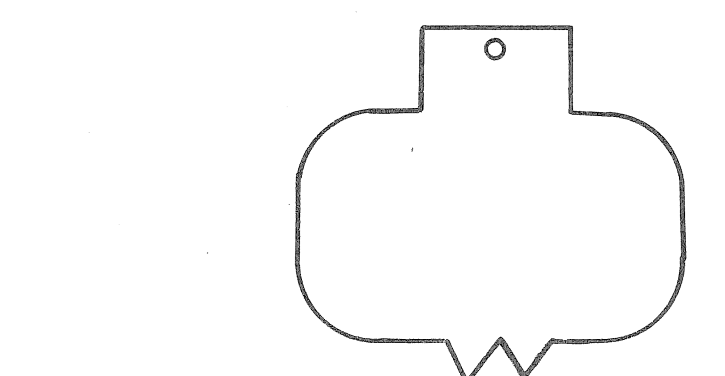
7200 VOLT FEEDER



SUPERVISORY CONTROL



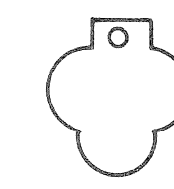
DEAD CABLE



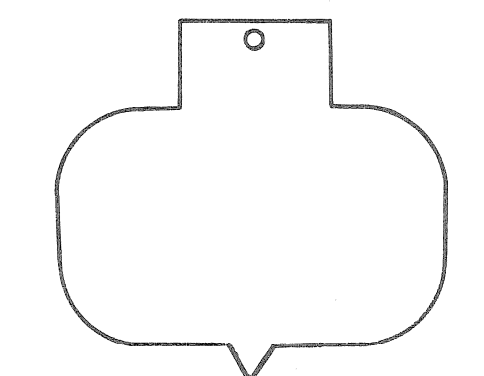
4800 & 5500 VOLT FEEDER



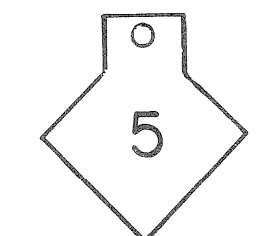
CIRCUIT DIRECTION



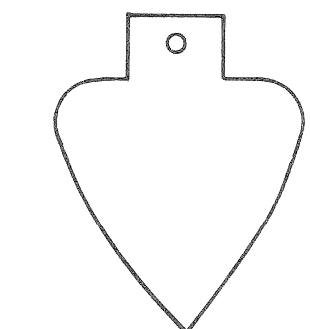
SECONDARY POWER TO SAFETY ISLANDS & TRAFFIC SIGNALS



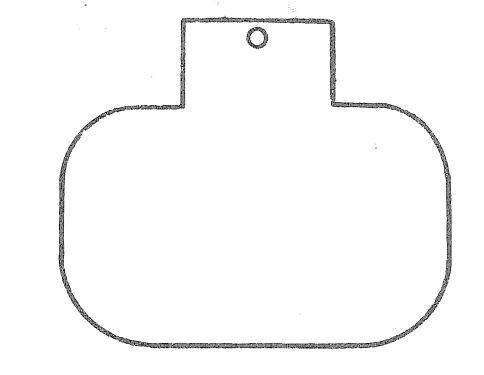
2400 VOLT FEEDER



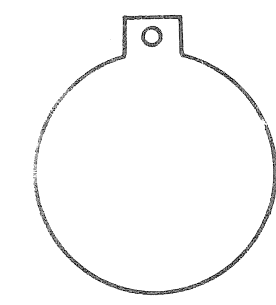
ST. LTG. COND. NO. (FROM 8/C CABLE)



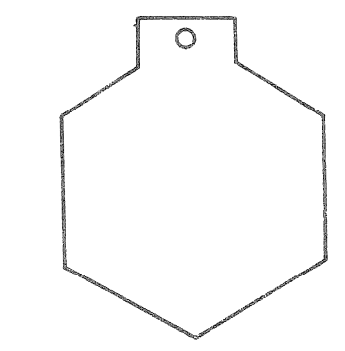
8 COND. CABLE



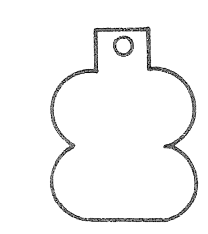
MISCELLANEOUS



ST. LTG. CIRC. NUMBER



MULTIPLE LTG. CONTROL



TRAFFIC SIGNAL CHRONOLIZER

IDENTIFICATION TAGS
MATERIAL LEAD

NOTE:

LEAD CABLE IDENTIFICATION TAGS WILL BE FURNISHED TO CONTRACTOR BY P.L.D. CABLE TAG MARKINGS SUCH AS SUBSTATION OR CABLE MARKINGS WILL BE AS SHOWN ON PLANS OR WILL BE FURNISHED BY P.L.D.

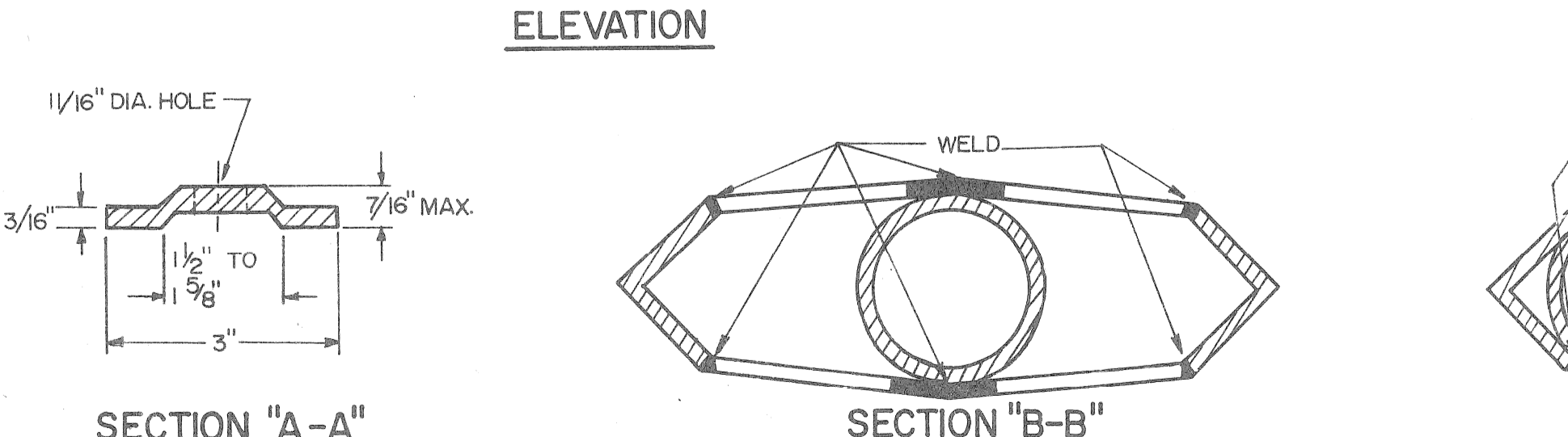
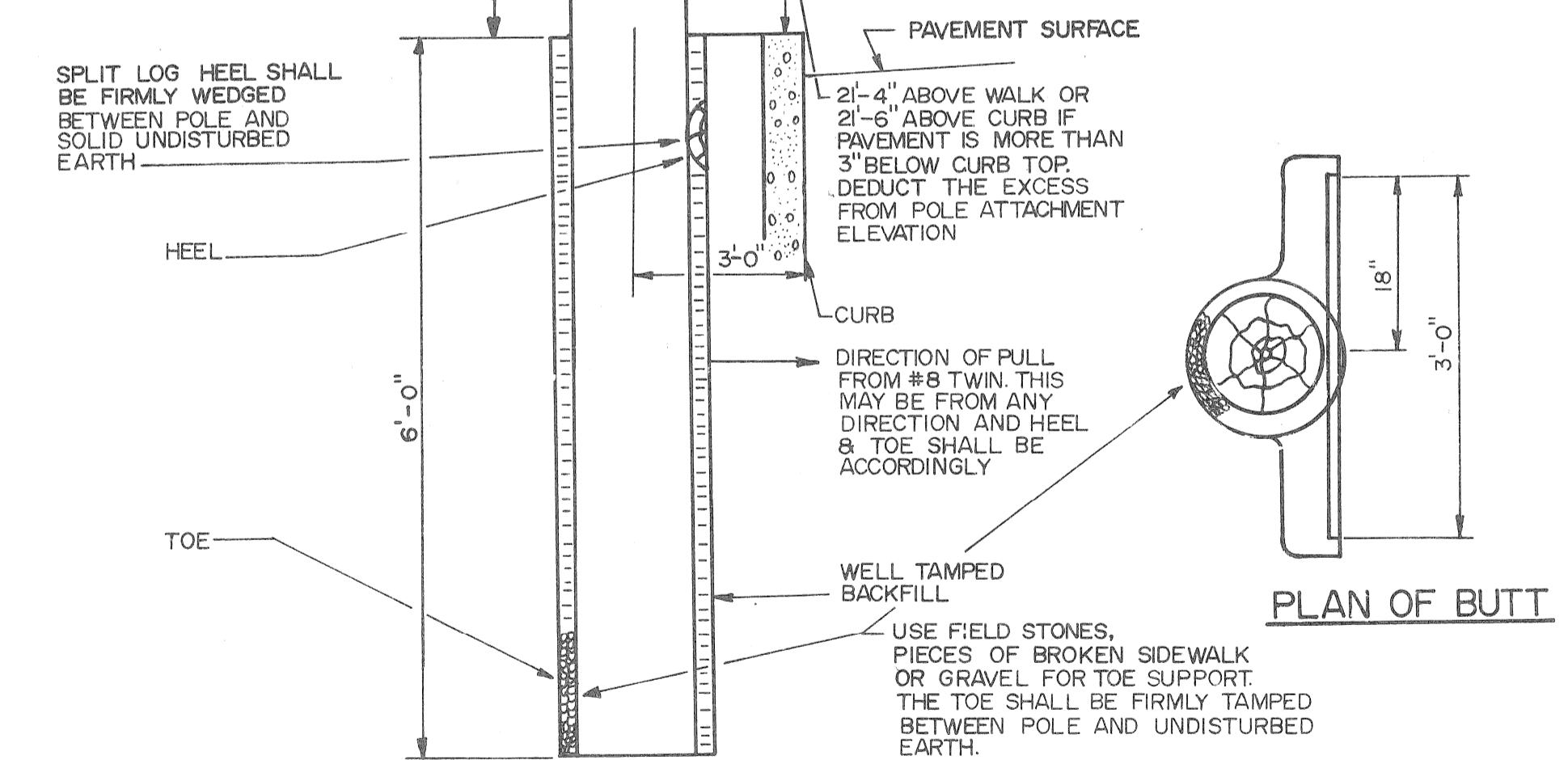
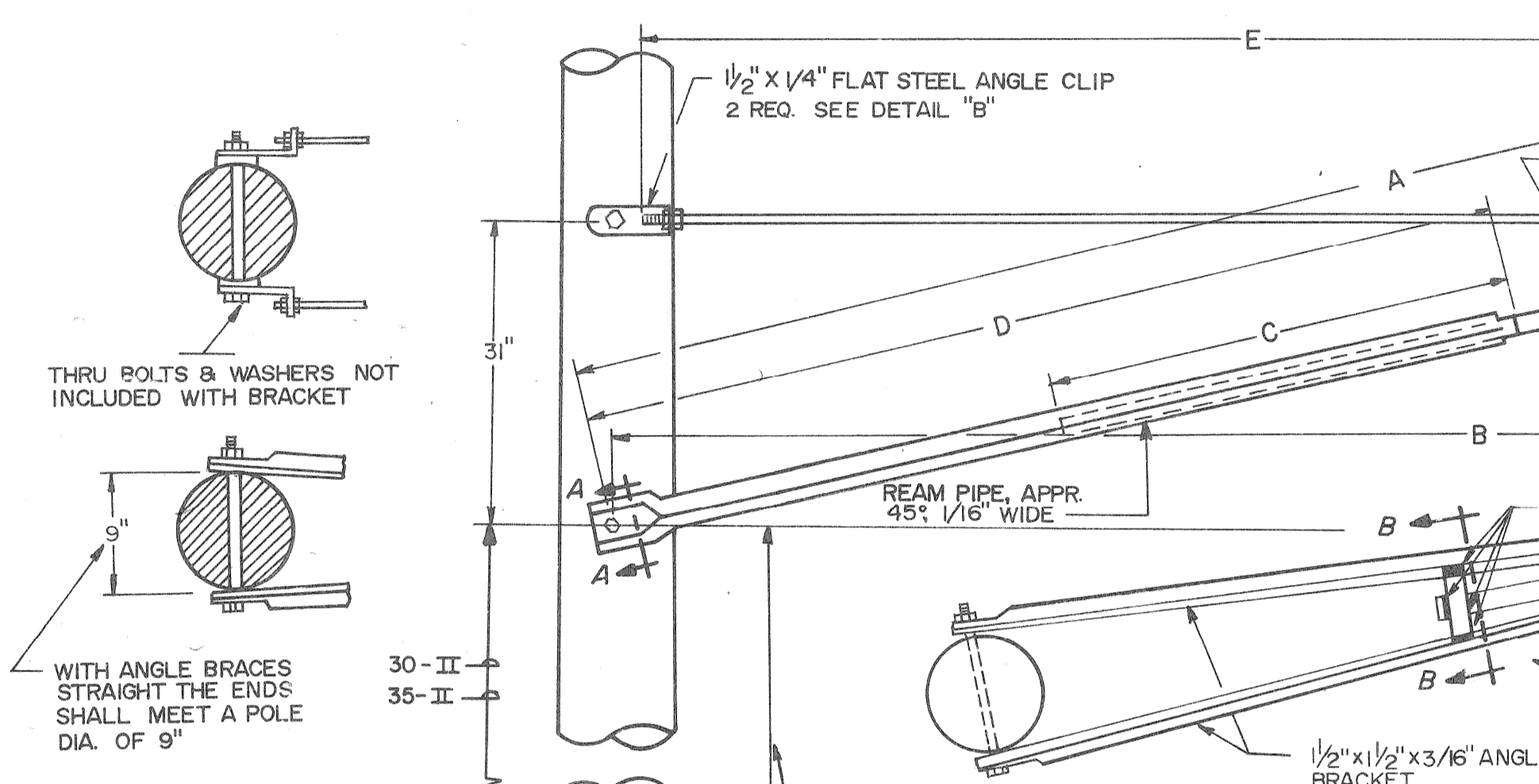
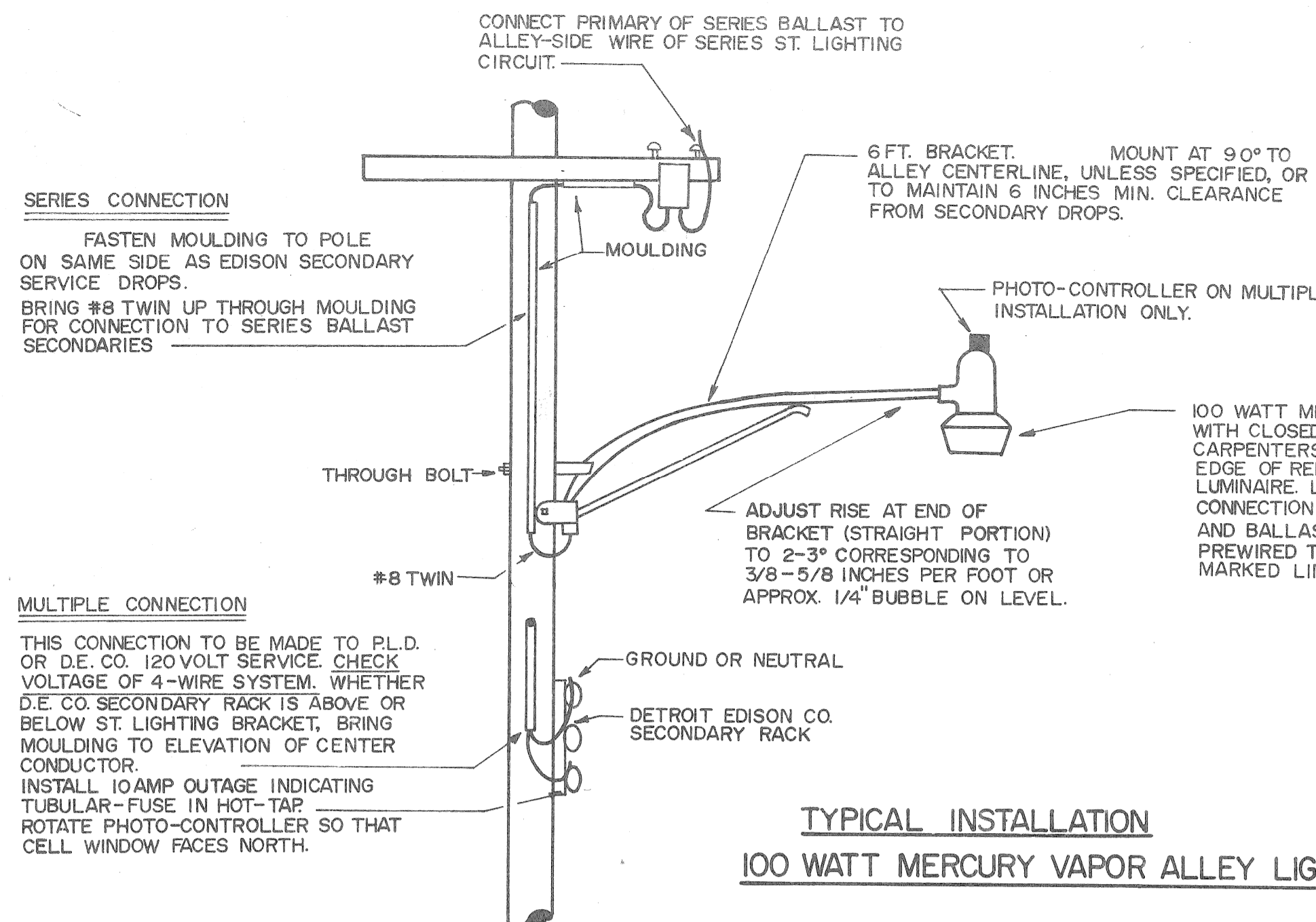
DATE	DESCRIPTION	CHKD. BY

JEFFERSON/CONNER INDUSTRIAL REVITALIZATION PROJECT
 MACK AVENUE LIGHTING
 CABLE TAGS DETAILS

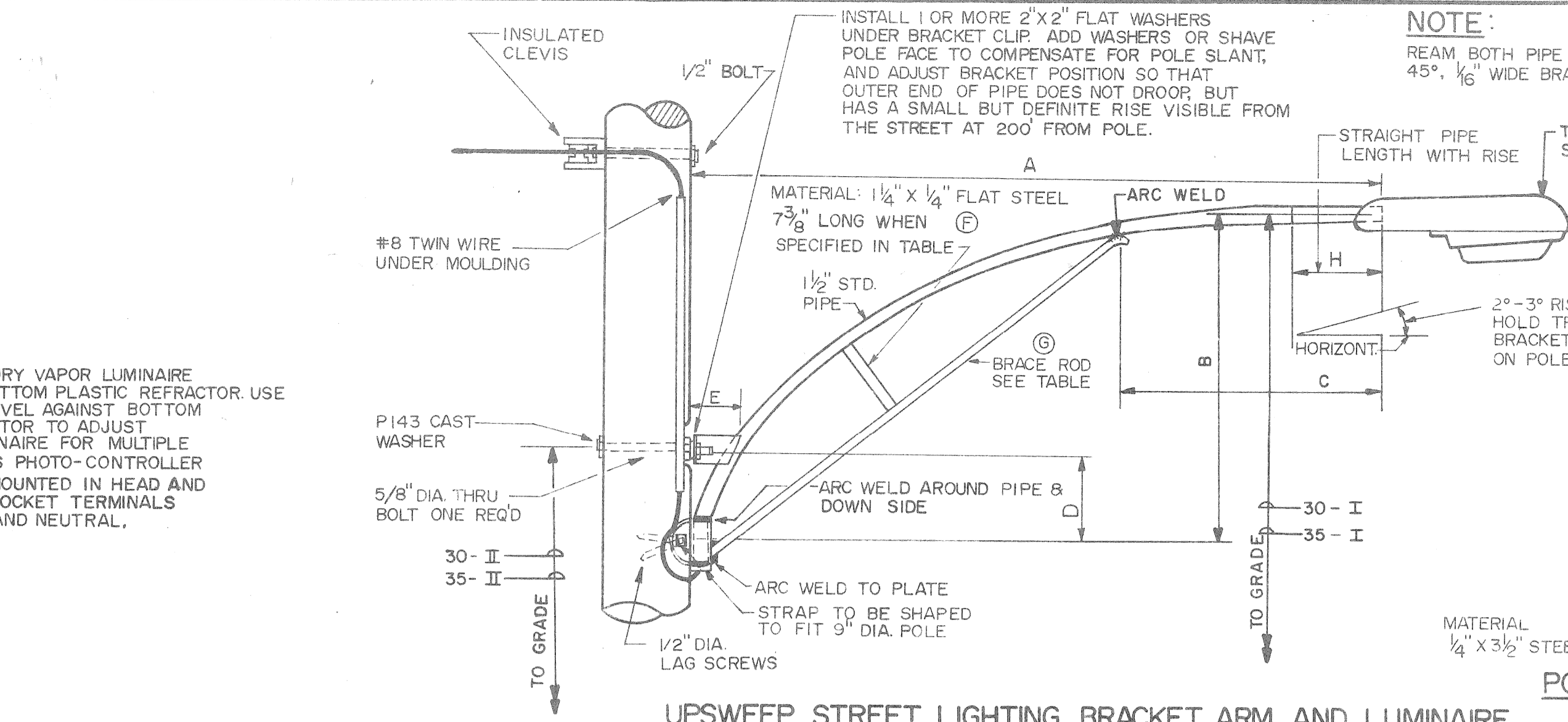
DRAWN CEA	PLAN PREPARED BY CONSULTING ENGINEERING ASSOCIATES INC. ENGINEERING CONSULTANTS
CHECKED	16580 WYOMING DETROIT, MICH., 48221
APPROVED <i>SM</i>	DATE AUG. 87
DATE AUG. 87	DRWG. NO. 32 OF 40
FILE NO. CEA 1137	CHECKED BY
APPROVED	APPROVED

PUBLIC LIGHTING DEPARTMENT
CITY OF DETROIT

FILE NO. 51-0606
SHEET NO. 109 OF 117
DATE AUG. 87



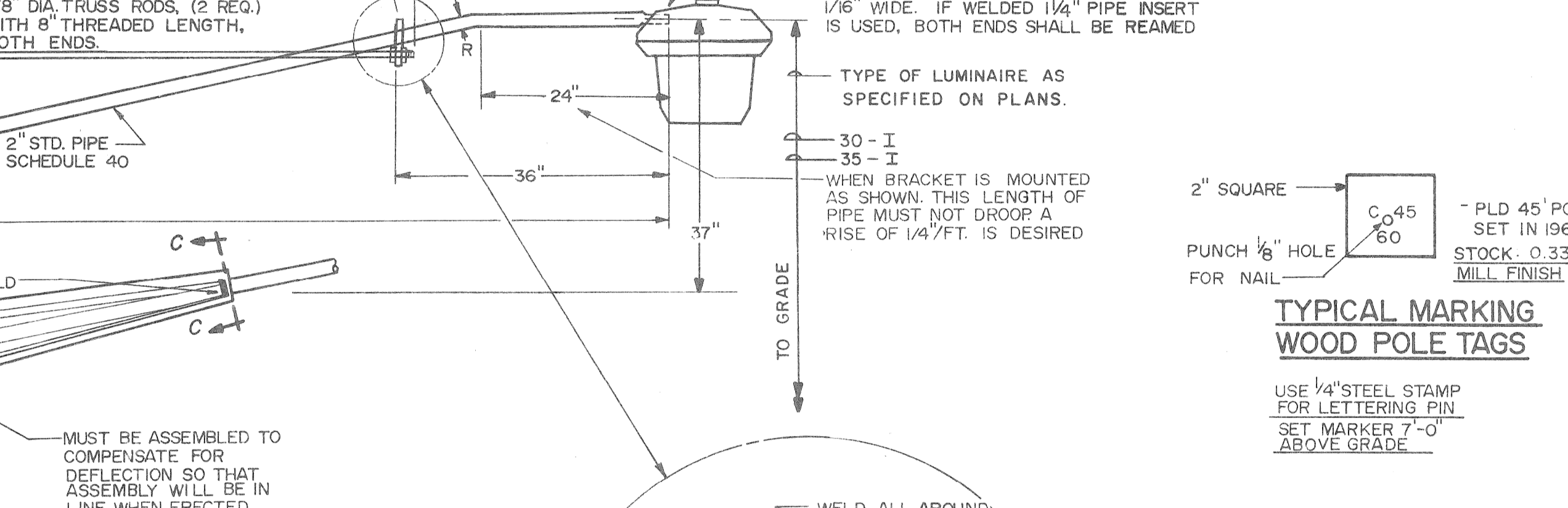
ST. LTG. BRACKET ARM & LUMINAIRE



ARM DIMENSION TABLE

TYPE	A	B	C	D	E*	F	G	H
6 FT.	6'-0"	2'-8"	2'-5"	8 3/4"	5 1/2"	NO	1" SOLID	1'-2"
8 FT.	7'-8"	4'-0"	3'-0"	8 3/4"	4 1/2"	YES	1" SOLID	8"
10 FT.	10'-2"	2'-9"	3'-6"	8 7/8"	8"	NO	1" SOLID	2'-0"

* THIS DIMENSION IS APPROXIMATE



ARM MOUNTING DIMENSION TABLE

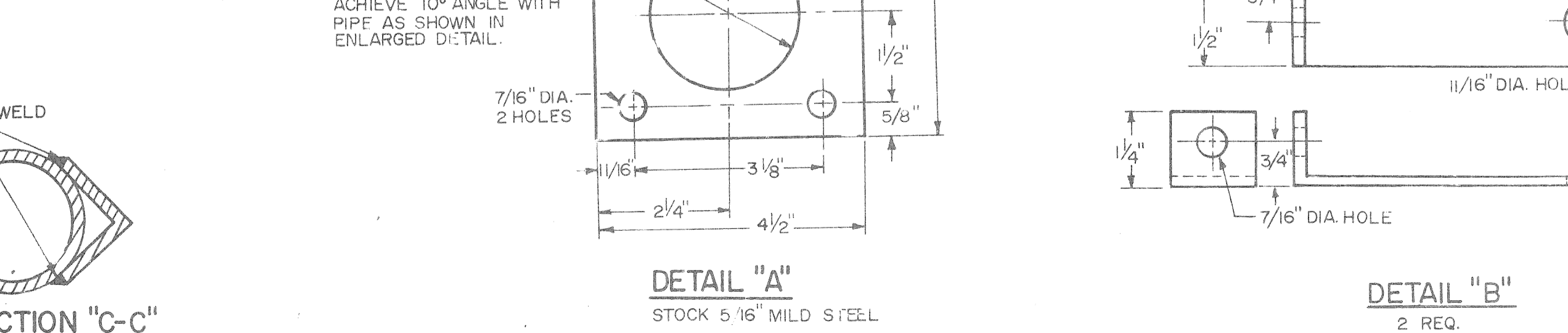
30 FT. LUM. MOUNTING HEIGHT			35 FT. LUM. MOUNTING HEIGHT		
ARM LENGTH			ARM LENGTH		
6 FT.	8 FT.	10 FT.	6 FT.	8 FT.	10 FT.
30-I	30 FT.	30 FT.	35-I	35 FT.	35 FT.
30-II	26'-3"	28'-0"	35-II	31'-3"	33'-0"

ARM DIMENSION TABLE

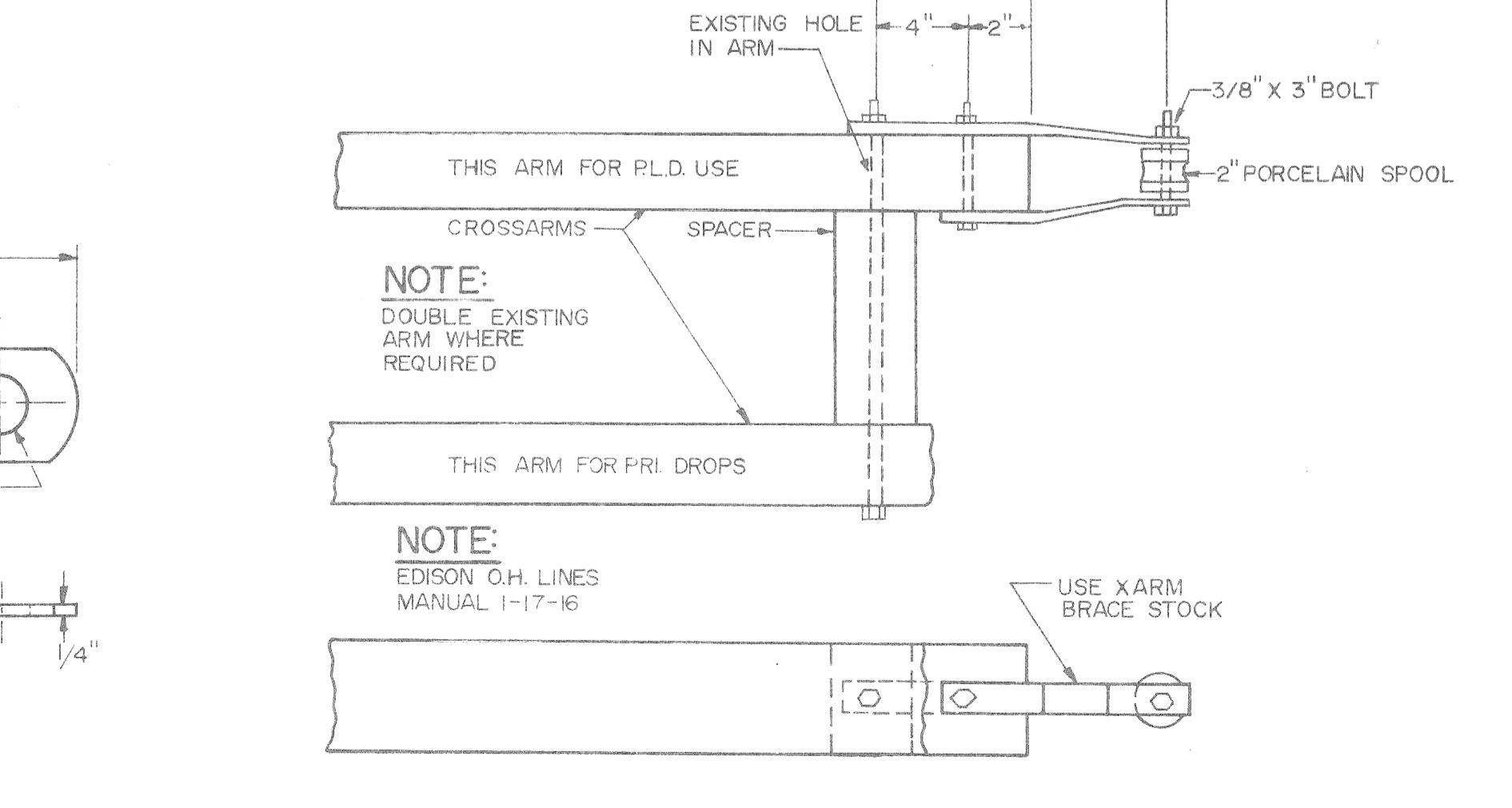
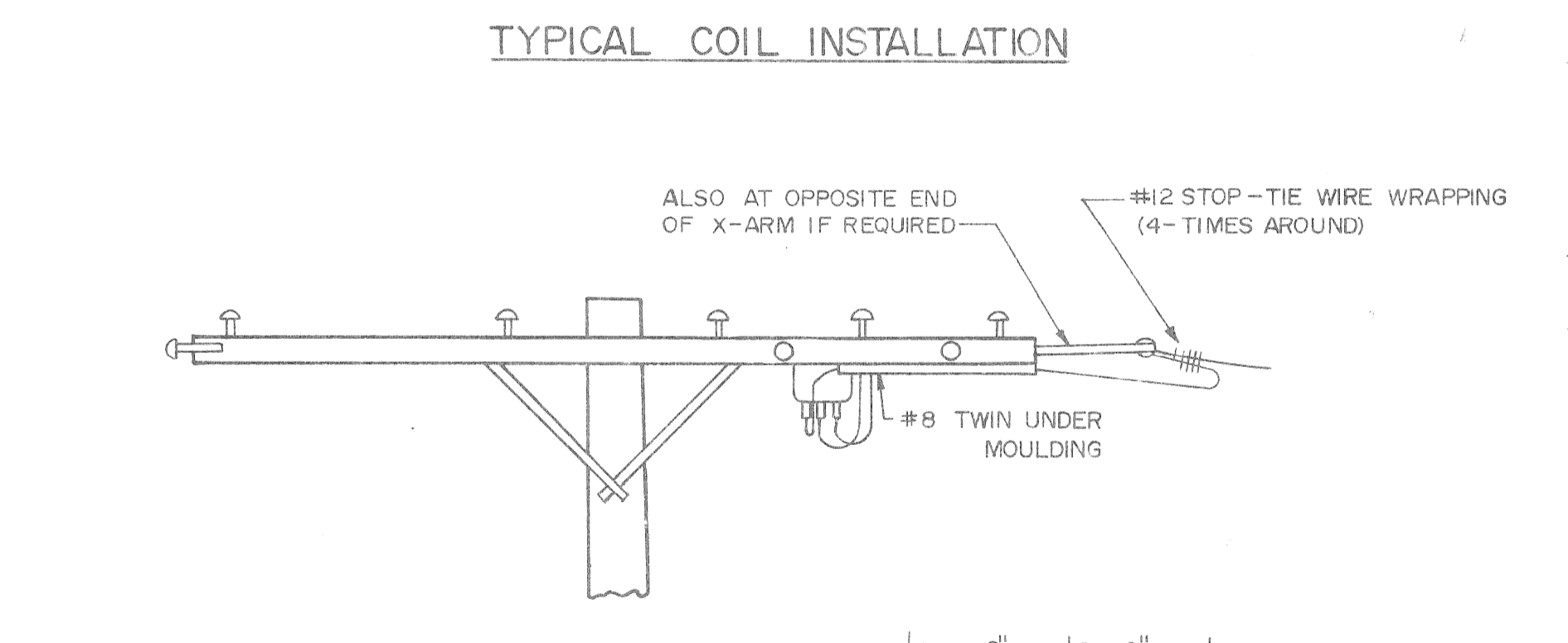
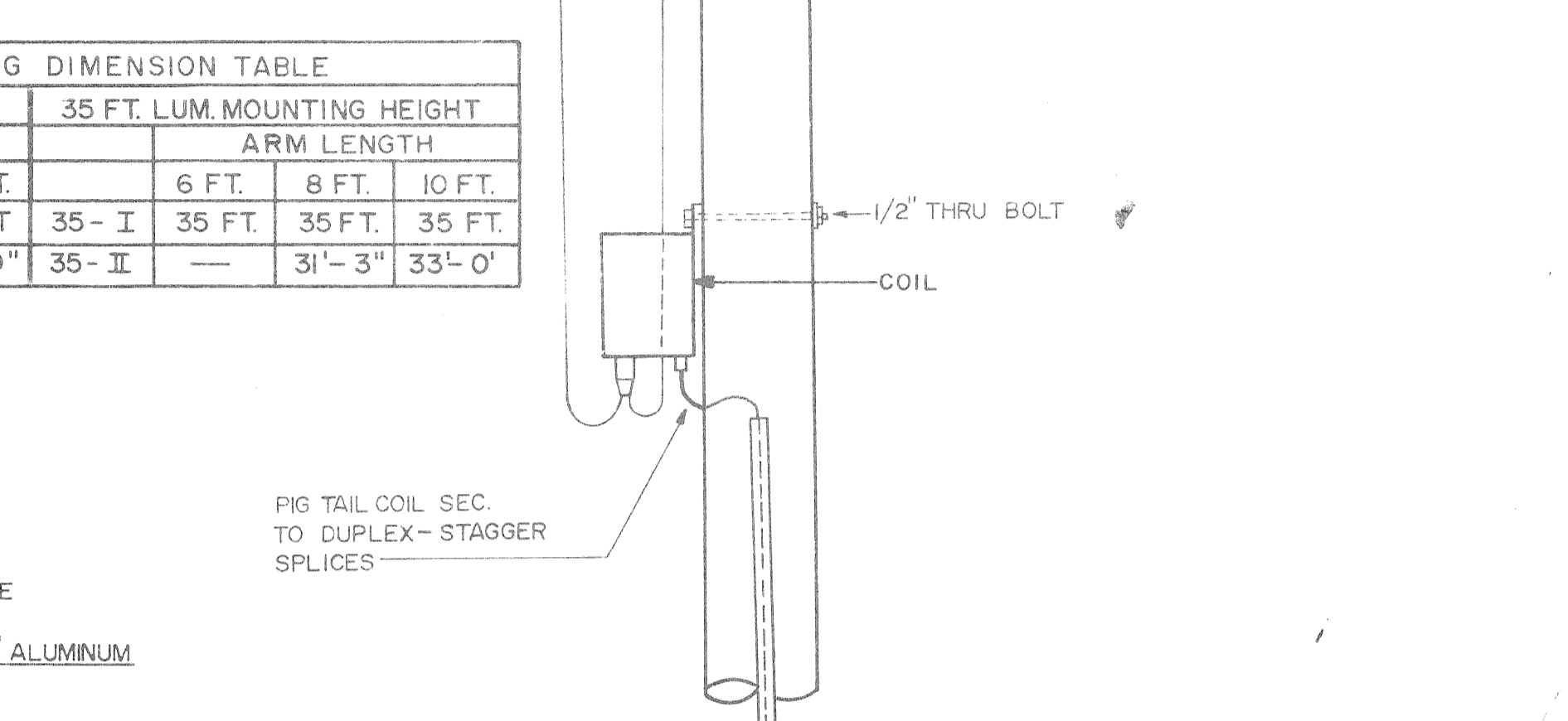
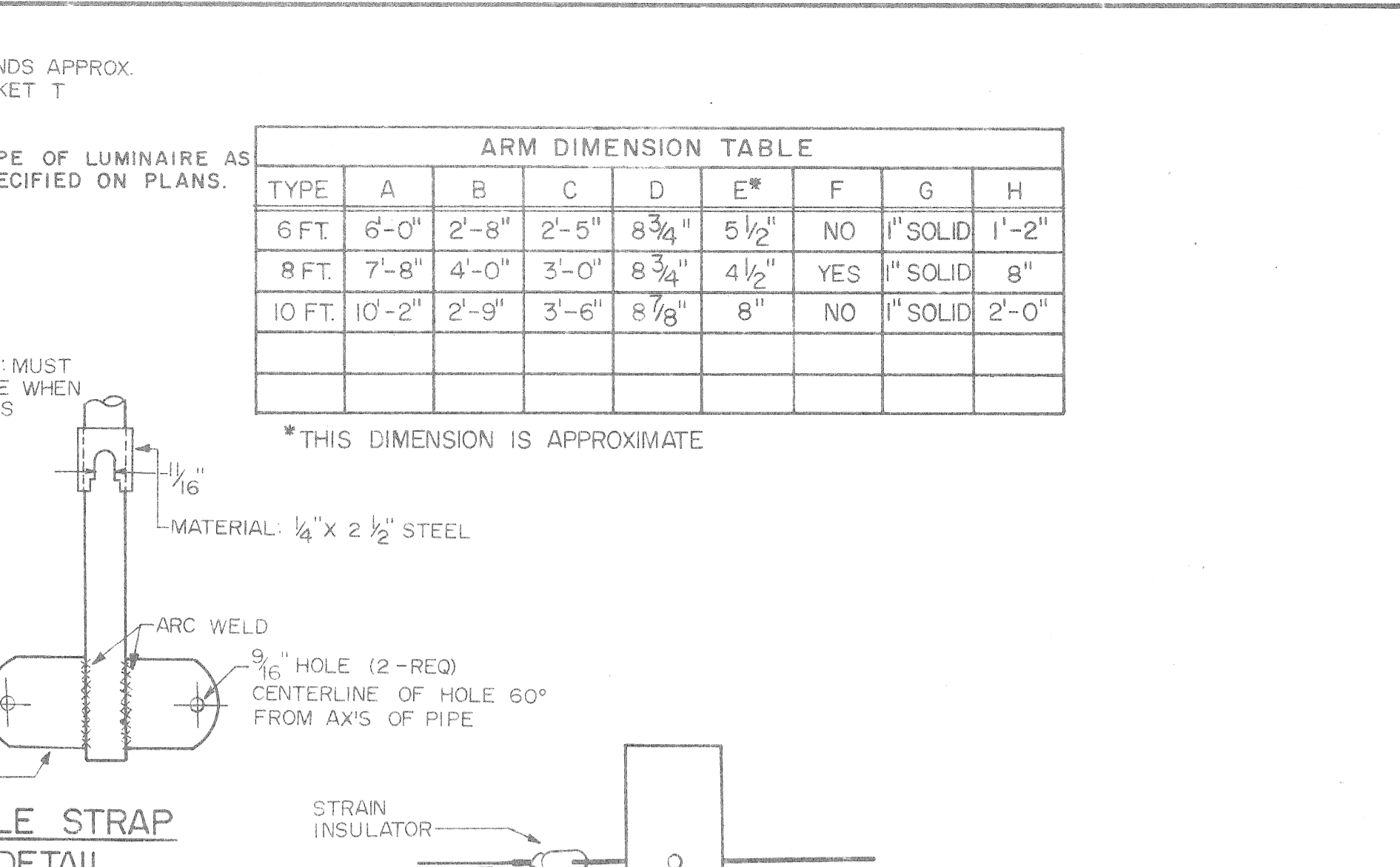
A	B	C	D	E	ROD LENGTH
13'-4"	16'-0"	4 8"	9 6"	13'-3"	
17'-3"	20'-0"	6'-0"	10'-0"	17'-3"	

MOUNTING DIMENSION TABLE

30 FT. LUM. MOUNTING HEIGHT		35 FT. LUM. MOUNTING HEIGHT	
16 FT. ARM	20 FT. ARM	30 FT. ARM	30 FT. ARM
30-I	30 FT.	30 FT.	30 FT.
30-II	26'-11"	26'-11"	26'-11"
35-I	35 FT.	35 FT.	35 FT.
35-II	31'-11"	31'-11"	31'-11"



END OF ARM CONSTRUCTION FOR STREET LIGHTING AT TRANSFORMER OR CABLE POLES



END OF ARM CONSTRUCTION FOR STREET LIGHTING AT TRANSFORMER OR CABLE POLES

JEFFERSON/CONNER INDUSTRIAL REVITALIZATION PROJECT
MACK AVENUE LIGHTING
MISCELLANEOUS OVERHEAD
DETAILS

DATE	DESCRIPTION	CHKD. BY	FILE NO.
AUG 87	33 OF 40	CEA 1137	51-0606

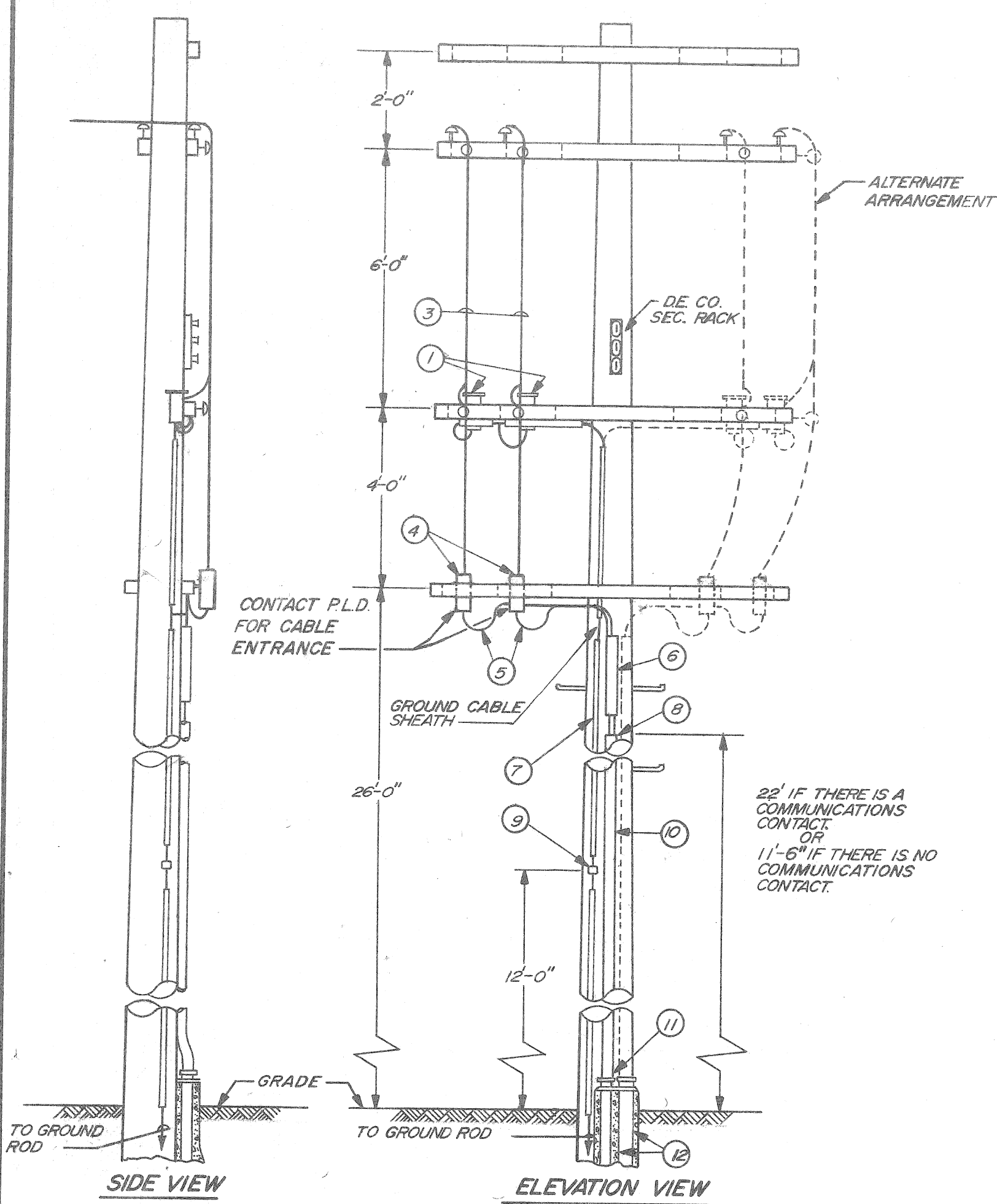
DRAWN BY CEA
CHECKED BY
APPROVED BY
DATE

PLAN PREPARED BY
CONSULTING ENGINEERING ASSOCIATES INC.
ENGINEERING CONSULTANTS
16580 WYOMING DETROIT, MICH., 48221

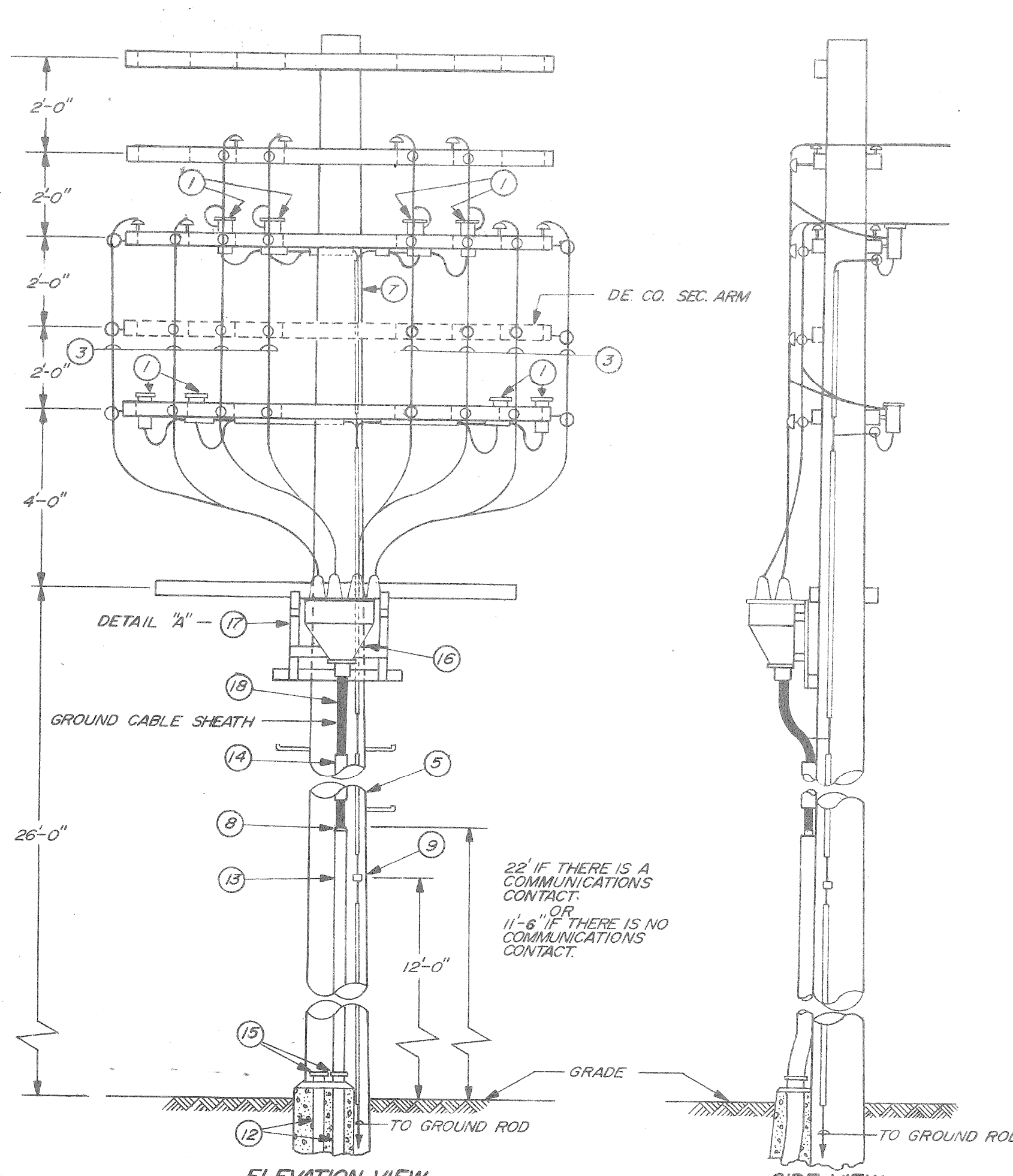
CHECKED BY
APPROVED BY

PUBLIC LIGHTING DEPARTMENT
CITY OF DETROIT

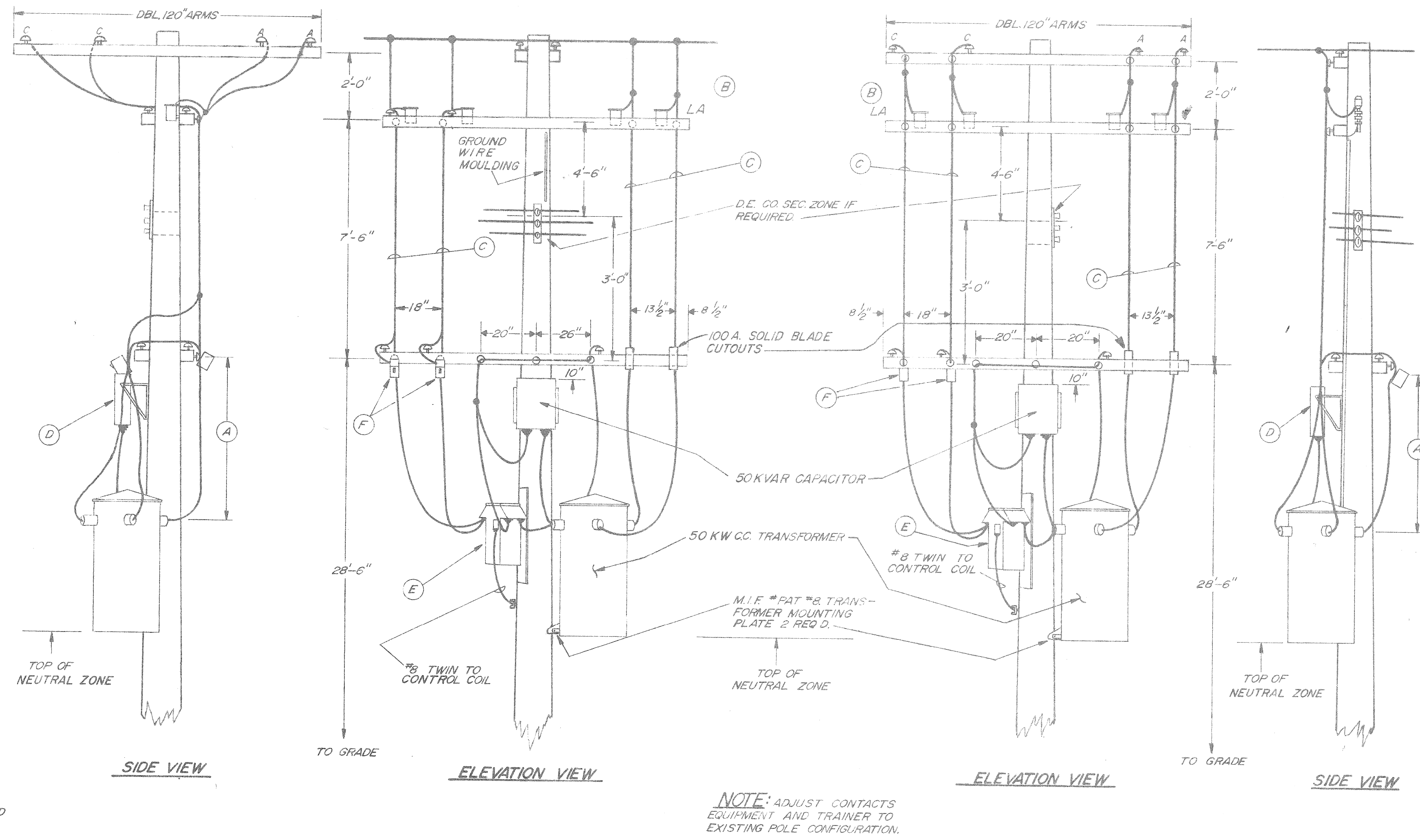
FILE NO. 51-0606
SHEET NO. 110
OF 117
DATE AUG 87



SERIES STREET LIGHTING CABLE POLE
N.T.S.



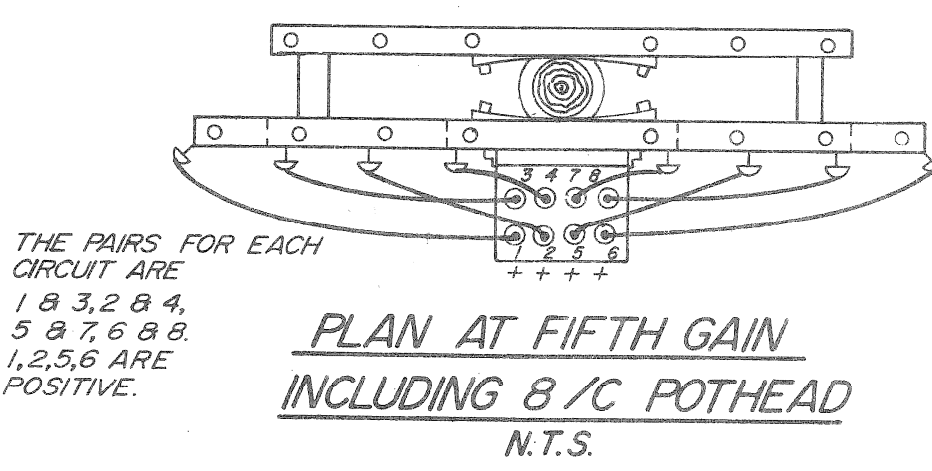
TYPICAL 8/C STREET LIGHTING CABLE POLE
N.T.S.



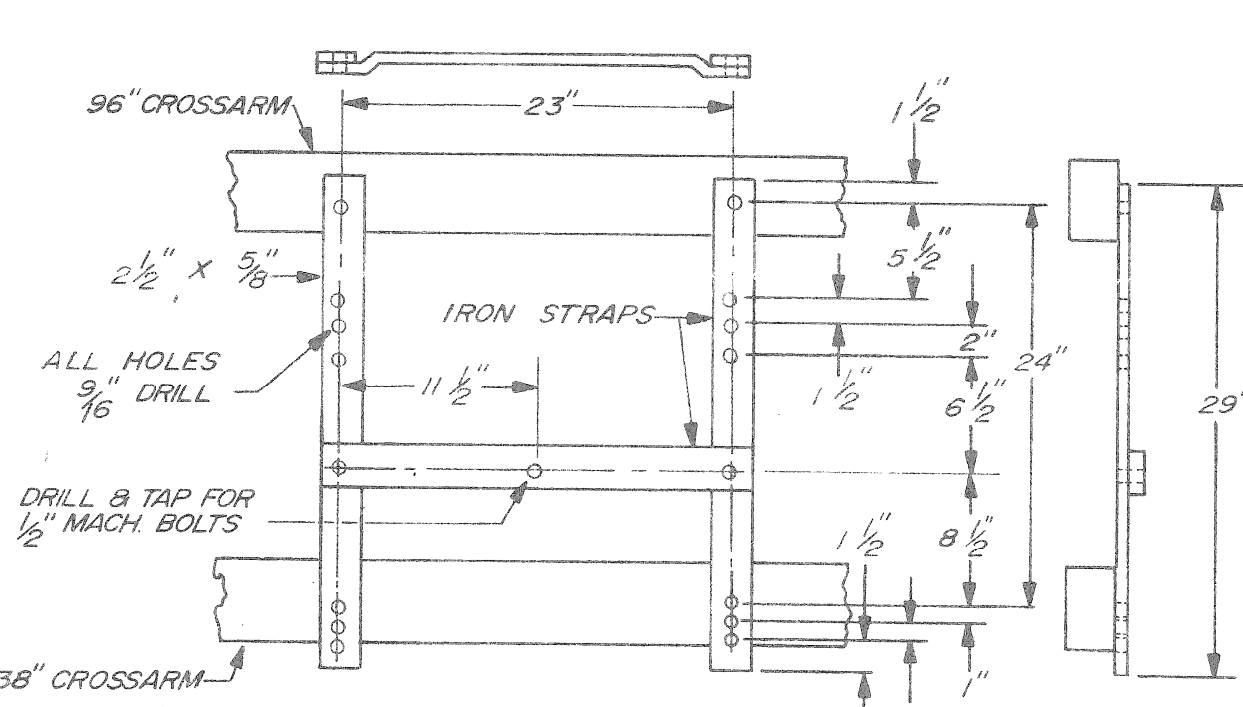
CONSTANT CURRENT ST. LTG. REGULATOR POLE
BUCK ARM INSTALLATION

CONSTANT CURRENT ST. LTG. REGULATOR POLE
LINE ARM INSTALLATION

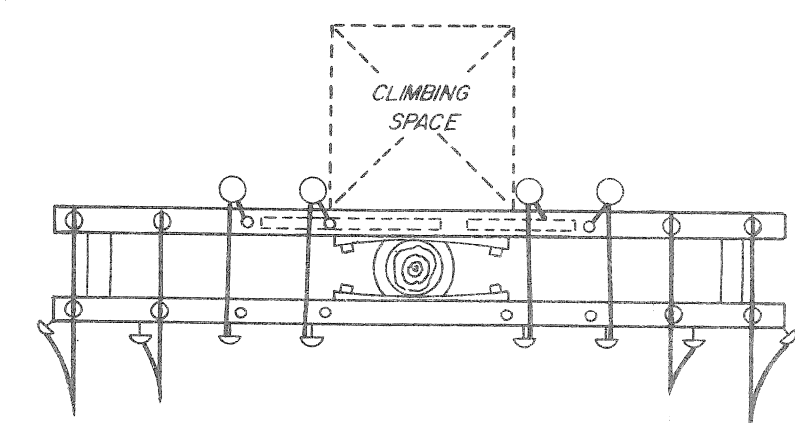
DETAIL ITEM	
1	LIGHTNING ARRESTER
2	#6 OVERHEAD TRAINING WIRE (NEOPRENE COVERED WEATHERPROOF)
3	#8 OVERHEAD FLEXIBLE TRAINING WIRE
4	100A. SOLID BLADE CUTOUT
5	1/2" #8 L.C. CABLE
6	3" SPLIT-DUCT ABOVE G.I.P. TO 8" BELOW CROSSARM
7	#2 GROUND WIRE UNDER MOULDING
8	LEAD WEATHERCAP & GALV. BUSHING
9	FOUR SCREW CONNECTOR
10	2 1/2" G.I.P. RISER
11	2 1/2" x 4" REDUCER ADAPTER
12	36" RADIUS PLASTIC BEND, NO. 8 SIZE OF CONDUIT AS SHOWN ON PLANS
13	3" G.I.P. RISER
14	4" SPLIT DUCT
15	3" x 4" REDUCER ADAPTER
16	8/C POTHEAD
17	8/C POTHEAD MOUNTING BRACKET (SEE DETAIL "A")
18	8/C L.C. CABLE



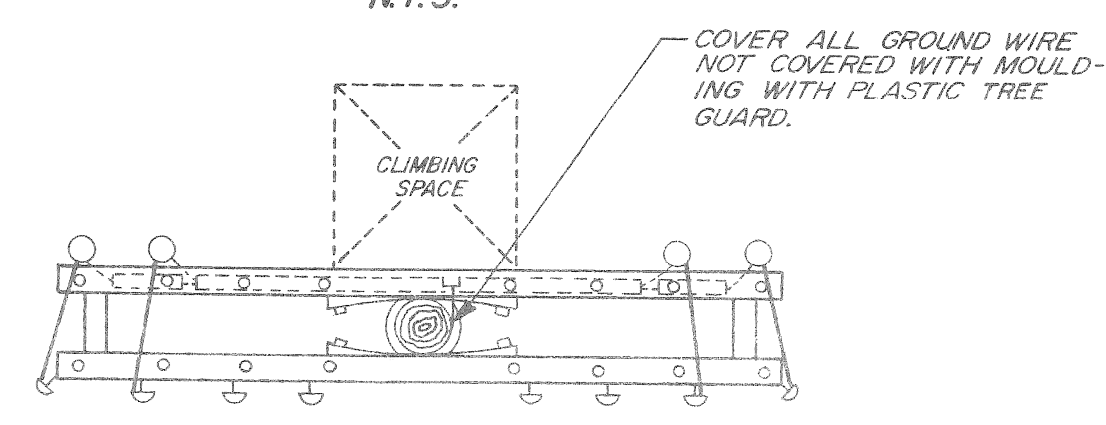
PLAN AT FIFTH GAIN
INCLUDING 8/C POTHEAD
N.T.S.



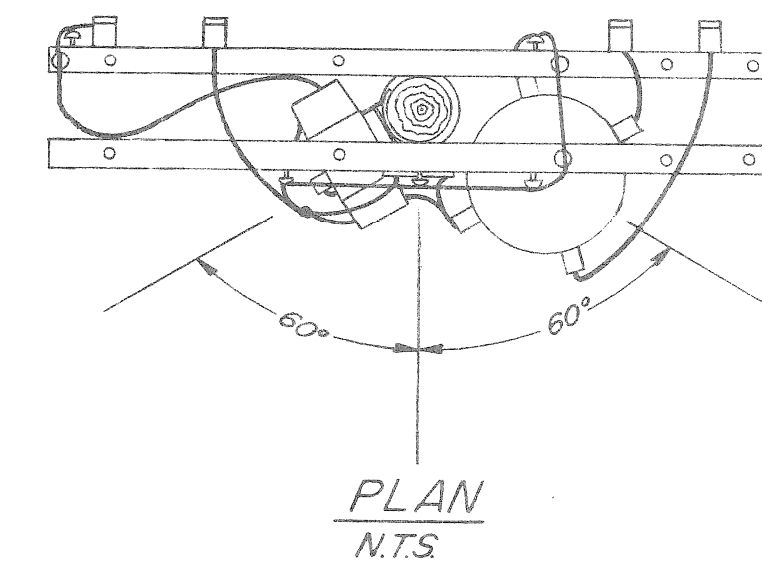
BRACKET FOR 8/C POLE TYPE POTHEAD
DETAIL "A" (17)
N.T.S.



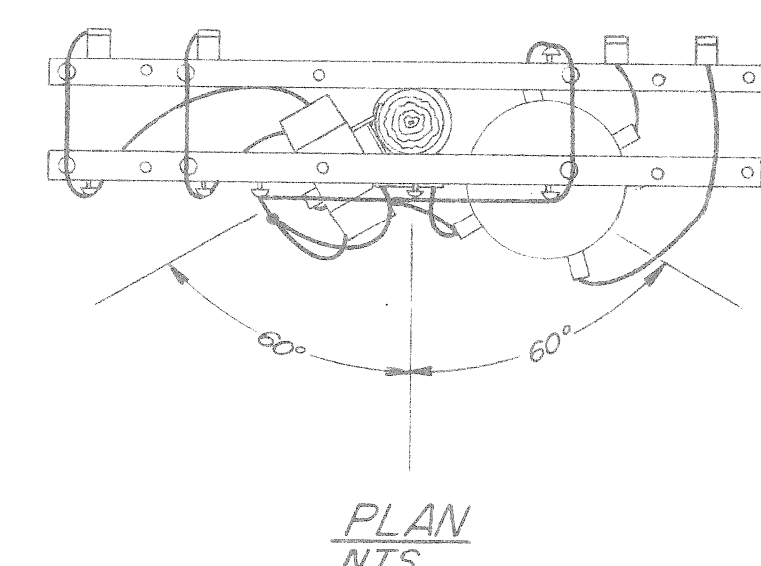
PLAN AT THIRD ARM
N.T.S.



PLAN AT FIFTH ARM
N.T.S.

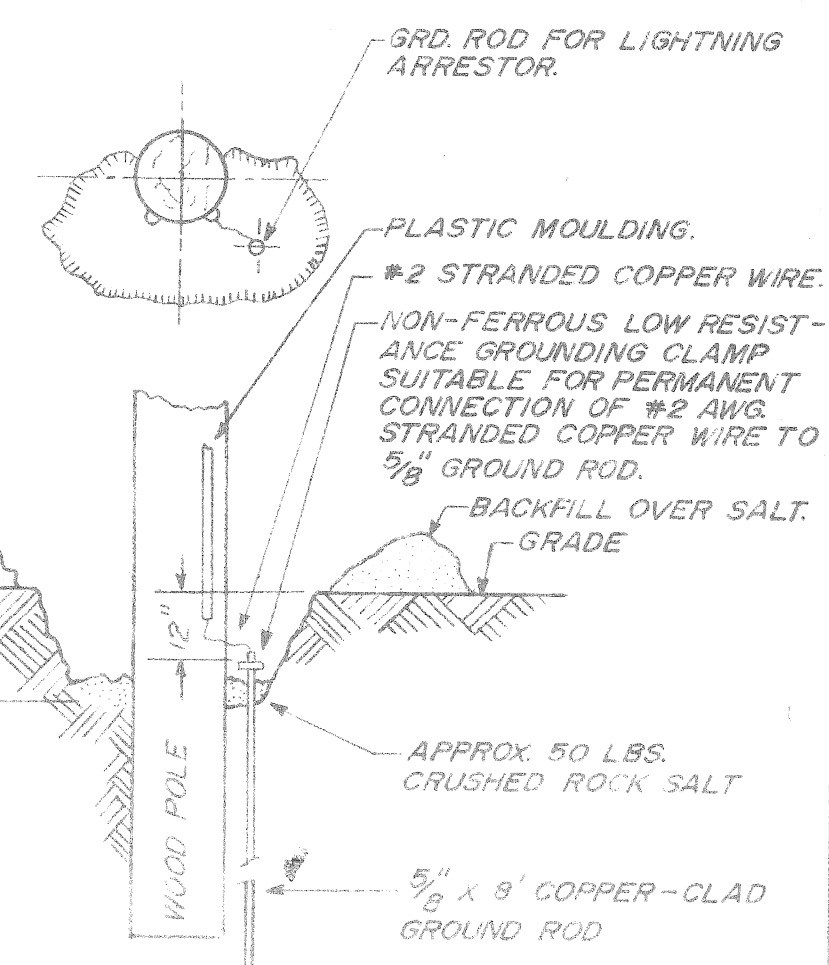


PLAN
N.T.S.



PLAN
N.T.S.

DETAIL ITEM	
(A)	TOP THRU BOLT, 5'-0" TO ARM (5'-6" FOR TOP BUSHED TRANSFORMER)
(B)	#8 OVERHEAD FLEXIBLE TRAINING WIRE
(C)	ALL TRAINERS #6 WP EXCEPT AS NOTED
(D)	CAPACITOR CASE CONNECT TO PRI. L.A. GRD. WIRE
(E)	SOUTH BEND OIL SWITCH 20 AMP CONTROL
(F)	100 AMP ENCLOSED CUTOUTS. FUSE AS SPECIFIED.



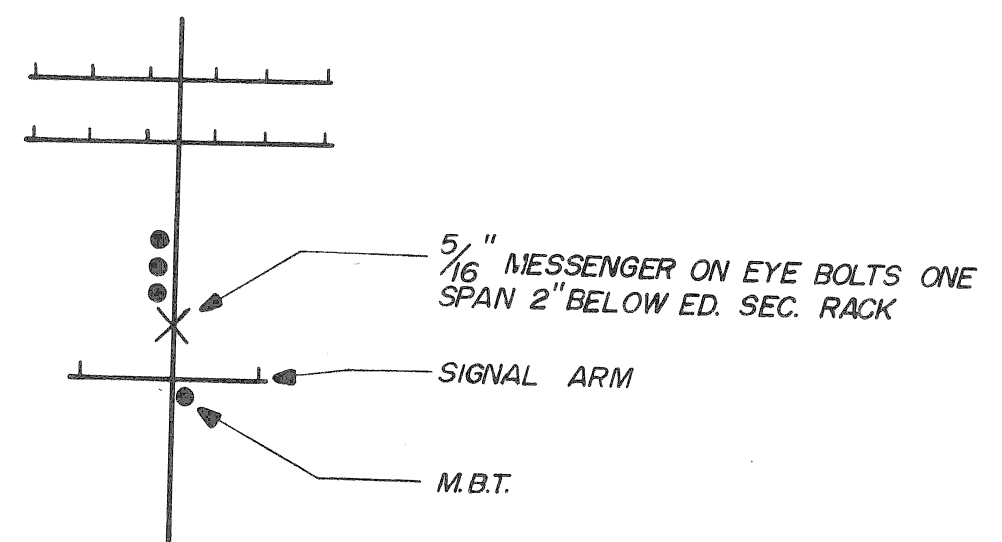
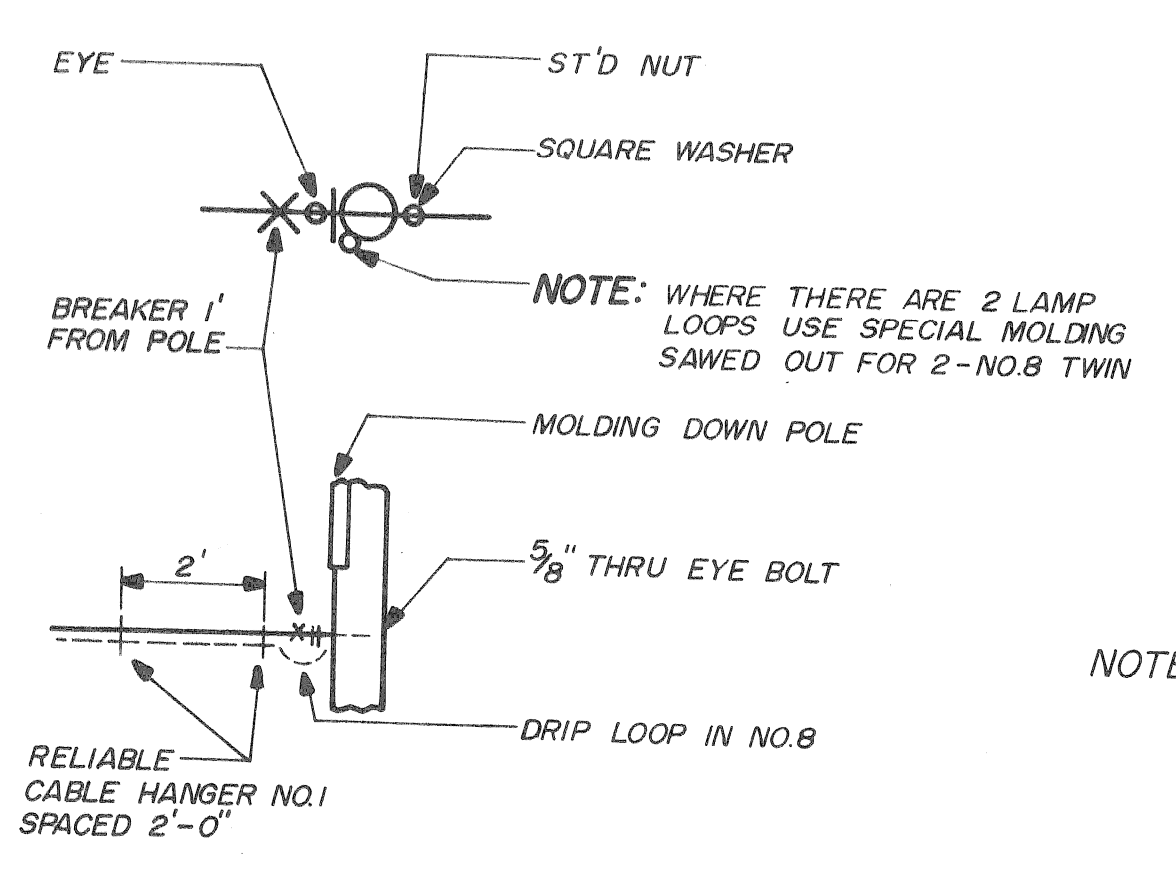
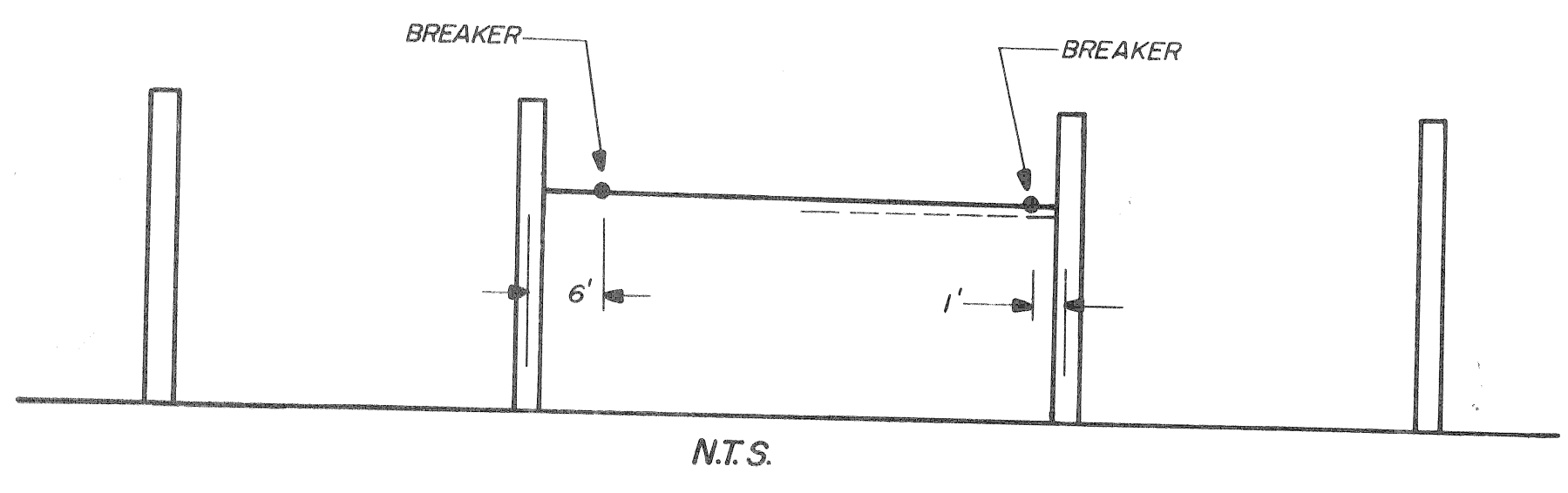
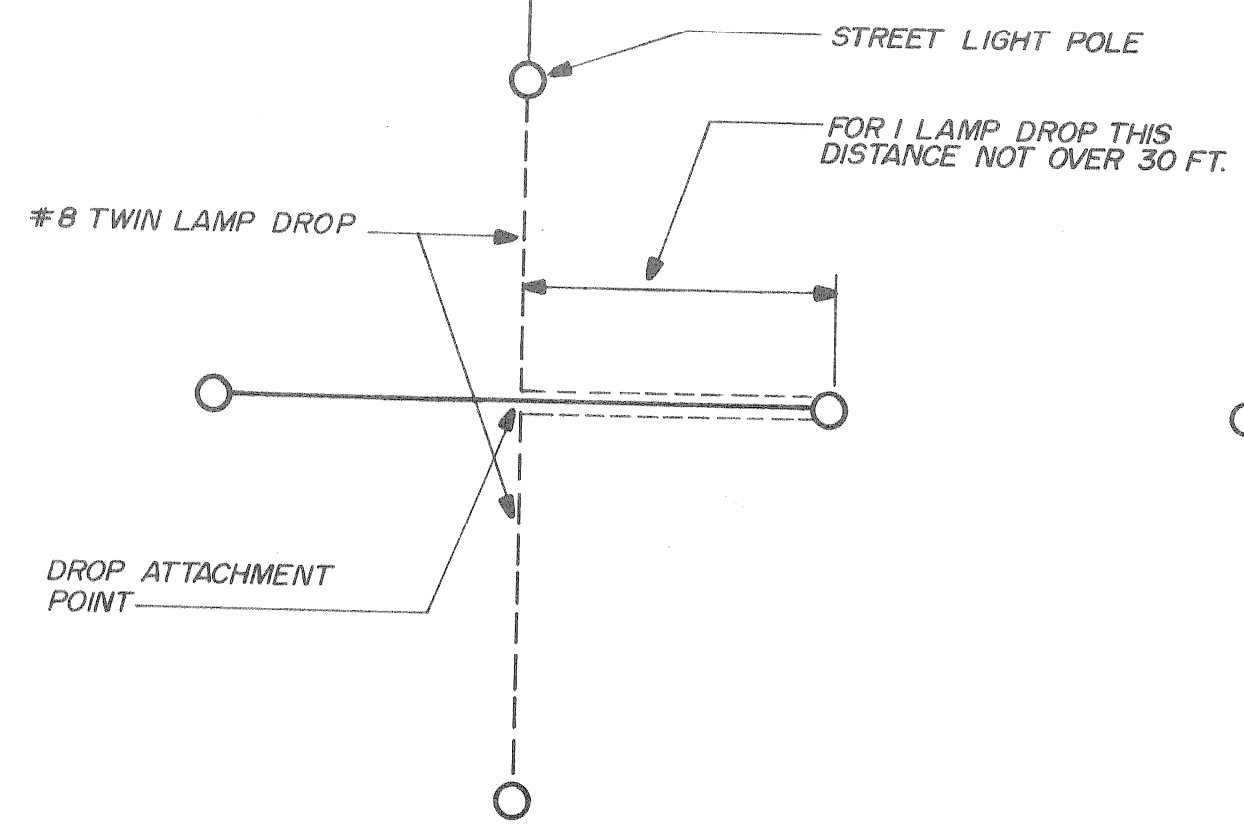
GROUND ROD INSTALLATION
N.T.S.

- NOTES:**
- SEE P.L.D. DETAILS FOR GROUND ROD AND CONDUIT INSTALLATION.
 - INSTALL STEPS ON POLE FROM 8'-0" ABOVE GROUND TO 48" BELOW POTHEAD ARM.
 - INSTALL BRASS TAG ON EACH P.H. CAP & P.H. BODY TAGS TO BE STAMPED WITH THE FOLLOWING INFORMATION: STREET LIGHTING CIRCUIT NUMBER & "PLUS" TO INDICATE POSITIVE LEAD.
 - THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A LIST OF ALL SPLICING MATERIALS HE PROPOSES TO USE WITH SUPPORTING DATA THAT THE MATERIAL IS SUITABLE FOR THE APPLICATION AS SHOWN ON THE DRAWINGS.

DATE	DESCRIPTION	CHKD. BY

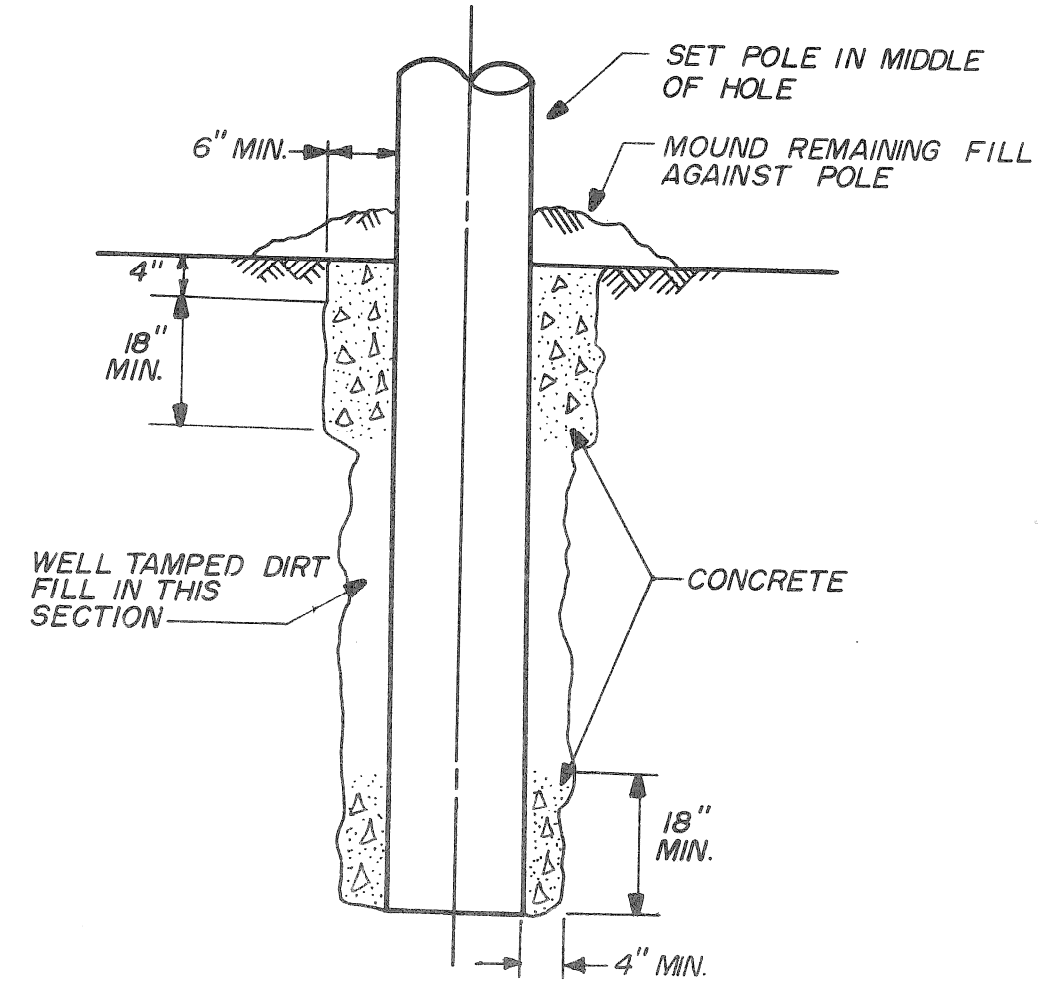
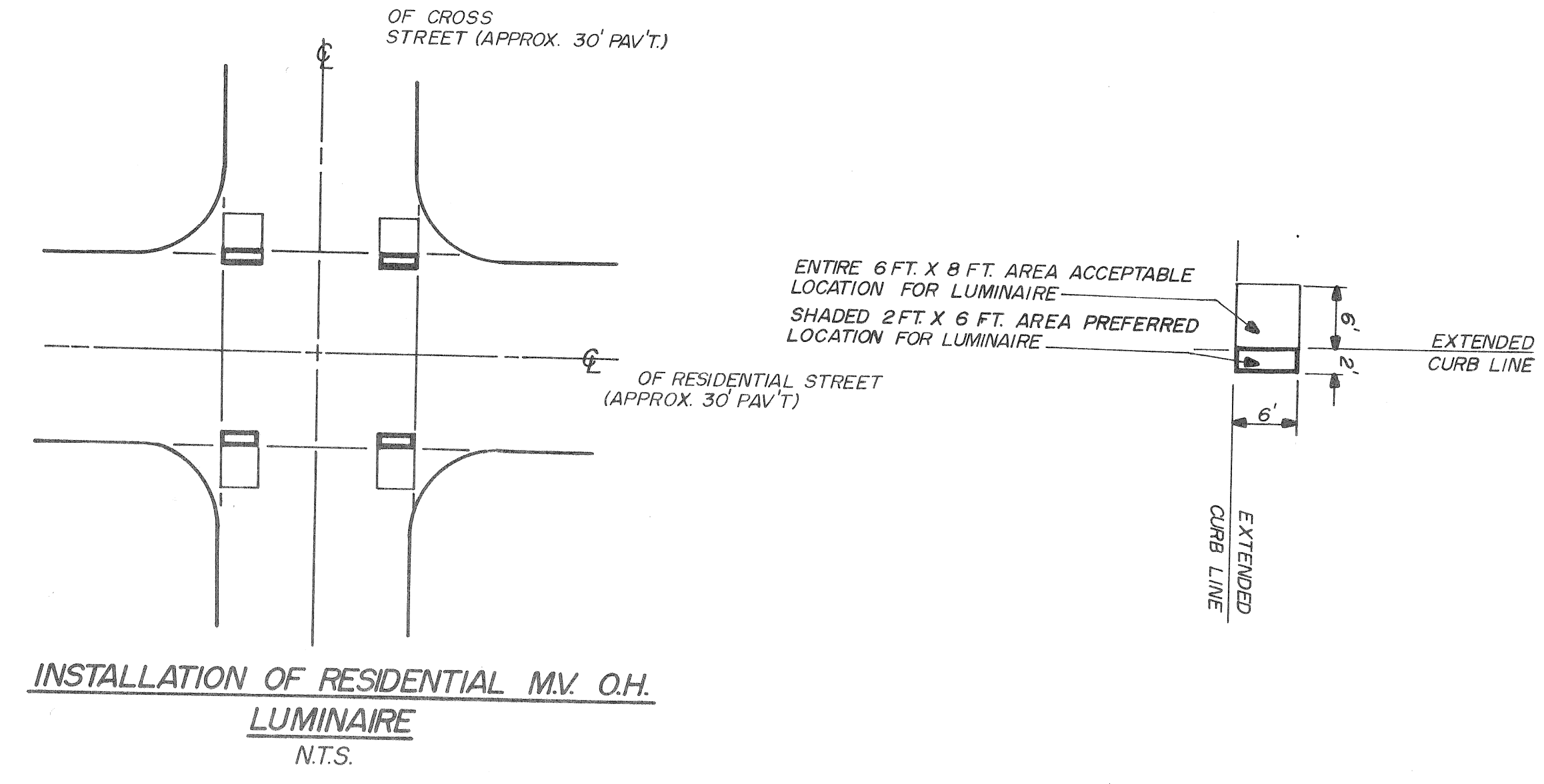
JEFFERSON/CONNER INDUSTRIAL REVITALIZATION PROJECT
MACK AVENUE LIGHTING
SERIES ST. LTG. CABLE POLE; 8/C ST. LTG. CABLE POLE; 8 CONSTANT CURRENT ST. LTG. REGULATOR POLES DETAILS

DRAWN: CEA CHECKED: APPROVED: SM DATE:	PLAN PREPARED BY: CONSULTING ENGINEERS ASSOCIATES INC. ENGINEERING CONSULTANTS 10580 WYOMING LECTURE HALL 103 DENVER, CO. 80231	CHECKED BY: PUBLIC LIGHTING DEPARTMENT	FILE NO.: 51-0606 SHEET NO.: 111 OF 117 AUG 87
---	---	---	---

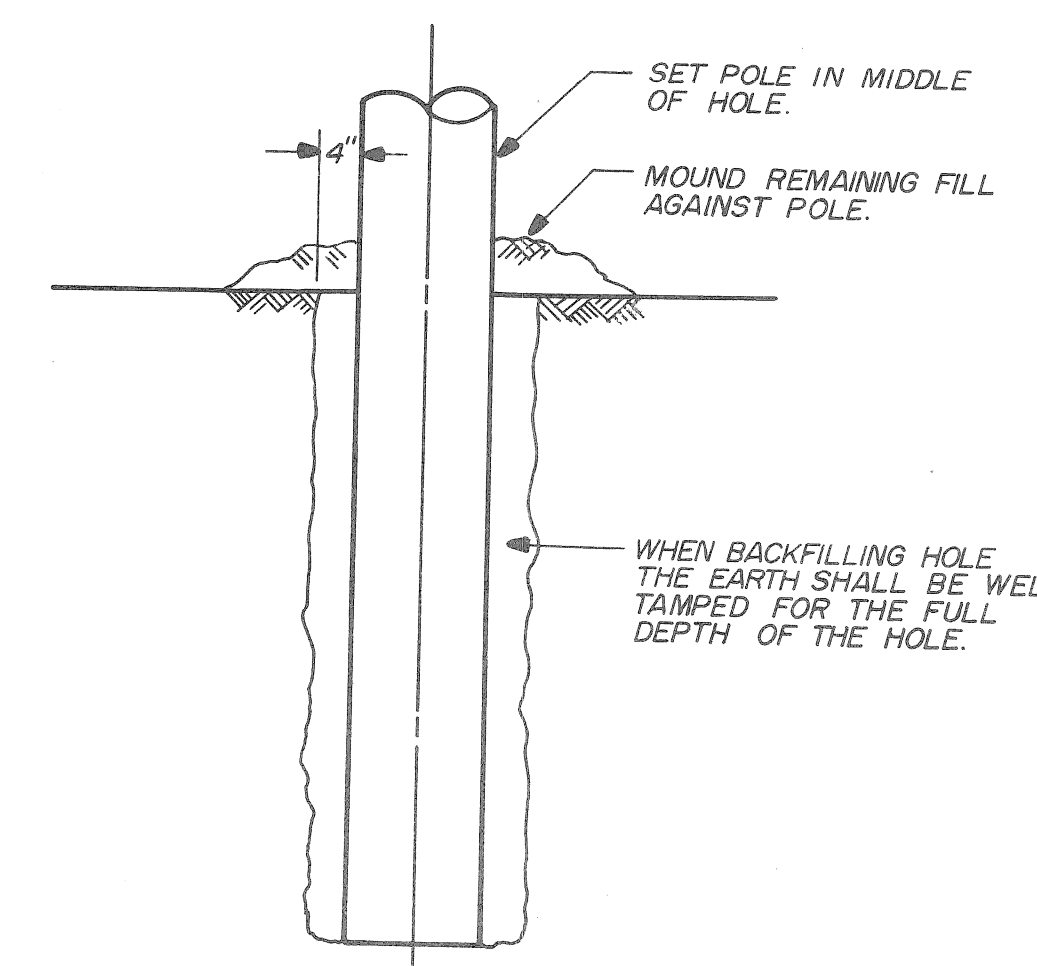


NOTE: INSTALL 5/8" MESSENGER SPAN FIRST WITH SAME SAG AS EDISON SEC. THEN INSTALL NO. 8 TWIN DROPS. IN THE CASES WHERE THERE IS A SINGLE DROP AND THE ATTACHMENT POINT IS PULLED OUT AND UP READJUST SAG AT EYE BOLT.

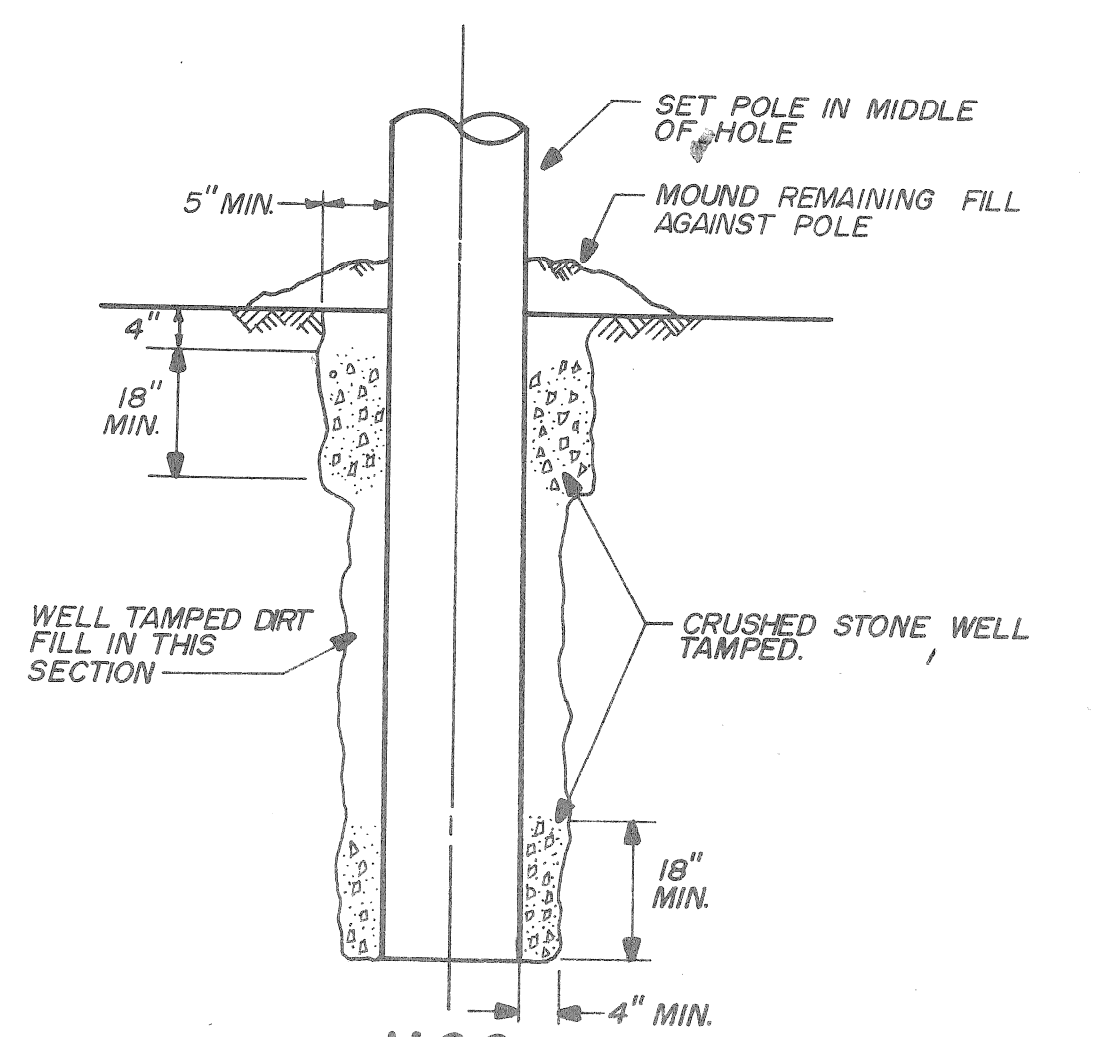
(POLE DETAIL)
MESSENGER WIRE LAMP DROP SUPPORT: STANDARD INSTALLATION METHOD



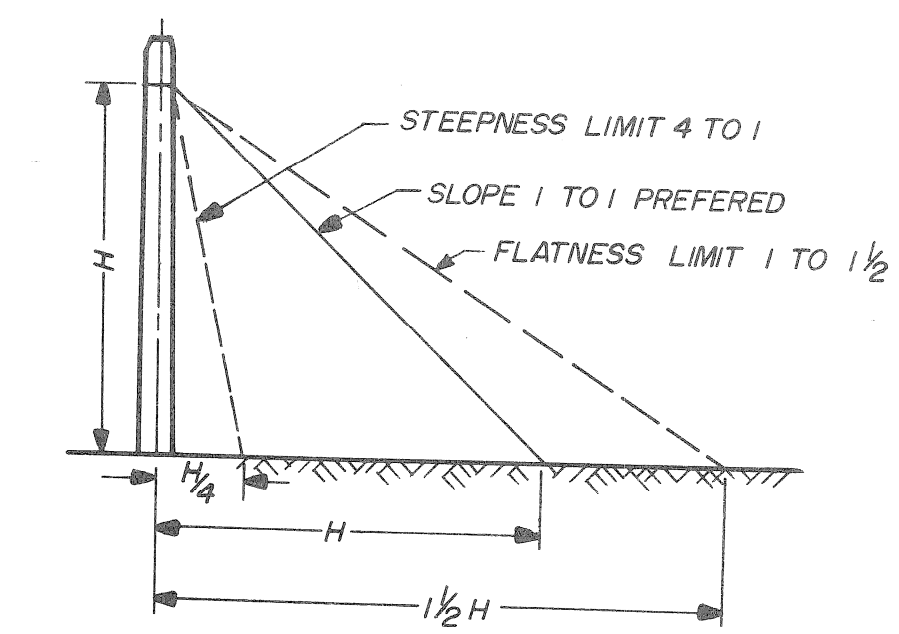
WOOD POLE IN CONCRETE
N.T.S.



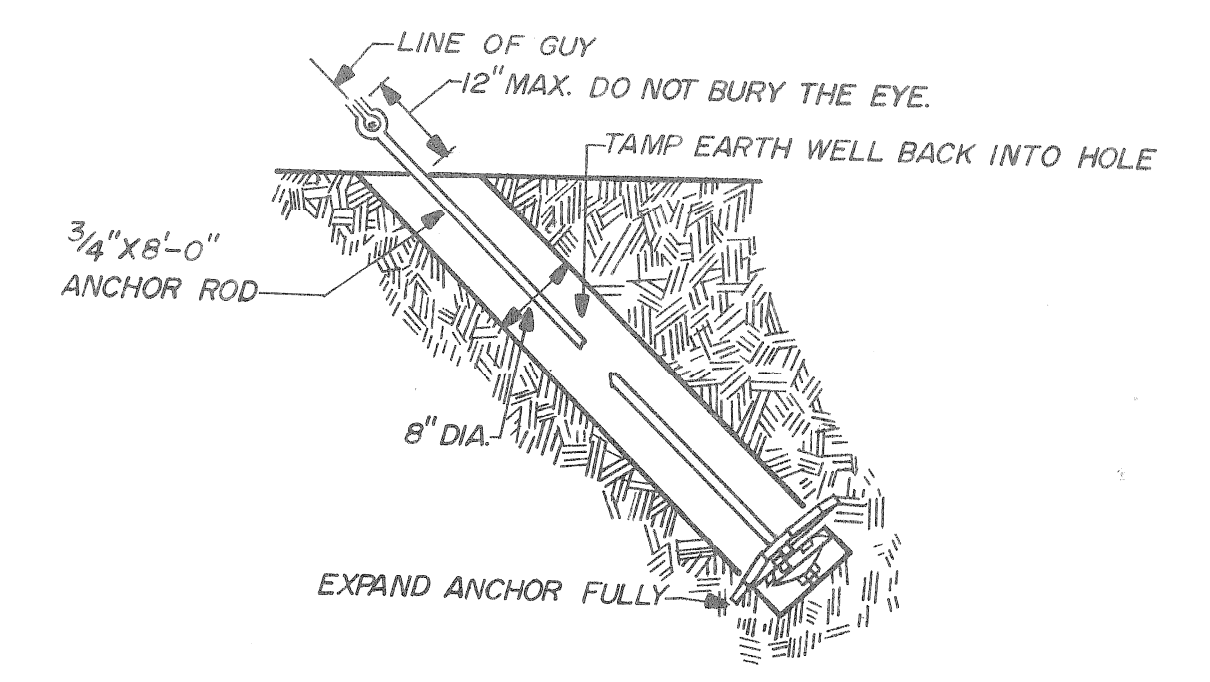
WOOD POLE INSTALLATION
N.T.S.



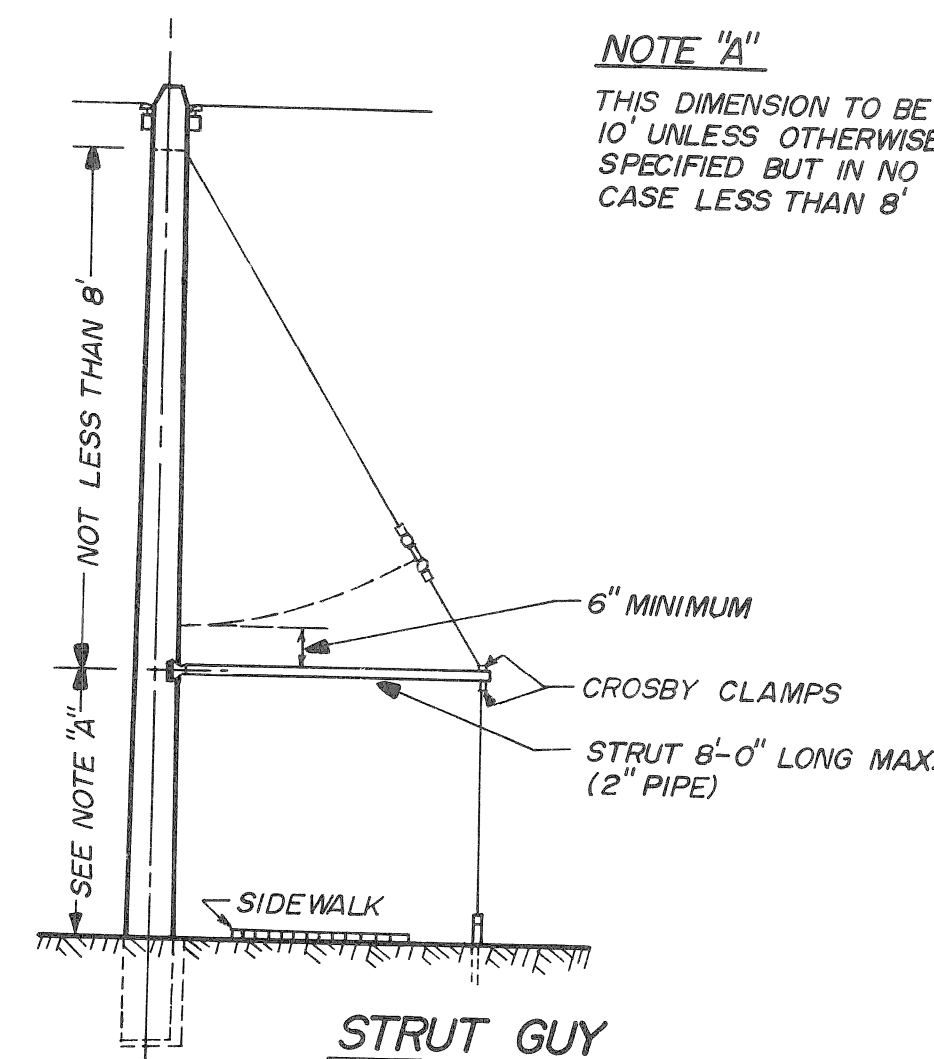
M.S.S. SELF-SUPPORTING WOOD POLE IN CRUSHED STONE
N.T.S.



SLOPE LIMITS FOR ANCHOR GUYS



EXPANDING ANCHOR

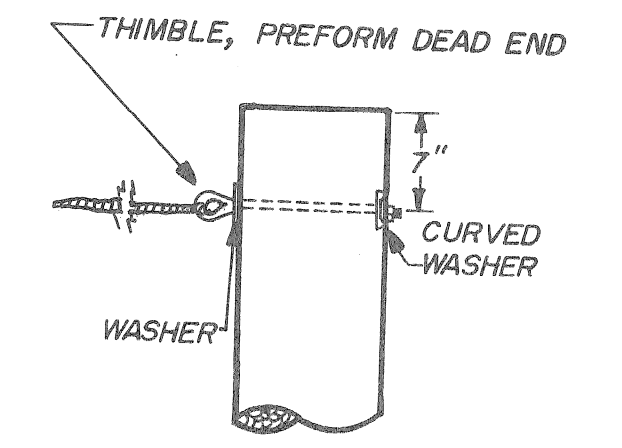


STRUT GUY

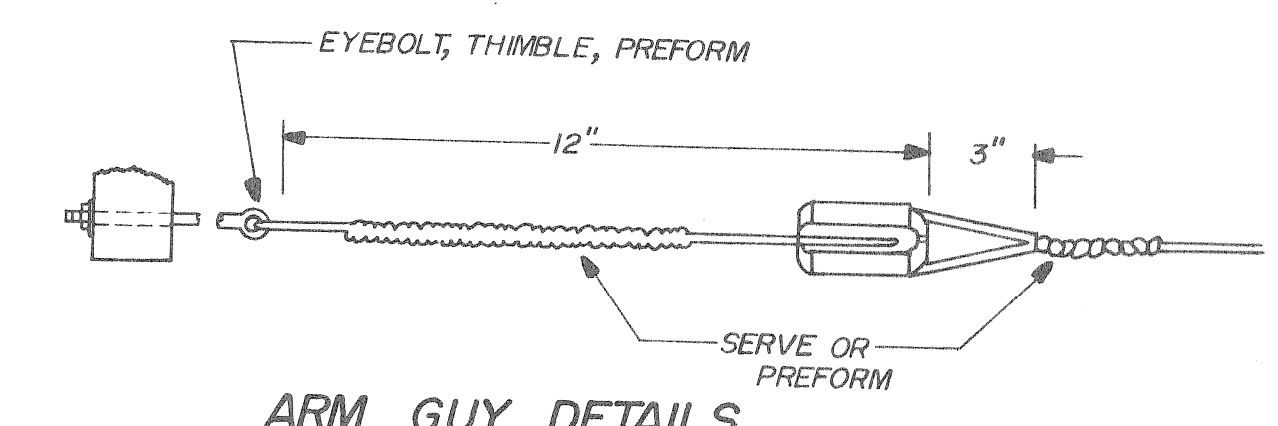
NOTE "A"
THIS DIMENSION TO BE 10' UNLESS OTHERWISE SPECIFIED BUT IN NO CASE LESS THAN 8'

POLE HEIGHT	SETTING DEPTH
30'	6.0'
35'	6.0'
40'	6.0'
45'	6.5'
50'	7.0'
55'	7.5'
60'	8.0'

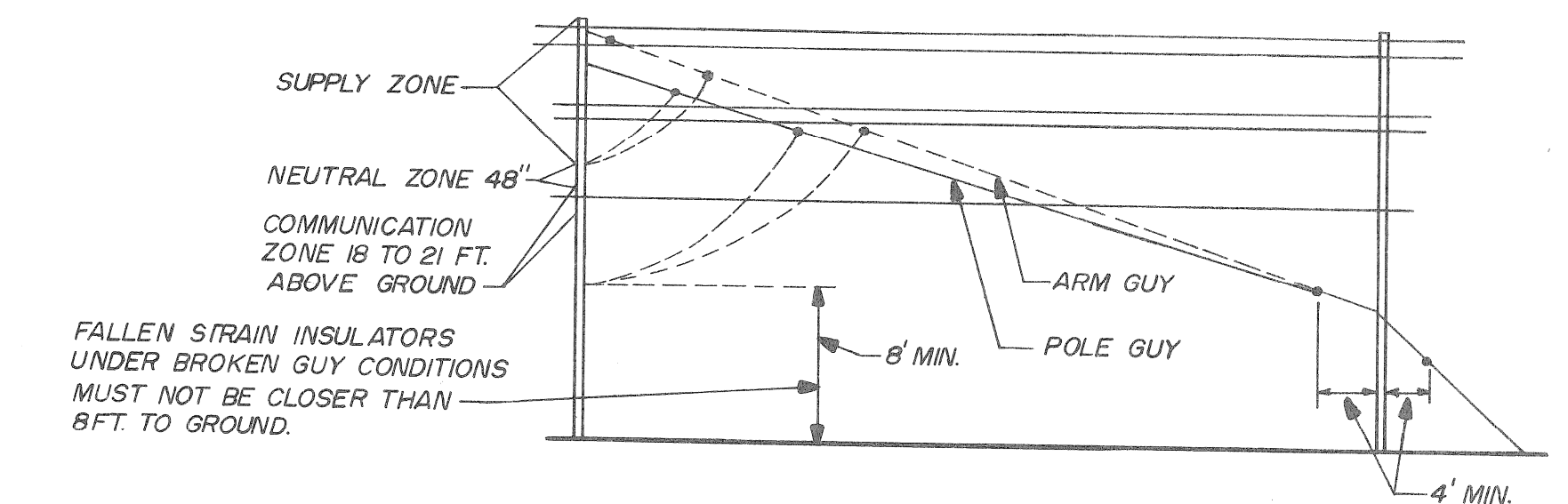
TYPICAL POLE SETTING DEPTH



POLE GUY



ARM GUY DETAILS

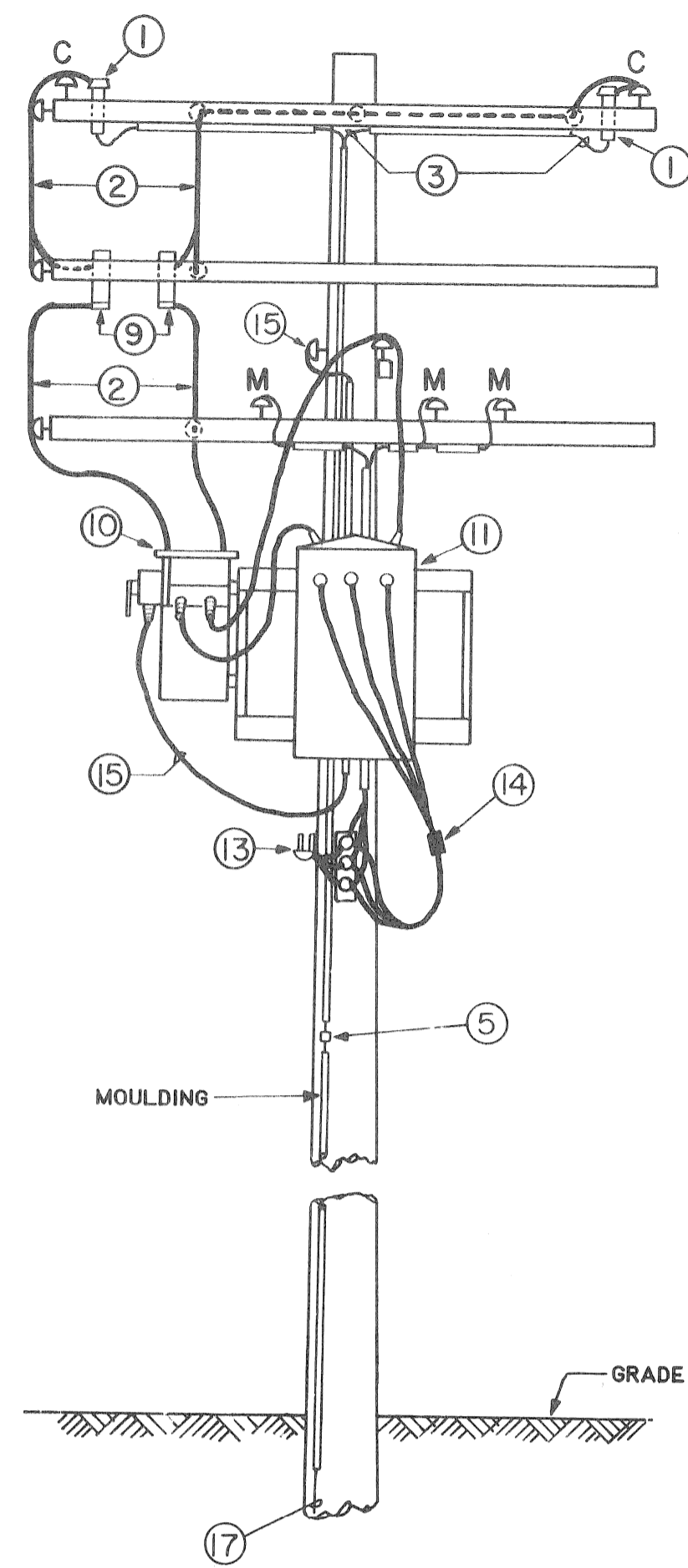


STRAIN INSULATOR POSITIONS IN GUY WIRES

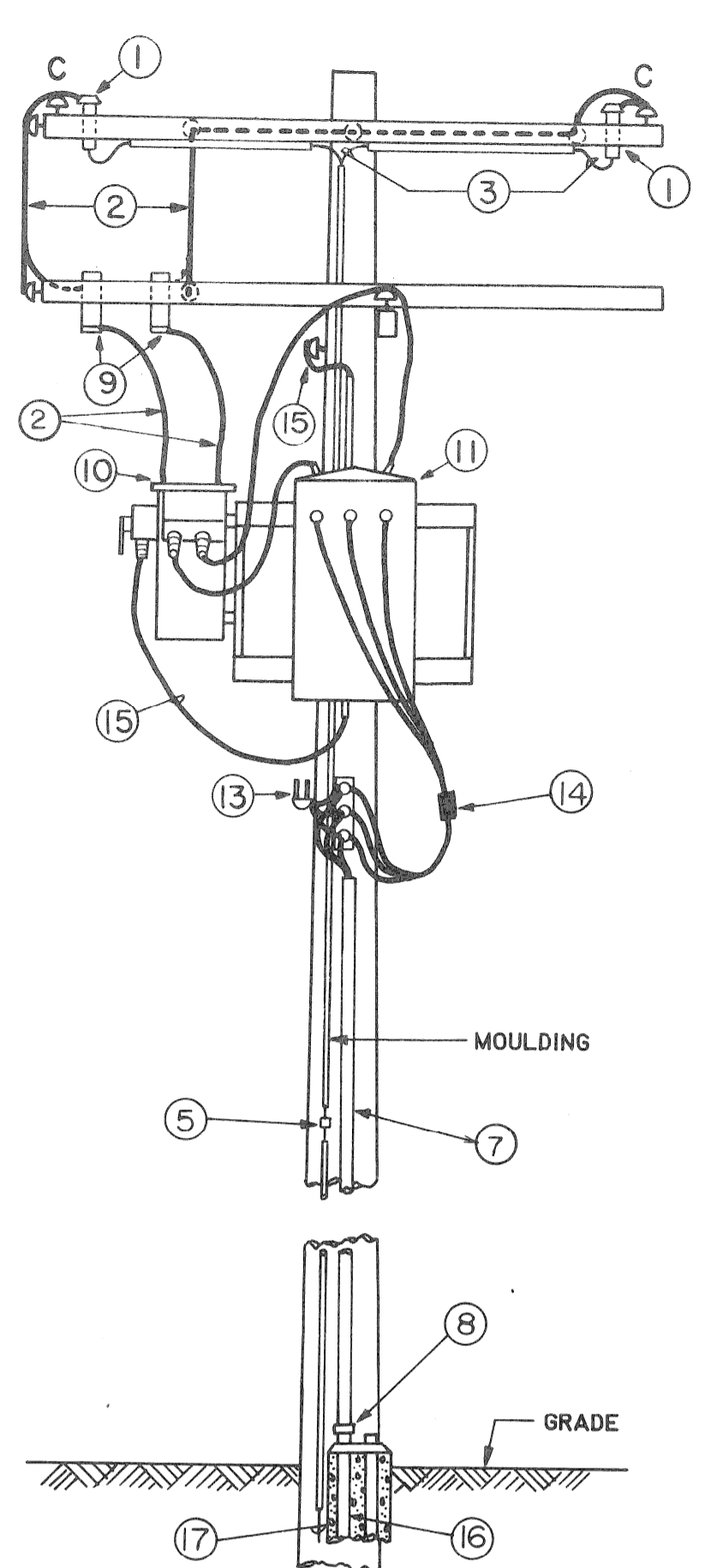
DATE	DESCRIPTION	CHKD. BY

JEFFERSON/CONNER INDUSTRIAL REVITALIZATION PROJECT
MACK AVENUE LIGHTING
MESSENGER WIRE INSTALLATION & MISC. DETAILS

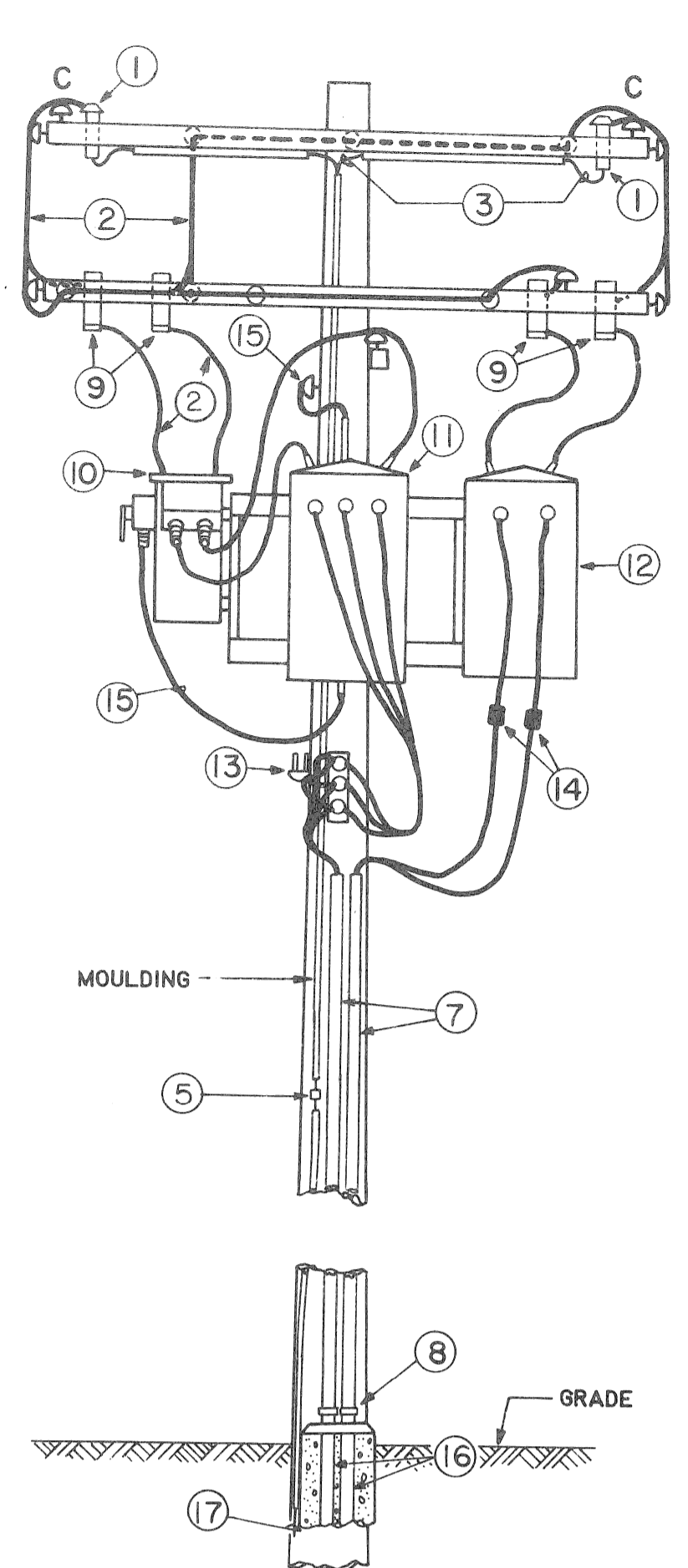
DRAWN CEA CHECKED APPROVED DATE AUG. 87	PLAN PREPARED BY CONSULTING ENGINEERING ASSOCIATES INC. ENGINEERING CONSULTANTS 16580 WYOMING DETROIT, MICH. 48221 DRWG. NO. 35 OF 40 FILE NO. CEA 1137	DRAWN BY CHECKED BY APPROVED PUBLIC LIGHTING DEPARTMENT CITY OF DETROIT	FILE NO. 305 51-0606 SHEET NO. 112 OF 117 DATE AUG. 87
--	---	---	--



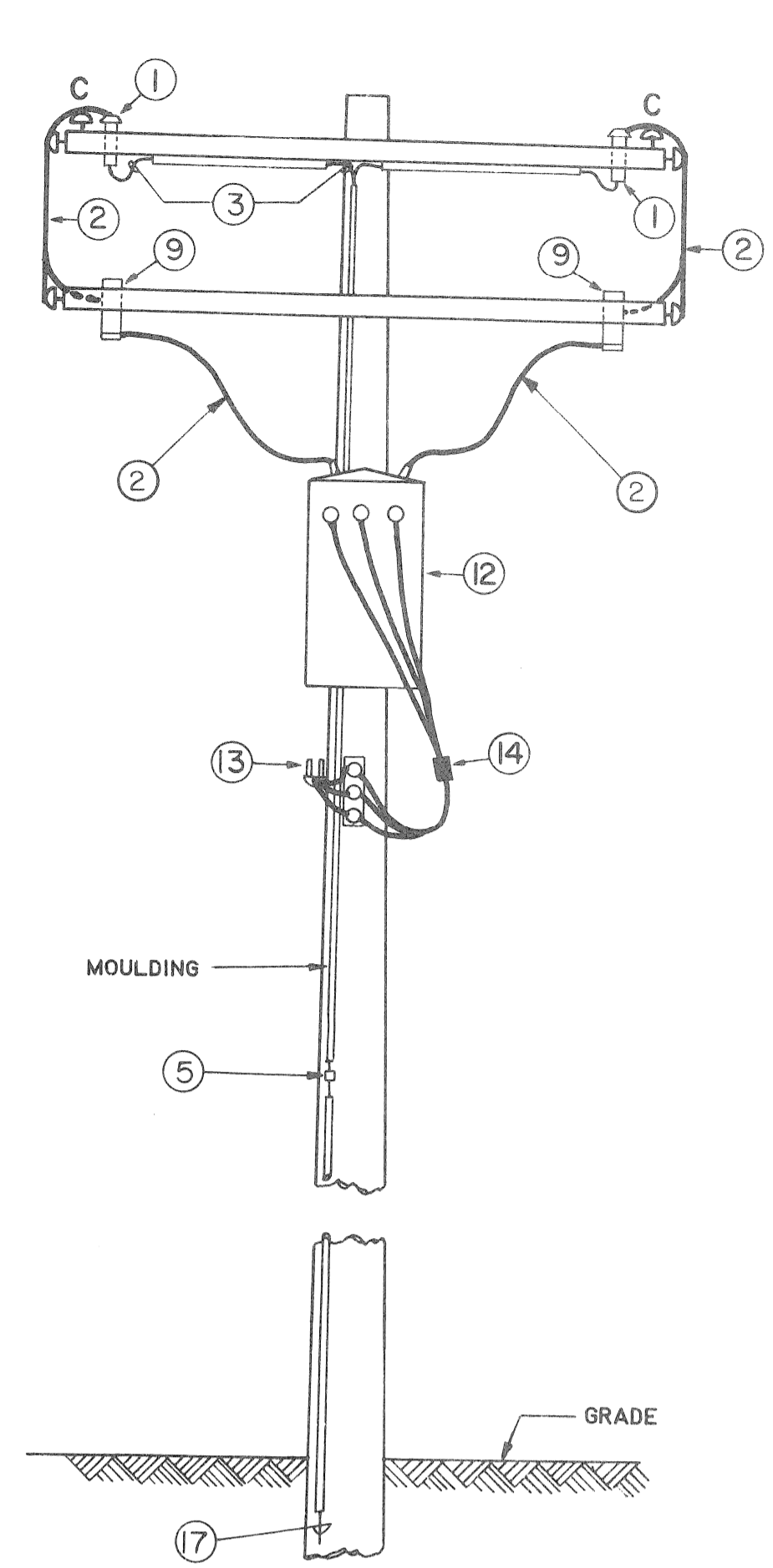
MULT. ST. LTG. TRANSFORMER POLE
DETAIL "A"
N.T.S.



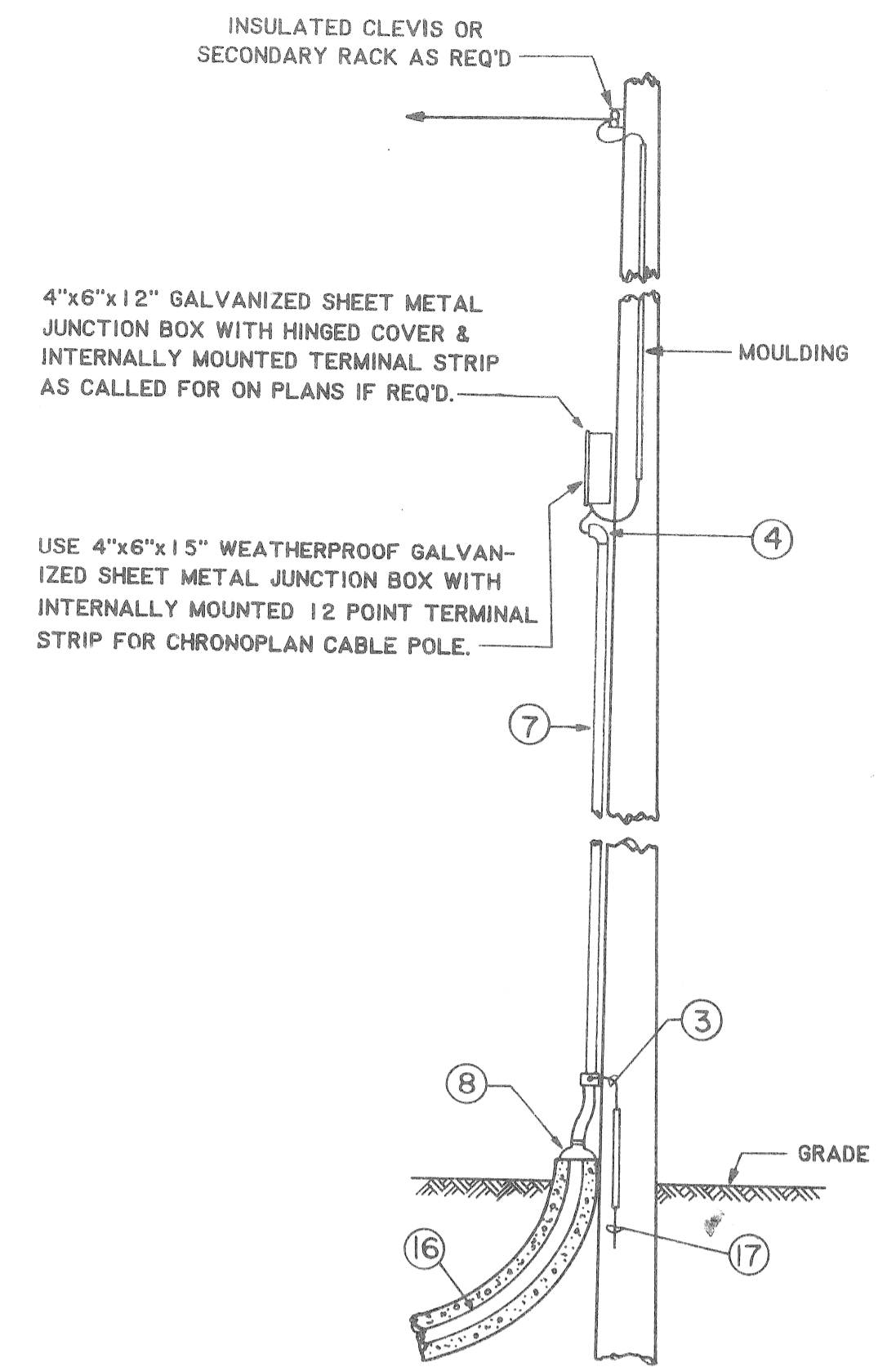
COMB. MULT. ST. LTG. TRANSFORMER POLE
& MULT. ST. LTG. CABLE POLE
DETAIL "B"
N.T.S.



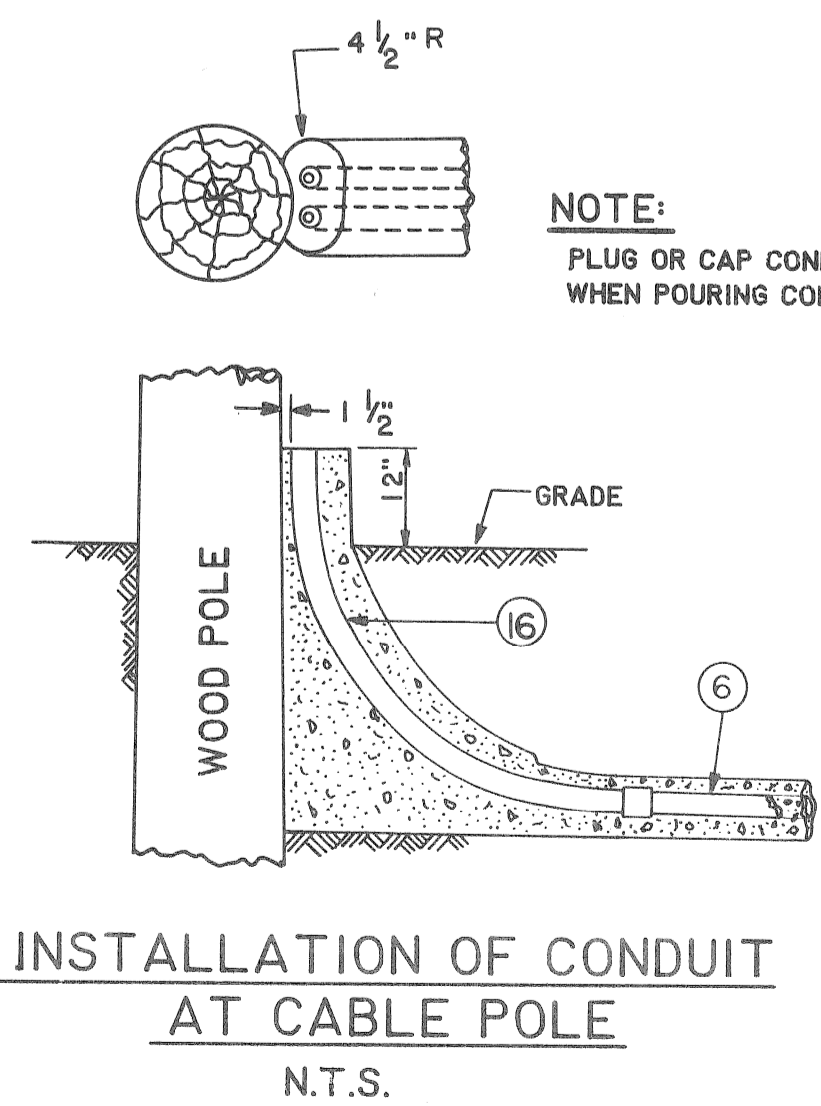
COMB. MULT. ST. LTG. TRANSFORMER POLE,
TRANSFORMER POLE, MULT. ST. LTG. &
SECONDARY CABLE POLE
DETAIL "C"
N.T.S.



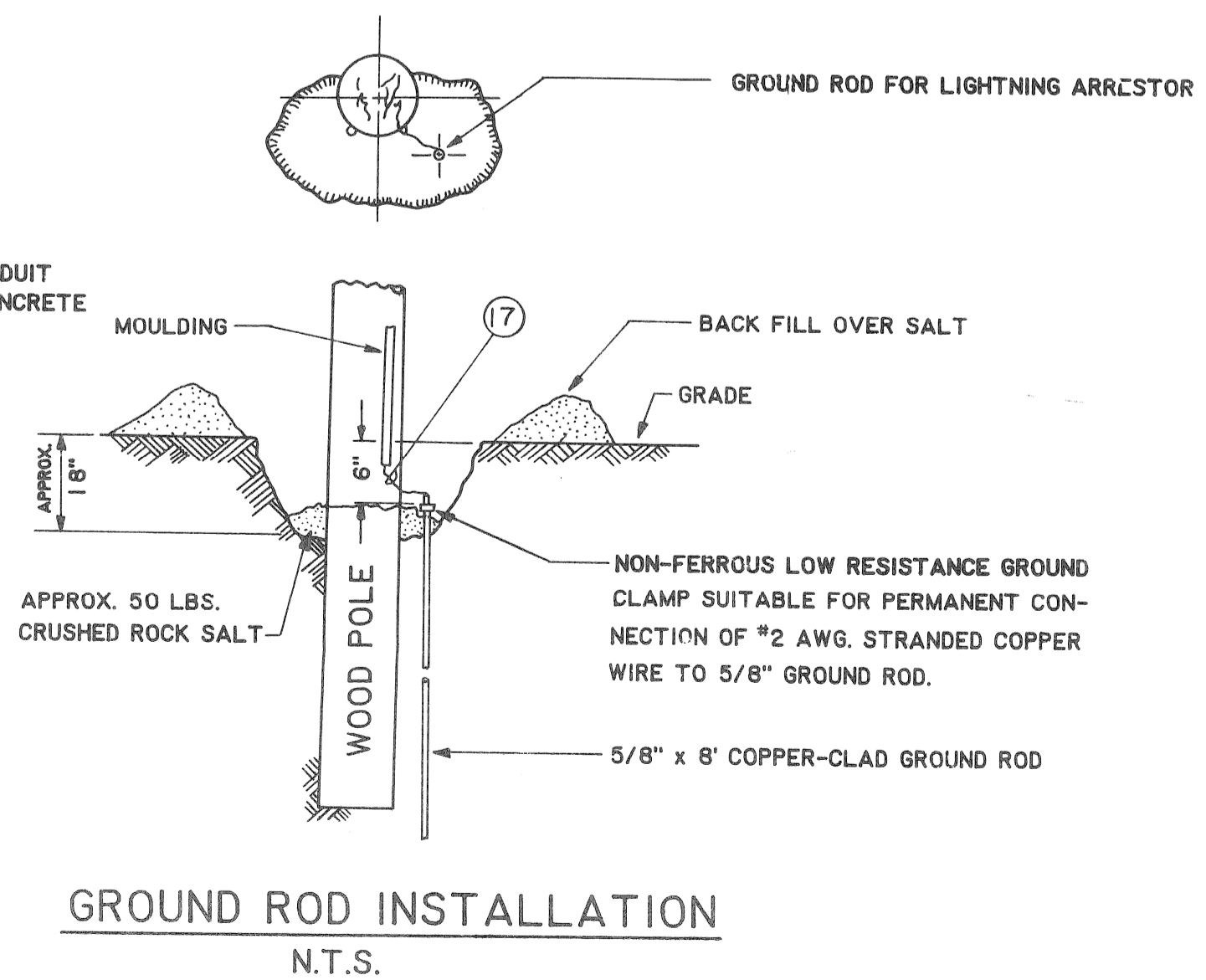
TRANSFORMER POLE
DETAIL "D"
N.T.S.



TYPICAL CHRONOPLAN, SECONDARY,
MULT. ST. LTG. & TRAFFIC SIGNAL
CABLE POLE
DETAIL "E"
N.T.S.



INSTALLATION OF CONDUIT
AT CABLE POLE
N.T.S.



GROUND ROD INSTALLATION
N.T.S.

DETAIL ITEMS	
(1)	LIGHTNING ARRESTER
(2)	OVERHEAD TRAINING WIRE
(3)	#2 GROUND WIRE UNDER MOULDING
(4)	LEAD WEATHERCAP & GALVANIZED BUSHING
(5)	FOUR SCREW CONNECTOR
(6)	4" PLASTIC CONDUIT
(7)	3" G.I.P. RISER
(8)	3" x 4" REDUCER ADAPTOR
(9)	100A. ENCLOSED CUTOUT (FUSE AS SHOWN ON PLANS)
(10)	TRANSFORMER CONTROL SWITCH, 20A. CONTROL
(11)	MULT. ST. LTG. TRANSFORMER (SIZE & RATING AS SHOWN ON PLANS)
(12)	120/240V. SEC. TRANSFORMER (SIZE & RATING AS SHOWN ON PLANS)
(13)	SECONDARY LIGHTNING ARRESTER
(14)	C.T.S.I. IN-LINE FUSES (SIZE AS SHOWN ON PLANS)
(15)	#8 TWIN CONTROL (FROM CONTROL COIL AS SHOWN ON PLANS)
(16)	36" RADIUS PLASTIC BEND, NO. & SIZE OF CONDUIT AS SHOWN ON PLANS
(17)	#2 STRANDED COPPER WIRE TO GROUND ROD

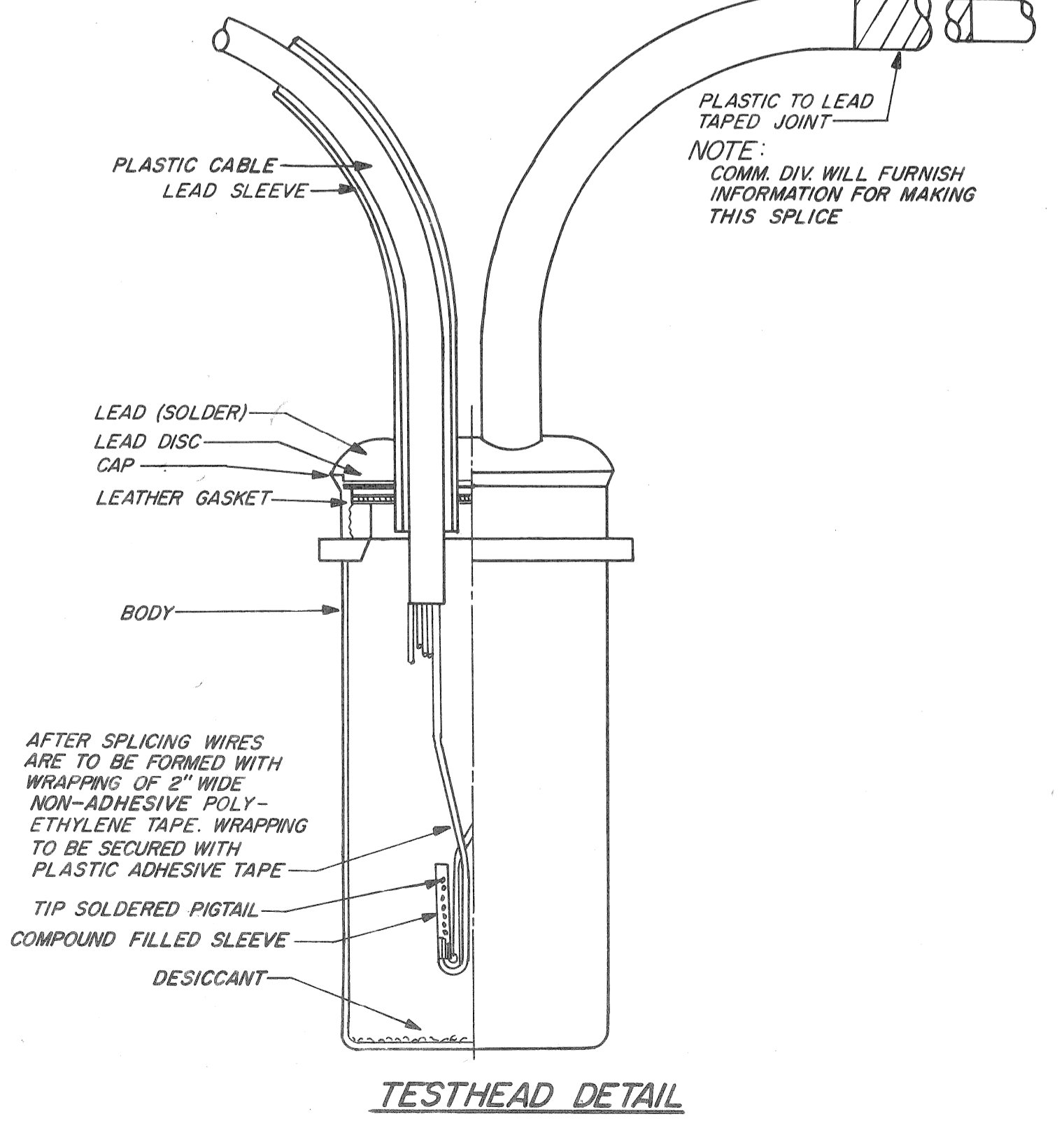
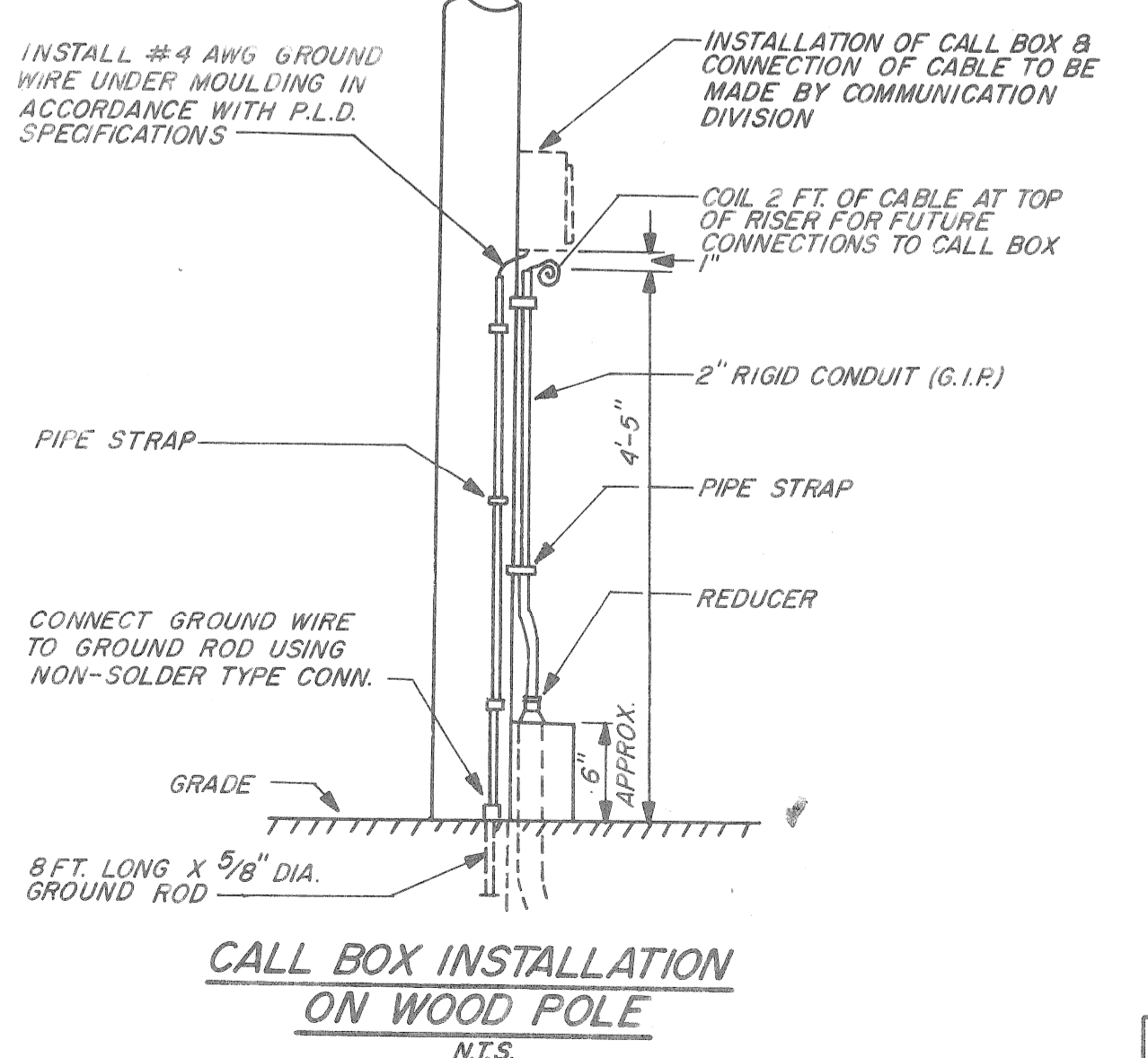
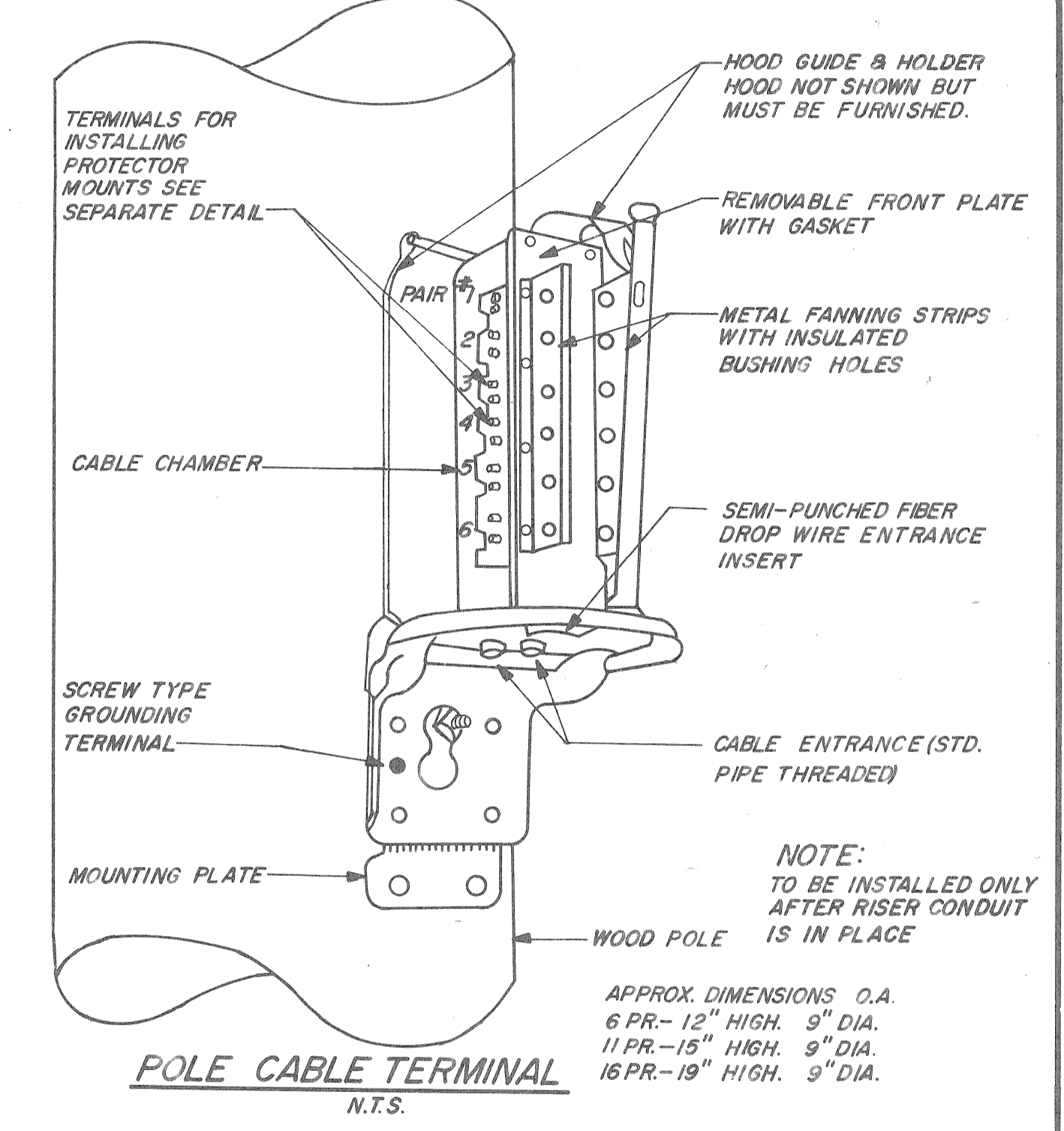
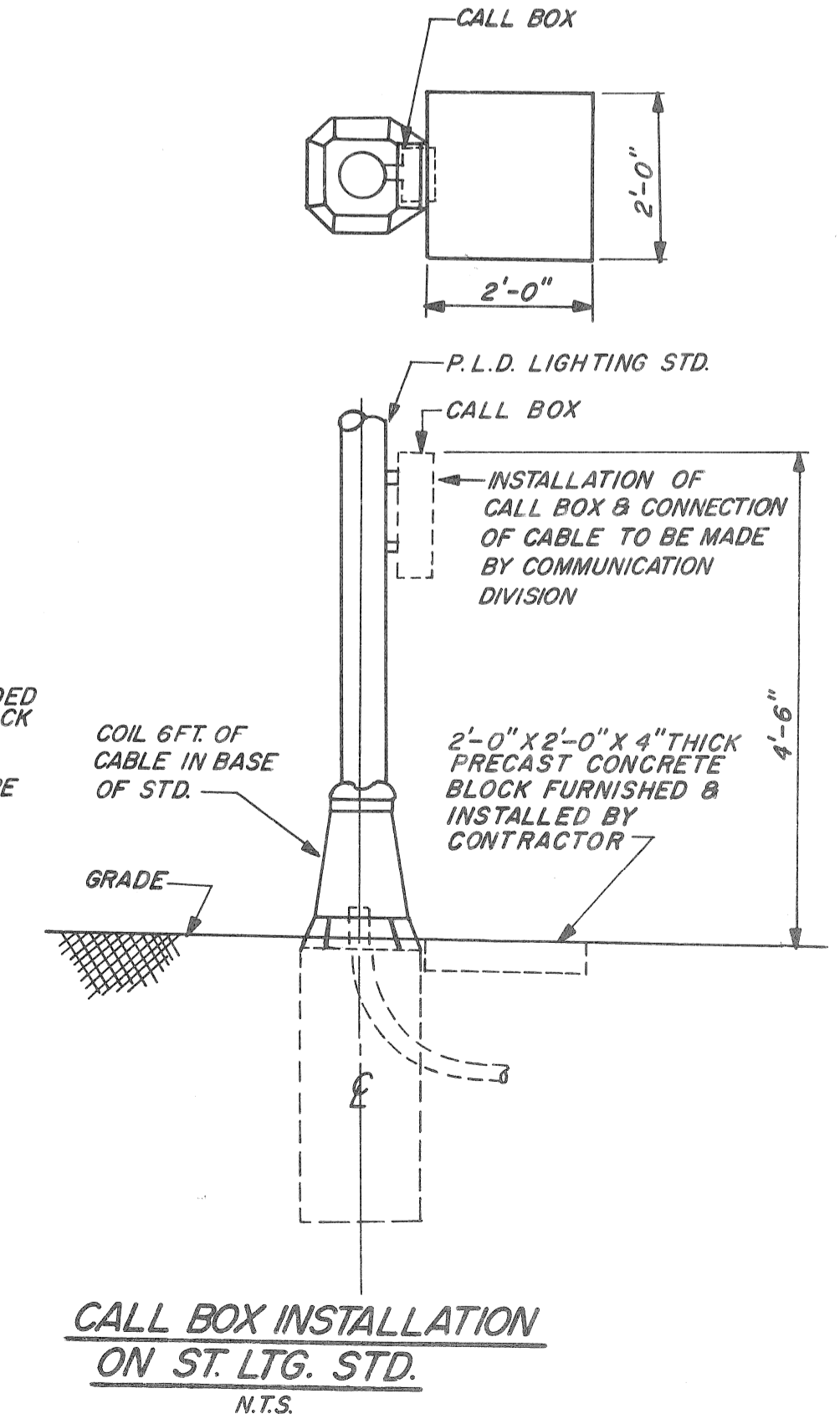
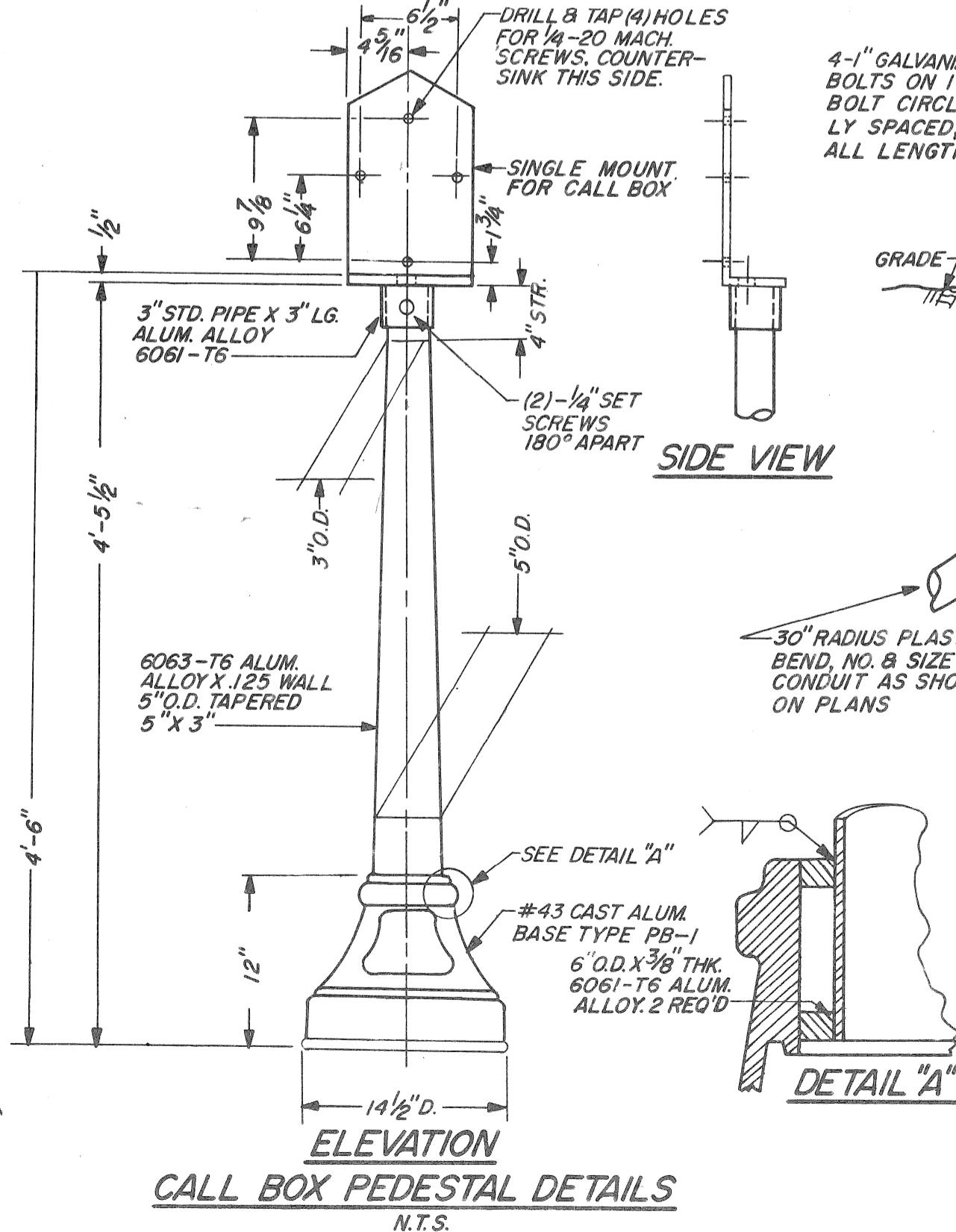
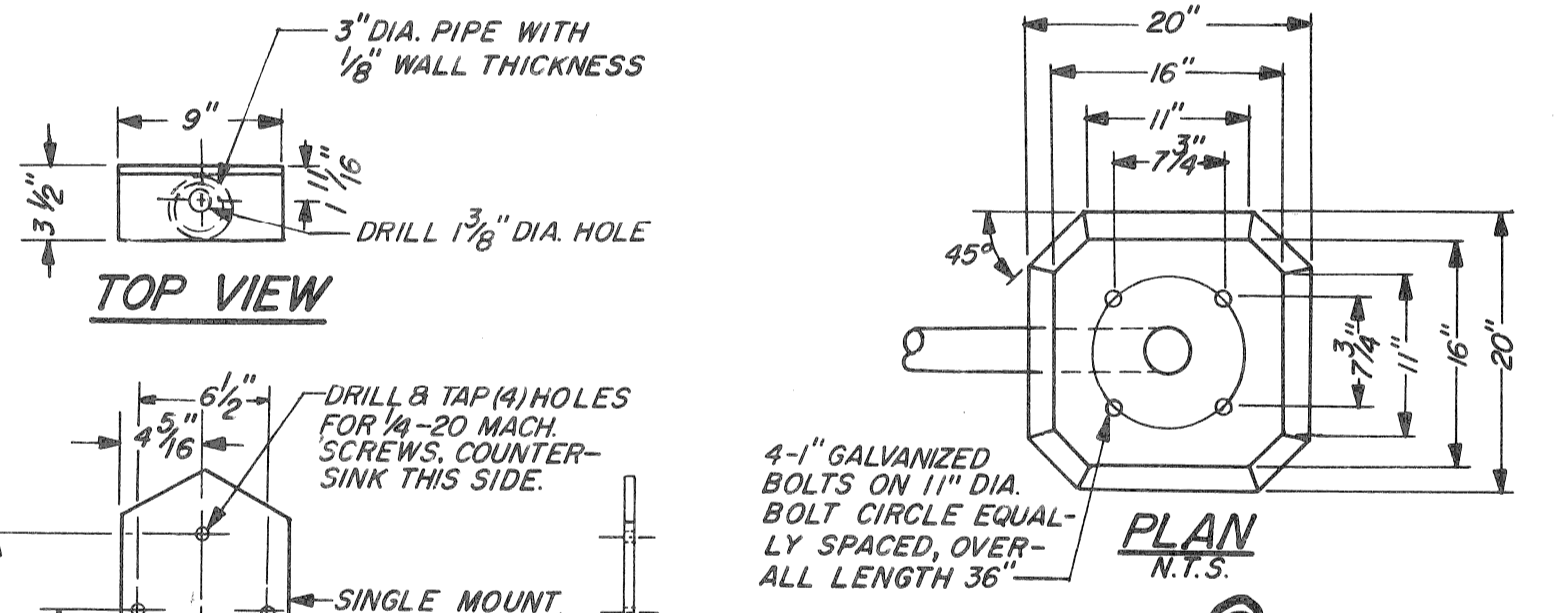
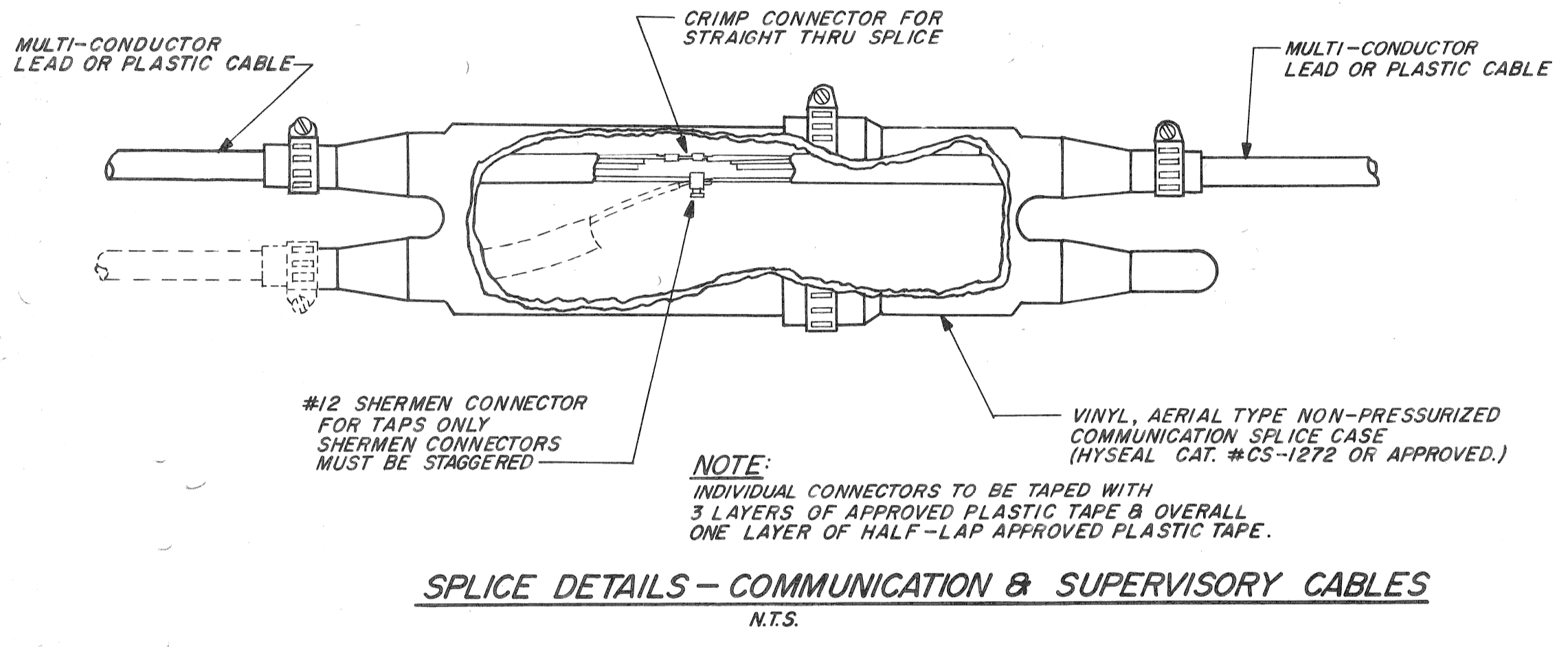
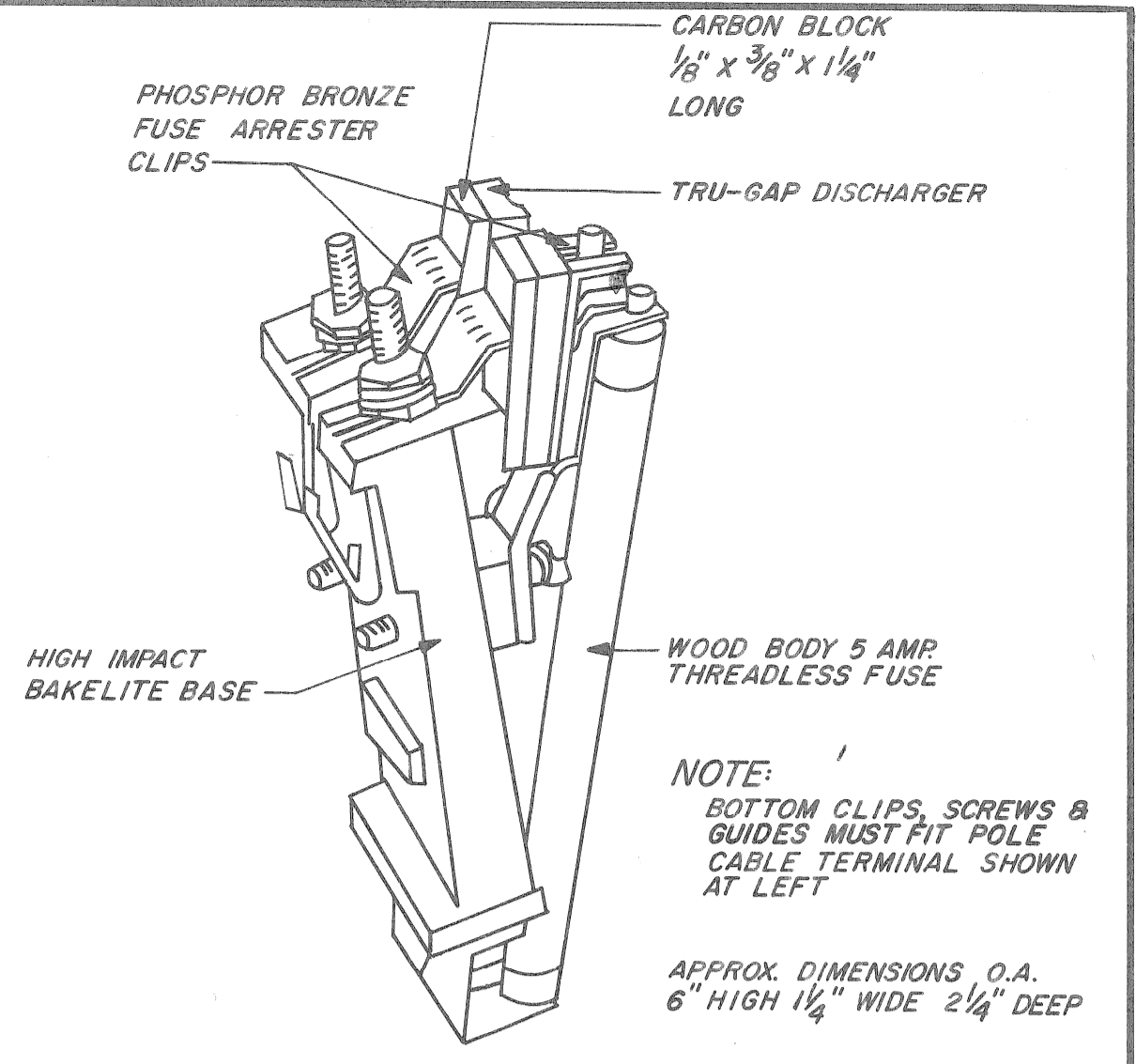
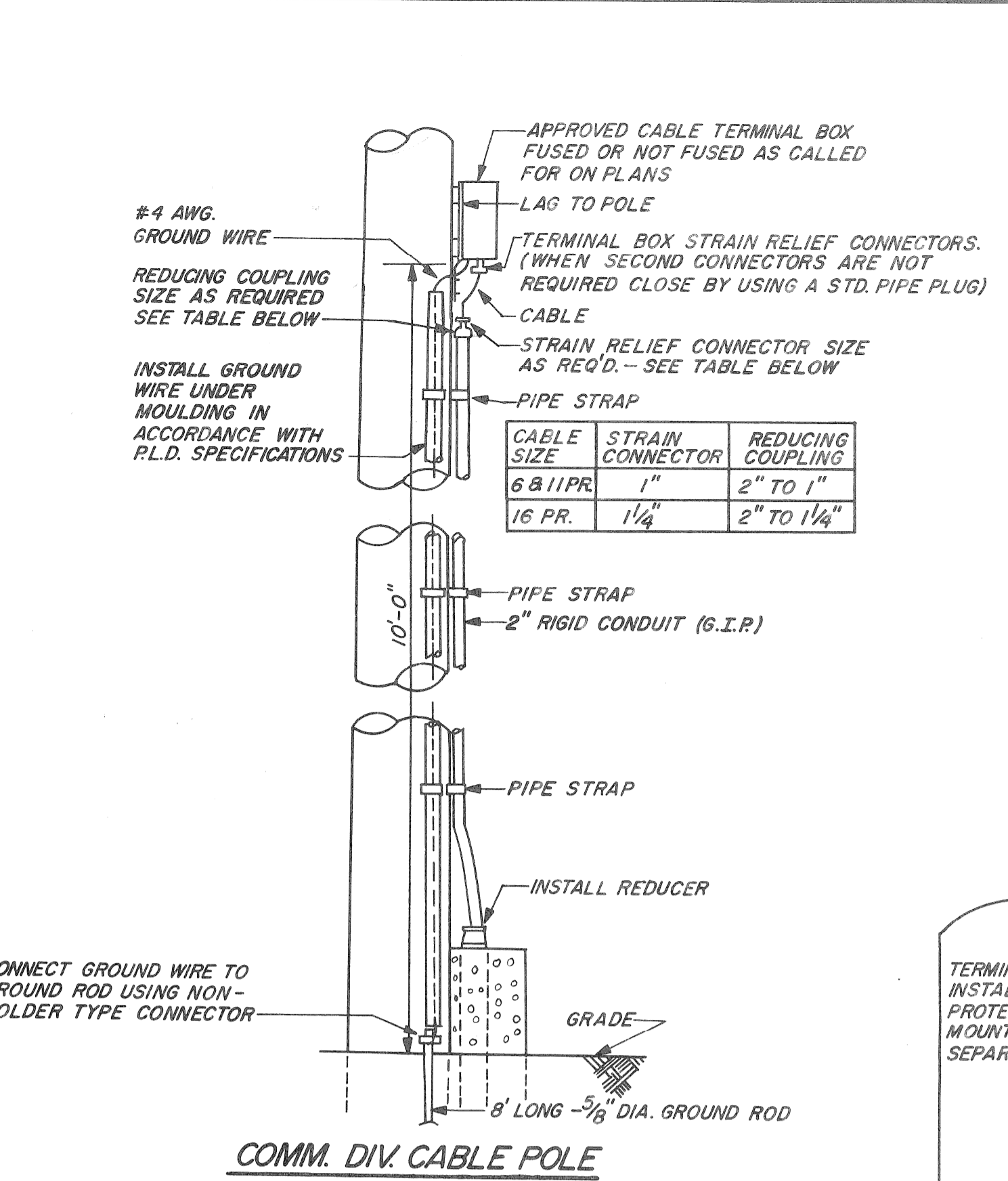
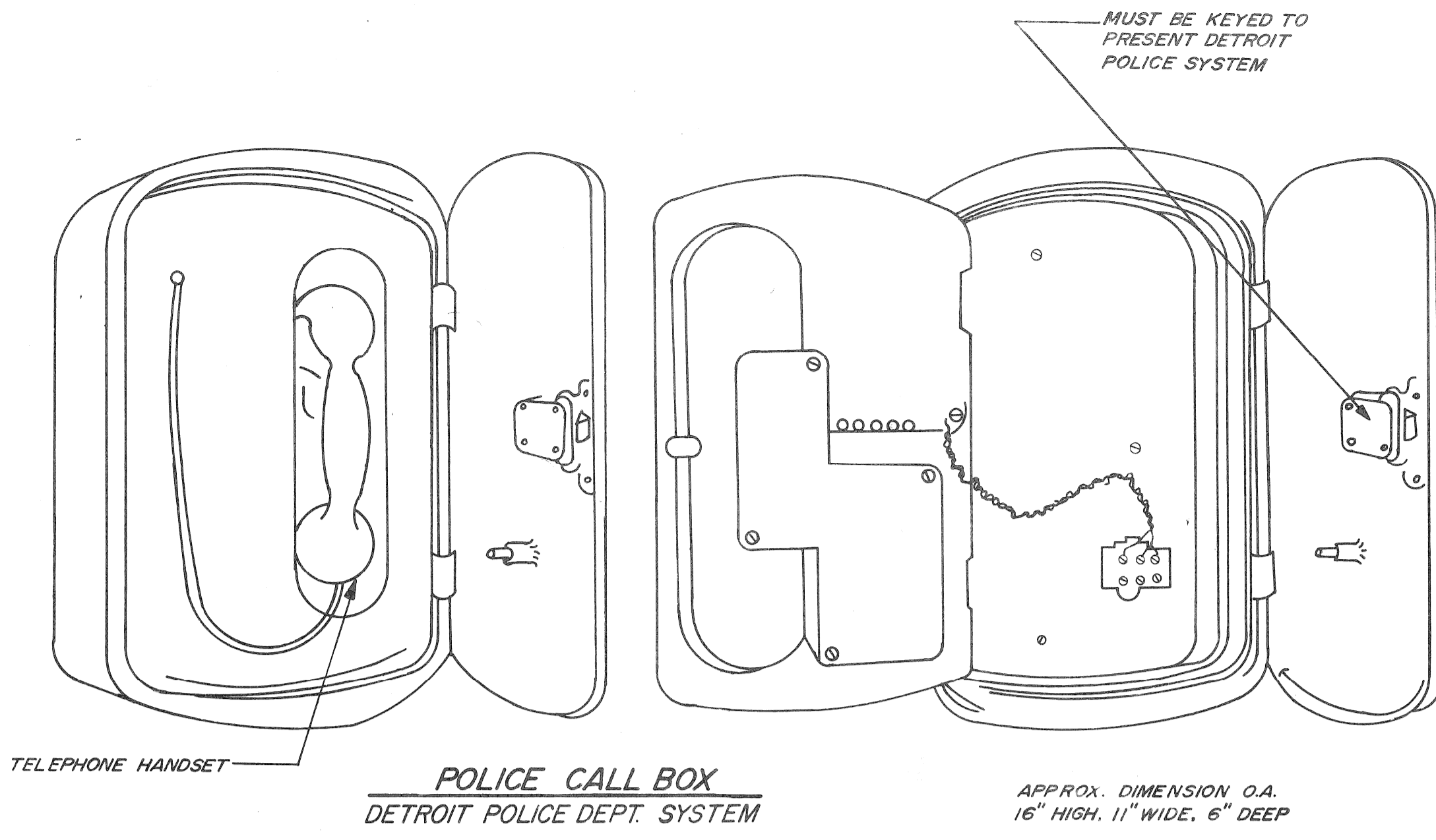
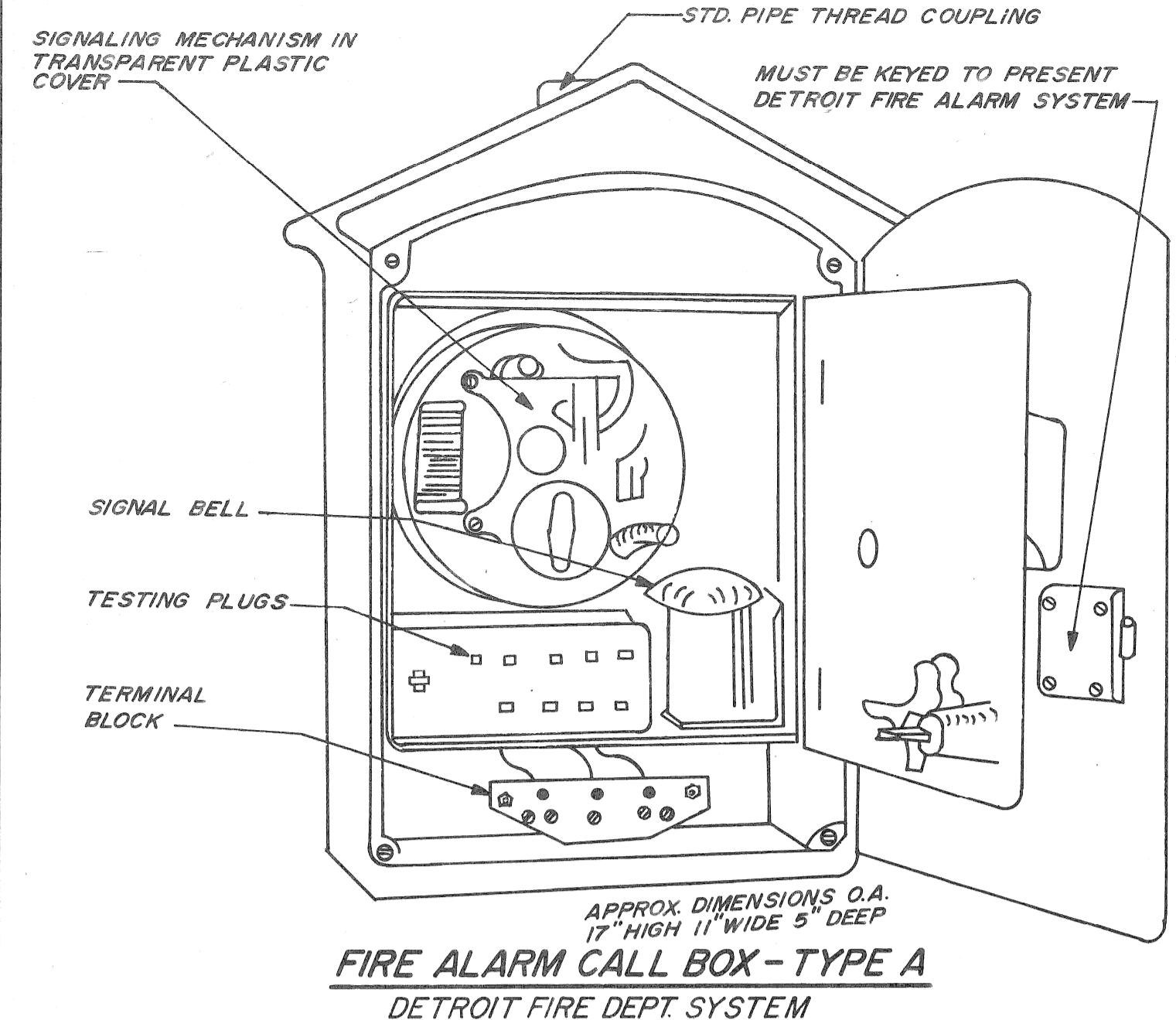
DATE	DESCRIPTION	CHKD. BY

JEFFERSON/CONNER INDUSTRIAL REVITALIZATION PROJECT
MACK AVENUE LIGHTING
TRANSFORMER POLE & CABLE POLE DETAILS

DRAWN CEA	PLAN PREPARED BY CONSULTING ENGINEERING ASSOCIATES INC. ENGINEERING CONSULTANTS
CHECKED SM	CHECKED BY
APPROVED SM	APPROVED BY
DATE AUG. 87	FILE NO. CEA 1137

PUBLIC LIGHTING
DEPARTMENT
CITY OF DETROIT

310
FILE NO.
51-0606
SHEET NO. 113
OF 117
DATE
AUG. 87



DATE	DESCRIPTION	CHKD. BY

JEFFERSON/CONNER INDUSTRIAL REVITALIZATION PROJECT

MACK AVENUE LIGHTING

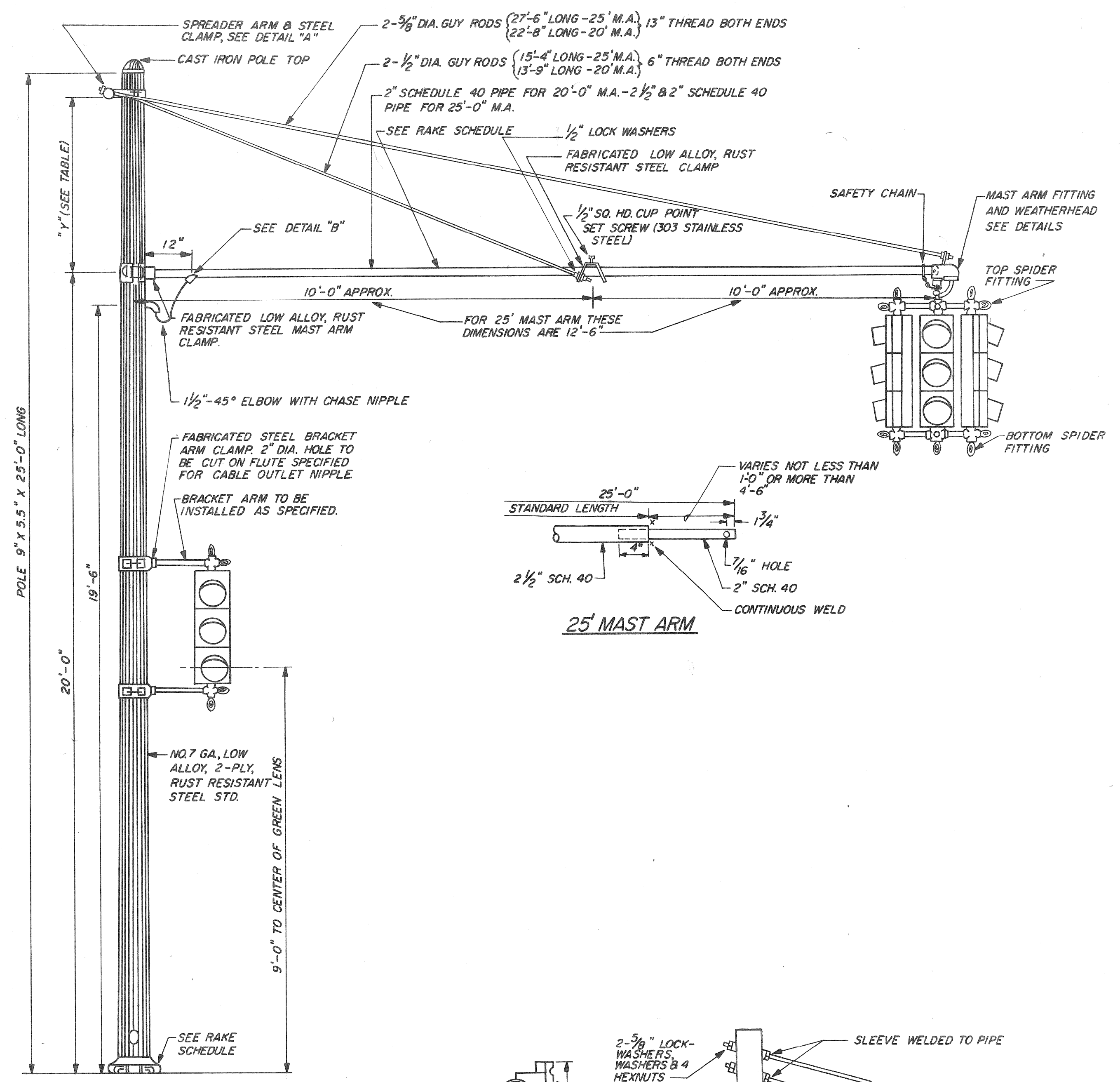
COMMUNICATION DETAILS

DRAWN	PLAN PREPARED BY CONSULTING ENGINEERING ASSOCIATES INC. ENGINEERING CONSULTANTS 16580 WYOMING DETROIT, MICH. 48221
CHECKED	
APPROVED	
DATE	AUG. 87
DRWG. NO.	37 OF 40
FILE NO.	CEA 1137

PUBLIC LIGHTING DEPARTMENT

CITY OF DETROIT

FILE NO.	51-0606
SHEET NO.	114 OF 117
DATE	AUG. 87



BACK-BRACE TYPE MAST ARM STD.
N.T.S.

RAKE SCHEDULE

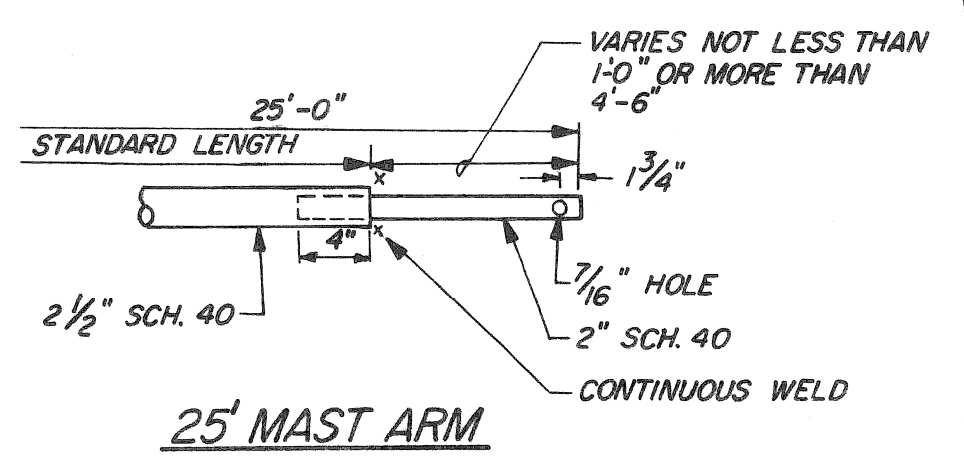
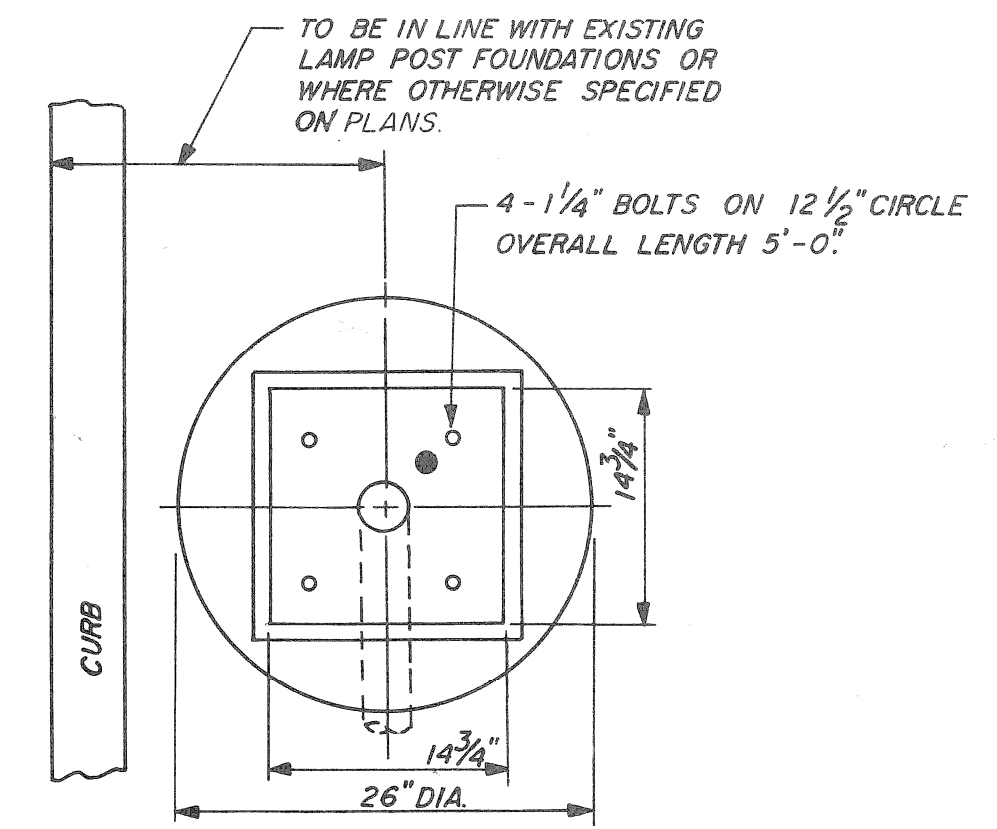
RAKE AT TOP OF POLE 180° FROM MAST ARM. USE STEEL U-SHAPED SHIMS

25' M.A.	16 FLUTE	8 FLUTE	COMBINATION
20' M.A. STD.	MA. STD.	MA. STD.	MA. STD.
4 WAY HD.	6" 5"	3" 2 1/2"	4" 3 1/2"
3 WAY HD.	4 1/2" 3 1/2"	2" 1 1/2"	3" 2"
2 WAY HD.	3" 2"	1 1/2" 1"	2" 1 1/2"
1 WAY HD.	1 1/2" 1"	1" 1"	1" 1"

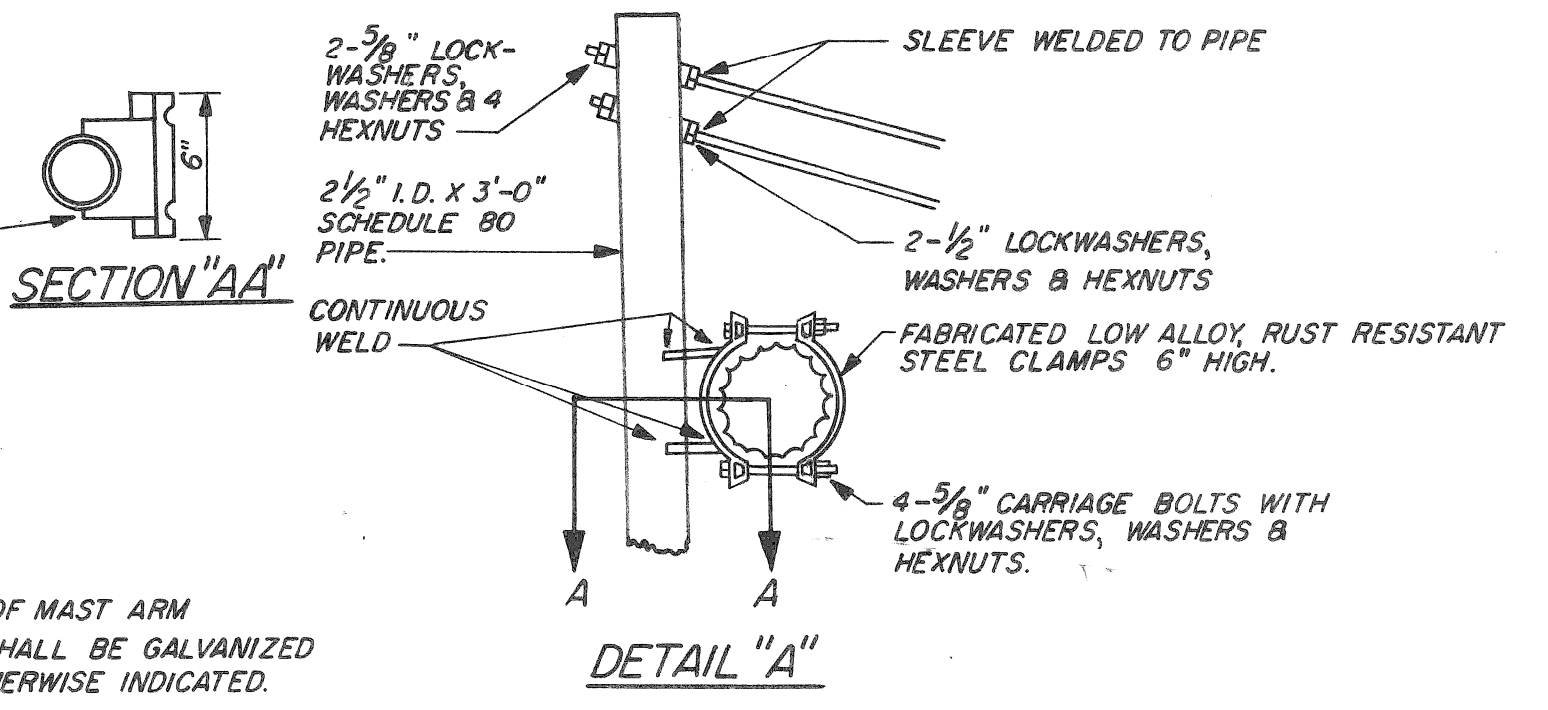
NOTE: THE 25' M.A. SHALL BE INSTALLED WITH A RISE OF 1 1/2" IN ITS LENGTH & THE 20' M.A. SHALL RISE 1".

LIGHTING FIXTURES SHALL BE PLUMBED AFTER THE POLE IS RAKED & THE T.S. MAST ARM WHEN SIGNAL IS INSTALLED.

POLE SIZE	NUMBER OF FLUTES	DIMENSION "Y"
9" x 5.5" x 25'-0" MAST ARM STD.	8	4'-6"
10" x 6.5" x 25'-0" COMB. STD.	16	6'-4"
9" x 5" x 28'-6" COMB. STD.	8	5'-0"



25' MAST ARM



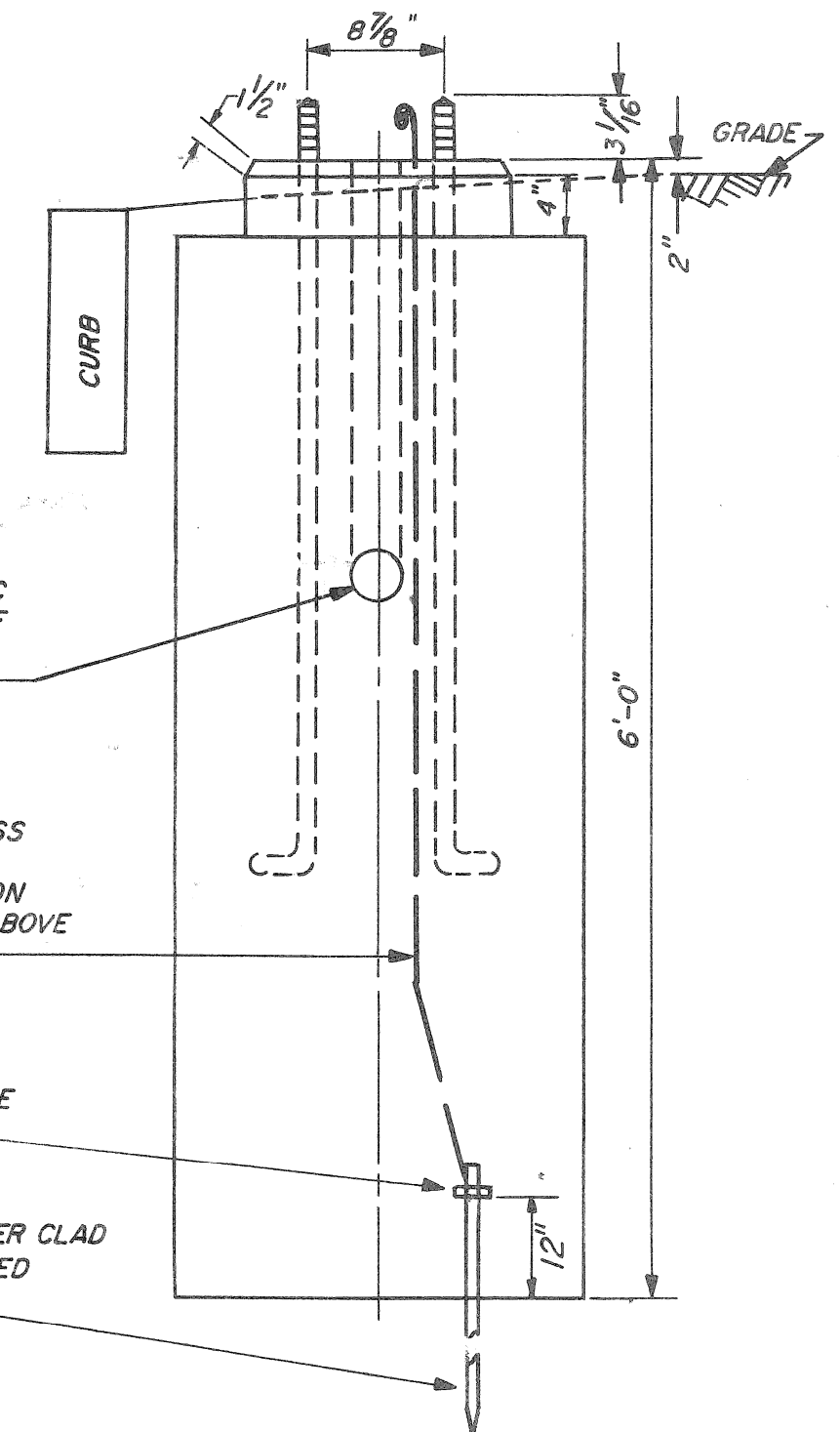
NOTE:
ALL PARTS OF MAST ARM ASSEMBLY SHALL BE GALVANIZED UNLESS OTHERWISE INDICATED.

30" RADIUS PLASTIC BEND, NO. & SIZE OF CONDUIT AS SHOWN ON PLANS

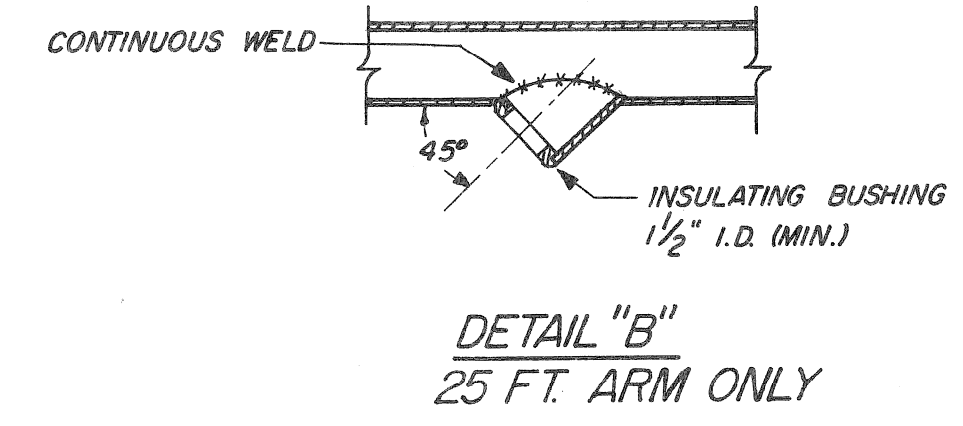
NO. 2 STRANDED COPPER GRD. NOT LESS THAN 24" BELOW BOTTOM OF EXCAVATION & WITH 18" SLACK ABOVE FOUNDATION

USE NON-SOLDER TYPE CONNECTOR

5/8" DIA. X 8'-0" COPPER CLAD GROUND ROD EMBEDDED IN FDN.



TRAFFIC SIGNAL MAST ARM STANDARD FOUNDATION 20 FT. & 25 FT. BACK-BRACE TYPE ONLY



DETAIL "B"
25 FT. ARM ONLY

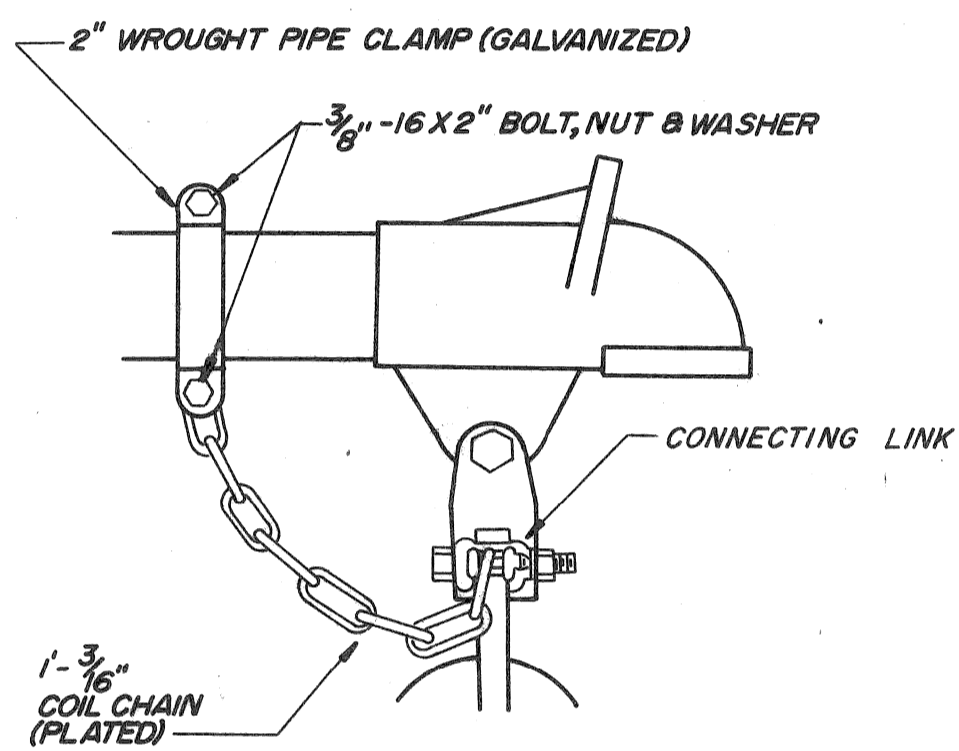
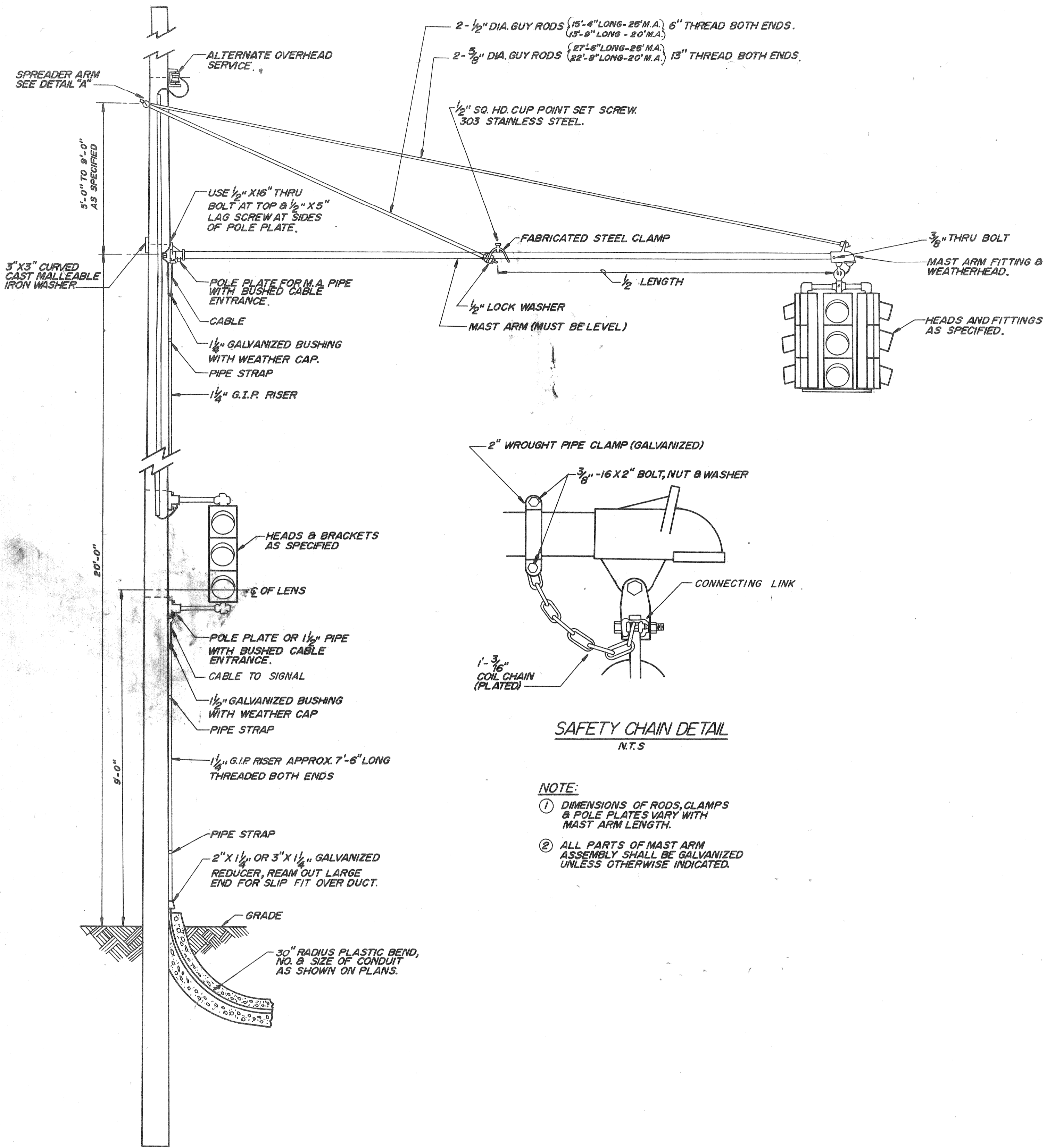
DATE	DESCRIPTION	CHKD. BY
		53

JEFFERSON/CONNER INDUSTRIAL REVITALIZATION PROJECT
MACK AVENUE LIGHTING
T.S. BACK-BRACE TYPE MAST ARM ASSEMBLY
DETAILS

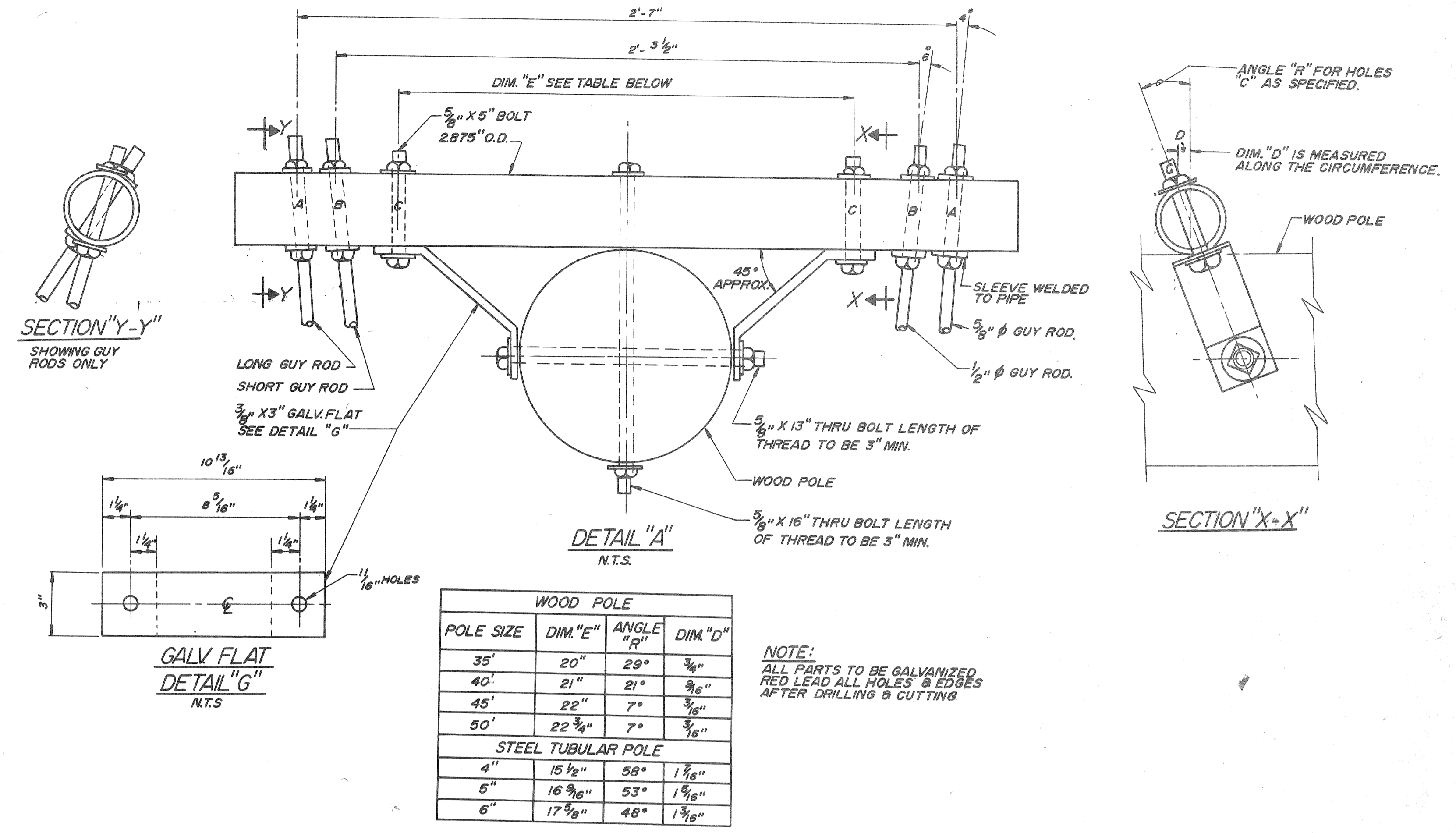
DRAWN BY CEA	PLAN PREPARED BY CONSULTING ENGINEERING ASSOCIATES INC. ENGINEERING CONSULTANTS
CHECKED BY	16580 WYOMING DETROIT, MICH. 48221
APPROVED BY	FILE NO. CEA 1137
DATE AUG. 87	DRAWING NO. 38 OF 40

PUBLIC LIGHTING DEPARTMENT
CITY OF DETROIT

504
FILE NO.
51-0606
SHEET NO. 115
OF 117
DATE
AUG. '87



NOTE:
 ① DIMENSIONS OF RODS, CLAMPS & POLE PLATES VARY WITH MAST ARM LENGTH.
 ② ALL PARTS OF MAST ARM ASSEMBLY SHALL BE GALVANIZED UNLESS OTHERWISE INDICATED.



DATE	DESCRIPTION	CHKD. BY

54

JEFFERSON/CONNER INDUSTRIAL REVITALIZATION PROJECT

MACK AVENUE LIGHTING

T.S. BACK-BRACE TYPE MAST ARM ASSEMBLY ON WOOD POLE

DRAWN BY CEA

CHECKED BY

APPROVED BY

DATE AUG. 87

DRWG. NO. 39 OF 40

FILE NO. CEA 1137

PLAN PREPARED BY CONSULTING ENGINEERING ASSOCIATES INC. ENGINEERING CONSULTANTS

16580 WYOMING DETROIT, MICH. 48221

CHECKED BY

APPROVED BY

505

PUBLIC LIGHTING DEPARTMENT CITY OF DETROIT

FILE NO. 51-0606

SHEET NO. 116 OF 117

DATE AUG. '87

