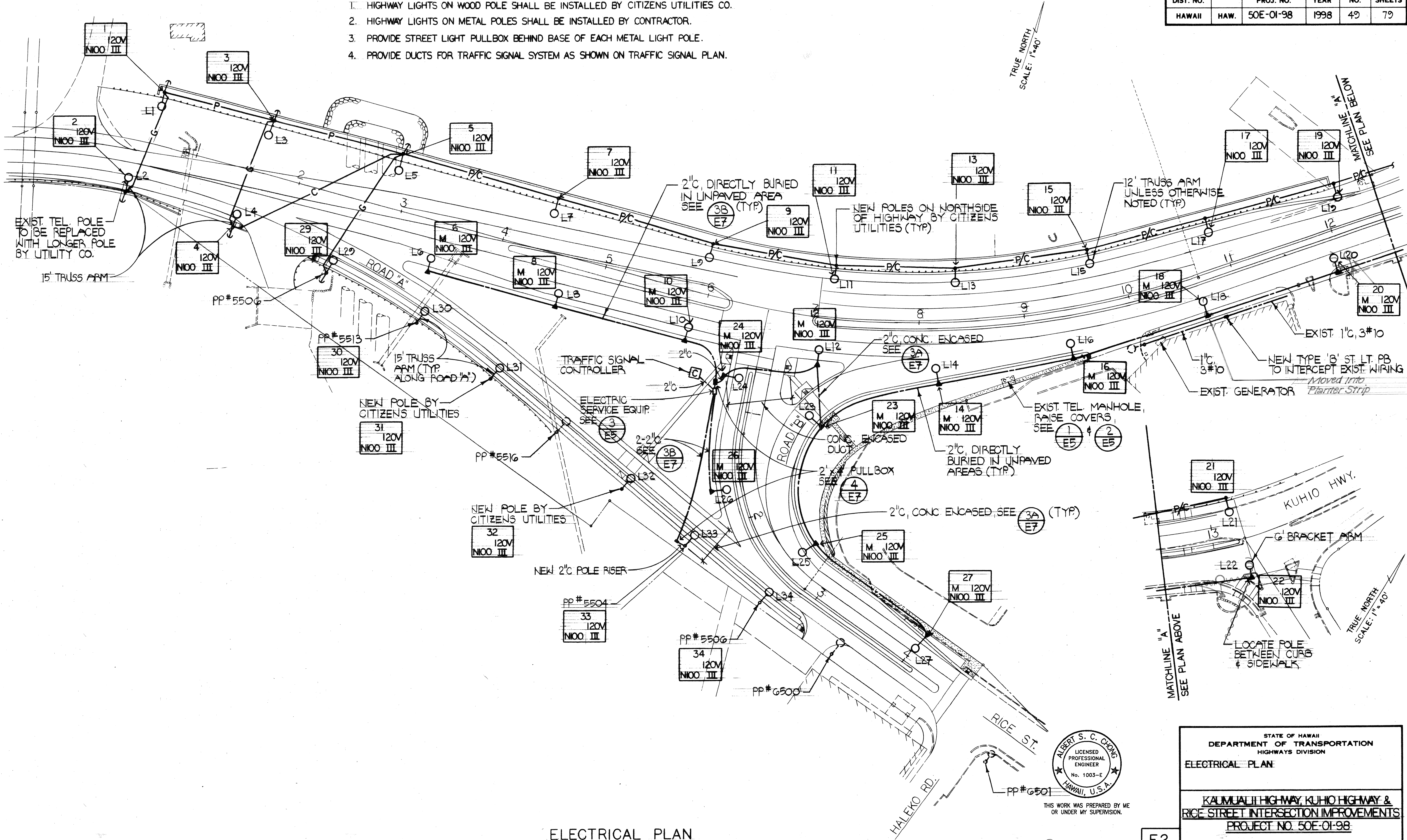
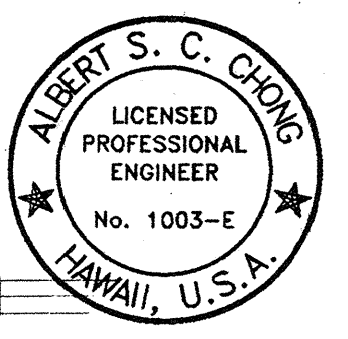


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	50E-01-98	1998	49	79

- NOTES:
- HIGHWAY LIGHTS ON WOOD POLE SHALL BE INSTALLED BY CITIZENS UTILITIES CO.
 - HIGHWAY LIGHTS ON METAL POLES SHALL BE INSTALLED BY CONTRACTOR.
 - PROVIDE STREET LIGHT PULLBOX BEHIND BASE OF EACH METAL LIGHT POLE.
 - PROVIDE DUCTS FOR TRAFFIC SIGNAL SYSTEM AS SHOWN ON TRAFFIC SIGNAL PLAN.



ELECTRICAL PLAN
SCALE: 1"=40'-0"



THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ELECTRICAL PLAN

KAUMUALII HIGHWAY, KUHIO HIGHWAY &
RICE STREET INTERSECTION IMPROVEMENTS
PROJECT NO. 50E-01-98
SCALE: AS NOTED
DATE:

SHEET NO. 2 OF 7 SHEETS

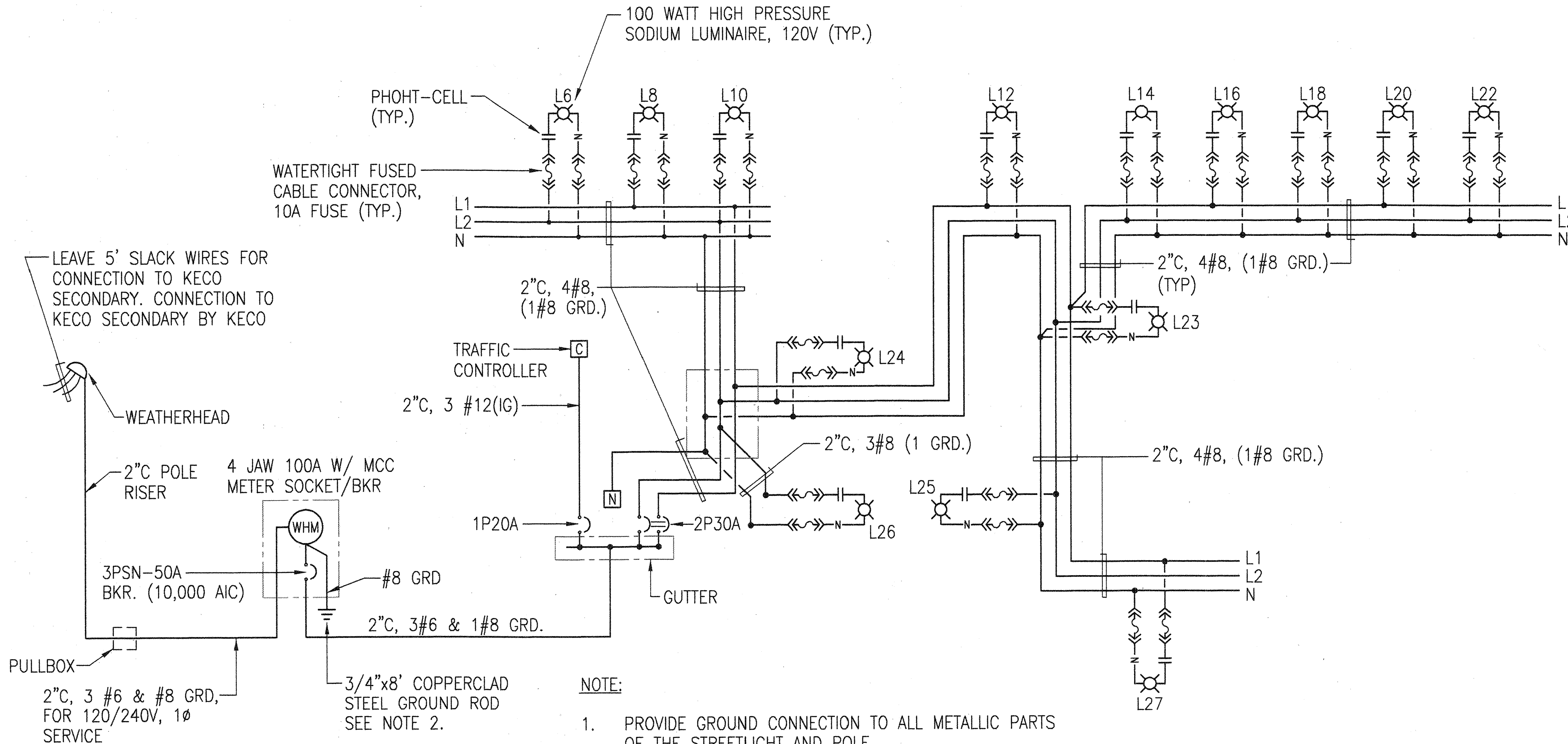
E2

"AS-BUILT"

FED. ROAD DIST. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	50E-01-98	1998	50	79

STREET LIGHT CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL MEASURE AND RECORD THE GROUND RESISTANCE AT EACH STANDARD WITH NO EXTERNAL GROUND WIRES CONNECTED TO THE GROUND ROD. CONTRACTOR SHALL SCHEDULE GROUND RESISTANCE MEASUREMENTS 48 HOURS IN ADVANCE AND SHALL NOT PROCEED WITH MEASUREMENTS UNTIL APPROVAL IS GRANTED. SCHEDULES ARE SUBJECT TO CHANGE DEPENDING UPON WEATHER CONDITIONS. REPORTS SHALL INCLUDE NAME OF PERSONNEL CONDUCTING THE TEST, METER TYPE AND SERIAL NUMBER, DATE OF TEST AND SOIL CONDITIONS. TEST RESULTS SHALL BE CERTIFIED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER.
2. CONTRACTOR SHALL NOT BACKFILL TRENCHES UNTIL APPROVAL HAS BEEN GRANTED BY THE ENGINEER.
3. COAT EXPOSED ANCHOR BOLT THREADS, HEX NUT, AND WASHER AFTER INSTALLATION WITH BEARING GREASE.
4. ALL NEUTRAL CONDUCTORS MUST HAVE WHITE INSULATION. ANY OTHER METHOD OF IDENTIFICATION IS UNACCEPTABLE.
5. CONTRACTOR TO ARRANGE WITH KECO TO ENERGIZE STREET LIGHT FOR A MINIMUM OF SIX (6) HOURS FOR INSPECTION AND ACCEPTANCE. CONTRACTOR TO ASSUME COST.
6. SUBMIT SHOP DRAWINGS FOR ALL STREET LIGHT COMPONENTS INCLUDING PULLBOXES FOR APPROVAL.
7. STREET LIGHTS SHALL NOT BE INSTALLED IN WALKWAYS.
8. STREET LIGHT PULL BOXES SHALL BE LOCATED BEHIND STREET LIGHT AND SHALL NOT BE INSTALLED IN ROADWAYS OR ROADWAY SHOULDERS.



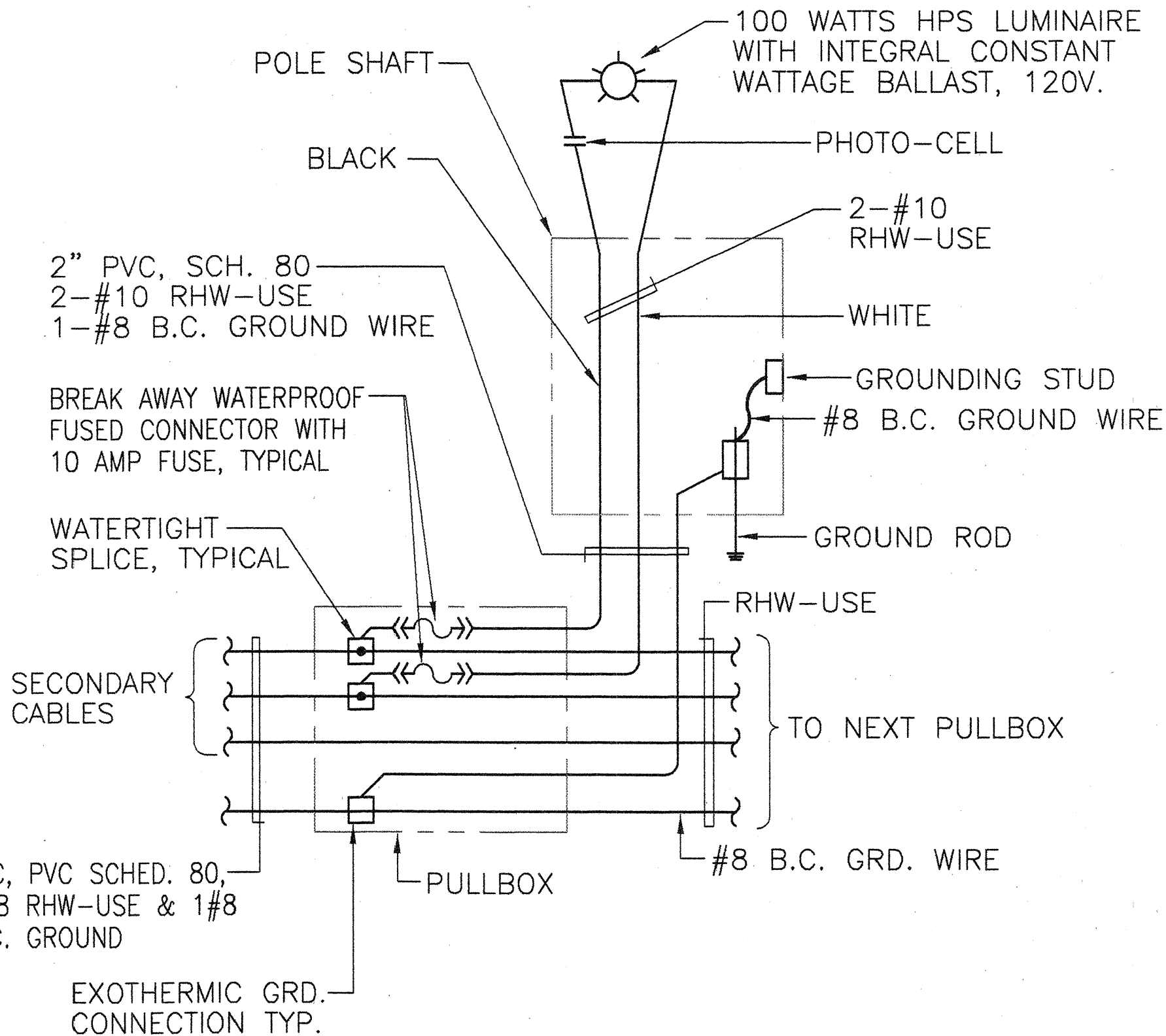
NOTE:

1. PROVIDE GROUND CONNECTION TO ALL METALLIC PARTS OF THE STREETLIGHT AND POLE.
2. TEST GROUND AT SERVICE EQUIPMENT. PROVIDE ADDITIONAL GROUND RODS. IF GROUND RESISTANCE MEASUREMENT IS MORE THAN 25 OHMS TO GROUND.

SINGLE LINE DIAGRAM

NOT TO SCALE

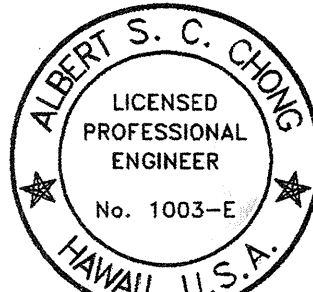
CAD - TIT 8



TYPICAL WIRING CONNECTION
DIAGRAM FOR HIGHWAY LIGHT

NOT TO SCALE

CAD : E5



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Arms & Chong

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WIRING DIAGRAMS

KAUMUALII HIGHWAY, KUHIO HIGHWAY &
RICE STREET INTERSECTION IMPROVEMENTS
PROJECT NO. 50E-01-98

SCALE: AS NOTED

DATE:

SHEET No. 3 OF 7 SHEETS

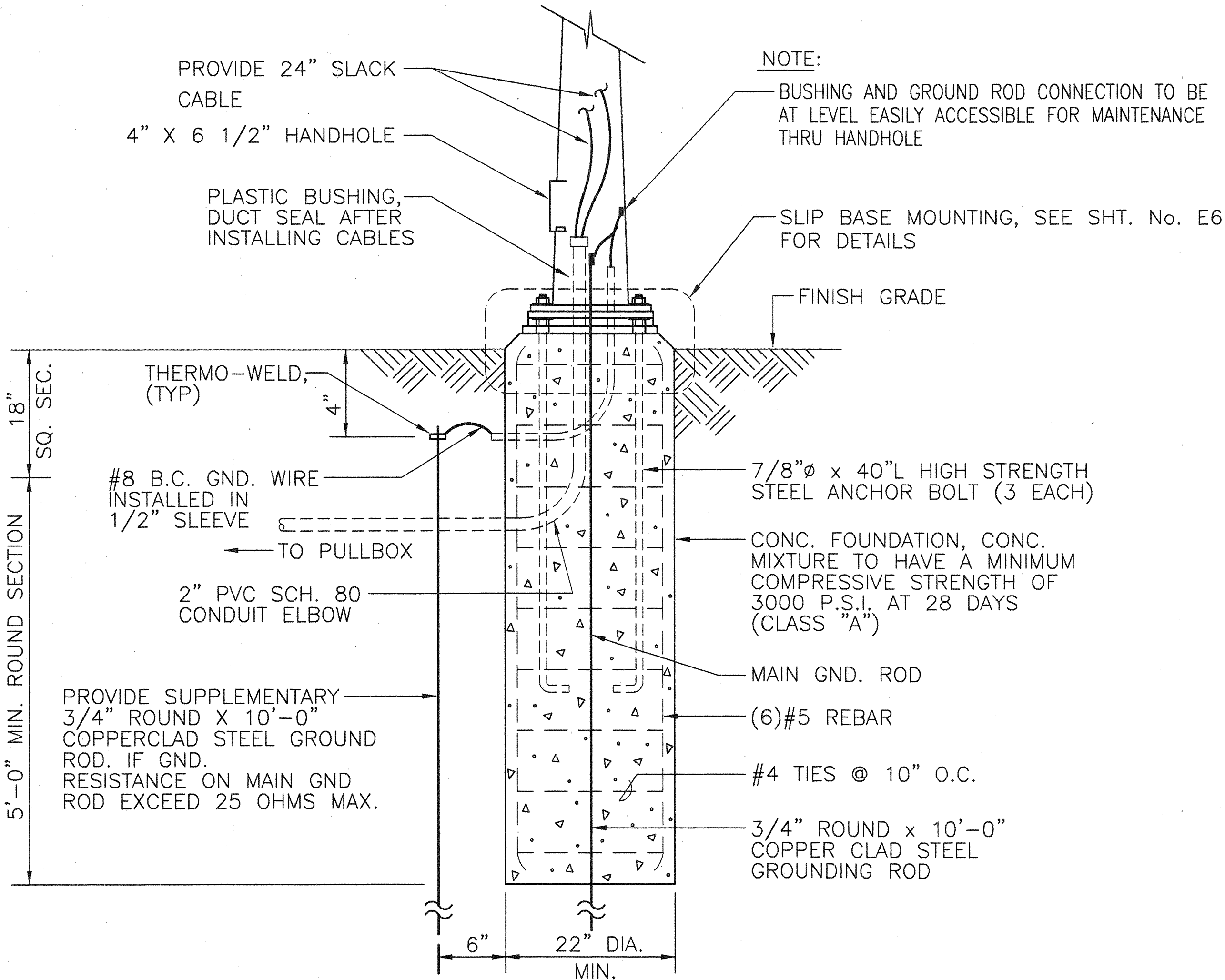
E3

ORIGINAL PLAN	SURVEY PLOTTED BY _____ DATE _____
	DRAWN BY _____ " _____
	TRACED BY _____ " _____
	DESIGNED BY _____ " _____
	QUANTITIES BY _____ " _____
NO. _____	CHECKED BY _____ " _____

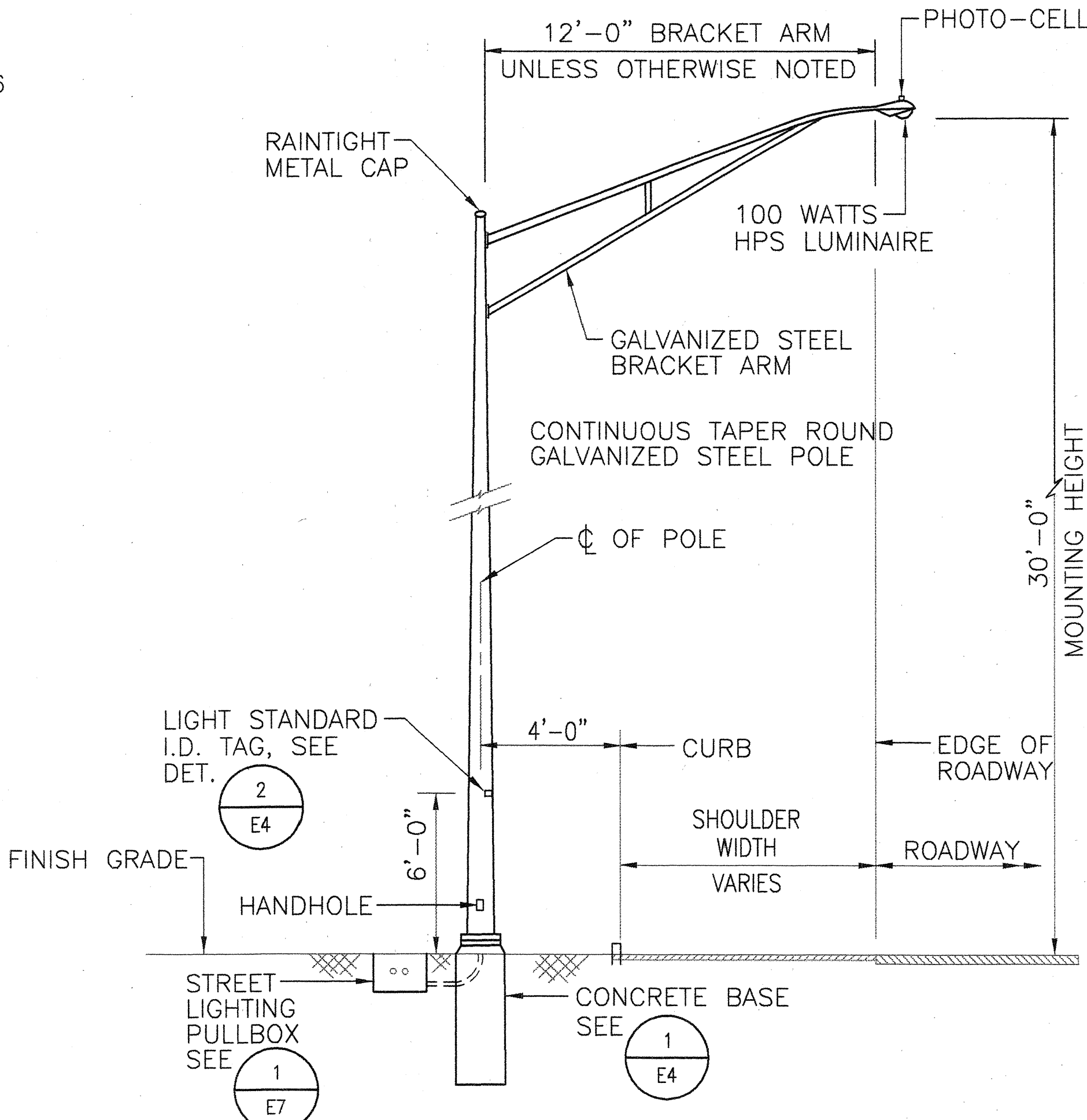
FED. ROAD DIST. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	50E-01-98	1998	51	79

HIGHWAY LIGHTING NOTES:

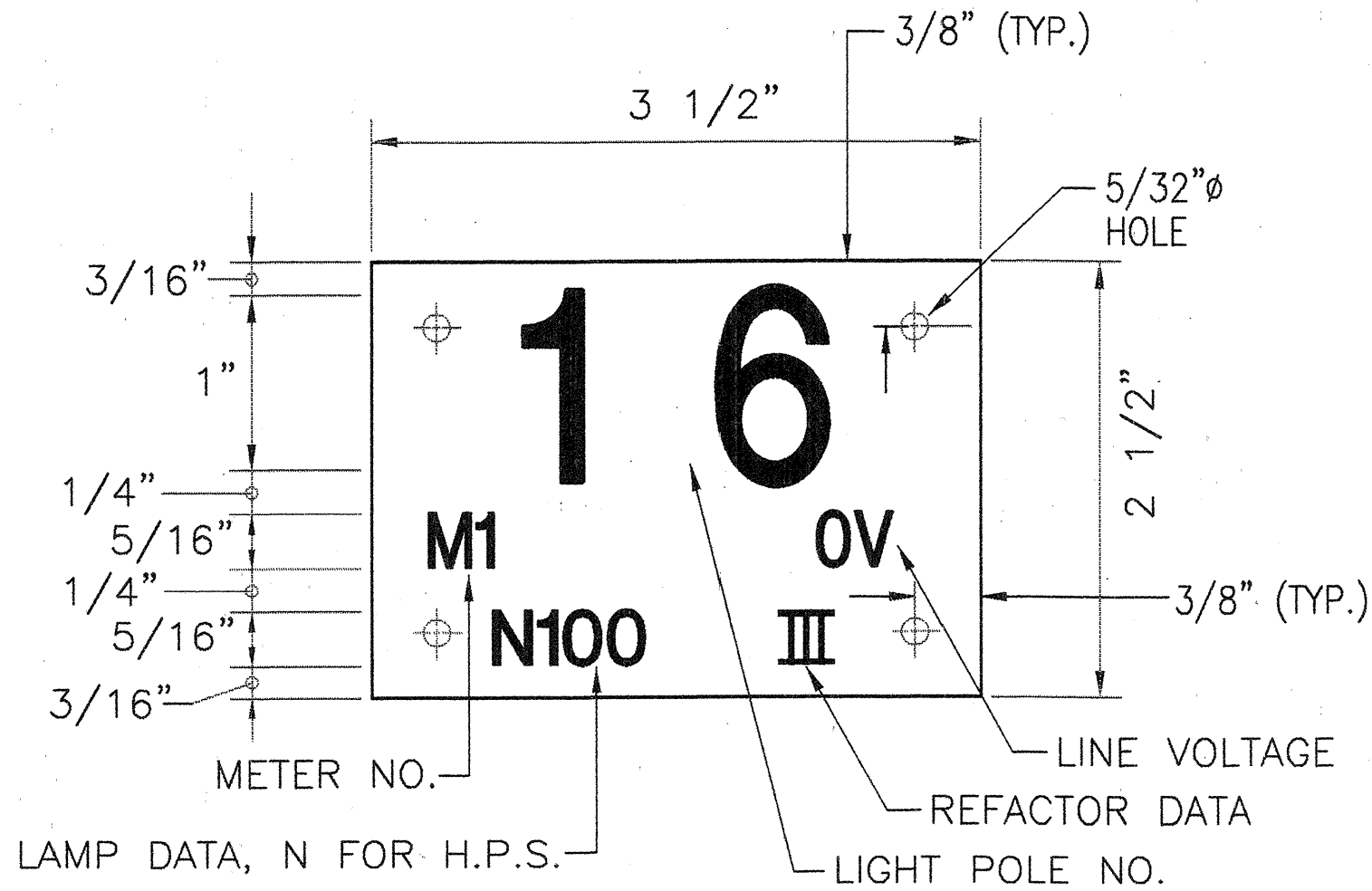
- ALL STEEL SHAFTS, PLATES, MAST ARMS, BOLTS, SCREWS, NUTS AND WASHERS TO BE GALV. AFTER FABRICATION OR MODIFICATION.
- 4" X 6 1/2" HANDHOLE REINFORCED W/#3 GA. RING 1 1/2" WIDE WELDED TO OUTSIDE OF POLE COVER OF 10 GA. PLATE LOCATE 90 DEGREES OF MAST ARM UNLESS SHOWN OTHERWISE.
- ROUND TAPERED STEEL TUBE W/MAX. TAPER OF 0.15"/FOOT.
- NO. 11 GAGE SHEET STEEL OF WELDABLE GRADE ACCEPTABLE IF STEEL AFTER FABRICATION HAS A MIN. YIELD STRENGTH OF 40,000 PSI.
- THE COST FOR CABLES AND EXCAVATING & BACKFILLING THE CONDUIT TRENCH SHALL BE INCIDENTAL TO THE CONDUITS.



1 CONCRETE BASE AND POLE MOUNTING DETAIL
NOT TO SCALE



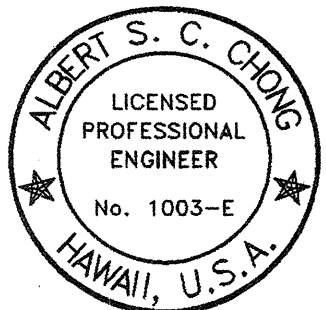
3 LIGHT STANDARD INSTALLATION
NOT TO SCALE



2 I.D. TAG DETAIL
NOT TO SCALE

NOTES:

- USE 3 PLY LAMINATED FLEXIBLE PLASTIC BLACK-WHITE-BLACK THICKNESS: BLACK CAP SHEET-0.010", WHITE BASE SHEET-0.052", BLACK BASE SHEET-0.010".
- LIGHT POLE NUMBER SIZE SHALL BE 1" HIGH AND ENGRAVED 1/8" WIDE, WHITE IN COLOR (NUMBER AS REQUIRED).
- NOMENCLATURE SIZE SHALL BE 5/16" HIGH AND EXGRAVED 1/32" WIDE, WHITE IN COLOR (METER NUMBER, CIRCUIT NUMBER, LINE VOLTAGE, LAMP DATA AND REFRACTOR DATA AS REQUIRED).
- ATTACH TO ALUMINUM AND STEEL POLES WITH NO. 8 STAINLESS STEEL, 1/2" LONG DRIVE SCREWS IN 1/8" DRILL HOLE. ATTACH TO WOOD POLES WITH 4D ALUMINUM NAILS.
- NUMBERS ARE INSCRIBED BY CUTTING THROUGH "BLACK CAP SHEET" TO EXPOSE "WHITE LETTERS".

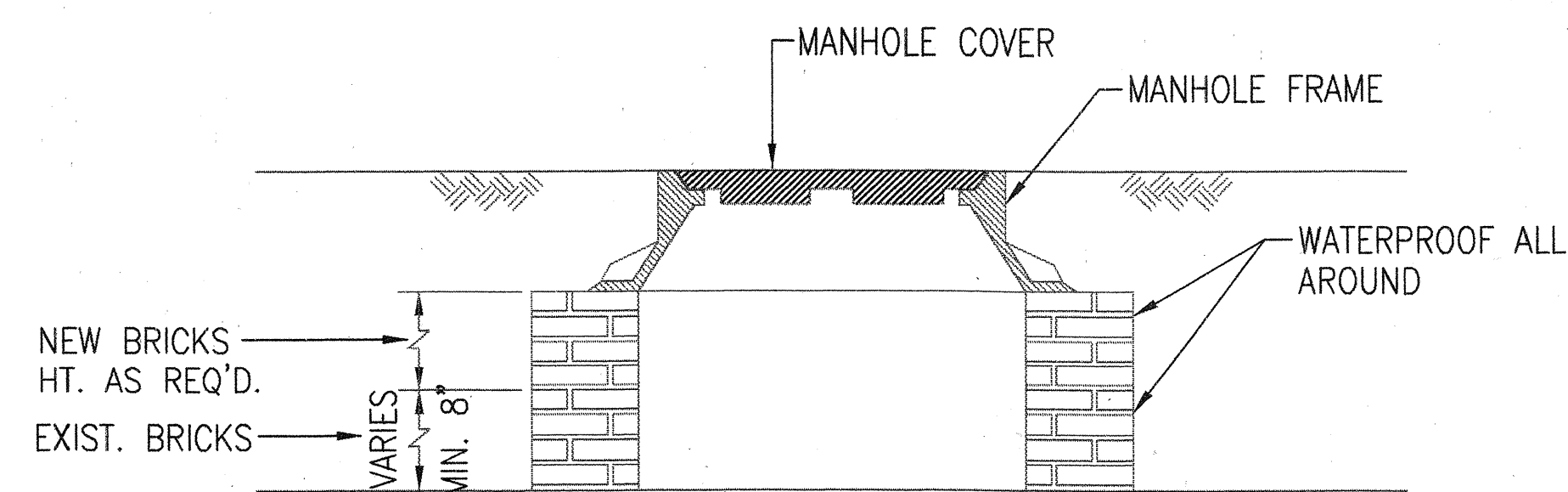


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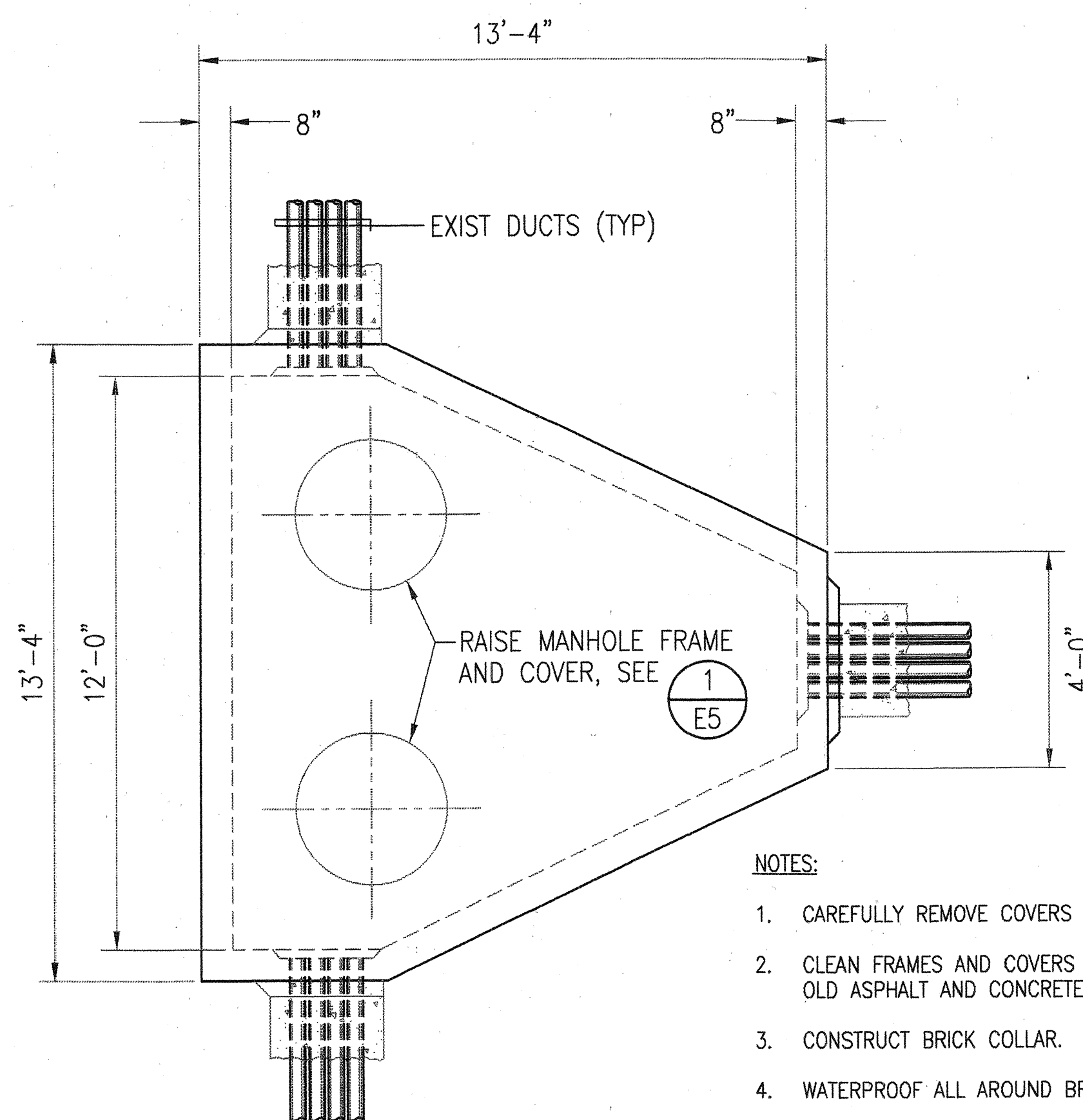
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
HIGHWAY LIGHT DETAILS	
KAUMUALII HIGHWAY, KUHIO HIGHWAY & RICE STREET INTERSECTION IMPROVEMENTS PROJECT NO. 50E-01-98	
SCALE: AS NOTED	DATE:
SHEET No. 4 OF 7 SHEETS	

E4

FED. ROAD DIST. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	50E-01-98	1998	52	79

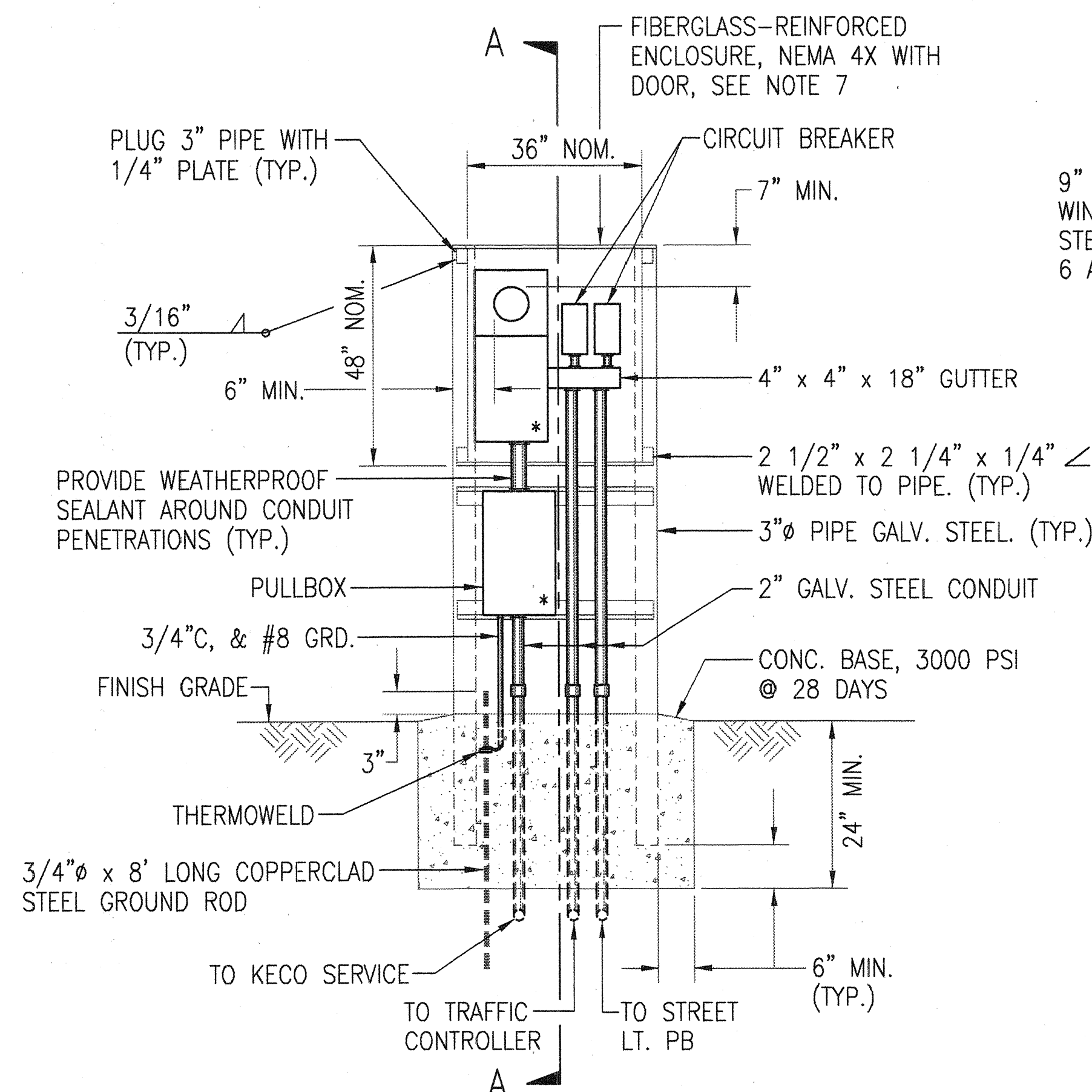


1
E5
MANHOLE COVER SECTION
NOT TO SCALE

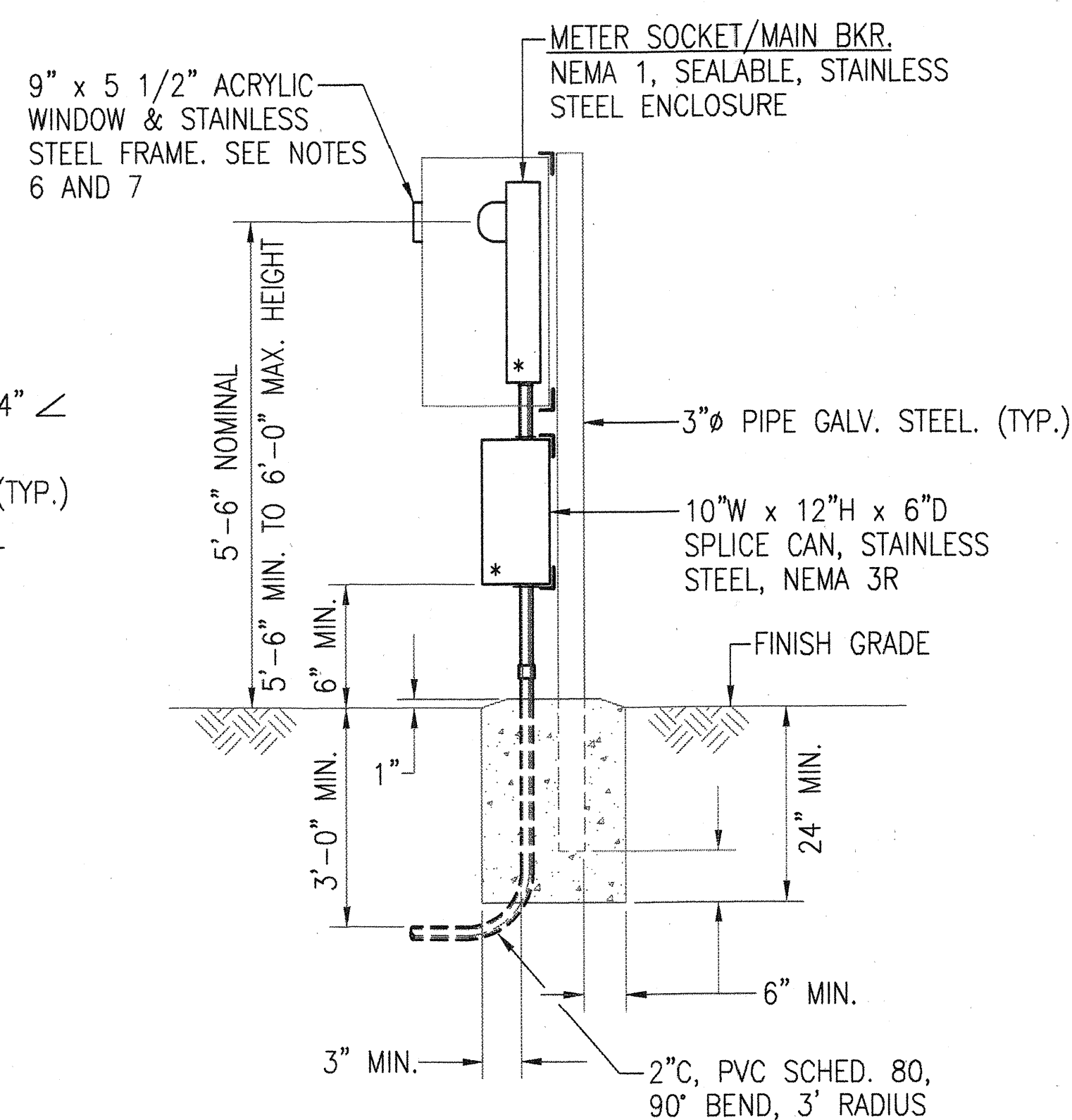


- NOTES:
- CAREFULLY REMOVE COVERS AND FRAMES FROM MANHOLES.
 - CLEAN FRAMES AND COVERS WITH STIFF BRUSH TO REMOVE DIRT, OLD ASPHALT AND CONCRETE.
 - CONSTRUCT BRICK COLLAR.
 - WATERPROOF ALL AROUND BRICK COLLAR.
 - SUPPLY BEADS OF ADHESIVE TO TOP OF COLLAR.
 - PATCH WITH ASPHALT OR CONCRETE AS REQUIRED AROUND THE MANHOLE.
 - ALL WORK SHALL BE DONE IN THE PRESENCE OF GTE FIELD INSPECTOR. COORDINATE WITH GTE.

2
E5
EXIST. TELEPHONE MANHOLE
ROOF PLAN
NOT TO SCALE



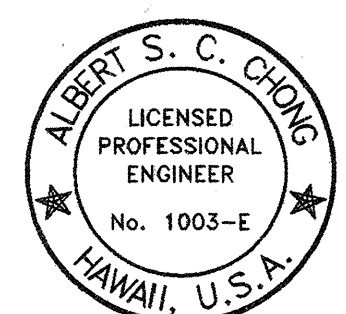
FRONT ELEVATION



SECTION 'A-A'

- NOTES:
- ALL CONDUITS TO CONTAIN A POLYOLEFIN PULL LINE. (JET LINE CAT. #232 OR EQUIV.)
 - PEDESTAL SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
 - ALL FASTENING BOLTS, NUTS & WASHERS SHALL BE STAINLESS STEEL. PROVIDE ONE COAT SHOP PRIMER & TWO COATS OF ACRYLIC ENAMEL FINISH. COLOR TO MATCH CONTROLLER CABINET.
 - PROVIDE MINIMUM 4 FT. CLEARANCE IN FRINT OF METER.
 - * INDICATES SEALABLE ENCLOSURE.
 - WINDOW LOCATION TO CORRESPOND WITH METER LOCATION.
 - HOFFMAN ENGINEERING OR APPROVED EQUAL. COLOR TO MATCH CONTROLLER.
ENCLOSURE: A-48H3620GQRLP
INTERIOR PANEL: A-48P36
STAINLESS STEEL WINDOW KIT: A-PWK95NFSS
CONTRACTOR SHALL ENSURE THAT SERVICE EQUIPMENT BEING PROVIDED SHALL FIT WITHIN ENCLOSURE.

3
E5
ELECTRICAL SERVICE DETAIL
NOT TO SCALE

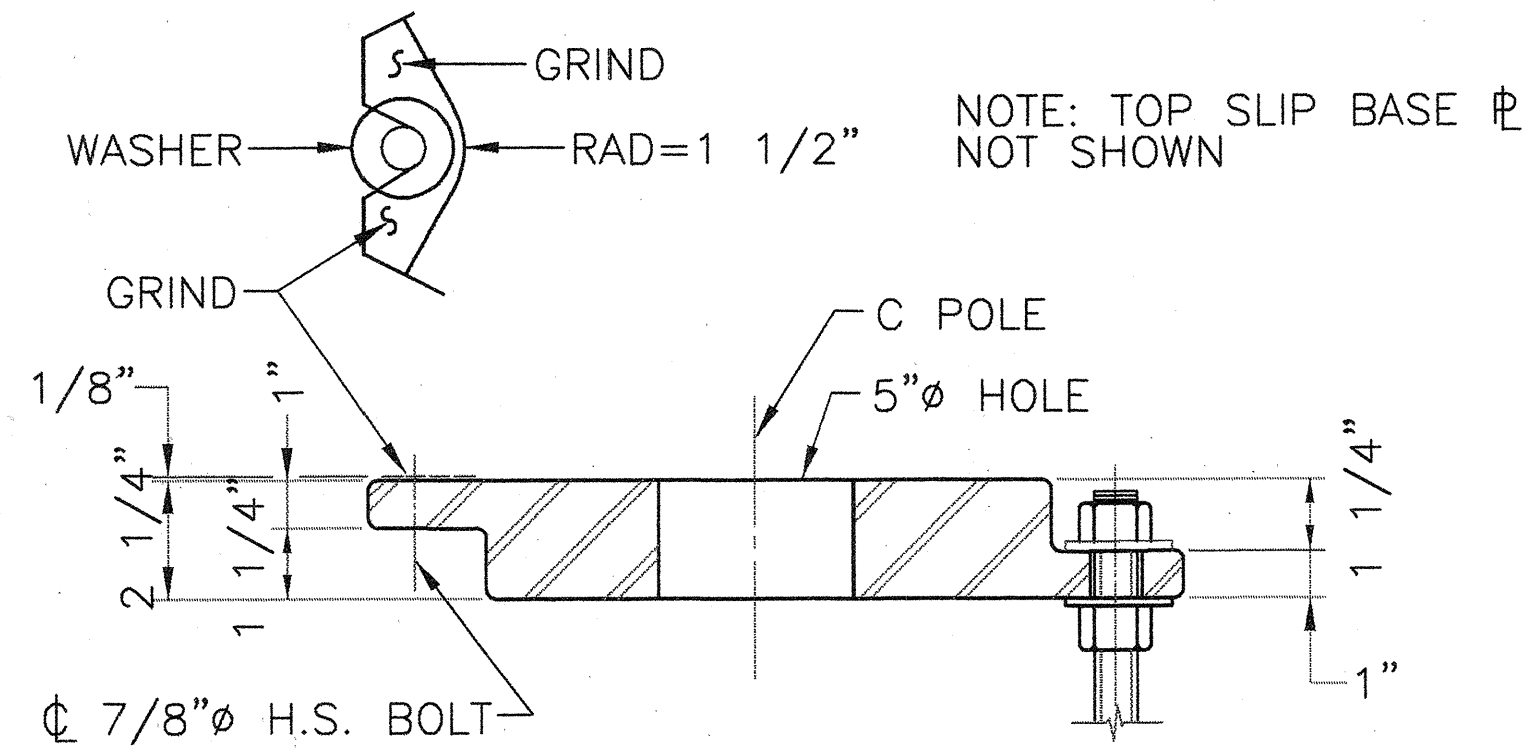
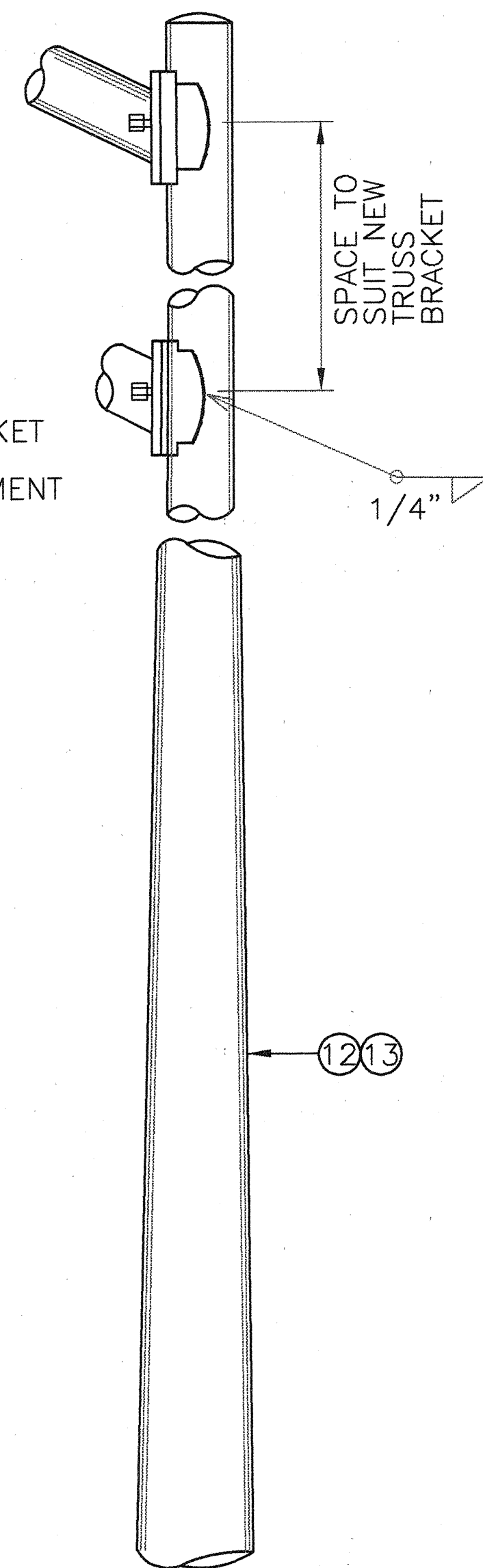


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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
MISCELLANEOUS DETAILS	
KAUMUALII HIGHWAY, KUHIO HIGHWAY & RICE STREET INTERSECTION IMPROVEMENTS PROJECT NO. 50E-01-98	
SCALE: AS NOTED	DATE:
SHEET No. 5 OF 7 SHEETS	


E5

- ① ALL STEEL SHAFTS, P'S MAST ARMS, BOLTS, SCREWS, NUTS & WASHERS TO BE GALV. AFTER FAB. OR MODIFICATION.
- ② P'S TO CONFORM TO ASTM A-36.
- ③ CAST OPTION TO CONFORM TO ASTM A-486 CL.90.
- ④ TORQUE 7/8" ϕ H.S. (HIGH STRENGTH STEEL) SLIP BASE P BOLTS TO 84 FT. LBS.
- ⑤ 7/8" ϕ H.S. ANCHOR BOLTS, WRENCH TIGHTEN-TORQUE REQUIREMENTS WAIVED.
- ⑥ FABRICATORS ELECTING LARGER THAN MIN. ARM DIAMETERS MUST ADJUST DETAILS AS REQUIRED TO PERMIT SOLID SEATING OF CAP SCREWS. IN LIEU OF TORQUE REQUIREMENTS FOR H.S. BOLTS, CAP SCREWS SHALL BE TIGHTENED BY THE TURN OF NUT METHOD 1/6 TURN FROM SNUG TIGHT CONDITION. NO WASHER WILL BE REQUIRED.
- ⑦ 4" x 6 1/2" HANDHOLE REINFORCED W/#3 GA. RING 1 1/2" WIDE WELDED TO OUTSIDE OF POLE COVER OF 10 GA. P. LOCATE 90 DEGREES TO MAST ARM UNLESS SHOWN OTHERWISE.
- ⑧ 28 GA. KEEPER P, ASTM A 526, 125 COMMERCIAL. PLACE ON TOP OF MIDDLE FLAT WASHER.
- ⑨ PLATE WASHER
- ⑩ 3 7/8" ϕ H.S. BOLTS, THREAD 6" & GALV. 10", W/ HEX, HD, NUT, LEVELING NUT & WASHER.
- ⑪ ANCHOR P'S MAY BE RETAINED W/ HEX, HD, NUT AS SHOWN OR AS AN ALT. DET. W/ 5/16" FILLET WELDS ALL AROUND OR FORMED HEADS.
- ⑫ ROUND TAPERED STEEL TUBE W/ MAX. TAPER OF 0.15"/FOOT.
- ⑬ NO. 11 GAGE SHEET STEEL OF WELDABLE GRADE ACCEPTABLE IF AFTER FABRICATION STEEL HAS MIN. YIELD STRENGTH OF 40,000 P.S.I.



Technical drawing of a pole base showing dimensions and components. The drawing includes a cross-section of a pole base with a central hole for a pole. Key dimensions and components are labeled:

- POLE**: The central vertical rod.
- SLIP**: The top horizontal plate.
- 5/16"**: Dimension for the slip plate thickness.
- 27**: Dimension for the pole diameter.
- 1/8" MIN. CL.**: Minimum clearance dimension.
- 1 1/4"**: Dimension for the base plate thickness.
- 1"**: Dimension for the base plate width.
- 1" ANCHOR P**: Dimension for the anchor plate.
- 5/16"**: Dimension for the anchor plate thickness.
- CONC. FOUNDATION**: The concrete foundation.
- C 7/8" Ø H.S. BOLT**: The bolt used to secure the base.
- 2 1/4"**: Dimension for the base plate width.
- 1 1/4"**: Dimension for the base plate thickness.
- 1"**: Dimension for the base plate width.
- 1"**: Dimension for the base plate width.



28 GA.
KEEPER PLATE

TOP SLIP BASE

BOTTOM SLIP BASE

7/8" H.S. BOLT

90°

30°

9" ϕ HOLE BOLT CIRCLE
DIA = 14"

⑧

1" ϕ HOLE

1"


DETAIL "F"

TYP

Technical drawing of a slip base plate for a pole. The drawing shows a triangular plate with a central circular hole. Key dimensions include a base width of 1'-8 1/4", a radius R=1', and a slip base hole diameter of 14". The drawing also shows a 5" hole and a 2" hole. The plate is labeled with a 9 and a 1' - 1 3/4" dimension.

Technical drawing of the bottom plates of a luminaire, showing a hexagonal arrangement of six plates. The drawing includes the following dimensions and labels:

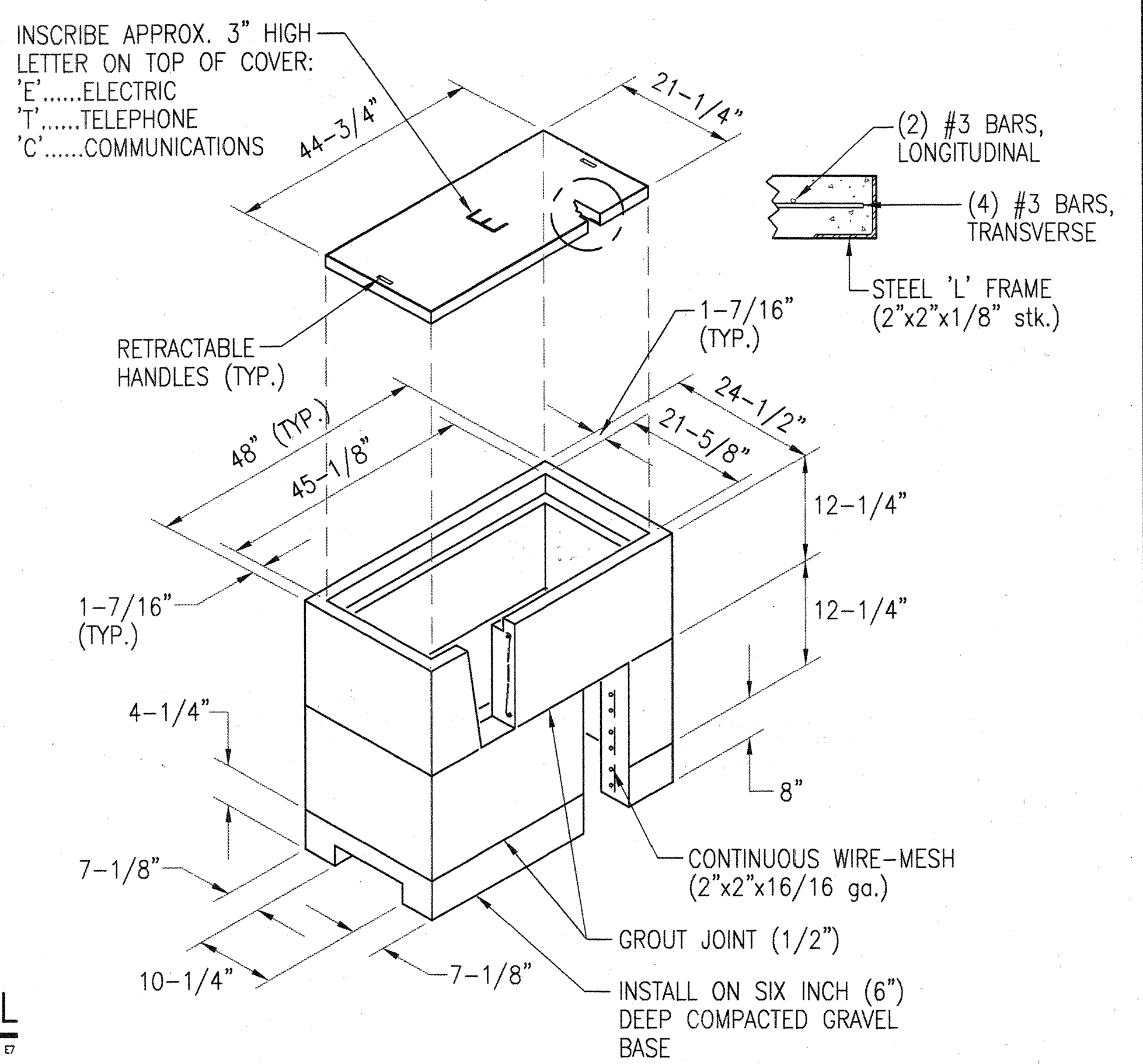
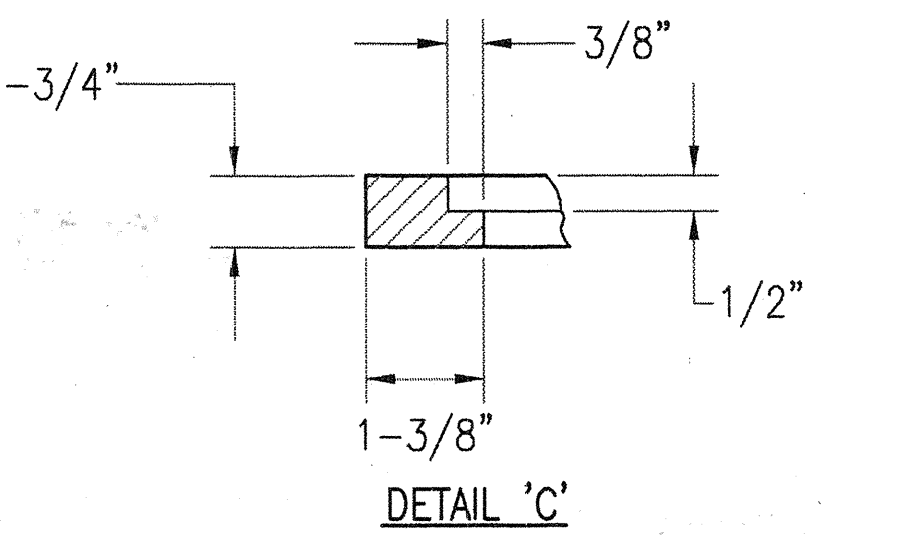
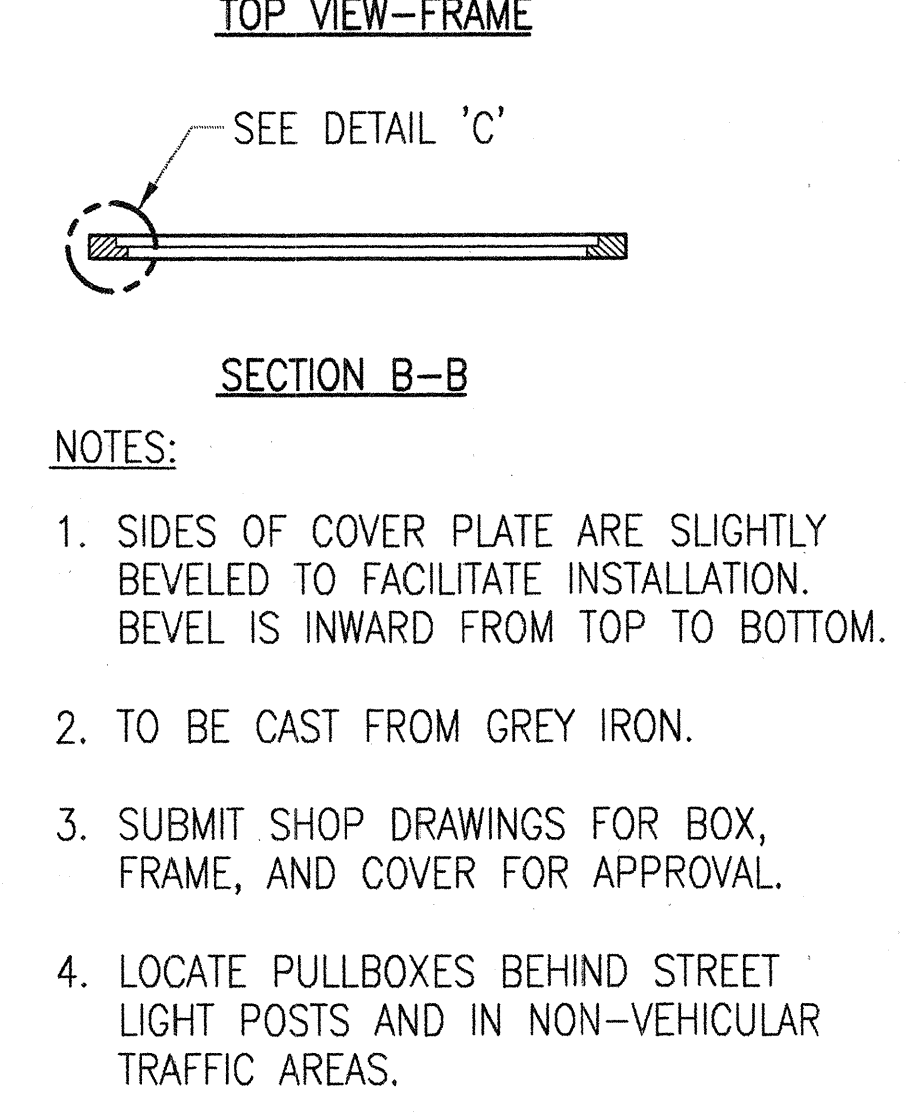
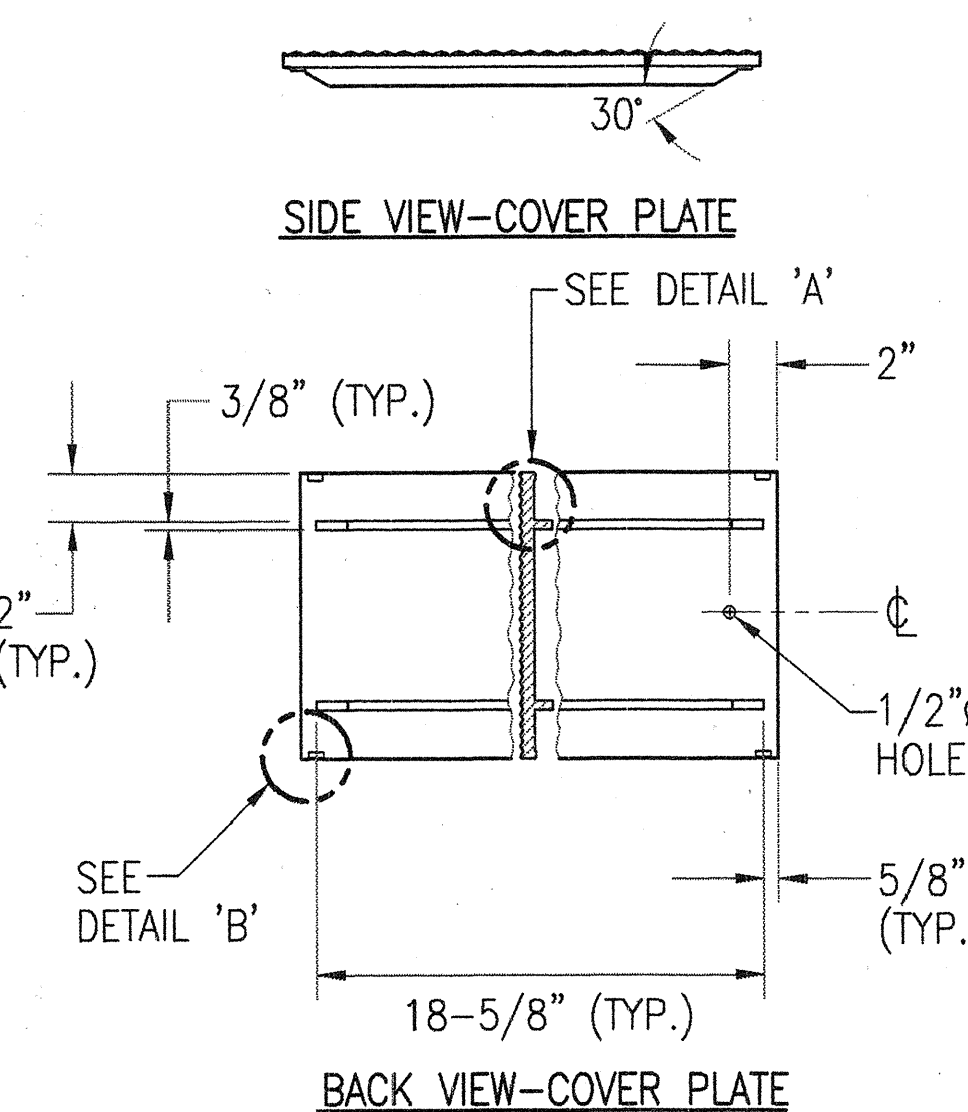
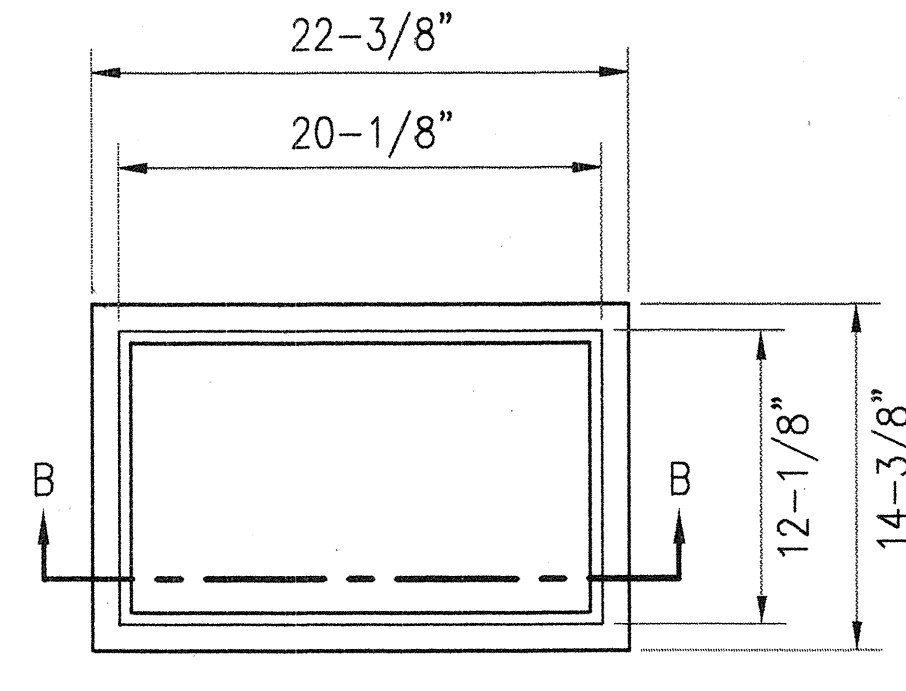
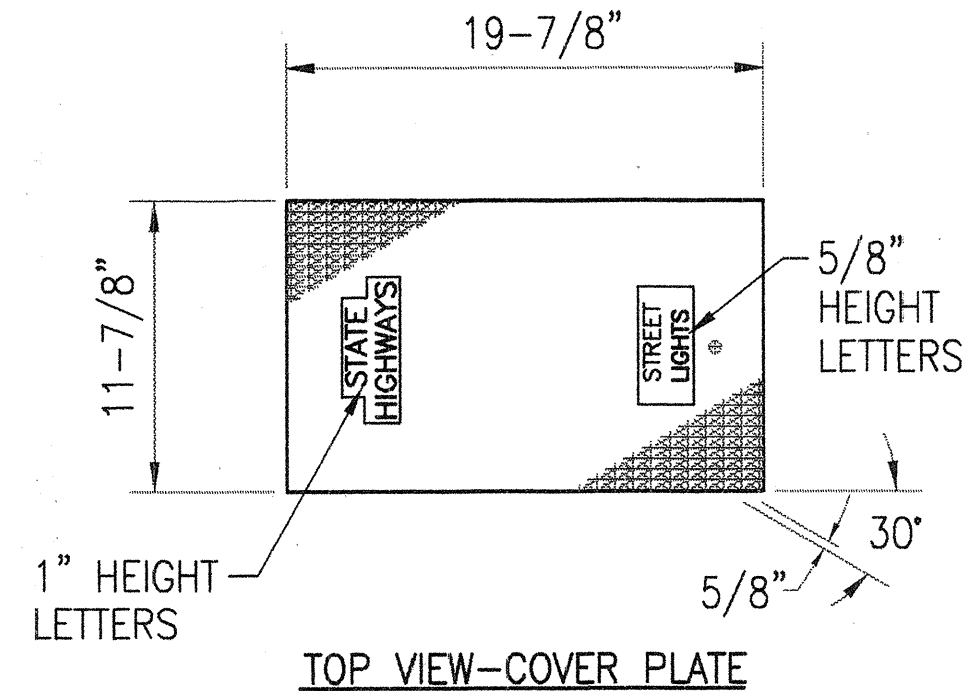
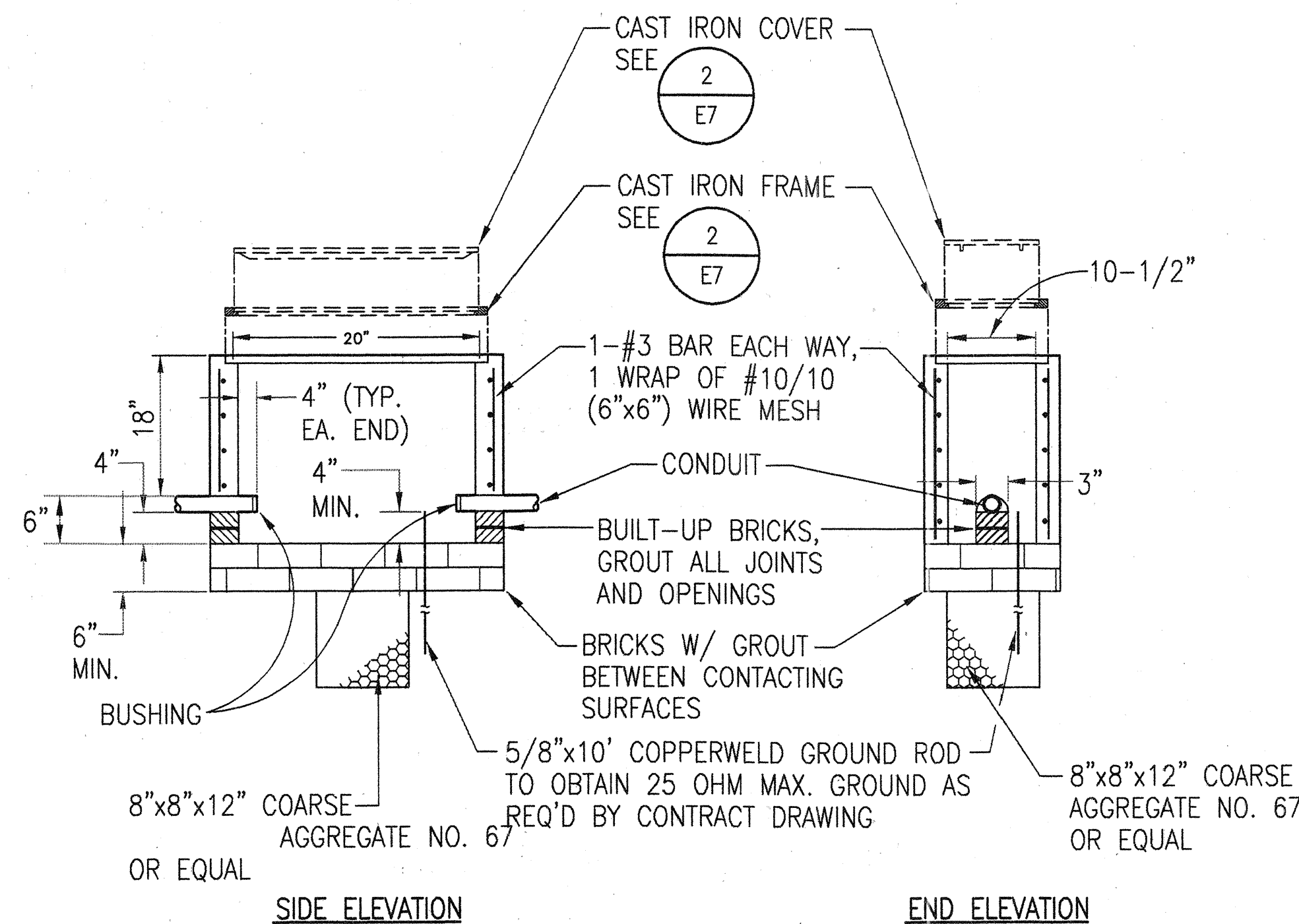
- 1" Ø HOLE**: Dimension for the central mounting hole in each plate.
- 60°**: Angle between adjacent plates.
- 5/8"**: Dimension for the mounting hole in the anchor plate.
- 30°**: Angle between the plate edge and the luminaire arm axis.
- 6" Ø HOLE IN ANCHOR PL.**: Dimension for the large central hole in the anchor plate.
- 5" Ø HOLE IN BOTTOM SLIP BASE PL.**: Dimension for the hole in the bottom slip base plate.
- BOTTOM SLIP BASE PL.**: Label for the bottom slip base plate.
- TRIM ANCHOR BOLT WASHER AS SHOWN**: Label for the trim anchor bolt washer.
- AXIS OF LUMINAIRE ARM**: Label for the axis of the luminaire arm.
- DIRECTION OF TRAFFIC**: Indicated by an arrow pointing right.
- PLAN-BOTTOM PLATES**: Title of the drawing.
- IP BASE BOLTS ANCHOR BOLTS CIRCLE=14"**: Label for the circle defining the positions of the IP base bolts and anchor bolts.
- CL POLE**: Label for the center line of the pole.



Albert A. Lehong

53

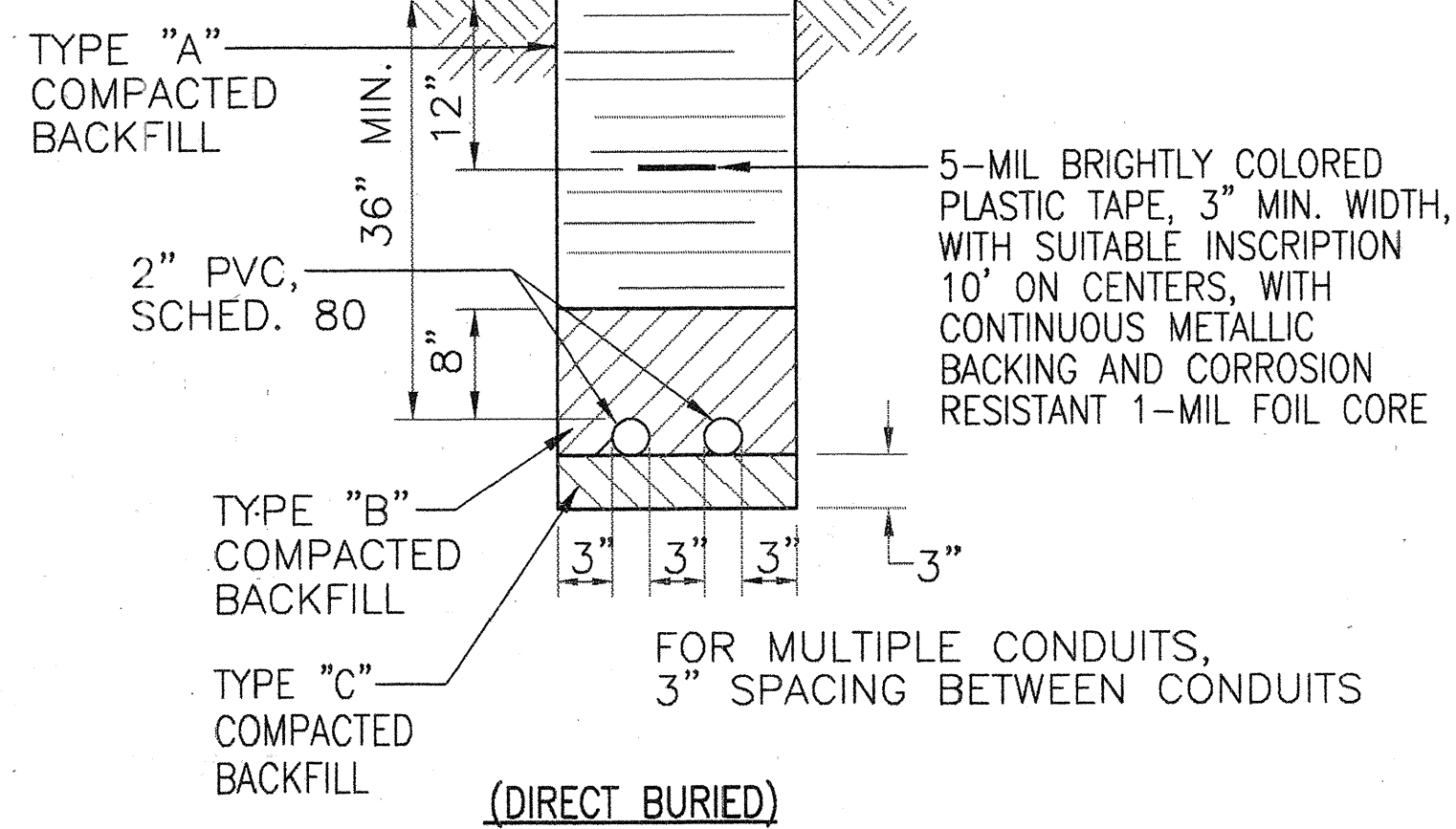
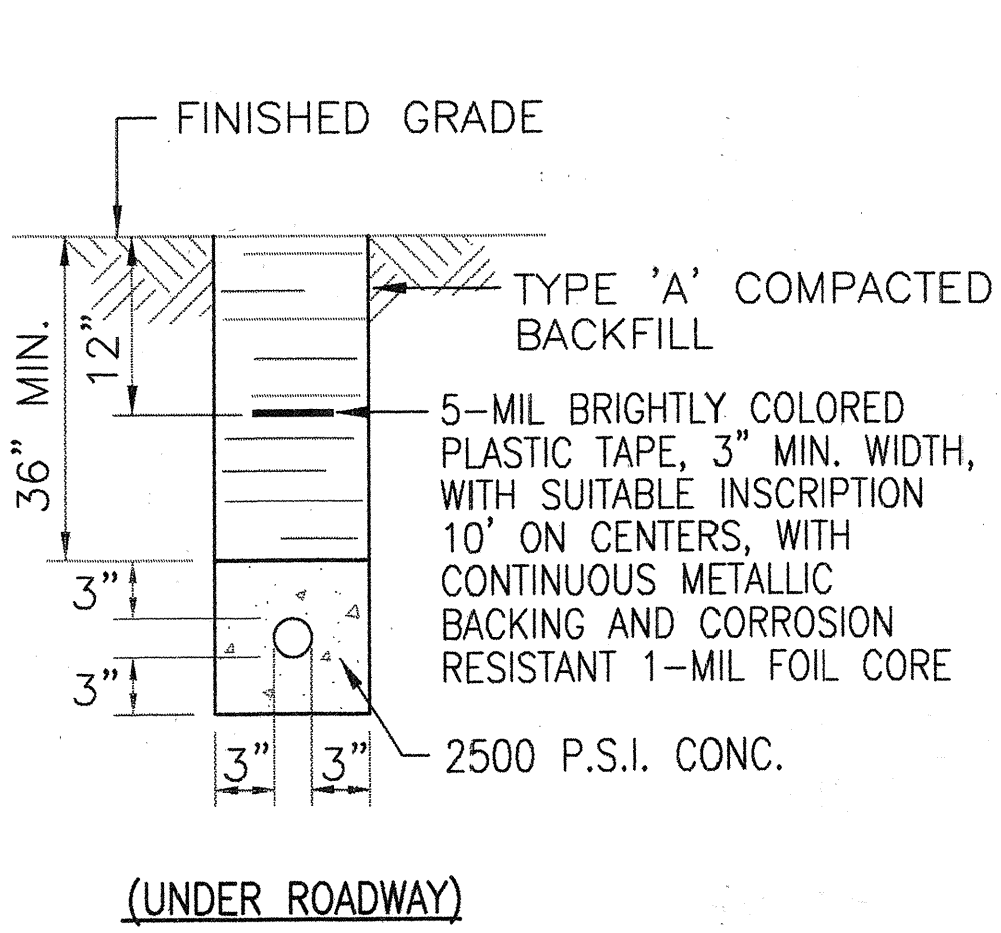
FED. ROAD DIST. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	50E-01-98	1998	54	79



1
E7
TYPE 'B' STREETLIGHT PULLBOX DETAIL (SLD 1)
NOT TO SCALE

2
E7
CAST IRON FRAME AND COVER DETAIL
NOT TO SCALE

4
E7
2' x 4' PULLBOX DETAIL
NOT TO SCALE



BACKFILL NOTES:

TYPE "A"
BEACH SAND, EARTH, OR EARTH & GRAVEL. THE MAXIMUM ROCK SIZE SHALL BE 1" AND THE MIXTURE SHALL CONTAIN NO MORE THAN 50% BY VOLUME OF ROCK PARTICLES.

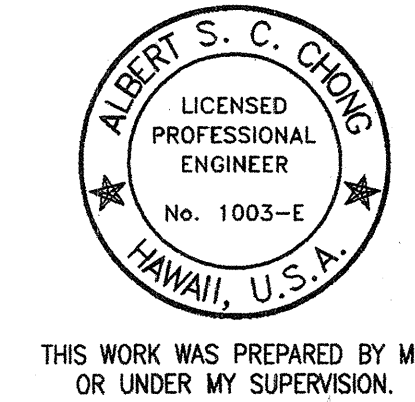
TYPE "B"
BEACH SAND, EARTH, OR EARTH & GRAVEL. IF EARTH AND GRAVEL MIXTURE. MUST PASS A 1/2" MESH SCREEN AND CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES.

TYPE "C"
IF THE NORMAL MATERIAL IN THE BOTTOM OF THE TRENCH IS NOT TYPE "B", AN ADDITIONAL 3" SHALL BE EXCAVATED AND TYPE "B" BACKFILL SHALL BE PROVIDED.

3A
E7
SECTION
NOT TO SCALE

3B
E7
SECTION
NOT TO SCALE

3
E7
TYP. DUCT SECTIONS
NOT TO SCALE



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT AND PULLBOX DETAILS

KAUMUALII HIGHWAY, KUHIO HIGHWAY &
RICE STREET INTERSECTION IMPROVEMENTS
PROJECT NO. 50E-01-98

SCALE: AS NOTED
DATE:
SHEET No. 7 OF 7 SHEETS

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E7