

STREET LIGHTING NOTES:

HOUSE SIDE

STREET SIDE

KUNIA, RD. - 151'-0" ALUM. BRACKET ARM

KUPUNA LOOP - 8'-0" ALUM. BRACKET ARM

PHOTO-CELL

5'-0" RISE (NOM.)

LUMINAIRE W/ HPS LAMP, HPF CONSTANT WATTAGE BALLAST, GLASS REFRACTOR. SEE NOTE.

NOMINAL MOUNTING HEIGHT: 36'-0"

ALUMINUM POLE TO WITH STAND 85 MPH WIND WITHOUT PERMANENT DEFORMATION

RIGHT OF WAY LINE

6' HIGH CHAIN LINK FENCE, BY OTHERS

BOLT COVER (2-PIECE)

ACCESS DOOR

KUNIA ROAD 6" FIN. GRADE

7'-0"

22"

STREET LT. I.D. TAG

+6'-0" TO FIN. SIDEWALK

CONCRETE BASE LEVEL WITH FINISHED CONCRETE SIDEWALK

EDGE OF CONCRETE SIDEWALK

KUPUNA LP. 6'-8" VARIES

CURB AND GUTTER

CONC. BASE SEE PLAN

ROADWAY

ELEVATION

Diagram details: The diagram shows a cross-section of a street lighting installation. A vertical aluminum pole is mounted on a concrete base. A luminaire arm extends from the pole, holding a luminaire with a photo-cell. The pole has an access door and bolt covers. The base is set into a concrete sidewalk and roadway. Dimensions include a 22-inch wide base, a 7-foot high pole section, and a 6-foot high chain link fence. The mounting height is 36 feet nominal. The diagram is labeled 'ELEVATION' and includes various callouts for materials and components.

POLE SHAFT

HOT DIP GALV. 4-1" DIA. X 3" LONG CONNECTING BOLTS & NUTS

#10 RHW-USE, 600V PROVIDE 24" SLACK

6A FUSE CONNECTOR KIT WP "TRON" FUSEHOLDER

DOOR OPENING

GND LUG

2" GROUT

22" SQ. SECTION

THERMOWELD CONN. OR APPROVED EQUAL

CONDUIT

#6 B.C. GND, 18" SLACK

1/2" DIA. SLEEVE

ANCHOR BOLT, PER MANUFACTURER'S RECOMMENDATIONS (4-TOTAL)

ADD GND ROD AS REQUIRED IF GND RESISTANCE EXCEEDS 25 OHMS (MAX. ALLOWED)

CONCRETE: MIN. COMPRESSIVE STRENGTH OF 3000 PSI @ 28 DAYS CLASS "B" TYPE

NEUTRAL CONDUCTOR, WHITE INSULATION

ESNA "Y" TYPE MOLDED SEPARABLE W.P. CONNECTOR

TRANSFORMER BASE, SEE #8 RHW-USE, 600V

SEAL OPENING WITH "DUCT SEAL" AFTER INSTALLING CABLES, TYP. 3" TYP.

LEVEL NUT AND WASHER (8-TOTAL)

1/2" DIA. WEEPHOLE (TOWARD CURB)

CONDUIT TO PULLBOX

#3 REBAR @ 12" O.C.

POUR AGAINST UNDISTURBED SOIL

22" DIA. ROUND SECTION

8#5 BARS

GND ROD: 5/8" DIA. X 10'-0" COPPERWELD

3" CLEAR, MIN.

NOTE: SEE CONCRETE BASE

D
52/52

PHOTO-CELL CONTACTS
RATED FOR 120/240V
OPERATION

2-#10 RHW-USE,
600V

WATERPROOF CABLE
CONNECTOR KIT WITH
6A FUSE

3-#8 600V RHW-USE

SECONDARY
CABLES

INSULATION SPLIT BOLT
CONNECTION (TYP.)

LUMINAIRE: HIGH
PRESSURE SODIUM
LAMP WITH INTEGRAL
CONSTANT WATTAGE
BALLAST, 120V.

SPLIT BOLT CONNECTION

BOND POLE TO GND. ROD

GROUND

CKT "a" SEE CONN. DIAG.

CKT "b" SEE CONN. DIAG.

NEUTRAL

240

120V

120V

NOTE: ALL NEUTRAL CONDUCTORS SHALL BE IDENTIFIED WITH
WHITE INSULATION. OTHER MEANS OF IDENTIFICATION
ARE NOT ACCEPTABLE.

15" DIA. BOLT CIRCLE

CURB SIDE

ANCHOR BOLTS

TRANSFORMER BASE

1 1/4" PVC SCHD. 80 WITHIN SIDEWALK AREA, PVC SCHD. 40 WITH 3" CONC. ENCASEMENT ACROSS ROADWAYS

RIGHT OF WAY LINE

HOUSE SIDE

#3 TIES @ 12" O.C.

1/2" DIA. WEEP HOLE

POLE SHAFT

CONCRETE BASE

ACCESS DOOR

22" SQ.

BUSHING OPENING & GND ROD CONNECTION TO BE READILY ACCESSIBLE FOR MAINTENANCE THRU ACCESS DOOR

3" CLEAR

GND ROD

8#5 BARS

ADDITIONAL GROUND ROD AS REQUIRED

6"

Diagram of a rectangular luminaire with the following dimensions and labels:

- Overall width: $2\frac{3}{4}"$
- Overall height: $1\frac{1}{2}"$
- Top mounting hole spacing: $\frac{1}{4}"$ (from top edge to hole center)
- Bottom mounting hole spacing: $\frac{3}{16}"$ (from bottom edge to hole center)
- Internal width between mounting holes: $3\frac{1}{4}"$
- Internal height between mounting holes: $3\frac{1}{4}"$
- Light number: 999
- Light number: 11
- Light number: N250
- Light number: III
- Distance from right edge to mounting hole center: $5/32"$ DIA.
- IES Type: DISTRIBUTION

LAMP DATA

- "N" - SODIUM
- "150" - WATTAGE

1. USE 3 PLY LAMINATED FLEXIBLE PLASTIC, BLACK-WHITE-BLACK. THICKNESS: BLACK CAP & BASE SHEET - 0.010", WHITE MIDDLE SHEET - 0.052".
2. LETTERS AND NUMBERS SHALL BE ENGRAVED $\frac{1}{4}$ " HIGH, $\frac{1}{16}$ " STROKE, WHITE IN COLOR.
3. ATTACH TO STEEL POLE WITH NO. 8 STAINLESS STEEL $\frac{1}{2}$ " LONG DRIVE SCREWS IN $\frac{1}{8}$ " DRILL HOLE.
4. LETTERS AND NUMBERS SHALL BE ENGRAVED THROUGH "BLACK CAP SHEET" TO EXPOSE "WHITE" LETTERS.

Diagram illustrating the dimensions and components of a concrete marker cube:

- Dimensions:**
 - Top edge: 6"
 - Side edge: 6"
 - Height: 6"
- Callouts:**
 - FLUSH WITH GRADE (pointing to the top surface)
 - 2" HIGH LETTERS ENGRAVED IN MARKER (pointing to the letters "E", "T", "V", "L", "TS")
 - CONCRETE (pointing to the body of the cube)
- Legend:**
 - "E" = ELECTRIC
 - "T" = TELEPHONE
 - "V" = CATV
 - "L" = STREET LIGHT
 - "TS" = TRAFFIC SIGNAL

10 1/2" TO 13 1/2" DIA.
BOLT CIRCLE

13 1/8" SQ.

9 1/4"

1" - 5"

1 3/4"

TAMPER PROOF
STAINLESS STEEL
SCREW

1/4" - 20NC TAPPED HOLE
(BACK WALL)

1/2" - 13NC
TAPPED HOLE

9 3/4"

15 3/8" SQ.

4043 WELD FILLER
(HEAT TREAT AFTER
WELDING)

13" TO 15" DIA.
BOLT CIRCLE

1 3/8"

MATERIAL: ALUM. ALLOY 356-T6

1. DOOR AND $\frac{1}{4}$ "-20NC S.S. SCREW
2. EIGHT 1" WASHERS $\frac{1}{2}$ " THICK X 2 $\frac{3}{4}$ " O.D.
(WASHERS MECHANICAL GALVANIZED PER
ASTM B454)
3. FOUR 1"-8NC X 3 $\frac{3}{4}$ " LONG GALVANIZED
STEEL HEX. HD. BOLTS
4. FOUR 1"-8NC GALVANIZED STEEL HEX. NUTS
5. FOUR 1" GALVANIZED STL. LOCK WASHERS
6. FOUR 1" X 2" O.D. GALVANIZED STL
FLATWASHERS

BREAKAWAY TRANSFORMER BASE DETAIL

1. STREET LIGHTING SYSTEM FOR THIS IMPROVEMENT SHALL BE UNDER HAWAIIAN ELECTRIC CO. METERED SECONDARY ELEC.
2. HIGHWAY LIGHT NUMBERS FOR THIS IMPROVEMENT SHALL BE AS SHOWN ON PLAN.
3. ALL SECONDARY CIRCUIT EXTENSION ON HECO SECONDARY CABLES SHALL BE PROVIDED BY THE CONTRACTOR. CONNECTION TO HECO SOURCE SHALL BE BY HECO.
4. CONTRACTOR SHALL NOTIFY STATE HIGHWAY DEPT. OF TRANSPORTATION MAINTENANCE OFFICE 72 HOURS BEFORE COMMENCING INSTALLATION OF STREET LIGHTING SYSTEM, PHONE: 548-2576.
5. ALL LUMINAIRES TO BE 150 WATT HIGH PRESSURE SODIUM LUMINAIRES, AND I.E.S. LIGHT DISTRIBUTION TYPE AS SHOWN ON PLAN.
6. CONTRACTOR SHALL STENCIL DATE OF INSTALLATION AT THE BOTTOM OF PHOTO-CELL.
7. NEW LUMINAIRE & POLE COUNT:

LUMINAIRE NO. 34 POLE NO. 34
8. CONTRACTOR SHALL HAVE ONE SET OF APPROVED PLANS AT THE JOBSITE AT ALL TIMES DURING THE CONSTRUCTION WORK AND RECORD ALL CHANGES ON CONSTRUCTION WORK.
9. CONTRACTOR SHALL ARRANGE WITH HECO TO ENERGIZE STREET LIGHTS A MINIMUM OF SIX HOURS FOR FINAL INSPECTION AND ACCEPTANCE. CONTRACTOR TO ASSUME COST.
10. CONTRACTOR SHALL MEASURE GROUND RESISTANCE OF EACH STREET LIGHT STANDARD AND SUBMIT SAME TO THE ENGINEER.
11. PAYMENT FOR ALL WORK RELATED TO STREET LIGHTING AND CONTROLLER INTERCONNECT CABLE SYSTEMS AND POWER SERVICE TO CONTROLLERS SHALL BE MADE UNDER "SECTION 622-HIGHWAY LIGHTING SYSTEM" AND "SECTION 623-TRAFFIC SIGNAL SYSTEM".
12. THE STREET LIGHTING CONCRETE FOUNDATION SHALL BE CONSTRUCTED AND INSTALLED 6" FROM THE HIGHWAY RIGHT-OF-WAY LINE, OR AS OTHERWISE NOTED ON PLAN.
13. CONTRACTOR SHALL SUBMIT COMPUTERIZED FOOTCANDLE ARRAY FOR ROADWAYS.
14. EXISTING LUMINAIRES SHALL NOT BE REMOVED OR DE-ENERGIZED UNTIL IT'S REPLACEMENT LUMINAIRE IS PLACED IN SERVICE.
15. EXISTING ARMS, LUMINAIRES, AND APPURTENANCES SHALL BE FULLY DISMANTLED AND STOCK-PILED AS DIRECTED BY THE ENGINEER. EXISTING PULLBOXES AND POLE FOOTINGS OR FOUNDATIONS SHALL BE REMOVED AND BE DISPOSED OF BY THE CONTRACTOR.
16. STREET LIGHTING SYSTEM SHALL PROVIDE A MINIMUM AVERAGE MAINTAINED (ILLUMINATION OF 1 FOOTCANDLE, 3:1 (AVERAGE/ MINIMUM UNIFORMITY), CONTRACTOR TO PROVIDE COMPUTERIZED FOOTCANDLE ARRAY FOR ROADWAYS.

MATERIAL: ALUM. ALLOY 356-T6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHTING DETAILS

KUNIA ROAD WIDENING: AND
H-1. KUNIA I.C., RAMP KO WIDENING
F.A.I. PROJECT NO. IM-STP-0750(10)

SCALE: AS NOTED

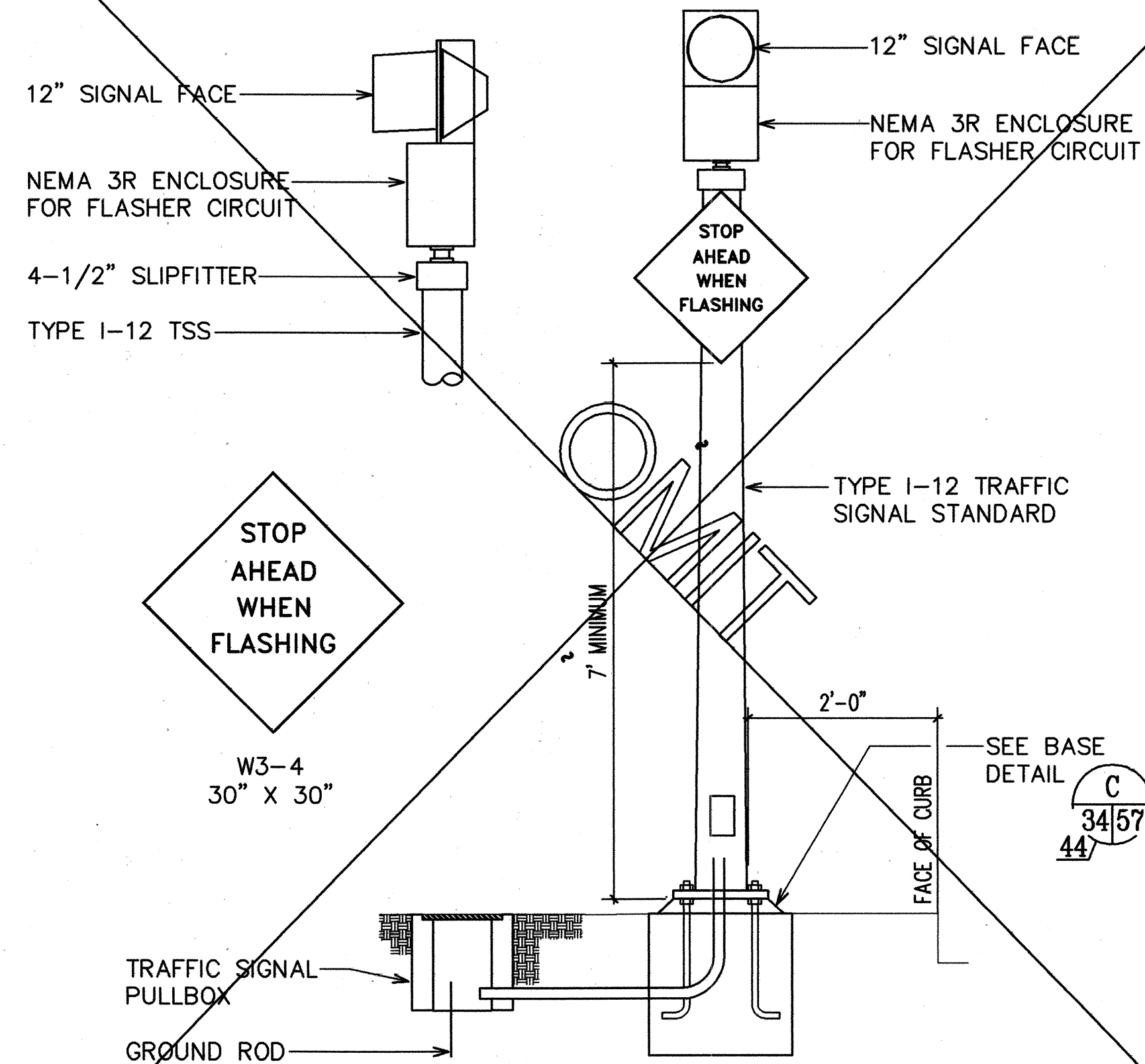
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SHEET No. 1 OF 5 SHEETS

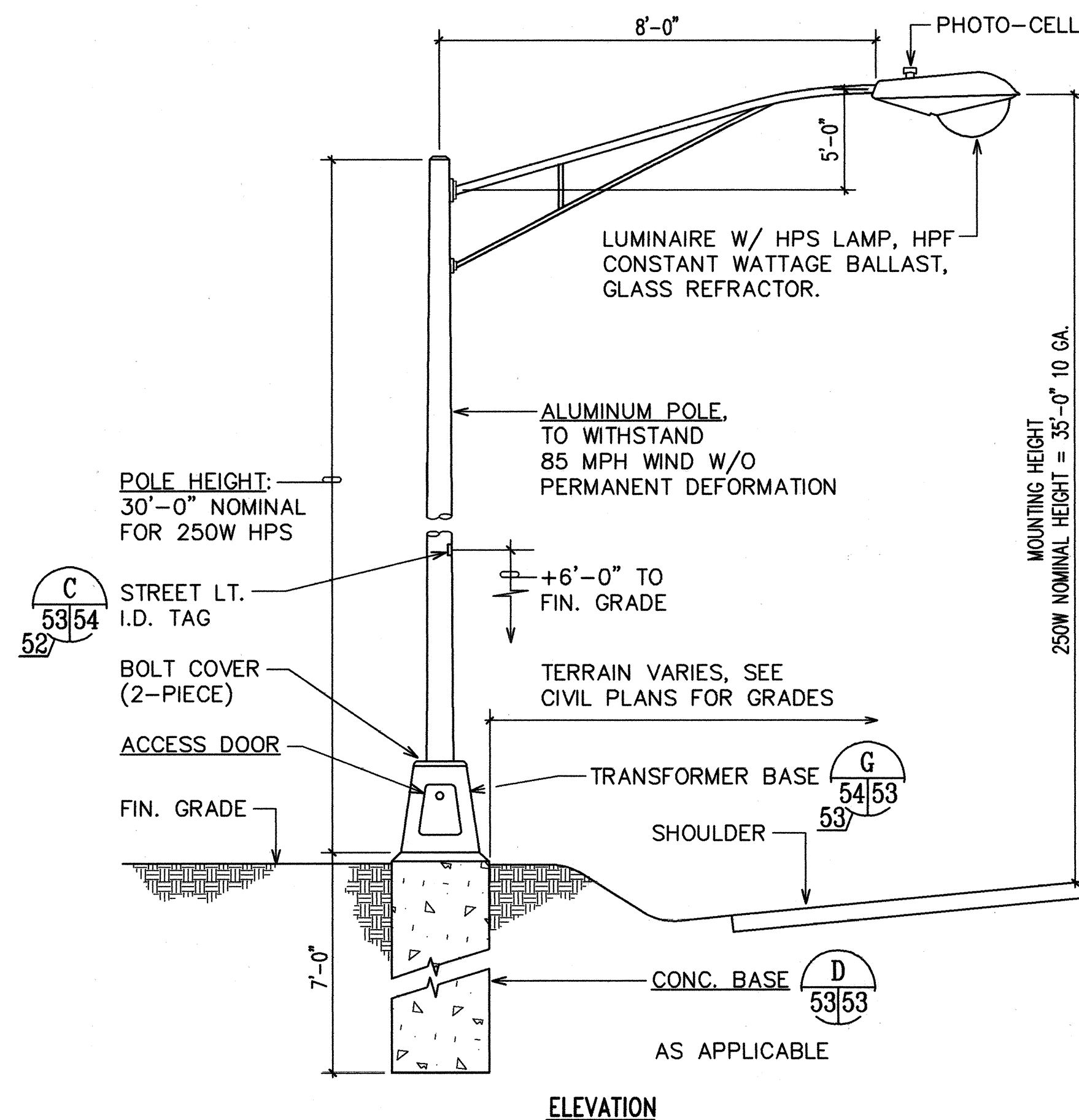
RECORD DRAWINGS

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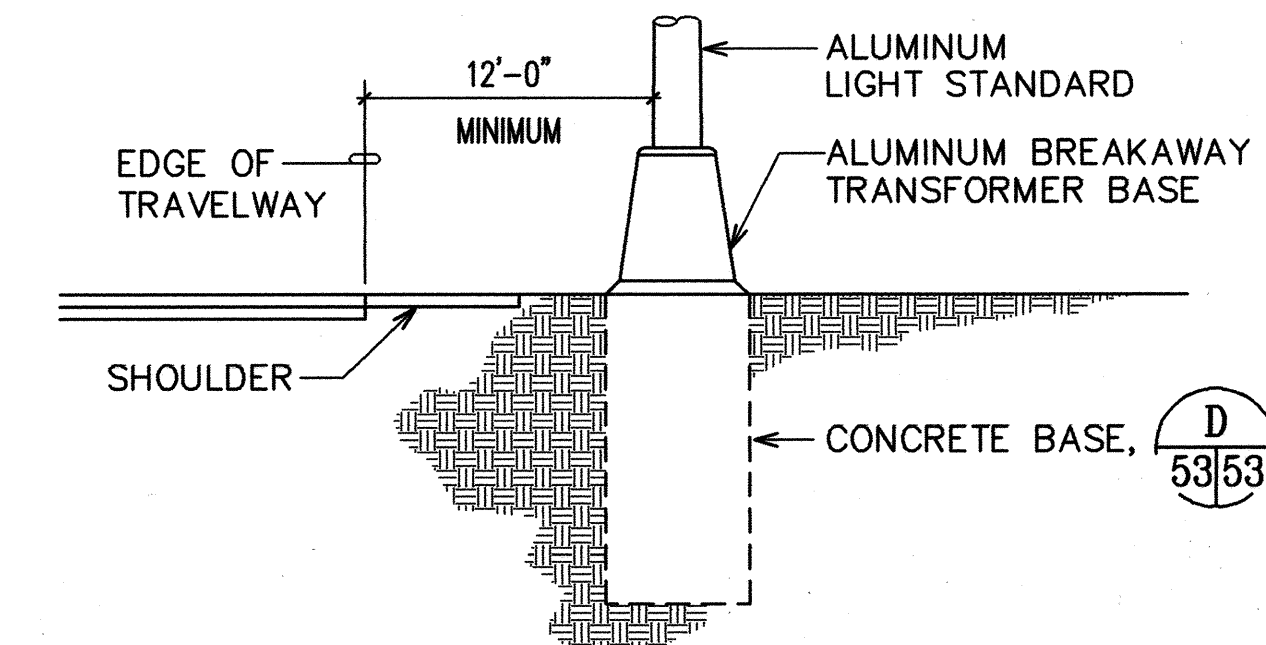
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-STP-0750(10)	1999	53	97



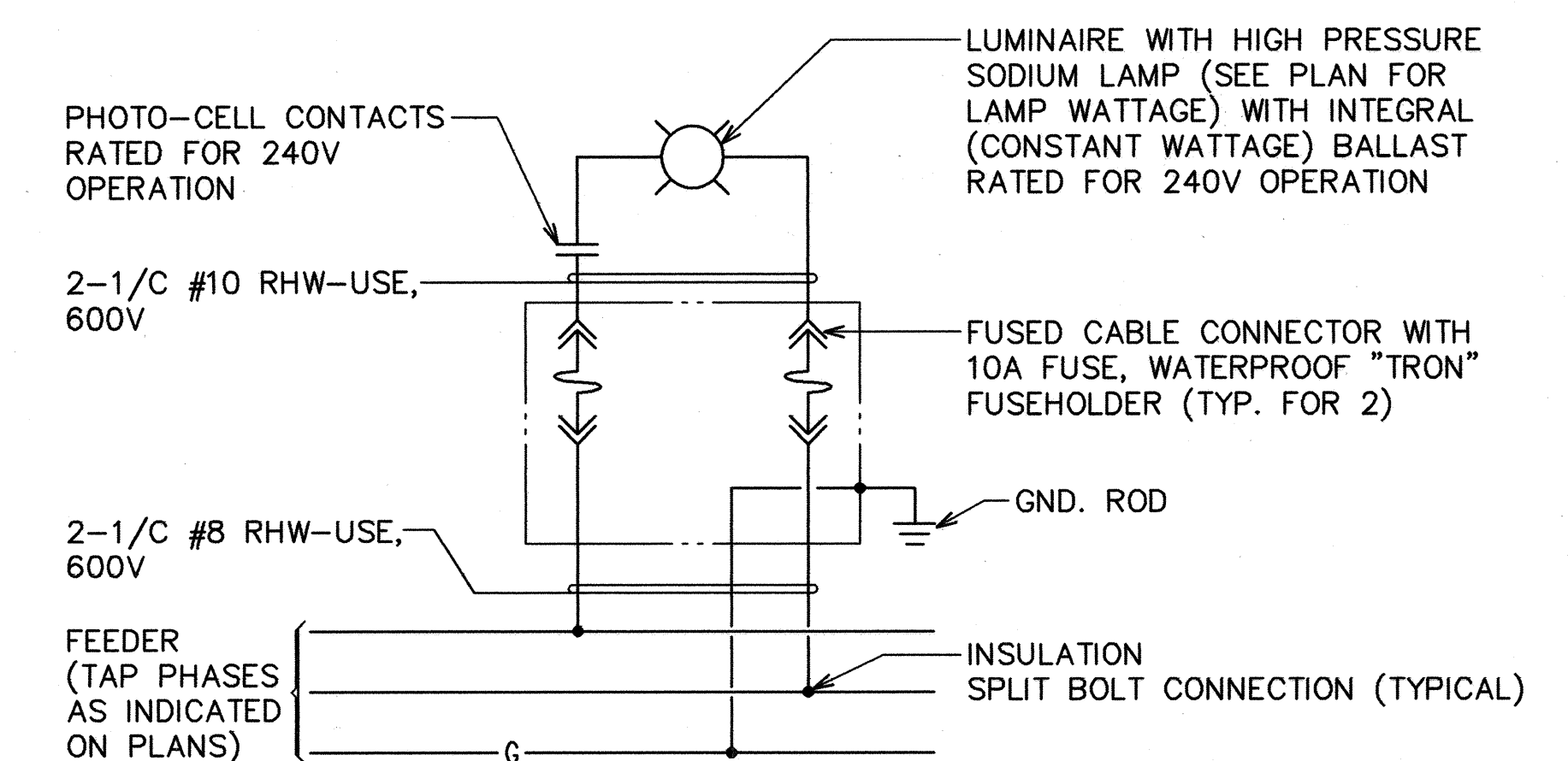
A STOP AHEAD WARNING FLASHER
44/44 NOT TO SCALE



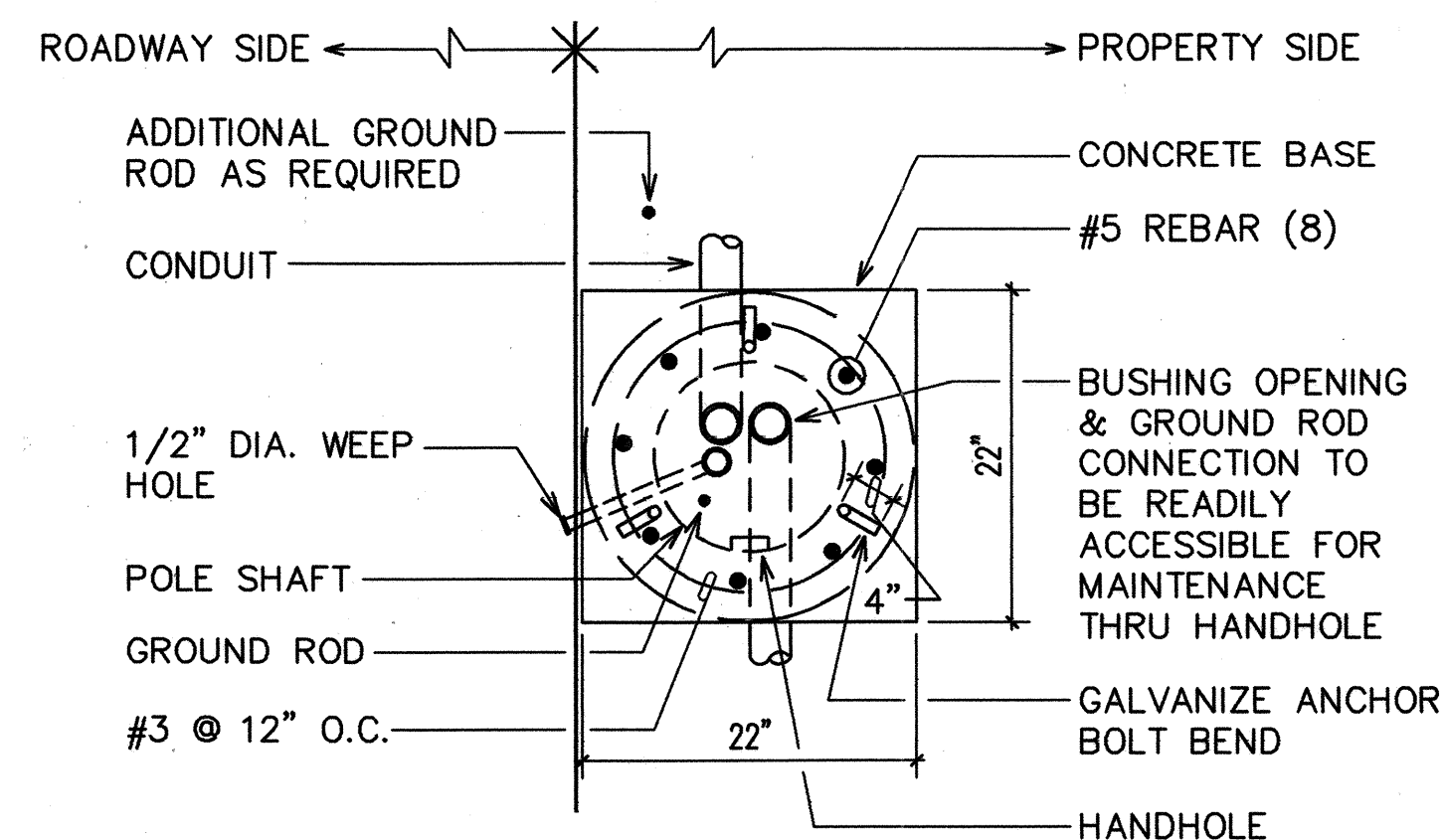
C STREET LIGHT STANDARD
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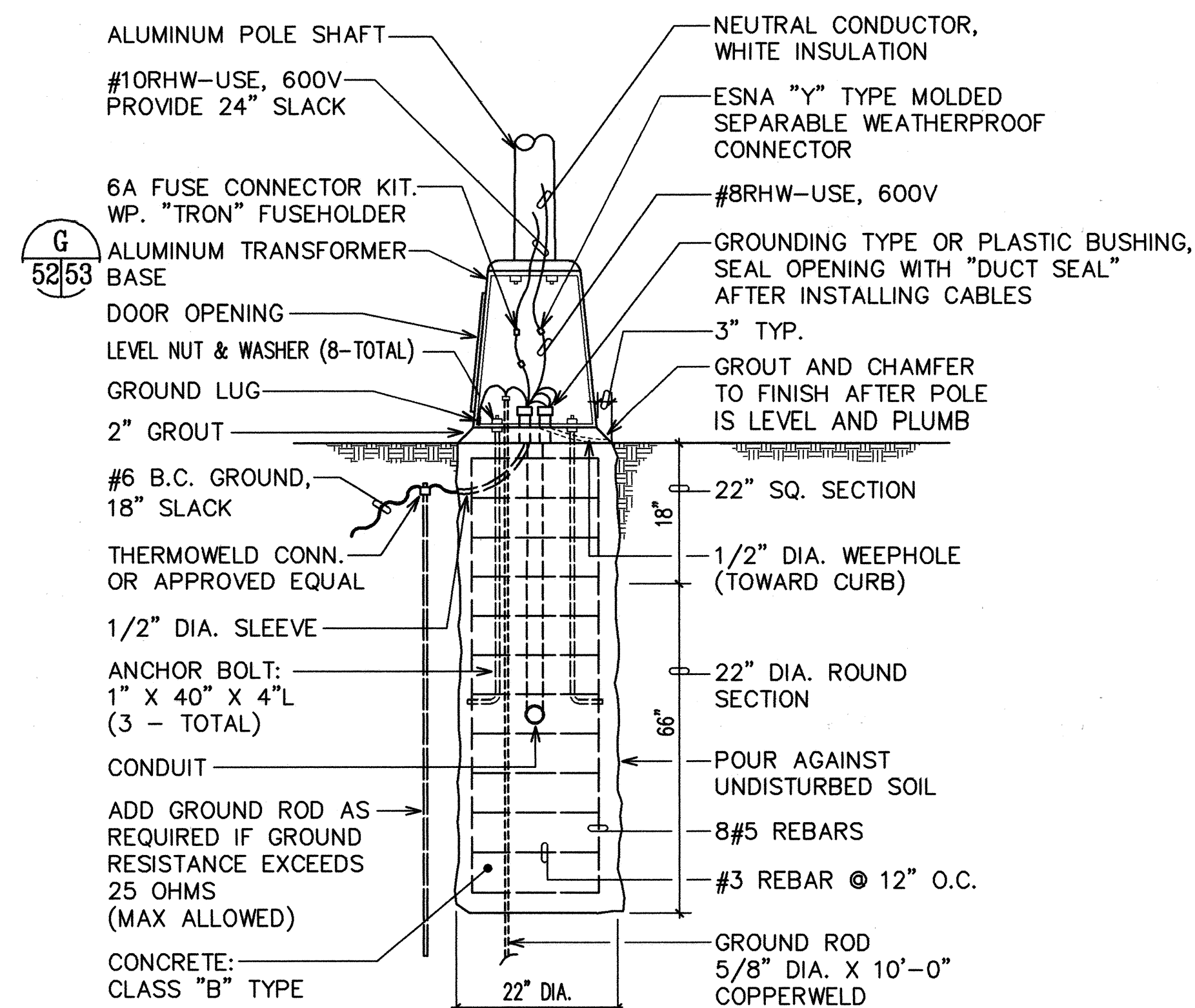
E TYPICAL LIGHT STANDARD SECTION WITH BREAKAWAY BASE
53/53 NOT TO SCALE



F RAMP KO METERED STREET LIGHT CONNECTION DIAGRAM
53/53



B CONCRETE BASE PLAN
53/53 NOT TO SCALE



D CONCRETE BASE ELEVATION
53/53 NOT TO SCALE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STREET LIGHTING DETAILS

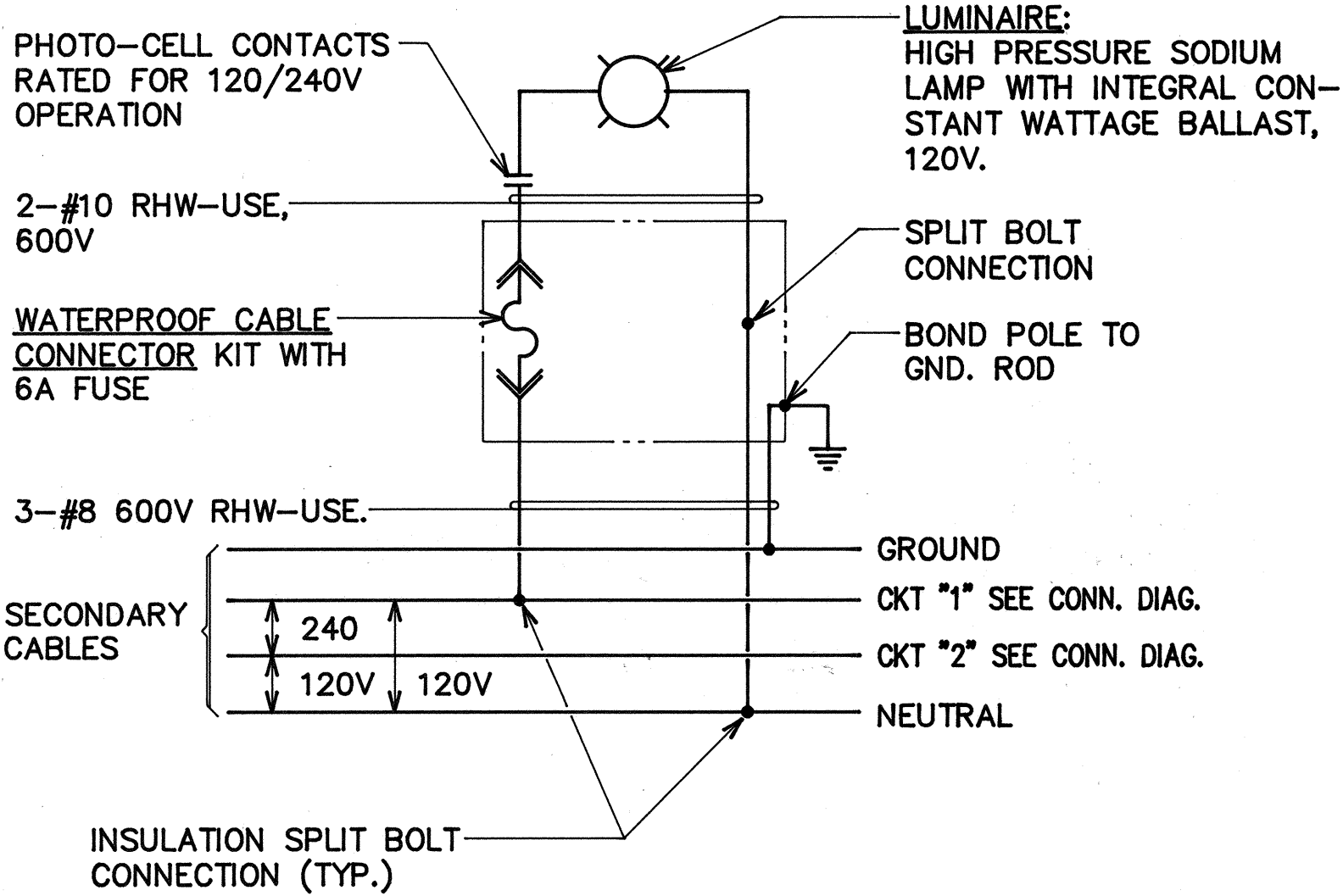
KUNIA ROAD WIDENING; AND
H-1, KUNIA I.C., RAMP KO WIDENING
F.A.I. PROJECT NO. IM-STP-0750(10)
SCALE: AS NOTED DATE: APRIL 1999
SHEET No. 2 OF 5 SHEETS

DATE	
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
NO. OF SHEETS	
LAST DATE REVISED	
BY	
REASON FOR REVISION	

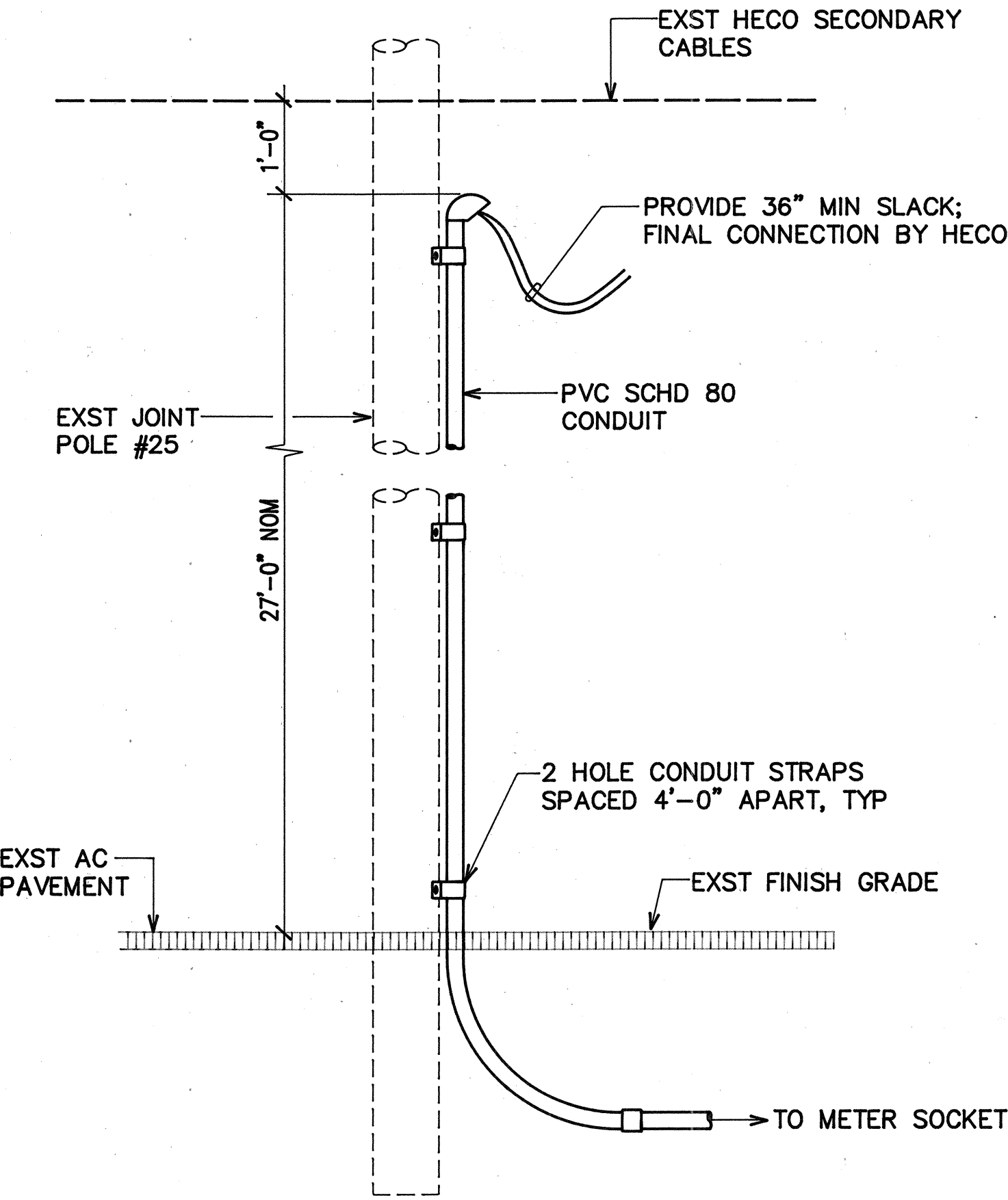
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BY: [Signature]
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-STP-0750(10)	1999	54	97

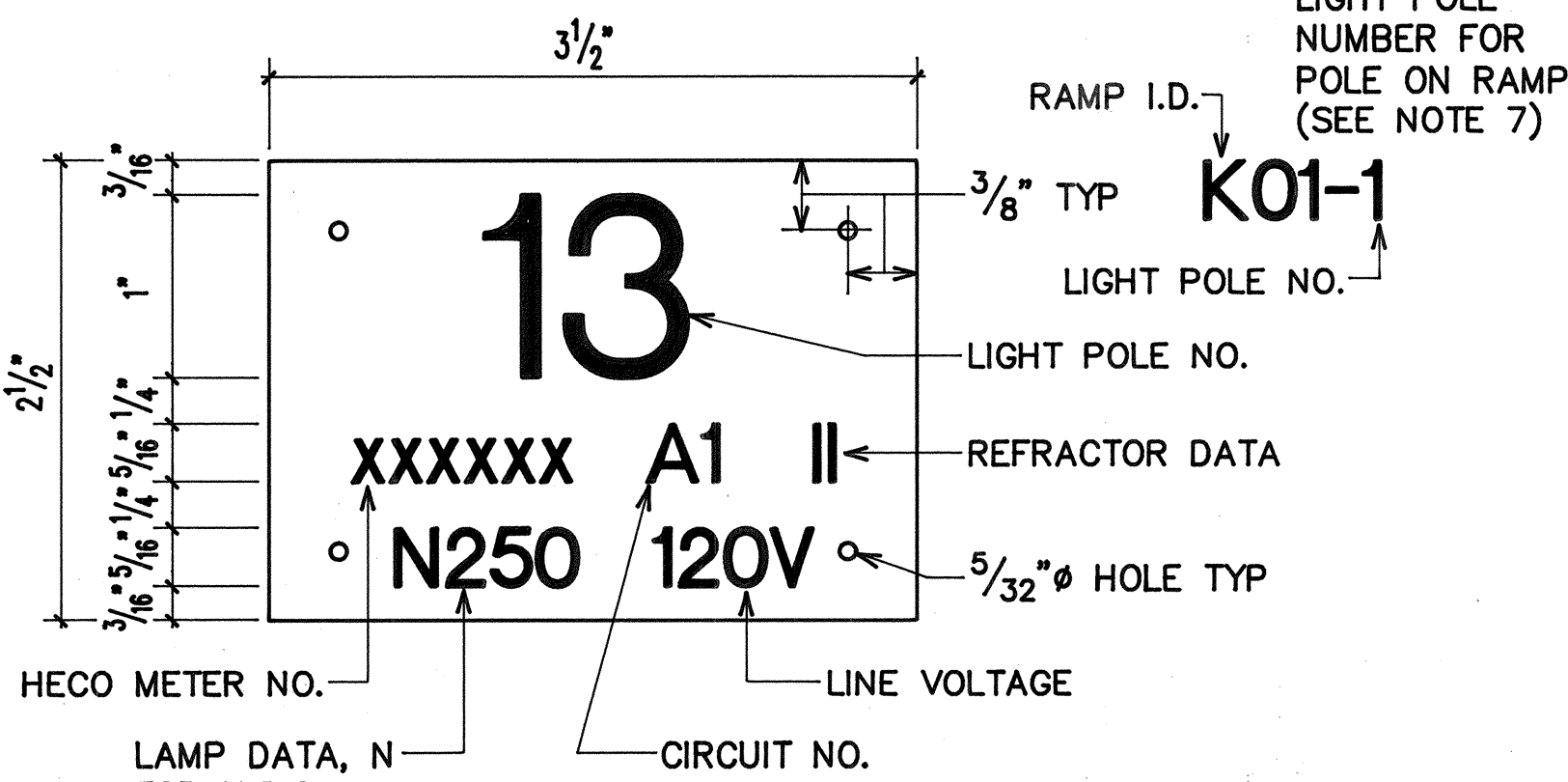
- NOTES:
- ALL NEUTRAL CONDUCTORS SHALL BE IDENTIFIED WITH WHITE INSULATION. ANY OTHER MEANS OF IDENTIFICATION IS NOT ACCEPTABLE.
 - SEAL ALL CONDUIT ENDS WITH DUCT SEAL AFTER INSTALLING CONDUCTORS



E METERED STREET LIGHT CONNECTION DIAGRAM
(120/240V METERED SYSTEM)

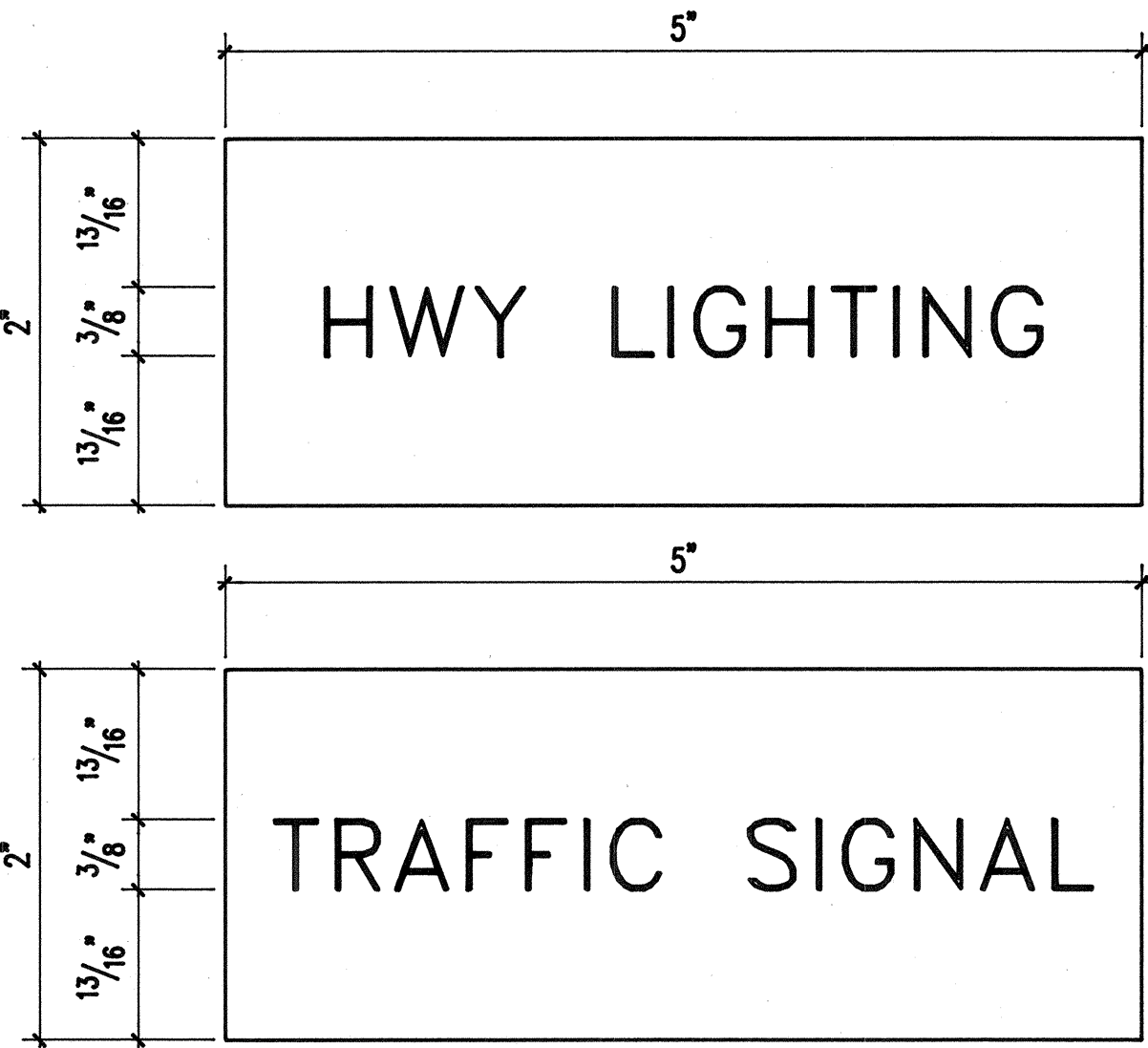


A RISER ELEVATION
NOT TO SCALE



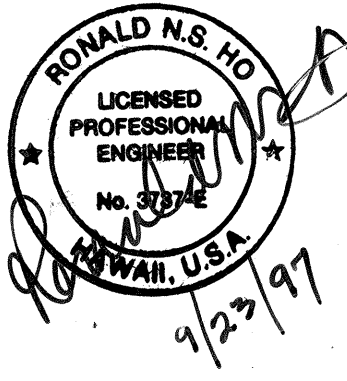
- NOTES:
- USE 3 PLY LAMINATED FLEXIBLE PLASTIC BLACK-WHITE-BLACK THICKNESS BLACK CAP SHEET-0.010", WHITE BASE SHEET-0.52", BLACK SHEET-0.010".
 - LIGHT POLE NUMBER SIZE SHALL BE 1" HIGH AND ENGRAVED 1/8" WIDE, WHITE IN COLOR (NUMBER AS REQUIRED).
 - NOMENCLATURE SIZE SHALL BE 5/16" HIGH AND ENGRAVED 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".
 - NOMENCLATURE REQUIRED FOR SYSTEMS WITH TWO OR MORE CIRCUITS. FIRST LETTER INDICATES PANEL BOARD, NUMBER INDICATES CIRCUIT, SECOND LETTER INDICATES PHASE.
 - FOR LIGHT POLES INSTALLED ON RAMP, ASSIGN NUMBERS TO INCLUDE RAMP I.D. AND POLE NUMBER. LEGEND MAY BE LESS THAN ONE (1) INCH IN HEIGHT.

C HIGHWAY LIGHT I.D. TAG DETAIL
METERED SYSTEM
NOT TO SCALE



- NOTES:
- USE 3 PLY LAMINATED FLEXIBLE PLASTIC, BLACK-WHITE-BLACK. THICKNESS: BLACK CAP & BASE SHEET - 0.010", WHITE MIDDLE SHEET - 0.052".
 - LETTERS AND NUMBERS SHALL BE ENGRAVED 3/8" HIGH, 1/16" STROKE, WHITE IN COLOR.
 - ATTACH TO METER SOCKET USING SCOTCH 3M BRAND VERY HIGH BOND (VHB) DOUBLE COATED ACRYLIC FOAM TAPE OR EQUIVALENT.
 - LETTERS AND NUMBERS SHALL BE ENGRAVED THROUGH "BLACK CAP SHEET" TO EXPOSE "WHITE" LETTERS.

D METER I.D. TAG DETAIL
NOT TO SCALE



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHTING DETAILS

KUNIA ROAD WIDENING; AND
H-1, KUNIA I.C., RAMP KO WIDENING
F.A.I. PROJECT NO. IM-STP-0750(10)

SCALE: AS NOTED DATE: APRIL 1999

SHEET No. 3 OF 5 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	
	NO.	

LAST SAVE: 09/16/97 09:32:22 BY: CH FLOT SC 1-0-01
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-STP-0750(10)	1999	55	97

STREET LIGHT NOTES:

- WIRE TO BE RHW-USE, 600V WITH OUTER COVERING.
- CONDUIT-PVC SCHD. 80 DIRECT BURIED @ SIDEWALK.
PVC SCHD. 40 WITH 3" CONC. JACKET @ ROAD CROSSINGS.
- CONTRACTOR SHALL IDENTIFY ALL CIRCUIT CABLES WITH LEAD TAG IN EACH PULLBOX AS SHOWN.

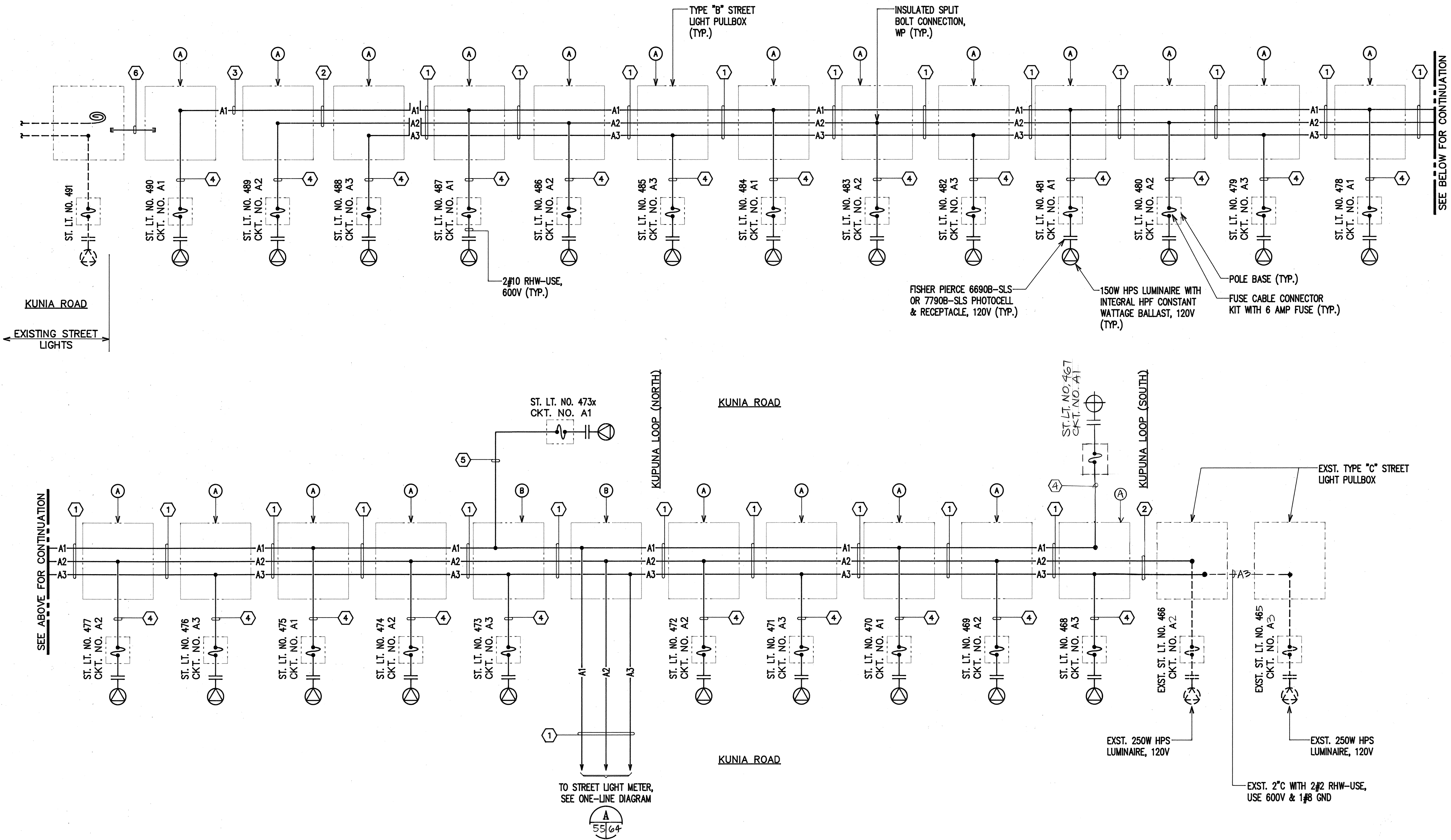
ALL NEUTRAL CONDUCTORS SHALL BE IDENTIFIED WITH WHITE INSULATION. OTHER MEANS OF IDENTIFICATION ARE NOT ACCEPTABLE.
- INSTALL PULLBOXES ON 6" OF #3 CRUSHED ROCK BASE.
- SEAL ALL CONDUIT ENDS WITH DUCT SEAL.

CONDUIT & WIRE SCHEDULE

ITEM	DESCRIPTION
①	2"C, 5#4 RHW-USE, #4 GND
②	2"C, 3#4 RHW-USE, #4 GND
③	2"C, 2#4 RHW-USE, #4 GND
④	1 1/4"C, 2#6 RHW-USE, #6 GND
⑤	1 1/2"C, 2#6 RHW-USE, #6 GND
⑥	2"C, WITH PULLWIRE
⑦	
⑧	
⑨	
⑩	

PULLBOX AND EQUIPMENT SCHEDULE

ITEM	DESCRIPTION
Ⓐ	19" X 28" STREET LIGHT PULLBOX, SEE DETAIL B/47
Ⓑ	2' X 4' STREET LIGHT PULLBOX, SEE DETAIL A/54
Ⓒ	
Ⓓ	
Ⓔ	

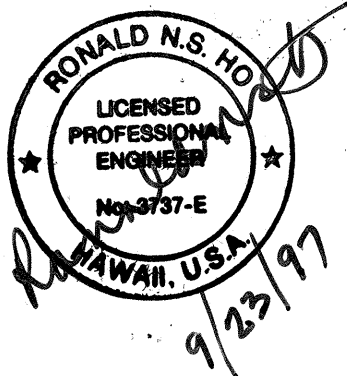


STREET LIGHT CONNECTION DIAGRAM

APPROVED:

HAWAIIAN ELECTRIC CO. DATE

DATE



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT CONNECTION DIAGRAM

KUNIA ROAD WIDENING; AND
H-1, KUNIA I.C., RAMP KO WIDENING
F.A.I. PROJECT NO. IM-STP-0750(10)

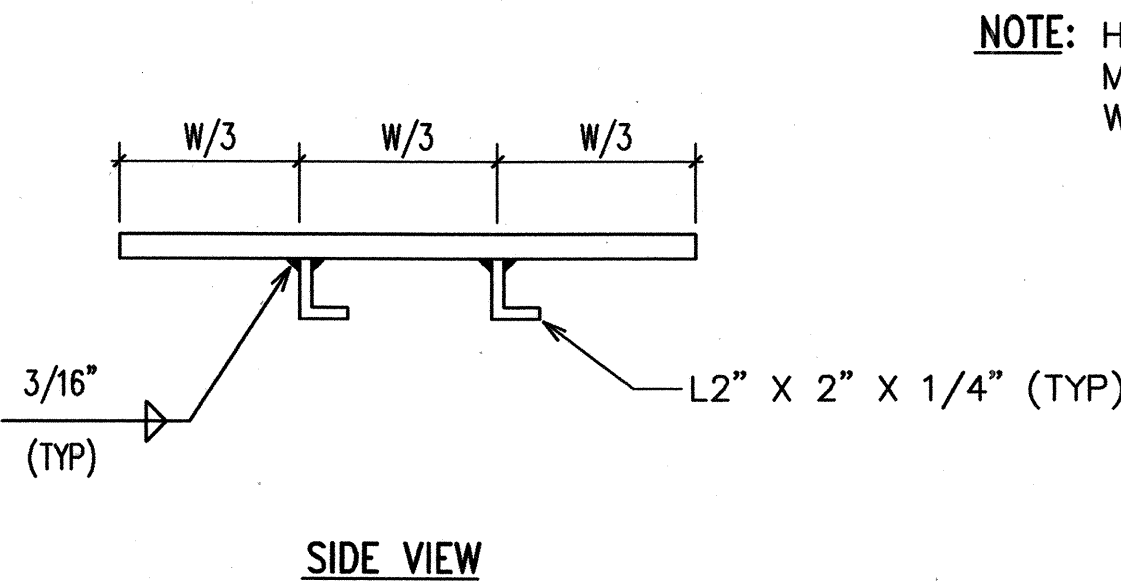
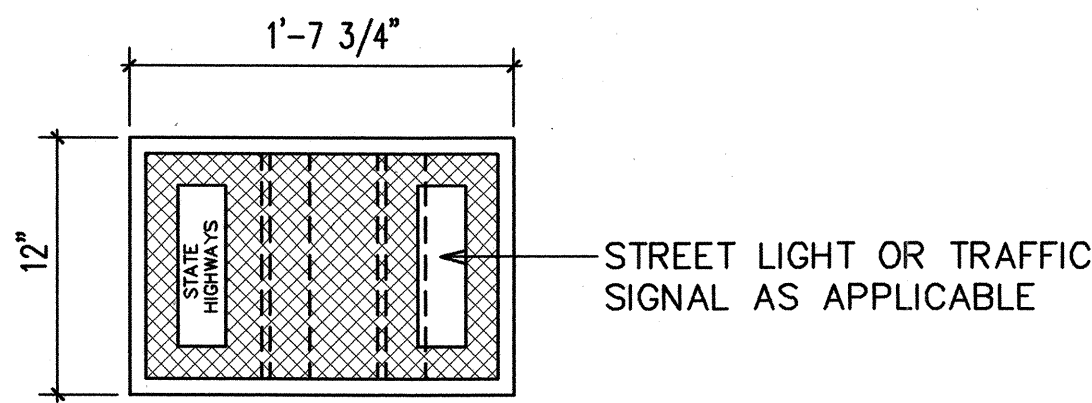
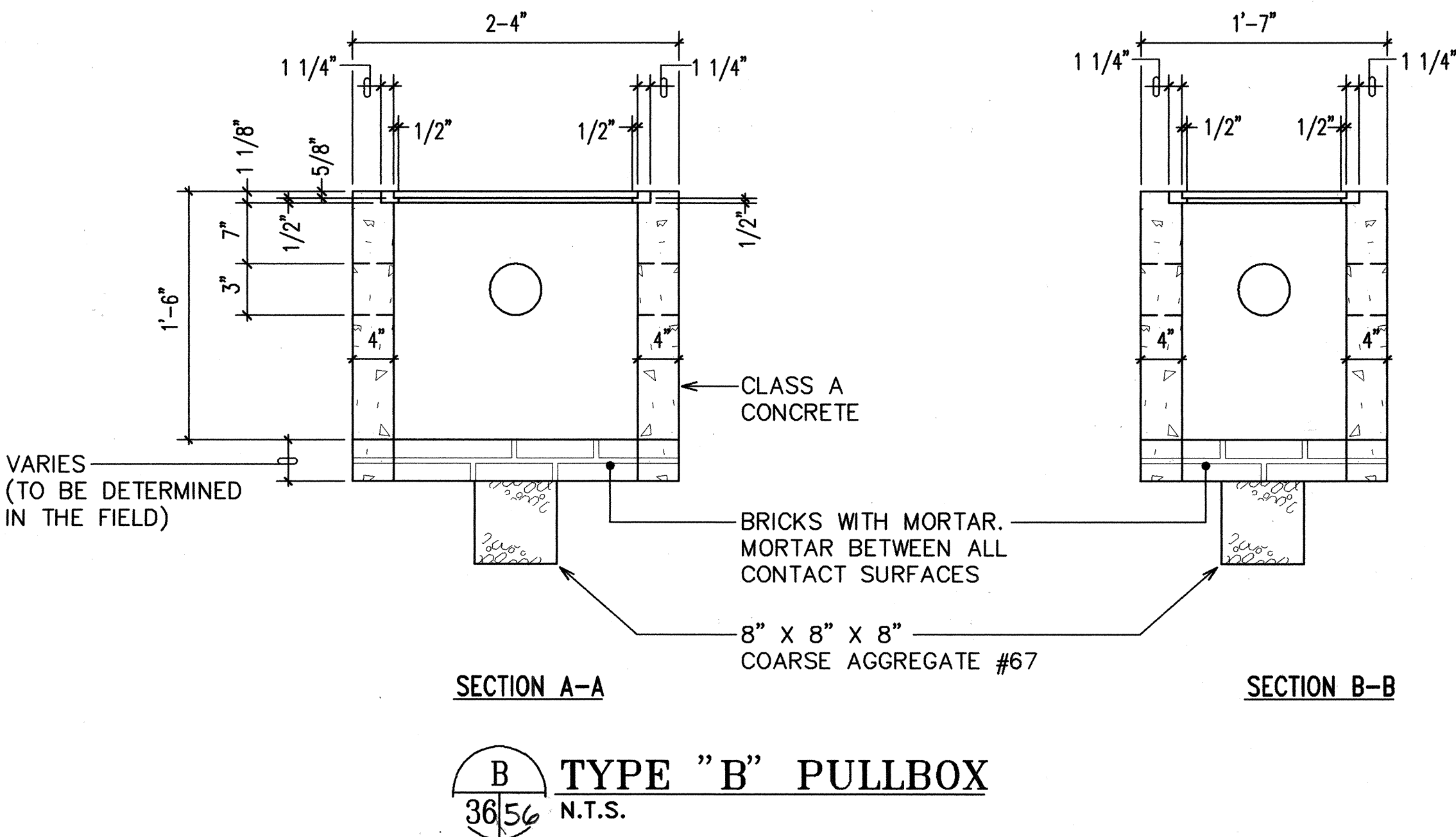
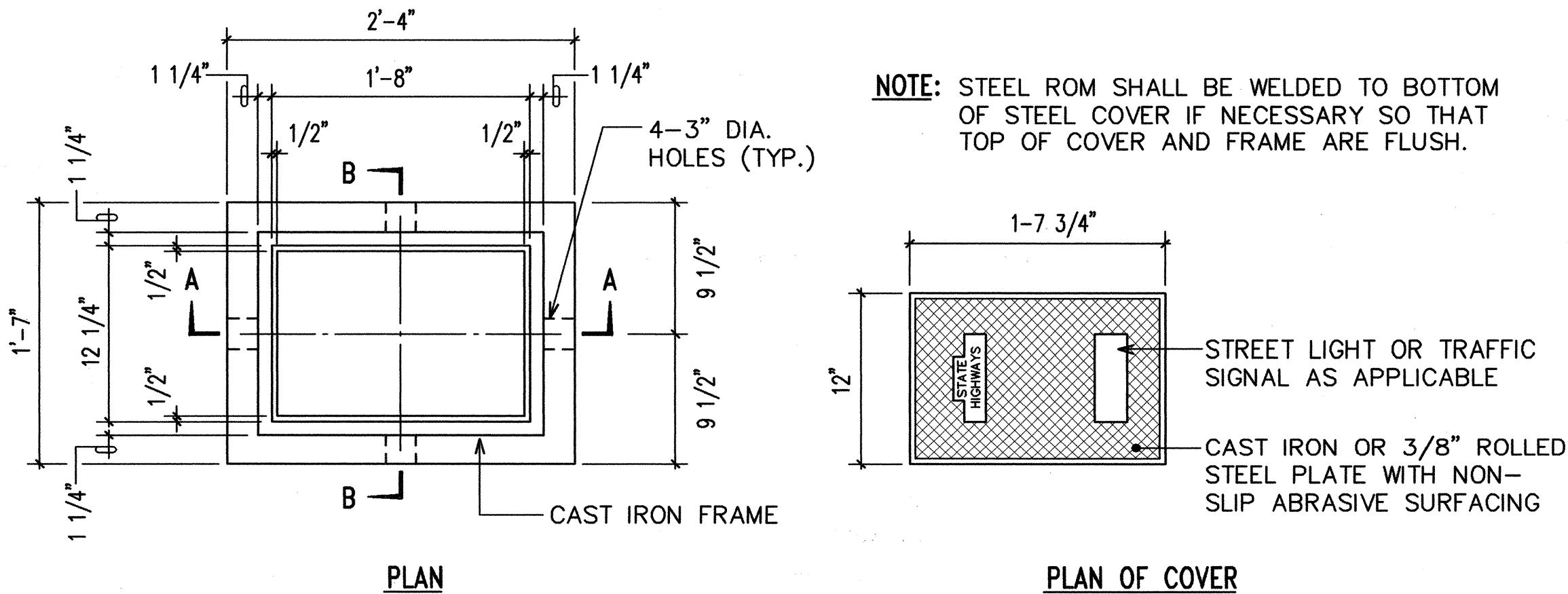
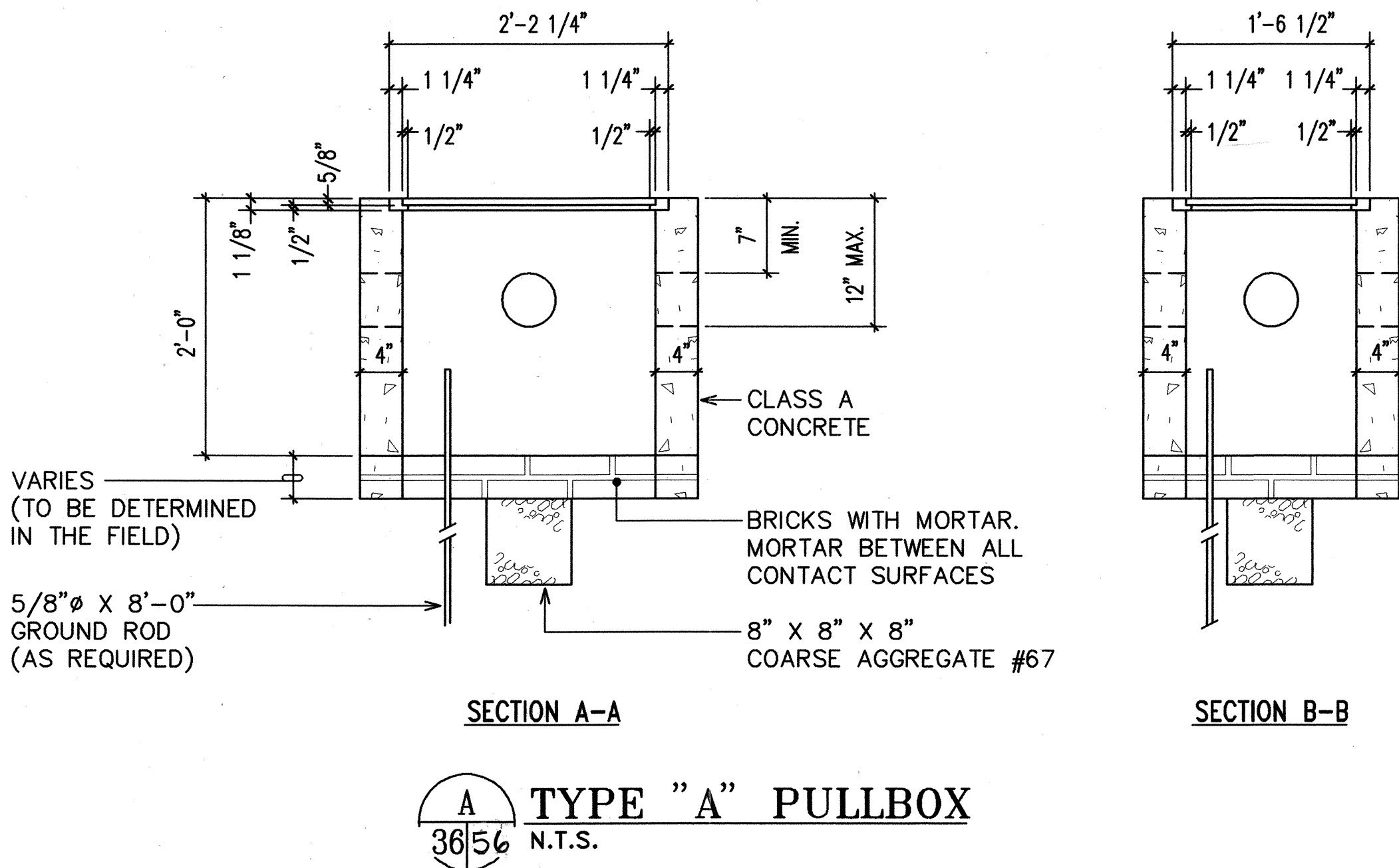
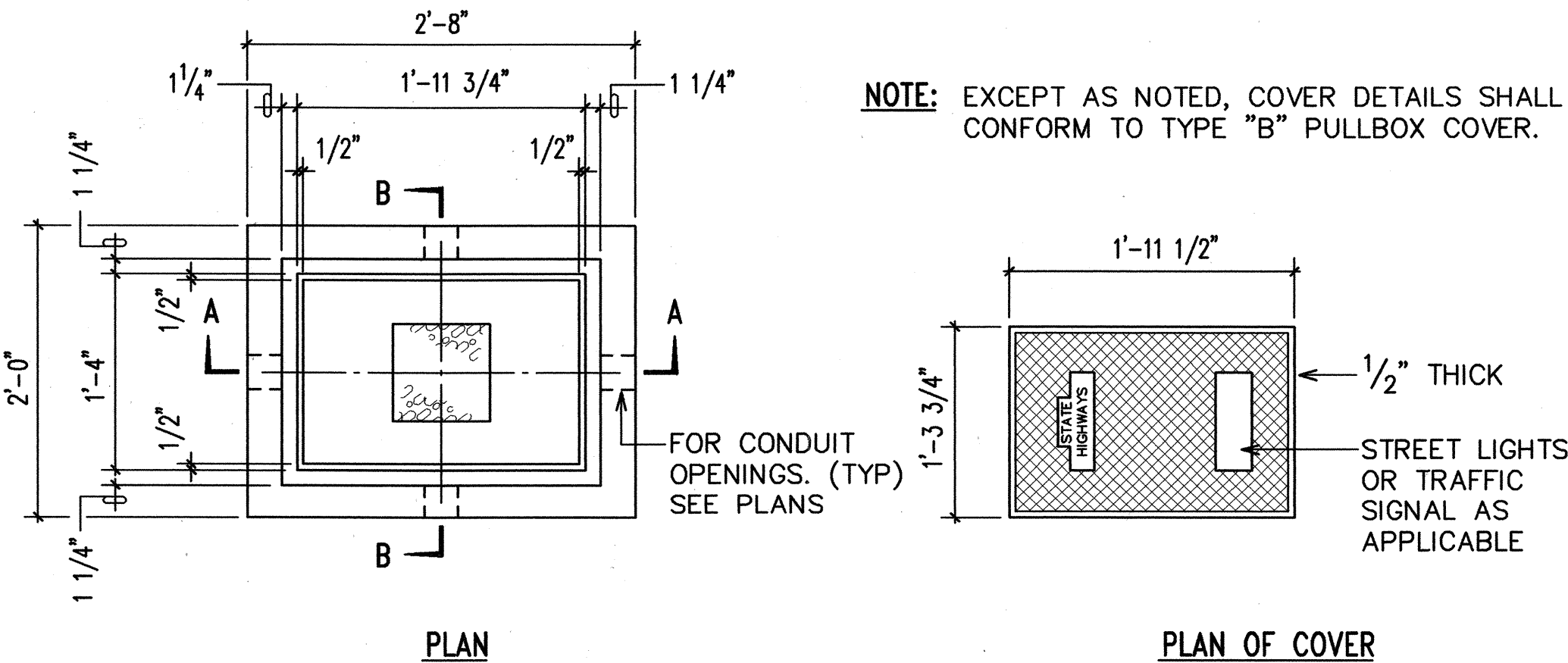
SCALE: AS NOTED DATE: APRIL 1999

SHEET No. 4 OF 5 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

LAST SAVE: 09/16/97 9:00:38 BY: GY/PLT/SE/1-0-01
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-STP-0750(10)	1999	56	97



NOTE: HOT DIP GALVANIZE AFTER FABRICATION. MODIFIED COVER SHALL BE FURNISHED WHEN CALLED FOR ON PLANS.

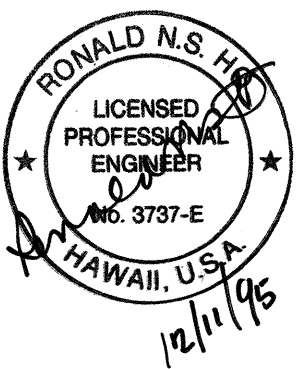
C MODIFIED COVER DETAIL

56/56 N.T.S.

APPROVED:

HAWAIIAN ELECTRIC CO. DATE

DATE



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**PULLBOX DETAILS,
MISCELLANEOUS
STREET LIGHT DETAILS**

KUNIA ROAD WIDENING; AND
H-I, KUNIA I.C., RAMP KO WIDENING
F.A.I. PROJECT NO. IM-STP-0750(10)

SCALE: AS NOTED DATE: APRIL 1999

SHEET No. 5 OF 5 SHEETS

ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	

No. 12/11/95
Last Date: 12/11/95
GLADWIN PROJECTS 881450.MS2