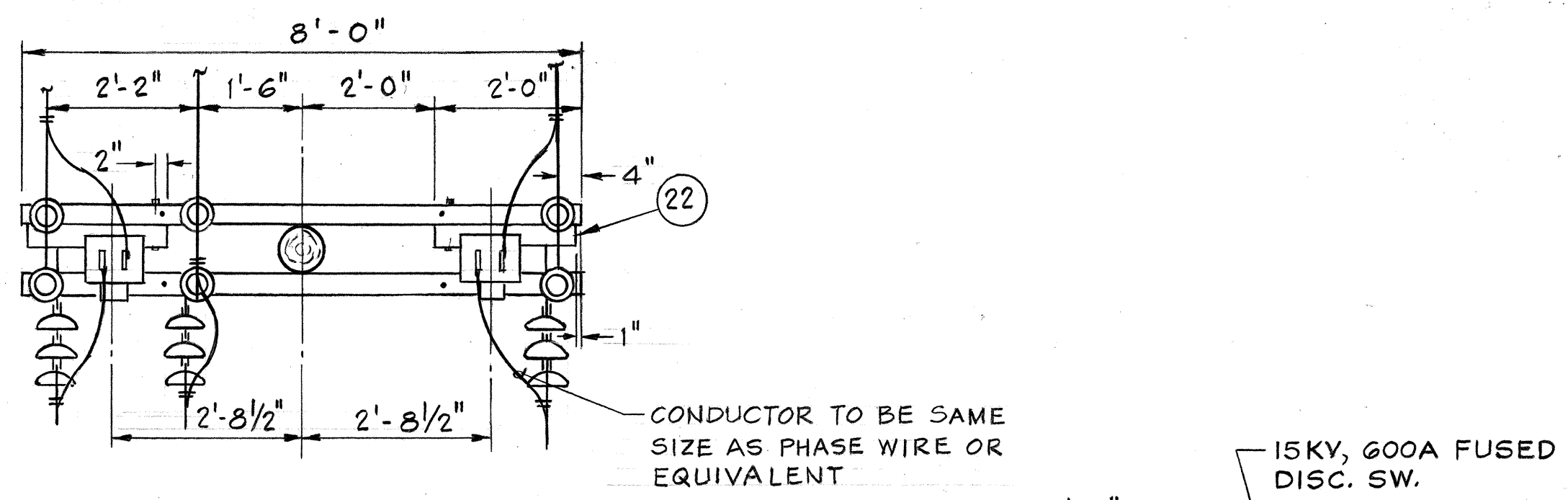
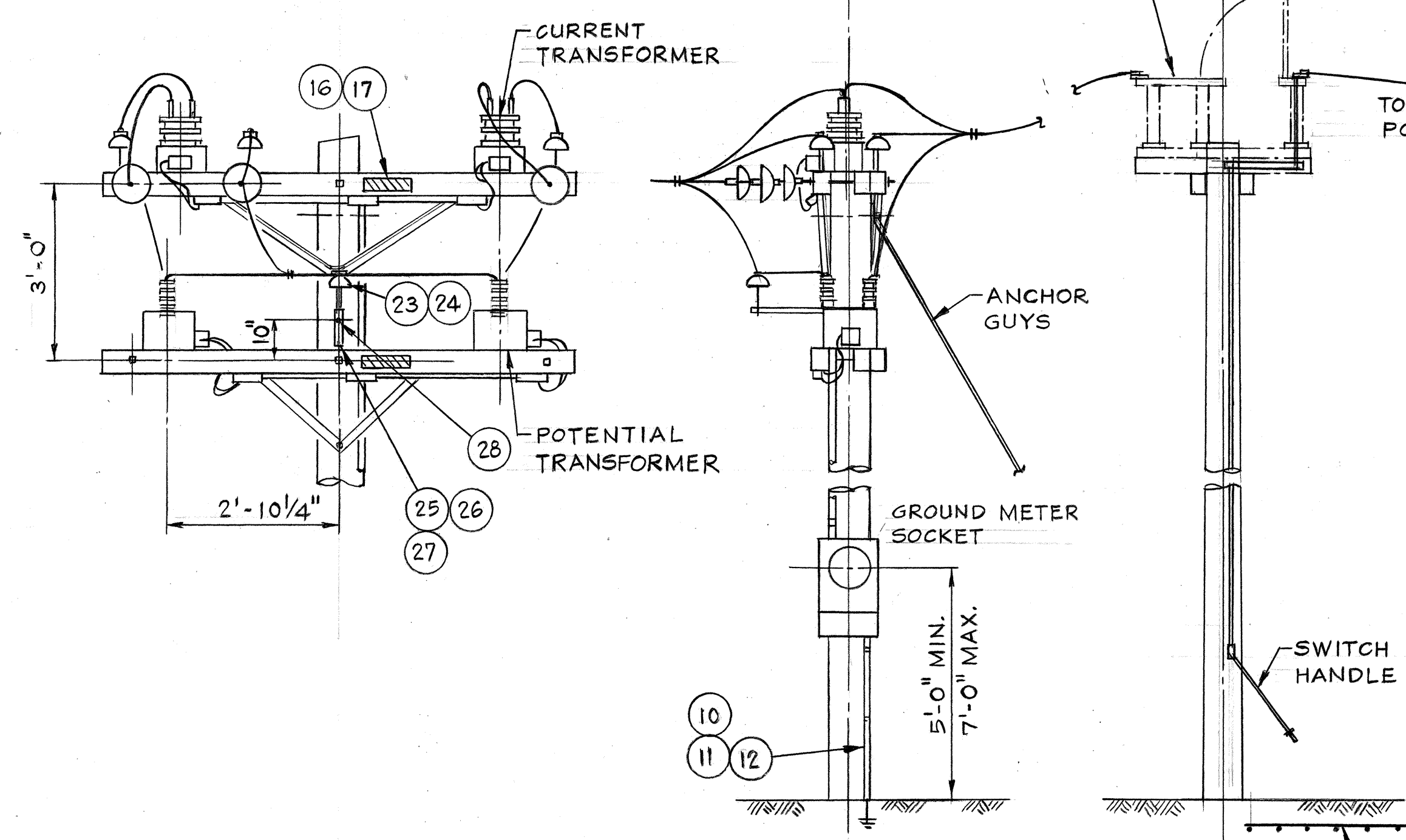




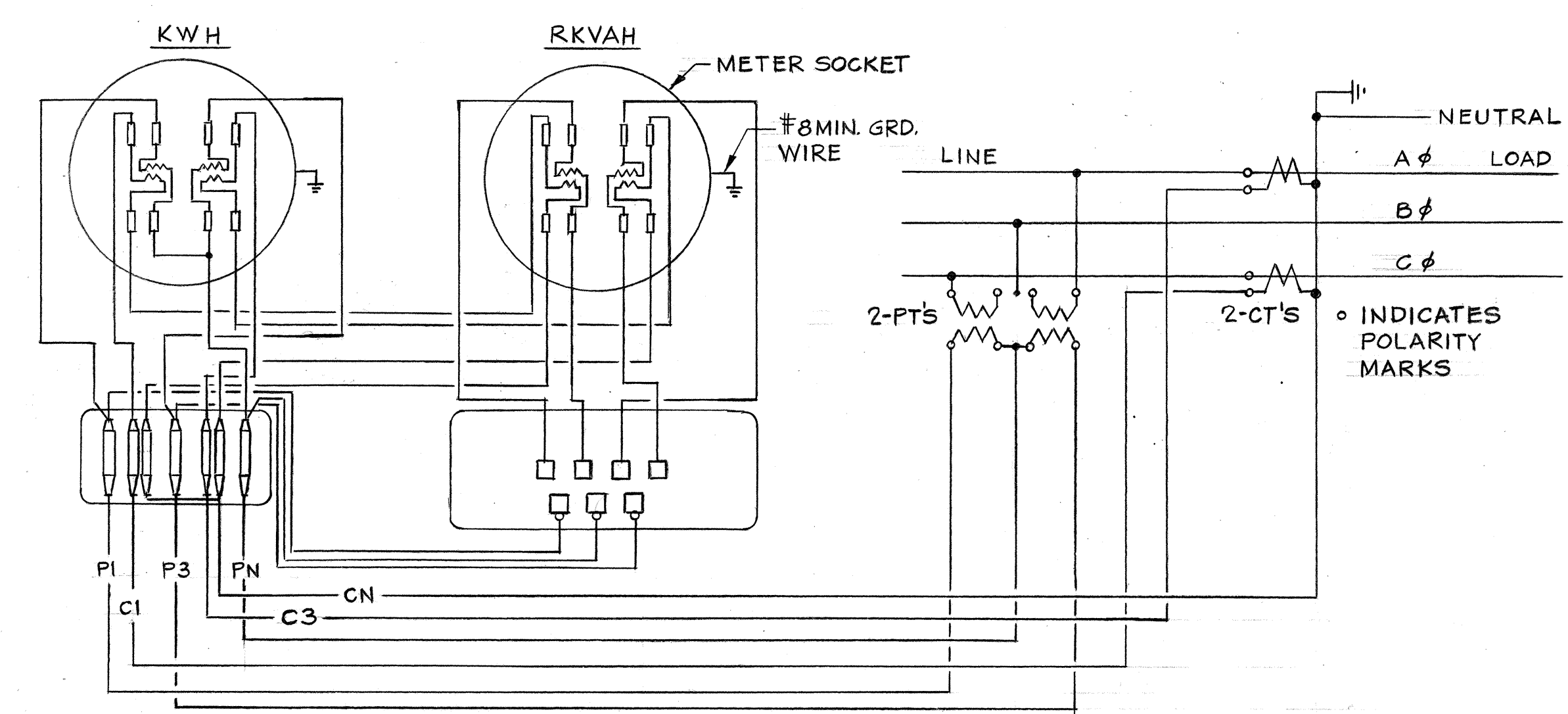
PLAN



FRONT VIEW

SIDE VIEW

3Ø 3 WIRE 11.5 KV & 12.47 KV



3Ø 3 WIRE DELTA WIRING DIAGRAM

POLE LINE MATERIAL LIST (NOTE 6)

ITEM NO	DESCRIPTION
1	ANGLE BRACE - GALV., 6'-3 1/2" L
2	CROSSARM - DOUGLAS FIR, 4" x 5" x 8'-0"
3	MACHINE BOLT - GALV., SQ HEAD & NUT 5/8" x 18"
4	WASHER - 2" SQUARE, GALV., 1/16" HOLE
5	MACHINE BOLT - GALV., SQ HEAD & NUT 1/2" x 8"
6	WASHER - 2" SQUARE, GALV., 5/8" HOLE
7	LAG SCREW - GALV., FETTER, 5/8" x 5"
8	POST TOP INSULATOR
9	MACHINE BOLT - GALV., SQ HEAD & NUT 5/8" x 24"
10	1 1/2" REDWOOD MOLDING
11	NO. 6 AWG BARE CU. SOLID GROUND WIRE
12	STAPLES, 11 GAUGE, 1 1/4"
13	GALV. DROP-FORGED CLEVIS
14	STUD FOR POST INSULATOR
15	CONDUCTOR CLAMP FOR INSULATOR
16	SIGN "HIGH VOLTAGE" - PLASTIC YELLOW
17	NAIL, SHINGLE, AL., 1 1/4" x 3D STD.
18	EYELET, CLEVIS, GALV., 1/16" HOLE
19	INSULATOR, SUSPENSION, PORC, 4 1/4" GALV. CAP
20	THIMBLE, DEADEND, AL., W/ GALV. COTTER BOLT & STAINLESS STEEL PIN
21	BOLT, DOUBLE ARMING, GALV. 5/8" x 24"
22	BLOCK ARM 3 1/2" x 4 1/2" x 2'-0"
23	INST. POST, PIN TYPE 12KV
24	PIN, INS., GSH GALV. 7 1/2", 1" LEAD THD.
25	SUPPORT BUS, GALV. 16"
26	BOLT, M GALV. 1/2" x 10"
27	WASHER, RND., GALV. 16"
28	SCREW, LAG GALV. 1/2" x 4"
29	GUY GUARD, ROUND, PLASTIC, 8'-0" COLORED YELLOW
30	GUY POLE ATTACHMENT
31	ANCHOR ROD - DOUBLE EYE, 3/4" x 8'-0"
32	3-BOLT GUY CLAMP
33	ROCK ANCHOR EXTENTION 1" x 5'-11"
34	ROCK ANCHOR & WEDGE 1" x 1'-6"
35	SCREW TYPE ANCHOR, THIMBLE-EYE, 3/4" DIA. x 8' LONG & HOT DIP GALVANIZED
36	STRAIGHT BIGHT DEADEND
37	PARALLEL GROOVE CLAMP
38	GROUND ROD, COPPER-ENCASED, STEEL ROD 3/4" DIA. x 10' LONG & HOT DIP GALVANIZED

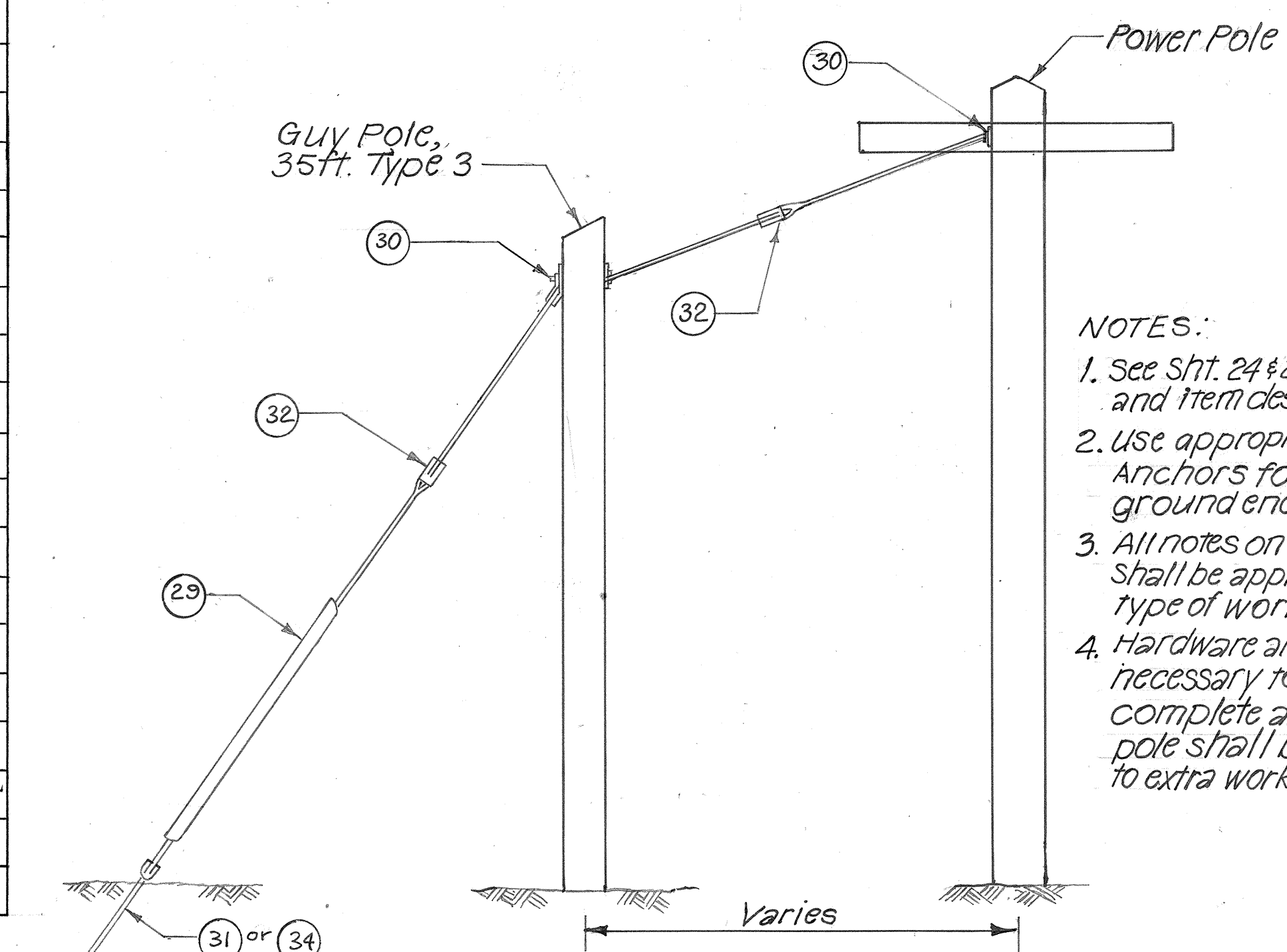
SYMBOL LIST

- ⊙ GROUND ROD
- ⊗ GROUND TEST WELL
- GROUND CONDUCTOR
- GROUND CONNECTION, WELDED
- OVERHEAD POLE & POWER LINE
- POLE ANCHOR
- FENCE, 8' HIGH

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1 (37)	1988	24	26

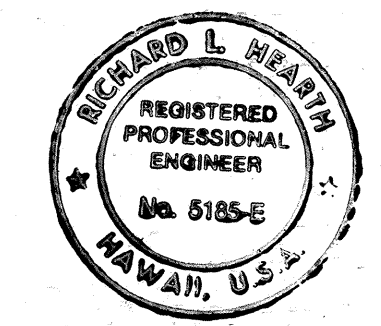
NOTES:

1. PRIMARY METERING EQUIPMENT SHALL NOT BE INSTALLED ON JOINTLY USED POLES OR ON HECO LINE POLES.
2. THE SECONDARY WINDINGS OF POTENTIAL AND CURRENT TRANSFORMERS SHALL BE GROUNDED. THE MINIMUM SIZE GROUNDING CONDUCTOR SHALL BE NO. 6 BARE COPPER.
3. METER EQUIPMENT SHALL BE RAIN-TIGHT.
4. MAINTAIN 4'-0" CLEARANCE IN FRONT OF METER SOCKET.
5. METERING EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH HECO REQUIREMENTS. REFER TO HECO ELECTRICAL SERVICE INSTALLATION MANUAL PP 55-58 FOR ADDITIONAL METERING REQUIREMENTS.
6. ONLY MAJOR ITEMS ARE DESCRIBED. FURNISH & INSTALL HARDWARE & EQUIPMENT NECESSARY TO PROVIDE A COMPLETE OVER-HEAD POWER LINE.



- NOTES:
1. See Sht. 24 & 25 for details and item descriptions.
 2. Use appropriate Guy Anchors for type of ground encountered.
 3. All notes on Shts. 24 & 25 shall be applicable to the type of work shown.
 4. Hardware and material necessary to provide a complete and functional pole shall be incidental to extra work item.

GUY POLE INSTALLATION N.T.S.



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
Richard L. Heath

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**OVERHEAD POWER LINE
POLE METERING DETAILS**

**HALAWA AND HAIKU
EXPLORATORY TUNNEL**

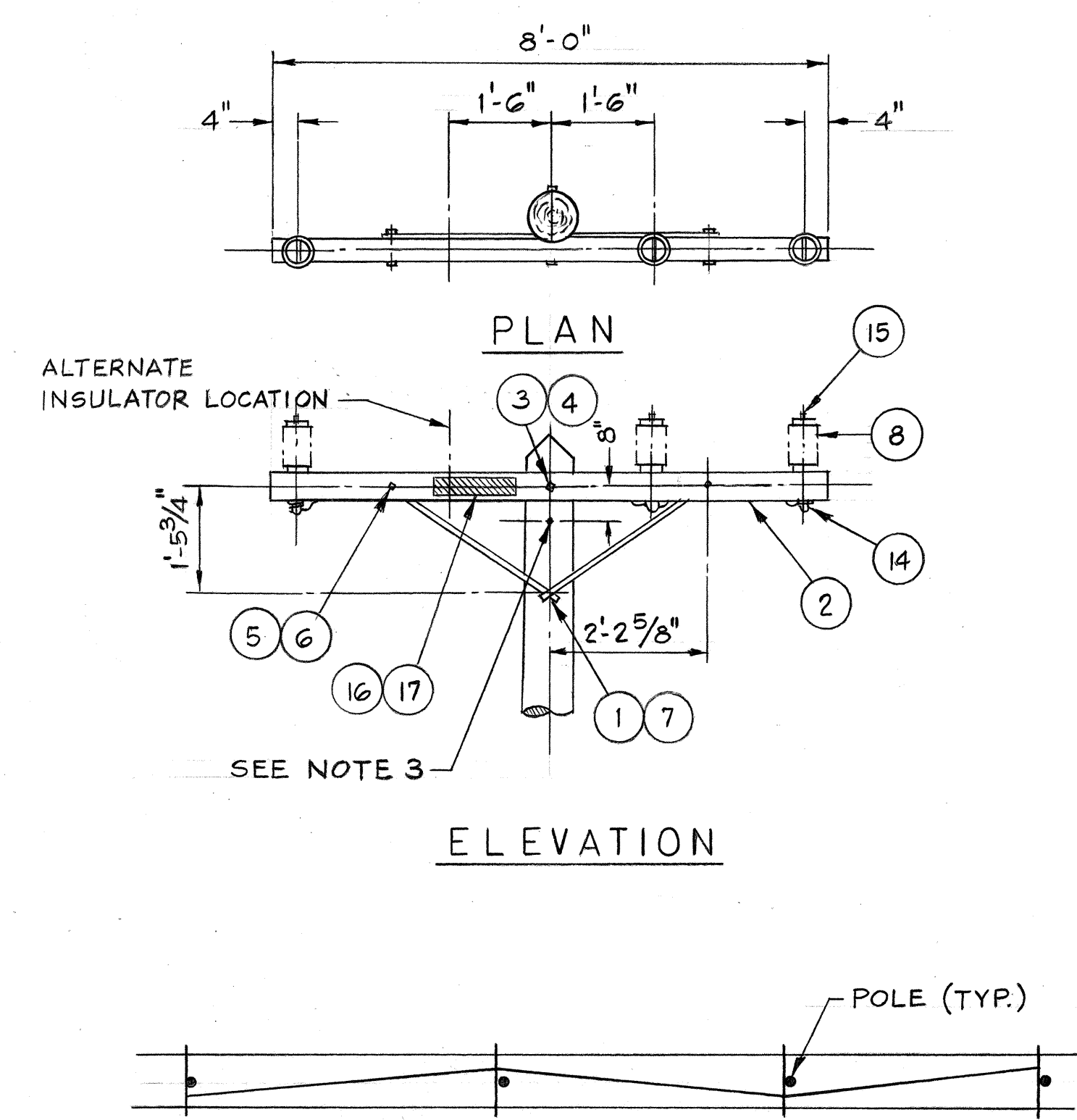
INTERSTATE ROUTE H-3
F.A.I. PROJECT NO. I-H3-1 (37)

SCALE: NONE DATE: AUG. 1988

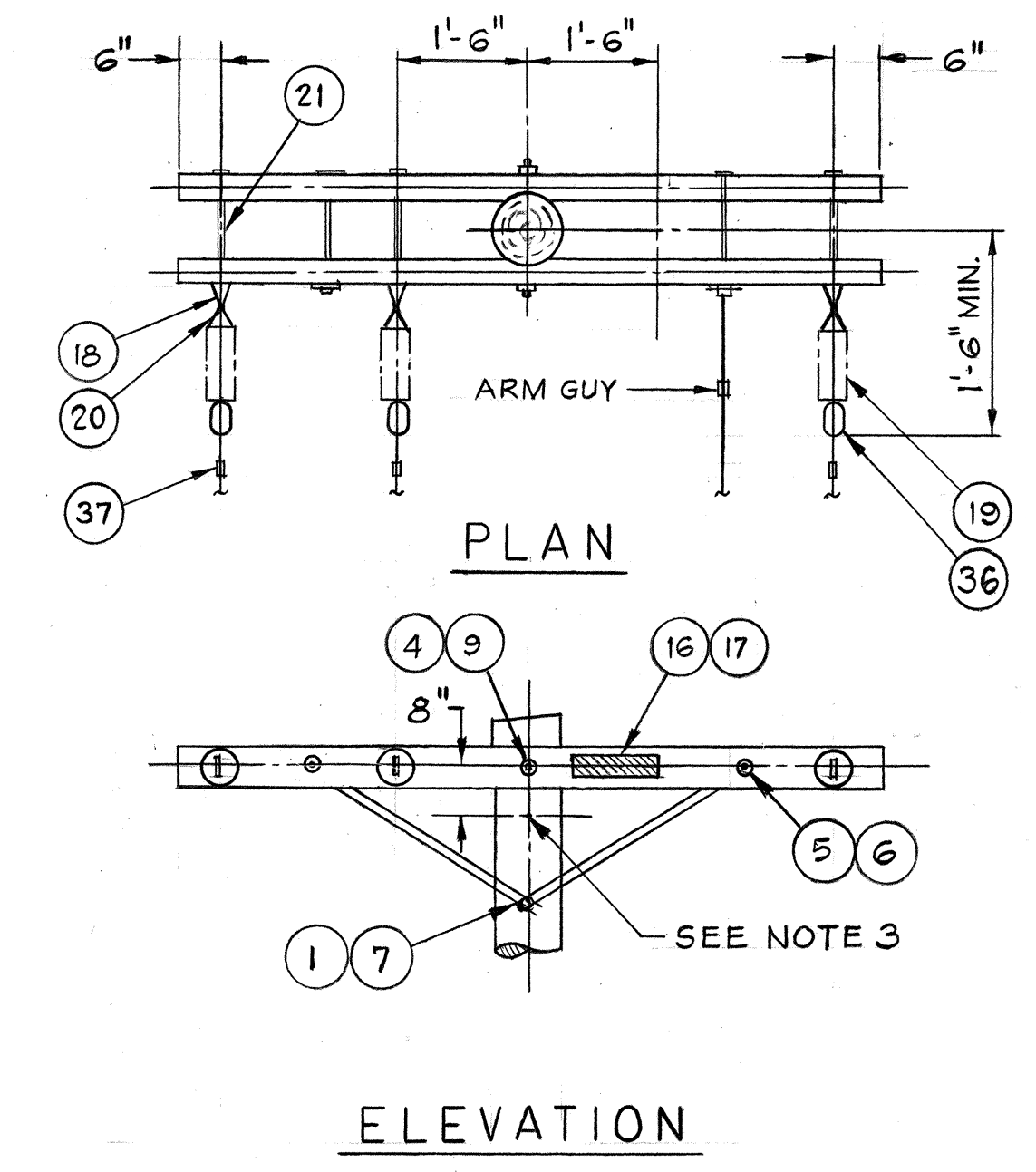
SURVEY PLOTTED BY: _____ DATE: _____
 DRAWN BY: _____
 DESIGNED BY: _____
 CHECKED BY: _____
 ORIGINAL PLAN: _____
 NOTE BOOK: _____
 NO. _____

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(37)	1988	25	26

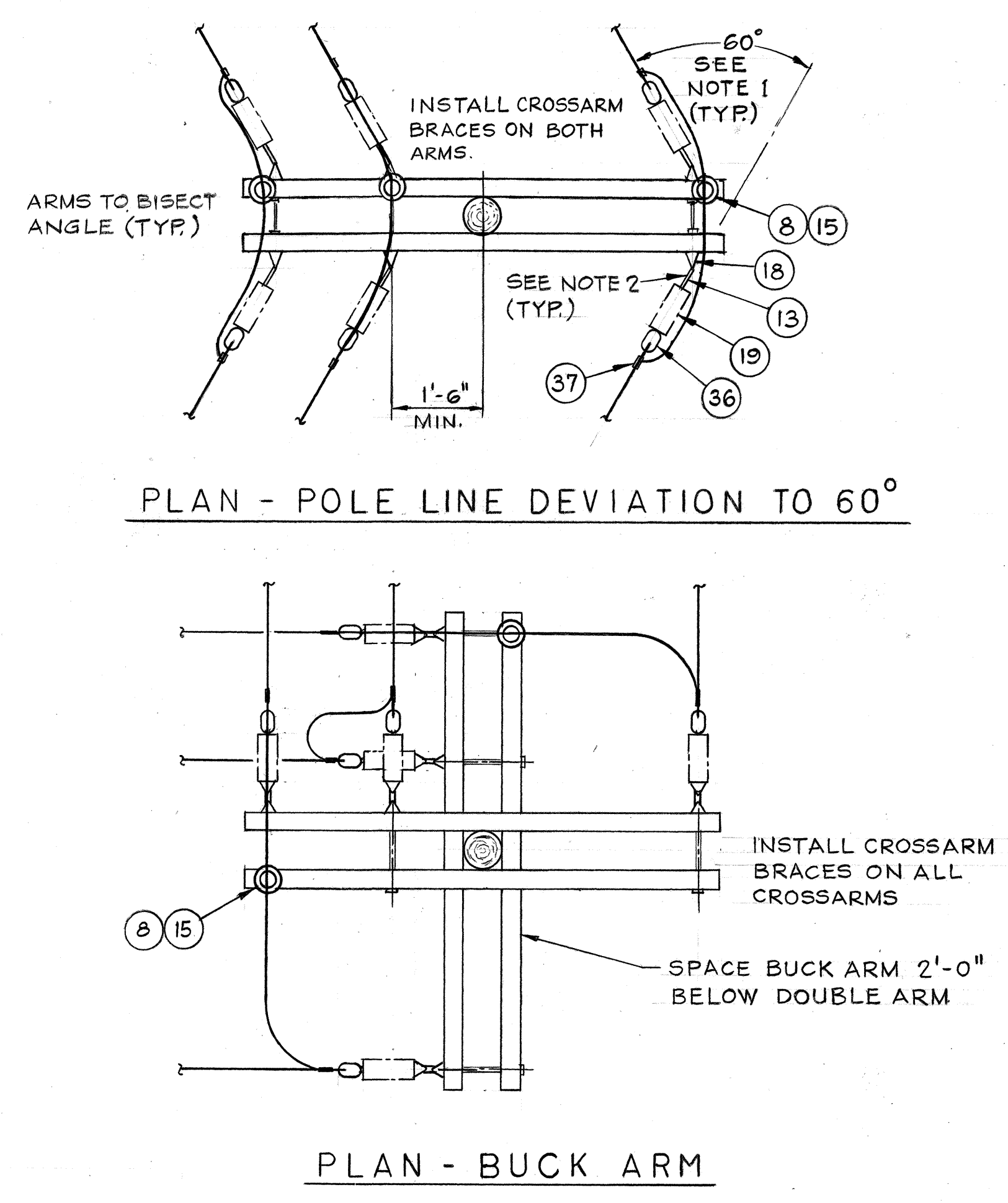
- NOTES:
1. THIS CONSTRUCTION SHALL BE LIMITED TO A DEVIATION ANGLE OF 60°.
 2. INSTALL GALV. DROP FORGED CLEVIS BETWEEN EYELET AND INSULATOR WHERE THE DEVIATION ANGLE OF THE POLES IS LESS THAN 60°.
 3. POINT OF GUY ATTACHMENT WHEN REQUIRED.
 4. MAXIMUM POLE SPAN SHALL BE 270' USING #3/0(AAAC). THE RESULTANT TENSION SHALL NOT EXCEED 400LBS. WITH A SINGLE INSULATOR AND 800LBS WITH A DOUBLE INSULATOR.



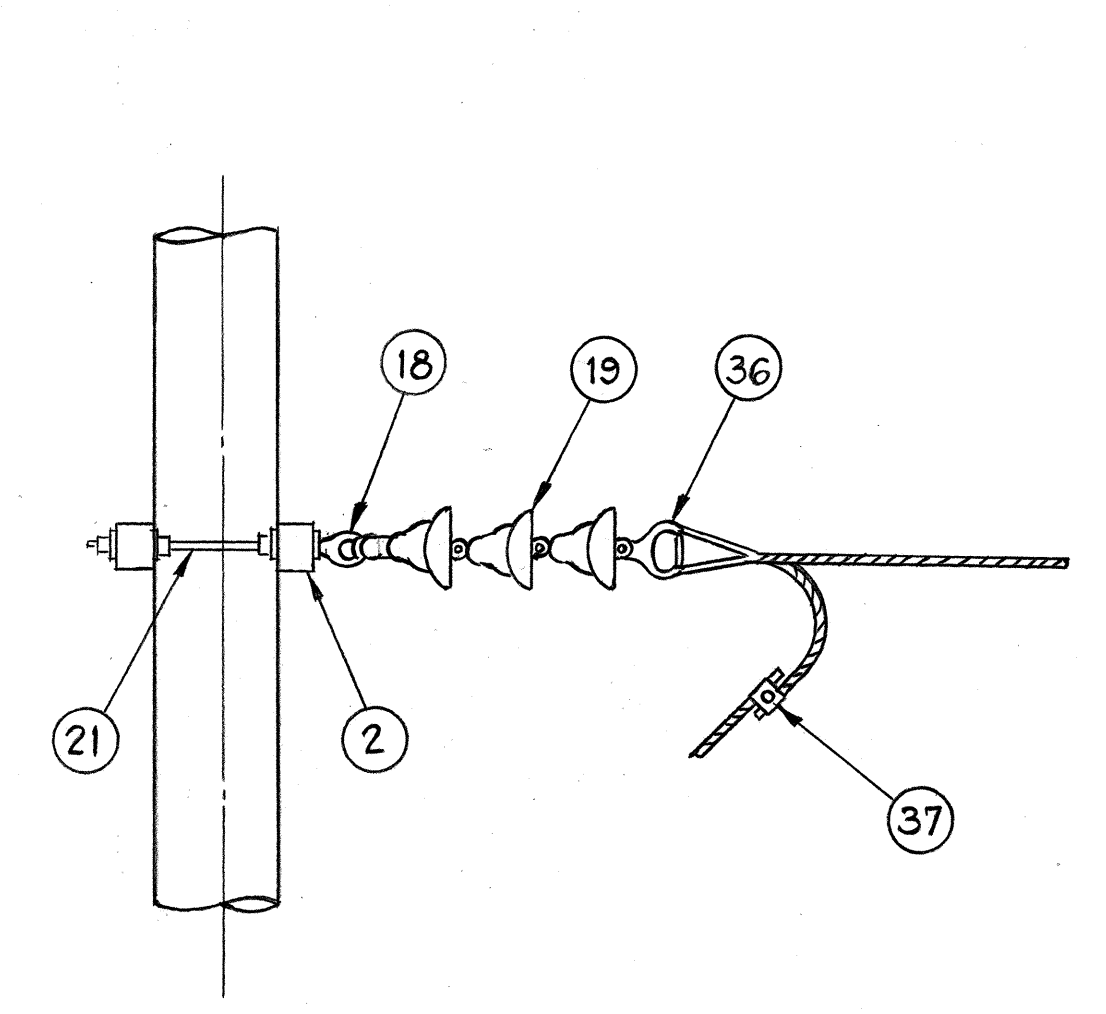
STAGGERING OF CENTER CONDUCTOR



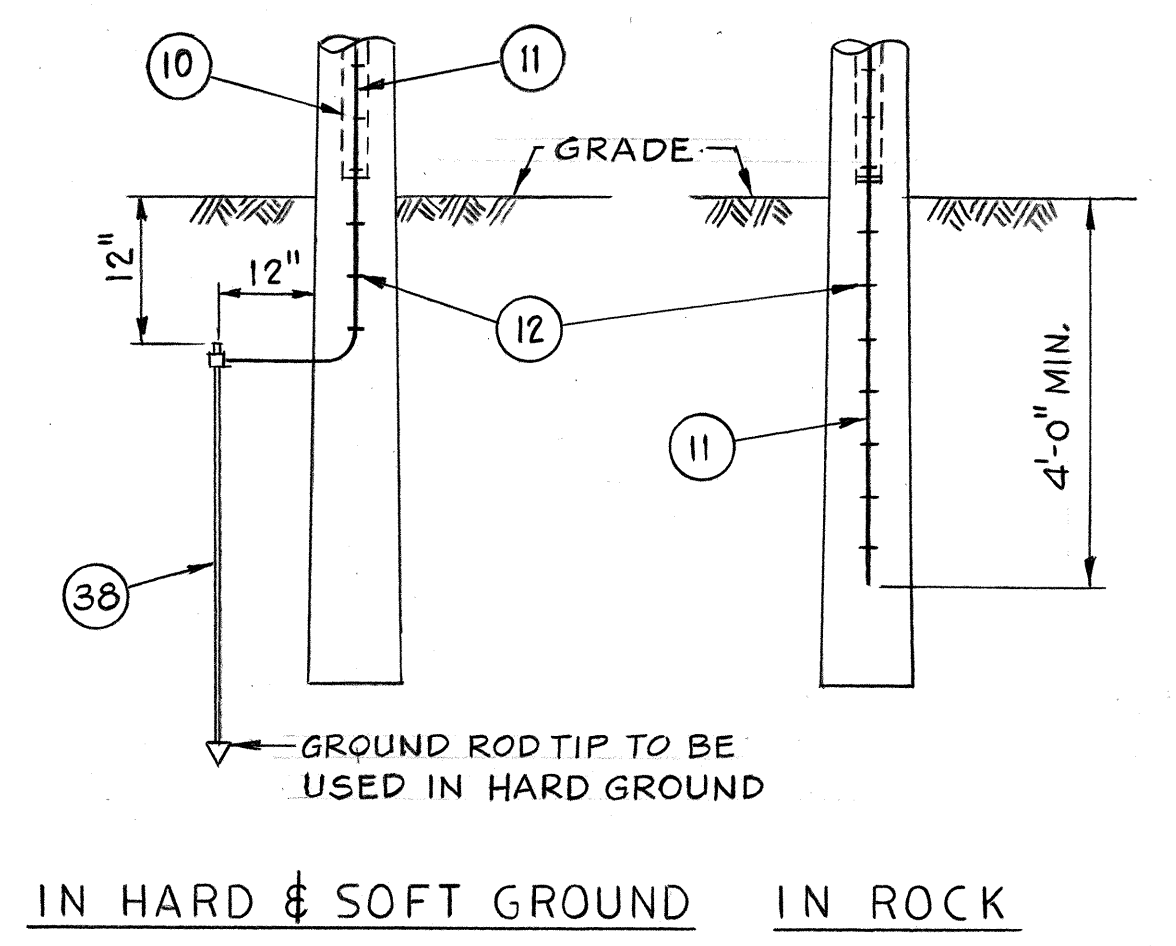
DOUBLE ARM DEADEND DETAIL



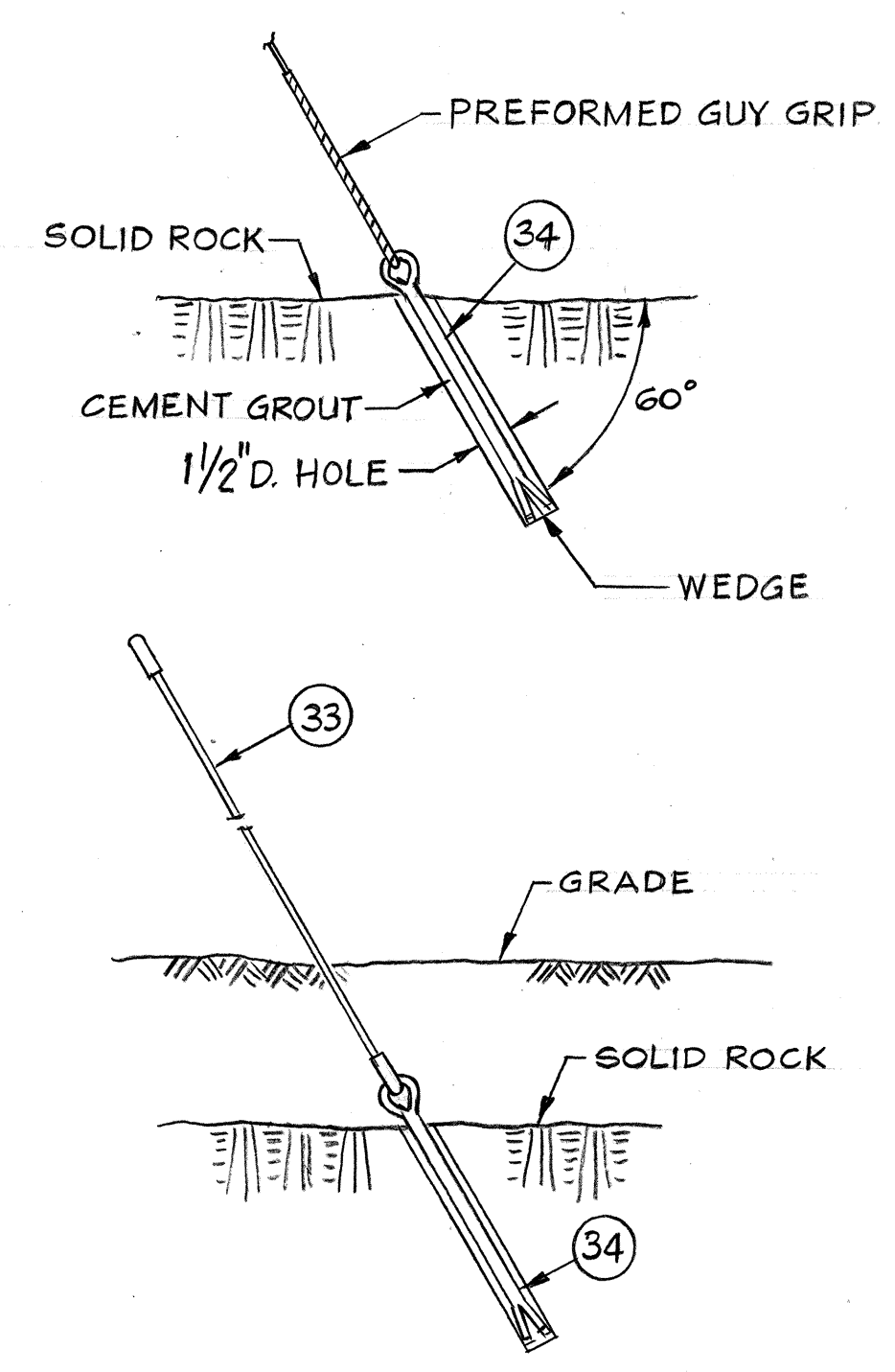
POLE LINE DEVIATION DETAILS



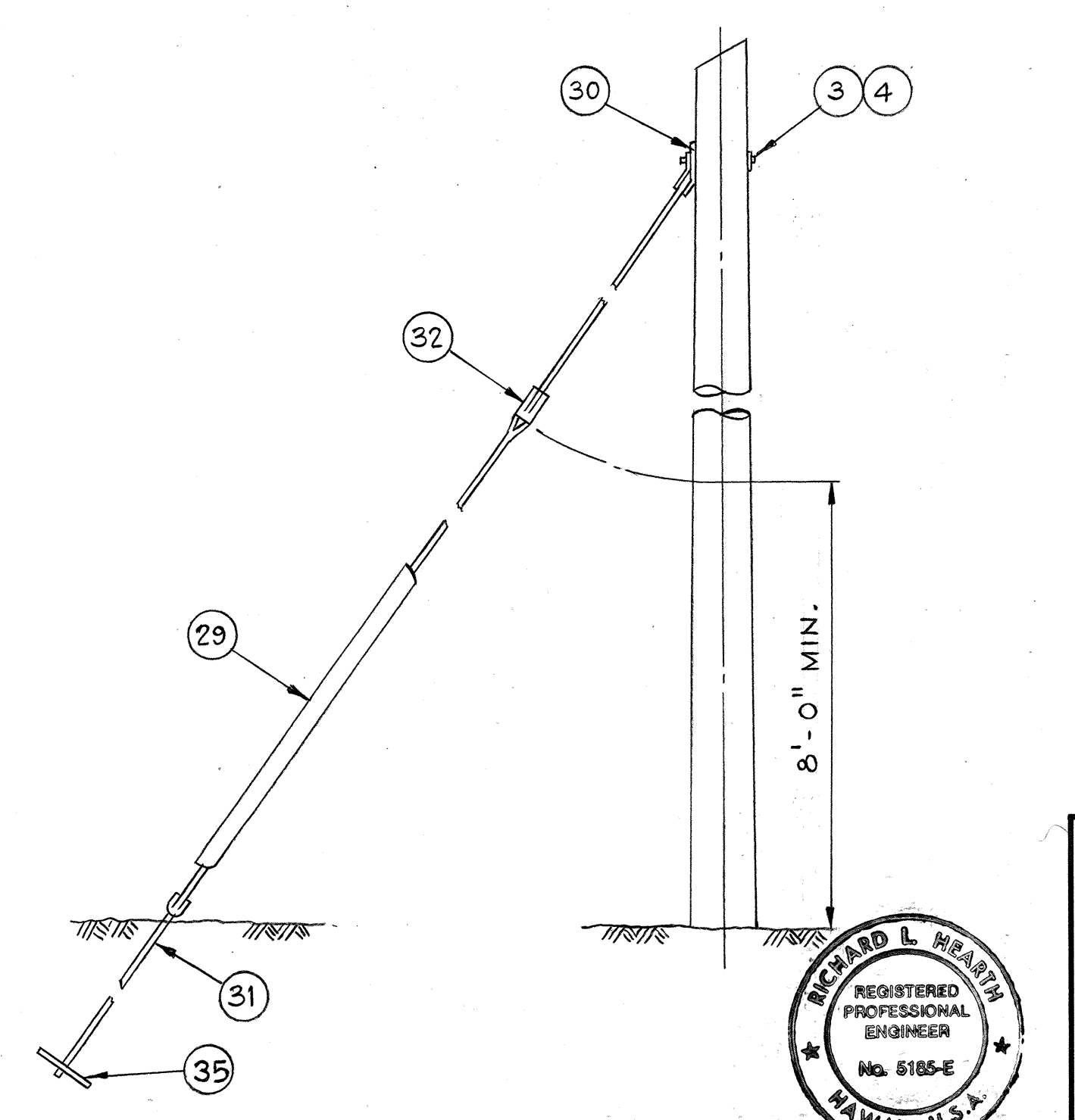
DEADEND DETAIL



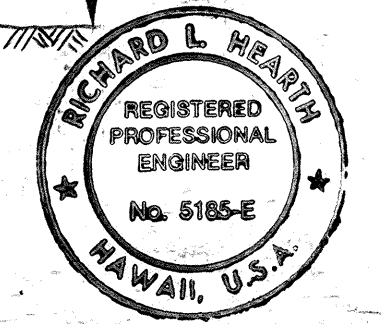
GROUNDING DETAILS



ROCK ANCHOR DETAILS



DOWN GUY DETAIL IN SOIL



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**OVERHEAD POWER LINE
POWER LINE DETAILS**

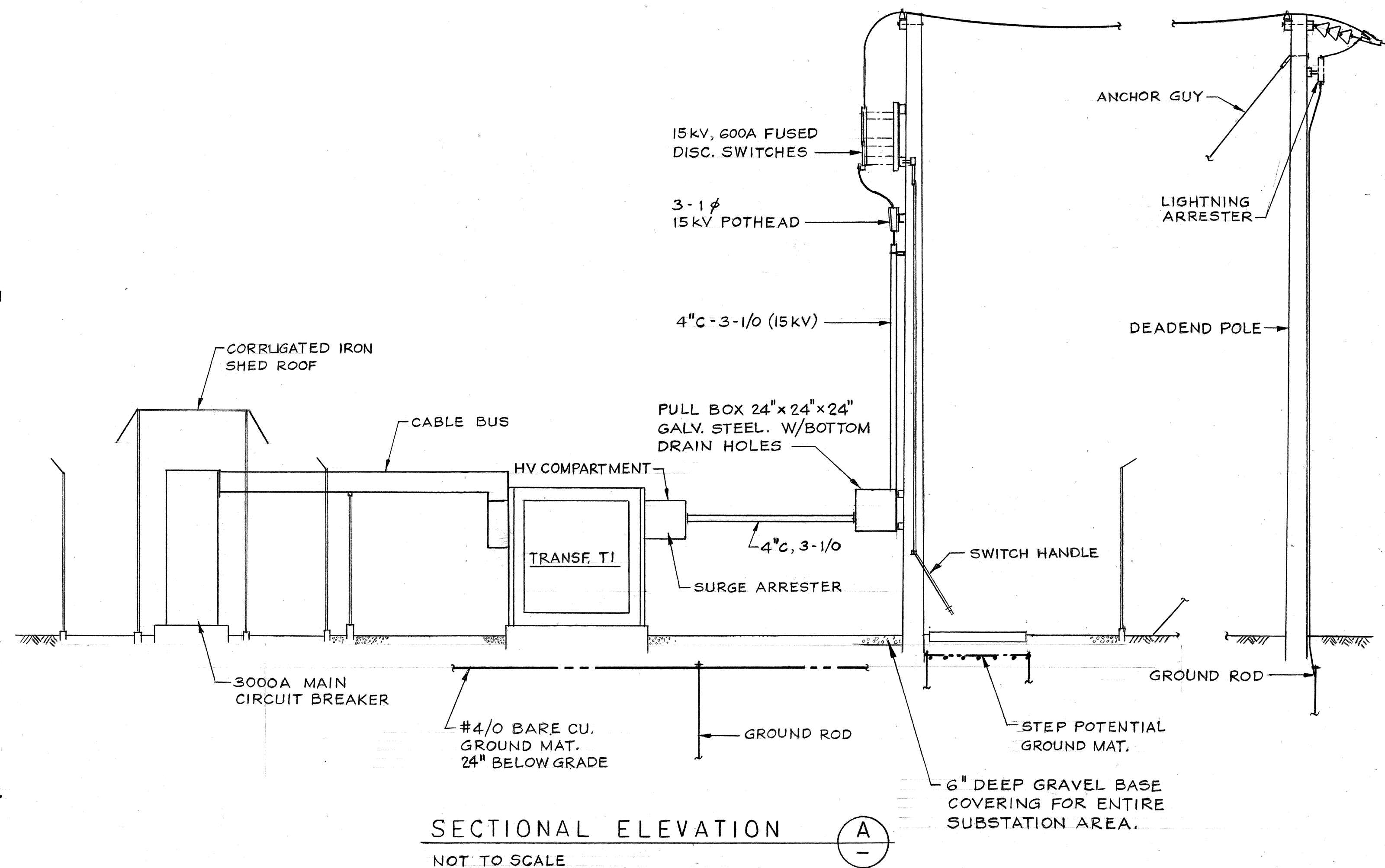
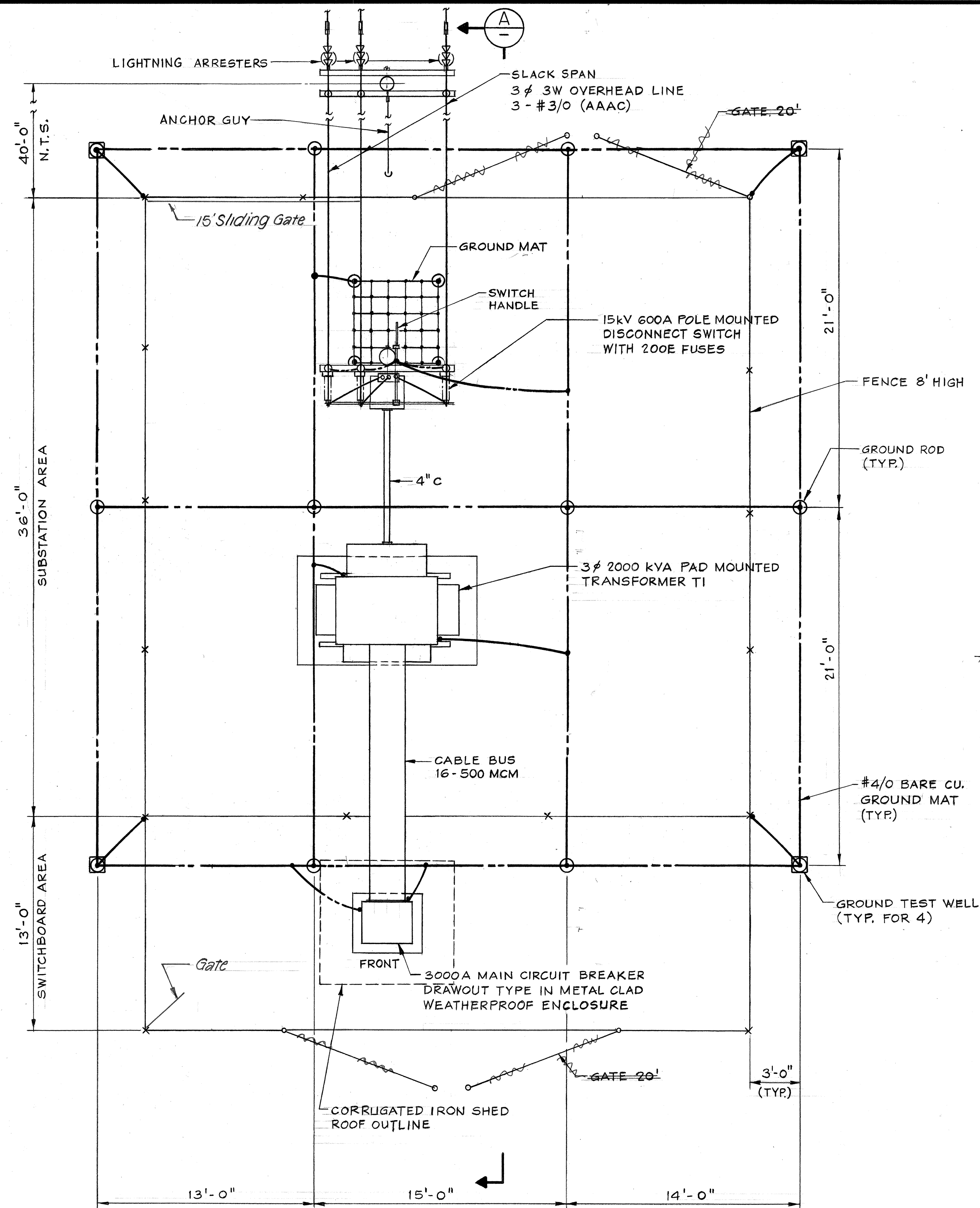
**HALAWA AND HAIKU
EXPLORATORY TUNNEL**

INTERSTATE ROUTE H-3
F.A.I. PROJECT NO. I-H3-1(37)

SCALE: NONE DATE: AUG. 1988

SHEET OF SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1 (37)	1988	26	26



ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DESIGNED BY	
TRACED BY	
NOTE BOOK	
QUANTITIES BY	
CHECKED BY	
No.	



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
Richard L. Heath

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**OVERHEAD POWER LINE
SUBSTATION LAYOUT
HALAWA AND HAIKU**
EXPLORATORY TUNNEL
INTERSTATE ROUTE H-3
F.A.I. PROJECT NO. I-H3-1(37)
SCALE: AS NOTED DATE: AUG. 1988
SHEET OF SHEETS