

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(88):13	1971	175	457

PLAN LEGEND

SYMBOL	REPRESENTS	DETAIL NO.	NOTE NO.
D-7 250W-A1 36+97 A-B	LTG STD W/250 WATT LUMINAIRE & FND (CLAMP #D-7; FDR A-1; PHASES A & B; STA 36+97)	2/8E 5/9E	G1
700W	LTG STD W/700 WATT LUMINAIRE & FND	2/8E 5/9E	G1
700W	LTG STD W/TWO 700 WATT LUMINAIRES & FND	2/8E 1/12E	G1
700W	LTG STD W/TWO 700 WATT LUMINAIRES & ANCHORAGE	2/8E	
700W	LTG STD W/700 WATT LUMINAIRE & ANCHORAGE	2/8E 1/10E	
1000W	LTG STD W/TWO 1000 WATT LUMINAIRES & FND	2/8E 1/12E	G1
C-A	ILLUMINATED SIGN CONNECTED TO PHASES C & A OF THE INDICATED CIRCUIT	5/7E	
	SUBSTATION LTG STD WITH LUMINAIRE & FND	3/8E	
WP	RETAIN EXISTING LUMINAIRE ON WOOD POLE		
WP	REMOVE EXISTING LUMINAIRE ON WOOD POLE		G18
	RETAIN EXISTING LUMINAIRE ON METAL STANDARD		
	UNDERPASS LUMINAIRE	5/10E 6/10E	
	CONDUIT RUN IN CONCRETE STRUCTURE OR ENCASED IN CONCRETE	7/9E	G4, G5, G8
	CONDUIT RUN IN EARTH WITHOUT ENCASEMENT		G3, G8
	CAPPED CONDUIT OR CONDUIT TRANSITION AS PLAN INDICATES	6/9E	G11
	CONDUIT TURNING DOWN		
	CONDUIT TURNING UP		
	PULL BOX TYPE A	1/11E 2/11E	
	PULL BOX TYPE B	3/11E	
	PULL BOX TYPE S	1/11E	
M	METAL PULL BOX	1/10E	
	PULL BOX TYPE B FOR TRAFFIC SIGNAL SYSTEM		
SIZE AS NOTED	BARE GROUND CABLE RUN IN EARTH BARE GROUND CABLE RUN IN CONCRETE	4/8E	
E	RETAIN EXISTING UNDERGROUND LTG CONDUCTORS		
EX	CUT FREE AND REMOVE OR ABANDON EXISTING UNDERGROUND LTG CONDUCTORS		
	ELECTRICAL SUBSTATION	4/8E	
	GROUND ROD	4/8E	
OA	WOOD POLE W/IDENTIFYING LETTER	1/15E	
	POLE MOUNTED TRAFFIC SIGNAL	1/15E	
	SPAN WIRE MOUNTED TRAFFIC SIGNAL	1/15E	
(E)	USED IN CONJUNCTION WITH OTHER SYMBOL TO INDICATE EXISTING CONSTRUCTION		

GENERAL NOTES

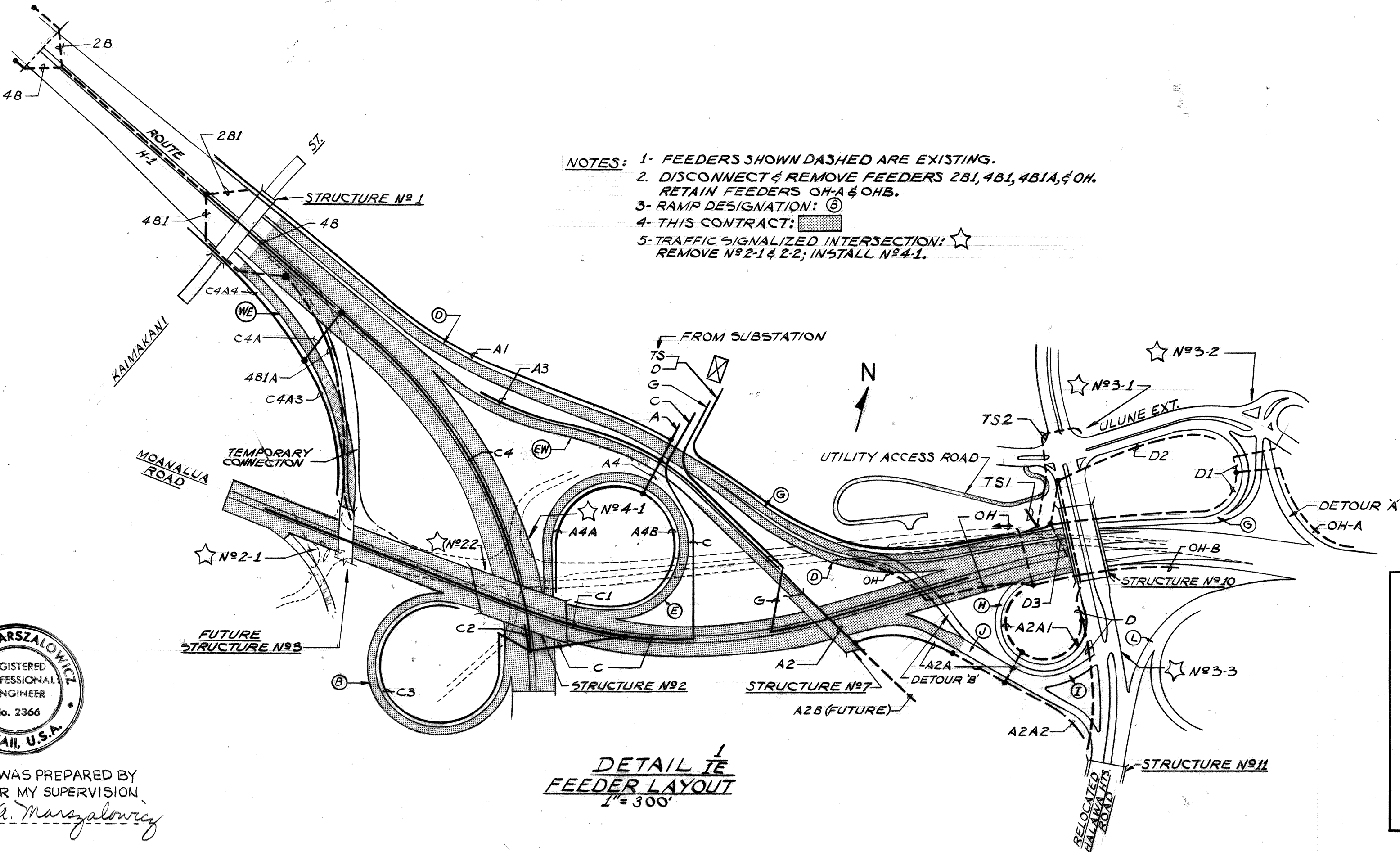
- G1. The indicated locations of lighting standards, conduit and other electrical components may be adjusted as field conditions necessitate.
- G2. Conduit one-inch and smaller shall be RGS or where noted RAL.
- G3. Conduit run in non-paved areas shall be NMC, directly buried.
- G4. Conduit run under roadway shall be PVC or RGS, encased.
- G5. Conduit run in median barrier or other structure shall be NMC unless otherwise noted. See Note G19.
- G6. Provide a conduit expansion/deflection fitting at beginning and end of bridge in runs crossing bridges. See details 8/9E, 9/9E.
- G7. As indicated on plan sheets, all three phase legs shall be run to the indicated pull point to enable future extension.
- G8. Underground lighting feeders shall be run in two-inch conduit except as Notes G14 and G15 provide.
- G9. None
- G10. None
- G11. At locations indicated, connect to existing capped conduit and extend as shown.
- G12. None
- G13. State forces will adjust controller phasing during the Contract Time.
- G14. The conduit containing feeders D and TS shall be three-inch.
- G15. Branch taps to underdeck lighting systems and to sign lighting systems shall be one-inch RGS, concrete encased.
- G16. Connect existing wiring from lighting standard left pigtailed in the indicated pull box to the designated feeder.
- G17. Connect existing wiring from sign left pigtailed at the indicated pull point to the designated feeder.
- G18. Where indicated, remove and stockpile existing State owned facilities.
- G19. Provide a conduit expansion/deflection fitting in all runs embedded in median barrier. See Details 8/9E and 9/9E.

LIST OF ABBREVIATIONS

LTG STD	Lighting Standard
FND	Concrete Foundation for LTG STD
CONC	Concrete
RGS	Rigid Galvanized Steel Conduit
NIC	Not in Contract
FDR	Feeder
LTS	Lights
CKT	Circuit
NMC	Non-metallic Conduit
GND	Ground
NTS	Not to Scale
LUM	Luminaire
PVC	Polyvinylchloride Conduit
RAL	Rigid Aluminum Conduit
FUT	Future

DETAIL (& NOTE) NUMBERING

- 1 Detail (or Note) numbering
2E Sheet No. on which Detail (or Note) appears



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ELECTRICAL SHEET 1E

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN
SYMBOLS AND NOTES

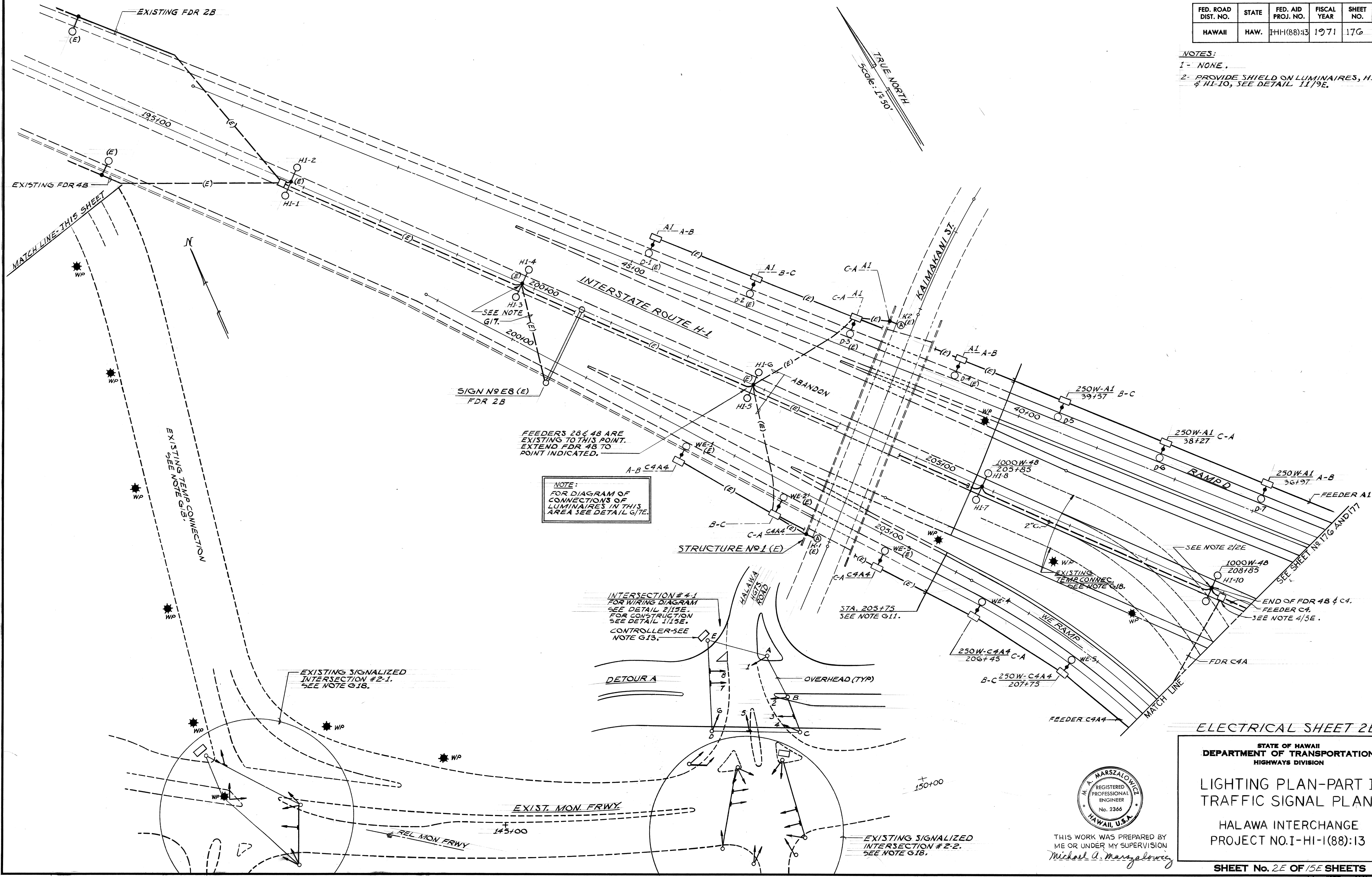
HALAWA INTERCHANGE
PROJECT NO. I-HI-1(88):13

SHEET No. 1E OF 15E SHEETS

175

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	111(88)13	1971	176	457

NOTES:
1- NONE.
2- PROVIDE SHIELD ON LUMINAIRES, H1-9 & H1-10, SEE DETAIL 11/9E.



DATE	_____
SURVEY PLOTTED BY	_____
DRAWN BY	_____
DESIGNED BY	_____
CHECKED BY	_____
NOTE BOOK	_____
No.	_____



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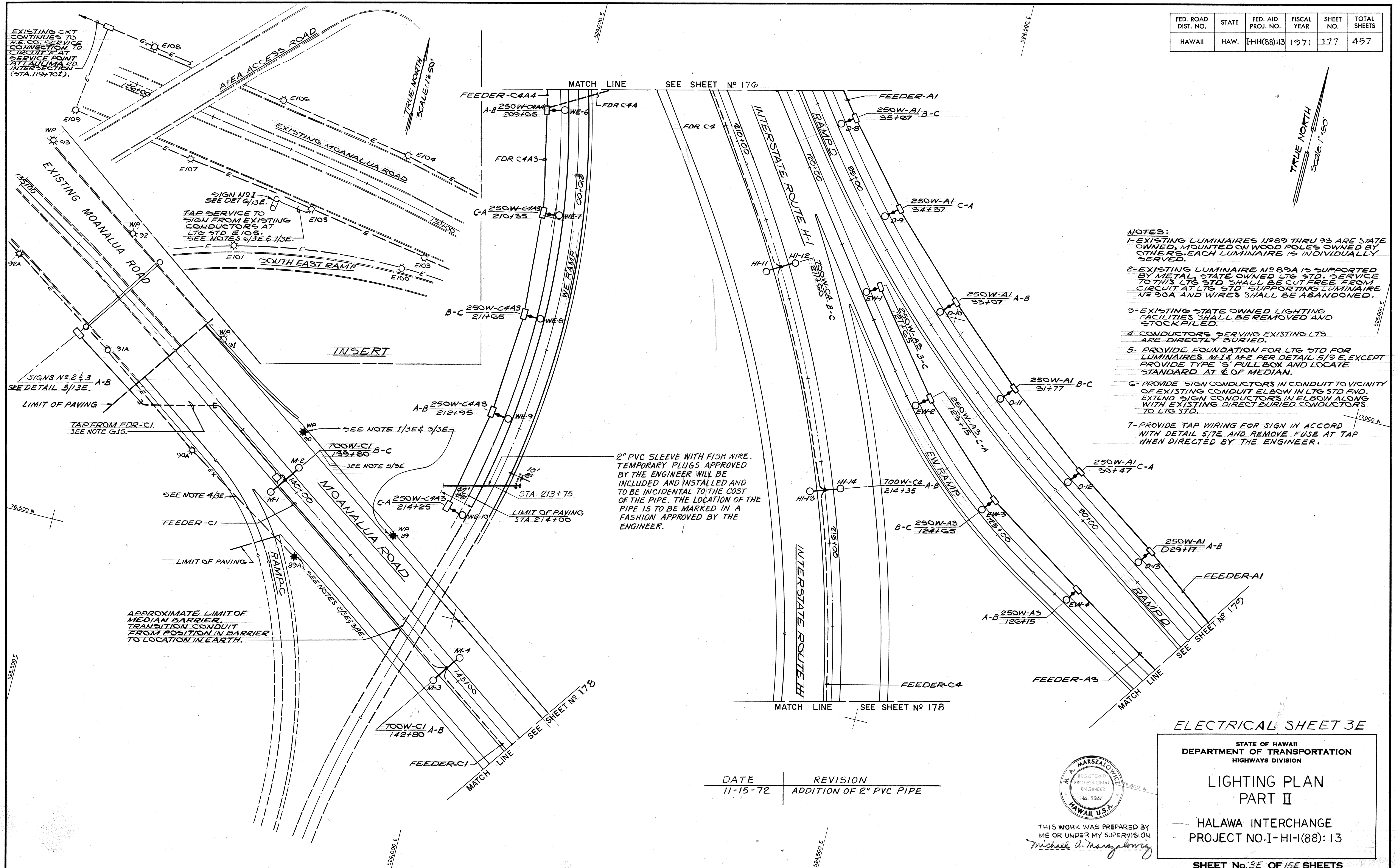
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LIGHTING PLAN-PART I
TRAFFIC SIGNAL PLAN

HALAWA INTERCHANGE
PROJECT NO. I-HI-1(88):13

SHEET No. 2E OF 15E SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	FHH(88)13	1971	177	457



ELECTRICAL SHEET 3E

**STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION**

LIGHTING PLAN

PART II

HALAWA INTERCHANGE
PROJECT NO. I-HI-1(88): I

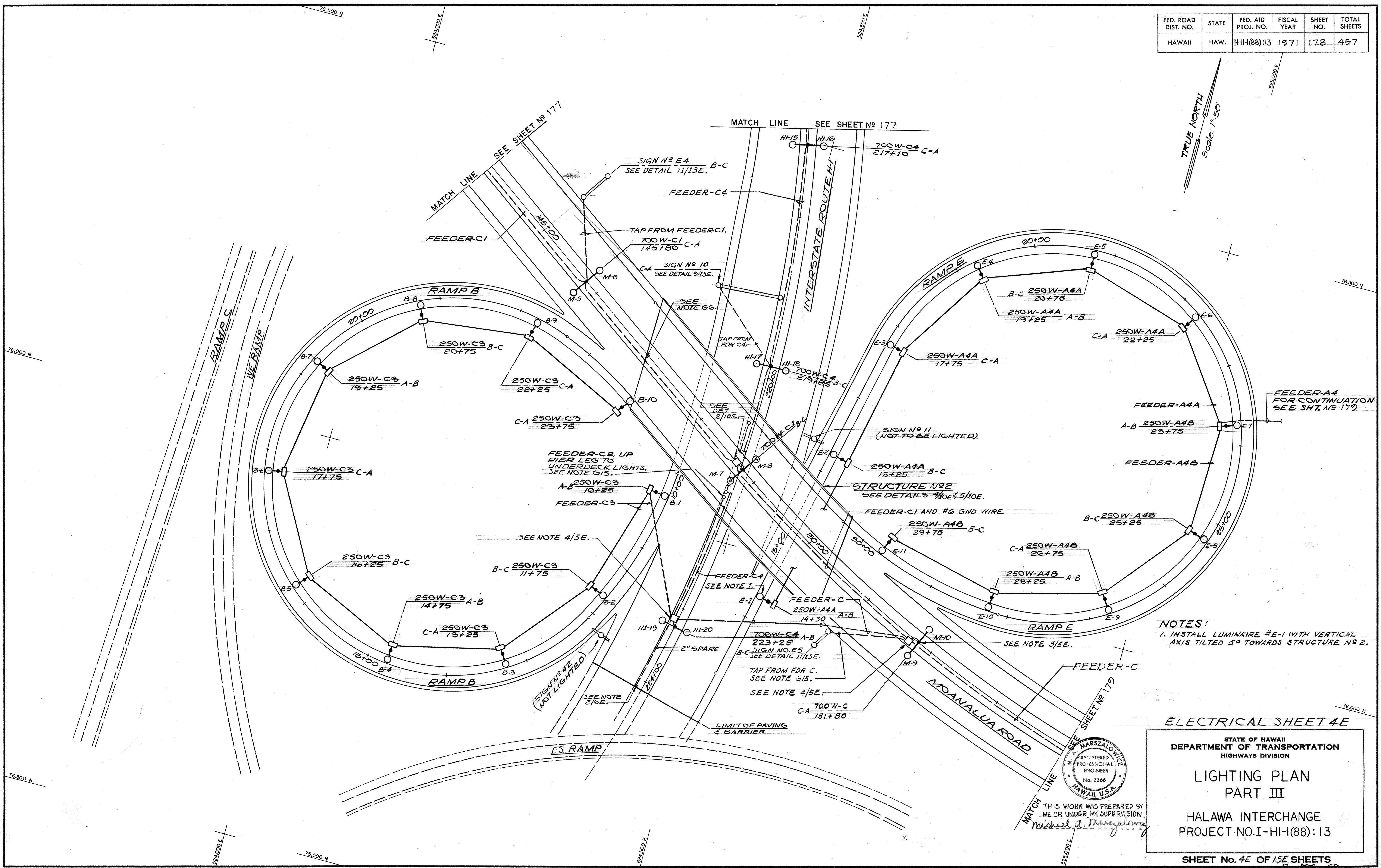
SHEET No. 3E OF 15E SHEET

C.O. 1175

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HIH(88):13	1971	178	457

DATE	_____
SURVEY PLOTTED BY	_____
DESIGNED BY	_____
NOTED BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
No.	_____



NOTES:
1. INSTALL LUMINAIRE #E-1 WITH VERTICAL AXIS TILTED 5° TOWARDS STRUCTURE NO. 2.

ELECTRICAL SHEET 4E

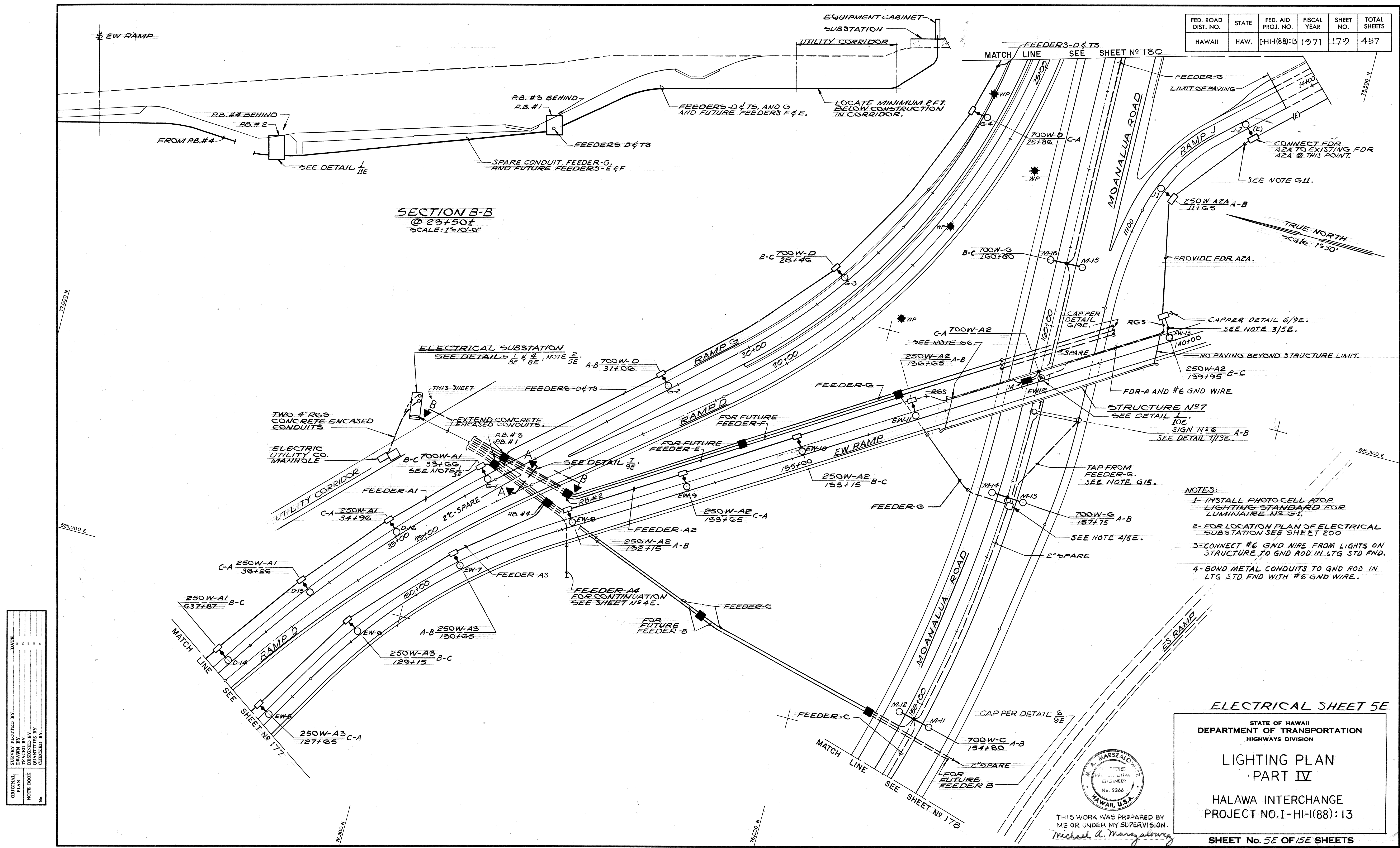
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LIGHTING PLAN PART III

HALAWA INTERCHANGE
PROJECT NO. I-HI-1(88):13

SHEET No. 4E OF 15E SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1HH(88):13	1971	179	457



SECTION B-B
@ 23+50+
SCALE: 1"=10'-0"

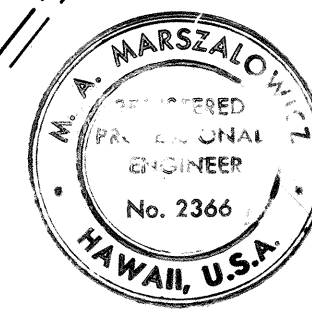
- NOTES:
- 1- INSTALL PHOTO CELL ATOP LIGHTING STANDARD FOR LUMINAIRE N° G1.
 - 2- FOR LOCATION PLAN OF ELECTRICAL SUBSTATION SEE SHEET 200.
 - 3- CONNECT #6 GND WIRE FROM LIGHTS ON STRUCTURE TO GND ROD IN LTG STD FND.
 - 4- BOND METAL CONDUITS TO GND ROD IN LTG STD FND WITH #6 GND WIRE.

ELECTRICAL SHEET 5E

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LIGHTING PLAN
PART IV

HALAWA INTERCHANGE
PROJECT NO. I-HI-(88):13

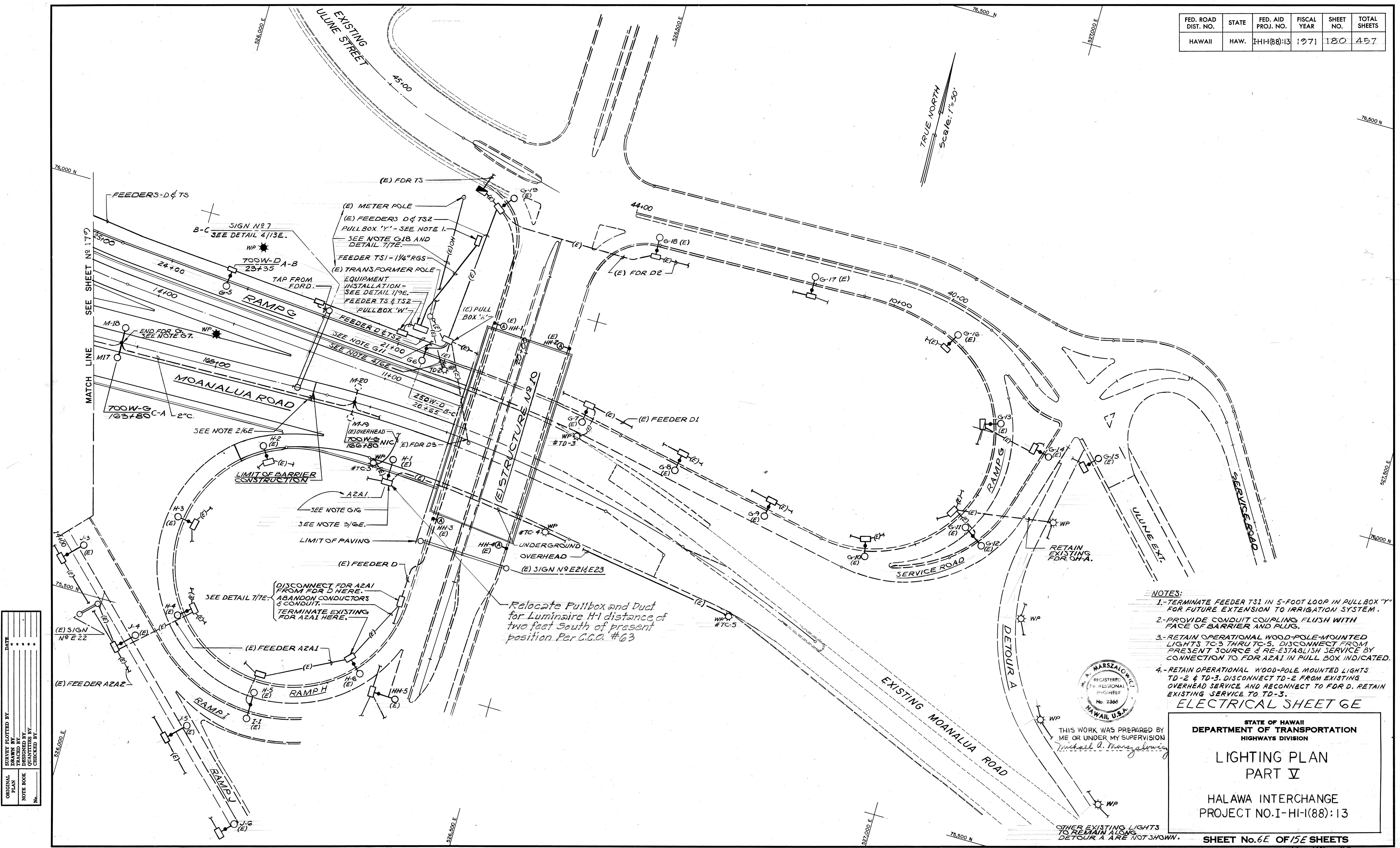


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SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HH(88)13	1971	180	457

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



- NOTES:
- 1.-TERMINATE FEEDER TS1 IN 5-FOOT LOOP IN PULL BOX "Y" FOR FUTURE EXTENSION TO IRRIGATION SYSTEM.
 - 2.-PROVIDE CONDUIT COUPLING FLUSH WITH FACE OF BARRIER AND PLUG.
 - 3.-RETAIN OPERATIONAL WOOD-POLE MOUNTED LIGHTS TC-3 THRU TC-5. DISCONNECT FROM PRESENT SOURCE & RE-ESTABLISH SERVICE BY CONNECTION TO FDR A2A1 IN PULL BOX INDICATED.
 - 4.-RETAIN OPERATIONAL WOOD-POLE MOUNTED LIGHTS TD-2 & TD-3. DISCONNECT TD-2 FROM EXISTING OVERHEAD SERVICE AND RECONNECT TO FDR D. RETAIN EXISTING SERVICE TO TD-3.



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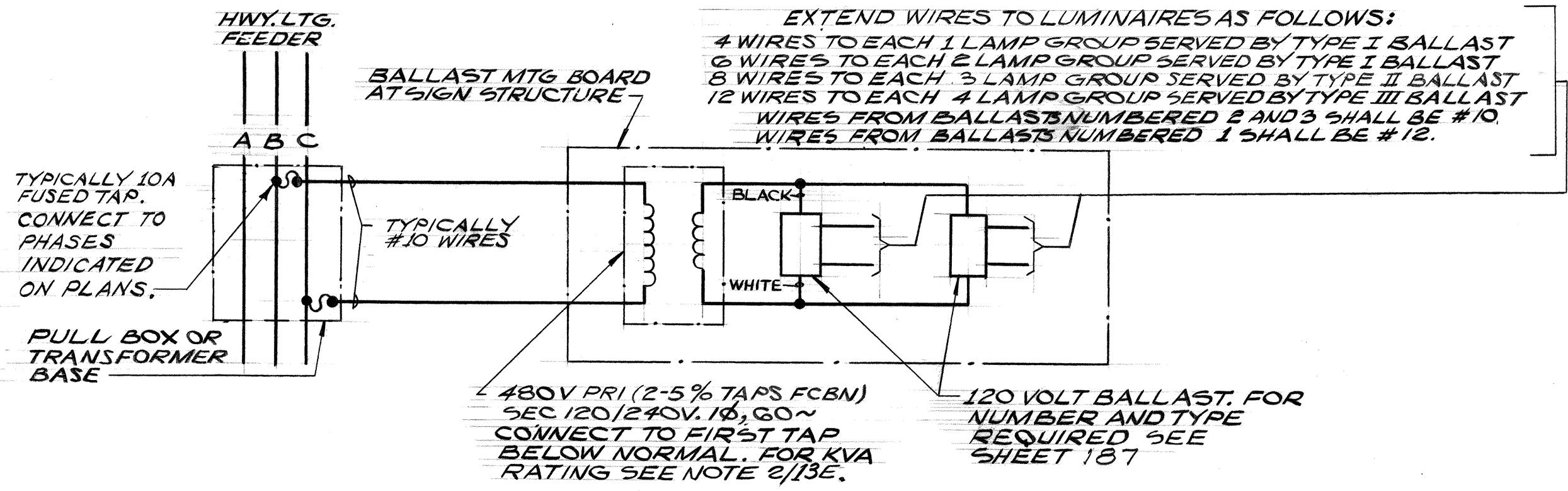
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LIGHTING PLAN PART V

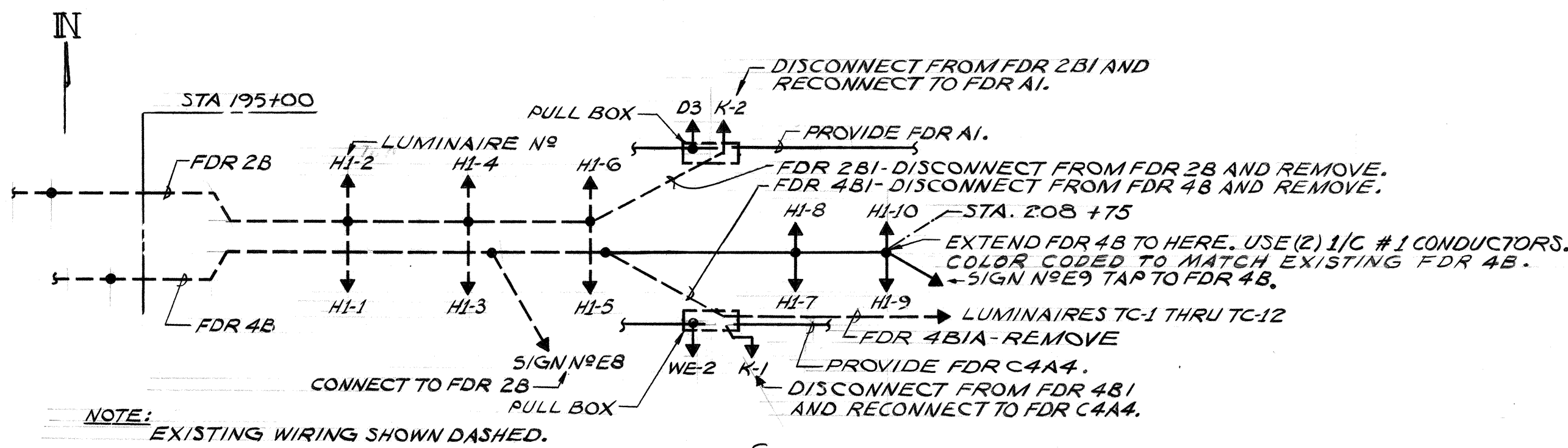
HALAWA INTERCHANGE
PROJECT NO. I-HI-(88):13

SHEET No. 6E OF 15E SHEETS

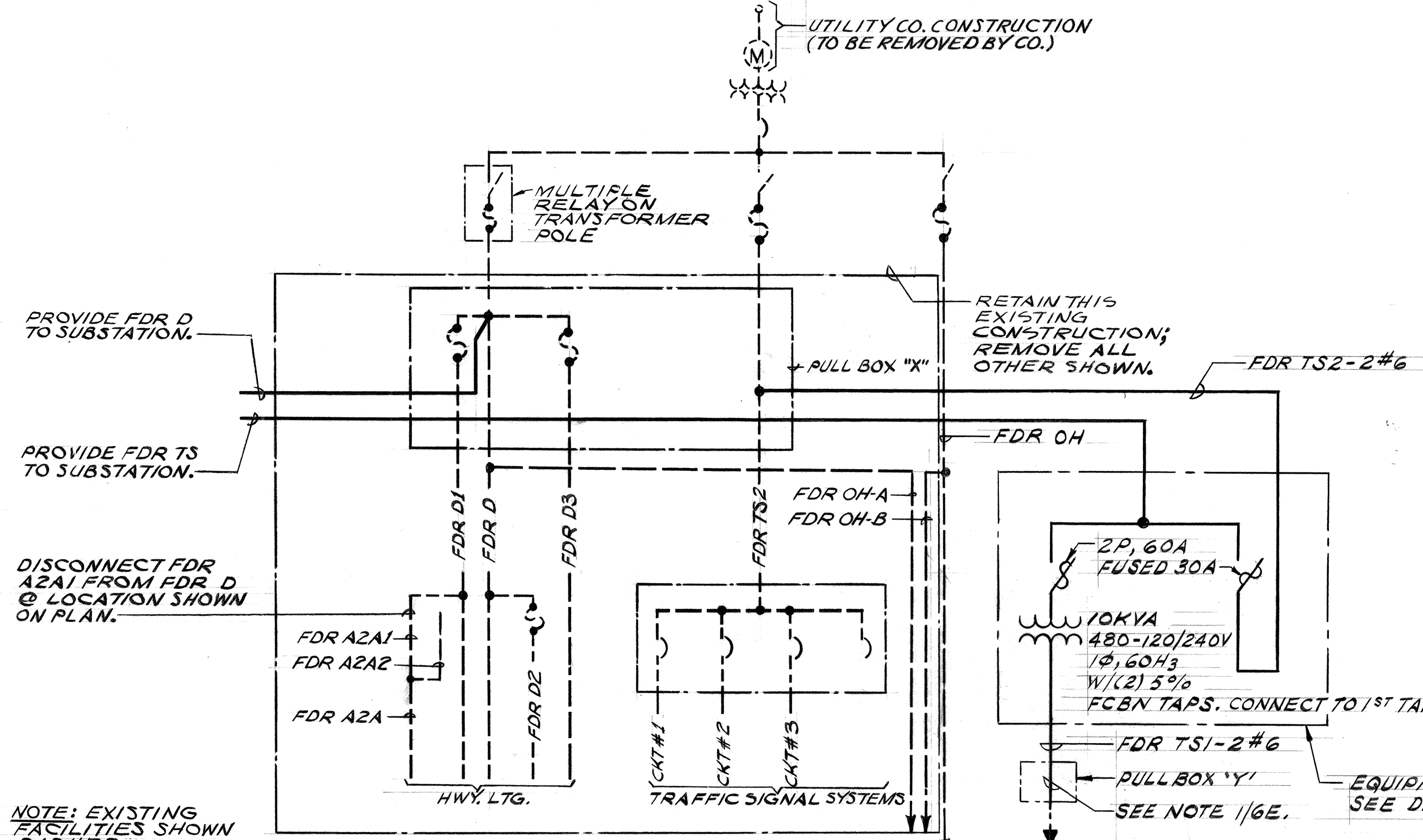
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HAWAII	HAW.	1H1-1(88)13	1971	181	457



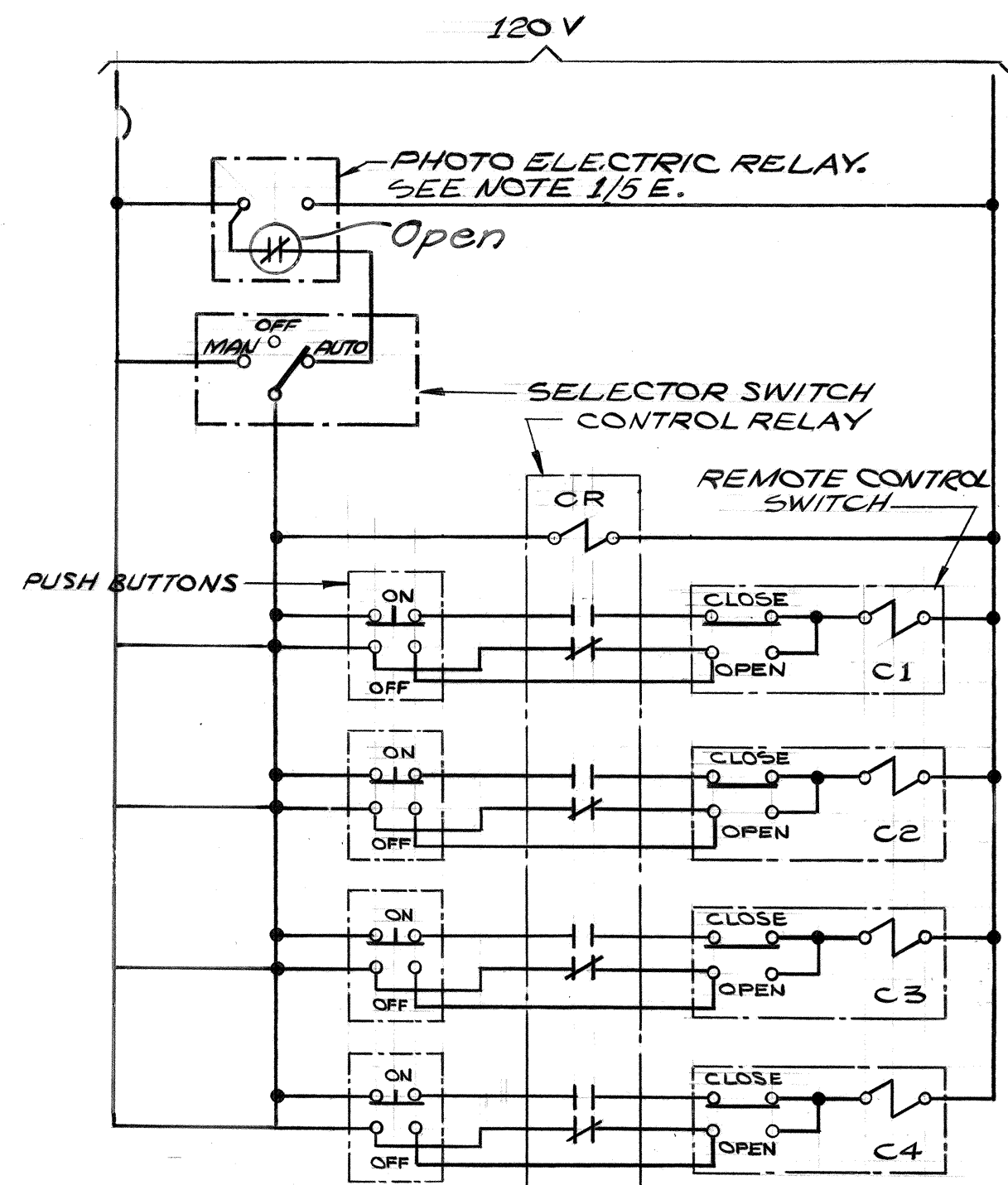
DETAIL 7E
TAP CONNECTION TO SIGN LUMINAIRE



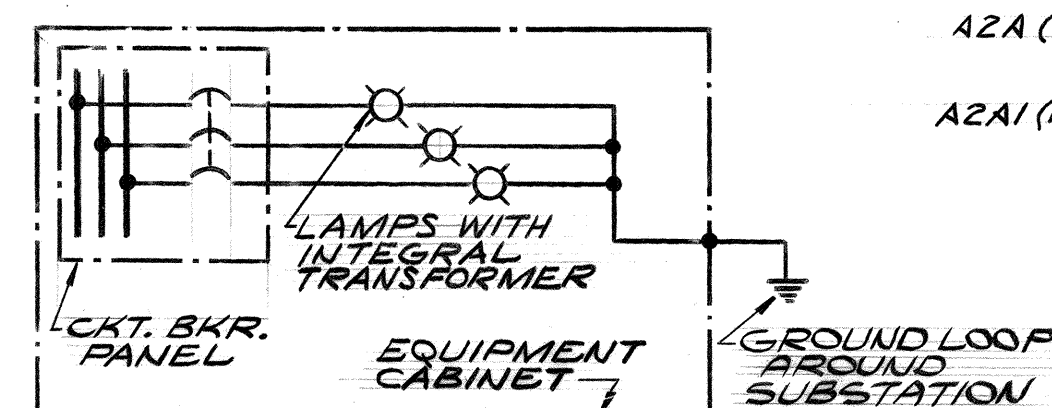
DETAIL 7E
ONE LINE DIAGRAM OF CORRECTIONS
HYGHWAY LIGHTING STA. 195+00 TO 208+85
N.T.S.



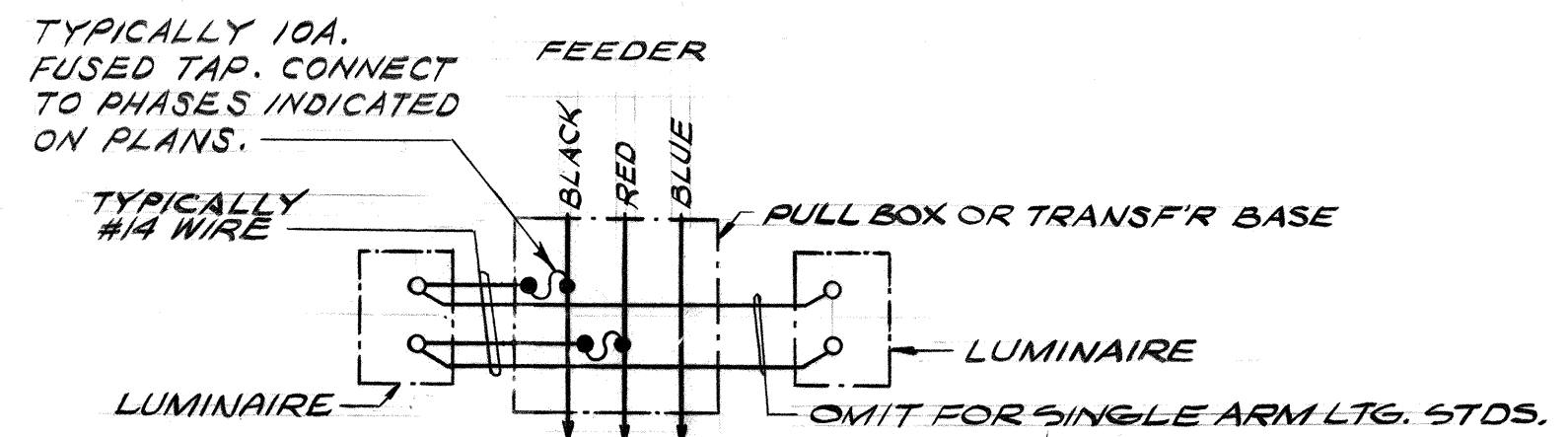
DETAIL 7E
ONE LINE DIAGRAM OF CONNECTIONS
FEEDERS D, TS, & OH
N.T.S.



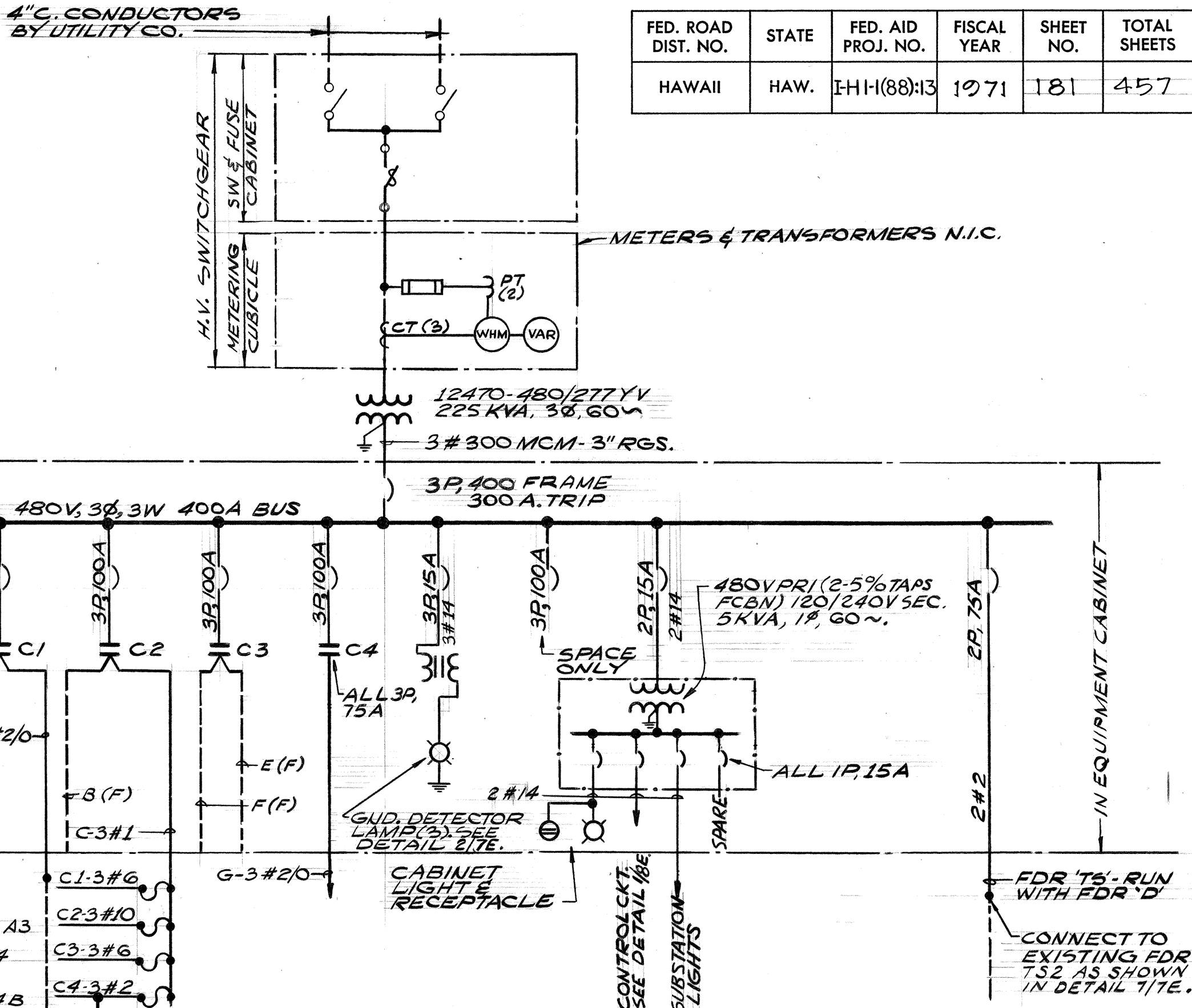
DETAIL 1E
HIGHWAY LIGHTING CONTROL SCHEMATIC



DETAIL 2E
GROUND DETECTOR LAMP CONNECTIONS



DETAIL 3E
TAP CONNECTION HWY. LTG. LUMINAIRE
TWIN ARM SHOWN; SINGLE ARM SIMILAR EXCEPT AS NOTED.



SYMBOL	REPRESENTS
=	REMOTE CONTROL RELAY LOAD CONTACT (2 POLE)
=	REMOTE CONTROL RELAY AUXILIARY CONTACT (1 POLE)
⌞	COIL
= ≠	RELAY CONTACT, RESPECTIVELY OPEN & CLOSE WHEN DE ENERGIZED (1 POLE)
o	TERMINAL POINT ON EQUIPMENT
+	ELECTRICAL CONNECTION
- - -	NOT IN THIS CONTRACT: (E) EXISTING, (F) FUTURE
- - -	EQUIPMENT IN COMMON ENCLOSURE
- - -	MOLDED CASE CIRCUIT BREAKER RATED AS INDICATED
⌞	FUSED TAP-30A

DETAIL 4E
ONE LINE DIAGRAM
HIGHWAY LIGHTING SYSTEM & TRAFFIC SIGNAL SYSTEM

ELECTRICAL SHEET 7E

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

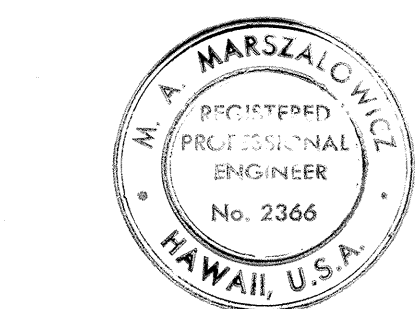
ELECTRICAL DETAILS PART I

HALAWA INTERCHANGE
PROJECT NO. I-HI-1(88):13

SHEET No. 7E OF 15E SHEETS

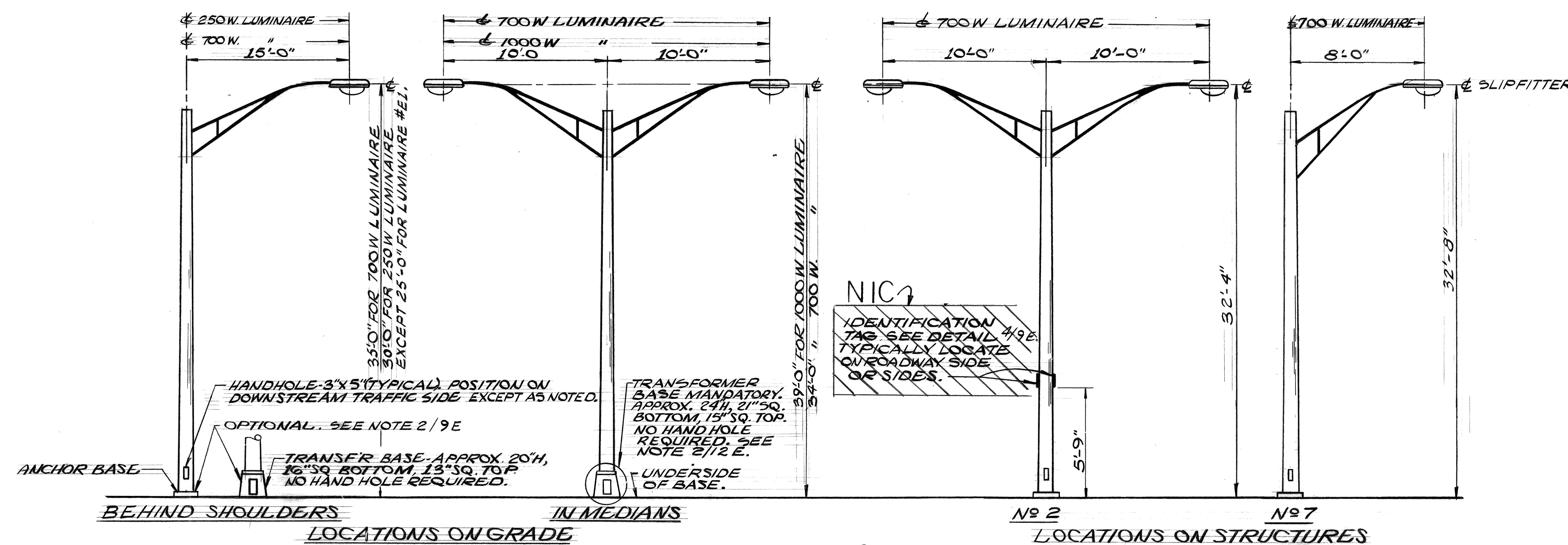
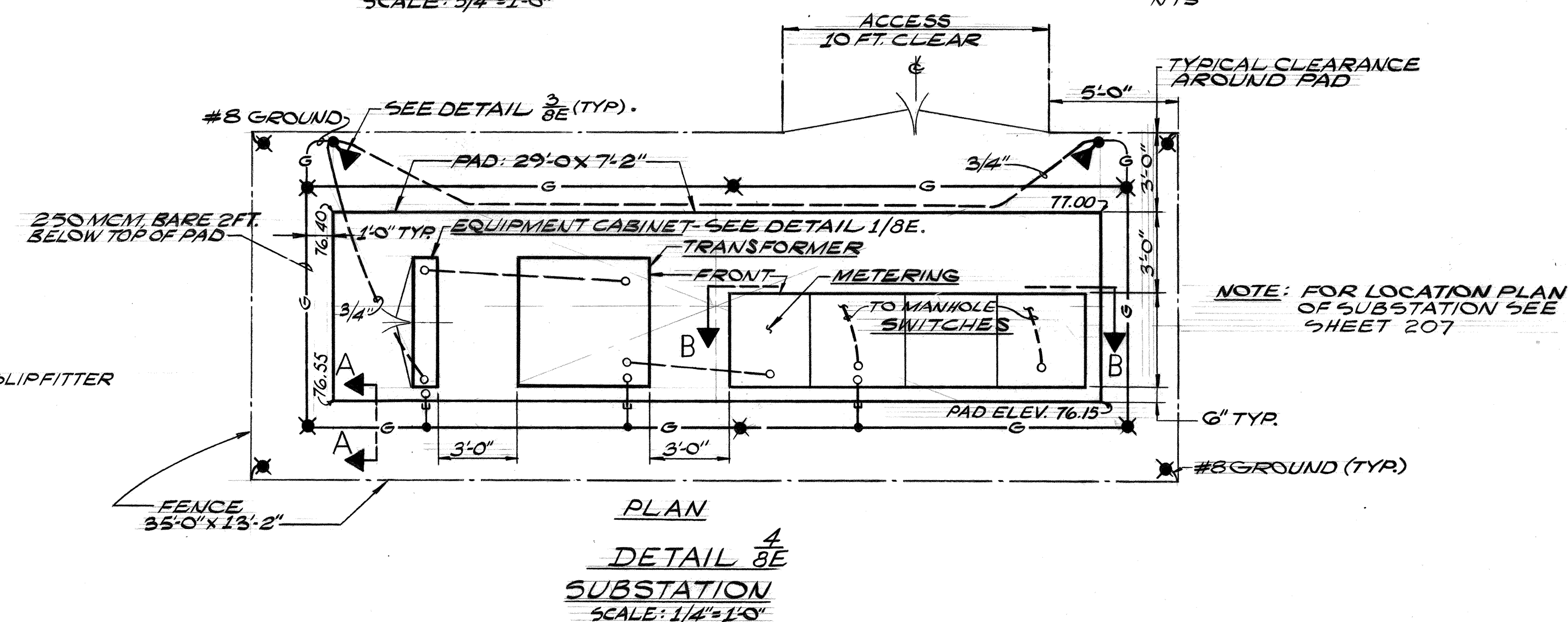
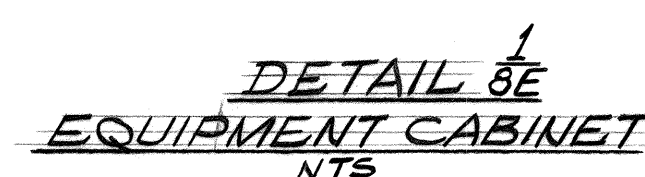
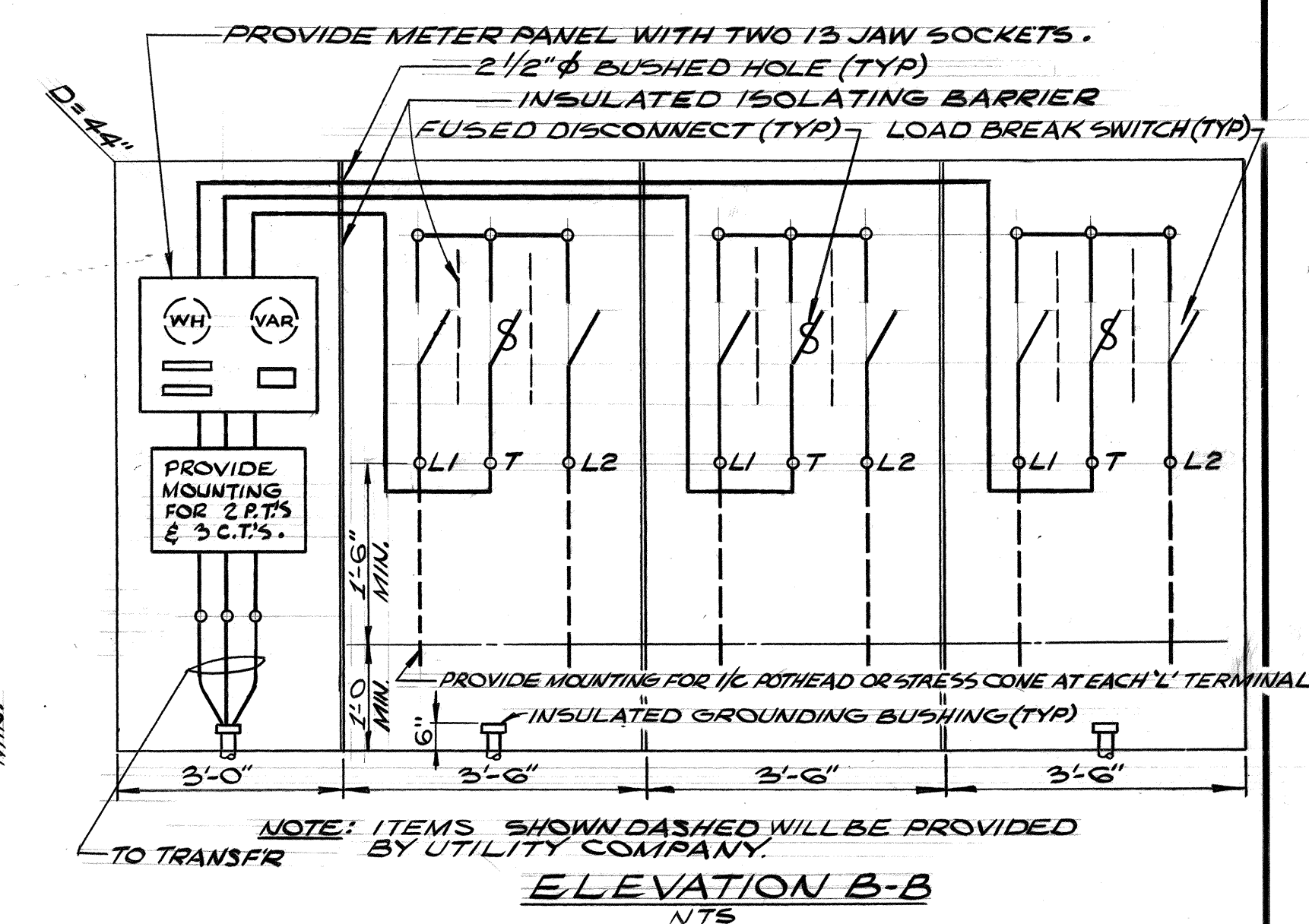
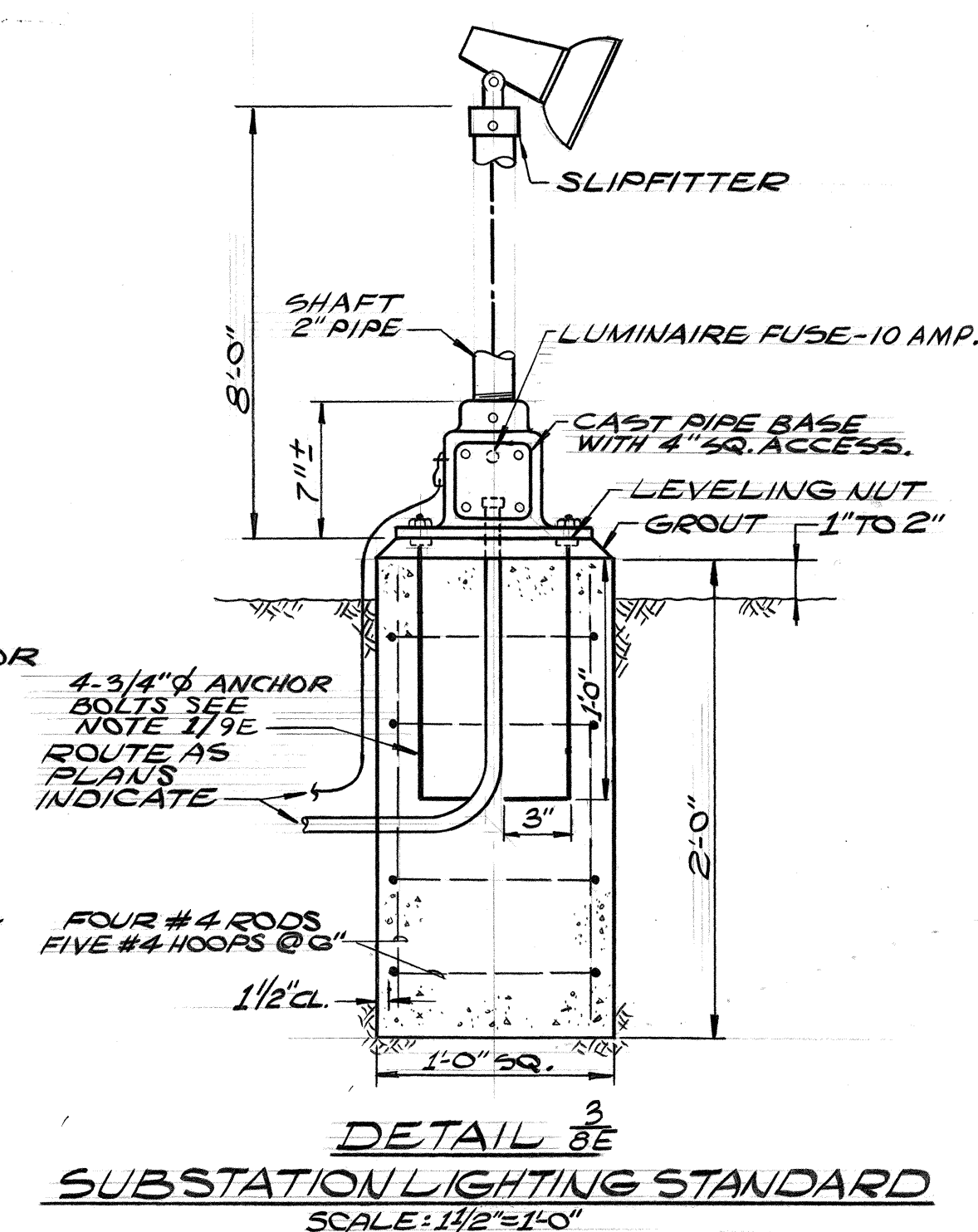
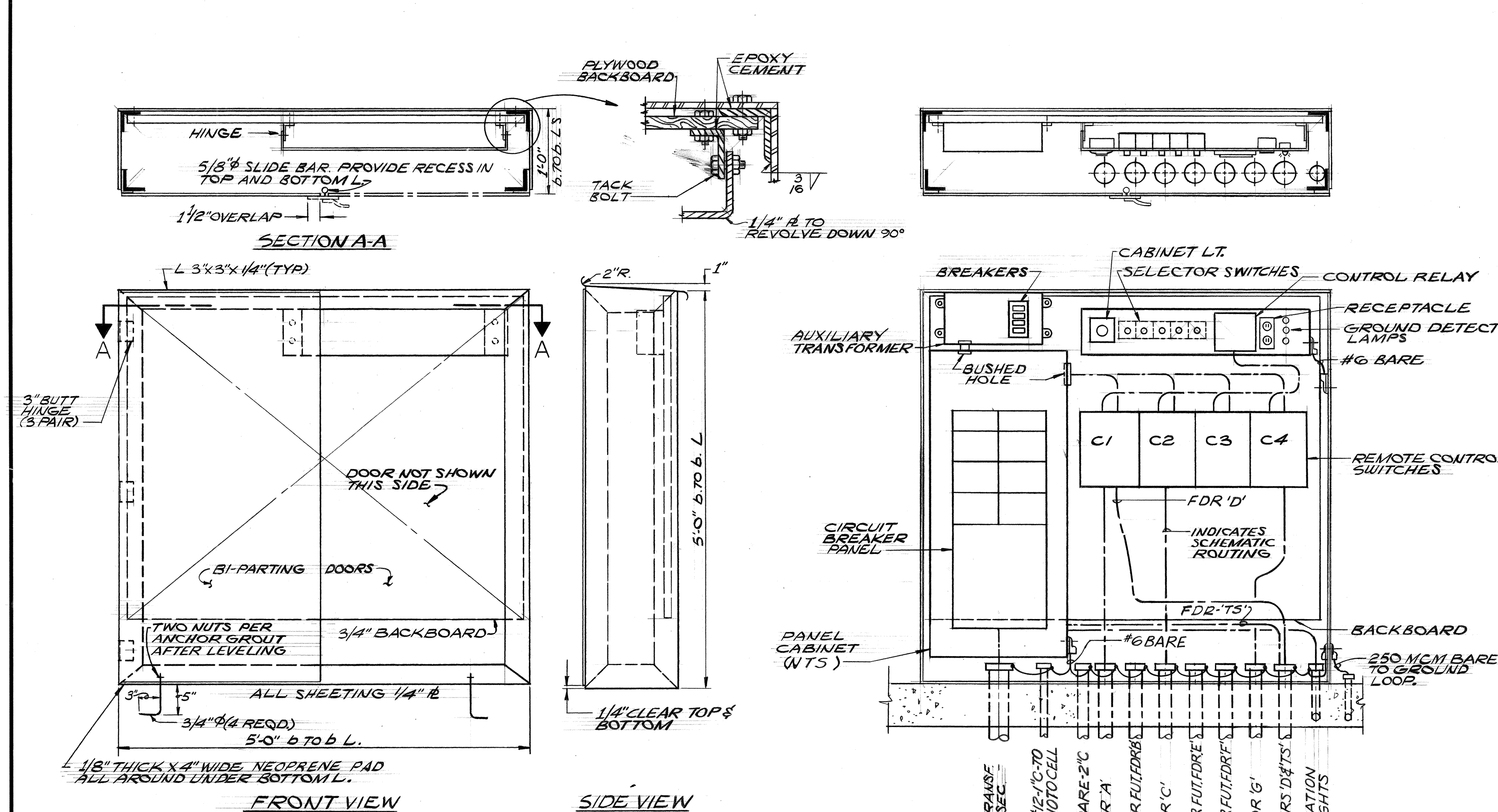
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DATE	DATE	DATE	DATE	DATE	DATE
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CHECKED BY	CHECKED BY	CHECKED BY	CHECKED BY	CHECKED BY	CHECKED BY
NOTED BY	NOTED BY	NOTED BY	NOTED BY	NOTED BY	NOTED BY
ORIGINAL PLAN	ORIGINAL PLAN	ORIGINAL PLAN	ORIGINAL PLAN	ORIGINAL PLAN	ORIGINAL PLAN



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HAWAII	HAW.	IHH(88):13	1971	182	457



DETAIL ²/_{8E}
LIGHTING STANDARD TYPES

NOTE: MOUNTING HEIGHTS AND BRACKET ARM LENGTHS ARE APPROX. $\pm 3"$

ELECTRICAL SHEET 8E

**STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION**

ELECTRICAL DETAILS

PART II

HALAWA INTERCHANGE
PROJECT NO.I-HI-1(88): 13

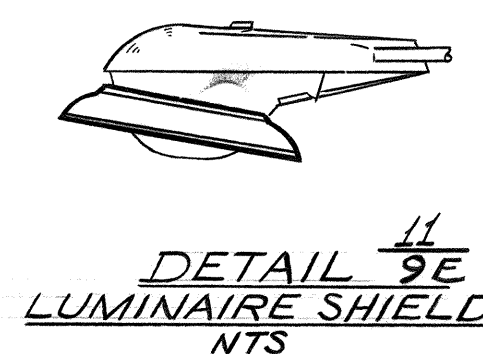
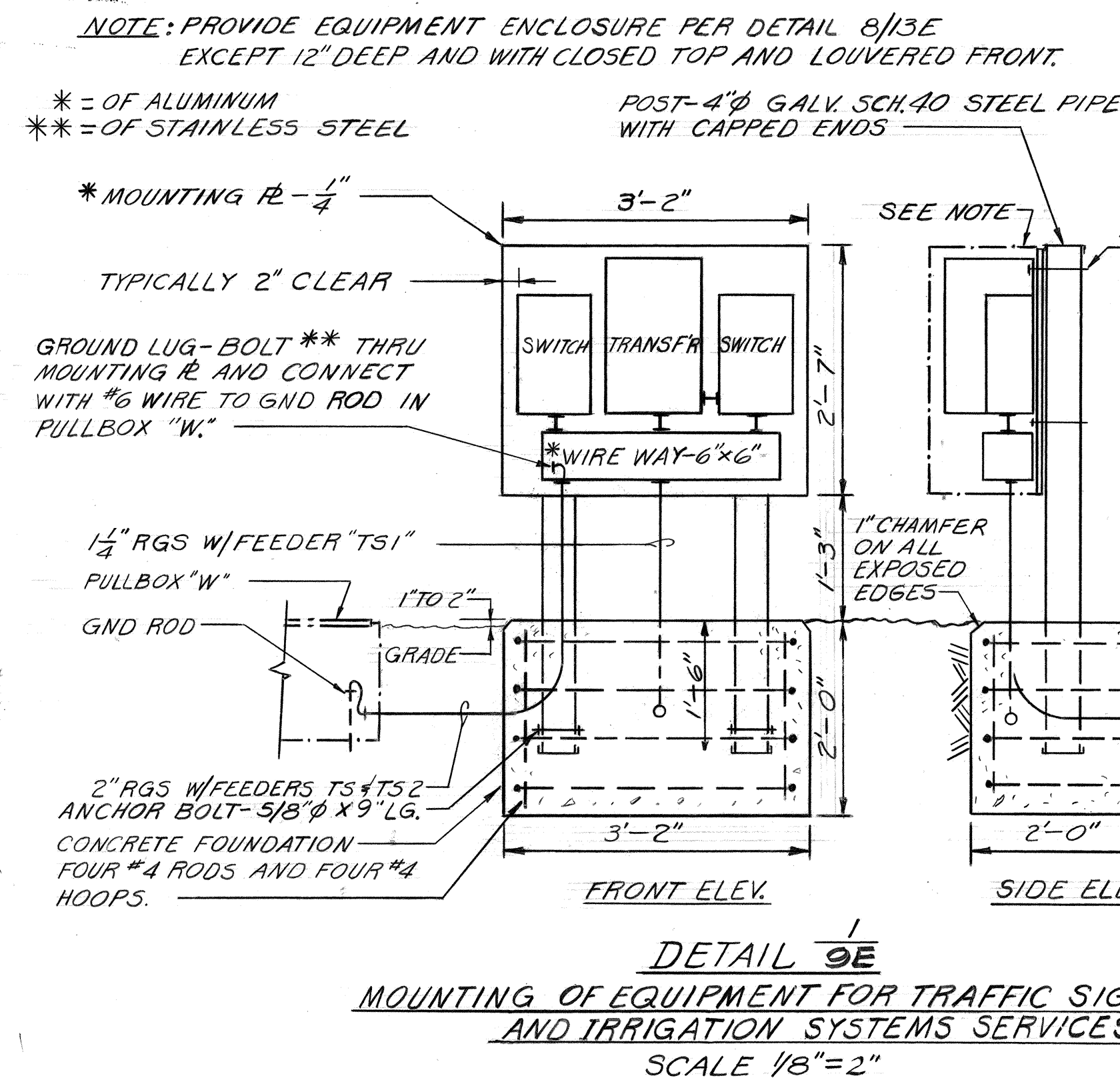
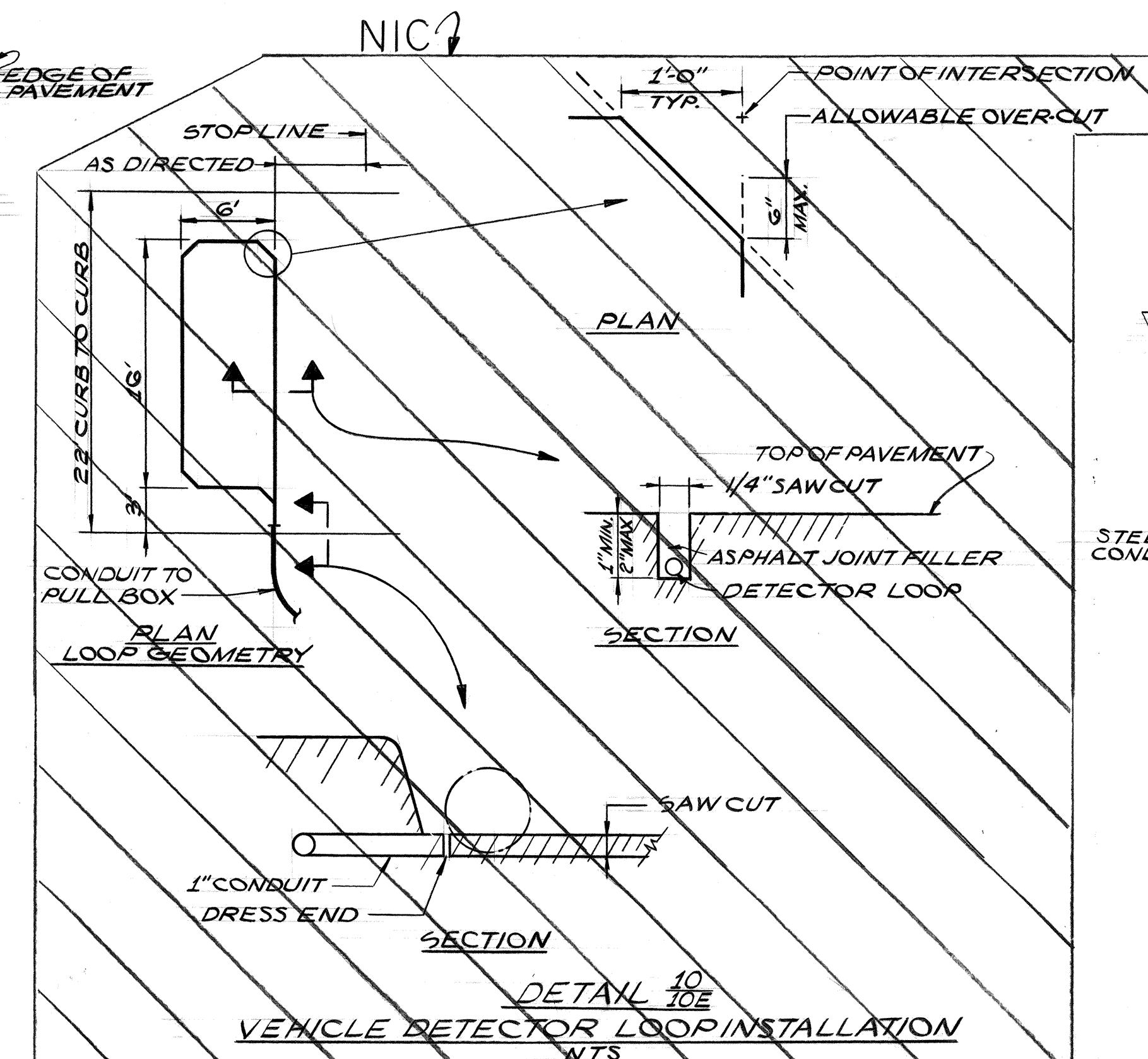
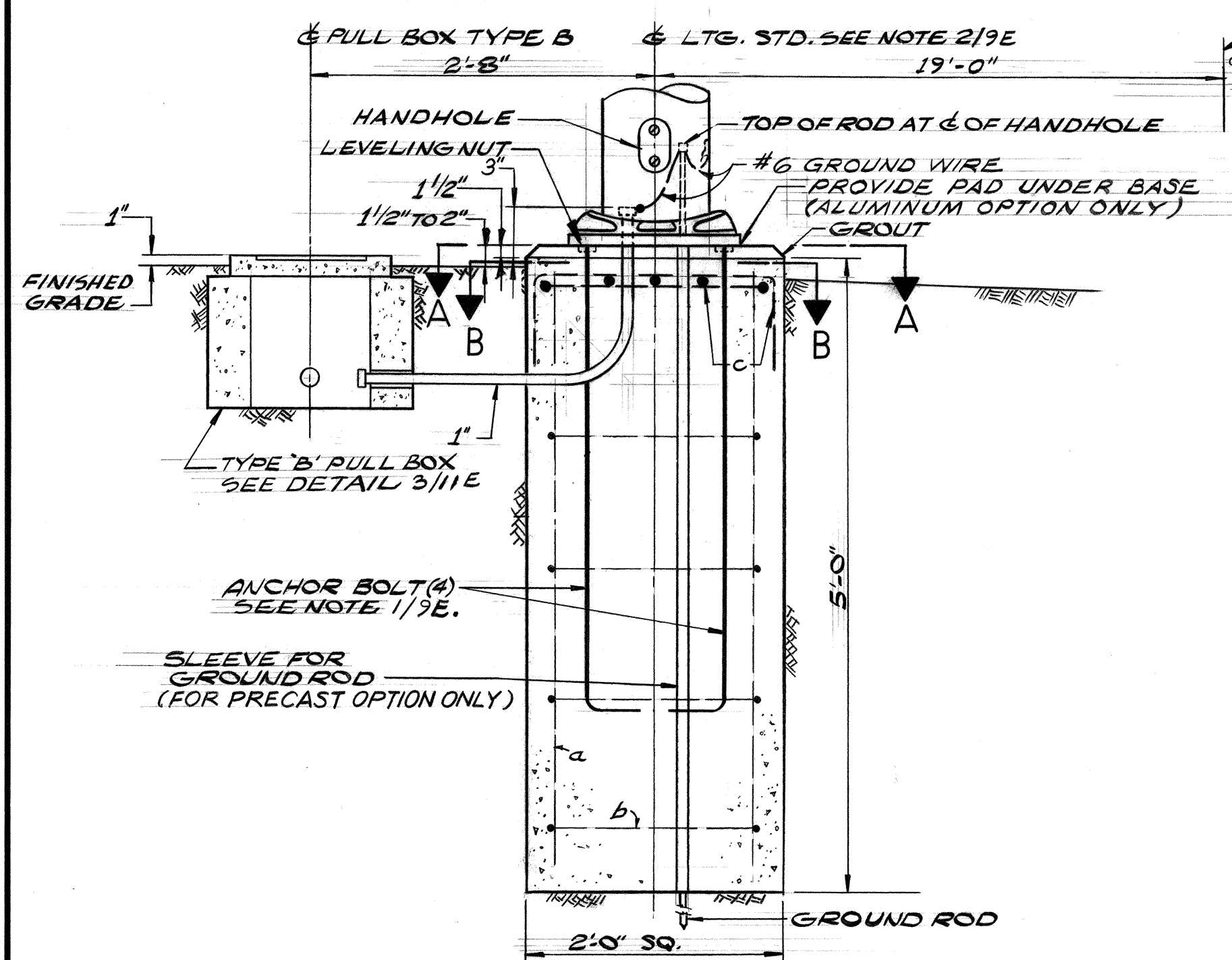
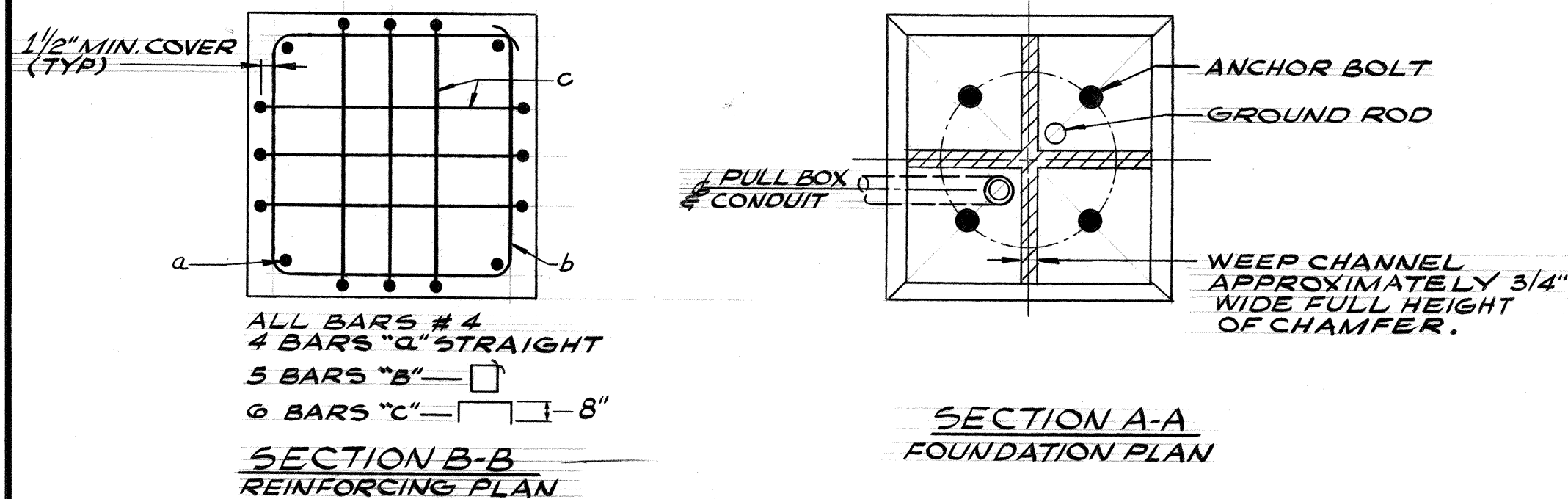
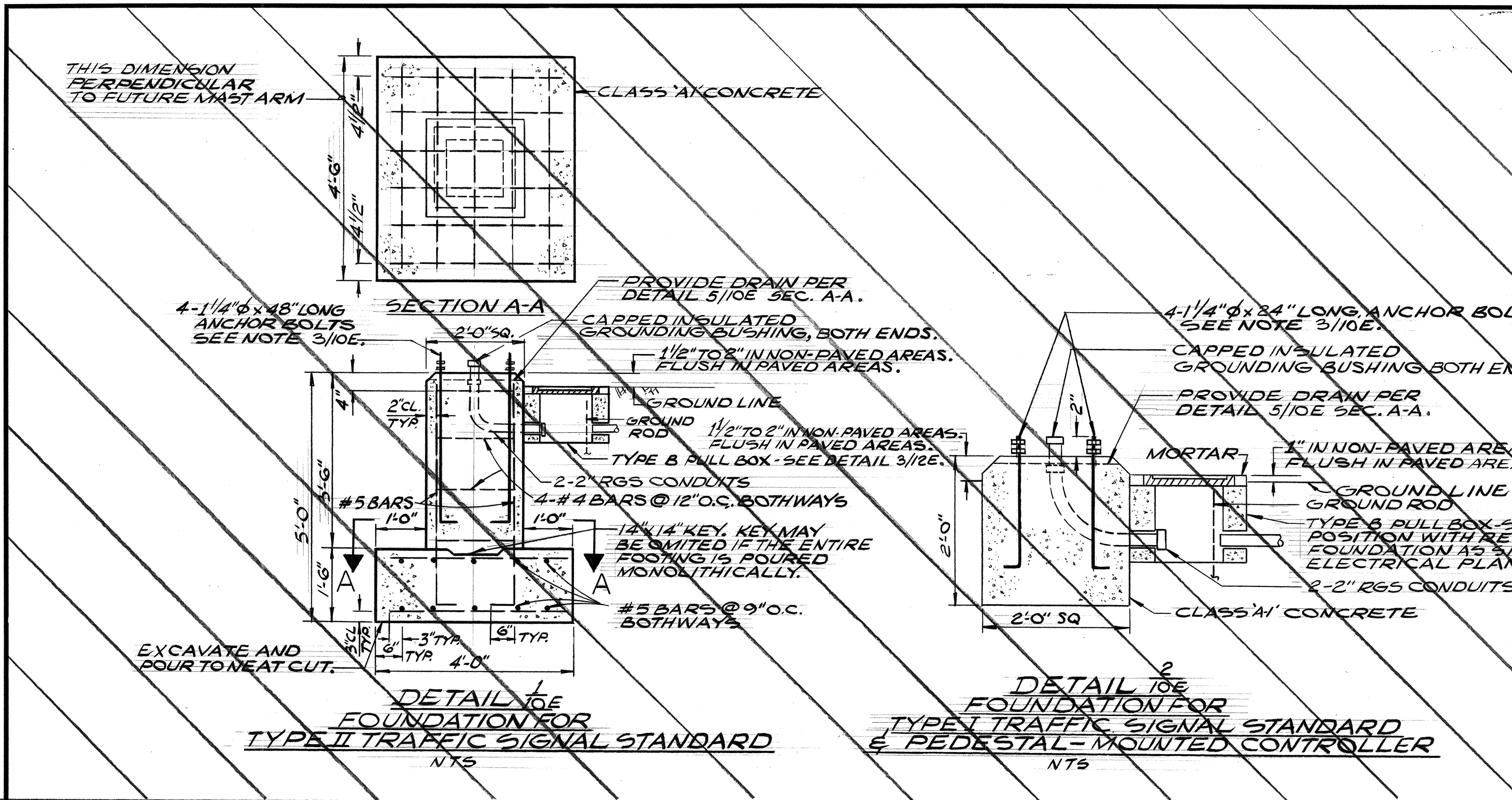
SHEET No.8E OF 15E SHEETS



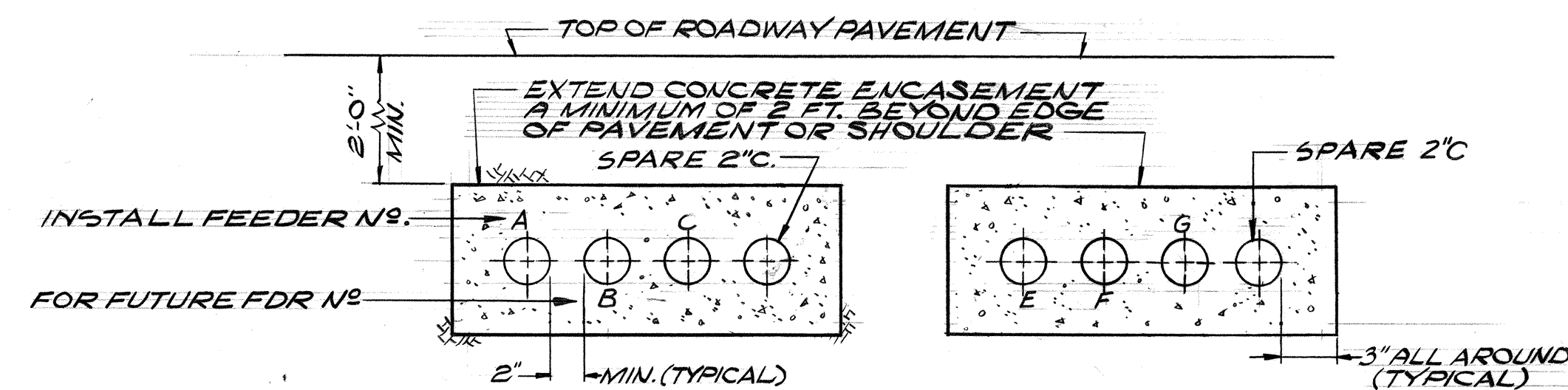
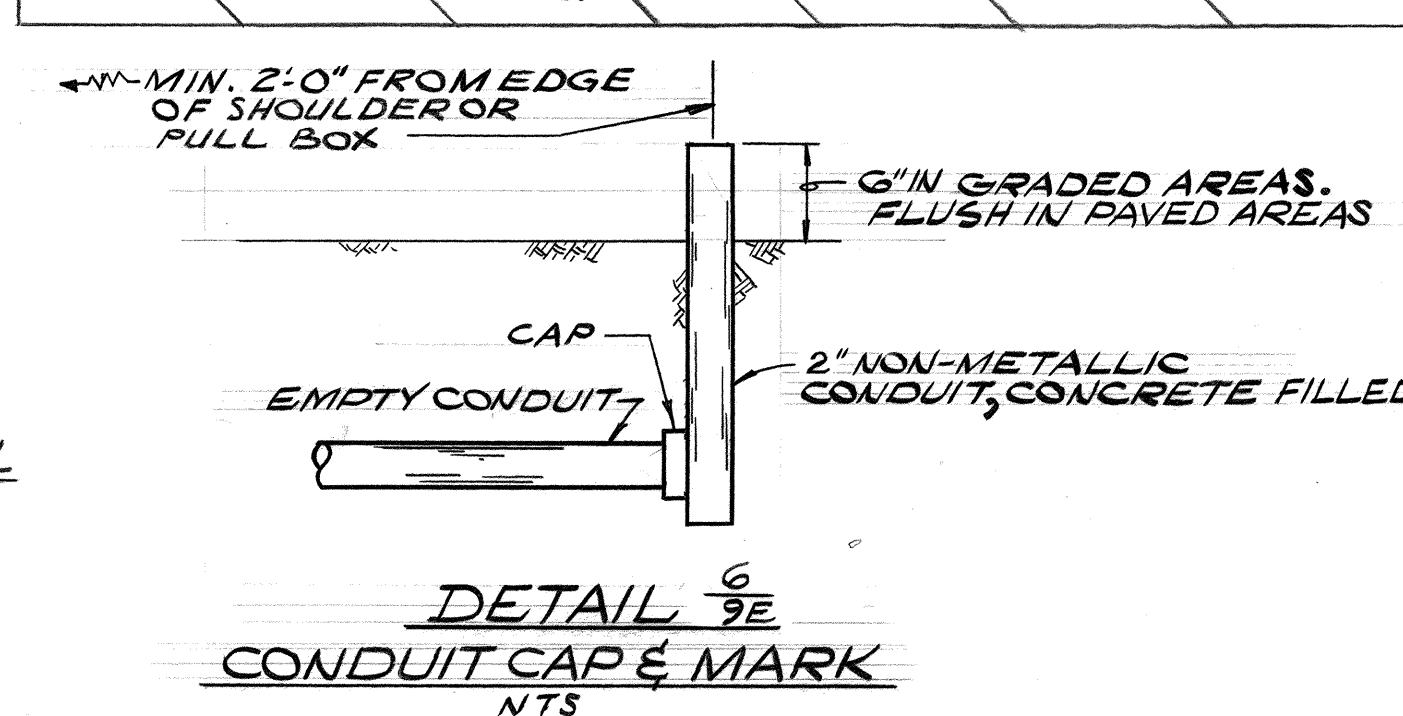
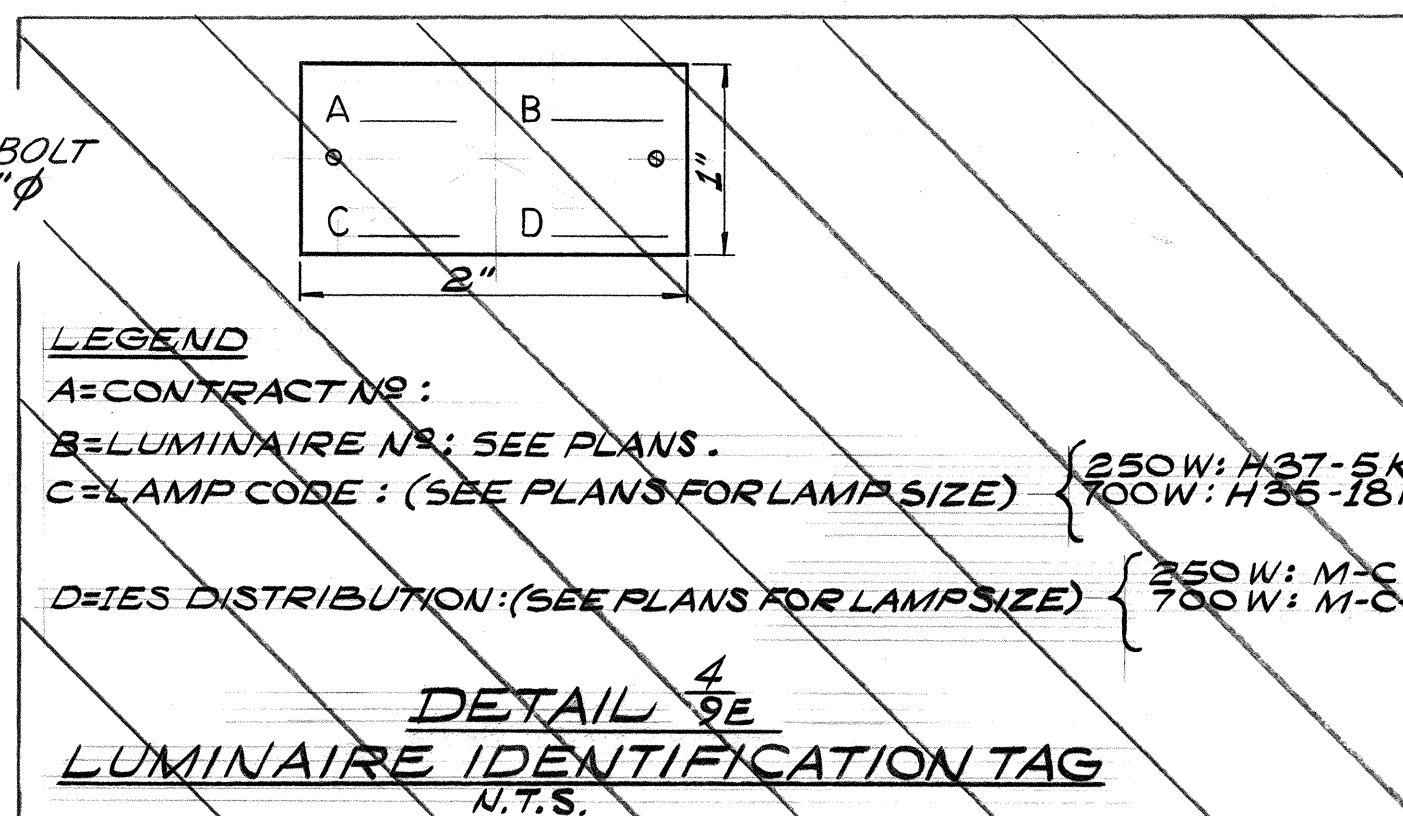
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1H1(88):13	1971	183	457



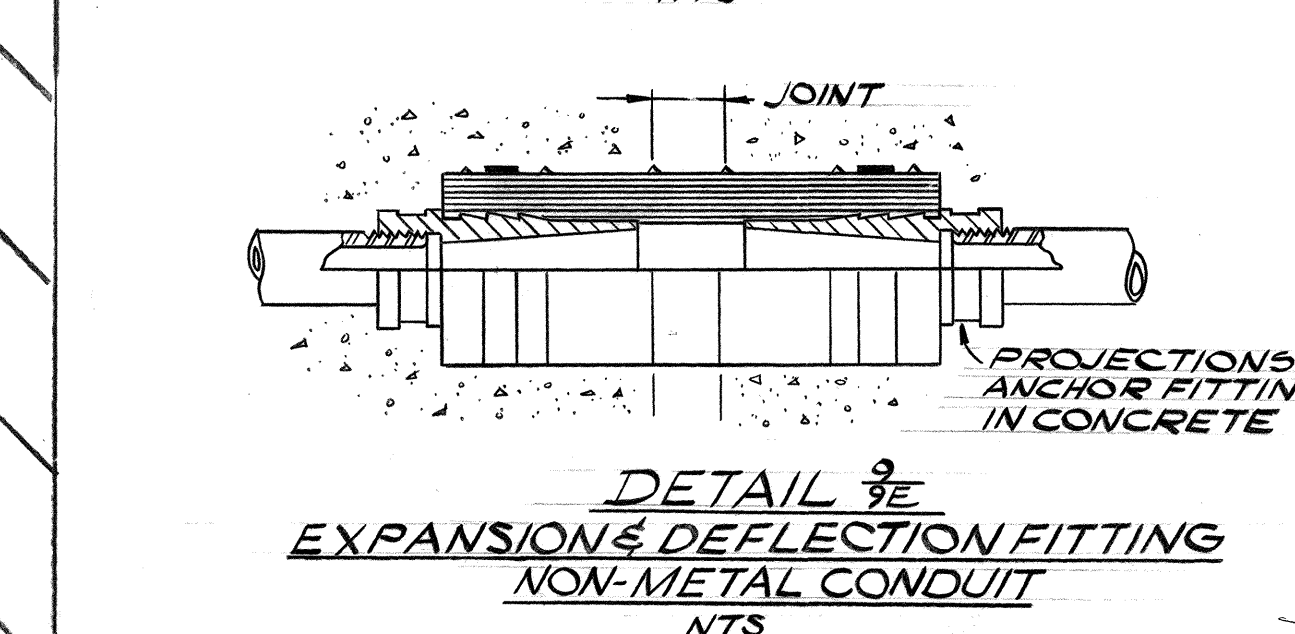
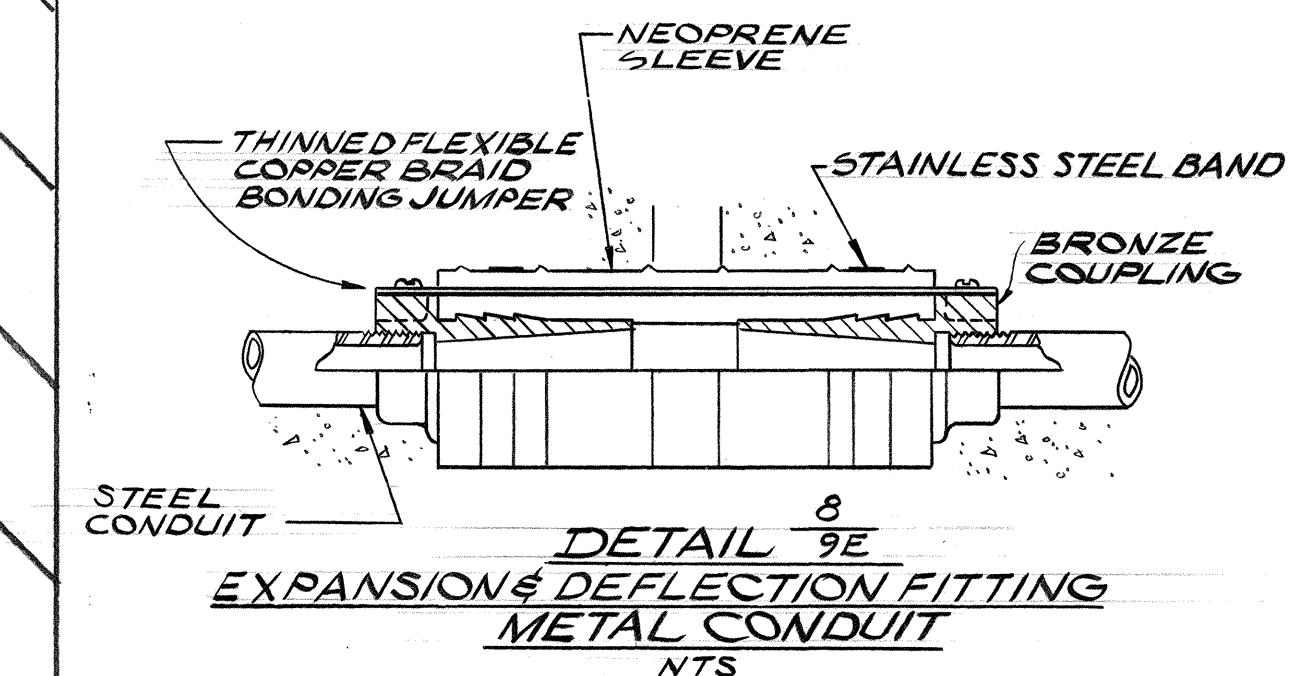
DETAIL 9E
MOUNTING OF EQUIPMENT FOR TRAFFIC SIGNAL
AND IRRIGATION SYSTEMS SERVICES
SCALE 1/8"=2"



NOTE: EXCEPT THAT THE NUMBER OF CONDUIT RUNS & FEEDERS TO BE INSTALLED SHALL BE AS INDICATED ON PLAN SHEETS, THIS DETAIL IS TYPICAL FOR ALL HWG LTG SYSTEM CONDUITS UNDER ROADWAY.

SECTION A-A
DETAIL 7E
NTS

NOTES:
1- ANCHOR BOLT DIAMETER & LENGTH, LOCATION AND PROJECTION SHALL BE SUITED TO THE LIGHTING STANDARD APPROVED.
2- ALUMINUM LIGHTING STANDARD WITH SHOE BASE OPTION IS PICTURED. STEEL LIGHTING STANDARD WITH CAST ALUMINUM TRANSFORMER BASE OPTION NOT PICTURED BUT IS SIMILAR. FOUNDATION DETAILS APPLY TO BOTH OPTIONS.



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ELECTRICAL SHEET 9E

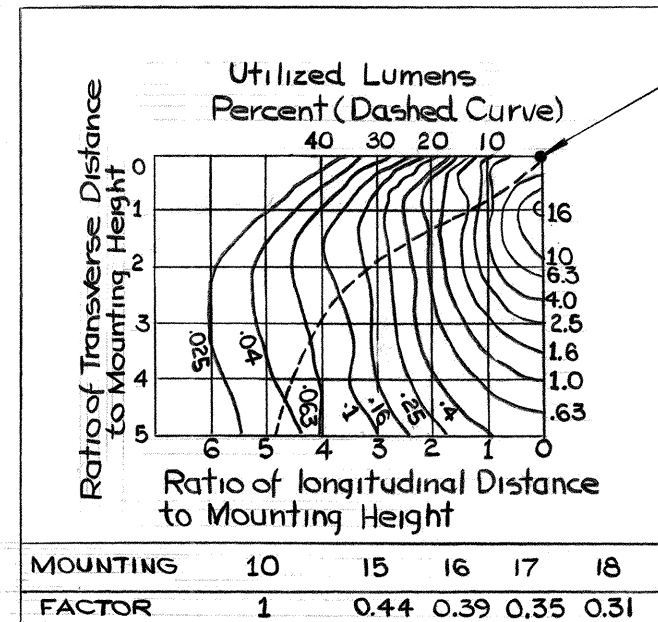
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL DETAILS PART III

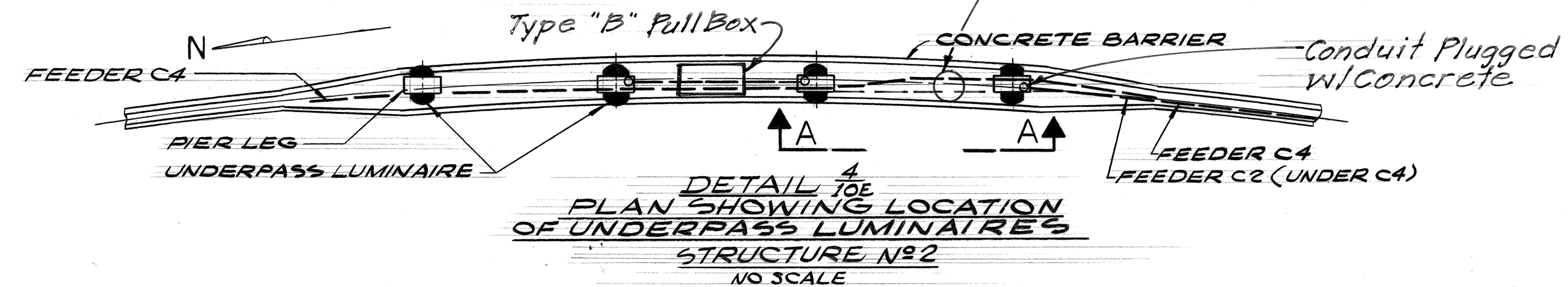
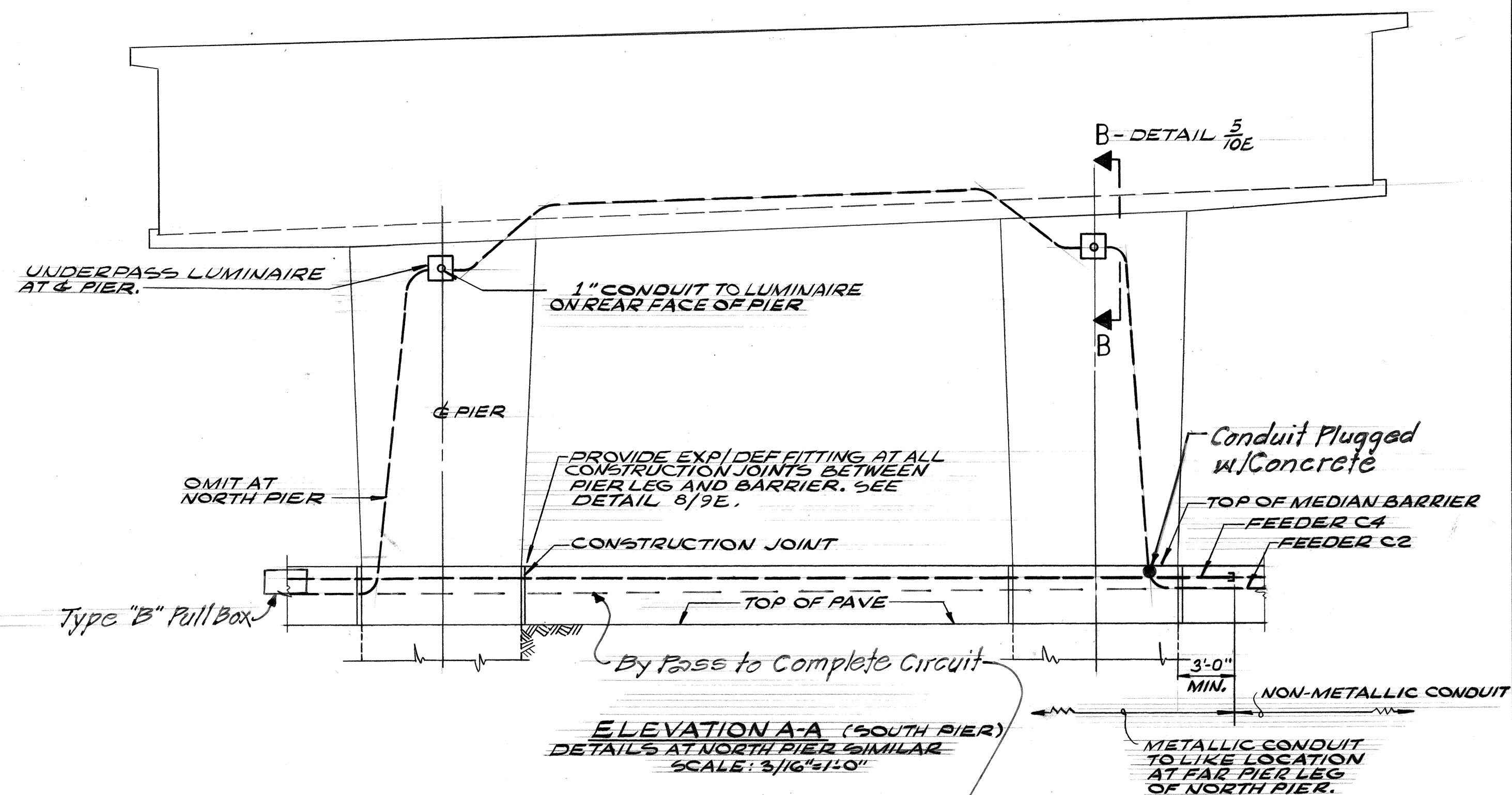
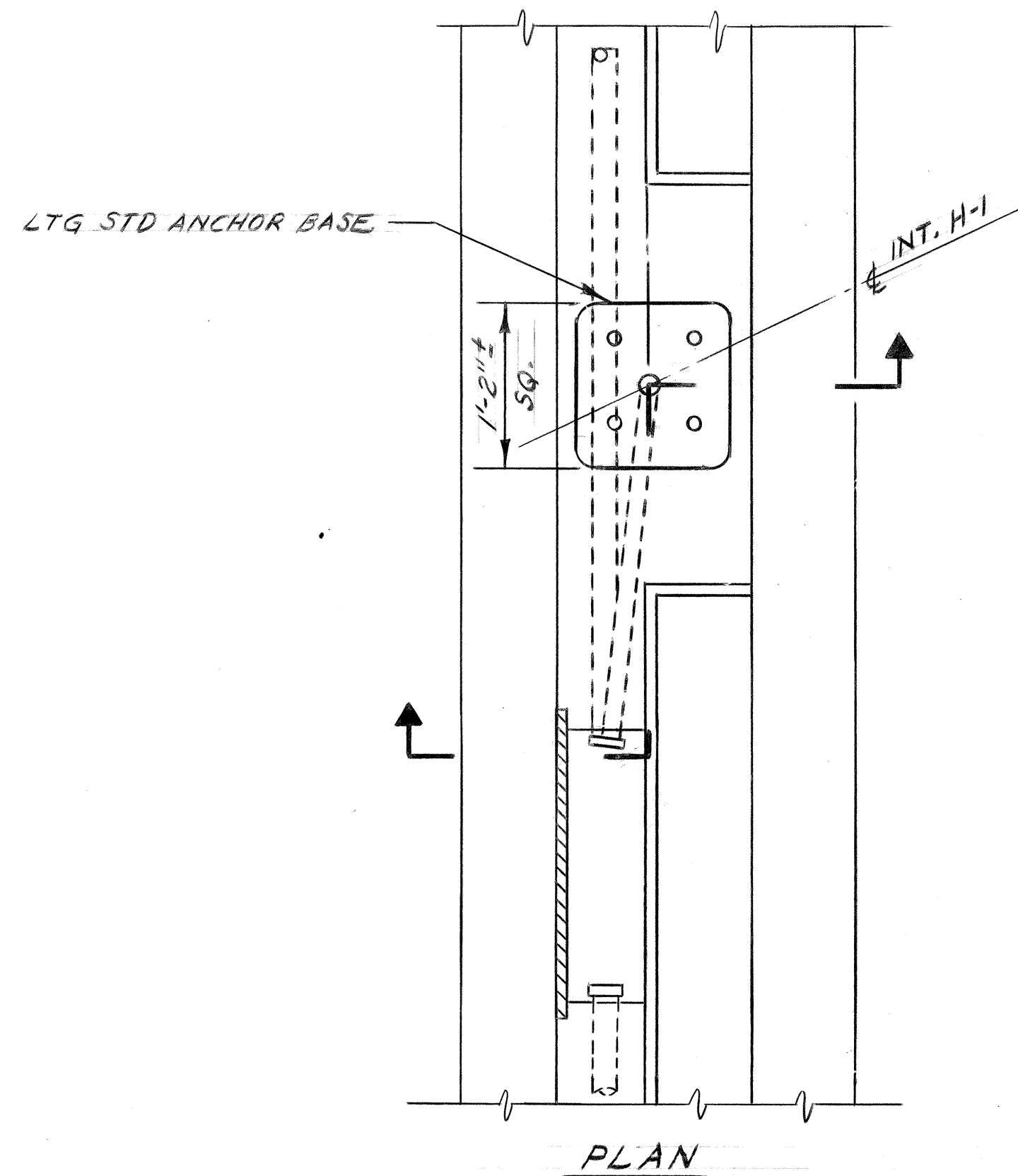
HALAWA INTERCHANGE
PROJECT NO. I-HI-1(88):13

SHEET No. 9E OF 15E SHEETS

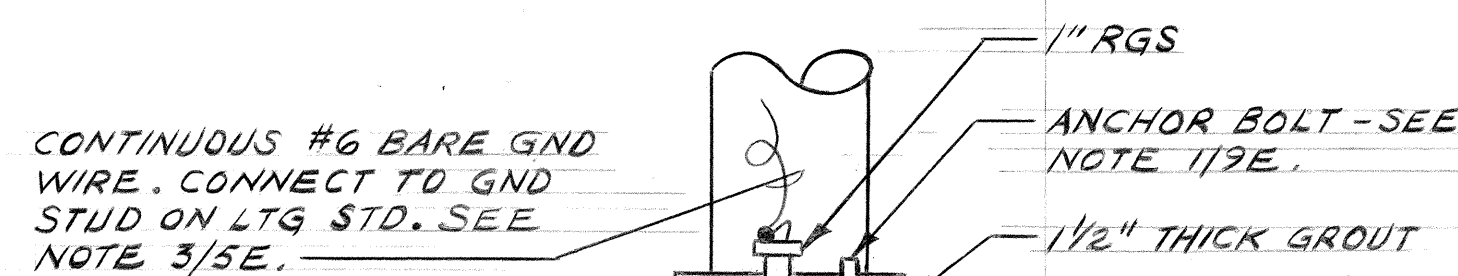
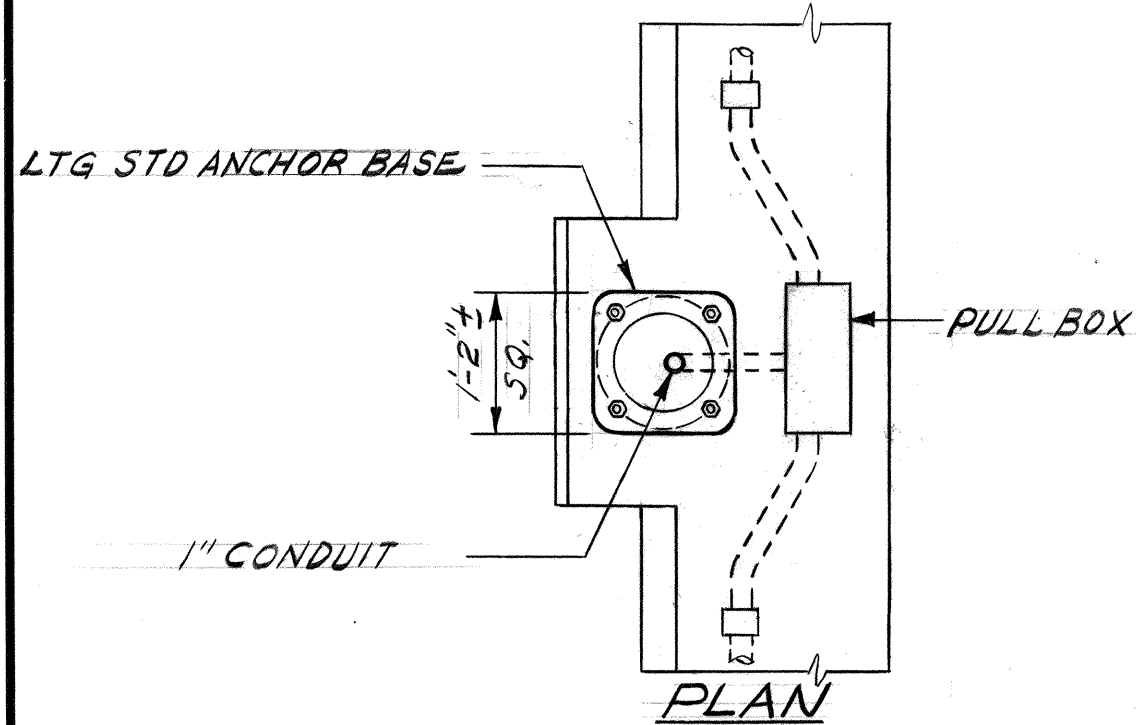
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HH(88)13	1971	184	457



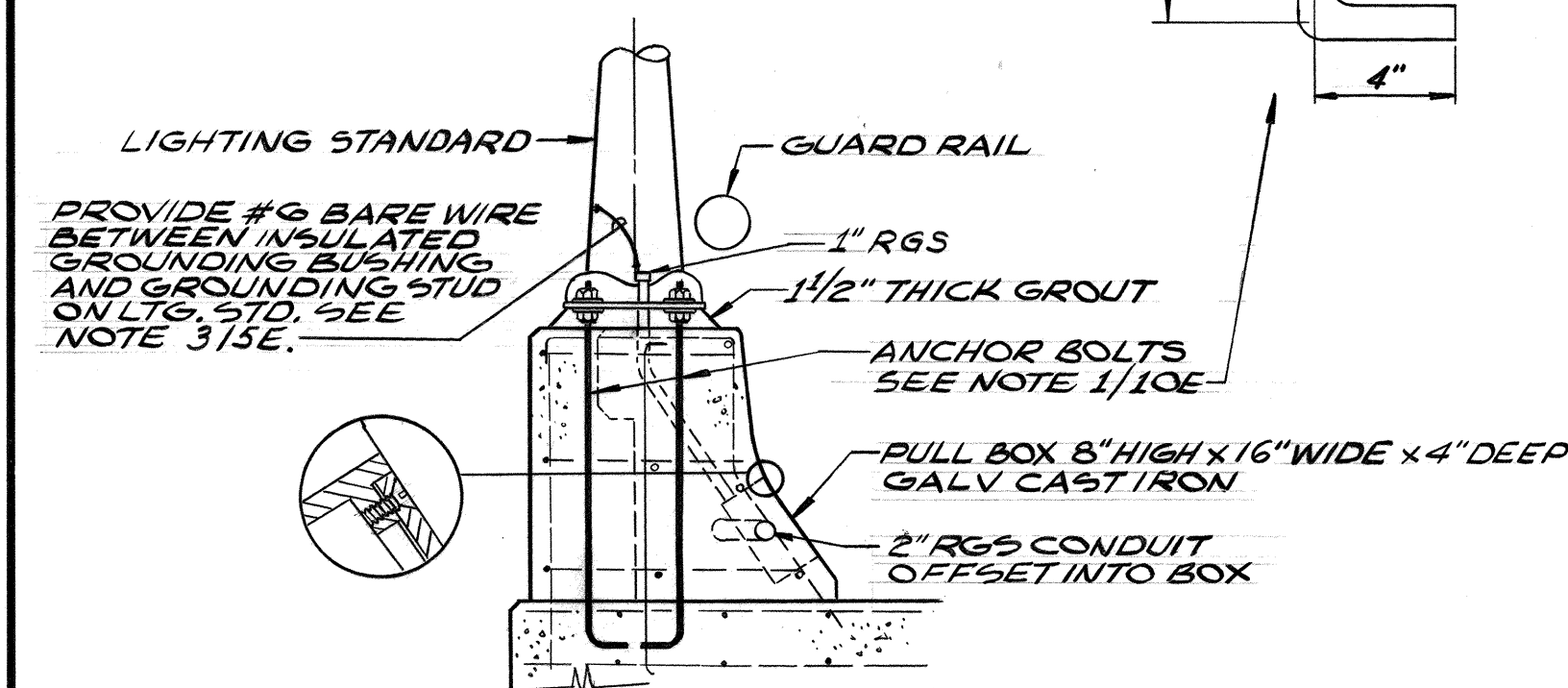
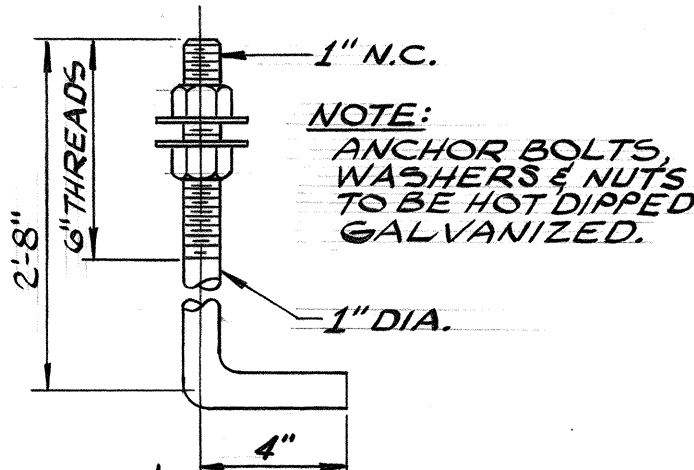
DETAIL 10E
PHOTOMETRIC CURVE FOR
UNDERPASS LUMINAIRE



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FORMED PULL BOX -
SEE SHEET 24E
FOR DETAILS.

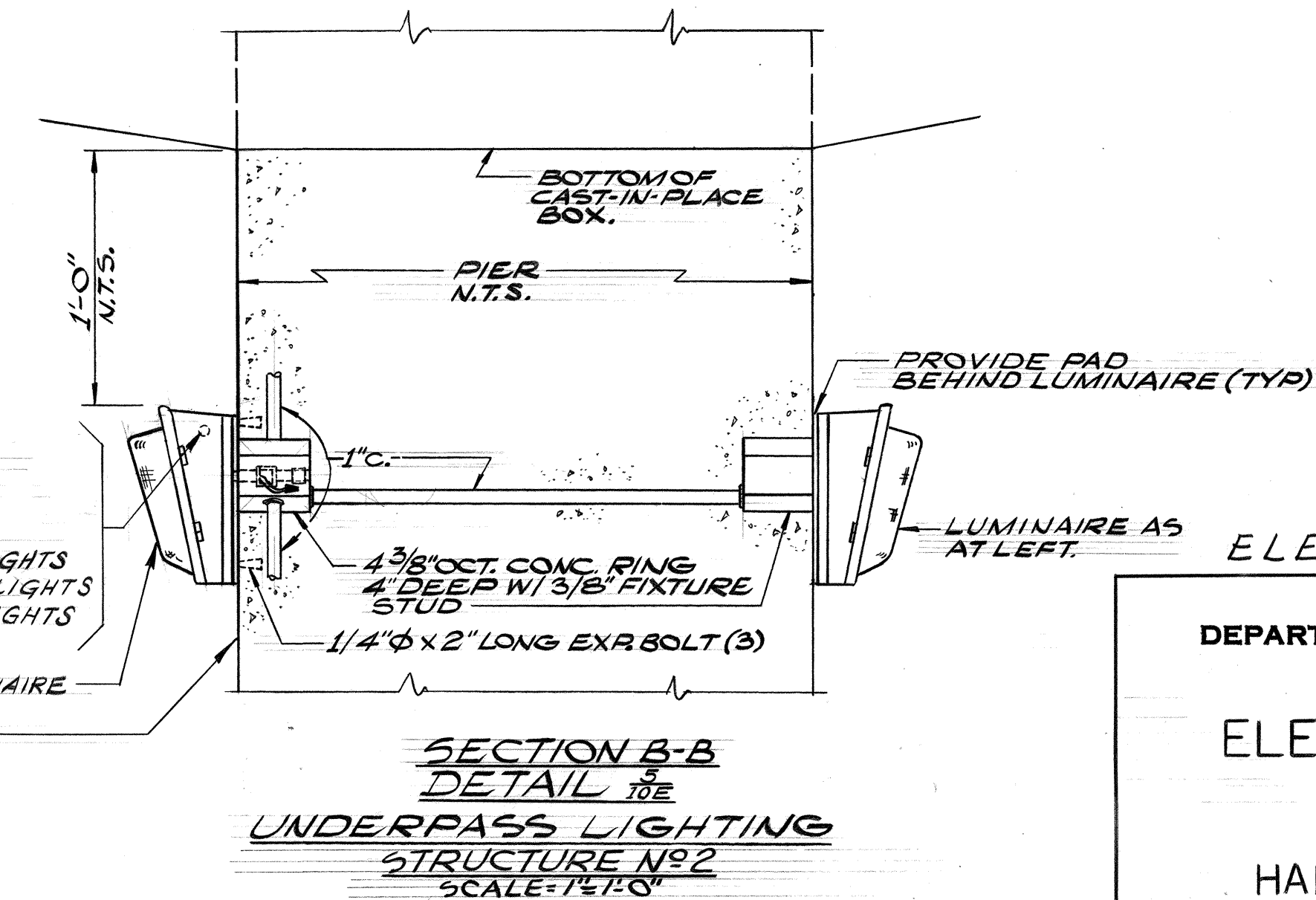


SECTION
DETAIL 10E
STRUCTURE NO. 2
NO SCALE

SECTION
DETAIL 10E
LTG STD ON STR NO. 2
SCALE 1"=1'-0"

PROVIDE 10A FUSE
AT EACH LUMINAIRE.
DISTRIBUTE CONNECTIONS
AMONG PHASES AS FOLLOWS:
BETWEEN PHASES A & B - 3 LIGHTS
BETWEEN PHASES B & C - 3 LIGHTS
BETWEEN PHASES C & A - 2 LIGHTS

UNDERPASS LUMINAIRE
FACE OF PIER



ELECTRICAL SHEET 10E

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL DETAILS STRUCTURES

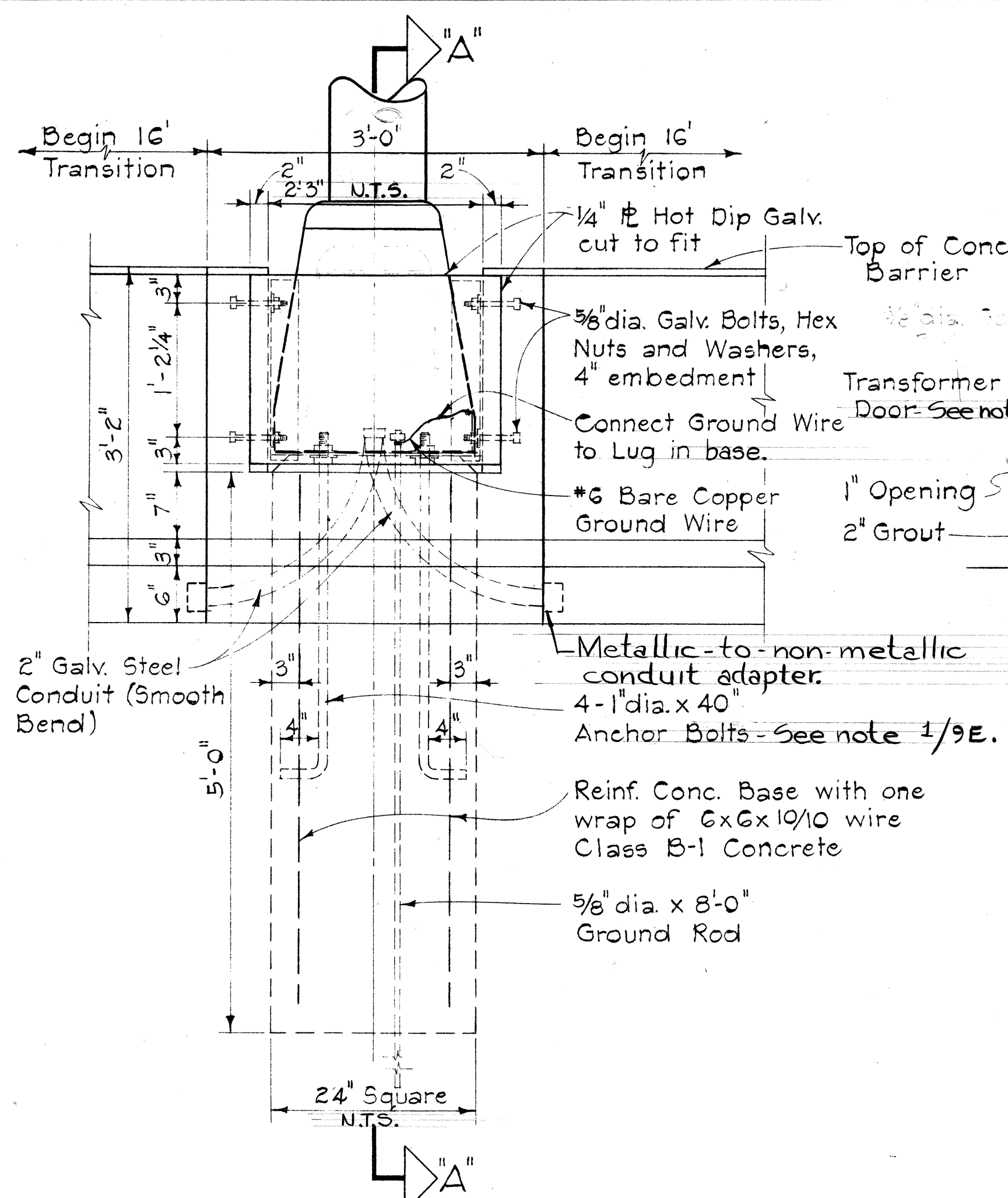
HALAWA INTERCHANGE
PROJECT NO. I-HI-1(88): 13

SHEET NO. 10E OF 15 SHEETS

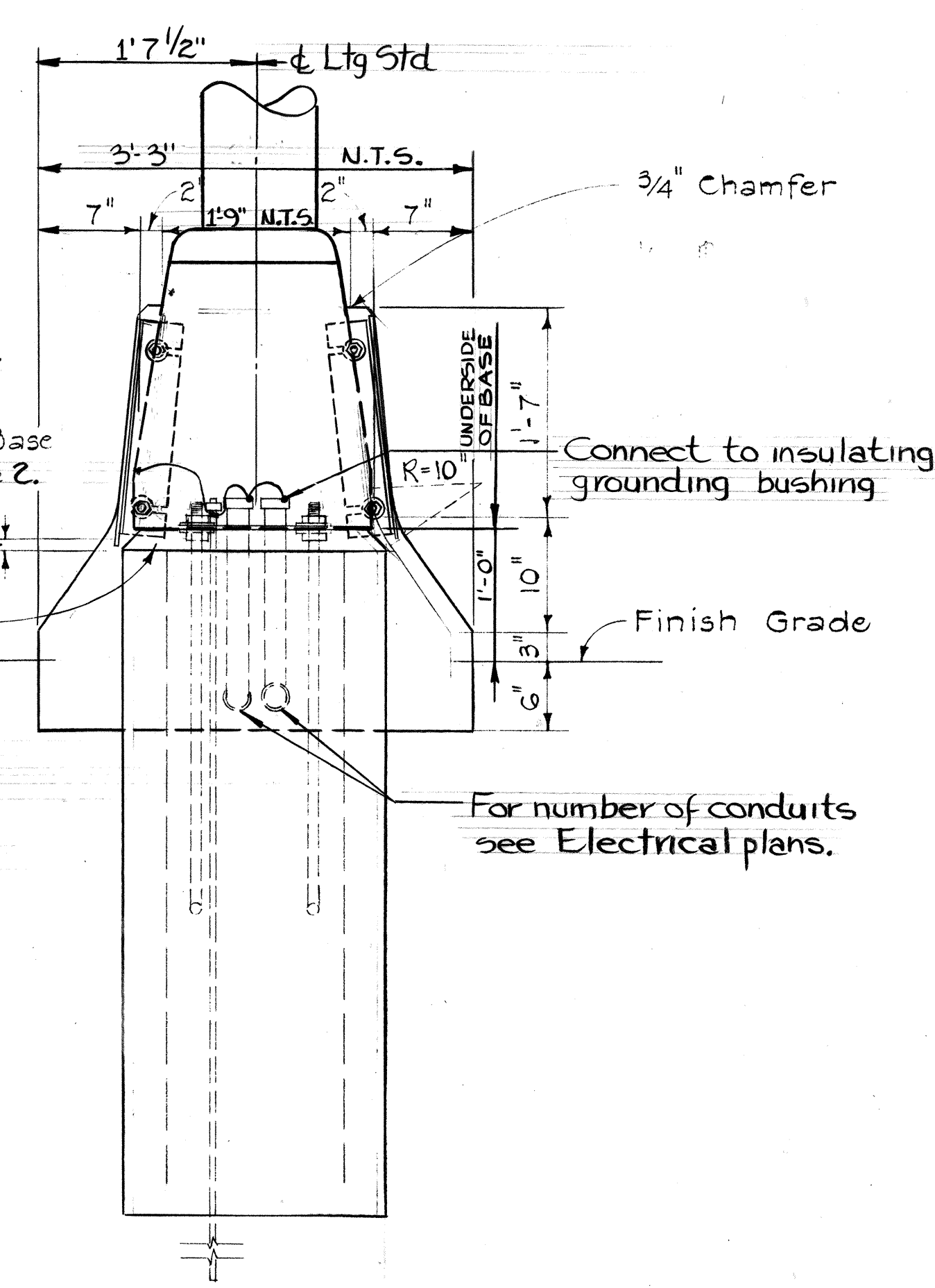
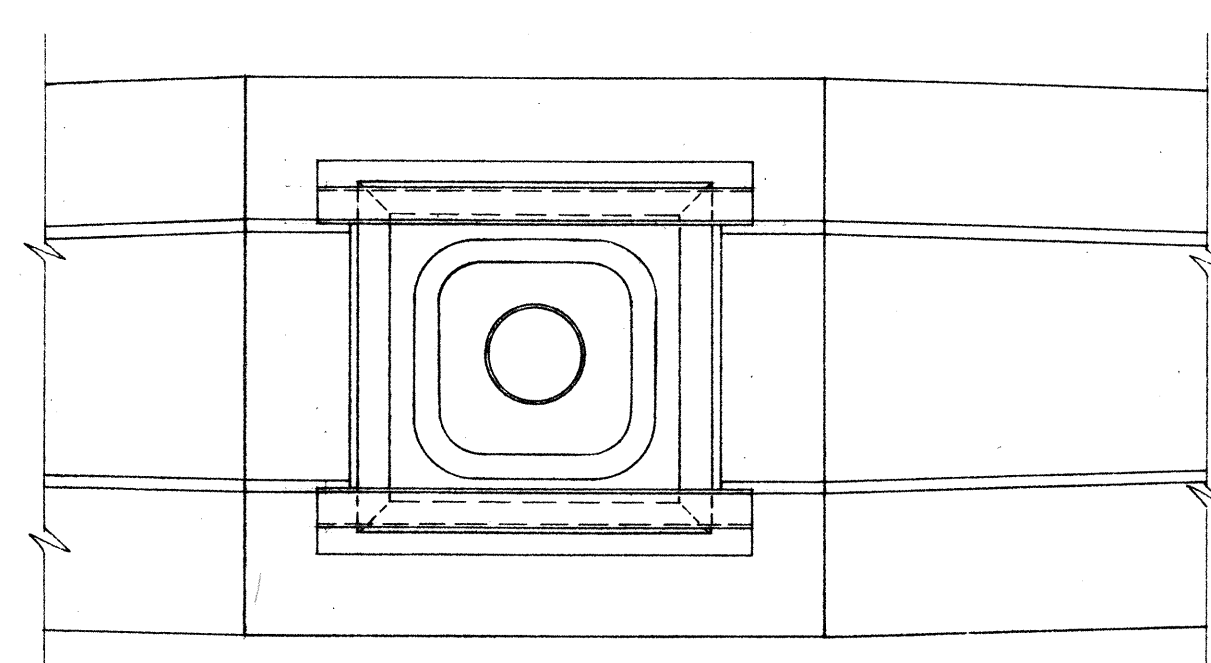
184

DATE	
DESIGNED BY	
CHECKED BY	
NOTED BY	
ORIGINAL PLAN	
NO.	

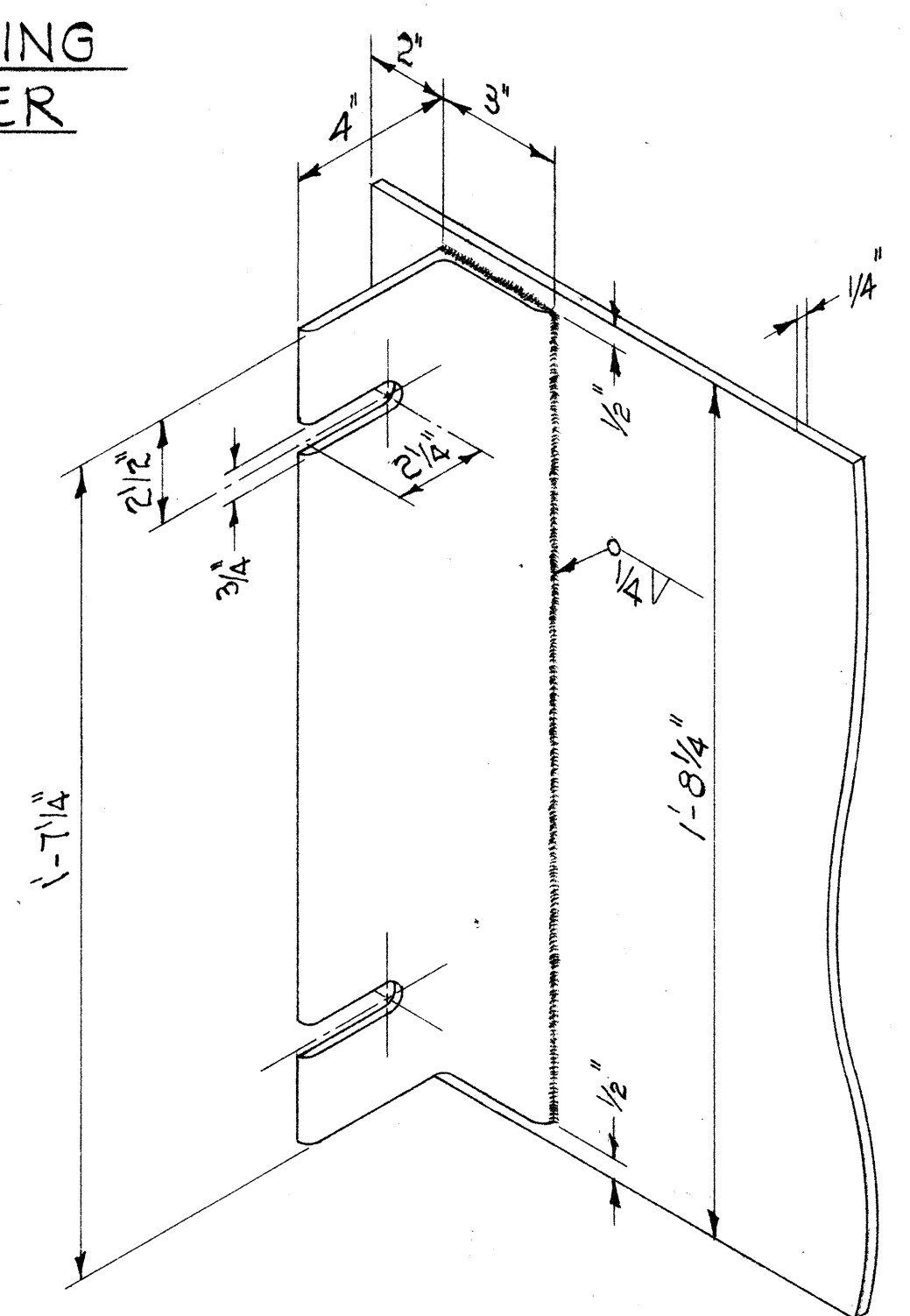
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IHH(88):13	1971	186	457



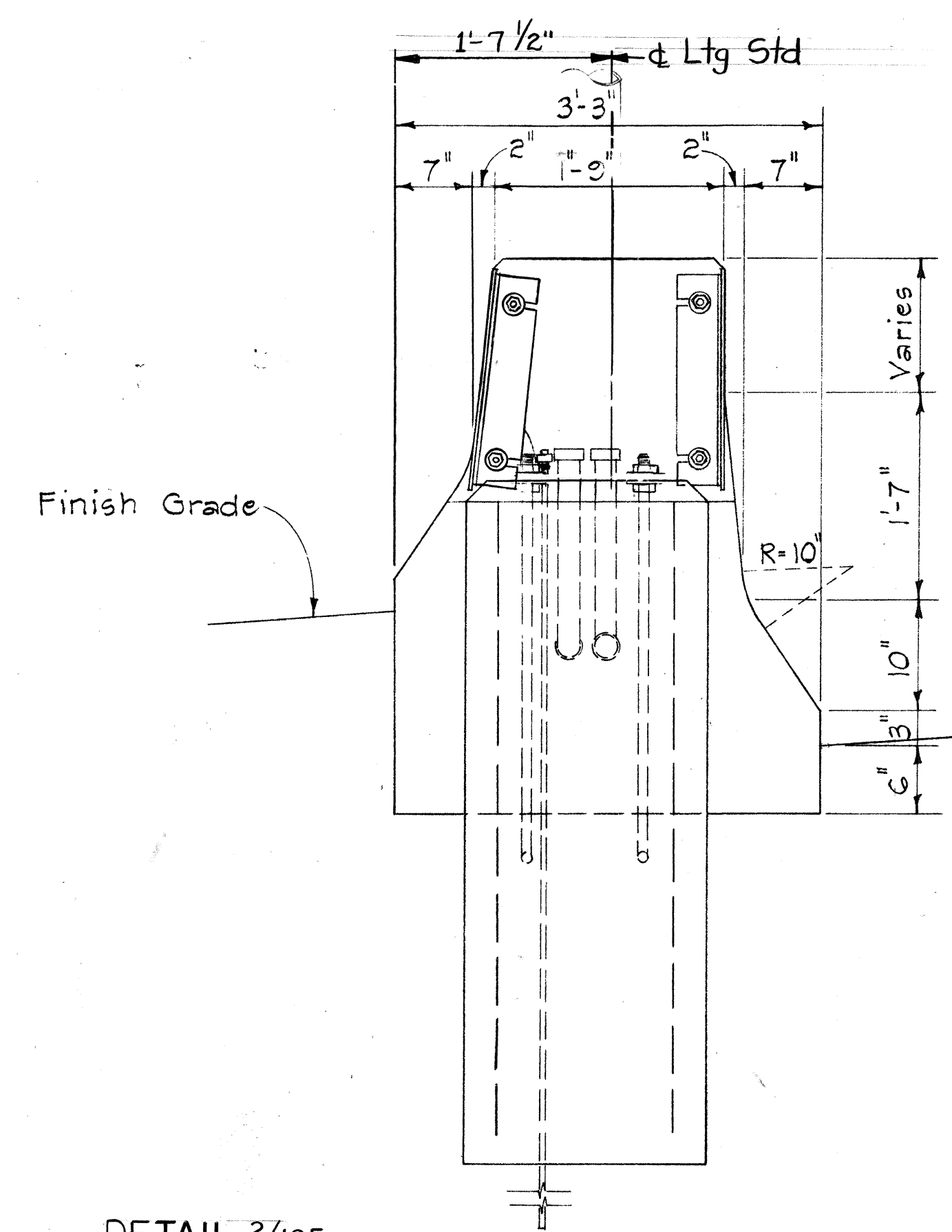
ELEVATION
 HIGHWAY LIGHTING STANDARD MOUNTING
 DETAIL ON TYPE "A" CONCRETE BARRIER
 Scale: 1" = 1'-0"



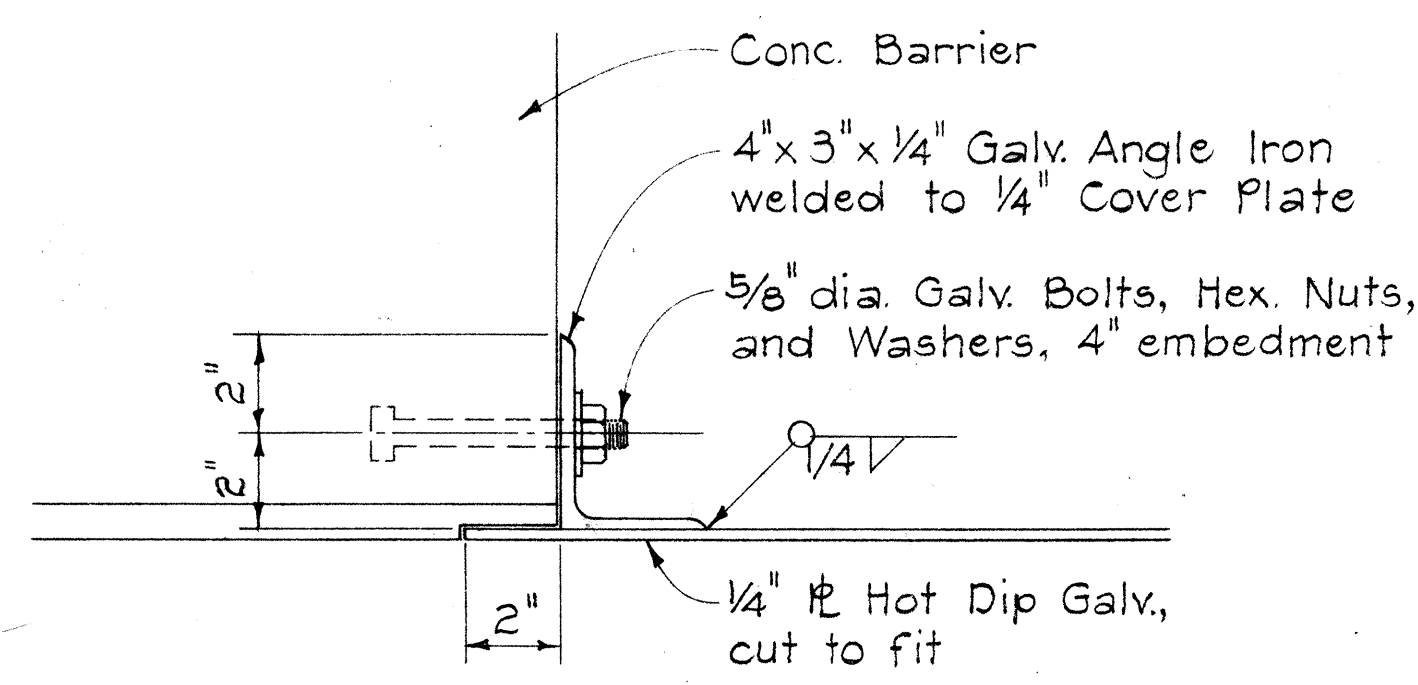
SECTION "A-A"



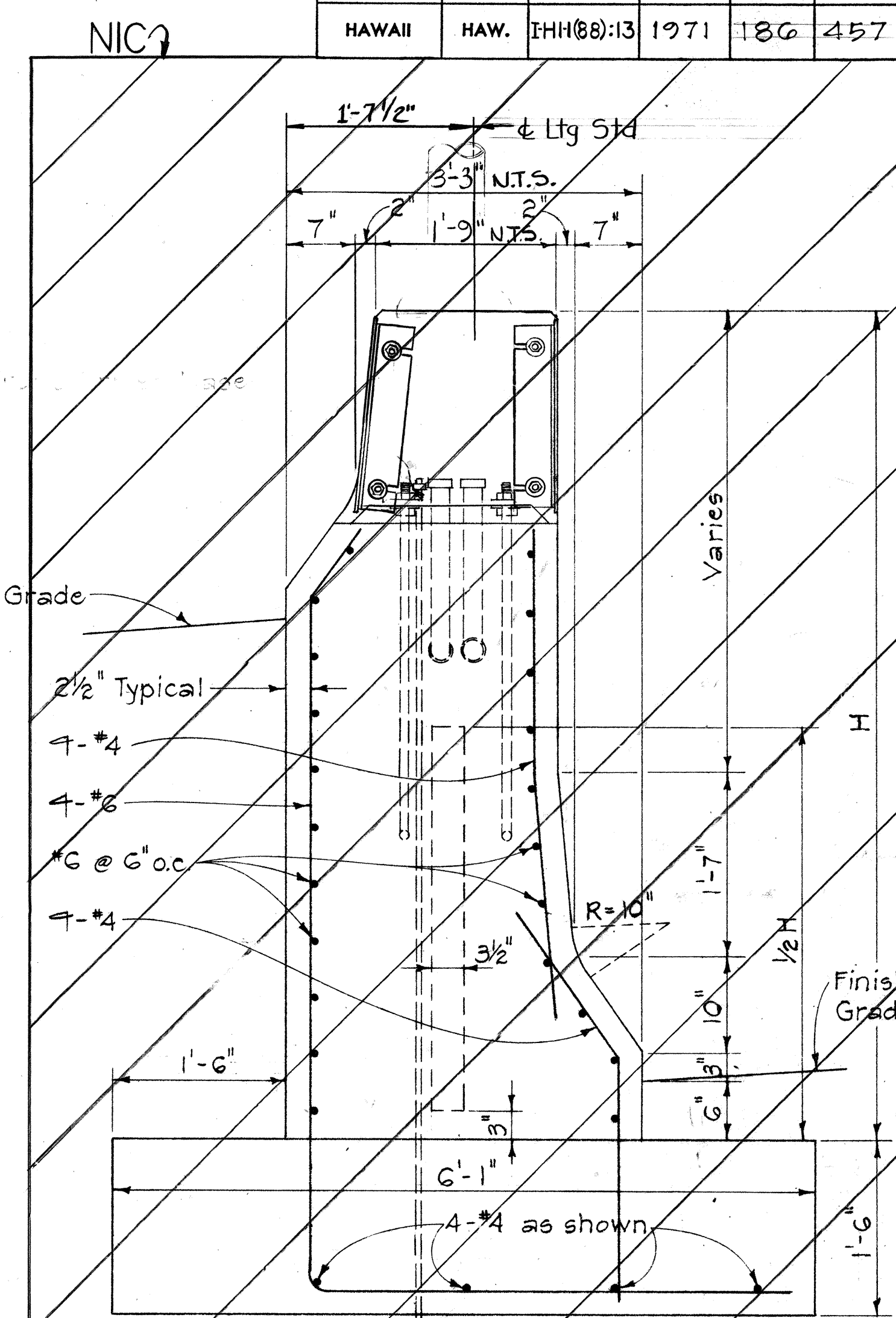
ANGLE IRON-COVER PLATE DETAIL
 Scale: 3" = 1'-0"



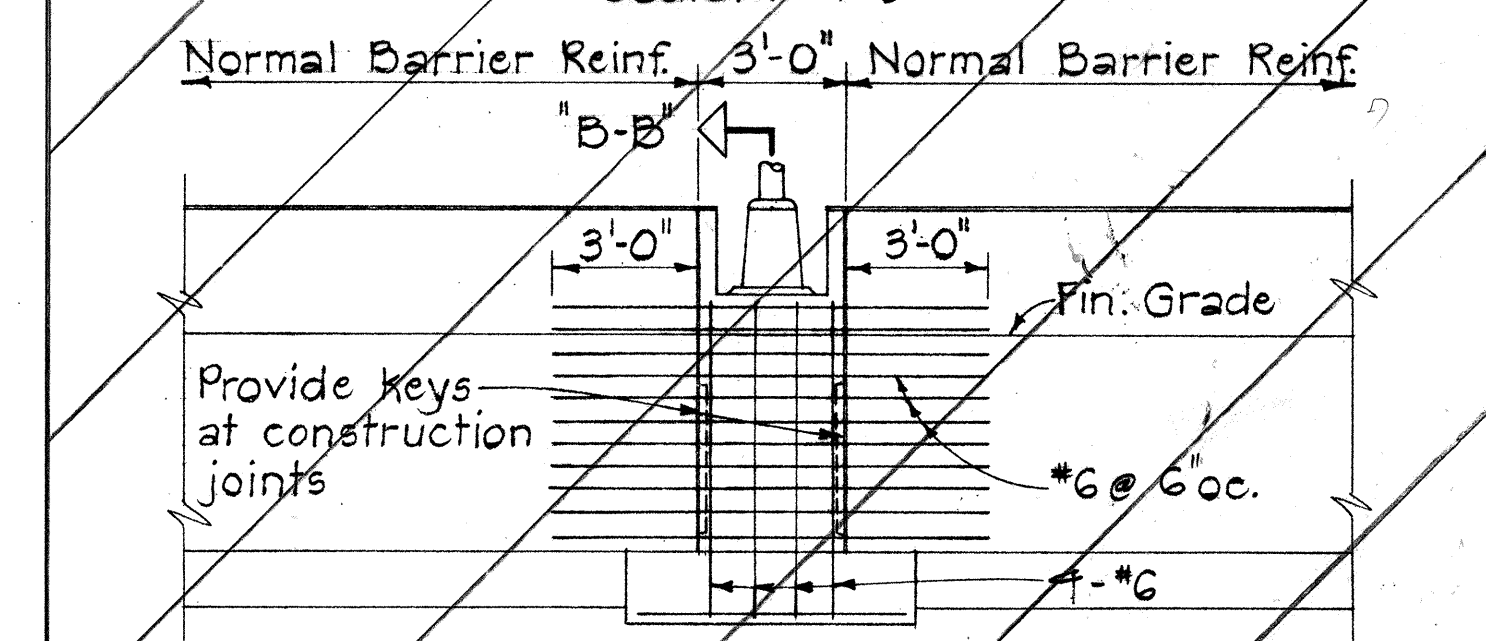
DETAIL 2/12E
 HIGHWAY LIGHTING STANDARD MOUNTING
 DETAIL ON TYPE "B" CONCRETE BARRIER
 Scale: 1" = 1'-0"



COVER PLATE ANCHOR DETAIL
 Scale: 3" = 1'-0"



SECTION "B-B"
 Scale: 1" = 1'-0"



ELEVATION
 Scale: 1/4" = 1'-0"
 DETAIL 3/12E
 HIGHWAY LIGHTING STANDARD MOUNTING
 DETAIL ON TYPE "C" CONCRETE BARRIER
 ELECTRICAL SHEET 12E

- NOTES:
1. Provide 5-foot by 2-foot by 2-foot lighting standard foundation complete including elbows, grounding, anchor rods, reinforcing, concrete, and excavation under lighting standard item. Provide all other indicated construction under barrier item.
 2. Position transformer base so that door is at right hand side of all lighting standards when looking up station.



THIS WORK WAS PREPARED BY
 ME OR UNDER MY SUPERVISION.
 Michael A. Marszalowicz

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

ELECTRICAL DETAILS
 LTG. STD. ON BARRIER

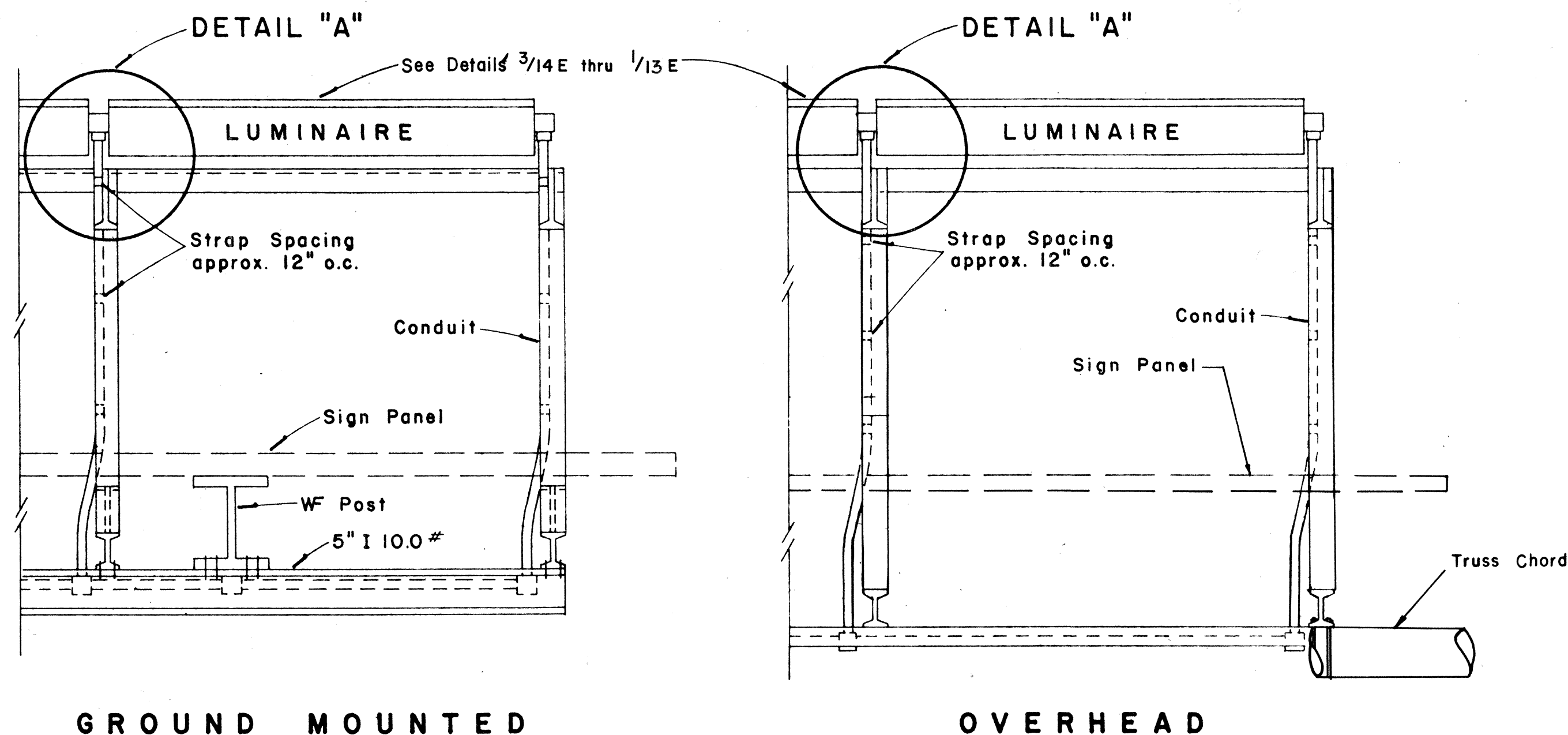
HALAWA INTERCHANGE
 PROJECT NO. I-HI-1(88):13
 Scale: As Shown Date:

SHEET No. 12E OF 15E SHEETS

DESIGNED BY	DATE
DRAWN BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

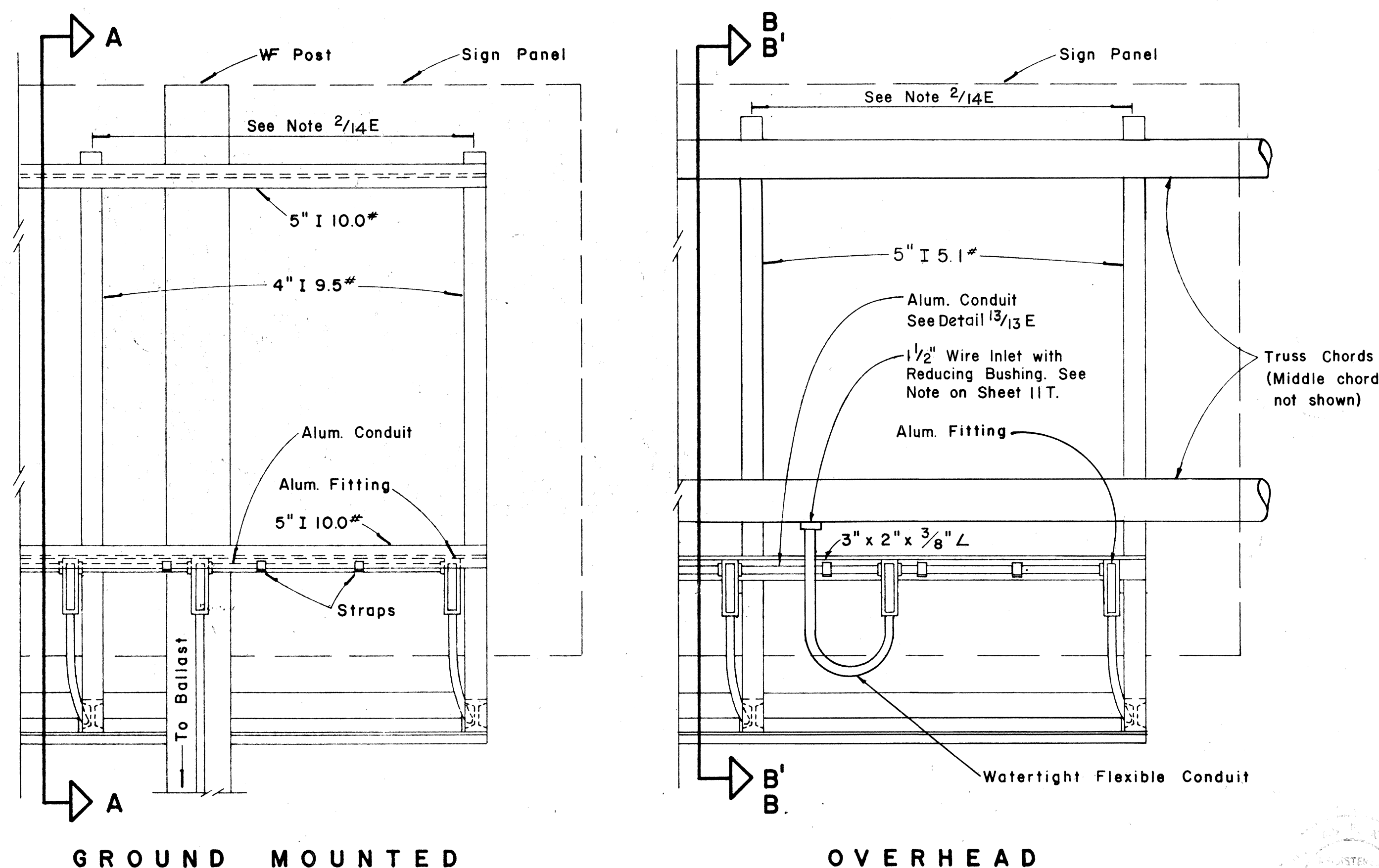
GENERAL NOTES

- For Raceway layout for sign luminaires see Detail 13/13 E.
- Luminaire brackets shall be spaced to fit luminaires. See Detail 1/13 E. Spacing between brackets shall not exceed 6'-9".
- Luminaire brackets shall be located behind sign panels so as to be concealed thereby from the motorist's view. Location shall also be such that a minimum conduit offset will be required.



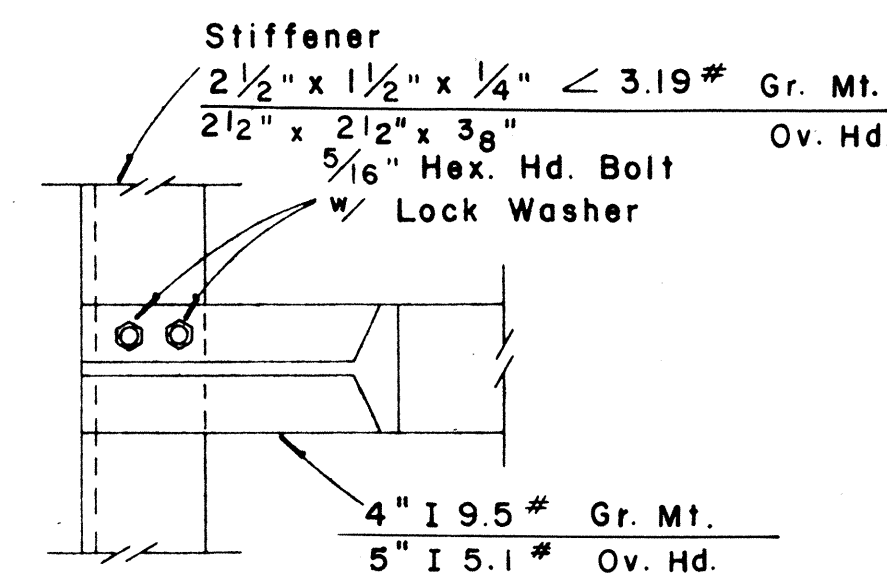
TOP VIEW LUMINAIRE MOUNTING

Scale: 1" = 1'-0"



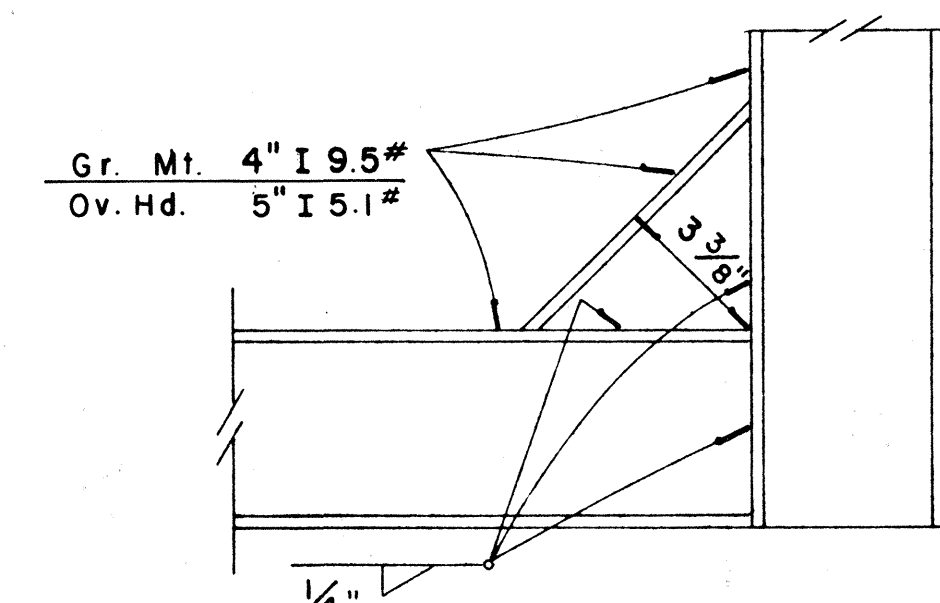
REAR VIEW LUMINAIRE MOUNTING

Scale: 1" = 1'-0"



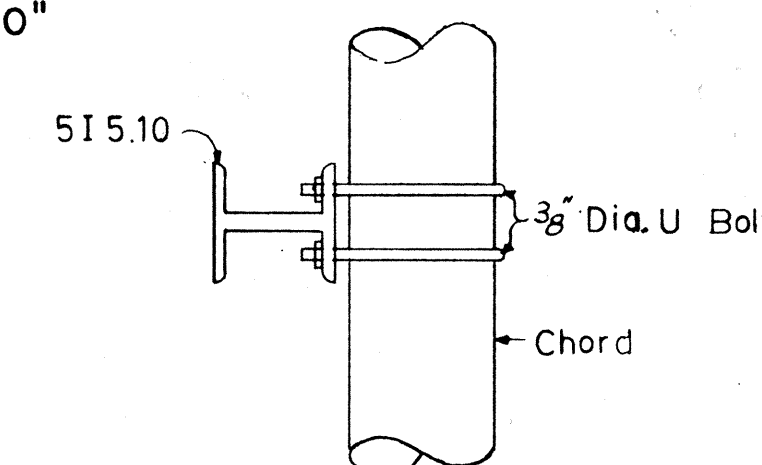
DETAIL "A"

Scale: 3" = 1'-0"

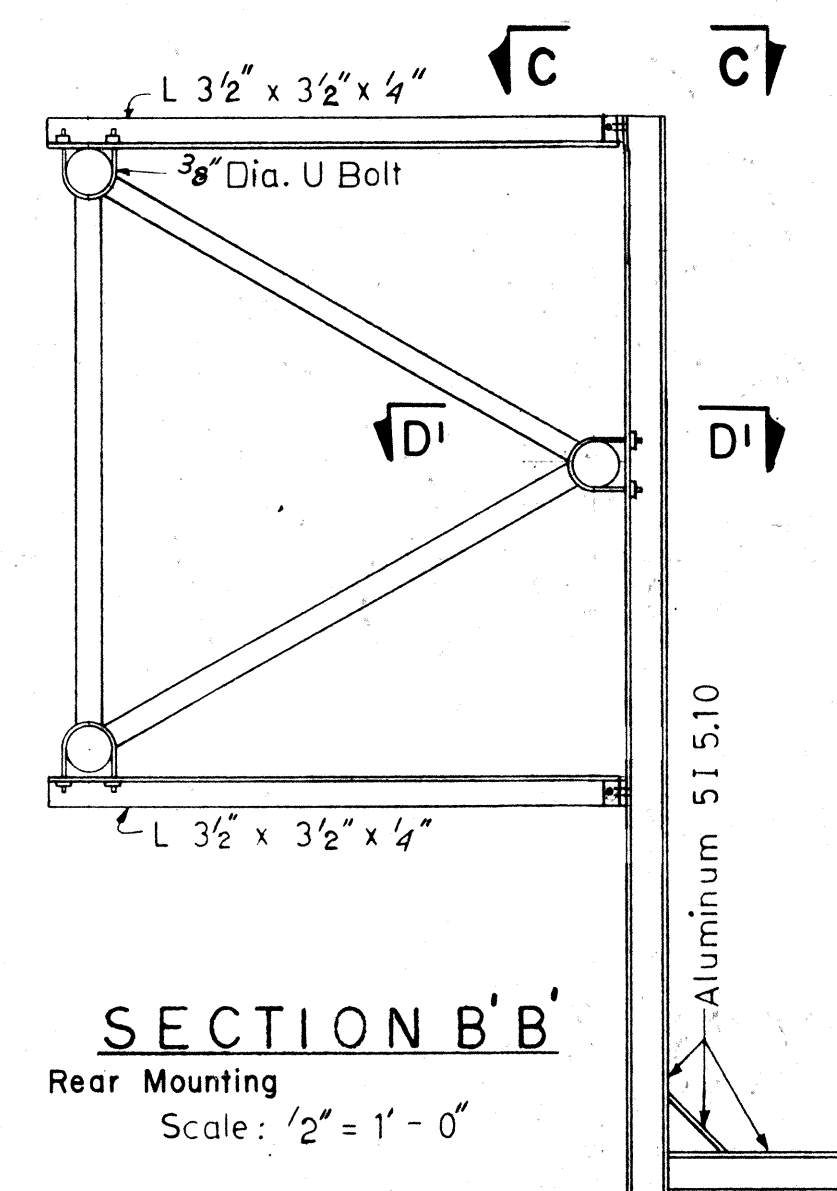


DETAIL "B"

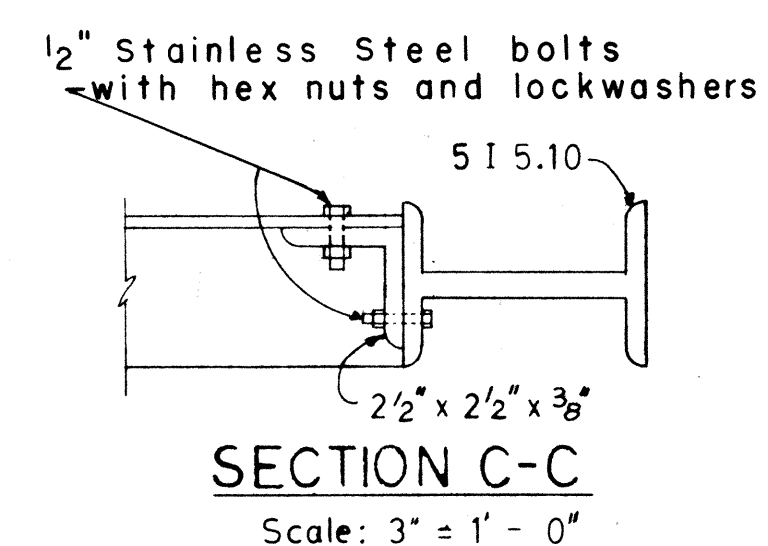
Scale: 3" = 1'-0"



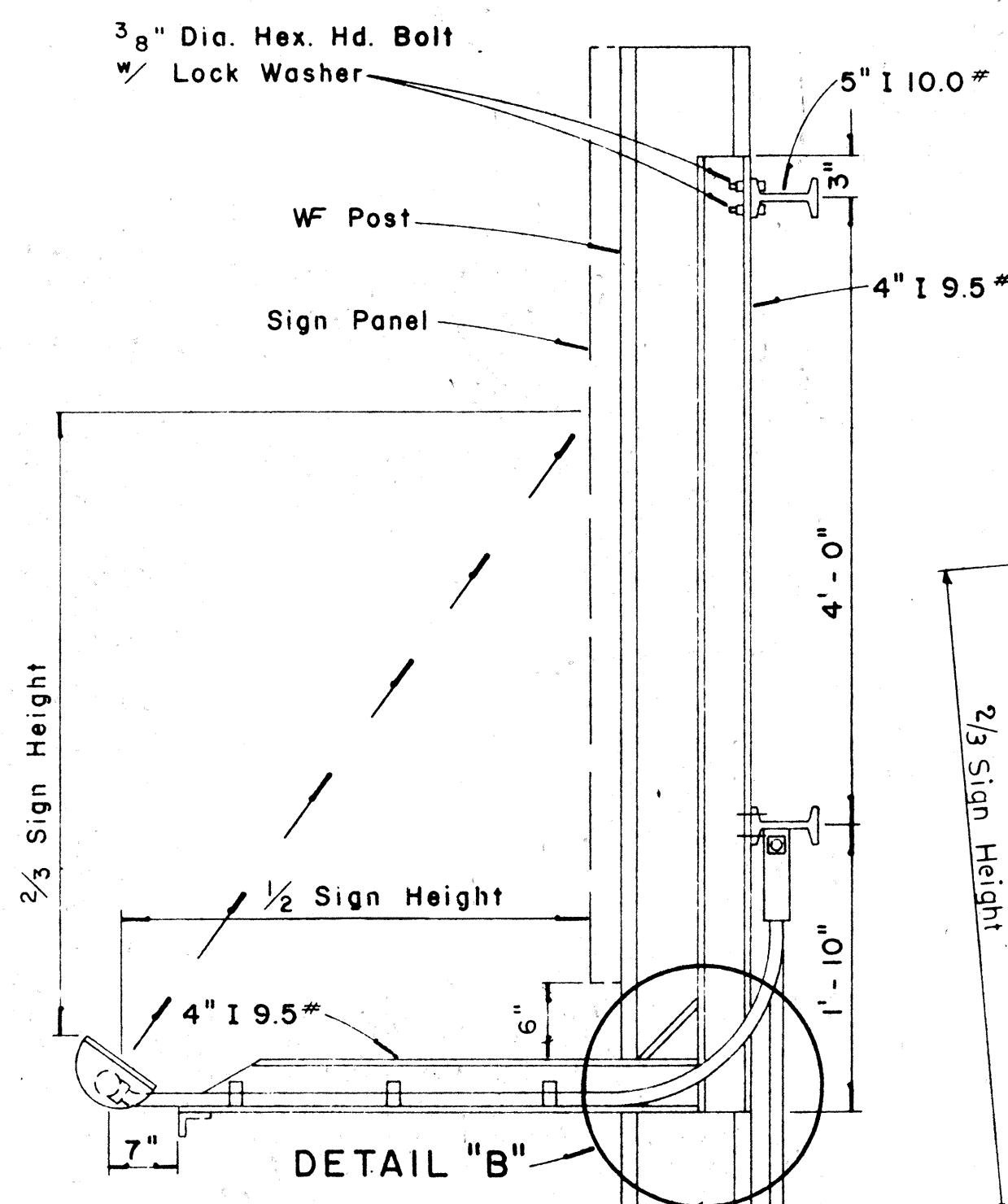
SECTION D-D Section D-D opposite hand Scale: 1/2" = 1'-0"



SECTION B-B Rear Mounting Scale: 1/2" = 1'-0"

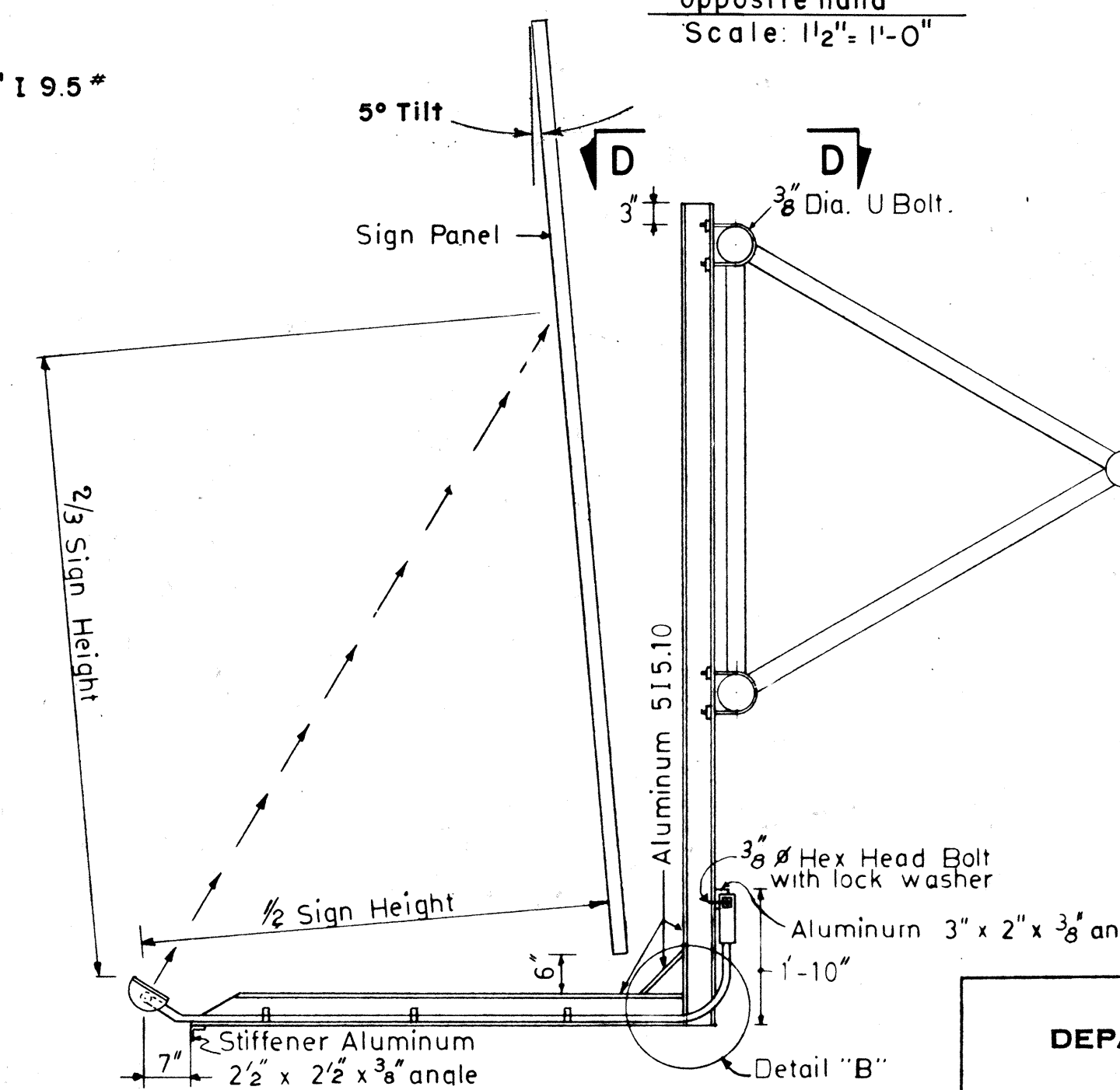


SECTION C-C Scale: 3" = 1'-0"



SECTION "A-A"

Scale: 1" = 1'-0"



SECTION B-B

Front Mounting
Scale: 1/2" = 1'-0"

NOTE: 3/8" Dia. "U" bolts to be Stainless Steel with hex nuts and washers

ELECTRICAL SHEET 14E

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

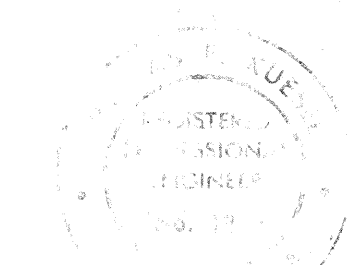
HIGHWAY ELECTRICAL SIGNS LUMINAIRE MOUNTINGS

Scale: As Shown

SHEET No. 14E OF 15E SHEETS

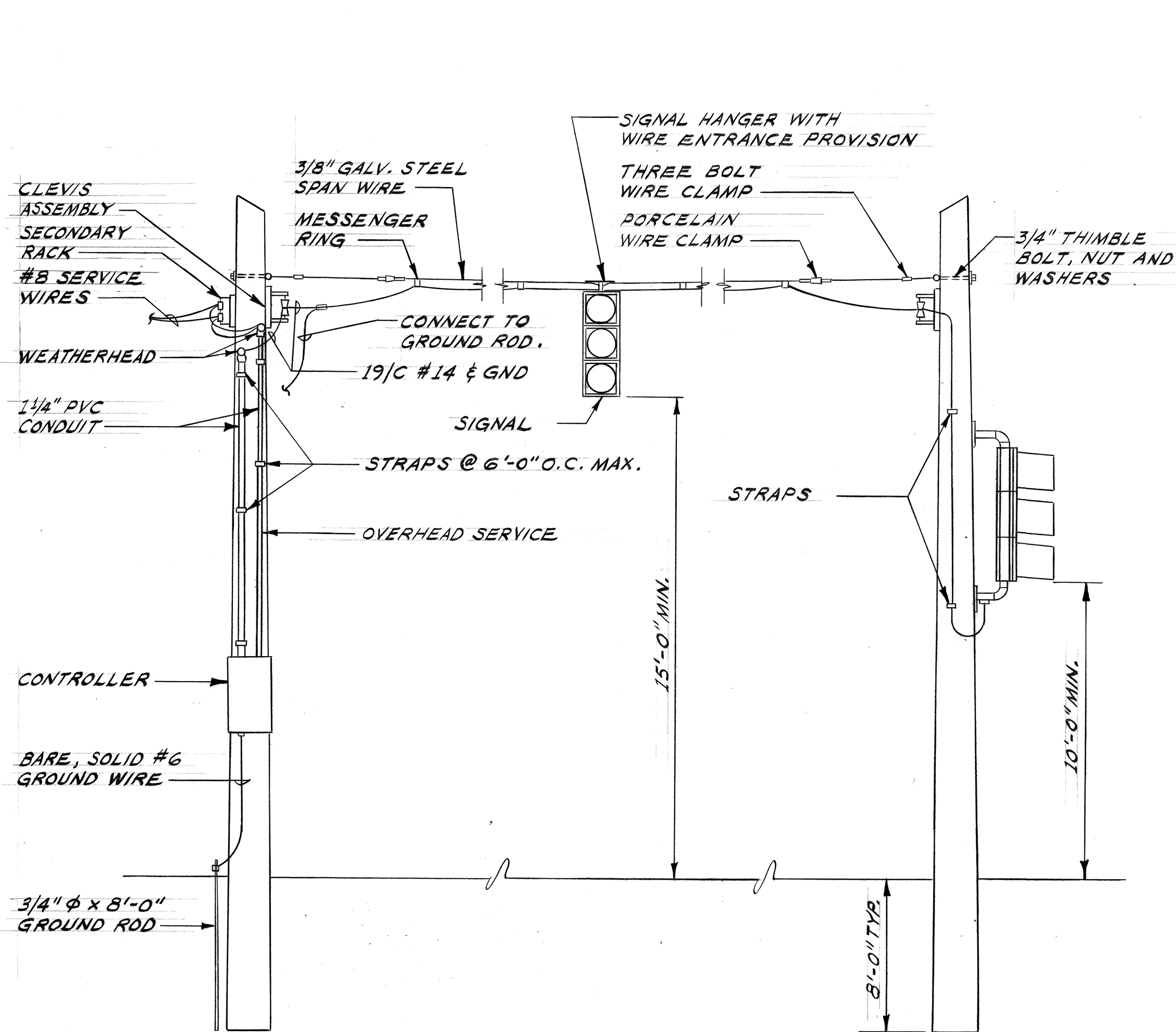
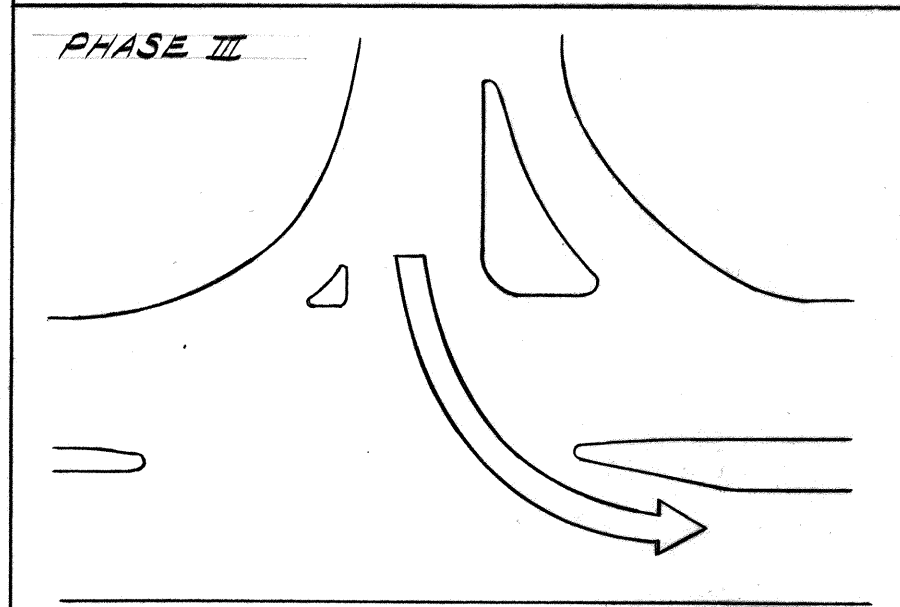
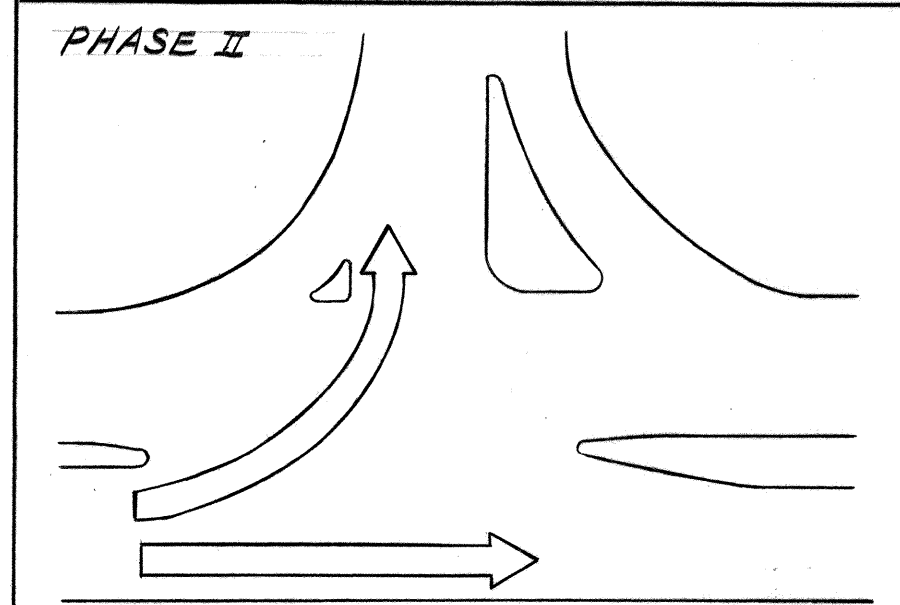
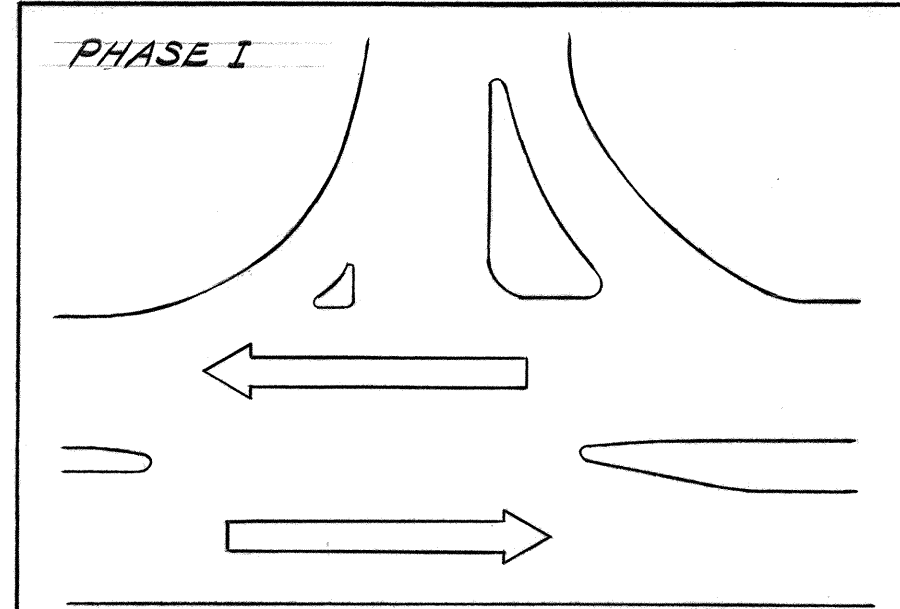
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SURVEY PLOTTED BY	DATE
DESIGNED BY	7/1/67
TRACED BY	7/1/67
QUANTITIES BY	7/1/67
CHECKED BY	7/1/67
ORIGINAL PLAN	
NOTE BOOK	
No.	

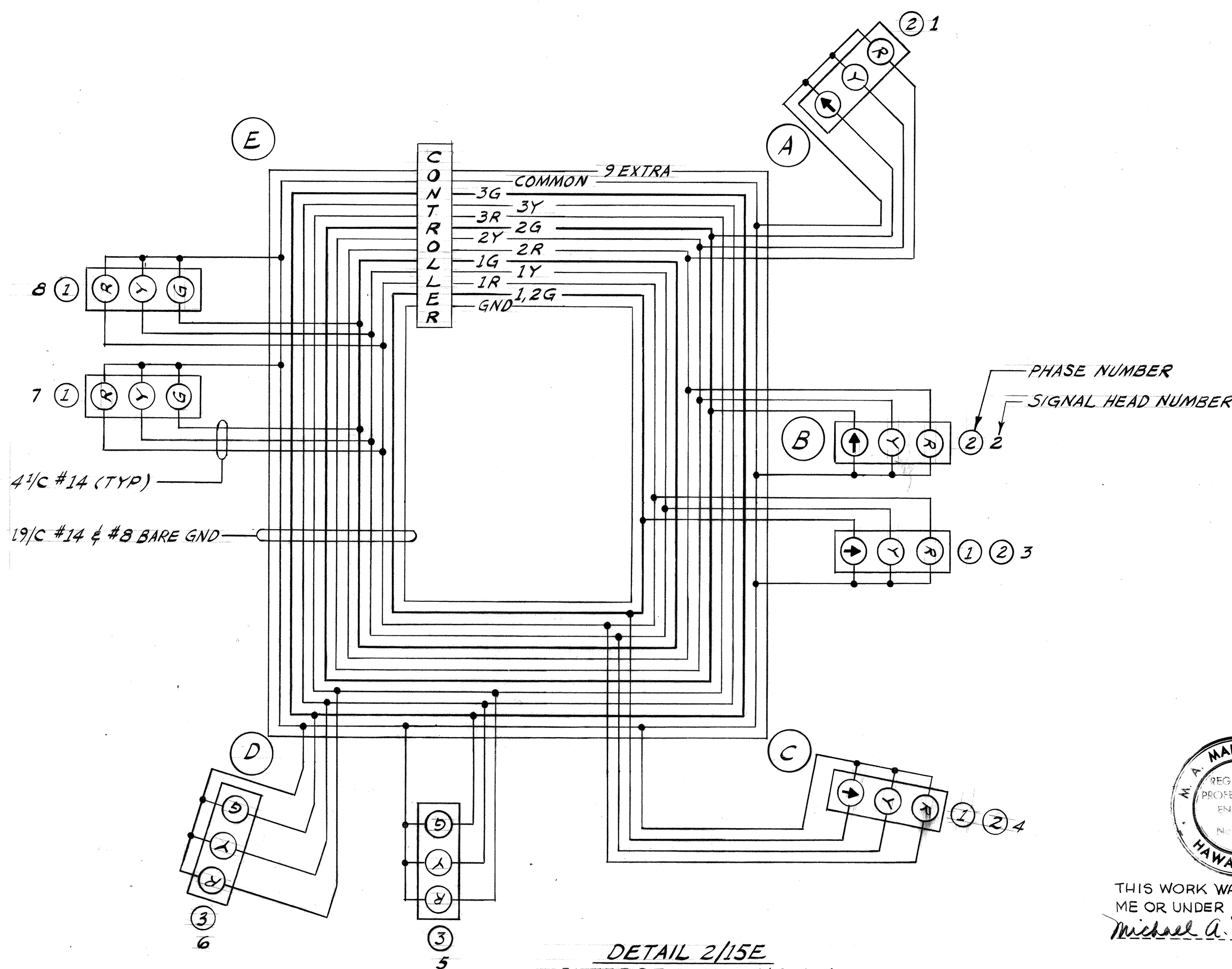


THIS WORK WAS
PREPARED BY
THOMAS R. KNEEL
REGISTERED PROFESSIONAL
ENGINEER
No. 111

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IHH(88):13	1971	189	457



DETAIL 1/15E
TRAFFIC SIGNAL
FACILITIES
N. T. S.



DETAIL 2/15E
INTERSECTION No. 4-1
WIRING DIAGRAM



THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION,
Michael A. Marszalowicz

ELECTRICAL SHEET 15E

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL SYSTEM DETAILS

HALAWA INTERCHANGE
PROJECT NO. I-HI-(88):13

SHEET No. 15E OF 15E SHEETS