

| FED. ROAD<br>DIST. NO. | STATE | FED. AID<br>PROJ. NO. | FISCAL<br>YEAR | SHEET<br>NO. | TOTAL<br>SHEETS |
|------------------------|-------|-----------------------|----------------|--------------|-----------------|
| HAWAII                 | HAW.  | I-HH(90):13           | 1972           | 90           | 202             |

### PLAN LEGEND

| PLAN LEGEND                                                                                             |                                                                                    |              |              |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------|--------------|
| SYMBOL                                                                                                  | REPRESENTS                                                                         | DETAIL NO    | NOTE NO      |
| L-1  250W-D4A<br>11+40 | LTG STD W/250 WATT LUMINAIRE & FND<br>(LAMP # L1; FDR D4A; PHASES A&B; STA. 11+40) | 1/5E<br>9/5E | G1           |
|  700W                  | LTG STD W/700WATT LUMINAIRE & FND                                                  | 1/5E<br>9/5E | G1           |
|  700W                  | LTG STD W/TWO 700 WATT LUMINAIRES & FND                                            | 1/5E<br>1/8E | G1           |
|  700W                  | LTG STD W/700 LUMINAIRE & ANCHORAGE                                                | 1/5E<br>6/6E |              |
|  -C-A                  | ILLUMINATED SIGN CONNECTED TO<br>PHASES C & A OF THE INDICATED CIRCUIT             | 8/5E         |              |
|                                                                                                         |                                                                                    |              |              |
|                                                                                                         |                                                                                    |              |              |
|                        | CONDUIT RUN IN CONCRETE STRUCTURE<br>OR ENCASED IN CONCRETE                        | 7/5E         | G4, G5<br>G8 |
|                        | CONDUIT RUN IN EARTH WITHOUT<br>ENCASEMENT                                         |              | G3, G8       |
|                        | CAPPED CONDUIT OR CONDUIT TRANSITION<br>AS PLAN INDICATES                          | 6/5E         |              |
|                        | CONDUIT TURNING DOWN                                                               |              |              |
|                        | CONDUIT TURNING UP                                                                 |              |              |
|                                                                                                         |                                                                                    |              |              |
|                        | PULL BOX TYPE A                                                                    | 1/1E<br>2/1E |              |
|                        | PULL BOX TYPE B                                                                    | 3/1E         |              |
|                        | PULL BOX TYPE S                                                                    | 1/1E         |              |
|  M                     | METAL PULL BOX                                                                     | 6/6E         |              |
|                                                                                                         |                                                                                    |              |              |
|                                                                                                         |                                                                                    |              |              |
|                                                                                                         |                                                                                    |              |              |
|                                                                                                         |                                                                                    |              |              |
|                                                                                                         |                                                                                    |              |              |
|                                                                                                         |                                                                                    |              |              |
| (E)                                                                                                     | USED IN CONJUNCTION WITH OTHER SYMBOLS<br>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 4/5E and 5/5E.
- 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 Note G15 provides.
- G9. None
- G10. At locations indicated connection to existing conductors.
- G11. At locations indicated, connect to existing capped conduit and extend as shown.
- G12. None
- G13. None
- G14. None
- G15. Branch taps 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. None
- G18. None
- G19. Provide at each expansion joint a conduit expansion/deflection fitting in all runs embedded in median barrier. See Details 4/5E and 5/5E.

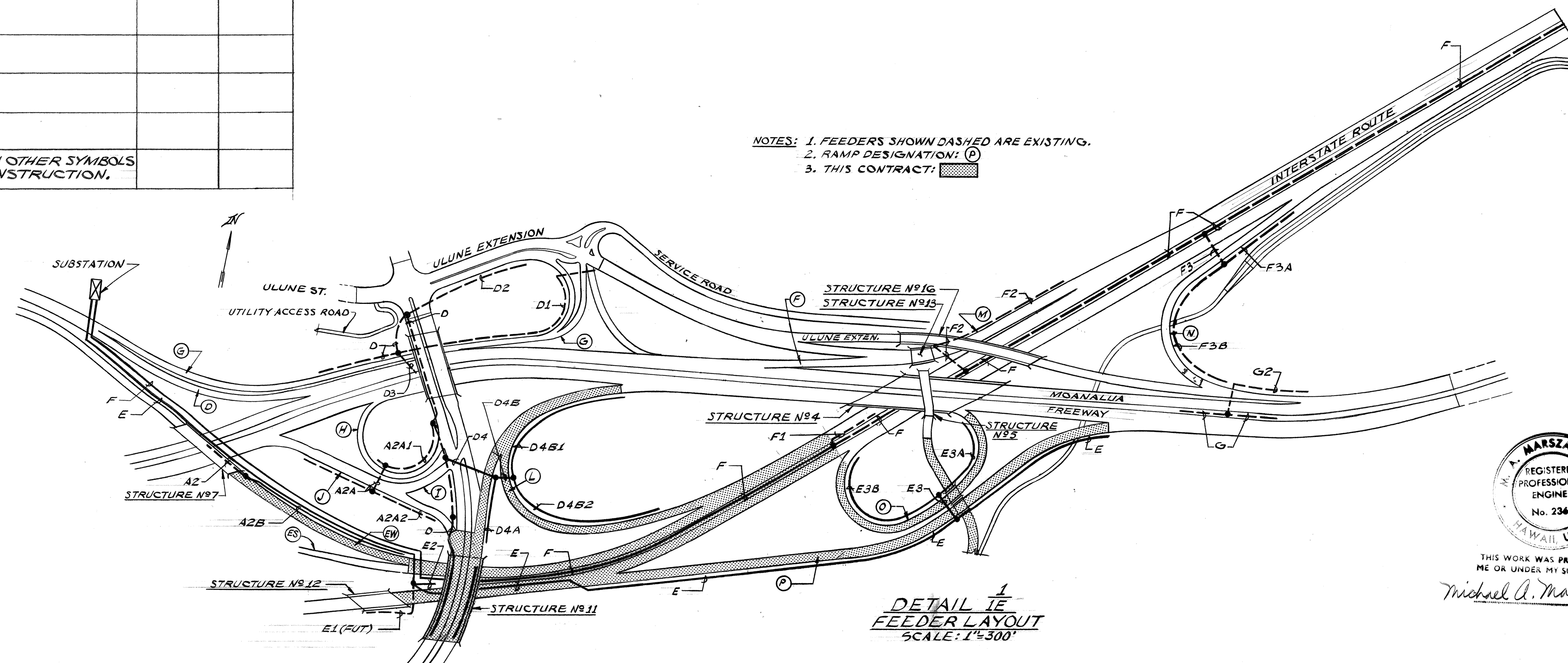
## LIST OF ABBREVIATIONS

|         |                                 |
|---------|---------------------------------|
| LTG STD | Lighting Standard               |
| PNC     | 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

NOTES: 1. FEEDERS SHOWN DASHED ARE EXISTING.  
2. RAMP DESIGNATION: (P)  
3. THIS CONTRACT: 



DETAIL 1E  
FEEDER LAYOUT  
SCALE: 1"=300'



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Michael A. Marszalko

ELECTRICAL SHEET 1E

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

## ELECTRICAL PLAN SYMBOLS AND NOTES

HALAWA INTERCHANGE  
PROJECT NO. I-HI-1(90):13

**SHEET No. 1 E OF 10 SHEETS**

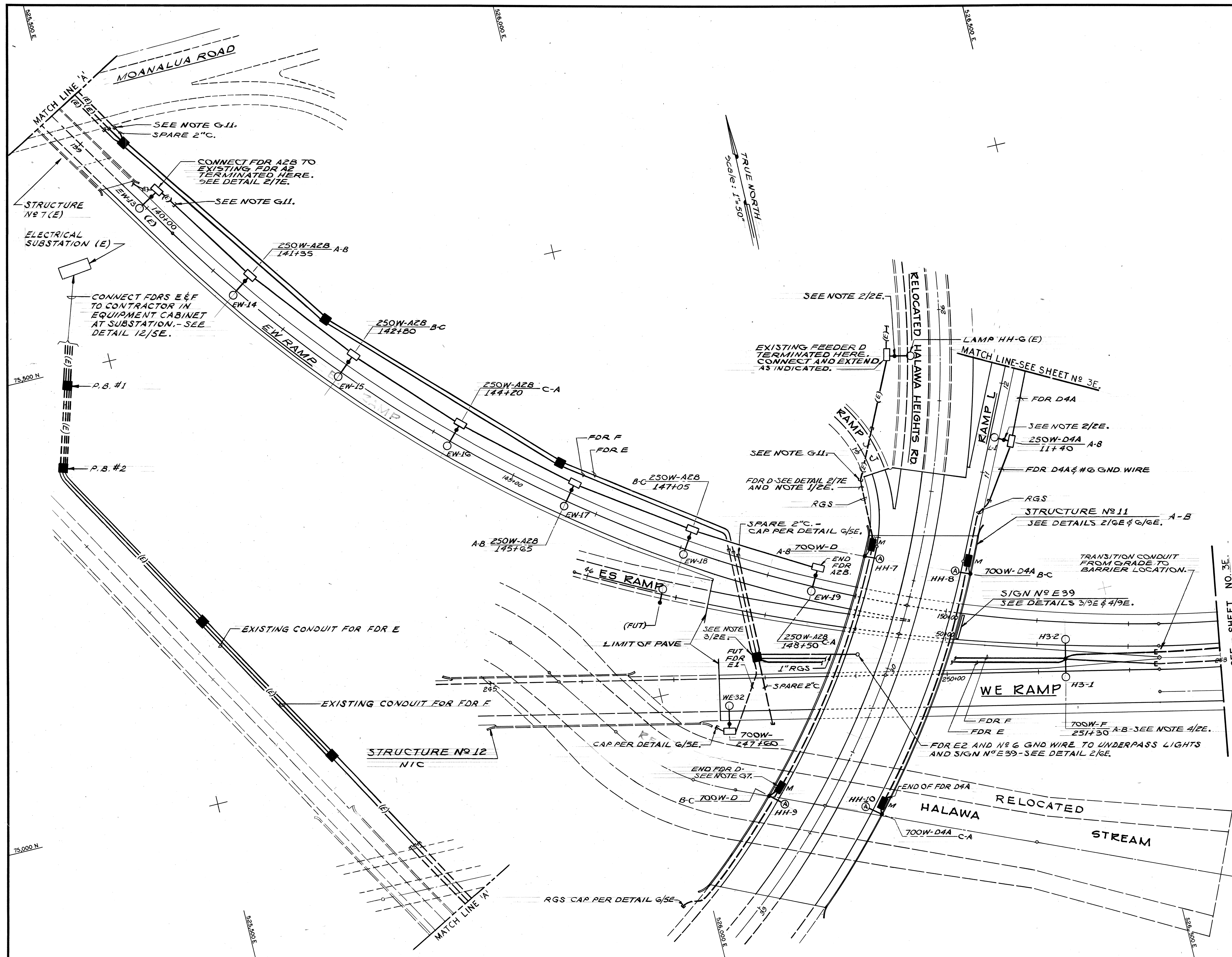
|                  |                                    |
|------------------|------------------------------------|
| ORIGINAL<br>PLAN | SURVEY PLOTTED BY _____ DATE _____ |
| NOTE BOOK        | DRAWN BY _____                     |
|                  | TRACED BY _____                    |
|                  | DESIGNED BY _____                  |
|                  | QUANTITIES BY _____                |
| No. _____        | CHECKED BY _____                   |



| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | I-HI-1(90)13       | 1972        | 01        | 202          |

- NOTES:
1. FOLLOWING TESTING, THE ENGINEER WILL DIRECT THAT LAMPS HH-7 THRU HH-10 BE DISCONNECTED FROM SERVICE AT THE FUSED BRANCH TAP TO EACH OF THESE LAMPS.
  2. CONNECT #6 GND. WIRE FROM LTG. STD. ON STRUCTURE TO GROUND ROD IN LTG. STD. FOUNDATION.
  3. PROVIDE GND. ROD IN PULL BOX AND BOND METAL CONDUITS TO IT WITH #6 GND. WIRE.
  4. LTG. STD. FOR LUMINAIRES H3-1 & H3-2 SHALL BE PROVIDED WITH TRANSFORMER BASE (DETAIL 1/5E) AND FND (DETAIL 3/5E).

|                   |       |
|-------------------|-------|
| DATE              | _____ |
| SURVEY PLOTTED BY | _____ |
| DRAWN BY          | _____ |
| TRACED BY         | _____ |
| DESIGNED BY       | _____ |
| CHECKED BY        | _____ |
| ORIGINAL PLAN     | _____ |
| NOTE BOOK         | _____ |
| No.               | _____ |



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*Michael A. Marszalowicz*

## ELECTRICAL SHEET 2E

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

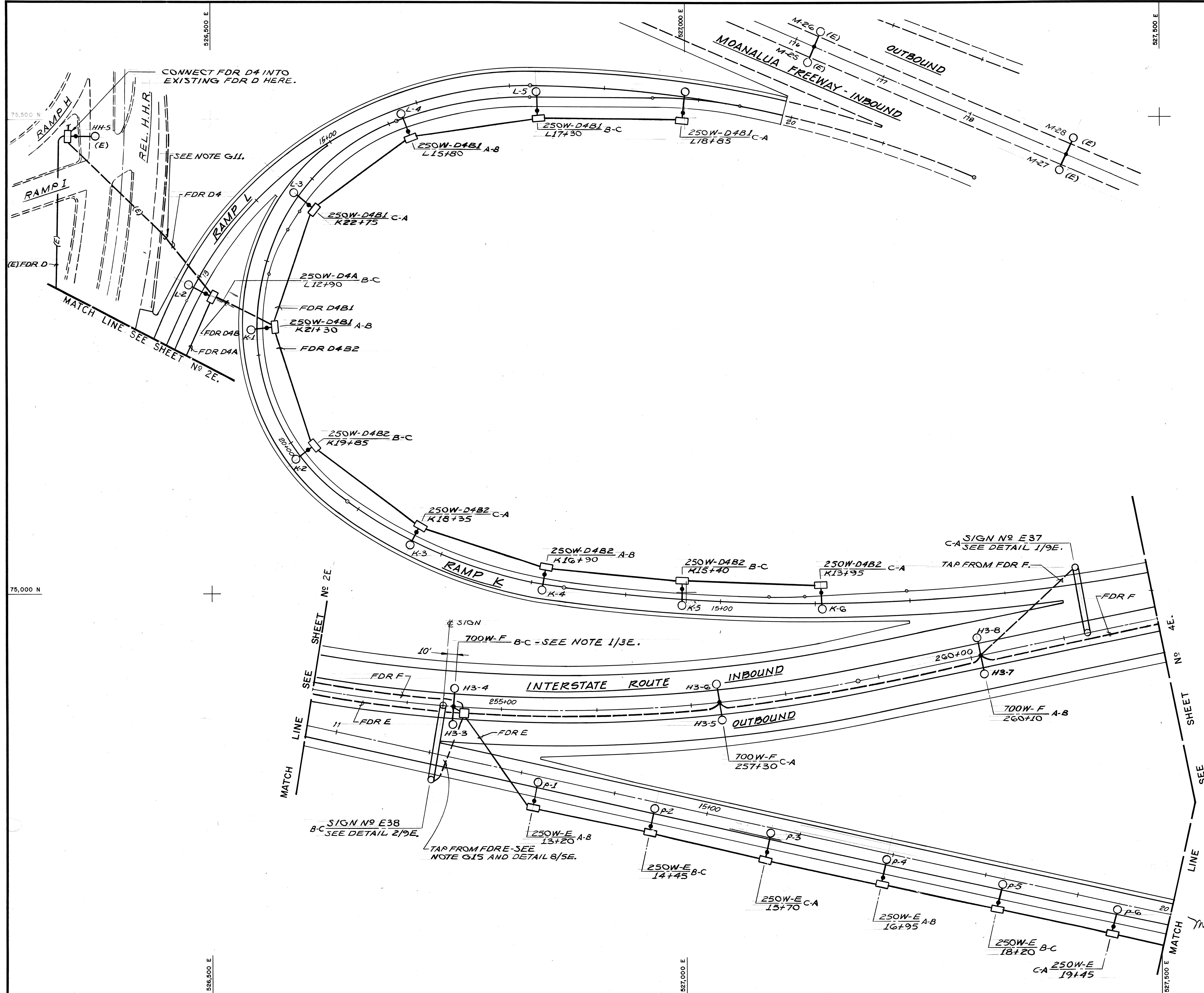
### LIGHTING PLAN PART I

HALAWA INTERCHANGE  
PROJECT NO. I-HI-1(90)13

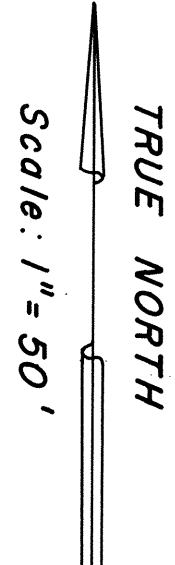
SHEET No. 2E OF 10 SHEETS



| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | I-HI-(90):13       | 1972        | 92        | 202          |



NOTE:  
1. PROVIDE LUMINAIRE SHIELD ON INDICATED LUMINAIRES, SEE DETAIL 11/5E.



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ELECTRICAL SHEET 3E

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

LIGHTING PLAN  
PART II  
HALAWA INTERCHANGE  
PROJECT NO. I-HI-(90):13

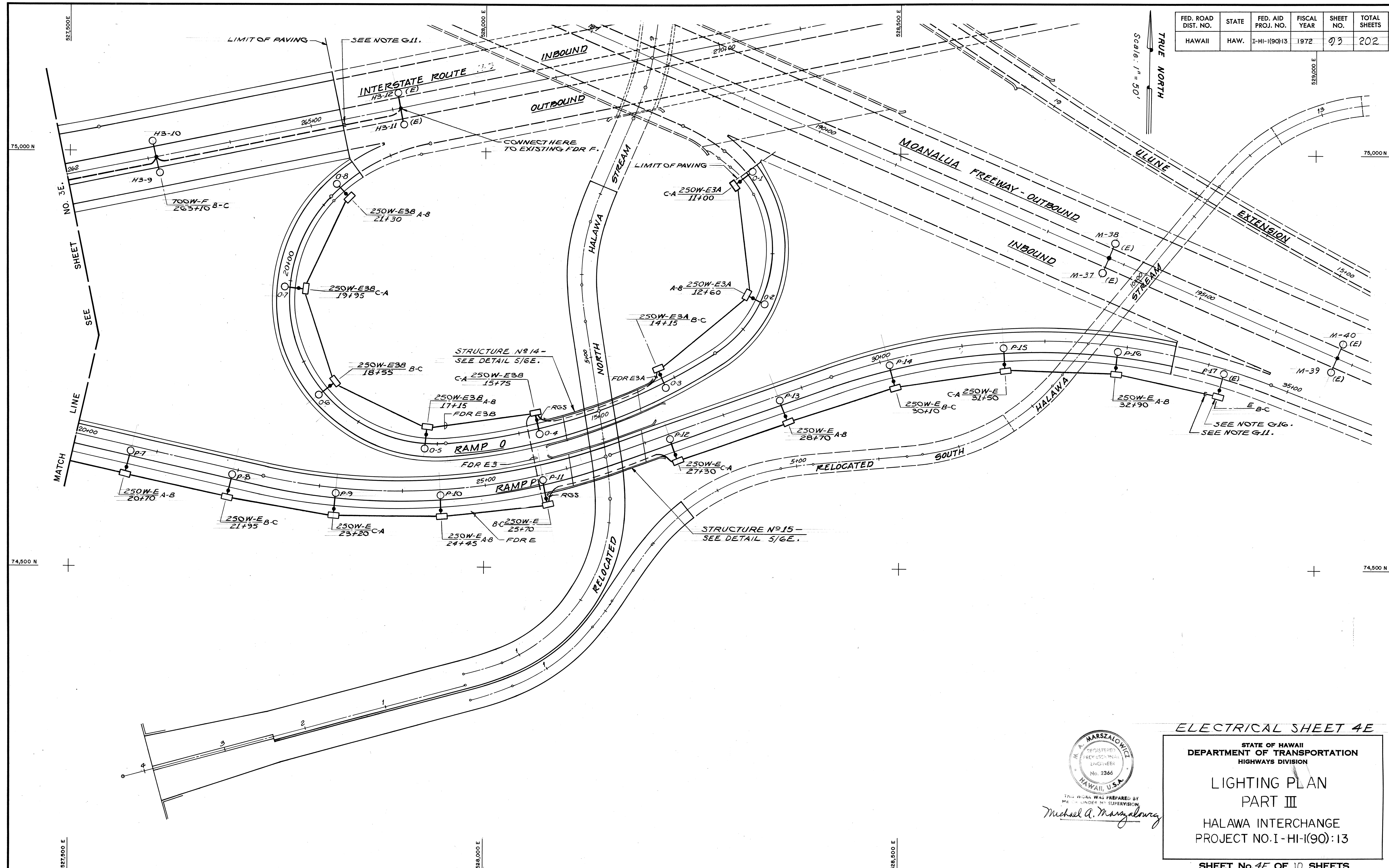
SHEET No. 3E OF 10 SHEETS

|                   |      |
|-------------------|------|
| 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.  | I-HI-(90)13        | 1972        | 03        | 202          |

Scale: 1" = 50'  
TRUE NORTH



|                   |       |
|-------------------|-------|
| DATE              | _____ |
| SURVEY PLOTTED BY | _____ |
| DRAWN BY          | _____ |
| NOTED BY          | _____ |
| CHECKED BY        | _____ |
| NO.               | _____ |



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**ELECTRICAL SHEET 4E**

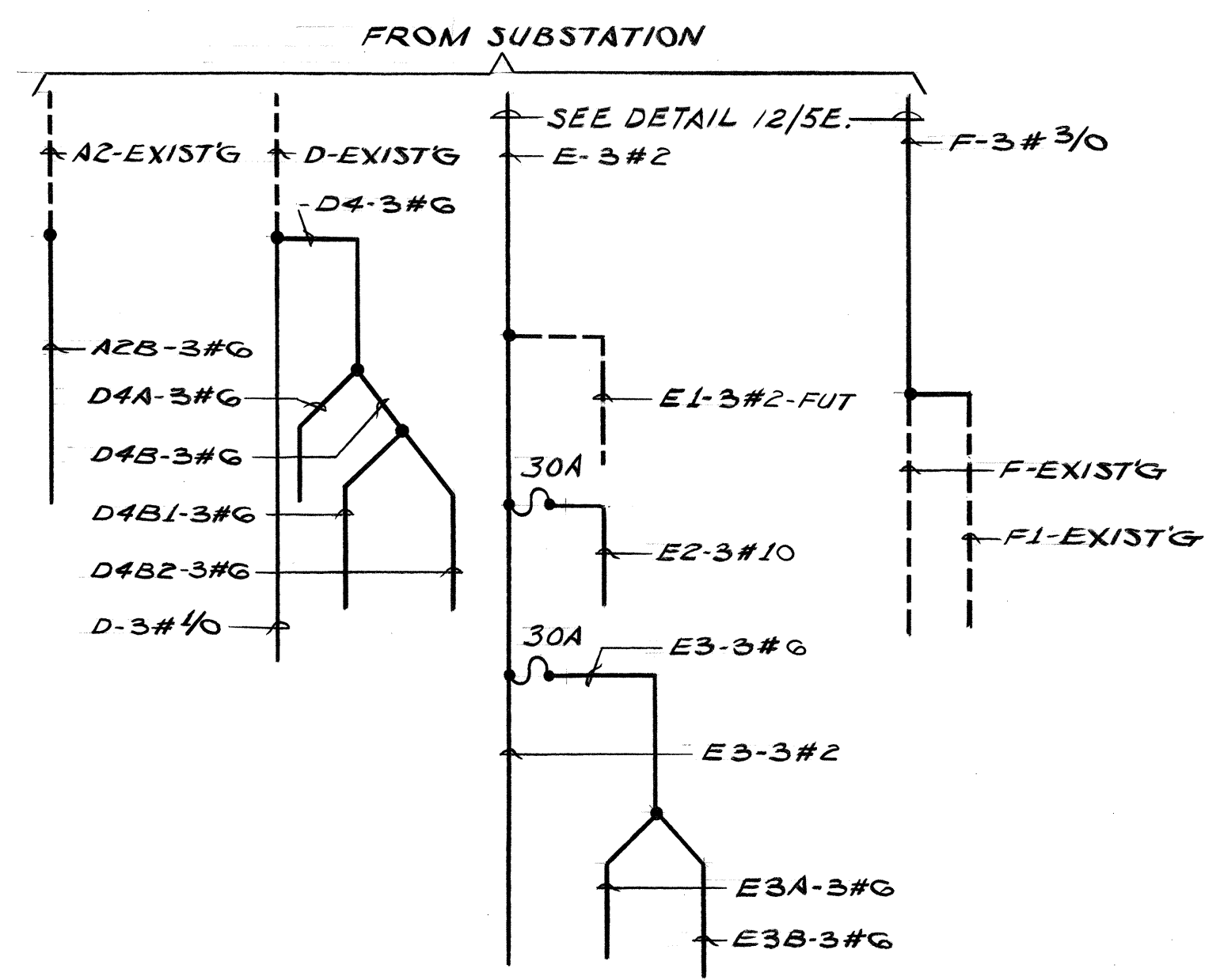
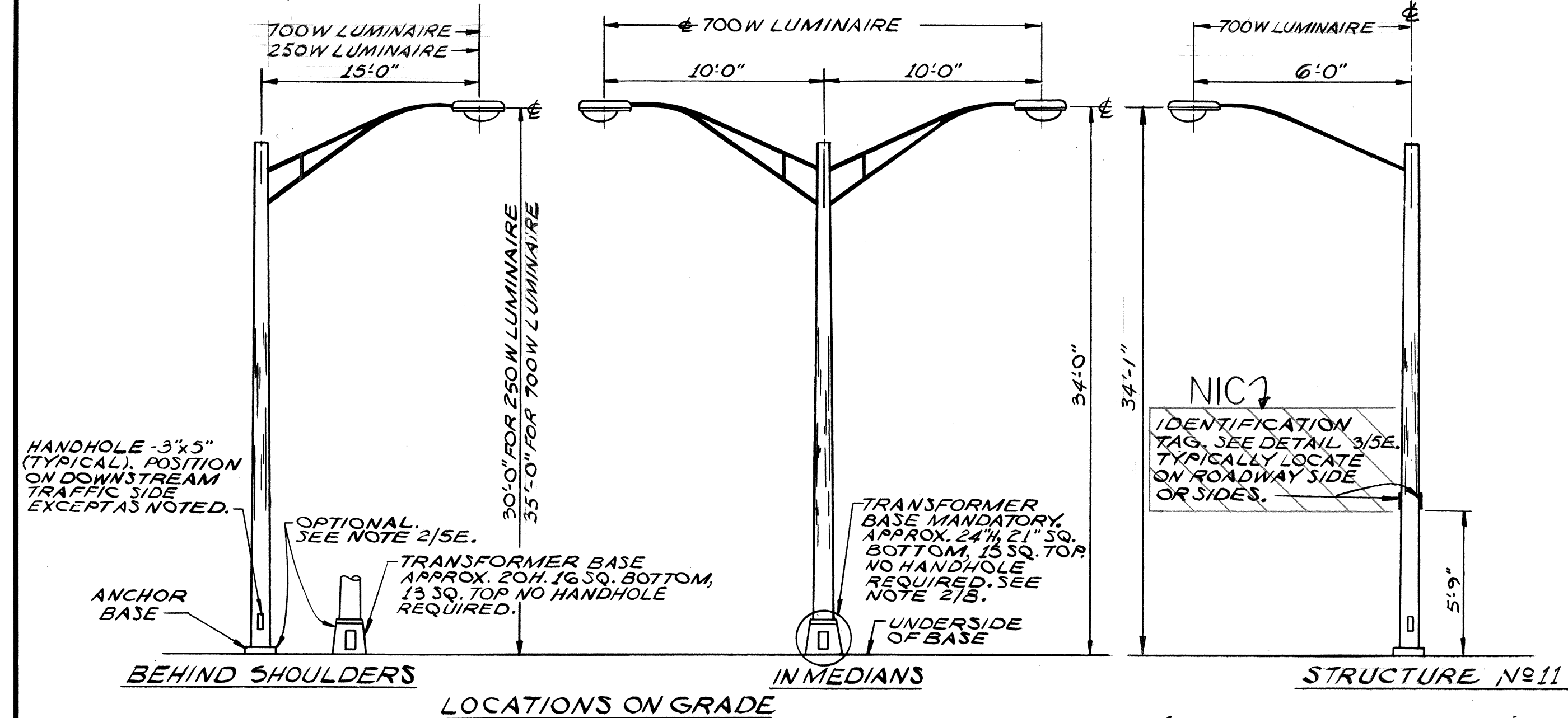
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**LIGHTING PLAN  
PART III**

HALAWA INTERCHANGE  
PROJECT NO. I-HI-(90):13



| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | 111-100-13         | 1972        | 04        | 202          |



A

B

C

D

2"

**LEGEND**  
A=CONTRACT NO.  
B=LUMINAIRE NO.: SEE PLANS  
C=LAMP CODE: (SEE PLANS FOR LAMP SIZE)  
D=LAMP DISTRIBUTION: (SEE PLANS FOR LAMP SIZE)

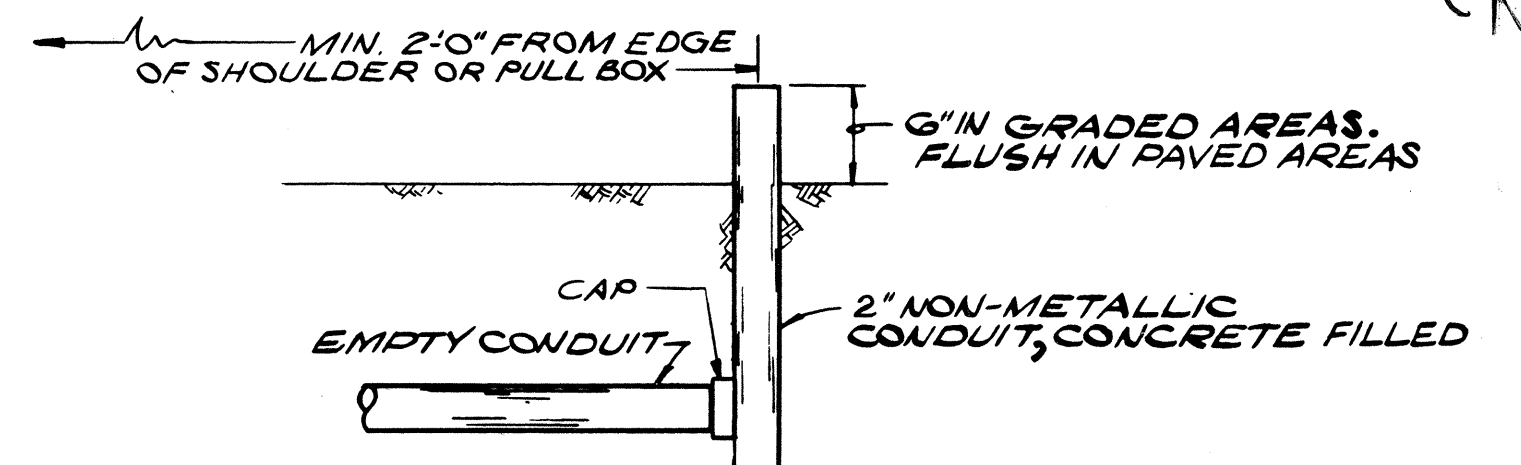
250W: H-37-5KB  
700W: H-35-18NA

250W: M-C-II  
700W: M-C-III

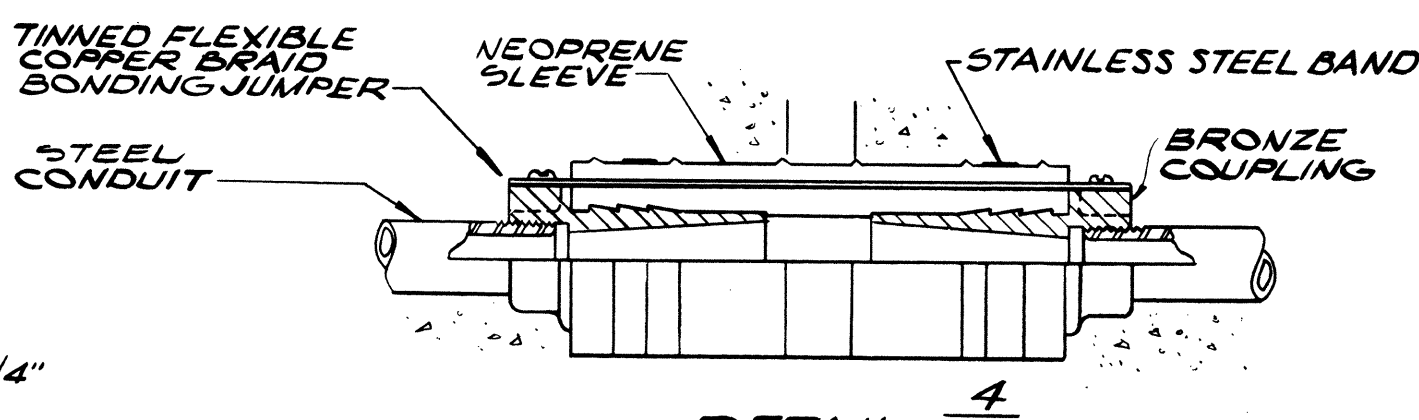
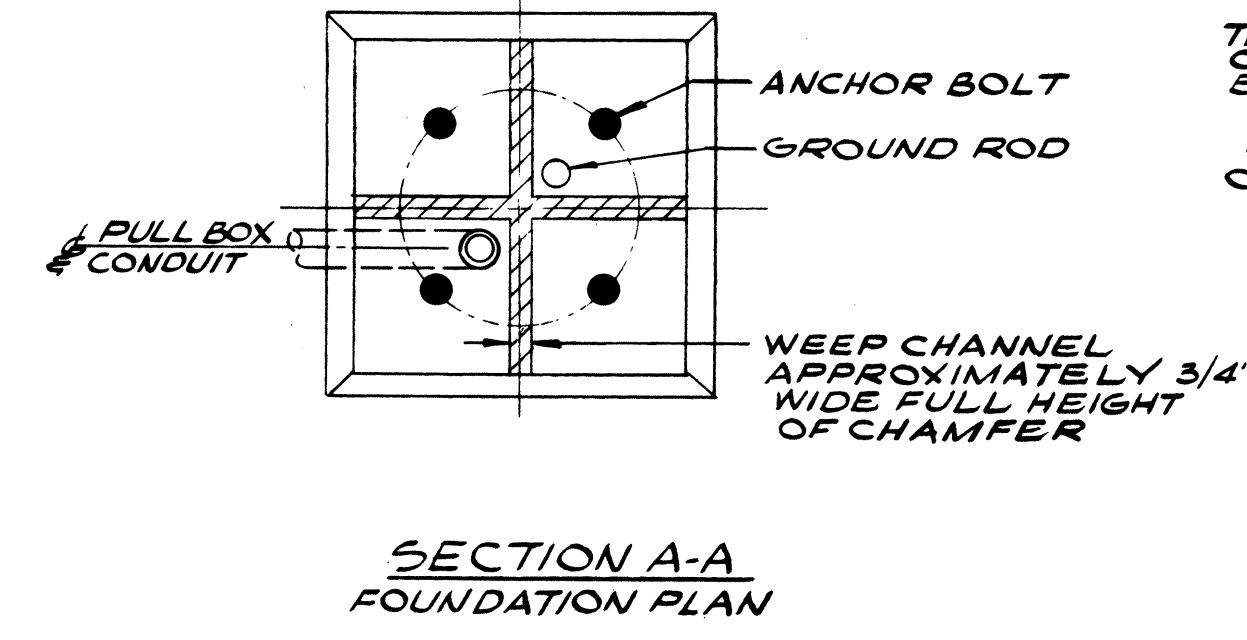
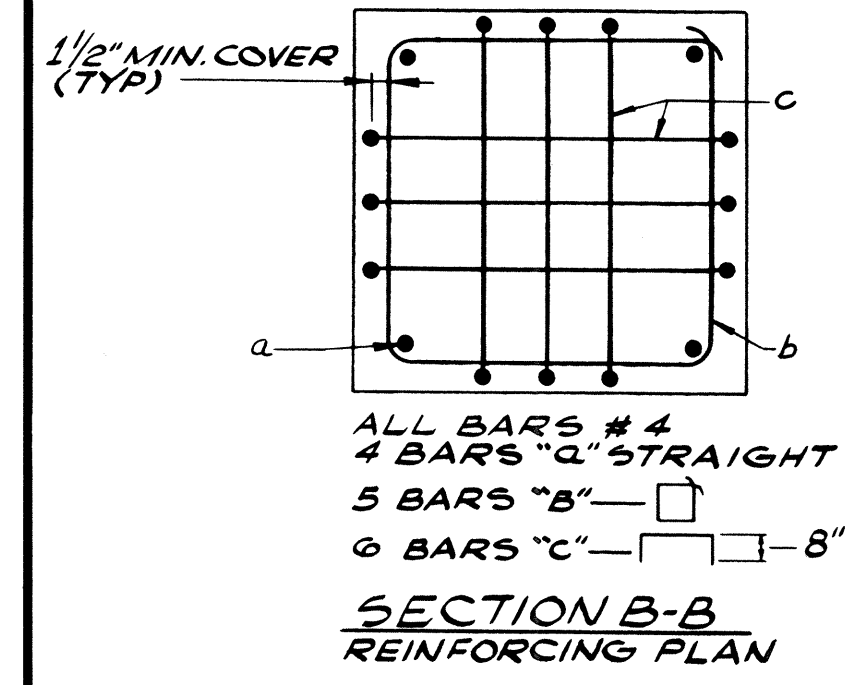
**DETAIL 3E**  
**LUMINAIRE IDENTIFICATION TAG**  
N.T.S.

**DETAIL 3E**  
**LIGHTING STANDARD TYPES**  
NOTE: MOUNTING HEIGHTS & BRACKET ARM LENGTHS ARE APPROX. ± 3"

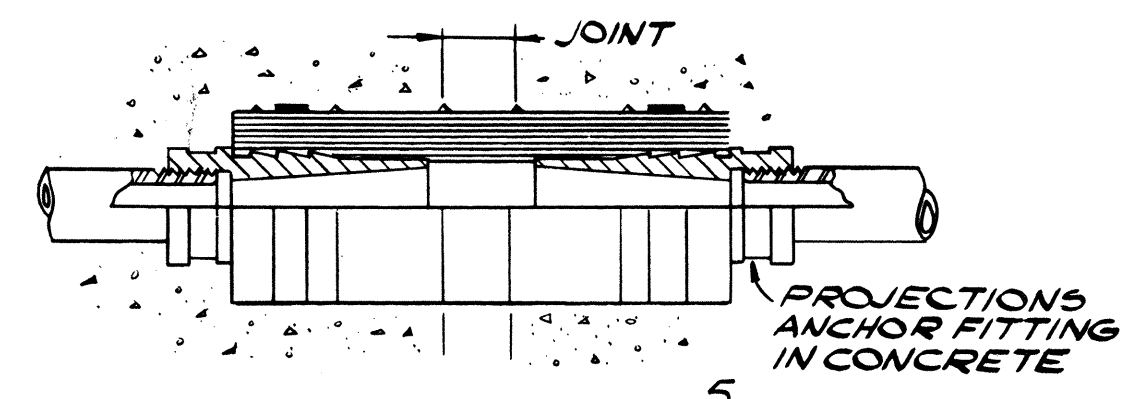
**DETAIL 3E**  
**ONE LINE DIAGRAM OF FDRS A, D, E & F**



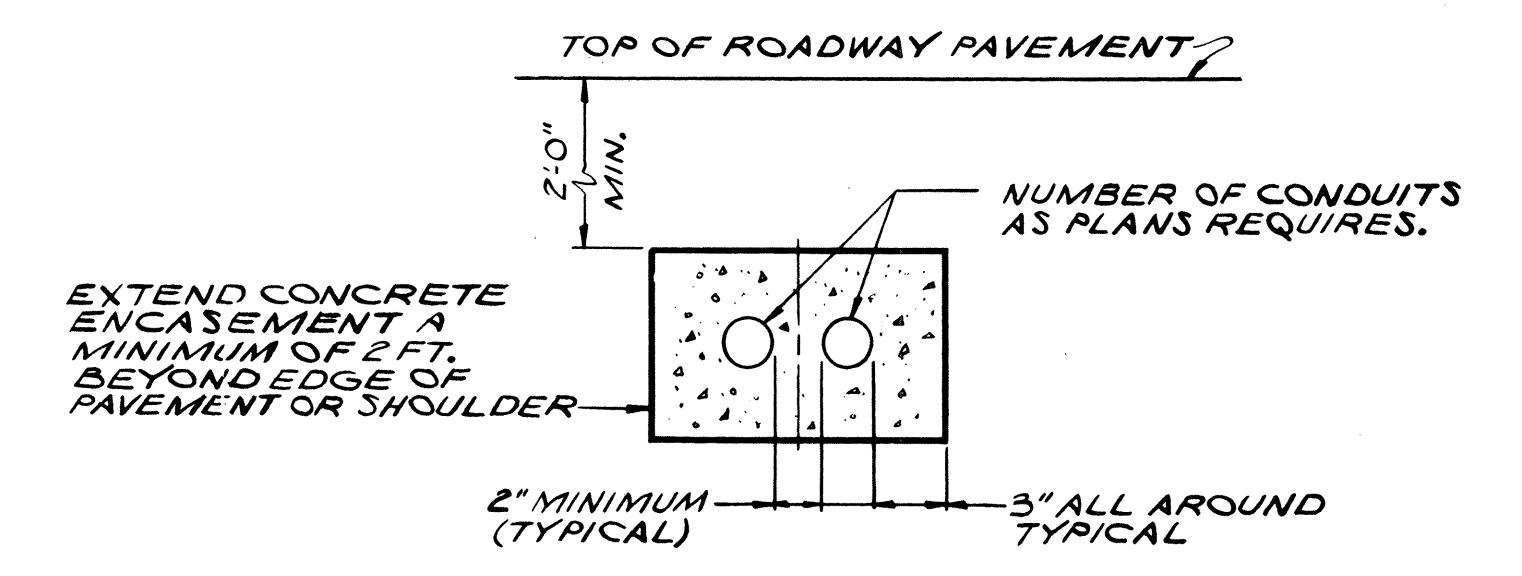
**DETAIL 3E**  
**CONDUIT CAP & MARK**



**DETAIL 3E**  
**EXP/DEF. FITTING METAL CONDUIT**  
N.T.S.

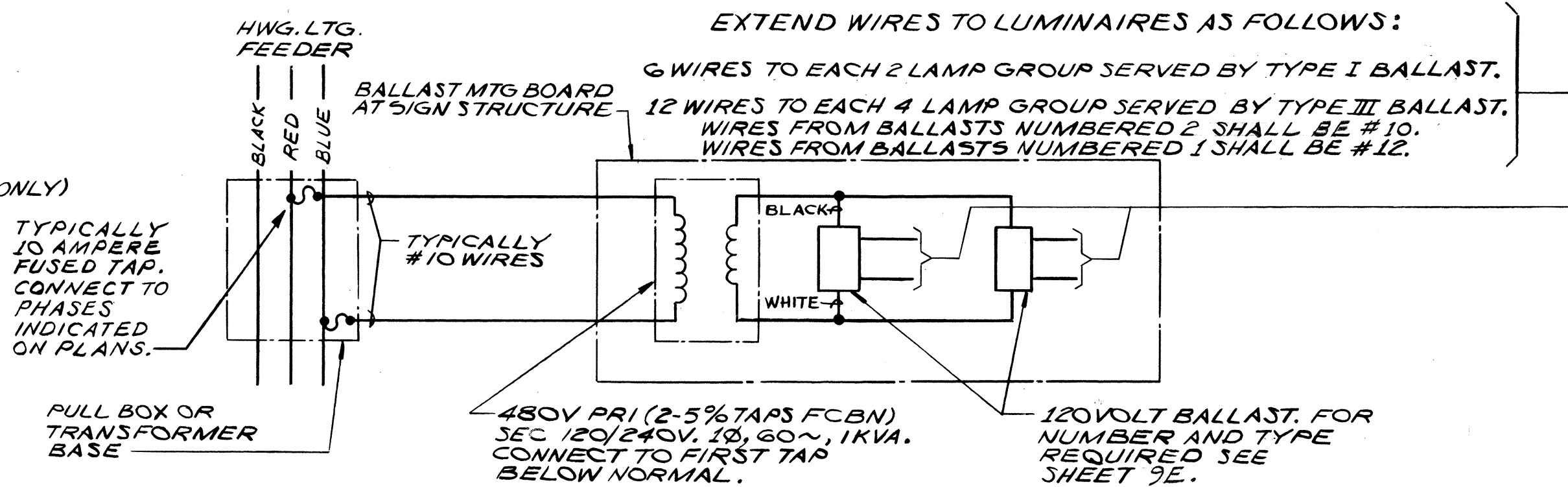
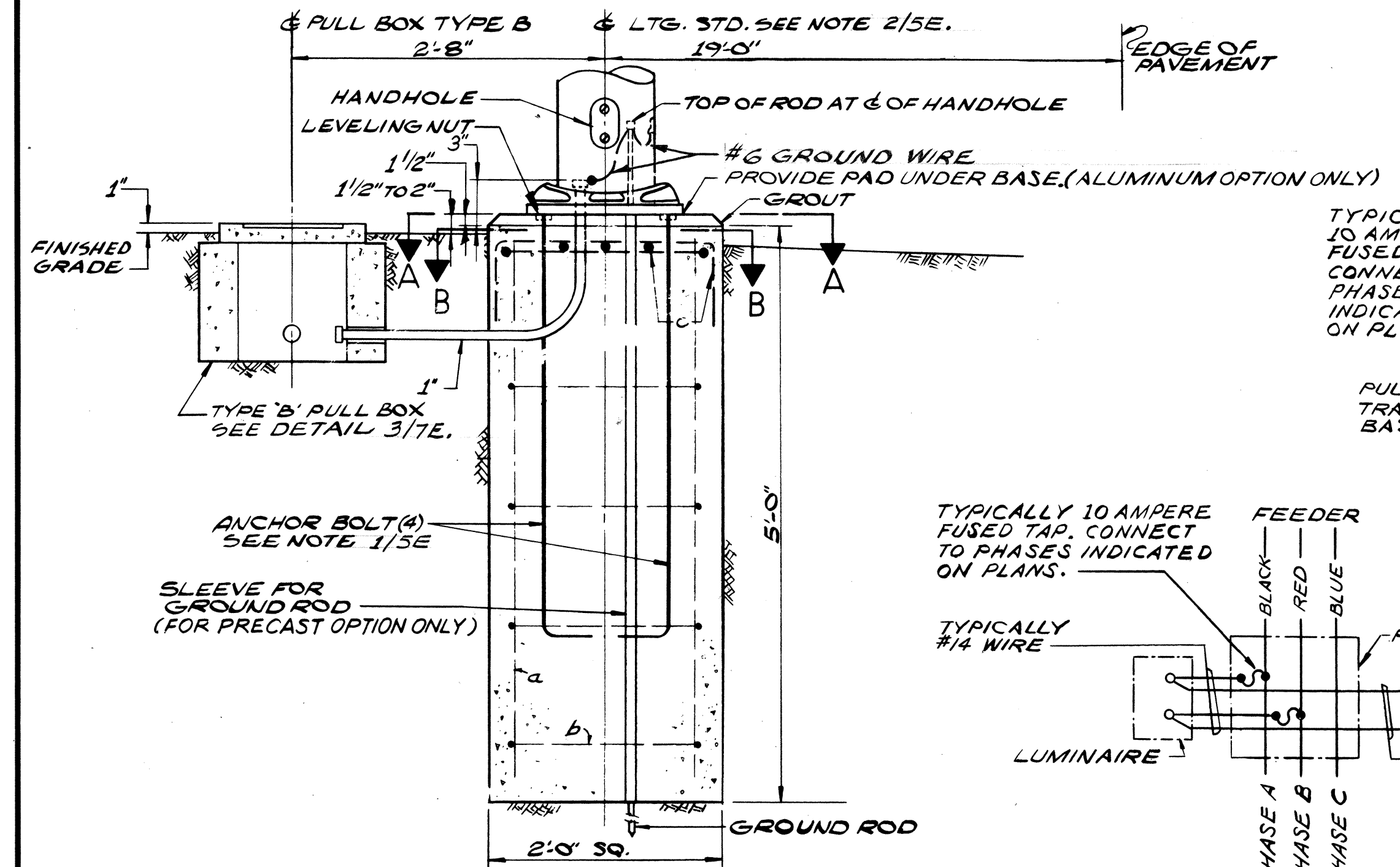


**DETAIL 3E**  
**EXP/DEF. FITTING NON-METAL CONDUIT**  
N.T.S.

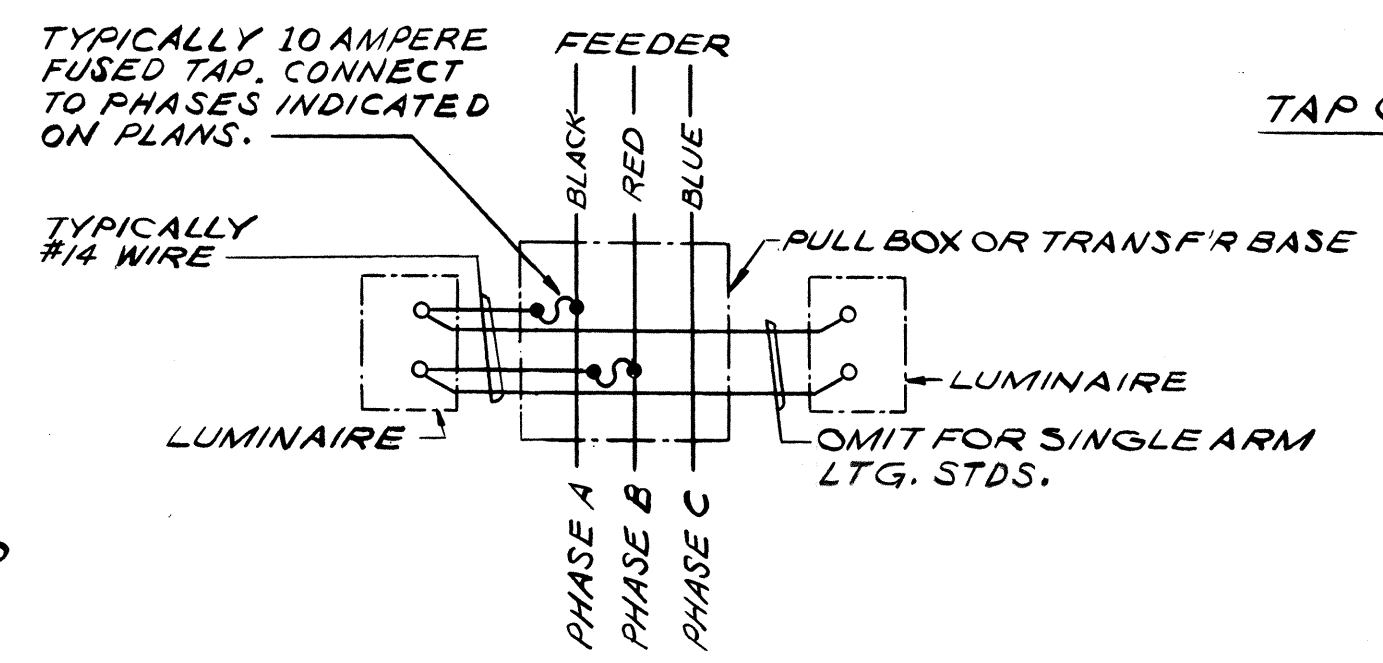


NOTE: EXCEPT THAT THE NUMBER OF CONDUITS RUNS & FEEDERS TO BE INSTALLED SHALL BE AS INDICATED ON PLAN SHEETS, THIS DETAIL IS TYPICAL FOR ALL HWY LTG SYSTEM CONDUITS UNDER ROADWAY.

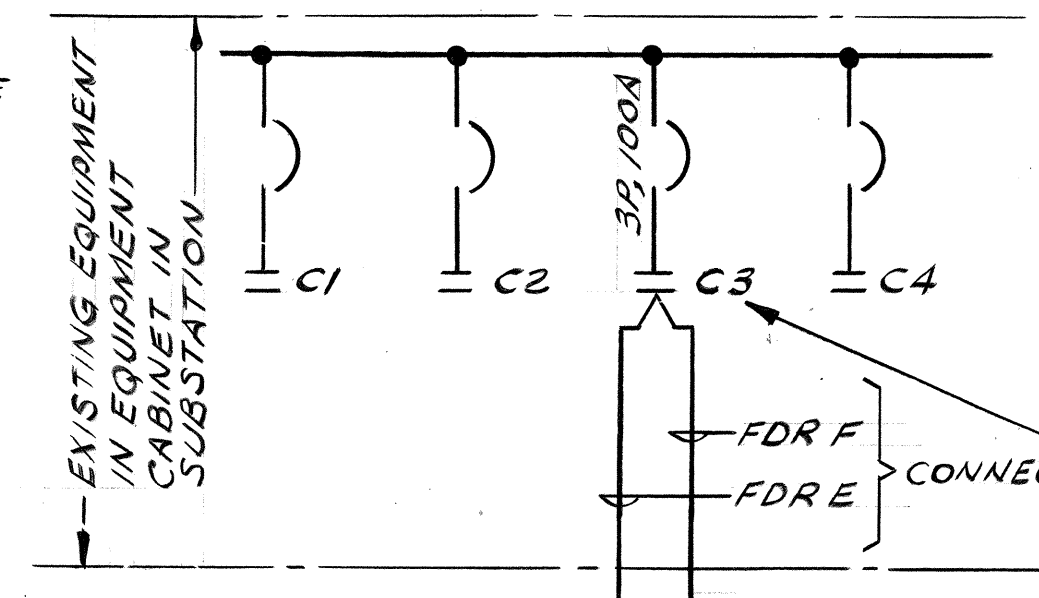
**DETAIL 3E**  
N.T.S.



**DETAIL 3E**  
**TAP CONNECTION TO SIGN LUMINAIRES**



**DETAIL 3E**  
**TAP CONNECTION HWG. LTG. LUMINAIRE**  
TWIN ARM SHOWN: SINGLE ARM SIMILAR EXCEPT AS NOTED.



**DETAIL 3E**  
**CONNECTION OF FDRS E & F AT SUBSTATION**



NOTES:  
1- ANCHOR BOLT DIAMETER & LENGTH, LOCATION AND PROTECTION 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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STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

ELECTRICAL SHEET 5E

ELECTRICAL DETAILS

HALAWA INTERCHANGE

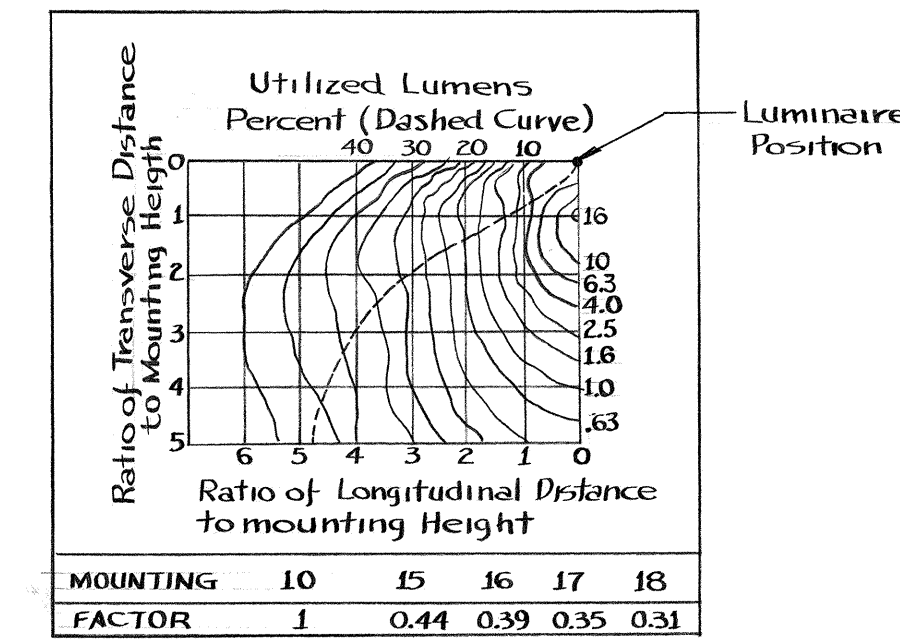
PROJECT NO. I-HI-1(90)-13

SHEET No. 5E OF 10 SHEETS

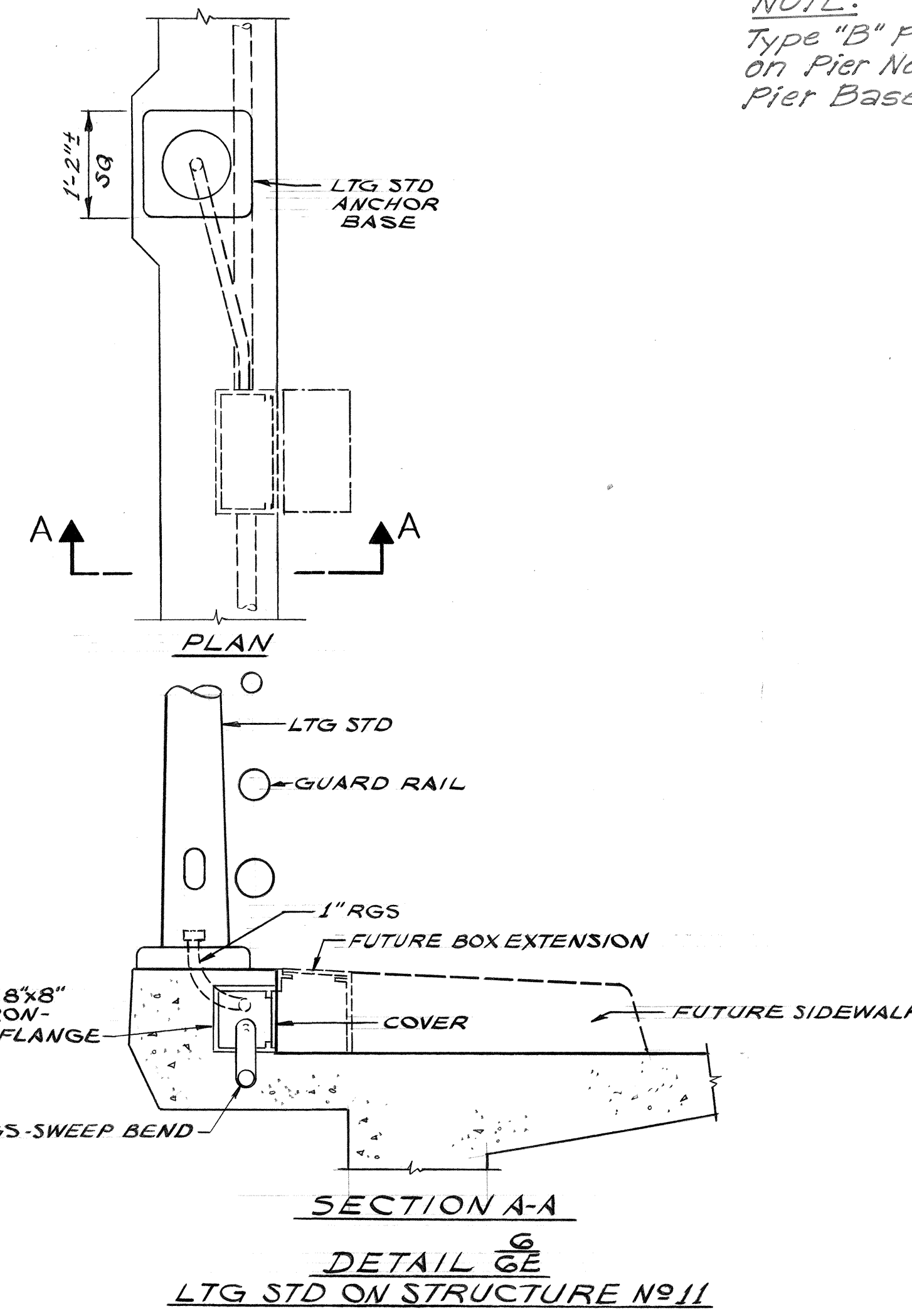
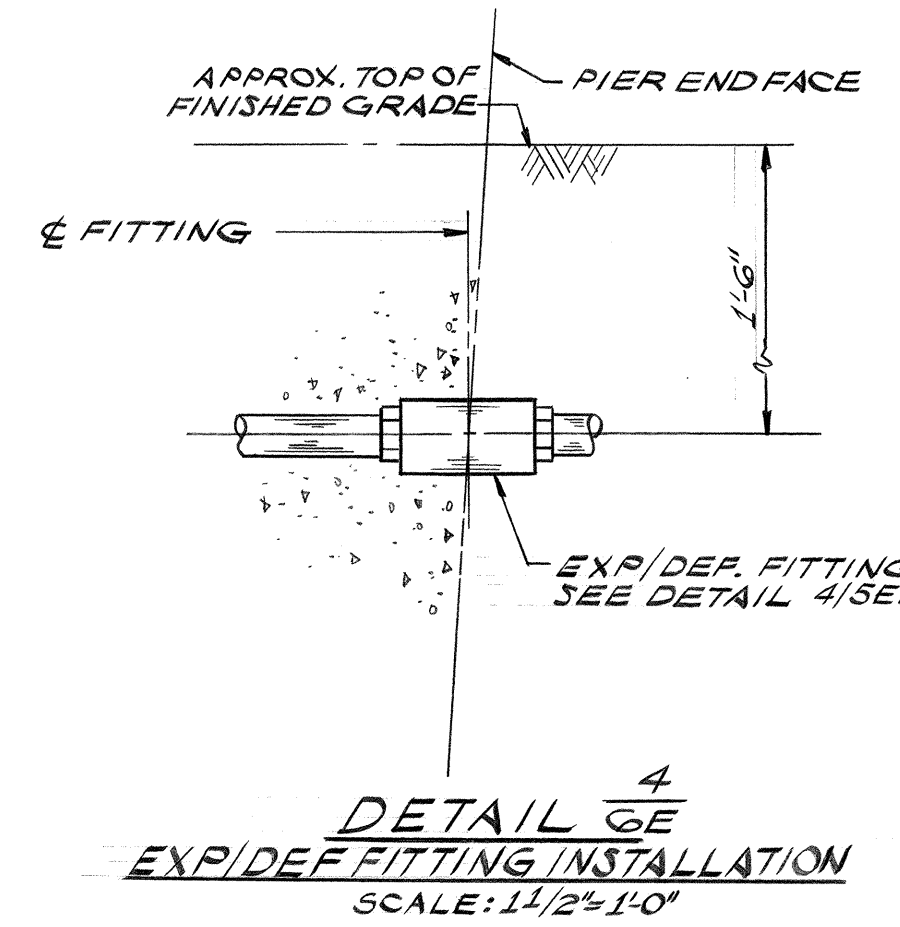
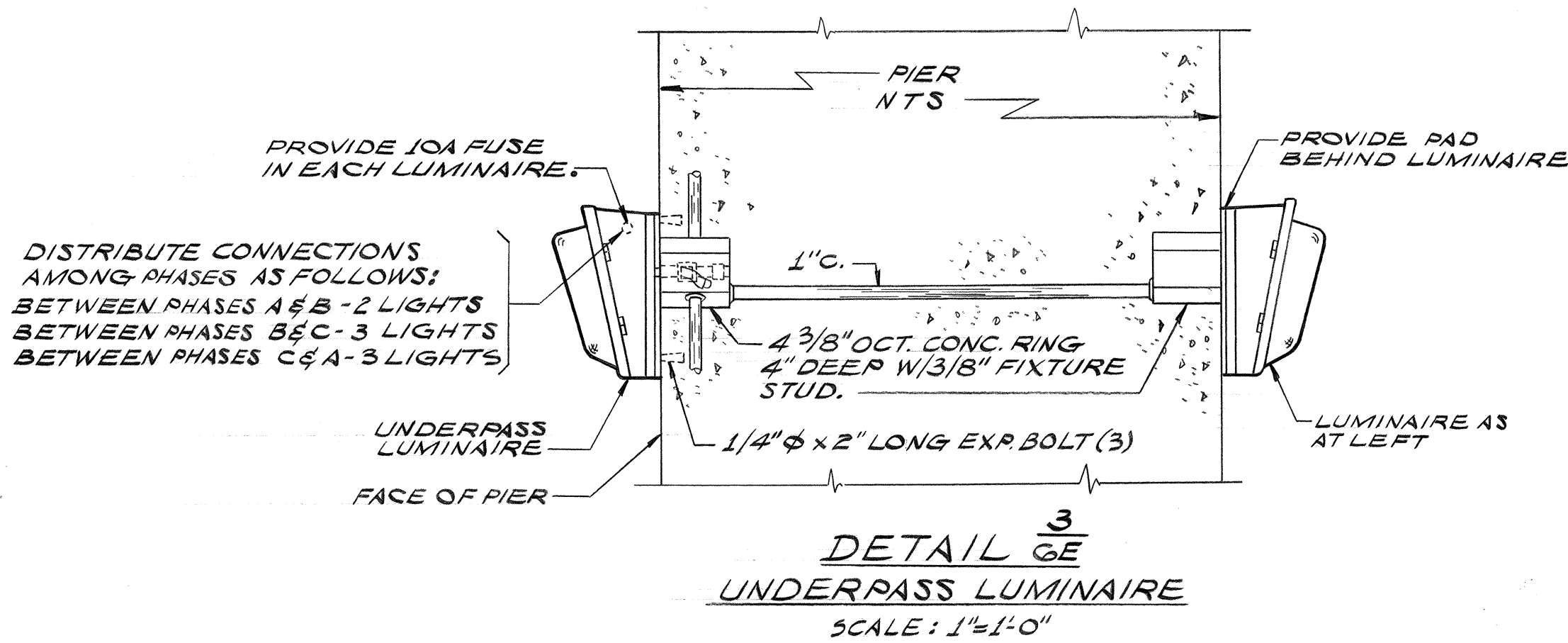
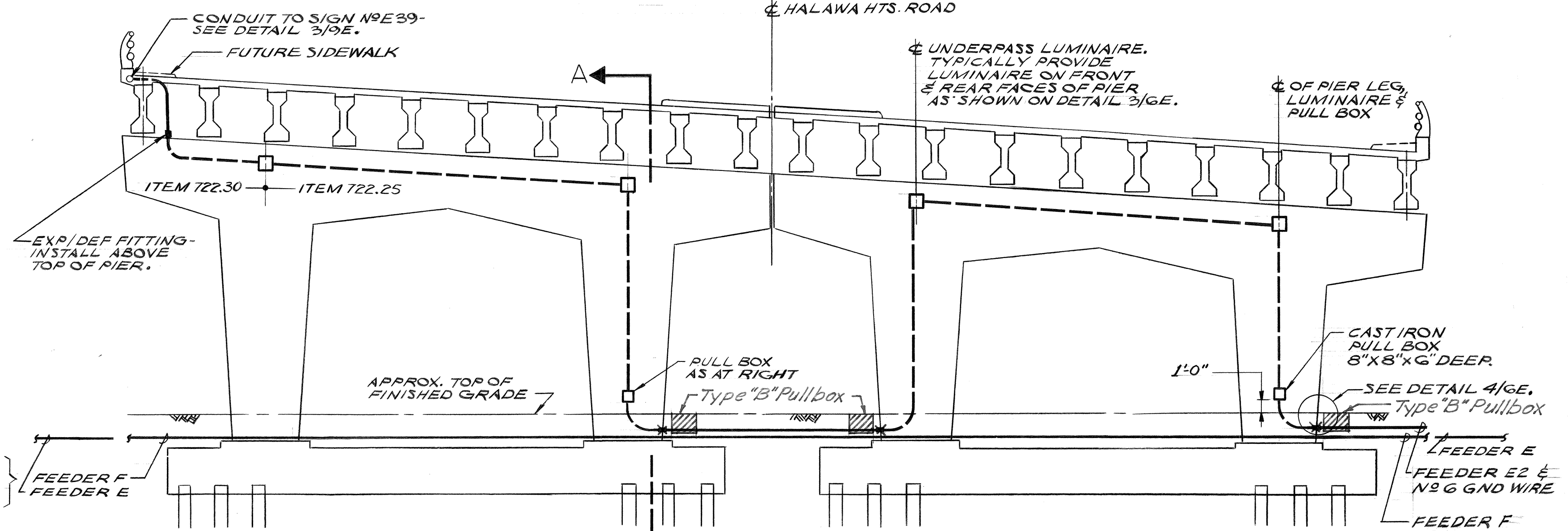
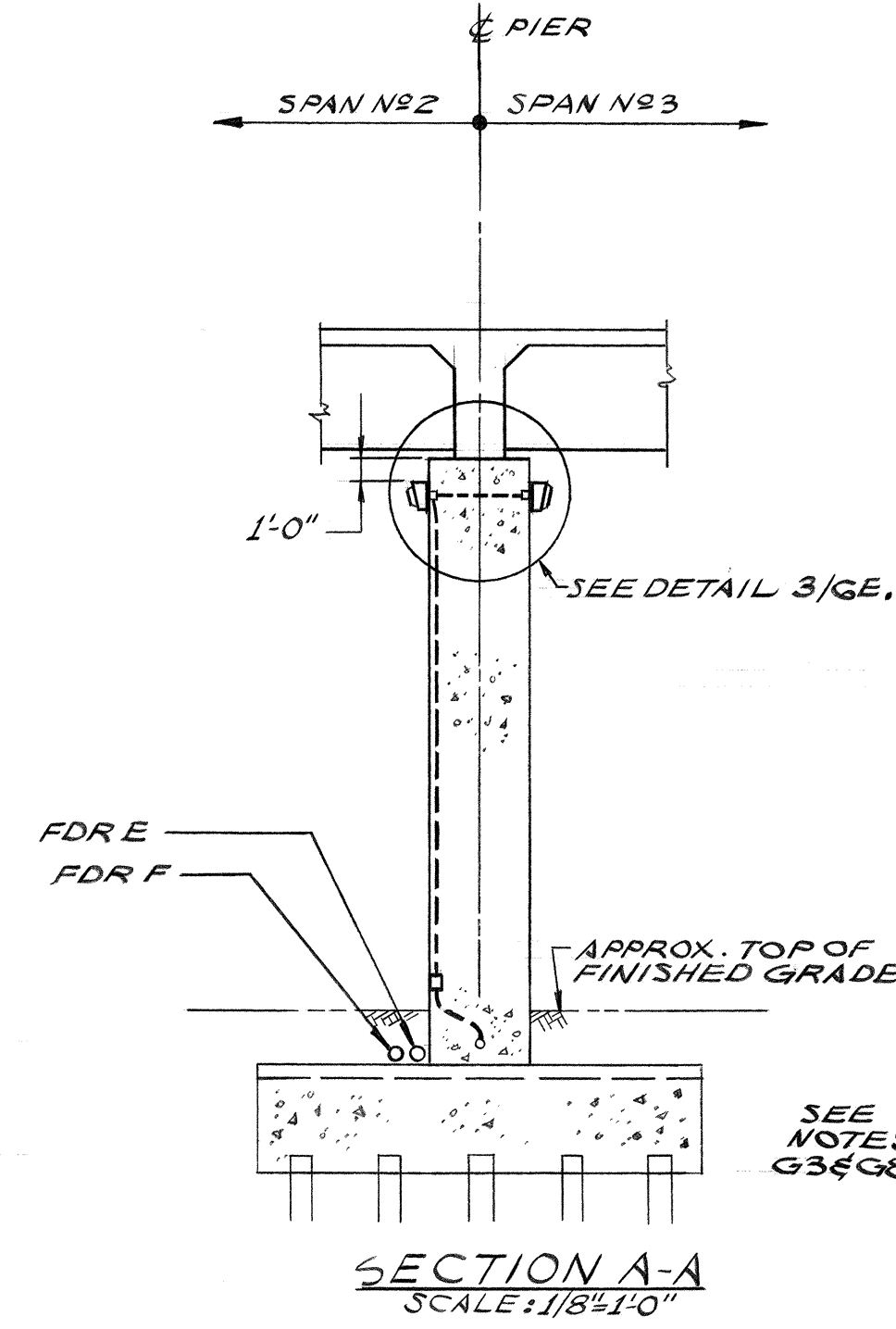
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| DATE              | _____ |
| SURVEY PLOTTED BY | _____ |
| DESIGNED BY       | _____ |
| NOTED BY          | _____ |
| CHECKED BY        | _____ |
| ORIGINAL PLAN     | _____ |
| NOTE BOOK         | _____ |
| NO.               | _____ |



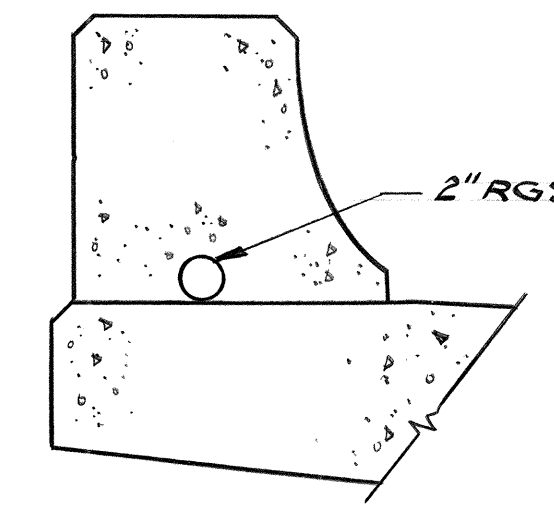
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | HI-1(90)13         | 1992        | 75        | 202          |



DETAIL 1/GE  
PHOTOMETRIC CURVE  
OF UNDERPASS LUMINAIRE



NOTE:  
Type "B" Pullboxes in place of Cast Iron Pullboxes  
on Pier No. 2 Structure 11. Exp/Def fittings at  
Pier Base deleted.



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ELECTRICAL SHEET 6E

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

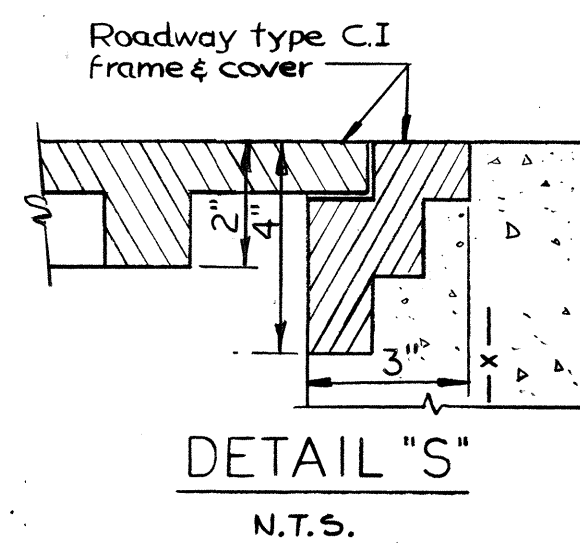
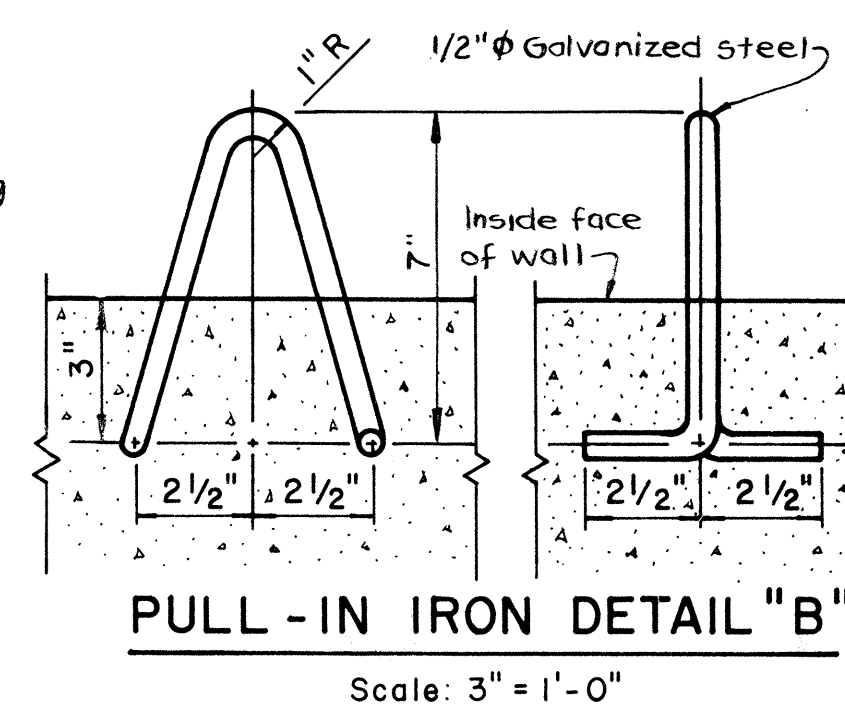
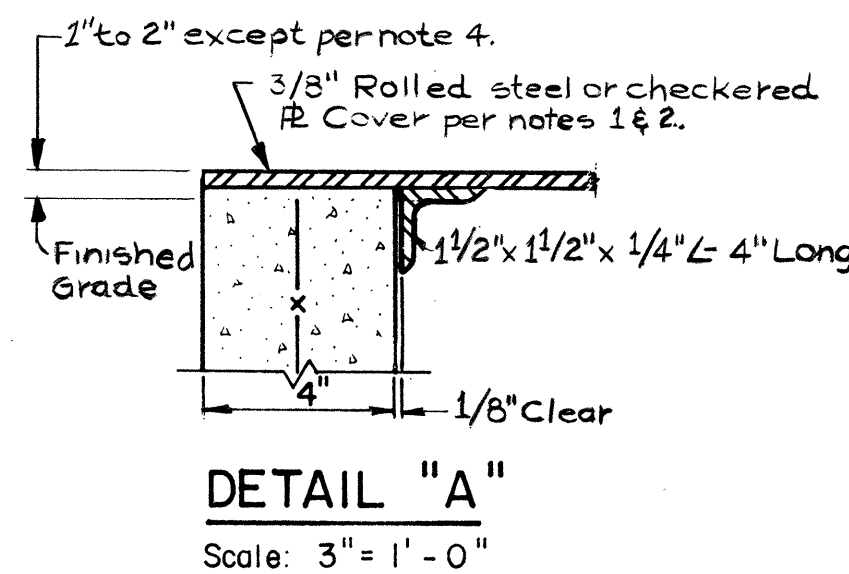
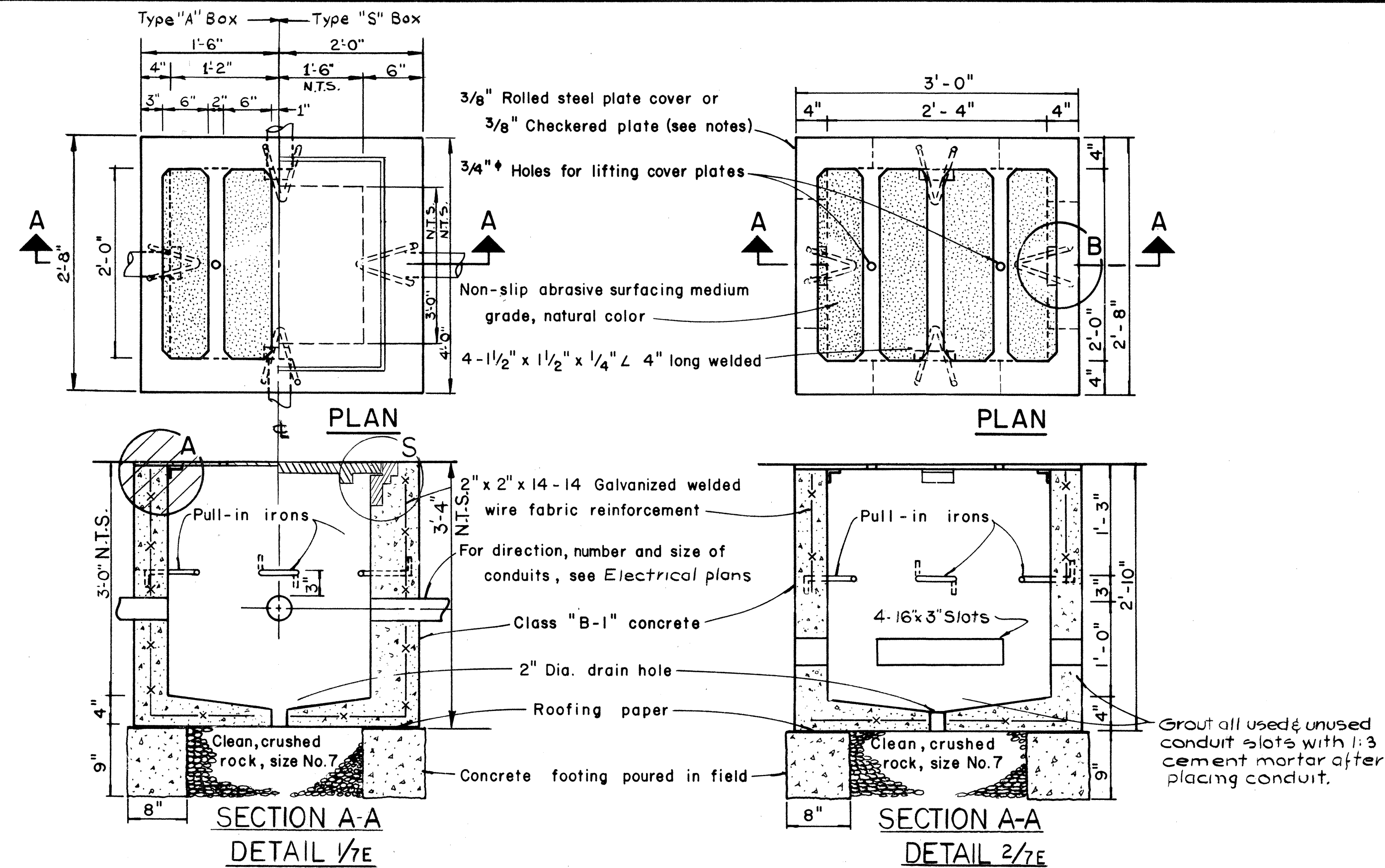
ELECTRICAL DETAILS  
STRUCTURES

HALAWA INTERCHANGE  
PROJECT NO. I-HI-(90):13

SHEET No. 6E OF 10 SHEETS

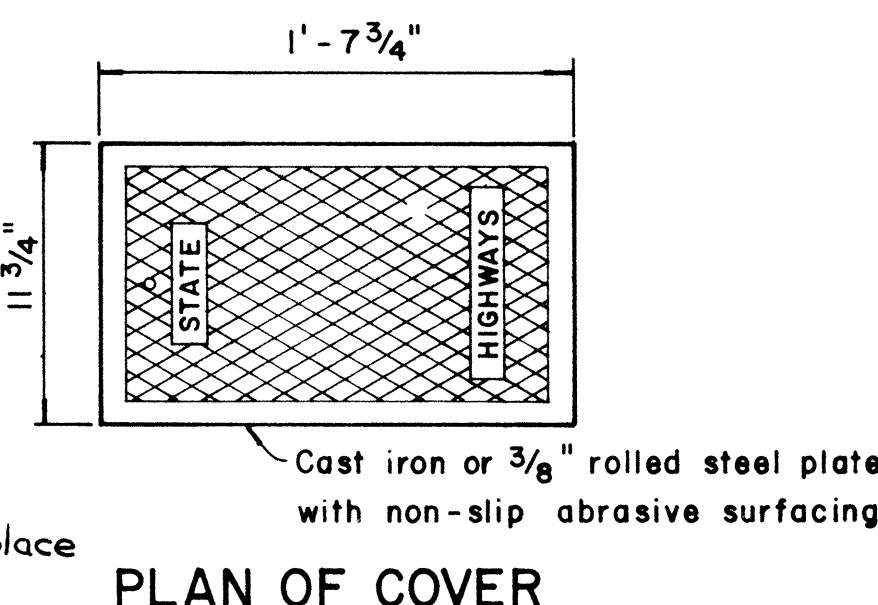
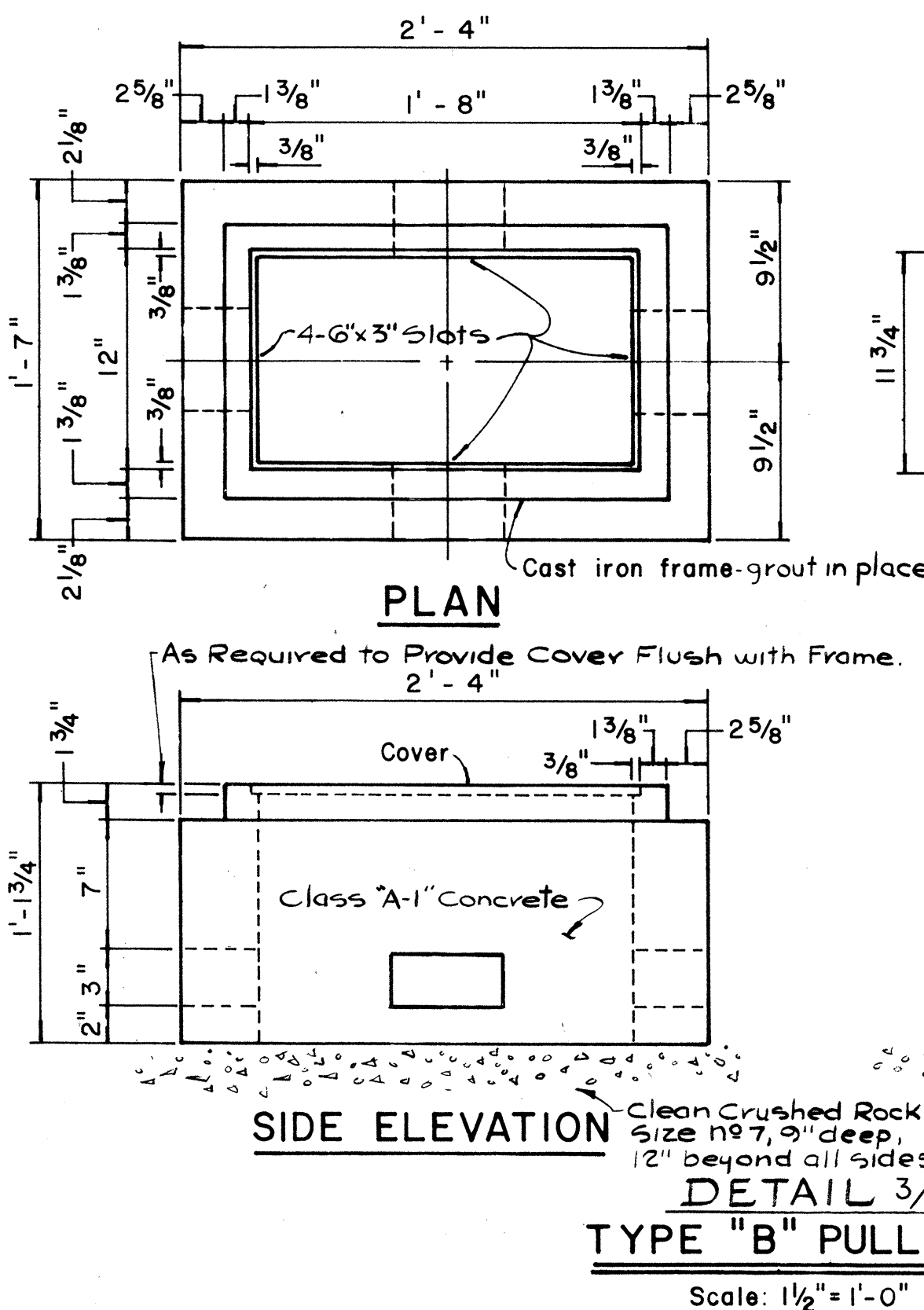
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| SURVEY PLOTTED BY | DATE |
| DRAWN BY          |      |
| CHECKED BY        |      |
| NOTED BY          |      |
| QUANTITIES BY     |      |
| CHECKED BY        |      |
| ORIGINAL PLAN     |      |
| NOTE BOOK         |      |
| No.          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





**NOTES: (FOR TYPES "A" & "S")**

- 3/8" Rolled steel plate cover with non-slip abrasive surfacing medium grade, natural color shall be used on all pullboxes located on sidewalk areas where pedestrians are walking.
- 3/8" Checkered plate cover shall be used on all pullboxes located in median areas and other locations where there are no pedestrians walking.
- Pull irons shall be placed opposite each conduit slot.
- Covers on all pullboxes located in sidewalk areas shall be set flush with the concrete sidewalk.
- Each pullbox shall have a pair of pull irons as indicated. These may be used for lifting.



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**ELECTRICAL SHEET 7E**

STATE OF HAWAII  
 DEPARTMENT OF TRANSPORTATION  
 HIGHWAYS DIVISION

**ELECTRICAL DETAILS  
 PULLBOXES**

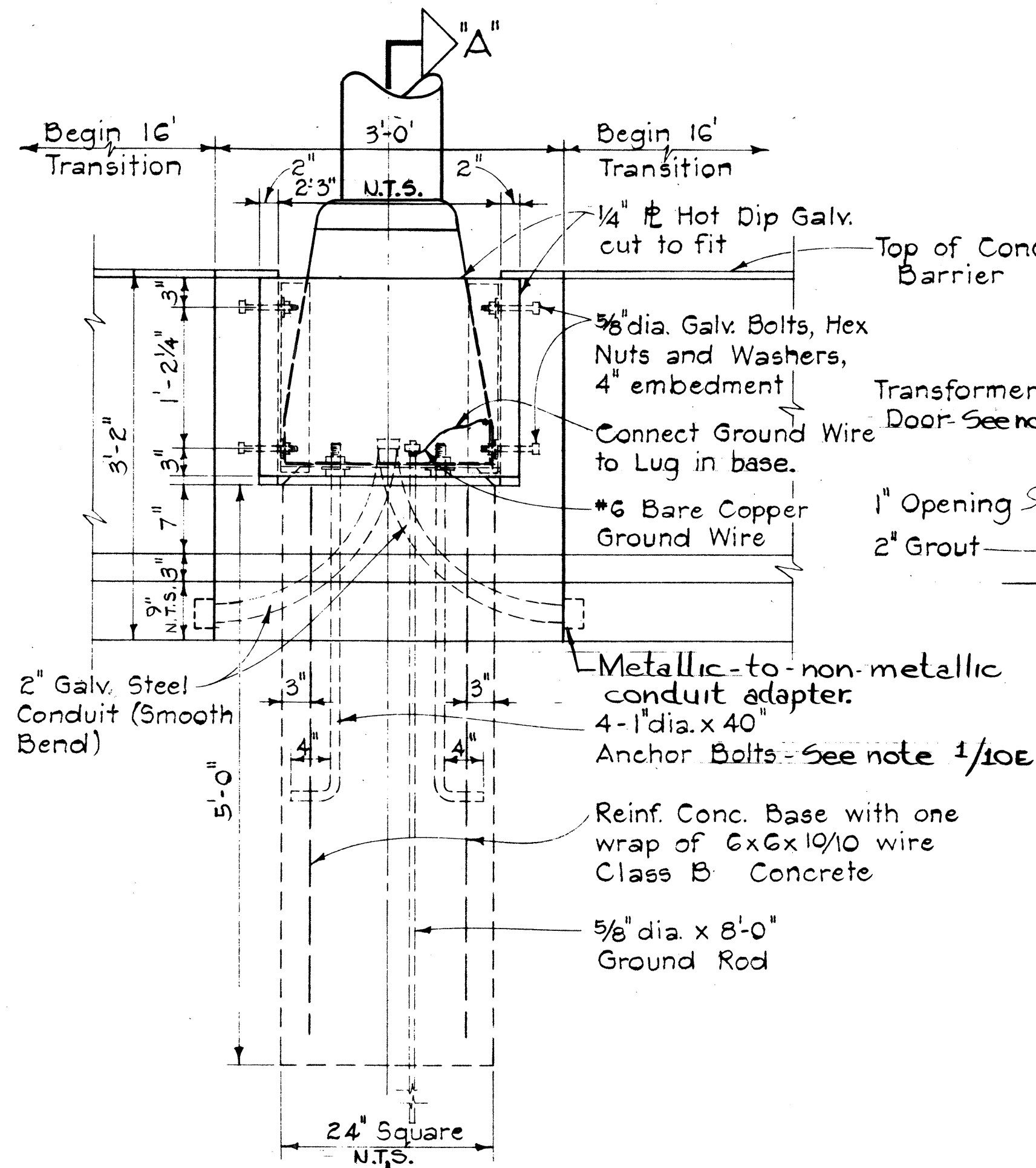
HALAWA INTERCHANGE  
 PROJECT NO. I-HI-1 (90) 13

Scale as noted Date

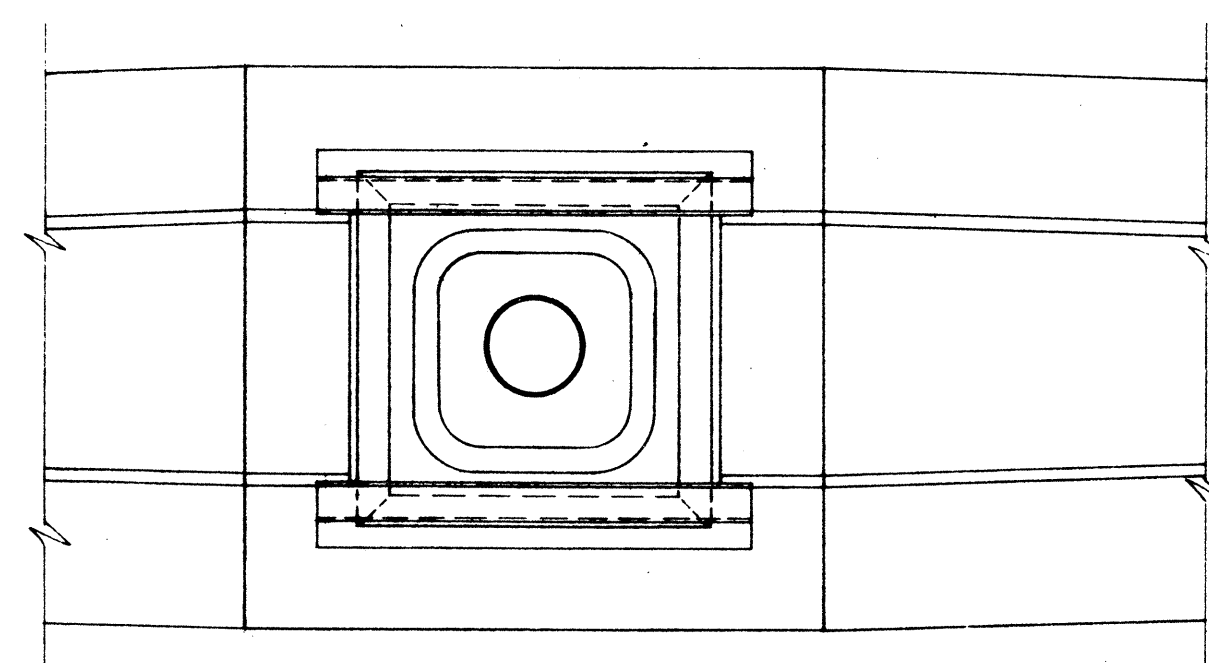
**SHEET No. 7E OF 10 SHEETS**



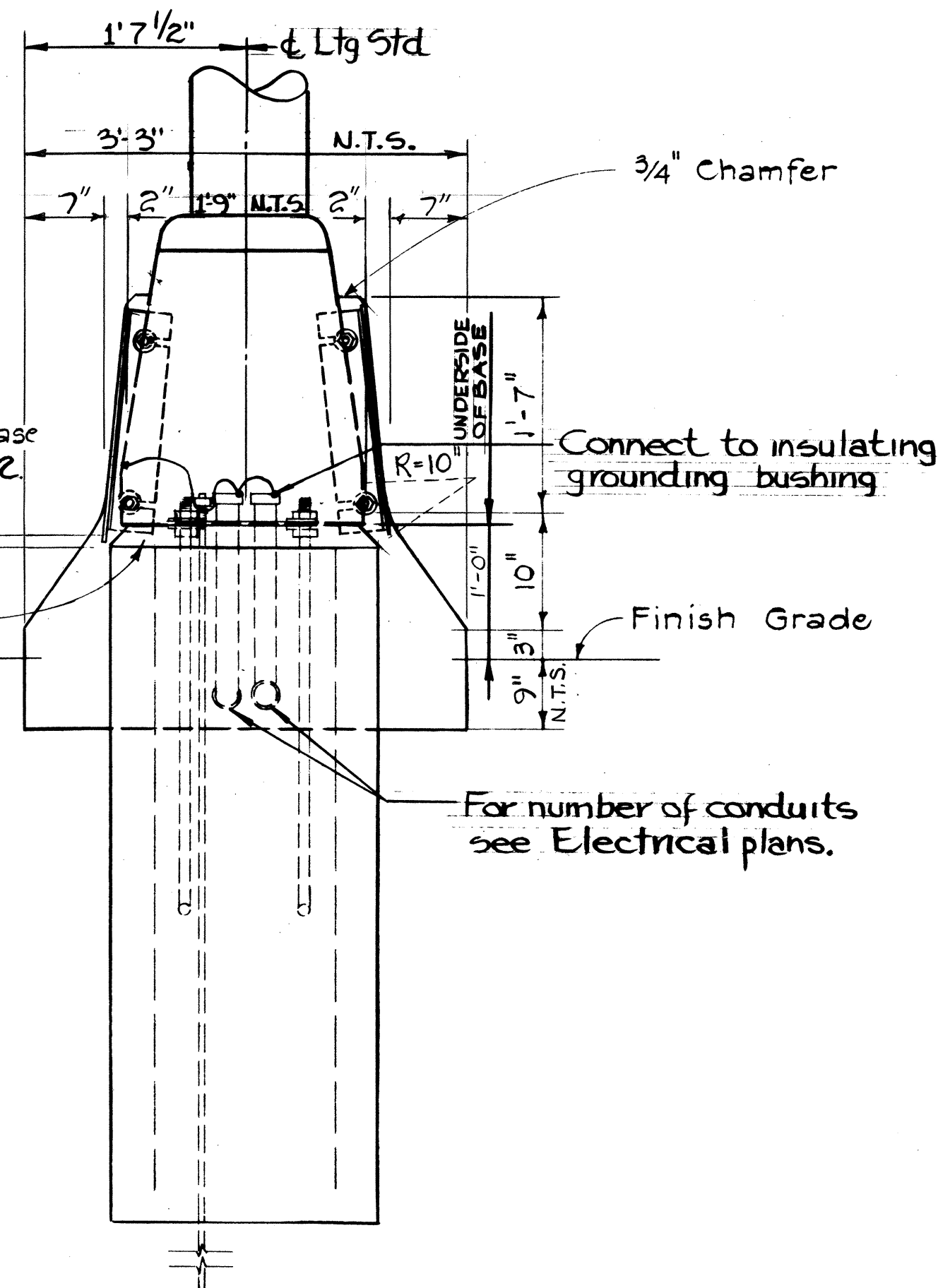
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | HH(90):13          | 1972        | 97        | 202          |



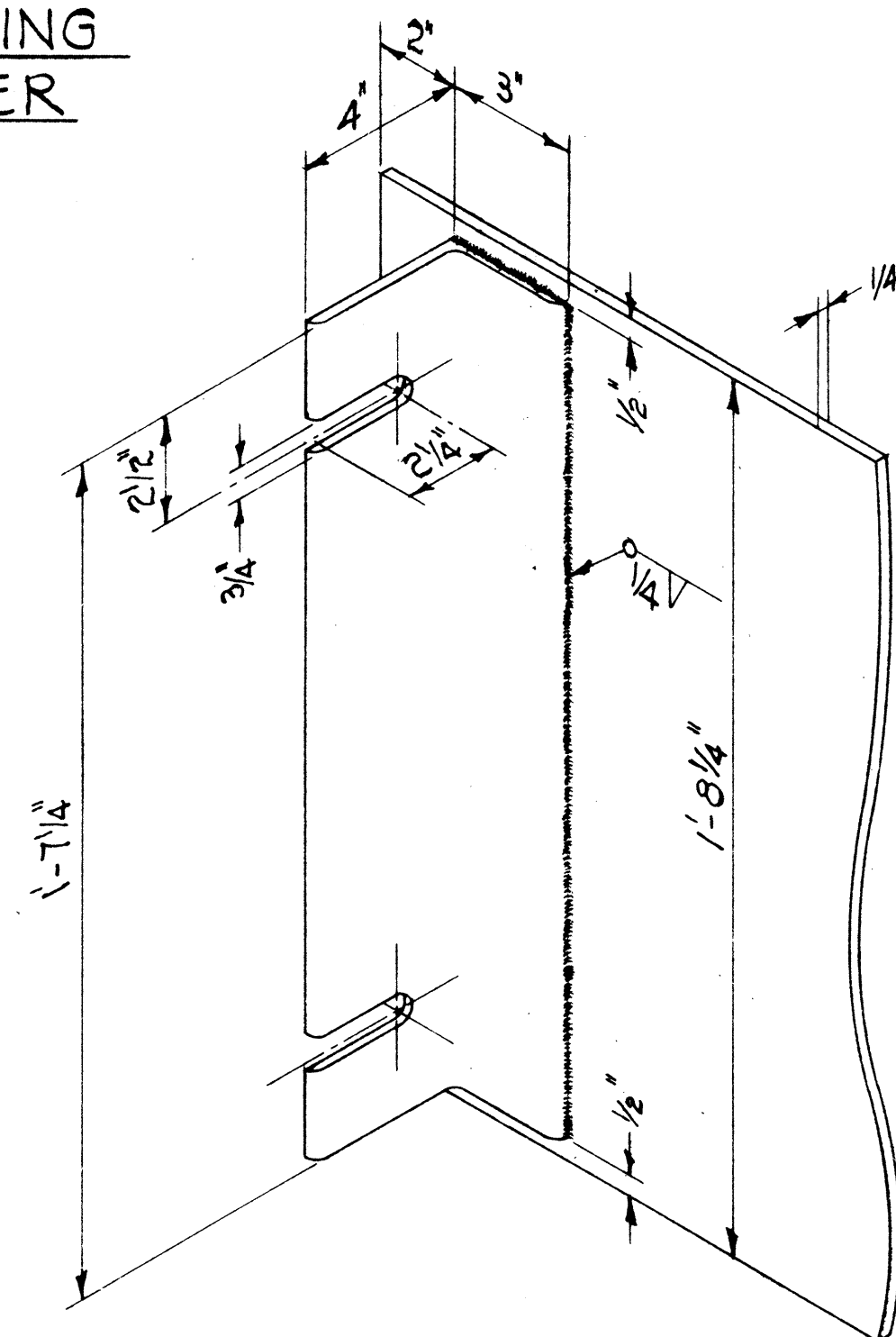
ELEVATION  
DETAIL 1/8E  
HIGHWAY LIGHTING STANDARD MOUNTING  
DETAIL ON TYPE "A" CONCRETE BARRIER  
Scale: 1" = 1'-0"



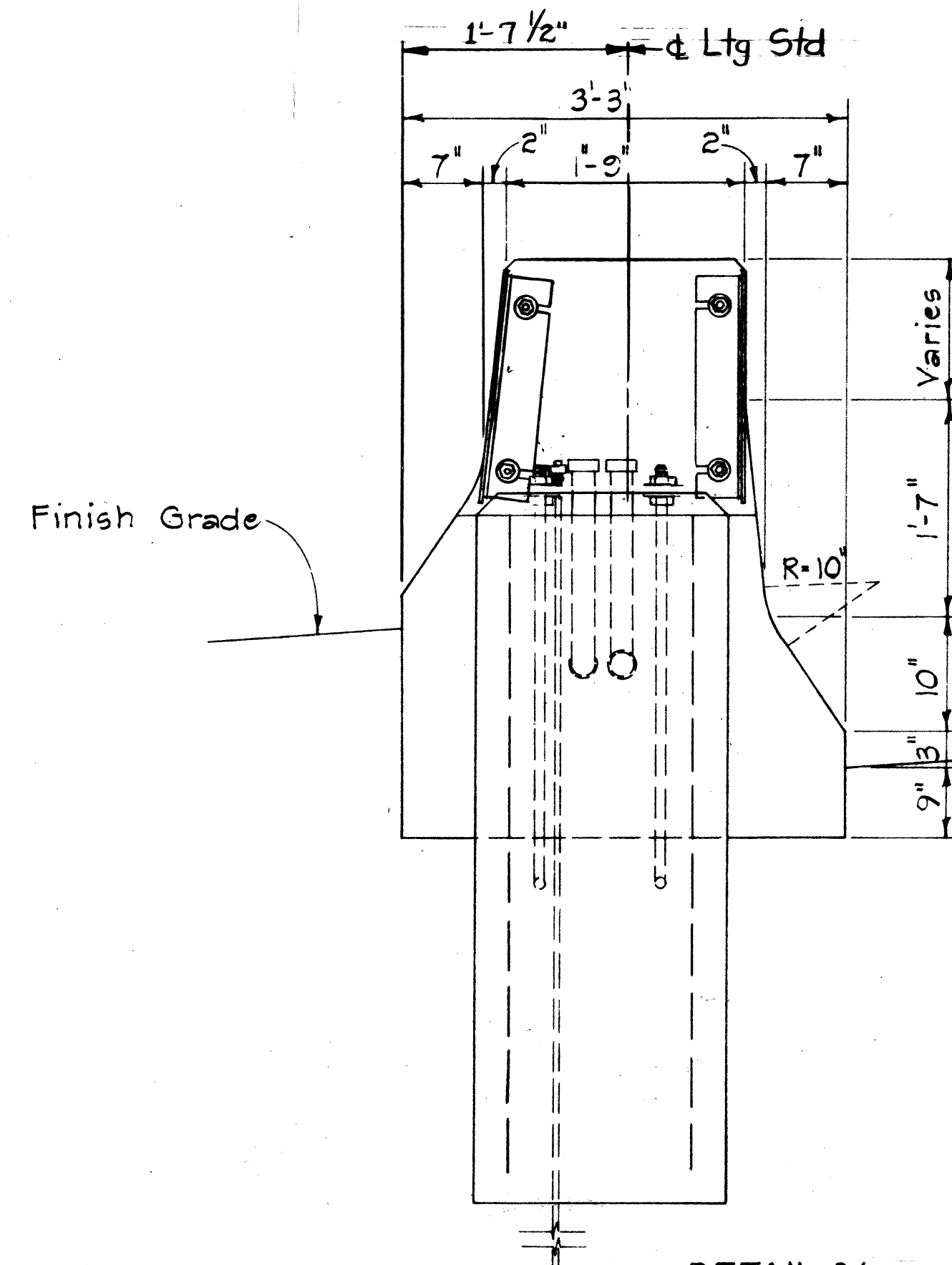
TYPICAL PLAN  
Scale: 1" = 1'-0"



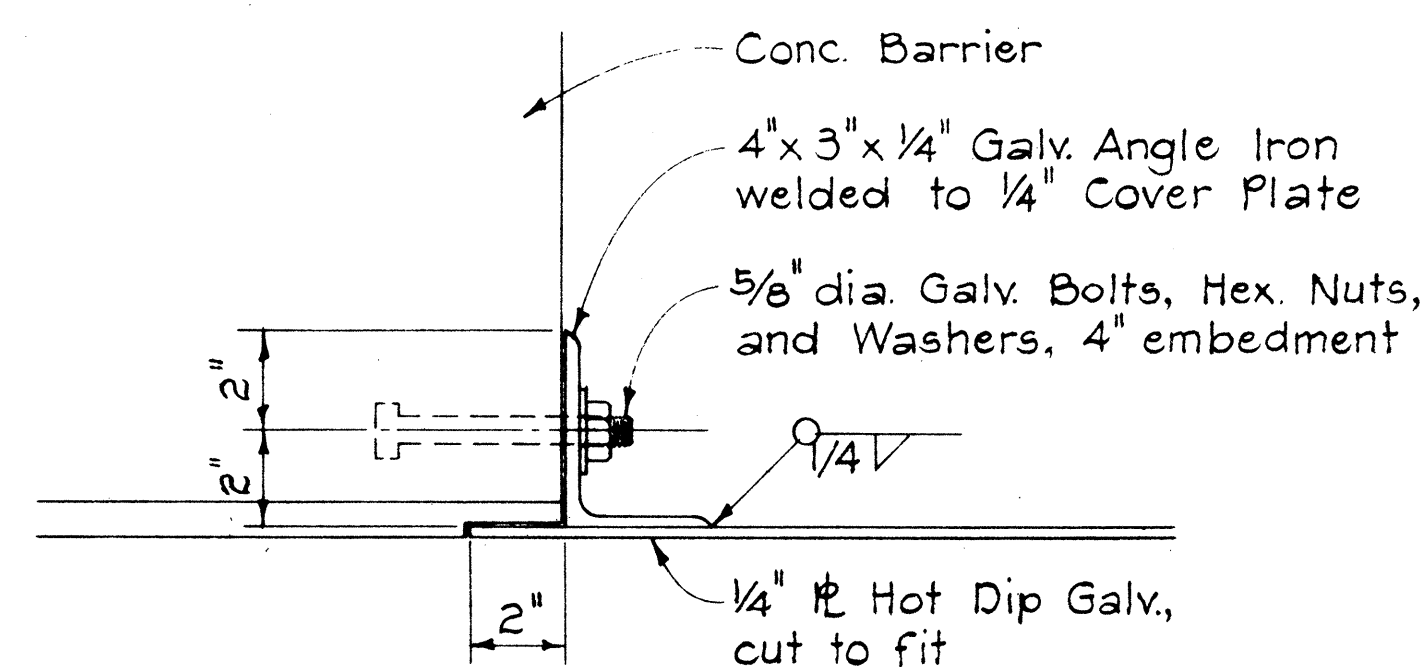
SECTION "A-A"



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



DETAIL 2/8E  
HIGHWAY LIGHTING STANDARD MOUNTING  
DETAIL ON TYPE "B" CONCRETE BARRIER  
Scale: 1" = 1'-0"

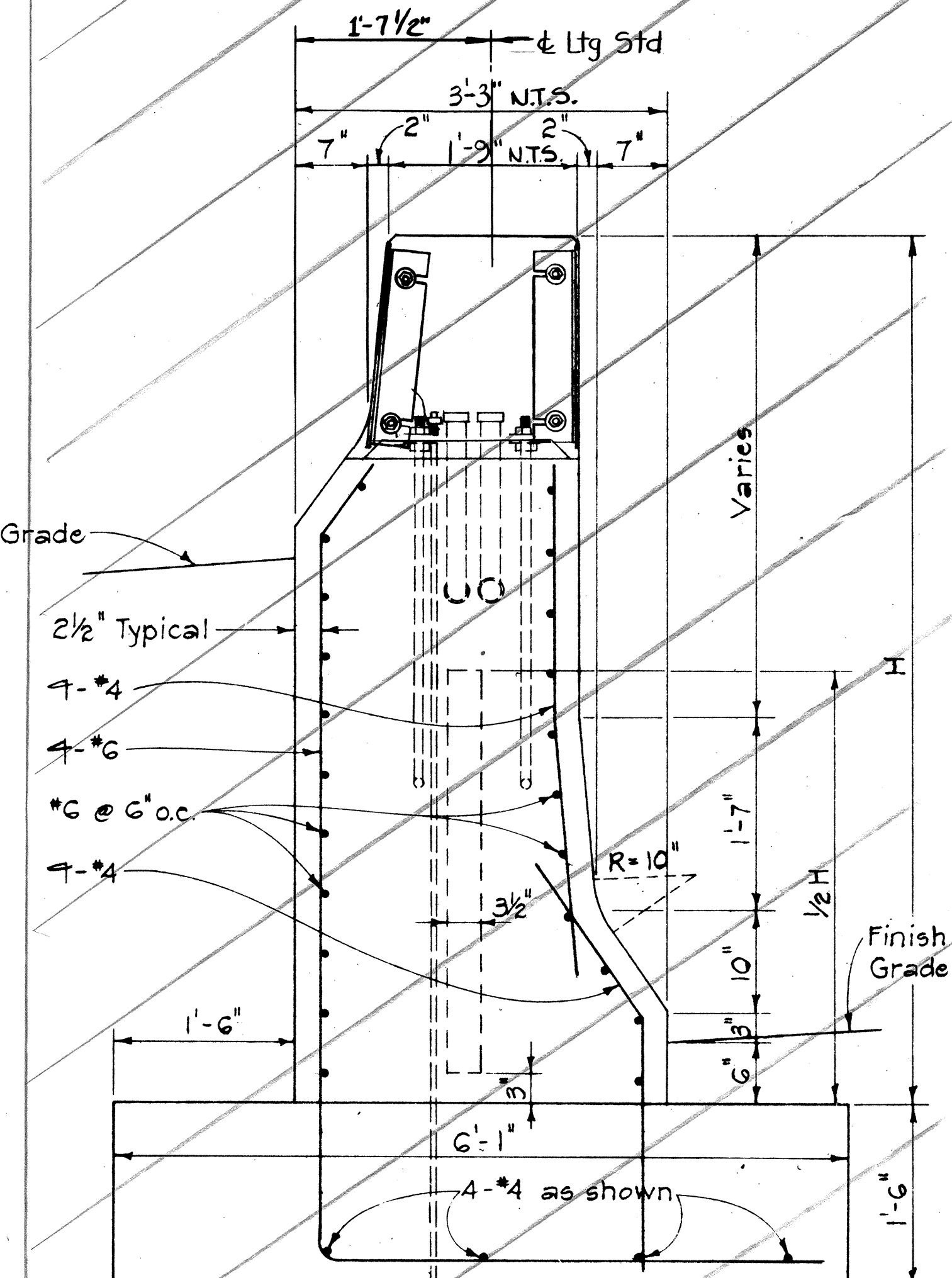


COVER PLATE ANCHOR DETAIL  
Scale: 3" = 1'-0"

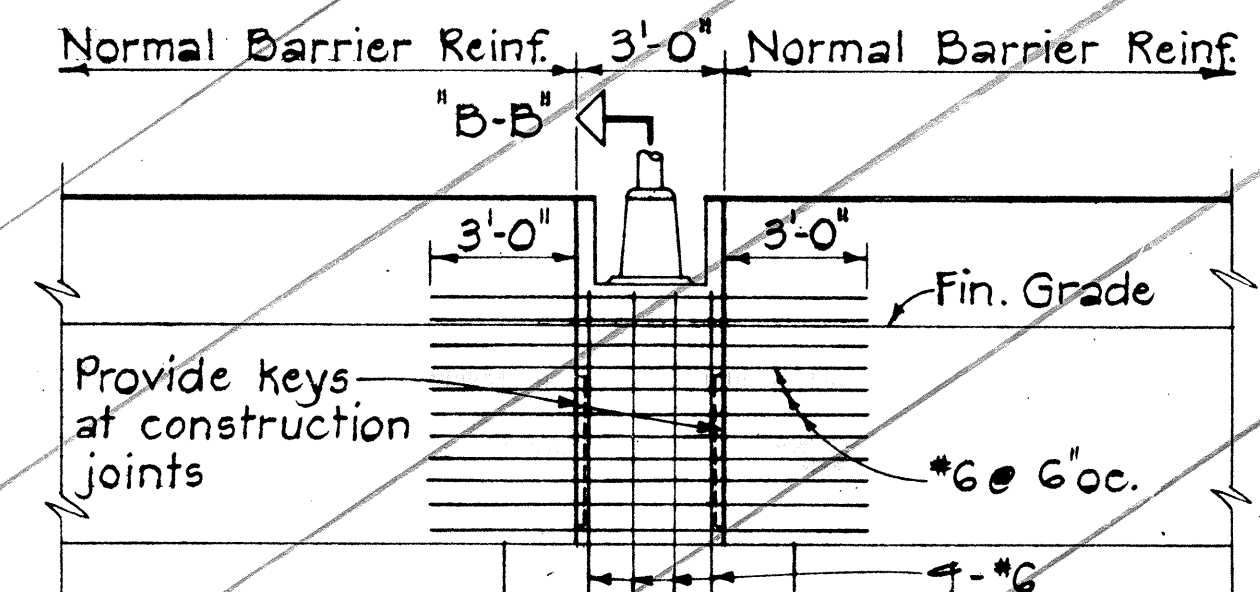
NOTES:

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.

NIC1



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



ELEVATION  
Scale: 1/4" = 1'-0"

HIGHWAY LIGHTING STANDARD MOUNTING  
DETAIL ON TYPE "C" CONC. BARRIER  
ELECTRICAL SHEET 8E



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ME OR UNDER MY SUPERVISION  
Michael A. Marszalowicz

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

ELECTRICAL DETAILS  
LTG. STD. ON BARRIER

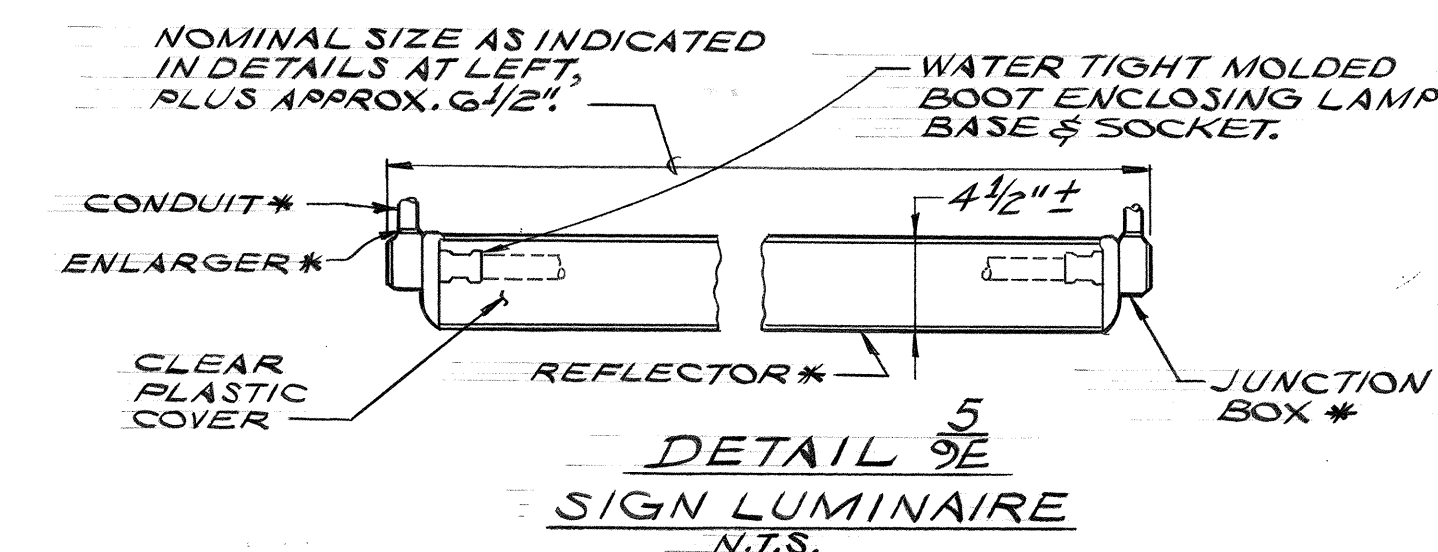
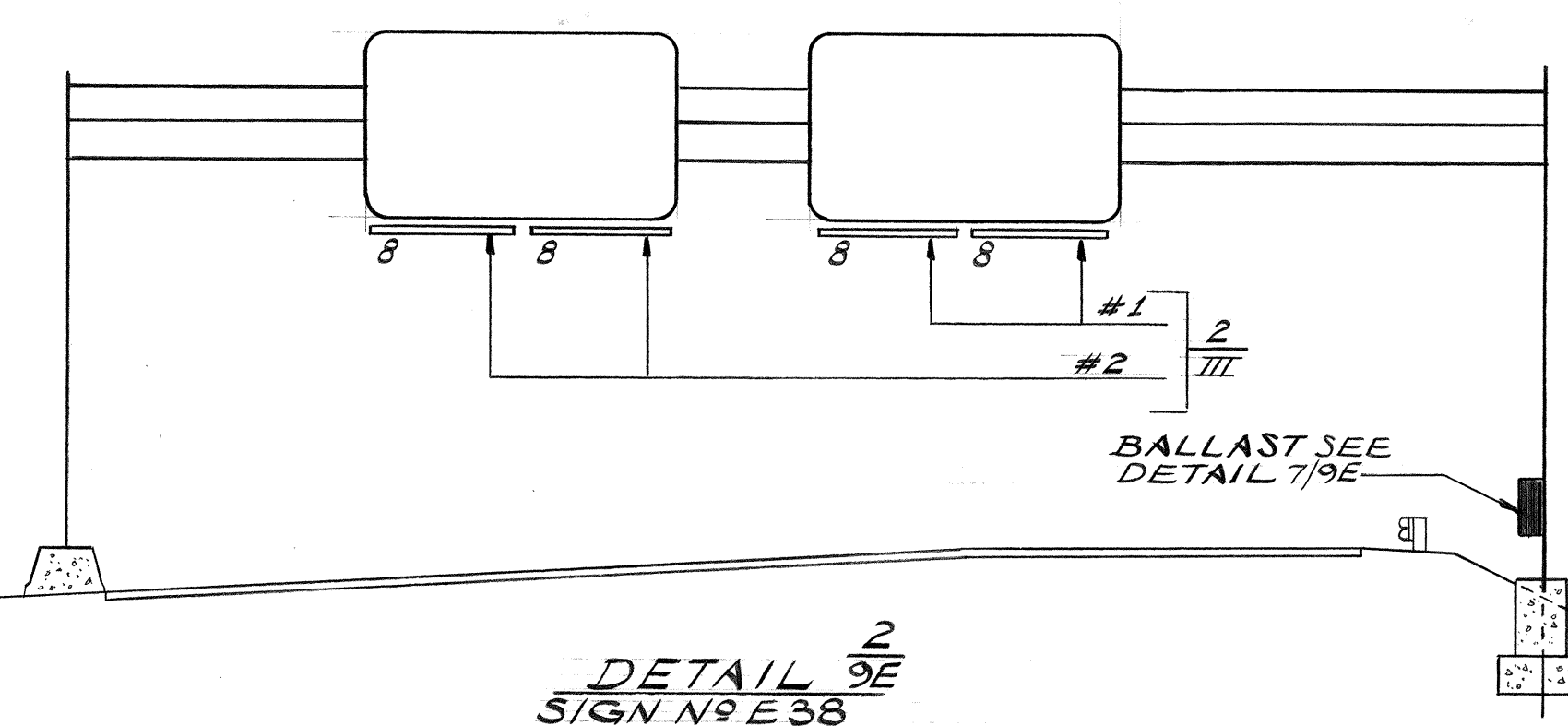
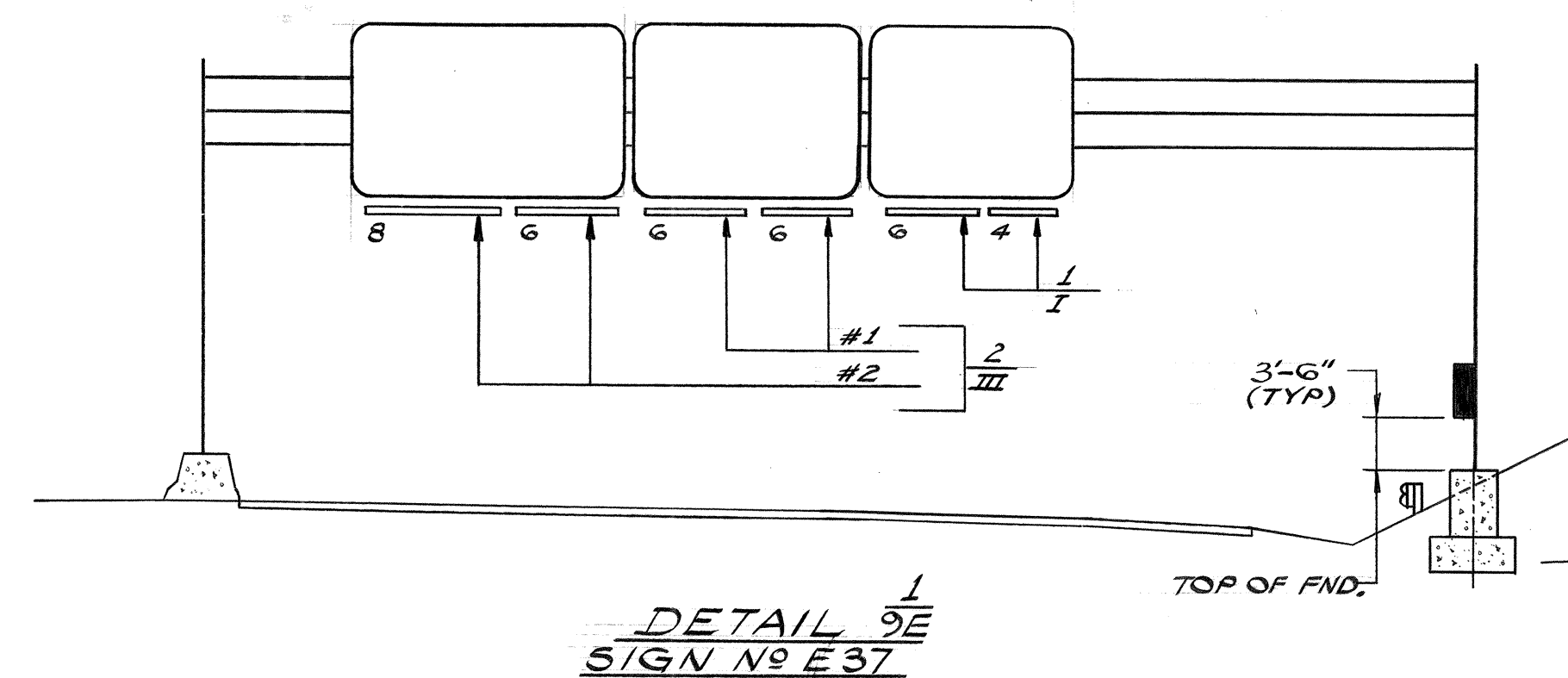
HALAWA INTERCHANGE  
PROJECT NO. I-HI(90):13

Scale: As Shown Date: DEC. 24, 1970

SHEET No. 8E OF 10 SHEETS



| FED. ROAD<br>DIST. NO. | STATE | FED. AID<br>PROJ. NO. | FISCAL<br>YEAR | SHEET<br>NO. | TOTAL<br>SHEETS |
|------------------------|-------|-----------------------|----------------|--------------|-----------------|
| HAWAII                 | HAW.  | I-HI(90):13           | 1972           | 98           | 202             |

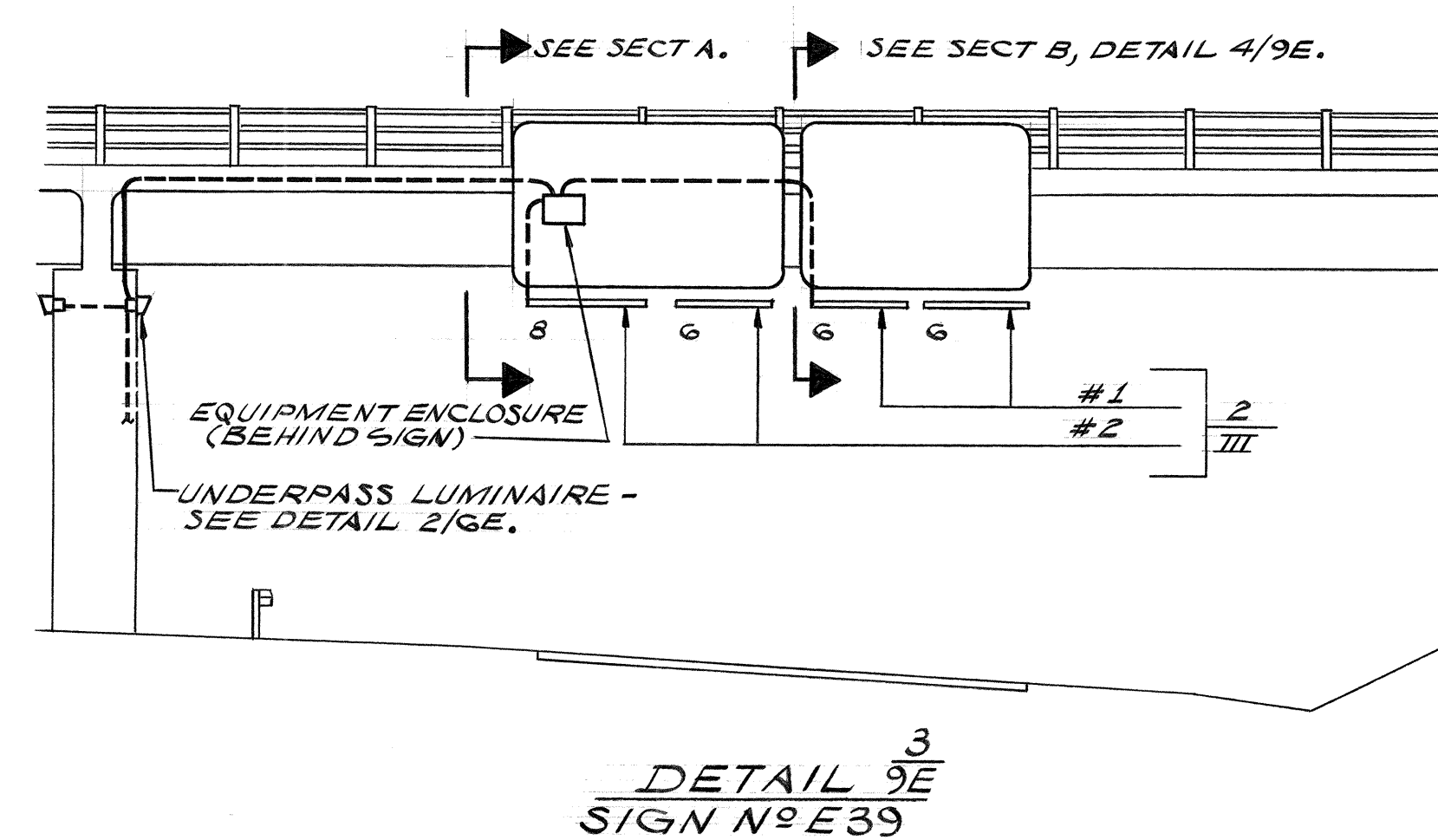


NOTES:

- 1 FOR SCHEMATIC DIAGRAM CONNECTION TO SIGN LUMINAIRES SEE DETAIL 8/5E.
- 2 FOR DETAIL OF FOUNDATION FOR OVERHEAD SIGN SEE SHEET T9.

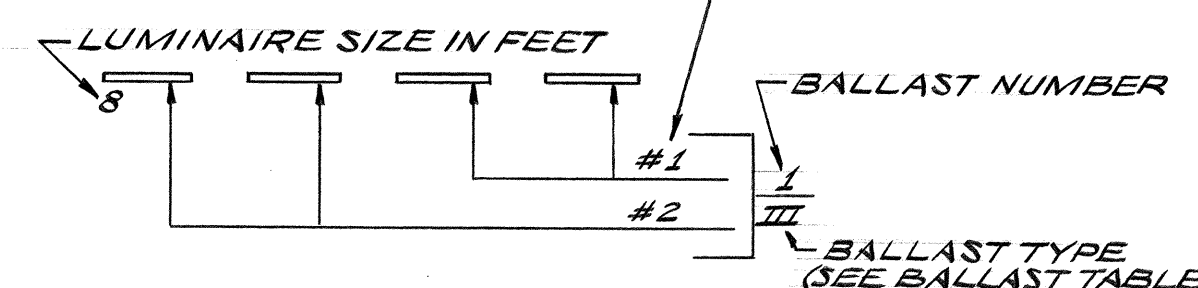
\* ITEMS REFERENCED WITH ASTERISK SHALL BE OF ALUMINUM.

\*\* ITEMS REFERENCED WITH DOUBLE ASTERISK SHALL BE OF STAINLESS STEEL.

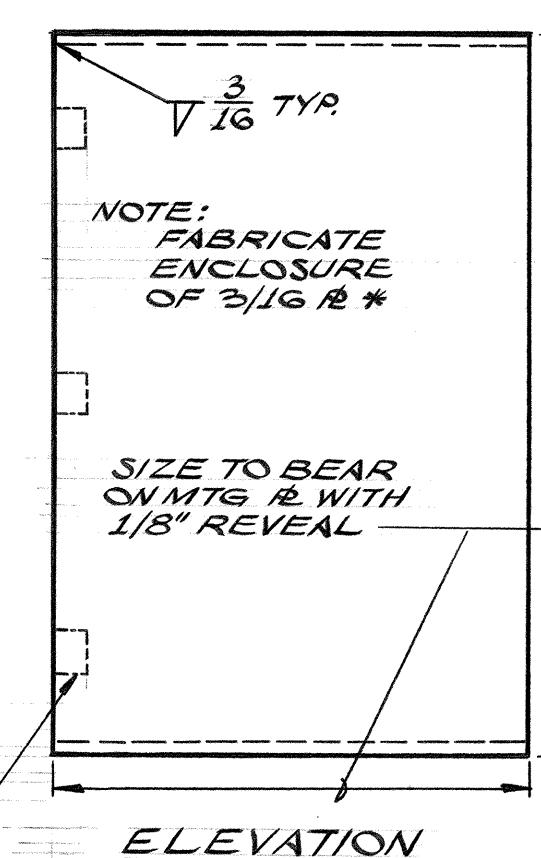


| BALLAST TABLE |                         |
|---------------|-------------------------|
| TYPE          | DESCRIPTION             |
| I             | 1 OR 2 LAMP COMBINATION |
| II            | 2 OR 3 LAMP COMBINATION |
| III           | 4 LAMP COMBINATION      |

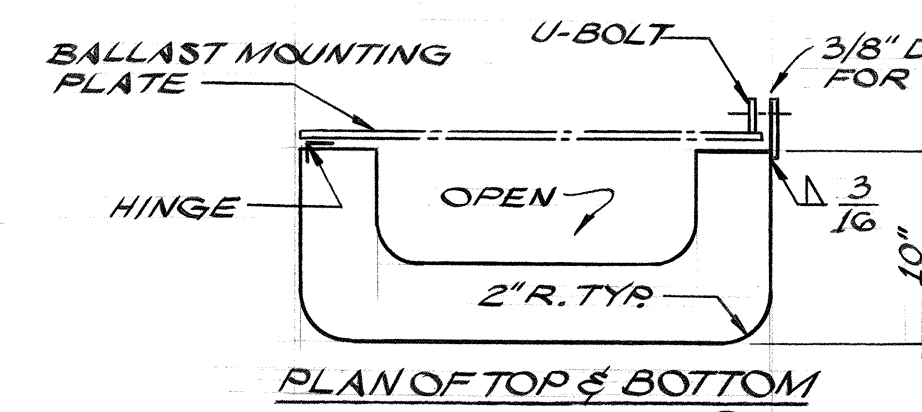
BALLAST CIRCUIT NO (WHEN NO CKT NO IS INDICATED ALL LUMINAIRES ARE ON ONE CIRCUIT) \_\_\_\_\_



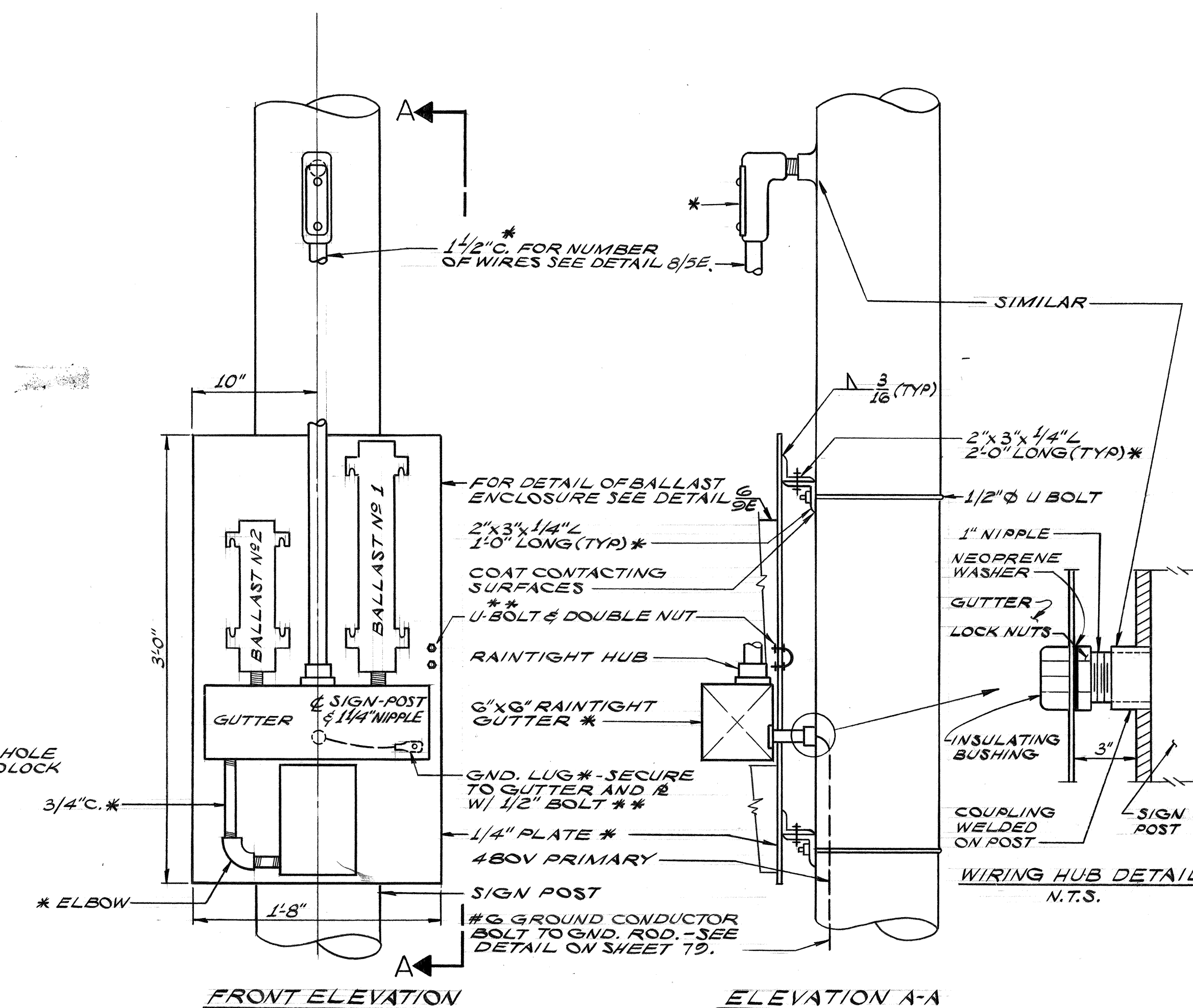
KEY  
LUM-TO-BALLAST  
CONNECTION



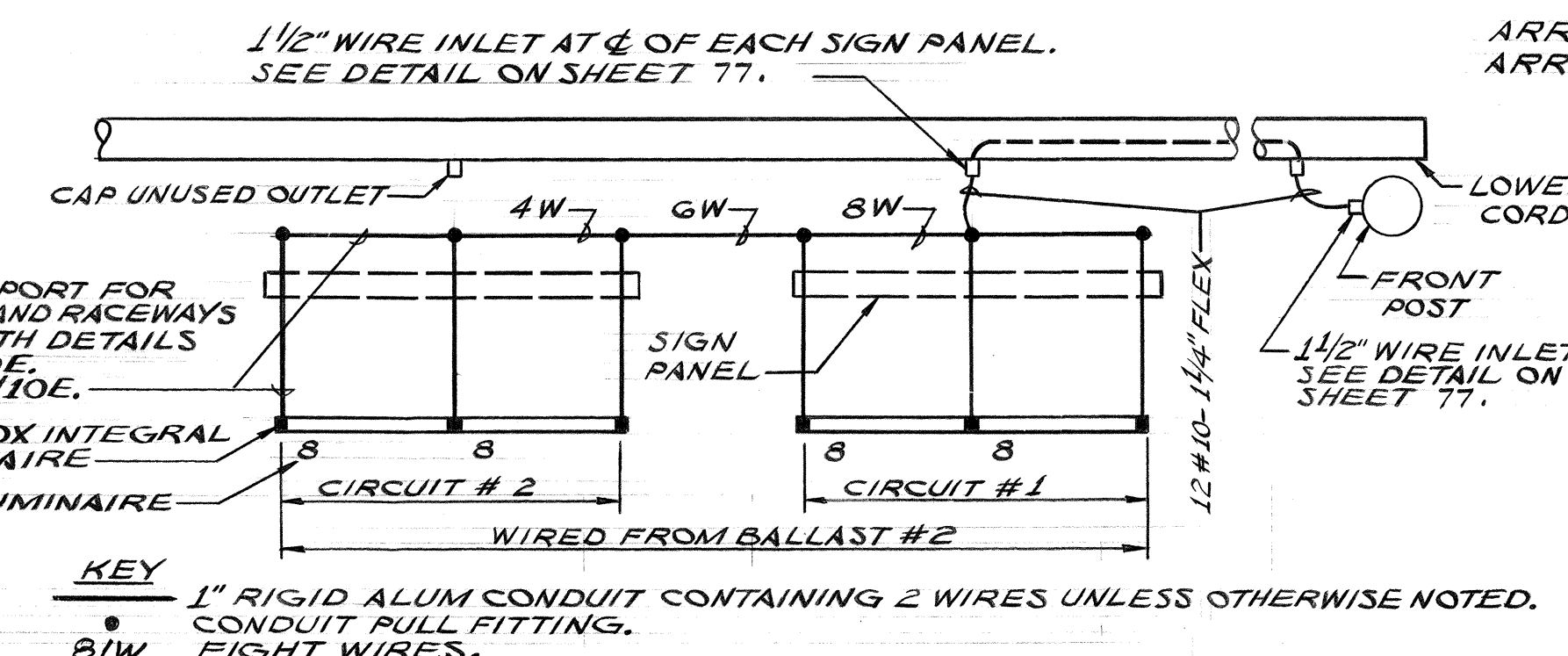
### ELEVATION



DETAIL 9E  
BALLAST ENCLOSURE  
SCALE: 1/10"=1"



7  
DETAIL 9E  
BALLAST MOUNTING  
ARRANGEMENT FOR SIGN NO E37 SHOWN  
ARRANGEMENT FOR SIGN NO E38 SIMILAR  
SCALE: 1/8"=1'-0"



PROVIDE SUPPORT  
LUMINAIRES AND R.  
IN ACCORD WITH DE  
ON SHEET 10E.  
SEE NOTE 3/10E.

KEY  
1" RIGID ALUM CONDUIT CONTAINING 2 WIRES UNLESS OTHERWISE NOTED  
CONDUIT PULL FITTING.  
81W. EIGHT WIRES.

PLAN 8  
DETAIL 9E  
RACEWAY LAYOUT FOR SIGN NO E 38 SHOWN  
SIGN NO E 37 & E 39 SIMILAR  
SCALE: 1/8" = 1'-0"



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Michael A. Margalov

ELECTRICAL SHEET 9E

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

ELECTRICAL DETAILS  
ILLUMINATED SIGNS  
PART I  
HALAWA INTERCHANGE  
PROJECT NO.1-HI-1(90):13

**SHEET No. 9E OF 10 SHEETS**

98

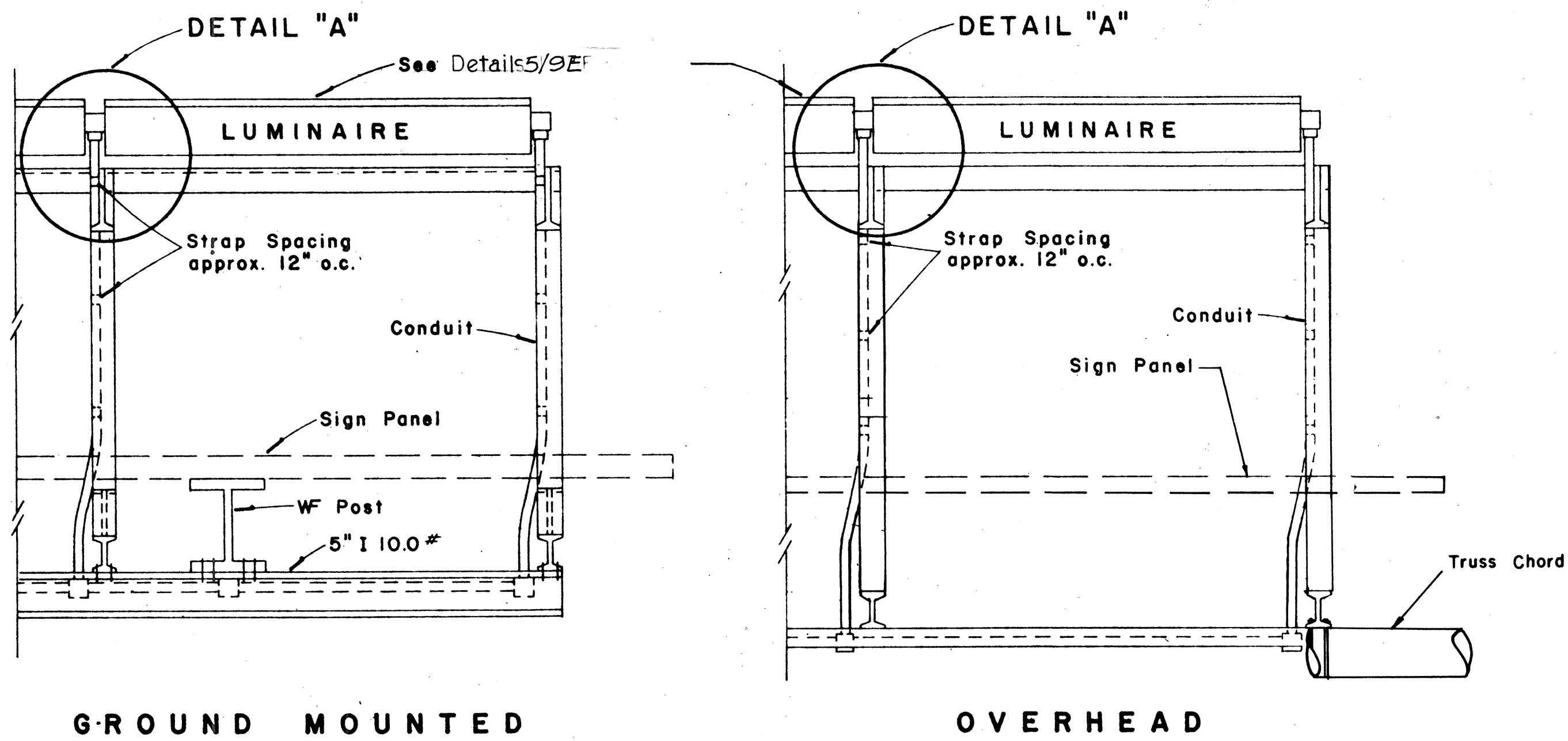
|                  |                        |           |
|------------------|------------------------|-----------|
| ORIGINAL<br>PLAN | SURVEY PLOTTED BY..... | DATE..... |
| NOTE BOOK        | DRAWN BY.....          | ".....    |
|                  | TRACED BY.....         | ".....    |
|                  | DESIGNED BY.....       | ".....    |
|                  | QUANTITIES BY.....     | ".....    |
| No.....          | CHECKED BY.....        | ".....    |

PRINTED ON NO. 100011 CLEARPRINT



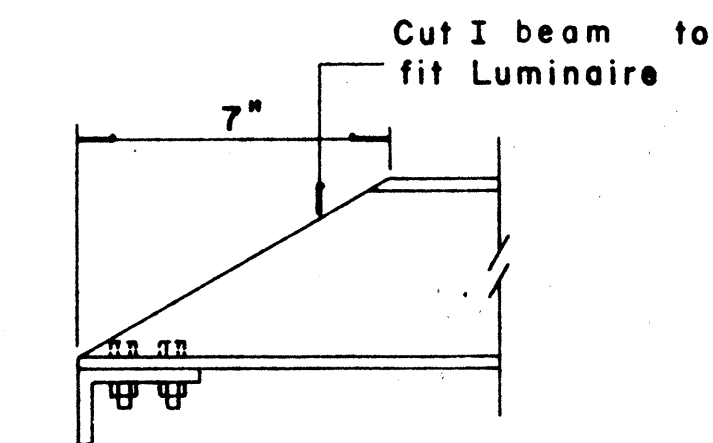
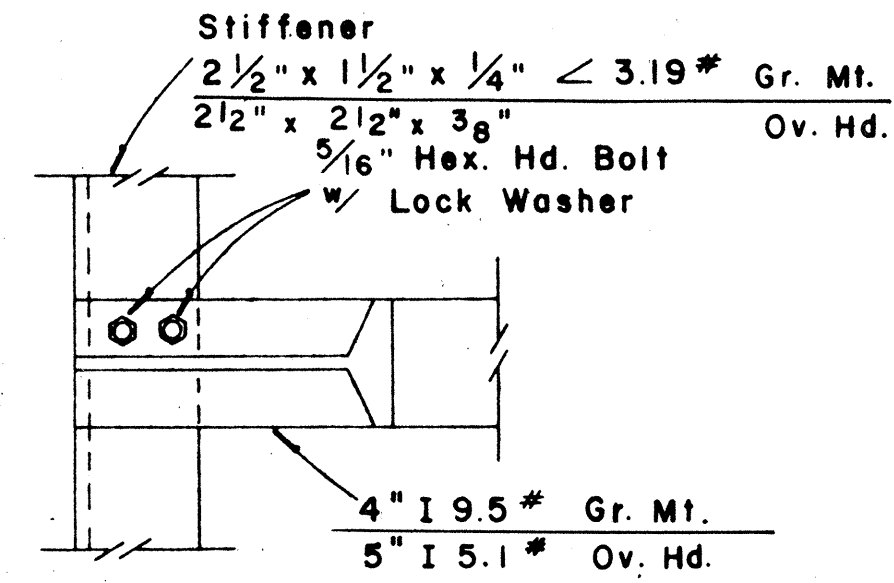
# GENERAL NOTES

1. For Raceway layout for sign luminaires see Detail 8/9E.
2. Luminaire brackets shall be spaced to fit luminaires. See Detail 5/9E. Spacing between brackets shall not exceed 6'-9".
3. 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.



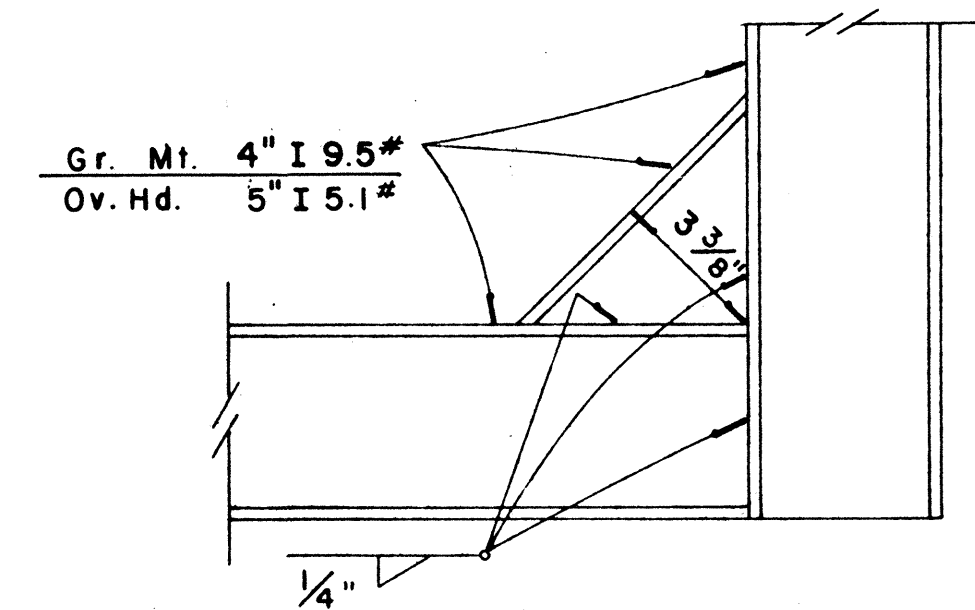
## TOP VIEW LUMINAIRE MOUNTING

Scale: 1" = 1'-0"



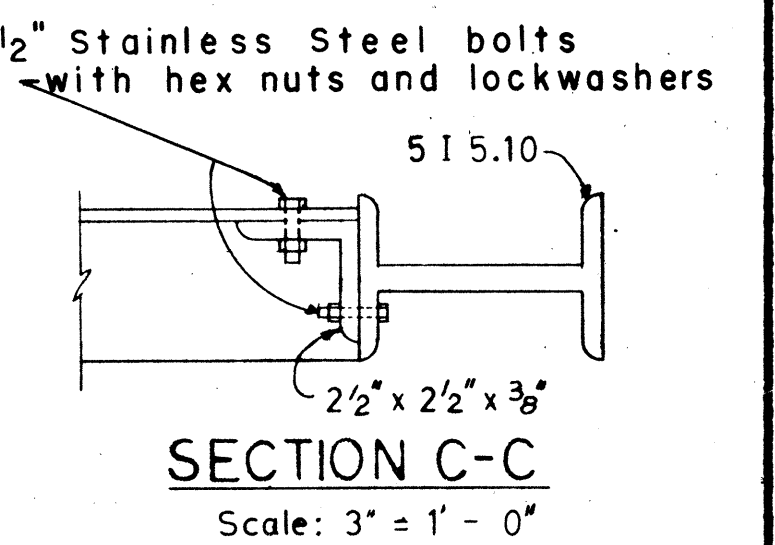
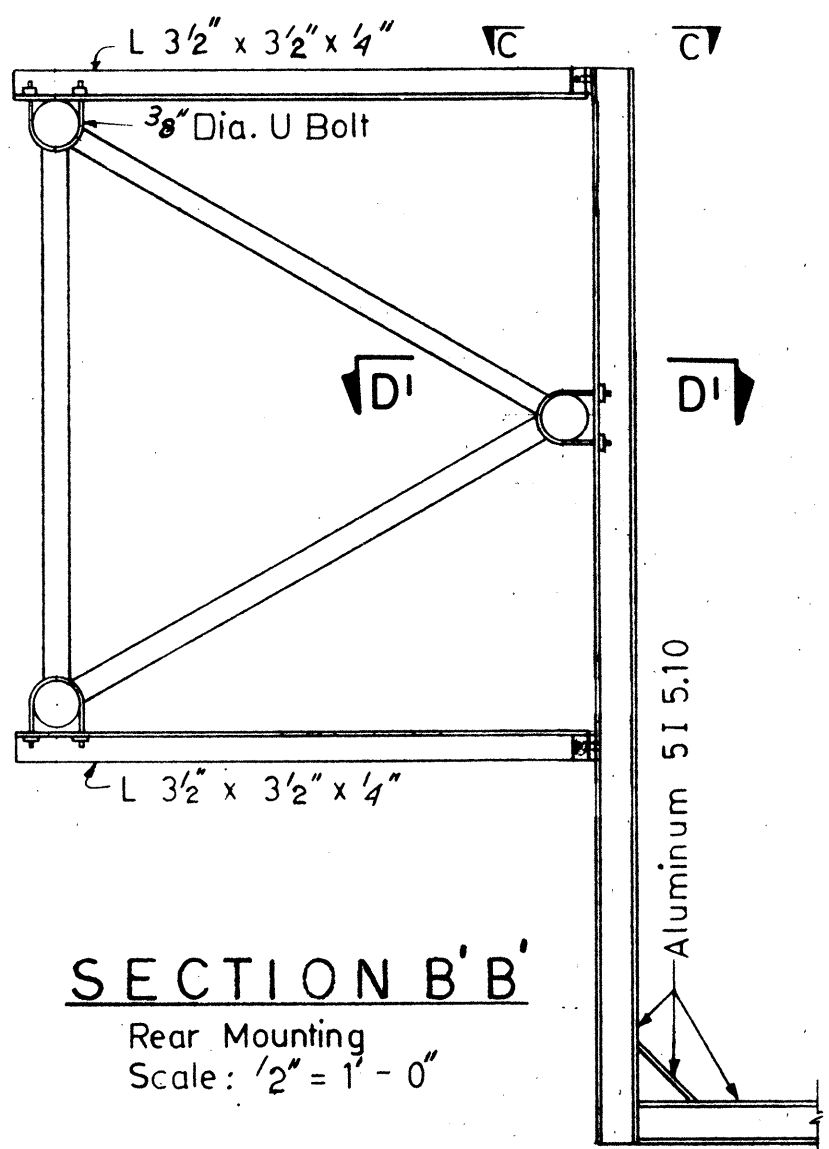
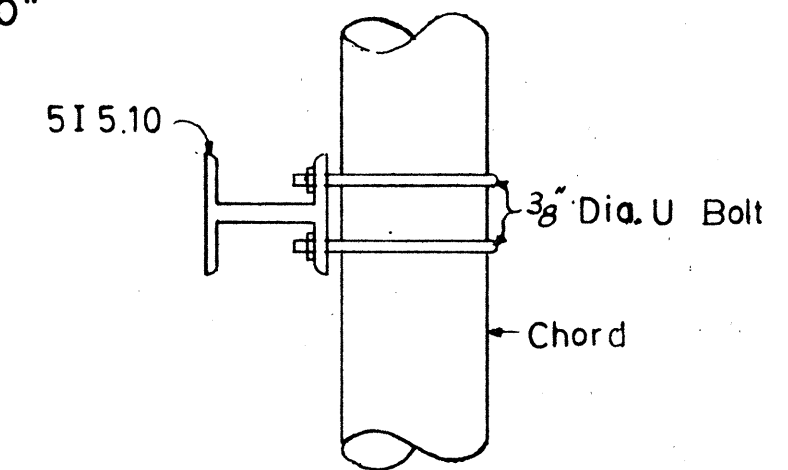
### DETAIL "A"

Scale: 3" = 1'-0"

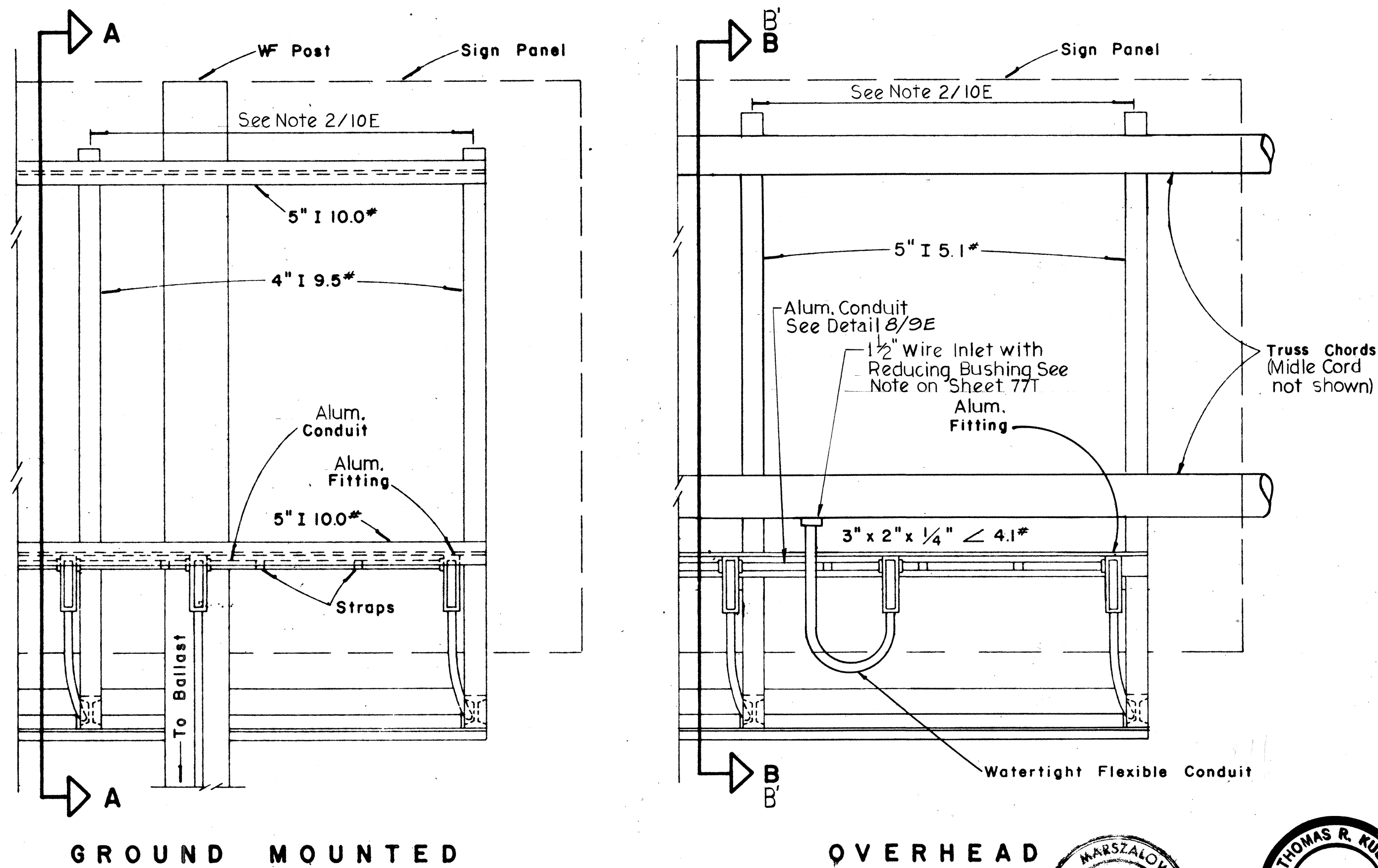


### DETAIL "B"

Scale: 3" = 1'-0"

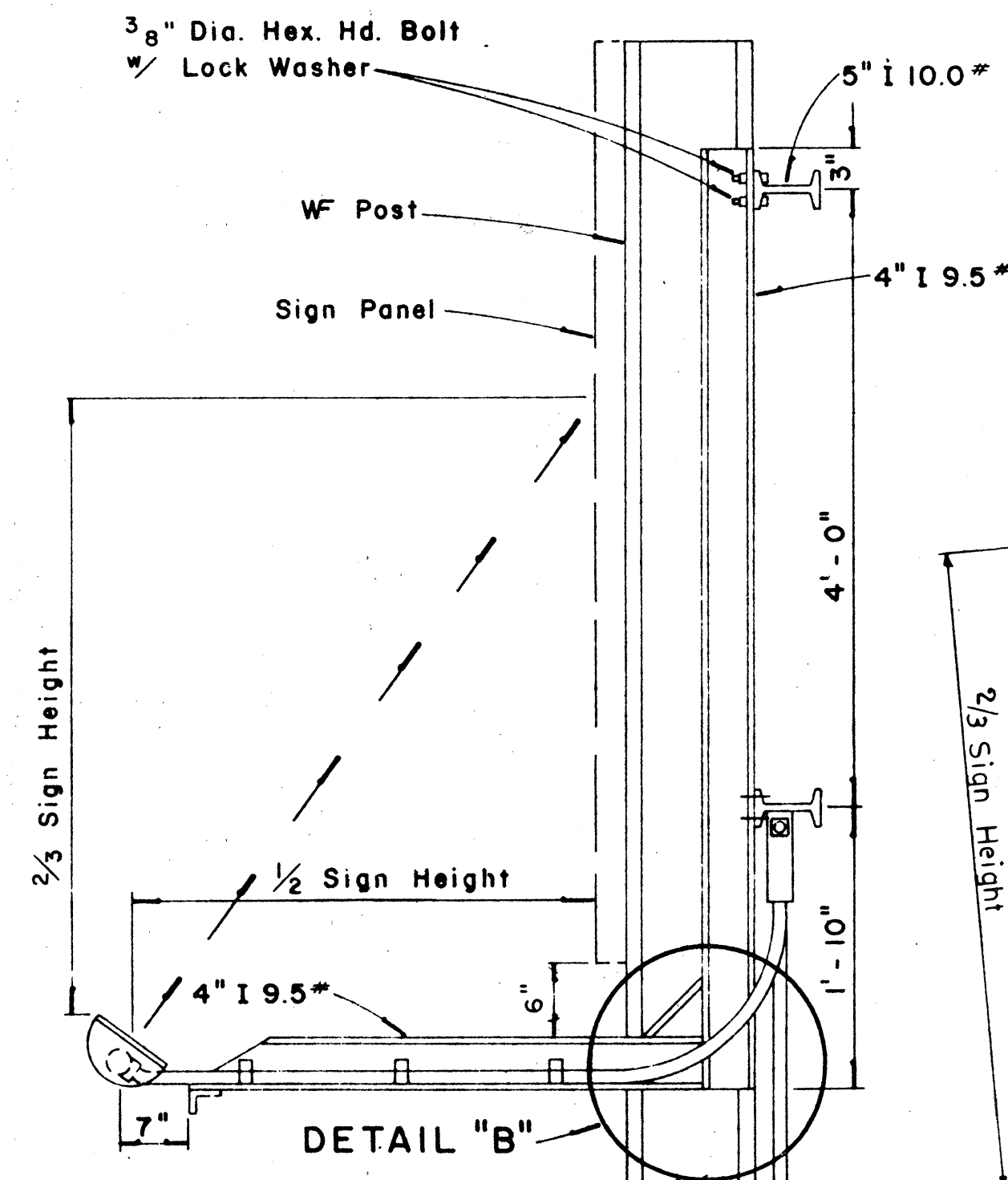


## ELECTRICAL SHEET 10E



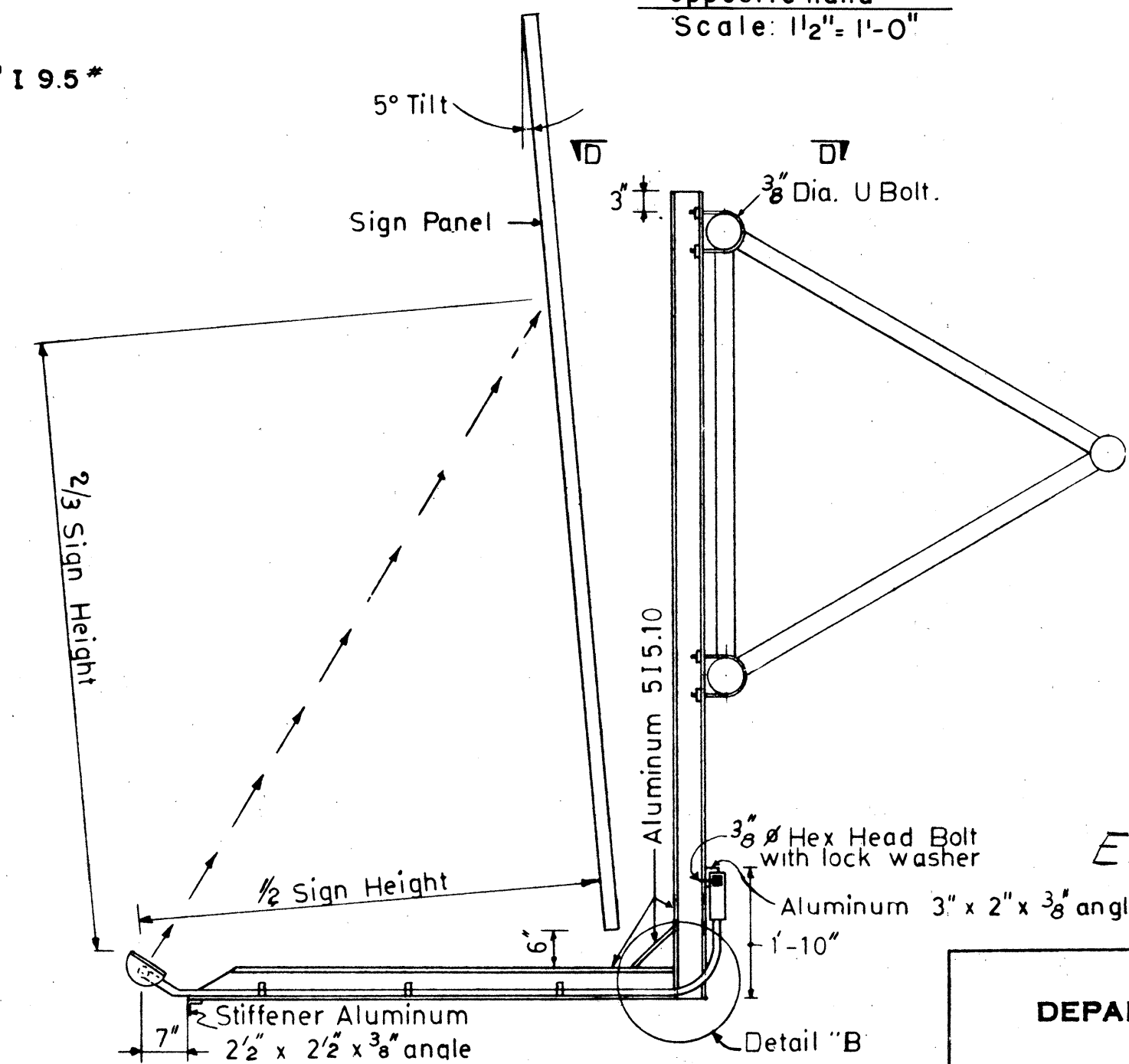
## REAR VIEW LUMINAIRE MOUNTING

Scale: 1" = 1'-0"



### SECTION "A-A"

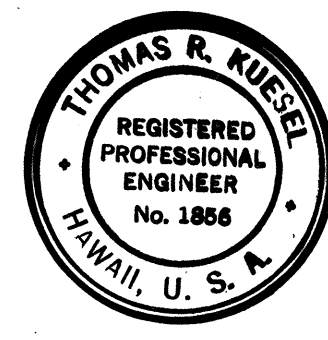
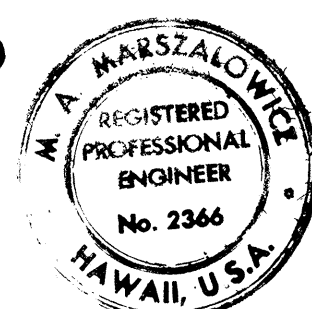
Scale: 1" = 1'-0"



### 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



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*Michael A. Marzalone*

|                   |      |
|-------------------|------|
| ORIGINAL PLAN     | DATE |
| SURVEY PLOTTED BY | DATE |
| DRAWN BY          | DATE |
| DESIGNED BY       | DATE |
| CHECKED BY        | DATE |