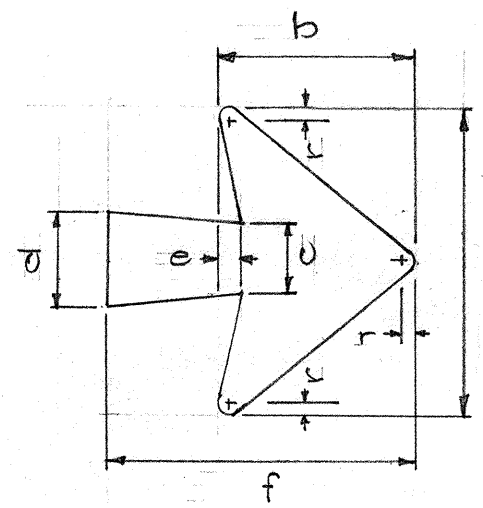
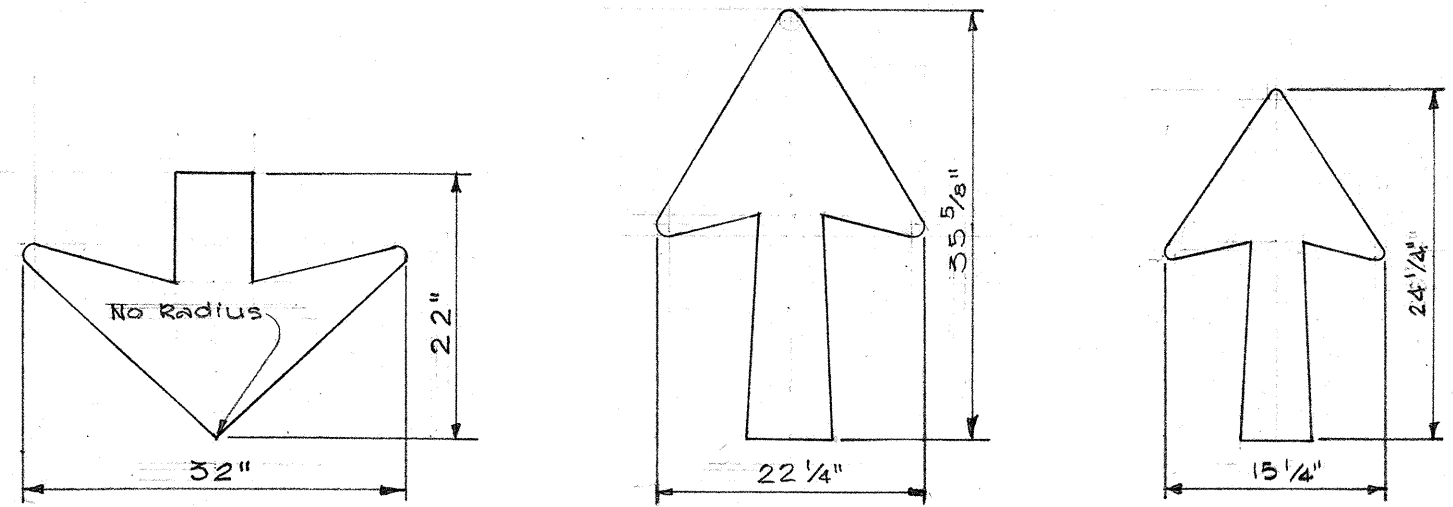
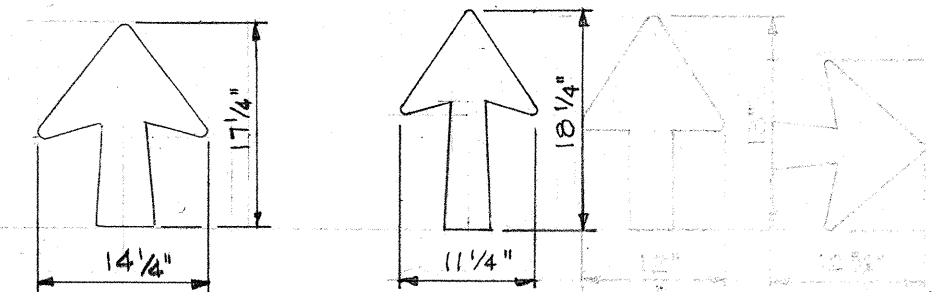
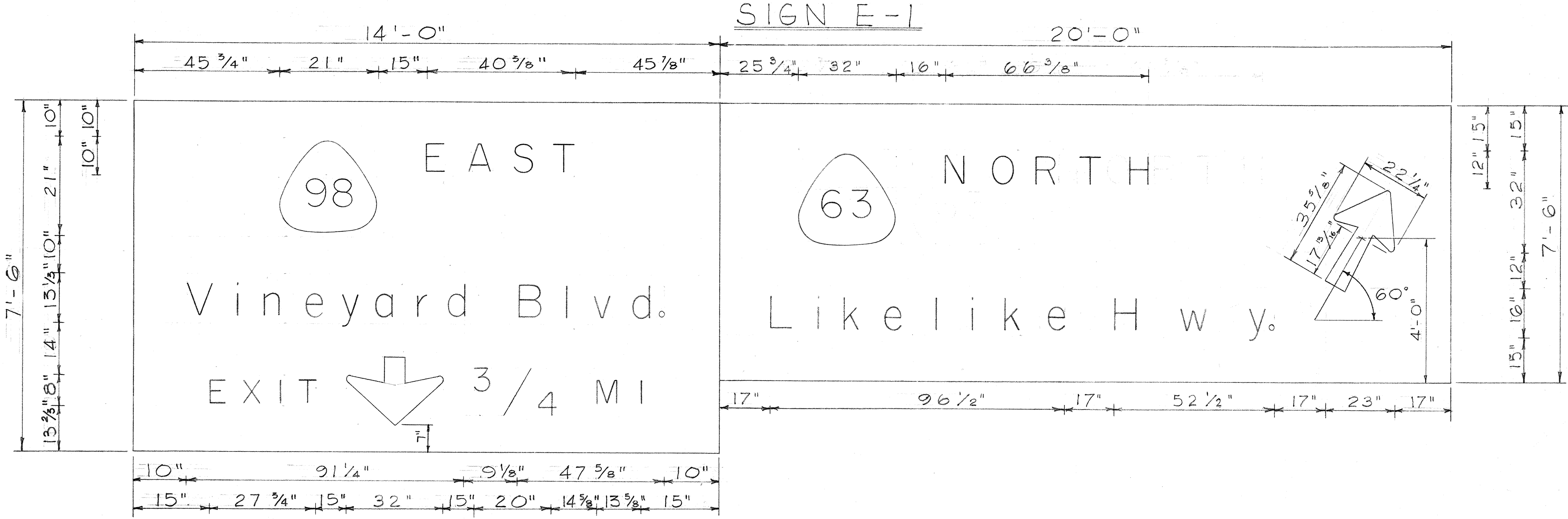
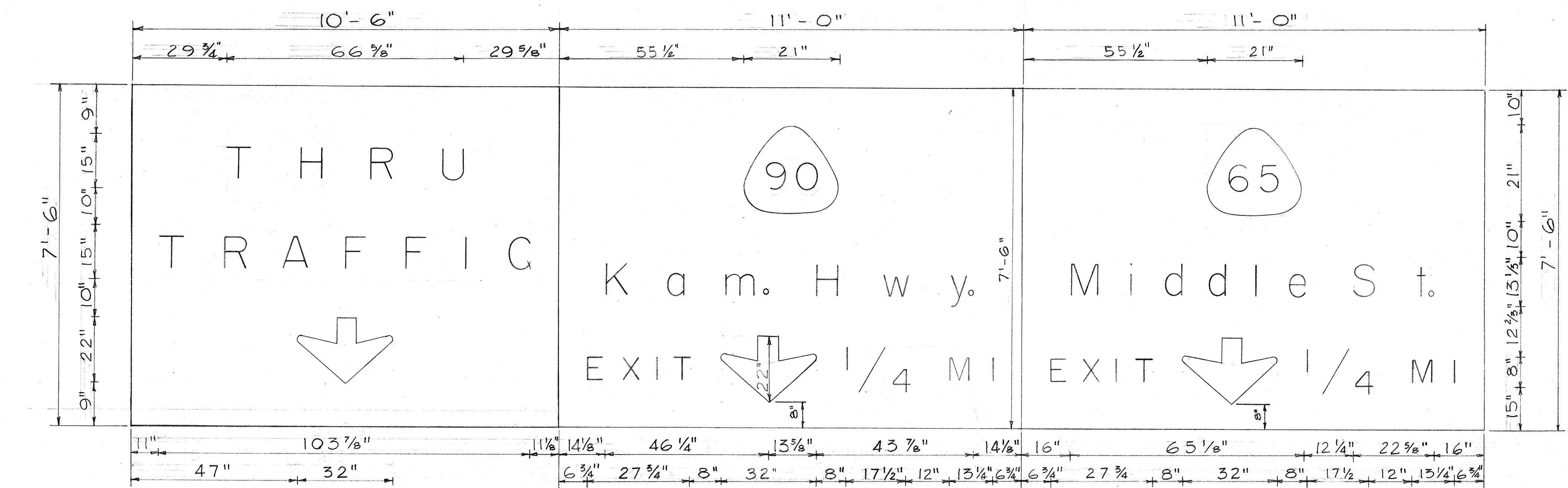




Arrow Size	Dimensions in inches						
11 1/4" x 18 1/4"	11 1/4	8 3/4	3 1/8	3 7/8	7/8	18 1/4	5/8
15 1/8" x 24 1/4"	15 1/8	11 1/8	3 3/4	5	1 5/16	24 1/4	1 3/16
14 1/4" x 17 1/4"	14 1/4	9 1/4	3 3/8	4 1/2	1 1/8	17 1/4	3/4
22 1/4" x 35 3/8"	22 1/4	17	5 3/8	7 1/8	1 3/4	35 3/8	1
32" x 22"	32	16	6 1/2	6 1/2	3	22	1



TYPICAL ARROW DETAILS



SIGN E-2

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXPRESSWAY SIGNS
PANEL LAYOUT,
TYPICAL ARROW DETAILS

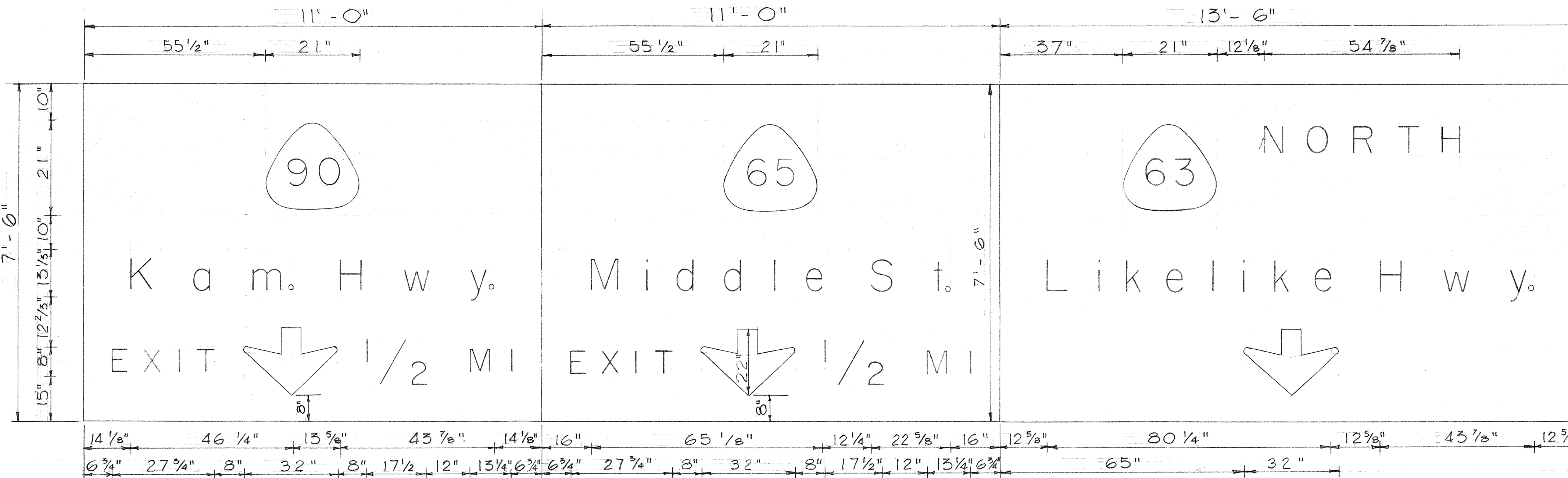
No Scale

SHEET No. 1 OF 3 SHEETS

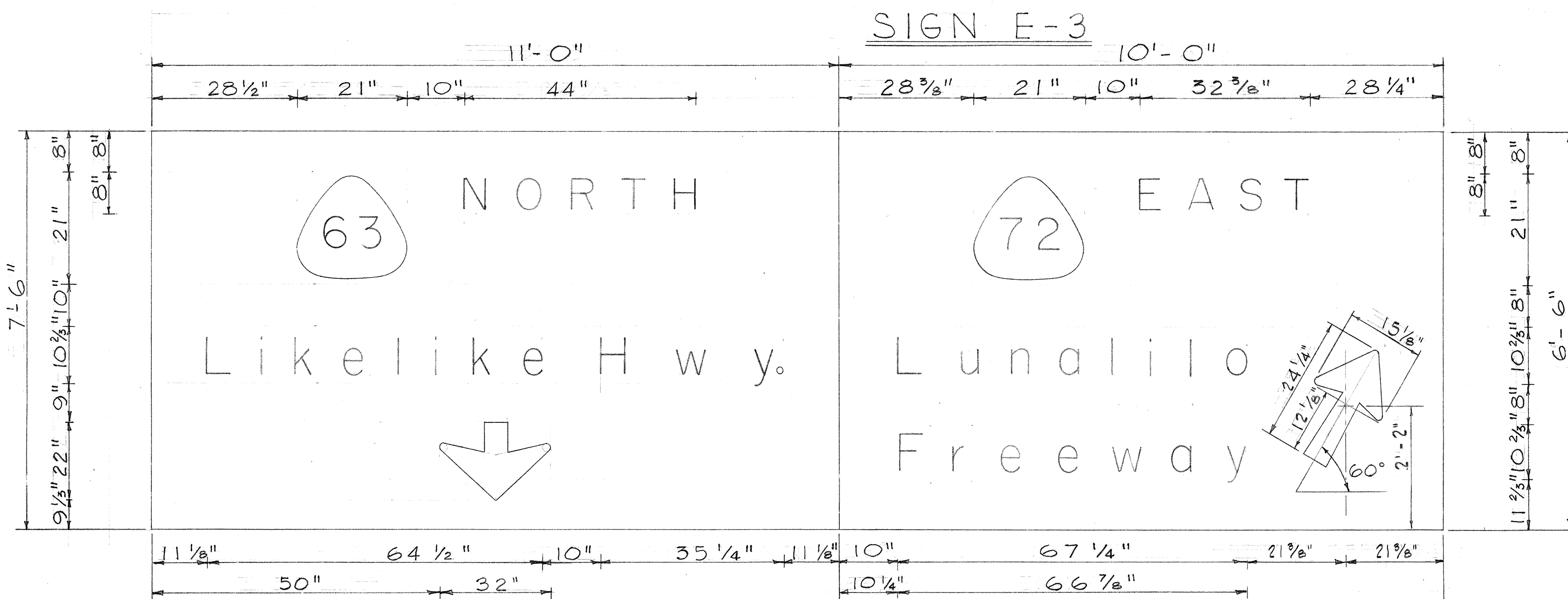
ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY
DATE

DRAWN BY
DESIGNED BY
QUANTITIES BY
CHECKED BY



- GENERAL NOTES**
1. Sign message shall be lettered in upper case according to "Standard Alphabets For Highway Signs," Bureau of Public Roads, 1952, and lower case according to "Standard Lower Case Alphabets For Highway Signs," Bureau of Public Roads, 1962. Use Series "E" modified letters unless otherwise noted.
 2. Arrows shall conform with details as shown on plans.
 3. All borders and State Route Markers shall conform with detail sheet "Destination and Expressway Signs, State Route Marker and Border Details."
 4. Letters, numerals, symbols and borders shall be reflectorized cut-outs or demountable copies. Destination signs will use reflectorized cut-outs.
 5. All reflectorized cut-outs and demountable copies shall be embossed and shall be fastened on sign panel with blind rivets. See Special Provisions.



SUMMARY OF SIGN AREAS (in Sq. Ft.)

SIGN NO.	MESSAGE	AREA U-072-1(10)	AREA U-063-1(1)
E-1	Thru Traffic	78.75	
E-1C	Kam. Hwy.	82.50	
E-1R	Middle St.	82.50	
E-2	Vineyard Blvd.	105.00	105.00
E-2R	Likelike Hwy.	150.00	150.00
E-3	Kam. Hwy.	82.50	
E-3C	Middle St.	82.50	
E-3R	Likelike Hwy.	101.25	
E-4	Likelike Hwy.	82.50	82.50
E-4R	Lunalilo Freeway	65.00	65.00
E-5	Lunalilo Frwy.	120.00	120.00
E-5R	Kalihi St.	42.00	42.00
E-6	Lunalilo Frwy.	82.50	82.50
E-6C	Kalihi St.	60.00	60.00
E-6R	Lunalilo Frwy.	82.50	82.50
D-1	WEST - Lunalilo Frwy.		* 37.50
D-2	Kalihi St. etc.		* 40.00
	TOTAL AREA	510.00#	867.00#

* NOTE: "D" Type Sign Panel (See Special Provisions).

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Project No. 123456

EXPRESSWAY SIGNS
PANEL LAYOUT

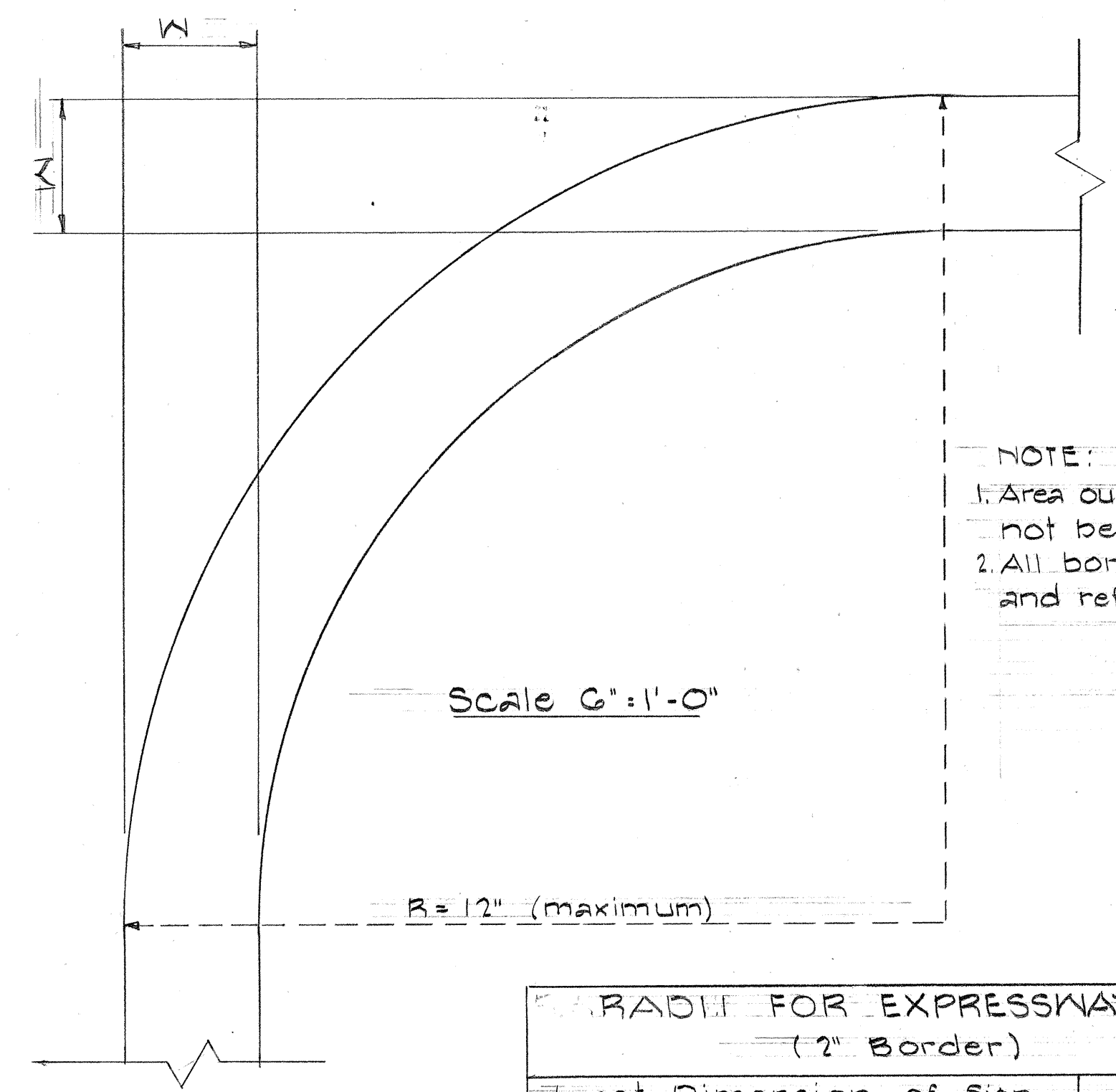
No Scale

SHEET No. 2 OF 3 SHEETS

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

GENERAL NOTES

1. All State Route Markers on Expressway Signs shall have white numerals on black background (sign panel) with the border of the shield around the numerals.
2. All numerals shall be Series "D" from the "Standard Alphabets for Highway Signs," Bureau of Public Roads, 1957.
3. All numerals and borders shall be Cut-outs.
4. All Cut-outs shall be fastened on sign panel with Aluminum blind rivets. See Special Provisions.
5. All signs shall have borders.



RADIUS FOR EXPRESSWAY SIGNS (2" Border)		
Least Dimension of Sign	W	R
3'-0" to 4'-6"	2"	3"
4'-9" to 5'-6"	2"	6"
5'-9" to 7'-6"	2"	9"
7'-9" and greater	2"	12"
RADIUS FOR DESTINATION SIGNS (1" BORDER)		
Least Dimension of Sign	W	R
Any Size	1"	3"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

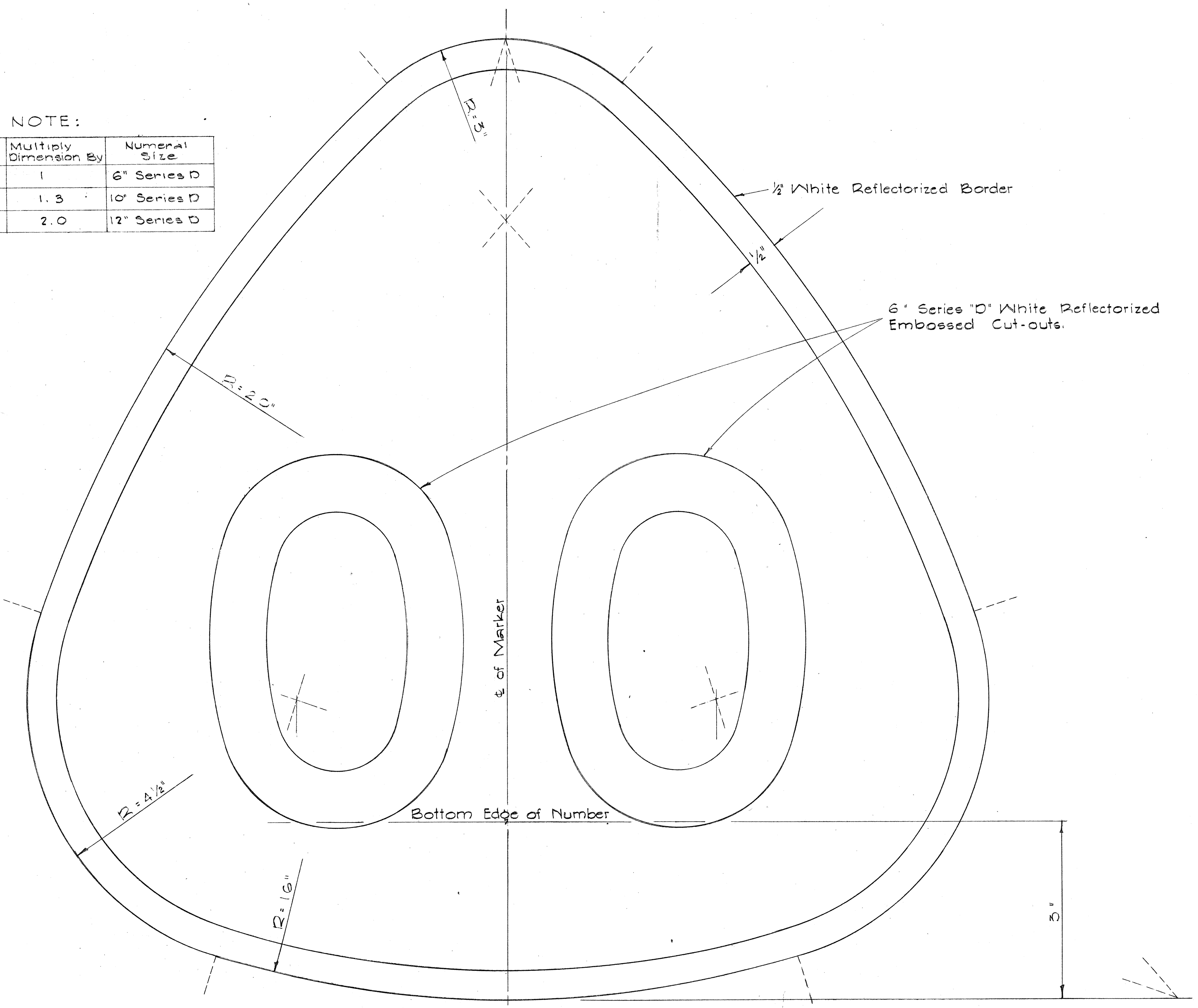
DESTINATION AND EXPRESSWAY SIGN
STATE ROUTE MARKER
AND BORDER DETAILS

SCALE: AS NOTED

SHEET No. OF SHEETS

NOTE:

Shield Size	Multiply Dimension By	Numerical Size
16"	1	6" Series D
21"	1.3	10" Series D
32"	2.0	12" Series D

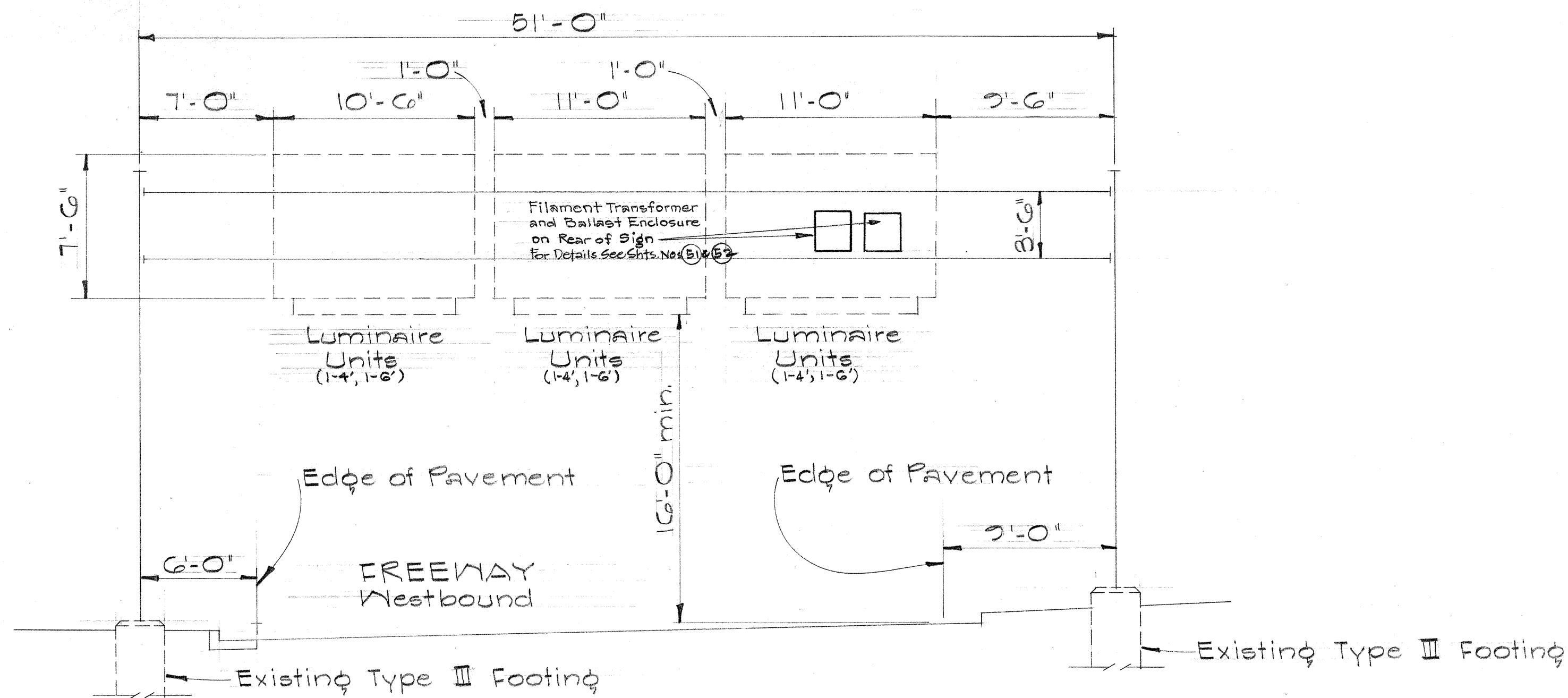


STATE ROUTE MARKER
FOR
DESTINATION AND EXPRESSWAY SIGNS

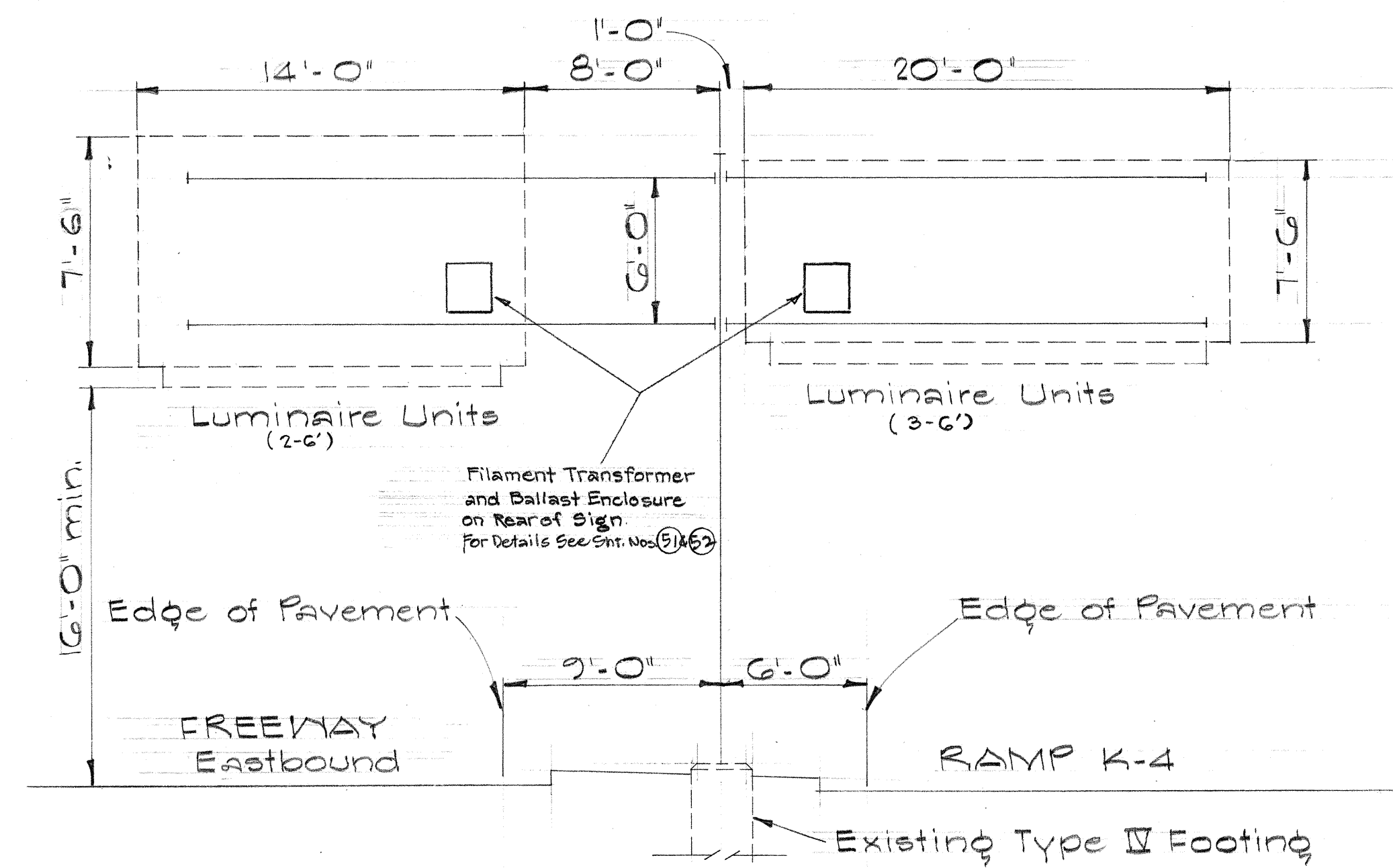
SCALE: Full Size

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

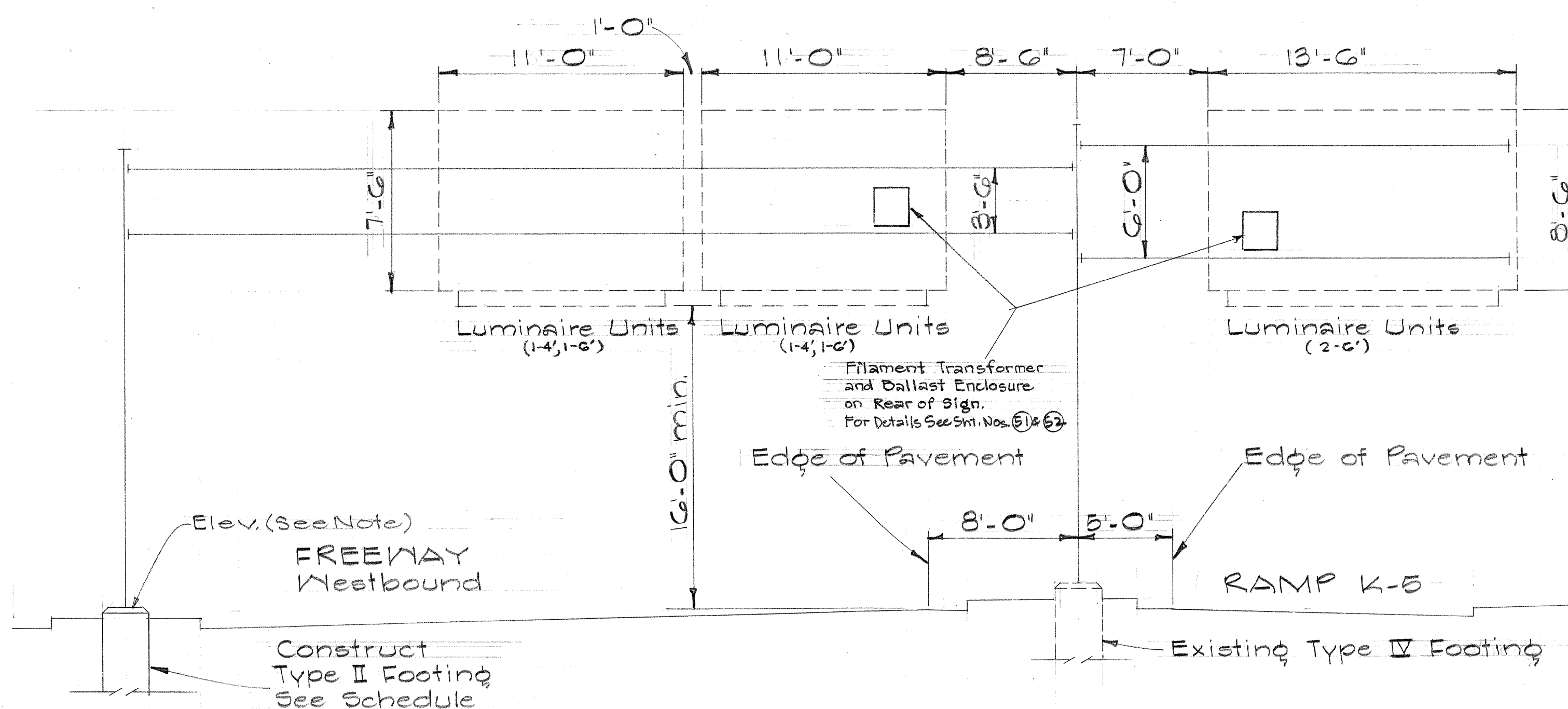
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	0072(10)	1963	A 39	45
		0063(11)	1963	B 39	45



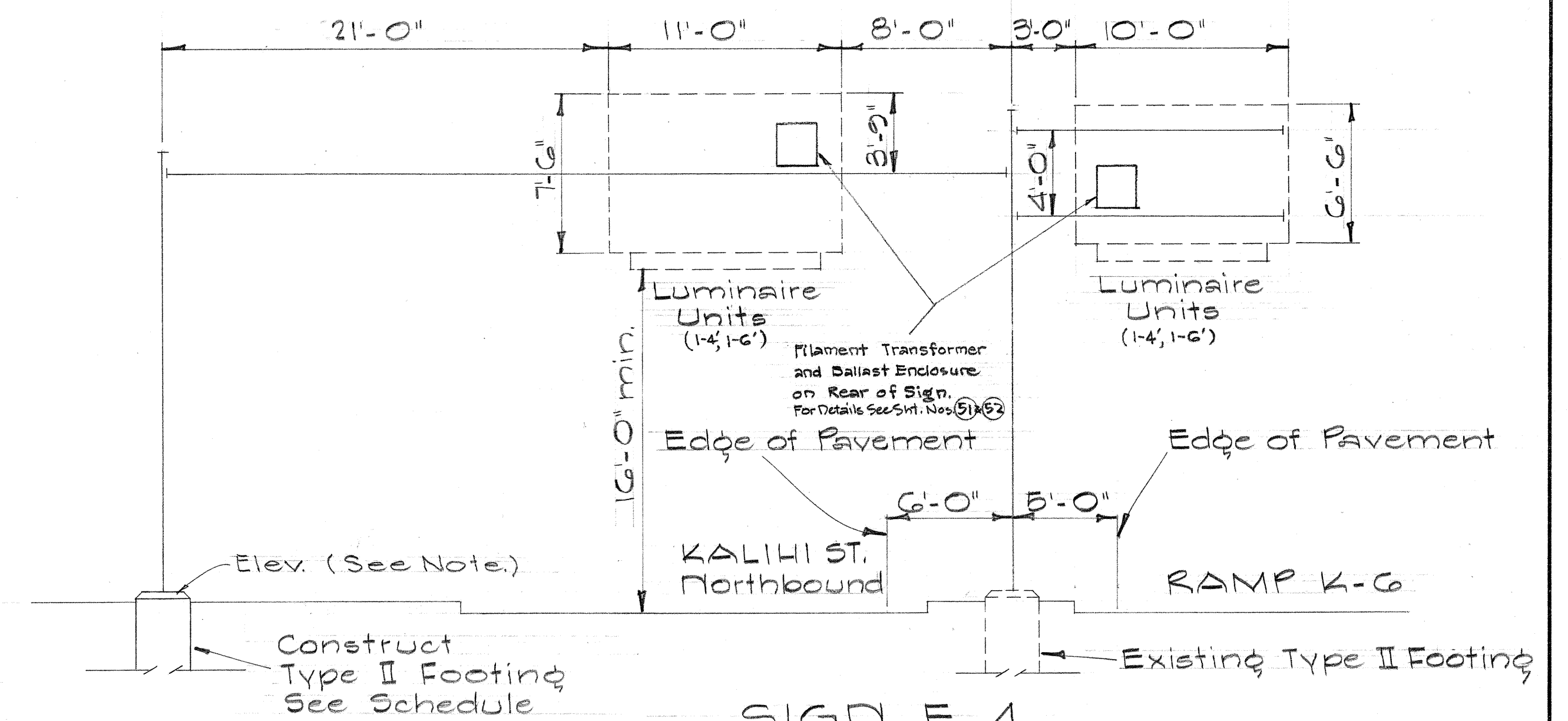
SIGN E-1
STA 37+75



SIGN E-2
STA 45+80



SIGN E-3
STA 50+10



SIGN E-4
KALIHI ST. STA 4+50

NOTE:
1. The elevations of the new footings shall be determined in the field by the Engineer.
2. The right vertical supports of signs E-4 and E-5 shall be longer than the left supports to accommodate the cantilever mast arms.

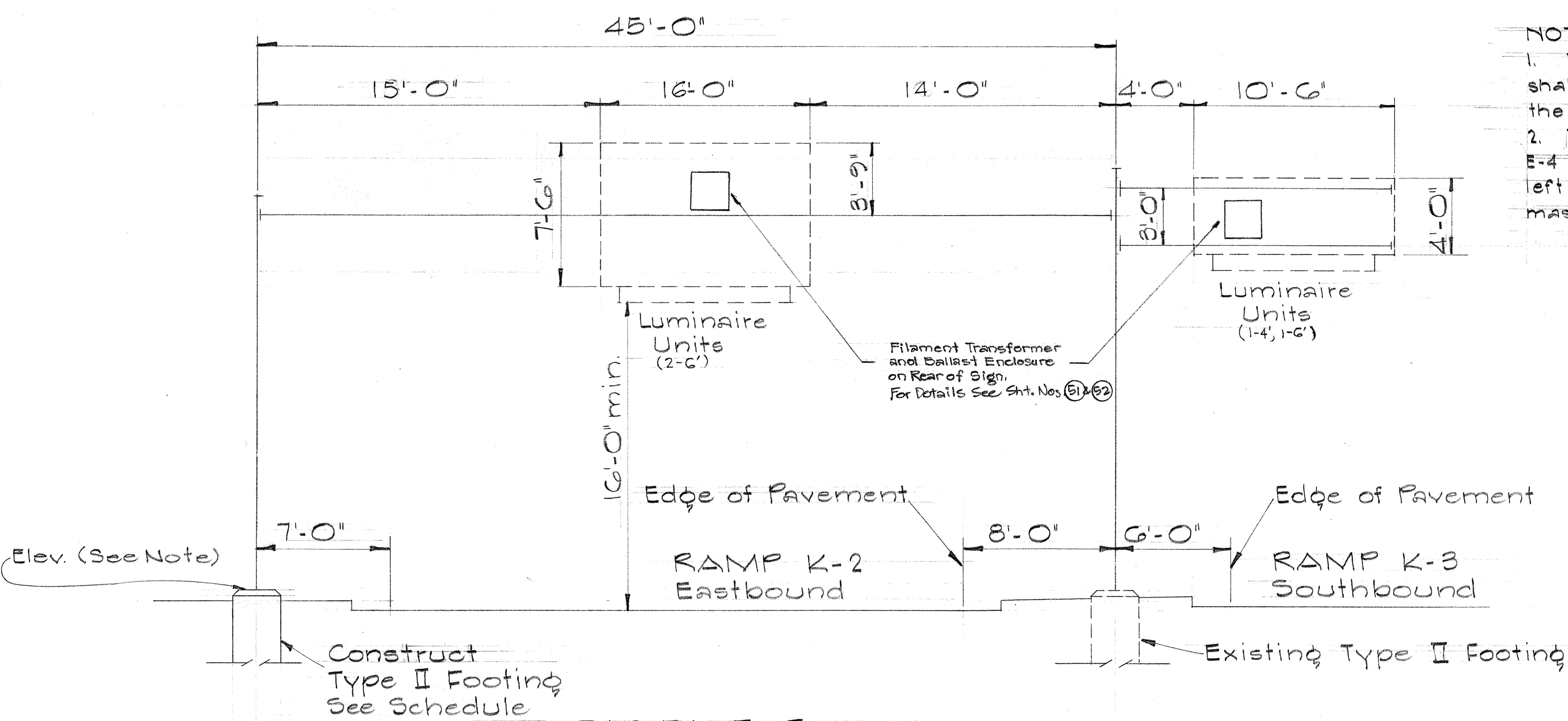
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXPRESSWAY SIGNS
FRAME LAYOUT

SHEET No. OF SHEETS

A 39 B 39

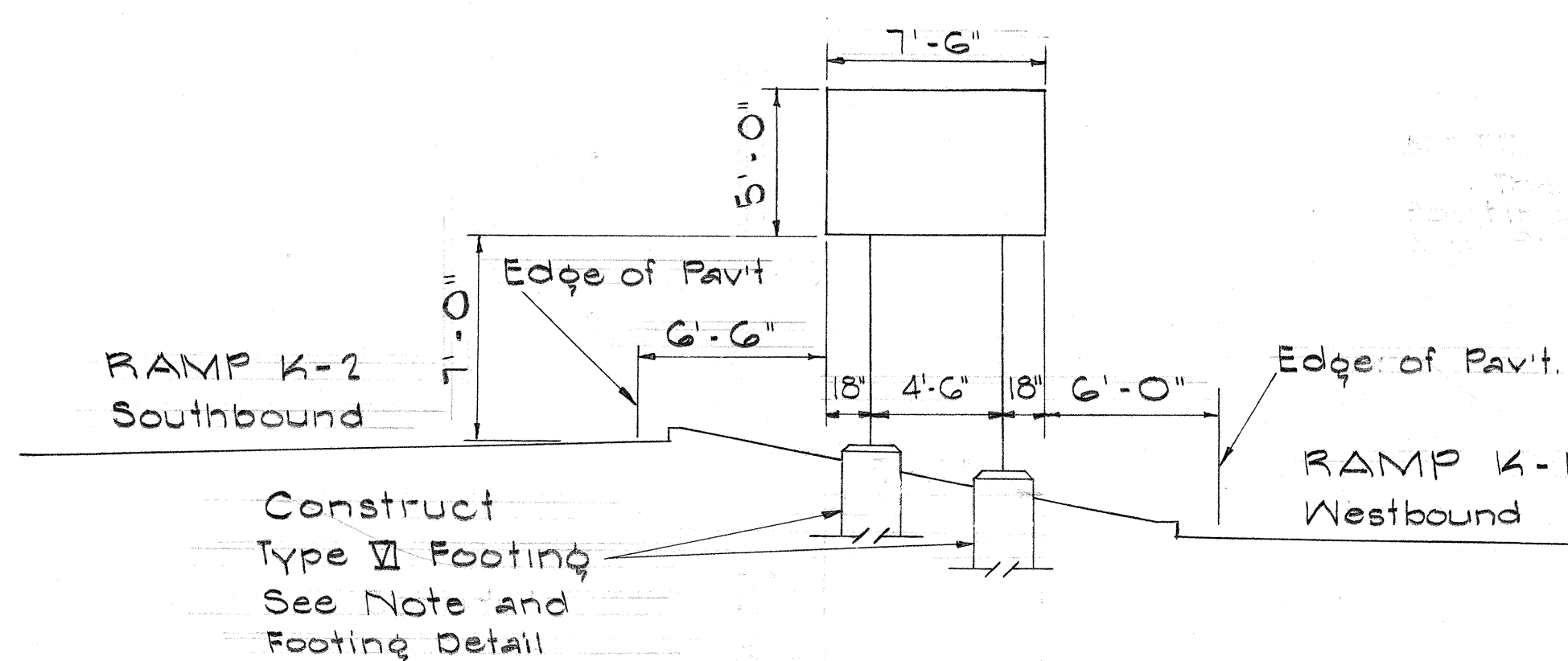
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1072(10)	1963	440	45
		1063(1)	1963	840	45



NOTE:
1. The elevations of the new footing shall be determined in the field by the Engineer.
2. The right vertical supports of signs E-4 and E-5 shall be longer than the left supports to accommodate the cantilever mast arms.

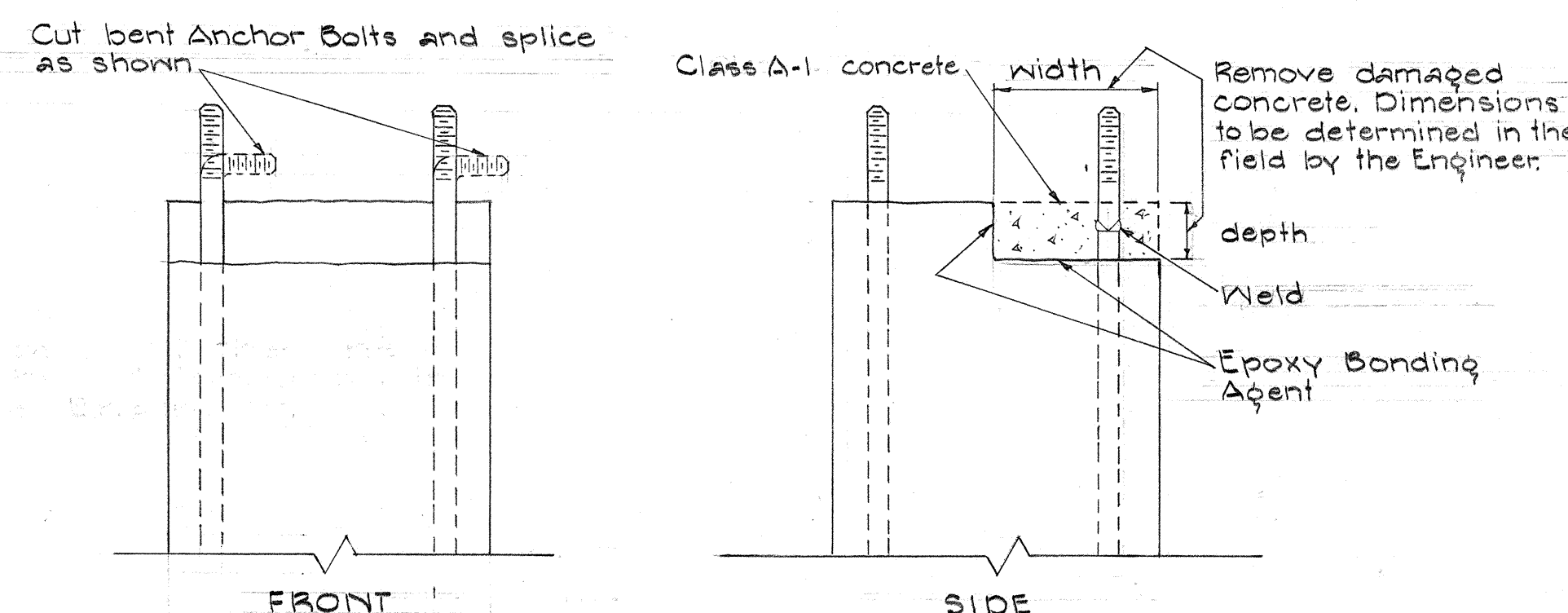
SIGN E-5
RAMP K-3
See Location Plan

SIGN E-6
RAMP K-1 STA. 2+90

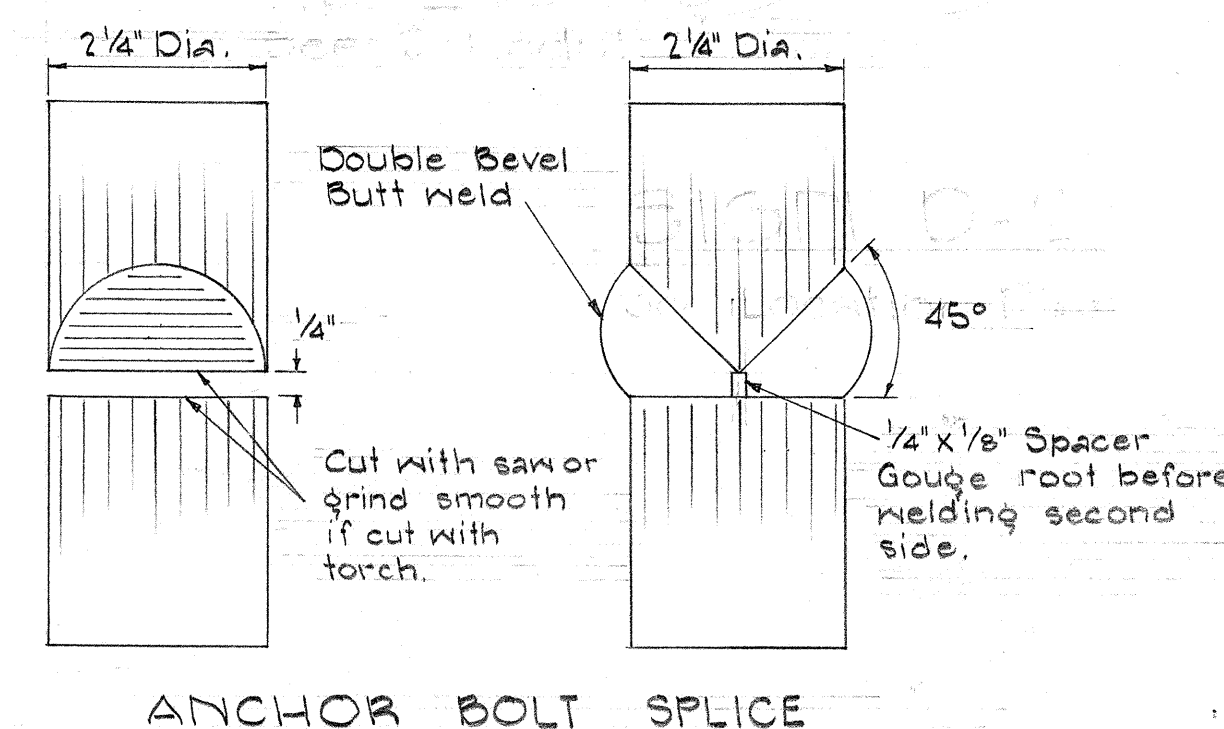
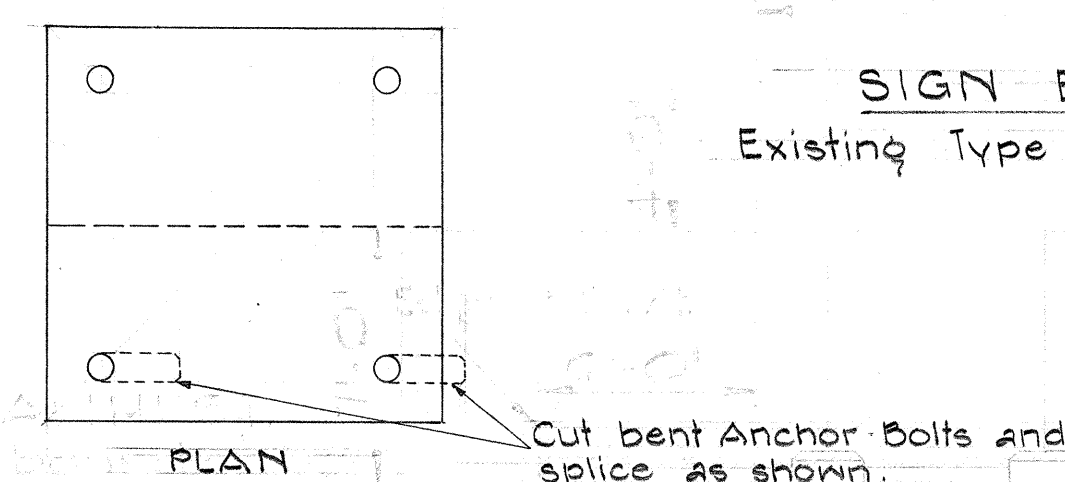


SIGN D-1
RAMP K-1 STA. 5+85

SIGN D-2
See Location Plan

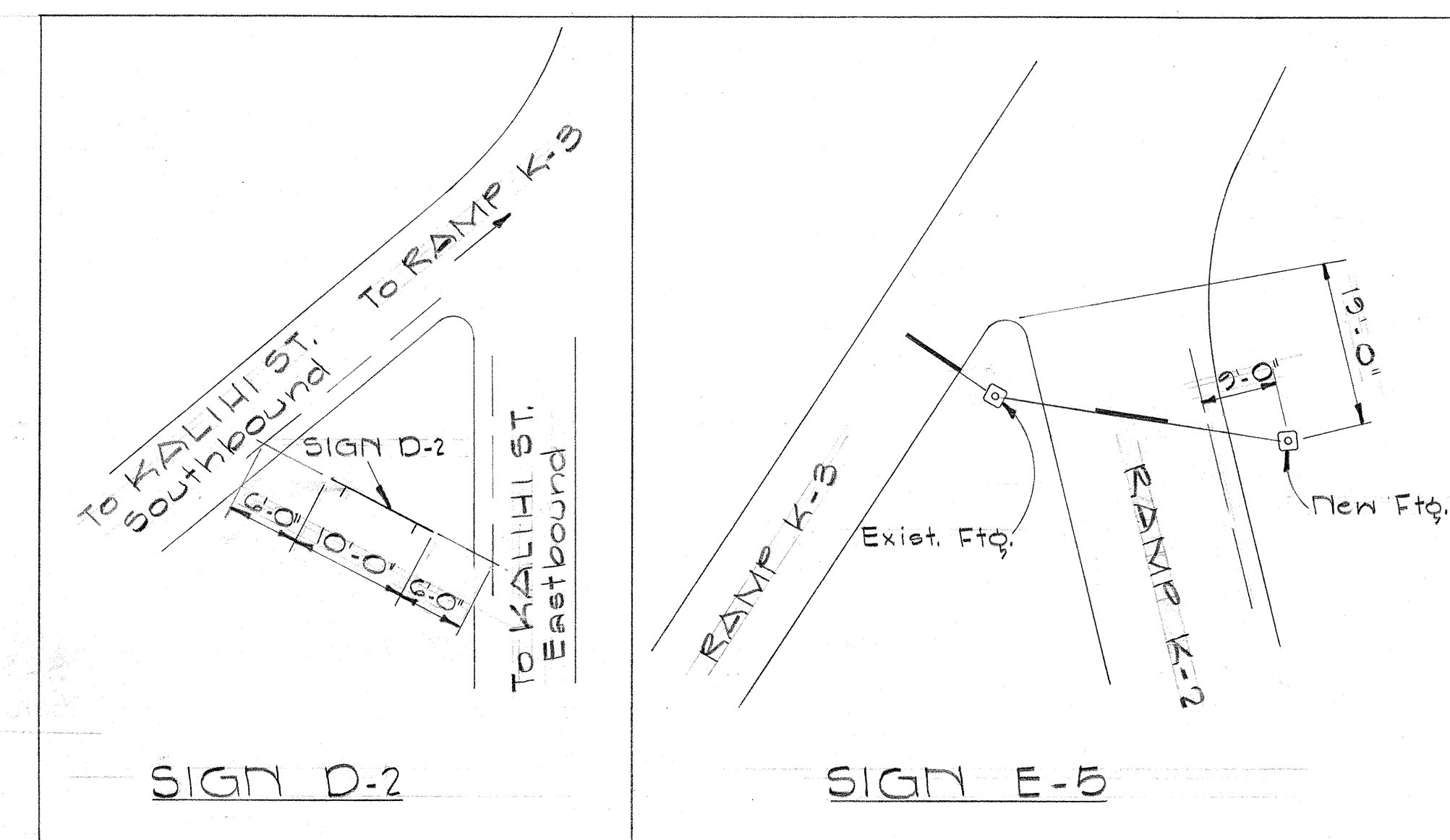


SIGN E-3
Existing Type IV Footing



ANCHOR BOLT SPLICE

NOTE:
1. Cost of repair of Anchor Bolts shall be incidental to item NE 107 (2).
2. The depth and width of concrete to be removed shall be determined in the field by the Engineer.
3. Exposed reinforcing bars shall not be removed or damaged.
4. The spliced anchor bolts shall be Structural Steel conforming to ASTM Designation: A-7.
5. The type of Electrode and amount of Carbon content for welding shall be determined by the Engineer. See Special Provisions.
6. Epoxy Bonding Agent shall be applied between existing concrete and the new concrete.
7. The new spliced anchor shall be threaded and hot-dipped galvanized before welding.



LOCATION PLAN

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

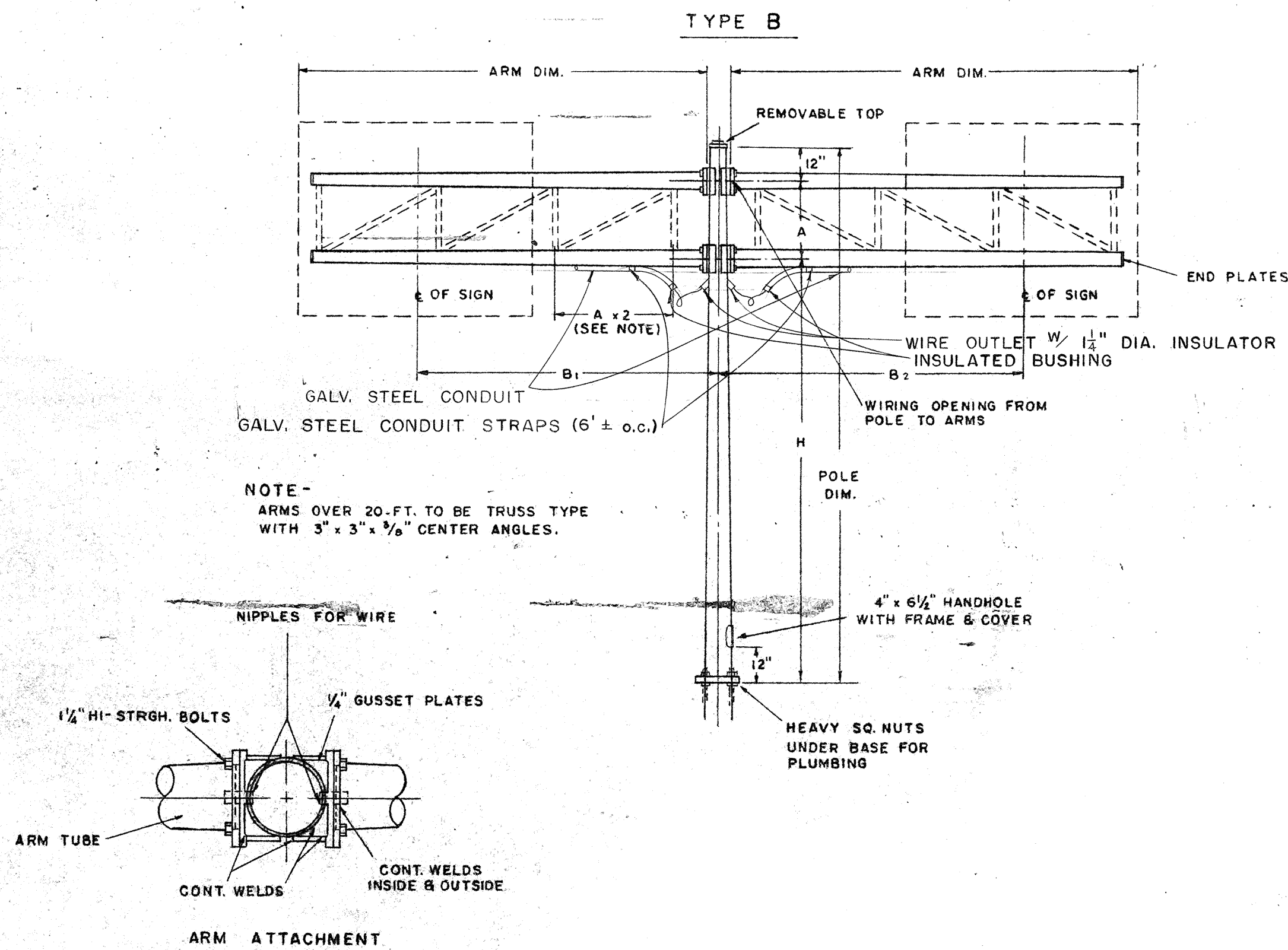
FRAME LAYOUT
EXPRESSWAY AND
DESTINATION SIGNS
ANCHOR BOLT SPLICE

SHEET No. OF SHEETS

A 40 B 40

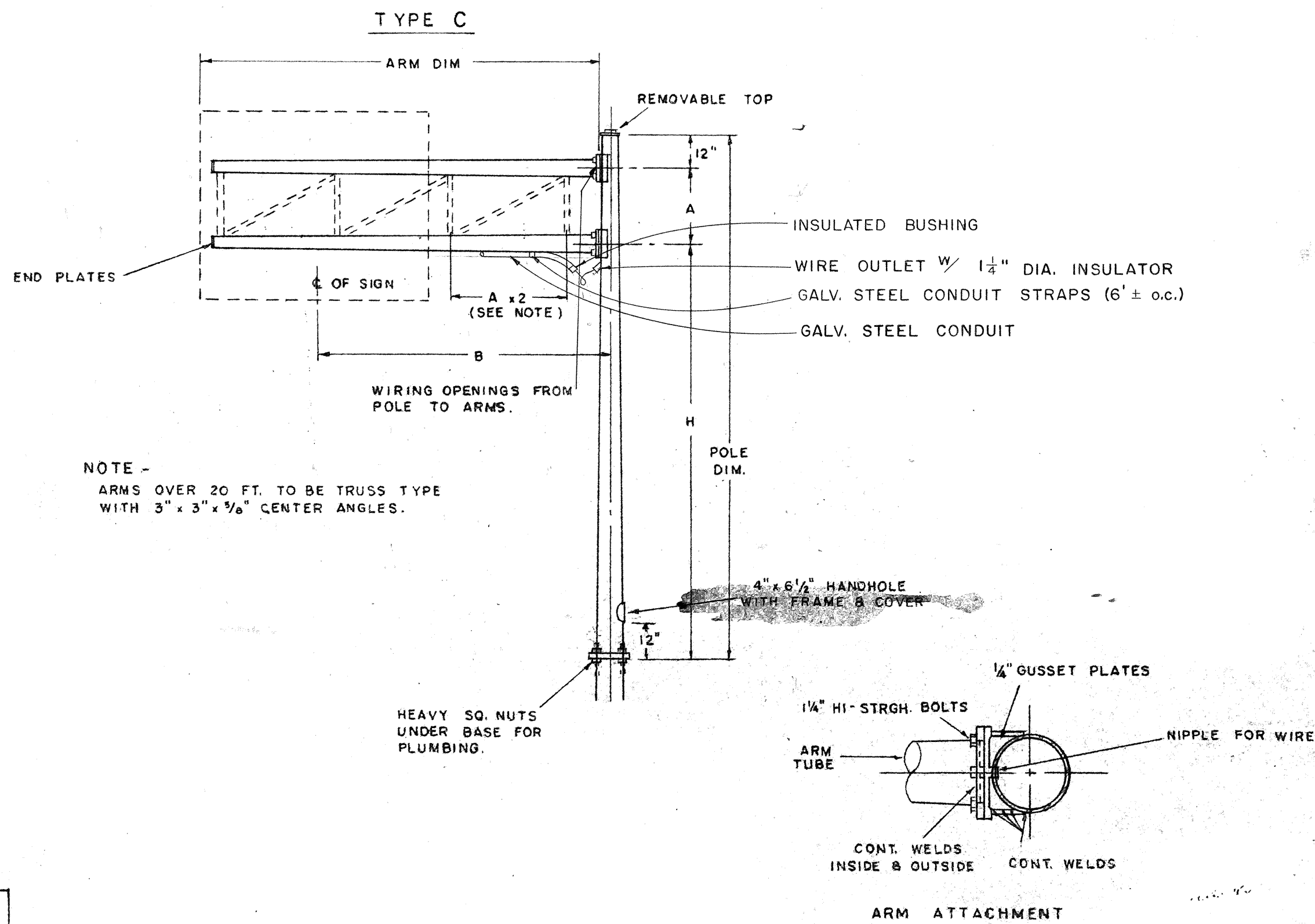
47

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-072-1(10)	1963	A 41	45
		U-063-1(1)	1963	B 41	45



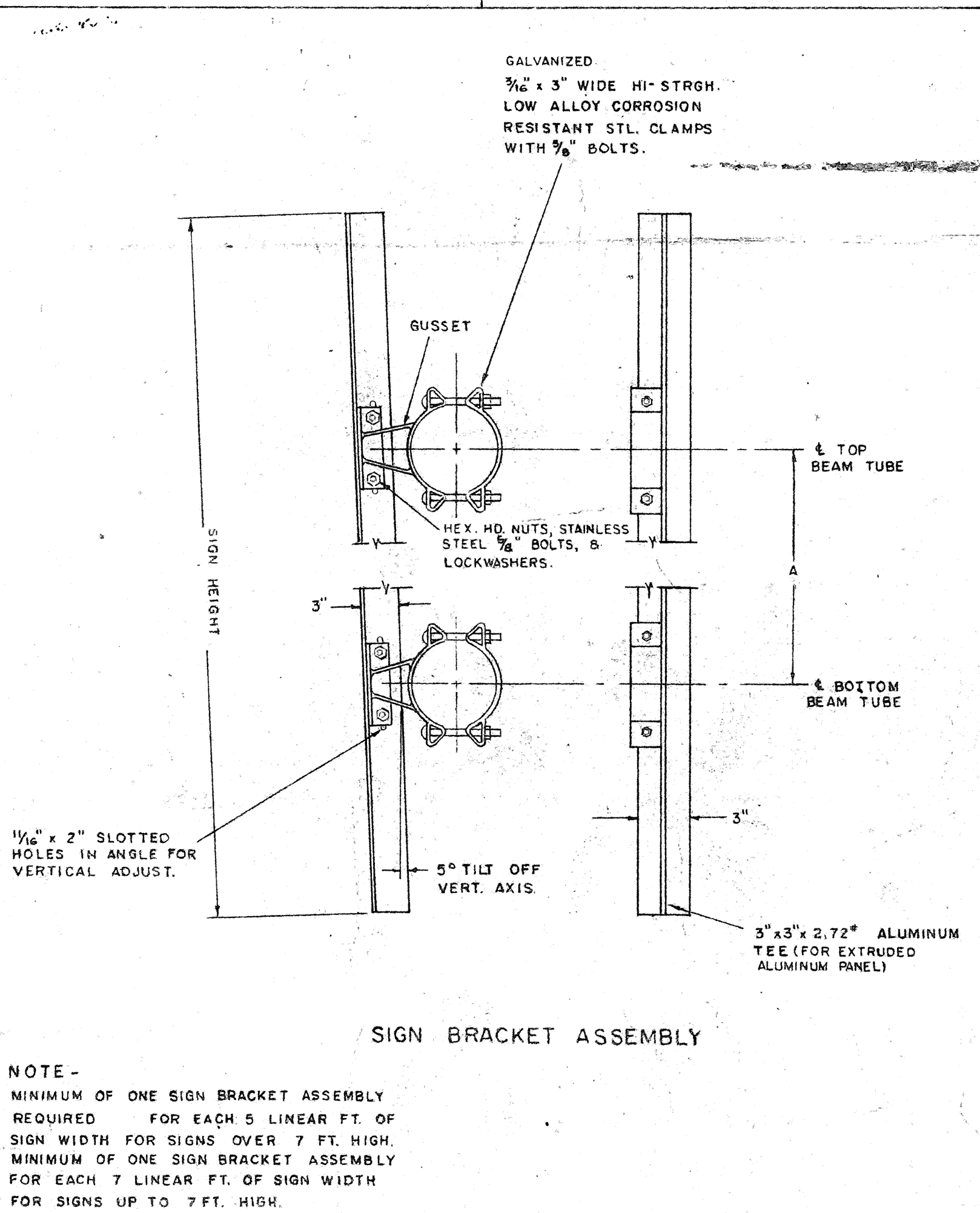
Sign No	Pole Dim	H	A	B1	B2	Arm Dim.	
						Left	Right
E-2	36ga. 18" Dia. x 25'	18'	6'	15'	11'	3ga. 9.2" Dia.	

NOTE: See Post and Arms Schedule on Sheet 50



Sign No	Left Pole Dim.	Right Pole Dim.	H	A	B	Arm Dim.	
E-3	3ga. 15.0" Dia.	36ga. 15.0" Dia.	18'	6'	13'-0"	3ga. 9.2" Dia.	
E-4	3ga. 15.0" Dia.	0ga. 15.0" Dia.	18'	4'	8'	6" Std. Pipe 18.91"/L.F.	
E-5	3ga. 12.0" Dia.	3ga. 15.0" Dia.	18'	3'	9'-3"	5" Std. Pipe 14.62"/L.F.	

NOTE: See Post and Arms Schedule on Sheet 50



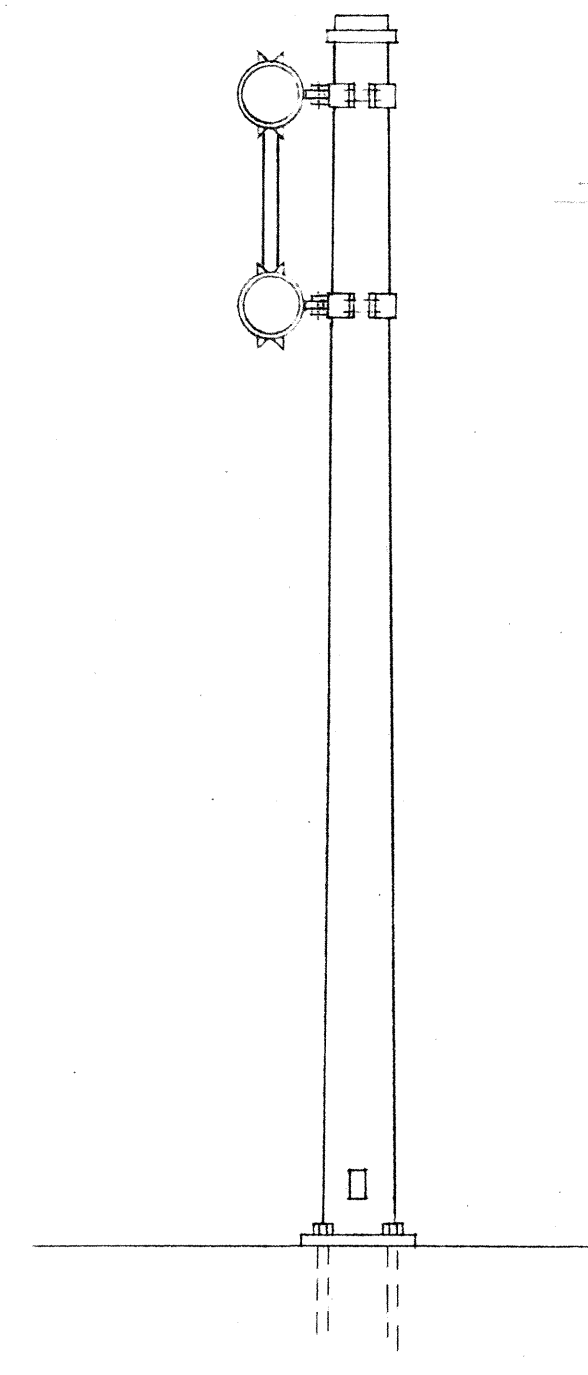
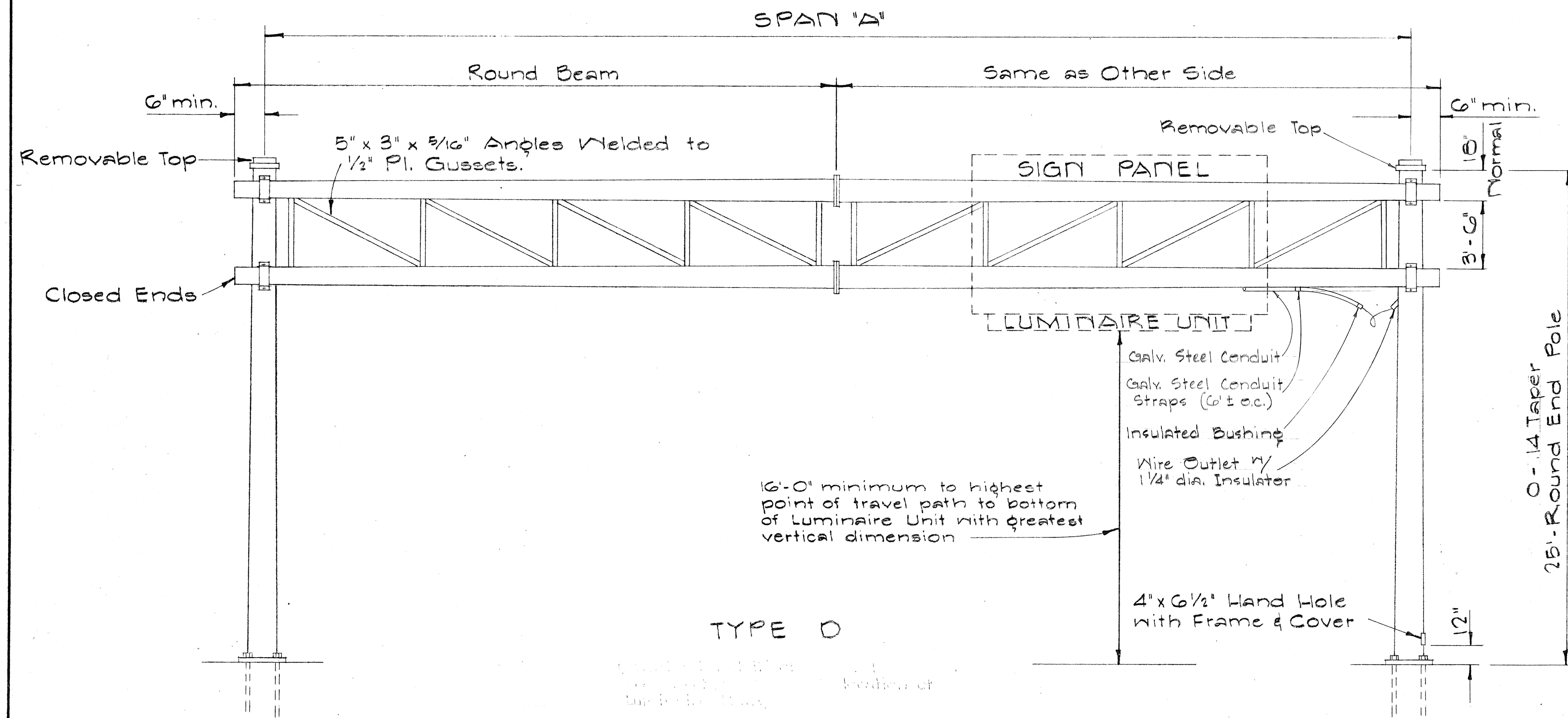
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE B & C
OVERHEAD SIGN SUPPORTS
STEEL

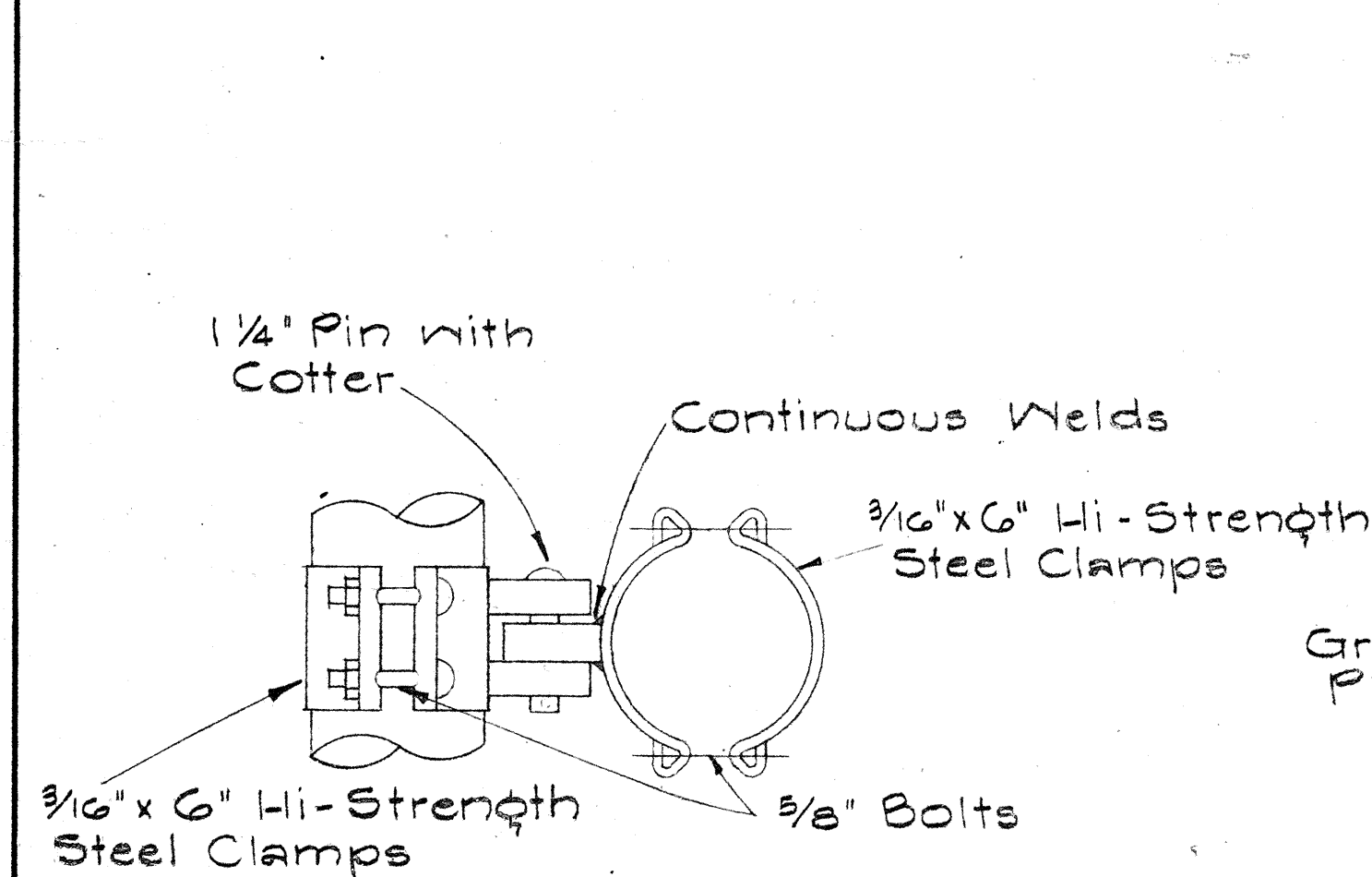
SHEET No. OF SHEETS

A 41 B 41

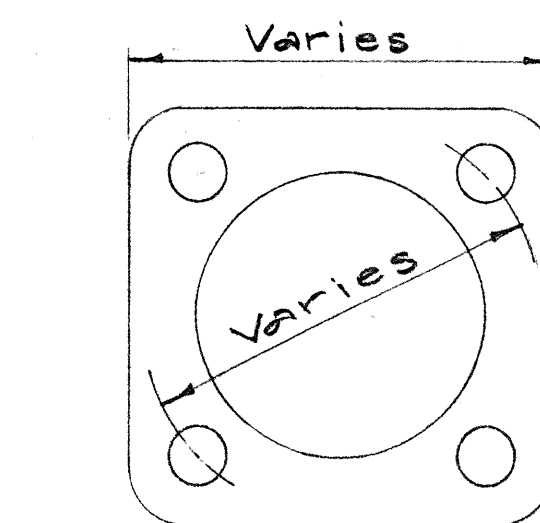
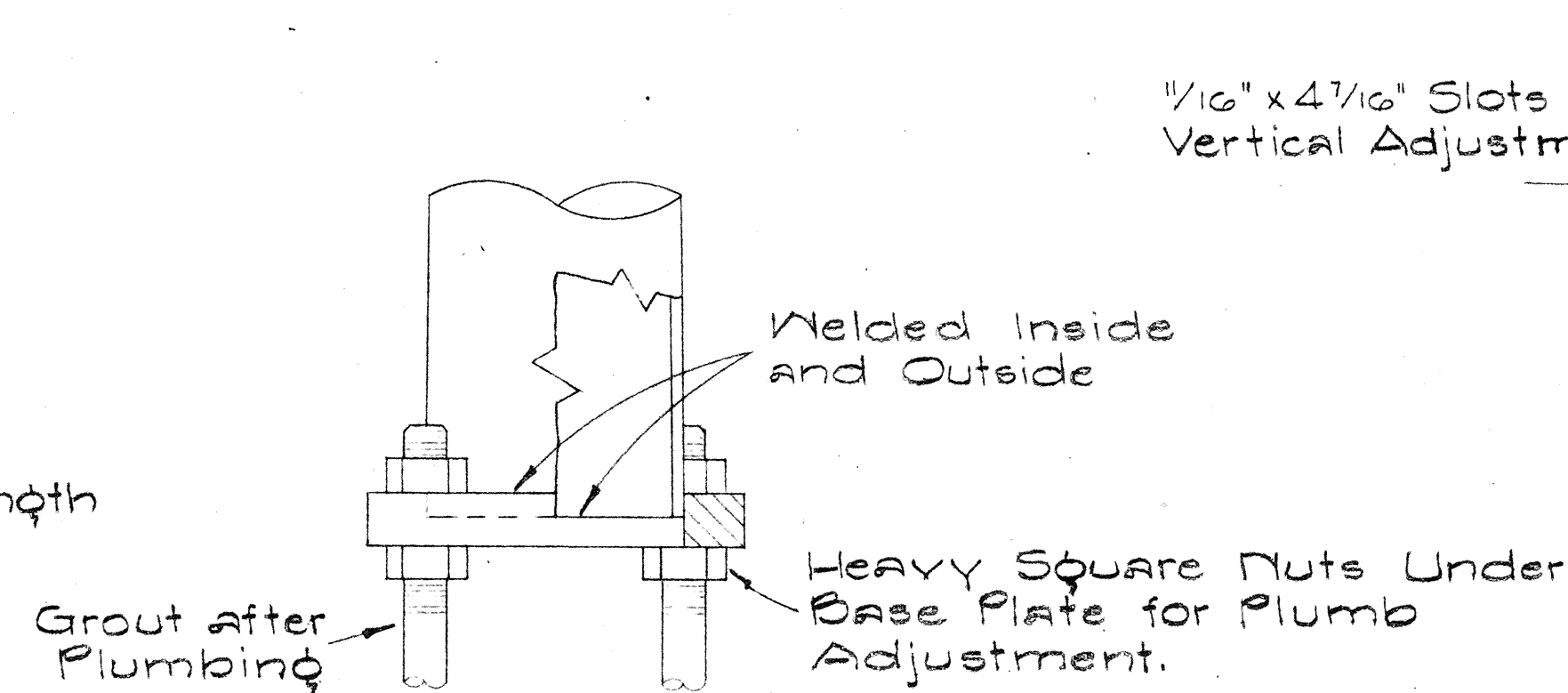
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-072(10)	1963	42	45
		U-063(11)	1963	342	43



NOTE: See Post and Arms Schedule on Sheet # 50

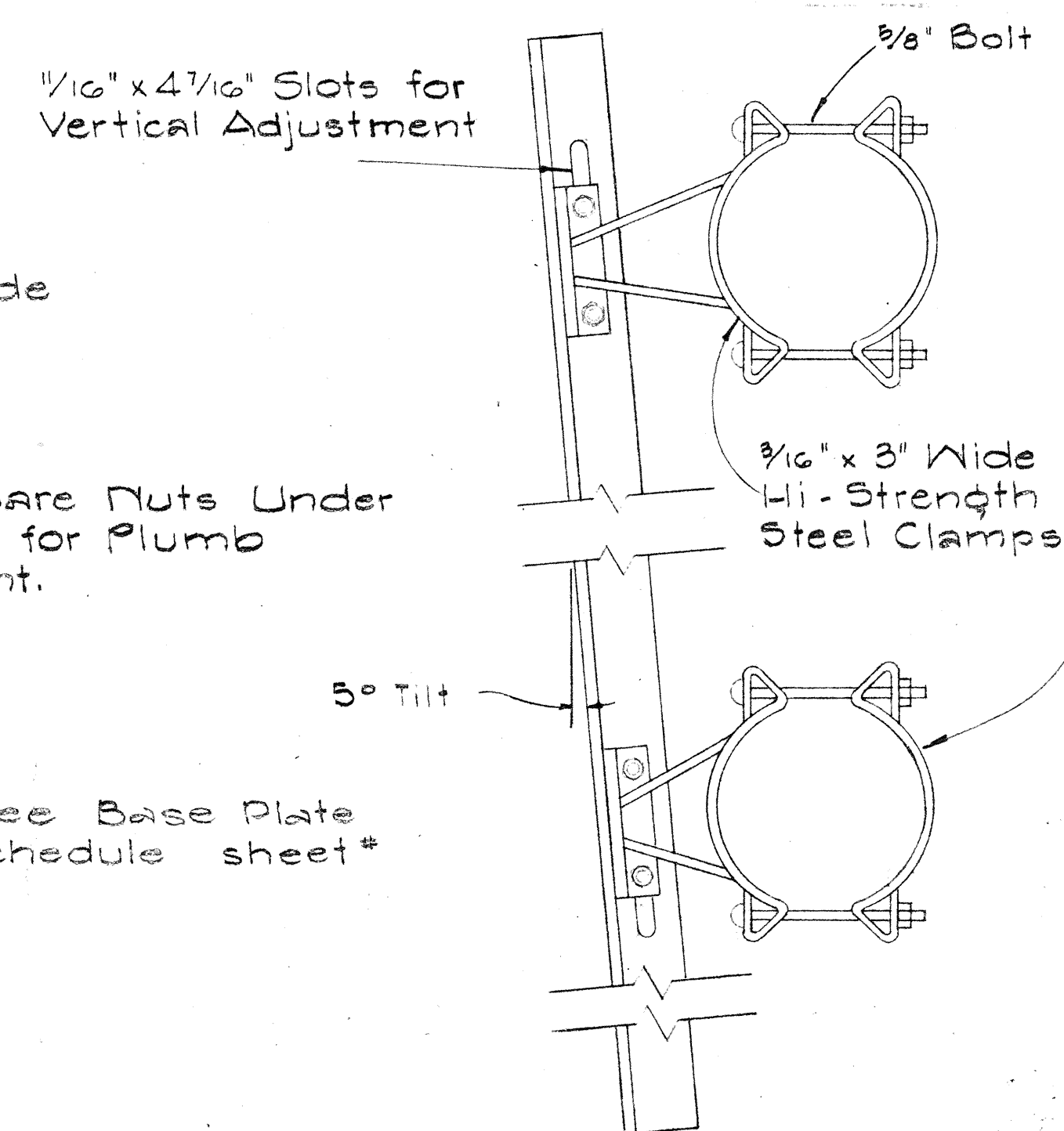


BEAM CLAMP DETAIL

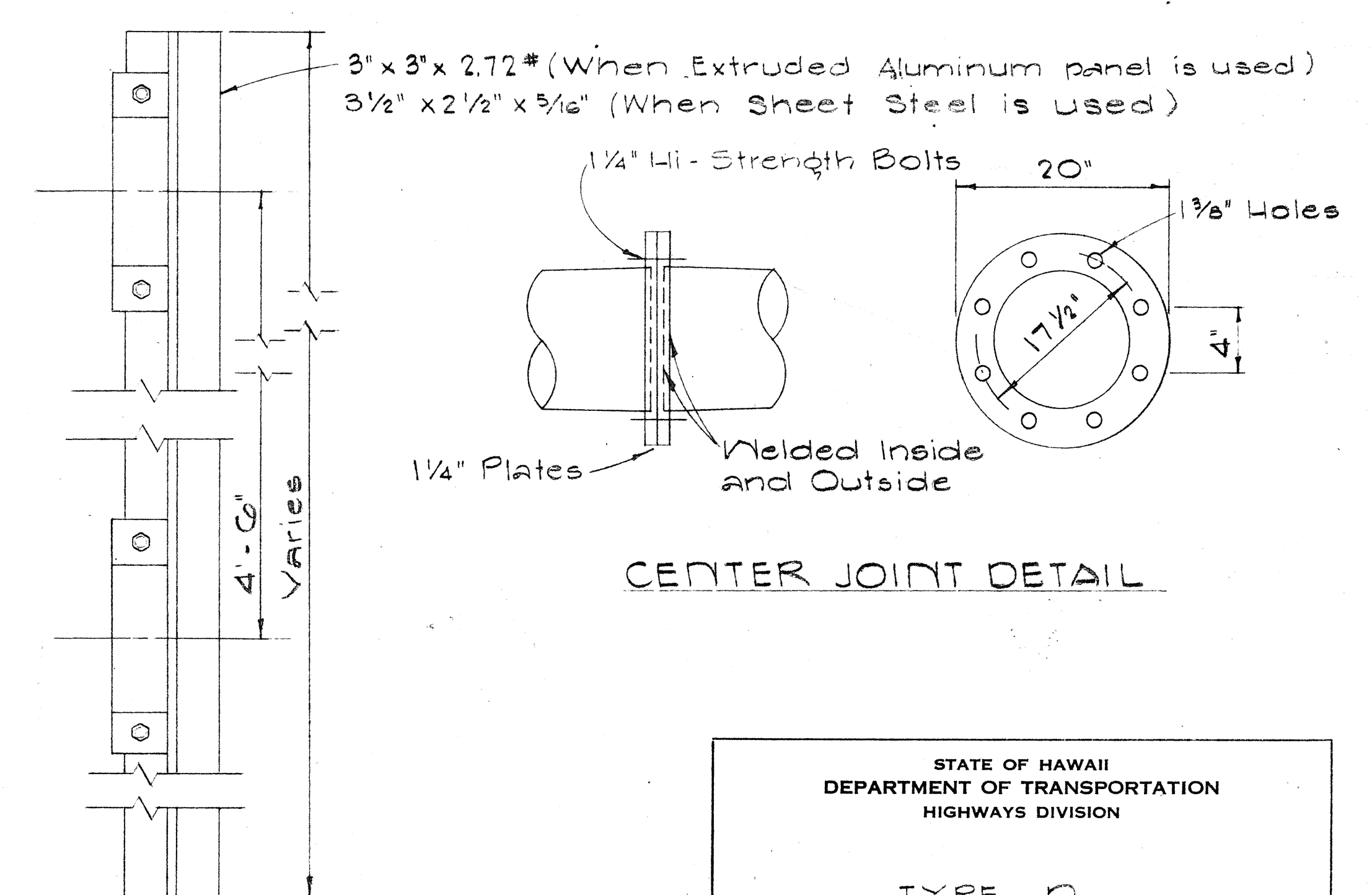


POLE BASE DETAIL

NOTE: See Base Plate Schedule sheet #



SIGN BRACKET ASSEMBLY



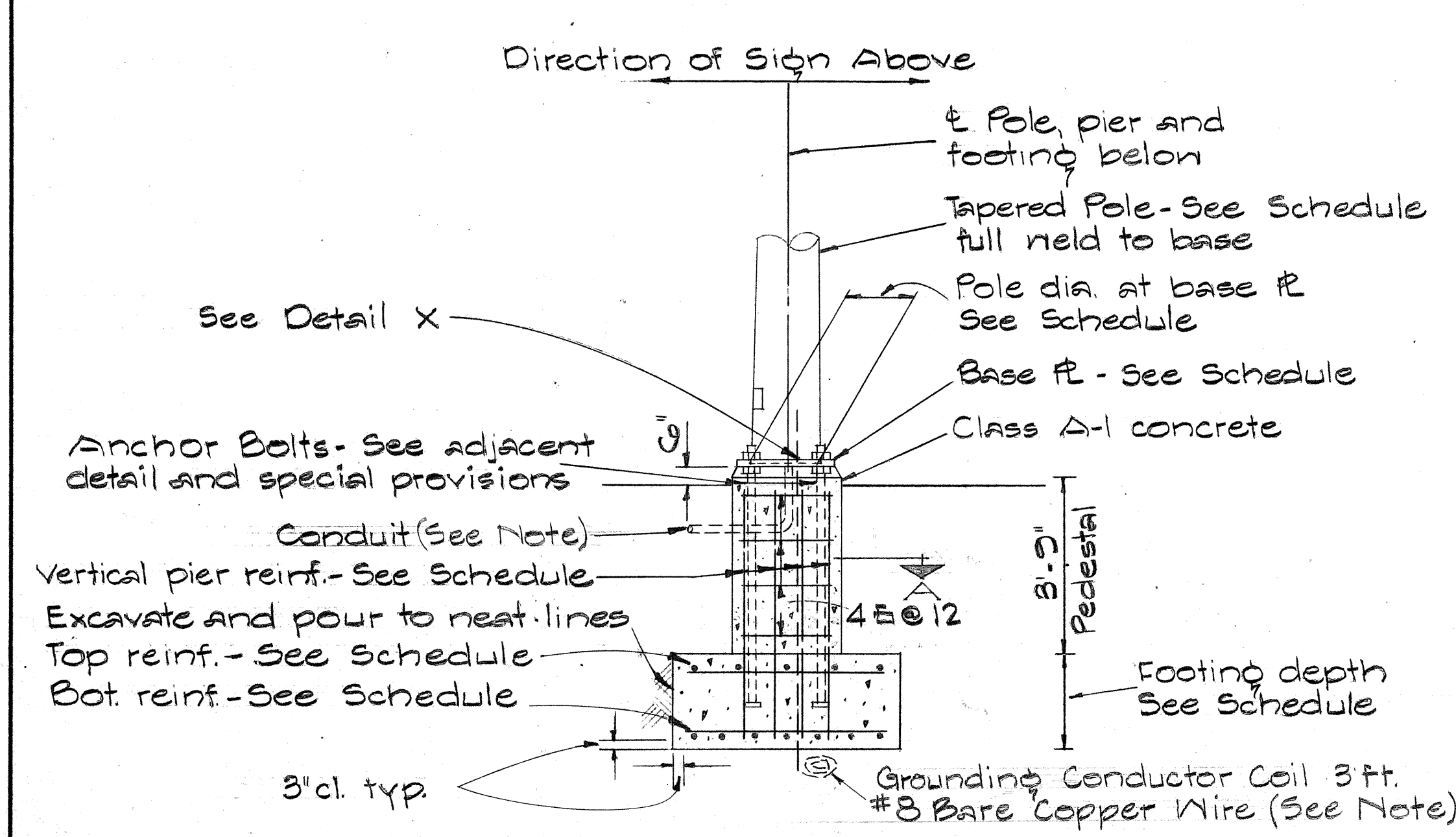
CENTER JOINT DETAIL

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

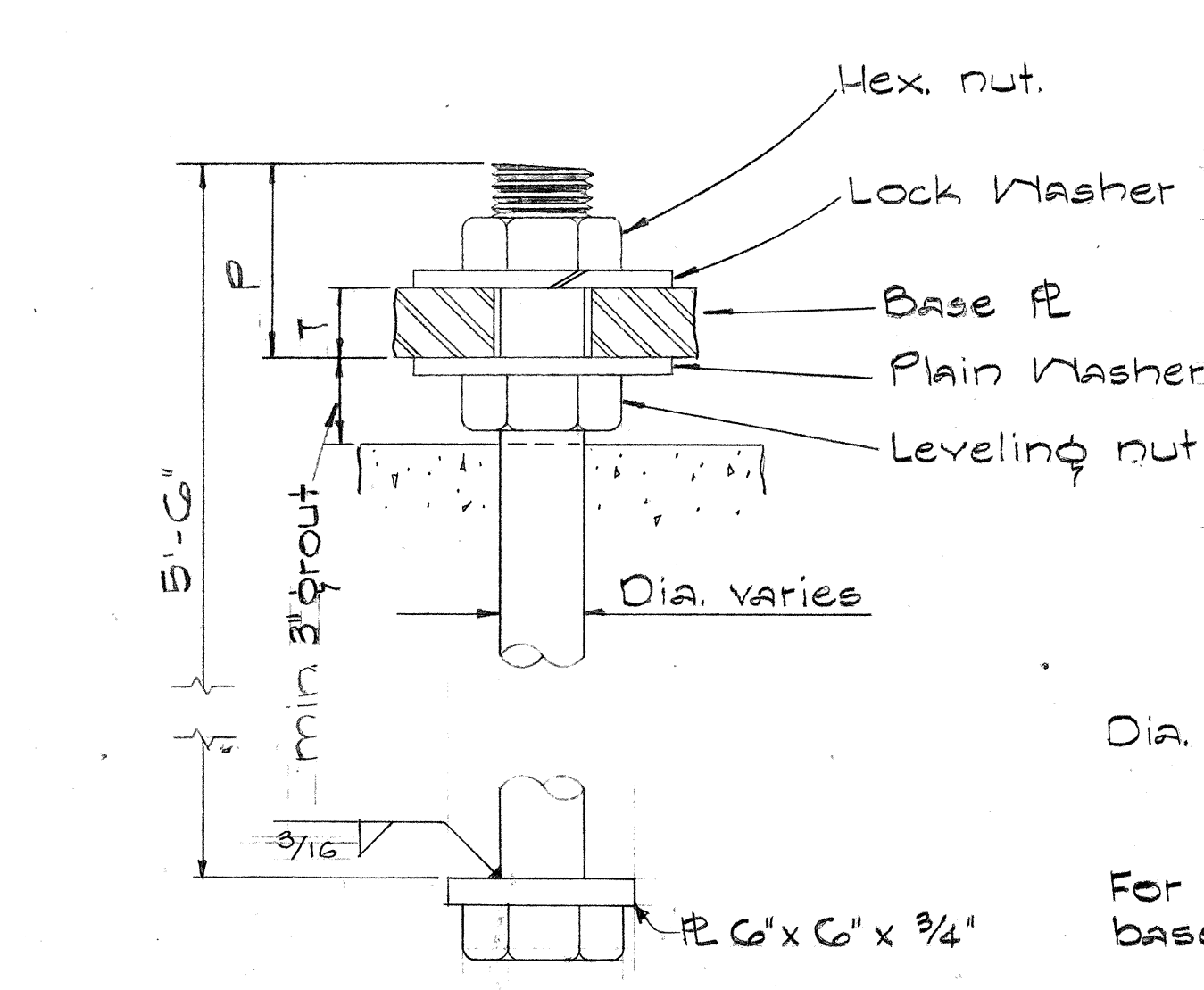
TYPE D
OVERHEAD SIGN SUPPORT
TWO-TUBE TRUSS TYPE
STEEL

SHEET No. OF SHEETS

A 42 B 42

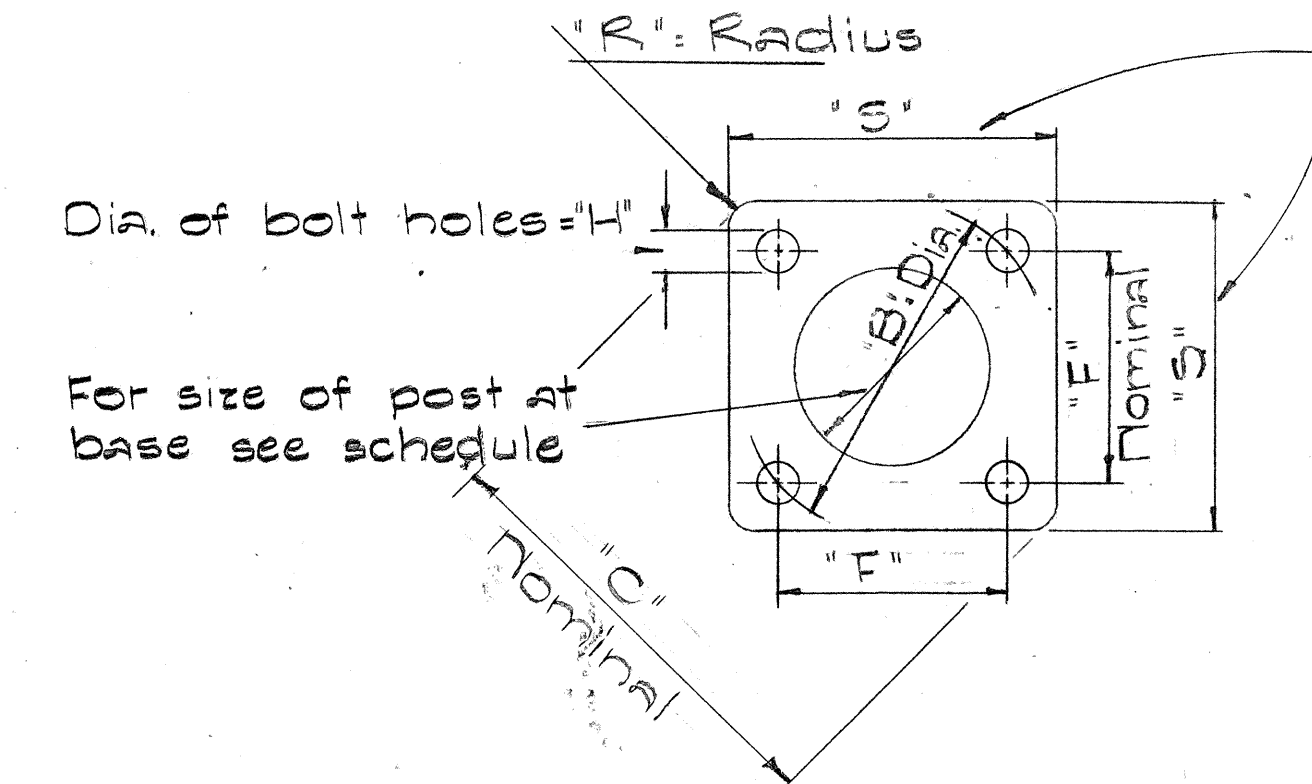


TYPICAL POLE FOUNDATION DETAIL



TYPICAL ANCHOR BOLT 4 REG'D

Sign No.	Gage No.	Post Size	B	C	F	H	P	R	S	T	Bolt Dia.
E-1	3	18"	29 3/4"	37 1/4"	21"	2 3/8"	4"	5 1/2"	29 1/2"	2"	2"
E-2	3-3	18"	34 1/2"	42"	24 1/2"	3 3/8"	6"	5 1/2"	33"	3"	3"
E-3	0-0	15"	33 3/4"	40 3/4"	24"	2 5/8"	6"	5"	32 1/2"	3"	2 1/4"
E-4	0	15"	30 1/2"	37 1/4"	21 1/2"	2 3/8"	4"	4 5/8"	30"	2"	2"
E-5	3	15"	30 1/2"	37 1/4"	21 1/2"	2 3/8"	4"	4 5/8"	30"	2"	2"
E-6	0	15"	30"	36 3/4"	21 1/4"	2 3/8"	4"	4 5/8"	29 3/4"	2"	2"

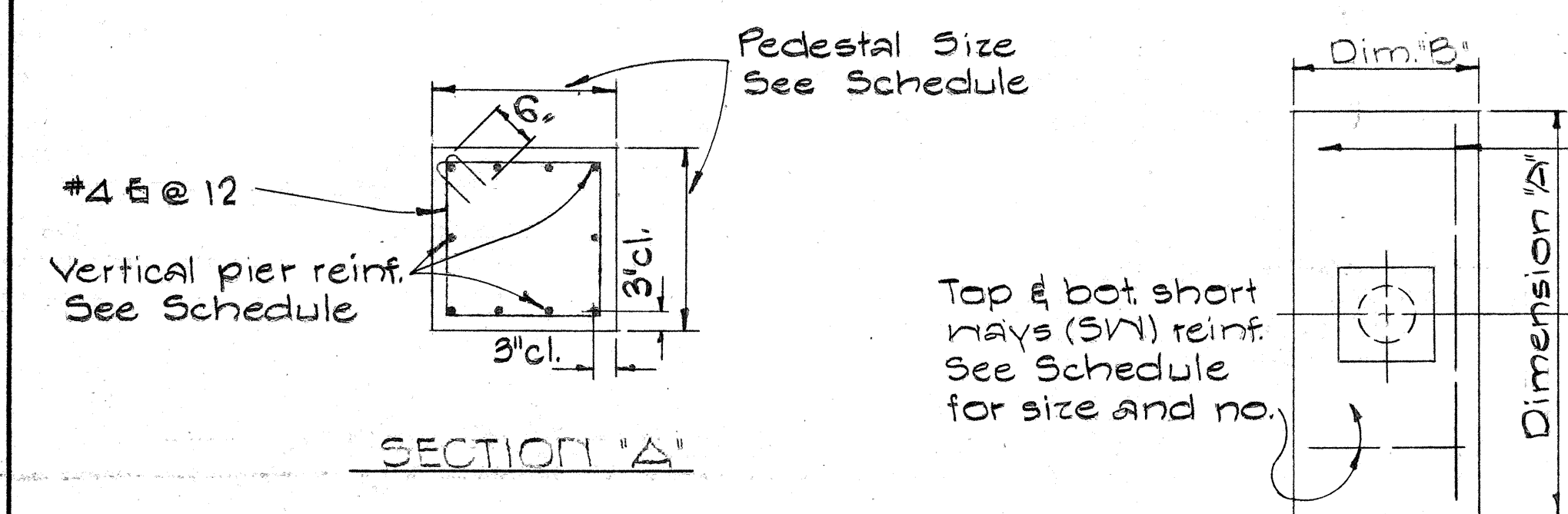


TYPICAL BASE PLATE

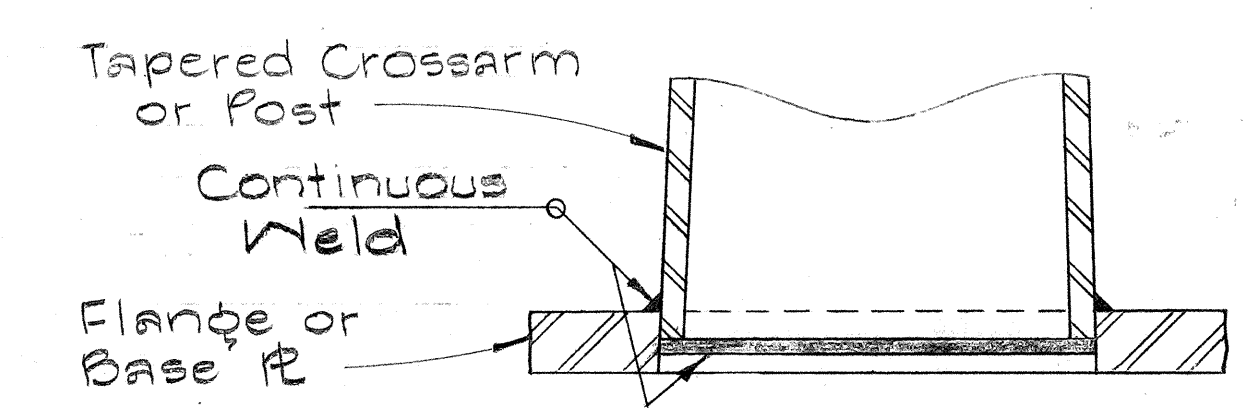
For Base R dimensions see schedule.

NOTE:
All measurements of the Base Plates shall be confirmed by the Contractor before purchasing.

NOTE:
1. Total number of conduits into pole foundation as indicated on drawings. Conduit shall slope away from pole foundation. Conduit shall be stubbed into existing R.B. Provide insulated bushings on both ends.
2. Grounding conductor shall be bonded to light standard.



TYPICAL FOOTING PLAN



DETAIL 'X'

GROUND MOUNTED TYPE-EXTRUDED ALUMINUM PANEL						
SIGN No.	STATIONS	I-SECTION POSTS		BASE PLATE	FOOTING	
		LEFT	RIGHT		Type	Anchor Bolts
O-1	RAMP K-1 5+90	8' J 10#		10" x 1" x 17 1/4"	II	4-1 1/8" Dia.
O-2	RAMP K-3 3+50	8' J 10#		10" x 1" x 17 1/4"	II	4-1 1/8" Dia.

Type	Dimension		Depth	Bot. Reinf.		Top Reinf.		Pedestal	
	A	B		L.W.	S.W.	L.W.	S.W.	Size	Vert Reinf.
I	7'-0"	3'-0"	2'-0"	3-#4	8-#4	#4 @ 12	Each Way	1'-11"	10-#5
II	9'-0"	4'-6"	2'-0"	6-#6	10-#4	Do.		2'-6"	10-#7
III	10'-0"	5'-0"	2'-0"	5-#8	11-#4	Do.		2'-6"	10-#8
IV	12'-0"	6'-0"	2'-0"	7-#9	13-#4	Do.		2'-9"	10-#10
V	14'-0"	7'-0"	2'-0"	8-#11	15-#4	Do.		2'-9"	10-#11

COMBINATION DOUBLE SIGN POST - SPAN TYPE & CANTILEVER TYPE - DOUBLE MASTARM											
SIGN No.	STATION	CROSSARM TAPERED		POST TAPERED		BASE PLATE		FOOTING		ANCHOR BOLTS	
		Span Type at Midspan	Cantilever Type at Post	LEFT at Base	RIGHT at Base	Left Post	Right Post	Left Base	Right Base	Left	Right
E-4	KALIHI ST. 4+50	3 QA - 2.5" Dia.	6 Std. Pipe 18.97" Dia.	3 QA 15.0" Dia.	0 QA 15.0" Dia.	28" x 2" x 28"	30" x 2" x 30"	II	Exist.	4-2" Dia.	Exist.
E-5	RAMP K-3 1+95	7 QA - 14.0" Dia.	5 Std. Pipe 14.62" Dia.	3 QA 12.0" Dia.	3 QA 15.0" Dia.	17" x 2" x 17"	30" x 2" x 30"	II	Exist.	4-1 3/4" Dia.	Exist.

COMBINATION TWO-TUBE TRUSS - SPAN TYPE & CANTILEVER TYPE - DOUBLE MASTARM											
SIGN No.	STATION	CROSSARM TAPERED		POST TAPERED		BASE PLATE		FOOTING		ANCHOR BOLTS	
		Span Type at Midspan	Cantilever Type at Post	LEFT at Base	RIGHT at Base	Left Post	Right Post	Left Base	Right Base	Left	Right
E-3	# 50+10	3QA x 14.25" x 26"	3QA - 2.2" Dia.	3QA - 15.0" Dia.	3QA 3QA - 15.0" Dia.	28' x 2" x 28"	32 1/2" x 3" x 32 1/2"	II	Exist.	4-2" Dia.	Exist.

SINGLE SIGN POST-CENTER MOUNTED TYPE-DOUBLE MASTARM							
SIGN No.	STATIONS	CROSSARM TAPERED AT POST		POST TAPERED AT BASE	BASE PLATE	FOOTING	
		LEFT	RIGHT			TYPE	ANCHOR BOLTS
E-2	# 45+80	3 QA - 2.2" Dia.	3 QA - 2.2" Dia.	3 QA - 18.0" Dia.	33" x 3" x 33"	Exist.	Exist.

TWO-TUBE TRUSS - SPAN TYPE							
SIGN No.	STATIONS	CROSS BEAMS TAPERED	POST TAPERED AT BASE	BASE PLATE	FOOTING		
		AT MIDSPAN			TYPE	ANCHOR BOLTS	
E-1	# 37+75	3 QA x 14.25" x 26"	2 ply. - 1/4" x 17"	29 1/2" x 2" x 29 1/2"	Exist.	Exist.	
E-6	RAMP K-1 2+90	3 QA x 14.25" x 26"	0 QA - 15.0" Dia	29 3/4" x 2" x 29 3/4"	Exist.	Exist.	

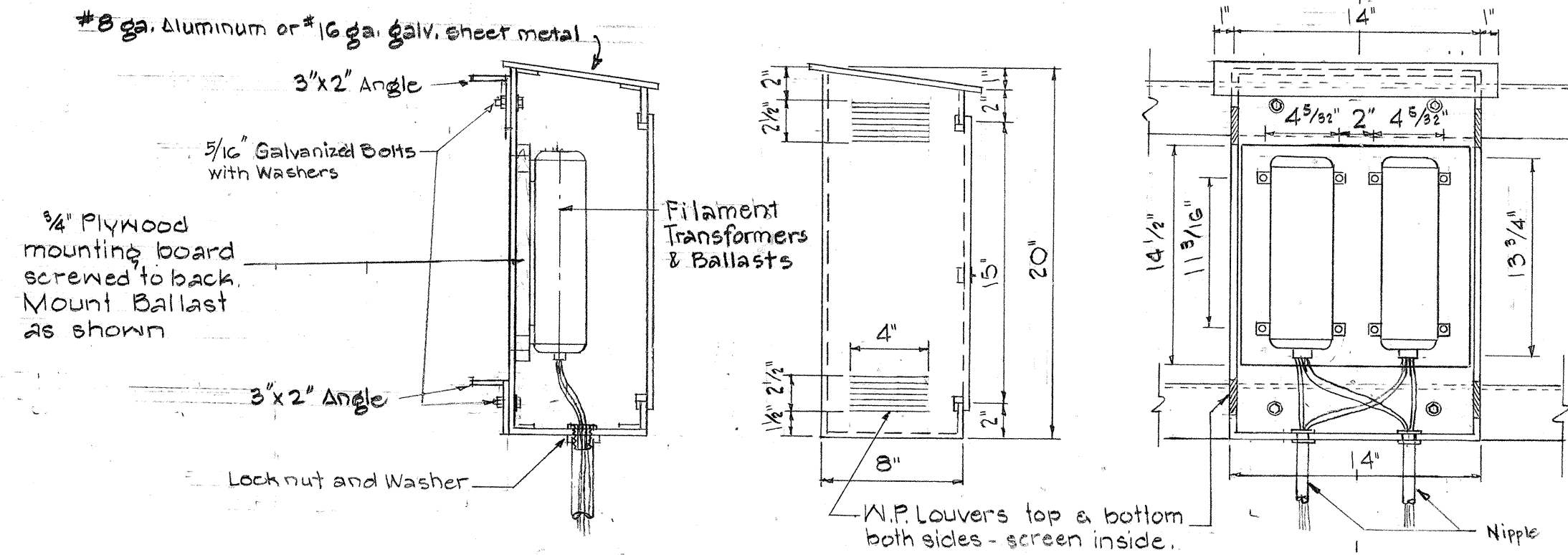
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXPRESSWAY SIGNS
FOOTING, BASE PLATE & POST
SCHEDULES & DETAILS

FILAMENT TRANSFORMER AND BALLAST ENCLOSURE

GENERAL NOTES

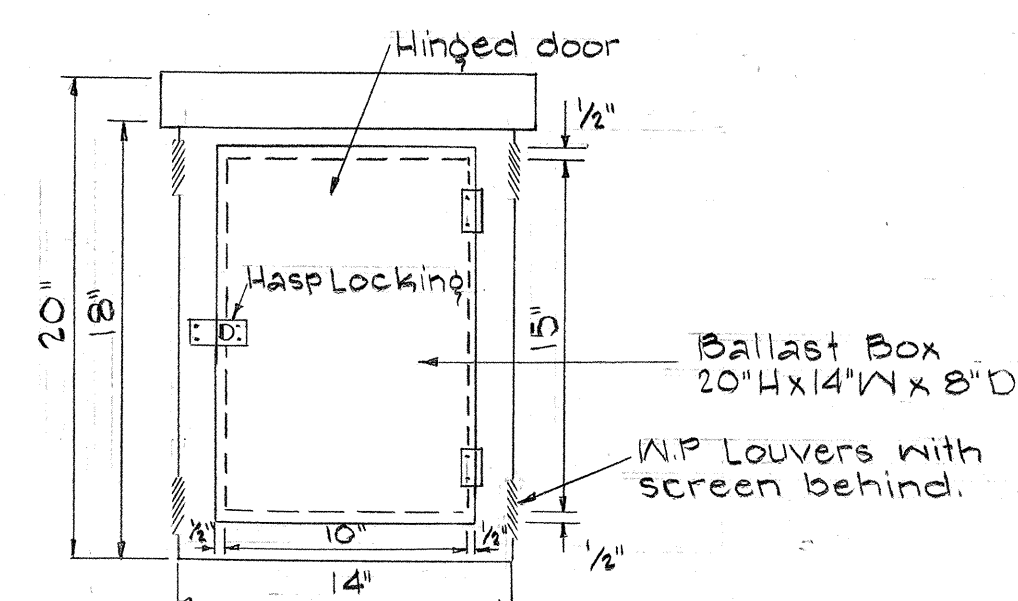
1. Enclosure shall accommodate at least two sets of filament transformers and ballasts. Dimensions shown are approximate only and may be varied to suit individual equipment requirements.
2. Aluminum enclosures shall be separated from the mounting angles by neoprene washers.



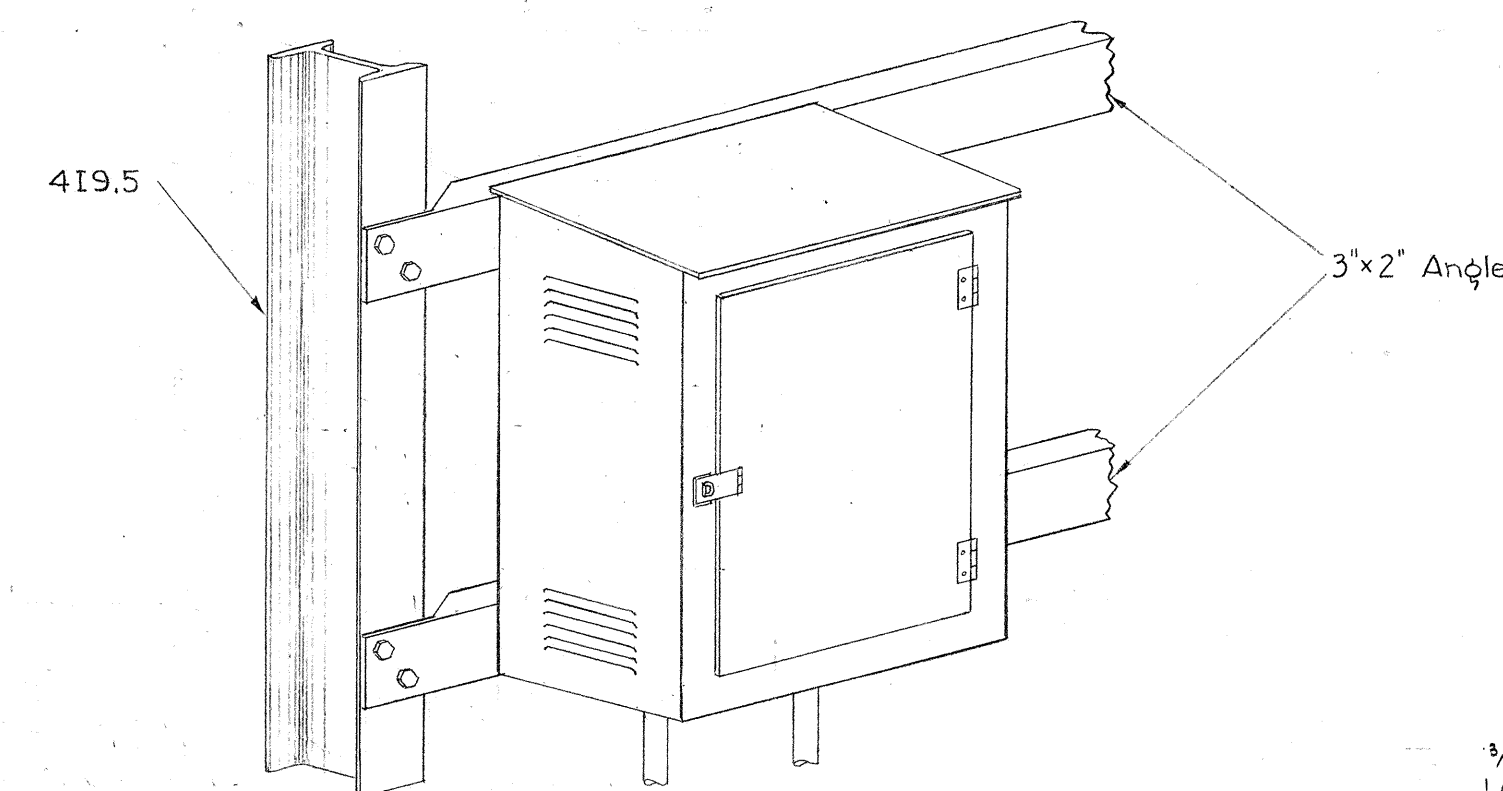
SIDE - SECTION
SCALE: 1 1/2" = 1'-0"

SIDE VIEW
SCALE: 1 1/2" = 1'-0"

FRONT - THRU VIEW
SCALE: 1 1/2" = 1'-0"



FRONT VIEW
SCALE: 1 1/2" = 1'-0"

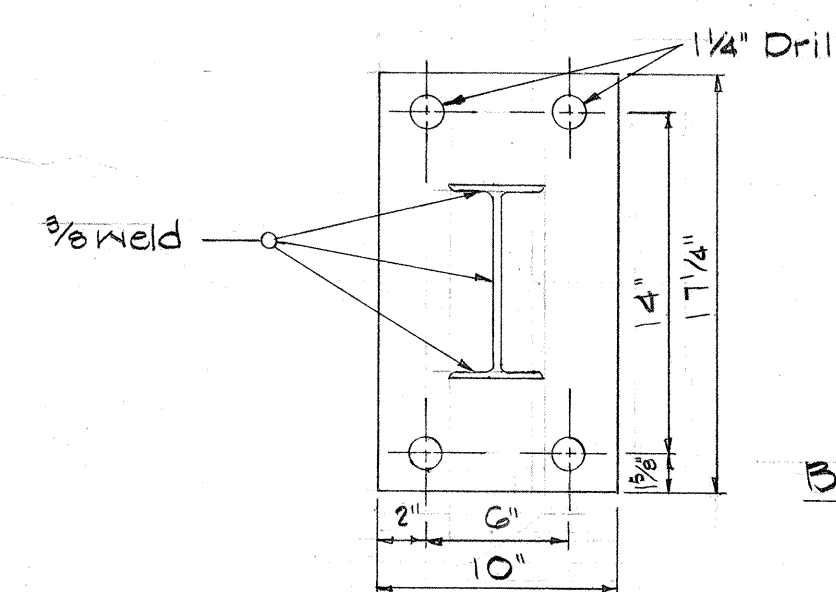


TYPICAL ENCLOSURE MOUNTING

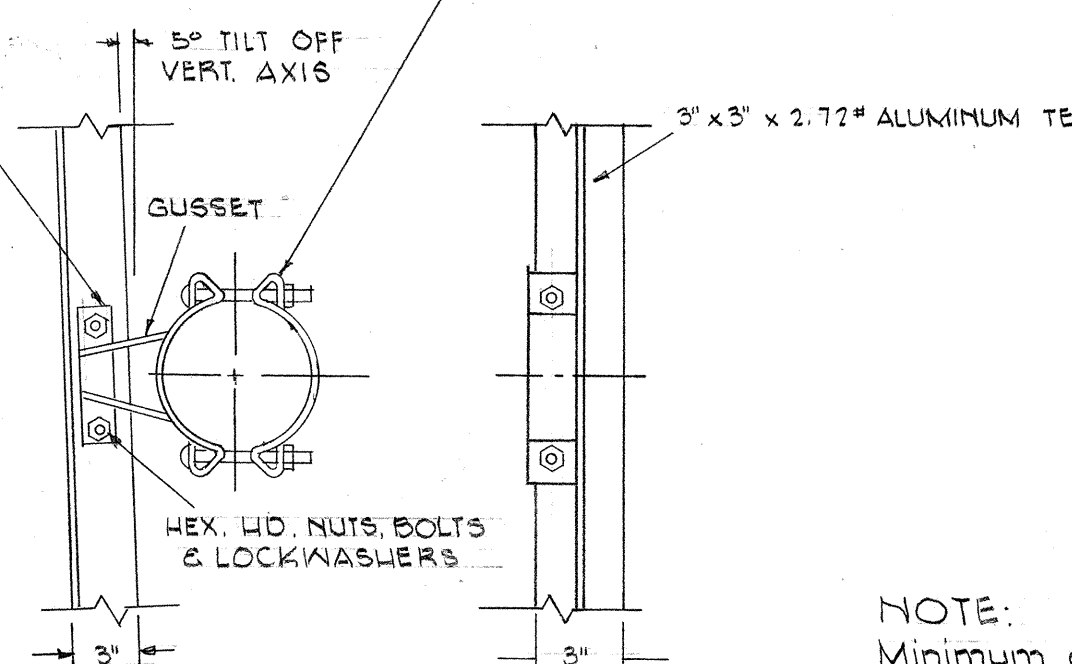
3/8" x 3" WIDE HI-STRGH.
LOW ALLOY CORROSION
RESISTANT STL CLAMPS
WITH 5/8" BOLTS.

1 1/8" x 2" SLOTTED
HOLES IN ANGLE FOR
VERTICAL ADJUST.

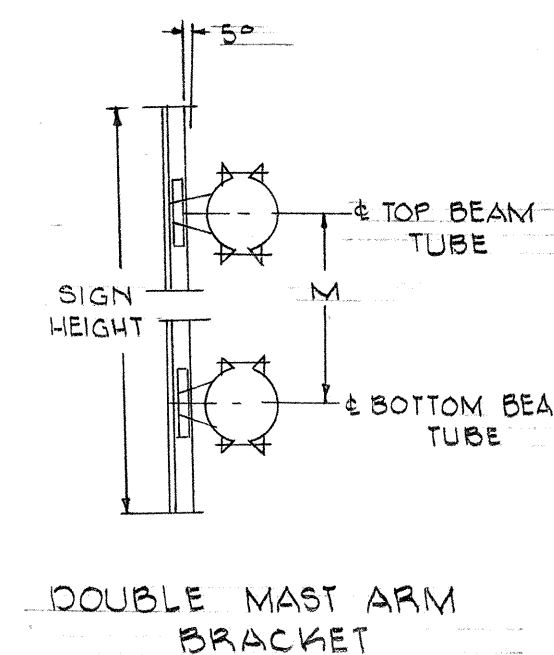
NOTE:
Concrete footing for Destination
Sign will be paid for under item
Post and Foundations, 107 (G).



BASE PLATE DETAIL

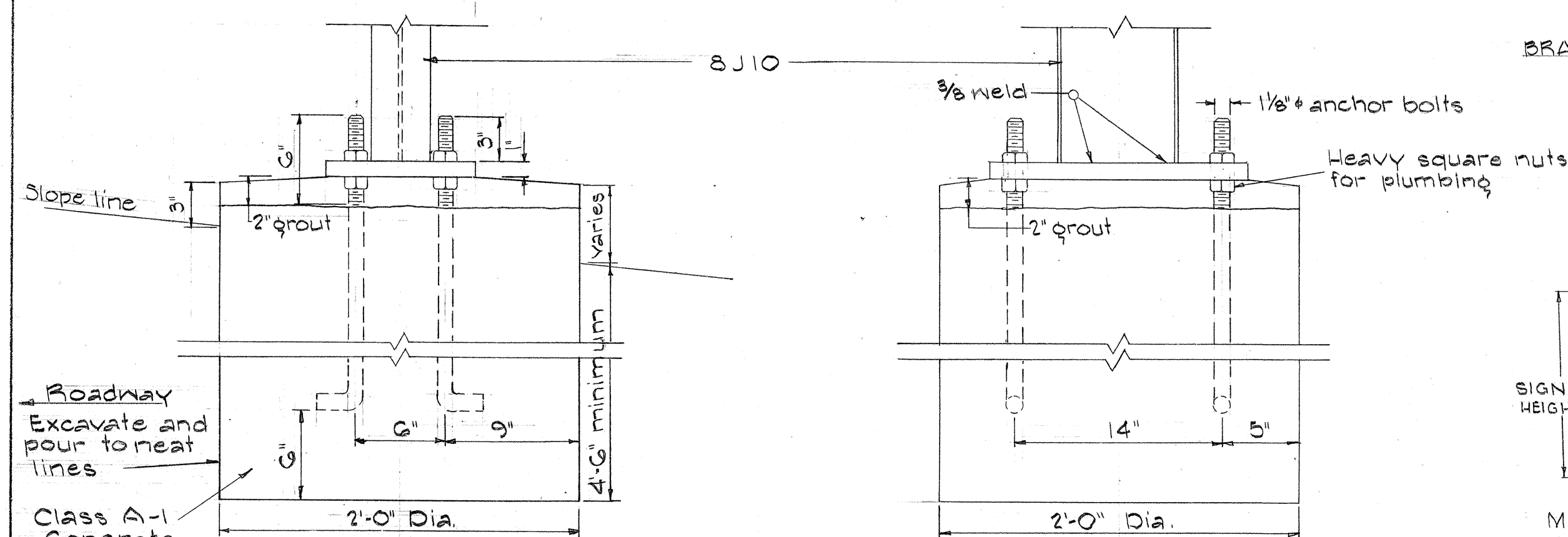


BRACKET & CLAMP DETAIL

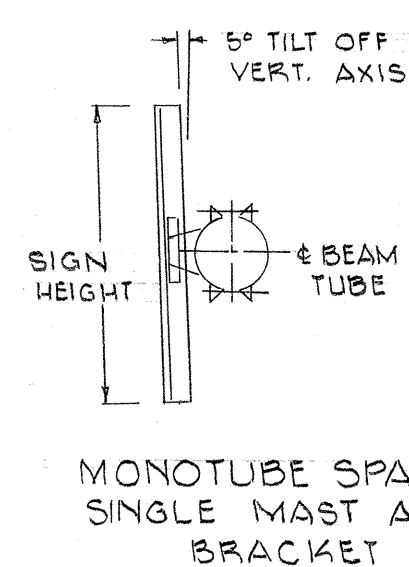


DOUBLE MAST ARM
BRACKET

NOTE:
Minimum of one sign bracket assembly
required for each 5 linear ft. of sign
width for signs over 7 ft. high.
Minimum of one sign bracket assembly
for each 7 linear ft. of sign width for
signs up to 7 ft. high

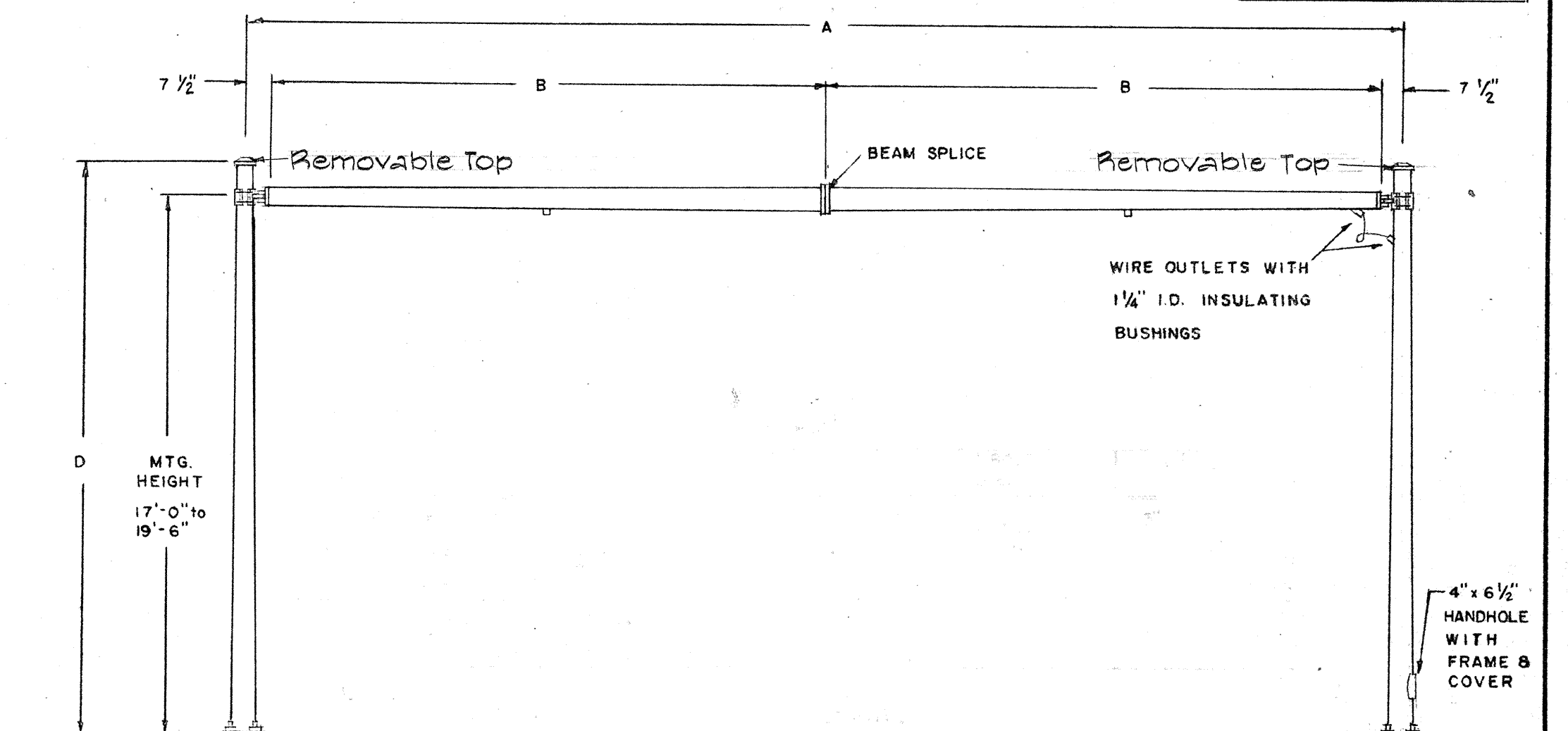


FOUNDATION DETAILS FOR SIDE MOUNTED SIGNS
EXTRUDED ALUMINUM
TYPE VI FOOTING

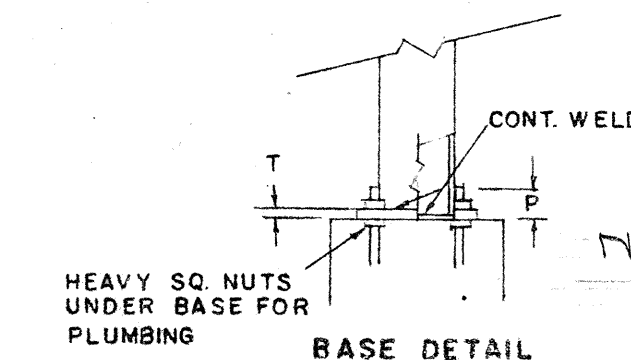


MONOTUBE SPAN &
SINGLE MAST ARM
BRACKET

SIGN HEIGHT	MAX. UN. FT. SIGN WIDTH PER BRACKET
4' & UNDER	16'
5'	9'
6'	6'
7'	4'
8'	3'

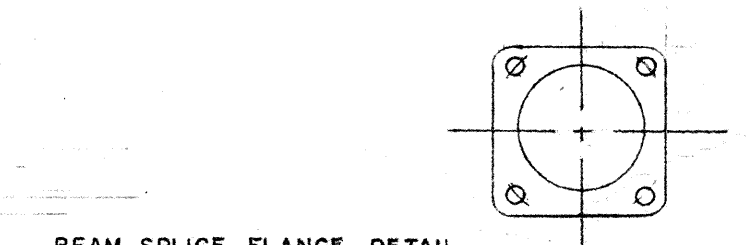


NOTE -
CROSSBEAMS ARE CAMBERED

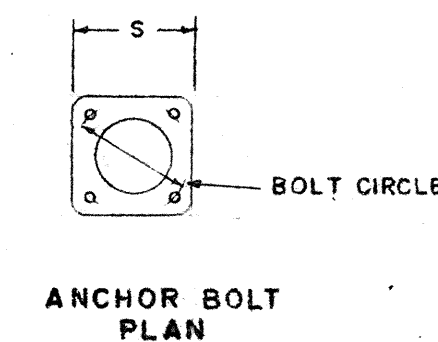


BASE DETAIL

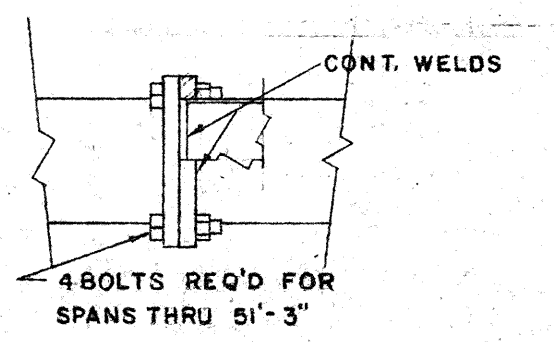
NOTE - See Base Plate
Schedule Sht. No. 50



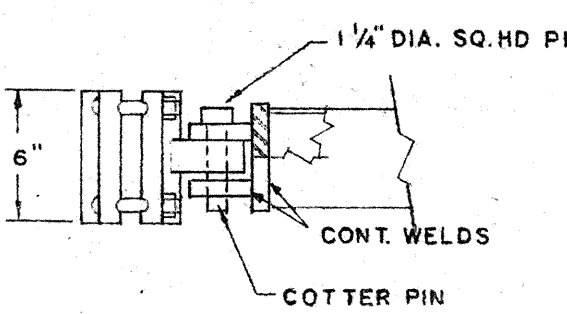
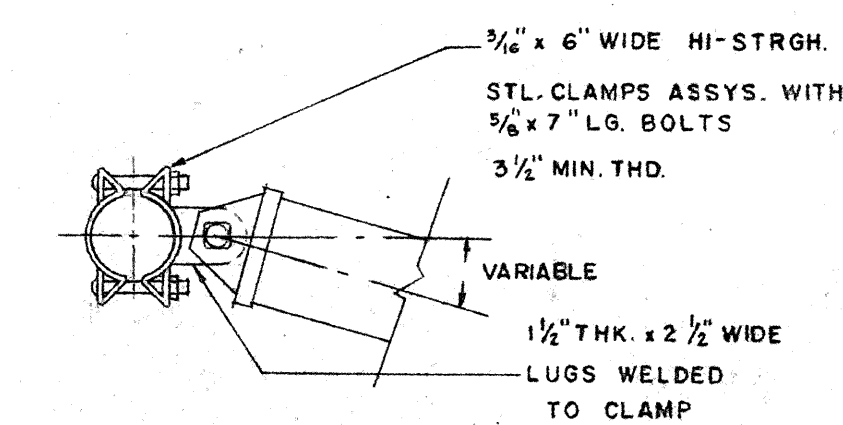
BEAM SPLICE FLANGE DETAIL



ANCHOR BOLT
PLAN



BEAM SPLICE DETAIL



BEAM CLAMP DETAIL

SPANS UNDER 61'-6"

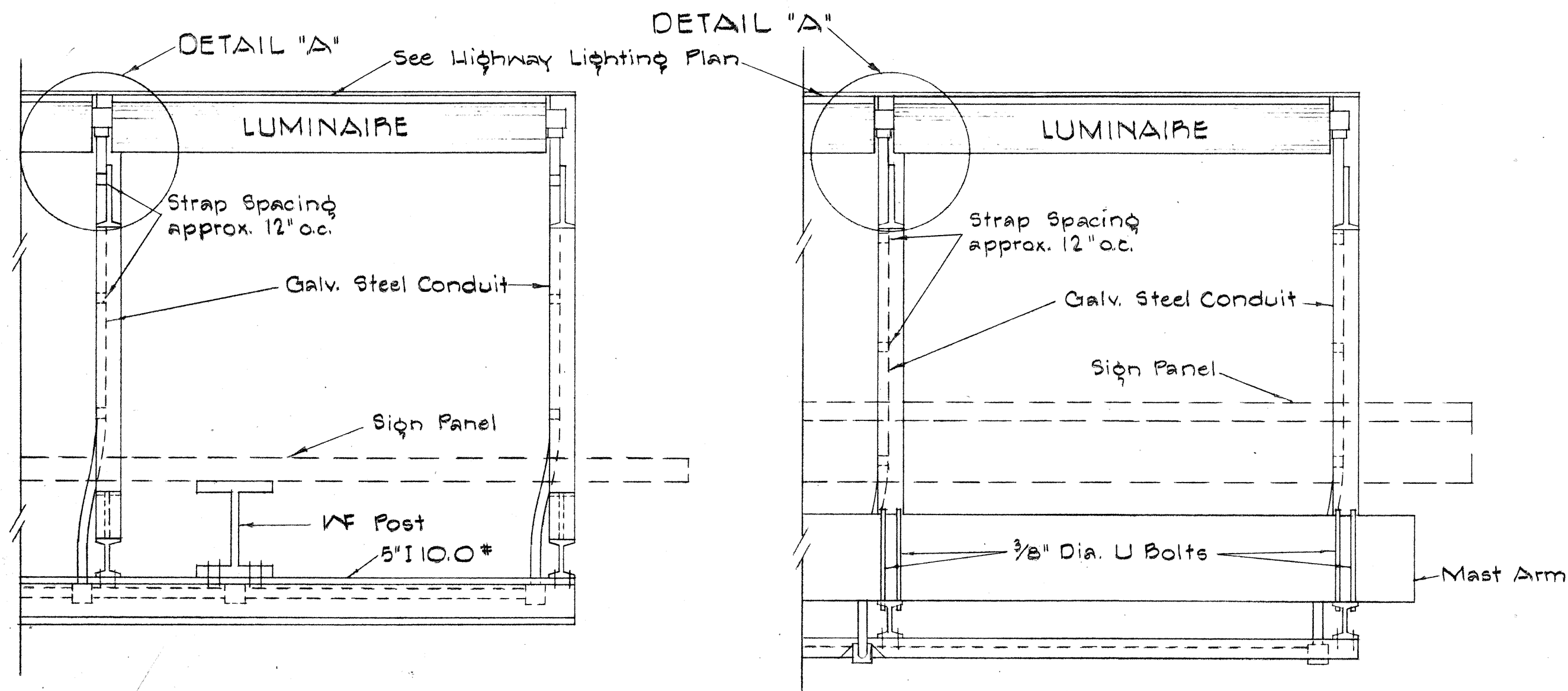
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STEEL
TYPE - II
OVERHEAD SIGN SUPPORTS
BALLAST MOUNTING DETAIL

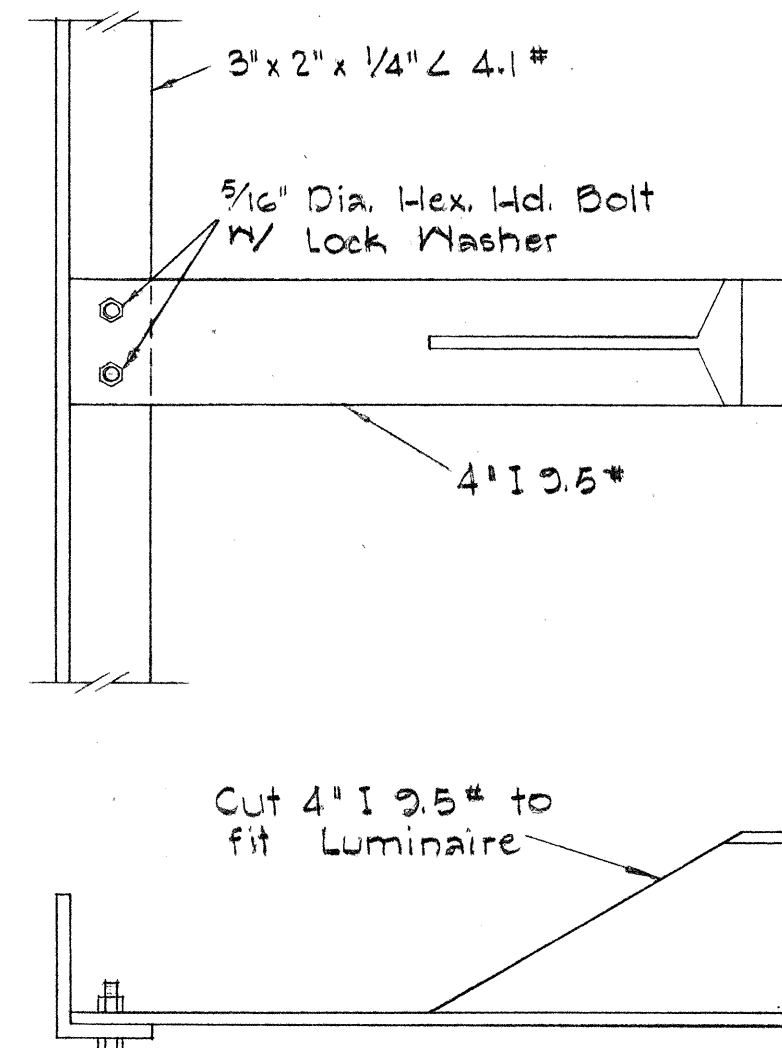
SHEET No. OF SHEETS

A 44 B 44

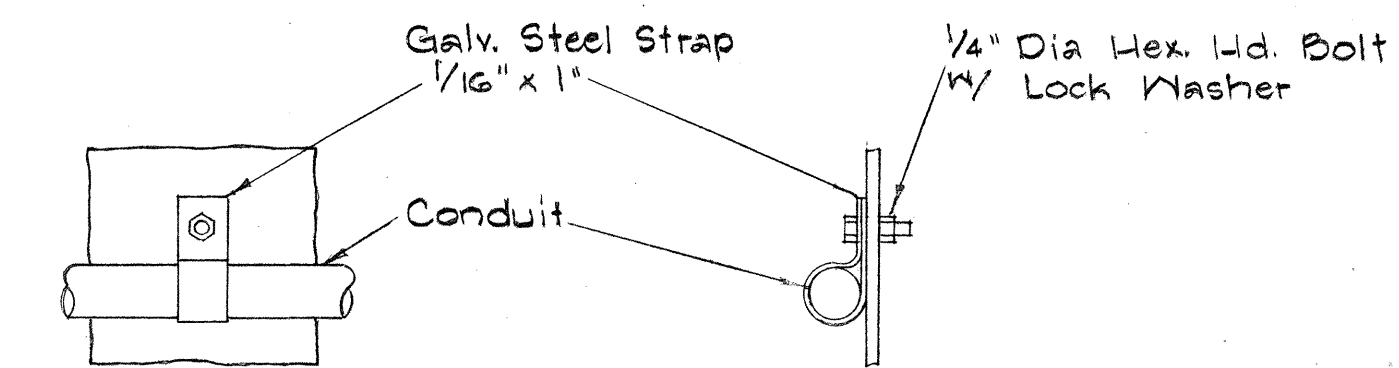
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-078-100	1963	A45	45
		U-068-100	1963	B45	45



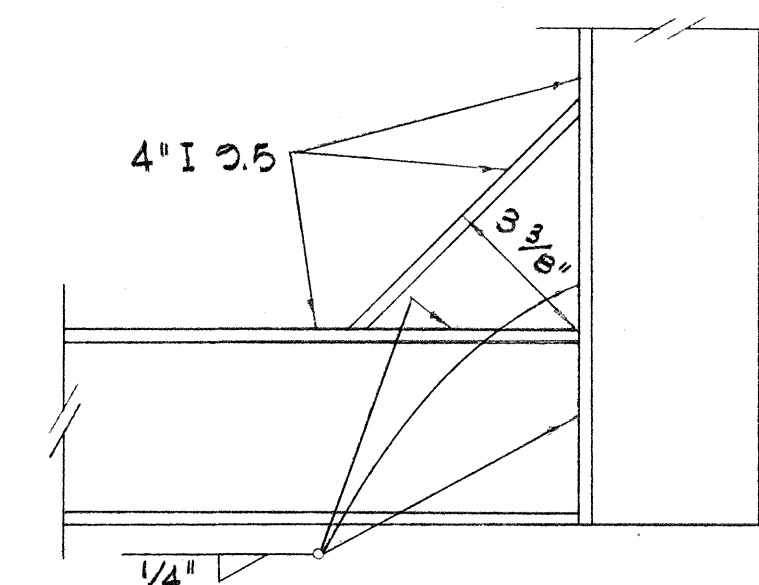
GROUND MOUNTED OVERHEAD
TOP VIEW
LUMINAIRE MOUNTING
Scale: 1" = 1'-0"



DETAIL 'A'
Scale: 3" = 1'-0"



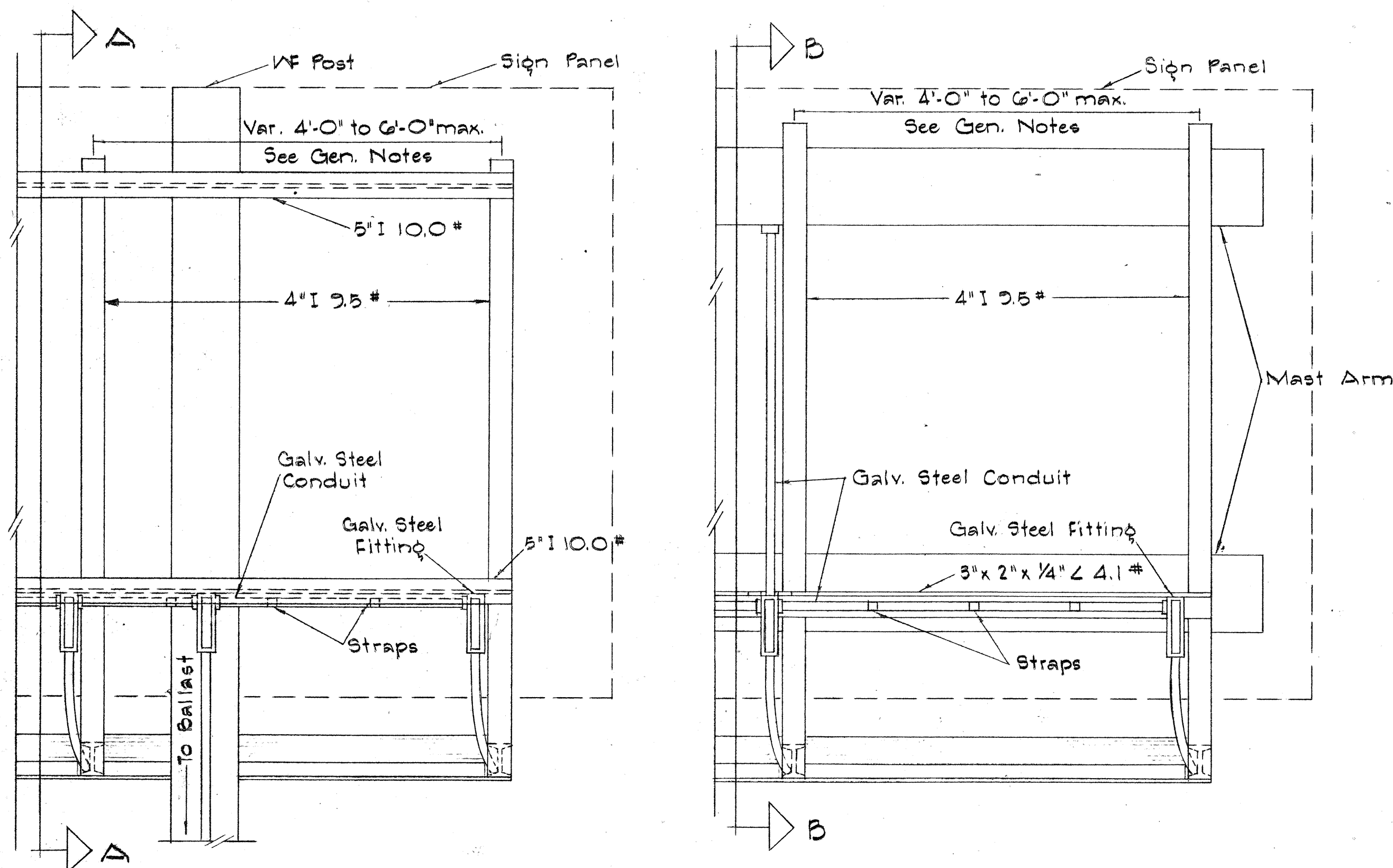
CONDUIT STRAP DETAIL
Scale: 3" = 1'-0"



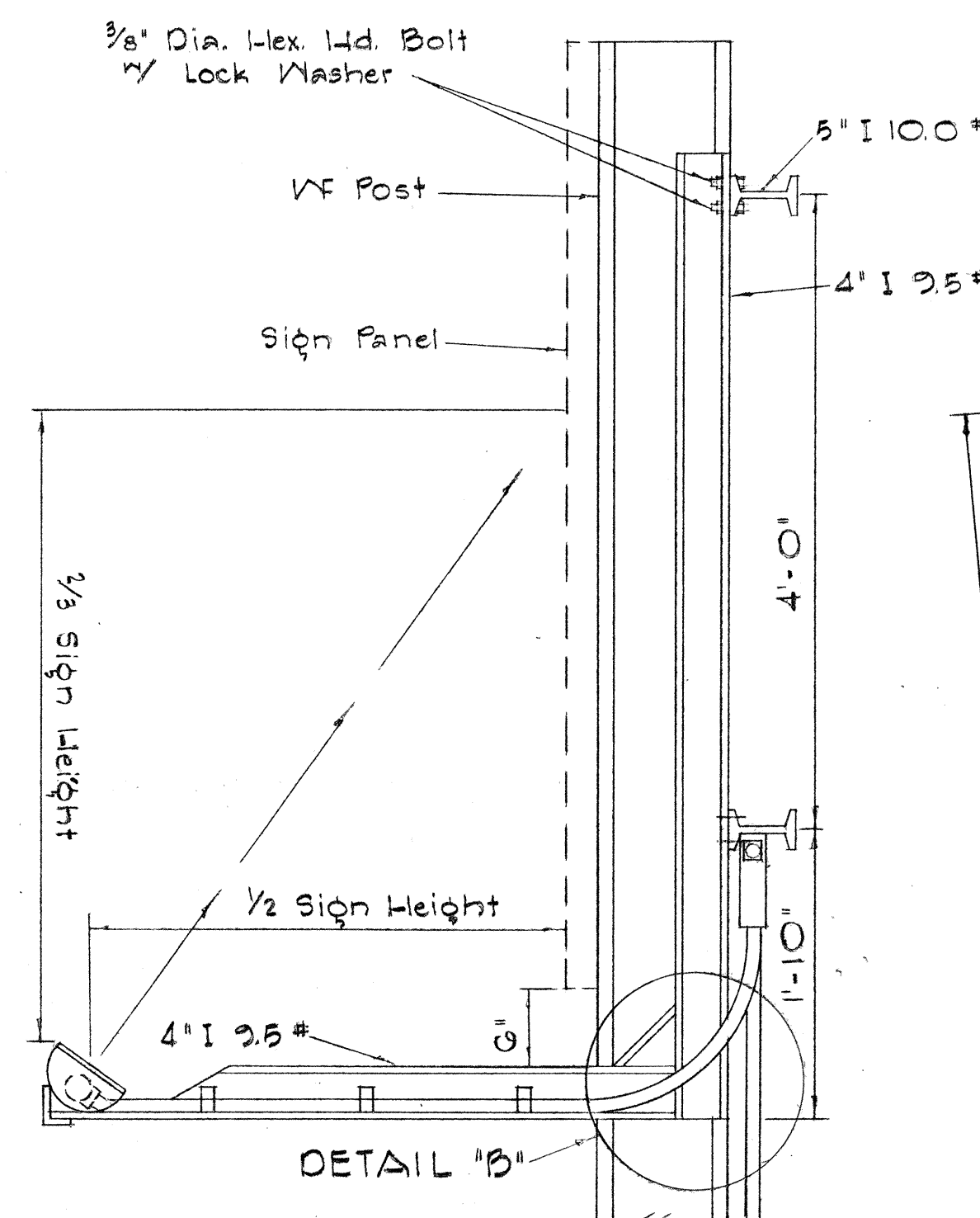
DETAIL 'B'
Scale: 3" = 1'-0"

GENERAL NOTES

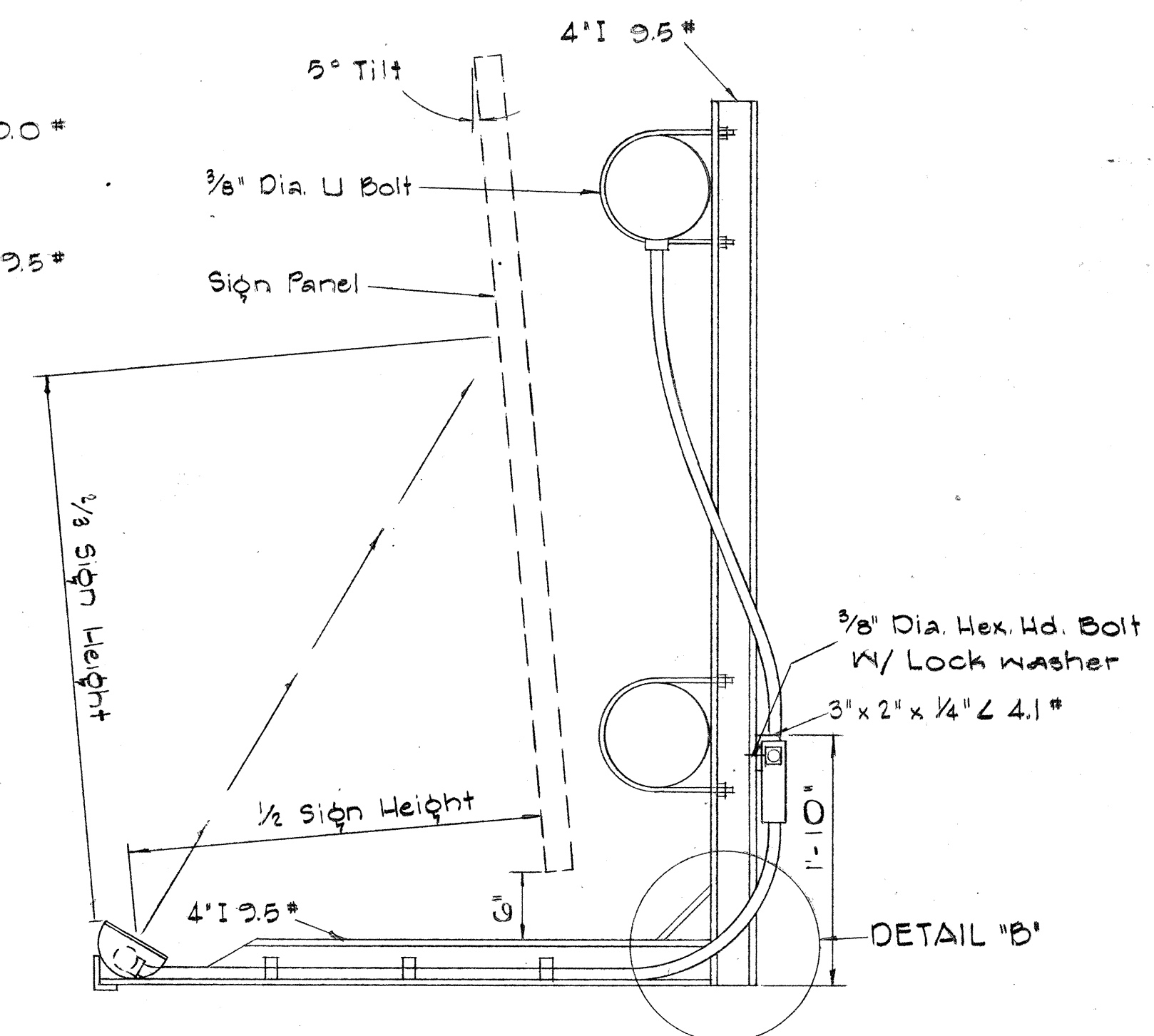
- Conduit sizes: 3/4" diameter for one or two Luminaire Units, 1" diameter for three or more Luminaire Units.
- Fluorescent Fixtures shall be installed as recommended by the manufacturer.
- Luminaire brackets shall be spaced 4'-0" to 6'-0" maximum. 8' long luminaires shall have an additional bracket at midpoint.
- All parts of the bracket shall be hot-dip galvanized, prime coated with a suitable primer and painted with three coats of dark green enamel.



GROUND MOUNTED OVERHEAD
REAR VIEW
LUMINAIRE MOUNTING
Scale: 1" = 1'-0"



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



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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXPRESSWAY SIGNS
LUMINAIRE MOUNTINGS

Scale: As Shown

SHEET No. OF SHEETS

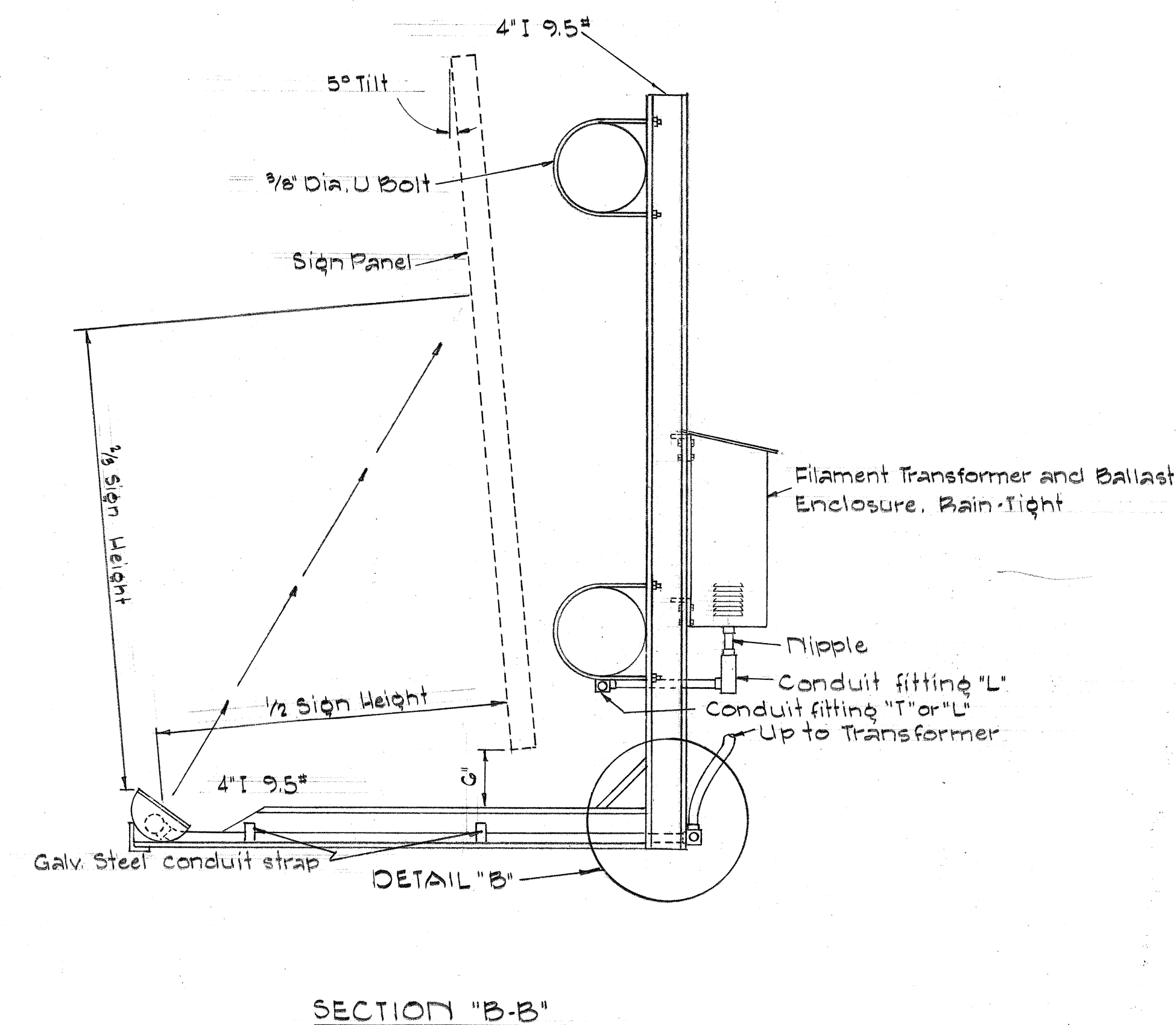
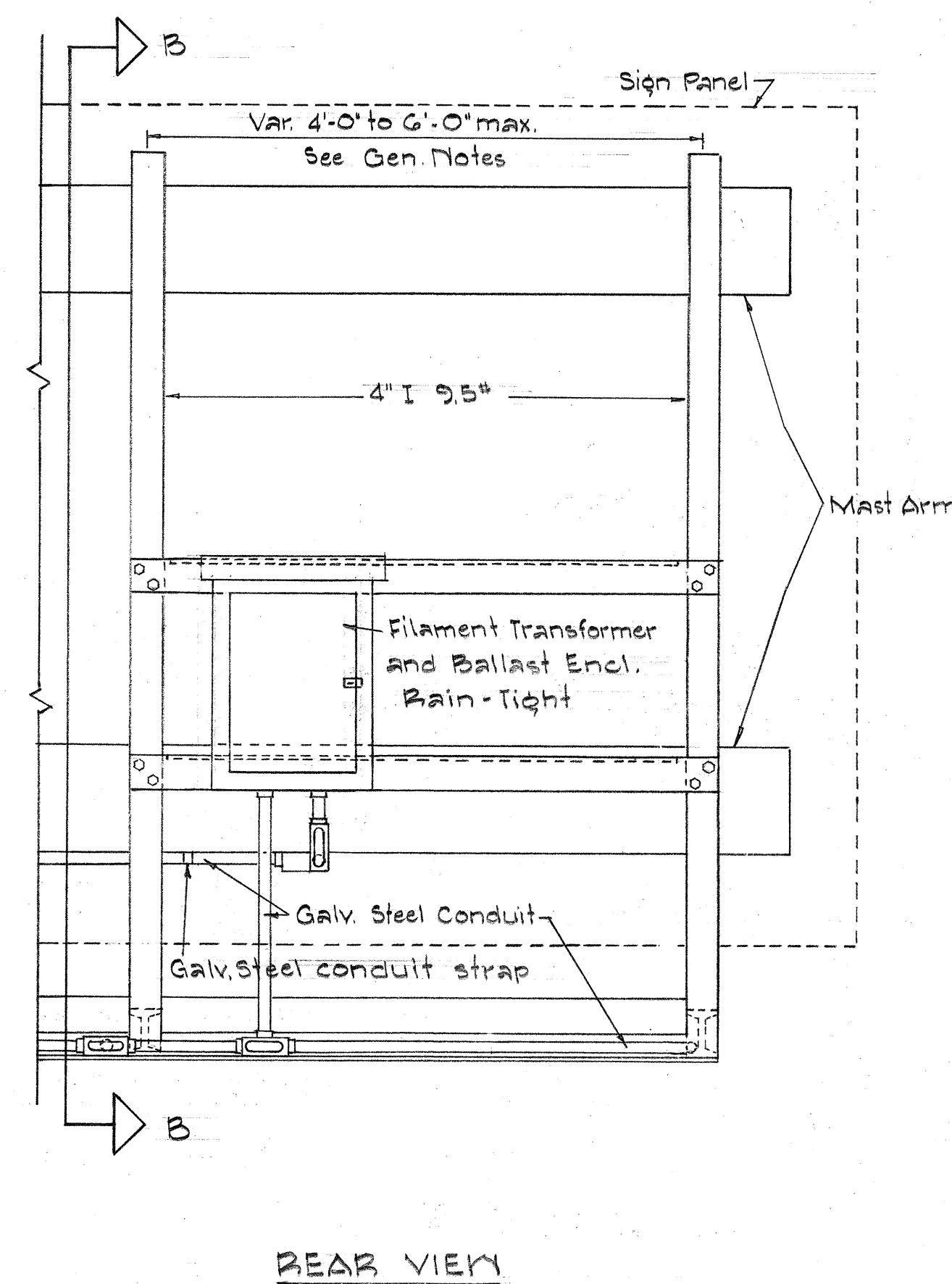
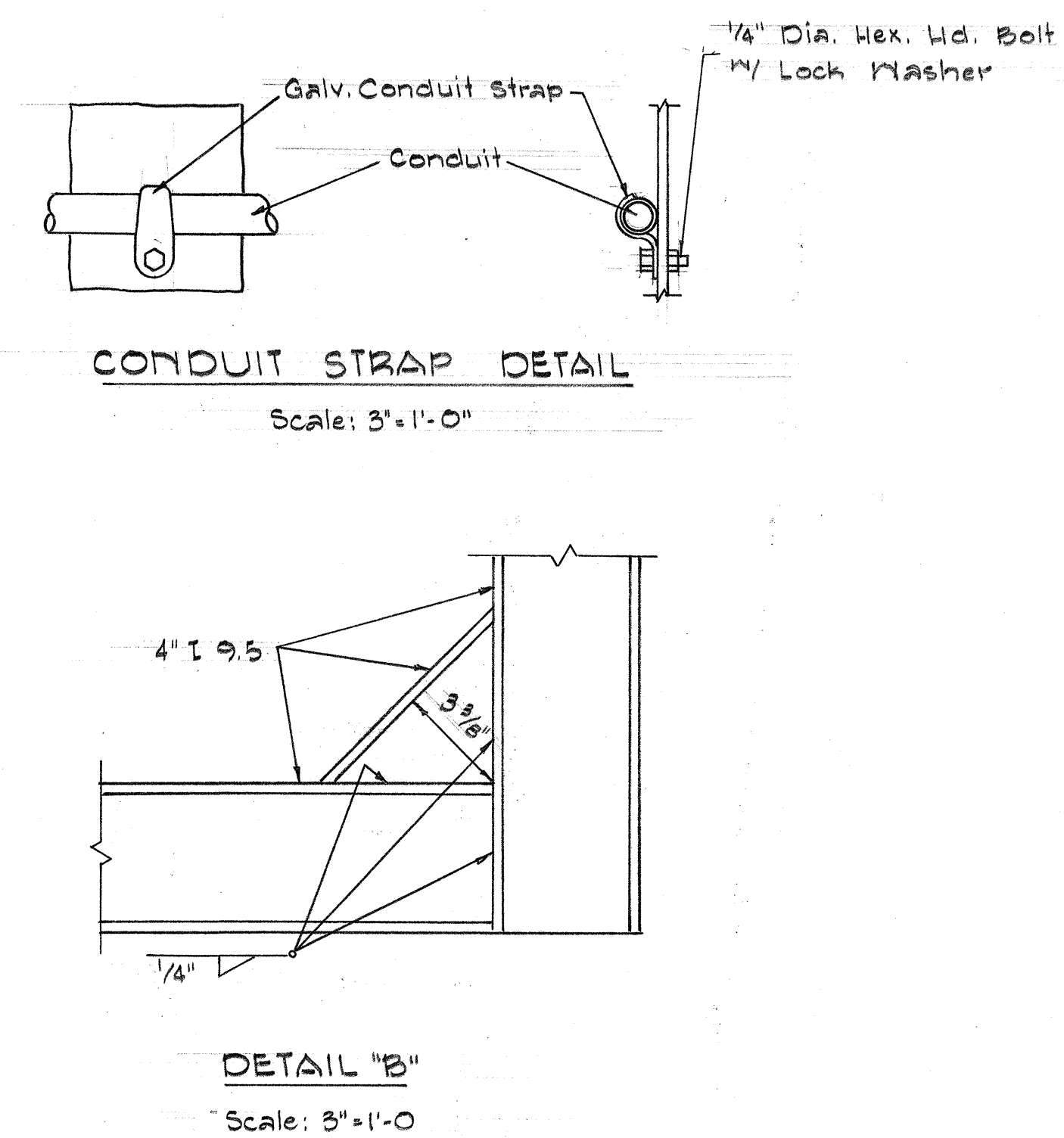
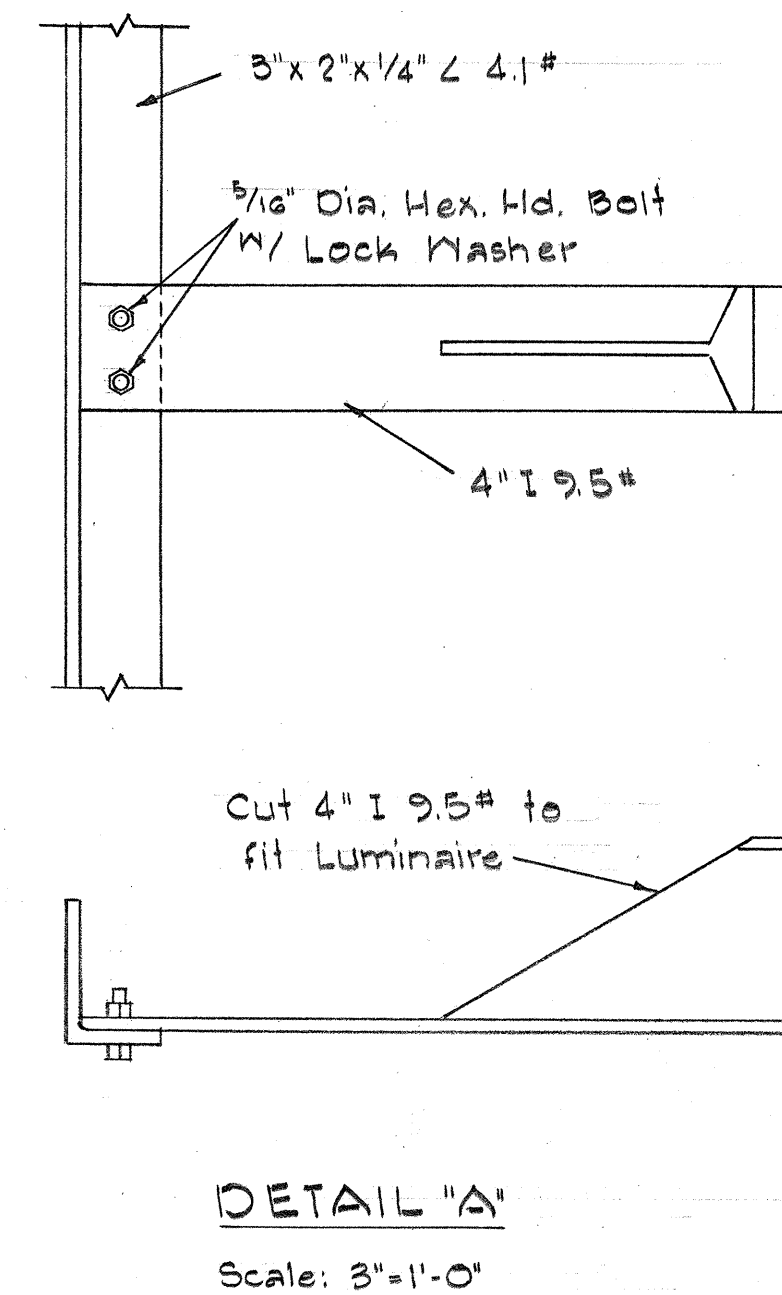
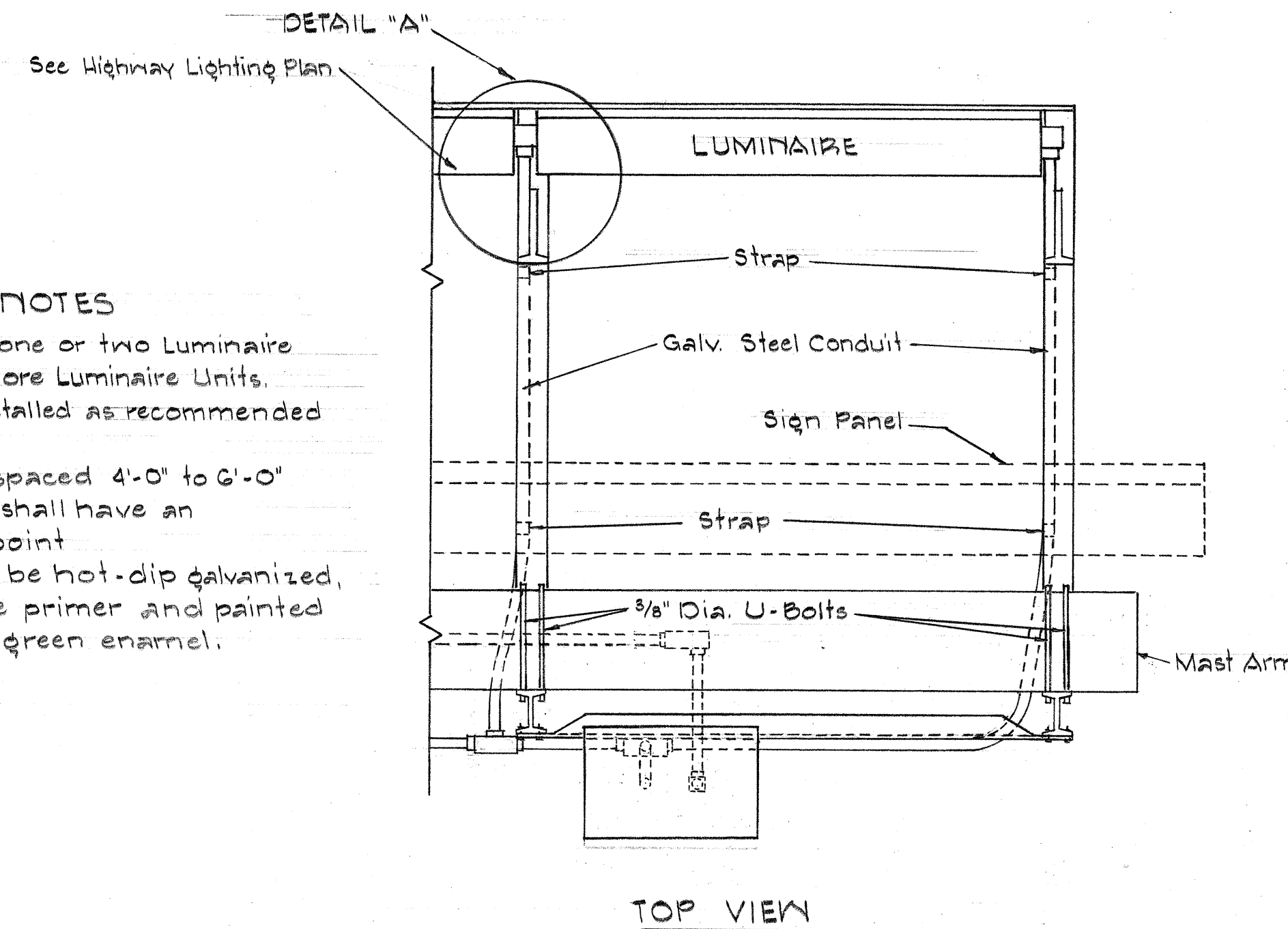
A 45 B 45

DATE	
DESIGNED BY	
DRAWN BY	
CHECKED BY	
NOTED BY	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	U-072-100	1963	A45	45
		U-063-101	1963	B45	45

GENERAL NOTES

1. Conduit sizes: $\frac{3}{4}$ " diameter for one or two Luminaire Units, 1" diameter for three or more Luminaire Units.
2. Fluorescent Fixtures shall be installed as recommended by the manufacturer.
3. Luminaire brackets shall be spaced 4'-0" to 6'-0" maximum. 8' long luminaires shall have an additional bracket at midpoint.
4. All parts of the bracket shall be hot-dip galvanized, prime coated with a suitable primer and painted with three coats of dark green enamel.



LUMINAIRE MOUNTING
Scale 1"=1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXPRESSWAY SIGNS
LUMINAIRE MOUNTINGS

Scale as Shown

SHEET No. OF SHEETS

A45 B45

ORIGINAL PLAN	DATE
DRAWN BY	" "
TRACED BY	" "
QUANTITIES BY	" "
CHECKED BY	" "
No.	" "