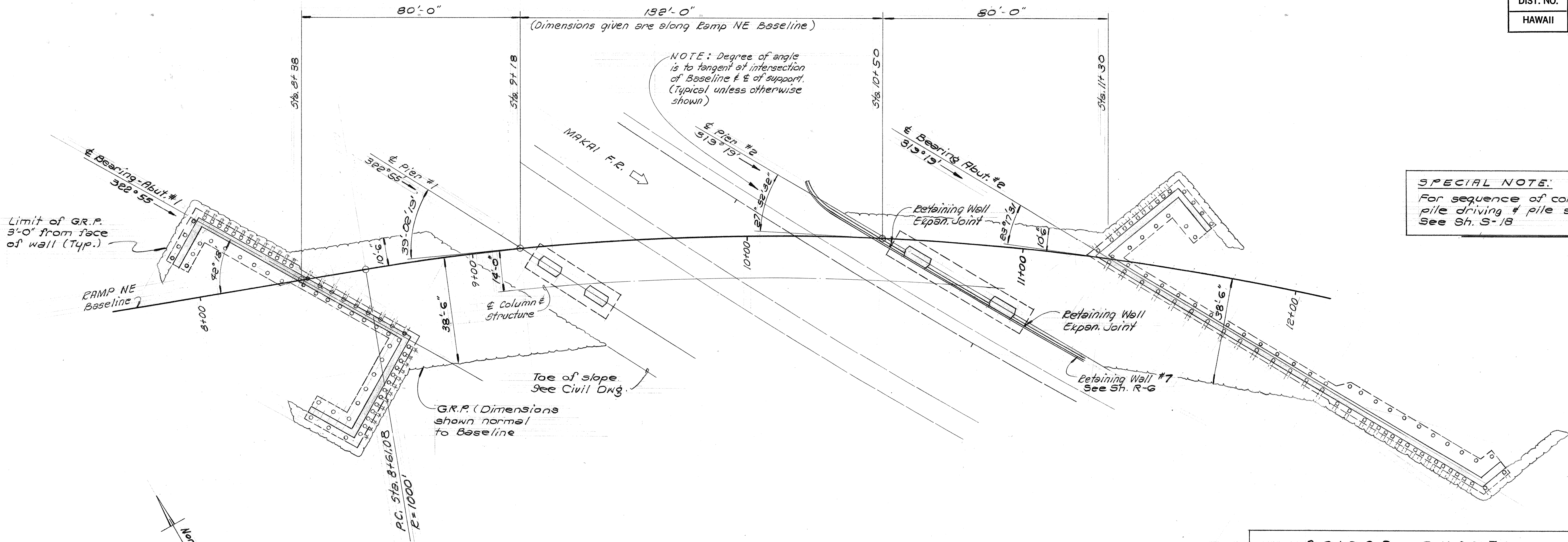


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(73):15	1974	252	369



SPECIAL NOTE:
For sequence of construction for pile driving & pile size & capacity See Sh. S-18

FOUNDATION LAYOUT PLAN
Scale: 1" = 20'-0"

BRIDGE QUANTITY ESTIMATES			
ITEM #	ITEM	UNIT	QUANTITY
206.60	Structural Excavation For Bridges	C.Y.	178
503.076	Concrete in Footings - Structure #7	L.S.	507 C.Y.
503.0702	Concrete for Cast in Place Structure - Sh. #7	L.S.	1581 C.Y.
602.017	Reinforcing Steel - Structure #7	L.S.	541,064 #
206.80	Filter Material	C.Y.	216
507.70	Concrete Bridge Parapet, Including End Post	L.F.	877
612.01	Grouted Rubble Paving	C.Y.	341
505.700	Drilled Holes	L.F.	2636
505.040	Precast Prestressed Concrete Piles, Furnished	L.F.	3908
505.400	Precast Prestressed Concrete Piles, Driven	L.F.	892
206.25	Structural Backfill For Bridges	C.Y.	942
505.040	Precast, Prestressed Concrete Test Piles, Furnished	L.F.	145
505.410	Precast, Prestressed Concrete Test Piles, Driven	L.F.	24

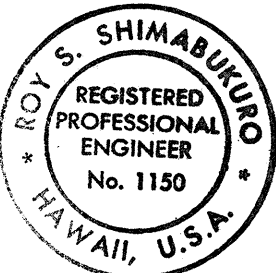
REFERENCE DRAWINGS

- 1. G.R.P. Details-----Sh. S-1
- 2. Abutment #1 Foundation-----Sh. S-37
- 3. Abutment #2 Foundation-----Sh. S-40
- 4. Pier #1 Foundation-----Sh. S-44
- 5. Pier #2 Foundation-----Sh. S-46
- 6. Pier Column-----Sh. S-44

DESIGN CRITERIA

- A. Loads - HS 20-44
- B. Specifications - Standard Specifications for Highway Bridges, AASHTO, 11th Edition & Standard Specifications for Road & Bridge Construction, Hawaii, 1973
- C. Allowable Foundation Pressure-----12000 P.S.F.
(Footings bearing 1'-0" min. into tuff-subject to soils Engineers approval)
- D. 28 Day Concrete strengths
Abutment walls, Wingwall & Column footings-----3000 P.S.I. (Class A conc.)
Columns-----4,000 P.S.I. (Class E conc.)
Superstructure-----4,000 P.S.I. (Class E conc.)
- E. Reinforcing Steel: ASTM A615, Grade 60

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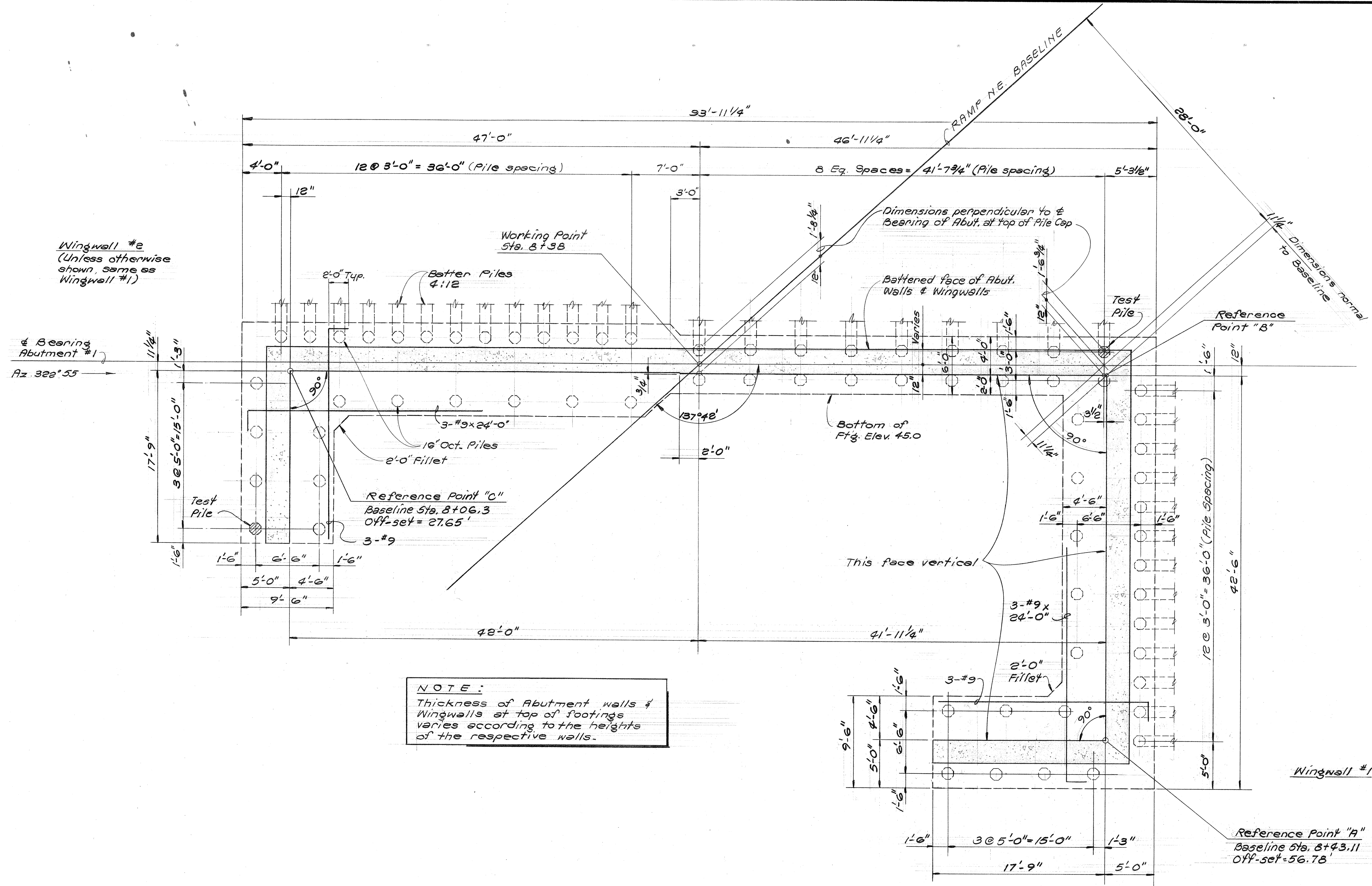
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURE No. 7
FOUNDATION LAYOUT PLAN

PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-HI-1(73):15
Scale: As Shown Date: DEC 7, 1973
SHEET No. 5-36 OF 106 SHEETS

DATE	SURVEY PLOTTED BY	DATE	DESIGNED BY	DATE	CHECKED BY

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(73)15	1974	253	369

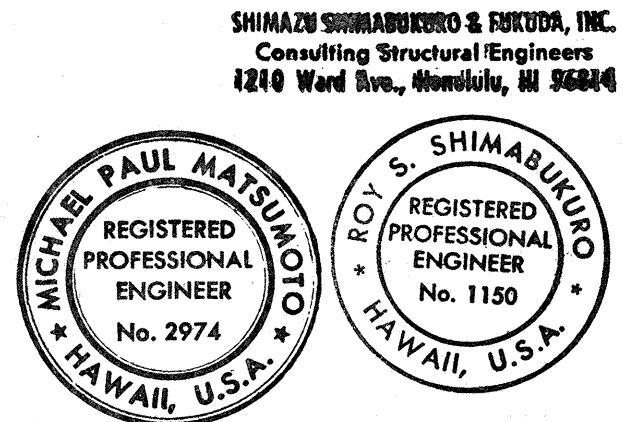


- NOTE:**
- Degree of angles given from $\pm$ are to Baseline tangent at Sta. 8+38.
 - Sequence of construction for pile driving See Sh. S-84
 - Typical wall & footing details Sh. S-84

- LEGEND**
- --- Vertical 16" Oct. Piles
 - --- Battered 16" Oct. Piles @ 4:12

- REFERENCE DRAWINGS:**
- Abutment & Wingwall sections --- Sh. S-43
 - Abutment Plan at Shelf --- Sh. S-38
 - Typical Footing & Wall Details --- Sh. S-84

ABUTMENT #1 - FOUNDATION PLAN
Scale: 3/16" = 1'-0"



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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURE No. 7

ABUTMENT #1

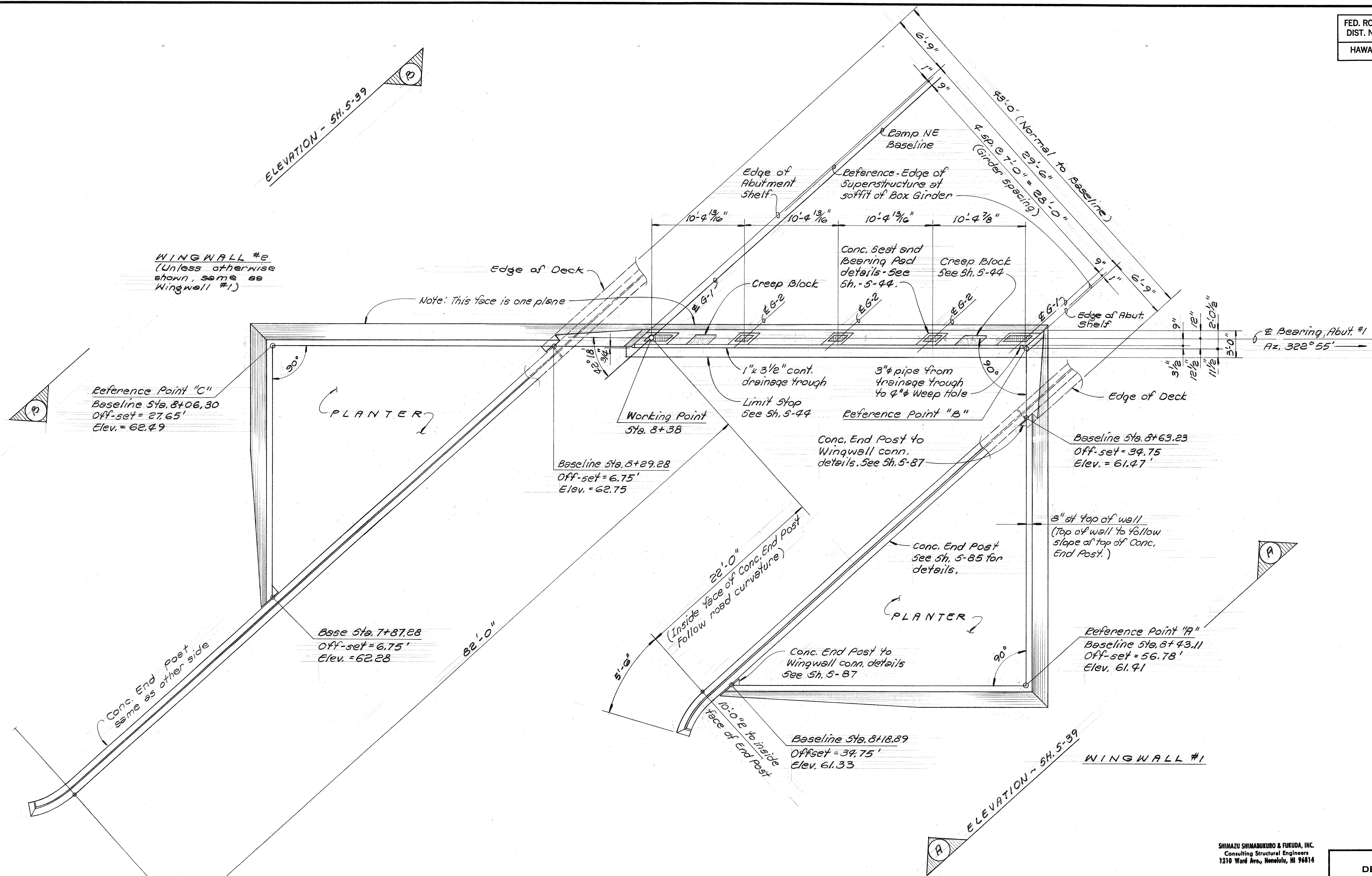
FOUNDATION PLAN

PEARL HARBOR INTERCHANGE
F.A. Proj. No. I-H-1(73)15

Scale: As Shown Date: DEC. 7, 1973

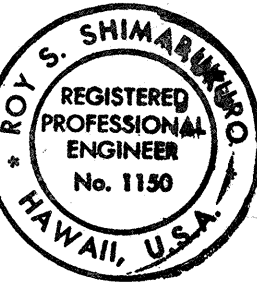
SHEET No. 5-37 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	FH-1(73)15	1974	254	369



ABUTMENT #1 - PLAN AT ABUTMENT SHELF
 Scale = 3/16" = 1'-0"

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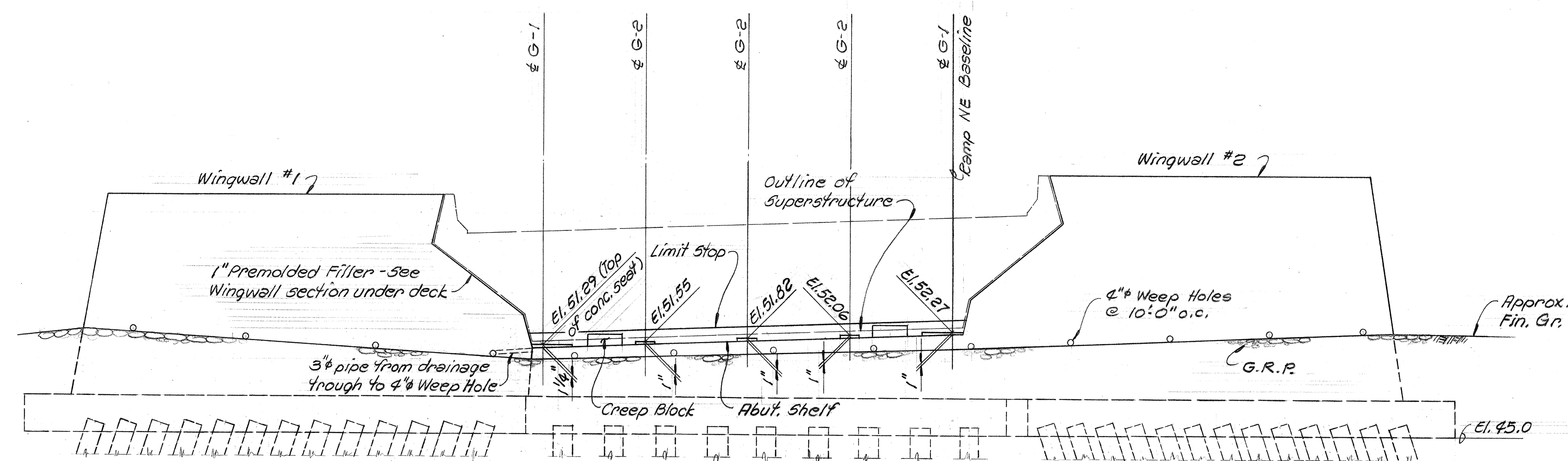
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

STRUCTURE No. 7
ABUTMENT #1 - PLAN
AT ABUTMENT SHELF

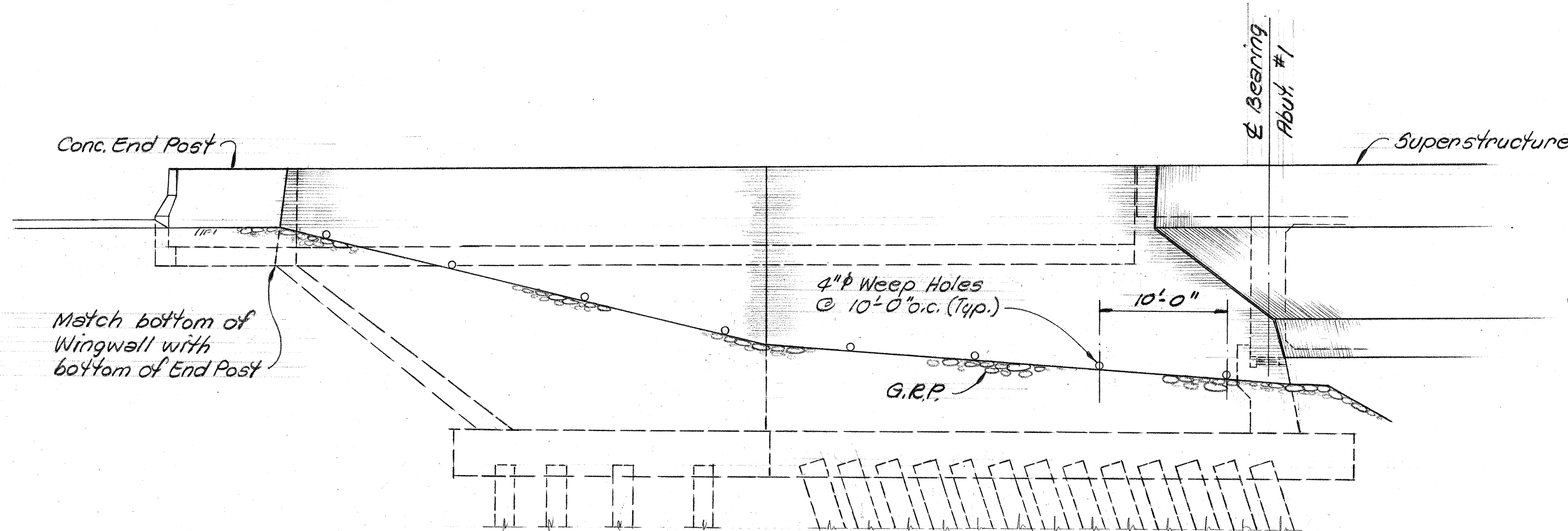
PEARL HARBOR INTERCHANGE
 F.A.I. Proj. No. I-HI-1(73)-15

Scale: As Shown Date: DEC. 7, 1973
 SHEET No. 5-38 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(73):15	1974	255	369

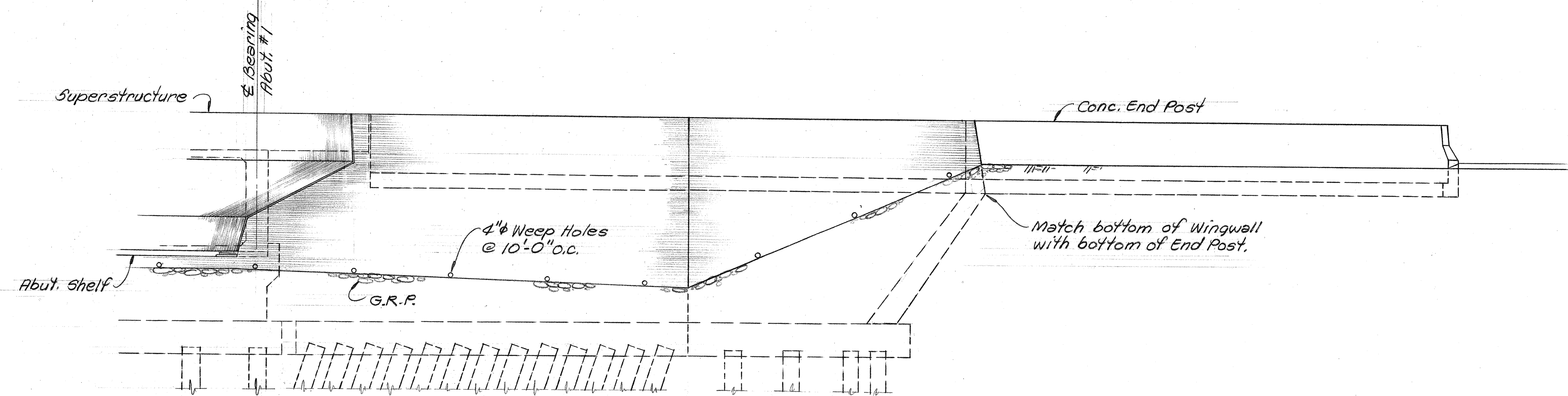


ELEVATION - ABUTMENT #1
3/16" = 1'-0" (Looking normal to Ramp NE)



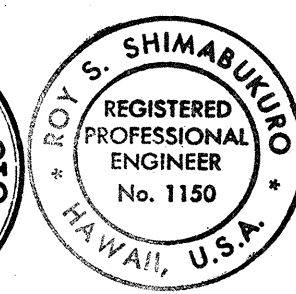
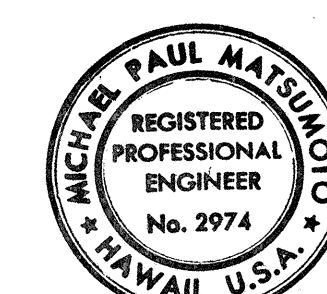
ELEVATION "A"~"A" ~ WINGWALL #1
3/16" = 1'-0"

PILE ELEVATIONS		
	Pile Tip	Pile Cut-Off
Abut. #1	24.0	48.0
Wingwall #1 & #2	24.0	48.0



ELEVATION "B"~"B" ~ WINGWALL #2
3/16" = 1'-0"

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STRUCTURE No. 7

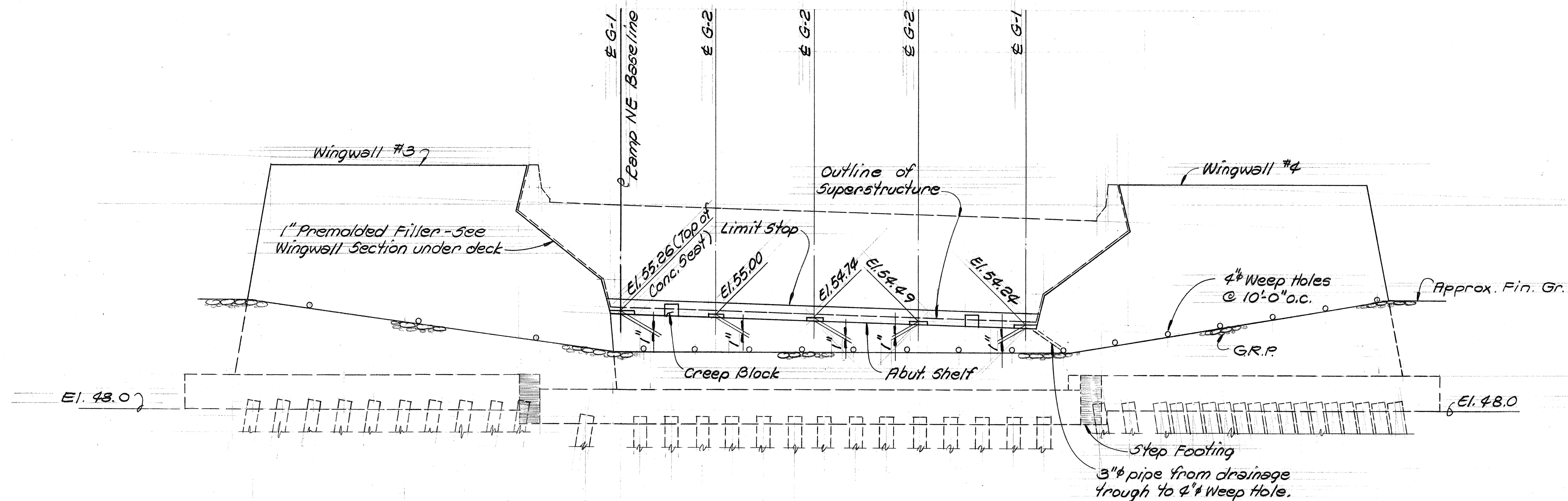
ABUTMENT #1 &
WINGWALL #1 & #2 ELEVATION

PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-HI-1(73):15

Scale: As Shown Date: DEC 7, 1973

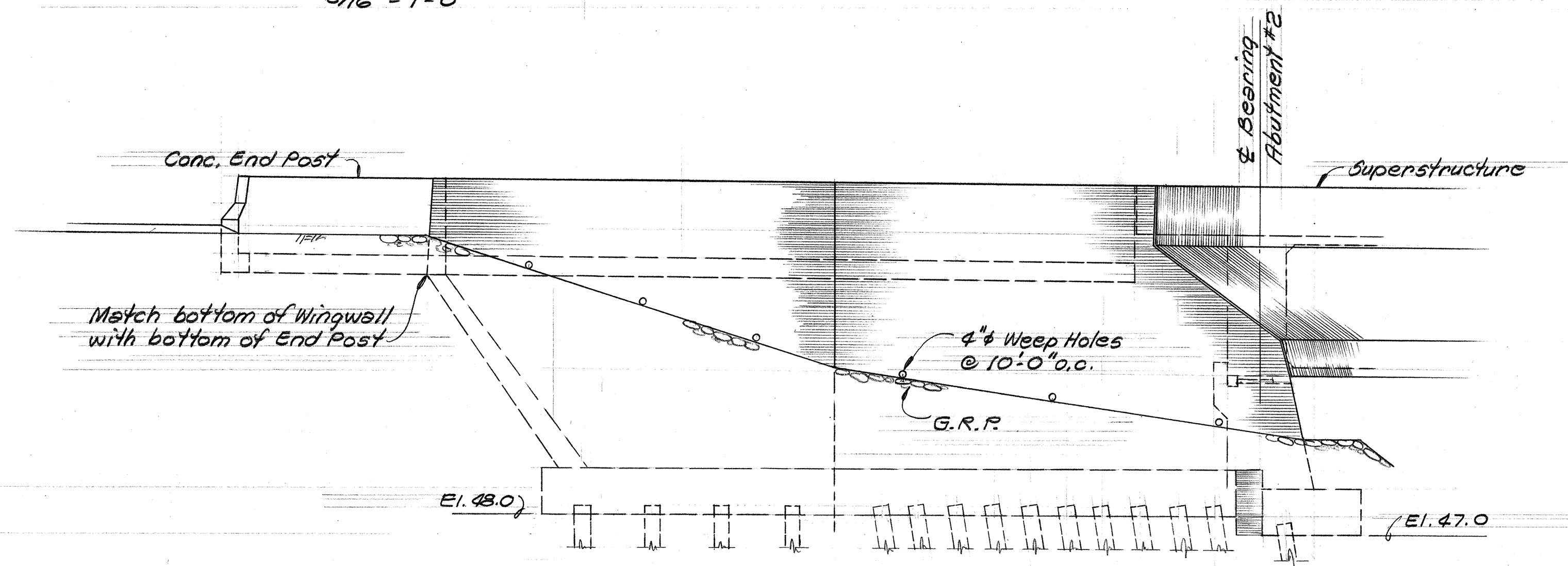
SHEET No. 539 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(73)115	1974	258	369

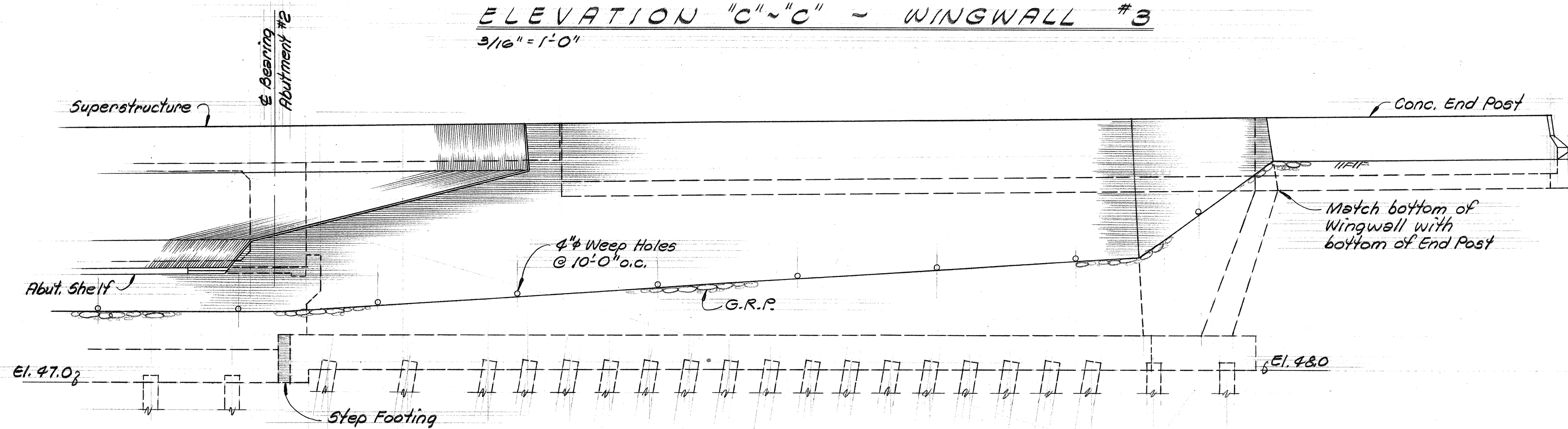


ELEVATION ~ ABUTMENT #2
3/16" = 1'-0"

PILE TIP & CUT OFF ELEVATIONS			
	Tip	Cut Off	
Abutment #2	22.5	50.0	
Wingwalls #3 & #4	22.5	51.0	



ELEVATION "C"~"C" ~ WINGWALL #3
3/16" = 1'-0"



ELEVATION "D"~"D" ~ WINGWALL #4
3/16" = 1'-0"

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HIGHWAYS DIVISION

STRUCTURE No. 7
ABUTMENT #2 & WINGWALL
#3 & #4 ELEVATIONS

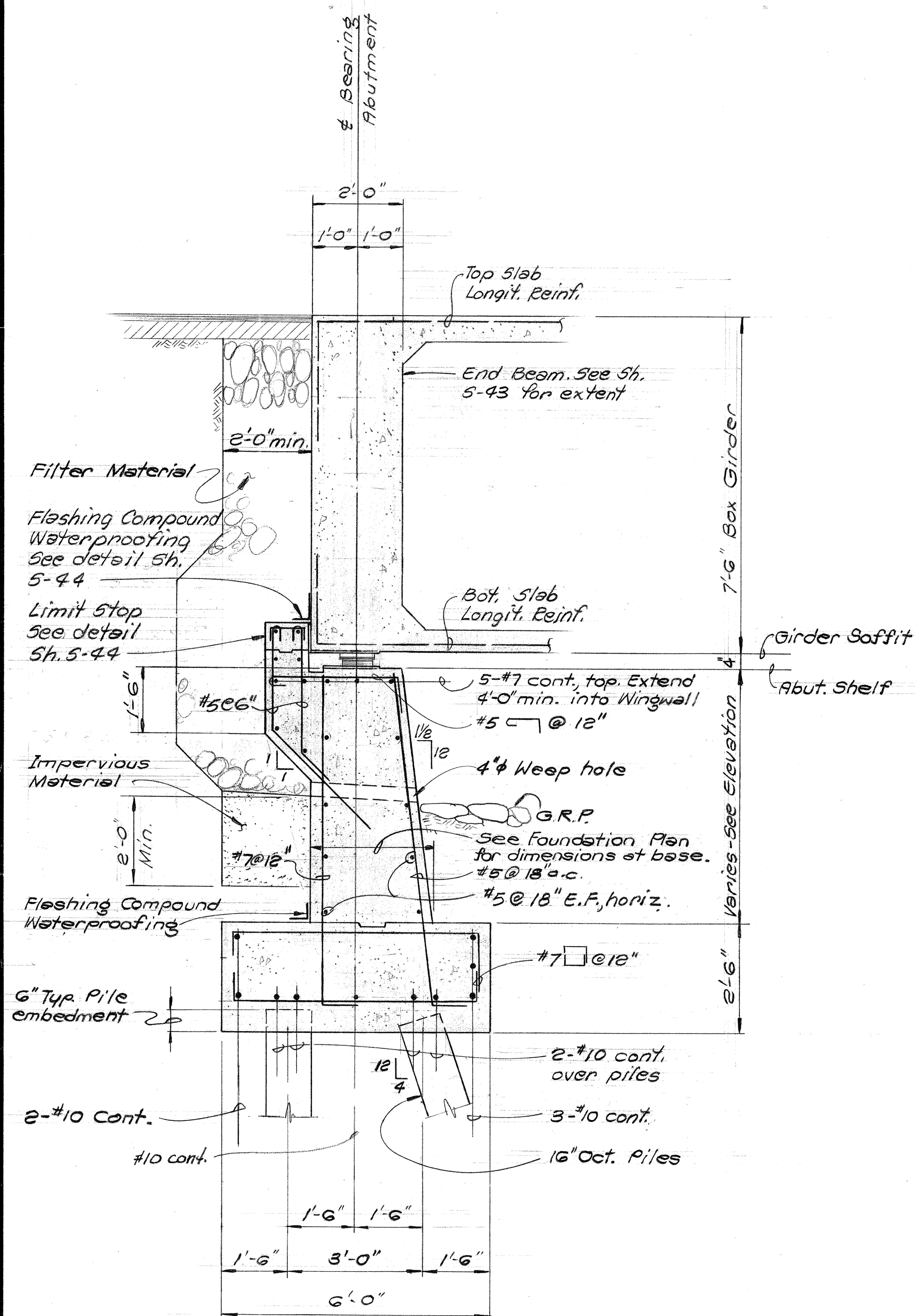
PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-HI-1(73)115

Scale: As Shown Date: DEC. 7, 1973

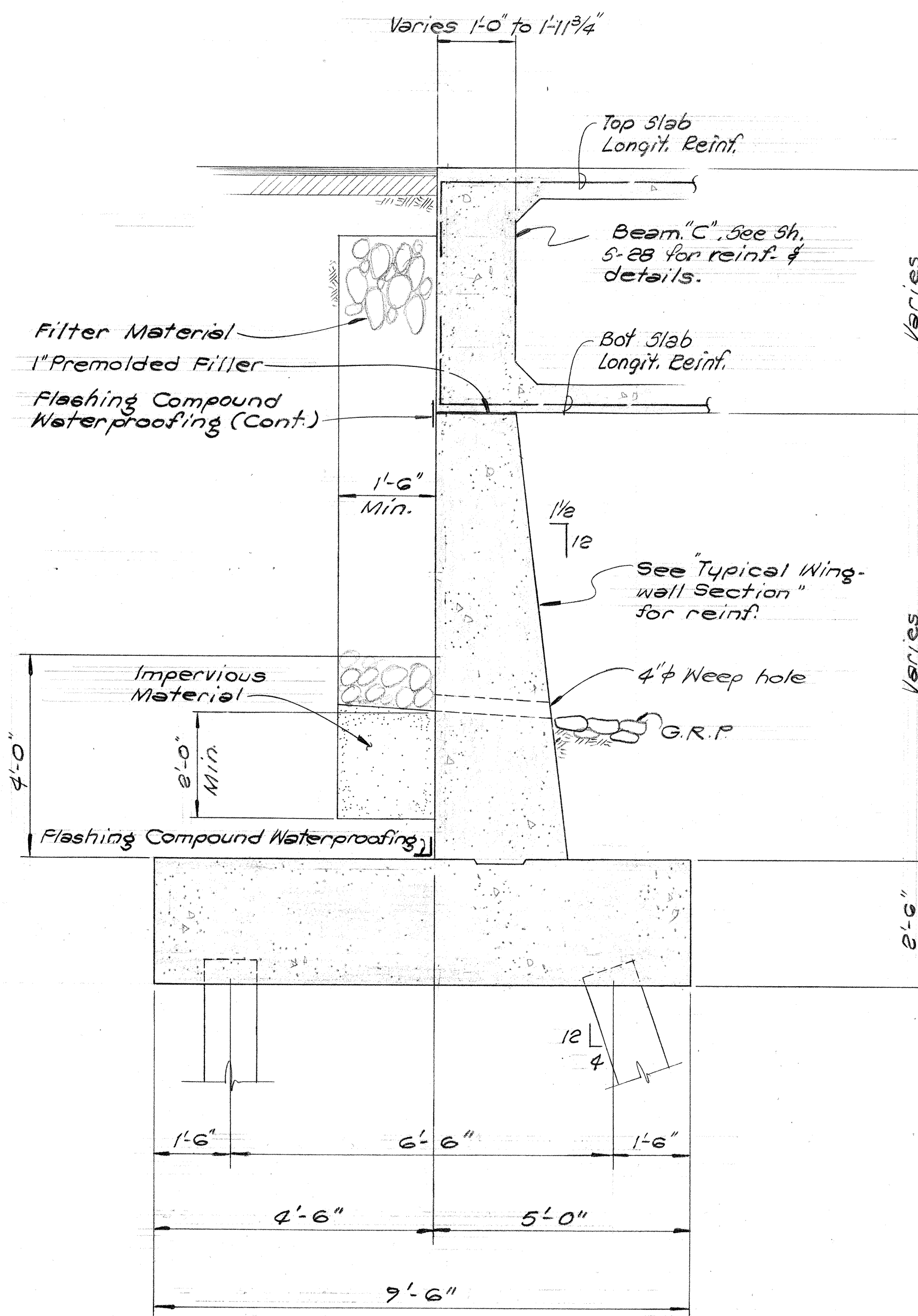
SHEET No. 42 OF 108 SHEETS

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

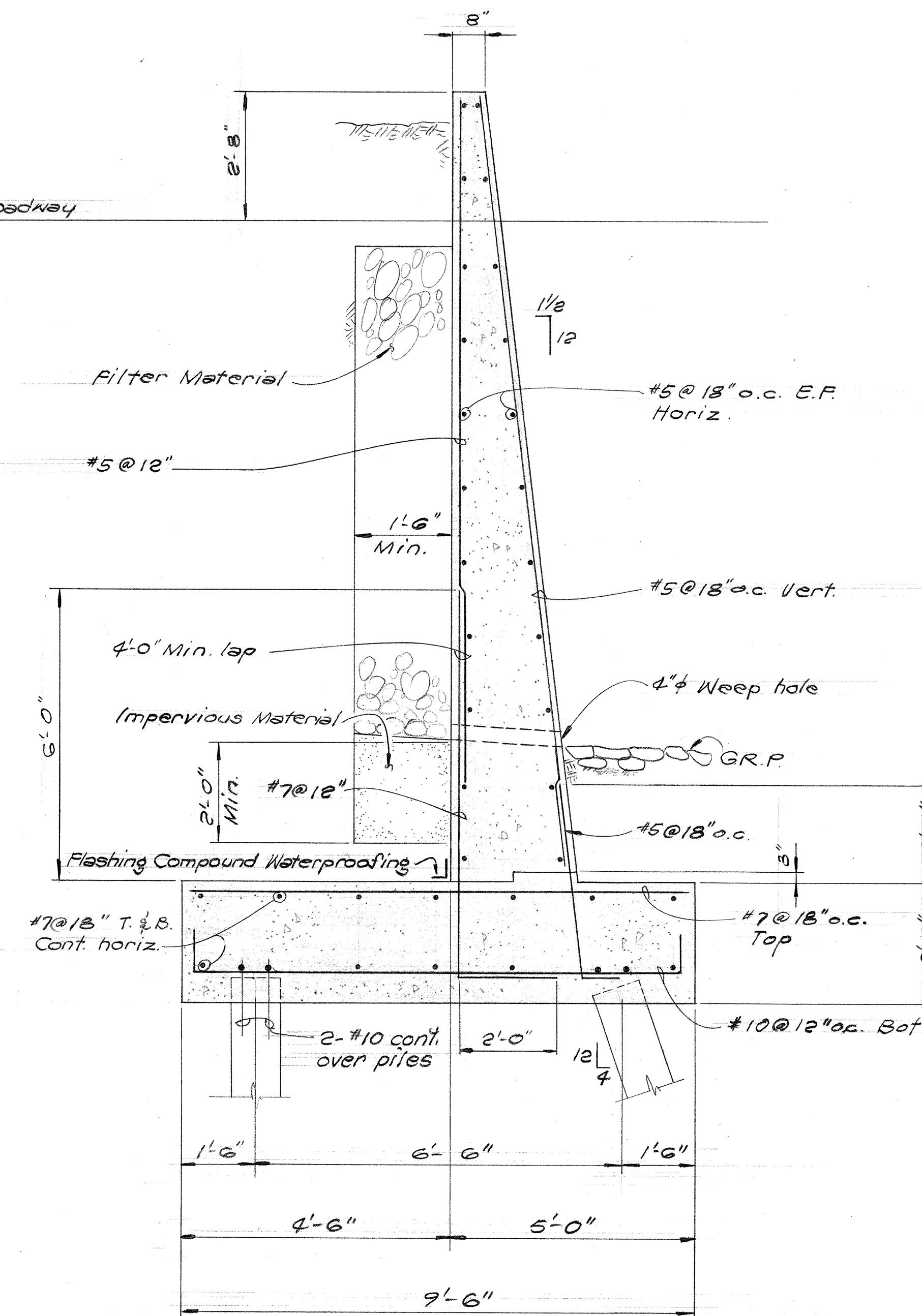
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(73)15	1974	259	369



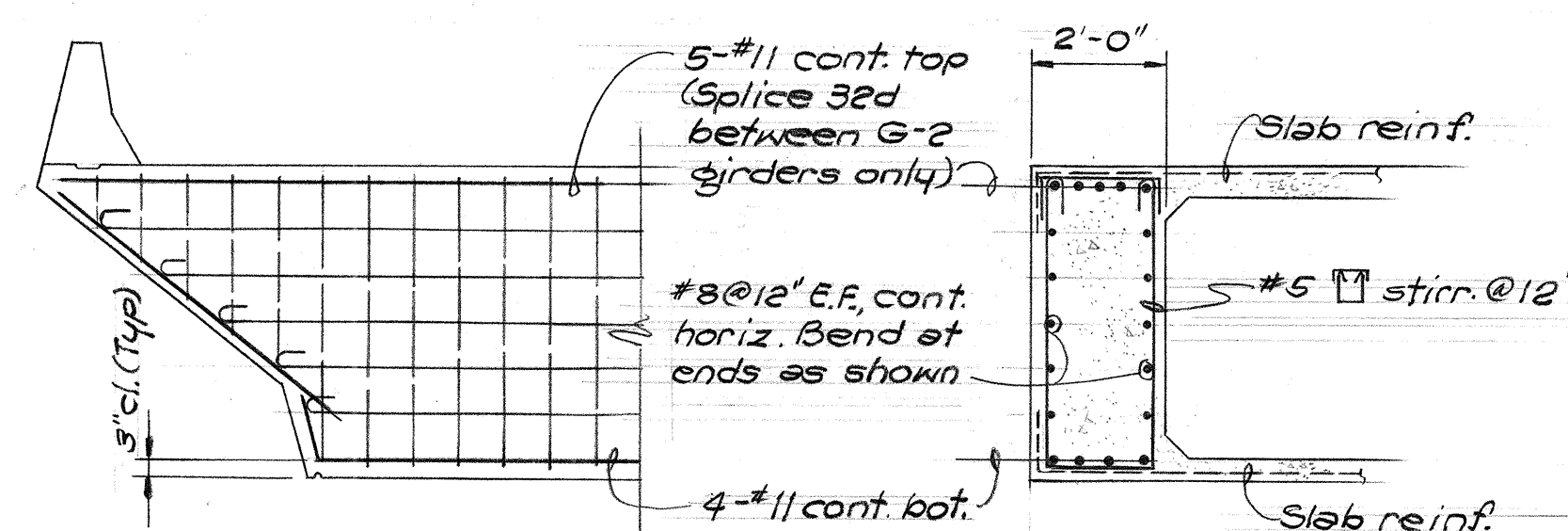
TYPICAL ABUTMENT SECTION
1/2" = 1'-0"



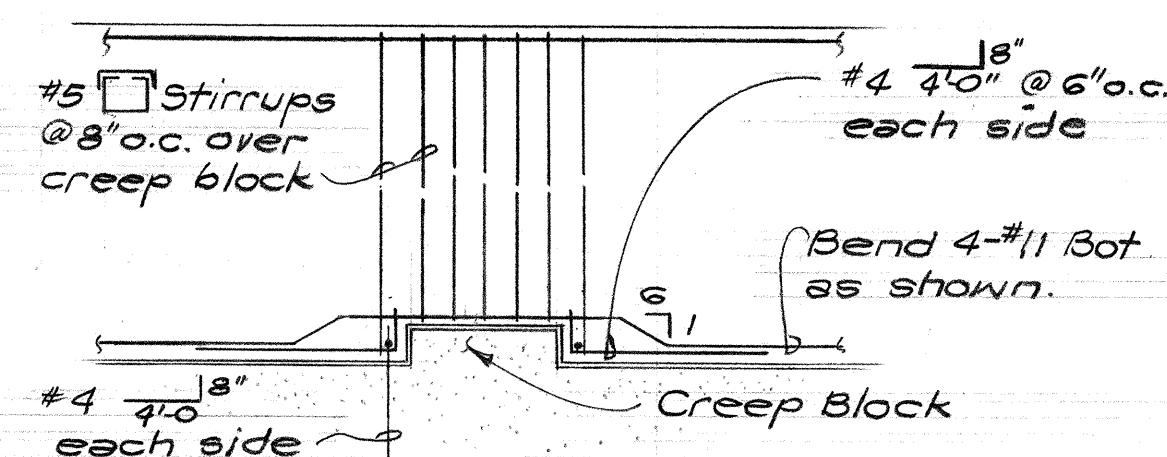
WINGWALL SECTION UNDER DECK
1/2" = 1'-0"



TYPICAL WINGWALL SECTION
1/2" = 1'-0"

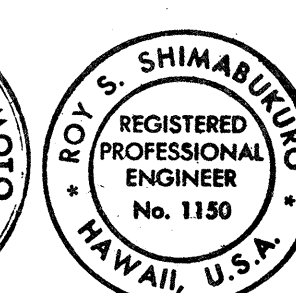
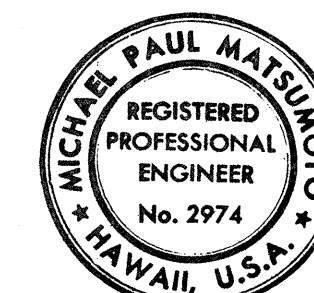


ELEVATION END BEAM DETAIL
1/4" = 1'-0"



ELEVATION AT CREEP BLOCK
1/4" = 1'-0"

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STRUCTURE No. 7

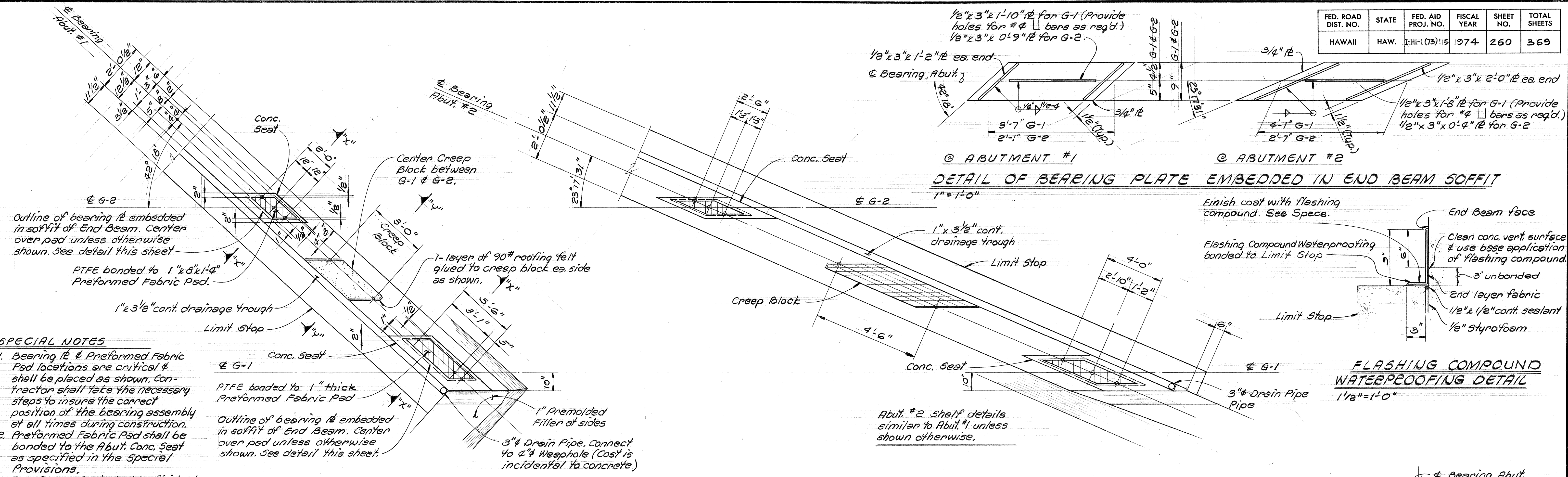
ABUTMENT #1 & #2
WINGWALL SECTIONS

PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-H-1(73)-15

Scale: As Shown Date: DEC. 7, 1973

SHEET No. 5-43 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-HI-1 (73) 115	1974	260	369



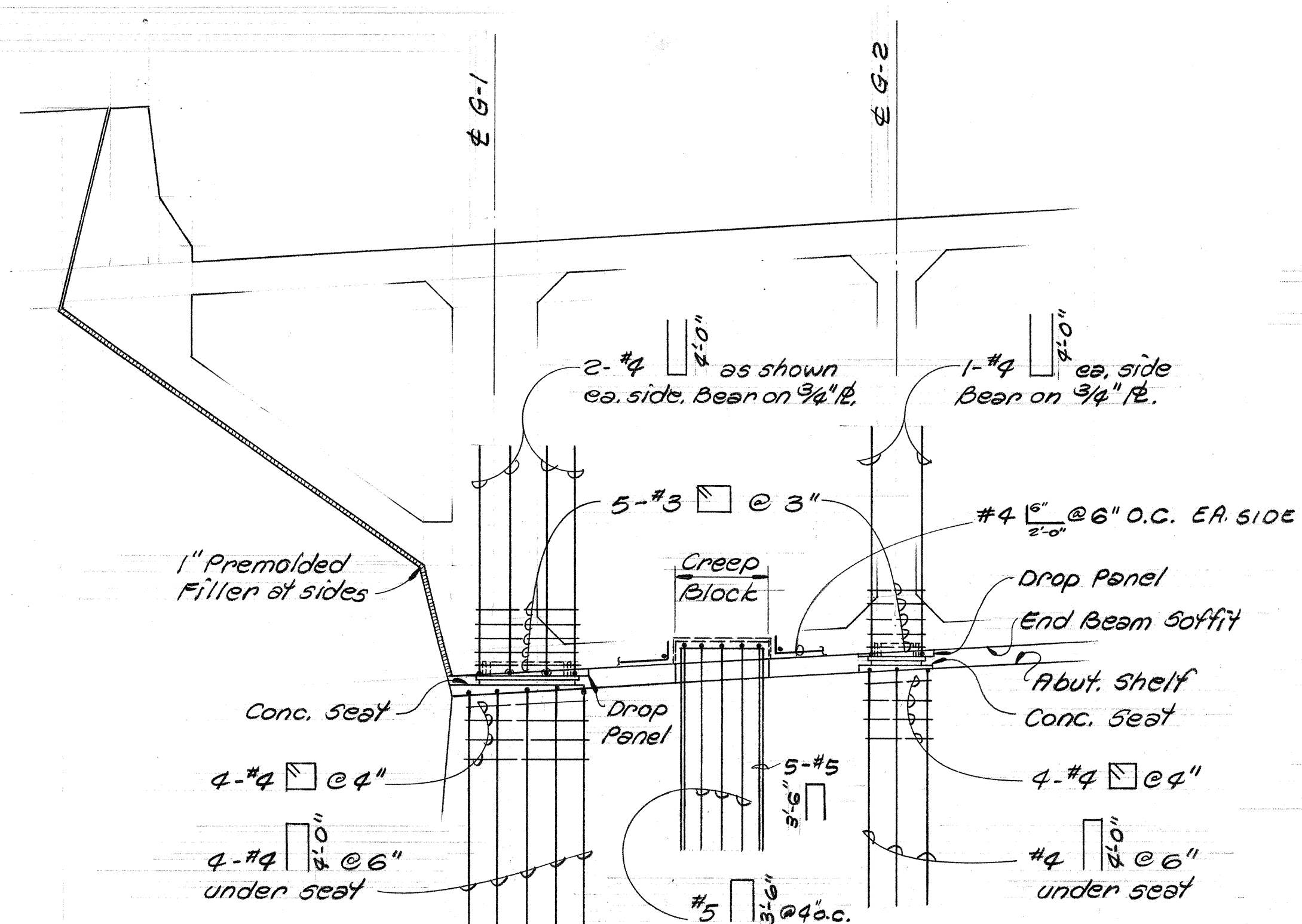
SPECIAL NOTES

1. Bearing Pl. & Preformed Fabric Pad locations are critical & shall be placed as shown. Contractor shall take the necessary steps to insure the correct position of the bearing assembly at all times during construction.
2. Preformed Fabric Pad shall be bonded to the Abut. Conc. Seat as specified in the Special Provisions.
3. Top of Conc. Seat shall be finished level & smooth with a steel trowel.
4. Conc. Box Girders shall be poured next to Creep Block faces (2 sides) with Roofing Felt.

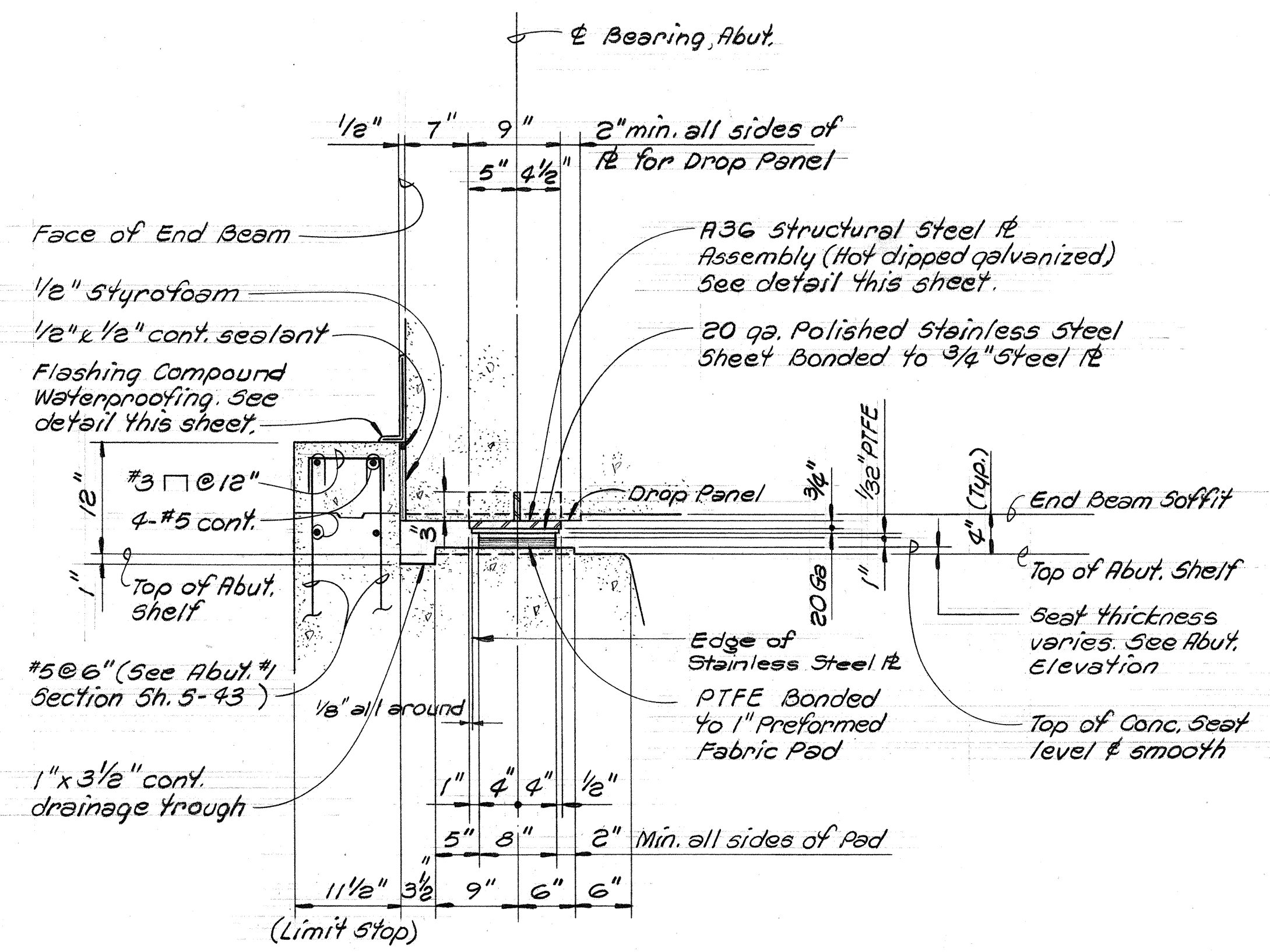
PART PLAN ~ ABUT. #1 SHELF

CREEP BLOCK, CONCRETE SEAT & BEARING PAD DETAILS

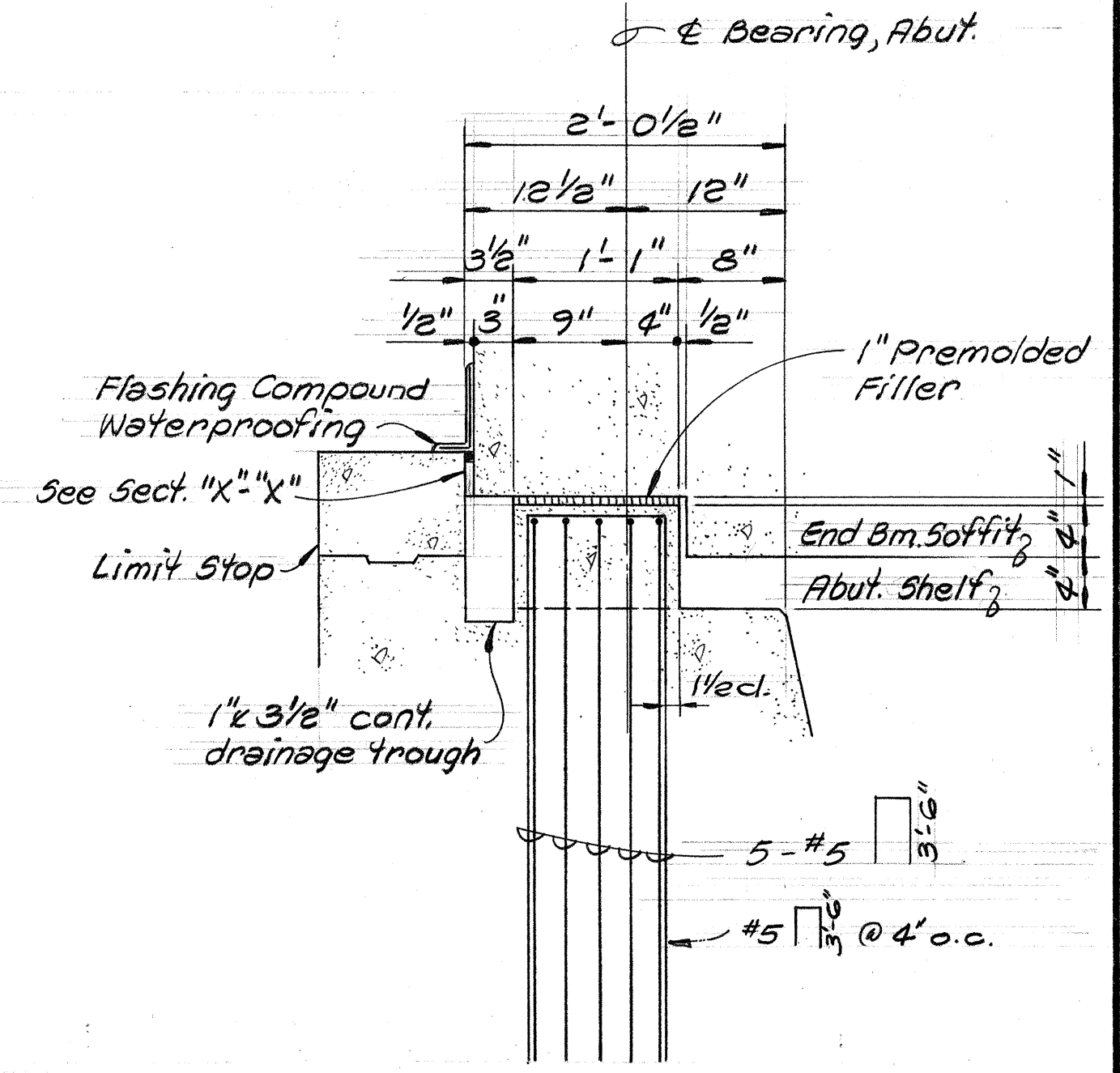
PART PLAN ~ ABUT. #2 SHELF



ELEVATION ~ ABUT. SHOWING CONC. SEAT & CREEP BLOCK REINF.



SECTION "X" - "X"



SECTION "Y" - "Y"

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REGISTERED PROFESSIONAL ENGINEER
No. 2974
HAWAII, U.S.A.

REGISTERED PROFESSIONAL ENGINEER
No. 1150
HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURE No. 7

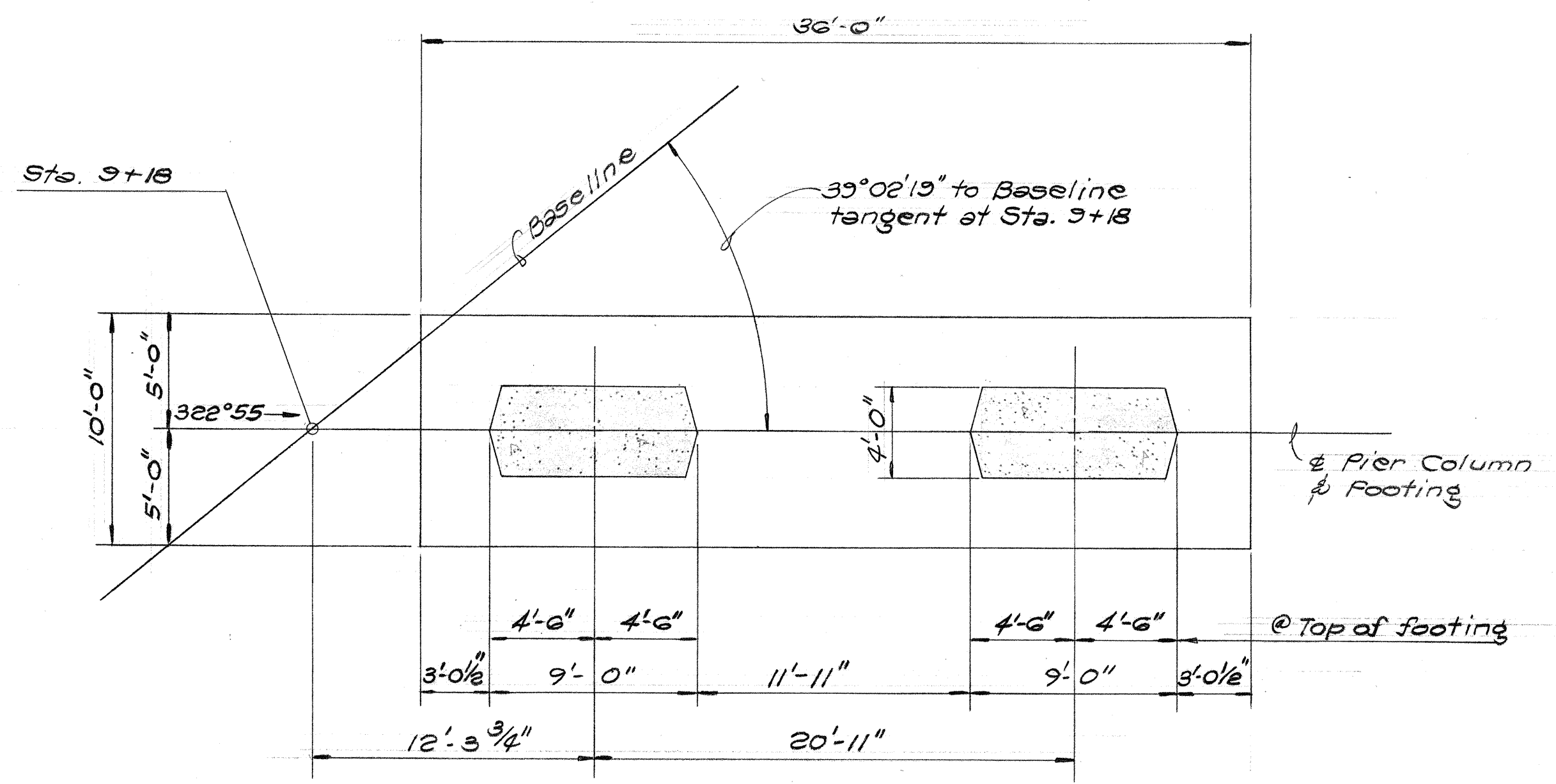
ABUTMENT CONCRETE SEAT,
LIMIT STOP & CREEP BLOCK DETAILS.

PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. 1-HI-1 (73) 115

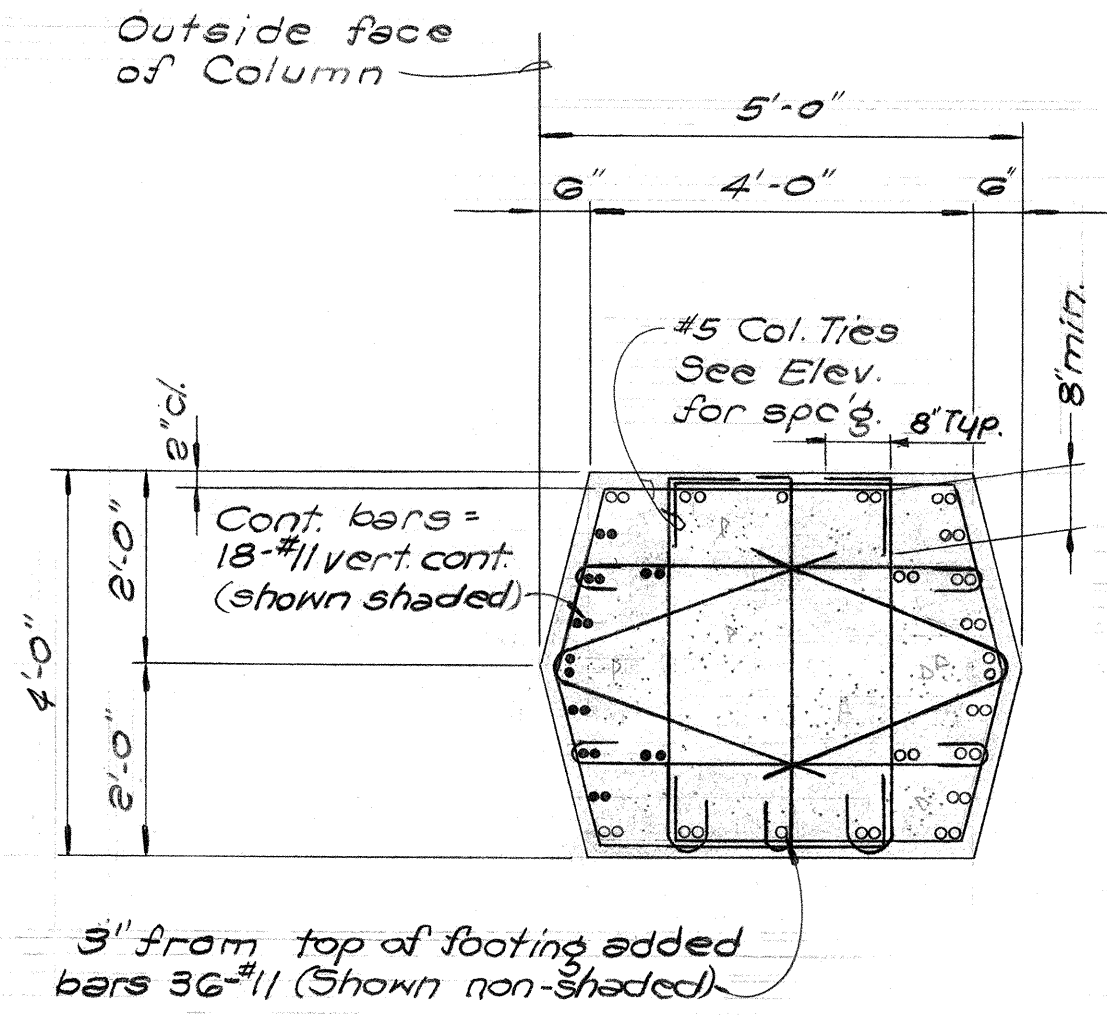
Scale: As Shown Date: DEC. 7, 1973

SHEET No. 5-44 OF 106 SHEETS

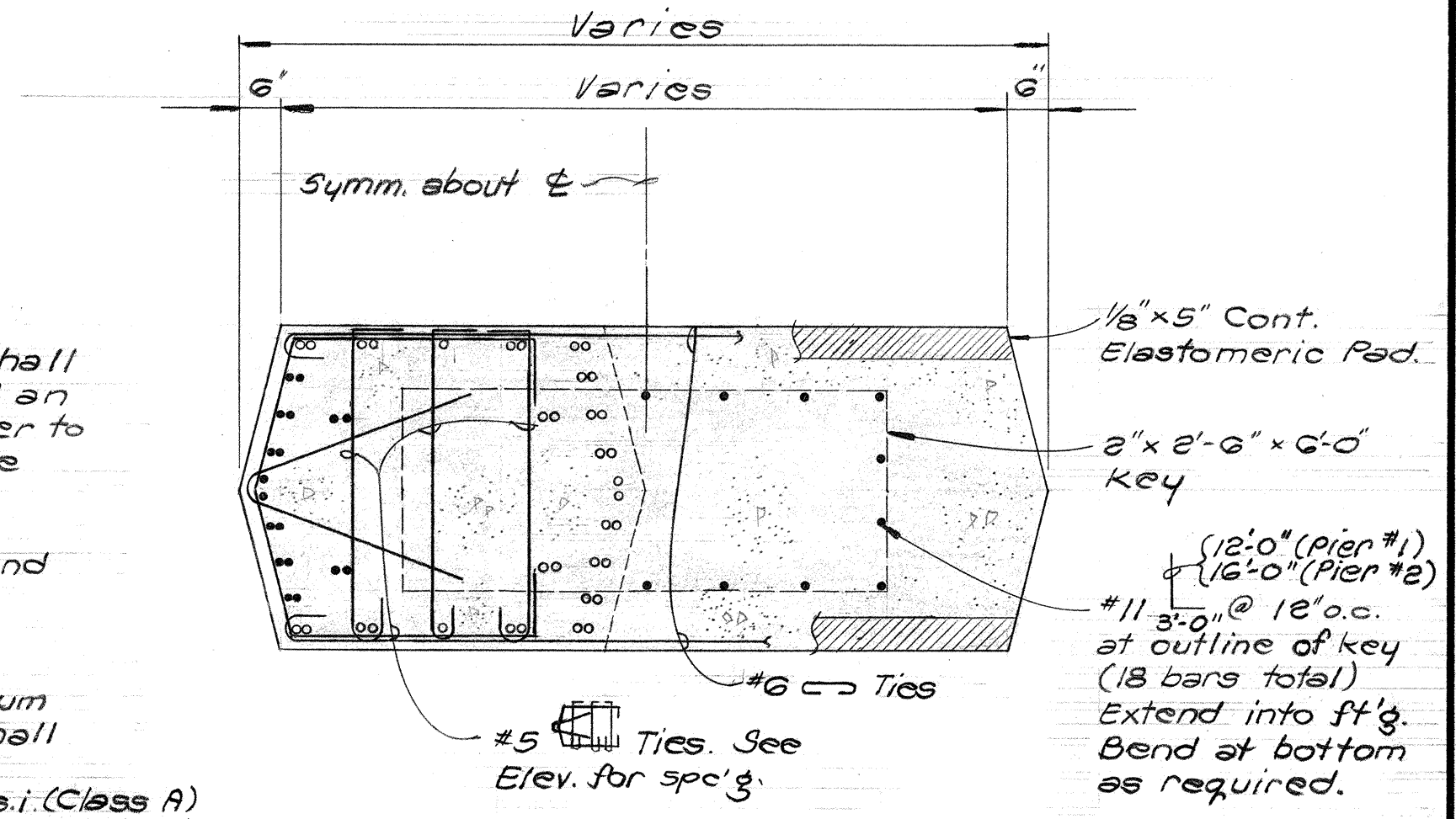
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-HI-1(73):15	1974	261	369



PLAN
3/16" = 1'-0"

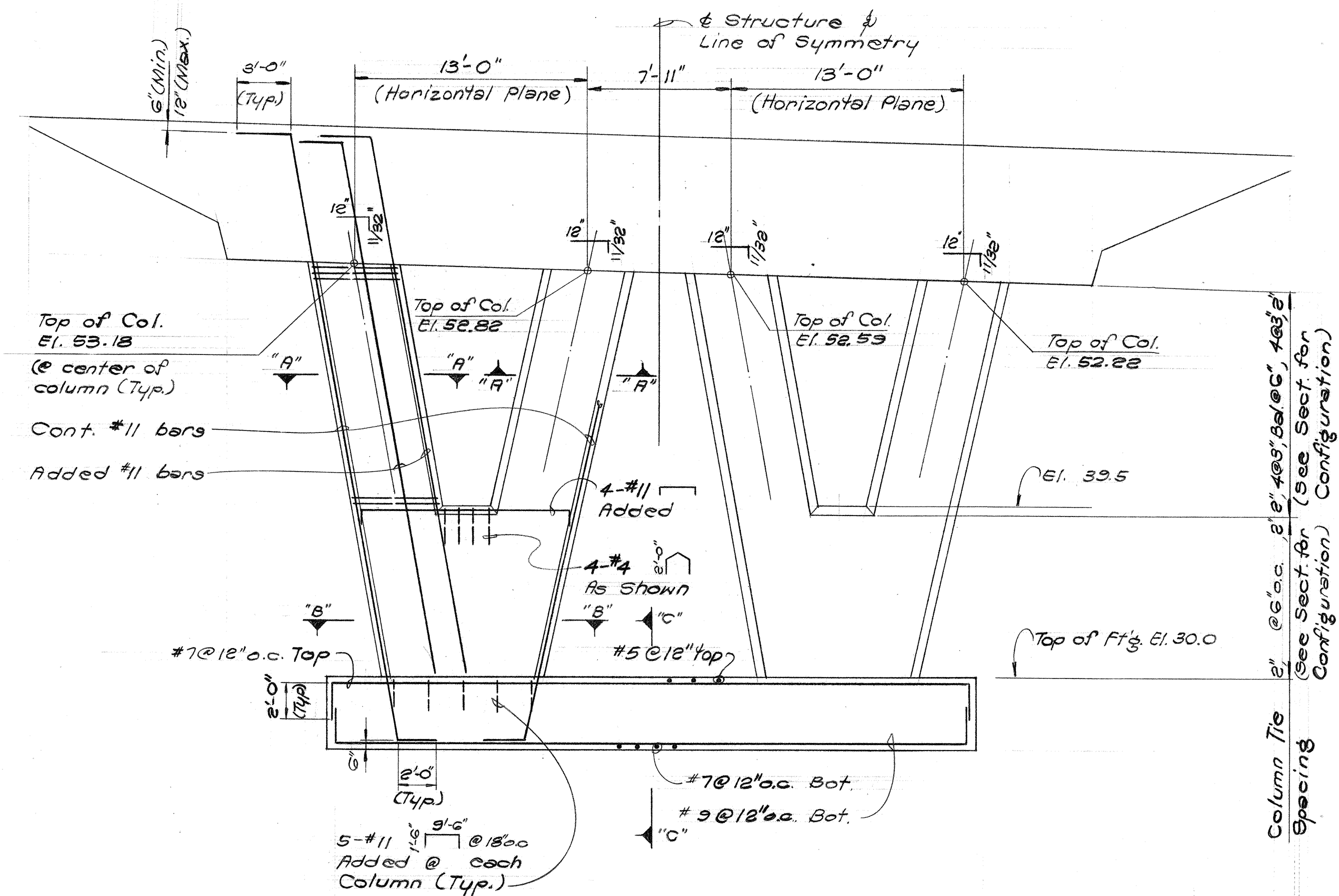


SECTION "A"-A"
1/8" = 1'-0"

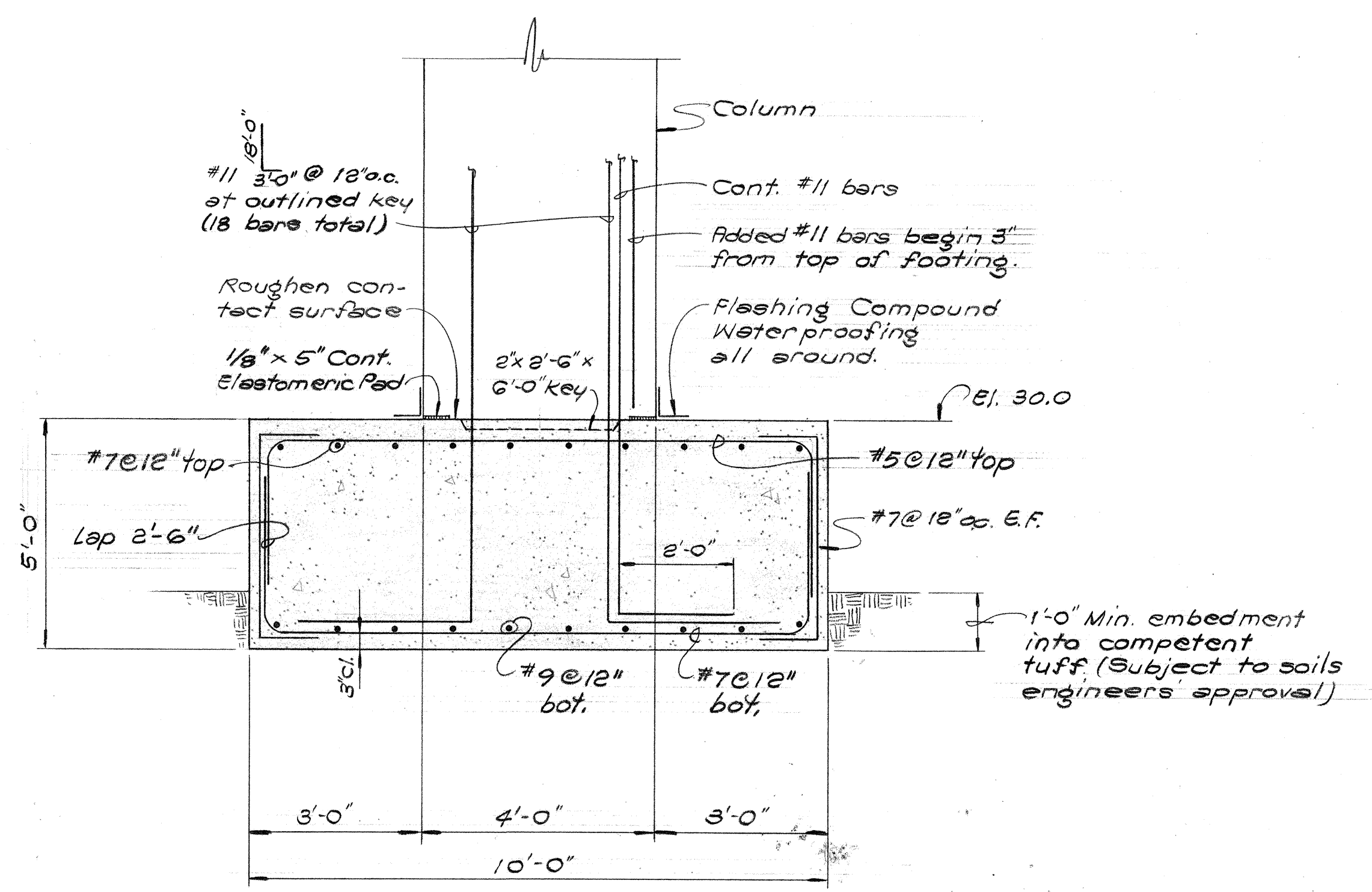


SECTION "B"-B"
1/8" = 1'-0"

- NOTES:
- Concrete for column shall be placed by means of an "elephant trunk" in order to avoid segregation of the concrete mix.
 - Reinforcing for column and footing shall conform to ASTM A615 Grade 60
 - Concrete 28 day minimum compressive strengths shall be as follows:
 - Footing-----3000 p.s.i. (Class A)
 - Columns-----4000 p.s.i. (Class E)

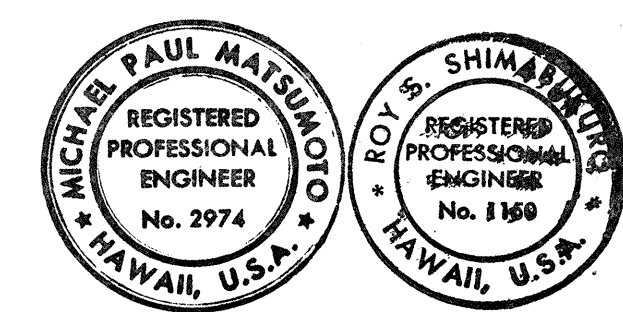


ELEVATION
3/16" = 1'-0"



SECTION "C"-C"
1/8" = 1'-0"

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HIGHWAYS DIVISION

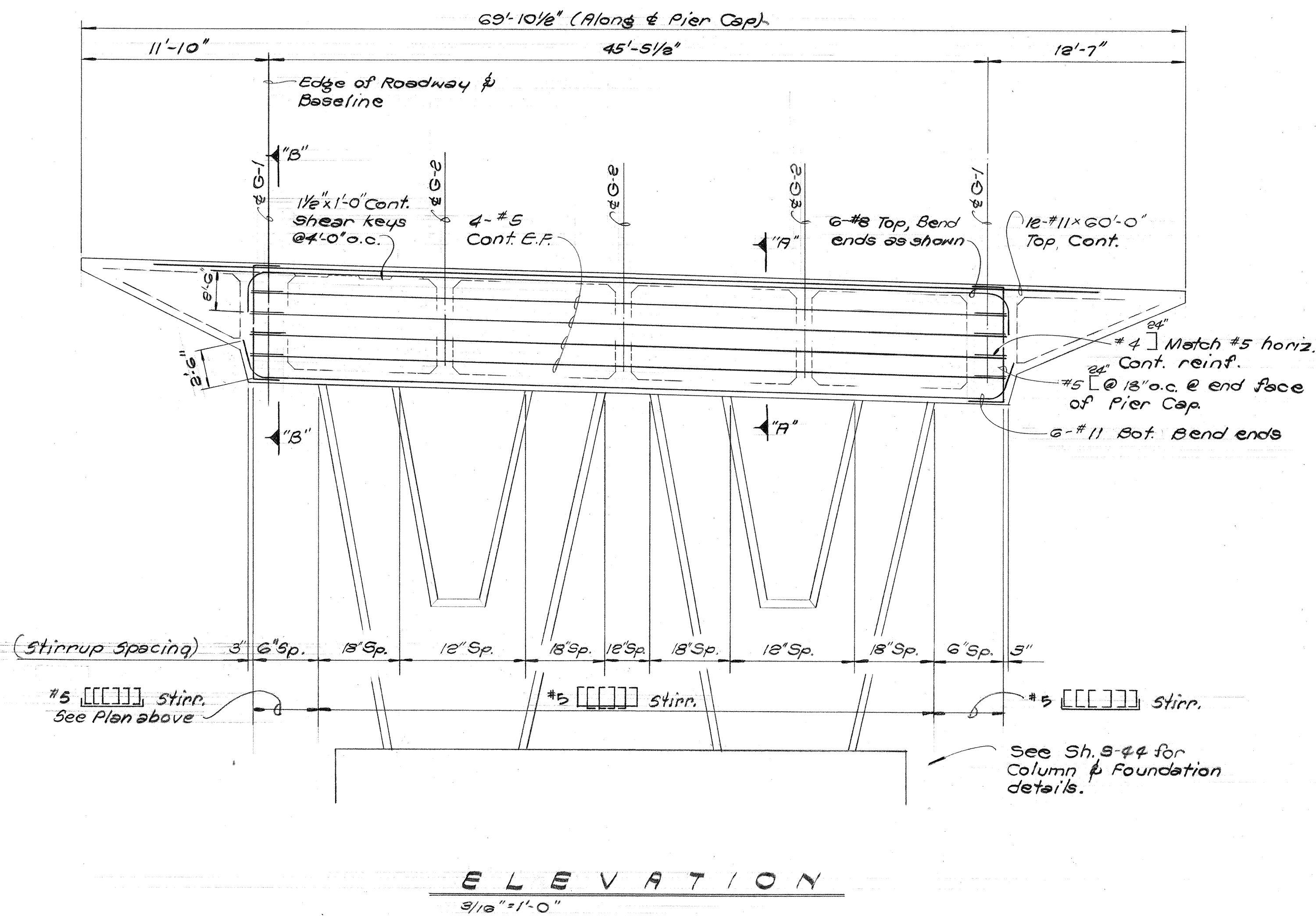
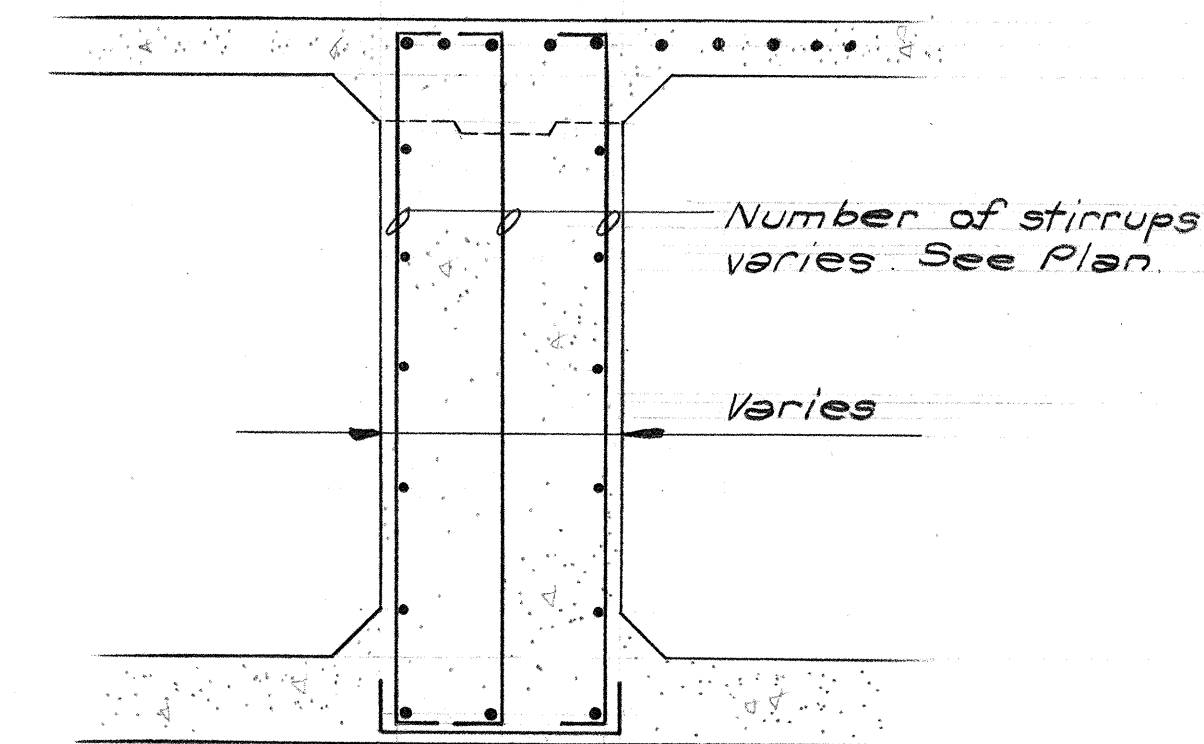
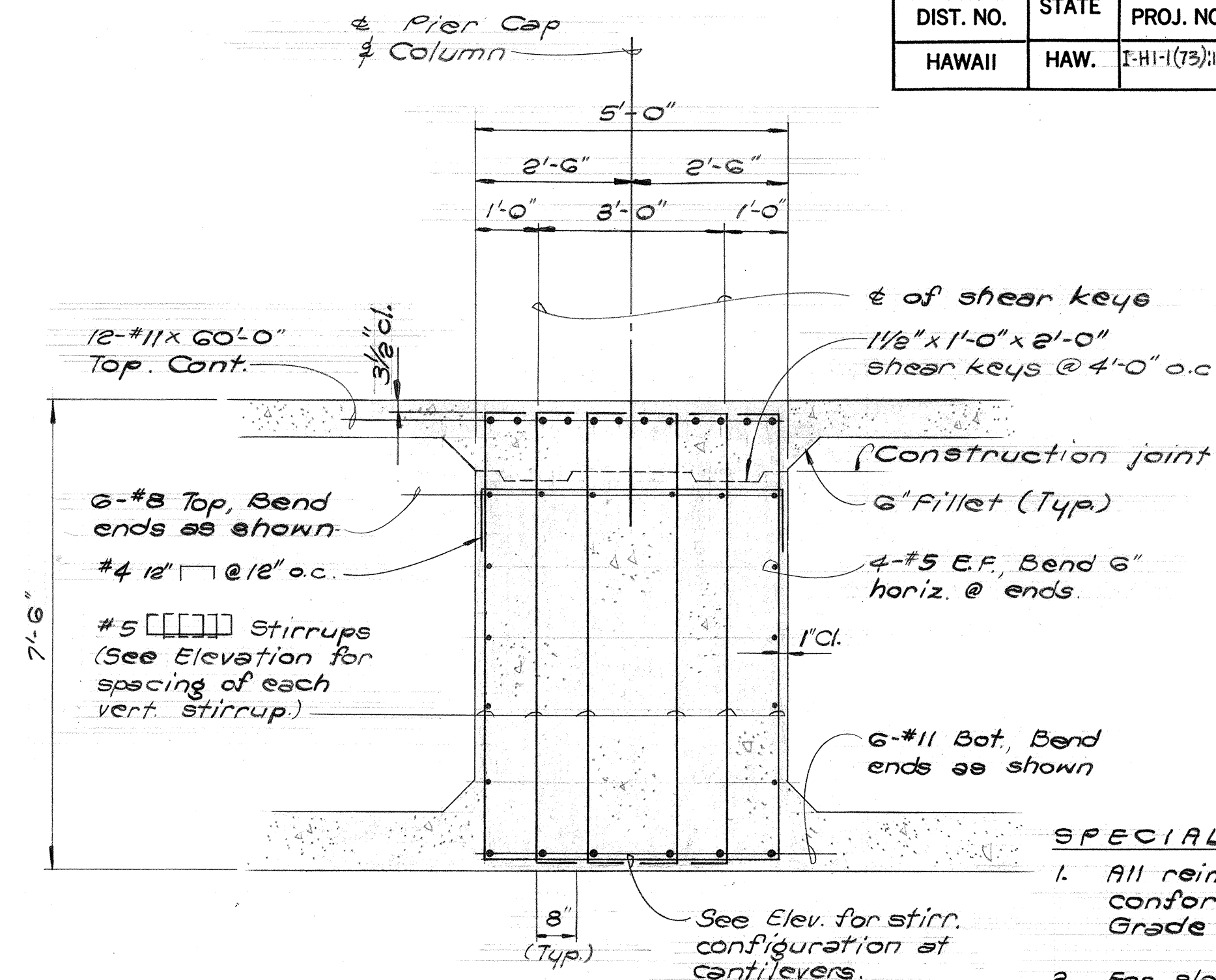
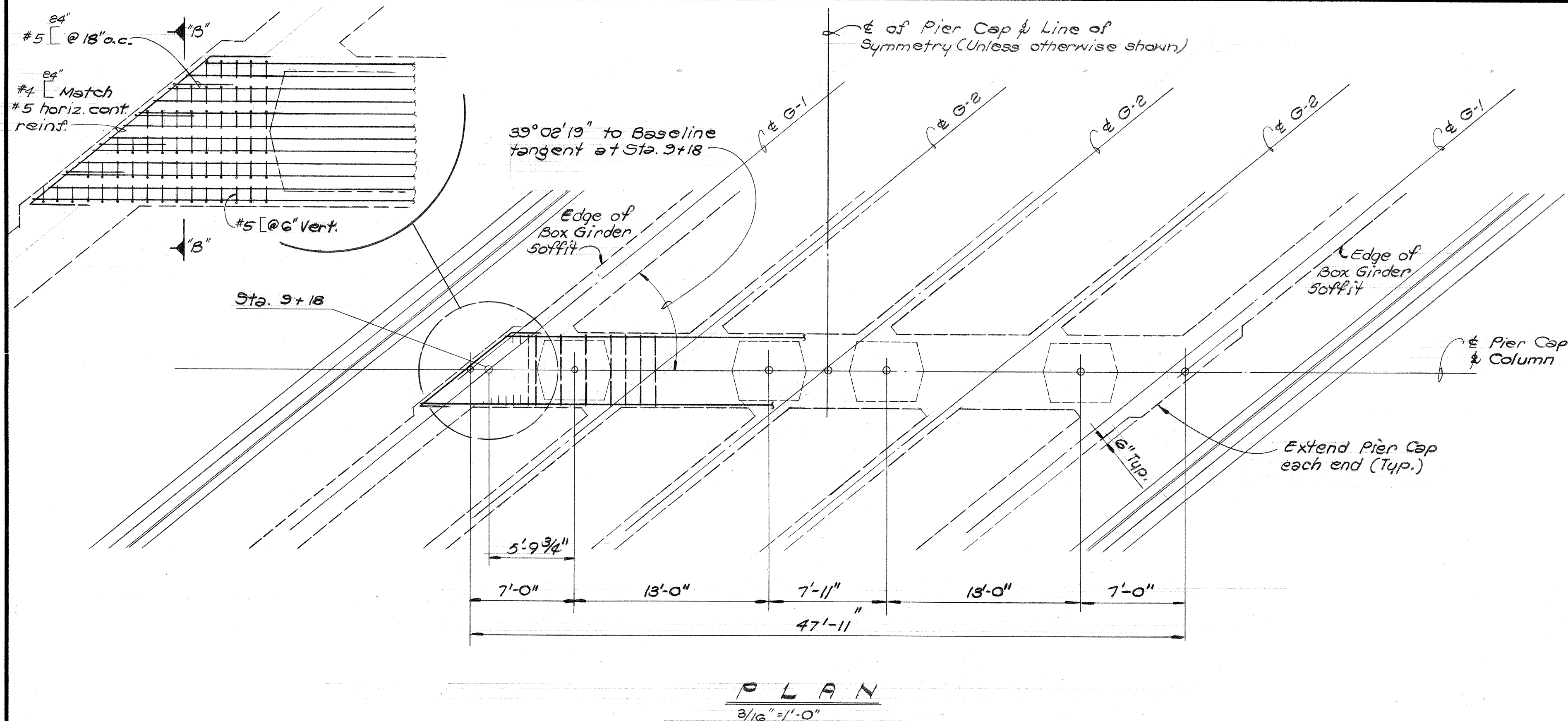
STRUCTURE No. 7

PIER #1
PLAN, ELEVATION & SECTION

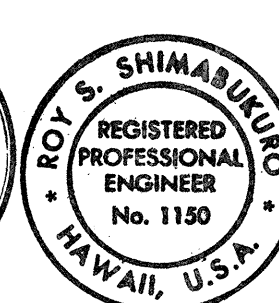
PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-HI-1(73):15
Scale: As Shown Date: DEC. 7, 1973
SHEET No. 45 OF 106 SHEETS

261

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(73)15	1974	262	369



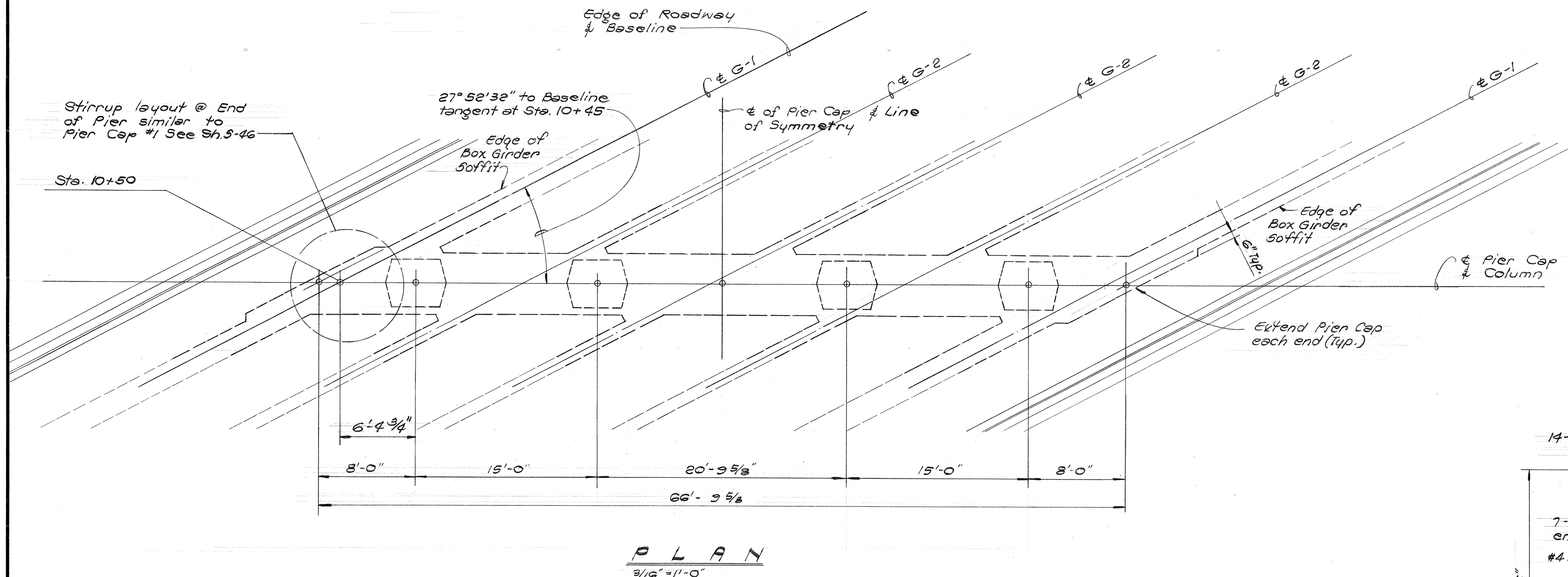
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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
STRUCTURE No. 7	
PIER #1 - PIER CAP PLAN, ELEVATION & SECTION	
PEARL HARBOR INTERCHANGE F.A.I. Proj. No. I-HI-1(73)-15	
Scale: As shown	Date: DEC. 7, 1973
SHEET No. 546 OF 106 SHEETS	

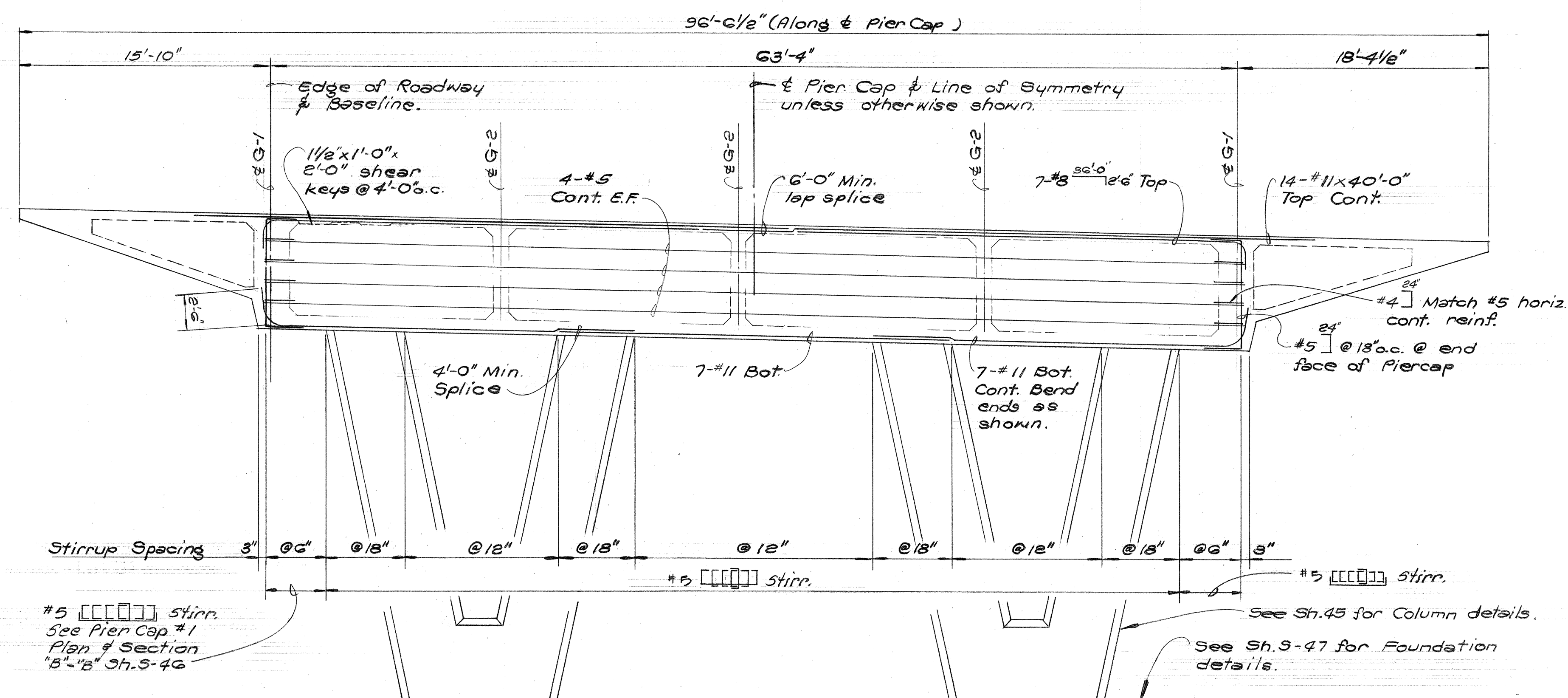
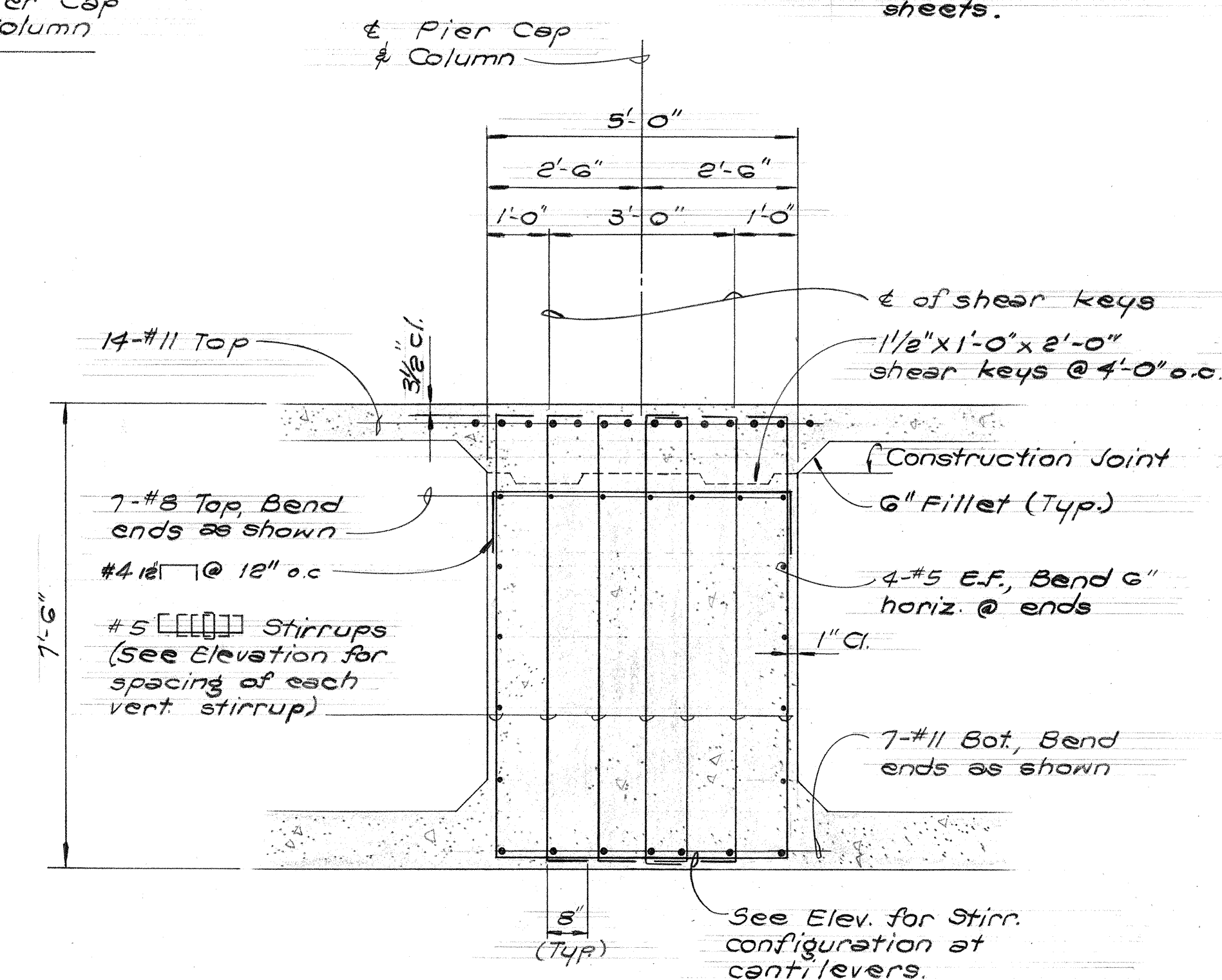
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(73)15	1974	264	369

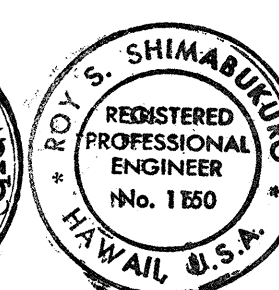
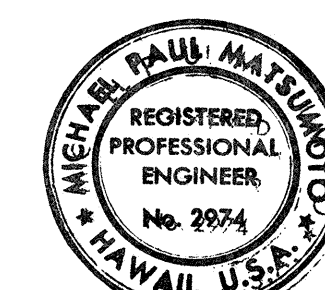


SPECIAL NOTES:

1. All reinf. shown shall conform to ASTM A615 Grade 60
2. For slab & girder reinf. not shown see other sheets.



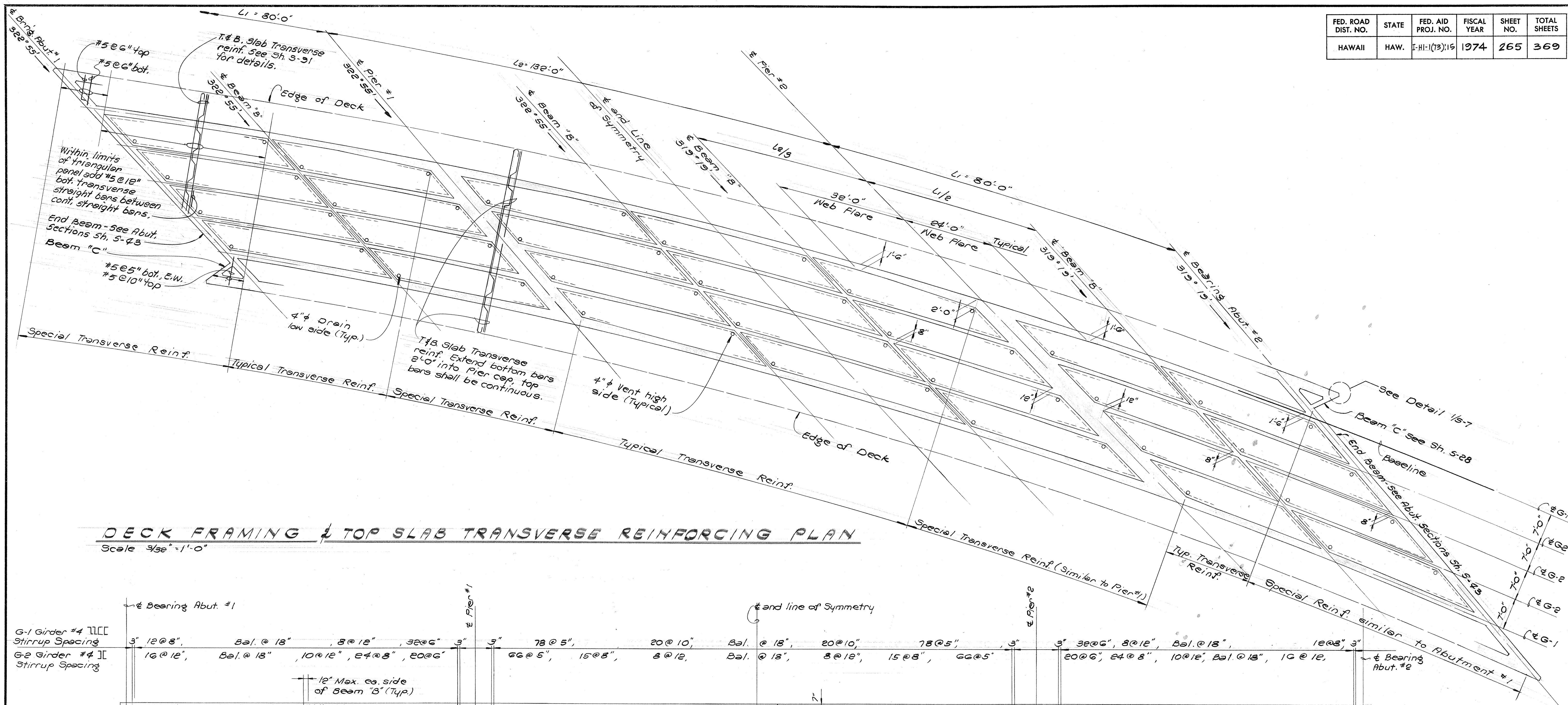
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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
STRUCTURE No. 7	
PIER #2 - PIER CAP PLAN, ELEVATION & SECTION	
PEARL HARBOR INTERCHANGE F.A.I. Proj. No. I-H-1(73):15	
Scale: As Shown	Date: DEC. 7, 1973
SHEET No. 2-48 OF 100 SHEETS	

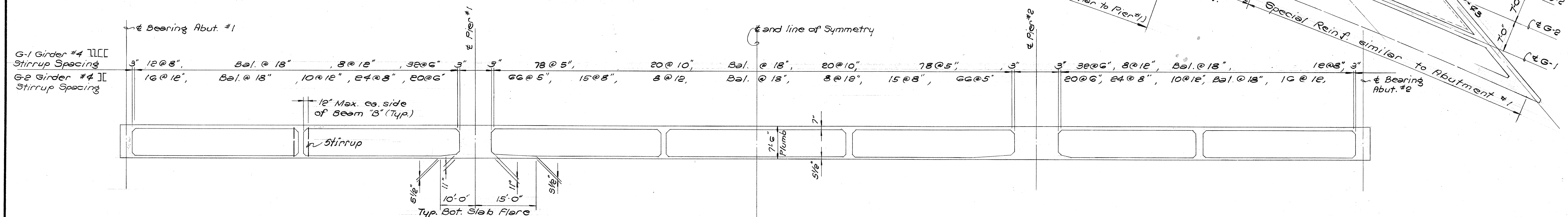
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(73)15	1974	265	369



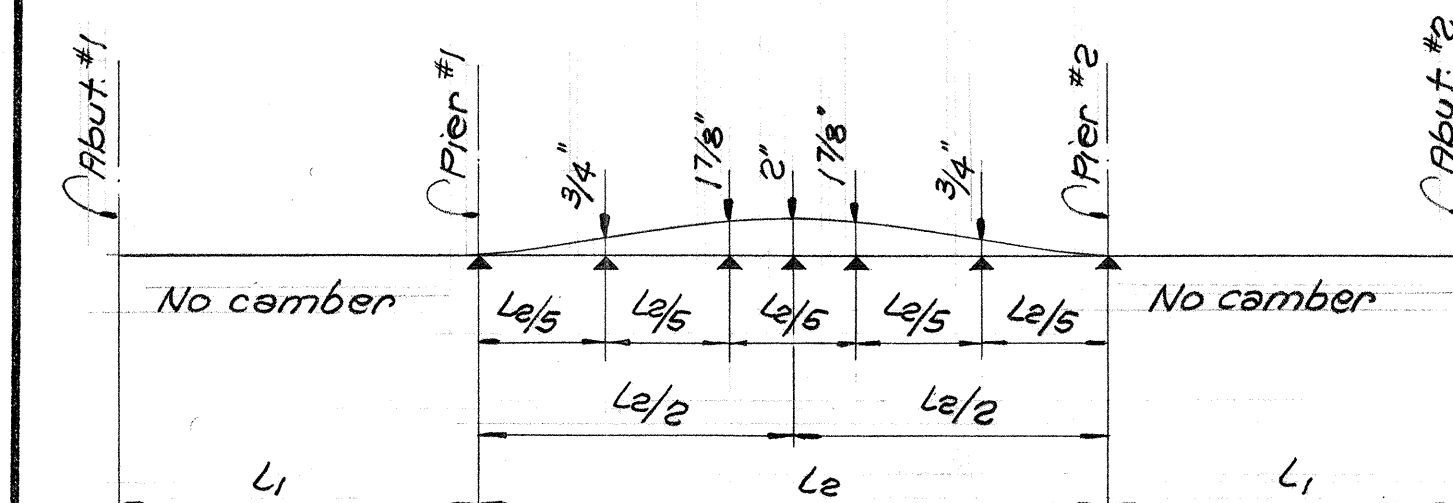
DECK FRAMING & TOP SLAB TRANSVERSE REINFORCING PLAN

Scale 3/32" = 1'-0"



ELEVATION SHOWING STIRRUP SIZE & SPACING

Scale: 3/32" = 1'-0"

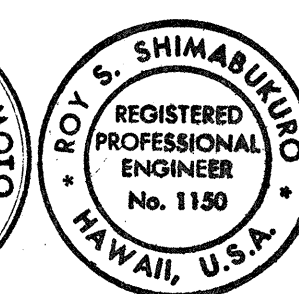
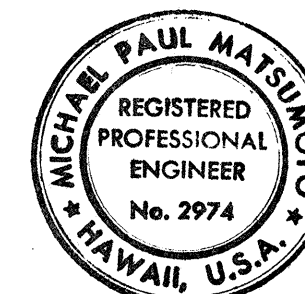


CAMBER DIAGRAM

NOTE:

False work shall be constructed in a manner that will permit cambering along the skewed lines.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURE No. 7

DECK FRAMING & TOP SLAB REINF. PLAN
& STIRRUP SIZE & SPACING

PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-HI-1 (73) 15

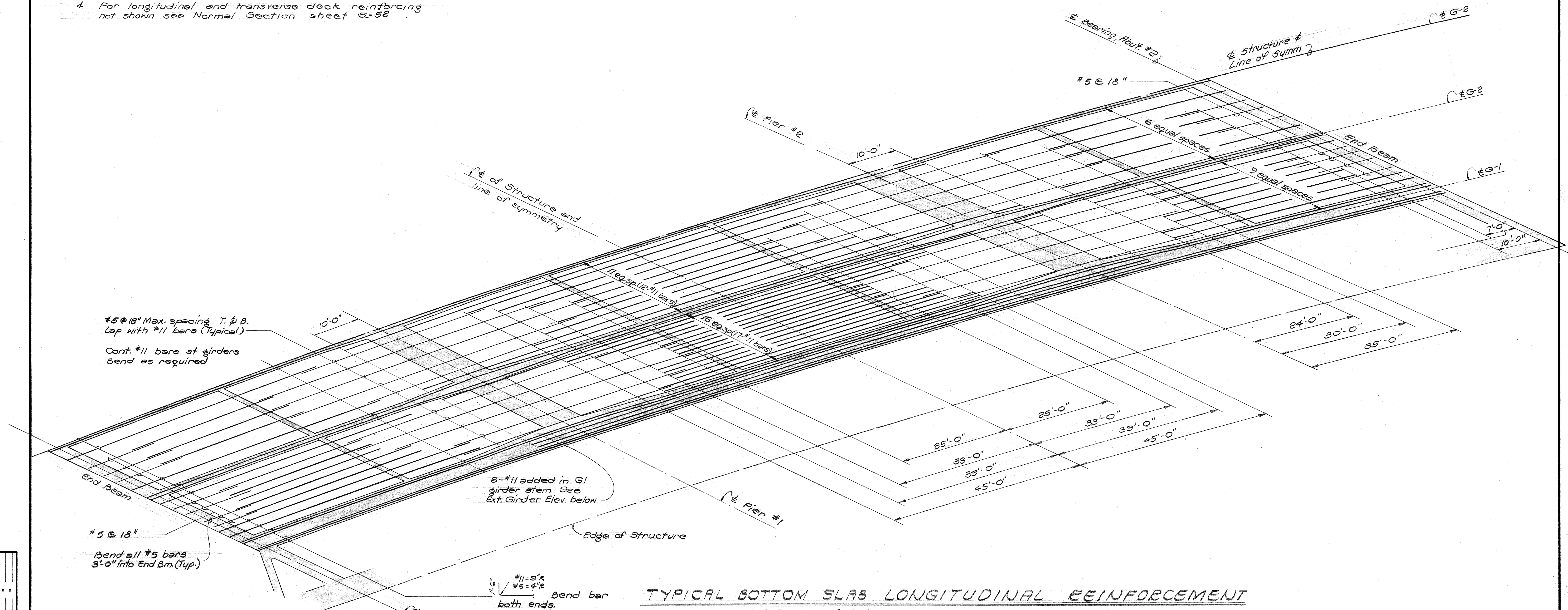
Scale: As Shown Date: DEC. 7, 1973

SHEET No. 5-49 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(73):15	1974	267	369

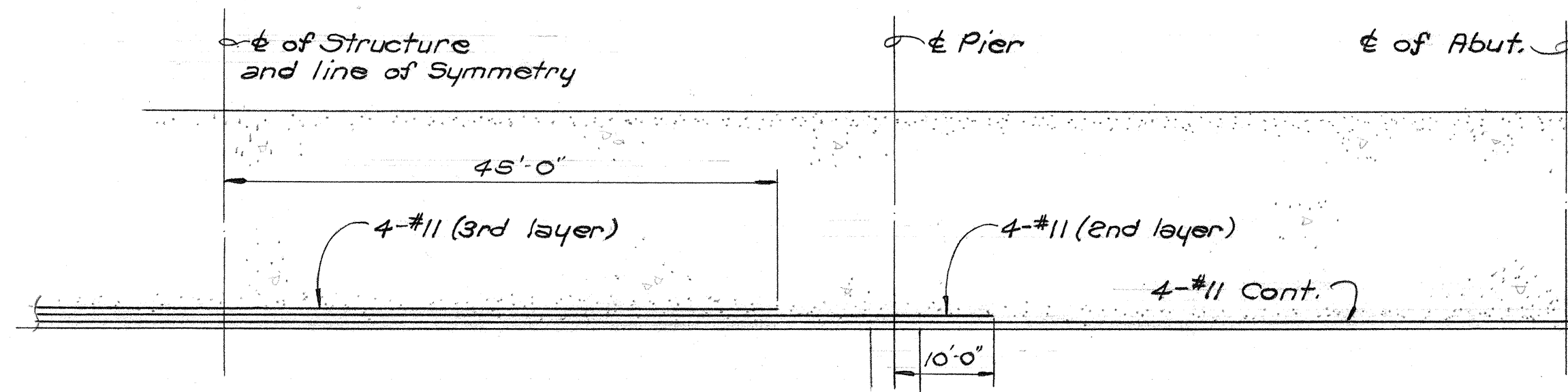
NOTES:

1. Except as otherwise noted all longitudinal bars are to be #11
2. All #5 bars at 18" max. spacing shall be extended and lapped a min. of 2'-6" with adjacent #11 bars as shown.
3. Longitudinal deck reinforcing to follow curvature of girder and deck slab where curvature occurs.
4. For longitudinal and transverse deck reinforcing not shown see Normal Section sheet S-52



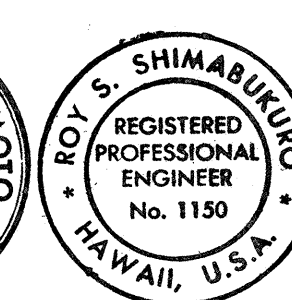
TYPICAL BOTTOM SLAB LONGITUDINAL REINFORCEMENT

Scale: Horiz. $\frac{3}{32}'' = 1'-0''$, Vert. $\frac{1}{4}'' = 1'-0''$



EXTERIOR GIRDER ELEVATION SHOWING EXTENT & LAYOUT OF #11 REBARS

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Consulting Structural Engineers
1210 Ward Ave., Honolulu, HI 96814



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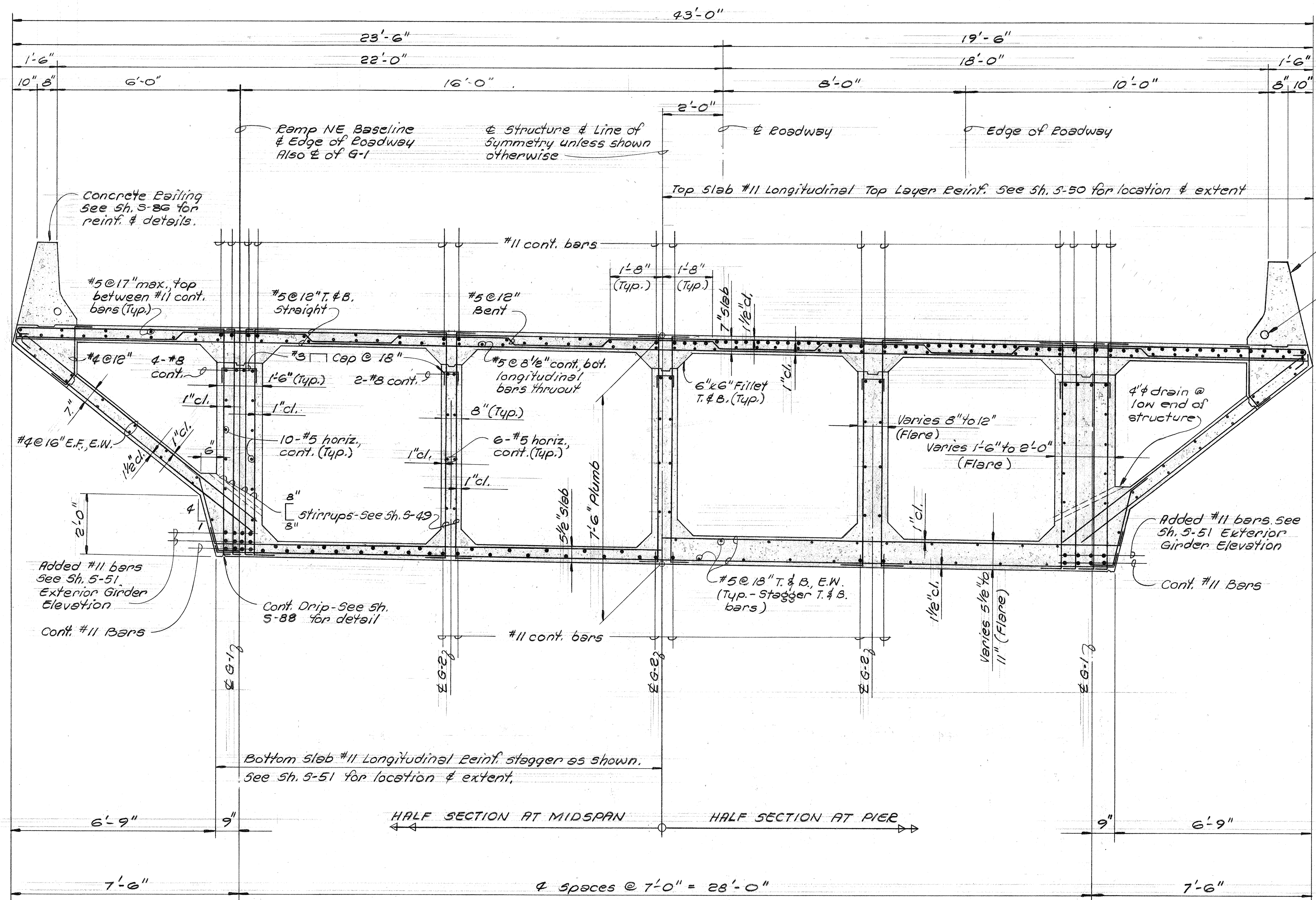
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURE No. 7
BOT. SLAB BOT. LAYER LONGIT.
REINFORCEMENT.

PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-H-1 (73):15

Scale: As Shown Date: DEC. 7, 1973
SHEET No. 5-51 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(73)15	1974	268	369



Concrete Railing - See Sh. 5-86 for reinf. & details.

Light conduit. See Elec. Dwg.

REINFORCING NOTES

1. Bend all bottom longitudinal #11 bars 30° @ Abutment ends.
2. All slab transverse reinforcing shall be placed normal to the Baseline.
3. Longitudinal deck reinforcing along edge of deck to follow curvature of deck edge.
4. For Special Transverse Reinf. at Abutments & Piers due to skew See Sh. 5-49

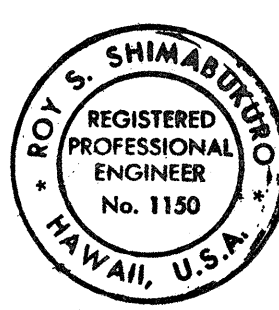
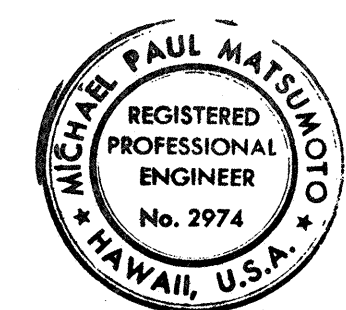
REFERENCE DRAWINGS

1. Stirrup size & spacing ---- Sh. 5-49
2. Top Slab added reinf. Plan ---- Sh. 5-50

TYPICAL BOX GIRDER SECTION

Scale: 1/2" = 1'-0" (Dimensions shown are normal to Baseline)

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HIGHWAYS DIVISION

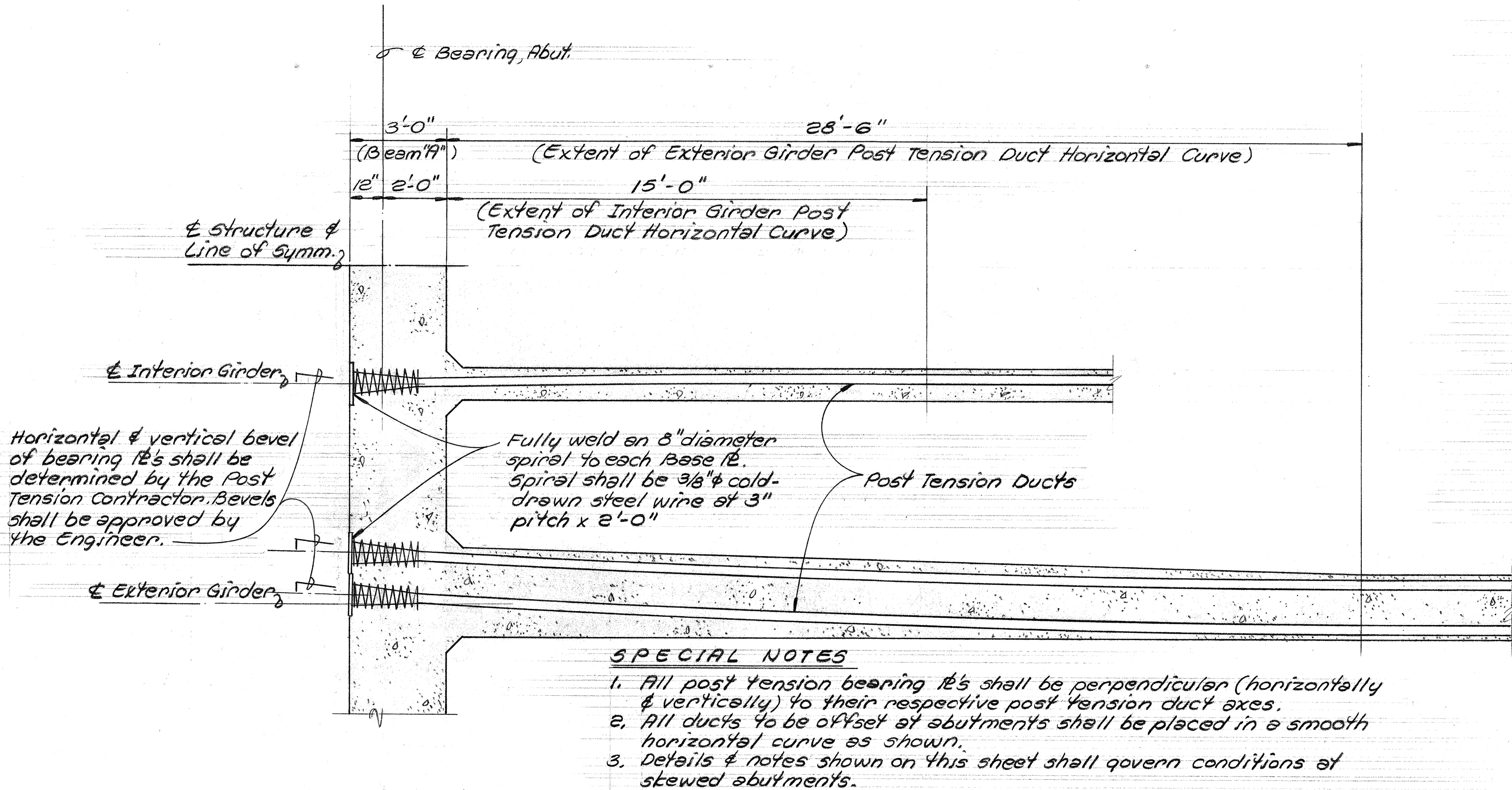
STRUCTURE No. 7
TYPICAL BOX GIRDER SECTION

PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-HI-1 (73) 15

Scale: As Shown Date: DEC. 7, 1973

SHEET No. 5-52 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(73):15	1974	297	369



PLAN - POST TENSION DUCT LAYOUT IN EXTERIOR & INTERIOR GIRDER
3/8" = 1'-0"

TYPICAL POST TENSION NOTES

- See specifications for other post tension requirements.
- All ducts shall be securely anchored at all times during construction to prevent any damage. Contractor shall exercise the maximum amount of care during placement of ducts, reinforcing & concrete in order to protect the ducts from damage.
- 1/2" & 270k strands shall be used for post tensioning.
- All strands are to be placed after the concrete is poured & the following criterion is met:
The last concrete placed must have attained a compressive strength equal to 4,000 p.s.i. & a minimum of 14 days must have elapsed since its placement.
- All prestressing steel shall be tensioned by means of hydraulic jacks so that the force in the prestressing steel shall not be less than the value shown on the plans. The force in the pre-stressing steel shall be considered as the smaller of the two values as determined by the measured elongation and the gage pressure.
- All ducts shall be cleaned out before placing strands.
- Strands shall be end anchored at an equivalent "anchor set" of 1/2".
- Post tensioning sequence shall be as follows:
a) All lower-most ducts in each girder shall be completely tensioned in the same day.
b) A minimum of 30% of the remaining ducts above the lower most ducts in each girder shall be completely tensioned in the same day.
c) The remaining ducts in each girder shall be completely tensioned.
- After all post tension operations & testing, if required, are completed, all ducts shall be grouted in accordance with the specifications.
- After grouting is completed, the anchorage assembly shall be reinforced & protected as shown above.

POST TENSION DESIGN NOTES

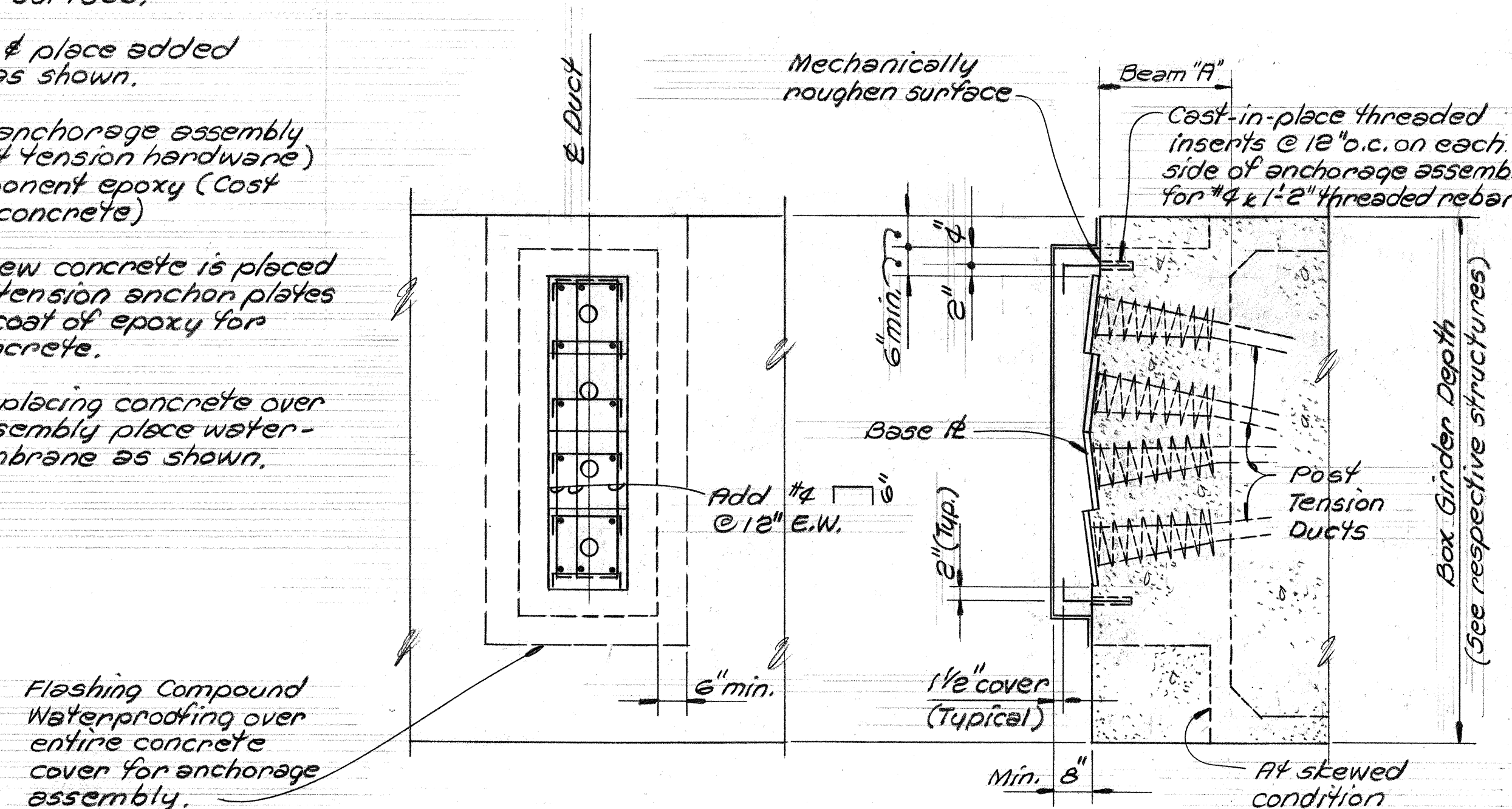
- Design is based on $K = 0.002$ (friction wobble coefficient) & $M = 0.25$ (curvature friction coefficient)
- Jacking stress for all strands shall be 70% of ultimate.
- Minimum concrete compressive strength at 28 days for the concrete box girder shall be 5,000 p.s.i.

SPECIAL NOTES:

- Contractor shall take steps necessary to allow Superstructure to contract during tensioning operations. During tensioning operations the box girder soffit forms will be subject to the same compressive force as the concrete box girder unless compressible joints &/or bond breakers are provided to relieve this force.
- No tensioning or grouting shall be performed in the absence of the Engineer.
- Friction test shall be conducted prior to final tensioning of strands to verify assumed friction loss. Payment to be incidental to post tensioning operation of the structures.

ANCHORAGE ASSEMBLY PROTECTION NOTES

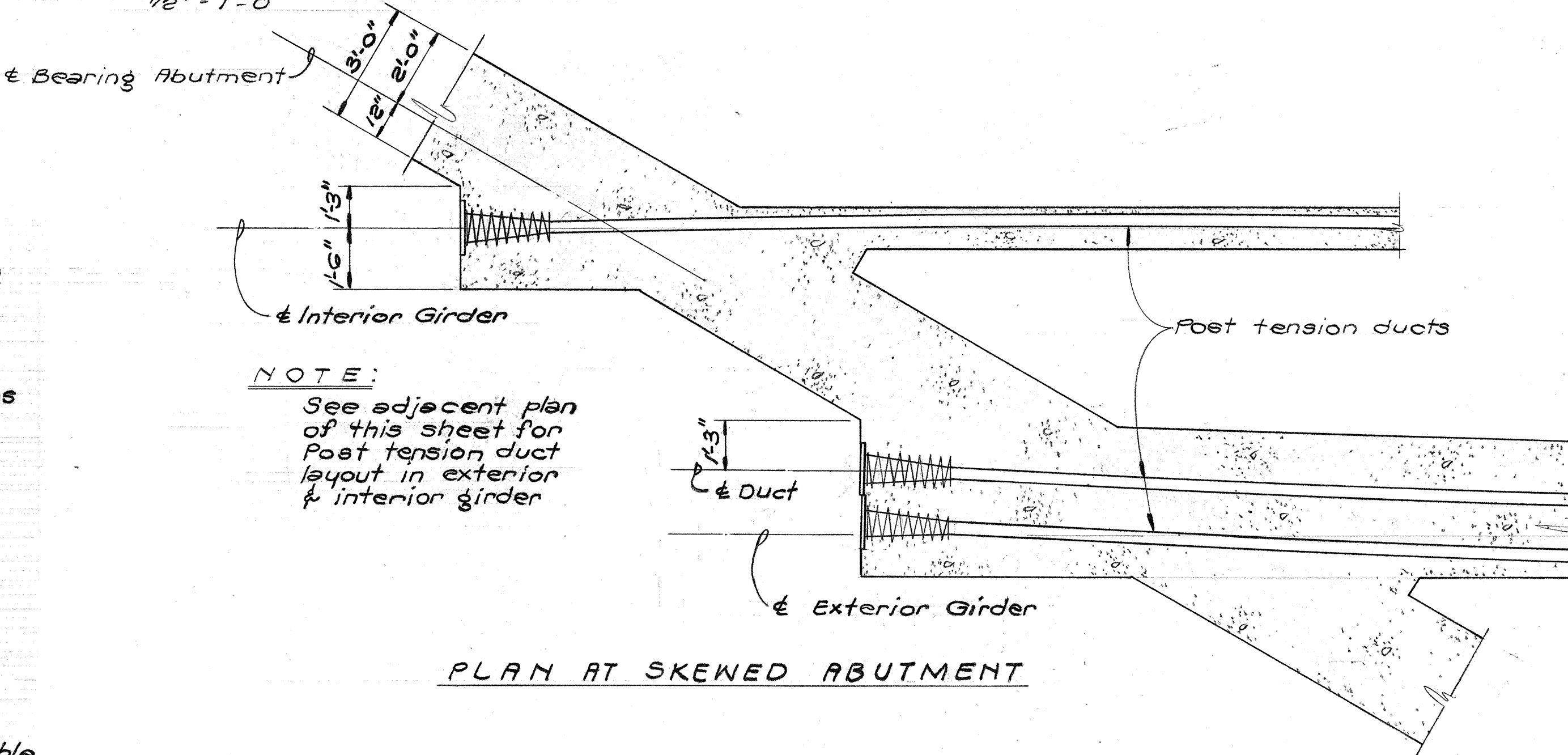
- After all post tension work is completed, clean hardware as required in order to provide good bonding surface.
- Bend dowels & place added reinforcing as shown.
- Paint entire anchorage assembly (including post tension hardware) with two component epoxy (Cost incidental to concrete)
- Just before new concrete is placed against post tension anchor plates apply a new coat of epoxy for bond with concrete.
- 7 days after placing concrete over anchorage assembly place water-proofing membrane as shown.



ELEVATION SECTION

POST TENSION DUCT ANCHORAGE GROUTING DETAILS

1/2" = 1'-0"



PLAN AT SKEWED ABUTMENT

POST TENSION DUCT LAYOUT IN EXTERIOR & INTERIOR GIRDER

3/8" = 1'-0"

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REGISTERED PROFESSIONAL ENGINEER
No. 1150
HAWAII, U.S.A.

REGISTERED PROFESSIONAL ENGINEER
No. 2974
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAIL
POST TENSION DUCT LAYOUT,
DETAILS & NOTES AT BEAM "A"

PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-H-1(73):15

Scale: As Shown Date: DEC. 7, 1973

SHEET No. 3-81 OF 106 SHEETS

3'-0"

12"

2'-0"

Beam "A"

3-#6 closed stirr. @ 4" each side of post tension duct anchors

Post-tension duct anchorage assembly. See Sh. 5-81

Interior Girder

Beam "A" cont, horiz. reinf. See beam section below.

2-#6 closed stirr. @ 4" each side of post tension duct anchors

Post tension duct anchorage assembly. See Sh. 5-81

Exterior Girder & of Duct

6-#6 @ 5" a.c. closed stirr.

12" fillet (Typ.)

#5 @ bend point of ea. horiz. bar.

Girder stirrups - See respective structures

Girder cont. horiz. reinf. See respective structures

Add 2-#5 x 10'-0" horiz. between girder cont. horiz. reinf. (Typ.)

Add #5 @ every other stirrup @ each cont. horiz. bar for extent of post tension duct horizontal curve in girder stem flare. See Sh. 5-81 for extent of duct curve.

#5 @ bend of ea. horiz. bar.

Add 2-#5 x 10'-0" horiz. between girder cont. horiz. reinf. (Typ.)

Girder cont. horiz. reinf. See respective structures

Girder stirrups - See respective structures

Post tension ducts

Post tension ducts

NOTE: See Sh. 5-83 for details at skewed abutments

Drop Constr. Jt. to bottom of fillet at supports as shown.

Constr. Jt.

Post tension duct

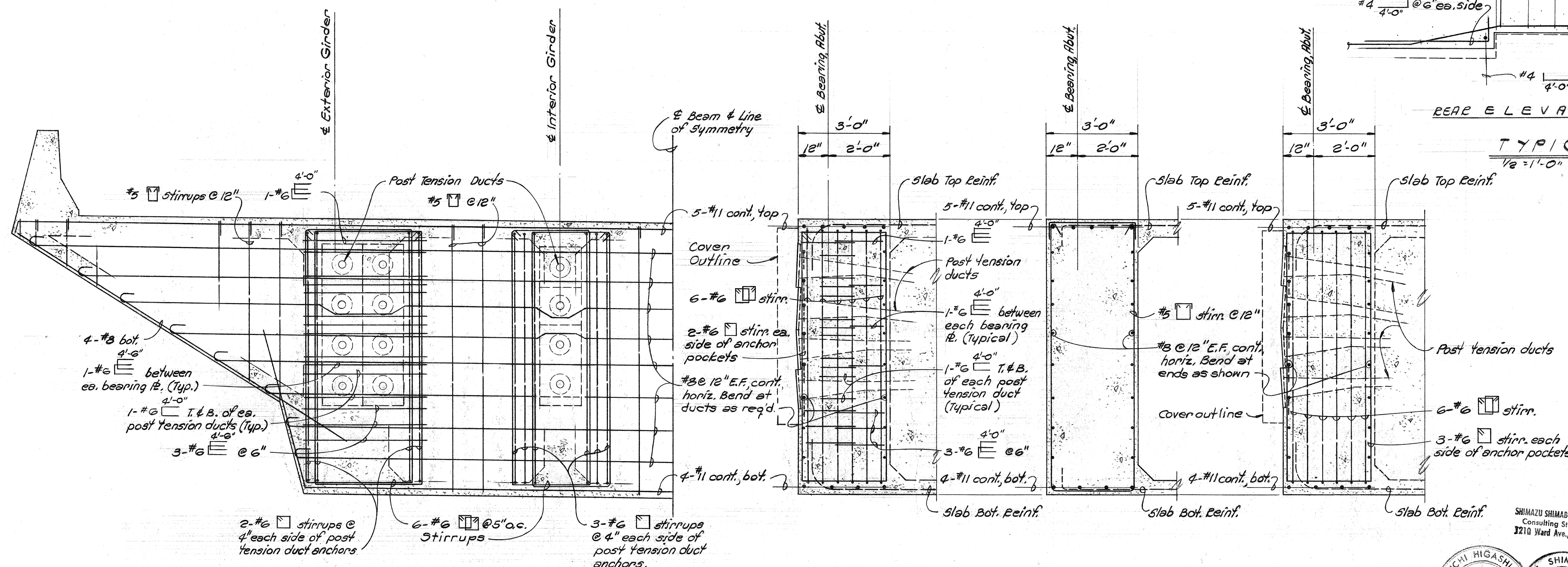
e'' min. cl. from joint to top of duct.

6" fillet

6" fillet

Slab

NOTE:
For details not shown
see Standard Detail Sheets

$$112'' = 1' - 0''$$


TYPICAL CONDITION @ CREEP BLOCK

$$\frac{1}{2} = 1' - 0''$$

AT G-1

BETWEEN GIRDERS

AT G-2

BEAM "A" ~ SECTIONS

$$1/2" = 1'-0"$$

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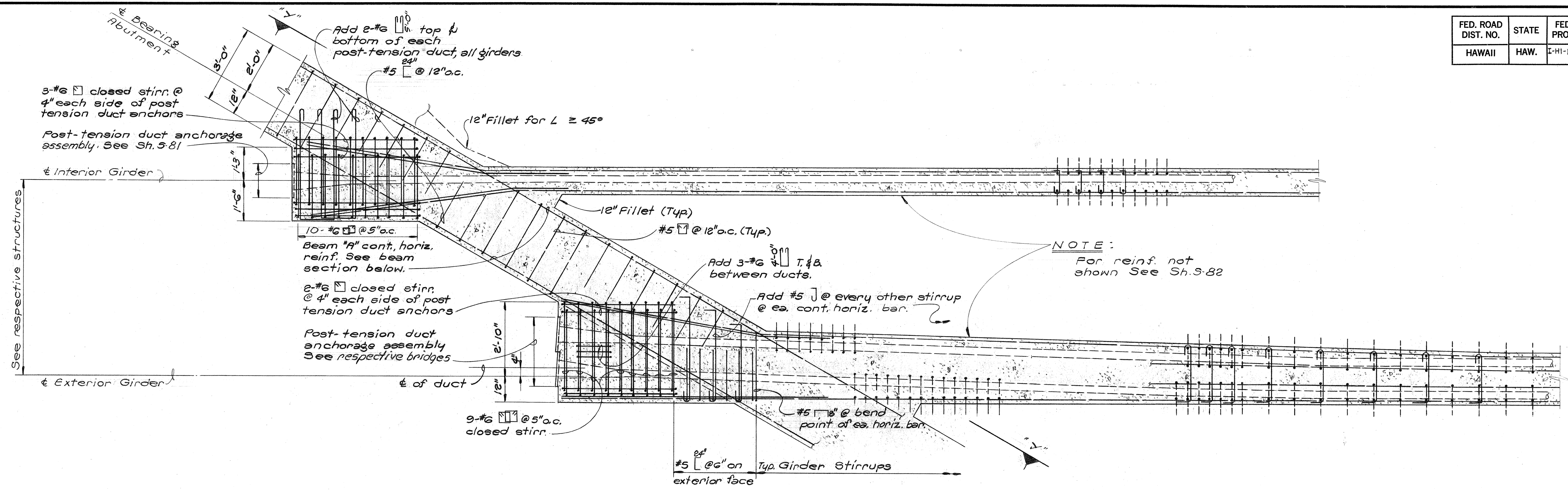
TYPICAL DETAIL

PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-HI-1 (73):15

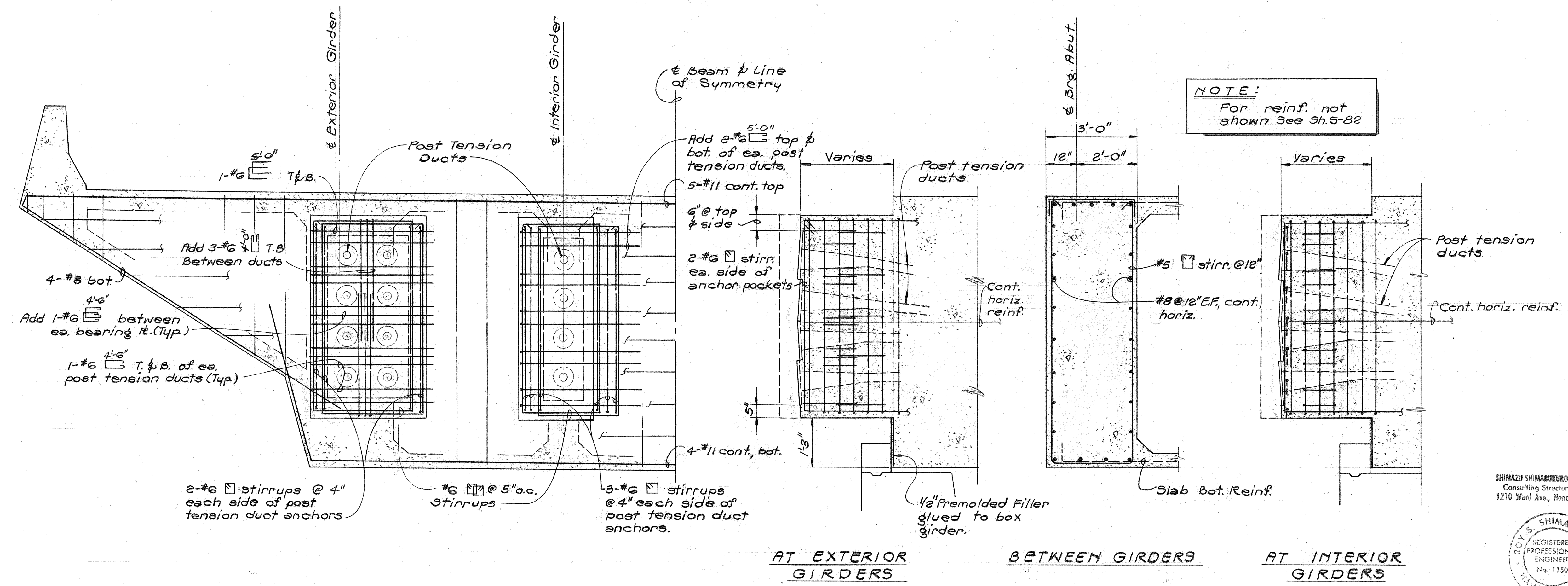
Scale: As Shown Date: DEC. 7, 1973

SHEET No. 5-82 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(73):15	1974	299	369



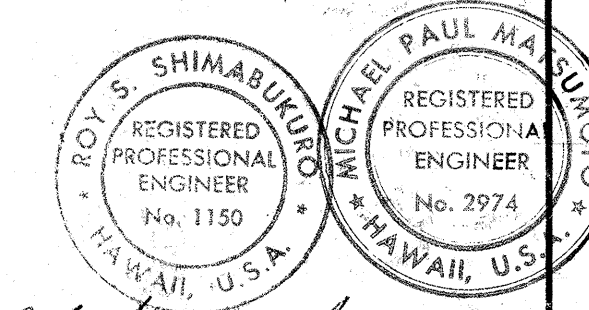
PLAN AT SKEWED ABUTMENTS
Scale = 1/2" = 1'-0"



BEAM "A" ~ ELEVATION "Y"- "Y"
1/2" = 1'-0"

BEAM "A" SECTIONS
1/2" = 1'-0"

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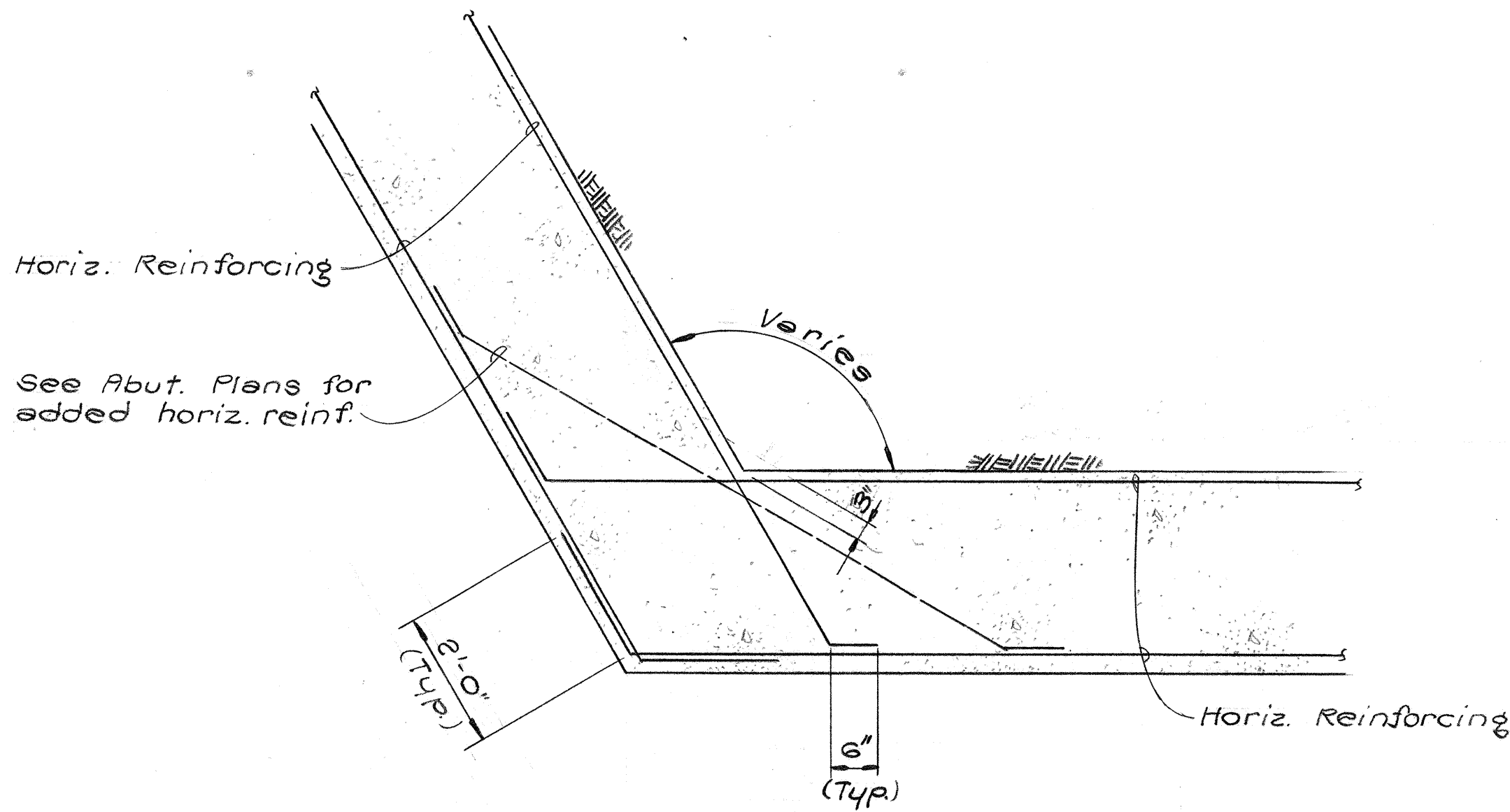
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAIL
REINFORCING DETAIL FOR BEAM "A" &
GIRDERS AT SKEWED ABUTMENTS

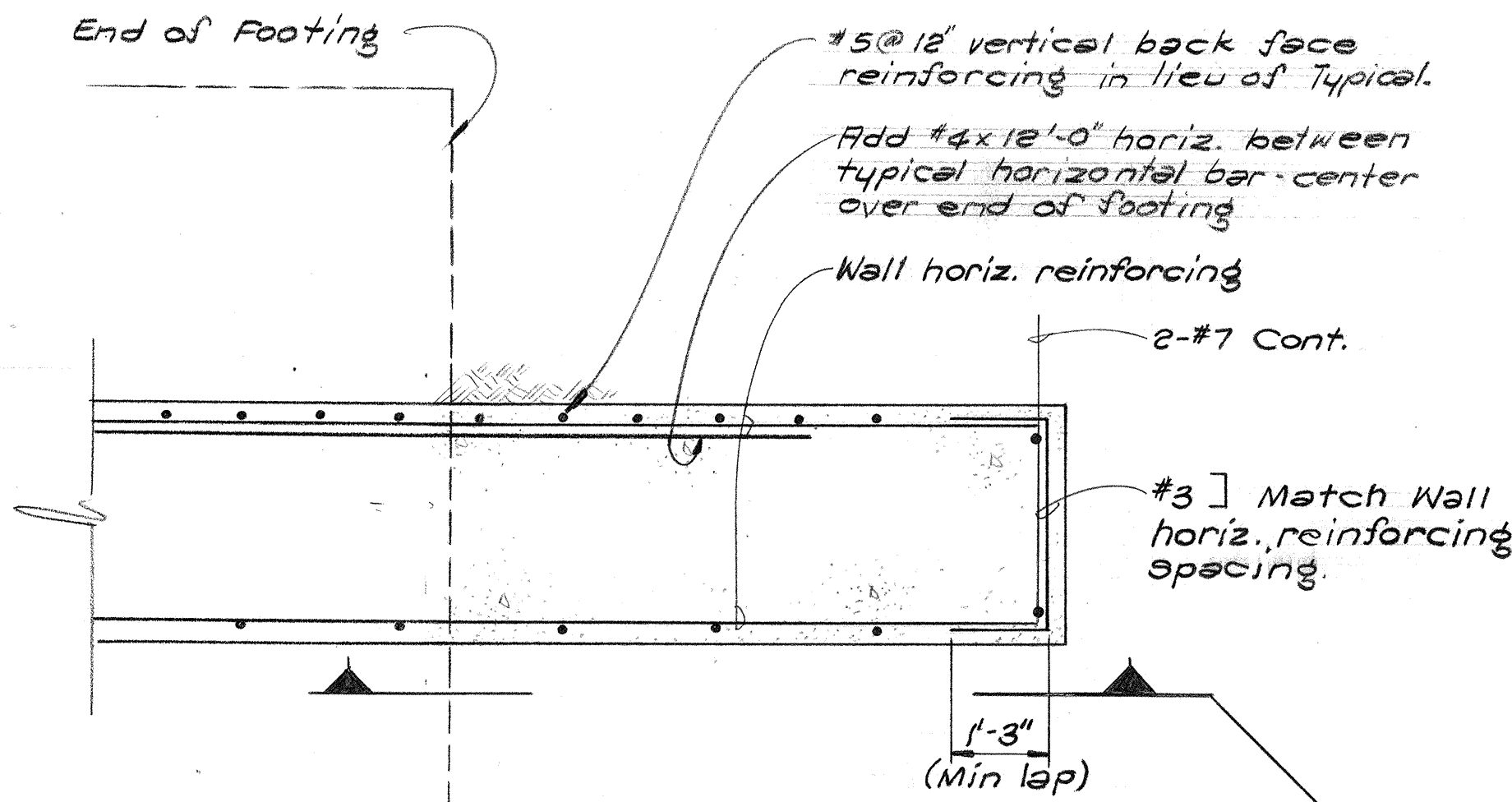
PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-HI-1(73):15
Scale: As shown Date: DEC. 7, 1973
SHEET No. 299 OF 106 SHEETS

299

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(73)15	1974	300	369



PLAN AT CORNERS



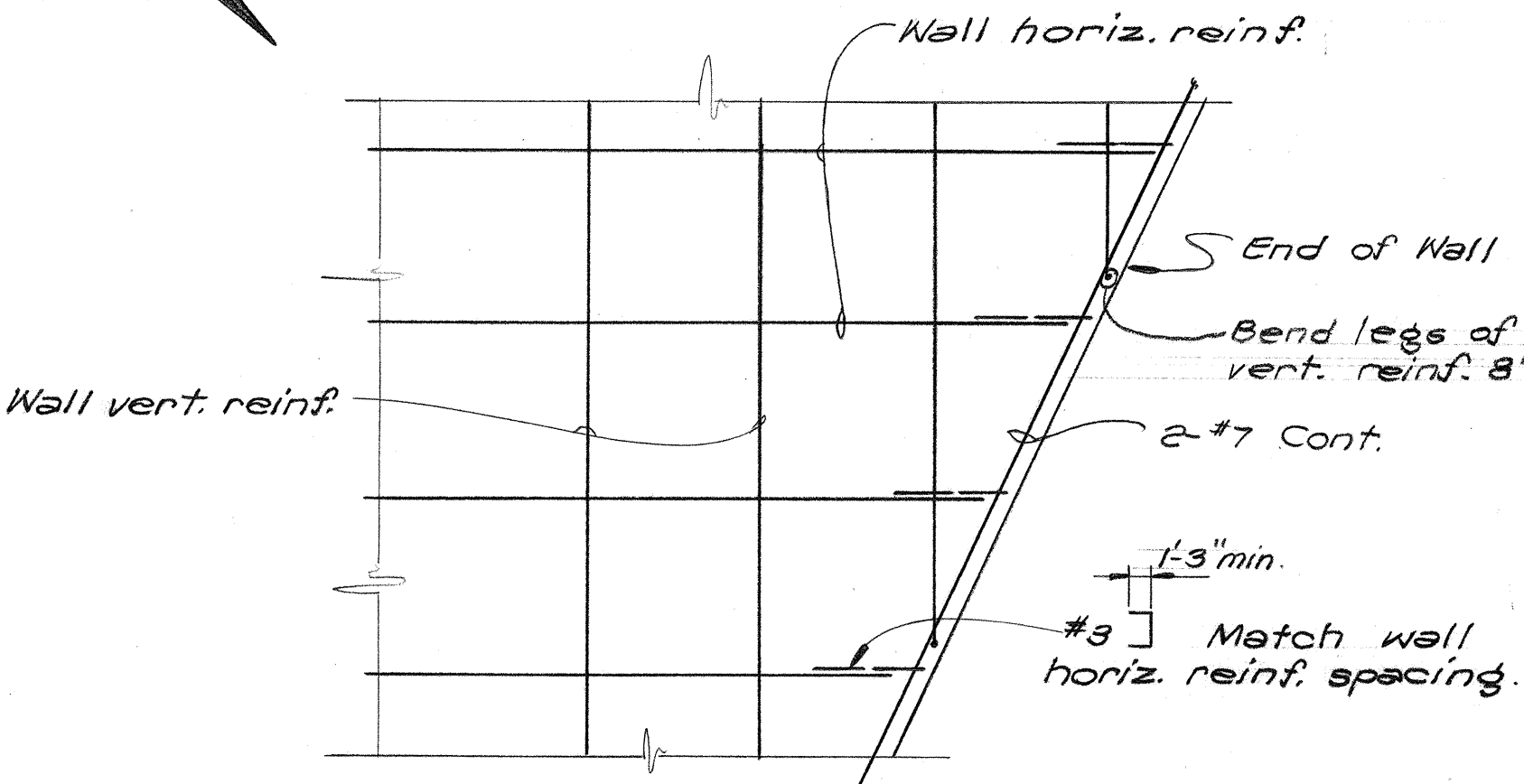
PLAN AT CANTILEVER ENDS

TYPICAL WALL REINFORCING DETAILS

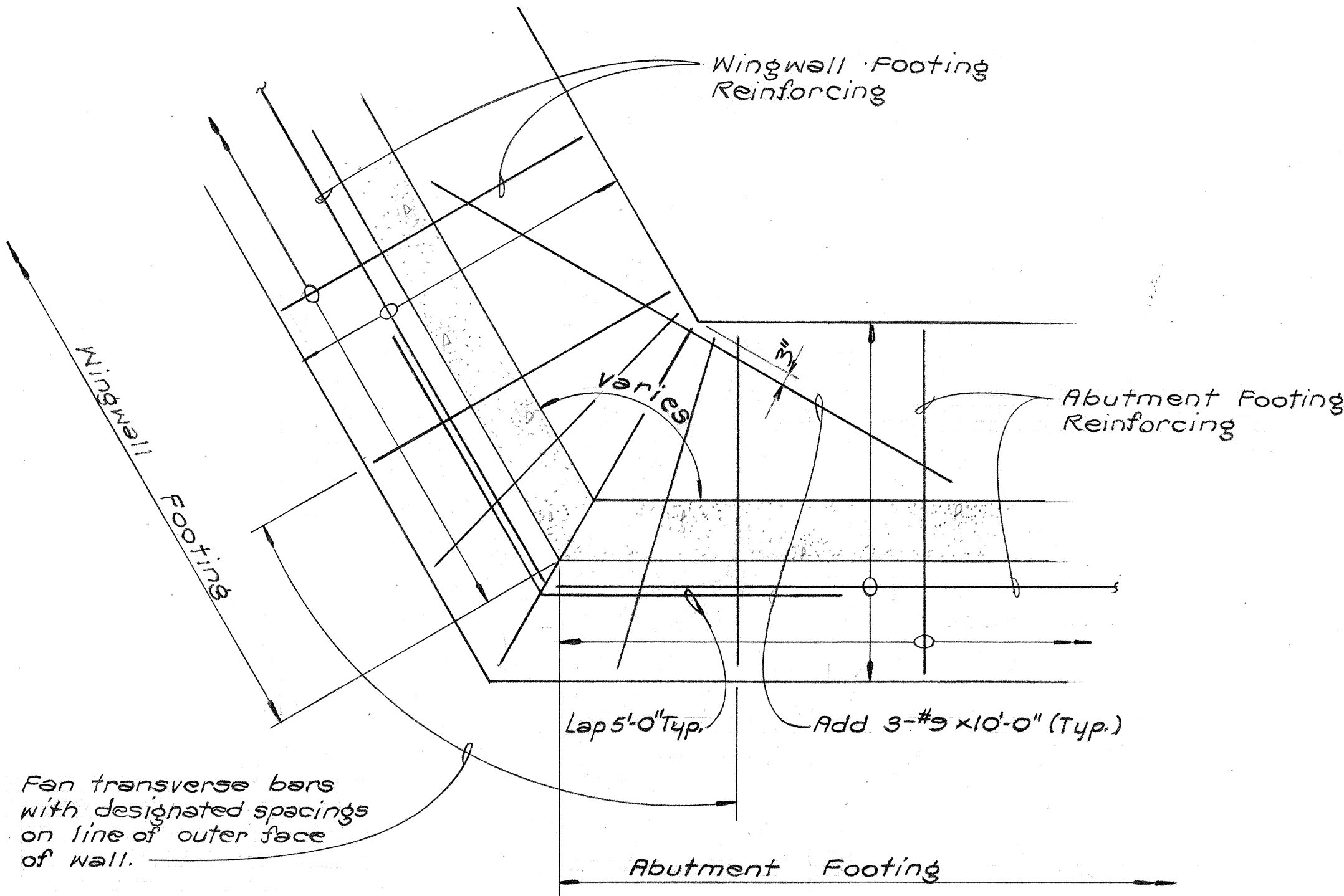
Scale: 1/2"=1'-0"

WALL & FOOTING NOTES

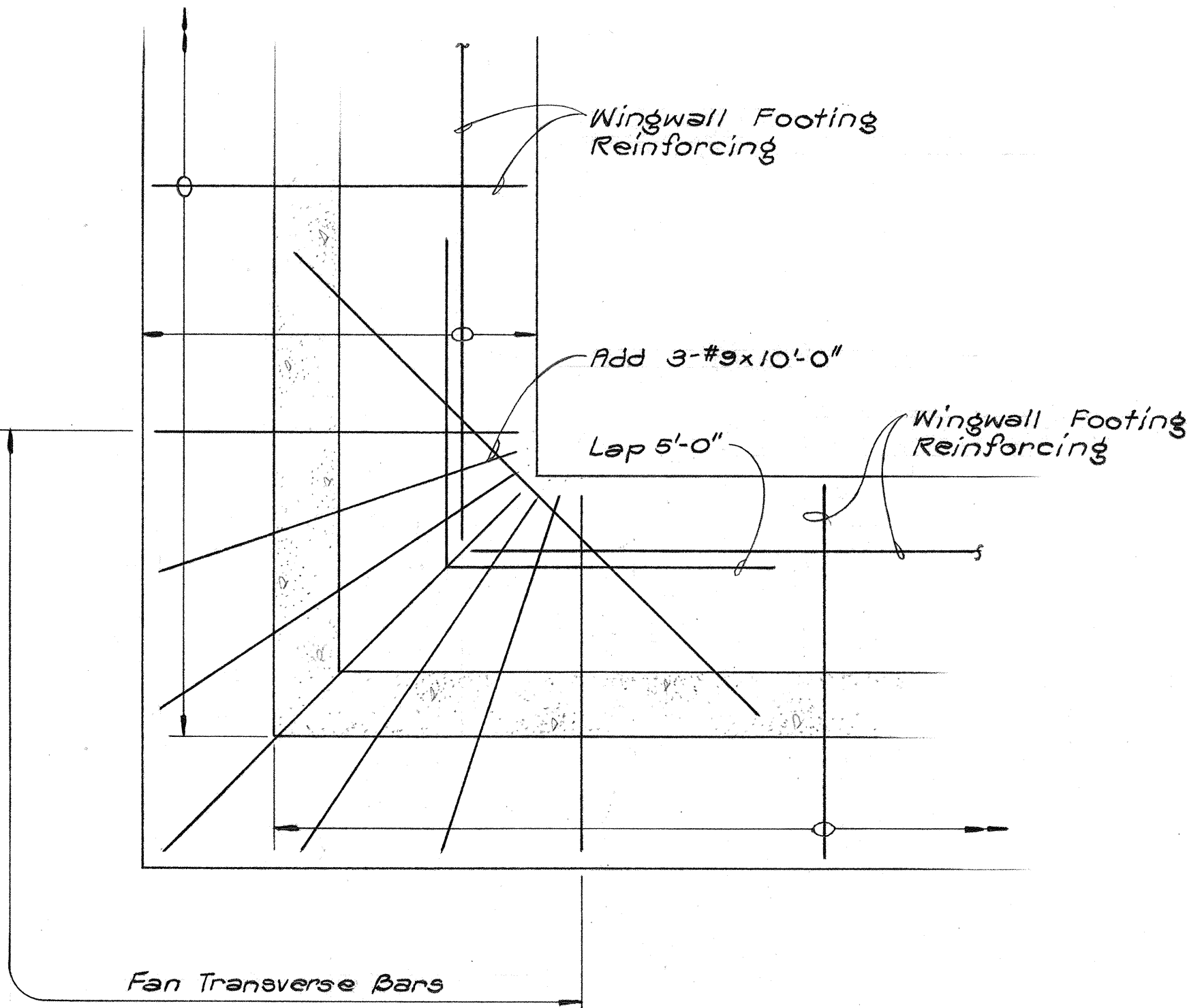
- Concrete for all footings shall be poured against neat excavations.
- All footings shall be embedded 1'-0" (minimum) into competent tuff.
- Bottom of footings shall be to elevations shown in these plans unless minimum embedment into competent tuff is not attainable - in which case the Engineer shall be notified of this situation.
- Concrete walls may be poured full height, provided pour windows 6'-0" o.c., E.W. are utilized for placing concrete.
- Minimum 28 day concrete strengths for walls & footings shall be - 3000 p.s.i.
- Reinforcing steel shall conform to A.S.T.M. A615, Grade 60.



ELEVATION



PLAN - ABUTMENT & WINGWALL CORNER FOOTING REINF.

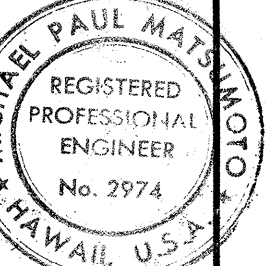
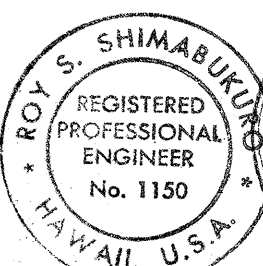


PLAN - WINGWALL CORNER FOOTING REINF.

ABUTMENT WALL & FOOTING DETAILS

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

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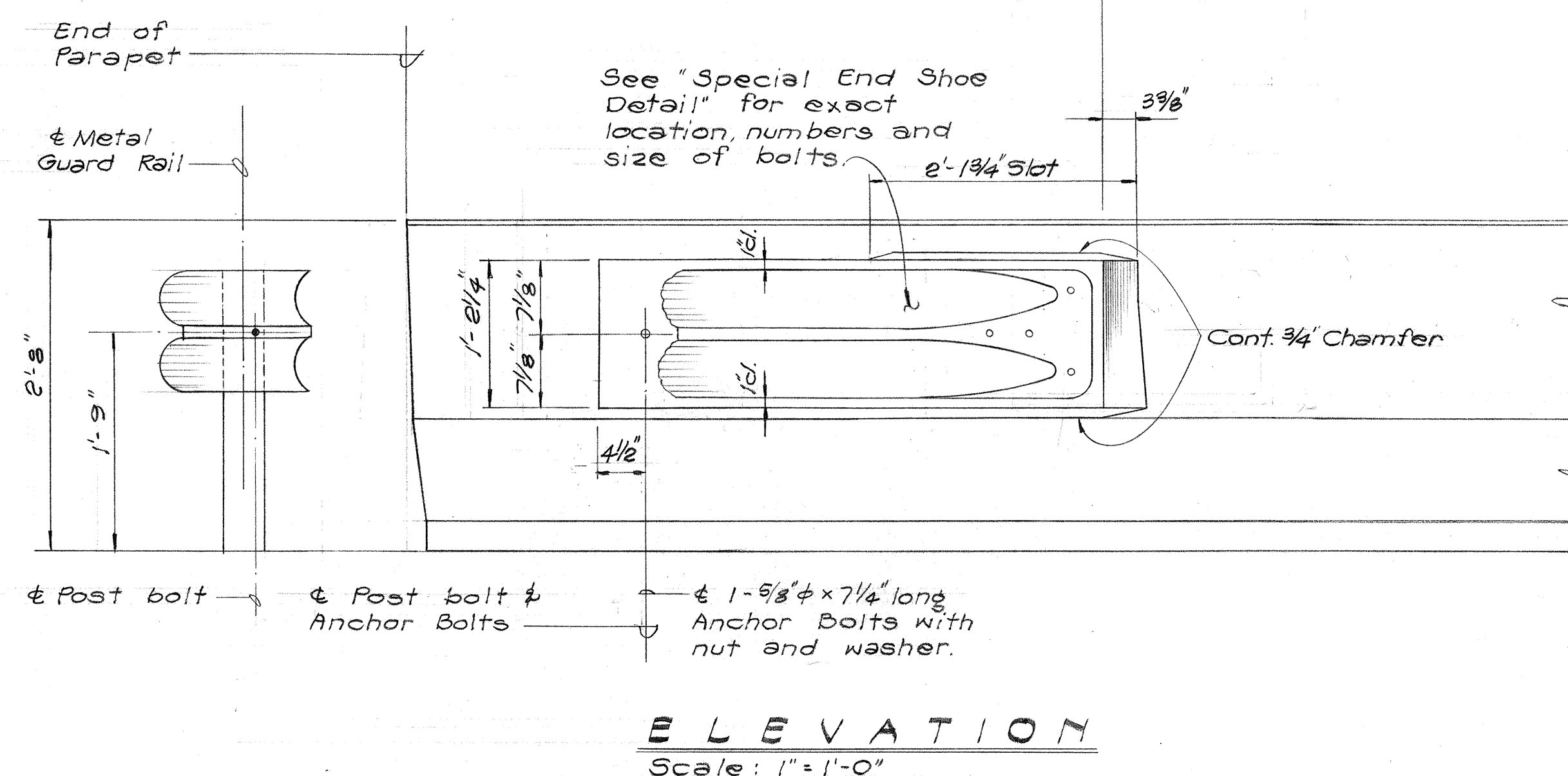
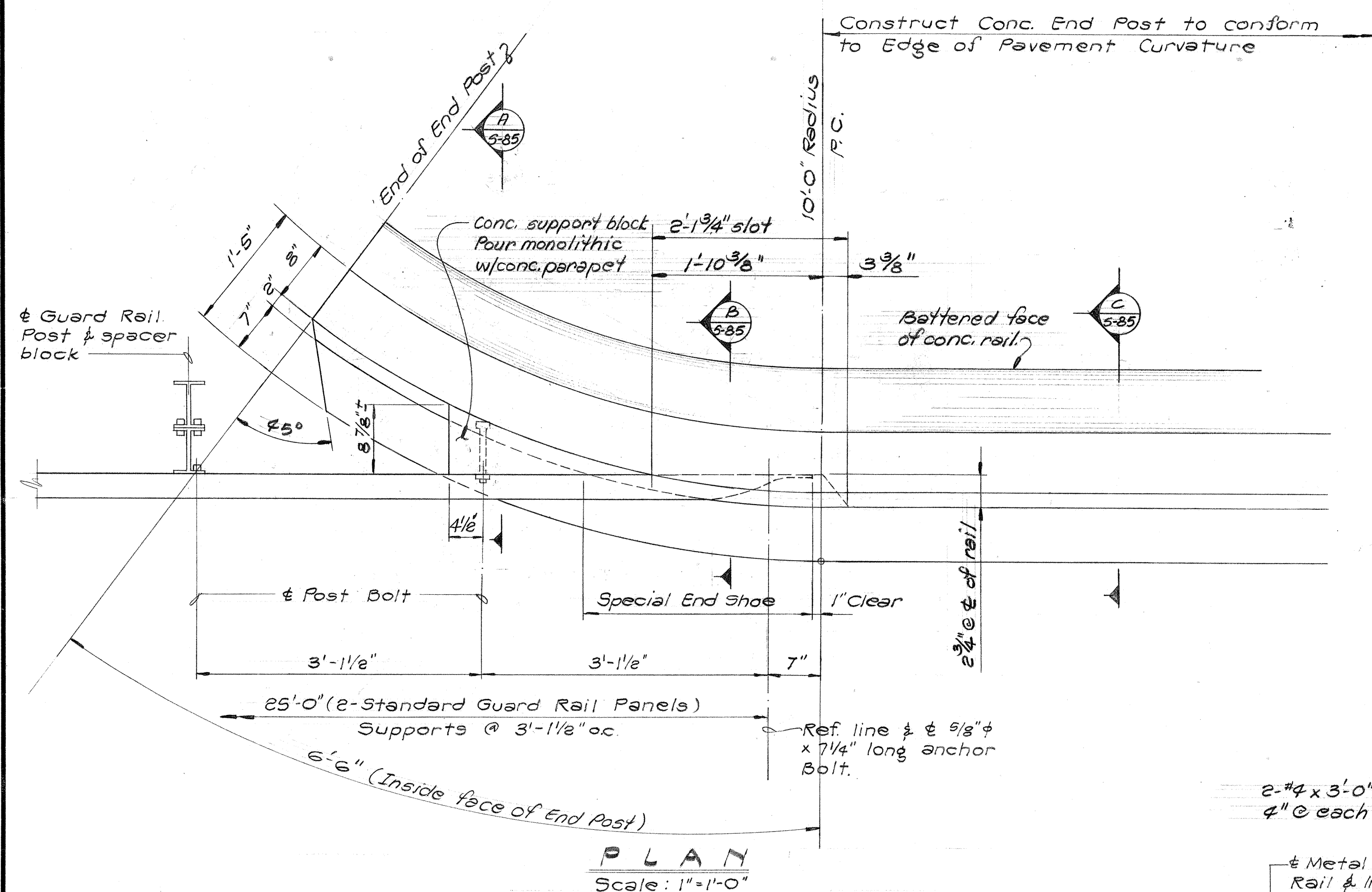
TYPICAL DETAIL
TYPICAL WALL AND FOOTING
REINFORCEMENT DETAILS

PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-HI-1(73):15

Scale: As Shown Date: DEC. 7, 1973

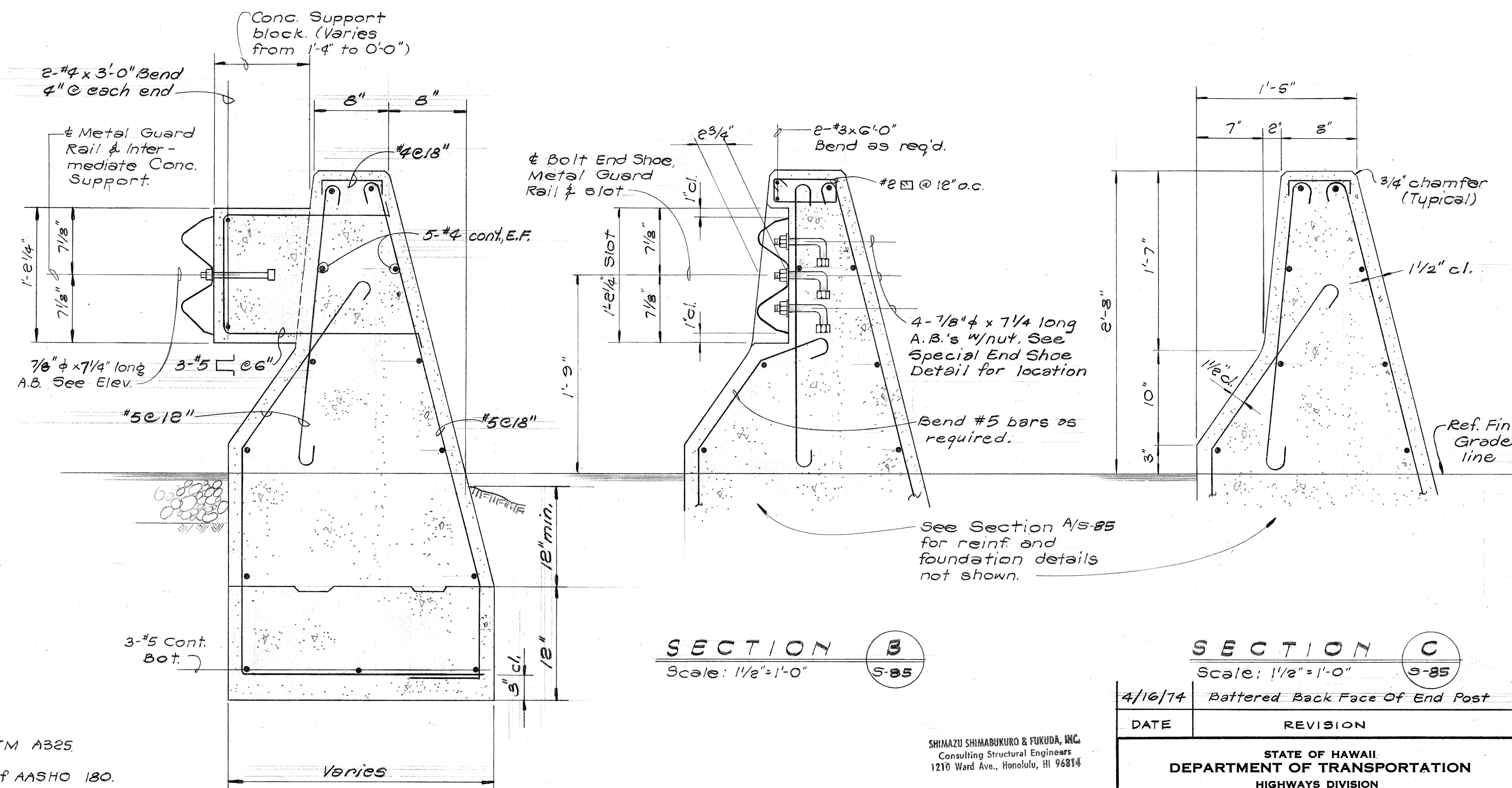
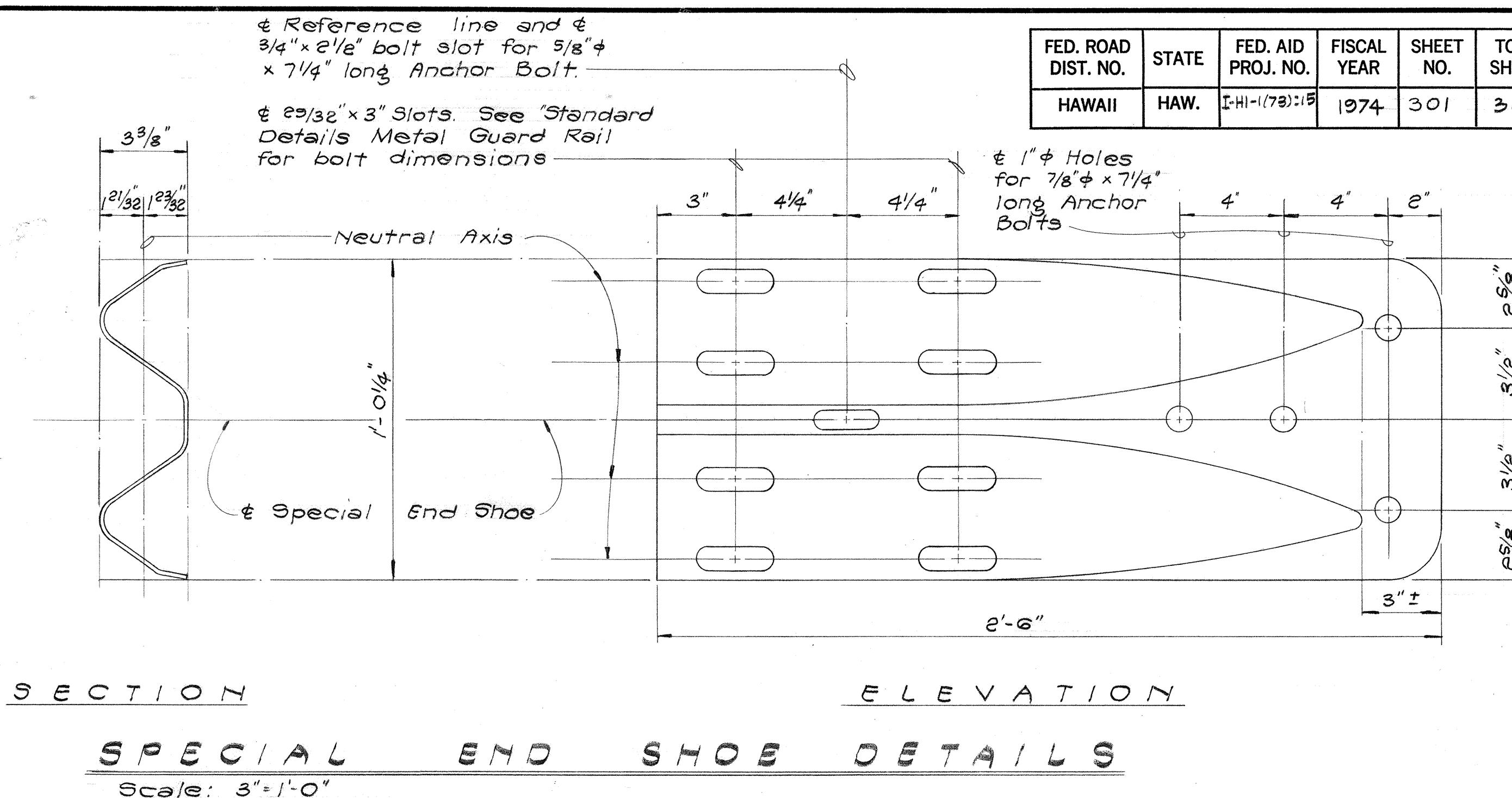
SHEET NO. 284 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEET
HAWAII	HAW.	I-HI-(73):15	1974	301	369

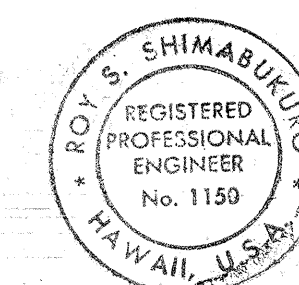


- NOTES:

1. All Anchor Bolts shall be High Strength bolts conforming to the requirements of ASTM A325.
2. All Shoe assembly, including anchor bolts, nuts and washers shall be galvanized.
3. Special End Shoe shall be fabricated from 10 gage steel conforming to the requirements of AASHTO 180.
4. First 25'-0" of guard rail adjoining "Special End Shoe" shall be galvanized steel.
5. Anchor Bolt length given from under bolt head.



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4/16/74	Battered Back Face Of End Post
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAIL
END POST DETAILS

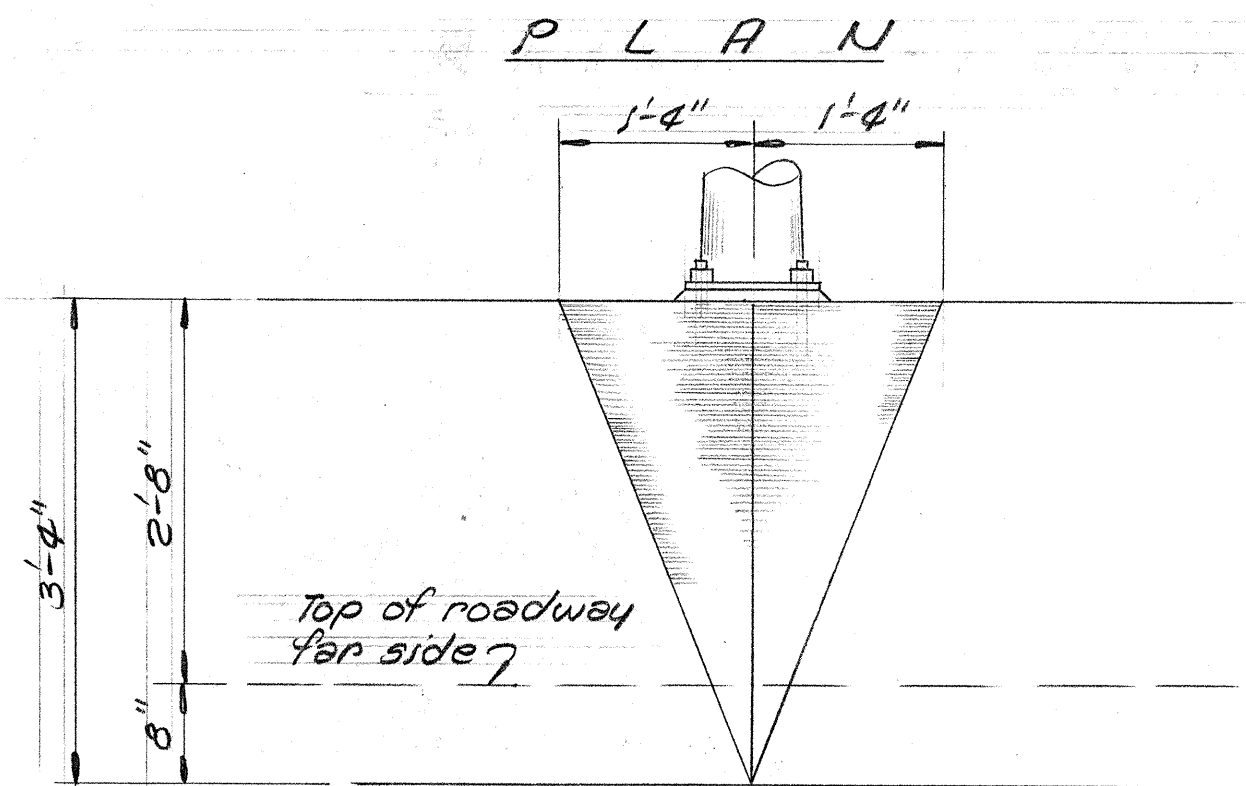
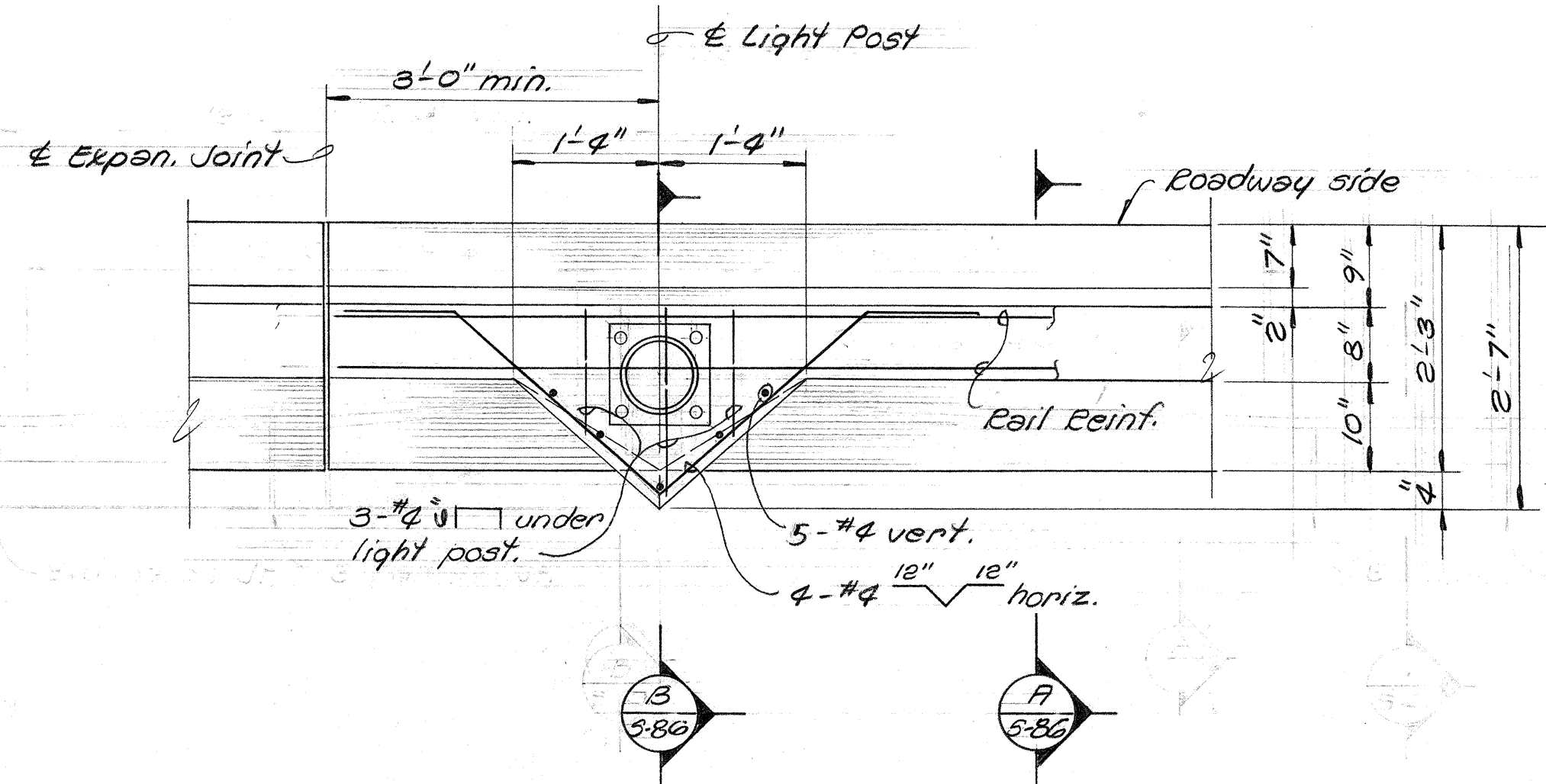
PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-HI-1(73) : 15

Scale: As Shown Date: DEC. 7, 1973

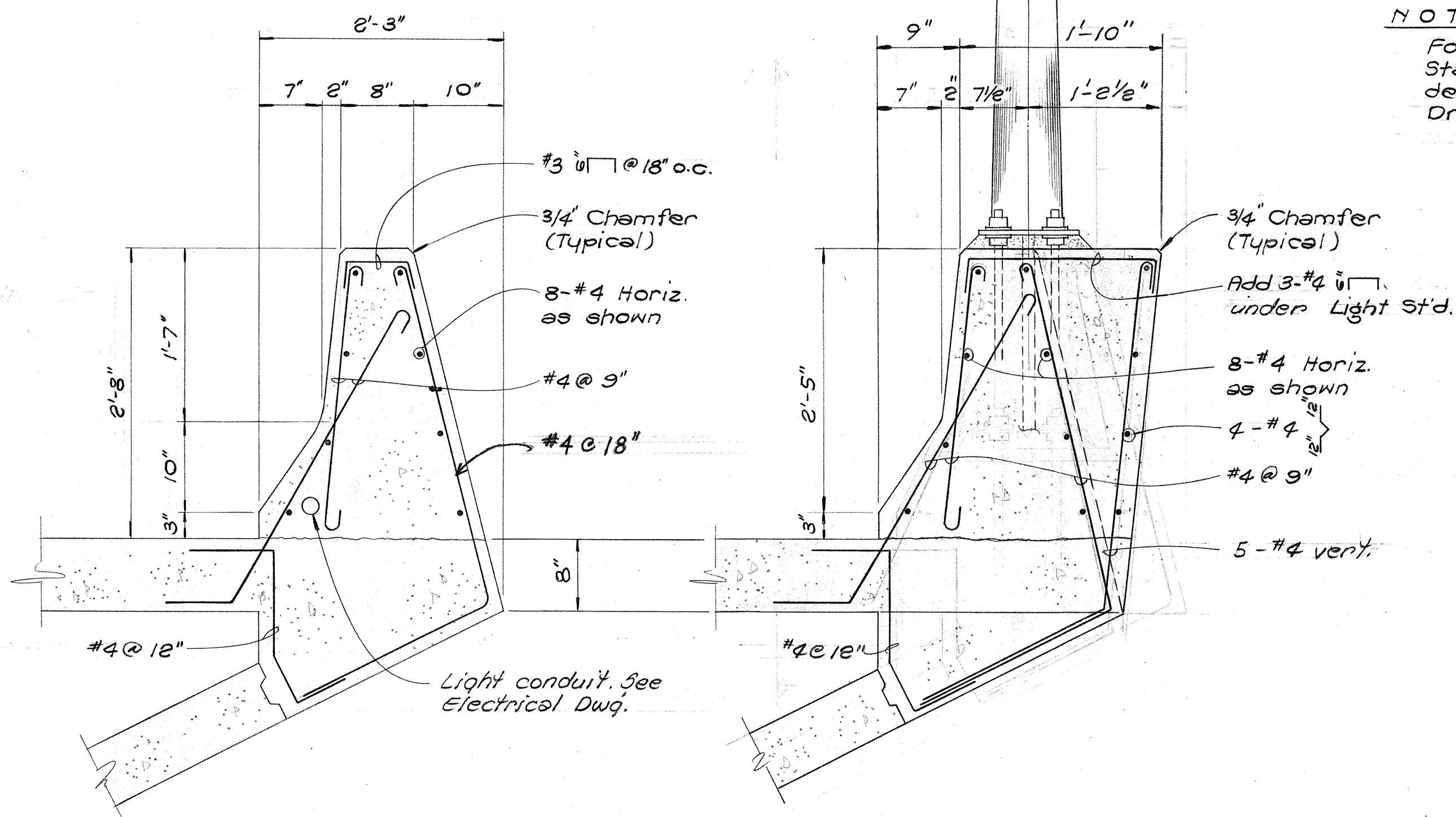
SHEET No.585 OF 106 SHEETS

ADD 301

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(78)15	1974	302	369



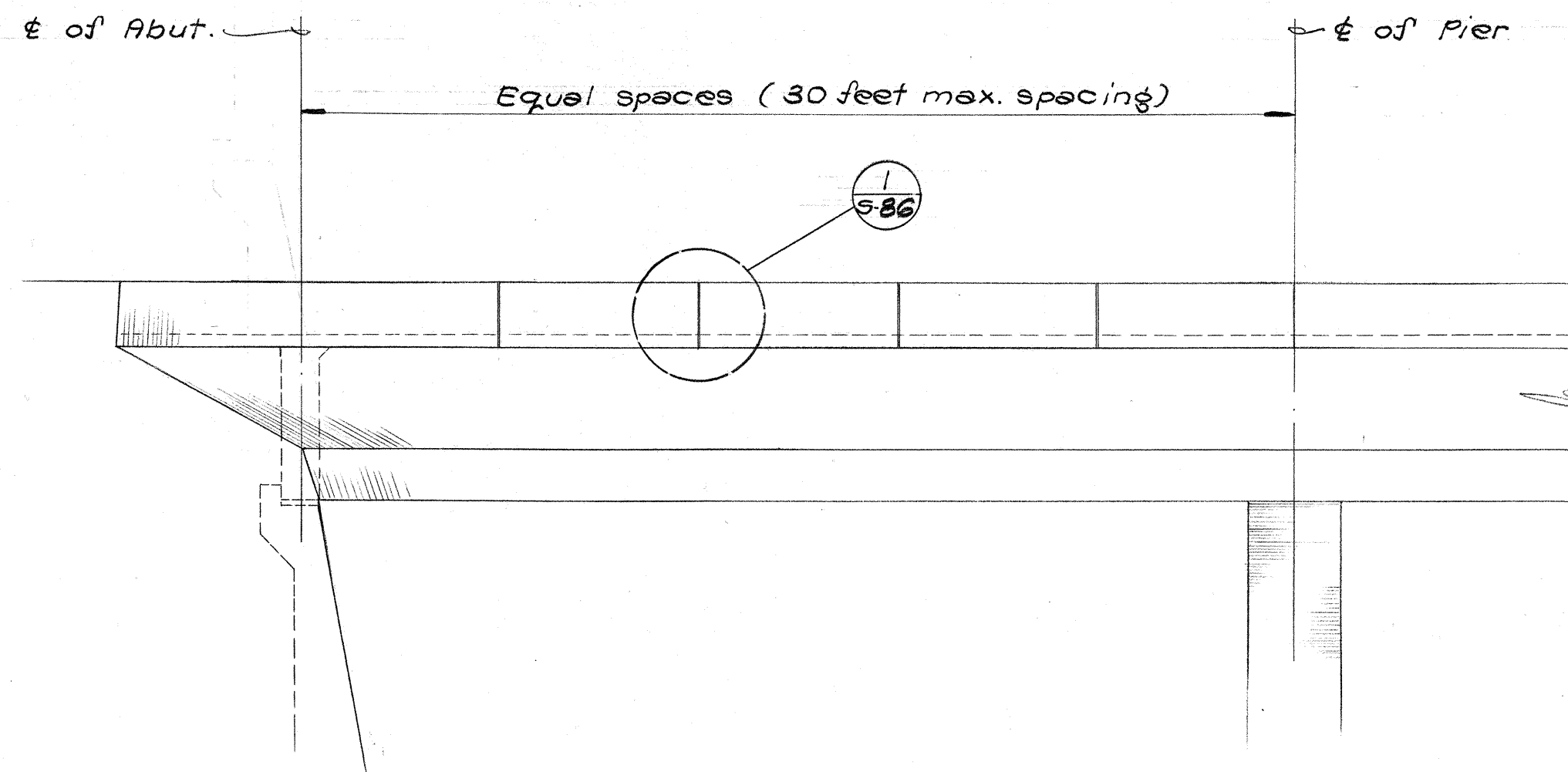
ELEVATION
CONC. RAIL AT LIGHT STANDARD
3/4" = 1'-0"



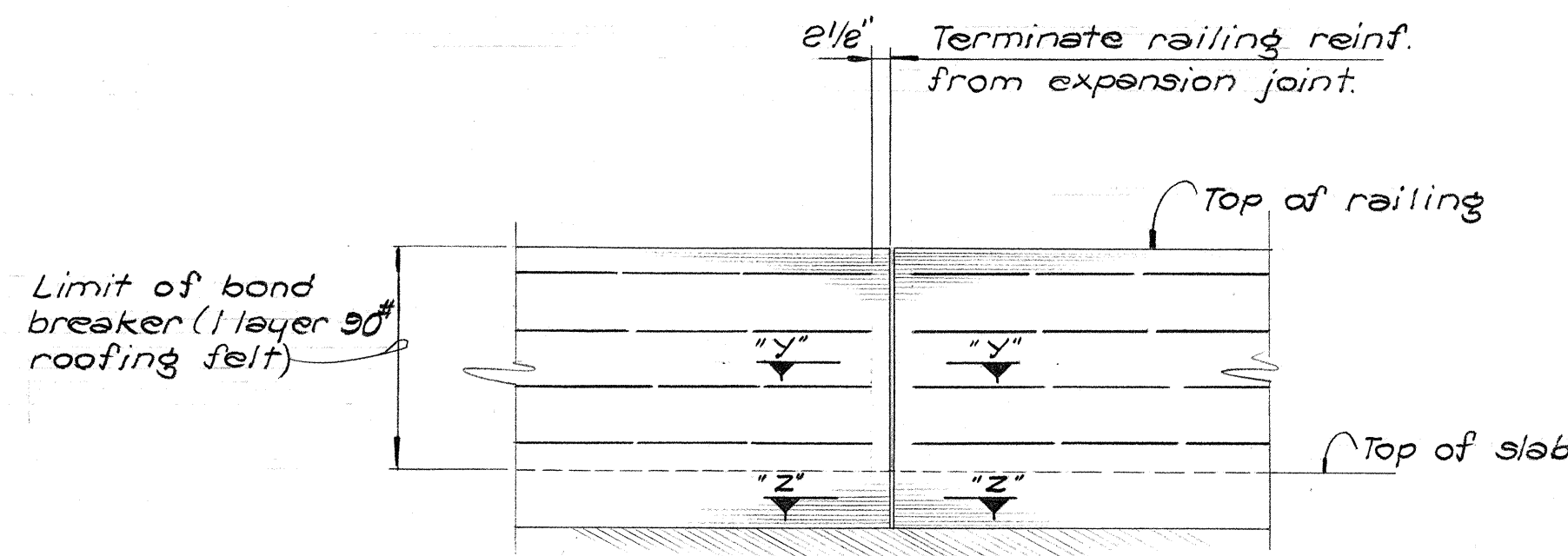
Note: Reference C.C.O. #12
Revision applicable to Structure Nos. 4, 6 and 7.

SECTION A
1" = 1'-0"

SECTION B
1" = 1'-0"



RAIL ELEVATION SHOWING EXPANSION JOINT SPACING
N.T.S.



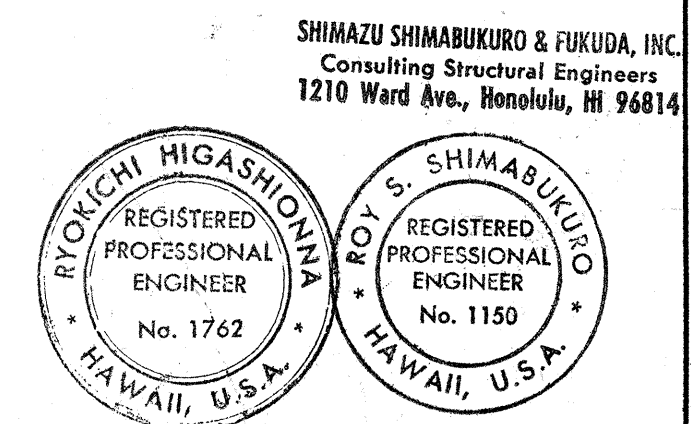
DETAIL 1
1/2" = 1'-0"



SECTION "Y-Y"
N.T.S.

SECTION "Z-Z"
N.T.S.

TYPICAL CONCRETE RAILING DETAILS



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

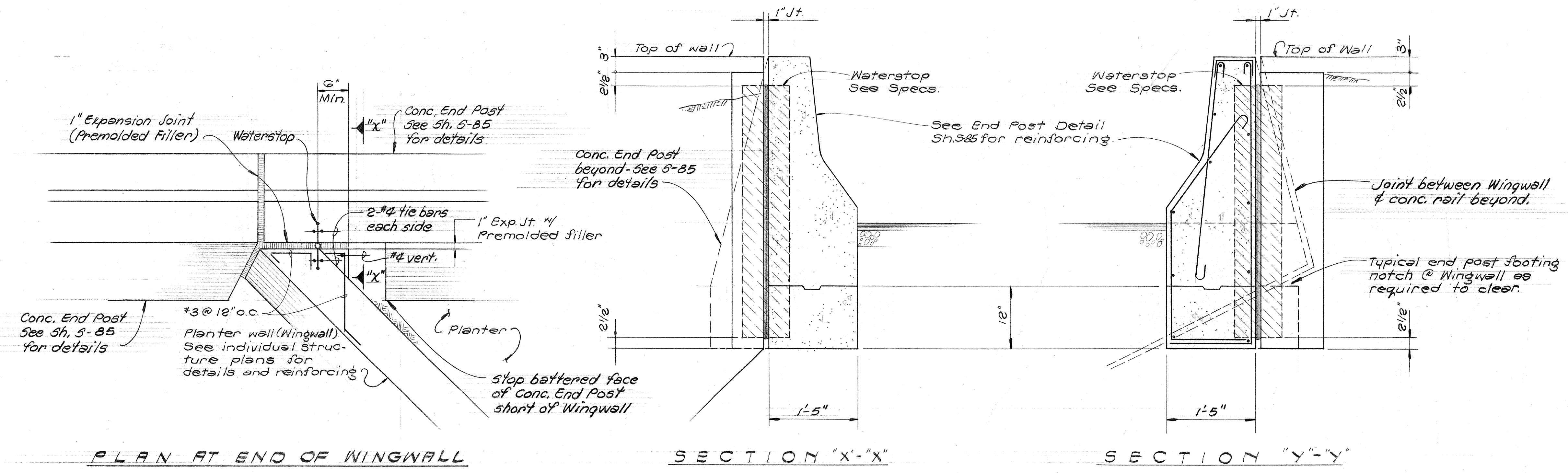
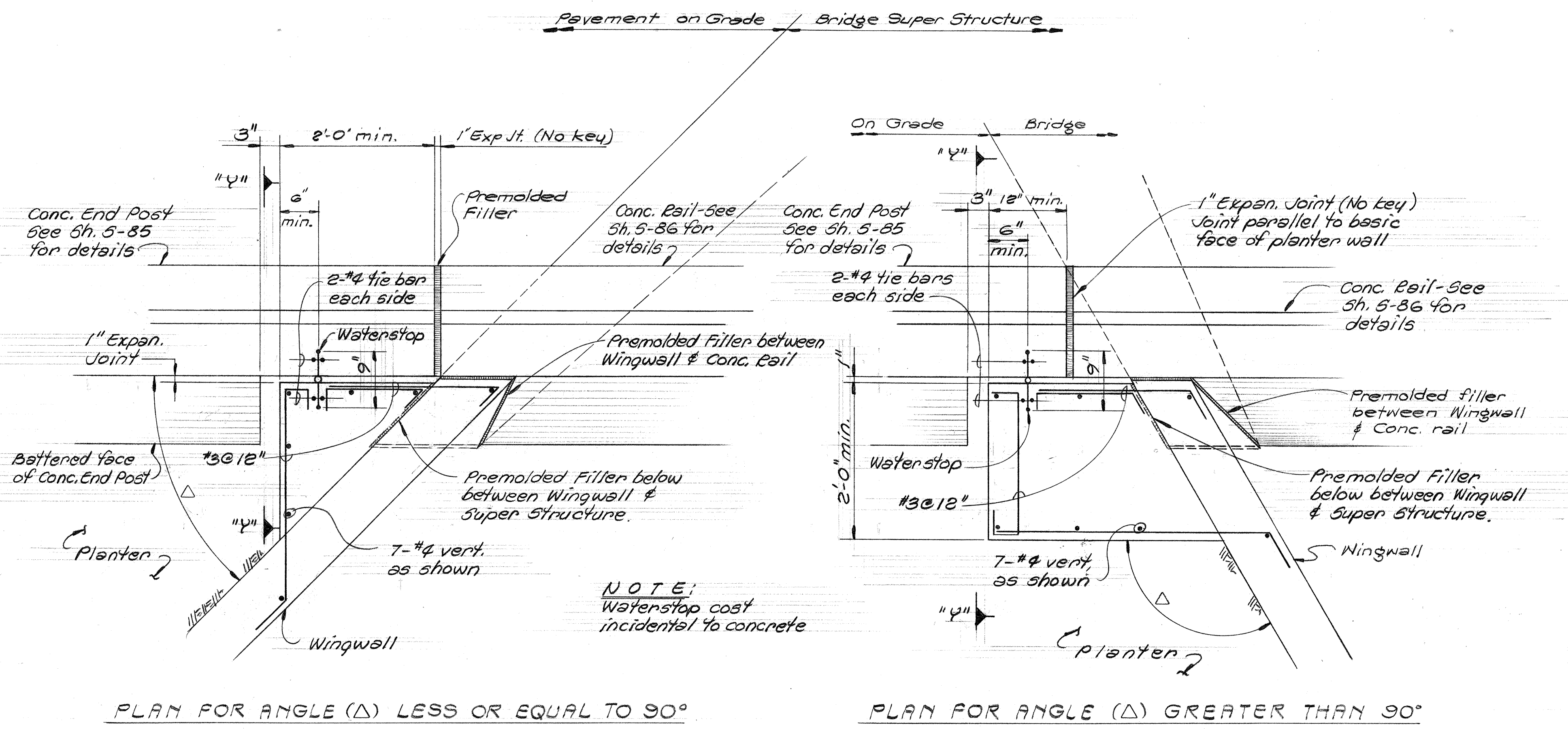
TYPICAL DETAIL
CONCRETE RAILING DETAIL

PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-H-1(78):15

Scale: As Shown Date: DEC. 7, 1973

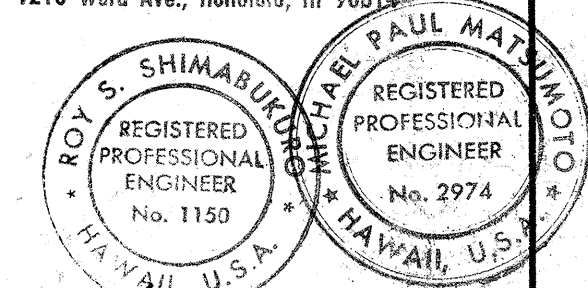
SHEET No. 586 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(73):15	1974	304	369



WINGWALL & END POST CONNECTION DETAILS
Scale: 1"=1'-0"

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Consulting Structural Engineers
1210 Ward Ave., Honolulu, HI 96814

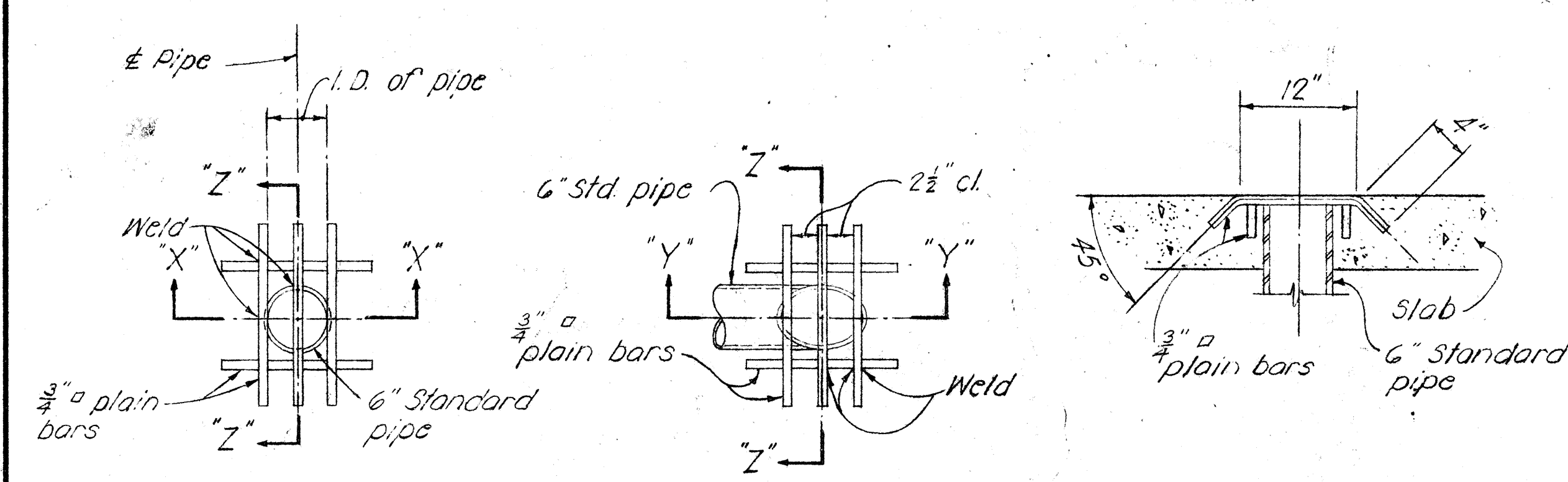


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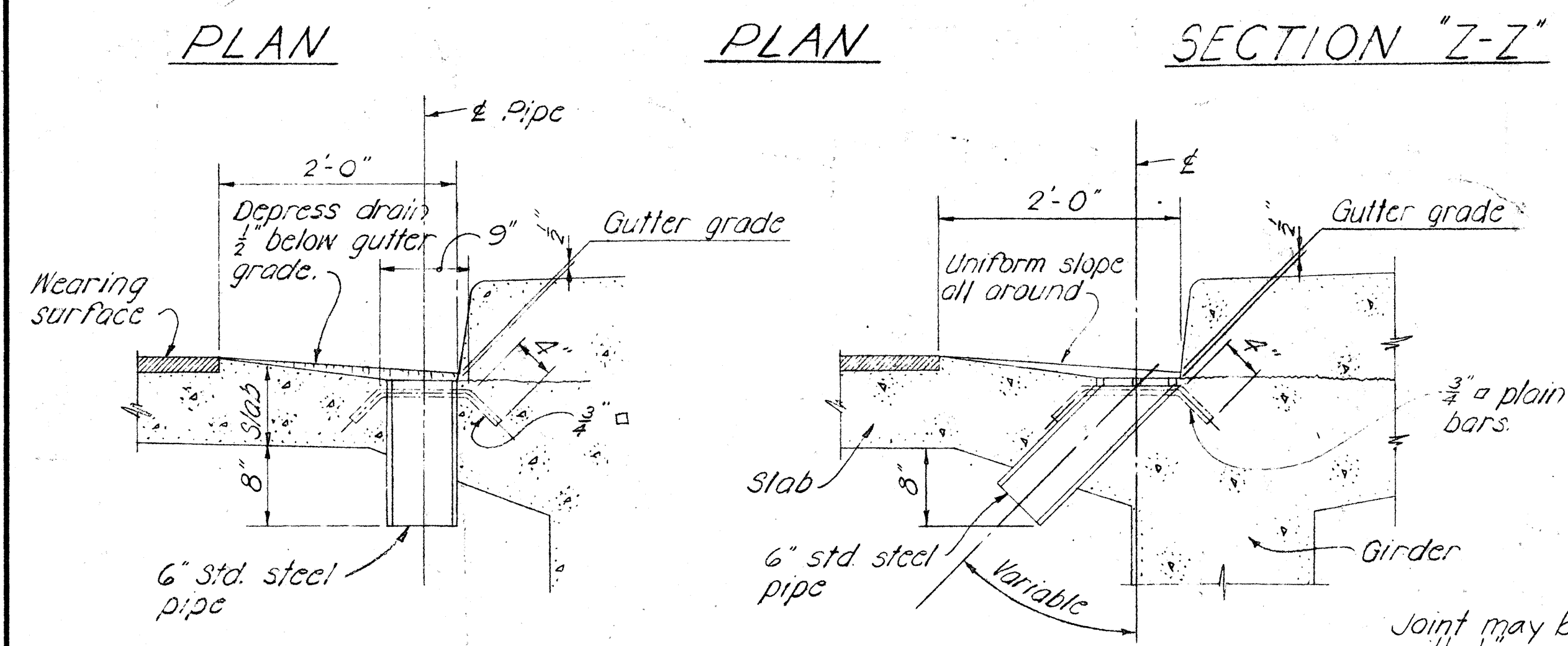
4/16/74	BATTERED OUTSIDE FACE OF END POST
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
TYPICAL DETAIL WINGWALL TO END POST CONNECTION DETAIL	
PEARL HARBOR INTERCHANGE F.A.I. Proj. No. I-HI-1(73):15	
Scale: As Shown	Date: DEC. 7, 1973
SHEET NO. 5-87 OF 106 SHEETS	

GENERAL NOTES

- All concrete shall be Class A unless otherwise noted.
- Reinforcing shall be detailed in accordance with A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures unless otherwise noted.
- Clearance for reinforcing bars shall be as follows, unless otherwise noted:
 - 1 1/2" For stirrups of beams & pier caps.
 - 2" For ties of columns.
 - 2" For formed walls.
 - 3" For footings.
- Minimum spacing between parallel bars shall be 2 1/2 times the diameter of bars, but in no case shall the clear distance between the bars be less than 1 1/2 times the maximum size of the coarse aggregate.
- All dimensions relating to reinforcing are to centers of bars unless otherwise noted.
- Reinforcing bars shall be securely tied at all intersections & lap splices & shall be held in place during pouring to maintain their proper locations as shown on plans.
- Vertical column bars shall be arranged in such a manner as to miss pier cap bars above as directed by the Engineer.
- Except as otherwise noted on drawings, all exterior corners & re-entrant angles in concrete work shall be chamfered 3/4" x 3/4".
- Concrete seats receiving steel plates, lead plates or neoprene pads shall be poured monolithically with supporting structures & top of concrete seats shall be finished with a steel trowel to a smooth level surface at the elevation shown on the plans.
- Elastomeric Pads: Bottom of bridge bearing pads shall be secured against displacement with adhesives approved by the Engineer. Pads shall be incidental to concrete and will not be paid for separately.
- Forms for all exposed surfaces of separation structures and surfaces of retaining walls visible from a traveled way or from a populated area shall be plywood except that metal forms may be permitted provided a surface finish satisfactory to the Engineer can be obtained and the use of such forms is approved in writing by the Engineer. Forms for round columns shall be made of materials that will give a smooth finish and true dimensions as given in the plans. Forms for prestressed concrete members shall be either metal or plywood.
- Gothic letters and figures approximating dimensions shown will be acceptable if approved by the Engineer.
- The contractor shall verify the location of all existing utility lines and notify the respective owners before commencing work of excavation or driving of piles.
- Standard Detail Drawings refer to all structures in general, except for modifications as may be required for special conditions. For such modifications refer to the corresponding detailed drawings.

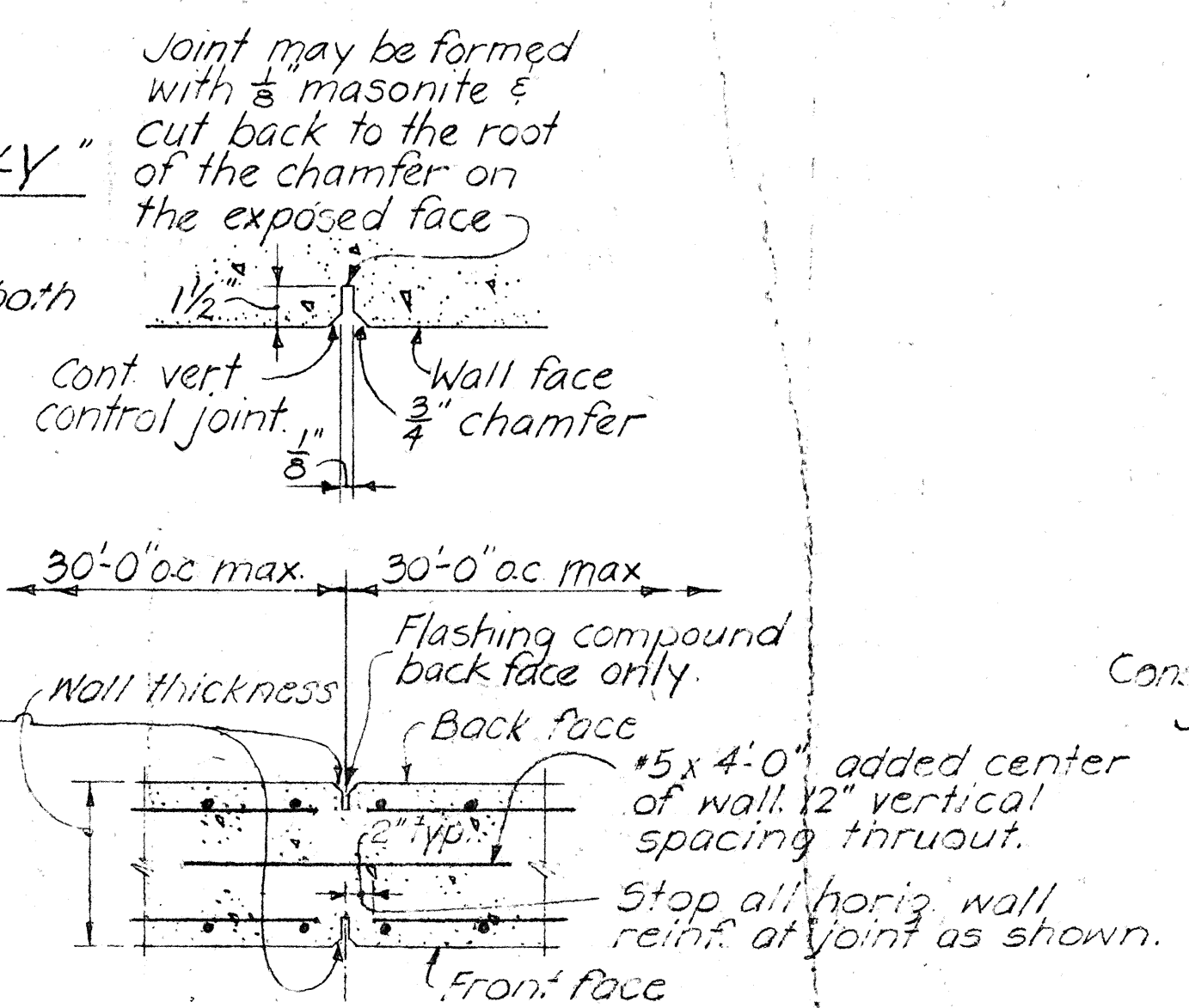
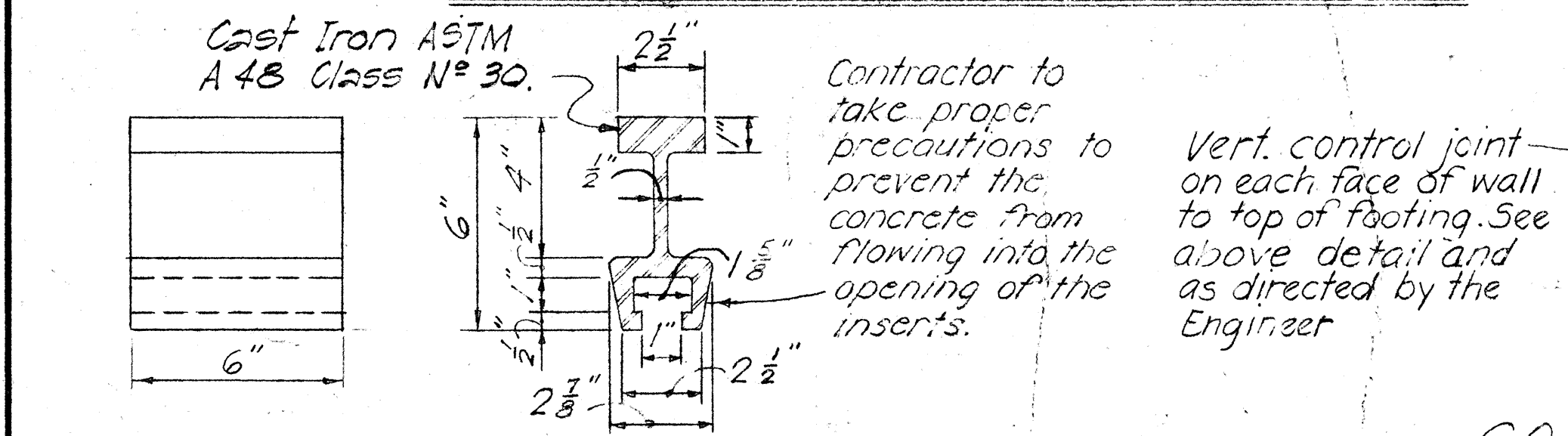


TYPICAL CONCRETE GROOVE DETAIL

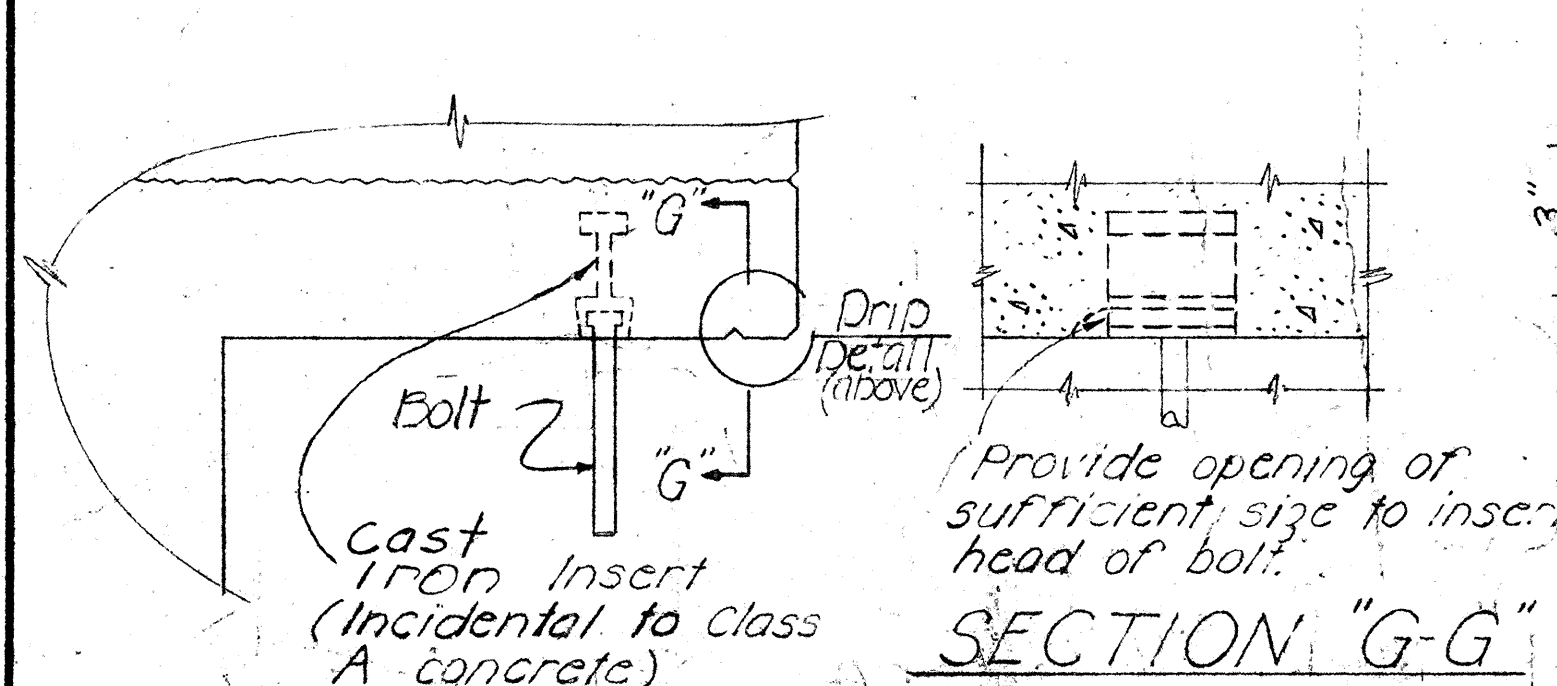


NOTE: Metal drains shall be considered incidental to Class A Concrete in both concrete and steel bridges and will not be paid for separately. Assembly of grillage and pipe shall be hot-dip galvanized after all welding is completed.

TYPICAL DRAINAGE DETAILS



TYP FLASHING COMPOUND WATERPROOFING DETAIL



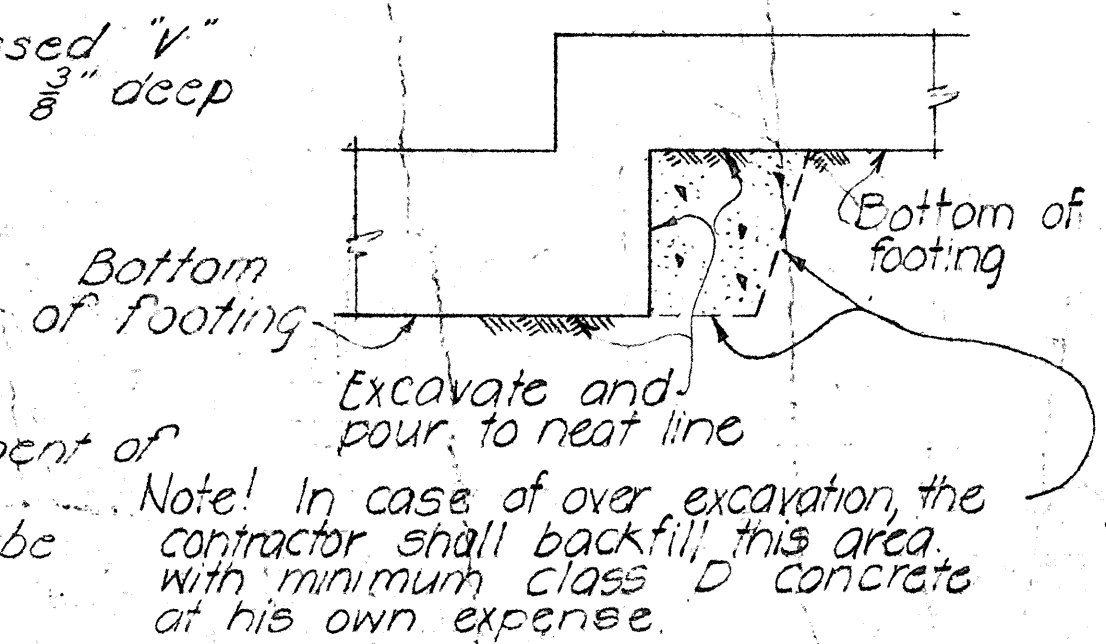
DETAIL of PIPE HANGERS & INSERTS

NAME **DATE**

Use correct name of bridge Date of Year built

NOTE: Refer to corresponding detail drawings for placement of such names & dates at end post. Exact details & spacing of letters & figures shall be as directed by the Engineer. See Note #12.

TYPICAL DETAIL OF LETTERS & FIGURES AT CONCRETE END POST



TYPICAL EXCAVATION FOR CONTINUOUS FOOTING STEP-UP

APPROVAL RECOMMENDED:
 Paul T. Lamashita
 BRIDGE DESIGN ENGINEER 1-23-76
 DATE

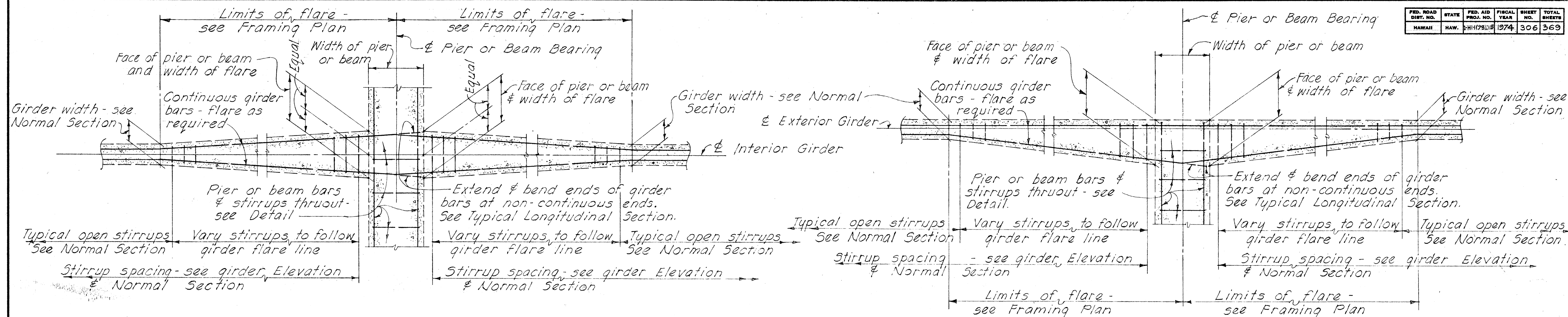
APPROVED:
 Paul T. Lamashita
 ASSISTANT CHIEF, ENGINEERING 1-28-76
 DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

STANDARD DETAILS
NOTES AND MISCELLANEOUS
DETAILS

Date: October 1969
 SHEET No. 304 OF 106 SHEETS DB-100



INTERIOR GIRDER

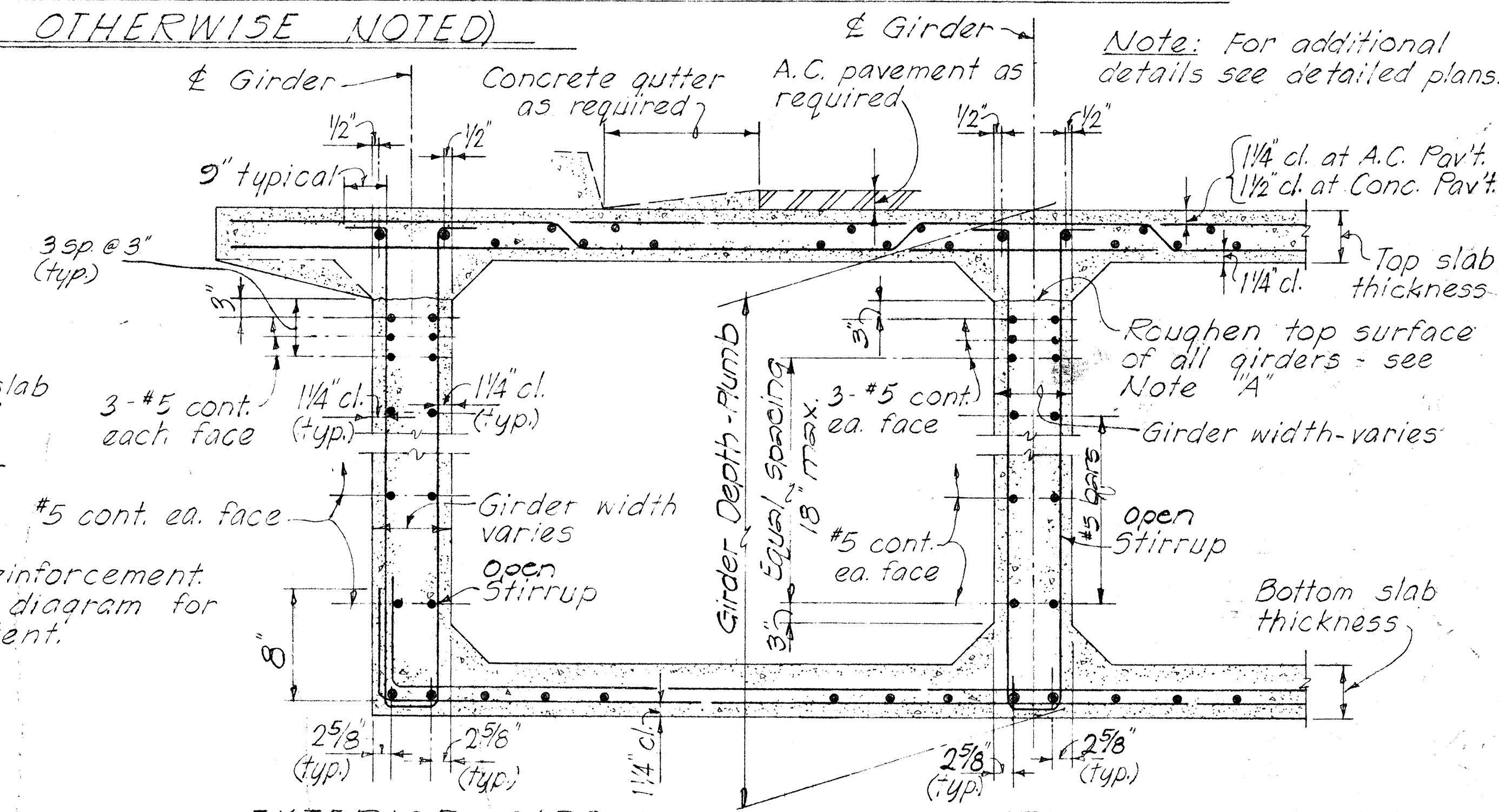
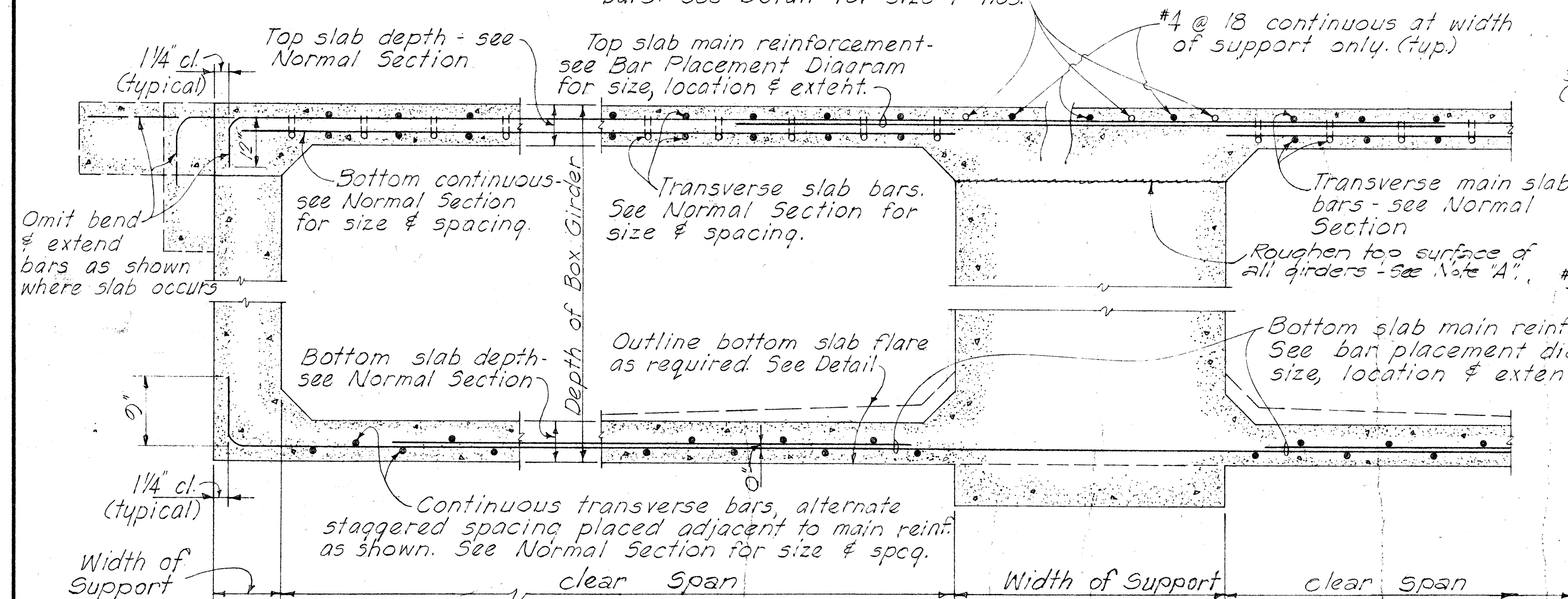
TYPICAL DETAILS OF GIRDER FLARE AT NORMAL OR RADIAL SUPPORTS - CONTINUOUS ENDS AS SHOWN

(NON-CONTINUOUS ENDS SIMILAR EXCEPT AS OTHERWISE NOTED)

EXTERIOR GIRDER

2 Girder ~ 1 No

Top added bars at cantilever ends placed alternately with continuous bars. See Detail for size & nos.



AT NON-CONTINUOUS END

AT CONTINUOUS SUPPORT

TYPICAL LONGITUDINAL DECK SECTION
ALONG GIRDER AT NORMAL OR RADIAL SUPPORTS

Note "A" The entire surface of the joint shall be thoroughly cleaned of surface laitance, curing compound and other material foreign to the concrete and clean aggregate be exposed by abrasive blast cleaning after the curing period or immediately before placing concrete at the joint.

NO.	REVISION	APPROVED BY	DATE

APPROVAL RECOMMENDED
Paul T. Yamashita
BRIDGE DESIGN ENGINEER

1-23-70
DATE

APPROVED Paul T. Yamashita
For ASSISTANT CHIEF, ENGINEERING

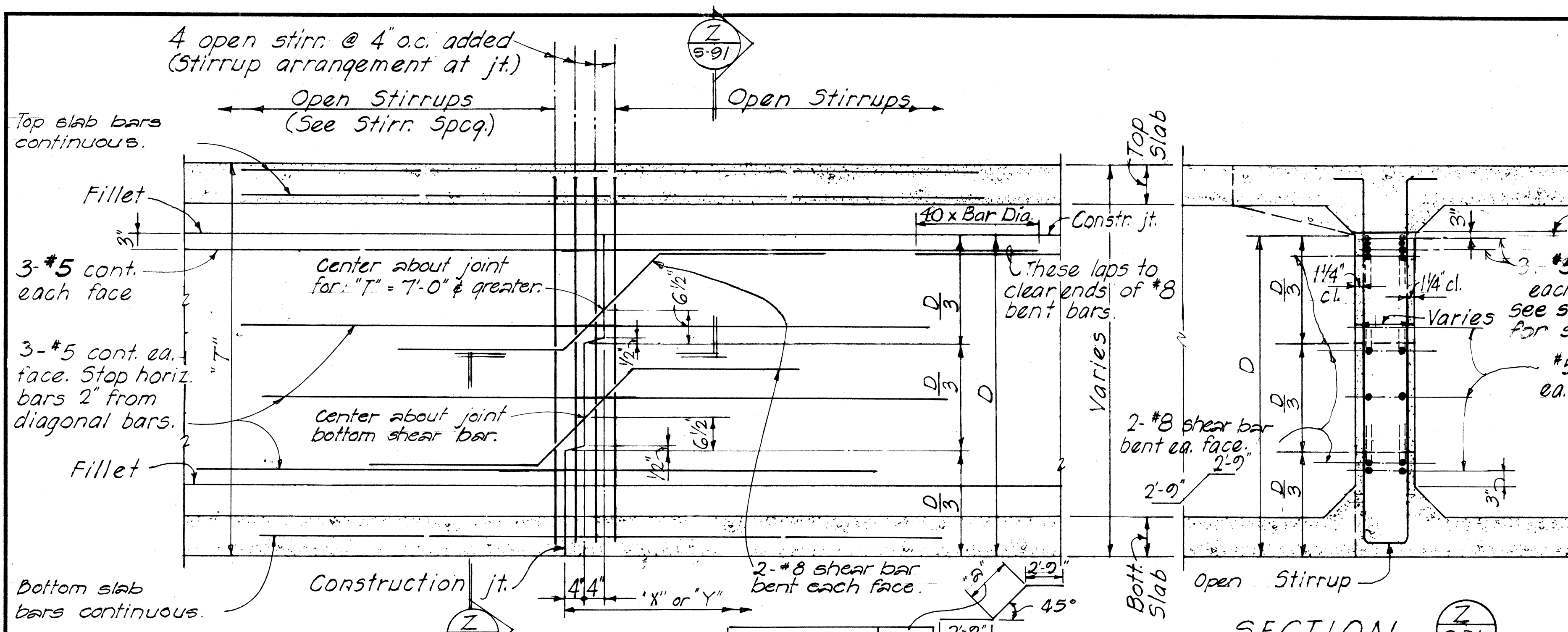
1-28-76
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
CONCRETE BOX GIRDER

Date _____

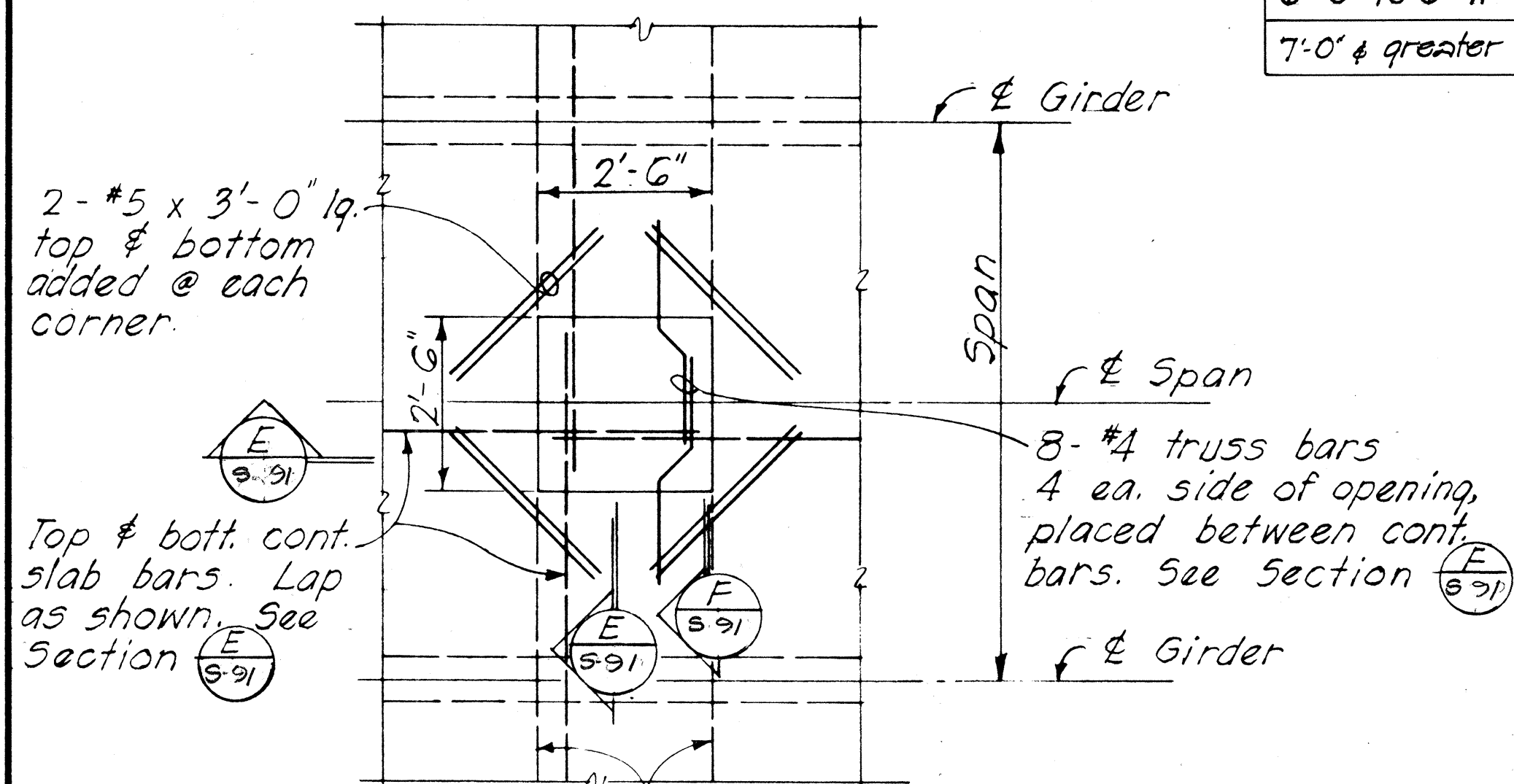
SHEET No. 590 OF 106 SHEETS DB-101-2



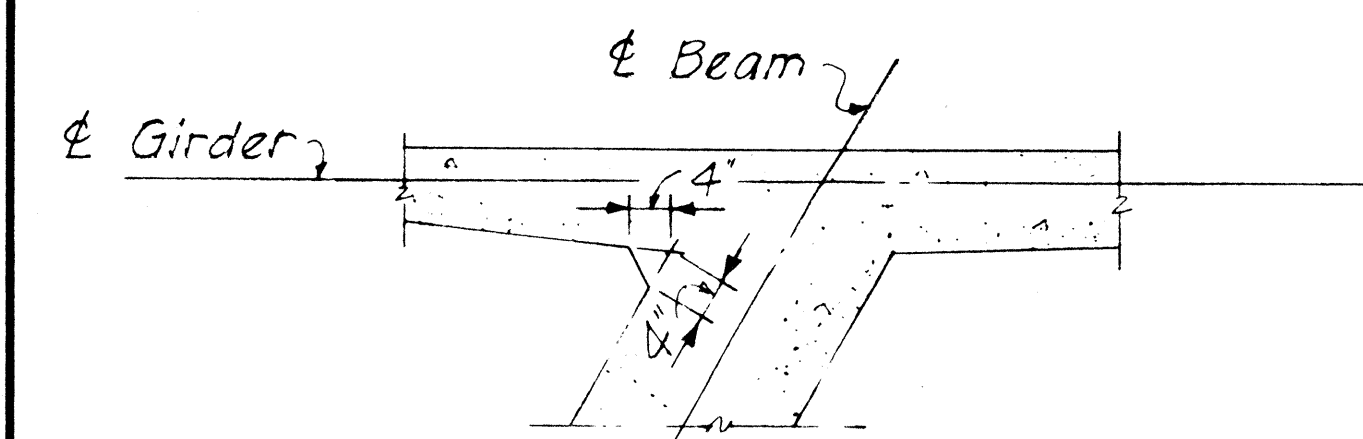
GIRDER STEM CONSTRUCTION JOINT

Depth "T"	"2"
4'-11" & smaller	1'-0"
5'-0" to 5'-11"	2'-0"
6'-0" to 6'-11"	2'-3"
7'-0" & greater	3'-0"

NOTE: D = Depth of girder stem to bott. of slab.



PART PLAN - DECK SHOWING FORM REMOVAL OPENING



TYPICAL DETAIL OF VERTICAL CHAMFER AT ACUTE INTERSECTION OF SKEWED CONCRETE MEMBER

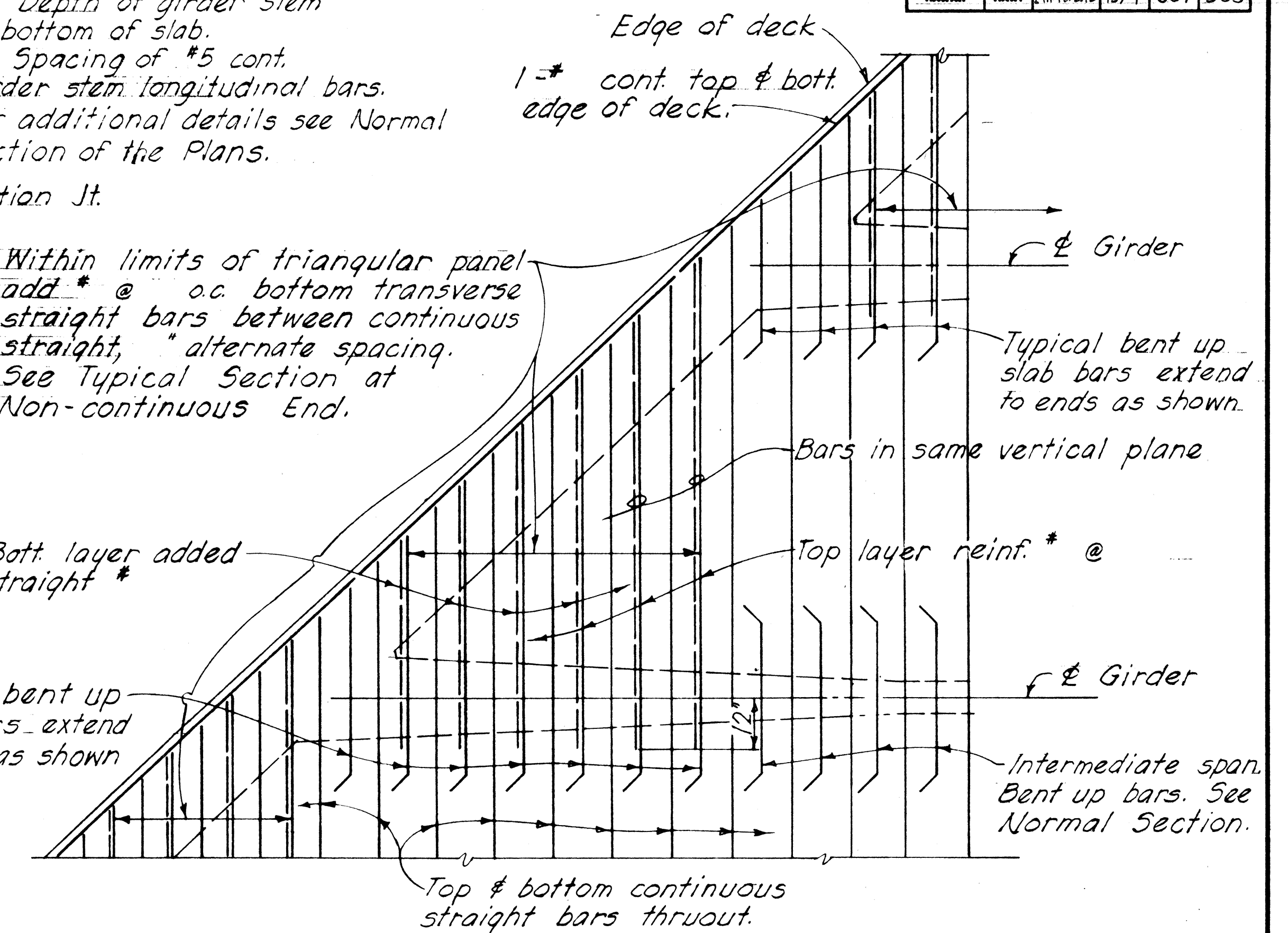
NOTE:

D = Depth of girder stem to bottom of slab.
S = Spacing of #5 cont. girder stem longitudinal bars.
For additional details see Normal Section of the Plans.

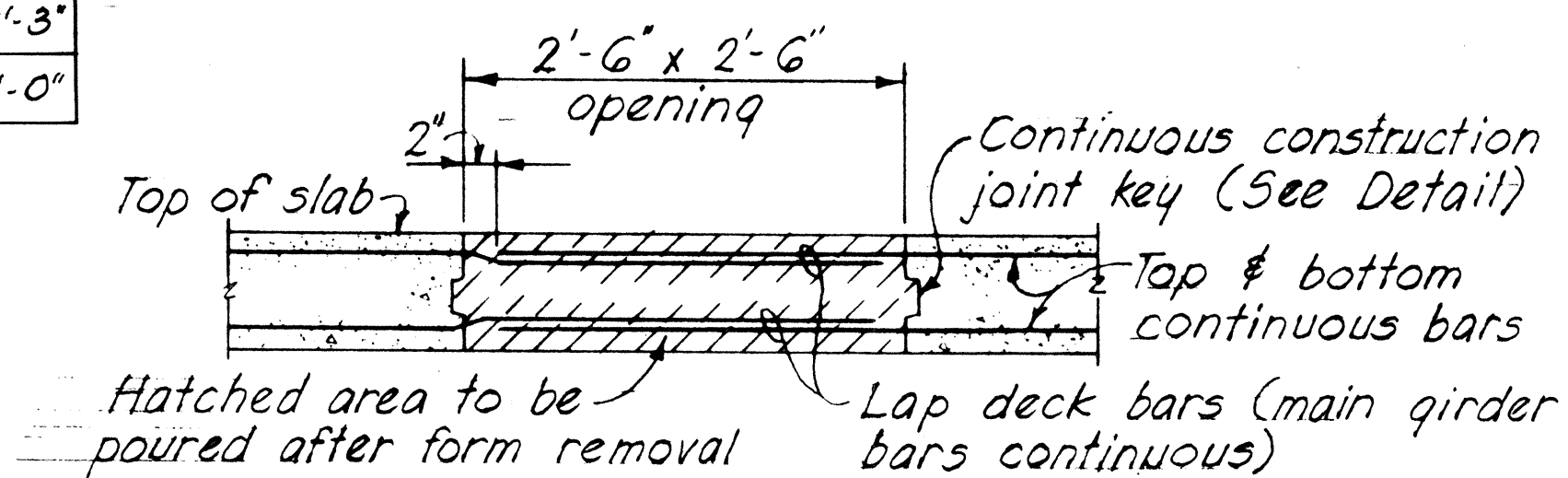
Within limits of triangular panel add # @ o.c. bottom transverse straight bars between continuous straight, alternate spacing. See Typical Section at Non-continuous End.

Bott. layer added straight #

Typical bent up slab bars extend to ends as shown

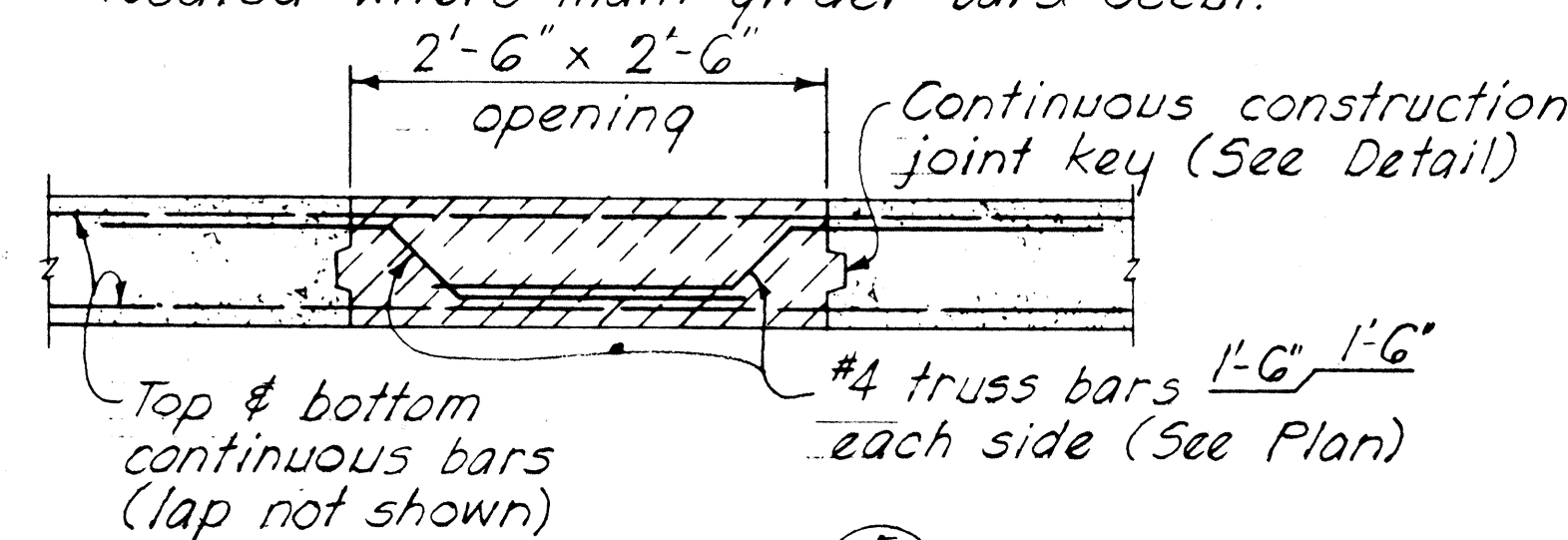


PART PLAN - TYPICAL ARRANGEMENT OF TOP SLAB REINFORCEMENT AT SKEWED ENDS



SECTION E 591

Note: Form removal opening at top slab shall not be located where main girder bars occur.



SECTION F 591

APPROVAL RECOMMENDED: Paul T. Yamashita 1-23-70
BRIDGE DESIGN ENGINEER DATE

APPROVED: Paul T. Yamashita 1-28-70
For ASSISTANT CHIEF, ENGINEERING DATE

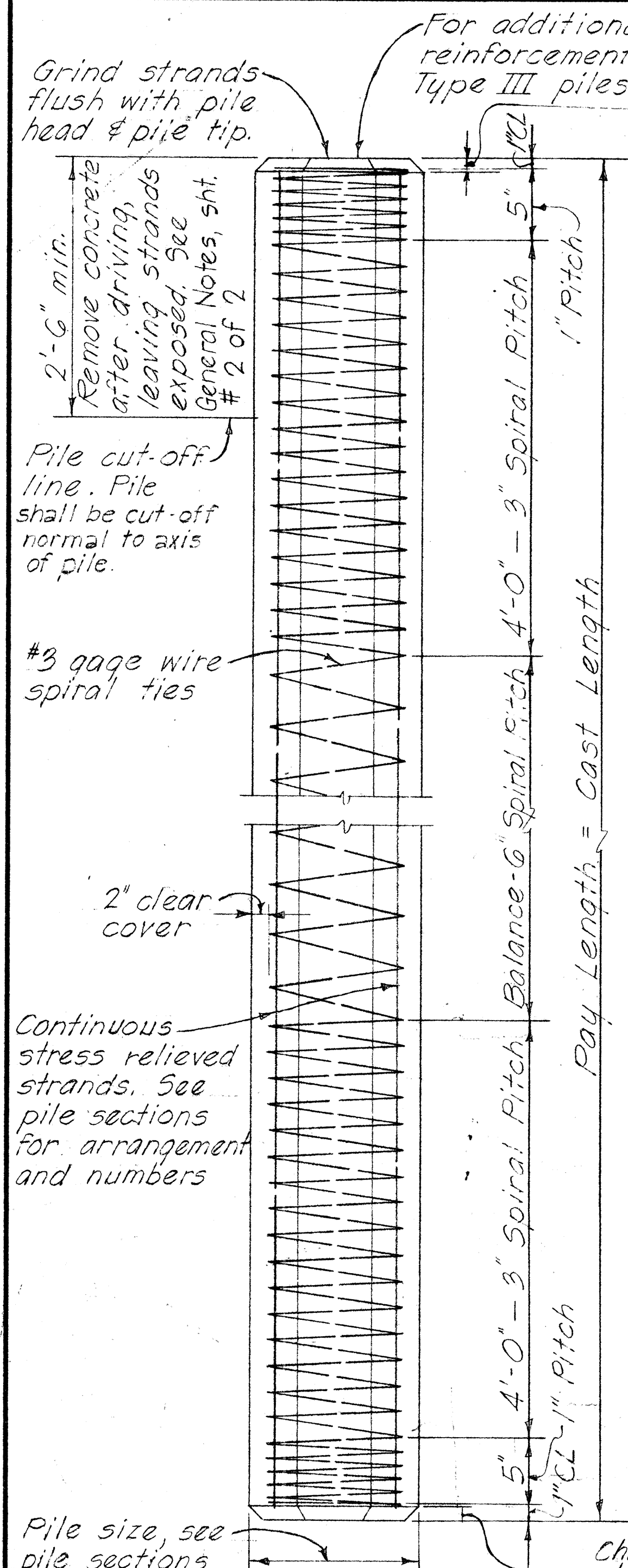
NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

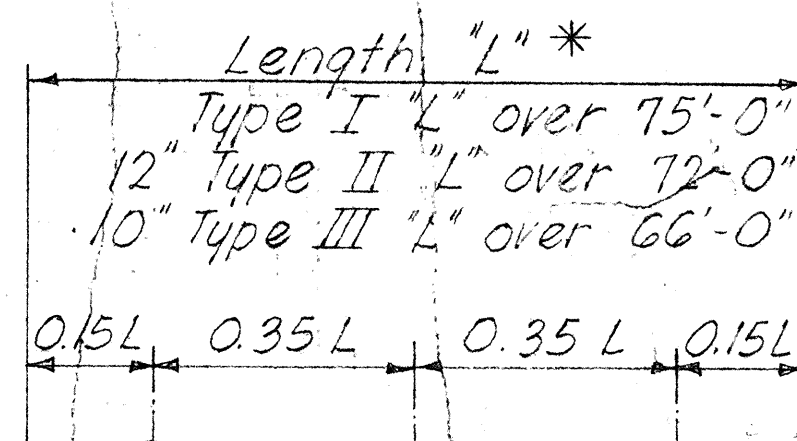
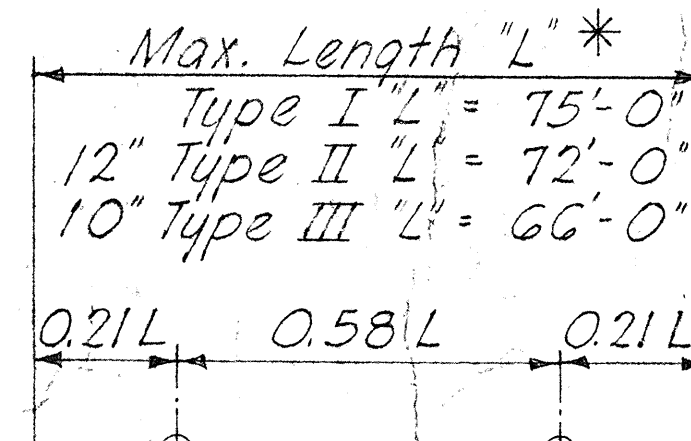
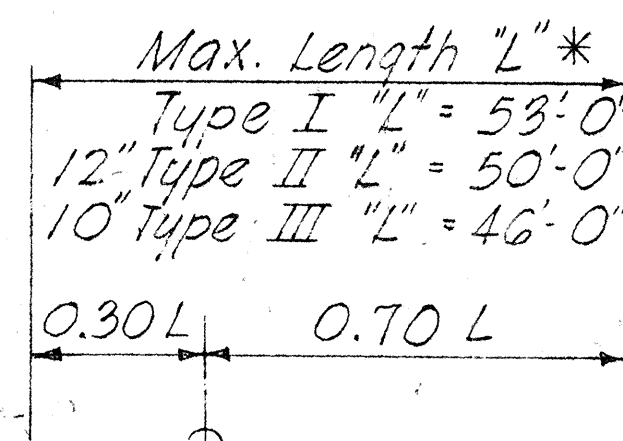
STANDARD DETAILS
CONCRETE BOX GIRDER

SCALE AS NOTED DATE:

SHEET No. 591 OF 106 SHEETS DB-101-3



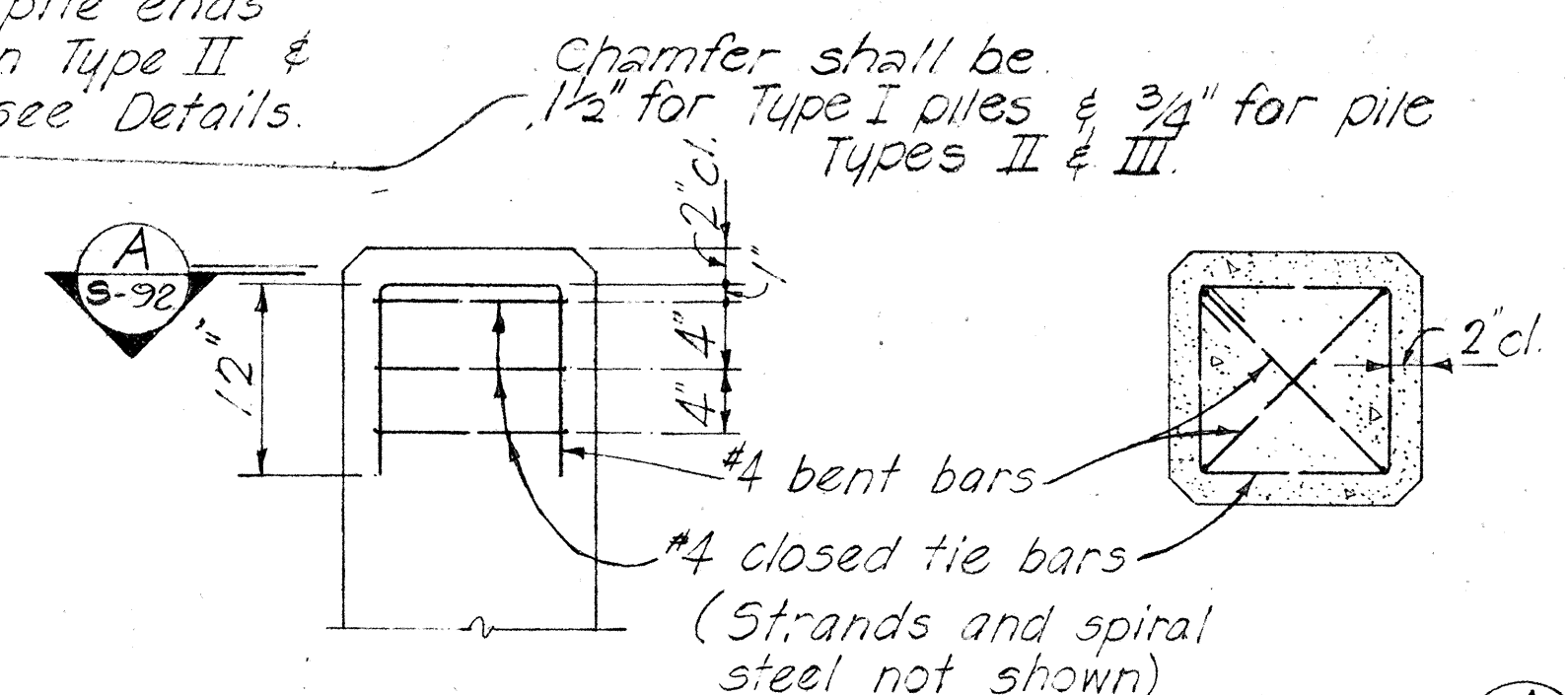
TYPICAL PILE DETAIL



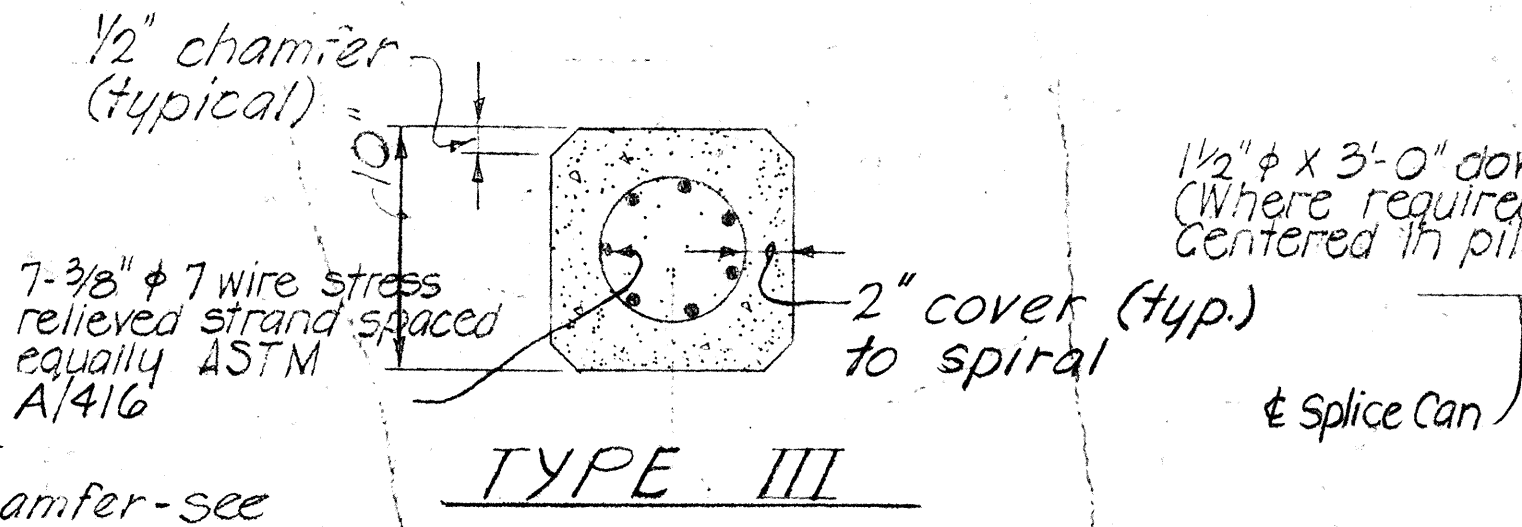
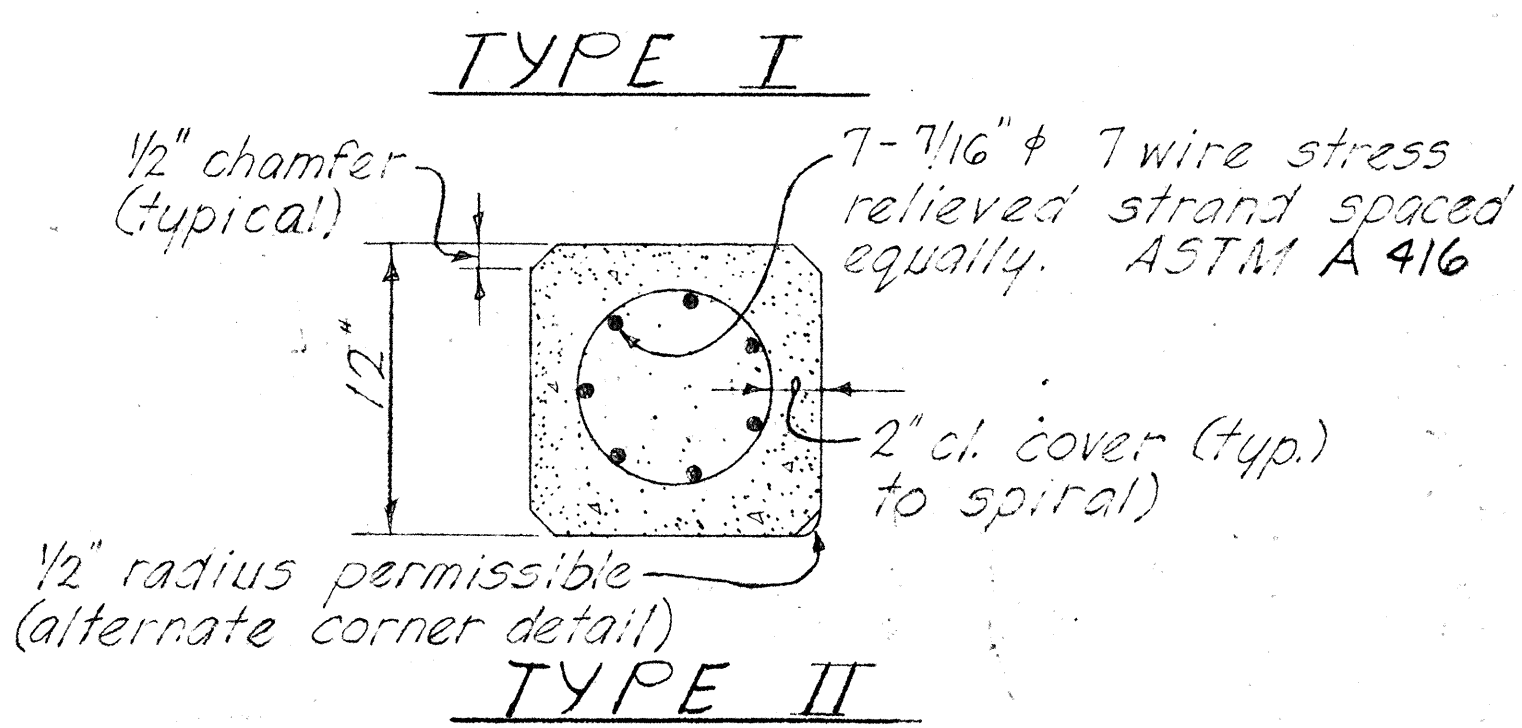
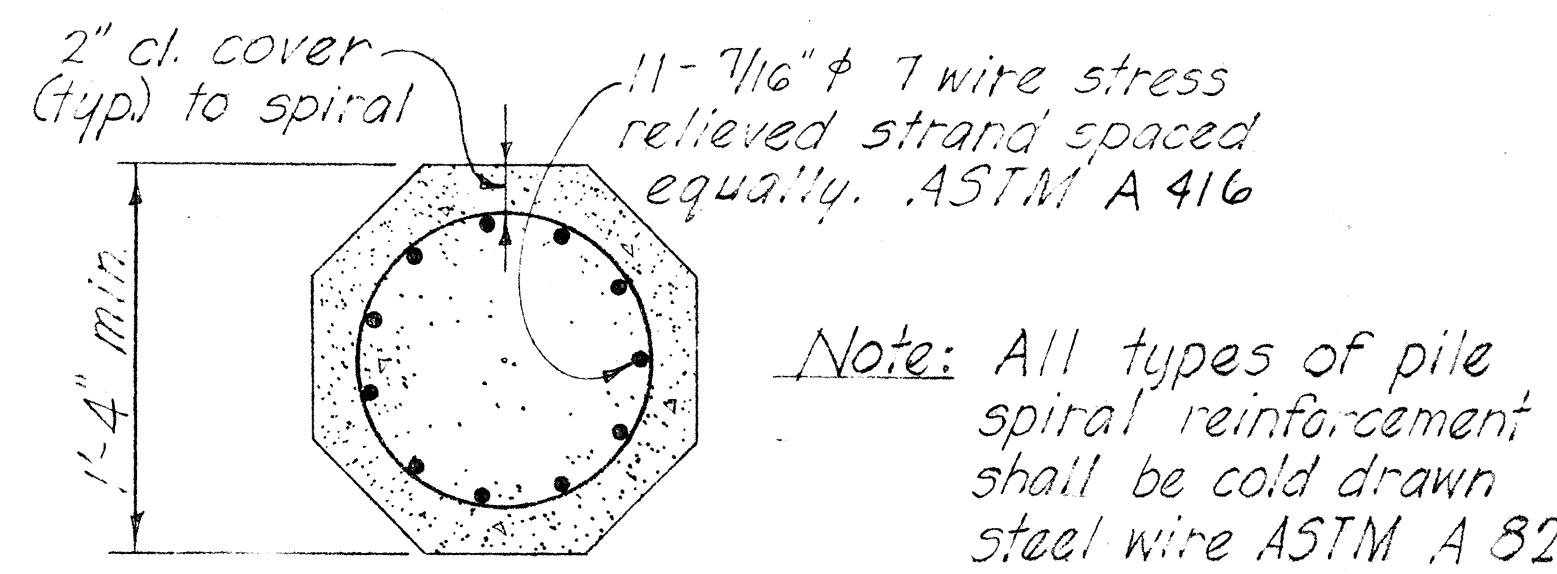
* The length "L" is the distance end to end of pile.

1 POINT PICK-UP 2 POINT PICK-UP 3 POINT PICK-UP

NOTE: Unless special lifting devices are attached for pick-up points, pick-up points shall be plainly marked on all piles after removal of the forms and all lifting shall be done at these points. The use of special embedded or attached lifting devices, the employment of other pick-up points or any other method of pick-up shall be subject to approval by the Engineer.

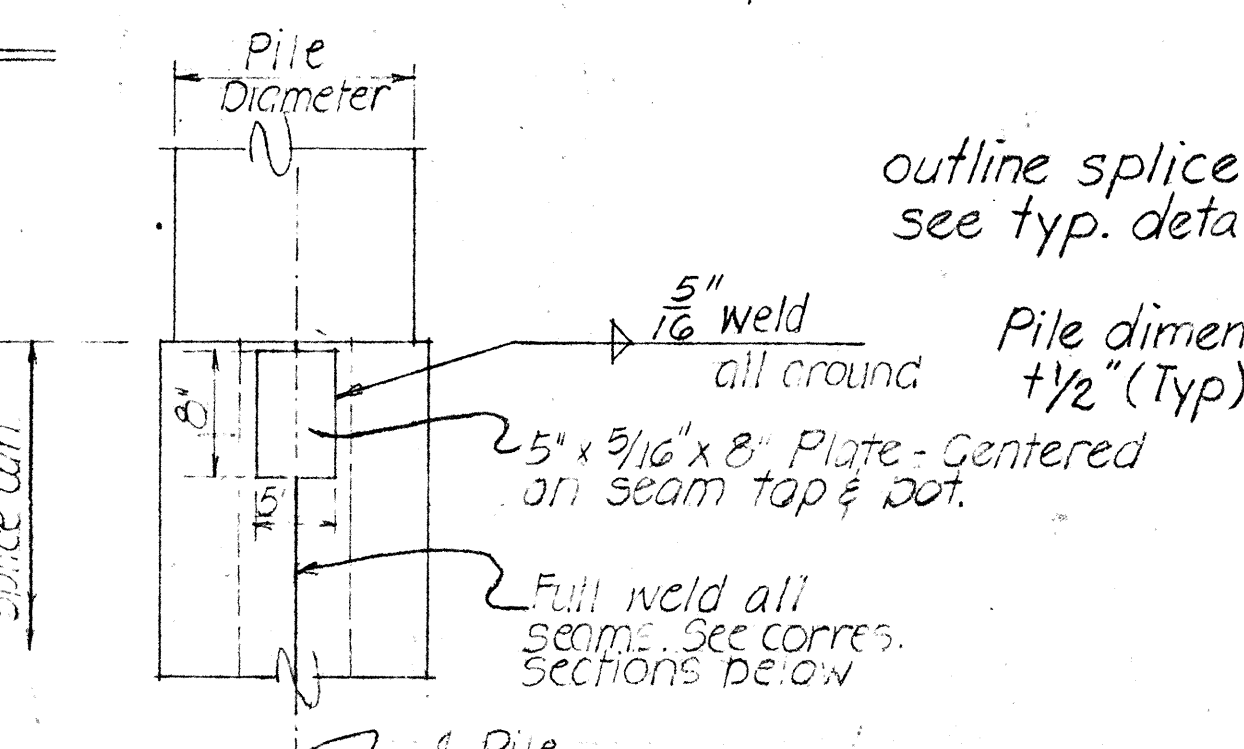


PART ELEVATION SECTION A-5-92 TYPICAL ADDED REINFORCEMENT PILE ENDS - TYPE II & III ONLY

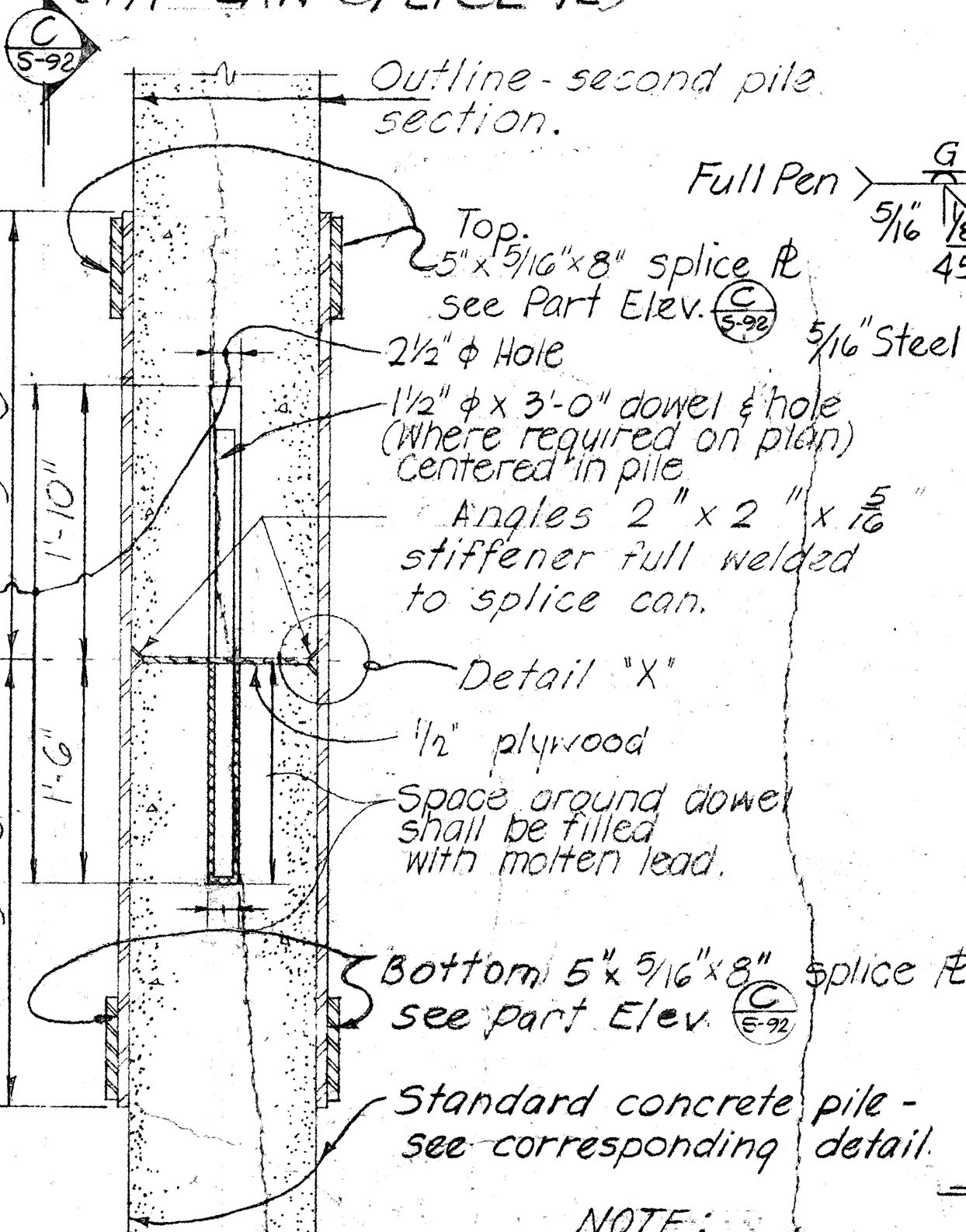


TYPICAL SECTIONS THRU PILES

NOTE: Concrete in pile build-ups without driving shall be Class A Concrete. Concrete in pile build-ups with driving shall have a minimum compressive cylinder strength f'_c of 5000 p.s.i. at 28 days. Build-ups may be driven if the specimen of concrete from which the piles were poured develops a strength of at least 3500 p.s.i. but not earlier than 7 days.



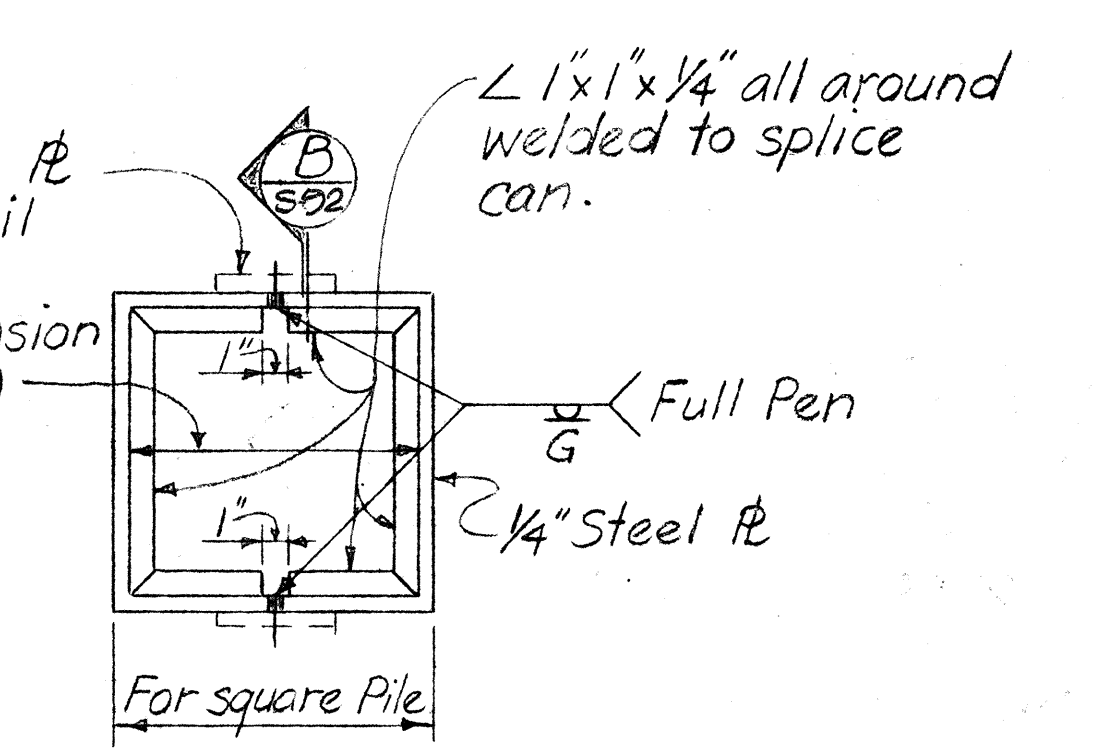
PART ELEV C-5-92 (TYP CAN SPICE R)



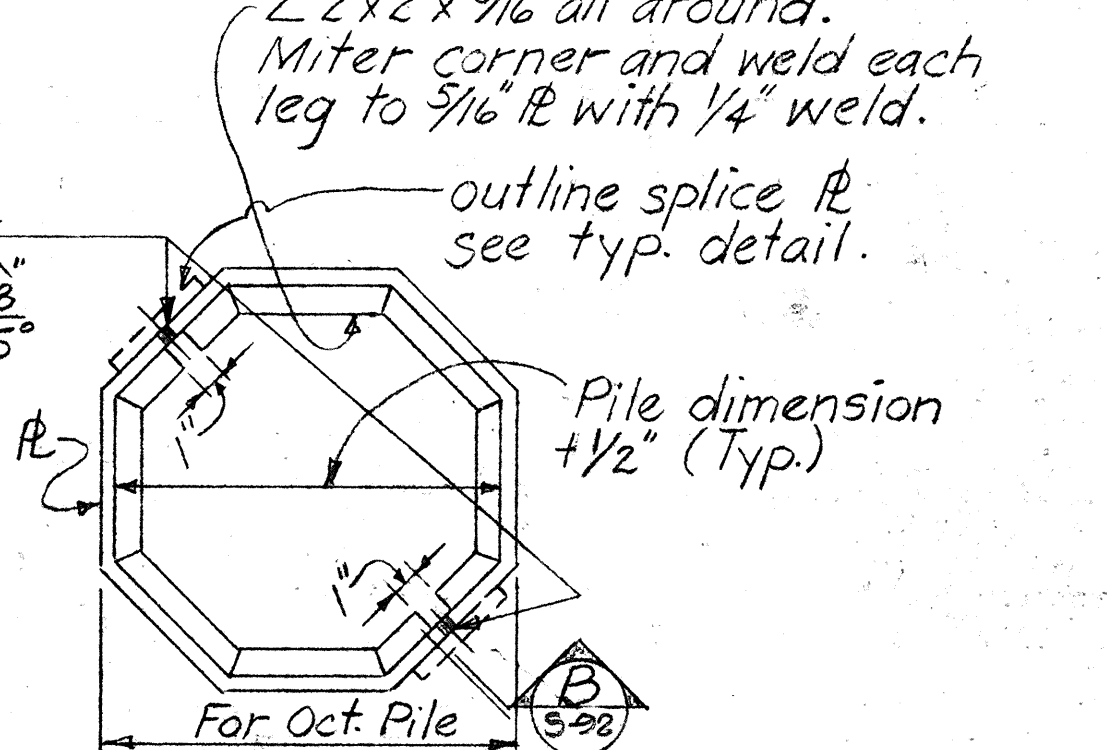
SECTION B-5-92

TYPICAL PILE SPICE DETAILS (FOR PRESTRESSED CONCRETE PILES WHEN CAST IN TWO OR MORE SECTIONS)

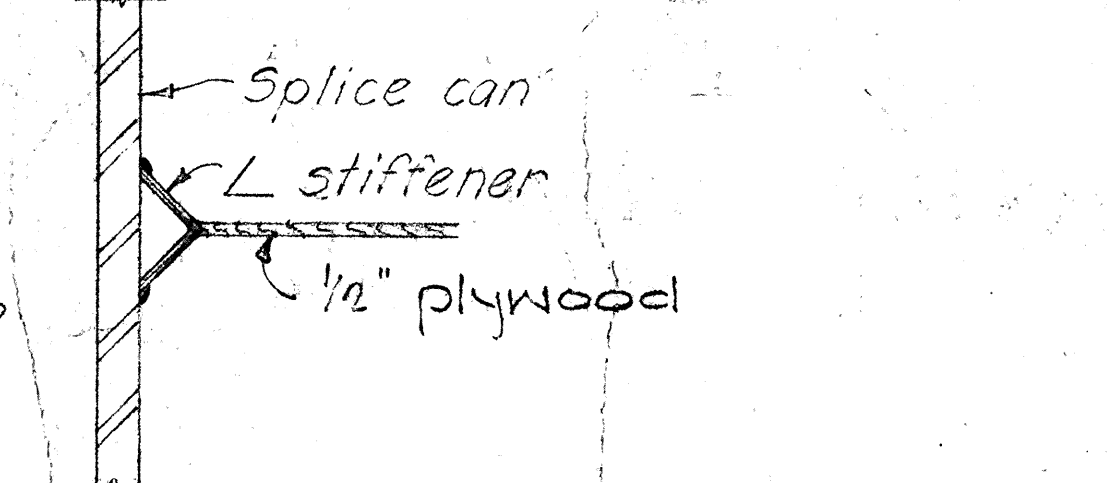
NOTE: All welding shall conform to the Specifications for "Welded Highway and Railway Bridges" of the American Welding Society.



TYPE II & III



TYPE I



DETAIL "X"

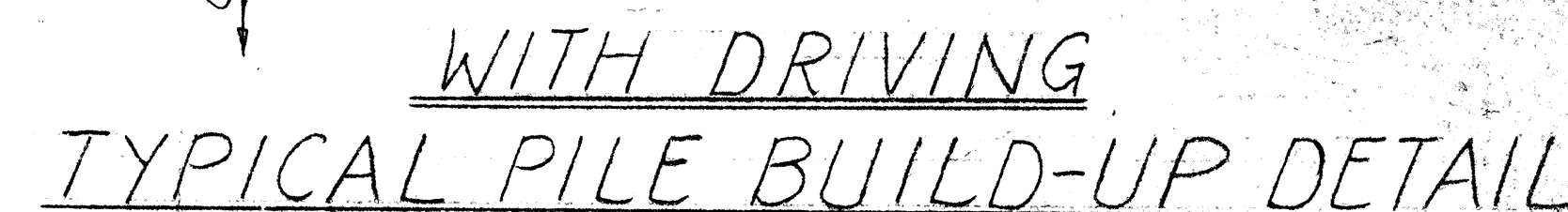
NO.	REVISION	APPROVED BY	DATE

APPROVAL RECOMMENDED: Paul T. Yamashita 1-23-76
BRIDGE DESIGN ENGINEER DATE

APPROVED: Paul T. Yamashita 1-28-76
ASSISTANT CHIEF, ENGINEERING DATE

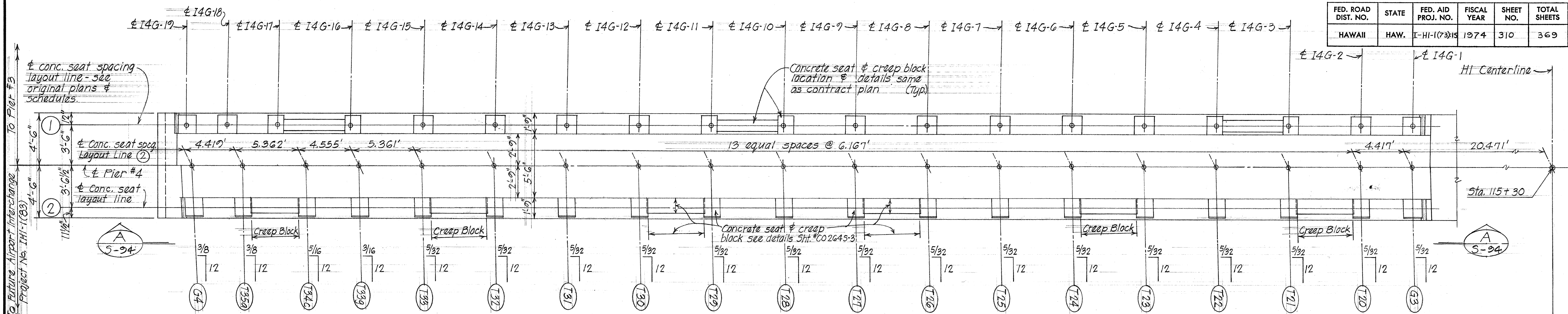
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
PRESTRESSED CONCRETE PILES

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

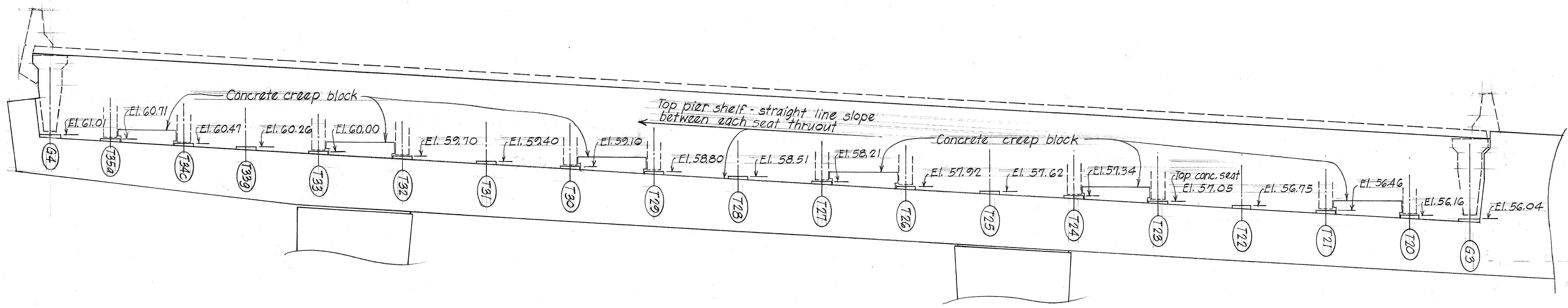


Date: Oct. 1968
SHEET No. 593 OF 106 SHEETS DB-300-

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(73)15	1974	310	369



PLAN - PIER #4 CAP HI INBOUND-SHOWING CONCRETE SEAT LOCATIONS ALONG LINE ②
Scale: 1/4" = 1'-0"

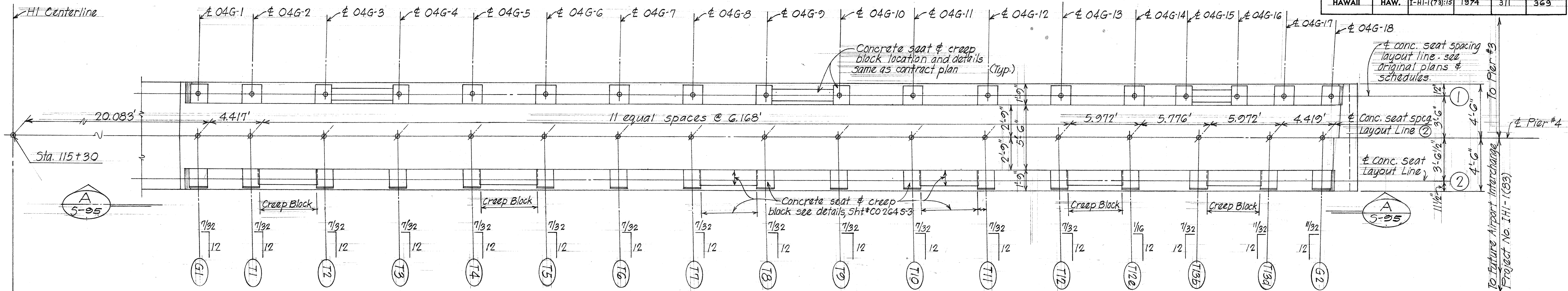


ELEVATION
Scale: 1/4" = 1'-0"

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STRUCTURE #8
PIER #4 - INBOUND
ADDITIONAL PIER & CONCRETE SEAT
LOCATION & DETAILS
PEARL HARBOR INTERCHANGE
F.A.I. PROJ. NO. I-HI-1(73)15
Scale: As Shown Date: Mar. 15, 1974
SHEET No. S-94 OF 106 SHEETS

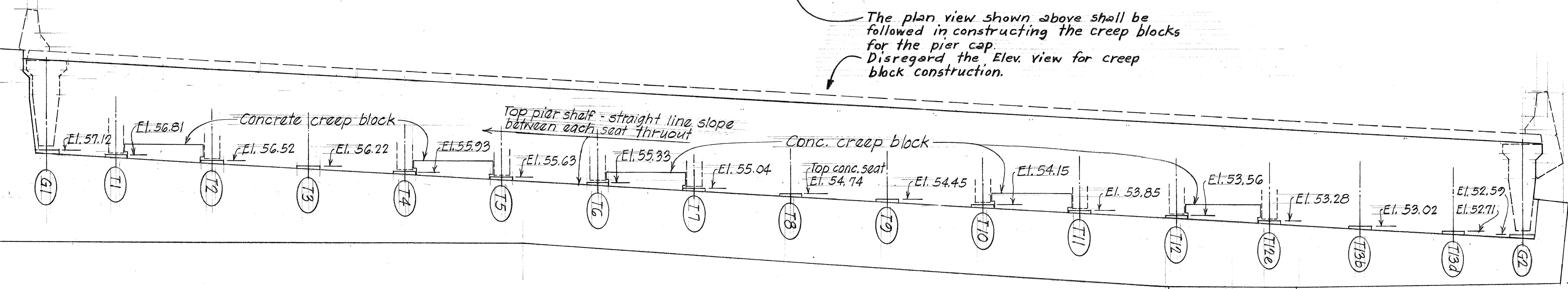
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-HI-(73)-15	1974	311	369



PLAN-PIER #4 CAP HI OUTBOUND- SHOWING CONCRETE SEAT LOCATIONS ALONG LINE ②
Scale: 1/4" = 1'-0"

FIELD DIRECTIVE March 9, 1976

The plan view shown above shall be followed in constructing the creep blocks for the pier cap. Disregard the Elev. view for creep block construction.



ELEVATION A 5-35
Scale: 1/4" = 1'-0"

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

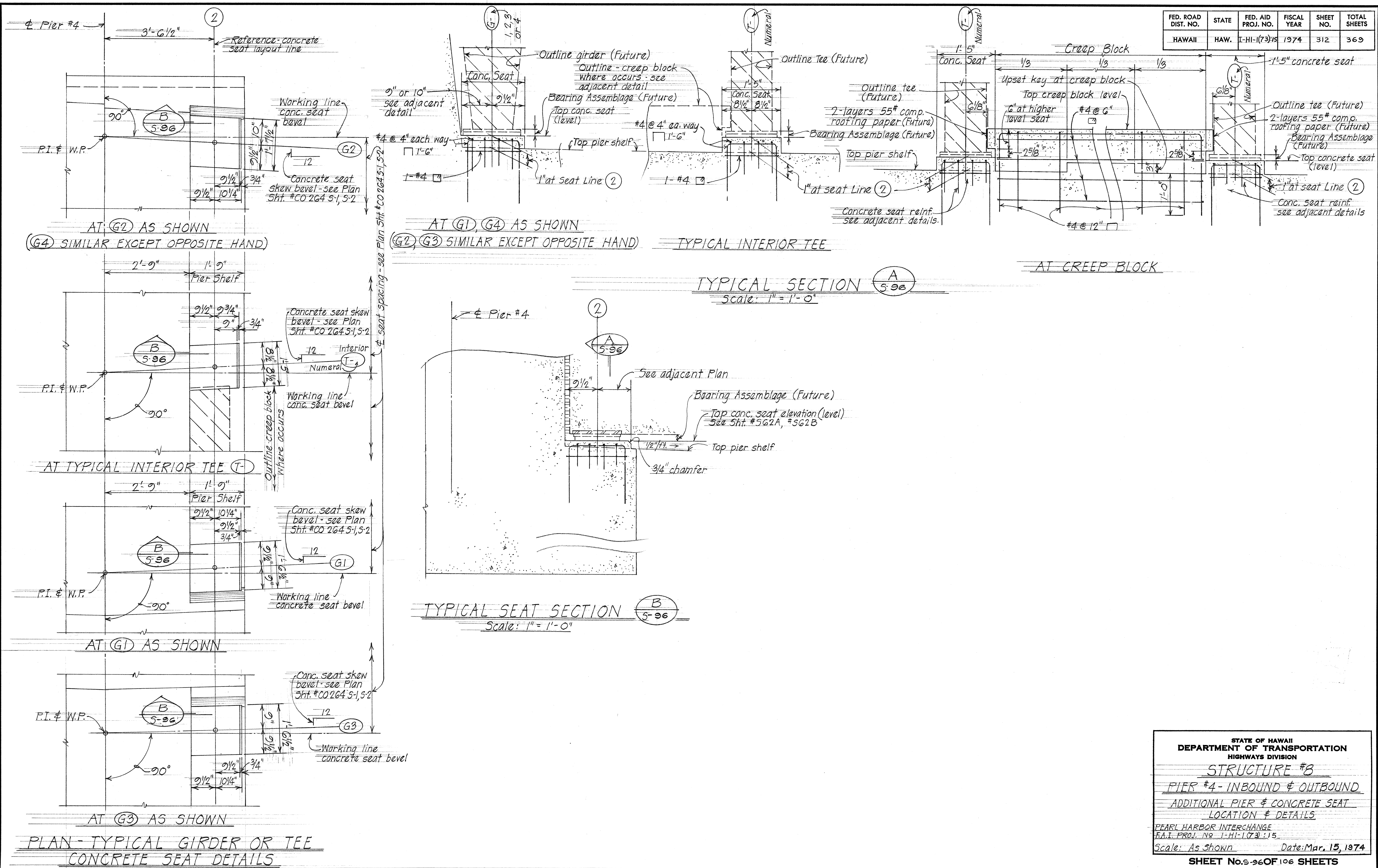
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURE #8
PIER #4 - OUTBOUND
ADDITIONAL PIER & CONCRETE SEAT
LOCATION & DETAILS

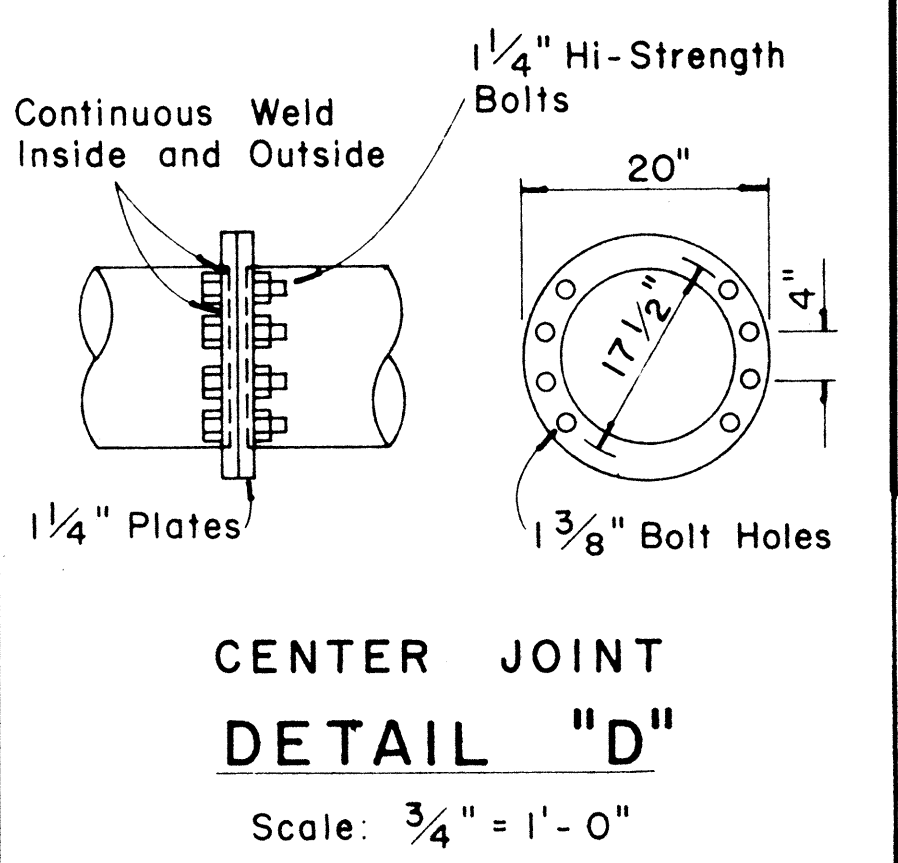
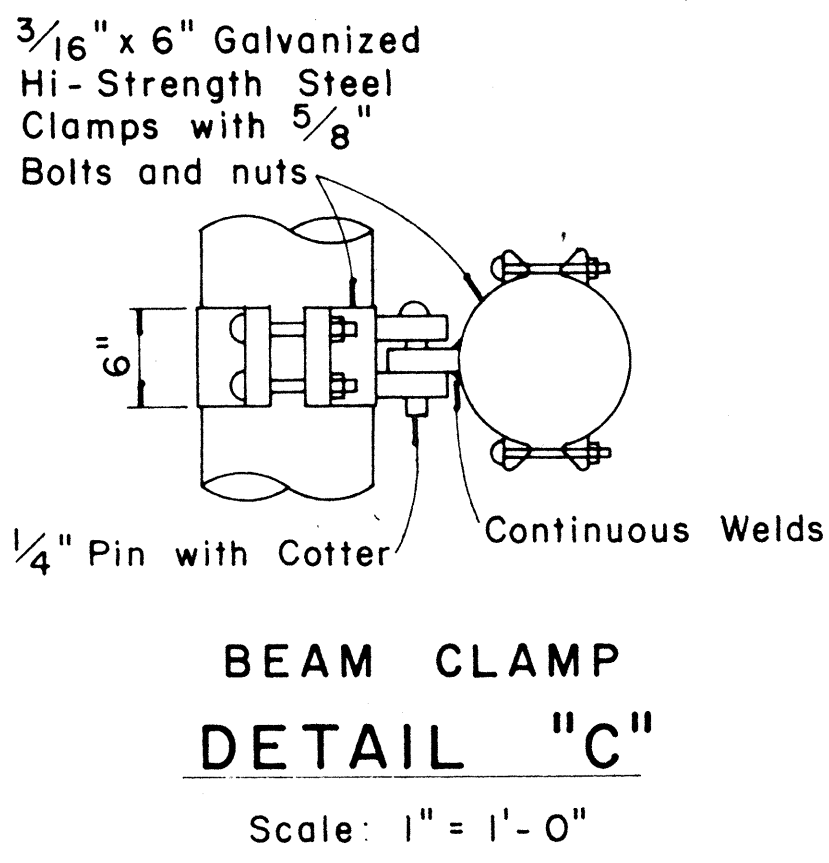
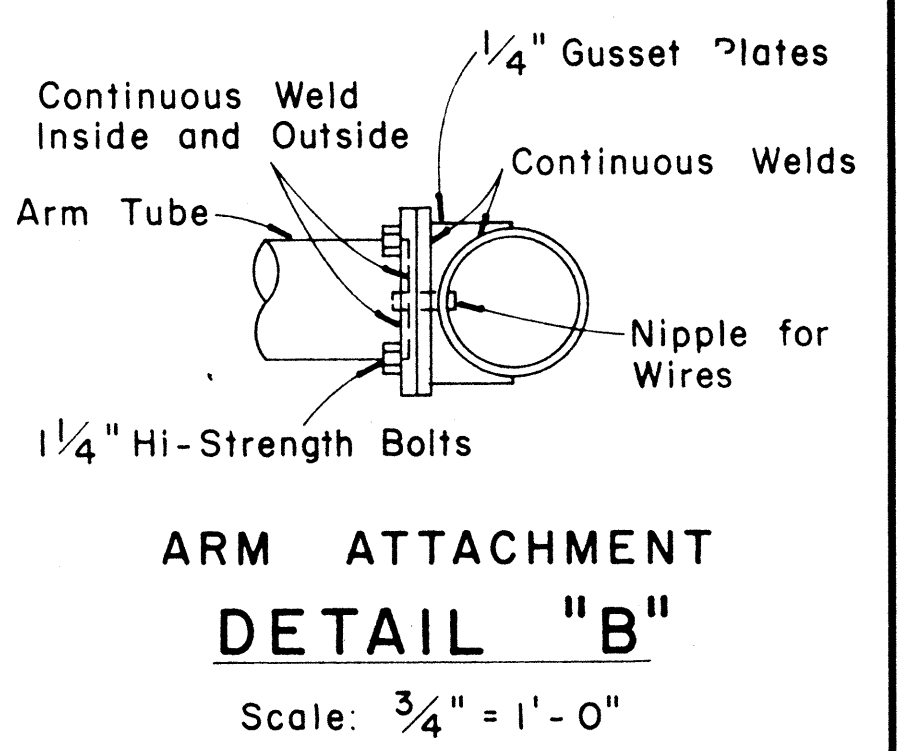
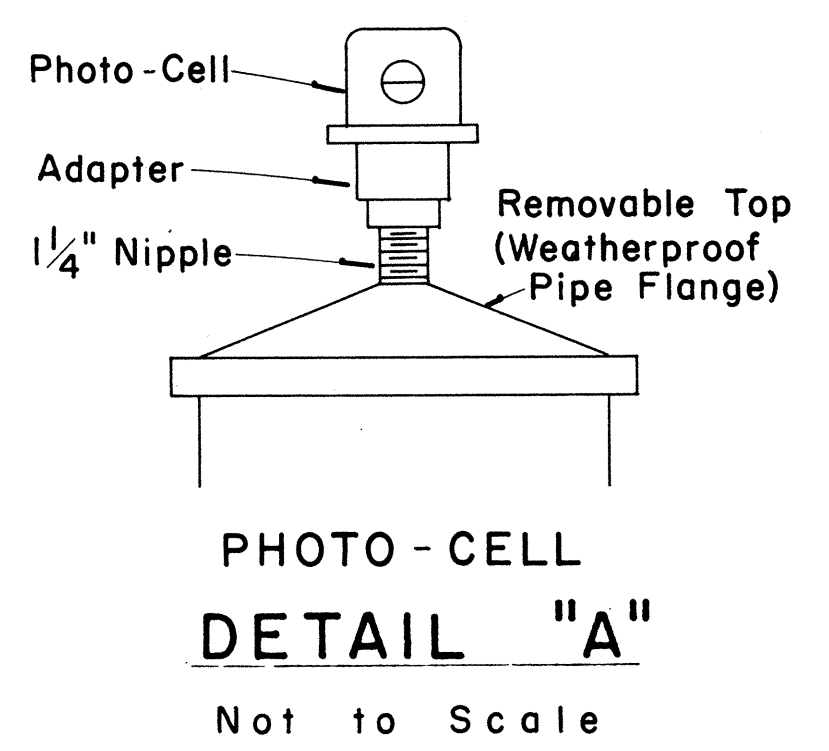
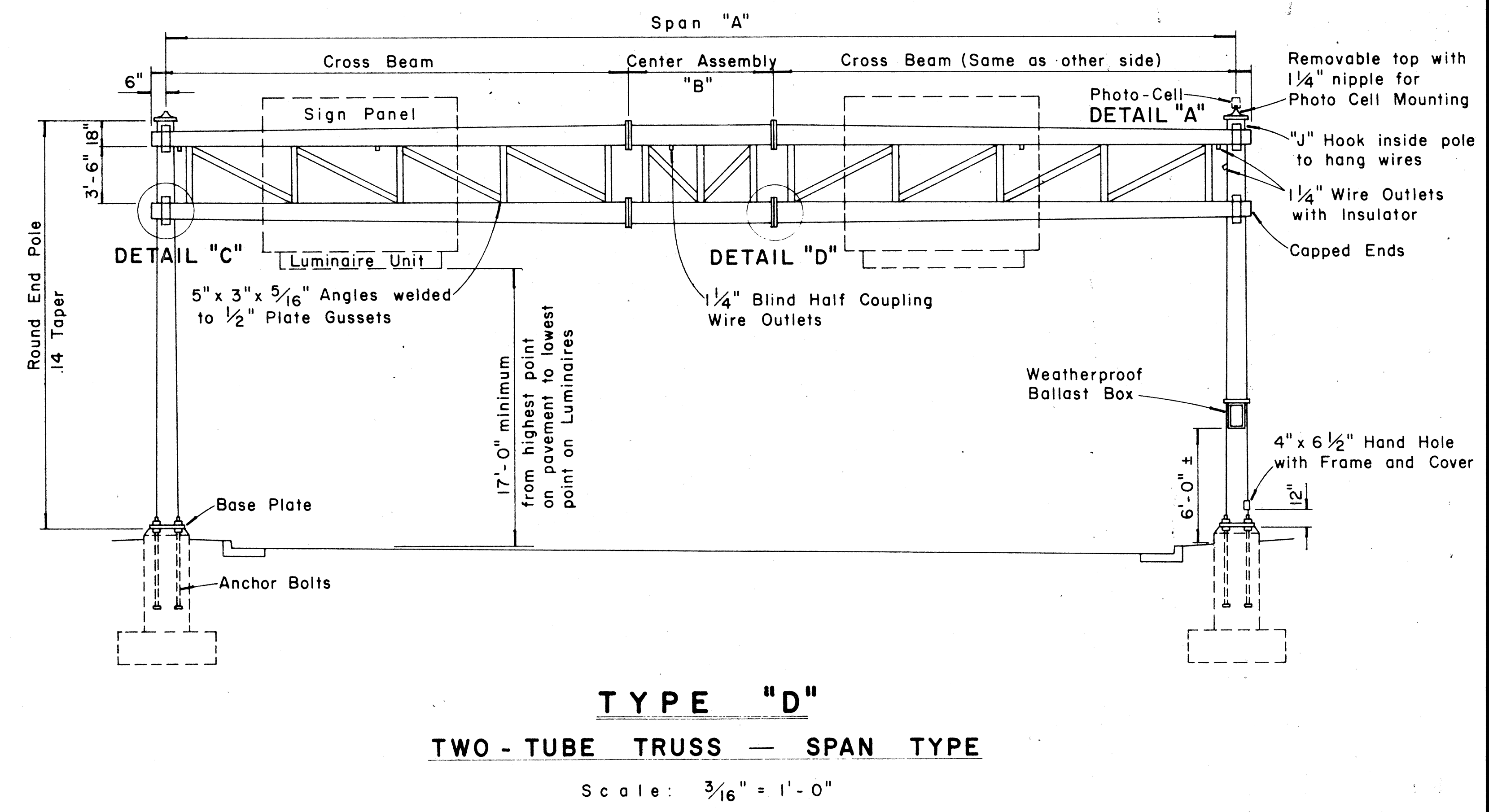
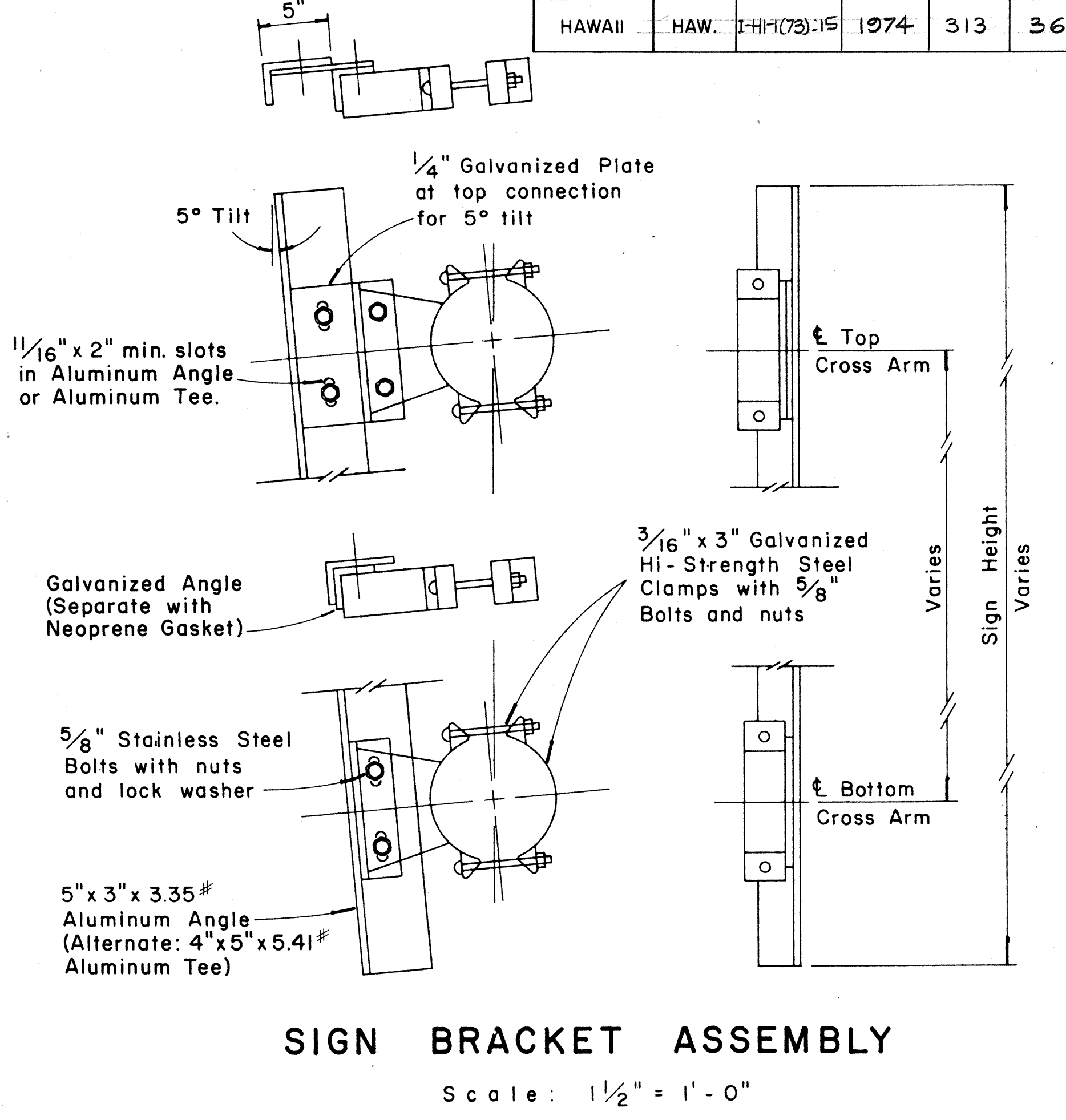
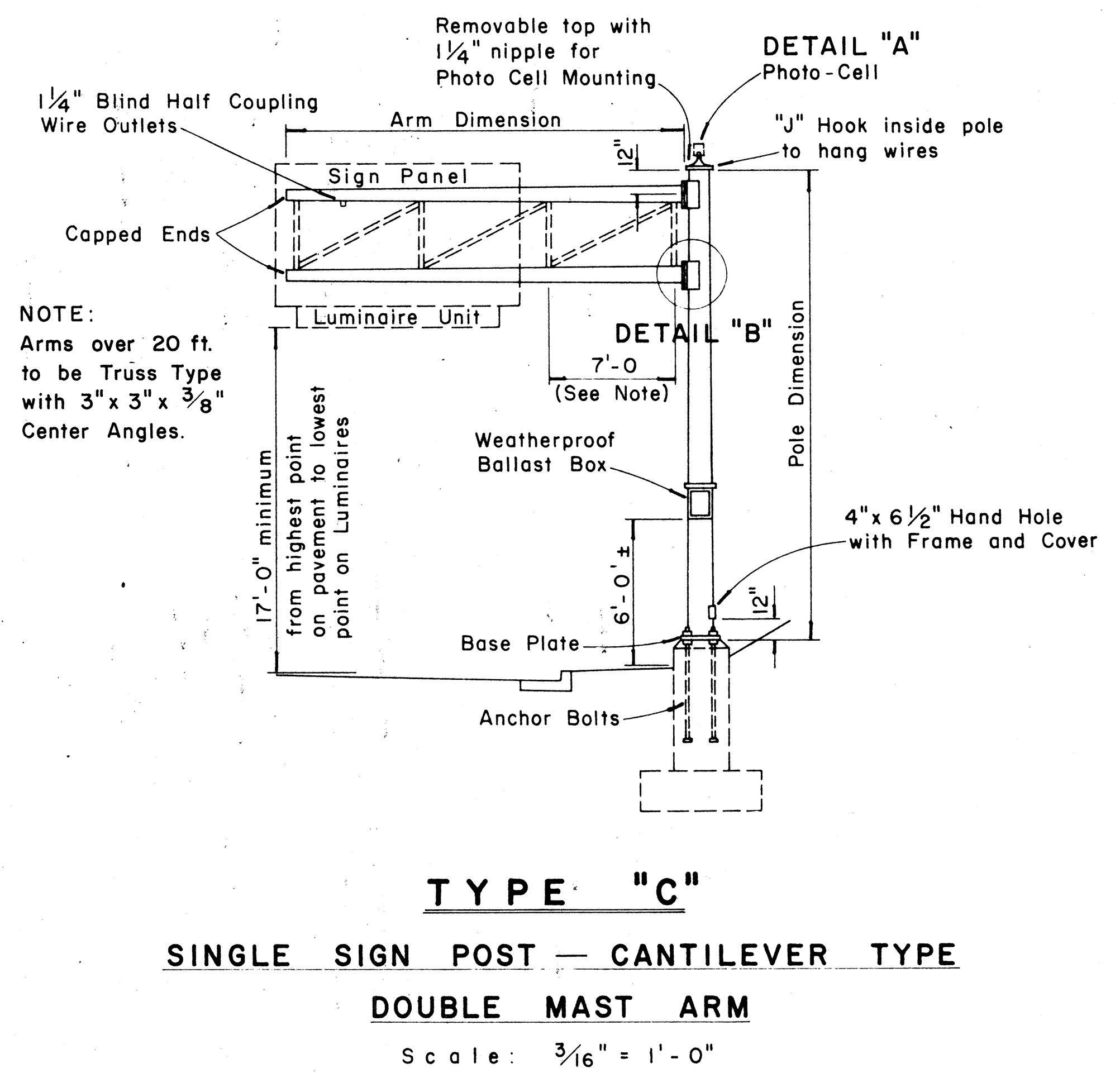
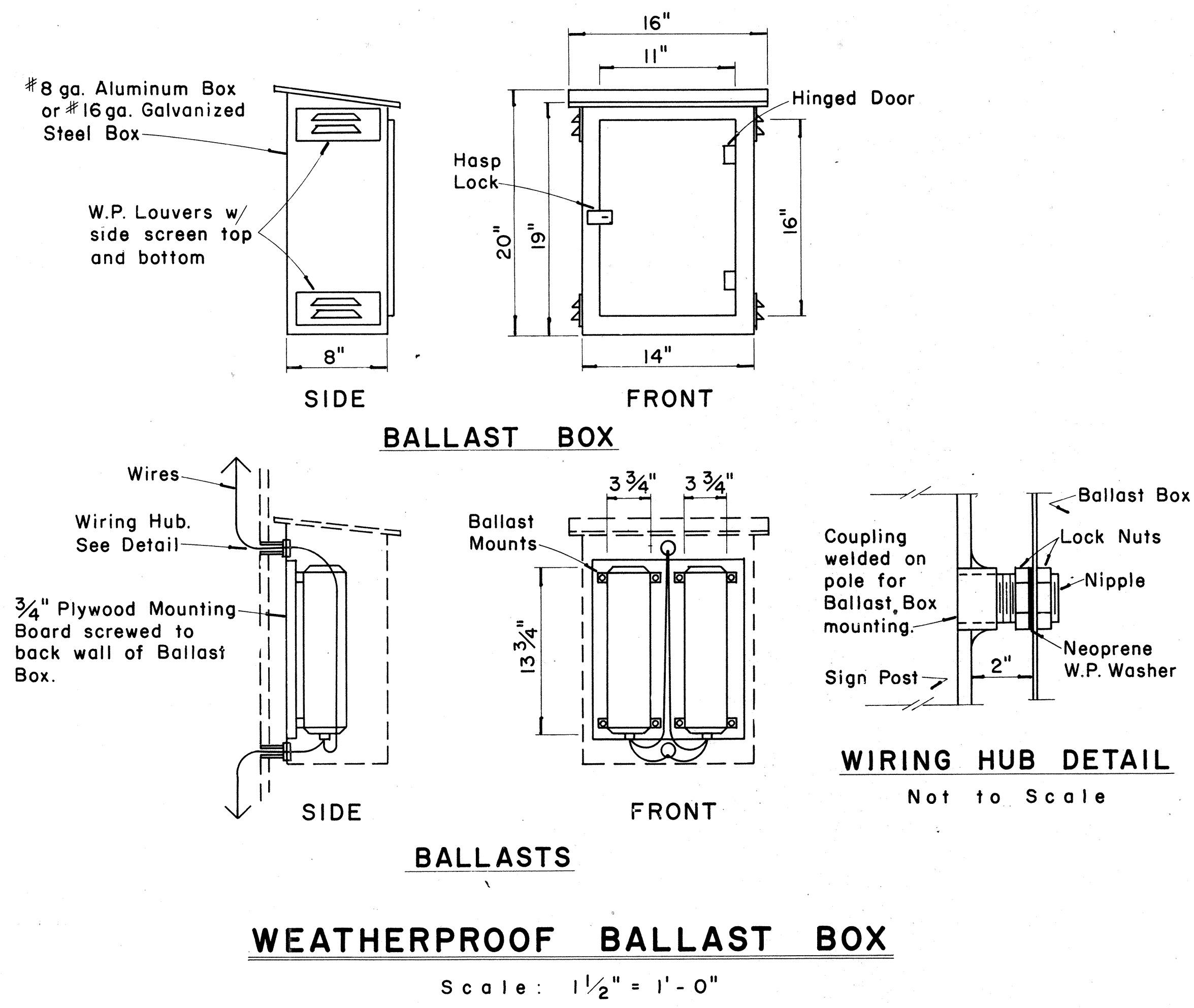
PEARL HARBOR INTERCHANGE
F.A.I. PROJ. NO. 1-HI-(73)-15
Scale: As Shown Date: Mar. 15, 1974

SHEET No. 5-35 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(73)15	1974	312	369



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-HH-1(73)-15	1974	313	369



APPROVAL RECOMMENDED:
Eishi Tanaka 12/29/69
TRAFFIC ENGINEER DATE

APPROVED:
William S. S. S. 12-30-69
ASSISTANT CHIEF, ENGINEERING DATE

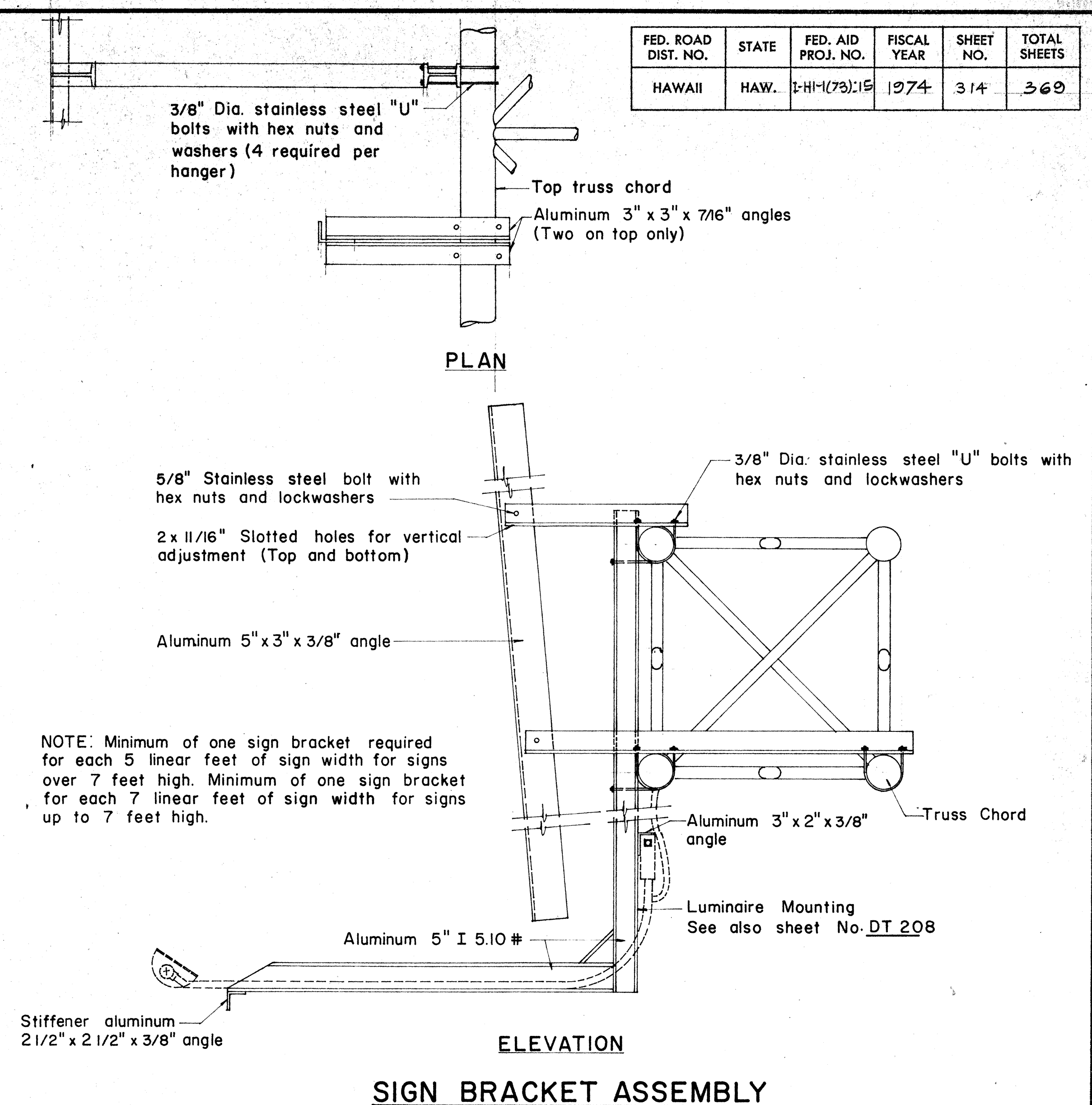
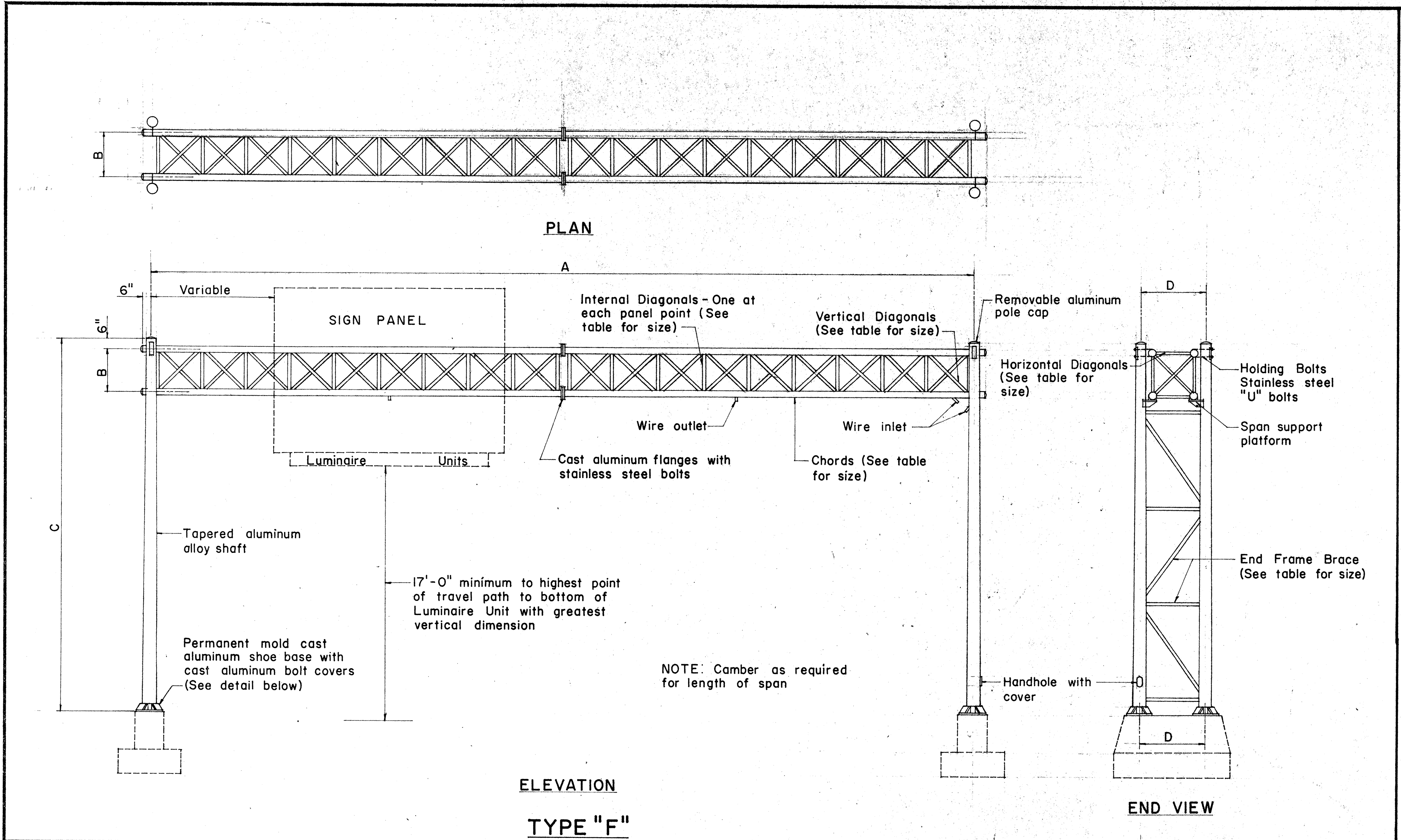
NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

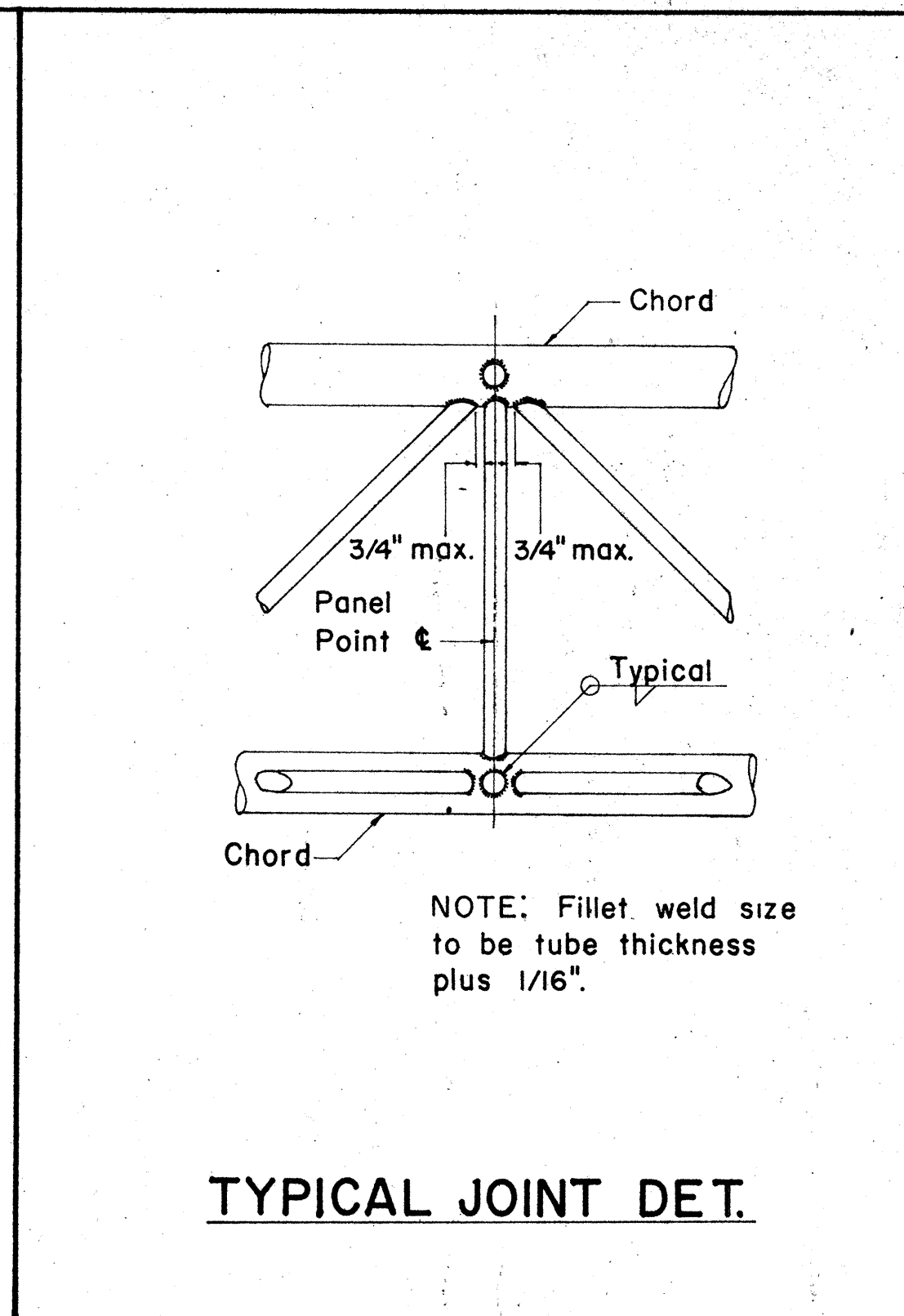
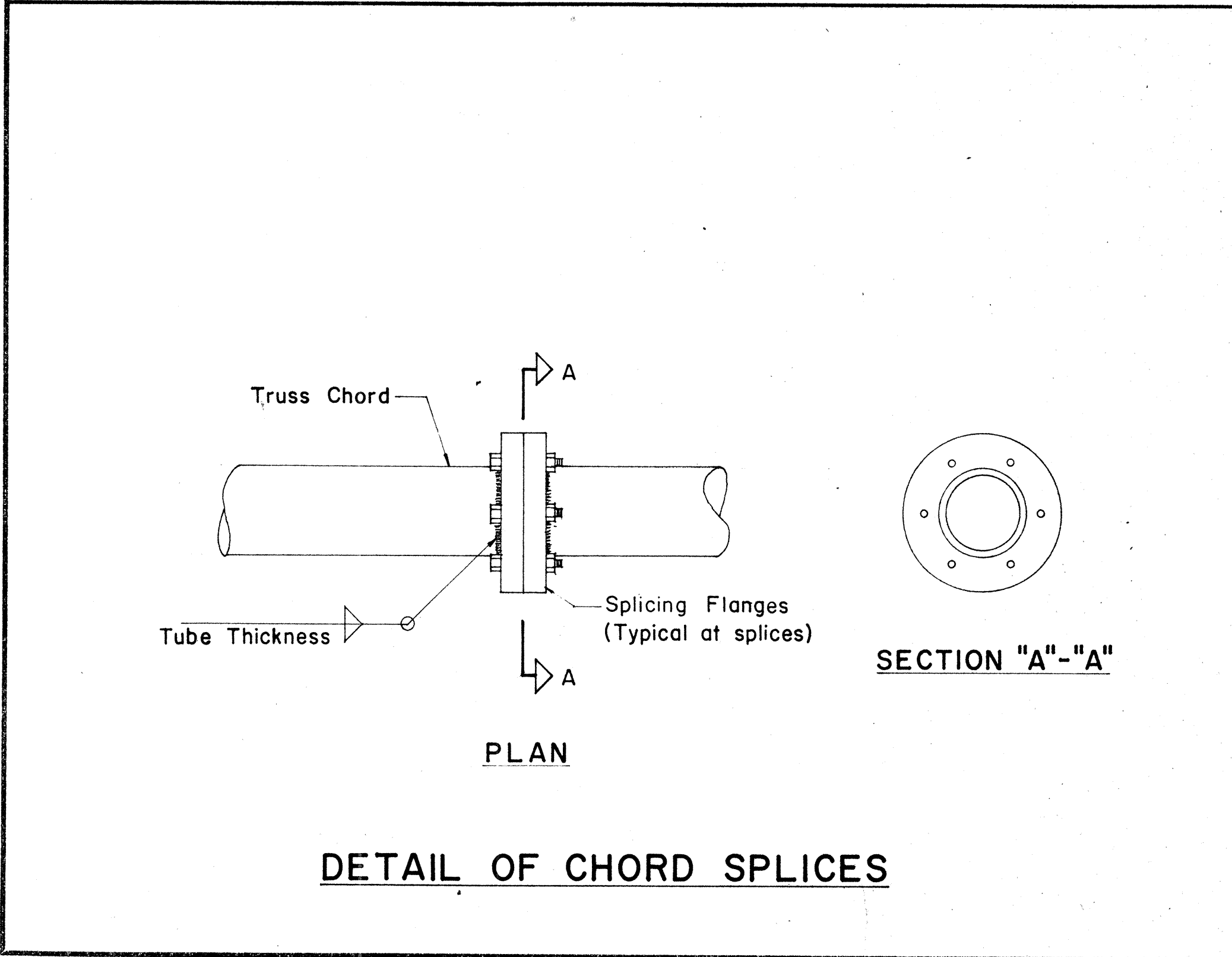
STANDARD DETAILS
OVERHEAD SIGN SUPPORTS

Scale: As Shown

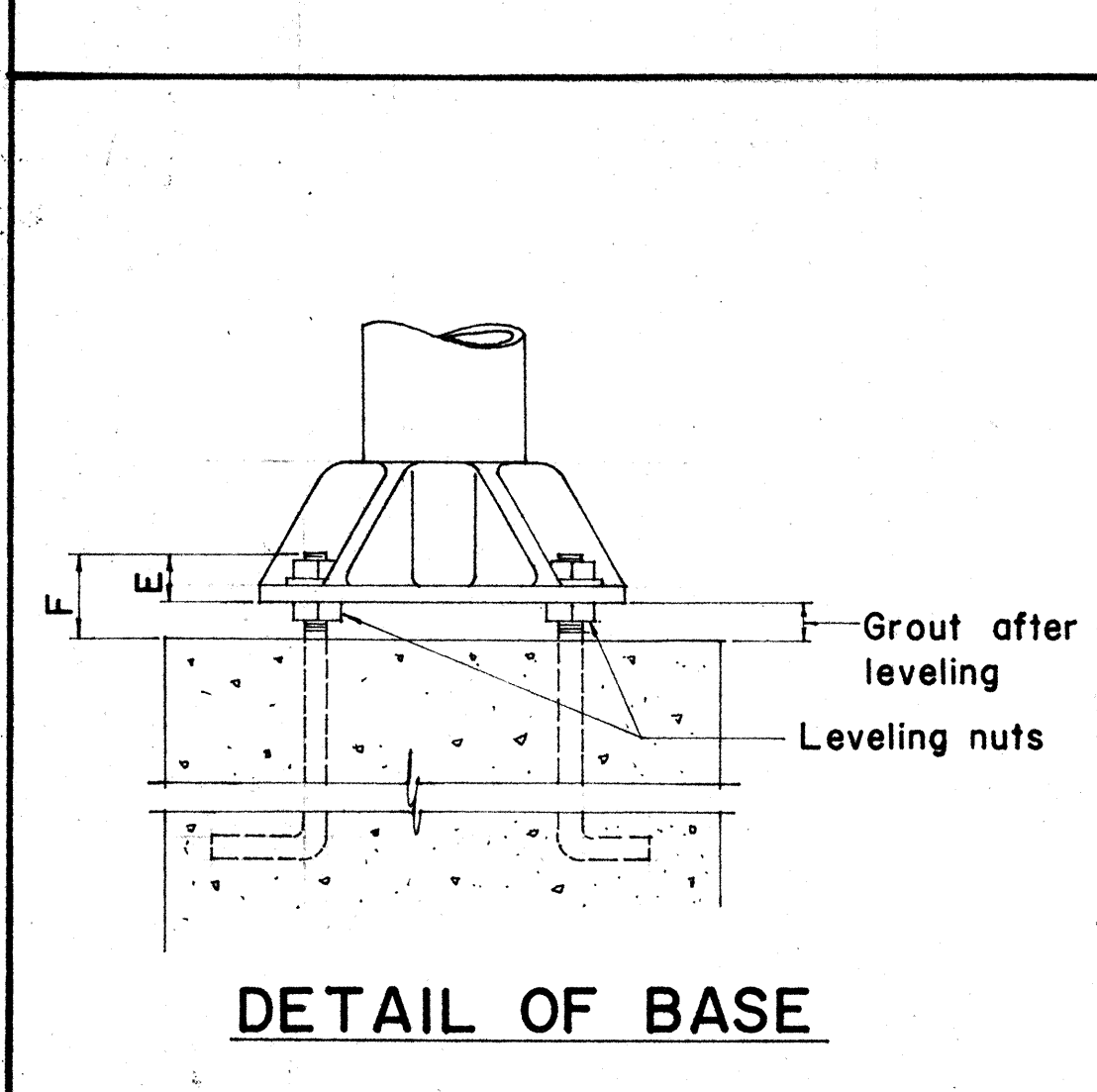
SHEET No. 597 OF 106 SHEETS DT 200



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-HI-1(73)15	1974	314	360



SIGN NO.	A	B	C	D	E	F	SPAN SECTIONS REQ'D.	CHORD SIZE	END FRAME SHAFT SIZE AND TAPER	VERTICAL DIAGONAL SIZE	HORIZONTAL DIAGONAL SIZE	INTERNAL DIAGONAL SIZE	END FRAME BRACE SIZE	BOLT CIRCLE DIA.	ANCHORAGE



APPROVAL RECOMMENDED:

Erich Tanaka 12/29/69
TRAFFIC ENGINEER DATE

APPROVED:

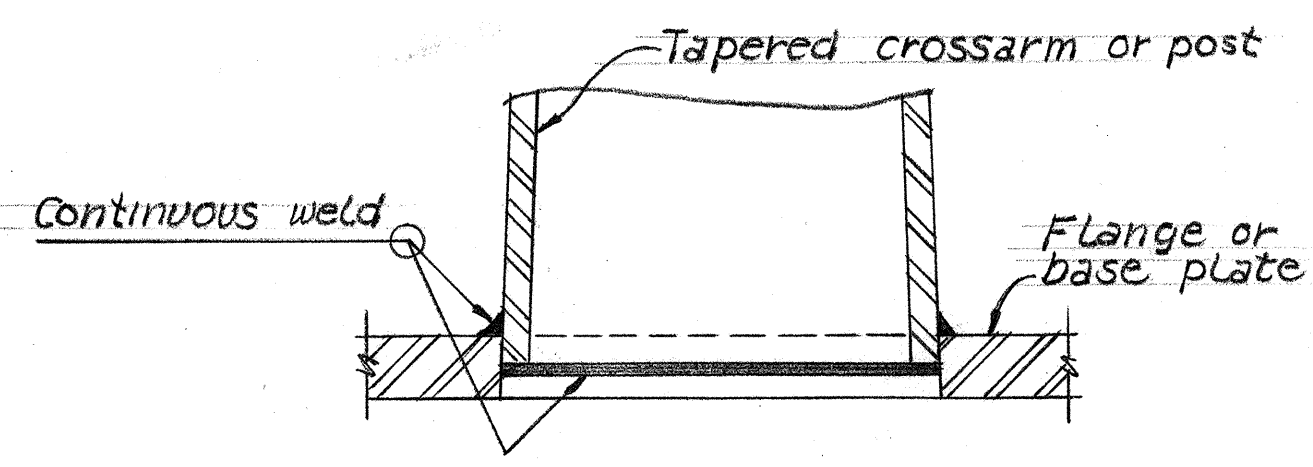
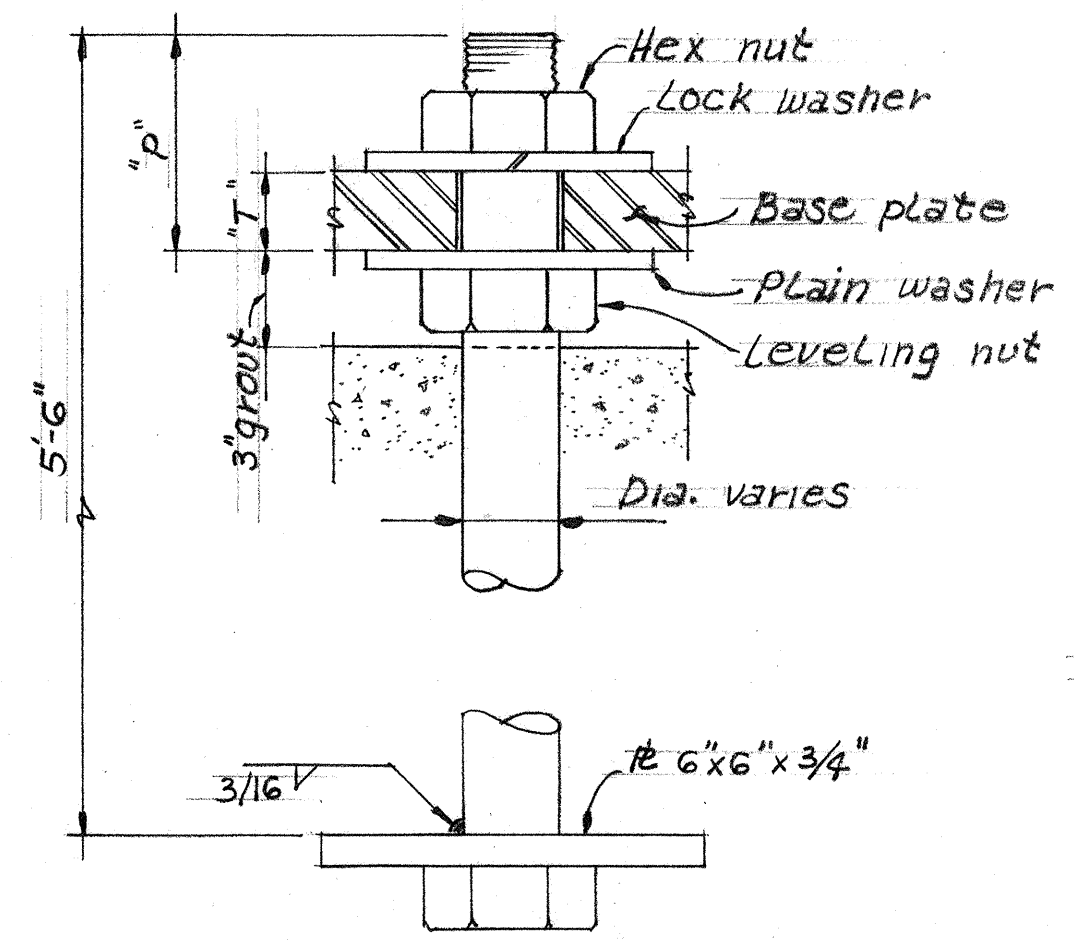
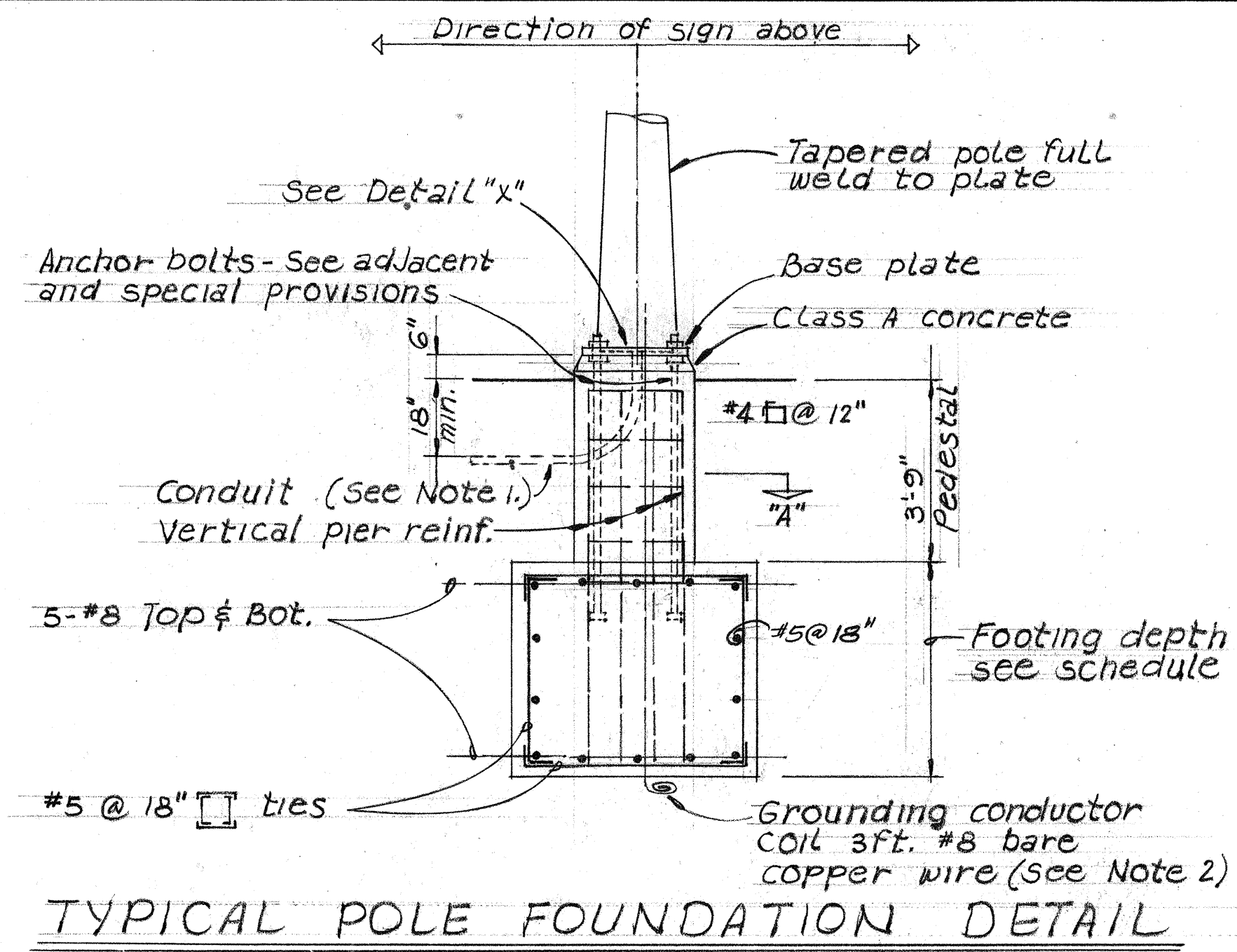
John J. Del 12-30-69
ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE

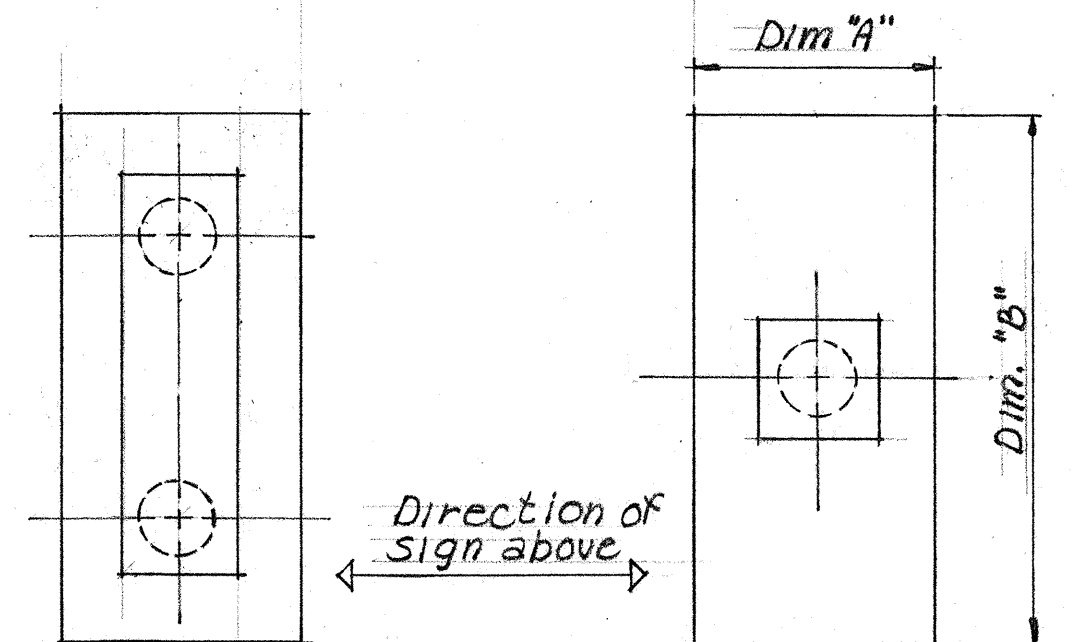
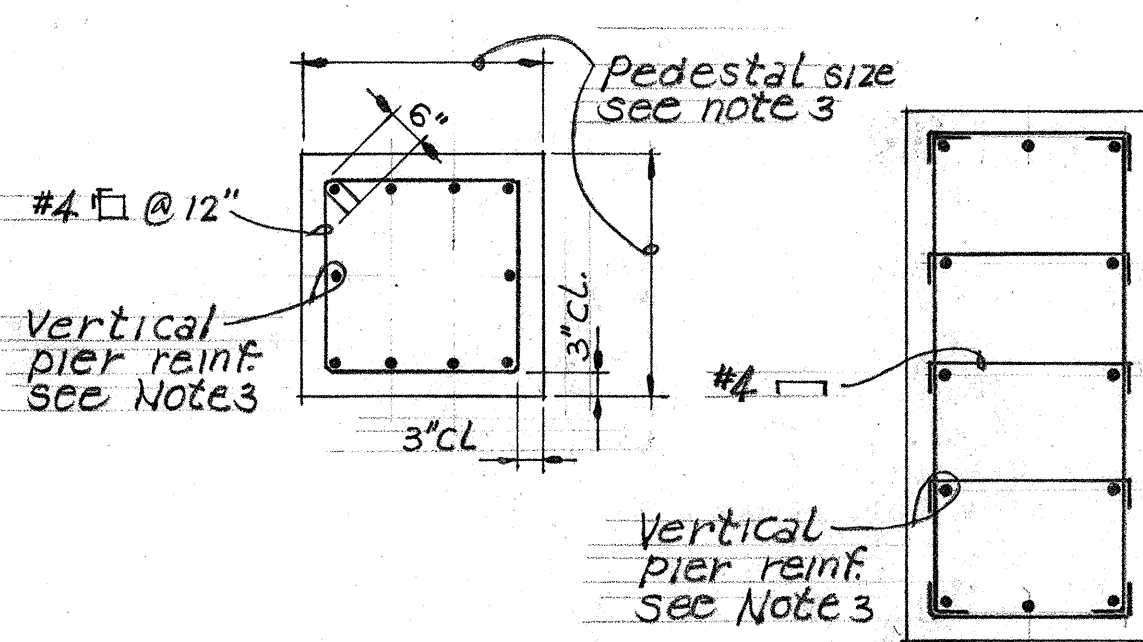
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE "F"
OVERHEAD SIGN SUPPORT
BOX TRUSS TYPE
ALUMINUM

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-H1-1(73)15	1974	315	369

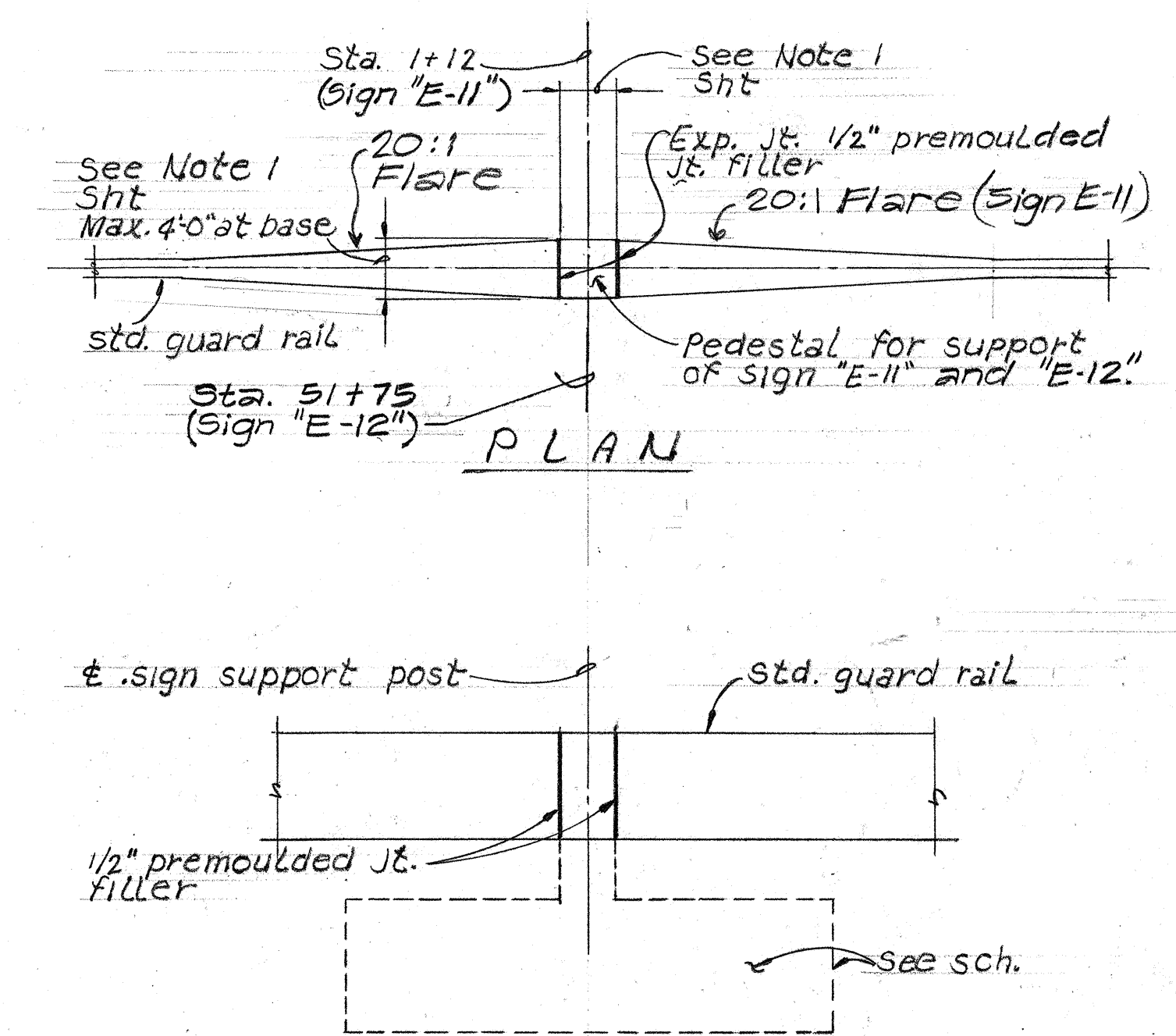
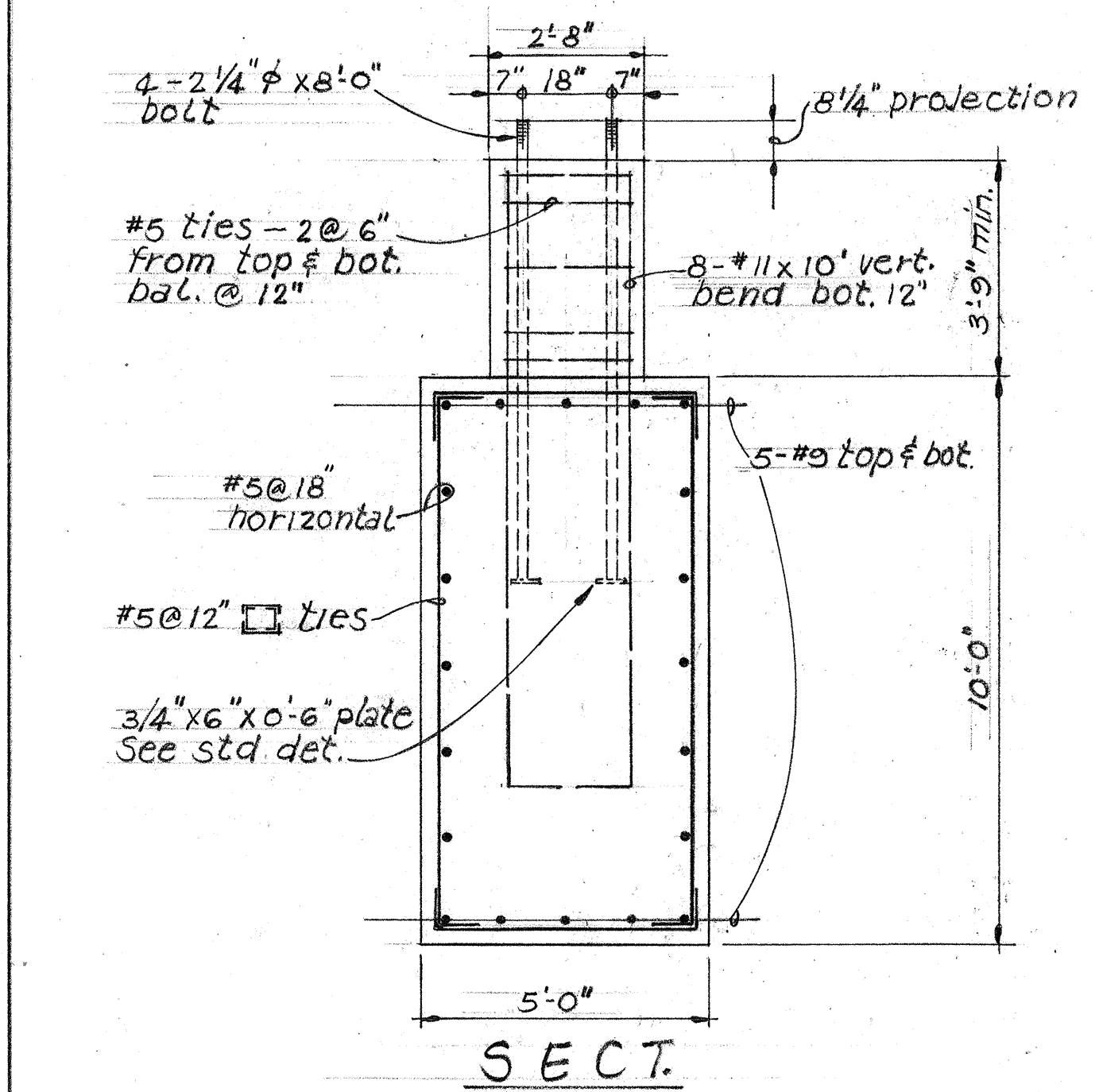
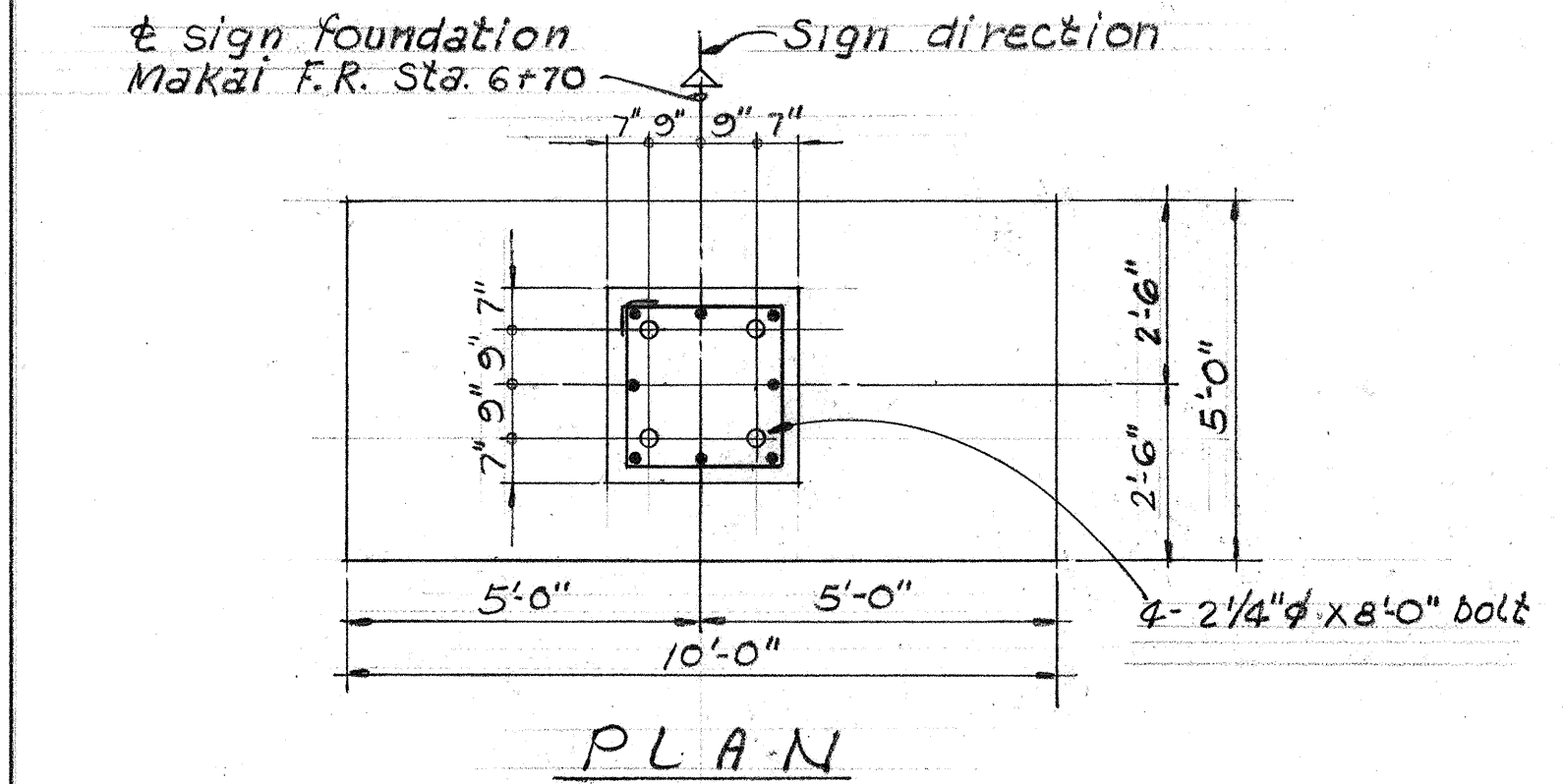


- NOTES:
1. Total number of conduits into pole foundation as indicated on Lighting plans. Conduits shall slope away from pole foundation. Conduit shall stub out 5'-0" min. for direct burial entry.
 2. Grounding conductor shall be bonded to sign support.
 3. Except specified otherwise, contractor shall determine the detail requirements of the pedestal, base plate, and anchor bolts in accord with type of sign support selected.



FOUNDATION SCHEDULE					
Sign	Support Type	Foundation Sch.			Remarks
		A	B	Depth	
E-2	Type "D"	5'	10'	10'-0"	a
3	Type "D" or "F"	5'	12'	5'	-
4	Type "D"	5'	16'	7'-6"	b
7	Type "D" or "F"	5'	10'	7'-6"	c
9	D.O.	5'	10'	7'-6"	-
10	D.O.	5'	10'	6'-6"	-
11	D.O.	5'	14'	5'-6"	d
12	D.O.	6'	15'	6'-6"	d
14	Standard Det.				
15	Type "C"				f
16	Standard Det.				

- a. Light footing & pedestal at median is existing. Right footing see Det. 1/5-99
- b. Left footing is integral with retaining wall- Det. 1/5-100 Right footing by others
- c. Left footing falls along median barrier- Det. 2/5-100
- d. Left footing on median barrier- Det. 2/5-99
- f. Ftg. is existing.



PEDESTAL AT CONC. GUARD RAIL 2
For sign E-12 see detail sheet 238 S-1. S-99

SHIMAZU SHIMABUKURO & FUKUDA, INC.
Consulting Structural Engineers
1210 Ward Ave., Honolulu, HI 96814

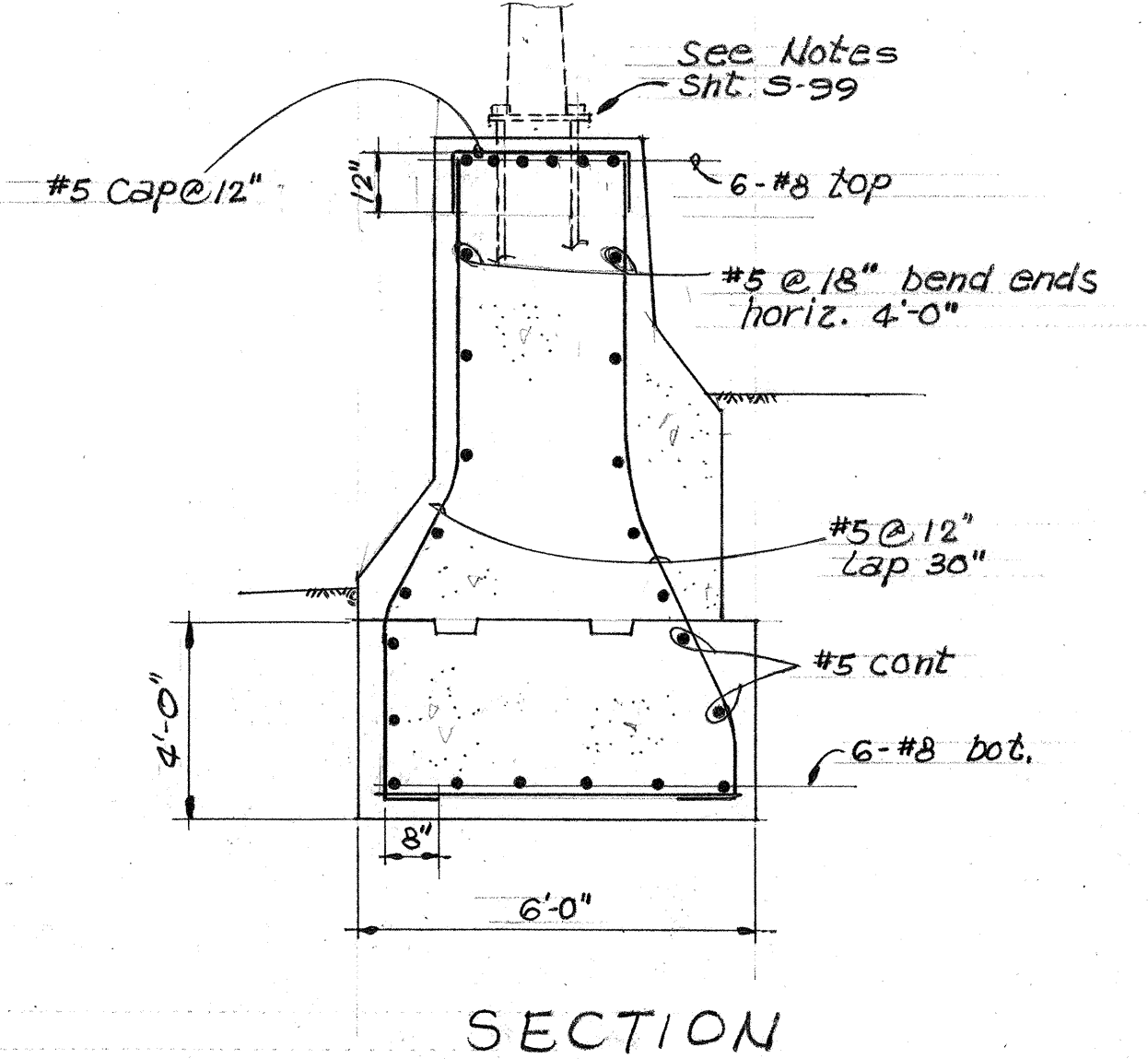
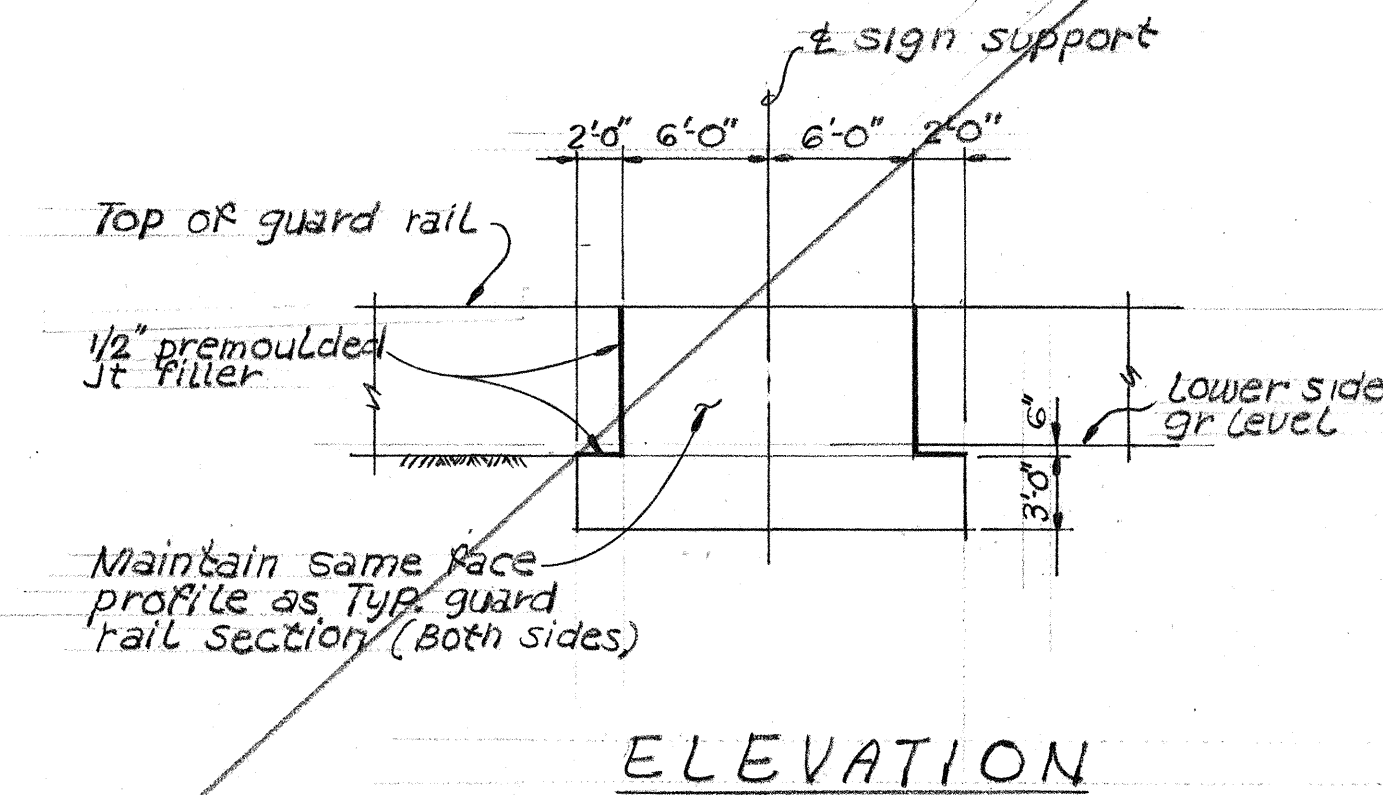
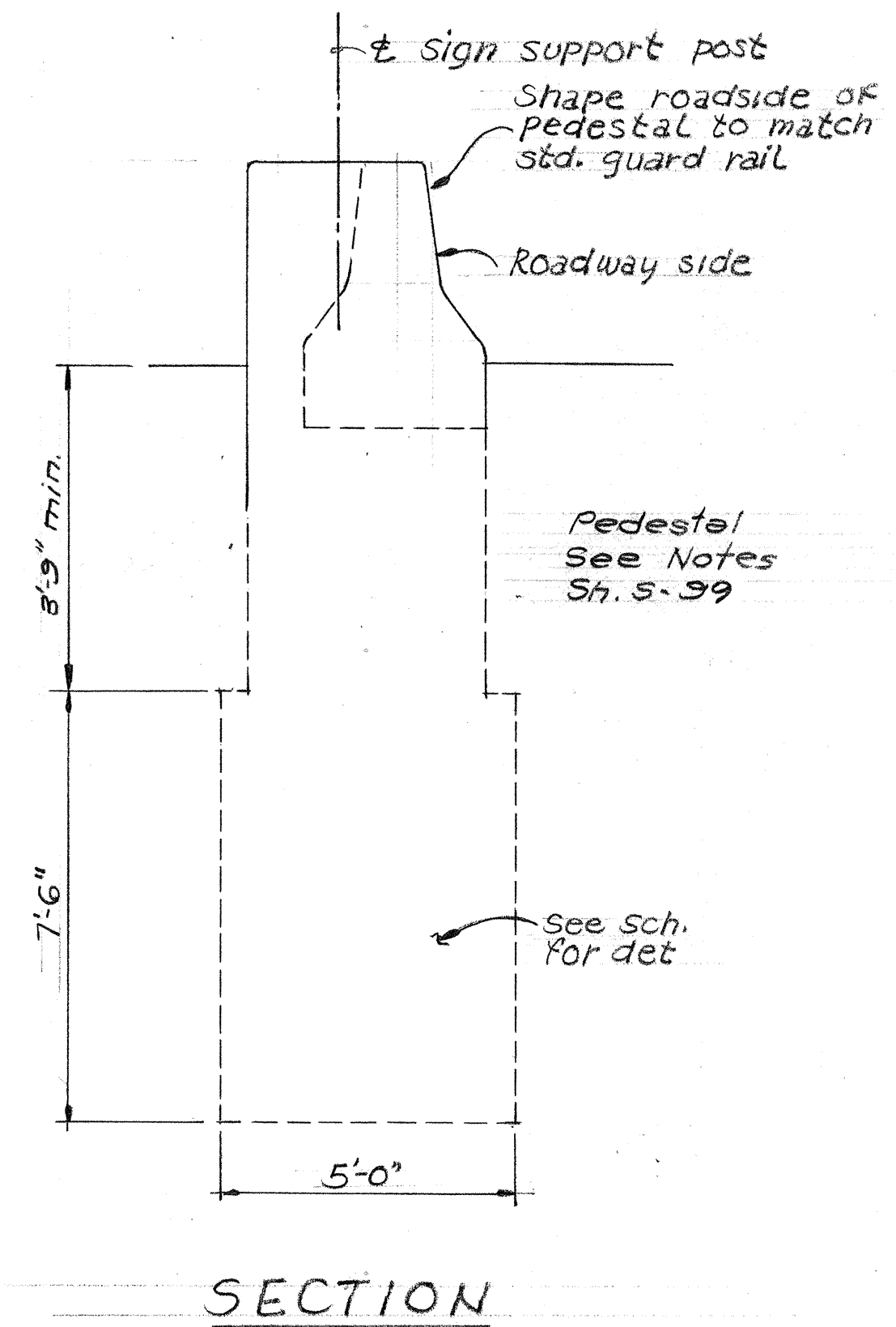
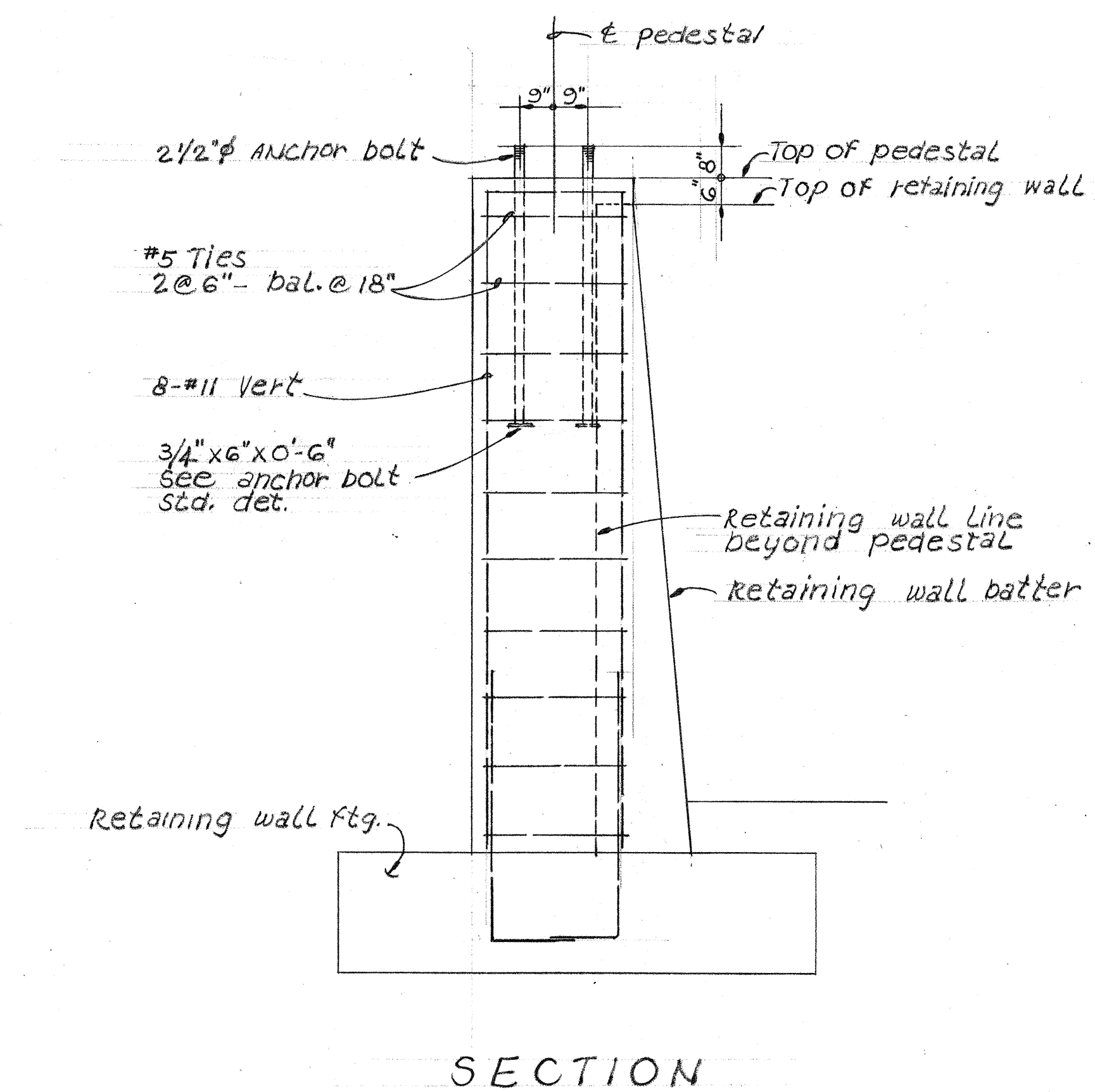
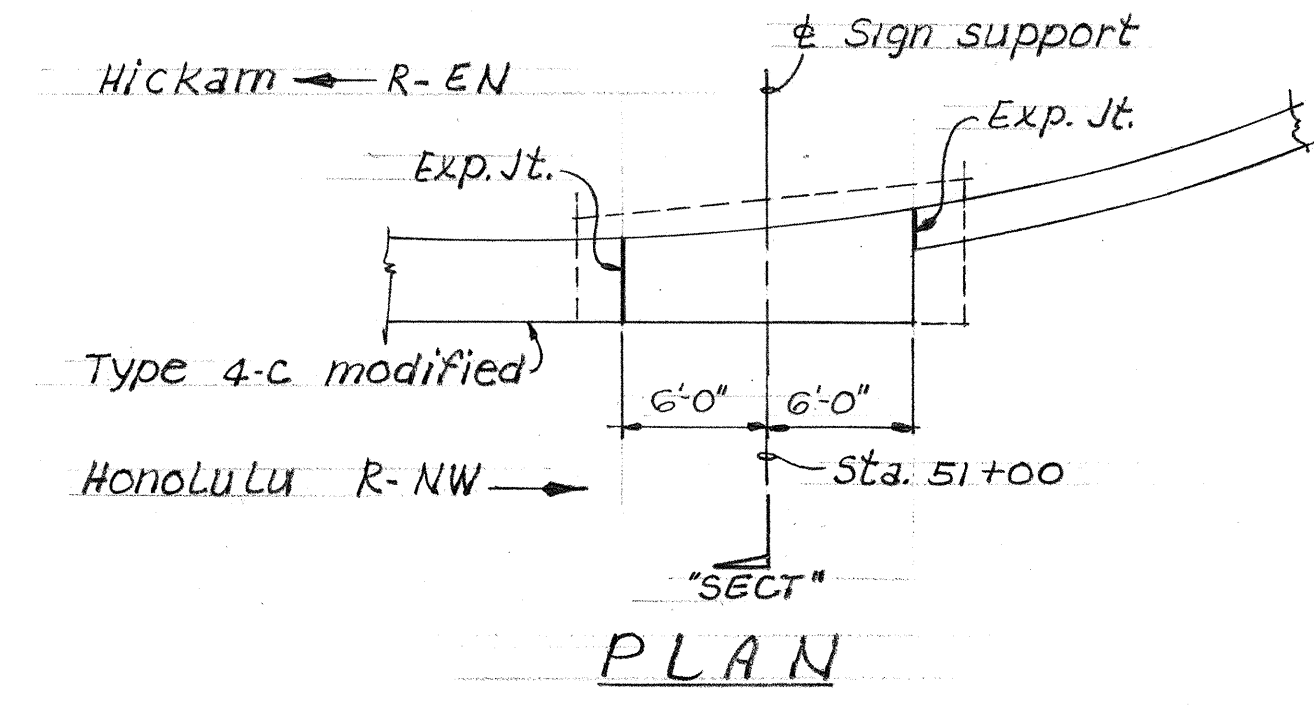
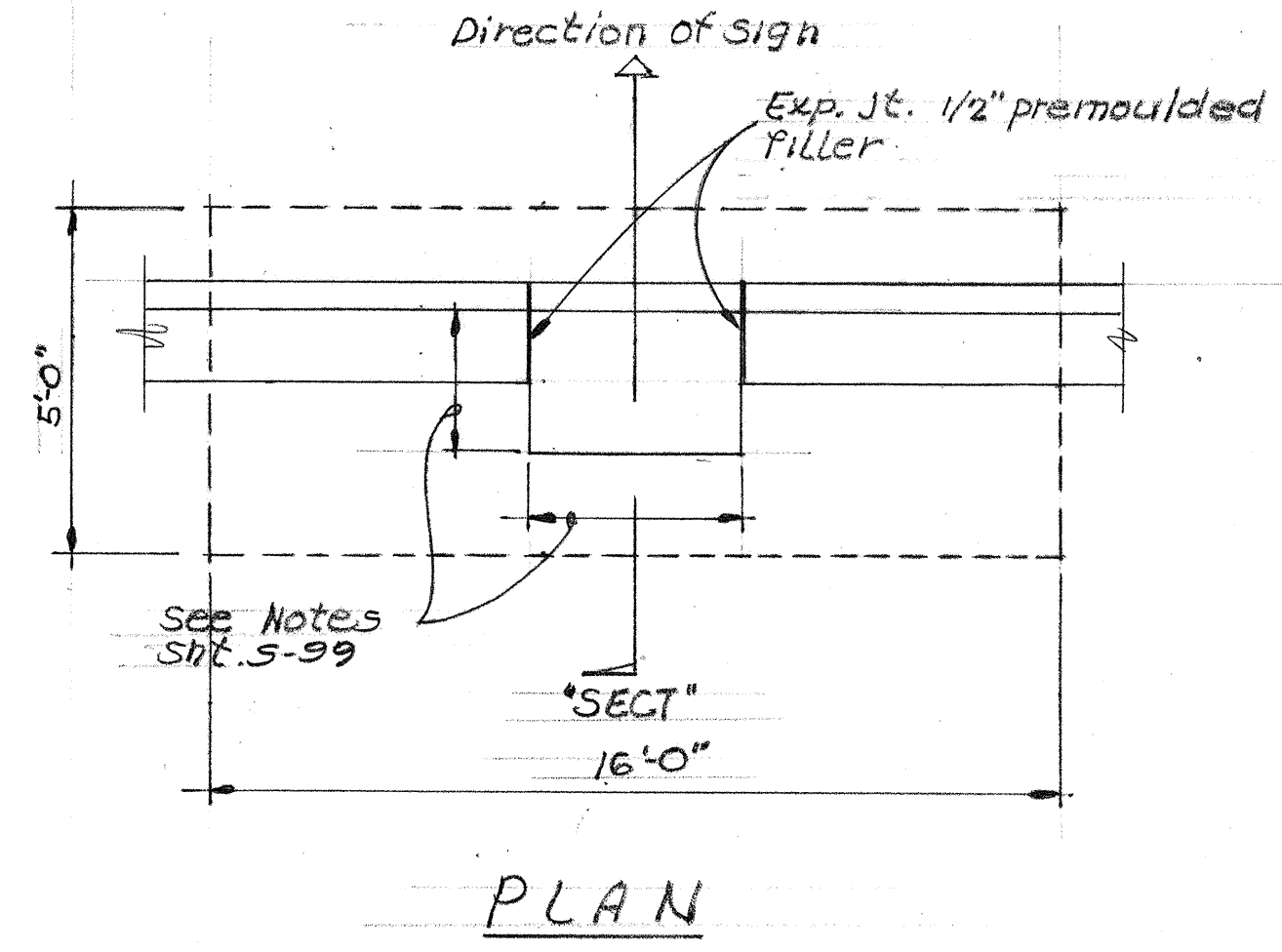
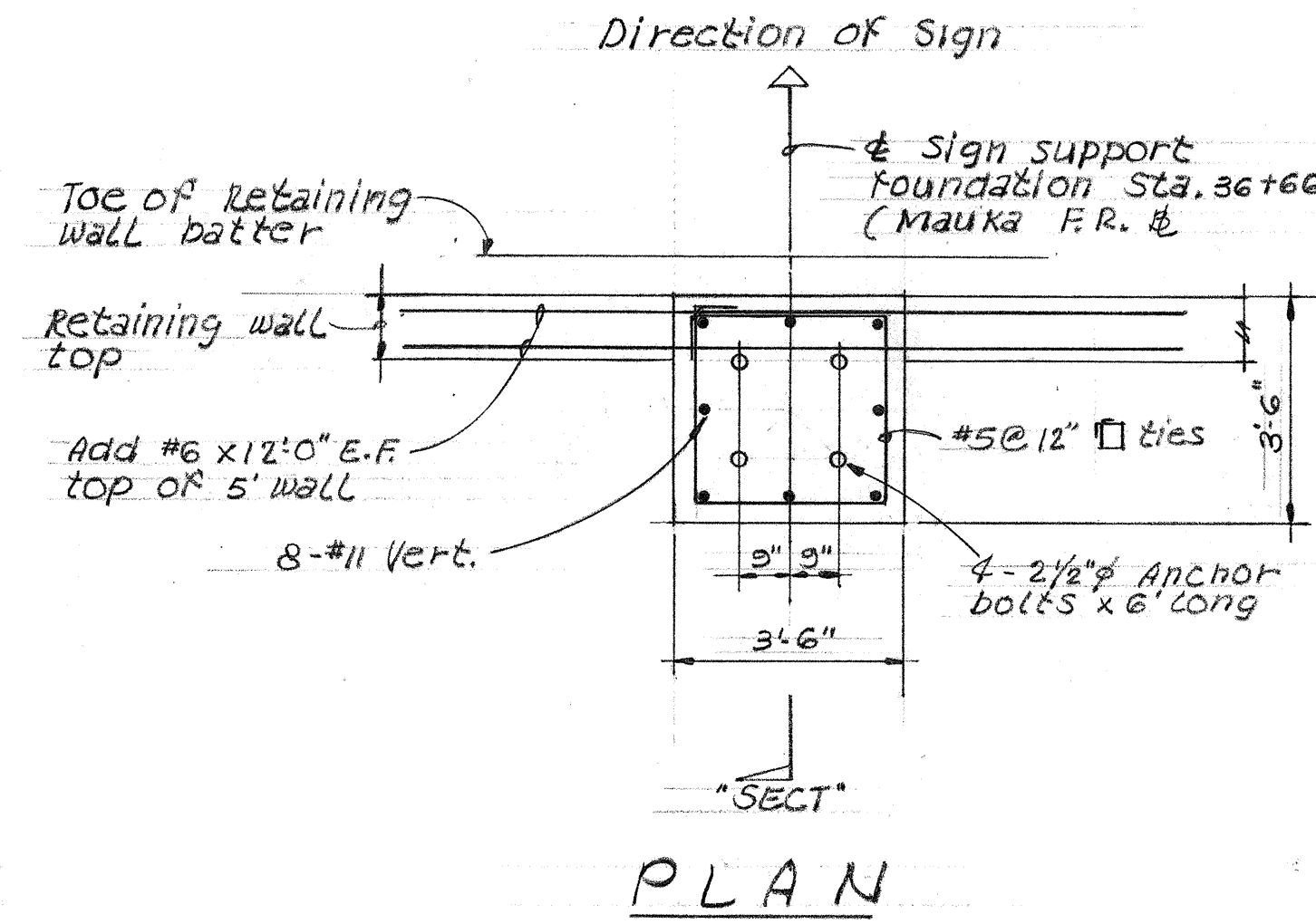
MICHAEL PAUL MATSUMOTO
REGISTERED PROFESSIONAL ENGINEER
No. 2974
HAWAII, U.S.A.

R.O.S. SHIMABUKURO
REGISTERED PROFESSIONAL ENGINEER
No. 1150
HAWAII, U.S.A.

DATE	REVISION
9/10/76	DELETED NOTE "e" AND REVISED E-12 REMARK TO "d".
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
STANDARD SIGN SUPPORT FOUNDATION DETAILS & SCHEDULES	
PEARL HARBOR INTERCHANGE F.A.I. Proj. No. 1-H1-1(73)15	
Scale: As Shown Date: DEC. 7, 1973	
SHEET NO. 5-99 OF 106 SHEETS	

THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-4-1(73)15	1974	316	369



DETAIL 1
N.T.S. 5-100

DETAIL 2
N.T.S. 5-100



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

DATE	9/10/76	DELETED DETAIL	2
DATE		REVISION	

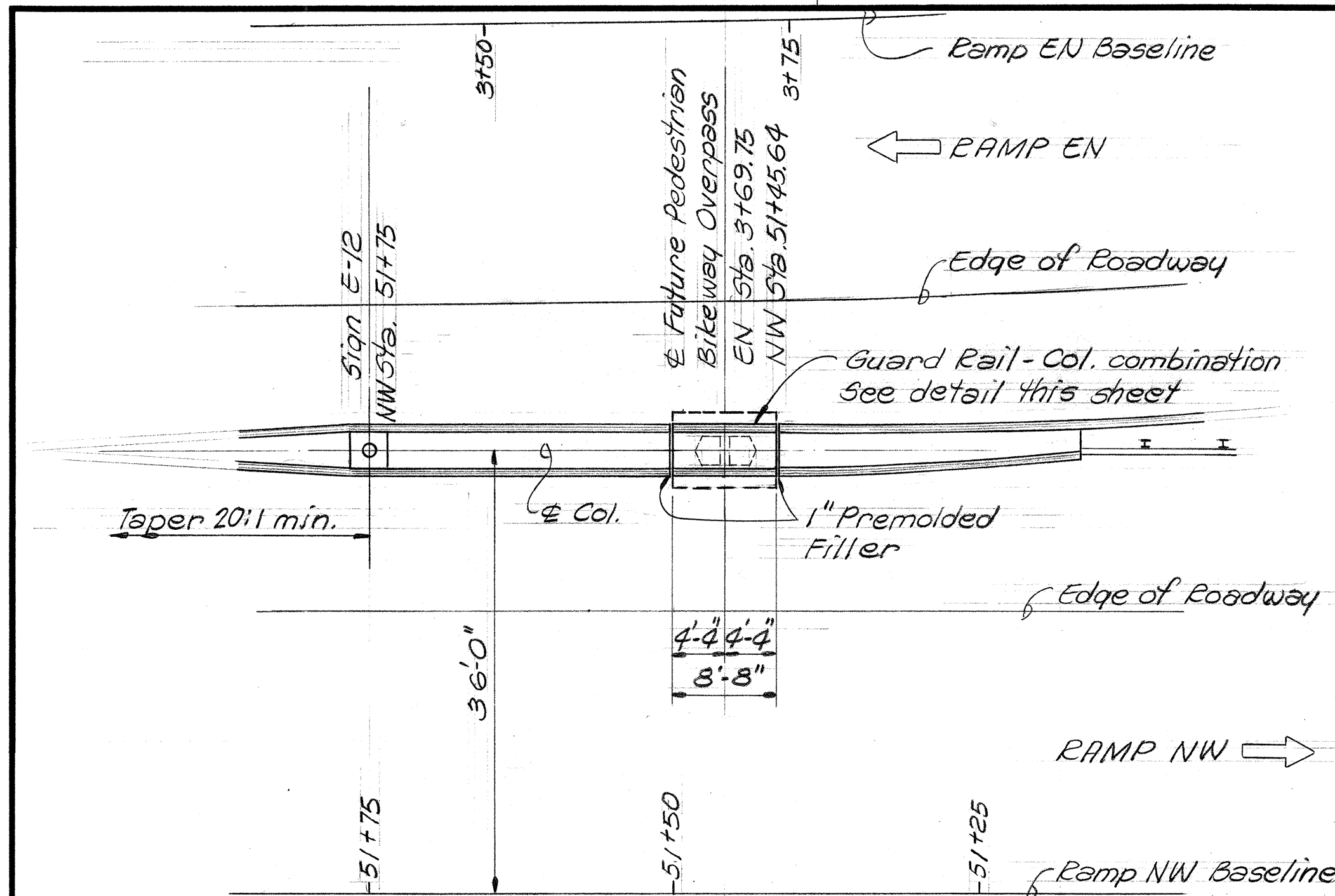
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD SIGN
SUPPORT FOUNDATION
DETAILS

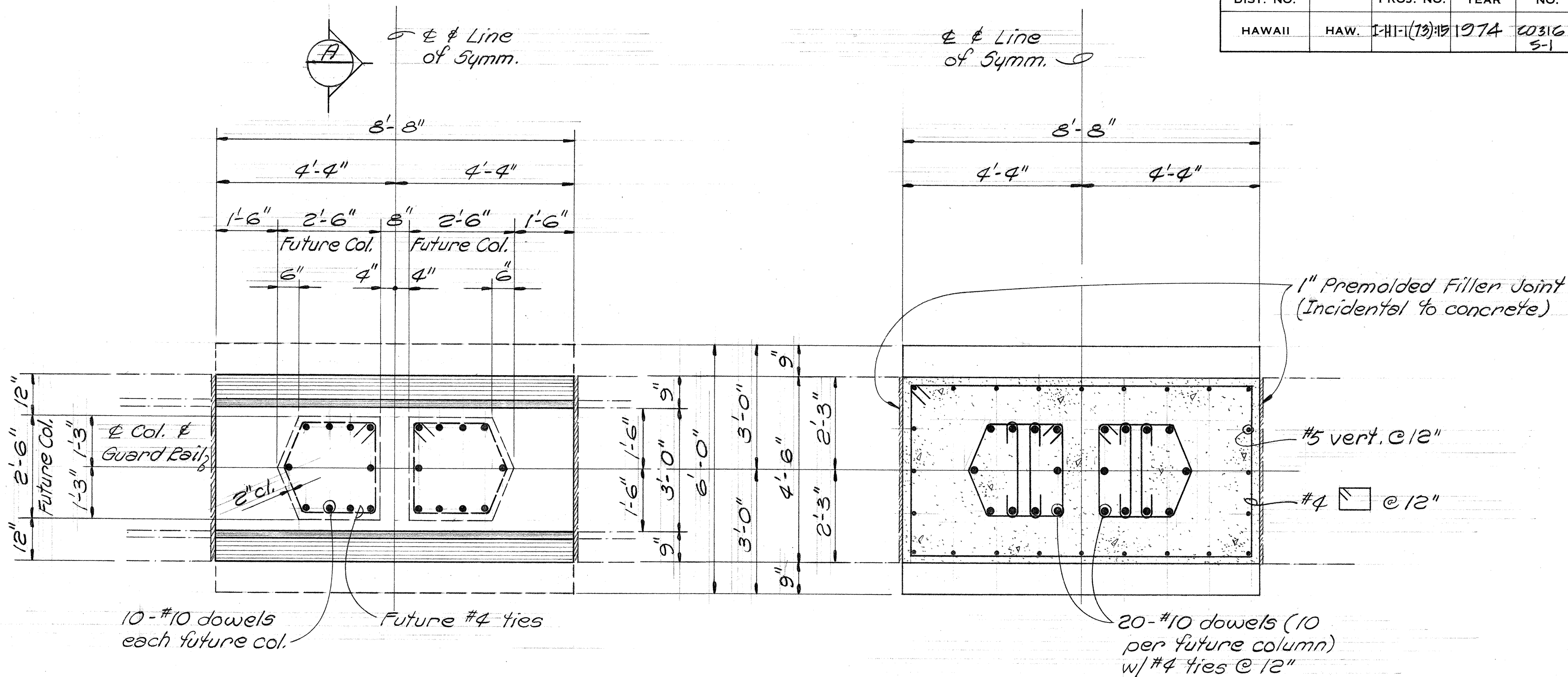
PEARL HARBOR INTERCHANGE
F.A.I. Proj. No. I-HI-1(73)-15

Scale: As Shown Date: DEC. 7, 1973
SHEET NO. 5-100 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-11-1(73)19	1974	369	369



PARTIAL PLAN
Scale: 1"=10'-0"



FOUNDATION PLAN
1/2"=1'-0"

PLAN AT TOP OF GUARD RAIL
1/2"=1'-0"

- NOTES**
- All reinforcing shall conform to ASTM A615 Grade 60.
 - Unless shown otherwise minimum 28 day concrete compressive strengths shall be as follows:
 - Footing --- 3,000 p.s.i. (Class A)
 - Guard Rail- Column --- 4,000 p.s.i. (Class E)

QUANTITY ESTIMATES			
ITEM NO.	ITEM	UNIT	QUANTITY
206.60	Structure Excavation for Bridges	C.Y.	11.8
206.65	Structure Backfill for Bridges	C.Y.	5.5
*503.0718	Concrete in footing- Ped O.P.	L.S.	2.90 C.Y.
*503.0703	Concrete in Bridges-guard rail-Col.	L.S.	7.60 C.Y.
*503.201	Class B Concrete other than in Bridges	C.Y.	2.90
*602.019	Reinforcing Steel in Bridges - Ped. O.P.	L.S.	2000 #

*NEW Item
SHIMABUKURO & FUKUDA, INC.
Consulting Structural Engineers
1210 Ward Ave., Honolulu, HI 96814

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GUARD RAIL-COLUMN COMBINATION
FOR FUTURE PEDESTRIAN-BIKEWAY OVERPASS

PEARL HARBOR INTERCHANGE
F.A.I. PROJ. NO. 1-1-1 (73) 15

Scale: As Shown Date: 9/10/76

SHEET NO. OF SHEETS

C.O. 316S-1

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

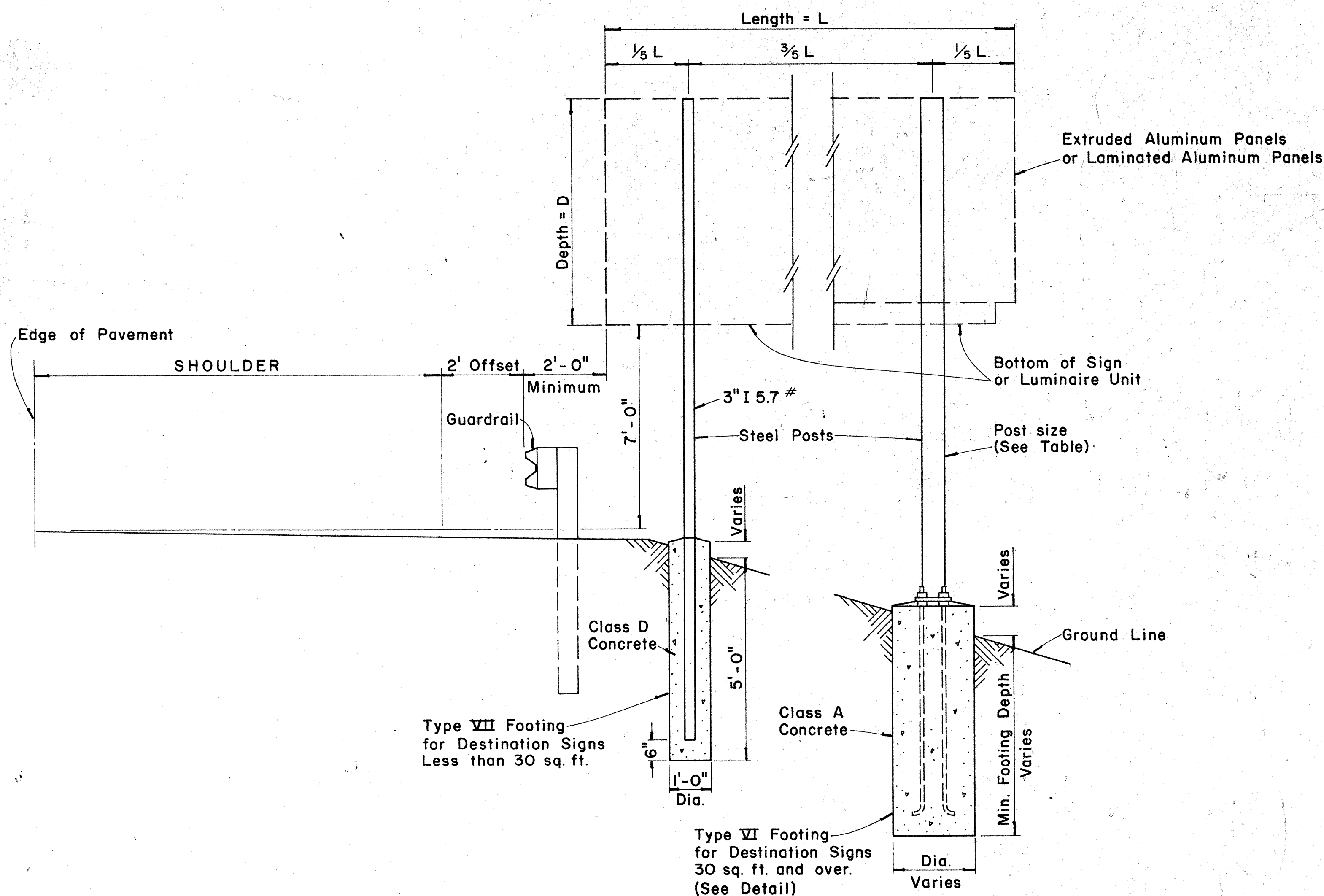
6" min. embedment
into competent stuff.
(Subject to Soils
Engineers approval)

SECTION A
Scale: 1/2"=1'-0"

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

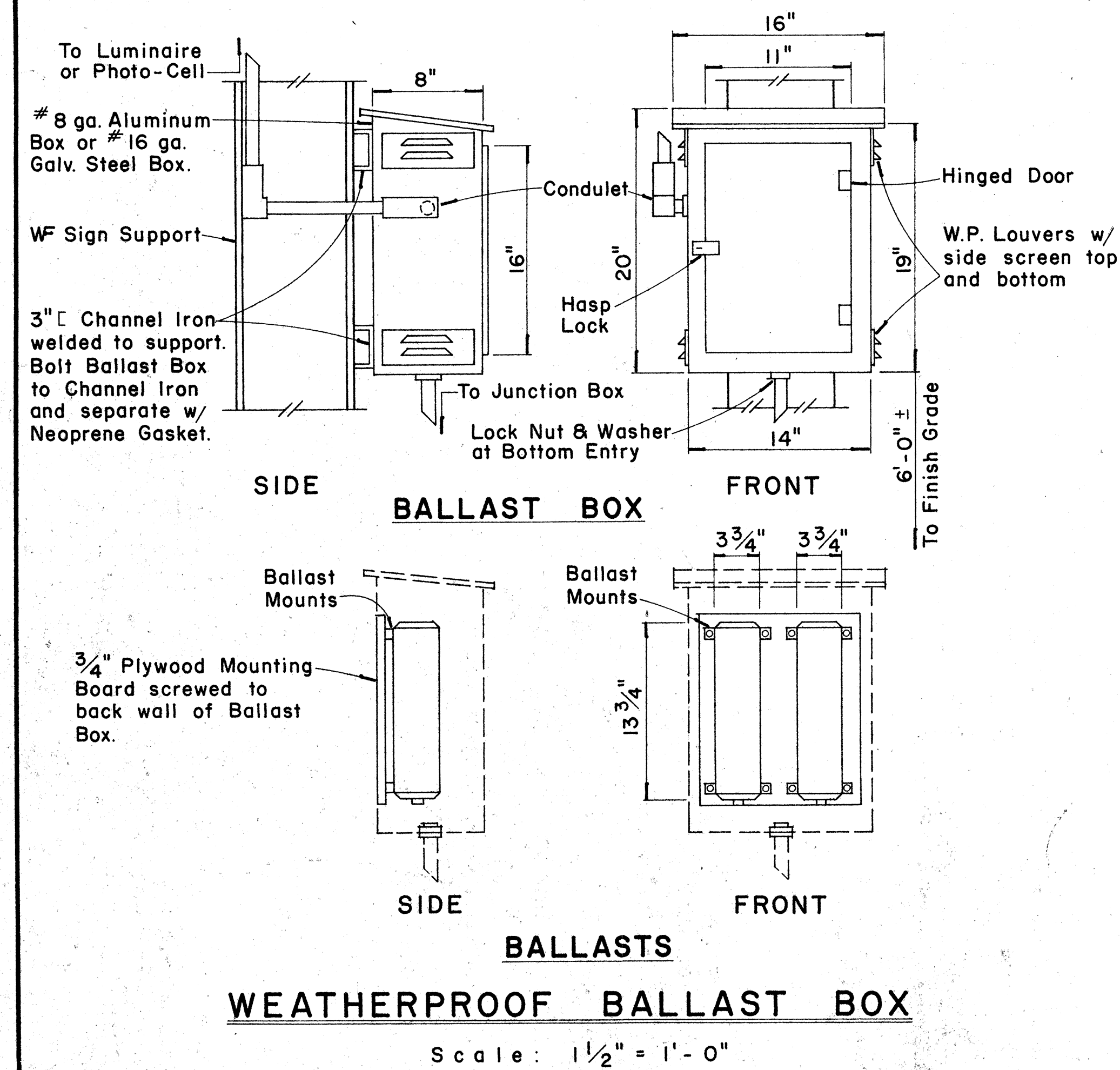
* For moment calculations only. Post shall be from top of foundation to top of sign.
 ** For fills with side slopes flatter than 4:1, Minimum Footing Depth shall be 4½ feet.

DATA TABLE FOR TYPE VI FOOTING																	
POST SIZE	MAXIMUM SIGN AREA	POST HEIGHT OF FOUNDATION TO CENTER OF SIGN *	D I M E N S I O N S											ANCHOR BOLT DIA.	MINIMUM FOOTING DEPTH		
			H	J	K	M	N	O	P	S	T	U	V		W	CUT	FILL**
8 J 10	50 sq. ft.	14'	14"	5"	24"	17¼"	15⅝"	6"	1¼"	9"	6"	10"	2"	1"	1⅛"Ø	4½'	4½'
8 WF 24	90 sq. ft.	21'	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	5'
8 WF 35	190 sq. ft.	15'	16½"	6¾"	30"	20"	1¾"	6"	1⅜"	11¾"	6½"	10"	1¾"	1"	1¼"Ø	6'	7'
10 WF 45	190 sq. ft.	25'	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
10 WF 45	200 sq. ft.	25'	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
12 WF 50	230 sq. ft.	25'	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	7'	↓
12 WF 50	250 sq. ft.	23'	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

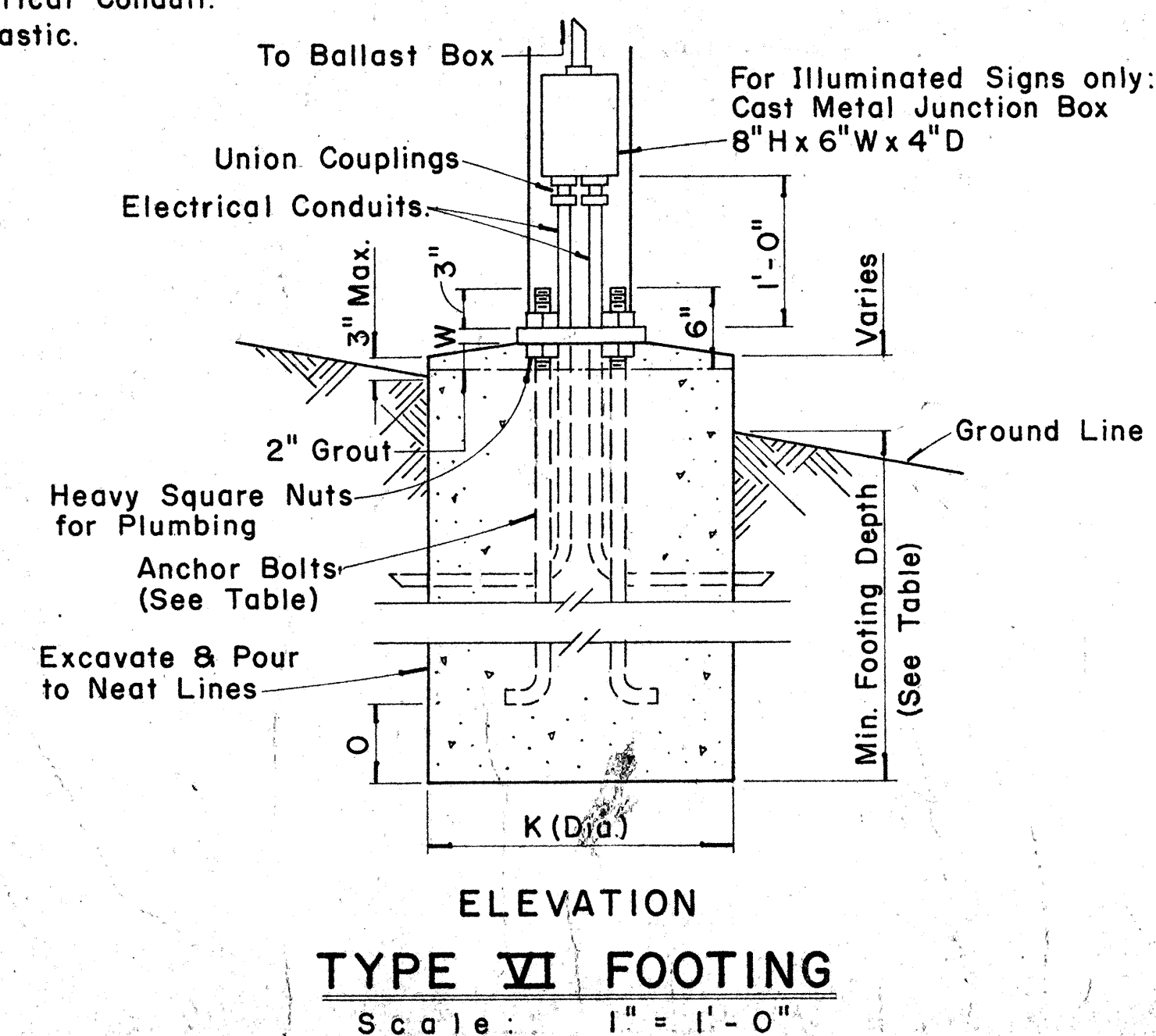


TYPICAL DESTINATION & GROUND MOUNTED EXPRESSWAY SIGN

Not to Scale



For Illuminated Signs only:
 Openings for Electrical Conduits.
 Dia. shall be ¼" larger than
 O.D. of Electrical Conduit.
 Seal with Mastic.



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-11-1(73)118	1974	317	369

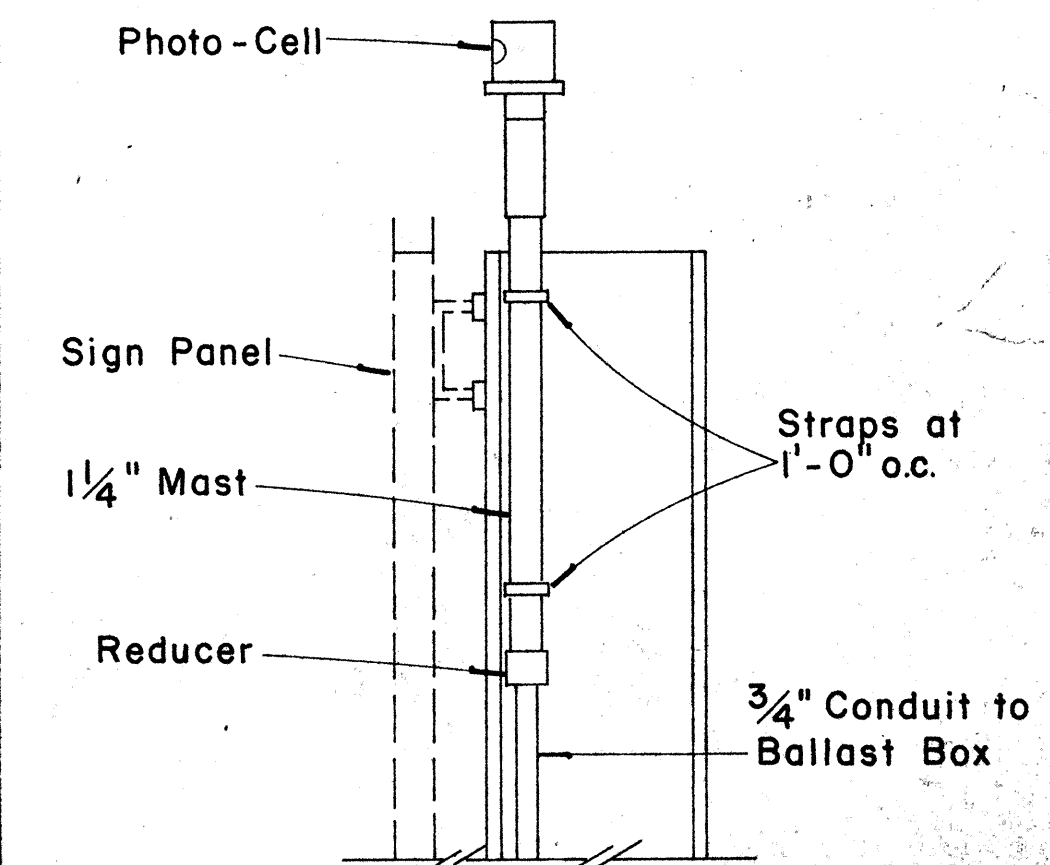


PHOTO-CELL DETAIL

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

APPROVAL RECOMMENDED:
Eishi Tanaka 12/23/62
 TRAFFIC ENGINEER DATE
 APPROVED:
John S. Salas 12-20-69
 ASSISTANT CHIEF, ENGINEERING DATE

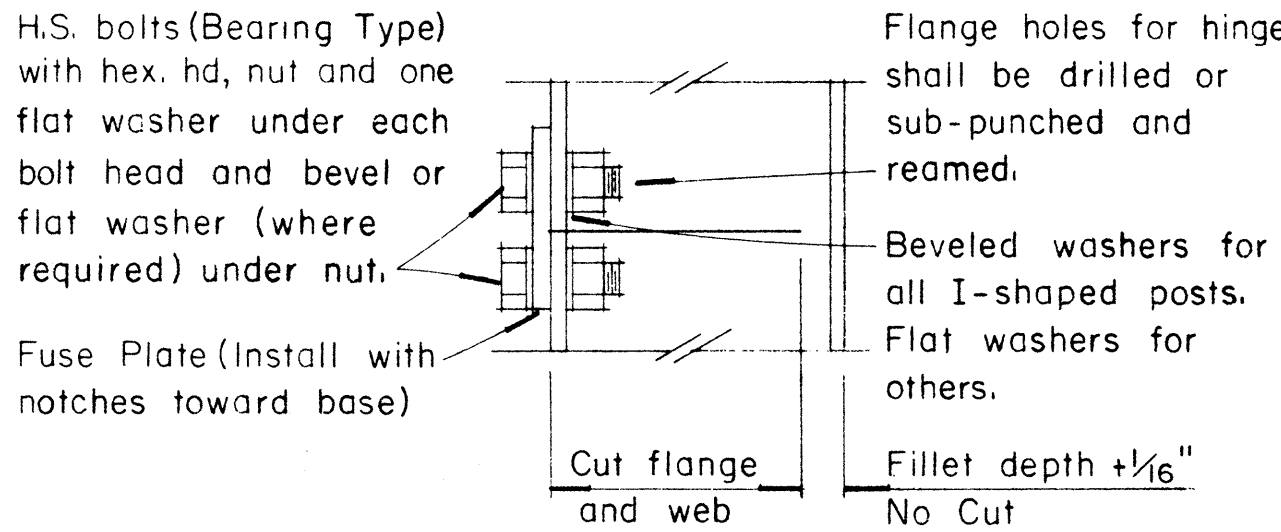
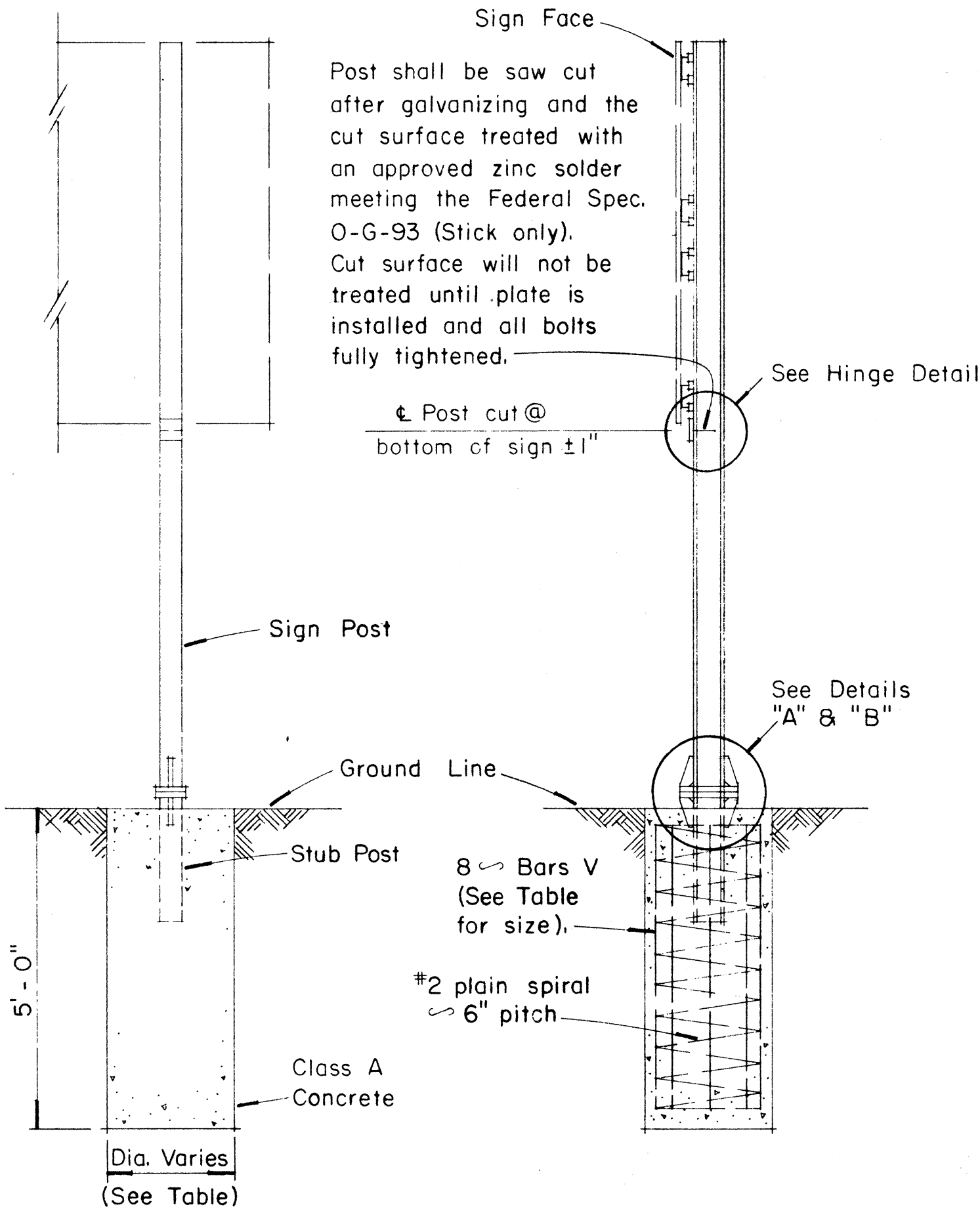
NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 STANDARD DETAILS
 DESTINATION & GROUND MOUNTED
 EXPRESSWAY SIGNS

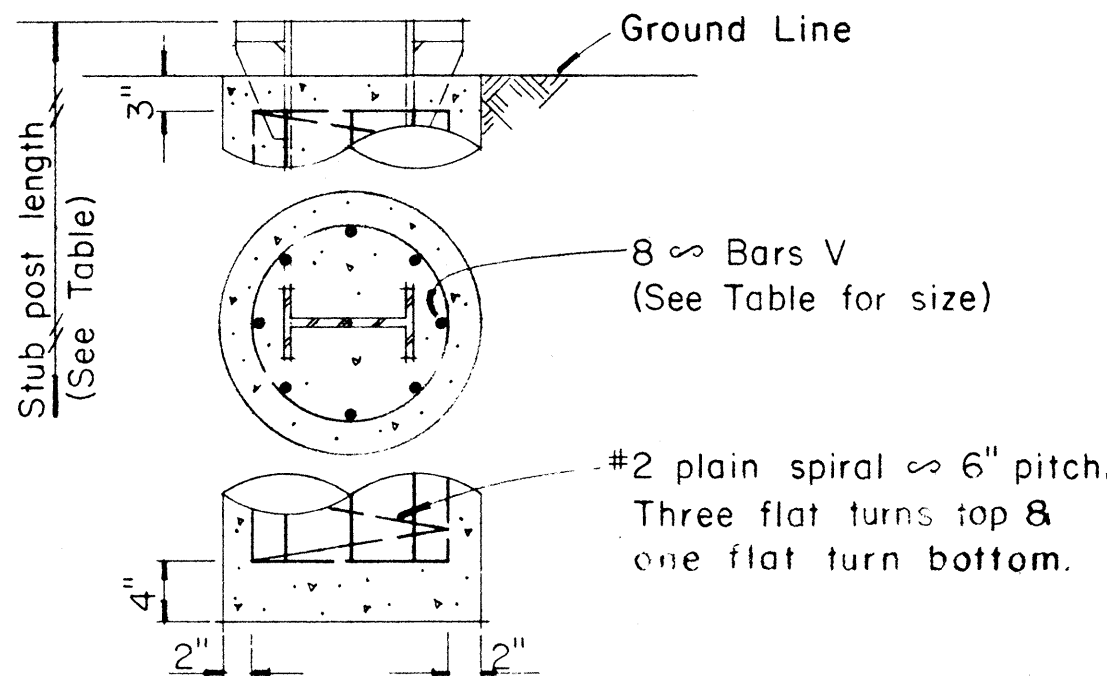
Scale: As Shown
 SHEET No. 5-101 OF 106 SHEETS DT 203

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-1(78)25	1974	318	369

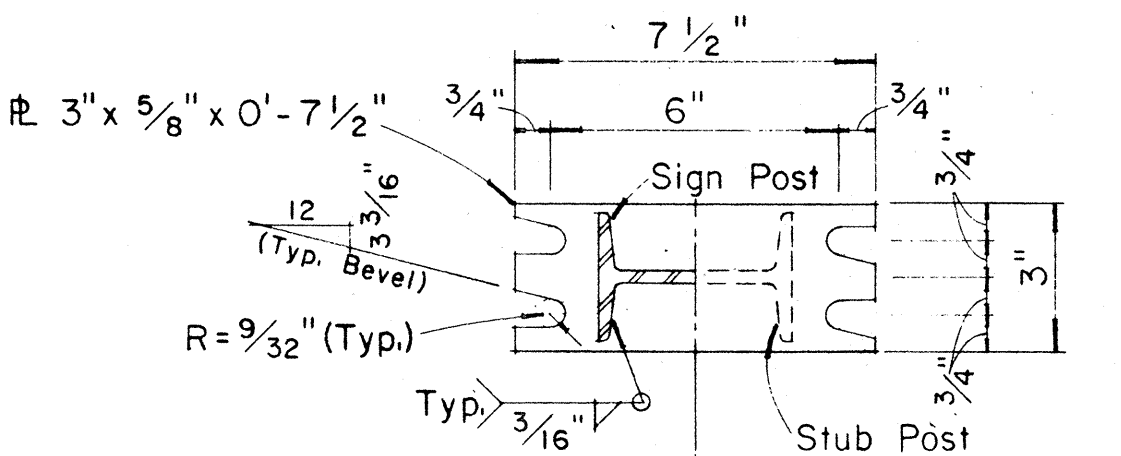
	BASE CONNECTION DATA TABLE										FUSE PLATE DATA TABLE										FOUNDATION DATA				
Post Size	Bolt Size & Torque	A	B	C	D	E	t1	t2	W	R	F	G	H	J	K	L	N	d1	t3	Bolt Dia.	Wt. of each Fuse Pl.	Stub Length	Stub Projection	Footing Diameter	Bars V Size
6 B 8.5	5/8" ϕ x 2 3/4" Torque = 450" #	5"	2"	1 1/4"	2 3/4"	1 1/8"	3/4"	1/2"	1/4"	1 1/32"	3 5/8"	2"	1 1/8"	4"	2 1/4"	7/8"	1/2"	9/16"	1/4"	1/2" ϕ	1.09 #	2'-0"	3"	2'-0"	#5
6 B 12											3 3/4"	2"	1 1/8"	4"	2 1/4"	7/8"	5/8"	1 1/16"	3/8"	5/8" ϕ	1.60 #	2'-0"	3"	2'-0"	#5
6 B 15.5											4 1/2"	2 1/2"	1 1/4"	6"	3 1/2"	1 1/4"	3/4"	13/16"	1/2"	3/4" ϕ	3.75 #	2'-6"	3"	2'-0"	#6
8 WF 17											4 1/2"	2 1/2"	1 1/4"	5 1/4"	2 3/4"	1 1/4"	3/4"	13/16"	1/2"	3/4" ϕ	3.27 #	2'-6"	3"	2'-0"	#7
8 WF 20	3/4" ϕ x 3 1/2" Torque = 750" #	6"	2 1/4"	1 3/8"	3 1/2"	1 1/4"	1"	3/4"	5/16"	13/32"	4 7/8"	2 1/2"	1 1/2"	5 1/4"	2 3/4"	1 1/4"	7/8"	15/16"	9/16"	7/8" ϕ	3.93 #	3'-0"	2 1/2"	2'-0"	#8
10 WF 21											5 3/8"	3"	1 1/2"	5 3/4"	2 3/4"	1 1/2"	7/8"	15/16"	9/16"	7/8" ϕ	4.75 #	3'-0"	2 1/2"	2'-0"	#9
10 WF 25											5 3/8"	3"	1 1/2"	5 3/4"	2 3/4"	1 1/2"	7/8"	15/16"	9/16"	7/8" ϕ	4.79 #	3'-0"	2 1/2"	2'-0"	#10
12 WF 27											5 3/8"	3"	1 1/2"	6 1/2"	3 1/2"	1 1/2"	7/8"	15/16"	9/16"	7/8" ϕ	5.42 #	3'-0"	2 1/2"	2'-0"	#11
3 I 5.7	1/2" ϕ x 2 1/2" Torque = 200" #	SEE DETAIL "A"									3 1/8"	1 1/2"	1 1/8"	2 5/8"	1 1/2"	9/16"	1/2"	9/16"	1/4"	1/2" ϕ	0.64 #	1'-6"	3 1/2"	1'-6"	#5
4 I 7.7											3 1/8"	1 1/2"	1 1/8"	2 5/8"	1 1/2"	9/16"	1/2"	9/16"	1/4"	1/2" ϕ	0.64 #	1'-6"	3 1/2"	1'-6"	#5



HINGE DETAIL

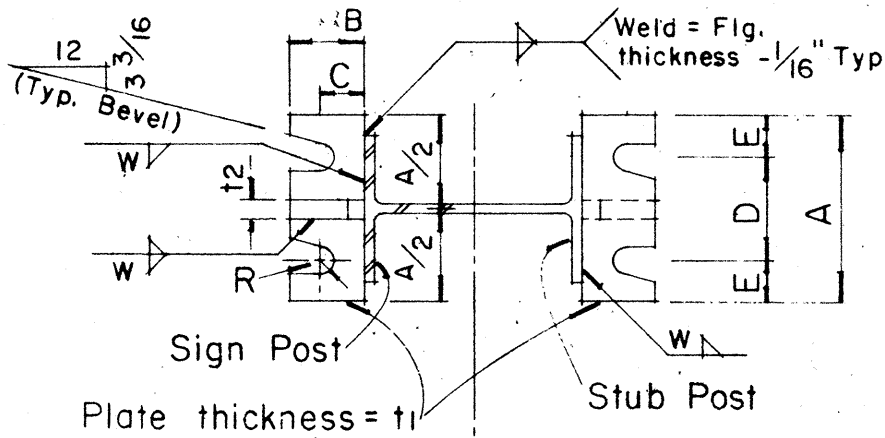


FOUNDATION DETAIL

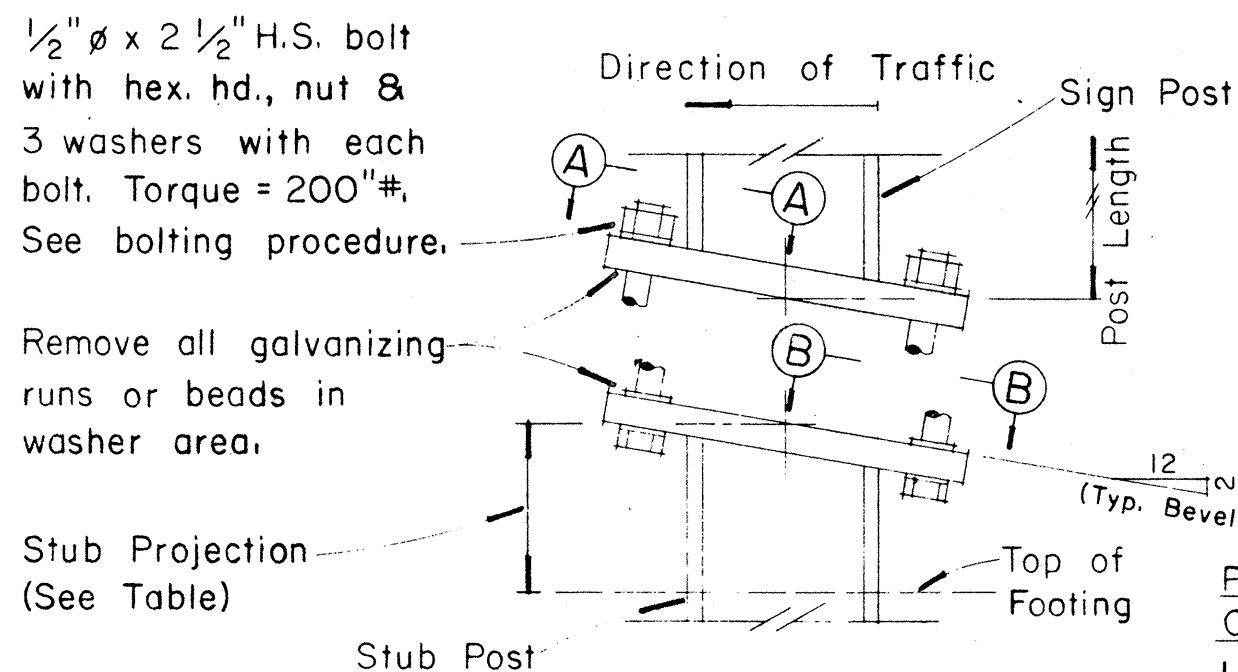


SECTION "A-A" SECTION "B-B"

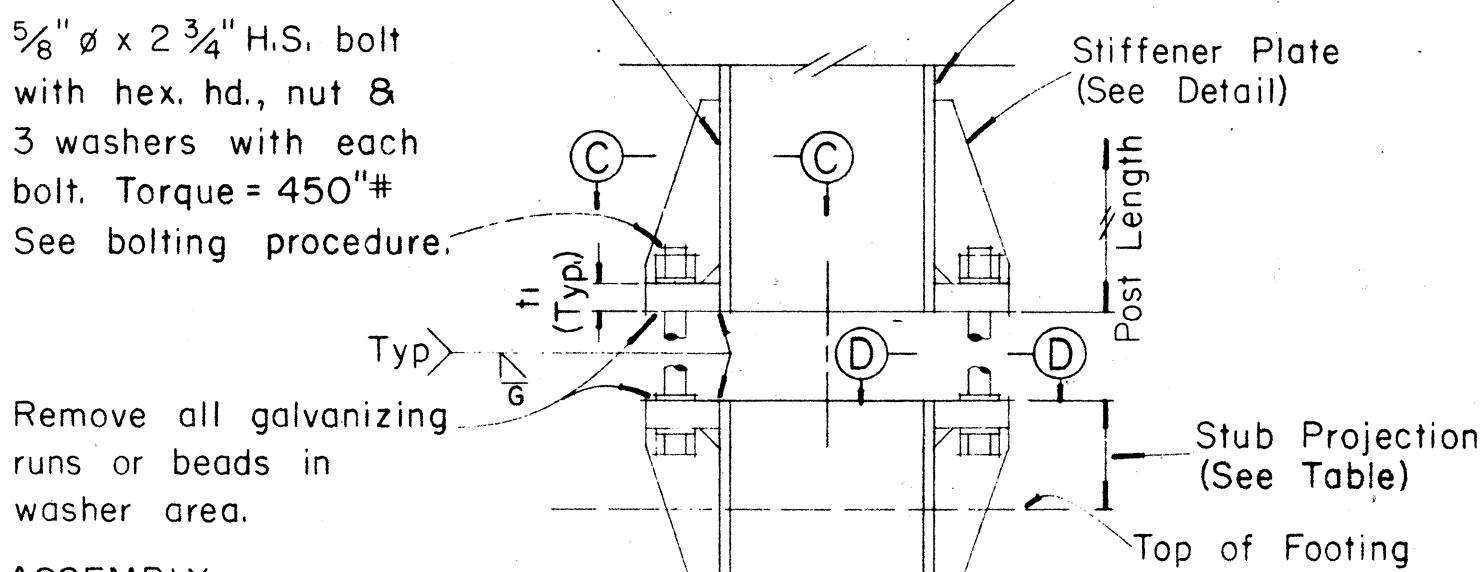
NOTE:
Sections shown are for installations on right shoulder and in gore. Reverse plate slot bevels for installations on left shoulder.



SECTION "C-C" SECTION "D-D"

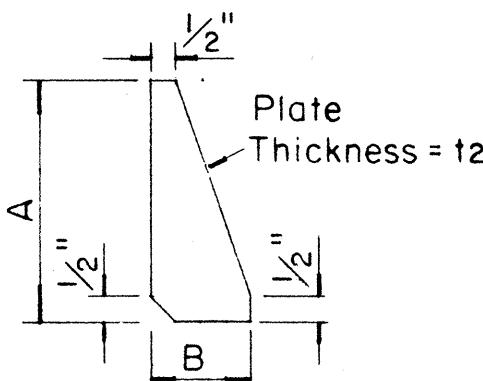


DETAIL "A"
SIGN POST & STUB POST
(For 4I7.7 and 3I5.7 Shapes)

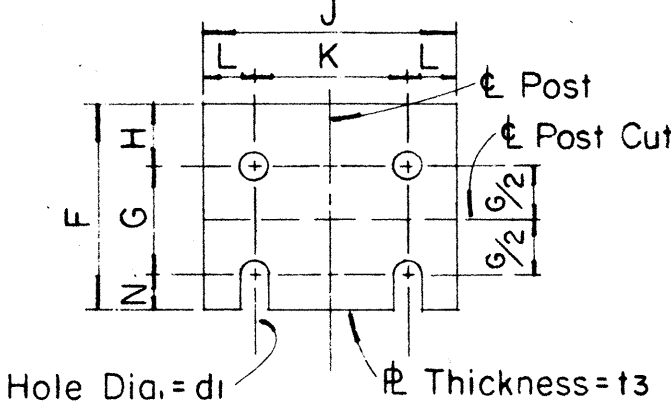


DETAIL "B"
SIGN POST & STUB POST
(For WF and B Shapes)

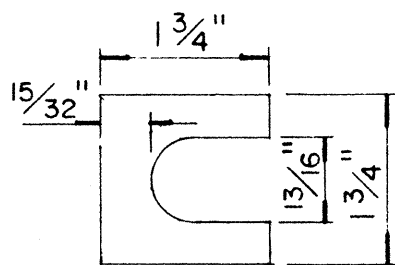
PROCEDURE FOR ASSEMBLY OF BASE CONNECTION:
1. Assemble post to stub with bolts and with one flat washer on each bolt between plates.
2. Shim as required to plumb post.
3. Tighten all bolts the max. possible with 12" to 15" wrench to bed washers & shims and to clean bolt threads then loosen each bolt in turn & retighten bolts in systematic order to prescribed torque. (See Table)
4. Burr threads at junction with nut using a center punch to prevent nut loosening.



STIFFENER PLATE DETAIL



FUSE PLATE DETAIL



SHIM DETAIL

Furnish 2 ∞ .012" ± thick and 2 ∞ .032" ± thick shims per post. Shims shall be fabricated from brass shim stock or strip conforming to A.S.T.M. - B 36.

GENERAL NOTES

- Design conforms with AASHTO Specifications for the design and Construction of Structural Supports for Highway Signs.
- Materials and Fabrication shall conform to the requirements of the Standard Specifications and Special Provisions.
- All holes shall be drilled. All plate cuts shall preferably be saw cuts, however; flame cutting will be permitted provided all edges are ground. Metal projecting beyond the plane of the plate face will not be tolerated.
- Tighten the high strength bolts in the base connection only to the torque shown, do not overtighten. All bolts other than high strength bolts shall conform to ASTM A 307, Class A.
- All structural steel, bolts, nuts and washers shall be galvanized as per the Standard Specifications and Special Provisions. Structural steel to be galvanized after fabrication except as noted.
- Structural steel shall conform with with the requirements of ASTM A 441
- Galvanizing of all posts shall be projection above concrete plus 6" minimum.
- All friction fuse bolts shall be tightened in the shop following a method approved by the Engineer. Tightening shall be to such a degree as to obtain the following minimum residual tension in each bolt:

Bolt Size	Min. Tension	Bolt Size	Min. Tension
1/2" ϕ	12050 Lbs.	3/4" ϕ	28400 Lbs.
5/8" ϕ	19200 Lbs.	7/8" ϕ	36050 Lbs.

APPROVAL RECOMMENDED:
Eiji Tanaka
TRAFFIC ENGINEER
12/29/69
DATE

APPROVED:
John J. S. S. S.
ASSISTANT CHIEF, ENGINEERING
12-30-69
DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
BREAK-AWAY SIGN SUPPORTS
FOR
GROUND MOUNTED GUIDE SIGNS

Not to Scale

SHEET No. 5-102 OF 106 SHEETS DT 204

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-H-1(73)-15	1974	319	369

(OVERHEAD SIGNS)
SUPPORT SPACING TABLE

PANEL THICK.	LENGTH OF SIGN A	NO. OF SUPPORTS	OVERHANG B	SUPPORT SPACING C or C ₁
1"	6'-0"	2	12"	48"
1"	6'-6"	2	15"	48"
1"	7'-0"	2	15"	54"
1"	7'-6"	2	18"	54"
1"	8'-0"	2	18"	60"
1"	8'-6"	2	20"	62"
1"	9'-0"	2	22"	64"
1"	9'-6"	2	23"	68"
1"	10'-0"	2	24"	72"
1"	10'-6"	2	24"	78"
1"	11'-0"	2	24"	84"
1"	11'-6"	2	27"	84"
1"	12'-0"	2	30"	84"
1"	12'-6"	2	30"	90"
1"	13'-0"	2	30"	96"
1"	13'-6"	2	30"	102"
1"	14'-0"	2	30"	108"
1"	14'-6"	2	36"	102"
1"	15'-0"	2	36"	108"
1"	15'-6"	3	24"	69"
1"	16'-0"	3	24"	72"
1"	16'-6"	3	24"	75"
1"	17'-0"	3	24"	78"
1"	17'-6"	3	24"	81"
1"	18'-0"	3	24"	84"
1"	18'-6"	3	27"	84"
1"	19'-0"	3	27"	87"
1"	19'-6"	3	27"	90"
1"	20'-0"	3	30"	90"
1"	20'-6"	3	30"	93"
1"	21'-0"	3	30"	96"
1"	21'-6"	3	33"	96"
1"	22'-0"	3	36"	96"
1"	22'-6"	3	36"	99"
1"	23'-0"	3	36"	102"
1"	23'-6"	3	36"	105"
1"	24'-0"	3	36"	108"

APPROVAL RECOMMENDED:
Eichi Tanaka 12/29/69
TRAFFIC ENGINEER DATE

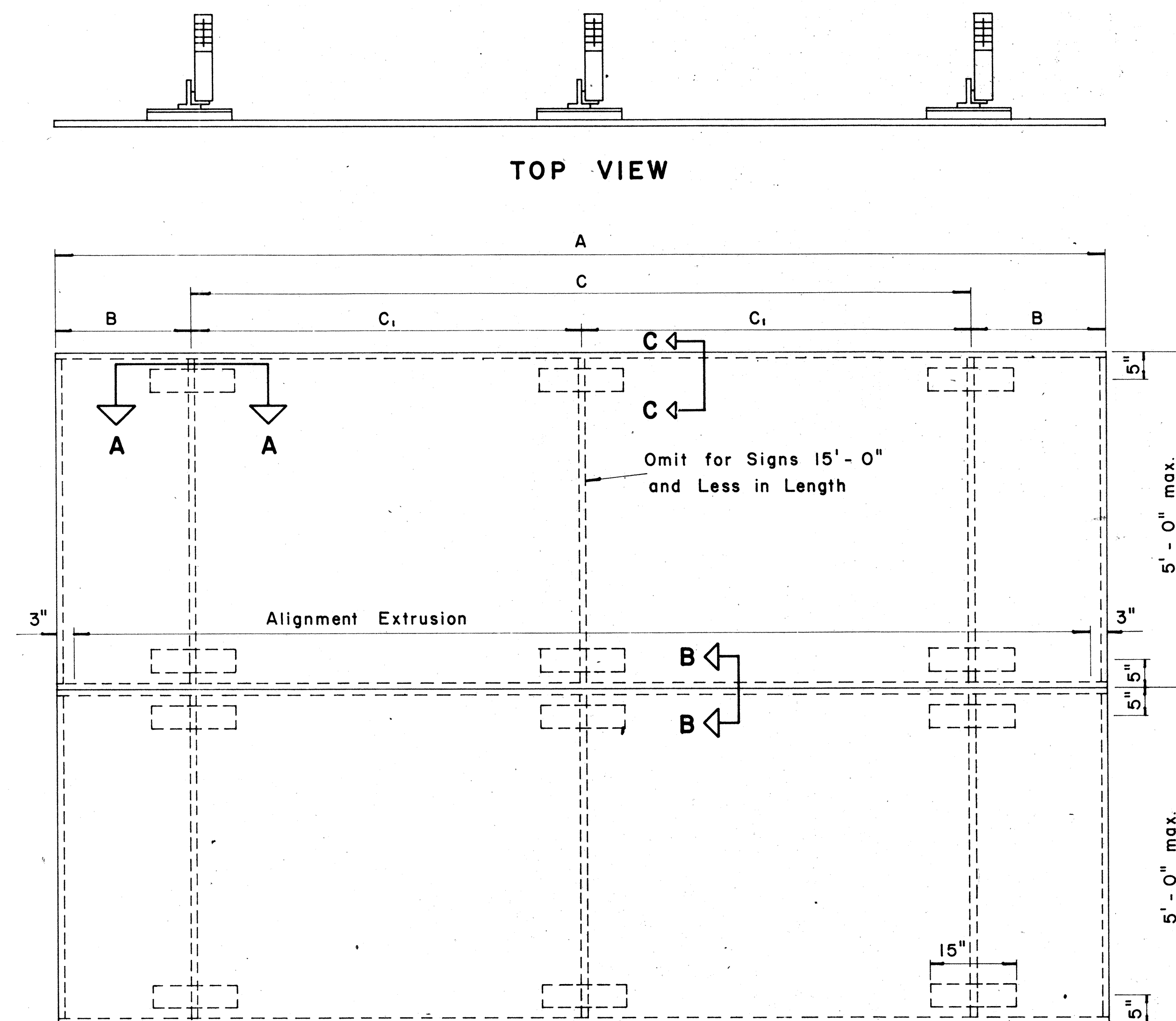
APPROVED:
John J. J. J. 12-30-69
ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE

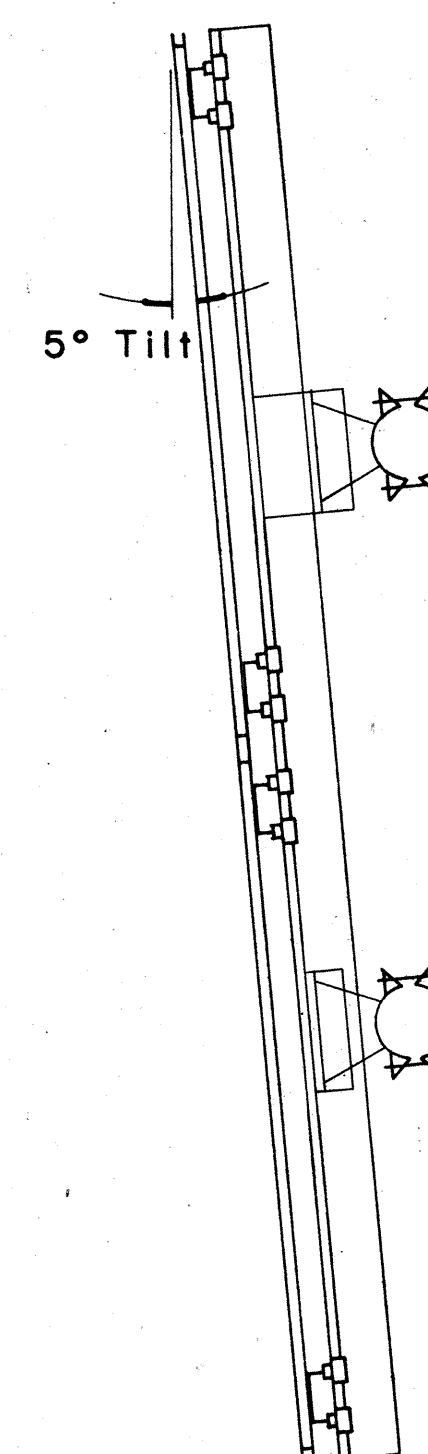
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
LAMINATED ALUMINUM
SIGN PANELS
(OVERHEAD)
Scale: As Shown

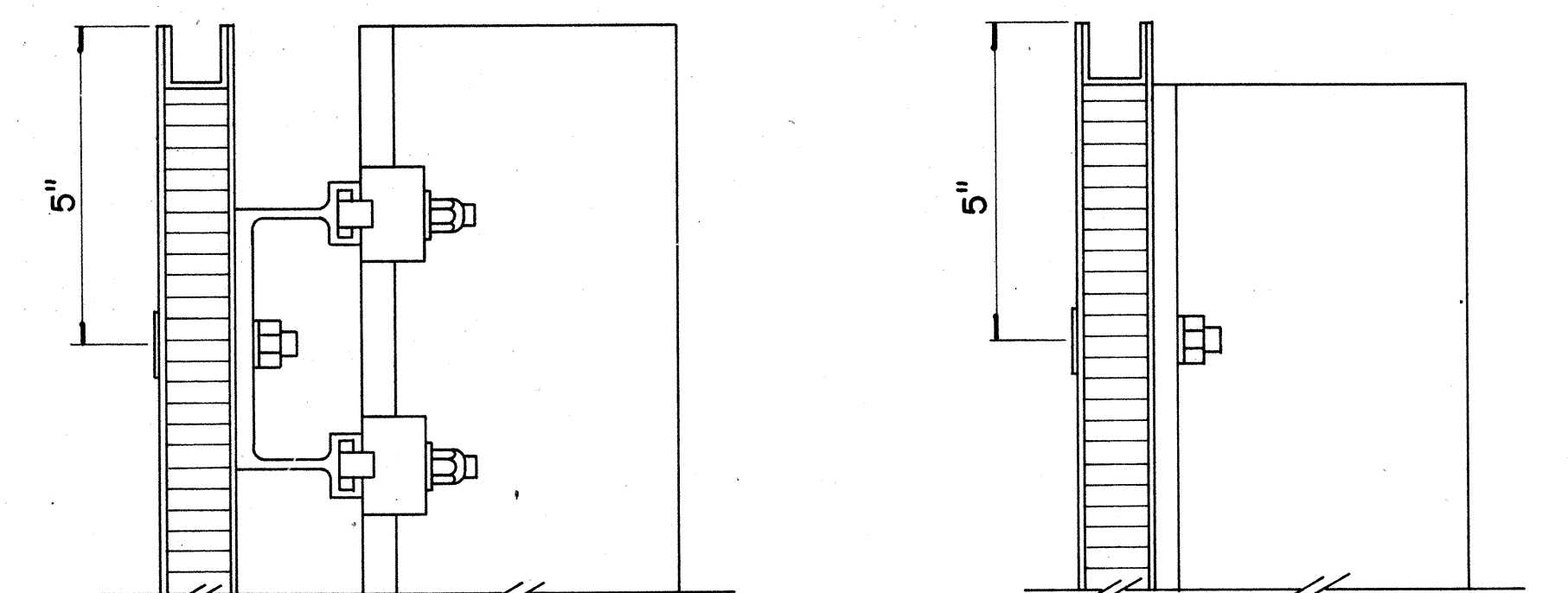
SHEET No. 319 OF 106 SHEETS DT 205



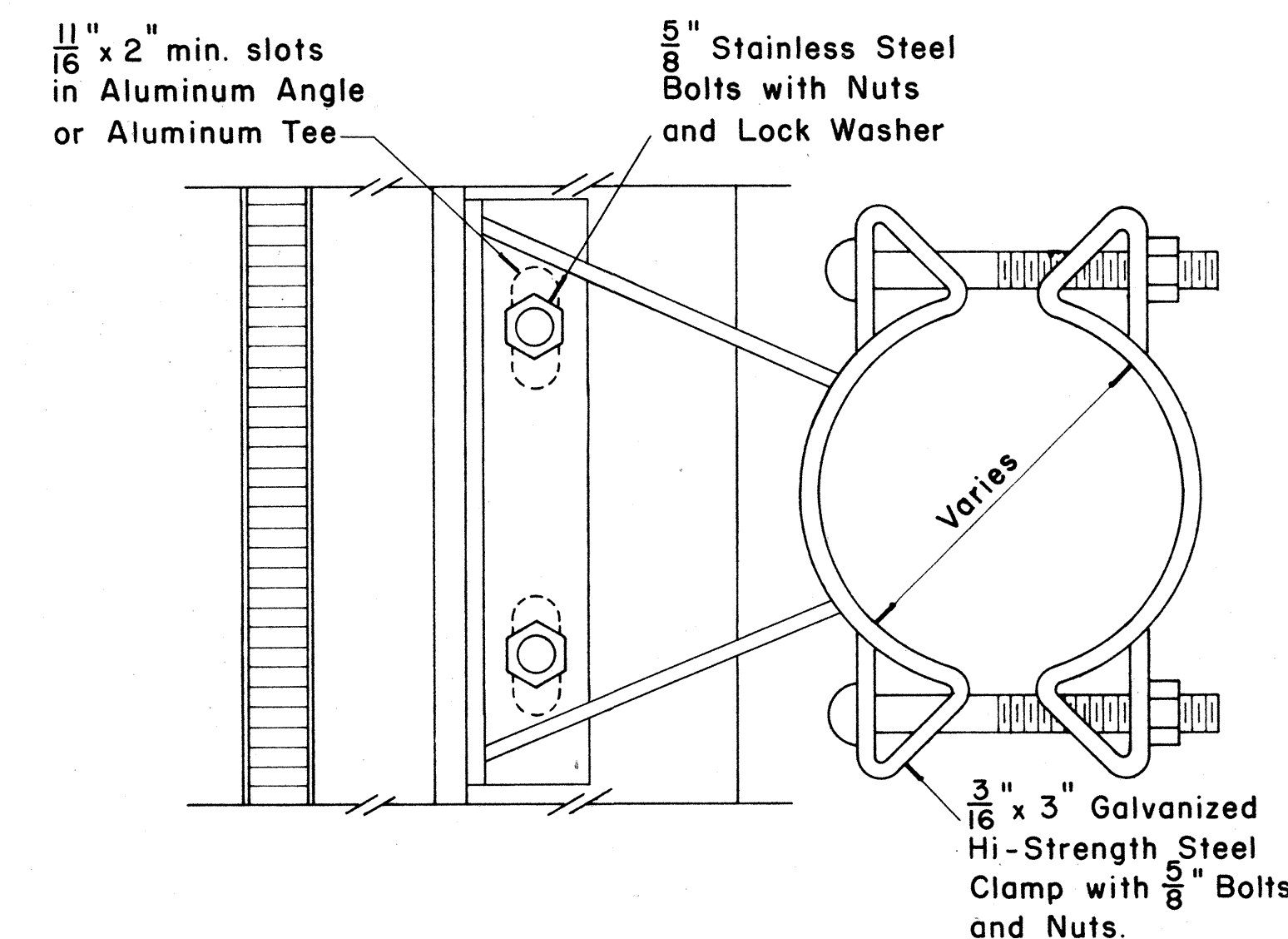
ELEVATION
TYPICAL SIGN ASSEMBLY
Scale: $\frac{3}{4}$ " = 1'-0"



SIDE VIEW

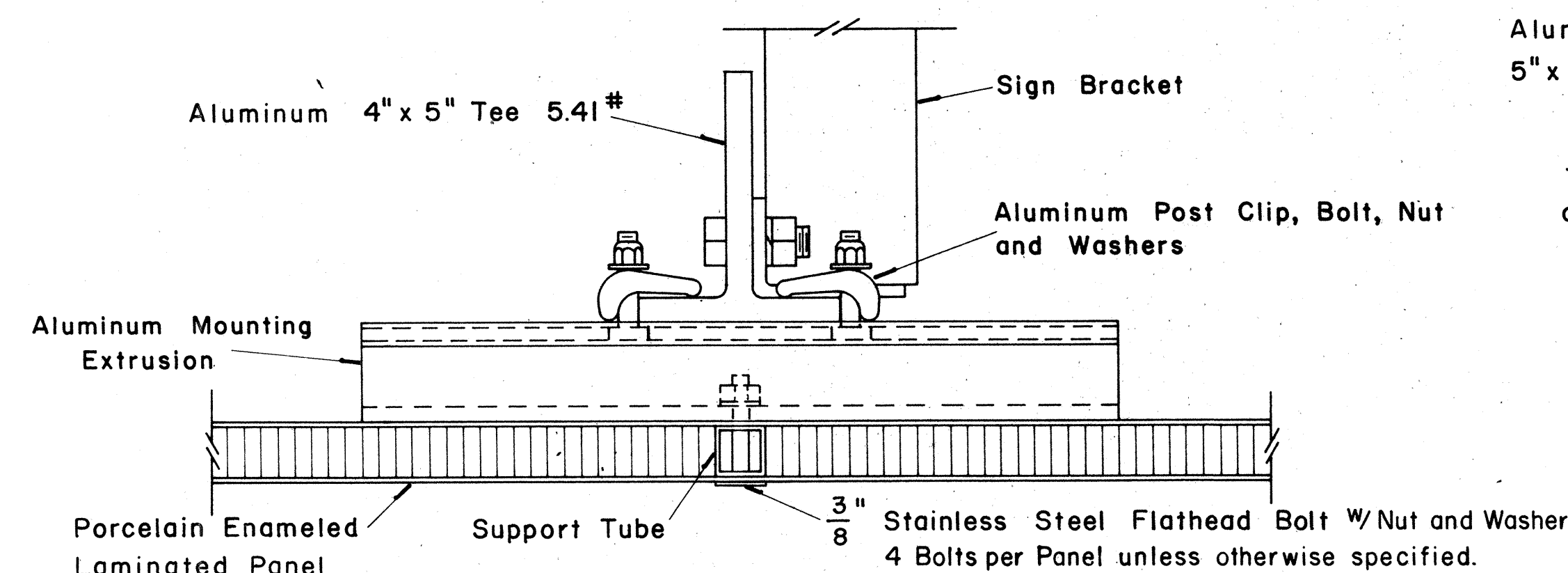


SECTION "C-C"
Scale: $\frac{3}{8}$ " = 1"
SECTION "C-C" (Alternate)
Scale: $\frac{3}{8}$ " = 1"

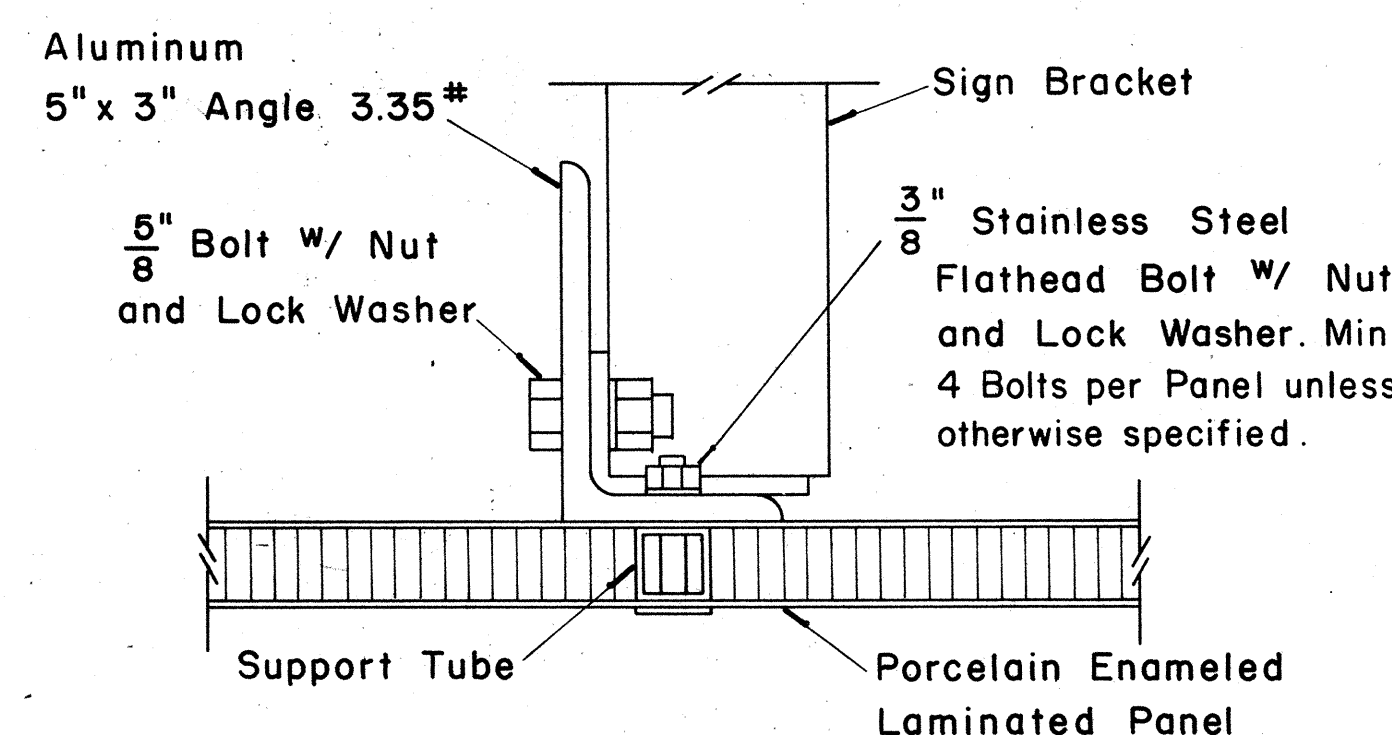


SIGN BRACKET ASSEMBLY
Scale: $\frac{3}{8}$ " = 1"

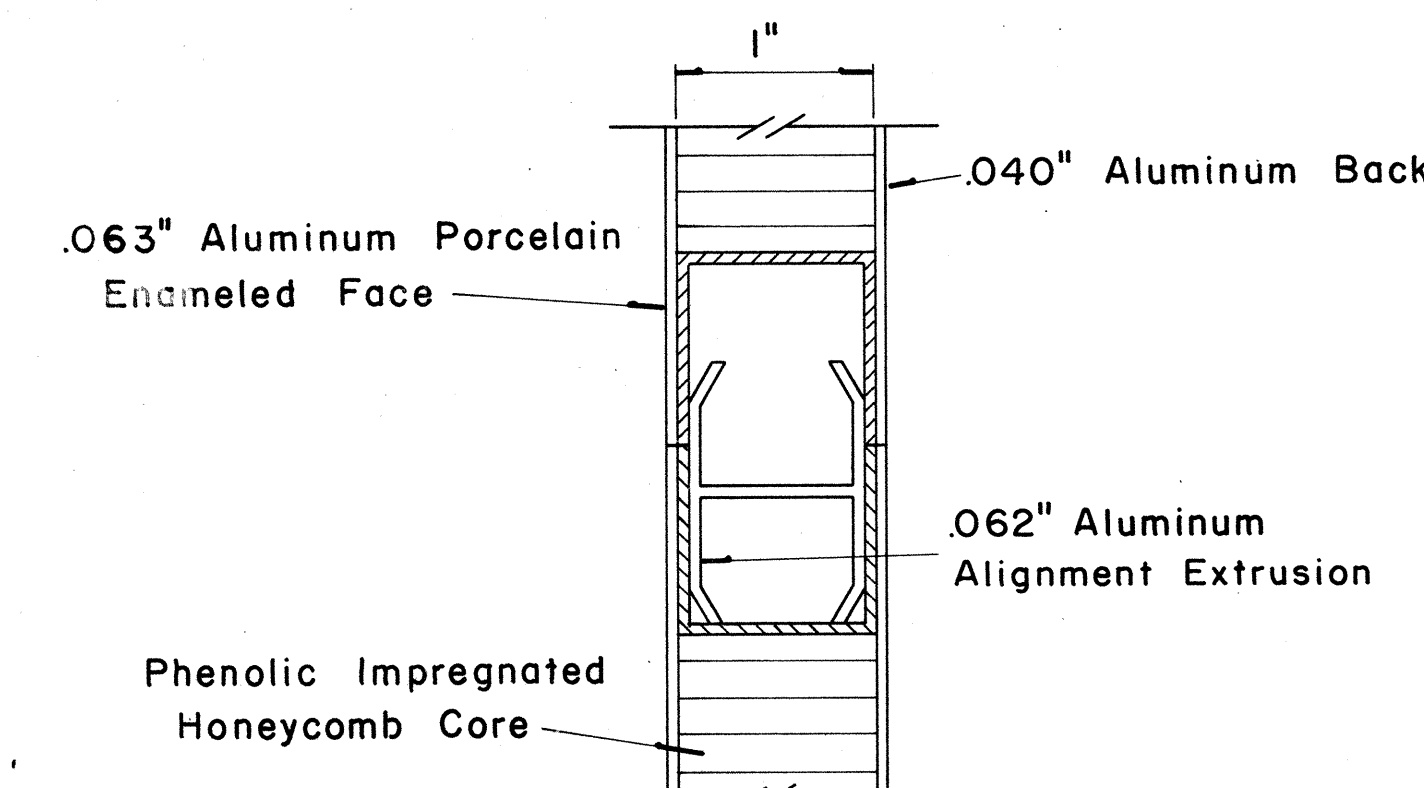
NOTE: For additional details of Sign Bracket Assembly, see Standard Detail Sheet "Overhead Sign Supports."



SECTION "A-A"
Scale: $\frac{3}{8}$ " = 1"



SECTION "A-A" (Alternate)
Scale: $\frac{3}{8}$ " = 1"



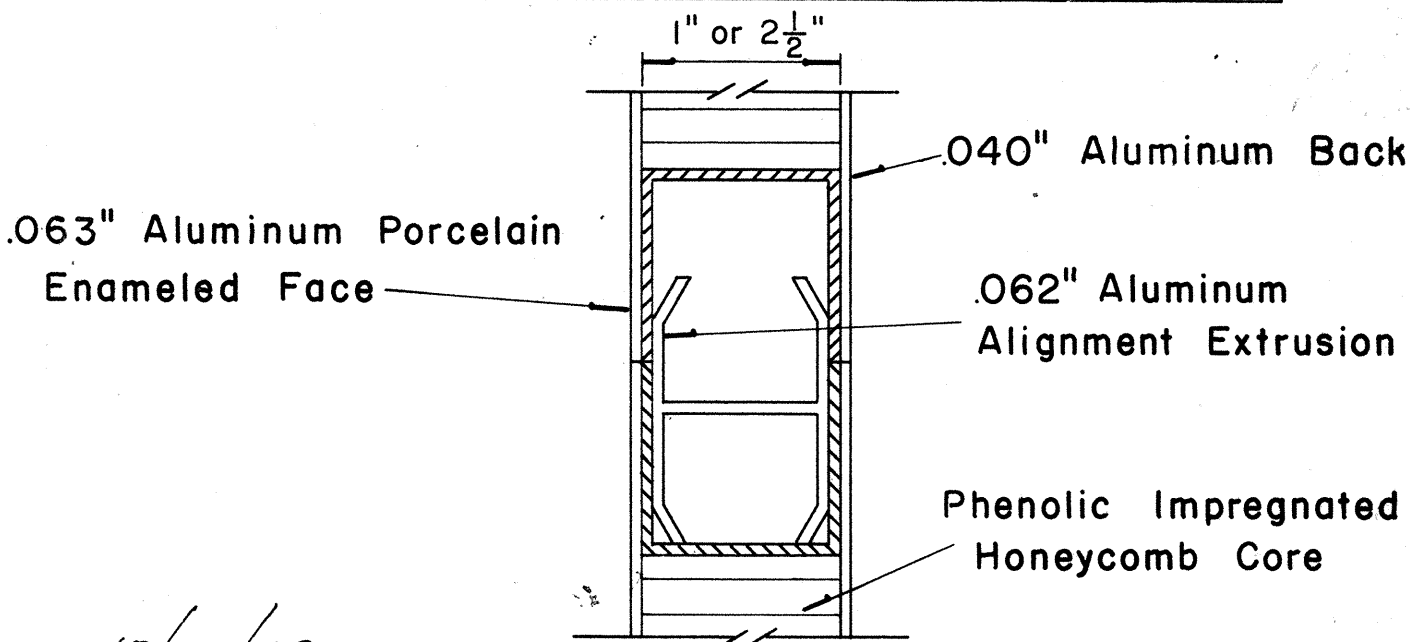
CLOSURE DETAIL
SECTION "B-B"
FULL SCALE

DATE
DRAWN BY
DESIGNED BY
CHECKED BY
No.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HI-1(73)-15	1974	320	369

(GROUND MOUNTED SIGNS)
SUPPORT SPACING TABLE

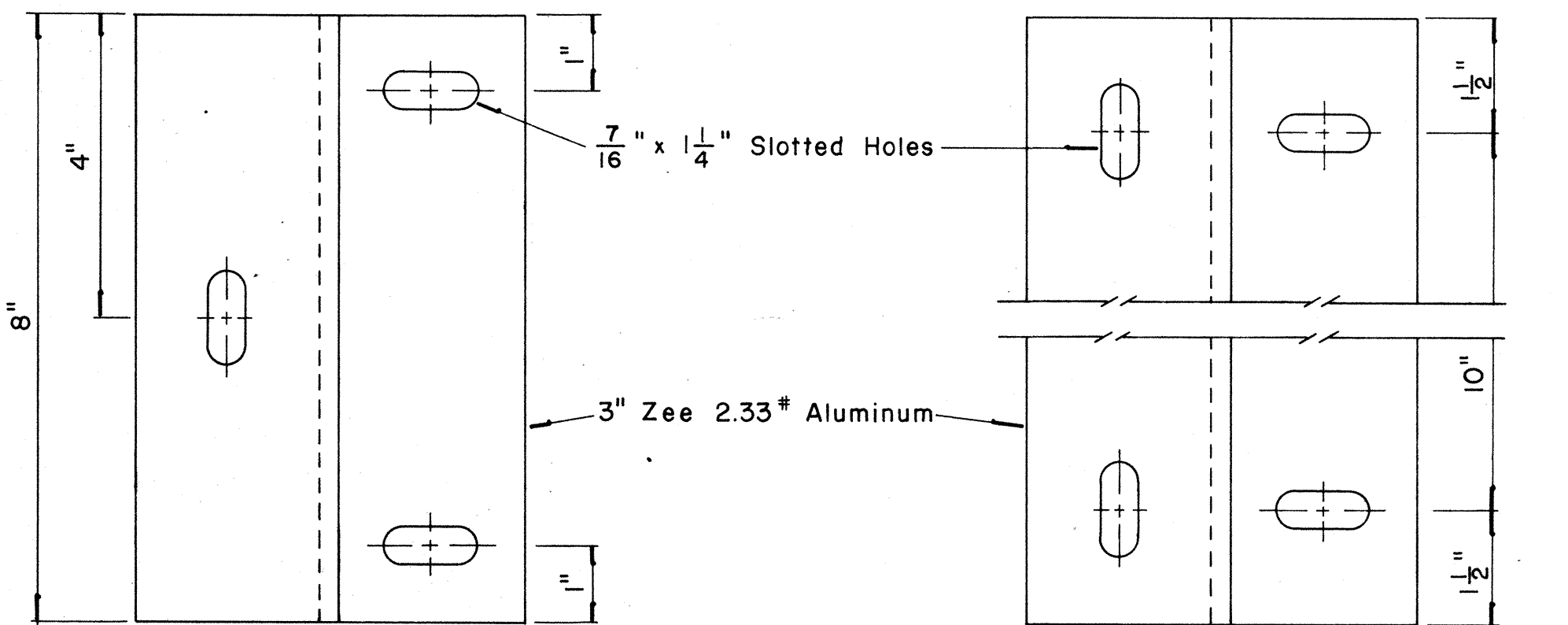
PANEL THICK.	LENGTH OF SIGN	NO. OF SUPPORTS	OVERHANG	SUPPORT SPACING
	A		B	C
1"	6' - 0"	2	12"	48"
1"	6' - 6"	2	15"	48"
1"	7' - 0"	2	15"	54"
1"	7' - 6"	2	18"	54"
1"	8' - 0"	2	18"	60"
1"	8' - 6"	2	20"	62"
1"	9' - 0"	2	22"	64"
1"	9' - 6"	2	23"	68"
1"	10' - 0"	2	24"	72"
1"	10' - 6"	2	24"	78"
1"	11' - 0"	2	24"	84"
1"	11' - 6"	2	27"	84"
1"	12' - 0"	2	30"	84"
1"	12' - 6"	2	30"	90"
1"	13' - 0"	2	30"	96"
1"	13' - 6"	2	30"	102"
1"	14' - 0"	2	30"	108"
1"	14' - 6"	2	36"	102"
1"	15' - 0"	2	36"	108"
2.5"	15' - 6"	2	36"	114"
2.5"	16' - 0"	2	39"	114"
2.5"	16' - 6"	2	39"	120"
2.5"	17' - 0"	2	39"	126"
2.5"	17' - 6"	2	42"	126"
2.5"	18' - 0"	2	42"	132"
2.5"	18' - 6"	2	45"	132"
2.5"	19' - 0"	2	45"	138"
2.5"	19' - 6"	2	45"	144"
2.5"	20' - 0"	2	48"	144"
2.5"	20' - 6"	2	48"	150"
2.5"	21' - 0"	2	51"	150"
2.5"	21' - 6"	2	51"	156"
2.5"	22' - 0"	2	51"	162"
2.5"	22' - 6"	2	54"	162"
2.5"	23' - 0"	2	54"	168"
2.5"	23' - 6"	2	54"	174"
2.5"	24' - 0"	2	57"	174"



CLOSURE DETAIL
SECTION "C-C"
FULL SCALE

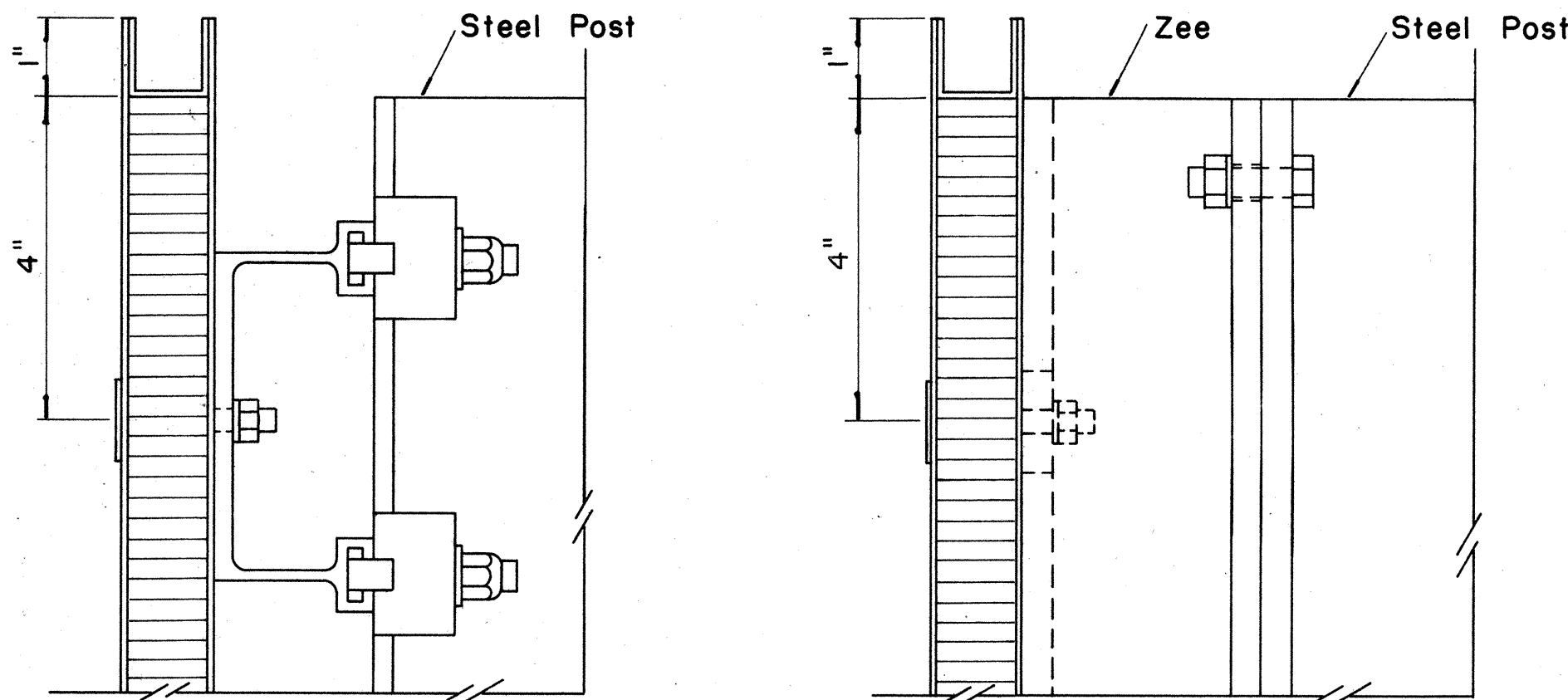
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
LAMINATED ALUMINUM
SIGN PANELS
(GROUND MOUNTED)
Scale: As Shown



ZEE MOUNTING DETAILS

Scale: $\frac{1}{2}$ " = 1'



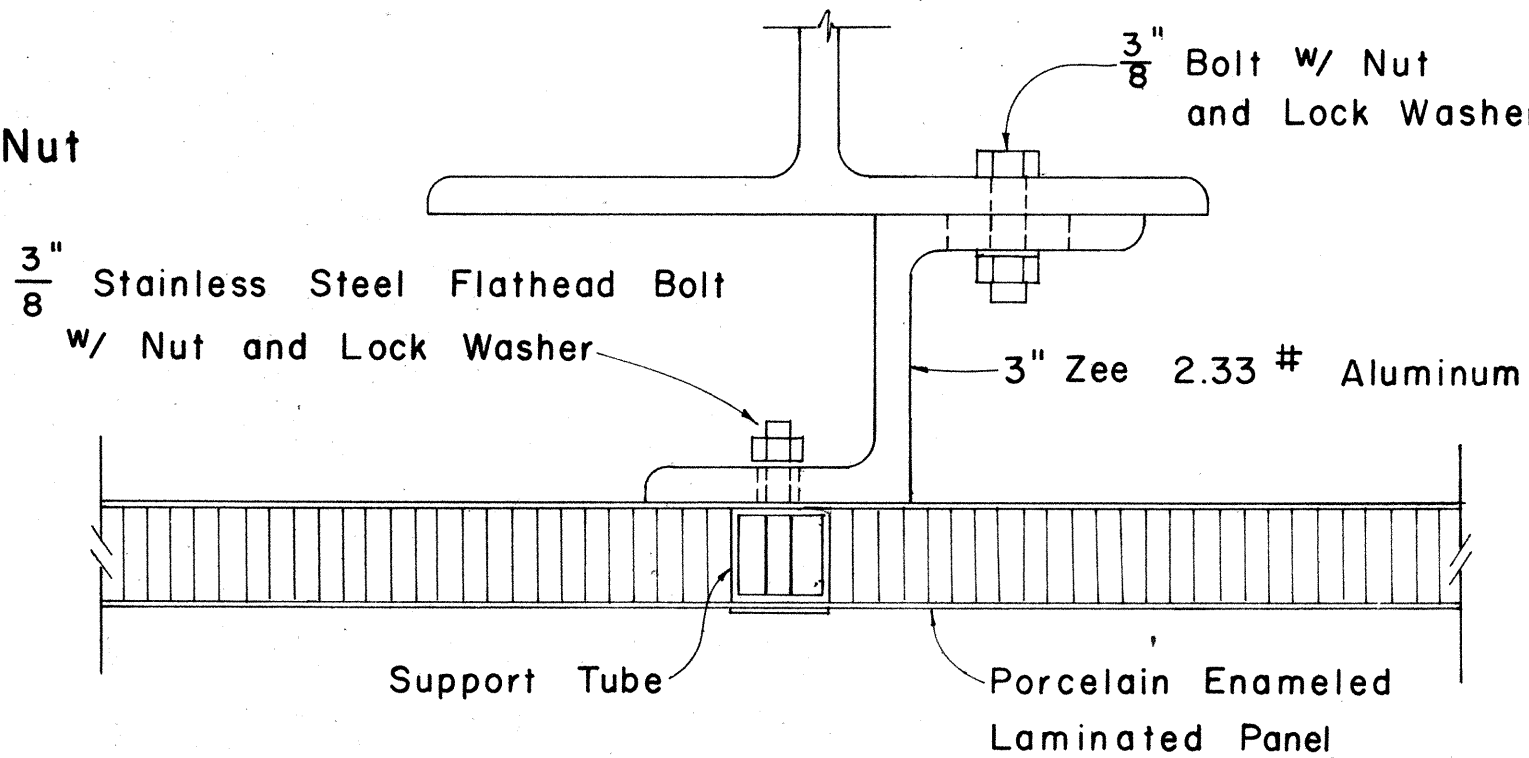
SECTION "B-B"

Scale: $\frac{1}{2}$ " = 1'

SECTION "B-B"

(Alternate)

Scale: $\frac{1}{2}$ " = 1'



SECTION "A-A"

(Alternate)

Scale: $\frac{1}{2}$ " = 1'

APPROVAL RECOMMENDED:

Erich Tanaka
TRAFFIC ENGINEER

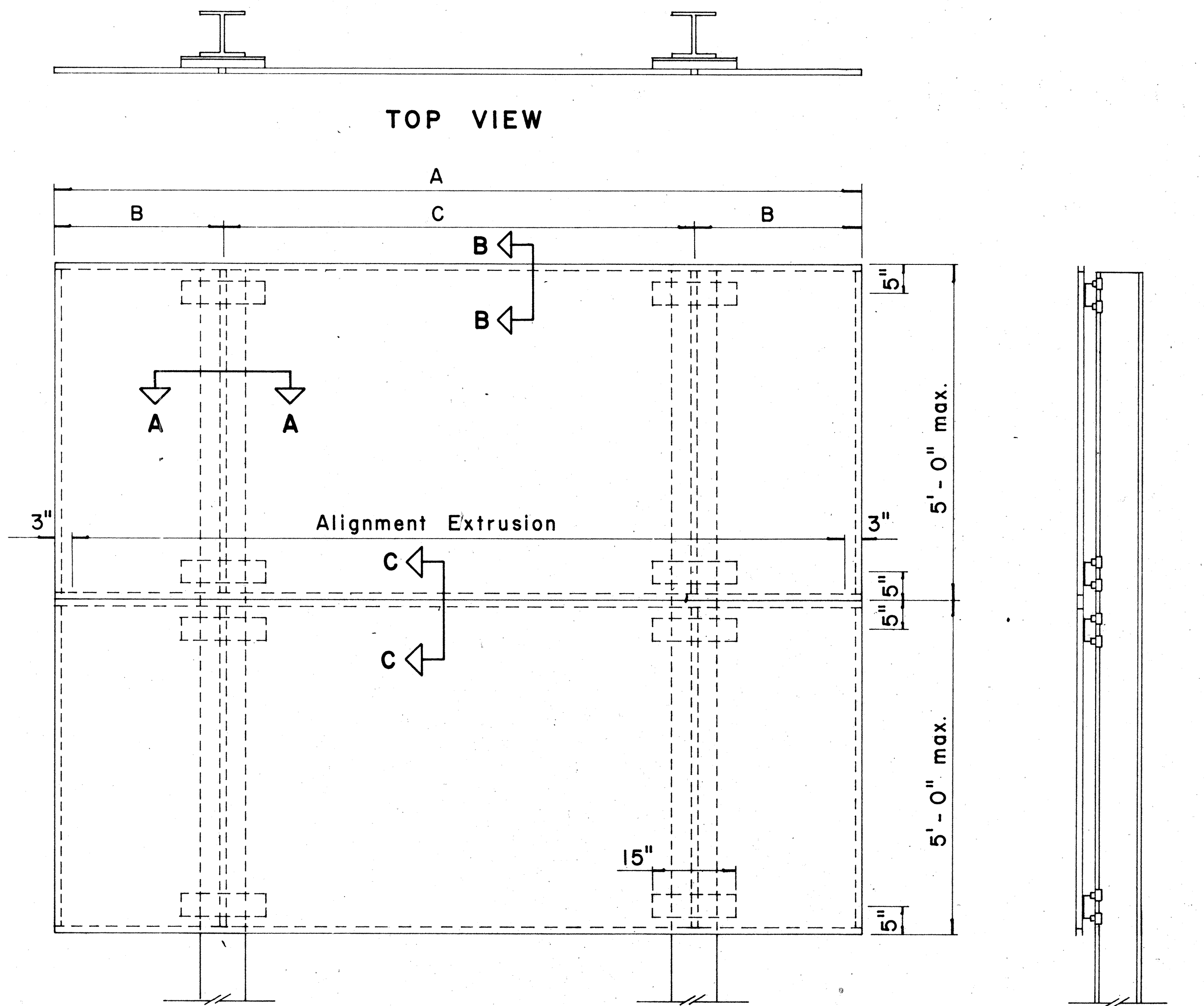
12/29/69
DATE

APPROVED:

John J. [Signature]
ASSISTANT CHIEF, ENGINEERING

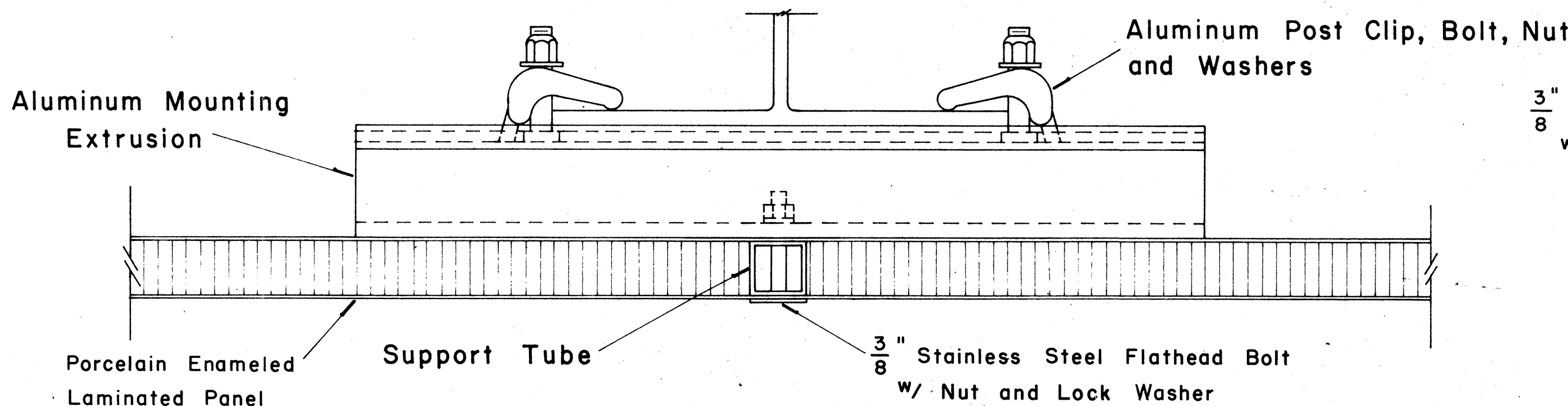
12-30-69
DATE

NO.	REVISION	APPROVED BY	DATE



TYPICAL SIGN ASSEMBLY

Scale: $\frac{3}{4}$ " = 1'-0"

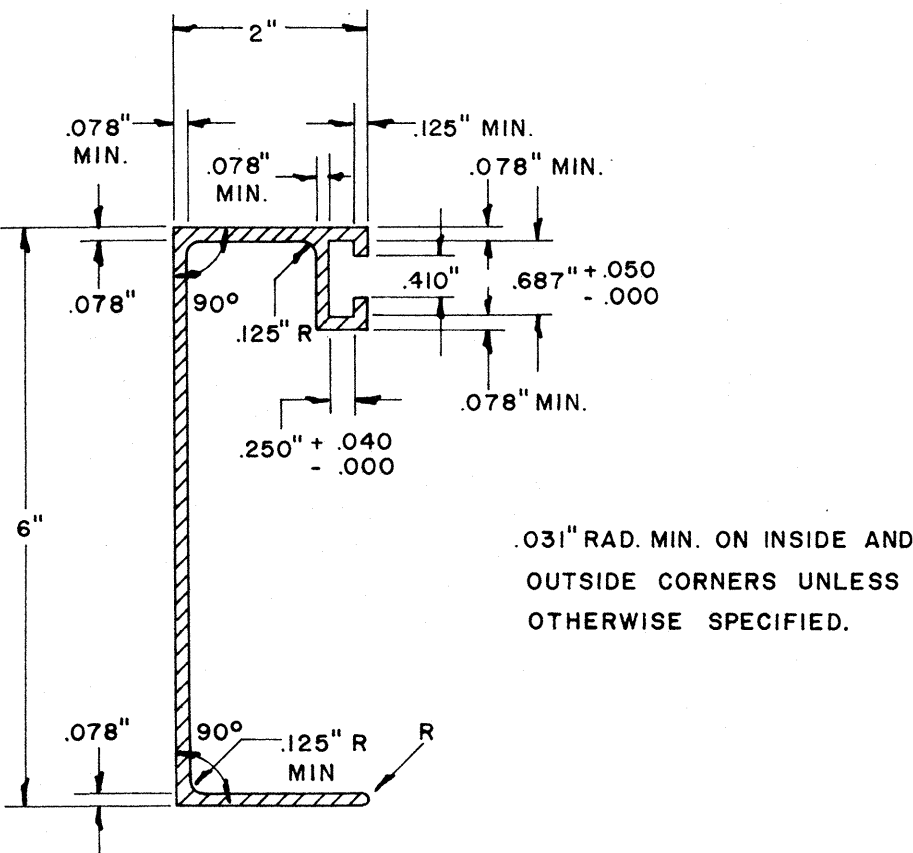
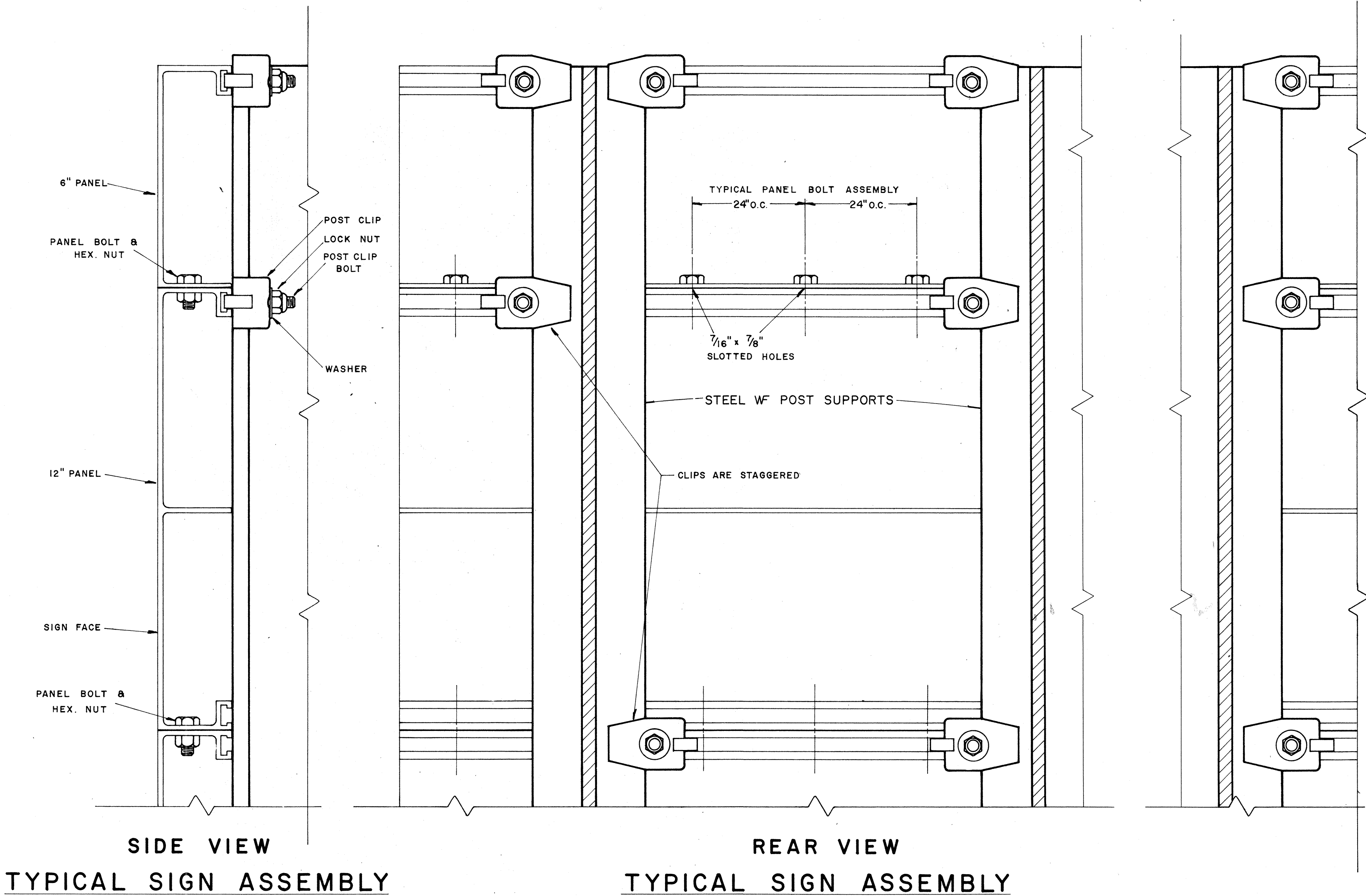


SECTION "A-A"

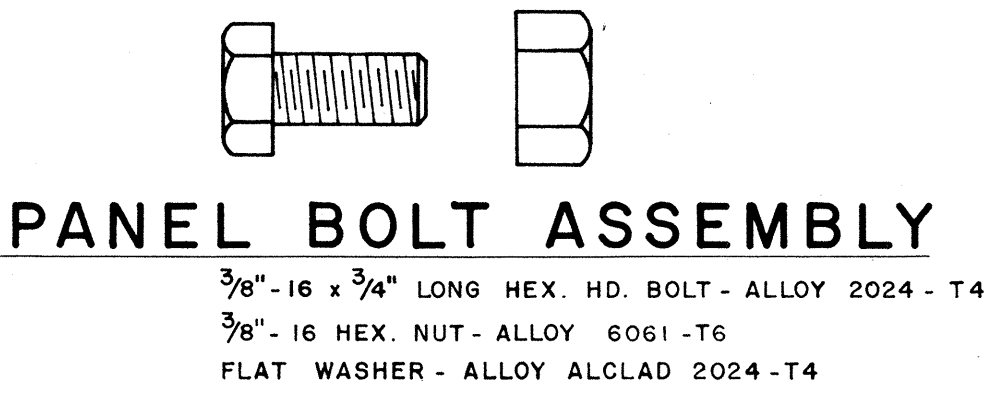
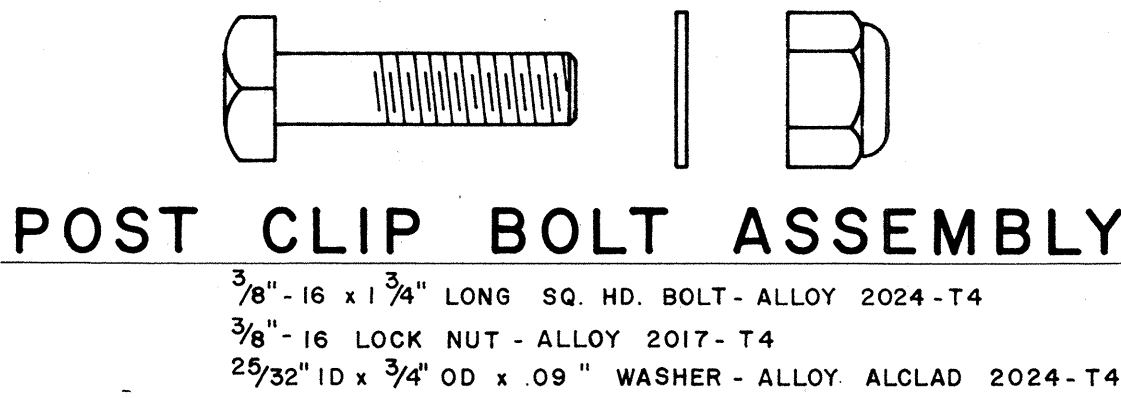
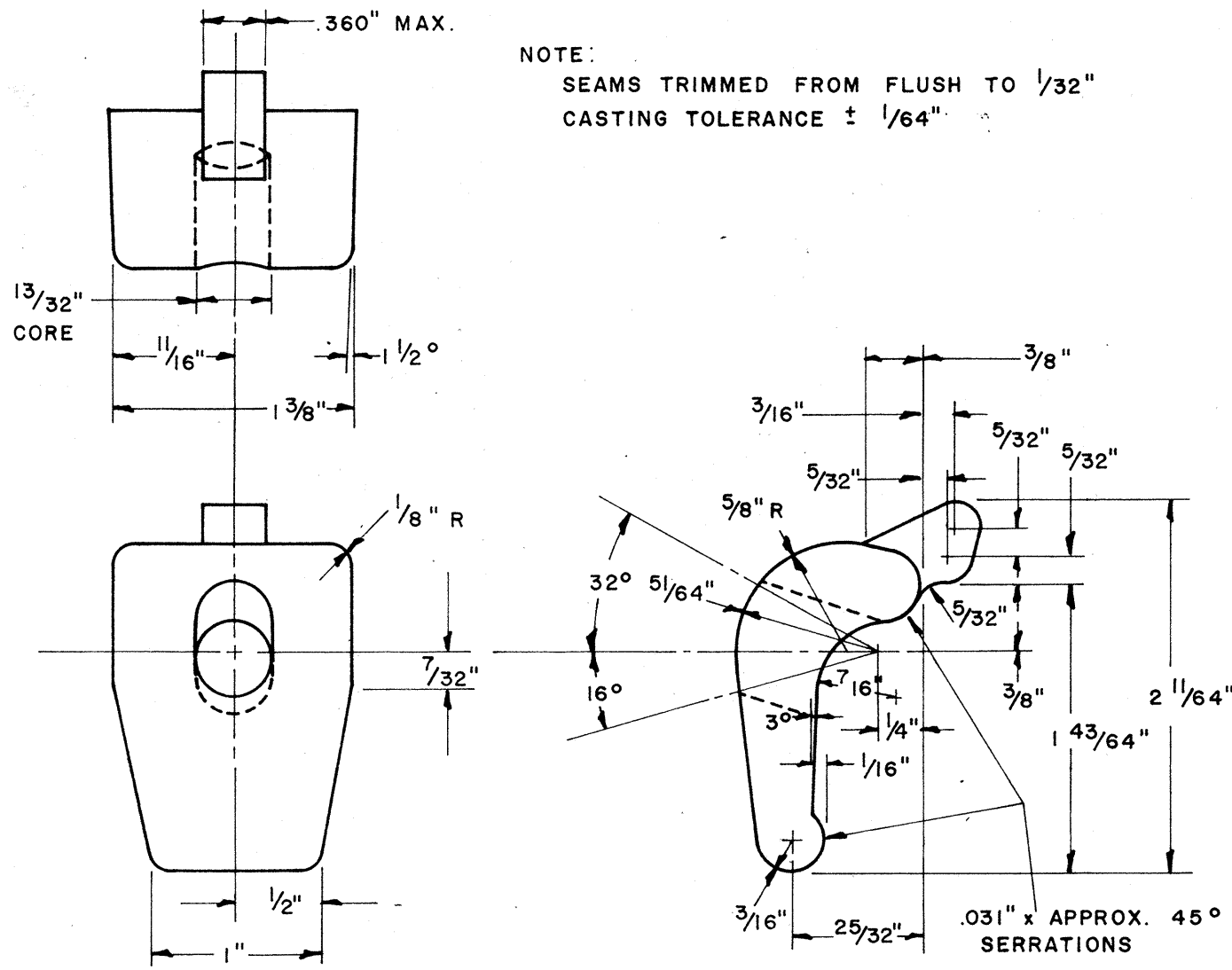
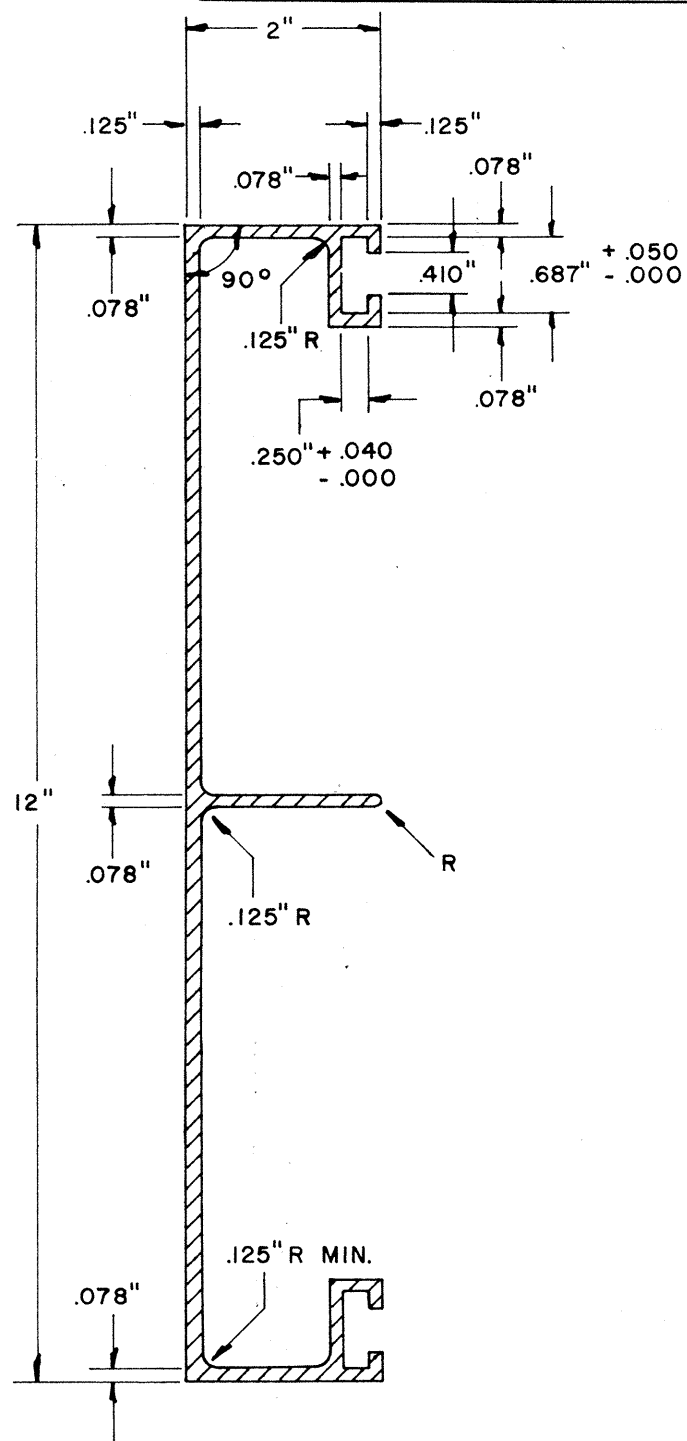
Scale: $\frac{1}{2}$ " = 1'

DATE	
SURVEY PLOTTED BY	
DRAWN BY	
TRACED BY	
CHECKED BY	
QUANTITIES BY	
CHECKED BY	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-H-1(73)15	1974	321	369



SOLID EXTRUDED SIGN PANEL DETAILS



NOTE:
Extruded Aluminum Panels to be used for
Destination Signs with Reflective Sheeting Background

NO.	REVISION	APPROVED BY	DATE

APPROVAL RECOMMENDED:
Eishi Tanaka 12/29/62
TRAFFIC ENGINEER DATE

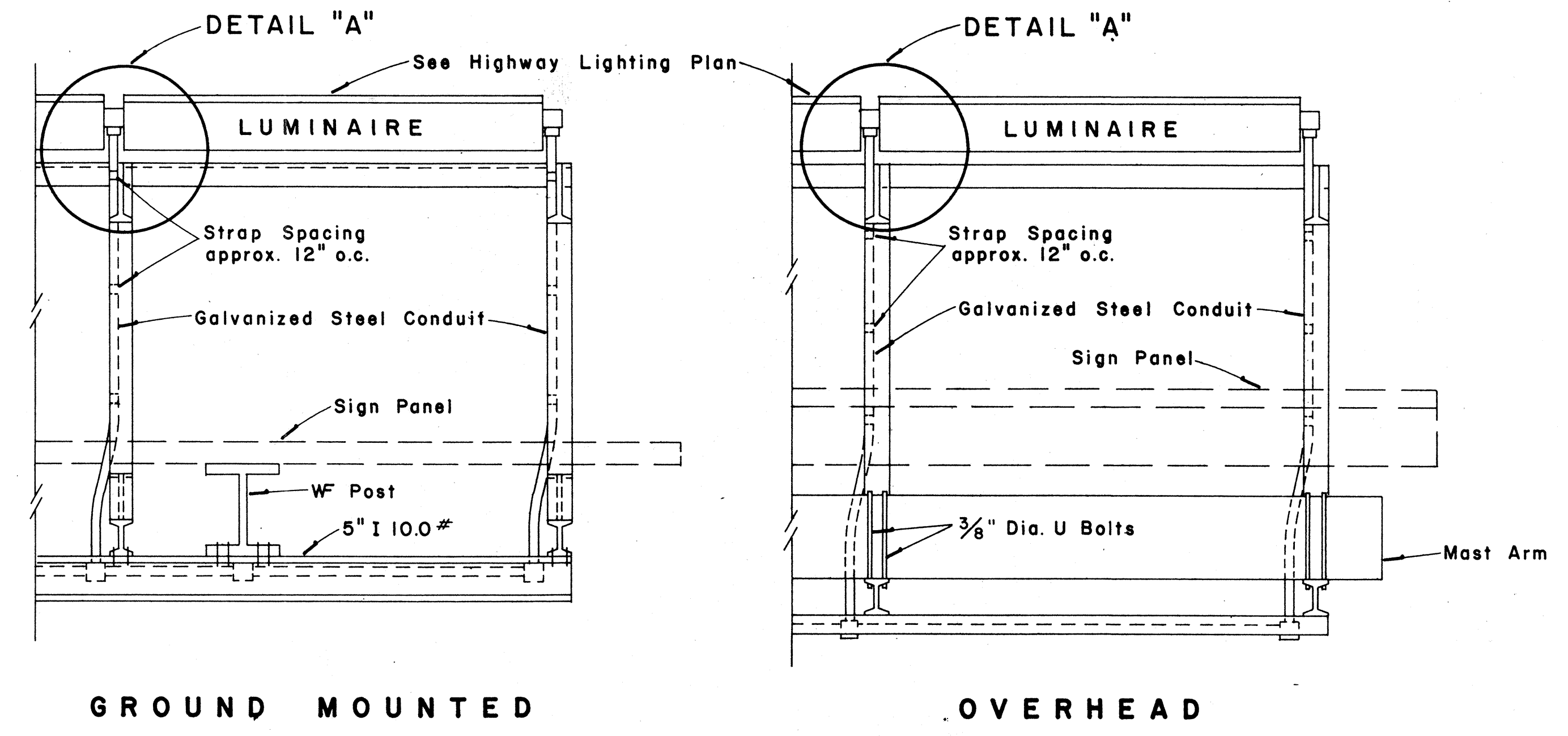
APPROVED:
John S. S. S. 12-30-69
ASSISTANT CHIEF, ENGINEERING DATE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION STANDARD DETAILS SOLID ALUMINUM EXTRUDED SIGN PANEL AND ACCESSORY DETAILS SCALE:
--

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-11(73)15	1974	322	369

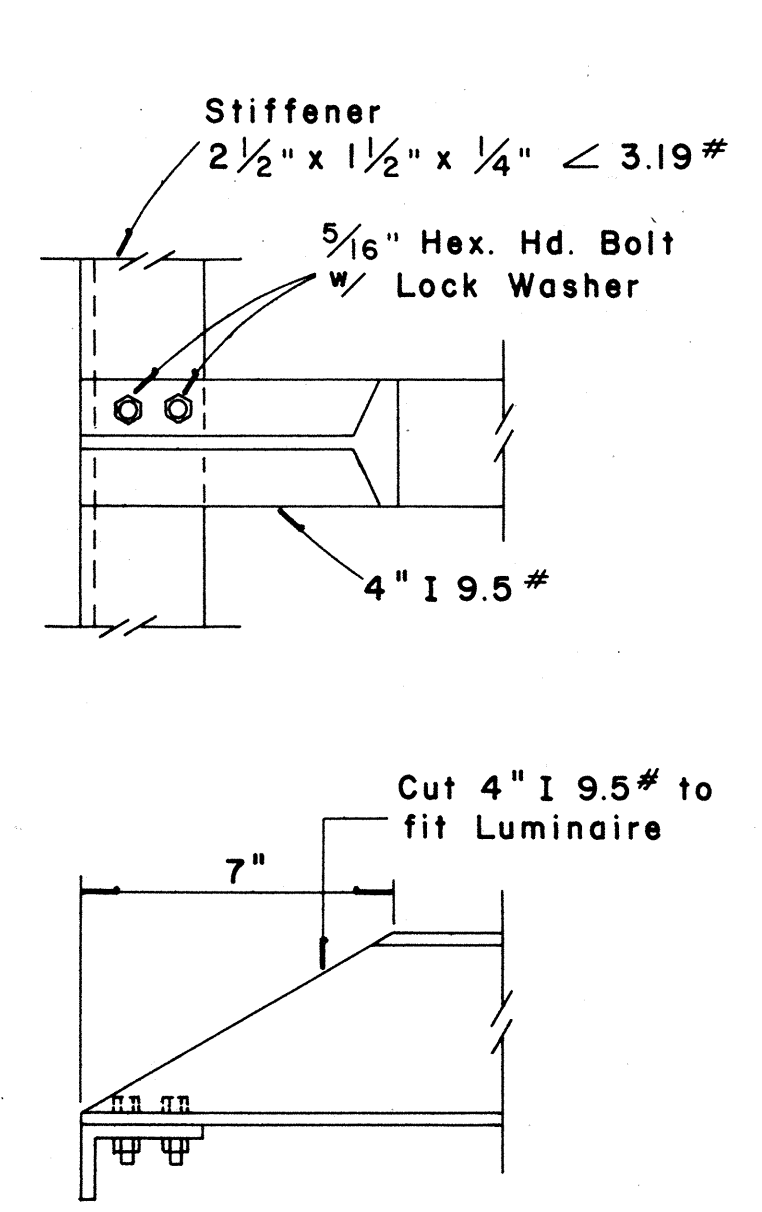
GENERAL NOTES

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 to fit 4'-0" to 6'-0" luminaires with fittings. Eight feet (8'-0") 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.



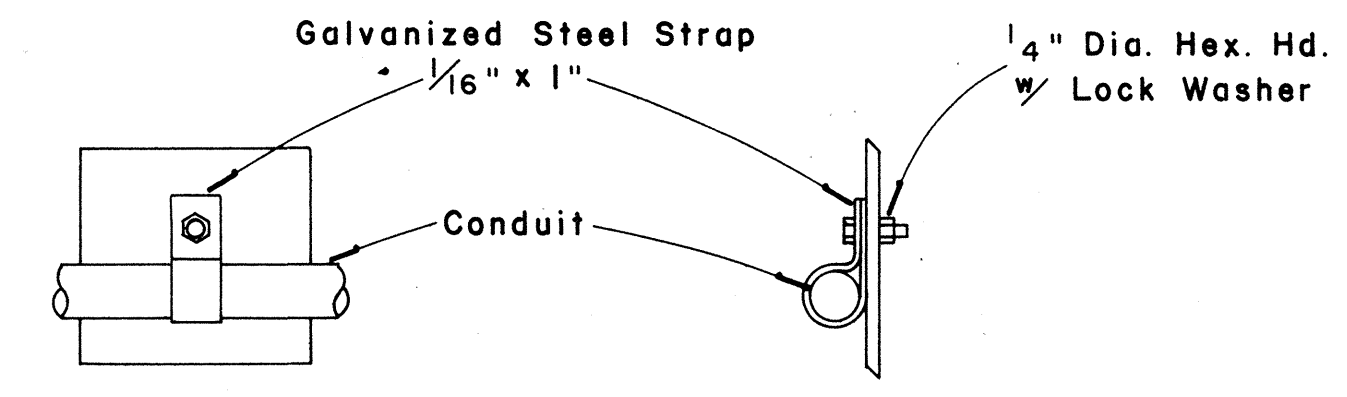
TOP VIEW LUMINAIRE MOUNTING

Scale: 1" = 1'-0"



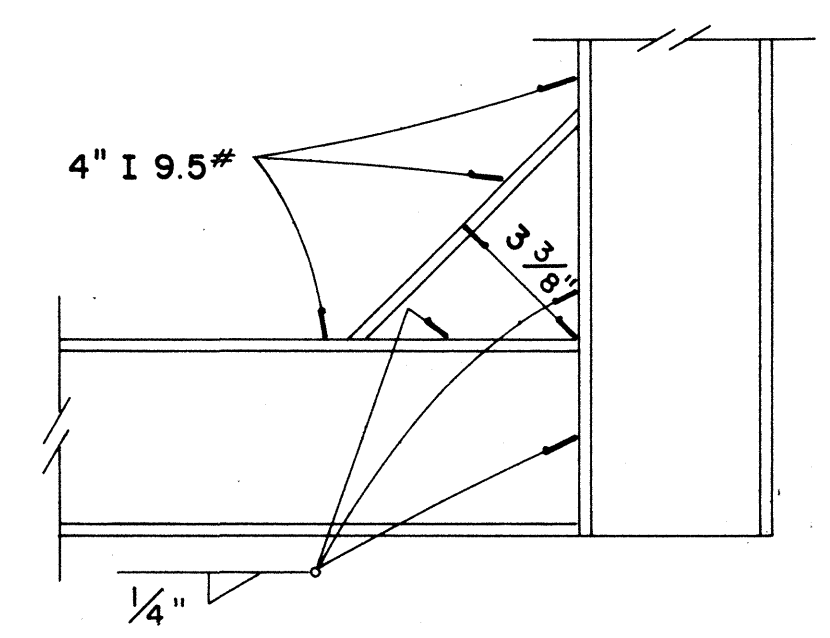
DETAIL "A"

Scale: 3" = 1'-0"



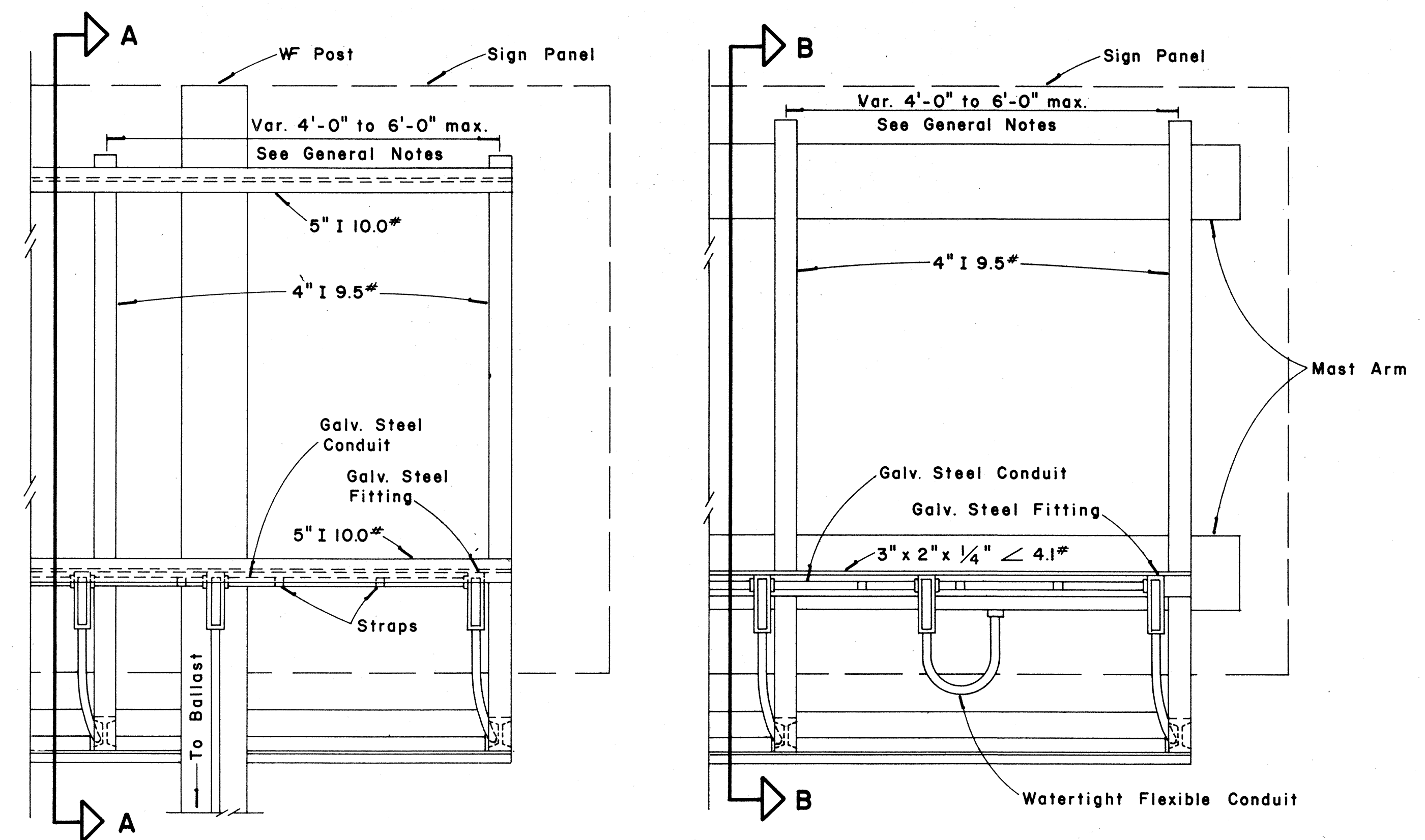
CONDUIT STRAP DETAIL

Scale: 3" = 1'-0"



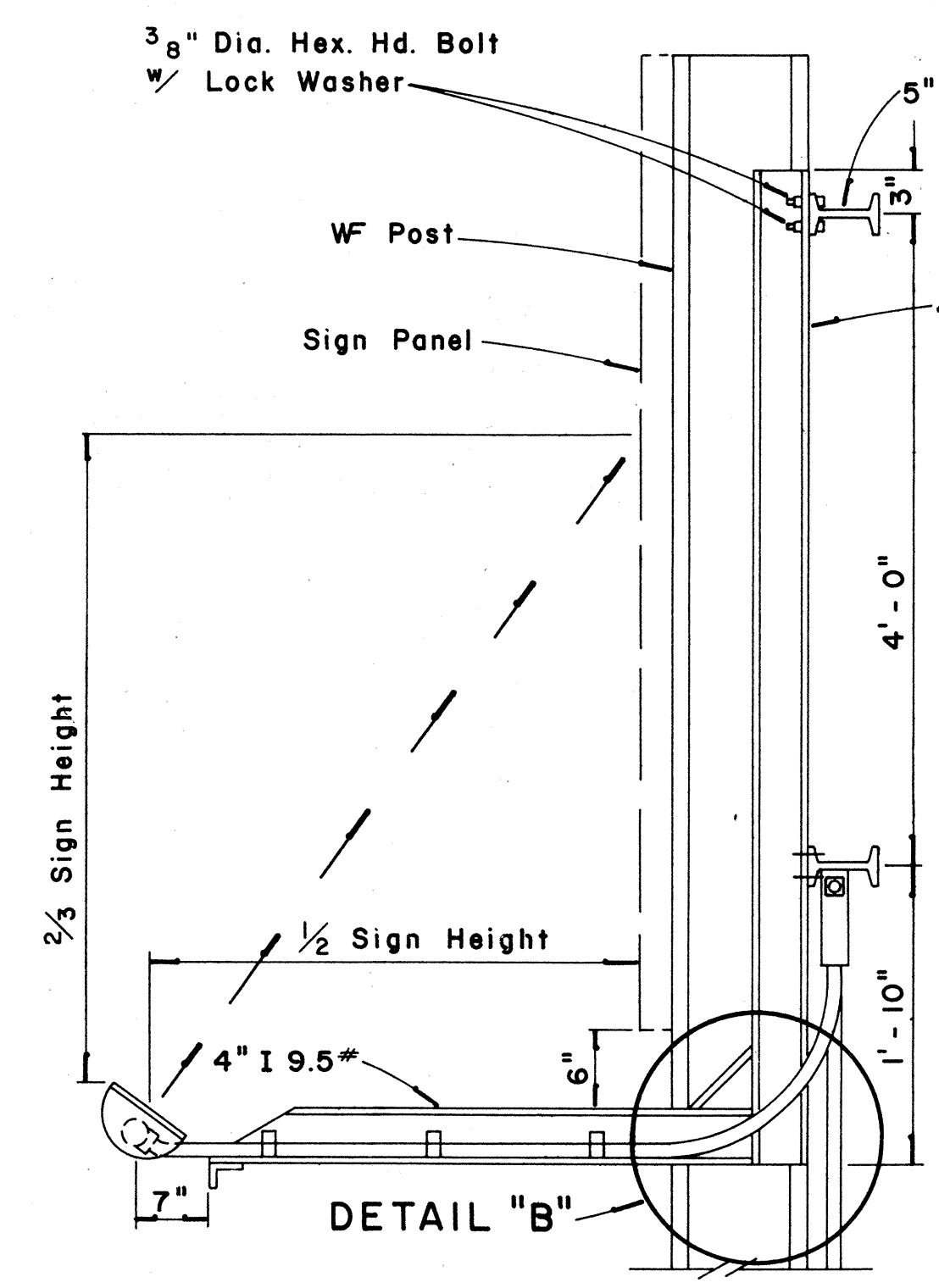
DETAIL "B"

Scale: 3" = 1'-0"



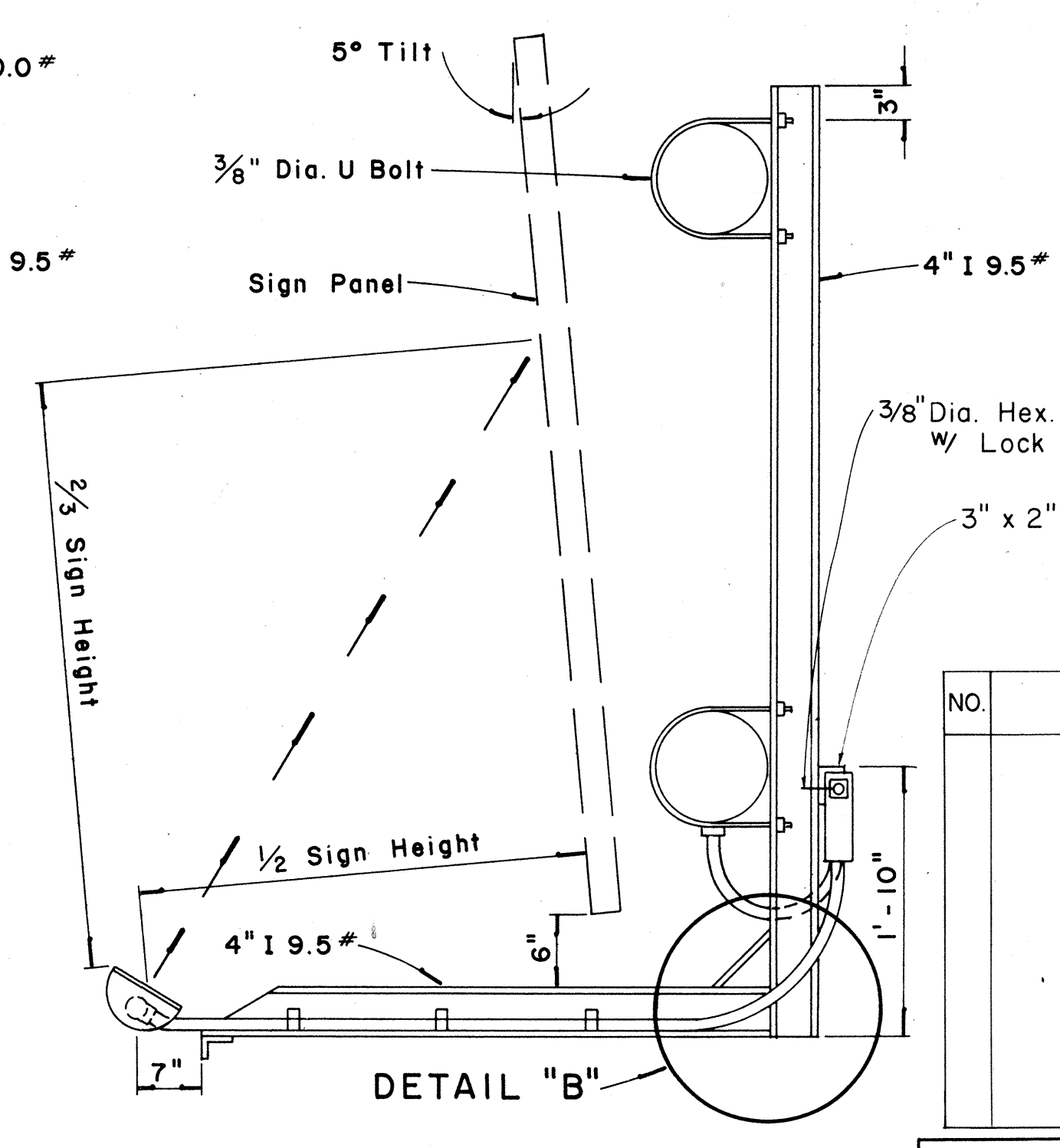
REAR VIEW LUMINAIRE MOUNTING

Scale: 1" = 1'-0"



SECTION "A-A"

Scale: 1" = 1'-0"



SECTION "B-B"

Scale: 1" = 1'-0"

APPROVAL RECOMMENDED:
Erich Tanaka
TRAFFIC ENGINEER
DATE 12/23/69

APPROVED:
[Signature]
ASSISTANT CHIEF, ENGINEERING
DATE 12/30/69

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**EXPRESSWAY SIGNS
LUMINAIRE MOUNTINGS**

Scale: As Shown

SHEET No. 5106 OF 106 SHEETS DT 208

ORIGINAL PLAN	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	
No.	