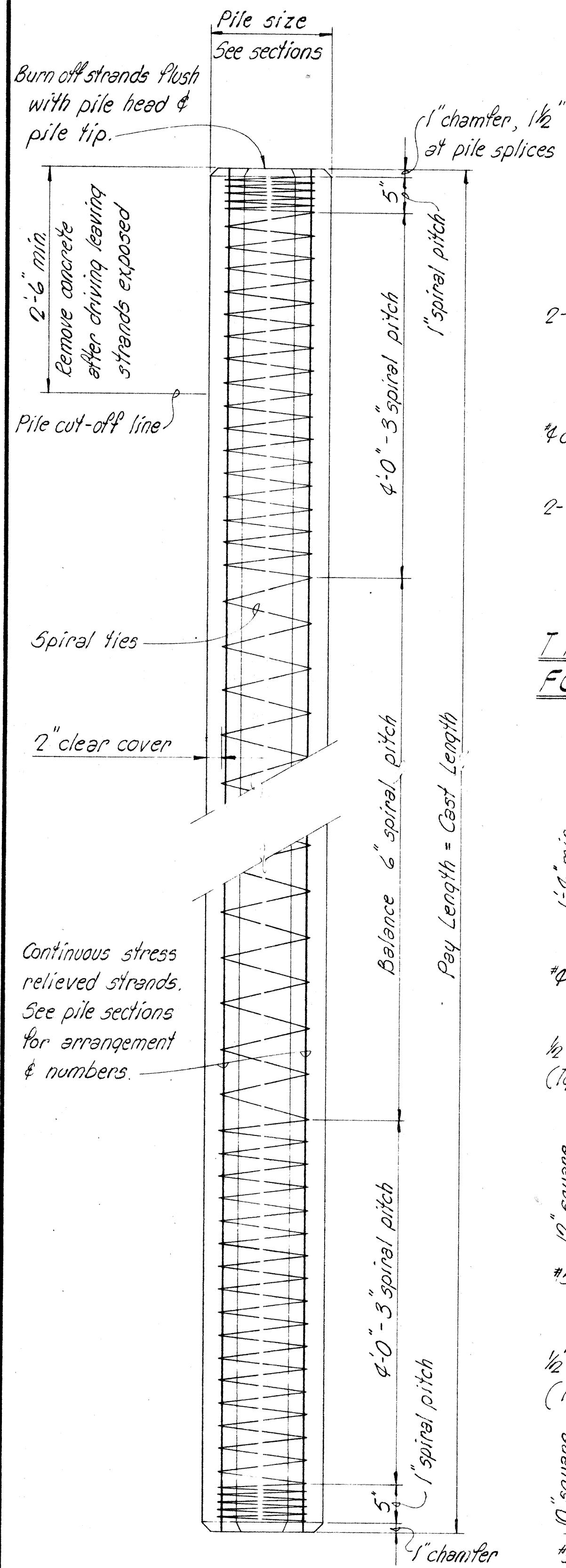
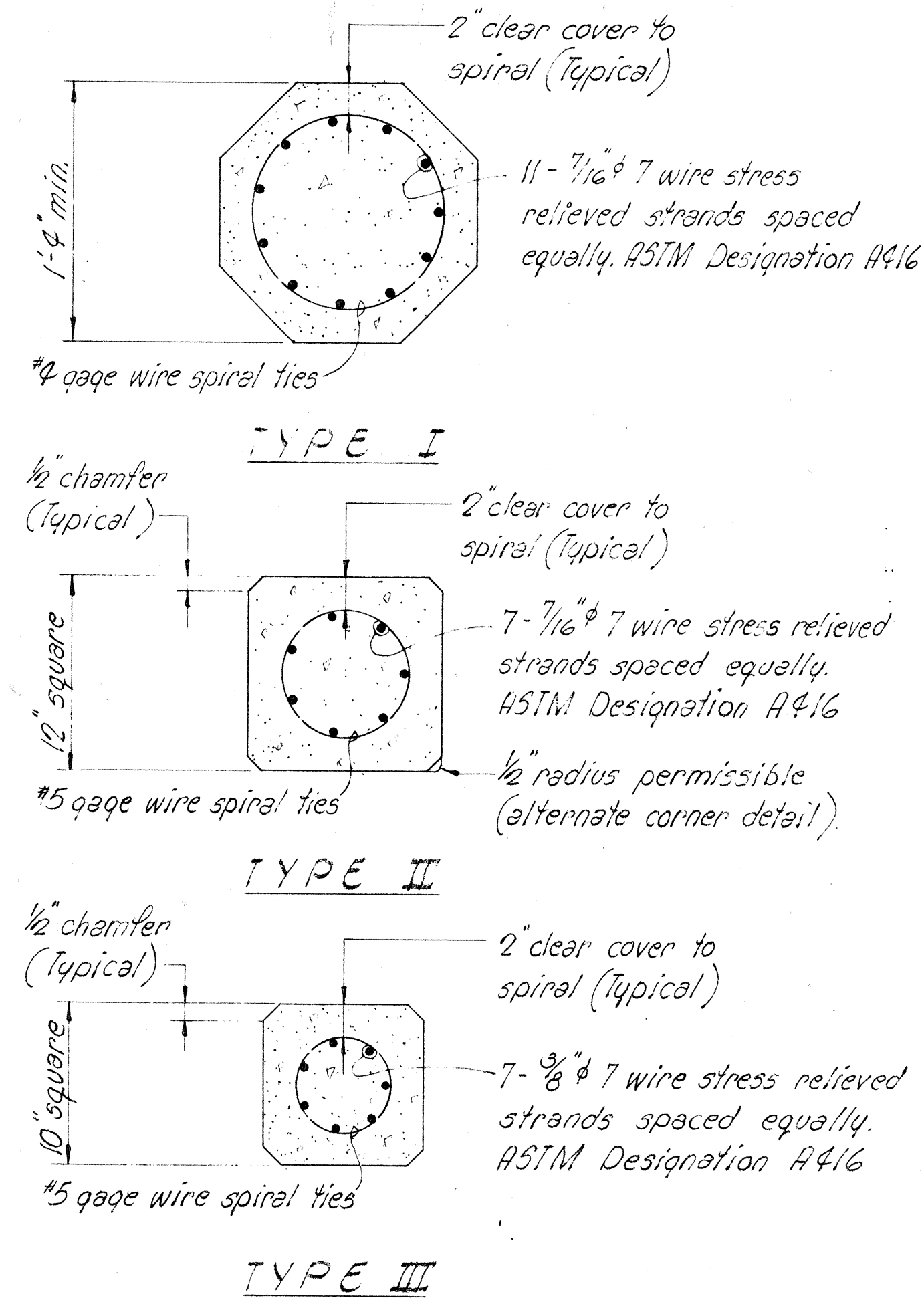




PART ELEVATION

PLAN

TYPICAL ADDED REINFORCEMENT FOR TYPES II & III PILE ENDS

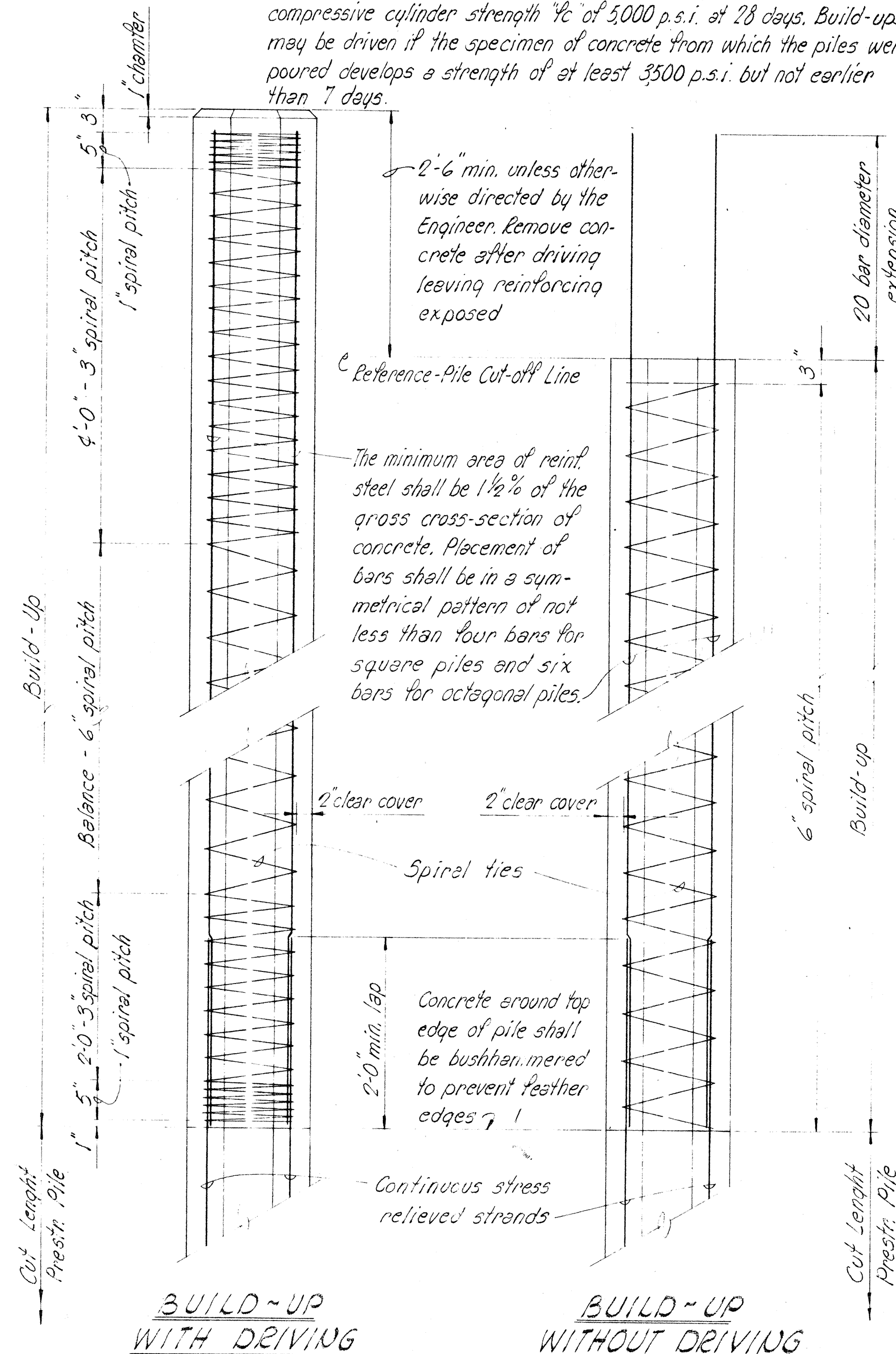


TYPICAL ELEVATION

TYPICAL SECTIONS

TYPICAL PILE DETAILS

NOTE: Concrete in pile build-ups without driving shall be Class A-1 Concrete. Concrete in pile build-ups with driving shall have a minimum compressive cylinder strength $\frac{1}{6}$ 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.



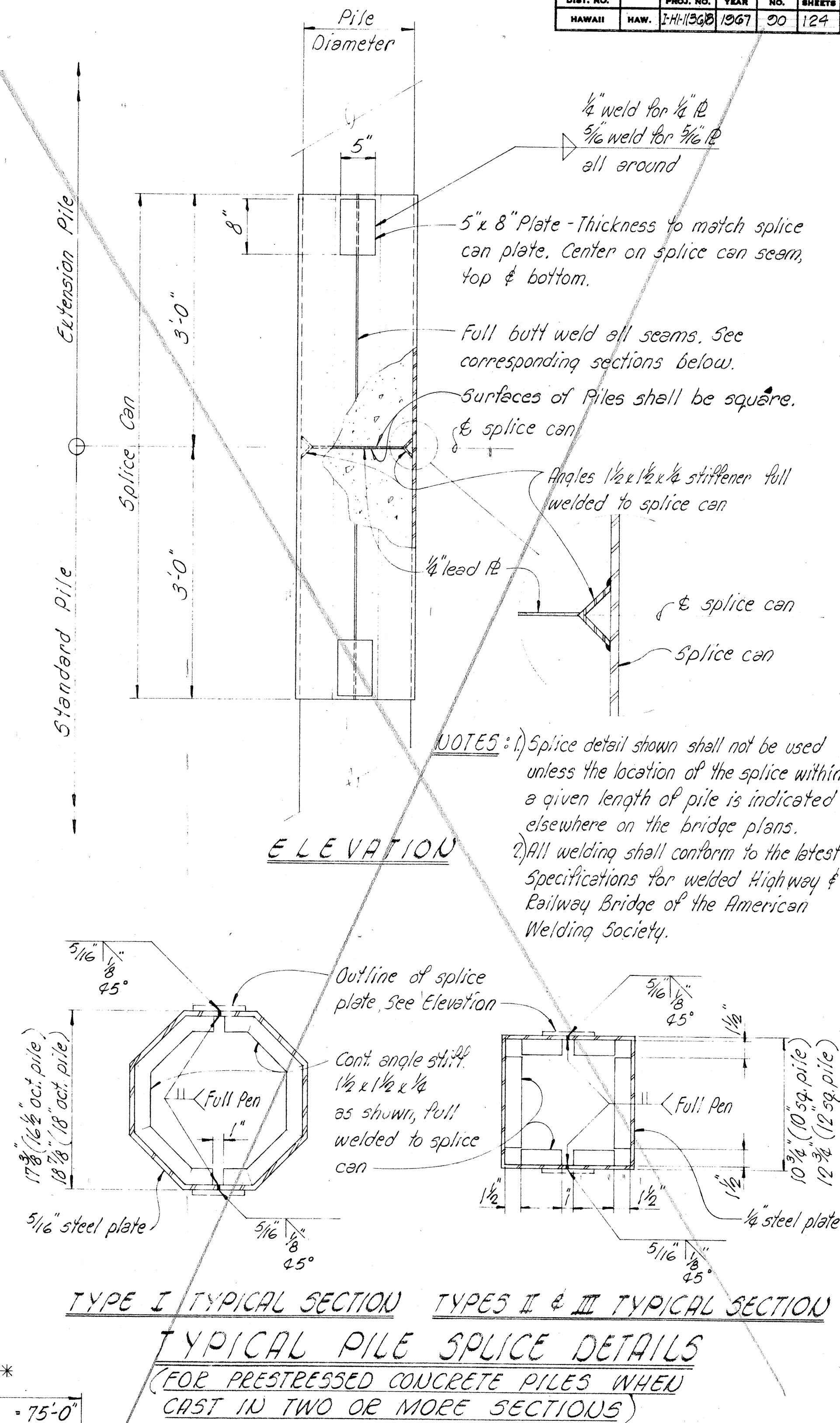
ELEVATIONS SHOWING TYPICAL PILE BUILD-UP DETAILS

Max. Length "L" *		Range of Length "L" *		Length "L" *	
Type I Oct.	"L" = 53'-0"	Type I Oct.	"L" = 53' to 75'	Type I Oct. over "L"	= 75'-0"
Type II 12" sq.	"L" = 50'-0"	Type II 12" sq.	"L" = 50' to 72'	Type II 12" sq. over "L"	= 72'-0"
Type III 10" sq.	"L" = 46'-0"	Type III 10" sq.	"L" = 46' to 66'	Type III 10" sq. over "L"	= 66'-0"
0.30L	0.70L	0.21L	0.58L	0.21L	
		0.15L	0.35L	0.35L	0.15L

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



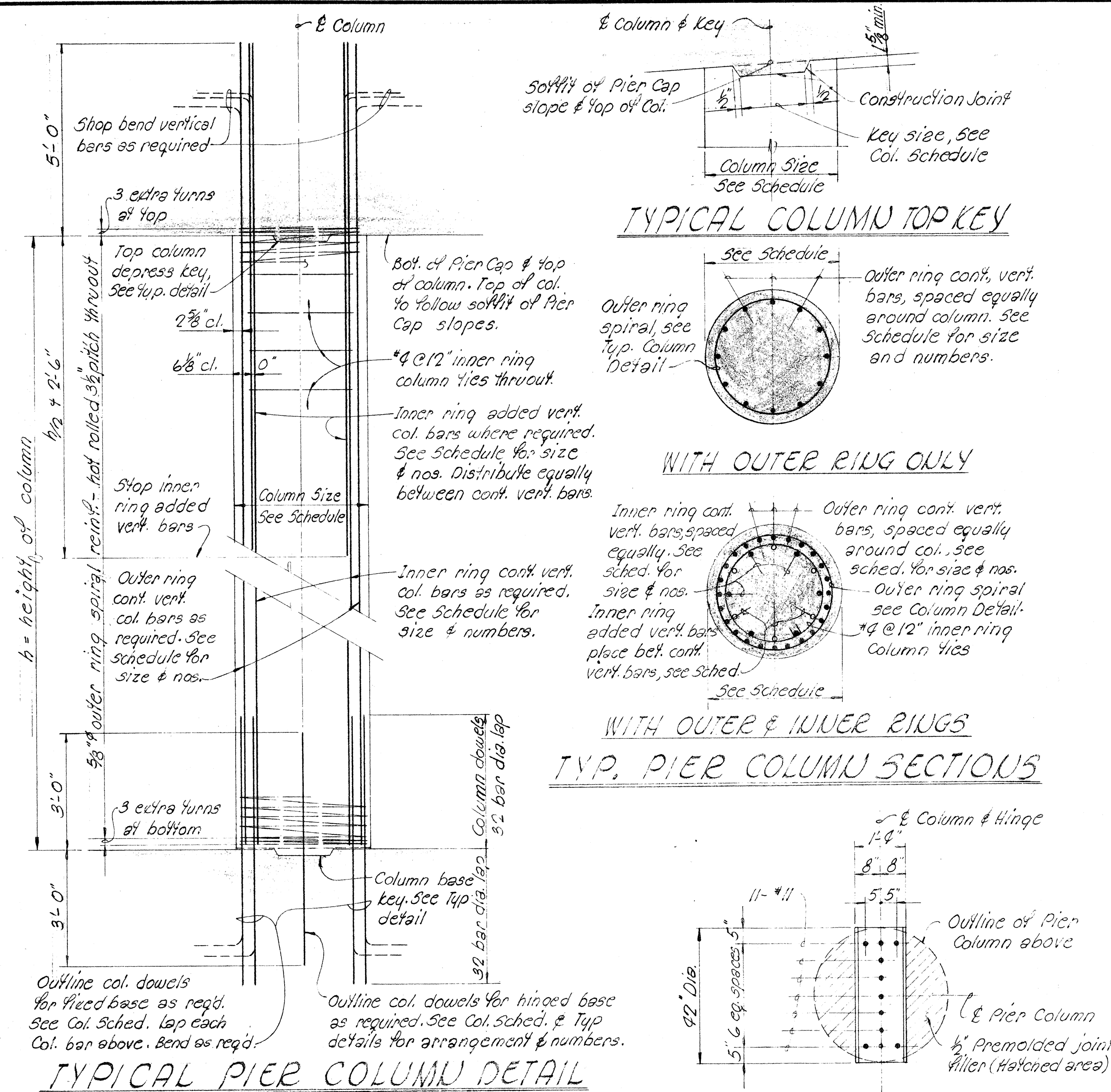
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
PRESTRESSED CONCRETE PILES

PIER COLUMN SCHEDULE

BRIDGE No.		4a 4b	4a, 4b	12					
PIER No.		1, 2	3, 4	1, 2, 3					
COLUMN TOP KEY		16" x 16"	16" x 16"	16" x 16"					
COLUMN SECTION	SIZE	48" Ø	48" Ø	42" Ø					
	OUTER RING CONT. VERT. REINF.	19-#9	18-#11	16-#9					
	INNER RING CONT. VERT. REINF.								
	INNER RING ADDED VERT. REINF.								
	SPIRAL REINF.	5/8" Ø @ 3" pitch	5/8" Ø @ 3" pitch	5/8" Ø @ 2 3/8" pitch					
COLUMN COLUMN BASE KEY	FIXED BASE	19-#9	18-#11						
	HINGED BASE			TYPE H-1					
	HINGED BASE	16" x 16"	16" x 16"	TYPE H-1					

SPECIAL NOTES

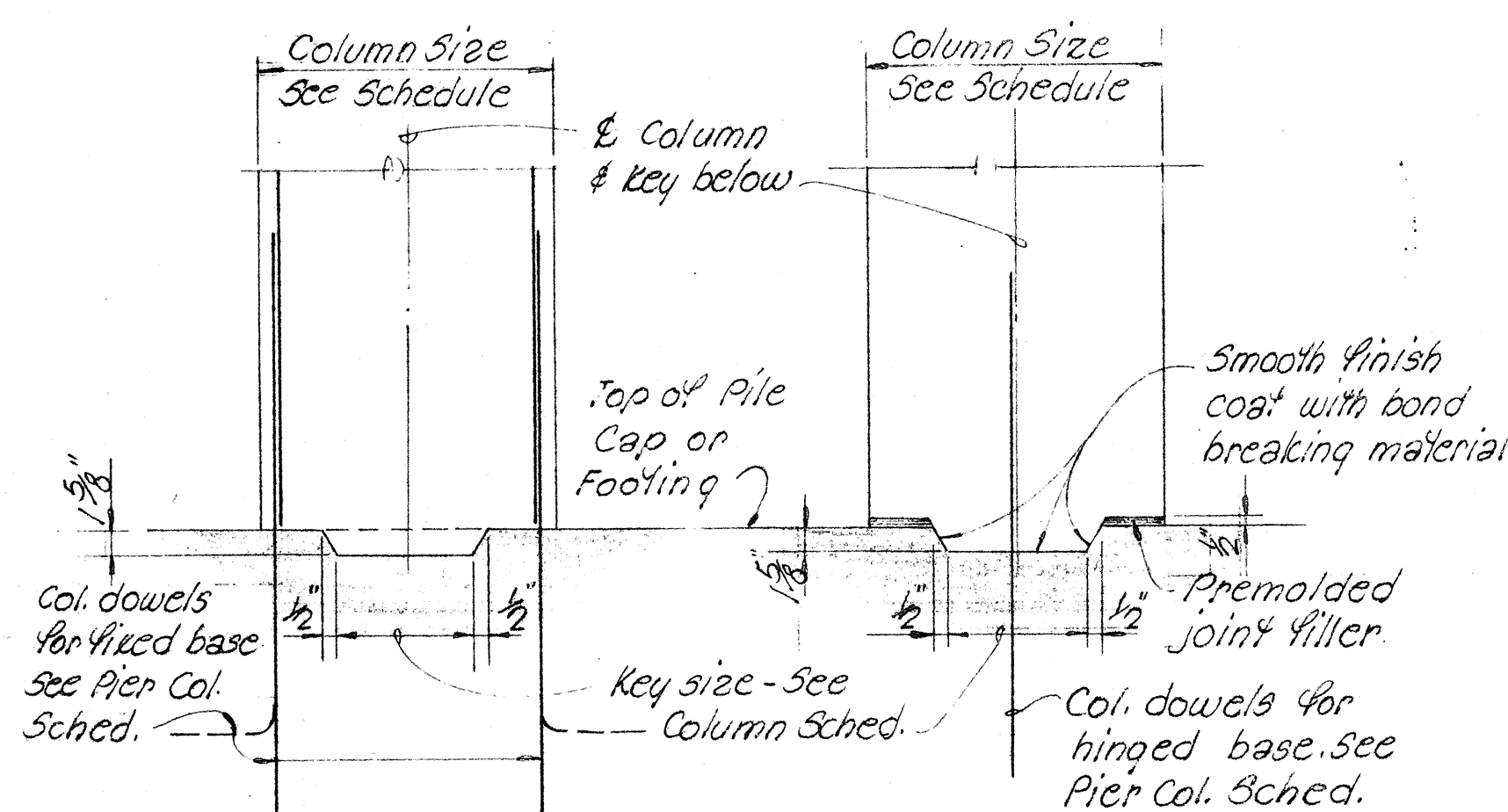
- For General Notes, See Sh. 510
- References for column lengths:
 - Structure #4a & 4b - Sh. B6
 - Structure #12 - Sh. B19
- The detail drawings on this sheet are made for general applicability to many situations, and particular applications by bridges are as shown in "PIER COLUMN SCHEDULE."



HINGED BASE DOWELS

TYPICAL DETAIL

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

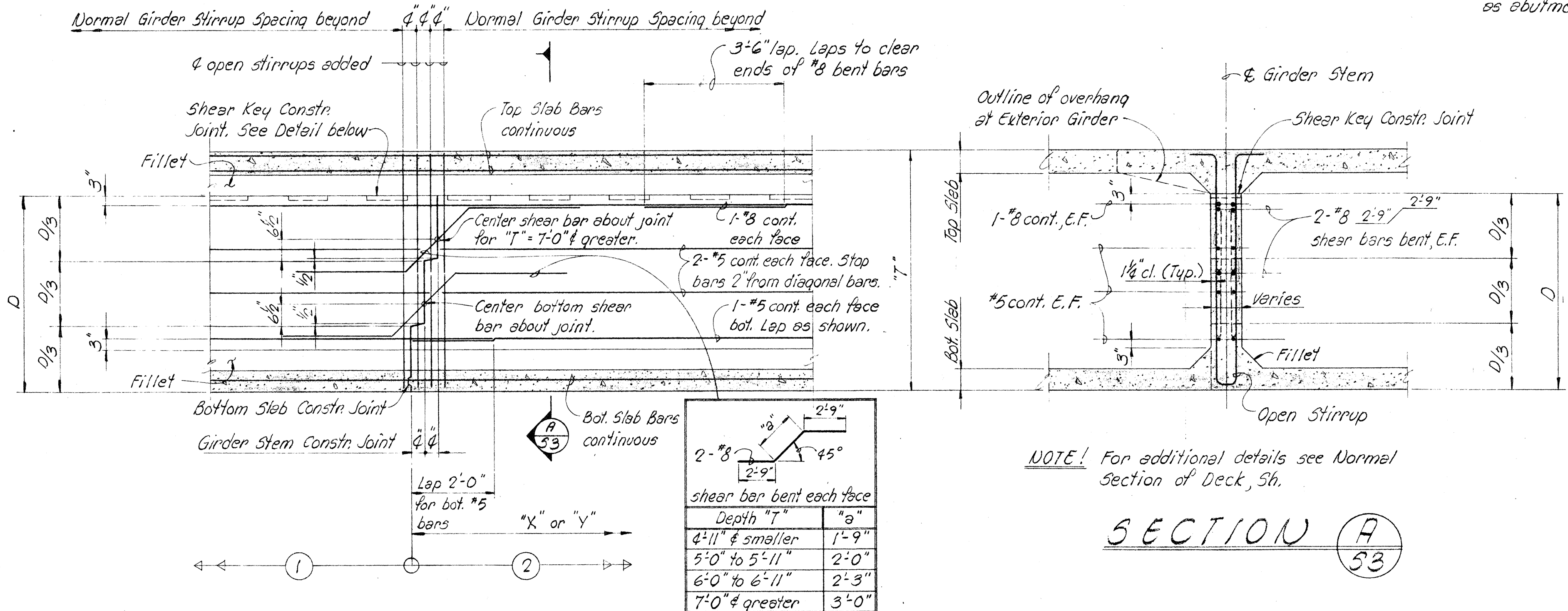


TYPICAL COLUMN BASE KEY DETAIL

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
TYPICAL PIER COLUMN

NOTES

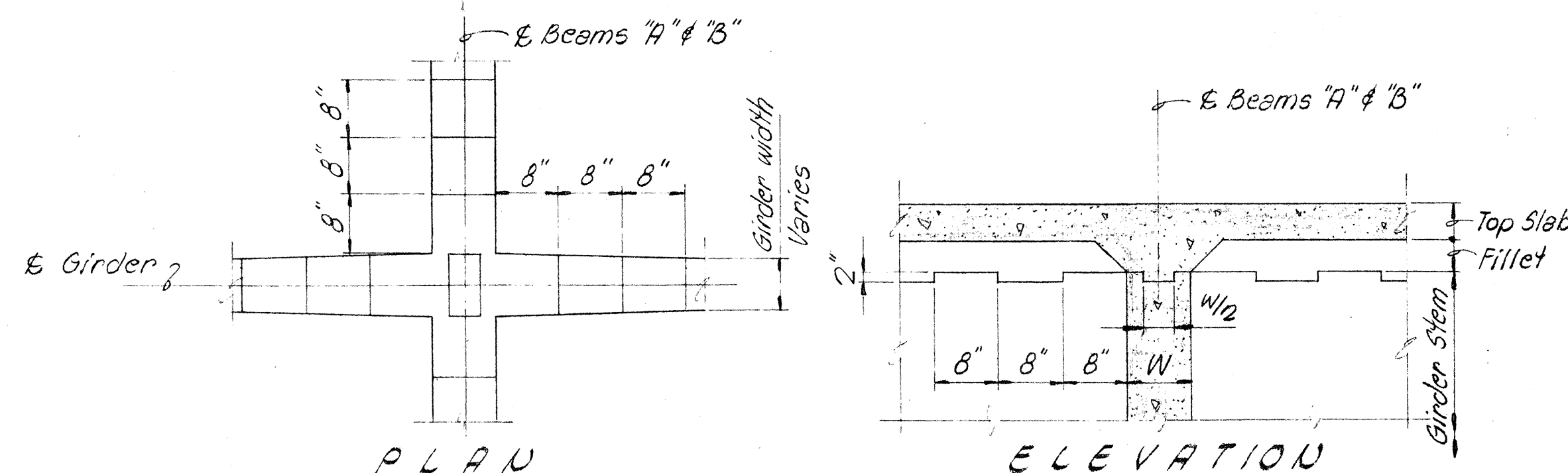
- LONGITUDINAL SECTION OF STRUCTURE SHOWING PLACING DIAGRAM FOR SUPERSTRUCTURE CONCRETE



NOTE! For additional details see Normal Section of Deck, Sh.

SECTION A
53

TYPICAL GIRDER STEM CONSTRUCTION JOINT DETAIL



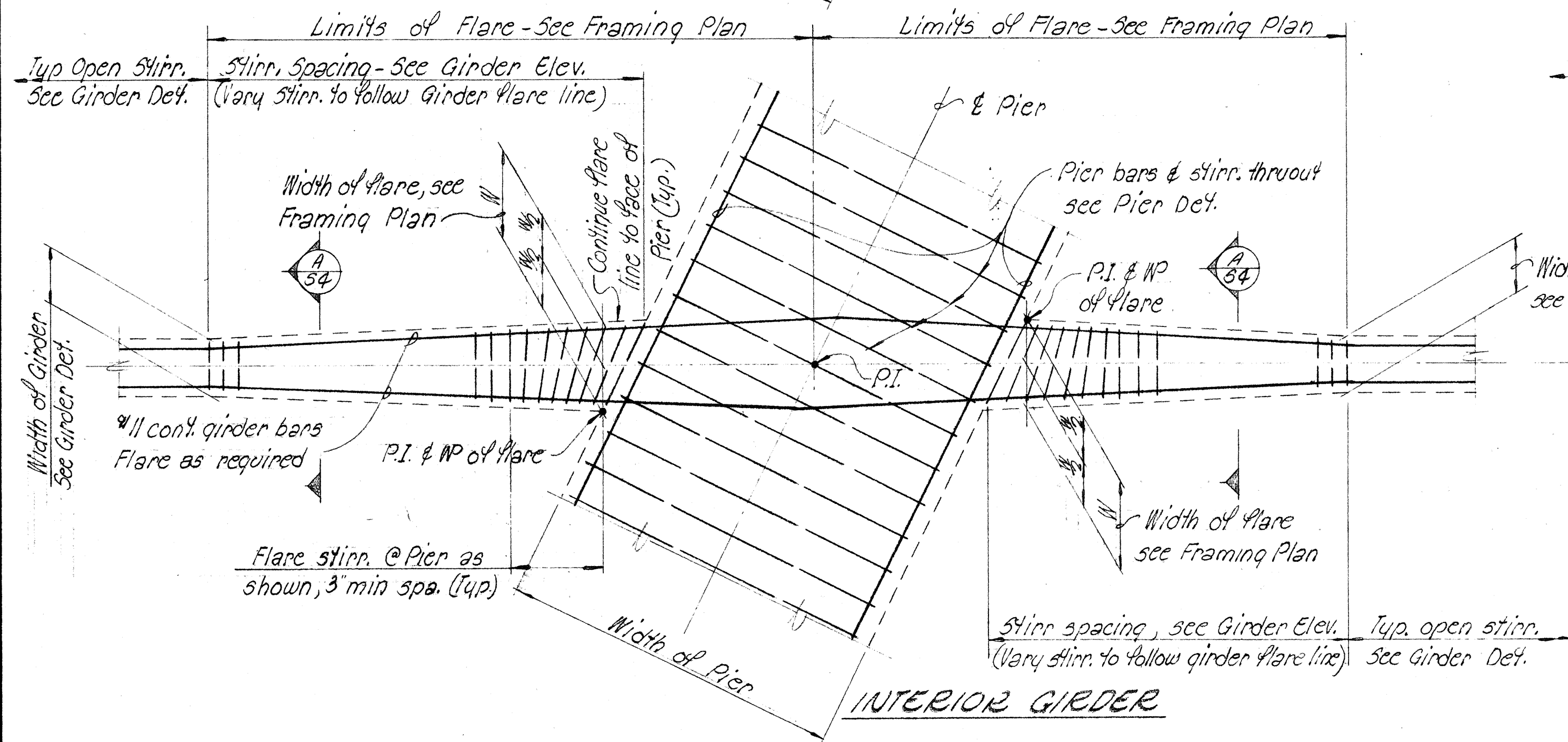
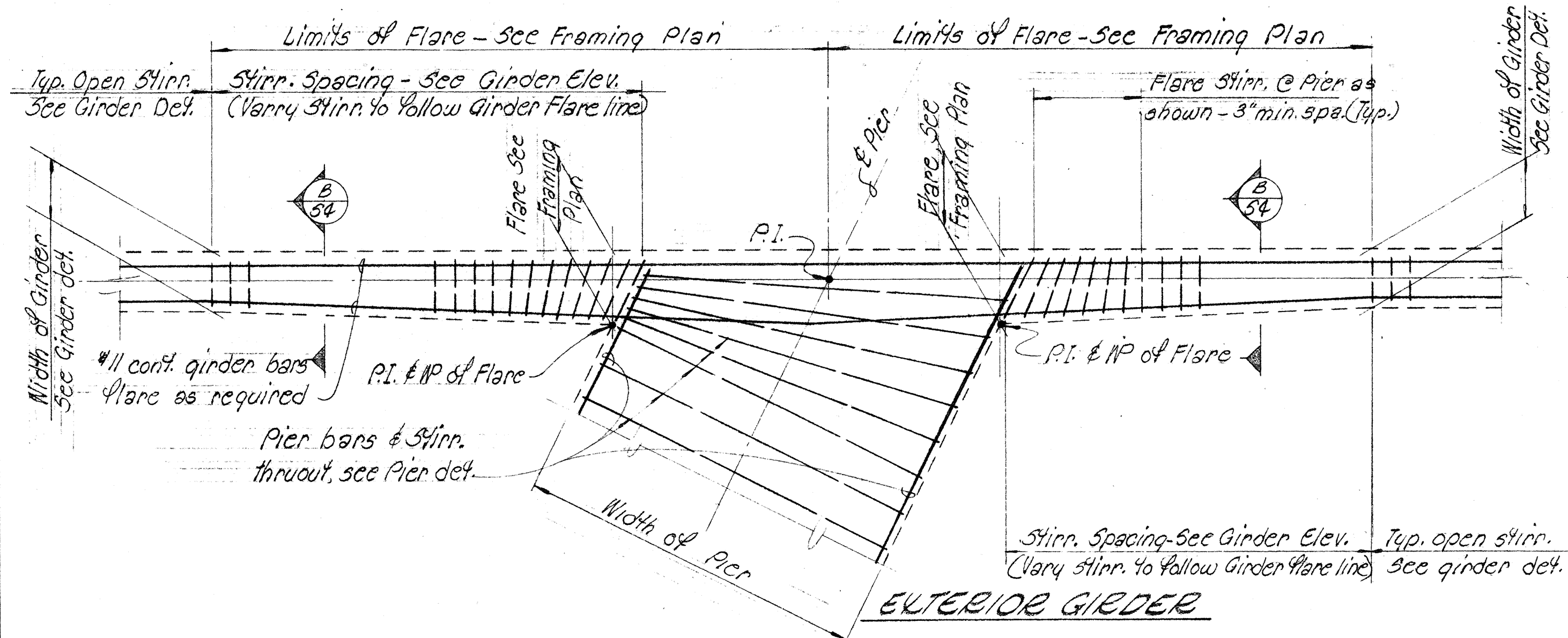
TYPICAL SLAB
CONSTR. JOINT DETAIL

PLAN ELEVATION

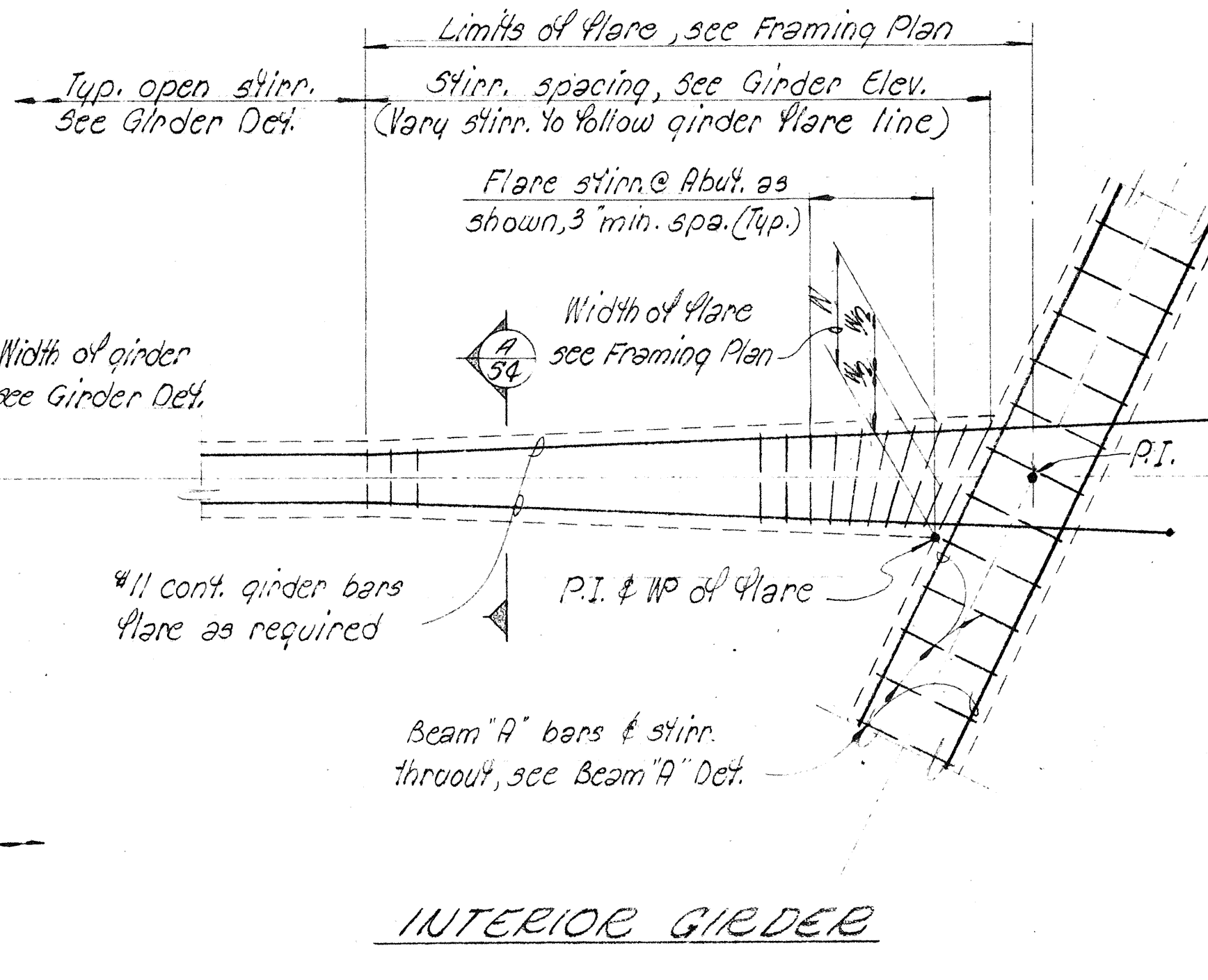
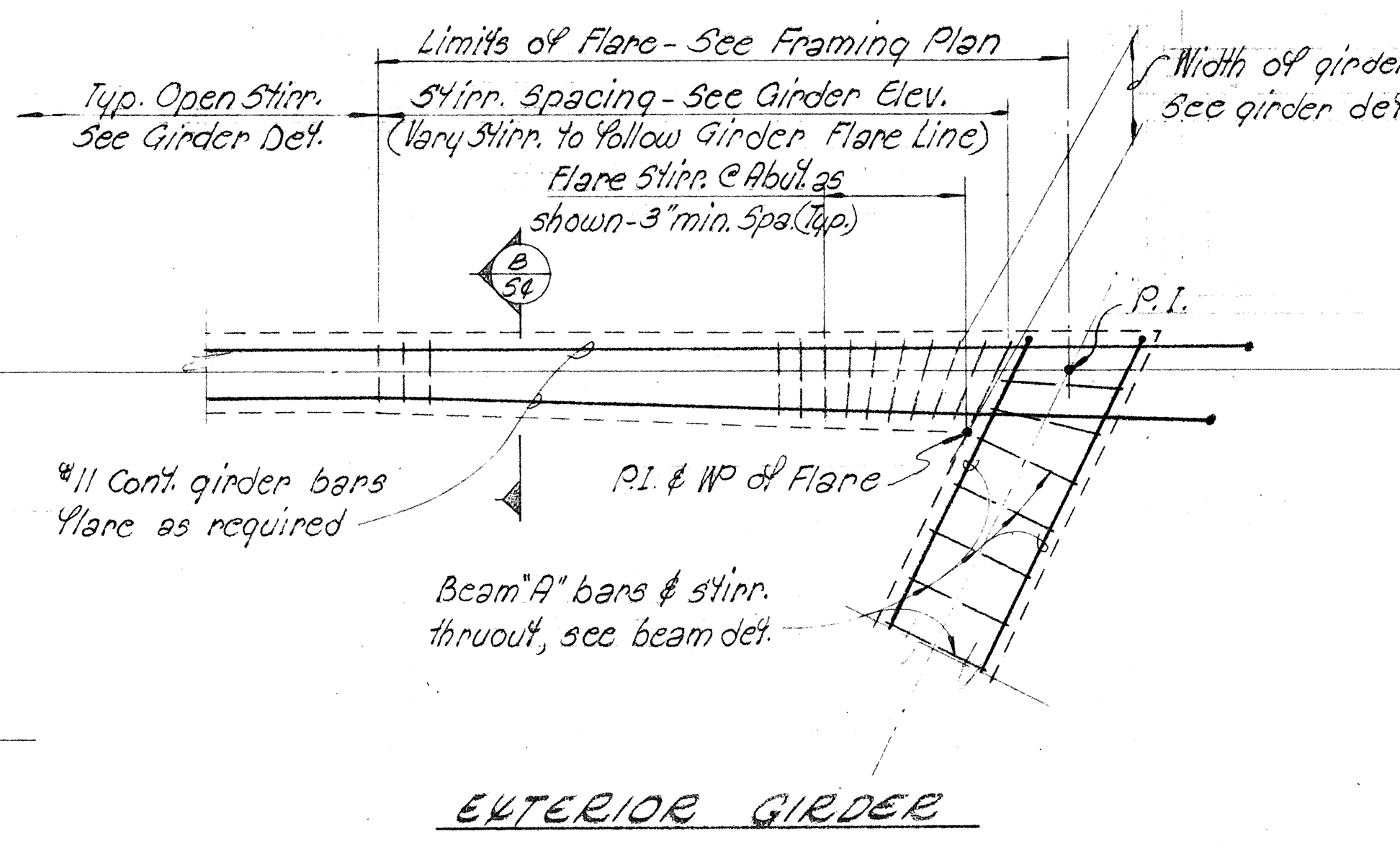
SHEAR KEY DETAIL FOR BEAMS "A" & "B"

STANDARD DETAILS
CONCRETE BOX GIRDER

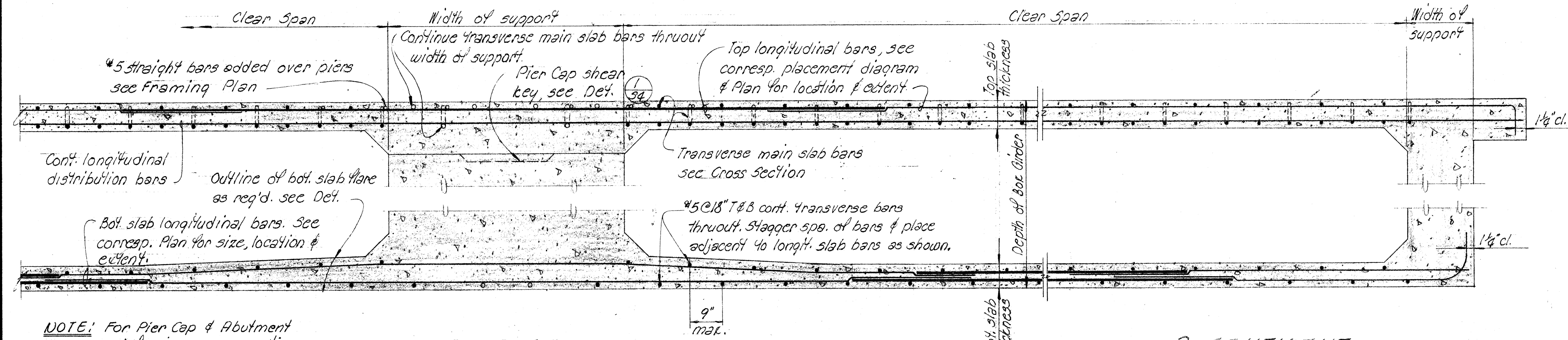
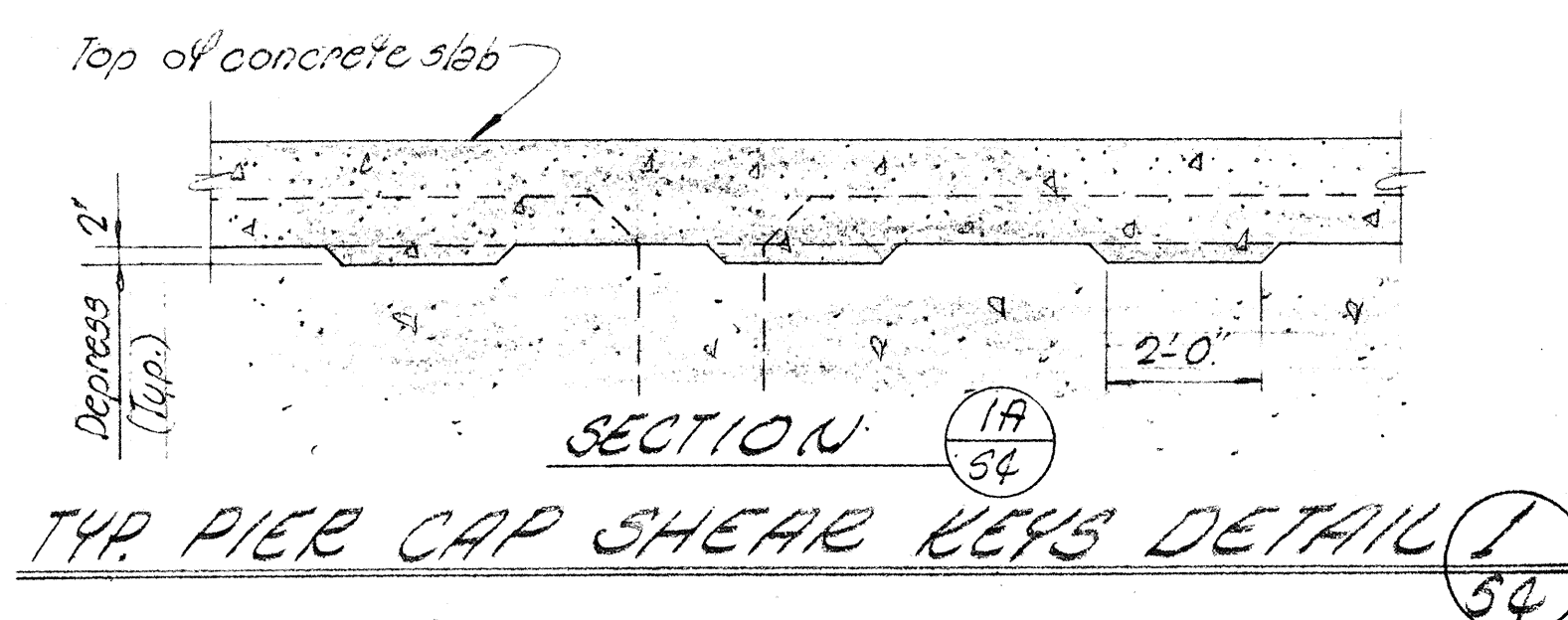
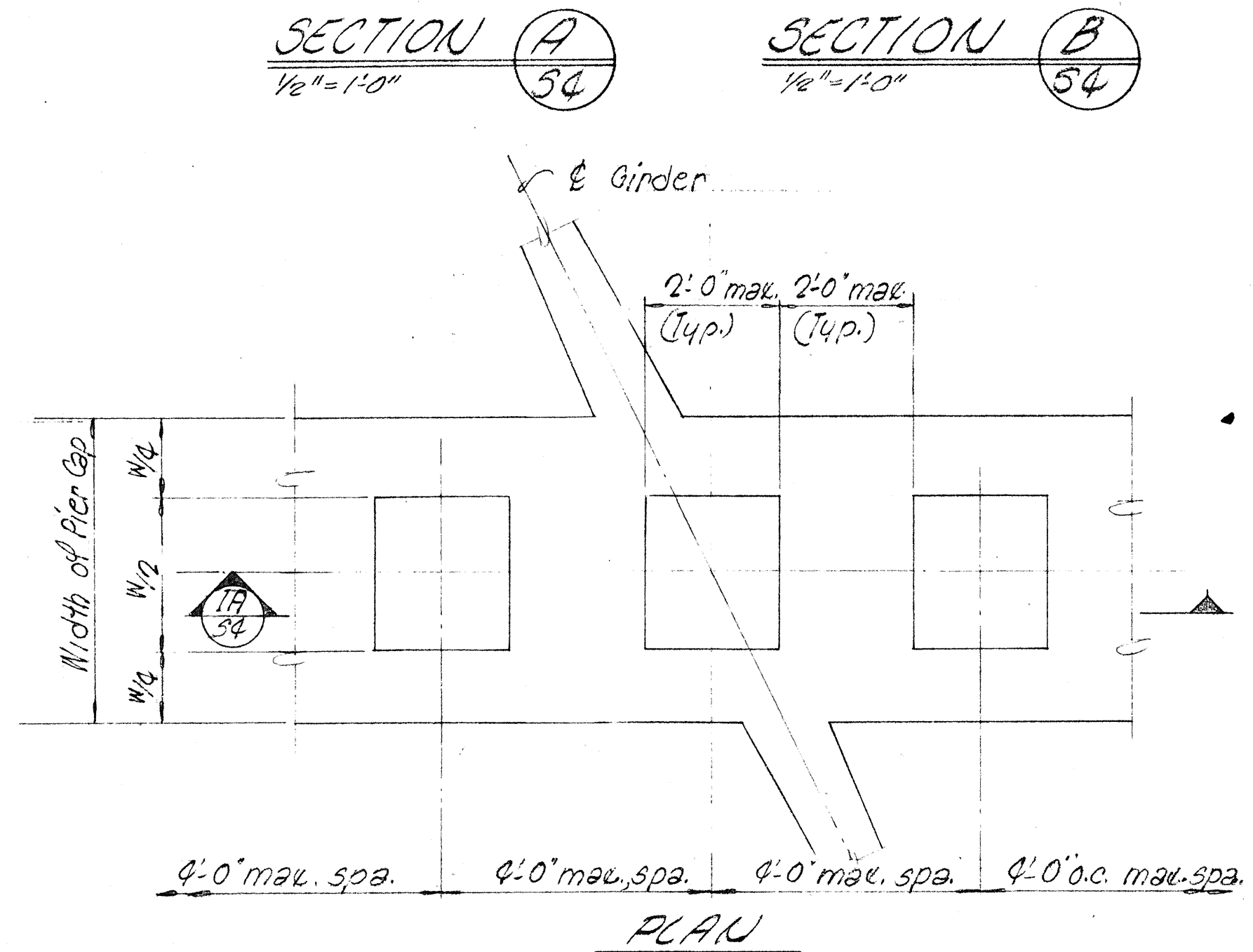
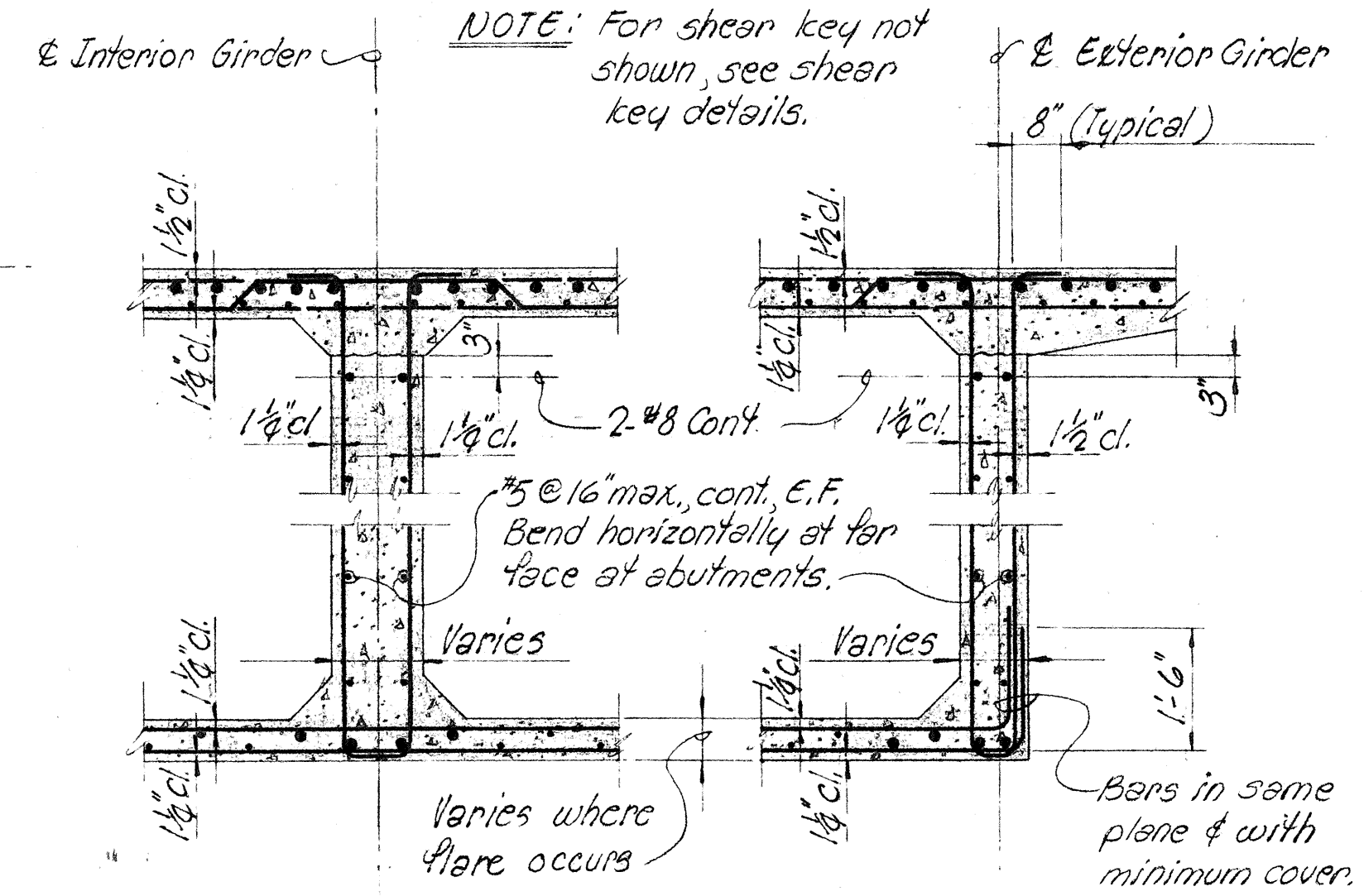
SHEET No. 63 OF SHEETS



TYP. DETAILS OF GIRDER FLARE @ PIER



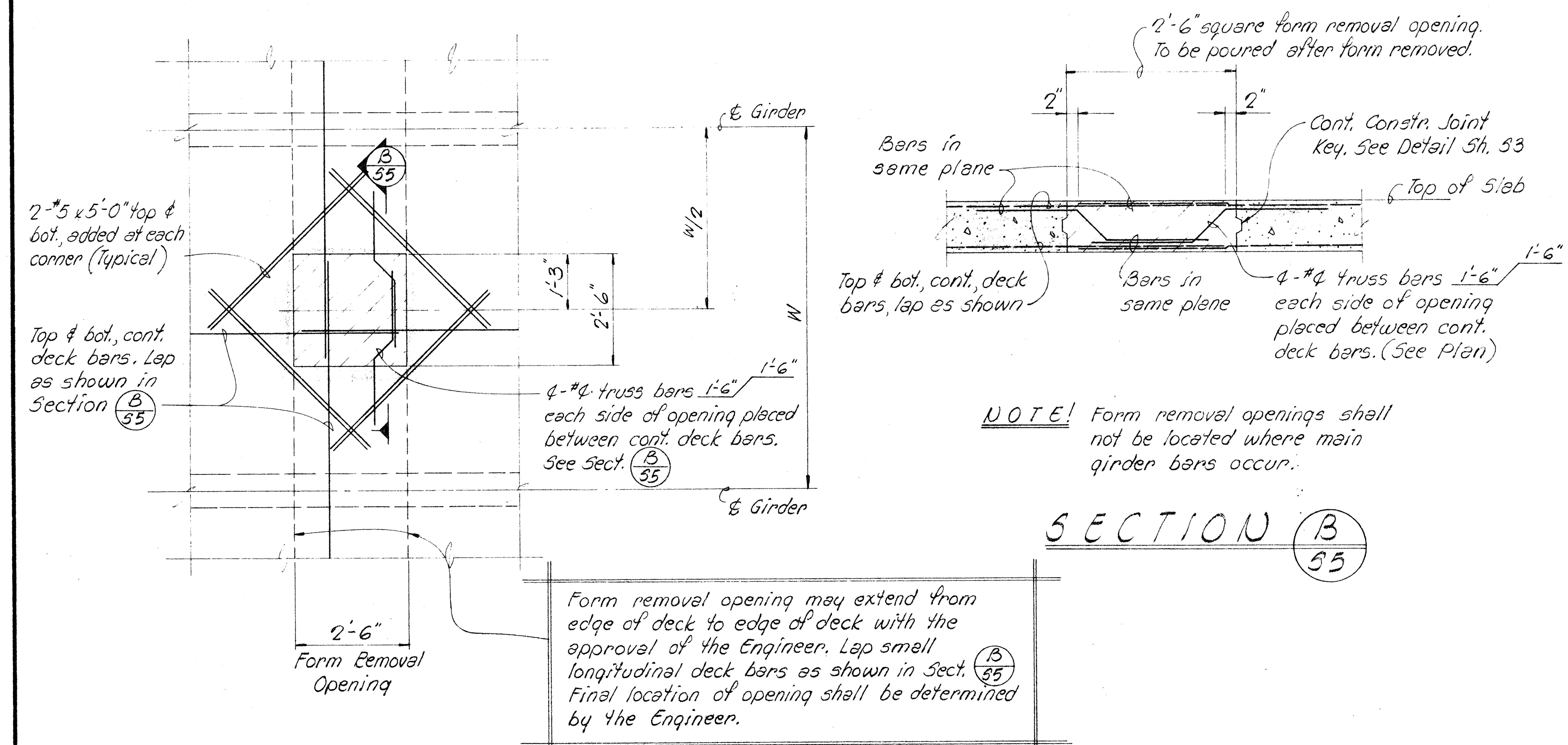
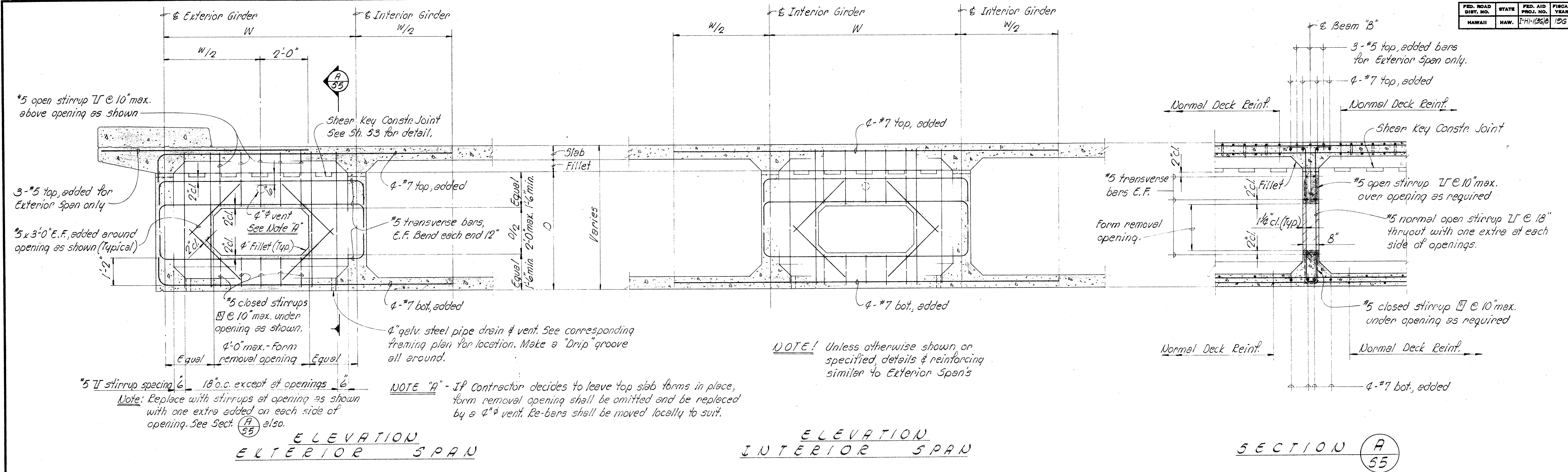
TYP. DETAILS OF GIRDER FLARE @ ABUT.



TYPICAL LONGITUDINAL SECTION THRU DECK

NOTE: For Pier Cap & Abutment reinforcing, see respective details.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-H-136	1967	94	124



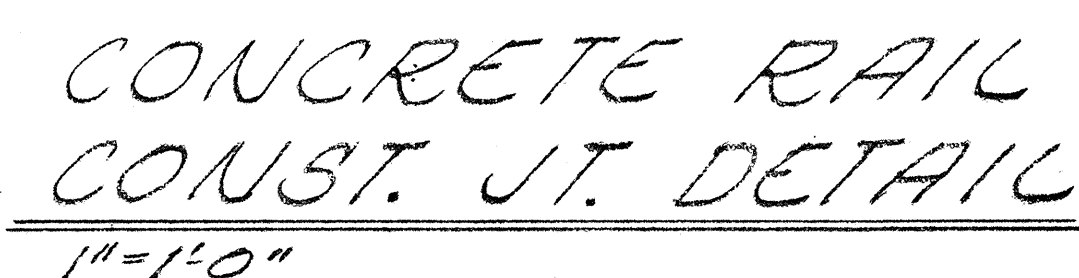
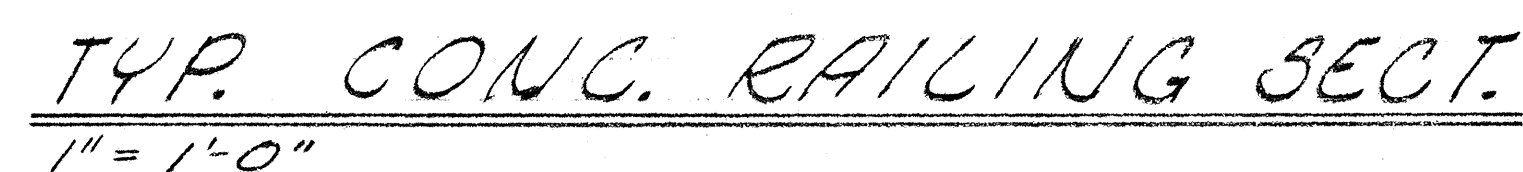
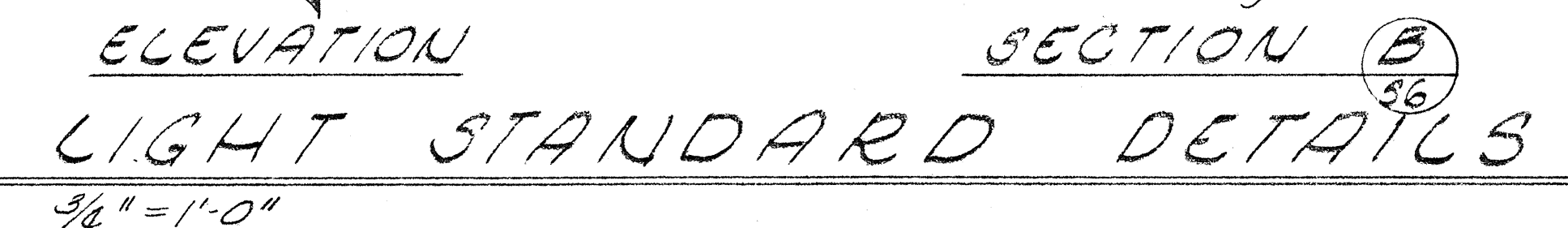
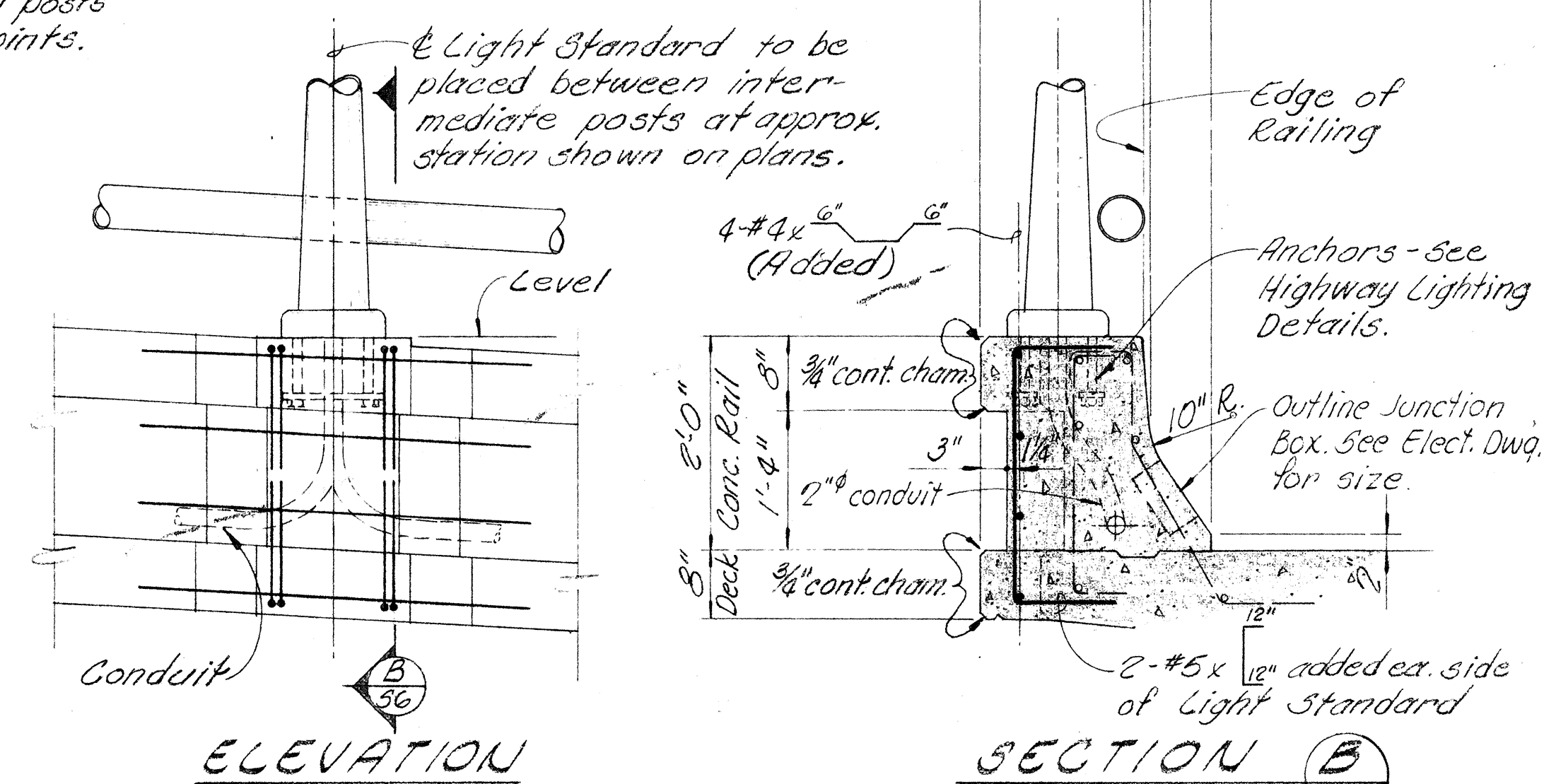
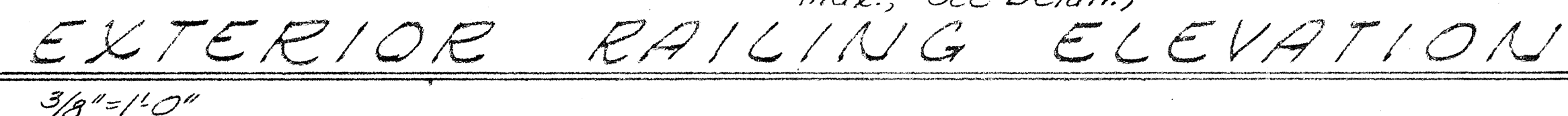
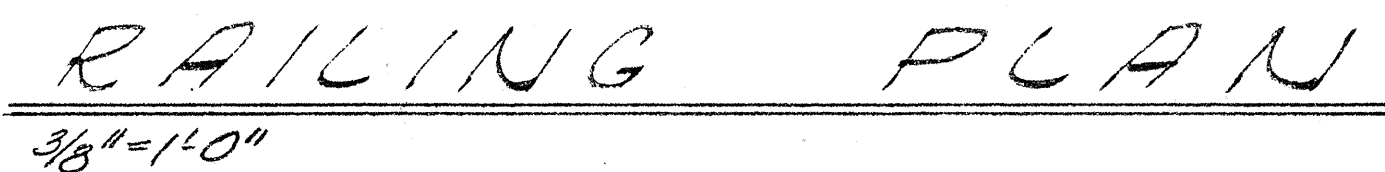
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
CONCRETE BOX GIRDER

NOTES: 1- Rail posts shall be normal to grade.
2- Provide double posts at each expansion joint, fixed bridge joint & as shown on detailed drawings.

NOTE: Details shown on this sheet are standard details except for modifications as may be required for special conditions. For such conditions refer to corresponding details shown on the plans.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H-11308	1967	95	124

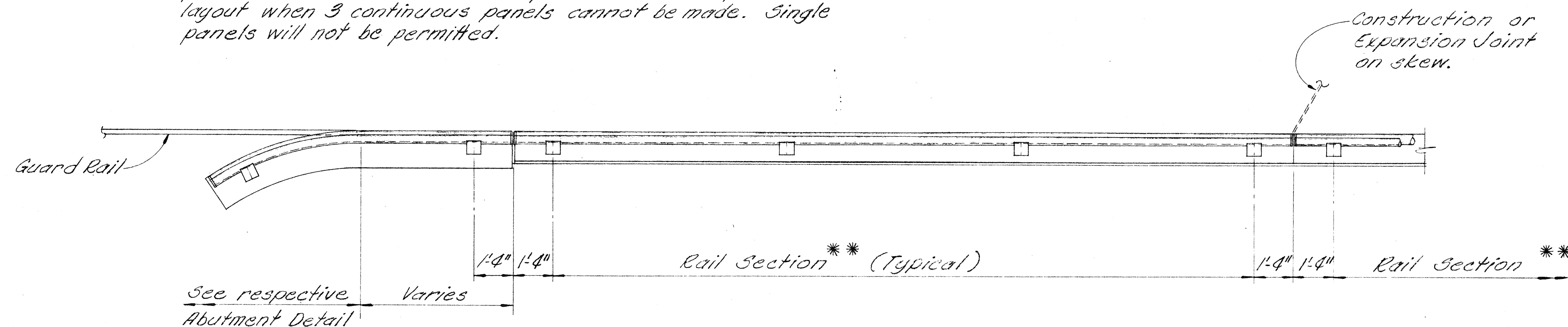


NOTE: The Contractor shall lay out the railing to provide 3 continuous panels per section where possible. 2 or 4 panels in end sections will be permitted to complete the layout when 3 continuous panels cannot be made. Single panels will not be permitted.

NOTES: 1- Rail posts shall be normal to grade.
2- Provide double posts at each expansion joint, fixed bridge joint & as shown on detailed drawings.

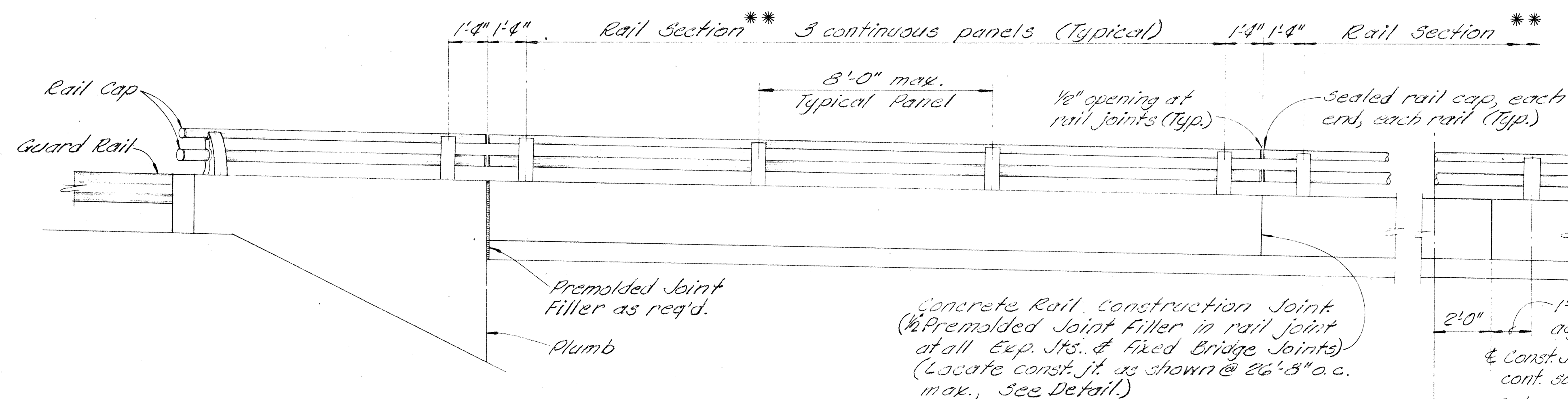
NOTE: Details shown on this sheet are standard details except for modifications as may be required for special conditions. For such conditions refer to corresponding details shown on the plans.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-11-1967	1967	26	124



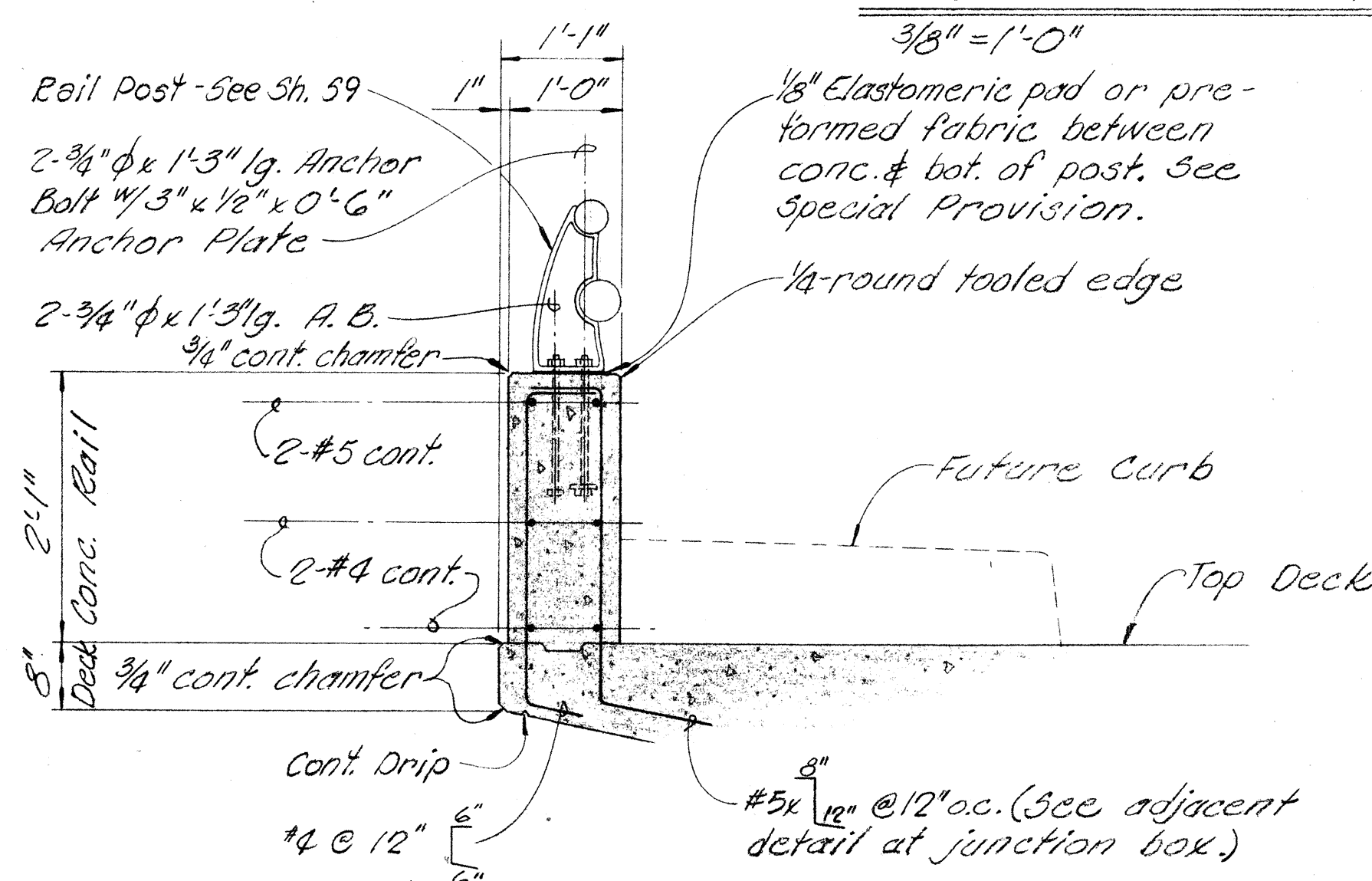
RAILING PLAN

3/8" = 1'-0"



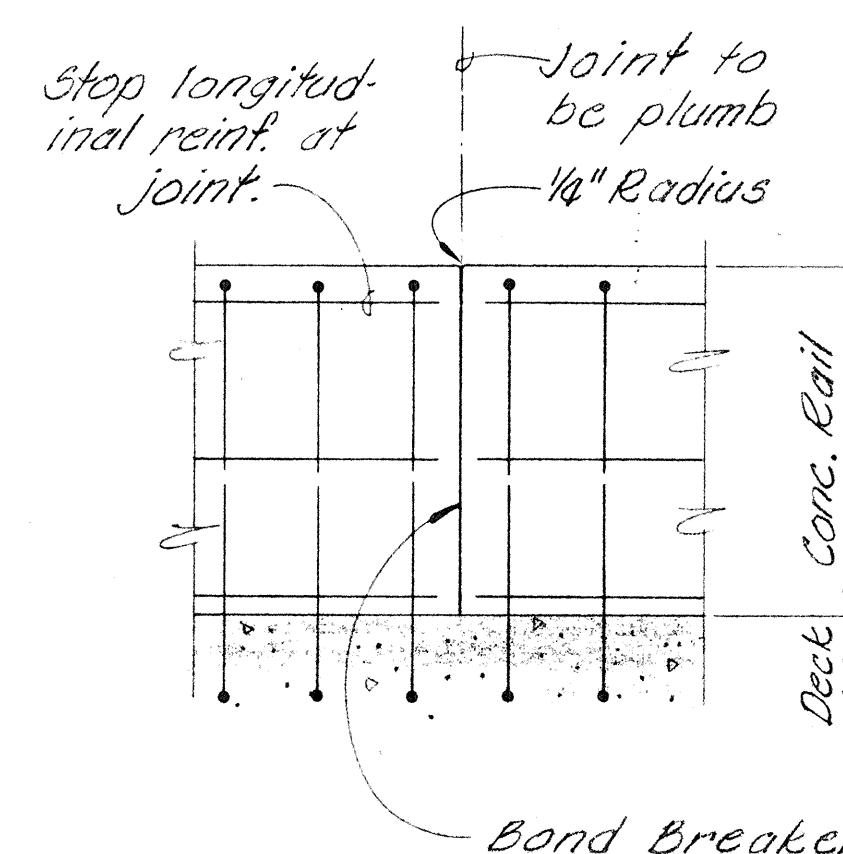
EXTERIOR RAILING ELEVATION

3/8" = 1'-0"



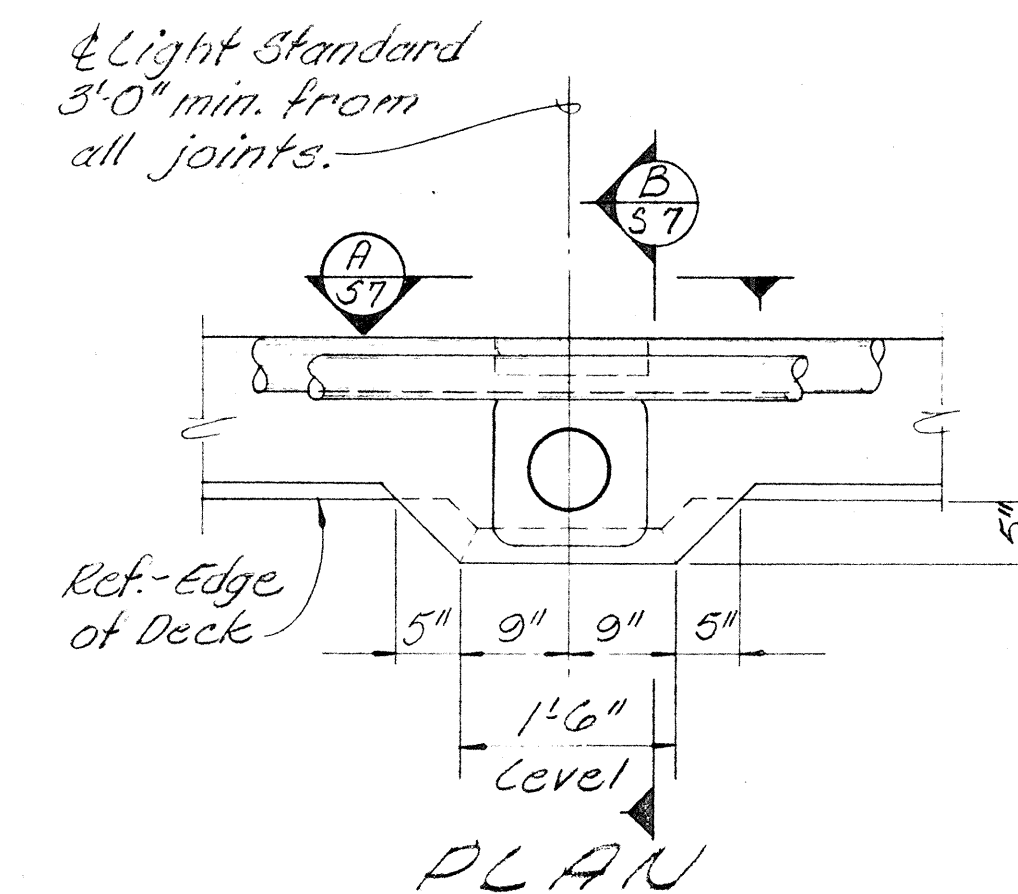
TYP. CONC. RAILING SECTION

3/4" = 1'-0"

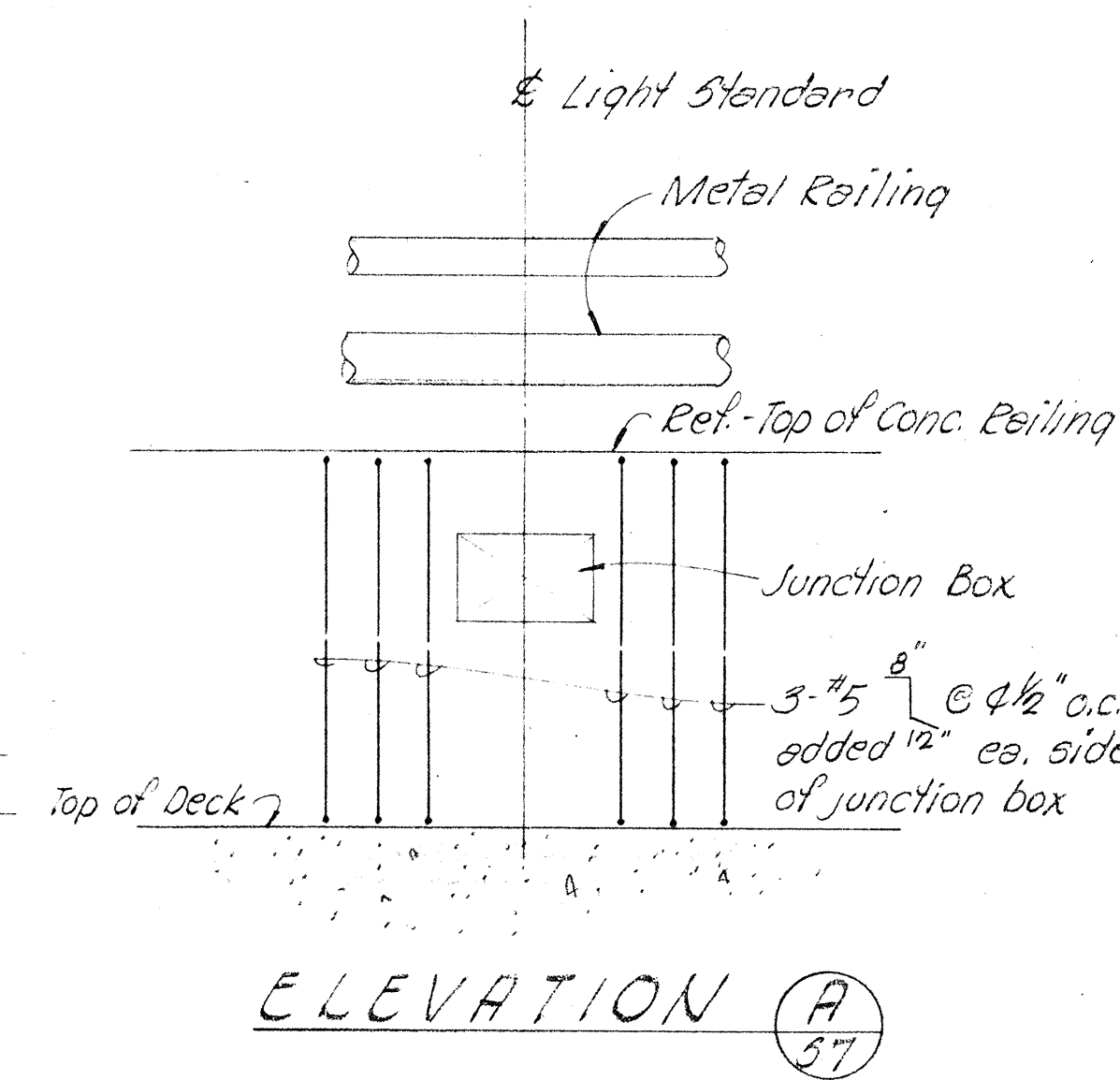


CONCRETE RAIL CONST. JT. DETAIL

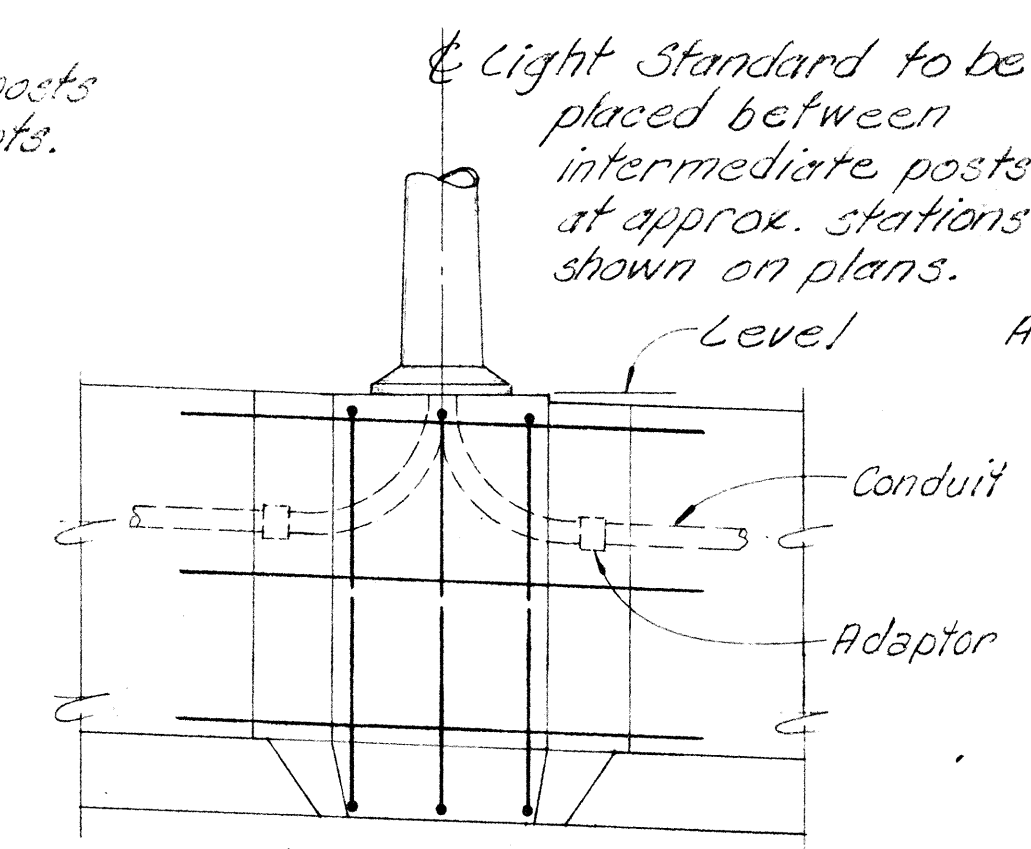
3/4" = 1'-0"



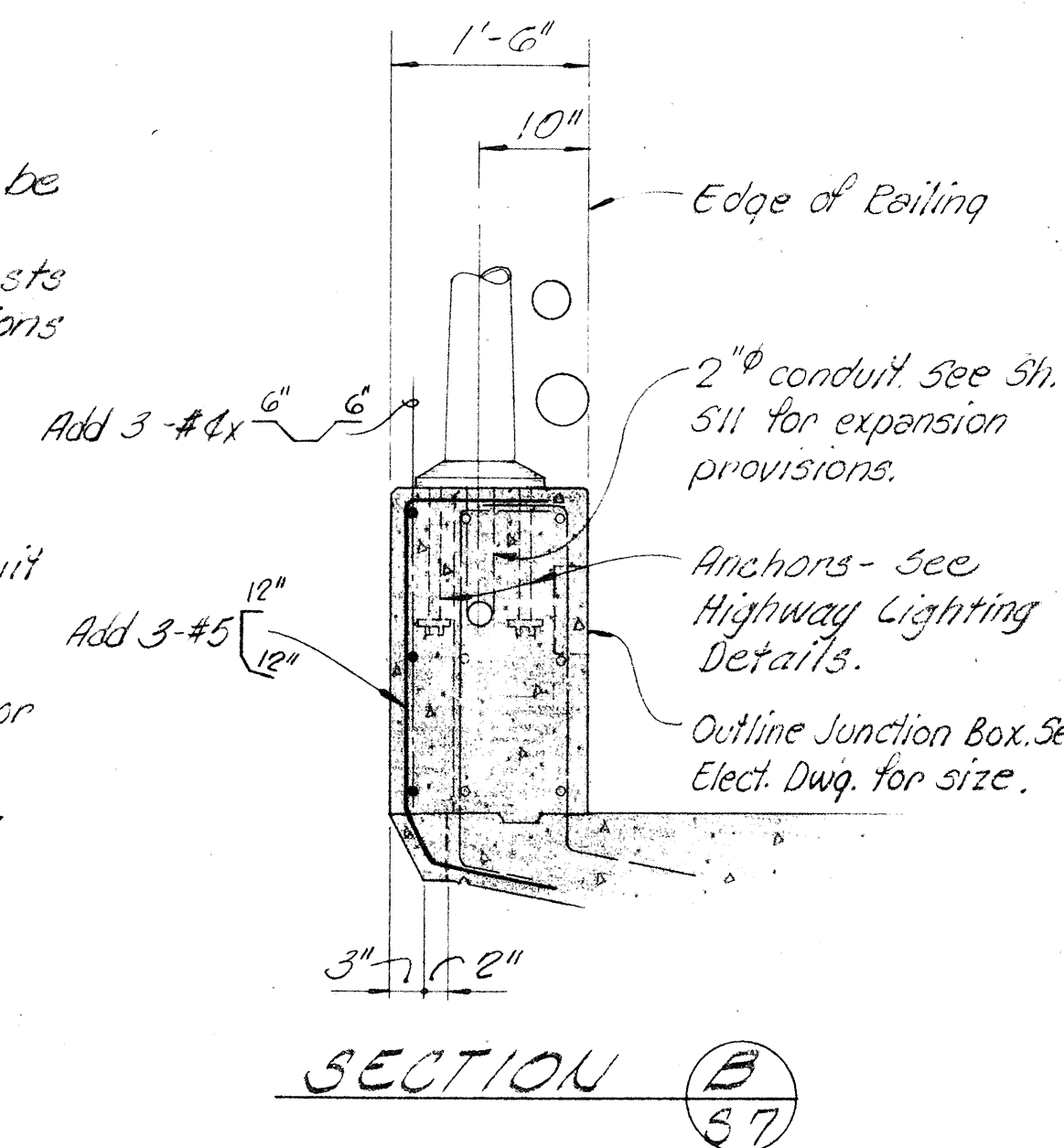
PLAN



ELEVATION (A)



ELEVATION



SECTION (B)

LIGHT STANDARD DETAILS

3/4" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
METAL BRIDGE RAILING
DOUBLE RAIL COMBINATION TYPE
ON PARAPET

SHEET No. 27 OF SHEETS

PLAN

6"

1 3/4" 2 1/2" 1 3/4"

1 1/2"

3"

Drill 2- 1 3/8" ϕ holes as shown

1 5/16" Dia x 1 3/8" thick galv steel washer

3/4" ϕ or 5/8" ϕ 10NC galv. steel ASTM-325-58-T anchor bolt

Anchor plate at 3/4" ϕ bolts only

3" Thread

1'-3 1/2" = 9 1/2" ϕ

Technical drawing of a circular table. The top view shows a circle with a diameter of 5 inches and four legs. The side view shows the table's profile with a 3-inch top, 16-inch radius, and 8-inch radius for the legs.

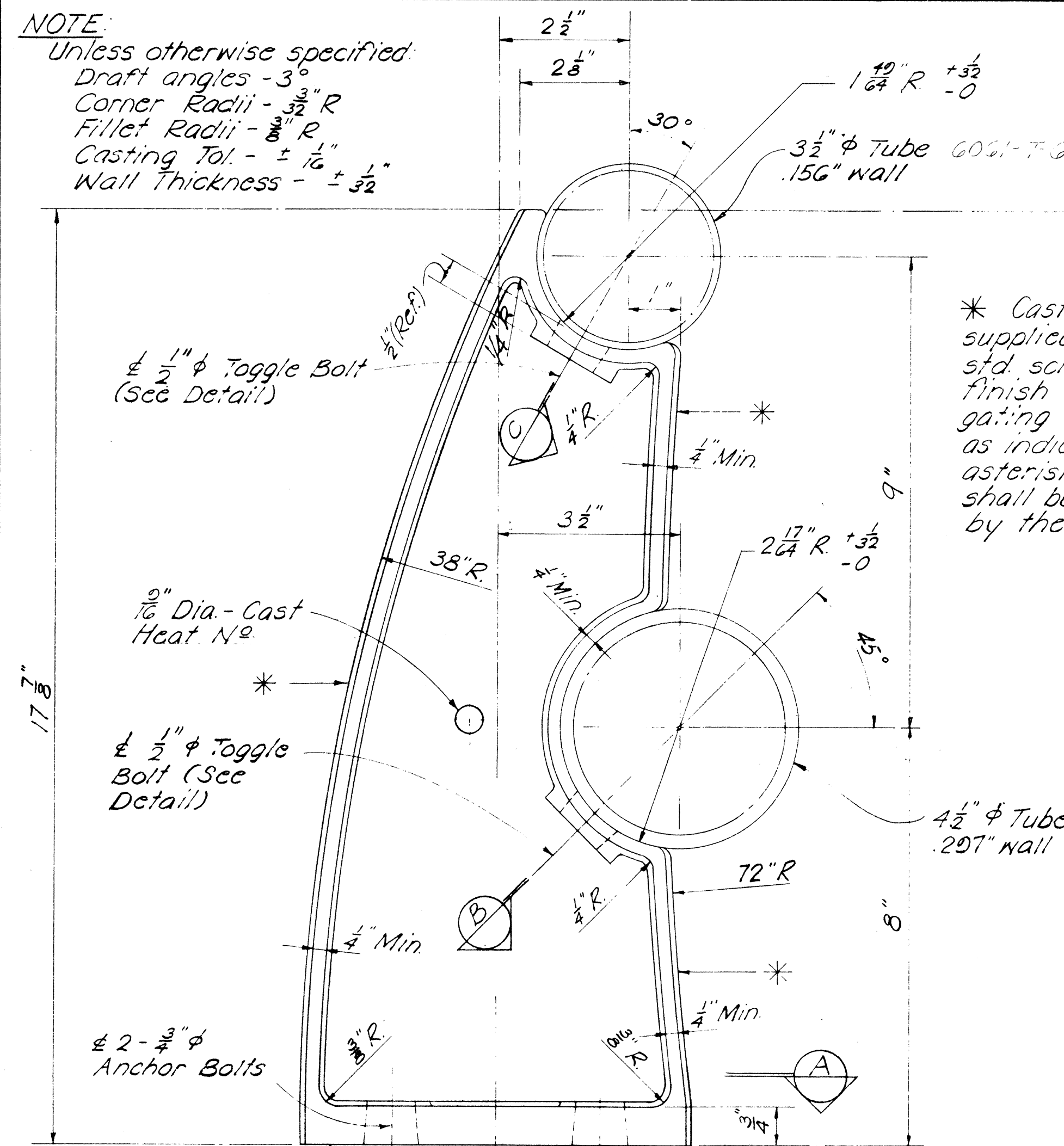
[illegible][illegible]

Technical drawing of a toggle bolt assembly. The drawing shows a side view of the bolt with the following dimensions and labels:

- Overall Length:** $3\frac{13}{32}$ "
- Thread Length:** $1\frac{5}{16}$ "
- Flat Surface Length:** $1\frac{7}{16}$ "
- Toggle Bolt Head Diameter:** $\frac{9}{16}$ "
- Toggle Bolt Head Thickness:** $\frac{21}{32}$ "
- Toggle Bolt Head Width:** $\frac{9}{16}$ "
- Labels:**
 - Special rivet material 1038 C.R. steel, heat treated ASTM-A105
 - Toggle bolt
 - Thread
 - Flat Surface
 - Toggle

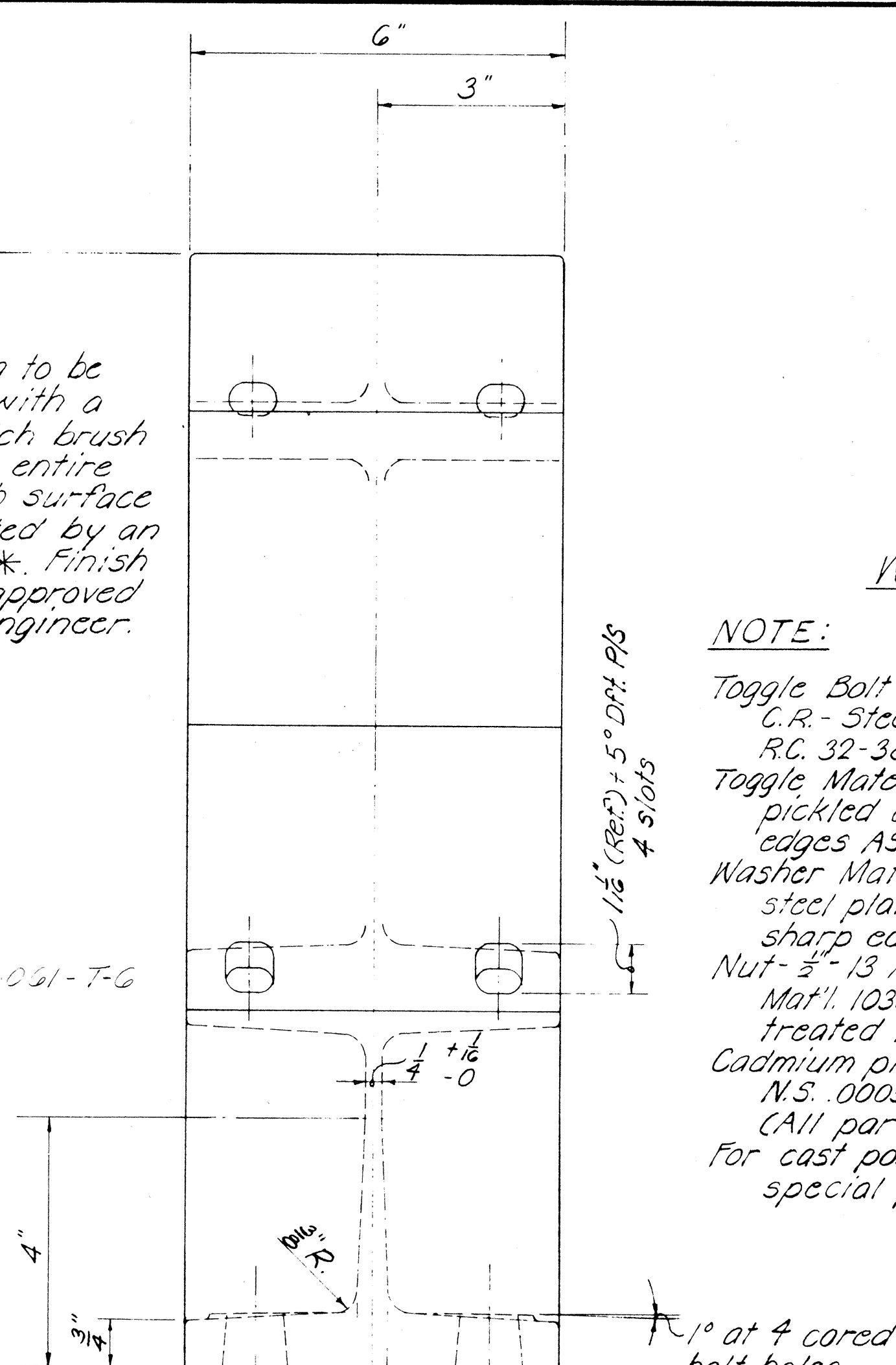
97

NOTE:
Unless otherwise specified:
Draft angles - 3°
Corner Radii - $\frac{3}{32}" R$
Fillet Radii - $\frac{3}{32}" R$
Casting Tol. - $\pm \frac{1}{16}"$
Wall Thickness - $\pm \frac{1}{32}"$



SIDE ELEVATION

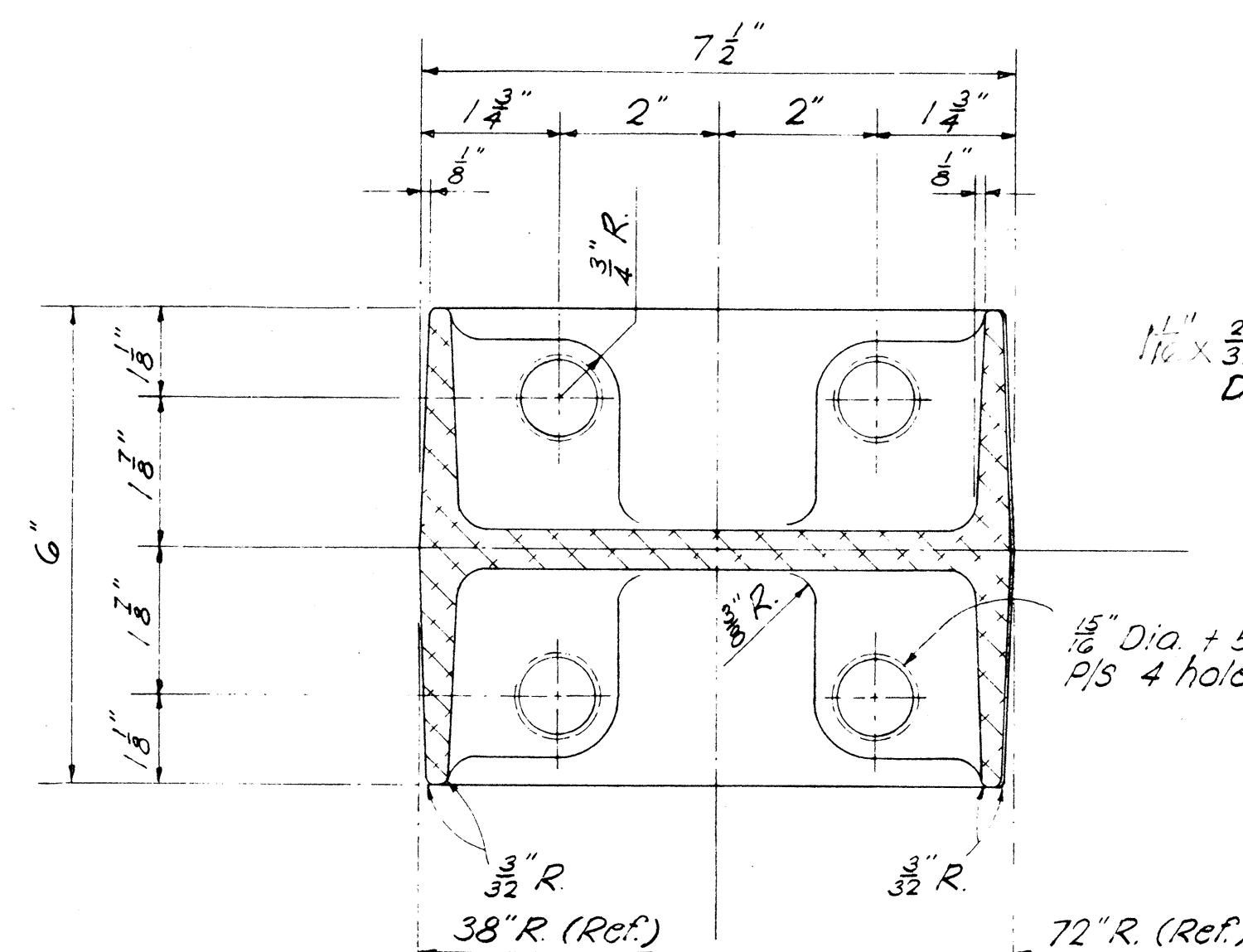
* Casting to be supplied with a std. scratch brush finish on entire gating rib surface as indicated by an asterisk *. Finish shall be approved by the Engineer.



END ELEVATION

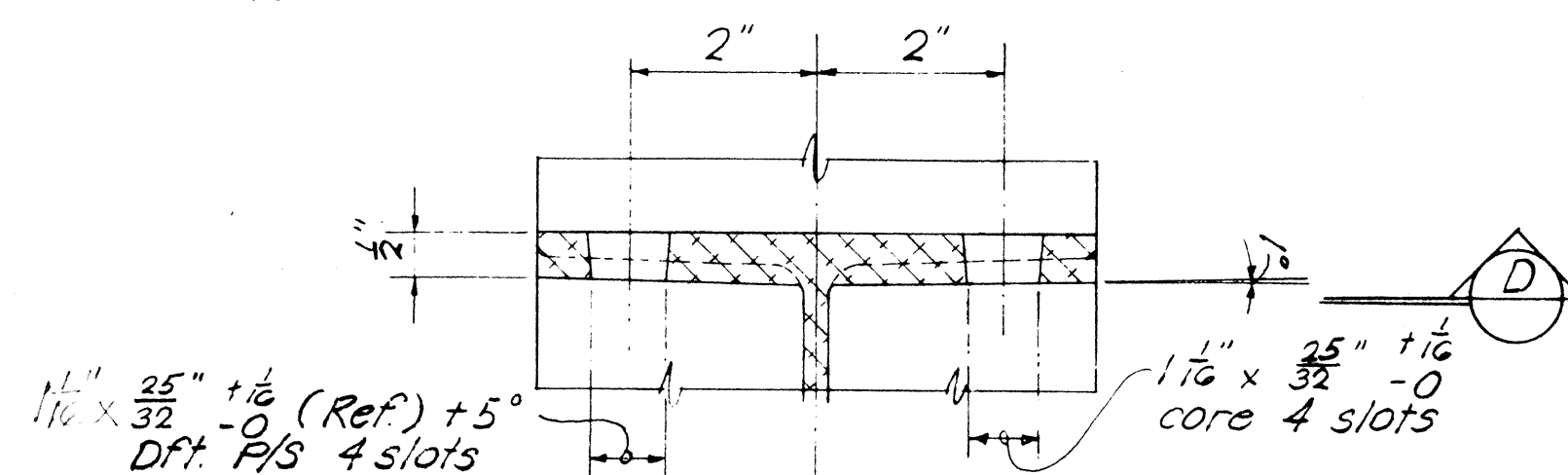
TYPICAL RAIL POST DETAILS

Scale: 6" = 1'-0"



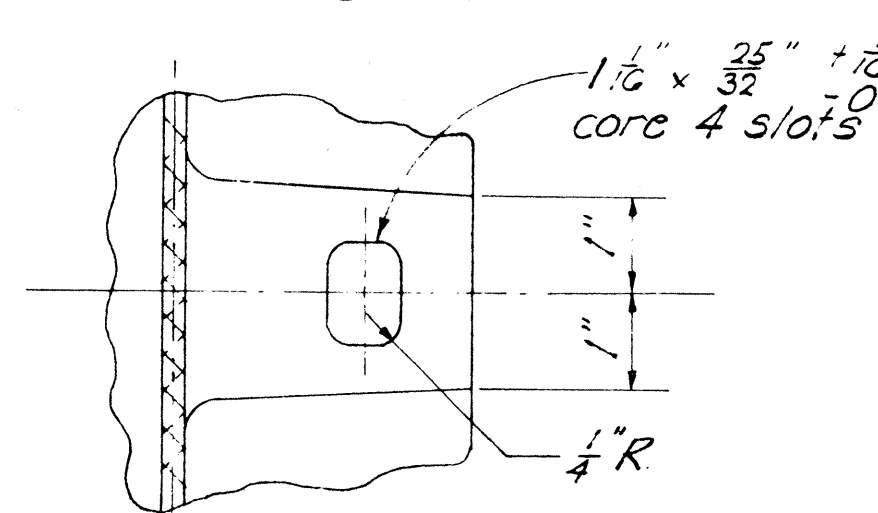
SECTION A-A

Scale: 6" = 1'-0"



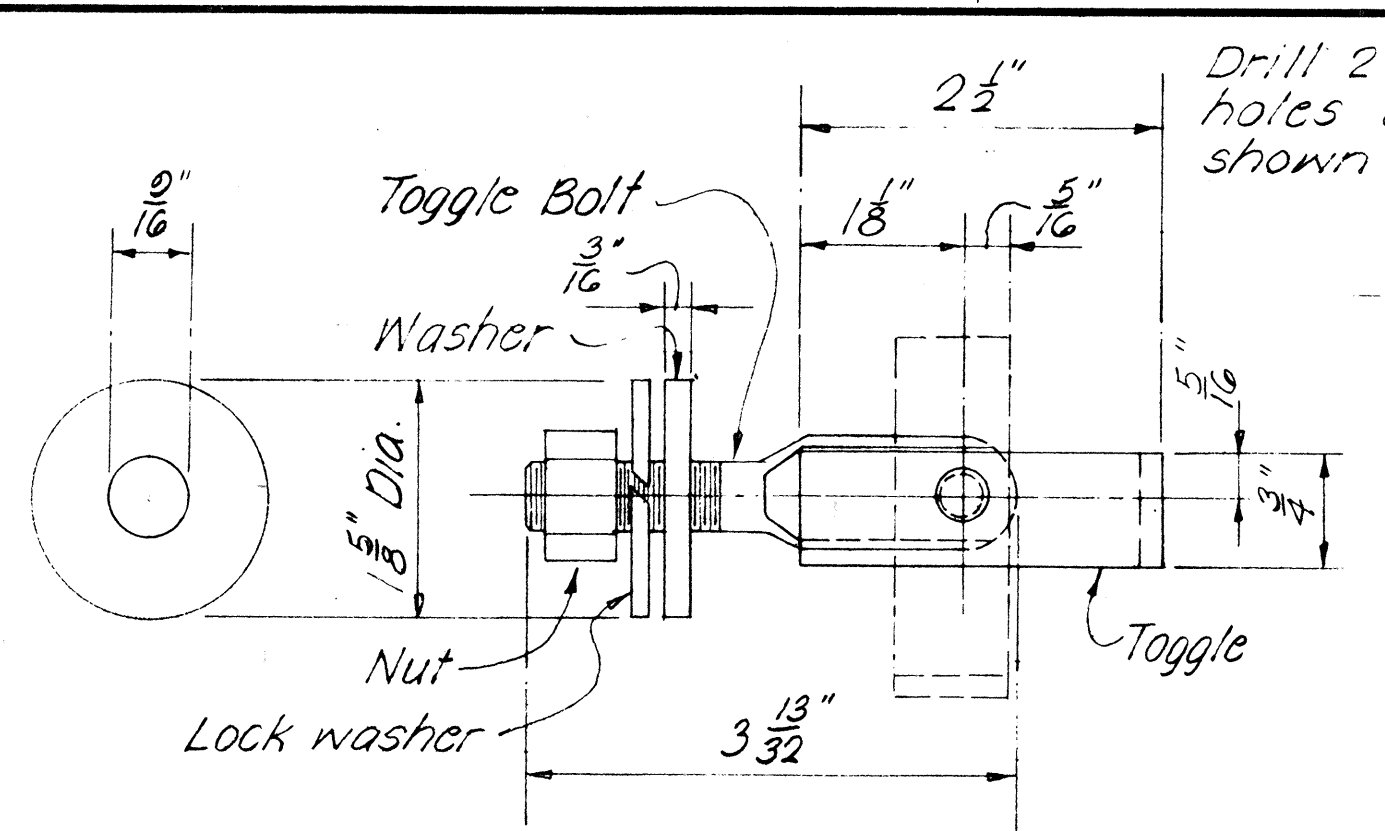
SECTION C-C (SECTION B-B SIMILAR)

Scale: 6" = 1'-0"



SECTION D-D

Scale: 6" = 1'-0"

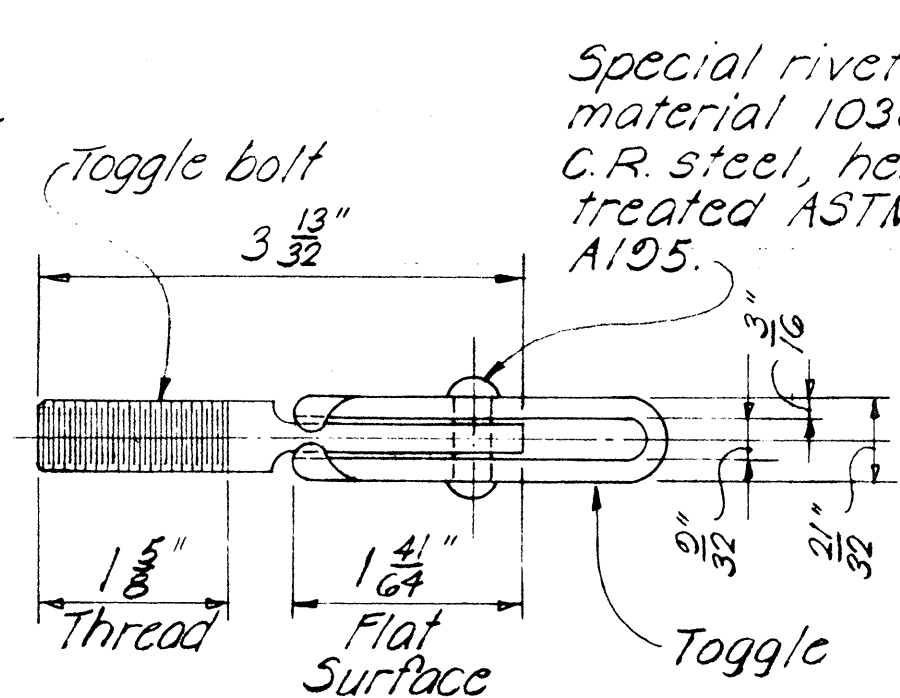


WASHER

SIDE ELEVATION ASSEMBLY

NOTE:

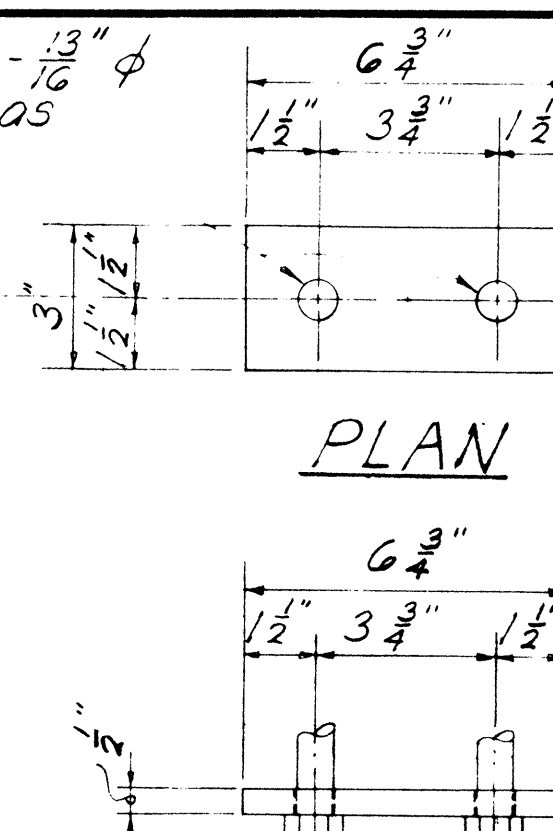
Toggle Bolt Material - $\frac{1}{2}" - 13 \text{ N.C. } 1335$
C.R. Steel heat treated
R.C. 32-38 ASTM-A354
Toggle Material - 1015 H.R. steel
pickled and oiled. Round
edges ASTM-A303-58T
Washer Material - SAE 1020 H.R.
steel plates. A.S.T.M. - A-7 Break
sharp edges.
Nut - $\frac{1}{2}" - 13$ Amer. hex. nut - Heavy
Mat'l. 1035 C.R. Stl. - Heat
treated ASTM A325
Cadmium plating on steel - Type
N.S. 0005 thick ASTM-A165-55
(All parts)
For cast post specifications, see
special provisions.



TOP PLAN

1/2" Ø TOGGLE BOLT DETAIL

Scale: 3" = 1'-0"



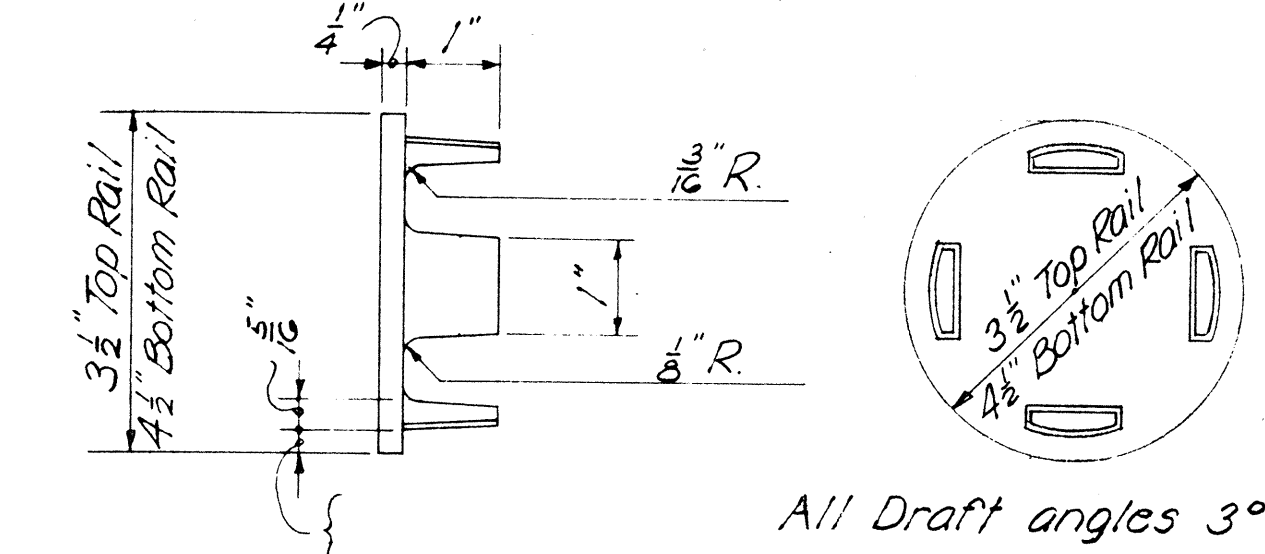
PLAN

ELEVATION

ANCHOR BOLT

TYPICAL RAIL POST ANCHOR BOLT ASSEMBLY

Scale: 3" = 1'-0"



RAIL CAP DETAIL

Scale: 6" = 1'-0"

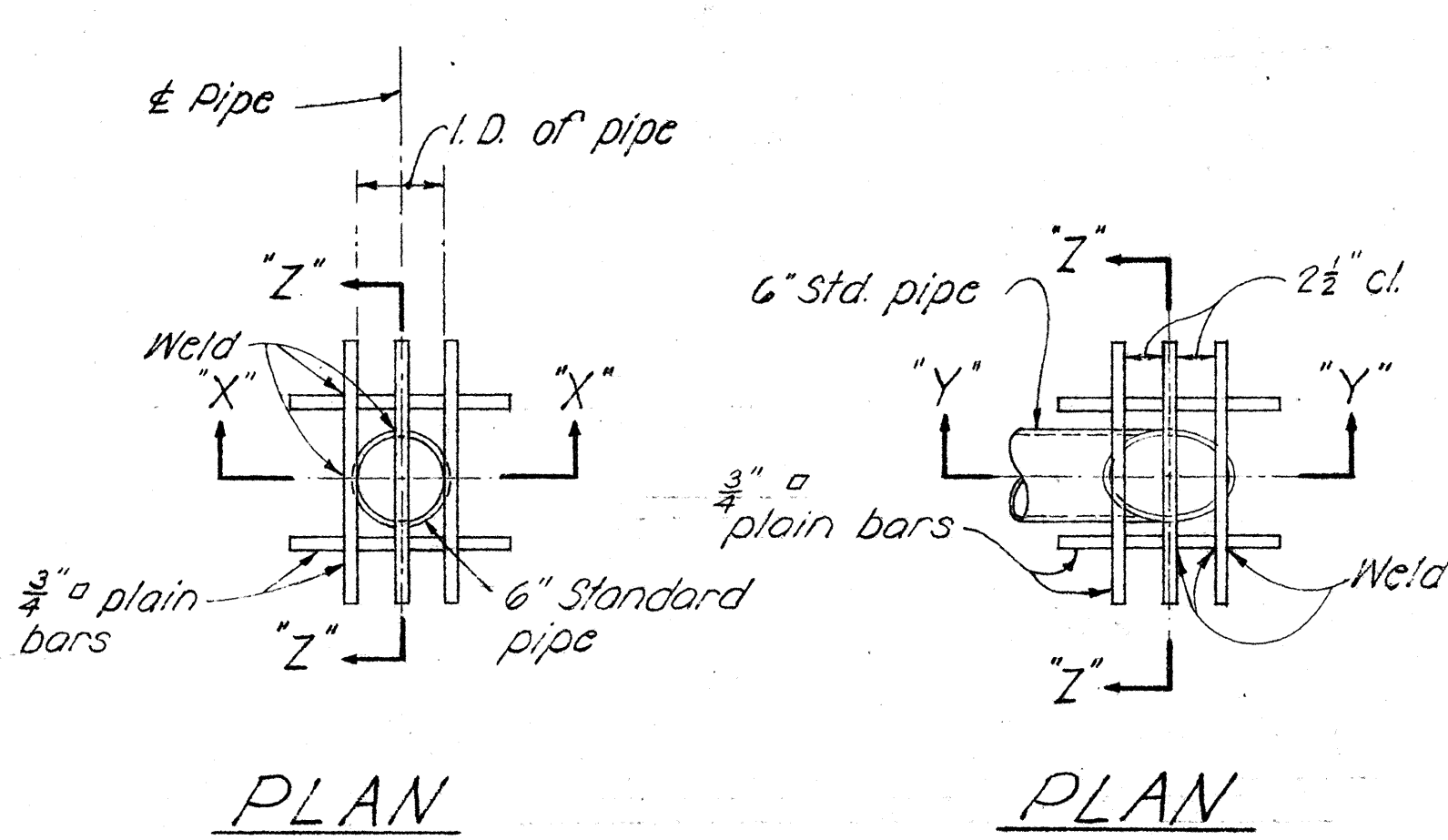
NOTE:
Metal Bridge Railing shown is
for Aluminum Bridge Railing. See
Special Provisions for alternate in
steel.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
METAL BRIDGE RAILING
DOUBLE RAIL COMBINATION TYPE
ON PARAPET

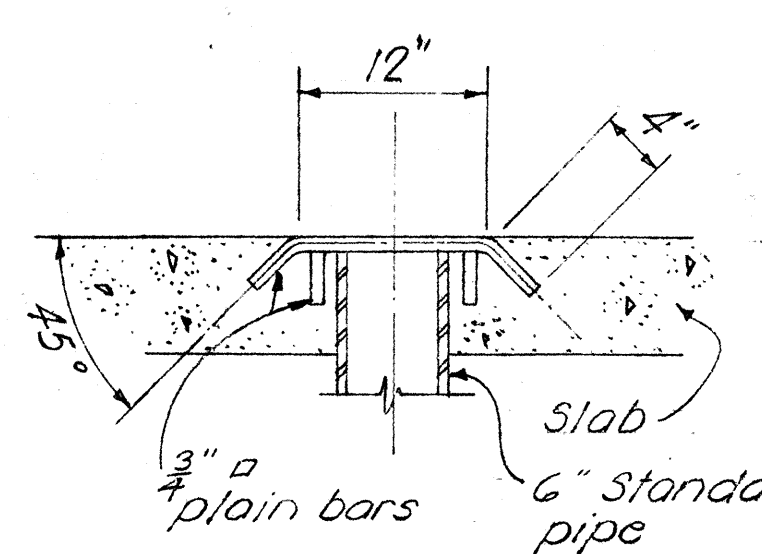
SHEET No. 89 OF SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-HI-1328	1967	99	124

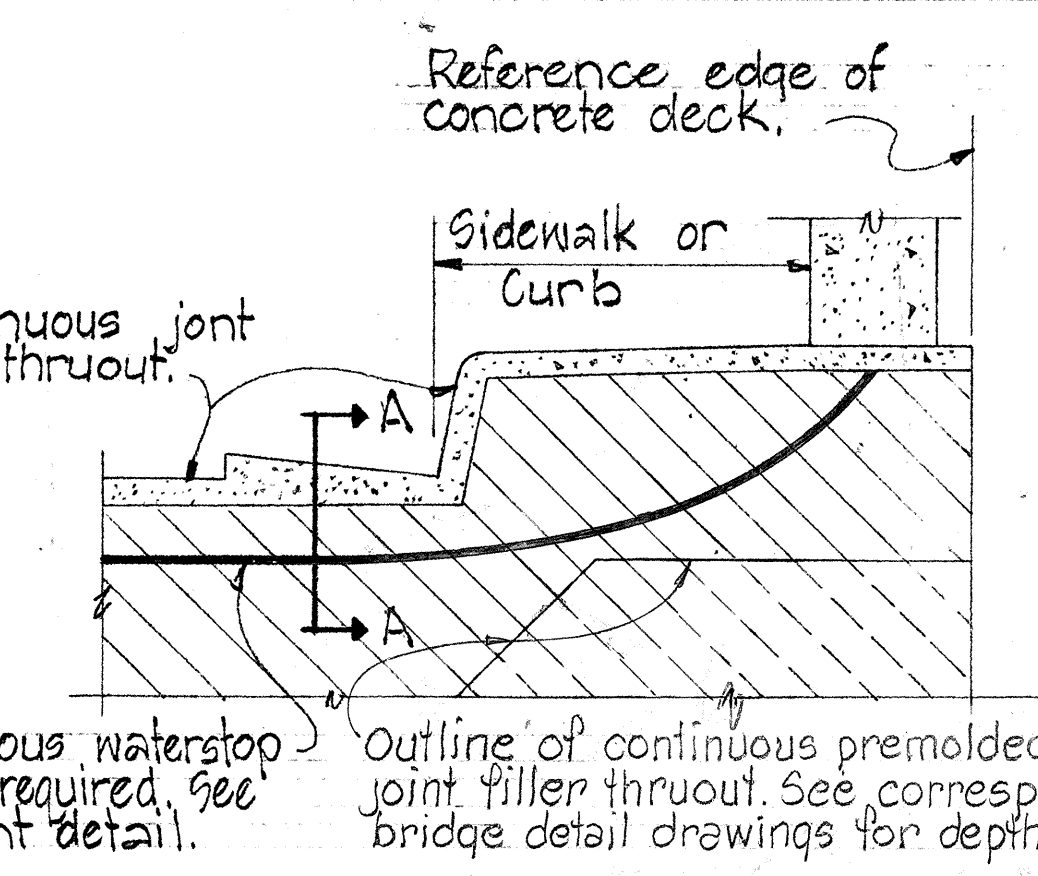


PLAN

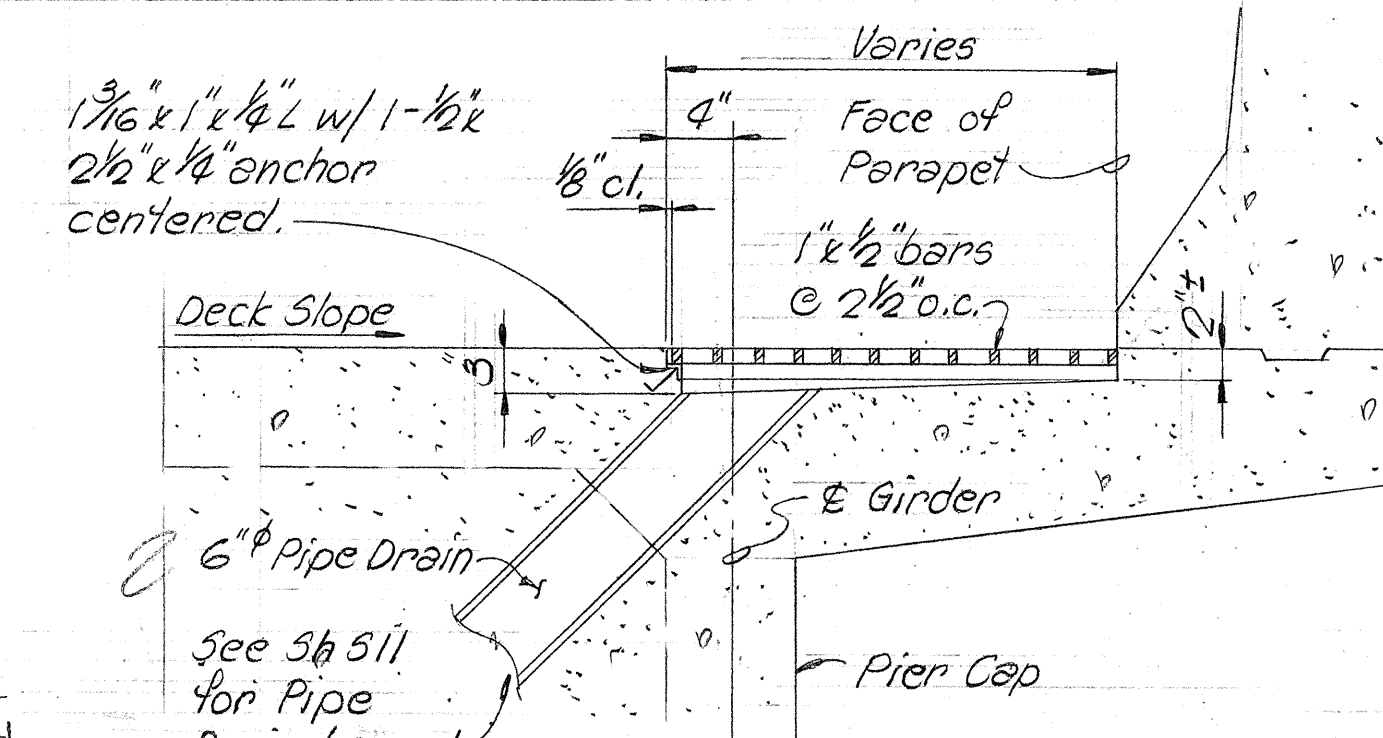
PLAN



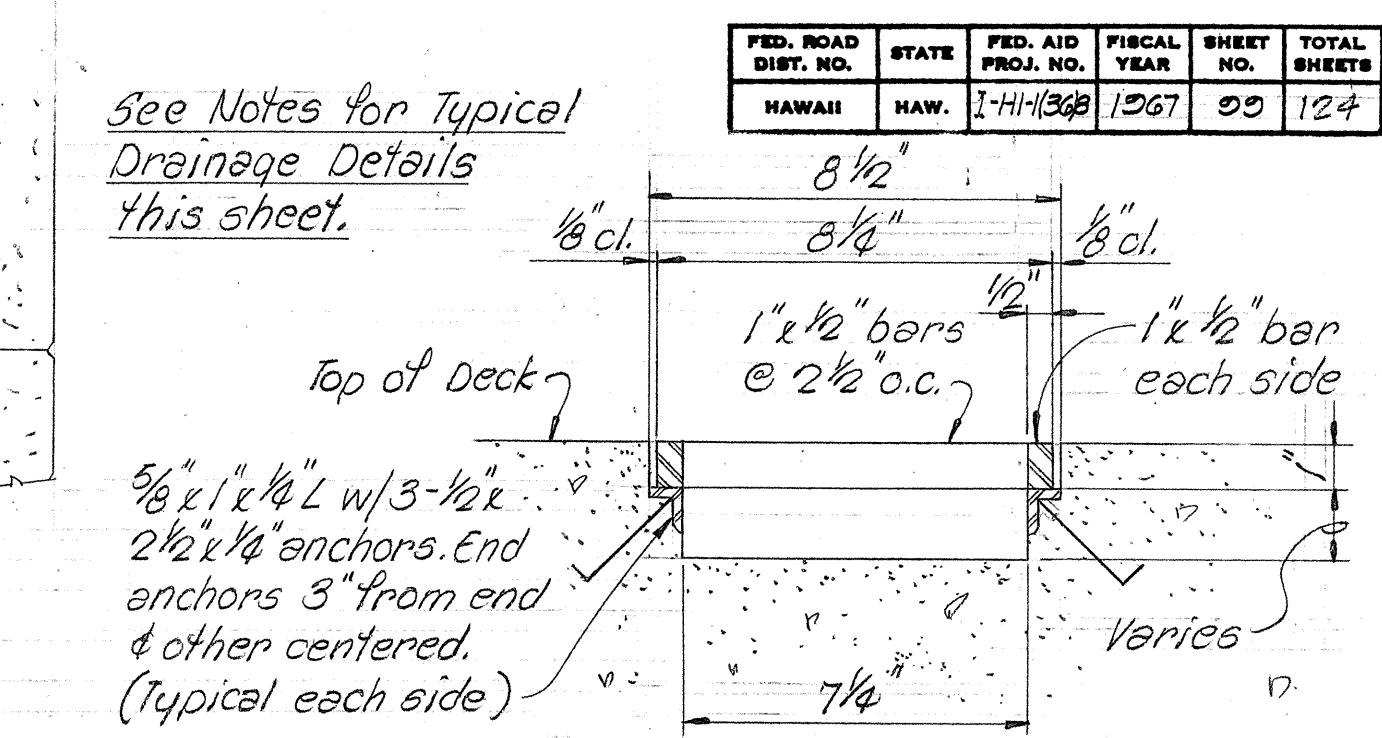
SECTION "Z-Z"



ELEVATION



DRAIN LONG SECTION



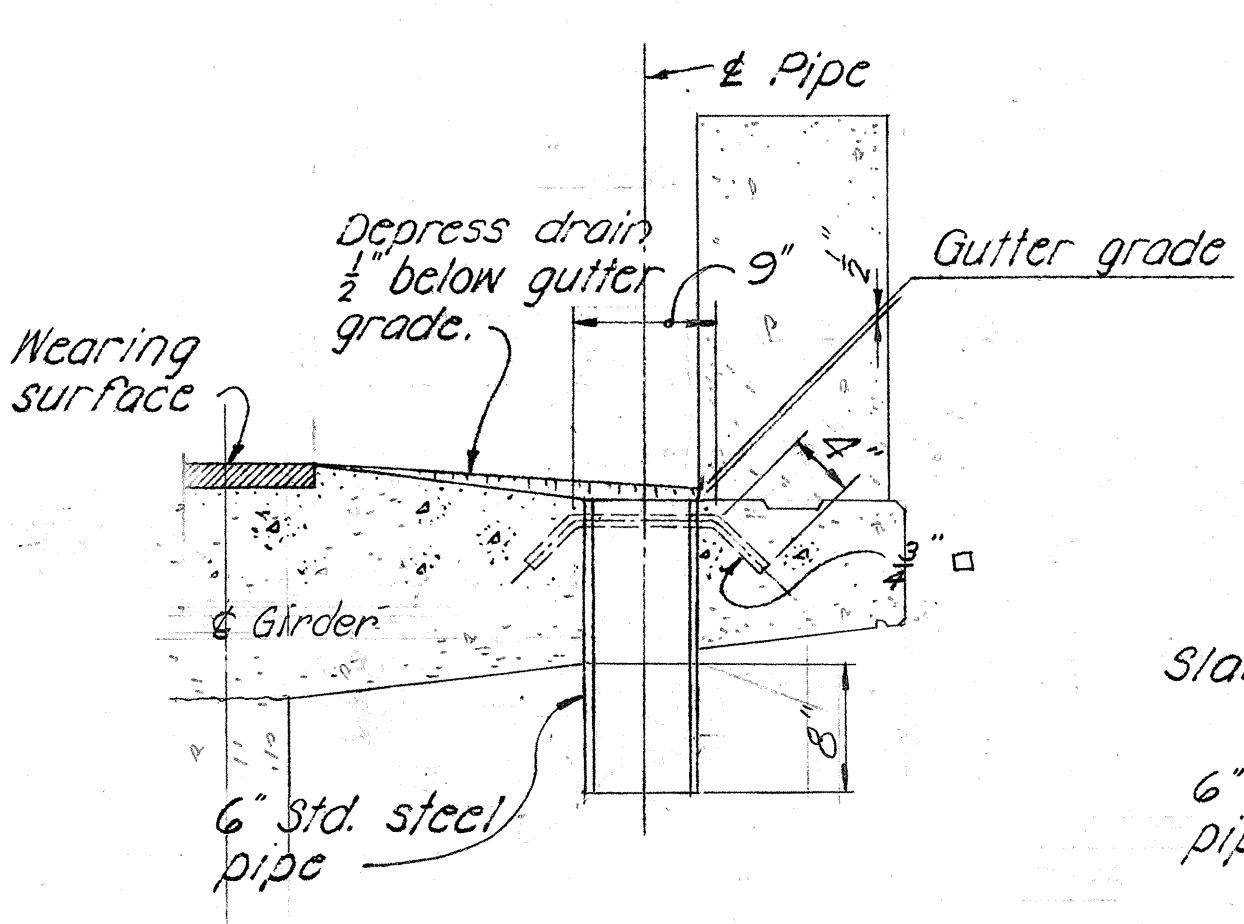
TYPICAL CROSS SECTION

TYPICAL 8 1/2" WIDE STORM DRAIN DETAIL

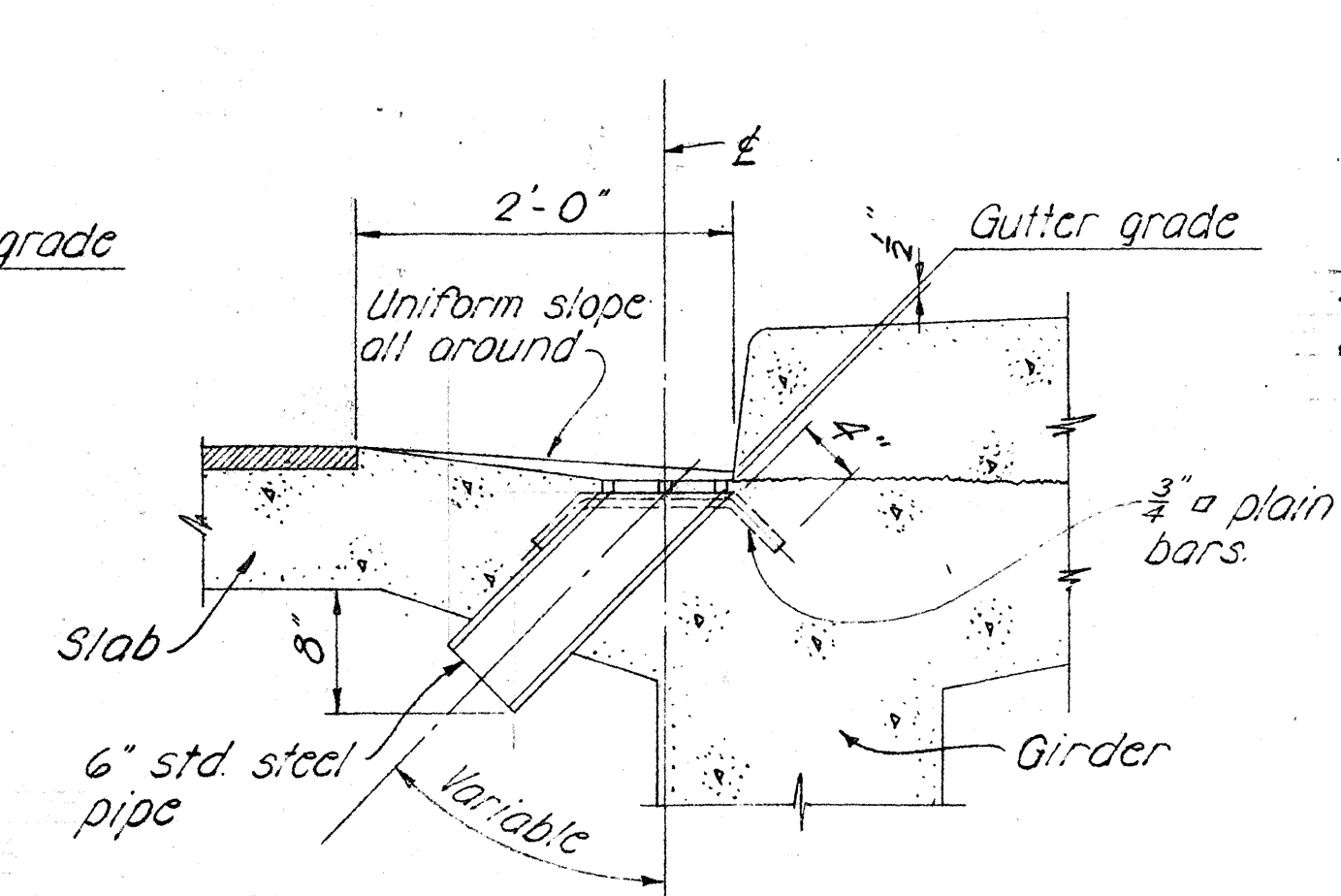
N. T. S.

GENERAL NOTES

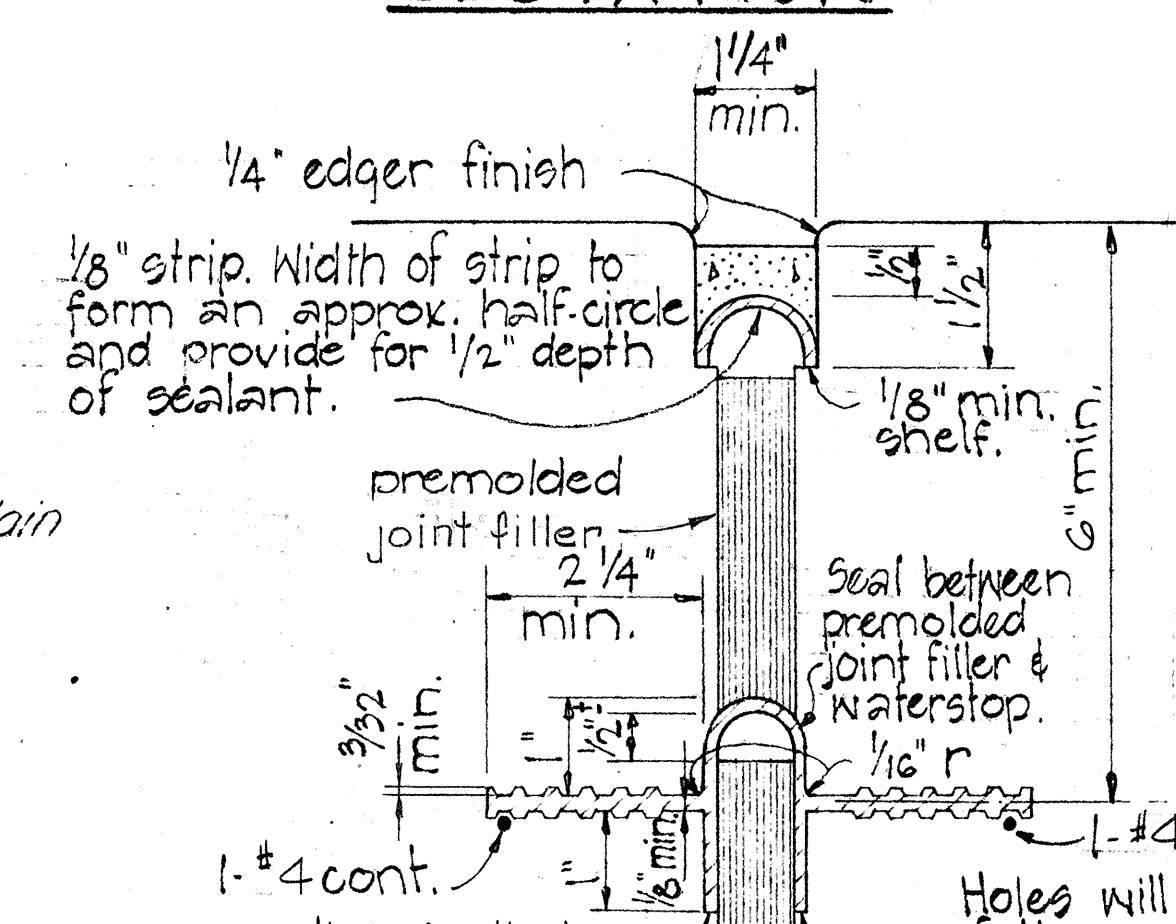
- All concrete shall be Class A-1 unless otherwise noted.
- Clearance for reinforcing bars shall be as follows, unless otherwise noted:
 - 1 1/2" For stirrups of beams & pier caps.
 - 2" For ties of columns.
 - 2" For formed walls.
 - 3" For footings.
- Concrete seats receiving steel plates, lead plates or neoprene pads shall be poured monolithically with supporting structures & top surfaces of the concrete seats shall be finished with a steel trowel to a smooth level at the elevation shown on the plans.
- Reinforcing shall be detailed in accordance with A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures 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.
- Reinforcing bars longer than stock lengths and smaller than #14 may be lap spliced in accordance with requirement of the Standard Specifications. Splicing of bottom bars at or near the center line of the span and top bars at or near continuous supports shall be avoided. Welded splices shall be made at locations and according to procedures approved by the Engineer.



SECTION "X-X"



SECTION "Y-Y"



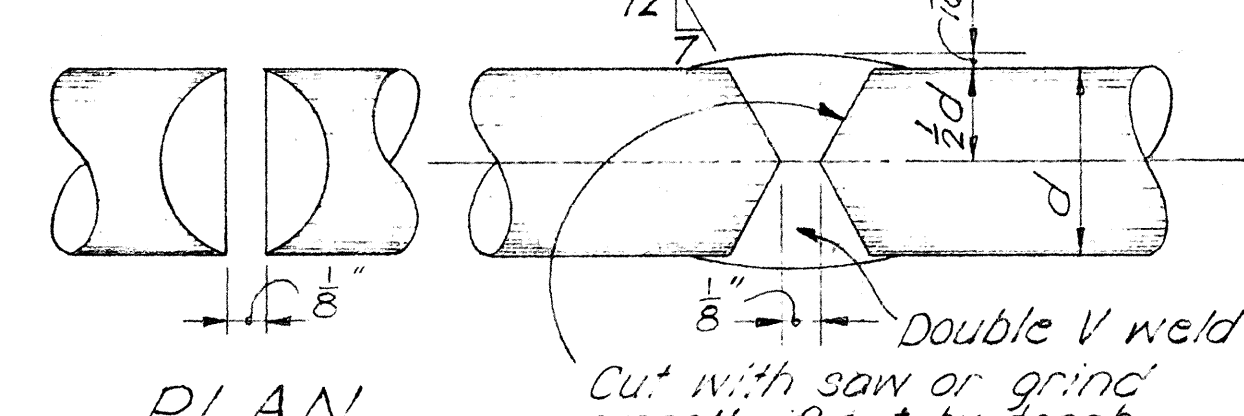
SECTION "A-A"

TYPICAL EXPANSION JOINT DETAIL

Waterstop to have 5 or more pairs of raised ribs to provide 0.1 sq. in. min. rib cross-section area on each half of the waterstop. Height of ribs to be 3/32" min.

Holes will be permitted in the outer 1/2" of the web for wires, rings, etc. Tie web to #4 reinforcing bars at 12" max. intervals to support the waterstop in proper position during concrete placement. Alternative detail may be submitted for approval of the Engineer.

NOTE: Carbon content of reinforcing bars for welding shall not be over 0.40%. Low hydrogen electrodes shall be used with preheat and interpass temperature determined by the qualified procedure.

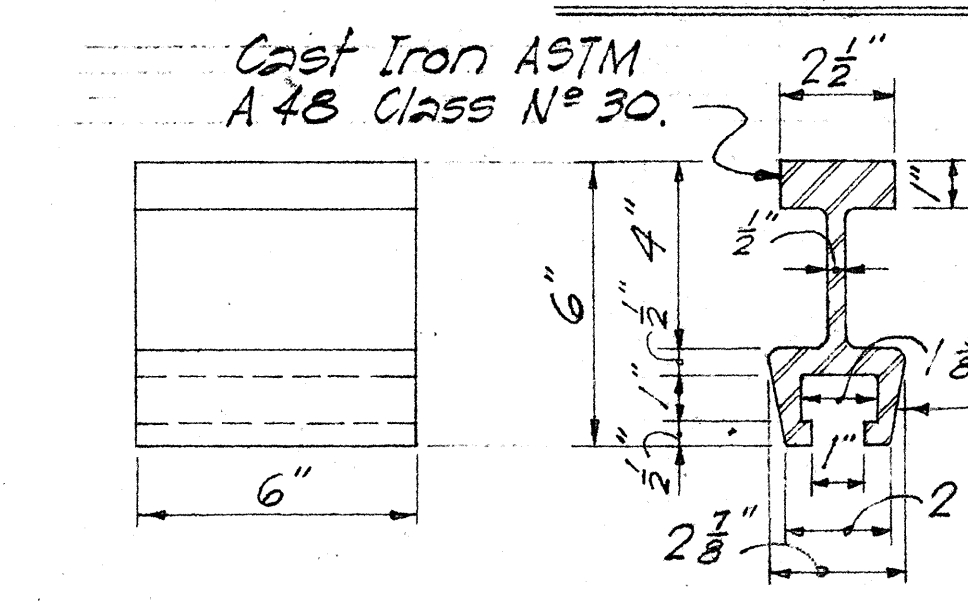


PLAN

REINFORCING BAR SPLICE

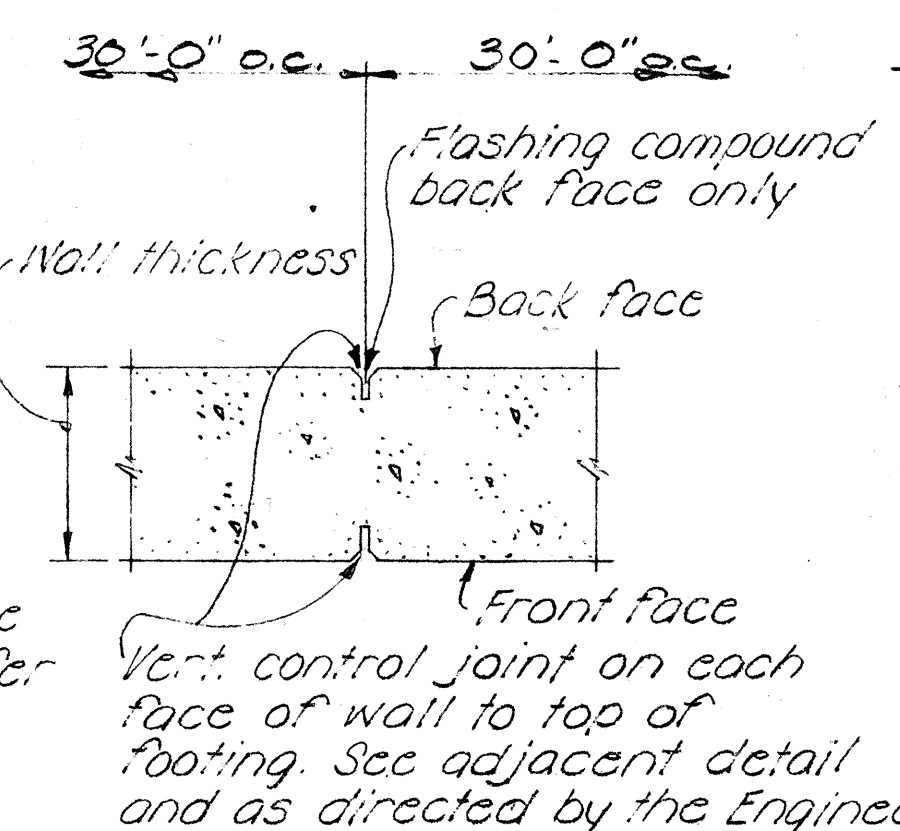
NOTE: Metal drains shall be considered incidental to Class A-1 Concrete in both concrete and steel bridges and will not be paid for separately. Assemblage of grillage and pipe shall be hot-dip galvanized after all welding is completed.

TYPICAL DRAINAGE DETAILS

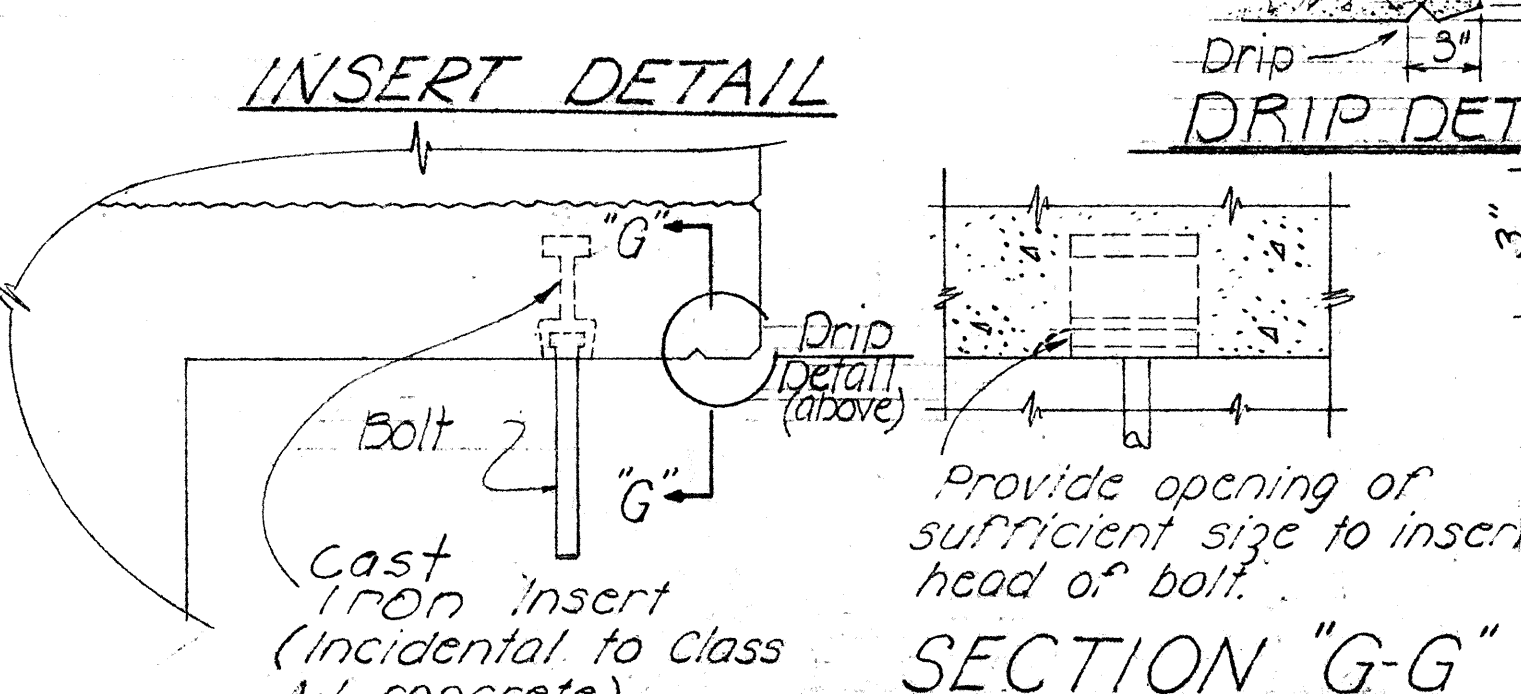


Contractor to take proper precautions to prevent the concrete from flowing into the opening of the inserts.

Joint may be formed with a masonite & cut back to the root of the chamfer on the exposed face.



CONTROL JOINT DETAIL



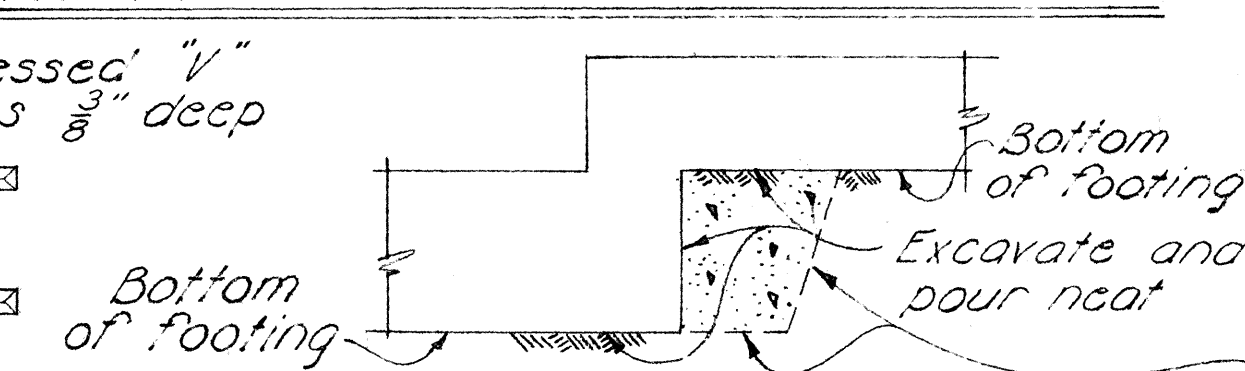
SECTION "G-G"

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.

TYPICAL DETAIL OF LETTERS & FIGURES AT CONCRETE END POST



NOTE: In case of over excavation, the contractor shall backfill this area with minimum class D-1 concrete at his own expense.

TYPICAL EXCAVATION FOR CONTINUOUS FOOTING STEP-UP

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD BRIDGE DETAILS

SHEET No. 510 OF

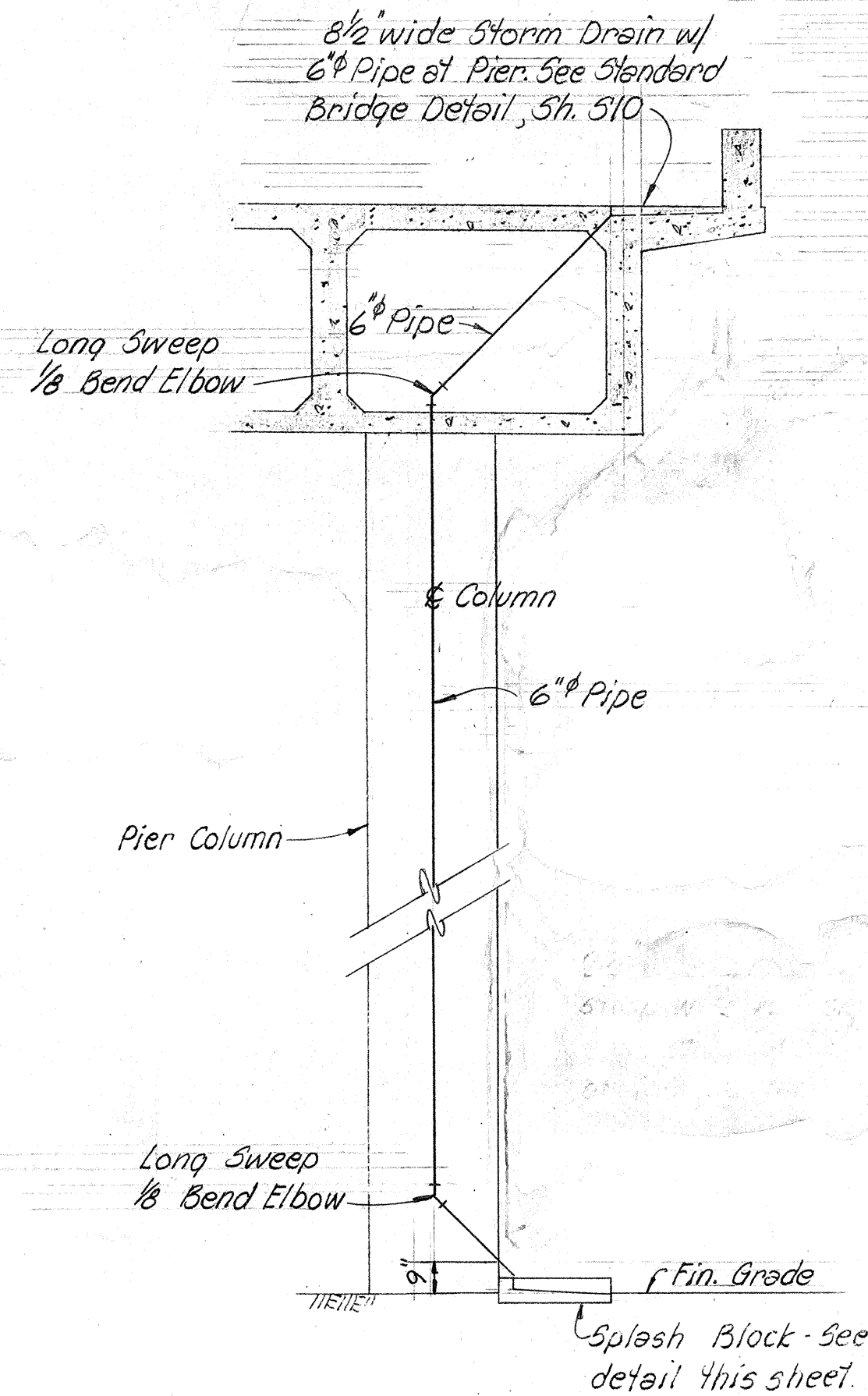
SHEETS

DATE	
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
NOTES BOOK	
CHECKED BY	

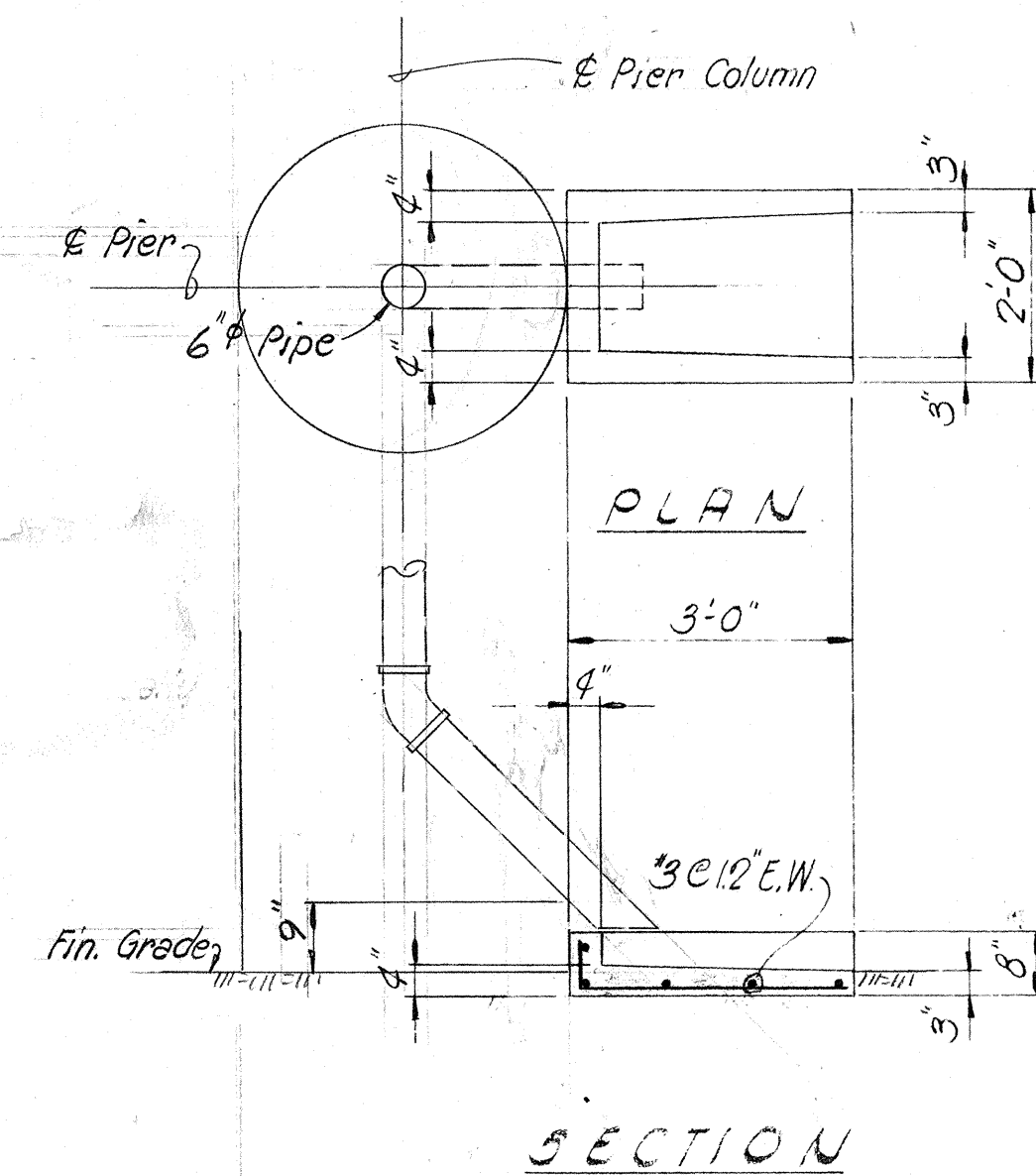
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(36)8	1967	100	124

NOTES:

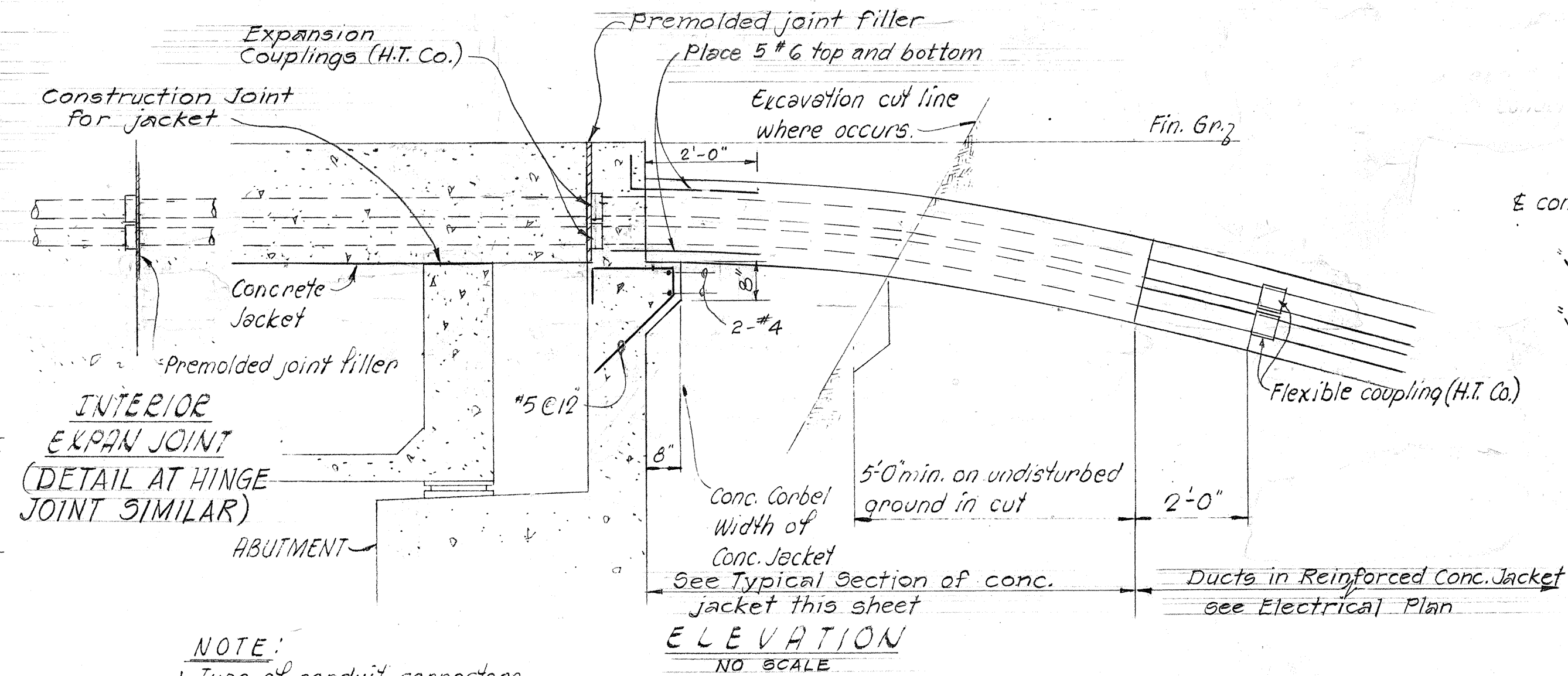
All pipes to be standard galvanized steel ASTM A120
All pipe fittings to be cast iron, screwed type drainage fittings (with 1/4 pitch). Federal Specifications WW-P-491a(1)
All drain pipes, drain frames, gratings & splash blocks to be incidental to Class A-1 concrete and will not be paid for separately.



ELEVATION
STORM DRAIN LEADER
Scale: $\frac{1}{4}" = 1'-0"$



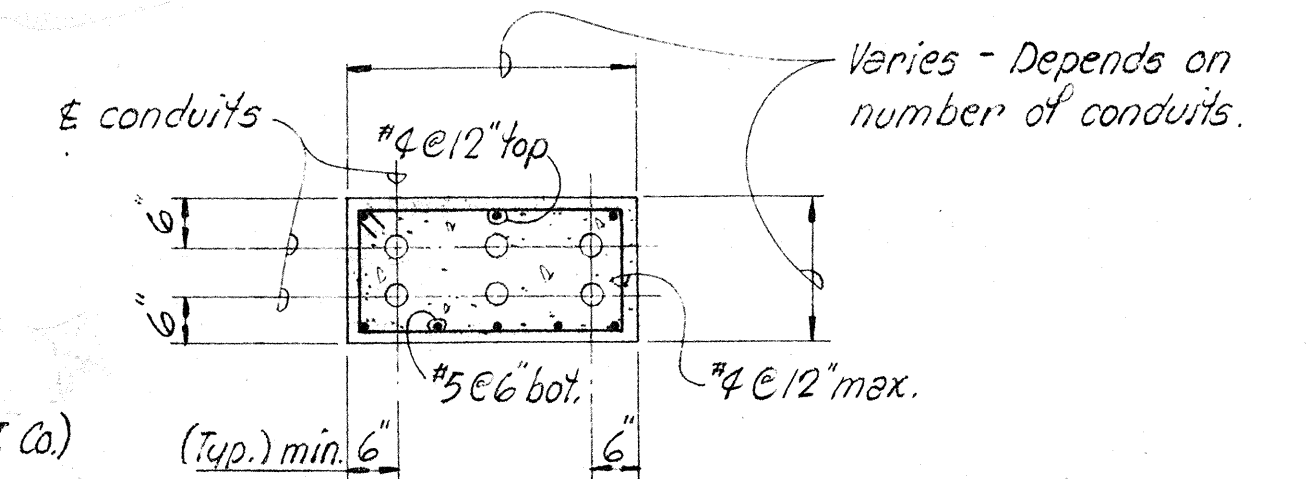
SPLASH BLOCK DETAIL
Scale: $\frac{1}{2}" = 1'-0"$



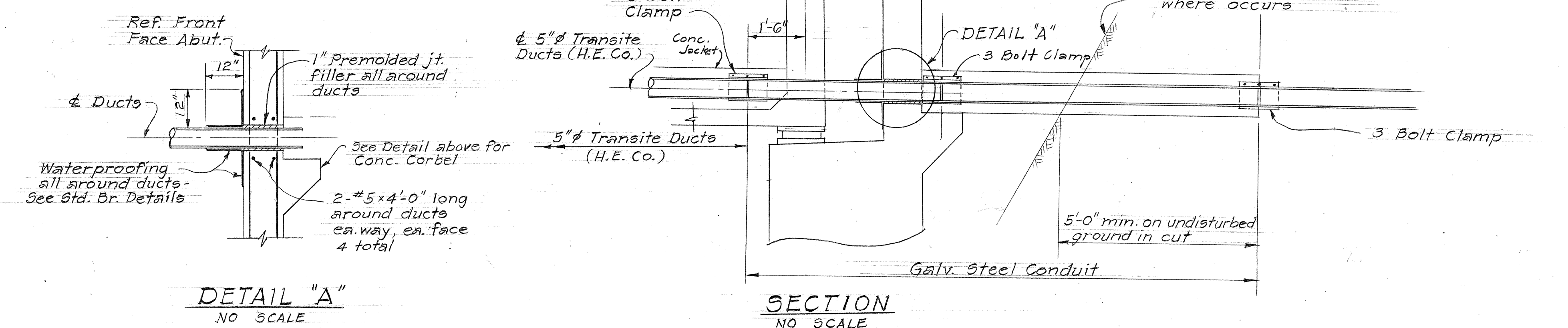
NOTE:

1. Type of conduit connectors used shall be determined by respective utility companies.
2. For exact location of ducts and conduits formation in structure see corresponding structural plans.

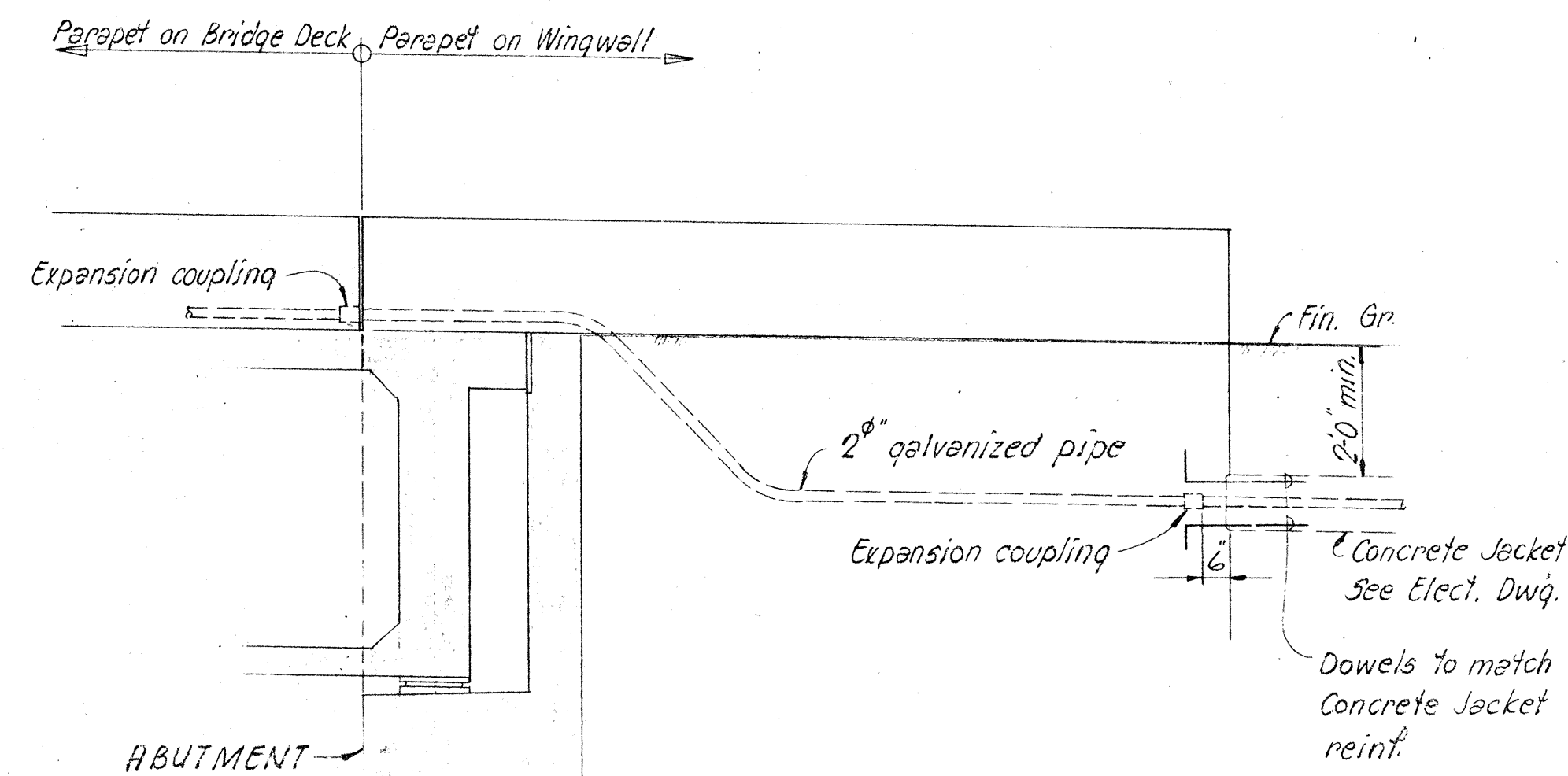
TYPICAL H.T.
CONDUIT LAYOUT AT ABUTMENT



TYPICAL SECTION
OF CONCRETE JACKET



TYPICAL H.E.
CONDUIT LAYOUT AT ABUTMENT

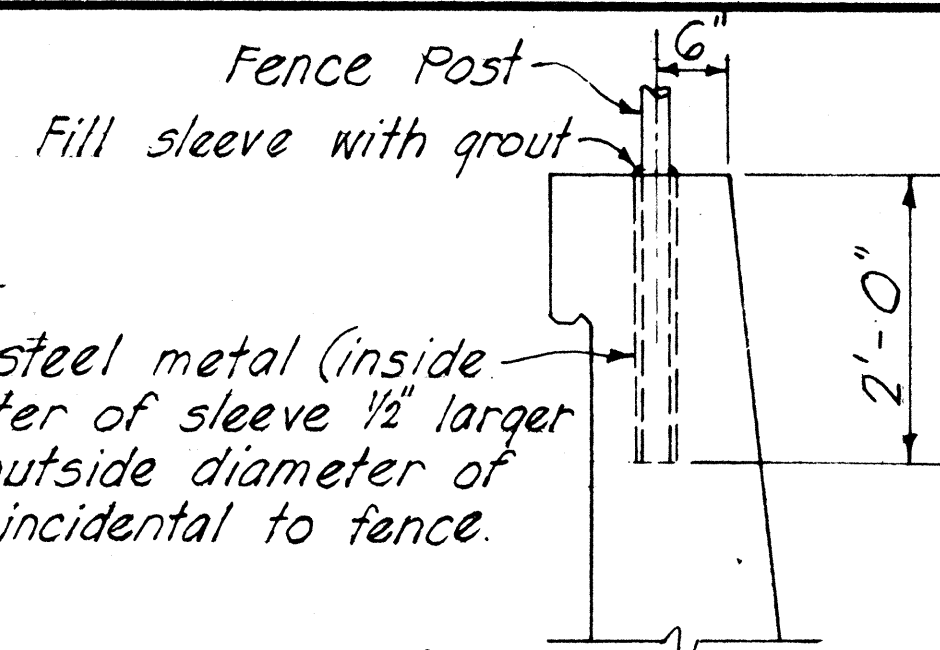


CONNECTION AT ABUTMENT FOR 2" Ø
HIGHWAY LIGHTING CONDUIT
Scale: $\frac{3}{8}" = 1'-0"$

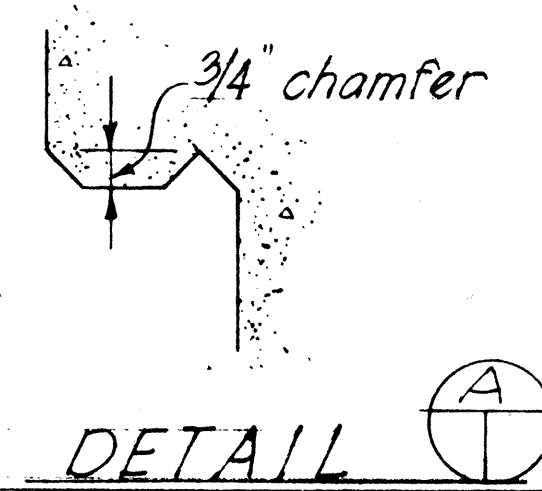
APPROVED: *R. Henderson* *10-18-67*
HAWAIIAN ELECTRIC CO., INC. DATE
J. H. Judd *10-18-67*
HAWAIIAN TELEPHONE CO., LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD BRIDGE DETAILS

F.A.I. PROJ. No. I-HI-1(36)B
Scale: As shown Date: 10/18/67
SHEET No. 511 OF SHEETS



CHAIN LINK FENCE
POST DETAIL

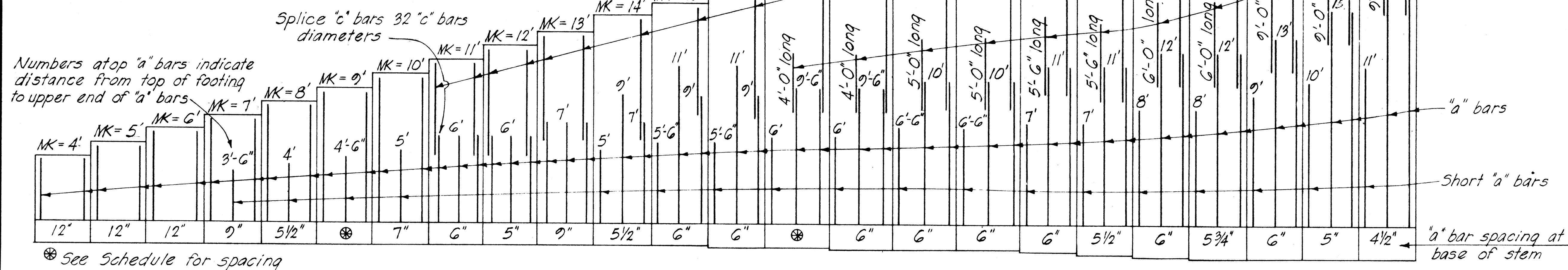


DETAIL

Maximum "MK"	4E	5E	6E	7E	8E	9E	10E	11E	12E	13E	14E	15E	16E	17E	18E	19E	20E	21E	22E	23E	24E	26E	28E	30E
a	6"	6"	6"	12"	12"	12"	12"	12"	12"	12"	15"	18"	21"	24"	24"	24"	27"	30"	33"	36"	39"	54"	60"	72"
t	14"	14"	14"	14"	14"	14"	14"	18"	18"	18"	18"	18"	21"	21"	24"	24"	24"	27"	30"	31"	33"	36"	39"	42"
L	2.5'	3.0'	3.5'	4.0'	4.5'	5.0'	5.5'	6.0'	6.5'	7.0'	7.75'	8.25'	9.0'	9.75'	10.5'	11.5'	12.5'	13.5'	14.5'	15.25'	16.0'	18.0'	20.0'	21.0'
"a" bars	*3@12"	*3@12"	*4@12"	*4@9"	*4@5 1/2"	*5@7"	*6@7"	*6@6"	*6@5"	*7@9"	*6@5 1/2"	*7@6"	*8@6"	*8@5 3/4"	*9@6"	*9@6"	*10@6"	*10@6"	*10@5 1/2"	*10@6"	*10@5 3/4"	*11@6"	*11@5"	*11@4 1/2"
"b" bars	*3@12"	*3@12"	*3@12"	*3@9"	*4@11"	*4@7"	*5@7"	*5@6"	*5@5"	*7@9"	*6@5 1/2"	*7@6"	*8@6"	*7@5 3/4"	*8@6"	*9@6"	*10@6"	*10@6"	*10@5 1/2"	*10@6"	*10@5 3/4"	*11@6"	*11@5"	*11@4 1/2"
"c" bars								*4	*4	*4	*4	*4	*5	*5	*5	*6	*6	*6	*7	*7	*7	*7	*7	*7
"d" bars	*3@12"	*3@12"	*3@12"	*3@12"	*4@18"	*4@15"	*4@15"	*4@12"	*4@11"	*4@9"	*5@12"	*5@12"	*5@10"	*5@9"	*5@9"	*5@8"	*6@10"	*6@9"	*7@12"	*7@11"	*7@10"	*7@	*7@	*7@6"

Maximum "NK"	4R	5R	6R	7R	8R	9R	10R	11R	12R	13R	14R	15R	16R	17R	18R	19R	20R	21R	22R	23R	24R	26R	28R	30R
a	6"	6"	6"	12"	12"	12"	12"	12"	12"	12"	15"	18"	21"	21"	21"	21"	24"	24"	27"	30"	33"	39"	39"	51"
t	14"	14"	14"	14"	14"	14"	14"	18"	18"	18"	18"	18"	18"	18"	18"	21"	21"	21"	21"	24"	24"	27"	30"	36"
L	2.5'	3.0'	3.5'	4.0'	4.5'	5.0'	5.5'	6.0'	6.5'	6.75'	7.25'	7.75'	8.25'	8.75'	9.25'	9.75'	10.25'	10.5'	11.0'	11.5'	12.0'	13.0'	14.0'	15.0'
"a" bars	*3@12"	*3@12"	*4@12"	*4@9"	*4@5½"	*5@6"	*6@7"	*6@6"	*6@5"	*7@9"	*6@5½"	*7@6"	*8@6"	*8@6"	*9@6"	*9@6"	*10@6"	*10@6"	*10@5½"	*10@6"	*10@5¾"	*11@6"	*11@5"	*11@4½"
"b" bars	*3@12"	*3@12"	*3@12"	*3@9"	*4@11"	*4@6"	*5@7"	*5@6"	*5@5"	*7@9"	*6@5½"	*7@6"	*7@6"	*8@6"	*9@6"	*9@6"	*10@6"	*10@6"	*10@5½"	*10@6"	*10@5¾"	*10@6"	*10@5"	*9@4½"
"c" bars								*4	*4	*4	*4	*4	*5	*5	*5	*6	*6	*6	*7	*7	*7	*7	*7	*7
"d" bars	*3@12"	*3@12"	*3@12"	*3@12"	*4@18"	*4@15"	*4@15"	*4@12"	*4@11"	*4@9"	*5@12"	*5@12"	*5@10"	*5@9"	*5@9"	*5@8"	*6@10"	*6@9"	*7@12"	*7@11"	*7@10"	*7@	*7@	*7@6"

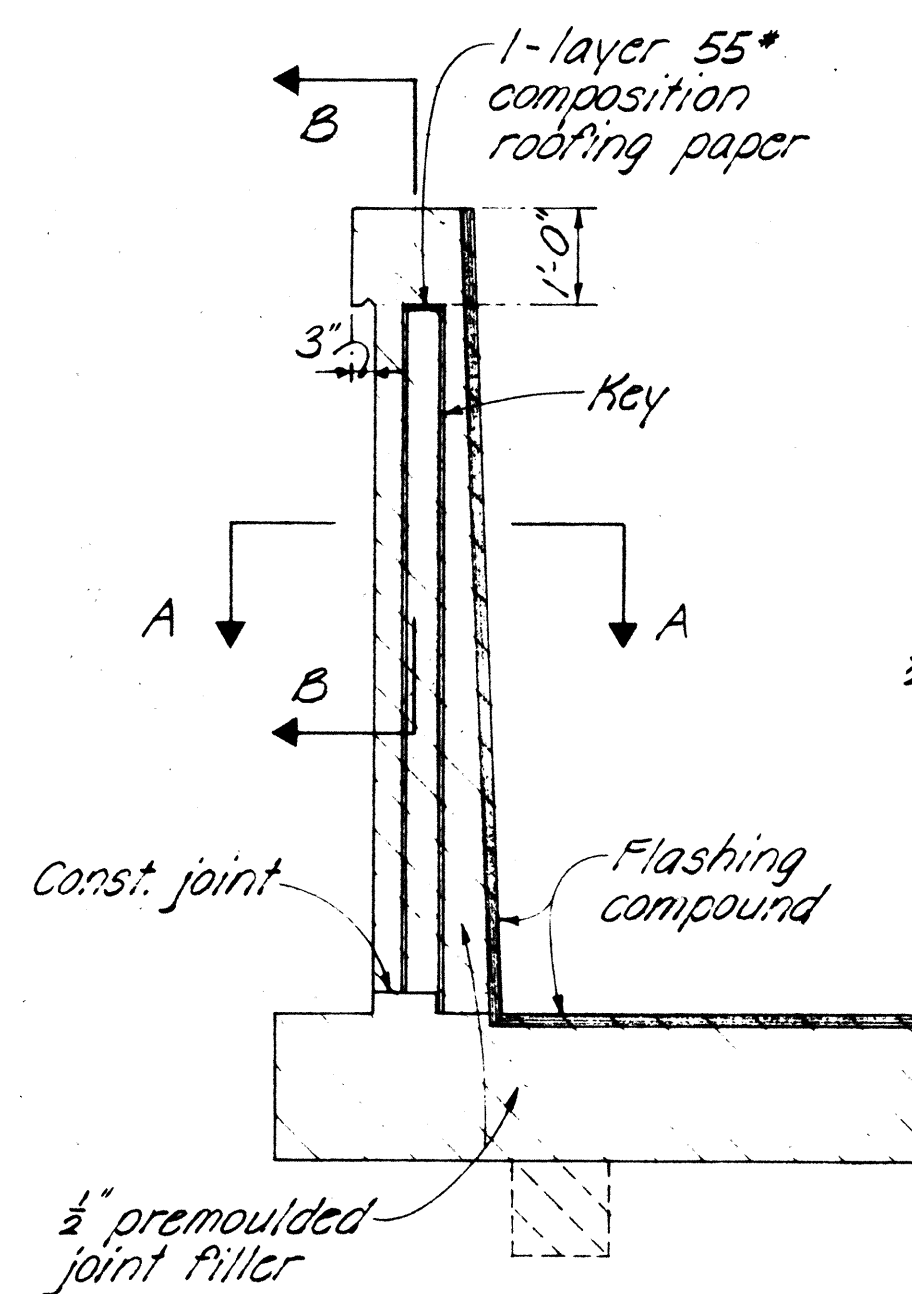
WALL SECTION



VERTICAL REINFORCING STEEL ARRANGEMENT

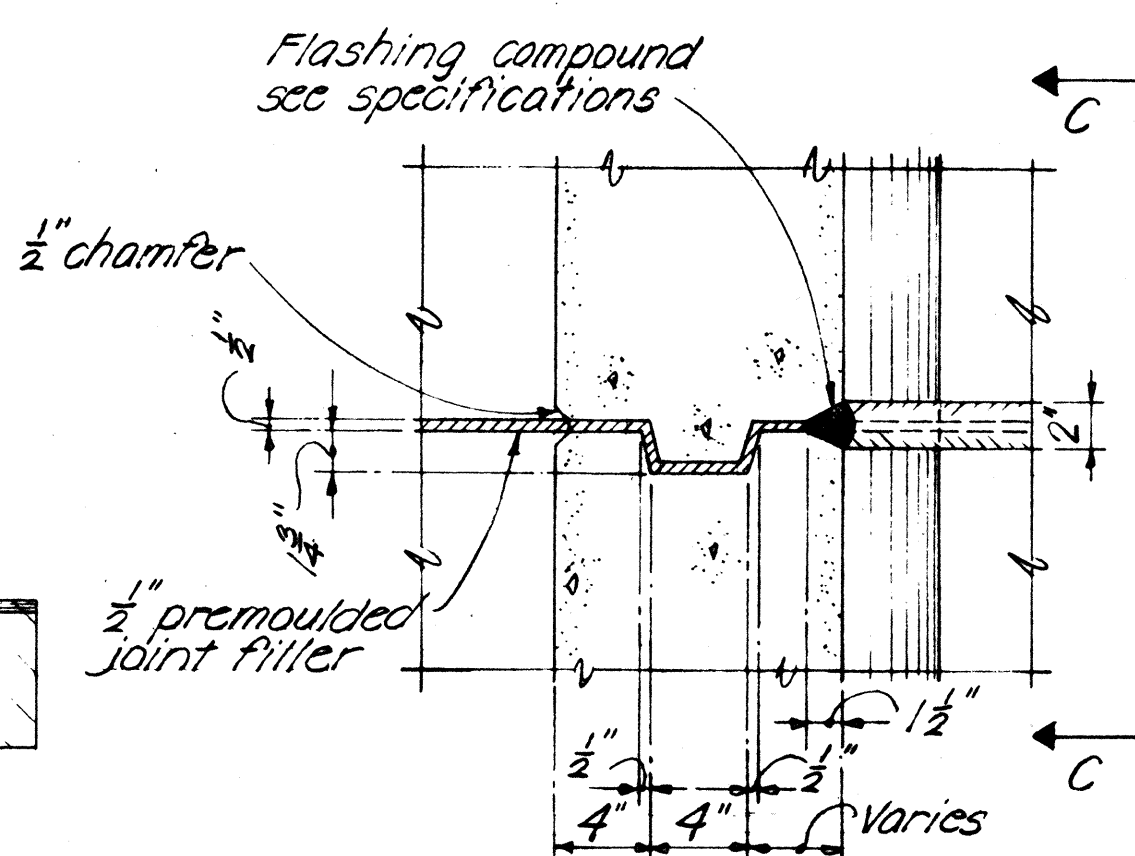
SCALE AS NOTED DATE: _____
SHEET No. 512 OF _____ SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-11-1369	1967	102	124

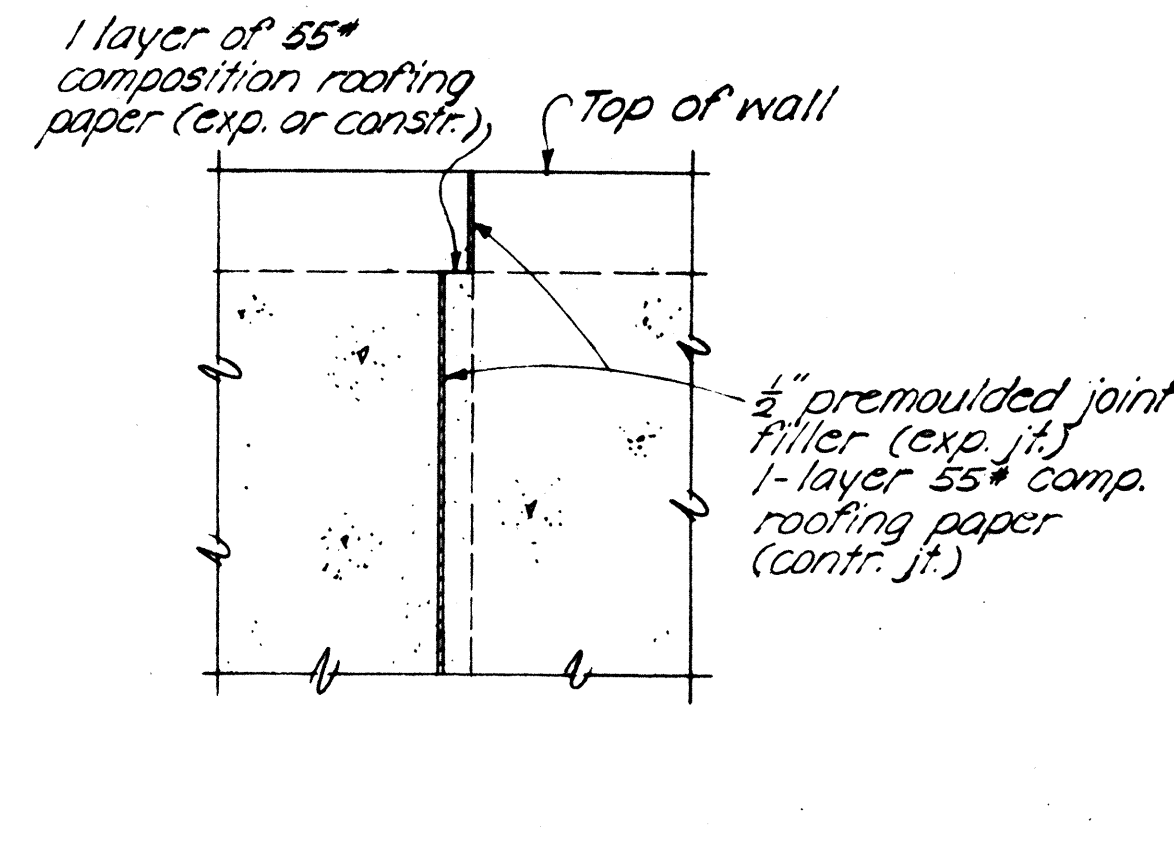


JOINT ELEVATION

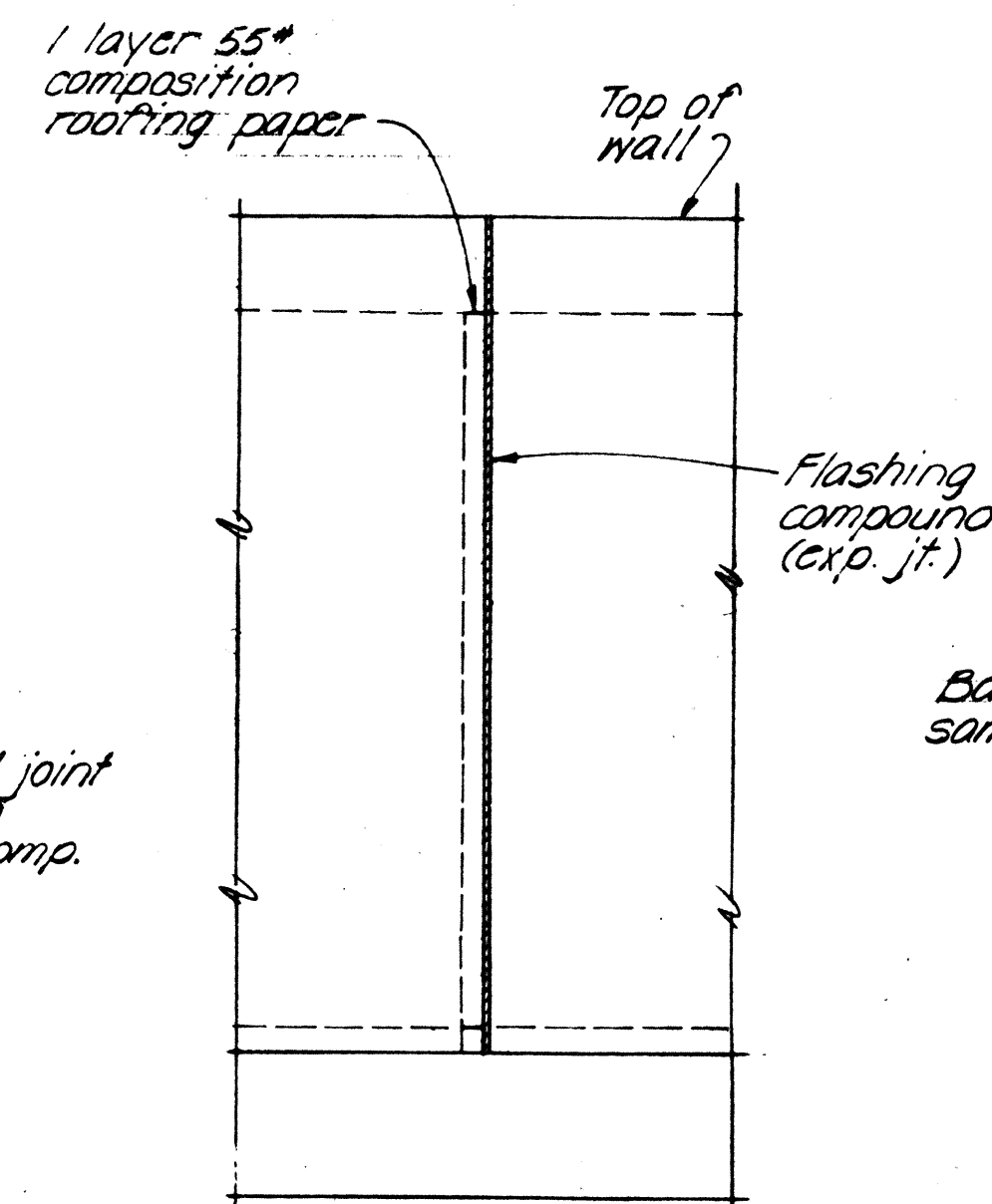
NOTE
Spacing of joints
Exp. = 90'-0" max.
Contr. = 30'-0" max.
For alternate contraction joint and control joint details-see Standard Bridge Details.



SECTION A-A

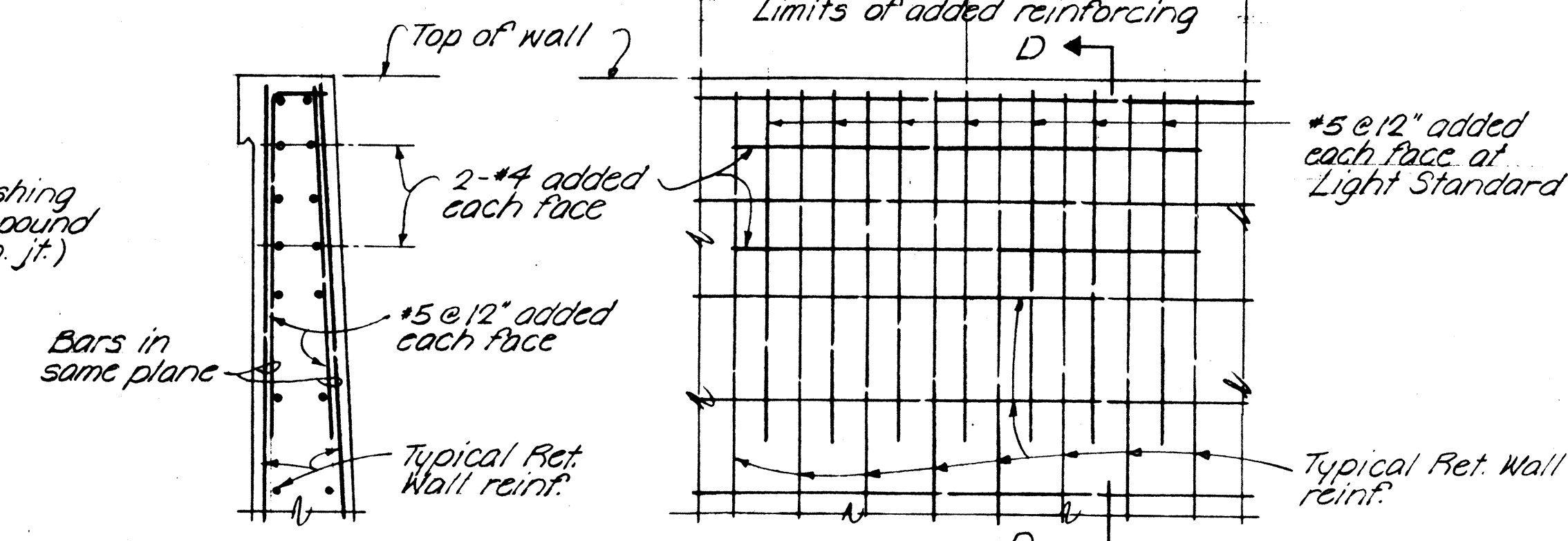


SECTION B-B



SECTION C-C

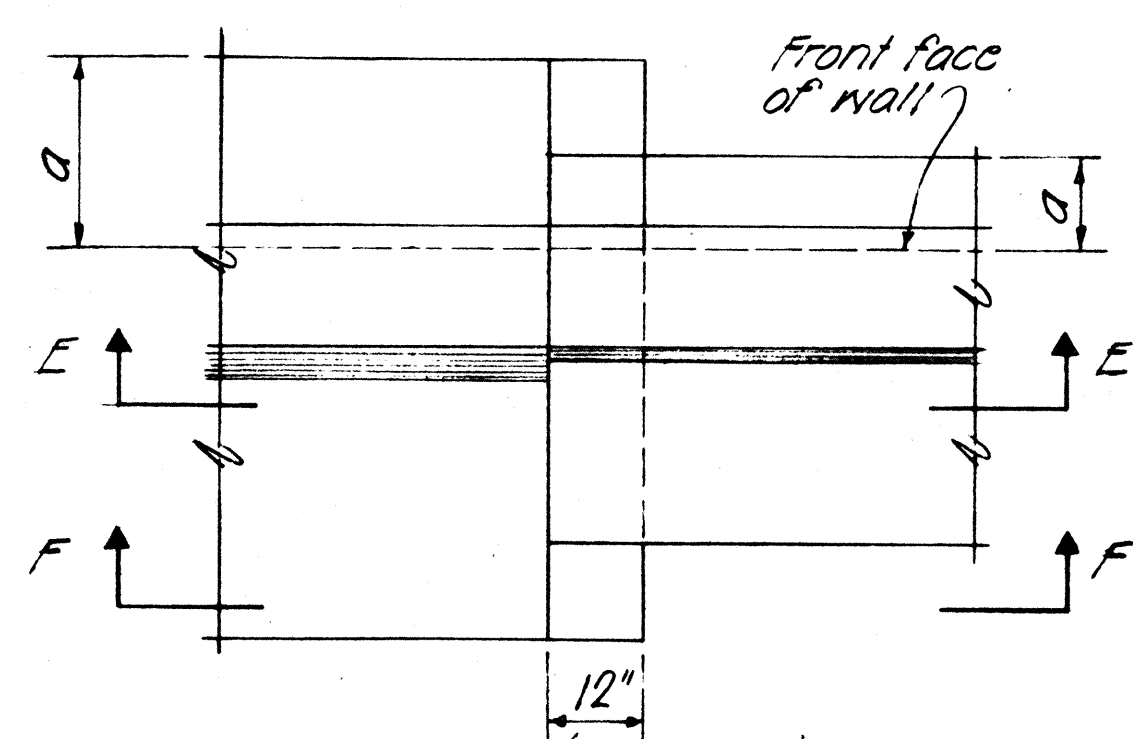
NOTE:
Limits of added reinf.
Height 0'-18' L = $\frac{h}{2}$
Height 19'-30' L = $\frac{2}{3}h$



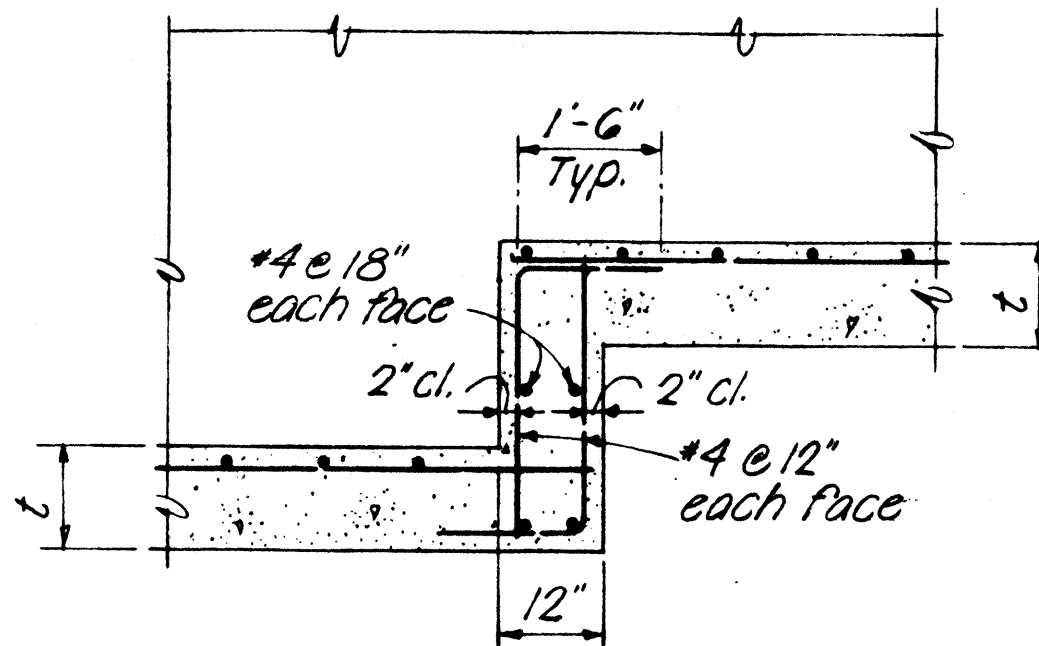
SECTION D-D

ELEVATION

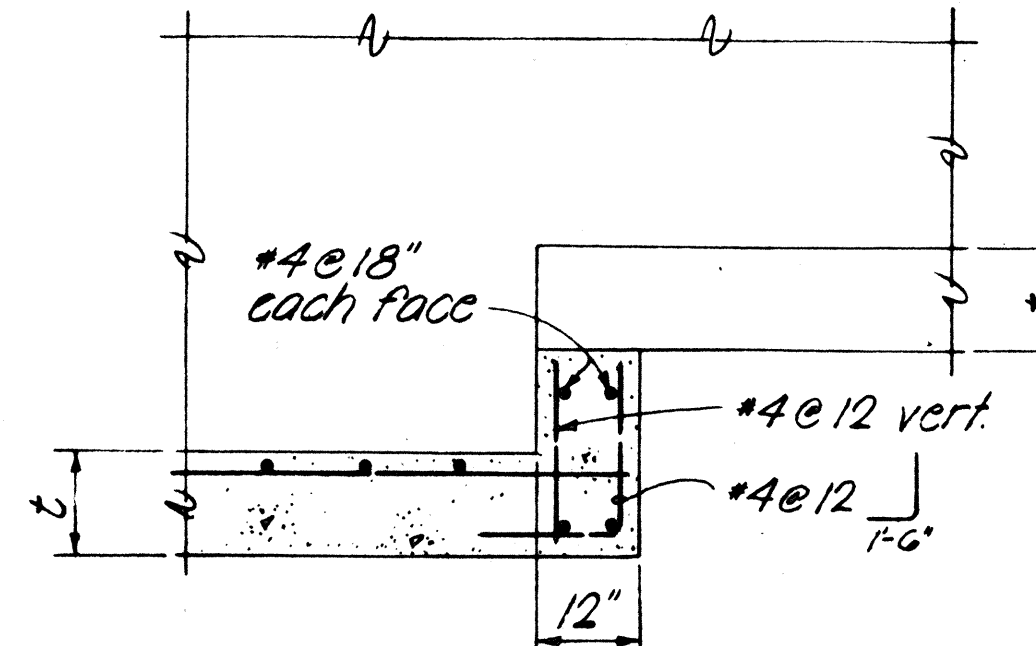
TYPICAL ADDED REINFORCEMENT
AT LIGHT STANDARD BASE No Scale



PLAN



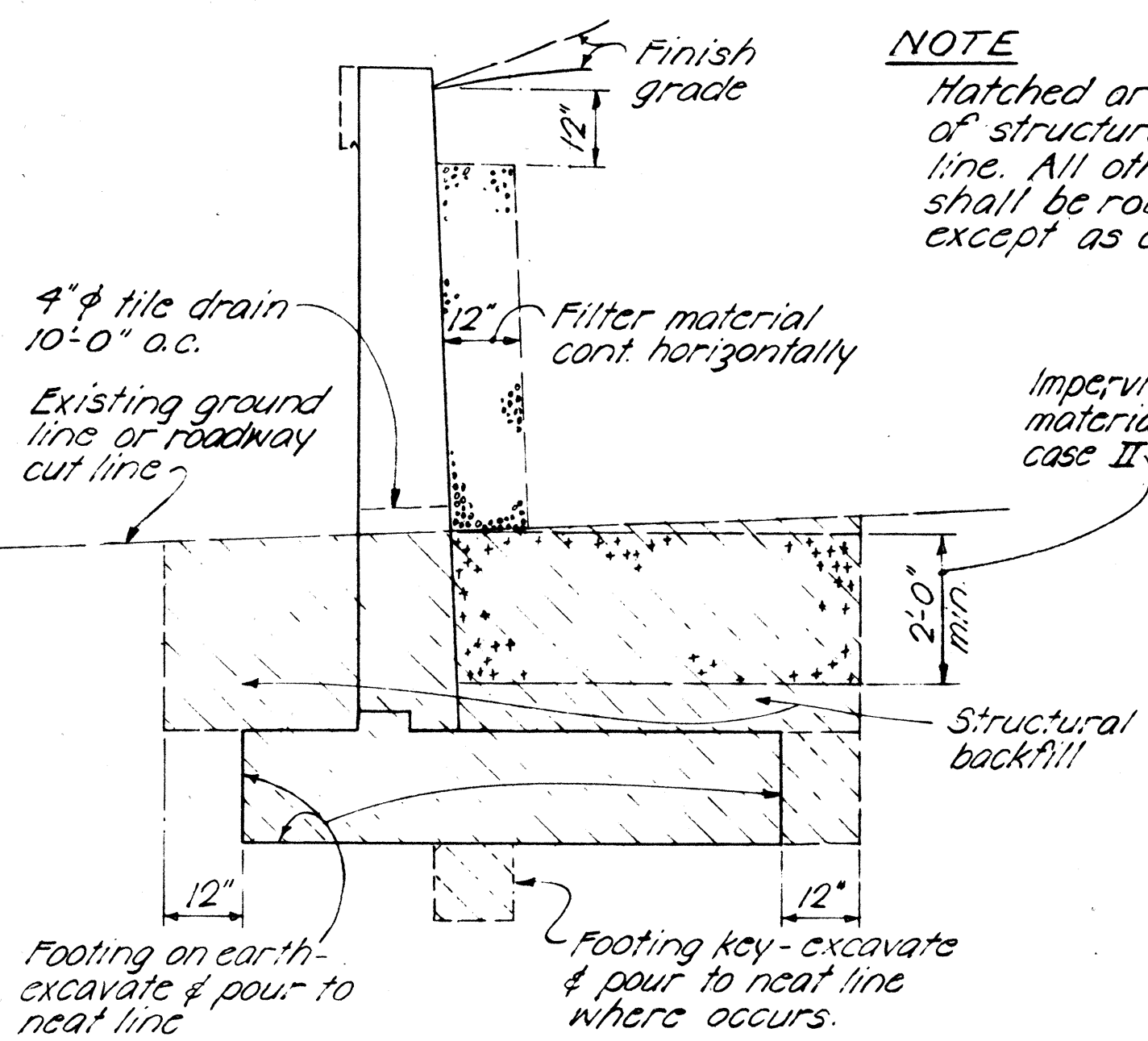
SECTION E-E



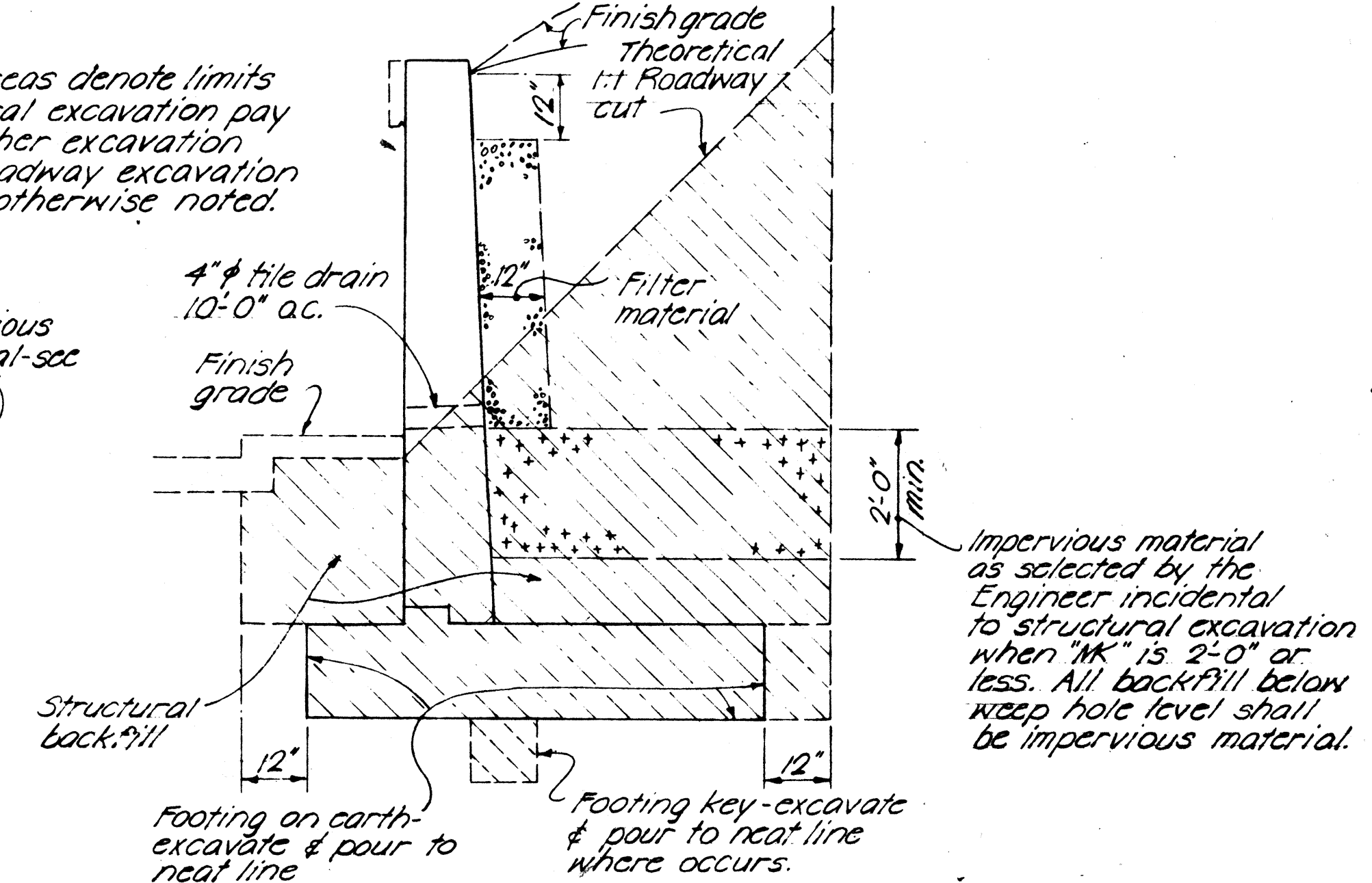
SECTION F-F

FOOTING STEP-UP DETAILS No Scale

NOTE
Hatched areas denote limits of structural excavation pay line. All other excavation shall be roadway excavation except as otherwise noted.



CASE I



CASE II

STRUCTURAL EXCAVATION & DRAINAGE DETAILS No Scale

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
RETAINING WALL TYPE T-1
SCALE As Noted DATE:
SHEET No. 102 OF 124 SHEETS