

ORIGINAL
PLAN
No.

DATE

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NOTE BOOK

QUANTITIES BY

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INDEX

SHEET NO.	DESCRIPTION
S-1	Index, Estimated Quantities and Structural Notes
S-2	Layout Plan
S-3	Longitudinal Section
S-4	Typical Deck Section and Pier "A" & "B" Elevation
S-5	Foundation Plan
S-6	Pier Footing Details and Abut. #1 & #2 Reinf. Layout
S-7	Pier Column Details
S-8	Pier Cap Details
S-9	Pier "A" & "B" and Abut. #1 & #2 Seat Plan
S-10	Abut. #1 & #2 Elevation and Details
S-11	Typical Abutment Sections
S-12	Wing Wall Elevations and Sections
S-13	Deck Framing Plan
S-14	Typical Deck Section and Concrete Seat Schedule
S-15	Top Deck and Skewed End Reinf. Details
S-16	Beam "A" Plan, Elevation & Sections
S-17	Beam "B" Plan, Elevation & Section
S-18	Plans - Girder End Details
S-19	Typ. Details Conc. Seats, Hinge & Creep Block, Vertical Restrainer
S-20	Prestress Girder & Intermediate Diaphragm Details
S-21	Conc. Bridge Rail Transition w/ Curved End and Guardrail Connection Details
S-22	Aluminum Bridge Railing Details
S-23	Concrete Railing Details
S-24	Deck Expansion Joint Details
S-25	Drilled Shaft Details

ESTIMATED QUANTITIES

ITEM NO.	ITEM	UNIT	QUANTITIES
203.0210	Imported Borrow for Bridge Abutment and Wing Walls	CY	233
206.6000	Structure Excavation for Bridges	CY	3403
206.7200	Structure Backfill for Bridge Abutment and Wing Walls	CY	3403
206.8200	Filter Material for Abutments and Wing Walls	CY	124
503.6010	Concrete In Bridges (Except Footing)	CY	1027
503.6011	Concrete In Bridge Footing	CY	689
504.2200	Type II Prestressed Concrete Girders	LIN.FT.	1280
507.1000	Metal Bridge Railing - One rail on parapet	LIN.FT.	1021
602.1300	Reinforcing Steel In Bridge	LBS	379,670
510.1000	Cast-In-Place Concrete Piles in drilled holes	LIN.FT.	963
510.2000	30" Dia. Pre drilled Holes for Cast-In-Place Piles	LIN.FT.	963

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-RS-0360(6)	1992	33	75

STRUCTURAL NOTES

1. GENERAL SPECIFICATIONS: Hawaii Department of Transportation, Standard Specifications for Road and Bridge Construction, 1985, together with special provisions prepared for this contract.
2. DESIGN SPECIFICATIONS: A.A.S.H.T.O. 1989 Standard Specifications for Highway Bridges and its subsequent interim specifications. Standard Specifications for Seismic Design of Highway Bridges, 1983, and its subsequent interims.
3. LOADS:
(A) DEAD LOAD: An allowance of 18 P.S.F. for future wearing surface of asphalt concrete has been provided for in the design for bridges.
(B) LIVE LOAD: HS20-44 or interstate loading.
(C) EARTHQUAKE: CATEGORY B, A = 0.19
4. MATERIALS:
(A) All concrete shall be 4,000 P.S.I. unless otherwise noted.
(B) All reinforcing steel shall be A.S.T.M. A615, Grade 60, except ties and stirrups shall be Grade 40, unless otherwise noted.
(C) All structural steel shall be A.S.T.M. A-36, hot dip galvanized, unless otherwise noted.
(D) All anchor bolts, washers and nuts shall be A.S.T.M. A-307, hot dip galvanized, unless otherwise specified.
(E) For materials of prestressed concrete girder see prestressed concrete notes.

5. DESIGN STRESSES: shall follow A.A.S.H.T.O. Standard Specifications for Highway Bridges in addition to those listed below.

	CONCRETE	CLASS BD (Bridge Deck)	ALL OTHERS (Except prestressed concrete girders and unless otherwise noted on the plans)
Fc'		3,750 P.S.I.	4,000 P.S.I.
Fc		1,200 P.S.I.	1,600 P.S.I.
N		9	8

For prestressed concrete girders, see prestressed concrete notes.

6. CONSTRUCTION METHODS:
(A) See specifications and special provisions.
(B) The footings for Piers "A" and "B" shall be founded on hard basalt and embedded a minimum of 30 inches into basalt.
(C) Drilled shafts for the abutments and wing walls shall be embedded at least 4 feet into basalt.

7. DESIGN NOTES:
(A) Piers "A" & "B"
1. Allowable bearing on basalt (embedded 30") 12,000 psf
2. Coefficient of friction 0.50 (used with dead loads)
3. Passive earth pressure 800 pcf (8,000 psf max.)
(B) Abutment and Wing Walls
1. Allowable downward load on 30" diameter drilled shafts 200 tons
2. Allowable lateral resistance per drilled shaft (fixed head condition)
(a) Abutment No. 1 40 kips
(b) Abutment No. 2 32 kips
3. Active earth pressures
(a) Free standing 40 pcf
(b) Restrained 55 pcf



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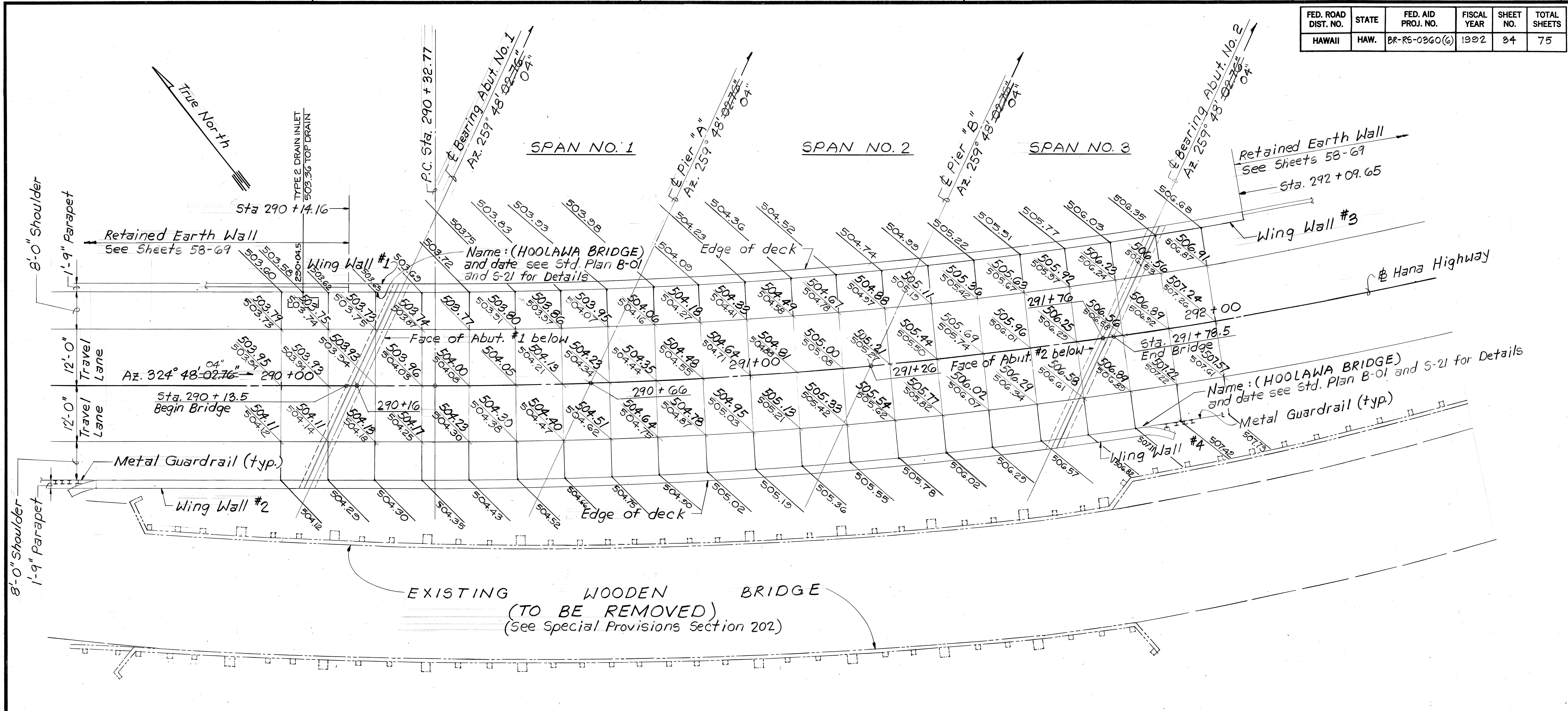
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**INDEX, ESTIMATED
QUANTITIES AND
STRUCTURAL NOTES**

**HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)**

SCALE: NO SCALE DATE: SEPT., 1991
SHEET NO.S-1 OF S-25 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-RS-0360(6)	1992	34	75



HOOLAWA BRIDGE REPLACEMENT LAYOUT PLAN
Scale: 1" = 10'-0"

NOTE: AS-BUILT BRIDGE DECK GRADES SHOWN WERE FIELD ADJUSTED TO ALLOW FOR ADEQUATE DRAINAGE INTO TYPE 2 DRAIN INLET AT REVISED STA. 290+04.5.

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STATE OF HAWAII
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HIGHWAYS DIVISION

LAYOUT PLAN

HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)
SCALE: 1" = 10' DATE: SEPT., 1991

SHEET NO. 3-2 OF 3-25 SHEETS

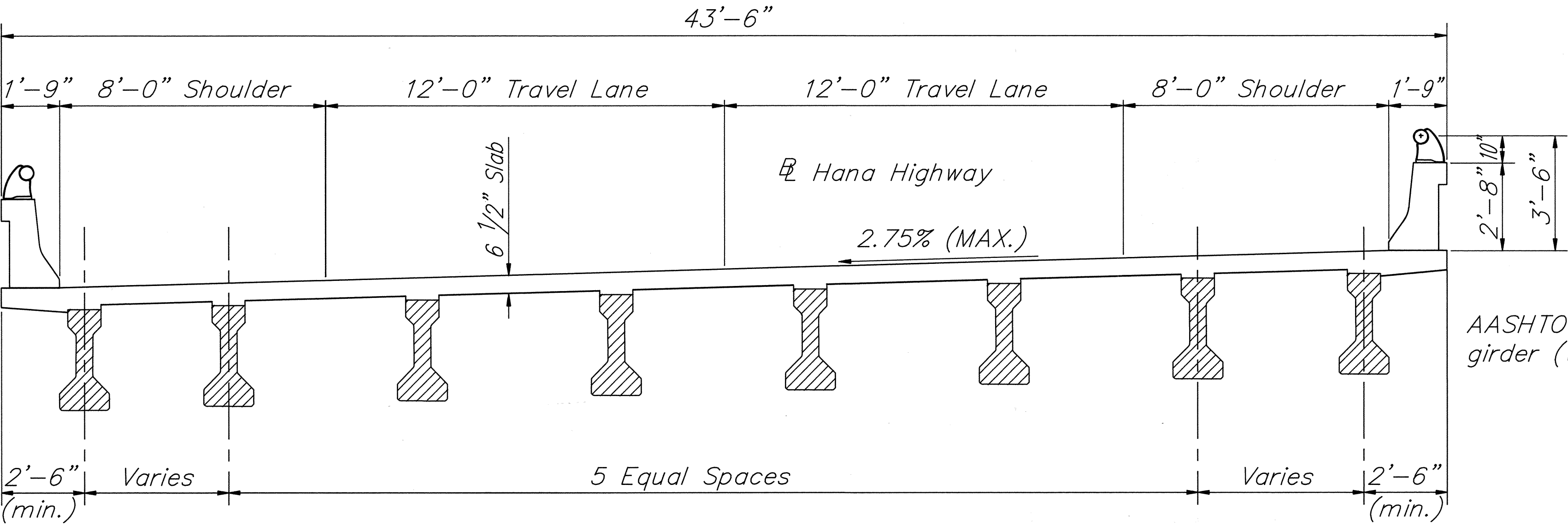
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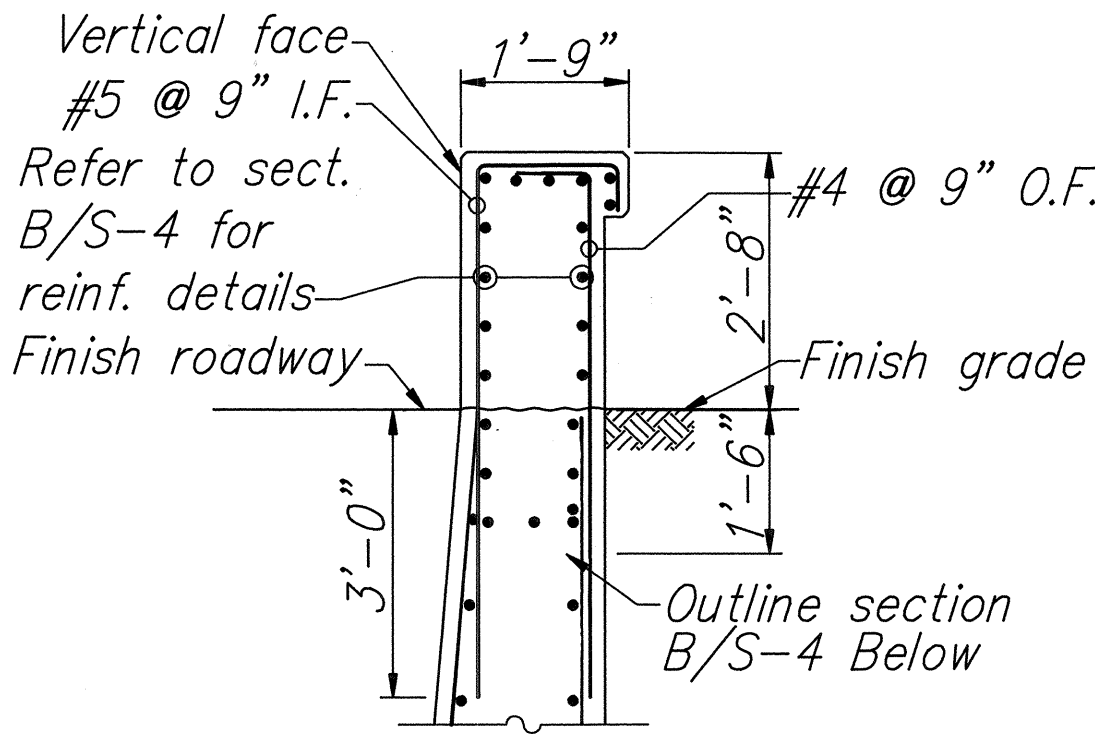
Harold J. Perjan

SHEET No. 5-3 OF 5-25 SHEETS

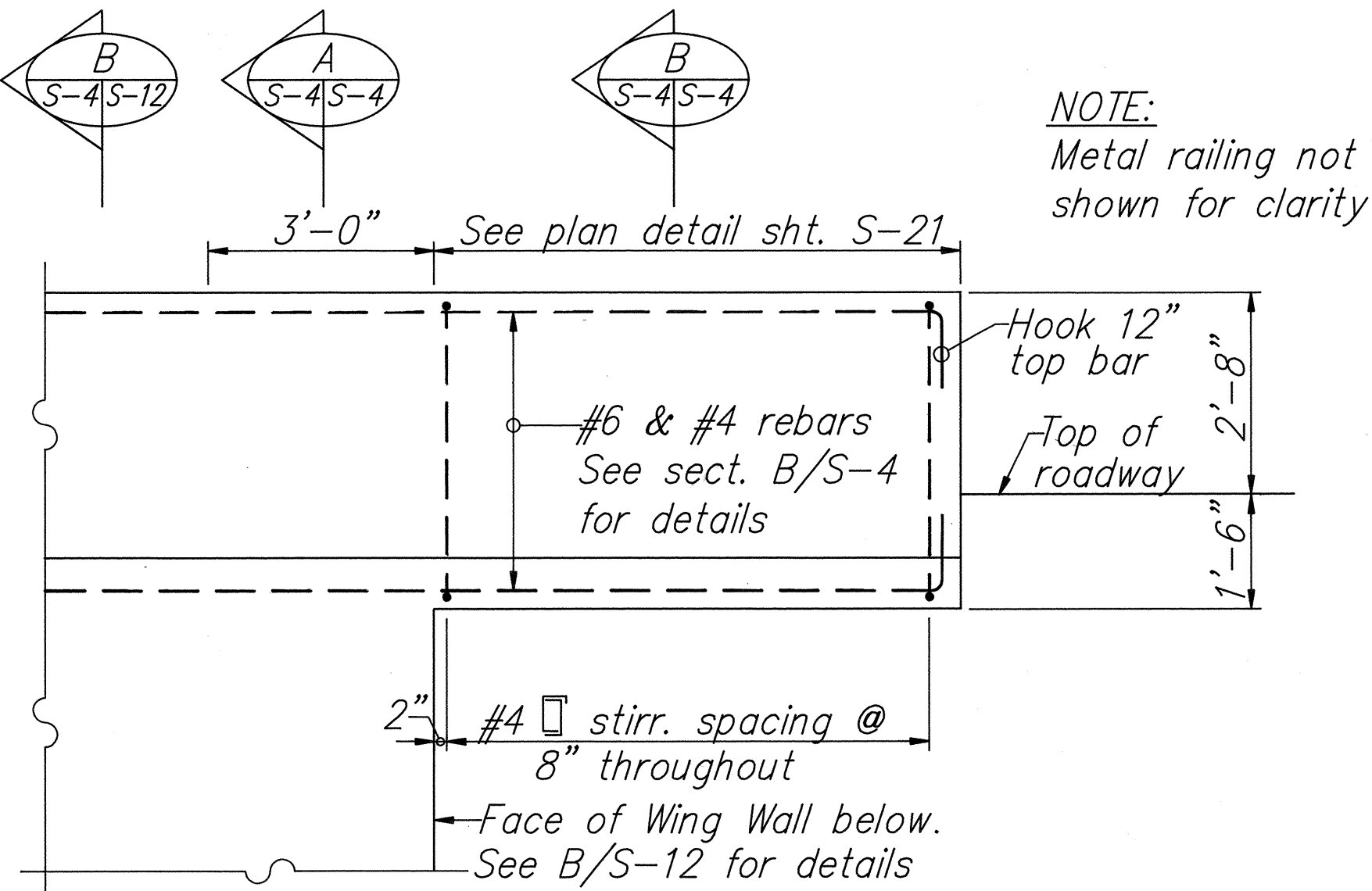
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HAWAII	HAW.	BR-RS-0360(6)	1992	36	75



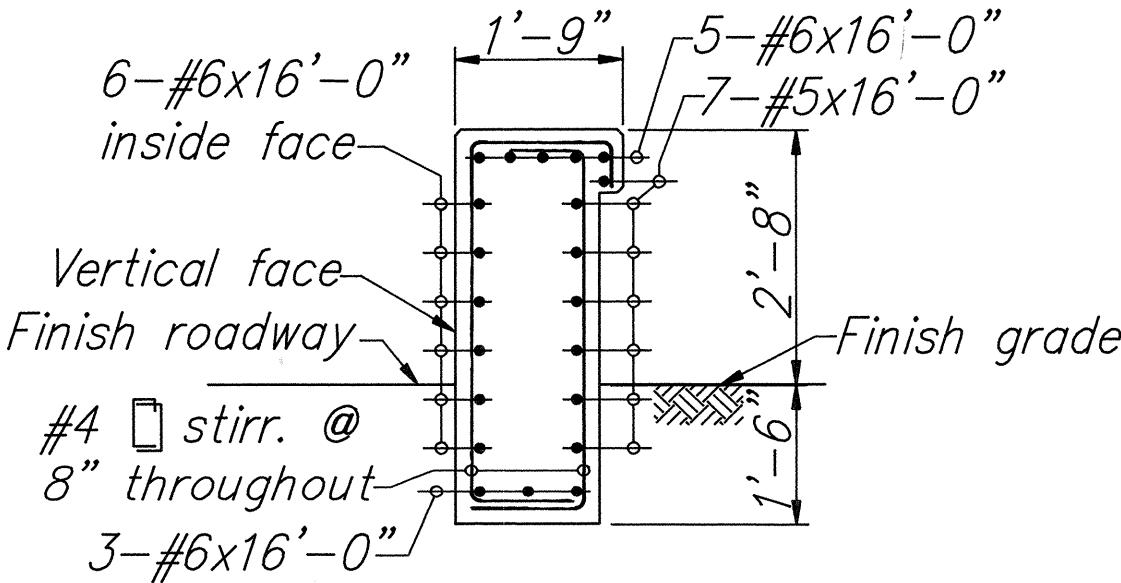
TYPICAL DECK SECTION
Scale: 3/8" = 1'-0"



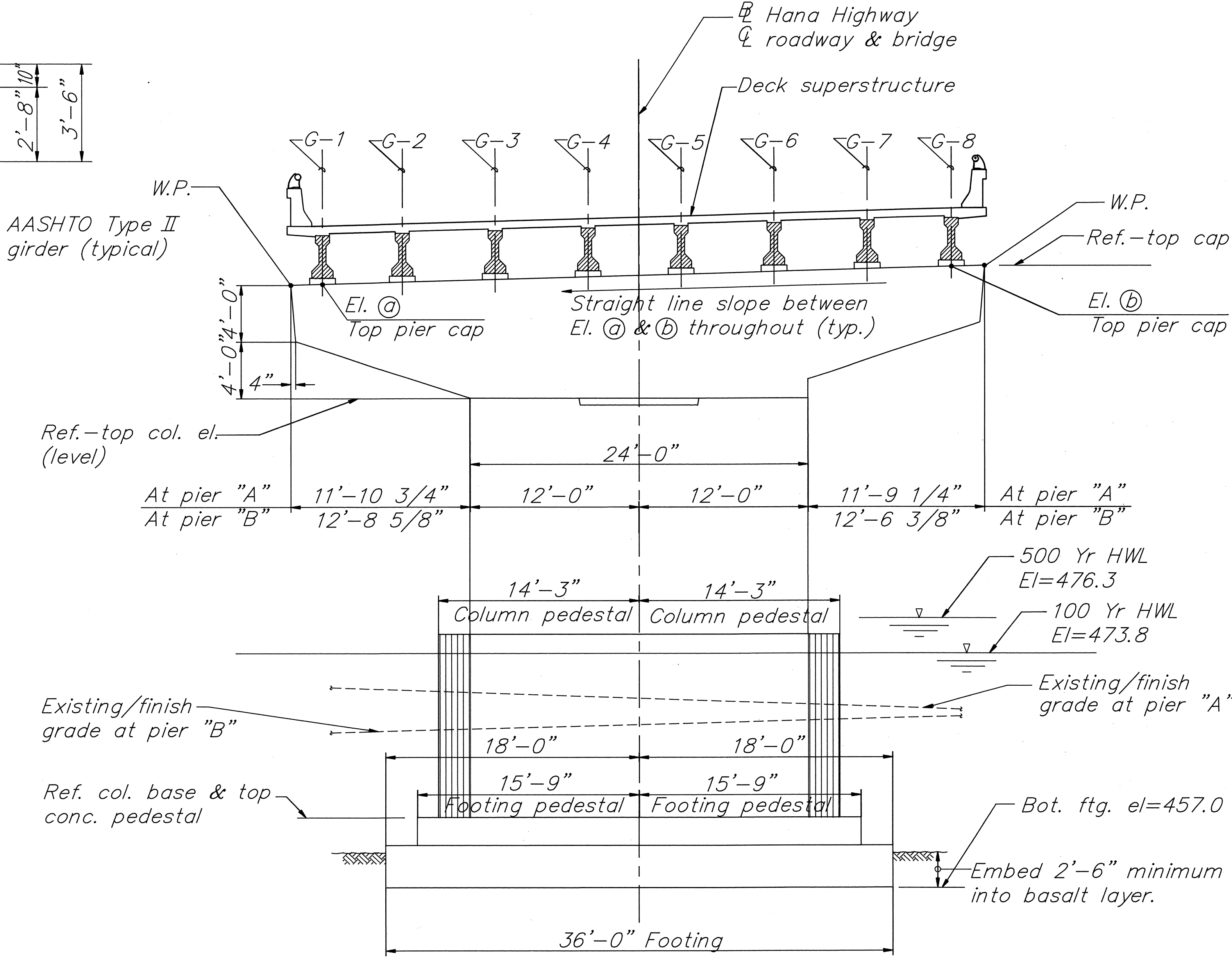
SECTION A
Scale: 1/2" = 1'-0"



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



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



ELEVATION - PIER "A" & "B"
Scale: 3/16" = 1'-0"

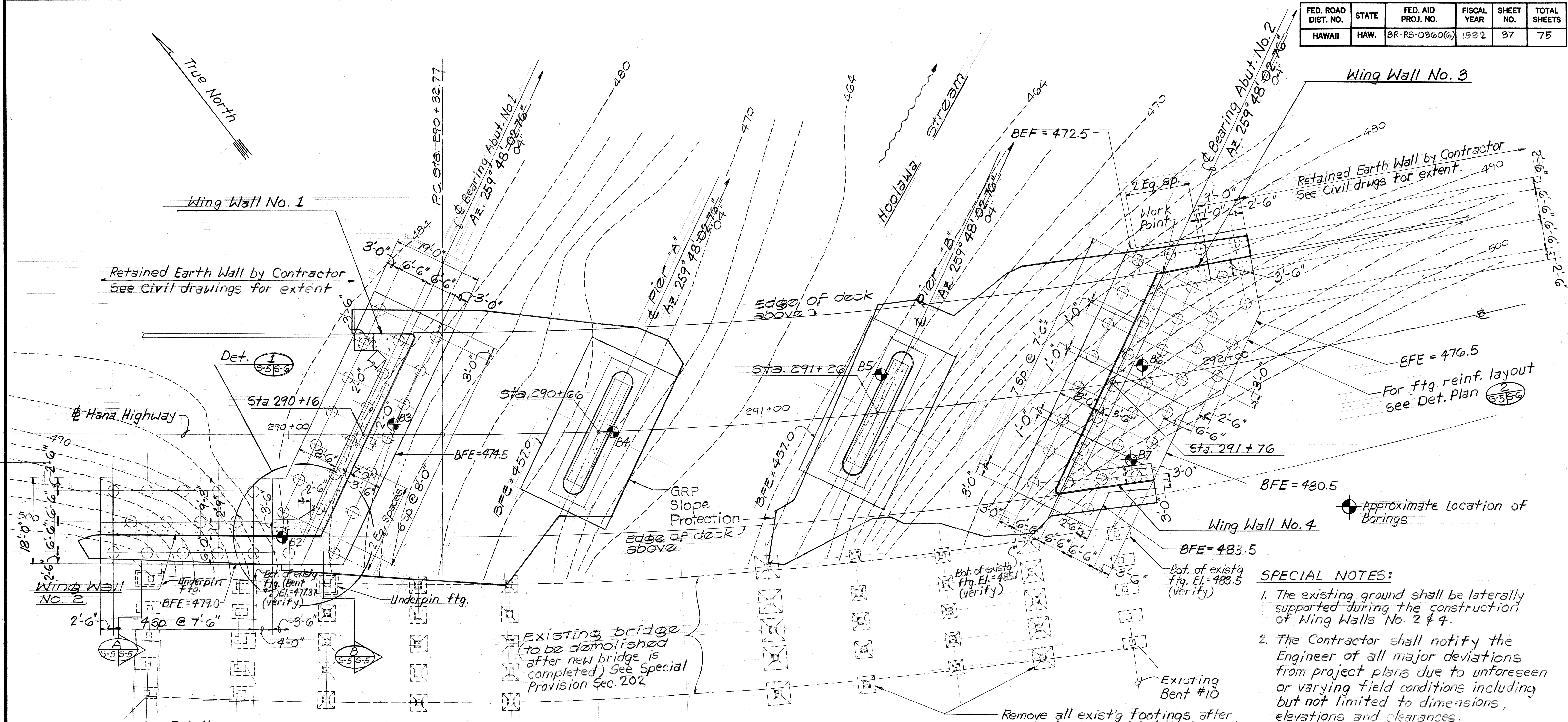
- NOTE:
1. Refer to sht. S-8 for pier cap dimension & reinf. details.
 2. Refer to sht. S-7 for pier column reinf. & details.
 3. Refer to sht. S-6 for pier footing reinf. & details.



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**TYPICAL DECK SECTION
AND PIER "A" & "B"**
ELEVATION
HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)
SCALE: AS NOTED DATE: SEPT., 1991
SHEET NO. S-4 OF S-25 SHEETS

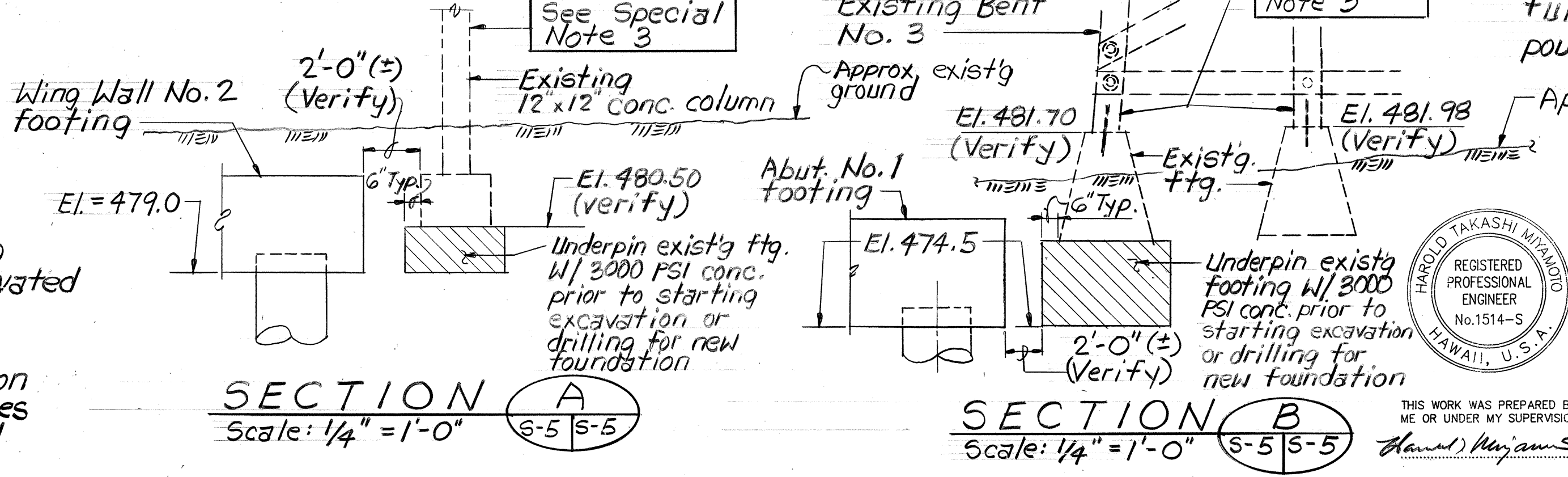
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HAWAII	HAW.	BR-RS-0360(6)	1992	37	75



- FOUNDATION NOTES:**
1. A foundation report entitled "Foundation Investigation, Hoolawa Bridge Replacement, Makawao, Maui, Hawaii, Project No. BR-036-1(6)" dated May 23, 1990 and subsequent addenda has been prepared for this project. A copy of this report is available for review at the State Department of Transportation.
 2. Spread footings shall be excavated and poured to neat lines as called for on the plans. In the event of over-excavation for spread footings, the space between the footing and ground shall be filled with a minimum of Class D concrete at the Contractor's expense and as directed by the Engineer. Over-excavated pile footings may be backfilled to the proper elevation with backfill material approved by the Engineer.
 3. The Contractor is cautioned that boulders, lava tubes and rock dikes are common in Hawaii and may not be indicated in the boring logs. Such possible occurrences including the presence of water table shall be included in the bid and will not be paid for separately.

FOUNDATION PLAN
Scale 1" = 10'-0"



- SPECIAL NOTES:**
1. The existing ground shall be laterally supported during the construction of Wing Walls No. 2 & 4.
 2. The Contractor shall notify the Engineer of all major deviations from project plans due to unforeseen or varying field conditions including but not limited to dimensions, elevations and clearances.
 3. Shore two end columns of existing bridge to support bridge and truck loading until underpin concrete has attained full strength or 7 days after concrete pour, whichever occurs later.

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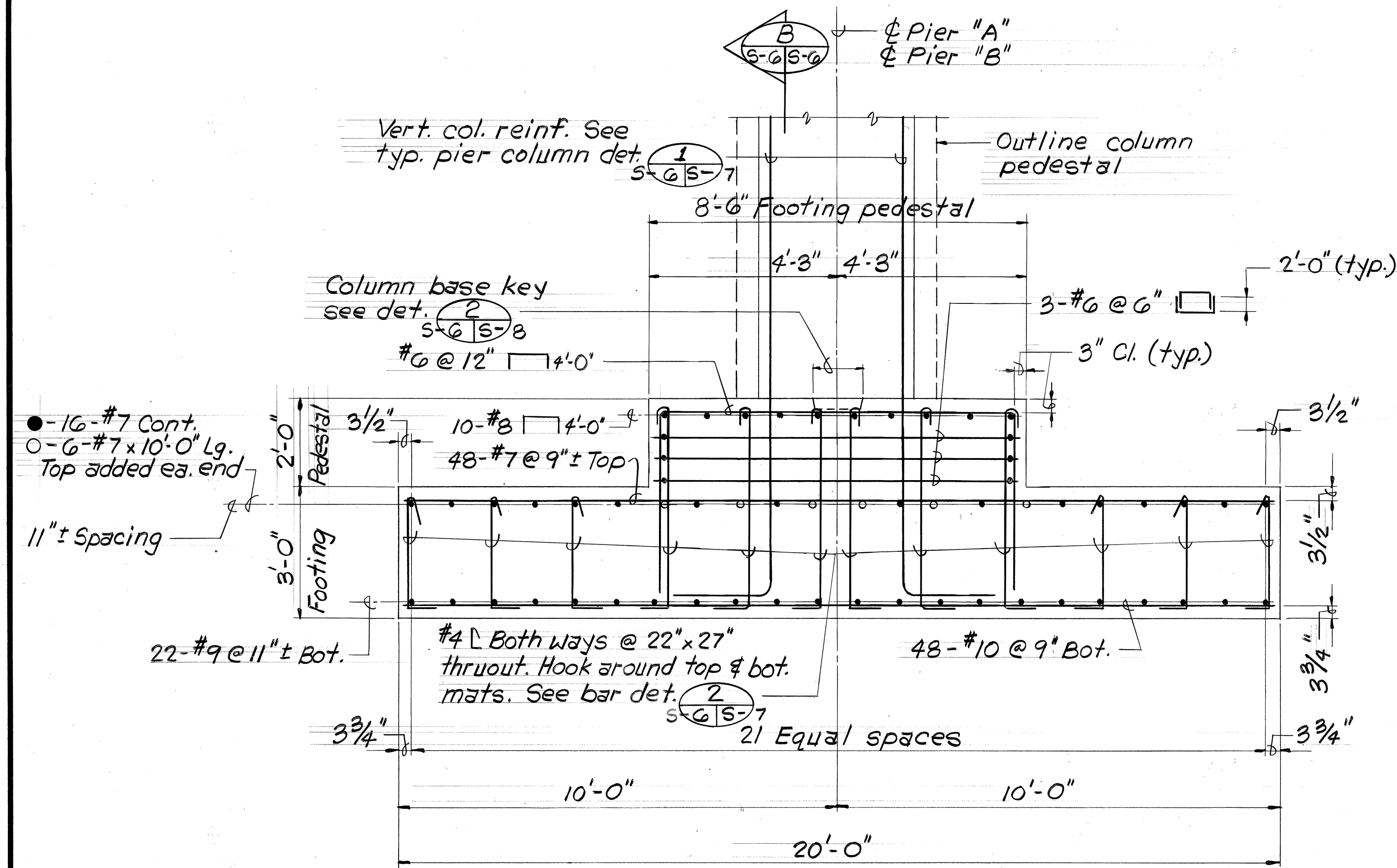
FOUNDATION PLAN

HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)
SCALE: AS NOTED DATE: SEPT., 1991

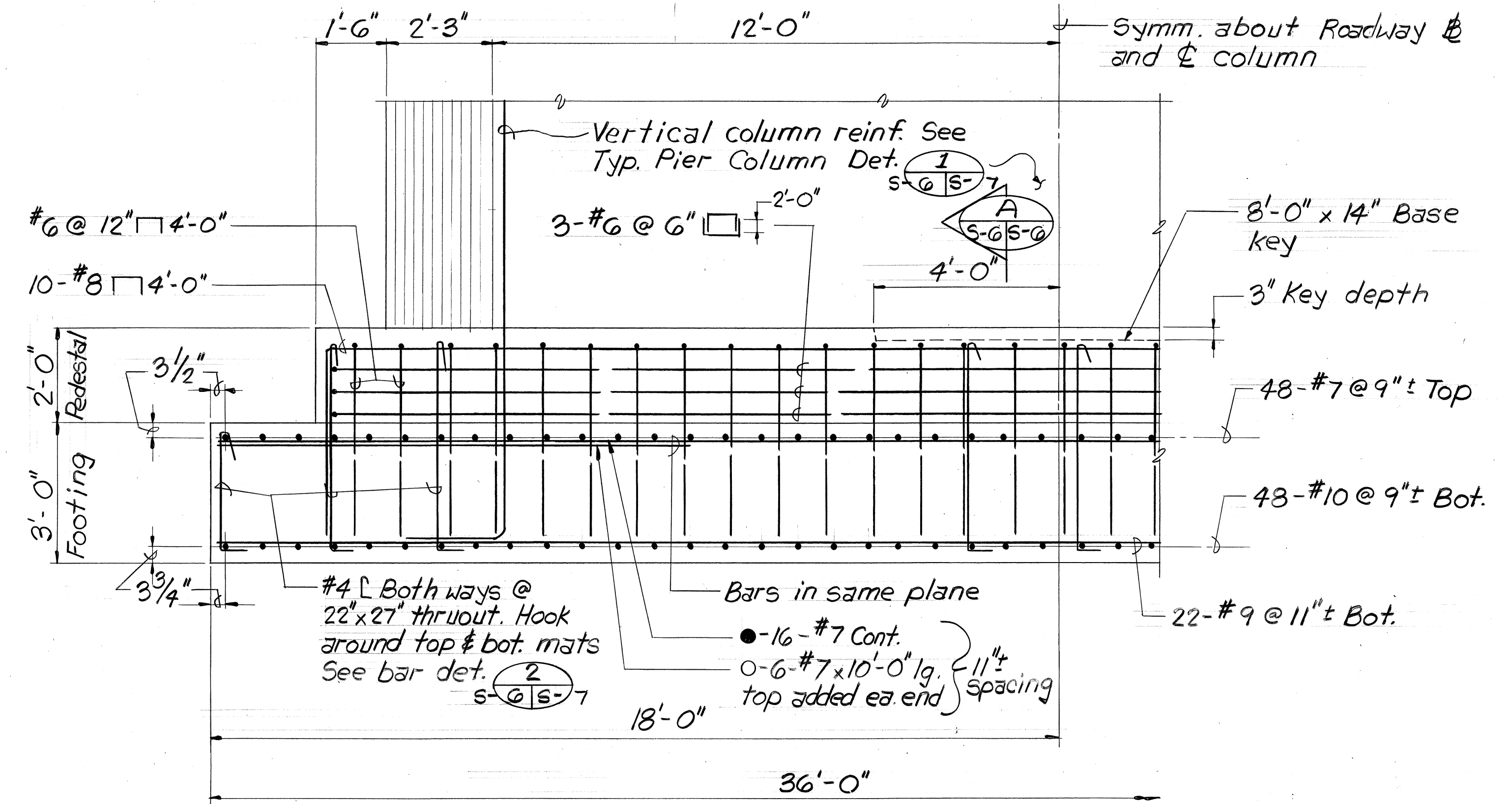
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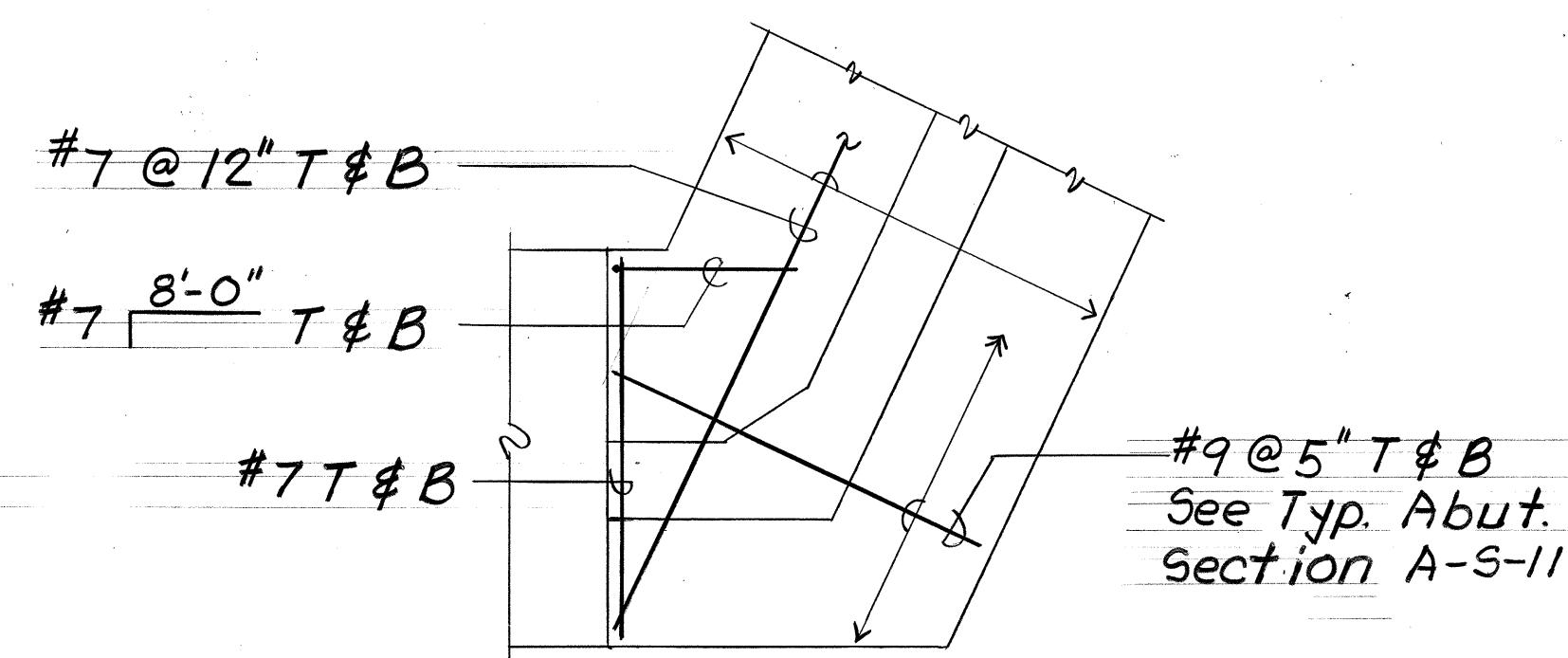
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HAWAII	HAW.	BR-RS-0360(6)	1992	38	75



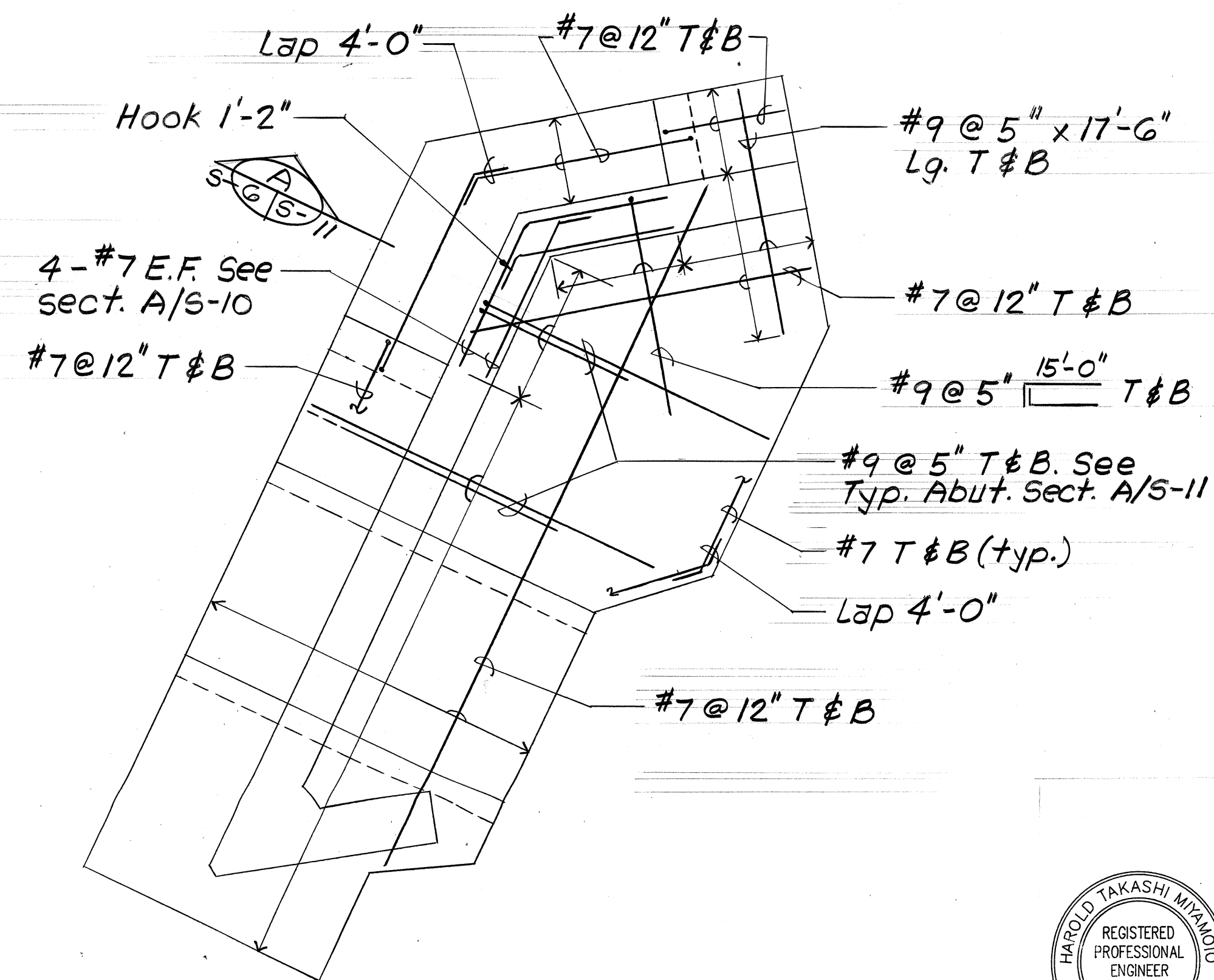
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 Scale: 1/2" = 1'-0"



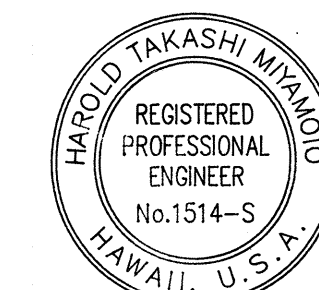
SECTION ~ PIER FOOTING AT PIER "A" & "B" B
 Scale: 1/2" = 1'-0"



DET. PARTIAL PLAN ~ ABUT. #1 REINF. LAYOUT 1
 Scale: 1/8" = 1'-0"



DET. PLAN ~ ABUT. #2 REINF. LAYOUT 2
 Scale: 1/8" = 1'-0"



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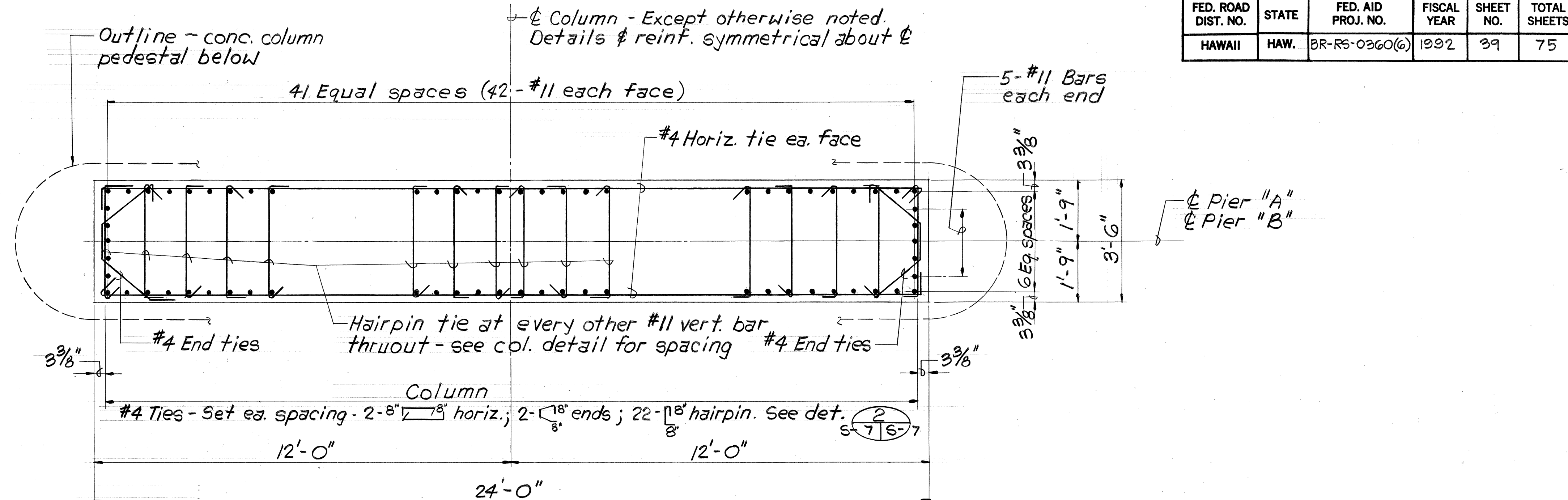
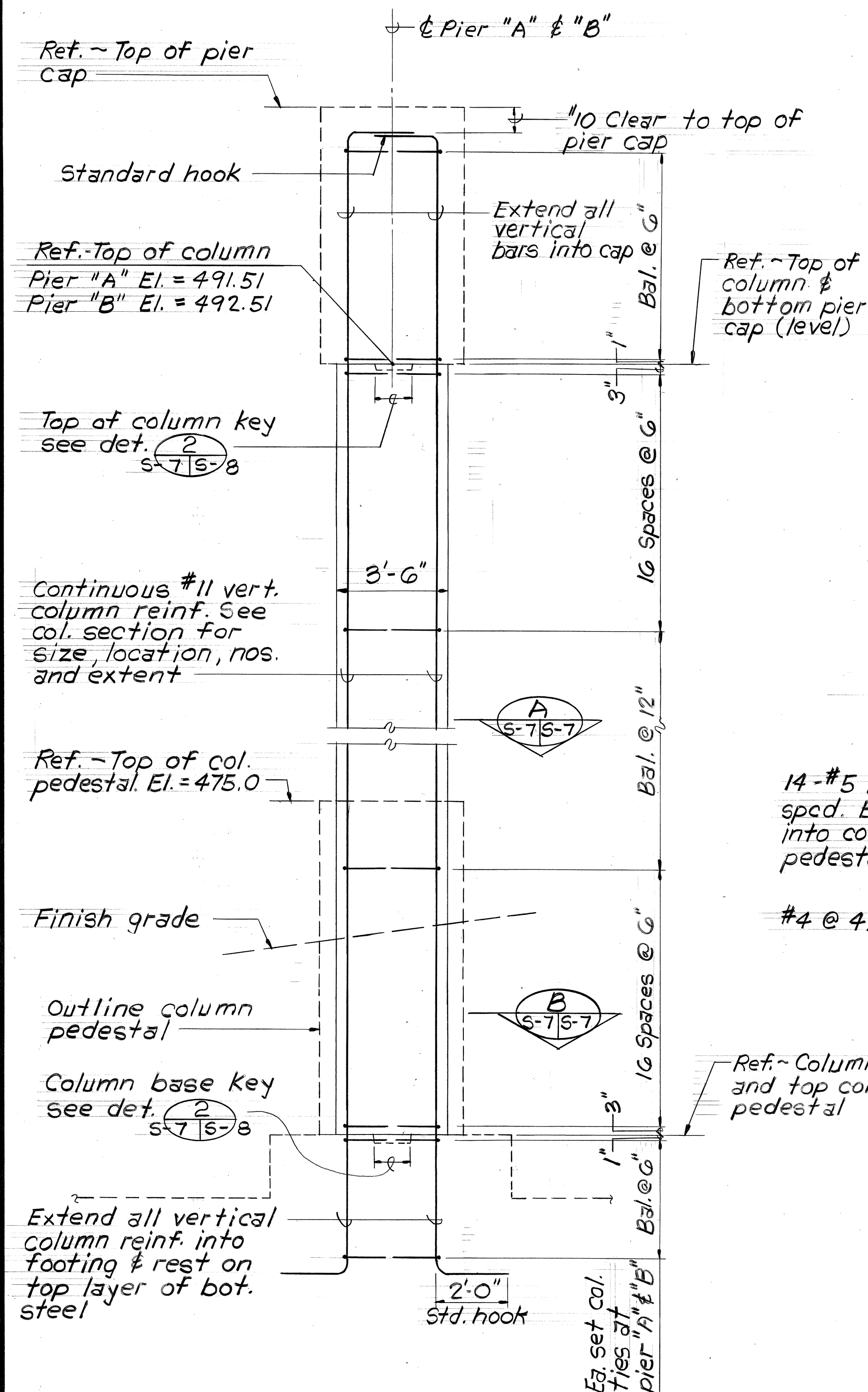
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**PIER FOOTING DETAILS
 AND ABUT. #1 & #2
 REINF. LAYOUT**

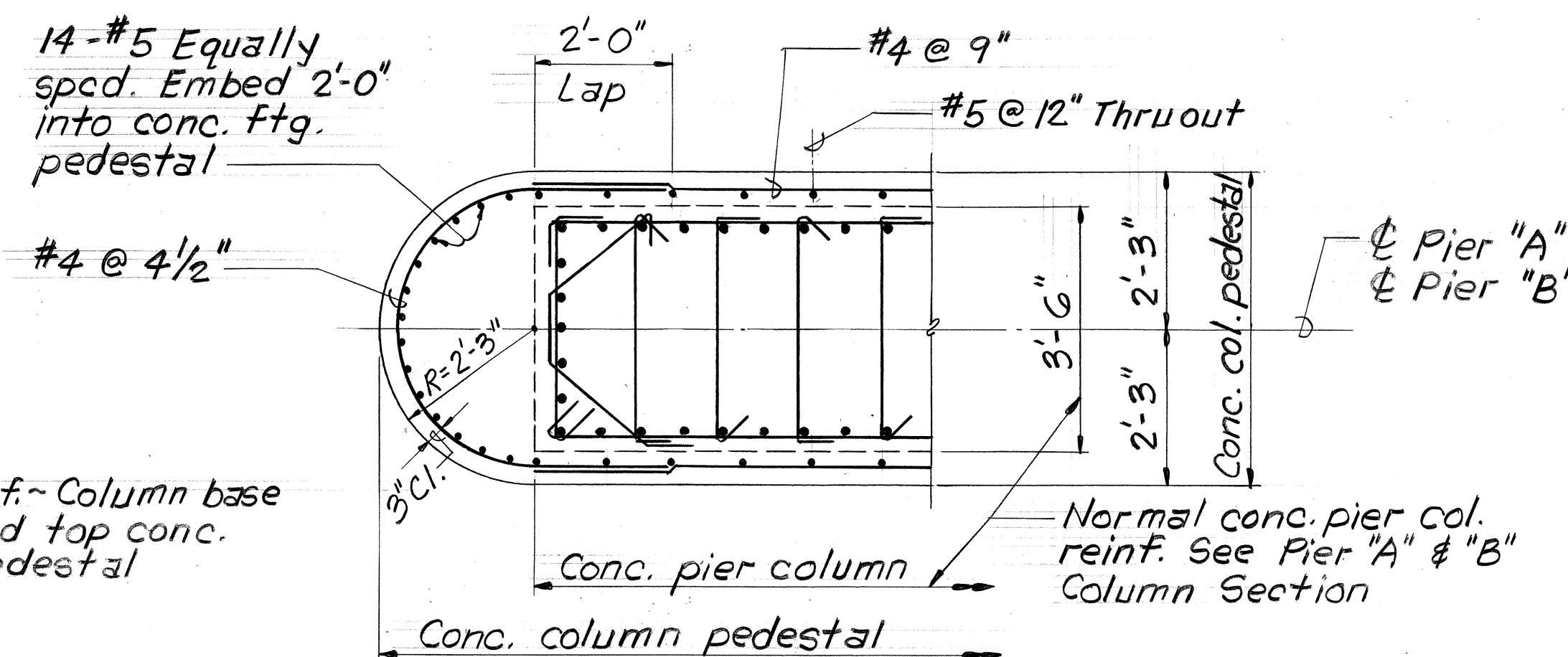
HOOLAWA BRIDGE REPLACEMENT
 HANA HWY., HOOLAWA, MAUI
 PROJECT NO. BR-RS-0360(6)
 SCALE: AS NOTED DATE: SEPT., 1991

SHEET NO. 38 OF 525 SHEETS

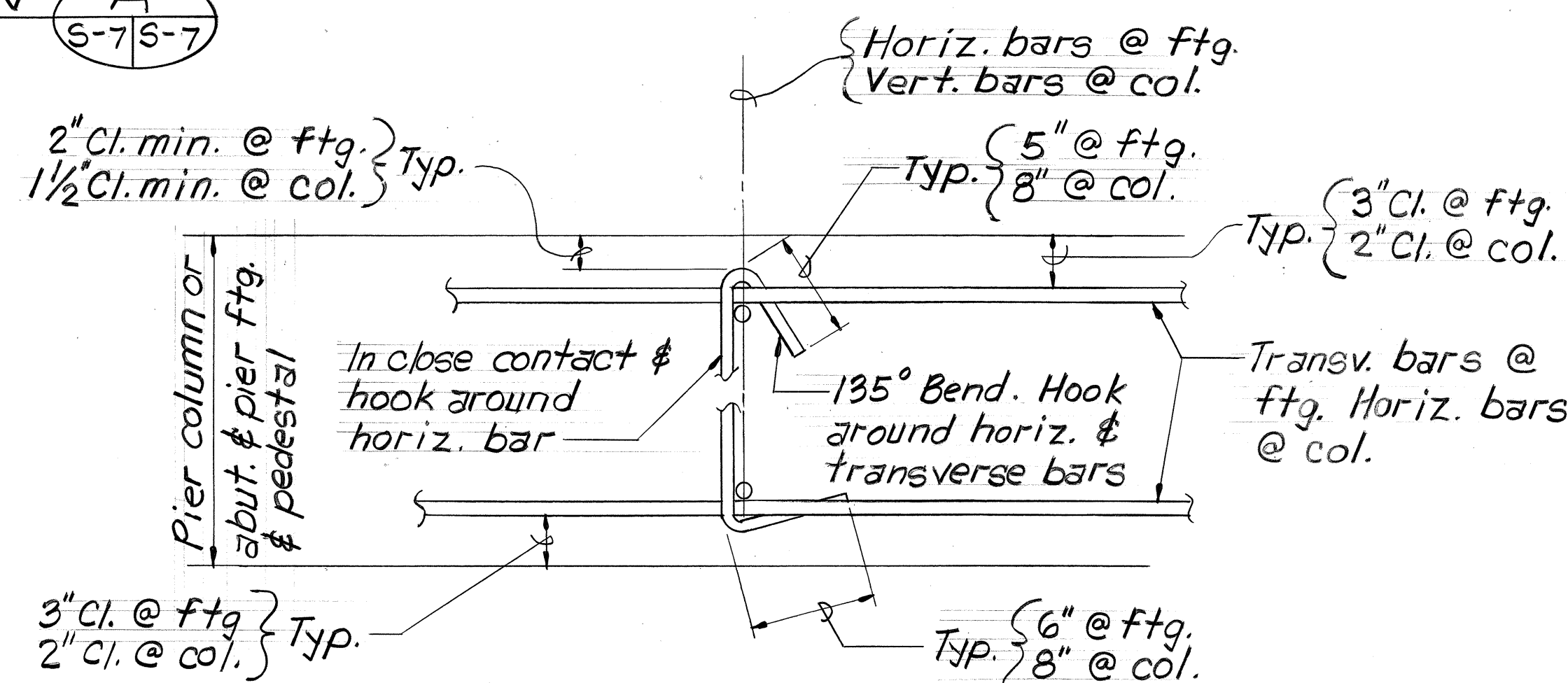
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HAWAII	HAW.	BR-RS-0360(6)	1992	39	75



PIER "A" & "B" COLUMN SECTION



TYPICAL END SECTION
CONCRETE COLUMN PEDESTAL AT PIERS "A" & "B" B
Scale: $1/2" = 1'-0"$ S-7 S-7



TIE BAR DETAIL (2)
Not to scale S-6, S-7

TYPICAL PIER COLUMN DETAIL 1
Not to scale 6-6 6-7

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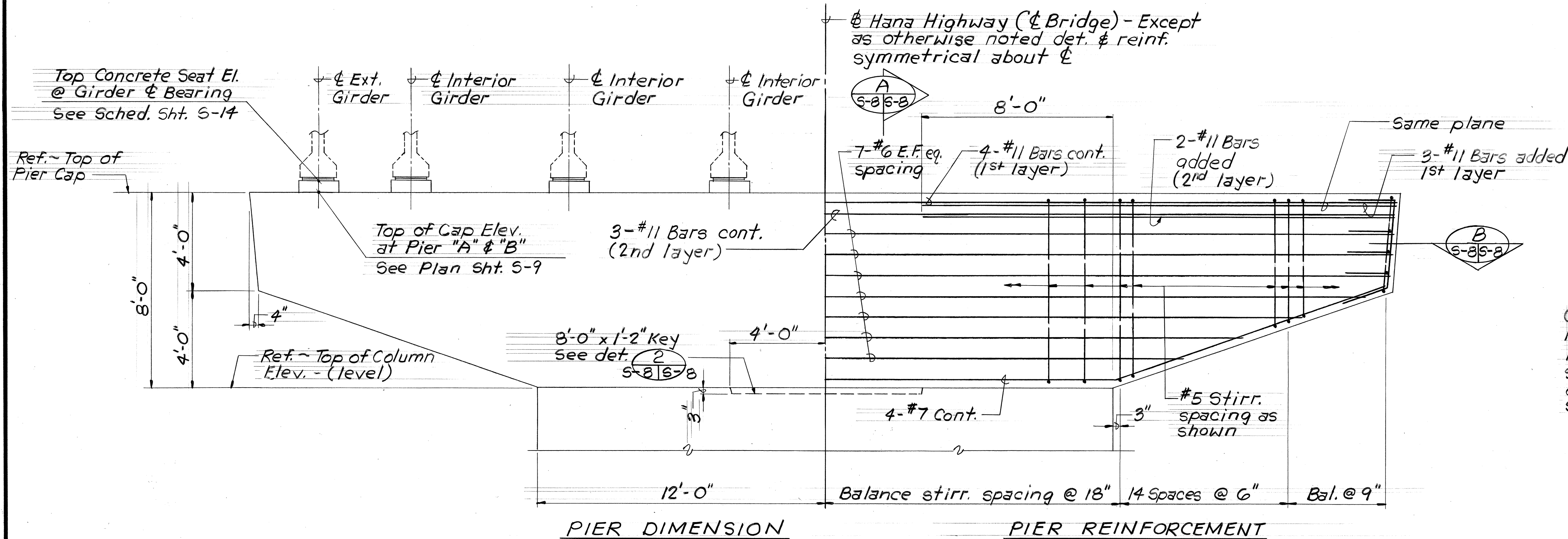
PIER COLUMN DETAILS

HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)

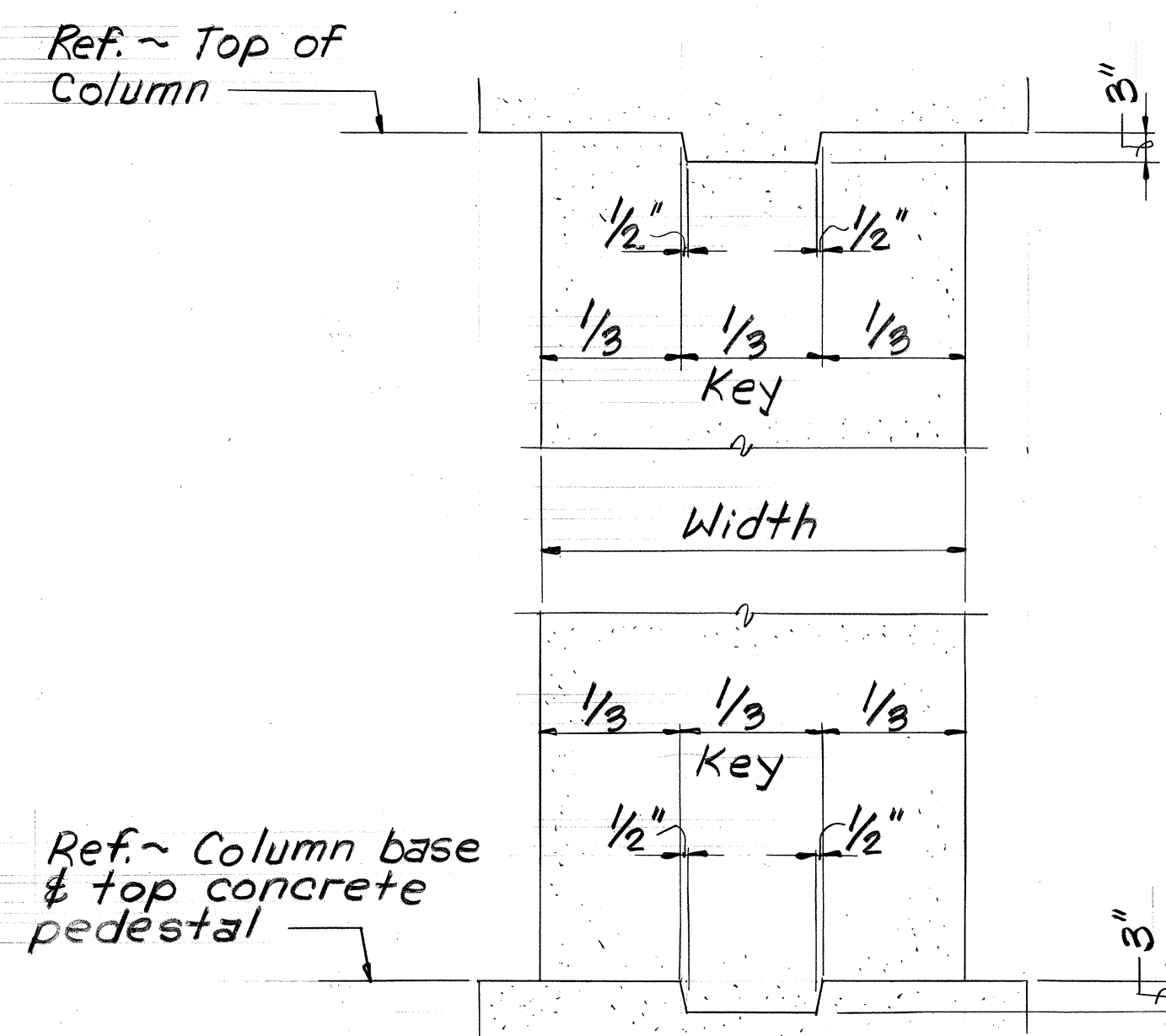
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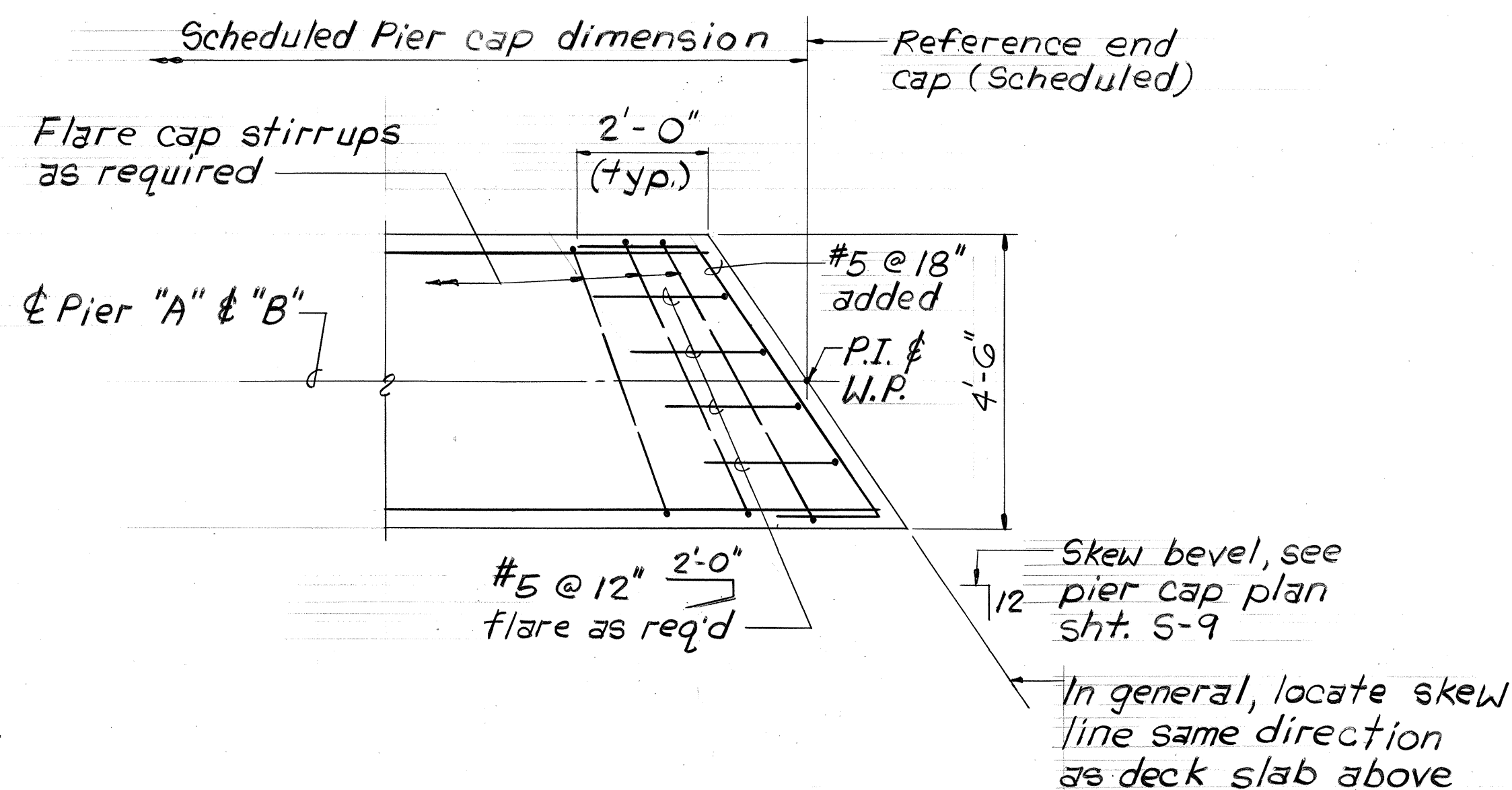
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HAWAII	HAW.	BR-RS-0360(6)	1992	40	75



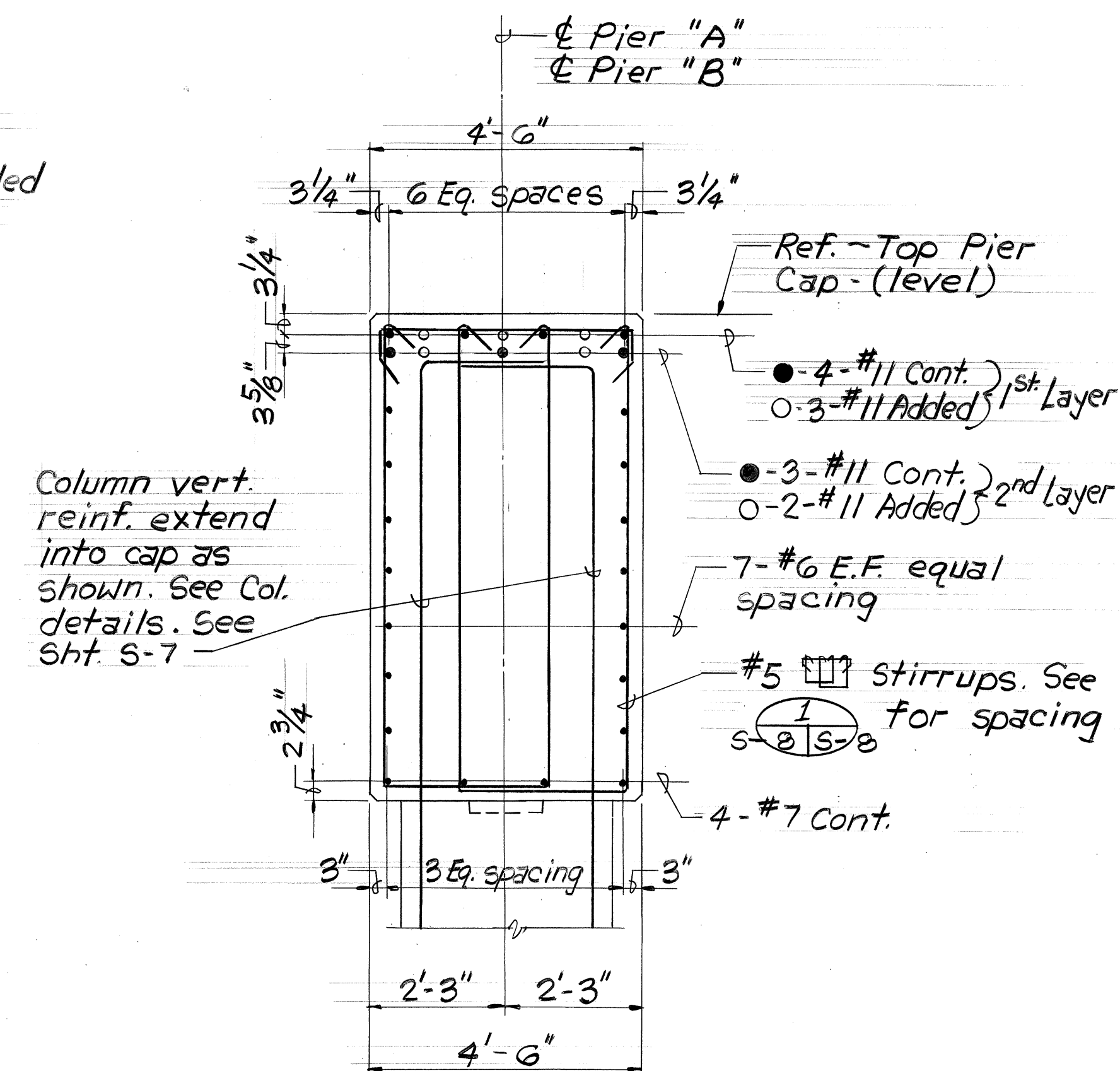
ELEVATION ~ PIER CAP "A" & "B" 1
Scale: 3/8" = 1'-0" 6-8 5-8



TYP. COLUMN KEY DETAIL 2
Scale: 3/4" = 1'-0" 5-6, 5-7, 5-8

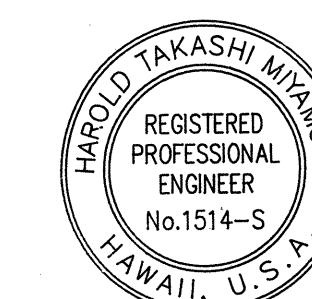


TYPICAL AT HORIZONTAL SKEWED ENDS B
Scale: 1/2" = 1'-0" 6-8 5-8



SECTION A
Scale: 1/2" = 1'-0" 6-8 5-8

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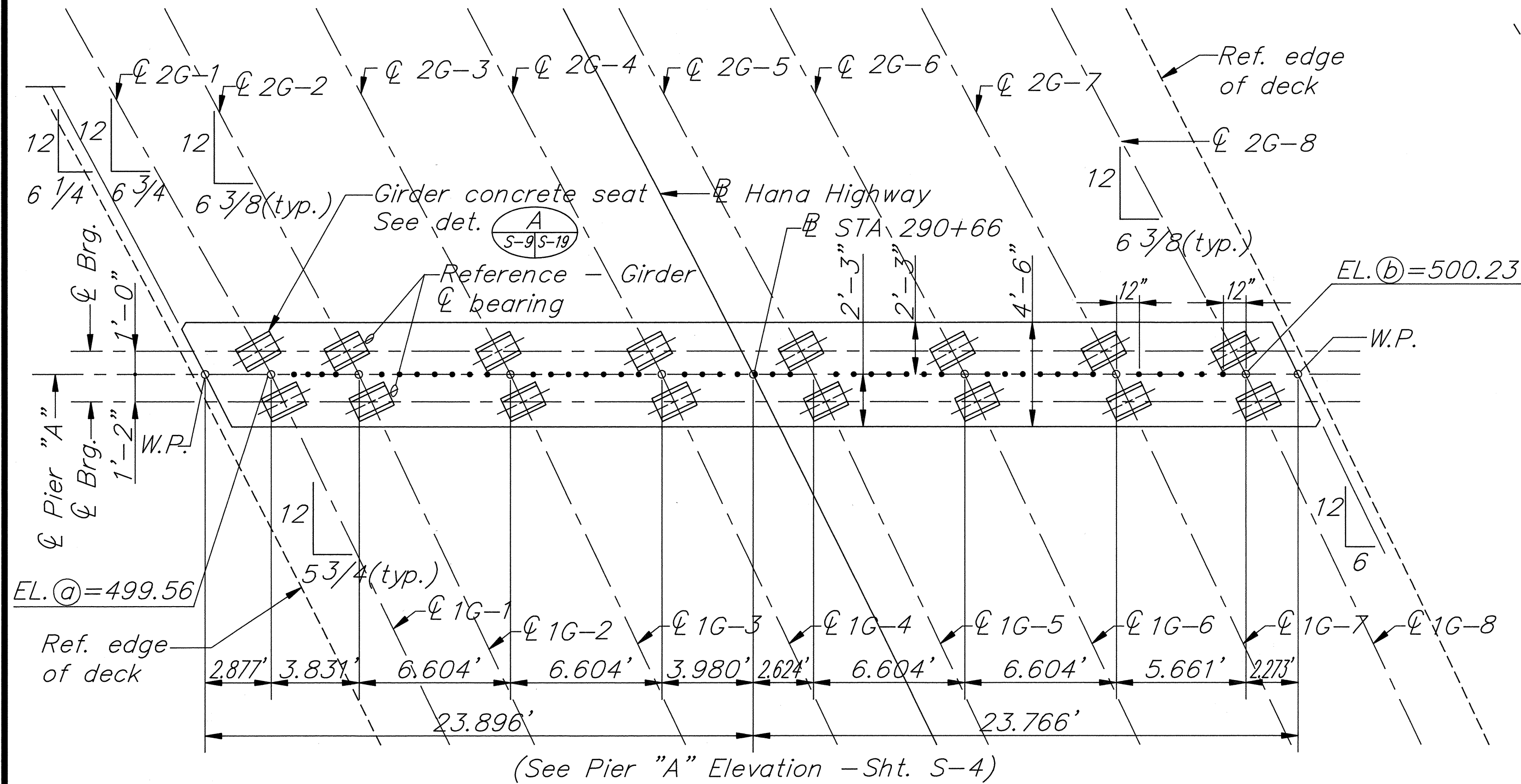
PIER CAP DETAILS

HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)

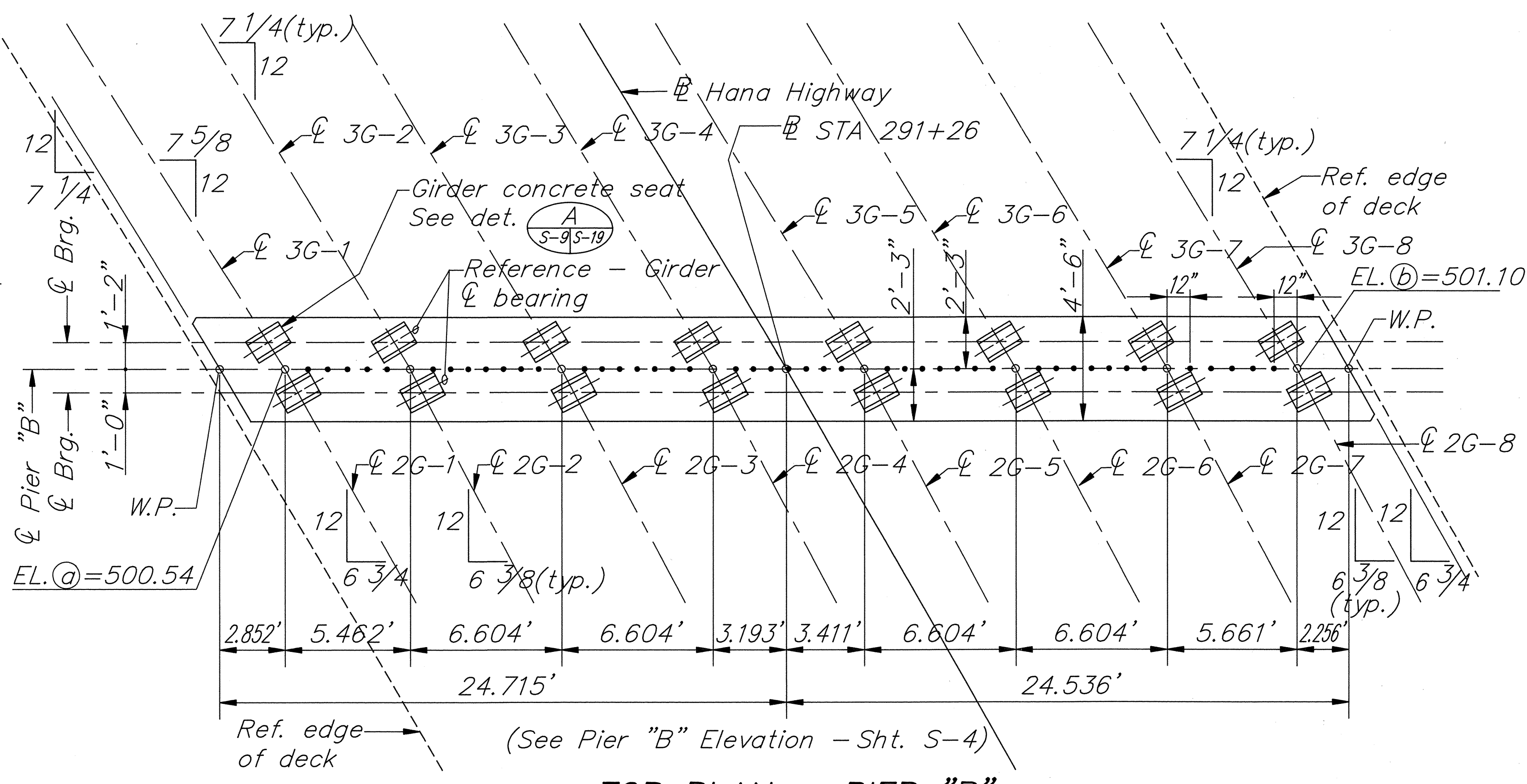
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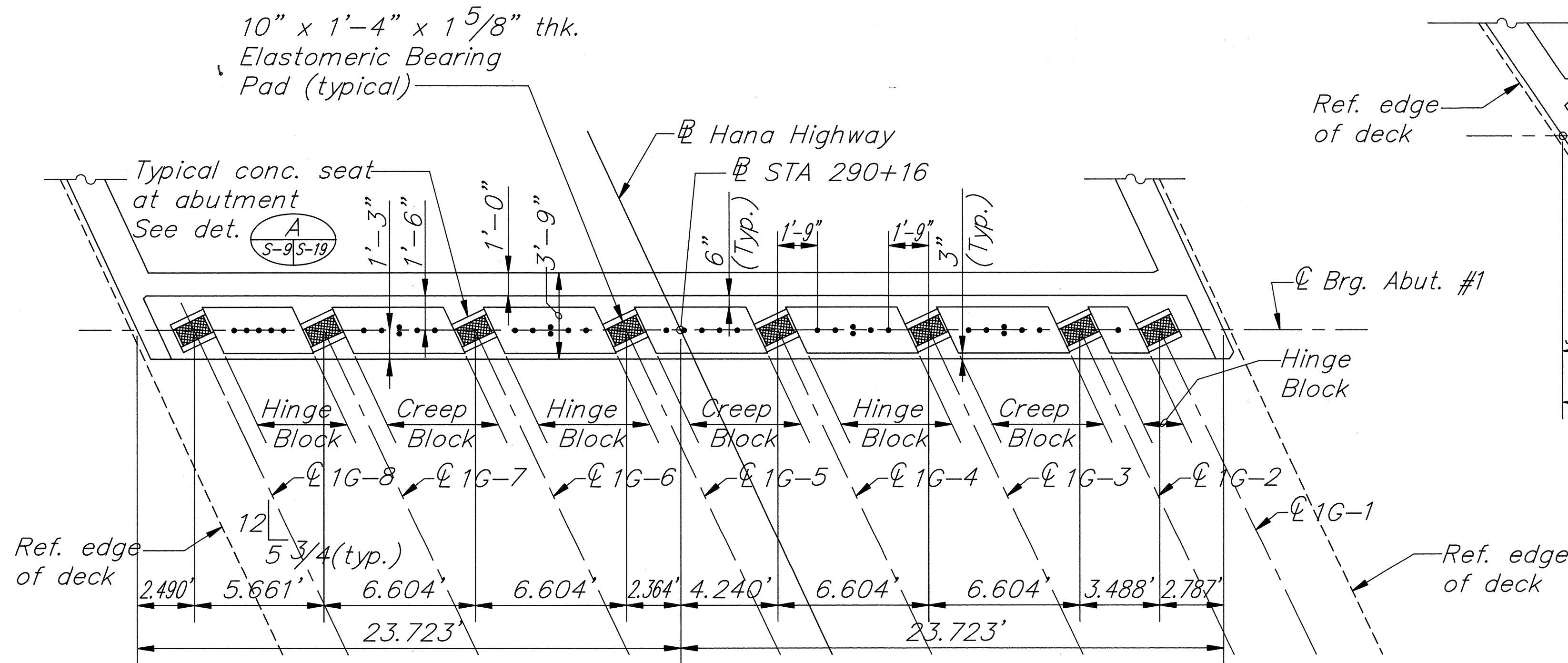
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HAWAII	HAW.	BR-RS-0360(6)	1992	41	75



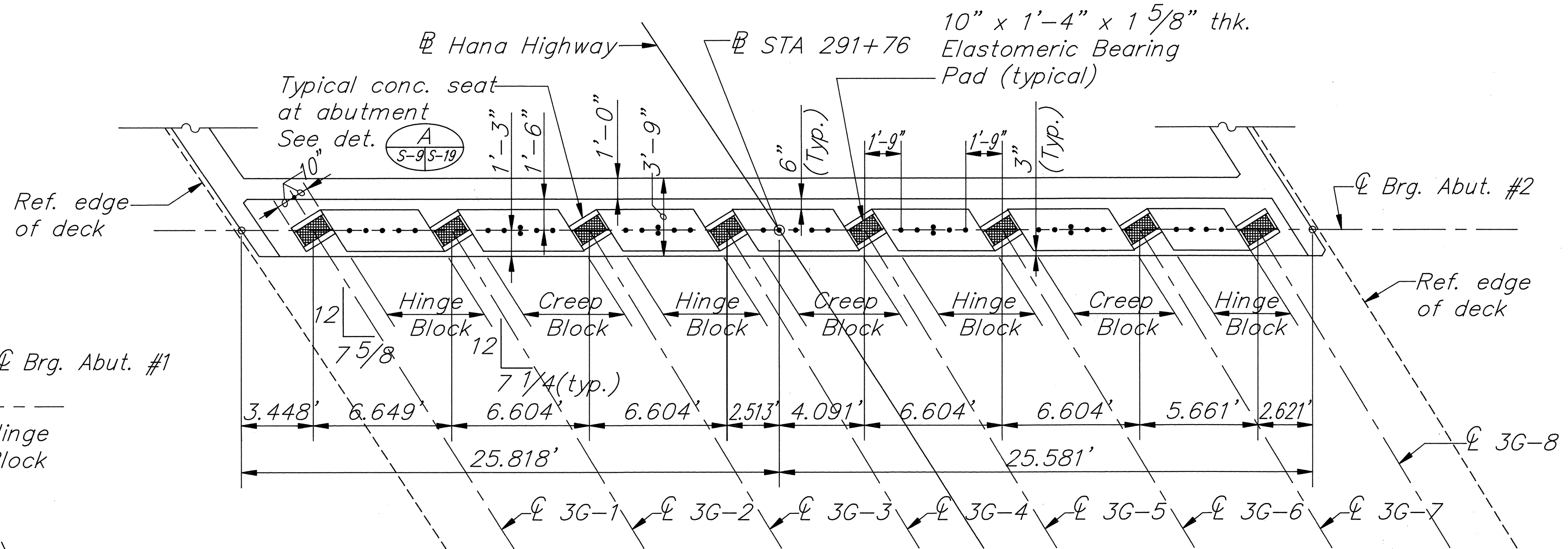
TOP PLAN - PIER "A"
Scale: 1/4"=1'-0"



TOP PLAN - PIER "B"
Scale: 1/4"=1'-0"



TOP PLAN - ABUTMENT #1
Scale: 1/4"=1'-0"



TOP PLAN - ABUTMENT #2
Scale: 1/4"=1'-0"

NOTE:
See Sheet S-14 for bearing pad detail and concrete seat elevations.



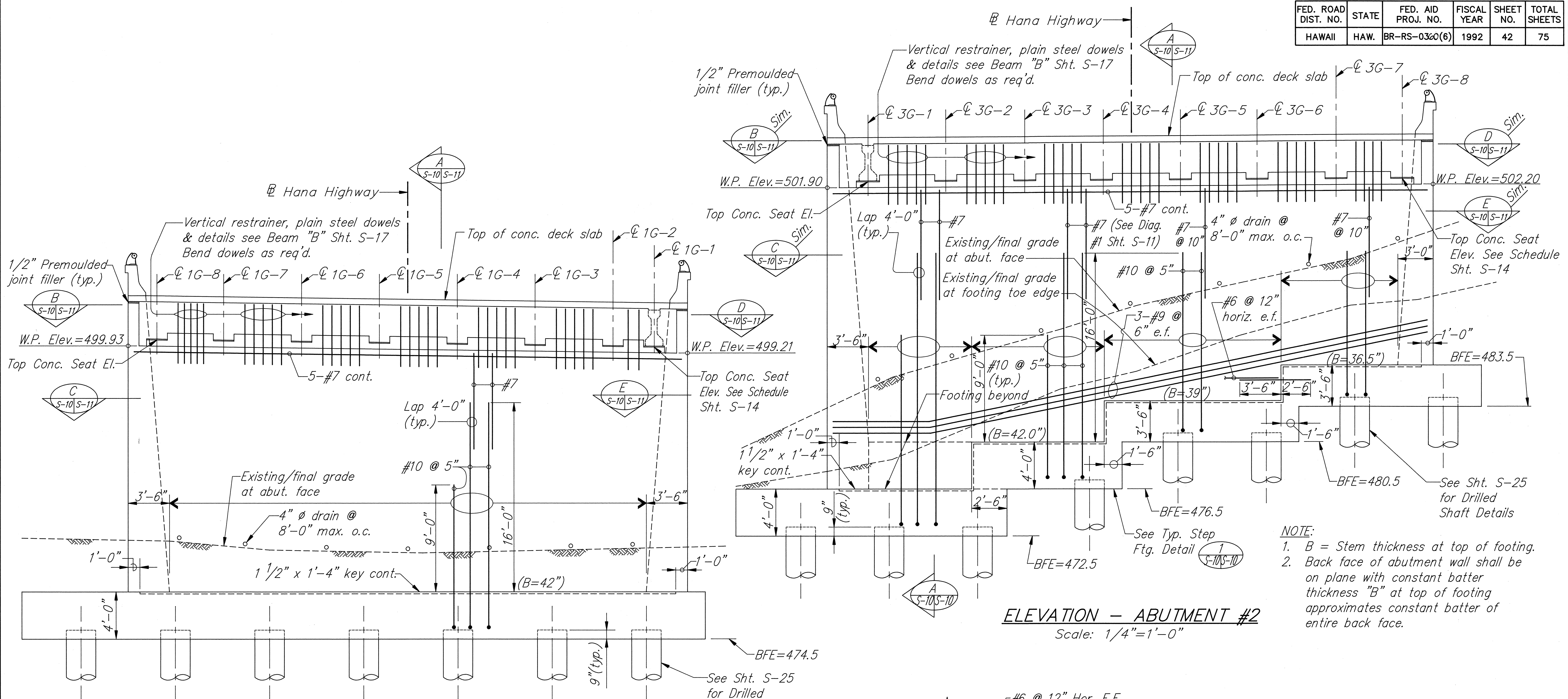
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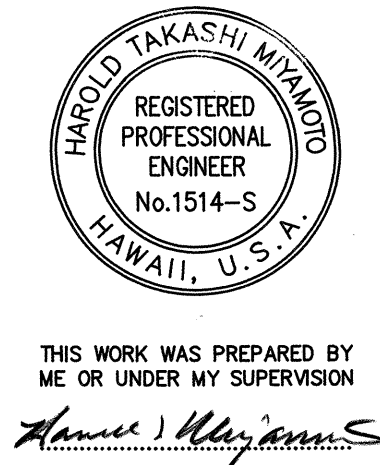
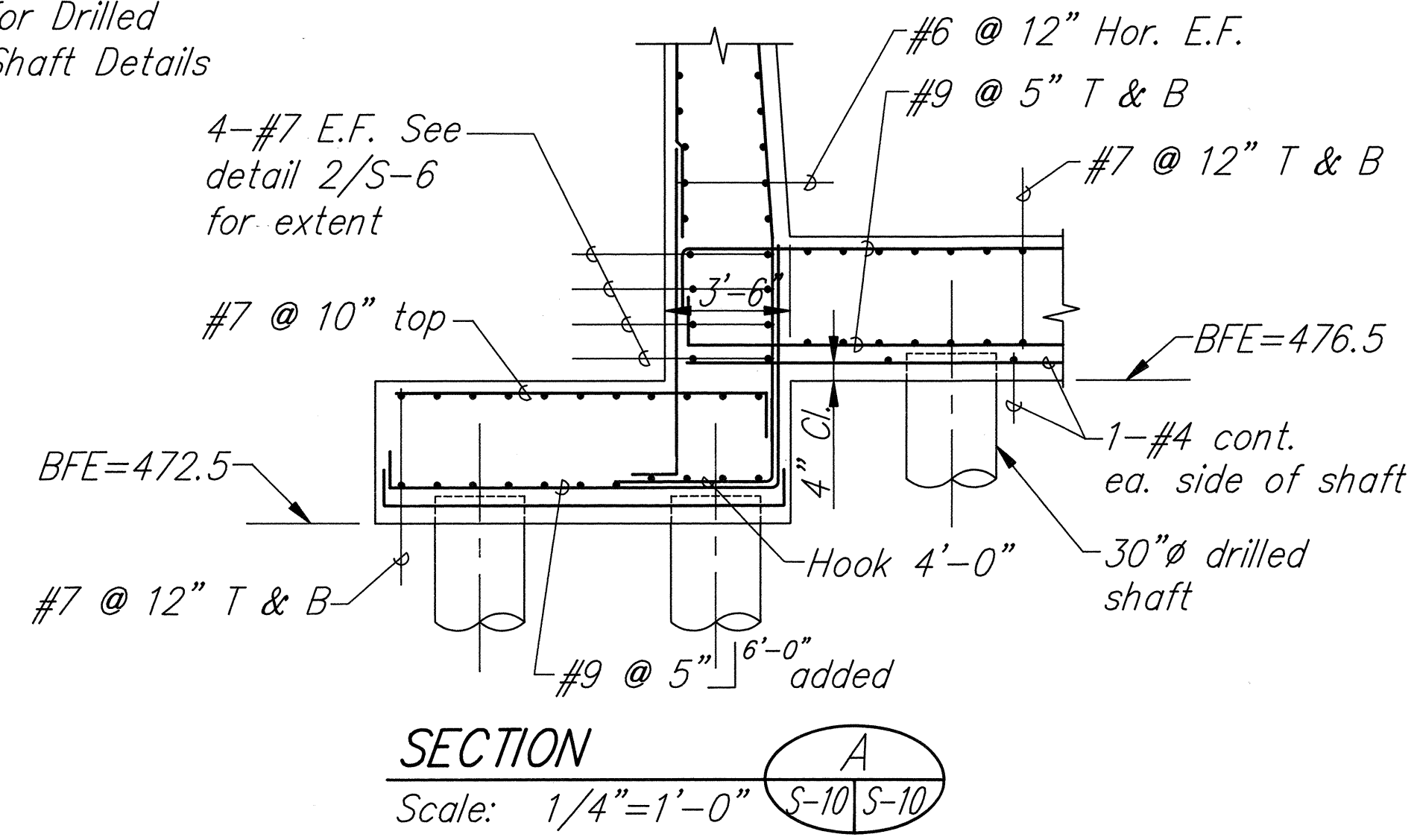
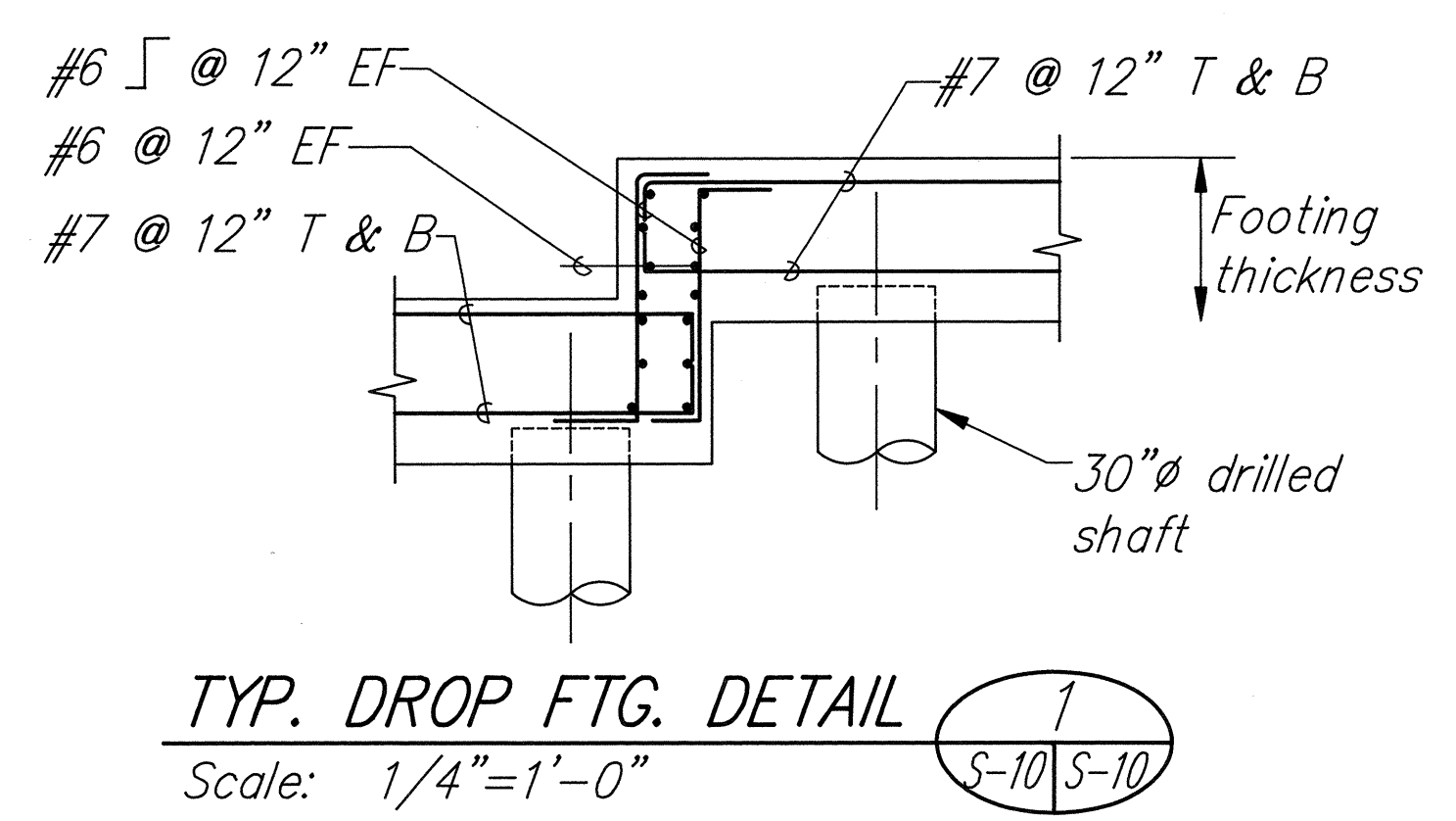
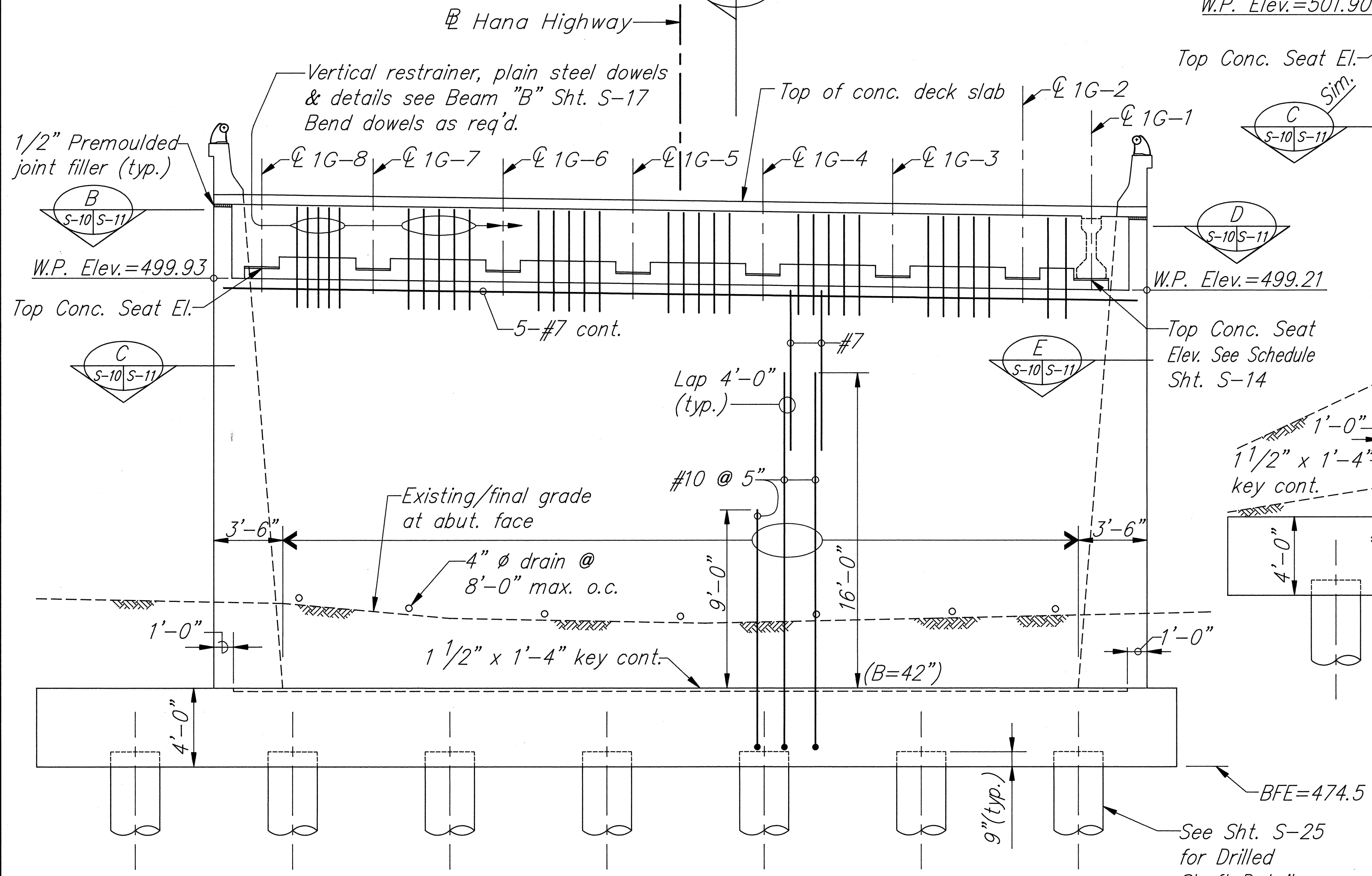
**PIER "A" & "B" AND
ABUT. #1 & #2 SEAT PLAN**
HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)
SCALE: 1/4" = 1'-0" DATE: SEPT., 1991
SHEET NO. S-9 OF S-25 SHEETS

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- NOTE:**
1. B = Stem thickness at top of footing.
 2. Back face of abutment wall shall be on plane with constant batter thickness "B" at top of footing approximates constant batter of entire back face.

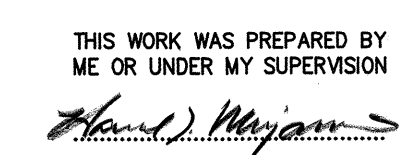


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ABUT. #1 & #2
ELEVATION AND DETAILS
HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
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SCALE: 1/4" = 1'-0" DATE: SEPT., 1991
SHEET NO. S-10 OF S-25 SHEETS

DATE	_____
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No.	_____

NOTE:
Refer to Std. Plan B-03
for Structural Excavation &
Buckfill Pay Limits



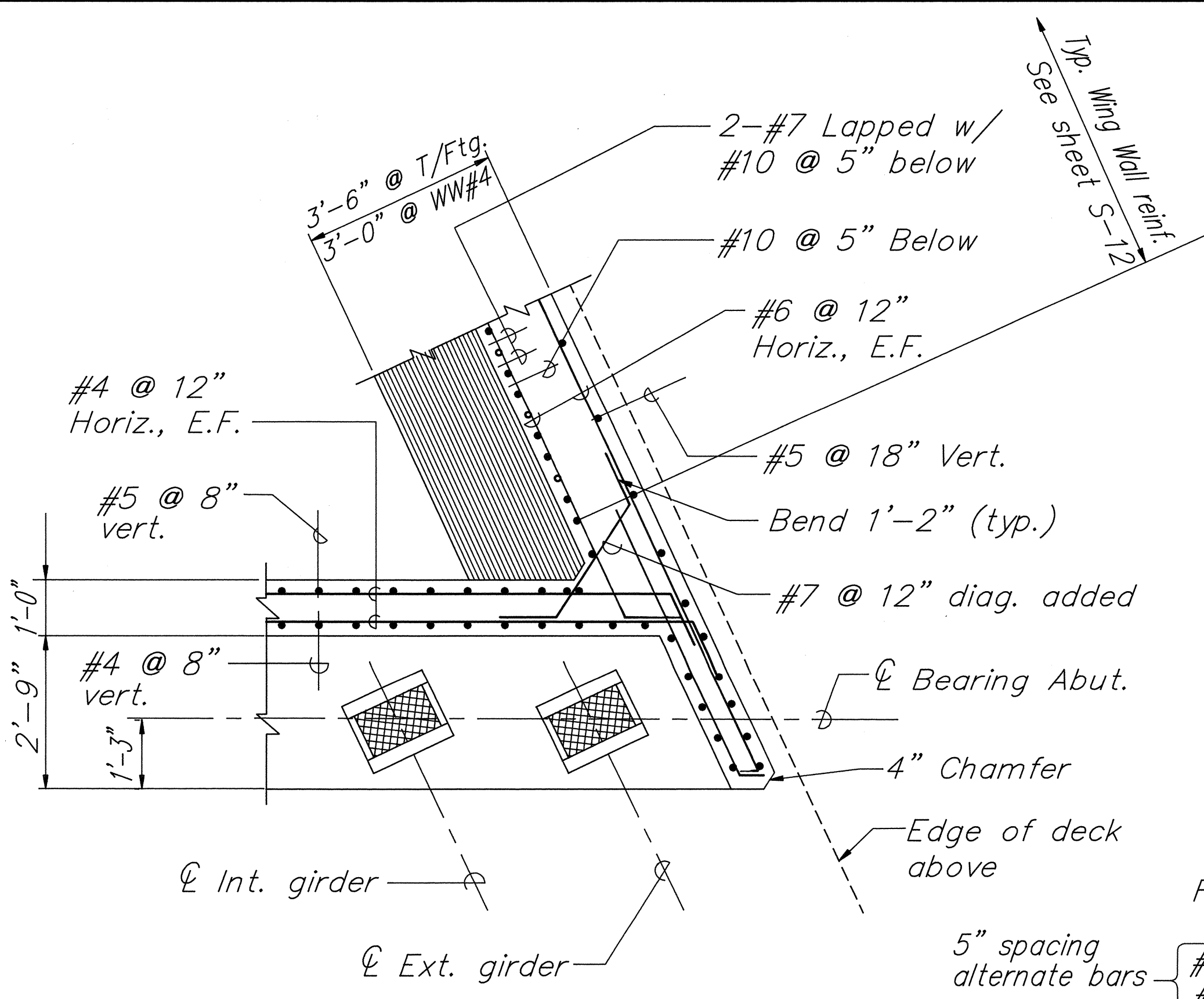
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TYPICAL ABUTMENT
SECTIONS

HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)

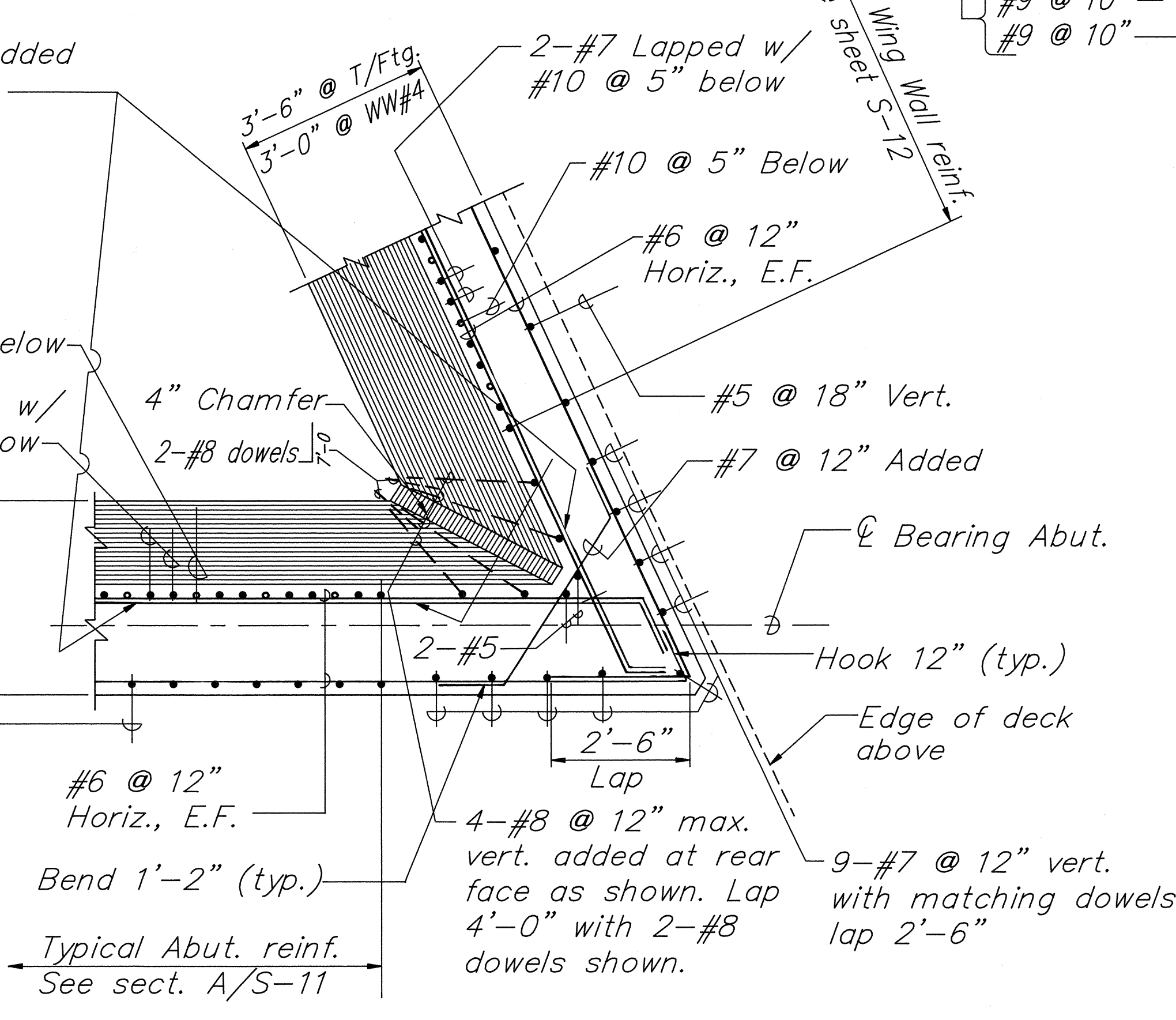
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SHEET NO. S-110F5-25 SHEETS



SECTION D

Scale: 1/2" = 1'-0" S-10 | S-11

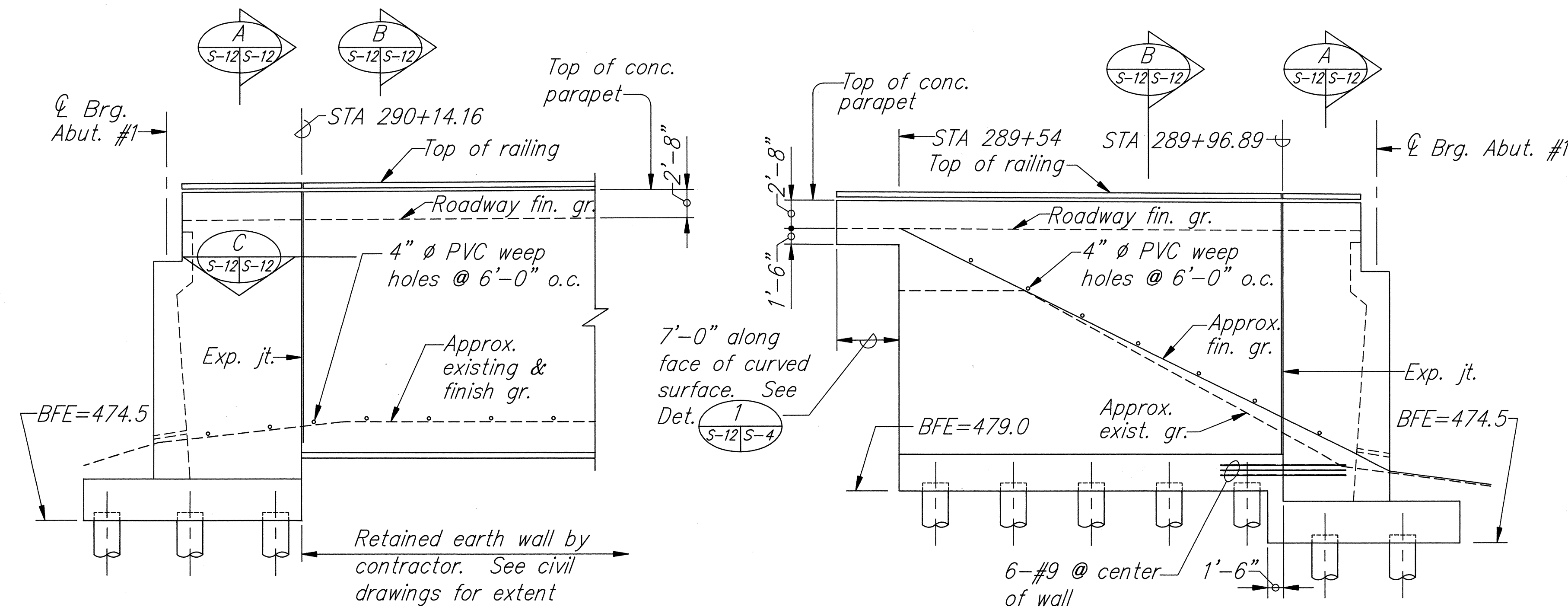


SECTION E

Scale: $1/2" = 1'-0"$ S-10 | S-11

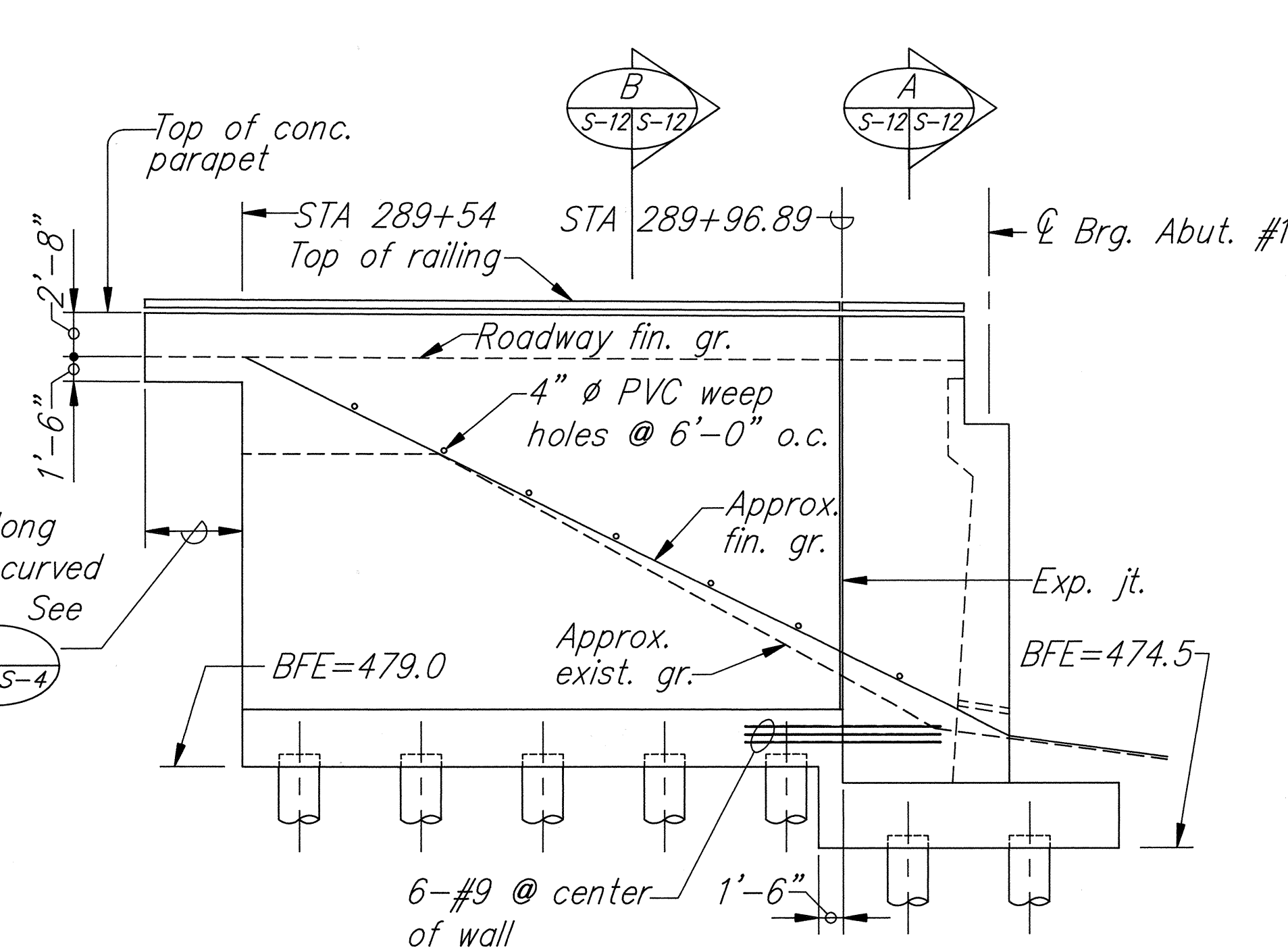
ORIGINAL PLAN	SURVEY PLOTTED BY _____	DATE _____
NOTE BOOK	DRAWN BY _____	" _____
	TRACED BY _____	" _____
	DESIGNED BY _____	" _____
	QUANTITIES BY _____	" _____
No. _____	CHECKED BY _____	" _____

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-RS-0360(6)	1992	44	75



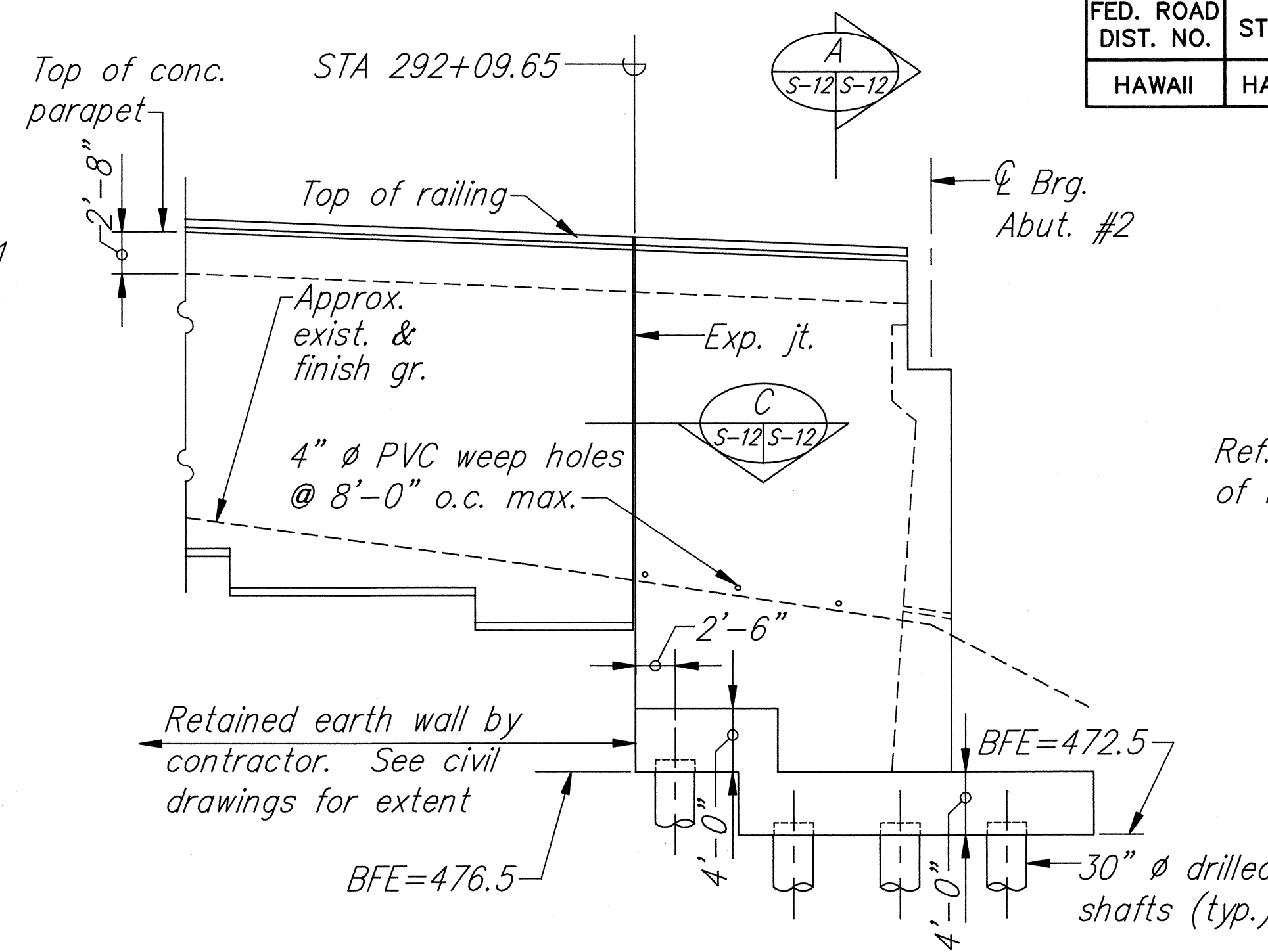
WING WALL #1 ELEVATION

Scale: $1/8" = 1' - 0"$



WING WALL #2 ELEVATION

Scale: $1/8" = 1' - 0"$



WING WALL #3 ELEVATION

Scale: $1/8" = 1' - 0"$

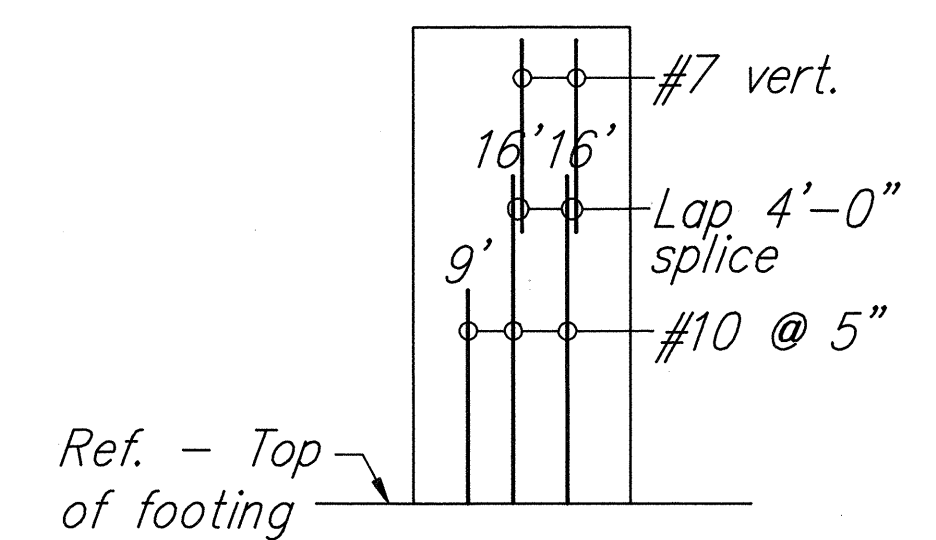


DIAGRAM 1

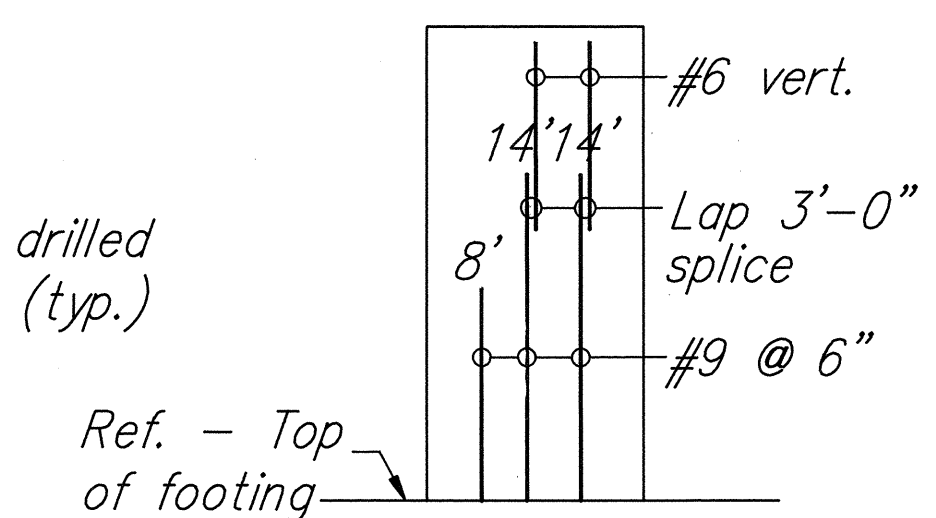
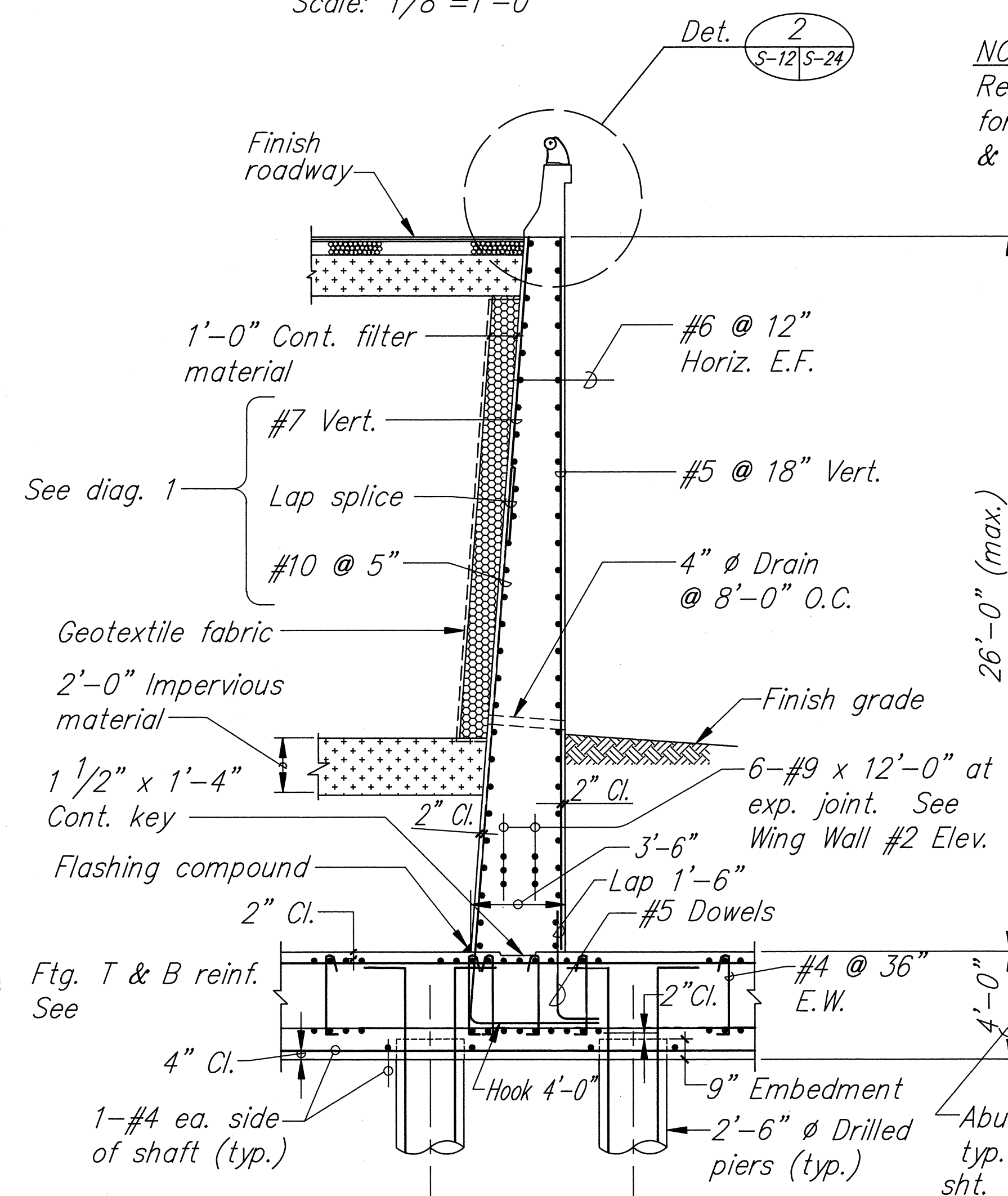


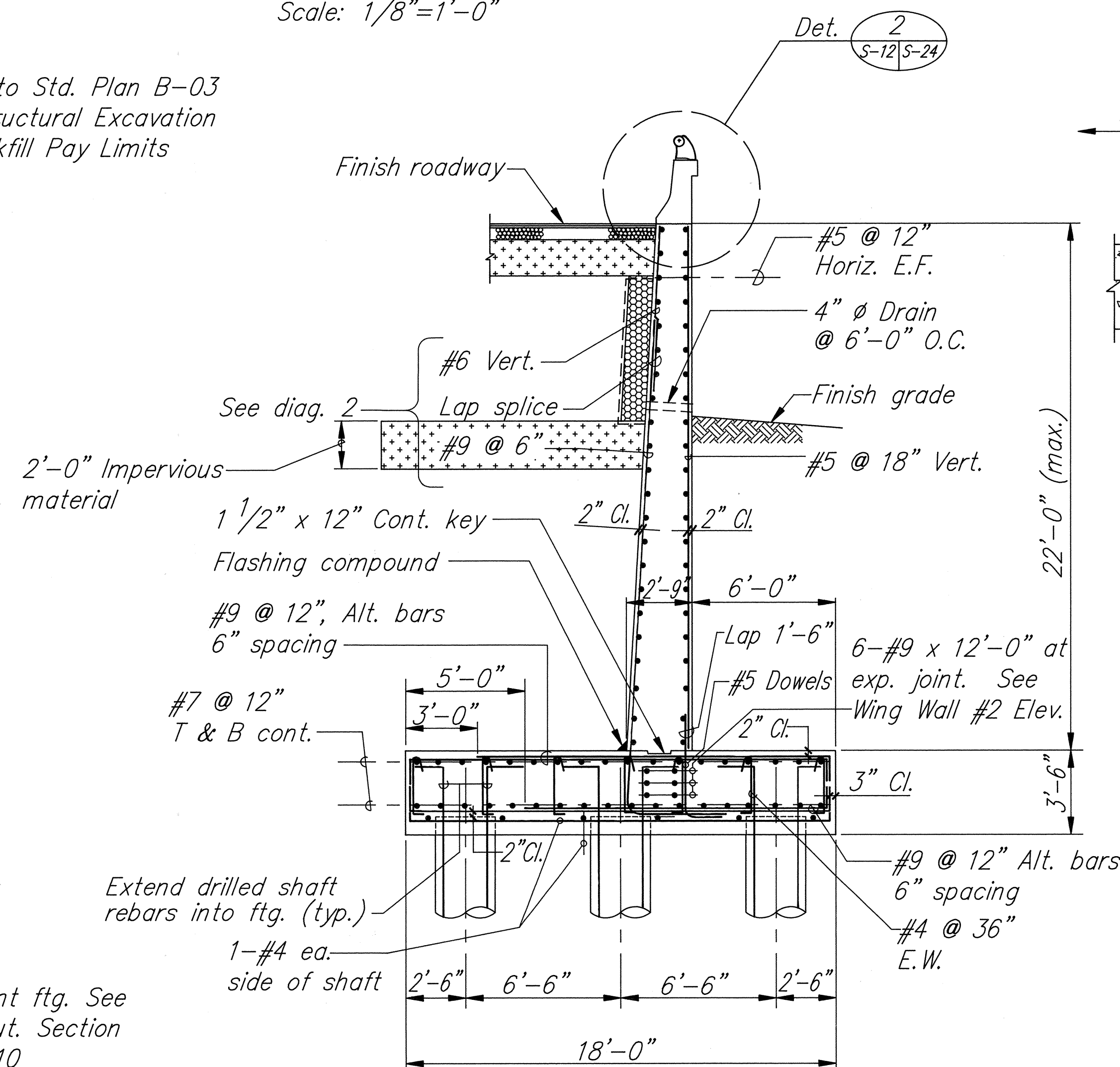
DIAGRAM 2

NOTE:
Refer to Std. Plan B-03
for Structural Excavation
& Backfill Pay Limits



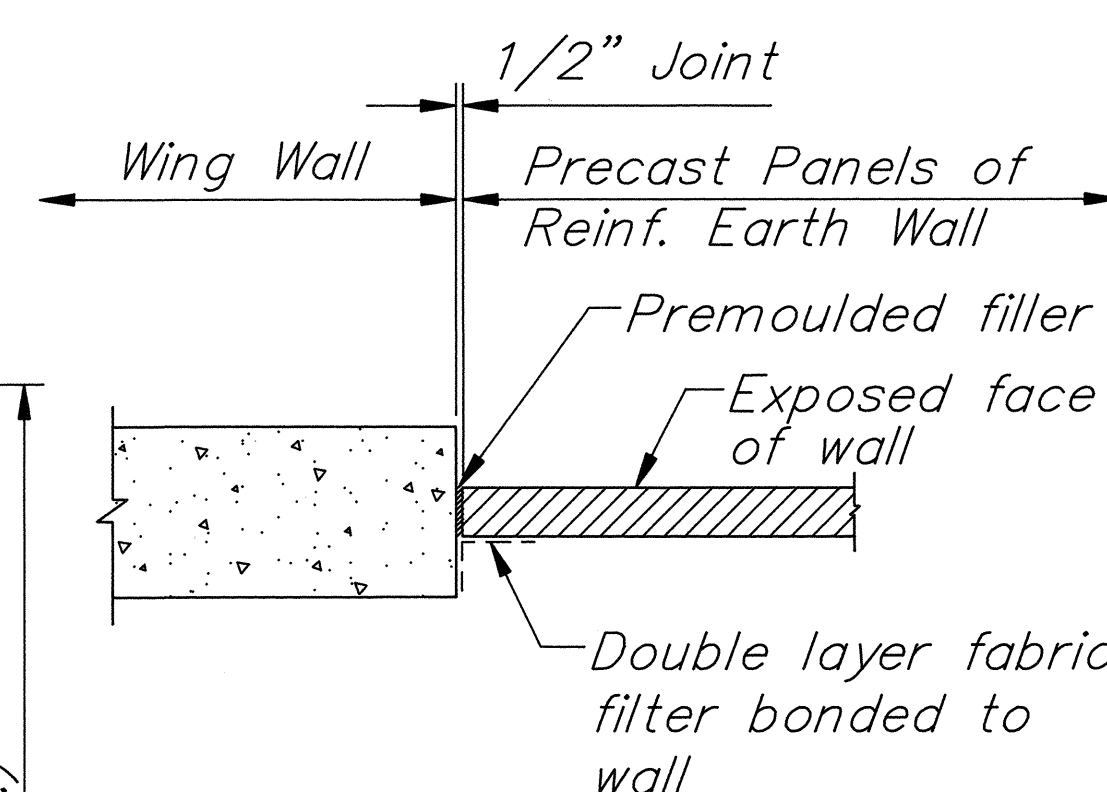
TYPICAL WING WALL SECTION

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



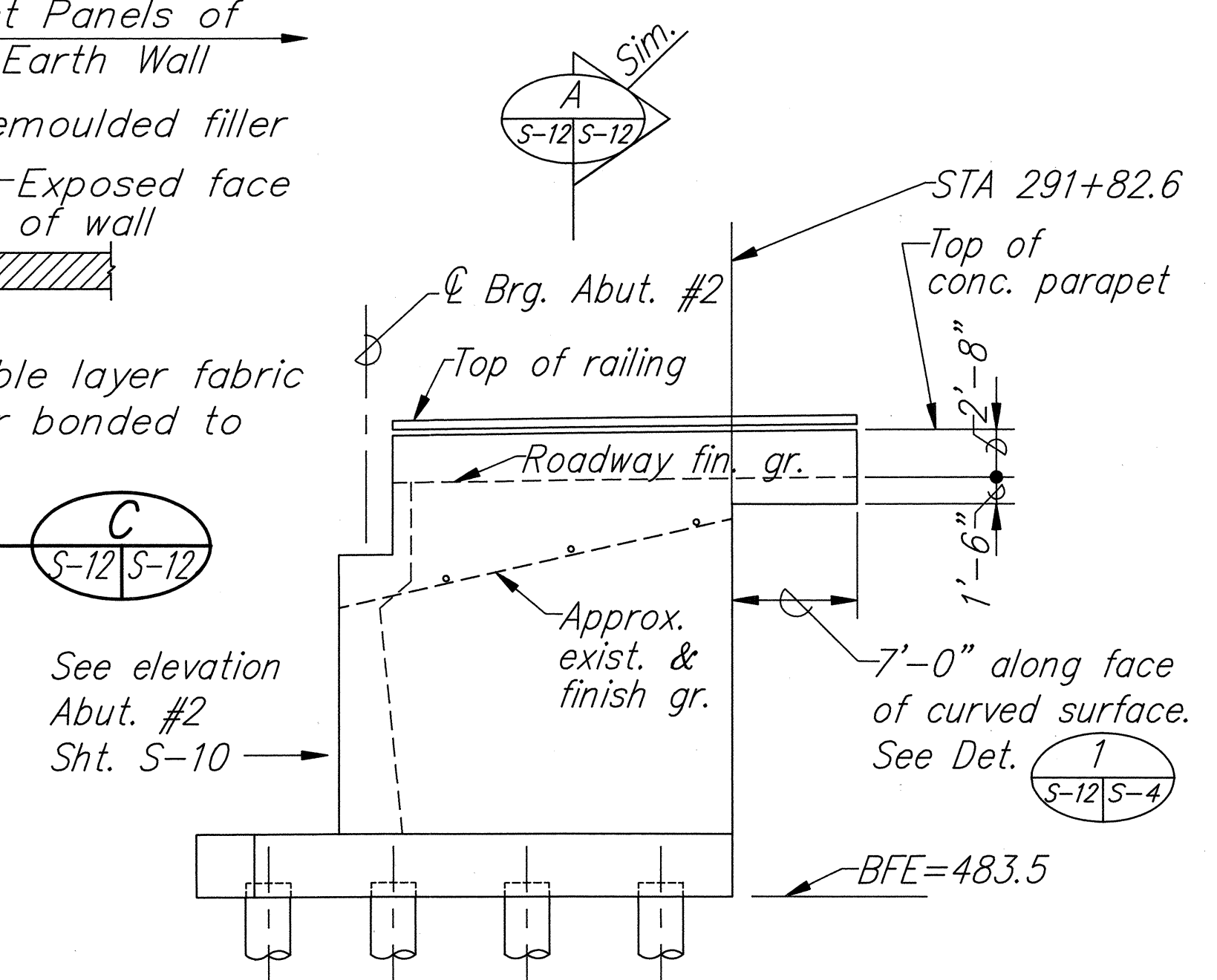
TYPICAL WING WALL SECTION

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



SECTION

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



WING WALL #4 ELEVATION

Scale: $1/8" = 1'-0"$



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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

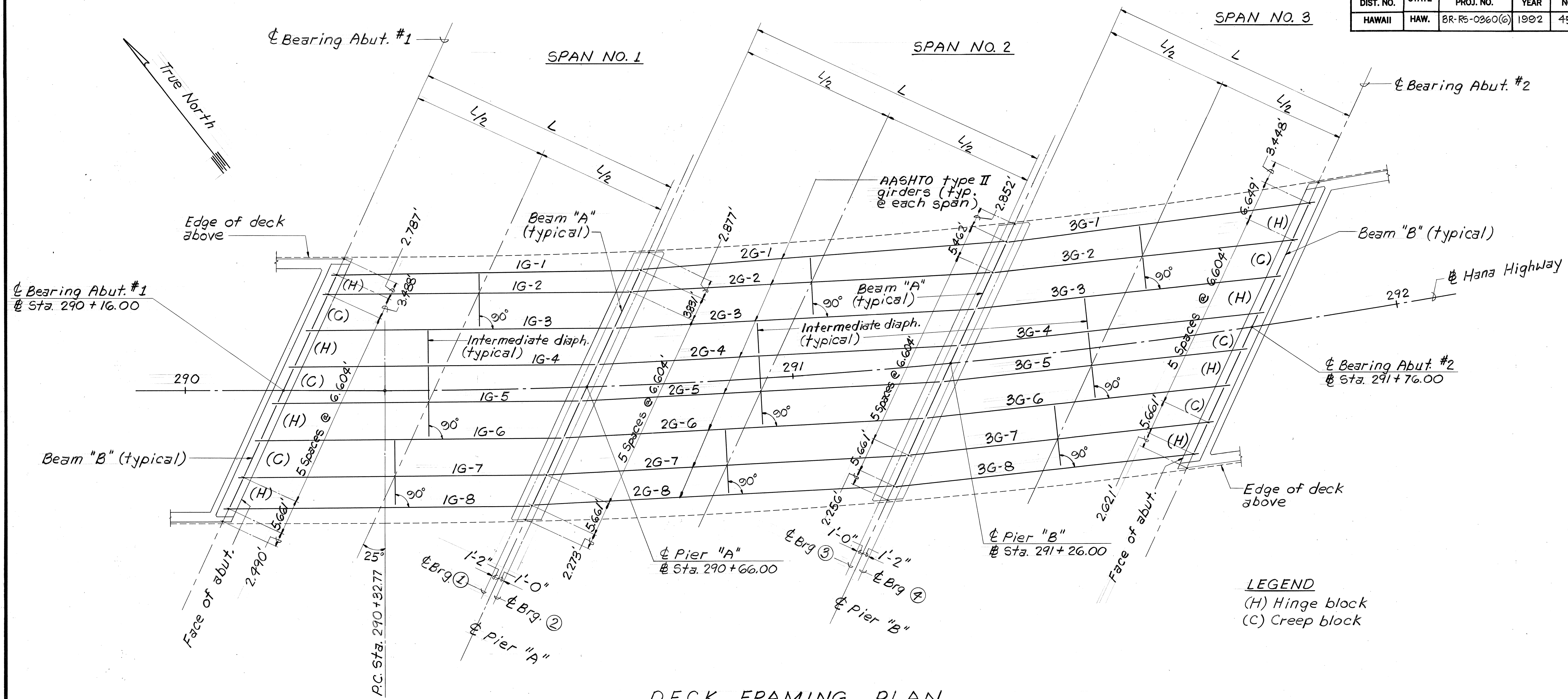
WING WALL ELEVATIONS AND SECTIONS

HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)

SCALE: AS NOTED DATE: SEPT., 1991

SHEET NO. S-12 OF S-25 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-RS-0360(6)	1992	45	75



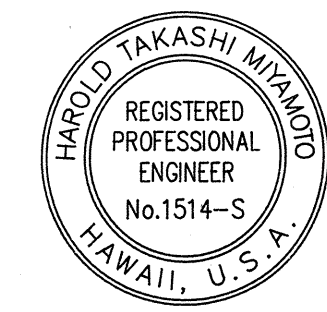
DECK FRAMING PLAN
Scale: 1/8" = 1'-0"

NOTES:

- The bearing are parallel to the pier and abutment as shown unless otherwise noted.
- For typical deck section see sht. S-14.
- For intermediate and end diaphragms see shts S-16, S-17 & S-20.
- Girder lengths shown are horizontal distance between bearing in feet.

GIRDER	SPAN NO. 1	SPAN NO. 2	SPAN NO. 3
G-1	48.738	58.103	48.887
G-2	48.594	57.354	48.278
G-3	48.594	57.354	48.278
G-4	48.594	57.354	48.278
G-5	48.594	57.354	48.278
G-6	48.594	57.354	48.278
G-7	48.594	57.354	48.278
G-8	48.594	57.354	48.278

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



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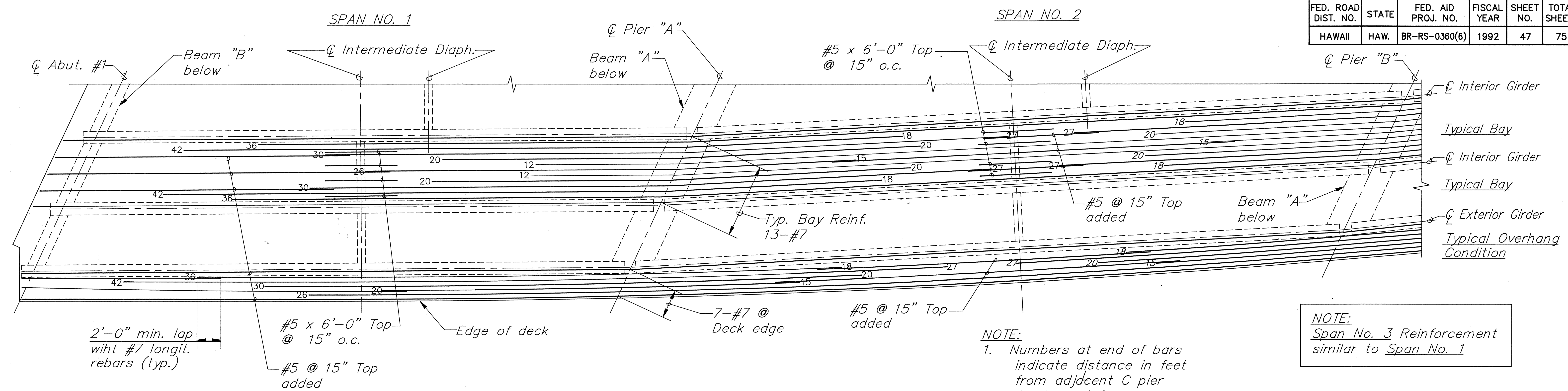
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

DECK FRAMING PLAN

HOOLAWA BRIDGE REPLACEMENT
 HANA HWY., HOOLAWA, MAUI
 PROJECT NO. BR-RS-0360(6)
 SCALE: 1/8" = 1'-0" DATE: SEPT., 1991

SHEET NO. 5-13 OF 5-25 SHEETS

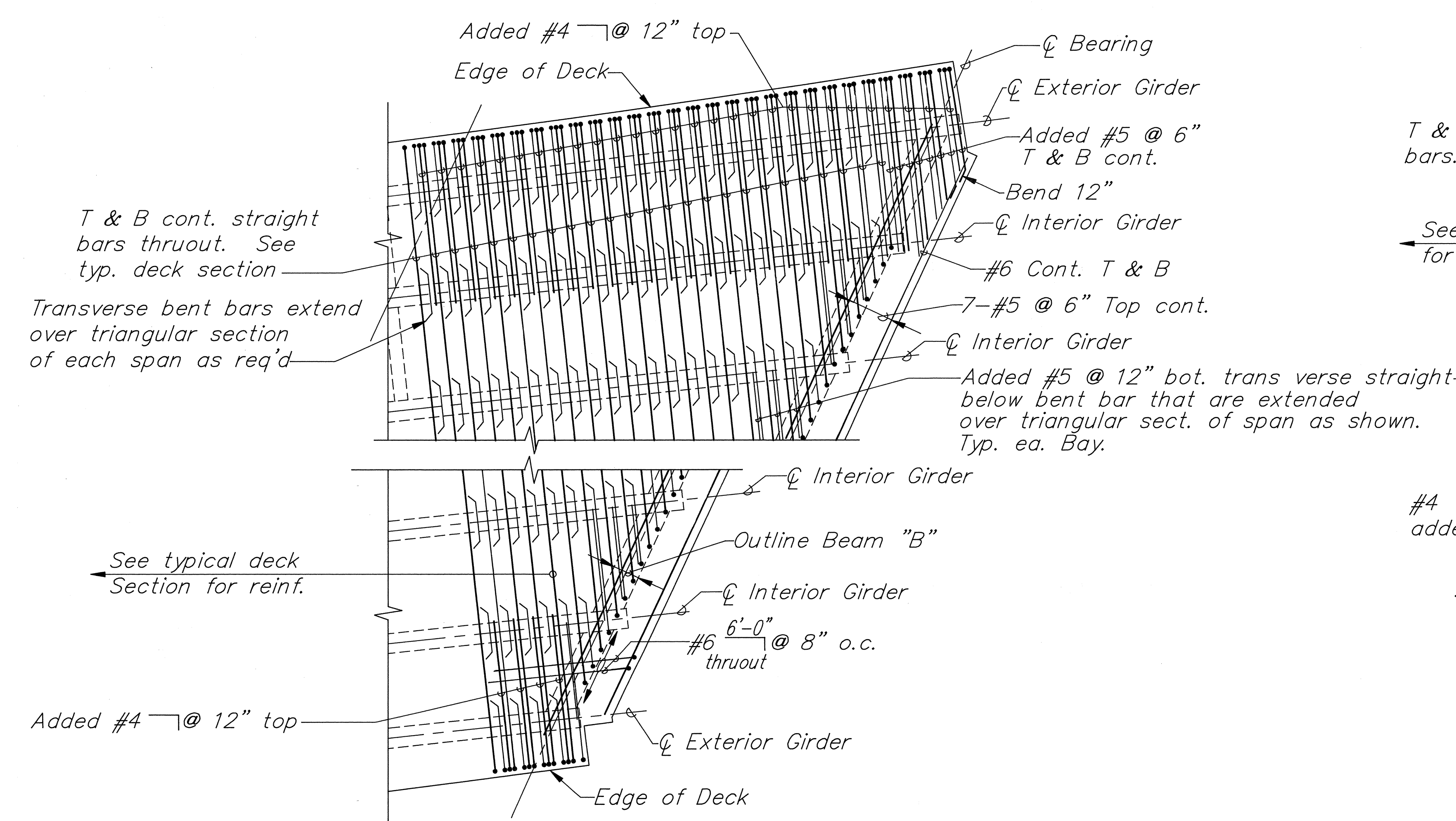
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-RS-0360(6)	1992	47	75



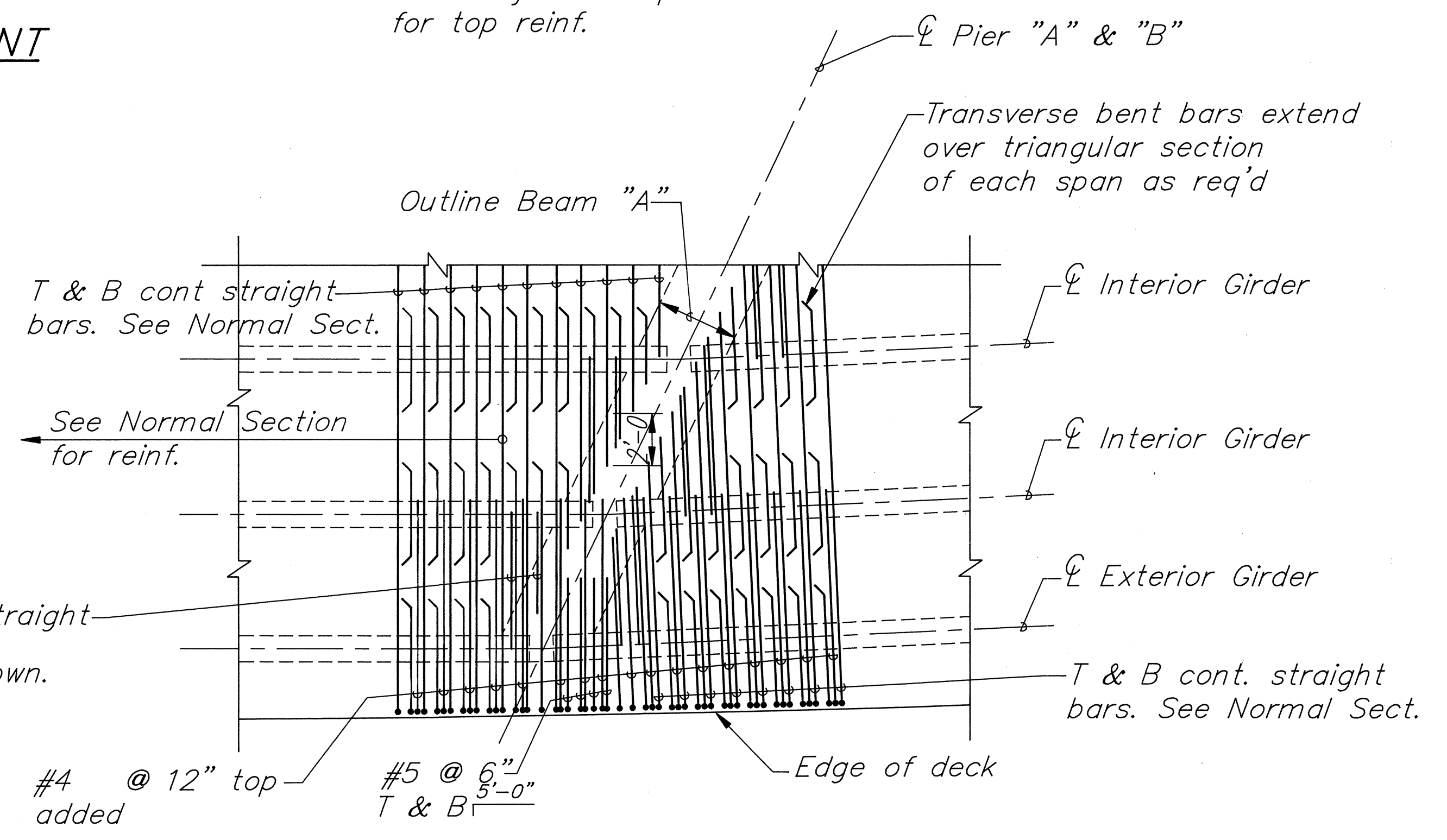
TYPICAL ARRANGEMENT OF TOP REINFORCEMENT
Scale: 1/4" = 1'-0"

NOTE:
1. Numbers at end of bars indicate distance in feet from adjdcent C pier for top reinf.

NOTE:
Span No. 3 Reinforcement similar to Span No. 1



TYP. TRANSVERSE REINF. PLACEMENT @ SKEWED ENDS
Scale: 1/4" = 1'-0"



TYP. TRANSVERSE REINF. PLACEMENT @ SKEWED PIER
Scale: 1/4" = 1'-0"

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



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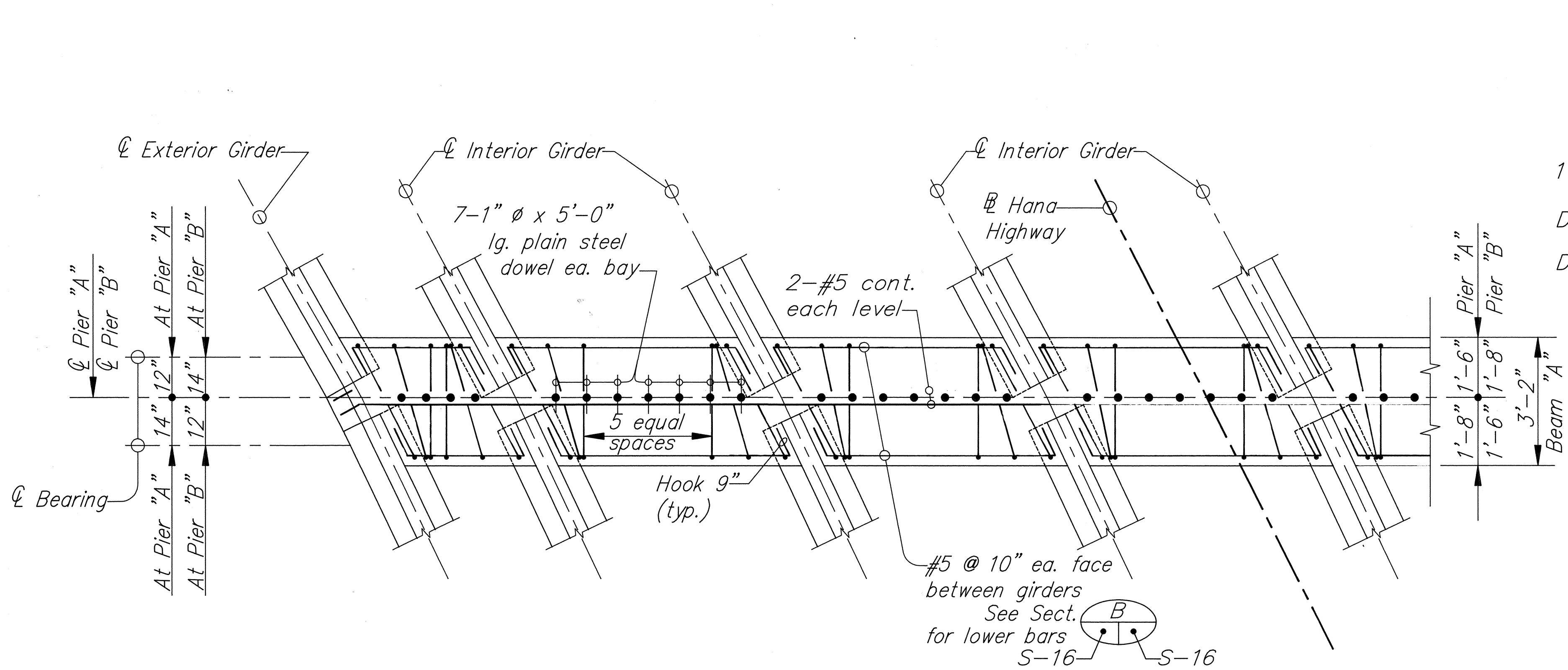
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**TOP DECK AND SKEWED
END REINF. DETAILS**

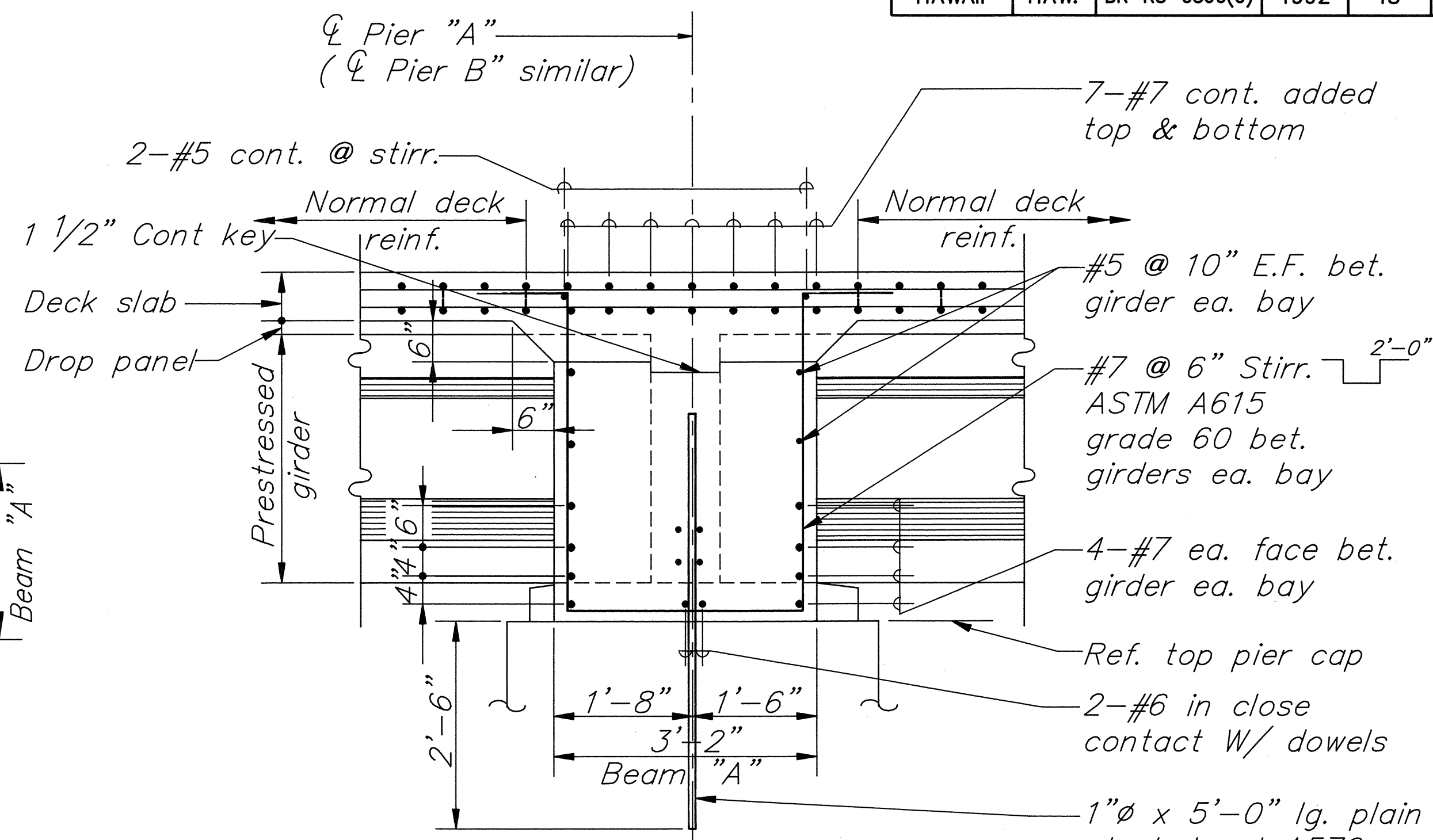
HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)

SCALE: 1/4" = 1'-0" DATE: SEPT., 1991
SHEET NO. S-15 OF S-25 SHEETS

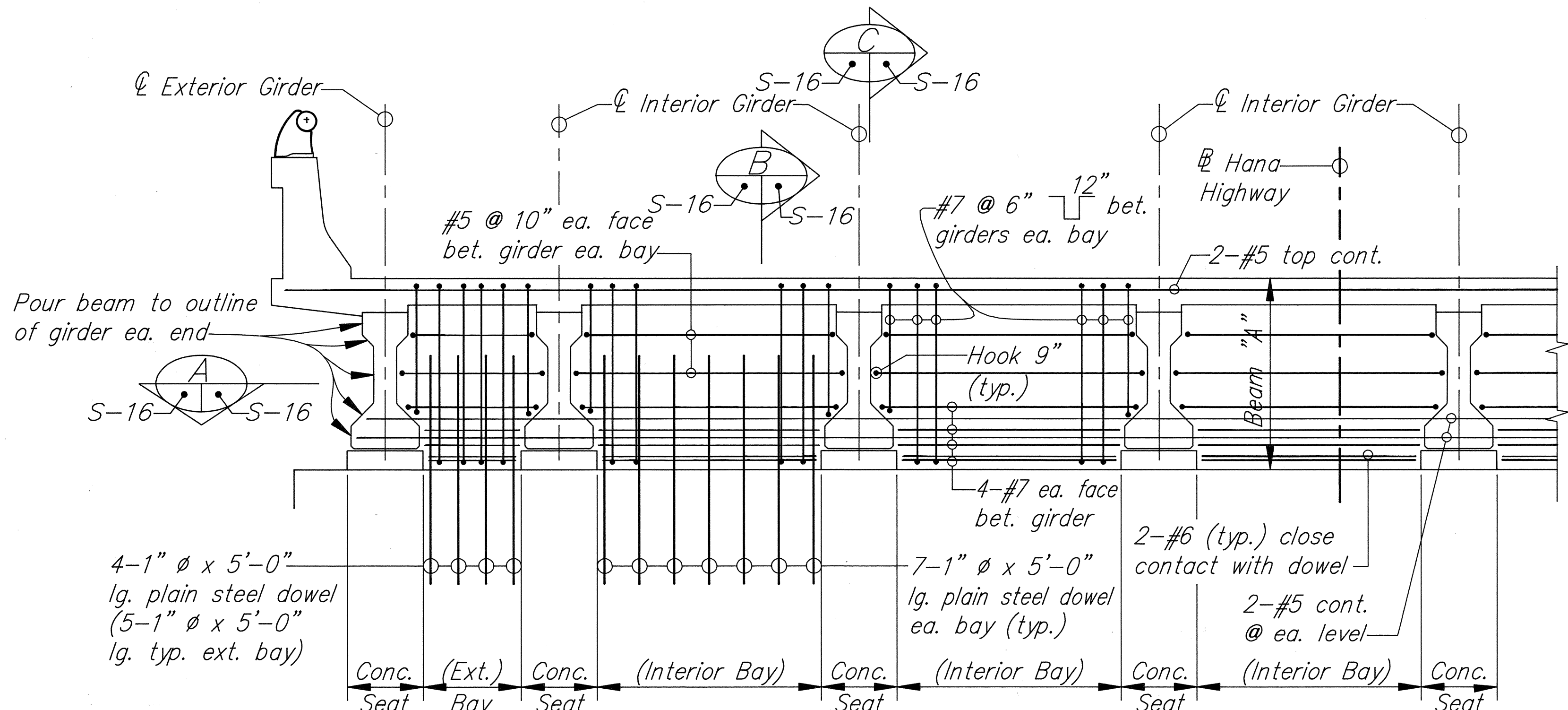
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-RS-0360(6)	1992	48	75



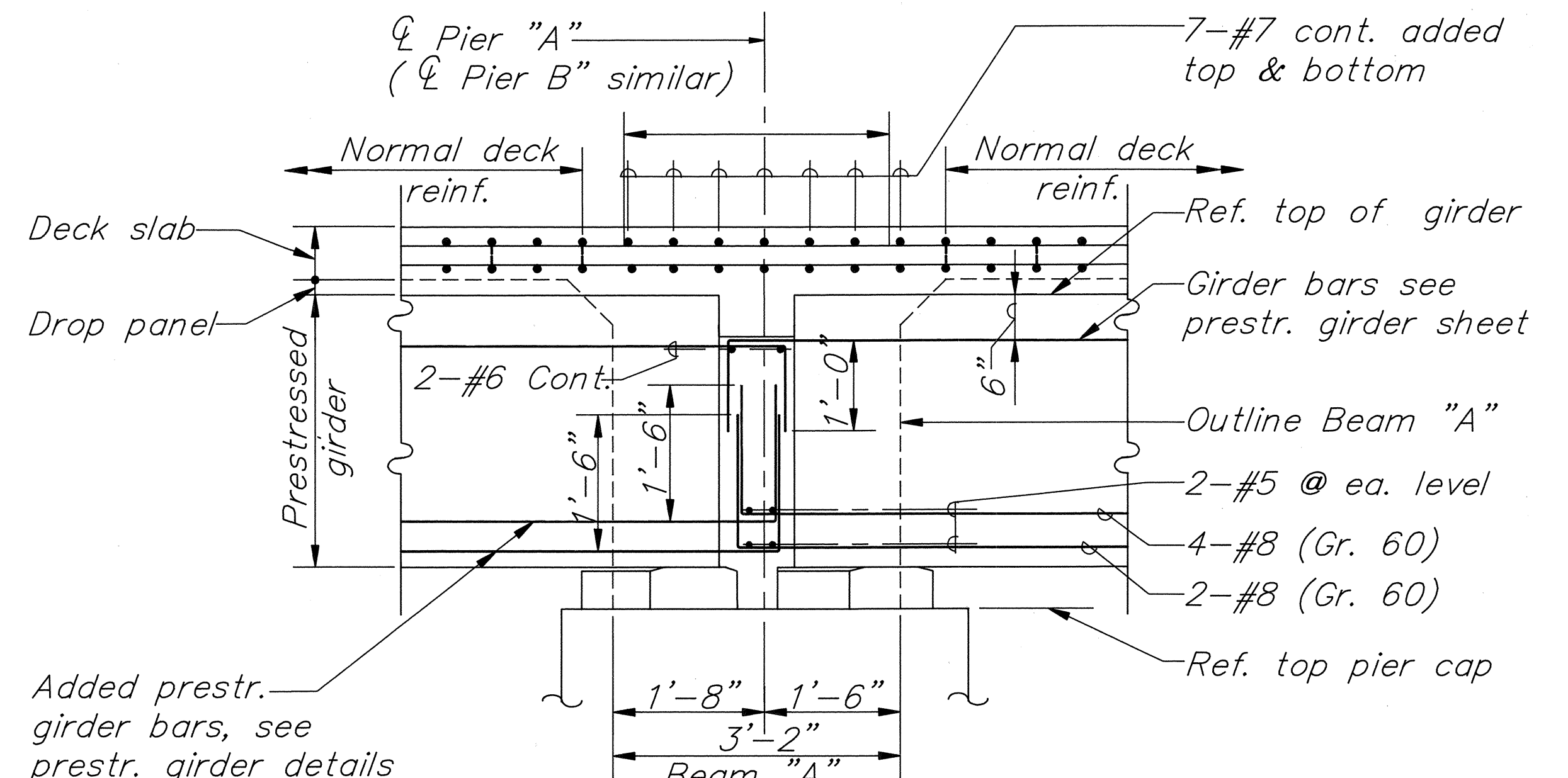
SECTION A
Scale: 1/2"=1'-0" S-16 S-16



SECTION B
Scale: 3/4"=1'-0" S-16 S-16



PART ELEVATION (PIER "A") - BEAM "A" [PIER "B" SIMILAR]
Scale: 1/2"=1'-0"



SECTION C
Scale: 3/4"=1'-0" S-16 S-16

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

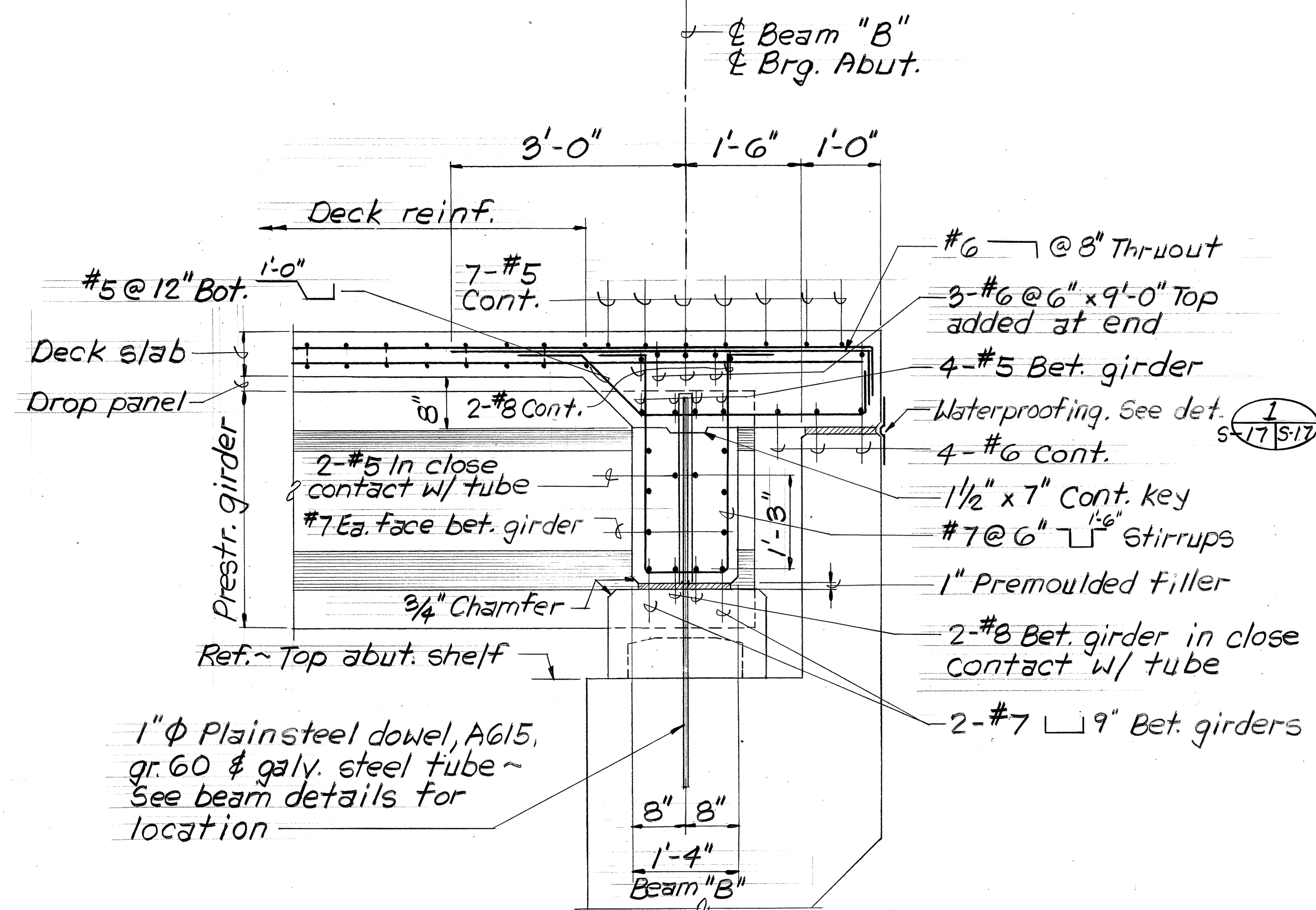


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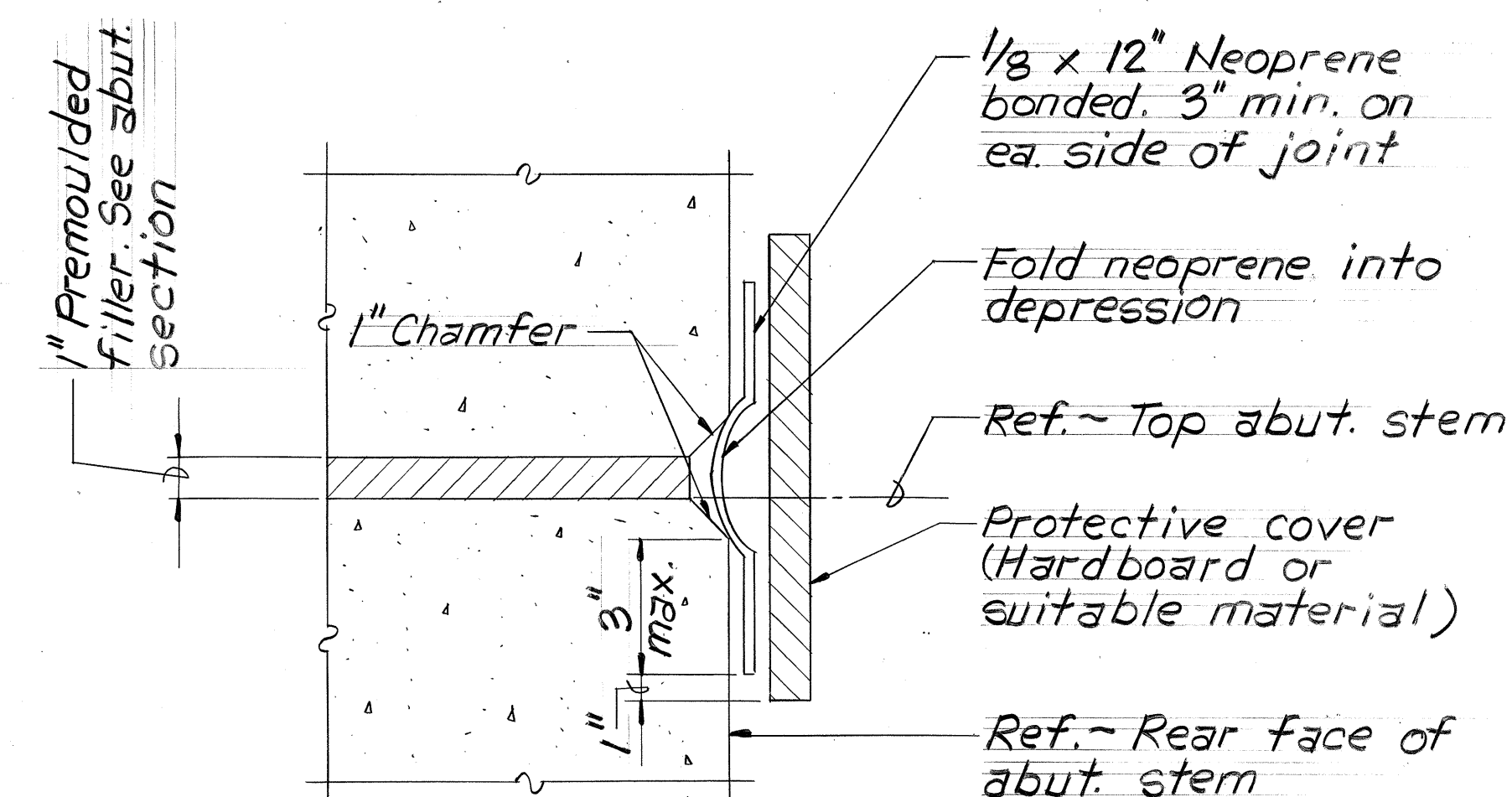
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BEAM "A" PLAN
ELEVATION & SECTIONS
HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)
SCALE: AS NOTED DATE: SEPT., 1991
SHEET NO. S-16 OF S-25 SHEETS

2-2 1/2" Ø Hole & dowel at ea.
interior girder locate on C beam
(typ.). Hickey at steel tube as
req'd. See Beam "B" Elevation



SECTION B
Scale: $\frac{3}{4}" = 1'-0"$ 5-17 5-17



PARTIAL ELEVATION ~ TYPICAL BEAM "B"
Scale: $\frac{1}{2}'' = 1'-0''$



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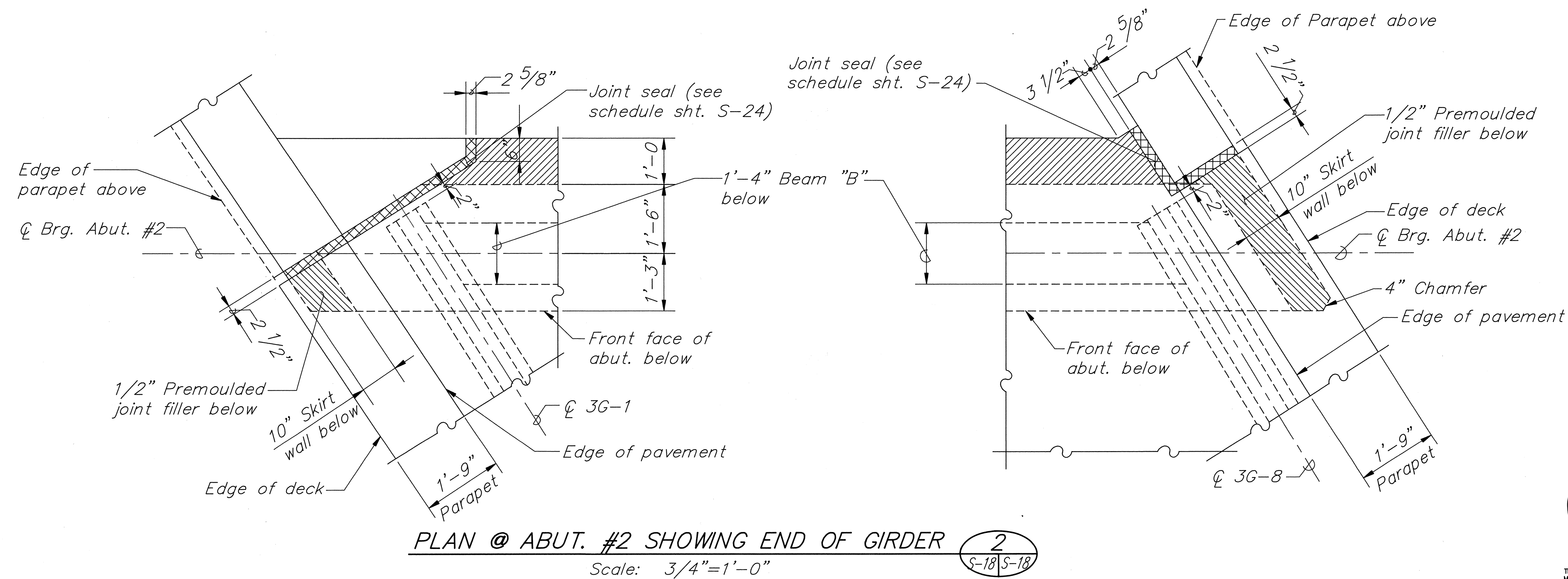
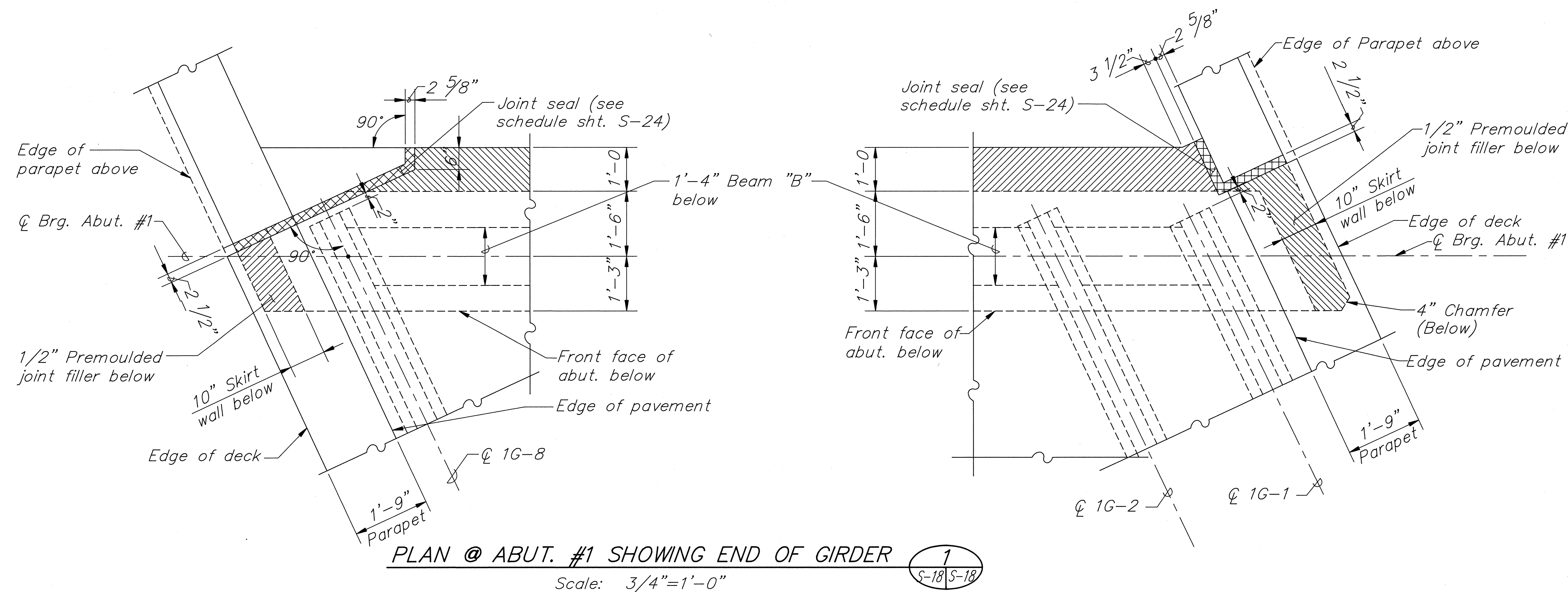
Harriet J. Merriam

BEAM "B" PLAN,
ELEVATION & SECTION

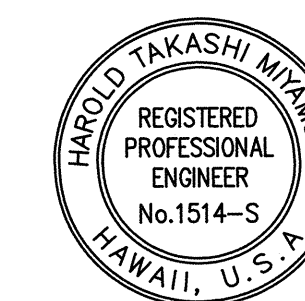
HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)
SCALE: AS NOTED DATE: SEPT. 1991

SHEET No. S-17 OF S-25 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-RS-0360(6)	1992	50	75



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



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

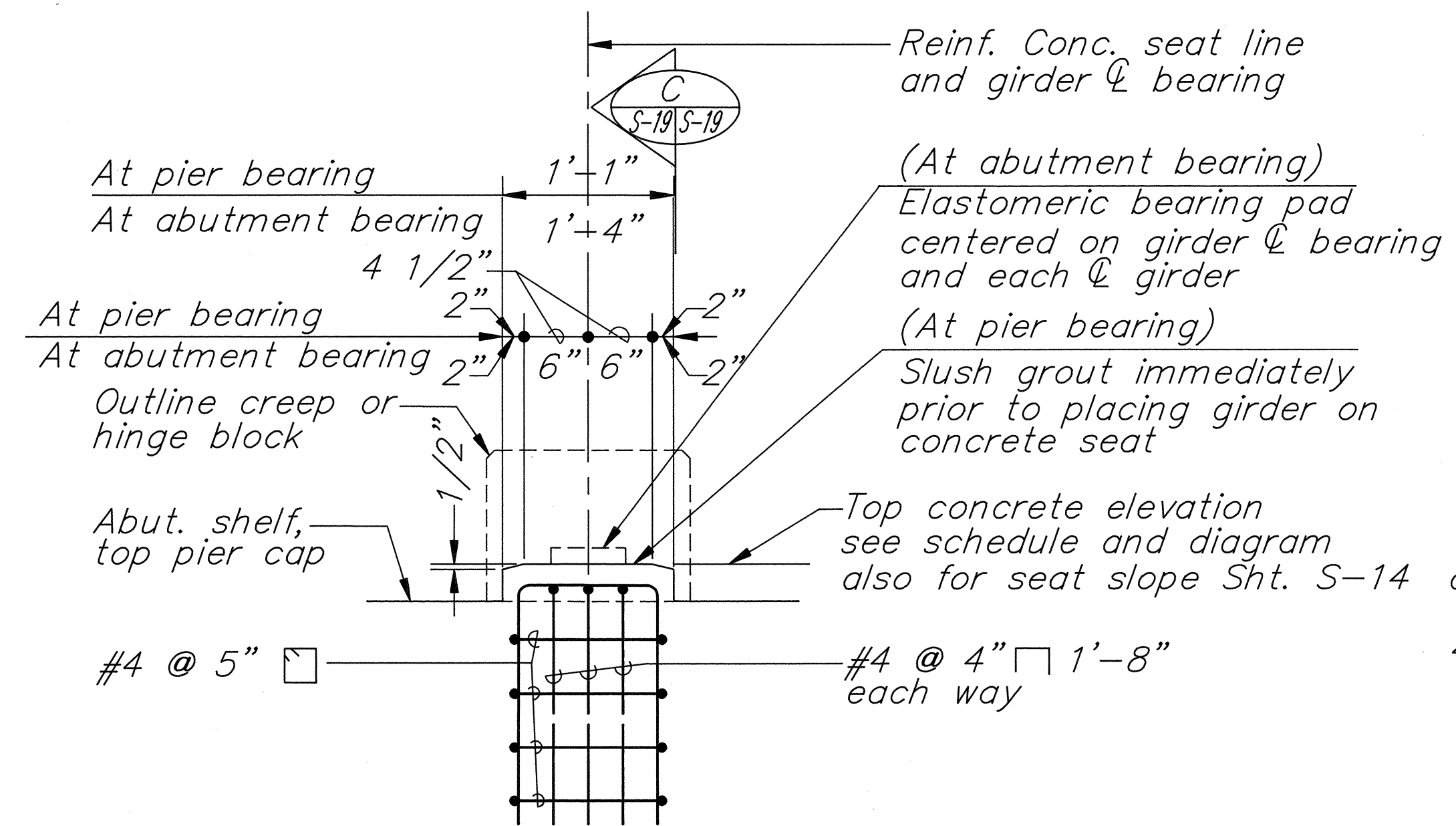
PLANS — GIRDER
END DETAILS

HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)

SCALE: $3/4" = 1'-0"$ DATE: SEPT., 1991
SHEET NO. S-18 OF S-25 SHEETS

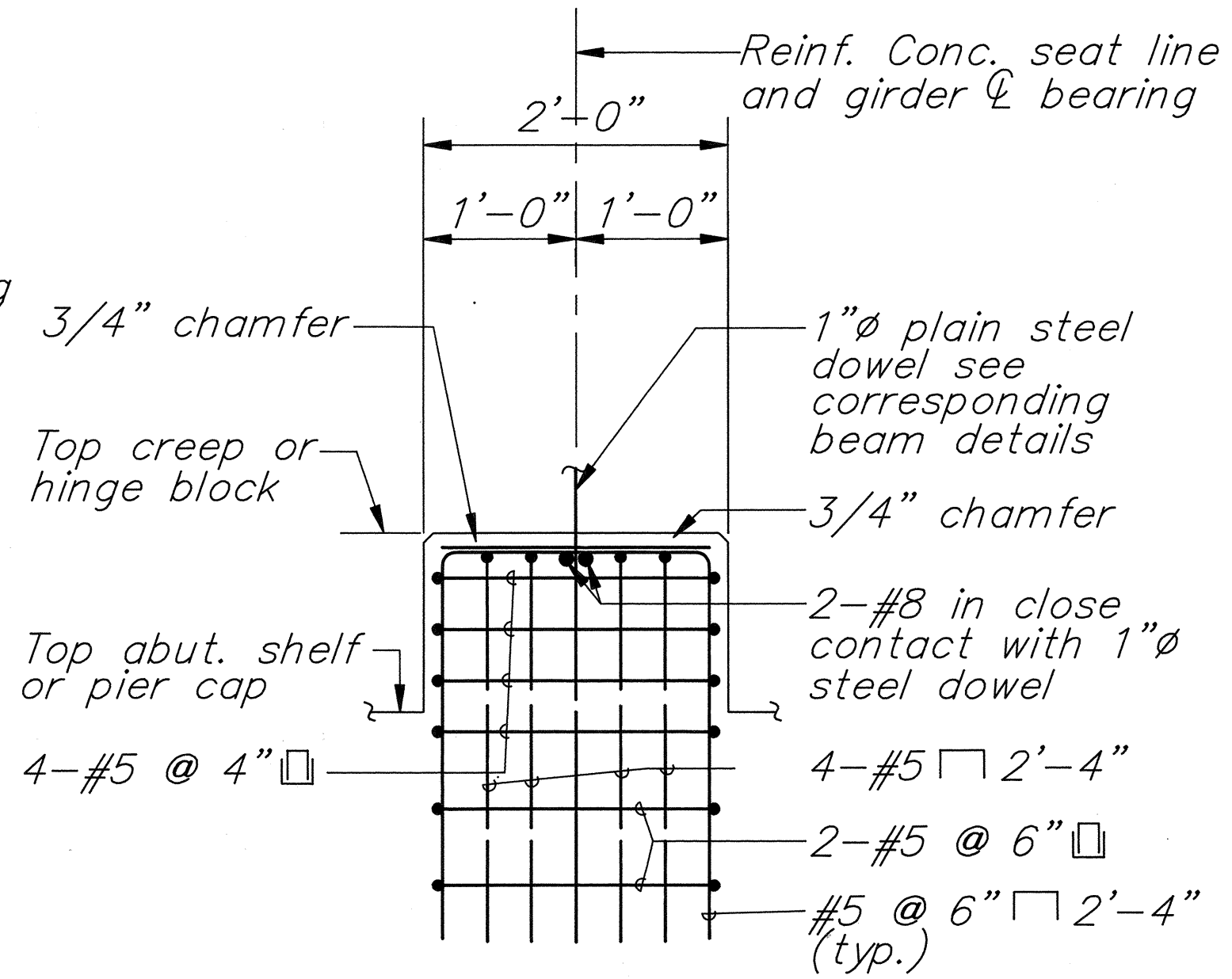
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-RS-0360(6)	1992	51	75

- NOTE:
1. Restrainer assemblage incidental to conc. and will not be paid separately.
 2. Restrainer assemblage shall be securely in place while placing concrete.



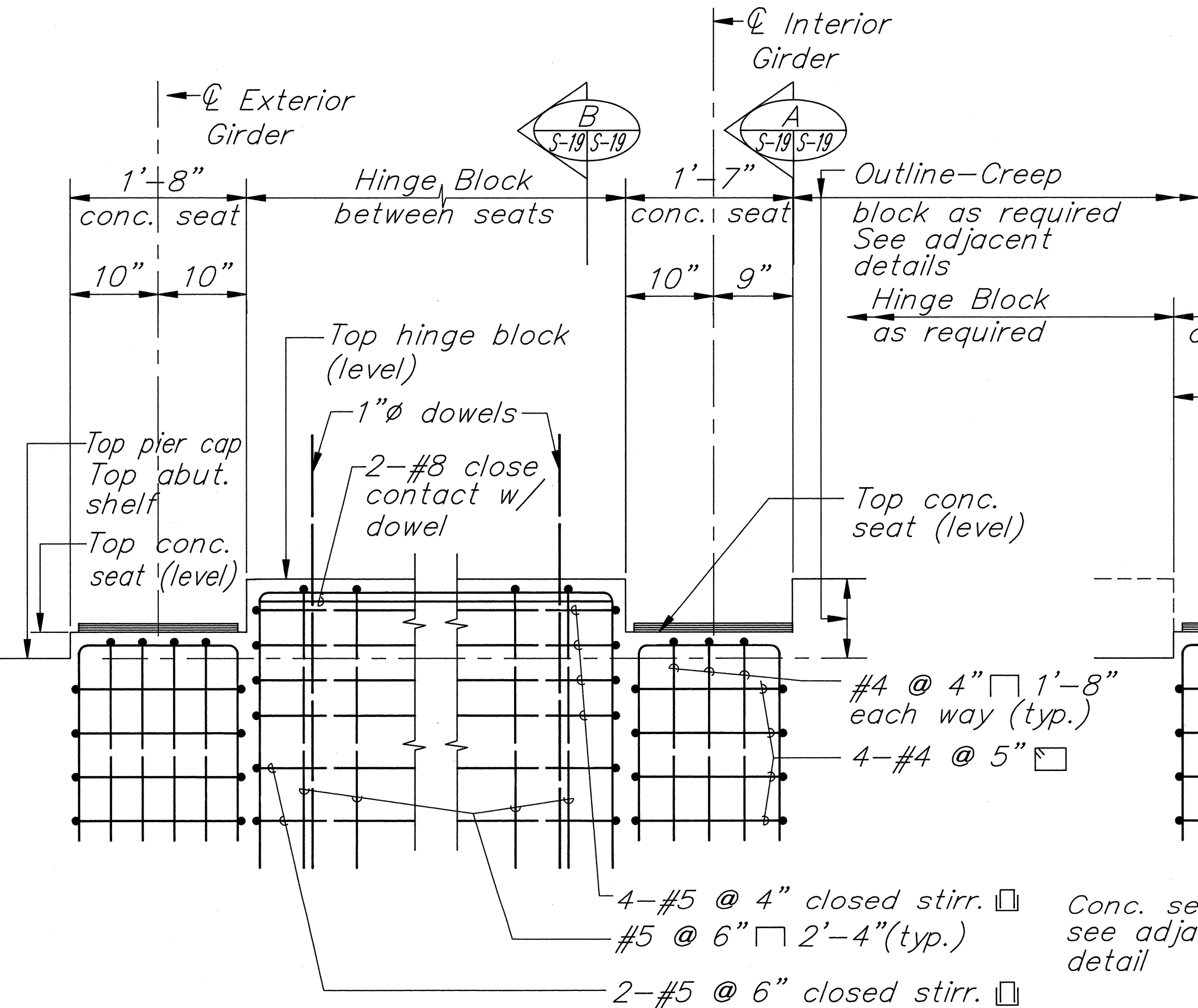
SECTION AT CONCRETE SEAT

TYPICAL SEAT SECTION A
Scale: 1"=1'-0"
S-9, S-19

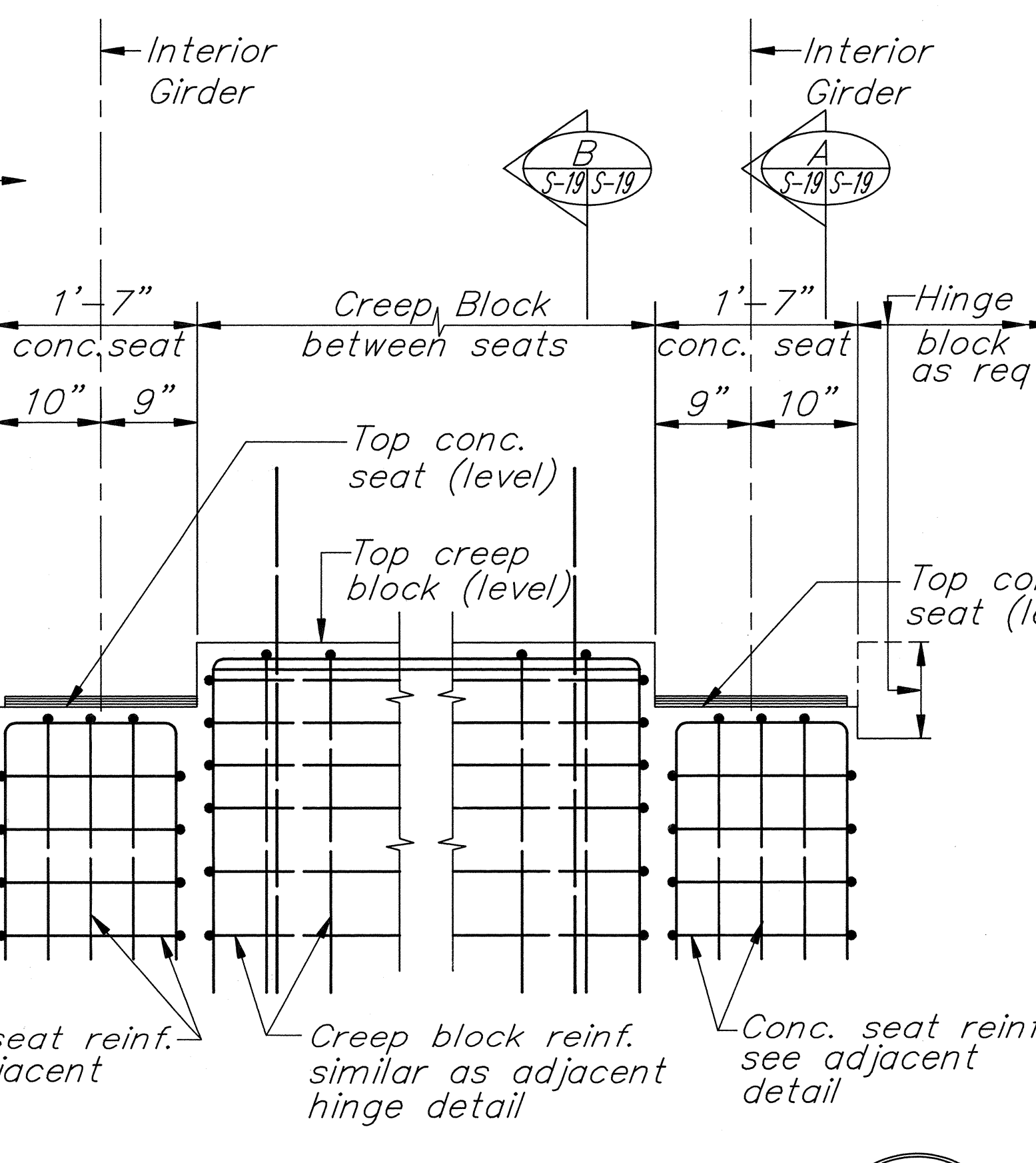


SECTION AT CREEP OR HINGE BLOCK

TYPICAL BLOCK SECTION B
Scale: 1"=1'-0"
S-19, S-19

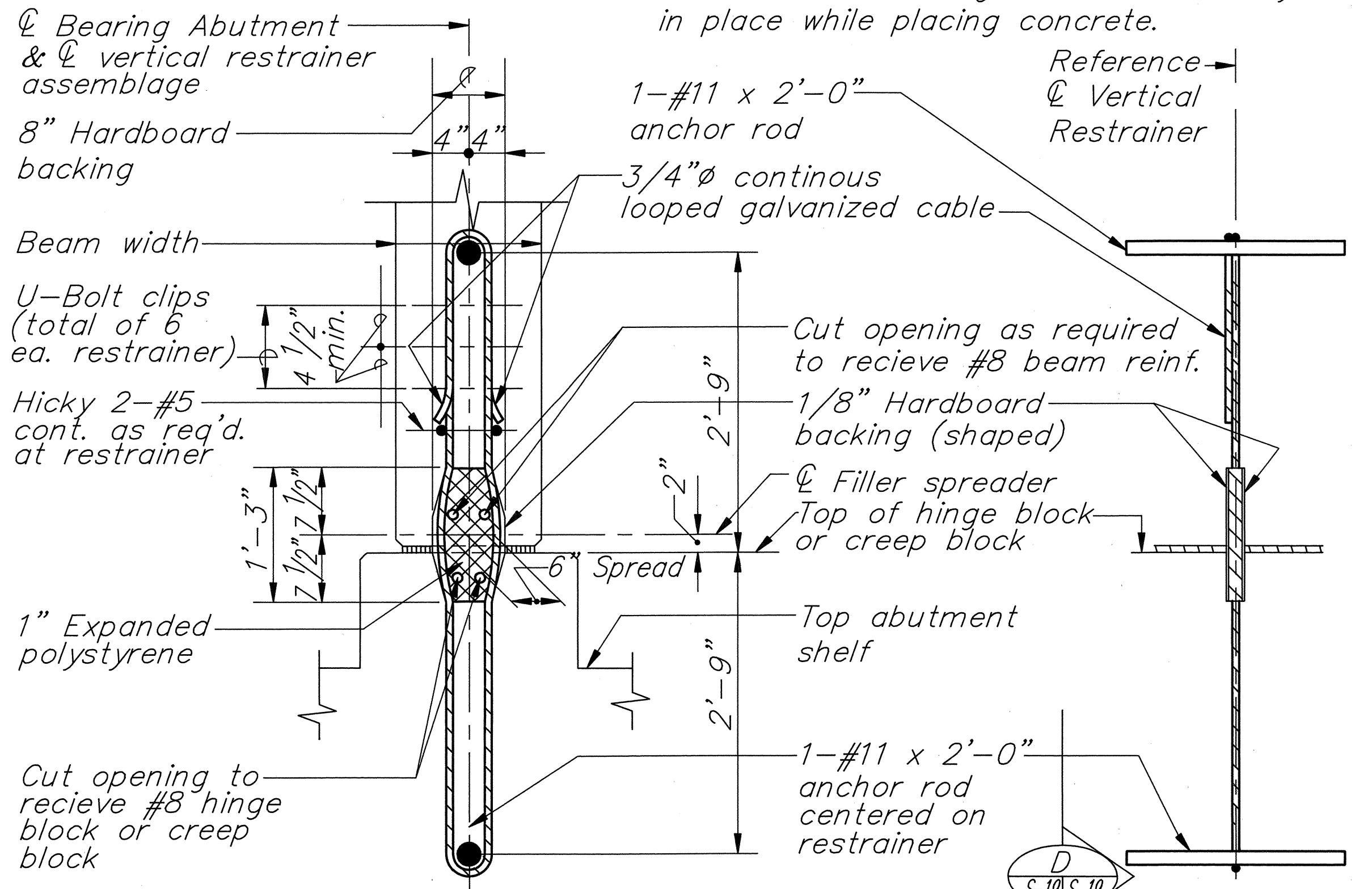


BETWEEN HINGE BLOCK



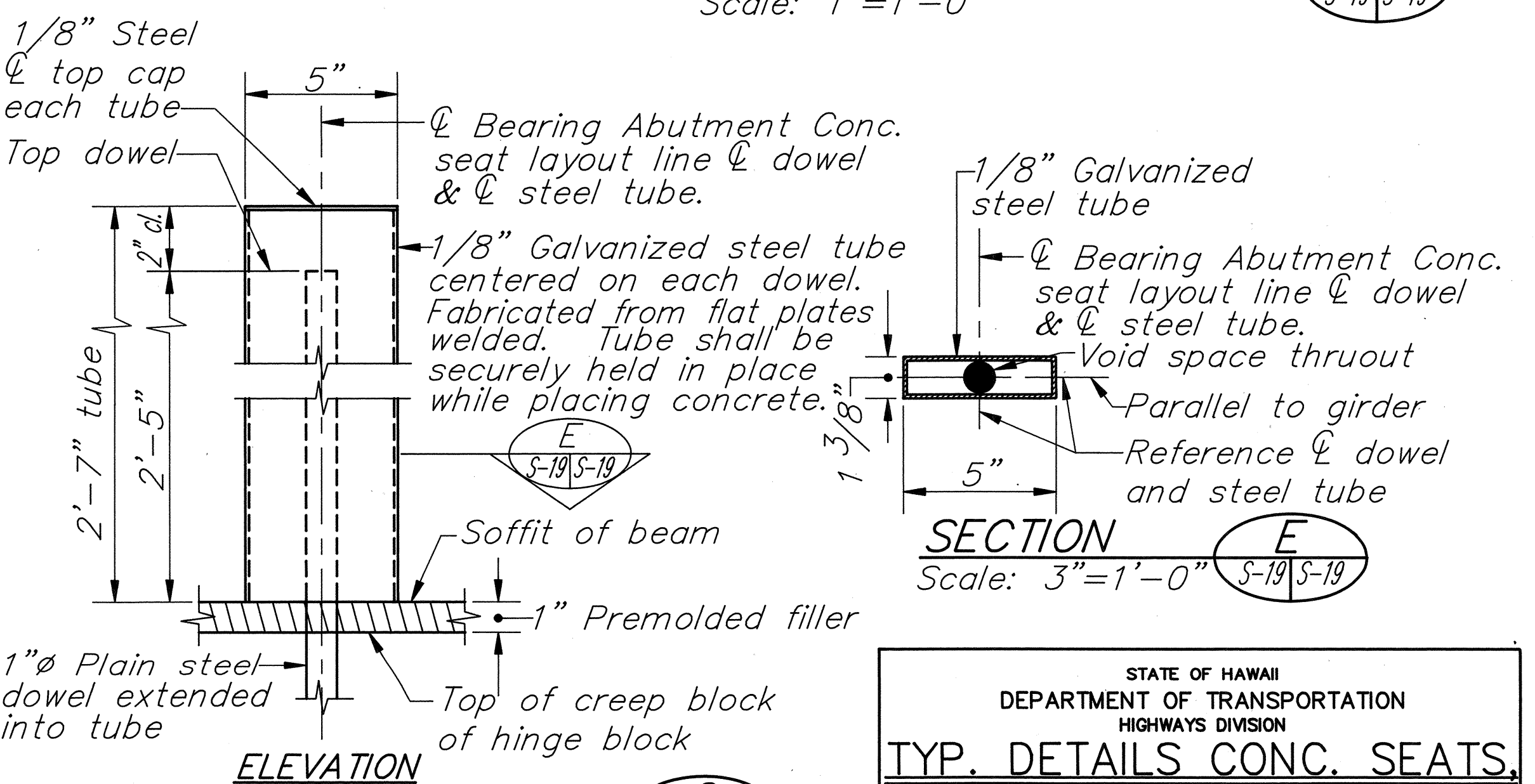
BETWEEN CREEP BLOCK

TYPICAL SECTION C
Scale: 1"=1'-0"
S-19, S-19



SECTION D
S-19, S-19

TYPICAL VERTICAL RESTRAINER DETAILS 1
Scale: 1"=1'-0"
S-19, S-19



ELEVATION

TYPICAL DETAIL 2
S-17, S-19

EXPANSION END HINGE DOWEL AND METAL TUBE
Scale: 3"=1'-0"

NOTE: Metal tube for hinge dowel shall be incidental to concrete.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
TYP. DETAILS CONC. SEATS,
HINGE & CREEP BLOCK,
VERTICAL RESTRAINER
HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)
SCALE: AS NOTED DATE: SEPT., 1991
SHEET NO. S-19 OF S-25 SHEETS

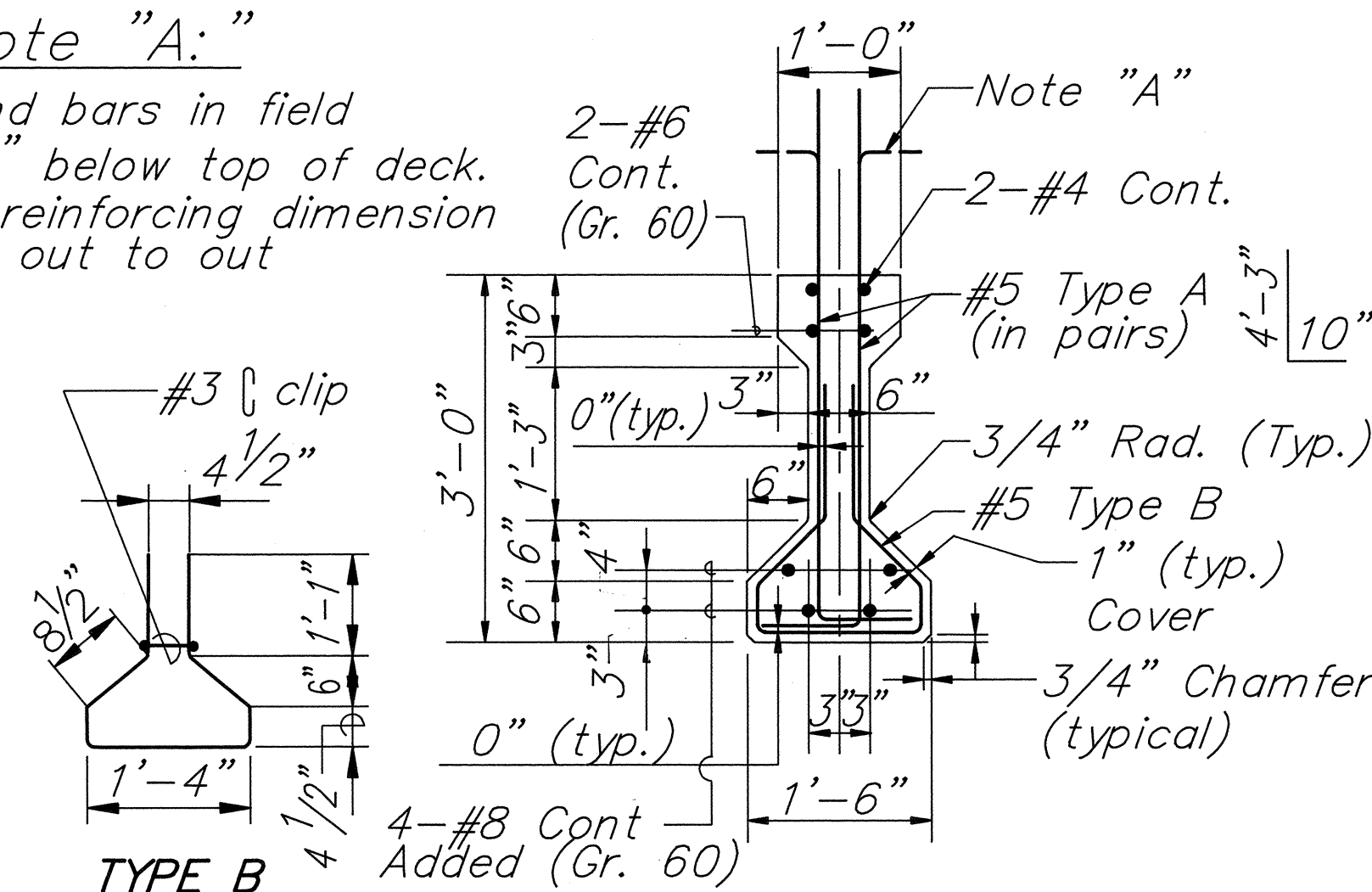


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ORIGINAL PLAN	DATE
DESIGNED BY	
NOTED BY	
CHECKED BY	
QUANTITIES BY	
NO.	

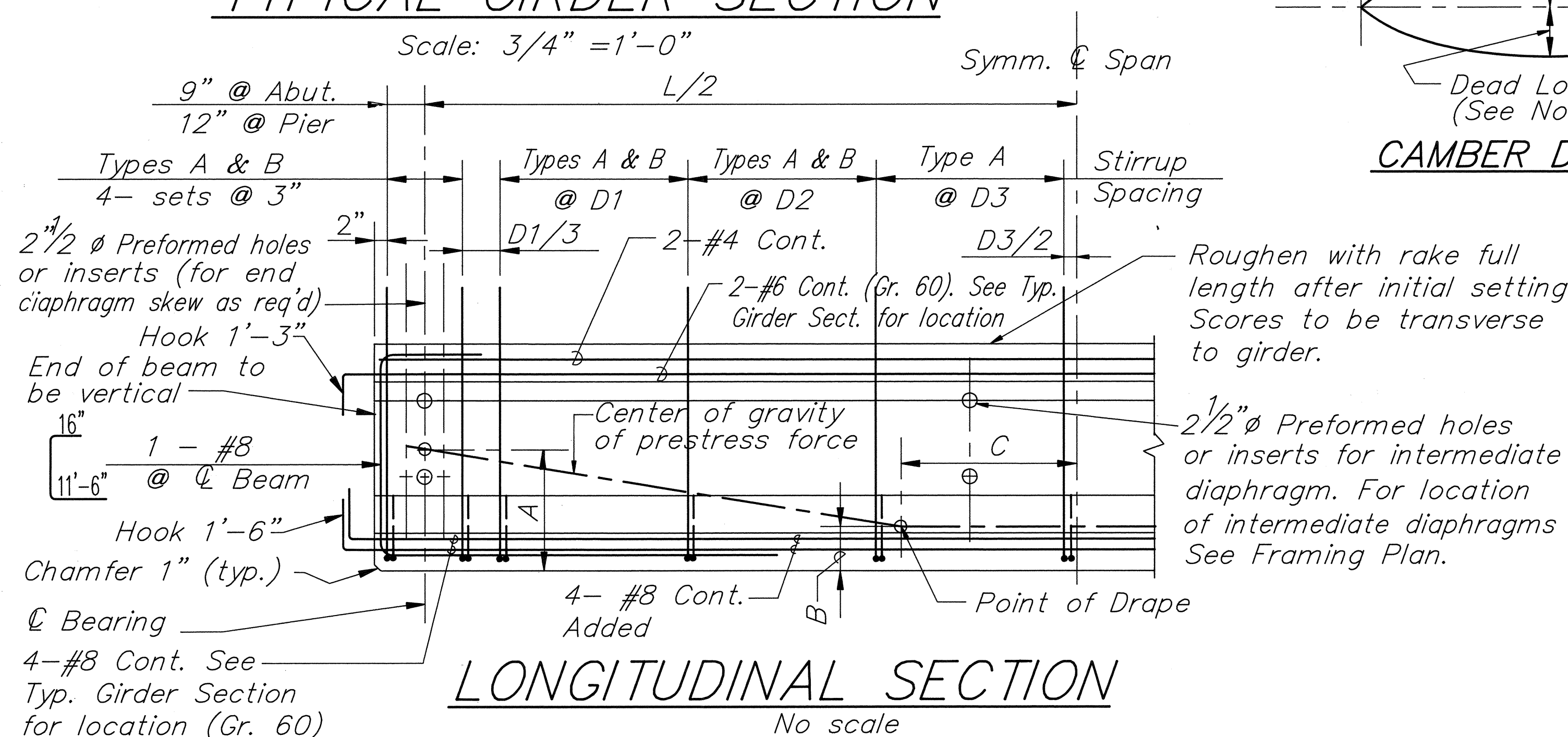
Note "A":

Bend bars in field
1 1/2" below top of deck.
All reinforcing dimension
are out to out



TYPICAL GIRDER SECTION

Scale: 3/4" = 1'-0"



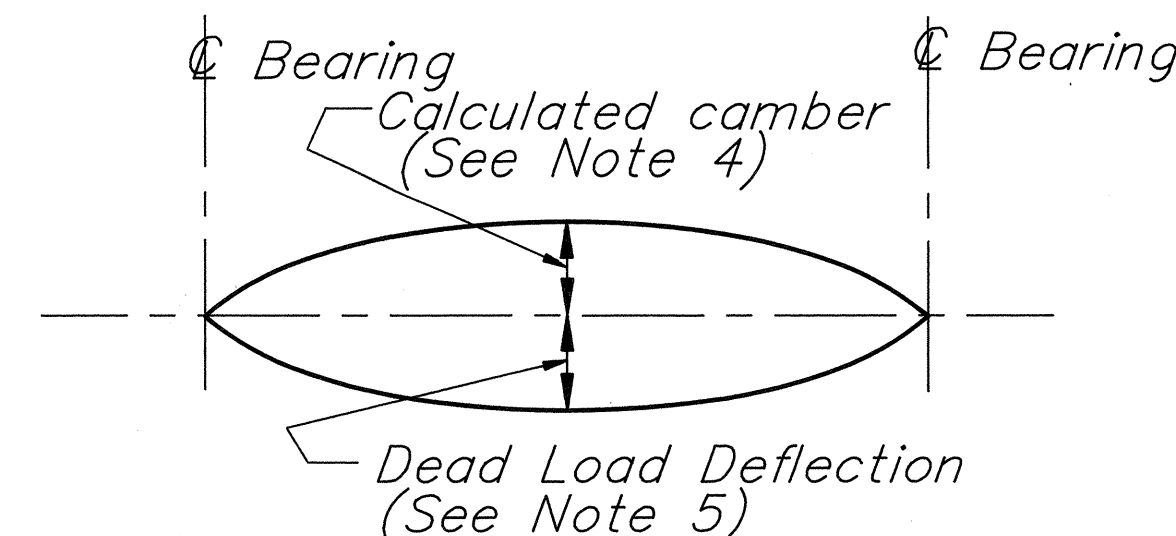
LONGITUDINAL SECTION

No scale

BEAM SCHEDULE

GIRDER TYPE	INITIAL PRESTRESS FORCE (KIPS)	WORKING * FORCE (KIPS)	CALCULATED CAMBER SEE NOTE 4	DEAD LOAD DEFLECTION SEE NOTE 5	LOCATION OF CENTER OF GRAVITY OF PRESTRESS FORCE			STIRRUPS			REQUIRED MIN. ULTIMATE CONC. STRENGTH BEFORE RELEASE OF STRANDS (PSI)	GIRDER LOCATIONS
					DIST. A	DIST. B	DIST. TO PT. OF DRAPE C	NO. OF STIRRUPS @ SPACING D1	NO. OF STIRRUPS @ SPACING D2	SPACING D3		
II-A	496	382	-1/2"	5/16"	1'-2 1/8"	7 1/4"	5'-6"	22 @ 6"	16 @ 9"	12"	4500	Girders 1G1-1G8, 3G1-3G8
II-B	586	451	-13/16"	5/8"	1'-1 7/8"	6 7/8"	5'-6"	34 @ 6"	14 @ 9"	12"	4500	Girders 2G1-2G8

* After all losses



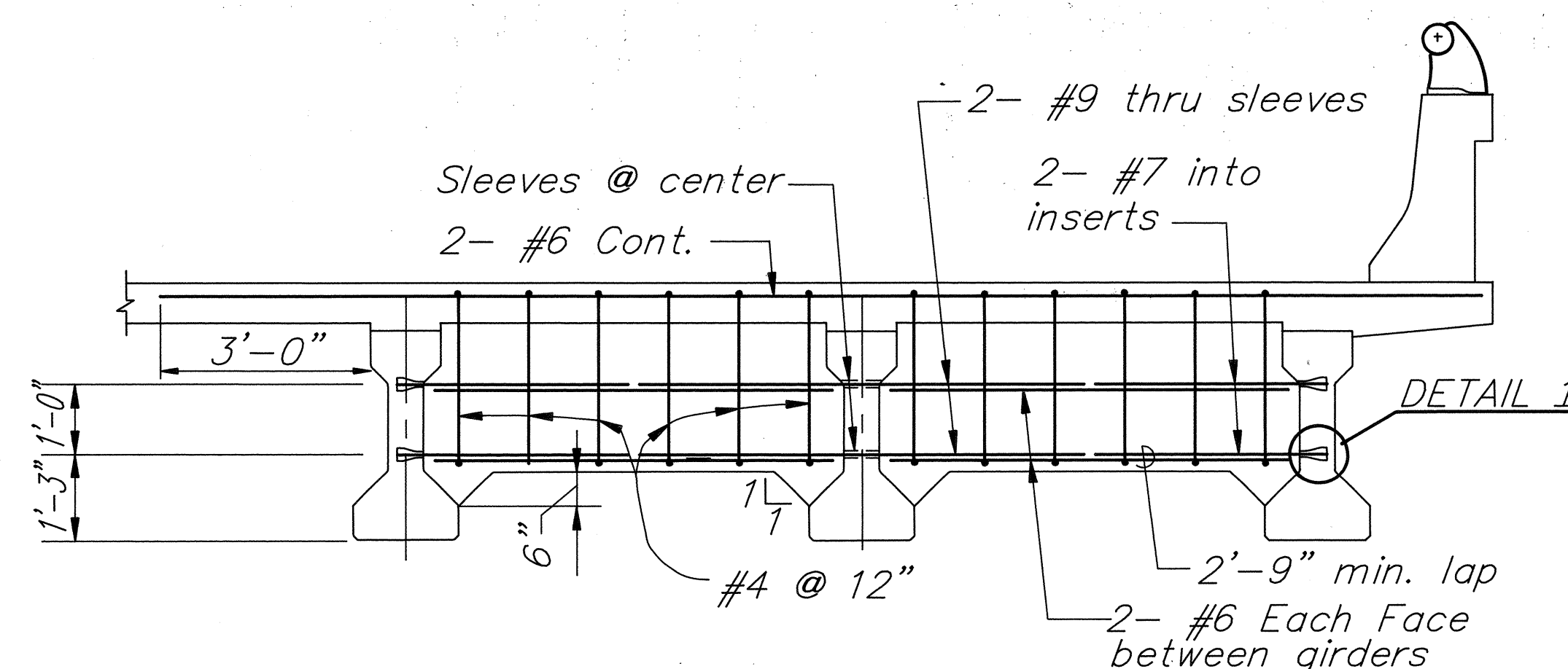
CAMBER DIAGRAM

NOTES:

- For prestress Notes and Camber Diagram See This Sheet.
- Intermediate Diaphragms shall be Class A concrete.
- Apply epoxy bonding compound to contact area on inside face of fascia girders before placing diaphragm concrete. Epoxy bonding compound incidental to concrete in bridges.
- Bars in sleeves shall be grouted in place before pouring the diaphragms.
- Inserts and sleeves are incidental to prestressed concrete girder.

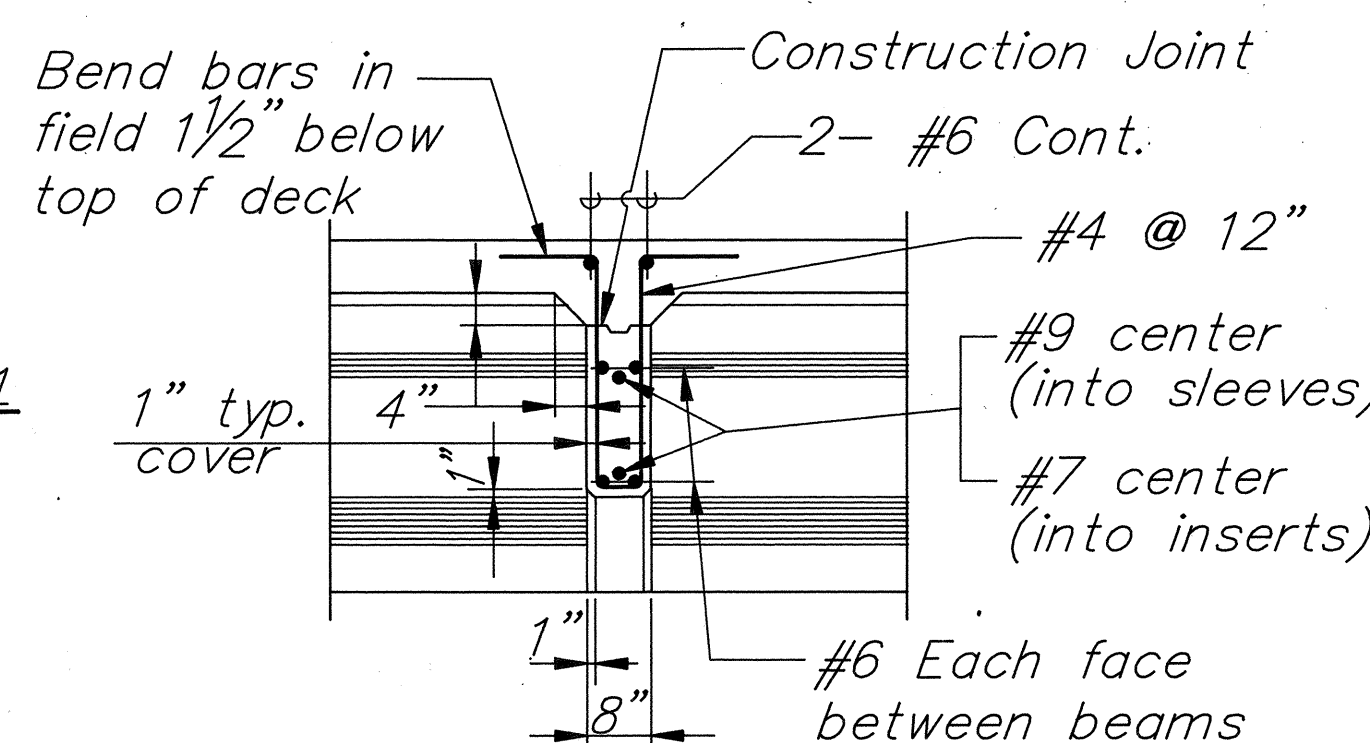
NOTES FOR PRESTRESSED BEAM

- Concrete shall have a minimum 28 days compression strength of 6,000 psi.
- Pretensioned strands shall be 7 wire 7/16" ϕ stress-relieved steel strands (area = 0.115 in²) with an ultimate strength of 270 ksi. For properties see State Standard Specifications. Total loss due to creep, shrinkage, elastic shortening and relaxation of steel = 45,000 psi.
- Non-prestressed reinforcing steel shall be Grade 40 unless otherwise noted. For properties see State Standard Specifications.
- The calculated camber includes the effect of the initial prestress force and the weight of the girder after removal from bed. Negative values shown for calculated camber indicate a net upward deflection. Calculated camber values shown do not account for any camber growth of the girder. the actual camber shall not exceed the calculated camber shown on the plans by more than 100%.
- The dead load deflection includes the combined effects of the weight of slab, haunch and diaphragm.
- Strands pattern shall be symmetrical about the longitudinal C of the girder.
- Strand release sequence shall not induce any lateral deflection of the girder.
- Contractor shall submit his proposed strand pattern and releasing sequence to the Engineer for approval.
- During curing care shall be taken to avoid any lateral deflection of the girder due to improper orientation.
- Lifting devices shall be placed as close as possible to the center line of bearings of the girder. Details and locations of the lifting devices shall be submitted to the Engineer for approval. Such approval does not relieve the Contractor of his responsibilities if the girder is damaged due to failure of the lifting device.
- See Framing Plan for locations of diaphragms, mark number and the length of the individual girders. Lengths shown do not include effect of elastic shortening.



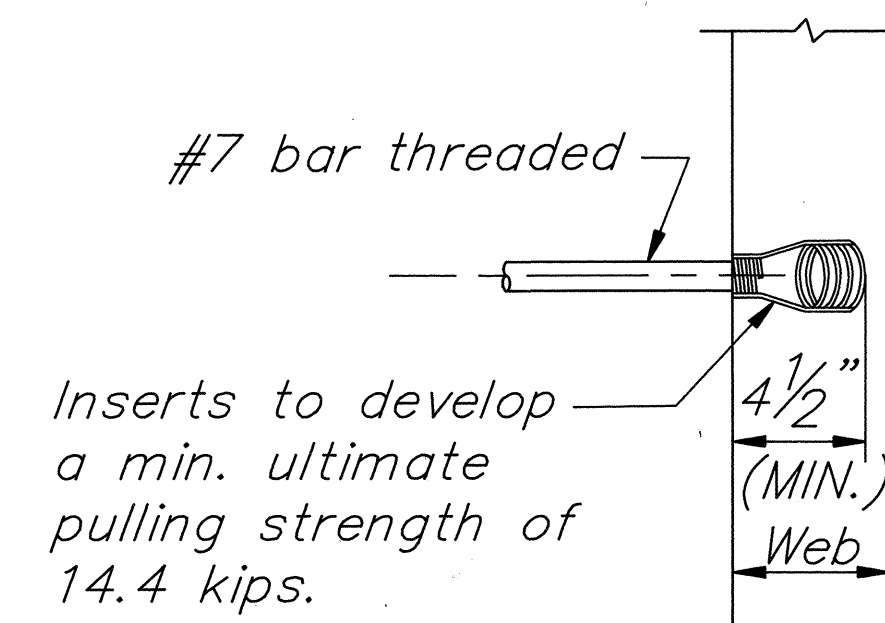
ELEVATION INTERMEDIATE DIAPHRAGMS

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



TYPICAL SECTION

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



DETAIL 1

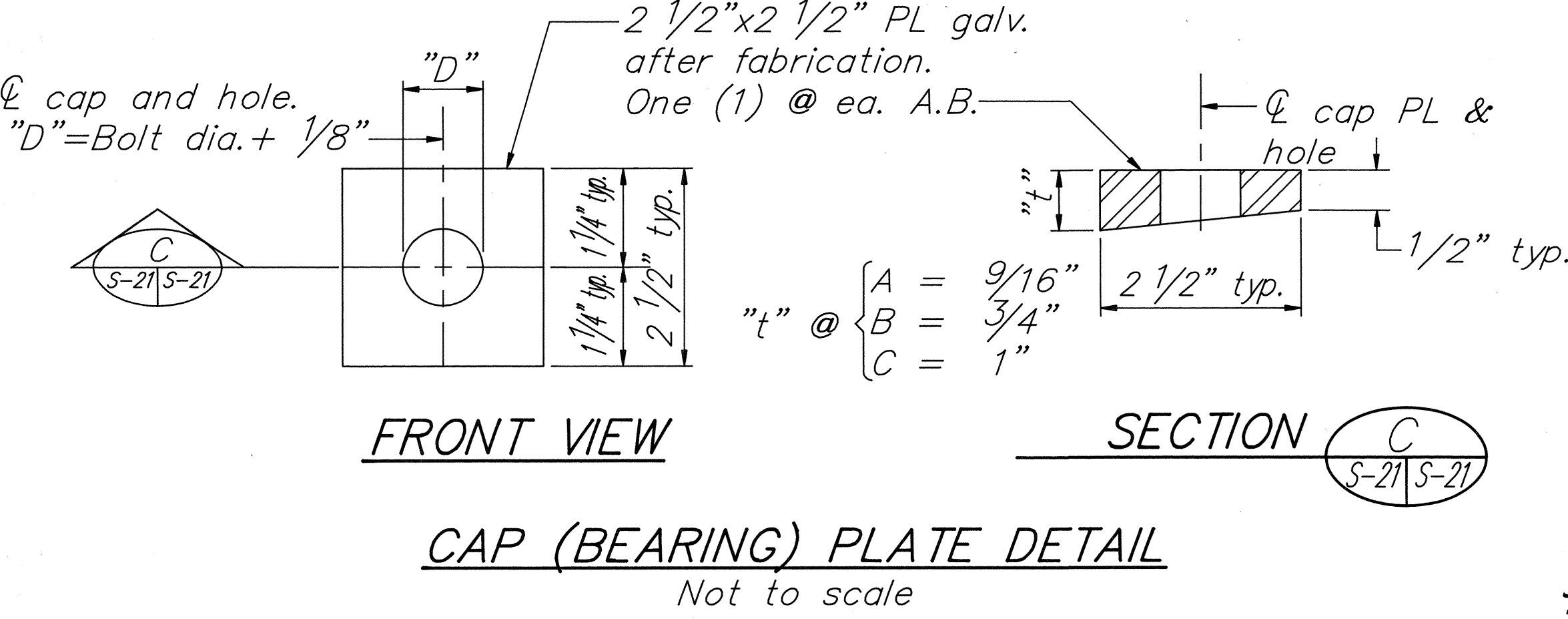
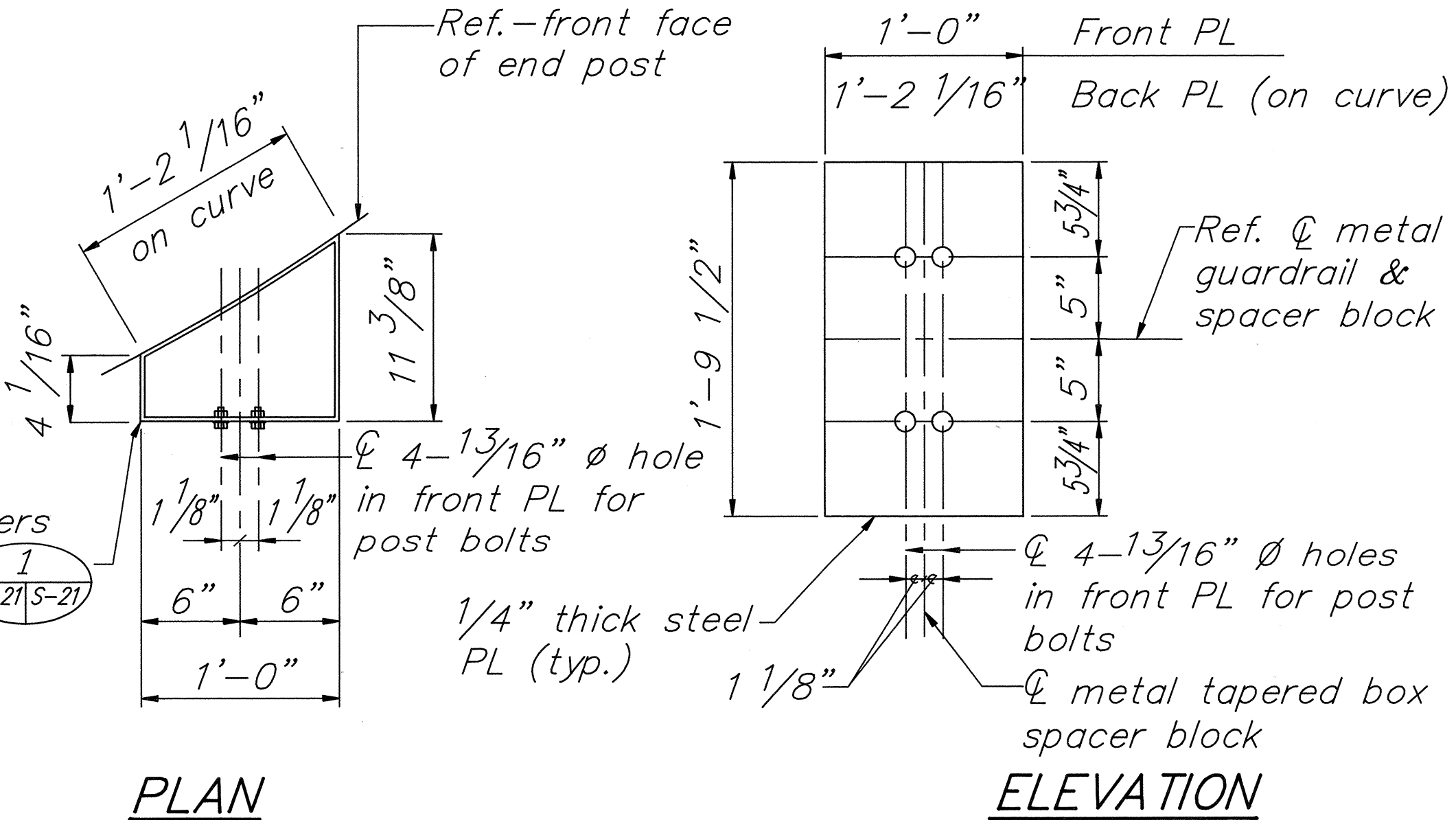
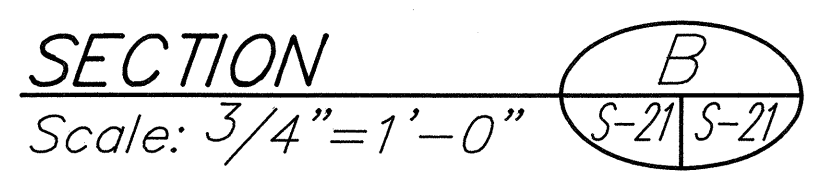
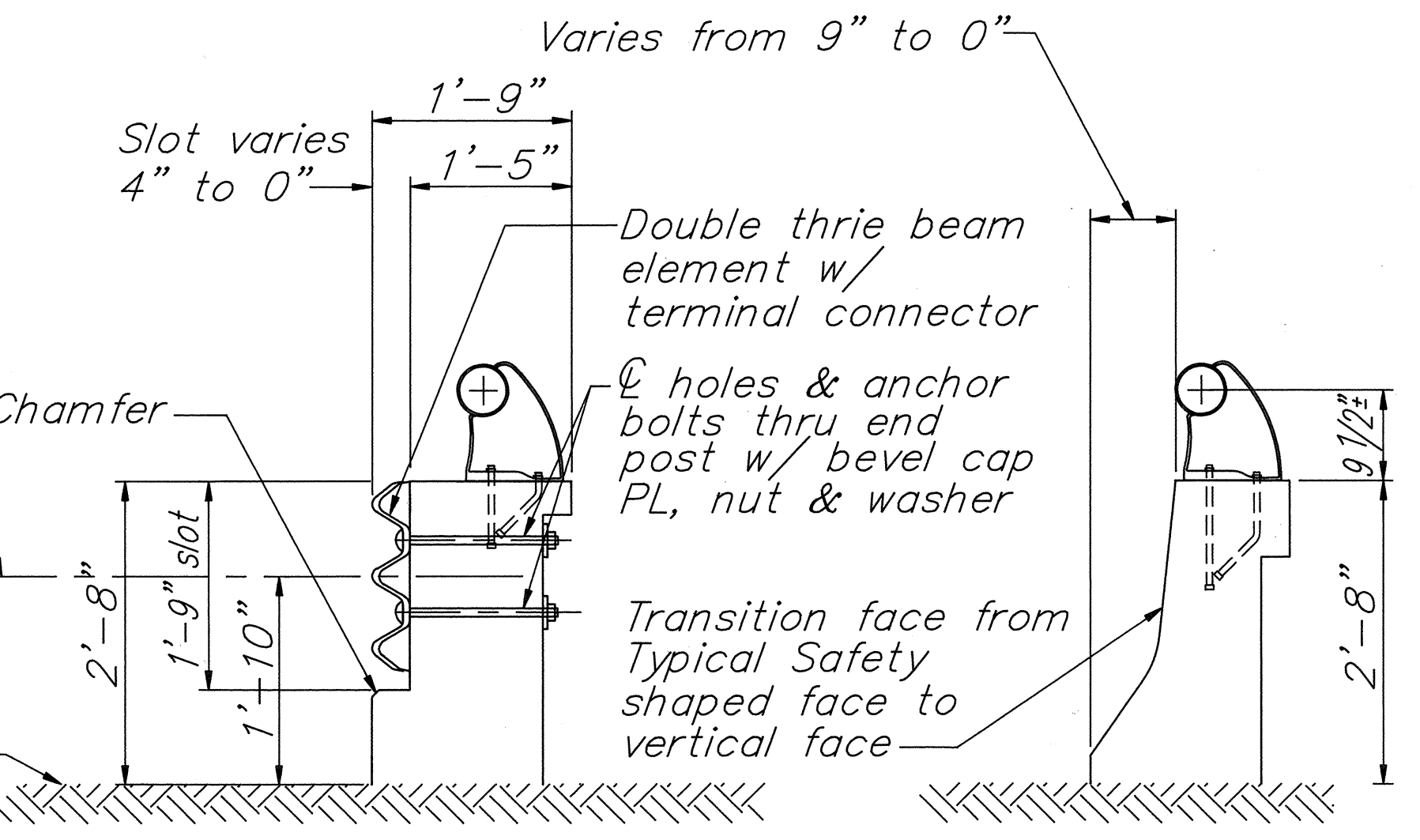
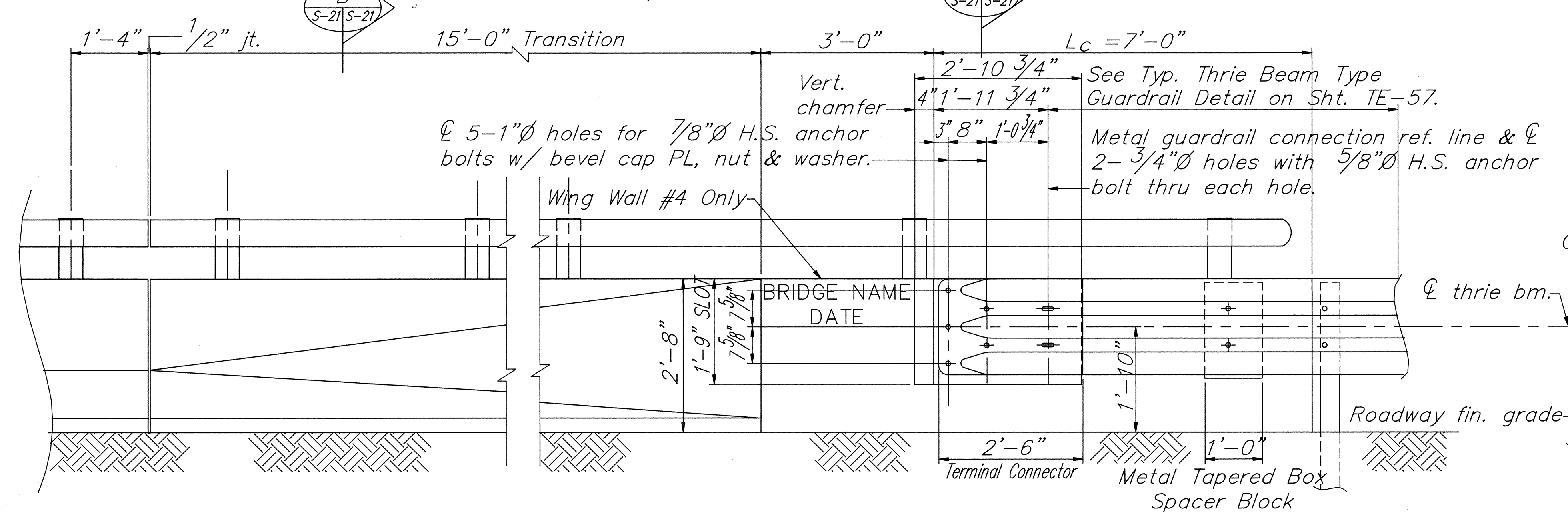
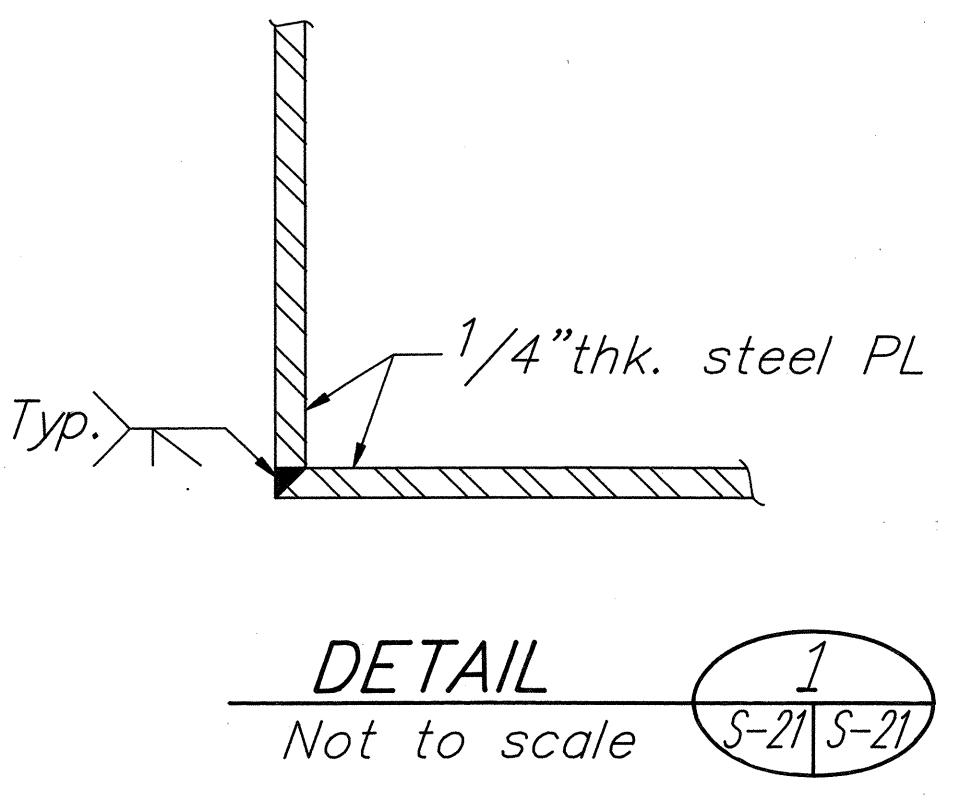
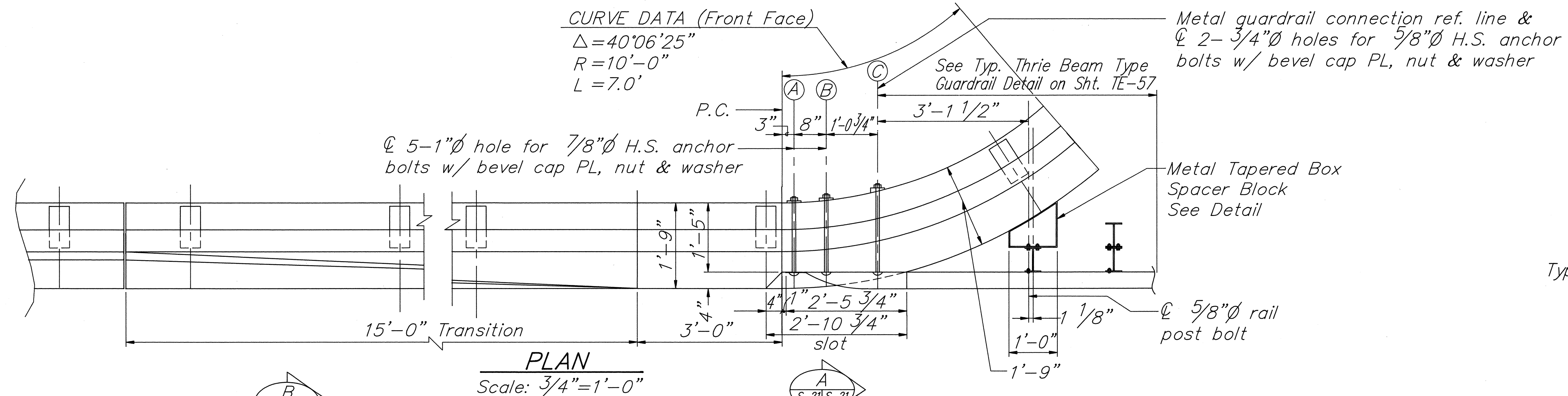
Not to scale



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DATE: SEPT. 1991

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
PRESTRESS GIRDER & INTERMEDIATE DIAPHRAGM DETAILS
HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)
SCALE: AS NOTED DATE: SEPT. 1991
SHEET NO. S-20 OF S-25 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-RS-0360(6)	1992	53	75



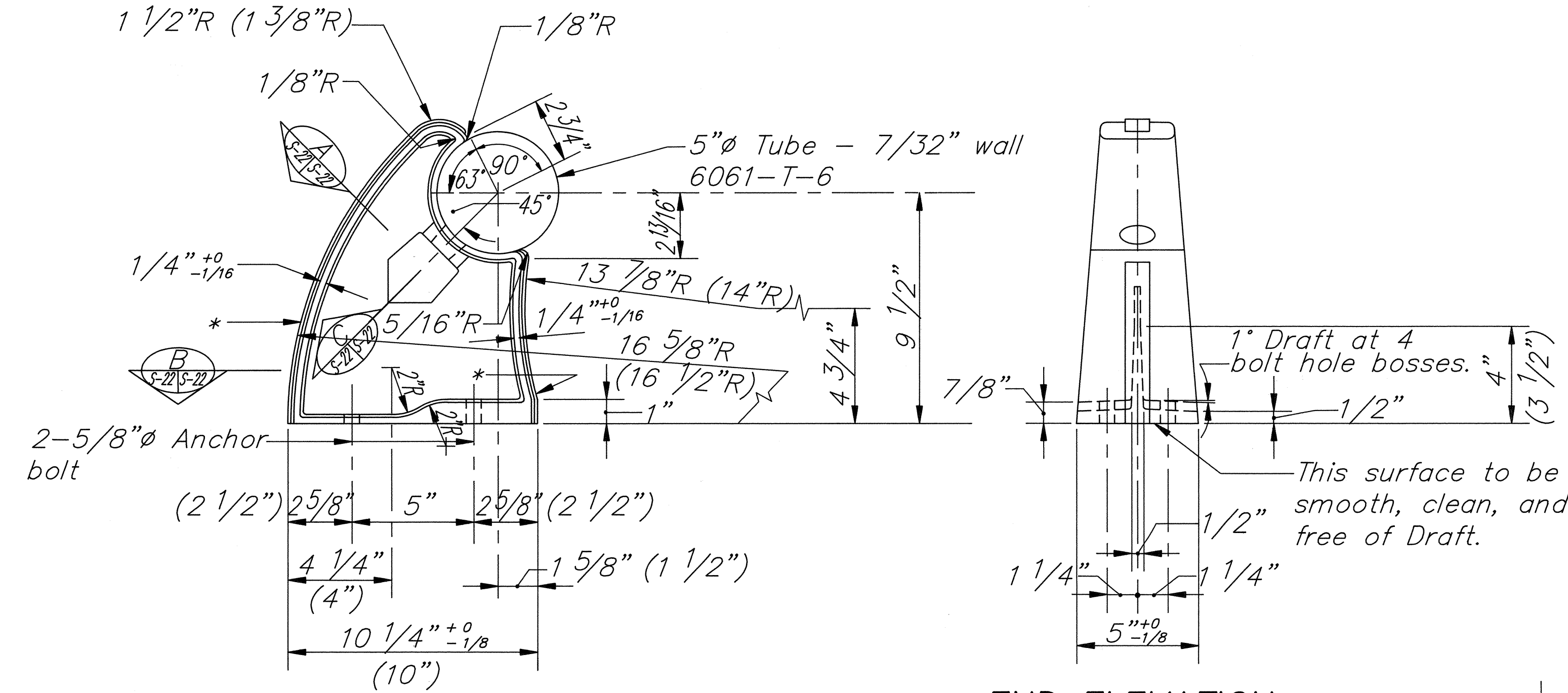
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
 HAROLD TAKASHI MINAMOTO
 REGISTERED PROFESSIONAL ENGINEER
 No. 1514-S
 HAWAII, U.S.A.

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
CONC. BRIDGE RAIL
TRANSITION W/ CURVED END AND
GUARDRAIL CONNECTION DETAILS
 HOOLAWA BRIDGE REPLACEMENT
 HANA HWY., HOOLAWA, MAUI
 PROJECT NO. BR-RS-0360(6)
 SCALE: AS NOTED
 DATE: SEPT., 1991
 SHEET NO. S-21 OF S-25 SHEETS

SURVEY PLOTTED BY: DATE: _____
 DRAWN BY: _____
 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.	BR-RS-0360(6)	1992	54	75

NOTE:
TOGGLE BOLT
 Cadum plating on steel-Type NS
 0.0005" thick ASTM-B766 (Class 12).



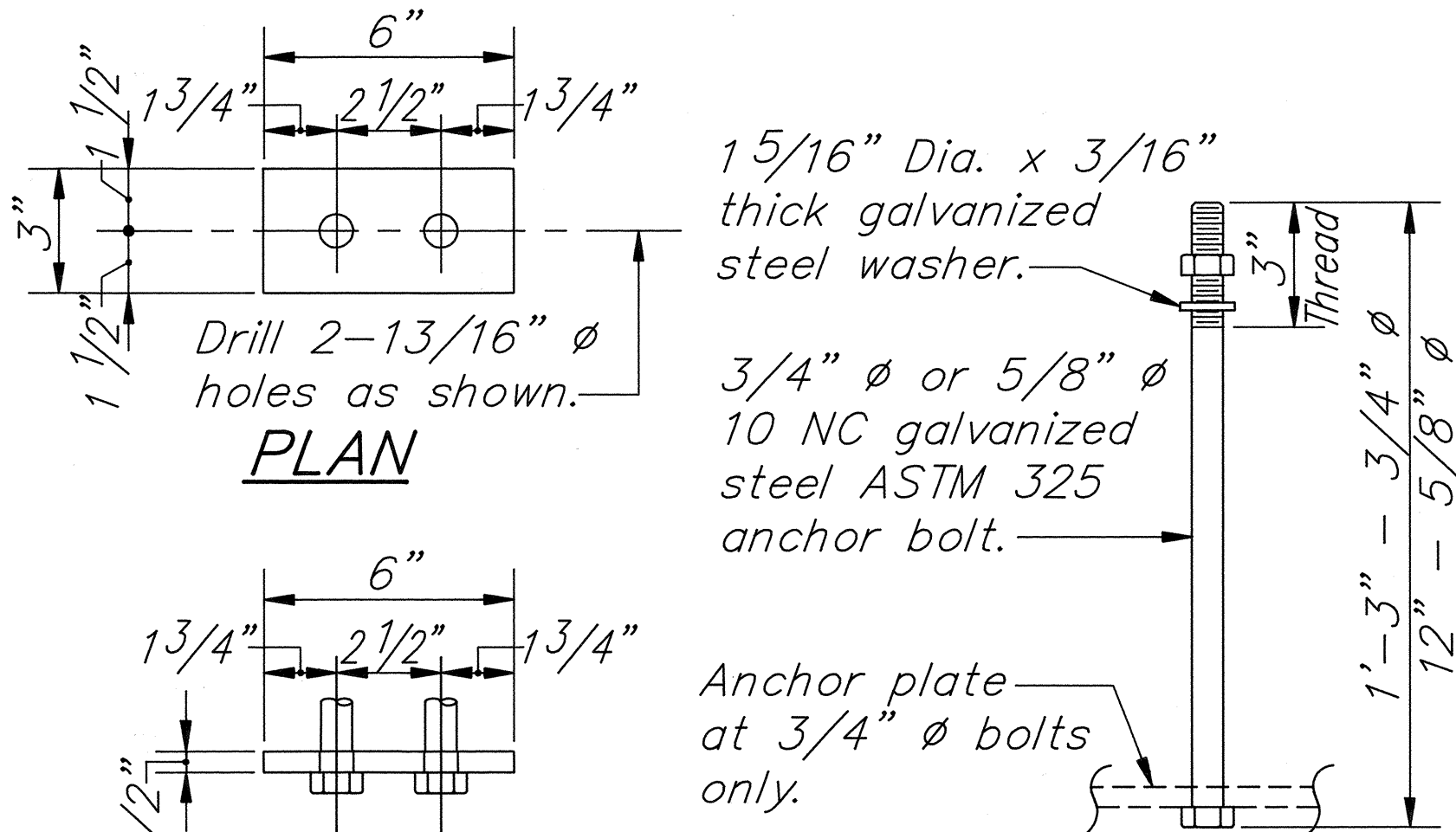
SIDE ELEVATION

END ELEVATION

NOTE:
 * Casting to be supplied with a standard scratch brush finish on entire gating rib surface and as indicated by an asterisk (*). Finish shall be approved by the Engineer.
 Casting to be neatly trimmed and any protruding flash to be broken off. Unless otherwise specified, draft angles to be 3°, corner radii to be 3/32"R, fillet radii to be 3/8"R, casting tol. to be ±1/16", wall thickness to be ±1/32". Dimensions may be as shown or as shown in the parenthesis ().

TYPICAL RAIL POST DETAILS

Scale: 3"=1'-0"



PLAN

ELEVATION

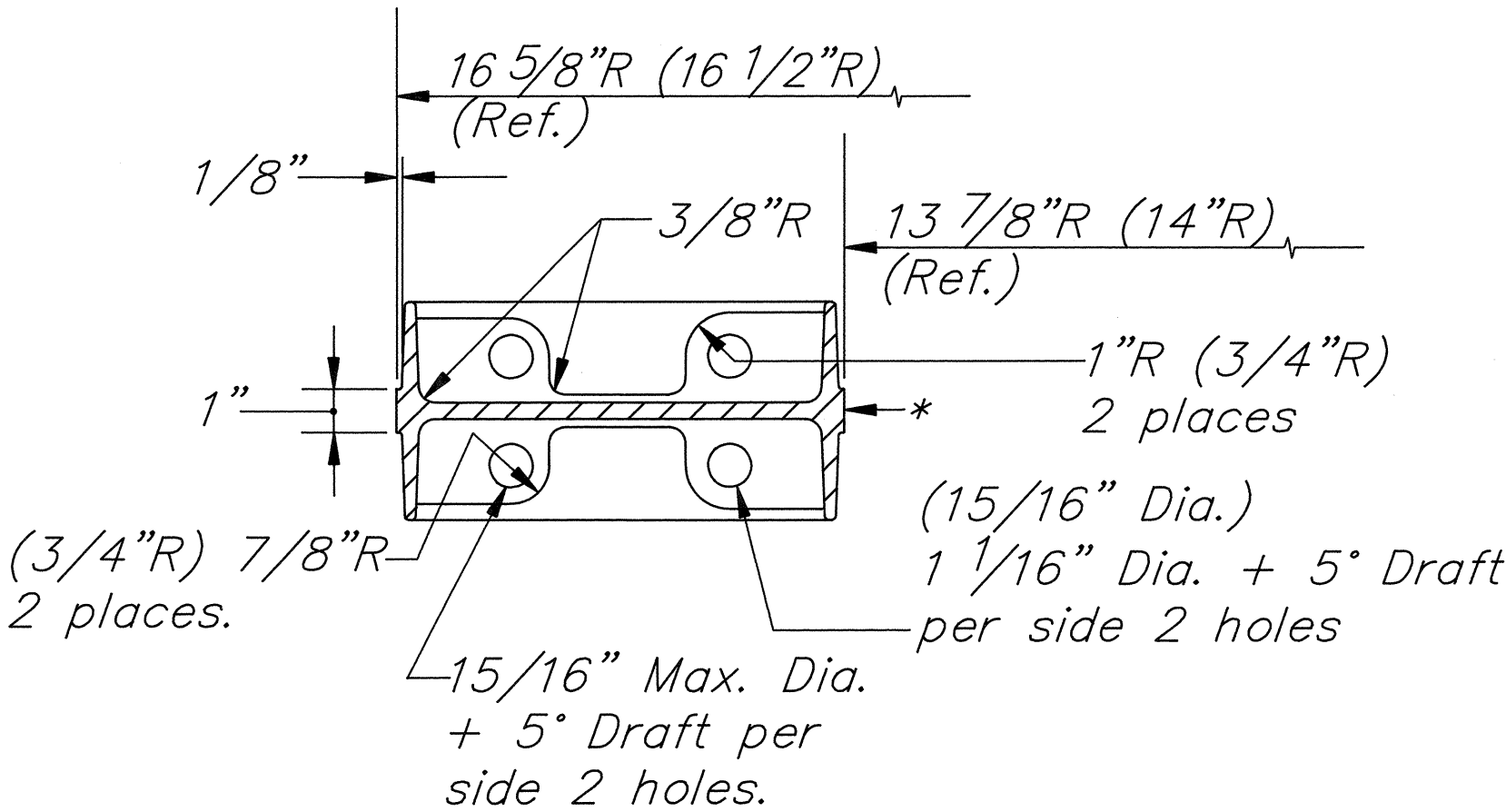
ANCHOR PLATE DETAIL

ANCHOR BOLT

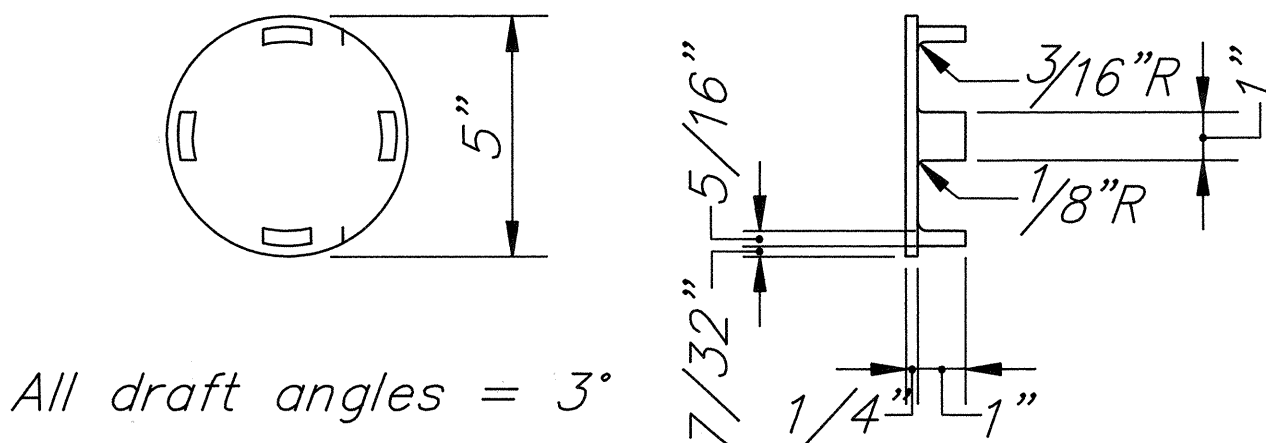
TYPICAL RAIL POST

STEEL ANCHOR BOLT ASSEMBLY

Scale: 3"=1'-0"



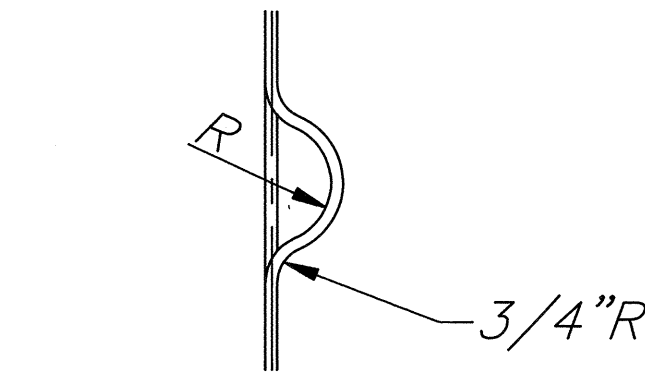
SECTION A



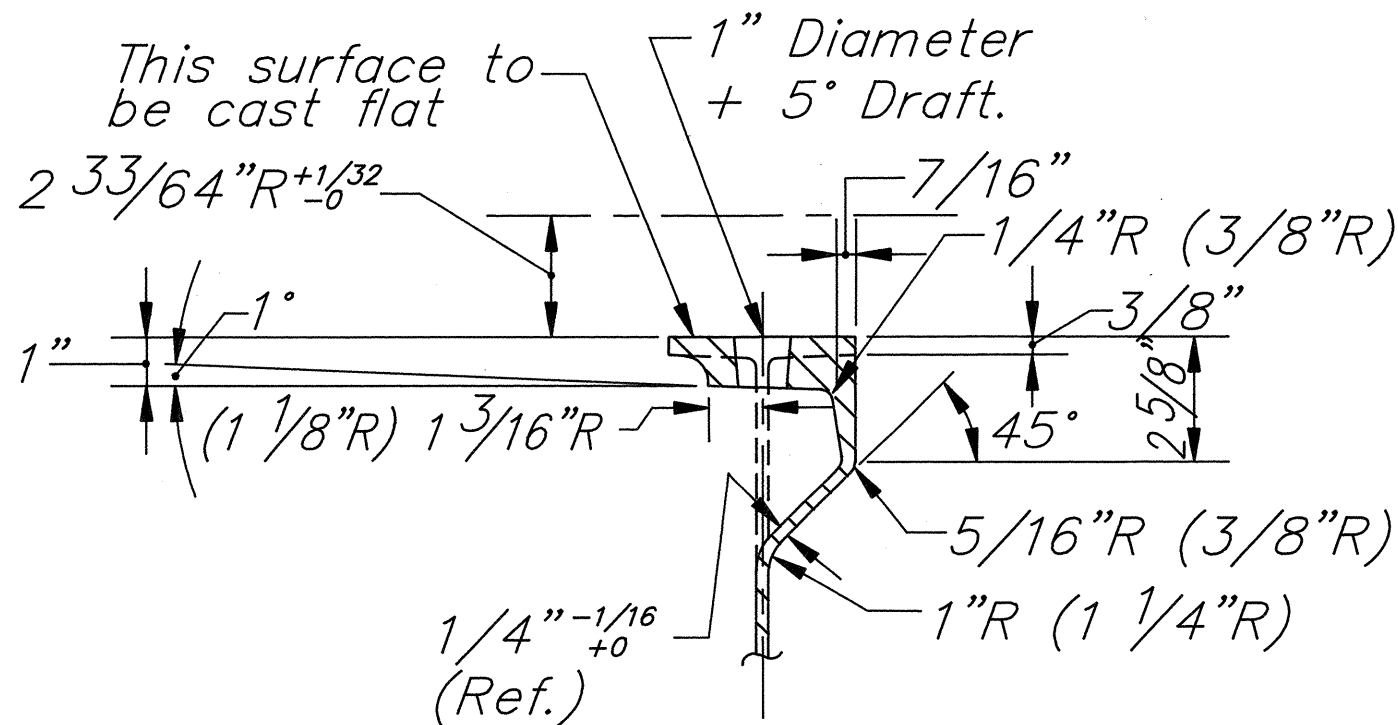
RAIL CAP DETAIL

Scale: 3"=1'-0"

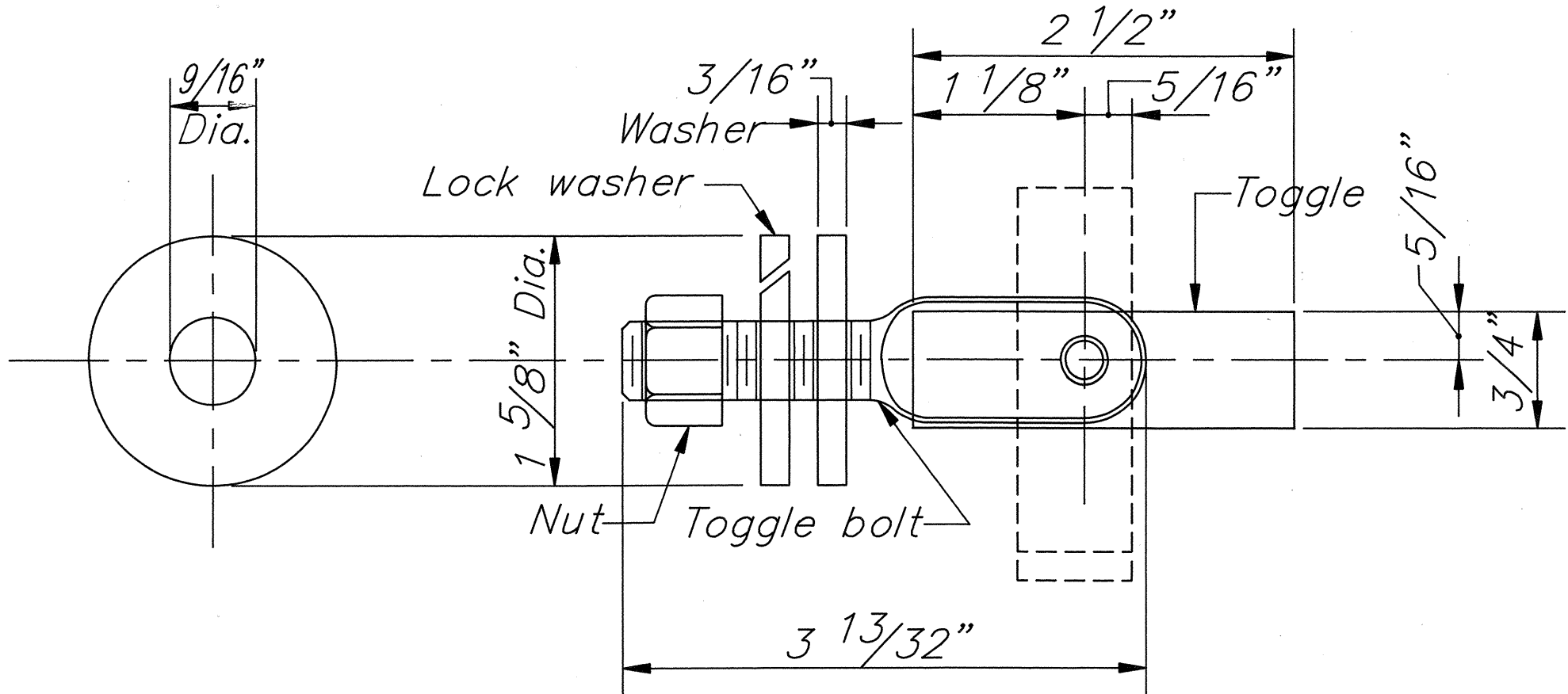
GENERAL NOTES:
 Metal bridge railing shown is for Aluminum bridge railing. See Specifications for alternate railing in steel.



SECTION B

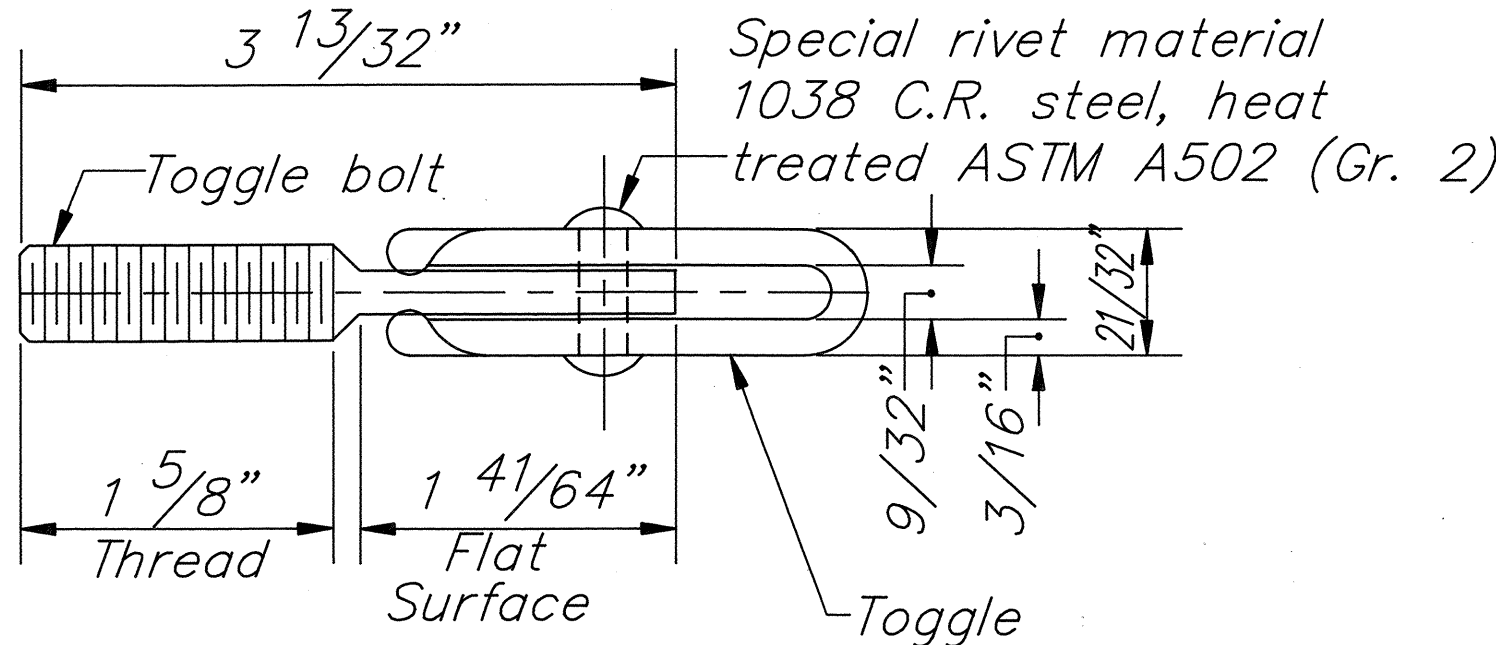


SECTION C



WASHER

SIDE ELEVATION ASSEMBLY



TOP PLAN

1/2"Ø STEEL TOGGLE BOLT DETAILS

Full Scale



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 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

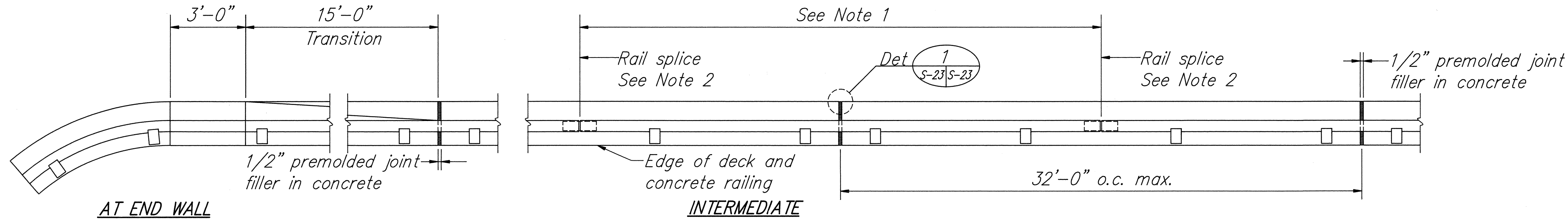
ALUMINUM BRIDGE
 RAILING DETAILS

HOOLAWA BRIDGE REPLACEMENT
 HANA HWY., HOOLAWA, MAUI
 PROJECT NO. BR-RS-0360(6)

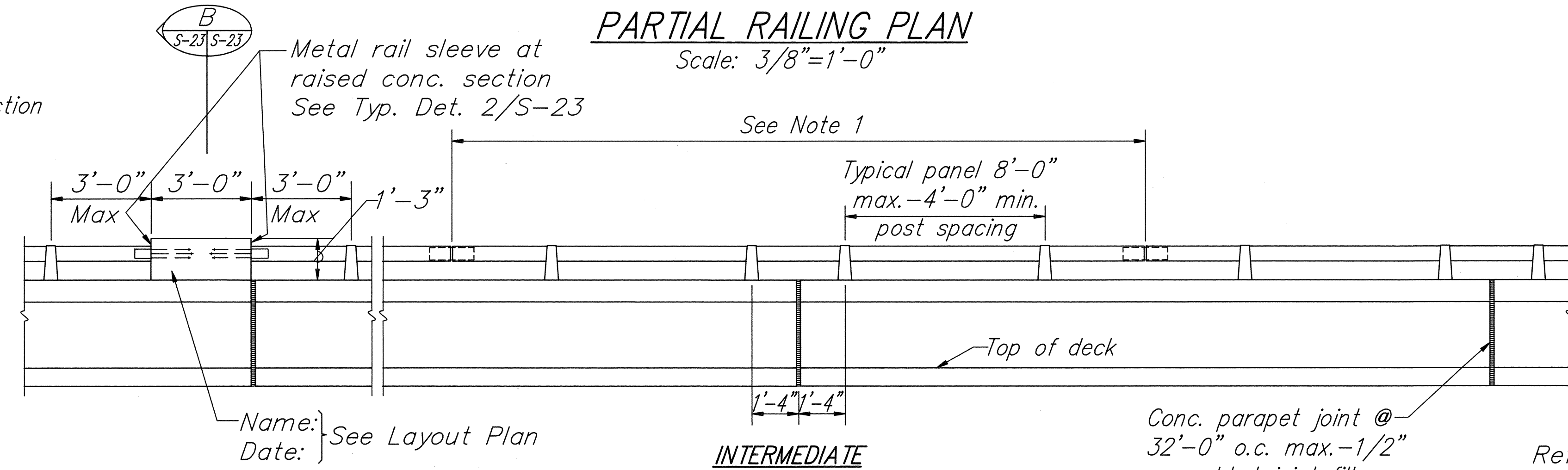
SCALE: AS NOTED
 DATE: SEPT., 1991

SHEET NO. S-22 OF S-25 SHEETS

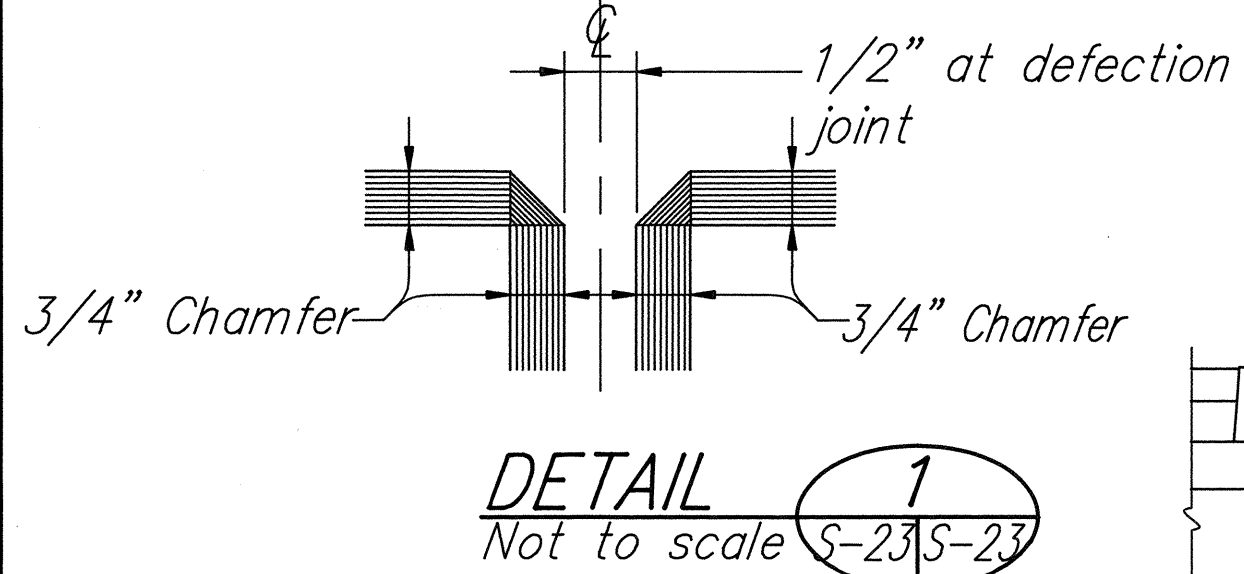
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-RS-0360(6)	1992	55	75



PARTIAL RAILING PLAN
Scale: $\frac{3}{8}"=1'-0"$

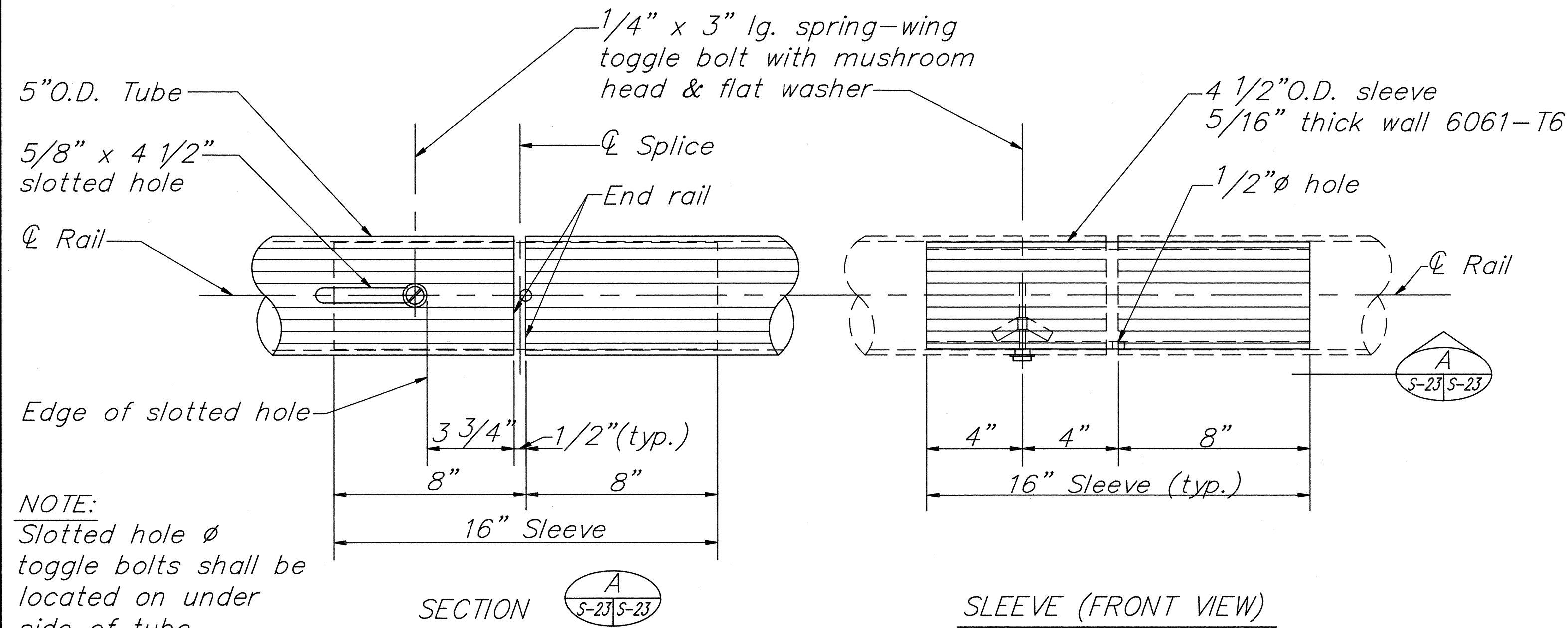


PARTIAL RAILING ELEVATION
Scale: $\frac{3}{8}"=1'-0"$



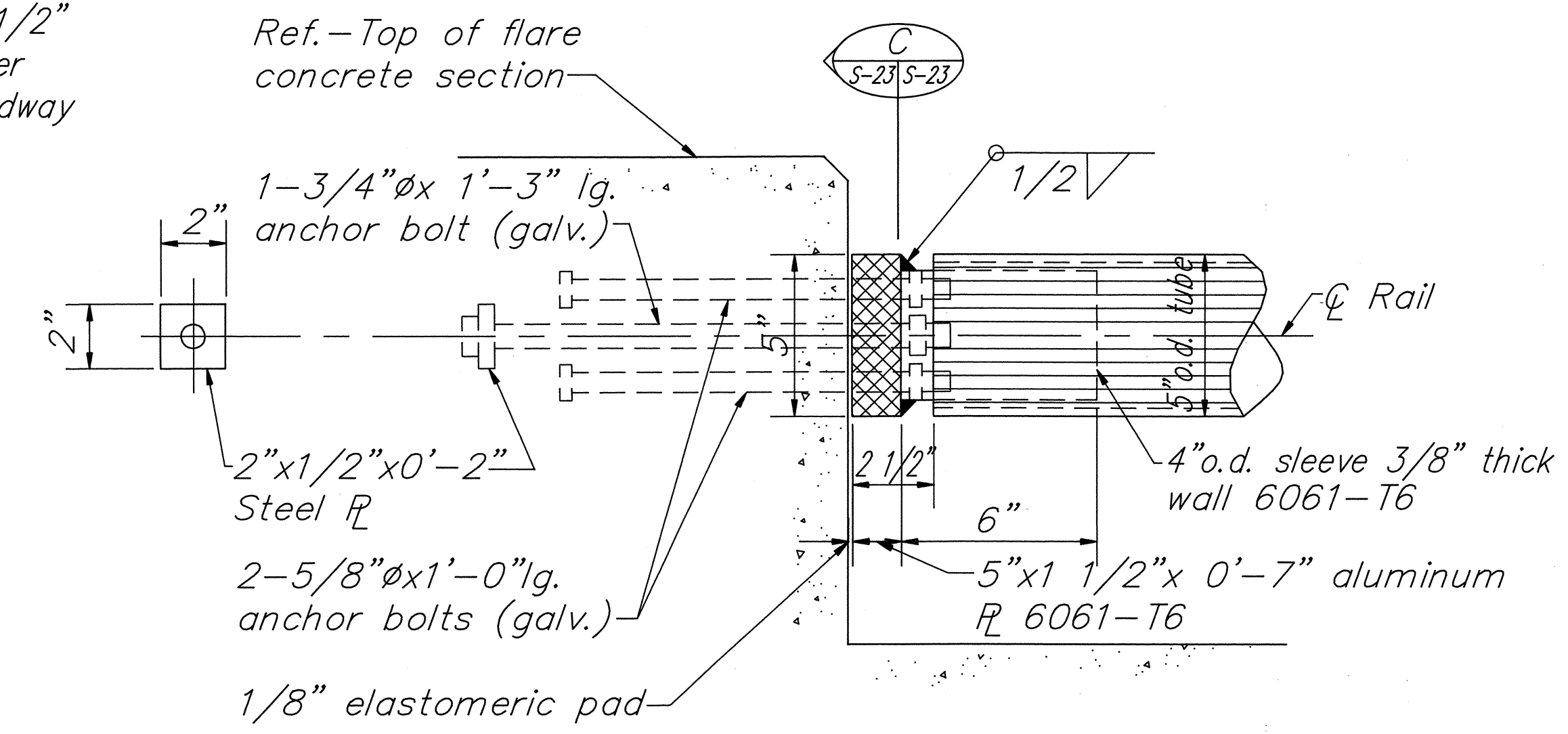
- NOTES:**
1. Tubing shall be continuous over not less than 3 post unless noted otherwise.
 2. All rail shall be spliced in the panel spanning deck expansion joints. Increase joint width between tube to 1 1/2" and increase sleeve length by 1" (see tube splice detail, this sheet).
 3. Rail post shall be normal to grade.
 4. NO more than one tube splice per panel shall be permitted except as noted.

CONDITION AT JT. AT ABUT. #1

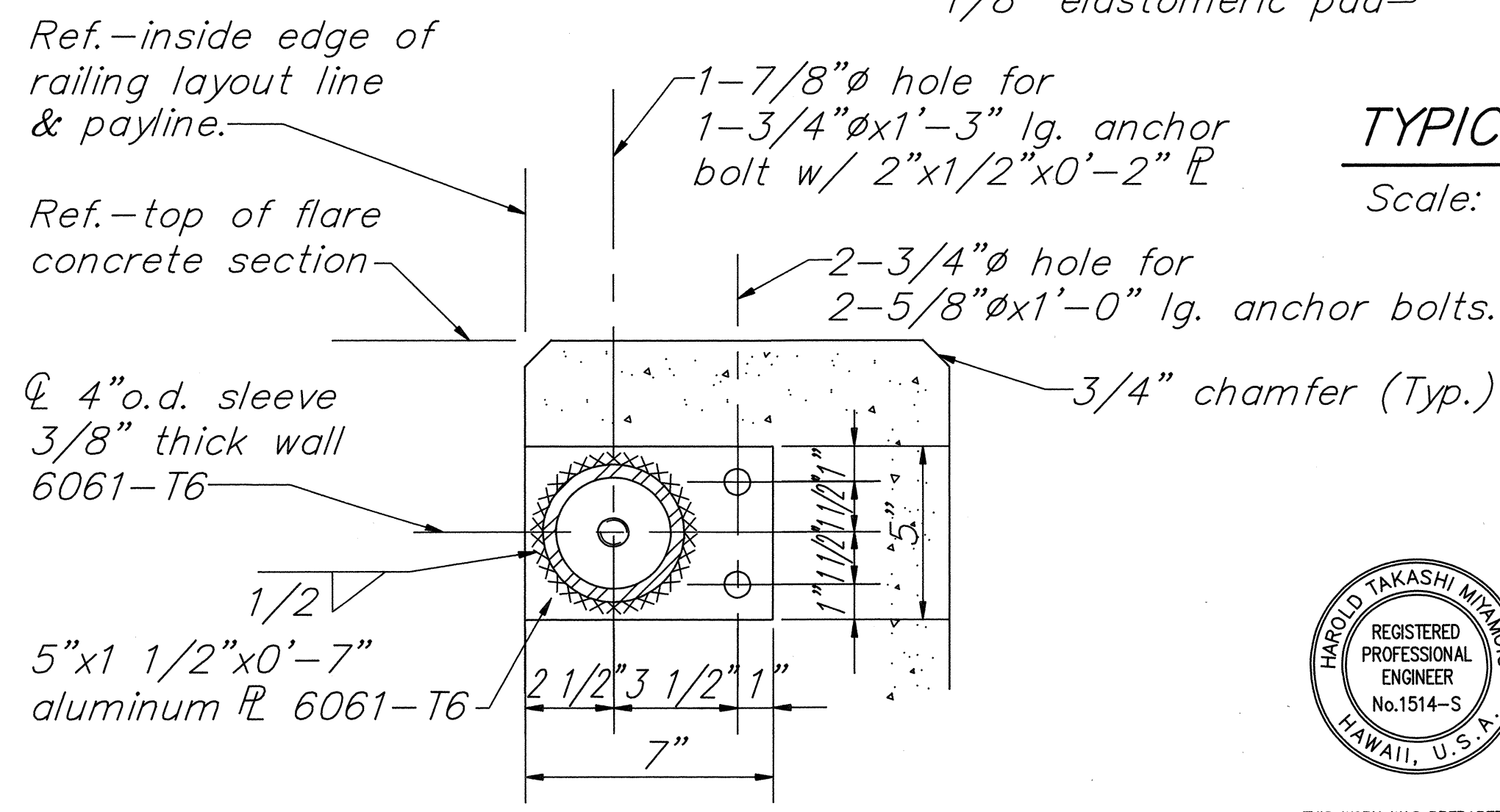


TUBE SPLICE DETAIL
Scale: $3"=1'-0"$

NOTE:
Slotted hole ϕ toggle bolts shall be located on under side of tube.



TYPICAL DETAIL
Scale: $3"=1'-0"$



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

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Harold Takashi Minato
REGISTERED PROFESSIONAL ENGINEER
No. 1514-S
HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE RAILING
DETAILS

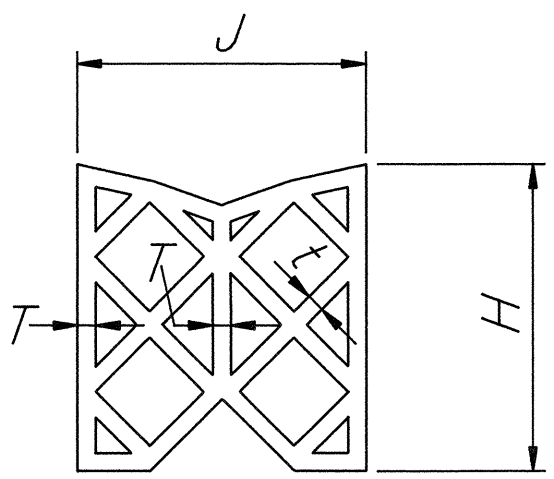
HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)

SCALE: AS NOTED DATE: SEPT., 1991
SHEET NO. S-23 OF S-25 SHEETS

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

EXPANSION JOINT SEALER SCHEDULE

Joint seal type	Exp. Jt. Size	Steel angle protective nosing	Groove size during construction @ 70°F		Minimum Groove size during installation		Joint seal dimensions & tolerances		
			W	D	W	D	type	J	H
1	2"	4"x3 1/2"x 1/2"	2 1/2"	4"	2 5/8"	4"	A	4" +3/16 -0"	±1/8"

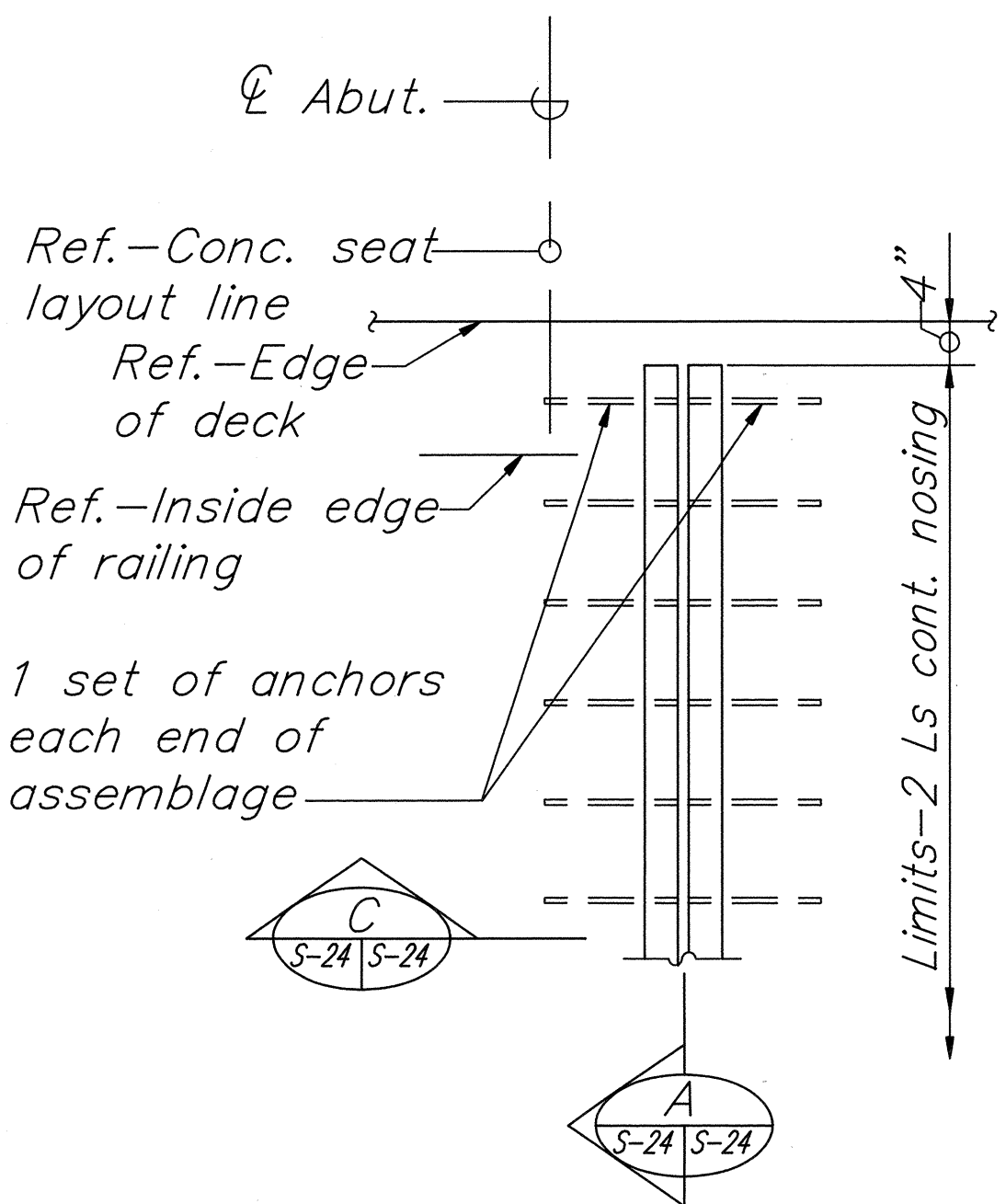


TYPE A

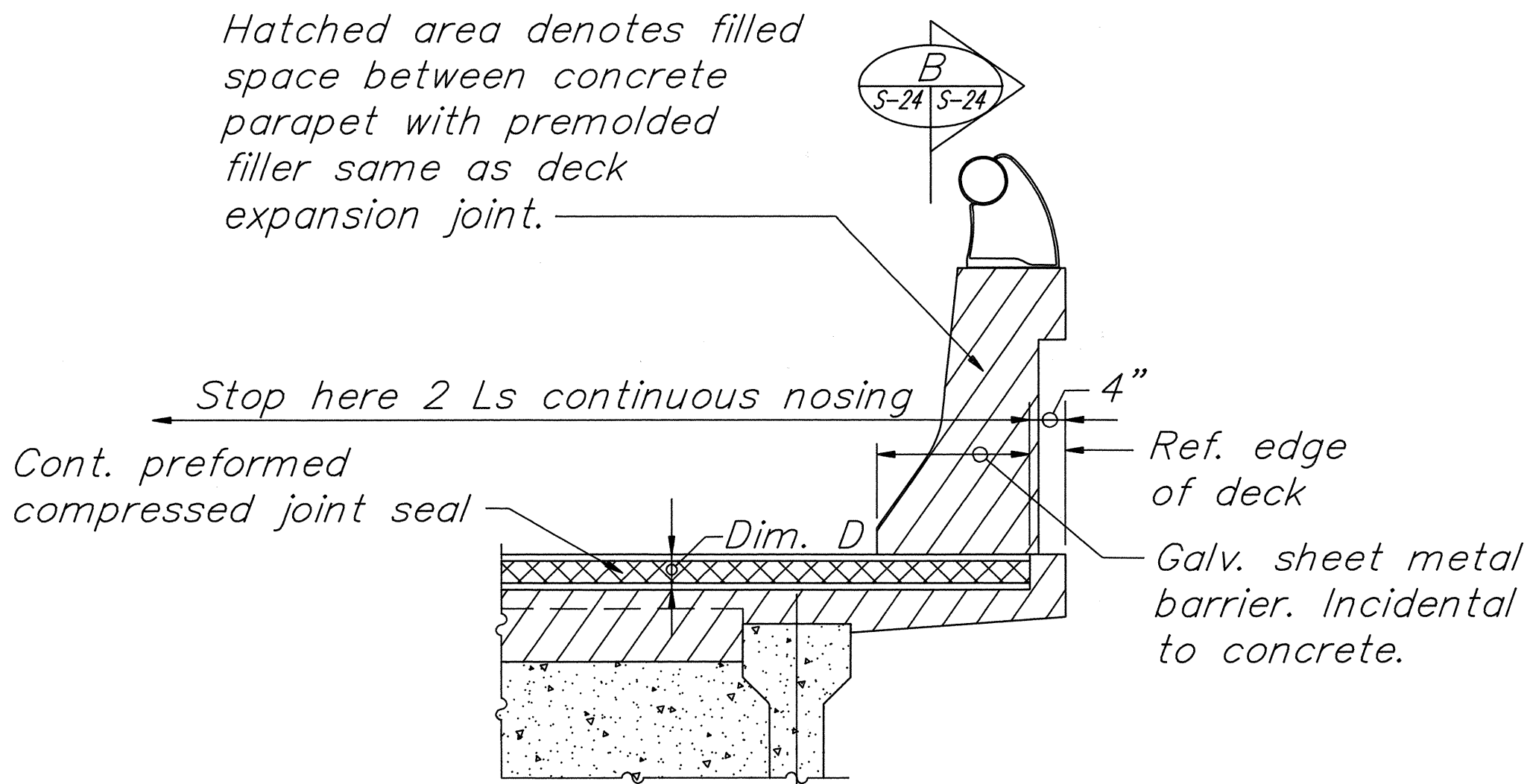
NOTE:

- Steel angle protective nosing assemblage shall be hot-dipped galvanized after fabrication.
- Preformed compressive joint seal and all other components of the protective nosing assemblage with the exception of the steel angles shall be incidental to concrete and will not be paid for separately.
- Continuous steel angles of the protective nosing shall be incidental to concrete.

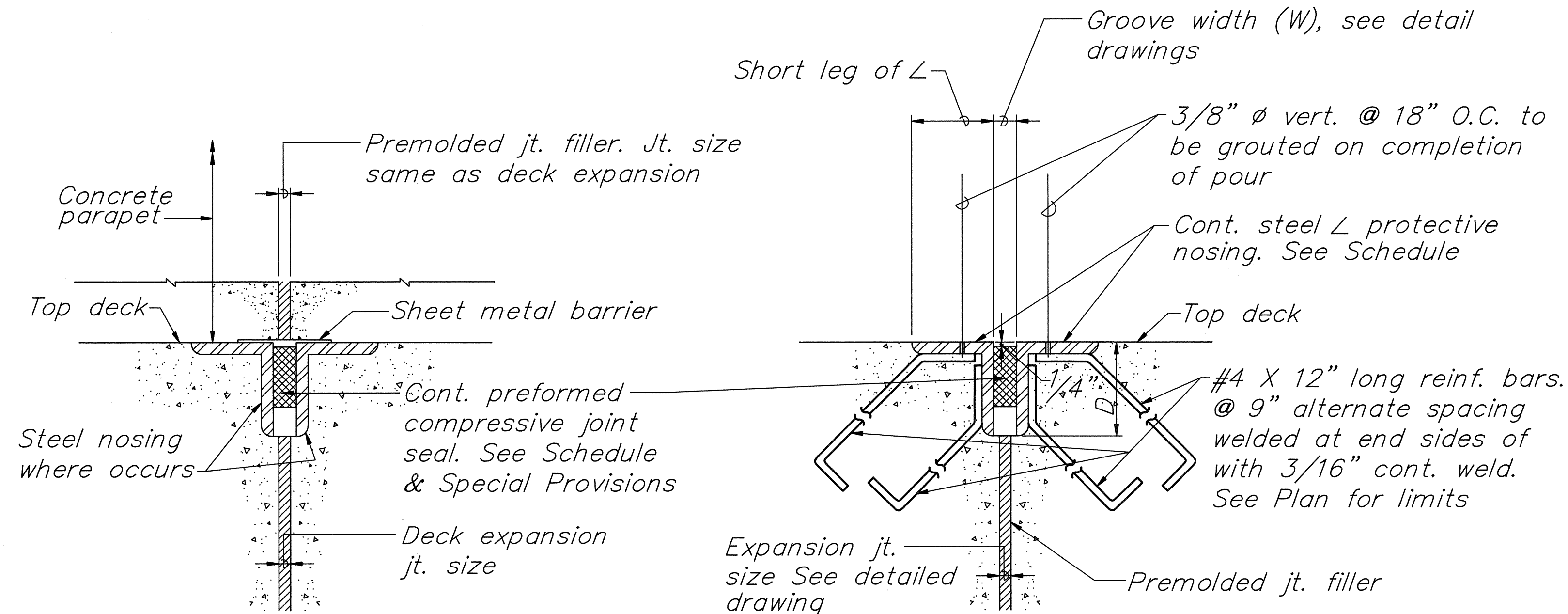
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-RS-0360(6)	1992	56	75



PLAN-TRAVERSE DECK
EXPANSION JOINT
Scale: 3/4"=1'-0"



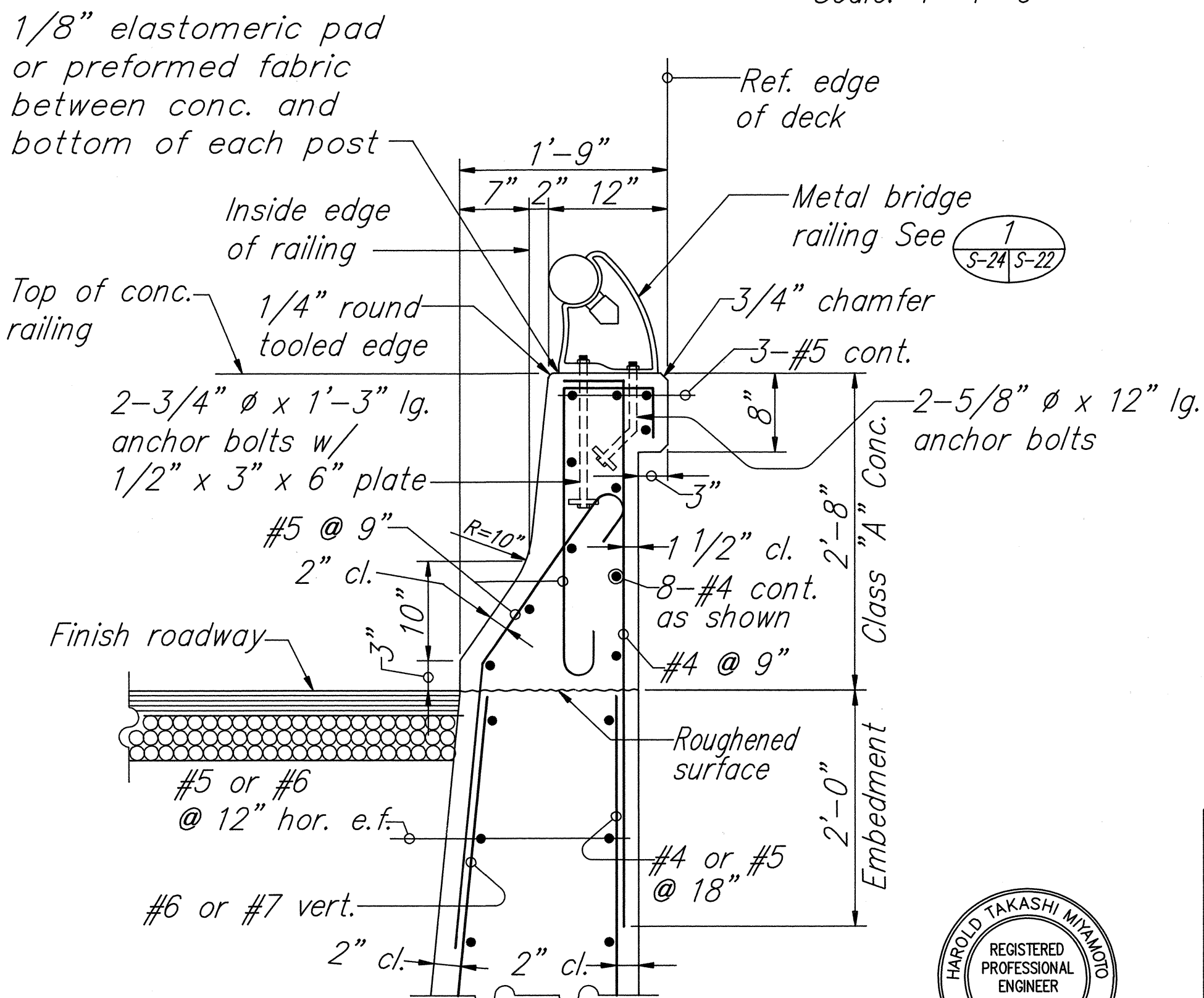
ELEVATION
Scale: 3/4"=1'-0"



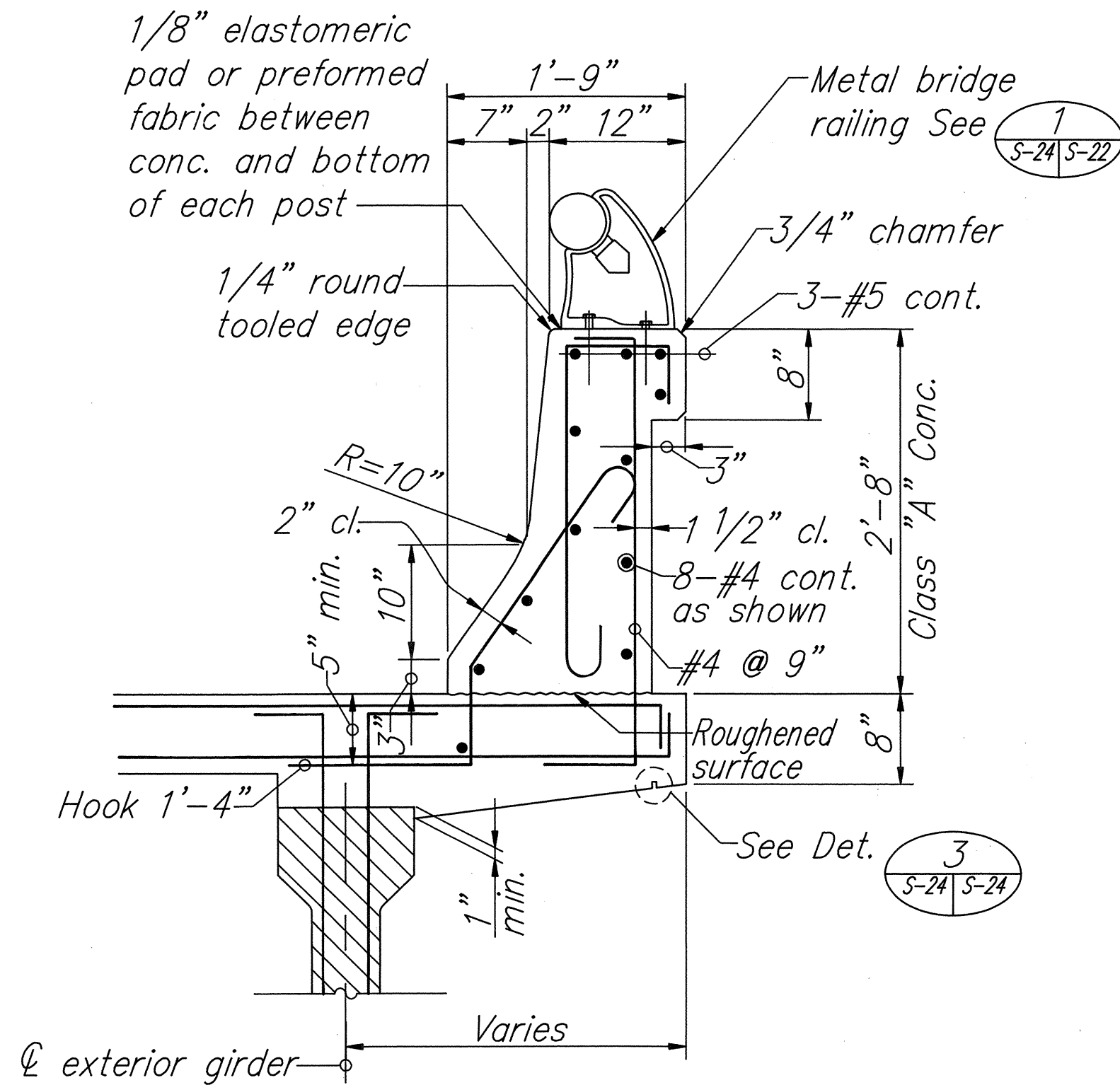
SECTION
Not to scale

AT STEEL ANGLE PROTECTIVE NOSING

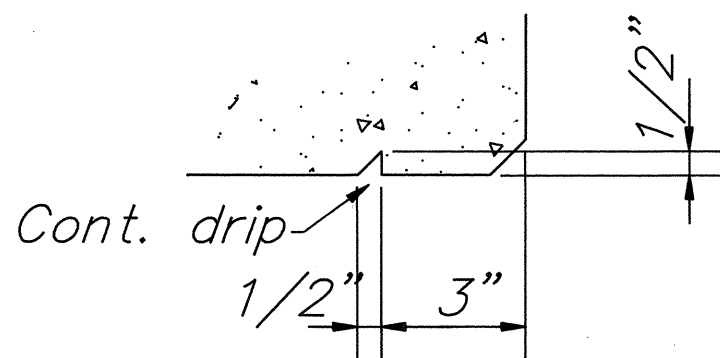
SECTION
Not to scale



DETAIL
Scale: 1"=1'-0"



TYPICAL CONCRETE RAILING
Scale: 1"=1'-0"



DETAIL
Scale: 3"=1'-0"



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HAROLD TAKASHI MIYAMOTO
S-12, S-23

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**DECK EXPANSION
JOINT DETAILS**

HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)
SCALE: AS NOTED DATE: SEPT., 1991
SHEET NO. S-24 OF S-25 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BR-RS-0360(6)	1992	57	75

30" Ø DRILLED SHAFT NOTES:

1. The Contractor shall refer to the Special Provisions, Section 5.10 – Drilled Shaft in addition to the following notes.
2. All excavation and drilling operations for foundations shall be monitored by the Engineer.
3. Bottom of excavations and holes for drilled shaft piles shall be free of water and cleared of debris and loose material prior to placing reinforcing steel or concrete.
4. Bottom of footing and pile tip elevations shall be verified by the Engineer prior to placing concrete.
5. Concrete shall not be placed without approval of the Engineer.
6. Pile tip elevations shown on the longitudinal section (sht. S-3) are estimated elevations. The actual pile tip elevations will be determined by the Engineer.
7. Drilled shafts shall extend a minimum of four feet into basalt.
8. Construction of drilled shaft piles shall comply with the "Standard and Specifications for the Foundation Drilling Industry", revised Nov. 1988, by ADSC: The International Association of Foundation Drilling and FHWA Student Workbook for Drilled Shafts, Pub. No. FHWA-HI-88-042, July 1988.
9. Construction of the drilled shafts shall be done in such a manner and sequence to prevent collapse of drilled shafts, premature loading of poured drilled shafts before its 28-day concrete strength and other mishaps that may reduce its capacity.
10. Shafts within three diameters of an adjacent shaft shall not be drilled within 8 hours of completion of concreting of the adjacent shaft.
11. Reinforcement:

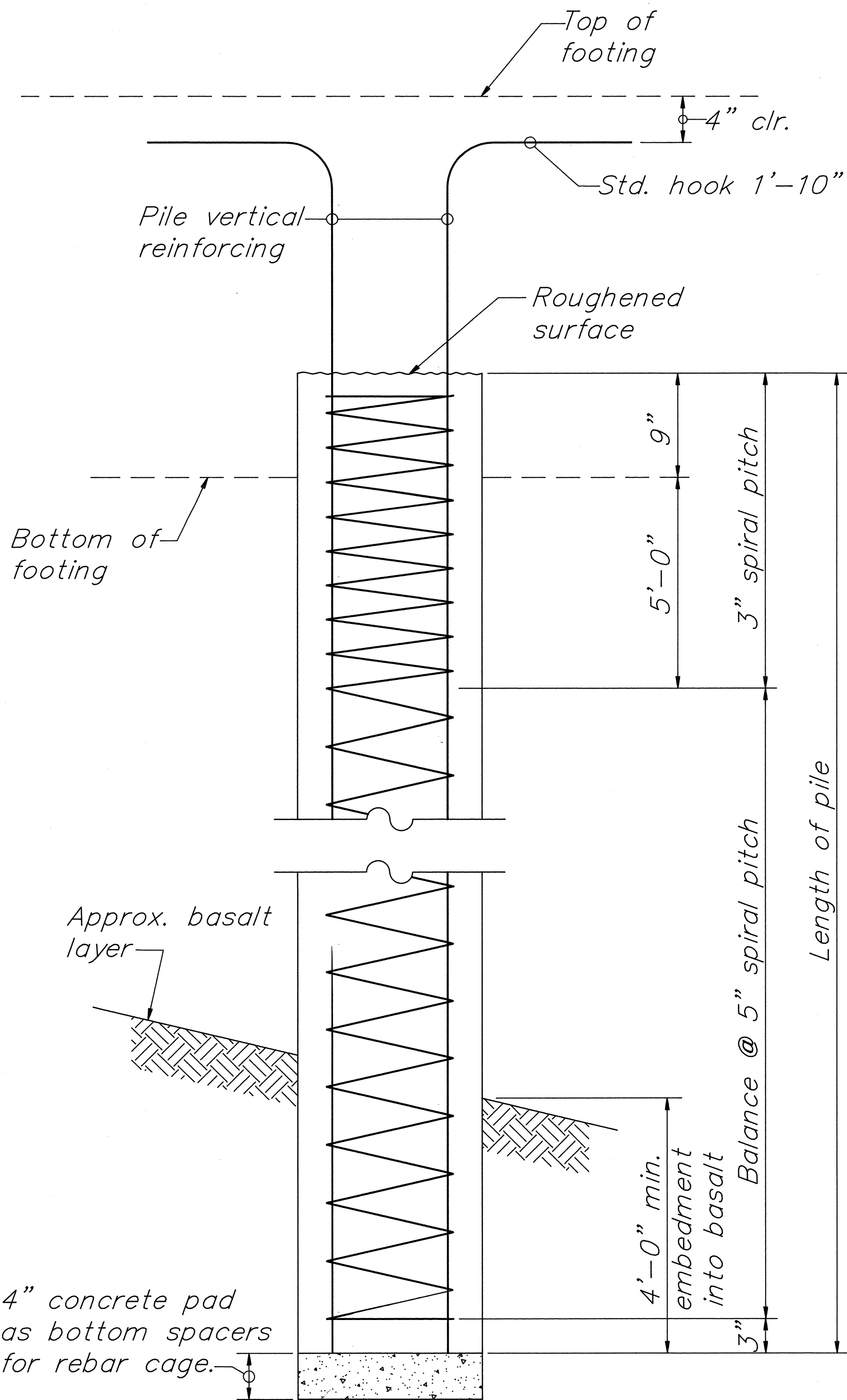
A. Longitudinal bars shall not be spliced.

B. Lap length for transverse reinforcement shall be 48 bar diameters or 12 inches minimum.

C. Concrete spacer blocks shall be used to maintain proper position and clearances to the reinforcing bars.

D. Drilled shaft concrete shall have a compressive strength of 4,500 PSI at 28 days of age.

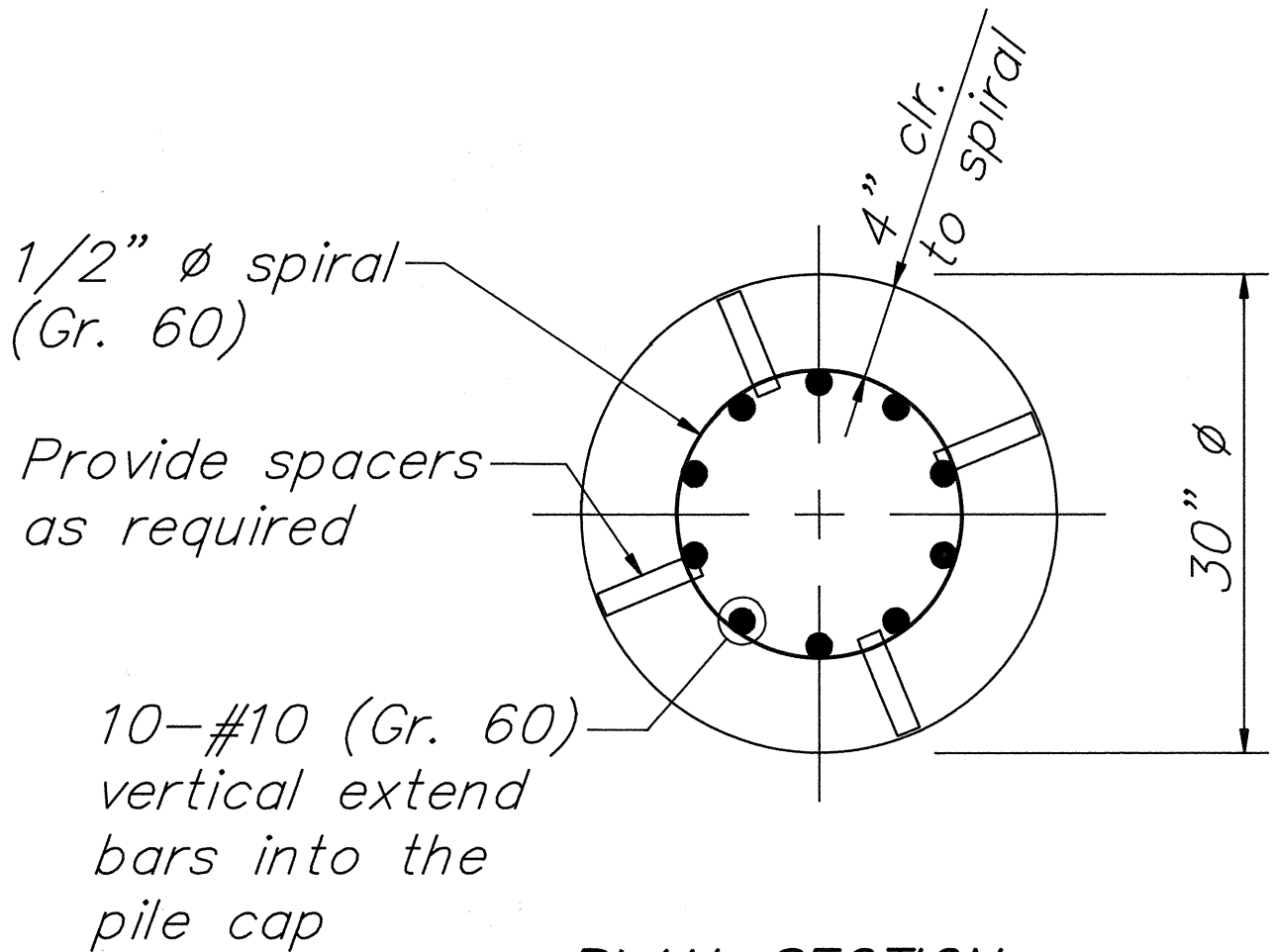
E. Reinforement shall be ASTM A615, Grade 60.
12. Concrete slump and maximum aggregate size shall conform to the Special Provisions.



Reinforcing steel to conform to ASTM A615, Grade 60.

Concrete to have a minimum 28 day compressive strength, $f'_c=4,500$ PSI

Contractor to provide adequate temporary bracing to reinforcing steel to prevent collapse of the cage during erection and placing of concrete.



30" Ø DRILLED SHAFT 1
Not to scale S-25 S-25



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRILLED SHAFT
DETAILS

HOOLAWA BRIDGE REPLACEMENT
HANA HWY., HOOLAWA, MAUI
PROJECT NO. BR-RS-0360(6)

SCALE: NO SCALE DATE: SEPT., 1991

SHEET NO. S-25 OF S-25 SHEETS

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NOTE BOOK	
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