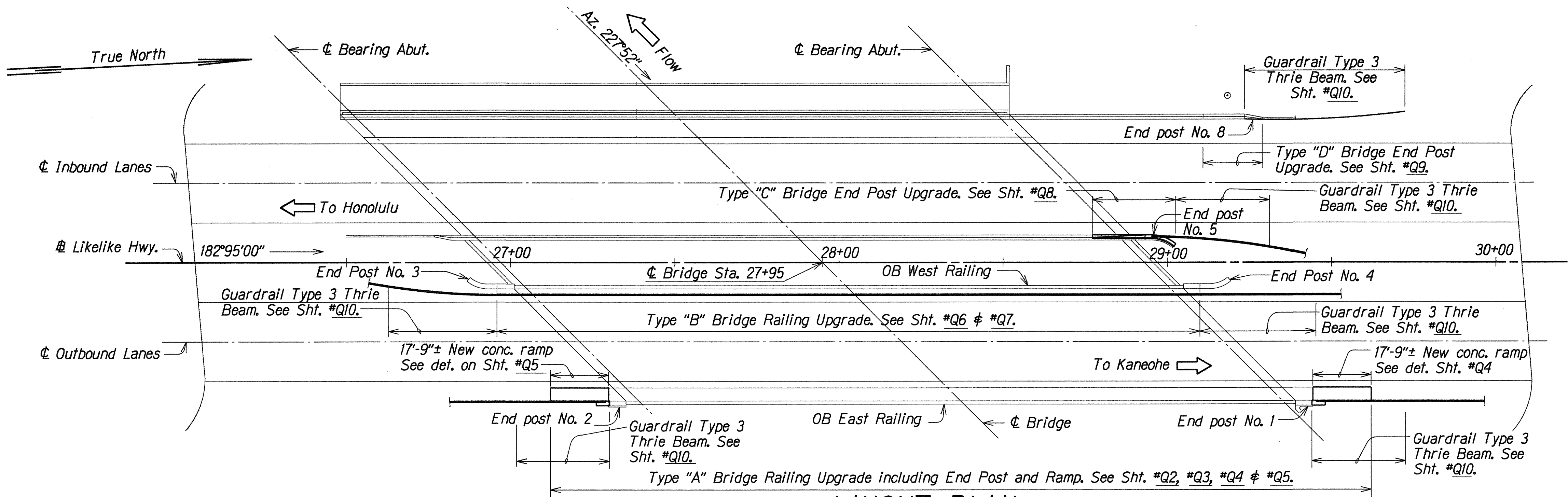


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	TOTAL SHEETS
HAWAII	HAW.	STP-0300(66)	1998	811



GENERAL NOTES

GENERAL SPECIFICATIONS:

Refer to Hawaii Department of Transportation Standard Plans, Standard Specifications for Road and Bridge Construction, 1994 edition, together with Special Provisions prepared for this contract.

DESIGN SPECIFICATIONS:

The 15th edition of A.A.S.H.T.O. Standard Specifications for Highway Bridges, 1992, with subsequent interim specifications.

LOAD:

Traffic Railing load: See A.A.S.H.T.O. Section 2.7.

MATERIALS:

- Concrete shall be Class A unless noted otherwise.
- All reinforcing steel shall be ASTM A 615, grade 40 unless noted otherwise.
- All structural steel shall be ASTM A 36 hot-dip galvanized, unless noted otherwise.
- All anchor bolts, washers and nuts shall be ASTM A 325, hot-dip galvanized after fabrication, unless noted otherwise.

DESIGN STRESSES:

Shall follow AASHTO Standard Specification for Highway Bridges in addition to those listed below:

Concrete	Class A
f'c	3,000 psi
fc	1,200 psi
n	9

CONSTRUCTION NOTES:

- The Contractor shall verify all existing conditions as specified on the plans and shall verify all dimensions in the field prior to commencing with the work.
- The Contractor shall verify the locations of all utility lines near structures and notify their respective owners before commencing with work.
- All vertical dimensions are measured plumb unless noted otherwise.
- All items noted incidental will not be paid for separately.
- Existing structure shown by hatched lines.
- Limits of removal of existing structure shown by x-hatched lines.
- Saw cut 1" deep along cut line of existing structure.
- Removal shall be done in such a manner as to preclude any damage to the existing structures.
- Large vibratory type of equipment will not be permitted in the removal operation, nor for drilling of holes.
- Only small vibratory hand tools approved by the Engineer will be allowed.
- Any damage to the existing structure due to the Contractor's operation or negligence shall be repaired by the Contractor at his expense to the satisfaction of the Engineer, with no additional cost to the State.
- All existing reinforcing and anchor bolts that can be incorporated in the new work shall be bent or cut as required and cleaned before being utilized in the new work.
- All existing reinforcing or anchor bolts that cannot be incorporated in the new work shall be completely removed or removed to a minimum depth of 1 1/2 inches below finish grade and the area patched with mortar.
- All existing concrete face, receiving new concrete in the finish product, shall be roughened and cleaned prior to placement of new pour, unless indicated otherwise or as directed by the Engineer.
- Drilling of through holes, shall be filled with mastic during placement of bolts, except as noted otherwise.
- Anchor bolt embedment length shall be such that a snug fit of the elements and full thread engagement plus 1/4" (max.) is attained.

LAYOUT PLAN
(KALIHI STREAM BRIDGE)

Scale: 1"= 20'-0"

- Guardrail Type 3 Thrie Beam - see "Department of Transportation Standard Plan TE-57", and additional details on Sht. #Q10.
- "Terminal Connector" shall be fabricated from 10 gauge steel conforming to the requirements of A.A.S.H.T.O. M 180.
- Terminal Connector, W8x10 spacer, W6x9 rail post on base plate, base plate and standard spacer including all anchor bolts, cap plates, nuts and washers shall be hot-dip galvanized after fabrication. (Clip washers shall be used as required.)
- Heads of through anchor bolts shall be placed on the traffic side of the rail.

ESTIMATED QUANTITIES (KALIHI STREAM BRIDGE ONLY)

ITEM NO.	ITEM	UNIT	QUANTITY
507.7610	Type "A" Bridge Railing Upgrade Including End Post and Ramp	LF	200 LF
507.7620	Type "B" Bridge Railing Upgrade	LF	209 LF
507.7630	Type "C" Bridge End Post Upgrade	LF	25 LF
507.7640	Type "D" Bridge End Post Upgrade	LF	28 LF
606.3112	Guardrail Type 3 Thrie Beam	LF	150 LF

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KALIHI STREAM BRIDGE
LAYOUT PLAN, GENERAL NOTES AND
ESTIMATED QUANTITIES
LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
F.A. Project No. NH-063-1(19)

Scale: As Noted Date: Apr. 1995

SHEET No. 01 OF 10 SHEETS

Technical drawing of a Type "A" Bridge Railing Upgrade, showing a side elevation with dimensions and callouts.

Dimensions:

- Overall length: $196'-10\frac{1}{2}" \pm$
- Left end post: 9'-1" Modified End Post No. 1. See details on Sht. #Q4.
- Left end post offset: 1'-4"
- Spacing between posts: 5 Spaces @ $5'-3\frac{1}{2}" \pm = 26'-5\frac{1}{4}"$
- Spacing between posts: 24 Spaces @ $6'-0" = 144'-0"$
- Spacing between posts: 5 Spaces @ $5'-3\frac{1}{2}" \pm = 26'-5\frac{1}{4}"$
- Right end post offset: 1'-4"
- Right end post: 9'-1" Modified End Post No. 2. See details on Sht. #Q5.
- Left ramp offset: 17'-9" \pm New ramp
- Left ramp offset: 3'-9"
- Left ramp offset: 5'-4"
- Right ramp offset: 5'-4"
- Right ramp offset: 3'-9"
- Right ramp offset: 17'-9" \pm New ramp

Callouts and Notes:

- Tube Splice. See Detail and Note 2 below.
- Joint size and location to match exist. joint. Fill w/premolded jt. filler
- 2'-6" min. (Post spacing)
- 1'-0" min. (Post spacing)
- See Note 1 below.
- Typical Panel 6'-0" max. 4'-0" min. post spacing
- 2'-0" max. (Typ.) (Pier spacing)
- Conc. rail constr. jt. as shown (32'-0" max.) See Note 6.
- "L" = $199'-6\frac{1}{2}"$ (along front face). See "Typical Rail Section"
- Left Pier (Pier)
- Right Pier (Pier)
- Metal Tube Sleeve at End Post. See Rail End Anchor Detail below.

Notes:

- See Note 1 below.
- See Note 2 below.
- See Note 6.

Labels:

- Left Pier (Pier)
- Right Pier (Pier)
- Left Ramp
- Right Ramp

Sheet Information:

- Sheet: Q2
- Project: Q2

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

1. *Tubing shall be continuous over not less than 4 posts unless noted otherwise. Single panel layout will not be permitted.*
2. *All tubes shall be spliced in the panel spanning concrete rail joint. See "Tube Splice Details" below.*
3. *Rail post shall be normal to grade.*
4. *No more than one tube splice per panel shall be permitted except as noted otherwise.*
5. *1/8" thick, full size elastomeric pads shall be placed between every post base and concrete surface.*
6. *Concrete rail contraction joint to be plumb with breaker in between. Stop longitudinal reinforcement at joint.*
7. *Removal of existing concrete railing shall be incidental to Type "A" Bridge Railing Upgrade.*

TUBE SLEEVE SCHEDULE		
D	D_1	T_1
3½"	3"	⅛"
4½"	3¾"	⅜"

[illegible]

Exist. conc. rail (shown by
x-hatched) to be removed.
Reinf. to be cleaned, cut
and/or incorporated into
new conc. rail and as
directed by the Engineer.—

EXISTING CONCRETE RAILING

Not to scale

- a. Alternate "A" and "B" bars (grade 60)
- b. Exposed existing reinf. shall be cleaned, straightened or bent as needed and lapped with new vert. reinf.
- c. Except as noted otherwise on plans, all exposed exterior corners 90° or less shall be chamfered $\frac{3}{4}" \times \frac{3}{4}"$. All exposed exterior corners greater than 90° shall not be chamfered.

Ref. front face of
 new bridge rail
 and exist. end post

1'-3"
 1'-0"
 For alum. railing and
 anchor bolts - See
 Sht. #Q3
 1/8" elastomeric pad
 #5@11" alt.
 "A" bars
 3 1/2"
 5"
 10"
 2" cl.
 typ.
 10"
 1"
 2"
 9"
 2'-3"
 1'-6"
 2'-3"
 1'-3"
 #5@11" alt.
 "B" bars
 Drill 2"Ø holes and fill
 with epoxy grout to
 secure #5 reinf.

Reinf. in same
 plane - 5 1/2" spc.
 bet. reinf.

Exist. sidewalk and
 deck to remain

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

ELEVATION SECTION
RAIL END ANCHOR DETAILS

Not to scale

ELEVATION

<i>B</i>	
<i>Q2</i>	<i>Q2</i>

TUBE SPLICE DETAILS

Not to scale

SLEEVE - FRONT VIEW

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KALIHI STREAM BRIDGE
TYPE "A" BRIDGE RAILING UPGRADE
TYPICAL RAIL SECTION AND TUBE DETAILS
LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
F.A. Project No. NH-063-1(I9)

Scale: As Noted Date: Apr. 1995

25'-0" Guardrail Type 3 Thrie Beam

4'-0" Ramp

17'-9"± Limits of new ramp

Remove curb. Limits to be determined in field.

Remove exist. rail post and guardrail

6" taper

2'-0" 8" 4" 9" (Taper below) 3'-0"

3'-9"

4" End of exist. sidewalk

5'-0" Build-up

exist. end post below

New conc. parapet and alum. railing - see sht. #Q2

Ref. beg. of end post line

1'-6"

Ref. exist. edge of deck

4"

1'-0"

4'-0" Exist. sidewalk

Ref. front face of railing

Match exist. sidewalk

3'-#5x2'-0" lg. dowels as shown

3'-#4@3'-6" lg.

4" Holes and anchor bolts w/cap PL, nut and washer. See Detail for number and sizes.

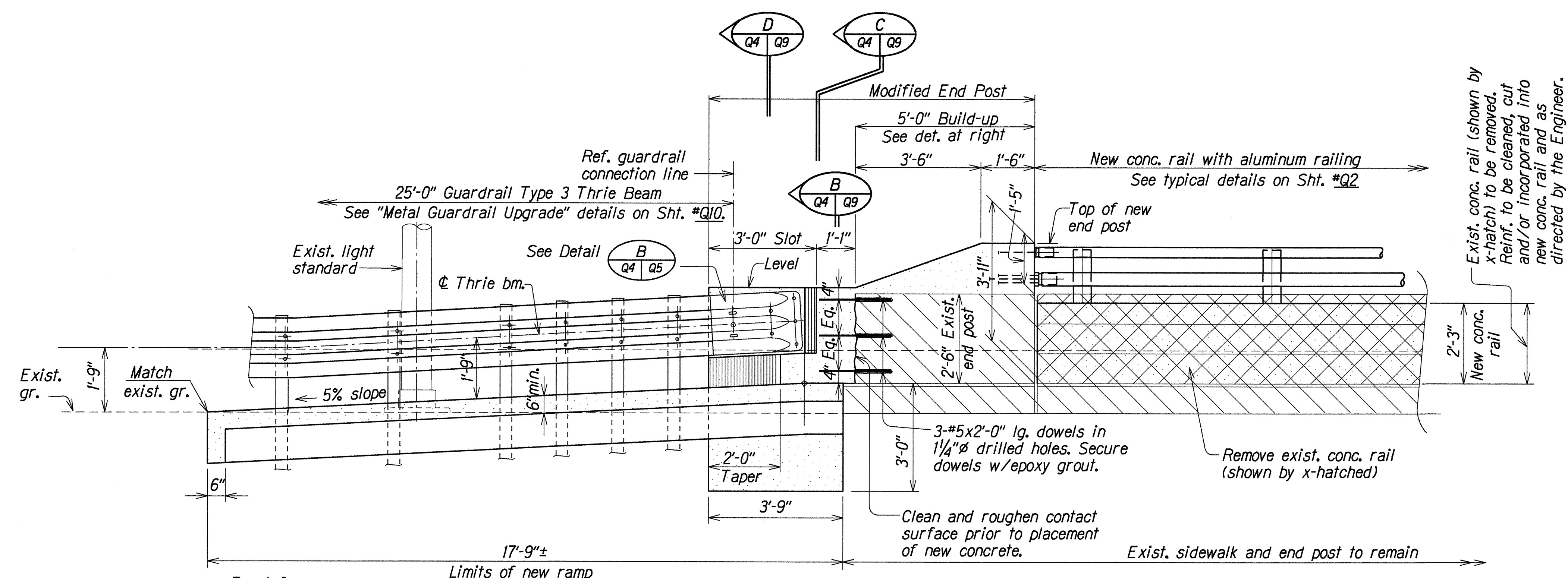
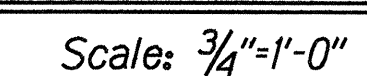
Ref. guardrail connection line

Q4 Q5

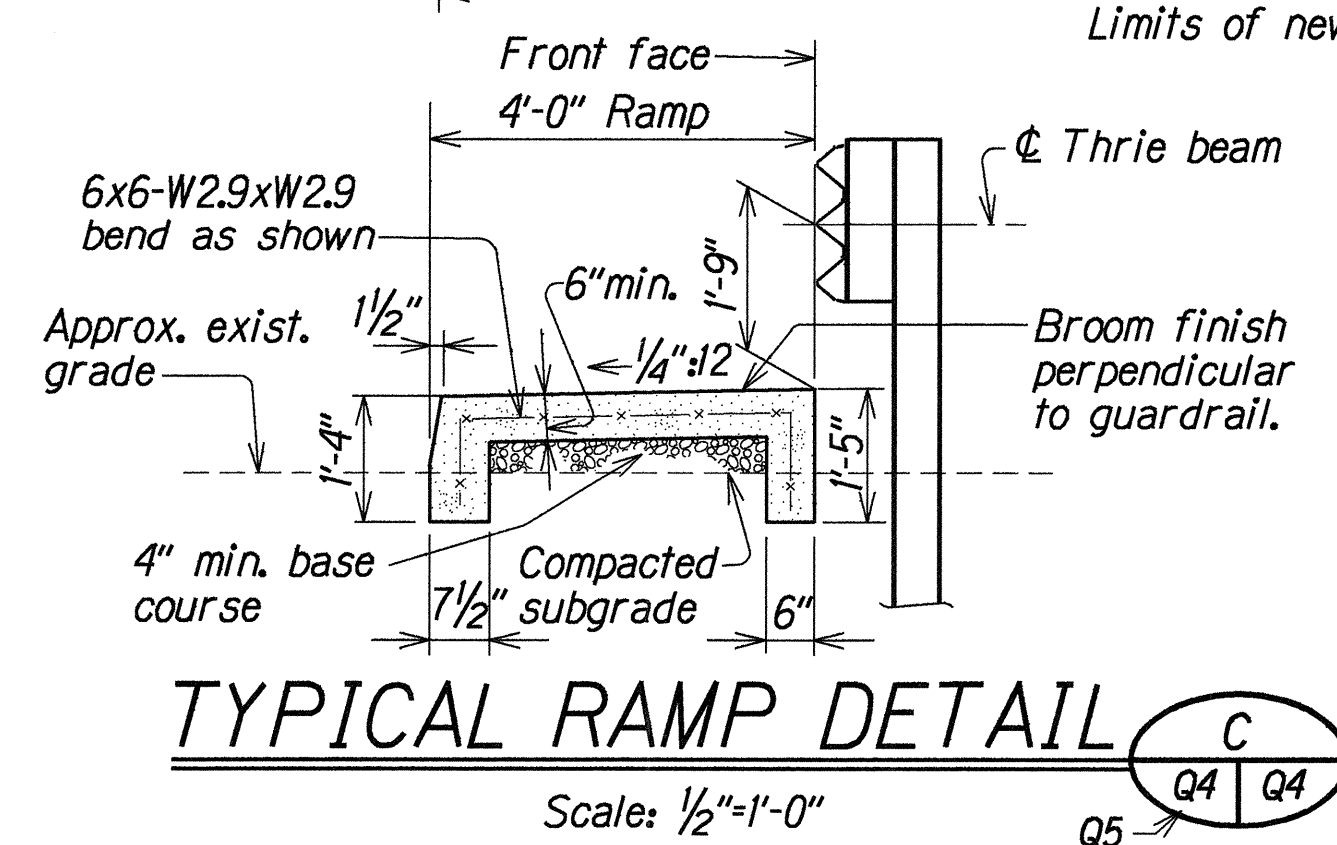
Q4 Q4

A

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



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



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

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

SHEET No. 04 OF 10 SHEETS

Technical drawing of a bridge deck and sidewalk construction detail. The drawing shows a cross-section of a bridge deck with a new concrete parapet and aluminum railing on the left, and a 25'-0" Guardrail Type 3 Thrie Beam on the right. Key dimensions include a 5'-0" build-up for the sidewalk, a 3'-9" distance to the guardrail, and a 4'-0" ramp. Reinforcement details include 3-#5x2'-0" lg. dowels, 3-#4@3'-6" lg. bars, and #4@18" bars. A circular detail shows a 1/2" hole with a 1/2" nut and washer. A note indicates an existing light standard to be relocated. The drawing also shows the limits of the new ramp and the existing sidewalk to remain.

[illegible]

25'-0" Guardrail Type 3 Thrie Beam
See "Metal Guardrail Upgrade" details on Sht. #Q10

Remove exist. guardrail and post

Ref. guardrail connection line

Ø 2-3/4" Ø x 1'-4" lg. anchor bolts w/cap PL, nut and washer

Ø 5-1/8" Ø thru holes for 5-7/8" Ø x 1'-4" lg. anchor bolts w/cap PL, nut & washer

5% slope

6" min.

3'-9"

3'-0" Taper

2'-9 3/4"

2'-6" Terminal connector

3'-0" Slot

1'-1"

4"

8"

1'-0 3/4" 7/4"

3"

1'-10"

7 5/8" 7 5/8"

10"

2'-8"

3'-0"

4"

1'-1"

8"

2'-0"

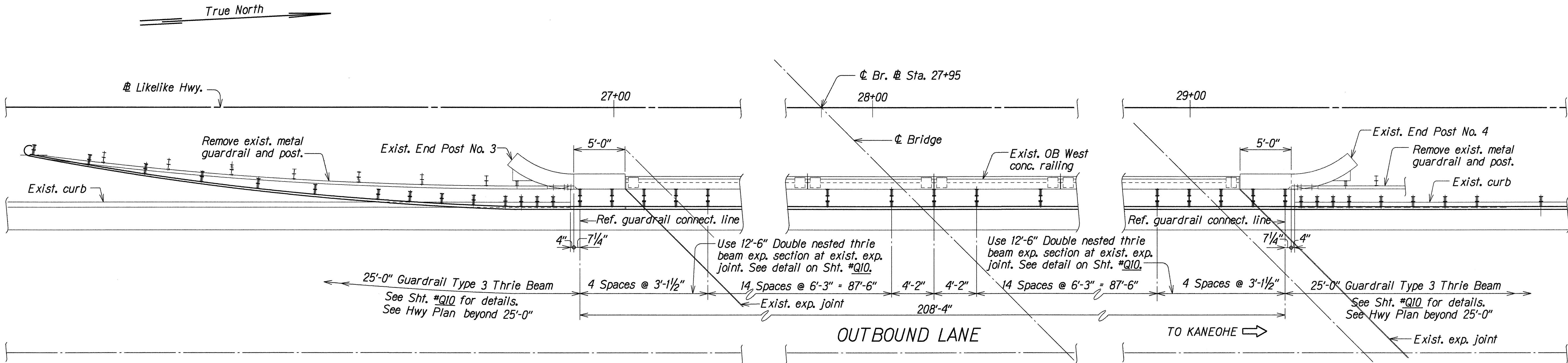
3'-9"

Q5 Q5

ORIGINAL PLAN	SURVEY PLOTTED BY _____	DATE _____
	DRAWN BY _____	
	TRACED BY _____	
NOTE BOOK	DESIGNED BY _____	APR 1995
	QUANTITIES BY _____	APR 1995
	CHECKED BY _____	APR 1995

34

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	TOTAL SHEETS
HAWAII	HAW.	STP-0300(66)	1998	811



TYPE "B" BRIDGE RAILING UPGRADE LAYOUT PLAN

Scale: 1" = 5'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	APR 1995
NO. 21646 (000)	DESIGNED BY	APR 1995
	CHECKED BY	APR 1995

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KALIHI STREAM BRIDGE

TYPE "B" BRIDGE RAILING UPGRADE LAYOUT PLAN

OB WEST CONCRETE RAILING

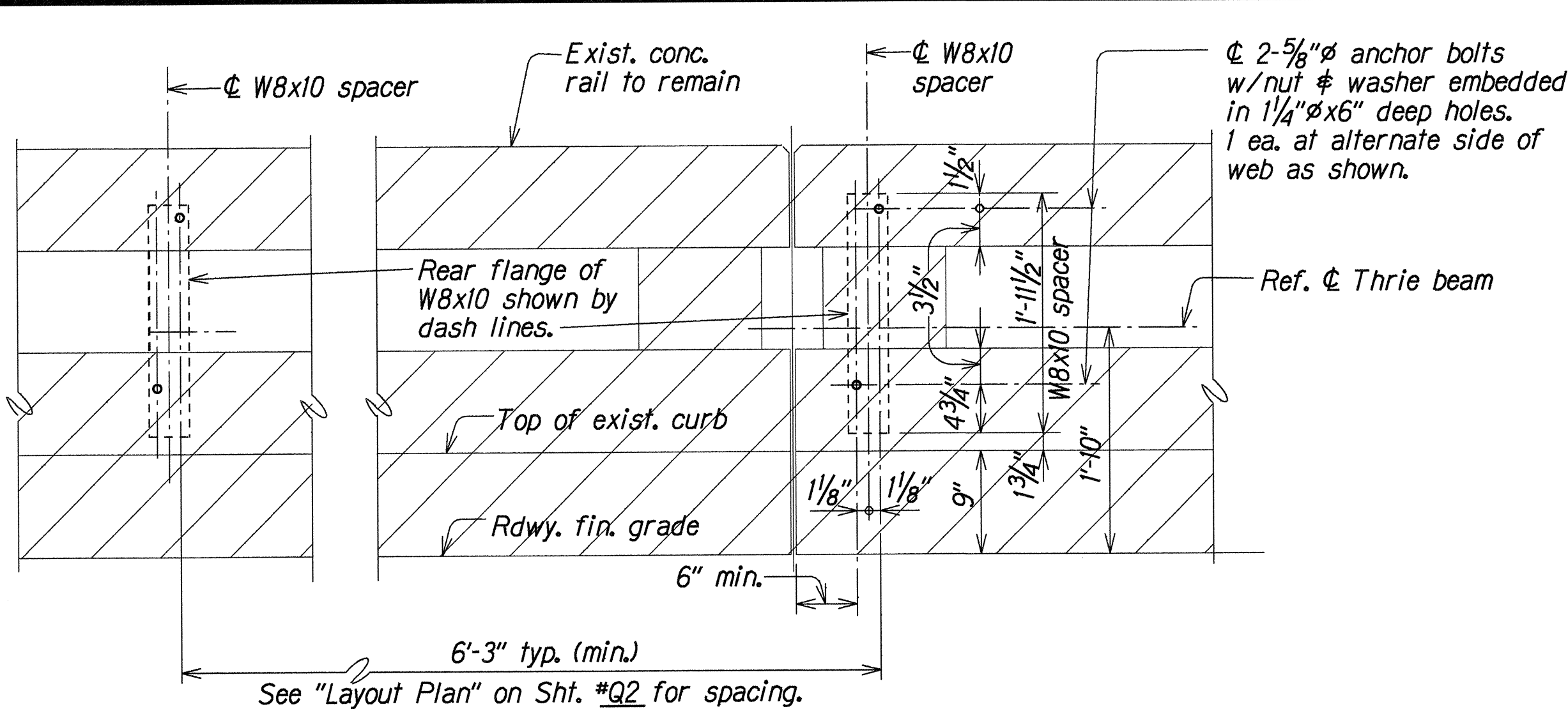
LIKELIKE HIGHWAY RESURFACING

School Street to Emmeline Place

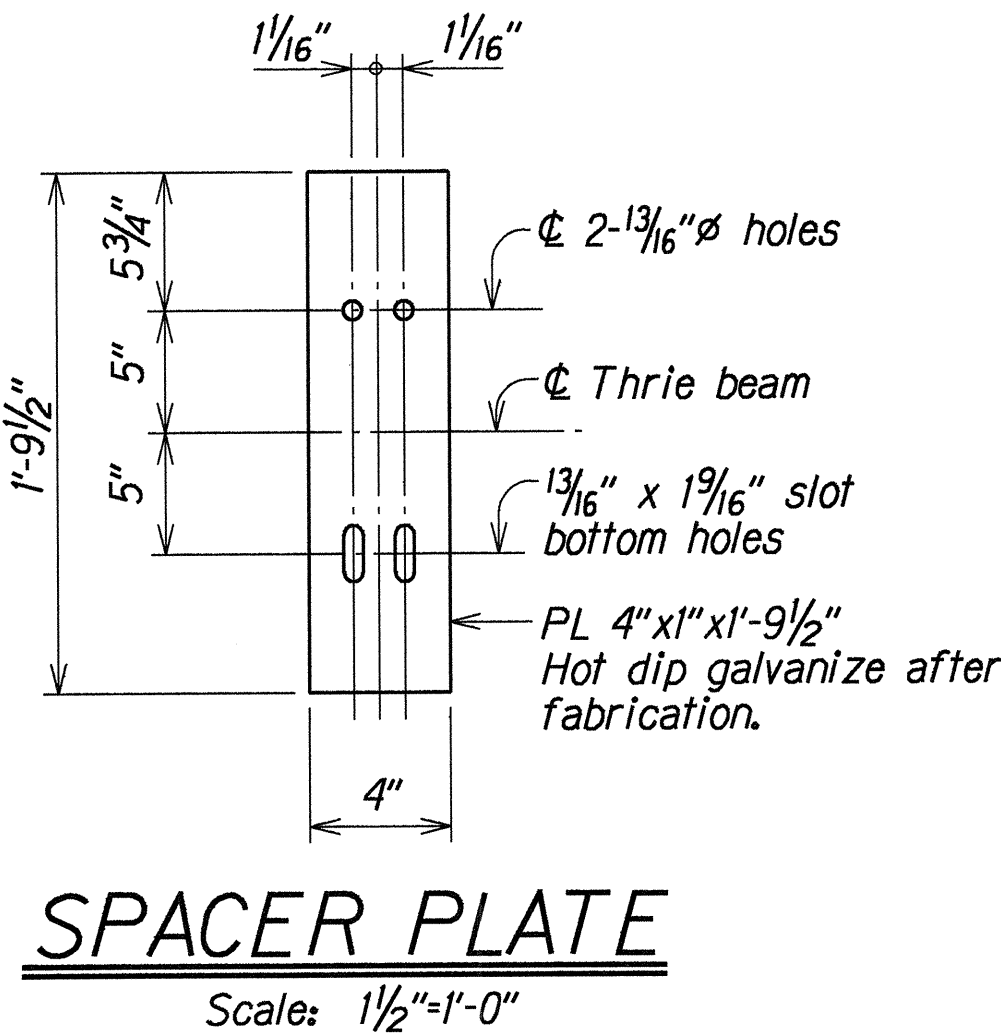
F.A. Project No. NH-063-1(19)

Scale: As Noted Date: Apr. 1995

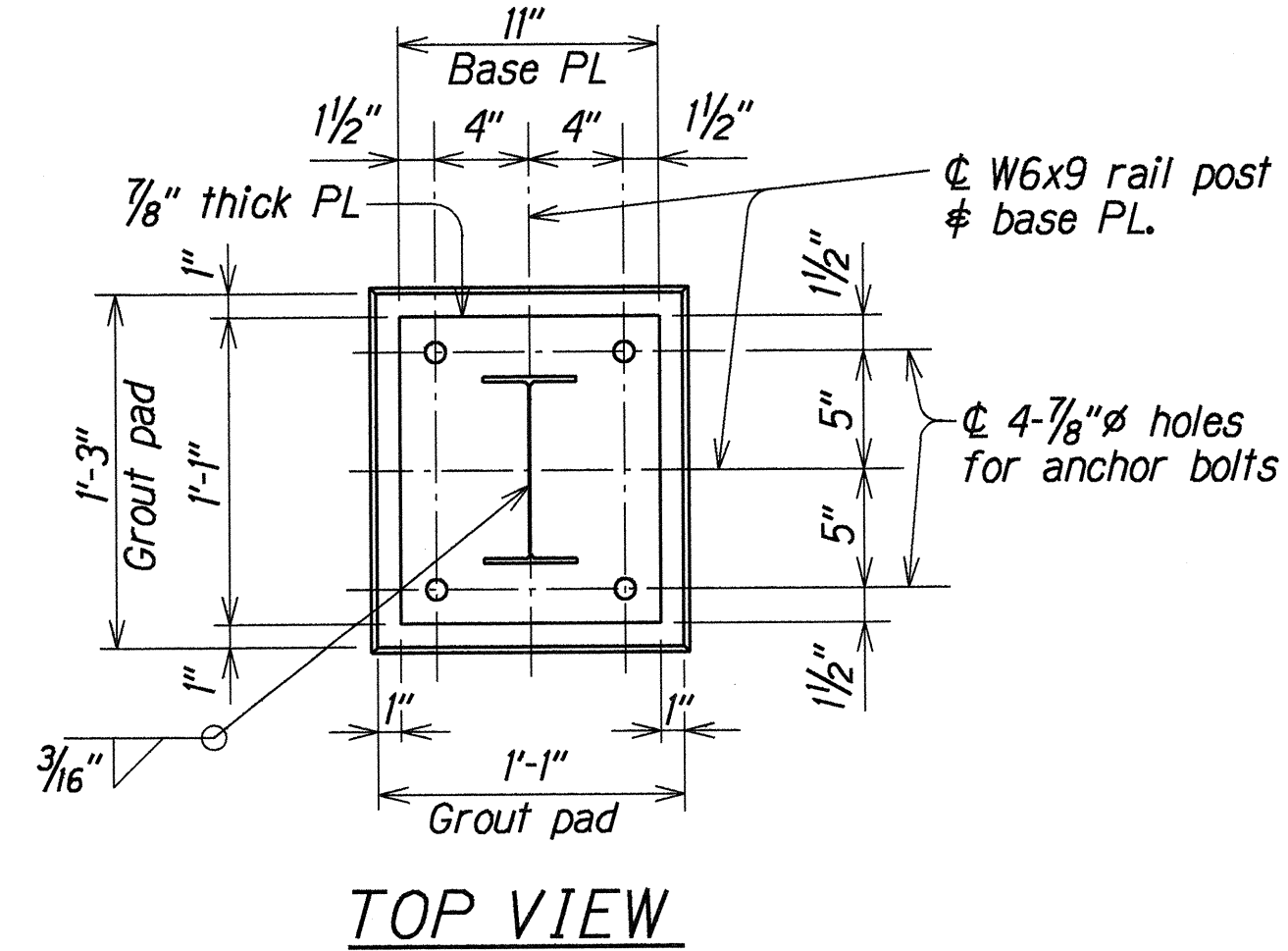
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HAWAII	HAW.	STP-0300(66)	1998	811



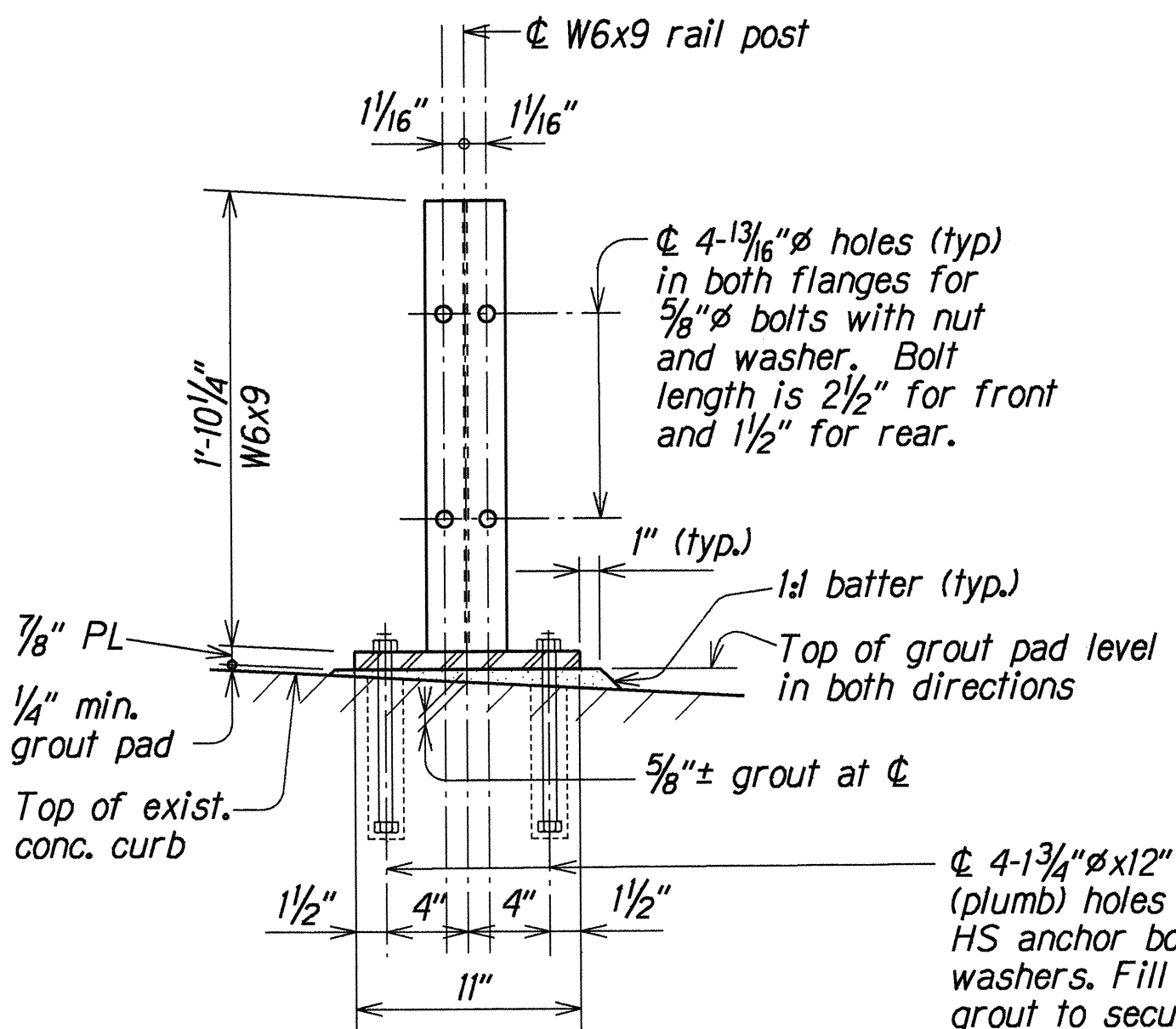
ELEVATION
TYPICAL W8X10 SPACER AND POST PLACEMENT DETAIL
 Scale: 1"=1'-0"



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

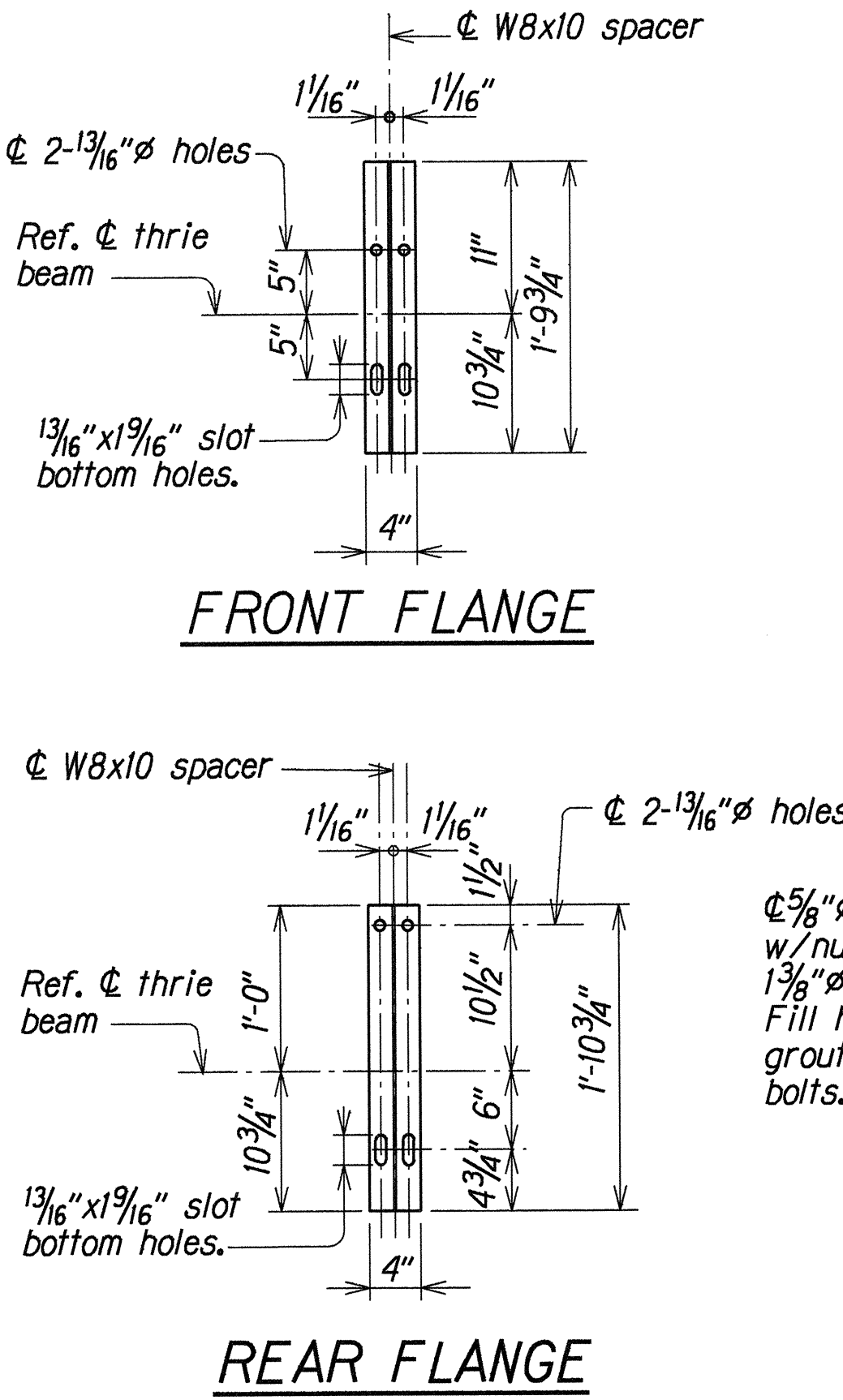


TOP VIEW

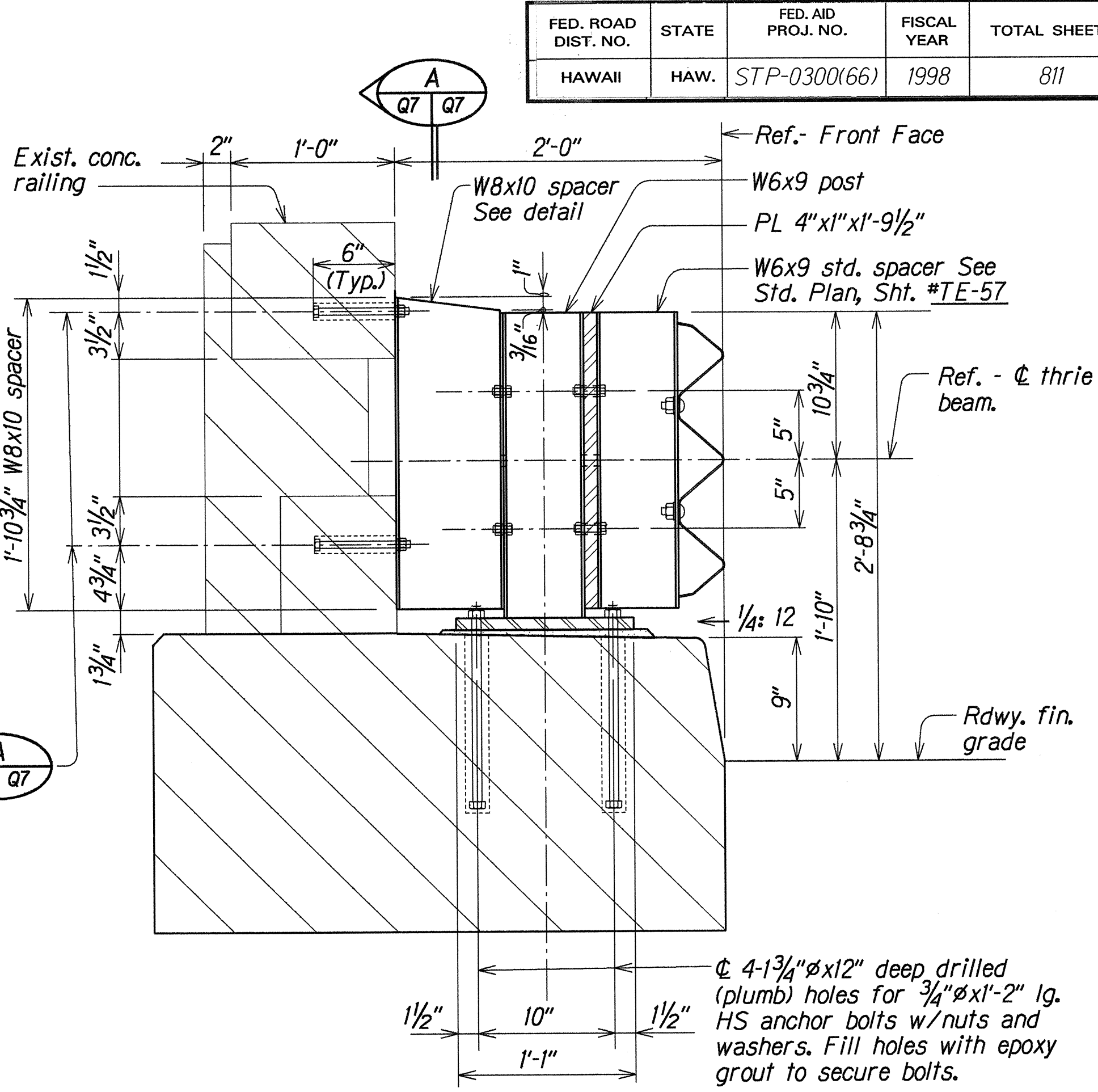


FRONT VIEW

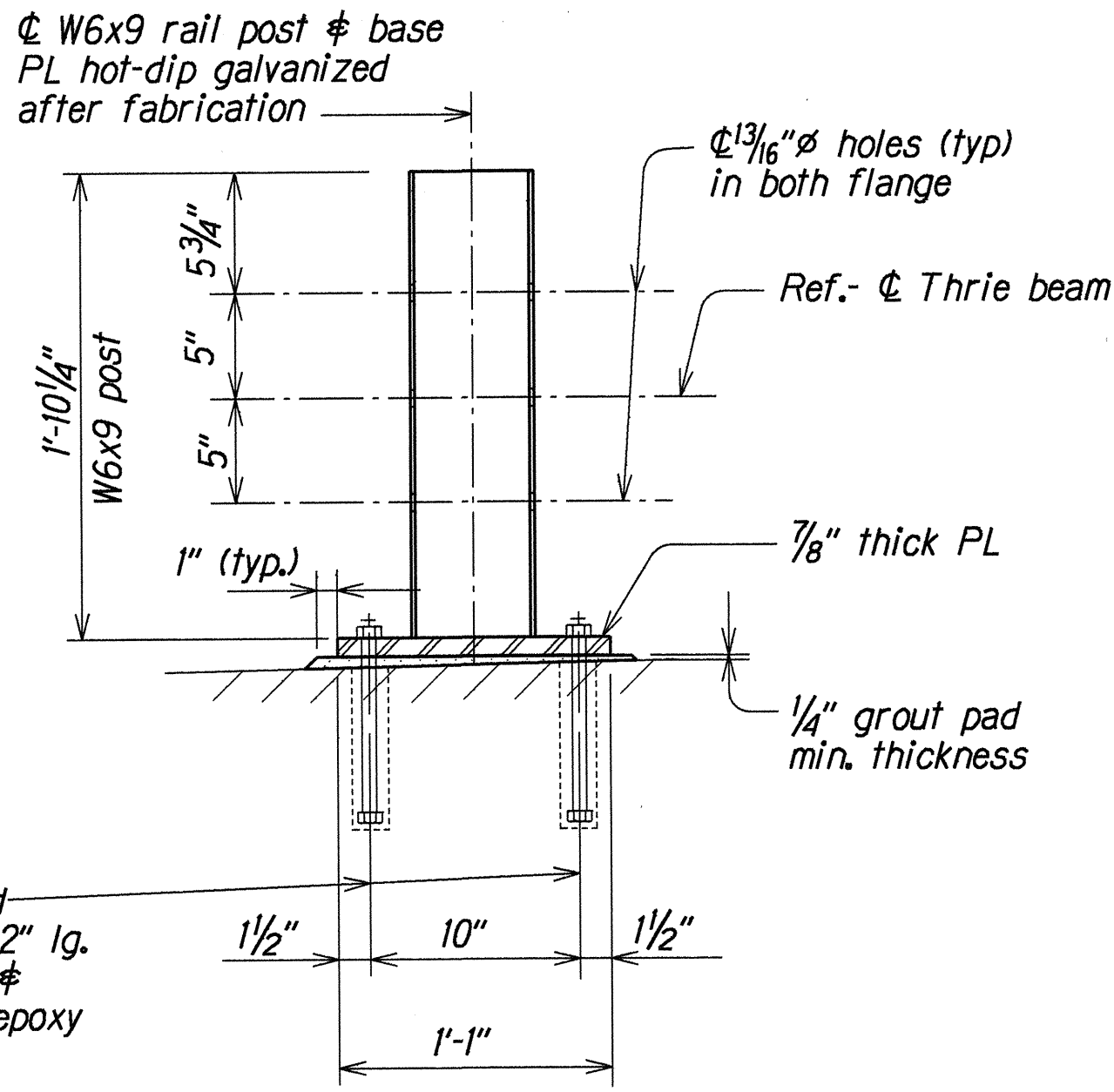
TYPICAL W6X9 POST ON BASE PLATE DETAIL
 Scale: 1 1/2"=1'-0"



W8X10 SPACER DETAIL
 Scale: 1"=1'-0"



TYPICAL SECTION THRU TYPE "B" BRIDGE RAILING UPGRADE
 Scale: 1 1/2"=1'-0"



SIDE VIEW

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

KALIHI STREAM BRIDGE

TYPE "B" BRIDGE RAILING UPGRADE

OB WEST CONCRETE RAILING

LIKELIKE HIGHWAY RESURFACING

School Street to Emmeline Place

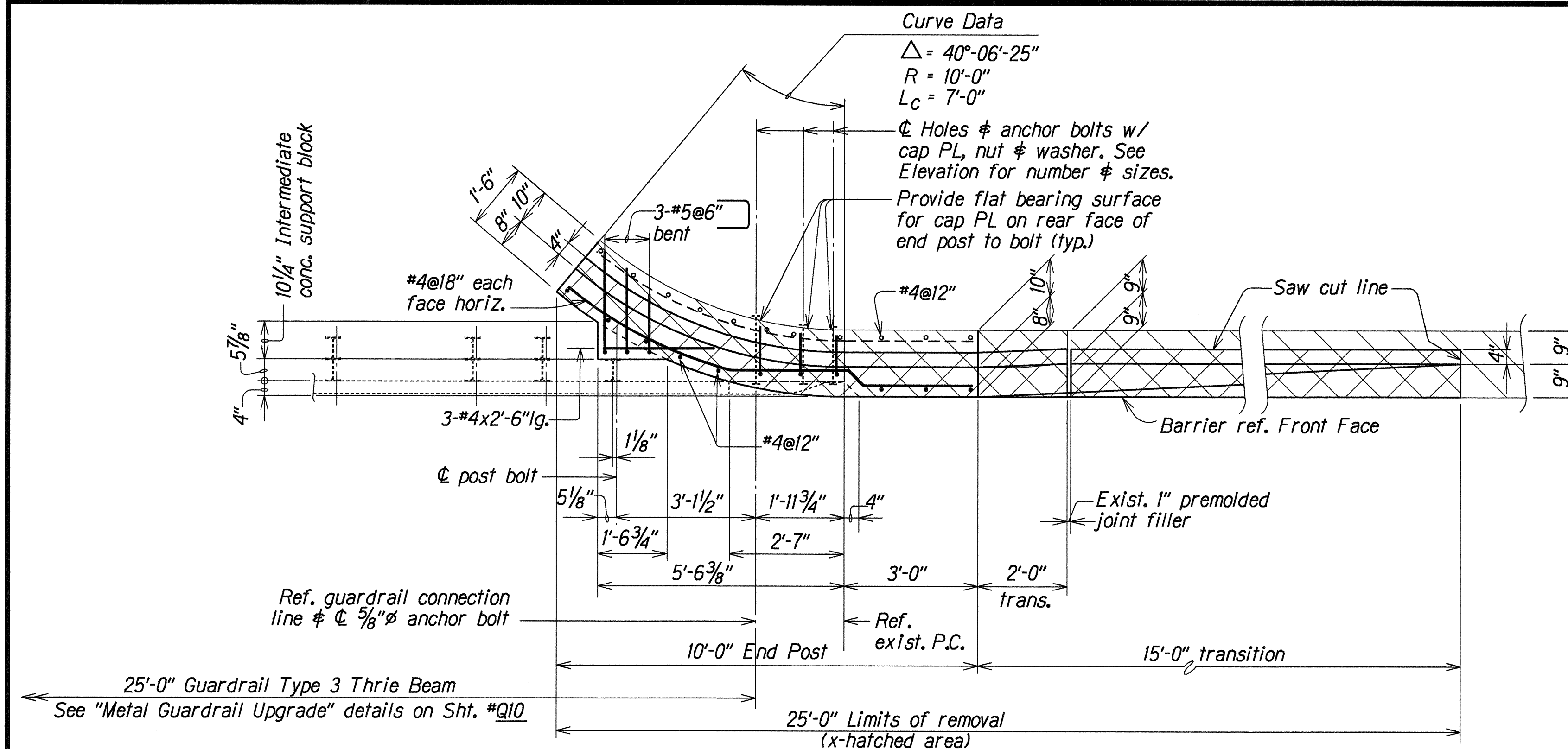
F.A. Project No. NH-063-1(19)

Scale: As Noted

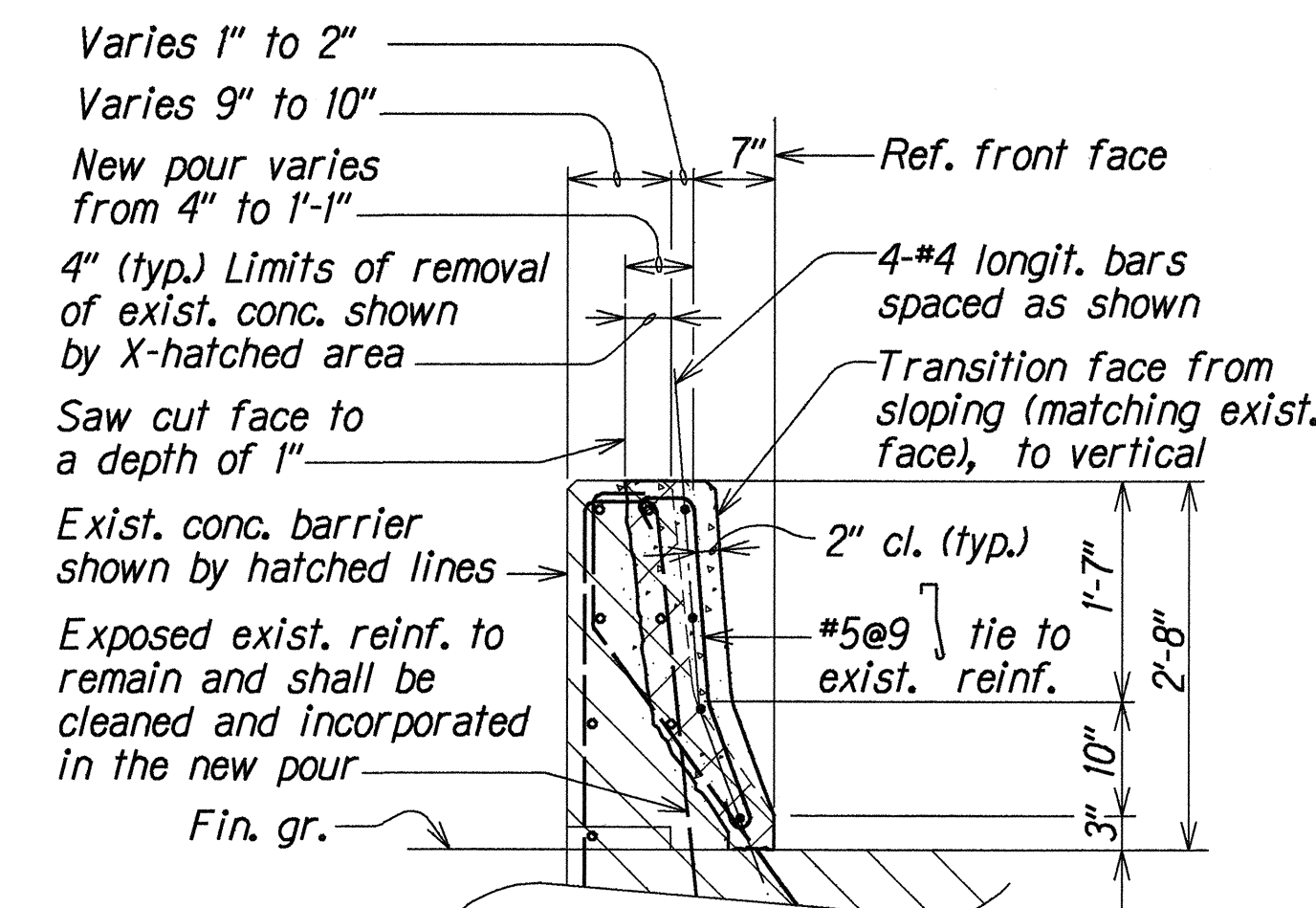
Date: Apr. 1995

SURVEY DICTATED BY	DATE
PLAN	APR 1995
DRAWN BY	TRACED BY
DESIGNED BY	APR 1995
CHECKED BY	APR 1995
NO. 210007.dwg	

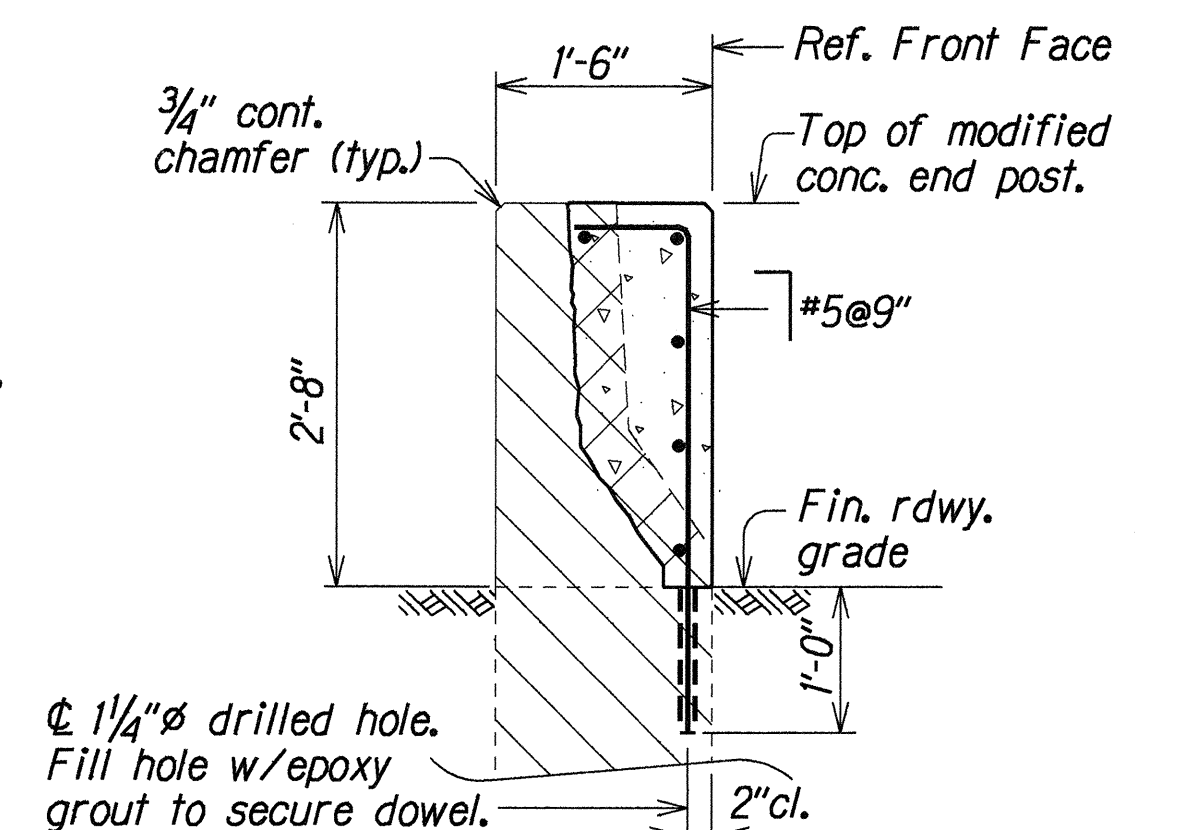
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	TOTAL SHEETS
HAWAII	HAW.	STP-0300(66)	1998	811



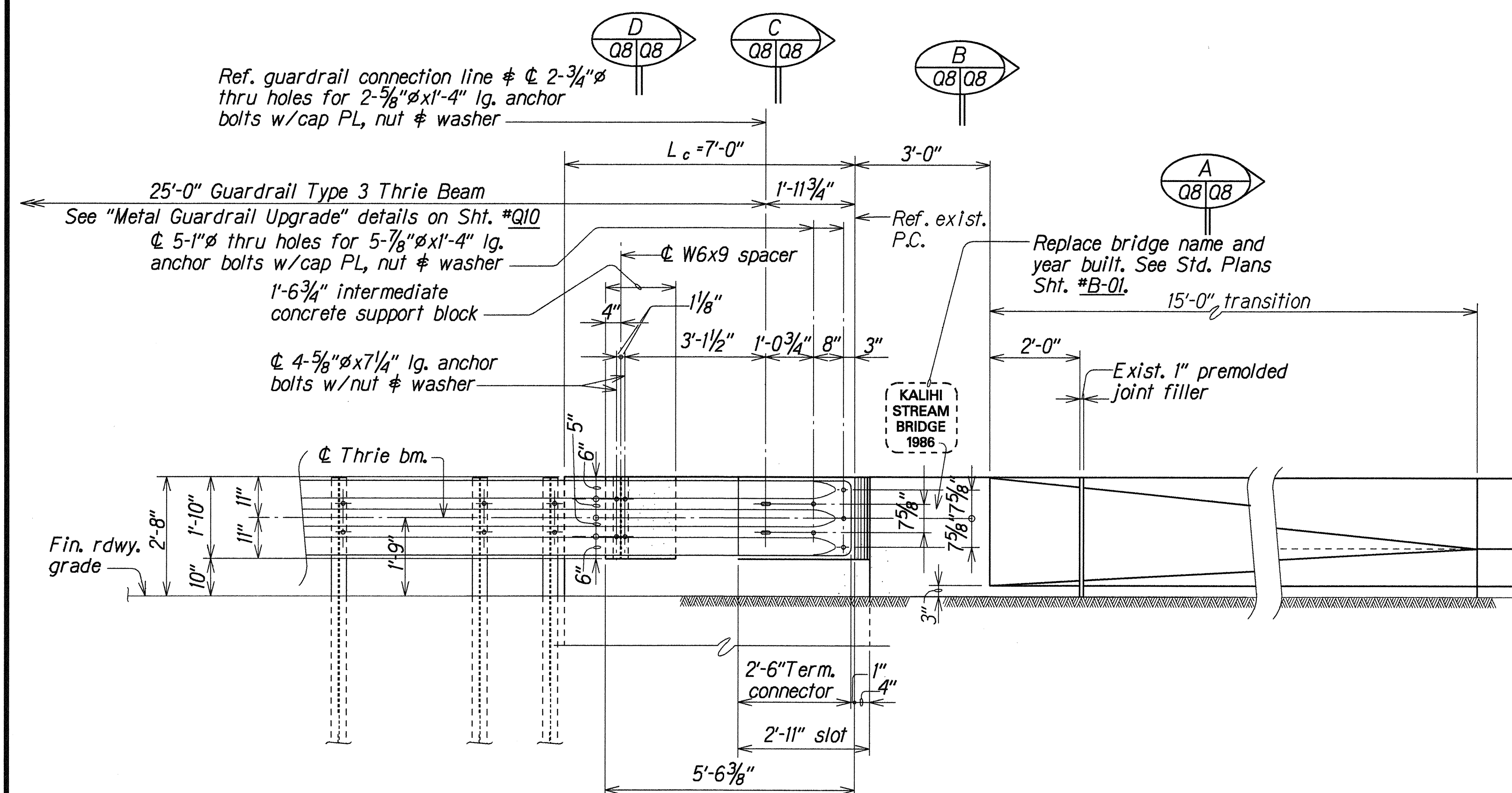
PART PLAN
Scale: $\frac{1}{2}" = 1'-0"$



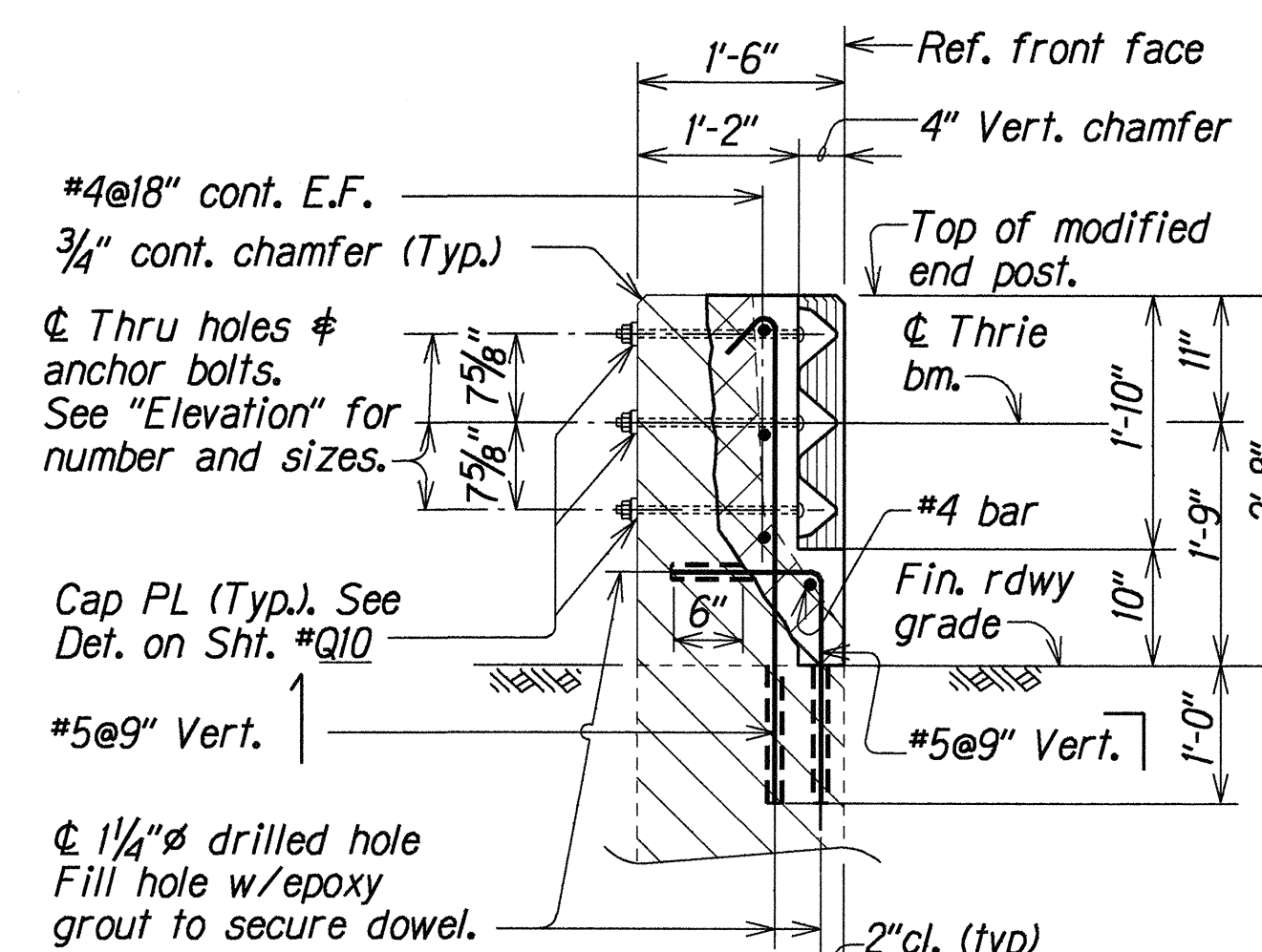
SECTION
 A
 Q8 | Q8
 Scale: $\frac{3}{4}" = 1'-0"$



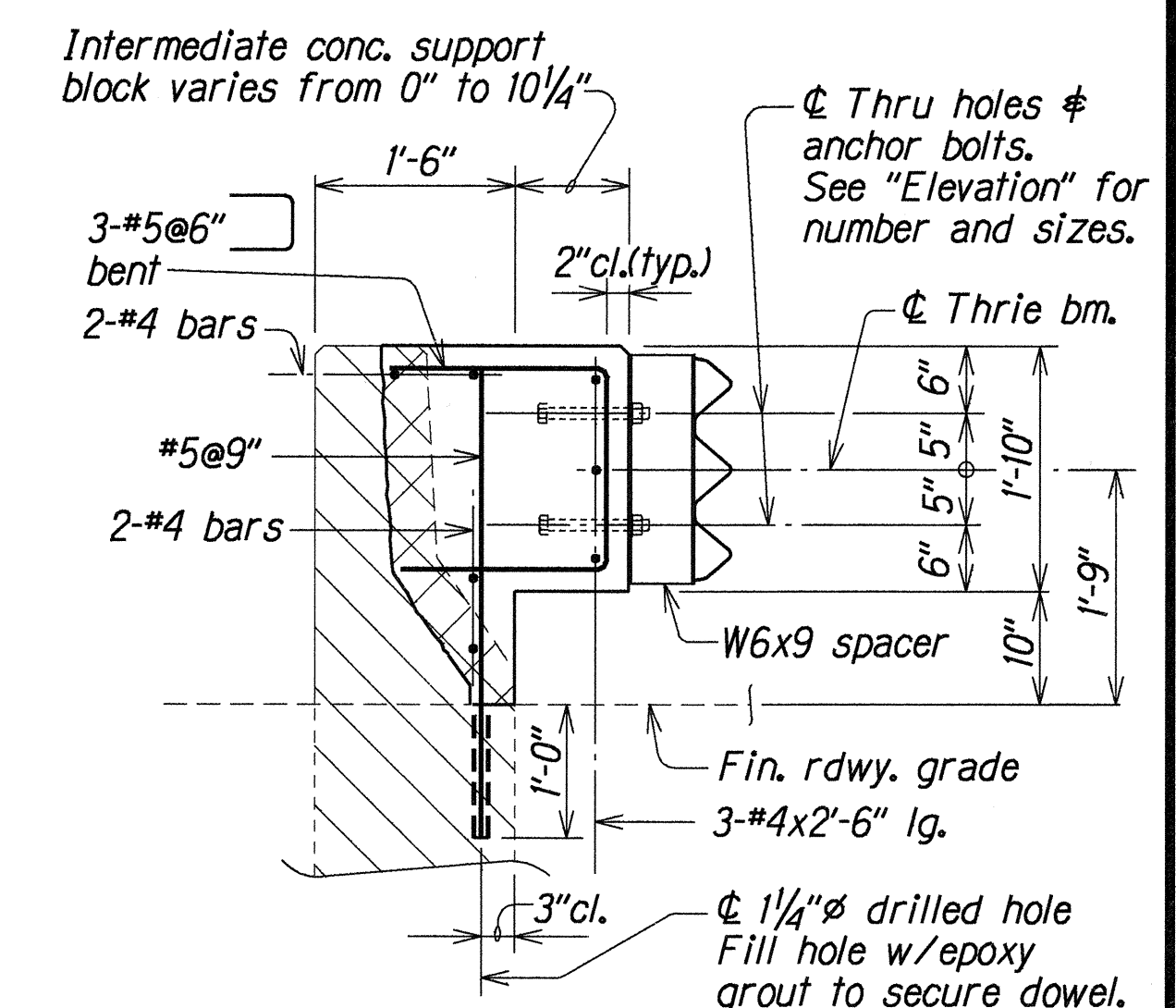
SECTION
Scale: $\frac{3}{4}'' = 1'-0''$



PART ELEVATION
Scale: $\frac{1}{2}" = 1'-0"$



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



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

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KALIHI STREAM BRIDGE
TYPE "C" BRIDGE END POST UPGRADE
END POST NO. 5 PLAN, ELEVATION AND SECTIONS

LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
F.A. Project No. NH-063-1(19)

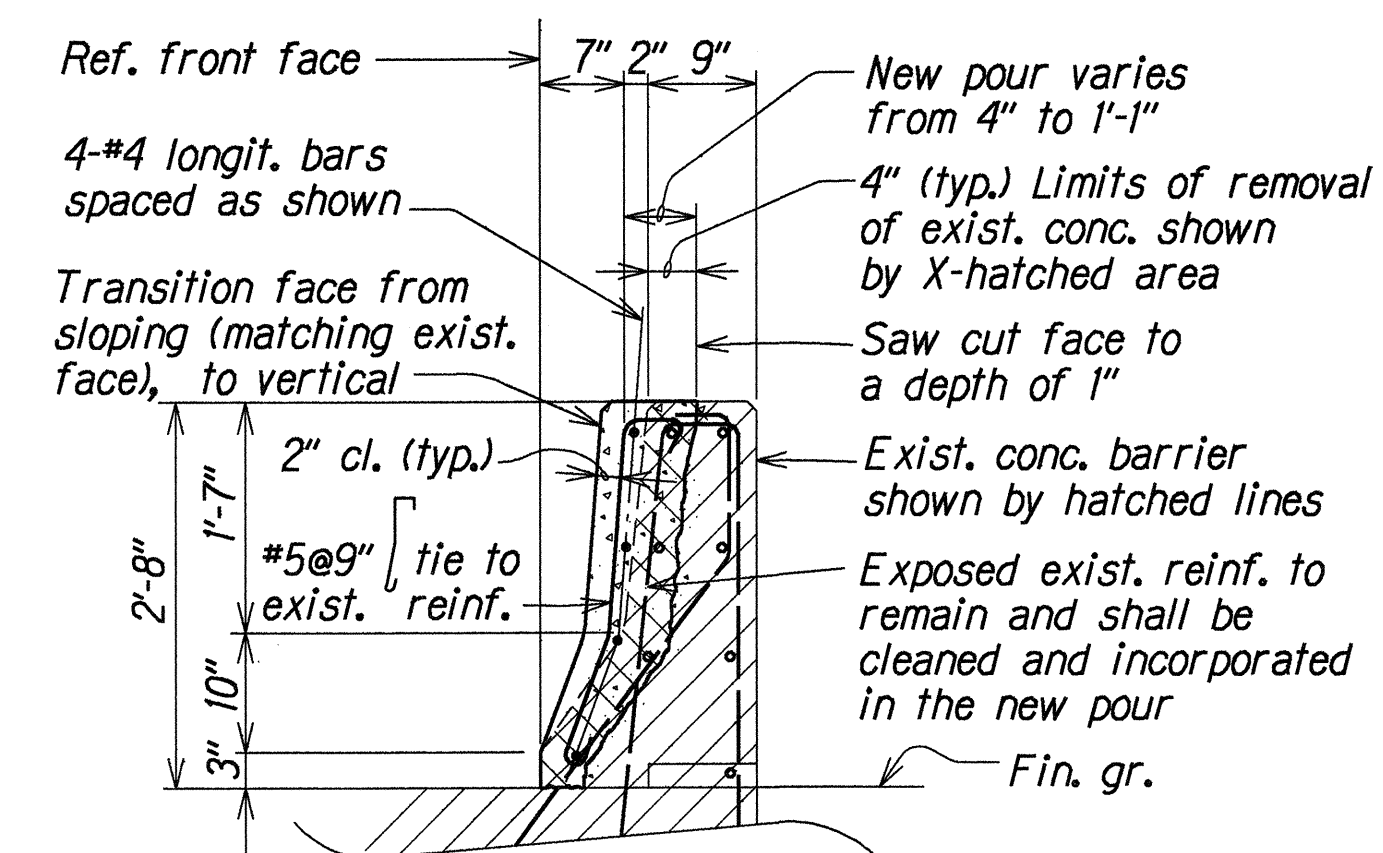
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SHEET No. 08 OF 10 SHEETS

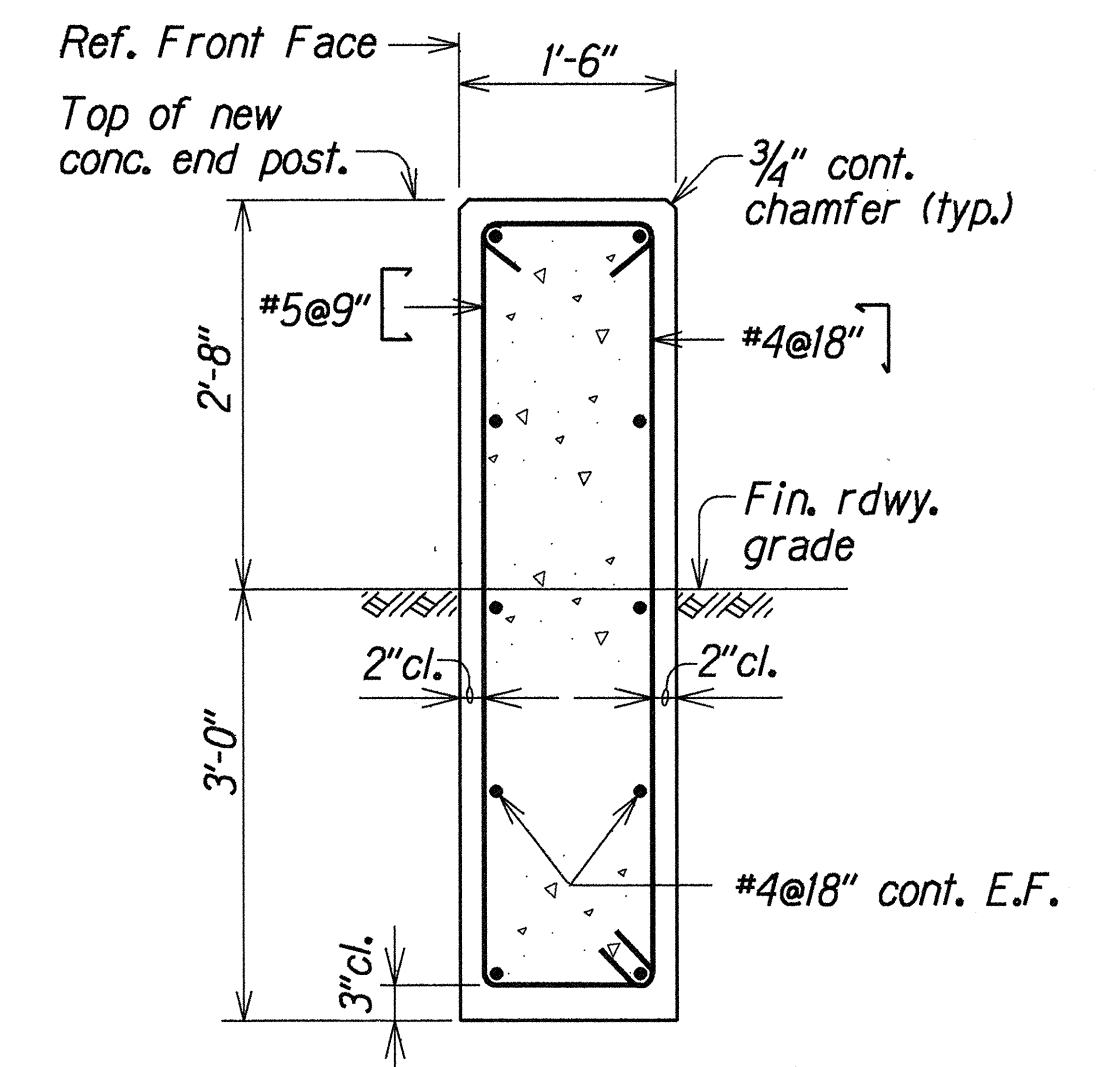
Technical drawing showing a cross-section of a guardrail connection detail. The drawing includes the following annotations and dimensions:

- Top Reinforcement:** 5-#4@6" bent
- Vertical Reinforcement:** 9-#5@9" vert.
- Horizontal Reinforcement:** 3-#5x2'-0" lg. dowels as shown.
- Internal Structure:** 3-#4x4'-6" lg. (likely a post or support)
- Reinforcement Continuation:** #4@18" cont. EF.
- Dimensions:**
 - 15'-0" transition
 - 3'-0" (taper below)
 - 4"
 - 7"
 - 2'-0"
 - 2'-11" slot
 - 12'-8" Exist. tapered end post (x-hatched area) to be removed.
 - 25'-0" Guardrail Type 3 Thrie Beam
 - Ref. guardrail connection line & $\frac{5}{8}" \varnothing$ anchor bolt
 - See "Metal Guardrail Upgrade" details on Sht. #Q10.
 - 7/4"
 - 4" o/s
 - 6" taper
 - 1'-6"
 - 9" (height of transition section)
 - Saw cut line
 - 4" (width of transition section)
- Notes:**
 - ☐ Holes & anchor bolts w/ cap PL, nut & washer. See Elevation for number & sizes.

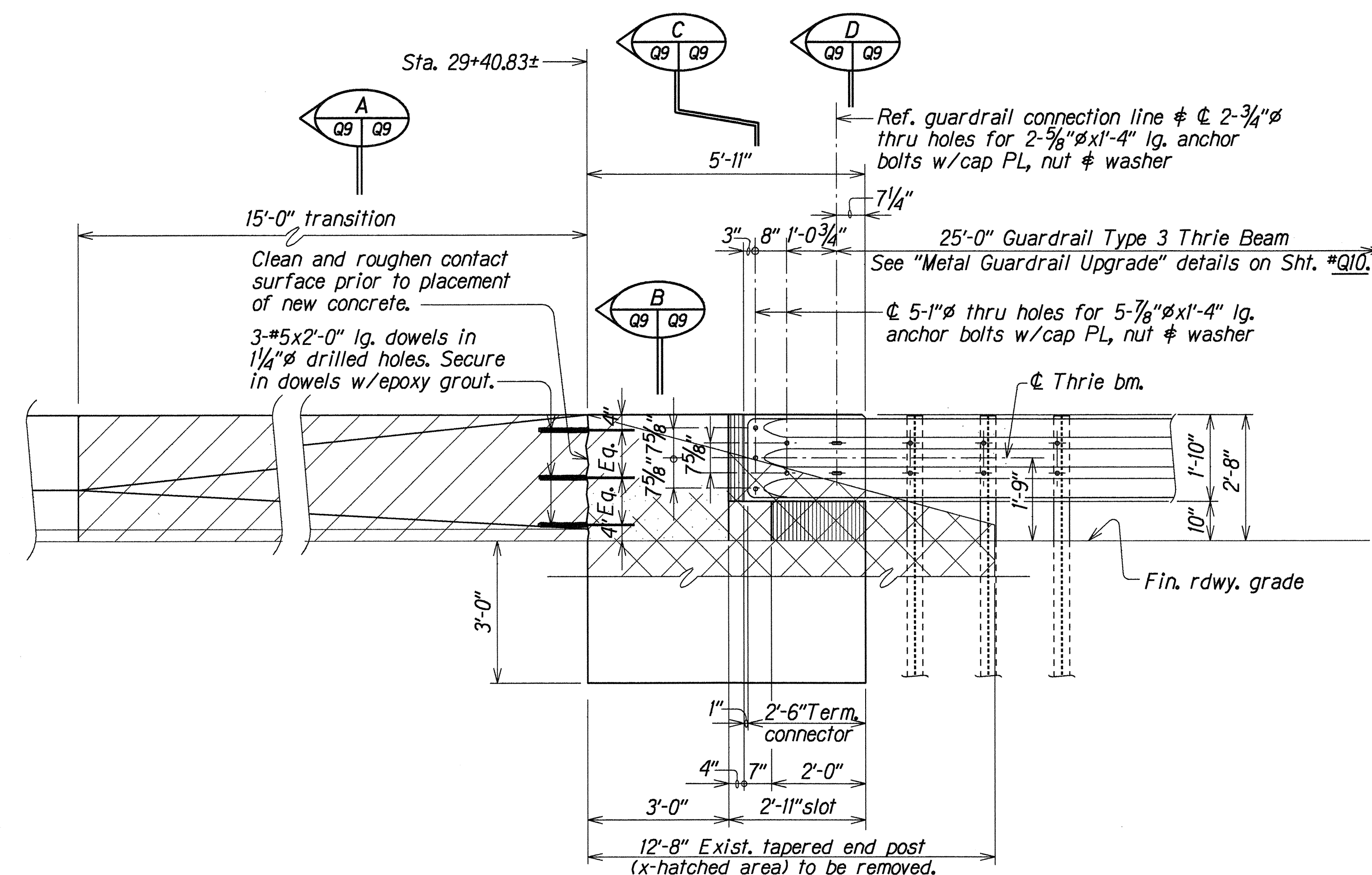
Scale: $\frac{1}{2}" = 1'-0"$



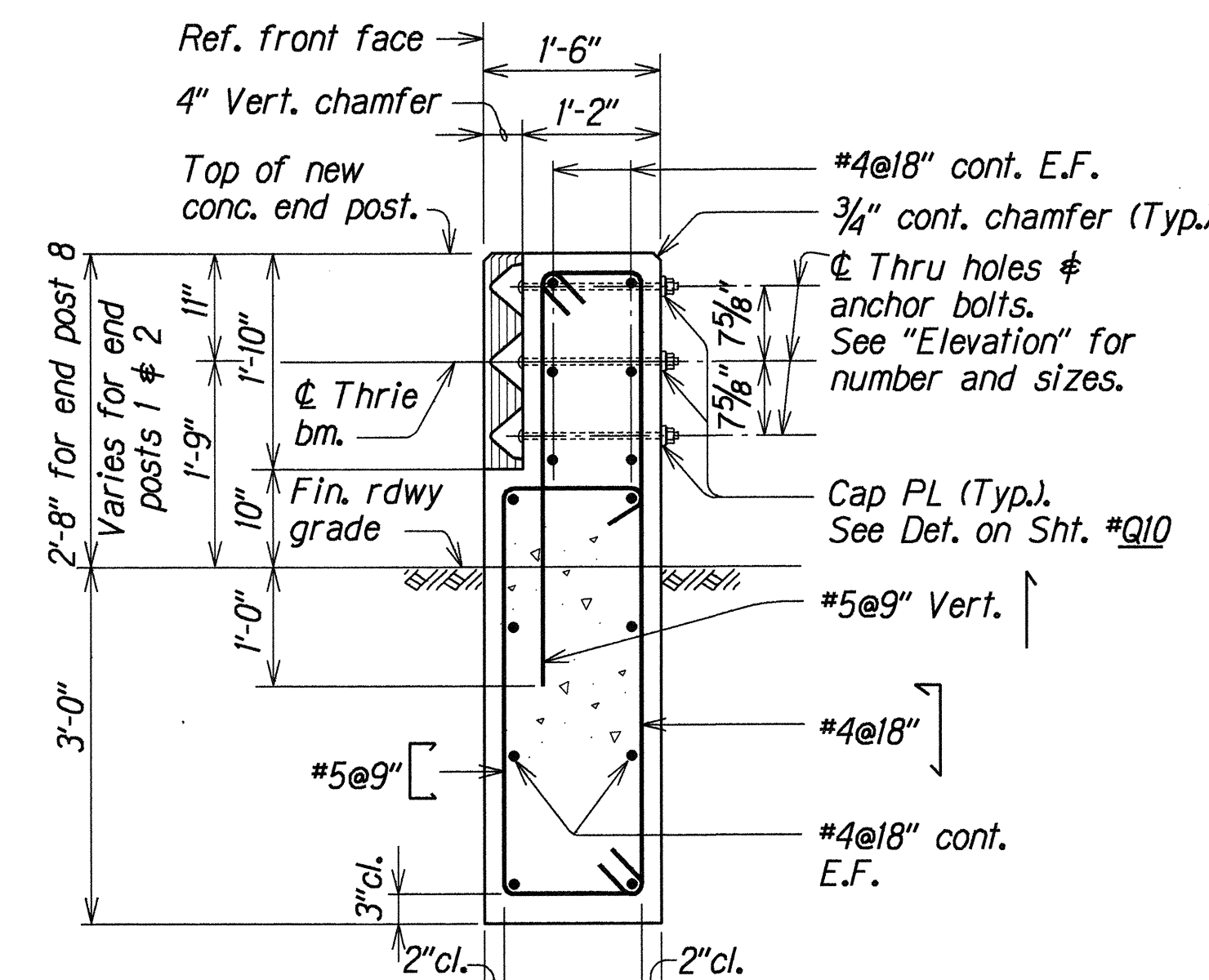
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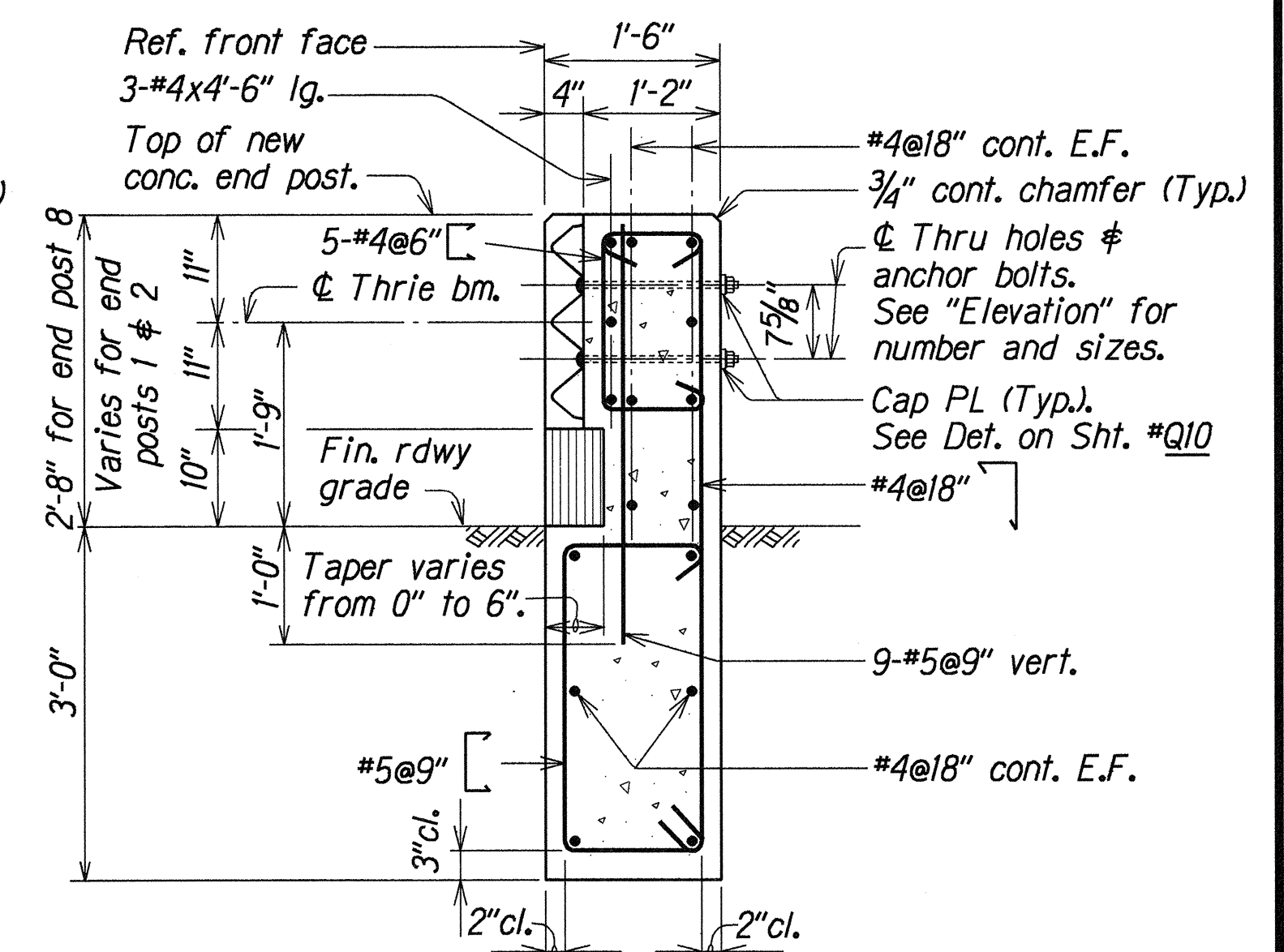
Scale: $\frac{3}{4}" = 1'-0"$



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



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



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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KALIHI STREAM BRIDGE

TYPE "D" BRIDGE END POST UPGRADE
END POST NO. 8 PLAN, ELEVATION AND SECTIONS

LIKELIKE HIGHWAY RESURFACING
School Street to Emmeline Place
F.A. Project No. NH-063-1191

Scale: As Noted Date: Apr. 1995

SHEET NO. 09 OF 10 SHEETS

