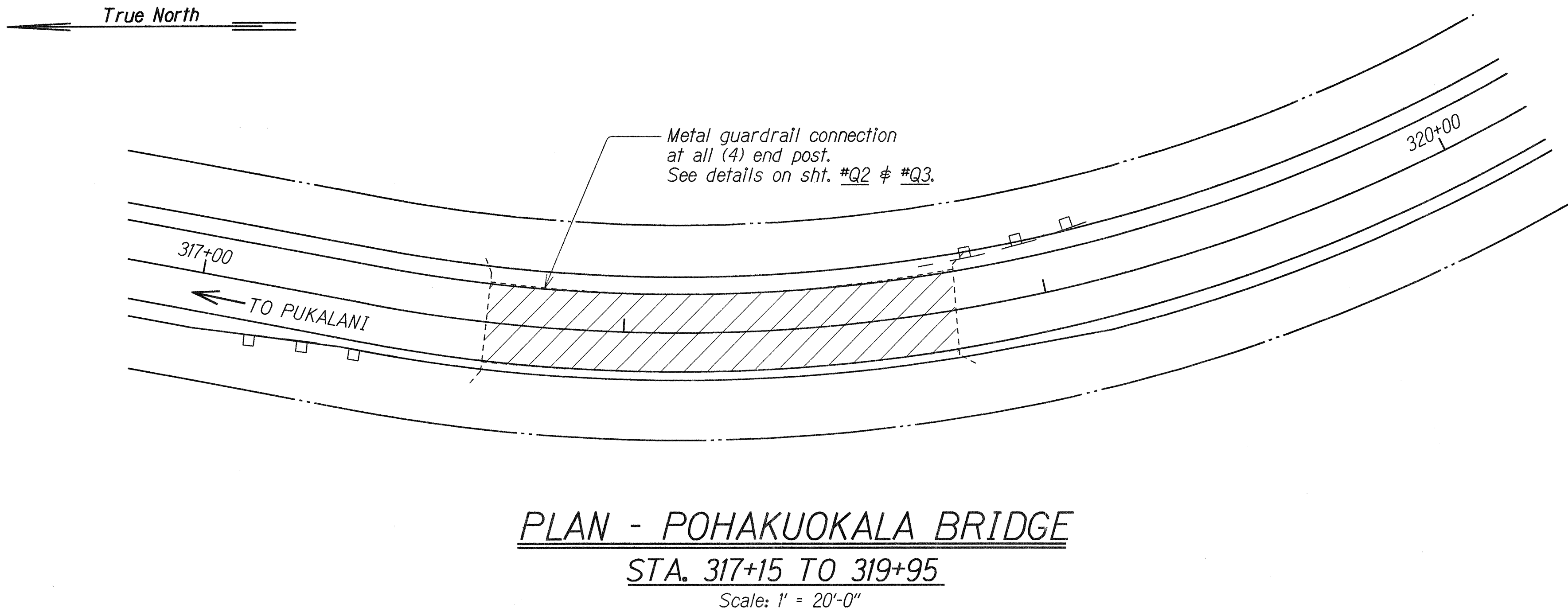
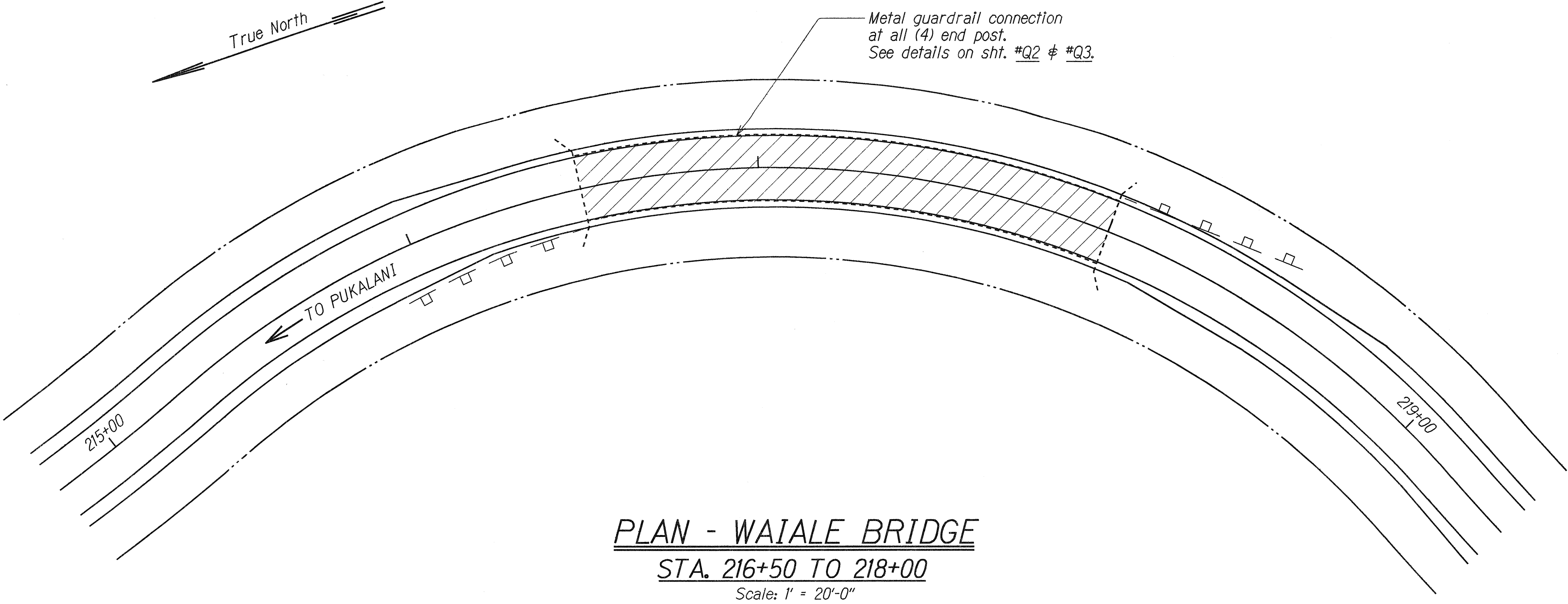


| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-0377(3)        | 1994        | 37        | 39           |

ESTIMATED QUANTITIES

| ITEM NO. | DESCRIPTION                                    | UNIT | QUANTITIES |
|----------|------------------------------------------------|------|------------|
| 606.3000 | Guardrail Type 3 Thrie Beam At Bridge End Post | L.F. | 250        |
| 606.8000 | End Post Connection                            | EA.  | 8          |
|          |                                                |      |            |



|               |                   |        |
|---------------|-------------------|--------|
| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE   |
| DESIGN FILE   | DRAWN BY          | XXX/99 |
| QUANTITIES BY | DESIGNED BY       | XXX/99 |
| CHECKED BY    | CHECKED BY        | XXX/99 |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

PLANS - WAIALE & POHAKUOKALA BRIDGES  
END POST CONNECTION  
HALEAKALA HIGHWAY GUARDRAIL & SHOULDER IMPROVEMENTS  
KULA JUNCTION TO CRATER ROAD JUNCTION  
Fed. Aid Project No. STP-0377(3)

Scale: As Noted Date: Aug. 1993

SHEET No. 37 OF 3 SHEETS

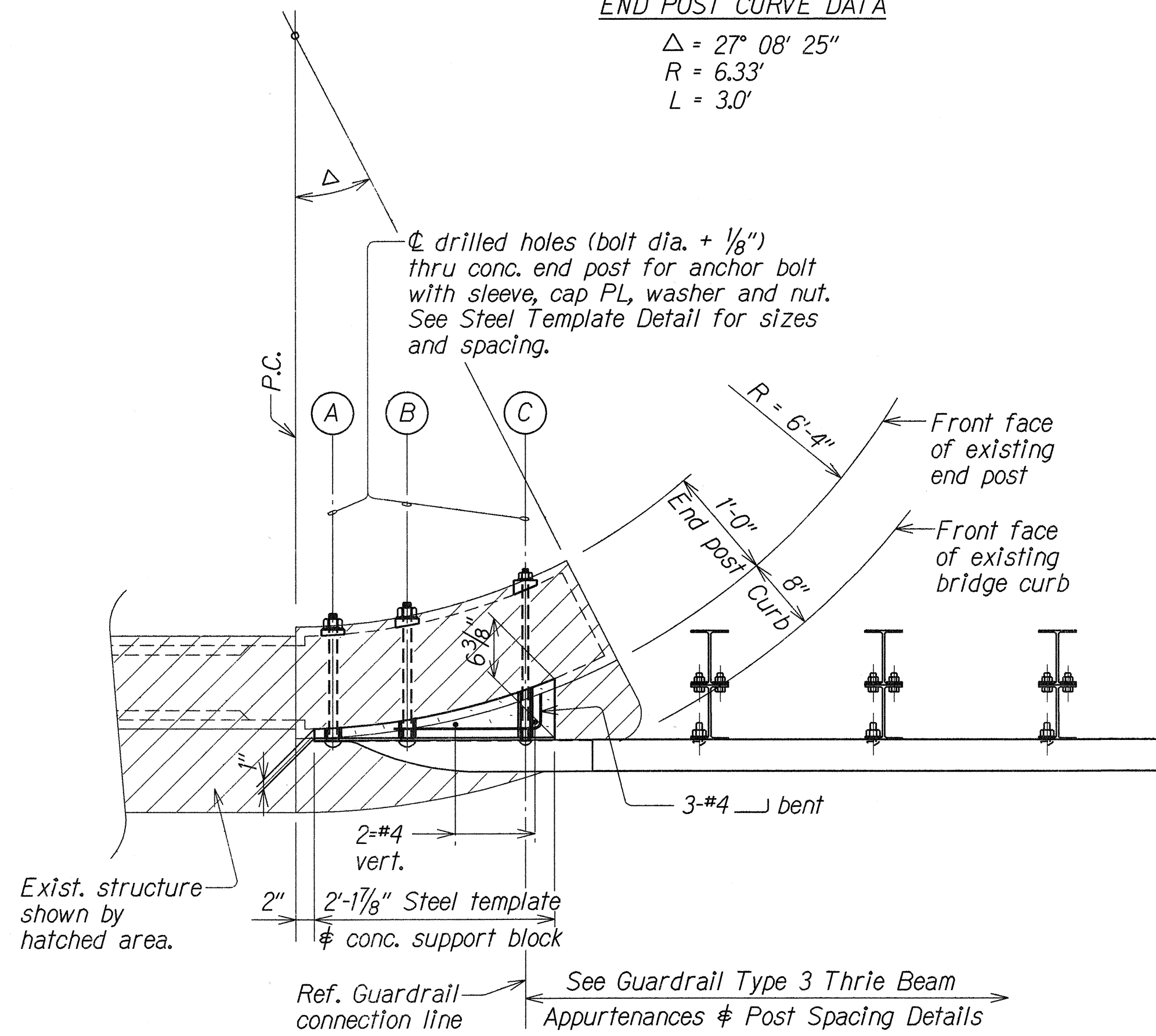
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-0377(3)        | 1994        | 38        | 39           |

# END POST CURVE DATA

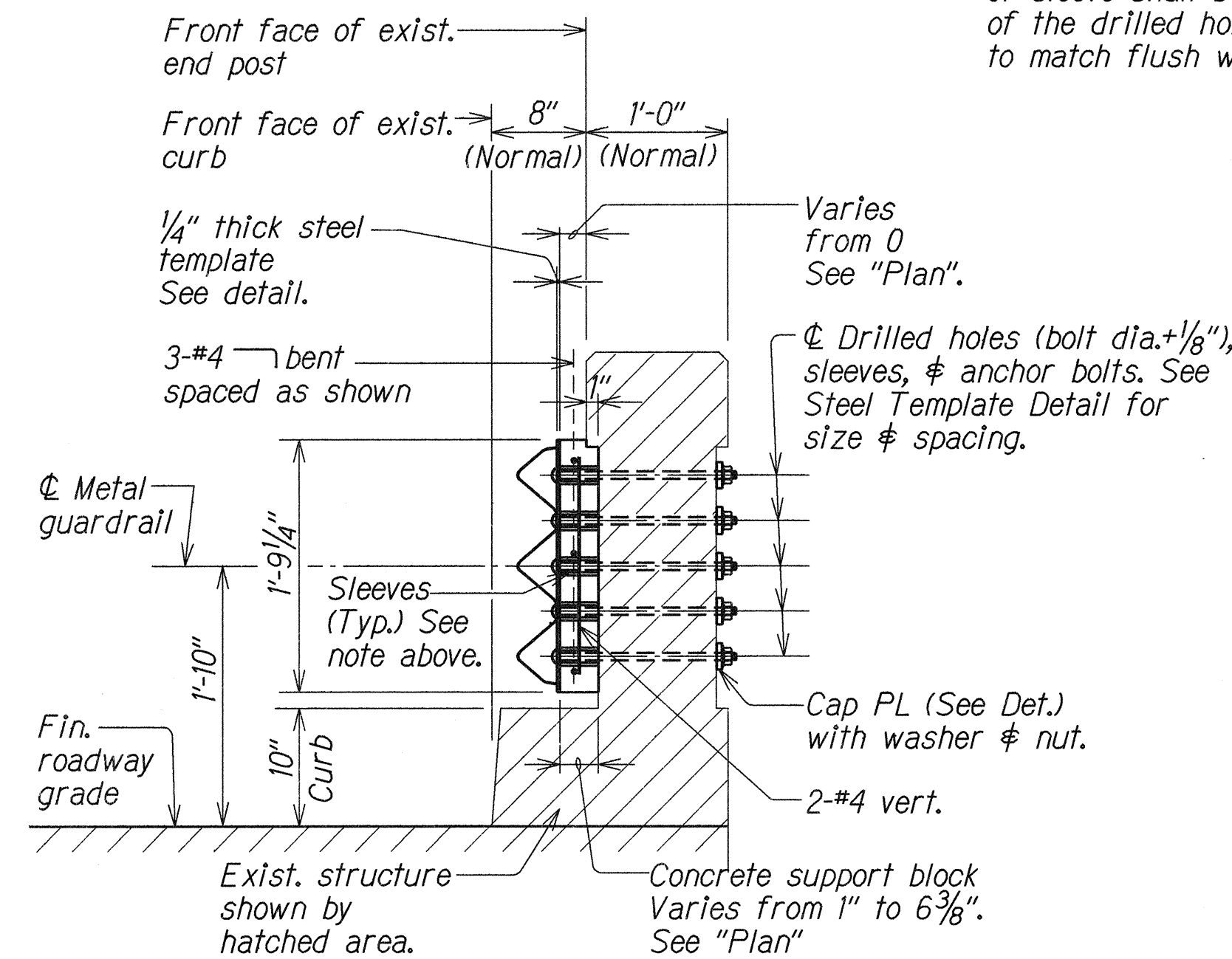
$\Delta = 27^\circ 08' 25''$   
 $R = 6.33'$   
 $L = 3.0'$

# NOTE:

Provide sleeves for anchor bolt thru concrete filled area. Inside diameter of sleeve shall be the same as that of the drilled hole. Cut sleeve ends to match flush with abutting faces.

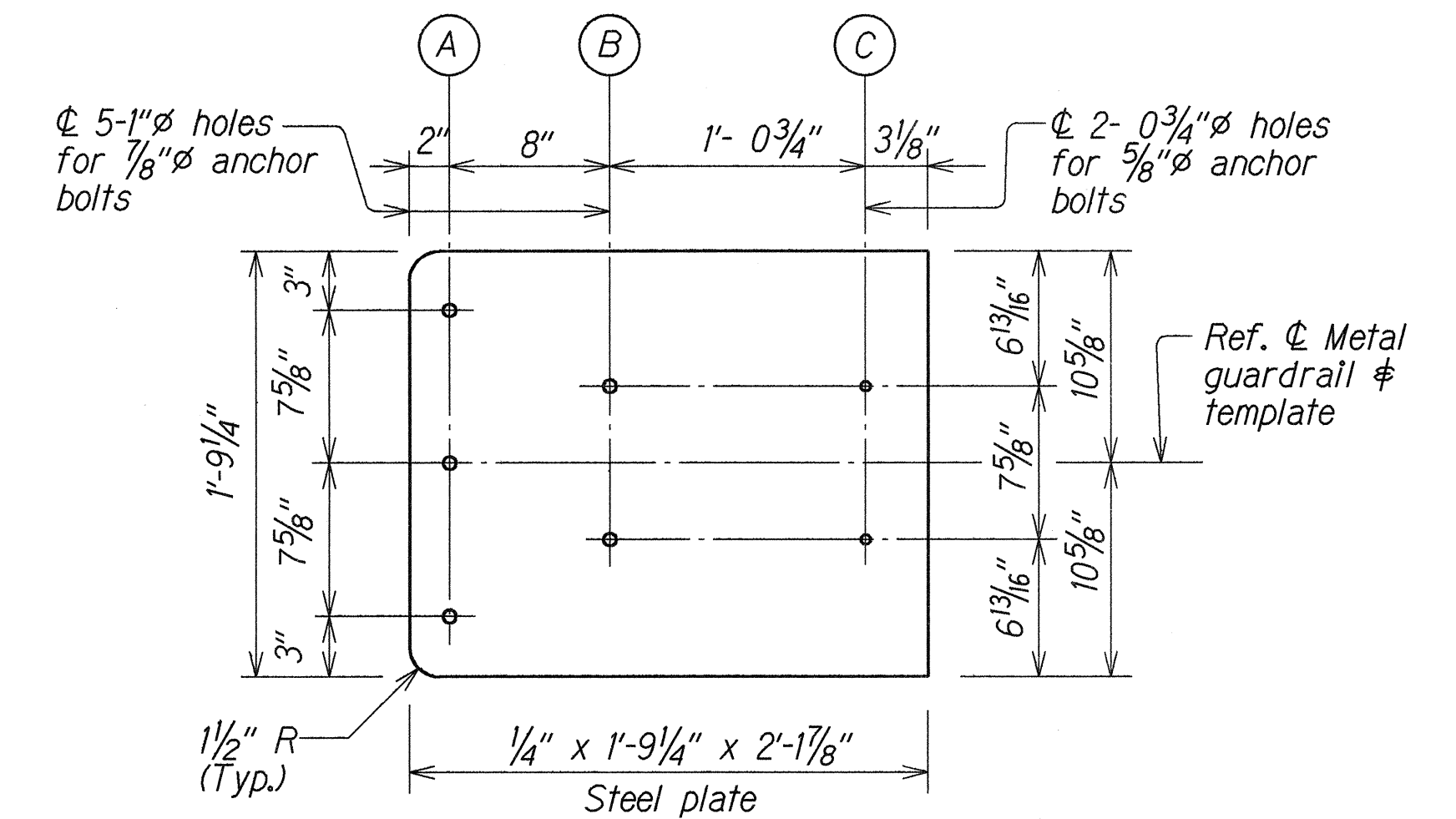


# PLAN



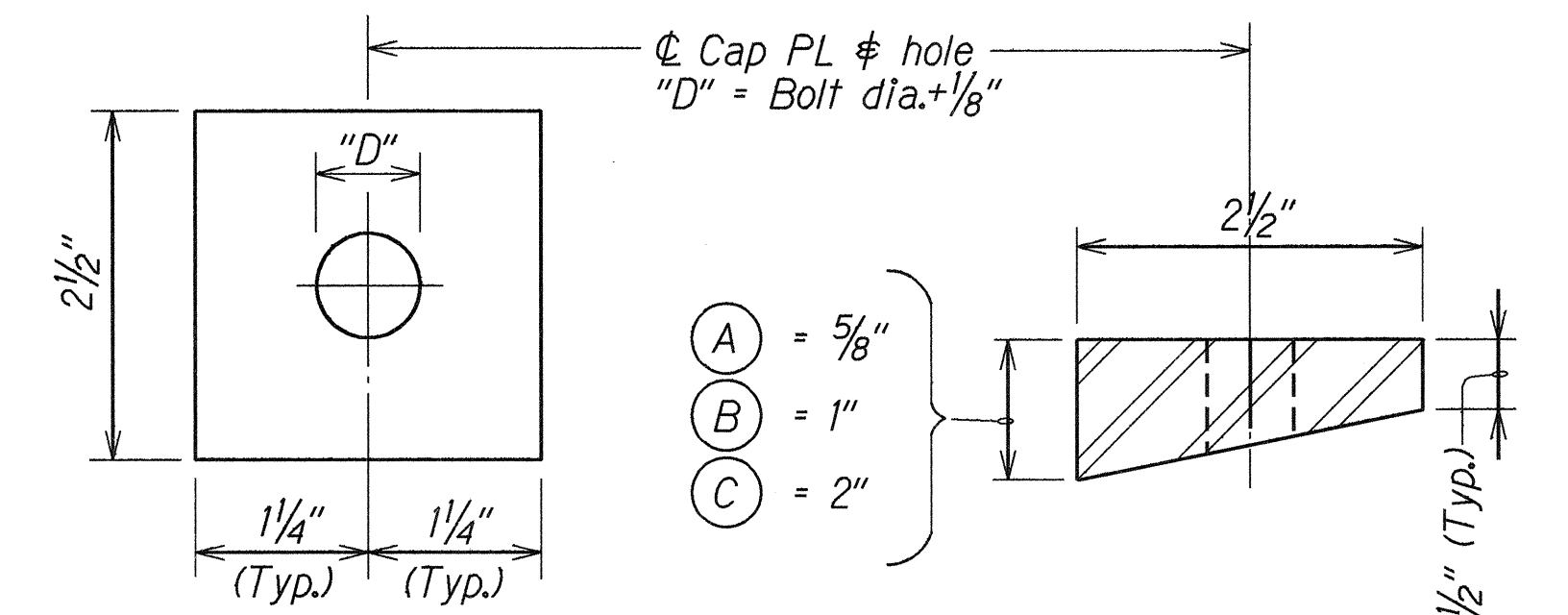
# SECTION

Scale: 1" = 1'-0"



# STEEL TEMPLATE DETAIL

Scale: 1" = 1'-0"

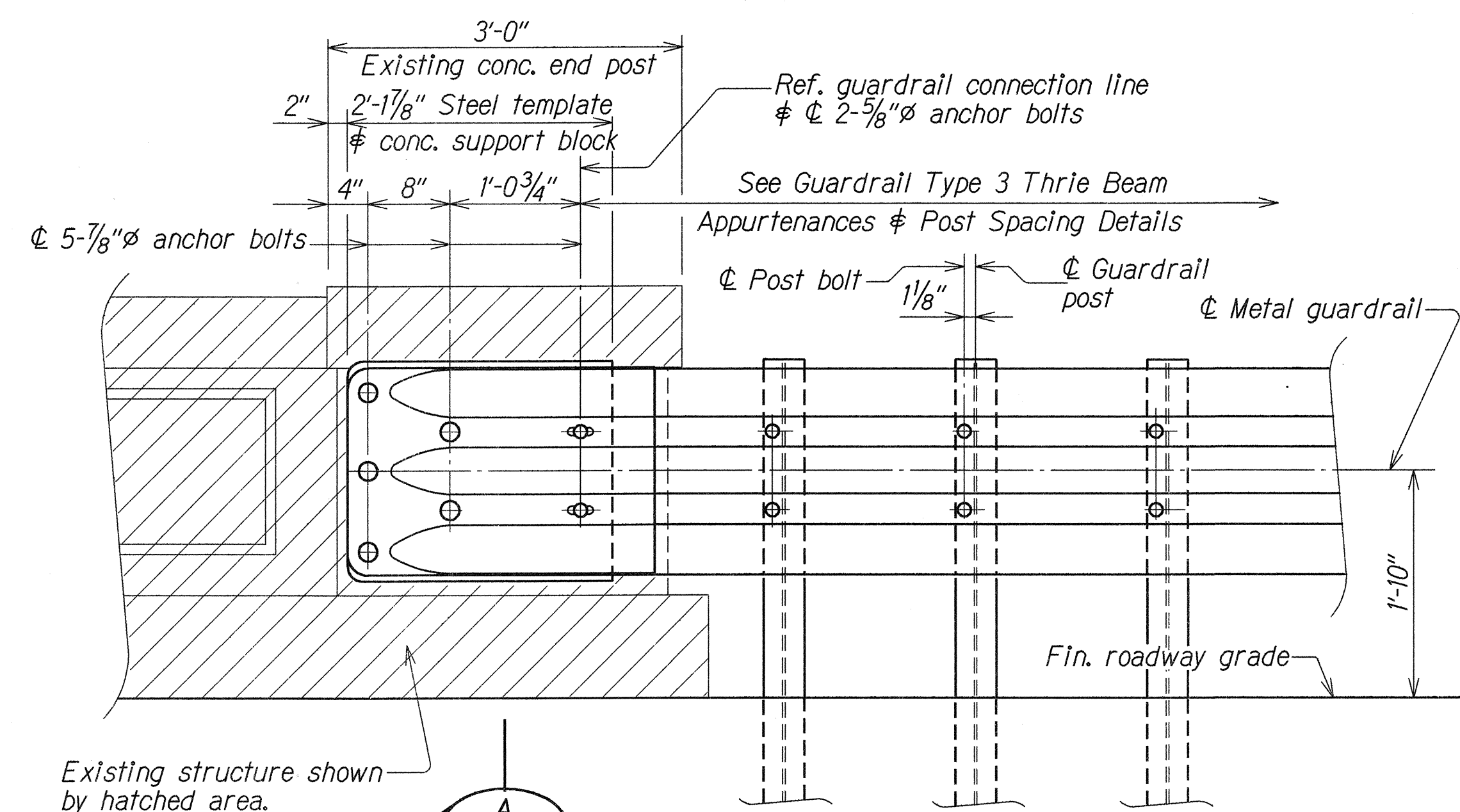


# FRONT VIEW

# SECTION

# CAP (BEARING) PLATE DETAILS

Scale: 3/4 size



# ELEVATION

# END POST CONNECTION DETAIL

# FOR WAIALE AND POHAKUOKALA BRIDGES

Scale: 1" = 1'-0"

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**END POST CONNECTION DETAILS**  
**FOR WAIALE & POHAKUOKALA BRIDGES**  
HALEAKALA HIGHWAY GUARDRAIL & SHOULDER IMPROVEMENTS  
KULA JUNCTION TO CRATER ROAD JUNCTION  
Fed. Aid Project No. STP-0377(3)

Scale: As Noted

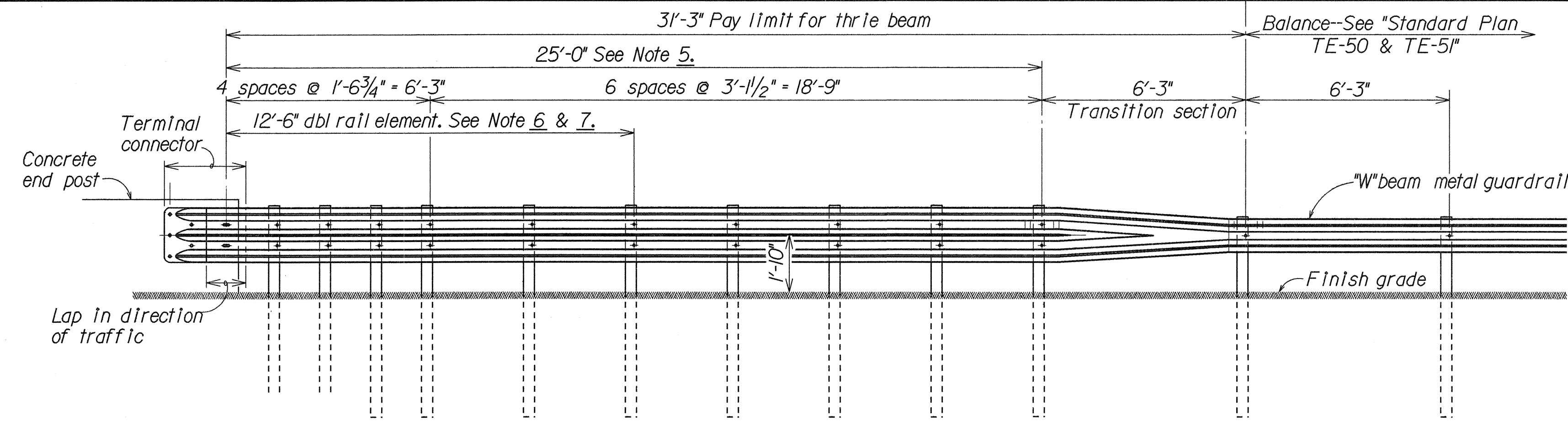
Date: Aug, 1993

SHEET No. Q2 OF 3 SHEETS

|               |     |      |          |
|---------------|-----|------|----------|
| DESIGNED BY   | XXX | DATE | XXX/1991 |
| CHECKED BY    | XXX |      |          |
| QUANTITIES BY | XXX |      |          |
| DESIGN FILE   | XXX |      |          |
| ORIGINAL PLAN | XXX |      |          |

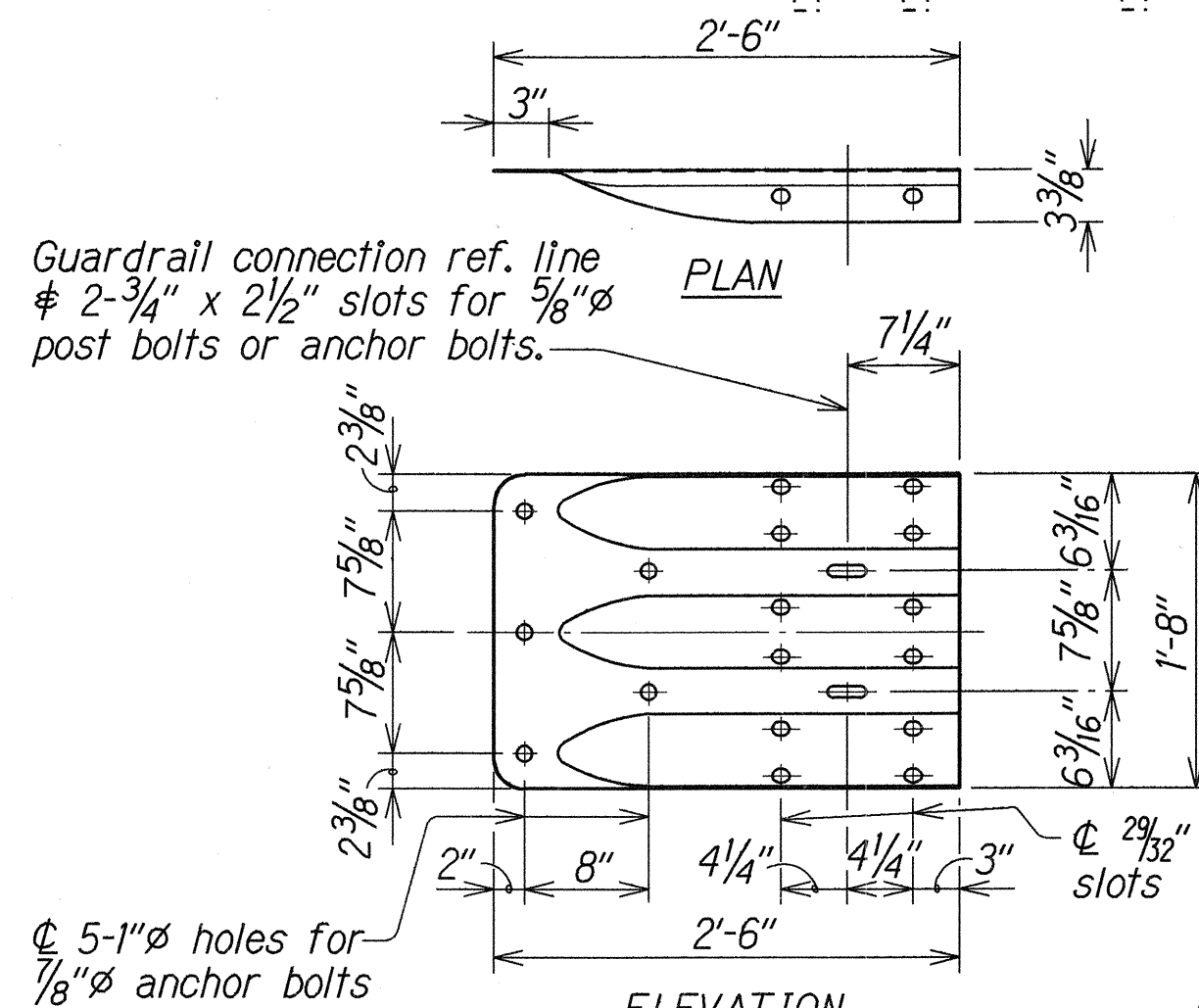
haleaks2

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | STP-0377(3)        | 1994        | 39        | 39           |



## GUARDRAIL POST SPACING DETAIL

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



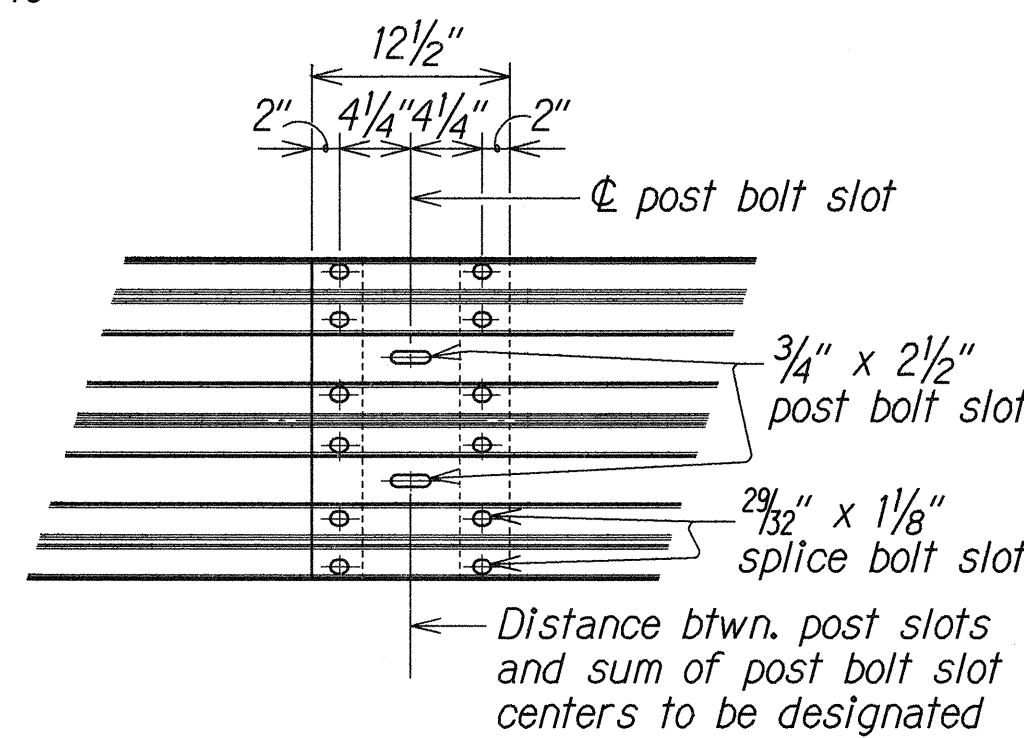
## TERMINAL CONNECTOR

Scale: 1" = 1'-0"

(Use at post where splices do not occur. Omit at double rail element section)

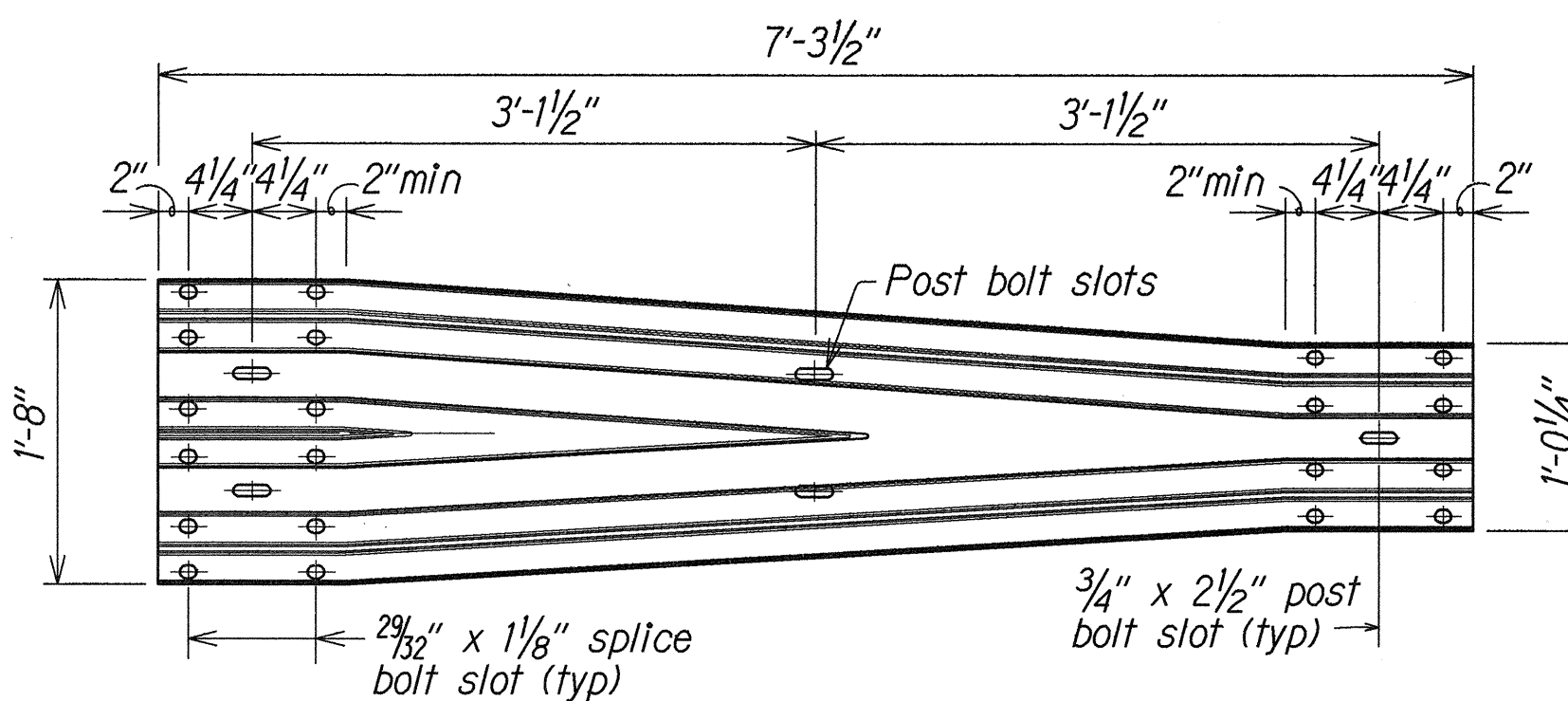
## BACKUP PLATE

Scale: 1" = 1'-0"



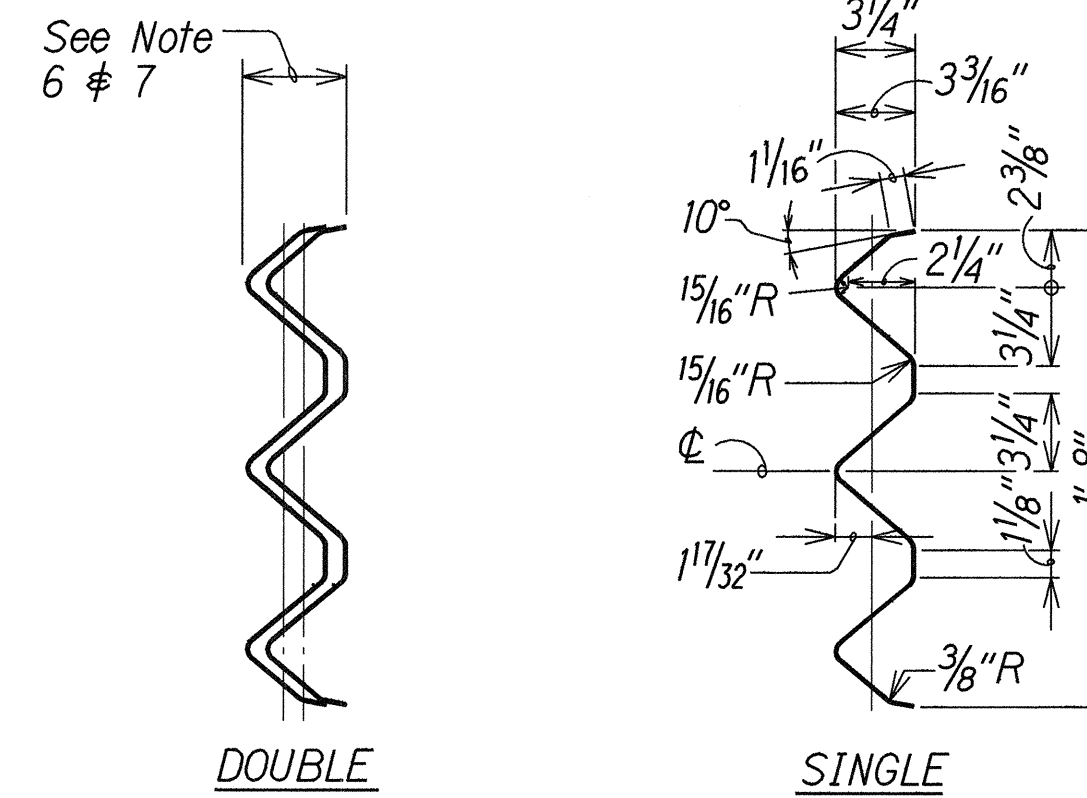
## RAIL SPLICE

Scale: 1" = 1'-0"



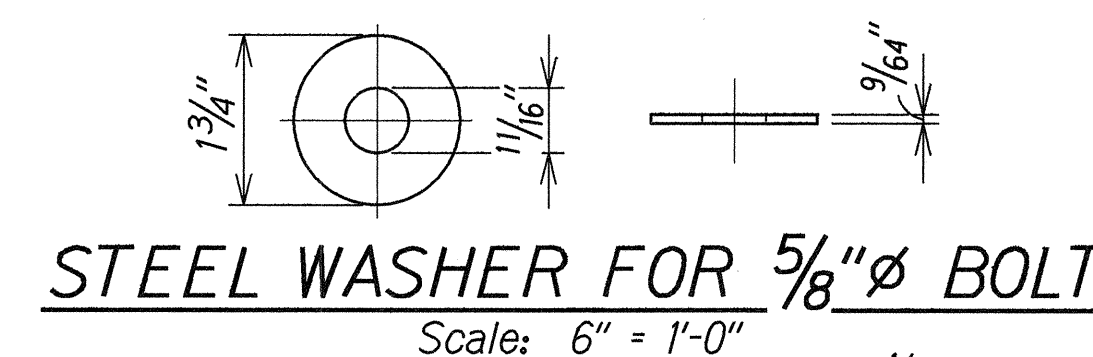
## TRANSITION SECTION

Scale: 1" = 1'-0"



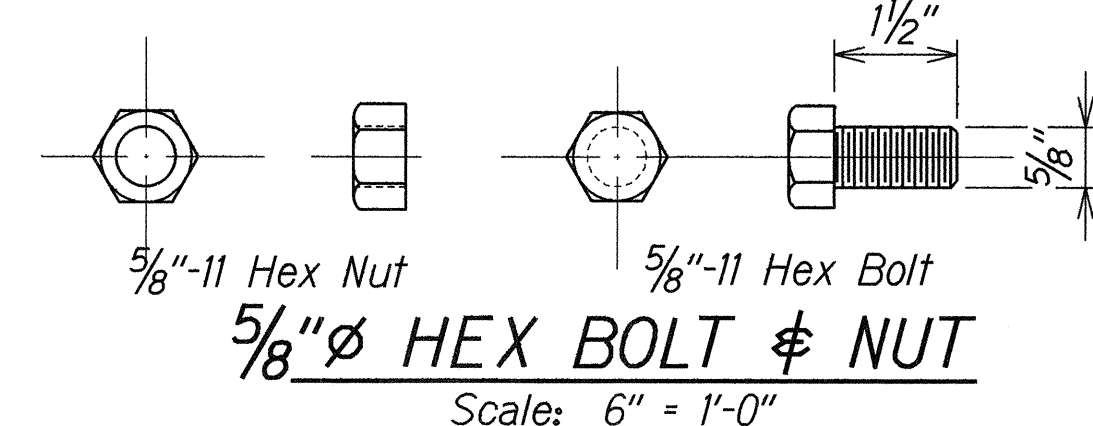
## SECTION THRU RAIL ELEMENT

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



## STEEL WASHER FOR 5/8" BOLT

Scale: 6" = 1'-0"

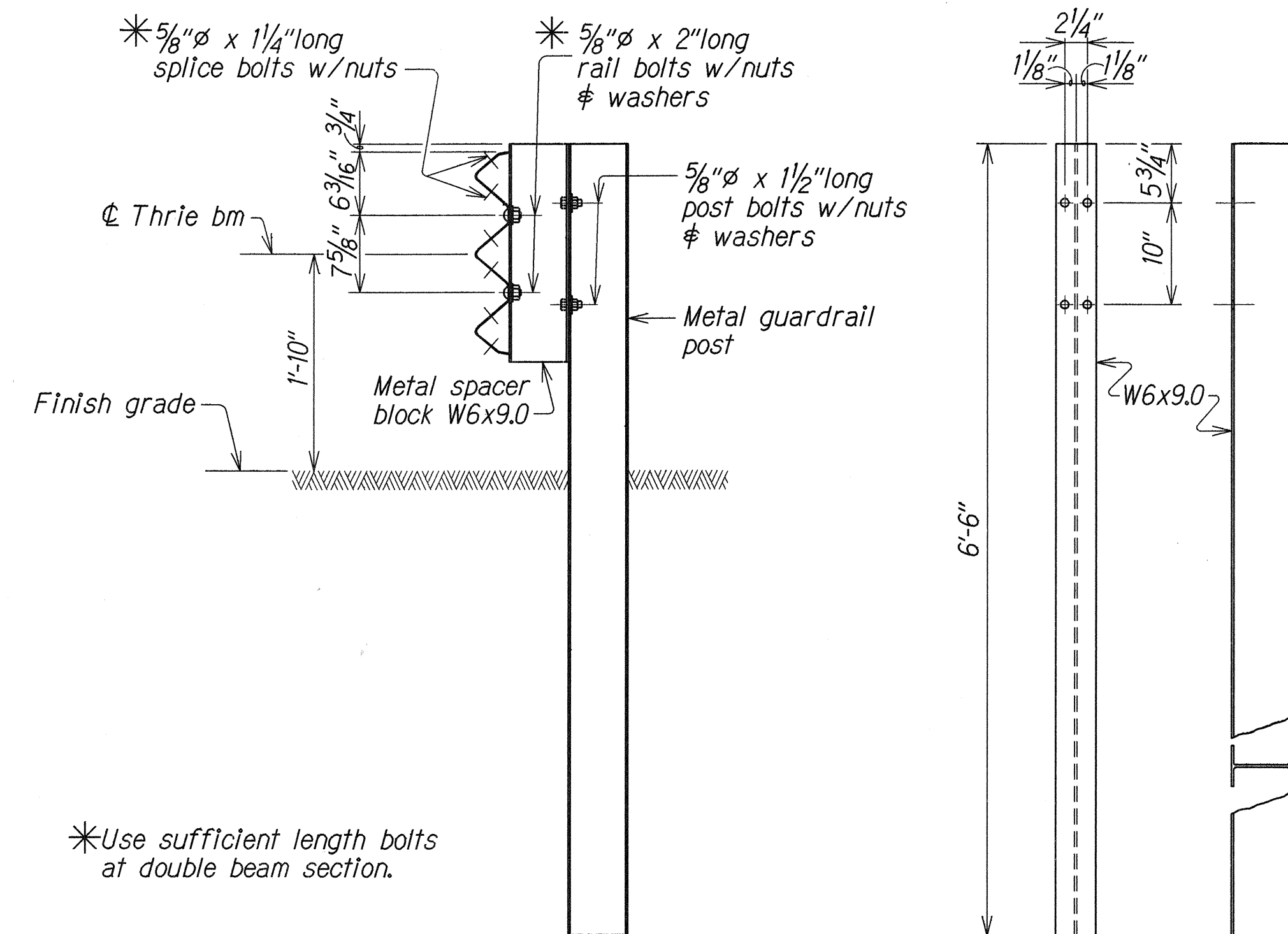


## 5/8" HEX BOLT & NUT

Scale: 6" = 1'-0"

## 5/8" BUTTON HEAD BOLT & RECESS NUT

Scale: 6" = 1'-0"



## TYPICAL SECTION

METAL GUARDRAIL ON METAL POST WITH METAL SPACER BLOCK

Scale: 1" = 1'-0"

## POST DETAILS

Scale: 1" = 1'-0"

\*Use sufficient length bolts at double beam section.

## NOTES:

- See Standard Specifications for Road and Bridge Constructions, (Hawaii 1985) and Special Provisions.
- "Terminal Connector" shall be fabricated from 10 gauge steel conforming to the requirements of AASHTO M 180.
- All anchor bolts shall be high strength bolts conforming to the requirements of ASTM 325.
- "Terminal Connector" and steel template, including all anchor bolts, cap PL, nuts and washers, shall be hot-dip galvanized after fabrication.
- First 25'-0" of guardrail adjoining "Terminal Connector" shall be of galvanized steel and supports spaced as shown on the detail drawings. This section of rail to be placed on tangent to the roadway, unless conditions at site render it impossible to do so. Flare point to be determined in field.
- Where double (nested) beam occur, 12" "Backup Plate" not required.
- Double (nest 1st panel) three beam elements at all end post connections.
- Cap plate and steel template shall be fabricated from A 36 steel.
- Large impacting or vibratory type of equipment will not be permitted for drilling.
- Drilling of through holes shall be done in such a manner as to prevent cone puncturing of the daylighting end.
- The Contractor shall verify all dimensions in field before commencing with work.
- The work necessary to connect guardrail to concrete end post shall include all labor, materials, tools, equipments and incidentals necessary to complete the work. This work will be measured and paid for in units of one.

|                   |          |
|-------------------|----------|
| SURVEY PLOTTED BY | DATE     |
| DESIGNED BY       | APR 1993 |
| TRACED BY         | APR 1993 |
| DESIGNED BY       | APR 1993 |
| QUANTITIES BY     | APR 1993 |
| CHECKED BY        | APR 1993 |

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**GUARDRAIL TYPE 3 THRIE BEAM  
APPURTENANCES AND POST SPACING DETAILS**

HALEAKALA HIGHWAY GUARDRAIL & SHOULDER IMPROVEMENTS  
KULA JUNCTION TO CRATER ROAD JUNCTION  
Fed. Aid Project No. STP-0377(3)

Scale: As Noted Date: Aug, 1993