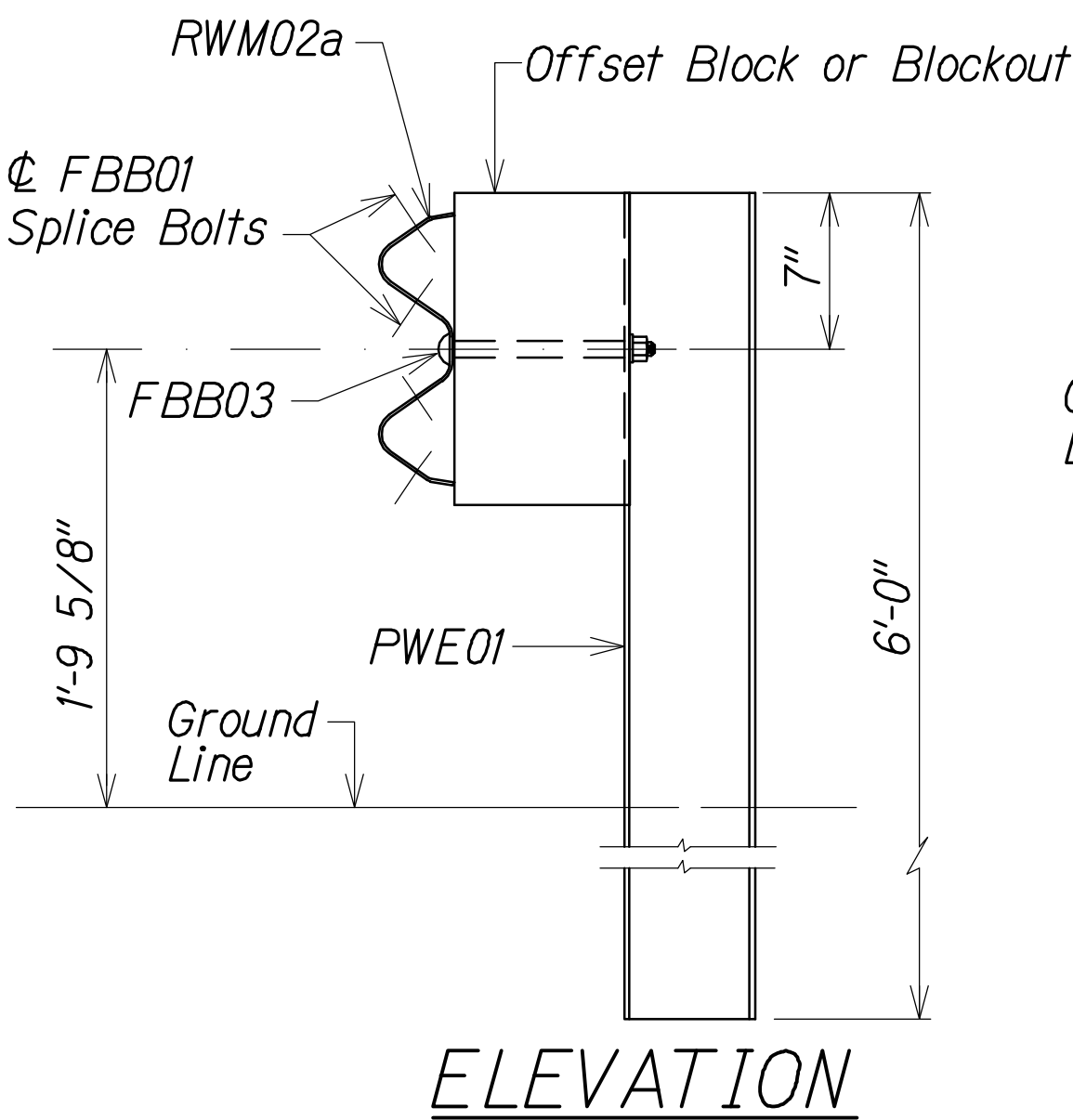
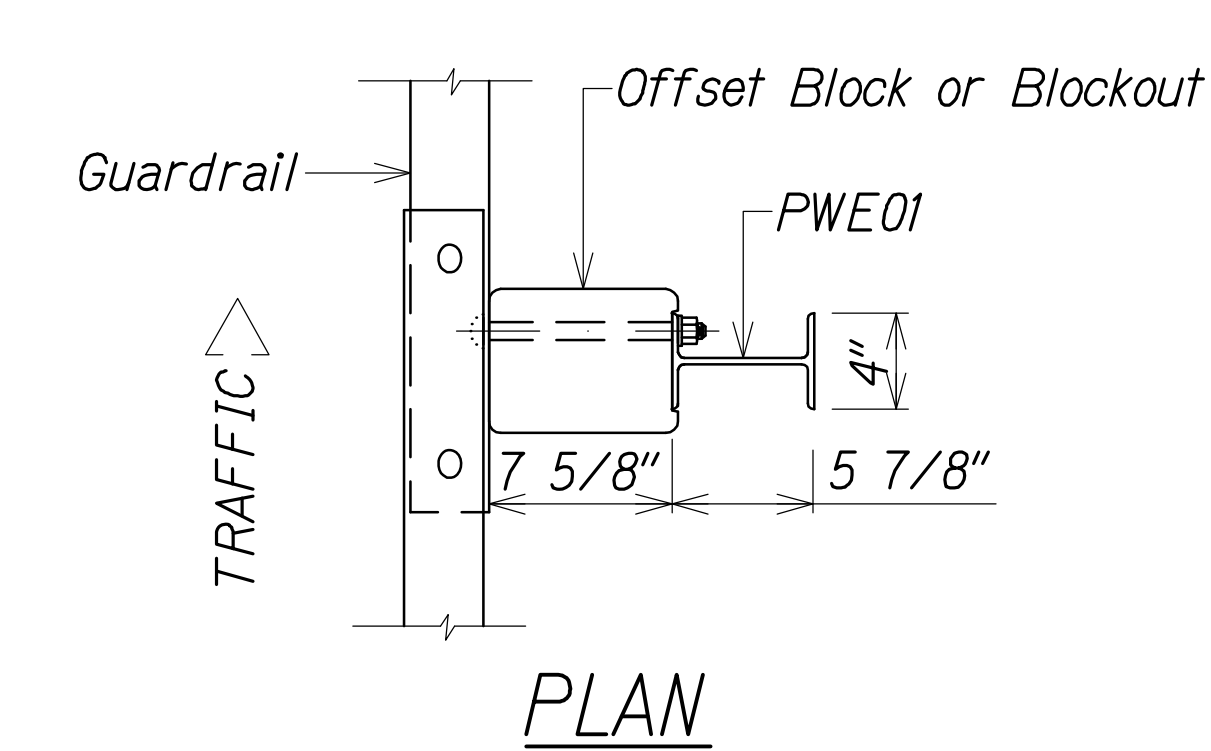


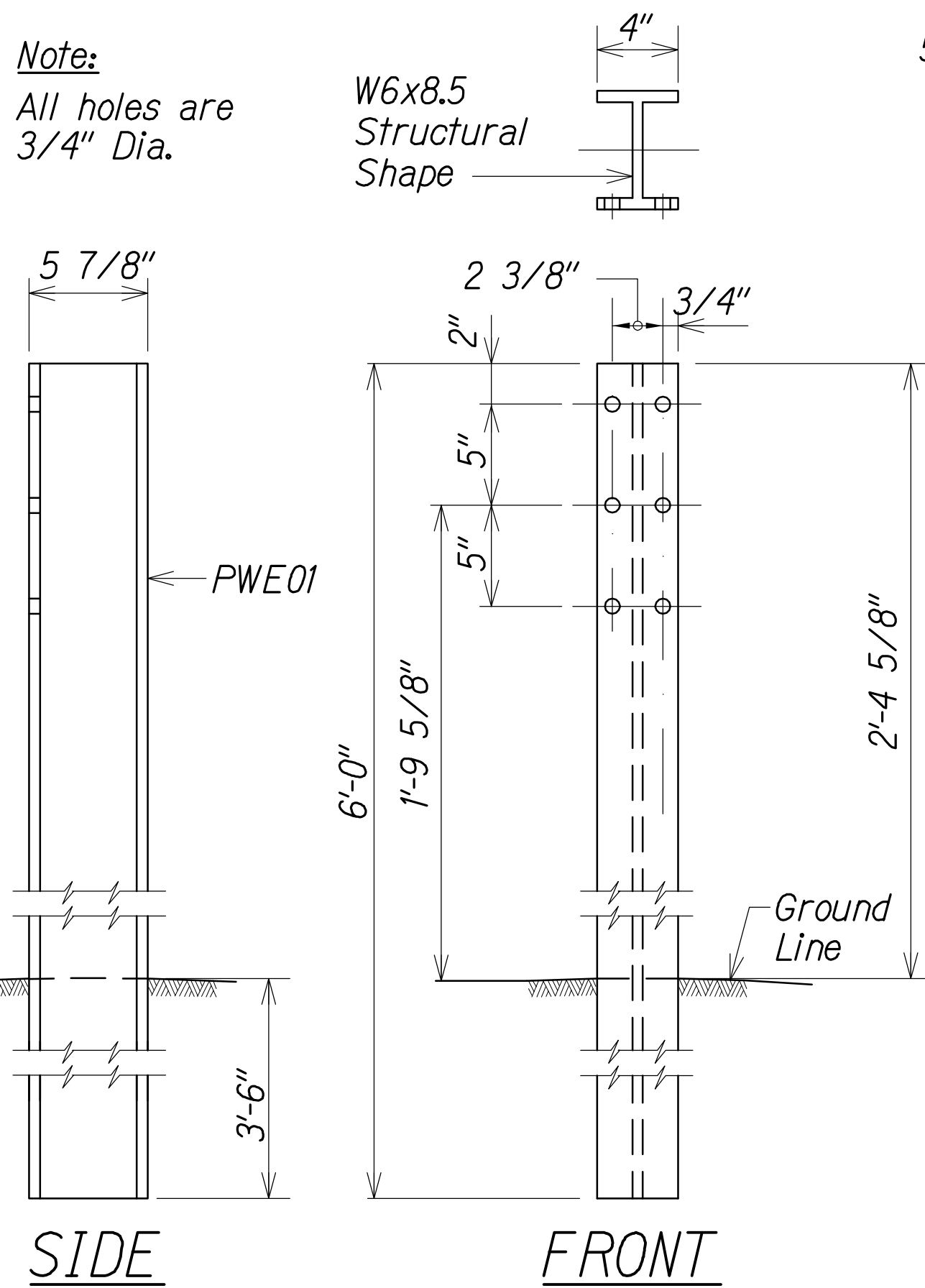




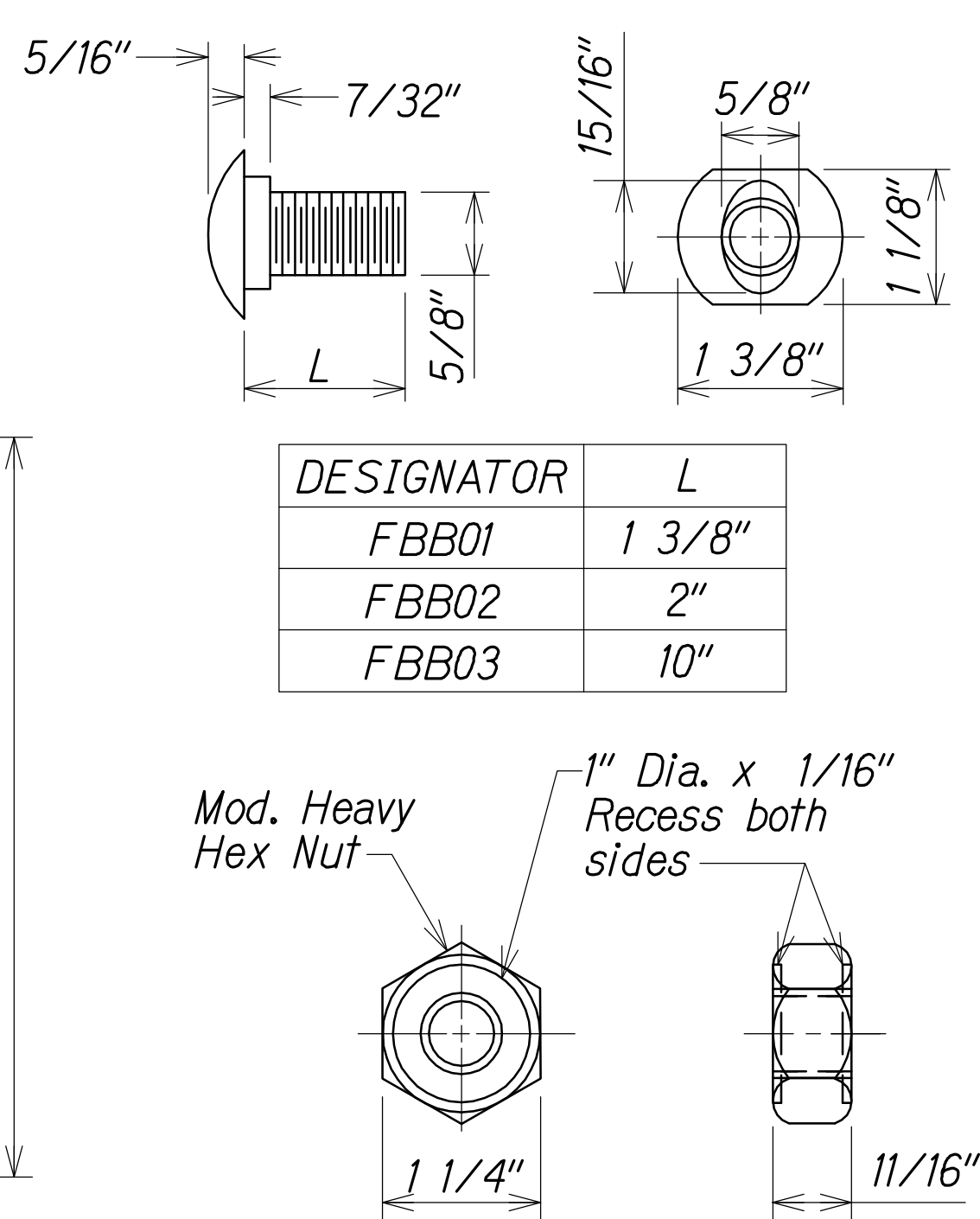
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-HI-1 (260)	2014	153	200



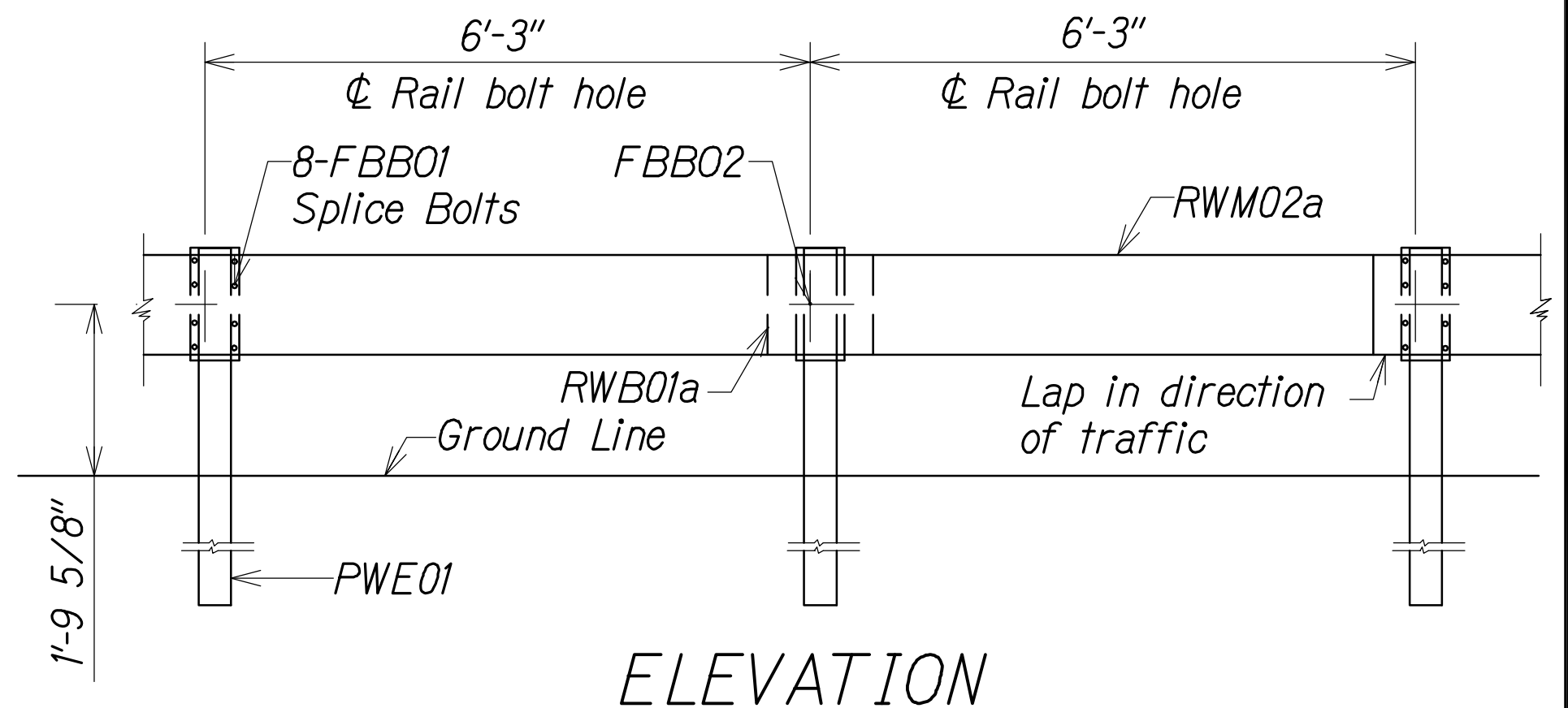
STRONG POST W-BEAM  
GUARDRAIL (SGR04a)  
Not to Scale



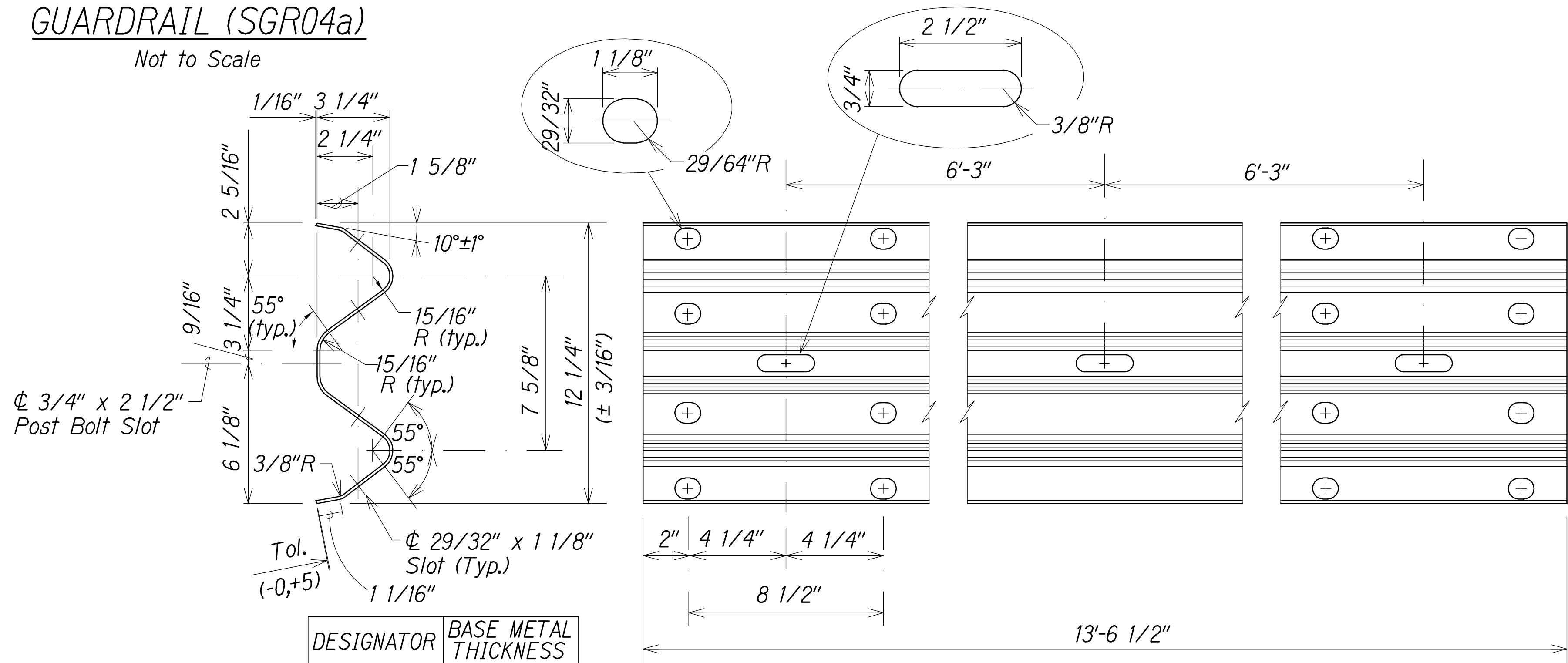
W-BEAM STRONG POST (PWE01)  
Not to Scale



GUARDRAIL BOLTS AND  
RECESSED NUT  
Not to Scale



STRONG POST W-BEAM GUARDRAIL WITH  
RECYCLED OFFSET BLOCK OR PLASTIC BLOCKOUT  
Not to Scale



2 SPACE W-BEAM GUARDRAIL (RWM02a)  
Not to Scale

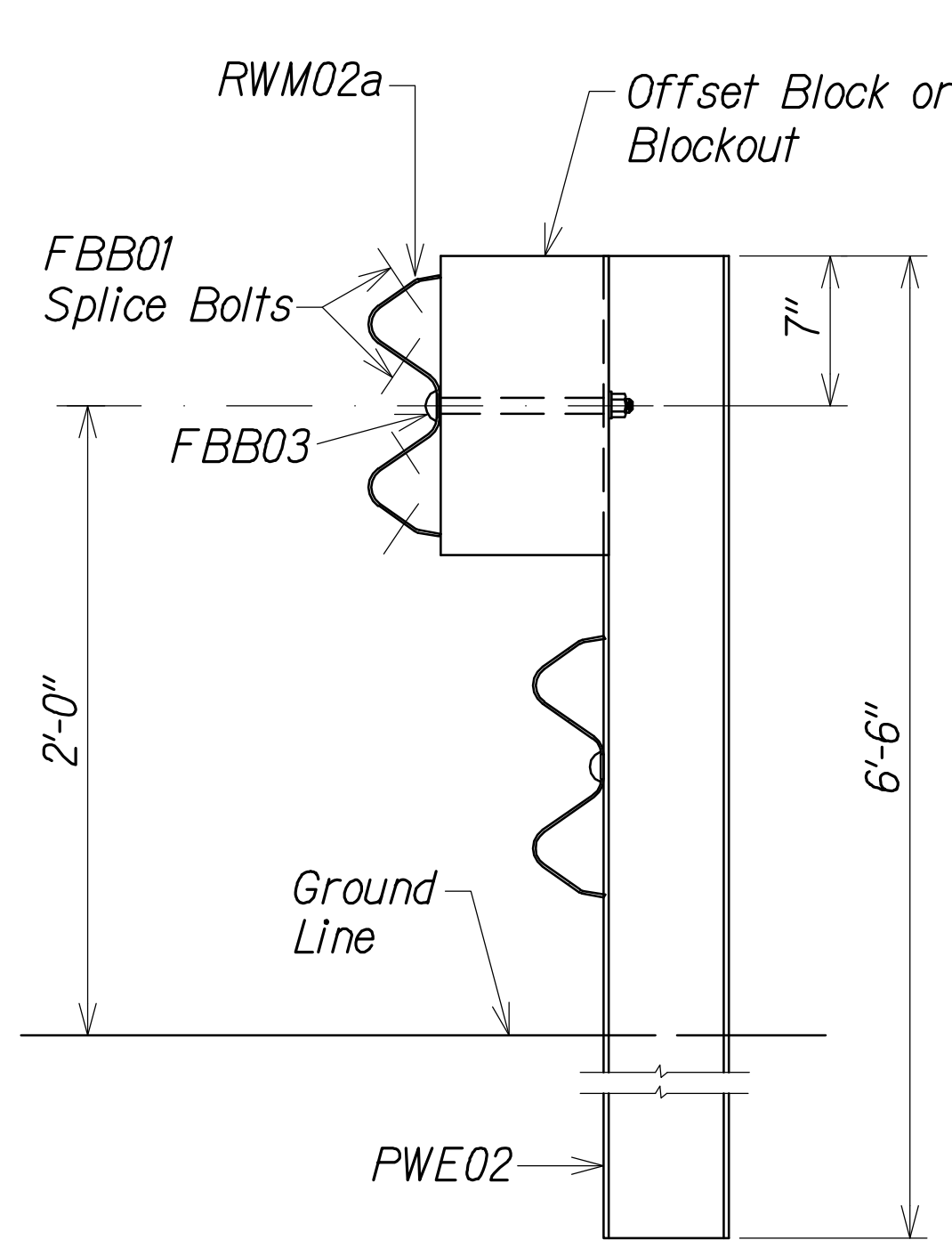
LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting



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*Matthew K. Fujioa*  
APRIL 30, 2016  
WILSON OKAMOTO CORPORATION LIC. EXP. DATE

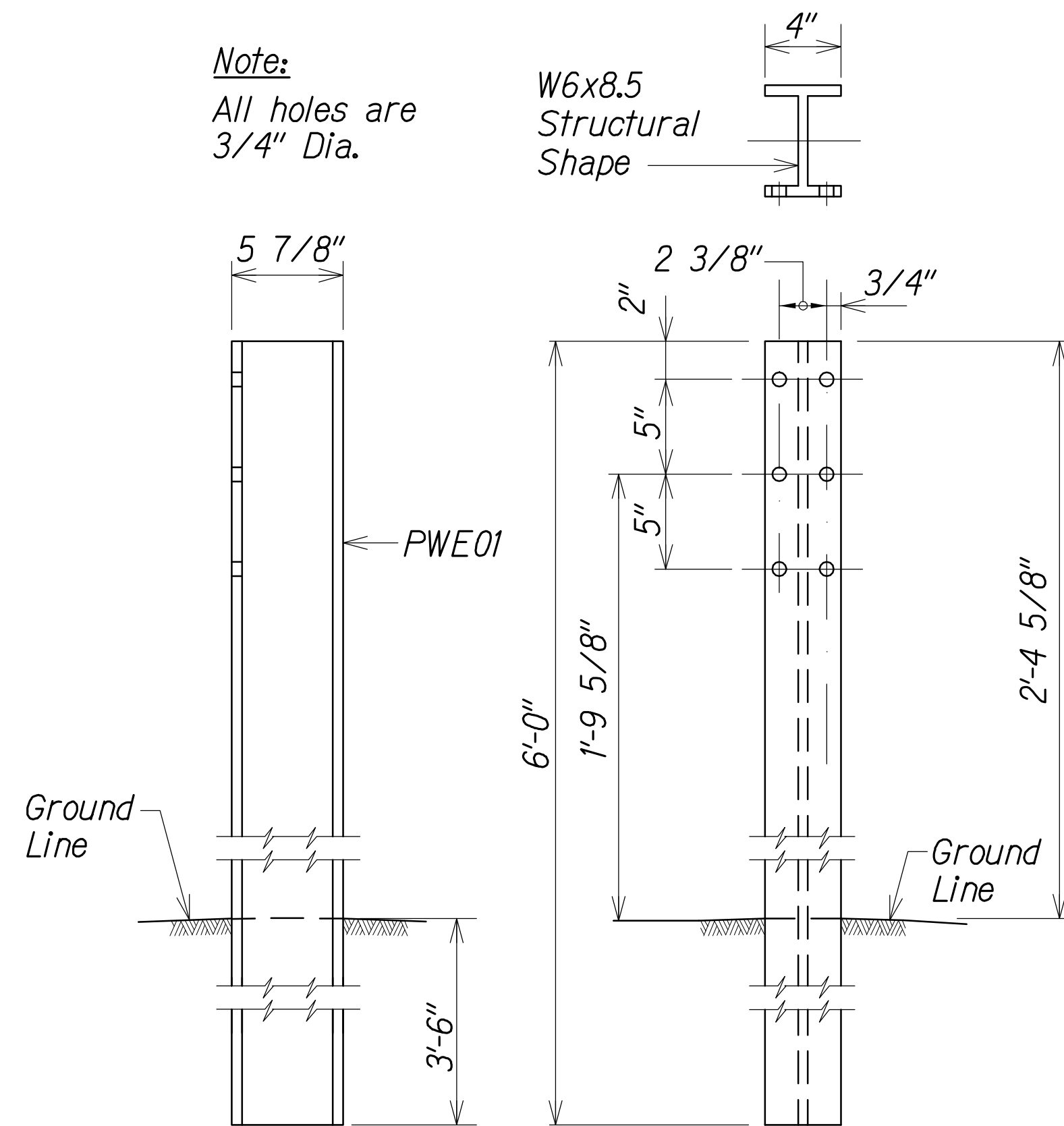
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
GUARDRAIL DETAILS  
  
INTERSTATE ROUTE H-1  
PM CONTRAFLOW LANE, PHASE 3  
FEDERAL AID PROJECT NO. NH-HI-1 (260)  
Scale: 1" = XX' Date: December, 2014  
SHEET No. GRD-02 of 11 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-HI-1 (260)	2014	154	200



ELEVATION

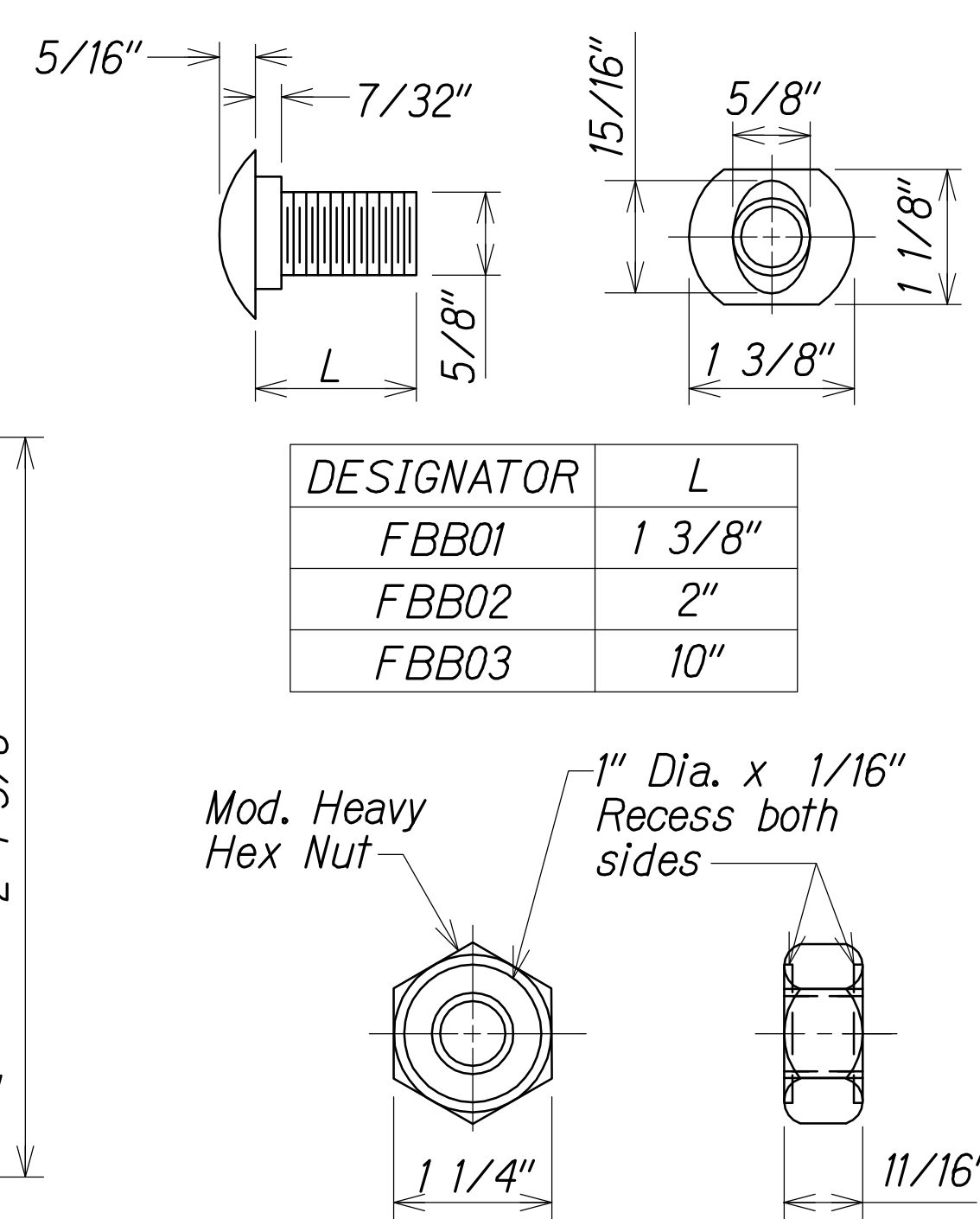
STRONG POST RUBRAIL  
(W-BEAM) GUARDRAIL  
Not to Scale



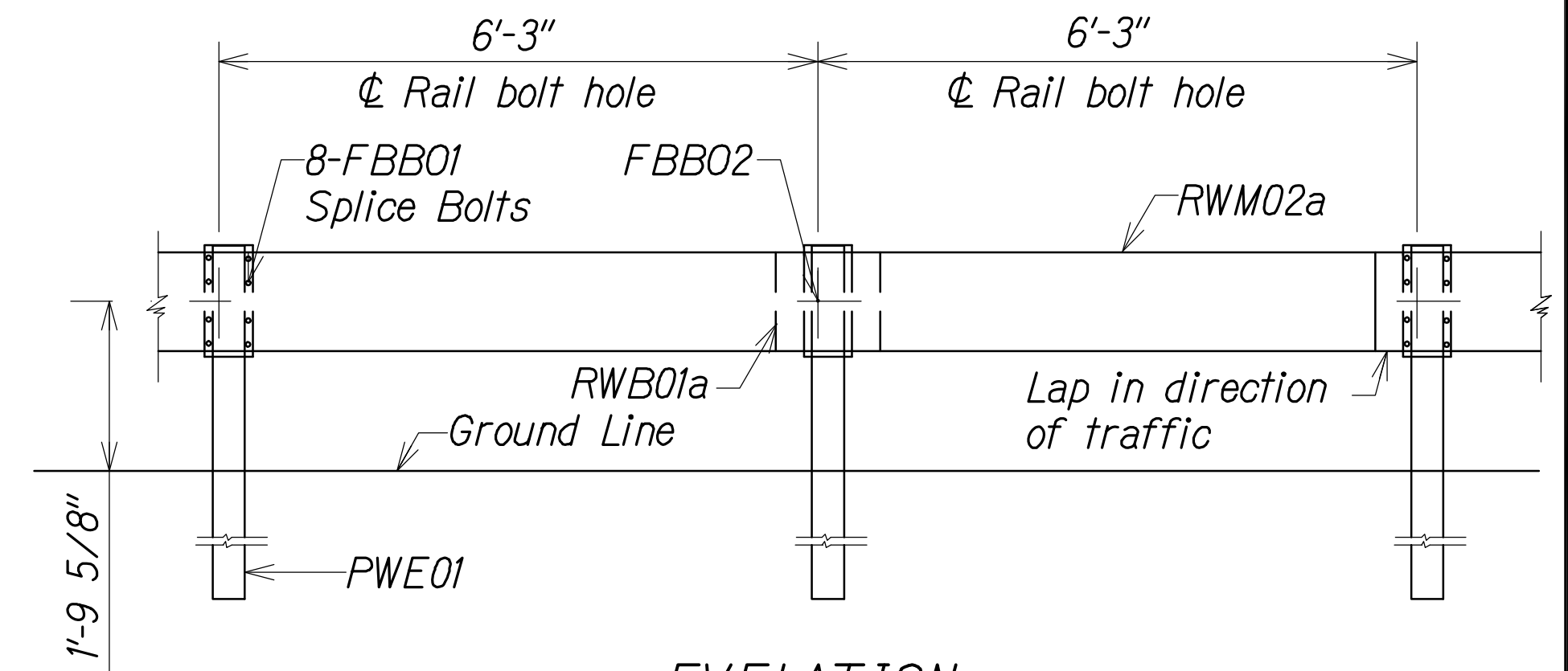
SIDE

FRONT

W-BEAM STRONG POST (PWE01)  
Not to Scale

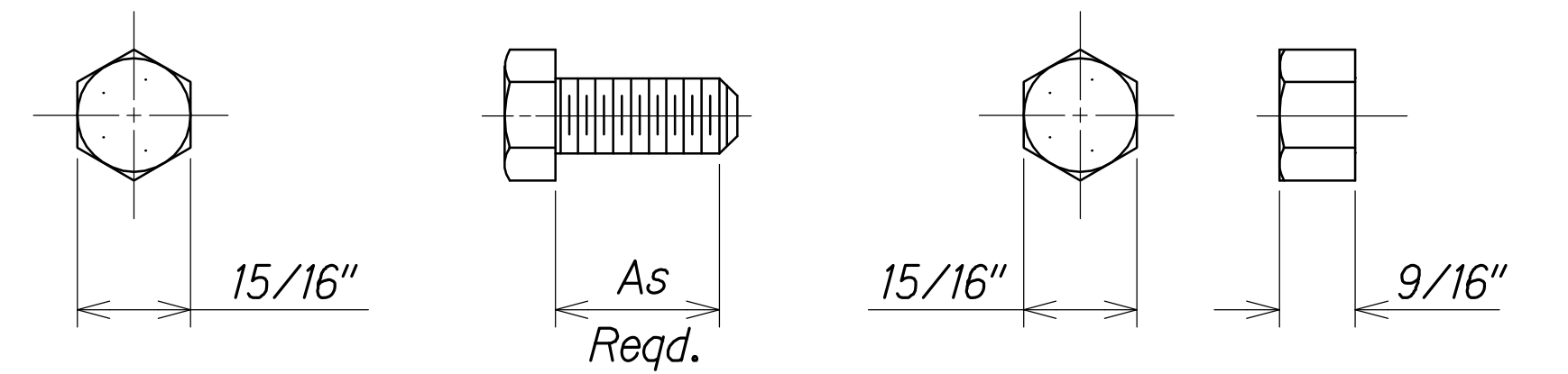


GUARDRAIL BOLTS AND  
RECESSED NUT  
Not to Scale

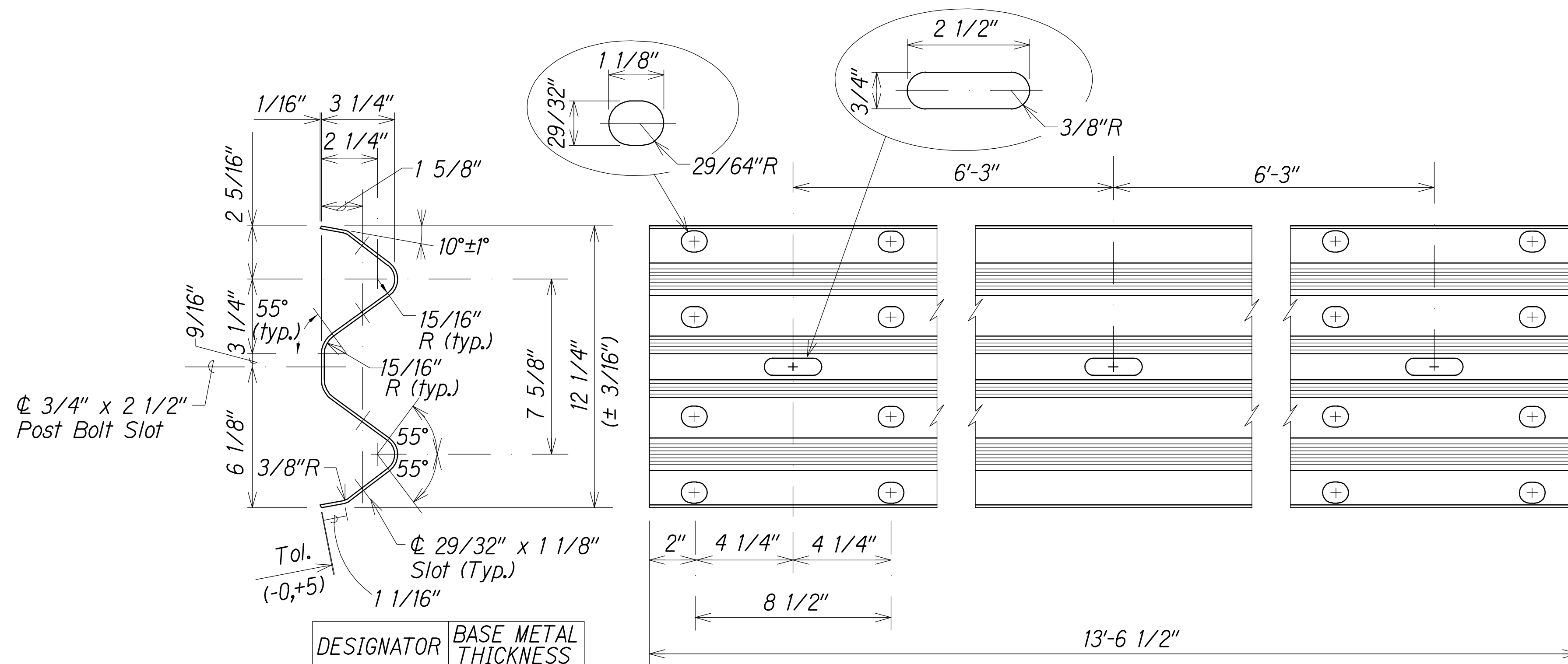


ELEVATION

STRONG POST W-BEAM GUARDRAIL WITH RECYCLED  
OFFSET BLOCK OR PLASTIC BLOCKOUT  
Not to Scale



HEX BOLT & NUT (FBX16a)  
Not to Scale



DESIGNATOR	BASE METAL THICKNESS
RWM02a	12 Gauge

2 SPACE W-BEAM GUARDRAIL (RWM02a)  
Not to Scale

LEGEND FOR  
AS-BUILT POSTINGS

~~~~~ Squiggly line for  
as-built deletion

== Double line for  
as-built deletion

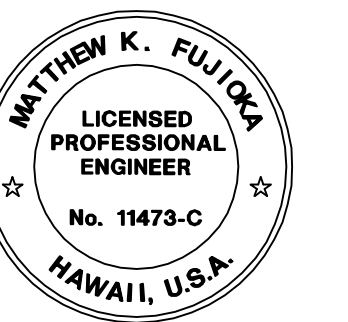
Roadway Text for as-built posting

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

GUARDRAIL DETAILS

INTERSTATE ROUTE H-1  
PM CONTRAFLOW LANE, PHASE 3  
FEDERAL AID PROJECT NO. NH-HI-1 (260)  
Scale: 1" = XX' Date: December, 2014

SHEET No. GRD-03 OF 11 SHEETS



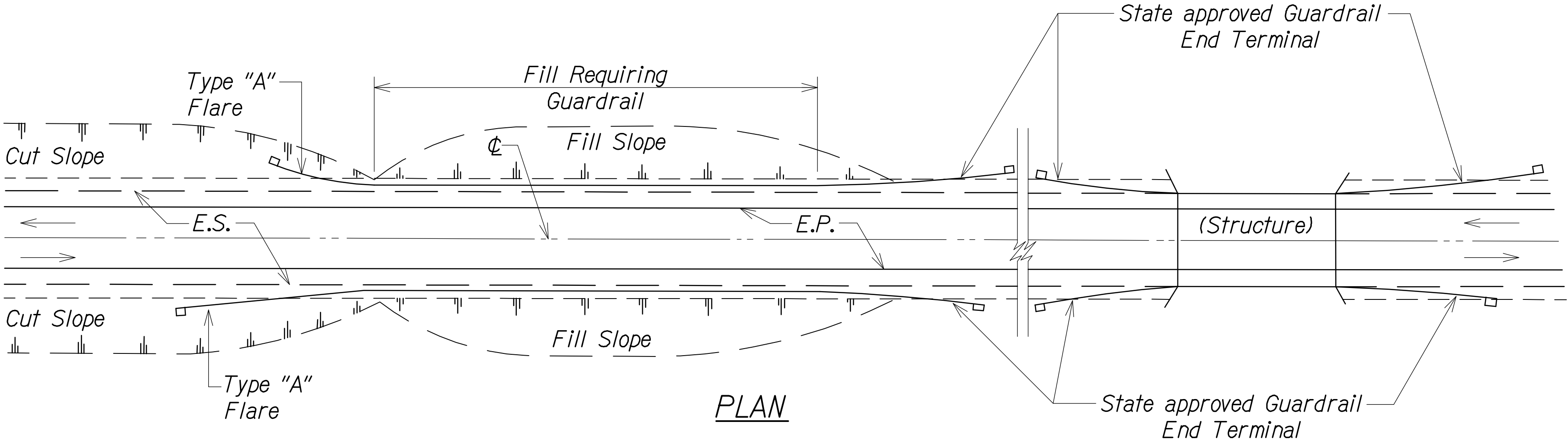
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APRIL 30, 2016  
WILSON OKAMOTO CORPORATION LIC. EXP. DATE

|              |      |                   |
|--------------|------|-------------------|
| QC/QA REVIEW | 100% | DATE JUL 12, 2015 |
| BY           |      |                   |
| BY           |      |                   |
| BY           |      |                   |
| BY           |      |                   |

|               |      |
|---------------|------|
| DESIGNED BY   | DATE |
| TRACED BY     |      |
| DESIGNED BY   |      |
| QUANTITIES BY |      |
| CHECKED BY    |      |



|                     |       |                    |             |           |              |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
| HAWAII              | HAW.  | NH-HI-1 (260)      | 2014        | 155       | 200          |

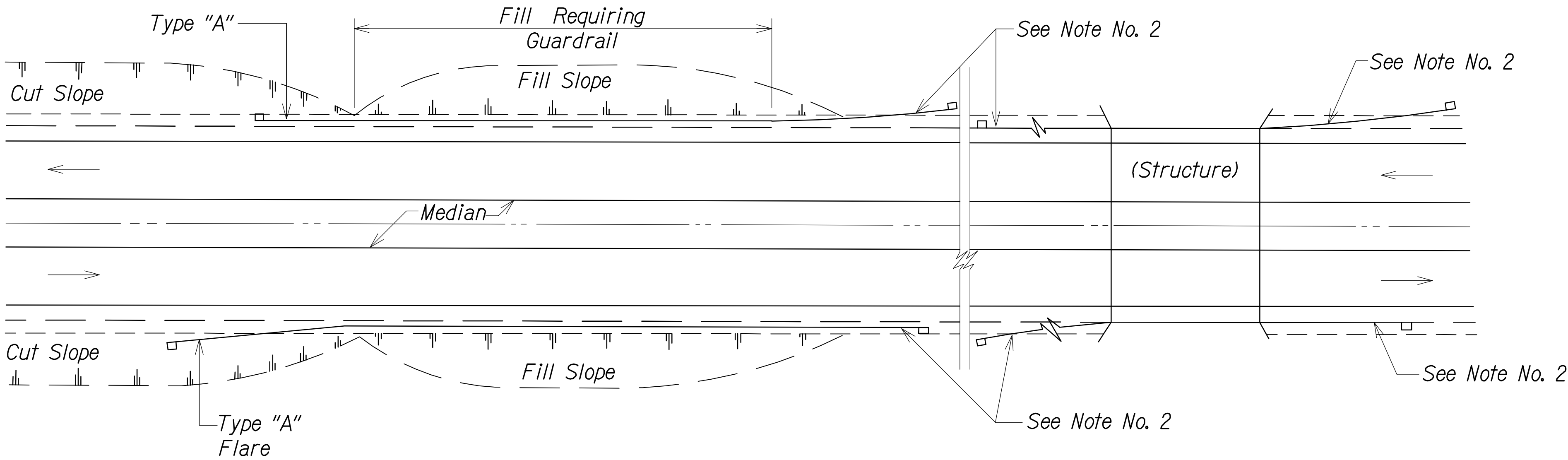


PLAN

TWO WAY ROADWAY  
Not to Scale

GENERAL NOTES:



1. Metal Guardrail connection to concrete structures requires End Post Connection. See Structure Plans.
2. Depending on the existing field conditions, the Engineer shall determine which guardrail end terminal should be installed.
3. Refer to State's most current approved Product List for NCHRP 350 approved Guardrail End Terminals.




PLAN

ONE WAY ROADWAY (DIVIDED HIGHWAY)  
Not to Scale

LEGEND FOR  
AS-BUILT POSTINGS

-  Squiggly line for as-built deletion
-  Double line for as-built deletion
- Roadway Text for as-built posting



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APRIL 30, 2016  
WILSON OKAMOTO CORPORATION LIC. EXP. DATE

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

GUARDRAIL DETAILS

INTERSTATE ROUTE H-1  
PM CONTRAFLOW LANE, PHASE 3  
FEDERAL AID PROJECT NO. NH-HI-1 (260)  
Scale: 1" = XX' Date: December, 2014

SHEET No. GRD-04 of 11 SHEETS

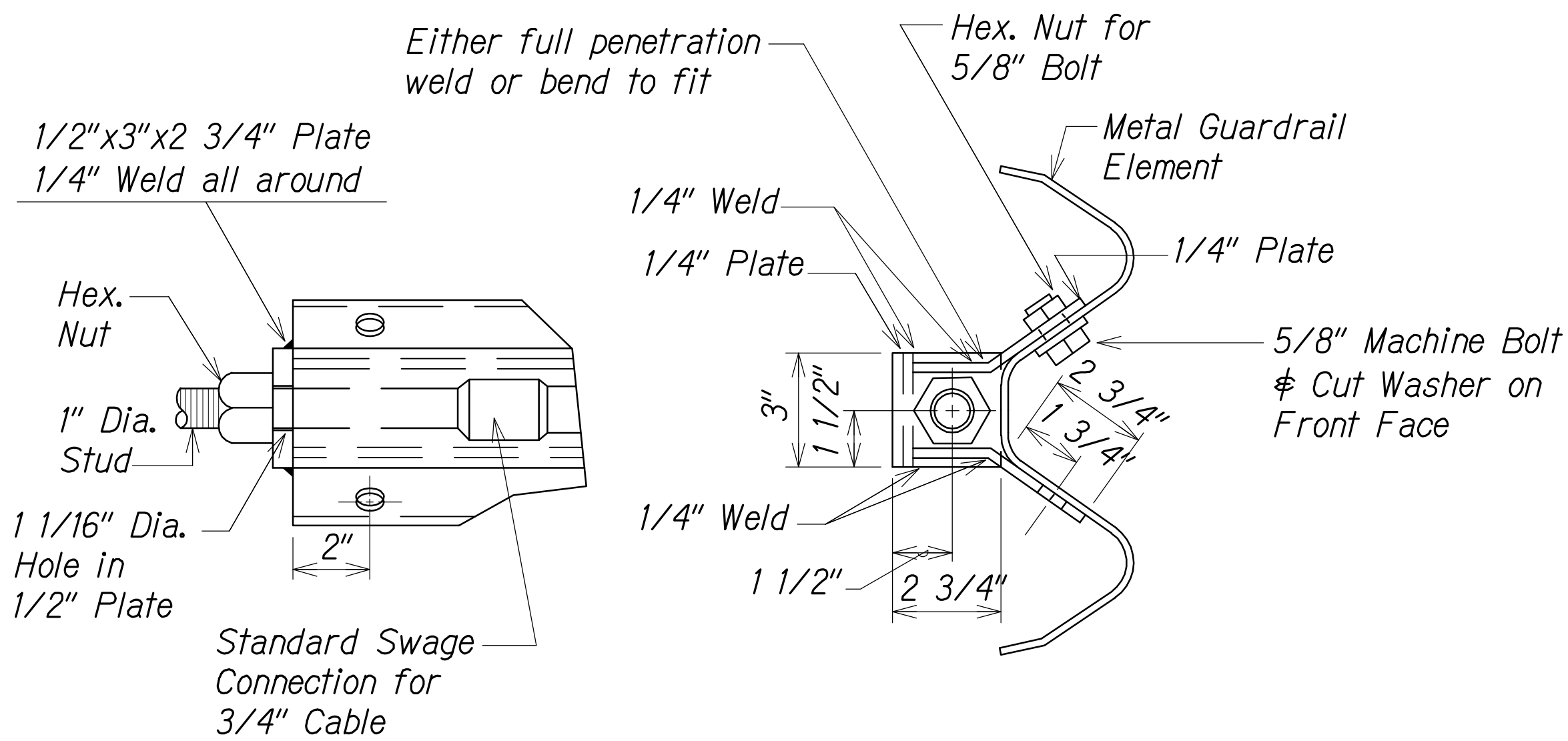
"AS-BUILT"

155

|              |      |      |              |
|--------------|------|------|--------------|
| QC/QA REVIEW | 100% | DATE | JUL 12, 2015 |
| BY           |      |      |              |
| BY           |      |      |              |
| BY           |      |      |              |

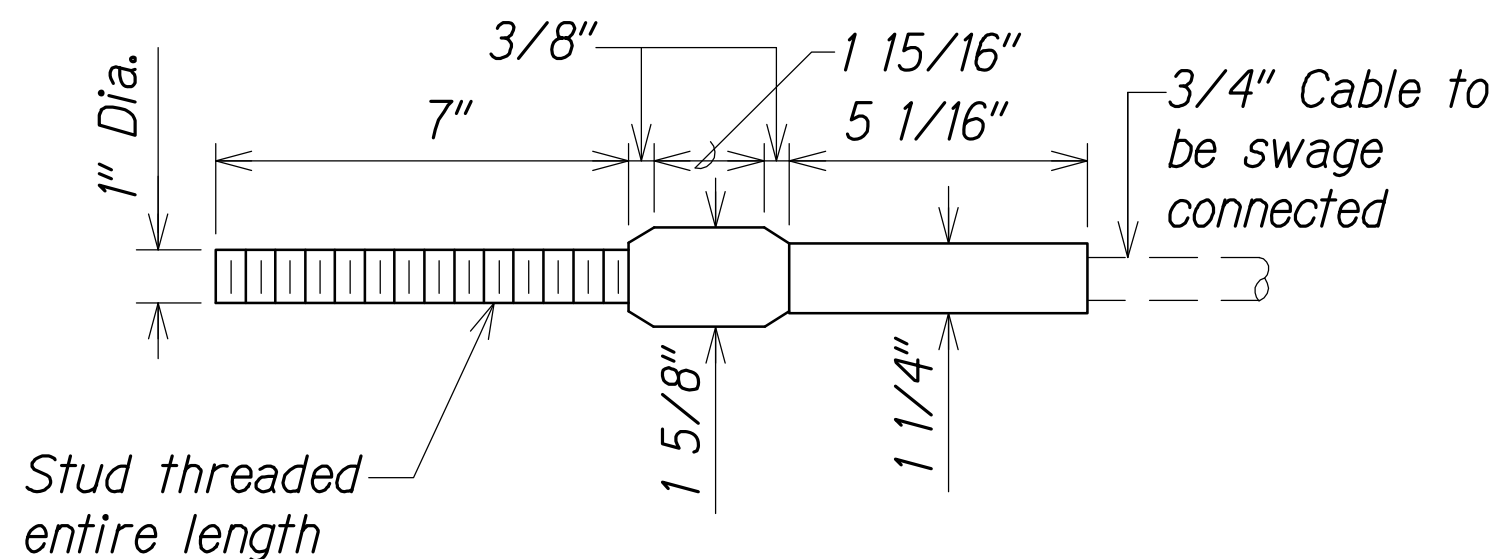
|               |      |
|---------------|------|
| ORIGINAL PLAN | DATE |
| NOTED BY      |      |
| DESIGNED BY   |      |
| QUANTITIES BY |      |
| CHECKED BY    |      |

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-HI-1 (260)      | 2014        | 156       | 200          |



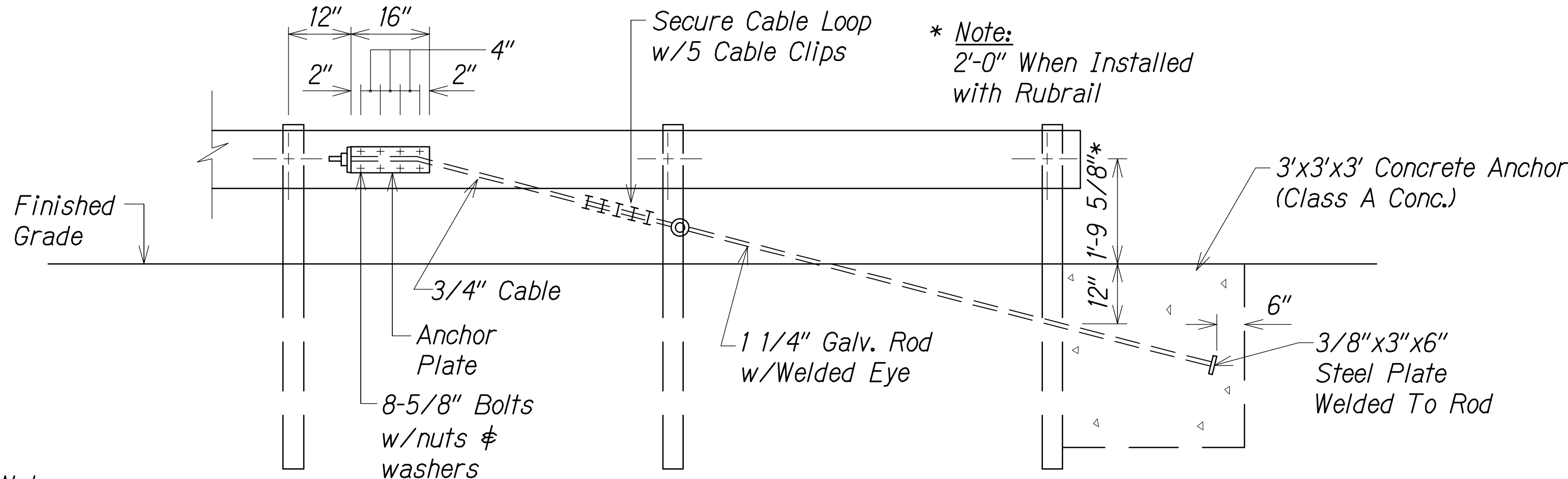
ANCHOR PLATE DETAILS

Not to Scale



STANDARD SWAGED FITTING AND STUD

Not to Scale

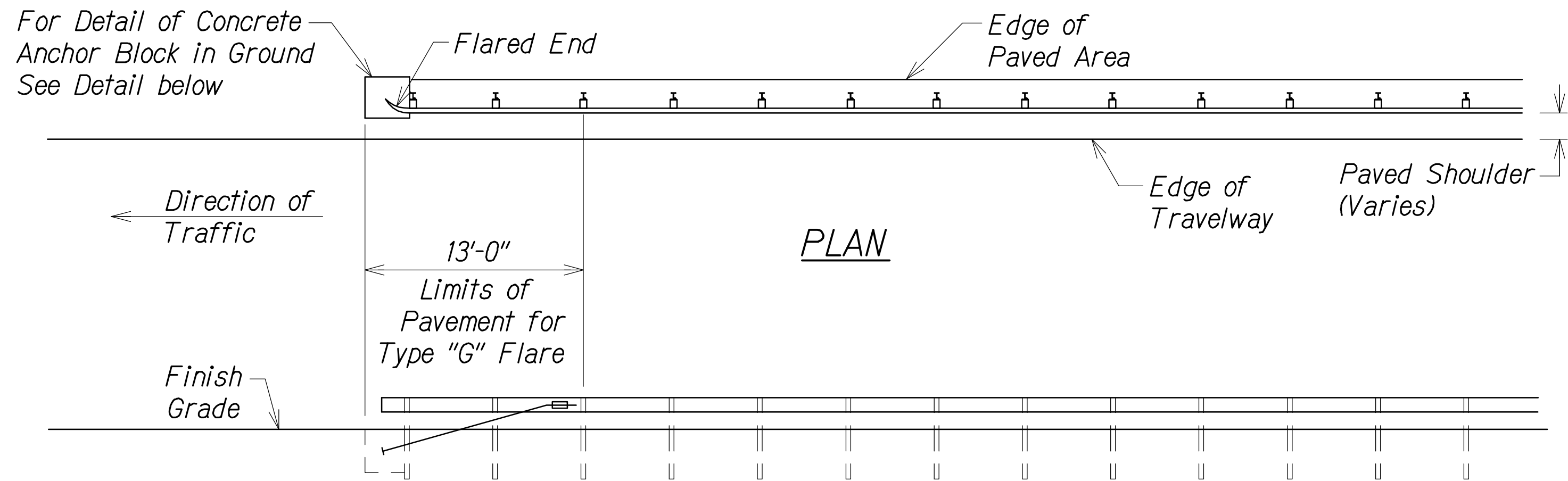


ANCHOR BLOCK DETAIL

Not to Scale

Note:

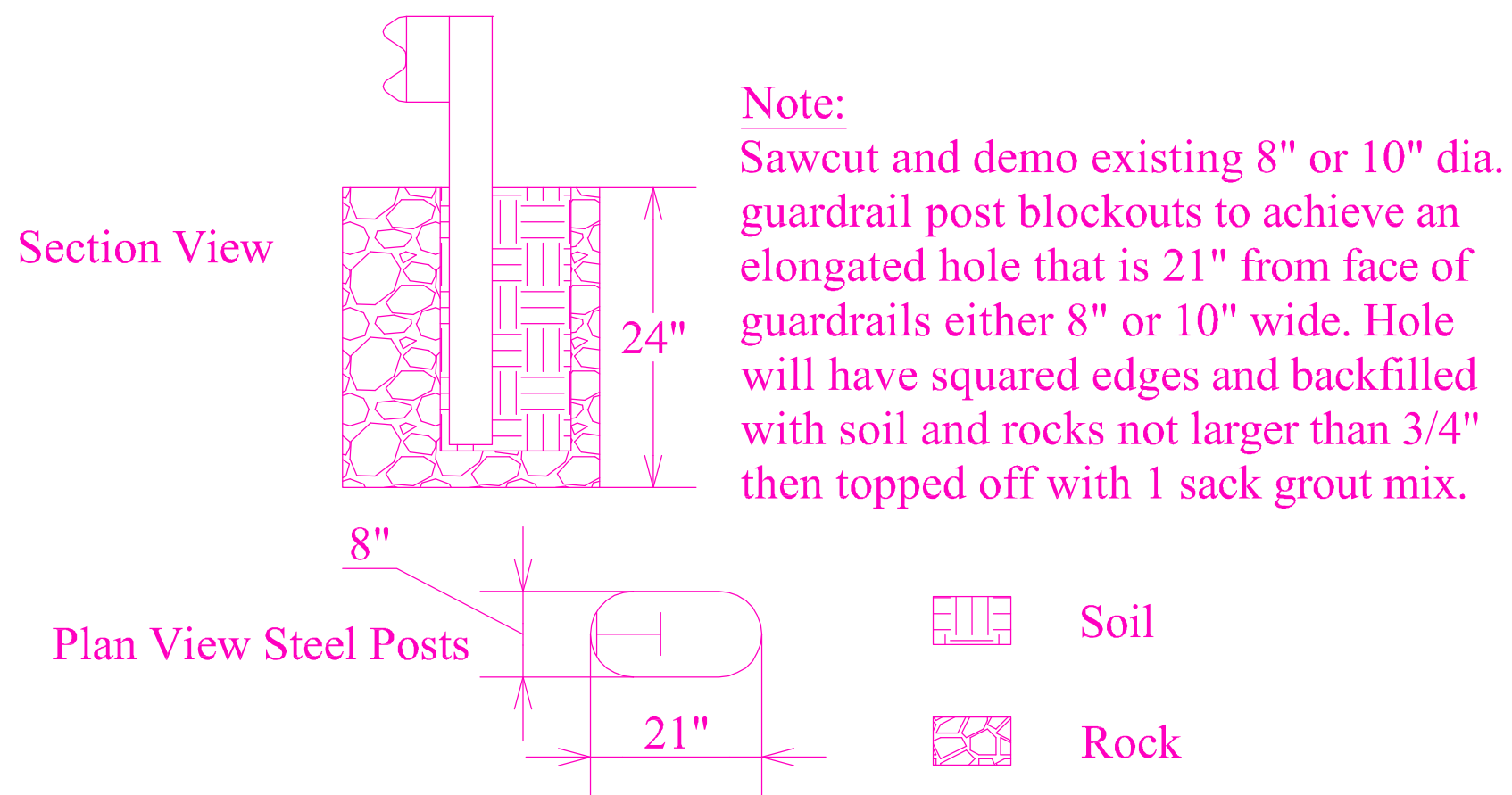
Concrete, G.R.P., excavation, anchor rod and miscellaneous appurtenances necessary to anchor the guardrail ends shall be incidental to metal guardrail.



ELEVATION

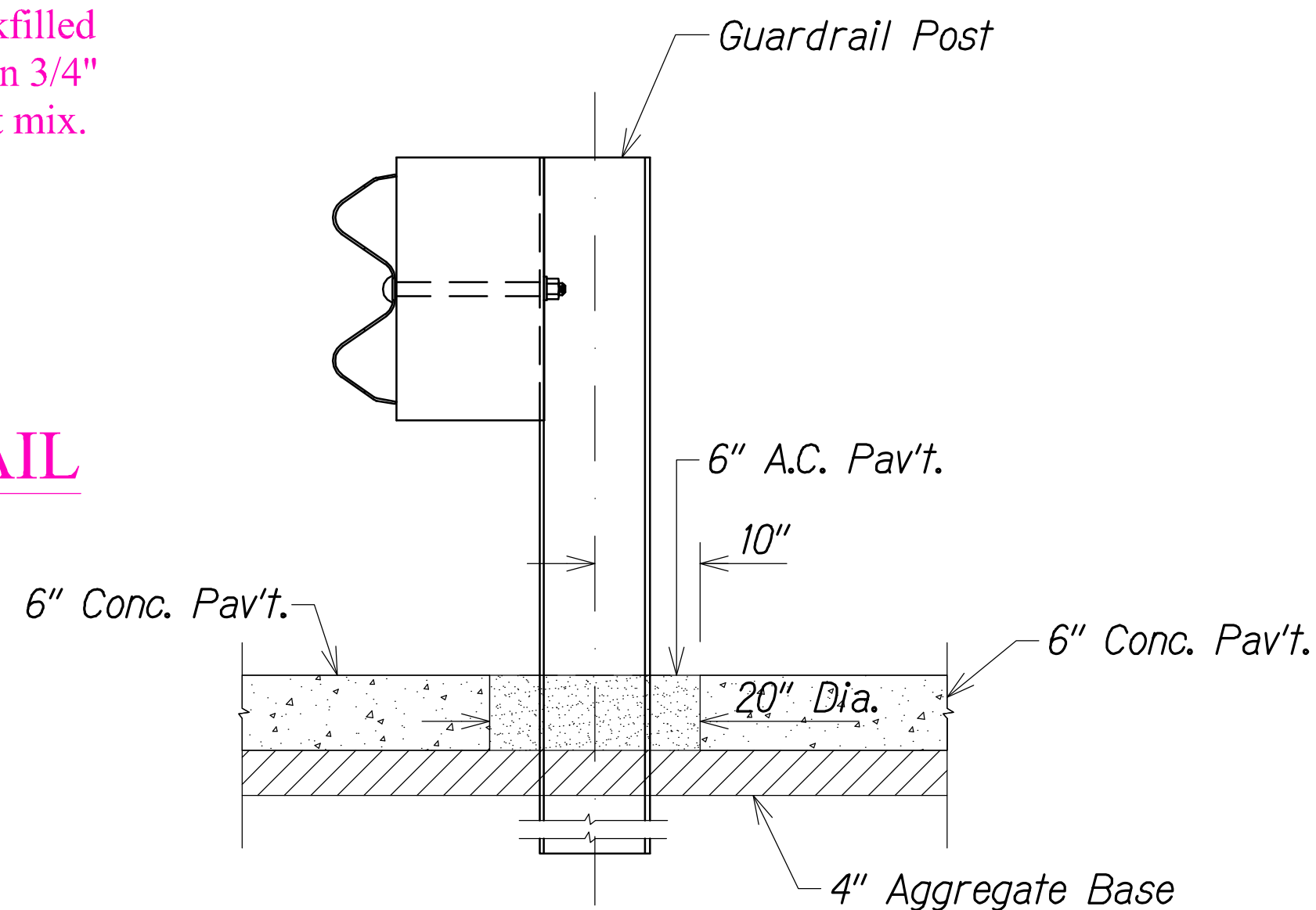
TYPE "G" FLARE END TERMINAL

Not to Scale



GUARDRAIL POST BLOCKOUT DETAIL

Scale: NTS



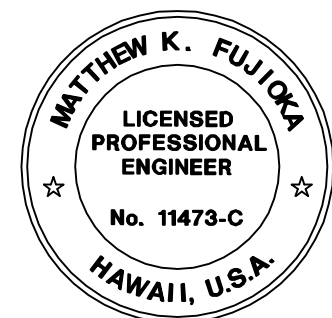
ELEVATION

GUARDRAIL POST IN CONCRETE SWALE OR CONCRETE PAV'T. DETAIL

Not to Scale

LEGEND FOR AS-BUILT POSTINGS

- Squiggly line for as-built deletion
- Double line for as-built deletion
- Roadway Text for as-built posting



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APRIL 30, 2016  
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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

GUARDRAIL DETAILS

INTERSTATE ROUTE H-1  
PM CONTRAFLOW LANE, PHASE 3  
FEDERAL AID PROJECT NO. NH-HI-1 (260)  
Scale: 1" = XX' Date: December, 2014

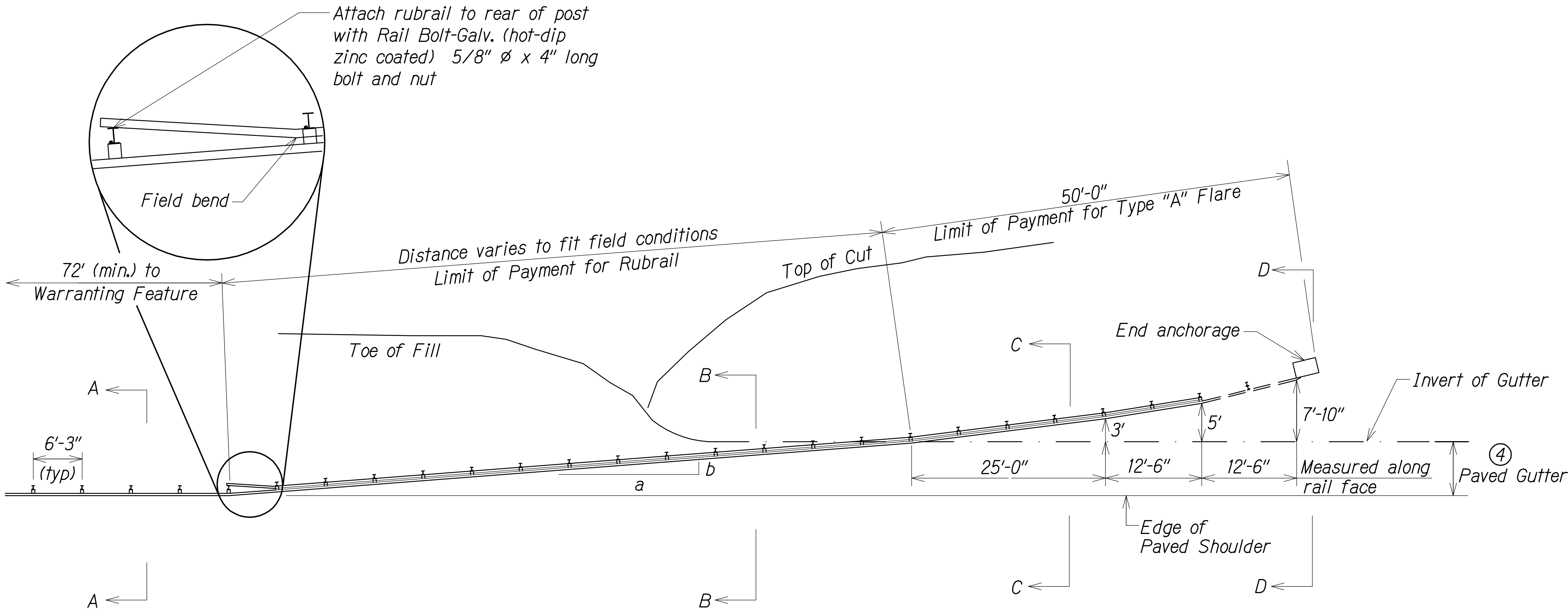
SHEET No. GRD-05 OF 11 SHEETS

"AS-BUILT"

156

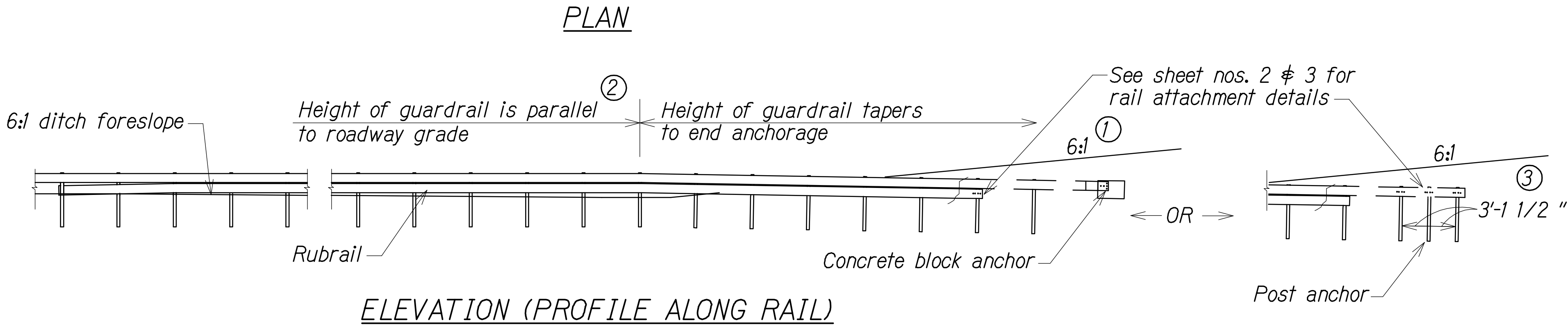


| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-H1-1 (260)      | 2014        | 157       | 200          |



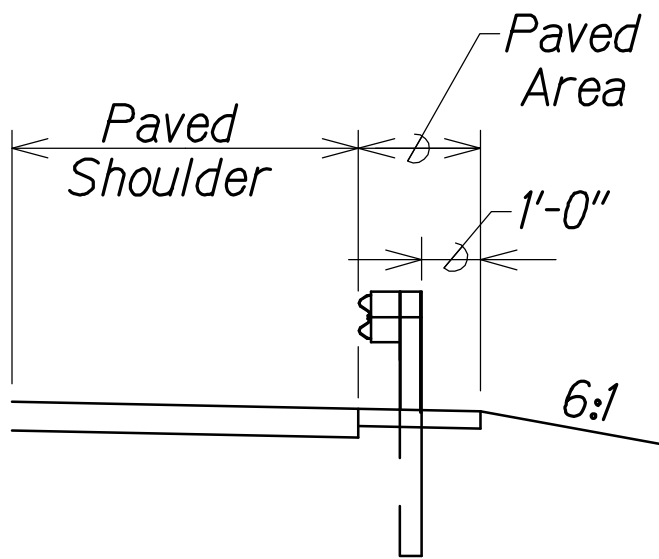
- GENERAL NOTES**
1. A 6:1 or flatter slope is desirable. However, a steeper or flatter existing slope may be used.
  2. Height of guardrail may be tapered down in elevation to maintain 3'-8" maximum height.
  3. All posts are 8'-0" in length from where the guardrail flares away from the shoulder back to the post anchor. Posts for the post anchor are 6'-0" long.
  4. Variable Paved Gutter offsets may be used to fit field conditions.
  5. The Guardrail Posts shall be located away from the gutter/swale invert.
  6. All fasteners, posts, blocks and rail elements shall conform to the latest edition and amendments of "A Guide to Standardized Highway Barrier Rail Hardware," a report prepared and approved by the AASHTO-AGCARTBA Joint Cooperative Committee.

| Design speed<br>mph | a:b  |
|---------------------|------|
| 68                  | 15:1 |
| 62                  | 13:1 |
| 56                  | 12:1 |
| 50                  | 11:1 |
| 43                  | 10:1 |
| 37                  | 9:1  |
| 31                  | 7:1  |

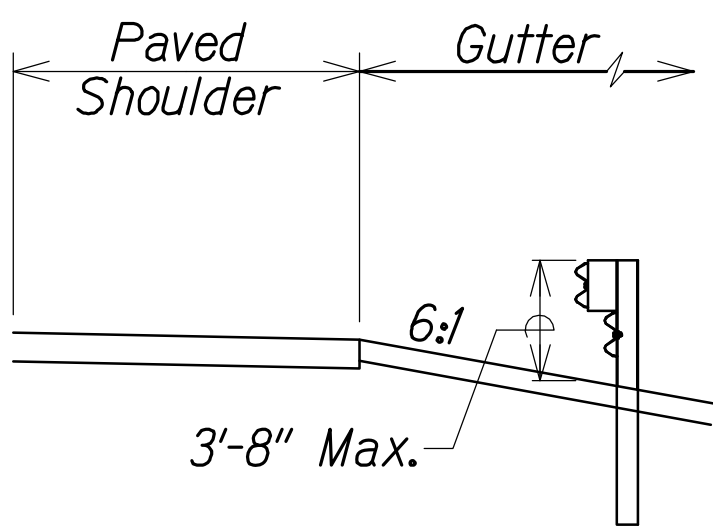


**LEGEND FOR AS-BUILT POSTINGS**

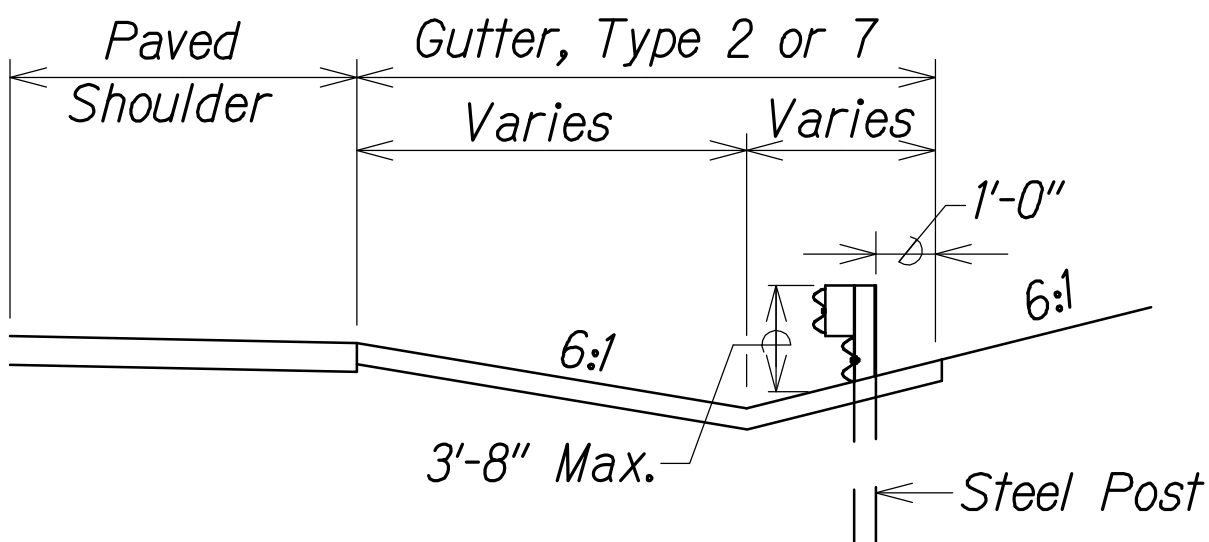
Squiggly line for as-built deletion  
 Double line for as-built deletion  
 Roadway Text for as-built posting



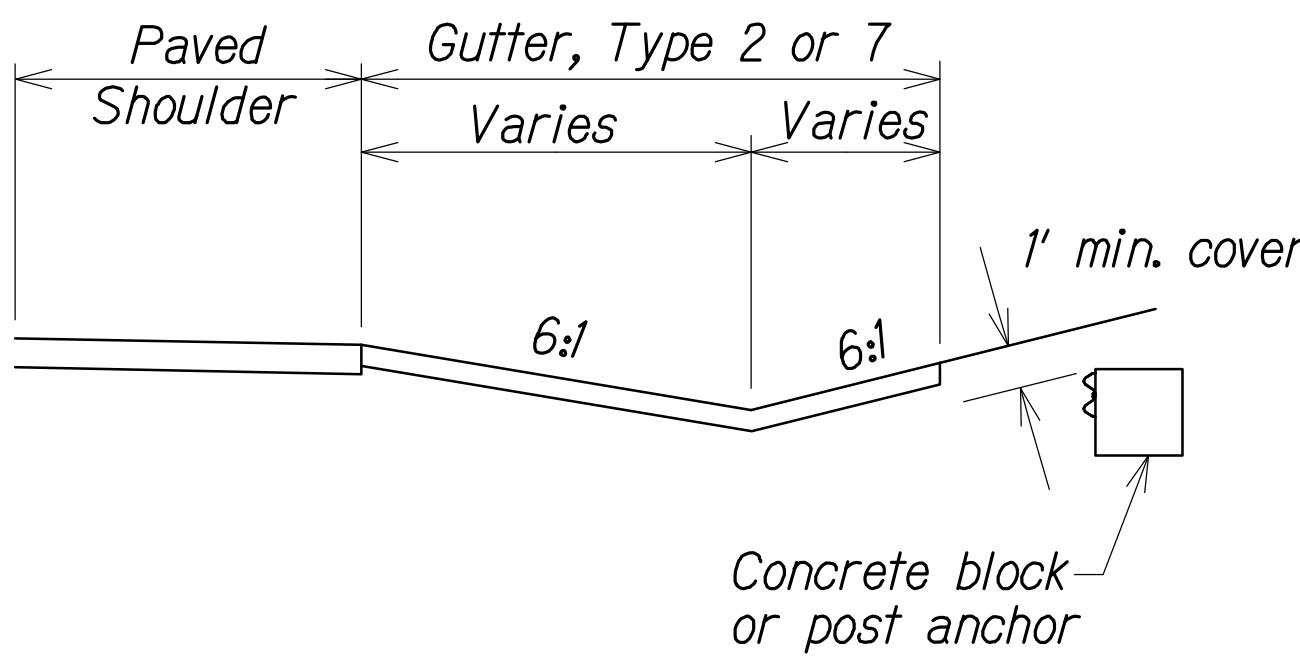
SECTION A-A



Section B-B  
(With Rubrail)



Section C-C  
(With Rubrail)



BACKSLOPE ANCHOR TERMINAL (WITH 6:1  
PAVED GUTTER AND TYPE "A" FLARE)  
Not to Scale



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WILSON OKAMOTO CORPORATION LIC. EXP. DATE  
APRIL 30, 2016

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

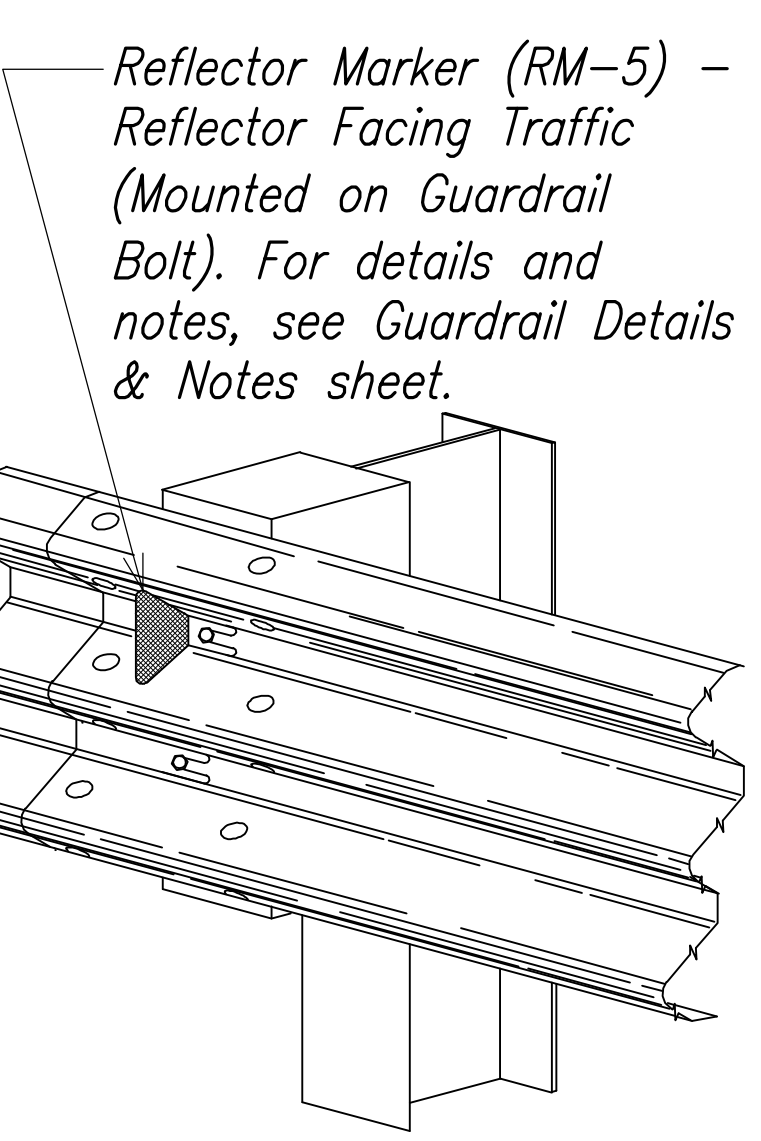
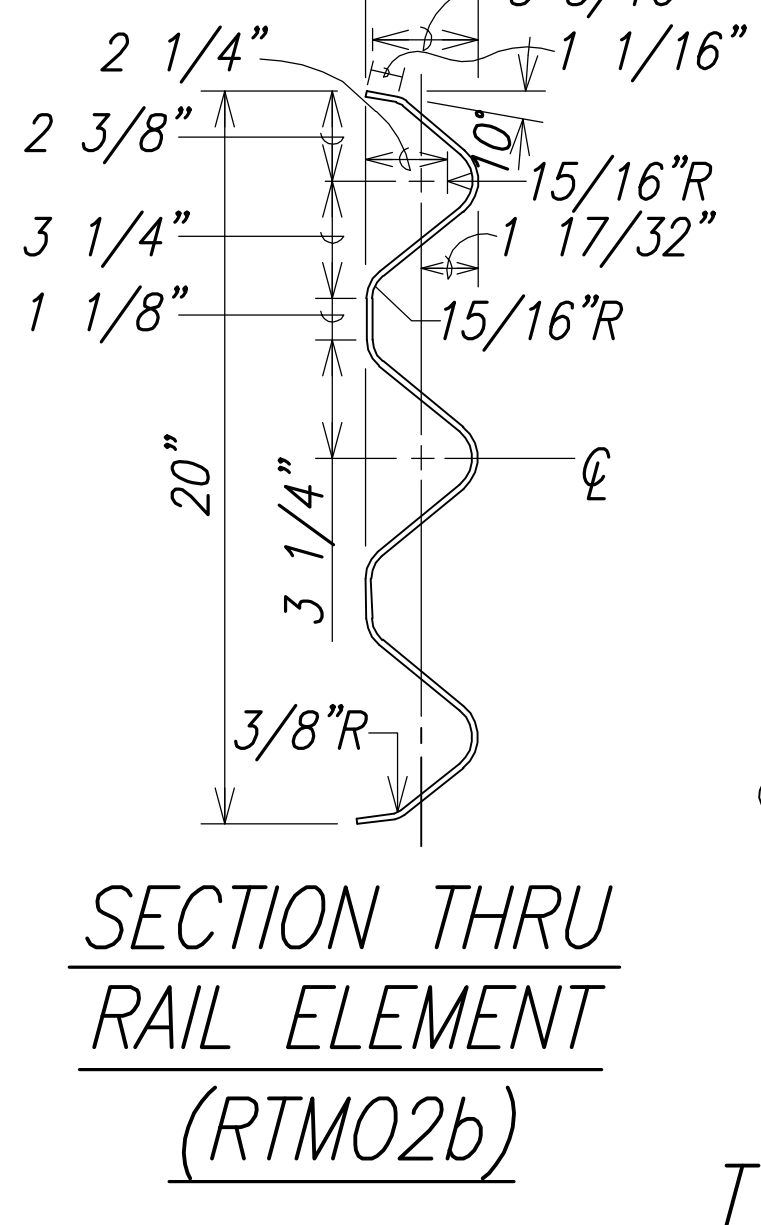
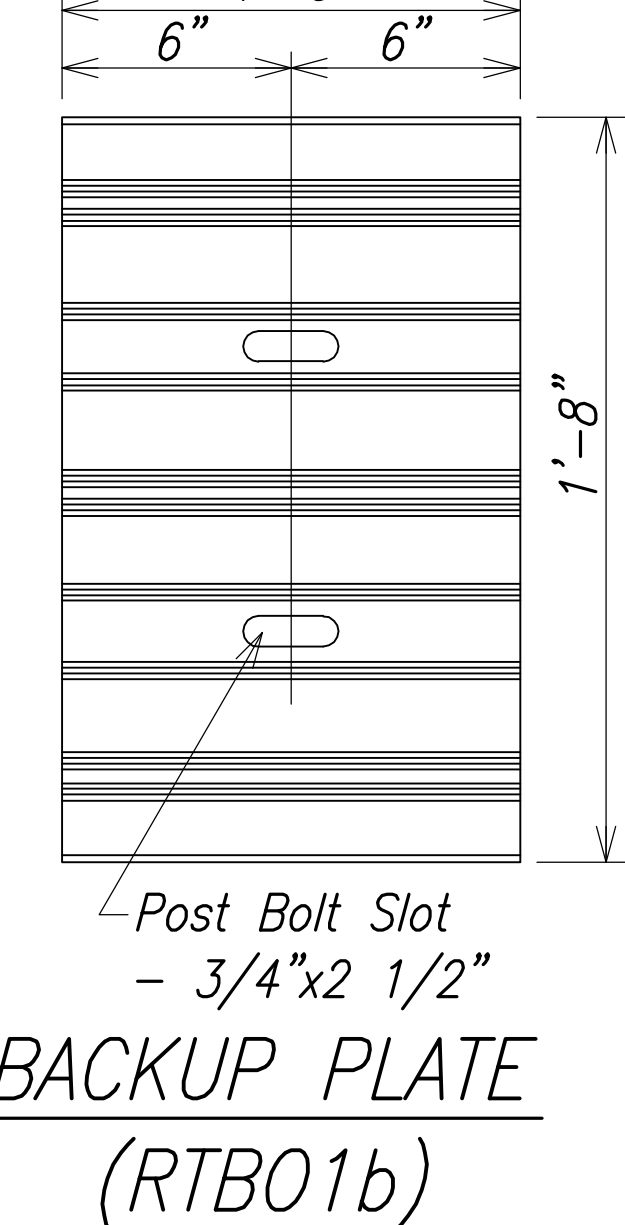
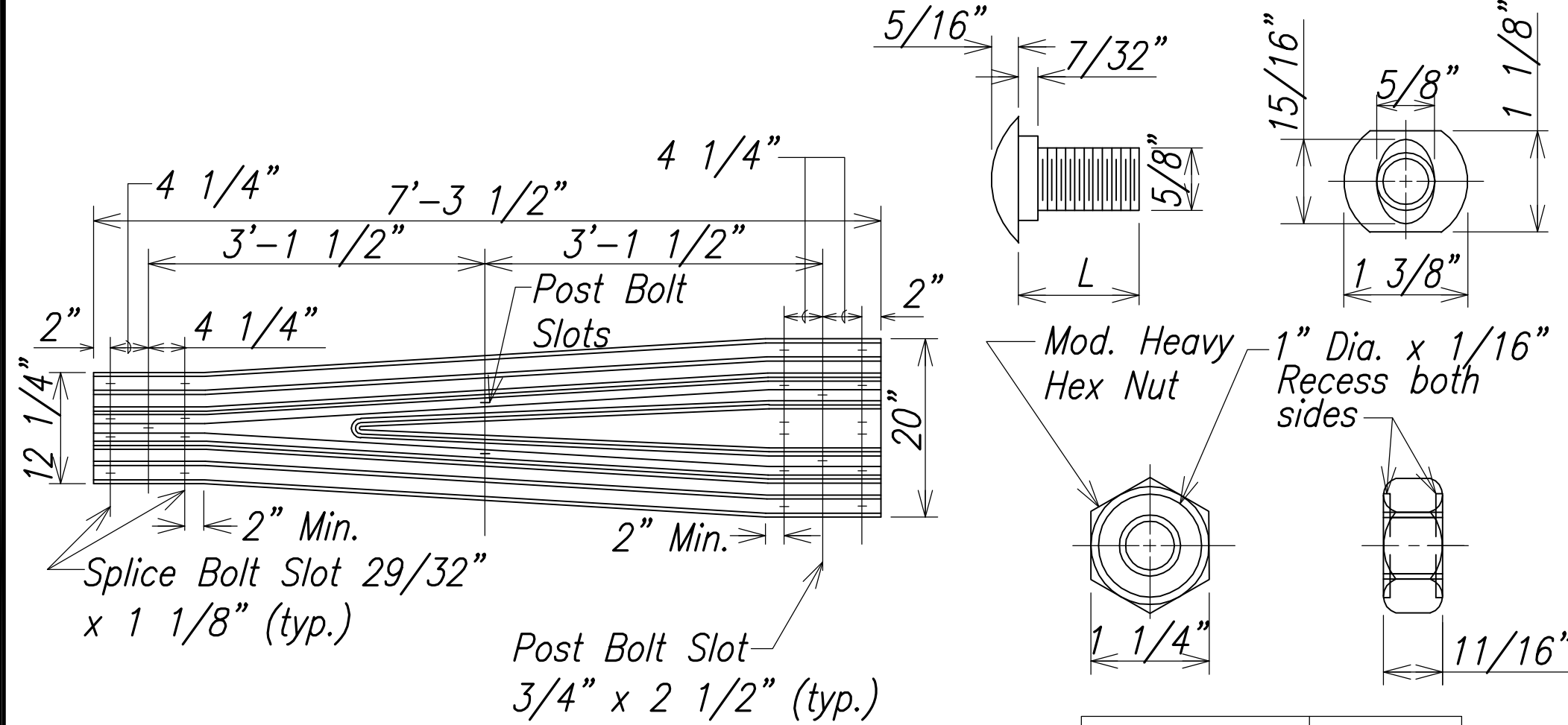
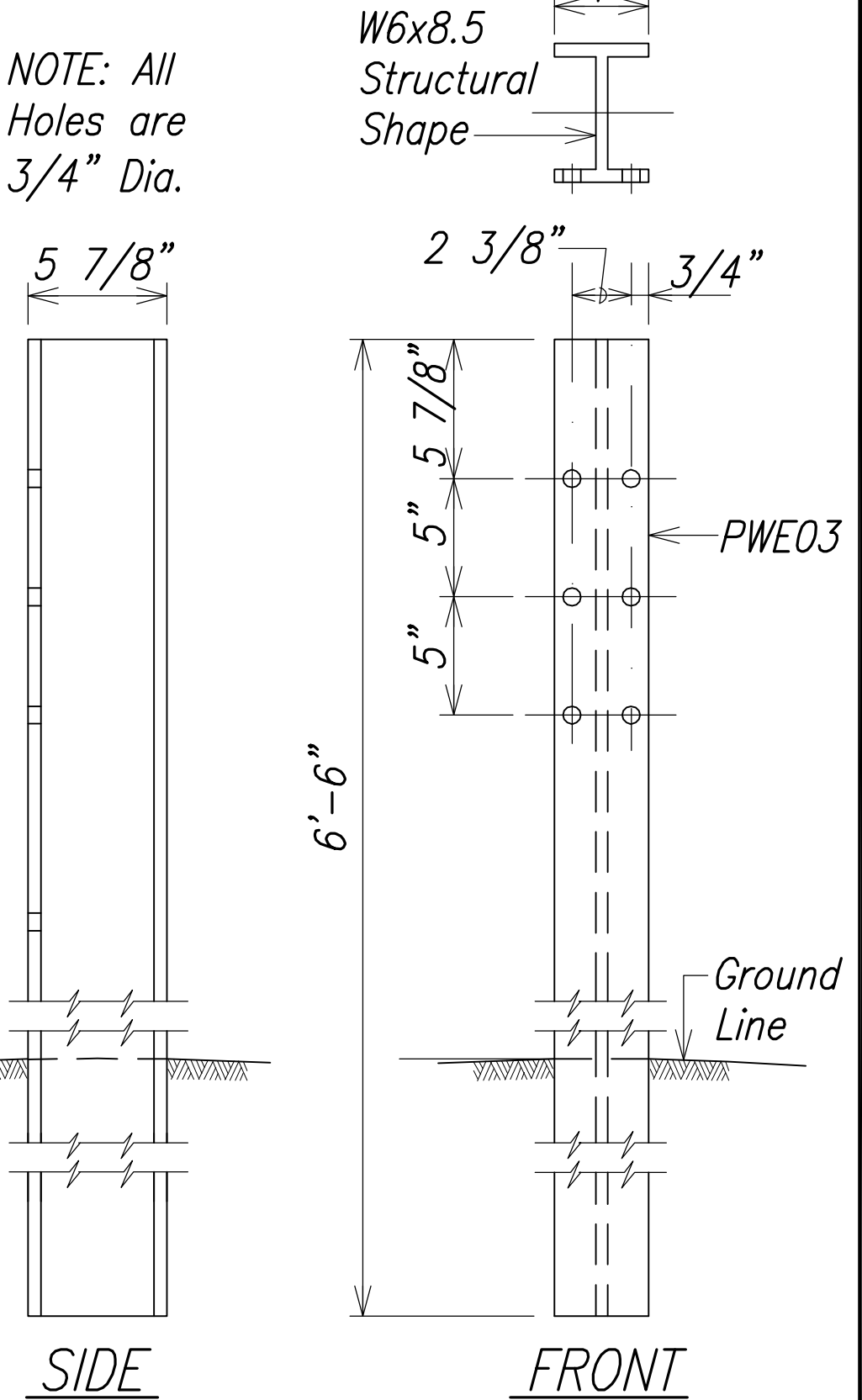
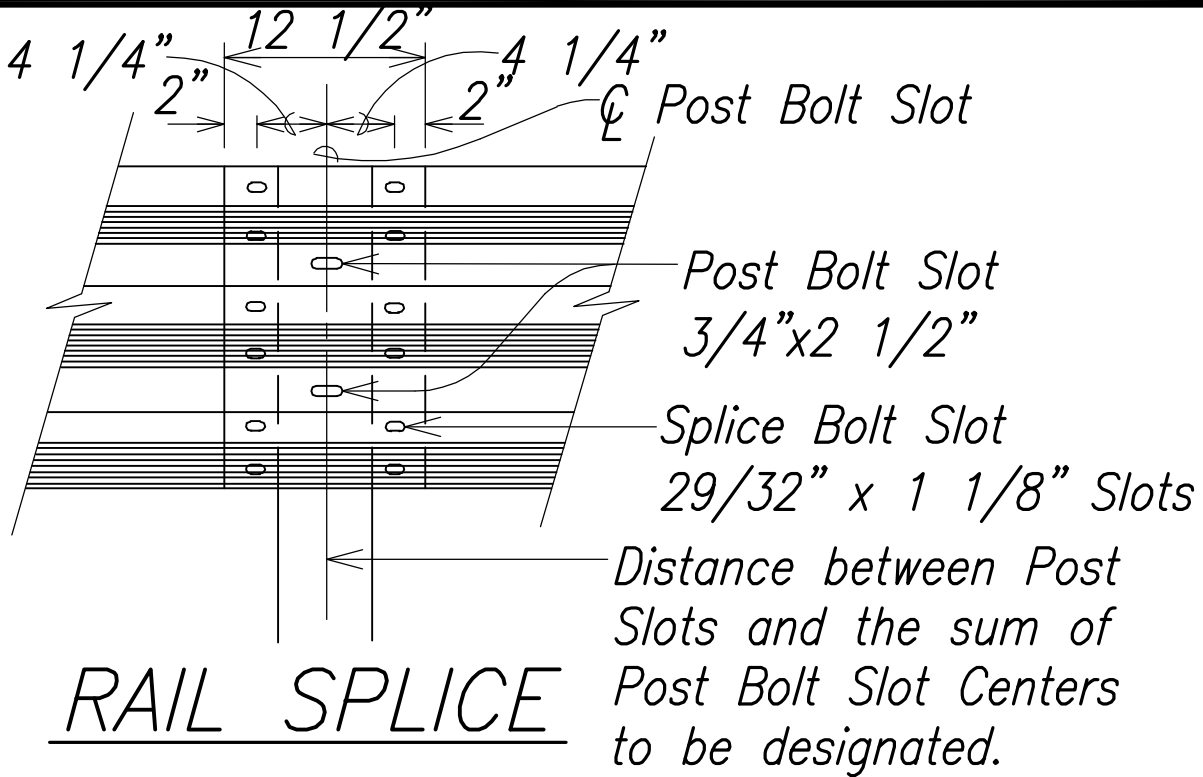
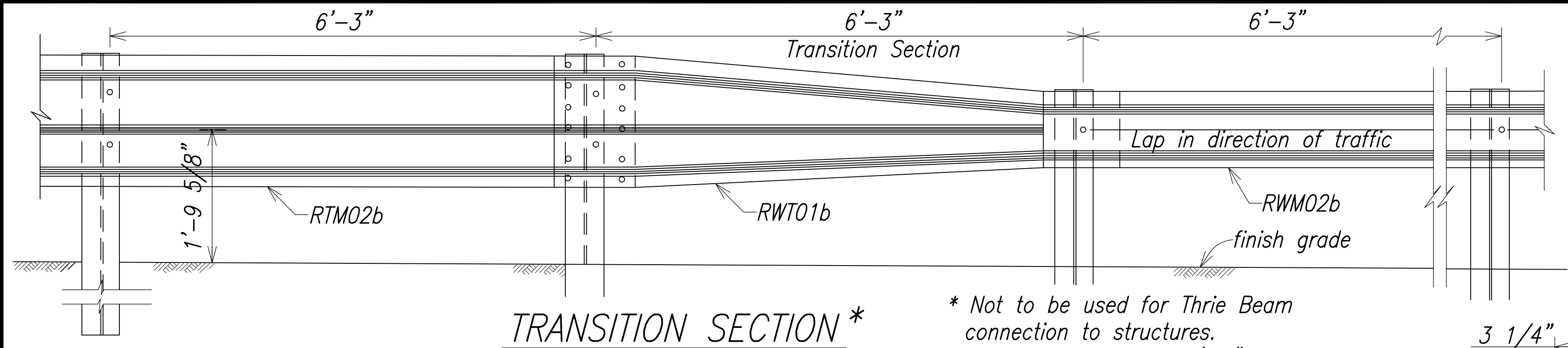
**GUARDRAIL DETAILS**

INTERSTATE ROUTE H-1  
PM CONTRAFLOW LANE, PHASE 3  
FEDERAL AID PROJECT NO. NH-H1-1 (260)  
Scale: 1" = XX' Date: December, 2014

SHEET No. GRD-06 OF 11 SHEETS



| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-HI-1 (260)      | 2014        | 158       | 200          |



TRANSITION SECTION (RWT01b)

BACKUP PLATE (RTB01b)

SECTION THRU RAIL ELEMENT (RTM02b)

TYPICAL INSTALLATION OF REFLECTOR MARKER (RM-5)

W-BEAM STRONG POST (PWE03)

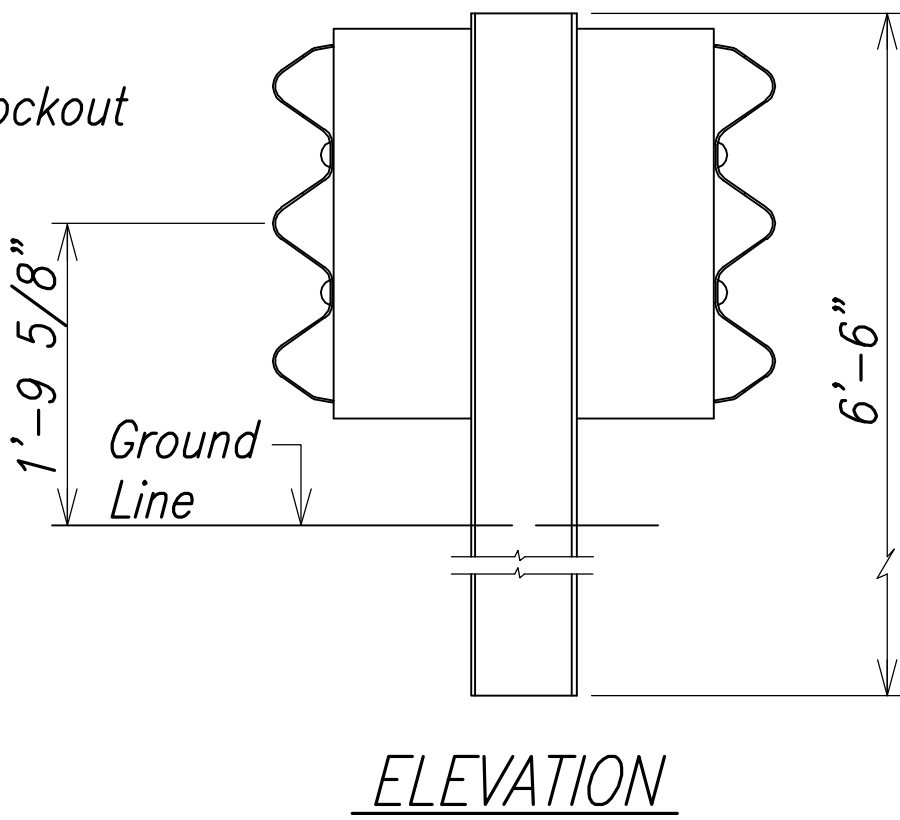
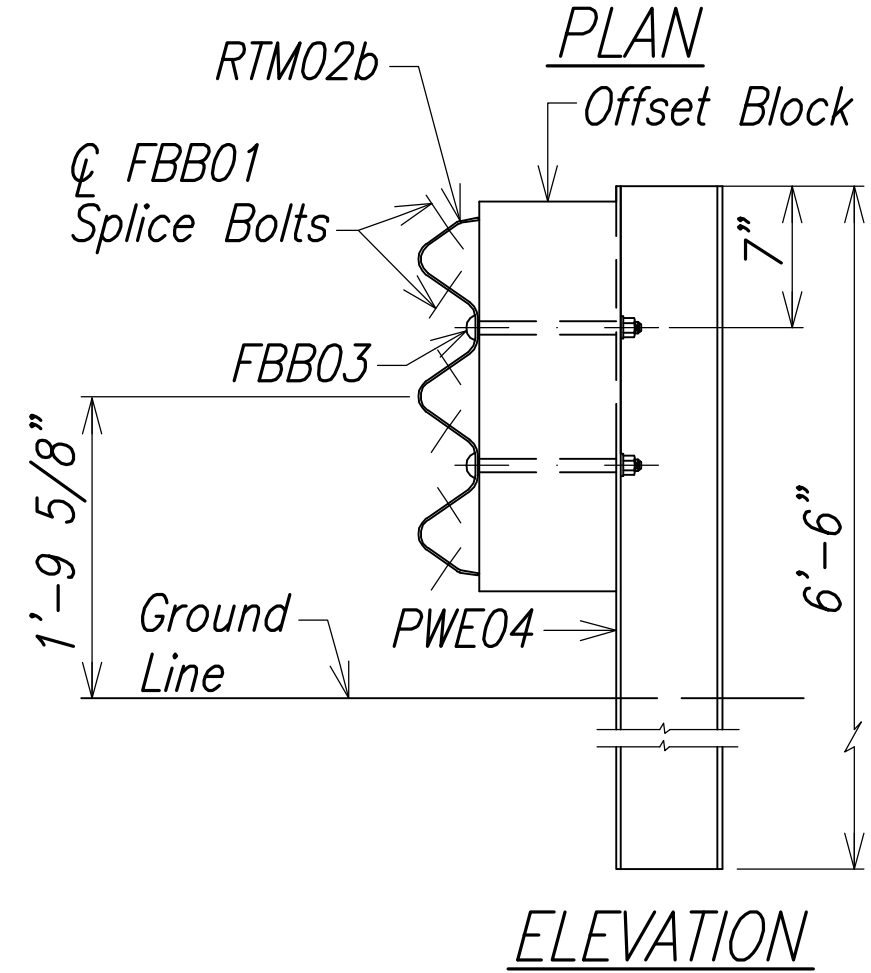
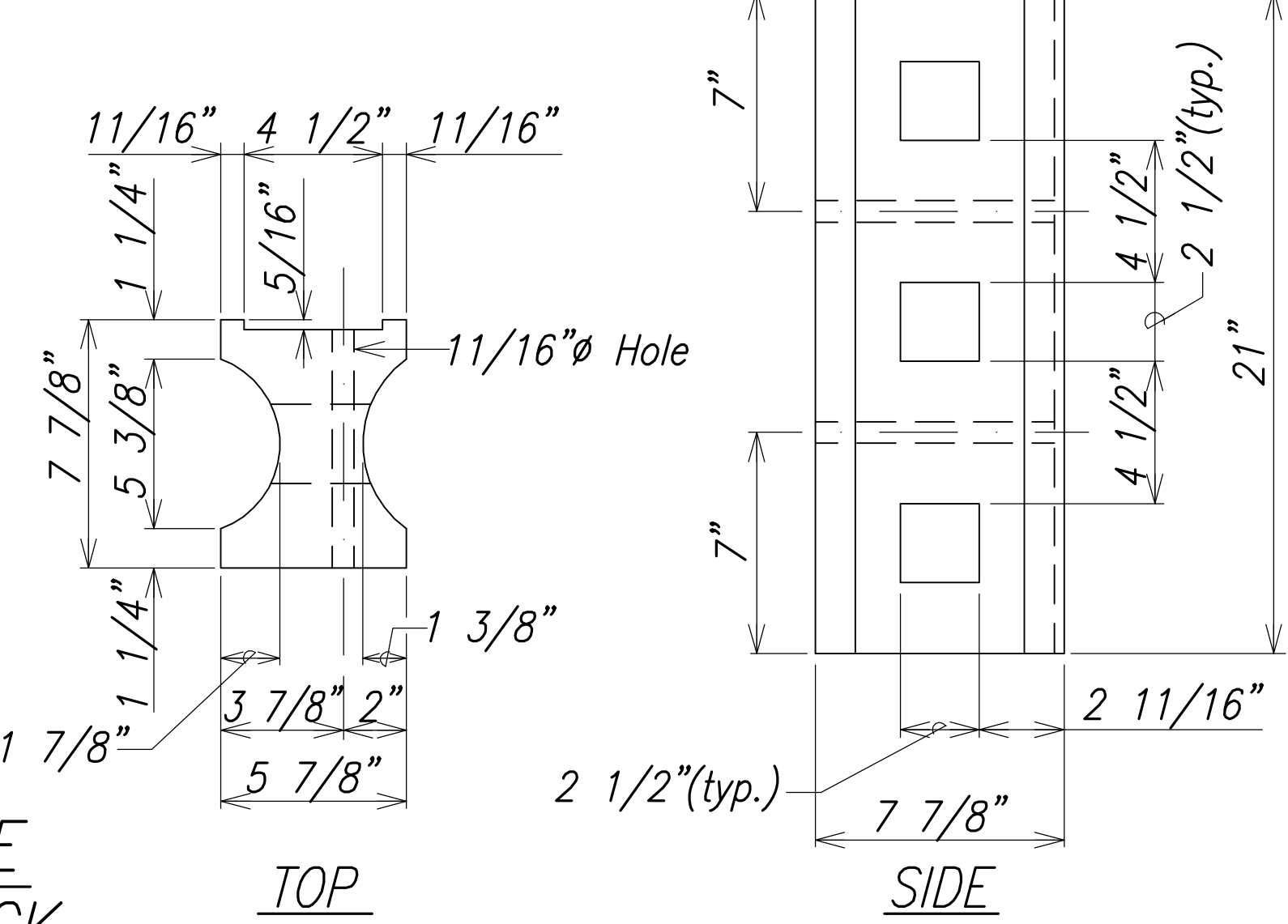
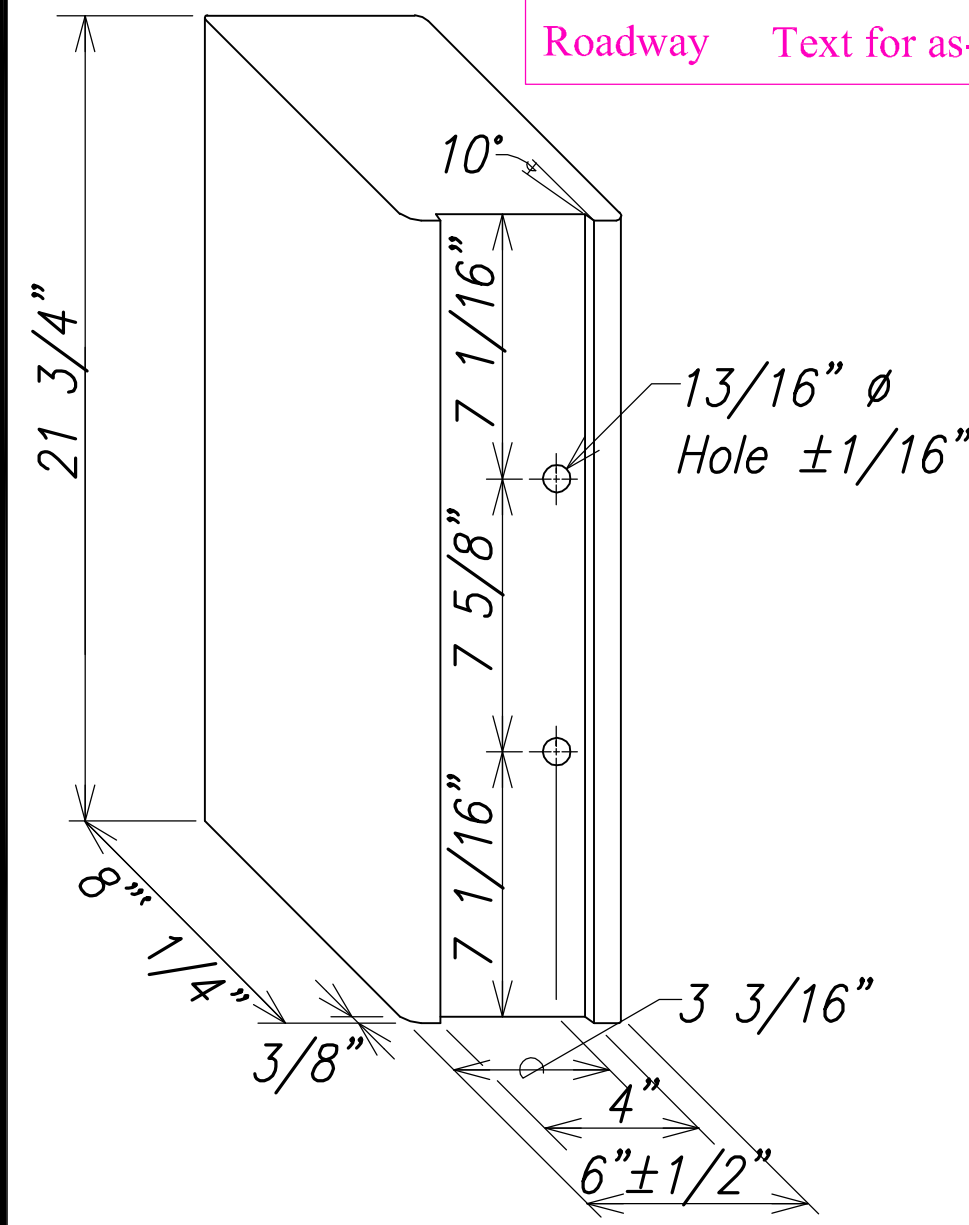
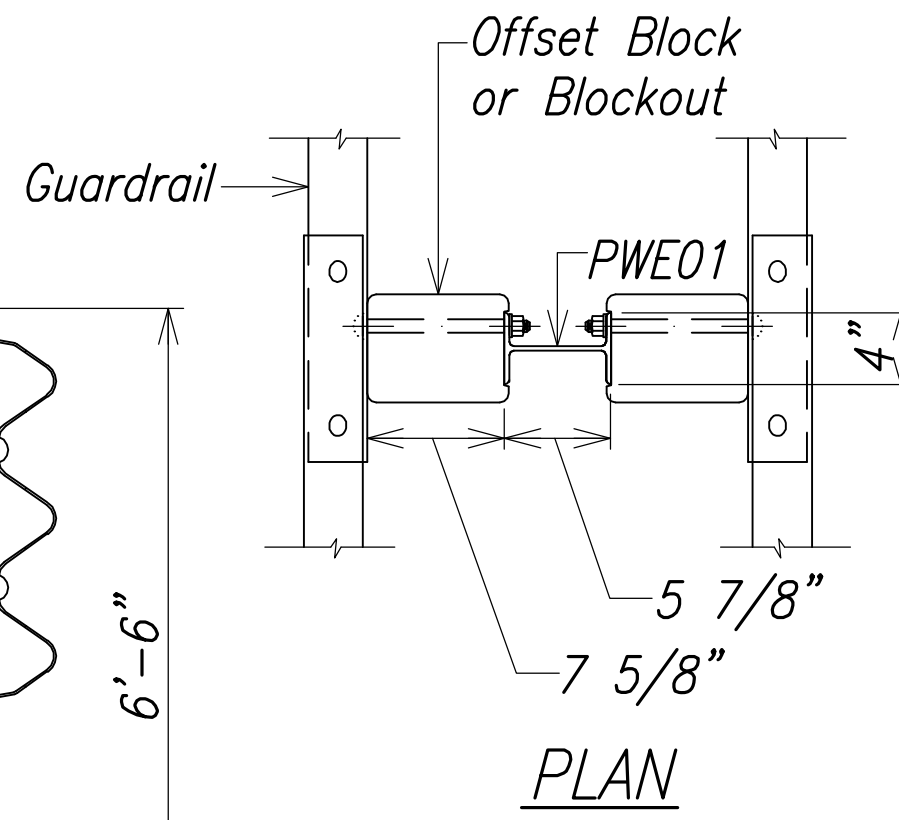
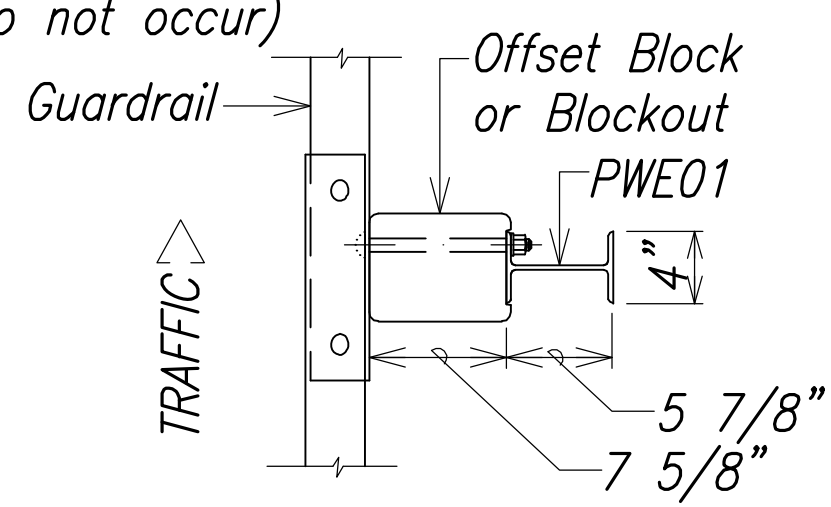
**LEGEND FOR AS-BUILT POSTINGS**

~~~~~ Squiggly line for as-built deletion

±00.00 Double line for as-built deletion

Roadway Text for as-built posting

GUARDRAIL BOLTS AND RECESSED NUT (Use at Posts where Splices do not occur)



RECYCLED POLYETHYLENE THRIE-BEAM OFFSET BLOCK (TYPE II - THRIE)

RECYCLED PLASTIC BLOCKOUT (TYPE I-THRIE)

STRONG POST THRIE-BEAM GUARDRAIL (SGR09a)

STRONG POST THRIE-BEAM MEDIAN GUARDRAIL (SGM09a)



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*Matthew K. Fujikawa*

APRIL 30, 2016

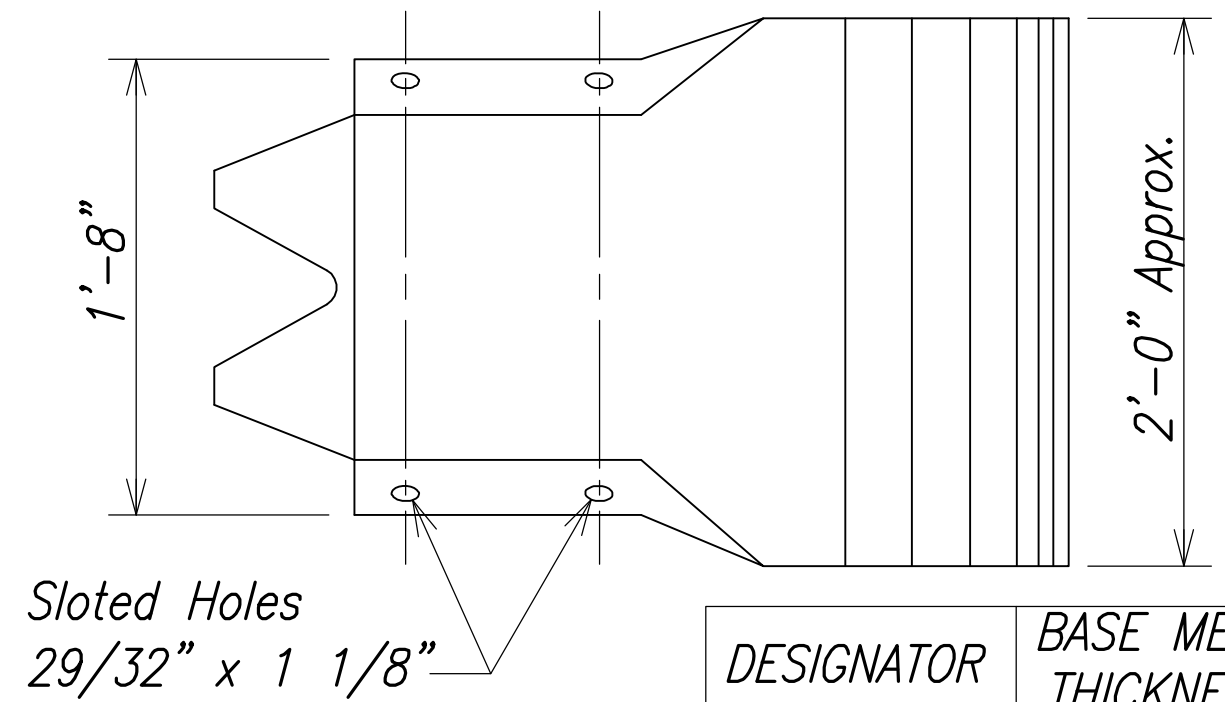
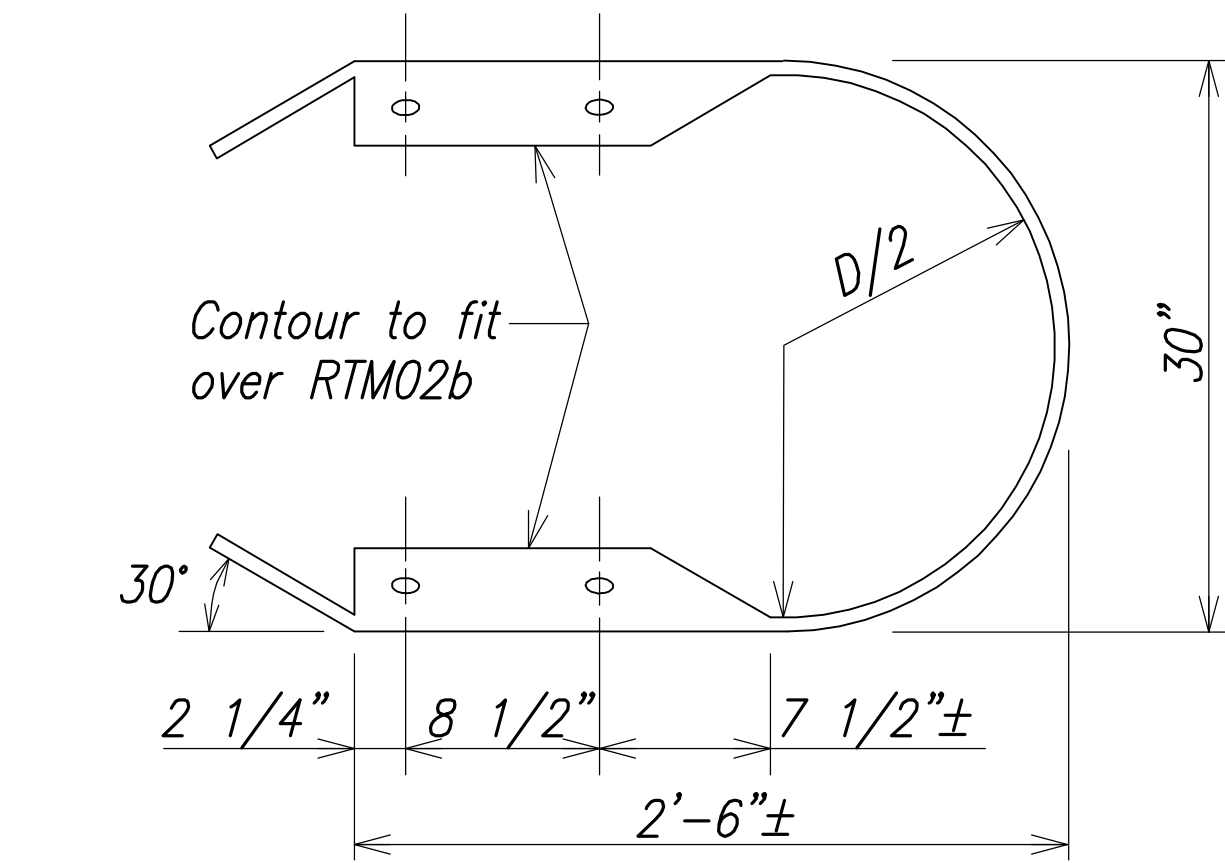
WILSON OKAMOTO CORPORATION LIC. EXP. DATE

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**GUARDRAIL DETAILS**

INTERSTATE ROUTE H-1  
PM CONTRAFLOW LANE, PHASE 3  
FEDERAL AID PROJECT NO. NH-HI-1 (260)  
Scale: 1" = XX'  
Date: December, 2014  
SHEET No. GRD-07 of 11 SHEETS

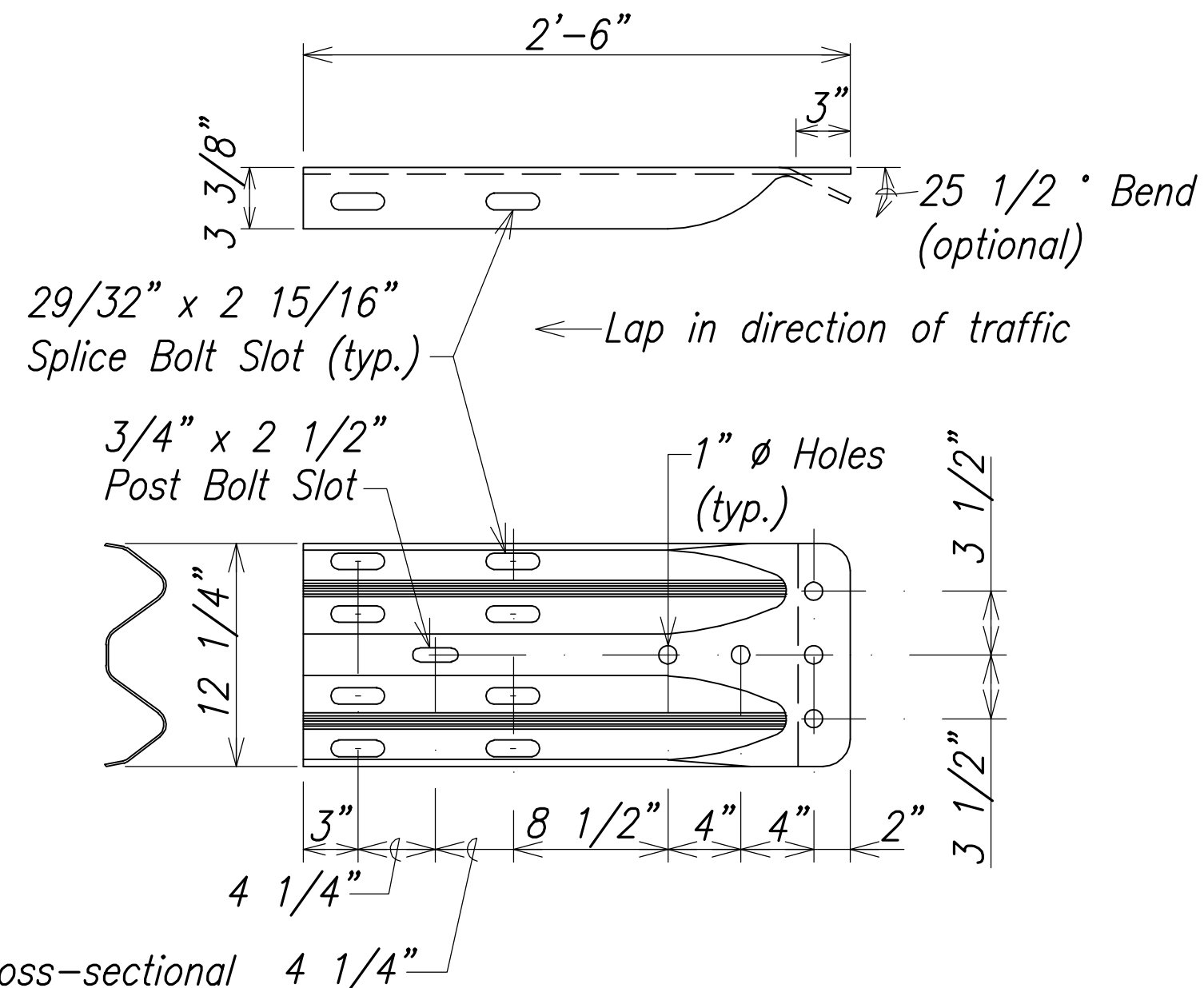


| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW.  | NH-H1-1 (260)      | 2014        | 159       | 200          |



| DESIGNATOR      | BASE METAL THICKNESS |
|-----------------|----------------------|
| RTE03b & RTE04b | 10 Gauge             |

THRIE-BEAM  
END SECTION (BUFFER RTE03b or RTE04b)



The cross-sectional dimensions for this part are to fit over part RWM02a on the approach end and under part RWM02a on the trailing end.

| DESIGNATOR | BASE METAL THICKNESS |
|------------|----------------------|
| RWE02b     | 10 Gauge             |

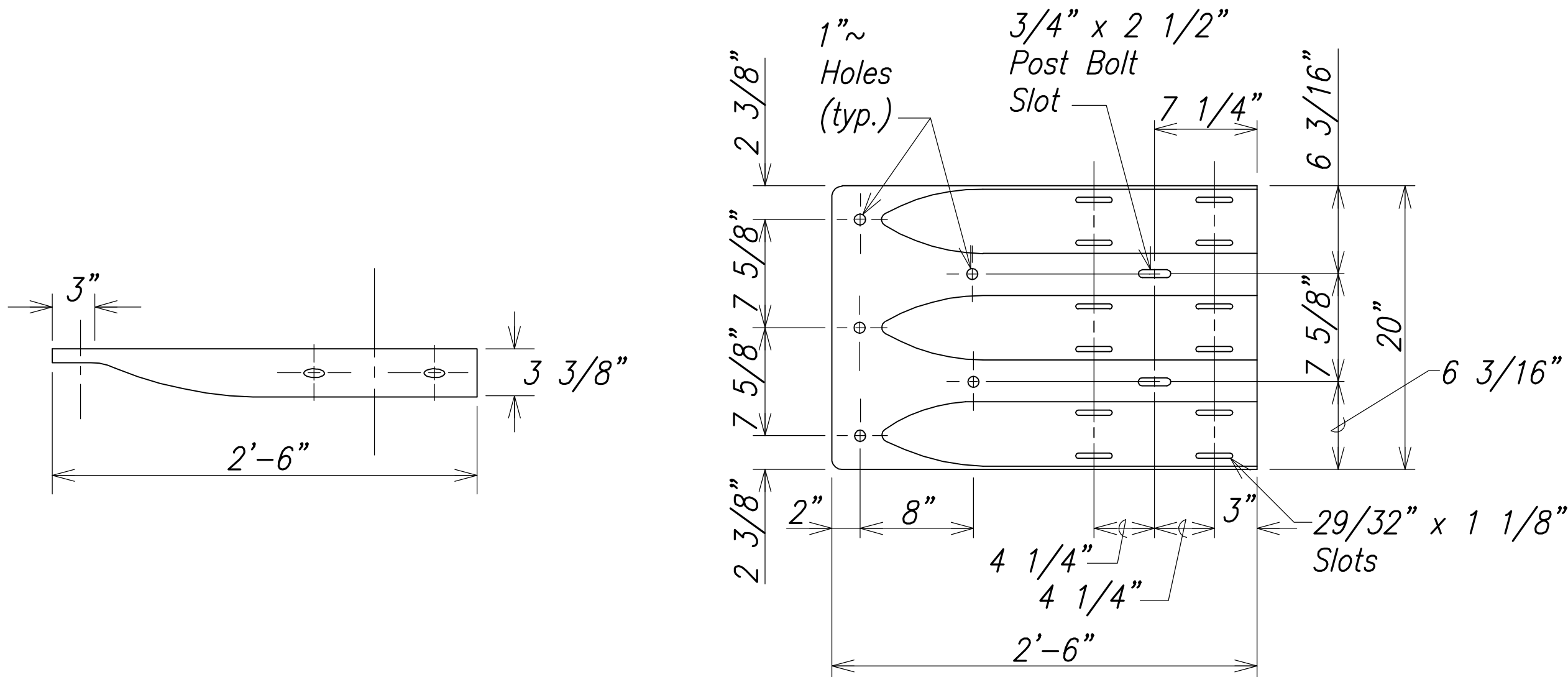
W-BEAM TERMINAL CONNECTOR (RWE02b)

**LEGEND FOR AS-BUILT POSTINGS**

Squiggly line for as-built deletion

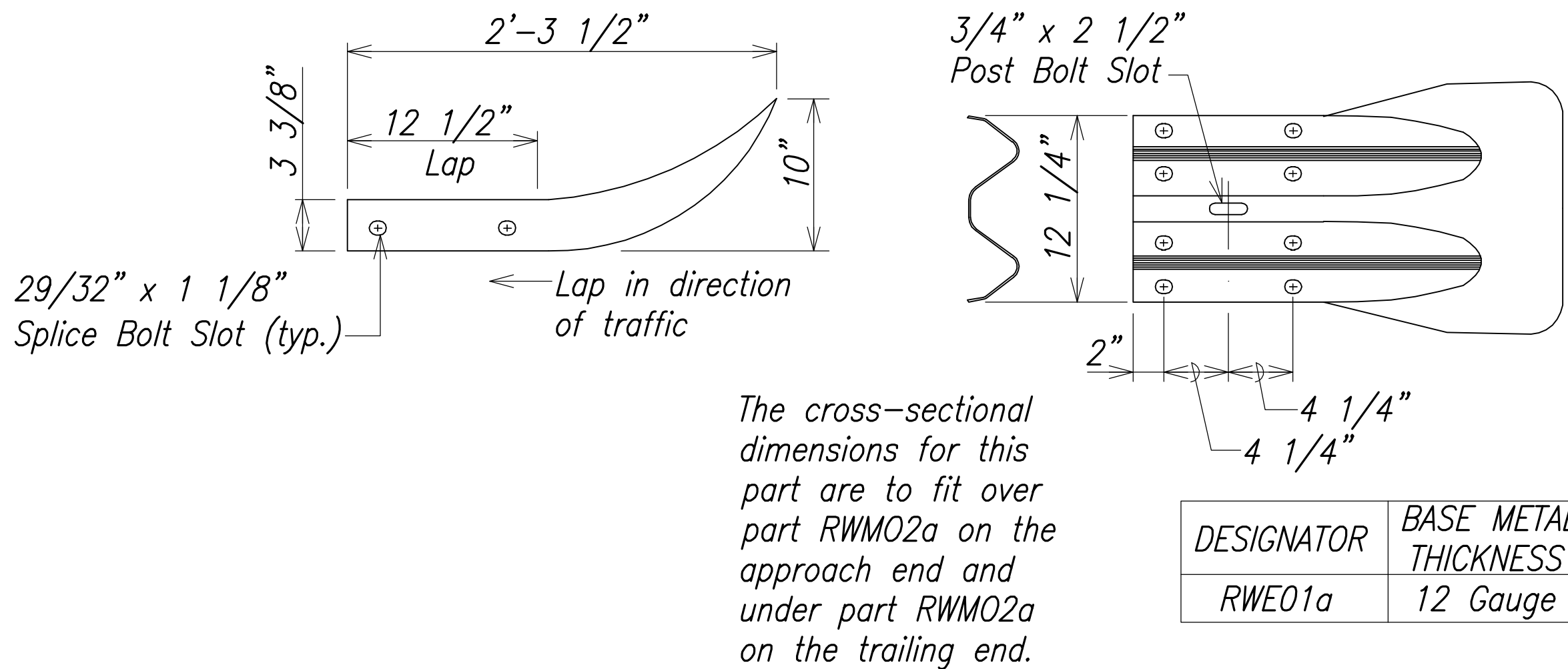
Double line for as-built deletion

Roadway Text for as-built posting



| DESIGNATOR | BASE METAL THICKNESS |
|------------|----------------------|
| RTE01b     | 10 Gauge             |

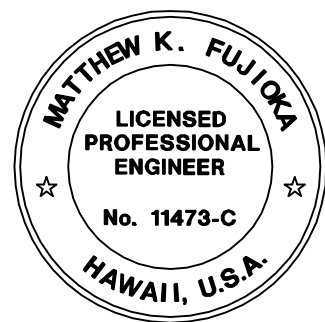
THRIE-BEAM  
TERMINAL CONNECTOR (RTE01b)



The cross-sectional dimensions for this part are to fit over part RWM02a on the approach end and under part RWM02a on the trailing end.

| DESIGNATOR | BASE METAL THICKNESS |
|------------|----------------------|
| RWE01a     | 12 Gauge             |

W-BEAM END SECTION (FLARED RWE01a)



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*Matthew K. Fujimura*  
WILSON OKAMOTO CORPORATION APRIL 30, 2016 LIC. EXP. DATE

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**GUARDRAIL DETAILS**

INTERSTATE ROUTE H-1  
PM CONTRAFLOW LANE, PHASE 3  
FEDERAL AID PROJECT NO. NH-H1-1 (260)  
Scale: 1" = XX' Date: December, 2014

SHEET No. GRD-08 OF 11 SHEETS



