

POST 1 THROUGH 9 - W6 x 9 OR W6 x 8.5 POST (6'-0" LONG) WITH 12" OFFSET BLOCK
 POST 10 THROUGH 12 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

DETAILS FOR CONNECTING GUARDRAIL TYPE MGS-8 TO 2-TUBE, 4-TUBE, AESTHETIC PARAPET TUBE, 3 TUBE WITH PICKETS, CONCRETE BLOCK RETROFIT, PIER BASE WALL, TYPE 6*, TYPE 7*, OR SINGLE FACE CONCRETE BARRIER* (WITHOUT EXPANSION AT BACKWALL)

* BARRIER ENDING MUST TRANSITION FROM SINGLE-SLOPE TO VERTICAL FACE IN ADVANCE OF END SHOE. ATTACHMENT TO VERTICAL FACE IS REQUIRED.

APPROVED BY: _____
 DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
 DIRECTOR, BUREAU OF DEVELOPMENT

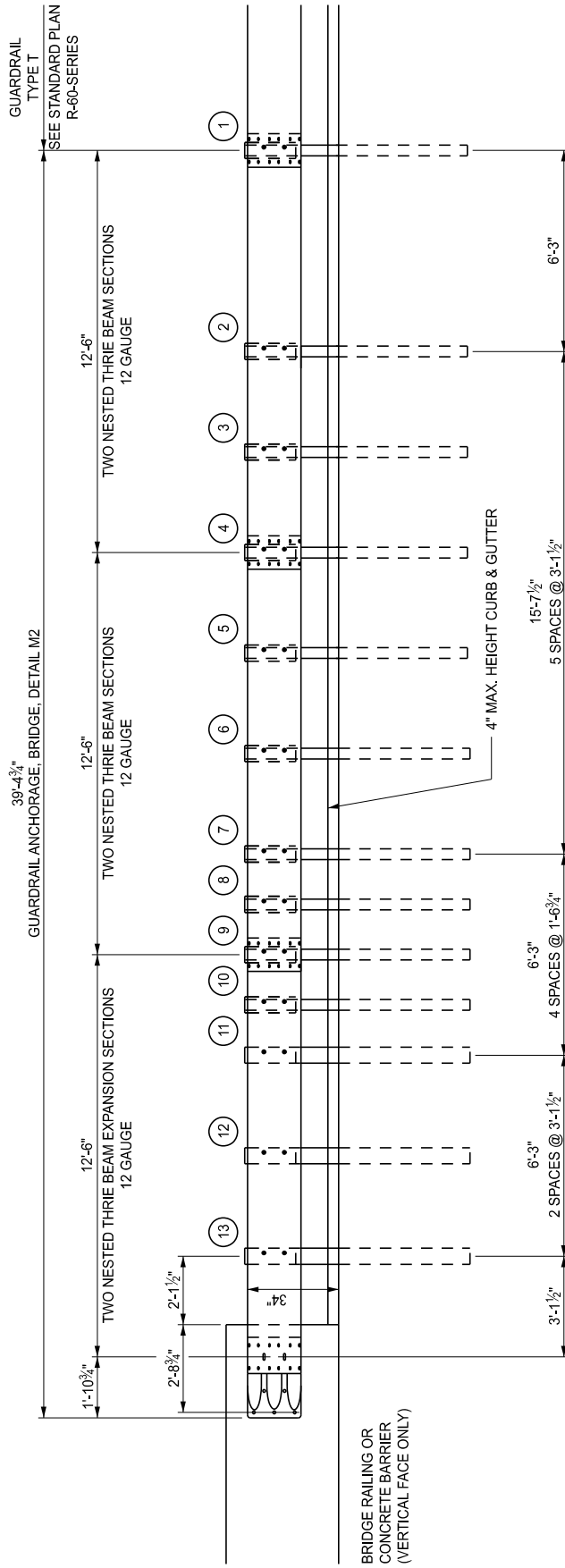


STANDARD PLAN FOR
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL) 04/03/2024
 FHWA APPROVAL PLAN DATE

R-67-G

SHEET
 1 OF 16



POST 1 THROUGH 10 - W6 x 9 OR W6 x 8.5 POST (7'-0" LONG) WITH 12" OFFSET BLOCK
 POST 11 THROUGH 13 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

DETAILS FOR CONNECTING GUARDRAIL TYPE T TO
 2-TUBE, 4-TUBE, AESTHETIC PARAPET TUBE, 3 TUBE WITH PICKETS,
 CONCRETE BLOCK RETROFIT, PIER BASE WALL,
 TYPE 6*, TYPE 7*, OR SINGLE FACE CONCRETE BARRIER*
 (WITHOUT EXPANSION AT BACKWALL)

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DEPARTMENT DIRECTOR
 BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
 GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

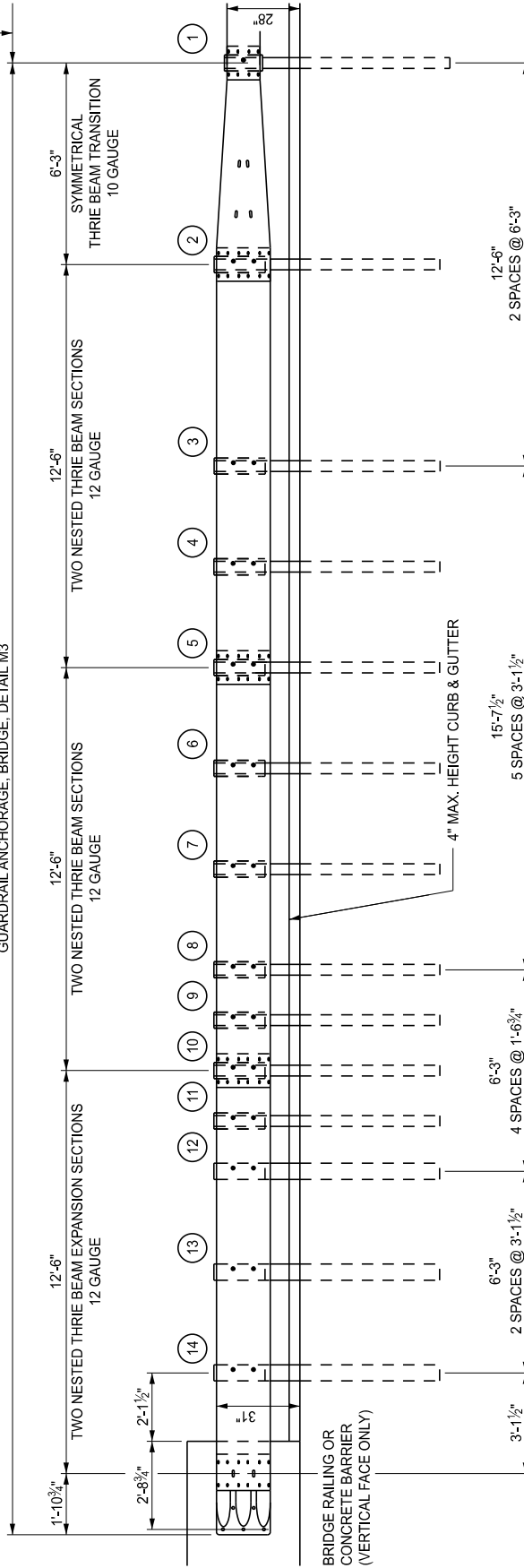
(SPECIAL DETAIL) 04/03/2024
 FHWA APPROVAL PLAN DATE

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GUARDRAIL TYPE B
SEE STANDARD PLAN
R-60-SERIES

45'-7 3/4"
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M3



POST 1 THROUGH 11 - W6 x 9 OR W6 x 8.5 POST (7'-0" LONG) WITH 12" OFFSET BLOCK
POST 12 THROUGH 14 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

DETAILS FOR CONNECTING GUARDRAIL TYPE B TO
2-TUBE, 4-TUBE, AESTHETIC PARAPET TUBE, 3 TUBE WITH PICKETS,
CONCRETE BLOCK RETROFIT, PIER BASE WALL,
TYPE 6*, TYPE 7*, OR SINGLE FACE CONCRETE BARRIER*
(WITHOUT EXPANSION AT BACKWALL)

* BARRIER ENDING MUST TRANSITION FROM SINGLE-SLOPE TO VERTICAL FACE IN ADVANCE OF END SHOE. ATTACHMENT TO VERTICAL FACE IS REQUIRED.



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STANDARD PLAN FOR
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)
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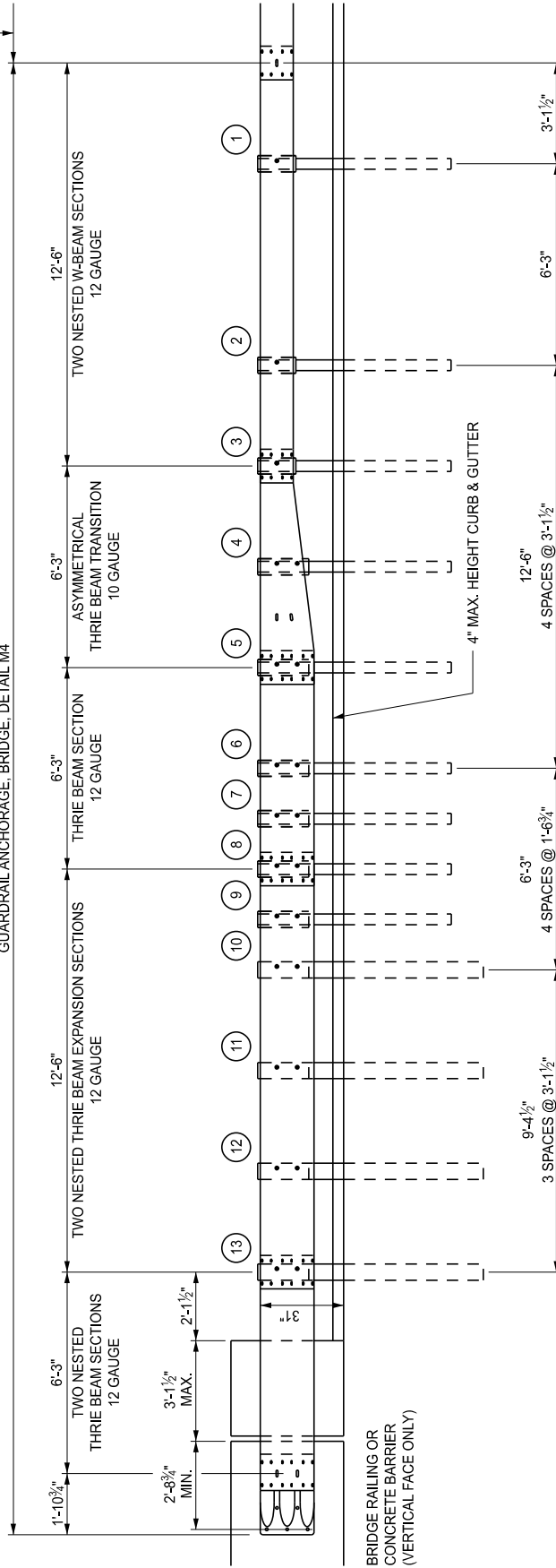
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GUARDRAIL TYPE MGS-8
SEE STANDARD PLAN
R-60-SERIES

45'-7 3/4"
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M4



POST 1 THROUGH 9 - W6 x 9 OR W6 x 8.5 POST (6'-0" LONG) WITH 12" OFFSET BLOCK
POST 10 THROUGH 13 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

DETAILS FOR CONNECTING GUARDRAIL TYPE MGS-8 TO
2-TUBE, 4-TUBE, AESTHETIC PARAPET TUBE,
3 TUBE WITH PICKETS, CONCRETE BLOCK RETROFIT,
TYPE 6*, TYPE 7*, OR SINGLE FACE CONCRETE BARRIER*
(WITH EXPANSION AT BACKWALL/END WALL OR SLEEPER SLAB)

* BARRIER ENDING MUST TRANSITION FROM SINGLE-SLOPE TO VERTICAL FACE IN ADVANCE OF END SHOE. ATTACHMENT TO VERTICAL FACE IS REQUIRED.



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STANDARD PLAN FOR
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)
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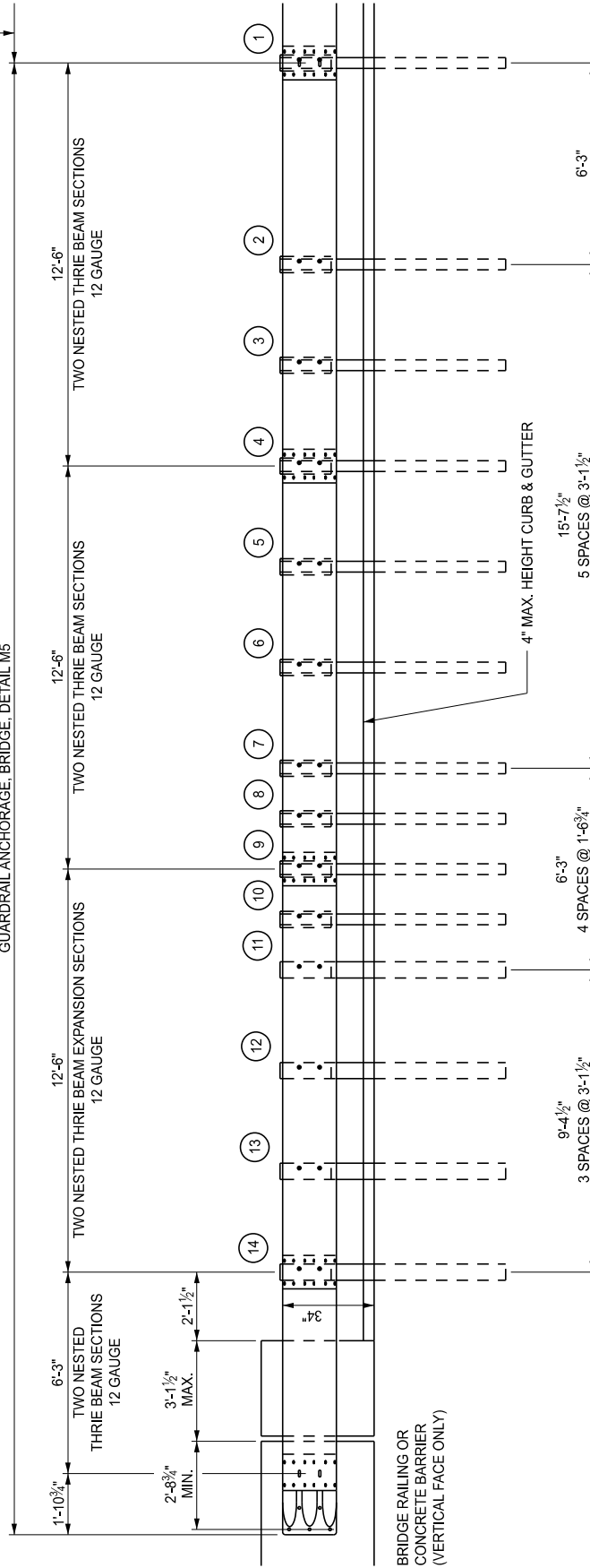
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GUARDRAIL TYPE T
SEE STANDARD PLAN
R-60-SERIES

45'-7 7/8"
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M5



BRIDGE RAILING OR
CONCRETE BARRIER
(VERTICAL FACE ONLY)

POST 1 THROUGH 10 - W6 x 9 OR W6 x 8.5 POST (7'-0" LONG) WITH 12" OFFSET BLOCK
POST 11 THROUGH 14 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

DETAILS FOR CONNECTING GUARDRAIL TYPE T TO
2-TUBE, 4-TUBE, AESTHETIC PARAPET TUBE,
3 TUBE WITH PICKETS, CONCRETE BLOCK RETROFIT,
TYPE 6*, TYPE 7*, OR SINGLE FACE CONCRETE BARRIER*
(WITH EXPANSION AT BACKWALL/END WALL OR SLEEPER SLAB)

* BARRIER ENDING MUST TRANSITION FROM SINGLE-SLOPE TO VERTICAL FACE IN ADVANCE OF END SHOE. ATTACHMENT TO VERTICAL FACE IS REQUIRED.



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STANDARD PLAN FOR
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

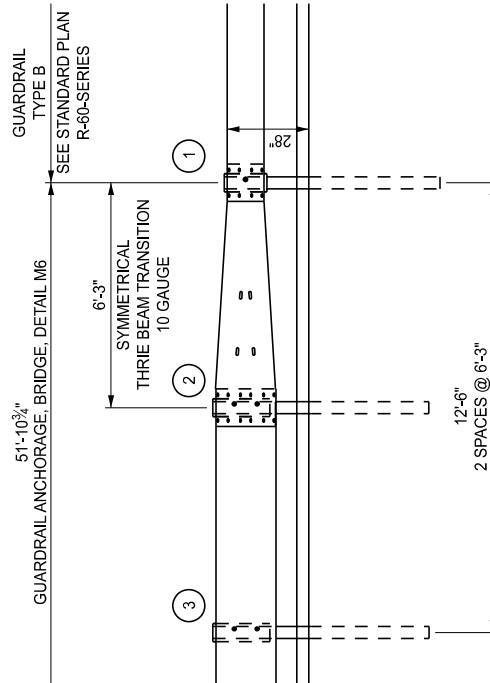
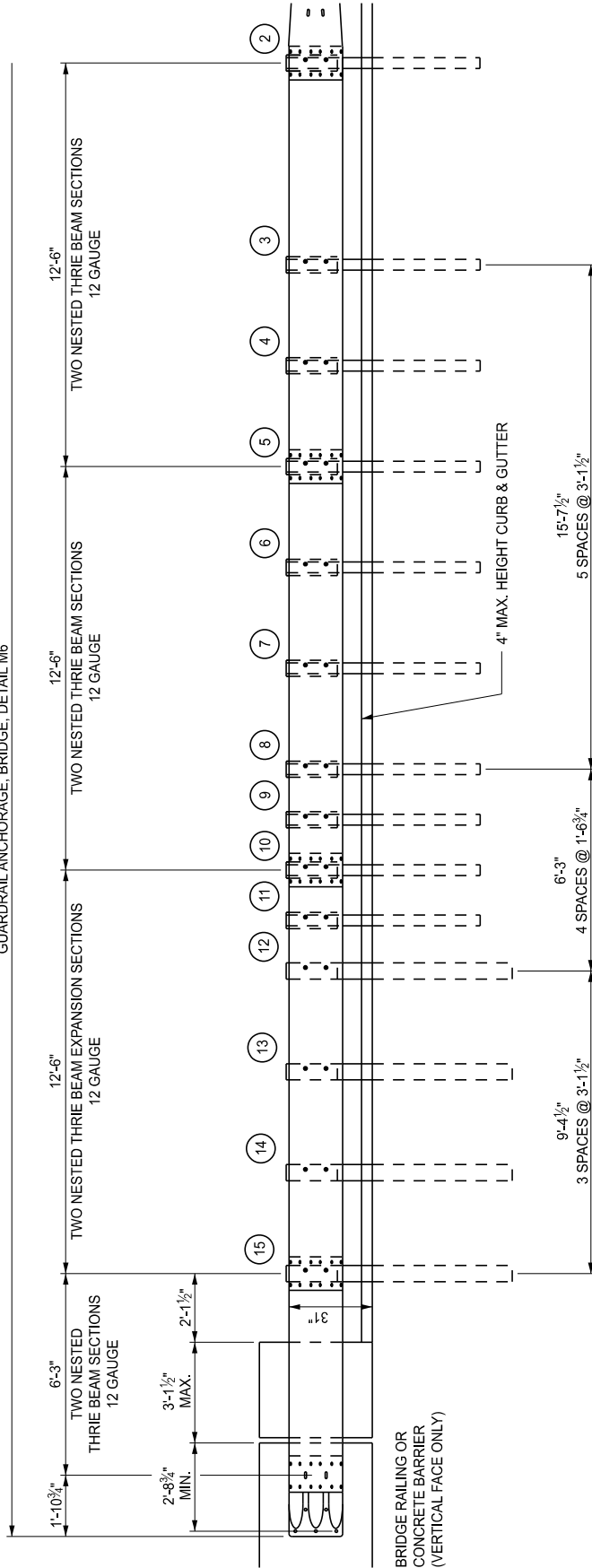
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51'-10³/₄"
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M6



POST 1 THROUGH 11 - W6 x 9 OR W6 x 8.5 POST (6'-0" LONG) WITH 12" OFFSET BLOCK
 POST 12 THROUGH 15 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

DETAILS FOR CONNECTING GUARDRAIL TYPE B TO
 2-TUBE, 4-TUBE, AESTHETIC PARAPET TUBE,
 3 TUBE WITH PICKETS, CONCRETE BLOCK RETROFIT,
 TYPE 6*, TYPE 7*, OR SINGLE FACE CONCRETE BARRIER*
 (WITH EXPANSION AT BACKWALL/END WALL OR SLEEPER SLAB)

* BARRIER ENDING MUST TRANSITION FROM SINGLE-SLOPE TO VERTICAL FACE IN ADVANCE OF END SHOE. ATTACHMENT TO VERTICAL FACE IS REQUIRED.



DEPARTMENT DIRECTOR
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STANDARD PLAN FOR
 GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

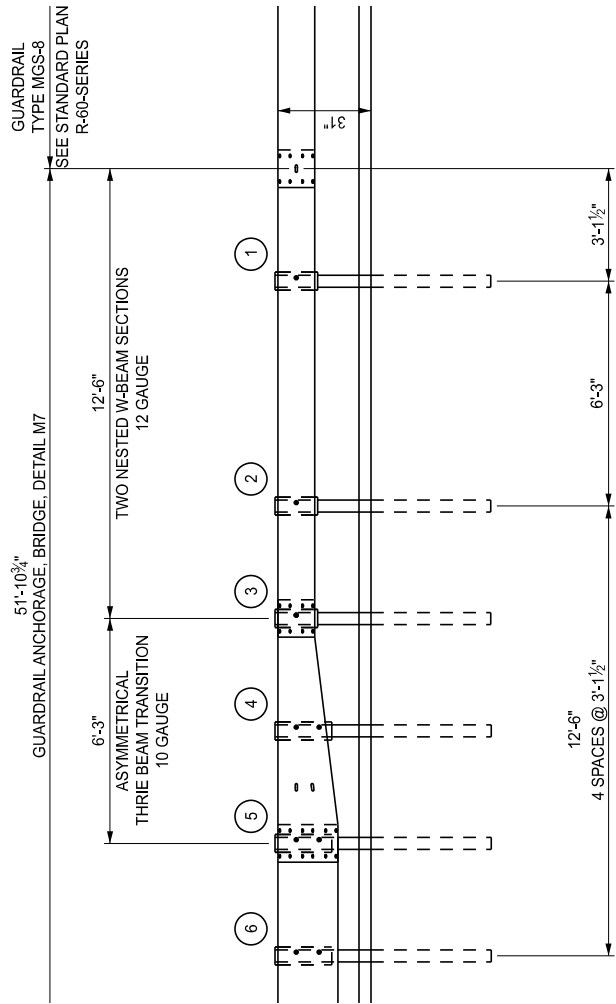
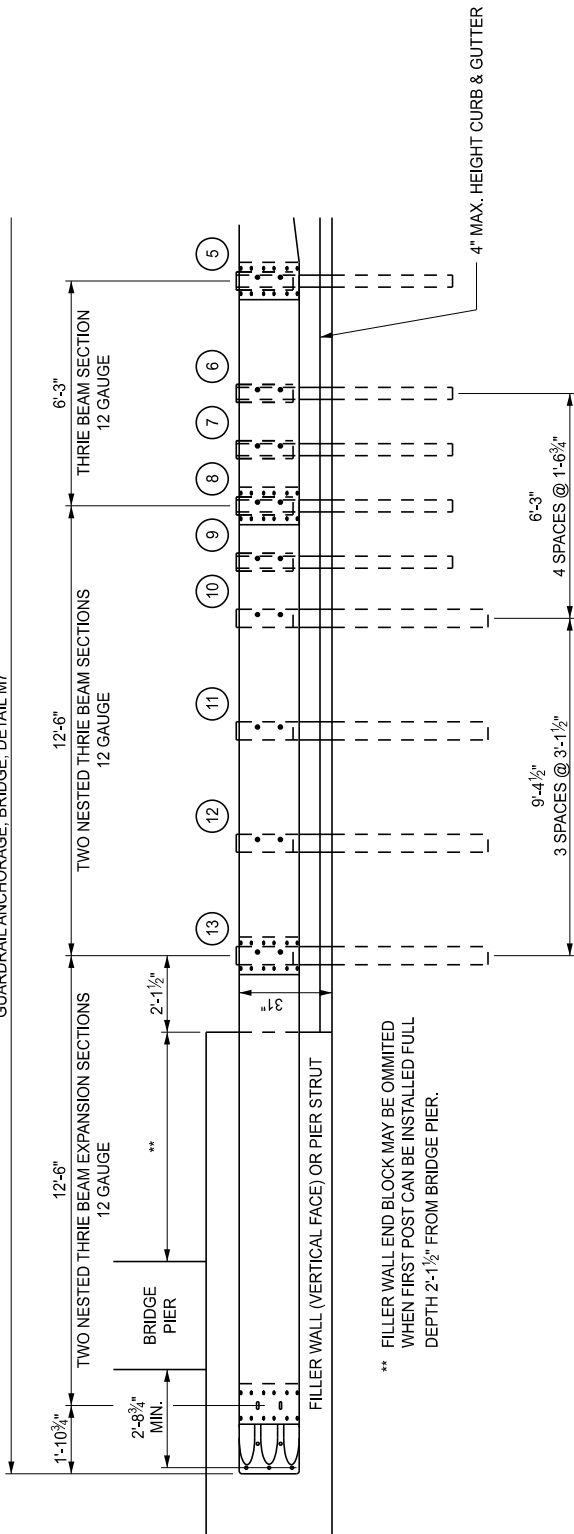
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04/03/2024
 PLAN DATE

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51'-10³/₄"
 GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M7



POST 1 THROUGH 9 - W6 x 9 OR W6 x 8.5 POST (6'-0" LONG) WITH 12" OFFSET BLOCK
 POST 10 THROUGH 13 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

DETAILS FOR CONNECTING GUARDRAIL TYPE MGS-8 TO FILLER WALL OR PIER STRUT



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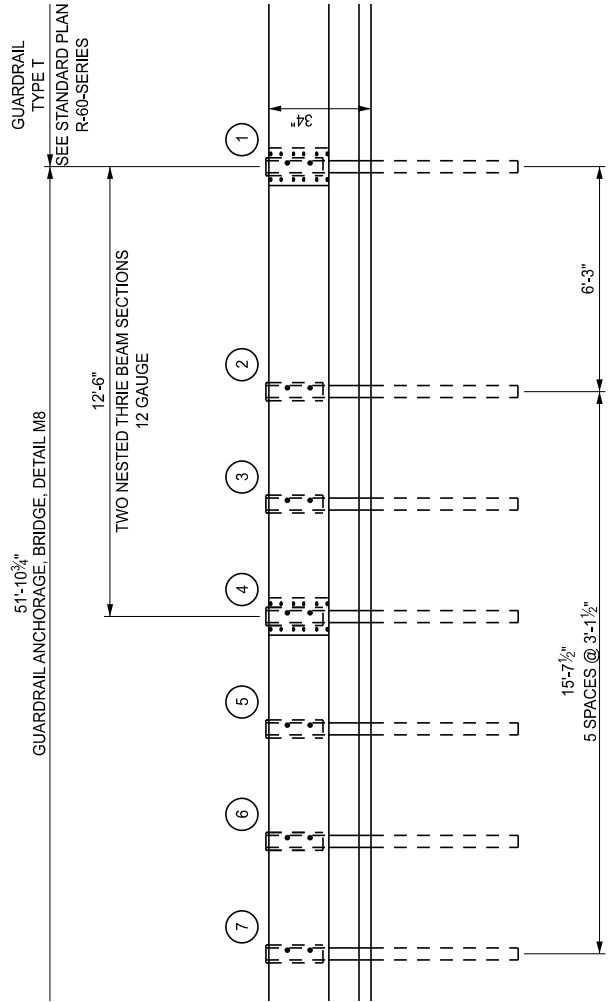
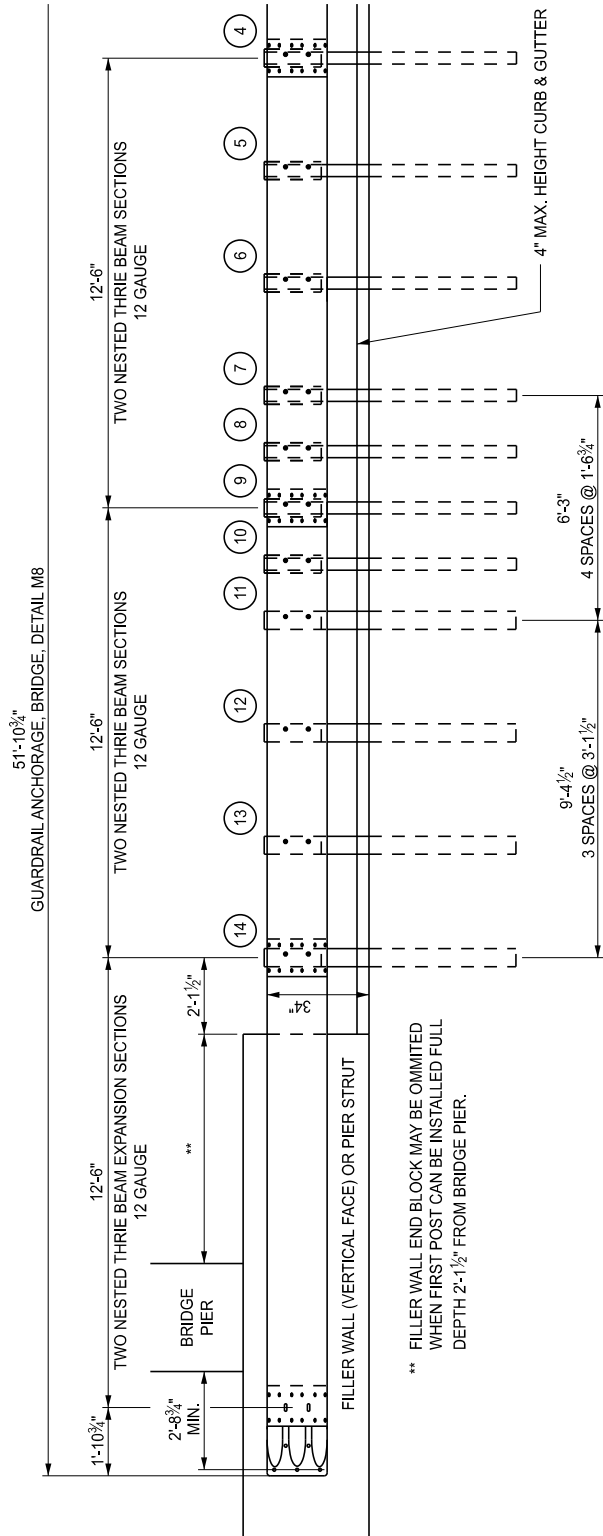
STANDARD PLAN FOR
 GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)
 FHWA APPROVAL

04/03/2024
 PLAN DATE

R-67-G

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** FILLER WALL END BLOCK MAY BE OMITTED
WHEN FIRST POST CAN BE INSTALLED FULL
DEPTH 2'-1 1/2' FROM BRIDGE PIER.

POST 0 THROUGH 10 - W6 x 9 OR W6 x 8.5 POST (7'-0" LONG) WITH 12" OFFSET BLOCK
POST 11 THROUGH 14 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

DETAILS FOR CONNECTING GUARDRAIL TYPE T TO FILLER WALL OR PIER STRUT



DEPARTMENT DIRECTOR
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STANDARD PLAN FOR
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

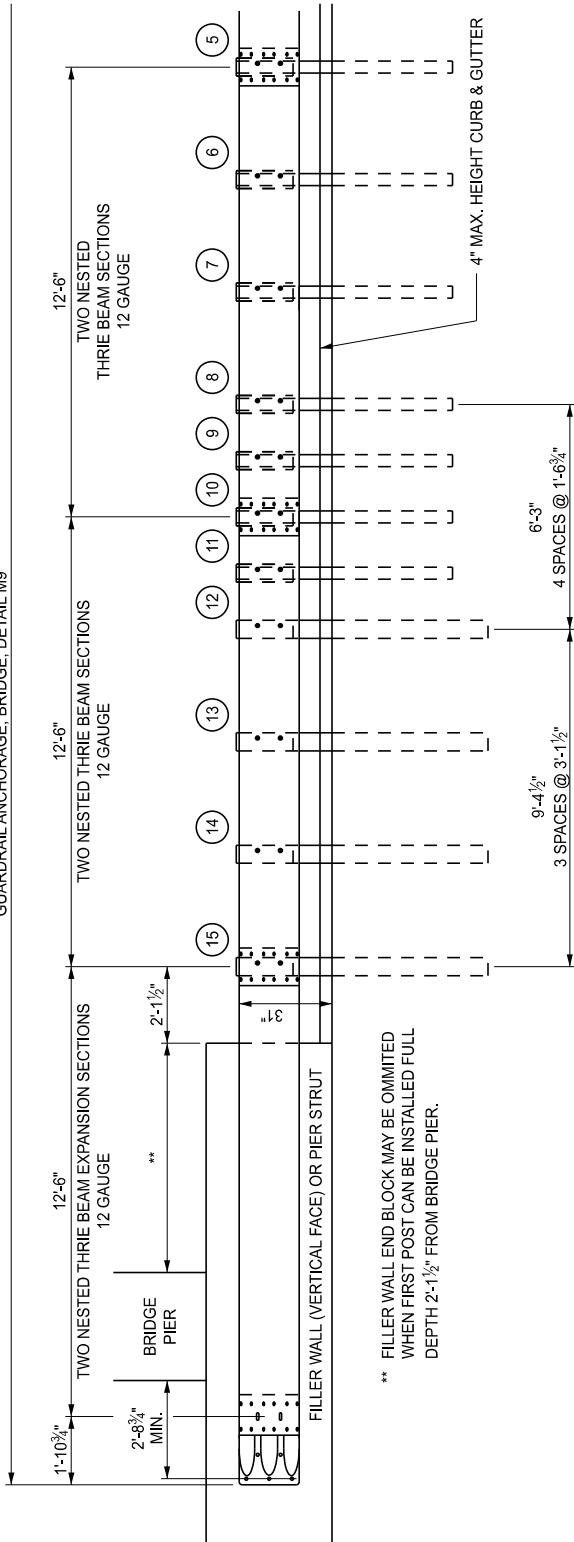
(SPECIAL DETAIL)
FHWA APPROVAL

04/03/2024
PLAN DATE

R-67-G

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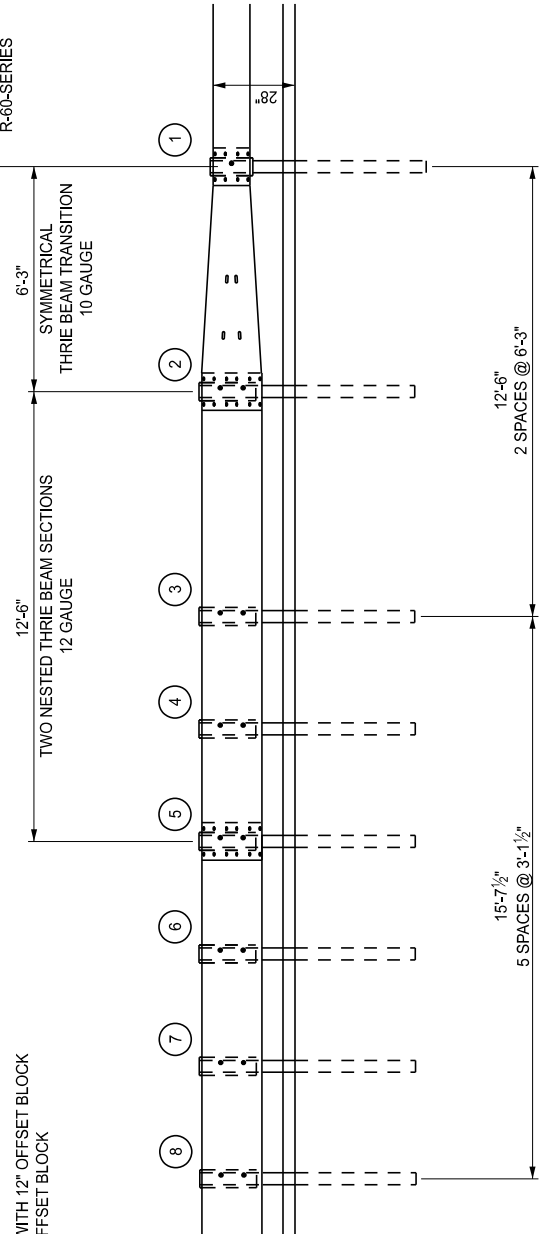
58'-1 1/2"
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M9



** FILLER WALL END BLOCK MAY BE OMITTED
WHEN FIRST POST CAN BE INSTALLED FULL
DEPTH 2'-1 1/2" FROM BRIDGE PIER.

58'-1 1/2"
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M9

POST 1 THROUGH 11 - W6 x 9 OR W6 x 8.5 POST (6'-0" LONG) WITH 12" OFFSET BLOCK
POST 12 THROUGH 15 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK



DETAILS FOR CONNECTING GUARDRAIL TYPE B TO FILLER WALL OR PIER STRUT



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BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)
FHWA APPROVAL

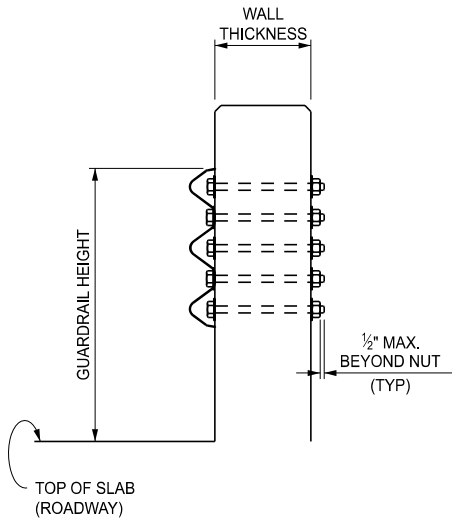
04/03/2024
PLAN DATE

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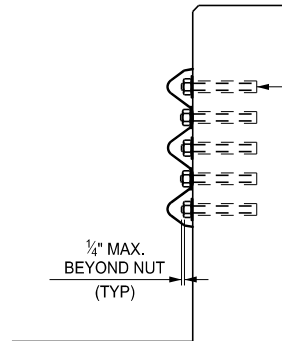
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REFER TO GUARDRAIL ANCHORAGE BRIDGE, DETAIL M1 THROUGH M9 FOR GUARDRAIL HEIGHT.

HIGH STRENGTH $\frac{7}{8}$ " DIA. HEX HEAD BOLT AND NUTS SHALL BE USED TO CONNECT GUARDRAIL TO BRIDGE RAILINGS WITH ROUND WASHERS ON FRONT AND SQUARE WASHERS ON BACK. (SEE CHART BELOW FOR BOLT LENGTH REQUIRED.) WASHER DETAILS ARE SHOWN ON SHEET 11.



BRIDGE RAILING & FILLER WALL



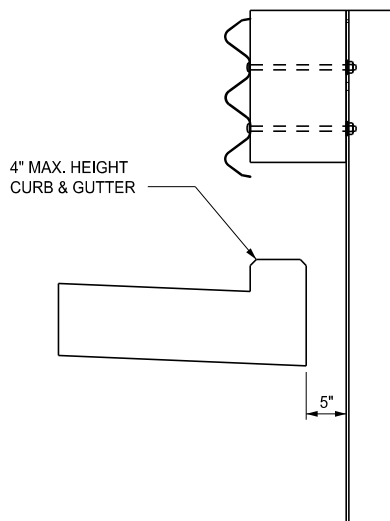
USE $\frac{7}{8}$ " DIA. ADHESIVE ANCHORED BOLTS EMBEDDED 8" TO ATTACH GUARDRAIL TO PIER BASE WALLS AND PIER STRUTS.

** USE $\frac{7}{8}$ " DIA. ADHESIVE ANCHORED BOLTS EMBEDDED 8" INSTEAD OF BOLTING THROUGH THE FILLER WALL UNDER THE FOLLOWING CONDITIONS:

1. AT OR NEAR THE JOINT LINE WHEN A FILLER WALL IS A DIFFERENT THICKNESS THAN THE FILLER WALL EXTENSION
2. IN EXISTING FILLER WALLS THICKER THAN 1'-6"
3. WHEN CONDITIONS PROHIBIT THE USE OF BOLTS

ALTERNATE CONSTRUCTION METHOD

APPLICABLE TO PIER BASE WALLS, PIER STRUTS AND FILLER WALLS MEETING CERTAIN CONDITIONS



POST DETAIL

BOLT REQUIREMENTS FOR CONNECTING GUARDRAIL TO BRIDGE RAILINGS

BRIDGE RAILING	WALL THICKNESS	BOLT LENGTH	MINIMUM THREAD LENGTH
2 TUBE	1'-5½"	1'-7½"	4"
4 TUBE	1'-7"	1'-9"	4"
AESTHETIC PARAPET TUBE	1'-0"	1'-2"	4"
3 TUBE WITH PICKETS	1'-4½"	1'-6½"	4"
TYPE 6	1'-5¾" / 1'-6¾" ***	1'-7¾" / 1'-8¾" ***	4"
TYPE 7	1'-2½" / 1'-3½" ***	1'-4½" / 1'-5½" ***	4"
CONCRETE BLOCK RETROFIT	1'-3¾"	1'-5¾"	4"
FILLER WALL (WITH THROUGH BOLTS) **	VARIES	WALL THK + 2"	4"
PIER BASE WALL, PIER STRUT, FILLER WALL (WITH ADHESIVE ANCHORED BOLTS) **	VARIES	****	4"

SHORTER BOLT LENGTHS MAY BE USED PROVIDED THE BOLT EXTENDS ¼" BEYOND THE NUT WHEN TIGHTENED.

** REFER TO APPLICABLE NOTES UNDER ALTERNATE CONSTRUCTION METHOD TO DETERMINE APPLICABLE BOLTING METHOD FOR FILLER WALL

*** THICKNESS/LENGTH DEPENDENT UPON AESTHETIC TREATMENT ON RAILING

**** LENGTH TO PROVIDE 8" EMBEDMENT AND BOLT EXTENDING ¼" MAXIMUM BEYOND NUT WHEN FULLY ENGAGED

GUARDRAIL POST SECTIONS FOR GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M1 THROUGH M9



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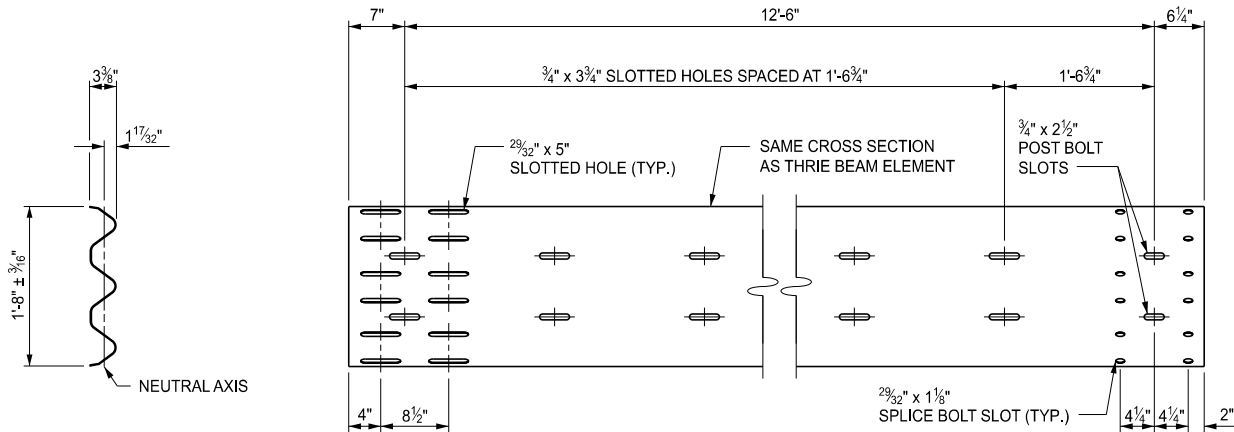
STANDARD PLAN FOR
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)
FHWA APPROVAL

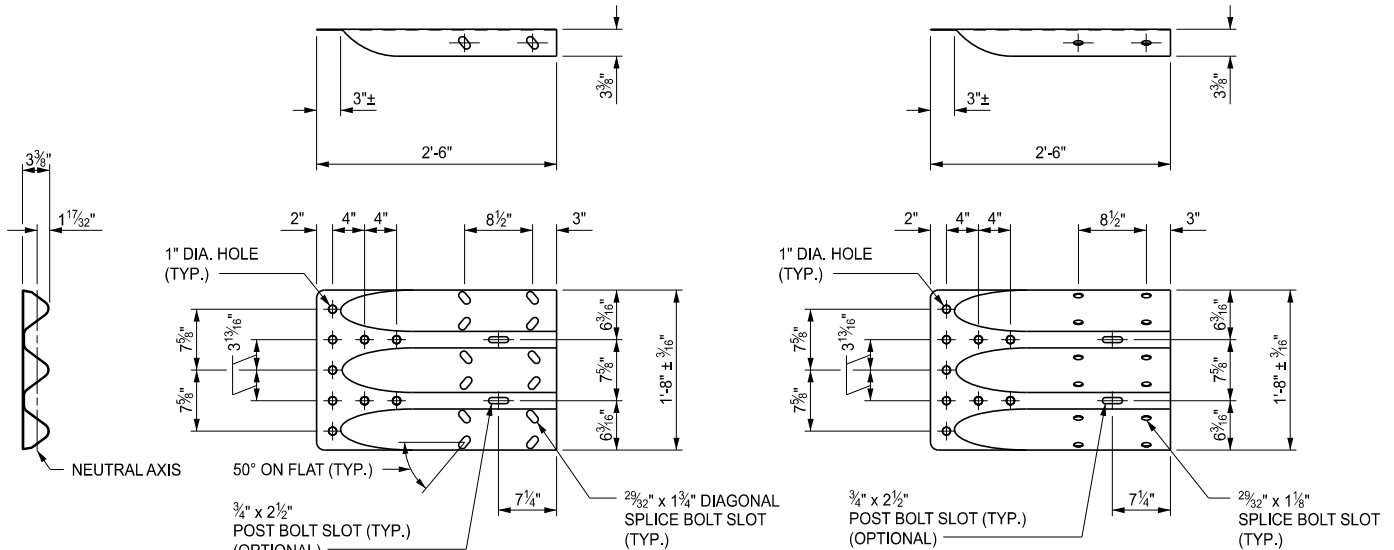
04/03/2024
PLAN DATE

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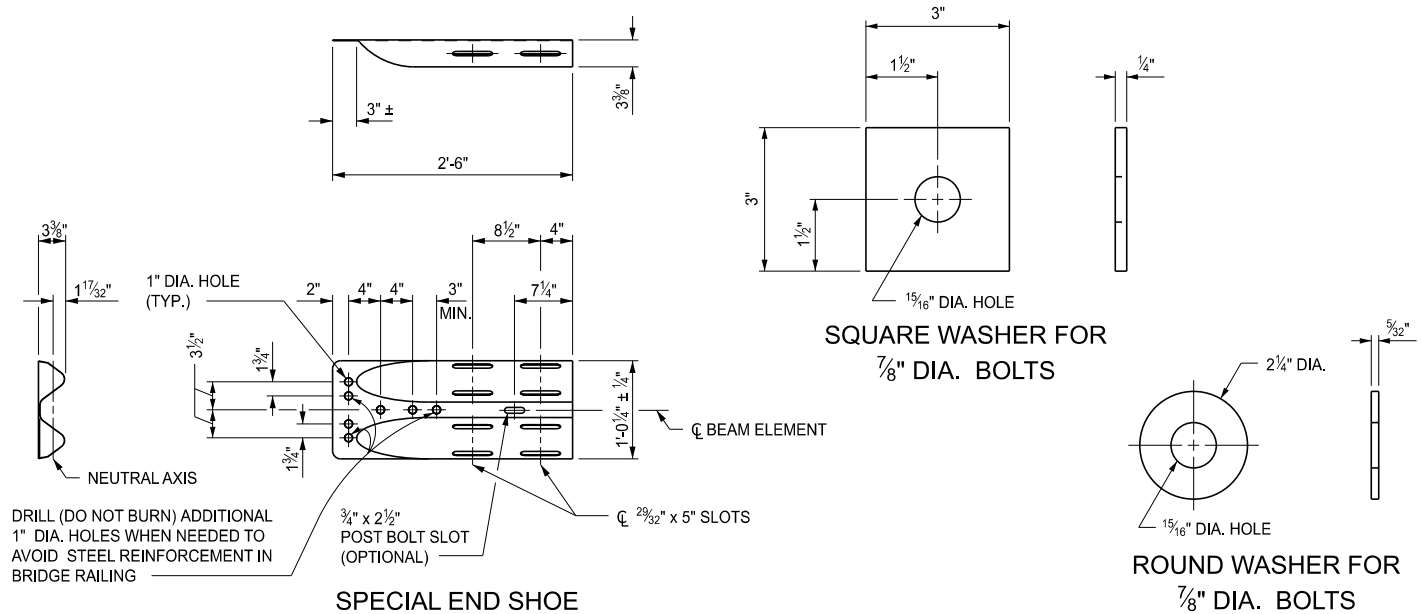
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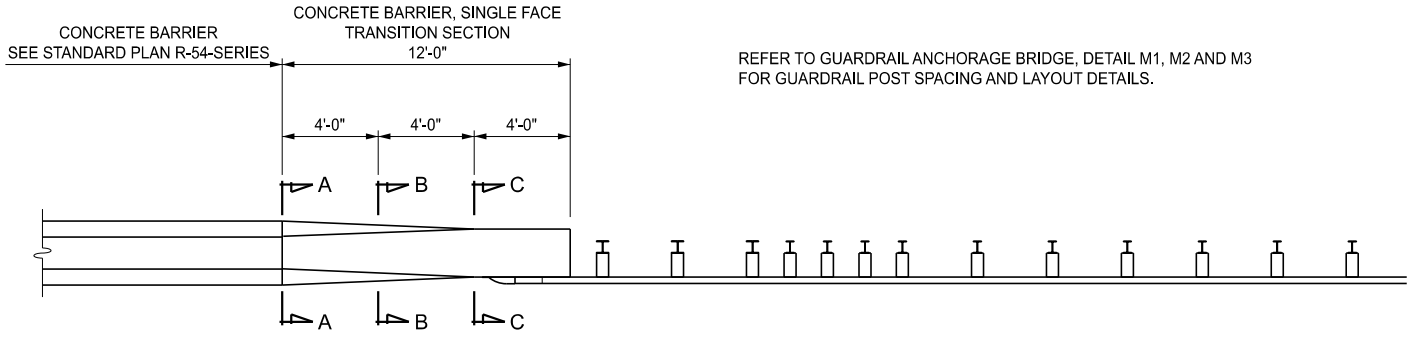
THRIE BEAM EXPANSION SECTION



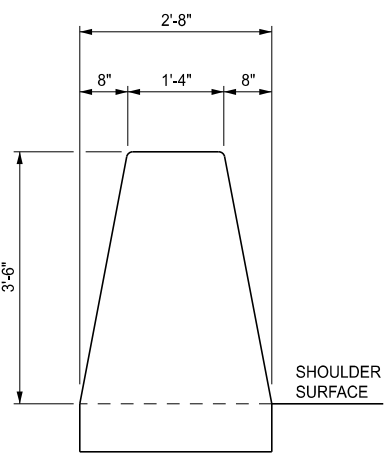
THRIE BEAM TERMINAL CONNECTOR



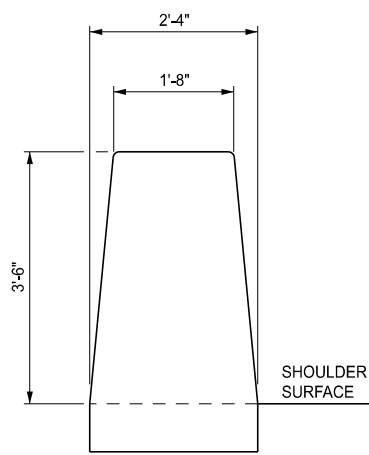
SPECIAL END SHOE



PLAN VIEW

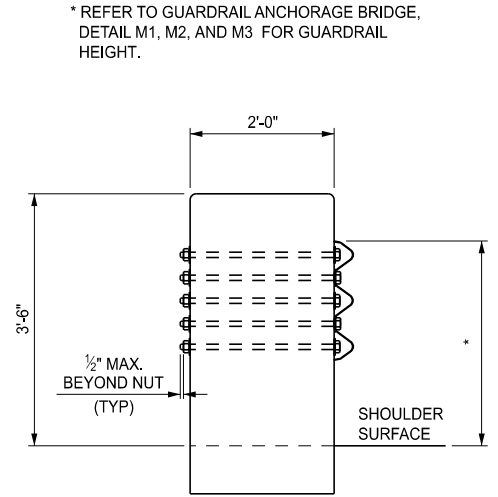


SECTION A-A



SECTION B-B

UNIFORMLY TRANSITION THE BARRIER FACES FROM SINGLE SLOPE SHAPE TO VERTICAL WALL



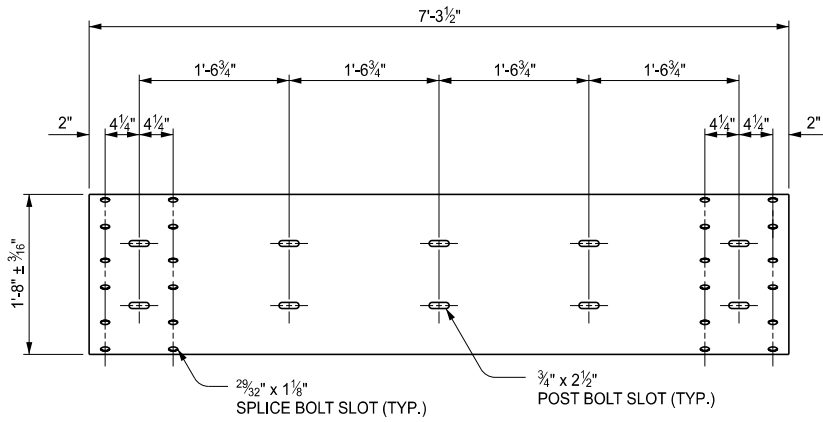
SECTION C-C

HIGH STRENGTH 1/8" DIAMETER x 26" LONG HEX HEAD BOLTS WITH 2" MINIMUM THREAD LENGTH AND NUTS WITH ROUND WASHERS FRONT AND BACK SHALL BE USED TO CONNECT GUARDRAIL TO CONCRETE BARRIER, SINGLE FACE TRANSITION SECTION.

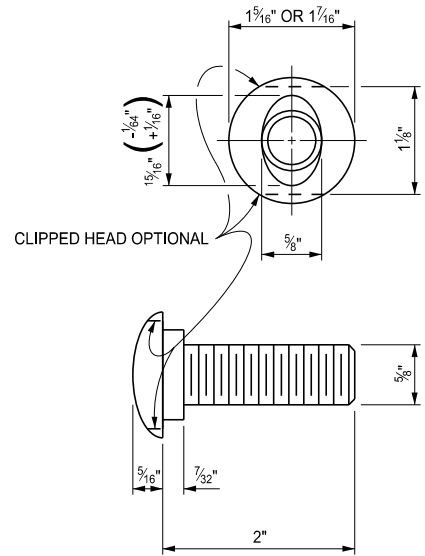
* REFER TO GUARDRAIL ANCHORAGE BRIDGE, DETAIL M1, M2, AND M3 FOR GUARDRAIL HEIGHT.

DETAILS FOR CONNECTING GUARDRAIL TO CONCRETE BARRIER, SINGLE FACE

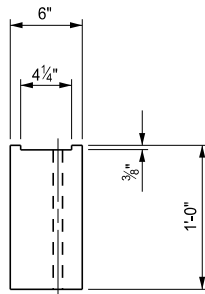
<p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	<p>STANDARD PLAN FOR GUARDRAIL ANCHORAGE, BRIDGE, DETAILS</p>		<p>R-67-G</p>	<p>SHEET 12 OF 16</p>
	<p>(SPECIAL DETAIL) FHWA APPROVAL</p>	<p>04/03/2024 PLAN DATE</p>		



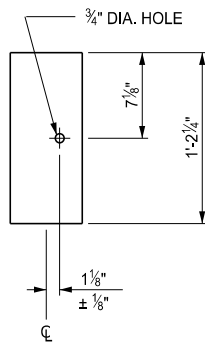
6'-3" THRIE BEAM SECTION



SPLICE BOLT
FOR USE WITH NESTED
GUARDRAIL BEAM ELEMENTS

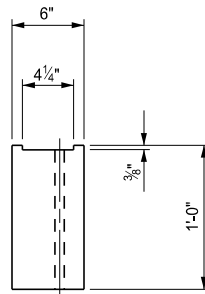


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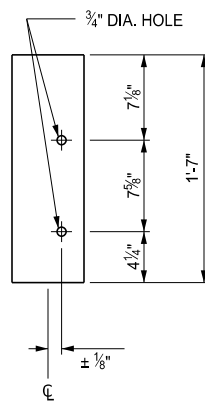


FRONT

OFFSET BLOCK FOR
W BEAM GUARDRAIL

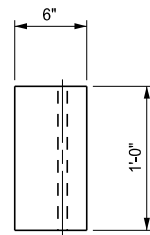


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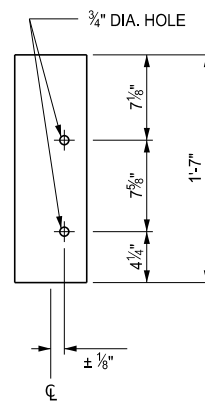


FRONT

OFFSET BLOCK FOR
THRIE BEAM GUARDRAIL
FOR USE WITH W6 x 8.5 OR W6 x 9 POSTS



TOP



FRONT

OFFSET BLOCK FOR
THRIE BEAM GUARDRAIL
FOR USE WITH W6 x 15 POSTS



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BRADLEY C. WIEFERICH, PE

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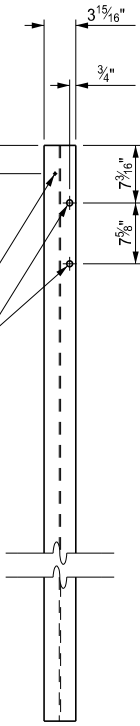
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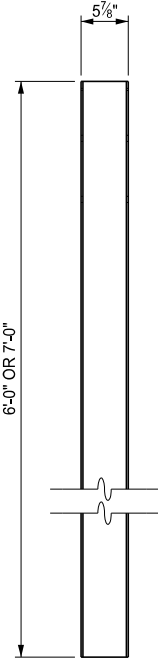


GALVANIZING HOLE (OPTIONAL)

3/4" DIA. HOLE

* BOTTOM HOLE FOR USE WITH THRIE BEAM GUARDRAIL

FRONT

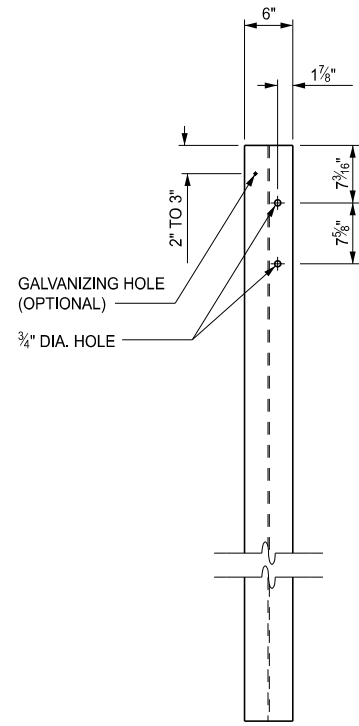


SIDE

W6 x 9 OR
W6 x 8.5 POST



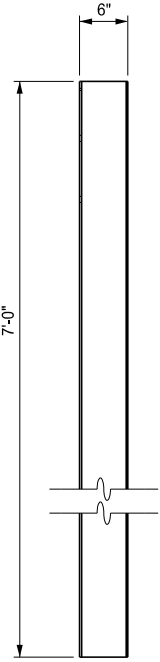
TOP



GALVANIZING HOLE (OPTIONAL)

3/4" DIA. HOLE

FRONT



SIDE

W6 x 15 POST



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

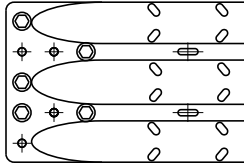
STANDARD PLAN FOR
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

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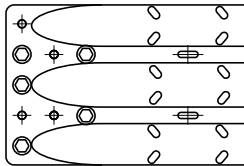
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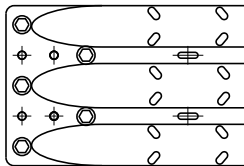
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THRIE BEAM TERMINAL CONNECTOR
 BOLT LOCATION FOR
 GUARDRAIL ANCHORAGE TYPE M1, M3, M4, M6
 ◎ = REQUIRED BOLT LOCATION TO ANCHOR INTO CONCRETE



THRIE BEAM TERMINAL CONNECTOR
 BOLT LOCATION FOR
 GUARDRAIL ANCHORAGE TYPE M2, M5
 ◎ = REQUIRED BOLT LOCATION TO ANCHOR INTO CONCRETE



THRIE BEAM TERMINAL CONNECTOR
 BOLT LOCATION FOR
 GUARDRAIL ANCHORAGE TYPE M7, M8, M9
 ◎ = REQUIRED BOLT LOCATION TO ANCHOR INTO CONCRETE

NOTES:

ALL POSTS, OFFSET BLOCKS, BEAM ELEMENTS, REFLECTORS, AND HARDWARE, (INCLUDING BOLTS, NUTS, AND WASHERS) SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION AND TO STANDARD PLAN R-60-SERIES, WHERE APPLICABLE, EXCEPT AS SPECIFIED ON THIS STANDARD.

BEAM ELEMENTS IDENTIFIED AS 12 GAUGE MUST MEET CLASS A REQUIREMENTS PER AASHTO M 180. BEAM ELEMENTS IDENTIFIED AS 10 GAUGE MUST MEET CLASS B REQUIREMENTS PER AASHTO M 180.

THE THRIE BEAM TERMINAL CONNECTOR AND SPECIAL END SHOE SHALL BE THE SAME MATERIAL AS ADJACENT RUN OF GUARDRAIL, AND SHALL NOT BE LIGHTER THAN 10 GAUGE (0.138").

SECTIONS OF THE THRIE BEAM ELEMENT REQUIRED TO BE TWISTED FOR USE IN ANCHORAGE SHALL BE FIELD BENT.

GUARDRAIL BEAM ELEMENTS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC, EXCEPT FOR THE THRIE BEAM TERMINAL CONNECTOR WHICH MAY BE LAPPED IN EITHER DIRECTION.

SPLICE BOLTS SHALL BE USED WHEN SPLICING THE THRIE BEAM TERMINAL CONNECTOR TO THE THRIE BEAM EXPANSION SECTION AND WHEN SPLICING THE SPECIAL END SHOE TO THE TRANSITION SECTION. THE SPLICE BOLT NUT SHALL BE INSTALLED FINGER-TIGHT AND SHALL FULLY ENGAGE THE SPLICE BOLT WITH A MINIMUM OF ONE THREAD EXTENDING BEYOND THE NUT. THIS SHALL BE FOLLOWED UP BY UPSETTING THE FIRST THREAD ON THE OUTSIDE OF THE NUT WITH A CENTER PUNCH OR COLD CHISEL, SO THAT IT WILL NOT LOOSEN.

SEE STANDARD PLAN R-32-SERIES FOR APPROACH CURB AND GUTTER AND DOWNSPOUT HEADER.

SEE APPROPRIATE PLANS TO DETERMINE WHETHER GUARDRAIL ANCHORAGE, BRIDGE SPANS A BRIDGE EXPANSION JOINT.

SEE APPROPRIATE PLANS FOR PIER BASE WALL OR PIER STRUT.

SEE STANDARD PLAN R-55-SERIES FOR FILLER WALLS AND FILLER WALL END BLOCK.

SEE STANDARD PLAN R-54-SERIES FOR CONCRETE BARRIER, SINGLE FACE, TYPE ___.

CONCRETE BARRIER, SINGLE FACE TRANSITION SECTION SHALL BE INCLUDED IN THE PAY ITEM "CONC BARRIER, SINGLE FACE, TYPE ___".



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)
FHWA APPROVAL

04/03/2024
PLAN DATE

R-67-G

SHEET
16 OF 16