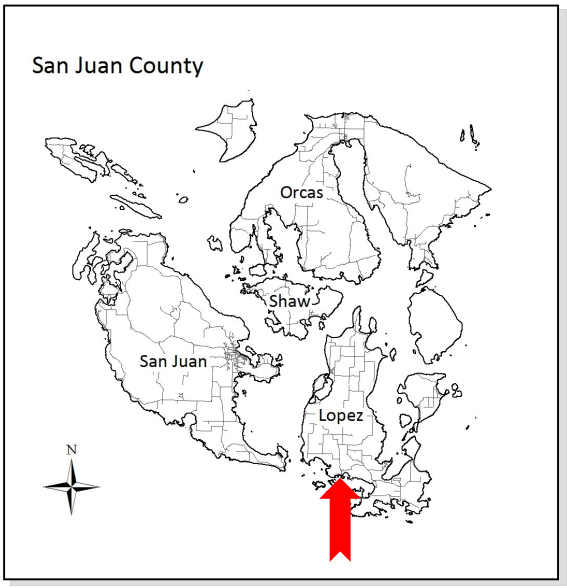
GRLZ08 - Lopez Island - Richardson Rd MP 9.533 to 9.646





Guardrail Location

D1 **Guardrail Location ID#**

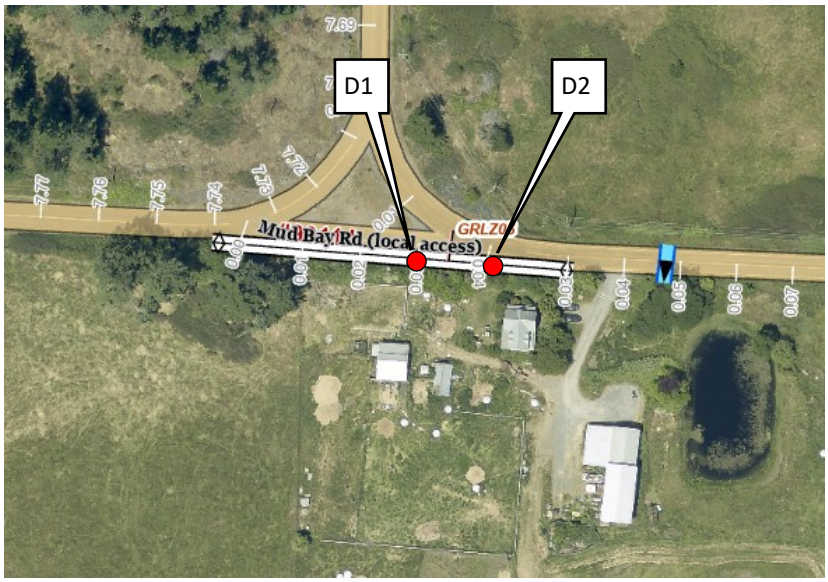
Damage location #D1

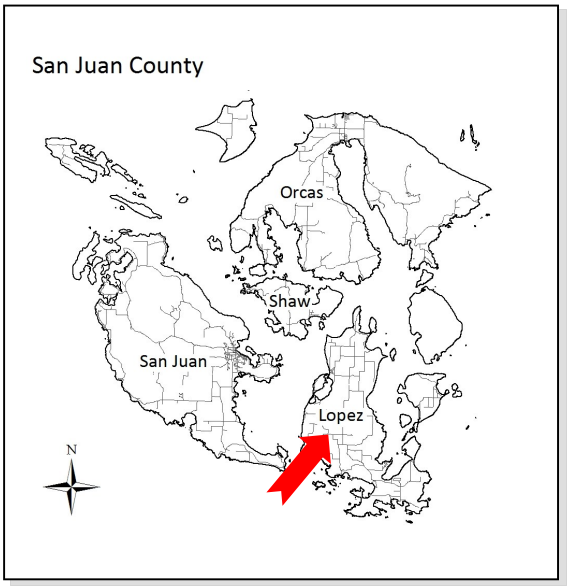
- Remove 635 LF of guardrail and posts (Bid Item No. 9)
- Install 625 LF Type F Precast Concrete Barriers with Scuppers and reflector tabs (unanchored), pinned per Standard Plan C-60.15-01 (Bid Item No. 4)
- Install 14 LF Type F Precast Concrete Terminals per Standard Plan C-60.80-02 (Bid Item No. 5)





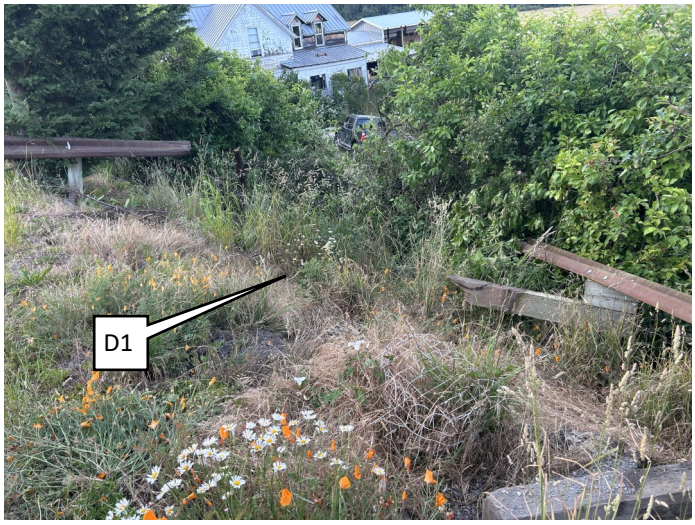
GRLZ05 - Lopez Island - Mud Bay Rd MP 0.030





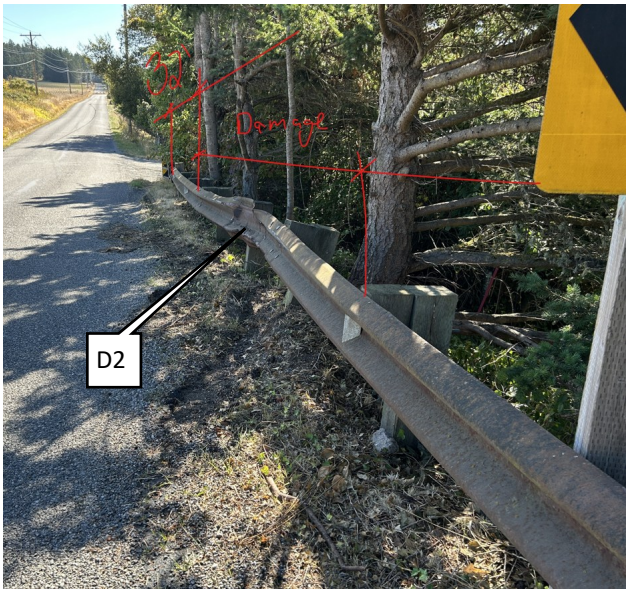
Damage Location

D1 **Damage Location ID#**



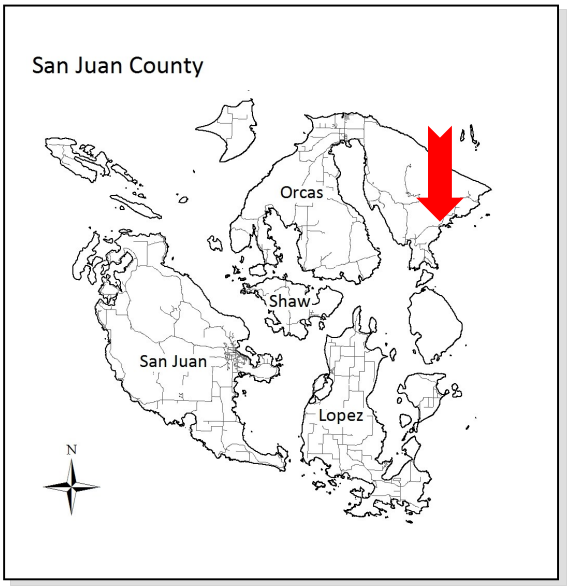
Damage location #D1 & #D2

- Remove 157 LF of guardrail and posts (Bid Item No. 9)
- Install 75 LF Type F Precast Concrete Barriers with Scuppers and reflector tabs (unanchored), pinned per Standard Plan C-60.15-01 (Bid Item No. 4)
- Install two (2) Type 24 Beam Guardrail Transition Sections, per Standard Plan C-25.30-01 (Bid Item No.7)
- Repair Beam Guardrail Type 31 terminal MSKT-SP-MGS (TL-2) in place, east end to pay limit (Bid Item No. 10)



GROR13 - Orcas Island - Point Lawrence Rd MP 1.95

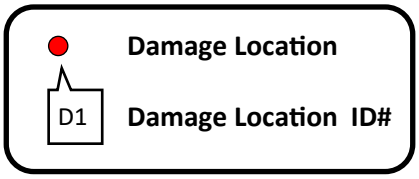


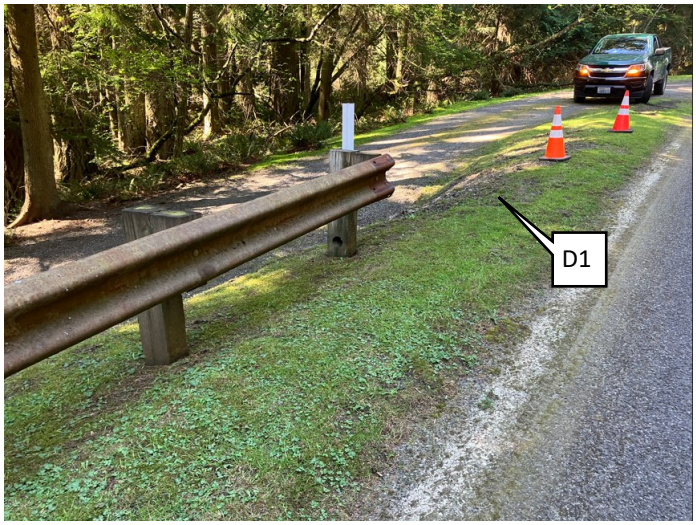


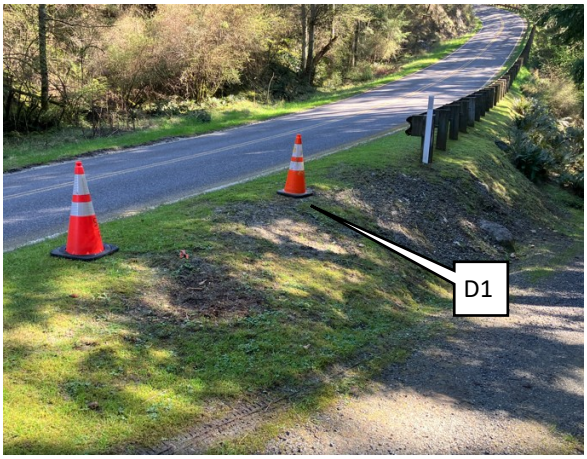
Damage location #D1

Replace Damaged Beam Guardrail Type 31 Non-Flared Terminal End, as Follows:

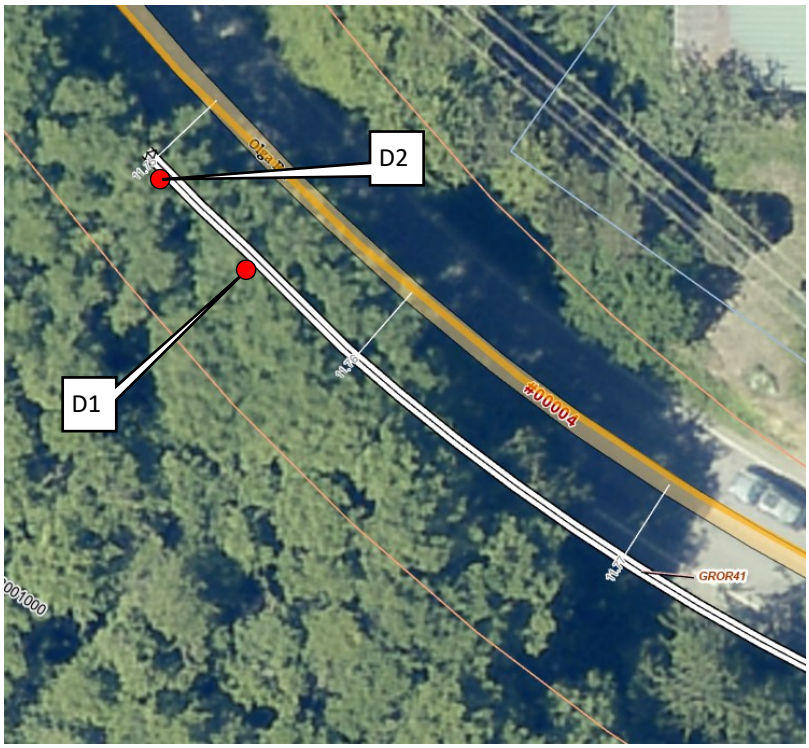
- Replace terminal assembly, including impact head, ground strut, foundation tubes, cable anchorage assembly and all hardware with new MSKT-SP-MGS (TL-2), per Standard Plan per Standard Plan C-22.25-07 (Bid Item No. 8)
- Replace 12.5 LF weathering steel, slotted end Beam Guardrail Type 31, per Standard Plan C -2010-09 (Bid Item No. 6)

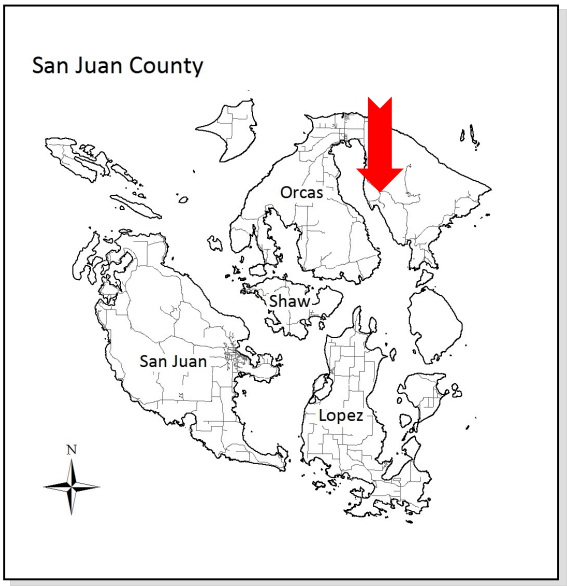






GROR21 - Orcas Island - Olga Rd. MP 11.75





Damage Location

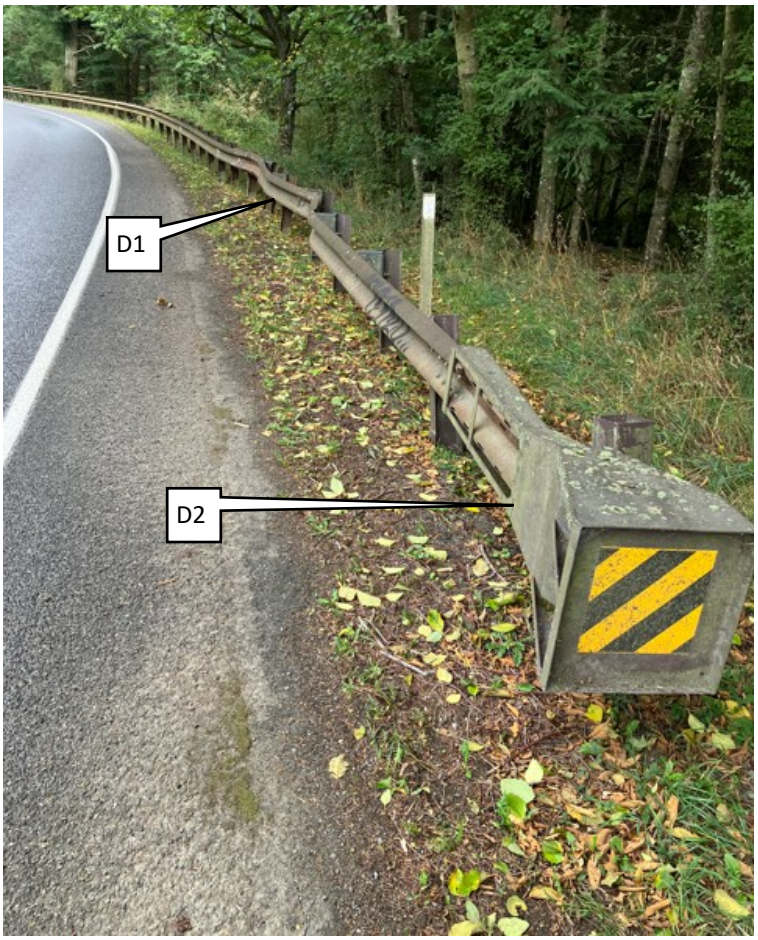
D1 **Damage Location ID#**

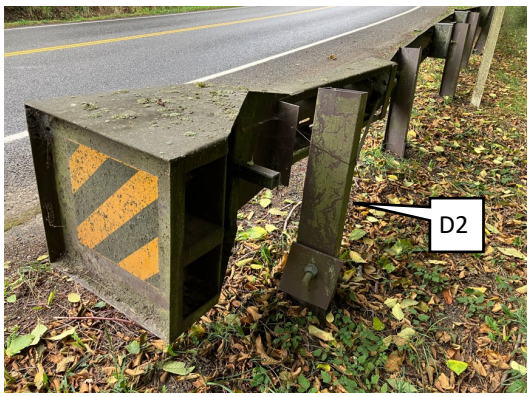
Damage location #D1

- Replace 37.5 LF weathering steel Beam Guardrail Type 31 (Bid Item No. 6)

Damage location #D2

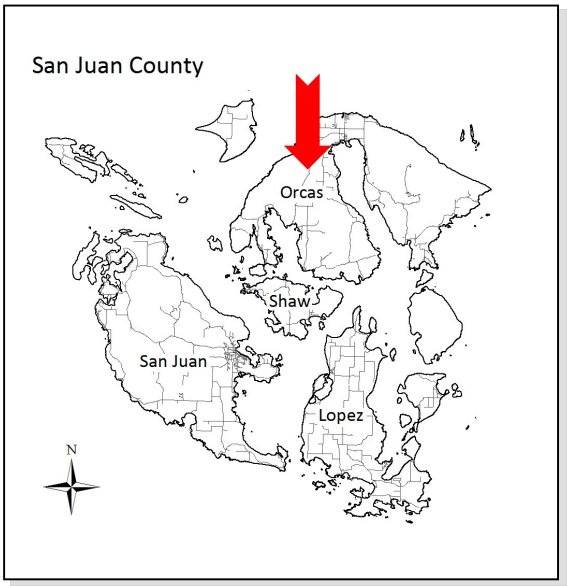
- Repair MSKT-SP-MGS (TL-2) beam guardrail terminal (Bid Item No. 10)





GROR50 - Orcas Island - Orcas Rd MP 4.37 to 4.53





Damage Location

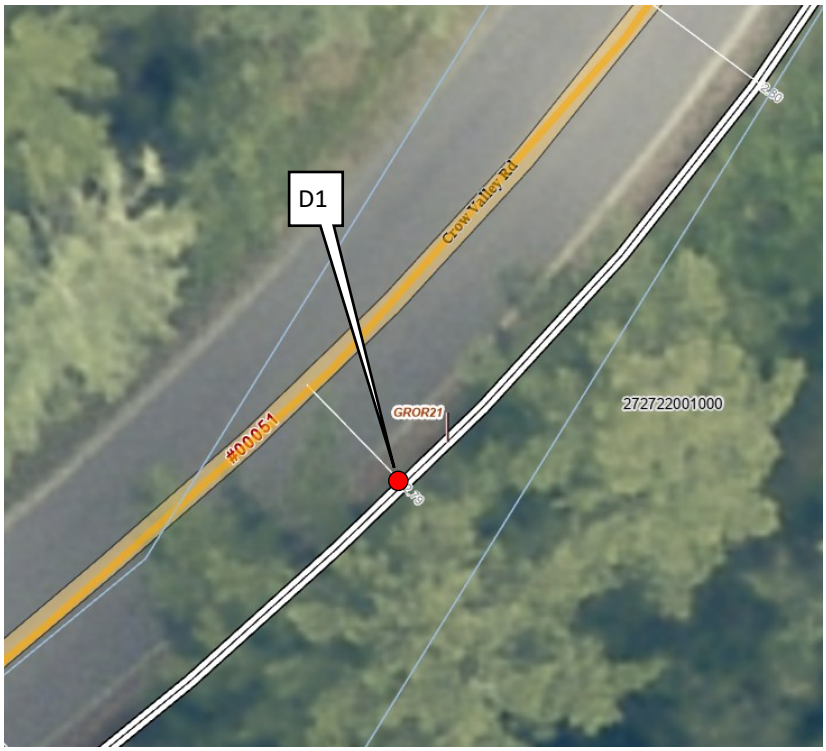
D1 **Damage Location ID#**

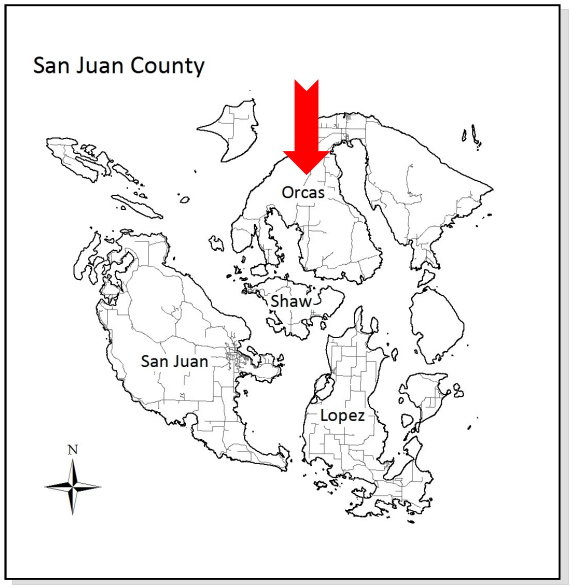
Damage location #D1

- Replace 50 LF weathering steel Beam Guardrail Type 31 (Bid Item No. 6)
- Replace 1 wood block



GROR21 - Orcas Island - Crow Valley Rd. MP 2.79



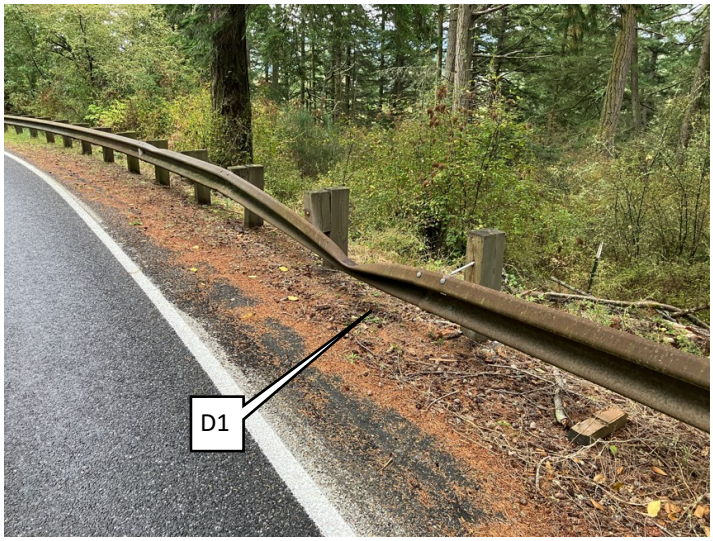


Damage Location

D1 **Damage Location ID#**

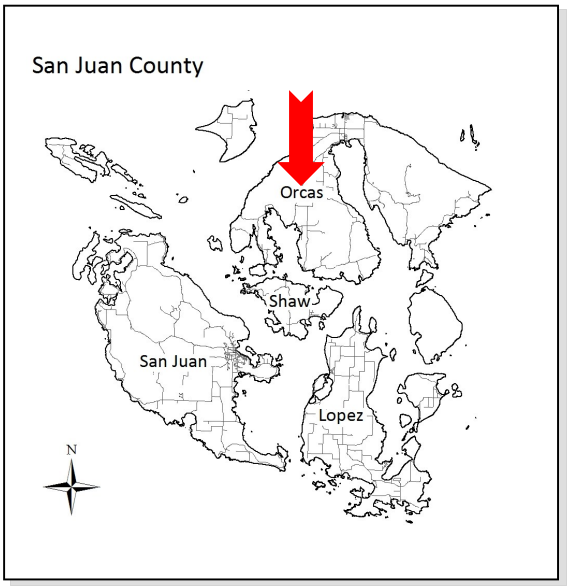
Damage location #D1

- Replace 25 LF weathering steel Beam Guardrail Type 31 (Bid Item No. 6)
- Replace one wood block



GROR20 — Orcas Island - *Crow Valley Rd MP 2.86*

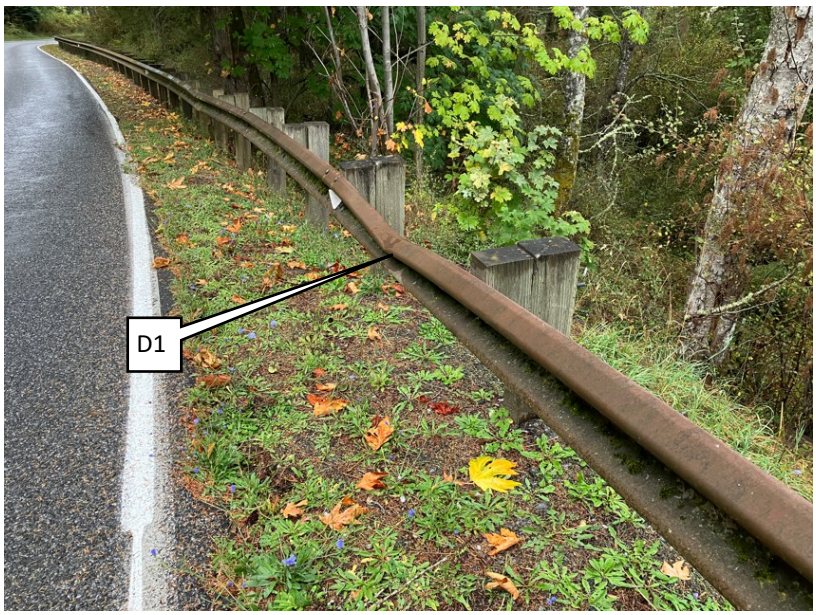




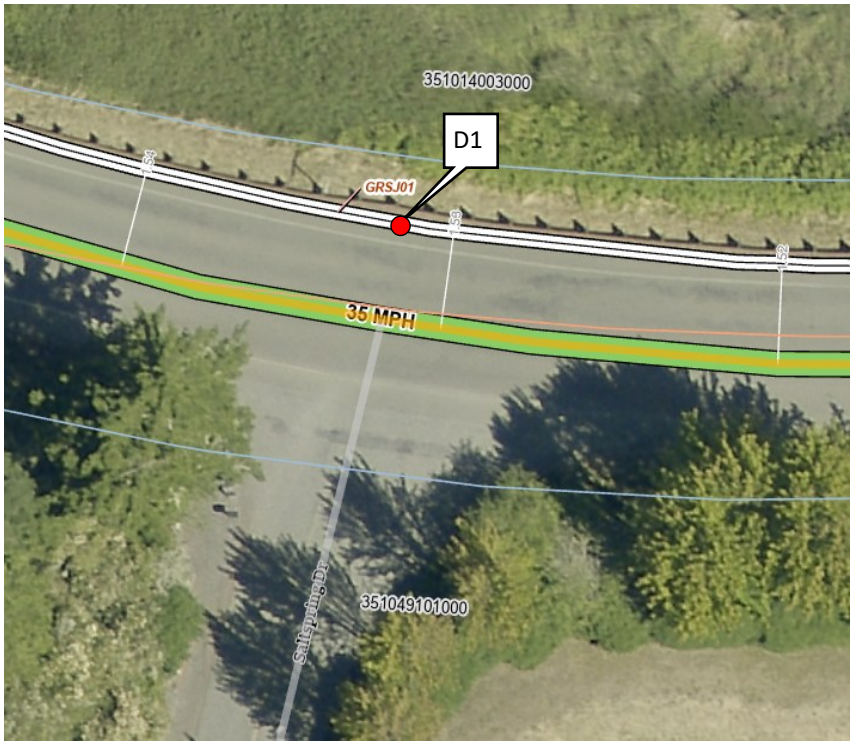
Damage location #D1

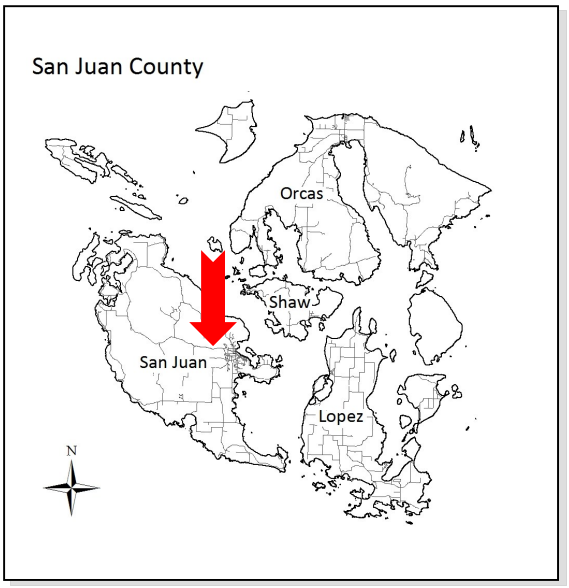
- Replace 12.5 LF weathering steel Beam Guardrail Type 31 (Bid Item No. 6)





GRSJ01 - San Juan Island - Beaverton Valley Rd. MP 1.53





Damage Location

D1 **Damage Location ID#**

Damage location #D1

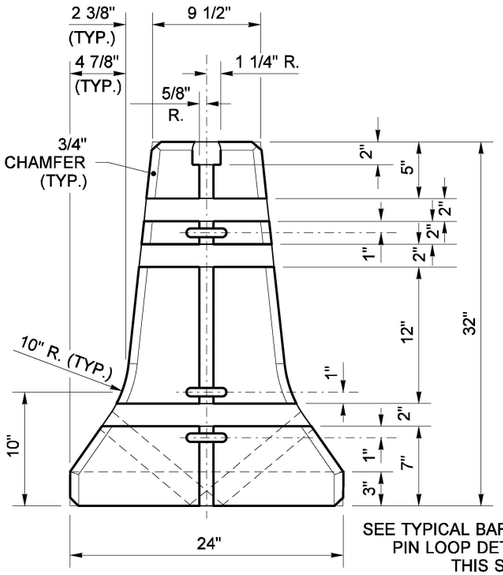
- Replace 12.5 LF of weathering steel Beam Guardrail Type 31 (Bid Item No. 6)
- Plumb one wood post



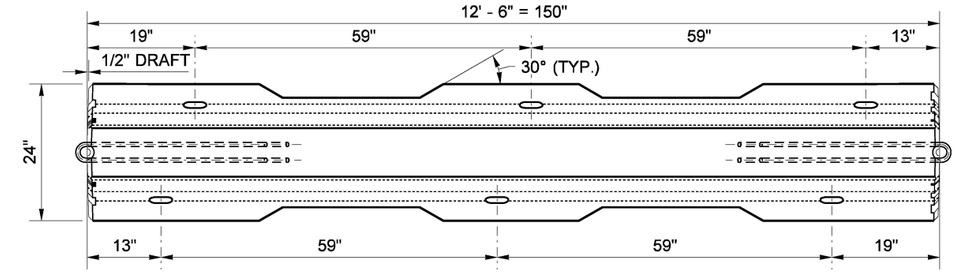


WSDOT Standard Plans

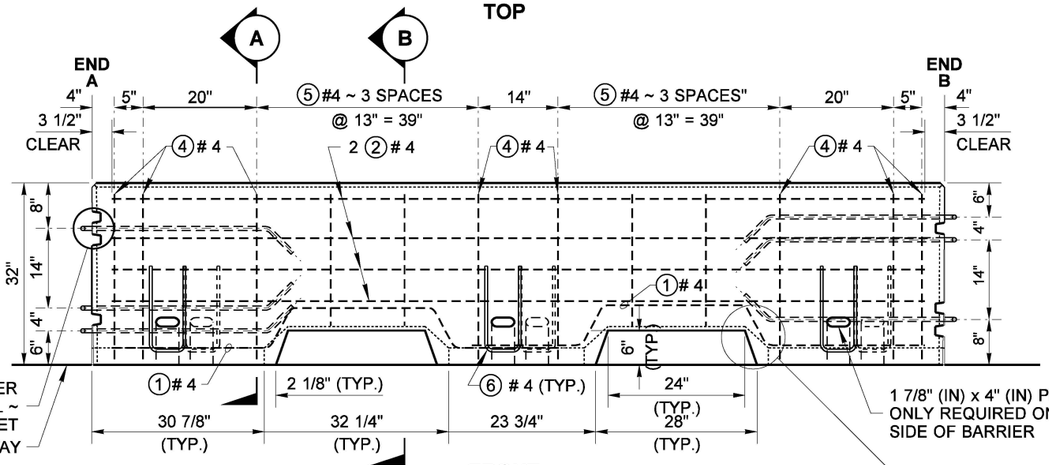
C-60.15-01	**CONCRETE BARRIER TYPE F WITH SCUPPERS (PRECAST)**
C-60.80-02	**CONCRETE BARRIER TYPE F (PRECAST) TERMINAL**
C-25.30-01	**BEAM GUARDRAIL (TYPE 31) TRANSITION SECTION TYPE 24**
C-22.45-07	**BEAM GUARDRAIL TYPE 31 NON-FLARED TERMINAL**
C-20.10-09	**BEAM GUARDRAIL TYPE 31**



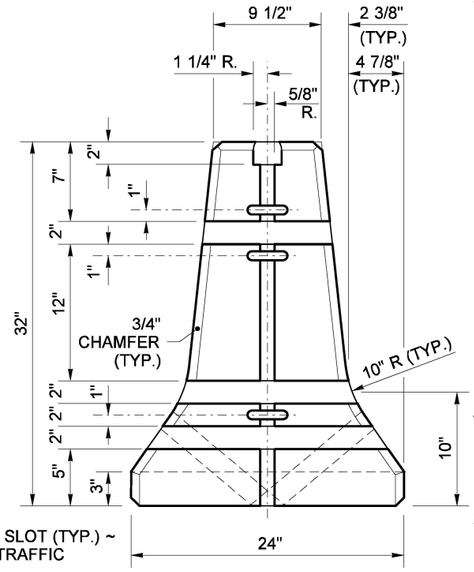
END A

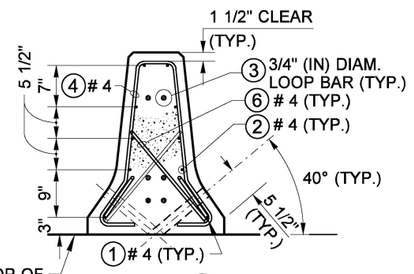


TOP

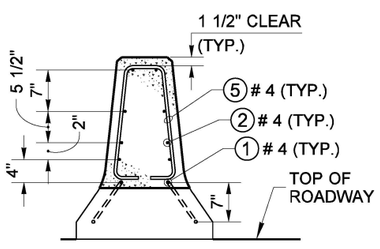


FRONT

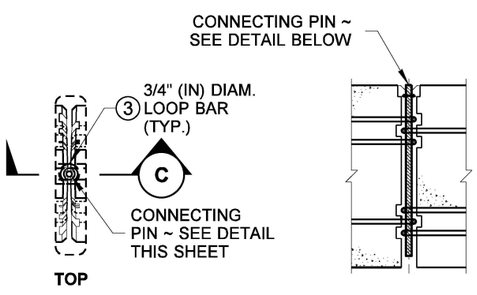




SECTION (A)



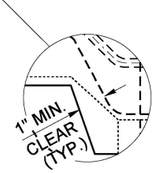
SECTION (B)

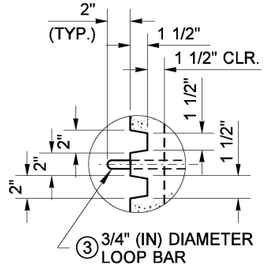


TOP

END DETAIL
JOINING TWO BARRIER SEGMENTS

SECTION (C)
(SEE NOTE 2)

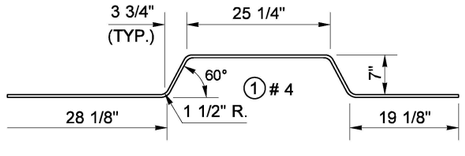




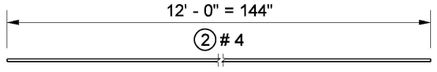
TYPICAL BARRIER PIN LOOP DETAIL

NOTE:
STEEL WELDED WIRE REINFORCEMENT DEFORMED FOR CONCRETE MAY BE SUBSTITUTED FOR REINFORCING STEEL IN ACCORDANCE WITH **STANDARD SPECIFICATION, SECTION 6-10.3**

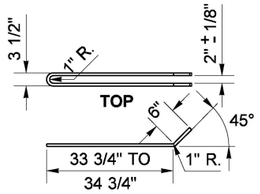
REINFORCING STEEL BENDING DIAGRAM



LONGITUDINAL SCUPPER BAR
QTY. = 4 BARS
HOT DIP GALVANIZE AFTER FABRICATION (**ASTM A767**)

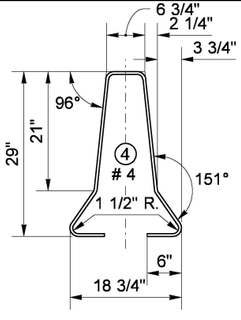


LONGITUDINAL BAR
QTY. = 8 BARS

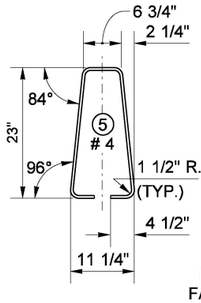


SIDE

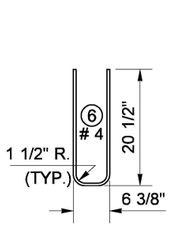
③ LOOP BAR DETAIL
3/4" DIAM. LOOP BAR PER **ASTM A36**, HOT ROLL
HOT DIP GALVANIZE AFTER FABRICATION PER **AASHTO M 111**
QTY. = 6 BARS



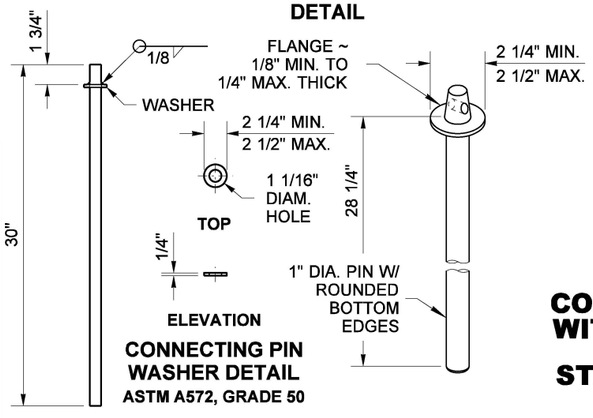
STIRRUP BAR A
QTY. = 8 BARS



STIRRUP BAR B
QTY. = 4 BARS



PIN SLOT BAR
HOT DIP GALVANIZE AFTER FABRICATION PER **ASTM A767** EXCEPT THAT CHROMATE TREATMENT IS OPTIONAL
QTY. = 6 BARS



CONNECTING PIN WASHER DETAIL
ASTM A572, GRADE 50

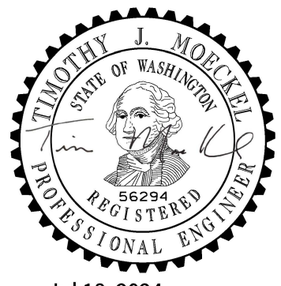
WELDED WASHER PIN SEE NOTE 6 | **FORGED HEAD PIN** (ALTERNATIVE)

CONNECTING PIN ASSEMBLY DETAIL
1" DIAMETER PER **ASTM A449**
HOT DIP GALVANIZE AFTER FABRICATION PER **ASTM F2329**

NOTES

1. Concrete shall be Class 5000.
2. Remove slack between barrier segments after inserting connecting pin.
3. Precast Concrete Barrier Type F with Scuppers can be installed in the following configurations:
   A) Unanchored on hot mix asphalt (HMA), or cement concrete pavement in permanent or temporary installations, and on compacted soil in temporary installations. It is permissible to manufacture the Type F scupper barrier without pin slots and pin slot bars when barrier is not anchored.

   B) Anchored on hot mix asphalt (HMA) or cement concrete pavement in permanent or temporary installations as shown on **Std. Plan C-60.10**. See **Std. Plan C-60.10** for anchoring pin details.
4. See **Std. Plan C-60.70** for anchoring patterns when transitioning from Type F anchored run to another type of barrier run.
5. After removing the anchoring pins, clean the pin holes and fill them with sealant according to **Std. Spec. Section 9-04.2**.
6. Connecting Pin head designs vary among different manufacturers. Pin designs that are shaped differently than those shown in the detail are acceptable, if the bearing surface is within the minimum and maximum widths specified.



Jul 18, 2024

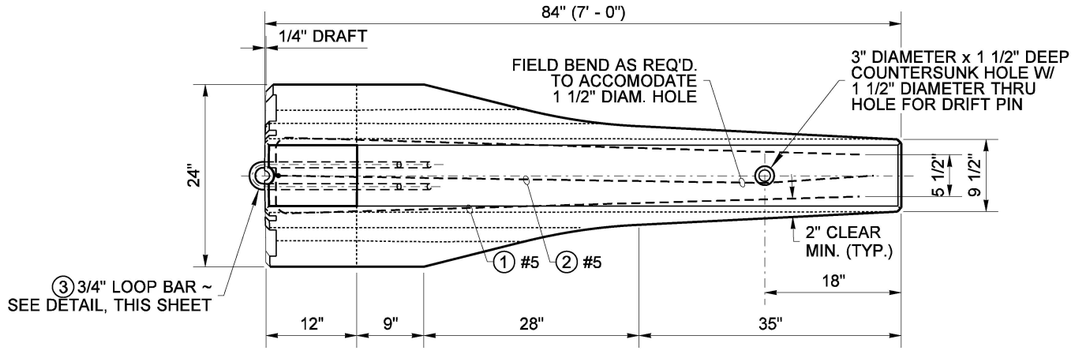
CONCRETE BARRIER TYPE F WITH SCUPPERS (PRECAST)

STANDARD PLAN C-60.15-01

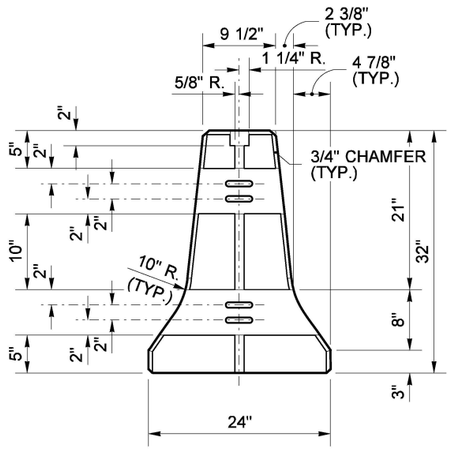
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Mark A Peaires Jul 21, 2024
STATE DESIGN ENGINEER
Washington State Department of Transportation

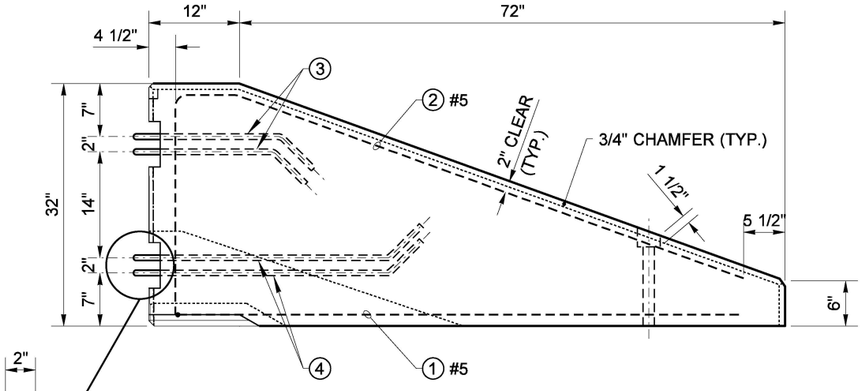
DRAWN BY: BILL BERENS



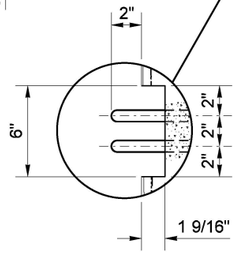
TOP



END

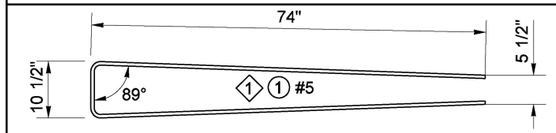


FRONT

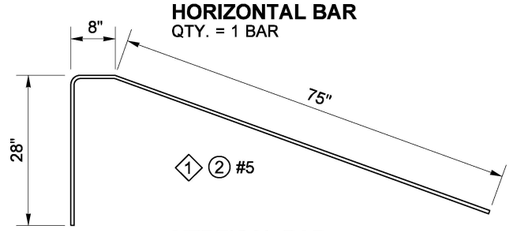


TYPICAL SLOT DETAIL

REINFORCING STEEL BENDING DIAGRAM

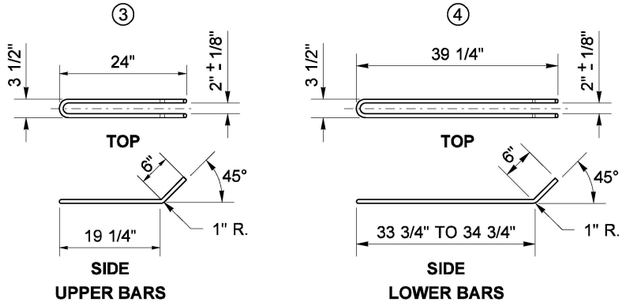


HORIZONTAL BAR
QTY. = 1 BAR

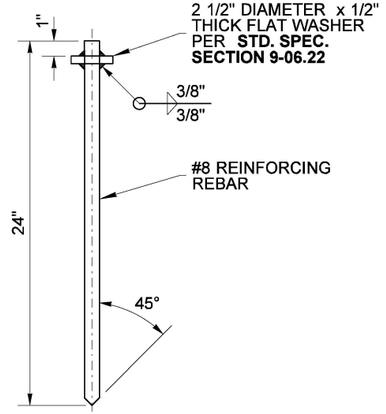


VERTICAL BAR
QTY. = 1 BAR

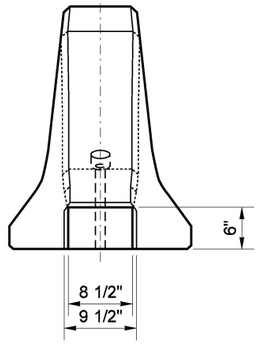
NOTE
① Field bend as required.



③④ LOOP BAR DETAIL
3/4" DIAM. LOOP BAR PER **ASTM A36**, HOT ROLL
HOT DIP GALVANIZE AFTER FABRICATION
PER **AASHTO M 111**
③ QTY. = 2 BARS ④ QTY. = 2 BARS



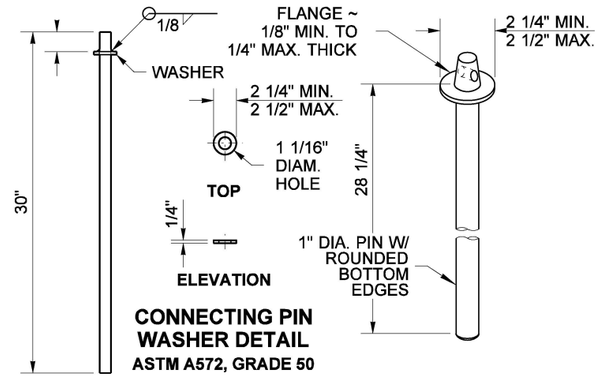
DRIFT PIN DETAIL



END

NOTES

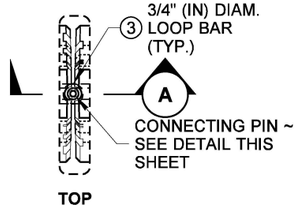
1. Concrete shall be Class 5000.
2. Remove slack between barrier segments after inserting the connecting pin.
3. Provide 2" minimum concrete cover over reinforcing steel, except for as noted on the plan.
4. Connecting Pin head designs vary among different manufacturers. Pin designs that are shaped differently than those shown in the detail are acceptable, if the bearing surface is within the minimum and maximum widths specified.



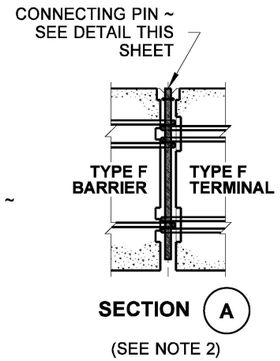
CONNECTING PIN WASHER DETAIL
ASTM A572, GRADE 50

WELDED WASHER PIN SEE NOTE 4 **FORGED HEAD PIN** (ALTERNATIVE)

CONNECTING PIN ASSEMBLY DETAIL
1" DIAMETER PER **ASTM A449**
HOT DIP GALVANIZE AFTER
FABRICATION PER **ASTM F2329**



END DETAIL
JOINING TWO BARRIER SEGMENTS



SECTION (A)
(SEE NOTE 2)

NOTE:
STEEL WELDED WIRE REINFORCEMENT DEFORMED FOR CONCRETE MAY BE SUBSTITUTED FOR REINFORCING STEEL IN ACCORDANCE WITH **STANDARD SPECIFICATION, SECTION 6-10.3**



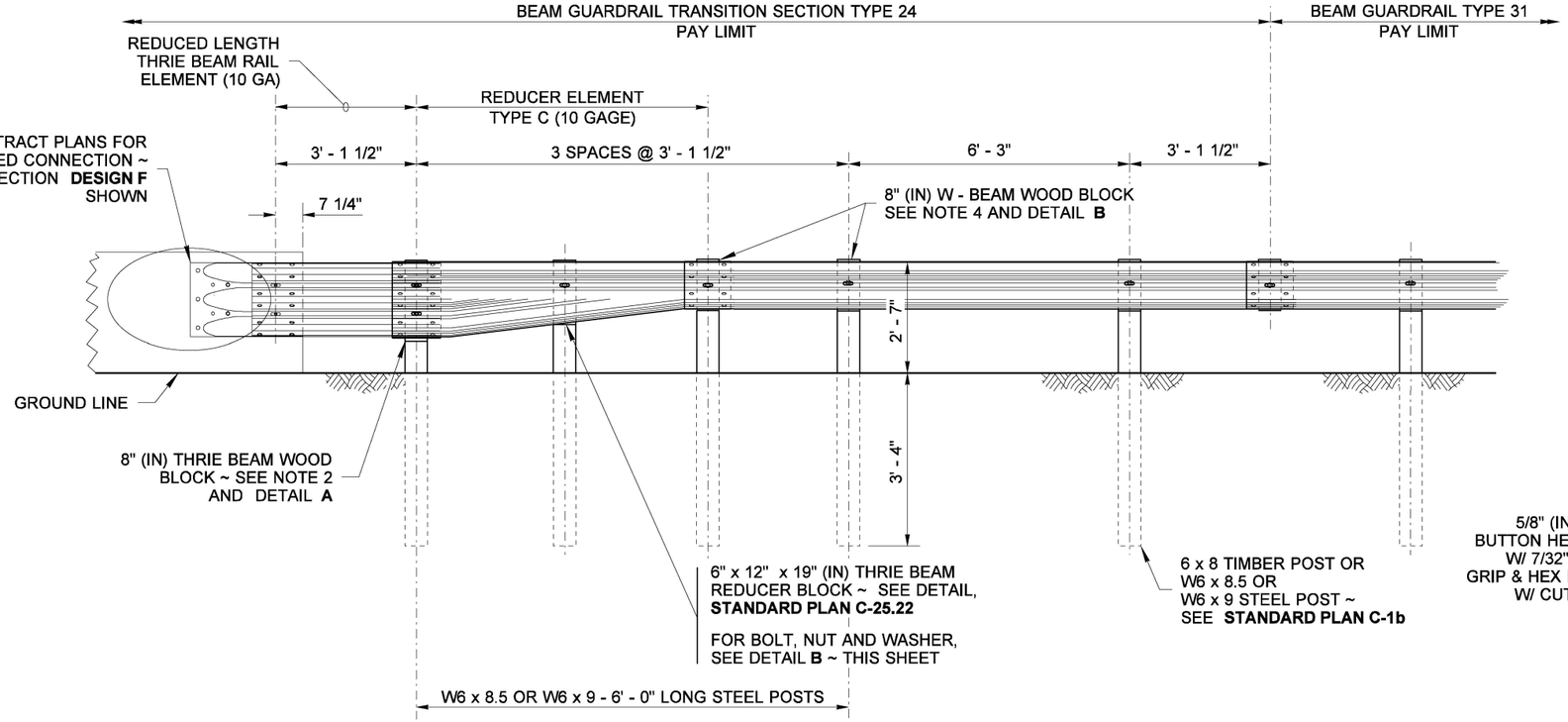
Jul 19, 2024

CONCRETE BARRIER TYPE F (PRECAST) TERMINAL

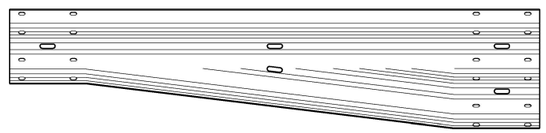
STANDARD PLAN C-60.80-02

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Mark A Haines Jul 21, 2024
STATE DESIGN ENGINEER
Washington State Department of Transportation

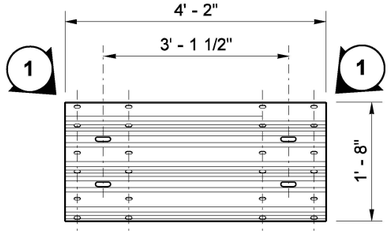


ELEVATION VIEW

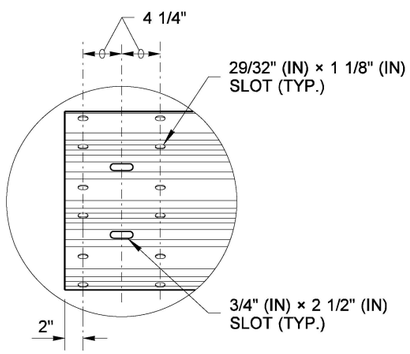


LEFT

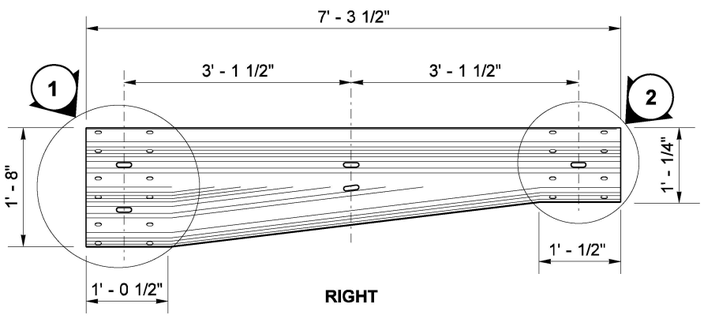
(MIRROR OF RIGHT)



REDUCED LENGTH THRIE-BEAM RAIL ELEMENT 10 GAGE

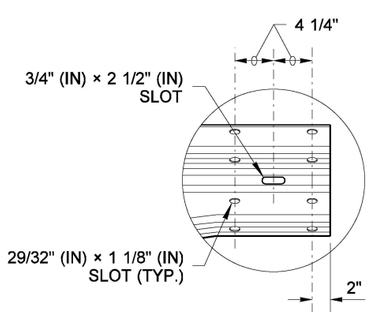


DETAIL 1



RIGHT

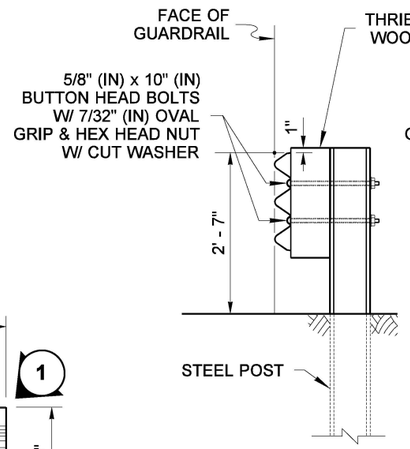
REDUCER ELEMENT TYPE C



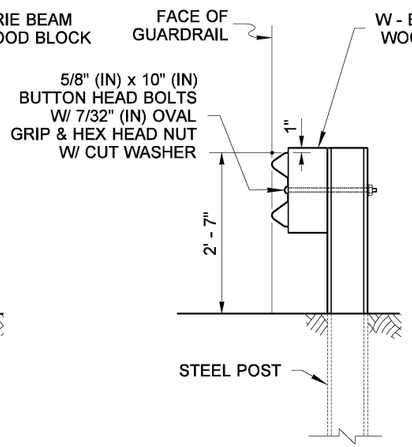
DETAIL 2

NOTES

1. This guardrail transition is for connection to a vertical concrete shape, a single slope, or a safety-shape barrier. The toe of the single slope and the safety-shape barrier shall be tapered or the barrier blocked out so that the toe of the barrier does not project beyond the face of the approach guardrail.
2. See **Standard Plan C-1b** for thrie beam wood block detail.
3. See **Standard Plan C-20.10** for typical components (nuts,washers and bolts) at splices.
4. See **Standard Plan C-1b** for W-Beam wood block detail.
5. All rail sections shall be lapped in the direction of traffic.
6. See **Standard Plan C-24.10** for details regarding connection to bridge rail or traffic barrier.
7. See **Standard Plans A-50.10,** or **A-50.40** for beam guardrail transition grading details at bridge ends.



DETAIL A



DETAIL B



Aug 17, 2021

BEAM GUARDRAIL (TYPE 31) TRANSITION SECTION TYPE 24 (POSTED SPEED 45 MPH AND BELOW)

STANDARD PLAN C-25.30-01

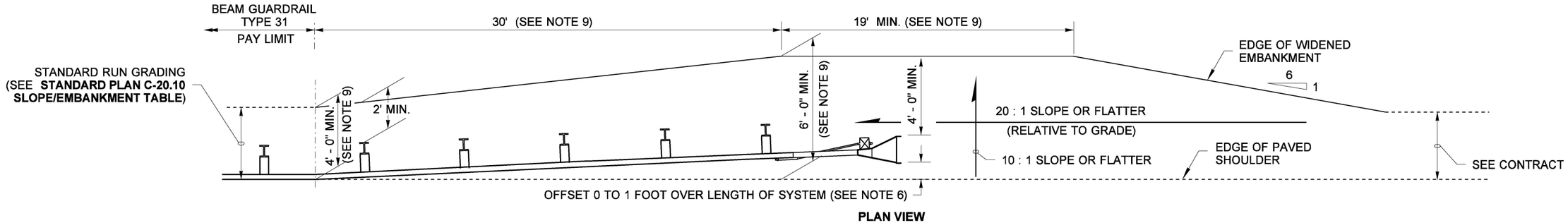
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

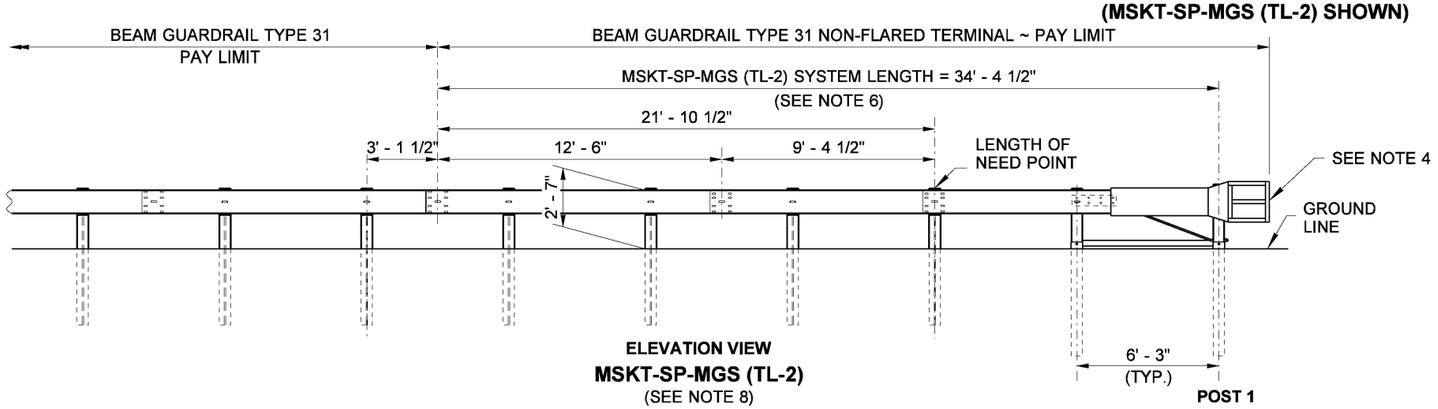
Aug 20, 2021

STATE DESIGN ENGINEER

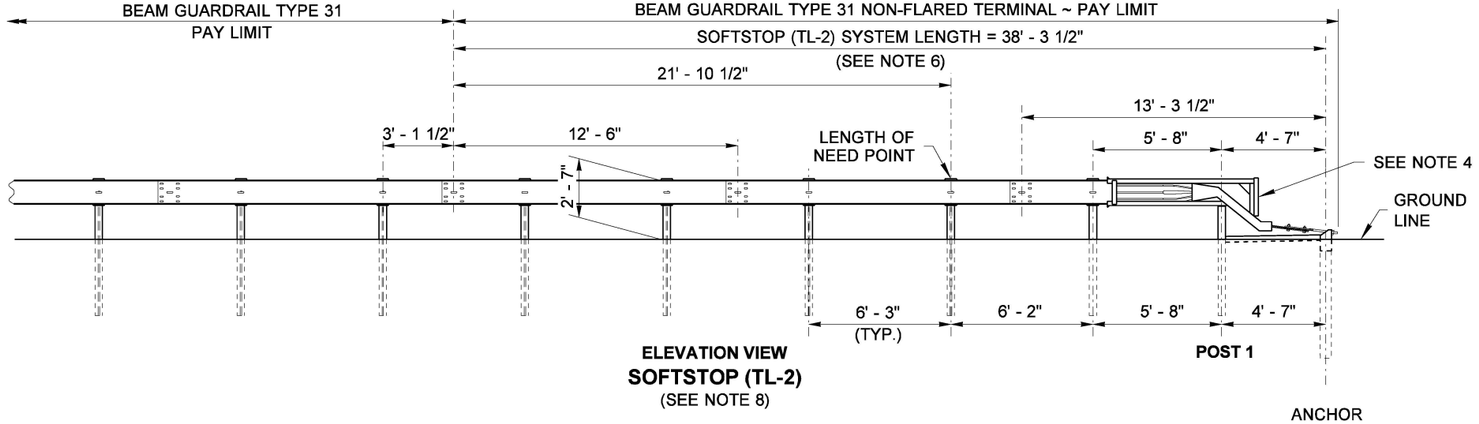
Washington State Department of Transportation



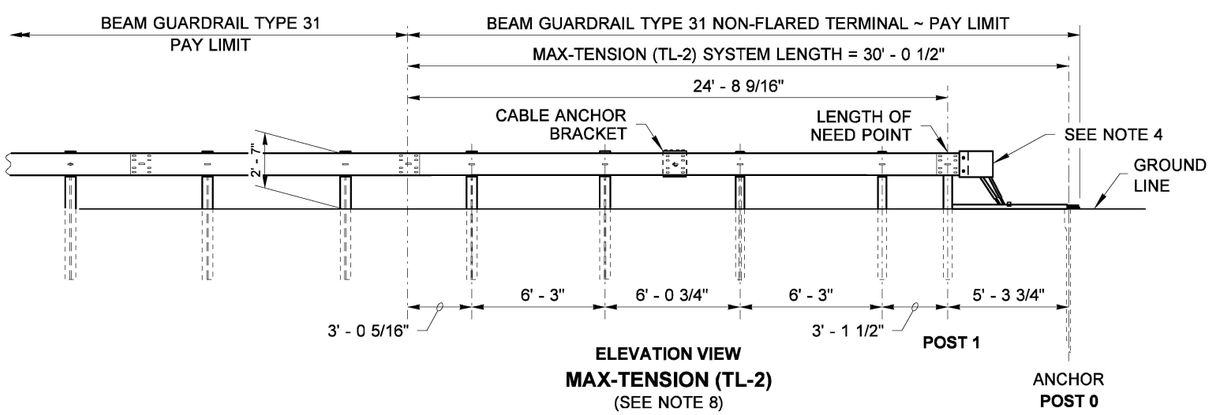
PLAN VIEW
(MSKT-SP-MGS (TL-2) SHOWN)



ELEVATION VIEW
MSKT-SP-MGS (TL-2)
(SEE NOTE 8)



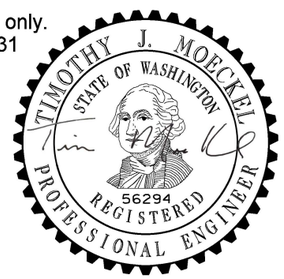
ELEVATION VIEW
SOFTSTOP (TL-2)
(SEE NOTE 8)



ELEVATION VIEW
MAX-TENSION (TL-2)
(SEE NOTE 8)

NOTES

1. The Implementation of the Manual for Assessment of Safety Hardware (MASH) criteria may result in the acceptance of guardrail terminal systems currently not shown on this plan. Non-Flared terminals shall be selected from the WSDOT Qualified Products List (QPL) or approved through the WSDOT Request for Approval of Materials (RAM) process.
2. This terminal is MASH compliant at Test Level Two (TL-2) and may be used in applications with posted speed of 45 mph or less.
3. An MSKT-SP-MGS (TL-2) as manufactured by Road Systems, Inc, SOFTSTOP (TL-2) as manufactured by Trinity Highway Products, LLC, or MAX-TENSION (TL-2) as manufactured by Lindsay Transportation Solutions, shall be installed according to manufacturer's recommendations.
4. A reflectorized object marker shall be installed according to manufacturer's recommendations.
5. Snow load rail washers are not allowed.
6. Provide an offset between 0 to 1 foot so that the impact head does not encroach onto the paved shoulder. The offset is provided over the length of the terminal system from the center of the last post splice to either: (1) The face of the impact head at its leading edge (MSKT-SP-MGS), or (2) The center of anchor **Post 0** (Softstop or Max-Tension). Provide the maximum offset where practicable.
7. For terminal details, see WSDOT approved manufacturer's drawings.
8. These terminals are supplied with steel posts only. They can be used with beam guardrail Type 31 runs, composed of steel or wood guardrail posts.
9. The widened embankment dimensions shown on this plan will satisfy the installation requirements of all 3 guardrail terminal systems shown on this plan.



Jul 18, 2024

BEAM GUARDRAIL TYPE 31 NON-FLARED TERMINAL (POSTED SPEED 45 MPH AND BELOW)

STANDARD PLAN C-22.45-07

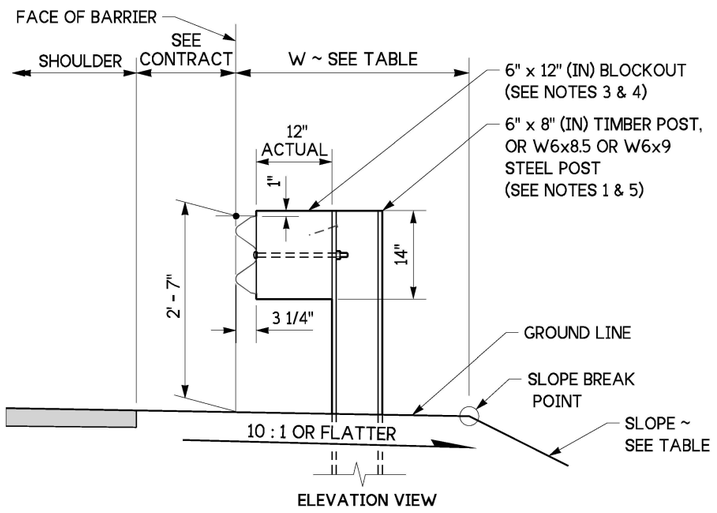
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

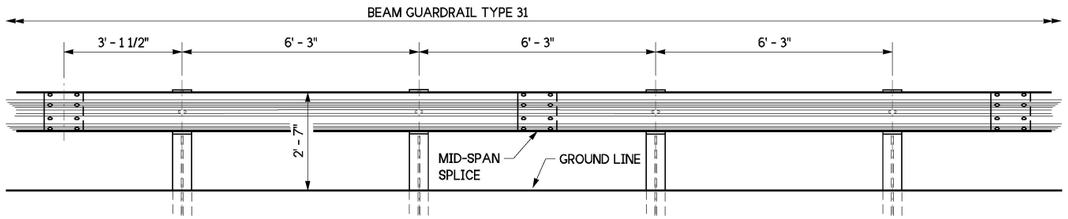
Mark A Dawes Jul 21, 2024

STATE DESIGN ENGINEER

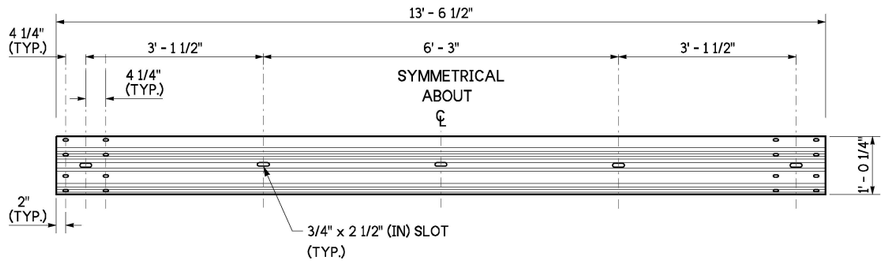
Washington State Department of Transportation



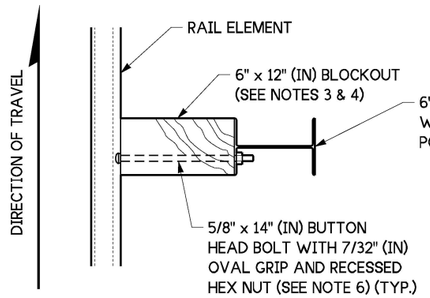
TYPICAL ELEVATION ~ WITHOUT CURB



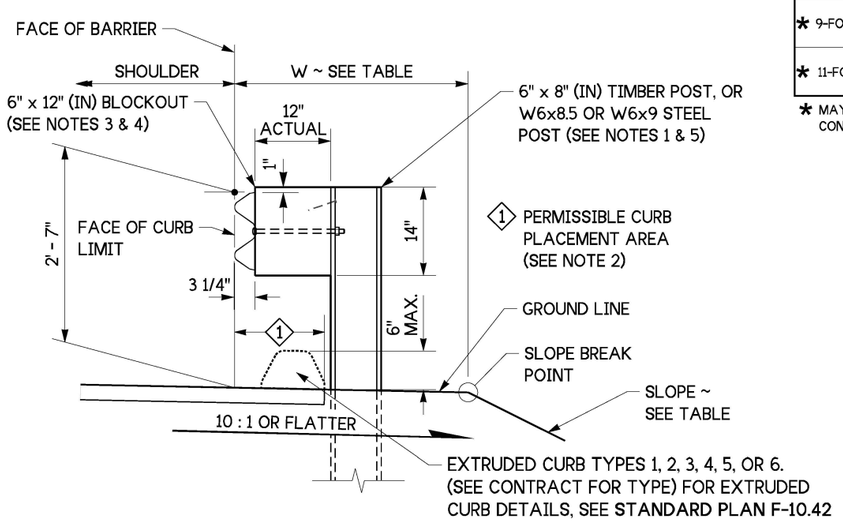
TYPICAL ELEVATION



TYPICAL RAIL ELEMENT



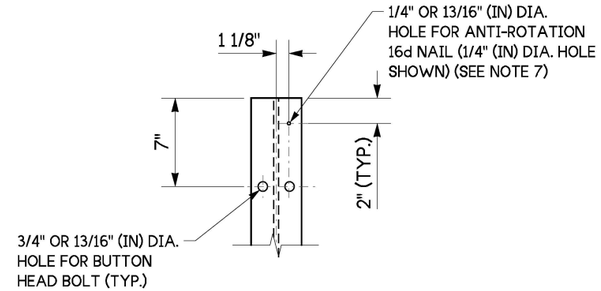
PLAN VIEW



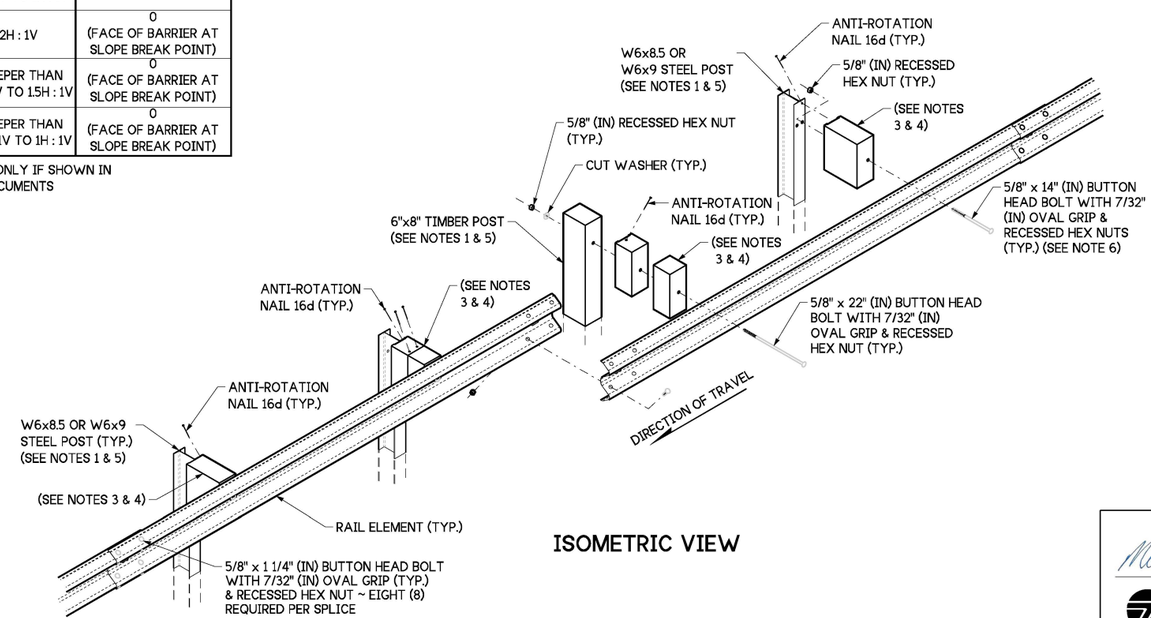
TYPICAL SECTION ~ WITH CURB

SLOPE/EMBANKMENT TABLE FOR 6', 8', 9', AND 11' LONG POSTS		
POST LENGTH	SLOPE	W (FT)
6-FOOT	2H : 1V OR FLATTER	2.5 MIN.
6-FOOT	1H : 1V OR FLATTER	4.0 MIN.
8-FOOT	STEEPER THAN 2H : 1V TO 1H : 1V	2.5 MIN.
8-FOOT	2H : 1V	0 (FACE OF BARRIER AT SLOPE BREAK POINT)
* 9-FOOT	STEEPER THAN 2H : 1V TO 1.5H : 1V	0 (FACE OF BARRIER AT SLOPE BREAK POINT)
* 11-FOOT	STEEPER THAN 1.5H : 1V TO 1H : 1V	0 (FACE OF BARRIER AT SLOPE BREAK POINT)

* MAY BE USED ONLY IF SHOWN IN CONTRACT DOCUMENTS



STEEL POST



ISOMETRIC VIEW

NOTES

1. Refer to **Standard Plan C-1b** for additional details not shown on this plan.
2. Extend shoulder pavement to provide a base for the extruded curb. See Contract Plans for exceptions to distances shown.
3. Use a single block or combination of blocks (no more than two (2) to achieve the actual 12" (in) offset. See **Standard Specification Section 9-16.3(2)**. Wood blocks shall be secured to the posts with anti-rotation nails. If combination blocks are used, the adjacent blocks shall be toenailed with two 16d galvanized nails to prevent block rotation.
4. Wood blocks are shown. Blocks of an approved alternative material may be used. See **Standard Specification Section 9-16.3(2)**.
5. All posts for any standard barrier run shall be of the same type; timber or steel.
6. Attach blockouts to steel posts using bolt holes on approaching traffic side of post web.
7. Anti-rotation holes in steel posts are not required when using blocks with anti-rotation features (e.g., routered blocks).



Oct 12, 2023

BEAM GUARDRAIL TYPE 31

STANDARD PLAN C-20.10-09

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Mark A Staines Oct 12, 2023

STATE DESIGN ENGINEER

Washington State Department of Transportation