2024 OREGON STANDARD DRAWINGS

Standard Distribution
Date of Issue: January 2026

Chris A. Bores 2026.02.06 14:34:51 -08'00'

Chris Bores, PE
Senior Standards Engineer

This is the January 2026 release of the 2024 Oregon Standard Drawings.

For ODOT Projects, the details in the standard drawings will be effective on the **June 1, 2026,** bid opening where these drawings are called for in the project plans.

These drawings are for use with projects using the **2024 Oregon Standard Specifications.**

The drawing "effective date" is located below the title block on each Standard Drawing. The bid opening date of a project should be in the effective date window of the drawings. This will ensure the correct drawings are being used on the projects.

Electronic PDF files with the effective date for each drawing are on the web at:

http://www.oregon.gov/ODOT/Engineering/Pages/Standards.aspx

Each standard drawing has a corresponding Standard Drawing Reports that contains useful information for the designer as well as updates that occur on the drawing. The link to the report is the title of the specific drawing on the webpage.

The following Standard Drawings were updated for the January 2026 release:

Drawing Number	Comment
RD388	
RD398	
RD410	
RD442	Retired Drawing
RD442A	New Drawing (Formerly RD442)
RD442B	New Drawing
RD486A	New Drawing
RD486B	New Drawing
RD486C	New Drawing
RD486D	New Drawing
RD488A	New Drawing
RD488B	New Drawing
RD488C	New Drawing
RD490A	
RD490C	

Drawing Number	Comment
RD535	Retired Drawing
RD535A	New Drawing (Formerly RD535)
RD535B	New Drawing (Formerly RD536)
RD536	Retired Drawing
RD582	New Drawing
RD710A	
RD710B	
RD711	
RD770	
RD906	
BR165	
BR192	
BR207	
BR220	
BR230	
BR233	
BR246	
BR250	
BR256	
BR266	Discontinued Drawing
BR273	
BR295	New Drawing
BR296	New Drawing
TM223	
TM240	
TM453	
TM454	
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TM482	
TM492	
TM493	
TM504	
TM505	
TM679	
TM701	
TM850	
TM854	

OREGON STANDARD DRAWINGS 2024
NUMBERS AND REVISION DATES

DRAWING NUMBER	REVISION DATE
RD100	1/2024
RD101	1/2024
RD110	
RD115	
RD120	
RD130	
RD140	
RD150	
RD160	
RD170	
RD250	
RD254	
RD255	
RD258	
RD262	
RD266	
RD270	
RD274	
RD278	
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RD286	
RD300	
RD302	
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RD306	
RD308	
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RD317	
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RD319	
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RD321	
RD322	1/2024
RD324	1/2024
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RD386	
RD388	1/2026
RD390	
RD391	
RD393	
RD398	1/2026
RD399	
RD400	
RD401	
RD402	7/2025
RD403	
RD404	
RD405	
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RD409	
RD410	1/2026
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RD417	
RD419	
RD420	1/2024
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RD435	
RD436	
RD437	
RD438	7/2024
RD440	
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RD442A	1/2026
RD442B	1/2026
RD443	1/2024
RD444	1/2024
RD445	
RD450	
RD451	1/2024
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RD471	1/2024
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RD474	
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RD482	
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RD484B	7/2024
RD486A	1/2026
RD486B	1/2026
RD486C	1/2026
RD486D	1/2026
RD488A	1/2026
RD488B	1/2026
RD488C	1/2026
RD490A	1/2026
RD490B	7/2024
RD490C	1/2026
RD490D	7/2024
RD490E	7/2024
RD490F	7/2024
RD490G	7/2024
RD490H	7/2024
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RD502	7/2024
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OREGON STANDARD DRAWINGS 2024
NUMBERS AND REVISION DATES

DRAWING NUMBER	REVISION DATE
RD526	
RD530	
RD535	Retired 1/2026
RD535A	1/2026
RD536	Retired 1/2026
RD535B	1/2026
RD545	7/2024
RD546	7/2024
RD548A	7/2025
RD548B	1/2025
RD550	
RD560	
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RD576	
RD580	
RD581	
RD582	1/2026
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RD615	
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RD701	
RD702	1/2024
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RD707	
RD710	Discontinued 7/2025
RD710A	1/2026
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RD722	7/2025
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RD913	1/2025
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BR246	1/2026
BR250	1/2026
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BR266	Discontinued 1/2026

OREGON STANDARD DRAWINGS 2024
NUMBERS AND REVISION DATES

DRAWING NUMBER	REVISION DATE
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TM620	
TM621	7/2024
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TM623	
TM624	7/2025

OREGON STANDARD DRAWINGS 2024
NUMBERS AND REVISION DATES

DRAWING NUMBER	REVISION DATE	DRAWING NUMBER	REVISION DATE	DRAWING NUMBER	REVISION DATE
TM625		TM840	7/2025		
TM626		TM841	7/2024		
TM627		TM842	1/2024		
TM628	1/2025	TM843			
TM629		TM844			
TM630	7/2025	TM845			
TM631		TM850	1/2026		
TM635		TM851			
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TM652	1/2024	TM854	1/2026		
TM653		TM855	7/2025		
TM654		TM860			
TM655	1/2024	TM861			
TM656		TM862			
TM657		TM870			
TM658		TM871			
TM670	1/2024	TM880			
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TM700	1/2025				
TM701	1/2026				
TM702	7/2025				
TM800	7/2024				
TM810					
TM820					
TM821					
TM822					
TM830	7/2024				
TM831					
TM832					
TM833					

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-L-

-M-

-P-

-R-

-S-

-T-

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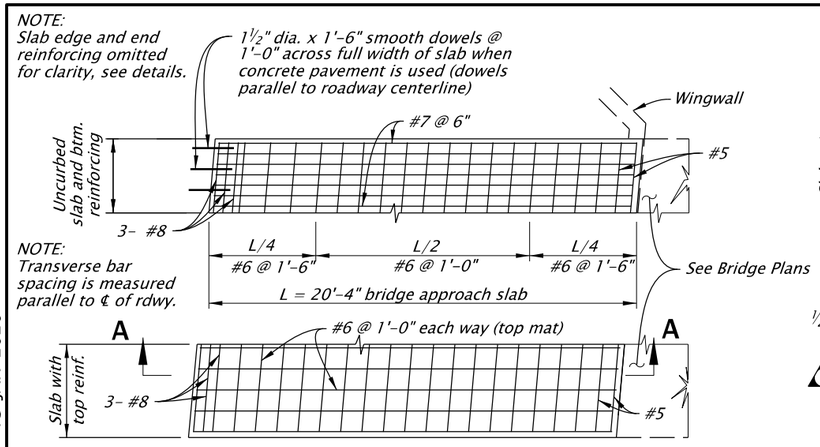
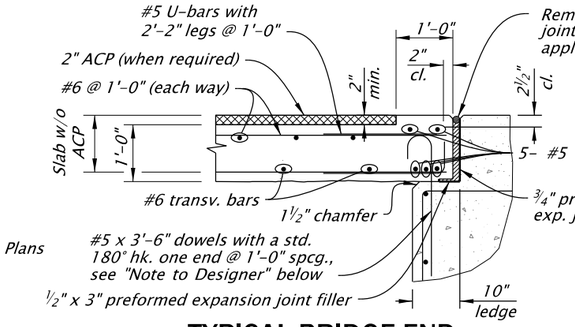
-W-

13-JAN-2026

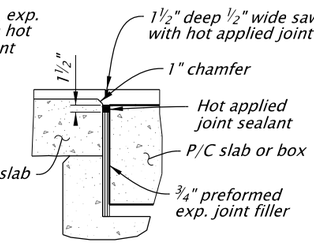
BR165.dgn



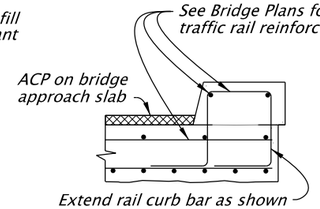
1 PLAN - TYPICAL APPROACH SLAB



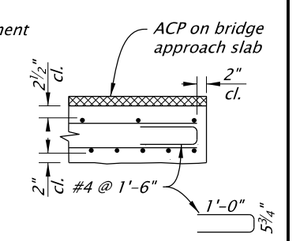
1 TYPICAL BRIDGE END WITHOUT EXPANSION JOINT BLOCKOUT



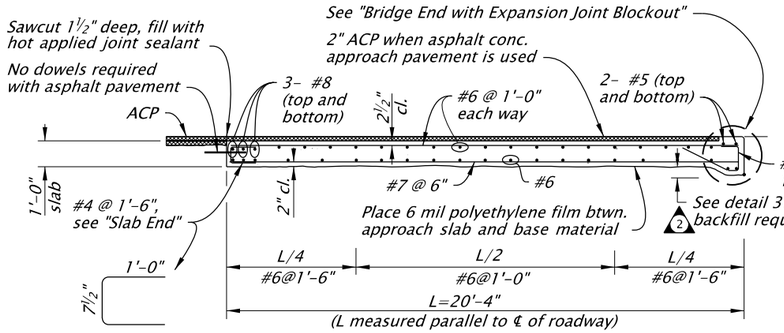
1 DETAIL "A" JOINT DETAIL with SLABS or BOXES



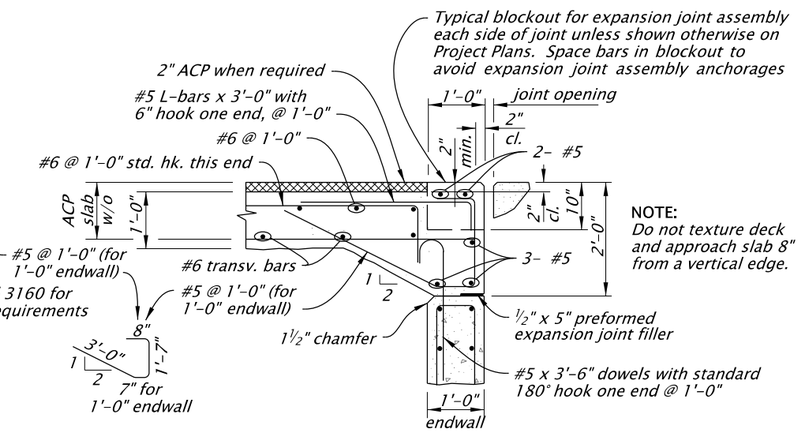
1 CURB EDGE



1 UNCURBED EDGE

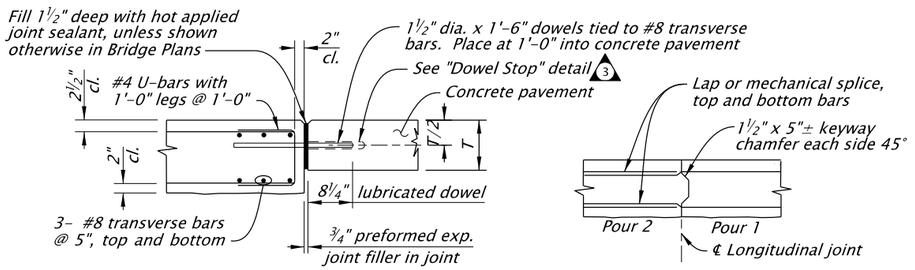


1 SECTION A-A



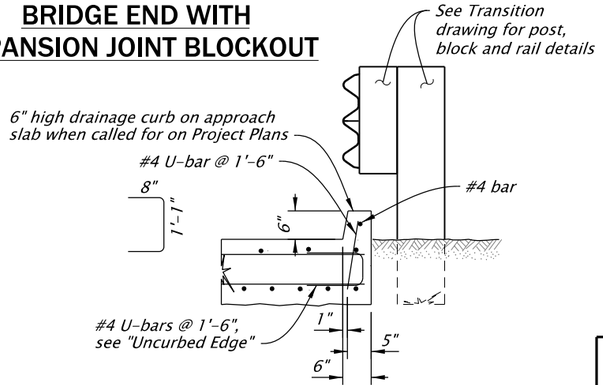
NOTE:
Do not texture deck and approach slab 8" from a vertical edge.

1 BRIDGE END WITH EXPANSION JOINT BLOCKOUT

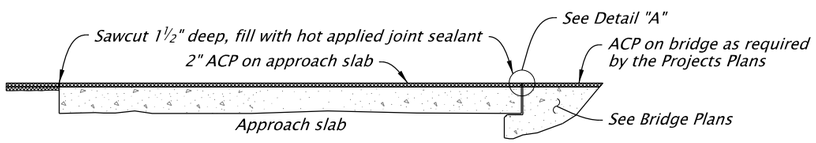


1 SLAB END

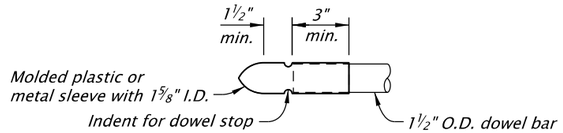
LONGITUDINAL JOINT



1 DRAINAGE CURB EDGE



1 APPROACH SLAB WITH ASPHALT PAVEMENT ON BRIDGE



3 DOWEL STOP

GENERAL NOTES:

1. *See Project Plans for bridge rail, median barrier, and/or guardrail transition details.*
2. *Bridge approach slab designed for HL-93 loading according to AASHTO LRFD Bridge Design Specifications with an allowance of 25 psf for present wearing surface and 25 psf for future wearing surface (Span = 17'-4").*
3. *Provide Class HPC-IC 4500 - 1 or 1½ concrete.* 4
4. *Provide reinforcing steel conforming to AASHTO Specification M31 (ASTM A615) Grade 60 or A706. Place steel 2" clear of nearest face of concrete unless shown otherwise. Use the following splice lengths unless shown otherwise:*

Bar Size		3	4	5	6	7	8	9	10	11
Splice Length	Uncoated	1'-4"	1'-6"	1'-11"	2'-3"	2'-7"	3'-0"	3'-4"	3'-9"	4'-2"
	Epoxy Coated	1'-8"	2'-3"	2'-10"	3'-4"	3'-11"	4'-5"	5'-0"	5'-8"	6'-3"

5. *Provide ¾" chamfer at all top transverse concrete edges (each end of approach slab and each end of bridge).*
6. *Longitudinal construction joints are allowed only when permitted by the Engineer or when shown on the Project Plans.*
7. *When a longitudinal construction joint is permitted, locate joint on a lane line.*
8. *Provide dowels conforming to AASHTO Specification M31 (ASTM A615) .*
9. *Use the details on this sheet unless shown otherwise on the Project Plans.*
10. *Flare approach slab as required. Maintain bottom longitudinal bars spacing requirements at midspan.*
11. *Support top and bottom mat reinforcing steel at 3'-0" max. centers each way. Use #4 C-bars with 8" legs, or approved bar support chairs for top mat.*
12. *For additional reinforcing bars needed in the approach slab, see bridge rail and transition drawings in project plans.*

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

BRIDGE APPROACH SLAB

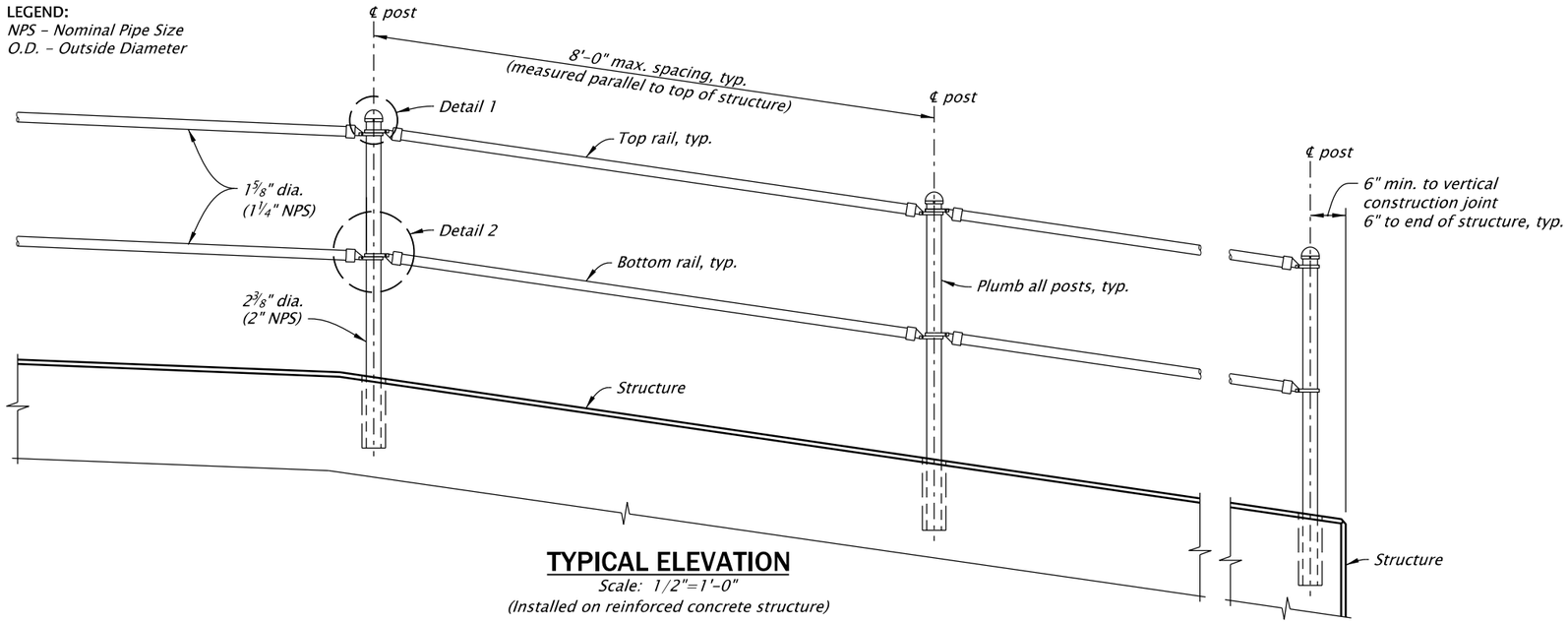
2024

	DATE	REVISION DESCRIPTION
4	07-2020	Changed end panel to approach slab, Removed 30'-4" length; CAD updates.
3	01-2024	General text revisions.
2	07-2025	Add detail callout and Dowel Stop detail; minor text edits.
1	01-2026	Change concrete class.

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **BR165**

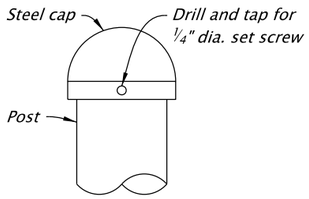
Effective Date: June 1, 2026 - November 30, 2026

LEGEND:
NPS – Nominal Pipe Size
O.D. – Outside Diameter

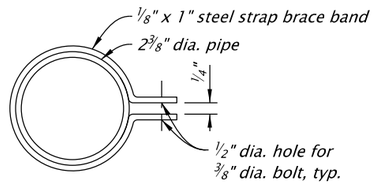


TYPICAL ELEVATION
Scale: 1/2"=1'-0"
(Installed on reinforced concrete structure)

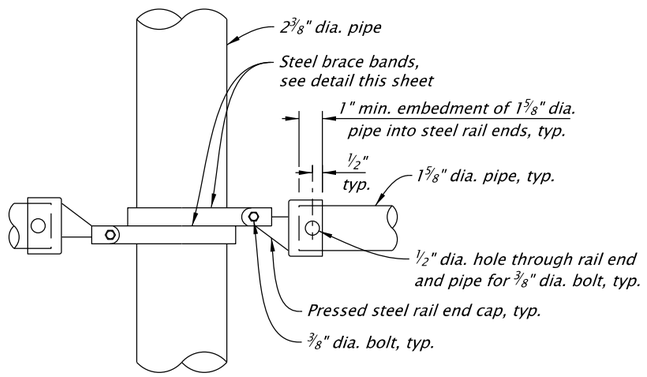
NOTES:
1. *This pipe rail fence meets the requirements for fall prevention in accordance with OAR 437 003 1926.502 and shall not be used for pedestrian applications.*
2. *All posts to be installed vertical and rail to be installed parallel to top of structure.*
3. *Do not install posts across joints.*
4. *Provide schedule 40 post and rail elements according to AASHTO M181, Type 1, Grade 1, with a minimum yield strength of 50 KSI.*
5. *Provide pressed steel fence fittings according to ASTM F626.*
6. *Provide fence hardware according to ASTM A307 or approved equal.*
7. *Hot dip galvanize all steel parts in accordance with AASHTO M111, M232 or ASTM F2329 after fabrication, unless noted otherwise.*
8. *Provide cellular molded type expanded polystyrene with a density of 1.5 (±0.25) pounds per cubic foot.*
9. *Provide Schedule 40 PVC pipe.*
10. *Provide structural grout from the QPL.*
11. *Place pipe rail fence outside roadway design clear zone, or shielded by a traffic barrier and placed outside the deflection distance of the traffic barrier. For traffic barrier having no deflection distance, the fence shall be placed a minimum horizontal distance of 3'-6" as measured from the top front face of the barrier.*



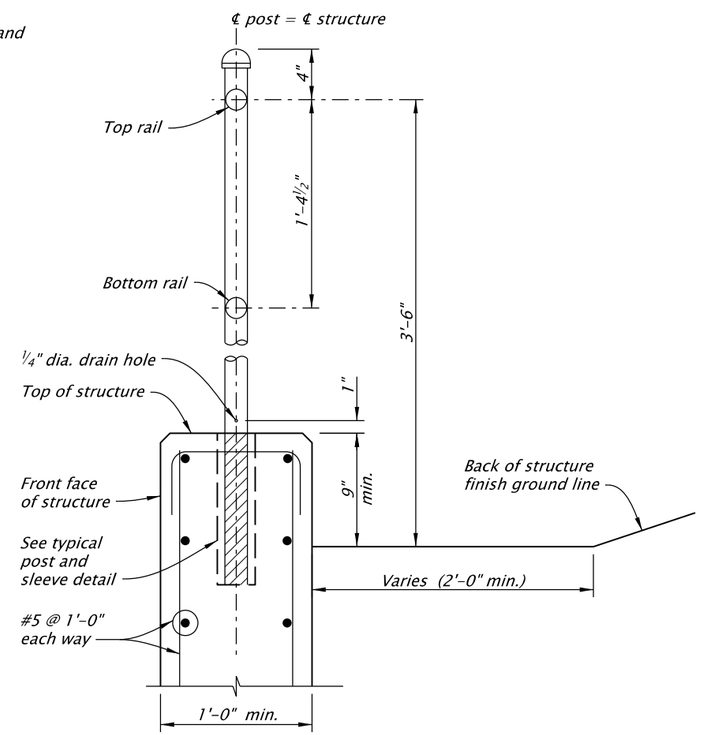
DETAIL 1
Scale: 3"=1'-0"



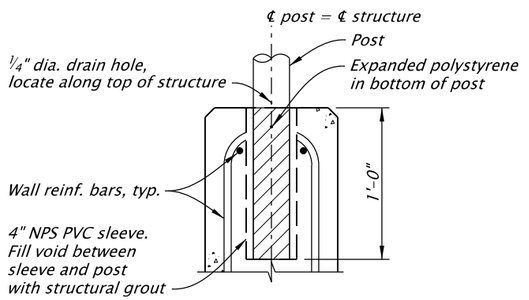
BRACE BAND
Scale: 3"=1'-0"



DETAIL 2
Scale: 3"=1'-0"



SECTION A-A
Scale: 1"=1'-0"



NOTE:
Steel sleeve may be omitted if hole is cored.
Cored holes shall be 3" in diameter and walls roughened.
It is structurally acceptable to core through top transverse ties.

TYPICAL POST AND SLEEVE DETAIL
Scale: 1"=1'-0"

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All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

PIPE RAIL FENCE

SHEET 1 OF 2
2024

DATE	REVISION DESCRIPTION
07-2025	NEW DRAWING
01-2026	Minor revision to Section A-A (fence rail dimension)

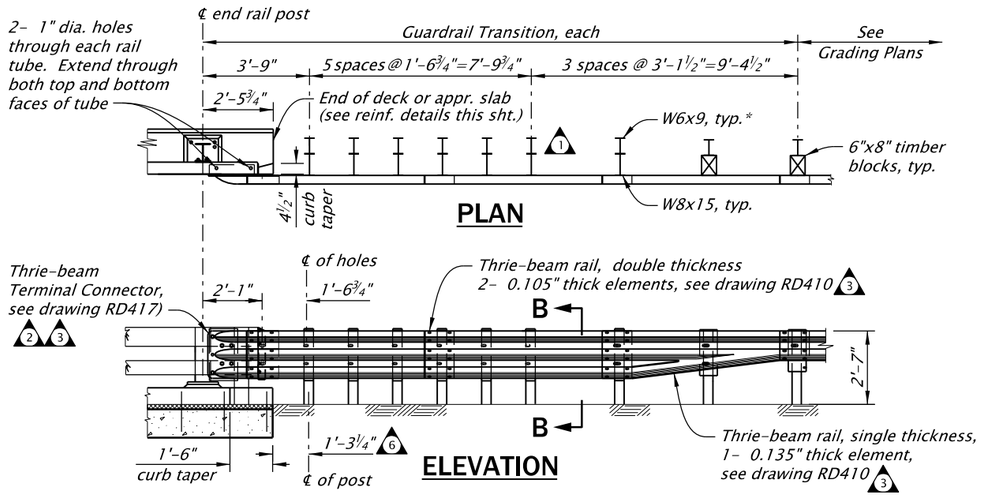
CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **BR192**

Effective Date: June 1, 2026 – November 30, 2026

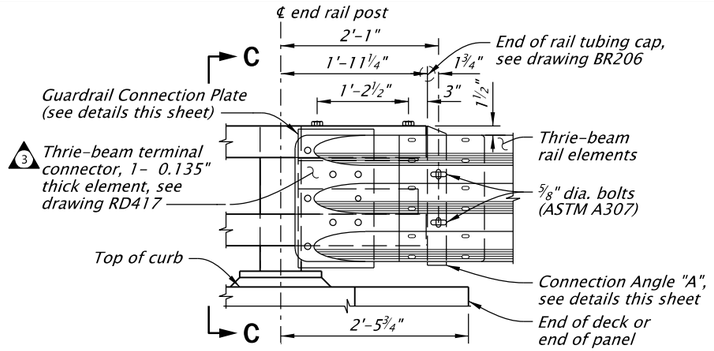
13-JAN-2026
BR192.dgn

13-JAN-2026

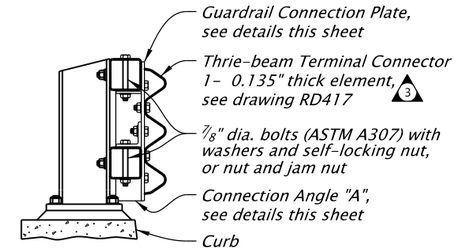
BR207.dgn



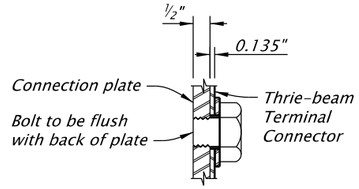
* Transition posts may be steel W6x9 or timber 8"x 8". All posts to be of same material. See drawing BR203 "Thrie-beam Block" for details.



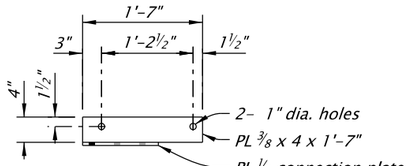
ELEVATION - TRANSITION CONNECTION



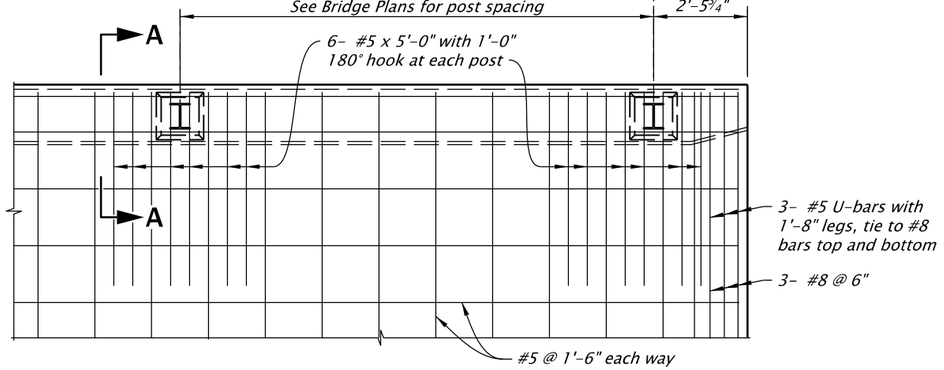
SECTION C-C



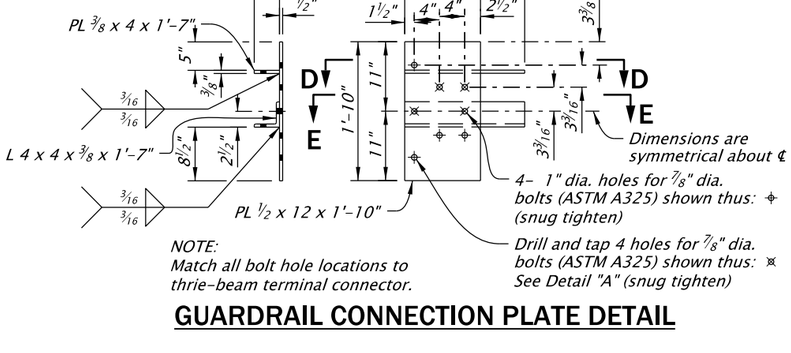
DETAIL "A"



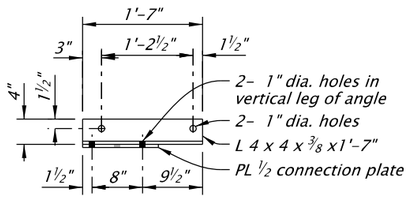
SECTION D-D



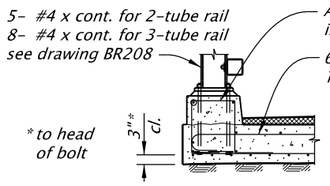
1 APPROACH SLAB TOP REBAR AT RAIL POSTS



GUARDRAIL CONNECTION PLATE DETAIL



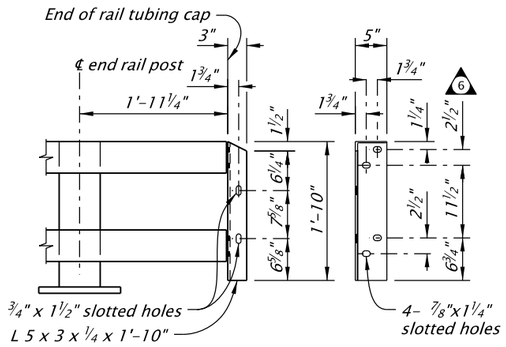
SECTION E-E



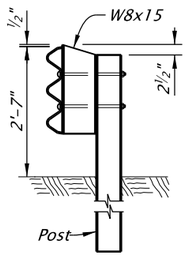
SECTION A-A

NOTES: 1
For approach slab reinforcement not shown, see project plans.

For rail and curb details not shown, see drawing BR206 or BR208.



CONNECTION ANGLE "A"



SECTION B-B

GENERAL NOTES:
Rail designed and crash tested to meet NCHRP 350 TL-4 requirements.

Provide steel plates and wide-flange posts conforming to AASHTO M183 (ASTM A36).

1 3 ACCOMPANIED BY DRAWINGS:
BR203, BR206, RD401, RD402, RD407, RD408, RD417, RD412

All materials shall be in accordance with the current Oregon Standard Specifications.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

2-TUBE CURB MOUNT RAIL TRANSITION

2024

	DATE	REVISION DESCRIPTION
6	01-2024	General text revisions.
5	07-2024	General text revisions.
4	01-2025	Thrie-beam transition revised; CAD standards updates.
3	07-2025	Dimension edit in Elevation view.
2	01-2026	Redrawn; minor corrections.

CALC. BOOK NO. 4057 & 4058 | SDR DATE 13-JAN-2026 | **BR207**

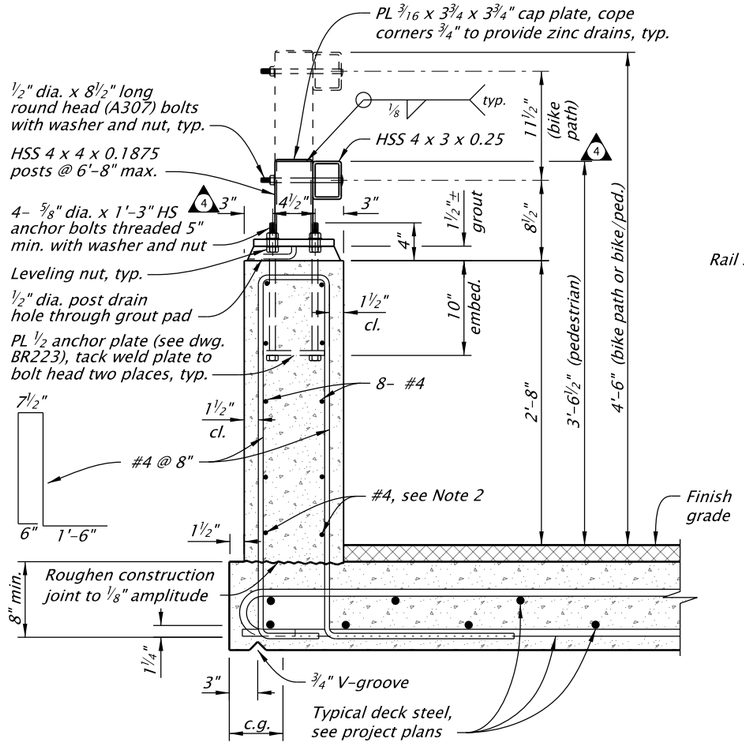
Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

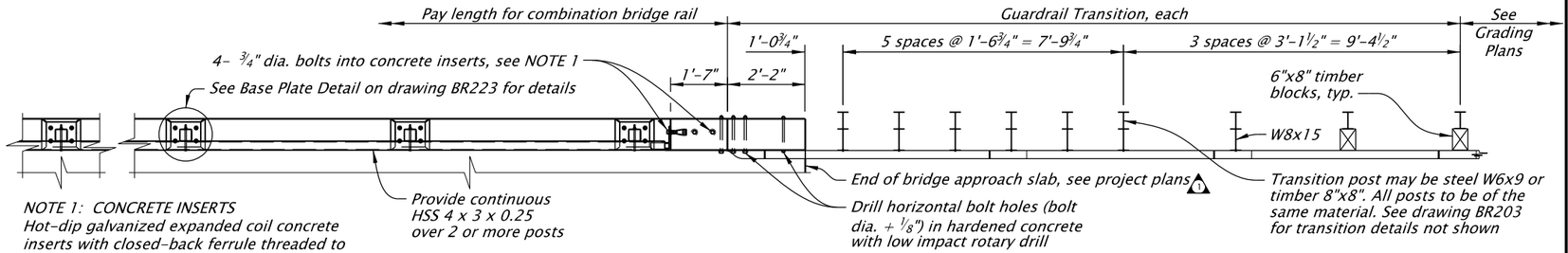
BR220.dgn

ESTIMATED QUANTITIES

		3'-6½" rail	4'-6" rail
Concrete Volume	(ft³/ft)	2.26	2.26
Reinforcement Weight	(lbs/ft)	23.39	23.39
Structural Steel Weight	(lbs/ft)	18.0	30.0
Total Rail Weight	(lbs/ft)	357	369
Center of Gravity	(cg, ft)	0.572	0.581



TYPICAL RAIL SECTION

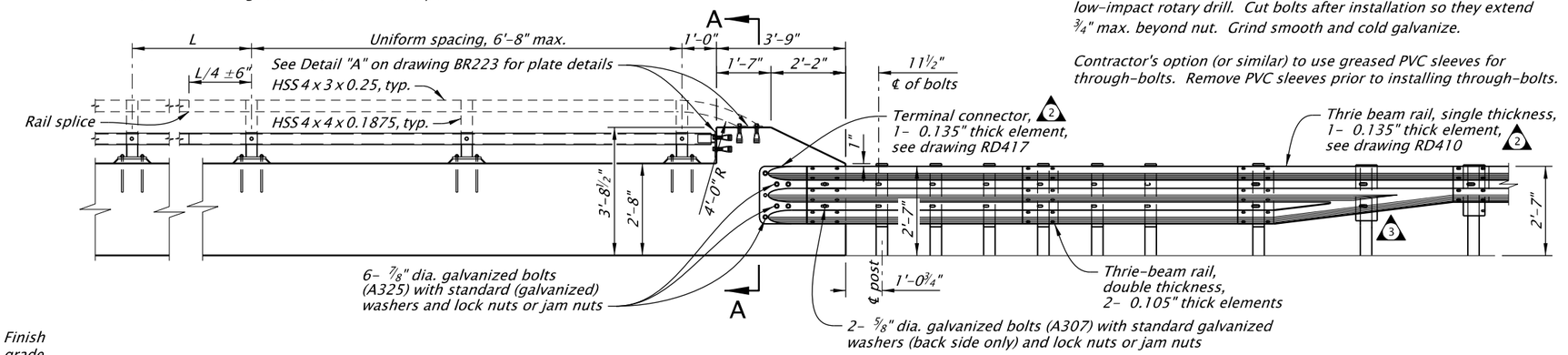


NOTE 1: CONCRETE INSERTS
Hot-dip galvanized expanded coil concrete inserts with closed-back ferrule threaded to receive ¾" dia. bolts, Grade 36 (ASTM A307).
Minimum insert length = 4½"
Minimum safe working load in tension = 4000 pounds

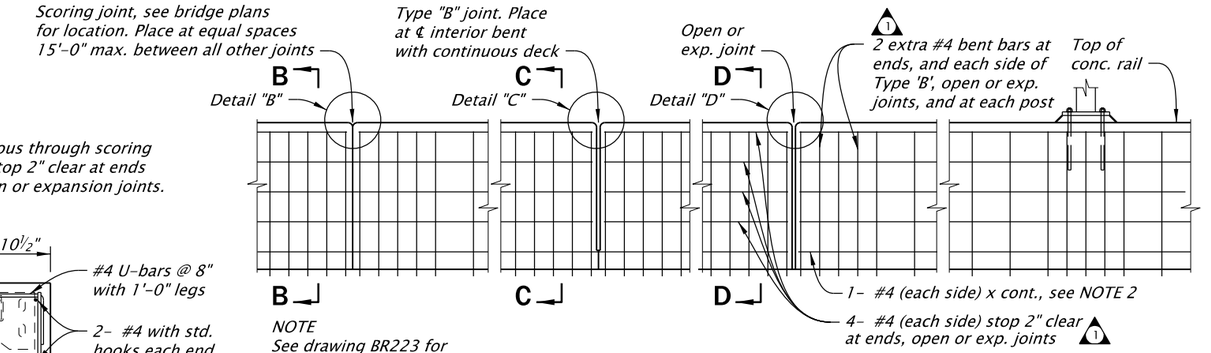
PLAN: TRANSITION RAIL DETAIL

NOTES:
Drill horizontal holes (bolt dia. + ⅛") in hardened concrete with low-impact rotary drill. Cut bolts after installation so they extend ¾" max. beyond nut. Grind smooth and cold galvanize.

Contractor's option (or similar) to use greased PVC sleeves for through-bolts. Remove PVC sleeves prior to installing through-bolts.



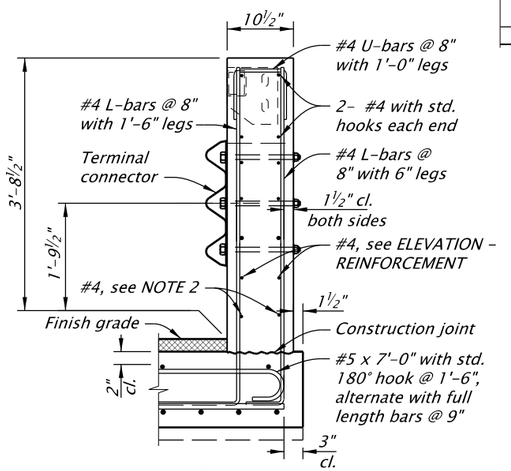
ELEVATION: TRANSITION RAIL DETAIL



NOTE 2
Continuous through scoring joints, stop 2" clear at ends and open or expansion joints.

NOTE
See drawing BR223 for Sections B-B, C-C, and D-D; and Details A, B, C, and D .

ELEVATION - REINFORCMENT



SECTION A-A 1

GENERAL NOTES:
Provide steel tubing conforming to ASTM A500, Grade B, A501 or A618.

Provide reinforcing steel conforming to ASTM A706, or AASHTO M31 (ASTM A615) Grade 60. Splice #4 bars 1'-4" min.

Provide concrete Class 3300 - 1½ or ¾.

Provide steel posts and plates conforming to AASHTO M183 (ASTM A36) unless otherwise noted.

Provide high strength anchor bolts (Grade 105) according to Oregon Standard Specification 02560.30 (b). 5

Construct rail (posts and parapet) normal to grade in the longitudinal direction and vertical in the transverse direction.

Hot-dip galvanize structural steel including fasteners after fabrication. Provide Galvanize-Control Silicon posts and horizontal rail steel tubing according to Oregon Standard Specification 02530.70. Tap nuts and inserts 0.021" oversize after galvanizing in accordance with ASTM A563.

Use 4'-6" height for bikeways when called for on project plans.

Accompanied by drawings BR203, BR223, RD401, RD402, RD407, RD408, RD410, RD417, RD412 2

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

FLUSH MOUNTED COMBINATION BRIDGE RAIL

2024

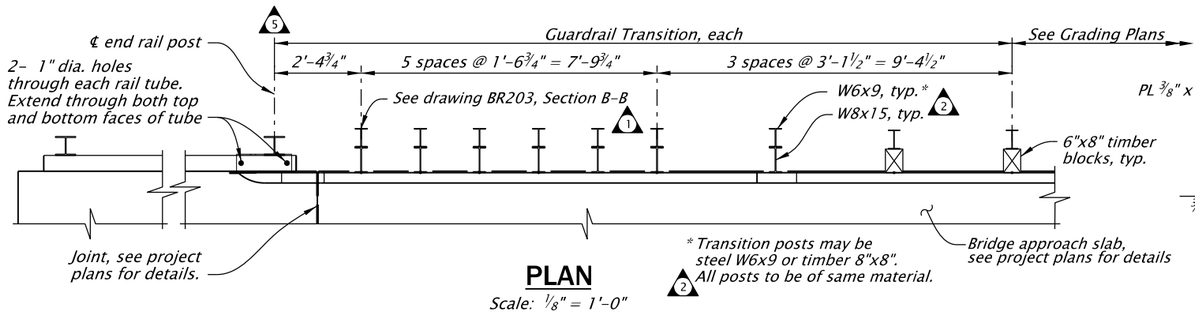
	DATE	REVISION DESCRIPTION
1	01-2023	Revised accompanied by dwg references, General text revisions.
2	07-2024	General text revisions.
3	01-2025	Thrie-beam transition revised; CAD standards updates
4	07-2025	Dimensions adjusted.
1	01-2026	Duplicated note deleted.

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | BR220

Effective Date: June 1, 2026 - November 30, 2026

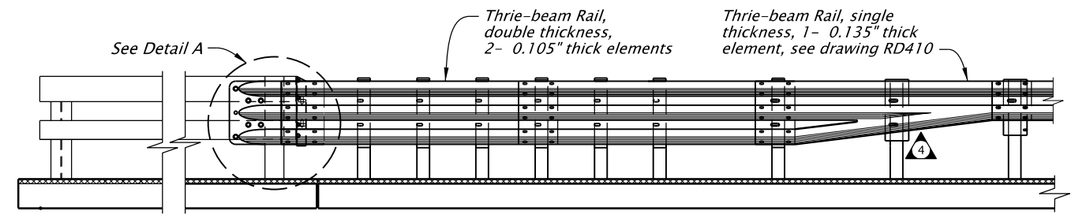
13-JAN-2026

BR230.dgn



PLAN

Scale: ⅛" = 1'-0"



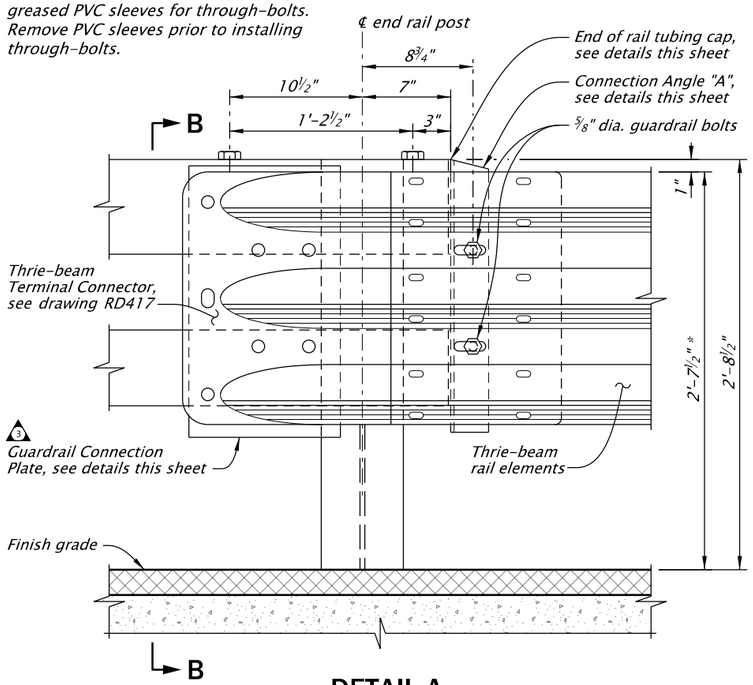
ELEVATION

Scale: ⅛" = 1'-0"

NOTES:

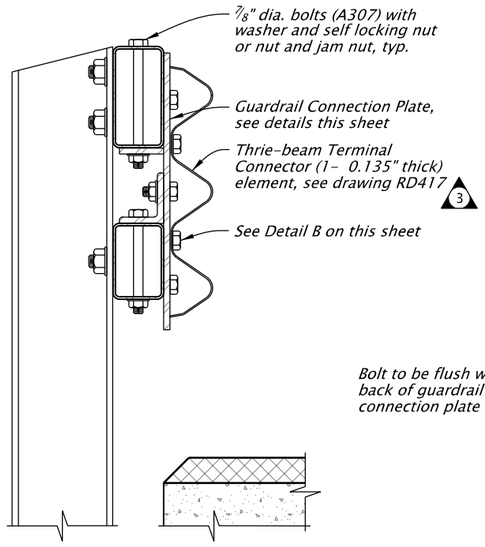
Drill horizontal holes (bolt dia. + ⅛") in hardened concrete with low-impact rotary drill. Cut bolts after installation so they extend ¾" max. beyond nut. Grind smooth and cold galvanize.

Contractor's option (or similar) to use greased PVC sleeves for through-bolts. Remove PVC sleeves prior to installing through-bolts.



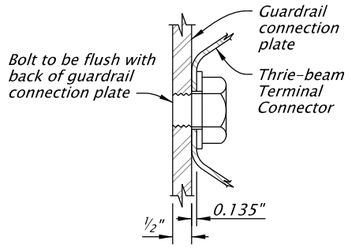
DETAIL A

Scale: 1" = 1'-0"



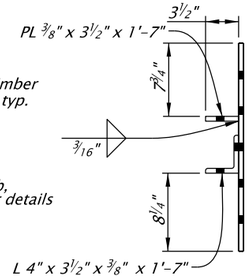
SECTION B-B

Scale: 1" = 1'-0"

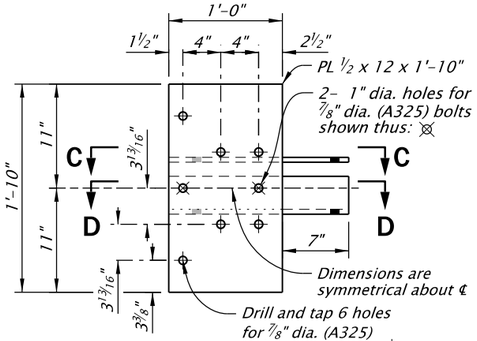


DETAIL B

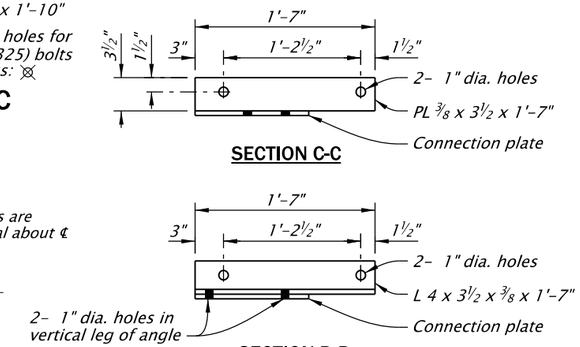
Scale: 3" = 1'-0"



ELEVATION

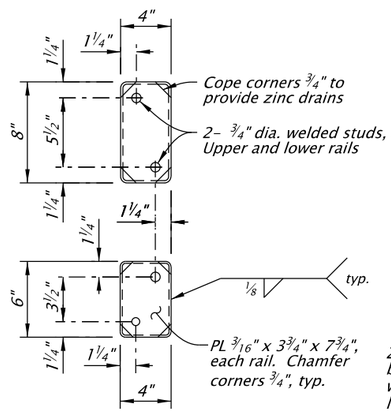


PLAN



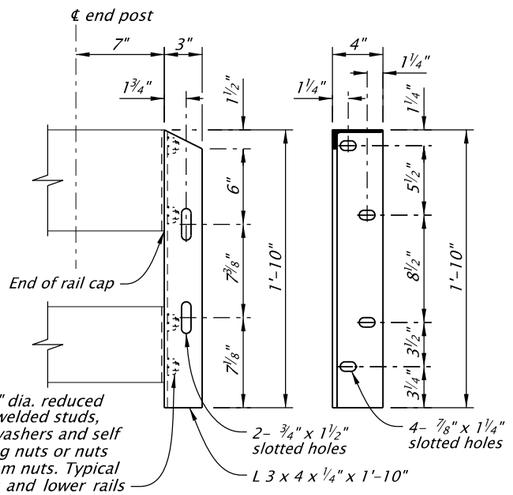
GUARDRAIL CONNECTION PLATE DETAILS

Scale: 1" = 1'-0"



UPPER AND LOWER RAILS

Scale: 1" = 1'-0"



CONNECTION ANGLE "A"

Scale: 1" = 1'-0"

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

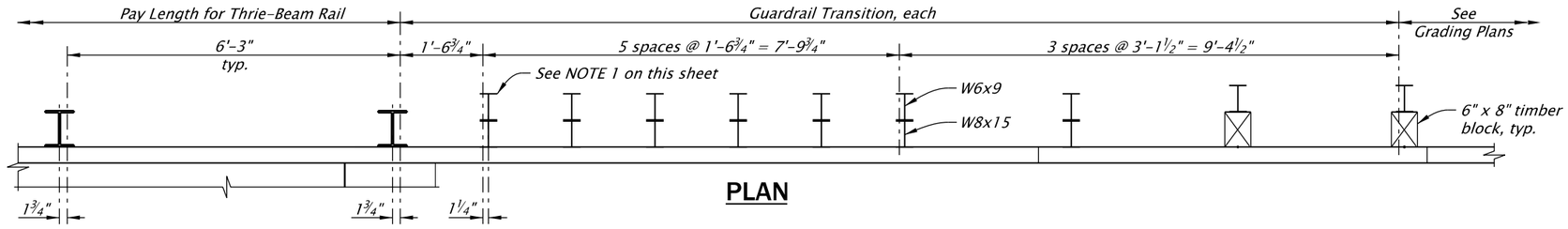
2-TUBE SIDE MOUNT RAIL TRANSITION

2024

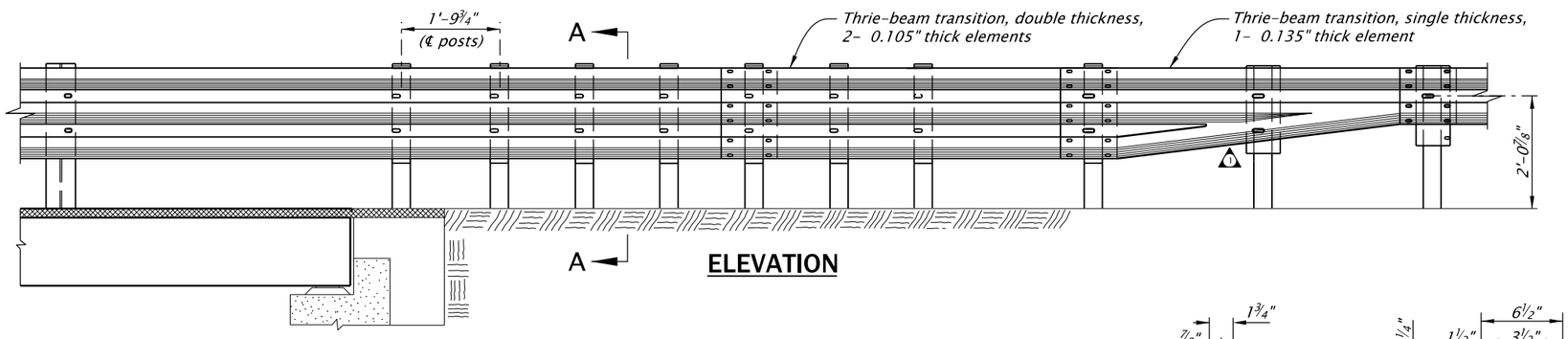
	DATE	REVISION DESCRIPTION
4	09-2020	Updated section note and removed note 3.
5	01-2022	Replaced timber block with W8x15 to be consistent to BR203.
6	07-2024	General text revisions.
7	01-2025	Thrie-beam transition revised: CAD standards updates
8	01-2026	Minor dimension line edit.

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **BR230**

Effective Date: June 1, 2026 - November 30, 2026



PLAN



ELEVATION

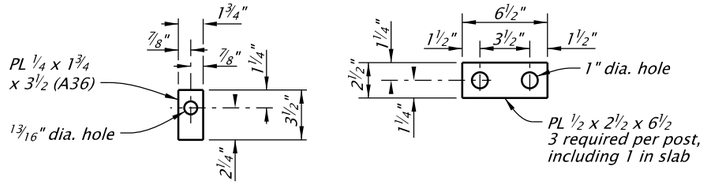


PLATE WASHER "A"

Position washer to completely cover slotted hole.

PLATE WASHER "B"

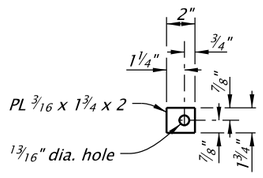
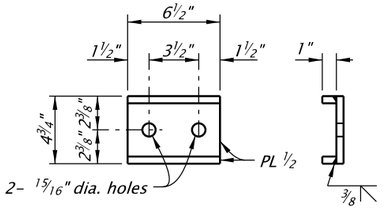
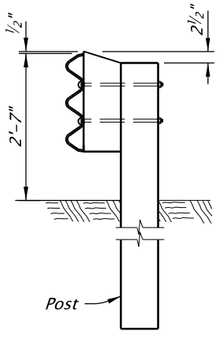


PLATE WASHER "C"

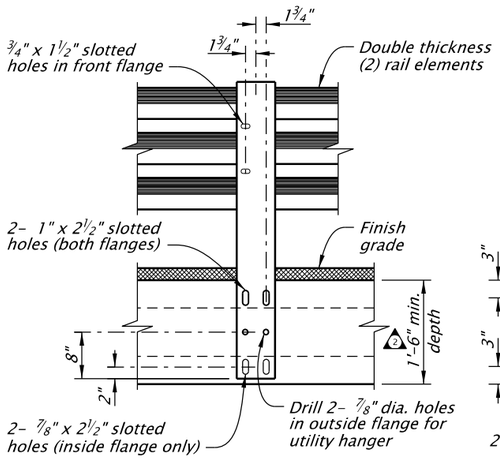
Position washer to completely cover slotted hole.



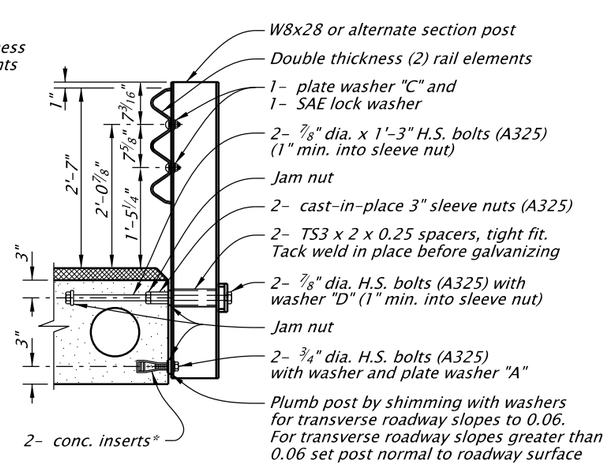
WASHER "D"



SECTION A-A



BACK ELEVATION



SIDE ELEVATION

POST DETAILS: SIDE MOUNT

NOTE
Field ream bolt holes in double thickness rail at splice locations. Repair damaged coating according to Specifications.

** CONCRETE INSERTS*

Hot-dip galvanized expanded coil concrete inserts with closed-back ferrule threaded to receive 3/4" dia., Grade 36 (ASTM A307) .

Minimum insert length= 4 1/2"
Minimum safe working load in tension= 4000 lbs.

NOTE 1
Transition posts may be steel W6x9 or timber 8"x 8".
All posts to be of same material.
See drawing BR203 for Thrie-Beam blockouts.

GENERAL NOTES
Provide steel posts and plates conforming to AASHTO Specification M183 (ASTM A36), unless noted otherwise.

Provide anchor bolts conforming to ASTM A325 (AASTHO M164).

Provide guardrail hardware as shown on Std. Dwgs. RD405 and RD410.

Hot dip galvanize all structural steel and hardware after fabrication.

Fabricate railing to the horizontal and vertical alignment of the structure. Install posts normal to grade. When wearing surface thickness varies due to beam camber and/or superelevation, vary rail post lengths to provide uniform rail height.

Tap nuts and inserts 0.0021 $^{+0.01}_{-0.00}$ oversize after galvanizing in accordance with ASTM A563.

Tighten upper high strength post bolts 1/6 turn past snug tight condition. Tighten lower high strength post bolts 1/3 turn past snug tight condition.

Do not use this rail for 12" thick slab.

Accompanied by drawings BR203, RD405, RD410, RD480.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

THRIE-BEAM RAIL AND TRANSITION

2024

DATE	REVISION DESCRIPTION
1 01-2025	Thrie-beam transition revised: CAD standards updates
2 01-2026	Dimension correction on "Post Details: Side Mount"

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **BR233**

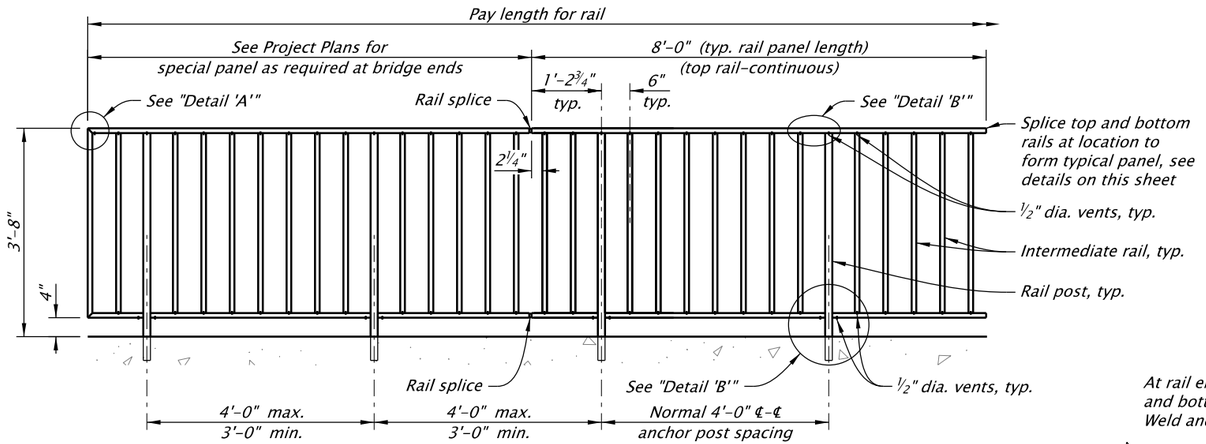
13-JAN-2026

BR233.dgn

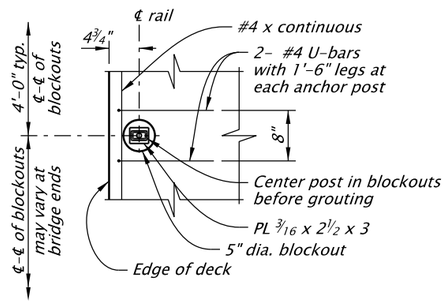
Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

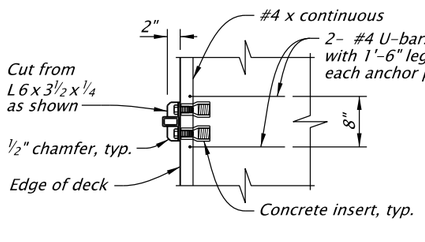
BR246.dgn



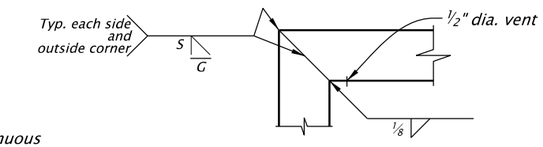
ELEVATION
Scale: 3/8"=1'-0"



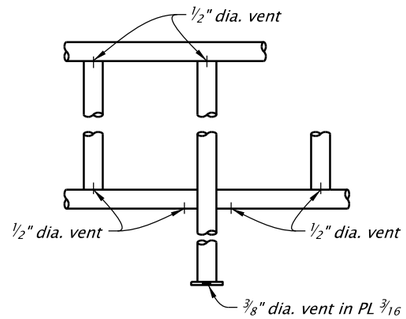
PLAN – ANCHOR POST
Scale: 1/2"=1'-0"



PLAN – SIDE MOUNTING POST
Scale: 1/2"=1'-0"



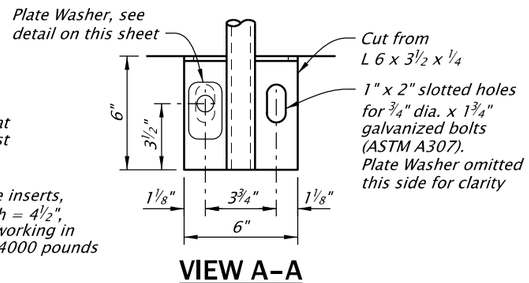
DETAIL "A"
Scale: 1"=4"



DETAIL "B"
Scale: 1 1/2"=1'-0"

SECTION – ANCHOR POST
Scale: 1/2"=1'-0"

SECTION – SIDE MOUNTING POST
Scale: 1/2"=1'-0"



VIEW A–A SIDE MOUNTING PLATE
Scale: 1 1/2"=1'-0"

GENERAL NOTES:
Provide rectangular structural steel tubing according to Oregon Standard Specification 02810.20.

Provide HSS 2½ x 1½ x ¼ for anchor post.

1 Provide HSS 2½ x 1½ x 0.120 (11 gauge) or HSS 2½ x 1 x 0.125 (11 gauge) for horizontal rails and terminal end verticals.

Provide HSS 2 x 1 x 0.083 (14 gauge), for intermediate verticals. HSS 2½ x 1 x 0.125 (11 gauge) may be used for intermediate verticals if the anchor post weld details are used.

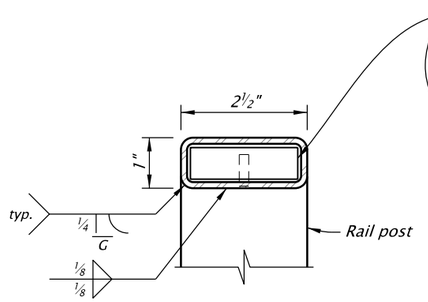
Provide all other structural steel conforming to AASHTO M183 (ASTM A36).

Hot-dip galvanize all structural steel including fasteners and inserts after fabrication. Provide Galvanize Control Silicon according to Oregon Standard Specification 02530.70.

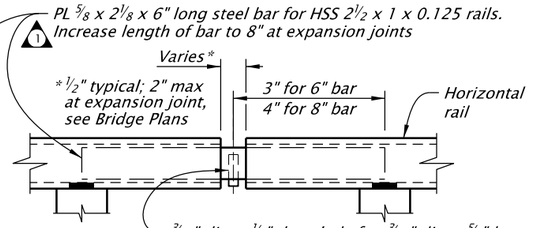
Construct railing conforming to the horizontal and vertical alignment of the structure.

Install posts normal to grade in the longitudinal direction and vertical in the transverse direction.

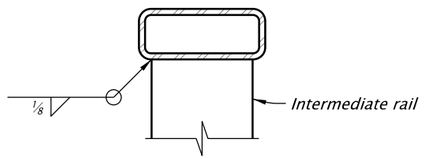
Provide continuous top horizontal rail elements over a minimum of two posts unless shown otherwise on detail plans. Provide a minimum of two anchor posts per rail panel.



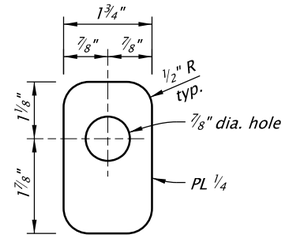
RAIL POST WELD
Not To Scale



RAIL SPLICE
Not To Scale



INTERMEDIATE VERTICAL RAIL WELD
Not To Scale



(2 required per post)

PLATE WASHER
Not To Scale

1 NOTE:
Provide a handrail when slope is 1:20 or greater. See RD series for details.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

PEDESTRIAN RAIL

2024

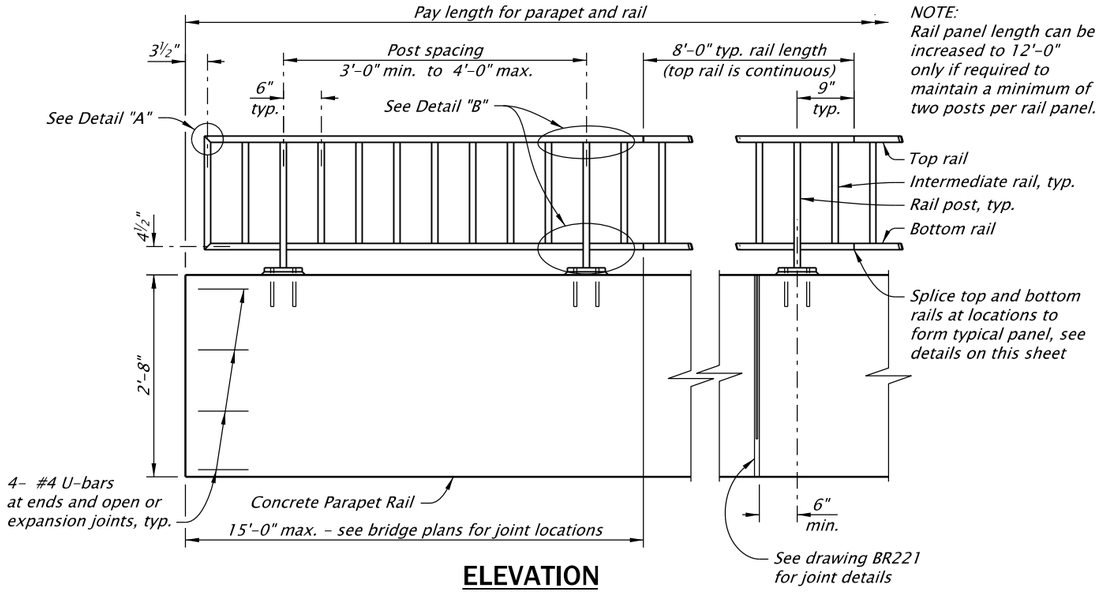
DATE	REVISION DESCRIPTION
10-Jan-2026	Handrail note added; remove 14-gauge HSS option; redrawn for CAD standards

CALC. BOOK NO. N/A

SDR DATE 13-JAN-2026

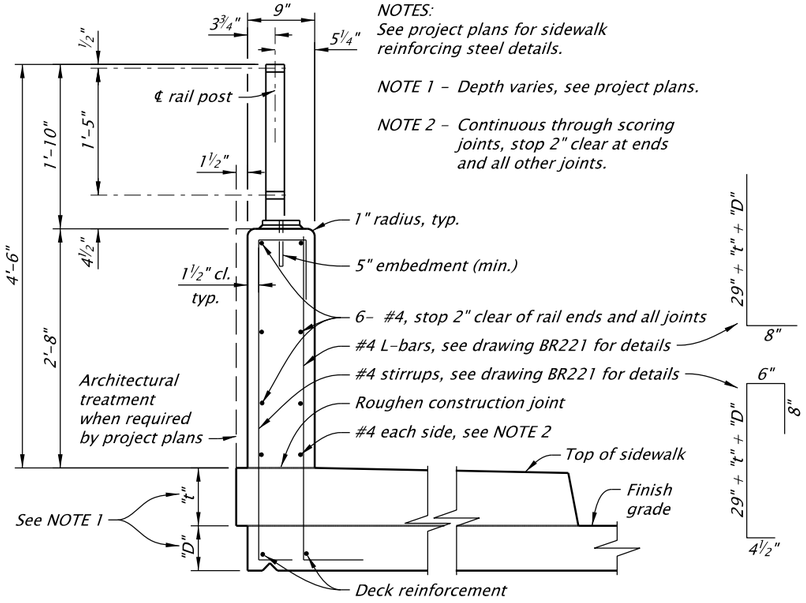
BR246

Effective Date: June 1, 2026 – November 30, 2026

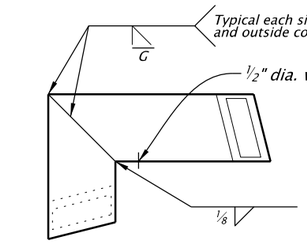


NOTE:
Rail panel length can be increased to 12'-0" only if required to maintain a minimum of two posts per rail panel.

ELEVATION

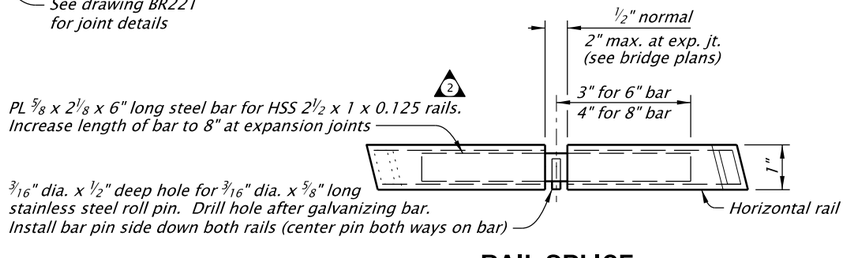


TYPICAL SECTION

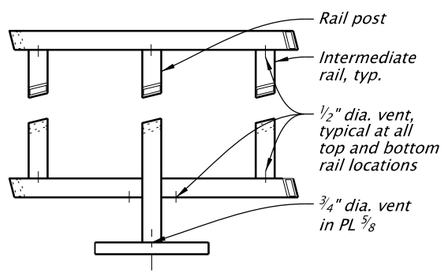


RAIL END NOTE:
Miter joints top and bottom rail members. Weld and grind smooth.

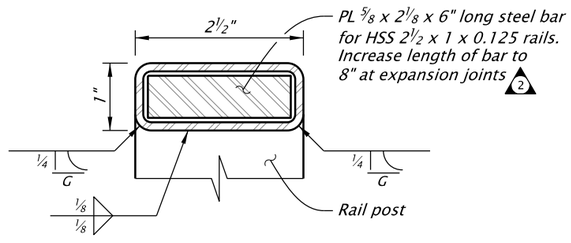
DETAIL "A"



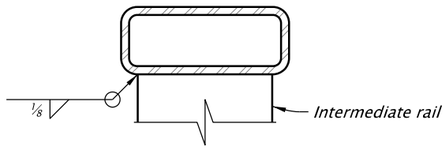
RAIL SPLICE



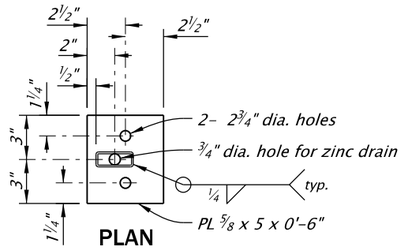
DETAIL "B"



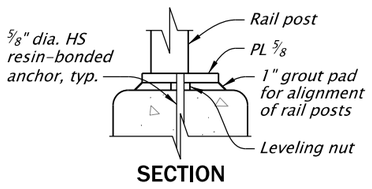
RAIL POST WELD



INTERMEDIATE VERTICAL RAIL WELD



PLAN



SECTION

BASE PLATE DETAIL

GENERAL NOTES

Provide rectangular structural steel tubing conforming to Oregon Standard Specification 02810.20.

Provide HSS 2½ x 1 x 0.125 (11 gauge) for rail posts.

Provide HSS 2½ x 1 x 0.125 (11 gauge) for horizontal, intermediate, and end vertical rails.

Provide all other structural steel conforming to AASHTO M183 (ASTM A36).

Hot-dip galvanize all structural steel including fasteners after fabrication.

Provide Galvanize-Control silicon according to Oregon Standard Specification 02530.70.

Provide Class 3300- 1½ or ¾ concrete.

Provide all reinforcing steel conforming to AASHTO M31 (ASTM A615), Grade 60 or A706.

Place all bars 2" clear of the nearest face of concrete, unless shown otherwise.

Construct steel railing and concrete parapet conforming to the horizontal and vertical alignment of the structure. Construct rail posts and parapet normal to grade in the longitudinal direction and vertical in the transverse direction.

Provide and install high strength resin bonded anchors (AASHTO M314, Grade 36, ASTM A307) according to Oregon Standard Specification 00535 and manufacturer's directions.

Tighten anchor nuts by the turn-of-the-nut method with a nut rotation of 60° turn from a snug tight condition.

Provide continuous top horizontal rail elements over a minimum of two posts unless shown otherwise on the detail plans. Provide a minimum of two rail posts per rail panel.

Locate reinforcing steel in parapet prior to drilling to eliminate conflicts.

Accompanied by drawing BR221.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

PEDESTRIAN RAIL ON SIDEWALK MOUNTED CONCRETE PARAPET

2024

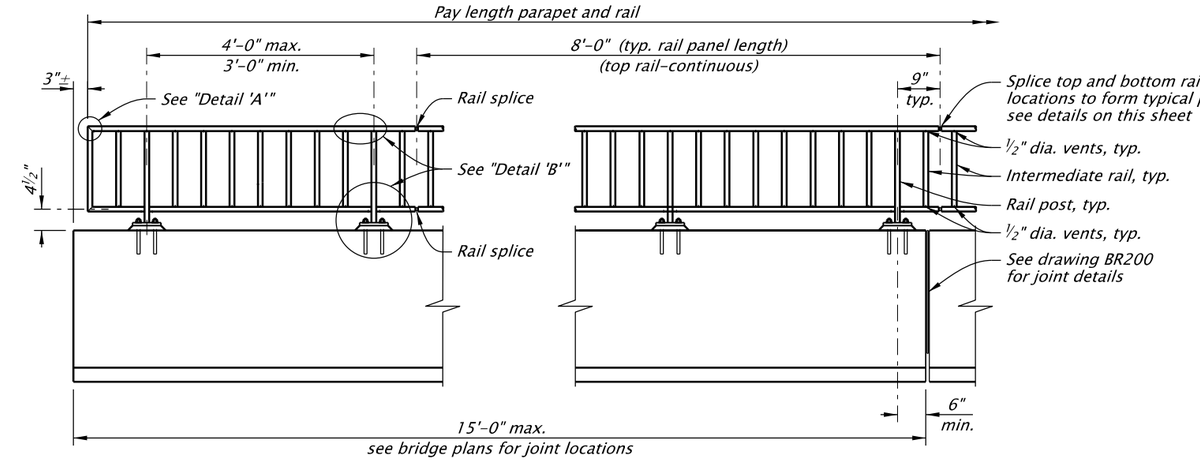
	DATE	REVISION DESCRIPTION
1	01-2025	CAD standards updates
2	01-2026	Remove 14-gauge HSS option.

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **BR250**

Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

BR246.dgn



NOTE:
Rail panel length can be increased to 12'-0" only if required to maintain a minimum of two posts per rail panel.

ELEVATION
Scale: 3/8"=1'-0"

GENERAL NOTES:
Provide rectangular structural steel tubing according to Oregon Standard Specification 02810.20.

(1) Provide HSS 2½ x 1 x 0.125 for rail posts, horizontal rails, end vertical rails, and intermediate rails.

Provide all other structural steel conforming to AASHTO M183 (ASTM A36).

Hot-dip galvanize all structural steel including fasteners and inserts after fabrication. Provide Galvanize Control Silicon according to Oregon Standard Specification 02530.70.

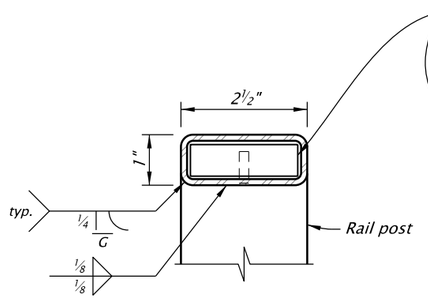
Construct railing conforming to the horizontal and vertical alignment of the structure.

Install posts normal to grade in the longitudinal direction and vertical in the transverse direction.

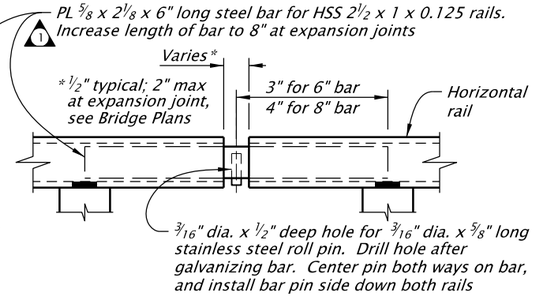
Provide and install high strength resin bonded anchors (AASHTO M314, Grade 36, ASTM A307) according to Oregon Standard Specification 00535 and manufacturer's directions.

Tighten anchor nuts by the turn-of-the-nut method with a nut rotation of 60° turn from a snug tight condition.

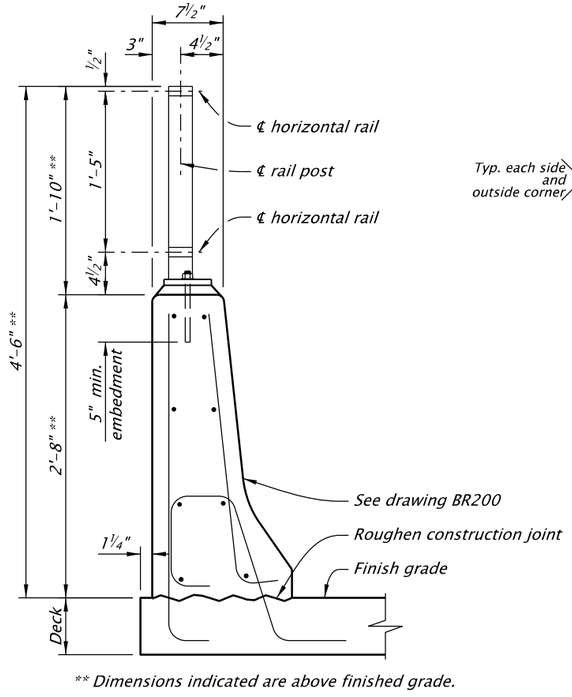
Provide continuous top horizontal rail elements over a minimum of two posts unless shown otherwise on detail plans. Provide a minimum of two anchor posts per rail panel.



RAIL POST WELD
Not To Scale

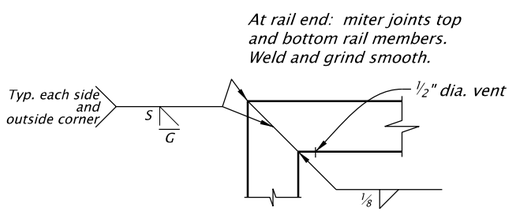


RAIL SPLICE
Not To Scale

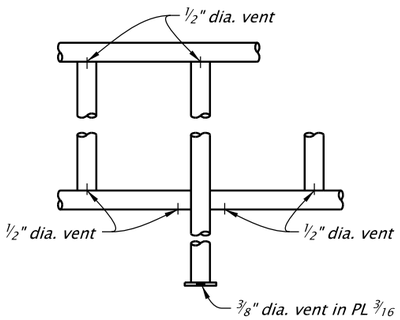


** Dimensions indicated are above finished grade.

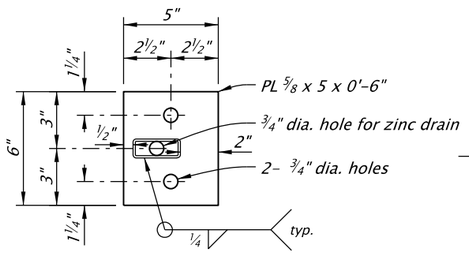
TYPICAL RAIL SECTION
Scale: 3/4"=1'-0"



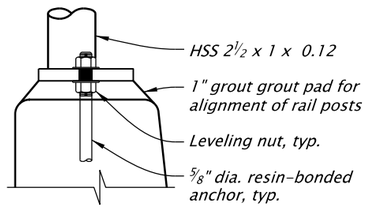
DETAIL "A"
Scale: 1"=4"



DETAIL "B"
Scale: 1 1/2"=1'-0"

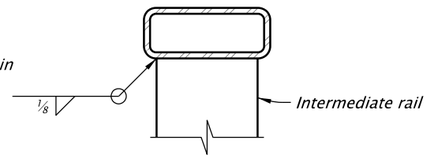


PLAN



TYPICAL SECTION

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



INTERMEDIATE VERTICAL RAIL WELD
Not To Scale

(1) NOTE:
Provide a handrail when slope is 1:20 or greater. See RD series for details.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

TYPE "F" CONCRETE RAIL WITH PEDESTRIAN RAIL

2024

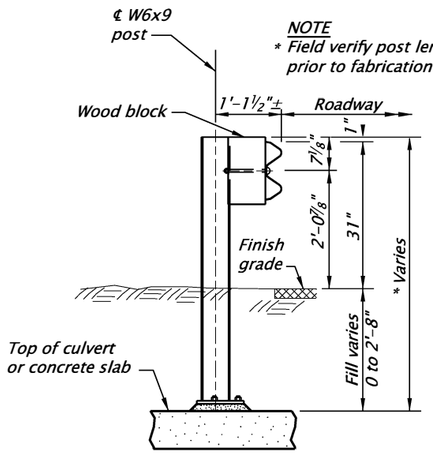
DATE	REVISION DESCRIPTION
(1) 10-Jan-2026	Remove 14-gauge HSS option; redrawn for CAD standards

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | BR256

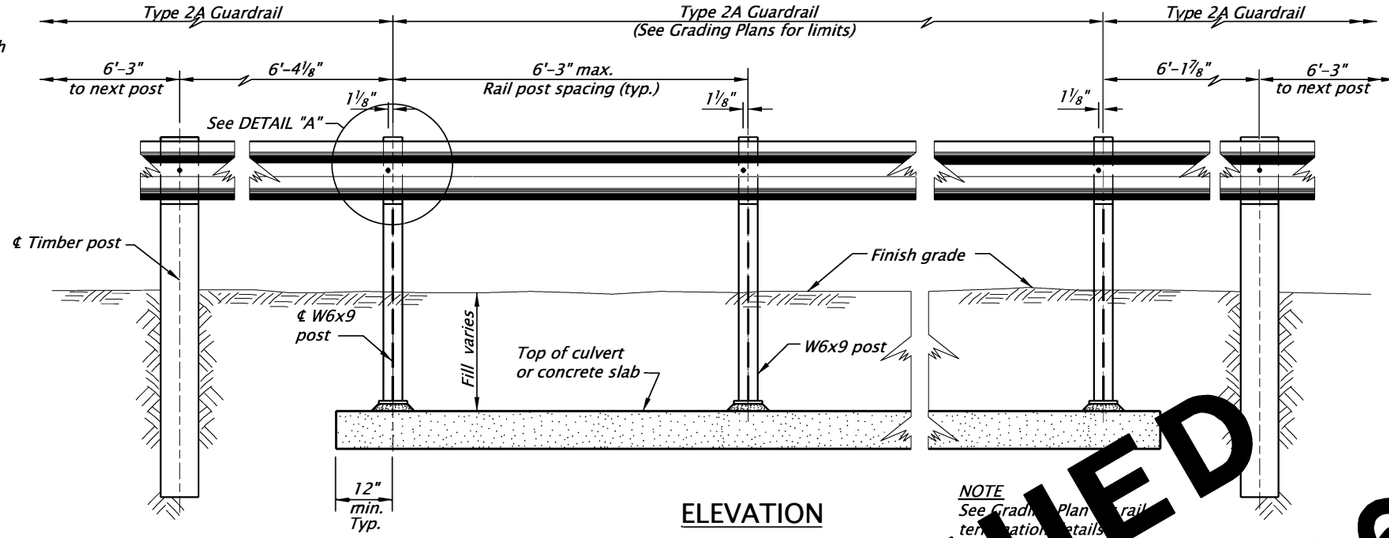
Effective Date: June 1, 2026 - November 30, 2026

MAR-2017

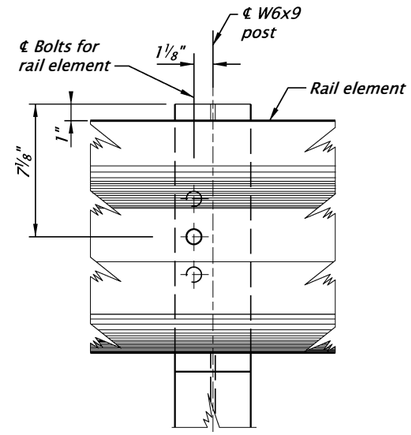
BR266.dgn



TYPICAL SECTION

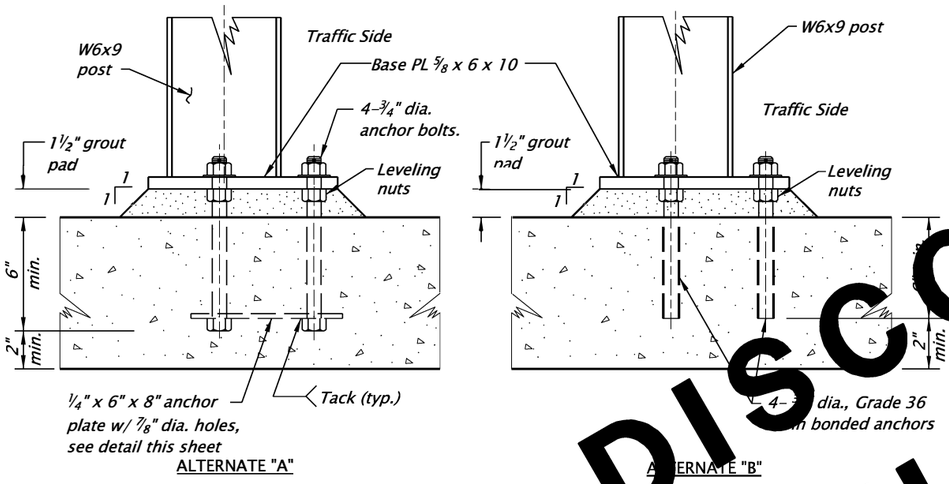


ELEVATION



DETAIL "A"

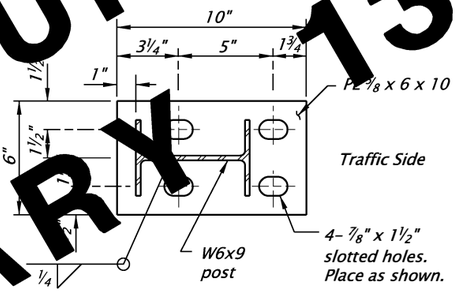
NOTE
See Grading Plans for rail termination details



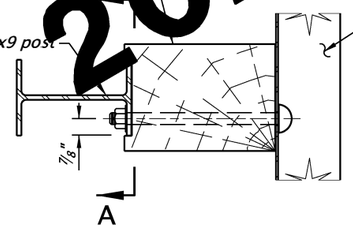
ALTERNATE "A"

ALTERNATE "B"

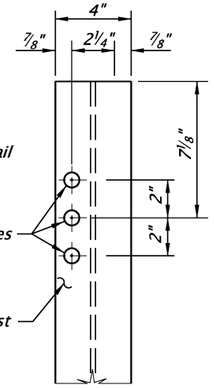
BASE PLATE DETAILS



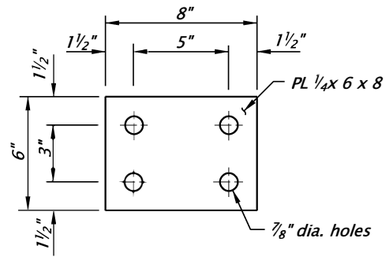
BASE PLATE DETAILS



TOP VIEW



SECTION A-A



ALTERNATE "A" ANCHOR PLATE

GENERAL NOTES:

Use guardrail hardware as shown on dwg. RD405.
Fabricate railing to the horizontal and vertical alignment of the roadway. Installing posts normal to grade.
Provide all structural steel (except anchor bolts) conforming to AASHTO M183 (ASTM A36).
Provide all bolts meeting ASTM A307, except as noted.
Hot-dip galvanize all structural steel after fabrication.
Provide Grade 36 anchor bolts according to ODOT Specification 02560.30 (a) (Alternate "A").
Provide and install Grade 36 resin bonded anchors according to ODOT Specification 00535.
Coat all buried steel for immersion exposure with an approved product from the qualified products list for structural coatings.
Prepare and coat surfaces according to section 00594 of Oregon Standard Specification.

DISCOUNTINUED
JANUARY 13 2026

Accompanied by dwgs. RD480, RD405

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

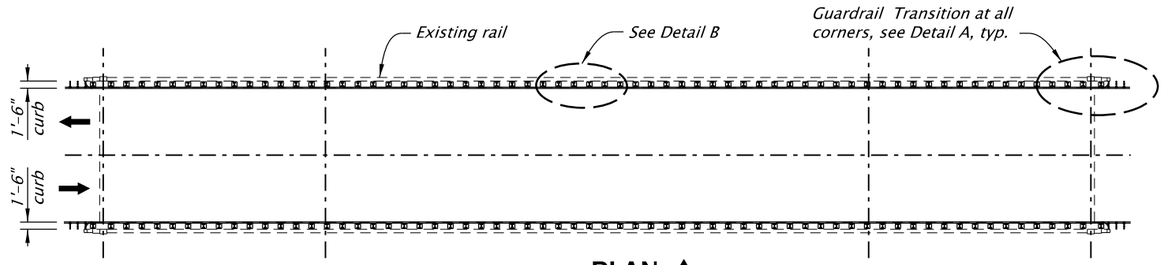
MODIFIED TYPE 2A RAIL

2024

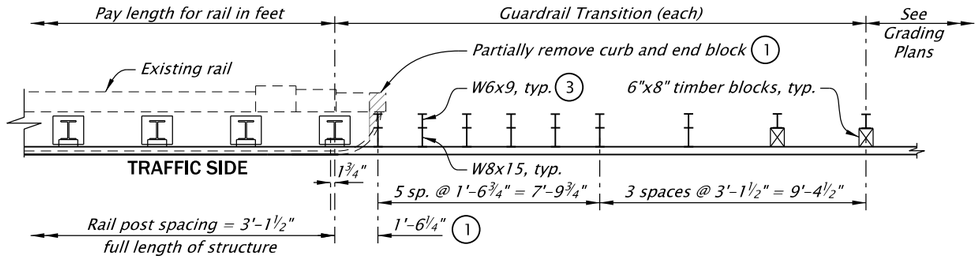
DATE	REVISION DESCRIPTION
-	-

CALC. BOOK NO. N/A | SDR DATE 20-APR-2018 | **BR266**

Effective Date: June 1, 2026 - November 30, 2026



PLAN (3)



DETAIL A (3)

(3) GENERAL NOTES:
Rail designed and crash tested to meet MASH TL-3 requirements.

Transition designed to meet MASH TL-3.

Furnish non-epoxy grout for the 1½" nominal grout pads in Section 02080.

Furnish structural steel posts and plates according to Oregon Standard Specification 2810.20. Provide steel posts and plates conforming to ASTM A572 Grade 50.

Hot-dip galvanize all posts, anchor rods, washers, and nuts after fabrication.

Construct railing conforming to the horizontal and vertical alignment of the structure. Install posts normal to grade in longitudinal direction and vertical in transverse direction.

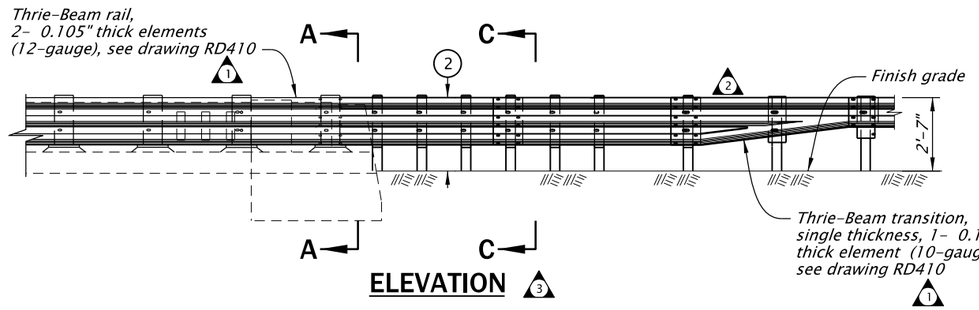
Furnish and install ⅞" diameter F1554 grade 105 resin-bonded anchors with epoxy resin from the QPL. The characteristic bond stress used in design is 1200 psi. Minimum pullout strength is 233 kips with a minimum embedment (hef) of 10 inches. (4)
Install anchors according to the manufacturer's recommendations.

Field verify dimensions before fabrication.

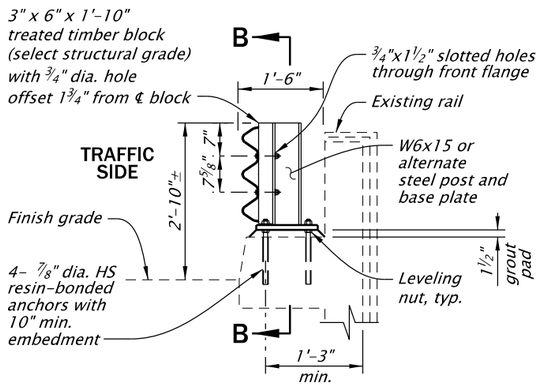
(1) Partially remove curb and end block to maintain first post spacing as shown. When removal is not feasible, consider alternative attachment details (i.e. addition of a new end block).

(2) Transition top of rail height to match 2'-7" approach rail.

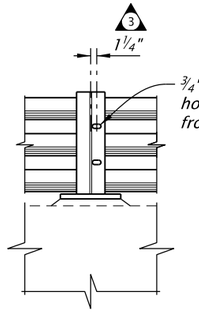
(3) Transition posts may be steel W6x9 or timber 8"x8". All posts to be of same material.



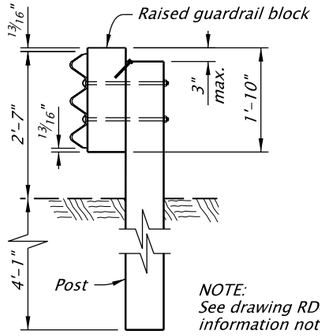
ELEVATION (3)



SECTION A-A (3)



SECTION B-B

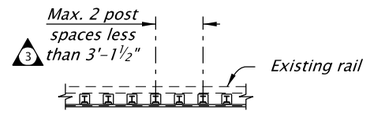


NOTE:
See drawing RD409 for information not shown.

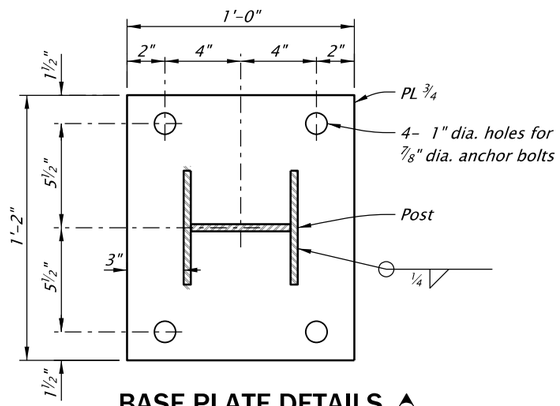
SECTION C-C (3)

NOTES: (3)
Maintain post spacing at 3'-1½" full length of structure.

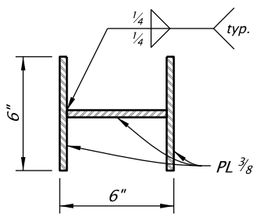
A maximum of 2 non-standard post spaces may be used to adjust the rail installation to match structure length.



DETAIL B



BASE PLATE DETAILS (3)



ALTERNATE POST (3)

(3) (1) Accompanied by drawings RD405, RD409, RD410.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

THRIE-BEAM RAIL RETROFIT FOR CURB AND PARAPET RAIL CONNECTION DETAILS (3)

2024

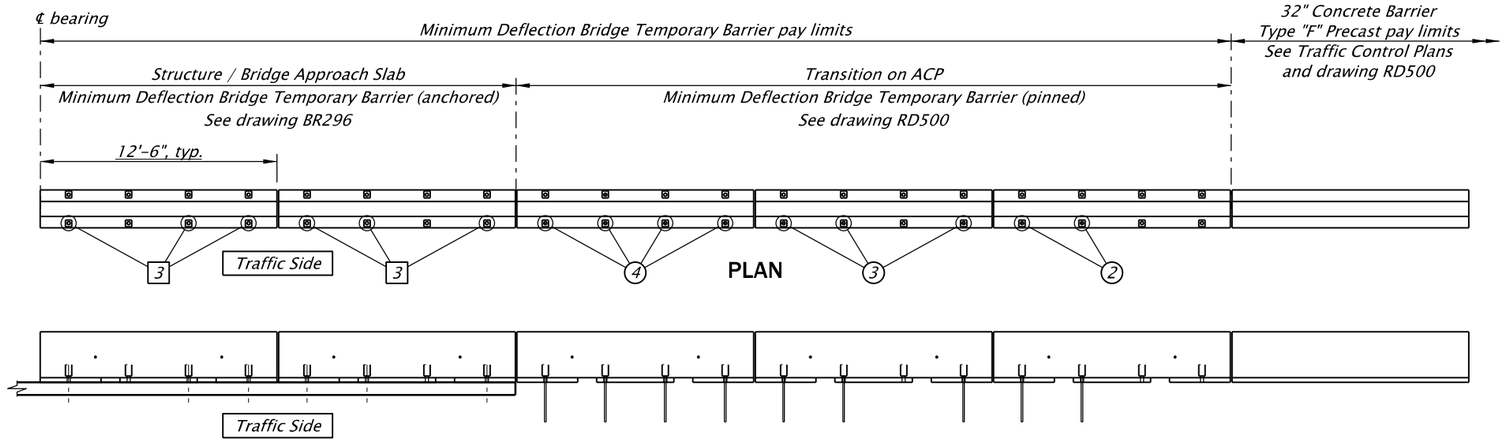
	DATE	REVISION DESCRIPTION
A	07-2024	General text revisions.
A	01-2025	Thrie-beam transition revised; CAD standards updates.
A	07-2025	Redrawn to reflect TR# 615131-01.
A	01-2026	Correction to pullout strength

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **BR273**

13-JAN-2026

BR273.dgn

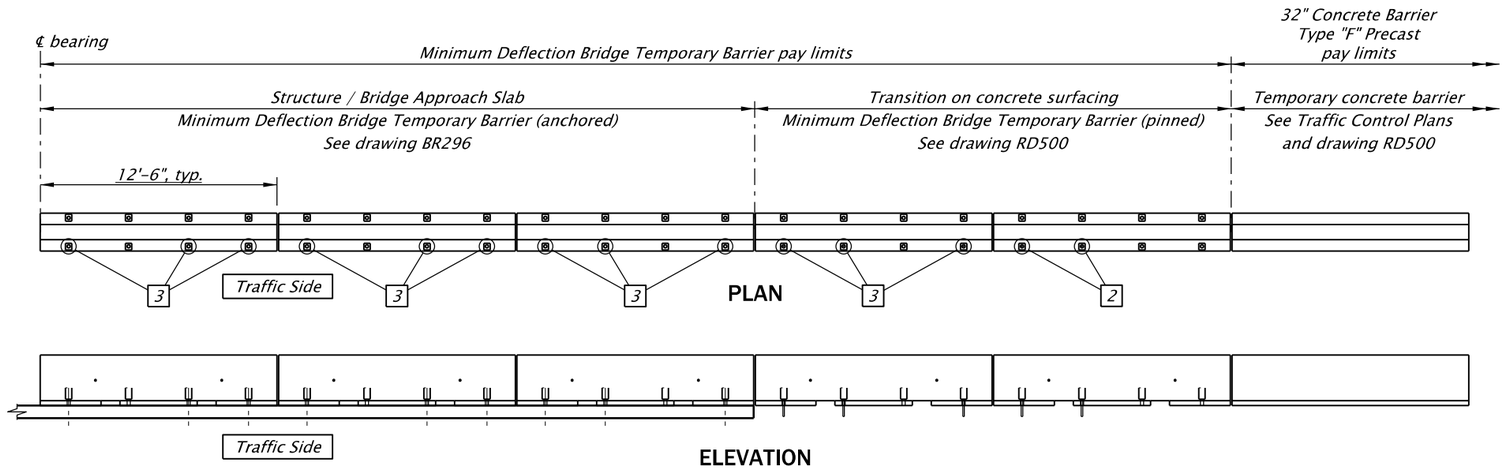
Effective Date: June 1, 2026 - November 30, 2026



MINIMUM DEFLECTION BRIDGE TEMPORARY BARRIER ON ACP

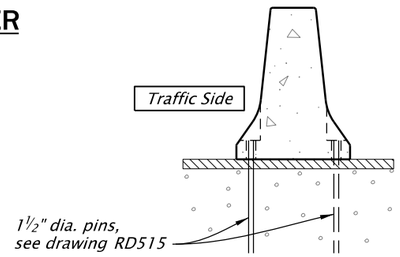
Scale: 1/8"=1'-0"

NOTE:
Provide barrier transition at each end of the bridge.



MINIMUM DEFLECTION BRIDGE TEMPORARY BARRIER ON CONCRETE SURFACE

Scale: 1/8"=1'-0"



SECTION PINNED BARRIER

Not to Scale
(Transitions only)

GENERAL NOTES

USE THIS DRAWING FOR TEMPORARY INSTALLATION AND MAINTENANCE PURPOSES ONLY. DO NOT USE FOR NEW OR PERMANENT INSTALLATIONS.

Provide all materials and perform all work according to the Oregon Standard Specifications for Construction 2024.

Minimum deflection bridge temporary barrier is designed and crash tested to meet MASH TL-3 loads.

All barrier is precast pin and loop type. See drawing BR296.

Provide all reinforcing steel according to ASTM A706, or AASHTO M31 (ASTM A615) Grade 60.

Provide Class 5000- 1½, 1, or ¾ concrete in precast barrier segments.

Provide 1" diameter Grade 36 anchor bolts, nuts and washers according to ODOT Specification 02560.30.

Provide plate washers according to AASHTO M270 (ASTM A709) Grade 36.

Provide and install (1⅛" diameter F1554 grade (36) resin-bonded anchors with epoxy resin from the QPL. The characteristic bond stress used in the design is 1650 psi. The minimum pullout strength is 30 kips with a minimum embedment (hef) of 5.25". Install anchors according to the manufacturer's recommendations.

Bolt-down barrier should not be installed on AC wearing surface, due to excessive bolt bending in an impact.

Do not use this drawing with traffic on both sides of the barrier.

REMOVAL OF ANCHOR BOLTS:
Upon removal or relocation of barrier units, remove all anchor bolts and completely fill the remaining holes in bridge decks and approach slabs with an approved patching material from the QPL.

ANCHOR REQUIREMENTS:

ON STRUCTURE:	
Anchored barrier:	3 anchors per barrier segment on traffic side, through bolted or resin-bonded. Omit no more than 1 anchor consecutively along a continuous stretch of barrier.
TRANSITIONS:	
On concrete surfacing:	Two barrier segments, resin bonded anchors, numbers and locations as shown.
On AC surfacing:	Three barrier segments, 1½" dia. vertical pins per drawing RD500, numbers and locations as shown.

(N) "N" = Number of anchors or pins per barrier segment, at locations shown.

[N] "N" = Number of through bolt or resin bonded anchors.

ACCOMPANIED BY DRAWINGS:
BR296, RD500, RD501, RD503, RD515, RD516

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

MINIMUM DEFLECTION BRIDGE TEMPORARY BARRIER - 1

2024

DATE	REVISION DESCRIPTION
01-2026	New drawing.

CALC. BOOK NO. _____ SDR DATE 13-JAN-2026

BR295

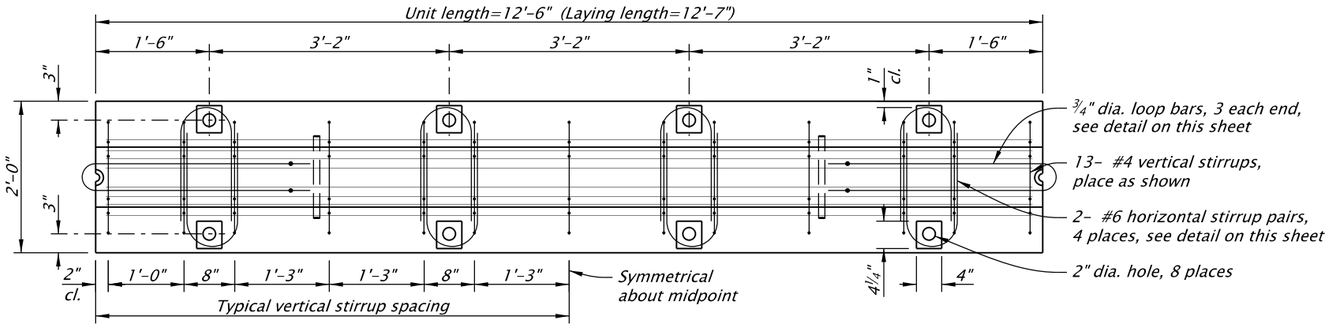
13-JAN-2026

BR295.dgn

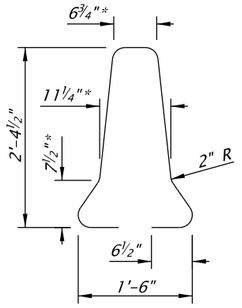
Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

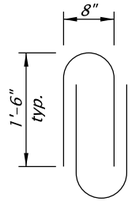
BR296.dgn



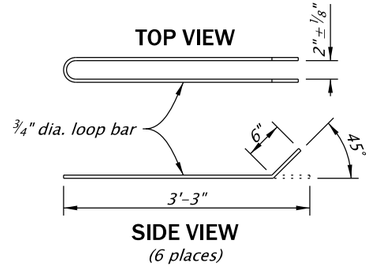
PLAN
Not to Scale



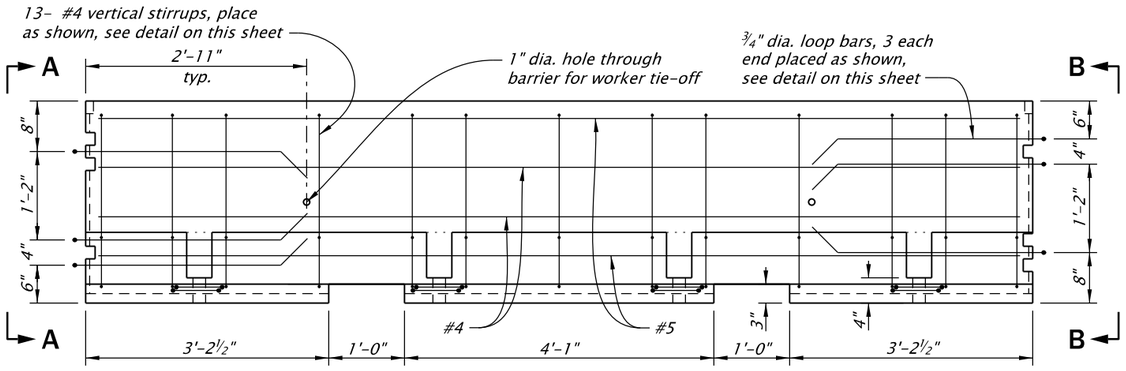
VERTICAL STIRRUP
Scale: 1/2"=1'-0"



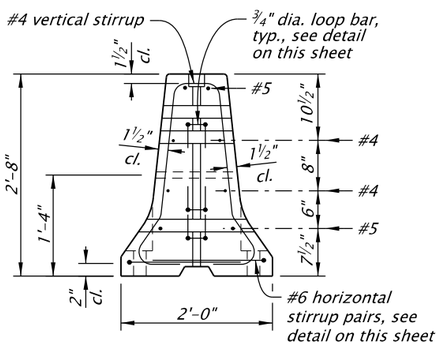
HORIZONTAL STIRRUP PAIR
Scale: 1/2"=1'-0"



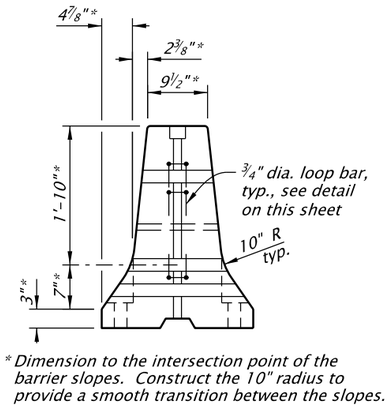
LOOP BAR
Scale: 1/2"=1'-0"



ELEVATION
Scale: 1/2"=1'-0"

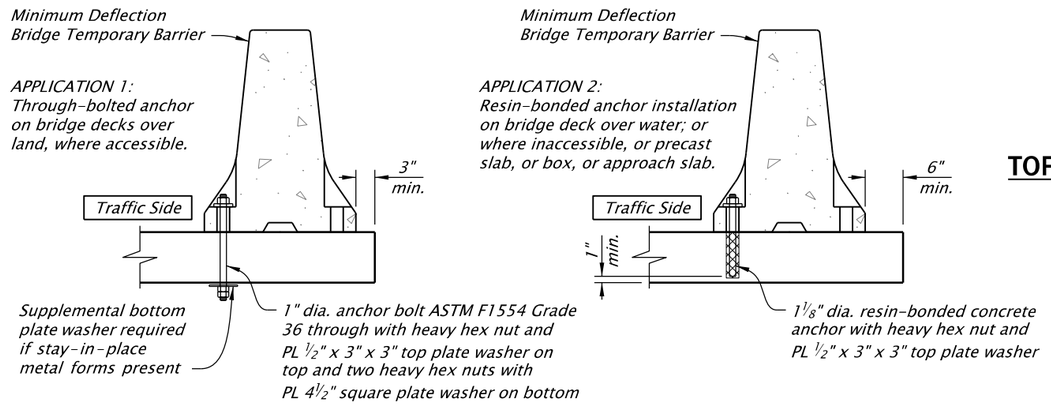


VIEW A-A
Scale: 1/2"=1'-0"

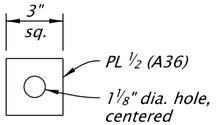


* Dimension to the intersection point of the barrier slopes. Construct the 10" radius to provide a smooth transition between the slopes.

VIEW B-B
Scale: 1/2"=1'-0"



TYPICAL SECTION
Scale: 1/2"=1'-0"



TOP PLATE WASHER
Not to Scale

NOTE:
See drawings RD500, RD501, and RD502 for forming details not shown.

ACCOMPANIED BY DRAWINGS:
BR295, RD500, RD501, RD503, RD515, RD516

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

MINIMUM DEFLECTION BRIDGE TEMPORARY BARRIER - 2

2024

DATE	REVISION DESCRIPTION
01-2026	New drawing.

CALC. BOOK NO. _____ SDR DATE 13-JAN-2026 **BR296**

Effective Date: June 1, 2026 - November 30, 2026

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
4	2.0	40	ASTM D 3034 DR 35 (46 psi stiffness)
6	2.0	40	
8	2.0	40	
10	2.0	40	
12	2.0	40	
15	2.0	40	
18	2.0	40	
21	2.0	40	
24	2.0	40	
27	2.0	40	
30	2.0	40	
33	2.0	40	
36	2.0	40	
42	2.0	40	
48	2.0	40	

PIPE	PROFILE WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
4	2.0	40	ASTM F 794 Series 46 (46 psi stiffness)
6	2.0	40	
8	2.0	40	
10	2.0	40	
12	2.0	40	
15	2.0	40	
18	2.0	40	
21	2.0	40	
24	2.0	40	
27	2.0	40	
30	2.0	40	
33	2.0	40	
36	2.0	40	
39	2.0	40	
42	2.0	40	
45	2.0	40	
48	2.0	40	

GENERAL NOTES FOR ALL TABLES ON THIS SHEET:

1. Maximum height of cover is greatest vertical distance from top of pipe to finish grade.
2. Minimum height of cover is least vertical distance from top of pipe to subgrade.
3. For ODOT, pipes with maximum cover greater than those shown in the Tables shall be approved by the Senior Standards Engineer.
4. For multiple pipe installations, see Std. Dwg. RD300.
5. Open ends of pipes normally require a site specific design, and may require special treatment (Sloped ends, culvert embankment protection, paved end slopes, safety end sections, or other measures). See special details or Standard Drawings as called for on plans.

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
14	2.0	41	AWWA C905 DR 32.5 (57 psi stiffness)
16	2.0	41	
18	2.0	41	
20	2.0	41	
24	2.0	41	
30	2.0	41	
36	2.0	41	
42	2.0	41	
48	2.0	41	

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
14	1.0	46	AWWA C905 DR 26 (115 psi stiffness)
16	1.0	46	
18	1.0	46	
20	1.0	46	
24	1.0	46	
30	1.0	46	
36	1.0	46	

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
14	1.0	48	AWWA C905 DR 25 (129 psi stiffness)
16	1.0	48	
18	1.0	48	
20	1.0	48	
24	1.0	48	
30	1.0	48	
36	1.0	48	
42	1.0	48	
48	1.0	48	

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
14	1.0	61	AWWA C905 DR 21 (224 psi stiffness)
16	1.0	61	
18	1.0	61	
20	1.0	61	
24	1.0	61	
30	1.0	61	
36	1.0	61	

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
4	1.0	48	AWWA C900 DR 25 (129 psi stiffness)
6	1.0	48	
8	1.0	48	
10	1.0	48	
12	1.0	48	

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
4	1.0	69	AWWA C900 DR 18 (364 psi stiffness)
6	1.0	69	
8	1.0	69	
10	1.0	69	
12	1.0	69	

PIPE	SOLID WALL PVC		
DIAMETER (Inches)	MINIMUM COVER (Feet)	MAXIMUM COVER (Feet)	REMARKS
4	1.0	109	AWWA C900 DR 14 (814 psi stiffness)
6	1.0	109	
8	1.0	109	
10	1.0	109	
12	1.0	109	

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

FILL HEIGHT TABLE FOR PVC PIPE

2024

DATE	REVISION DESCRIPTION
01-2026	UPDATED ASTM REFERENCE

CALC. BOOK NO. RD11-02 | SDR DATE 13-JAN-2026 | RD388

Effective Date: June 1, 2026 – November 30, 2026

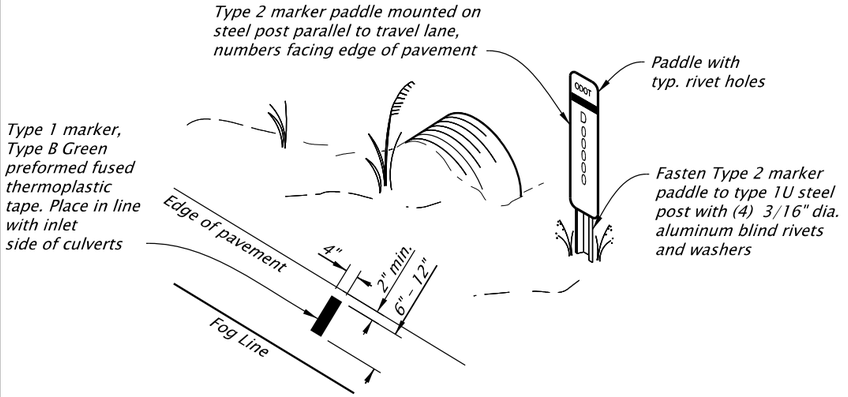
13-JAN-2026

RD388.dgn

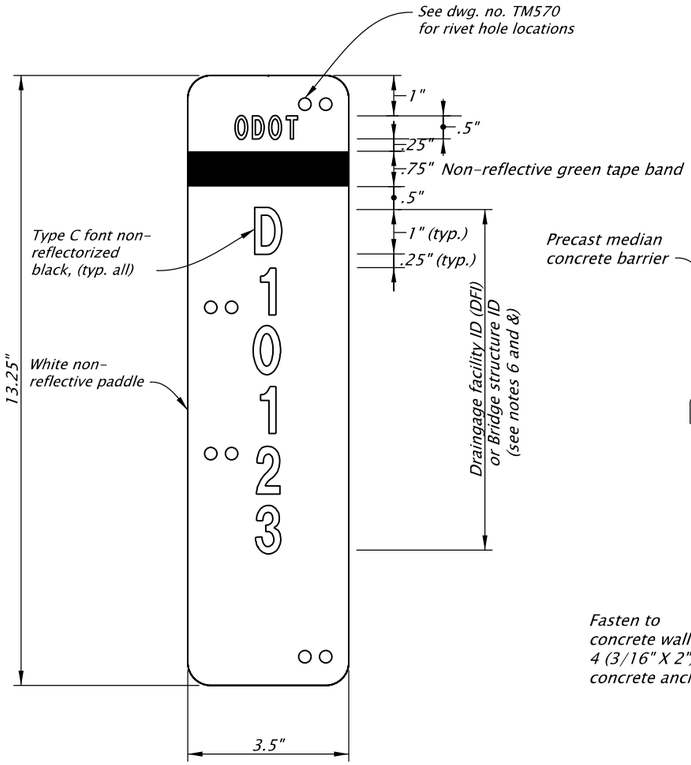
13-JAN-2026

RD398.dgn

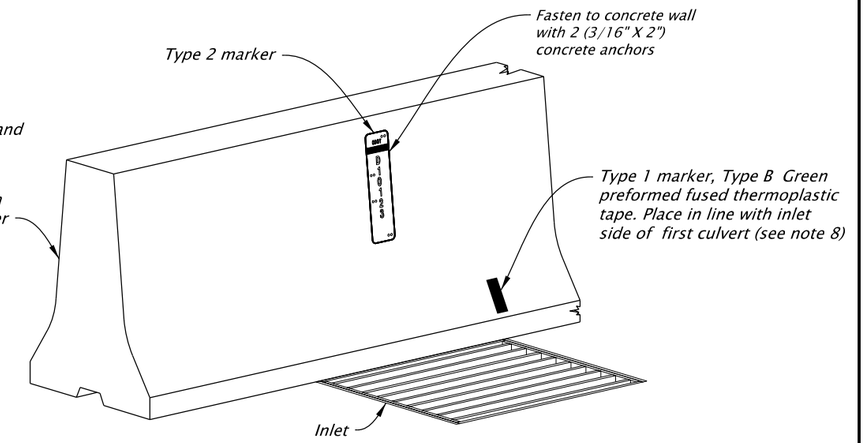
TYPE 2 MARKER INSTALLATION



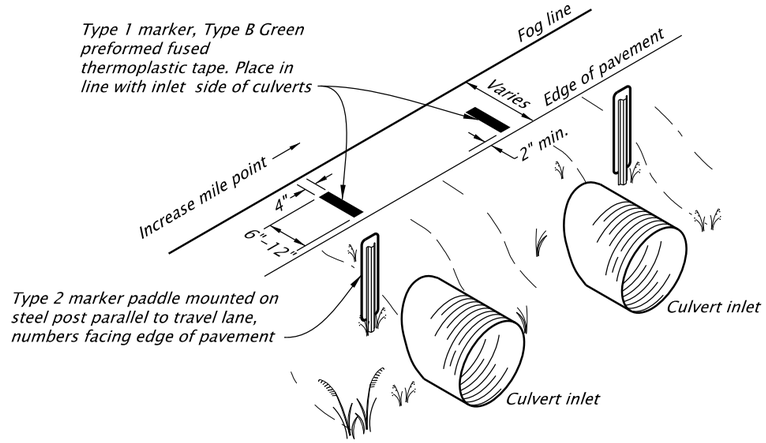
SINGLE DRAINAGE FACILITY SINGLE PIPE



TYPE 2 MARKER



CONCRETE BARRIER INSTALLATION



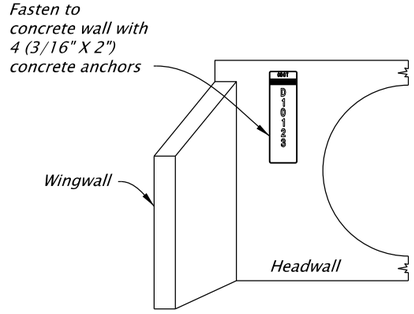
MULTIPLE DRAINAGE FACILITY

CULVERT DFI MARKER REQUIREMENTS	
Culvert Parameter/ Conditions	**Culvert DFI Marker Direction**
Culvert total span between 12" and less than 20 ft, and with a manufactured bottom	Culvert DFI marker required when located: · Under highway travel lanes and shoulder · Culverts parallel or adjacent to the highway
Box culverts, Rigid frames, Open bottom culverts	Culvert DFI marker not permitted
Culverts under private approaches	Culvert DFI marker not permitted
Culverts connected to stormwater systems by manholes or inlets	Culvert DFI marker not permitted

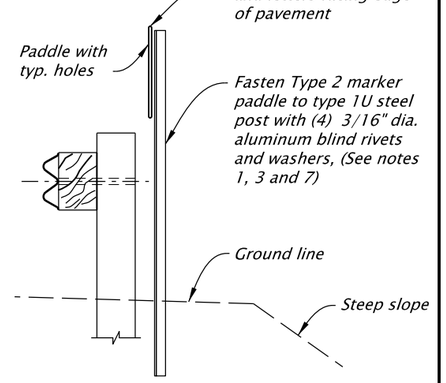
*Refer to the Culvert chapter in the Hydraulic Manual for more details
**When a culvert DFI is not permitted, check with Bridge Section or the Stormwater program within the Hydraulic Engineering Section.

NOTES:

1. See Standard Drawing TM571 for 'Type 1U Steel Post Dimensions' details.
2. Place Type 1 marker on inlet edge of the pavement directly in line with the inlet.
3. Install Type 2 culvert markers parallel to travel lane and inconspicuous to traffic.
4. Do not install Type 2 marker in locations that obstruct or interfere with maintenance activities.
5. On non-divided highways place markers only at the culvert inlet side of highway.
6. On divided highways placing markers on the outlet side is optional.
7. Steep slopes where guardrail or concrete barrier are present, install Type 2 marker on slope side of barrier.
8. Install only a Type 1 marker or a Type 2 marker on concrete barrier.



CONCRETE HEADWALL INSTALLATION



GUARDRAIL INSTALLATION

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

CULVERT ID MARKER

2024

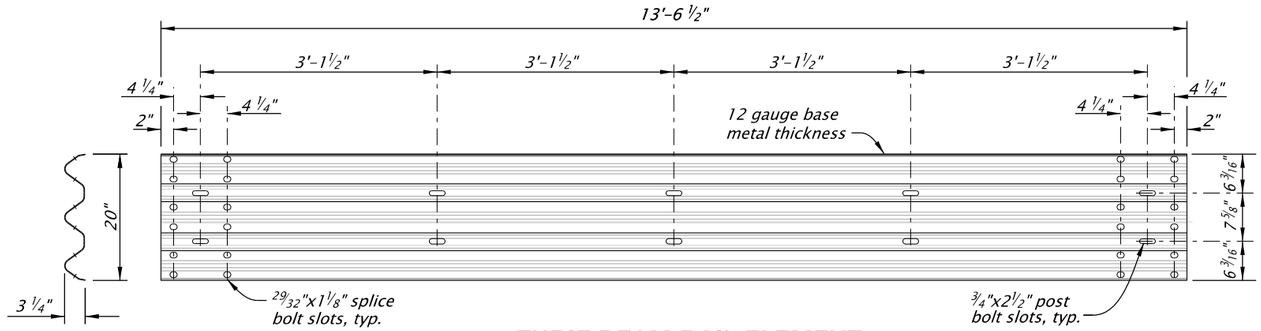
DATE	REVISION DESCRIPTION
01-2026	UPDATED DFI REQUIREMENTS

CALC. BOOK NO. RD11-01 | SDR DATE 13-JAN-2026 | **RD398**

Effective Date: June 1, 2026 - November 30, 2026

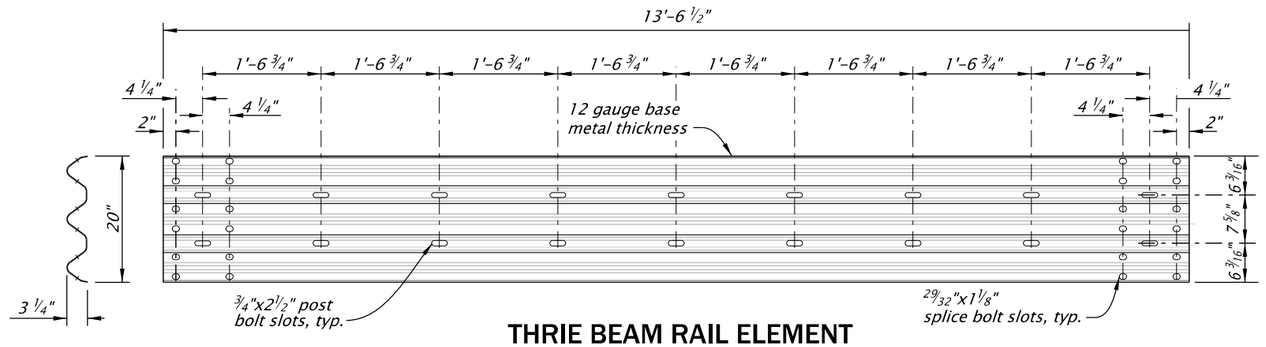
13-JAN-2026

RD410.dgn



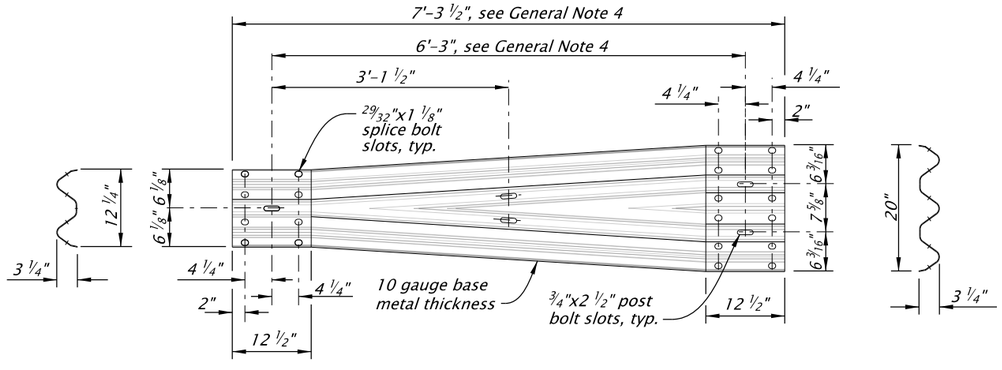
THRIE BEAM RAIL ELEMENT
1/2 POST SPACING

(12'-6" length shown)



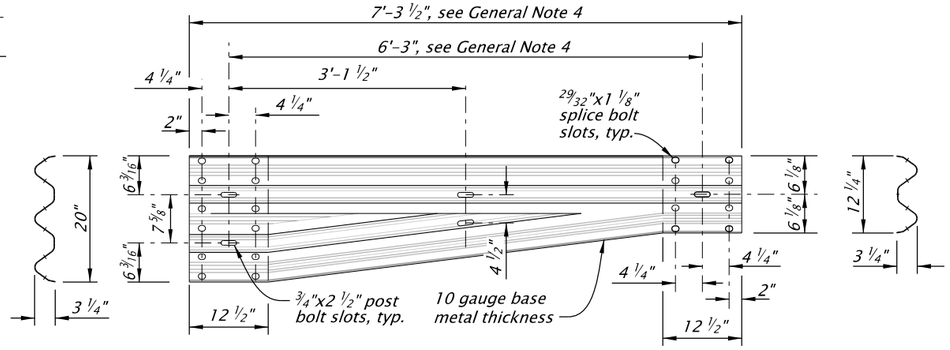
THRIE BEAM RAIL ELEMENT
1/4 POST SPACING

(12'-6" length shown)

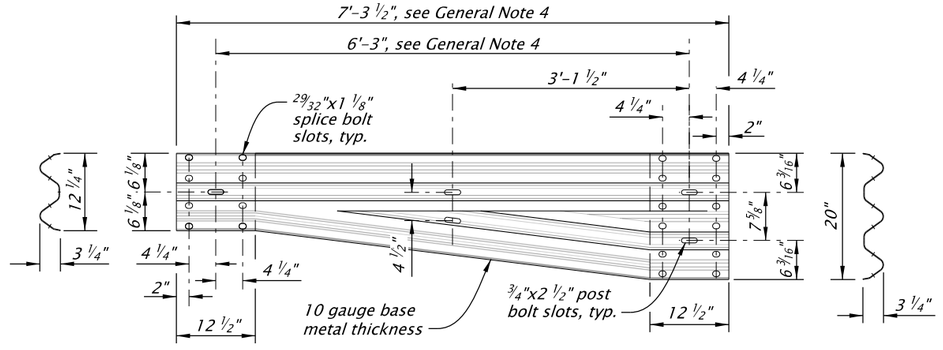


SYMMETRICAL THRIE BEAM TRANSITION ELEMENT

(Left section shown, right section reversed)



RIGHT SECTION



LEFT SECTION

TYPICAL THRIE BEAM TRANSITION ELEMENT

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *See appropriate guardrail standard drawing(s) for details not shown.*
2. *See appropriate bridge standard drawing(s) for transition guardrail detail and installation limits at bridge ends.*
3. *All rail sections shall be lapped in the direction of adjacent traffic.*
4. *Slot layout per manufacturer with appropriate post and block.*

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

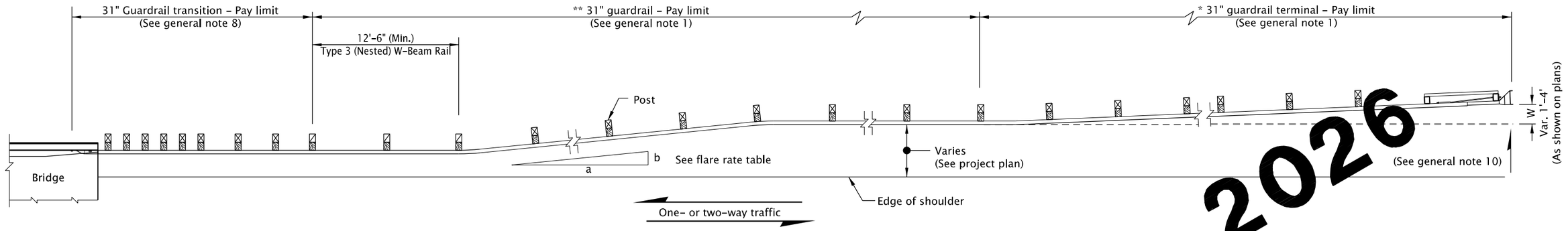
THRIE BEAM GUARDRAIL TRANSITION

2024

DATE	REVISION DESCRIPTION
12-2025	REVISED DETAILS AND UPDATED CAD STANDARDS

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD410**

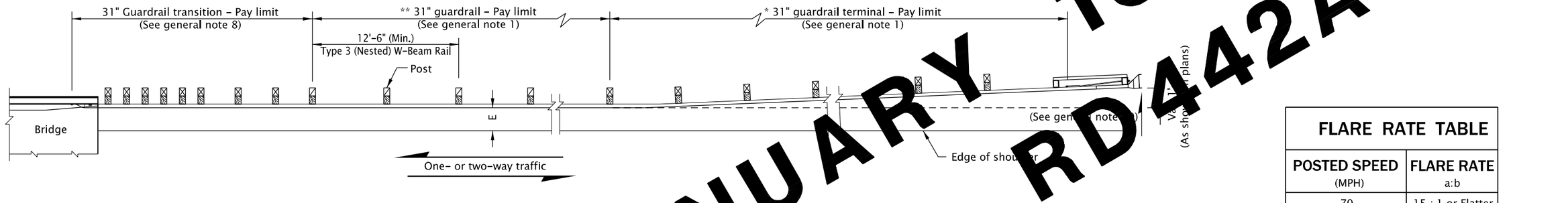
Effective Date: June 1, 2026 - November 30, 2026



NARROW BRIDGE ON ONE OR TWO-WAY TRAFFIC

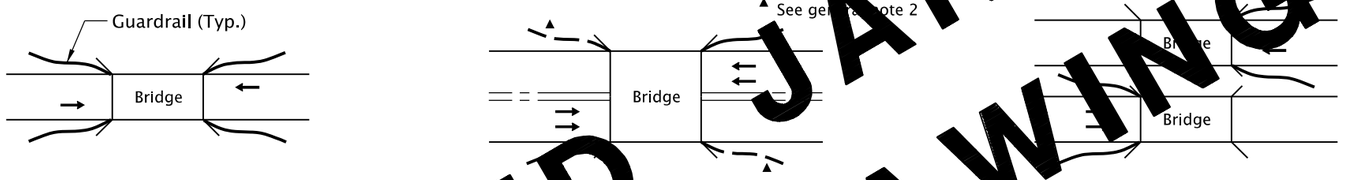
* Provide from ODOT's QPL.
Install according to manufacturer's instruction.

** Length of need calculation will determine quantity of Type 2A required.



ONE OR TWO-WAY TRAFFIC

FLARE RATE TABLE	
POSTED SPEED (MPH)	FLARE RATE a:b
70	15 : 1 or Flatter
60	14 : 1 or Flatter
55	12 : 1 or Flatter
50	11 : 1 or Flatter
45	10 : 1 or Flatter
40 or less	9 : 1 or Flatter



TWO LANE

MULTILANE

MULTILANE

LOCATIONS AT BRIDGE ENDS (MINIMUM SHOWN)

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. See appropriate standard drawing(s) for details not shown.
   See dwg. no. RD482 for Type 3 (Nested) W-Beam Rail details.
2. Guardrail at indicated positions is required for protection at bridge ends.
   Additional guardrail is to be installed as required by guardrail warrant and fastened to bridge.
3. Face of guardrail at locations shown above must match face of bridge curb or bridge rail on structure without curb.
4. Trailing ends (Freeway, multilane and similar one-way facilities not exposed to opposing traffic:
   (a) Guardrail terminals, use a Downstream Anchor Terminal (DAT) (RD438), Type B end piece and do not flare.
   (b) At bride ends, omit transition guardrail & Type 3 guardrail. Use bridge connection (Bridge drawing BR236) and guardrail as required in plans.
5. Rail expansion slots to be provided at bridge end connections.
   See dwg. no. RD412 "MIDWEST GUARDRAIL SYSTEM INSTALLATION AT BRIDGE DECK EXPANSION JOINT" details and notes.
6. Where bridges employ guardrail in lieu of handrail or vehicular barriers, adjacent connecting guardrail runs shall be the same type.
7. (a) All bolts except adjustment bolts shall be drawn tight on rails and components on initial installation.
   (b) Final tightness check on rail and component bolts and re-tightening as required to be done 30 days after initial installation.
8. See project plans for details not shown. For transition guardrail detail and installation limits at bridge ends, see applicable bridge drawings.
9. "W" distance is measured from face of guardrail at end post, exclusive of end piece.
10. The slope from the edge of the shoulder into the face of the guardrail should not be steeper than 1V : 10H when the guardrail is within 12'-0" from the edge of the shoulder. Paving of widened shoulder to face of posts in both ends of guardrail runs is required.
11. Wood or steel post. Wood post shown.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

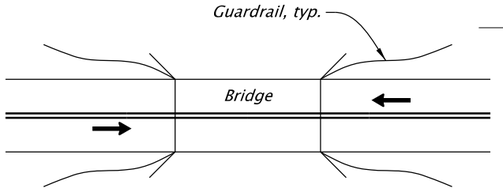
MIDWEST GUARDRAIL SYSTEM TYPICAL LAYOUTS AT BRIDGE ENDS

2024

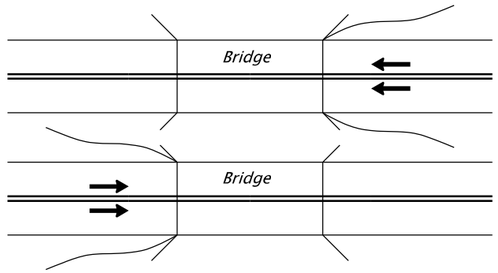
DATE	REVISION DESCRIPTION
12-2021	REVISED NOTES
12-2023	REVISED DETAILS AND NOTES

CALC. BOOK NO. N/A | SDR DATE 19-JAN-2024 | **RD442**

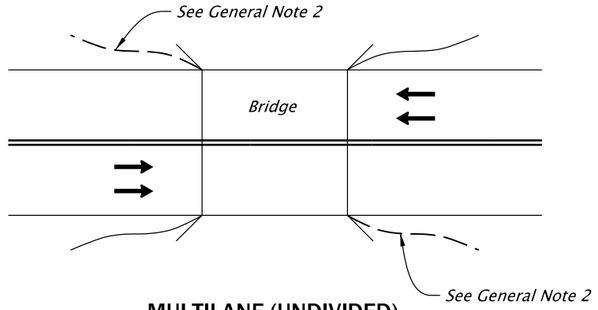
Effective Date: June 1, 2026 – November 30, 2026



TWO LANE



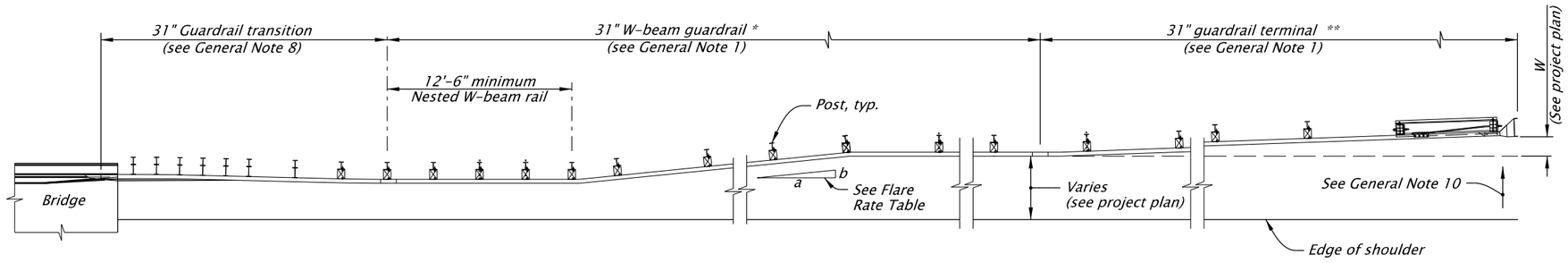
MULTILANE



MULTILANE (UNDIVIDED)

31" GUARDRAIL PLACEMENT AT BRIDGE ENDS

(Minimum Shown)

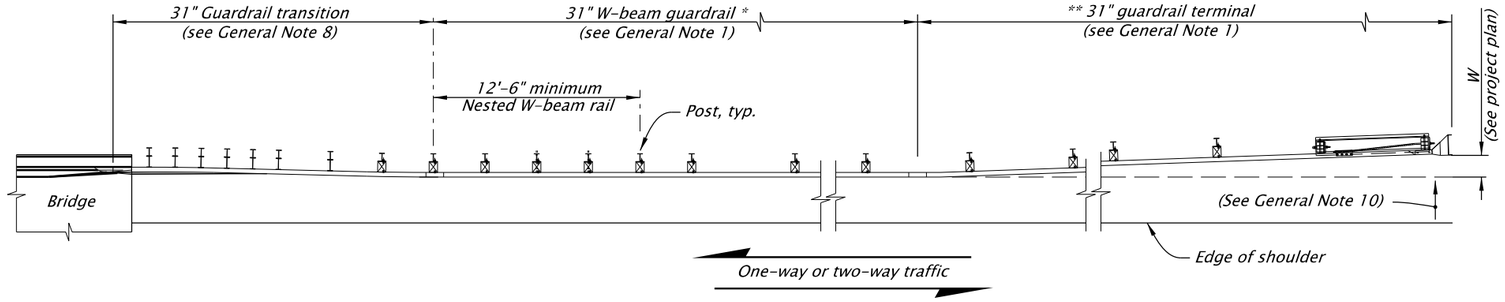


* *Length of need calculation will determine quantity of 31" W-beam required.*

** *Provide from ODOT's QPL. Install according to manufacturer's instructions.*

NARROW BRIDGE ON ONE-WAY OR TWO-WAY TRAFFIC

FLARE RATE TABLE	
POSTED SPEED (MPH)	FLARE RATE a:b
70	15 : 1 or Flatter
60	14 : 1 or Flatter
55	12 : 1 or Flatter
50	11 : 1 or Flatter
45	10 : 1 or Flatter
40 or less	9 : 1 or Flatter



ONE-WAY OR TWO-WAY TRAFFIC

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *See appropriate standard drawing(s) for details not shown.*
2. *Guardrail at indicated positions is required for protection at bridge ends. Additional guardrail is to be installed as required guardrail warrant and fastened to bridge.*
3. *Face of guardrail at locations shown above must match face of bridge curb or bridge rail on structure without curb.*
4. *Trailing ends (freeway, multilane and similar one-way facilities) outside the horizontal clearance area and not exposed to opposing traffic:*
   a) *Guardrail terminals, use a Downstream Anchor Terminal (DAT) drawing RD438, Type B end piece and do not flare.*
   b) *At bridge ends, omit transition guardrail and Type 3 guardrail. Use bridge connection drawing BR236 and guardrail as required in plans.*
   c) *A minimum 25' length, three standard line posts is required.*
5. *Rail expansion slots to be provided at bridge end connections. See drawing RD412 "MIDWEST GUARDRAIL SYSTEM INSTALLATION AT BRIDGE DECK EXPANSION JOINT" details and notes.*
6. *Where bridges employ guardrail in lieu of handrail or vehicular barriers, adjacent connecting guardrail runs shall be the same type.*
7. a) *All bolts except adjustment bolts shall be drawn tight on rails and components on initial installation.*
   b) *Final tightness check on rail and component bolts and retightening as required to be done 30 days after initial installation.*
8. *Transition length and post spacing will vary depending on the transition type. See project plans for guardrail transition type and conection to bridge ends.*
9. *'W' distance is measured from face of guardrail at end post, exclusive of end piece.*
10. *The slope from the edge of the shoulder into the face of the guardrail should not be steeper than 1V : 10H. Paving of widened shoulder to face of posts in both ends of guardrail runs is required.*
11. *Wood or steel post. Steel post shown.*

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

MIDWEST GUARDRAIL SYSTEM PLACEMENT AT BRIDGE ENDS

SHEET 1 OF 2

2024

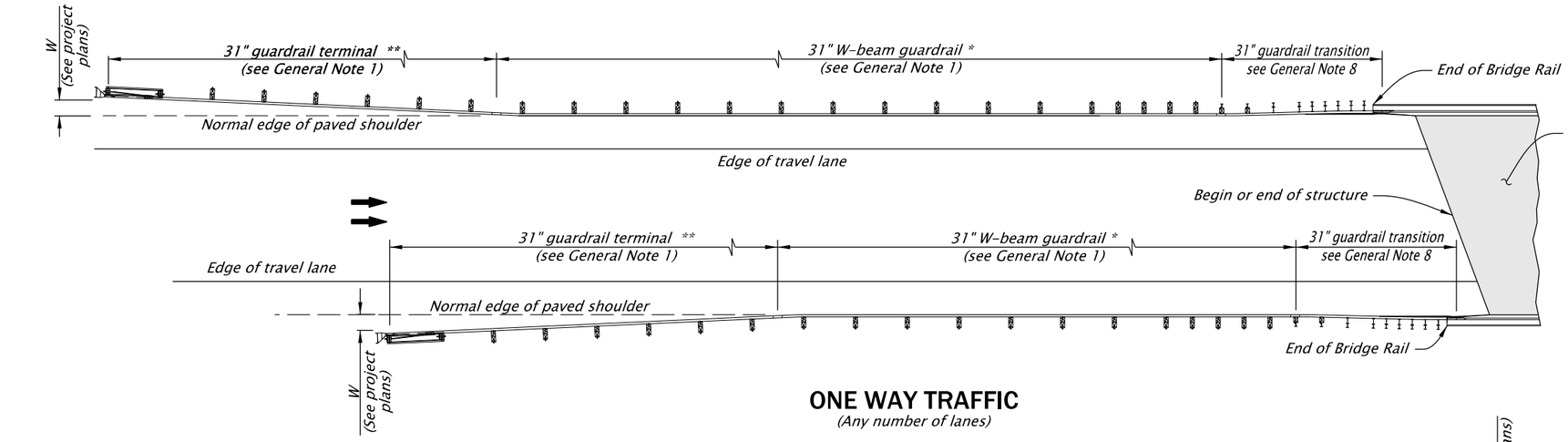
DATE	REVISION DESCRIPTION
12-2021	REVISED NOTES
12-2023	REVISED DETAILS AND NOTES
09-2025	REVISED DETAILS, RENUMBERED DRAWING FROM RD442

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD442A**

Effective Date: June 1, 2026 - November 30, 2026

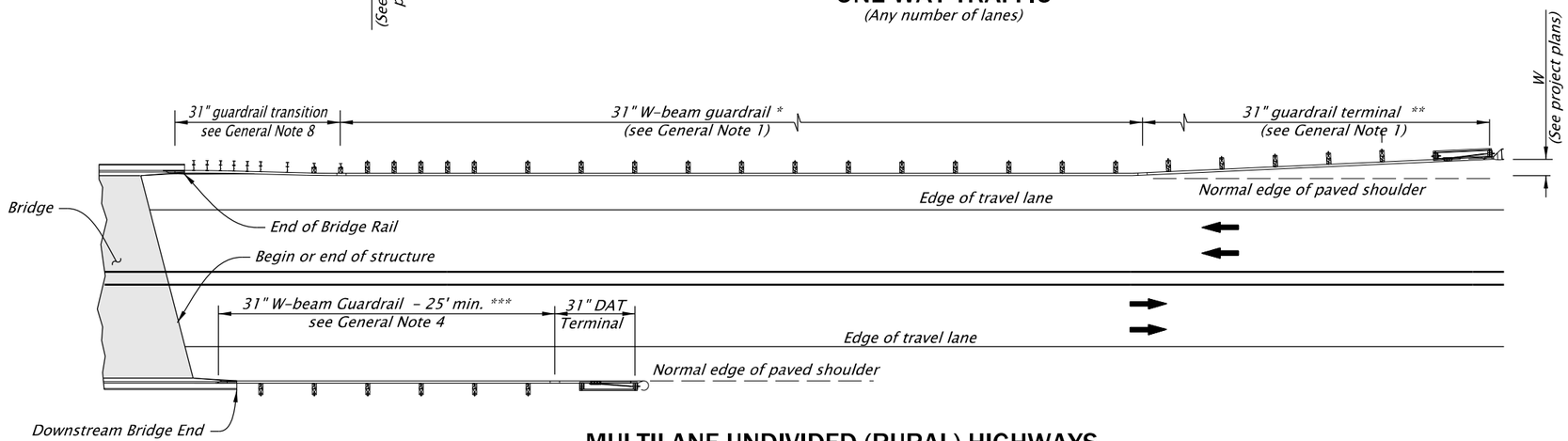
13-JAN-2026

RD442A.dgn



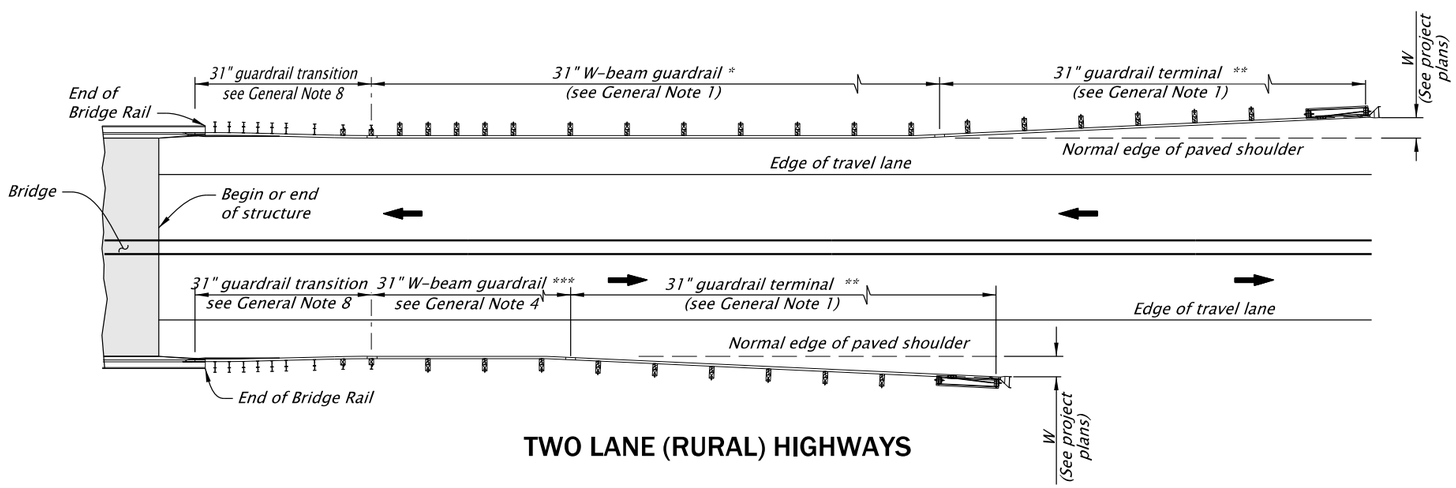
ONE WAY TRAFFIC

(Any number of lanes)



MULTILANE UNDIVIDED (RURAL) HIGHWAYS

(Two or more lanes in each direction)



TWO LANE (RURAL) HIGHWAYS

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *See appropriate standard drawing(s) for details not shown.*
2. *Guardrail at indicated positions is required for protection at bridge ends. Additional guardrail is to be installed as required guardrail warrant and fastened to bridge.*
3. *Face of guardrail at locations shown above must match face of bridge curb or bridge rail on structure without curb.*
4. *Trailing ends (freeway, multilane and similar one-way facilities) outside the horizontal clearance area and not exposed to opposing traffic:*
   a) *Guardrail terminals, use a Downstream Anchor Terminal (DAT) drawing RD438, Type B end piece and do not flare.*
   b) *At bridge ends, omit transition guardrail and Type 3 guardrail. Use bridge connection drawing BR236 and guardrail as required in plans.*
   c) *A minimum 25' length, three standard line posts is required.*
5. *Rail expansion slots to be provided at bridge end connections. See drawing RD412 "MIDWEST GUARDRAIL SYSTEM INSTALLATION AT BRIDGE DECK EXPANSION JOINT" details and notes.*
6. *Where bridges employ guardrail in lieu of handrail or vehicular barriers, adjacent connecting guardrail runs shall be the same type.*
7. a) *All bolts except adjustment bolts shall be drawn tight on rails and components on initial installation.*
   b) *Final tightness check on rail and component bolts and retightening as required to be done 30 days after initial installation.*
8. *Transition length and post spacing will vary depending on the transition type. See project plans for guardrail transition type and connection to bridge ends.*
9. *'W' distance is measured from face of guardrail at end post, exclusive of end piece.*
10. *The slope from the edge of the shoulder into the face of the guardrail should not be steeper than 1V : 10H. Paving of widened shoulder to face of posts in both ends of guardrail runs is required.*
11. *Wood or steel post. Wood post shown.*

* *Length of need calculation will determine quantity of 31" W-beam required.*

** *Provide from ODOT's QPL. Install according to manufacturer's instructions.*

*** *Check for horizontal clearance protection,*

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

MIDWEST GUARDRAIL SYSTEM PLACEMENT AT BRIDGE ENDS

SHEET 2 OF 2

2024

DATE	REVISION DESCRIPTION
10-2025	NEW DRAWING

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD442B**

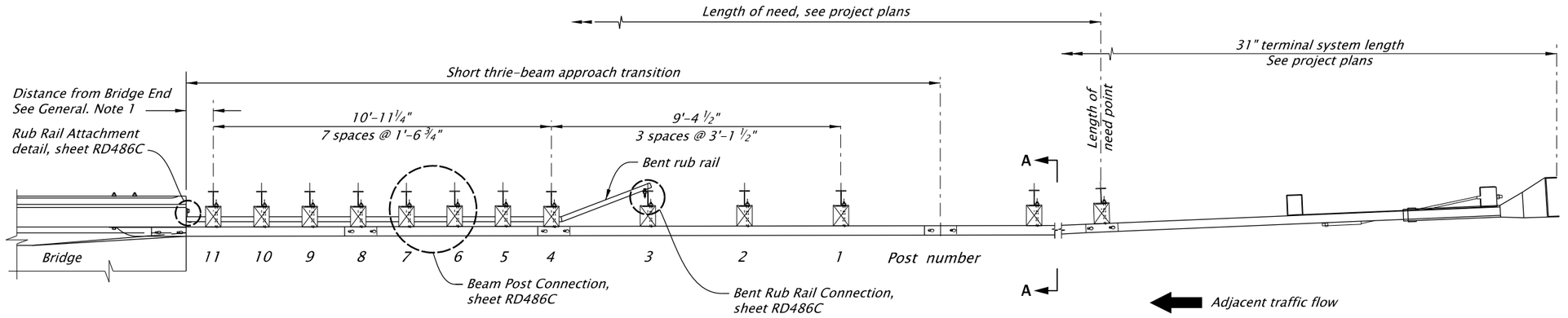
Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

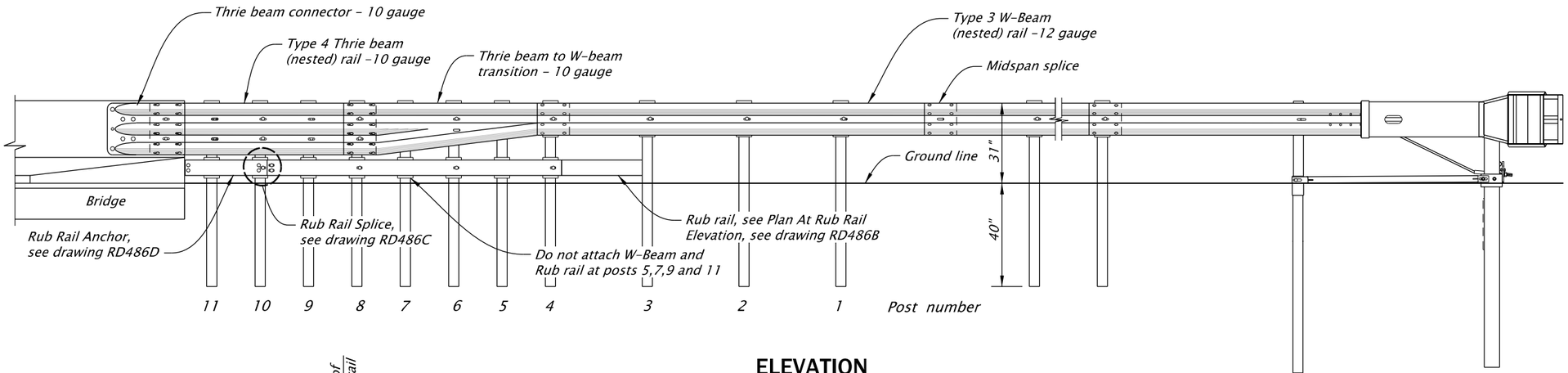
RD442B.dgn

13-JAN-2026

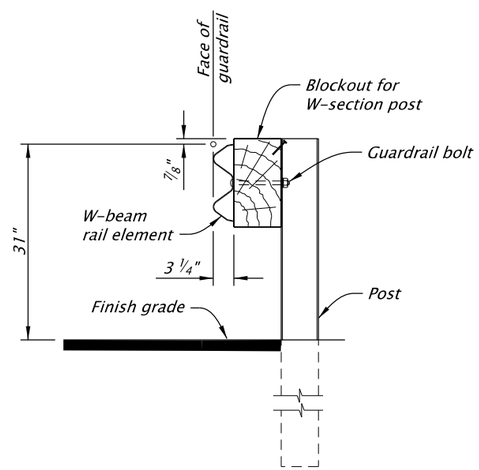
RD486A.dgn



PLAN



ELEVATION



SECTION A-A

(Steel post shown)

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *See appropriate standard drawing(s) for details not shown.*
2. *Install a guardrail terminal system that meets MASH requirements per manufacturer's recommendations. Ensure that guardrail terminal meets appropriate test level for the project.*
3. *Provide guardrail terminal from ODOT's QPL. Install according to manufacturer's recommendations (post count varies). Provide shop drawings to Engineer.*
4. *Recessed guardrail nuts on all 5/8-inch diameter bolts unless otherwise indicated.*
5. *All steel components, including hardware, are galvanized, and all bolts are ASTM A307 unless otherwise indicated.*
6. *Lap guardrail in direction of adjacent traffic.*
7. *Final paved surfacing to extend to face of post. Rail height measured from final paved surface at face of rail to top of rail, typical all types. 1-inch ± tolerance.*
8. *Wood or steel post. Steel post shown.*
9. *See drawings RD486B, RD486C, and RD488D for transition details not shown.*

ACCOMPANIED BY DWGS.:
RD486B, RD486C, RD486D

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

SHORT THRIE-BEAM APPROACH (MASH TL-3) TRANSITION OVERVIEW

SHEET 1 OF 4

2024

DATE	REVISION DESCRIPTION
10-2025	NEW DRAWING

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD486A**

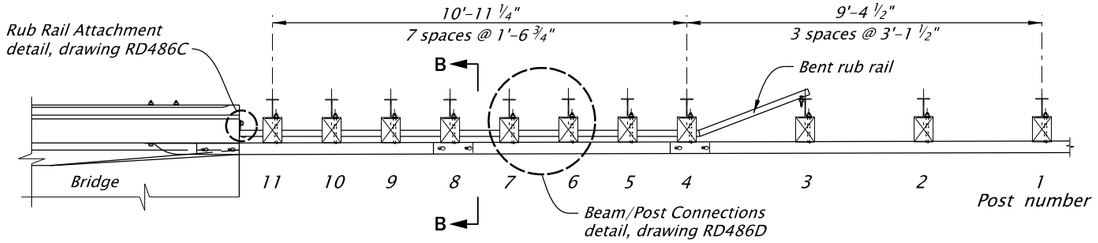
Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

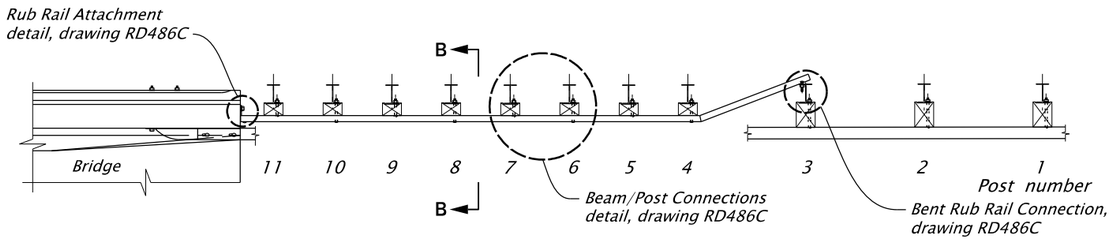
RD486B.dgn

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

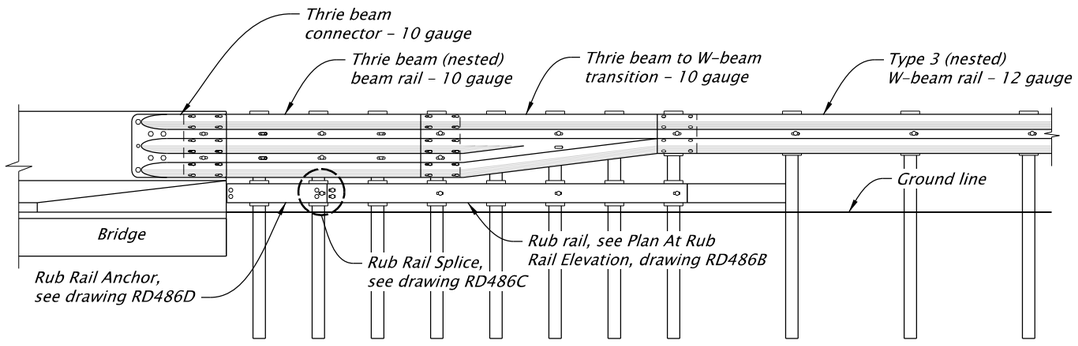
1. *See appropriate standard drawing(s) for details not shown.*



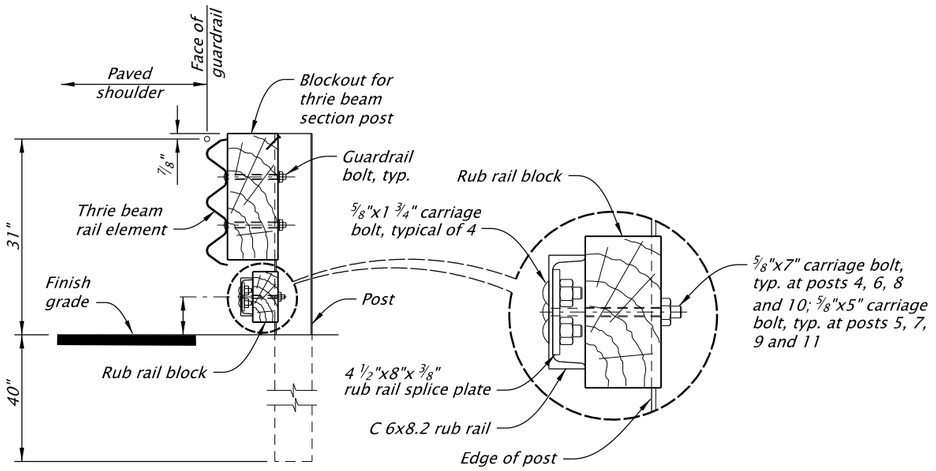
PLAN



PLAN AT RUB RAIL

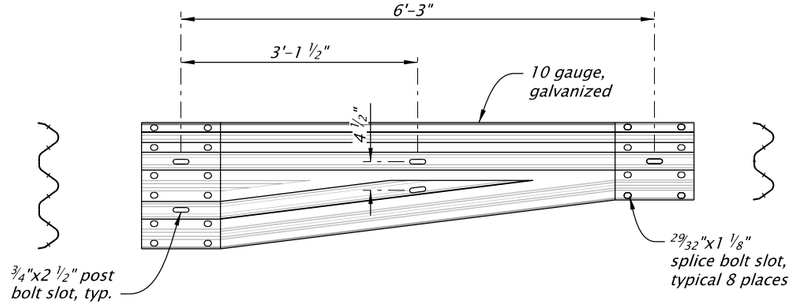


ELEVATION



SECTION B-B

Posts 7 - 10 typical, unless otherwise noted



THRIE BEAM TO W-BEAM ASYMMETRICAL TRANSITION

ACCOMPANIED BY DWGS.:
RD486A, RD486C, RD486D

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

SHORT THRIE-BEAM APPROACH (MASH TL-3) TRANSITION DETAILS

SHEET 2 OF 4

2024

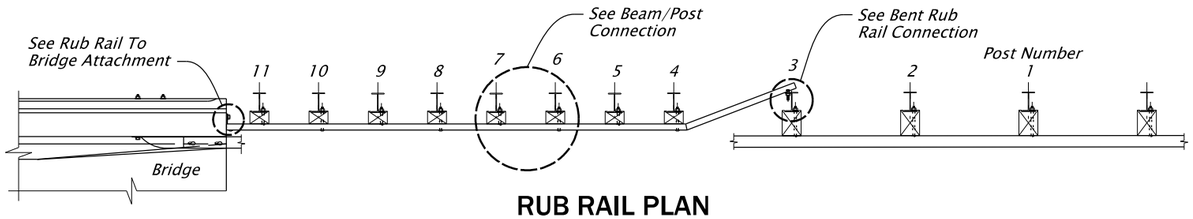
DATE	REVISION DESCRIPTION
10-2025	NEW DRAWING

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD486B**

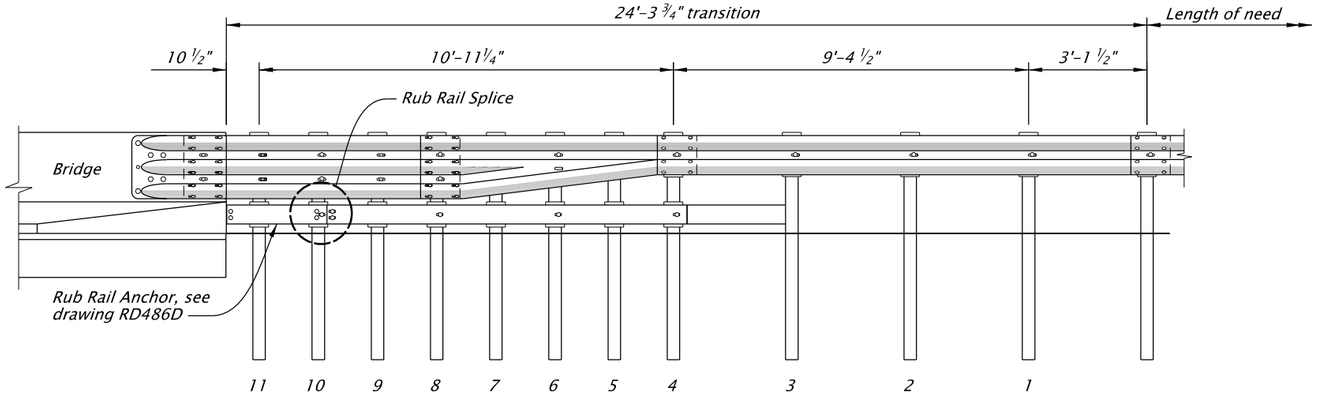
Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

RD486C.dgn

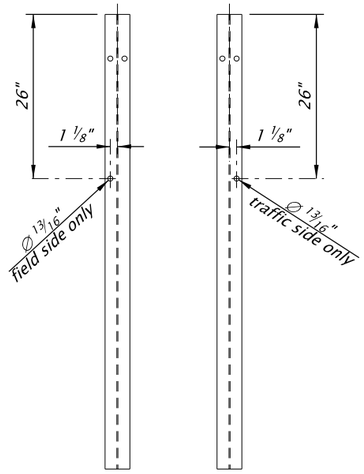


RUB RAIL PLAN



RUB RAIL ELEVATION

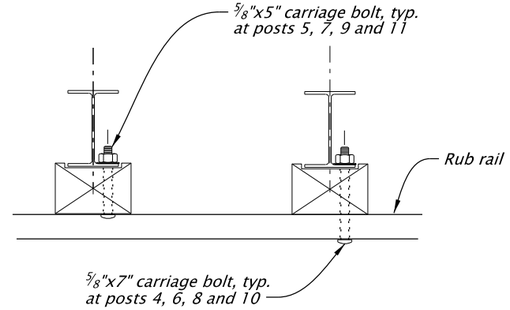
(Do not attach W-beam and rub rail at Post 5, 7, 9 and 11)



POST DRILLING DETAILS

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *See appropriate standard drawing(s) for details not shown.*

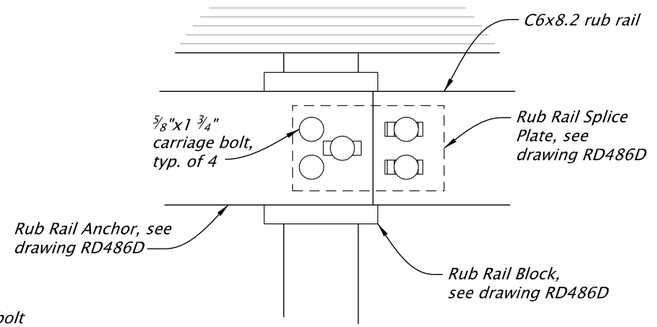


BEAM / POST CONNECTION

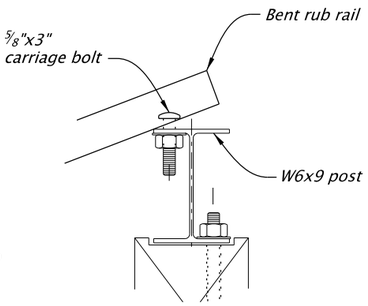
THRIE BEAM WOOD BLOCK FOR STEEL POST

W-BEAM WOOD BLOCK FOR STEEL POST

RUB RAIL TO BRIDGE ATTACHMENT



RUB RAIL SPLICE



BENT RUB RAIL CONNECTION

ACCOMPANIED BY DWGS.:
RD486A, RD486B, RD486D

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

SHORT THRIE-BEAM APPROACH (MASH TL-3) RUB RAIL CONNECTION

SHEET 3 OF 4

2024

DATE	REVISION DESCRIPTION
10-2025	NEW DRAWING

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD486C**

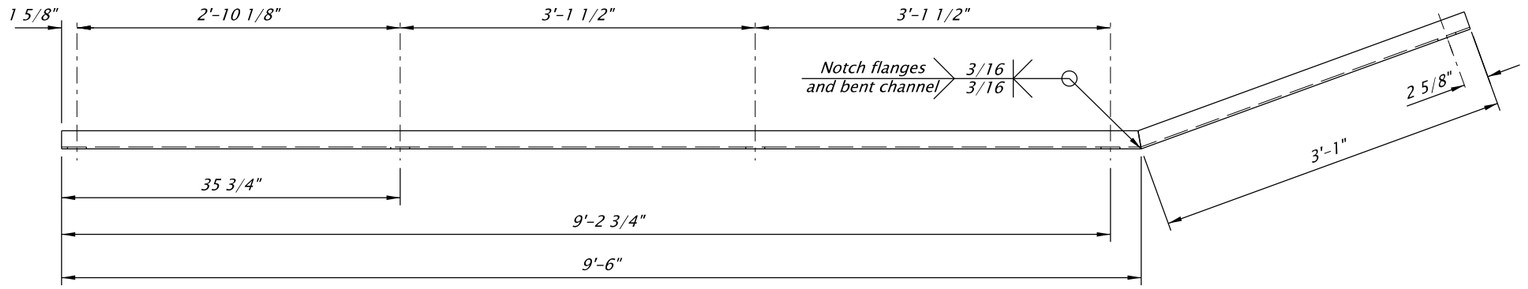
Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

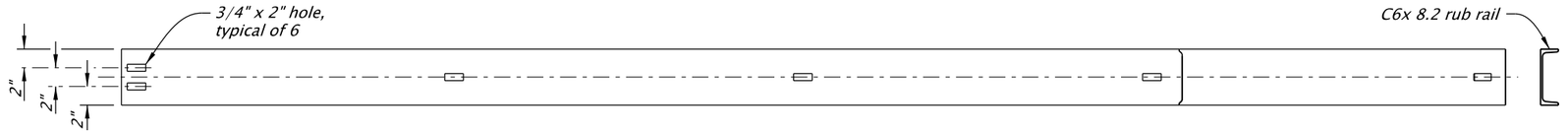
RD486D.dgn

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

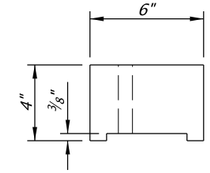
1. *See appropriate standard drawing(s) for details not shown.*



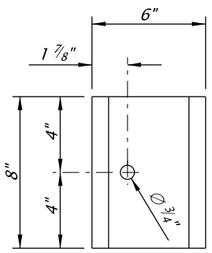
BENT RUB RAIL PLAN



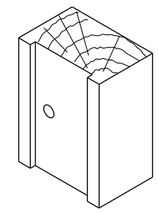
BENT RUB RAIL ELEVATION



TOP VIEW

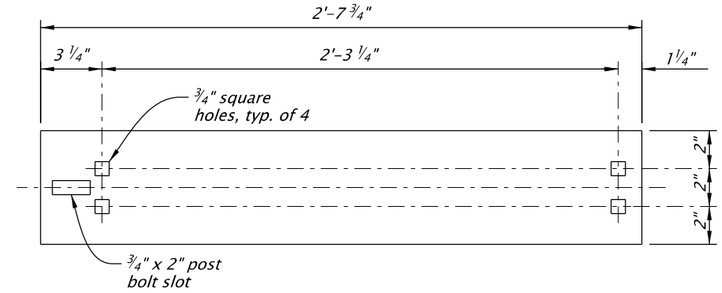


FRONT VIEW

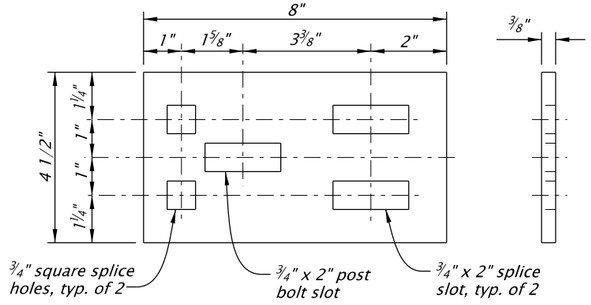


ISOMETRIC

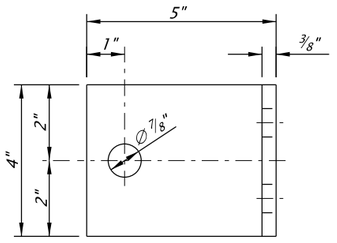
RUB RAIL BLOCK



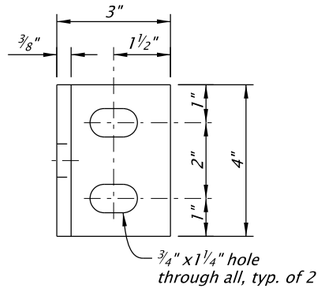
RUB RAIL ANCHOR



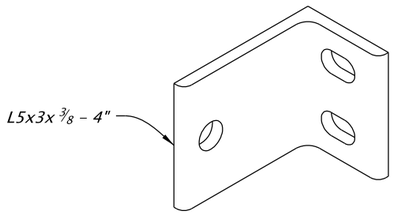
RUB RAIL SPLICE PLATE



FRONT VIEW



SIDE VIEW



ISOMETRIC

RUB RAIL BRACKET

ACCOMPANIED BY DWGS.:
RD486A, RD486B, RD486C

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

SHORT THRIE-BEAM APPROACH (MASH TL-3) BENT RUB RAIL DETAILS

SHEET 4 OF 4

2024

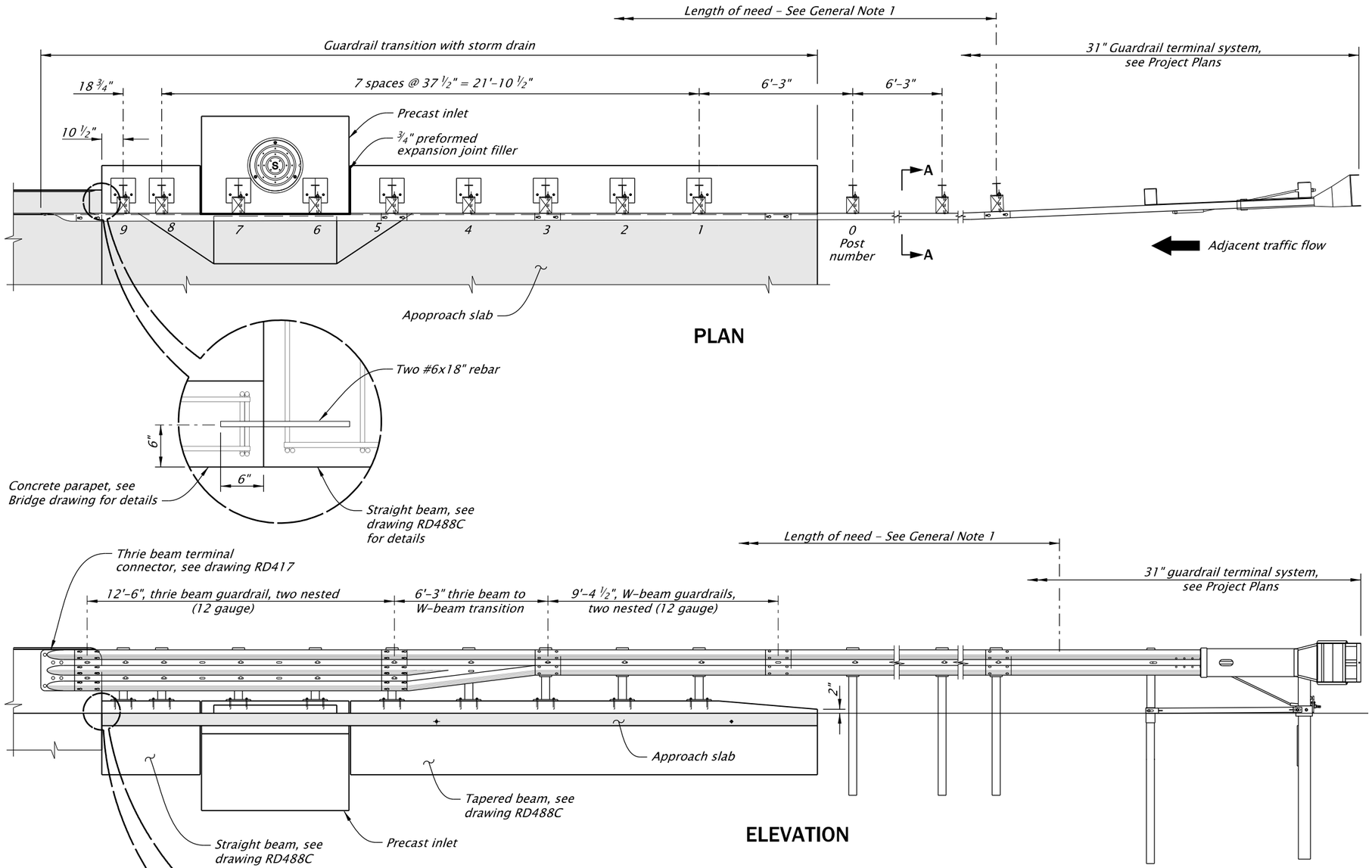
DATE	REVISION DESCRIPTION
10-2025	NEW DRAWING

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD486D**

Effective Date: June 1, 2026 - November 30, 2026

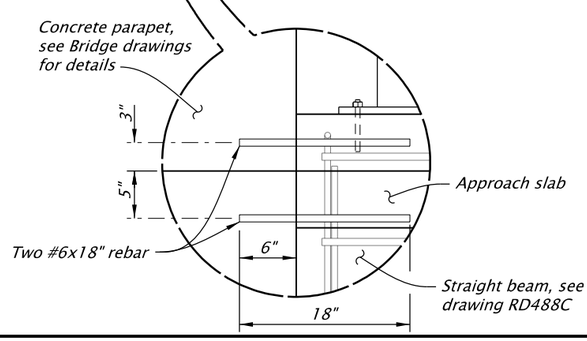
13-JAN-2026

RD488A.dgn



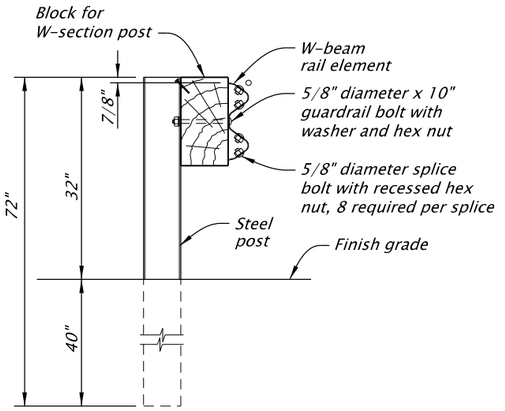
PLAN

ELEVATION



GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *See appropriate guardrail standard drawing(s) for posts, rail, and other hardware details not shown. See project plans for details not shown.*
2. *Install a guardrail terminal system that meets MASH requirements per manufacturer's recommendations. Ensure that guardrail terminal meets appropriate test level for the project.*
3. *Provide guardrail terminal from ODOT's QPL. Install according to manufacturer's recommendations (post count varies). Provide shop drawings to Engineer.*
4. *Recessed guardrail nuts on all 5/8-inch diameter bolts unless otherwise indicated.*
5. *All steel components, including hardware, are galvanized, and all bolts are ASTM A307 unless otherwise indicated.*
6. *Lap guardrail in direction of adjacent traffic.*
7. *See drawings RD488B and RD488C for transition details not shown.*



SECTION A-A

ACCOMPANIED BY DWGS.:
RD488B, RD488C

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

MIDWEST GUARDRAIL SYSTEM TRANSITION WITH STORM DRAIN (MASH TL-3) INSTALLATION

SHEET 1 OF 3

2024

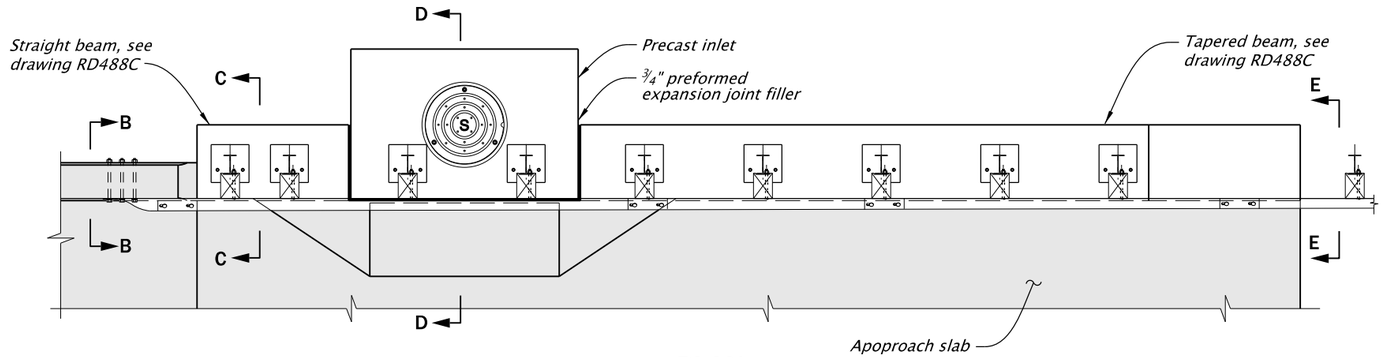
DATE	REVISION DESCRIPTION
12-2025	NEW DRAWING

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD488A**

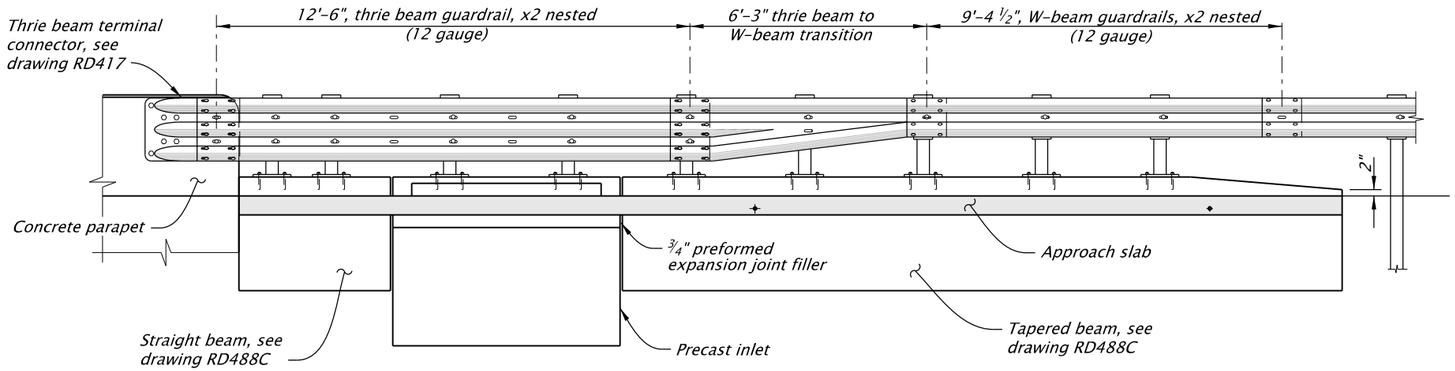
Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

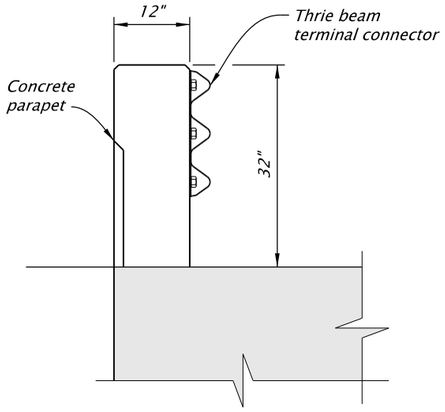
RD488B.dgn



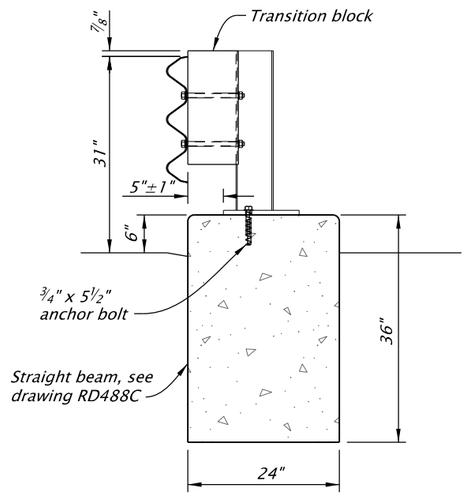
PLAN



ELEVATION



SECTION B-B



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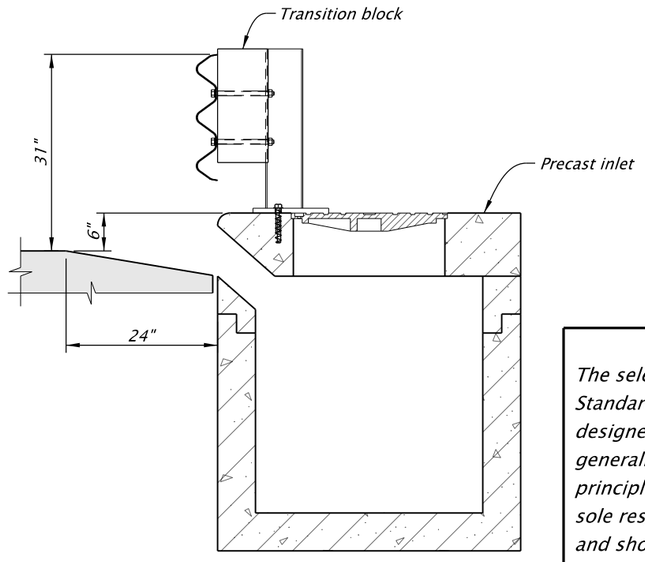

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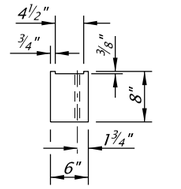

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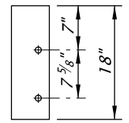

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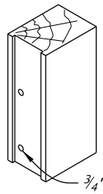
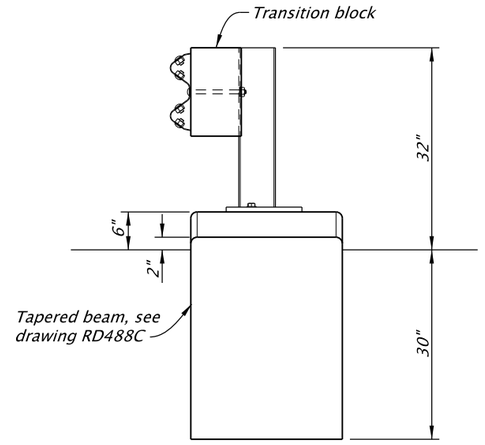


ISOMETRIC

ROUTED TRANSITION BLOCK FOR STEEL POST



END VIEW E-E

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *See appropriate guardrail standard drawing(s) for details not shown.*
2. *See drawing RD488A for overview installation.*
3. *See drawing RD488C for details not shown.*

ACCOMPANIED BY DWGS.:
RD488A, RD488C

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

MIDWEST GUARDRAIL SYSTEM TRANSITION WITH STORM DRAIN (MASH TL-3) CROSS SECTIONS

SHEET 2 OF 3

2024

DATE	REVISION DESCRIPTION
12-2025	NEW DRAWING

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD488B**

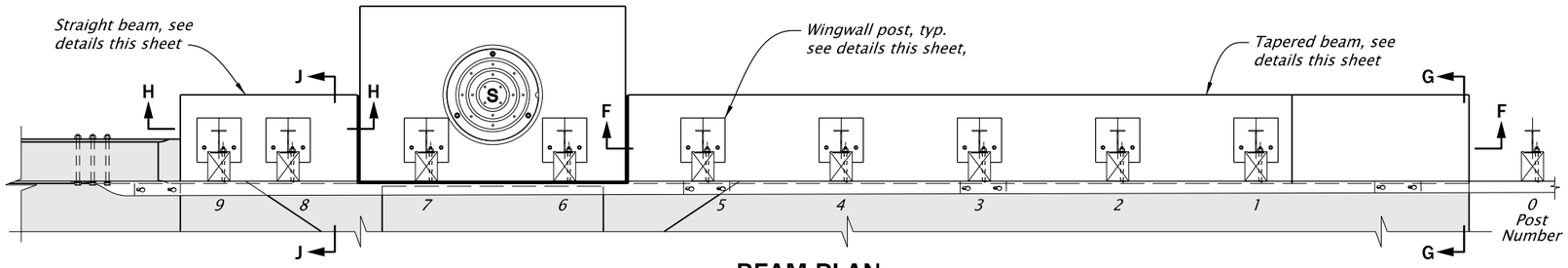
Effective Date: June 1, 2026 – November 30, 2026

13-JAN-2026

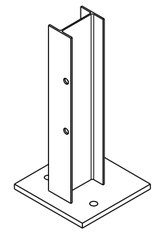
RD488C.dgn

GENERAL NOTES FOR ALL DETAILS THIS SHEET:

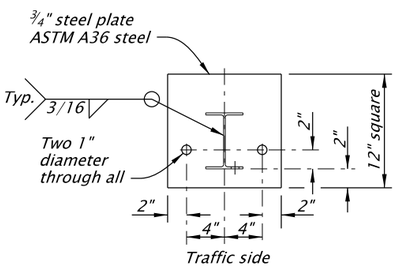
1. *See appropriate standard drawing(s) for details not shown.*



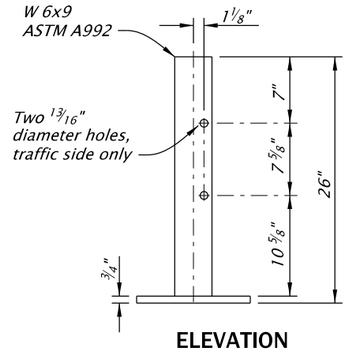
BEAM PLAN



ISOMETRIC VIEW



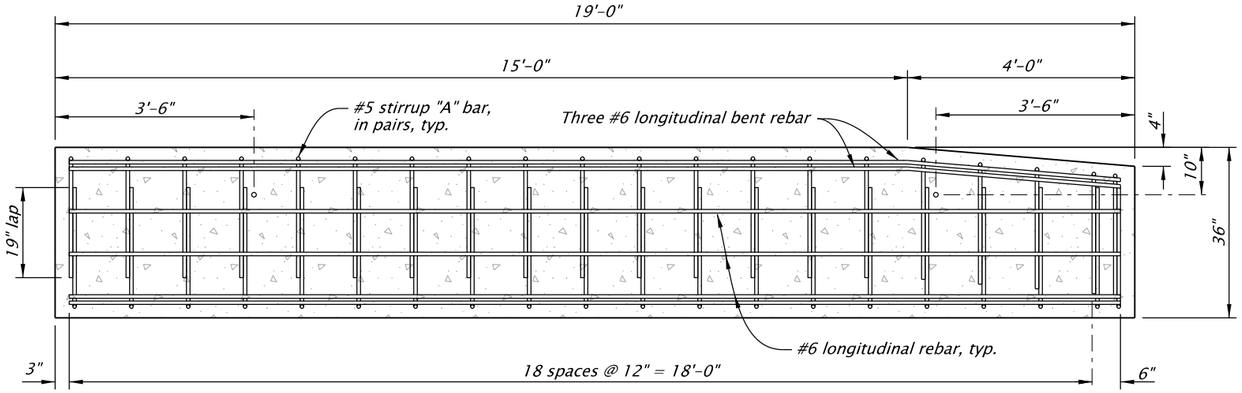
PLAN



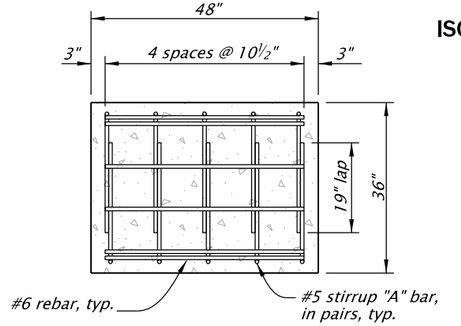
ELEVATION

WINGWALL POST

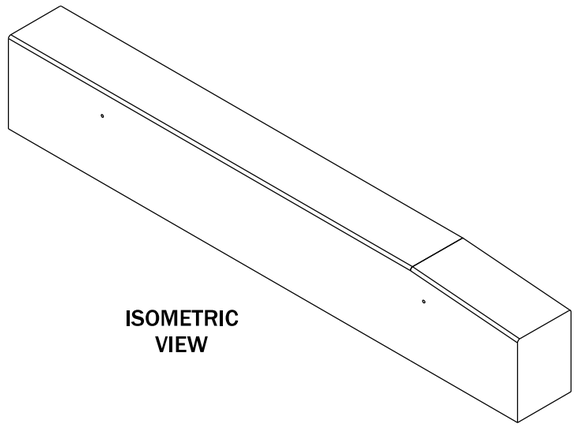
Typical @ posts 1-9



SECTION F-F

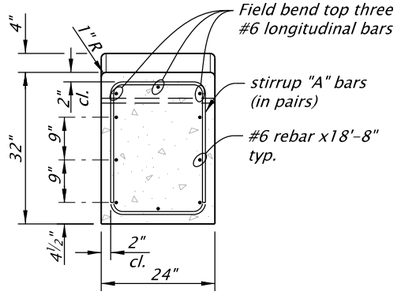


SECTION H-H

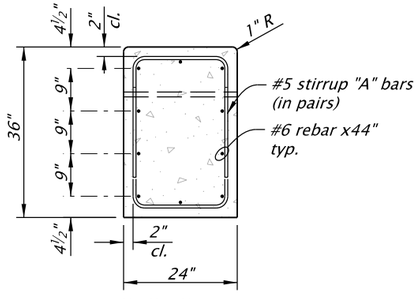


ISOMETRIC VIEW

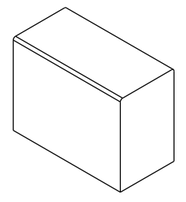
STRAIGHT BEAM



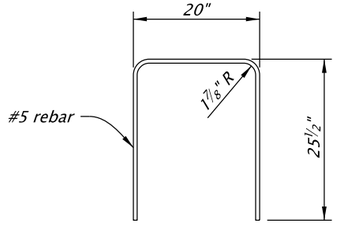
SECTION G-G



SECTION J-J



ISOMETRIC VIEW



STIRRUP "A" BAR

TAPERED BEAM

ACCOMPANIED BY DWGS.:
RD488A, RD488B

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

MIDWEST GUARDRAIL SYSTEM TRANSITION WITH STORM DRAIN (MASH TL-3) MISCELLANEOUS DETAILS

SHEET 3 OF 3

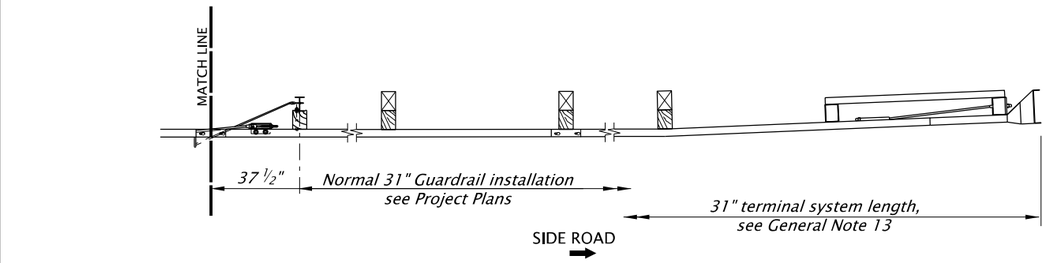
2024

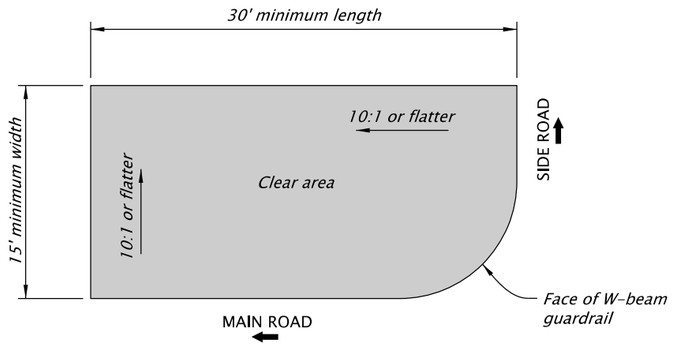
DATE	REVISION DESCRIPTION
12-2025	NEW DRAWING

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD488C**

Effective Date: June 1, 2026 - November 30, 2026

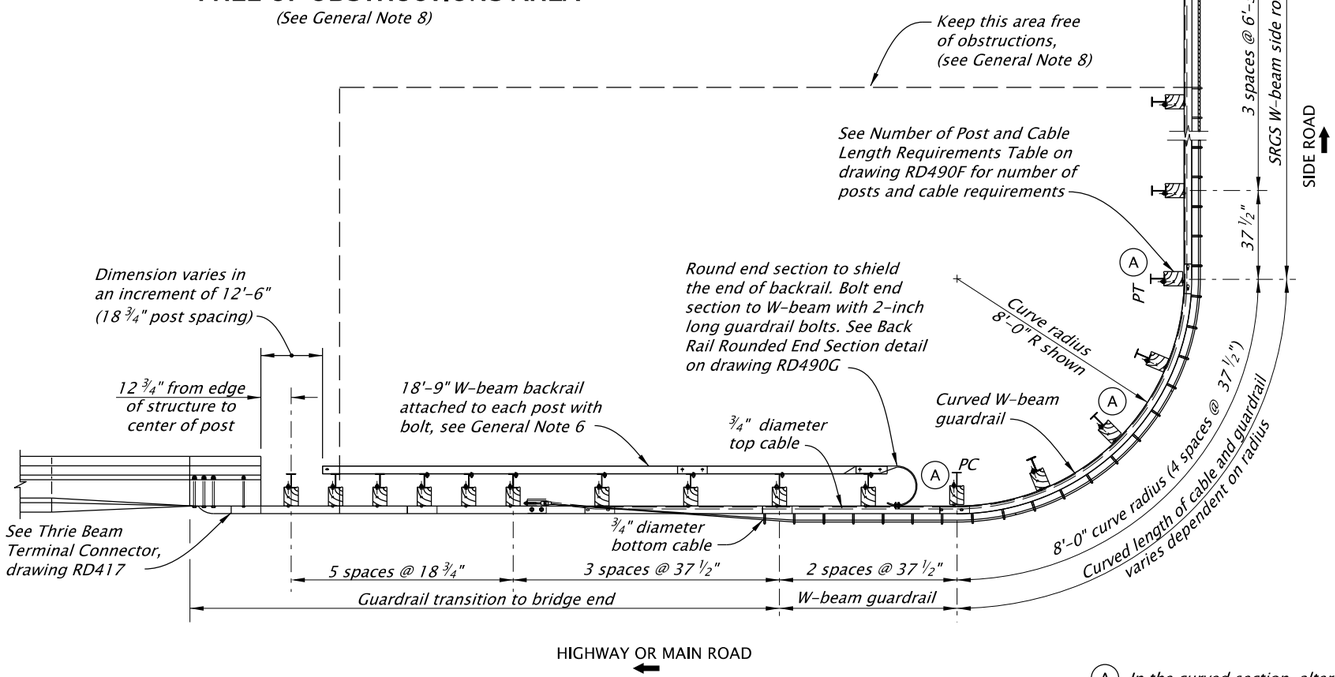
RD490A.dgn 13-JAN-2026





FREE OF OBSTRUCTIONS AREA

(See General Note 8)



PLAN

Ⓐ *In the curved section, alternate posts are not bolted to the rail, including the center post, the first post, and the last post. The bolt head shall be bolted behind the W-beam (not attached to the rail).*

GENERAL NOTES:

1. *The short radius W-beam guardrail system (SRGS) shown is a MASH TL-3 barrier system. The system is for shielding highway or road users from roadside areas where a main road and a side road intersect in close proximity to a bridge or a location that the length of need cannot be provided upstream of the hazard.*
2. *Use SRGS thrie beam transition with W-beam backrail as shown. Do not shorten the transition. Curb is not required beneath the thrie beam transition, but can be added.*
3. *The cables begin in the SRGS thrie beam transition section and end in the trailing end section.*
4. *If there is no rigid barrier on the highway or main road, the SRGS should be installed symmetrically without the SRGS thrie beam transition. The section along the highway or main road should be the mirror image of the side road installation.*
5. *The top and bottom cables shall be 3/4-inch diameter galvanized. The finished cable assembly will be installed so that the cable assembly is put in tension until all slack is removed.*
6. *An additional 18 foot 9-inch long W-beam (10 gauge) is attached to the back of the thrie beam. The W-beam backrail is directly connected to the posts without blockouts.*
7. *Install rectangular guardrail plate washers under guardrail nuts at the splice between the thrie beam guardrail and thrie beam terminal connector.*
8. *The clear area (measured 15 feet from the highway or main road and 30 feet from the side road) behind the SRGS shall remain unobstructed and unencumbered to allow the guardrail to function properly. Obstacles (i.e. endwalls, signs, ditches, etc.) within this area must be removed, relocated, or redesigned.*
9. *W-beams shall be shop bent as required. Where indicated, bolt blockout to post, but do not bolt through W-beam. Do not install curb in the curved section.*
10. *In the 8-foot radius curved section, the center post, the first post, the last post and every other post shall not be connected to the rail. The radius and post spacing are measured from inside of the rail, and the installation lengths of guardrail and cables are measured along traffic side.*
11. *SRGS W-beam trailing end consists of a guardrail anchor, a guardrail terminal, or continuation of 31-inch W-beam guardrail on the side road.*
12. *Extend the 31-inch W-beam guardrail when guardrail continues on the minor road.*
13. *Use a crashworthy guardrail terminal to end the SRGS when approaching traffic on the minor road is within the clear zone for the minor road.*
14. *Use the anchor system to end the SRGS when the anchor is outside of the clear zone for approaching traffic on the minor road.*
15. *Overlap splices so the exposed W-beam edge is downstream of the adjacent traffic on the highway or main road.*
16. *Use 10 gauge W-beam and thrie beam unless otherwise noted. Drill or punch holes and slots before galvanizing unless otherwise noted.*
17. *See appropriate guardrail standard drawing(s) for posts, rail, and other hardware details not shown.*
18. *See drawing RD490B for SRSG along the main road and connection to bridge end or other concrete barrier details.*
19. *See drawing RD490C for SRSG along the side road.*
20. *See drawings RD490D and RD490E for SRGS eye bolt spacing and anchor bracket slot details.*
21. *See drawing RD490F for SRGS alternate radii layout.*
22. *See drawings RD490G and RD490H for details not shown.*
23. *A Downstream Anchor Terminal (DAT) may be installed on private driveways and approaches or where a crashworthy end terminal is not required.*
24. *If the SRGS is not connected to bridge or concrete barrier with a transition, the SRGS main road section should be a symmetrical mirror image of the SRGS side road section. The two straight sections of the SRGS are required off both ends of the curved radius section.*

ACCOMPANIED BY DWGS.:
RD490B, RD490C, RD490D, RD490E
RD490F, RD490G, RD490H

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

SHORT RADIUS GUARDRAIL SYSTEM (SRGS) OVERVIEW

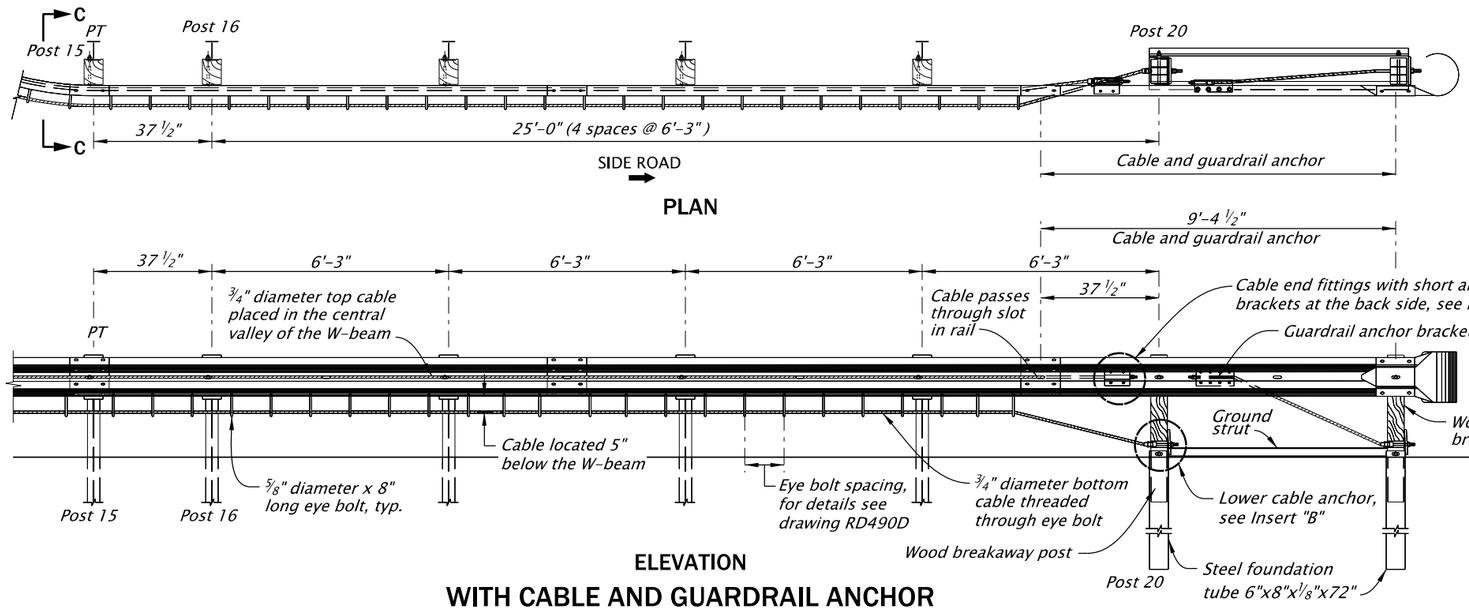
SHEET 1 OF 8

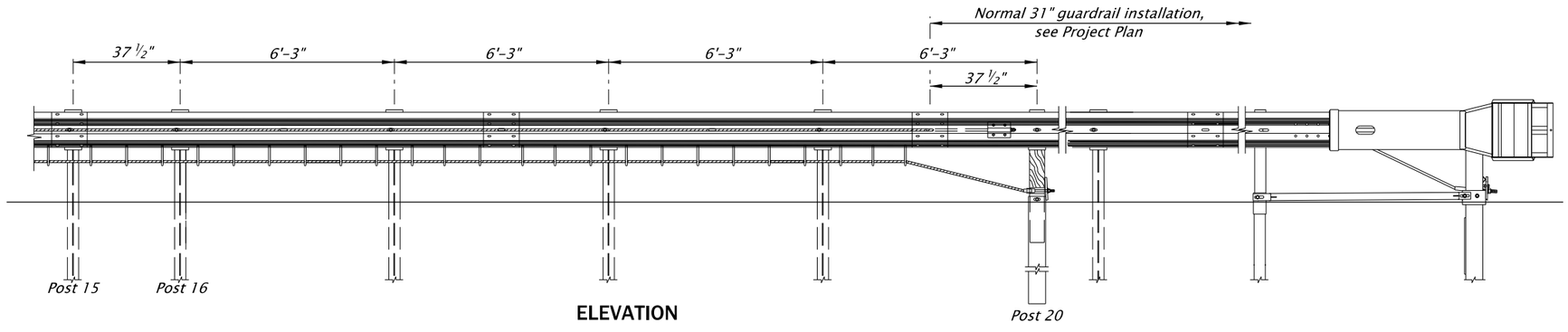
2024

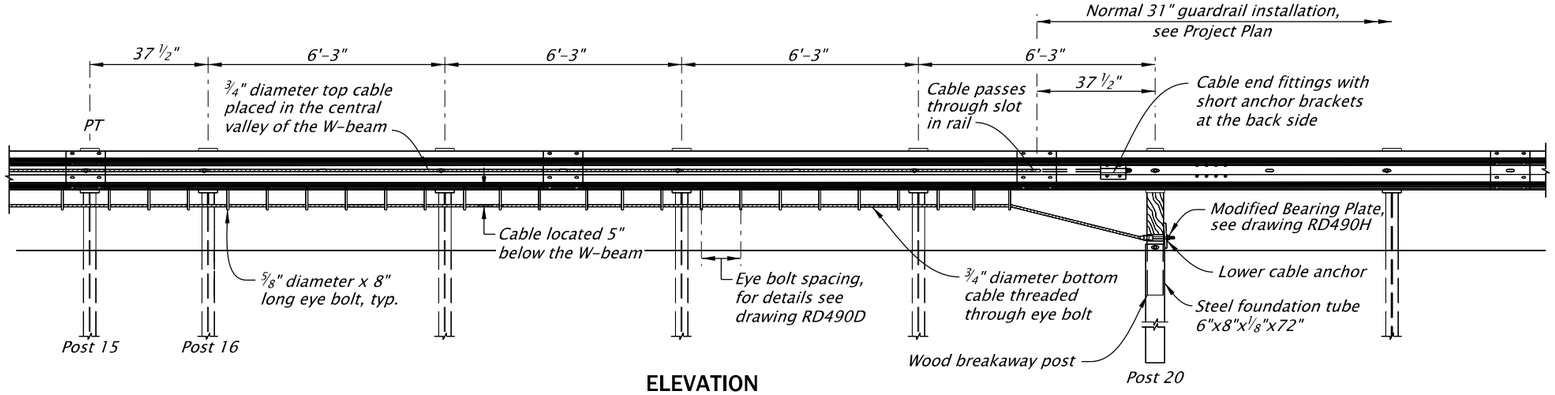
DATE	REVISION DESCRIPTION
05-2024	CREATED NEW DRAWING
12-2025	REVISED NOTES AND DETAILS

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD490A**

Effective Date: June 1, 2026 - November 30, 2026

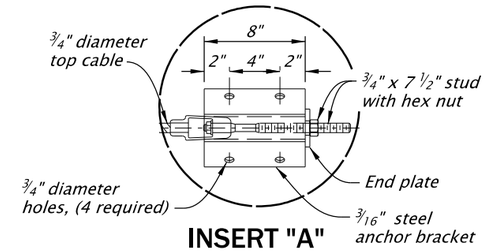




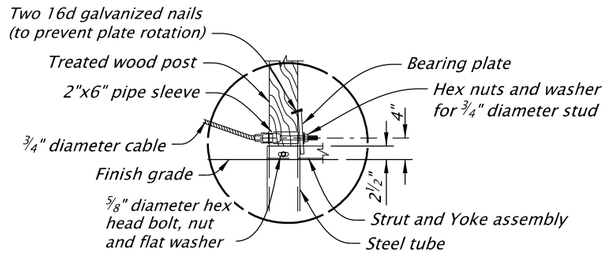


GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *See appropriate guardrail standard drawing(s) for posts, rail, and other hardware details not shown.*
2. *See drawing RD490A for SRGS overview details.*
3. *See drawing RD490B for SRGS along the main road and connection to bridge end or other concrete barrier details.*
4. *See drawings RD490D and RD490E for SRGS eye bolt spacing and anchor bracket slot details.*
5. *See drawings RD490G and RD490H for details not shown.*



INSERT "A"



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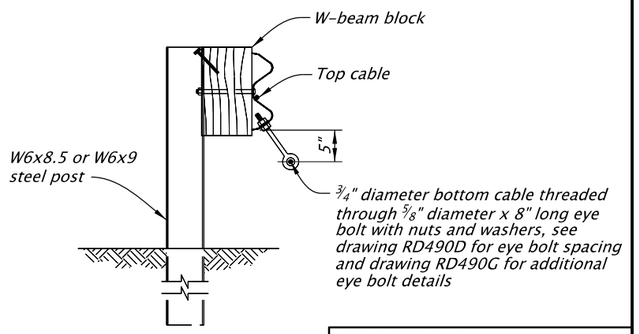


SECTION C-C

ACCOMPANIED BY DWGS.:
RD490A, RD490B, RD490D, RD490E, RD490F, RD490G, RD490H

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

SHORT RADIUS GUARDRAIL SYSTEM (SRGS) ALONG SIDE ROAD

SHEET 3 OF 8

2024

DATE	REVISION DESCRIPTION
05-2024	CREATED NEW DRAWING
12-2025	REVISED NOTES AND DETAILS

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD490C**

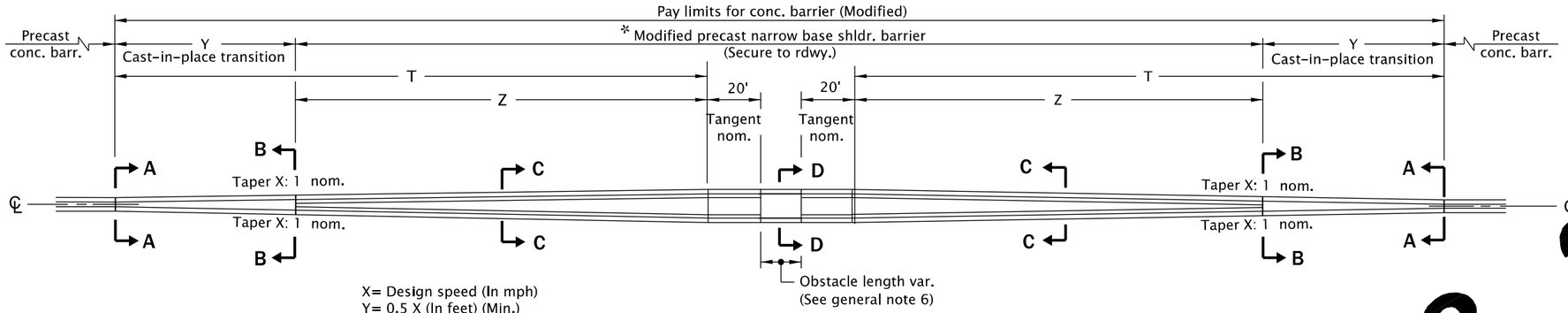
Effective Date: June 1, 2026 – November 30, 2026

13-JAN-2026

RD490C.dgn

14-JUL-2023

RD535.dgn



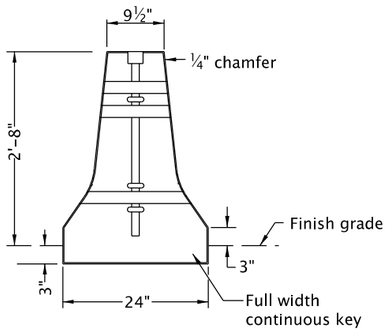
X= Design speed (In mph)
Y= 0.5 X (In feet) (Min.)
T= (½ obstacle width in feet + 0.40' + a) (X)
Z= T - Y

PLAN VIEW

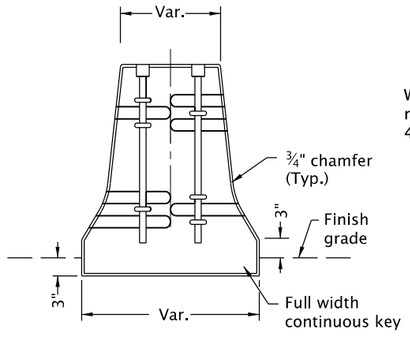
* Modification of barrier consists of providi... 1½"x4" paving ledge as shown in Sectio...

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

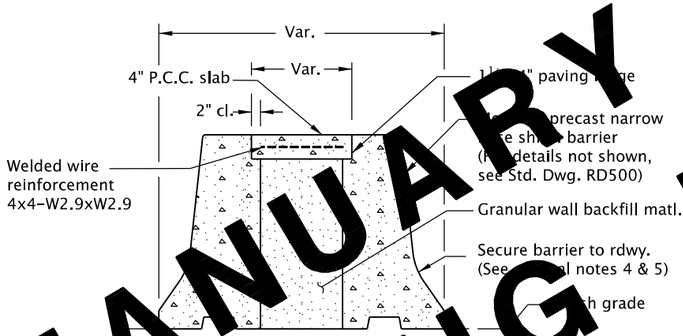
1. *Field verify end configurations of connecting barriers prior to forming connections at transitions.*
2. *All reinforcing bars shall be full length as shown and shall be placed 1-1/2 inch clear of the nearest face of concrete unless shown otherwise.*
3. *See Std. Dwgs. RD500 and RD505 for details not shown.*
4. *See Std. Dwg. RD502 for securing new permanent installations concrete barrier to roadway (when being anchored). See Std. Dwgs. RD515 and RD516 for securing concrete barrier to roadway that is to remain for use in temporary installations.*
5. *All pins, bolts, dowels, loop bars, and connectors shall be hot-dip galvanized after fabrication.*
6. *This barrier is not for use with bridge railing.*
7. *See Std. Dwg. RD536 for transition details.*



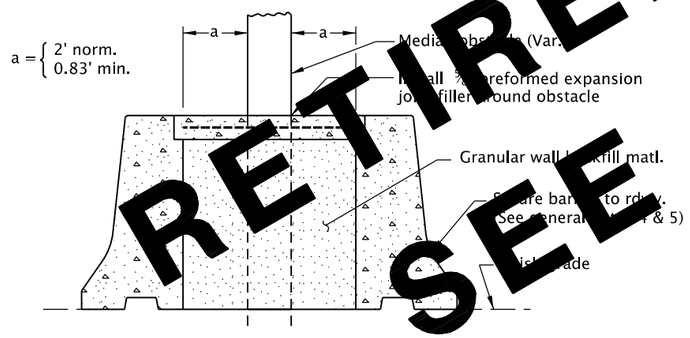
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D
(Precast option shown, see Section C-C for additional details not shown)

ISOMETRIC VIEW

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

CONCRETE BARRIER (MODIFIED) AROUND MEDIAN OBSTACLE

2024

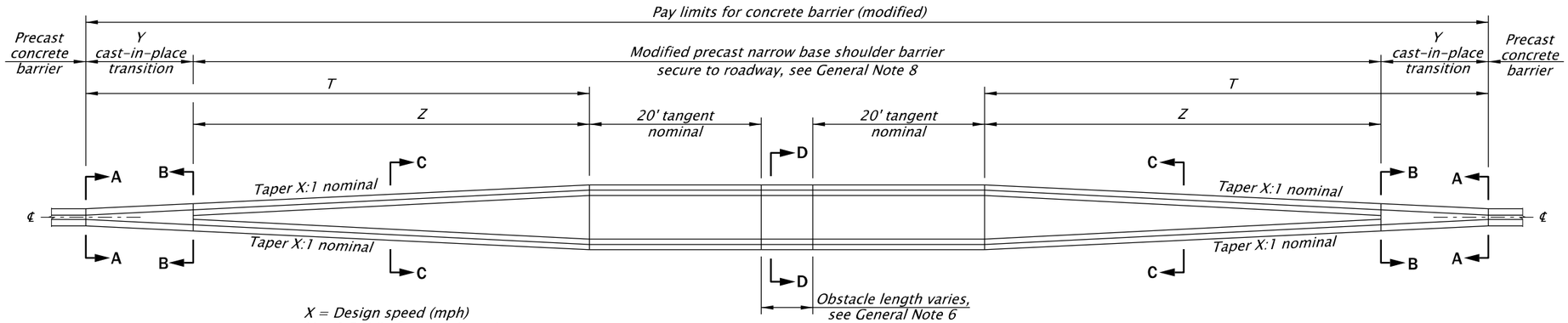
DATE	REVISION DESCRIPTION
05-2022	REVISED DETAILS AND NOTES
06-2023	REVISED NOTES

CALC. BOOK NO. N/A | SDR DATE 14-JUL-2023 | **RD535**

Effective Date: June 1, 2026 - November 30, 2026

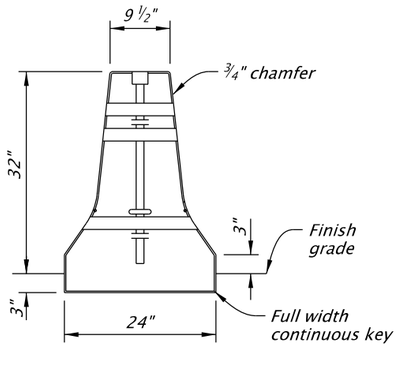
13-JAN-2026

RD535A.dgn

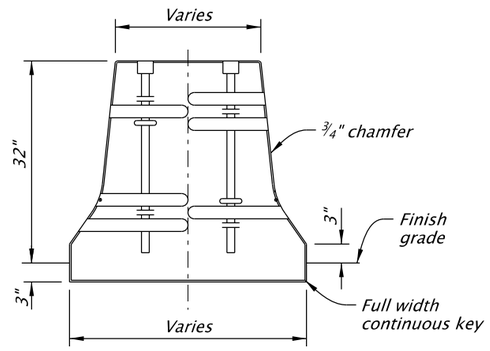


X = Design speed (mph)
Y = 0.5 X (in feet, minimum)
T = (½ obstacle width in feet + 0.40' + a) (X)
Z = T - Y

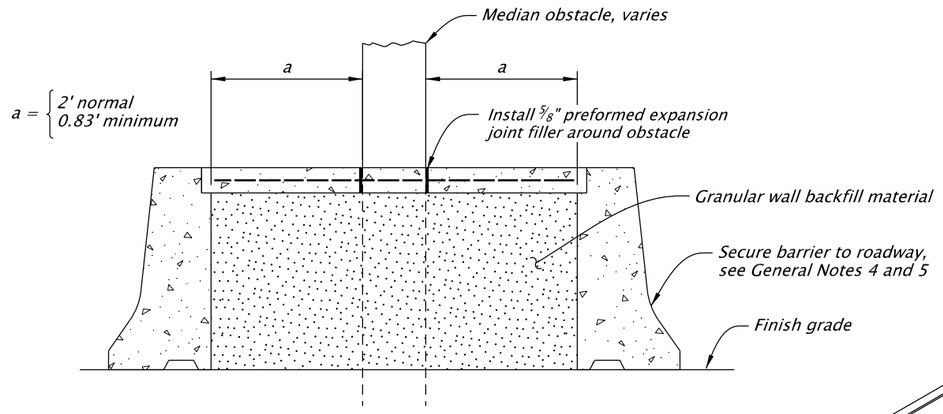
PLAN



SECTION A-A

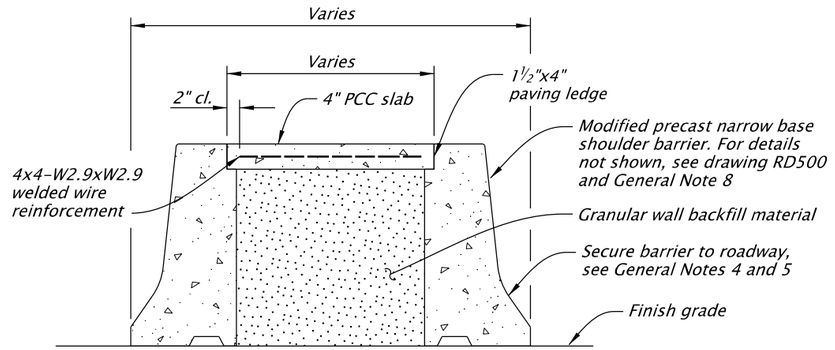


SECTION B-B

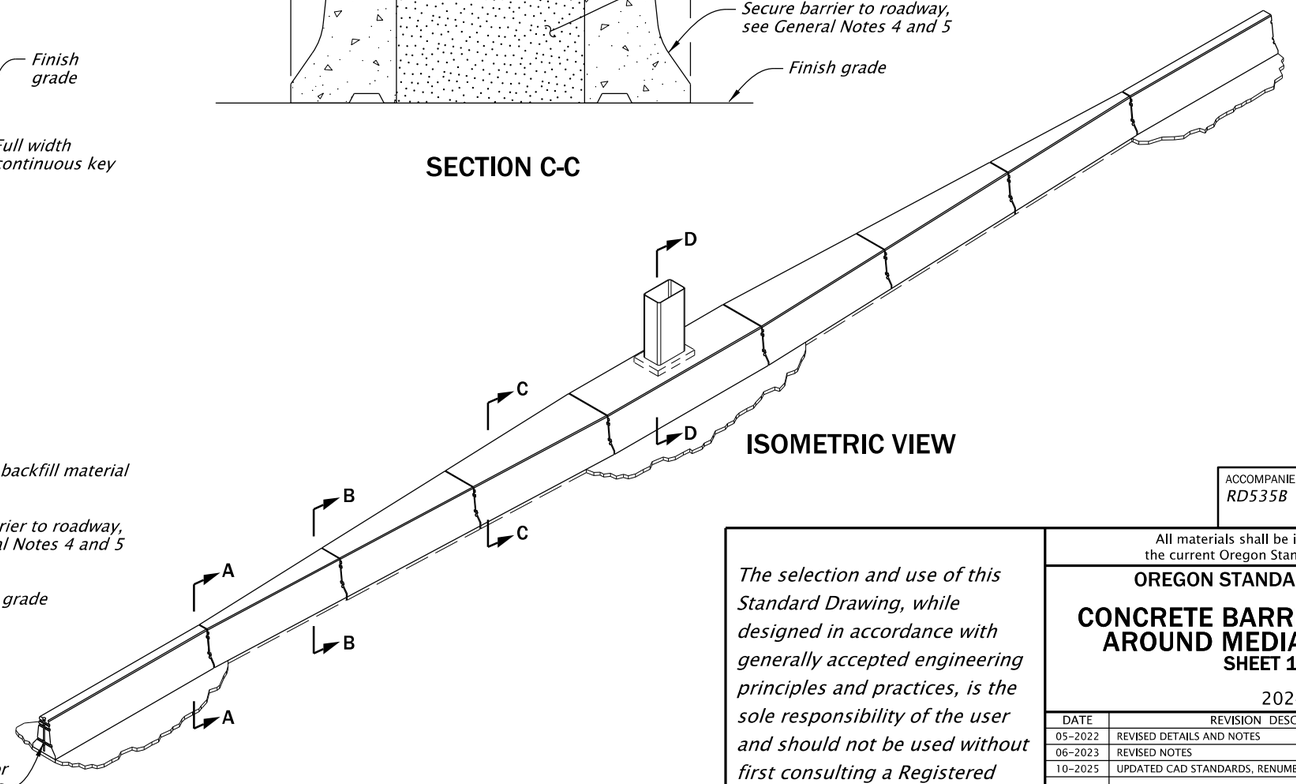


SECTION D-D

(Precast option shown, see Section C-C for additional details not shown)



SECTION C-C



ISOMETRIC VIEW

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *Field verify end configurations of connecting barriers prior to forming connections at transitions.*
2. *All reinforcing bars shall be full length as shown and shall be placed 1½" inches clear of the nearest face of concrete unless shown otherwise.*
3. *See drawings RD500 and RD505 for details not shown.*
4. *See drawing RD502 for securing new permanent installations concrete barrier to roadway (when being anchored). See drawings RD515 and RD516 for securing concrete barrier to roadway that is maintained for use in temporary installations.*
5. *All pins, bolts, dowels, loop bars, and connectors shall be hot-dip galvanized after fabrication.*
6. *This barrier is not for use with bridge railing.*
7. *See drawing RD535B for transition details.*
8. *Modification of barrier consists of providing 1½"x4" paving ledge as shown in Section C-C.*

ACCOMPANIED BY DWGS.:
RD535B

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

CONCRETE BARRIER (MODIFIED) AROUND MEDIAN OBSTACLE

SHEET 1 OF 2

2024

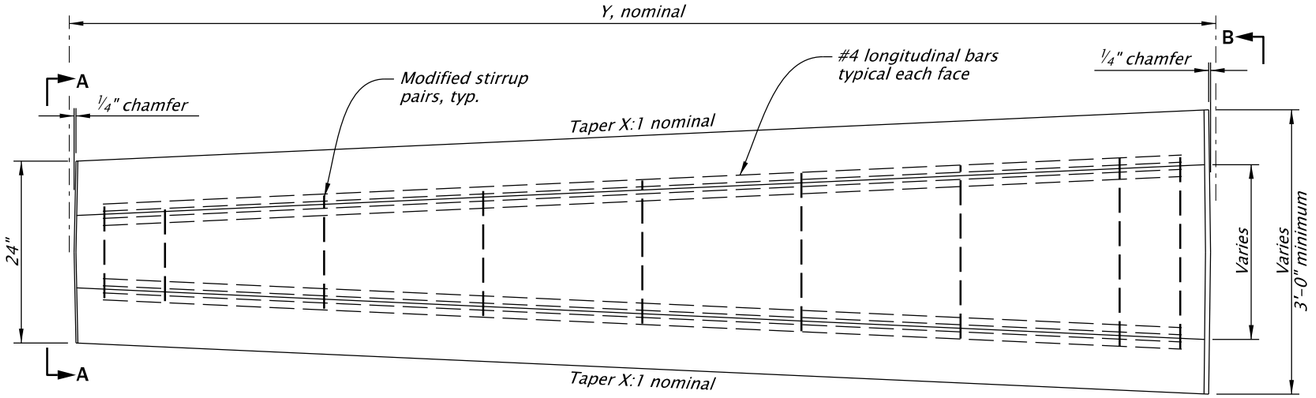
DATE	REVISION DESCRIPTION
05-2022	REVISED DETAILS AND NOTES
06-2023	REVISED NOTES
10-2025	UPDATED CAD STANDARDS, RENUMBERED DRAWING FROM RD535

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD535A**

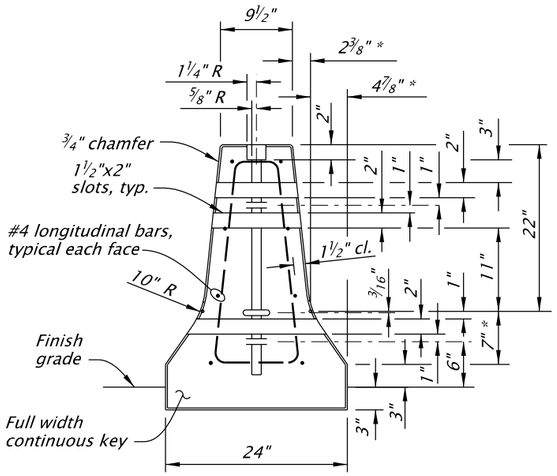
Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

RD535B.dgn



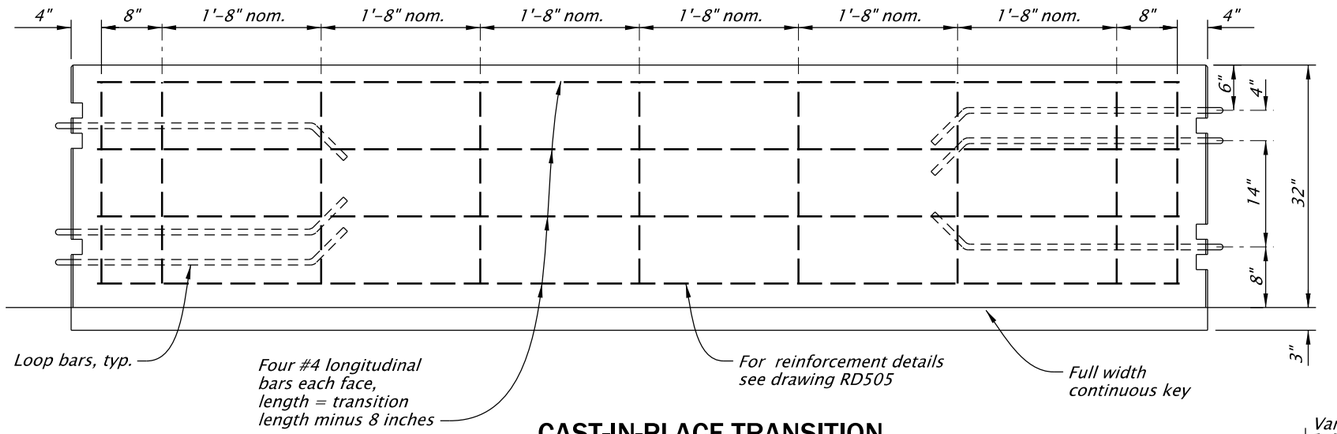
CAST-IN-PLACE TRANSITION BARRIER PLAN



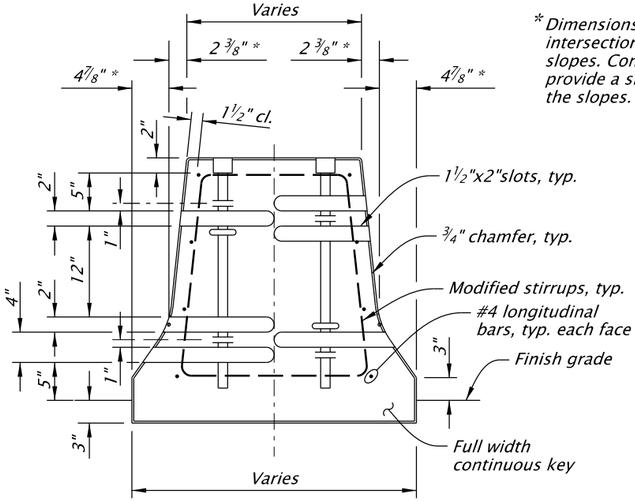
SECTION A-A
(See General Note 2)

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *Field verify end configurations of connecting barriers prior to forming connections at transitions.*
2. *All reinforcing bars shall be full length as shown and shall be placed 1½" clear of the nearest face of concrete unless shown otherwise.*
3. *See drawings RD500, RD501 and RD502 for details not shown.*
4. *Secure precast concrete barrier to roadway. See drawing RD502 for new permanent installations barrier anchoring details (when being anchored). See drawings RD515 and RD516 for securing concrete barrier to roadway hat is maintained for use in temporary installations.*
5. *All pins, bolts, dowels, loop bars, and connectors shall be hot-dip galvanized after fabrication.*
6. *This barrier is not for use with bridge railing.*

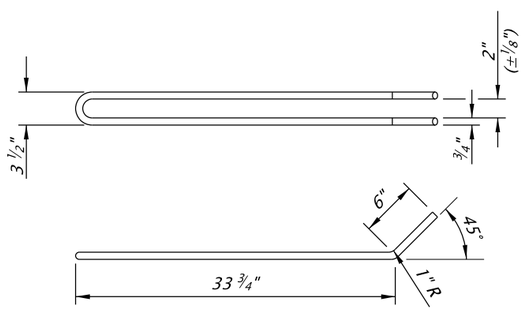


CAST-IN-PLACE TRANSITION BARRIER ELEVATION

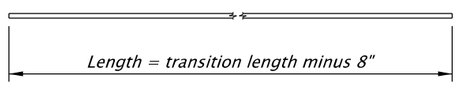


SECTION B-B
(See General Note 2)

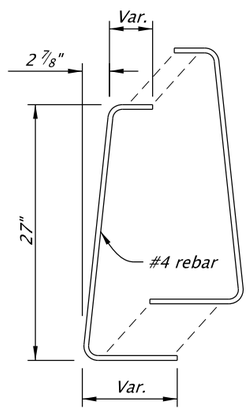
* *Dimensions marked thus are to the intersection point of the barrier slopes. Construct the 10" radius to provide a smooth transition between the slopes.*



#4 LOOP BAR



#4 LONGITUDINAL BAR



MODIFIED STIRRUP PAIR

ACCOMPANIED BY DWGS.:
RD535A

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

CONCRETE BARRIER (MODIFIED) AROUND MEDIAN OBSTACLE

SHEET 2 OF 2

2024

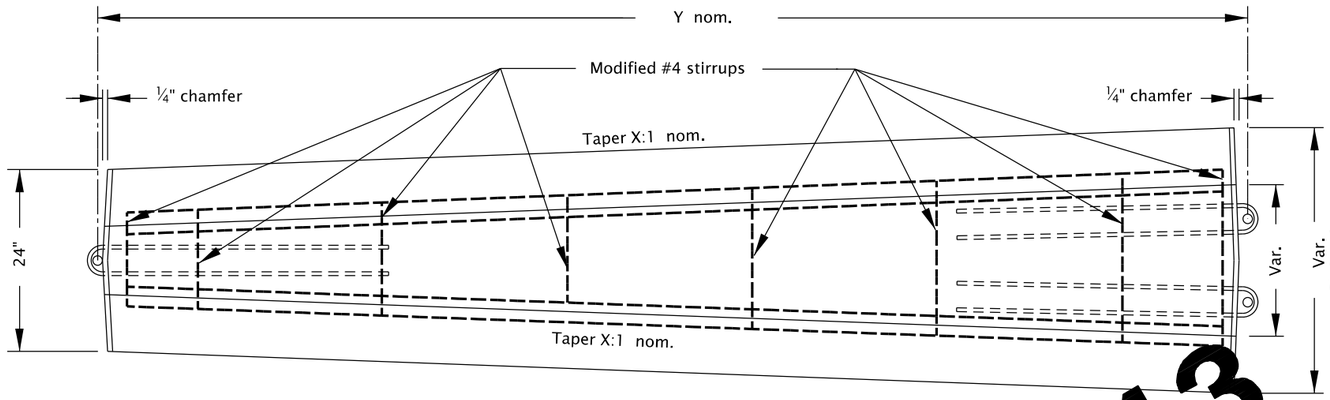
DATE	REVISION DESCRIPTION
07-2022	NEW DRAWING CREATED
06-2023	REVISED NOTES
10-2025	UPDATED CAD STANDARDS, RENUMBERED DRAWING FROM RD536

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD535B**

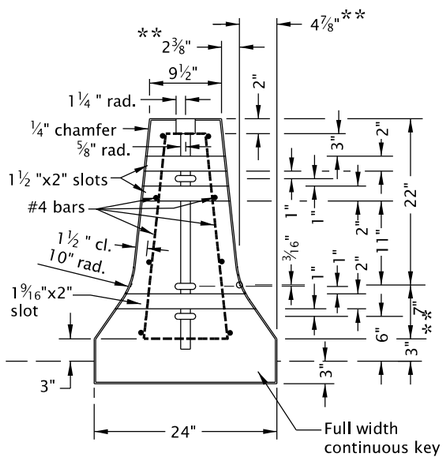
Effective Date: June 1, 2026 - November 30, 2026

14-JUL-2023

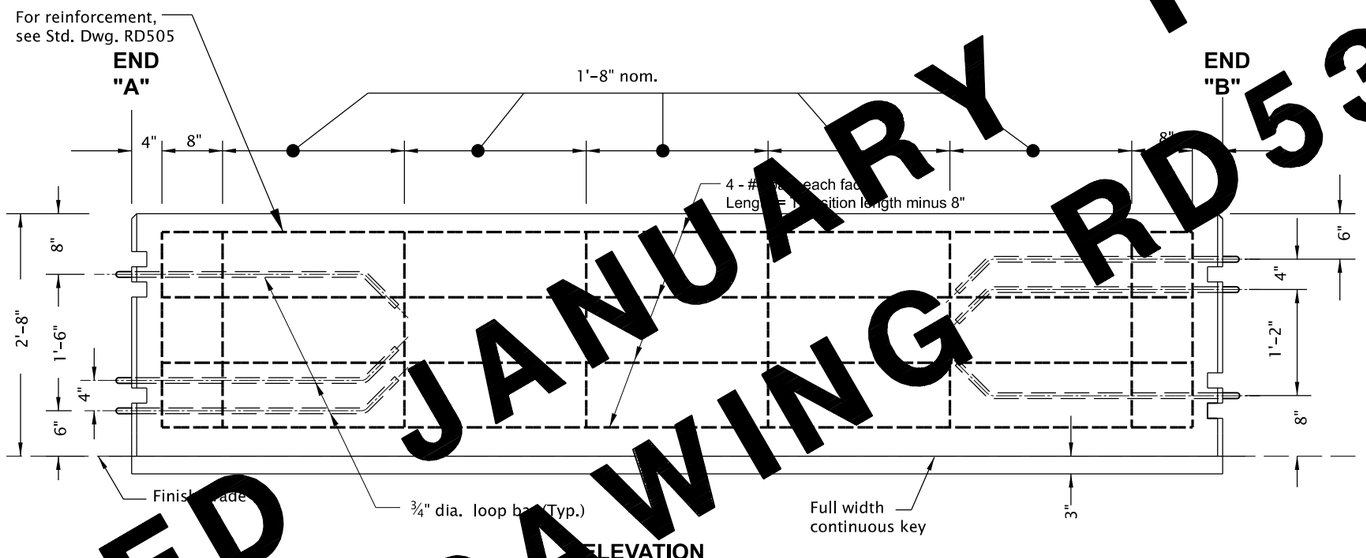
RD536.dgn



PLAN

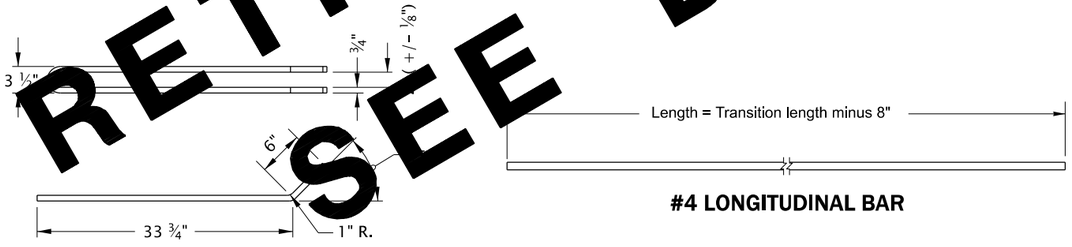


END VIEW A
(See general note 2)



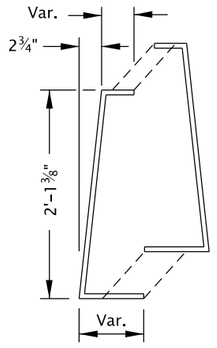
ELEVATION

CAST-IN-PLACE TRANSITION

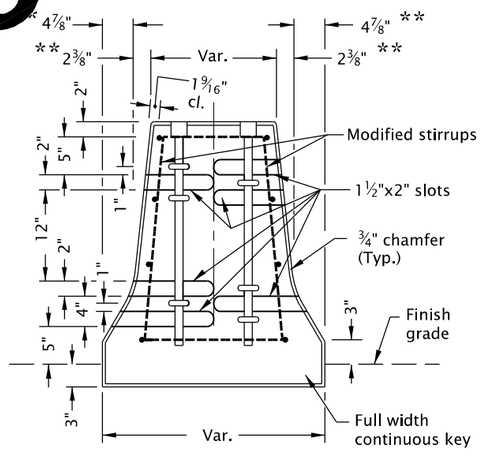


#4 LOOP BAR DETAIL

#4 LONGITUDINAL BAR



MODIFIED STIRRUP PAIRS
#4 Rebar



END VIEW B
(See general note 2)

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *Field verify end configurations of connecting barriers prior to forming connections at transitions.*
2. *All reinforcing bars shall be full length as shown and shall be placed 1-1/2 inch clear of the nearest face of concrete unless shown otherwise.*
3. *See Std. Dwgs. RD500, RD501 and RD502 for details not shown.*
4. *Secure precast concrete barrier to roadway. See Std. Dwg. RD502 for new pavement installations barrier anchoring details (when being anchored). See Std. Dwgs, RD515 and RD516 for securing concrete barrier to roadway that is maintained for use in temporary installations.*
5. *All anchor bolts, dowels, loop bars, and connectors shall be hot-dip galvanized after fabrication.*

This barrier is not for use with bridge railing.

RETIRED JANUARY 13 2026
SEE DRAWING RD535B

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

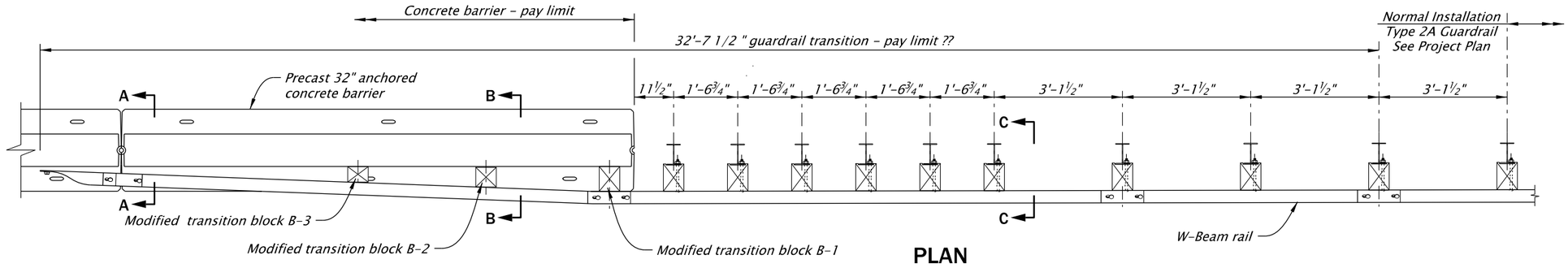
CONCRETE BARRIER (MODIFIED) AROUND MEDIAN OBSTACLE

2024

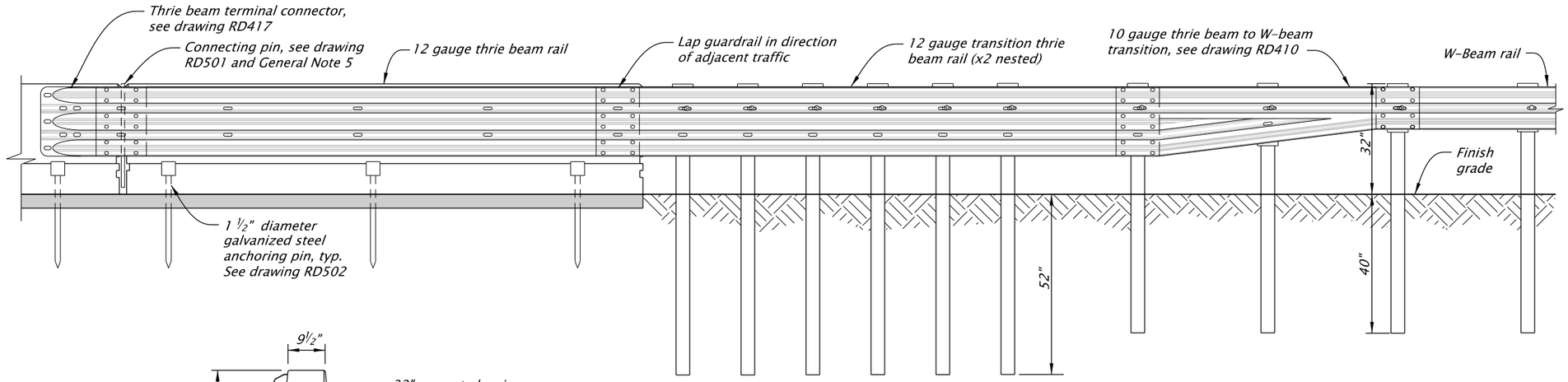
DATE	REVISION DESCRIPTION
07-2022	NEW DRAWING CREATED
06-2023	REVISED NOTES

CALC. BOOK NO. N/A | SDR DATE 14-JUL-2023 | **RD536**

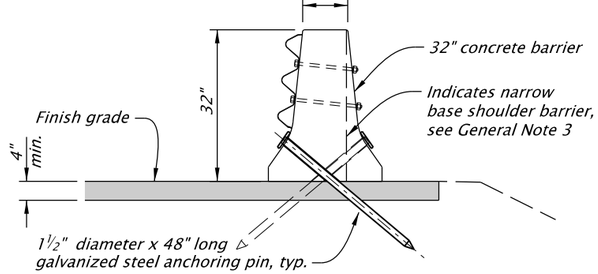
Effective Date: June 1, 2026 - November 30, 2026



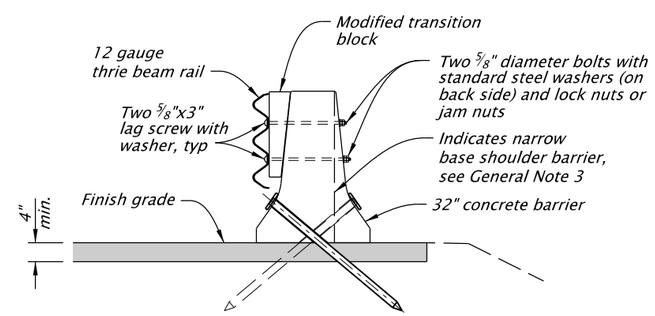
PLAN



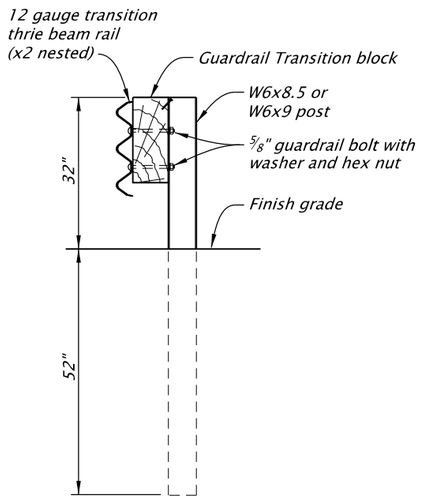
ELEVATION



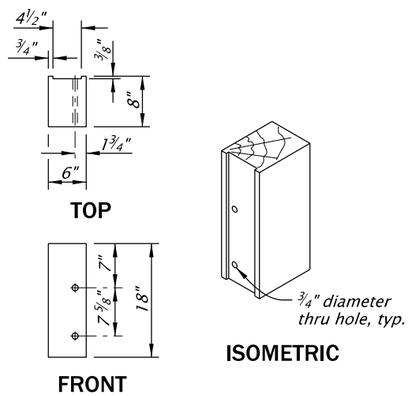
SECTION A-A



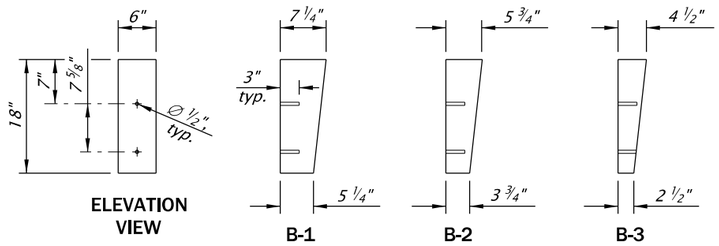
SECTION B-B



SECTION C-C



ROUTED TRANSITION BLOCK



MODIFIED TRANSITION BLOCK

Traffic side

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *See appropriate guardrail standard drawing(s) for post, rail and other hardware details not shown. See drawing RD410 for Thrie Beam Guardrail Transition. See drawing RD417 for Thrie Beam Terminal connector.*
2. *See appropriate concrete barrier standard drawing(s) for details not shown.*
3. *See drawing RD502 for methods of permanent concrete barrier anchoring details. See drawings RD515 and RD516 for concrete barriers that are maintained for use in temporary installations.*
4. *Narrow base shoulder barrier to be used only at locations with backfill behind barrier as shown on plans.*
5. *Concrete grout for grouting over pins, pinning holes or grouting of scuppers shall be portland cement grout, weak in strength and of thick consistency, as directed.*
6. *All pins, bolts, dowels, loop bars, and connectors shall be hot-dip galvanized after fabrication.*
7. *Connecting pin head designs vary among different manufacturers. Pin designs that are shaped differently than those shown in the details are acceptable, if the bearing surface is within the minimum and maximum widths specified.*
8. *Lap guardrail in direction of adjacent traffic*

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

MIDWEST GUARDRAIL SYSTEM TRANSITION TO ANCHORED CONCRETE BARRIER (MASH TL-3)

2024

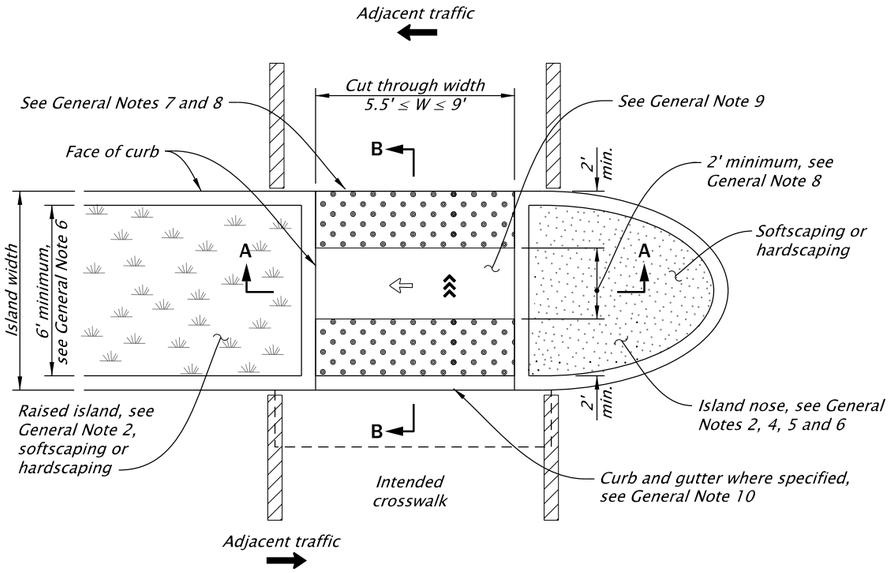
DATE	REVISION DESCRIPTION
12-2025	NEW DRAWING

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD582**

13-JAN-2026

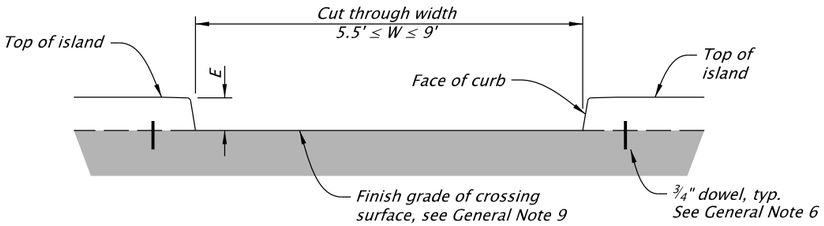
RD582.dgn

Effective Date: June 1, 2026 - November 30, 2026

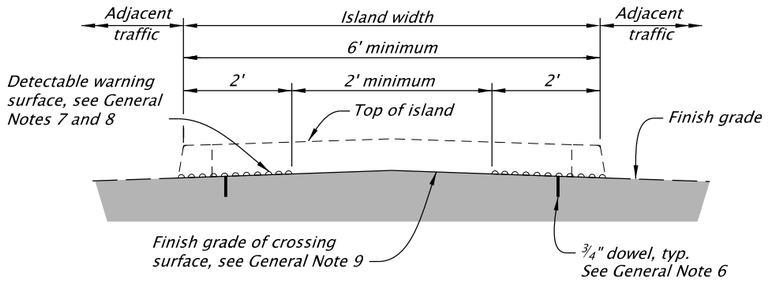


PLAN

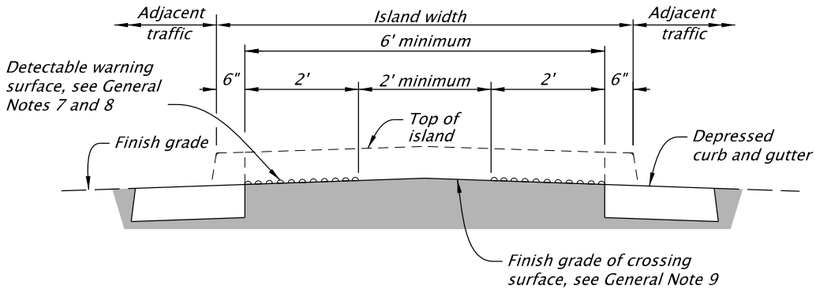
MEDIAN CUT-THROUGH ISLAND CROSSING



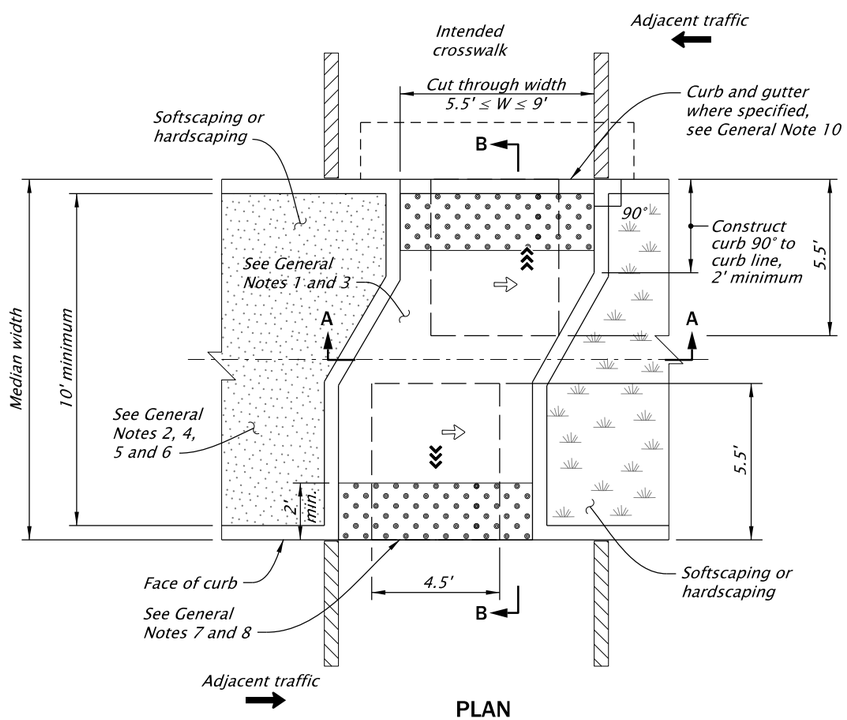
SECTION A-A
Type C island shown



SECTION B-B
Type C island shown



SECTION B-B
(WITH DEPRESSED CURB SHOWN)



PLAN

MEDIAN CUT-THROUGH CROSSING

LEGEND:

- Marked or intended crossing location
- Detectable warning surface (DWS)
- Maximum cross slope governed by intersection condition types, shown on drawing RD900
- Running slope, 4.0% maximum (Maximum 4.9% finished surface slope)
- For this drawing the clear space is 4.5' x 5.5' (longer dimension in direction of pedestrian street crossing)

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Accessible route islands are based on applicable ODOT Standards. Details intended for pedestrian route only. For multi-use path, see project plans for specific details.
2. See project plans for details not shown. See drawings RD700, RD702, RD705 and RD706 for additional details. See drawing RD707 for island nose treatment. See TM Standard Drawings for signal pole, pedestrian pedestal, crosswalk markings, and related details.
3. Raised islands in crossings shall have accessible curb ramps at all crossings or all crossings shall be cut through flush with the street. Align cut through island with the crosswalk.
4. Curb type and island width as shown on plans or as directed. Type A or Type CA islands are acceptable alternates, see drawing RD705.
5. The minimum area of islands that contain signal poles, pedestals, etc., shall be 75 square feet. Square feet to be measured to outer perimeter of entire island.
6. For cut through islands, dowel each island segment to the pavement with minimum of two 3/4-inch diameter dowels. Dowel the nose section of the raised median island with a minimum of two 3/4-inch diameter dowels. Place dowels as directed. See drawings RD705 and RD707.
7. Place detectable warning surface for a minimum depth of 2 feet that is adjacent to traffic. For details not shown, see drawings RD902 and RD906.
8. Detectable warning surfaces shall be separated by a 2-foot minimum length of walkway without detectable warnings. Where no curb, the detectable warning surface shall be placed at the edge of roadway.
9. When there is no pedestrian pushbutton serving the cut through island, a level area is not required.
10. On or along state highways, curb and gutter is required at curb ramps.

ACCOMPANIED BY DWGS.:
RD710B

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

ACCESSIBLE ROUTE ISLANDS CUT THROUGH

SHEET 1 OF 2

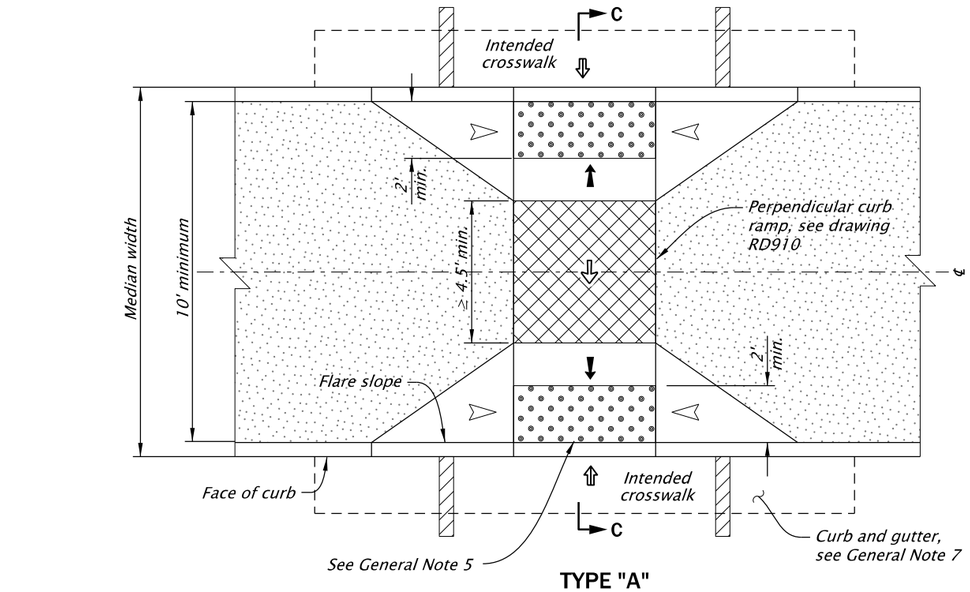
2024

DATE	REVISION DESCRIPTION
07-2025	NEW DRAWING CREATED – SPLIT FROM RD710 TO IMPROVE CLARITY.
01-2026	MODIFIED DETAILS

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD710A**

Effective Date: June 1, 2026 – November 30, 2026

13-JAN-2026
RD710A.dgn



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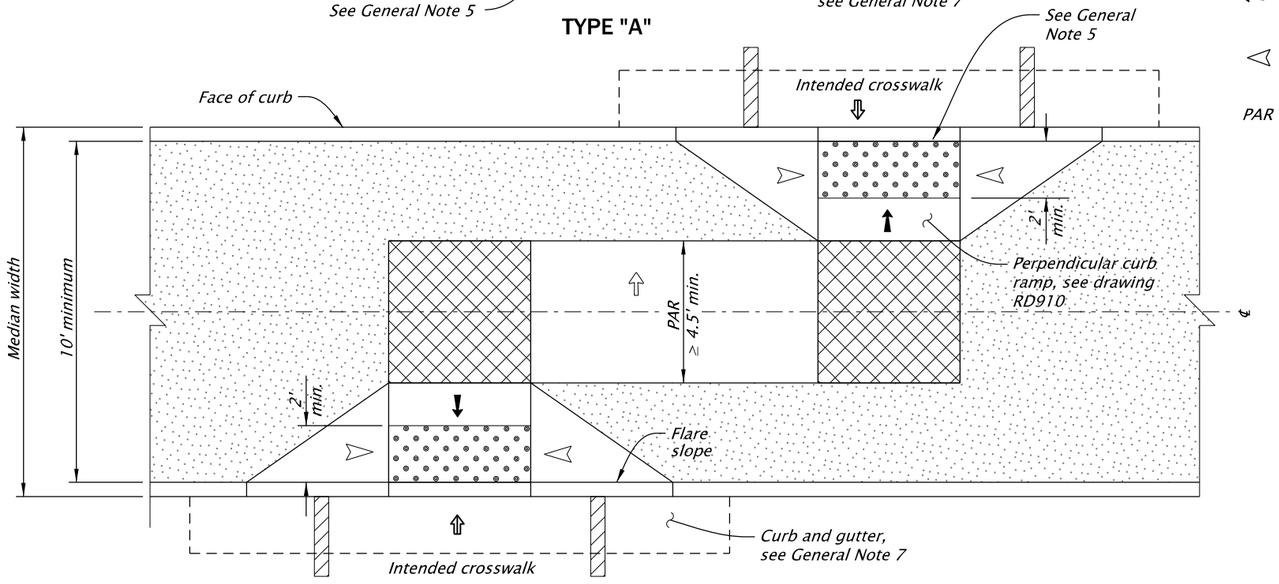
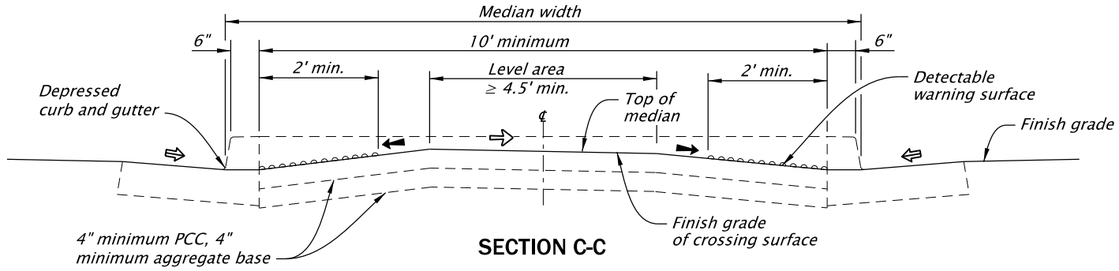


TYPE "B"



SECTION C-C

MEDIAN RAISED CROSSING

LEGEND:

- *Marked or intended crossing location*
- *Detectable warning surface (DWS)*
- *Level area (Turning space/landing)*
  Unobstructed 4.5' x 4.5'
  With obstruction 4.5' x 5.5' (longer dimension in direction of pedestrian street crossing).
  For the purposes of this application, a maximum 2.0% finished surface slope (for drainage) measured perpendicular in two directions is considered level.
- *Counter slope 4.0% maximum ascending or descending*
  (Maximum 5.0% finished surface slope)
  Slope as required for drainage
- *Cross slope 1.5% maximum*
  (Maximum 2.0% finished surface slope)
  (Normal sidewalk cross slope)
- *Running slope 7.5% maximum*
  (Maximum 8.3% finished surface slope)
- *Flare slope*
  (Maximum 10.0% finished surface slope)
- PAR *Pedestrian Access Route*

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *Accessible route islands are based on applicable ODOT Standards. Details intended for pedestrian route only. For multi-use path, see project plans for specific details.*
2. *See project plans for details not shown. See drawings RD700, RD701, RD705 and RD706 for additional details. See drawing RD707 for island nose treatment. See TM Standard Drawings for signal pole, pedestrian pedestal, crosswalk markings, and related details.*
3. *Raised islands in crossings shall have accessible curb ramps at all crossings or all crossings shall be cut through flush with the street. Align curb ramps with the crosswalk.*
4. *The minimum area of islands that contain signal poles, pedestals, etc., shall be 75 square feet. Square feet to be measured to outer perimeter of entire island.*
5. *Place detectable warning surface at the back of curb for a minimum depth of 2 feet at curb ramp that is adjacent to traffic. For details not shown, see drawings RD902, RD904 and RD906.*
6. *Detectable warning surfaces shall be separated by a 2-foot minimum length of walkway without detectable warnings.*
7. *On or along state highways, curb and gutter is required at curb ramps.*

ACCOMPANIED BY DWGS.:
RD710A

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS
ACCESSIBLE ROUTE ISLANDS WITH PERPENDICULAR CURB RAMP
SHEET 2 OF 2
2024

DATE	REVISION DESCRIPTION
07-2025	NEW DRAWING CREATED - SPLIT FROM RD710 TO IMPROVE CLARITY.

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD710B**

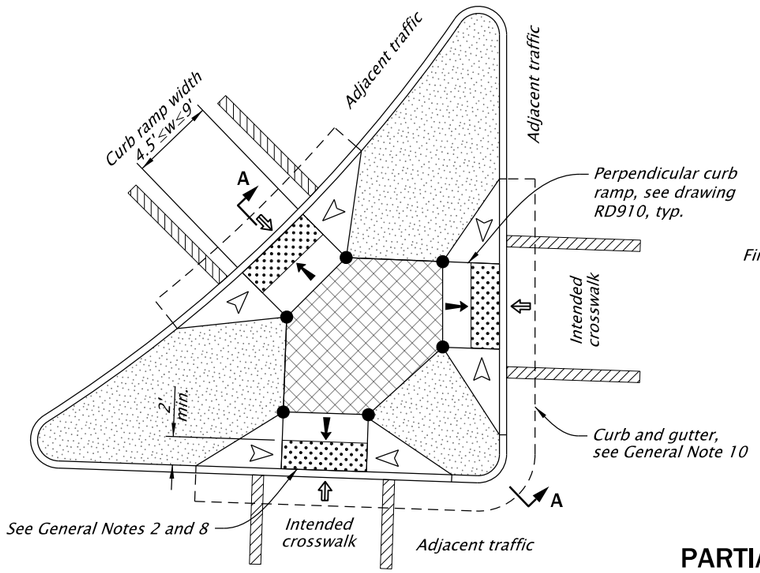
13-JAN-2026

RD710B.dgn

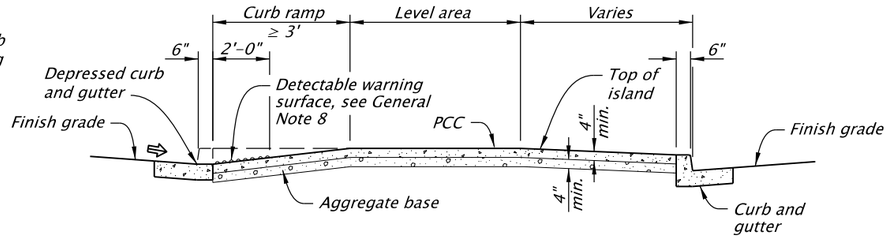
Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

RD711.dgn



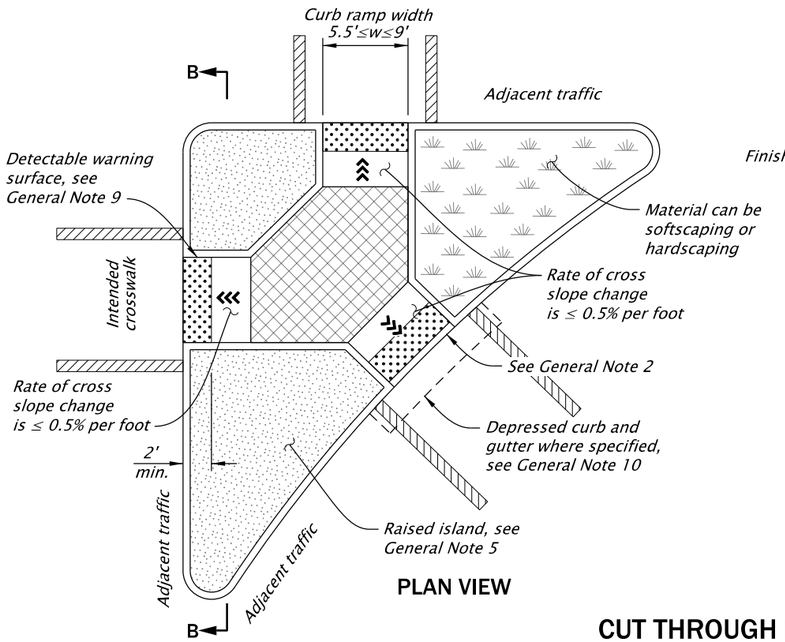
PLAN VIEW



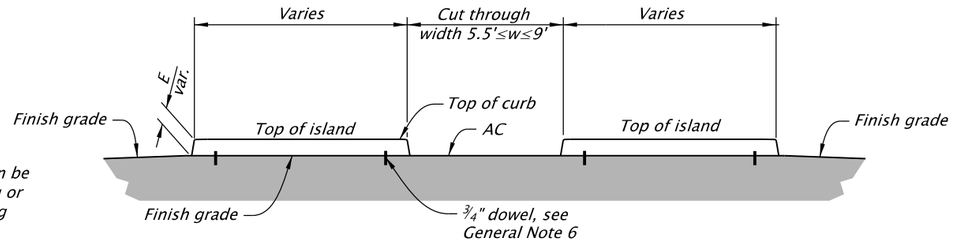
SECTION A-A

PARTIALLY LOWERED ISLAND DETAIL

(Use perpendicular curb ramp inspection form)



PLAN VIEW



SECTION B-B

Type C island with AC shown

CUT THROUGH ISLAND DETAIL

LEGEND:

- *Marked or intended crossing location*
- *Detectable warning surface*
- *Level area (Turning space/landing)*
  Unobstructed 4.5' x 4.5'
  With obstruction 4.5' x 5.5'
  (longer dimension in direction of pedestrian street crossing).
  For the purposes of this application, a maximum 2.0% finished surface slope (for drainage) measured perpendicular in two directions is considered level.
- *Flare slope (Maximum 10.0% finished surface slope)*
- *Zero curb exposure*
- *Counter slope 4.0% maximum ascending or descending (Maximum 5.0% finished surface slope) Slope as required for drainage*
- *Running slope 4.0% maximum (Maximum 4.9% finished surface slope)*
- *Running slope 7.5% maximum (Maximum 8.3% finished surface slope)*

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *Accessible route islands are based on applicable ODOT Standards. Details intended for pedestrian route only. For multi-use path, see project plans for specific details.*
2. *Raised islands in crossings shall have accessible curb ramps at all crossings or all crossings shall be cut through with the street. Align curb ramps for lowered or partially lowered island and cut through island with the crosswalk.*
3. *The minimum area of islands that contain signal poles, pedestals, etc., shall be 75 square feet. Square feet to be measured to outer perimeter of entire island.*
4. *See project plans for details not shown. See drawing RD707 for island nose treatment. See drawing RD705 for expansion and contraction joint spacing. See drawings RD700, RD701, RD705 and RD706 for additional details. See TM drawings for signal pole, pedestrian pedestal, crosswalk markings, and related details.*
5. *Curb type and island width as shown on plans or as directed. Type A or Type CA islands are acceptable alternates, see drawing RD705.*
6. *For cut through islands dowel each island segment to the pavement with a minimum of two 3/4-inch diameter dowels. Dowel the nose section of the raised median island with a minimum of two 3/4-inch diameter dowels. Place dowels as directed. See drawing RD705.*
7. *Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks shall be flush.*
8. *Place detectable warning surface at the back of curb for a minimum depth of 2 feet at curb ramp that is adjacent to traffic. For details not shown, see drawings RD902, RD904 and RD906.*
9. *Detectable warning surfaces shall be separated by a 2-foot minimum length of walkway without detectable warnings. Where no curb, the detectable warning surface shall be placed at the edge of roadway.*
10. *On or along state highways, curb and gutter is required at curb ramps.*

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

ACCESSIBLE ROUTE RAISED CHANNELIZED ISLANDS

2024

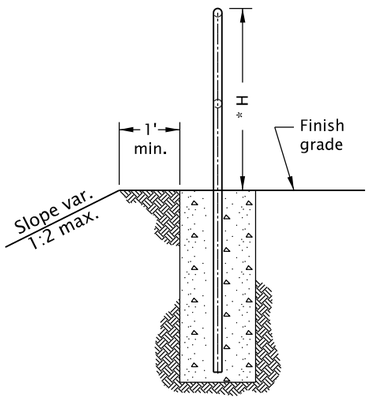
DATE	REVISION DESCRIPTION
07-2021	NEW DRAWING CREATED
07-2021	REVISED NOTES
11-2021	REVISED NOTES
01-2026	REVISED DETAIL TITLE, UPDATED CAD STANDARDS

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD711**

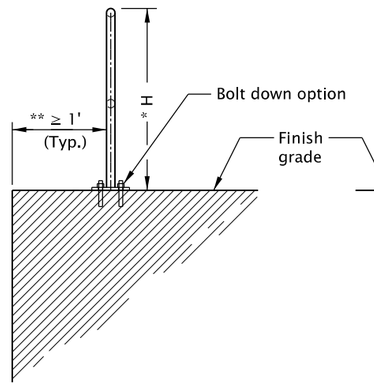
Effective Date: June 1, 2026 - November 30, 2026

* H varies { 34" min. / 38" max.

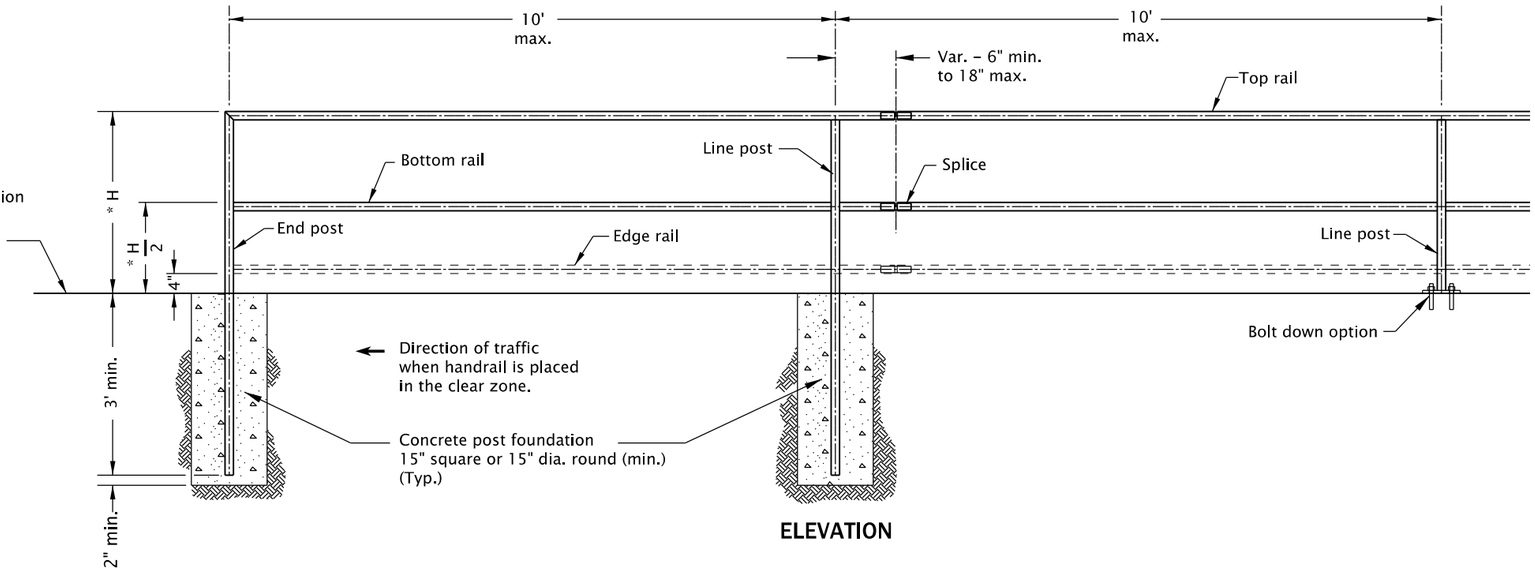
** Edge rail is required when min. 1' dimension is not met.



SIDE VIEW (ON GRADE)



SIDE VIEW (ON STRUCTURE)
(See general note 4 & 9)

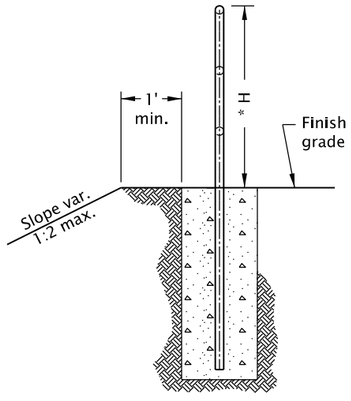


ELEVATION

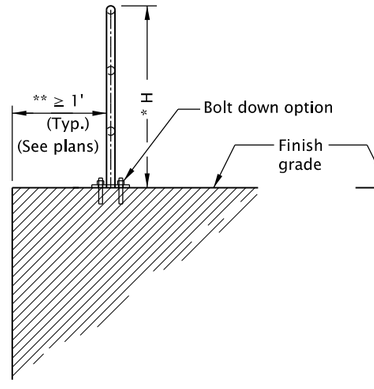
TWO RAIL HANDRAIL

* H varies { 34" min. / 38" max.

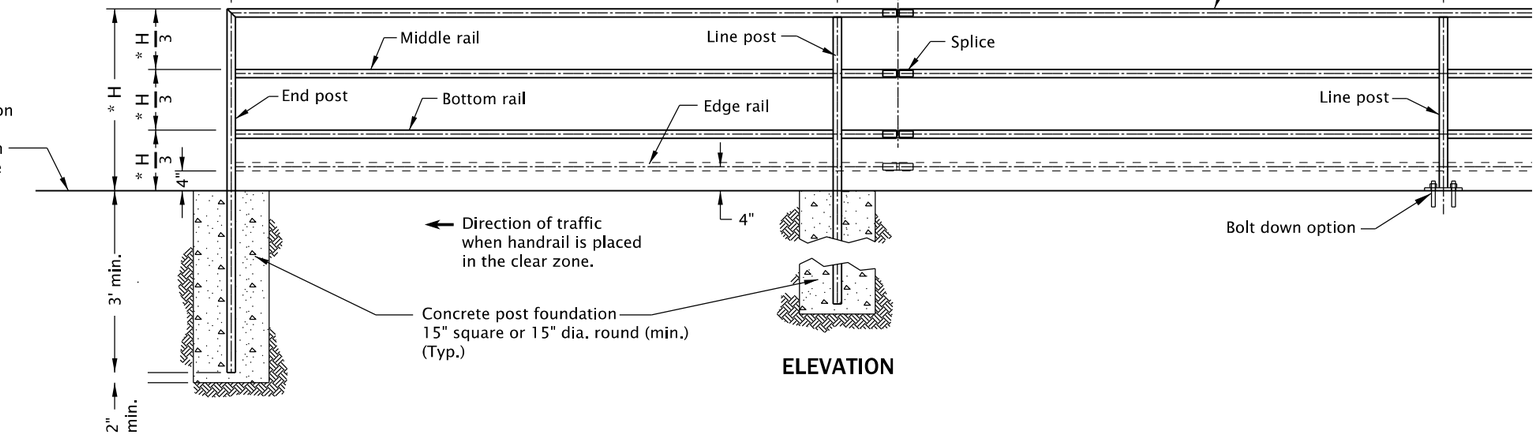
** Edge rail is required when min. 1' dimension is not met.



SIDE VIEW (ON GRADE)



SIDE VIEW (ON STRUCTURE)
(See general note 4 & 9)



ELEVATION

THREE RAIL HANDRAIL

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Handrail details are based on applicable ODOT Standards.
2. See Std. Dwg. RD771 for details not shown.
3. Hot-dip galvanize all metal parts after fabrication.
4. Structure varies, see project plans.
5. Handrail height (H) shall be constant within a ramp run or stairway.
6. All concrete shall be commercial grade concrete.
7. See Std. Dwg. RD120 for concrete stairway.
8. See project plans for details not shown.
9. Review Standard Drawing Report for application on structures.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

METAL HANDRAIL

2024

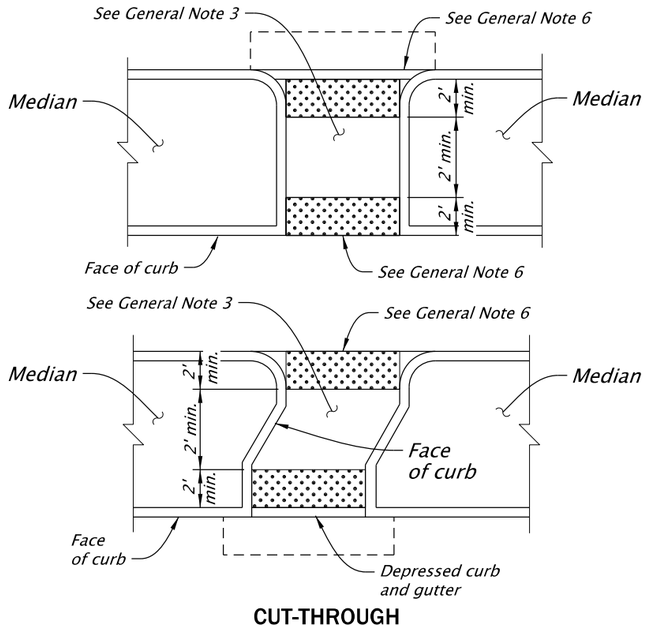
DATE	REVISION DESCRIPTION
01-2026	ADDED NOTE 9, UPDATED RAIL NAME

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD770**

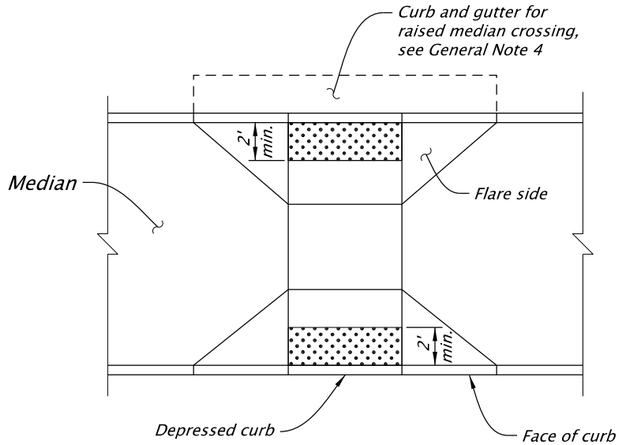
Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

RD906.dgn

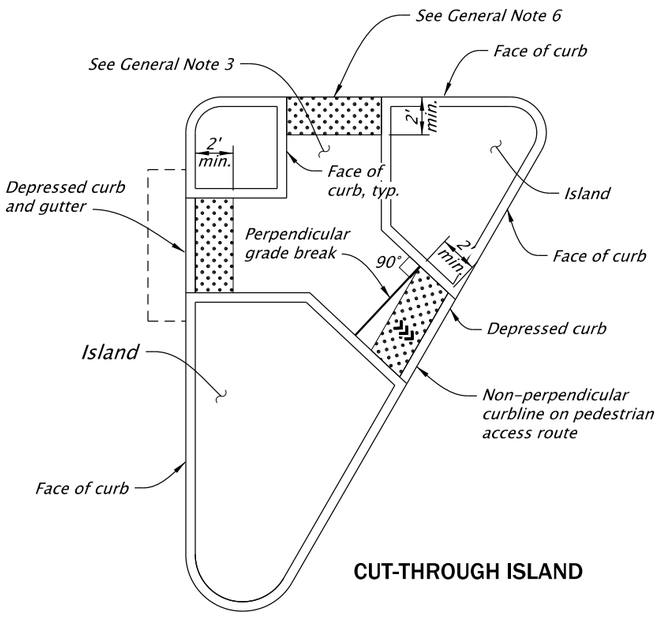


CUT-THROUGH

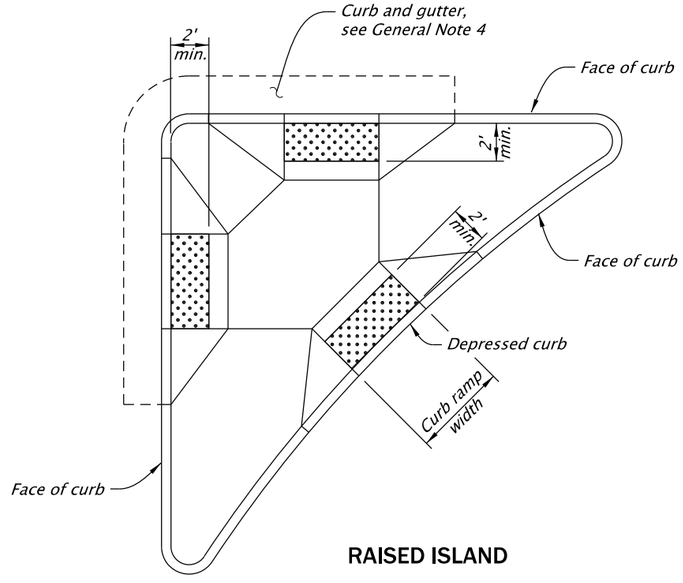


RAISED MEDIAN

MEDIAN CROSSING



CUT-THROUGH ISLAND



RAISED ISLAND

CHANNELIZATION ISLAND

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *Detectable warning surface details and locations are based on applicable ODOT Standards.*
2. *See project plans for details not shown. See drawings RD700 and RD701 for curbs. See drawings RD710A, RD710B and RD711 for accessible route island. See drawing RD902 for detectable warning surface installation details.*
3. *Detectable warning surfaces shall be separated by a 2-foot minimum length of walkway without detectable warnings. Site conditions normally require a project specific design. See project plans for details not shown. Omit detectable warning surfaces if less than 2 feet.*
4. *On or along state highways, curb and gutter is required at curb ramps.*
5. *Details intended for pedestrian route only. For protected bike lanes on multi-use paths, see project plans for specific details.*
6. *Where the island has no depressed curb, the detectable warning surface shall be placed at the edge of roadway. Detectable warning surface shall be full width where radial return curbs are installed.*

LEGEND:

Detectable warning surface

Running slope, 4.0% maximum (Maximum 4.9% finished surface slope)

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

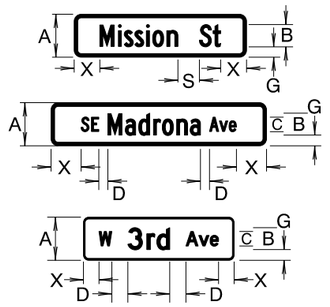
DETECTABLE WARNING SURFACE PLACEMENT FOR ACCESSIBLE ROUTE ISLAND

2024

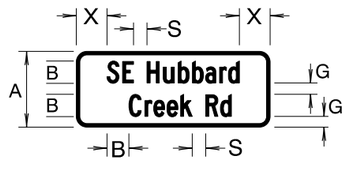
DATE	REVISION DESCRIPTION
01-2025	UPDATED CAD STANDARDS
12-2025	MODIFIED DETAILS

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **RD906**

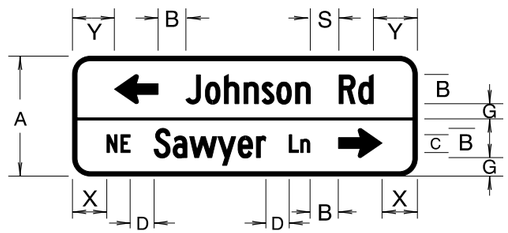
Effective Date: June 1, 2026 - November 30, 2026



LEGEND EXAMPLES FOR STREET NAME SIGNS



STACKED LEGEND FOR STREET NAME SIGN
(GROUND-MOUNTED)



STACKED LEGEND FOR STREET NAME SIGN
(MAST ARM MOUNTED)

Notes: If 12"C font on mast arm mounted sign yields signs larger than 21 square feet, the 10" Alternate may be used.

White border and legend on mast-arm signs are to be ASTM Type IX retroreflective sheeting. Borders shall be flush with edge of sign. Dividers, where used, shall be same width as border.

New Projects: Include mast-arm signs on Signing Plans.

Existing Poles: Perform pole analysis prior to adding or enlarging signs.

STREET NAME SIGN DETAILS

	A	A*	B	C	D**	E	F	G	G*
GROUND-MOUNTED SIGN (2-3 LANE HWYS)	12"	15"	6"	4"	2½"	1"	1½"	3"	5"
GROUND-MOUNTED SIGN (4+ LANES AND 40 MPH OR LESS)	12"	15"	6"	4"	2½"	1"	1½"	3"	5"
GROUND-MOUNTED SIGN (4+ LANES AND > 40 MPH)	15"	18"	8"	5"	3⅛"	1"	1½"	3½"	6"
GROUND-MOUNTED SIGN (LOCAL ROAD, 25 MPH OR LESS)	12"	12"	5"	3"	1⅞"	½"	1½"	2"	4"
MAST ARM MOUNTED SIGN *** (12" STANDARD)	24"	24"	12"	8"	5"	1"	3"	4½"	7½"
MAST ARM MOUNTED SIGN **** (10" ALTERNATE)	21"	21"	10"	6"	3¾"	1"	3"	5½"	7"
STACKED LEGEND SIGN (GROUND-MOUNTED)	24"	24"	6"	N/A	N/A	1"	3"	3"	4"
STACKED LEGEND SIGN *** (MAST ARM MOUNTED)	48"	48"	8"	5"	3⅛"	1"	3"	3½"	5"

E = BORDER WIDTH
F = BORDER RADIUS
H = LETTER HEIGHT
S = SPACE BETWEEN WORDS
X = 1/2 OF REMAINING SPACE
* = USE FOR TEXT INCLUDING LOWER-CASE g, j, p, q and y
** = MINIMUM SIZE; CAN BE LARGER TO MATCH STANDARD HIGHWAY SIGN'S D3-1
*** = SIGNS EXCEEDING THE MAXIMUM SIGN HEIGHT "Z" COLUMN OF THE MAST ARM STREET NAME SIGN MOUNT DETAIL ON TM679 WILL REQUIRE STRUCTURAL ANALYSIS OF THE MAST ARM AND POLE.
*** = THE 10" ALTERNATIVE SHOULD BE USED WHEN A 24" HEIGHT SIGN INDUCES A LOAD OVER THE STRUCTURAL CAPACITY OF THE MAST ARM OR WHEN THE LEGEND IS EXCESIVELY LONG.

SERIES (FONT)				
	B	C	D	E
S	.531 H	.625 H	.836 H	1.00 H

SPACING BETWEEN WORDS

X-Dimension should be approximately the same dimension as the letter Height (H). At a minimum the X-Dimension shall be no less than one-half the letter height (1/2 H)

Sign examples shown here are not drawn to scale, but to illustrate the layout of the legend items.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

STREET NAME SIGN LAYOUT

2024

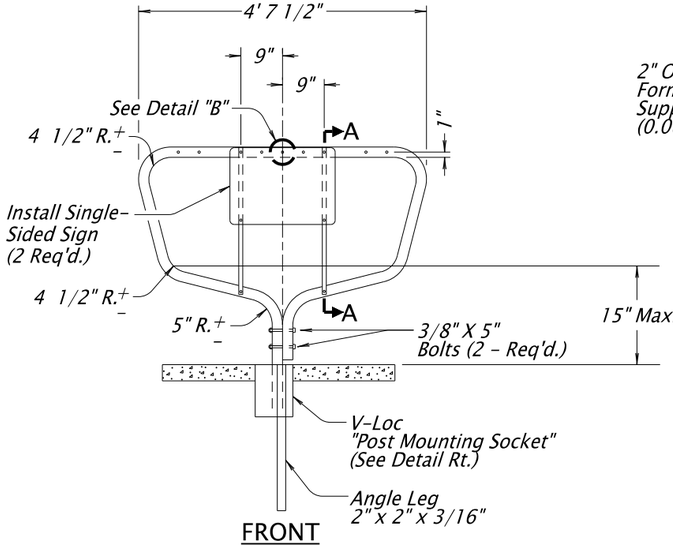
DATE	REVISION DESCRIPTION
01-2024	MOVED DIRECTIONAL SIGN CONTENT TO NEW STD DWG TM226
01-2024	ADDED STREET SIGN EXAMPLE AND EDITED DIMENSION TABLE
01-2026	UPDATED SIGN HEIGHTS ACCORDING TO 2025 MUTCD UPDATE
01-2026	ADDED NOTE FOR 10" ALTERNATIVE SIGN

CALC. BOOK NO. N/A | SDR DATE 19-JAN-2024 | **TM223**

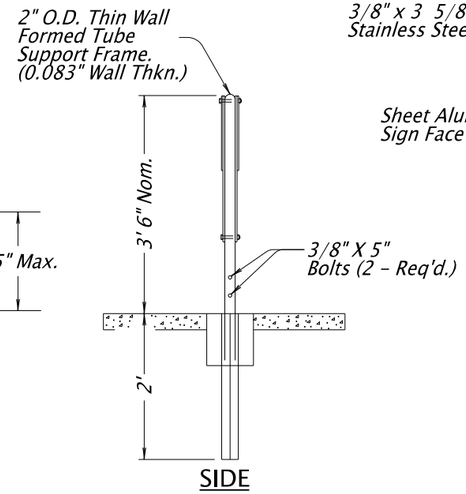
Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

TM223.dgn

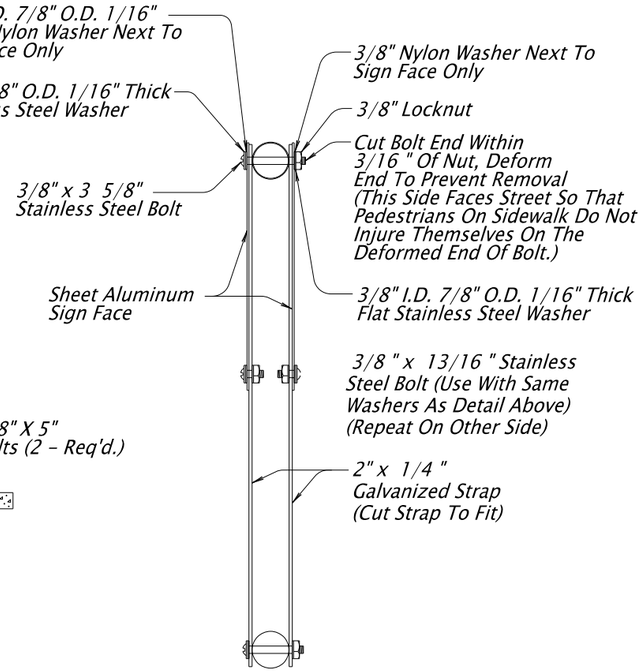


FRONT

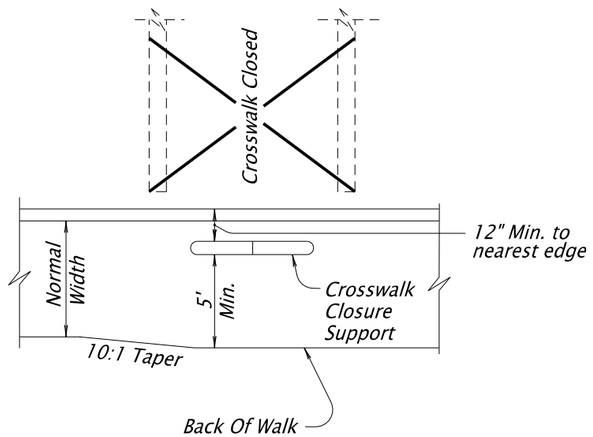


SIDE

CROSSWALK CLOSURE SUPPORT DETAIL



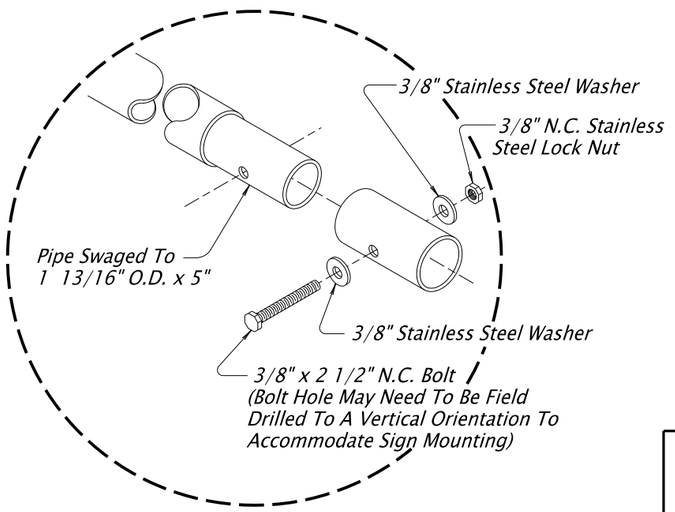
SECTION A-A



Align support perpendicular to the closed unmarked crosswalk or as shown in plan.

See RD913, RD920 and RD932 for additional closure support placement details.

PLAN VIEW



DETAIL "B"

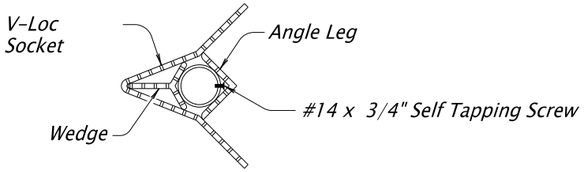
GENERAL NOTES:

1. All Holes In The Tube Support Frame To Be Predrilled By The Manufacturer. (1/32" Larger Than Mounting Bolt)
2. Pipe Swaged By The Manufacturer.

SIGN DETAIL

OR22-7
24" x 18"

Drill 3/8" Dia. Bolt Hole At Each Corner Where Needed.



POST MOUNTING SOCKET

For Additional Details See Standard Drg. No. RD100

NOTE:

Care Shall Be Taken That No Concrete Is Placed Within Mounting Socket.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

CROSSWALK CLOSURE DETAIL

2024

DATE	REVISION DESCRIPTION
01/2026	Amended Plan View and Crosswalk Closure Support Detail
07/2024	Edited Section A-A detail text for clarity

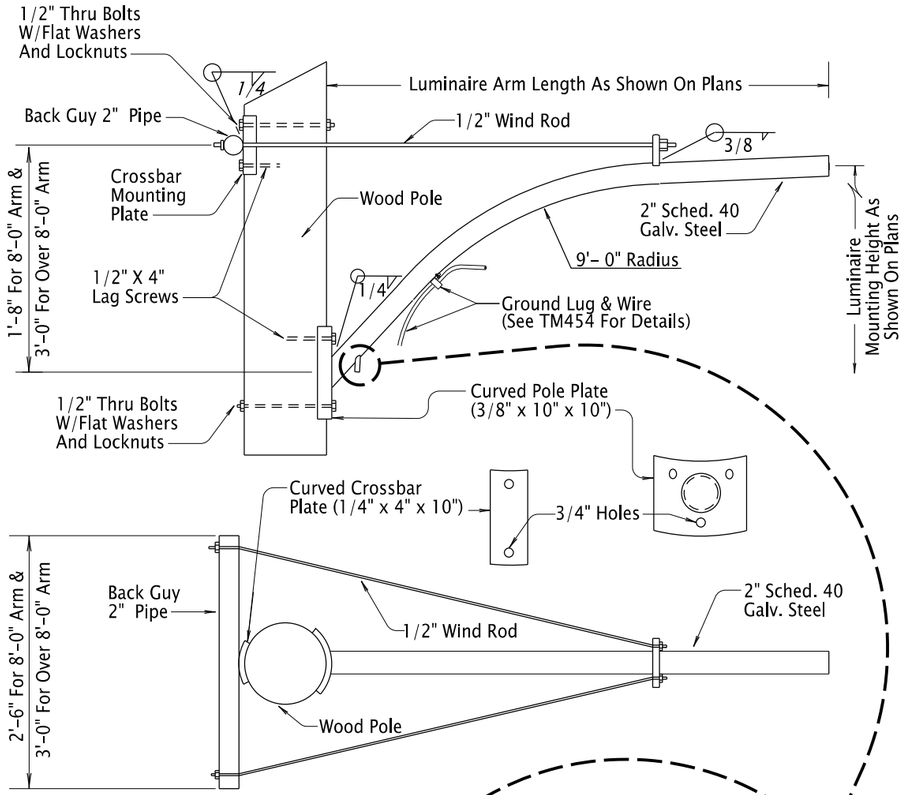
CALC. BOOK NO. N/A | SDR DATE 9-JUL-2024 | **TM240**

Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

TM453.dgn

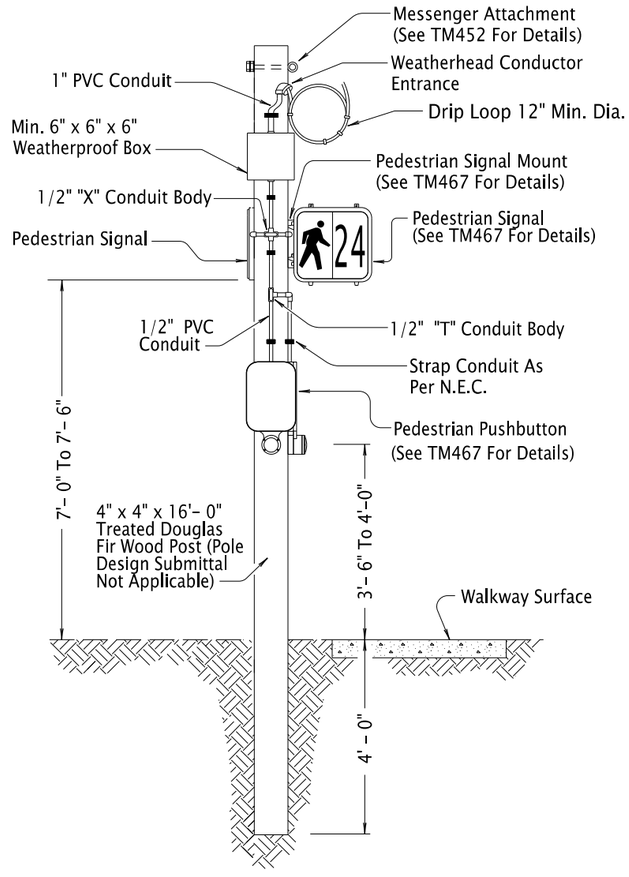
ARM LENGTH	LUM. MAX. WT.	MAX. PROJ. AREA
8'- 0" thru 20'- 0"	65 lbs.	2 sq. ft.



NOTES:

1. Bolts Shall Conform To ASTM Specification A307
2. Steel Sheet And Plate Shall Be Merchant Quality
3. All Structural Steel, Including Washers And Nuts, Shall Be Hot Dip Galvanized After Fabrication

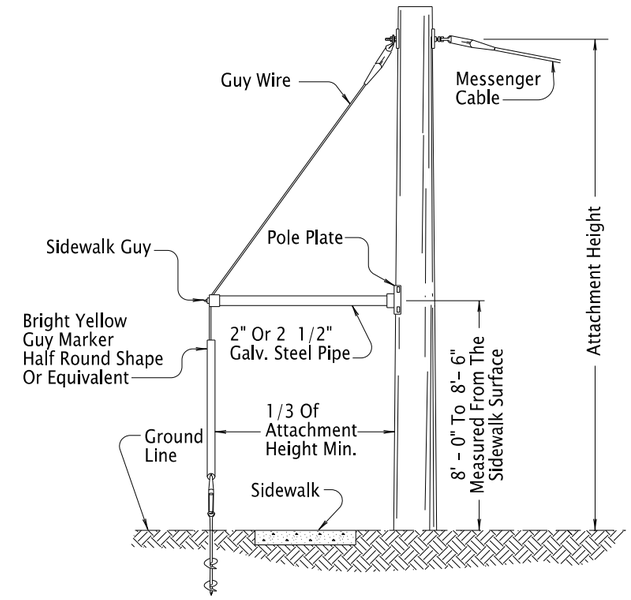
LUMINAIRE ARM INSTALLATION ON WOOD POLE



PEDESTRIAN WOOD POST INSTALLATION OVERHEAD CONDUCTORS

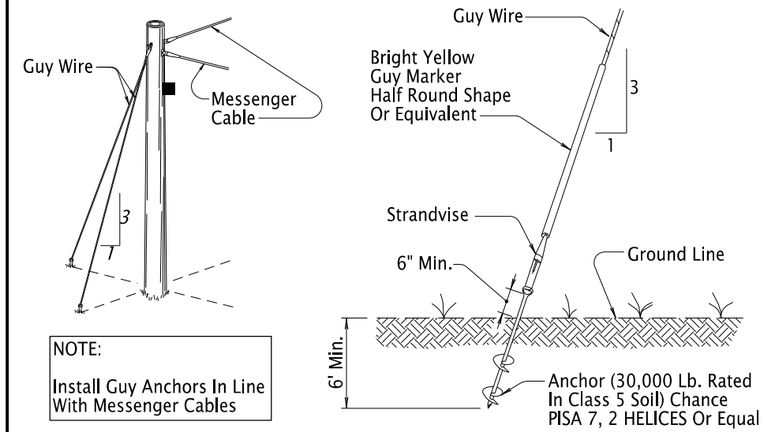
GENERAL NOTES:

1. All Screws, Bolts, Nuts And Washers Shall Be Type 304 or 316 Stainless Steel Or Galvanized Unless Noted Otherwise.
2. Bolts And Screws Shall Have Hex Or Square Heads. Allen Head Fasteners Not Allowed.
3. Conduit Mounted On Wood Poles/Posts May Be Liquid Tight Flex Conduit.



TYPICAL SIDEWALK GUY ANCHOR ASSEMBLY

Install As Per Approved Pole Design Submittal



NOTE:

Install Guy Anchors In Line With Messenger Cables

TYPICAL GUY ANCHOR ASSEMBLY

Install As Per Approved Pole Design Submittal

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

TEMPORARY PEDESTRIAN WOOD POST, GUY WIRE/ANCHOR, & LUMINAIRE ARM DETAILS

2024

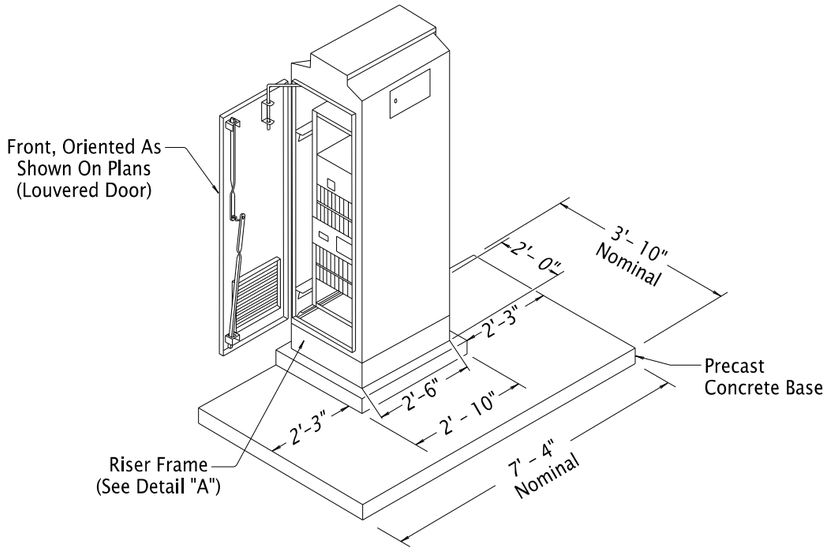
DATE	REVISION DESCRIPTION
07-2023	ADDED POLE DESIGN SUBMITTAL INFO, ADDED POST INFO, CHANGED NOTE 1.
01-2026	REMOVED GROUND ROD IN PED WOOD POST DETAIL

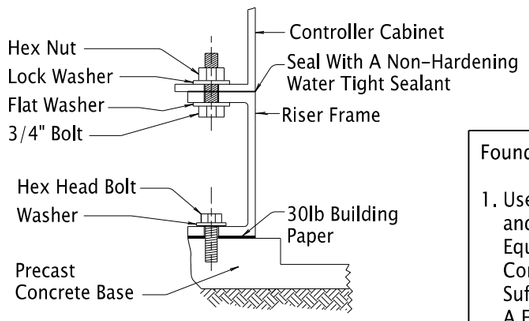
CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **TM453**

Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

TM454.dgn

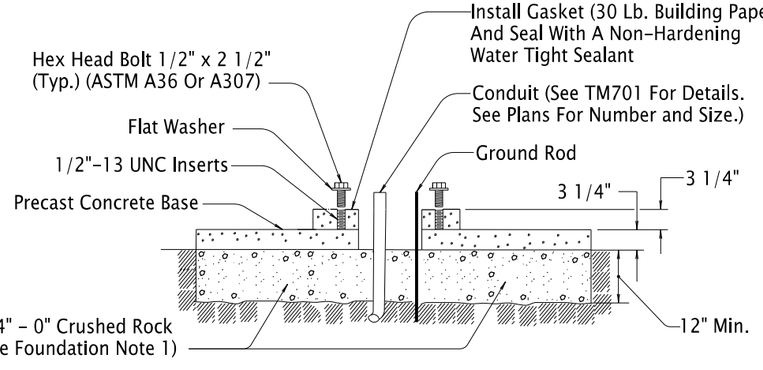




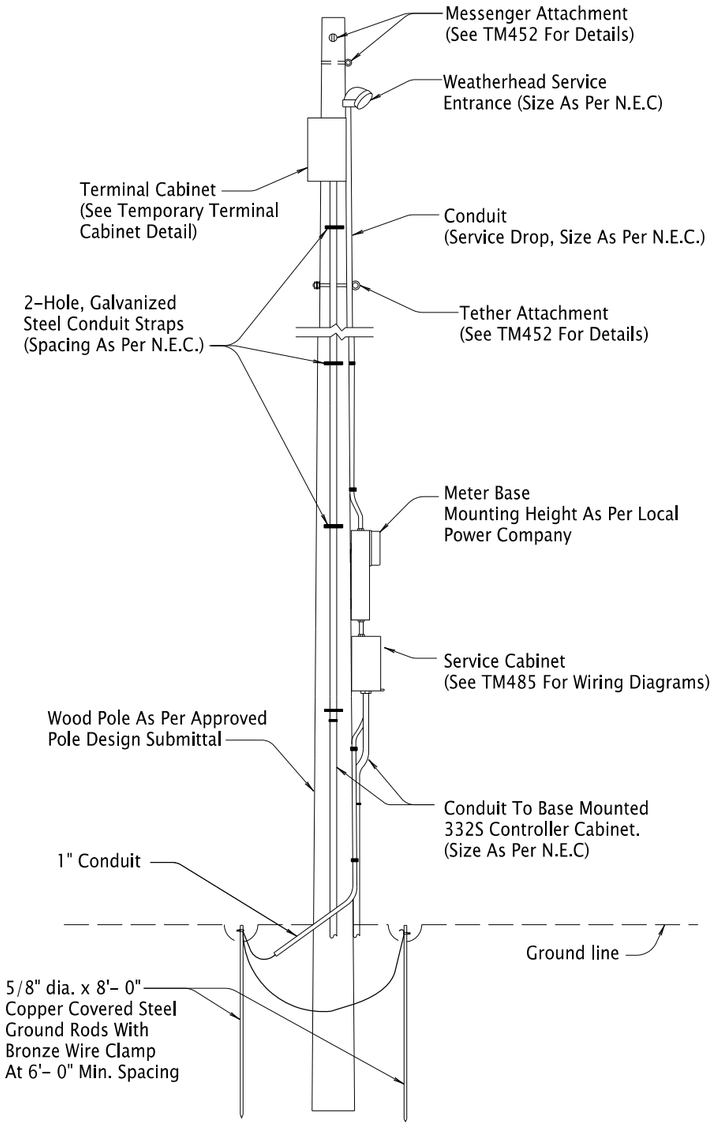
DETAIL "A"
RISER FRAME CONNECTION

Foundation Note:

1. Use Materials According To 00640.10 and 00640.16. Use Compaction Equipment Suitable For Area And Compact Each Six Inch Layer With Sufficient Coverage To Produce A Firm Unyielding Surface.



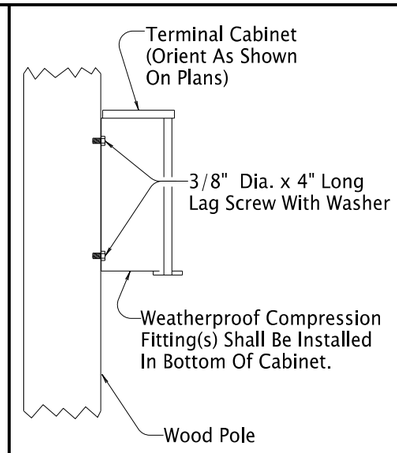
TEMPORARY CONTROLLER CABINET FOUNDATION
(Model 332, 334, And 340 Cabinets)



TEMPORARY SERVICE CABINET AND METER BASE

General Notes:

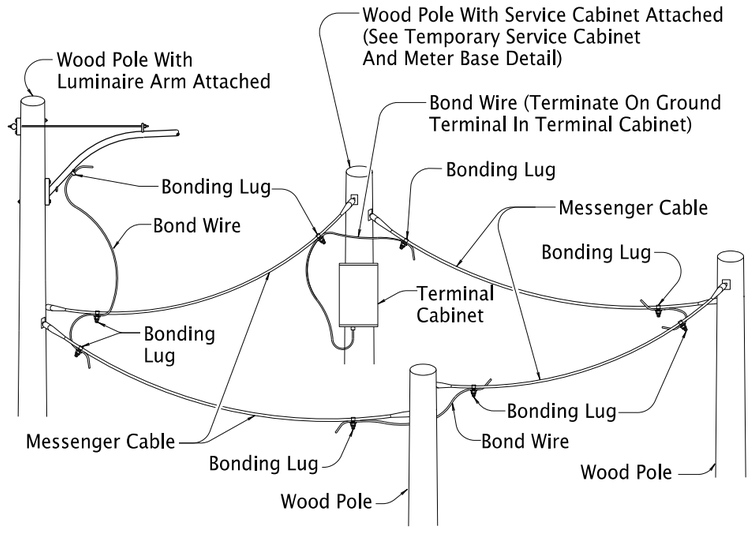
1. All Screws, Bolts, Nuts And Washers Shall Be Type 304 Or 316 Stainless Steel Or Galvanized Unless Noted Otherwise.
2. Bolts And Screws Shall Have Hex Or Square Heads. Allen Head Fasteners Not Allowed.
3. Conduit Mounted On Wood Poles/Posts May Be Liquid Tight Flex Conduit.



Terminal Cabinet General Notes:

1. Install The Number Of Terminal Blocks Needed For The Circuits. Evenly Distribute All The Terminal Blocks Among The Three Mounting Brackets.
2. Terminate Only One Wire In Each Termination Point. Use Additional Terminals With A Factory Jumper Between The Terminals If Additional Taps Are Necessary.
3. See TM470 General Notes 2 And 3 For Labeling Wires And Cables.

TEMPORARY TERMINAL CABINET



TEMPORARY GROUNDING/BONDING

All materials shall be in accordance with the current Oregon Standard Specifications.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS
TEMPORARY CONTROLLER CABINET, SERVICE CABINET, METER BASE, & TERMINAL CABINET
2024

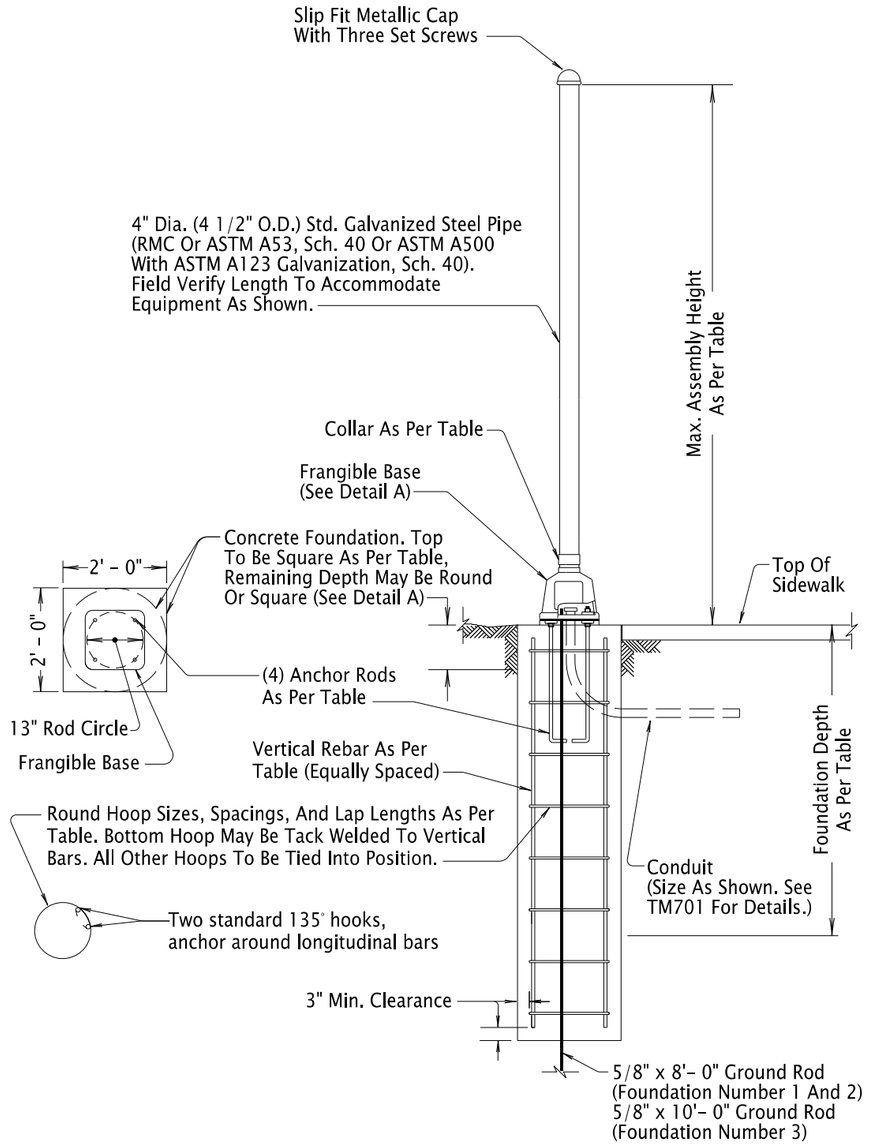
DATE	REVISION DESCRIPTION
07-2023	ADDED POLE DESIGN SUBMITTAL INFO, DRAFTING REVISIONS, CHANGED NOTE 1.
01-2025	UPDATED STANDARD DRAWING REFERENCES
01-2026	UPDATED TERMINAL CABINET GENERAL NOTE 1 FOR CLARITY

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **TM454**

Effective Date: June 1, 2026 - November 30, 2026

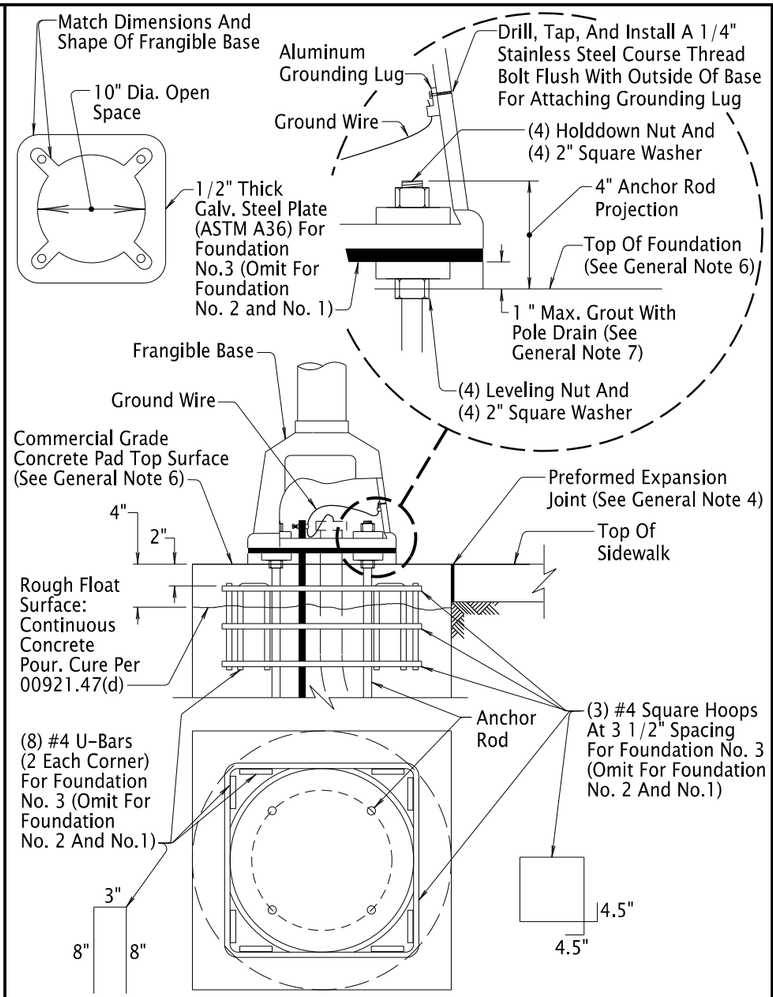
13-JAN-2026

TM457.dgn



Pedestal Foundation Number	Max. Assembly Height	Foundation Depth	Depth of Square Foundation	Anchor Rods (ASTM F 1554 Grade 36)	Reinforcing Steel			Collar
					Vertical Rebar	Hoop Size & Spacing	Hoop Lap Length	
1	6' - 0"	2' - 0"	4"	3/4" x 18" x 4" (6" Thread)	N/A	N/A	N/A	N/A
2	10' - 0"	3' - 0"	4"					
3	20' - 6"	8' - 0"	12"	1" x 36" x 4" (6" Thread)	8-#6	#4-12"	6" with 2 hooks	Req'd

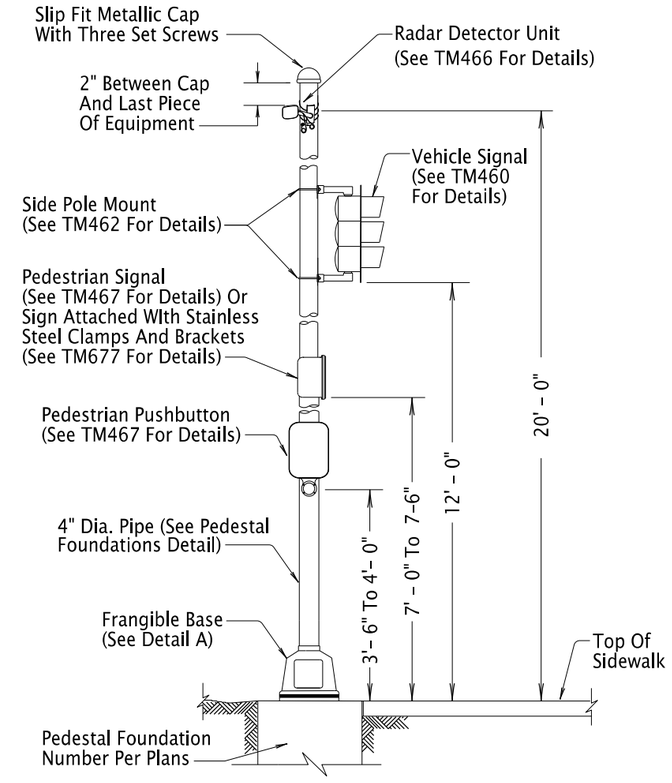
PEDESTAL FOUNDATIONS



DETAIL A - FRANGIBLE BASE

General Notes:

1. All Bolts, Nuts And Washers To Conform To 02560.20 And Be Galvanized Steel According To 02560.40 Unless Noted Otherwise.
2. All Anchor Rods To Be Galvanized Steel Conforming To 02560.30.
3. All Pole Entrances Containing Wiring To Be Smooth.
4. Install 1/4" To 3/8" Thick Preformed Expansion Joint Filler Around Footing In Sidewalk Areas.
5. The Entire Foundation To Be Located On A Single Plane With Less Than 2% Slope. The Flat Edge(s) Of The Foundation May Be Adjacent To The Turn Space, Back Of Walk, Or A Curb Ramp Grade Break Line.
6. Install Commercial Grade Concrete Pad Above Rough Float Surface With Top Surface Matching Sidewalk Grade And Less Than 1/4 " Vertical Exposure From Adjacent Grade. Clean Rough Float Surface Prior To Placing Fresh Concrete By Removing All Scum, Laitance, Loose Gravel, And Sediment. Pour During Sidewalk Installation After Installing Pipe And Appurtenances.
7. Non-Shrink High Early Strength Grout (Non-Ferrous) with 3/4" Diameter Pole Drain And A Minimum Strength of 5000 psi. Do Not Use Footing Concrete.



Notes:

1. Equipment Shown In the Assembly Detail Is An Example Of The Equipment That May Be Mounted. Install Equipment As Shown.
2. See TM492 For Ramp Meter Pedestal Mounting Details.
3. See TM493 For RRFB Pedestal Mounting Details.

TRAFFIC SIGNAL PEDESTAL ASSEMBLY

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

PEDESTAL FOUNDATION AND TRAFFIC SIGNAL ASSEMBLY

2024

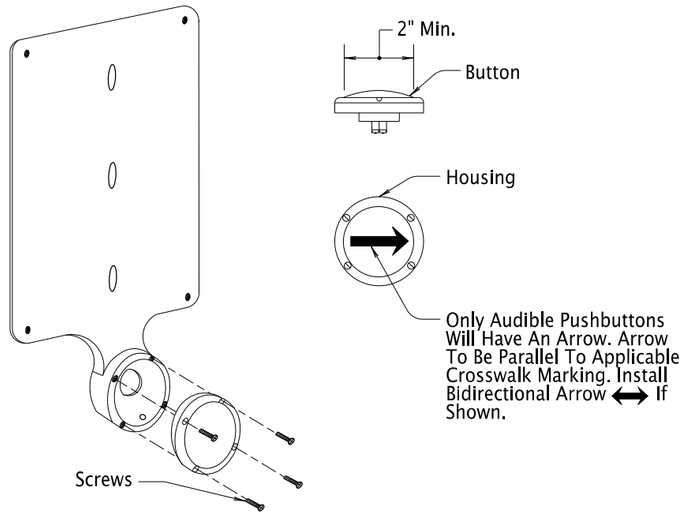
DATE	REVISION DESCRIPTION
07-2023	NOTE 5 - CHANGED TO 2% SLOPE, ADDED RMC AS PIPE OPTION, MINOR
	TEXT CHANGES FOR CLARITY.
01-2025	TYPO CORRECTION, UPDATED STANDARD DRAWING REFERENCES
07-2025	REVISED GEN. NOTE 4 EXPANSION JOINT THICKNESS
01-2026	REVISED "DETAIL A" TO INCLUDE ALUMINUM GROUNDING LUG

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **TM457**

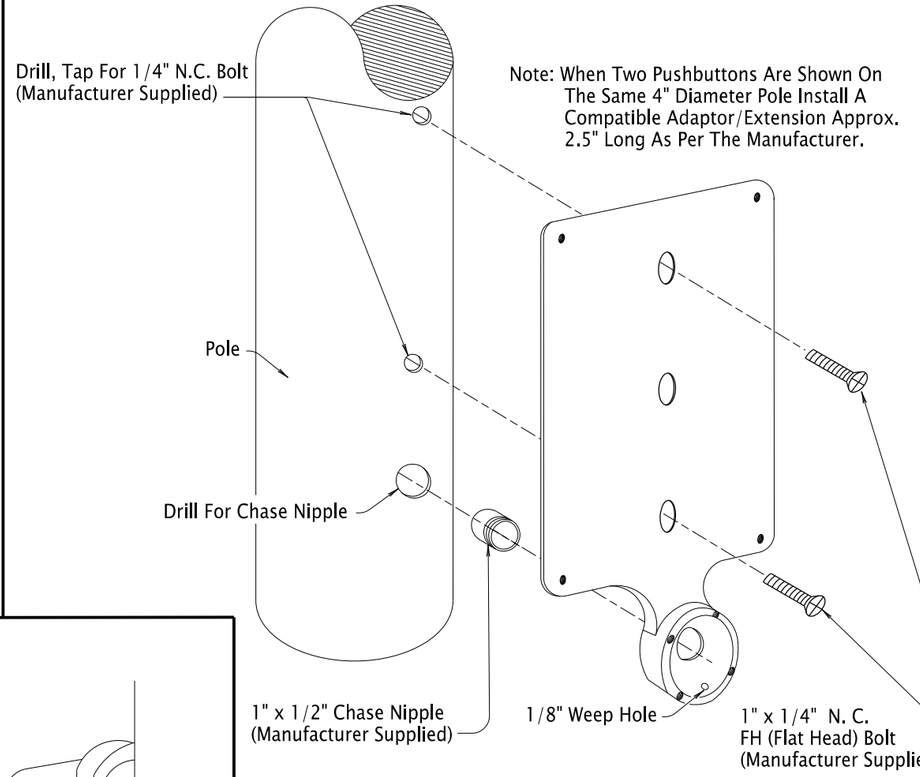
Effective Date: June 1, 2026 - November 30, 2026

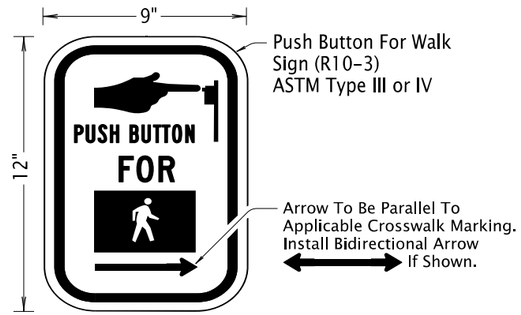
13-JAN-2026

TM467.dgn

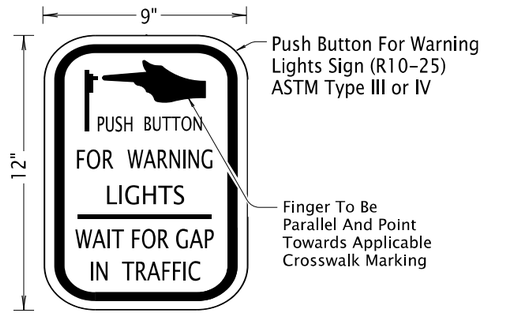


STANDARD PUSHBUTTON



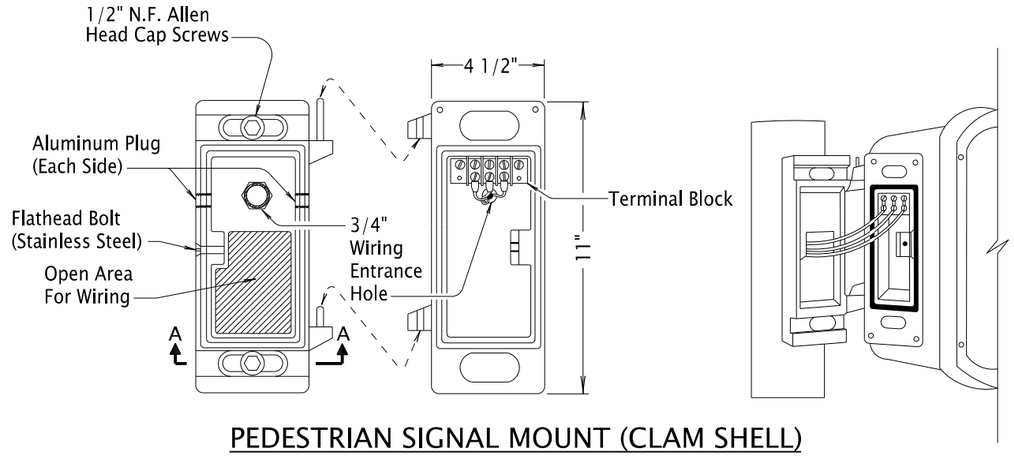


SIGN FOR PEDESTRIAN SIGNALS



SIGN FOR WARNING BEACON ASSEMBLY

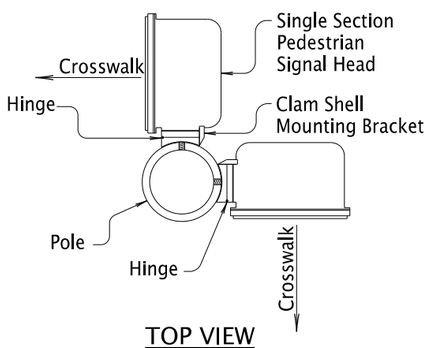
STANDARD PUSHBUTTON STATION AND INSTRUCTION SIGN



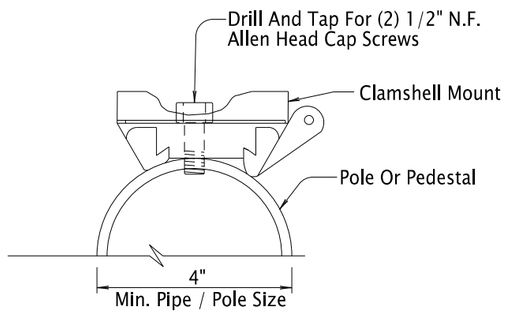
PEDESTRIAN SIGNAL MOUNT (CLAM SHELL)

NOTES:

1. Where Two Heads Are Side Mounted On 4" Conduit, Proper Clearance To Be Maintained To Allow Legend To Be Fully Visible.
2. Clam Shells To Be Orientated So That The Heads Can Be Opened For Maintenance. (Verify Hinge Placement Of Clamshell).



TOP VIEW



SECTION A-A

CLAM SHELL ORIENTATION

General Notes:

1. All Screws, Bolts, Nuts And Washers To Be Type 304 Or 316 Stainless Steel Unless Noted Otherwise.
2. Bolts And Screws To Have Square Or Hex Heads. Allen Head Fasteners Not Allowed.
3. Drill And Tap Pole As Per Orientation Shown On Plans.
4. Horizontal Reach To The Pushbutton To Be 10 Inches Maximum. See Plans Or Consult Engineer To Ensure Compliance.
5. Drill A 1/4" Drain Hole In the Bottom Of The Hex Head Pipe Plug Of The Pedestrian Signal Head When Not Using The Bottom Opening For Mounting.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

PEDESTRIAN SIGNAL MOUNT AND PEDESTRIAN PUSHBUTTON DETAILS

2024

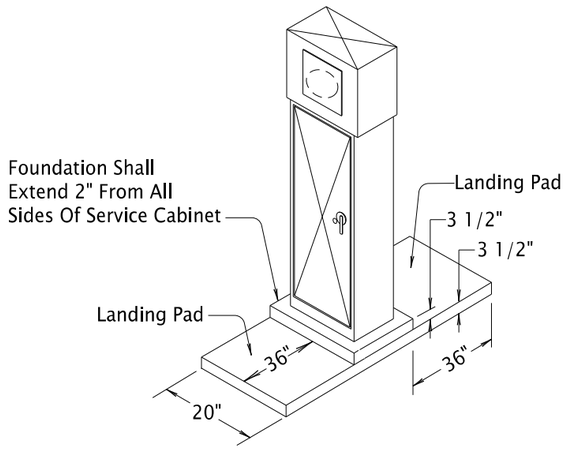
DATE	REVISION DESCRIPTION
07-2022	ADDED R10-25 SIGN. ADDED EXTENSION MOUNTING NOTE FOR
	2 PUSHBUTTONS ON SAME 4" DIA. POLE.
07-2024	ADDED ARROW TO PUSHBUTTON. ADDED BI-DIRECTIONAL ARROW.
07-2025	REVISED SIGN R10-25. ADDED GEN. NOTE 5.
01-2026	ADDED CLARIFICATION TO ARROW ON PUSHBUTTON

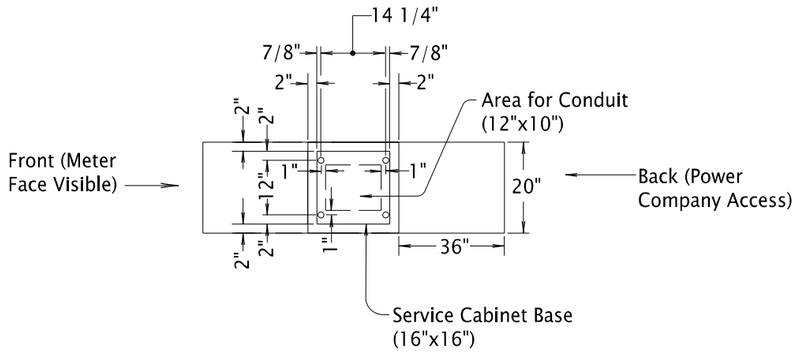
CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **TM467**

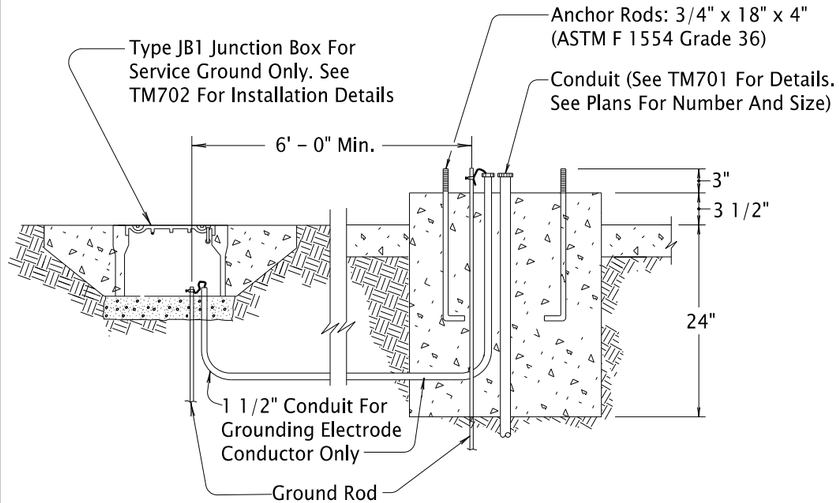
Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

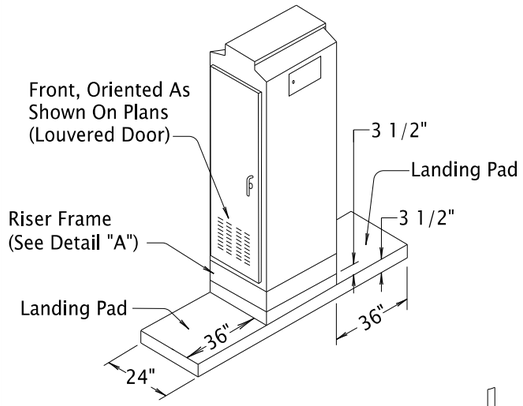
TM482.dgn

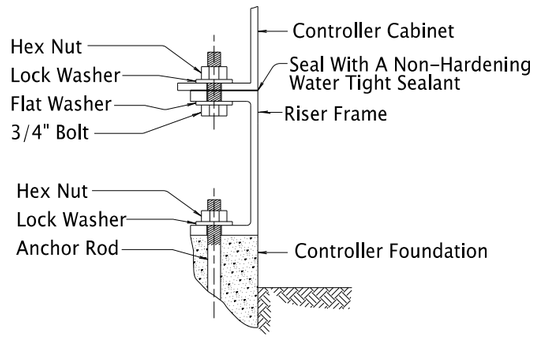




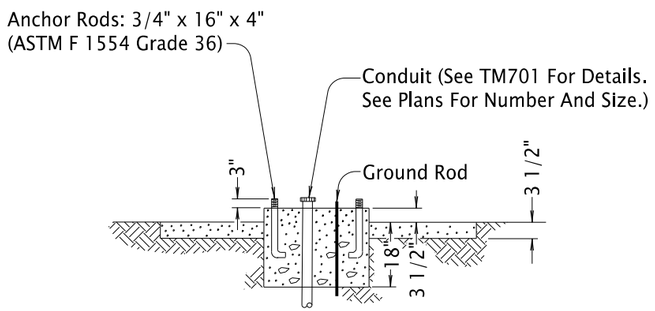


BASE MOUNTED SERVICE CABINET FOUNDATION





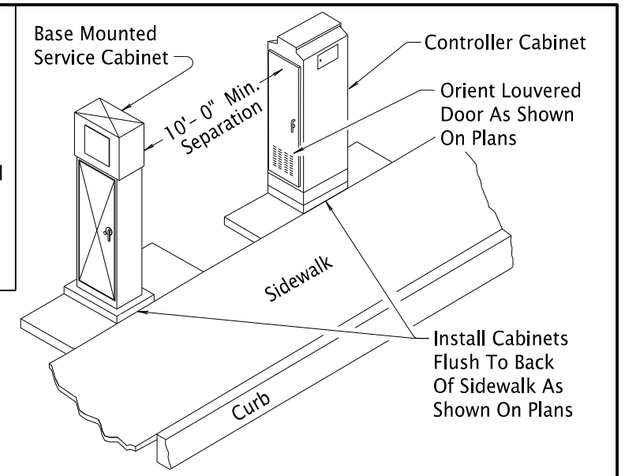
DETAIL "A"
RISER FRAME CONNECTION



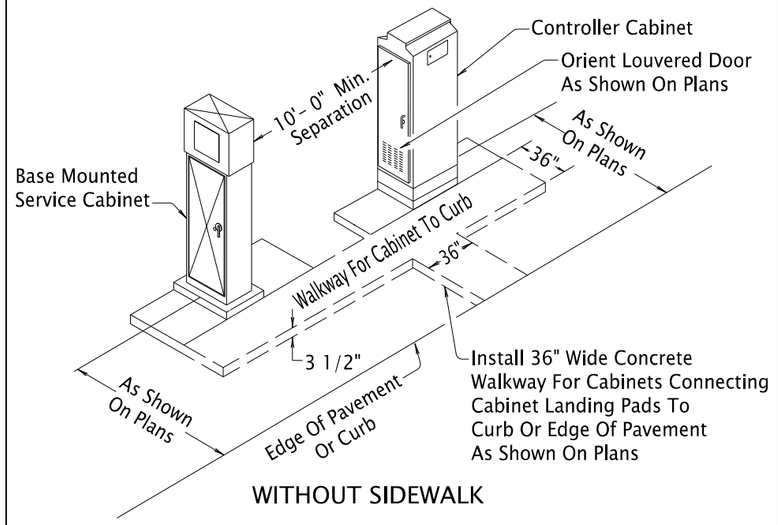
CONTROLLER CABINET FOUNDATION DETAILS
(Model 332S, 332, 334, And 340 Cabinets)

General Notes:

1. All Screws, Bolts, Nuts And Washers Shall Be Galvanized Steel Unless Noted Otherwise.
2. Bolts And Screws Shall Have Square Or Hex Heads. Allen Fasteners Not Allowed.
3. Type 304 Or 316 Stainless Steel Or Galvanized Steel May Be Used For Mounting Cabinet To Riser Frame.
4. Provide A 3/4" Chamfer On All Exposed Concrete Edges.



WITH SIDEWALK



WITHOUT SIDEWALK

CABINET FOUNDATION LOCATIONS

Note: Verify Base Mounted Service Cabinet Location And Meter Placement Is Acceptable To Local Power Company

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

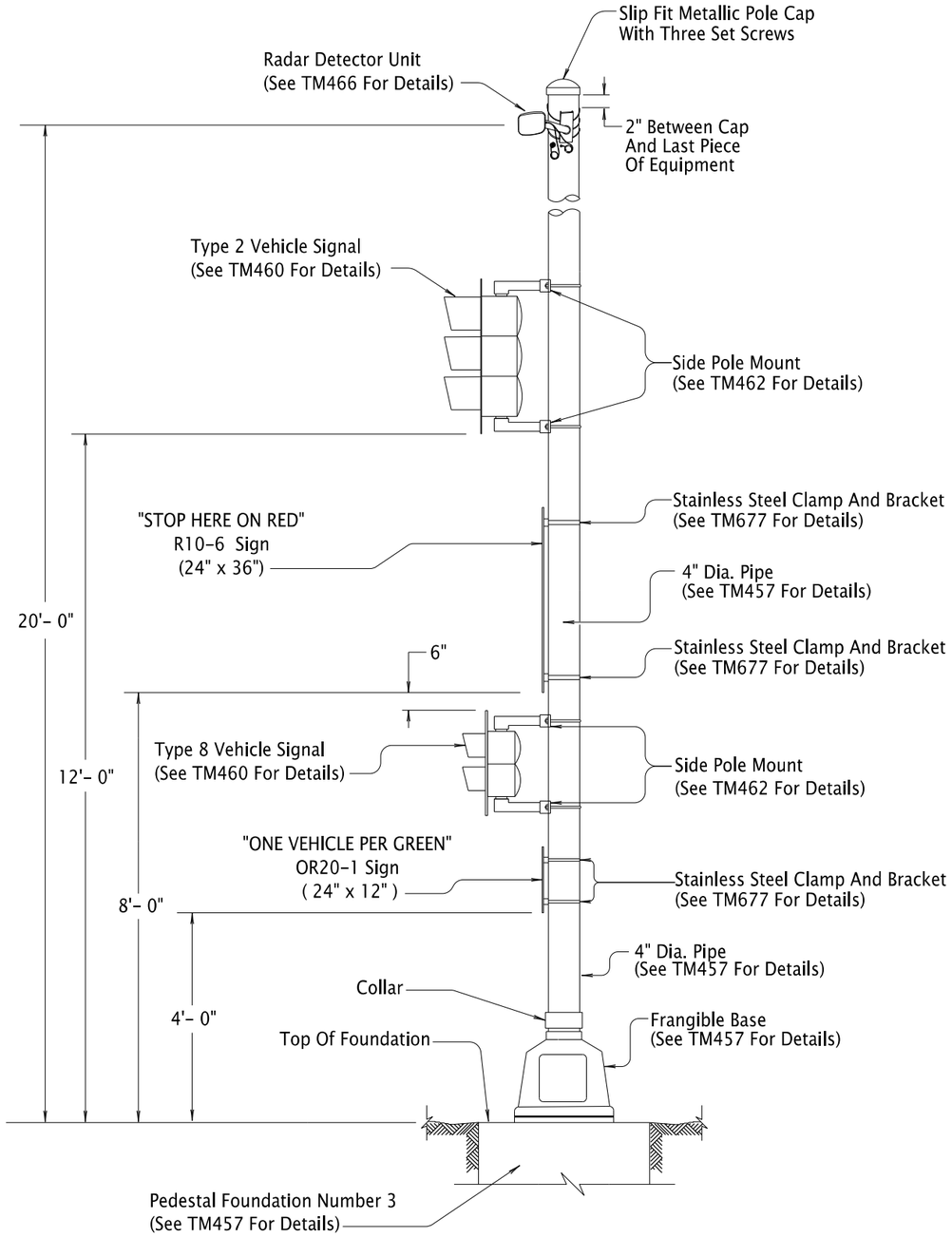
CONTROLLER CABINET & SERVICE CABINET FOUNDATION DETAILS

2024

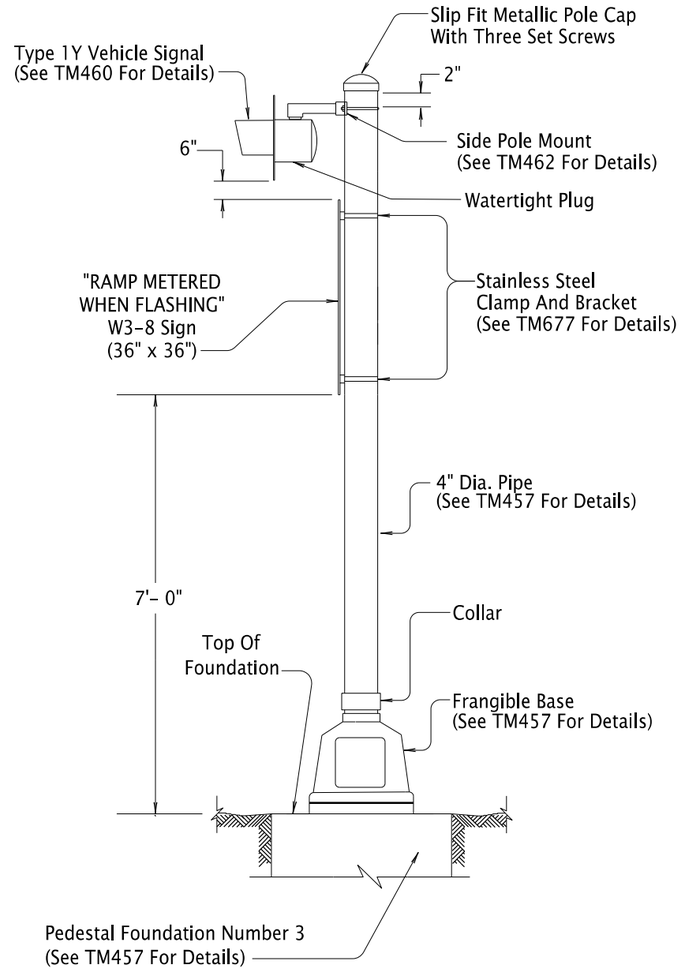
DATE	REVISION DESCRIPTION
01-2021	UPDATED ALL ANCHOR ROD DETAILS
01-2025	UPDATED STANDARD DRAWING REFERENCES
07-2025	REMOVED BUILDING PAPER REQUIREMENT
01-2026	CORRECTED TYPOS

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **TM482**

Effective Date: June 1, 2026 - November 30, 2026



RAMP METER SIGNAL ASSEMBLY



RAMP METER ADVANCE WARNING SIGN ASSEMBLY

General Notes:

1. Equipment Shown In the Assembly Details Is An Example Of The Equipment That May Be Mounted. Install Equipment As Shown.
2. All Equipment Mounted On The Pipe Shall Be Vertically Separated By A Minimum Of 6 Inches.
3. Do NOT Install Assemblies Within Paved Gore Area.
4. Locate Ramp Meter Signal Assembly 25'- 0" Beyond Stop Line Or As Shown.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

RAMP METER ASSEMBLIES

2024

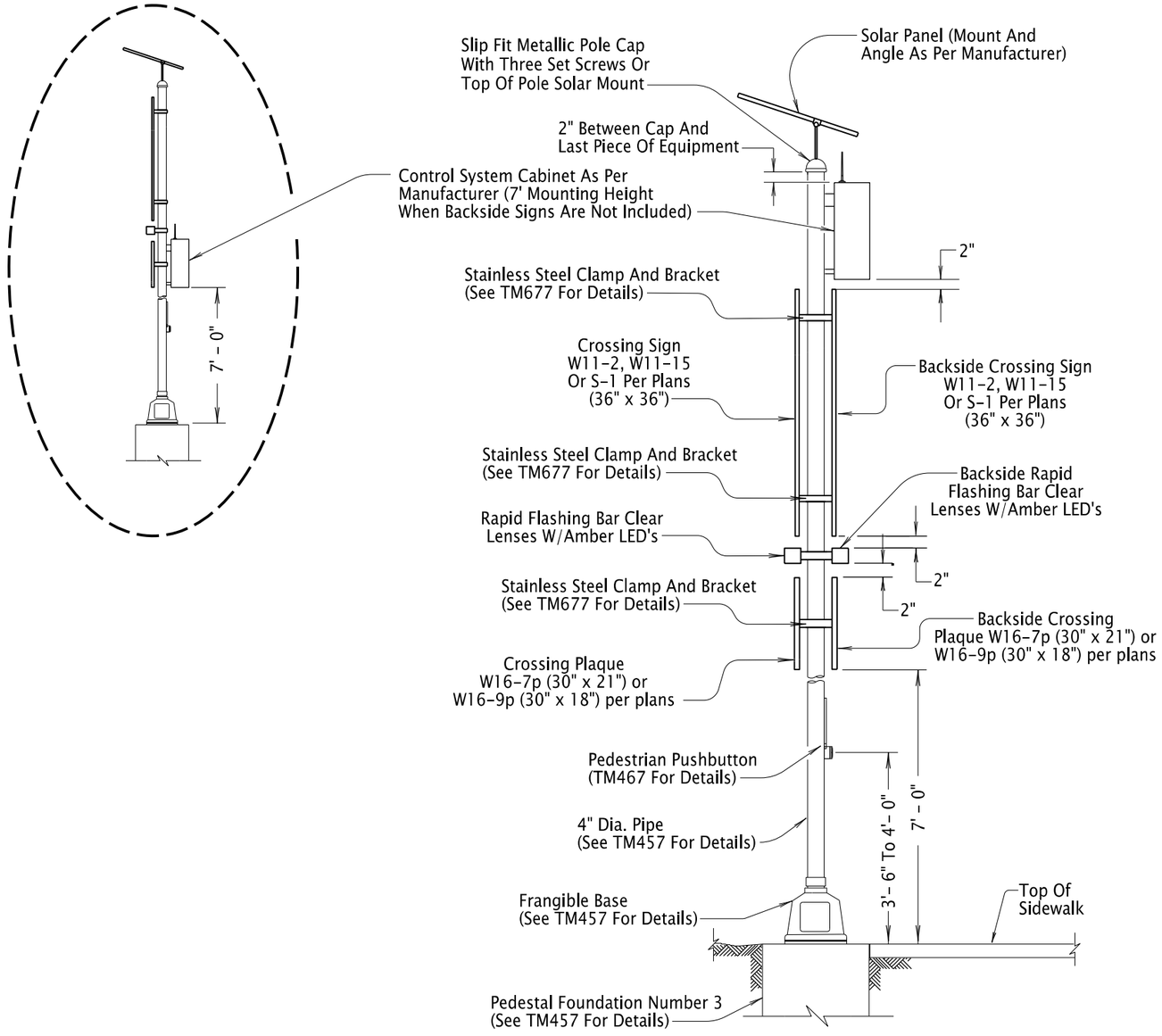
DATE	REVISION DESCRIPTION
01-2022	REFERENCED TM457 FOR ALL PIPE INFO
07-2022	REVISED TO MATCH TM457 REVISIONS/FORMAT
07-2023	MINOR TEXT CHANGES FOR CLARITY
01-2026	ADDED GENERAL NOTE 2 FOR CLARITY

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **TM492**

13-JAN-2026

TM492.dgn

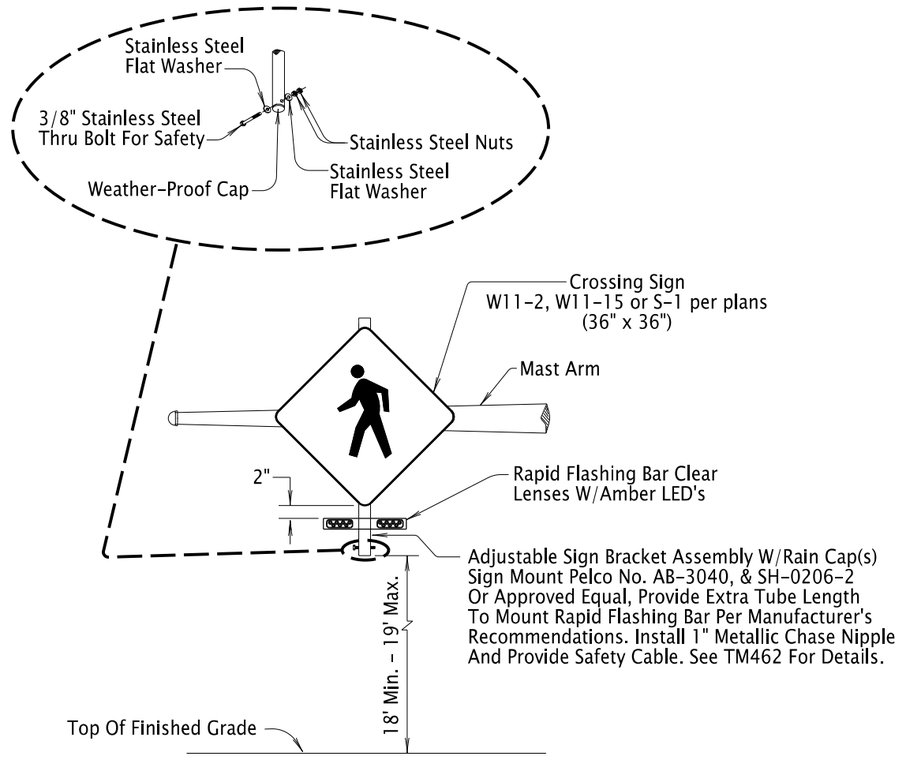
Effective Date: June 1, 2026 - November 30, 2026



Notes:

1. Equipment Shown In The Assembly Detail Is An Example Of The Equipment That May Be Mounted. Install Equipment As Shown.
2. Equipment Mounting Details Shown Are Also Applicable When Mounting Equipment To A Large Signal Pole.

RECTANGULAR RAPID FLASHING BEACON PEDESTAL ASSEMBLY
(Use Green Sheet Listed Items Only)



RECTANGULAR RAPID FLASHING BEACON MAST ARM ASSEMBLY
(Use Green Sheet Listed Items Only)

GENERAL NOTES:

1. Install Cable/Wire Terminations And Splices As Per The Rectangular Rapid Flashing Beacon Manufacturer's Recommendations.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

RECTANGULAR RAPID FLASHING BEACON (RRFB) ASSEMBLIES

2024

DATE	REVISION DESCRIPTION
07-2022	NEW DRAWING
07-2023	MINOR TEXT CHANGES FOR CLARITY
01-2025	CORRECTED TYPO
07-2025	ADDED GENERAL NOTE 1
01-2026	UPDATED CROSSING PLAQUE SIGN DIMENSIONS PER MUTCD

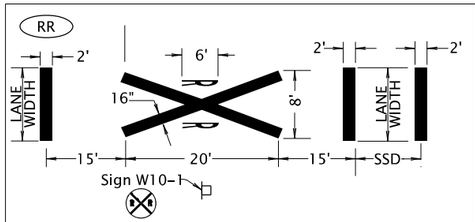
CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **TM493**

Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

TM504.dgn

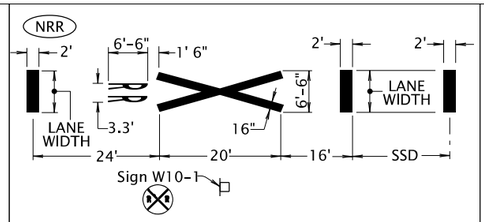
RR



RAILROAD CROSSING (white)

Install per ODOT Rail Crossing Order or as shown.
For letter proportion details, see current version of Standard Highway Signs

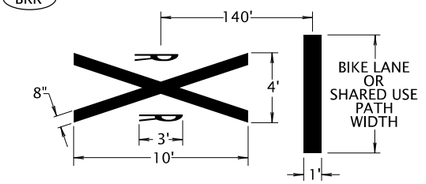
NRR



NARROW RAILROAD CROSSING (white)

Install per ODOT Rail Crossing Order or as shown.
For letter proportion details, see current version of Standard Highway Signs

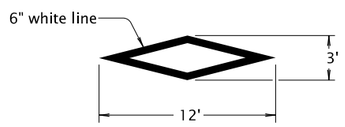
BRR



BICYCLE RAILROAD CROSSING (white)

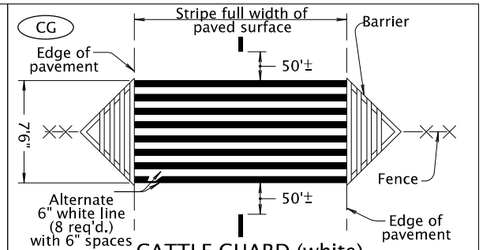
Install per ODOT Rail Crossing Order or as shown.
For letter proportion details, see current version of Standard Highway Signs

HOV



HIGH-OCCUPANCY VEHICLE DIAMOND DETAIL (white)

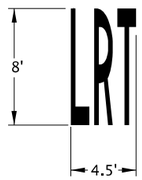
CG



CATTLE GUARD (white)

For barrier and fence details, see Std. Dwg. RD110

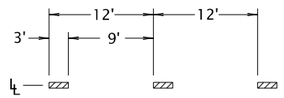
LRT



LIGHT RAIL TRANSIT (white)

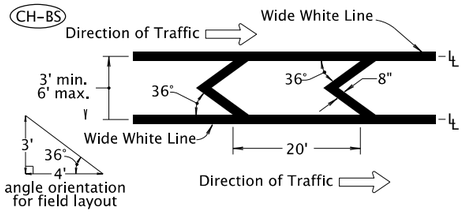
Center marking within lane width
For letter proportion details, see current version of Standard Highway Signs

YB-SP



4" YELLOW SHARED PATH BROKEN LINE

CH-BS



CHEVRON BARS - BUFFER SPACE 8" WHITE BARS AT 20' SPACING

General Note:

1. Center pavement markings within the lane width.
2. Arrow and letter dimensions nominal, excluding WWA.

Direction Of Traffic, Increasing Stationing Or Thru Traffic Side

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

PAVEMENT MARKING STANDARD DETAIL BLOCKS

2024

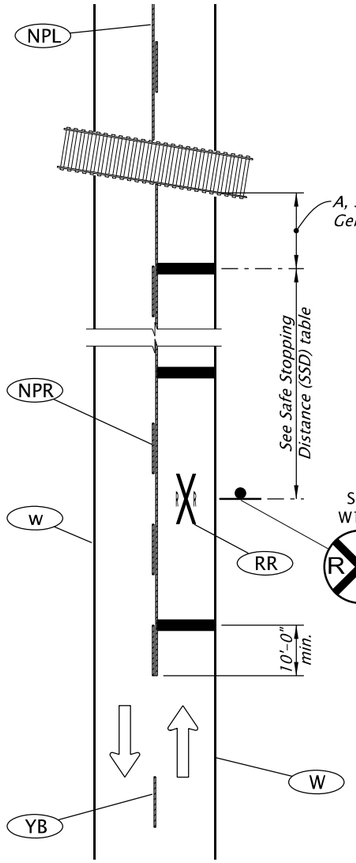
DATE	REVISION DESCRIPTION
07-2020	NEW DRAWING FOR ADDITIONAL DETAIL BLOCKS
01-2026	UPDATED RAILROAD CROSSING DETAIL BLOCKS

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **TM504**

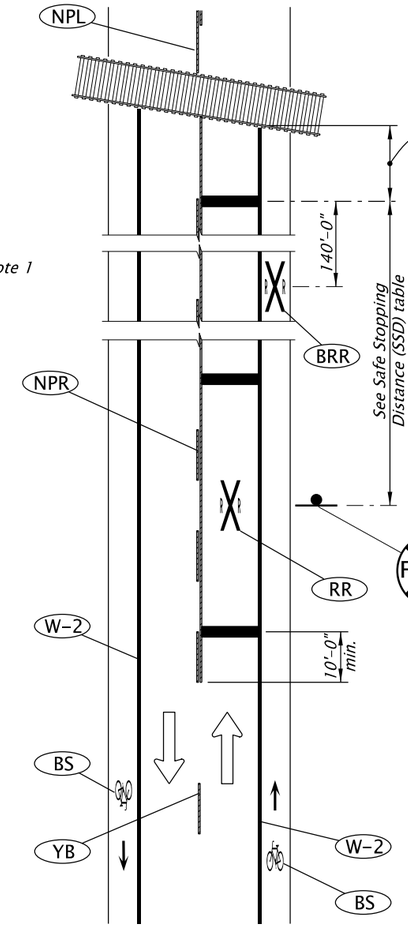
Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

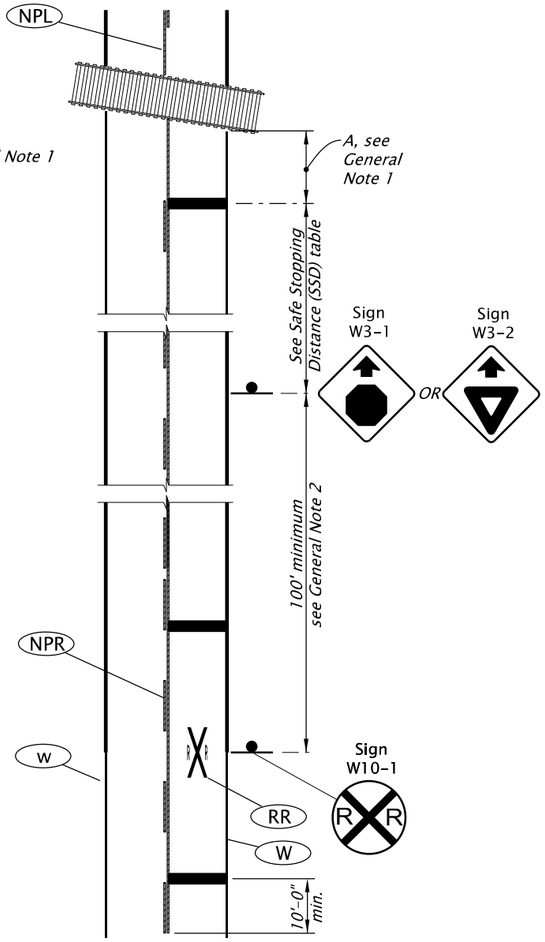
TM505.dgn



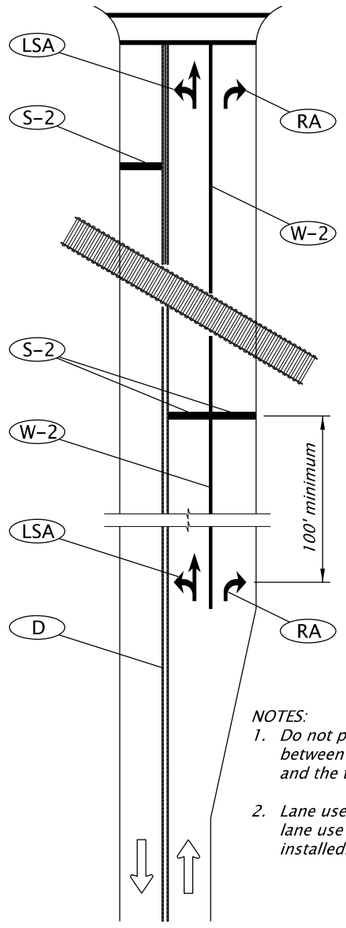
TYPICAL RAILROAD GRADE CROSSING MARKINGS NO BIKE LANE



TYPICAL RAILROAD GRADE CROSSING MARKINGS WITH BIKE LANE



TYPICAL RAILROAD GRADE CROSSING MARKINGS WITH STOP OR YIELD AHEAD SIGNS



NOTES:
1. *Do not place lane use arrows between the RxR stop bar and the tracks.*
2. *Lane use signing required if lane use arrows cannot be installed.*

LANE USE ARROW MARKINGS APPROACHING RAILROAD GRADE CROSSING AT INTERSECTIONS WITH MULTIPLE LANES

GENERAL NOTES FOR ALL DETAILS THIS SHEET:

1. *A = 15' minimum from nearest rail and approximately 8 feet upstream from where automatic gate arm crosses the roadway. Install stop bar perpendicular to roadway.*
2. *See MUTCD 11th Edition, Figures 8C-1 and 8C-2 for details.*
3. *Install all markings per Crossing Order or as shown.*
4. *Start and end all longitudinal lines within 2 feet of the nearest rail.*
5. *See drawing TM504 for RR and BRR legend dimensions.*

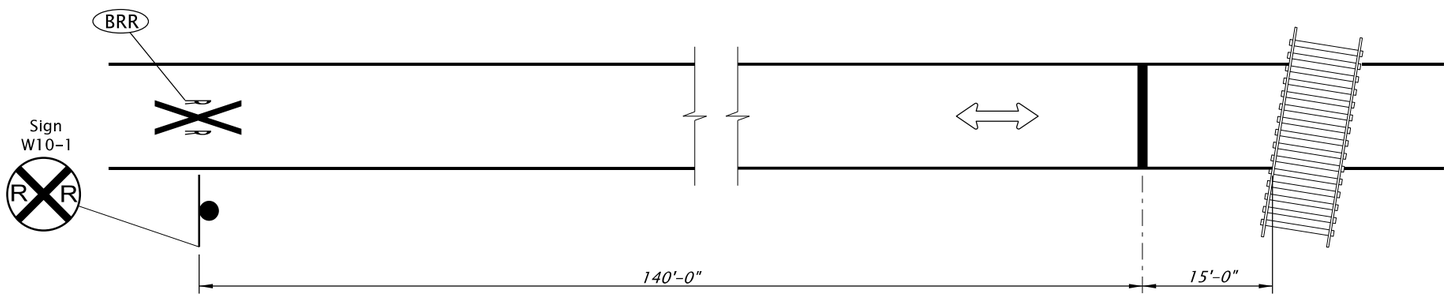
SAFE STOPPING DISTANCE (SSD) TABLE

POSTED SPEED (mph)	DISTANCE (feet)
10	50 (100 Standard)
15	80 (100 Standard)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

LEGEND

Increasing stationing from bottom to top

Direction of Travel



TYPICAL SHARED USE PATH RAILROAD GRADE CROSSING MARKINGS

This sheet to be accompanied by drawings TM500 thru TM504

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

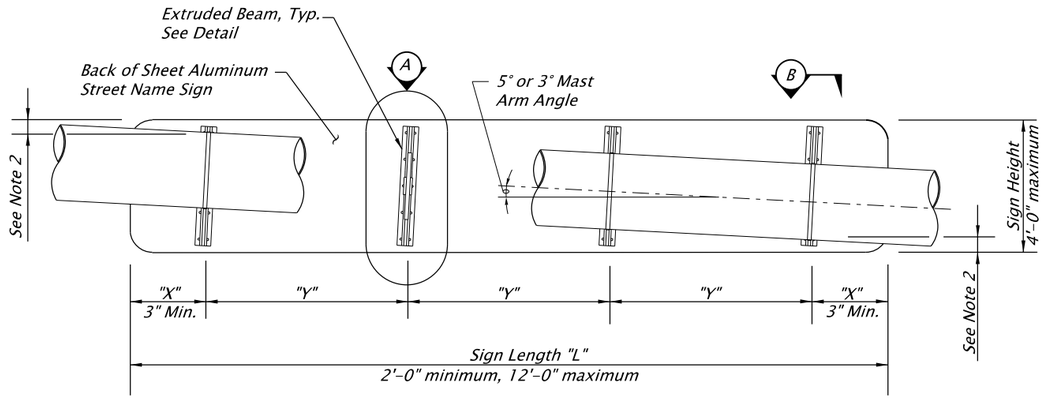
RAIL CROSSING PAVEMENT MARKINGS

2024

DATE	REVISION DESCRIPTION
07-2020	EXTENDED ACCOMPANIED BY DRAWINGS TO INCLUDE TM504
01-2022	CORRECTED NOTES TO REFERENCE TM504 INSTEAD OF TM501
	ADDED 70 AND 75 MPH MATCHING THE TRAFFIC LINE MANUAL
01-2026	CORRECTED DETAILS, ADDED STOP OR YIELD AHEAD DETAIL AND UPDATED
	CAD STANDARDS

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **TM505**

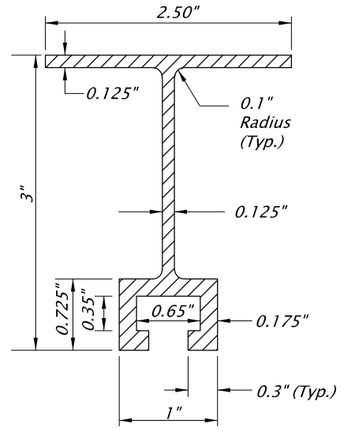
Effective Date: June 1, 2026 - November 30, 2026



Mast Arm Street Name Mount Requirements			
Sign Length "L"	Maximum Edge Distance "X"	Maximum Support Spacing "Y"	Number of Extruded Beam Locations
"L" greater than or equal to 2'-0" and "L" less than or equal to 4'-0"	"L"/4	"L"/2	2
"L" greater than 4'-0" and "L" less than or equal to 8'-0"	1'-0"	3'-0"	3
"L" greater than 8'-0" and "L" less than or equal to 10'-0"	1'-0"	2'-8"	4
"L" geater than 10'-0" and "L" less than or equal to 12'-0"	1'-0"	2'-6"	5

MAST ARM STREET NAME SIGN MOUNT

No Scale

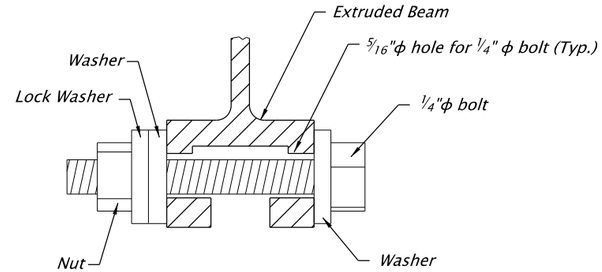


EXTRUDED BEAM DETAIL

No Scale

GENERAL NOTES:

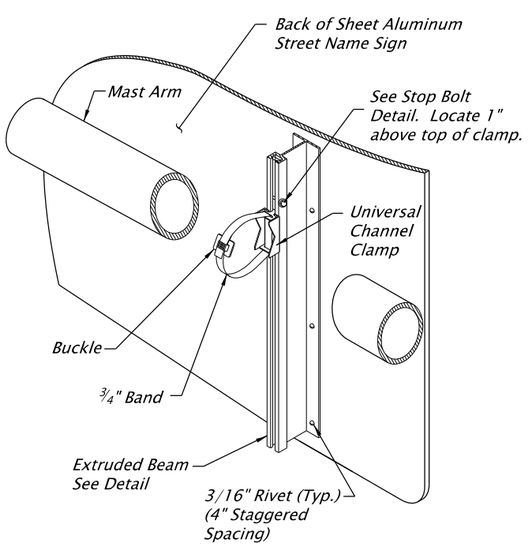
1. Physical fit of the sign must be verified. The edges of the street name sign shall not be within 6" of other signs or the mast arm connection flanges.
2. Equal spaces top and bottom.
3. The top of the street name sign shall be leveled.
4. Extruded Beams are to be set at an angle perpendicular to the mast arm.
5. Material for extruded beam shall be ASTM B 221 6061-T6 Aluminum.
6. Material for 3/4" Band shall be 3/4" wide, 0.03" thick, and ASTM A 666, Type 201 Stainless Steel.
7. Material for the Sign Bracket, Universal Channel Clamp, and buckle shall be ASTM A 666, Type 201 Stainless Steel.
8. Existing signal poles must be analyzed to verify that the pole and foundation can support the new street name sign loading. See TM650 and TM655 for allowable street name sizes on new installations.
9. Mounts are designed in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals LRFD 1st edition with 2022 interim revisions and ASD 6th edition with 2025 interim revisions.
10. The design LRFD Ultimate 3 second gust wind speed is 145 mph and the design ASD 3 second gust wind speed is 110 mph. The sign drag coefficient Cd is 1.2 and the maximum distance above the surface is 25 feet.



1. All hardware to be Type 316 Stainless Steel.
2. Locate 1" above the top of the Universal Channel Clamp.

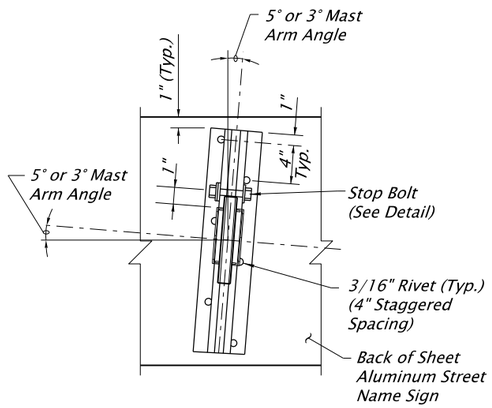
STOP BOLT DETAIL

No Scale



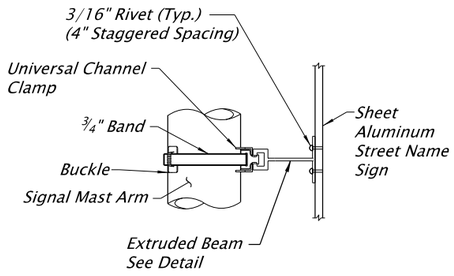
TYPICAL MAST ARM INSTALLATION

No Scale



DETAIL A

No Scale



DETAIL VIEW B

No Scale

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All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

SIGNAL MAST ARM STREET NAME SIGN MOUNTS

2024

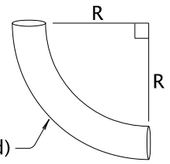
DATE	REVISION DESCRIPTION
01-2026	SIGN HEIGHTS WERE 30" FOR 8' AND LESS LENGTHS AND 21" FOR SIGNS
	GREATER THAN 8' AND LESS THAN OR EQUAL TO 12', ADDED AASHTO
	LRFD, AASHTO ASD, WIND SPEEDS, CD, AND DISTANCE ABOVE SURFACE.

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **TM679**

Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

TM679.dgn

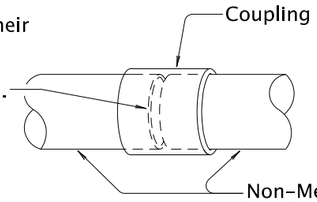


Standard Factory Fiberglass Bend
(No Crimping, Flattening, Field
Manipulation, Or Cutting In The Field)

Conduit Diameter	R (min.)
1 1/2"	10"
2"	12"
2 1/2"	15"
3"	18"

CONDUIT ELBOWS

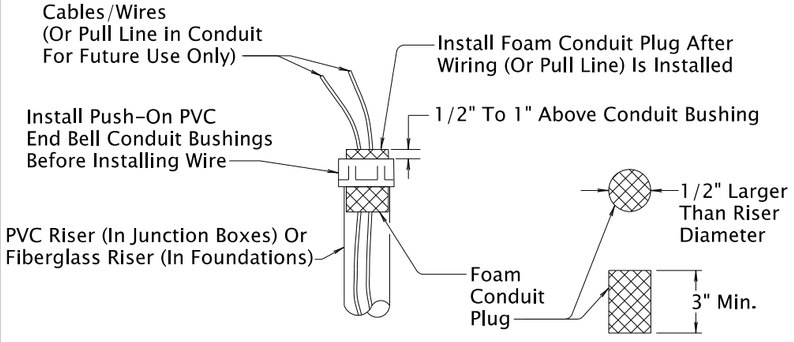
Make Cuts Square And True So
Conduit Ends Fit Together For Their
Full Circumference. Use Solvent
Weld To Connect Conduit As Per
Manufacturer's Recommendation.



Notes:

1. Slip Joints, Running Threads Or Reducing Couplings Not Allowed. Use The Same Size Conduit For The Entire Length, Outlet To Outlet.

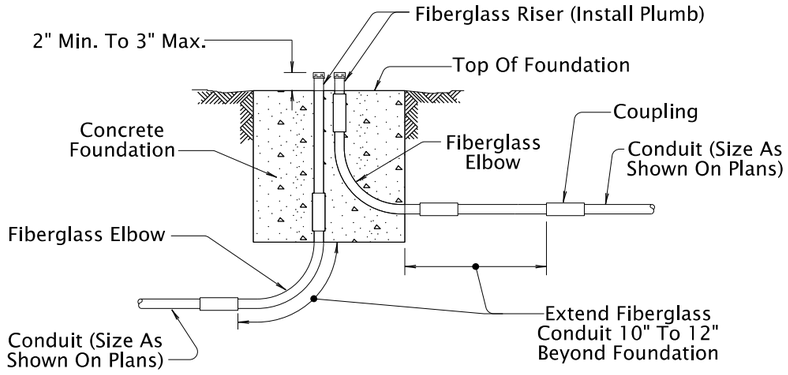
CONDUIT COUPLINGS



Notes:

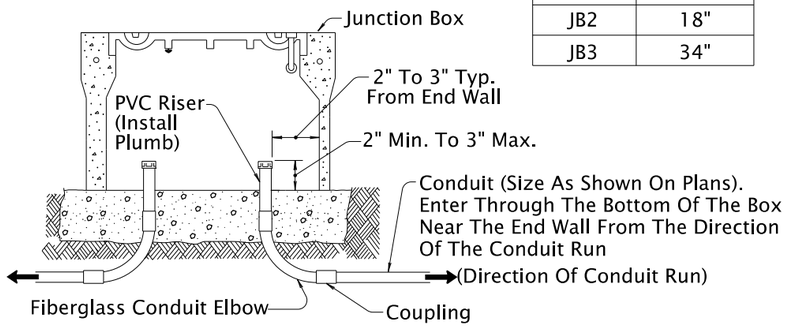
1. Ream Conduit Ends To Remove Rough Edges And Burrs
2. Temporarily Plug Or Cap Conduit Ends At All Times To Keep Debris Out

CONDUIT ENDS AND BUSHINGS

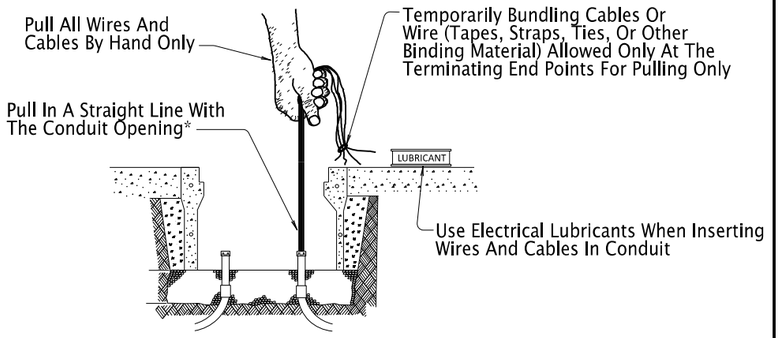


CONDUIT INSTALLATIONS IN FOUNDATIONS

Junction Box Type	Max. Sum Of Conduit Diameters
JB1	12"
JB2	18"
JB3	34"



CONDUIT INSTALLATION IN JUNCTION BOXES



* Use A Pulley Device To Achieve A Straight Line If
Pulls Are Made With Poles Or Controller Cabinets In Place

WIRE & CABLE INSTALLATION IN CONDUITS

Wire & Cable Installation General Notes:

1. See TM470 For Additional Wire/Cable Installation Requirements That Apply To Specification Section 00990 Bid Items.
2. Label Wires And Cables With Permanent Tags As Shown Or Directed. Use Handheld Labeler (Brady M210 Label Maker With Vinyl B-595 Tape) Unless Otherwise Shown.
3. Install No. 16 AWG TFFN Orange Base With Blue Tracertone Wire In All Conduits As A Locate Wire. Leave Slack As Shown Or Directed And Install A Wire Nut. Do Not Join Multiple Locate Wires Under A Common Wire Nut Unless Otherwise Shown.
4. Tape The Ends Of Unused Conductors With Insulated Vinyl Plastic Tape.
5. Leave A Minimum Of 2 Feet Slack In Each Wire And Cable In Junction Boxes, Poles, Cabinets Unless Otherwise Shown.
6. Install Polyethylene Pull Line In All Conduits Noted On The Plans For Future Use (No Wires/Cables In Conduit). Leave 6 Feet Of Slack Pull Line.

Conduit Installation General Notes:

1. Install Non-Metallic Conduit Unless Otherwise Shown. Conduit Runs Shall Be Continuous Between Any Pole, Junction Box, Or Cabinet.
2. Larger Conduit Than Specified May Be Used At The Option And Cost Of The Contractor If Max. Sum Of Conduit Diameters In Junction Box Is Not Exceeded.

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OREGON STANDARD DRAWINGS

GENERAL CONDUIT & WIRE/CABLE INSTALLATION

2024

DATE	REVISION DESCRIPTION
01-2025	NEW DRAWING (CONTENT FROM RETIRED TM470 & TM471)
01-2026	DELETED APPLICABILITY LANGUAGE IN CONDUIT IN FOUNDATIONS DETAIL

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **TM701**

Effective Date: June 1, 2026 - November 30, 2026

13-JAN-2026

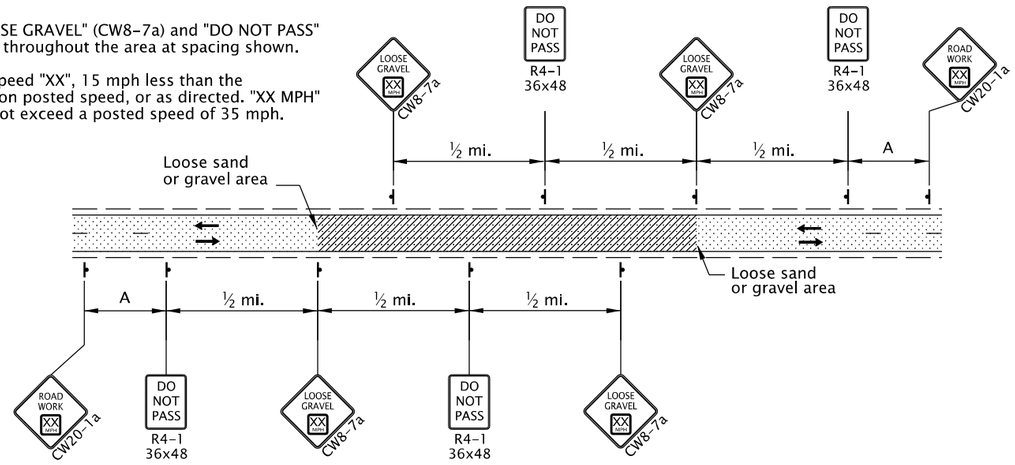
TM701.dgn

13-JAN-2026

TM850.dgn

NOTE:

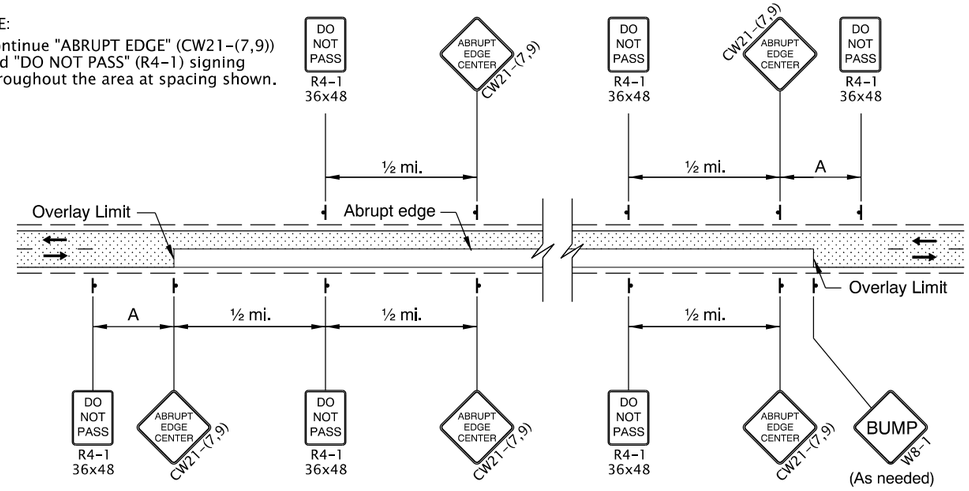
- Continue "LOOSE GRAVEL" (CW8-7a) and "DO NOT PASS" (R4-1) signing throughout the area at spacing shown.
- Use advisory speed "XX", 15 mph less than the pre-construction posted speed, or as directed. "XX MPH" placard shall not exceed a posted speed of 35 mph.



2-Lane, 2-Way Roadway
LOOSE GRAVEL IN ROADWAY SIGNING

NOTE:

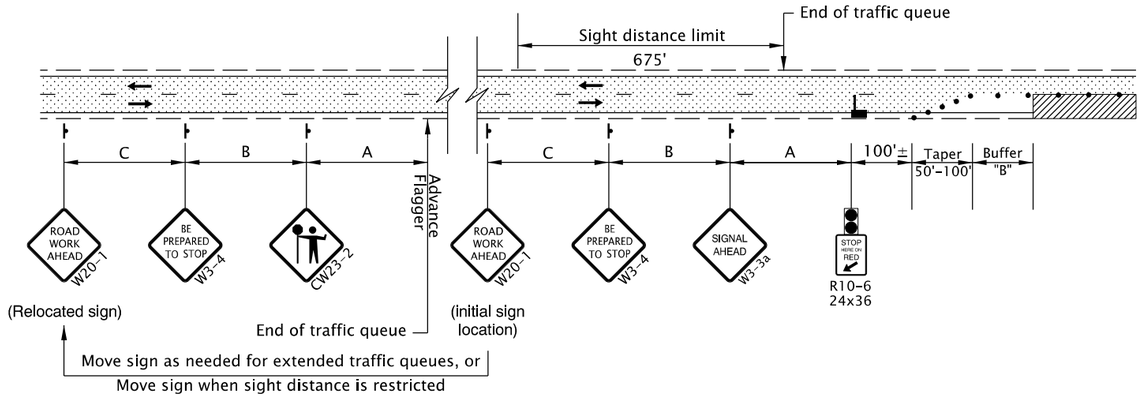
- Continue "ABRUPT EDGE" (CW21-(7,9)) and "DO NOT PASS" (R4-1) signing throughout the area at spacing shown.



2-Lane, 2-Way Roadway
OVERLAY AREA SIGNING

NOTES:

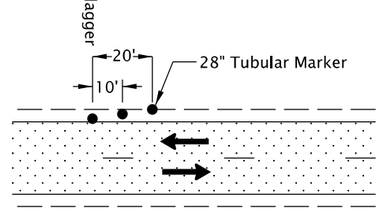
- Place Advance Flagger and additional signing when traffic queues extend beyond initial warning signing OR when sight distance is restricted.
- Relocate initial "ROAD WORK AHEAD" (W20-1) sign in advance of additional "BE PREPARED TO STOP" (W3-4) and Flagger Ahead (CW23-2) signs, as shown.
- Place additional Tubular Markers for Flagger and Advance Flagger Stations according to FLAGGER STATION DELINEATION detail.



ADVANCE FLAGGER FOR EXTENDED TRAFFIC QUEUES

NOTE:

- Use a minimum of 3 tubular markers in shoulder taper on 10' spacing for flagger station delineation.



FLAGGER STATION DELINEATION

GENERAL NOTES FOR ALL DETAILS:

- The "SIGNAL AHEAD" (W3-3a) sign may be substituted with the Signal Ahead (W3-3) symbol sign.
- Cover existing passing zone signing, as directed.
- Install temporary striping as required.
- To determine Taper Length ("L") and Buffer Length ("B"), use the "MINIMUM LENGTHS TABLE" shown on Dwg. No. TM800.
- To determine sign spacing A, B, and C, use "TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE" on Dwg. No. TM800.
- Install a "BICYCLES ON ROADWAY" (CW11-1) sign in advance of the closure when a bike lane is closed, or when the shoulder is closed and bikes are expected.
- At night, flagger stations shall be illuminated according to the FLAGGER STATION LIGHTING DELINEATION detail on Dwg No. TM800.
- To be accompanied by Dwg. Nos. TM820, TM821 & TM854.

- Automated Flagging Assistance Device (AFAD)
- • • • • 28" Tubular Markers on 20' max. spacing for flagger tapers and stations
- • • • 28" Tubular Markers See TCD Spacing Table on TM800 for max. spacing.
- UNDER TRAFFIC
- UNDER CONSTRUCTION
- CONSTRUCTION UNDER TRAFFIC

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All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

2-LANE, 2-WAY ROADWAYS

2024

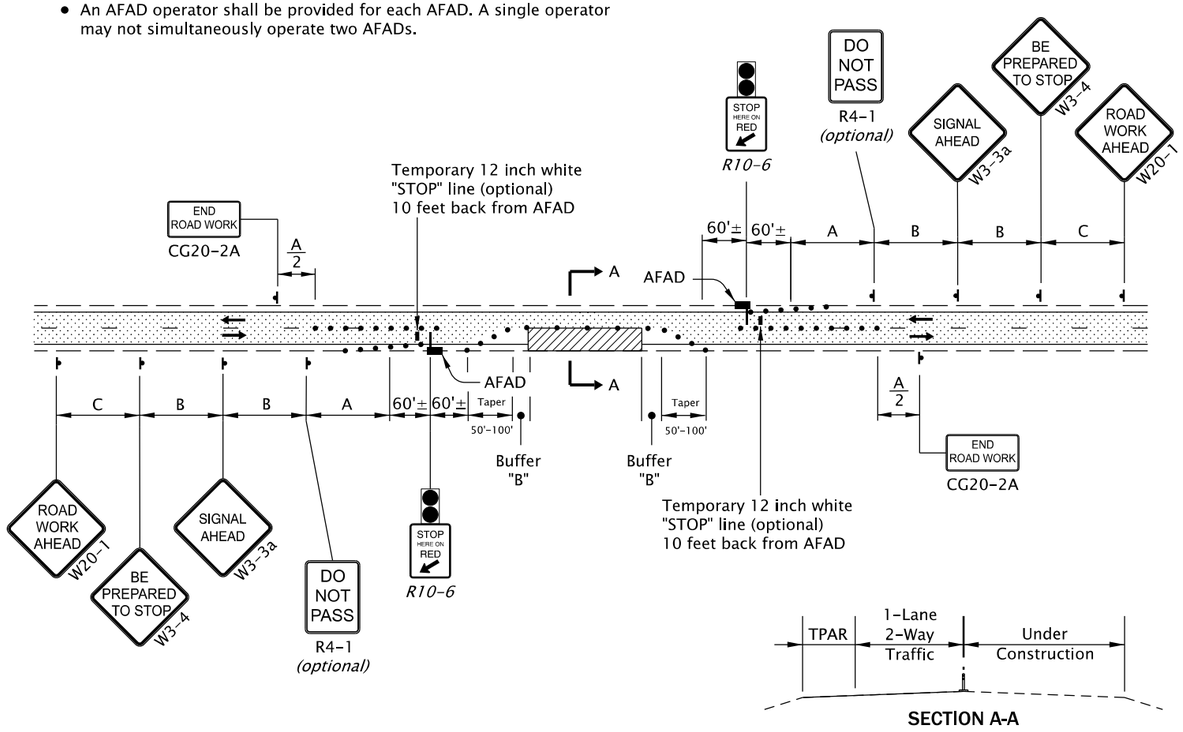
DATE	REVISION DESCRIPTION
01-2022	Added AFADs to drawing.
07-2025	Clarified location of "WAIT FOR FLAGGER" sign.
01-2026	Consolidated AFAD detail.

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **TM850**

Effective Date: June 1, 2026 - November 30, 2026

NOTES:

- An AFAD operator shall be provided for each AFAD. A single operator may not simultaneously operate two AFADs.

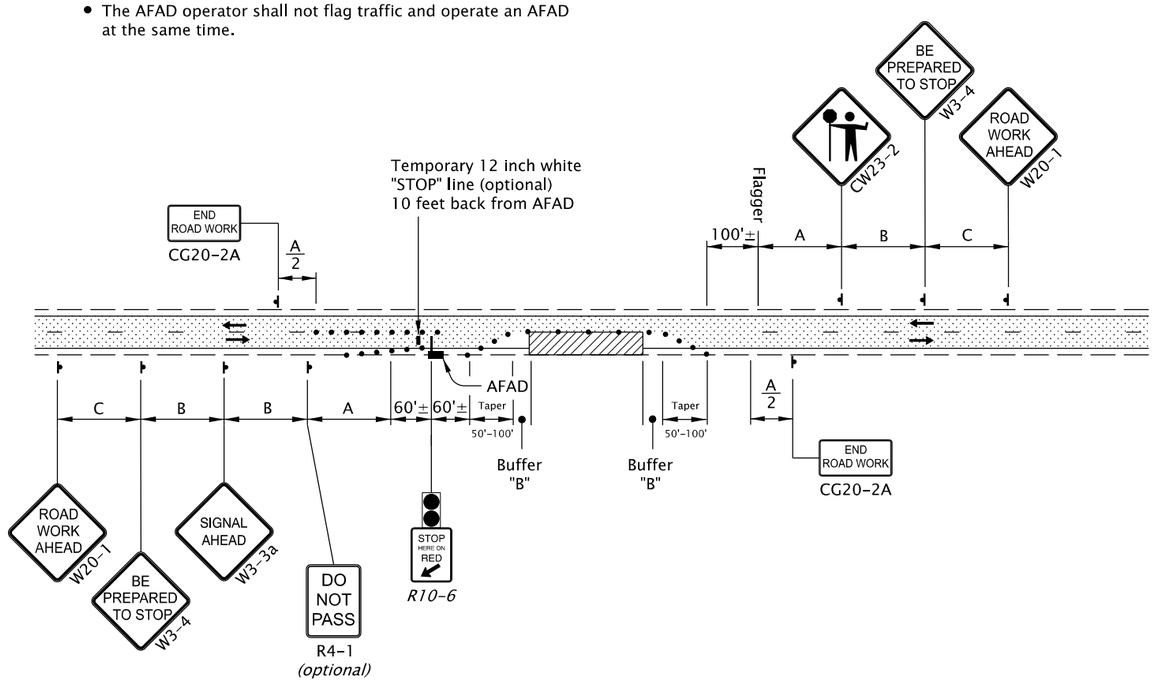


SECTION A-A

2-Lane, 2-Way Roadway
ONE LANE CLOSURE, TWO AFADs

NOTES:

- The AFAD operator shall not flag traffic and operate an AFAD at the same time.



2-Lane, 2-Way Roadway
ONE LANE CLOSURE, ONE AFAD & ONE FLAGGER

GENERAL NOTES FOR ALL DETAILS:

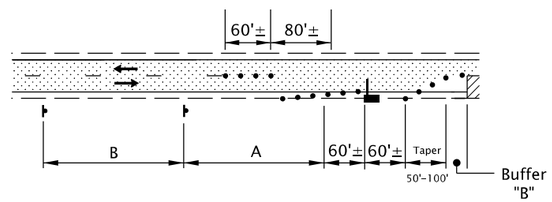
- Flagger station shall be delineated according to "FLAGGER STATION" detail shown on Standard Drawing TM800
- Bottom of lens housing shall be a minimum of 7 ft. above surface when mounted on shoulder and at least 17 ft. above any portion of the travel lane.
- The gate arm shall cover at least one half of the approaching vehicle travel lane.
- Signing and other TCD installed in conjunction with the work area, shall move with the work area.
- Use 1/3 "L" taper for shoulder closure, where necessary.
- For Taper Length ("L") and Buffer Length ("B") shown on this sheet, use the "MINIMUM LENGTHS TABLE" shown on Drg. No. TM800.
- The AFAD operator shall be a certified flagger who has been trained in the operation of the AFAD in use.
- Operator shall operate AFAD from a designated area. Designated area should maintain visual presence of the AFAD and should be at least 50' away from the AFAD and have an escape route available for the operator.
- See "TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE" on Drg. TM800 for sign spacing A, B, and C.
- Include "WAIT FOR FLAGGER" (CR4-23) signs mounted on Type II Barricade located approx. 50' before each Flagger Station.
- Remove existing striping and install temporary striping as required.
- The "SIGNAL HEAD" (W3-3a) sign may be substituted with the Signal Ahead (W3-3) symbol sign.
- Cover existing passing lane signing, as directed.
- When extended traffic queues develop during AFAD operations, protect traffic by providing advance flaggers(s) and signing according to the "Extended Traffic Queues Detail" shown on Standard Drawing TM850.
- When AFAD is not in use for less than one work shift, turn off AFAD, or switch YELLOW lens to flashing mode, and cover or remove all accompanying signing.
- When AFAD is not in use for longer than one work shift, remove AFAD and all accompanying signing from the roadway.
- Do not use the AFAD to control more than one lane of approaching traffic.
- Use temporary pavement markings or a white portable rumble strip for temporary stop line. Remove temporary stop line when AFAD is no longer in use.
- Tubular markers along centerline placed in advance of AFAD to first sign are optional, unless the DO NOT PASS sign is used.
- Include "WAIT FOR FLAGGER" (CR4-23) signs mounted on Type II Barricade located approx. 50' before each Flagger Station.
- Coordinate and control pedestrians movements through the TPAR using flaggers, other TCM, or as directed. When the existing shoulder is greater than or equal to 4' wide, provide a minimum of 4' of width for the TPAR.
- When using pilot cars with flaggers to control traffic during paving operations, the Tubular Marker spacing along centerline may be increased to 200' within the Activity Area, as shown or as directed.
- To be accompanied by Dwg. Nos. TM820 & TM821.

L — Automated Flagger Assistance Device (AFAD)

• • • • — 28" Tubular Markers See TCD spacing table on TM800 for max. spacing

UNDER TRAFFIC

UNDER CONSTRUCTION



OVER-DIMENSIONAL VEHICLE ACCOMMODATION DETAIL

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All materials shall be in accordance with the current Oregon Standard Specifications.

OREGON STANDARD DRAWINGS

2-LANE, 2-WAY ROADWAYS

2024

DATE	REVISION DESCRIPTION
MM-YYYY	REVISION
07-2023	Minor drafting revision.
07-2025	Added notes for TPAR.
01-2026	Added cross section and notes.

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2026 | **TM854**

13-JAN-2026

TM854.dgn

Effective Date: June 1, 2026 - November 30, 2026