BIDDING PLANS

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
A01	*Title Sheet*
A02	*Index Of Sheets Cont'd. & Std. Dwg. Nos.*

Deschutes County Road Department

PLANS FOR PROPOSED PROJECT

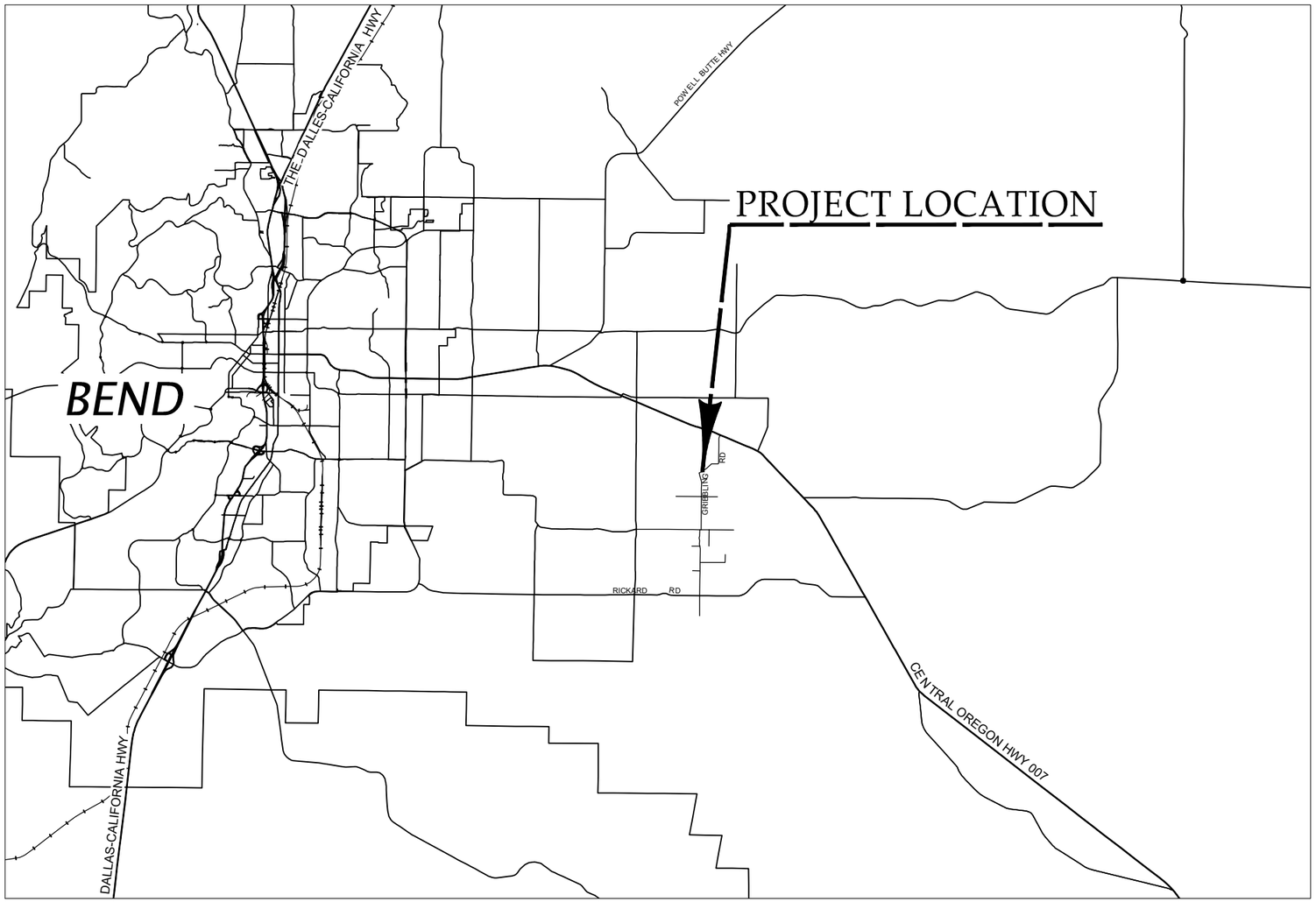
Structures, Grading, Paving & Drainage

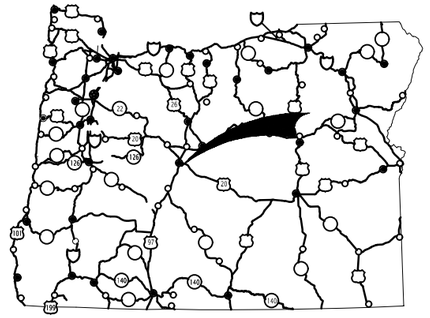
Gribbling Road Bridge #17C30 Replacement Project

Gribbling Road

Deschutes County

2023





Overall Length Of Project – 0.06 Miles

ATTENTION:
Oregon Law Requires You To Follow Rules Adopted By The Oregon Utility Notification Center. Those Rules Are Set Forth In OAR 952-001-0010 Through OAR 952-001-0090. You May Obtain Copies Of The Rules By Calling The Center. (Note: The Telephone Number For The Oregon Utility Center Is (503) 232-1987.)

N

SEC. 09, T. 18 S., R. 13 E., W.M.

COUNTY COMMISSION

ANTHONY DEBONE	COMMISSIONER
PHIL CHANG	COMMISSIONER
PATTI ADAIR	COMMISSIONER
CHRIS DOTY	DIRECTOR, ROADS DEPARTMENT

PLANS PREPARED FOR
Deschutes County Road Department

5121 Skyline Village Loop S., Suite 200
Salem Oregon 97306 Ph: 503.361.8635

These plans were developed using AASHTO design standards. Exceptions to these standards, if any, have been submitted and approved by the Deschutes County Road Department Director or their delegated authority.

PLANS PREPARED FOR
Deschutes County Road Department

Shon K. Heern 2023.08.01 11:18:51-07'00'

Signature & date

Shon Heern, P.E. – Project Manager

Print name and title

GRIBBLING ROAD BRIDGE
#17C30 REPLACEMENT PROJECT
DESCHUTES COUNTY

TITLE SHEET

SHEET NO. A01

BIDDING PLANS

INDEX OF SHEETS, CONT.	
SHEET NO.	DESCRIPTION
ROADWAY DETAILS	
BA01	Typical Sections
BB01	Details
ROADWAY CONSTRUCTION	
C01	General Construction
TRAFFIC CONTROL	
EA01	Traffic Control Details
EA02	Detour plan
BRIDGE	
Bridge Name - Structure No. 24286	
J01	Plan And Elevation
J02	General Notes And Typical Section
J03	Geotechnical Data
J04	Foundation Plan
J05	Prestressed Slab Details
J06	Bent Details
J07	Wingwall Details
J08	Miscellaneous Details

Standard Drg. Nos.

RD317	-Culvert Embankment Protection and Riprap Pads
RD402	-Midwest Guardrail System Types
RD403	-Midwest Guardrail System Wood Post and Block
RD406	-Placement of Guardrails on Slopes
RD407	-Midwest Guardrail System (W-Beam)
RD409	-Thrie Beam Guardrail
RD410	-Thrie Beam Guardrail Transition
RD415	-Guardrail and Metal Median Barrier Parts (29" Rail Height)
RD416	-Midwest Guardrail System Standard Hardware (Nuts, Bolts, Washers and Misc.)
RD417	-Midwest Guardrail System End Sections
RD419	-Midwest Guardrail Systems Grading for Terminals
RD420	-Midwest Guardrail System Non-Flared Energy-Absorbing Terminal
RD442	-Midwest Guardrail System Typical Layouts at Bridge Ends
RD451	-Wood Breakaway Posts
RD610	-Asphalt Concrete Pavement (ACP) Details
RD615	-Surface Edge Details
RD701	-Drainage Curbs
RD715	-Approaches and Non-Sidewalk Driveways
RD1030	-Sediment Barrier Type 2, 3, and 4
BR233	-Thrie-Beam Rail and Transition
BR410	-18" Precast Prestressed Slab
BR445	-Precast Prestressed Box and Slab Details
TM222	-Installation Details Milepost Marker Posts
TM670	-Wood Post Sign Supports
TM671	-3-Second Gust Wind Speed Map
TM800	-Tables, Abrupt Edge and PCMS Details
TM820	-Temporary Barricades
TM821	-Temporary Sign Supports
TM822	-Temporary Sign Supports
TM840	-Closure Details
TM841	-Intersection Work Zone Details
TM850	-2-Lane, 2-Way Roadways
TM855	-2-Lane, 2-Way Roadways

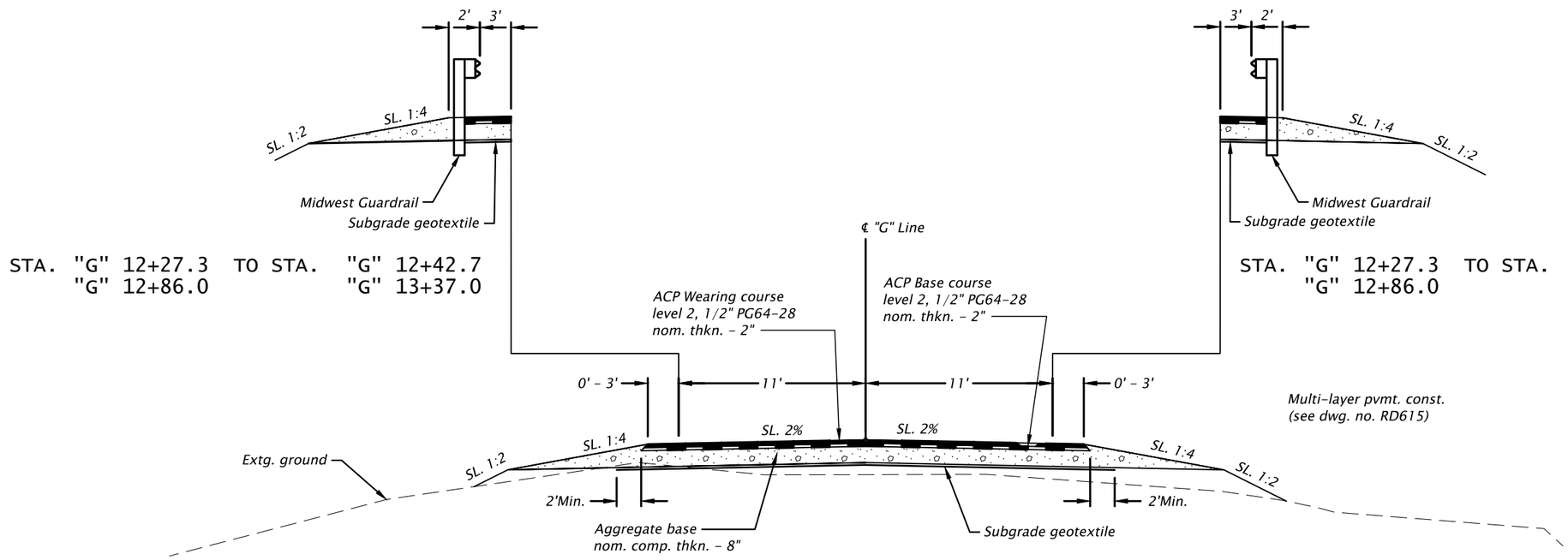
ABBREVIATIONS

ACP	Asphalt concrete pavement
Approx.	Approximate
Conc.	Concrete
Const.	Construct
CY	Cubic yards
Dia.	Diameter
Dwg.	Drawing
Dwy.	Driveway
El.	Elevation
Emb.	Embankment fill
Ease	Easement
Exc.	Excavation
Extg.	Existing
FL	Flow line
Horiz.	Horizontal
Inst.	Install
Lt. / Rt.	Left / Right
Max.	Maximum
Min.	Minimum
No. / Nos.	Number(s)
Nom.	Nominal
OD	Outside diameter
Pvmt.	Pavement
Ref.	Reference
R/W	Right of Way
Sl.	Slope
SF	Square feet
Shldr.	Shoulder
Sht.	Sheet
Sta.	Station
Std.	Standard
TCD	Traffic Control Devices
TCM	Traffic Control Measures
Thkn.	Thickness
Typ.	Typical
Vert.	Vertical

GRIBBLING ROAD BRIDGE
#17C30 REPLACEMENT PROJECT
DESCHUTES COUNTY

INDEX, ABBREVIATIONS & STD. DRAWINGS | SHEET NO. A02

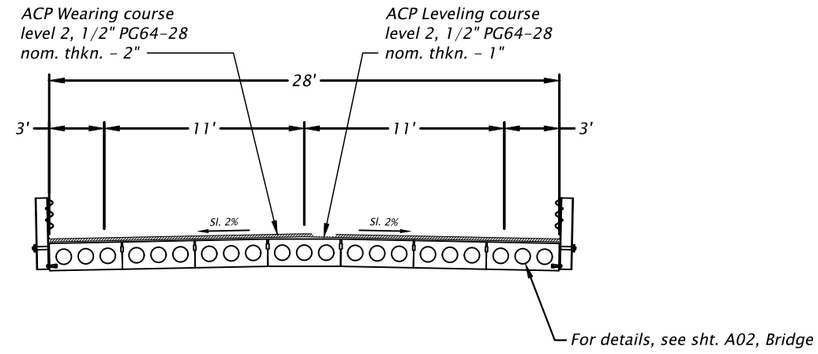
BIDDING PLANS



STA. "G" 12+27.3 TO STA. "G" 12+42.7
"G" 12+86.0 "G" 13+37.0

STA. "G" 12+27.3 TO STA. "G" 12+42.7
"G" 12+86.0 "G" 13+37.0

"G" 11+15.7 TO STA. "G" 12+27.3
"G" 13+37.0 "G" 14+15.7



"G" 12+42.7 TO STA. "G" 12+86.0

REGISTERED PROFESSIONAL ENGINEER
91702PE
DIGITALLY SIGNED 2023.07.28 09:59:40-07'00'
OREGON
JANUARY 10, 2017
TAISEI IMAMURA
RENEWS: 06-30-2023

DAVID EVANS AND ASSOCIATES INC.
5121 Skyline Village Loop S., Suite 200
Salem Oregon 97306
Phone: 503.361.8635

DESCHUTES COUNTY ROAD DEPARTMENT

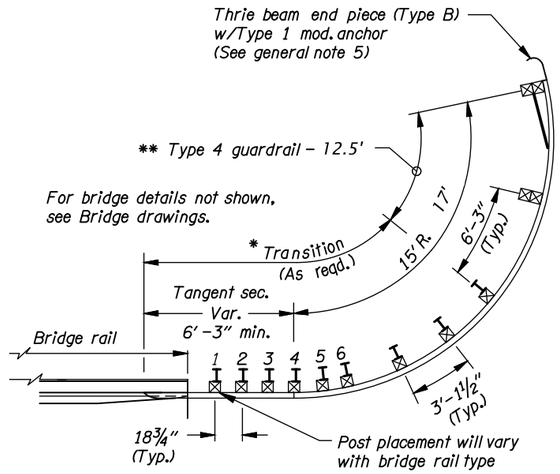
GRIBBLING RD. BRIDGE #17C30 REPLACEMENT PROJ.
GRIBBLING ROAD
DESCHUTES COUNTY

Designer: T. Imamura Reviewer: S. Heern
Drafter: C. Spielman Checker: L. Hunt

TYPICAL SECTIONS

SHEET NO. BA01

BIDDING PLANS



6'-3" OF TRANSITION IN TANGENT
15' RADIUS

GENERAL NOTES FOR ALL DETAILS:

1. For transition details, see appropriate bridge standard drawings. Eliminate thrie beam to W-beam rail element when type 4 rail is used.

2. Place radius identification plate (For details, see drg. no. RD415).

3. Shop fabricate all radius rail to dimensions shown (14'-9" radius is min. allowable for thrie beam rail).

4. Rail elements:
   * Thrie beam rail:
     2 - 12 gauge rail elements
   ** Thrie beam rail:
     1 - 12 gauge rail element

5. Anchor and end piece shown are to be used only for private driveways/approach roads. An approved end treatment is required on public roadways.

REGISTERED PROFESSIONAL ENGINEER
91702PE
DIGITALLY SIGNED 2023.07.28 09:59:21-07'00'
OREGON
JANUARY 10, 2017
TAISEI IMAMURA
RENEWS: 06-30-2023

DAVID EVANS AND ASSOCIATES INC.
5121 Skyline Village Loop S., Suite 200
Salem Oregon 97306
Phone: 503.361.8635

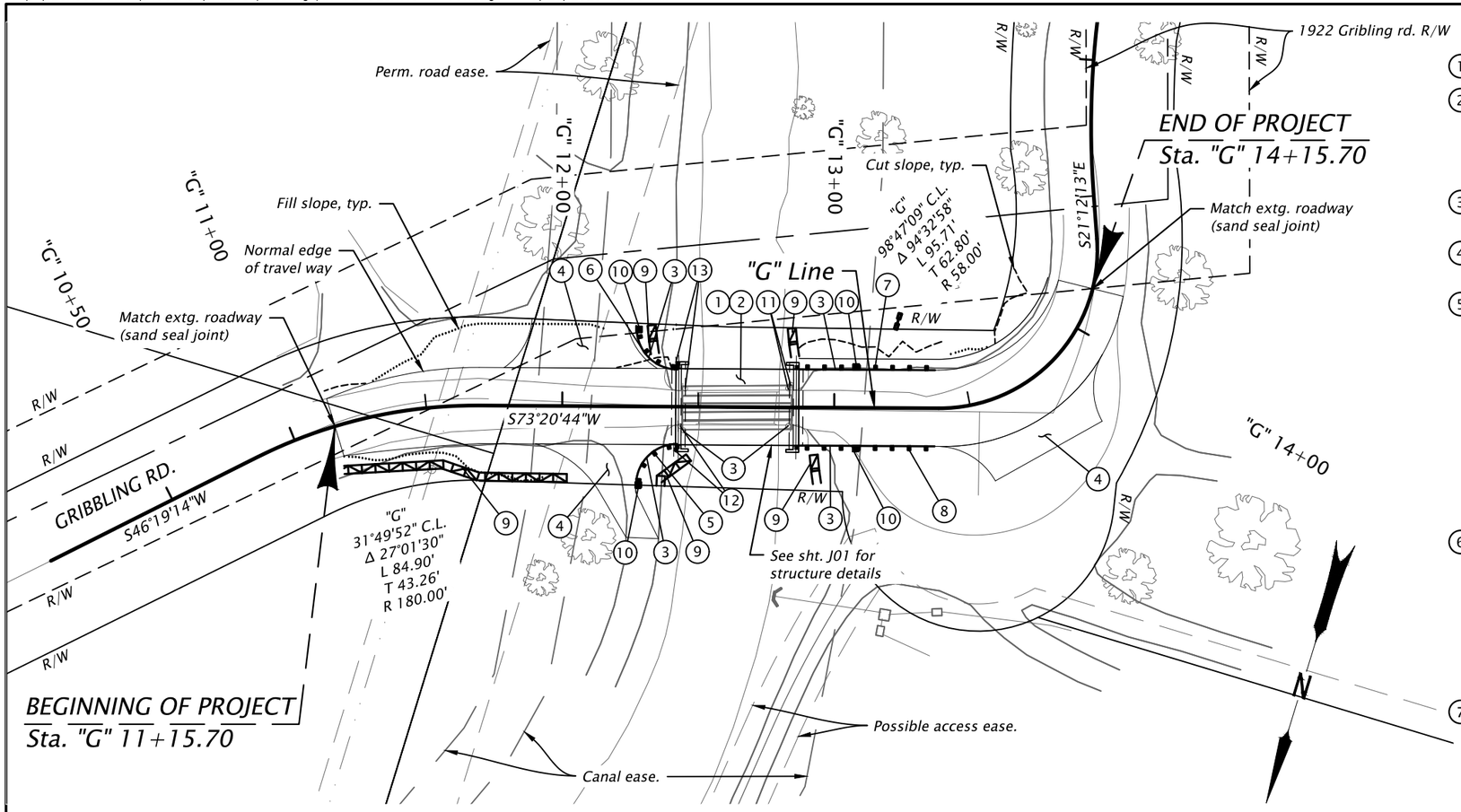
DESCHUTES COUNTY ROAD DEPARTMENT

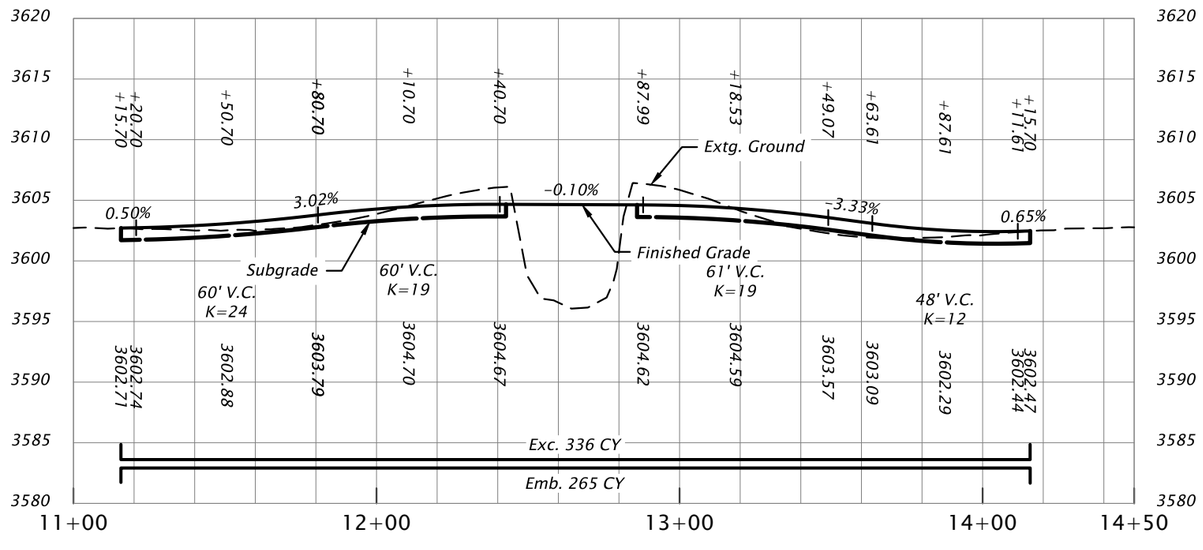
GRIBBLING RD. BRIDGE
#17C30 REPLACEMENT PROJ.
GRIBBLING ROAD
DESCHUTES COUNTY

Designer: T. Imamura	Reviewer: S. Heern
Drafter: C. Spielman	Checker: L. Hunt

DETAILS SHEET NO. BB01

BIDDING PLANS





1. Remove extg. Bridge No. 17C30

2. Structure no. 24286
   Const. structure - 43.25'
   Rdwy. width - 28'
   (For sht. nos., see sht. A02, Bridge)

3. Const. asph. drainage curb- 80'
   (See dwg no. RD701 for details)

4. Const. ACP approach - 5
   (See dwg. no. RD715 for details)

5. Sta. "G" 12+27.3 to Sta. "G" 12+41.8, Rt.
   Remove extg. guardrail - 12.5'
   Const. guardrail - 12.5' (Type 4)
   Rad. = 15'
   Const. type 1 mod. anchor
   Inst. type B end piece
   Const. guardrail to bridge rail transition
   (For details, see sht. BB01)
   (See dwg. nos. BR233, RD402, RD403, RD406, RD407, RD409, RD410, RD416, RD417, RD419, RD442 & RD451)

6. Sta. "G" 12+27.3 to Sta. "G" 12+41.8, Lt.
   Remove extg. guardrail - 12.5'
   Const. guardrail - 12.5' (Type 4)
   Rad. = 15'
   Const. type 1 mod. anchor
   Inst. type B end piece
   Const. guardrail to bridge rail transition
   (For details, see sht. BB01)

7. Sta. "G" 12+87.0 to Sta. "G" 13+31.0, Lt.
   Const. guardrail to bridge rail transition
   W=0, E=0
   Const. guardrail terminal, non-flared
   Test level 2
   (See dwg. nos. BR233 & RD420)

8. Sta. "G" 12+87.0 to Sta. "G" 13+31.0, Rt.
   Const. guardrail to bridge rail transition
   W=0, E=0
   Const. guardrail terminal, non-flared
   Test level 2

9. Inst. sediment barrier, type 3 - 132'
   (See dwg. no. RD1030 for details)

10. Const. riprap pad- 2
    4' length by 4' width
    (See dwg. no. RD317)

11. Remove sign and sign post

12. Remove and save extg. OM-3R object marker
    Remove extg. object marker post
    Reinstall OM-3R object marker on new milepost marker post in front of bridge end, behind guardrail
    (See dwg. no. TM222)

13. Remove and save extg. OM-3R object marker
    Remove extg. object marker post
    Reinstall OM-3R object marker on new milepost marker post in front of bridge end, behind guardrail

General Notes:

1. Seed disturbed areas as directed by the engineer.
2. Maintain access to driveways at all times.

REGISTERED PROFESSIONAL ENGINEER
91702PE
DIGITALLY SIGNED 2023.07.28 09:58:46-07'00'
OREGON
JANUARY 10, 2017
TAISEI IMAMURA
RENEWS: 06-30-2023

DAVID EVANS AND ASSOCIATES INC.
5121 Skyline Village Loop S., Suite 200
Salem Oregon 97306
Phone: 503.361.8635

DESCHUTES COUNTY ROAD DEPARTMENT

GRIBBLING RD. BRIDGE #17C30 REPLACEMENT PROJ.

GRIBBLING ROAD
DESCHUTES COUNTY

Designer: T. Imamura
Drafter: C. Spielman
Reviewer: S. Heern
Checker: L. Hunt

GENERAL CONSTRUCTION

SHEET NO. C01

BIDDING PLANS

5'-0" x 2'-0"

36x36
W20-3
(1)

5'-0" x 2'-0"

36x36
W20-2
(2)

5'-0" x 2'-0"

30x24
M4-9R
(3)

5'-0" x 2'-0"
Custom

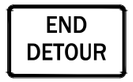
30x24
M4-9L
(4)

5'-0" x 2'-0"
Custom

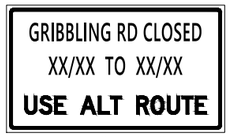
30x36
CG20-6
(5)

6'-0" x 3'-6"
Custom
(6)

6'-0" x 3'-6"
Custom
(7)



30x24
CG20-5
(8)



6'-0" x 3'-6"
Custom
(See note 4, sht. EA02)
(9)

48x30
R11-2
(Mount on Type-3 Barricade)
(10)

To Be Accompanied by Standard Dwg. Nos.
TM670, TM671, TM800, TM820, TM821, TM822,
TM840, TM841, TM850 & TM855.

REGISTERED PROFESSIONAL ENGINEER
91702PE
DIGITALLY SIGNED 2023.07.28 09:58:13-07'00'
OREGON
JANUARY 10, 2017
TAISEI IMAMURA

RENEWS: 06-30-2023

DAVID EVANS AND ASSOCIATES INC.
5121 Skyline Village Loop S., Suite 200
Salem Oregon 97306
Phone: 503.361.8635

DESCHUTES COUNTY ROAD DEPARTMENT

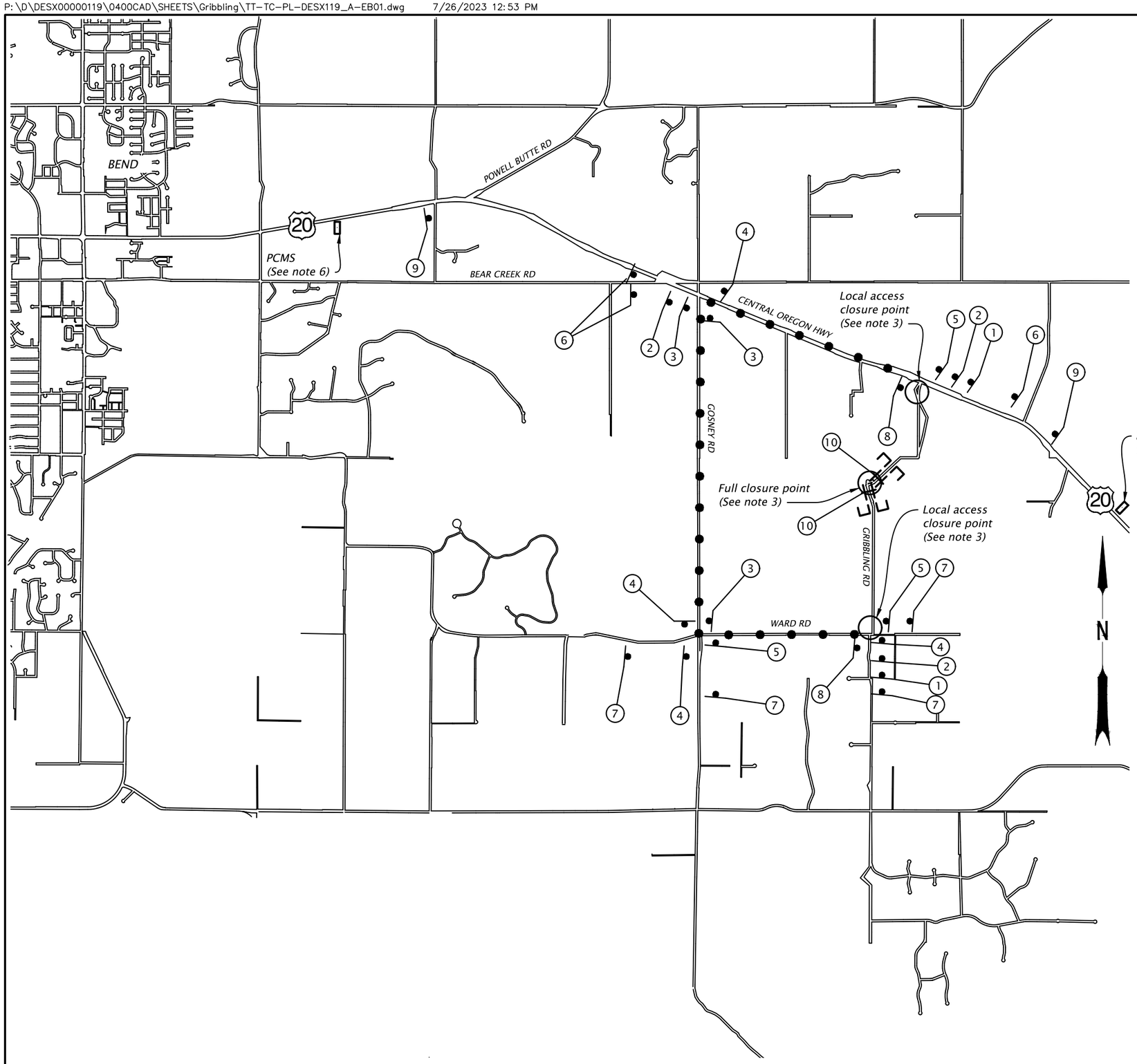
GRIBBLING RD. BRIDGE #17C30 REPLACEMENT PROJ.
GRIBBLING ROAD
DESCHUTES COUNTY

Designer: T. Imamura
Reviewer: S. Heern
Drafter: C. Spielman
Checker: L. Hunt

TRAFFIC CONTROL DETAILS

SHEET NO.
EA01

BIDDING PLANS



DETOUR PLAN NOTES

1. *Traffic control devices (TCD) spacing not shown on the detour plan shall follow the "TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE" on std. dwg. TM800.*
2. *Signs and other TCD shown are min. reqd. Adjustment of temp TCD may be reqd. to accomodate extg. field conditions. Addl Traffic Control Measures (TCM) may be reqd.*
3. *For closure TCD and signing, see dwg. no. TM840.*
4. *Inst. Sign No. 9 as advance warning sign a min. of 2 weeks prior to closure. Place as directed by the engineer.*
5. *Contractor to obtain appropriate permits from the Oregon Department Of Transportation for temporary traffic control devices in state highway right-of-way.*
6. *Place PCMS boards as directed by the engineer. (See TM800 for details)*

LEGEND

- *Detour Route*
- *Detour Route Sign*
- *2-8' B(III) LR Barricades & TSS*
- *Portable changeable message sign*

GRIBB LING RD CLOSED	USE DETOUR

PORTABLE CHANGEABLE MESSAGE SIGN

(Suggested Message)
(Locate As Directed)

REGISTERED PROFESSIONAL ENGINEER
91702PE
DIGITALLY SIGNED 2023.07.28 09:57:13-07'00'
OREGON
JANUARY 10, 2017
TAISEI IMAMURA
RENEWS: 06-30-2023

DAVID EVANS AND ASSOCIATES INC.
5121 Skyline Village Loop S., Suite 200
Salem Oregon 97306
Phone: 503.361.8635

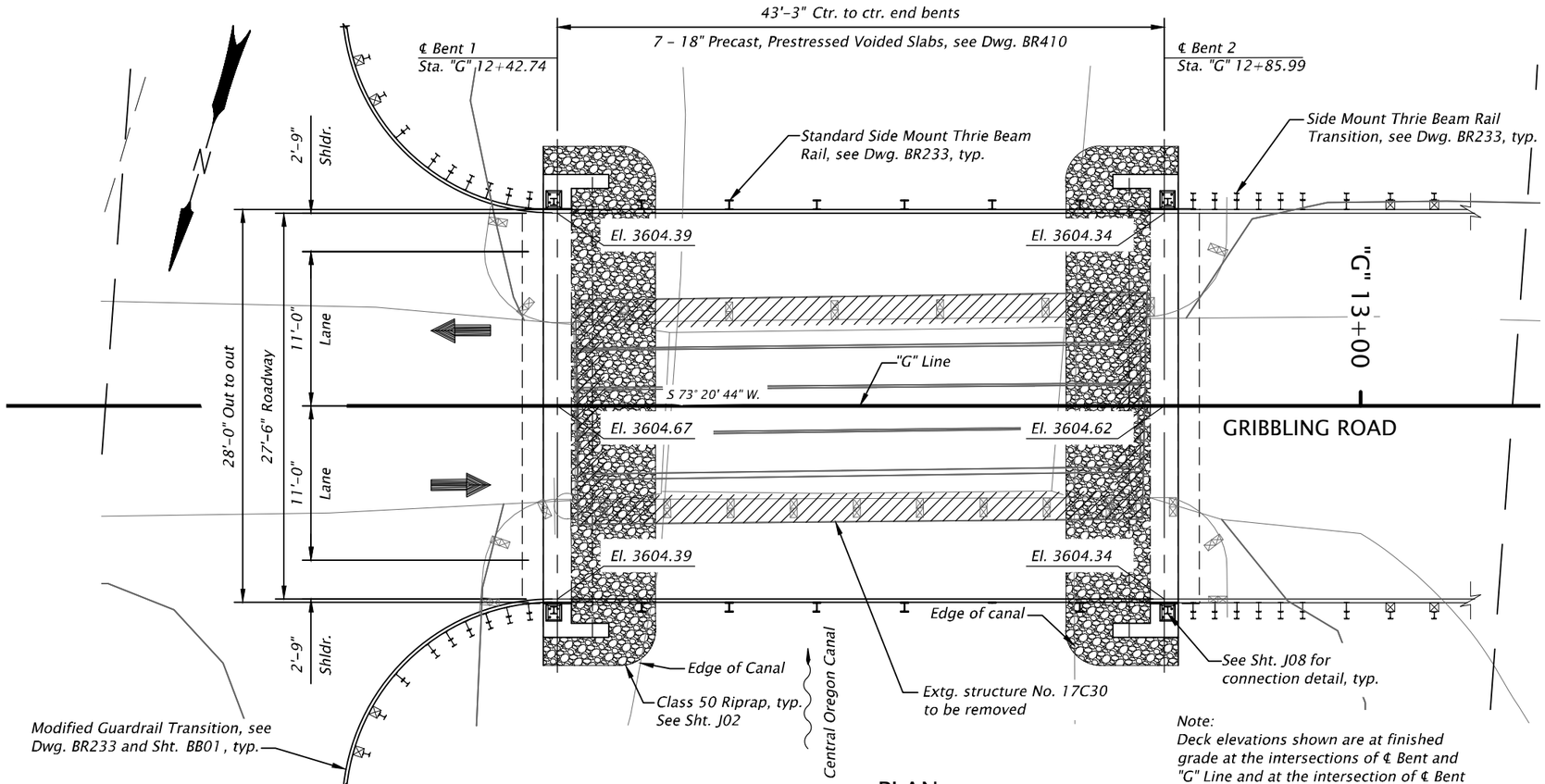
DESCHUTES COUNTY ROAD DEPARTMENT

GRIBBLING RD. BRIDGE #17C30 REPLACEMENT PROJ.
GRIBBLING ROAD
DESCHUTES COUNTY

Designer: T. Imamura	Reviewer: S. Heern
Drafter: C. Spielman	Checker: L. Hunt

DETOUR PLAN — SHEET NO. EA02

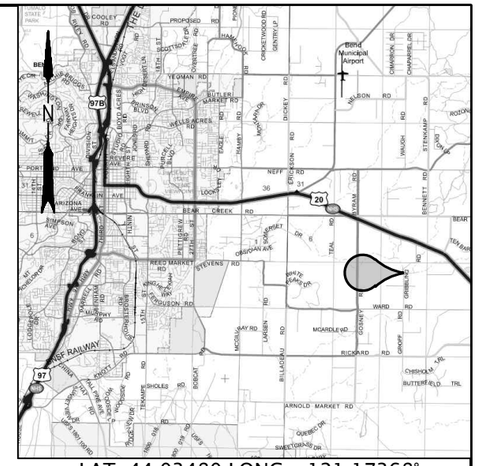
BIDDING PLANS



PLAN

Scale: 1" = 10'-0"

Note:
Deck elevations shown are at finished grade at the intersections of ℄ Bent and "G" Line and at the intersection of ℄ Bent and an offset of 14'-0" left and right

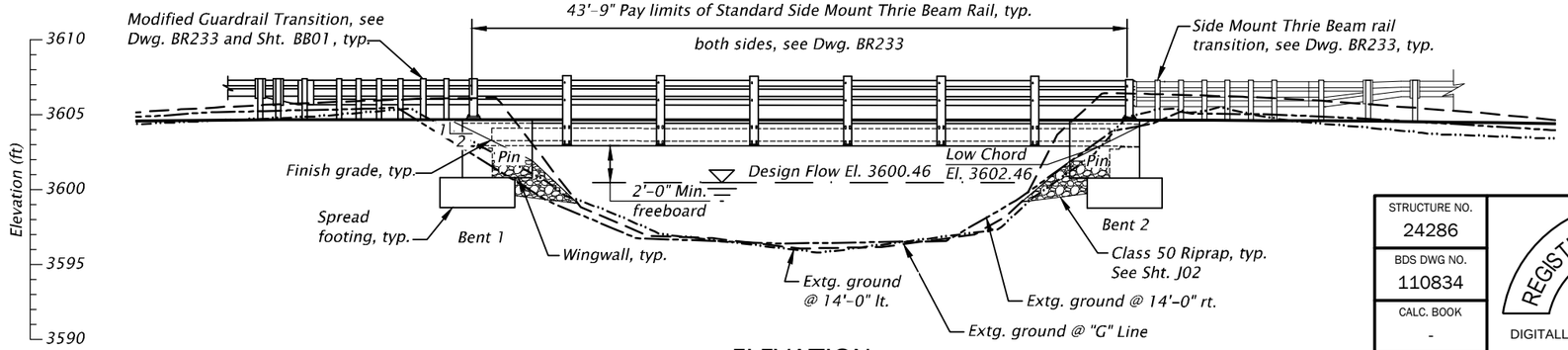


LAT. 44.03480 LONG. -121.17368°
SEC. 09, T. 18 S., R. 1 E., W.M.

LOCATION MAP

No Scale

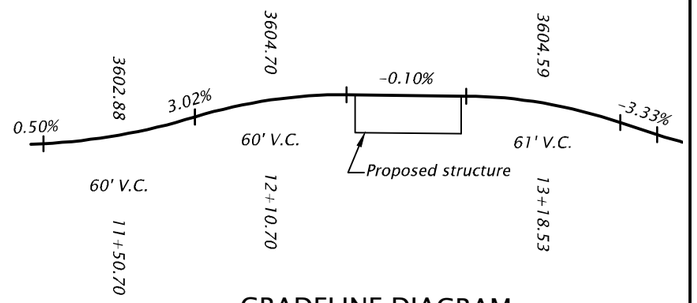
HYDRAULIC DATA		
ITEMS	UNITS	DESIGN FLOW
DISCHARGE	$ft.^3/s$	500
HIGH WATER ELEVATION AT UPSTREAM FACE OF BRIDGE ALONG EMBANKMENT	feet	3600.46
BACKWATER	feet	0.0
SCOUR DEPTH	feet	0.1



ELEVATION

Scale: 1" = 10'-0"

Note:
Elevations shown are based on North American Vertical Datum (NAVD88).



GRADELINE DIAGRAM

ACCOMPANIED BY DWGS.:
J02 -J08 , BR233, BR410 and BR445

SCALE WARNING
IF THIS SCALE LINE DOES NOT MEASURE ONE INCH, THEN DRAWING IS NOT TO SCALE

STRUCTURE NO. 24286
BDS DWG NO. 110834
CALC. BOOK -
HWY: 318401
M.P.: 0.99
COUNTY DESCHUTES
DATE 07/2023

REGISTERED PROFESSIONAL ENGINEER
94489PE
DIGITALLY SIGNED 2023.07.27 08:59:10-07'00'
OREGON
NOVEMBER 9, 2021
ANTONIO MITITIERO
RENEWS: 12-31-2024
FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

DAVID EVANS AND ASSOCIATES INC.
5121 Skyline Village Loop S., Suite 200
Salem Oregon 97306
Phone: 503.361.8635

DESCHUTES COUNTY ROAD DEPARTMENT

COI Canal_Gribbling Rd_44.03480/-121.17368

GRIBBLING RD. BRIDGE #17C30 REPLACEMENT PROJ.

GRIBBLING ROAD
DESCHUTES COUNTY

Designer: Antonio Mititiero
Drafter: Dustin Altenburg
Reviewer: Amanda Blankenship
Checker: Brett Karnes

PLAN AND ELEVATION

SHEET NO. J01

BIDDING PLANS

GENERAL NOTES

Provide all materials and perform all work according to the "Oregon Standard Specifications for Construction 2021".

Bridge is designed in accordance with the 2020 edition of the "AASHTO LRFD Bridge Design Specifications (including interim revisions)" and the October 2022 edition of the "ODOT Bridge Design Manual", with an allowance of 50 psf for present wearing surface and 40 psf for future wearing surface and all of the following Live Loads:

Service and Strength-I Limit States:
HL-93: Design truck (or trucks per LRFD 3.6.1.3) or the design tandem and the design lane load.

Strength-II Limit State:
ODOT Type STP-5BW Permit truck
ODOT Type STP-4E Permit truck

Seismic design is performed in accordance with the "AASHTO Guide Specifications for LRFD Seismic Bridge Design" as modified by the May 2021 edition of the "ODOT Bridge Design Manual". The Horizontal Peak Ground Acceleration Coefficient (PGA) for 1000-year return (Life Safety) is 0.11g based on 2014 USGS Seismic Hazard Maps. The bridge site is defined as a Site Class B with Site Factor (Fpga) of 0.90.

Provide all reinforcing steel according to ASTM Specification A706, or AASHTO 31 (ASTM A615) Grade 60. Provide field bent bars according to ASTM Specification A706. Use the following splice lengths (unless shown otherwise).

Reinforcing Splice Lengths (Class B) Grade 60 f'c = 4.0 ksi, λ_{rc} = 0.4, 2" min. cl. cover											
Bar Size	#3	#4	#5	#6	#7	#8	#9	#10	#11	#14	#18
Uncoated	1'-4"	1'-7"	2'-0"	2'-5"	2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	Not Permitted	

Increase all splice lengths 30% for horizontal or nearly horizontal bars so placed that more than 12" of fresh concrete is cast below the bar.

Splice reinforcing steel at alternate bars, staggered at least one splice length or as far as possible, unless shown otherwise.

All reinforcing shall have 2" of concrete cover unless shown otherwise.

All reinforcing spacing is intended to be maximum unless shown otherwise.

Provide concrete and prestressing steel in precast prestressed units according to detail plans.

Provide a ¾" chamfer on all exposed concrete edges unless noted otherwise.

Provide Class 4000 - 1½", 1", or ¾" concrete for all concrete.

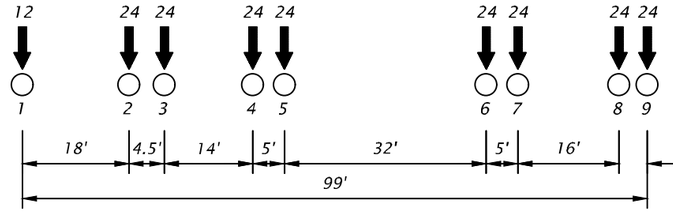
See Foundation Plan for Foundation Design Notes.

Contractor to field verify all dimensions and elevations prior to beginning work.

Remove entire existing bridge substructure to a minimum of 3'-0" below existing ground.

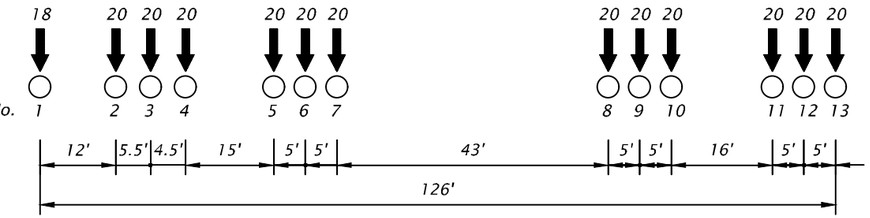
TYPE 0R-STP-5BW

9 Axle Vehicle
Gross Weight = 204K



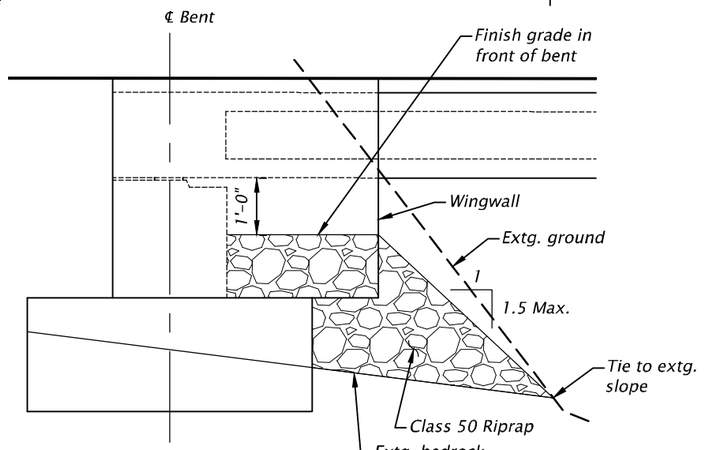
TYPE 0R-STP-4E

13 Axle Vehicle
Gross Weight = 258K



PERMIT TRUCK DIAGRAMS

No Scale

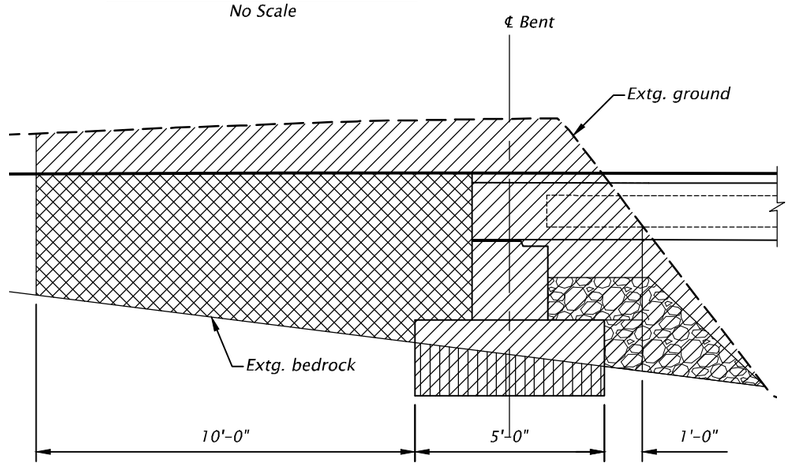


Notes:
Wrap Class 50 Riprap around wingwalls at corners of bridge, to back of wingwall.

Field verify bedrock before placing riprap.
Riprap need not be placed below existing rock.

RIPRAP DETAILS

No Scale



Note:
Granular Structural Backfill need not be placed below existing rock.

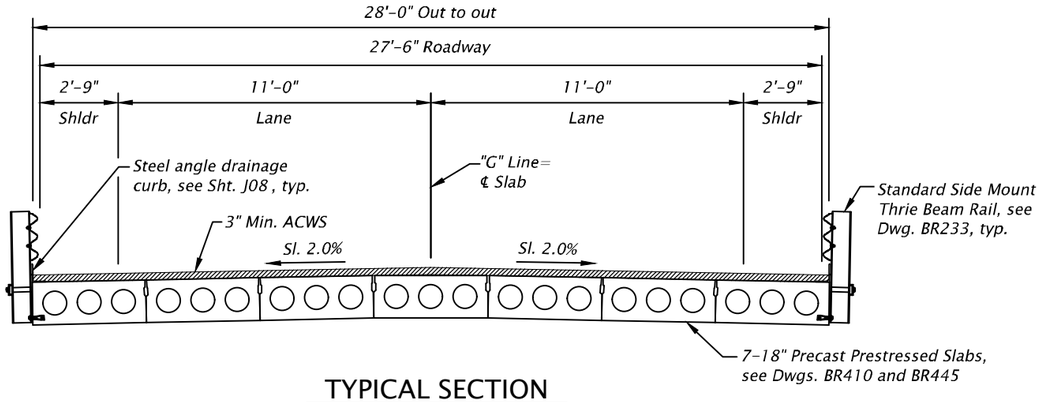
EXCAVATION/BACKFILL DIAGRAM

No Scale

Pay limits of Structural Excavation (Granular)

Pay limits of Structural Excavation (Rock)

Pay limits of Granular Structural Backfill



TYPICAL SECTION

Scale: 3/16" = 1'-0"

SCALE WARNING
IF THIS SCALE LINE DOES NOT MEASURE ONE INCH, THEN DRAWING IS NOT TO SCALE

STRUCTURE NO.	24286
BDS DWG NO.	1108345
CALC. BOOK	-
HWY: 318401 M.P.: 0.99	
COUNTY	DESCHUTES
DATE	07/2023

REGISTERED PROFESSIONAL ENGINEER
94489PE
DIGITALLY SIGNED 2023.07.27 08:59:34-07'00'
OREGON
NOVEMBER 9, 2021
ANTONIO MITITIERO
RENEWS: 12-31-2024
FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

DAVID EVANS AND ASSOCIATES INC.
5121 Skyline Village Loop S., Suite 200
Salem Oregon 97306
Phone: 503.361.8635

DESCHUTES COUNTY ROAD DEPARTMENT

COI Canal_Gribbling Rd_44.03480/-121.17368

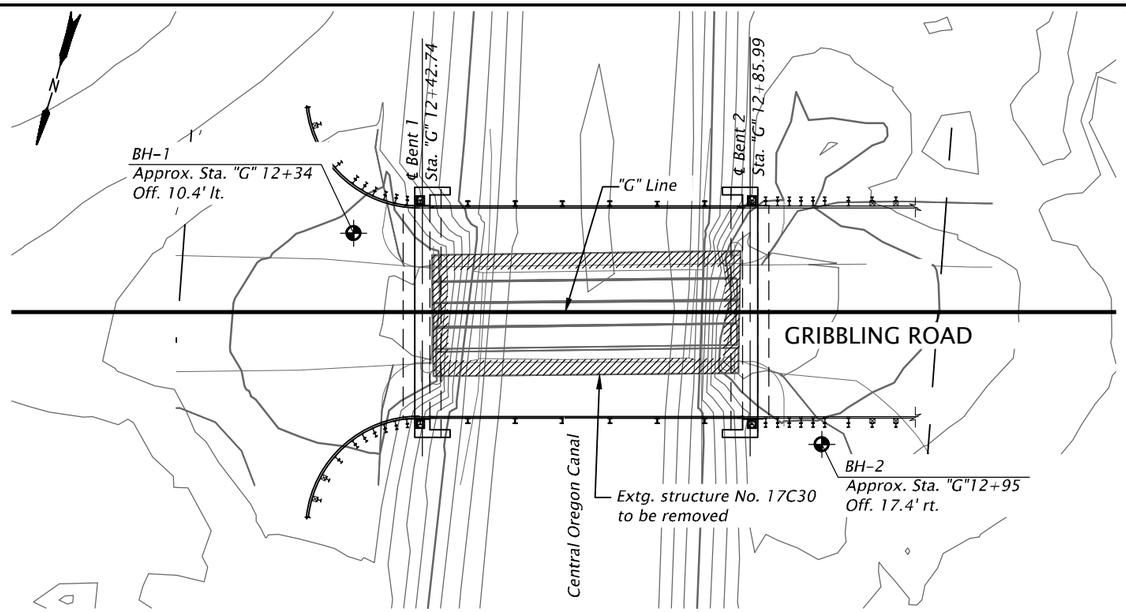
GRIBBLING RD. BRIDGE #17C30 REPLACEMENT PROJ.
GRIBBLING ROAD
DESCHUTES COUNTY

Designer: Antonio Mititiero
Drafter: Dustin Altenburg
Reviewer: Amanda Blankenship
Checker: Brett Karnes

GENERAL NOTES AND TYPICAL SECTION

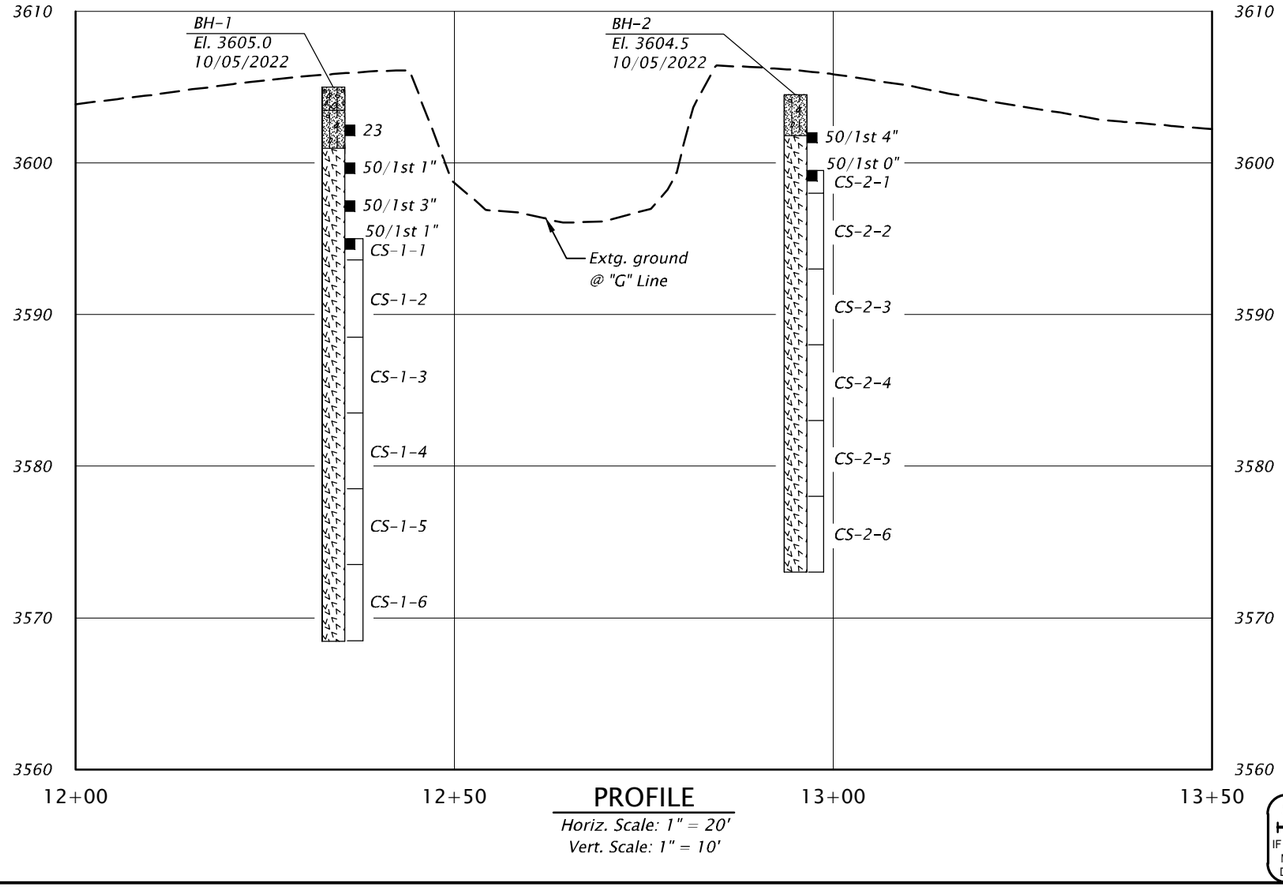
SHEET NO. J02

BIDDING PLANS



PLAN

Scale: 1" = 20'



PROFILE

Horiz. Scale: 1" = 20'

Vert. Scale: 1" = 10'

UNIT DESCRIPTIONS

Silty GRAVEL (GM); grey, non-plastic silt, dry, loose to medium dense, ±¾-inch minus angular basaltic rock, (fill).

Silty SAND, some gravel, scattered cobbles (SM); brown, non-plastic silt, dry to damp, loose to medium dense, fine sand, fine to coarse subgranular basaltic gravel, cobbles up to ±10-inch diameter, (fill).

BASALT; dark grey, slightly weathered to fresh, very soft to hard (R1 to R4), close to moderately close joints are planar to irregular, very rough to rough and open to closed, some vesicles to highly vesicular, (Basalt of Newberry volcano).

LEGEND

24 / N-Value	=	Standard Penetration Test (SPT)
50/1st #	=	SPT Test Refusal Length
⊕	=	Geotechnical Test Boring (BH)
CS-1-1	=	Core Sample Interval
RQD	=	Rock Quality Designation
% Rec	=	Percent Core Sample Recovery
q_u	=	Unconfined Compressive strength

GENERAL NOTES

1. *Elevations are based on North American Vertical Datum 1988 (NAVD88).*
2. *1' Contour Interval.*
3. *Geotechnical data shown on this drawing are a consolidation of information and/or revision in terminology from the drill logs. The drill logs used in compiling this drawing are available upon request. Contractor shall refer to geotechnical reports and drill logs and information therein.*
4. *In accordance with ASTM D1586-84, N-values are reported for an interval of 1 ft. except as noted.*
5. *Refer to the ODOT Soil and Rock Classification Manual (1987) for a description of the terms used on this sheet.*
6. *Borings were sampled with a hammer efficiency of 85.5%.*

TEST BORING	CORE RUN	% REC	HARDNESS	RQD	q_u (psi)
BH-1	CS-1-1	83	R3	83	6,429
	CS-1-2	98	R3 to R4	86	
	CS-1-3	99	R3 to R4	81	
	CS-1-4	100	R3 to R4	68	11,102
	CS-1-5	100	R3 to R4	30	
	CS-1-6	100	R3 to R4	80	
BH-2	CS-2-1	100	R2 to R3	80	3,830
	CS-2-2	100	R2 to R3	100	
	CS-2-3	100	R2 to R3	99	4,856
	CS-2-4	100	R3 to R4	85	8,095
	CS-2-5	100	R3 to R4	100	
	CS-2-6	100	R3 to R4	92	

SCALE WARNING

IF THIS SCALE LINE DOES NOT MEASURE ONE INCH, THEN DRAWING IS NOT TO SCALE

STRUCTURE NO.	24286
BDS DWG NO.	110836
CALC. BOOK	-
HWY: 318401 M.P.: 0.99	
COUNTY	DESCHUTES
DATE	07/2023

REGISTERED PROFESSIONAL ENGINEER
60776PE
William L Nickels Jr
Digitally signed by William L Nickels Jr
Date: 2023.07.28 11:53:20 -07'00'
OREGON
MAY 17, 1999
WILLIAM L. NICKELS JR.
RENEWS: 12-31-2024

FOUNDATION ENGINEERING, INC.
PROFESSIONAL GEOTECHNICAL SERVICES
820 N.W. CORNELL AVENUE
CORVALLIS, OREGON 97330
BUS. (541) 757-7640 FAX (541) 757-7650

DESCHUTES COUNTY ROAD DEPARTMENT

COI Canal_Gribbling Rd_44.03480/-121.17368

GRIBBLING RD. BRIDGE
#17C30 REPLACEMENT PROJ.
GRIBBLING ROAD
DESCHUTES COUNTY

Designer: William Nickels, Jr. Reviewer: Mallory McAdams

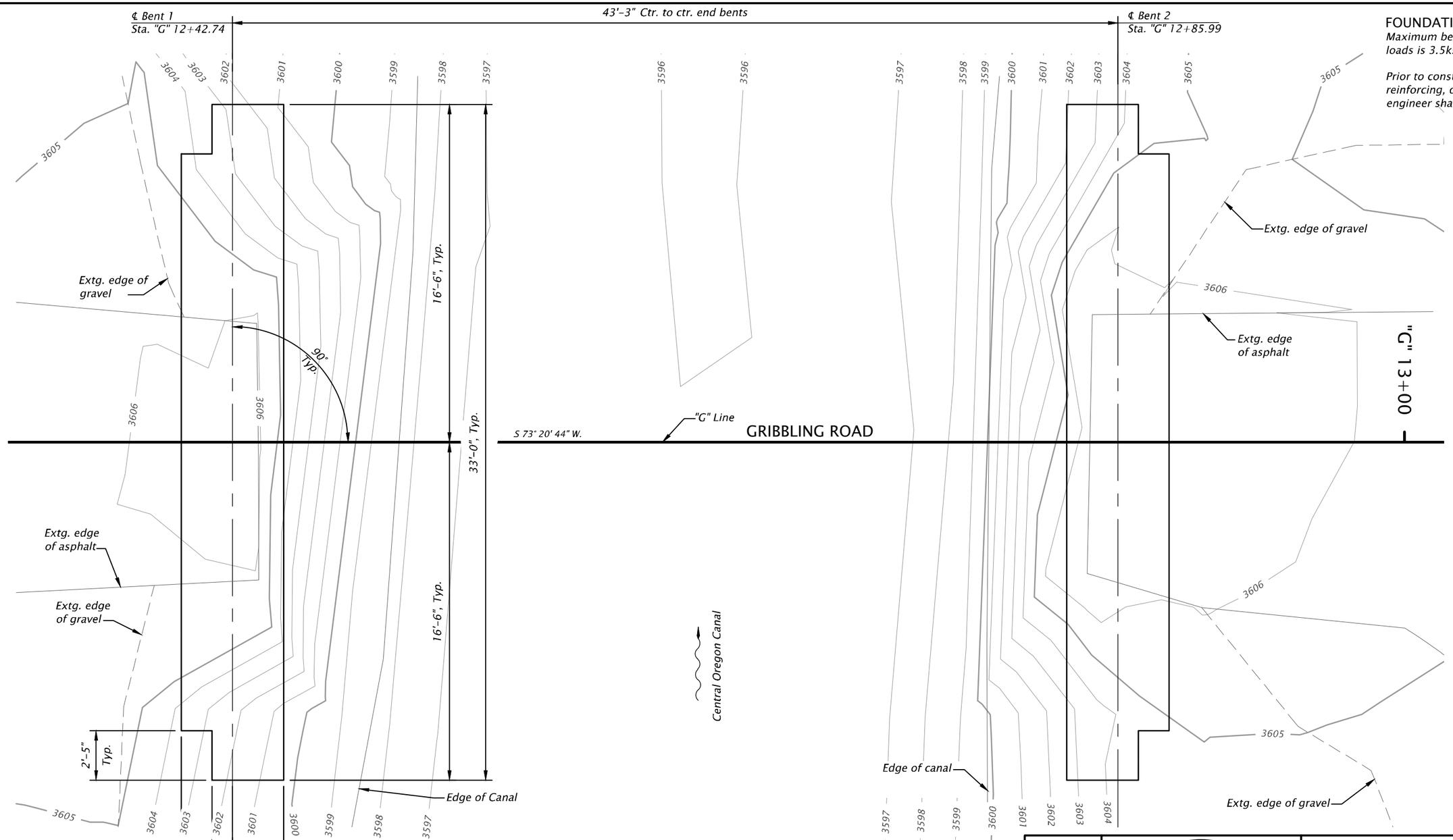
Drafter: Dustin Altenburg Checker: Brooke Running

GEOTECHNICAL DATA

SHEET NO. J03

FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

BIDDING PLANS



PLAN

Scale: 1" = 5'-0"

FOUNDATION DESIGN NOTES:

Maximum bearing pressure demand for service loads is 3.5ksf at bottom of spread footing.

Prior to constructing footing forms, placing reinforcing, or pouring concrete, geotechnical engineer shall field verify bearing conditions.

SCALE WARNING

IF THIS SCALE LINE DOES NOT MEASURE ONE INCH, THEN DRAWING IS NOT TO SCALE

STRUCTURE NO.	24286
BDS DWG NO.	110837
CALC. BOOK	-
HWY: 318401 M.P.: 0.99	
COUNTY	DESCHUTES
DATE	07/2023

REGISTERED PROFESSIONAL ENGINEER
94489PE
DIGITALLY SIGNED 2023.07.27 09:02:29-07'00'
OREGON
NOVEMBER 9, 2021
ANTONIO MITITIERO

RENEWS: 12-31-2024

FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

DAVID EVANS AND ASSOCIATES INC.
5121 Skyline Village Loop S., Suite 200
Salem Oregon 97306
Phone: 503.361.8635

ROAD DEPARTMENT

COI Canal_Gribbling Rd_44.03480/-121.17368

GRIBBLING RD. BRIDGE #17C30 REPLACEMENT PROJ.

GRIBBLING ROAD
DESCHUTES COUNTY

Designer: Antonio Mititiero	Reviewer: Amanda Blankenship
Drafter: Dustin Altenburg	Checker: Brett Karnes

FOUNDATION PLAN — SHEET NO. J04

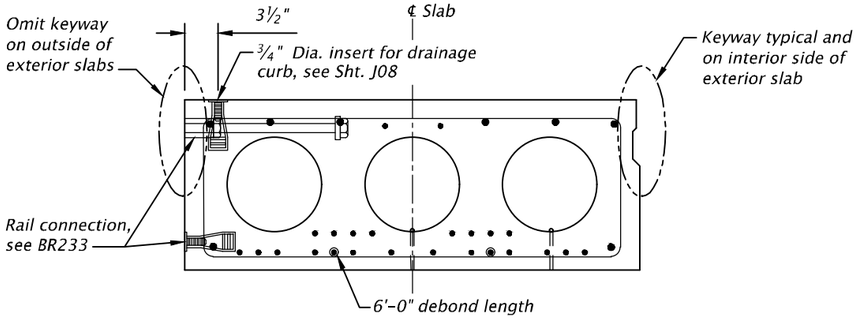
BIDDING PLANS

18" STANDARD PRECAST PRESTRESSED SLABS

No. Slabs Required	Span No.	Horizontal Length o-o at slab, ft. (after Shortening)	Skew Angle		Total Strand	Debonded Strands	Distance "Yc" to c.g. strand at midspan, in.	Distance "Yu" to c.g.s. at midspan subtracting top strand, in.	Concrete Strength @ 28 Days, ksi	Concrete Strength @ Release, ksi	Initial Tension per Strand, kips	Estimated Midspan Deflection			
			Back	Ahead								Upward at Transfer of Prestress	Upward 4 months after transfer of Prestress (No SIDL)	Downward Due to SIDL	Estimated Shortening 2 weeks after Transfer of Prestess
7	1	45.25	0	0	24	2	3.64	2.60	6.0	4.5	31	0.70"	1.58"	0.12"	0.10"

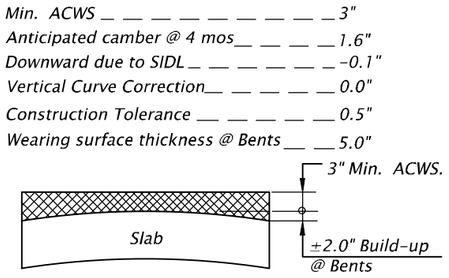
For General Notes and details not shown, see Dwgs. BR410 & BR445.

The superimposed dead load (SIDL) is 52 lbs./ft^2 which includes the present wearing surface and bridge rails.



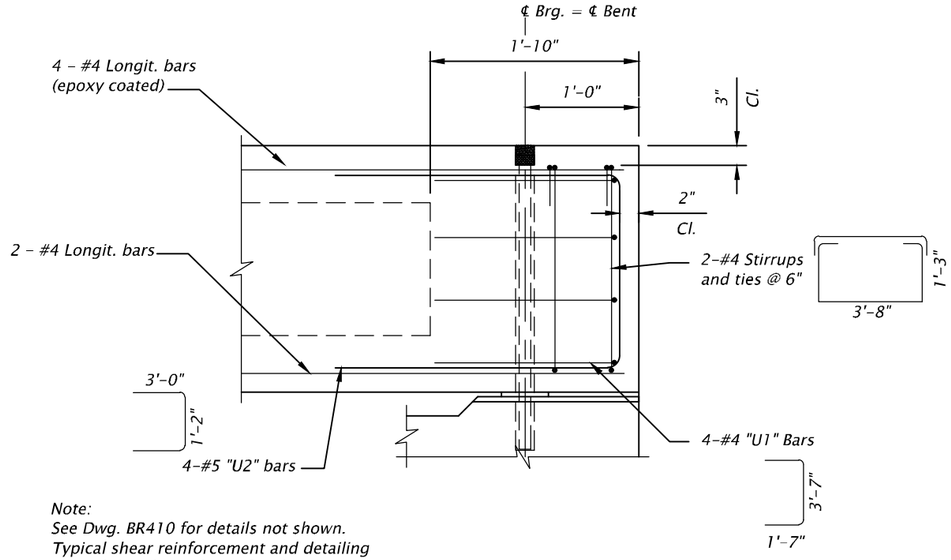
TYPICAL 18" SLAB SECTION

No Scale



ACWS BUILD-UP DETAIL

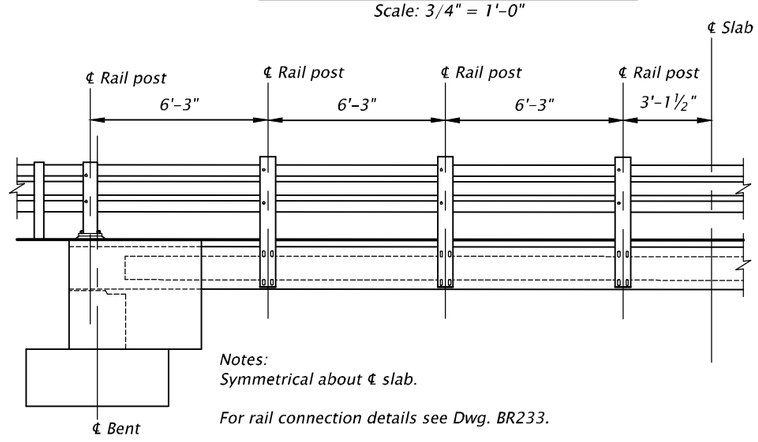
No Scale



Note:
See Dwg. BR410 for details not shown.
Typical shear reinforcement and detailing around dowel not shown for clarity.

MODIFIED END SLAB DETAIL

Scale: 3/4" = 1'-0"

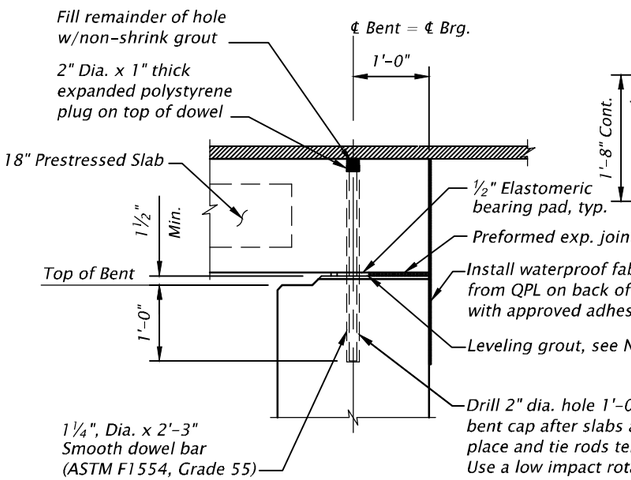


Notes:
Symmetrical about ℄ slab.

For rail connection details see Dwg. BR233.

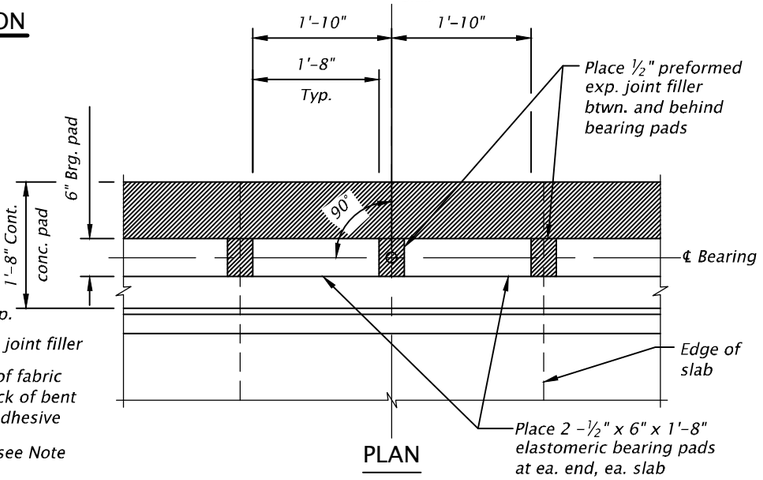
THRIE BEAM RAIL POST DETAIL

Scale: 3/16" = 1'-0"



CONCRETE PAD DETAIL

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



PLAN

BEARING DETAIL

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

Note:
Form 1½" concrete pad integrally with Bent. Allow concrete to cure 3 days or until concrete obtains design strength.
Place ½" grout layer immediately before placing slabs.
Place elastomeric bearing pads, preformed expansion joint filler and prestressed slabs before grout is set to ensure uniform bearing across full width of slab. If uniform bearing is not achieved, lift slab and repeat procedure.
Any excess grout protruding above bottom of bearing pads shall be removed immediately after placing slabs.

SCALE WARNING
IF THIS SCALE LINE DOES NOT MEASURE ONE INCH, THEN DRAWING IS NOT TO SCALE

STRUCTURE NO.	24286
BDS DWG NO.	110838
CALC. BOOK	-
HWY: 318401 M.P.: 0.99	
COUNTY	DESCHUTES
DATE	07/2023

REGISTERED PROFESSIONAL ENGINEER
94489PE
DIGITALLY SIGNED 2023.07.27 09:01:23-07'00'
OREGON
NOVEMBER 9, 2021
ANTONIO MITITIERO
RENEWS: 12-31-2024
FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

DAVID EVANS AND ASSOCIATES INC.
5121 Skyline Village Loop S., Suite 200
Salem Oregon 97306
Phone: 503.361.8635

ROAD DEPARTMENT

COI Canal_Gribbling Rd_44.03480/-121.17368

GRIBBLING RD. BRIDGE #17C30 REPLACEMENT PROJ.
GRIBBLING ROAD
DESCHUTES COUNTY

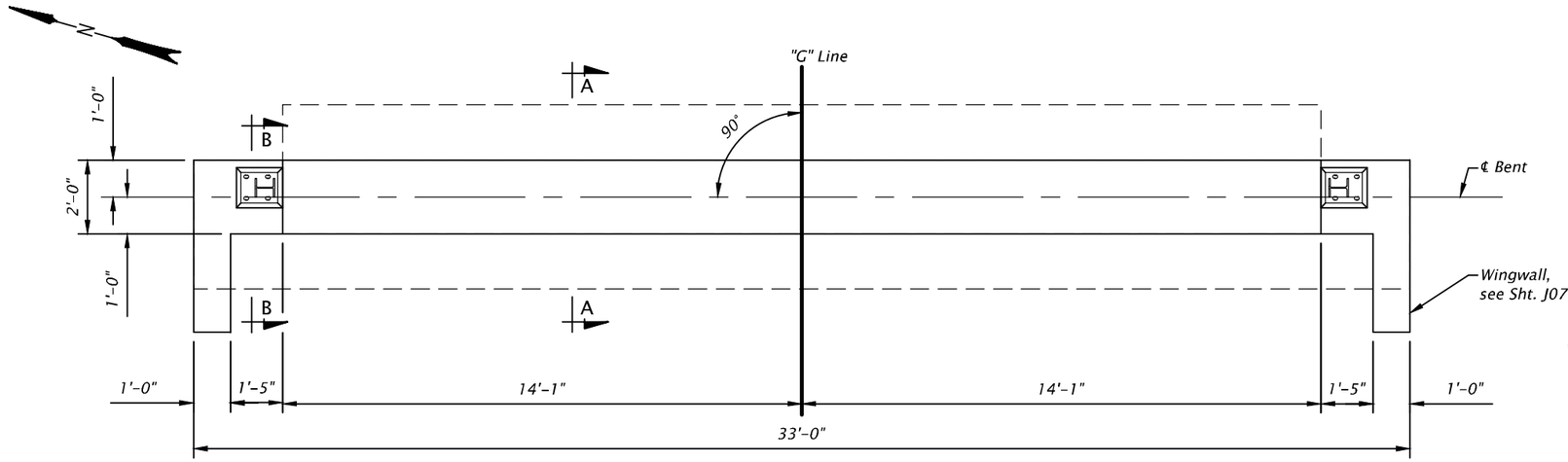
Designer: Antonio Mititiero
Drafter: Dustin Altenburg
Reviewer: Amanda Blankenship
Checker: Brett Karnes

PRESTRESSED SLAB DETAILS

SHEET NO. J05

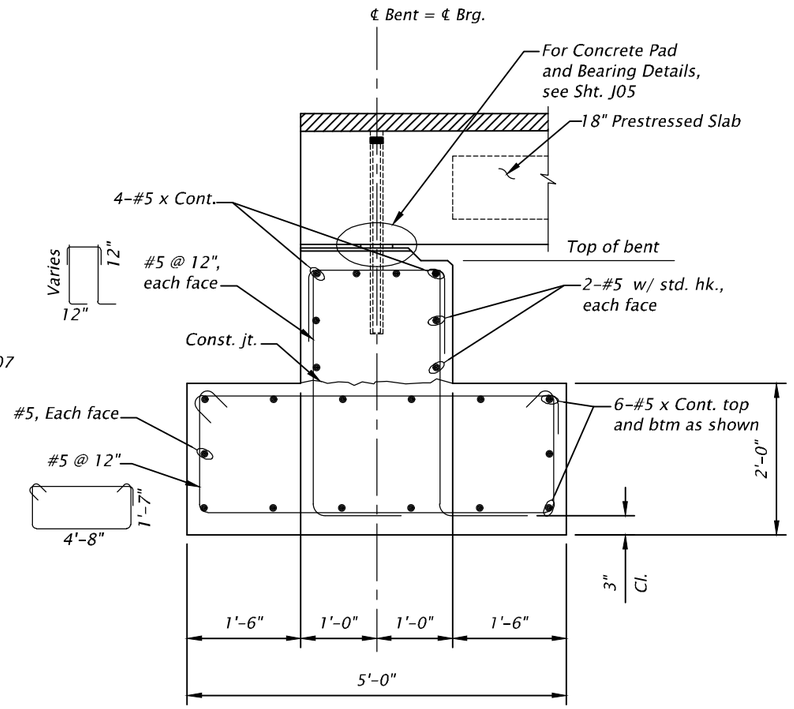
BIDDING PLANS

P:\D\DESX00000119\0400CAD\SHEETS\Gribbling\EB-J06-DESX00019_A-BT01.dwg 7/26/2023 3:05 PM



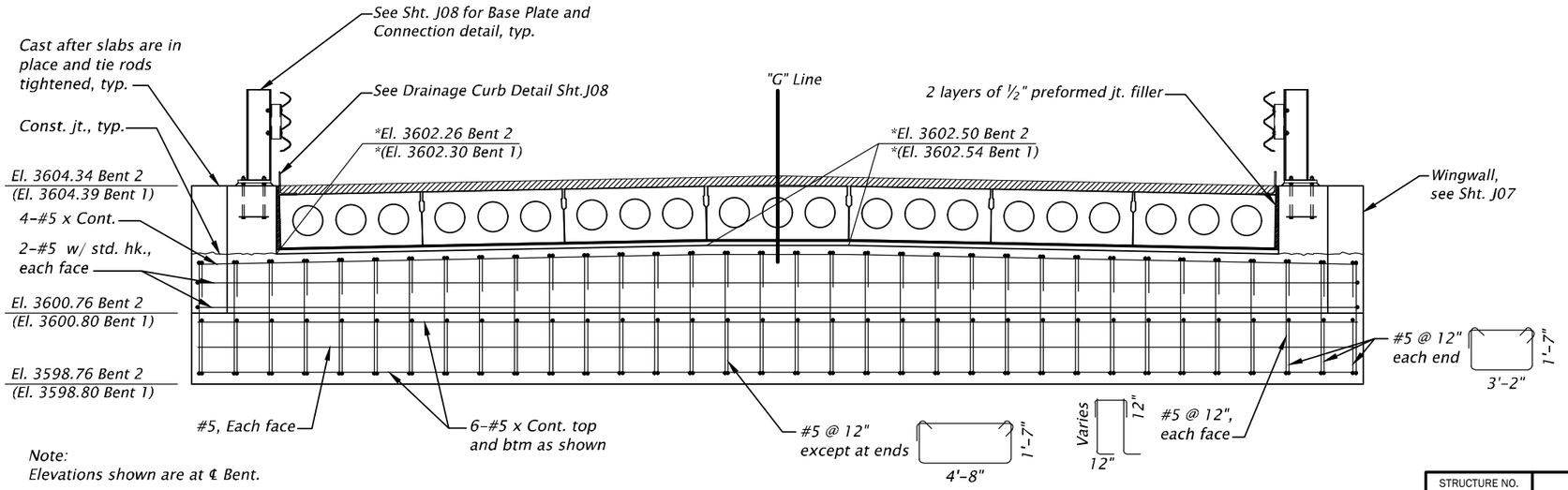
PLAN

Scale: 1/4" = 1'-0"
(Bent 2 shown, Bent 1 similar)



SECTION A-A

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

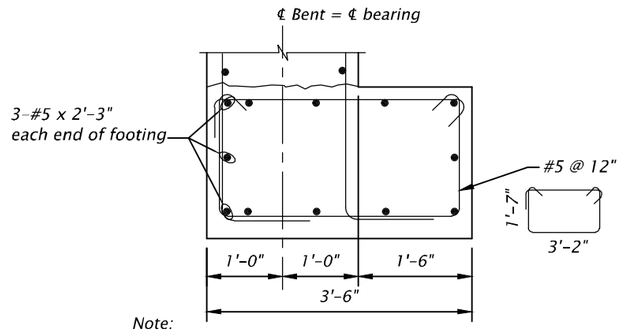


Note:
Elevations shown are at ℄ Bent.

* Elevations are at top of bent.

ELEVATION

Scale: 1/4" = 1'-0"
(Bent 2 shown, Bent 1 similar)



Note:
See Section A-A for reinforcing details not shown.

SECTION B-B

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

SCALE WARNING
IF THIS SCALE LINE DOES NOT MEASURE ONE INCH, THEN DRAWING IS NOT TO SCALE

STRUCTURE NO.	24286
BDS DWG NO.	110839
CALC. BOOK	-
HWY: 318401 M.P.: 0.99	
COUNTY	DESCHUTES
DATE	07/2023

REGISTERED PROFESSIONAL ENGINEER
94489PE
DIGITALLY SIGNED 2023.07.27 09:02:54-07'00'
OREGON
NOVEMBER 9, 2021
ANTONIO MITITIERO
RENEWS: 12-31-2024
FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

DAVID EVANS AND ASSOCIATES INC.
5121 Skyline Village Loop S., Suite 200
Salem Oregon 97306
Phone: 503.361.8635

DESCHUTES COUNTY | ROAD DEPARTMENT

COI Canal_Gribbling Rd_44.03480/-121.17368

GRIBBLING RD. BRIDGE #17C30 REPLACEMENT PROJ.

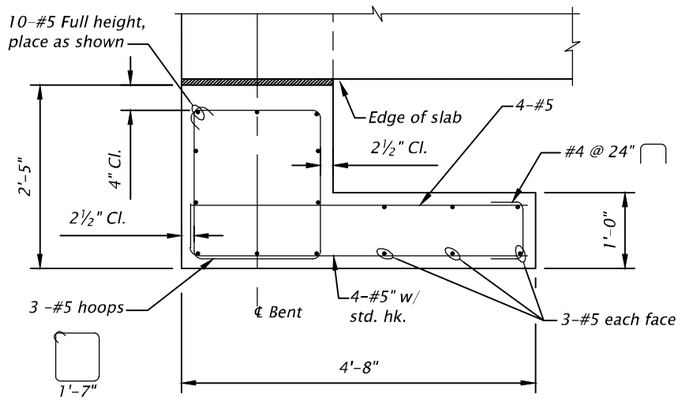
GRIBBLING ROAD
DESCHUTES COUNTY

Designer: Antonio Mititiero
Drafter: Dustin Altenburg
Reviewer: Amanda Blankenship
Checker: Brett Karnes

BENT DETAILS

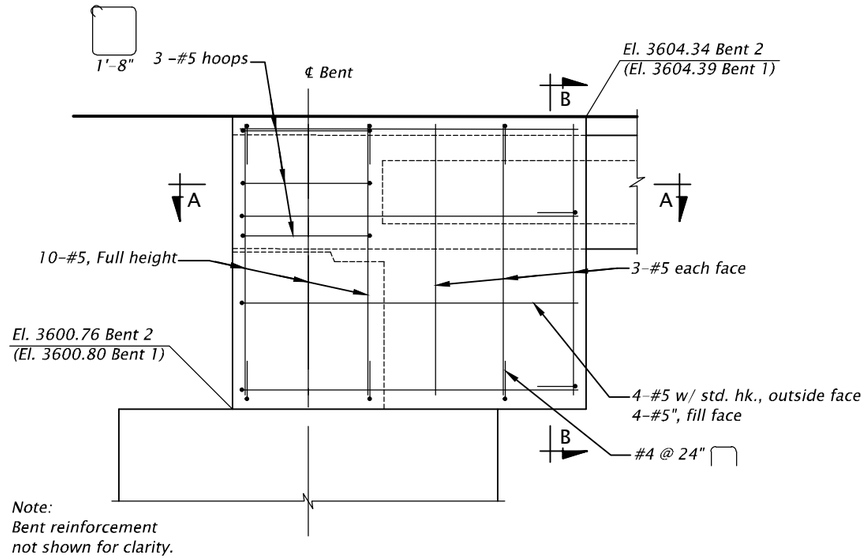
SHEET NO. J06

BIDDING PLANS



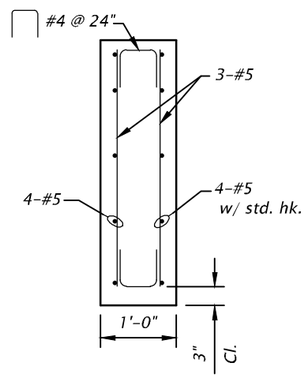
SECTION A–A

Scale: 1/2" = 1'–0"



TYPICAL WINGWALL ELEVATION

Scale: 1/2" = 1'–0"



SECTION B–B

Scale: 3/4" = 1'–0"

SCALE WARNING

IF THIS SCALE LINE DOES NOT MEASURE ONE INCH, THEN DRAWING IS NOT TO SCALE

STRUCTURE NO.	24286
BDS DWG NO.	110840
CALC. BOOK	-
HWY: 318401 M.P.: 0.99	
COUNTY	DESCHUTES
DATE	07/2023

REGISTERED PROFESSIONAL ENGINEER
94489PE
DIGITALLY SIGNED 2023.07.27 09:00:24-07'00'
OREGON
NOVEMBER 9, 2021
ANTONIO MITITIERO

RENEWS: 12-31-2024

FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

DAVID EVANS AND ASSOCIATES INC.
5121 Skyline Village Loop S., Suite 200
Salem Oregon 97306
Phone: 503.361.8635

DESCHUTES COUNTY ROAD DEPARTMENT

COI Canal_Gribbling Rd_44.03480/-121.17368

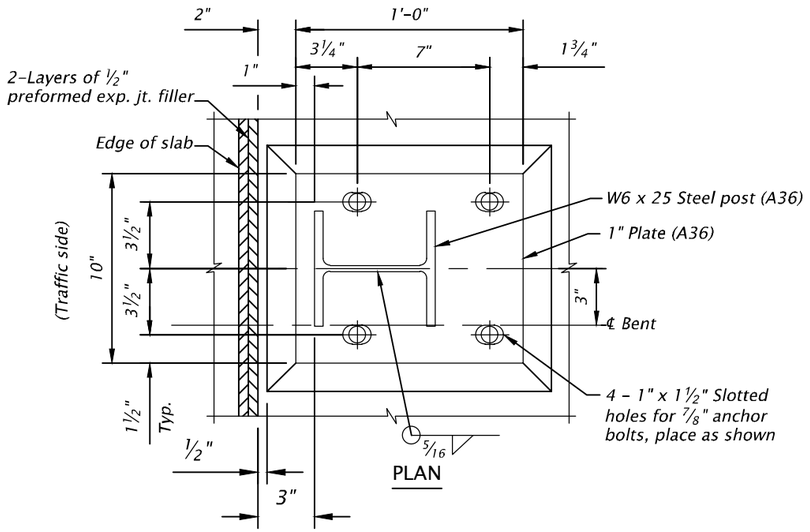
GRIBBLING RD. BRIDGE
#17C30 REPLACEMENT PROJ.
GRIBBLING ROAD
DESCHUTES COUNTY

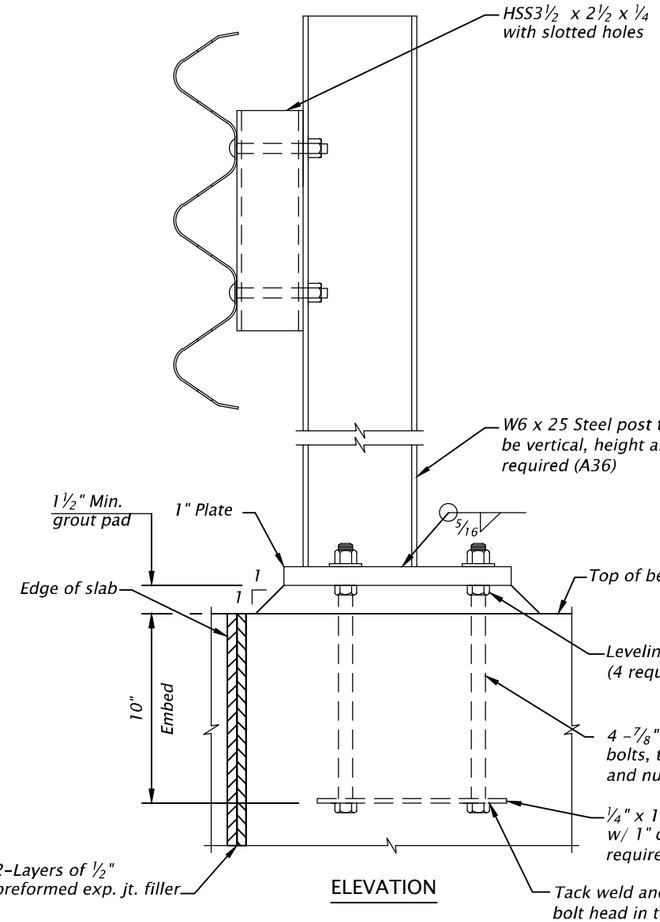
Designer: Antonio Mititiero
Drafter: Dustin Altenburg
Reviewer: Amanda Blankenship
Checker: Brett Karnes

WINGWALL DETAILS

SHEET NO. J07

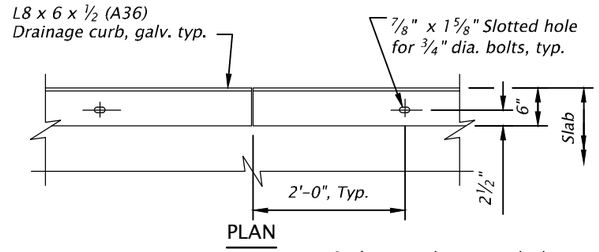
BIDDING PLANS

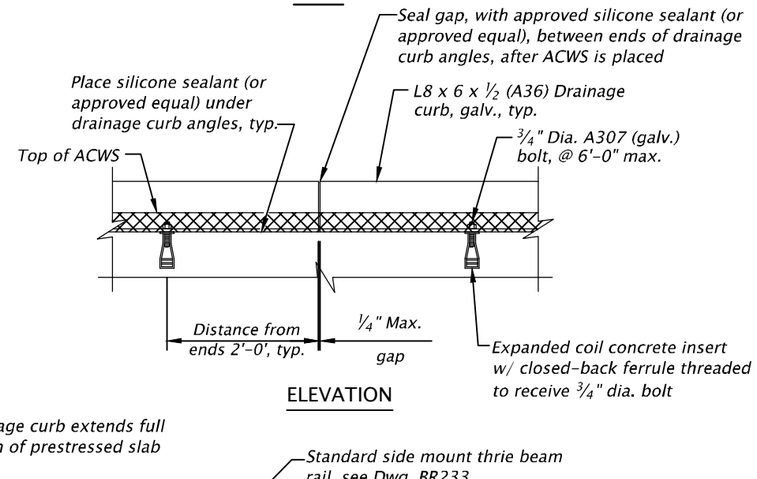




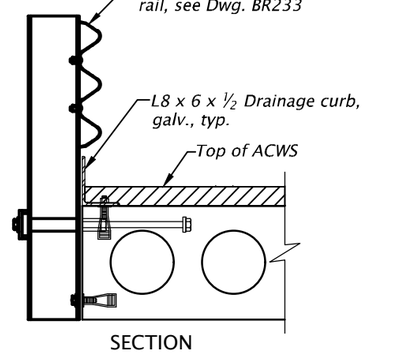
BASE PLATE DETAILS

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





Note:
Drainage curb extends full length of prestressed slab



DRAINAGE CURB DETAIL

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

SCALE WARNING
IF THIS SCALE LINE DOES NOT MEASURE ONE INCH, THEN DRAWING IS NOT TO SCALE

STRUCTURE NO.	24286
BDS DWG NO.	110841
CALC. BOOK	-
HWY: 318401 M.P.: 0.99	
COUNTY	DESCHUTES
DATE	07/2023

REGISTERED PROFESSIONAL ENGINEER
94489PE
DIGITALLY SIGNED 2023.07.27 09:00:04-07'00'
OREGON
NOVEMBER 9, 2021
ANTONIO MITITIERO
RENEWS: 12-31-2024
FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

DAVID EVANS AND ASSOCIATES INC.
5121 Skyline Village Loop S., Suite 200
Salem Oregon 97306
Phone: 503.361.8635

ROAD DEPARTMENT

COI Canal_Gribbling Rd_44.03480/-121.17368

GRIBBLING RD. BRIDGE #17C30 REPLACEMENT PROJ.
GRIBBLING ROAD
DESCHUTES COUNTY

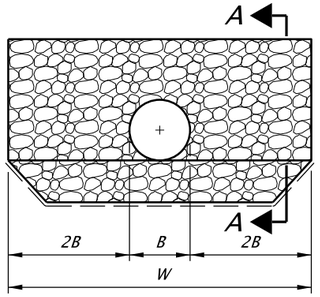
Designer: Antonio Mititiero | Reviewer: Amanda Blankenship
Drafter: Dustin Altenburg | Checker: Brett Karnes

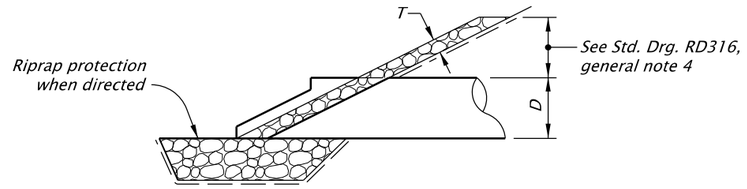
MISCELLANEOUS DETAILS

SHEET NO. J08

BIDDING PLANS

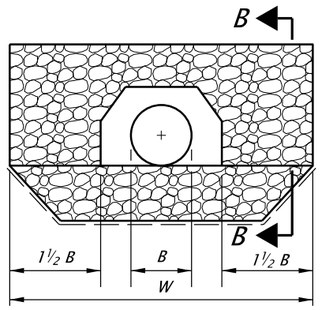
30-JUN-2022
RD317.dgn

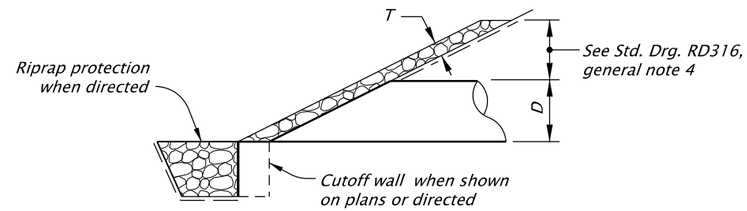




SECTION A-A

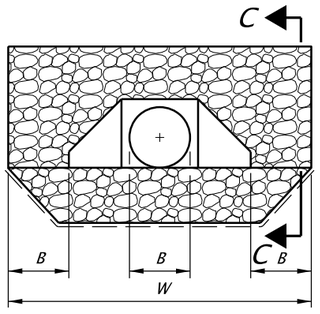
SLOPED OR PROJECTING END

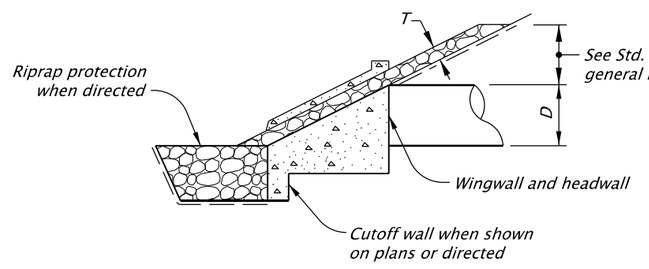




SECTION B-B

SLOPED END WITH SLOPE PAVING



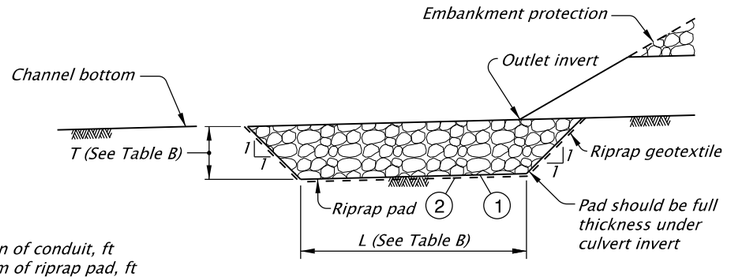


SECTION C-C

HEADWALL AND WINGWALLS

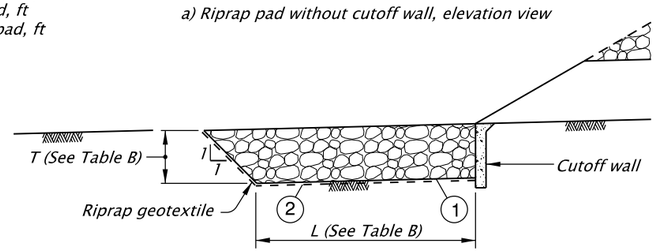
B = Diameter of circular barrel or span of arch pipe, box, or open-bottom arch.
D = Diameter of circular barrel or rise of arch pipe, box, or open-bottom arch.
T = Thickness of riprap blanket, see Table A.

EMBANKMENT PROTECTION



B = Diameter or span of conduit, ft
L = Length of bottom of riprap pad, ft
T = Thickness of riprap pad, ft
W= Width of top of riprap pad, ft

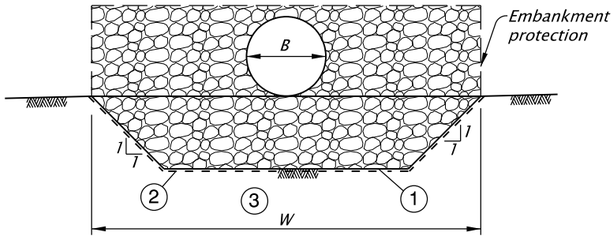
a) Riprap pad without cutoff wall, elevation view



b) Riprap pad with cutoff wall, elevation view

RIPRAP PAD NOTES:

1. *Do not excavate non-erodible rock in order to place riprap.*
2. *Use riprap geotextile under Class 200 and Class 700 loose riprap.*
3. *Top width (W) of the riprap pad is the larger of 5B or the width of the embankment slope protection.*



c) Riprap pad, end view

RIPRAP PADS

TABLE A - Embankment Slope Protection	
Riprap Class	T Distance
50	12 Inches
100	18 Inches
200	24 Inches *
700	36 Inches *

** Riprap geotextile required between riprap and embankment*

TABLE B - Riprap Pad Dimensions		
Riprap Class	L * (ft)	T (ft)
50	4B or 1.3	2.3
100	4B or 1.6	3.3
200	4B or 2.0	4.3
700	4B or 3.3	5.6

** L is the greater of 4B or the listed dimension.*

GENERAL NOTES FOR ALL DETAILS:

1. *See Std. Drg's. RD300 & RD304 for installation details.*
2. *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.*

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 EMBANKMENT PROTECTION AND RIPRAP PADS

2021

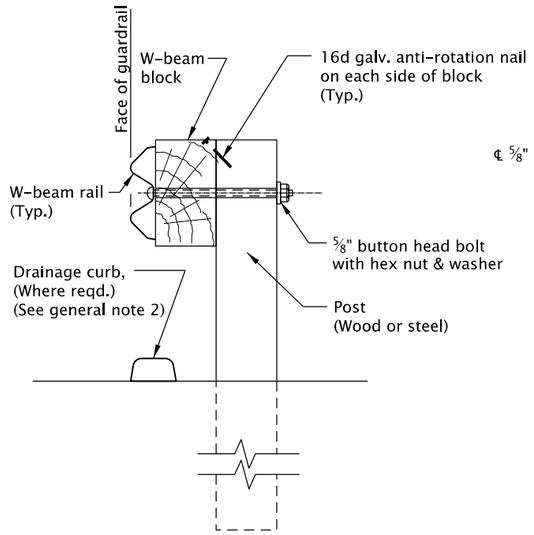
DATE	REVISION DESCRIPTION

CALC. BOOK NO. N/A | SDR DATE 30-JUN-2022 | **RD317**

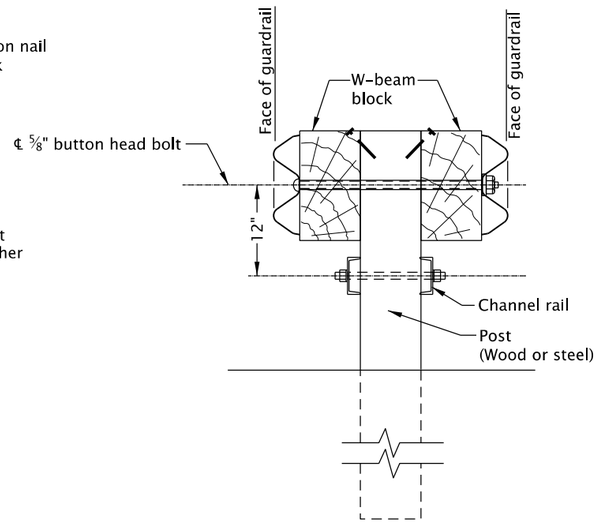
Effective Date: June 1, 2023 - November 30, 2023

BIDDING PLANS

19-JUL-2021
RD402.dgn

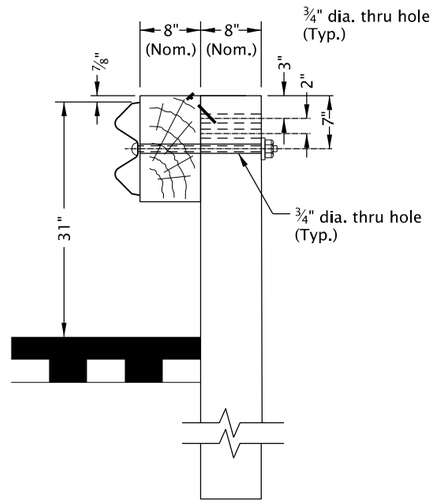


TYPES 2A & 3
(For Type 3 use double thickness (2) rail elements)



METAL MEDIAN BARRIER
(DOUBLE SIDED W/ CHANNEL RAIL)
(See general note 3)

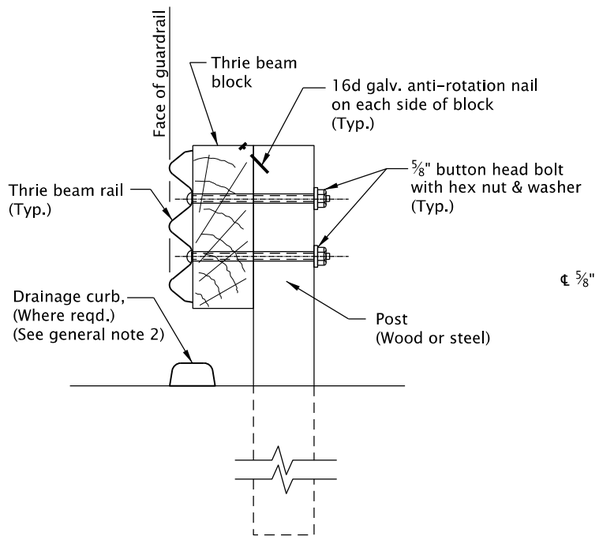
W-BEAM GUARDRAIL



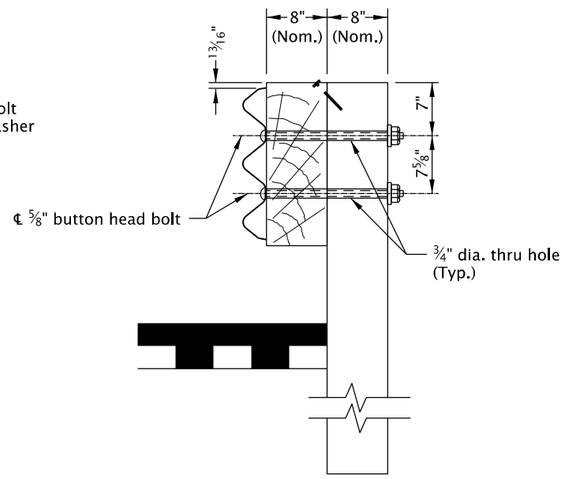
TYPICAL INSTALLATION

W-BEAM GUARDRAIL ASSEMBLY

NORMAL RAIL ELEMENT DATA			
TYPE	RAIL	EFFECTIVE LENGTHS	GAUGE
2A	W-beam	6.25', 12.5', 25'	10 & 12
3	W-beam	6.25', 12.5', 25'	10 & 12
4	Thrie beam	6.25', 12.5', 25'	10 & 12
4 TRANSITION	Thrie beam	6.25'	10 & 12



TYPE 4 & 4 TRANSITION



INITIAL INSTALLATION

THRIE BEAM GUARDRAIL

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. See appropriate guardrail standard drawing(s) for details not shown.
2. When required by the plans, Drainage curb alignment same as face of guardrail.
3. Orient post bolts with the button head located on the side nearest the traffic lane.
   The bolt's threaded portion is not permitted to extend beyond limits of ¼" to ½" from the face of the tightened nut; trim the treated portion as needed.
4. Lap guardrail in direction of adjacent traffic.
5. Final paved surfacing to extend to face of post. Rail height measured from final paved surface at face of rail (Typical all types). 1"± tolerance.
6. Wood block shall be toe-nailed to the post with 2 - 16d galvanized nails in top of block to prevent block rotation.
7. Wood blocks shown. Blocks of an approved alternate material may be used.
   See ODOT's QPL.
8. Existing posts shall not be raised.
   Replace posts as necessary to achieve required guardrail height.

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 TYPES

2021

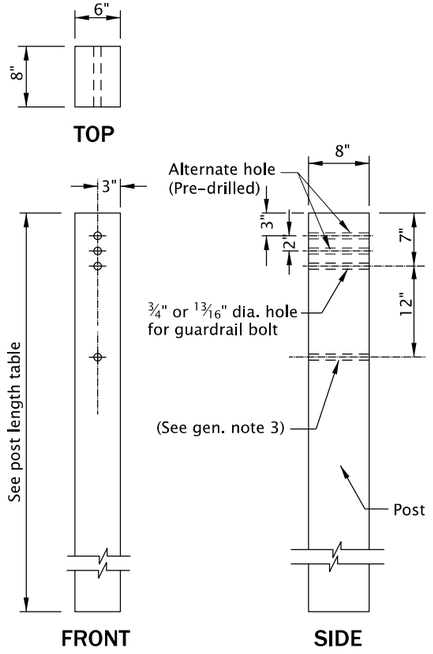
DATE	REVISION DESCRIPTION
07-2021	REVISED DETAILS AND NOTES

CALC. BOOK NO. N/A | SDR DATE 19-JUL-2021 | **RD402**

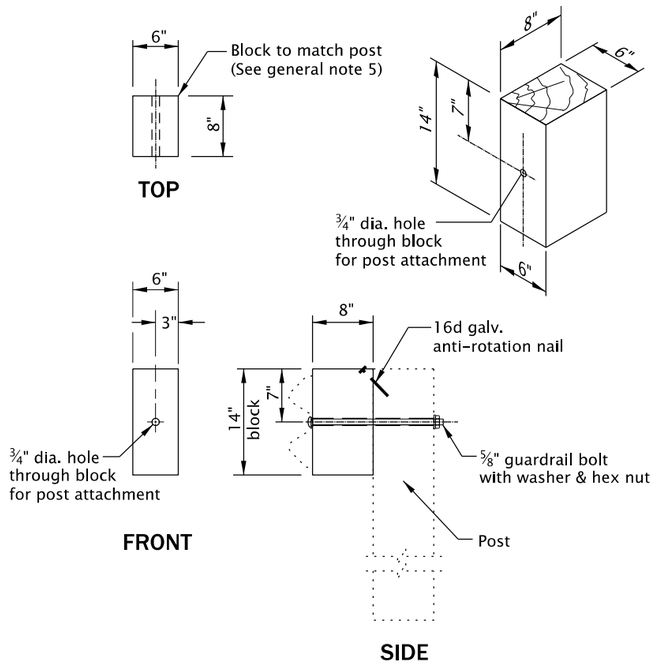
Effective Date: June 1, 2023 - November 30, 2023

19-JUL-2021

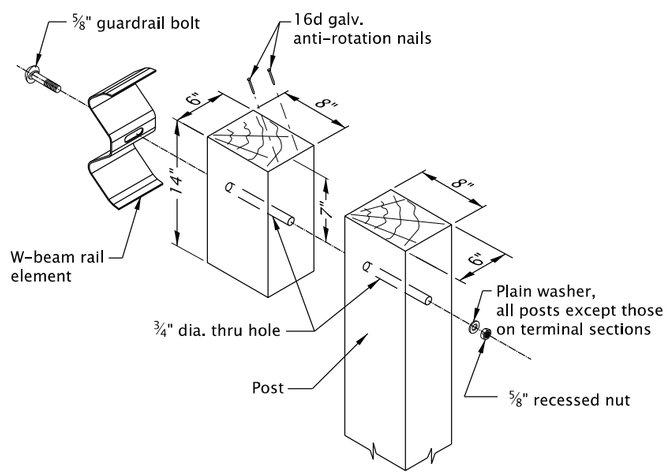
RD403.dgn



W-BEAM WOOD POST
(6x8 post shown)



W-BEAM WOOD BLOCK FOR WOOD POST
(6x8 wood block shown)



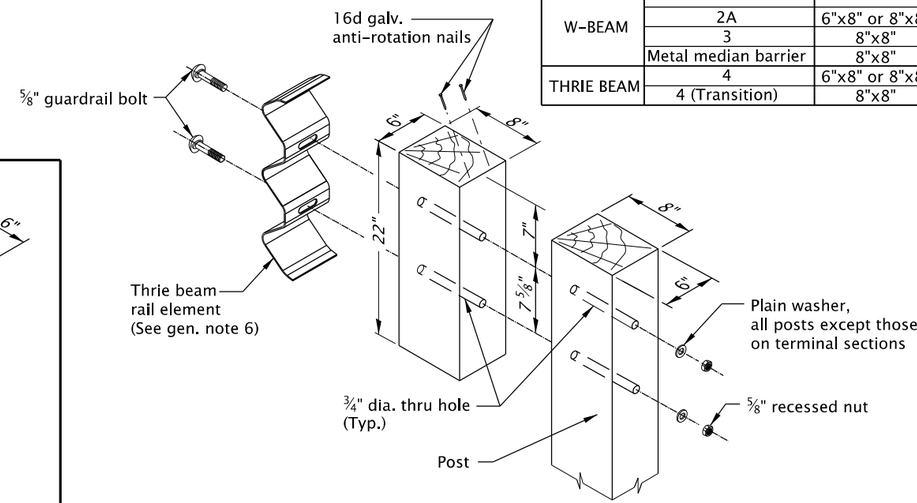
W-BEAM ASSEMBLY DETAIL
(6x8 wood post and 6x8 wood block shown)

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

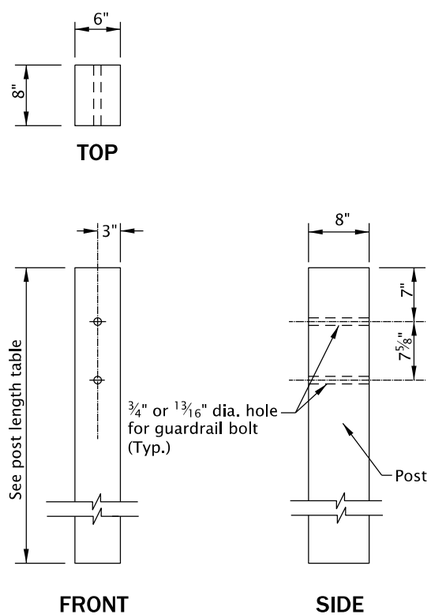
1. See appropriate guardrail standard drawing(s) for details not shown.
2. See Bridge Dwgs. for bridge transition guardrail post and block requirements.
3. Lowest hole(s) required only when channel rail is to be installed. Drill 12" below top ¾" or 13⁄16" hole(s) used.
4. Dimensions shown are for nominal posts and blocks.
5. Wood blocks shown. Blocks of an approved alternate material may be used. See ODOT's QPL.
6. When required by the plans, nested thrie beam wood post shall be 8"x8".
7. Wood block shall be toe-nail to the post with 2 - 16d galvanized nails in top of block to prevent block rotation.

GUARDRAIL WOOD POST TABLE

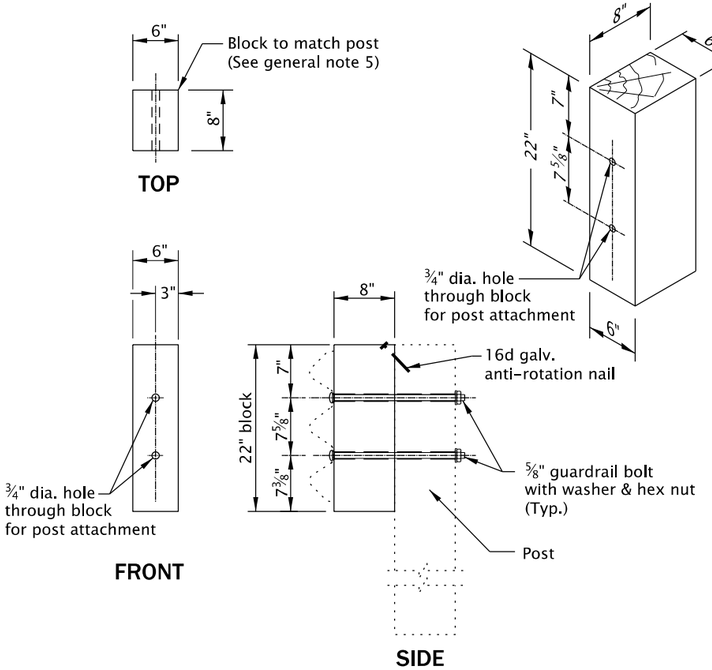
GUARDRAIL TYPE		POST SIZE	POST LENGTH	POST SPACING
W-BEAM	2A	6"x8" or 8"x8"	6'-0"	6'-3"
	3	8"x8"	6'-0"	3'-1½"
	Metal median barrier	8"x8"	6' 6"	6'-3"
THRIE BEAM	4	6"x8" or 8"x8"	7'-0"	6'-3"
	4 (Transition)	8"x8"	6'-0"	3'-1½"



THRIE BEAM ASSEMBLY DETAIL
(6x8 wood post and 6x8 wood block shown)



THRIE BEAM WOOD POST
(6x8 post shown)



THRIE BEAM WOOD BLOCK FOR WOOD POST
(6x8 wood block 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 WOOD POST AND BLOCK

2021

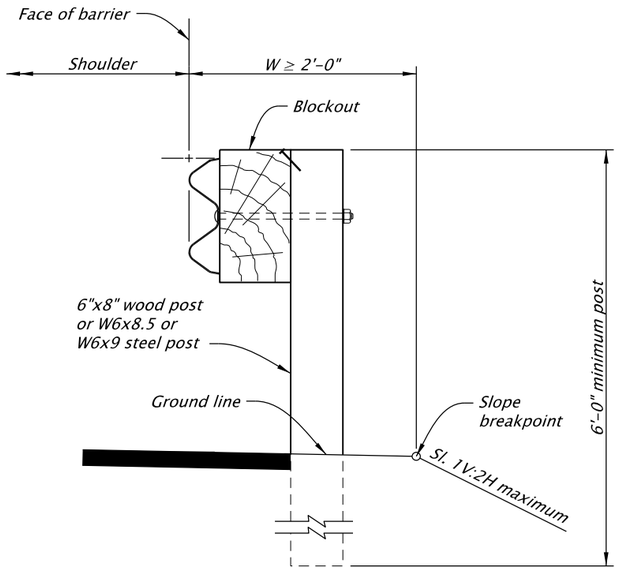
DATE	REVISION DESCRIPTION
07-2021	REVISED DETAILS AND NOTES

CALC. BOOK NO. N/A | SDR DATE 19-JUL-2021 | **RD403**

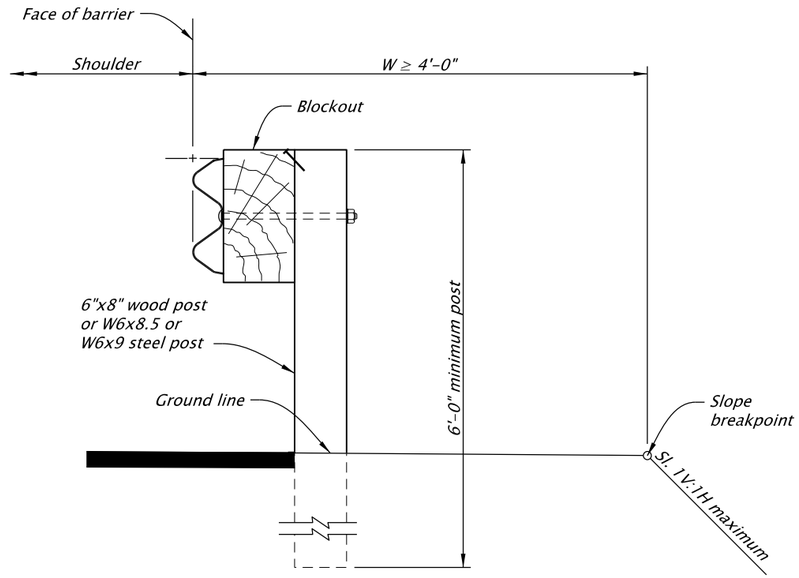
Effective Date: June 1, 2023 - November 30, 2023

BIDDING PLANS

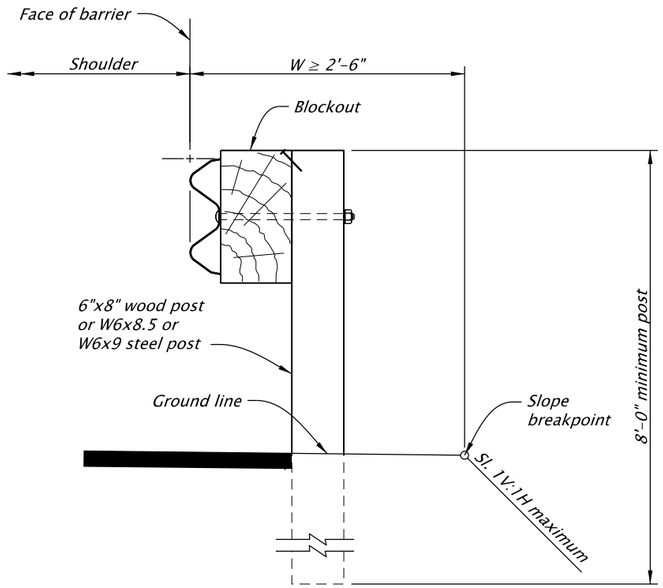
20-JAN-2023
RD406.dgn



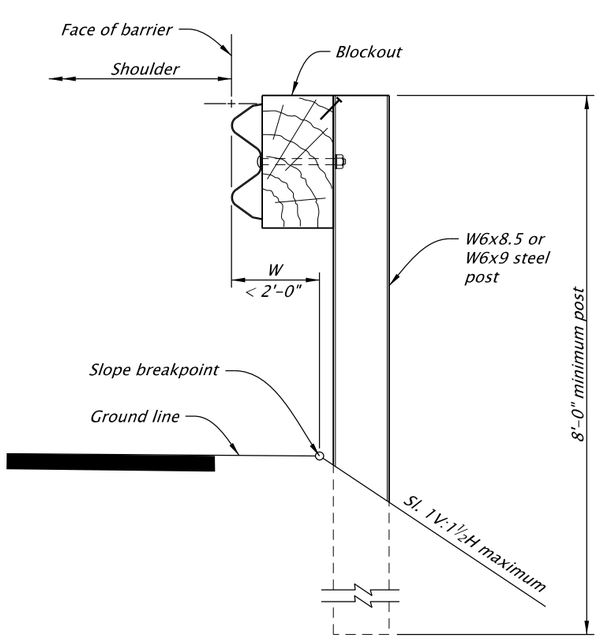
CASE 1
(Wood post shown)



CASE 2
(Wood post shown)
Use when there is a 4'-0" or greater shoulder widening from face of guardrail to the slope breakpoint



CASE 3
(Wood post shown)
Use when there is a 2'-6" or greater shoulder widening from face of guardrail to the slope breakpoint



CASE 4
(Steel post shown)
Do not use in weak soil conditions.
Use when there is less than a 2'-0" shoulder widening from face of guardrail to the slope breakpoint

PLACEMENT OF GUARDRAIL ON SLOPES

NOTE: Cases shown do not apply to terminals, transition sections or anchors.

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *See appropriate guardrail standard drawing(s) for details not shown.*
2. *Wood blocks shown. Blocks of an approved alternate material may be used. See ODOT's QPL.*
3. *All posts for guardrail run shall be of the same type: wood or steel.*

SLOPE / EMBANKMENT TABLE			
POST LENGTH (ft)	POST TYPE	SLOPE (V:H)	W (ft) (Face of barrier to slope of breakpoint)
6	*Wood/Steel*	*1:2 or flatter*	*2'-0" minimum*
6	*Wood/Steel*	*1:1 or flatter*	*4'-0" minimum*
8	*Wood/Steel*	*1:1 or flatter*	*2'-6" minimum*
8	*Steel*	*1:1½ or flatter*	*Less than 2'-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

PLACEMENT OF GUARDRAILS ON SLOPES

2021

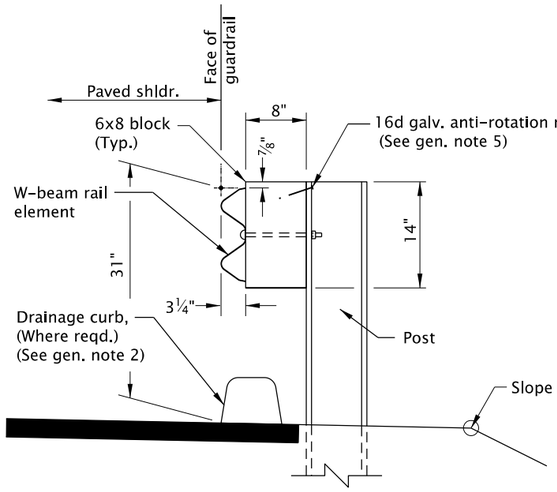
DATE	REVISION DESCRIPTION
07-2021	NEW DRAWING CREATED
12-2021	REVISED DETAILS AND NOTES
12-2022	REVISED NOTE

CALC. BOOK NO. N/A | SDR DATE 20-JAN-2023 | **RD406**

BIDDING PLANS

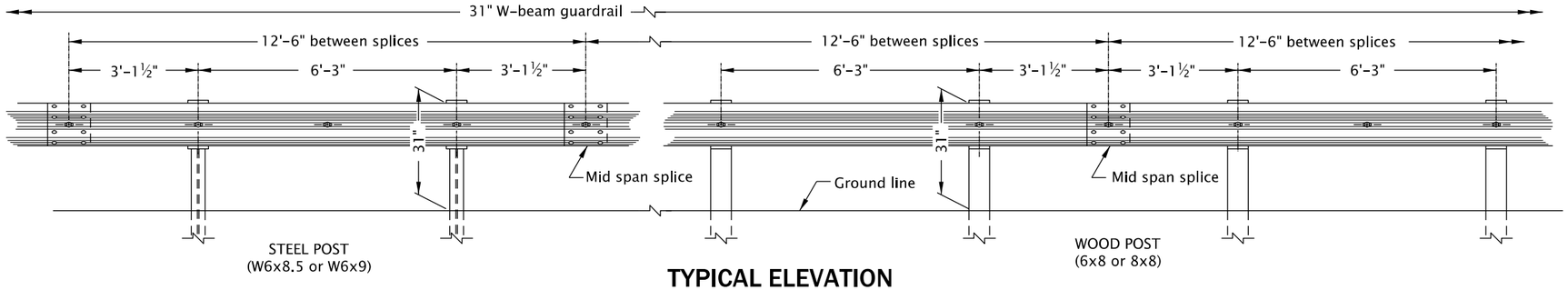
19-JUL-2021

RD407.dgn

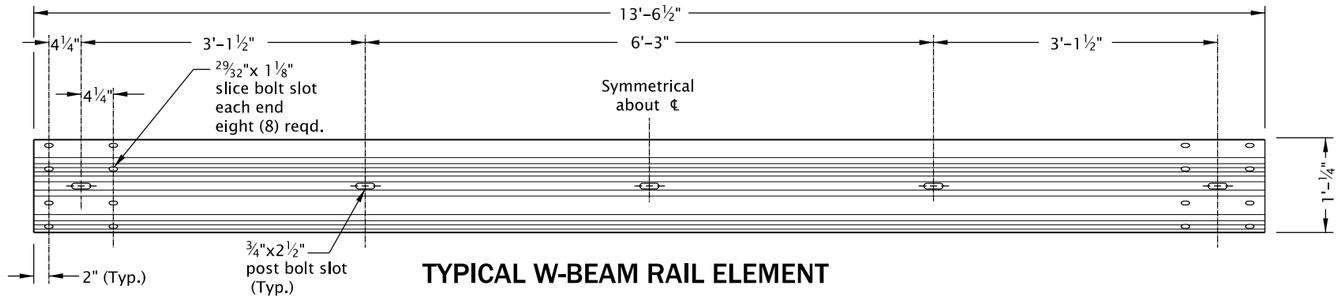


TYPICAL SECTION

(Steel post shown)



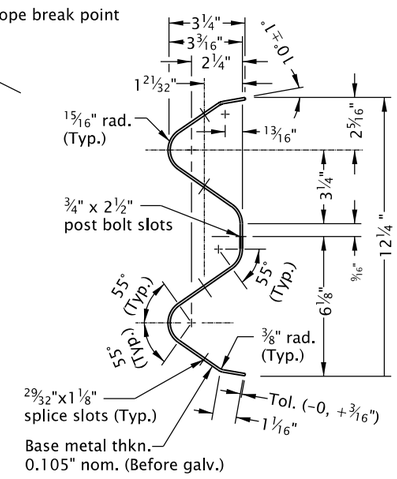
TYPICAL ELEVATION



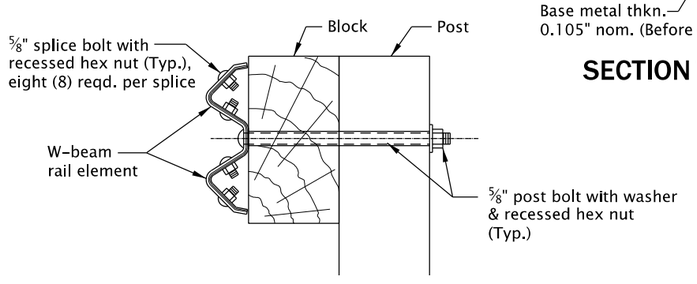
TYPICAL W-BEAM RAIL ELEMENT

NORMAL RAIL ELEMENT DATA

Type	Effective Lengths	Thkn. (Galv.)
2A, 3	6.25', 12.5', 25'	10 ga. & 12 ga.



SECTION THRU RAIL ELEMENT

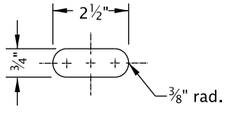


FITTINGS

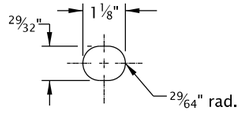
NOTES:

a. When required by the plans, post bolts to extend beyond the tightened nuts within limits of ¼" to ½".

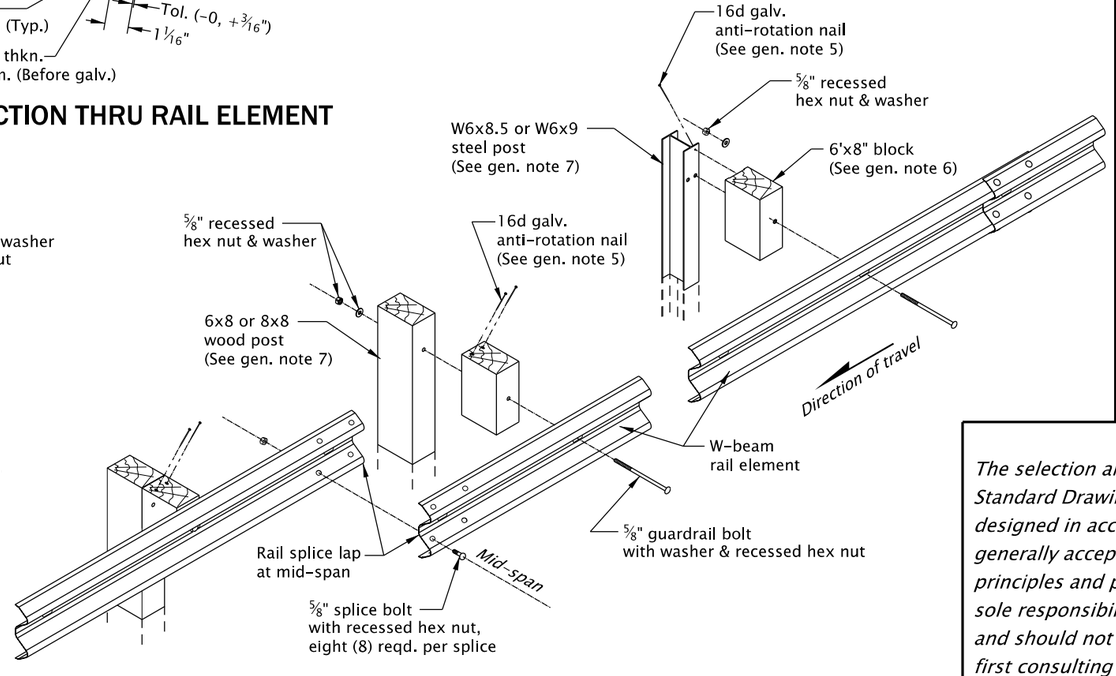
b. All post bolt threads to be set after assembly for wrench removal only.



POST BOLT SLOT



SPLICE BOLT SLOT



W-BEAM ASSEMBLY DETAILS

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. See appropriate guardrail standard drawing(s) for details not shown.
2. When required by the plans, drainage curb alignment same as face of guardrail.
3. Lap guardrail in direction of adjacent traffic.
4. Final paved surfacing to extend to face of post. Rail height measured from final paved surface at face of rail to top of rail (typ. all types). 1" ± tolerance.
5. Blocks shall be toe-nailed to prevent rotation when wood posts are used (see Std. Dwg. RD403). Blocks shall be rounted or toe-nailed when steel posts are used to prevent rotation (see Std. Dwg. RD404).
6. Wood blocks shown. Blocks of an approved alternate material may be used. See ODOT's QPL.
7. All posts for guardrail run shall be of the same type: wood or steel.
8. For guardrail installed on radii of 150' or less (5' min. radius) use rail elements pre-curved to industry standard. Install "Radius Identification Plate".

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 W-BEAM

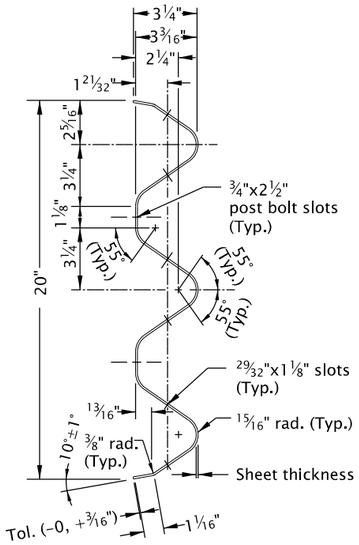
2021

DATE	REVISION DESCRIPTION
07-2021	REVISED DETAILS AND NOTES

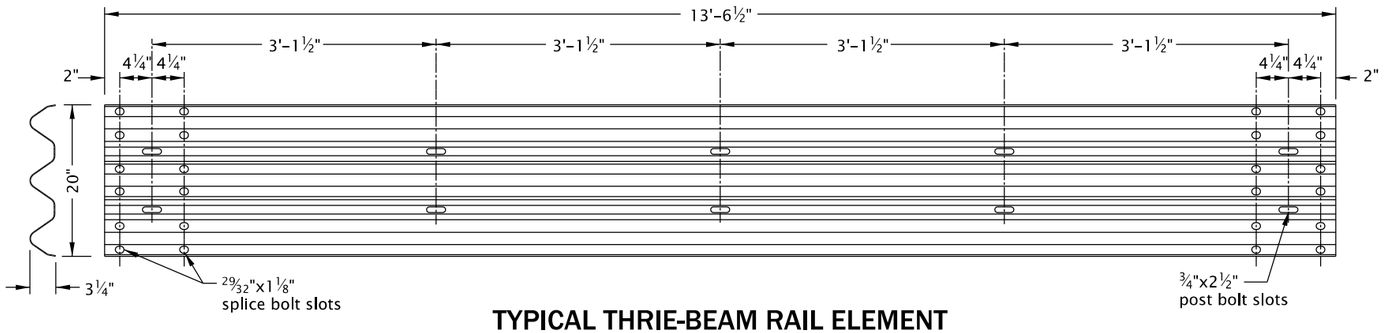
CALC. BOOK NO. N/A | SDR DATE ~~19-JUL-2021~~ | **RD407**

Effective Date: June 1, 2023 - November 30, 2023

20-JUL-2020
RD409.dgn

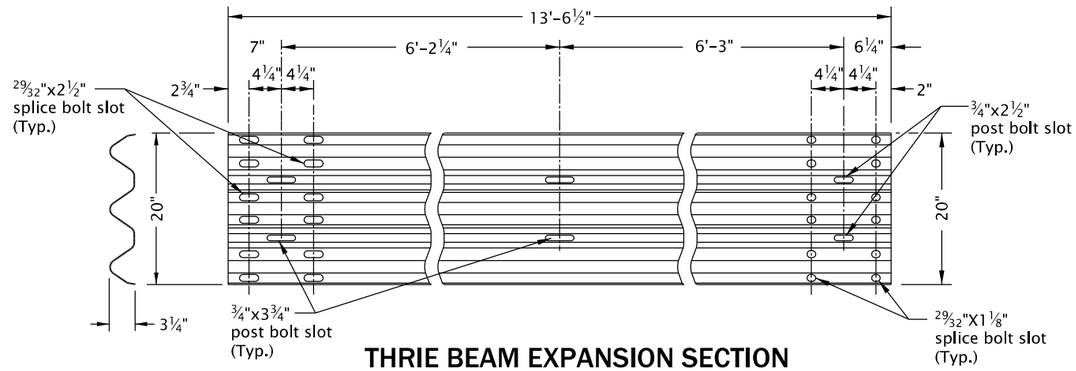


SECTION THRU RAIL ELEMENT

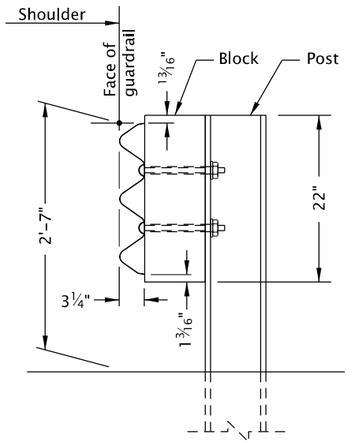


TYPICAL THRIE-BEAM RAIL ELEMENT

(12'-6" length shown)

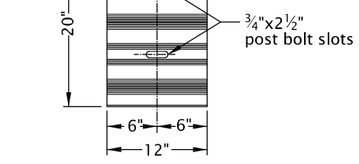


THRIE BEAM EXPANSION SECTION



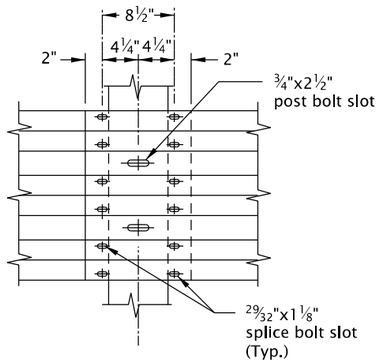
TYPICAL SECTION

(Steel post shown)

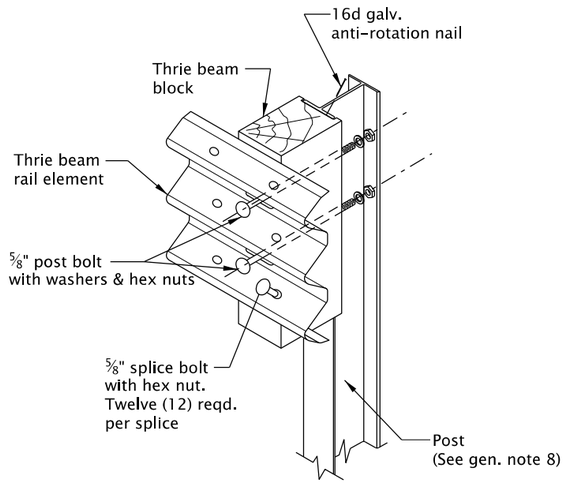


THRIE BEAM BACK-UP PLATE

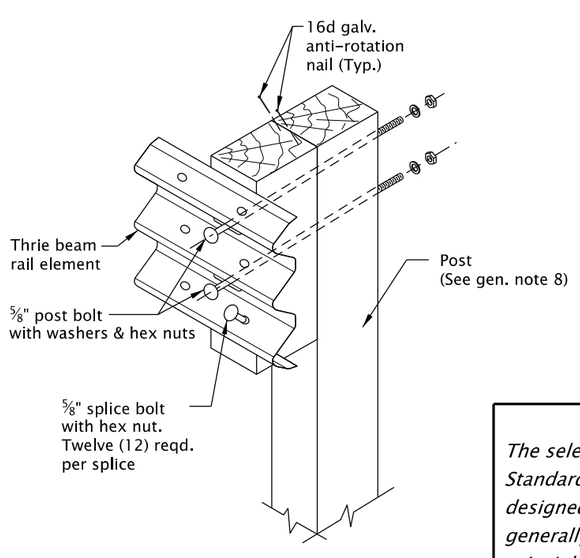
(For detail not shown, see "Section Thru Rail Element")



THRIE BEAM SPLICE



STEEL POST ASSEMBLY



WOOD POST ASSEMBLY

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. See appropriate guardrail standard drawing(s) for details not shown.
2. Lap guardrail in direction of adjacent traffic.
3. Hole layout per manufacturer with appropriate post and block.
4. Final paved surfacing to extend to face of post. Rail height measured from final paved surface at face of rail to top of rail (Typ. all types). 1" ± tolerance.
5. Wood block shall be toe-nailed to the post with 2 - 16d galvanized nails in top of block to prevent block rotation.
6. Wood blocks shown. Blocks of an approved alternate material may be used. See ODOT's QPL.
7. All posts for guardrail run shall be of the same type: wood or steel.
8. When required by the plans, nested thrie beam post shall be 8x8 wood or W6x9 steel.

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

2021

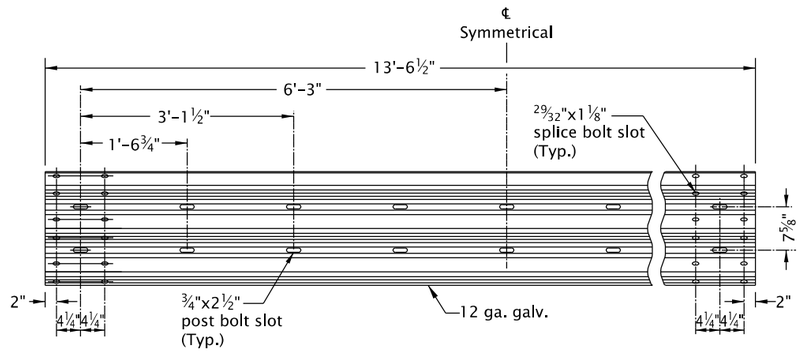
DATE	REVISION DESCRIPTION

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2020 | **RD409**

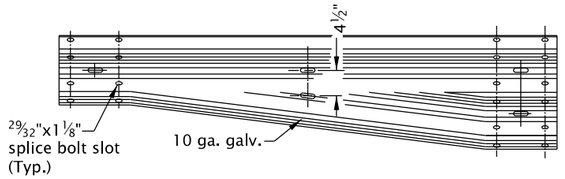
Effective Date: June 1, 2023 - November 30, 2023

BIDDING PLANS

20-JUL-2020
RD410.dgn

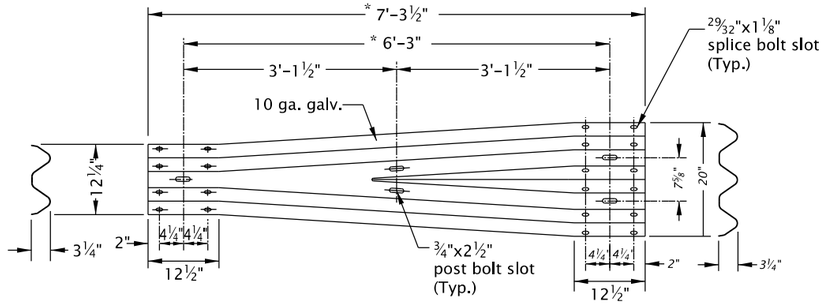


THRIE BEAM RAIL ELEMENT
¼ POST SPACING
(12'-6" section shown)

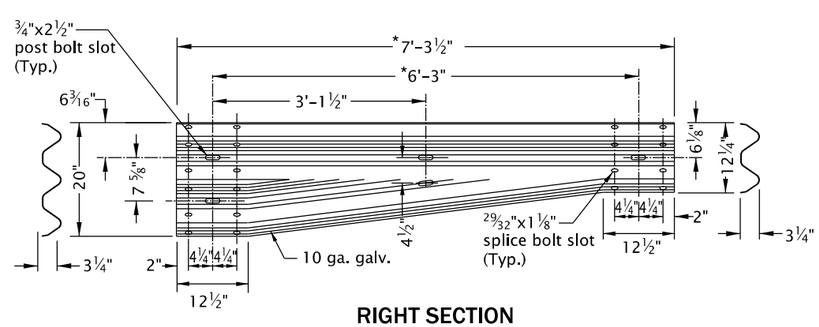


LEFT SECTION
(Reverse of right section)

* See general note 4



SYMMETRICAL THRIE BEAM TRANSITION ELEMENT
(Left section shown, right section reversed)



RIGHT 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

2021

DATE	REVISION DESCRIPTION

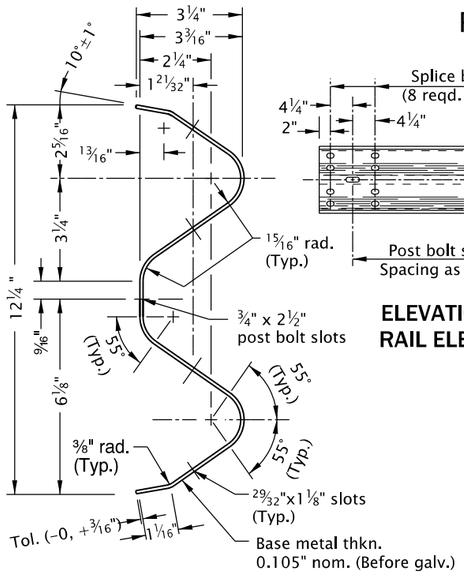
CALC. BOOK NO. N/A | SDR DATE 13-JAN-2020 | **RD410**

Effective Date: June 1, 2023 – November 30, 2023

20-JUL-2020

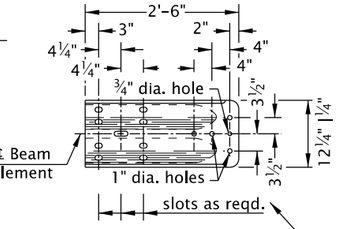
RD415.dgn

RAIL MEMBERS

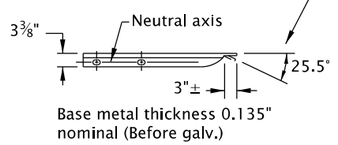


SECTION THRU RAIL ELEMENT

ELEVATION OF RAIL ELEMENT



25.5° bend and hole reqd. only for use with alternate Type "C" end piece.

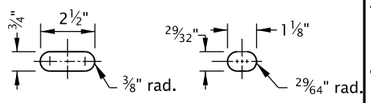


Base metal thickness 0.135" nominal (Before galv.)

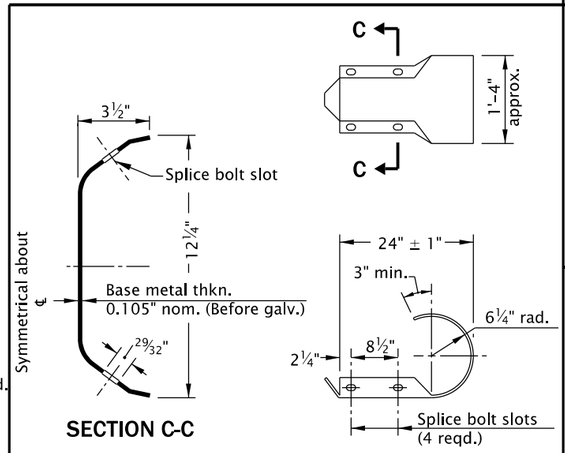
TERMINAL CONNECTOR

NOTES:

1. For guardrail installed on radii of 150' or less (5' min. radius) use rail elements pre-curved to industry standard. Install "Radius Identification Plate" (See detail right).
2. Effective length of rail sections shall be 12'-6".



POST BOLT SLOT SPLICE BOLT SLOT



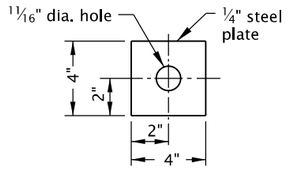
SECTION C-C

TYPE B END PIECE

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

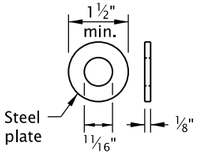
1. See appropriate guardrail standard drawing(s) for details not shown.
2. For details of guardrail connections to structural handrails, see special details or Standard Drawings as called for on plans.
3. All indicated welds shall attain the full strength of the section welded.
4. Radius dimensions, in feet to the nearest 0.5 foot, shall be placed on the plate with a raised weld bead replacing the letters "HHH", shown on the Radius Identification Plate detail. Digits shall be 1½" min. height and ¾" max. width. Plate shall be galvanized after placement of digits.
5. The guardrail radius identification plate is to be mounted on the back side of the rail element with the lowest splice bolt nearest the P.C. of the guardrail radius.

APPURTENANCES



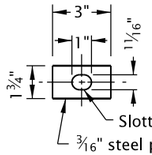
SNOW LOAD (OPTIONAL)

(In area of heavy snow, as directed by the engineer)



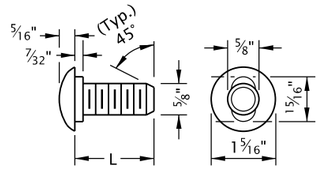
PLAIN ③

USE ON BACK OF POST



RECTANGULAR

USE ON RAIL ELEMENT FACE ON TYPE C END PIECE

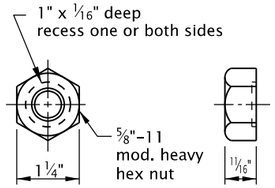


ALTERNATIVE No. 2

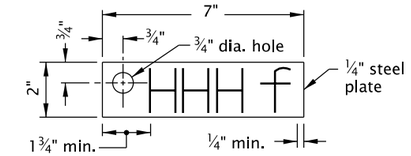
ALTERNATIVE No. 1

WASHERS ④

L (in.)	Thread Length (in.)
1¼	1⅛ min.
2	1¾ min.
10	4 min.
18	4 min.
25	4 min.

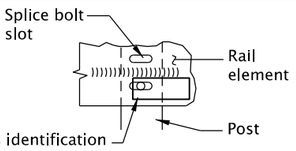


POST OR SPLICE BOLT AND NUT



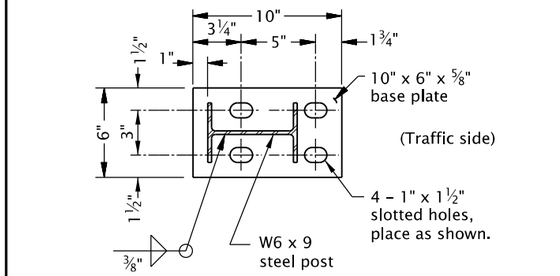
RADIUS IDENTIFICATION PLATE

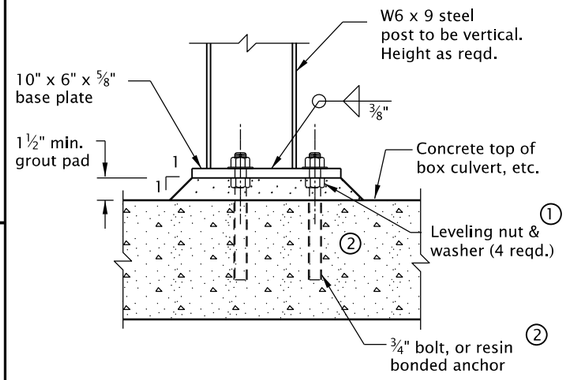
(See general note 4)



RADIUS IDENTIFICATION PLATE MOUNTING DETAIL

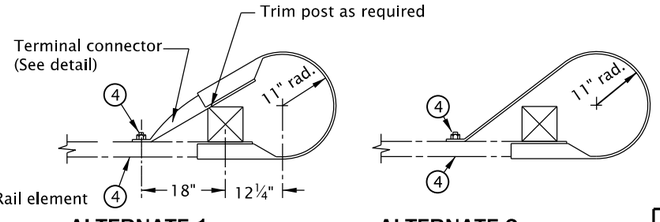
(See general note 5)





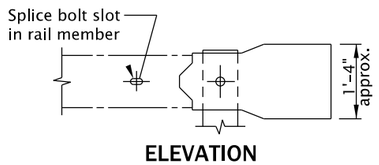
BASE PLATE DETAILS

(For additional details, see Std. Dwg. BR266)
(Use when depth of cover is less than normal for post installation.)



ALTERNATE 1

ALTERNATE 2



ELEVATION

TYPE C END PIECE

(For details not shown, see Type B End Piece)

NOTES:

① Furnished & installed by structure contractor when shown on structure plans.

② 6" min. penetration into concrete slabs other than bridge decks. Cast in place or core and install using approved resin bonding system.

③ Not required if "Snow Load" washer option is used.

④ Use rectangular washer under bolt head and nut on Type C End Piece as shown.

NOTES: THIS DRAWING IS RETAINED FOR MAINTENANCE PURPOSES. DO NOT USE FOR NEW CONSTRUCTION.

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

GUARDRAIL AND METAL MEDIAN BARRIER PARTS (29" RAIL HEIGHT)

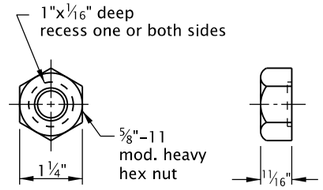
2021

DATE	REVISION DESCRIPTION

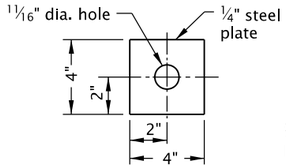
CALC. BOOK NO. N/A | SDR DATE 13-JAN-2020 | **RD415**

Effective Date: June 1, 2023 - November 30, 2023

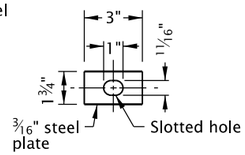
20-JUL-2020
RD416.dgn



5/8" DIA. RECESSED HEX NUT

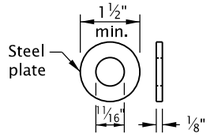


SNOW LOAD POST WASHER



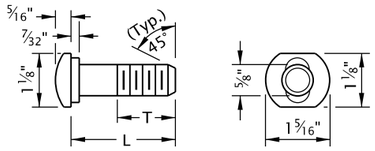
SNOW LOAD RAIL WASHER (b)

Use in area of heavy snow,
as directed by the engineer
(See general note 6)

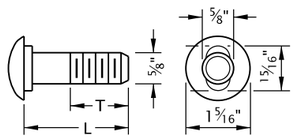


PLAIN WASHER (a)

Use on back of post.



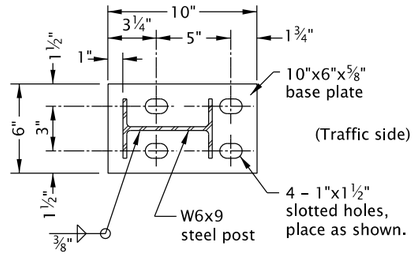
ALTERNATIVE No. 1



ALTERNATIVE No. 2

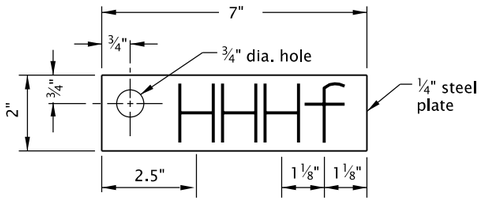
BOLT DIMENSION TABLE

Length (L) (in.)	Thread Length (T) (in.)
1 1/4	1 1/8 min.
2	1 3/4 min.
10	4 min.
18	4 min.
25	4 min.



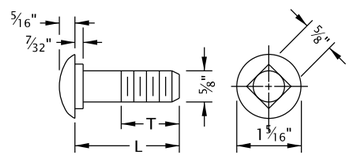
PLAN

5/8" GUARDRAIL POST/SPICE BOLT (BUTTON HEADED)

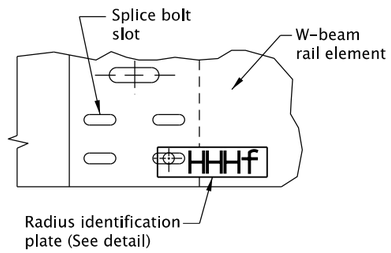


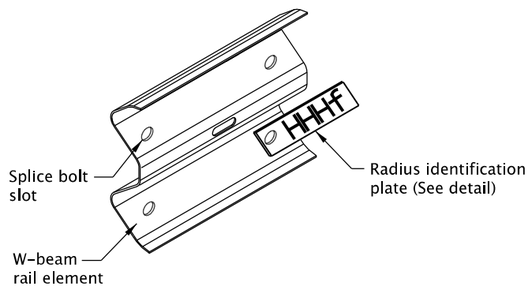
RADIUS IDENTIFICATION PLATE

(See general note 4)



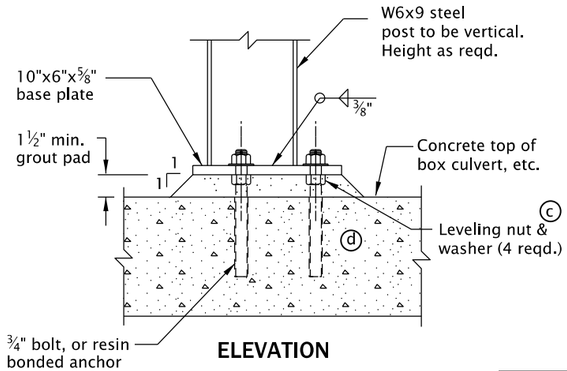
5/8" DIA. CARRIAGE BOLT





RADIUS IDENTIFICATION PLATE MOUNTING DETAIL

(See general note 5)



ELEVATION

BASE PLATE DETAILS

(For additional details, see Std. Dwg. BR266)
(Use when depth of cover is less
than normal for post installation.)

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. See appropriate guardrail standard drawing(s) for details not shown.
2. For details of guardrail connections to structural handrails, see special details or Standard Drawings as called for on plans.
3. All indicated welds shall attain the full strength of the section welded.
4. Radius dimensions, in feet to the nearest 0.5 foot, shall be placed on the plate with a raised weld bead replacing the letters "HHH", shown on the Radius Identification Plate detail. Digits shall be 1½" min. height and ¾" max. width. Plate shall be galvanized after placement of digits.
5. The guardrail radius identification plate is to be mounted on the back side of the rail element with the lowest splice bolt nearest the P.C. of the guardrail radius.
6. When required by the plans, a Snow Load Post Washer shall be used on the backside of the post and a Snow Load Rail Washer shall be placed on rail element face. Snow Load Rail Washers shall not be installed on terminals.

SUPPLEMENTARY NOTES:

(a) Not required if Snow Load Post washer option is used.

(b) Use rectangular Snow Load Rail washer under bolt head and nut on Type C End Piece as shown.

(c) Furnished & installed by structure contractor when shown on structure plans.

(d) 6" min. penetration into concrete slabs other than bridge decks. Cast in place or core and install using approved resin bonding system.

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 STANDARD HARDWARE (NUTS, BOLTS, WASHERS AND MISC.)

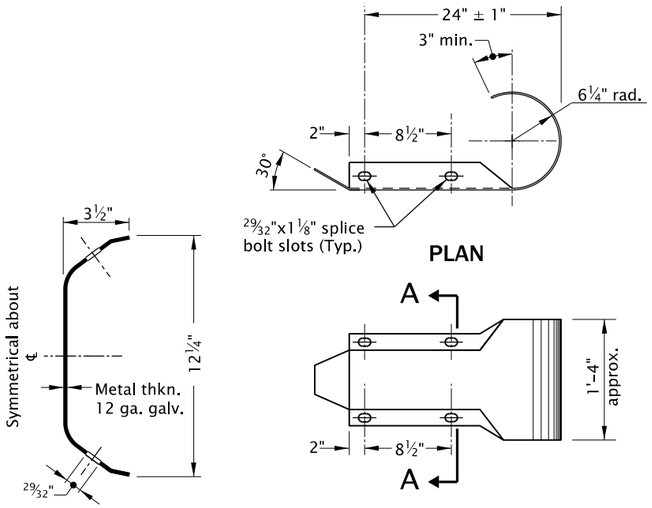
2021

DATE	REVISION DESCRIPTION

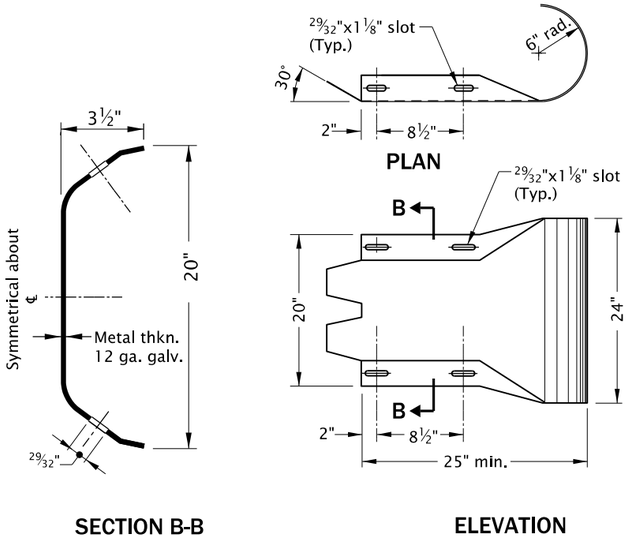
CALC. BOOK NO. N/A | SDR DATE 13-JAN-2020 | **RD416**

20-JUL-2020

RD417.dgn

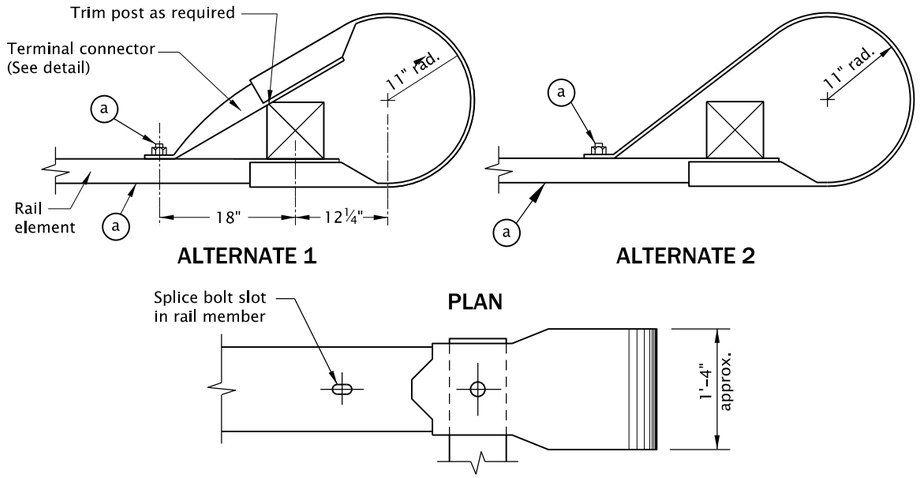


W-BEAM TYPE B END PIECE



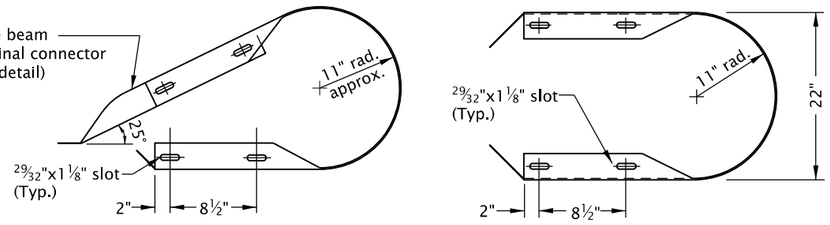
THRIE BEAM TYPE B END PIECE

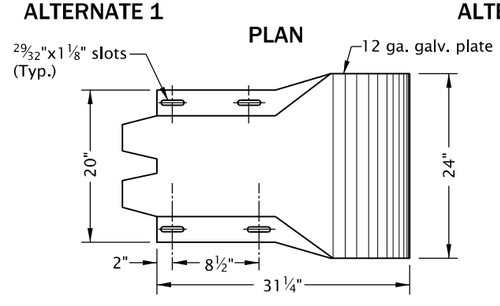
(a) Use rectangular washer under bolt head and nut on Type C End Piece as shown.



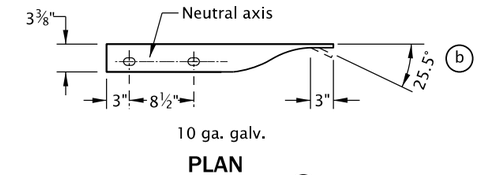
W-BEAM TYPE C END PIECE

(For details not shown, see Type B End Piece)

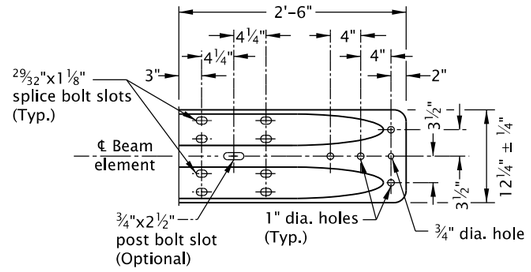




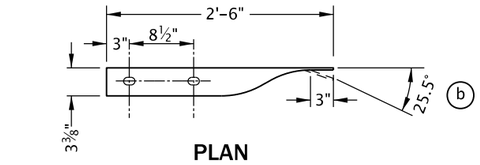
THRIE BEAM TYPE C END PIECE

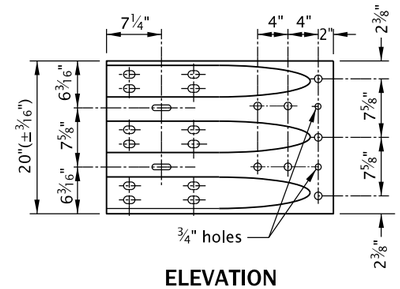


(b) 25.5" bend and hole reqd. only for use with alternate Type "C" end piece.



W-BEAM TERMINAL CONNECTOR





THRIE BEAM TERMINAL CONNECTOR

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. See appropriate guardrail standard drawing(s) for details not shown.
2. For details of guardrail connections to structural handrails, see special details or Standard Drawings as called for on 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

MIDWEST GUARDRAIL SYSTEM END SECTIONS

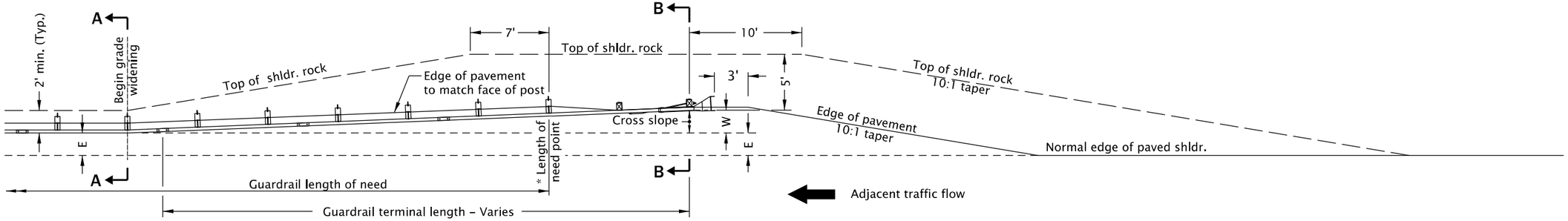
2021

DATE	REVISION DESCRIPTION

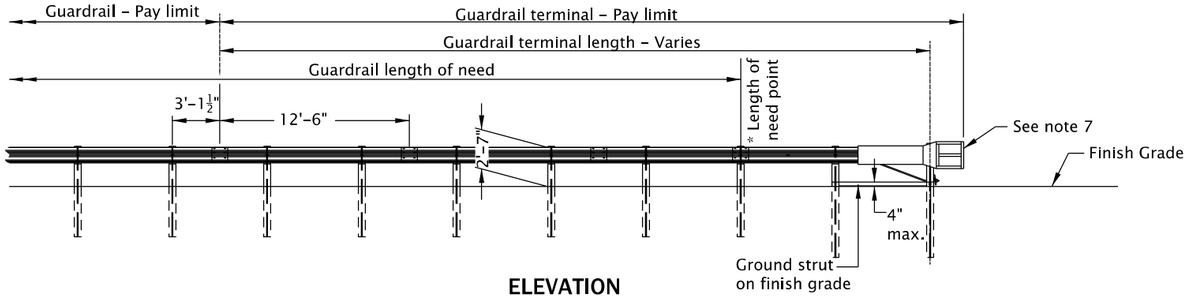
CALC. BOOK NO. N/A | SDR DATE 13-JAN-2020 | **RD417**

Effective Date: June 1, 2023 - November 30, 2023

19-JUL-2021
RD419.dgn

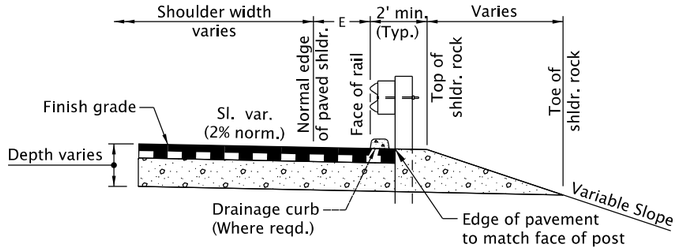


PLAN

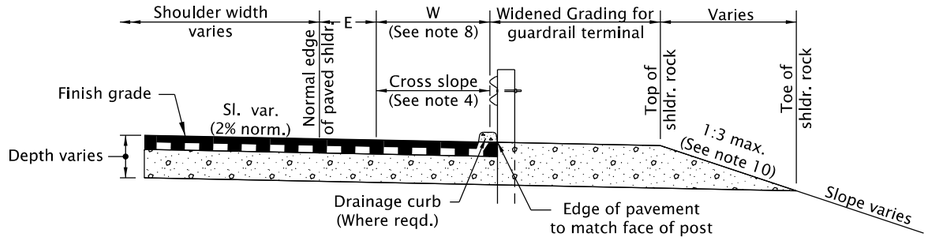


ELEVATION

* See note 6 and 9

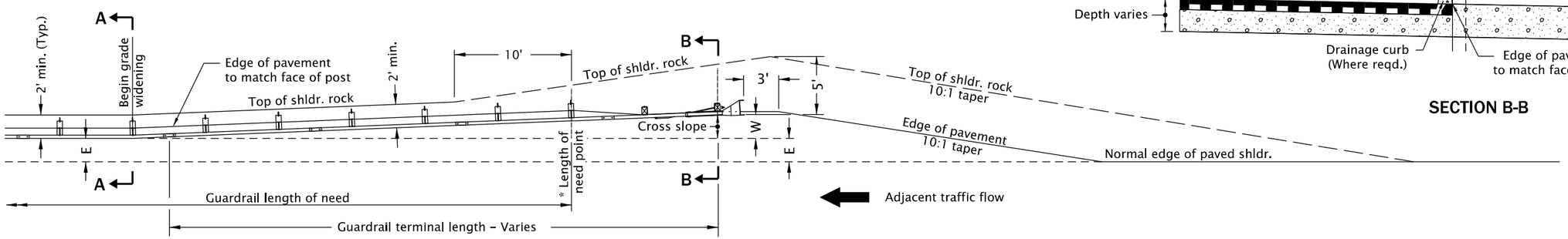


SECTION A-A



SECTION B-B

PREFERRED GRADING



ALTERNATIVE GRADING

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Use details shown as a general guide since manufacturer's details may vary. Install a guardrail terminal system that meets MASH requirements per manufacturer's recommendations. Ensure that guardrail terminal meets appropriate test level for the project.
2. See appropriate guardrail standard drawing(s) for details not shown. See project plans for details not shown. See Std. Dwg. RD701 for drainage curbs, where required. E=2' or as shown on project plans.
3. Guardrail Non-flared terminal shall be installed with a minimum 1 foot offset ensuring that the end piece is entirely off normal shoulder.
4. Cross slope to match adjacent roadway cross slope (preferred). If required, maximum shoulder slope 10% for guardrail widening. If required, maximum grade break at normal edge of shoulder 8%.
5. On two way two lane highways, both ends of guardrail runs shall be provided with a terminal flared or non-flared. Paving of widened shoulder to the face of posts on both ends of guardrail runs is required.
6. Provide guardrail terminal from ODOT's QPL. Install according to manufacturer's recommendations (post count varies). Provide shop drawings to Engineer.
7. Install a reflectorized object marker on head of every guard rail terminal with "W" 4 feet or less according to manufacturer's recommendations.
8. "W" distance is measured to face of guardrail at end post, exclusive of end piece.
9. Length of need post location varies by manufacturer.
10. 1:4 slope or flatter preferable, 1:3 maximum.

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 GRADING FOR TERMINALS

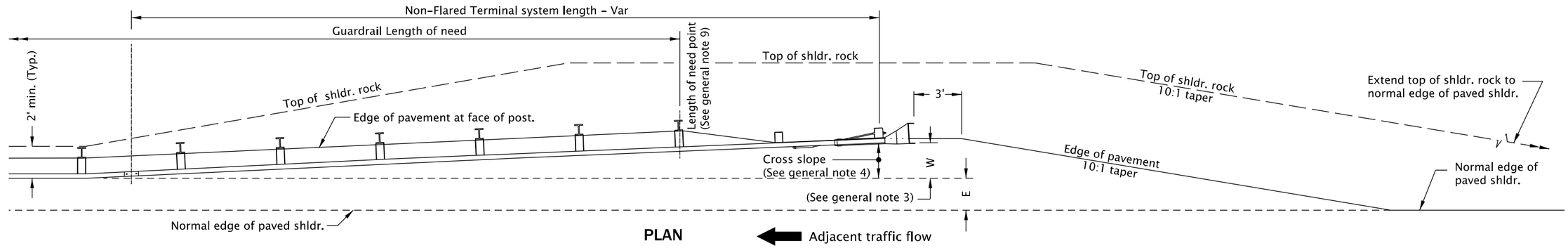
2021

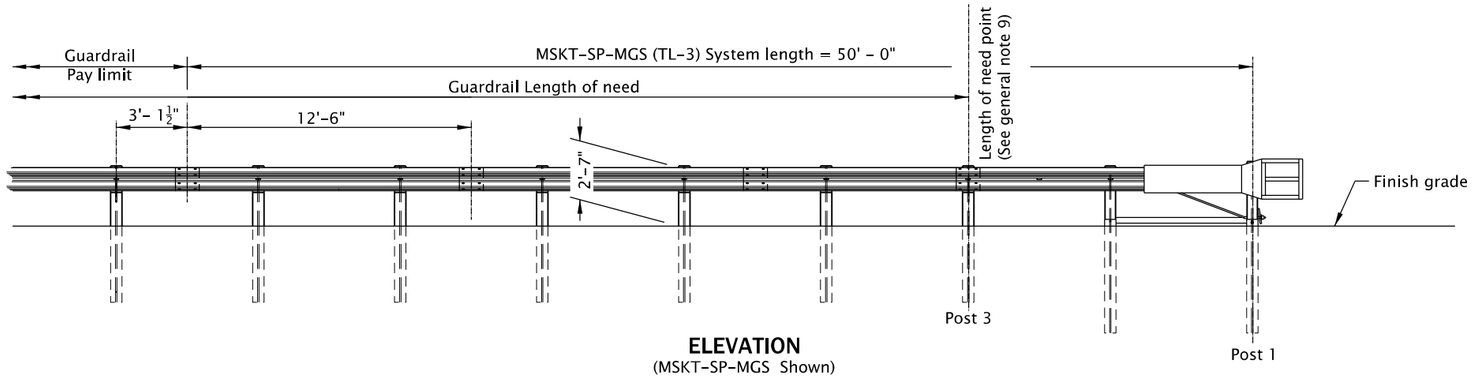
DATE	REVISION DESCRIPTION

CALC. BOOK NO. N/A | SDR DATE 19-JUL-2021 | **RD419**

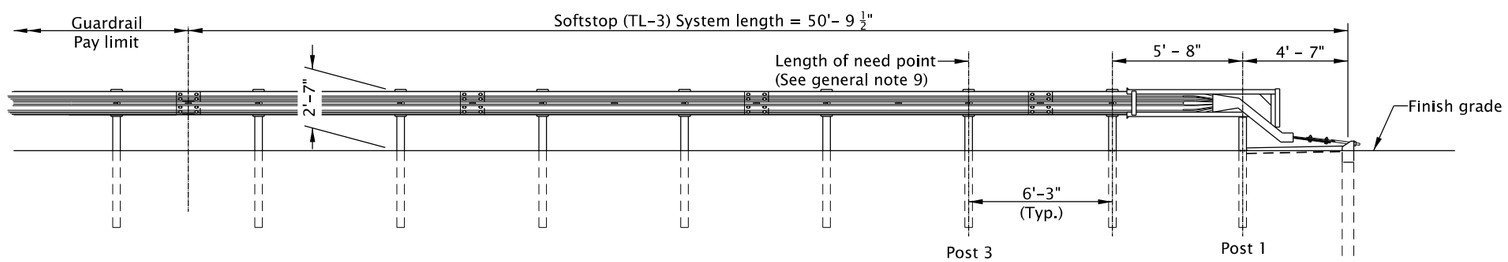
BIDDING PLANS

19-JUL-2021
RD420.dgn

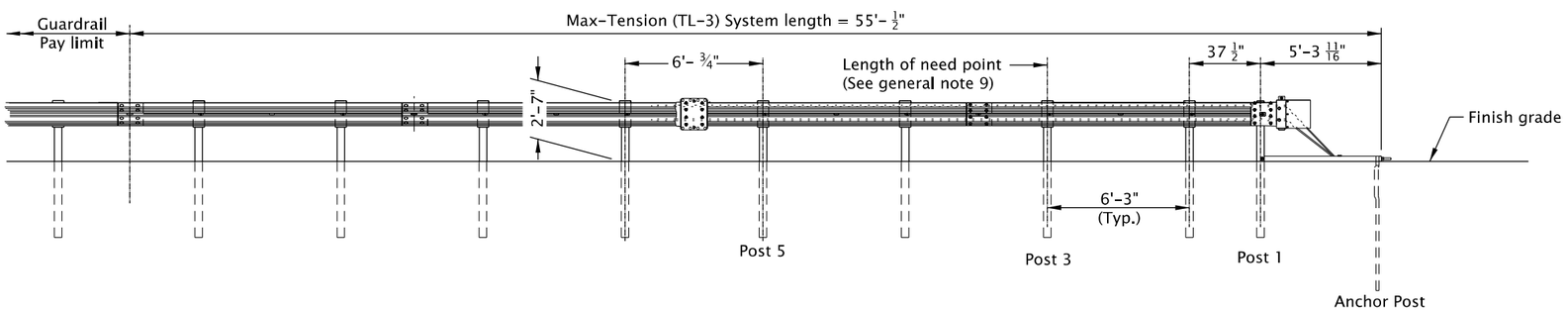




ELEVATION
(MSKT-SP-MGS Shown)



ELEVATION
(SOFTSTOP Shown)



ELEVATION
(MAX-TENSION Shown)

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Use details shown as a general guide since manufacturer's details may vary. Install a guardrail terminal system that meets MASH requirements per manufacturer's recommendations. Ensure that guardrail terminal meets appropriate test level for the project.
2. See appropriate guardrail standard drawing(s) for details not shown. See project plans for details not shown. See Std. Dwg. RD701 for drainage curbs, where required. E=2' or as shown on project plans.
3. Guardrail Non-flared terminal shall be installed with a min. 1 foot offset ensuring that the end piece is entirely off normal shldr.
4. Cross slope to match adjacent roadway cross slope (preferred). If required, maximum shoulder slope 10% for guardrail widening. If required, maximum grade break at normal edge of shoulder 8%.
5. On two way two lane highways, both ends of guardrail runs shall be provided with a terminal flared or non-flared. Paving of widened shldr. to the face of posts on both ends of guardrail runs is required.
6. Provide guardrail terminal from ODOT's QPL. Install according to manufacturer's recommendations (post count varies). Provide shop drawings to Engineer.
7. Install a reflectorized object marker on head of every guard rail terminal with "W" 4 feet or less according to manufacturer's recommendations.
8. "W" distance is measured to face of guardrail at end post, exclusive of end piece.
9. Length of need post location varies by manufacturer.

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 NON-FLARED ENERGY-ABSORBING TERMINAL

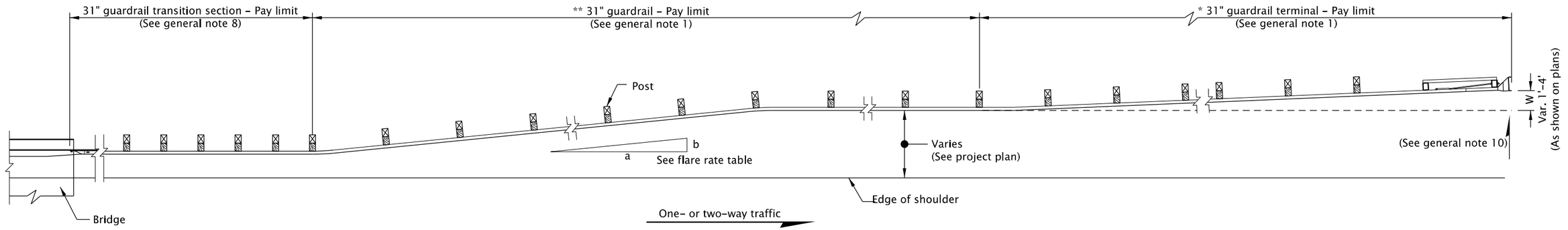
2021

DATE	REVISION DESCRIPTION

CALC. BOOK NO. N/A | SDR DATE 19-JUL-2021 | **RD420**

BIDDING PLANS

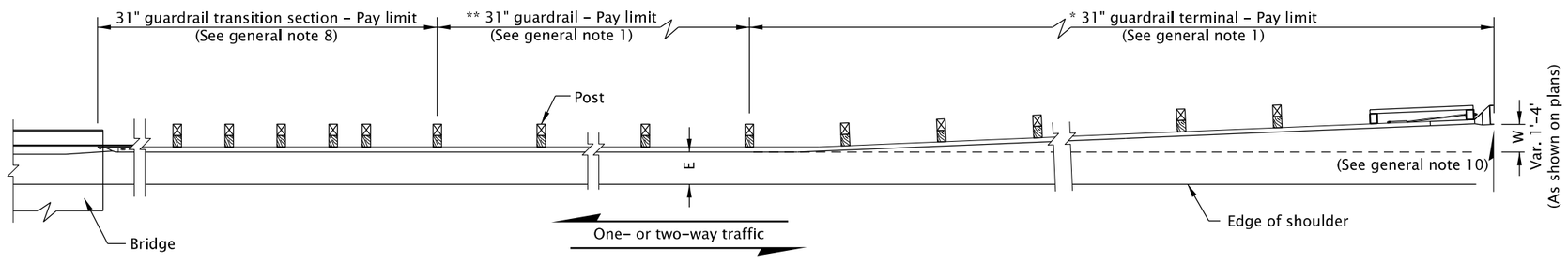
14-JAN-2022
RD442.dgn



NARROW BRIDGE ON ONE OR TWO-WAY TRAFFIC

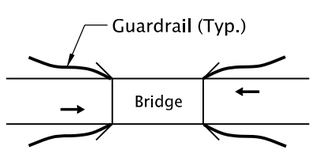
* Provide from ODOT's QPL.
Install according to manufacturer's instruction.

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

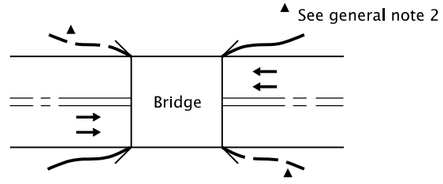


ONE OR TWO-WAY TRAFFIC

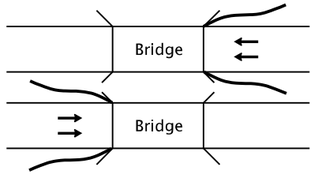
FLARE RATE TABLE	
POSTED SPEED (MPH)	FLARE RATE a:b
70	15 : 1
60	14 : 1
55	12 : 1
50	11 : 1
45	10 : 1
40 or less	9 : 1



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.
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. See dwg. no. RD482 for Type 3, Nested W-Beam details. 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

2021

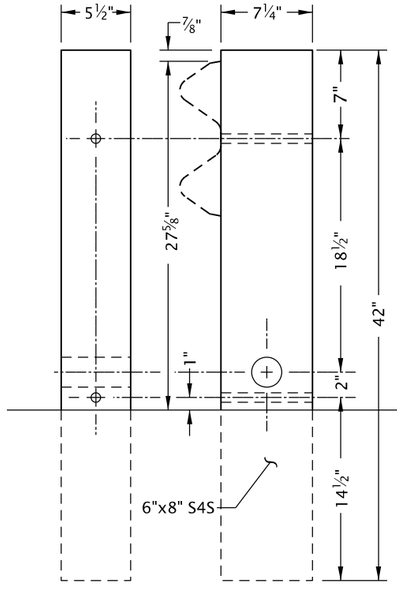
DATE	REVISION DESCRIPTION

CALC. BOOK NO. N/A | SDR DATE 14-JAN-2022 | **RD442**

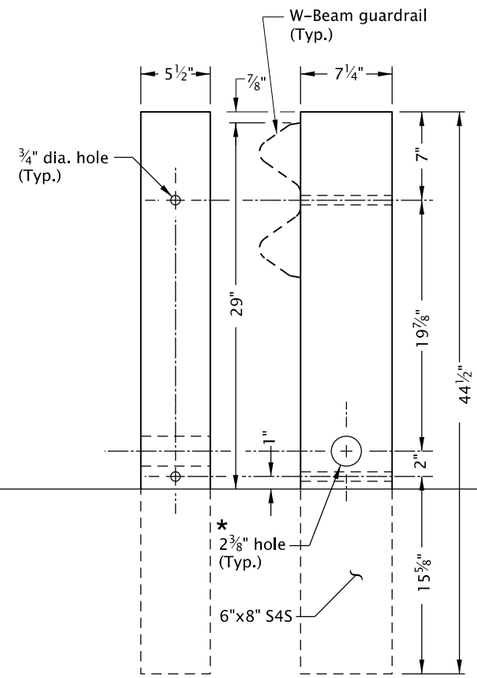
Effective Date: June 1, 2023 - November 30, 2023

20-JUL-2020

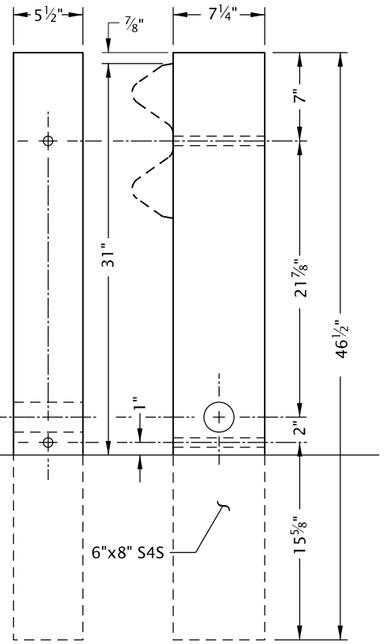
RD451.dgn



TOP OF RAIL
HEIGHT 27⅝"
(This detail is retained for maintenance purposes.
Do not use for new construction.)



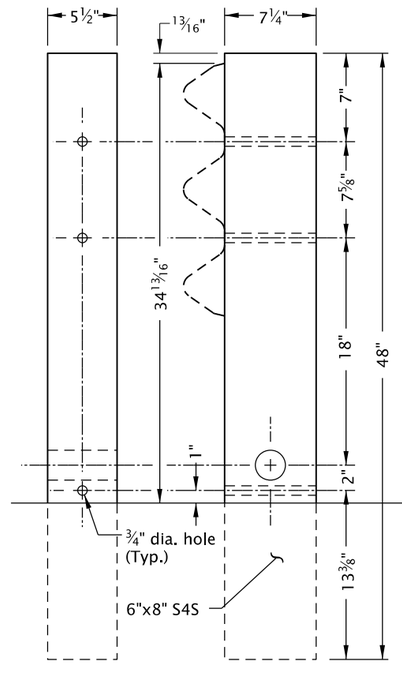
TOP OF RAIL
HEIGHT 29"



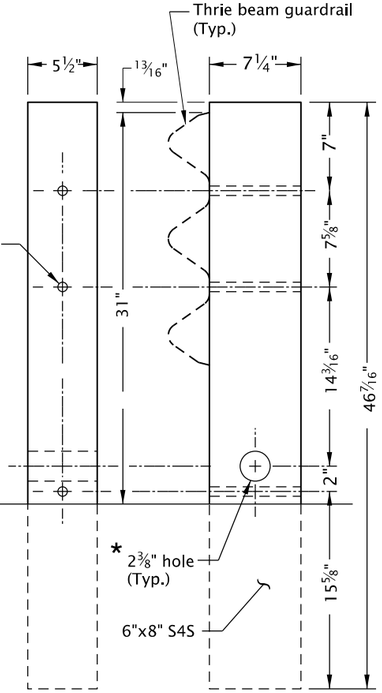
TOP OF RAIL
HEIGHT 31"

* 2" std. pipe in end post only, 2⅜" dia.hole

W-BEAM WOOD BREAKAWAY POST



TOP OF RAIL
HEIGHT 35" (Nom.)



TOP OF RAIL
HEIGHT 31"

THRIE BEAM WOOD BREAKAWAY POST

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. See appropriate guardrail standard drawing(s) for details not shown.
2. Use only 6"x8" S4S wood posts, trim to fit steel tube if reqd.

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

WOOD BREAKAWAY POSTS

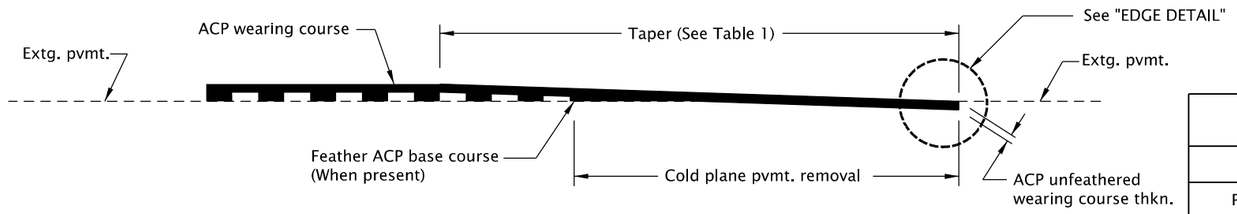
2021

DATE	REVISION DESCRIPTION

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2020 | **RD451**

Effective Date: June 1, 2023 – November 30, 2023

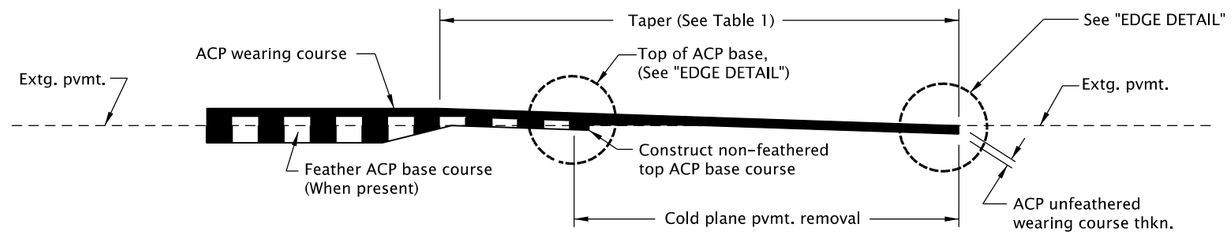
20-JUL-2020
RD610.dgn



METHOD A *

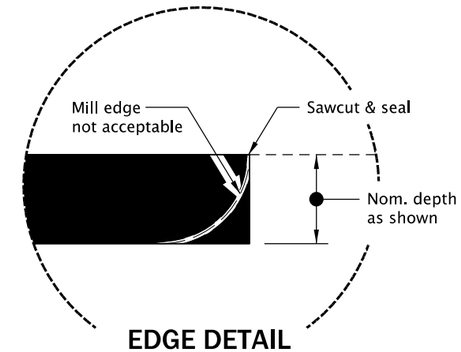
* See project plans for method.

TABLE 1	
TAPER LENGTHS	
Posted Speed	Taper Length
< 45 mph	1" per 50'
≥ 45 mph	1" per 100'

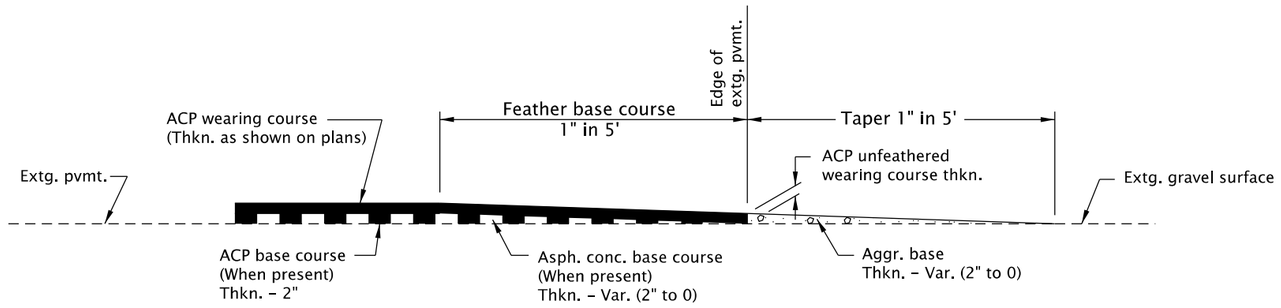


METHOD B *

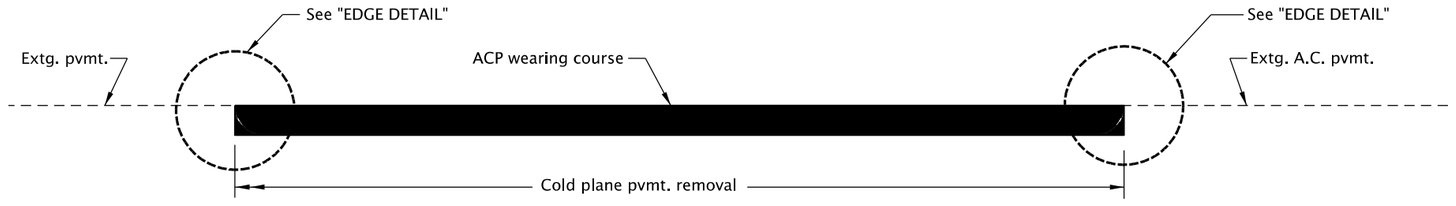
ACP PAVEMENT MATCH AT PROJECT ENDS OR BRIDGE ENDS WHEN NOT OVERLAYING THE BRIDGE



EDGE DETAIL



METHOD OF FEATHERING ACP PAVEMENT AT GRAVEL APPROACHES



METHOD OF MATCHING EXTG. ACP INLAY SURFACING

(Inlay to extg. asphalt conc. pvmt.)

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

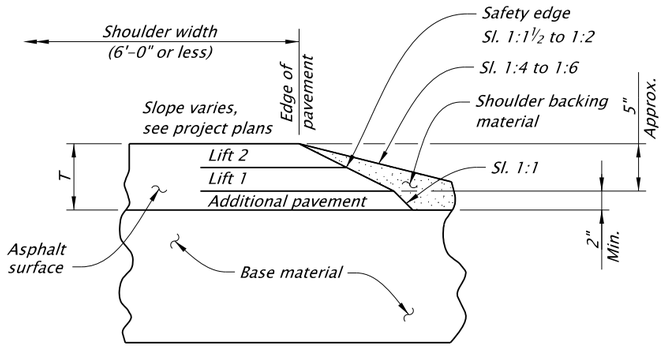
ASPHALT CONCRETE PAVEMENT (ACP) DETAILS

2021

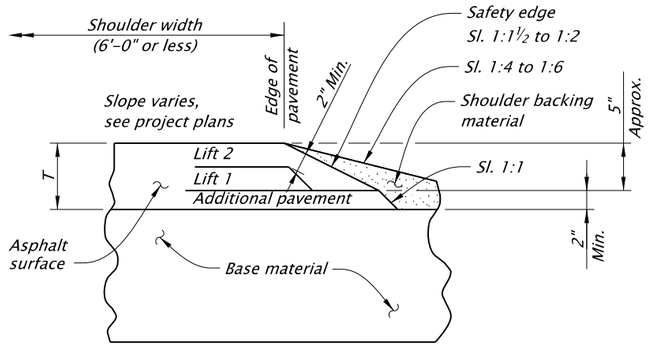
DATE	REVISION DESCRIPTION

CALC. BOOK NO. N/A | SDR DATE 25-JUL-2017 | **RD610**

19-JUL-2021
RD615.dgn

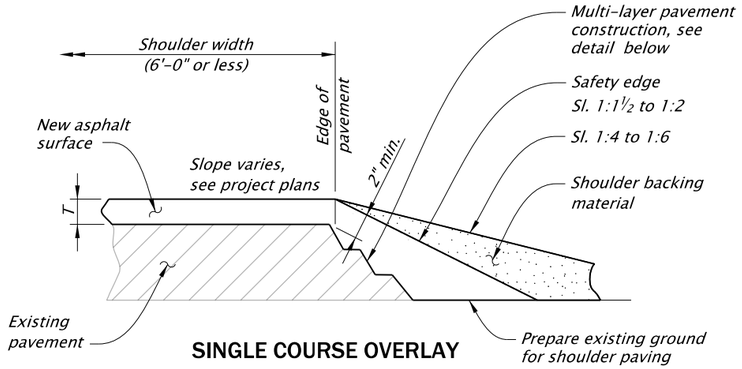


SAFETY EDGE PLACED WITH LIFTS

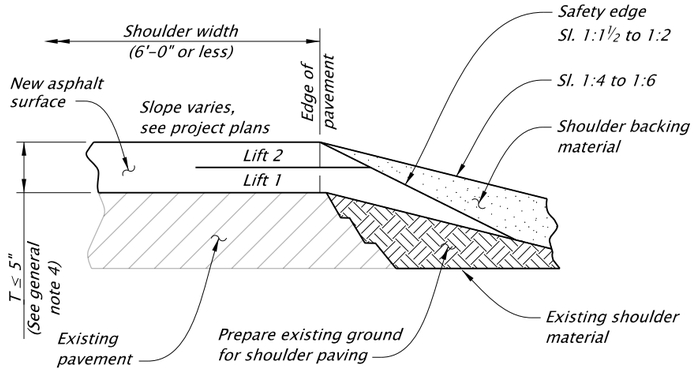


SAFETY EDGE PLACED ONLY WITH FINAL LIFT

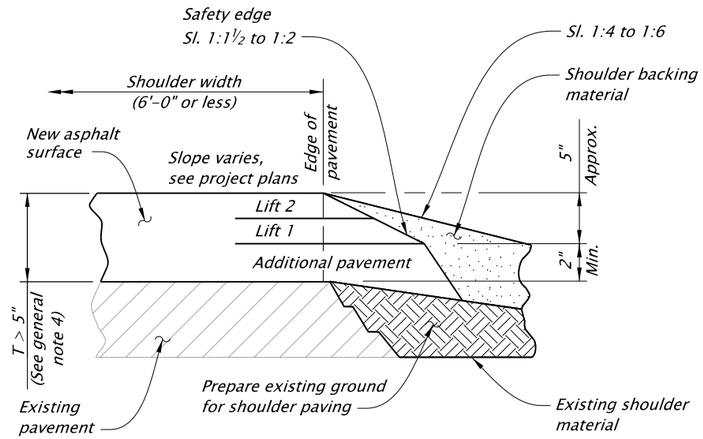
SAFETEY EDGE FOR ASPHALT CONCRETE (NEW CONSTRUCTION)



SINGLE COURSE OVERLAY



PAVEMENT THICKNESS (T) 5" OR LESS

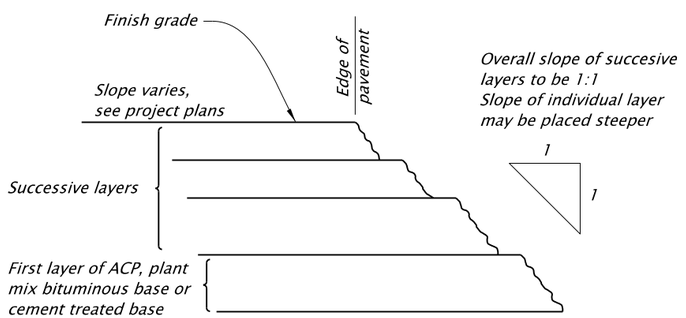


PAVEMENT THICKNESS (T) GREATER THAN 5"

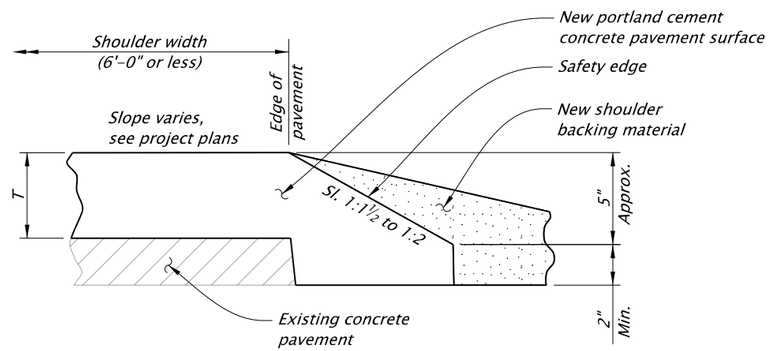
SAFETY EDGE FOR ASPHALT CONCRETE RECONSTRUCTION (INCLUDING MILL, INLAY AND OVERLAY)

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. *Safety edges are required at the outside edges of the paved roadway (edge of travel lane or edge of paved shoulders), where the wearing surface thickness is 2" or greater, except where indicated in the plans.*
2. *Construct the safety edge at a slope of 1:1½ to 1:2 measured from the pavement surface.*
3. *Do not construct safety edge at intersections, paved drives, or other obstructions.*
4. *For total new asphalt depth of "T"≤5", construct the safety edge to the full thickness of the surface and intermediate courses. For total new asphalt depth of "T" > 5", construct the safety edge to a depth of 5" approximately with a 1:1 sloped face below the safety edge.*



MULTI-LAYER PAVEMENT CONSTRUCTION



SAFETY EDGE FOR PORTLAND CEMENT CONCRETE PAVEMENT OVERLAY

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

SURFACE EDGE DETAILS

2021

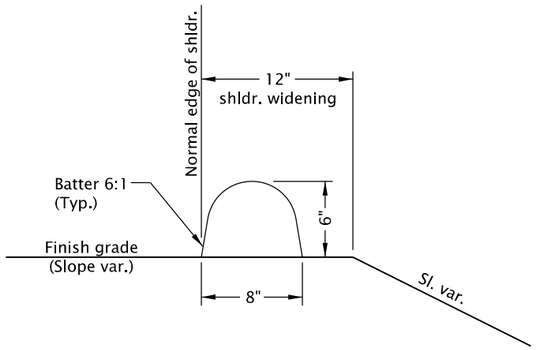
DATE	REVISION DESCRIPTION
07-2021	TITLE CHANGED, REVISED DETAILS AND NOTES

CALC. BOOK NO. N/A | SDR DATE 19-JUL-2021 | **RD615**

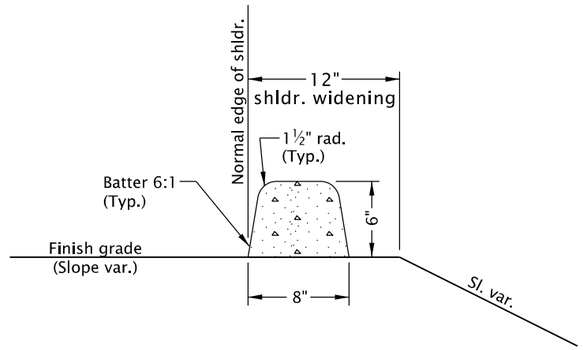
Effective Date: June 1, 2023 - November 30, 2023

BIDDING PLANS

20-JUL-2020
RD701.dgn



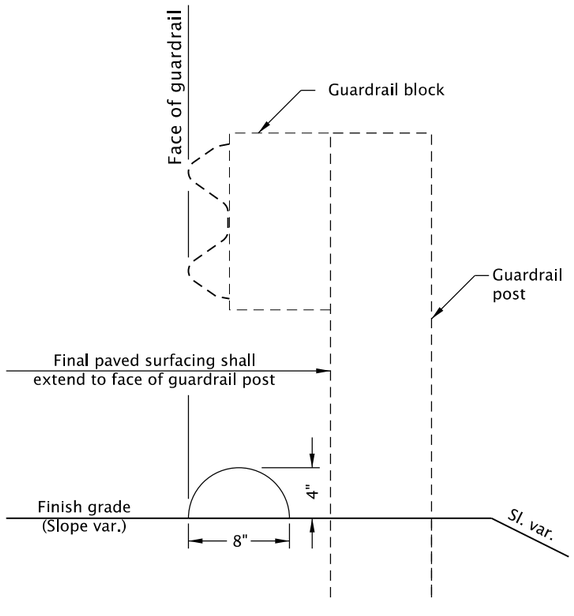
ASPHALT CONCRETE



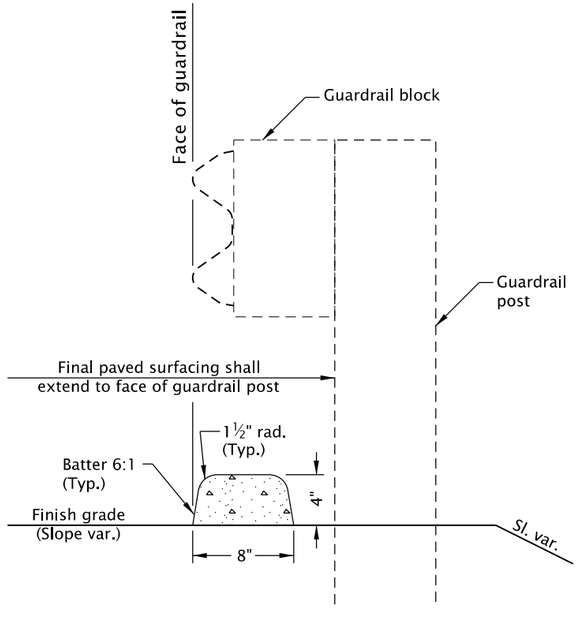
PORTLAND CEMENT CONCRETE

DRAINAGE CURBS

(See general note 4)



ASPHALT CONCRETE



PORTLAND CEMENT CONCRETE

DRAINAGE CURBS UNDER GUARDRAIL

(See general note 4)

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. For PCC drainage curbs, construct curb expansion joints at 200' maximum spacing, and at points of tangency.
2. For PCC drainage curbs, construct curb contraction joints at 15' maximum spacing.
3. Dimensions are nominal, vary to conform with curb machine approved by the engineer.
4. When bonding to dense graded ACP, apply epoxy cement between surfaces.
5. When drainage curb is required, curb alignment shall be the same as face of guardrail, as shown above. When a run of drainage curb, or any part thereof, is placed under guardrail, curb height shall be 4".
6. For other curb types, see Std. Dwg. RD700.
7. For guardrail details not shown, see Std. Dwg. RD400.

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

DRAINAGE CURBS

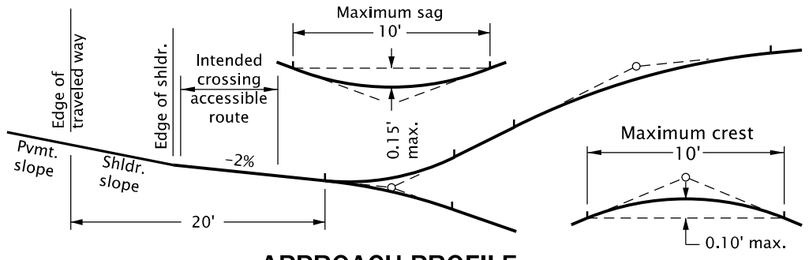
2021

DATE	REVISION DESCRIPTION

CALC. BOOK NO. N/A | SDR DATE 20-JUL-2020 | **RD701**

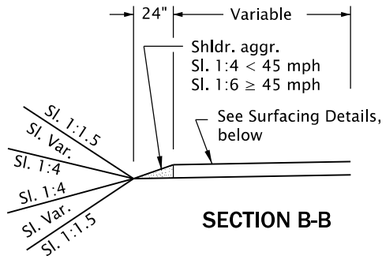
BIDDING PLANS

20-JUL-2020
RD715.dgn



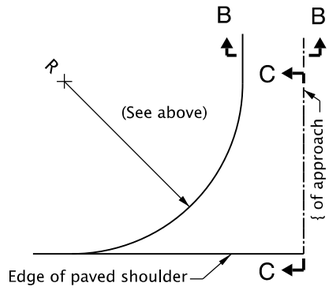
APPROACH PROFILE

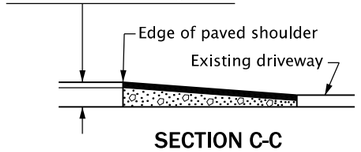
NOTE:
When grades on approaches meet without vertical curves the maximum algebraic difference on crests should be 8% and on sags 12%. Grades steeper than 15% should not be used without prior approval of the engineer of record. Any driveways with slopes exceeding 12% shall be paved.



SECTION B-B

R= { 30' normal (Major constr.) / 20' normal (Minor constr.)



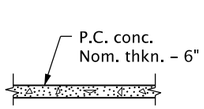


SECTION C-C

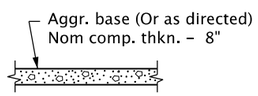
HALF PLAN

NOTE:
Normal paving limits to extend 20' (30' for public road connections) from the edge of pavement or to the right of way line, whichever is less. Approach surfacing and width to then match existing approach.

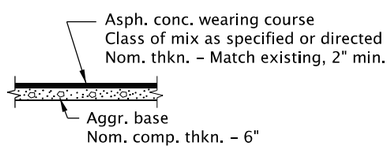
APPROACH



P.C. CONCRETE SURFACING



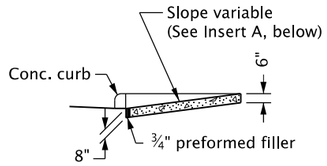
GRAVEL SURFACING



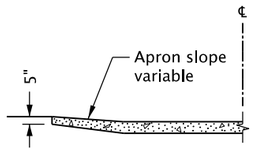
ASPHALT CONCRETE SURFACING

APPROACH AND DRIVEWAY CONNECTION SURFACING DETAILS

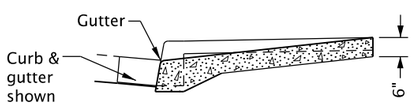
TYPE A
PORTLAND CEMENT CONCRETE



SECTION D-D

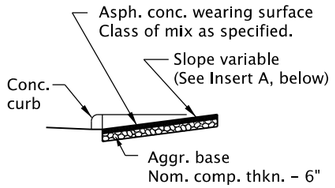


SECTION E-E

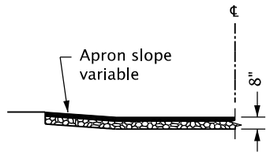


SECTION A-A
FOR MONOLITHIC DRIVEWAYS

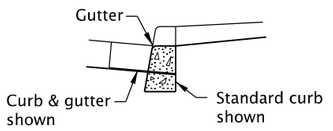
TYPE A-1
ASPHALT CONCRETE



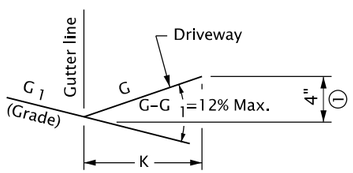
SECTION D-D



SECTION E-E

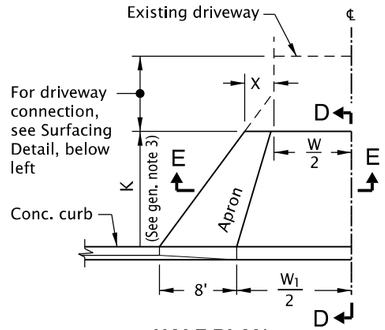


SECTION A-A
FOR DRIVEWAYS

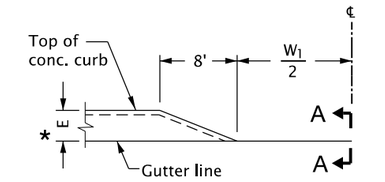


INSERT A

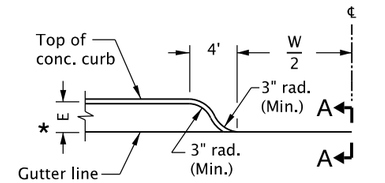
① Minimum allowable for drainage control on negatively sloped driveways.



HALF PLAN



HALF ELEVATION



HALF ELEVATION
(ALTERNATE APRON SLOPE)

(See General Note 5)

* Curb exposure E = 7" normal. Vary as shown on plans or as directed.

TABLE A

W (ft)	X (ft)	K (ft) 5	6	8	10
		W_1 (ft)			
12	3	15	15	15	15
14		17	17	17	17
16		19	19	19	19
18		21	21	21	21
20		23	23	23	23
22	4	27	28	29	30
24		29	30	31	32
26		31	32	33	34
28		33	34	35	36
30		35	36	37	38
32	5	41	42	44	46
34		43	44	46	48
36		45	46	48	50

Where a travel lane is constructed adjacent to the curb line, use 16' W min. for residence and 30' W min. for light commercial, add 5' to W_1 for both. Do not add the 5' to W_1 when 4' min. shldr. or bikeway is included in the typical.

NON-SIDEWALK DRIVEWAYS

NOTE: This driveway type shall not be used along a pedestrian route. See "Table A" for dimensions not shown.

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Driveway details shown on this drawing are to be used on roadways where there are no existing or planned sidewalks in driveway vicinity. For driveways located in a sidewalk see Std. Dwgs. RD720, RD721, RD725 and/or RD730, RD735, RD740, RD745, RD750.
2. Width of driveway (W) as shown on plans or as directed.
3. K is the distance from back of curb to back of driveway (10' max.).
4. Where existing driveway is in good condition, construct only as much as required for satisfactory connection with new work.
5. "Alternate Apron Slope" used only where plans designate. Alternate Apron Slope may also be used at local jurisdiction's request when approved by the Project Manager.
6. Increase thickness of asphalt concrete and stone base where shown on plans.
7. For curb details, see Std. Dwgs. RD700 & RD701.
8. For expansion and contraction joint requirements, see applicable curb and sidewalk standard drawings.

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

APPROACHES AND NON-SIDEWALK DRIVEWAYS

2021

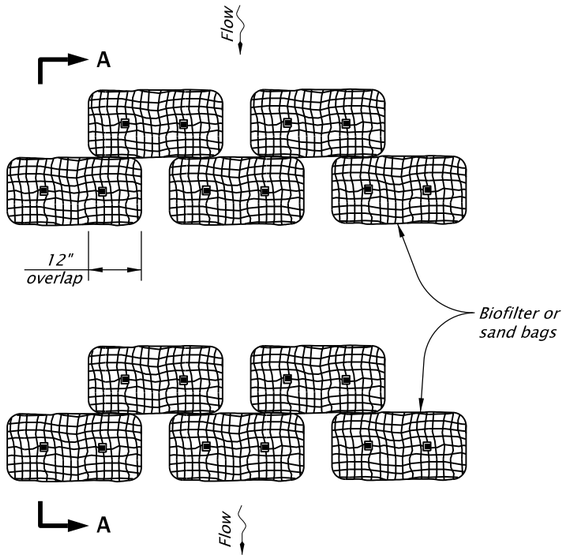
DATE	REVISION DESCRIPTION

CALC. BOOK NO. N/A | SDR DATE 14-JAN-2022 | **RD715**

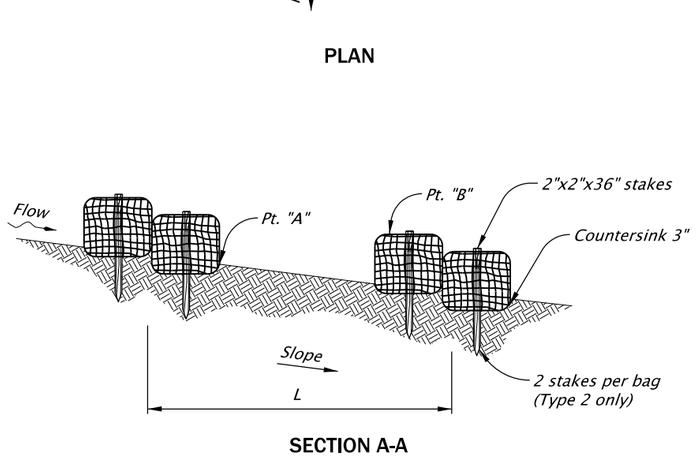
Effective Date: June 1, 2023 - November 30, 2023

BIDDING PLANS

RD1030.dgn 20-JAN-2021



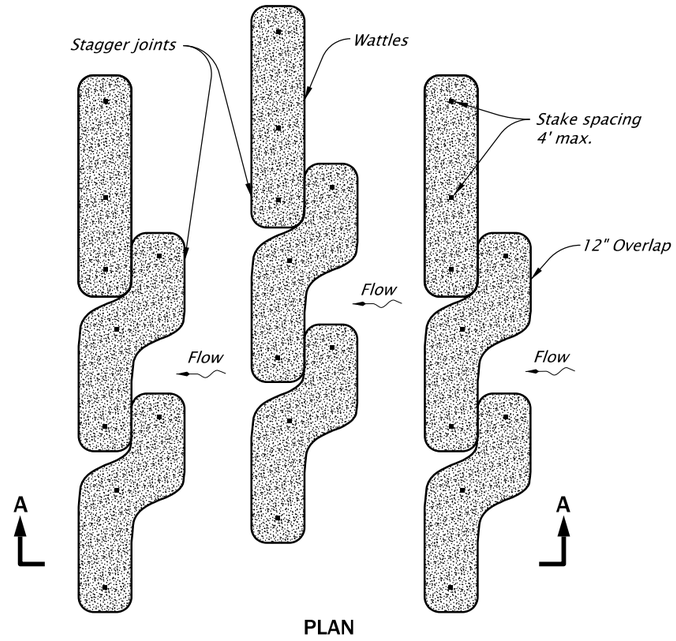
PLAN



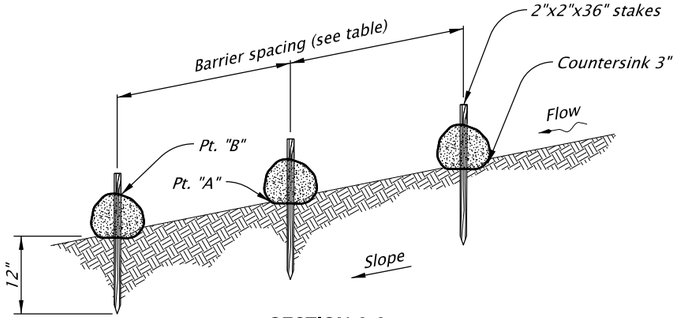
SECTION A-A

BIOFILTER BAG / SAND BAG BARRIER - TYPE 2 AND 4

NOT TO SCALE



PLAN



SECTION A-A

FIBER ROLL BARRIER - TYPE 3

NOT TO SCALE

NOTES:

1. *For Type 2 barrier, drive stakes flush with top of bag and into undisturbed ground a min. of 12". Omit stakes if bags are placed on paved surface.*

2. *For Type 2 and Type 4 barriers, space bags (L) so that the elevation of point "A" is less than or equal to the elevation of point "B".*

Type 2 – Biofilter bags
Type 3 – Wattles
Type 4 – Sand bags

BARRIER SPACING		
INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS		
% SLOPE	% SLOPE	MAXIMUM SPACING ON SLOPE
10% Flatter	1:10 or Flatter	300'
10 > % ≥ 15	10 > X ≥ 7.5	150'
15 > % ≥ 20	7.5 > X ≥ 5	100'
20 > % ≥ 30	5 > X ≥ 3	50'
Steeper than 30%	Steeper than 1:3	25'

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

SEDIMENT BARRIER TYPE 2, 3 AND 4

2021

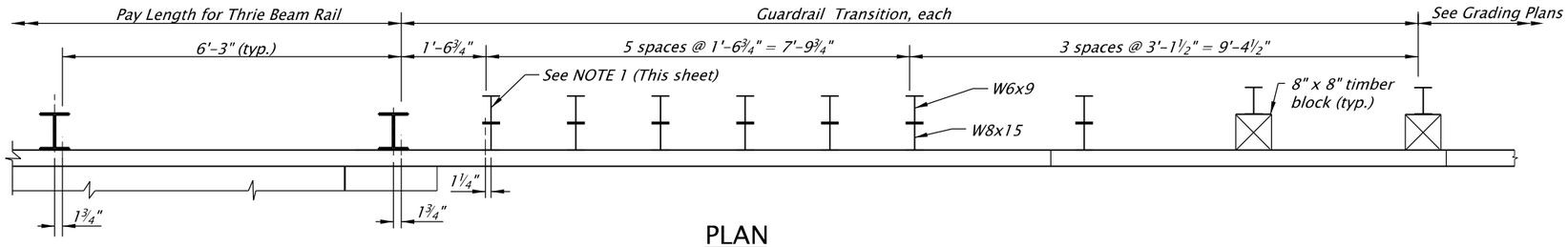
DATE	REVISION DESCRIPTION
01-2021	REMOVED CALC BOOK NUMBERS

CALC. BOOK NO. N/A | SDR DATE 20-JAN-2021 | RD1030

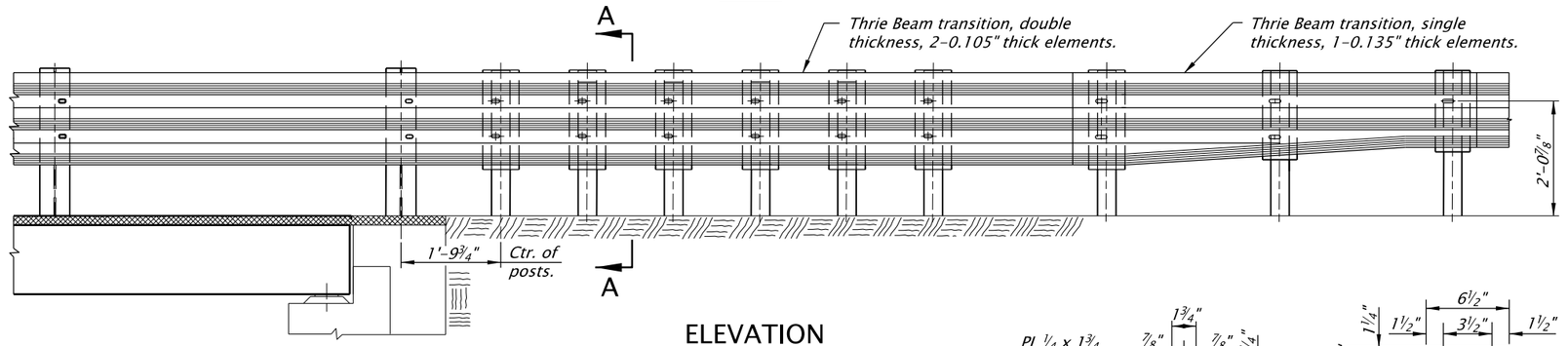
BIDDING PLANS

MAR-2017

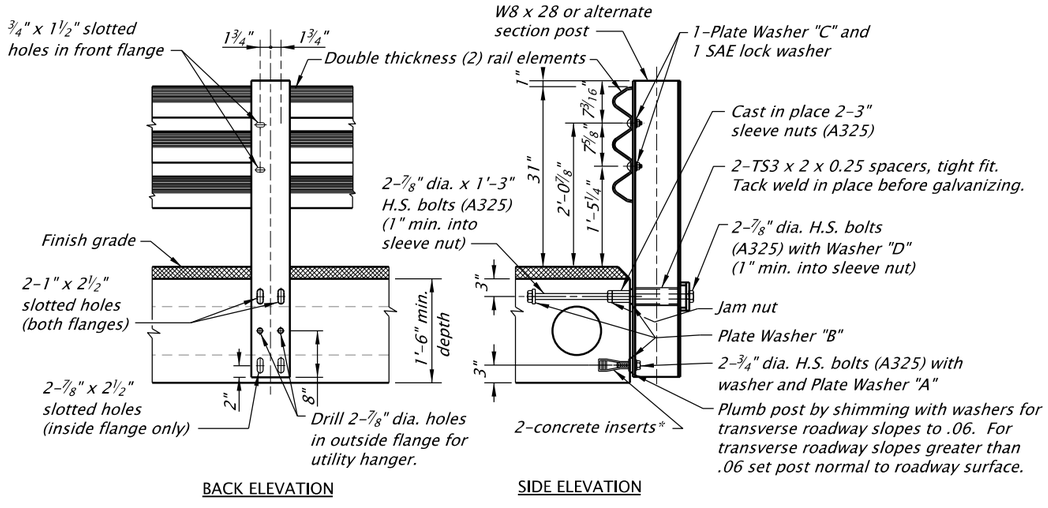
BR233.dgn



PLAN



ELEVATION



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.

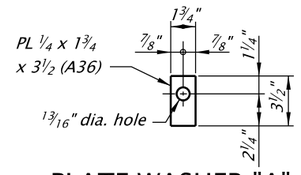


PLATE WASHER "A"

Position washer to completely cover slotted hole.

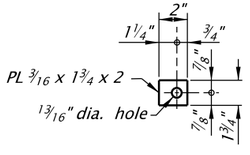


PLATE WASHER "C"

Position washer to completely cover slotted hole.

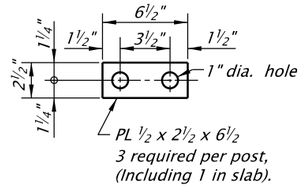
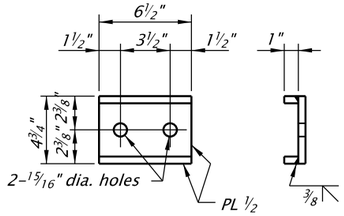


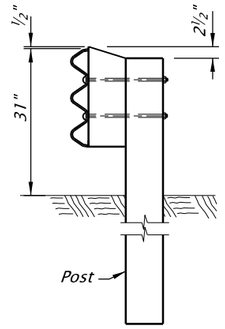
PLATE WASHER "B"



WASHER "D"

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

**CONCRETE INSERTS*
Hot-dip galvanized expanded coil concrete inserts with closed-back ferrule threaded to receive ¾" dia., Gr36 (ASTM A307)
Minimum insert length= 4½"
Minimum safe working load in tension= 4000 lbs.



SECTION A-A

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 dwgs. 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

2021

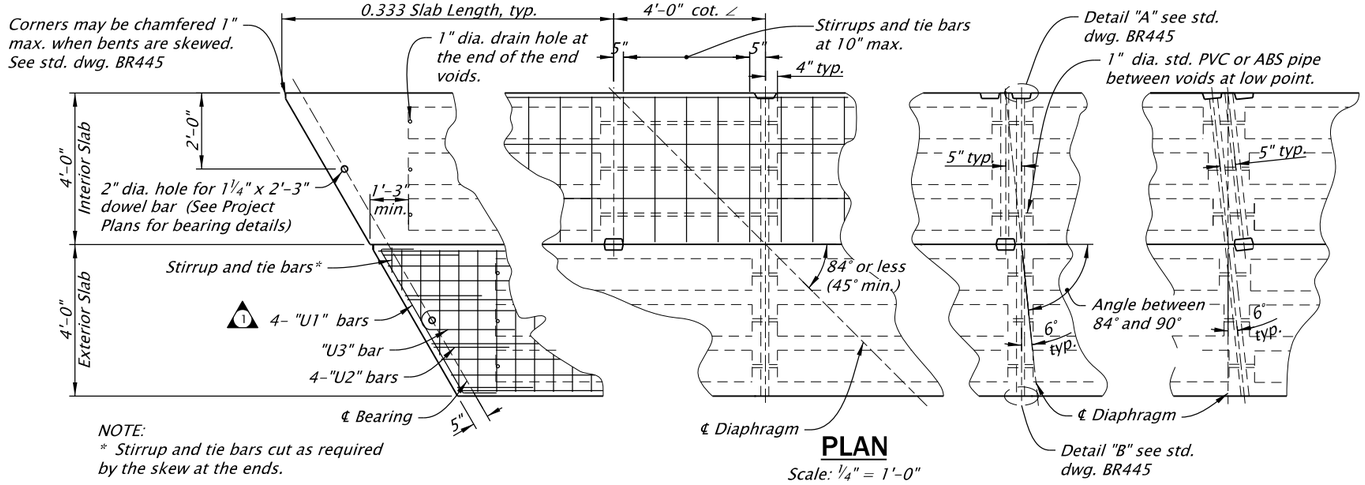
DATE	REVISION DESCRIPTION
-	-

CALC. BOOK NO. _ _ _ N/A _ _ _ | SDR DATE_ 20-APR-2018 | **BR233**

Effective Date: June 1, 2023 - November 30, 2023

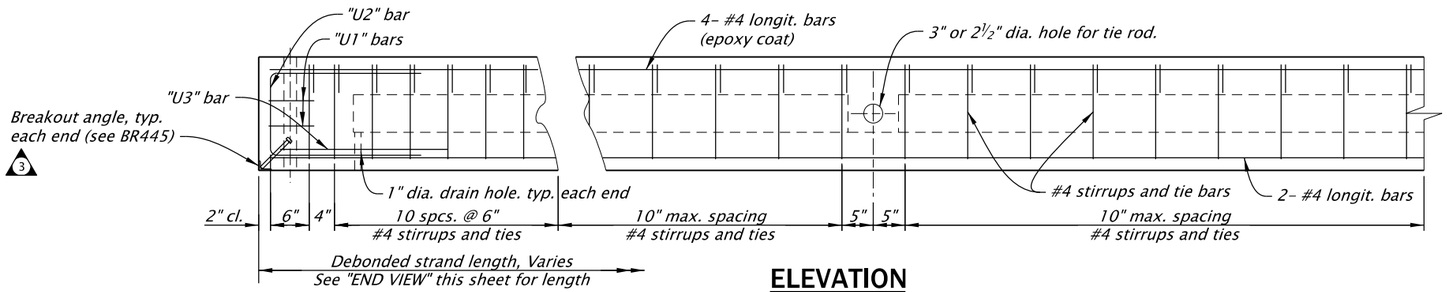
JUL-2022

BR410.dgn



PLAN

Scale: ¼" = 1'-0"



ELEVATION

Scale: ½" =1'-0"

NOTE "A" (Slab End Bars)
2- #4 x 10'-0", slabs 4, 5, and 6
4- #4 x 15'-0", slabs 7, 8 and 9
Place bars each end of each slab (Epoxy coat).

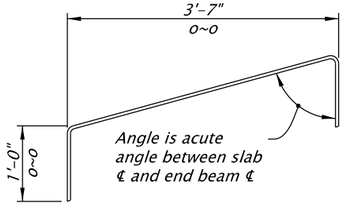
NOTE:
Grout keyway as specified in General Notes.
Omit keyway on exterior side of exterior slabs.
Keyway is continuous.

SECTION PROPERTIES

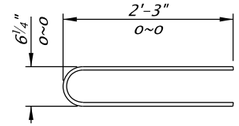
Area =	621in²
c.g. =	8.94 in
I =	21,626 in⁴
St =	2386 in³
Sb =	2420 in³
Weight =	668 lbs/ft
J =	52,200 in⁴
K =	0.71
V/S =	4.70
Form wt = (tubes)	14 lbs/ft
Total wt w/forms=	682 lbs/ft

Diaphragm Weight

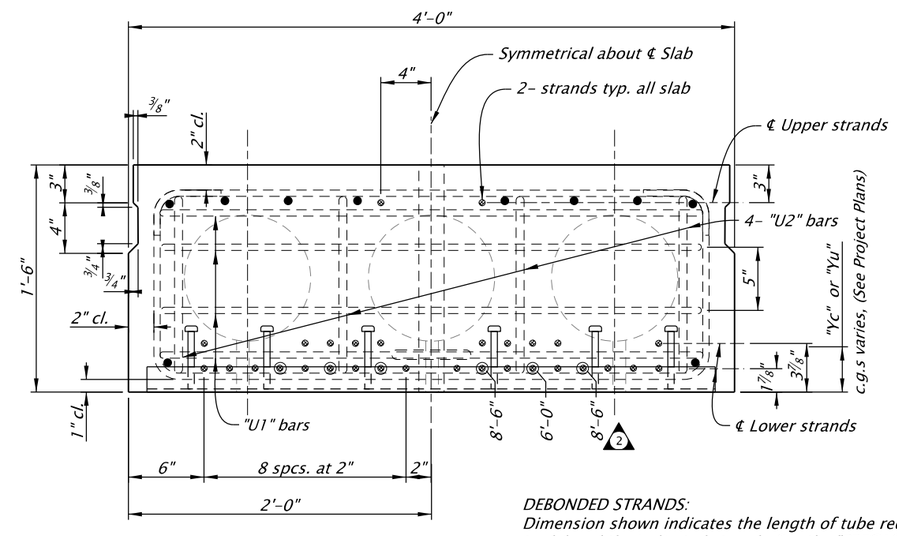
No Skew	260 lb
15° Skew	430 lb
30° Skew	740 lb
45° Skew	1170 lb



1 **#4 "U1" BAR**
(8- required per slab)



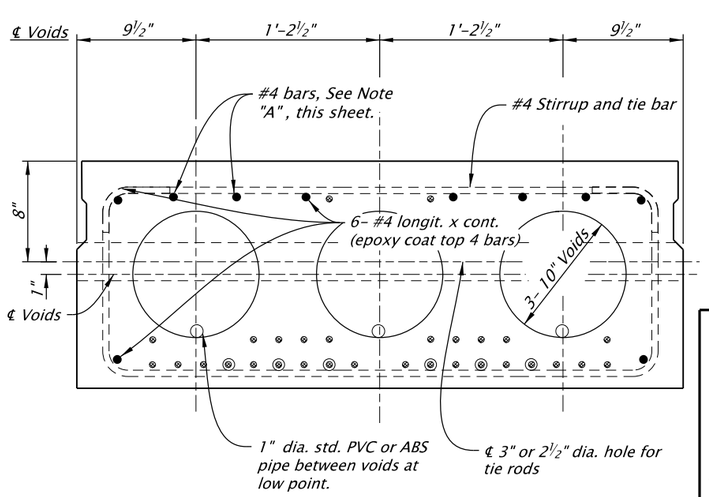
#6 "U3" BAR (A706)
(2- required per slab)



END VIEW

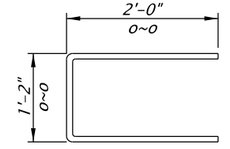
Scale: 1" = 1'-0"

DEBONDED STRANDS:
Dimension shown indicates the length of tube required, at both ends, to debond the indicated strand. See the "PRECAST PRESTRESSED SLAB SCHEDULE" in the project plans for the strand pattern detail.
Detension strands in order of increasing tube length shown.

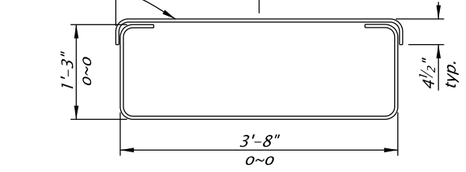


MIDSPAN VIEW

Scale: 1" = 1'-0"



#5 "U2" BAR
(8- required per slab)



#4 STIRRUP & TIE

Accompanied by dwg. BR445

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

18" PRECAST PRESTRESSED SLAB

2021

	DATE	REVISION DESCRIPTION
4	07-2020	Added end zone reinf.
5	07-2020	Revised debonded lengths
	07-2020	Updated drawing to current stds.
6	07-2022	Added breakout angle.

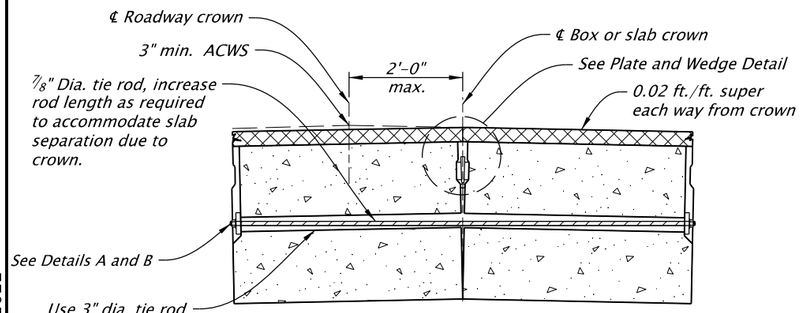
CALC. BOOK NO. N/A | SDR DATE 08-JUL/2022 | **BR410**

Effective Date: June 1, 2023 - November 30, 2023

BIDDING PLANS

JUN-2022

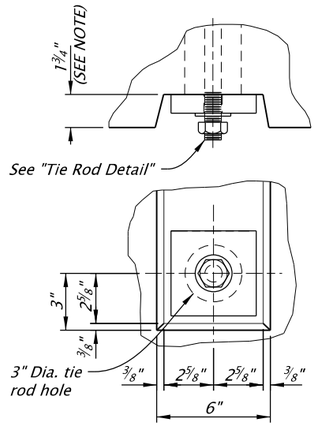
BR445.dgn



TYPICAL DETAIL FOR INSTALLING BOXES OR SLABS ON CROWN

NOTE:
Tighten tie rods until the bottom corners of the boxes or slabs are in contact. Loosen the tie rod and install the plates and wedges per detail. Shift wedge location as required to avoid conflict with the tie rod.

Tension the tie rods. Install boxes or slabs level and build up roadway crown with AC wearing surface when roadway width is 28' or less (for bridges with ACWS).



DETAIL "A"

Non-Tensioning End

NOTE:
1 3/4" @ tie rod ℄ (2 1/2" depth may be used for slabs with an appropriate reduction in tie rod length)

GENERAL NOTES FOR PRESTRESSED BOXES AND SLABS

Boxes and slabs are designed for live and superimposed dead loading as shown in the General Notes for the Project.

Provide the class of concrete shown in the Slab or Box Schedule with nominal maximum size aggregate of 1 or 3/4 . Transfer prestress after the concrete reaches the minimum concrete strength at transfer shown in the Slab or Box Schedule.

Select a keyway grout from the QPL for filling keyways, lifting blockouts and tie rod blockouts.

Allow traffic on the bridge only after keyway grout has reached design strength.

Provide reinforcing steel as specified in the General Notes for the Project.

Provide smooth dowels conforming to AASHTO M31, Grade 60 (ASTM A615, Grade 60), ASTM F1554, Grade 55 or ASTM A529, Grade 55. (2) (1)

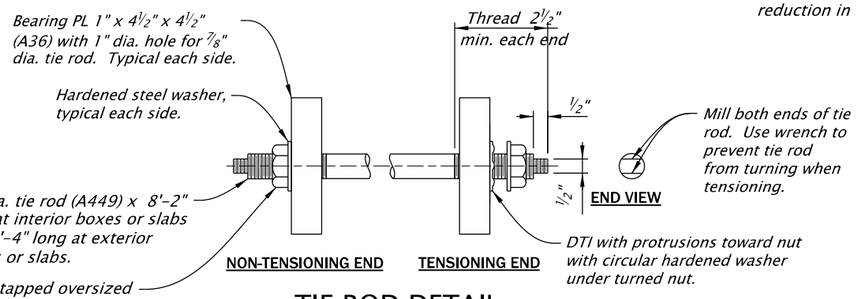
Provide 1/2" diameter 7 wire low relaxation prestressing steel strand conforming to AASHTO Specification M203 (ASTM A416), Grade 270 Supplement 1.

Tension strand initially to 31.0 kips per strand (after harping deflected strand). Debond strands where specified using either split or solid plastic sheathing with a minimum wall thickness of 0.025".

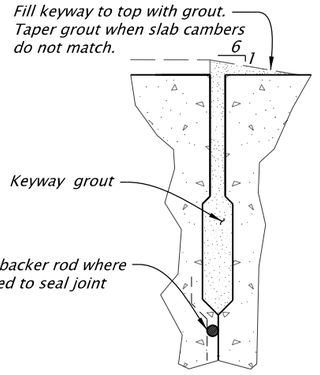
Provide high strength tie rods conforming to ASTM A449. Provide heavy hexagon nuts conforming to ASTM A563. Provide hardened steel washers conforming to ASTM F436. Hot-dip galvanize tie rods, plates, nuts and washers (except DTIs) after fabrication. (1)

Tighten tie rods to 39 kips (minimum) using mechanically galvanized direct tension indicators (DTIs) conforming to ASTM F959 and ASTM F3125, Grade A325. Tighten all tie rods (per box or slab) to about one half the specified tension before proceeding with final tensioning. (1)

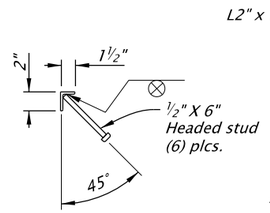
Keep boxes and slabs upright at all times. Support them within 2'-0" of the ends during storage (to prevent excessive camber, overstress or failure). Locate transport supports and lifting devices within 2'-0" of the ends of boxes and slabs. Transportboxes and slabs after the concrete has reached the 28 day design strength and a minimum of 7 days after casting.

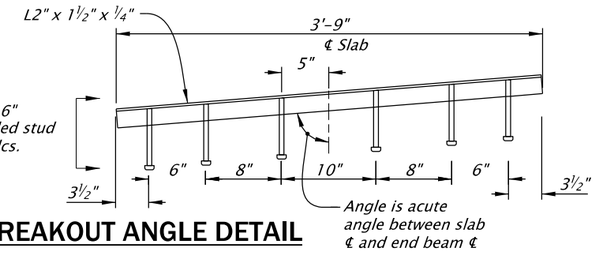


TIE ROD DETAIL



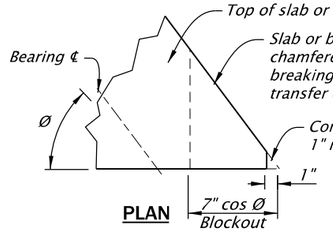
KEYWAY GROUT DETAIL

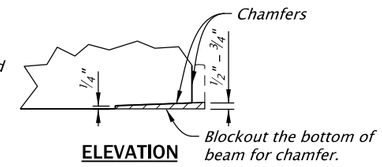




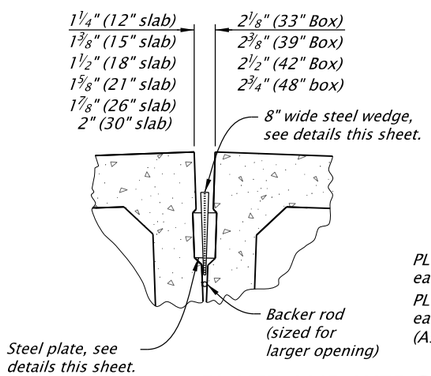
BREAKOUT ANGLE DETAIL

NOTE:
Provide steel angle conforming to ASTM A36. Hot-dip galvanize breakout angle after fabrication. Shift headed studs as required, no more than 2", to avoid prestressing strands.





PARTIAL ELEVATION CHAMFER DETAIL



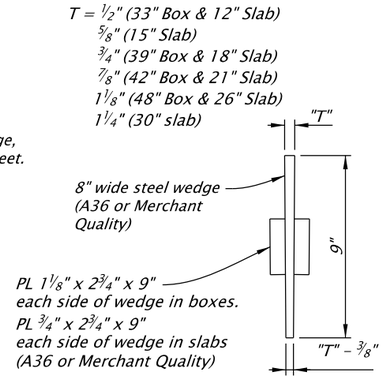
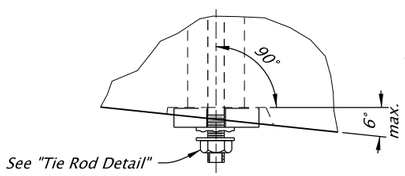
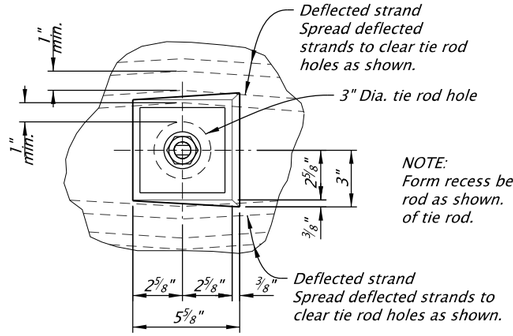


PLATE AND WEDGE DETAIL

NOTE:
Add steel plates and wedge at each tie rod crossing before tensioning tie rods. Hot-dip galvanize wedges and plates.





DETAIL "B"

Tensioning End

NOTE:
Form recess bearing area perpendicular to tie rod as shown. Use Detail "B" at tensioning end of tie rod.

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

PRECAST PRESTRESSED BOX AND SLAB DETAILS

2021

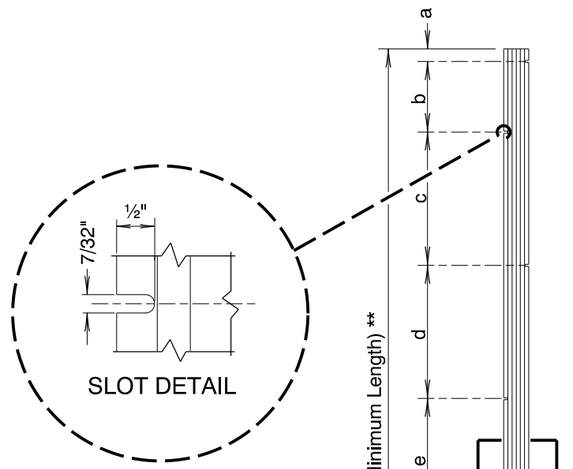
	DATE	REVISION DESCRIPTION
1	07-2020	Revised steel grade for dowels and tie rods.
2	07-2020	Updated drawing to current stds.
3	07-2020	Moved rail anchorage detail to det3465.
4	06-2022	Revised General Notes. Added breakout Angle Detail.

CALC. BOOK NO. N/A | SDR DATE 08-JUL-2022 | **BR445**

Effective Date: June 1, 2023 - November 30, 2023

10-DEC-2009

TM222.dgn



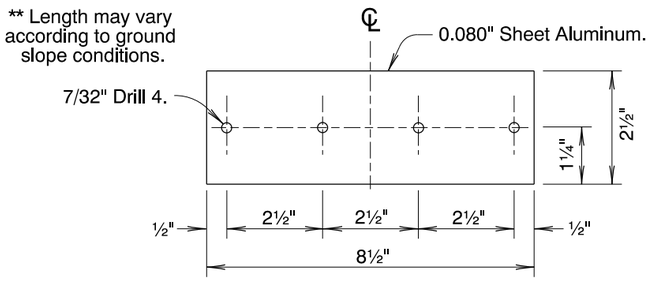
SECTION A-A
Dimensions Nominal

POST DETAILS

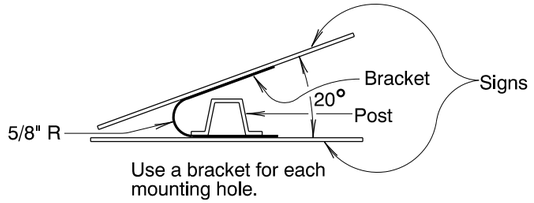
POST DIMENSION TABLE						
SIGN *	a	b	c	d	e	f **
A	1"	7"	8½"	——	——	8'-6"
B	1"	7"	8½"	9"	——	9'-3"
C	1"	7"	8½"	9"	9"	10'-0"
D	1"	7"	12½"	——	——	9'-0"
E	1"	7"	12½"	13"	——	10'-6"
F	1"	7"	12½"	13"	13"	12'-0"

* See TM221

** Length may vary according to ground slope conditions.



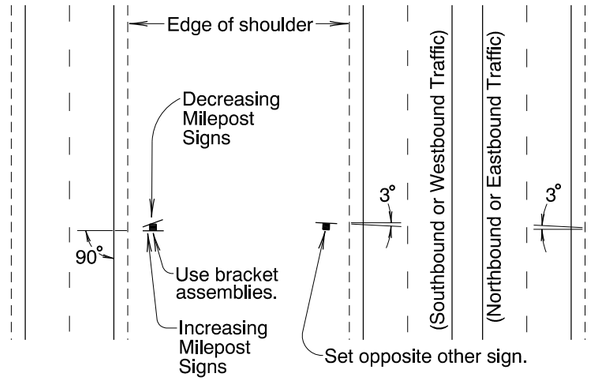
Bend around centerline.



BRACKET ASSEMBLY
(Use only on 2 lane roads)

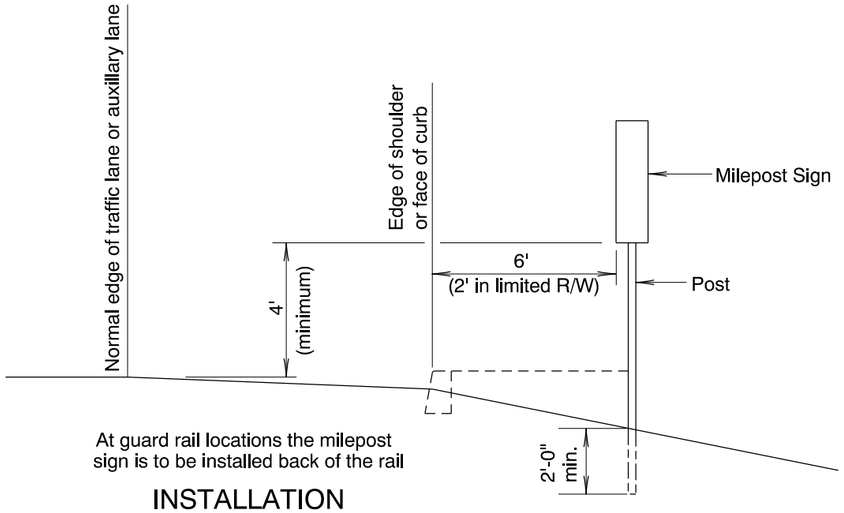
GENERAL NOTES:

1. POST AND BRACKET ASSEMBLIES
   (a) The nominal weight of the post shall be 2 pounds per lineal foot.
   (b) Bracket assemblies shall conform to subsection 2910.10 of the current Oregon Standard Specifications for Construction.
2. INSTALLATION
   (a) If roadway conditions prohibit locating the milepost sign at the milepoint, it may be moved up to 50 feet in either direction. If it cannot be located within this variation, it should be omitted.
   (b) Signs shall be mounted to posts with 3⁄16" diameter aluminum blind rivets that conform to subsection 2910.40 of the current Oregon Standard Specifications for Construction.
   (c) If the milepost sign is located within 25 feet of a delineator, the delineator should be moved or deleted.
   (d) Installation of the post and sign panel shall conform to subsection 840.41 of the current "Oregon Standard Specifications".



CONVENTIONAL ROADS EXPRESSWAYS & FREEWAYS

INSTALLATION



At guard rail locations the milepost sign is to be installed back of the rail

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

INSTALLATION DETAILS MILEPOST MARKER POSTS

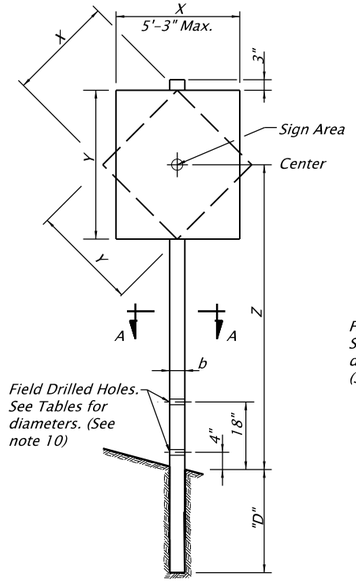
2021

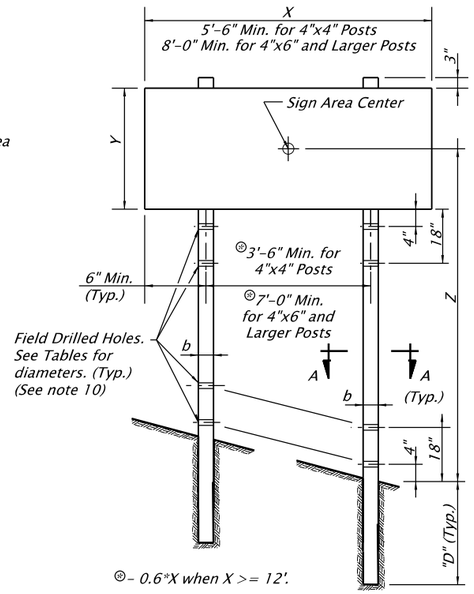
DATE	REVISION DESCRIPTION

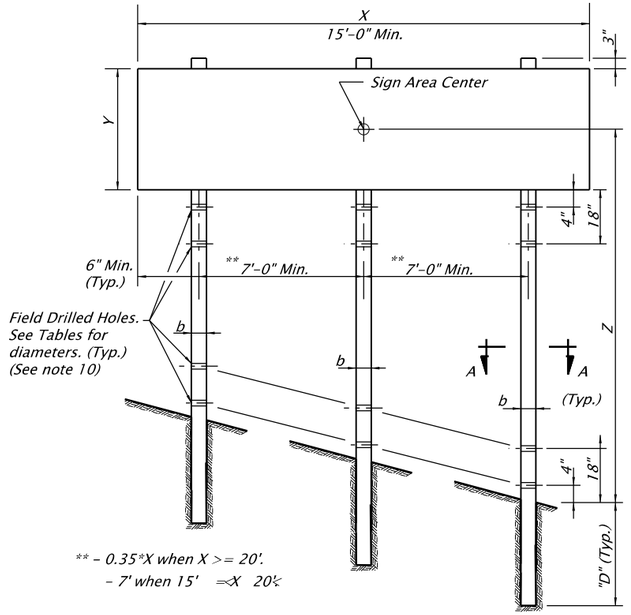
CALC. BOOK NO. N/A | SDR DATE 10-DEC-2009 | **TM222**

Effective Date: June 1, 2023 - November 30, 2023

BIDDING PLANS







ELEVATION

No scale

		(X * Y * Z) in ft³ - Maximum												Field Drilled Hole Diameters	Post Embedment Depth "D"
		3 Second Gust Wind Speed (TM671)													
		85 MPH				95 MPH				105 and 110 MPH					
		Number of Posts				Number of Posts				Number of Posts					
		1	2	3 * X=15'	3 * X ≥20'	1	2	3 * X=15'	3 * X ≥20'	1	2	3 * X=15'	3 * X ≥20'		
POST SIZE b x d	4" x 4"	77	154	165	231	62	124	132	186	56	112	120	168	Not Req'd	4' - 0"
	4" x 6"	162	324	347	486	130	260	278	390	117	234	250	351	1½"	5' - 0"
	6" x 6"	270	540	578	810	216	432	462	648	195	390	417	585	2"	5' - 0"
	6" x 8"	494	988	1058	1482	395	790	846	1185	356	712	762	1068	3"	7' - 0"

PERMANENT WOOD POST TABLE **

* - Linear Interpolate X*Y*Z 3 post values for signs greater than 15' and less than 20'.

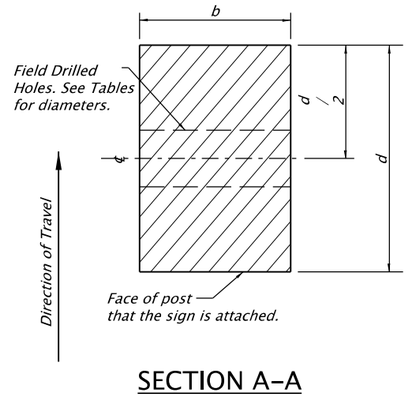
** - See note 8

		(X * Y * Z) in ft³ - Maximum												Field Drilled Hole Diameters	Post Embedment Depth "D"
		3 Second Gust Wind Speed (TM671)													
		85 MPH				95 MPH				105 and 110 MPH					
		Number of Posts				Number of Posts				Number of Posts					
		1	2	3 * X=15'	3 * X ≥20'	1	2	3 * X=15'	3 * X ≥20'	1	2	3 * X=15'	3 * X ≥20'		
POST SIZE b x d	4" x 4"	122	244	261	366	98	196	210	294	88	176	188	264	Not Req'd	4' - 0"
	4" x 6"	257	514	550	771	205	410	439	615	185	370	396	555	1½"	5' - 0"
	6" x 6"	426	852	912	1278	341	682	730	1023	308	616	660	924	2"	5' - 0"
	6" x 8"	779	1558	1669	2337	624	1248	1337	1872	563	1126	1206	1689	3"	7' - 0"

TEMPORARY WOOD POST TABLE **

* - Linear Interpolate X*Y*Z 3 post values for signs greater than 15' and less than 20'.

** - See note 9



SECTION A-A

No scale

General Notes:

1. Wood posts are available in the following commercial lengths: 12', 14', 16', 18', 20', 22', 24', 26'.
2. Material shall be Douglas Fir No. 1 and according to Section 02110.40.
3. For horizontal and vertical clearances of permanent signs refer to TM200 and of temporary signs refer to TM822.
4. Wood post design in accordance with the 5th Edition 2009 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.
5. Use the 3 second gust wind speeds shown on TM671 for the site specific sign location.
6. General design parameters are Kz = 0.87, SIF (duration factor) = 1.6, Cd (sign) = 1.20, and G = 1.14.
7. The sign width to sign height or sign height to sign width ratio shall not exceed 5.0.
8. Permanent signing uses an Ir = 0.71 for a recurrence interval of 10 years.
9. Temporary signing uses an Ir = 0.45 for a recurrence interval of 1.5 years.
10. Posts protected by barrier or guardrail do not require field drilled holes.
11. 4" x 4" posts should not be used in snow plow areas.

Post Embedment Installation:

1. Excavate the hole at least 12" larger in diameter than the diagonal dimension of the post. Maintain at least 6" of space around the edges of the post to accomodate compaction equipment.
2. Align the post in the hole to a vertical position.
3. The space around the wood post shall be backfilled to finished ground surface.
4. Backfill with selected general backfill meeting the requirements of 00330.13.
5. Place in layers not greater than 6 inches.
6. Solidly ram and tamp the layers into the excavation area around the post.
7. Dampen during placement if too dry to compact properly.
8. Replace and finish the surface around the post to match the surrounding surface.

Accompanied by dwgs. TM200, TM671, TM822

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

WOOD POST SIGN SUPPORTS

2021

DATE	REVISION DESCRIPTION
01-2022	ADDED 3'-6" MINIMUM SPACING FOR 4"x4" POSTS AND 8'-0" MINIMUM
	SIGN WIDTHS FOR 4"x6" AND LARGER POSTS

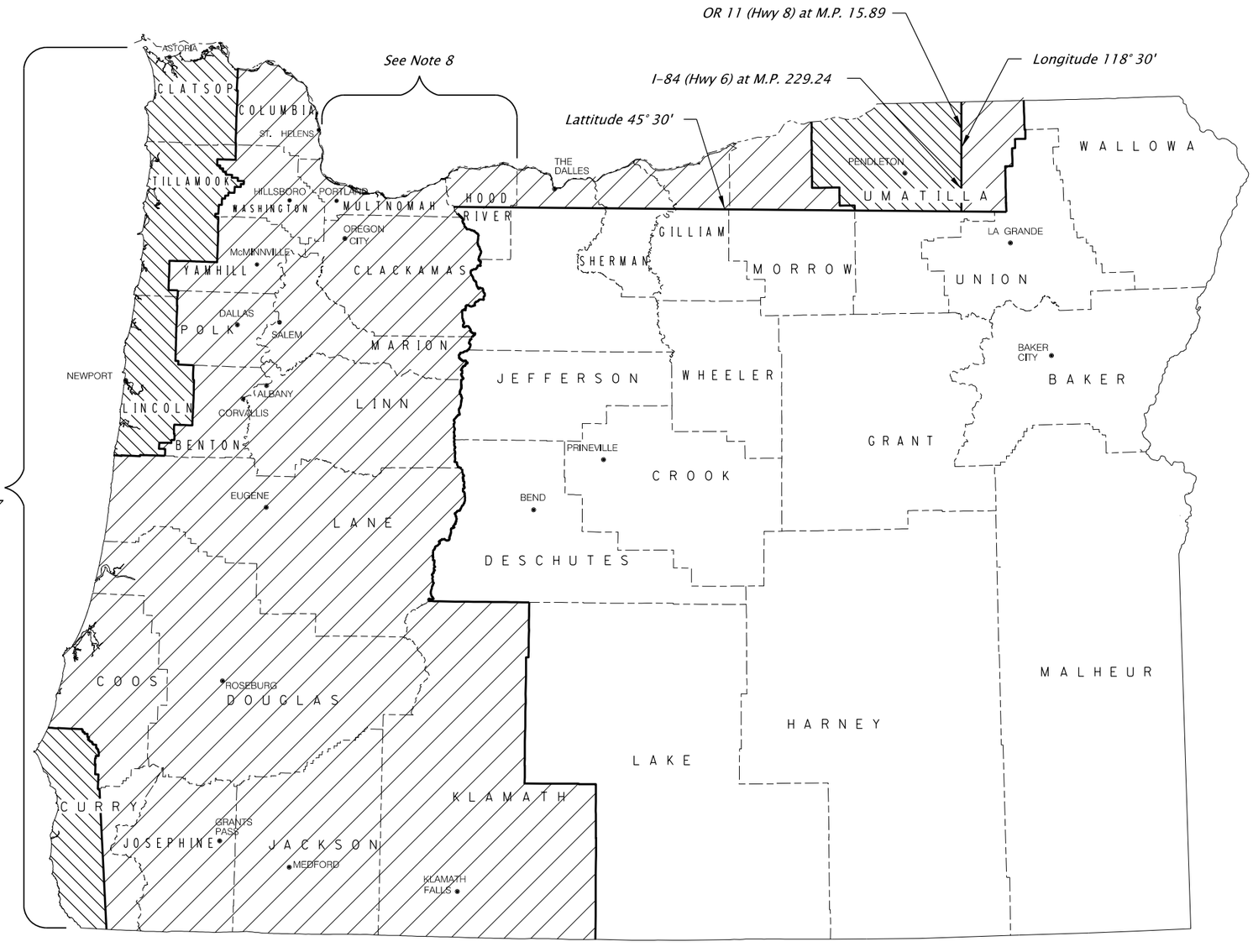
CALC. BOOK NO. 5850 | SDR DATE 07-JAN-2022 | **TM670**

Effective Date: June 1, 2023 - November 30, 2023

BIDDING PLANS

10-JUL-2020

TM671.dgn



NOTES:

1. *The wind velocity map as shown is adapted from AASHTO 2001 4th Edition - "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals", Appendix C, Figure C-3 and Section 3, Figure 3-2. It uses the wind speed map shown in Figure 1609 of the 2007 Oregon Structural Code to account for locations in the State with special wind regions.*
2. *The wind velocities shown above are 3-Second Gust wind velocities.*
3. *The Exposure Catagory is C.*
4. *The mean recurrence interval is 50-Years.*
5. *Mountanious terrain, gorges, and ocean promontories are classified as special wind regions and shall be examined for unusual wind conditions.*
6. *The Interval Height (Kz) is 30 ft.*
7. *All areas with full exposure to ocean winds shall be designated 110 mph areas.*
8. *Areas in Multnomah and Hood River counties with full exposure to Columbia River Gorge winds shall be designated 110 mph areas.*
9. *Localities may have adopted wind speed higher that shown on this map. Those higher wind speed shall be used.*

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

3 SECOND GUST WIND SPEED MAP

2021

DATE	REVISION DESCRIPTION

CALC. BOOK NO. N/A | SDR DATE 06-JAN-2012 | **TM671**

Effective Date: June 1, 2023 - November 30, 2023

01-JUL-2022

TM800.dgn

TAPER TYPES & FORMULAS

TAPER	FORMULA
Merging (Lane Closure)	"L"
Shifting	"L"/2 or ½"L"
Shoulder Closure	"L"/3 or ⅓"L"
Flagging (See Drg. TM850)	50' – 100'
Downstream (Termination)	Varies (See Drawings)

★ Use Pre-Construction Posted Speed to select the Speed from the Tables below:

TEMPORARY BARRIER FLARE RATE TABLE

★SPEED (mph)	MINIMUM FLARE RATE
≤ 30	8:1
35	9:1
40	10:1
45	12:1
50	14:1
55	16:1
60	18:1
65	19:1
70	20:1

MINIMUM LENGTHS TABLE

★ SPEED (mph)	"L" VALUE FOR TAPERS (ft) W = Lane or Shoulder Width being closed or shifted				BUFFER "B" (ft)
	W ≤ 10	W = 12	W = 14	W = 16	
25	105	125	145	165	75
30	150	180	210	240	100
35	205	245	285	325	125
40	265	320	375	430	150
45	450	540	630	720	180
50	500	600	700	800	210
55	550	660	770	880	250
60	600	720	840	960	285
65	650	780	910	1000	325
70	700	840	980	1000	365
FREEWAYS					
55	1000	1000	1000	1000	250
60	1000	1000	1000	1000	285
65	1000	1000	1000	1000	325
70	1000	1000	1000	1000	365

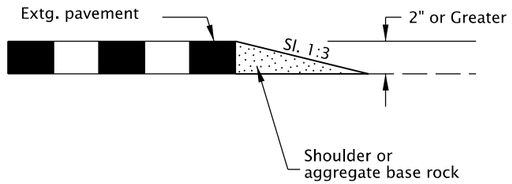
NOTES:
- For Lane closures where W < 10', use "L" value for W = 10'.
- For Shoulder closures where W < 10', use "L" value for W = 10' or calculate "L" using formula, for Speeds ≥ 45: L = WS, Speeds < 45: L = $S^2W/60$, S = Speed, W=Width

TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE

★ SPEED (mph)	Sign Spacing (ft)			Max. Channelizing Device Spacing (ft)
	A	B	C	
20 – 30	100	100	100	20
35 – 40	350	350	350	20
45 – 55	500	500	500	40
60 – 70	700	700	700	40
Freeway	1000	1500	2640	40

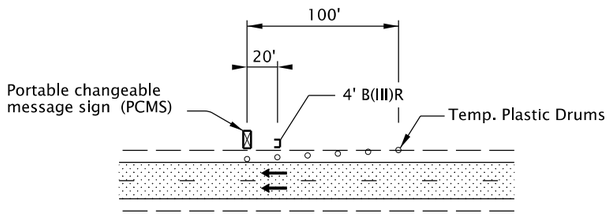
NOTES:
- Place traffic control devices on 10 ft. spacing for intersection and access radii.
- When necessary, sign spacing may be adjusted to fit site conditions. Limit spacing adjustments to 30% of the "A" dimension for all speeds.

NOTES:
- When paved shoulders adjacent to excavations are less than four feet wide protect longitudinal abrupt edge as shown.
- Use aggregate wedge when abrupt edge is 2 inches or greater.



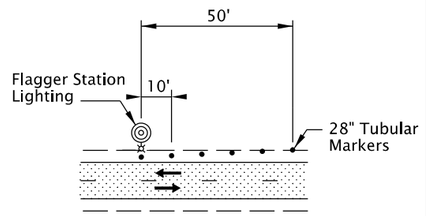
EXCAVATION ABRUPT EDGE

NOTES:
- Install PCMS beyond the outside shoulder, when possible.
- Use the appropriate type of barricade panels for PCMS location. Right shoulder, use Type B(III)R Left shoulder, use Type B(III)L
- Use six drums in shoulder taper on 20' spacing. The drums and barricade may be omitted when PCMS is placed behind a roadside barrier.
- Detail as shown is used for trailered and non-crashworthy components of:
  - Portable Traffic Signals
  - Smart Work Zone Systems



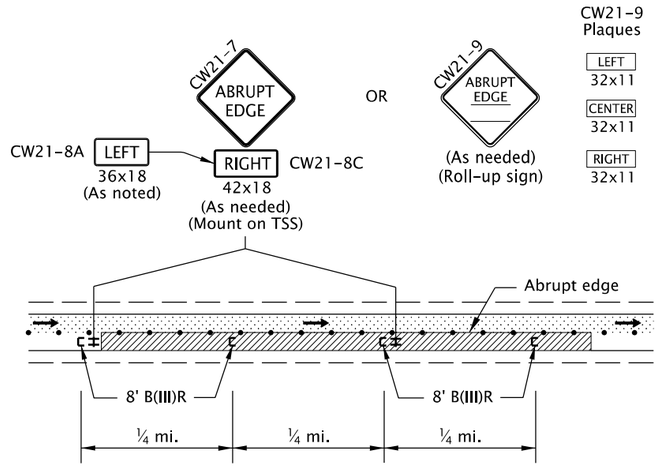
PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) INSTALLATION

NOTES:
- Install Flagger Station Lighting beyond the outside shoulder, where practical.
- Use six tubular markers in shoulder taper on 10' spacing.
- Place cart / generator / power supply off of the shoulder, as far as practical.



FLAGGER STATION LIGHTING DELINEATION

NOTES:
- Abrupt edges may be created by paving, operations, excavations or other roadway work. Use abrupt edge signing for longitudinal abrupt edges of 1 inch or greater.
- If the excavation is located on left side of traffic, replace the 8' B(III)R barricades with 8' B(III)L barricades and replace the "RIGHT" (CW21-8C) riders with "LEFT" (CW21-8A) riders.
- Continue signing and other traffic control devices throughout excavation area at spacings shown.
- If roll-up signs are used, attach the correct (CW21-9) plaques to the sign face using hook and loop fasteners. Place roll-up signs in advance of barricades.



TYPICAL ABRUPT EDGE DELINEATION

GENERAL NOTES FOR ALL TCP DRAWINGS:
- Signs and other Traffic Control Devices (TCD) shown are the minimum required.
- Place a barricade approx. 20' ahead of all sequential arrow boards.
- Arrows shown in roadway are directional arrows to indicate traffic movements.
- All signs are 48" x 48" unless otherwise shown. Use fluorescent orange sheeting for the background of all temporary warning signs.
- All diamond shaped warning signs mounted on barrier sign supports shall be 36" by 36". All other signs mounted on barrier sign supports shall not exceed 12 sq. ft. in total sign area.
- Low speed highways have a pre-construction posted speed of 40 mph or less. High speed highways have a pre-construction posted speed of 45 mph or higher.
- Do not locate sign supports in locations designated for bicycle or pedestrian traffic.
- Combine drawing details to complete temporary traffic control for each work activity.
- Coordinate and control pedestrian movements through a Temporary Accessible Route using Flaggers, Traffic Control Measures, or as directed.
- To be accompanied by Dwg. Nos. TM820 & TM821.

○ ○ ○ Temp. Plastic Drums See TCD Spacing Table for max. spacing.

• • • 28" Tubular Markers See TCD Spacing Table for max. spacing.

UNDER TRAFFIC

UNDER CONSTRUCTION

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

TABLES, ABRUPT EDGE AND PCMS DETAILS

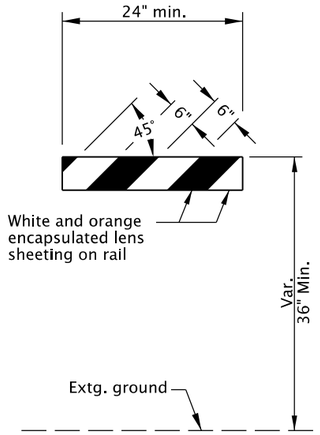
2021

DATE	REVISION DESCRIPTION
07-2022	Added a note for TPARs

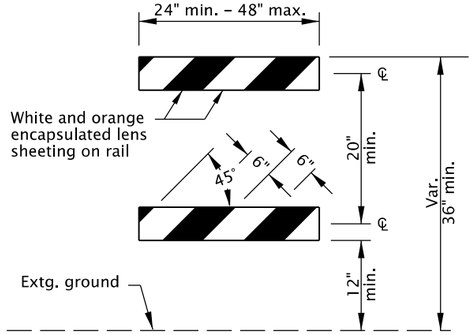
CALC. BOOK NO. N/A | SDR DATE 01-JUL-2022 | **TM800**

Effective Date: June 1, 2023 – November 30, 2023

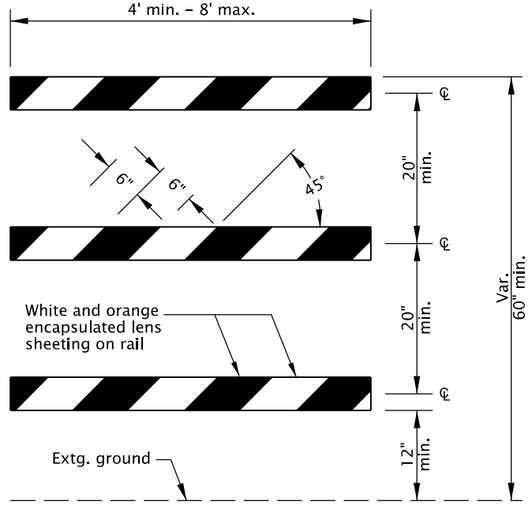
BIDDING PLANS



TYPE I



TYPE II



TYPE III

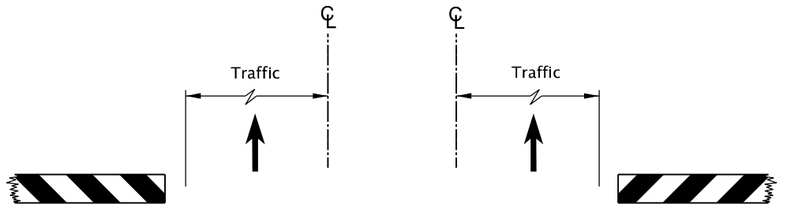
BARRICADE RAIL LAYOUT

GENERAL NOTES FOR ALL DETAILS:

- Sandbags (approximately 25 lb sack filled with sand) may be placed on lower frame to provide additional ballast.
- Ballast shall not extend above bottom rail or be suspended from barricade.
- For rails less than 36" long, 4" wide stripes shall be used.
- Rails must be 8" min. to 12" max. in height.
- Use barricades from ODOT Qualified Products List (QPL).
- Use 4' Type III barricades where horizontal space is limited.
- Do not block bike lanes or shoulders unless the facility is properly closed and signed.
- Do not place barricades in sidewalks unless sidewalk is closed and a temporary pedestrian accessible route (TPAR) is signed according to the TCP. See Dwg. No. TM844.

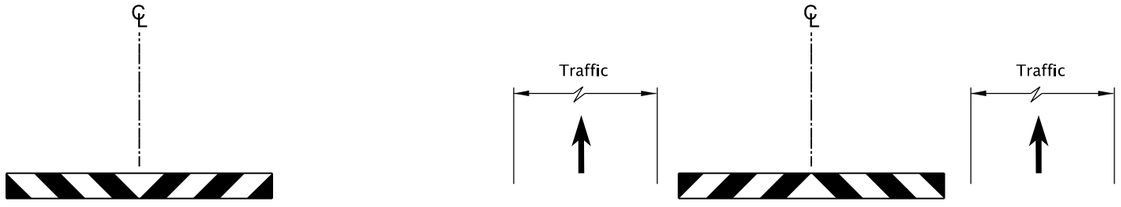
NOTES:

- Markings for barricade rails shall slope downward at an angle of 45° in the direction traffic is to pass.
- Where a barricade extends entirely across a roadway, it is desirable that the stripes slope downward in the direction toward which traffic must turn in detouring.
- Where both right and left turns are provided for, slope the chevron striping downward in both directions from the center of the barricade.
- For full roadway closures, the C or LR barricade may be used. Extend barricades completely across roadway unless access is required for local road users.



LT. SIDE - L
(For approaching traffic)

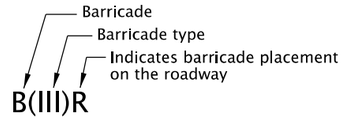
RT. SIDE - R
(For approaching traffic)



CLOSED - C
(For approaching traffic)

LT. / RT. - LR
(For approaching traffic)

DIAGRAM FOR BARRICADE PLACEMENT AND SLOPE MARKING



BARRICADE NOTATION

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

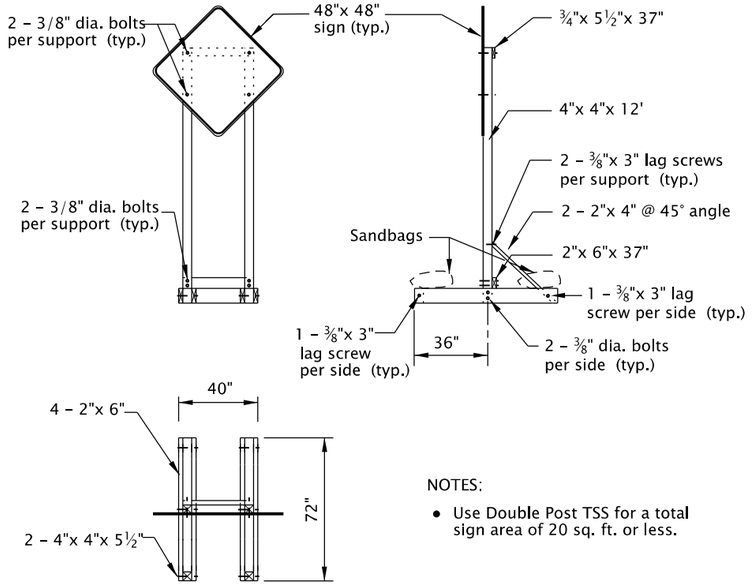
TEMPORARY BARRICADES

2021

DATE	REVISION DESCRIPTION

CALC. BOOK NO. N/A | SDR DATE 01-JUL-2020 | **TM820**

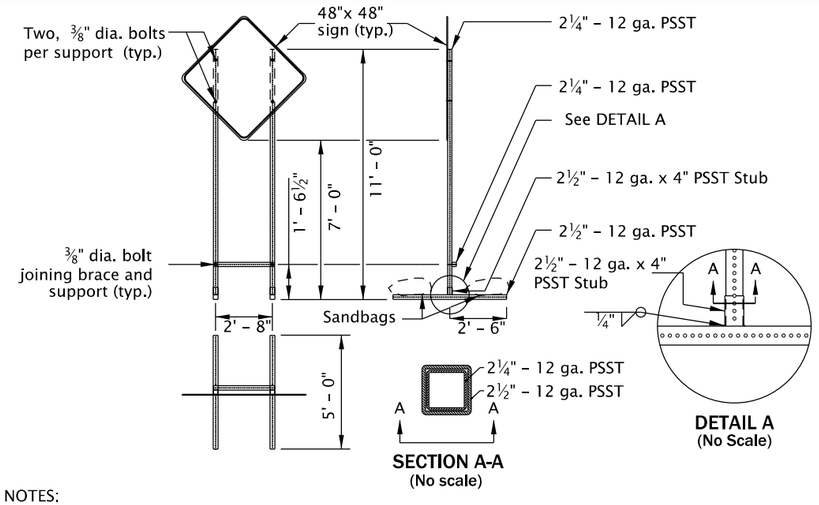
Effective Date: June 1, 2023 – November 30, 2023



NOTES:

- Use Double Post TSS for a total sign area of 20 sq. ft. or less.

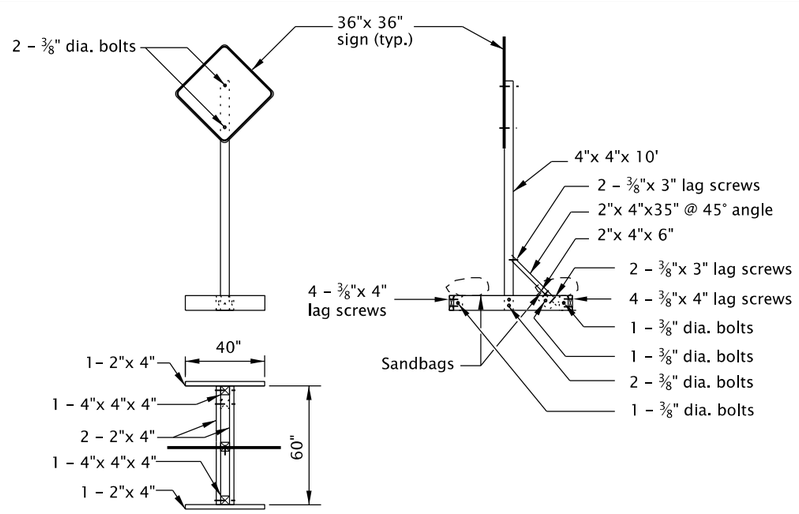
DOUBLE POST DETAIL



NOTES:

- Use PSST TSS's for a total sign area of 16 sq. ft. or less.
- All members shall have a minimum yield stress of 50 ksi.
- Galvanize steel according to ASTM A653 with coating designation G90. Remove Galvanizing from steel before welding. Repair Galvanizing according to ASTM A780.
- Use A325 Bolts or equivalent.
- *2¼" - 12 ga. PSST to extend entire length inside of the 2½" - 12 ga. x 4" PSST Stub.*
- *Do not use bolt to secure 2 ¼" PSST inside of the 2½" - 12 ga. x 4" PSST Stub.*
- *Weld steel according to American Welding Society (AWS) D.1.1.*

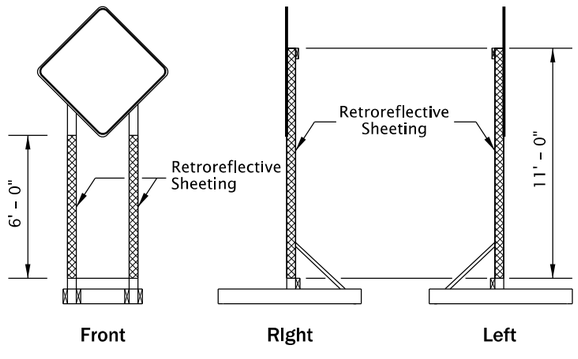
PERFORATED STEEL SQUARE TUBE (PSST) DETAIL



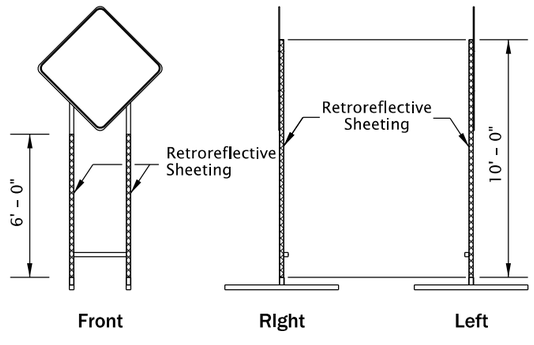
NOTES:

- Use Single Post TSS for a total sign area of 12 sq. ft. or less.
- Use Single Post TSS for mounting "Business Access" (CG20-11) signs. Do not mount signs on Type II or III Barricades.

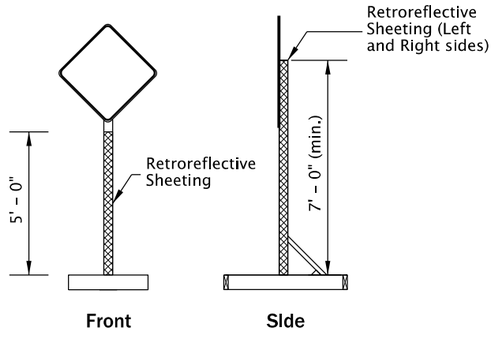
SINGLE POST DETAIL



Double Post



Perforated Steel Square Tube (PSST)



Single Post

TEMPORARY SIGN SUPPORT GENERAL NOTES:

- Do not tip over TSS at any time.
- Do not locate TSS's in locations that block pedestrian or bicycle traffic.
- For wooden TSS's, use either Douglas Fir or Hem Fir, which is surfaced four sides (S4S) and free of heart center (FOHC).
- See "Temporary Sign Placement" detail on TM822 for sign installation heights.
- Do not place or stack ballast more than 24" above the ground.
- When sign is inconsistent with current work zone conditions, cover sign: or turn sign 90 degrees away from approaching traffic. Remove TSS from roadway when signing is not needed for more than 3 days.
- Place a minimum of 50 lbs of sandbags on each of the four TSS supports legs. (25 lb. max per bag) (min. 100 lbs per side of each TSS).
- See Dwg. No. TM204 for flag board mounting detail.

NOTES:

- Apply fluorescent orange, ANSI Type VIII or IX retroreflective sheeting to TSS posts, as shown, for all temporary signs, except "STOP" and "DO NOT ENTER". For "STOP" and "DO NOT ENTER" signs, used red ANSI Type III or IV retroreflective sheeting on the TSS posts.
- Apply sign post retroreflectivity to each TSS post facing front; and to the left and right sides of the TSS, as shown. Use 3" wide sheeting for wood post TSS's. Use 2" wide sheeting for PSST TSS's.
- Sheeting may be applied directly to post material; or applied to a rigid, lightweight substrate, then securely attached to the posts.

SIGN POST REFLECTIVE SHEETING PLACEMENT

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 SIGN SUPPORTS

2021

DATE	REVISION DESCRIPTION

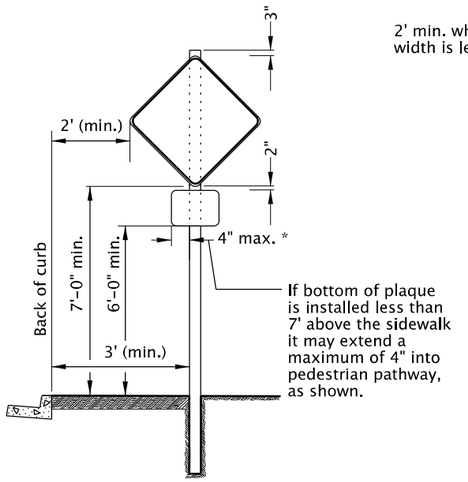
CALC. BOOK NO. N/A | SDR DATE 01-JUL-2020 | TM821

Effective Date: June 1, 2023 – November 30, 2023

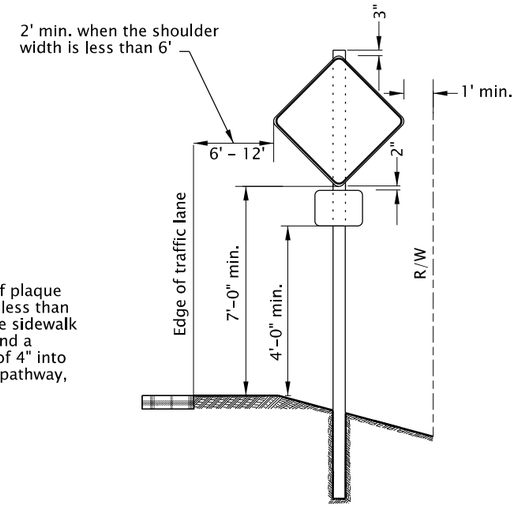
01-JUL-2020
TM822.dgn

NOTES:

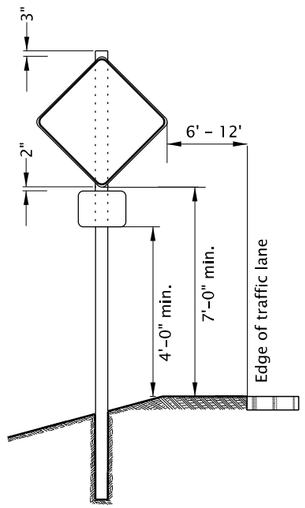
- Do not block bicycle lanes, sidewalks, or TPAR's with sign supports. Maintain minimum widths for these facilities according TCP Design Manual, MUTCD, ADA, or as directed.
- To be accompanied by Dwg. Nos. TM670, TM671, TM687, TM688 & TM689.



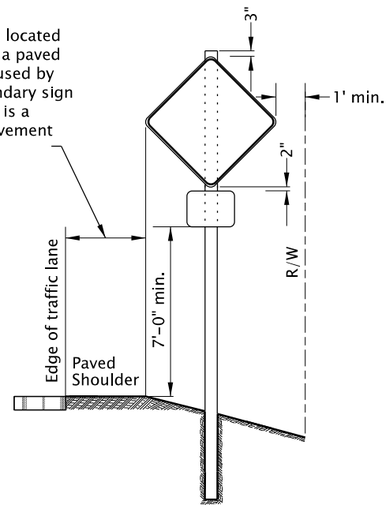
Urban Areas With Curb/Sidewalk



Rural Areas

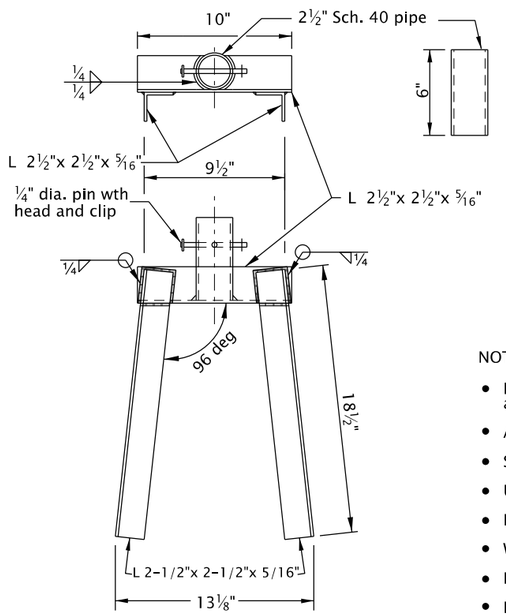


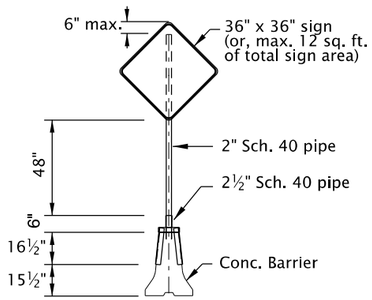
**Divided Highway/Freeway Medians
No Curb/Sidewalk**



**Rural or Urban Areas - Curb or No Curb
Bicycles On Shoulder**

TEMPORARY SIGN PLACEMENT





NOTES:

- Drill additional holes so sign can be rotated 90 degrees and pinned when not in use.
- All structural steel shall conform to ASTM A36.
- Support fits both 32" and 42" tall "F" barrier.
- Use for supporting a maximum 12 sq. ft. of total sign area.
- Place support at connection between two concrete barrier sections.
- Weld steel according to American Welding Society (AWS) D.1.1.
- Do not use clipped signs.
- Follow manufacturer recommendation when installing signs on barrier other than concrete.

CONCRETE BARRIER SIGN SUPPORT

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 SIGN SUPPORTS

2021

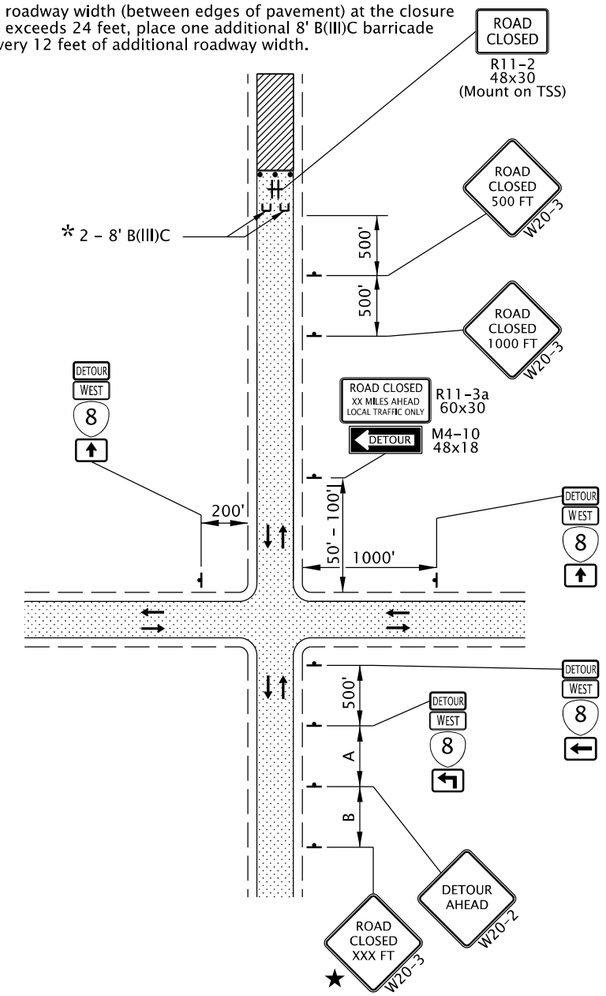
DATE	REVISION DESCRIPTION

CALC. BOOK NO. N/A | SDR DATE 01-JUL-2020 | **TM822**

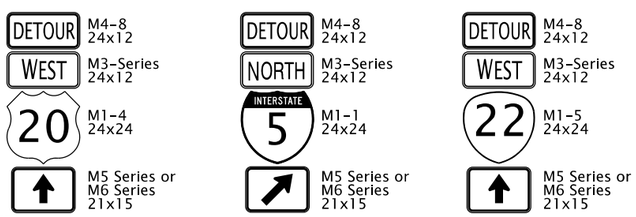
01-JUL-2020
TM840.dgn

NOTES:
If closure point is less than 1500 ft. from nearest intersection, use a "ROAD CLOSED TO THRU TRAFFIC" (R11-4)sign in place of the "ROAD CLOSED XX MILES AHEAD" sign.

✲ If the roadway width (between edges of pavement) at the closure point exceeds 24 feet, place one additional 8' B(III)C barricade for every 12 feet of additional roadway width.

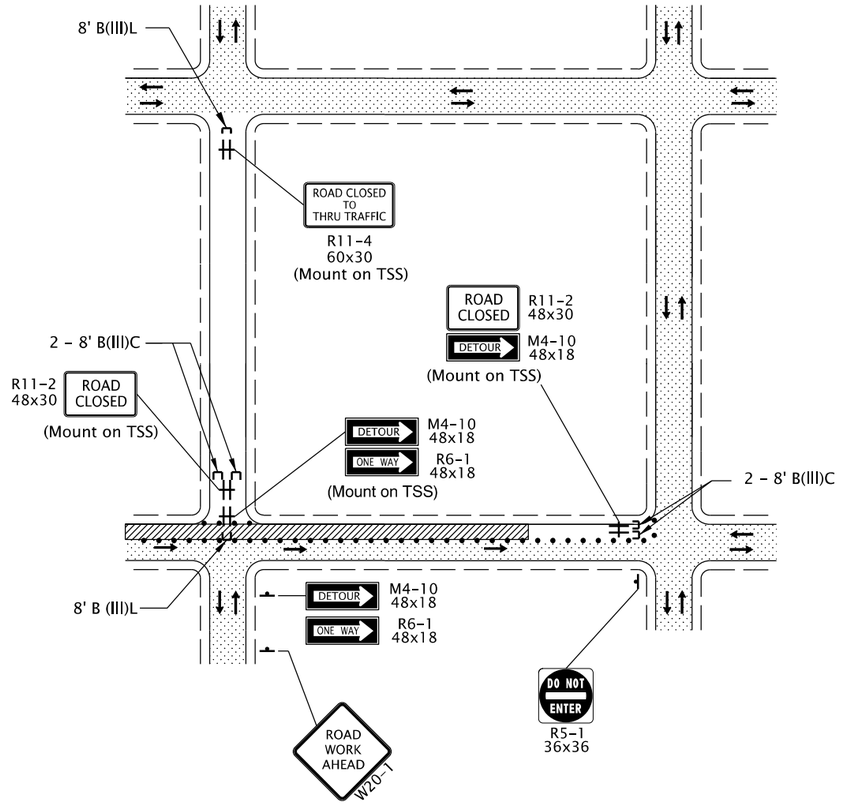


TYPICAL ROAD CLOSURE WITH DETOUR



NOTE:
- When detour routes overlap, each Route Shield will include a seperate cardinal direction, detour, and directional arrow auxiliary sign assembly.

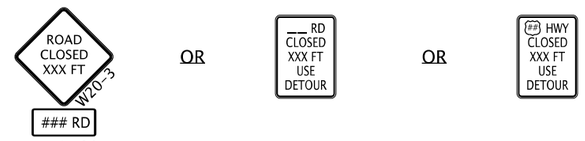
TYPICAL TRAILBLAZER ASSEMBLY



TYPICAL PARTIAL ROAD CLOSURE

GENERAL NOTES FOR ALL DETAILS:

★ A "Street Name" rider may be used to enhance Road Closure signing; or provide a project specific design; or, as shown in the traffic control plan.



##x18 Rider
Rider width to be determined by width of street name.

48 x 60 (nom.)
Project Specific Design

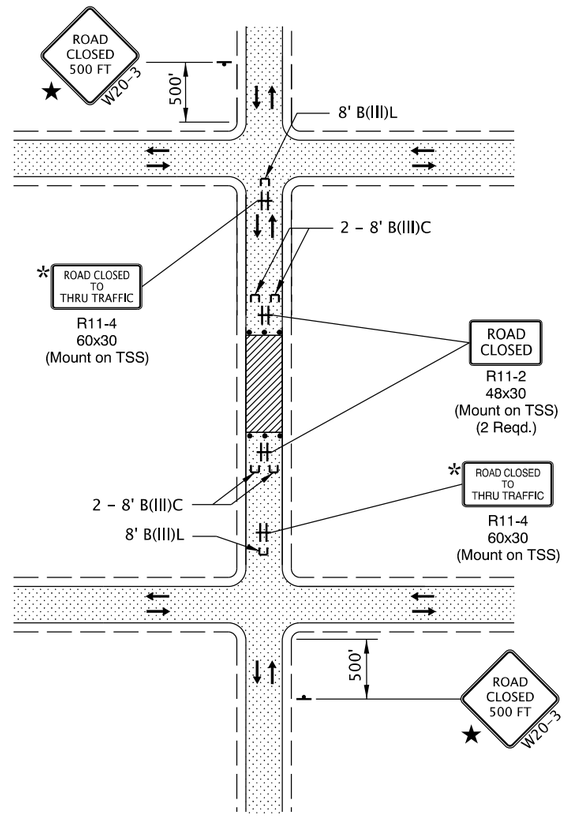
48 x 60 (nom.)
Project Specific Design

- Use a minimum of two Type III barricades for a road closure. For roads ≥ 36' wide between curbs or edge of pavement, use a minimum of three Type III barricades for the closure point.
- For full road closures, the C or LR barricade may be used.
- Place additional signing as directed.
- To determine sign spacing A, B, & C, use the "TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE" on Dwg. TM800.
- To be accompanied by Dwg. Nos.TM820 & TM821.

• • • • • 28" Tubular Markers See TCD Spacing Table on TM800 for max. spacing.

UNDER TRAFFIC

UNDER CONSTRUCTION



NOTE:
✲ If accesses exist between intersection and point of closure, install "ROAD CLOSED TO THRU TRAFFIC" sign as shown.

TYPICAL ROAD CLOSURE

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

CLOSURE DETAILS

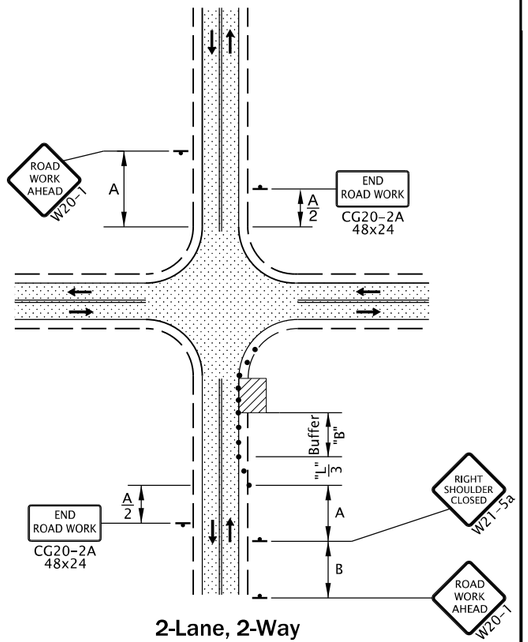
2021

DATE	REVISION DESCRIPTION

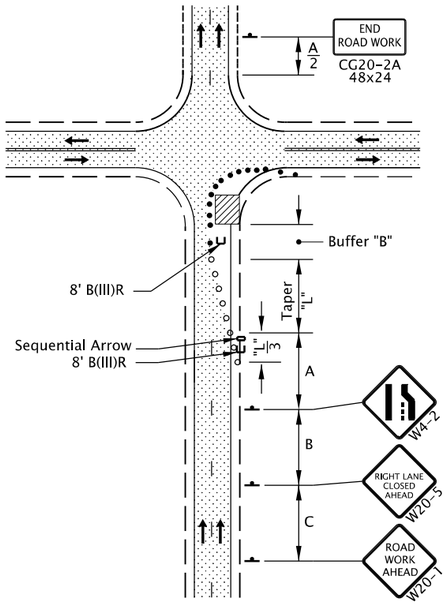
CALC. BOOK NO. N/A | SDR DATE 01-JUL-2020 | **TM840**

BIDDING PLANS

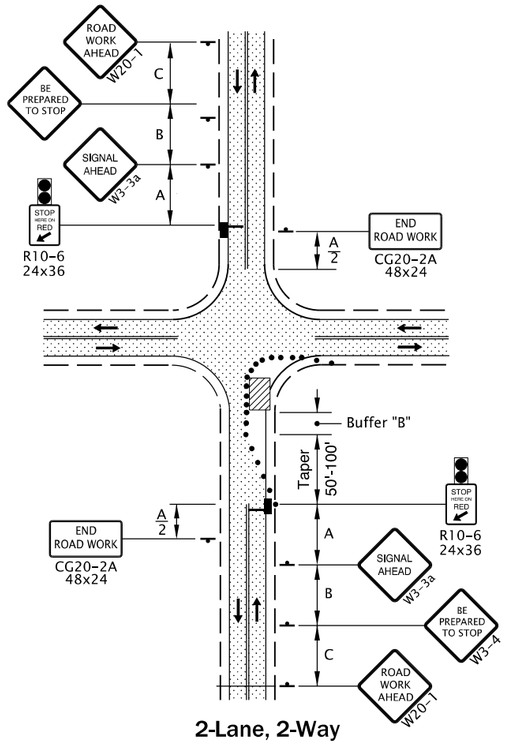
01-JUL-2022
TM841.dgn



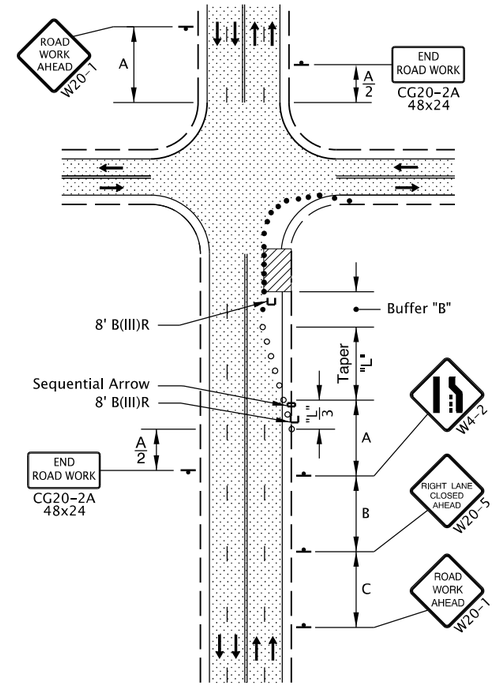
2-Lane, 2-Way
SHOULDER CLOSURE



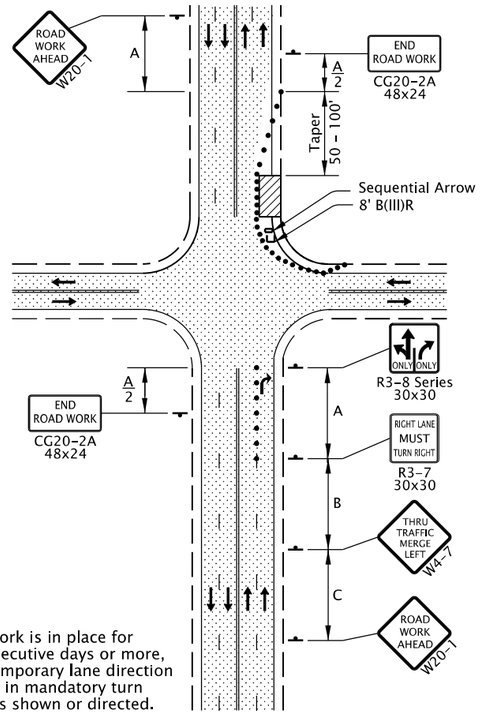
2-LANE, 1-WAY
RIGHT LANE CLOSURE



2-Lane, 2-Way
ONE LANE CLOSURE



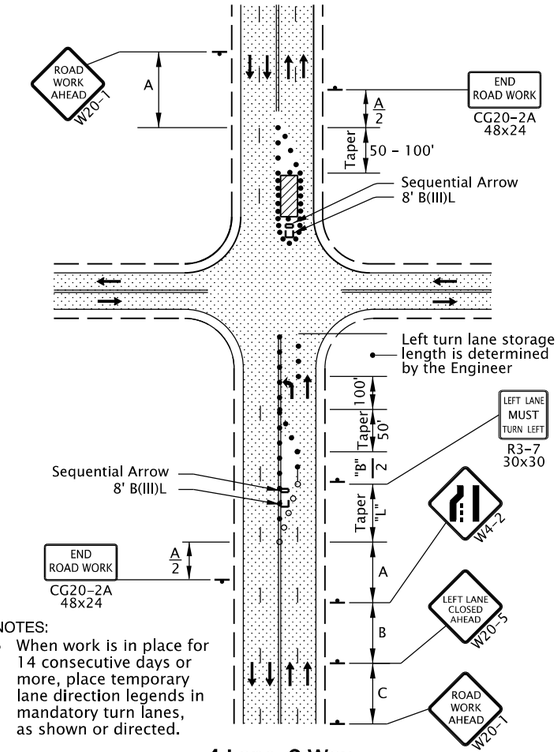
4-Lane, 2-Way
RIGHT LANE CLOSURE, NEAR SIDE



NOTES:

- When work is in place for 14 consecutive days or more, place temporary lane direction legends in mandatory turn lanes, as shown or directed.

4-Lane, 2-Way
RIGHT LANE CLOSURE, FAR SIDE



NOTES:

- When work is in place for 14 consecutive days or more, place temporary lane direction legends in mandatory turn lanes, as shown or directed.

4-Lane, 2-Way
LEFT LANE CLOSURE, FAR SIDE

GENERAL NOTES FOR ALL DETAILS:

- Additional Traffic Control Measures (TCM) may be required for all legs of the intersection.
- The "SIGNAL AHEAD" (W3-3a) sign may be substituted with the signal ahead symbol (W3-3) sign.
- To determine Taper Length ("L") and Buffer Length ("B"), use the "MINIMUM LENGTHS TABLE" on Dwg. TM800.
- For left lane or shoulder work, place TCD to close left lane or shoulder. Use "LEFT LANE CLOSED AHEAD" (W20-5) sign, "LEFT LANE ENDS" (W4-2L) symbol sign, or "LEFT SHOULDER CLOSED" (W21-5a) sign, where applicable.
- To determine sign spacing A, B, and C, use "TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE" on Dwg. TM800.
- When a through road intersects within the work zone, place a "ROAD WORK AHEAD" (W20-1) sign in advance of the intersection at sign spacing A.
- Tubular markers may be used in lane closure tapers where posted speed is 40 mph or less.
- Where shoulder width is limited, Sequential Arrow may be placed within the lane closure taper.
- Place channelizing devices around intersection radii, business accesses and driveways at 10' spacing.
- 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.
- To be accompanied by Dwg. Nos. TM820, TM82, TM840 & TM854.

Automated Flagging Assistance Device (AFAD)

28" Tubular Markers See TCD Spacing Table on TM800 for max. spacing.

Temp. Plastic Drums See TCD Spacing Table on TM800 for max. spacing.

UNDER TRAFFIC

UNDER CONSTRUCTION

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

INTERSECTION WORK ZONE DETAILS

2021

DATE	REVISION DESCRIPTION

CALC. BOOK NO. N/A | SDR DATE 01-JUL-2022 | **TM841**

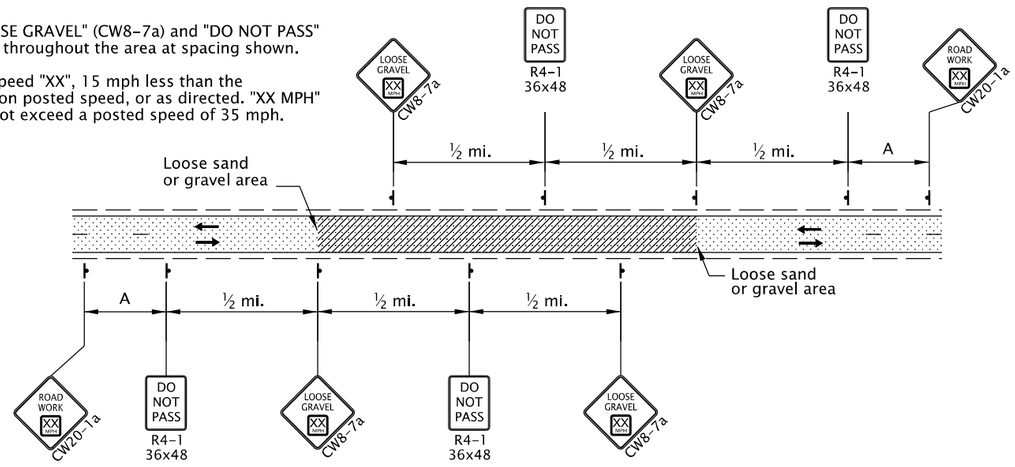
BIDDING PLANS

01-JUL-2022

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.

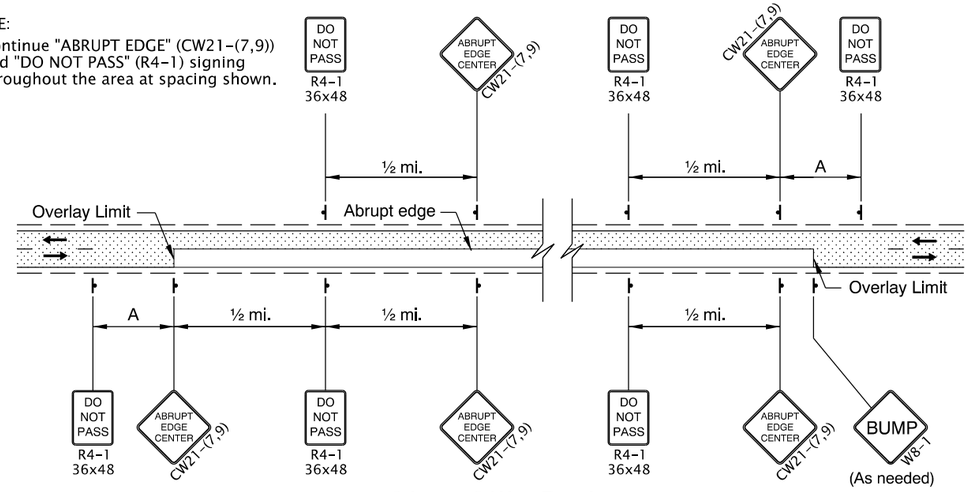


2-Lane, 2-Way Roadway

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.

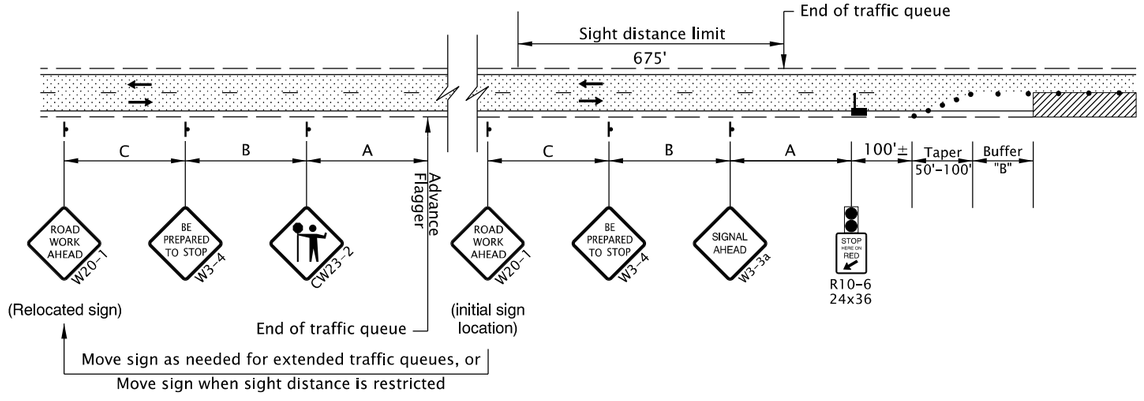


2-Lane, 2-Way Roadway

OVERLAY AREA SIGNING

NOTES:

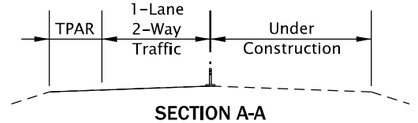
- Place Advance Flagger and additional signing when traffic queues extend beyond initial warning signing OR when sight distance is restricted.
- Relocate initial "ROAD WORK AHEAD" (W20-1) sign in advance of additional "BE PREPARED TO STOP" (W3-4) and Flagger Ahead (CW23-2) signs, as shown.
- Place additional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



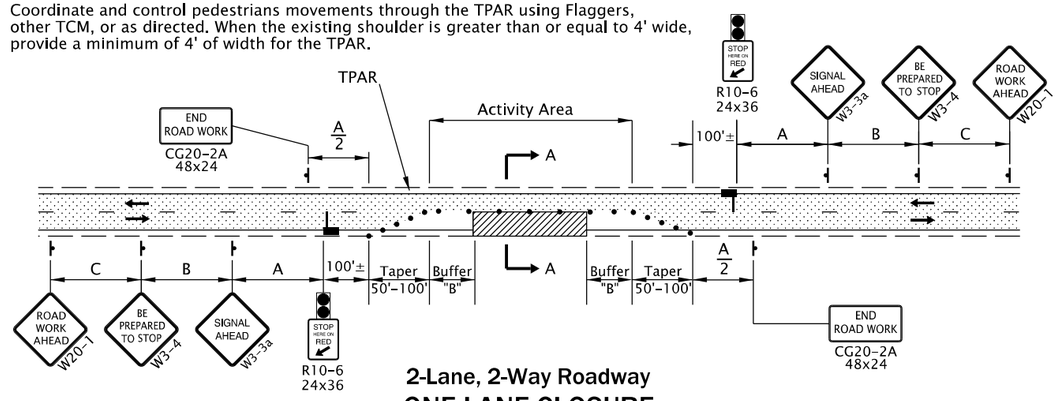
ADVANCE FLAGGER FOR EXTENDED TRAFFIC QUEUES

NOTE:

- 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.
- Include "WAIT FOR FLAGGER" (CR4-23) signs mounted on Type II Barricade located approx. 50' before each Flagger.
- 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.



SECTION A-A



2-Lane, 2-Way Roadway

ONE LANE CLOSURE

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.

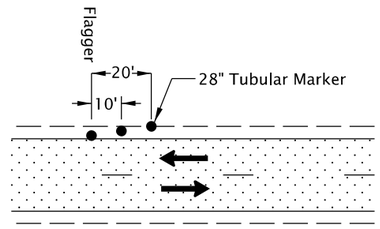
UNDER TRAFFIC

UNDER CONSTRUCTION

CONSTRUCTION UNDER TRAFFIC

NOTE:

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



FLAGGER STATION DELINEATION

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-LANE, 2-WAY ROADWAYS

2021

DATE	REVISION DESCRIPTION
01-2022	Added AFADs to drawing.

CALC. BOOK NO. N/A | SDR DATE 01-JUL-2022 | **TM850**

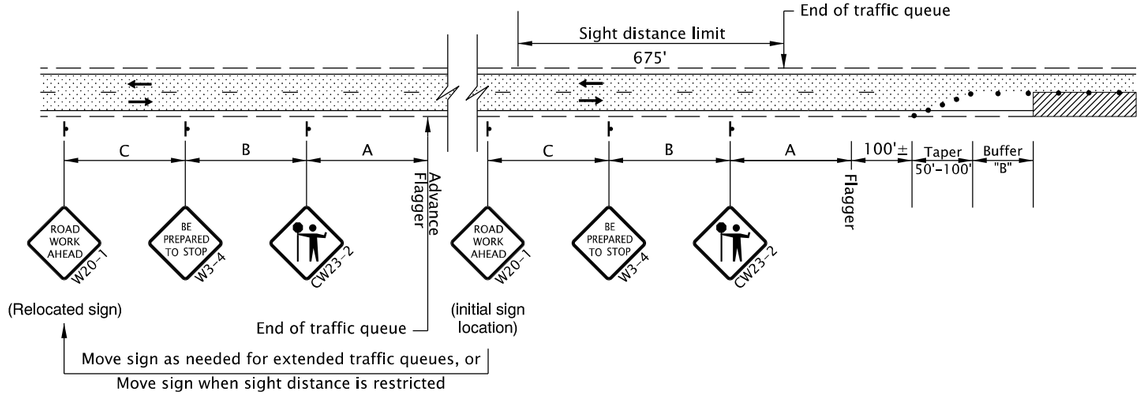
Effective Date: June 1, 2023 - November 30, 2023

13-JAN-2023

TM855.dgn

NOTES:

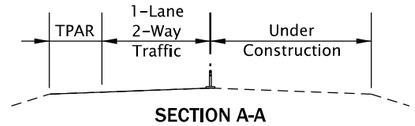
- Place Advance Flagger and additional signing when traffic queues extend beyond initial warning signing OR when sight distance is restricted.
- Relocate initial "ROAD WORK AHEAD" (W20-1) sign in advance of additional "BE PREPARED TO STOP" (W3-4) and Flagger Ahead (CW23-2) signs, as shown.
- Place additional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



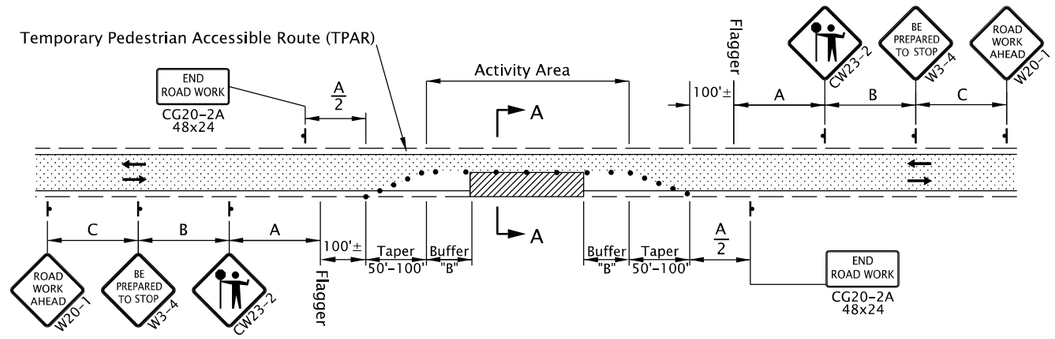
ADVANCE FLAGGER FOR EXTENDED TRAFFIC QUEUES

NOTE:

- 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.
- Include "WAIT FOR FLAGGER" (CR4-23) signs mounted on Type II Barricade located approx. 50' before each Flagger.
- 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.



SECTION A-A



2-Lane, 2-Way Roadway
ONE LANE CLOSURE

GENERAL NOTES FOR ALL DETAILS:

- This drawing is only intended to be used where an Automated Flagger Assistance Device (AFAD) cannot be utilized.
- The "FLAGGER" (CW23-2) symbol sign shall be used only in conjunction with the "BE PREPARED TO STOP" (W3-4) 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.

••••••••• 28" Tubular Markers on 10'max. spacing arround intersection radii.

• • • • • 28" Tubular Markers on 20' max. spacing for flagger tapers and stations

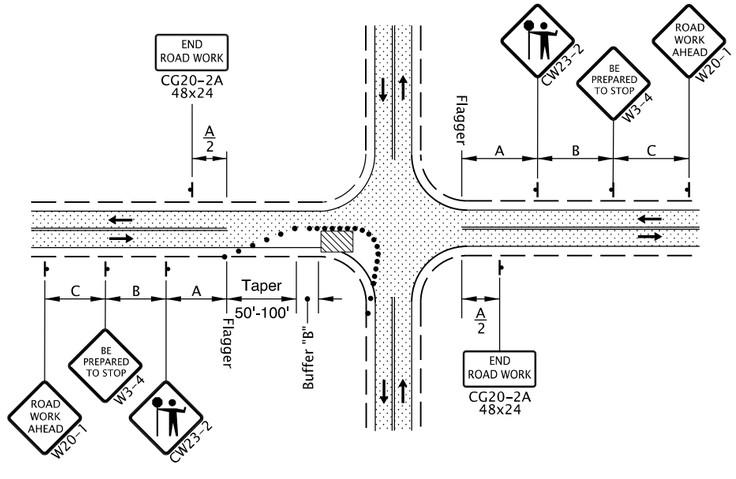
• • • 28" Tubular Markers See TCD Spacing Table on TM800 for max. spacing.

UNDER TRAFFIC

UNDER CONSTRUCTION

NOTE:

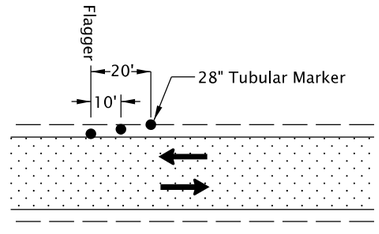
- Additional Traffic Control Measures (TCM) may be required for all legs of the intersection



2-Lane, 2-Way Roadway
ONE LANE CLOSURE, INTERSECTION

NOTE:

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



FLAGGER STATION DELINEATION

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-LANE, 2-WAY ROADWAYS

2021

DATE	REVISION DESCRIPTION

CALC. BOOK NO. N/A | SDR DATE 13-JAN-2023 | **TM855**