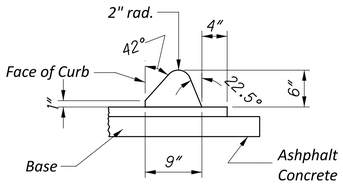
Update Date	Revision Type	Reference	Section Description	Description of Revision	New or Deletion
1/16/2026	L&D Vol. 1	101.3	Classification Used in ODOT Design Criteria	Updated Office of Systems Planning and Program Management to Office of Technical Services	
1/16/2026	L&D Vol. 1	105.5.1	Documentation Format	Updated Safety Analysis Guidelines link & updated Office of Program Management to Office of T.E.D.	
1/16/2026	L&D Vol. 1	106.1	General	Updated Office of Program Management to Office of T.E.D.	
1/16/2026	L&D Vol. 1	106.3	Data-Driven Safety Analysis	Updated Safety Analysis Guidelines link & updated Office of Program Management to Office of T.E.D.	
1/16/2026	L&D Vol. 1	106.4	Data-Driven Safety Analysis Documentation	Modified language on when safety should be considered for projects. Updated Safety Analysis Guidelines link & updated Office of Program Management to Office of T.E.D.	
1/16/2026	L&D Vol. 1	Figure 107-1	Non-Complex Project Flowchart	Deleted because this figure is managed by Safety and posted to their website	Deletion
1/16/2026	L&D Vol. 1	Figure 107-2	Complex Projects Assessment with Alternatives Analysis without Safety	Deleted because this figure is managed by Safety and posted to their website	Deletion
1/16/2026	L&D Vol. 1	Figure 107-3	Complex Projects Assessment with Alternative Analysis with Safety	Deleted because this figure is managed by Safety and posted to their website	Deletion
1/16/2026	L&D Vol. 1	Figure 202-2	Maximum Degree of Curve	Corrected errors	
1/16/2026	L&D Vol. 1	Figure 202-5	Methods of Superelevation Rotation	Corrected print-error (letter A was missing in multiple locations)	
1/16/2026	L&D Vol. 1	305.2	Types and Uses	Added Type 11 curb	
1/16/2026	L&D Vol. 1	307.6.4	Adjacent to Noise Sensitive Areas	Revised Noise Wall contact to Statewide Noise Wall Coordinator	
1/16/2026	L&D Vol. 1	401.3	Crossroad Alignment	Added guidance for curves approaching a stop-controlled intersection	
1/16/2026	L&D Vol. 1	Figure 401-11	Double Left Turn Lanes	Corrected Green Book sheet reference in note 2	
1/16/2026	L&D Vol. 1	Figure 403-2	Roundabout Critical Design Parameters	Deleted merged cells to conform to website accessibility requirements (WCAG 2.1)	
1/16/2026	L&D Vol. 1	550.1	General	Defined access point and updated references to 23 CFR Part 624.	
1/16/2026	L&D Vol. 1	550.2	Interchange Study (Access Point Request Document)	Substantial guidance additions/revisions. Clarified that safety includes all users. The safety analysis shall include at least the most recent 3 years of available safety data in the project's area of influence. Updated references to 23 CFR Part 624.	
1/16/2026	L&D Vol. 1	550.2.1	Interchange Operations Study (IOS)	Updated references to 23 CFR Part 624 and made other minor clerical edits. A reevaluation of the IOS may be required by ODOT if the project or a phase of the project has not progressed to construction within 5 years of the approval date of the document	
1/16/2026	L&D Vol. 1	602.6.1	Transverse Drainage	Added guidance on decision making process for extending culverts versus installing guardrail.	
1/16/2026	L&D Vol. 1	603.1.2	Semi Rigid Barriers	Changed three inches to two inches for asphalt paving around MGS	
1/16/2026	L&D Vol. 1	603.1.2.1	Type MGS Guardrail	Revised guardrail grounding guidance	
1/16/2026	L&D Vol. 1	603.1.2.4	Barrier Design Guardrail with Rub Rail	Added guidance associated with new MGS-2.2 SCD	New
1/16/2026	L&D Vol. 1	603.1.2.6	MGS Top-Mounted to Culverts	Added information on mounting guardrail to culverts, associated with new and revised details from MGS-2.1.	New
1/16/2026	L&D Vol. 1	603.1.2.7	Socketed Weak Post - Side Mounted to Headwall	Added guidance associated with MGS-2.4.	New
1/16/2026	L&D Vol. 1	603.1.4.7	Type N Single Slope Barrier	Revised nomenclature to "Type N"	
1/16/2026	L&D Vol. 1	603.3.2	Type B	Updated system length, LON, and offset guidance due to new device (4F-T)	
1/16/2026	L&D Vol. 1	604.3	Glare Screen Options	Corrected link to APL	
1/16/2026	L&D Vol. 1	606.3.3	Freeway Fence Design Conditions	Revised fence grounding requirements	
1/16/2026	L&D Vol. 1	Figure 603-2	TYPICAL PERMANENT BARRIER USES & WORKING WIDTHS	Added working width information for various details that were added to MGS-2.1, added MGS-2.2, and revised 81" to Type N	
1/16/2026	L&D Vol. 1	Example 602-2	Length of Need at a Large Culvert	Completely new version of this sample problem using modern standards	
1/16/2026	L&D Vol. 1	Example 602-4	Barrier on the Outside of a Curve	Revised calculations and improved graphic readability	
1/16/2026	L&D Vol. 1	1002.2	HSM for Evaluation	Updated Safety Analysis Guidelines link & updated Office of Program Management to Office of T.E.D.	
1/16/2026	L&D Vol. 1	Plan Note R112a	ITEM 606 – ANCHOR ASSEMBLY, MGS TYPE B	Updated designer notes for system length, LON, and offset guidance due to new device (4F-T)	
1/16/2026	L&D Vol. 1	Plan Note R113a	ITEM 606 – ANCHOR ASSEMBLY, MGS TYPE E	Fixed typo	
1/16/2026	L&D Vol. 1	Plan Note R116	MGS GUARDRAIL INSTALLED IN ASPHALT	Revised asphalt item, allowable depth to 2", and other minor edits in conjunction with new detail added to MGS-2.1	
1/16/2026	L&D Vol. 1	Plan Note R127	CABLE BARRIER	Corrected title and item Special references.	



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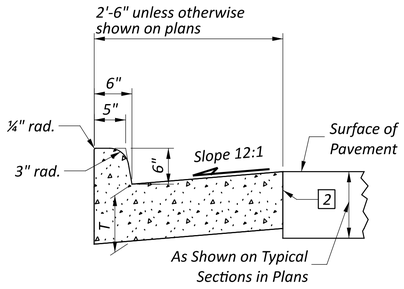

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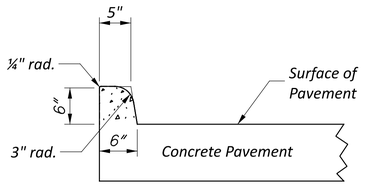

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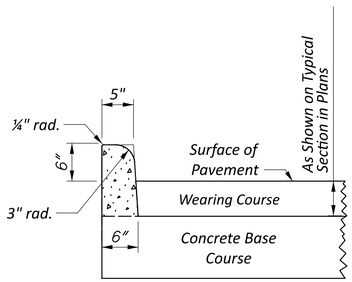

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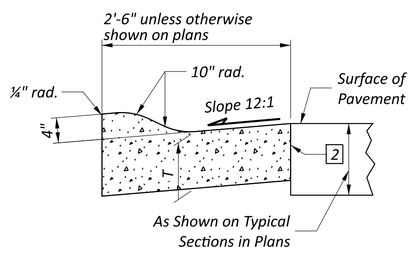

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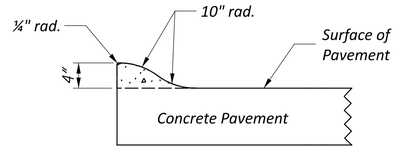

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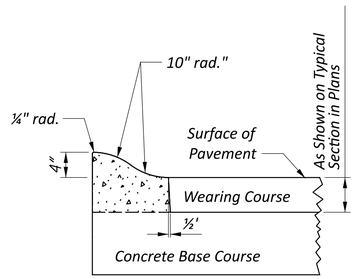

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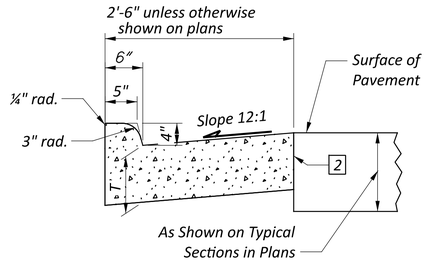

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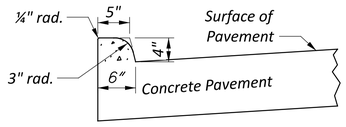

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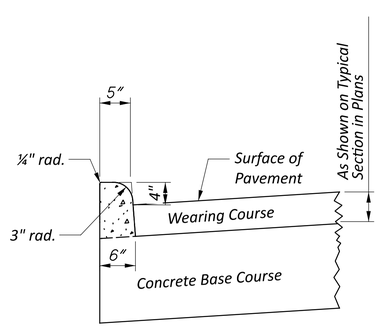

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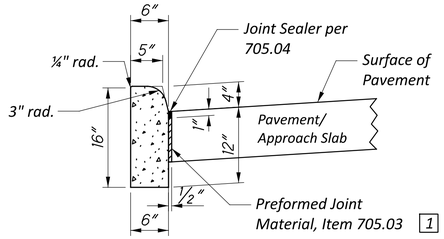

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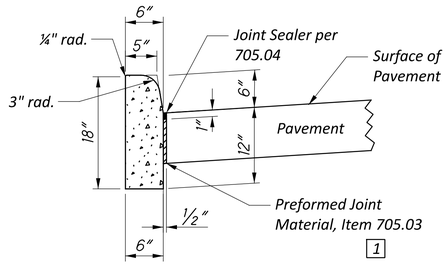

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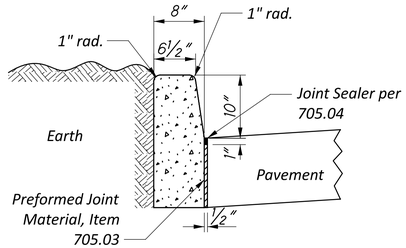

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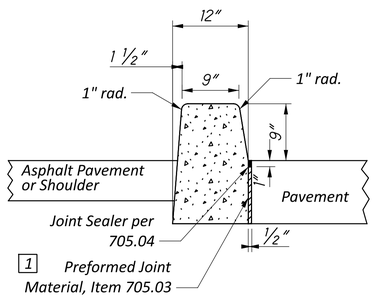


TYPE 8

NOTES

GENERAL: This drawing shows alternate types of curb that may be used on various types of pavement. The typical section of the project shows the type to be used, also the thickness of the edge of the pavement or the edge of the curb and gutter section.

JOINTS: 1" expansion joints shall extend up to the top of the curb and shall be constructed in the curb and gutter section in such a manner that the joint seal will extend the full width of the gutter and into the curb face a sufficient distance to seal the joint to an elevation of at least 2" above the flow line of the gutter. Dowel bars shall be used in the curb and gutter section at expansion joints and to the surface of the pavement.

Transverse expansion joint material shall meet the requirements of Item 705.03.

GUTTER PLATE THICKNESS: Thickness of gutter plate "T" shall be 9" unless otherwise shown on the plans.

TOLERANCES: Dimensional tolerances are as follows:

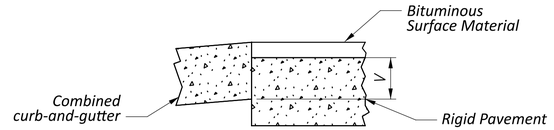
Curbs: -1/32" to +¼".
Gutters: 0 to +½".

LEGEND

1 Expansion joint material and joint sealer are not required for the portion of the curb that is adjacent to a flexible pavement type. Both materials are required, as detailed, for the full height of rigid pavement and concrete bases.

2 Butt joints shall be provided between combined curb-and-gutter and new or existing rigid pavements, with tie bars or hook bolts provided at intervals of 5'. See SCD BP-2.1 for details of tie bars and hook bolts.

If the combined curb-and-gutter adjoins a new rigid base or an existing rigid base or pavement that is to be surfaced with asphalt concrete, a butt joint shall also be provided. However, tie bars or hook bolts shall be omitted when the vertical overlap ("V" in detail below) between the curb-and-gutter and rigid pavement is less than 7".



OFFICE OF ROADWAY ENGINEERING

REVISIONS

01-21-2022
07-15-2022
01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
CONCRETE CURBS AND COMBINED CURB AND GUTTER

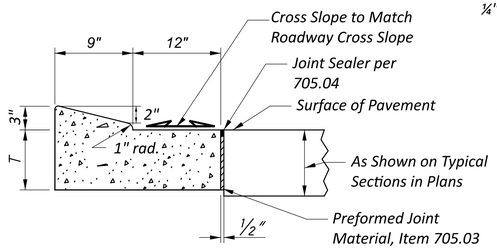
DESIGN AGENCY

SCD NUMBER
BP-5.1

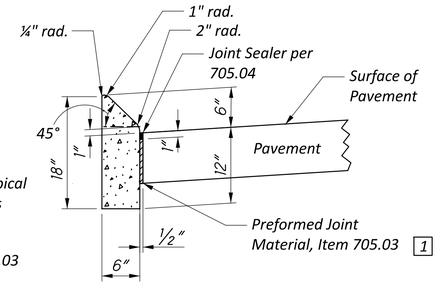
SHEET P.1 | TOTAL 2

BP-5.1

See sheet P.1 for notes and legend



TYPE 9



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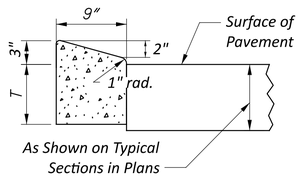

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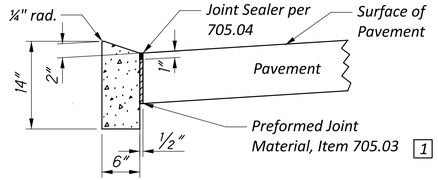
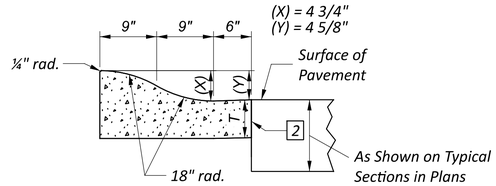


TYPE 10-B



TYPE 11

BP-5.1

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OFFICE OF ROADWAY ENGINEERING

REVISIONS

01-21-2022
07-15-2022
01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

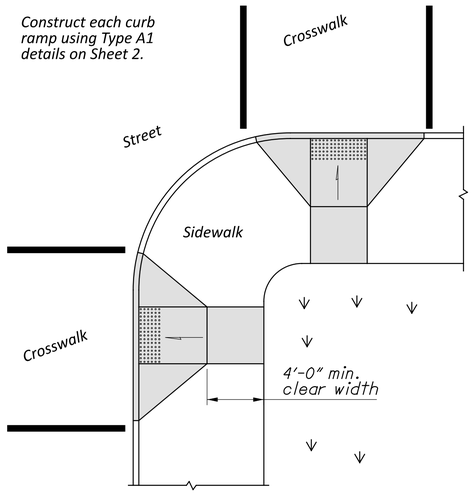
STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
CONCRETE CURBS AND COMBINED CURB AND GUTTER

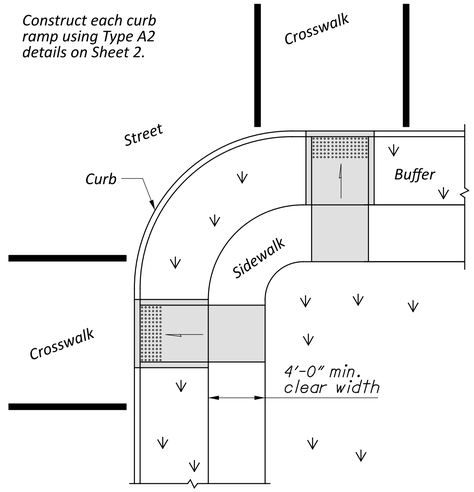
DESIGN AGENCY

SCD NUMBER
BP-5.1

SHEET P.2 | TOTAL 2

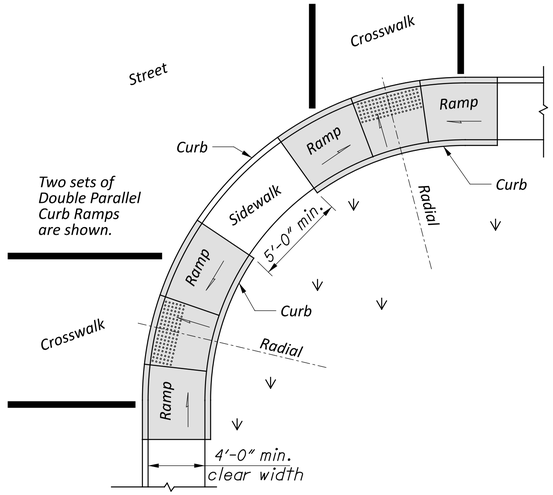


Use curb ramps with flared sides at locations with wide sidewalks.



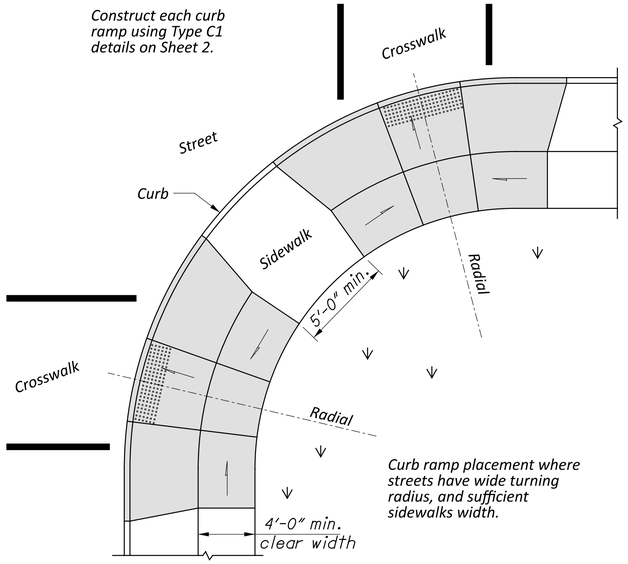
Use curb ramps with returned curbs where buffer is wide enough to accommodate ramp slope.

PERPENDICULAR CURB RAMPS



Place on streets having wide turning radius and where sidewalks are narrow.

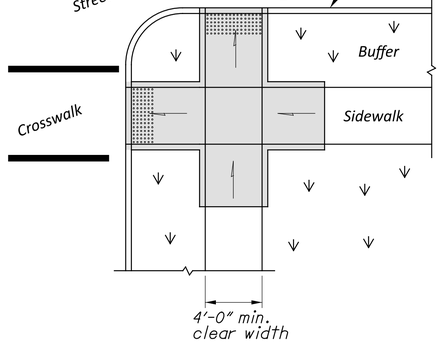
PARALLEL CURB RAMPS



Curb ramp placement where streets have wide turning radius, and sufficient sidewalks width.

COMBINATION CURB RAMPS

PREFERRED CONSTRUCTION PLACEMENT



NOTES

GENERAL: *This drawing shows curb ramp types details and placement examples for curb ramp construction, including the installation of detectable warnings.*

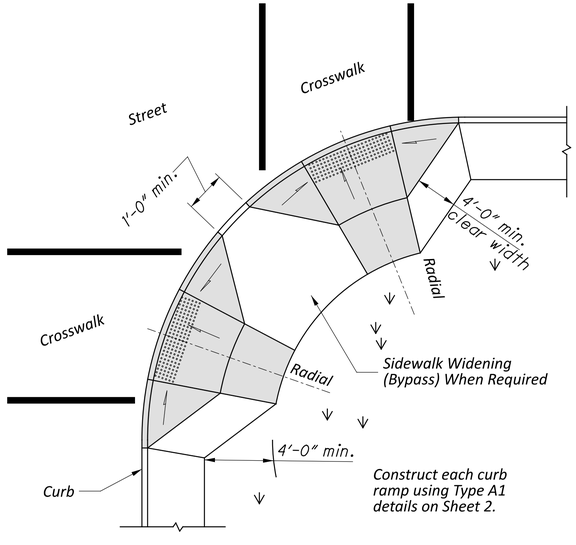
Curb ramp types are shown on Sheet 2 and include Perpendicular, Parallel, and Combined types as specified to be constructed in the locations shown on the project plans.

Curb ramps added to an existing intersection or walk should be individually detailed on the project plans to assure that the design is appropriate for site constraints and all items can be constructed to ADA standards. The contractor may adjust the placement of curb ramps if existing field conditions warrant with the approval of the Engineer.

PAYMENT: *Measure and pay for the ramp area within the shaded limits of this drawing as Item 608 Curb Ramp, Square Foot. This includes the cost of any curb or curb and gutter, detectable warnings, landing areas and any additional materials, installation, grading, forming, and finishing required within the shaded area.*

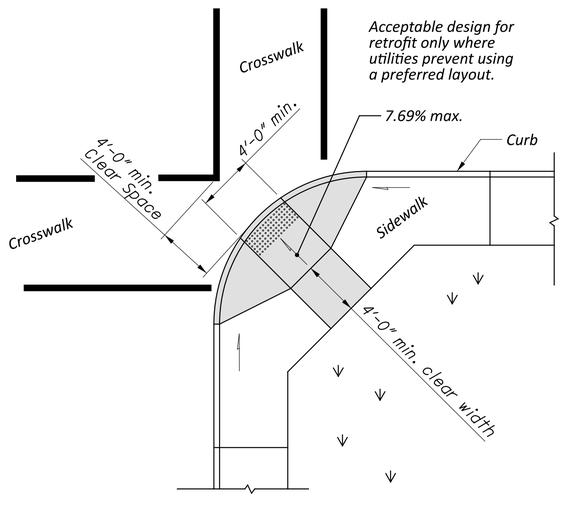
Work beyond the shaded ramp/landing area is paid for as curb (609) and walk (608). Removal of existing curb, walk (or existing curb ramps) are paid under Item 202.

For at-grade crossing locations where only detectable warnings are required in order to acheive ADA compliance, measure and pay for the strip of detectable warnings as Item 608 Detectable Warning, Square Foot. The work to cast the tiles in place will also require removal of existing pavement (Item 202) to the nearest joint, or if no joint exists, a minimum of 4 feet.



Acceptable design on corners with wide turning radius where user is able to maneuver within crosswalk limits so as not to encroach into adjacent traveled lanes.

PERPENDICULAR RAMPS



Use this design only for existing walks, and when site constraints prohibit other designs. The diagonal Type D ramp may be constructed as either a Perpendicular, Parallel or Combination curb ramp type. Avoid using where curb radii are less than 20'-0" .

DIAGONAL RAMP (Type D)

ACCEPTABLE CONSTRUCTION PLACEMENT

THIS DRAWING REPLACES BP-7.1 DATED 01-17-2025.

OFFICE OF ROADWAY ENGINEERING

REVISIONS
01-21-2022
01-20-2023
07-21-2023
01-19-2024
07-19-2024
01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
NEW CURB RAMPS
(with Detectable Warnings)

DESIGN AGENCY

SCD NUMBER
BP-7.1

SHEET P.1 | TOTAL 5

BP-7.1

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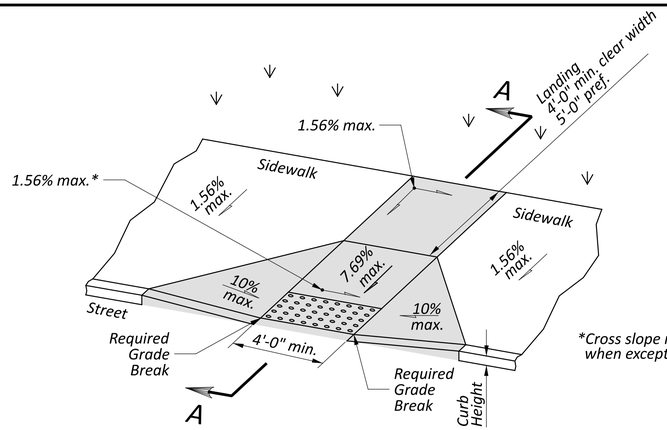
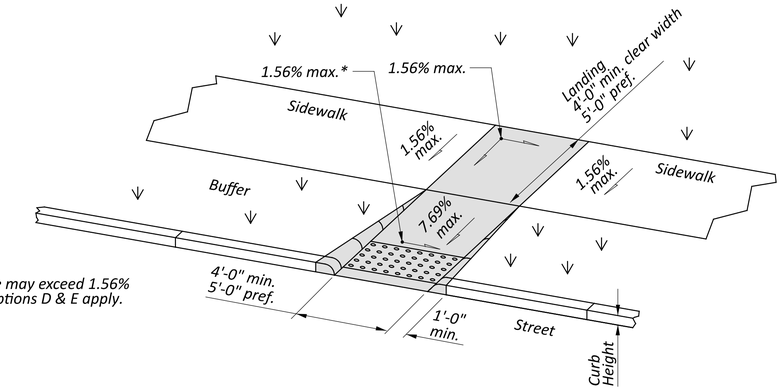
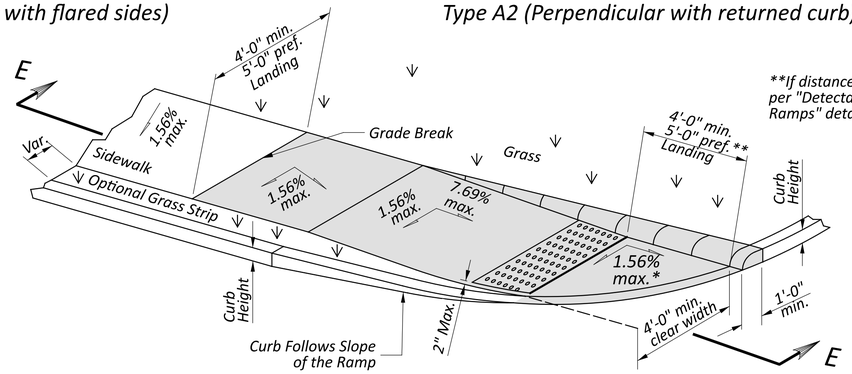


*Cross slope may exceed 1.56% when exceptions D & E apply.

Type A1 (Perpendicular with flared sides)



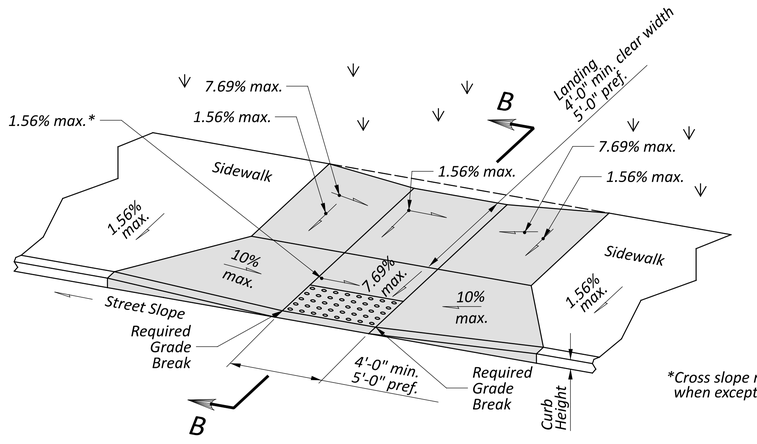
Type A2 (Perpendicular with returned curb)



**If distance exceeds 5', then install detectable warnings per "Detectable Warning Alignment for Directional Curb Ramps" detail on P.6

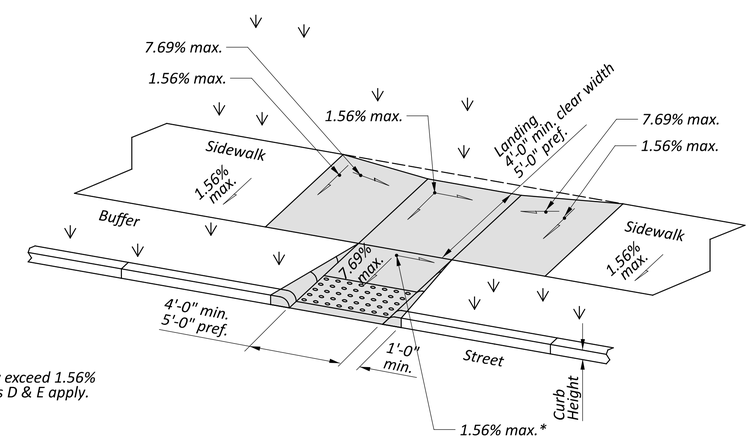
Type A3 (Single sided Perpendicular)

PERPENDICULAR CURB RAMP DETAILS



*Cross slope may exceed 1.56% when exceptions D & E apply.

Type C1 (Combined with flared sides)



Type C2 (Combined with returned curb)

COMBINED CURB RAMP DETAILS

NOTES CONTINUED

The running slope of the curb ramp shall be a 7.69% maximum or flatter. In existing sidewalks, where the maximum ramp slope is not feasible due to site constraints (e.g. utility poles or vaults, right-of-way limits) it may be adjusted as follows:

A) 10:1 for a max. rise of 6",
B) 8:1 for a max. rise of 3",
C) 6:1 over a max. run of 2'-0" for historic areas where a flatter slope is not feasible.

To prevent chasing the grade indefinitely, the transition from existing sidewalk to the shaded curb ramp area is not required to exceed 15 feet in length.

While ramps may be skewed to the crosswalk, the entire lower landing area must fall within the cross walk that the ramp serves and cannot be located in the traveled lane of opposing traffic.

The counter slope of the gutter or street at the foot of a curb ramp, landing, or blended transitions shall be 5% or flatter.

The bottom edge of the ramp shall change planes perpendicular to the landing.

The edge of the curb shall be flush with the edge of the adjacent pavement and gutter and surface slopes that meet grade breaks shall also be flush.

Where pedestrian street crossings are without yield or stop control conditions, or at a traffic signal that is designed for green phase and vehicles do not slow to navigate the intersection, the maximum cross slope at the edge of the asphalt pavement and gutter may be increased as follows:

D) 5% maximum cross slope at street crossings without yield or stop control
E) Cross slope may match grade of street asphalt edge profile at Mid-block Street Crossings

A 4' minimum continuous clear width, exclusive of the width of any curb, is required for a pedestrian access route. Ramp landings shall be 4' min. x 4' min. with a 1.56% or flatter cross slope and running slope.

Provide 24" wide level strip if the algebraic difference between the ramp slope and the street exceeds 11%.

***DETECTABLE WARNINGS:** Install Detectable Warnings on each curb ramp with approved materials, as shown on Sheet 4. Install these proprietary products as per manufacturer's written instructions.*

***BLENDED TRANSITIONS:** Blended Transititons do not require a landing since the slopes shall not exceed 5%.*

***DRAINAGE:** Contractor is to ensure the base of each constructed curb ramp allows for proper drainage, without exceeding allowable cross slope or ramp slopes. Vertical change in level exceeding ⅛" between the 1) pavement and gutter, and 2) gutter and ramp, are not allowed.*

***SURFACE TEXTURE:** Texture concrete surfaces by coarse brooming transverse to the ramp slopes to be rougher than the adjacent walk.*

***JOINTS:** Provide expansion joints in the curb ramp as extensions of walk joints and consistent with Item 608.03 requirements for a new concrete walk. Provide a ½" Item 705.03 expansion joint filler around the edge of ramps built in existing concrete walks. Lines shown on this drawing indicate the ramp edges and slope changes, and do not necessarily indicate joint lines.*

***SLOPES:** Where 7.69% maximum and 1.56% maximum slopes are listed, ramps shall be considered compliant for payment where the as-built slopes are 8.33% maximum and 2.10% maximum, respectively.*

See Sheet P.4 for Sections.

THIS DRAWING REPLACES BP-7.1 DATED 01-17-2025.

OFFICE OF ROADWAY ENGINEERING

REVISIONS
01-21-2022
01-20-2023
07-21-2023
01-19-2024
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01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
NEW CURB RAMPS
(with Detectable Warnings)

DESIGN AGENCY

SCD NUMBER
BP-7.1

SHEET P.2 | TOTAL 5

BP-7.1

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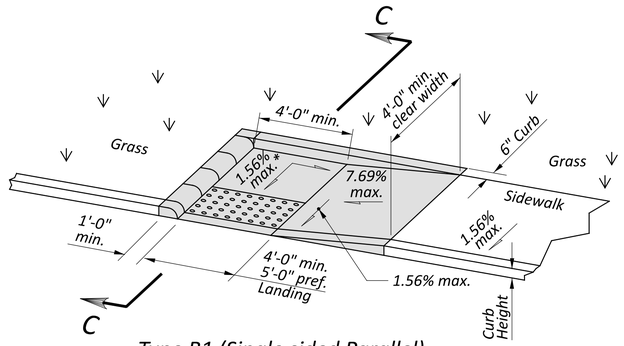
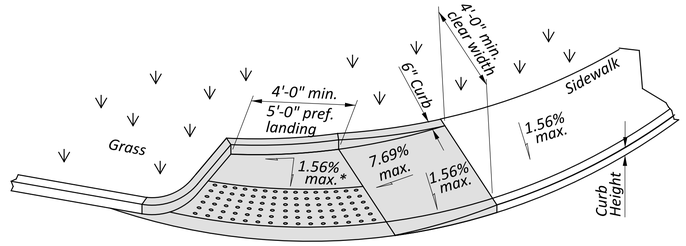
PARALLEL CURB RAMP DETAILS

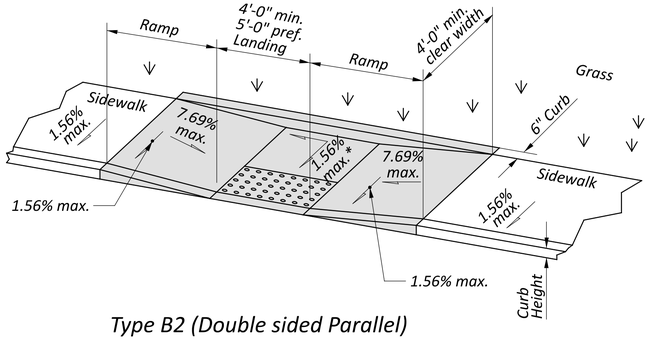


Type B1 (Single sided Parallel)

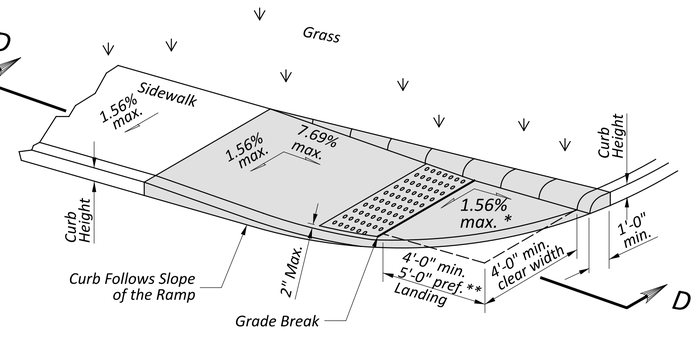


Type B1-R (Single sided Parallel on Radius)

*Cross slope may be increased for parallel curb ramps when exceptions D & E apply.



Type B2 (Double sided Parallel)



Type B3 (Single sided Parallel)

**If distance exceeds 5', then install detectable warnings per "Detectable Warning Alignment for Directional Curb Ramps" detail on P.6

See Sheet P.4 for Sections.

THIS DRAWING REPLACES BP-7.1 DATED 07-18-2025.

OFFICE OF ROADWAY ENGINEERING

REVISIONS
01-21-2022
01-20-2023
07-21-2023
01-19-2024
07-19-2024
01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
NEW CURB RAMPS
(with Detectable Warnings)

DESIGN AGENCY

SCD NUMBER
BP-7.1

SHEET P.3 TOTAL 5

BP-7.1

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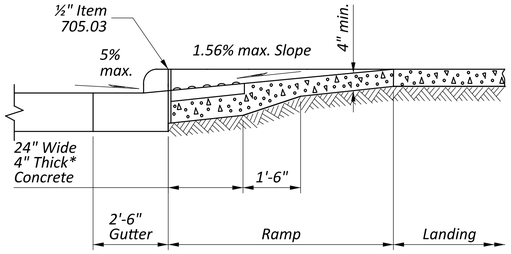
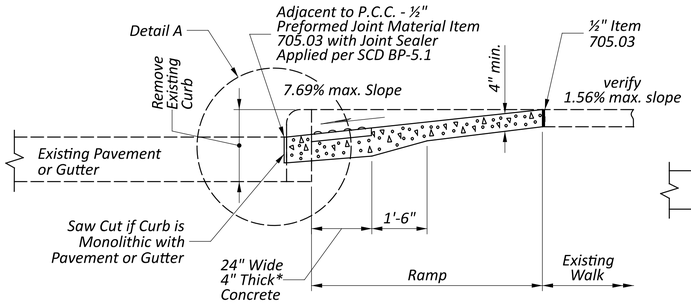


New gutter shown.

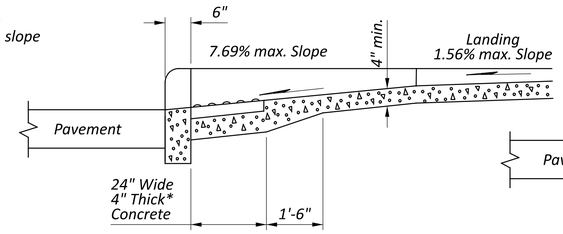
SECTION A-A NORMAL DETAIL

See Sheet P.2.



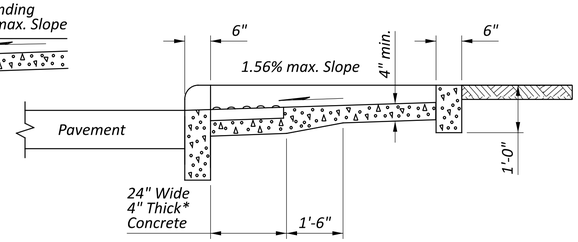
SECTION A-A EXISTING WALK DETAIL

See Sheet P.2.



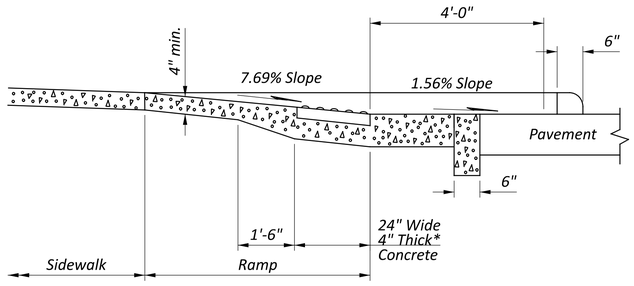
SECTION B-B

See Sheet P.2.



SECTION C-C

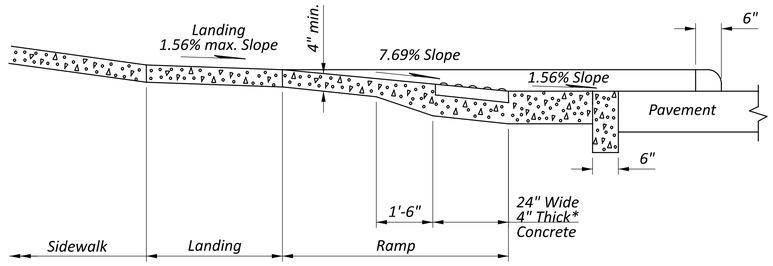
See Sheet P.3.



SECTION D-D

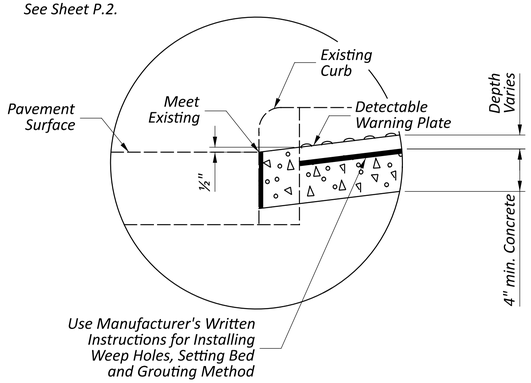
See Sheet P.3.

*Where possible, pour ramp area integral with the curb, otherwise use 6" thick walk.

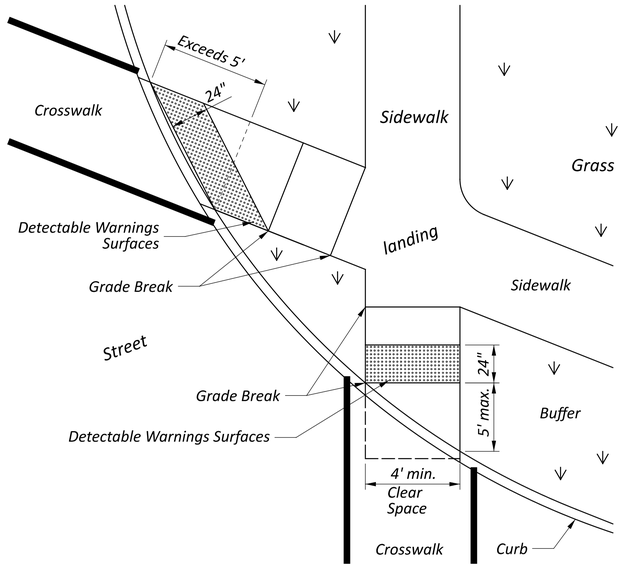


SECTION E-E

See Sheet P.2.



DETAIL A



DETECTABLE WARNING ALIGNMENT FOR DIRECTIONAL CURB RAMPS

DETECTABLE WARNINGS NOTES

GENERAL: *Detectable Warnings are a distinctive surface pattern of truncated domes which are detectable by cane or underfoot to alert people with vision impairments of their approach to streets and hazardous drop-offs.*

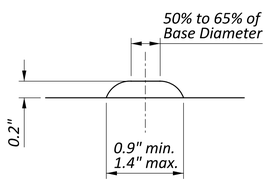
PLACEMENT: *Detectable warnings are to be installed at any location where pedestrians might cross paths with vehicular traffic lanes, such as the base of curb ramps or at blended curbs. A 24" strip of domes is to be installed for the full width of the ramp or walk. Typical street corner placement locations are shown on Sheet 1.*

Some detectable warning products require a concrete border for proper installation. The concrete border should not exceed 2". Where the back of curb edge is tooled to provide a radius, the border dimension should be measured from the end of the radius.

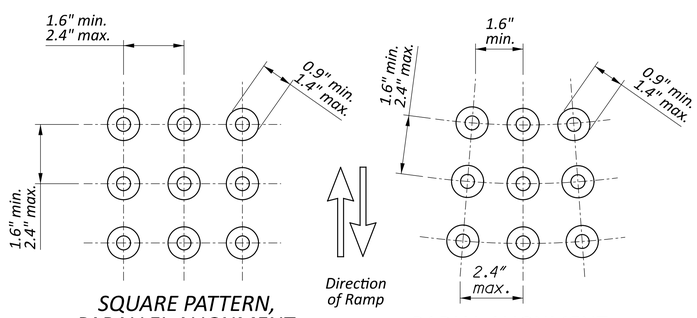
The depth of concrete underneath detectable warning products shall be a minimum of 4". See DETAIL A.

ALIGNMENT: *Truncated domes should be aligned with the primary direction of the ramp as shown on the DETECTABLE WARNING ALIGNMENT Detail to direct pedestrians toward the landing. Normally the detectable warnings should be flush with the back of the curb, but for skewed conditions see DETECTABLE WARNING ALIGNMENT Detail. For non-standard layouts, detectable warning materials may have to be mitered and placed segmentally.*

PRODUCTS & COLORS: *Color of the detectable warnings should contrast with surrounding concrete walk and ramp. Black is not an acceptable color. Approved products and guidance on color may be found on the Office of Roadway Engineering Service's Detectable Warnings Approved List. Install products as per manufacturer's printed instructions.*



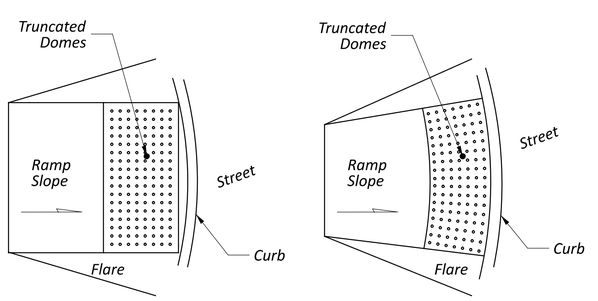
HEIGHT AND DIAMETER



SQUARE PATTERN, PARALLEL ALIGNMENT

RADIAL ALIGNMENT

TRUNCATED DOMES DETAILS



DOME ALIGNMENT ON RADIUSED CURB

THIS DRAWING REPLACES BP-7.1 DATED 01-17-2025.

OFFICE OF ROADWAY ENGINEERING

REVISIONS
01-21-2022
01-20-2023
07-21-2023
01-19-2024
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01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
NEW CURB RAMPS
(with Detectable Warnings)

DESIGN AGENCY

SCD NUMBER
BP-7.1

SHEET P.4 TOTAL 5

BP-7.1

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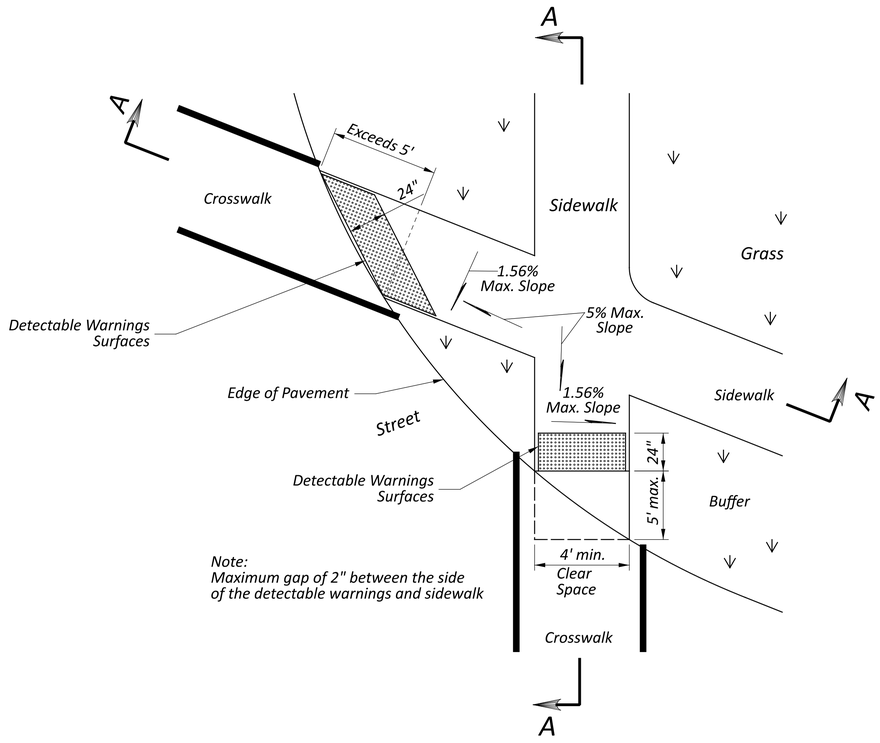
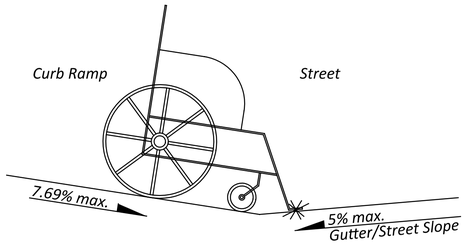
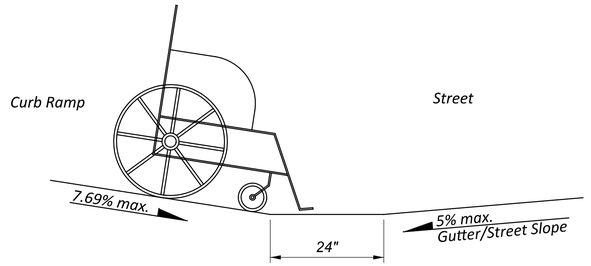


BLENDED TRANSITION

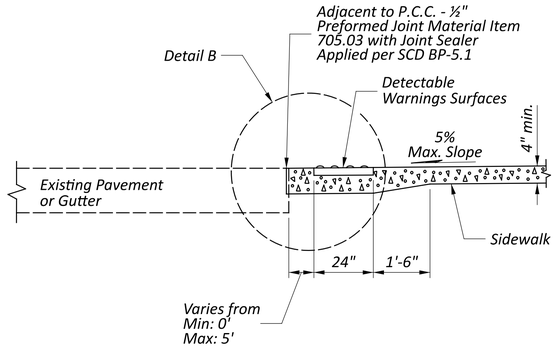


Algebraic difference greater than 11% is not permitted

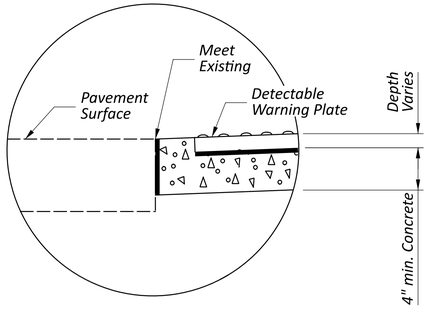


Provide 24 inch level strip if algebraic difference exceeds 11%

ALGEBRAIC GRADE DIFFERENCE DETAIL



SECTION A-A



DETAIL B

THIS DRAWING REPLACES BP-7.1 DATED 01-17-2025.

STANDARD ROADWAY CONSTRUCTION DRAWING
NEW CURB RAMPS
(with Detectable Warnings)

OFFICE OF ROADWAY ENGINEERING

REVISIONS
01-21-2022
01-20-2023
07-21-2023
01-19-2024
07-19-2024
01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

DESIGN AGENCY

SCD NUMBER
BP-7.1

SHEET P.5 TOTAL 5

BP-7.1

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pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\03 Standards\PIS_SCD\Roadway\Working Folder\2026\01_Jan\BP-7.1_2026-01-16.dgn

NOTES:

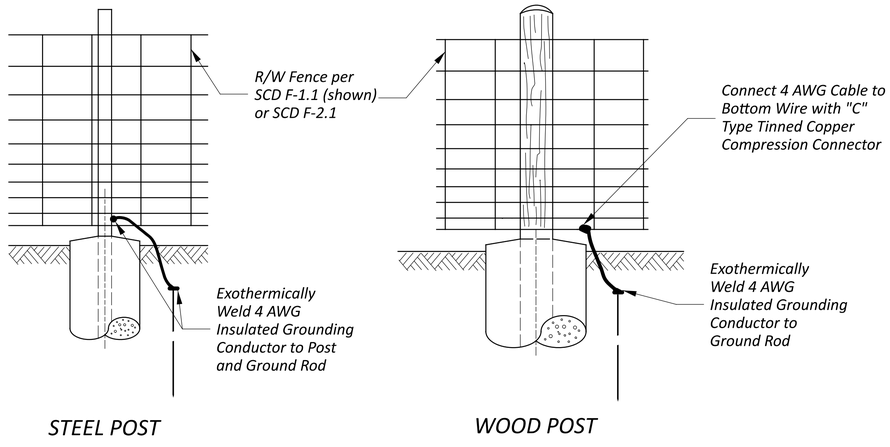
GENERAL: *Apply two coats of insulating varnish over exothermic welds and exposed cable.*

Ground rods may be omitted when driven steel line posts are installed in lieu of concrete encased posts.

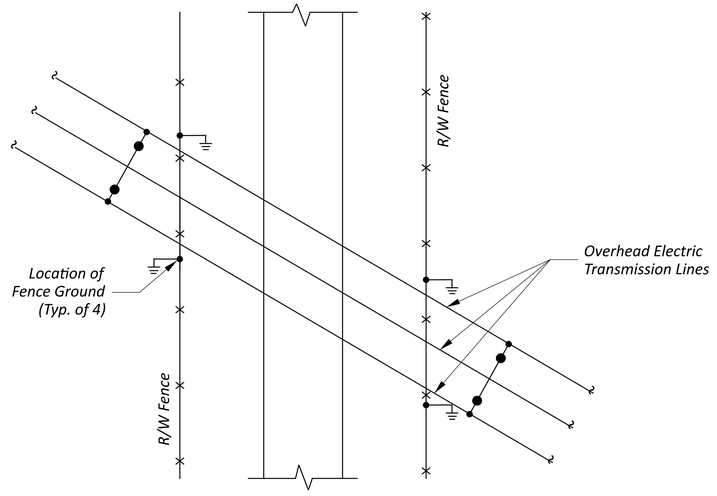
PAYMENT: *Fence grounds will be paid for at the unit price bid for* ***Item 625 - Ground Rod****, Each.*

Ground Rod Installation Guidelines

	Transmission/Sub-Transmission Power Lines (≥69kV)	***Distribution/Service Power Lines (<69kV)***
Cross alignment of fence	*Install Ground Rods per Fence Grounds at Transmission Lines Crossing Detail*	*No Ground Rods required*
Run Parallel to the fence (within 50' measured horizontally of fence alignment)	*Install (1) Ground Rod at the center of the run*	*No Ground Rods required*



R/W FENCE GROUND



FENCE GROUNDS AT TRANSMISSION LINES CROSSING

OFFICE OF ROADWAY ENGINEERING

REVISIONS

07-18-2025
01-16-2026

STDS ENGINEER
A. Holloway

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

FENCE GROUNDING DETAILS

DESIGN AGENCY

SCD NUMBER
F-3.5

SHEET P.1 | TOTAL 1

F-3.5

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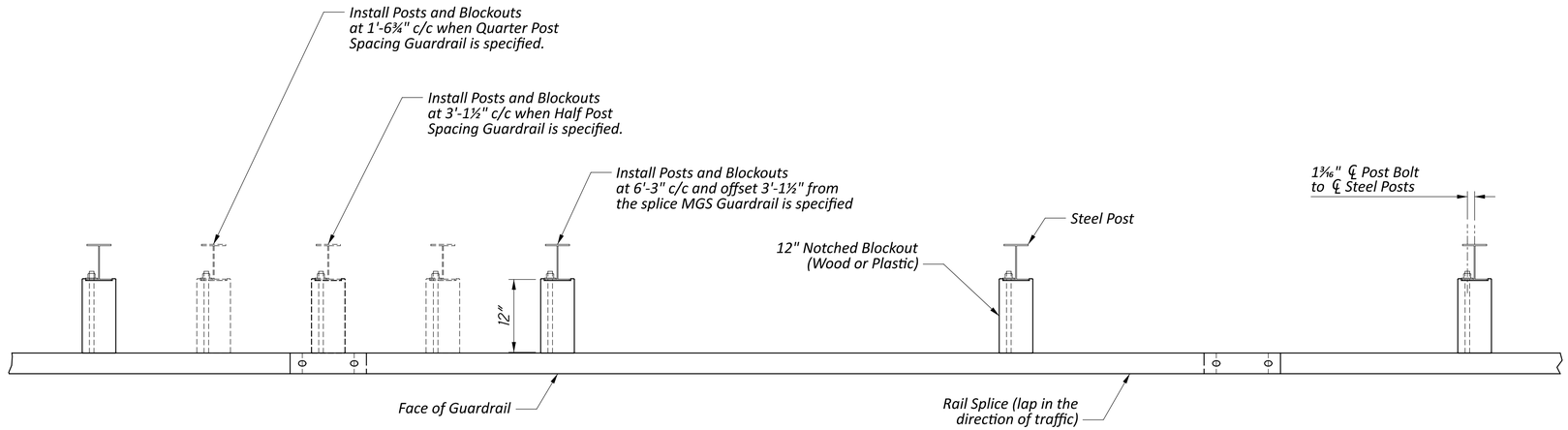
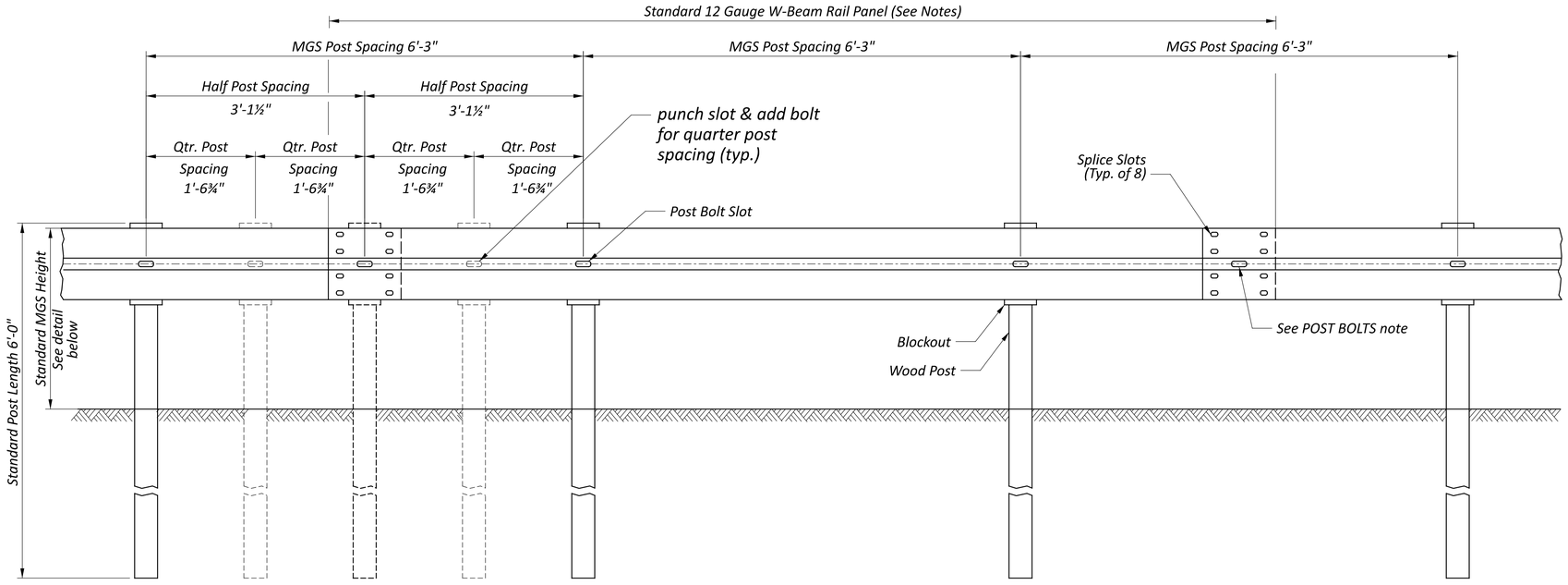


PLAN VIEW
(Steel Posts shown)



ELEVATION
(Wood Posts shown)

NOTES

RAIL: *Use W-Beam rail meeting the requirements of CMS 606.02. Either 13'-6½" long (12'-6" between splices) or 26'-½" long (25'-0" between splices) rail sections may be used. See sheet P.3 for details*

POSTS: *Posts may be round wood, rectangular wood, or steel. A consistent post material shall be used for mainline posts of the same length unless otherwise specified in the plans or permitted by the Engineer. See sheet P.2 for details.*

Wood post shall be fabricated and pressure-treated for approved species as per CMS 710.12. Bore bolt holes and, if required, trim the tops of posts after the posts are set. Exposed wood in result of boring holes or trimming posts shall be treated with copper napthanate or other AWPA standard M4 approved chemical.

Half-post and quarter-post spacing sections shall be constructed with steel posts.

Posts shall not be set in concrete, at any depth. See sheet P.5 for details on setting posts in asphalt, rocky terrain, and vegetation control strips.

See sheets P.6-P.7 for details on culvert mounted posts.

BLOCKOUTS: *Blockout dimensions are dependent on post used, see sheet P.2. Wood Blockouts are to be pressure treated as specified in CMS 710.14. Bore bolt holes. Approved Alternate blockouts may be used in lieu of the wood blockouts shown. See the Approved Products List posted on Office of Roadway Engineering's website.*

Half-post spacing sections require a 10" (height) blockout for each post spaced at 3'-1 1/2" c/c. See sheet P.2 for details. Quarter-post spacing sections require a 14" (height) blockout for each post spaced at 1'-6 3/4".

When terminating double-sided barrier guardrail with an impact attenuator, use reduced 8" deep blockouts on the last # posts on the barrier design to accomodate the narrower widths of the attenuators.

WASHERS: *Install appropriate sized standard galvanized steel washers on the nut side of bolts installed on wood posts. Beam washers are not to be used.*

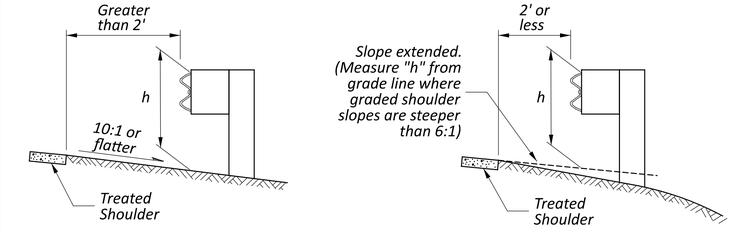
POST BOLTS: *The post bolt is not required at mid-span rail splice locations, but the contractor may install a bolt here to aid in installation. The bolt may remain in place when the splice is not within the pay limits of an end treatment.*

GUARDRAIL HEIGHT: *For initial installation, construct the guardrail within ±1" of the standard 31" height to the top of W-Beam rail. When subsequent projects, such as resurfacings, affect theheight of existing guardrail, adjustment is not required if the finished height is within ±3" of the standard height.*

DELINEATION: *For Barrier Reflectors see CMS 626.*

PAYMENT: *MGS guardrail is paid in feet per* ***Item 606 - Guardrail, Type MGS.***
MGS with Long Posts is paid in feet per ***Item 606 - Guardrail, Type MGS With Long Posts***
MGS with Half or Quarter Post Spacing is paid in feet per ***Item 606 - Guardrail, Type MGS Half Post Spacing*** *or* ***Item 606 - Guardrail, Type MGS Quarter Post Spacing***
Double sided MGS (barrier design) is paid in feet per ***Item 606 - Guardrail, Barrier Design, Type MGS***

See Sheet P.2 for details on raising existing guardrail height



MEASURING GUARDRAIL HEIGHT

OFFICE OF ROADWAY ENGINEERING

REVISIONS
01-19-2018
01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
A. Holloway

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

MIDWEST GUARDRAIL SYSTEM
STANDARD TYPE MGS
ALIGNMENT, HEIGHT, AND GENERAL DETAILS

DESIGN AGENCY

SCD NUMBER
MGS-2.1

SHEET P.1 | TOTAL 7

MGS-2.1

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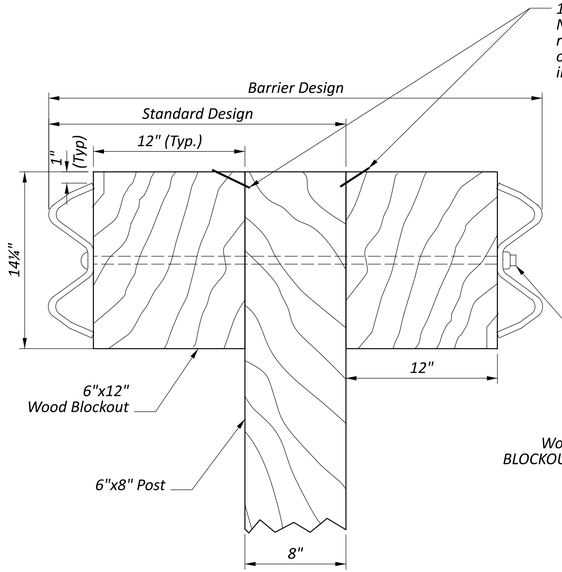
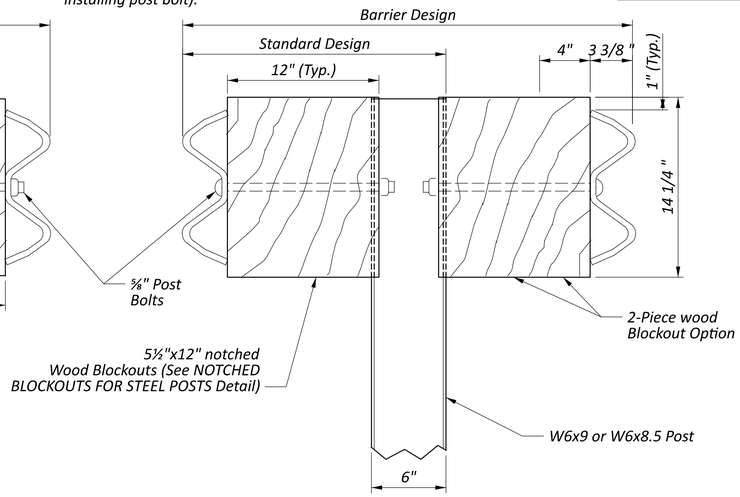
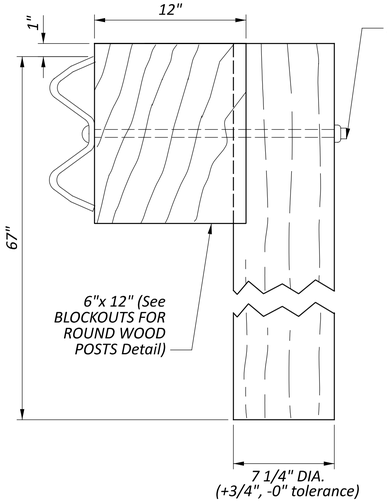
See POSTS and BLOCKOUTS Notes on Sheet P.1



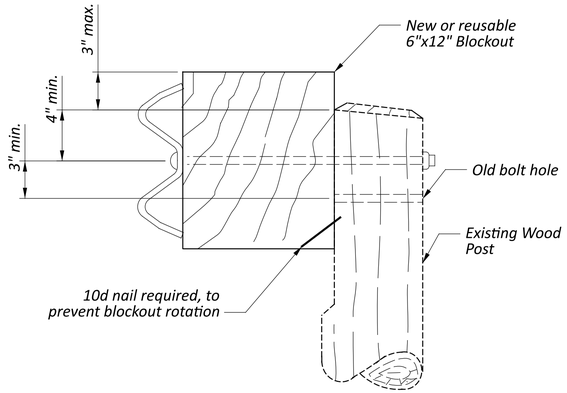
RECTANGULAR WOOD POST



STEEL POST

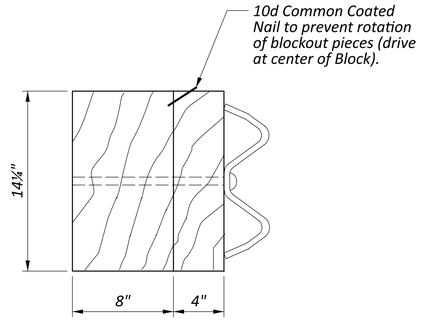


ROUND WOOD POST

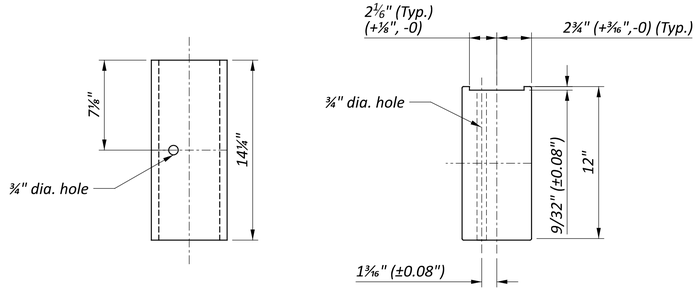


RAISING EXISTING GUARDRAIL HEIGHT

STEEL BEAM POSTS				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W6x8.5	5.8"	3.94"	0.193"	0.170"
Rolled W6x9	5.9"	3.94"	0.215"	0.170"
Welded 6x8.5	6.0"	3.94"	0.193"	0.170"
Welded 6x9	6.0"	3.94"	0.215"	0.170"



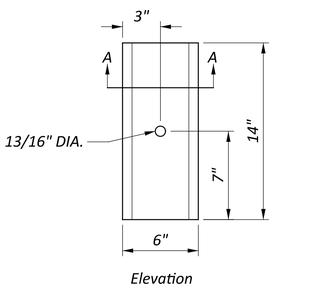
TWO-PIECE WOOD BLOCKOUT OPTION



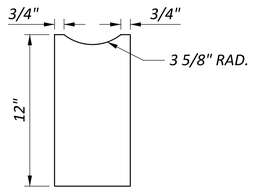
ELEVATION PLAN

NOTCHED BLOCKOUTS FOR STEEL POSTS

See BLOCKOUTS Note on Sheet P.1

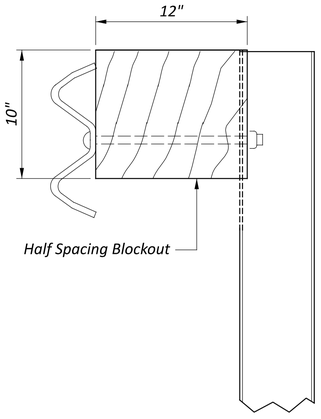


Elevation



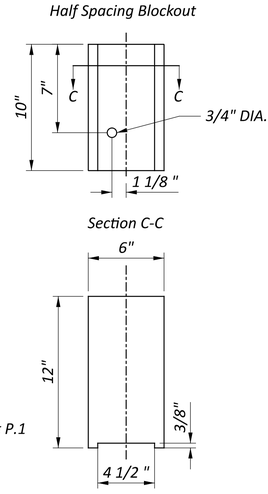
Section A-A

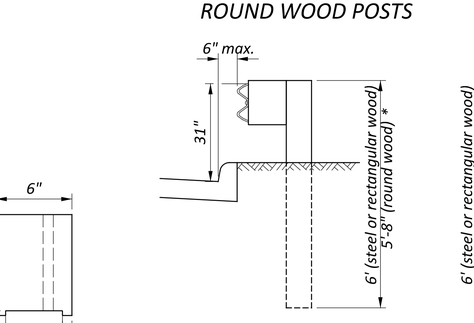
BLOCKOUTS FOR ROUND WOOD POSTS

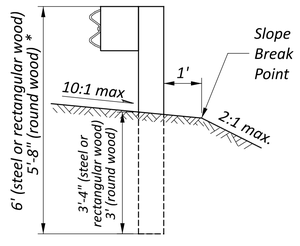


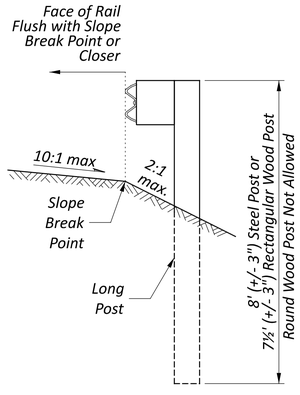
Half-Post Spacing

See BLOCKOUTS Note, Sheet P.1

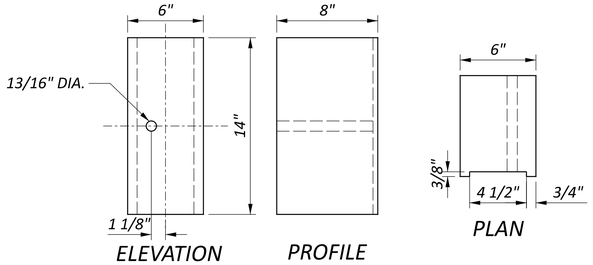








GUARDRAIL POST LENGTH AND POSITION



ELEVATION PROFILE PLAN

BLOCKOUT FOR TOP MOUNTED CULVERT DETAIL #1

See detail on Sheet P.6

NOTES

POSTS: *The standard post length is 6'-0" (+3",-0" tolerance) for steel and rectangular wood posts. Round wood posts shall be 5'-8" (+3", -0" tolerance) in length. Post type shall remain consistent along the length of a run of MGS; do not use round wood posts if a portion of the run requires long posts.*

POST EMBEDMENT DEPTH: *Standard embedment depth is 3'-4" minimum for steel and rectangular wood posts. Embedment depth shall be 3'-0" for round wooden posts.*

Do not drive posts located over a culvert with less than 4'-3" of cover; instead set in drilled or dug holes. Where site constraints prohibit the post from being placed at least one foot in front of the slope break point, use longer posts as shown in the Guardrail Post Length and Position Detail. The face of the rail may not be beyond the slope break point.

SPECIAL POST MOUNTINGS: *Install posts located over a drainage inlet or structure with a cover of less than 3'-4" as shown in the FOOTING ANCHOR Detail on Sheet P.4.*

ANCHORS: *Holes shall comply with CMS 510. Use non-shrink, nonmetallic grout per CMS 705.20.*

PROTECTIVE COATING: *In lieu of the complying with CMS 710.06, coat expansion shields, anchors and concrete insert anchor assembliesembedded in concrete in accordance with ASTM A 153 or be of stainless steel. Any bolts screwed into these devices shall meet CMS 710.06.*

OFFICE OF ROADWAY ENGINEERING

REVISIONS

01-19-2018
01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
A. Holloway

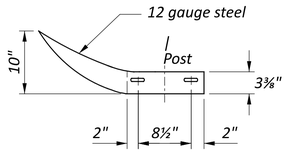
STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

MIDWEST GUARDRAIL SYSTEM STANDARD TYPE MGS POST AND BLOCKOUT DETAILS

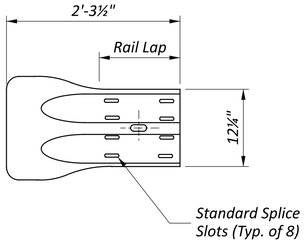
DESIGN AGENCY

SCD NUMBER
MGS-2.1

SHEET P.2 TOTAL 7

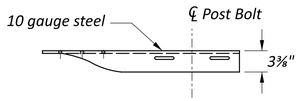


PLAN

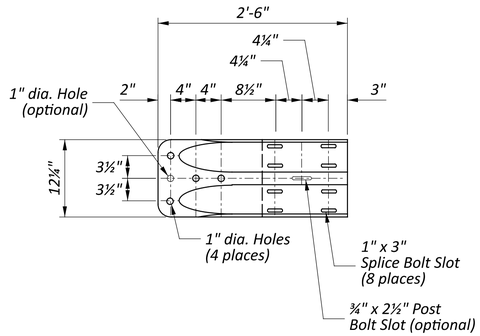


ELEVATION

W-BEAM FLARED END SECTION

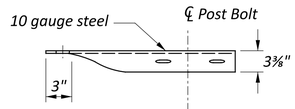


PLAN

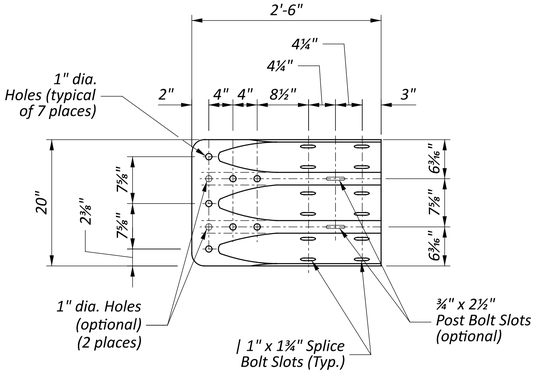


ELEVATION

W-BEAM TERMINAL CONNECTOR

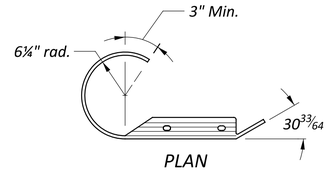


PLAN

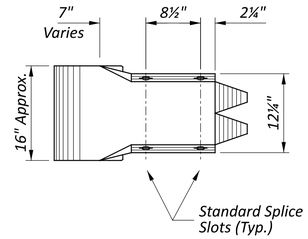


ELEVATION

THRIE-BEAM TERMINAL CONNECTOR

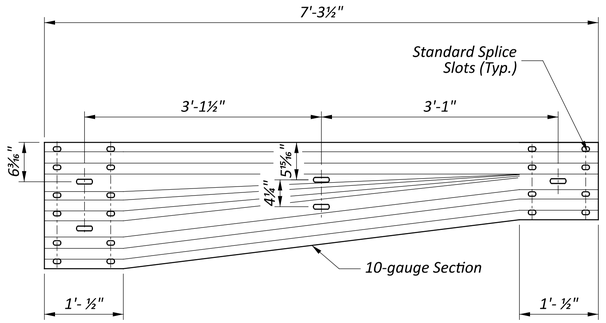


PLAN



ELEVATION

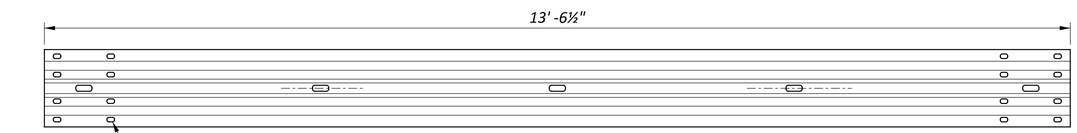
ROUNDED W-BEAM END SECTION



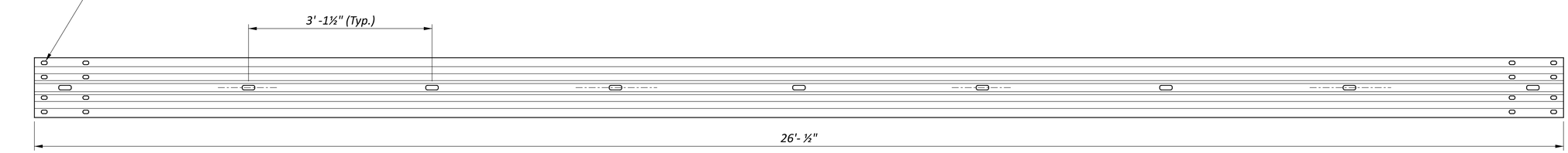
ASYMMETRIC TRANSITION SECTION

(W to Thrie-Beam)

(For details of Type 1 Transition Section (Symmetric), refer to AASHTO M 180 Figure 4.)



12'-6" W-BEAM SECTION



25'-0" W-BEAM SECTION

NOTES

GENERAL: Components shown on this drawing are used in a variety of guardrail systems. See individual guardrail drawing for specific applications.

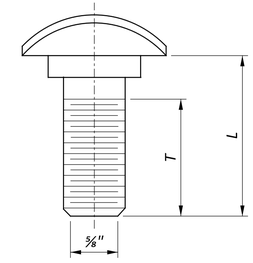
See CMS 606 for guardrail specifications not covered on these drawings.

Refer to AASHTO M 180 for dimensional details of W-Beam and Thrie-Beam rail elements, related buffer and end sections, beam splices, post and splice bolts, nuts, and Type 1 W-Beam to Thrie-Beam Transition sections. Beam washers are not to be used. Bolts grade shall be ASTM A307.

RAIL ELEMENTS: Unless otherwise specified, W-Beam Rail is 12 gauge steel with an effective length of 12'-6" or 25'-0", with 29/32"x1⅛" splice bolt slots, and ¾" x 2½" post bolt slots on 3'-1½"" centers regardless of post spacing. Field punch or drill bolt holes or slots for irregularly spaced posts as specified in CMS 606.04.

Substituting one 10 guage steel beam element where two nested 12 guage steel beams are specified is permitted (both W-beam and Thrie-beam).

RAIL SPLICES: Lap splices between two rail elements or between a rail and terminal connector in the direction of traffic. Lap the flared end sections in the direction of traffic.



GUARDRAIL BOLT

(For Post and Splice Bolts)

L	T min.	Bolt Use
22" (Standard Rail)	4"	Type MGS: WP/WB, PB
34" (Barrier Rail)		
14"	4"	Type MGS: SP/WB, PB
1¼"	1⅛"	Splice Bolt

WP = Wood Post
SP = Steel Post
WB = Wood Blockout
PB = Plastic Blockout

Longer Bolt may be needed for round Wood Post larger than 8" dia.

MGS-2.1

MODEL: Sheet 3 PAPERSIZE: 34x22 (in.) DATE: 11/17/2025 TIME: 10:43:40 AM PLTDRV: OHDOT_PDF.pltcfg PENTBL: OHDOT_Pen.tbl USER: Andrew.Holloway@dot.ohio.gov WORKSPACE: OHDOTCEv02 WORKSET: PIS_SCD PRODUCT: OpenRoadsDesigner 24.00.00.205
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OFFICE OF ROADWAY ENGINEERING

REVISIONS

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01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
A. Holloway

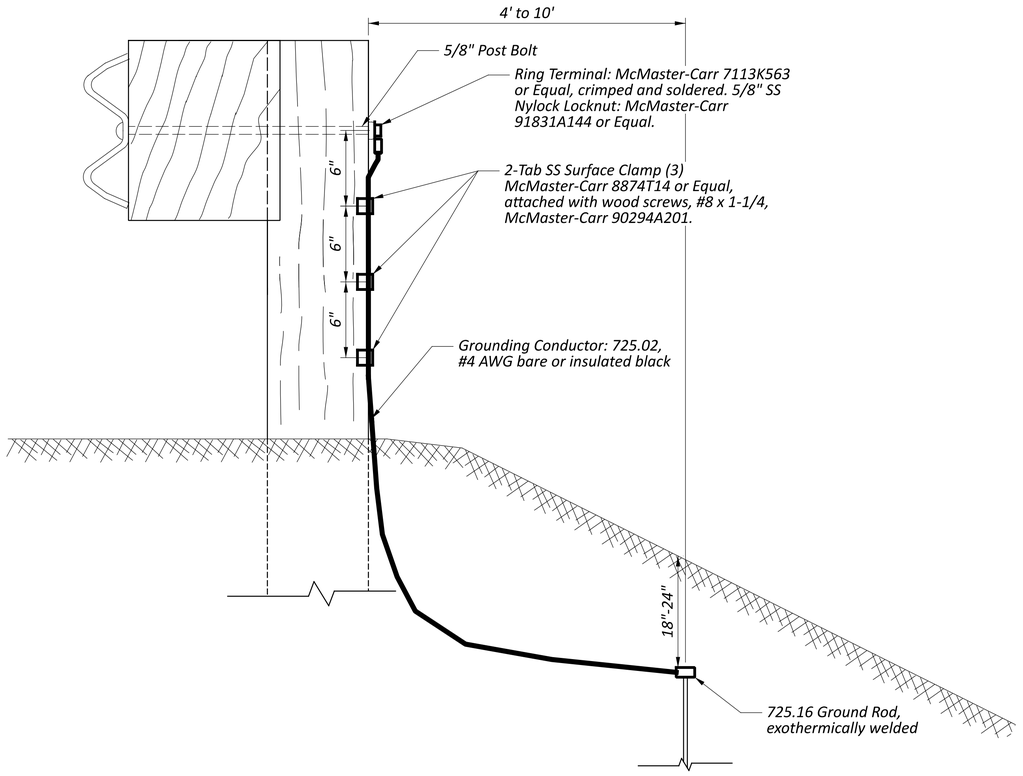
STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

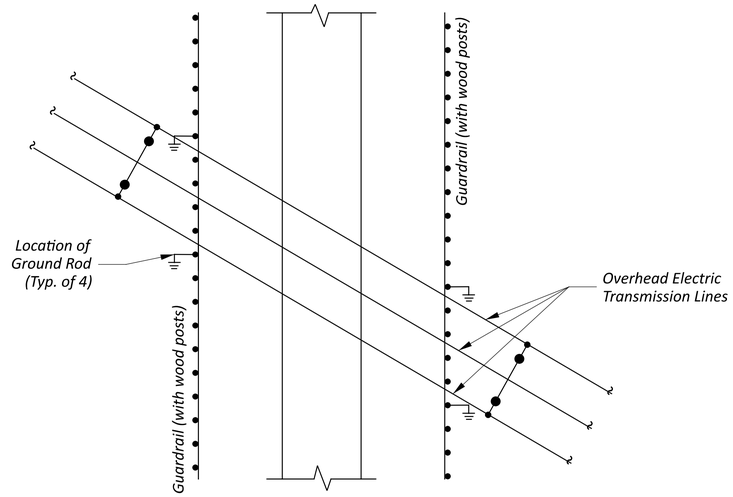
MIDWEST GUARDRAIL SYSTEM
STANDARD TYPE MGS
RAIL COMPONENTS

DESIGN AGENCY

SCD NUMBER
MGS-2.1

WOOD POST GROUNDING DETAIL
ROUND (SHOWN) OR RECTANGULAR WOOD POSTS





GUARDRAIL GROUNDS AT TRANSMISSION/SUB-TRANSMISSION LINES CROSSING

NOTES:

GENERAL: *Apply two coats of insulating varnish over exothermic welds and exposed cable.*

PAYMENT: *Guardrail grounds will be paid for at the unit price bid for* ***Item 625 - Ground Rod****, Each.*

Ground Rod Installation Guidelines

	Transmission/Sub-Transmission Power Lines (≥69kV)	***Distribution/Service Power Lines (<69kV)***
Cross alignment of guardrail with wood posts	*Install Ground Rods per Guardrail Grounds at Transmission Lines Crossing Detail*	*No Ground Rods required*
Run Parallel to the guardrail with wood posts (within 50' measured horizontally of guardrail alignment)	*Install (1) Ground Rod at the center of the run*	*No Ground Rods required*

OFFICE OF ROADWAY ENGINEERING

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01-16-2026

STDS ENGINEER
A. Holloway

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

MIDWEST GUARDRAIL SYSTEM, STANDARD TYPE MGS GROUNDING DETAILS

DESIGN AGENCY

SCD NUMBER
MGS-2.1

SHEET P.4 | TOTAL 7

MGS-2.1

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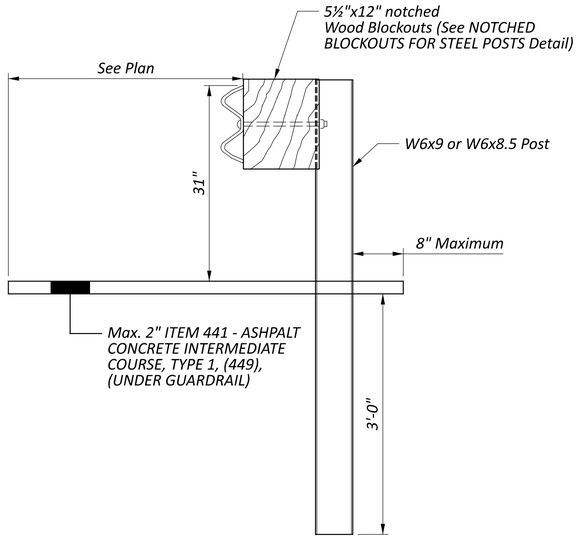
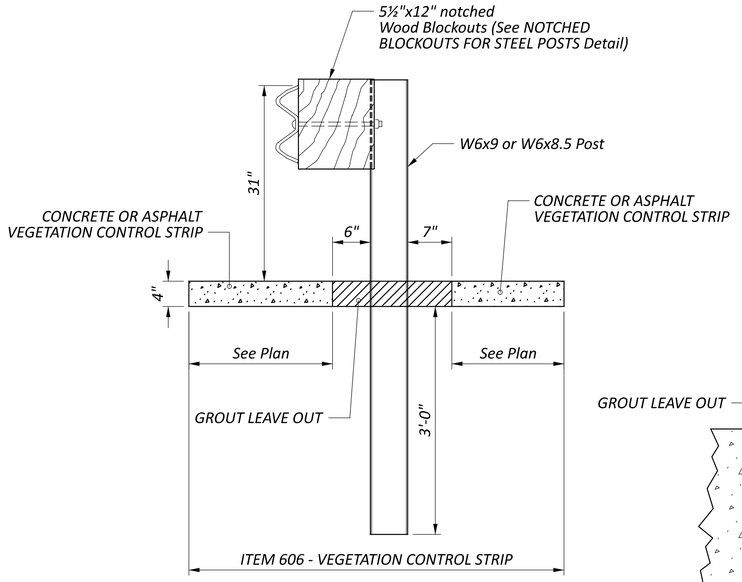
MGS GUARDRAIL INSTALLED IN ASPHALT



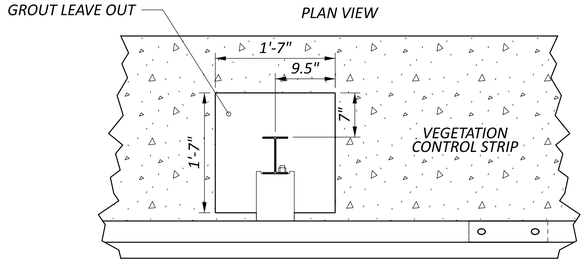
POSTS: *GUARDRAIL POSTS SHALL BE STEEL W6X9 OR W6X8.5. DO NOT USE LONG POSTS.*

MGS GUARDRAIL INSTALLED IN CONCRETE OR ASPHALT VEGETATION CONTROL STRIP

SECTION VIEW



PLAN VIEW



NOTES:

CONCRETE VEGETATION CONTROL STRIP: *CONCRETE VEGETATION CONTROL STRIP SHALL BE CONSTRUCTED WITH QC 1 CONCRETE PER CMS 499 AND CURED PER CMS 451.11 WITH A CURING COMPOUND CONFORMING TO CMS 705.07. IMMEDIATELY PRIOR TO PLACEMENT OF THE CONCRETE, THOROUGHLY MOISTEN THE SUBGRADE.*

FOLLOW ITEM 511.12 FOR CONCRETE PLACEMENT DURING COLD WEATHER CONDITIONS.

SAW OR FORM TRANSVERSE JOINTS TO A MINIMUM DEPTH OF 1" AND TO A WIDTH OF APPROXIMATELY 1/8" EVERY 8 FEET. INSTALL 1/2" THICK EXPANSION JOINT FILLER PER CMS 705.03 EVERY 100 FEET.

ASPHALT VEGETATION CONTROL STRIP: *THE ASPHALT SHALL BE AS SPECIFIED IN THE PLANS.*

GROUT LEAVE OUT: GROUT LEAVE OUTS ARE TO BE 19" WIDE X 19" LONG X 4" DEEP. THE LEAVE OUT SHALL EXTEND A MINIMUM OF 7" FROM BACK OF POST TO THE END OF THE LEAVE OUT.

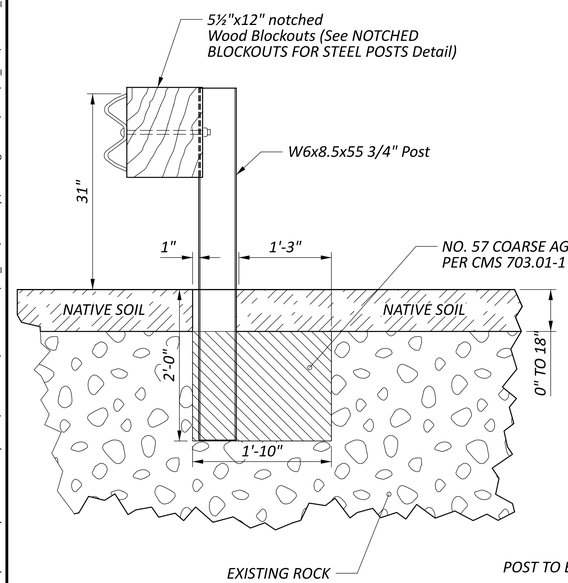
THE GROUT USED FOR THE LEAVE OUT SHALL BE A MIXTURE CONSISTING OF: ONE PART TYPE 1A CEMENT PER CMS 701.01, 14 PARTS SAND PER CMS 703.03, AND 5 PARTS WATER PER VOLUME.

POSTS: *GUARDRAIL POSTS SHALL BE STEEL W6X9 OR W6X8.5. DO NOT USE LONG POSTS.*

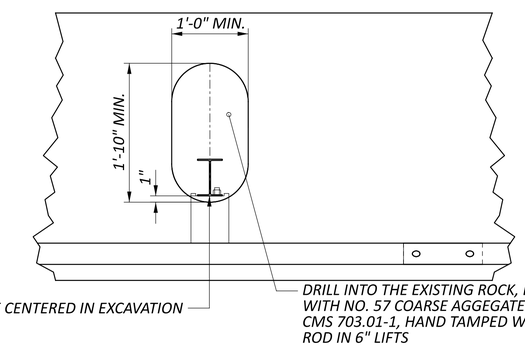
PAYMENT: *THE LABOR, MATERIALS, AND EQUIPMENT REQUIRED TO CONSTRUCT THE ENTIRE SECTION OF THE VEGETATION CONTROL STRIP, INCLUDING THE CONCRETE OR ASPHALT, GROUT LEAVE OUTS, TRANSVERSE JOINTS, EXPANSION JOINTS, AND OTHER INCIDENTALS SHALL BE PAID AT THE UNIT BID PRICE PER SQUARE YARD FOR* ***ITEM 606 - VEGETATION CONTROL STRIP, CONCRETE*** *OR* ***ITEM 606 - VEGETATION CONTROL STRIP, ASPHALT****. GUARDRAIL SHALL BE PAID SEPARATELY BY LINEAR FOOT UNDER* ***ITEM 606 - GUARDRAIL, TYPE MGS****.*

MGS GUARDRAIL EMBEDDED IN ROCK (ROCK ENCOUNTERED 0" TO 18" FROM FINISHED GRADE)

SECTION VIEW



PLAN VIEW



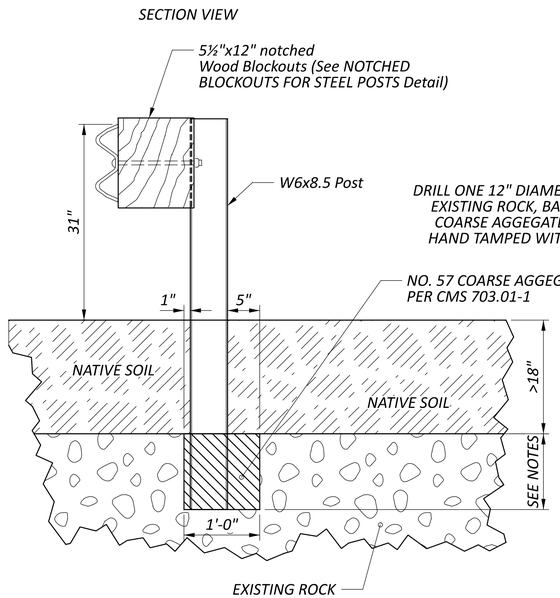
NOTES:

POSTS: *GUARDRAIL POSTS SHALL BE STEEL W6X8.5X55 3/4. POSTS MAY BE FIELD CUT IF ROCK IS ENCOUNTERED UNEXPECTEDLY AND NOT IDENTIFIED IN THE PLANS. OTHERWISE, POSTS OF THE CORRECT LENGTH SHALL BE FURNISHED. WHEN FIELD CUTTING POSTS, REPAIR THE EXPOSED SURFACE ACCORDING TO ASTM A 780 EXCEPT THE DEPARTMENT WILL NOT ALLOW AEROSOL SPRAY APPLICATIONS OF PAINTS CONTAINING ZINC DUST.*

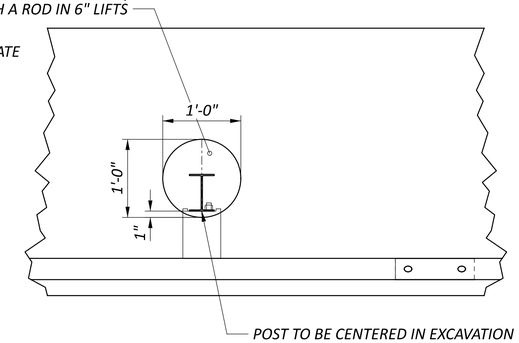
PAYMENT: *THE LABOR, MATERIALS, AND EQUIPMENT REQUIRED TO DRILL INTO THE EXISTING ROCK, REMOVE THE MATERIAL, BACKFILL WITH NO. 57 COARSE AGGREGATE, AND INSTALL THE SPECIFIED POSTS, BLOCKOUTS, W-BEAM RAIL, AND OTHER INCIDENTALS TO COMPLETE THE INSTALLATION SHALL BE PAID BY LINEAR FOOT UNDER* ***ITEM 606 - GUARDRAIL, TYPE MGS EMBEDDED IN ROCK (0" TO 18" COVER).***

MGS GUARDRAIL EMBEDDED IN ROCK (ROCK ENCOUNTERED >18" FROM FINISHED GRADE)

SECTION VIEW



PLAN VIEW



NOTES:

POSTS: *GUARDRAIL POSTS SHALL BE STEEL W6X8.5. THE POST SHALL EXTEND 12" INTO THE EXISTING ROCK OR TO THE STANDARD EMBEDMENT DEPTH (40"), WHICHEVER IS LESS. DO NOT USE LONG POSTS.*

POSTS MAY BE FIELD CUT IF ROCK IS ENCOUNTERED UNEXPECTEDLY AND NOT IDENTIFIED IN THE PLANS. OTHERWISE, POSTS OF THE CORRECT LENGTH SHALL BE FURNISHED. WHEN FIELD CUTTING POSTS, REPAIR THE EXPOSED SURFACE ACCORDING TO ASTM A 780 EXCEPT THE DEPARTMENT WILL NOT ALLOW AEROSOL SPRAY APPLICATIONS OF PAINTS CONTAINING ZINC DUST.

PAYMENT: *THE LABOR, MATERIALS, AND EQUIPMENT REQUIRED TO DRILL INTO THE EXISTING ROCK, REMOVE THE MATERIAL, BACKFILL WITH NO. 57 COARSE AGGREGATE, AND INSTALL THE SPECIFIED POSTS, BLOCKOUTS, W-BEAM RAIL, AND OTHER INCIDENTALS TO COMPLETE THE INSTALLATION SHALL BE PAID BY LINEAR FOOT UNDER* ***ITEM 606 - GUARDRAIL, TYPE MGS EMBEDDED IN ROCK (GREATER THAN 18" COVER).***

OFFICE OF ROADWAY ENGINEERING

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01-16-2026

STDS ENGINEER
A. Holloway

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

MIDWEST GUARDRAIL SYSTEM, STANDARD TYPE MGS EMBEDMENT IN ASPHALT, CONCRETE, AND ROCK DETAILS

DESIGN AGENCY

SCD NUMBER
MGS-2.1

SHEET P.5 | TOTAL 7

MGS-2.1

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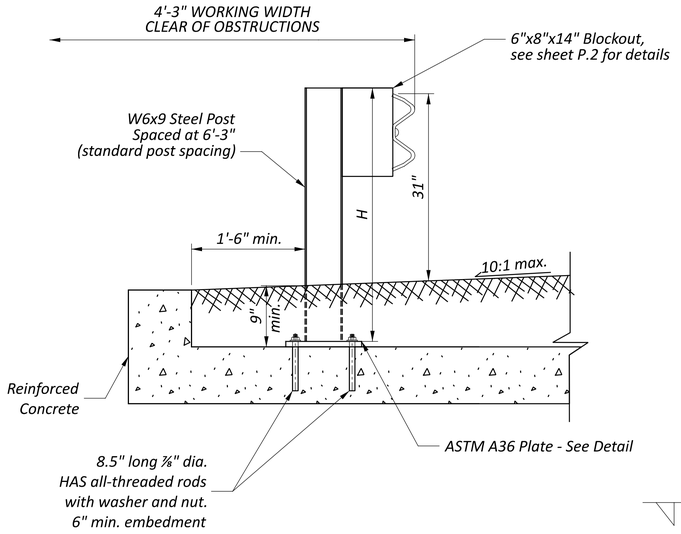
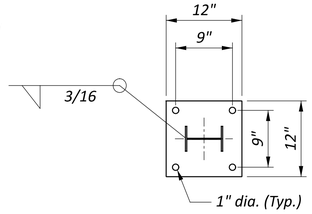
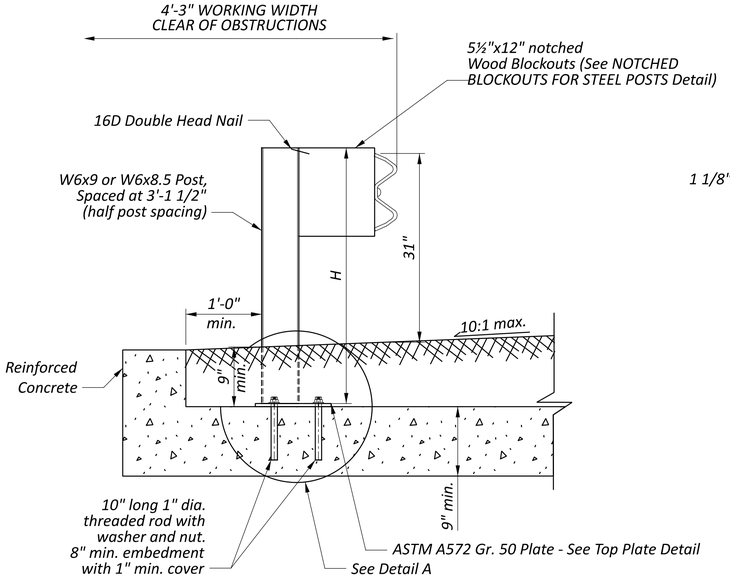
TOP MOUNTED CULVERT DETAIL #1



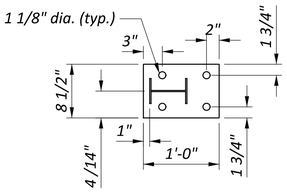


ASTM A 36 PLATE
7/8" thick with
1" round bolt holes

TOP MOUNTED CULVERT DETAIL #2

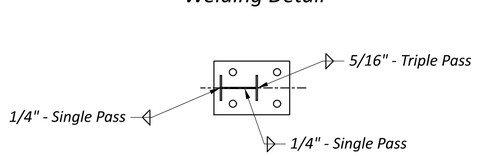


Top Plate Detail

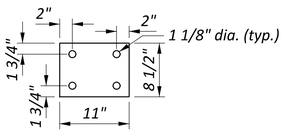


ASTM A572 Gr. 50 Plate
1/2" thick with
1 1/8" dia. bolt holes

Post Assembly Welding Detail

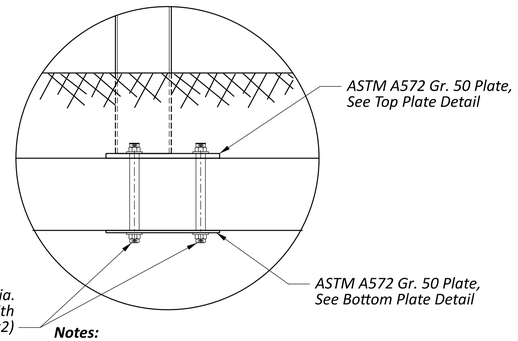


Bottom Plate Detail



ASTM A572 Gr. 50 Plate
1/4" thick with
1 1/8" dia. bolt holes

Detail A
Bolt-Through Anchorage



Notes:
1) This detail shall only be used in situations where the minimum 8" embedment depth cannot be achieved.

2) Drill holes starting from bottom of culvert slab.

NOTES (FOR BOTH DETAILS #1 & #2):

GENERAL: *SEE SHEET P.7 FOR PLAN VIEW LAYOUT DETAILS. APPLY WATERPROOFING TO THE BOX CULVERT SURFACE AS SPECIFIED IN THE PLANS PRIOR TO DRILLING ANCHOR HOLES.*

SLOPES BEHIND POST*: THE 10:1 SHALL EXTEND A MINIMUM OF 2' BEHIND THE BACK OF POST PRIOR TO ANY GRADE BREAK. A 3:1 MAXIMUM SLOPE IS ALLOWED AFTER THE GRADE BREAK. SEE "SLOPES BEHIND POST" DETAIL.*

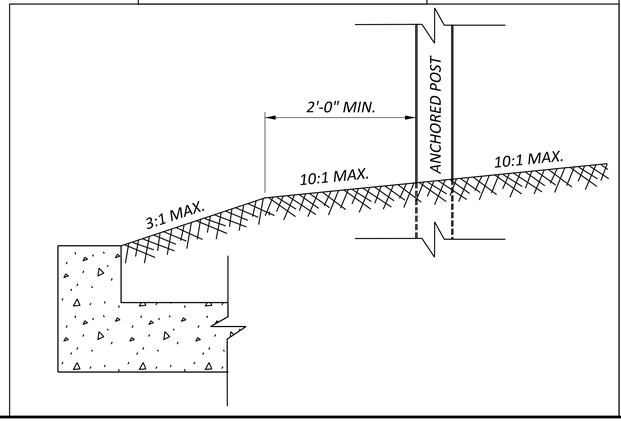
ANCHORS: *HOLES SHALL COMPLY WITH CMS 510. USE NON-SHRINK, NONMETALLIC GROUT PER CMS 705.20.*

POST EMBEDMENT: *THERE SHALL BE A MINIMUM OF 9" OF FILL MATERIAL FROM THE TOP OF CONCRETE SLAB TO THE FINISHED GRADE WHEN MEASURED AT THE BACK OF POST.*

POST HEIGHT: *SEE PLAN DETAILS FOR POST HEIGHT. GUARDRAIL POSTS MAY BE FIELD CUT IF THE HEIGHT IS NOT PROVIDED IN THE PLANS OR IF FIELD CONDITIONS DIFFER FROM THE PLAN. OTHERWISE, POSTS OF THE CORRECT LENGTH SHALL BE FURNISHED. WHEN FIELD CUTTING POSTS, REPAIR THE EXPOSED SURFACE ACCORDING TO ASTM A 780 EXCEPT THE DEPARTMENT WILL NOT ALLOW AEROSOL SPRAY APPLICATIONS OF PAINTS CONTAINING ZINC DUST.*

PAYMENT: *THE LABOR, MATERIALS, AND EQUIPMENT REQUIRED TO INSTALL THE TOP MOUNTED CULVERT POST(S) SHALL BE CONSIDERED INCIDENTAL TO THE ITEM USED FOR THAT GUARDRAIL RUN (**GUARDRAIL, TYPE MGS** OR **GUARDRAIL, TYPE MGS HALF POST SPACING**).*

SLOPES BEHIND POST DETAIL



OFFICE OF ROADWAY ENGINEERING

REVISIONS
01-19-2018
01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
A. Holloway

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

MIDWEST GUARDRAIL SYSTEM, STANDARD TYPE MGS CULVERT MOUNTING DETAILS

DESIGN AGENCY

SCD NUMBER
MGS-2.1

SHEET P.6 | TOTAL 7

MGS-2.1

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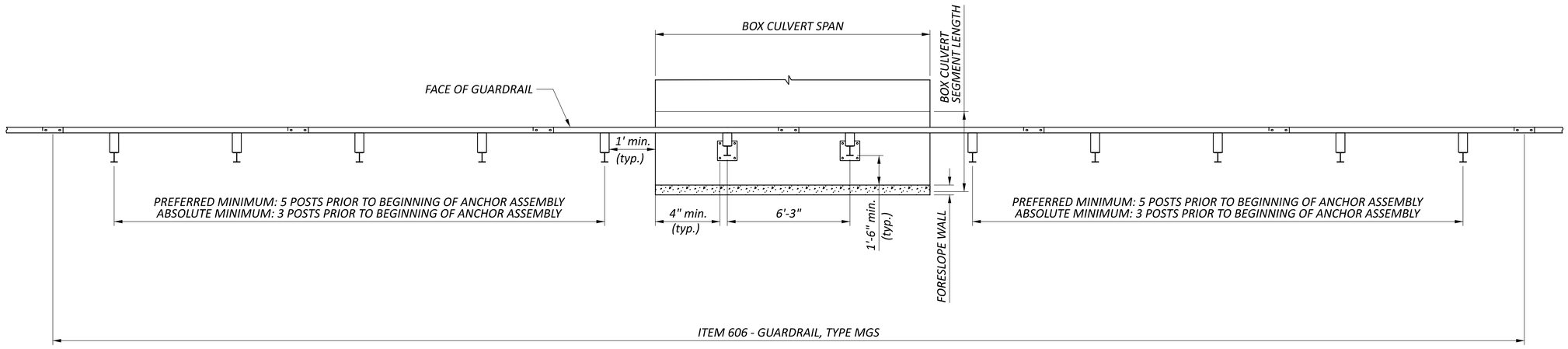
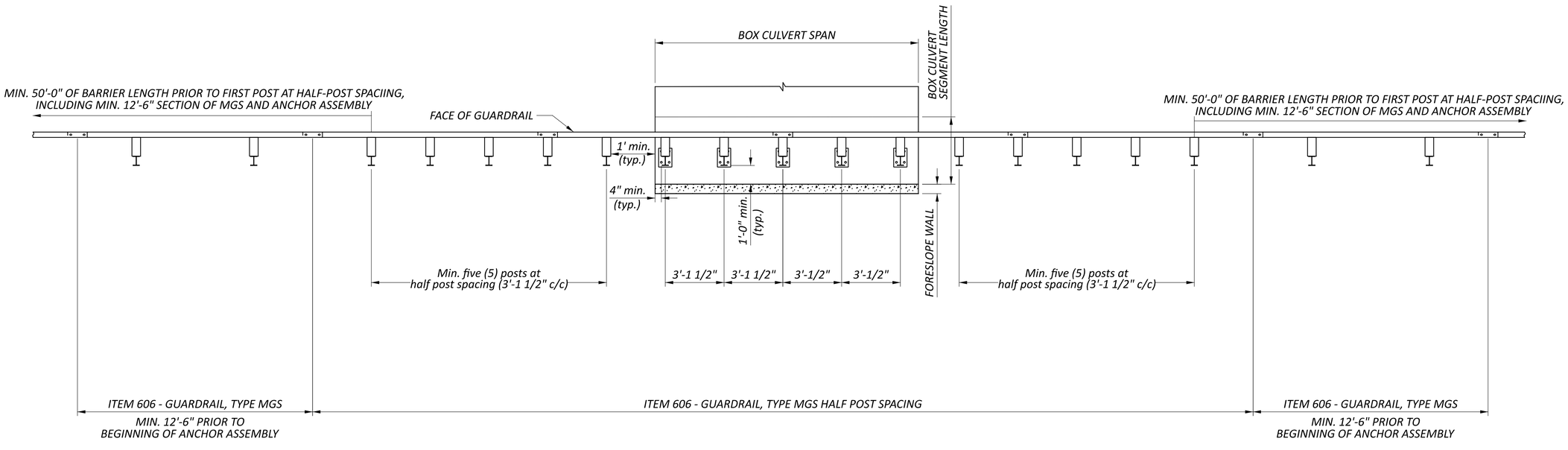
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\03 Standards\PIS_SCD\Roadway\Working Folder\2026\01_Jan\MGS-2.1_2026-01-16.dgn

TOP MOUNTED CULVERT DETAIL #1
PLAN VIEW



TOP MOUNTED CULVERT DETAIL #2
PLAN VIEW



MGS-2.1

OFFICE OF ROADWAY ENGINEERING

REVISIONS
01-19-2018
01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
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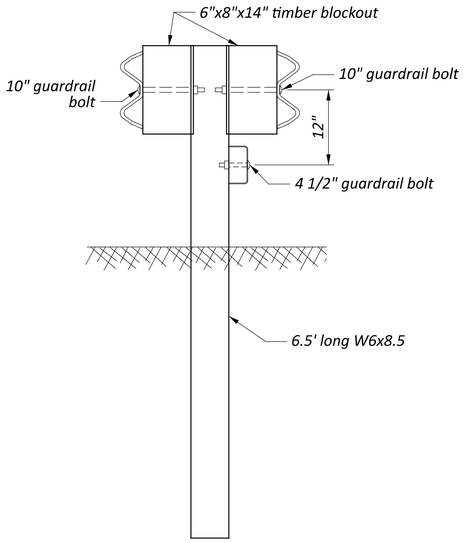
STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

MIDWEST GUARDRAIL SYSTEM, STANDARD TYPE MGS
LAYOUT DETAILS FOR CULVERT MOUNTED POSTS

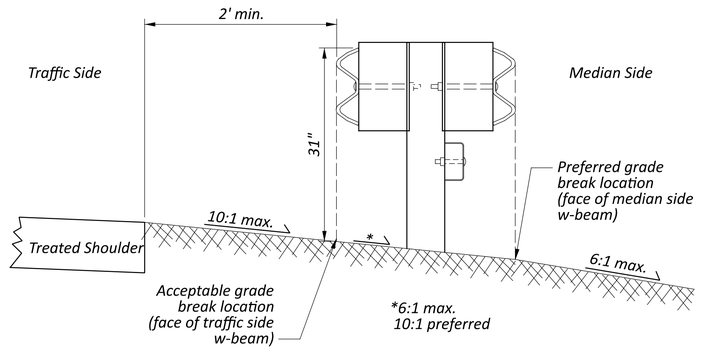
DESIGN AGENCY

SCD NUMBER
MGS-2.1

SHEET P.7 | TOTAL 7



BARRIER DESIGN WITH RUB RAIL
SECTION VIEW



BARRIER DESIGN WITH RUB RAIL
HEIGHT AND GRADING DETAIL

NOTES

GENERAL: *See Sheet P.2 for transition and component details.*

RAIL: *Use W-Beam rail meeting the requirements of CMS 606.02.*

The rub rail shall meet the requirements of ASTM A36. Drill, punch, and/or weld the panels prior to galvanizing in accordance with ASTM A123.

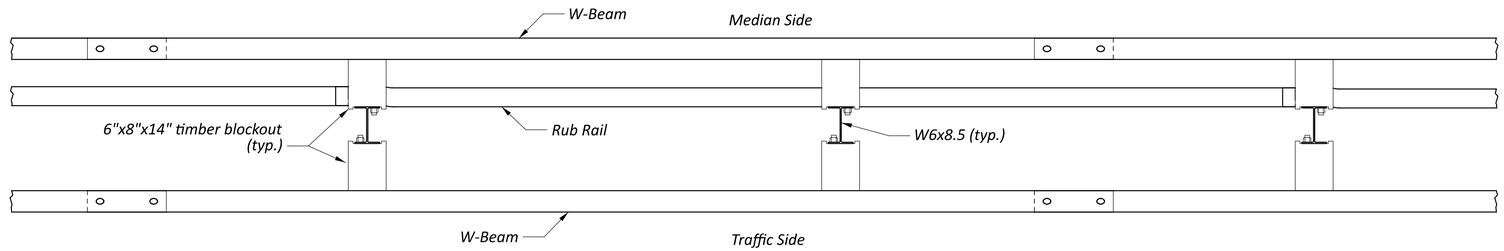
POSTS: *Use 6'-6" long W6x8.5 steel posts. Wood posts are not allowed.*

BLOCKOUTS: *Use 6"x8"x14" timber blockouts; see detail on sheet P.2.*

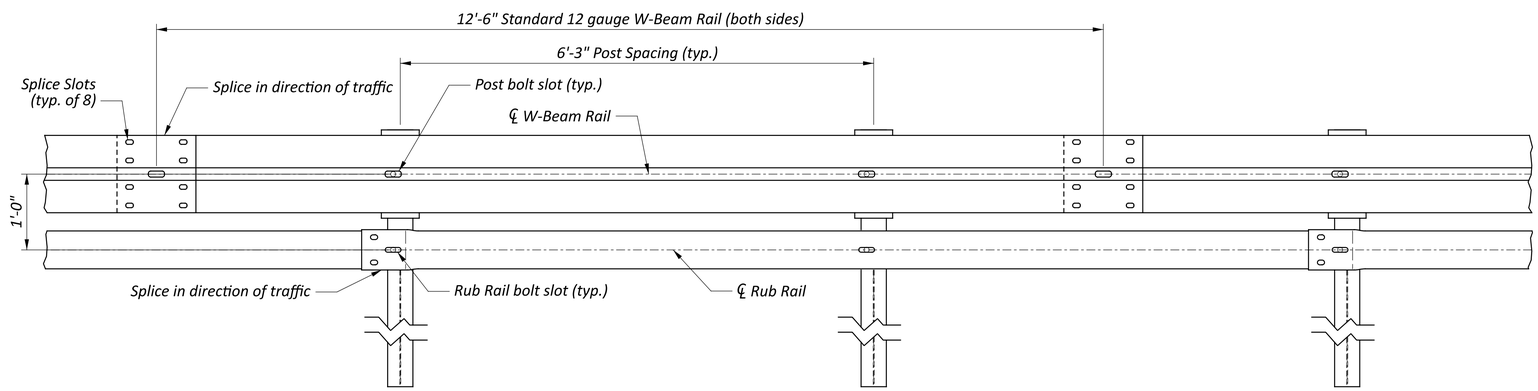
GUARDRAIL HEIGHT: *Install the traffic side guardrail within ±1" of the standard 31" height to the top of W-Beam rail.*

DELINEATION: *For Barrier Reflectors see CMS 626.*

PAYMENT: *Guardrail is paid in feet per*
ITEM 606 - GUARDRAIL, BARRIER DESIGN WITH RUB RAIL, TYPE MGS



PLAN VIEW



ELEVATION VIEW (MEDIAN SIDE)

MGS-2.2

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OFFICE OF ROADWAY ENGINEERING

REVISIONS

01-16-2026

STDS ENGINEER
A. Holloway

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

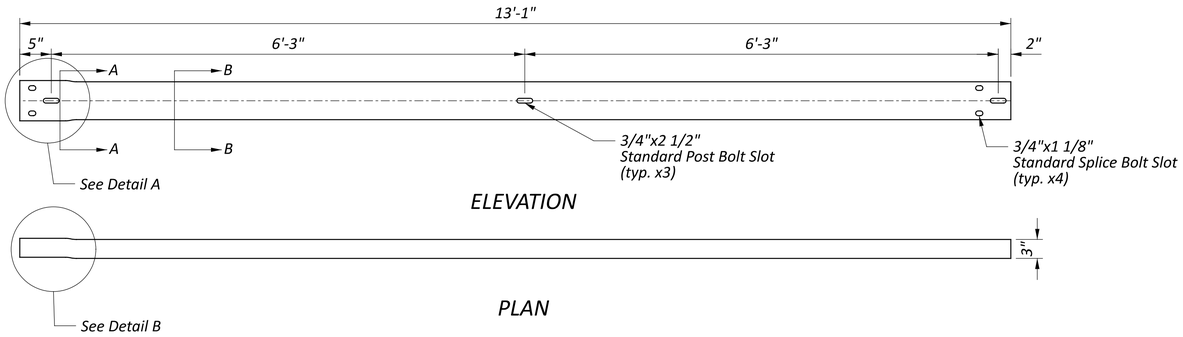
MIDWEST GUARDRAIL SYSTEM
BARRIER DESIGN WITH RUB RAIL
DESIGN AND LAYOUT

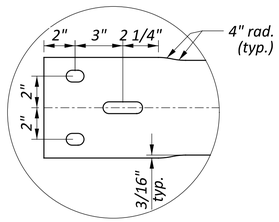
DESIGN AGENCY

SCD NUMBER
MGS-2.2

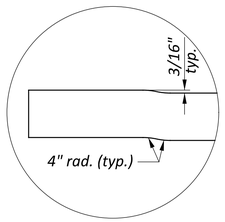
SHEET P.1 | TOTAL 2

RUB RAIL DETAIL

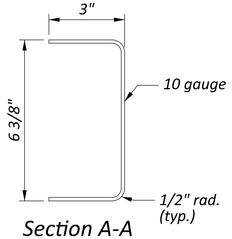




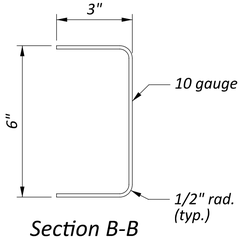
DETAIL A



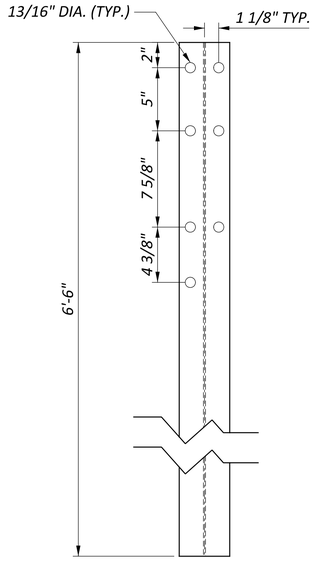
DETAIL B



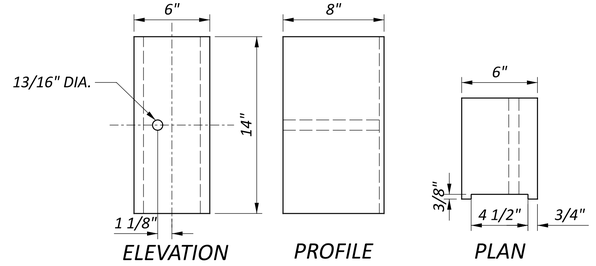
Section A-A



Section B-B

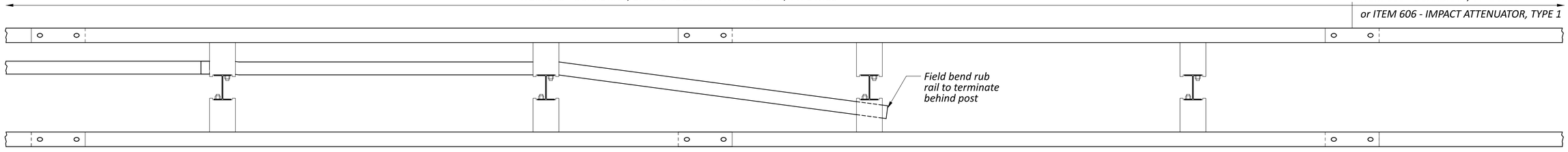


MEDIAN RAIL POST
W6x8.5 x 78"



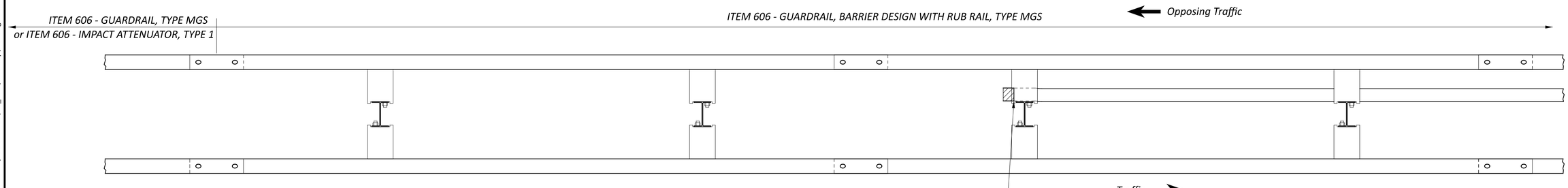
ELEVATION PROFILE PLAN

TIMBER BLOCKOUT DETAIL
6"x8"x14"

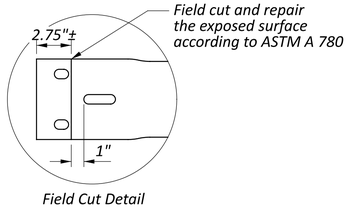


LEADING END TERMINATION
PLAN VIEW

Traffic



TRAILING END TERMINATION
PLAN VIEW



Field Cut Detail

MGS-2.2

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OFFICE OF ROADWAY ENGINEERING

REVISIONS

01-16-2026

STDS ENGINEER
A. Holloway

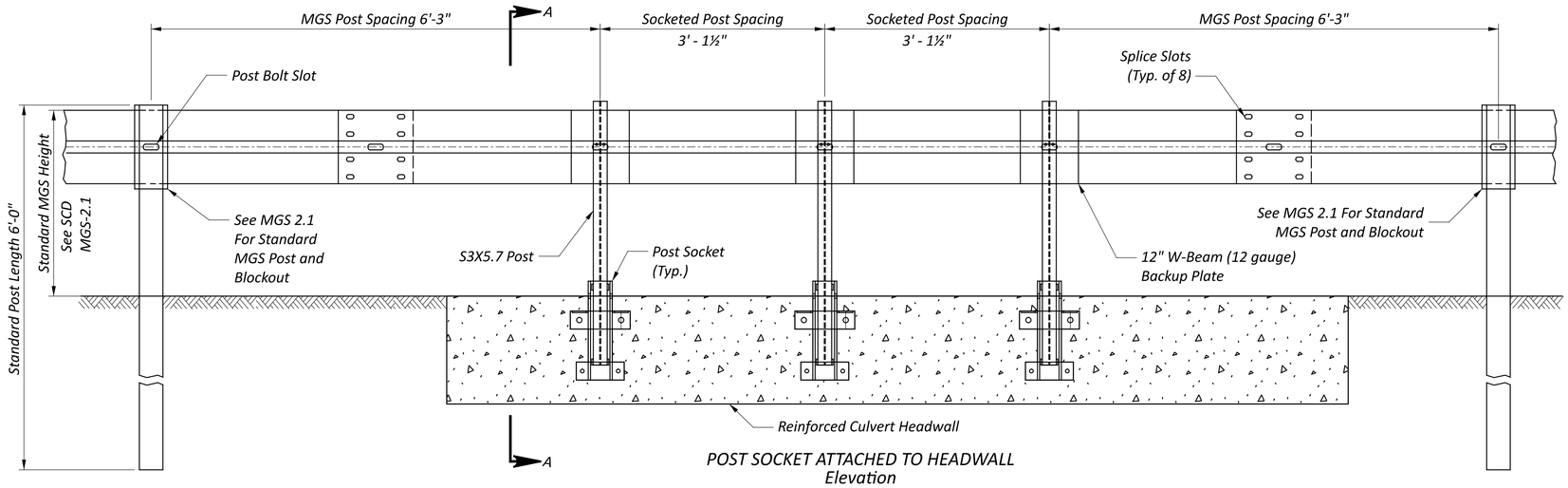
STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

MIDWEST GUARDRAIL SYSTEM
BARRIER DESIGN WITH RUB RAIL
COMPONENT AND TRANSITION DETAILS

DESIGN AGENCY

SCD NUMBER
MGS-2.2

SHEET P.2 | TOTAL 2



POST SOCKET ATTACHED TO HEADWALL
Elevation

NOTES

DESIGNER NOTE: Post/Socket location should be detailed in the plans to coordinate with the rebar spacing in the Headwall.

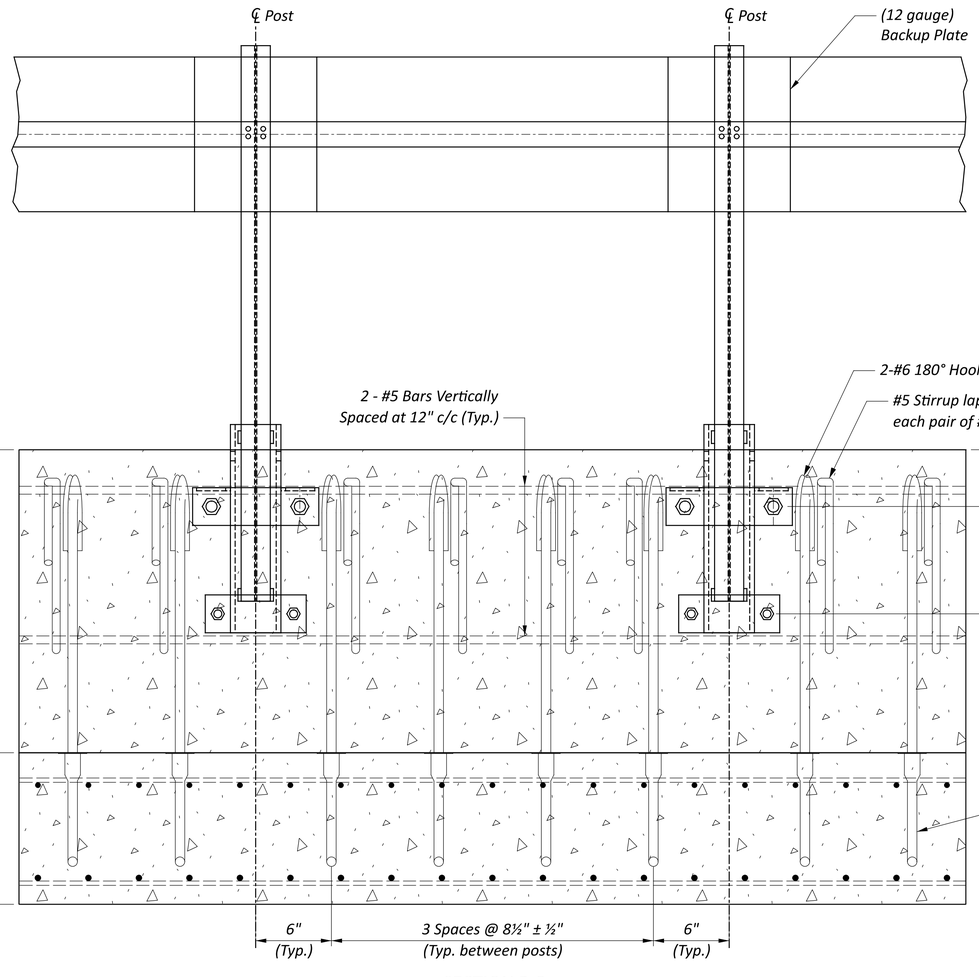
GENERAL: See Sheet P.2 for rebar bending diagrams and for detailed guardrail components. All guardrail parts are galvanized steel. Plates and Gussets are ASTM A572 Grade 50, Bolts are ASTM 307, and the S3x5.7 Posts are ASTM A992.

BACKUP PLATE: The S3x5.7 Posts utilize a 12" wide W-Beam backup plate instead of a blockout.

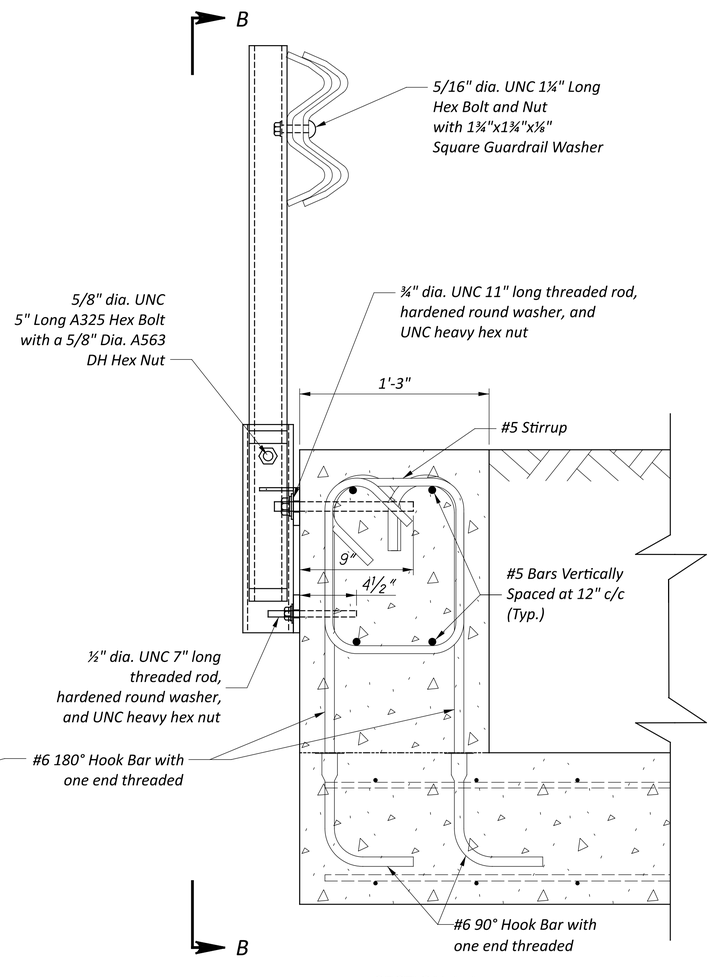
ANCHORS: Holes shall comply with CMS 510. Use non-shrink, nonmetallic grout according to CMS 705.20.

MECHANICAL SPLICES shall comply with CMS 509.

*PAYMENT: The Socketed Post Connections shall be paid in in feet as **Item 606 - Guardrail, Type MGS With Socketed Posts**. The #6 90° hook bars shall be paid for with the culvert. All headwall reinforcement shall be paid for with the headwall.*



SECTION B-B



SECTION A-A

OFFICE OF ROADWAY ENGINEERING

REVISIONS

07-19-2019
01-16-2026

STDS ENGINEER
A. Holloway

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

MIDWEST GUARDRAIL SYSTEM
SOCKETED WEAK POST ATTACHED TO HEADWALL
System Layout

DESIGN AGENCY

SCD NUMBER
MGS-2.4

SHEET P.1 | TOTAL 2

MGS-2.4

MODEL: Sheet 1 PAPERSIZE: 34x22 (in.) DATE: 11/17/2025 TIME: 11:06:19 AM PLTDRV: OHDOT_PDF.pltcfg PENTBL: OHDOT_Pen.tbl USER: Andrew.Holloway@dot.ohio.gov WORKSPACE: OHDOTCEv02 WORKSET: PIS_SCD PRODUCT: OpenRoadsDesigner 24.00.00.205
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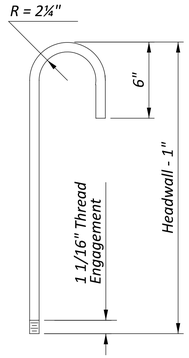
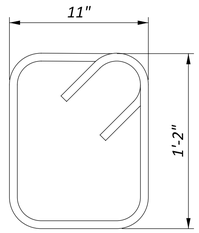
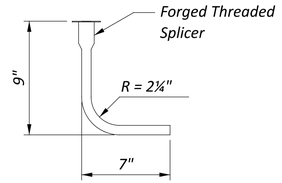


#6 180° Hook Bar with one end threaded

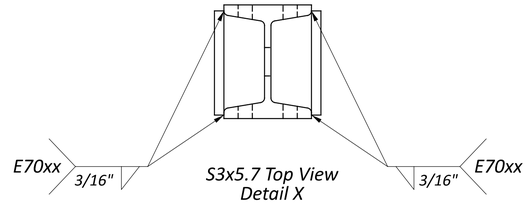


#5 Stirrup

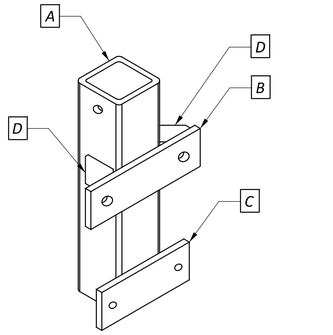


#6 90° Hook Bar with one end threaded

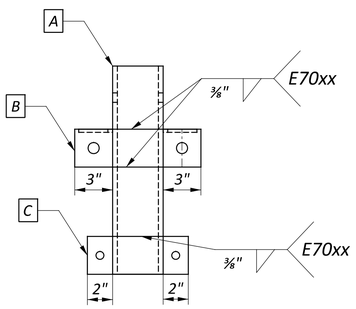
BENDING DIAGRAMS



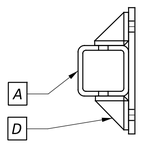
TOP VIEW
(see detail X above)



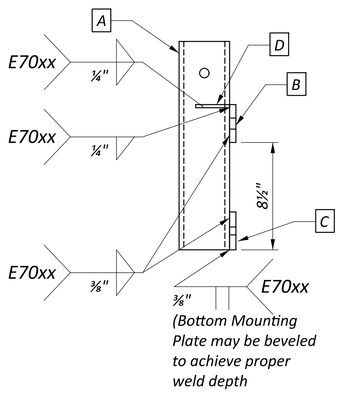
ISOMETRIC VIEW



FRONT VIEW

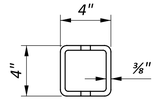


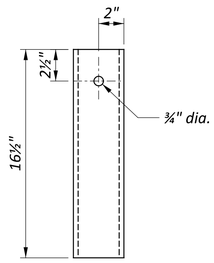
TOP VIEW



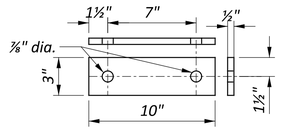
(Bottom Mounting Plate may be beveled to achieve proper weld depth

SIDE VIEW

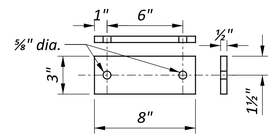




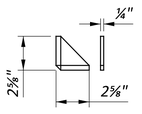
A. SQUARE TUBE



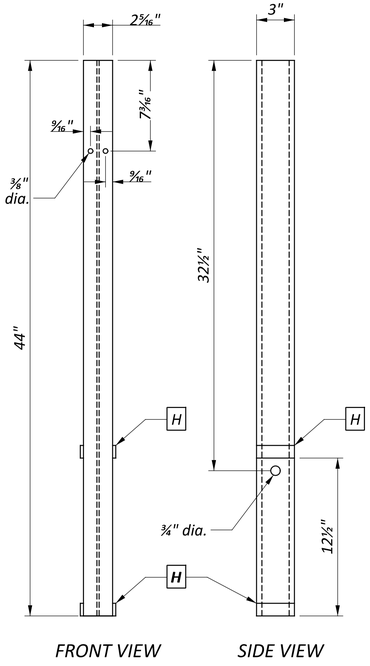
B. TOP MOUNTING PLATE



C. BOTTOM MOUNTING PLATE

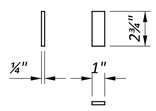


D. TOP PLATE GUSSET



FRONT VIEW SIDE VIEW

S3x5.7 POST



H. POST STANDOFF

POST SOCKET ATTACHED TO HEADWALL

MGS-2.4

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OFFICE OF ROADWAY ENGINEERING

REVISIONS

07-19-2019
01-16-2026

STDS ENGINEER
A. Holloway

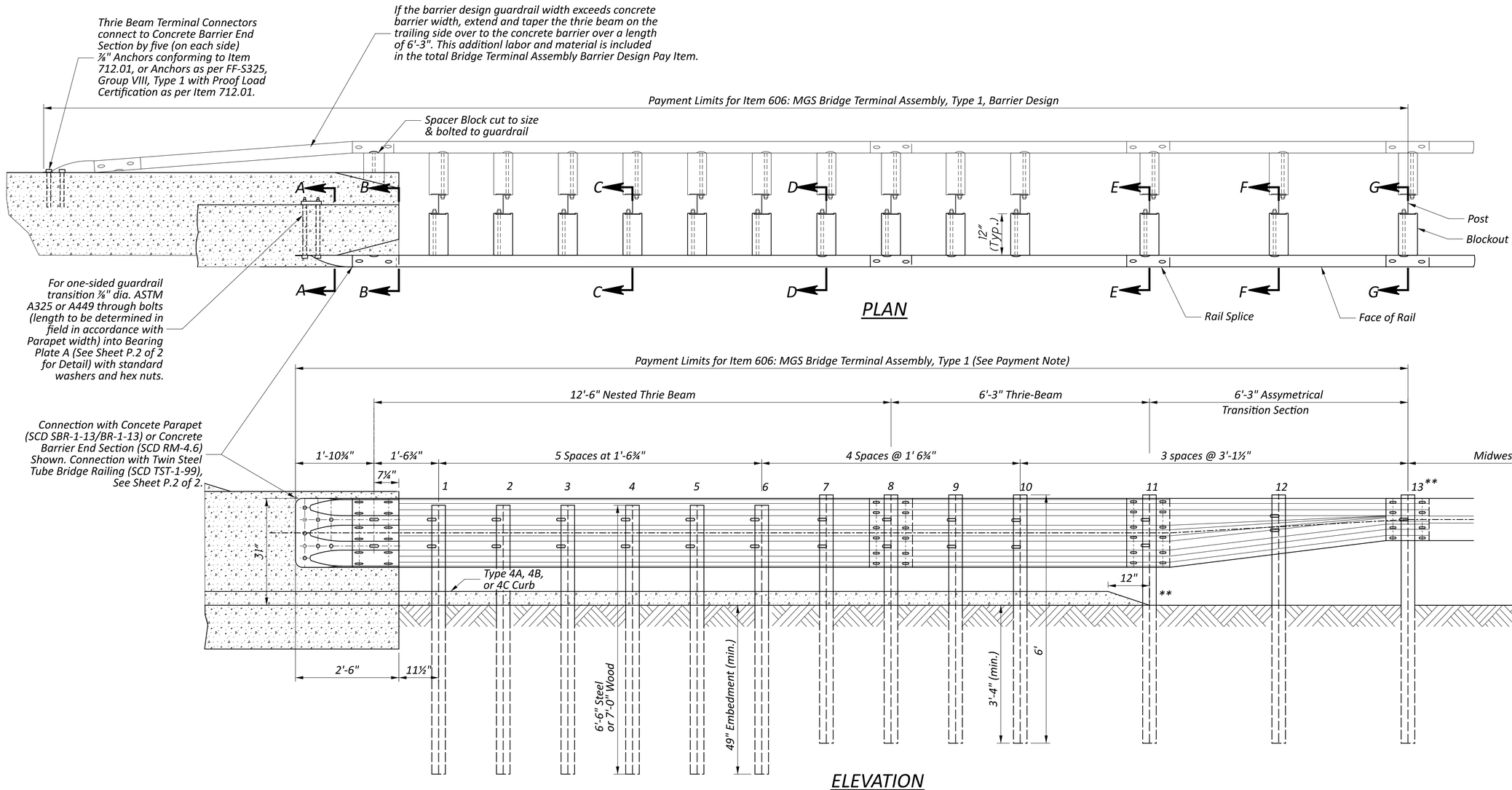
STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

MIDWEST GUARDRAIL SYSTEM
SOCKETED WEAK POST
Rail Components & Rebar Bending Diagrams

DESIGN AGENCY

SCD NUMBER
MGS-2.4

SHEET P.2 TOTAL 2



NOTES

GENERAL: *For additional guardrail details see* ***SCD MGS-2.1****. See Sheet P.2 for Sections (single sided BTA shown).*

APPLICATION: *Use Type 1 MGS Bridge Terminal Assembly to connect guardrail runs to bridges having deflector Parapet Type Bridge Railing (see Structural Engineering's SCD SBR-1-13, BR-1-13, TST-1-99) and for runs to the approach ends of Concrete Barrier (see SCD RM-4.6).*

This BTA should also be used to connect guardrail runs to bridges with Twin Steel Tube Railing (see Structural Engineering's (SCD TST-1-99). Connection details for the TST are shown on Sheet P.2.

THRIE BEAM: *An 18'-9" Section of Thrie beam may be substituted for one of the 12'-6" panels and the 6'-3" section as shown. When attaching this BTA to preexisting walls/parapets,a longer thrie beam panel or a short (approx. 1'-6") panel is permitted to reach the available bolt hole locations.*

THRIE BEAM TRANSITION: *Asymmetrical W-Beam to Thrie Beam transition panel shall be 10 gauge.*

POSTS: *Use standard steel or 6"x8"x72" wood posts per SCD MGS-2.1 for Posts No. 7-13. Posts may be set in drilled holes or driven to grade. Posts No. 1-6 are 6'-6" W6x9 steel or 6"x8"x84" wood.*

Use the same post material throughout the length of the transition unless otherwise specified in the plans or permitted by the Engineer (steel posts shown in this drawing).

Wood posts shall be fabricated and pressure-treated for approved species as per CMS 710.12. Bore bolt holes and, if required, trim the tops of posts after the posts are set.

BLOCKOUTS: *Use 6"x12"x19" (or 6"x12"x22") wood blockouts at Posts No. 1-12. The standard MGS 6"x12"x14" blockout is used at Post 13. Approved Alternate Blockouts can be found on the Office of Roadway Engineering's website. Steel Blockouts are not permitted.*

FLARED GUARDRAIL: *The MGS guardrail should be tangential within 25 ft. of the BTA.*

CURB: *Type 4A, 4B, or 4C Curb per SCD BP-5.1 is required under the thrie-beam portion of this transition when connecting to concrete barrier or parapet, but shall not extend past Post No. 11. Curb is NOT required when connecting to TST Bridge Rail.*

***** Where curb must extend upstream of Post No. 11 for drainage purposes, an extra 12'-6" panel of 12 gauge w-beam must be nested prior to the transition (upstream of Post No. 13). This added component shall be included as incidental to the cost of the BTA.***

PAYMENT: Item 606 - MGS Bridge Terminal Assembly, Type 1, Each or Item 606 - MGS Bridge Terminal Assembly, Type 1, Barrier Design, Each, *includes the cost of all components including additional and different size of posts and blockouts, nested Thrie-Beam, transition and connector sections, Bearing Plate, bolts, washers, nuts, and other hardware.*

Curb is paid separately under Item 609 - Curb, Type 4__, in feet.

** Place the first post of the MGS 3'-1½" past the BTA, then every 6'-3" thereafter to keep posts offset from the rail splices. A minimum of 12'-6" of MGS Guardrail should be placed between the BTA and end anchor.*

OFFICE OF ROADWAY ENGINEERING

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STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
MIDWEST GUARDRAIL SYSTEM
MGS BRIDGE TERMINAL ASSEMBLY, TYPE 1

DESIGN AGENCY

SCD NUMBER
MGS-3.1

SHEET P.1 | TOTAL 2

MGS-3.1

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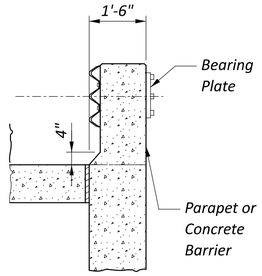
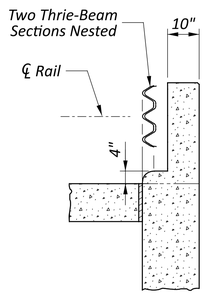
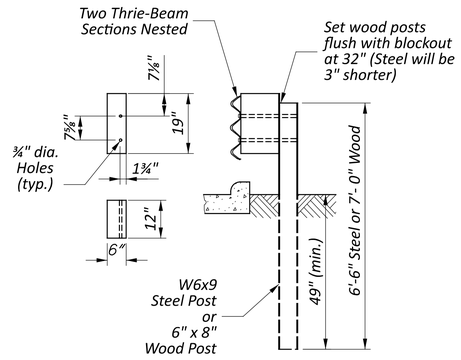


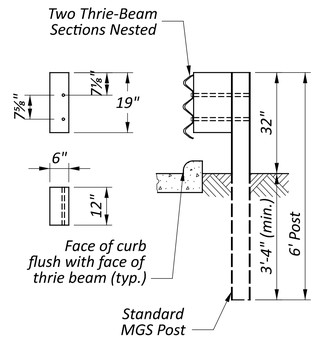
SECTION A-A



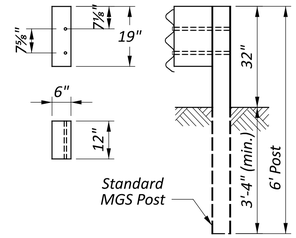
SECTION B-B



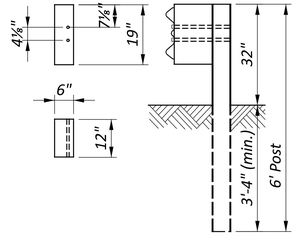
SECTION C-C



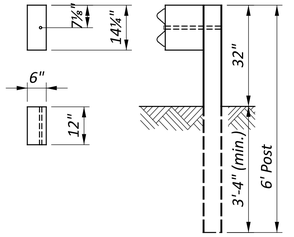
SECTION D-D



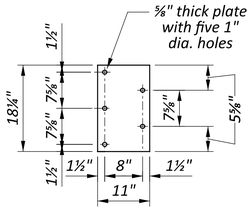
SECTION E-E



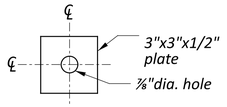
SECTION F-F



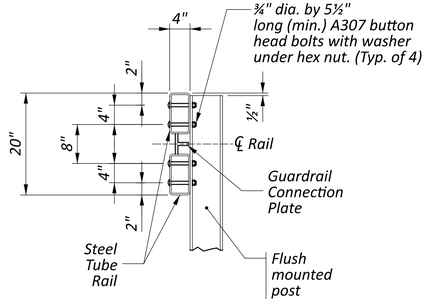
SECTION G-G



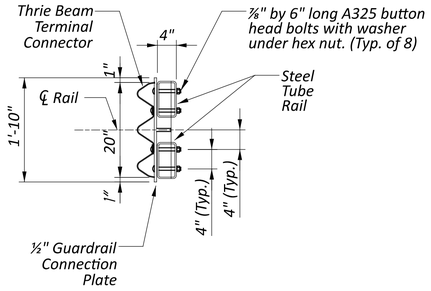
BEARING PLATE A



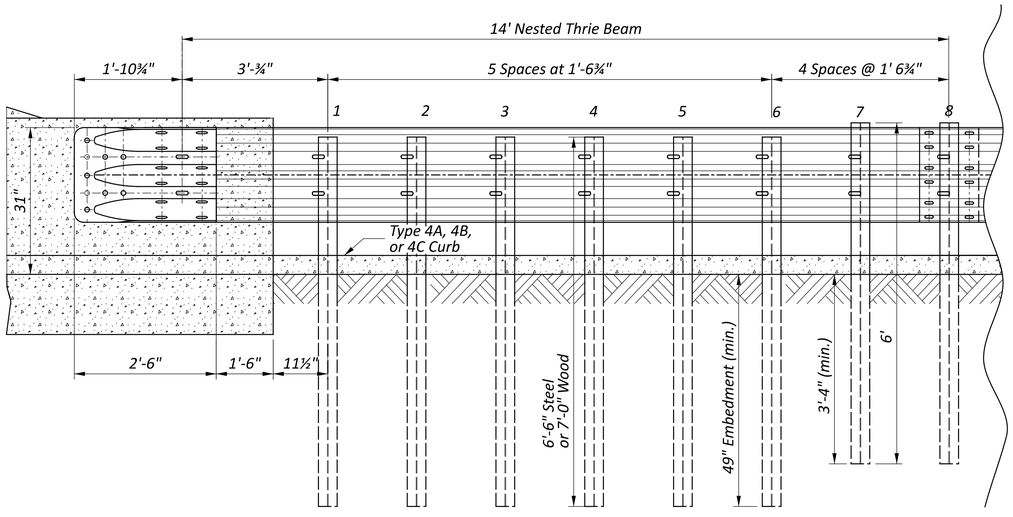
BEARING PLATE B
AASHTO/AGC/ARTBA Standardized Hardware Guide part FWRO9



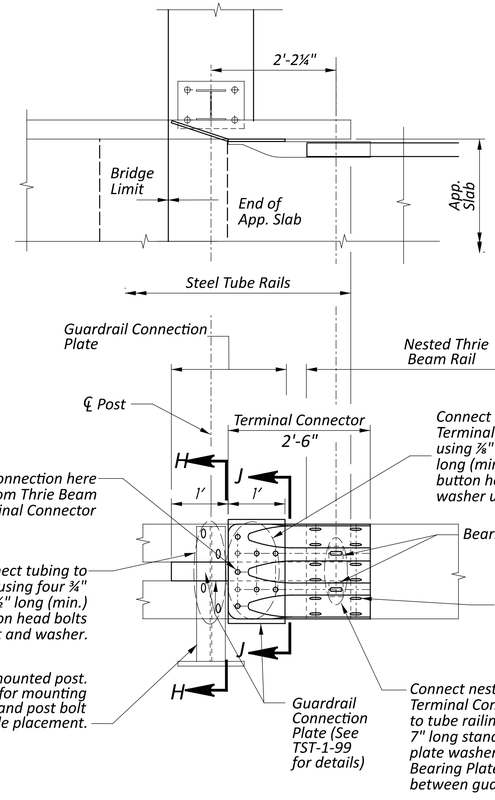
SECTION H-H
Section through Tubing at Post



SECTION J-J
Section through Tubing at Terminal Connector



CONNECTION DETAILS TO CONNECT
THRIE BEAM TO PREEXISTING WALLS/PARAPETS



CONNECTION DETAILS TO CONNECT
WITH TWIN STEEL TUBE BRIDGE RAILING
(SEE SCD TST-1-99)

OFFICE OF ROADWAY ENGINEERING

REVISIONS
01-19-2018
07-18-2025
01-16-2026

STDS ENGINEER
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STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
MIDWEST GUARDRAIL SYSTEM
MGS BRIDGE TERMINAL ASSEMBLY, TYPE 1

DESIGN AGENCY

SCD NUMBER
MGS-3.1

SHEET P.2 | TOTAL 2

MGS-3.1

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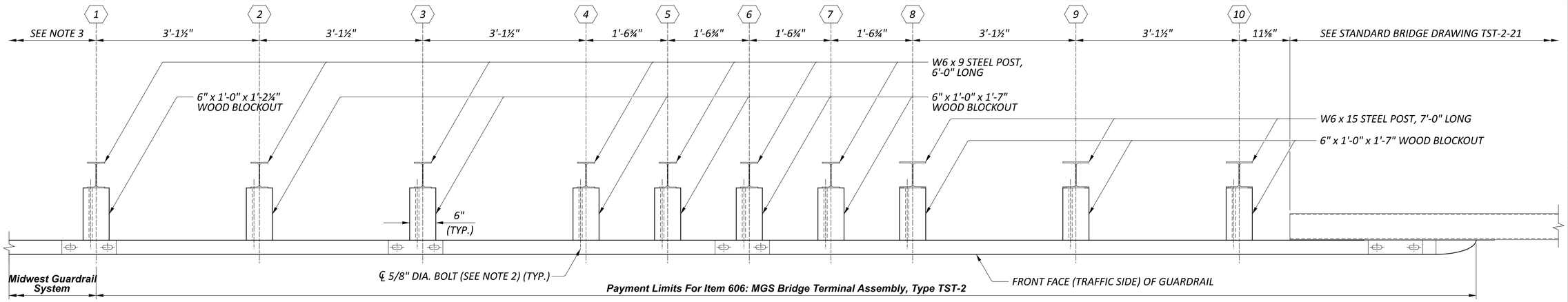
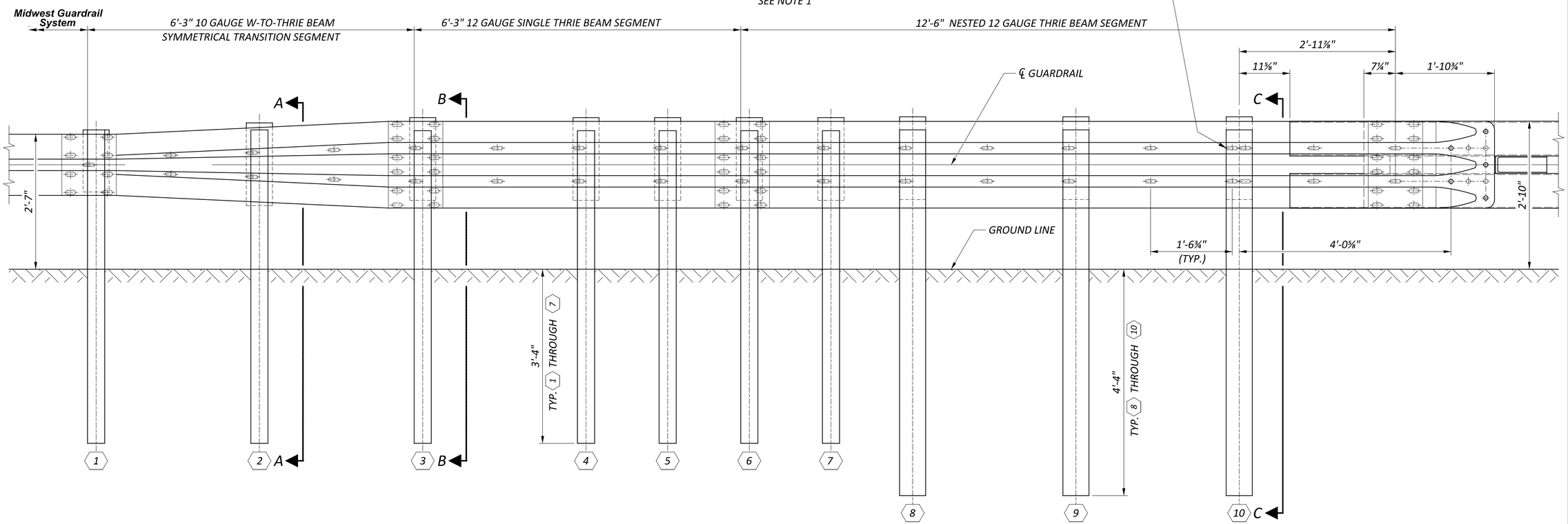


PLAN - MGS RAILING TRANSITION

BOLTED CONNECTIONS NOT SHOWN FOR CLARITY
SEE NOTE 1



ELEVATION - MGS RAILING TRANSITION

BOLTED CONNECTIONS NOT SHOWN FOR CLARITY
SEE NOTE 1

NOTES:

1) FOR ADDITIONAL DETAILS, SEE ***SCD MGS-2.1.***
2) FOR ADDITIONAL INFORMATION ON GUARDRAIL BOLT, SEE SECTIONS A-A B-B, AND C-C ON SHEET P.2.
3) FOR GENERAL NOTES, SEE SHEET P.2.

OFFICE OF ROADWAY ENGINEERING

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07-16-2021
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
MIDWEST GUARDRAIL SYSTEM
MGS BRIDGE TERMINAL ASSEMBLY, TYPE TST-2

DESIGN AGENCY

SCD NUMBER
MGS-3.3

SHEET P.1 TOTAL 2

MGS-3.3

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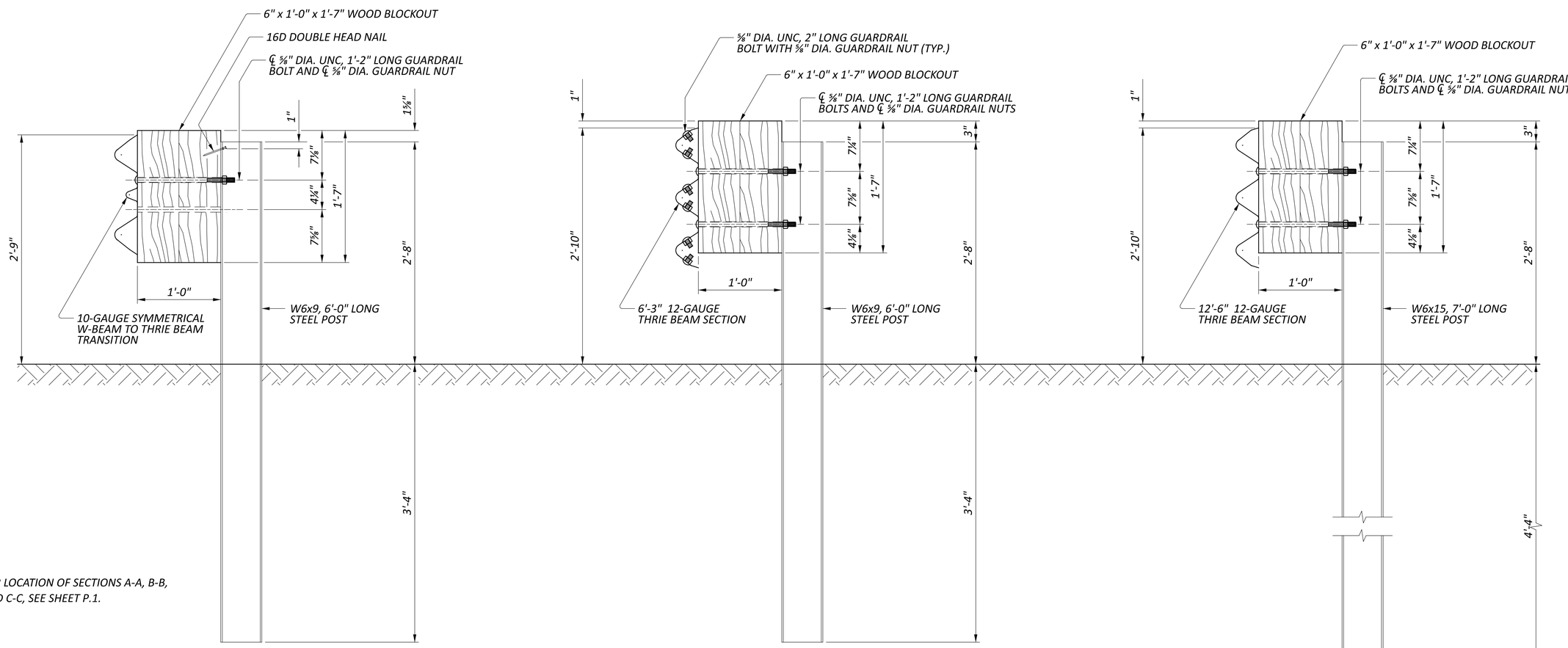

NOTE:
1. FOR LOCATION OF SECTIONS A-A, B-B, AND C-C, SEE SHEET P.1.

SECTION A-A
SEE NOTE 1

SECTION B-B
SEE NOTE 1

SECTION C-C
SEE NOTE 1

GENERAL NOTES

GENERAL:
THIS STANDARD CONSTRUCTION DRAWING DETAILS THE TRANSITION REQUIREMENTS BETWEEN THE MIDWEST GUARDRAIL SYSTEM AND TST-2-21 BRIDGE RAILING. FOR ADDITIONAL GUARDRAIL DETAILS AND NOTES, SEE STANDARD ROADWAY CONSTRUCTION DRAWINGS MGS-2.1 AND OTHER DRAWINGS PERTAINING TO THE DESIGN OF SPECIFIC END TERMINALS

DESIGN CRITERIA:
THIS BRIDGE TERMINAL ASSEMBLY DESIGN CONFORMS TO THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR TEST LEVEL 3 (TL-3)

DESIGN DATA:
STRUCTURAL STEEL POSTS: ASTM A992, Fy= 50 KSI
W-BEAM AND THRIE-BEAM RAILING SECTIONS: AASHTO M180, Fy= 50.

POST MATERIALS:
STRUCTURAL STEEL POSTS (W6x9 AND W6x15) SHALL BE AS PER CMS 711.01. IN LIEU OF W6x9 AND W6x15 STEEL POSTS, THE CONTRACTOR HAS AN OPTION TO SUPPLY 6-FOOT LONG 6" x 8" AND 6.5-FOOT LONG 8" X 10" WOOD POSTS, RESPECTIVELY.

FASTENERS:
ALL ⅝" DIA. UNC GUARDRAIL BOLTS SHALL BE ASTM A307 GRADE A AND ⅝" DIA. GUARDRAIL NUTS SHALL BE ASTM A563A.

GALVANIZING:
GALVANIZE ALL STRUCTURAL STEEL POSTS (W6x9 AND W6x15), HARDWARE, AND ACCESSORIES ACCORDING TO CMS 711.02. PRIOR TO GALVANIZING, ALL EXPOSED STRUCTURAL POST ENDS SHALL BE ROUNDED, AND BURRS SHALL BE REMOVED FROM ALL STRUCTURAL STEEL POSTS.

UPSTREAM GUIDELINES FOR APPROACH GUARDRAIL TRANSITION:
1. MINIMUM BARRIER LENGTH OF 47'-0" SHALL BE INSTALLED BEYOND THE UPSTREAM END OF THE "W-TO-THRIE BEAM SYMMETRICAL TRANSITION SEGMENT" WHICH SHALL INCLUDE STANDARD MIDWEST GUARDRAIL SYSTEM (MGS) OR A CRASHWORTHY GUARDRAIL END TERMINAL, AND AN ACCEPTABLE ANCHORAGE SYSTEM.
2. FOR FLARED GUARDRAIL APPLICATIONS, A MINIMUM LENGTH OF 25'-0" SHALL BE PROVIDED BETWEEN THE UPSTREAM END OF THE "W-TO-THRIE BEAM SYMMETRICAL TRANSITION SEGMENT" AND THE START OF THE FLARED SECTION, THAT IS, BEND BETWEEN FLARE AND TANGENT SECTIONS.

THRIE BEAM:
A 10-GAUGE SINGLE THRIE BEAM PANEL MAY NOT BE SUBSTITUTED FOR NESTED 12- GAUGE PANELS ON THIS BRIDGE TERMINAL ASSEMBLY.

FUTURE OVERLAYS: THIS RAILING SYSTEM WILL ACCOMMODATE A MAXIMUM FUTURE WEARING SURFACE THICKNESS OF 3". AFTER APPLICATION OF A MAXIMUM 3" OVERLAY, RAISE THE W-BEAM ELEMENTS AND BLOCKOUTS IN THE STANDARD TYPE MGS GUARDRAIL TO A NOMINAL HEIGHT OF 31" AND REATTACH TO THE ORIGINAL POSTS. ALSO, REPLACE THE SYMMETRIC W-TO-THRIE TRANSITION PANEL WITH AN ASSYMMETRIC W-TO-THRIE TRANSITION PANEL.

PAYMENT FOR ITEM 606 - GUARDRAIL, TYPE MGS:
PAYMENT: ITEM 606 - MGS BRIDGE TERMINAL ASSEMBLY, TYPE TST-2, EACH, INCLUDE THE COST OF ALL COMPONENTS INCLUDING ADDITIONAL AND DIFFERENT SIZE OF POSTS AND BLOCK-OUTS, THRIE-BEAM, TRANSITION AND CONNECTOR SECTIONS, AND CONNECTION HARDWARE.

OFFICE OF ROADWAY ENGINEERING

REVISIONS
07-16-2021
07-18-2025
01-16-2026

STDS ENGINEER
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STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
MIDWEST GUARDRAIL SYSTEM
MGS BRIDGE TERMINAL ASSEMBLY, TYPE TST-2

DESIGN AGENCY

SCD NUMBER
MGS-3.3

SHEET P.2 | TOTAL 2

MGS-3.3

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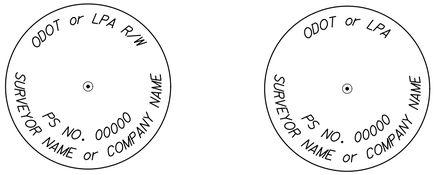
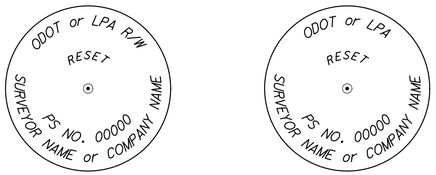
CAP DESIGN



DESIGN 1

DESIGN 2



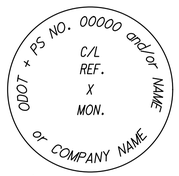
DESIGN 3

DESIGN 4

2" MIN. DIA.
ALUMINUM CAPS
PLAN VIEW

+DESIGN 5

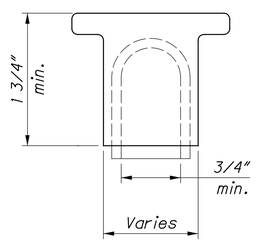
3" MIN. DIA.
ALUMINUM CAP
PLAN VIEW



+DESIGN 6

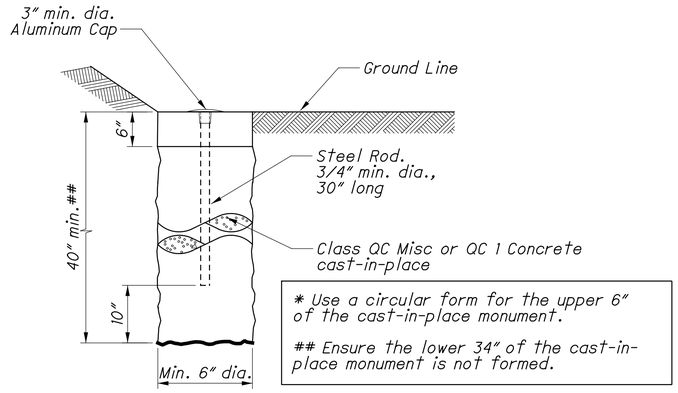
3" MIN. DIA.
ALUMINUM CAP
PLAN VIEW

+ *Furnish a positional mark after monument is constructed. Ensure positional mark is either a Punch Mark or a Chisled X.*

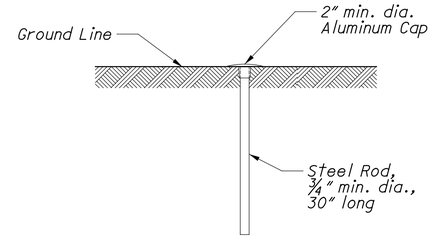


SIDE VIEW OF CAP

MONUMENT TYPE



TYPE A



TYPE B

APPLICATION	MONUMENT TYPE	CAP DESIGN	PAY ITEM	DESCRIPTION
Right-of-Way	B	1	623	Right-of-Way Monument
	B	3	623	Right-of-Way Monument
E Parcels & Non-Right-of-Way	B	2	623	Right-of-Way Monument
	B	4	623	Right-of-Way Monument
Set on R/W Centerline	A	5	623	Reference Monument
	C or D	-	623	Monument Assembly
Offset from R/W Centerline	A	6	623	Reference Monument
	C or D	-	623	Monument Assembly

NOTES

- *Monument Types A & B are typically set outside pavement areas.*
- *Monument Type C or D is typically set in pavement areas.*
- *Cap Designs 3 and 4 are to be installed when the Right-of-Way Monuments are disturbed, destroyed, and/or damaged by construction activities and are to be reset.*
- *Right-of-Way Monuments are typically set prior to construction and are expected to be protected during construction unless otherwise specified in the plans.*
- *During construction the contractor will install the Monument Assemblies and Reference Monuments at locations specified in the Right-of-Way plans.*
- *All Reference Monuments and Right-of-Way Monuments set and/or reset by the contractor's surveyor will include an aluminum cap according to this drawing.*

OFFICE OF ROADWAY ENGINEERING

REVISIONS

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01-16-2026

STDS ENGINEER
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STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
ROADWAY MONUMENTS

DESIGN AGENCY

SCD NUMBER
RM-1.1

SHEET P.1 TOTAL 3

RM-1.1

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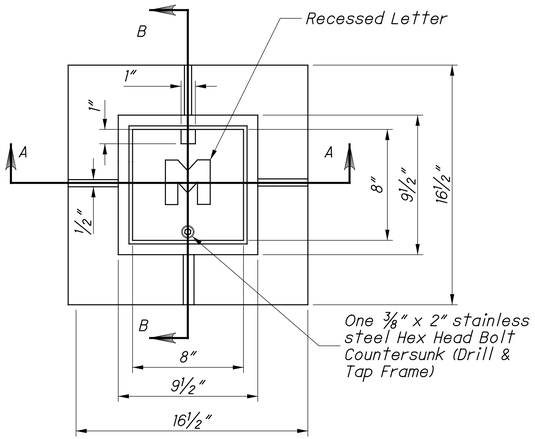
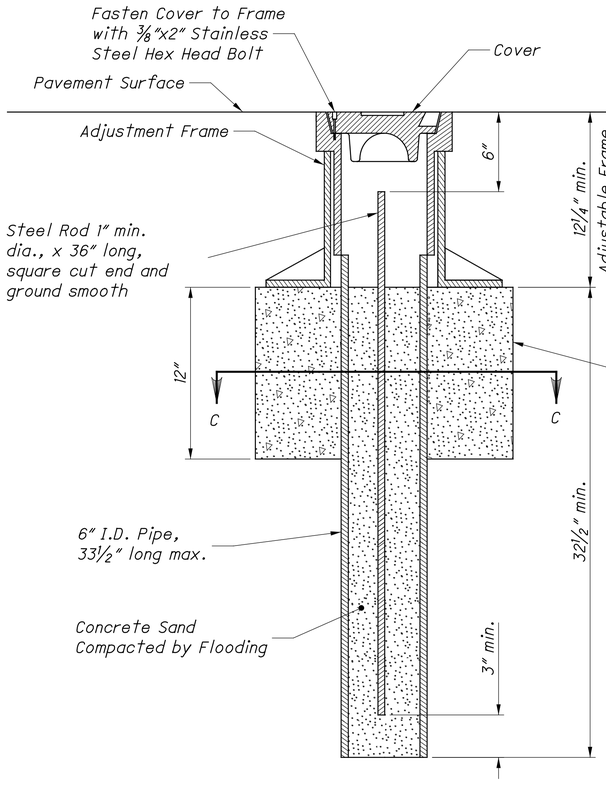
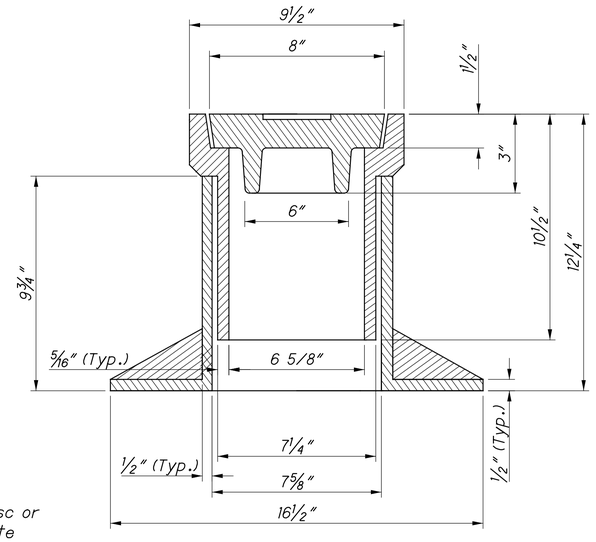


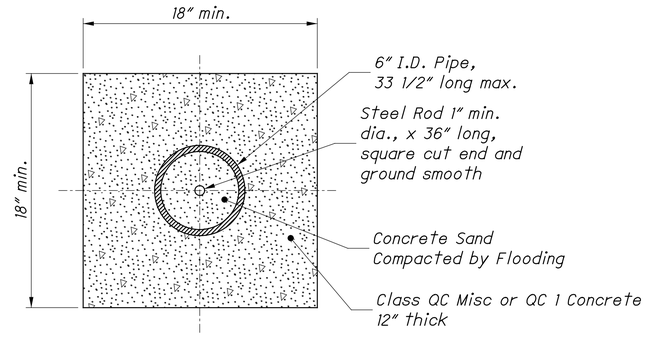
PLAN VIEW



SIDE VIEW

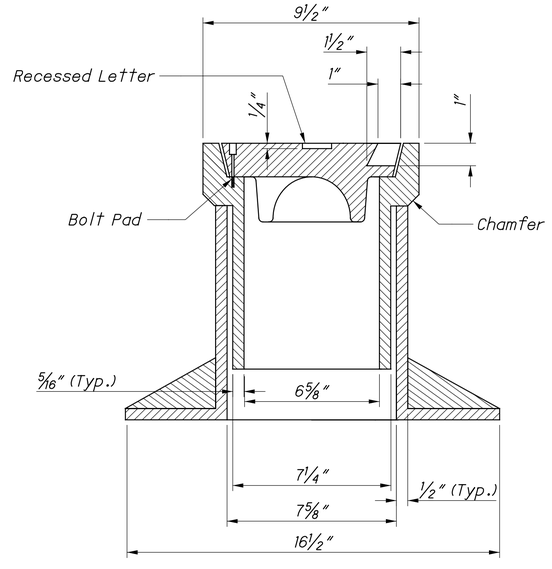


SECTION A-A



SECTION C-C

MONUMENT TYPE C



SECTION B-B

RM-1.1

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OFFICE OF ROADWAY ENGINEERING

REVISIONS

01-20-2023
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
ROADWAY MONUMENTS

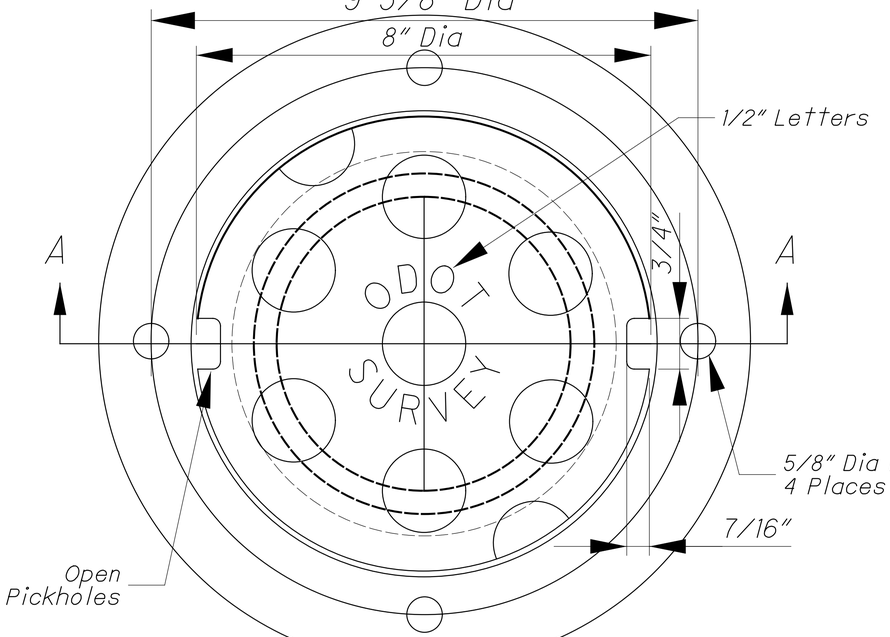
DESIGN AGENCY

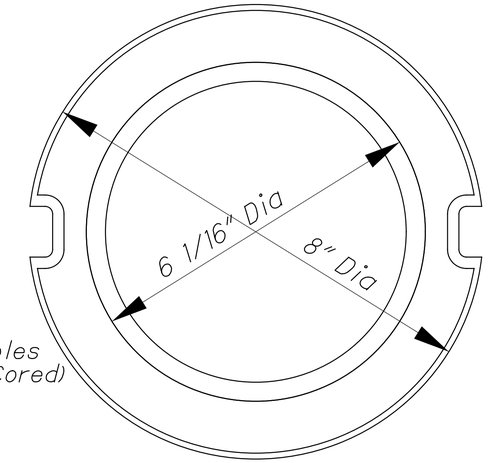
SCD NUMBER
RM-1.1

SHEET P.2 | TOTAL 3

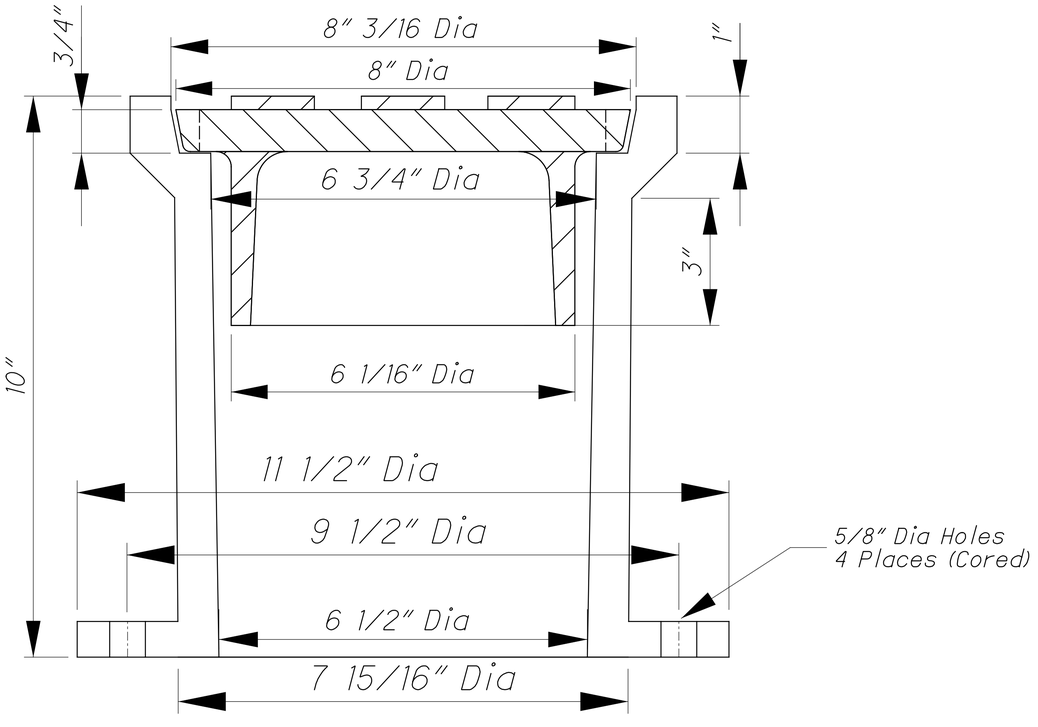
MONUMENT TYPE D

TOP VIEW OF BOX COVER
N.T.S

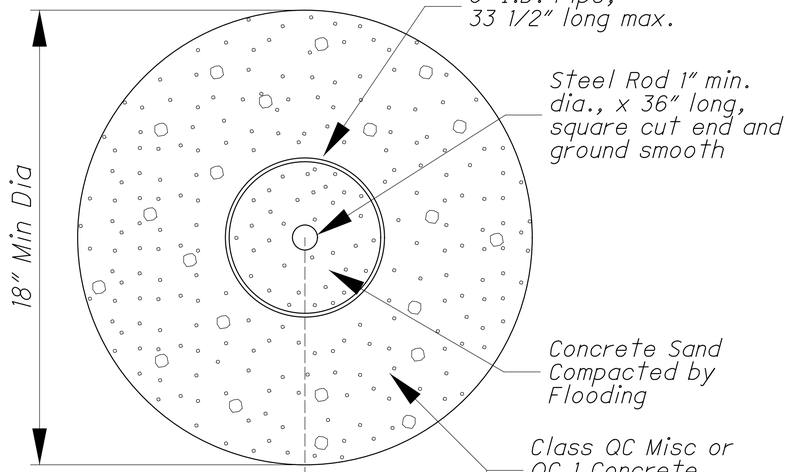




BOTTOM VIEW OF BOX COVER
N.T.S.



SECTION A-A
N.T.S



SECTION B-B
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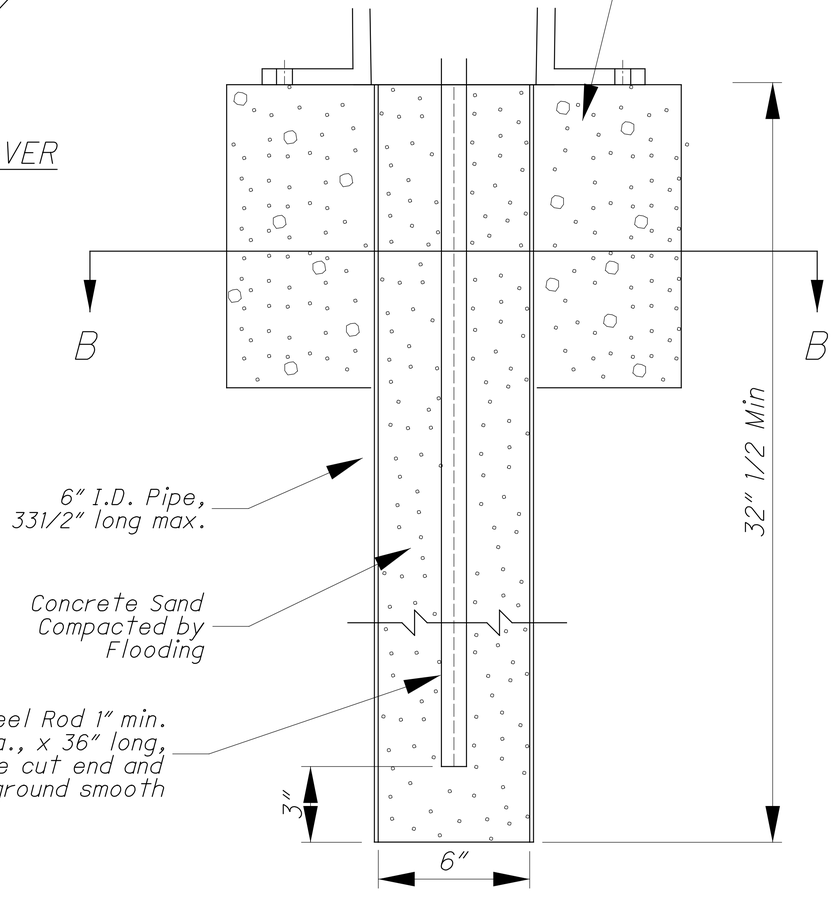

SIDE VIEW
N.T.S

OFFICE OF ROADWAY ENGINEERING

REVISIONS

01-20-2023
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
ROADWAY MONUMENTS

DESIGN AGENCY

SCD NUMBER
RM-1.1

SHEET P.3 | TOTAL 3

RM-1.1

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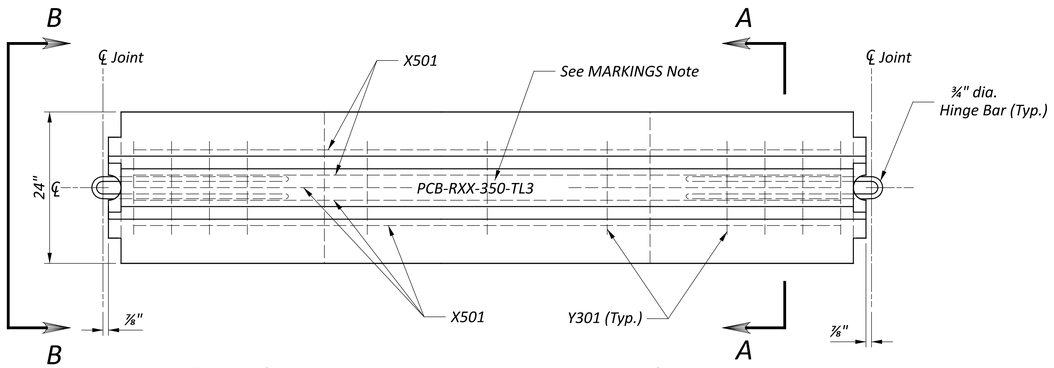
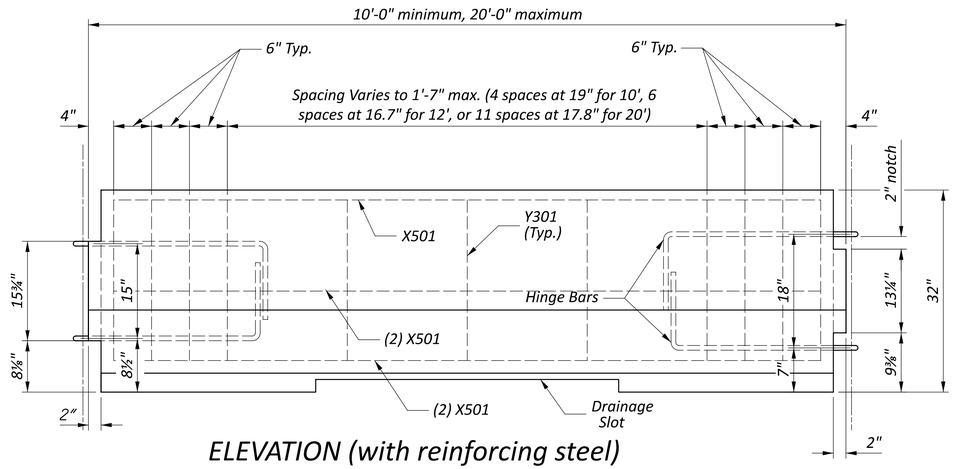
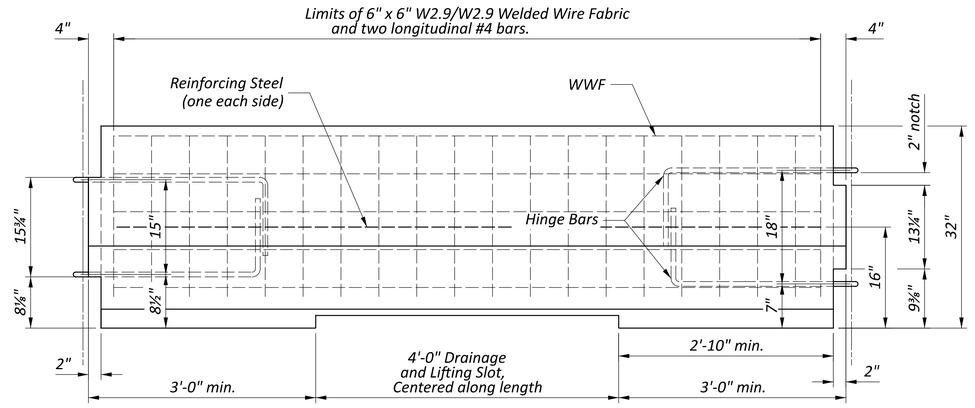


PLAN (reinforced casting option shown)



ELEVATION (with reinforcing steel)



ELEVATION (with wire mesh)

32" BARRIER SECTION WITH PIN & LOOP CONNECTION

NOTES (NEW JERSEY SHAPE)

GENERAL: This barrier may be manufactured with reinforcing steel or with welded wire fabric as shown in the ELEVATION and SECTION A-A details. See CMS 622 for additional information. The minimum design strength of the concrete is 4,000 psi and meets the requirements of CMS 499.

Barrier types shall not be mixed within the same run, except when a transition per RM-4.7 is provided.

See MT-101.80 for transitions.

PORTABLE CONCRETE BARRIER (PCB): Do not use the PCB detailed here on bridge deck edges, or similar drop-offs. PCB, Bridge Mounted, shown on Structural Engineering's Standard Drawing PCB-91, or approved alternative products as shown on the Office of Roadway Engineering's website, shall be used at those locations in accordance with that office's PCBDD Design Data Sheet.

HINGE AND REINFORCING BARS: Use ASTM A 36 for the ¾" hinge bars. Use rebars meeting the requirements of CMS 509 (ASTM A 615 Grade 60). Wire mesh shall meet CMS 709.10. Black Steel is permitted.

CONNECTING HARDWARE: Bolts, washers and hex nuts are to be galvanized after fabrication per CMS 711.02 and meet the requirements of CMS 711.09 except that the Rotational Capacity test specified in ASTM A 325 shall be waived.

ALTERNATE BARRIER: Approved Alternate Portable Barrier can be found on the Office of Roadway Engineering's Website.

HANDLING DEVICES: Such devices may be used in lieu of the lifting slot for moving the barrier. They may be of any design sufficient to safely handle the weight of the section being lifted. No handling devices shall protrude from the surface of the barrier when in place.

MARKINGS: All barrier segments are to be marked on the top, as shown, where XX indicates the year cast. If the barrier is cast using welded wire fabric instead of the rebar, add "WWF" to the end of the notation. Permanently impress these markings in the barrier using a minimum of 2" high lettering. The tapered end section is not required to be marked.

On the top of each barrier segment, including tapered end sections, permanently mark a unique identification as to its manufacturer. On each barrier, somewhere permanently mark the day and month the barrier was manufactured.

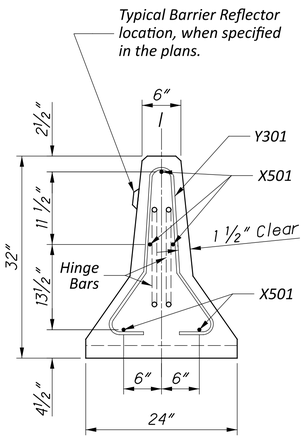
REFLECTORIZATION: Install barrier reflectors in accordance with Roadway Engineering Standard Drawing MT-101.70, when specified in the plans.

PAYMENT: This barrier is paid for in feet as ITEM 622 - Portable Barrier, Anchored, and ITEM 622 - Portable Barrier, Unanchored. Approved alternatives to the barrier shown on this drawing (and SCD PCB-91) can be found on the Office of Roadway Engineering's website.

Barrier sections meeting this standard and cast before January 1, 2020, may continue to be used until December 31, 2029, provided the barrier section remains in conformance with the most Current Version of the Quality Standards for Temporary Traffic Control Devices and Acceptable Delineation Methods for Vehicles.

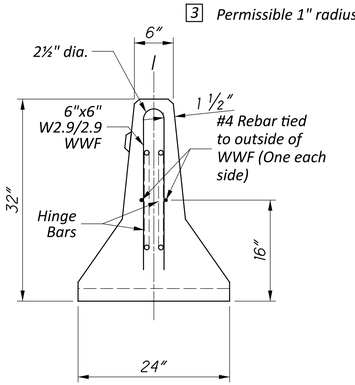
LEGEND

1. *1" radius or ¾" chamfer, all top and end corners.*
2. *Permissible 10" radius.*
3. *Permissible 1" radius.*



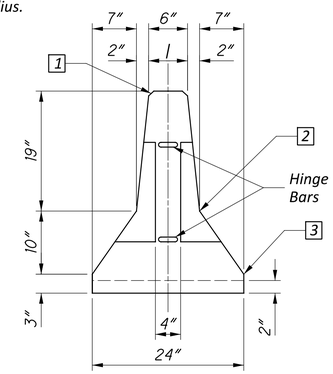
SECTION A-A

Rebar casting option



SECTION A-A

WWF casting option



VIEW B-B

Vertical edges on Lifting Slot may be battered. Depth 2" ¼"

THIS DRAWING REPLACES RM-4.2 DATED 07-18-2025

OFFICE OF ROADWAY ENGINEERING

REVISIONS

04-17-2020
07-19-2024
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
32" PORTABLE CONCRETE BARRIER (New Jersey Shape)
PIN & LOOP CONNECTION

DESIGN AGENCY

SCD NUMBER
RM-4.2

SHEET P.1 | TOTAL 6

RM-4.2

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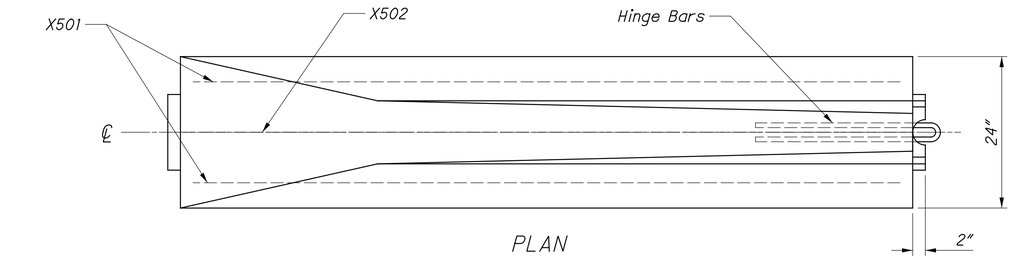
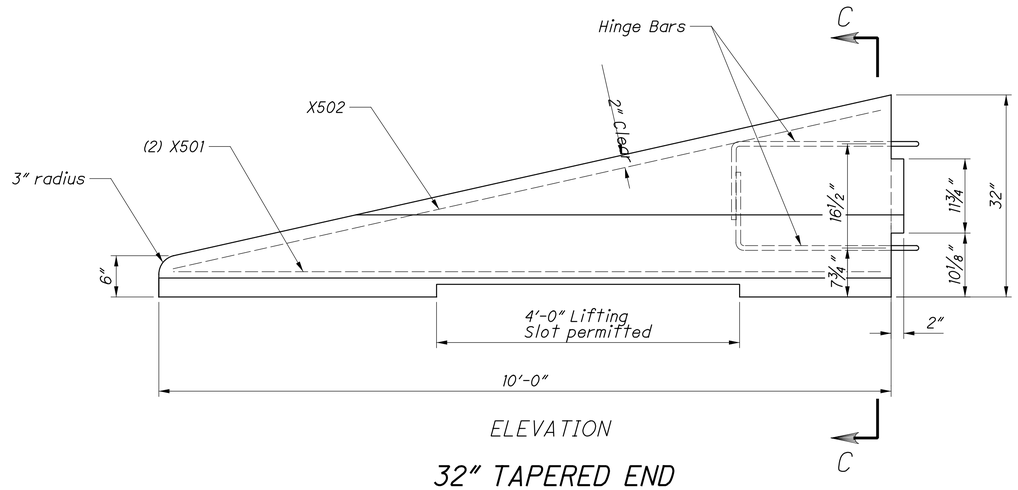


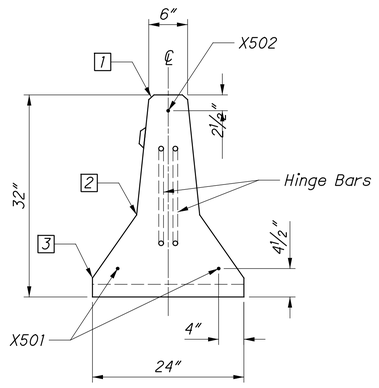
PLAN



ELEVATION

32″ TAPERED END WITH PIN & LOOP CONNECTION

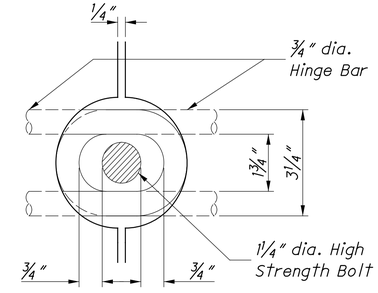
The Tapered End section is not a crashworthy terminal and should not be used on the approach end of temporary barrier unless it is fully located beyond the clear zone.



SECTION C-C

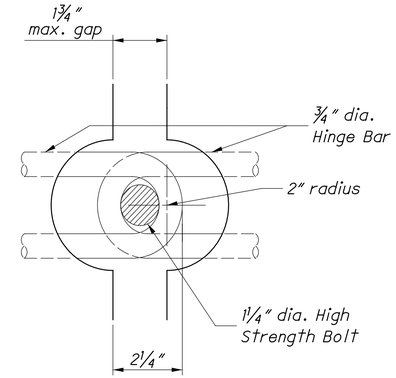
CLOSED JOINT

Barriers shall initially be placed close together so that Bolts can be easily inserted through Hinge Bar loop.

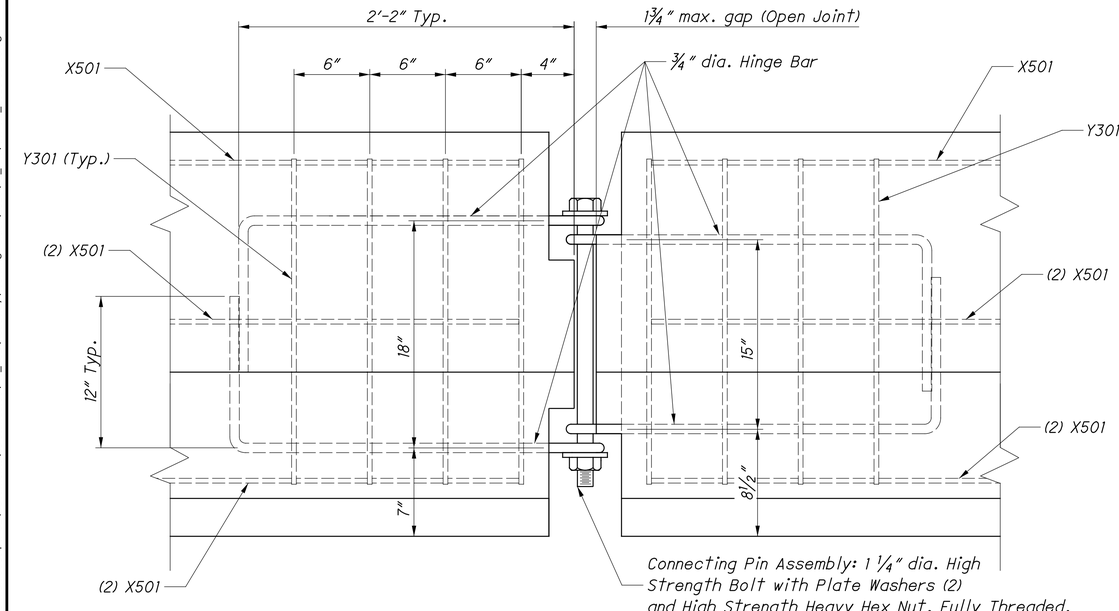


OPEN JOINT

Barrier joints shall be fully open before the Nut is tightened onto Bolt.

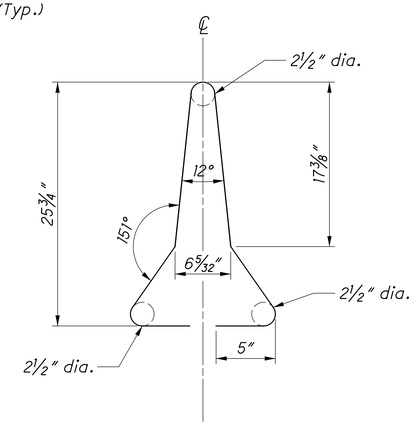


PIN & LOOP JOINT CONNECTION DETAILS



PIN & LOOP DETAIL AT HINGED CONNECTION

Shown with reinforcing.



Y301

BENDING DIAGRAM

REINFORCING BAR LIST

	Mark	Bar	Bar Length	Shape	Quantity per typ. length		
					10′	12′	20′
BARRIER SECTION (reinforced)	X501	#5	9′-4″	Str.	5	---	---
			11′-4″	Str.	---	5	---
			19′-4″	Str.	---	---	5
	Y301	#3	5′-5″	Bent	11	13	18
TAPERED END	X501	#5	9′-4″	Str.	2	---	---
	X502	#5	9′-6″	Str.	1	---	---

THIS DRAWING REPLACES RM-4.2 DATED 07-18-2025

OFFICE OF ROADWAY ENGINEERING

REVISIONS

04-17-2020
07-19-2024
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
32" PORTABLE CONCRETE BARRIER (New Jersey Shape)
PIN & LOOP CONNECTION

DESIGN AGENCY

SCD NUMBER
RM-4.2

SHEET P.2 | TOTAL 6

RM-4.2

MODEL: Sheet 2 PAPERSIZE: 34x22 (in.) DATE: 11/14/2025 TIME: 1:25:15 PM PLTDRV: OHDOT_PDF.pltcfg PENTBL: OHDOT_Pen.tbl USER: Andrew.Holloway@dot.ohio.gov
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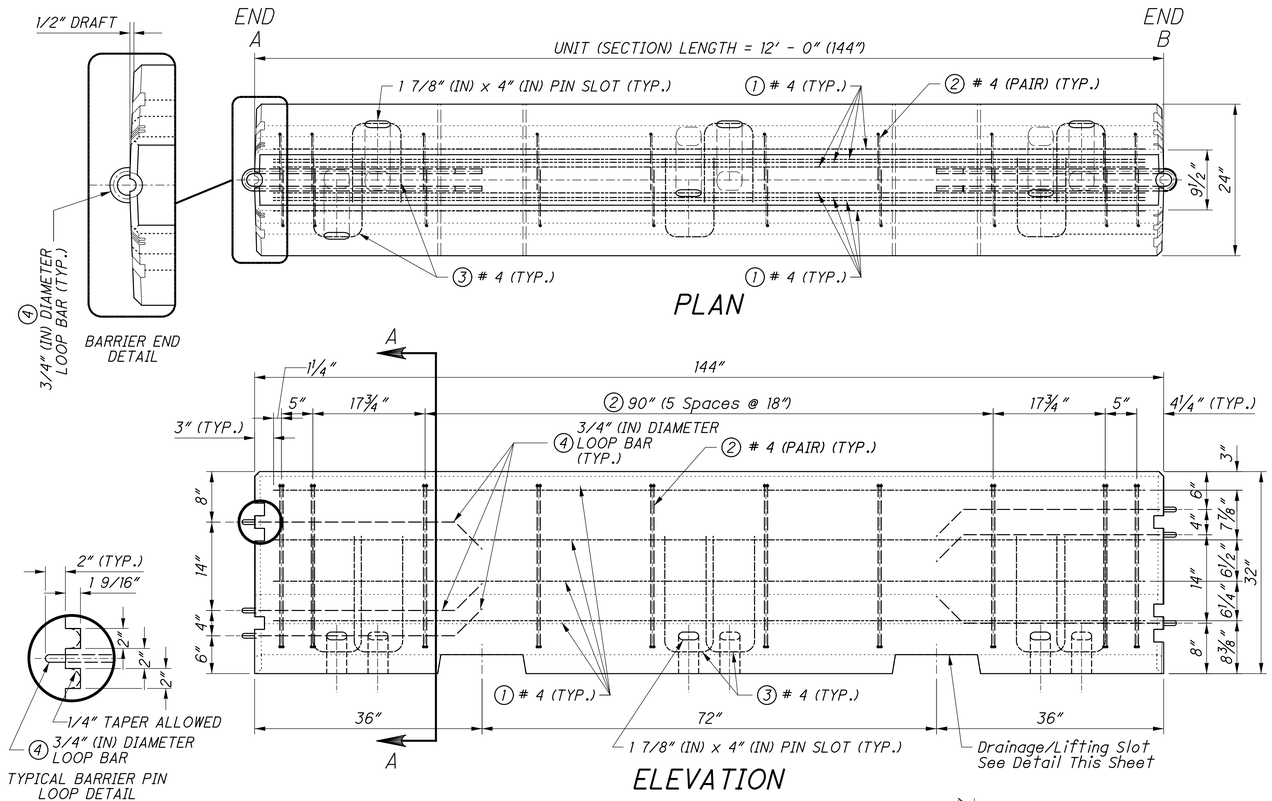


NOTES (F-SHAPE ANCHORED)

GENERAL: This barrier may be manufactured with reinforcing steel or with welded wire fabric as shown in the ELEVATION and SECTION A-A details. See CMS Item 622 for additional information. Provide class QC3 concrete with a minimum compressive strength of 5,000 psi and permeability of 2,000 coulombs. Provide uncoated reinforcing steel or welded wire fabric in accordance with CMS Item 509.

Barrier types shall not be mixed within the same run, except when a transition per RM-4.7 is provided.

See MT-101.80 for transitions.

Welded Wire Fabric with the same bar sizes as shown may be used instead of Rebar.

F-Shape Portable Barrier anchored type segments, without the anchors installed, may be used in lieu of F-Shape Portable Barrier unanchored type sections.

HINGE AND REINFORCING BARS: Use ASTM A 36 for the ¾" hinge bars. Use rebars meeting the requirements of CMS 509 (ASTM A 615 Grade 60). Wire mesh shall meet CMS 709.10. Black Steel is permitted.

CONNECTING HARDWARE: Bolts and washers are to meet the requirements of CMS 711.09 except that the Rotational Capacity test specified in ASTM A 325 shall be waived.

ALTERNATE BARRIER: Approved Alternate Portable Barrier can be found on the Office of Roadway Engineering's Website.

HANDLING DEVICES: Such devices may be used in lieu of the lifting slot for moving the barrier. They may be of any design sufficient to safely handle the weight of the section being lifted. No handling devices shall protrude from the surface of the barrier when in place.

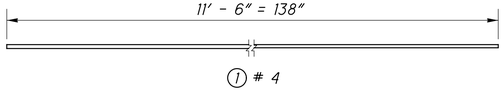
MARKINGS: All barrier segments are to be marked on the top, PCB-XX-MASH-TL3, where XX indicates the year cast. If the barrier is cast using welded wire fabric instead of the rebar, add "WWF" to the end of the notation. Permanently impress these markings in the barrier using a minimum of 2" high lettering.

On the top of each barrier segment permanently mark a unique identification as to its manufacturer. On each barrier, somewhere permanently mark the day and month the barrier was manufactured.

REFLECTORIZATION: Install barrier reflectors in accordance with Roadway Engineering Standard Drawing MT-101.70, when specified in the plans.

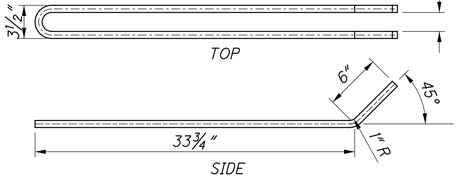
PAYMENT: This barrier is paid for in feet as ITEM 622 - Portable Barrier, Anchored. Approved alternatives to the barrier shown on this drawing can be found on the Office of Roadway Engineering's website.

REINFORCING STEEL BENDING DIAGRAM



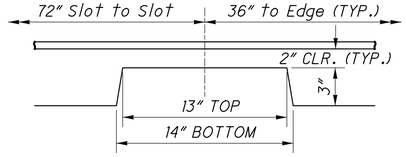
① # 4

LONGITUDINAL BAR
QTY. = 8 BARS



LOOP BAR DETAIL
QTY. = 6 BARS

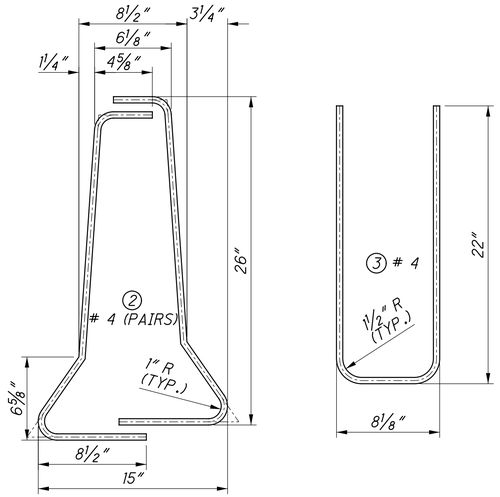
④ 3/4" DIAM. LOOP BAR (ASTM A36) COLD ROLL
HOT DIP GALVANIZE AFTER FABRICATION ACCORDING TO CMS 711.02



DRAINAGE / LIFTING SLOT DETAIL

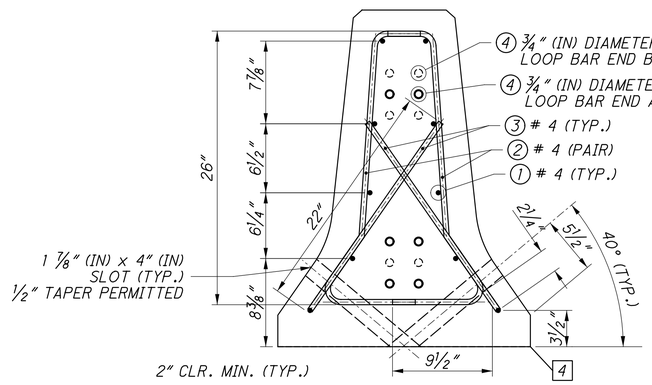
LEGEND

1. 1" RADIUS OR ¾" CHAMFER ALL TOP AND END CORNERS
2. PERMISSIBLE 10" RADIUS
3. PERMISSIBLE 1" RADIUS
4. SURFACE TO BE EDGED WHEN CAST

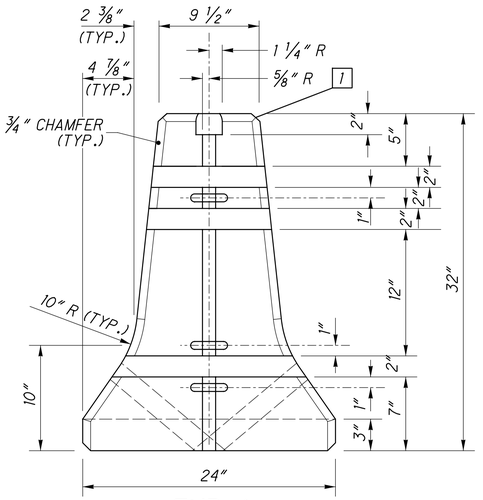


STIRRUP BAR
QTY. = 10 BARS

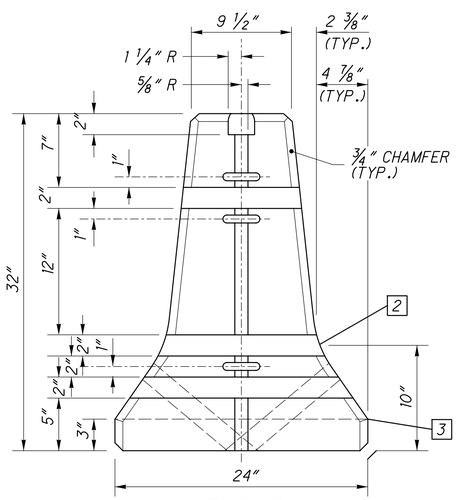
PIN SLOT BAR
QTY. = 6 BARS



SECTION A-A



END A



END B

THIS DRAWING REPLACES RM-4.2 DATED 07-18-2025

STANDARD ROADWAY CONSTRUCTION DRAWING
32" PORTABLE CONCRETE BARRIER (F-Shape)
PIN & LOOP CONNECTION

OFFICE OF ROADWAY ENGINEERING

REVISIONS
04-17-2020
07-19-2024
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

DESIGN AGENCY

SCD NUMBER
RM-4.2

SHEET P.3 | TOTAL 6

RM-4.2

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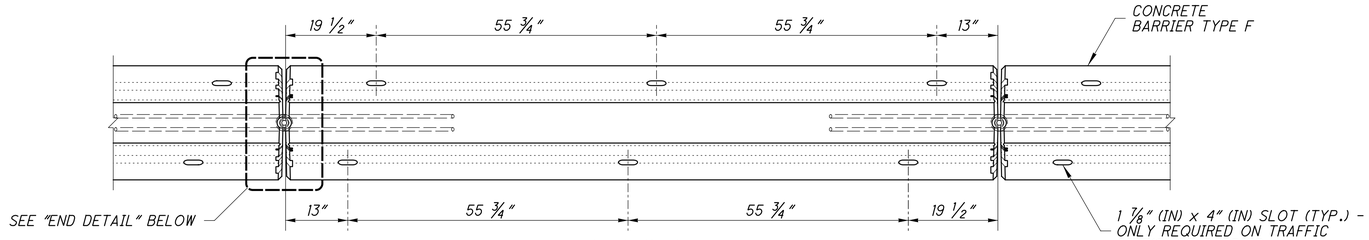


PLAN VIEW
CONCRETE BARRIER F-SHAPE - ANCHORING PIN LOCATIONS

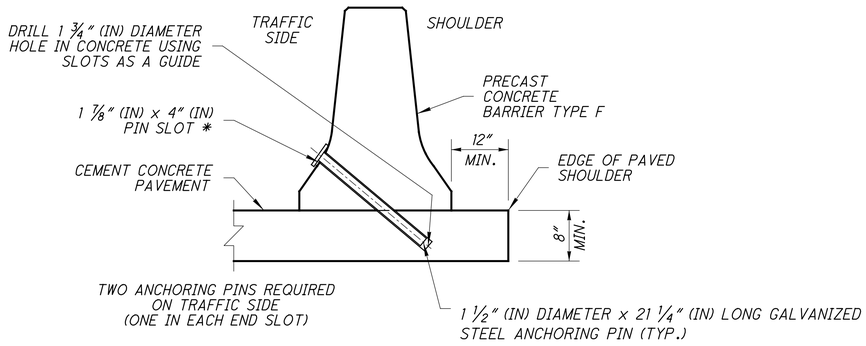
NOTES (F-SHAPE ANCHORED)

1. Use this standard for the anchoring of precast concrete barrier on asphalt or portland cement concrete pavement including bridge decks.

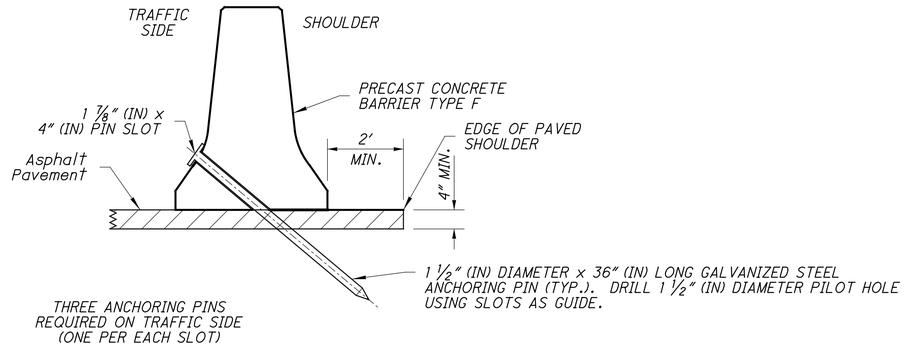
2. After removing anchoring pins, clean the pin holes and fill them per CMS 622.04.

3. Refer to the Plans for locations of anchored barrier.

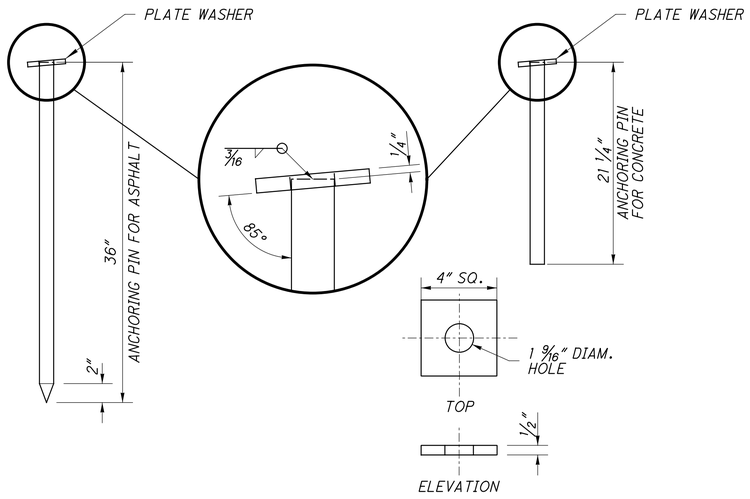
* THE MAXIMUM DEPTH FROM THE SURFACE OF THE PCB TO THE END OF THE HOLE SHALL BE 21 ½" (IN). USE REBAR CUTTING BIT IF STEEL IS ENCOUNTERED.



SECTION VIEW
CONCRETE ANCHORING PIN LOCATIONS

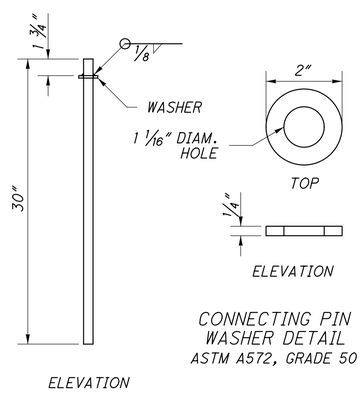


SECTION VIEW
ASPHALT CONCRETE ANCHORING PIN LOCATIONS



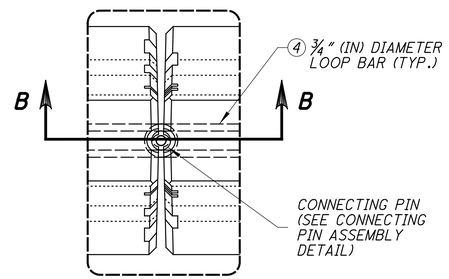
ANCHORING PIN PLATE WASHER DETAIL
ASTM A36

ANCHORING PIN ASSEMBLY DETAIL
1 ½" DIAMETER (ASTM A36), COLD ROLL HOT DIP GALVANIZE AFTER FABRICATION ACCORDING TO CMS 711.02

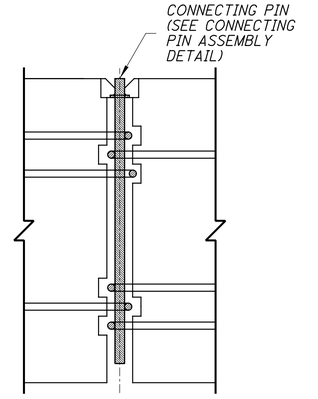


CONNECTING PIN WASHER DETAIL
ASTM A572, GRADE 50

CONNECTING PIN ASSEMBLY DETAIL
1" DIAMETER PER ASTM A449
HOT DIP GALVANIZE AFTER FABRICATION ACCORDING TO CMS 711.02



END DETAIL
JOINING TWO BARRIER SEGMENTS



SECTION B-B

CONNECTION DETAILS

THIS DRAWING REPLACES RM-4.2 DATED 07-18-2025

STANDARD ROADWAY CONSTRUCTION DRAWING
32" PORTABLE CONCRETE BARRIER (F-Shape)
PIN & LOOP CONNECTION

OFFICE OF ROADWAY ENGINEERING

REVISIONS
04-17-2020
07-19-2024
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

DESIGN AGENCY

SCD NUMBER
RM-4.2

SHEET P.4 TOTAL 6

RM-4.2

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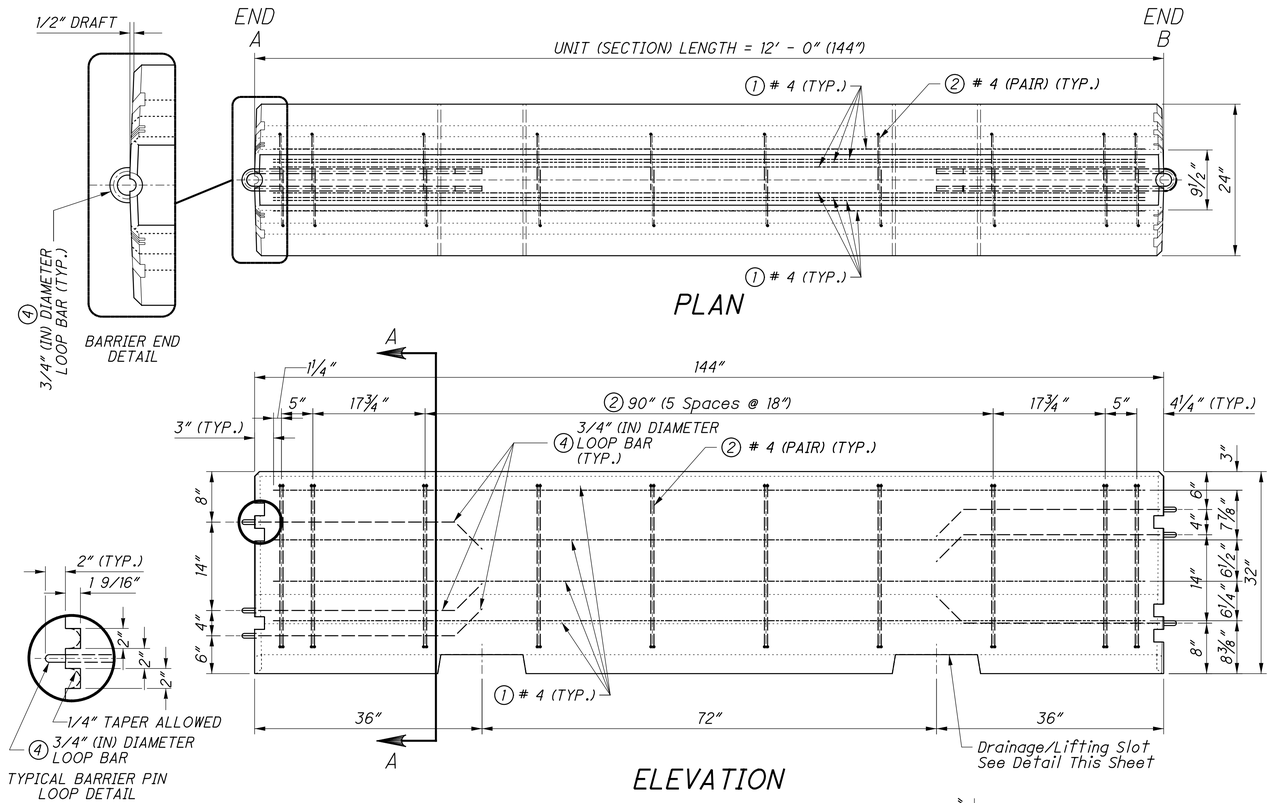


NOTES (F-SHAPE UNANCHORED)

GENERAL: This barrier may be manufactured with reinforcing steel or with welded wire fabric as shown in the ELEVATION and SECTION A-A details. See CMS Item 622 for additional information. Provide class QC3 concrete with a minimum compressive strength of 5,000 psi and permeability of 2,000 coulombs. Provide uncoated reinforcing steel or welded wire fabric in accordance with CMS Item 509.

Barrier types shall not be mixed within the same run, except when a transition per RM-4.7 is provided.

See MT-101.80 for transitions.

Welded Wire Fabric with the same bar sizes as shown may be used instead of Rebar.

HINGE AND REINFORCING BARS: Use ASTM A 36 for the ¾" hinge bars. Use rebars meeting the requirements of CMS 509 (ASTM A 615 Grade 60). Wire mesh shall meet CMS 709.10. Black Steel is permitted.

CONNECTING HARDWARE: Bolts and washers are to meet the requirements of CMS 711.09 except that the Rotational Capacity test specified in ASTM A 325 shall be waived.

ALTERNATE BARRIER: Approved Alternate Portable Barrier can be found on the Office of Roadway Engineering's Website.

HANDLING DEVICES: Such devices may be used in lieu of the lifting slot for moving the barrier. They may be of any design sufficient to safely handle the weight of the section being lifted. No handling devices shall protrude from the surface of the barrier when in place.

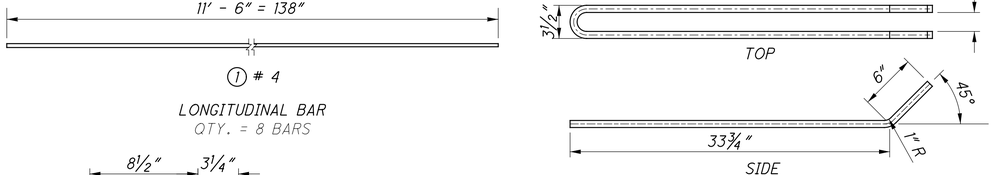
MARKINGS: All barrier segments are to be marked on the top, PCB-XX-MASH-TL3, where XX indicates the year cast. If the barrier is cast using welded wire fabric instead of the rebar, add "WWF" to the end of the notation. Permanently impress these markings in the barrier using a minimum of 2" high lettering.

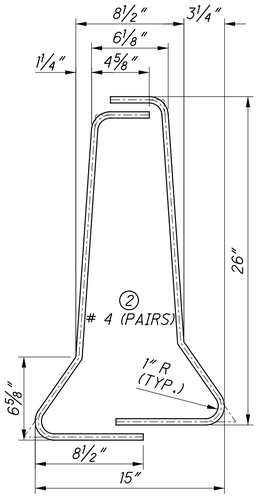
On the top of each barrier segment permanently mark a unique identification as to its manufacturer. On each barrier, somewhere permanently mark the day and month the barrier was manufactured.

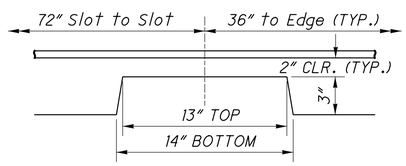
REFLECTORIZATION: Install barrier reflectors in accordance with Roadway Engineering Standard Drawing MT-101.70, when specified in the plans.

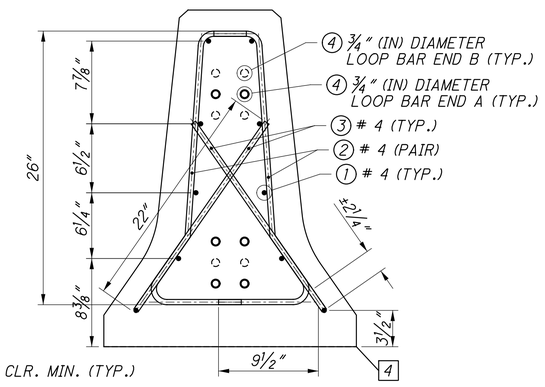
PAYMENT: This barrier is paid for in feet as ITEM 622 - Portable Barrier, Unanchored. Approved alternatives to the barrier shown on this drawing can be found on the Office of Roadway Engineering's website.

REINFORCING STEEL BENDING DIAGRAM



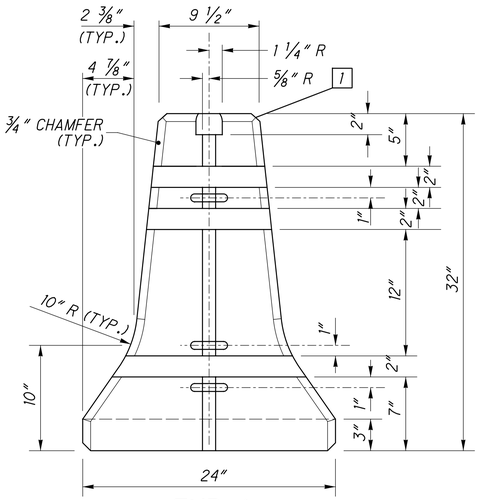


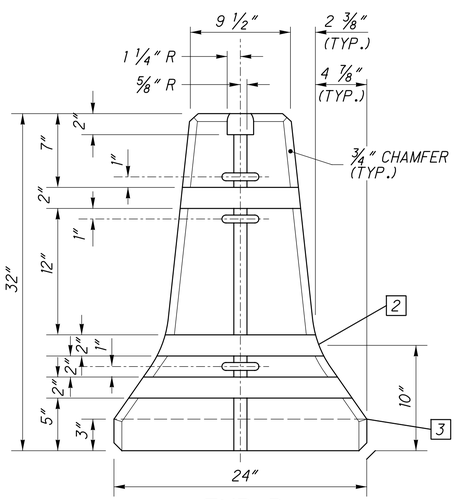




LEGEND

1. 1" RADIUS OR ¾" CHAMFER ALL TOP AND END CORNERS
2. PERMISSIBLE 10" RADIUS
3. PERMISSIBLE 1" RADIUS
4. SURFACE TO BE EDGED WHEN CAST





OFFICE OF ROADWAY ENGINEERING

REVISIONS
04-17-2020
07-19-2024
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

THIS DRAWING REPLACES RM-4.2 DATED 07-18-2025

STANDARD ROADWAY CONSTRUCTION DRAWING
32" PORTABLE CONCRETE BARRIER (F-Shape)
PIN & LOOP CONNECTION

DESIGN AGENCY

SCD NUMBER
RM-4.2

SHEET P.5 | TOTAL 6

RM-4.2

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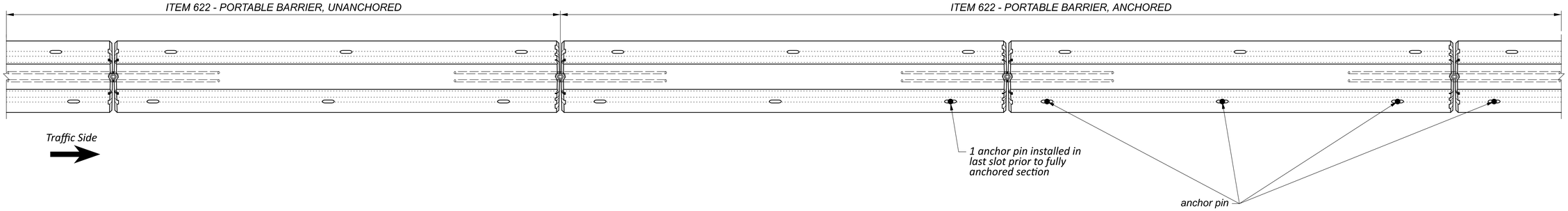
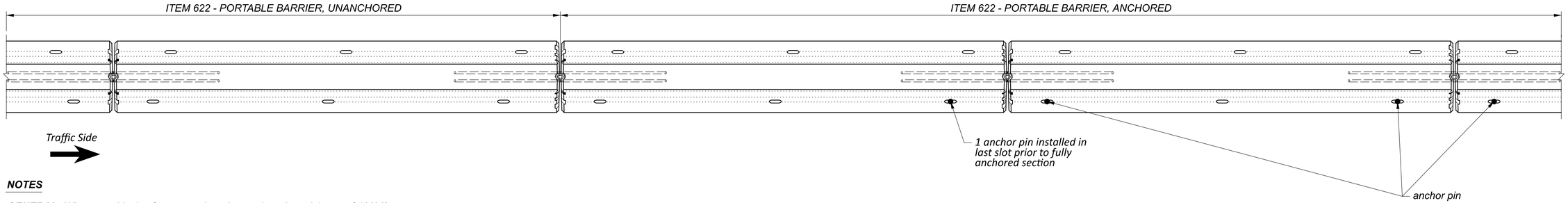
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\03 Standards\PIS_SCD\Roadway\Working Folder\2026\01_Jan\RM-4.2_2026-01-16.dgn

Transition from Unanchored F-Shape to F-Shape Anchored in Asphalt
(approach transition shown, mirror for trailing end)



Transition from Unanchored F-Shape to F-Shape Anchored in Concrete
(approach transition shown, mirror for trailing end)



NOTES

GENERAL: *When transitioning from unanchored to anchored, a minimum of 100' (8 segments) of unanchored portable barrier is required prior to the transition segment.*

Details shown are not applicable for transitions from portable barrier to permanent barrier. See SCD MT-101.80 for portable concrete barrier to permanent barrier transitions.

PAYMENT: *The transition segment containing one pin shall be considered incidental to "Item 622 - Portable Barrier, Anchored"*

OFFICE OF ROADWAY ENGINEERING

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04-17-2020
07-19-2024
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

THIS DRAWING REPLACES RM-4.2 DATED 07-18-2025

STANDARD ROADWAY CONSTRUCTION DRAWING
32" PORTABLE CONCRETE BARRIER (F-Shape)
TRANSITION FROM UNANCHORED TO ANCHORED

DESIGN AGENCY

SCD NUMBER
RM-4.2

SHEET P.6 TOTAL 6

RM-4.2

MODEL: Sheet 6 PAPERSIZE: 34x22 (in.) DATE: 11/14/2025 TIME: 1:24:45 PM PLTDRV: OHDOT_PDF.pltcfg PENTBL: OHDOT_Pen.tbl USER: Andrew.Holloway@dot.ohio.gov WORKSPACE: OHDOTCEv02 WORKSET: PIS_SCD PRODUCT: OpenRoadsDesigner 24.00.00.205
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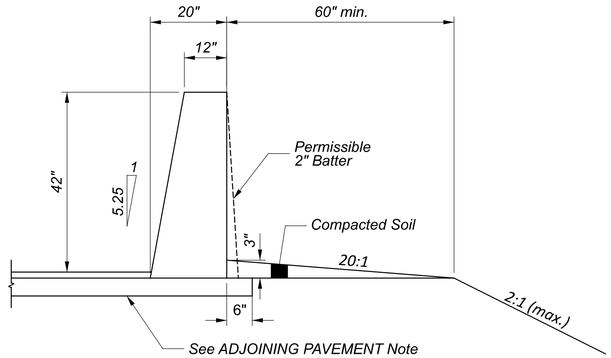
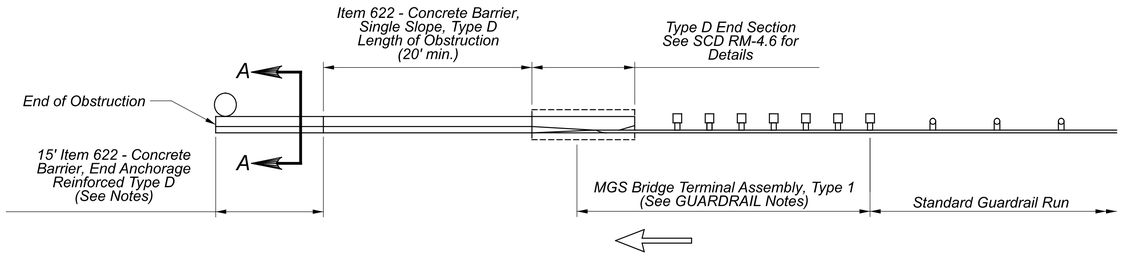
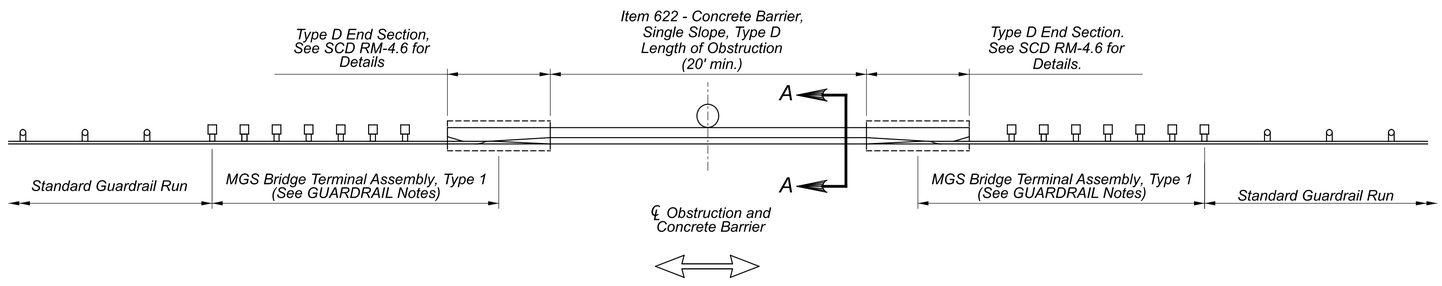


SECTION A-A



Directional Travel Where No Trailing Guardrail is Used



Use MGS Bridge Terminal Assembly, Type 2 for directional roadways where trailing guardrail is used and is out of the Clear Zone of opposite direction traffic.

Bi-directional Travel or Direction Travel Where Trailing Guardrail is Used

TYPICAL INSTALLATIONS CONCRETE BARRIER AT OBSTRUCTIONS

NOTES:

GENERAL: Single Slope Concrete Barrier, Type D, may be cast-in-place or slip-formed. See SCD RM-4.3 for other standard barrier types and any details not shown, including materials, adjoining pavement, and doweling details. Longitudinal steel is not required when top width of barrier is 12" or greater.

CONTRACTION JOINTS: Maximum allowable spacing of unsealed joints is 20' throughout the run of the barrier. Construct joints by using metal inserts inside the forms, preformed full width joint filler, a grooving tool, or by sawing. Inserts, tooled or sawed joints will have a 3" minimum depth.

Construct all joints for the full height of the barrier. Saw as soon as curing will allow to prevent spalling. When used in conjunction with concrete pavement, match joints to those in the concrete pavement but not exceeding the maximum allowable spacing

ADJOINING PAVEMENT: When the barrier is constructed in conjunction with new asphalt pavement, place it directly on the intermediate course. Construct the surface course directly against the barrier. Set barrier placed on existing pavement with a continuous wedge of surface material tapering from a 1" minimum thickness at the toe of the barrier to zero. For unidirectional installations, construct the wedge on the traveled way side and the width may be reduced to 12" minimum.

When the barrier is constructed in conjunction with new concrete pavement, extend the concrete pavement 20" to the back side of barrier and dowel as shown in DOWELING DETAILS (See Sheet P.2).

Barrier may be placed on top of existing concrete pavement and doweled as shown in DOWELING DETAILS (See Sheet P.2).

When pavement is to be constructed on one side of the barrier only, then embankment must be placed against the barrier on the other side at a minimum height of 3" and at a 20:1 over a width of 5'. The embankment shall be considered incidental to the barrier installation.

SEALING JOINTS: Use a butt longitudinal joint between the barrier and any adjoining concrete pavement sealed with CMS 705.04 joint sealer.

CONSTRUCTION JOINTS: Barrier runs with abutting vertical surfaces at either required or permissible construction joints are to be doweled to each other by use of ¾" dia. by 18" long epoxy coated deformed dowel bars as per CMS 622.02. Bars are to be placed as shown on the DOWEL BAR PLACEMENT detail on Sheet P.2.

RACEWAYS: Raceways on Type D barriers are typically not embedded within the barrier, but are mounted outside of it on the back side and not exposed to traffic.

END SECTIONS: End Sections are used when barrier connects to Bridge Terminal assemblies, Guardrail runs, or Impact Attenuator. See SCD RM-4.6 for Type D End Section details.

END ANCHORAGE: At other barrier ends, or at vertical construction joints, construct a reinforced End Anchorage as shown on Sheet P.2.

GUARDRAIL: For MGS Bridge Terminal Assembly, Type 1, details and connections, see SCD MGS-3.1.

PAYMENT: Will be made at the unit price bid per Feet for Item 622 - CONCRETE BARRIER, SINGLE SLOPE, TYPE D. Include all materials, labor, and incidentals, to construct the barrier.

Payment for any reinforced end anchorages, as shown on the END ANCHORAGE details shown on sheet P.2, will be made at the unit price bid per each for Item 622 - Concrete Barrier End Anchorage, Reinforced Type D. This includes all materials, labor, and other incidentals necessary to construct this anchor.

OFFICE OF ROADWAY ENGINEERING

REVISIONS
07-21-2017
07-19-2024
01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
Single Slope Barrier, Type D

DESIGN AGENCY

SCD NUMBER
RM-4.5

SHEET P.1 TOTAL 2

RM-4.5

MODEL: Sheet 1 PAPERSIZE: 34x22 (in.) DATE: 12/9/2025 TIME: 11:00:22 AM PLTDRV: OHDOT_PDF.pltcfg PENTBL: OHDOT_Pen.tbl USER: Andrew.Holloway@dot.ohio.gov WORKSPACE: OHDOTCEv02 WORKSET: PIS_SCD PRODUCT: OpenRoadsDesigner 24.00.00.205
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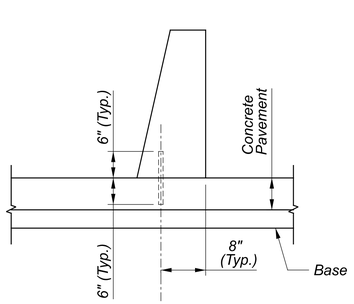

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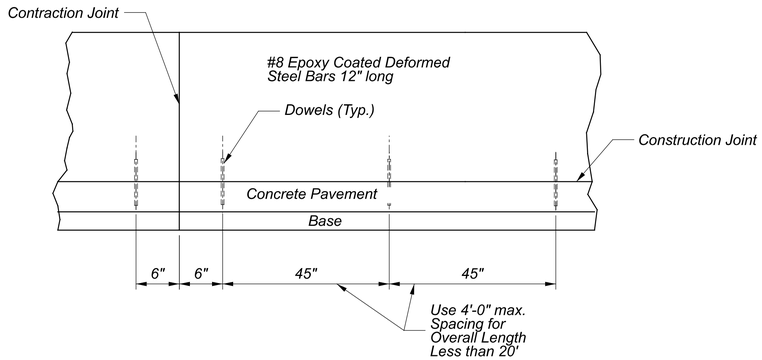
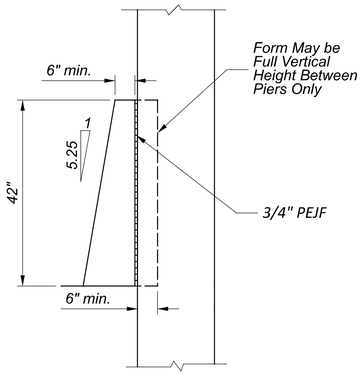


ELEVATION

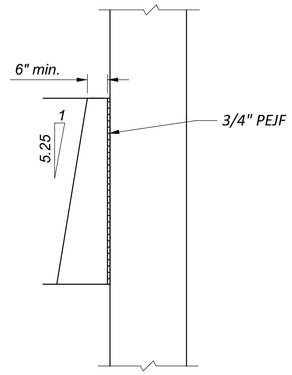
DOWELING DETAILS

See AJOINING PAVEMENT Notes on Sheet P.1

PEJF = PREFORMED EXPANSION JOINT FILLER



PIER (Optional)



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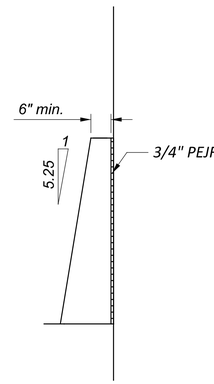
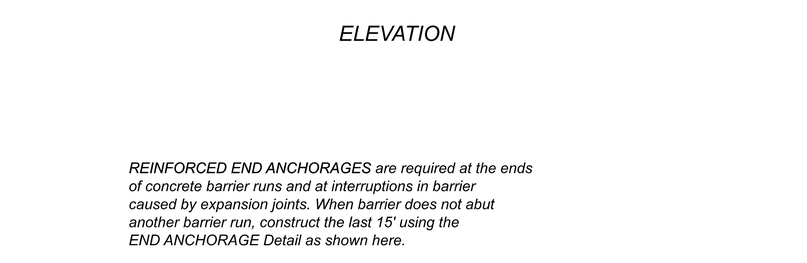


VERTICAL WALL

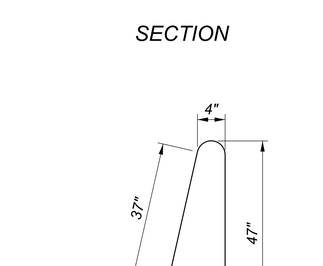
INCORPORATED INSTALLATIONS: For barrier installations that cannot be constructed at the normal guardrail offset the incorporated installations shown on Sheet 2 may be installed at vertical walls, piers or other similar obstructions. A 3/4" preformed expansion joint filler per CMS 705.03 shall be provided between the barrier and wall/pier, and shall be considered incidental to the cost of Item 622.

For pier-incorporated installations that contractor may use the optional treatment, forming the back face of the Single Slope Barrier, Type D, to the location shown (between piers only), with any additional cost being included in the cost of Item 622.

INCORPORATED INSTALLATIONS



ELEVATION



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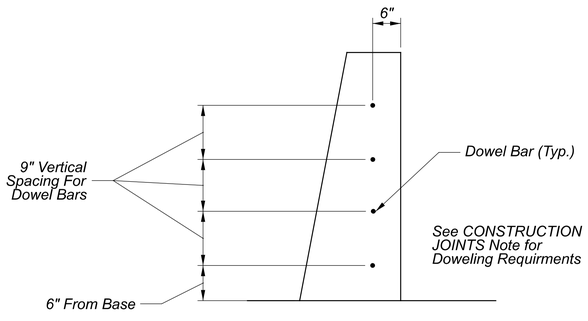

DOWEL BAR PLACEMENT

REINFORCED END ANCHORAGES are required at the ends of concrete barrier runs and at interruptions in barrier caused by expansion joints. When barrier does not abut another barrier run, construct the last 15' using the END ANCHORAGE Detail as shown here.

At expansion joints, construct an End Ancorage on both sides of joint, with a maximum gap of 2" for the open joint. The maximum expansion joint spacing shall be 800'. This anchorage is not needed at construction joints, provide dowel bar connections instead. See CONSTRUCTION JOINT Note.

END ANCHORAGE

See Notes on Sheet P.1.

BENDING DIAGRAM

Y401 #4

OFFICE OF ROADWAY ENGINEERING

REVISIONS

07-21-2017
07-19-2024
01-17-2025
07-18-2025
01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
Single Slope Barrier, Type D

DESIGN AGENCY

SCD NUMBER
RM-4.5

SHEET P.2 | TOTAL 2

RM-4.5

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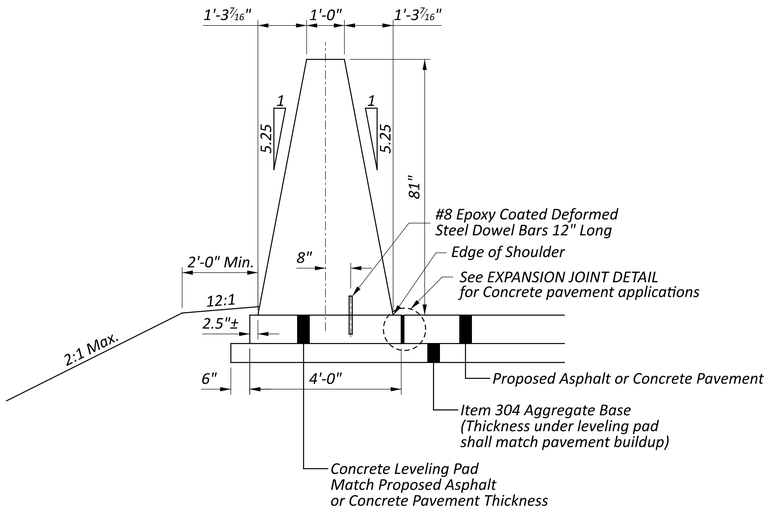
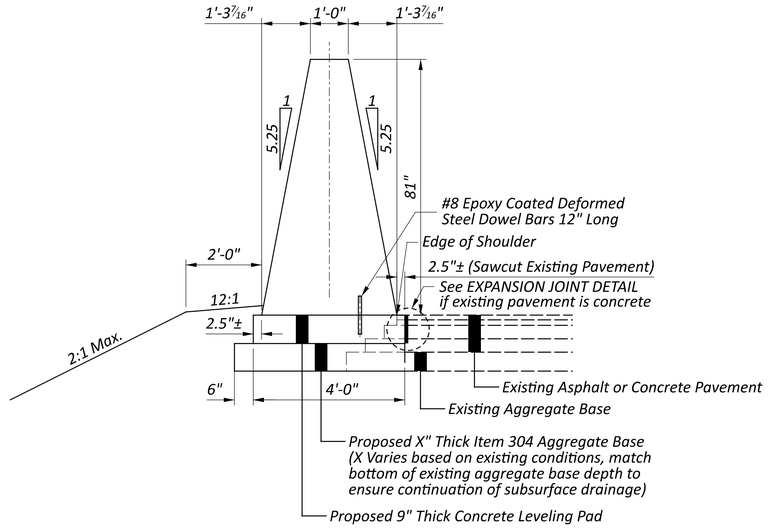
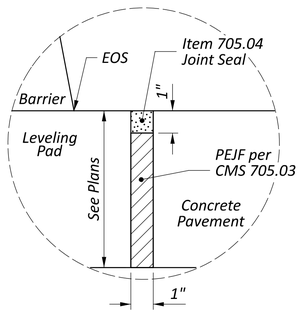
New Pavement Installation



Existing Pavement Installation



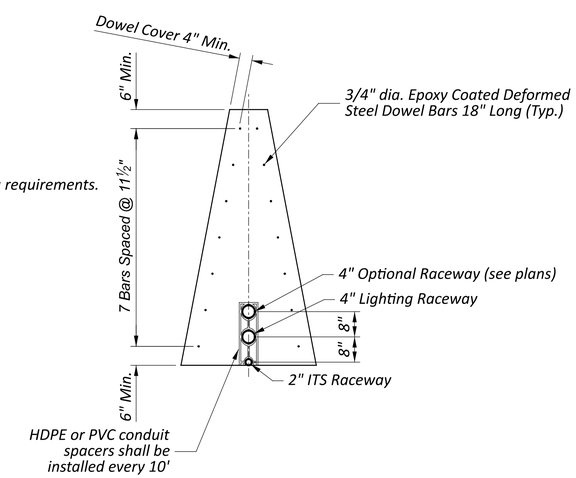


EXPANSION JOINT DETAIL
(FOR USE WITH CONCRETE PAVEMENT ONLY)

RACEWAY AND DOWEL BAR PLACEMENT

See CONSTRUCTION JOINTS note for doweling requirements.

Do not place dowels closer
than 4" to any conduit.



NOTES

SINGLE SLOPE CONCRETE BARRIER may be cast-in-place or slip formed.
See SCD RM-4.3 for Type B, B1, C, and C1 barrier.
See SCD RM-4.5 for Type D barrier.
See SCD RM-4.6 for End Sections.

MATERIALS: Construct using concrete with a minimum design strength of 4000 psi conforming to the requirements of CMS 499. Construct top and end edges with either a 1" radius or ¾" chamfer, except at light pole foundations.

CONTRACTION JOINTS: Maximum allowable spacing of unsealed joints is 10' throughout the run of the barrier. Construct joints by using metal inserts inside the forms, preformed full width joint filler, a grooving tool, or by sawing. Inserts, tooled, or sawed joints will have a 3" depth. Construct all joints for the full height of the barrier. Saw as soon as curing will allow to prevent spalling.

ADJOINING PAVEMENT: When the barrier is constructed in conjunction with new pavement (asphalt or concrete), the concrete leveling pad and aggregate base layer shall match the thickness of the proposed asphalt or concrete pavement buildup. The barrier shall then be doweled in to the concrete leveling pad. Barrier constructed next to existing pavement shall have a 9" thick concrete leveling pad placed on a minimum 6" aggregate base (thickness varies based on existing conditions, but should match the bottom of the existing aggregate base depth). The barrier shall then be doweled in to the concrete leveling pad. Compacted soil on the back side must be placed against the barrier at a minimum height of 3" and extend for a minimum of 2' prior to the breakpoint of the slope.

EXPANSION JOINTS: Install a 1" thick preformed expansion joint filler per CMS 705.03 between the leveling pad and concrete pavement section for the full depth of the concrete pavement section as shown on the plans. Seal the top 1" with joint sealer per CMS 705.04. See detail for more information. This item is considered incidental to the cost of the concrete pavement item (Item 451 or Item 452). The PEJF may be eliminated if the contractor elects to pour the leveling pad in conjunction with the concrete pavement shoulder.

CONSTRUCTION JOINTS: Barrier runs with abutting vertical surfaces at either required or permissible construction joints are to be doweled to each other by use of 3/4" dia. by 18" long epoxy coated deformed dowel bars as per CMS 622.02. Bars are to be placed as shown on the RACEWAY and DOWEL BAR PLACEMENT detail on this sheet. Provide a 4" clearance to barrier surfaces and to any raceways.

STATION MARKINGS: Impress markings in the "green" concrete on both sides at the top of the barrier. The cost is incidental to the unit cost bid for this barrier.

RACEWAY: Locate as shown in the RACEWAY AND DOWEL BAR PLACEMENT Detail, unless otherwise directed by the Engineer. Ensure that the raceways are clear of obstructions. The ITS raceway shall be 2" HDPE per SS809. The Lighting raceway shall be 4" per CMS 625.12. See HL-30.31 and ITS-14.50 for additional details.
Cost of the raceways are included where shown in the plans. The cost for additional raceways and No. 10 AWG copper-clad or aluminum-clad wire is also included where shown on the plans for future installation of circuits. Spacers shall be installed every 10' and shall be considered incidental to the barrier.

PAYMENT: will be made at the unit price bid per Foot for ***ITEM 622 - CONCRETE BARRIER, SINGLE SLOPE, TYPE N****. Include all materials, labor, raceways, dowel holes, expansion joints and other incidentals necessary to construct the barrier, except as follows:*

Item 304 - AGGREGATE BASE	*CY*
Item 451 - 9" REINFORCED CONCRETE PAVEMENT, CLASS QC 1P *(leveling pad)*	*CY*
Item 611 - BARRIER MEDIAN INLET	*20 FT*
Item 625 - LIGHT POLE FOUNDATION OR PULLBOX	*8 FT*
Item 630 - RIGID OVERHEAD SIGN SUPPORT OR FOUNDATION	*EACH*

Payment for any reinforced end anchors, as shown on the END ANCHORAGE details shown on Sheet P.3, will be made at the unit price bid per Each for ***ITEM 622 - CONCRETE BARRIER, END ANCHORAGE, REINFORCED, TYPE N****. This includes all materials, labor, and other incidentals necessary to construct this anchor.*

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07-19-2024
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01-16-2026

STDS ENGINEER
D. Fisher

STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
Single Slope Concrete Barrier, Type N

DESIGN AGENCY

SCD NUMBER
RM-4.8

SHEET P.1 | TOTAL 5

RM-4.8

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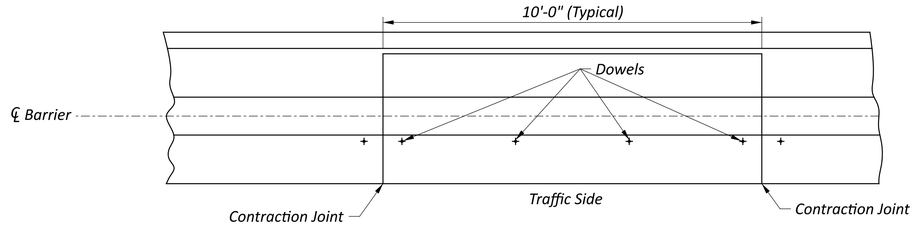
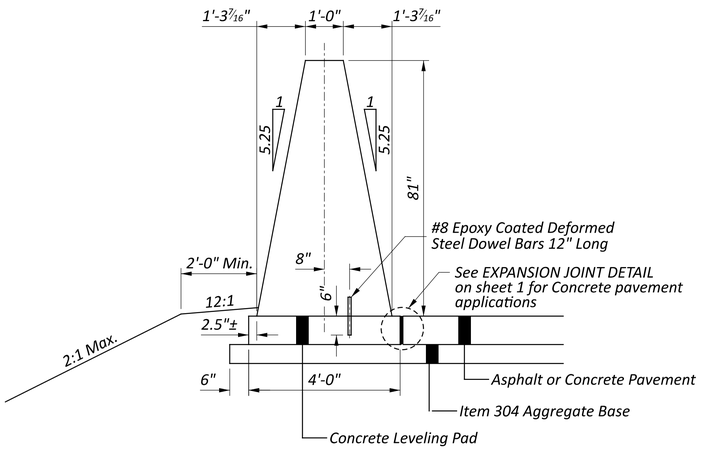
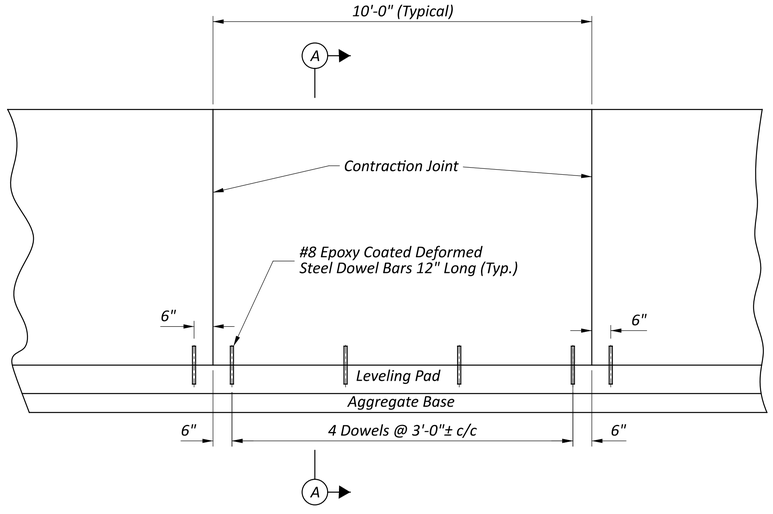
VERTICAL DOWELING DETAILS



PLAN



SECTION A-A



ELEVATION

RM-4.8

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OFFICE OF ROADWAY ENGINEERING

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STANDARD ROADWAY CONSTRUCTION DRAWING
Single Slope Concrete Barrier, Type N
Vertical Doweling Details

DESIGN AGENCY

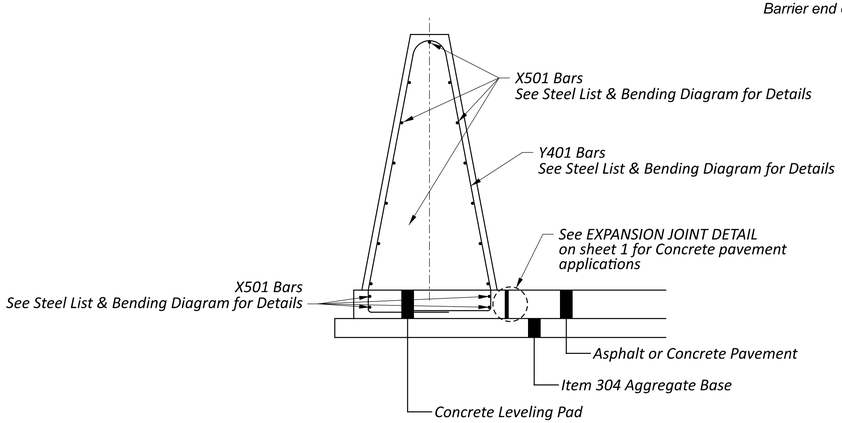
SCD NUMBER
RM-4.8

SHEET P.2 | TOTAL 5

REINFORCED END ANCHORAGE

REINFORCED END ANCHORAGES are required at the ends of concrete barrier runs and at interruptions in barrier caused by expansion joints. When barrier does not abut another barrier run, construct the last 15' using the END ANCHORAGE Detail as shown here.

At expansion joints, construct an End Anchorage on both sides of joint, with a maximum gap of 2" for the open joint. The maximum expansion joint spacing shall be 400'. This anchorage is not needed at construction joints, provide dowel bar connections instead. See CONSTRUCTION JOINT NOTE on Sheet 1 for doweling details.



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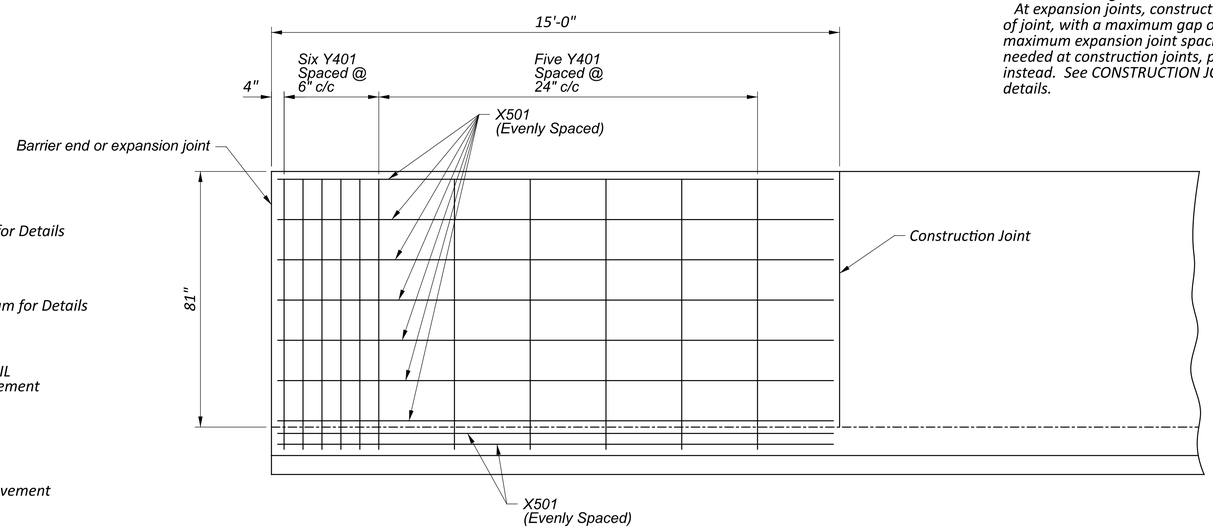
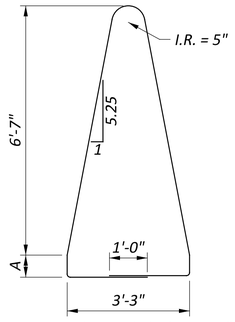


ELEVATION

Reinforcement List				
Mark	***Number***	***Length***	***Type***	***Material***
X501	*17*	*14'-8"*	*Straight*	*Steel*
Y401	*11*	*2A + 18'-3"*	*Bent*	*Steel*

Y401 Bending Diagram



A = Leveling Pad Thickness - 2"

OFFICE OF ROADWAY ENGINEERING

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Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
Single Slope Concrete Barrier, Type N
Reinforced End Anchorage

DESIGN AGENCY

SCD NUMBER
RM-4.8

SHEET P.3 | TOTAL 5

RM-4.8

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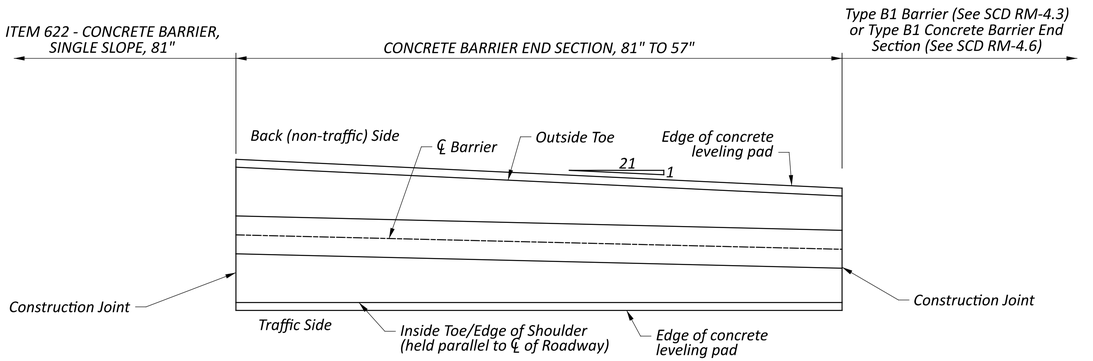
BARRIER END SECTION 81" TO 57"



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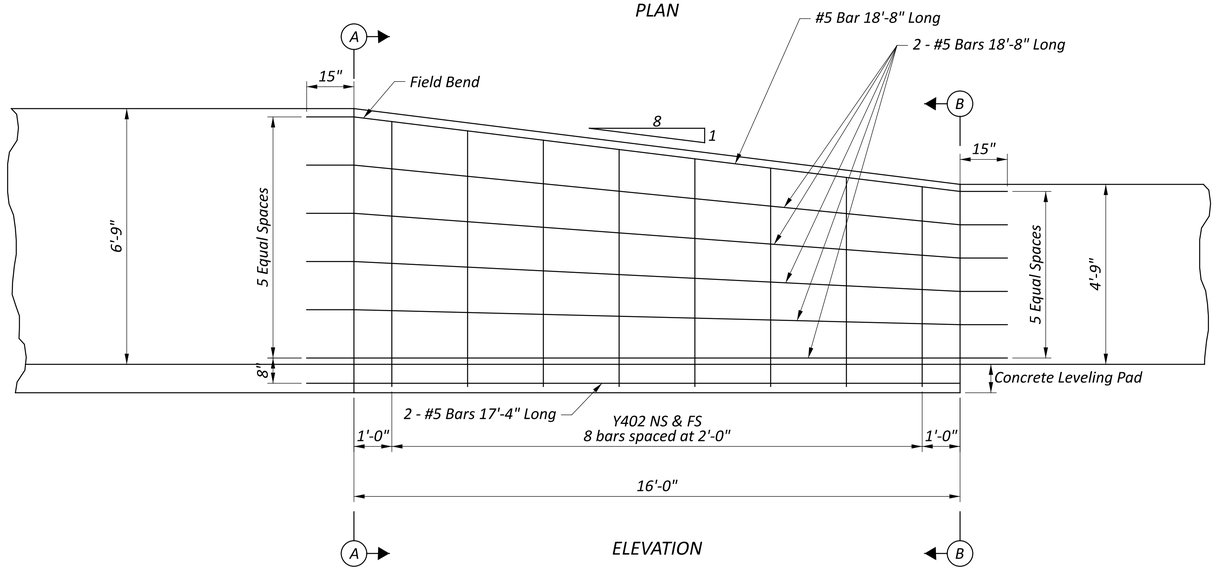
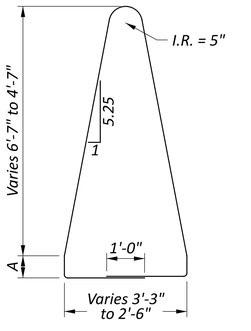
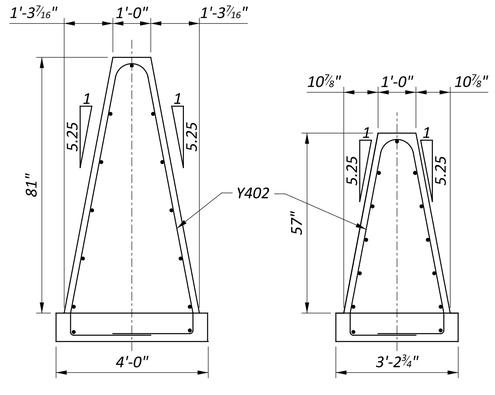


ELEVATION

Y402 Bar



A = Leveling Pad Thickness - 2"



Section A-A

Section B-B

NOTES

General: *This end section transition is to be used when transitioning 81" Single Slope Barrier to 57" tall barrier (Type B1 or C1). Provide 2" concrete cover over rebar.*

Aggregate base not shown on details for clarity.

Expansion Joints: *1" preformed expansion joint filler shall be continued through the end section segment at the concrete levelling pad/pavement interface for concrete pavement applications. The PEJF shall be considered incidental to the concrete end section pay item under Item 622.*

Payment: *Payment for the Concrete End Section shall be made at the unit price for* ***Item 622 - Concrete Barrier End Section, 81" to 57"****, Each, and shall include all materials, labor, and reinforcing steel required to construct the barrier end section as shown.*

RM-4.8

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STDS ENGINEER
A. Holloway

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Adam Koenig

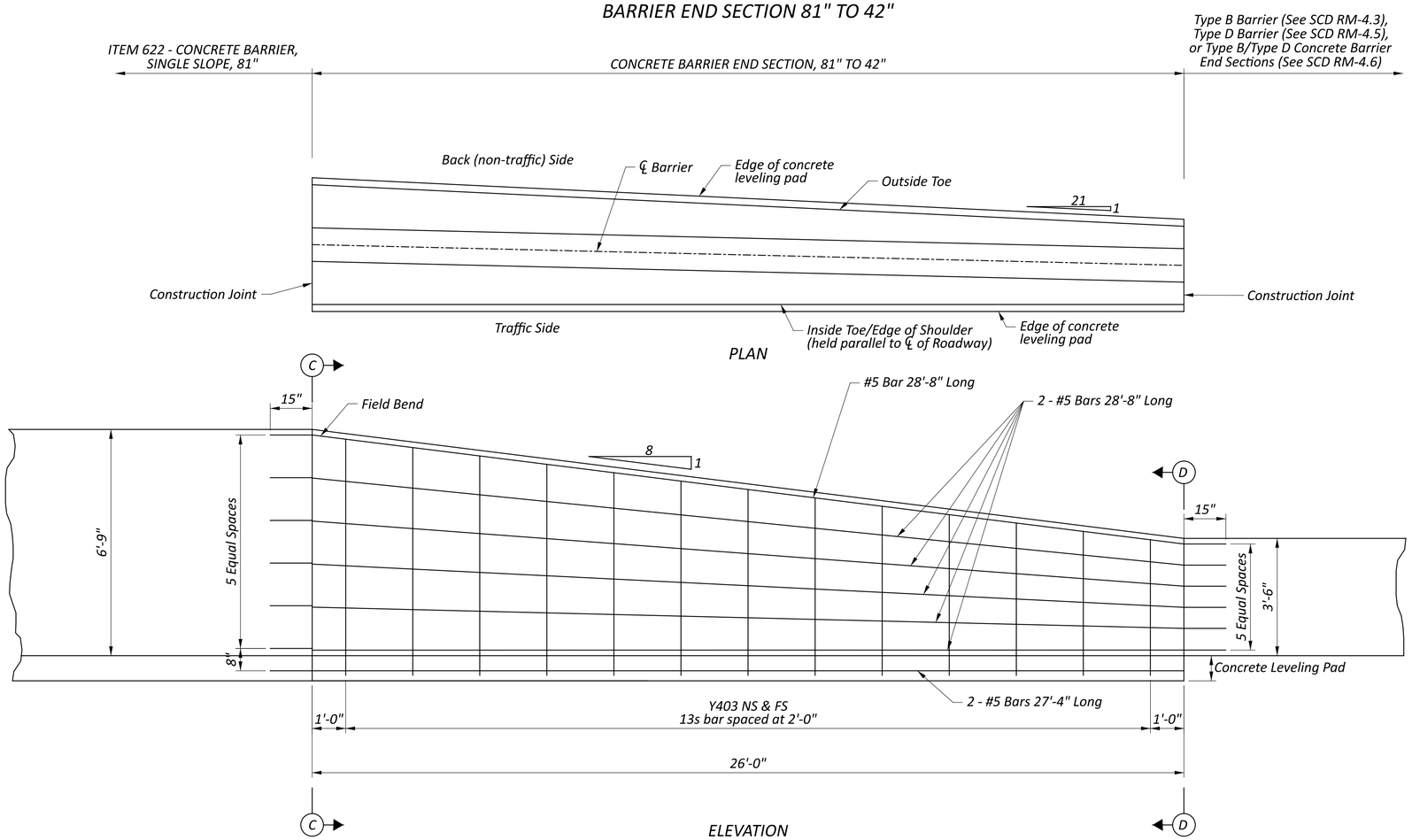
STANDARD ROADWAY CONSTRUCTION DRAWING
Single Slope Concrete Barrier, Type N
Transition from 81" Tall to 57" Tall Barrier

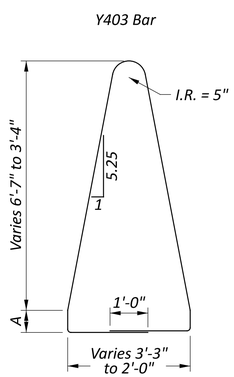
DESIGN AGENCY

SCD NUMBER
RM-4.8

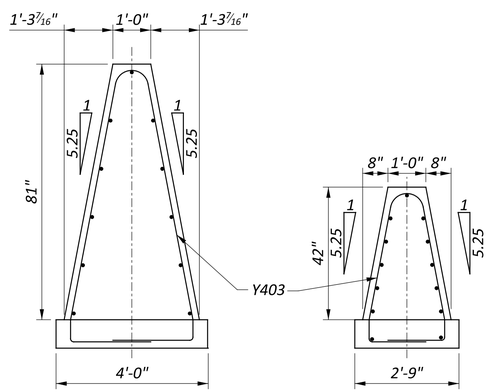
SHEET P.4 TOTAL 5

BARRIER END SECTION 81" TO 42"





A = Leveling Pad Thickness - 2"



NOTES

General: *This end section transition is to be used when transitioning 81" Single Slope Barrier to 42" tall barrier (Type B or D). Provide 2" concrete cover over rebar.*

Aggregate base not shown on details for clarity.

Expansion Joints: *1" preformed expansion joint filler shall be continued through the end section segment at the concrete levelling pad/pavement interface for concrete pavement applications. The PEJF shall be considered incidental to the concrete end section pay item under Item 622.*

Barrier Face Transitions: *To prevent vehicle snagging, smooth transitions from vertical faces to the single slope faces shall be made over a 20' distance, at a minimum, following the end anchor.*

Payment: *Payment for the Concrete End Section shall be made at the unit price for* ***Item 622 - Concrete Barrier End Section, 81" to 42"****, Each, and shall include all materials, labor, and reinforcing steel required to construct the barrier end section as shown.*

RM-4.8

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STDS ENGINEER
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STATE OF OHIO OFFICE OF ROADWAY ENGINEERING ADMINISTRATOR
Adam Koenig

STANDARD ROADWAY CONSTRUCTION DRAWING
Single Slope Concrete Barrier, Type N
Transition from 81" Tall to 42" Tall Barrier

DESIGN AGENCY

SCD NUMBER
RM-4.8

SHEET P.5 TOTAL 5