Detailed Drawing Revisions

The Department is proposing revisions to 23 Standard Specifications and 23 Detailed Drawings. These proposed revisions will be out for comment during the month of October 2025.

Comment period will end October 31st.

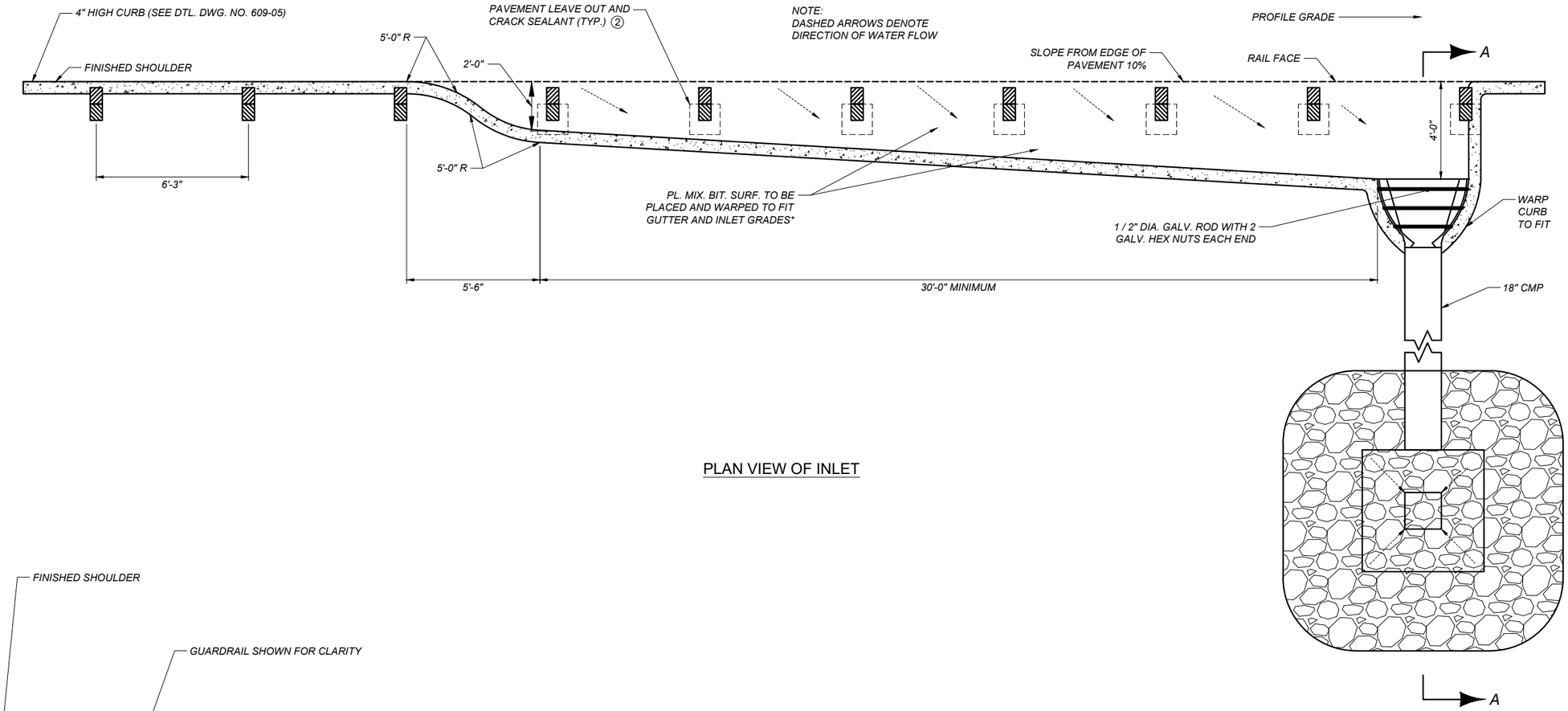
Detailed Drawings are posted to the Department webpage:

Detailed Drawings | Montana Department of Transportation (MDT)

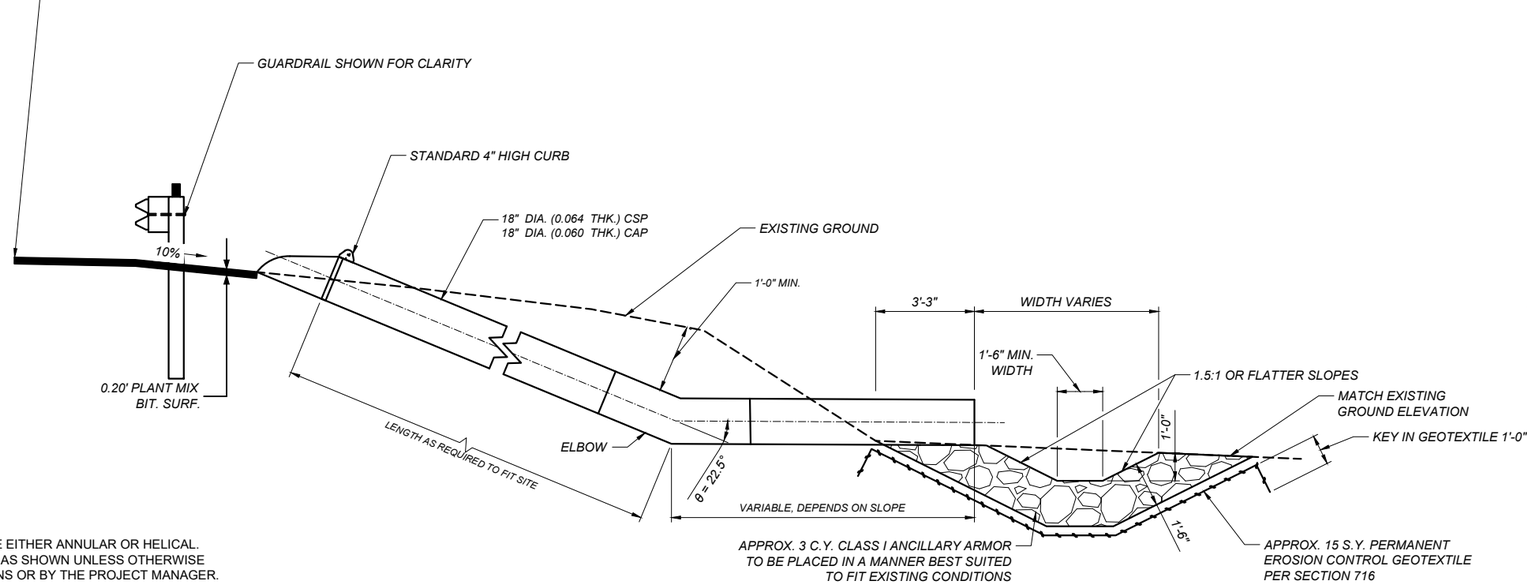
Detail Drawing revisions are shown on the following pages.

Proposed Revisions to the MDT Detailed Drawings - January 2026 Edition

Detailed Drawing No.	Detailed Drawing Title	Remarks
603-28	EMBANKMENT PROTECTOR	Revised to not show curbing over pipe. Replaced Type 3 Bank Protection with Class I Ancillary Armor. Added pavement leave outs with crack sealant. Miscellaneous format revisions.
604-02	CONCRETE MANHOLE	Type 1 and Type 3 Section B-B were removed. Inlet and Type 3 Manhole Roof Slab table was revised. Miscellaneous format and label revisions.
604-03	CURB INLET TYPE II	Changed “Combination” detail to “Barrel diameters 48” or Larger”. Revised the note regarding qualified products list. Miscellaneous format and label revisions.
604-04	DROP INLET TYPE IV	Changed “Combination” detail to “Barrel diameters 48” or Larger”. Revised the note regarding qualified products list. Miscellaneous format and label revisions.
604-14	DROP INLETS	Added note regarding qualified products list. Miscellaneous format and label revisions.
604-16	DROP INLETS TYPE V AND VI	Added note regarding qualified products list. Miscellaneous format and label revisions.
604-18	TYPE A AND B CURB INLET	Removed Section A-A detail. Added note regarding qualified products list. Miscellaneous format and label revisions.
606-05A	METAL GUARDRAIL – WOOD POSTS (MGS)	Minimum clearance to obstacle revised for consistency with Road Design Manual. Reflector sheeting revised to reference Section 704.
606-05B	METAL GUARDRAIL – STEEL POSTS (MGS)	Minimum clearance to obstacle revised for consistency with Road Design Manual. Reflector sheeting revised to reference Section 704.
606-09	LONG SPAN GUARDRAIL (MGS)	Minimum clearance to obstacle revised for consistency with Road Design Manual.
606-11A	METAL GUARDRAIL - LONG POSTS - WOOD (MGS)	Minimum clearance to obstacle revised for consistency with Road Design Manual. Reflector sheeting revised to reference Section 704.
606-11B	METAL GUARDRAIL - LONG POSTS - STEEL (MGS)	Minimum clearance to obstacle revised for consistency with Road Design Manual. Reflector sheeting revised to reference Section 704.
606-20	MGS TO METAL GUARDRAIL TRANSITION	A second transition option was added utilizing standard-length rail segments.
606-50	BOX BEAM GUARDRAIL	Minimum clearance to obstacle revised for consistency with Road Design Manual. Reflector sheeting revised to reference Section 704.
606-53B	BOX BEAM BRIDGE APPROACH SECTION - TYPE 4	Multiple component and dimension revisions.
606-80	SCHEDULE OF GUARDRAIL HARDWARE	Multiple updates per revisions to the Box Beam Bridge Approach Section - Type 4 system.
606-80A	SCHEDULE OF GUARDRAIL HARDWARE	Multiple updates per revisions to the Box Beam Bridge Approach Section - Type 4 system.
606-97	BOX BEAM GUARDRAIL HARDWARE	Dimension revisions to the Type 4 Box Beam Support Bracket.
606-98A	BOX BEAM GUARDRAIL HARDWARE	Dimension revisions to the T-1, R-1, and R-2 Transition Rail components. Addition of the Rub Rail Splice Sleeve component.
613-16	RIPRAP SLOPE PROTECTION	Added note for maximum allowed riprap slope protection at bridges.
615-06	CONCRETE IRRIGATION INLET AND OUTLET TRANSITION FOR RCP AND CSP PIPES	Revised dimensions and quantities in the tables for 18” CSP and RCP. Added note regarding alternate designs. Miscellaneous format and label revisions.
621-00	MANHOLE AND VALVE BOX ADJUSTMENT DETAILS	Miscellaneous label revisions for manhole frame, lid, adjustment rings and surfacing.
621-05	OPTIONAL MANHOLE AND VALVE BOX ADJUSTMENT DETAILS	Miscellaneous label revisions for manhole frame, lid, adjustment rings and surfacing.



PLAN VIEW OF INLET



SECTION A-A

NOTES:

① CORRUGATION MAY BE EITHER ANNULAR OR HELICAL. BEND ON ELBOW (θ) IS AS SHOWN UNLESS OTHERWISE SPECIFIED IN THE PLANS OR BY THE PROJECT MANAGER.

② SEE DTL. DWG. NO. 606-05A AND 606-05B FOR PAVEMENT LEAVE OUT DETAILS. APPLY CRACK SEALANT PER SECTION 707 TO FULLY COVER THE C.A.C. IN LEAVE OUT AREAS WITHIN THE EMBANKMENT PROTECTOR.

* INCLUDED WITH ROADWAY QUANTITIES.

Revised to not show curbing over pipe. Replaced Type 3 Bank Protection with Class I Ancillary Armor. Added pavement leave outs with crack sealant. Miscellaneous format revisions.

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 603, 707, 716

DWG. NO. 603-28

EMBANKMENT PROTECTOR

EFFECTIVE: JAN 23, 2020

MONTANA Department of Transportation

--REVISED--
APR 28, 2022
JAN 15, 2026

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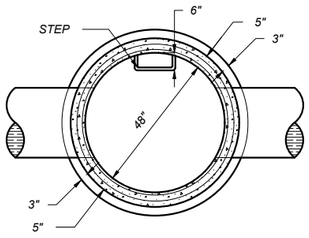
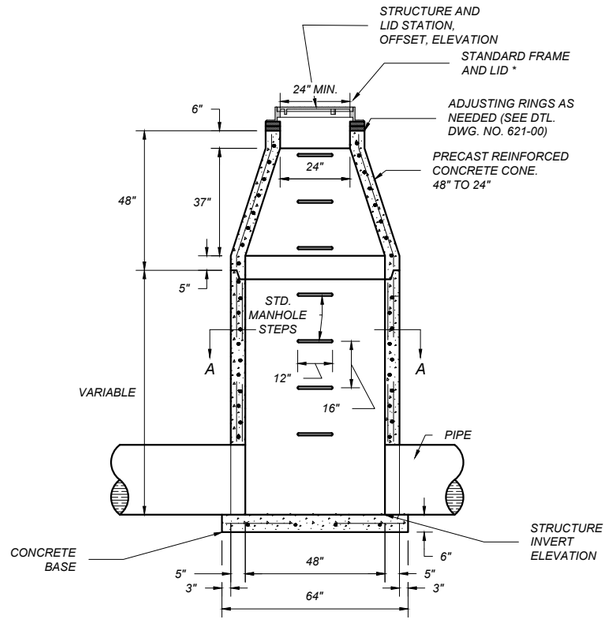


TYPE 1 SECTION A-A



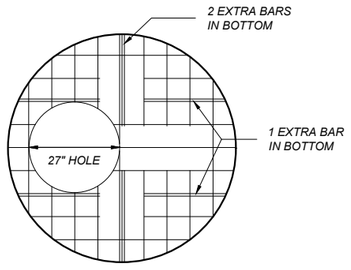
ELEVATION

TYPE 1 MANHOLE

* MINIMUM WEIGHT FOR FRAME AND LID IS 400 LB. TOOL RING AND COVER TO A MACHINE FIT. A LIGHTER FRAME AND LID MAY BE USED IF APPROVED BY THE FACILITY OWNER RESPONSIBLE FOR MAINTENANCE OF THE MANHOLE. SEE QUALIFIED PRODUCTS LIST FOR APPROVED LIDS.

NOTES:

1. UPPER PART IS A CONE TO REDUCE DIAMETER FROM 48" TO 24". CUT BOTTOM OF LOWER SECTION SQUARE TO FIT BASE. GROUT JOINT BETWEEN BASE AND WALL. A GROUT CONSISTING OF ONE PART PORTLAND CEMENT AND TWO PARTS APPROVED SAND MAY BE USED; AN APPROVED PREMIXED GROUT, AVAILABLE COMMERCIALLY, MAY BE USED.
2. THE CONSTRUCTION AND REINFORCEMENT OF THE BASE FOR EACH TYPE MUST BE COMPATIBLE WITH THE CONDITIONS AND THE WEIGHT OF THE SUPER-STRUCTURE. AASHTO M 199 PROVIDES FOR 4000 PSI CONCRETE. THE MIX CALLS FOR 6 SACKS OF CEMENT PER CUBIC YARD. REINFORCEMENT SHOWN IS ILLUSTRATIVE ONLY. SEE AASHTO M 199.
3. THE ECCENTRIC CONE TRANSITION WILL BE PERMITTED WHEN ITS USE WILL BE AS GOOD OR BETTER THAN THE ONES SHOWN, OR IF IT IS MORE ADAPTABLE TO EXISTING CONDITIONS.
4. IN MANHOLES, USE STEPS THAT ARE METALLIC AND COATED WITH COPOLYMER POLYPROPYLENE, OR AN APPROVED EQUAL. THE MINIMUM DESIGN LIVE LOAD FOR A SINGLE CONCENTRATED LOAD IS 300 POUNDS.



TYPE 3 MANHOLE ROOF SLAB

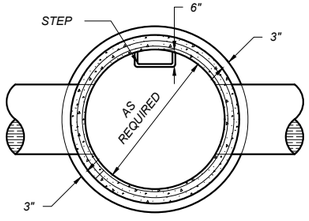
INLET AND TYPE 3 MANHOLE ROOF SLAB

BARREL DIA. #	SLAB DIA.	T	K ##	BOTTOM BARS	TOP BARS
48"	58"	6"	6"	#4 AT 6"	~
60"	72"	8"	7"	#4 AT 6"	#3 AT 6"
72"	86"	8"	8"	#4 AT 6"	#3 AT 6"
84"	100"	8"	9"	#4 AT 4"	#4 AT 4"
96"	114"	8"	9"	#5 AT 4"	#4 AT 4"
108"		8"	9"	#4 AT 4"	#4 AT 4"
120"		8"	9"	#5 AT 4"	#4 AT 4"
144"		8"	9"	#5 AT 4"	#4 AT 4"

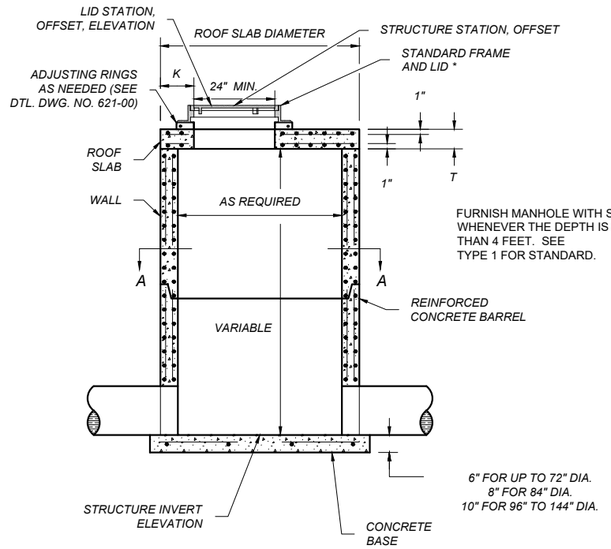
Type 1 and Type 3 Section B-B were removed. Inlet and Type 3 Manhole Roof Slab table was revised. Miscellaneous format and label revisions.

NOTES:

\# AVAILABLE MANHOLE AND INLET BARREL DIAMETERS.
\## K DOES NOT APPLY TO DROP INLETS AND CURB INLETS. CENTER THE OPENING IN THE BARREL.



TYPE 3 SECTION A-A



TYPE 3 MANHOLE

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 604,711

DWG. NO. 604-02

CONCRETE MANHOLE

EFFECTIVE: JAN 23, 2020

--REVISED--
JUN 27, 2024
JAN 15, 2026

MONTANA Department of Transportation

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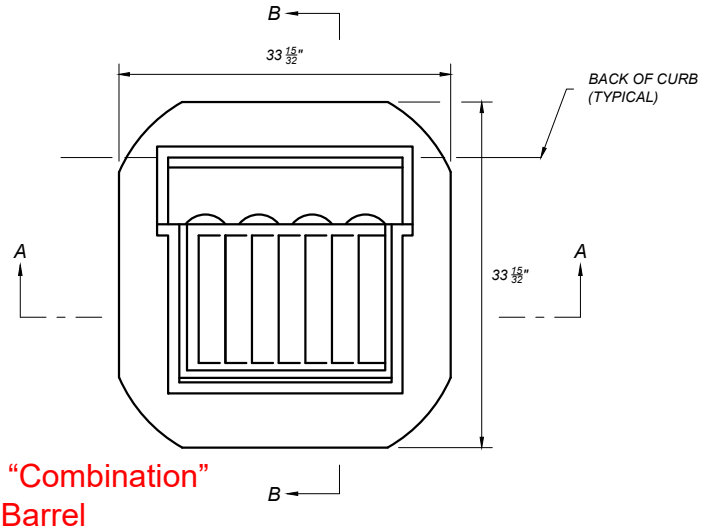
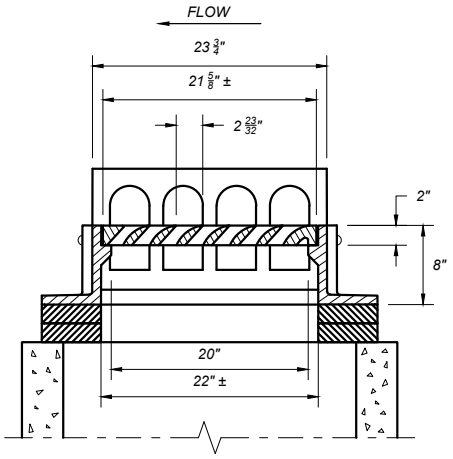
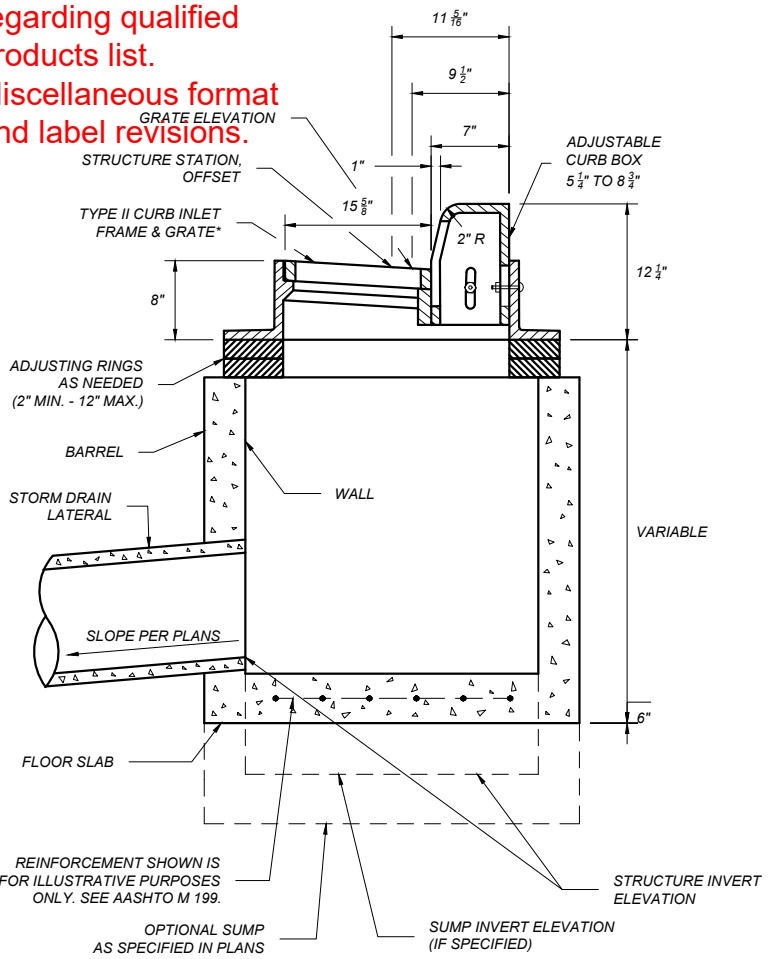


PLAN



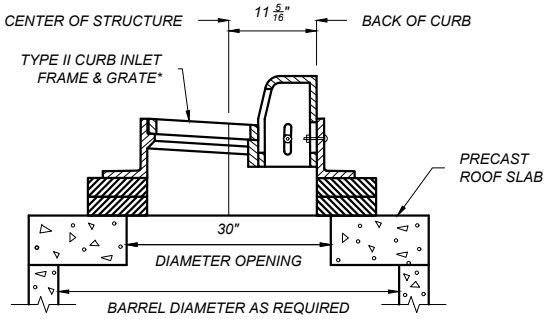
SECTION A-A

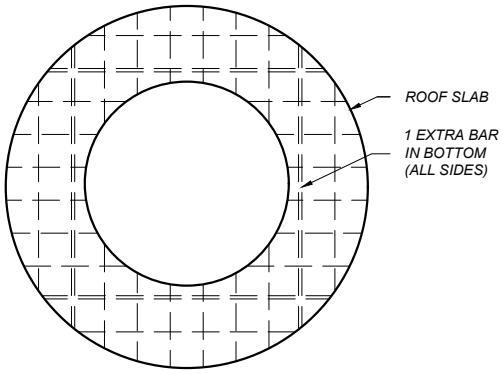
Changed "Combination" detail to "Barrel diameters 48" or Larger". Revised the note regarding qualified products list. Miscellaneous format and label revisions.



SECTION B-B

BARREL DIAMETERS 48" OR LARGER





ROOF SLAB

SEE DETAILED DRAWING NO. 604-02 FOR DIAMETER, SLAB THICKNESS AND REINFORCING REQUIREMENTS CENTER 30" ROOF SLAB OPENING FOR ALL BARREL DIAMETERS.

NOTES:

SEE PLANS FOR LOCATIONS AND QUANTITIES.

SET ALL FINAL INLET GRATE ELEVATIONS TO ENSURE THAT POSITIVE DRAINAGE IS PROVIDED FROM THE FLOWLINE OF THE CURB AND GUTTER SECTION INTO THE INLET.

ALL CONCRETE IS CLASS GENERAL OR APPROVED EQUAL.

* SEE QUALIFIED PRODUCTS LIST FOR APPROVED GRATES. DIMENSIONS SHOW BASED ON NEENAH R-3286-8V.

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 604,708

DWG. NO. 604-03

CURB INLET TYPE II

EFFECTIVE: JAN 23, 2020

--REVISED--
JAN 15, 2026

MONTANA
Department of Transportation

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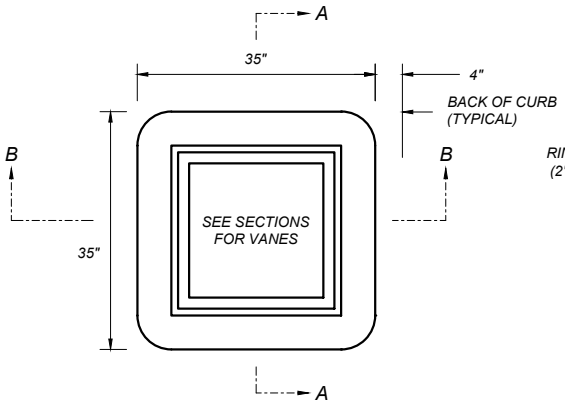
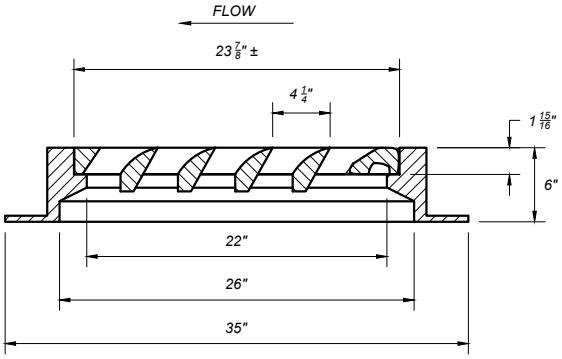
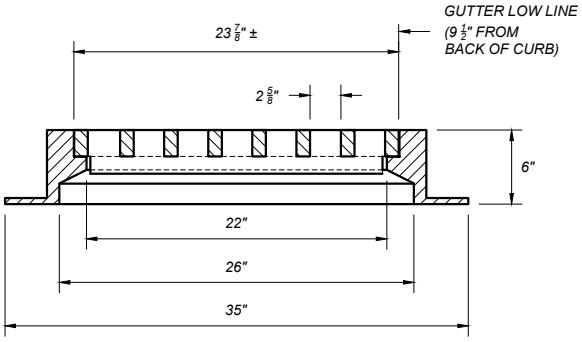


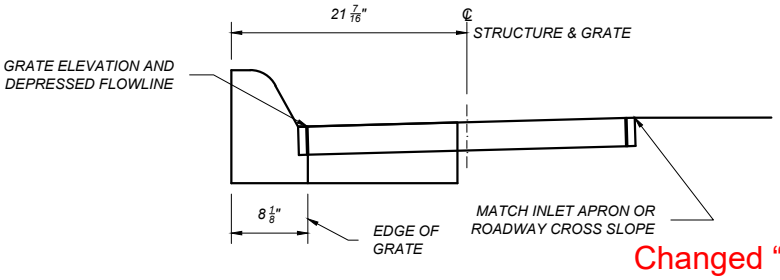
PLAN



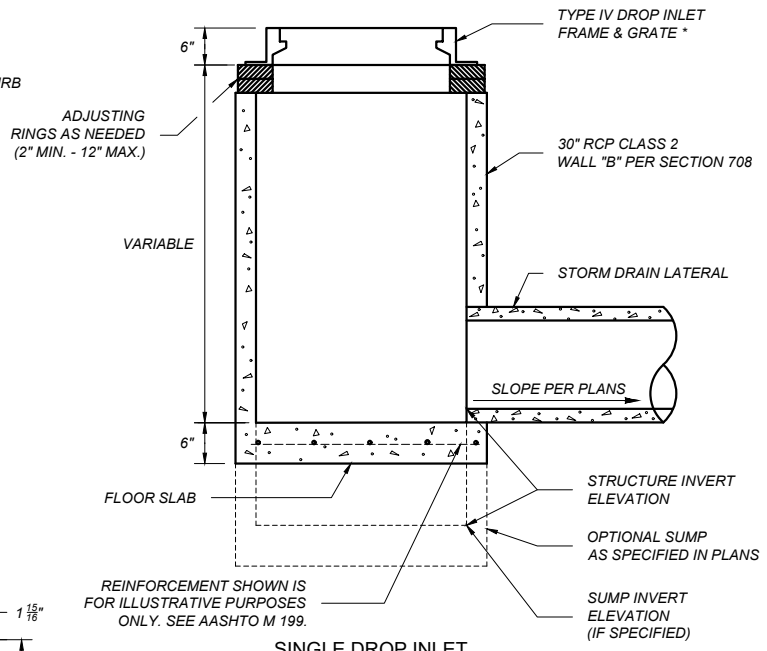
SECTI0N A-A



SECTI0N B-B

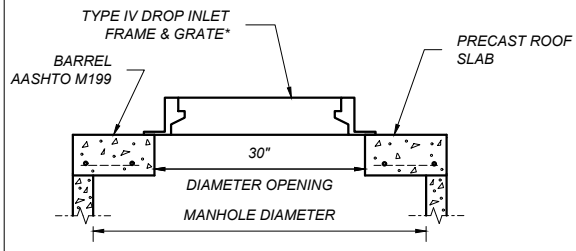


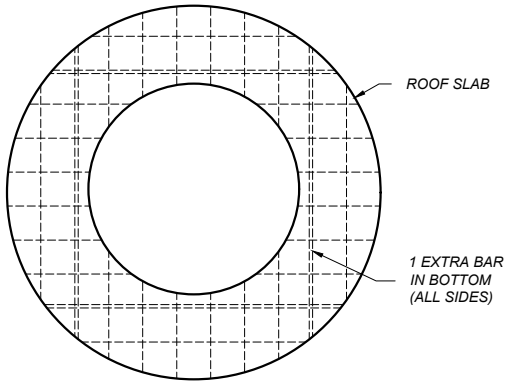
CURB TO GRATE



SINGLE DROP INLET
TYPE IV *

BARREL DIAMETERS 48" OR LARGER





ROOF SLAB

SEE DETAILED DRAWING NO. 604-02 FOR DIAMETER, SLAB THICKNESS AND REINFORCING REQUIREMENTS FOR COMBINATION TYPE 3 MANHOLE, TYPE IV DROP INLET. WHEN COMBINATION MANHOLE DEPTHS ARE GREATER THAN 4 FEET, OFFSET THE ACCESS HOLE OVER THE MANHOLE STEPS.

NOTES:

SEE PLANS FOR LOCATIONS AND QUANTITIES.

SET ALL FINAL INLET GRATE ELEVATIONS TO ENSURE THAT POSITIVE DRAINAGE IS PROVIDED FROM THE FLOWLINE OF THE CURB AND GUTTER SECTION INTO THE INLET.

ALL CONCRETE IS CLASS GENERAL OR APPROVED EQUAL

* SEE QUALIFIED PRODUCTS LIST FOR APPROVED GRATES. DIMENSIONS SHOWN BASED ON NEENAH R-3210-L.

Changed “Combination” detail to “Barrel diameters 48” or Larger”. Revised the note regarding qualified products list. Miscellaneous format and label revisions.

--REVISED--
JAN 15, 2026

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 604,708

DWG. NO. 604-04

DROP INLET TYPE IV

EFFECTIVE: JAN 23, 2020

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MONTANA
Department of Transportation

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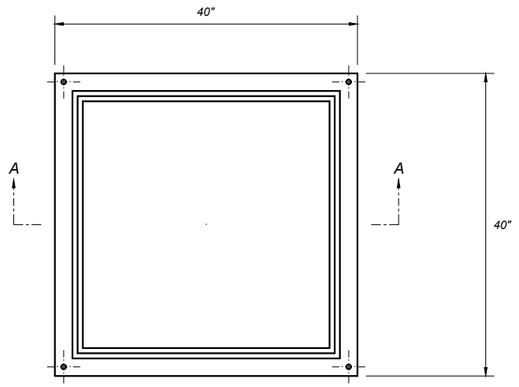
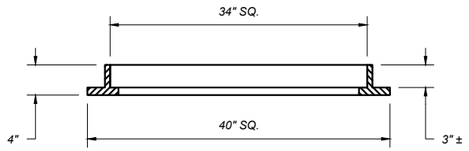
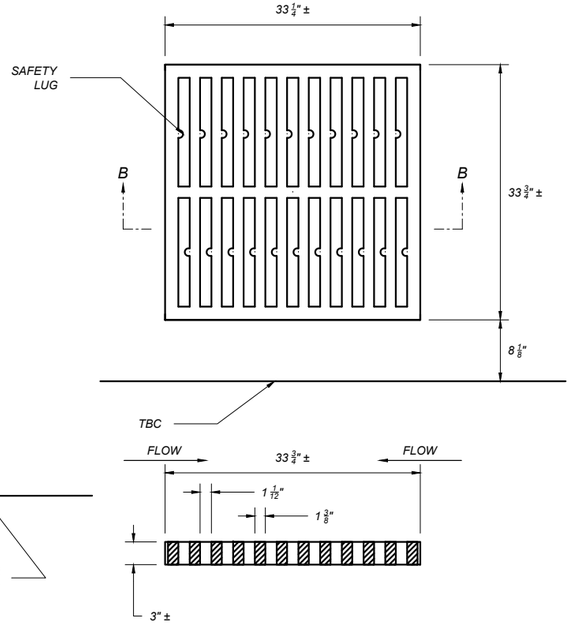


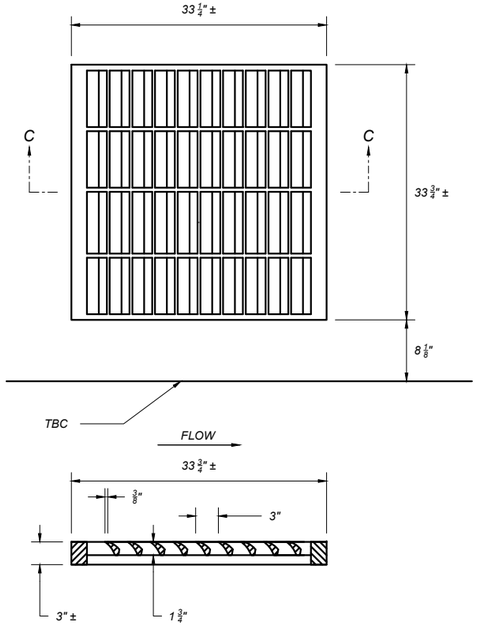
PLAN - FRAME



SECTION A-A

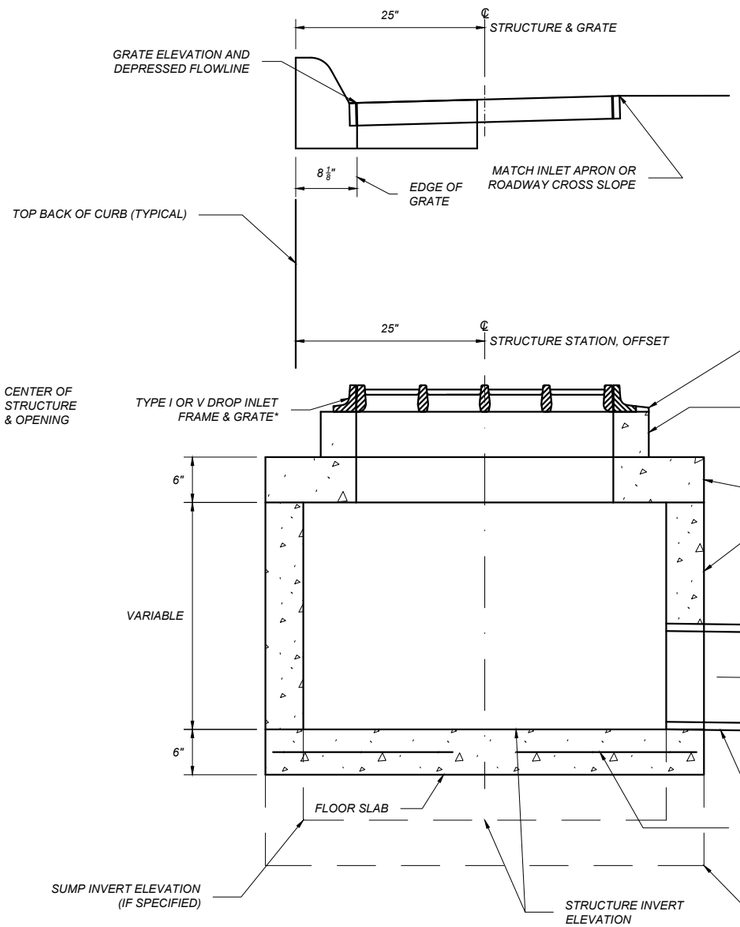


SECTION B-B
STRAIGHT BAR GRATE
TYPE I *

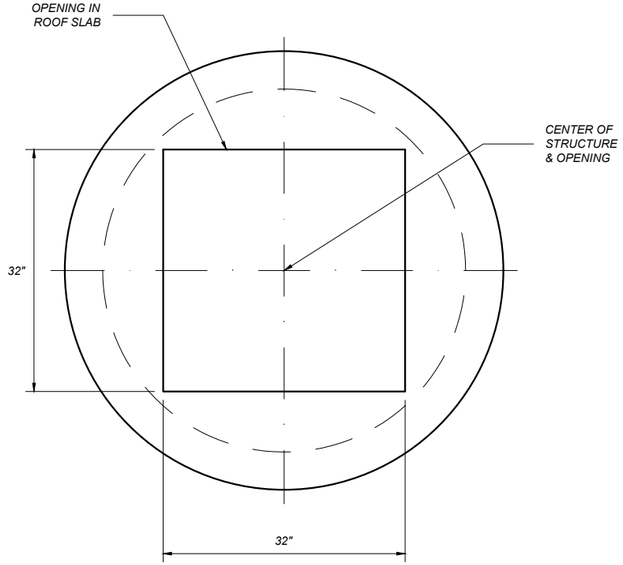


SECTION C-C
VANE STYLE GRATE
TYPE V *

CURB TO GRATE



SECTION VIEW



ROOF SLAB

TYPE I AND V DROP INLET

Added note regarding qualified products list. Miscellaneous format and label revisions.

NOTES:

ALL CONCRETE IS CLASS GENERAL OR APPROVED EQUAL.

SEE PLANS FOR LOCATIONS AND QUANTITIES.

SET ALL FINAL INLET GRATE ELEVATIONS TO ENSURE THAT POSITIVE DRAINAGE IS PROVIDED FROM THE FLOWLINE OF THE CURB AND GUTTER SECTION INTO THE INLET.

STANDARD UNLESS OTHERWISE NOTED ON PLANS.

TYPE I AND TYPE V GRATES ARE INTERCHANGEABLE WITH THE SAME FRAME AND HAVE THE ABILITY TO BE ROTATED 90 DEGREES IN ANY DIRECTION. INSTALL GRATE TO MATCH FLOW DIRECTION SHOWN.

PROVIDE SAFETY LUG ON STRAIGHT BAR GRATE BETWEEN EACH BAR.

* SEE QUALIFIED PRODUCTS LIST FOR APPROVED GRATES. DIMENSIONS SHOWN BASED ON D&L I-3421I01 AND D&L I-3421-02.

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 604

DWG. NO. 604-14

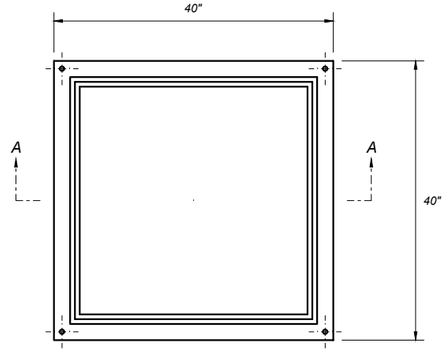
DROP INLETS TYPE I AND V

EFFECTIVE: JAN 23, 2020

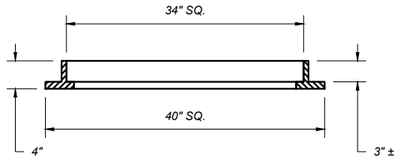
--REVISED--
JAN 15, 2026

MONTANA
Department of Transportation

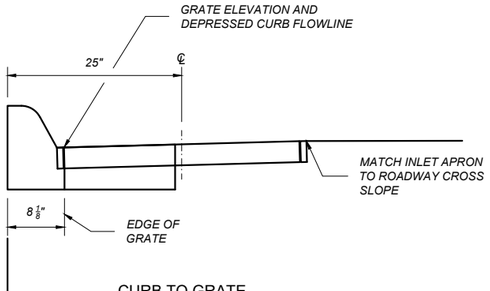
9/24/2025 11:16 AM STDDRD604014.DWG



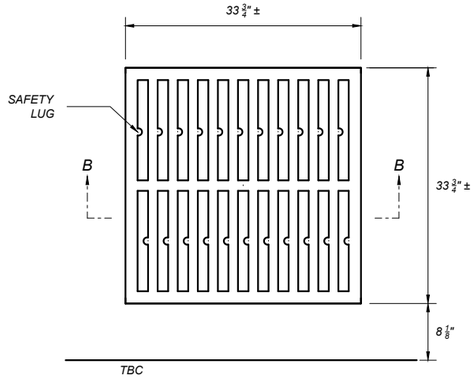
PLAN - FRAME

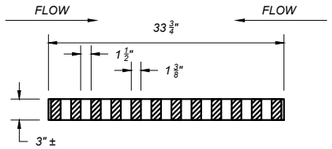


SECTION A-A



CURB TO GRATE

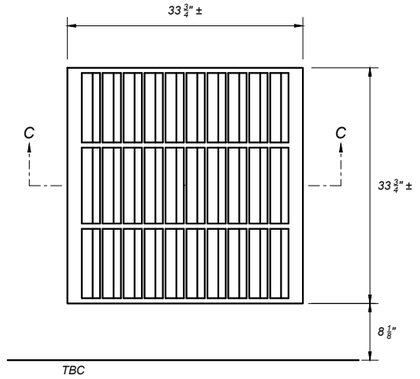


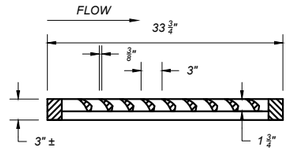


SECTION B-B

STRAIGHT BAR GRATE

TYPE III *

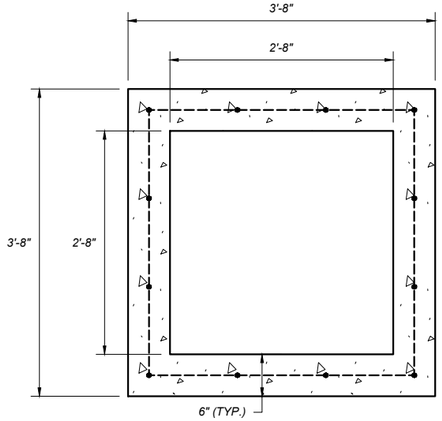




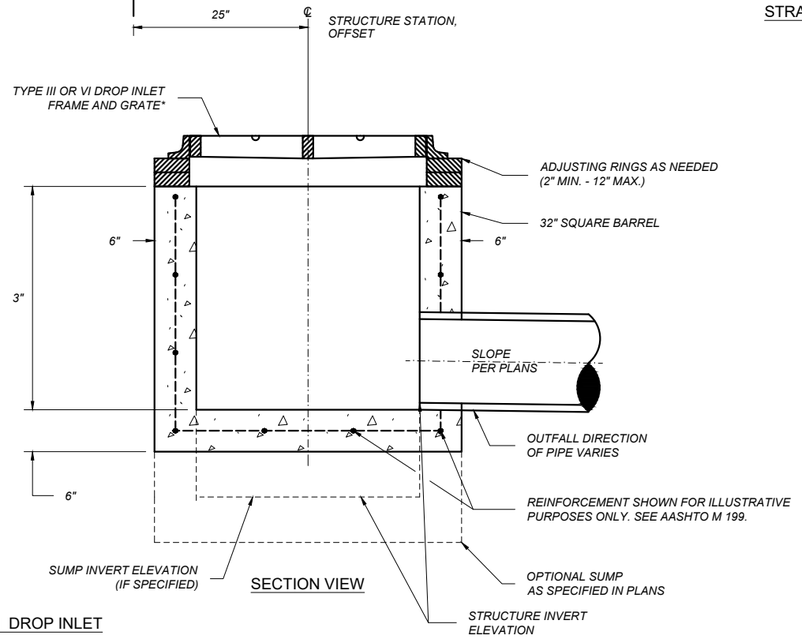
SECTION C-C

VANE STYLE GRATE

TYPE VI *



TOP VIEW



SECTION VIEW

TYPE III AND VI DROP INLET

NOTES:

SEE PLANS FOR LOCATIONS AND QUANTITIES.

SET ALL FINAL INLET GRATE ELEVATIONS TO ENSURE THAT POSITIVE DRAINAGE IS PROVIDED FROM THE FLOWLINE OF THE CURB AND GUTTER SECTION INTO THE INLET.

TYPE III AND TYPE VI GRATES ARE INTERCHANGEABLE WITH THE SAME FRAME AND HAVE THE ABILITY TO BE ROTATED 90 DEGREES IN ANY DIRECTION. INSTALL GRATE TO MATCH FLOW DIRECTION SHOWN.

PROVIDE SAFETY LUG ON STRAIGHT BAR GRATE BETWEEN EACH BAR.

* SEE QUALIFIED PRODUCTS LIST FOR APPROVED GRATES. DIMENSIONS SHOWN BASED ON D&L I-3421-01 AND D&L I-3421-02.

Added note regarding qualified products list. Miscellaneous format and label revisions.

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 604

DWG. NO. 604-16

DROP INLETS TYPE III AND VI

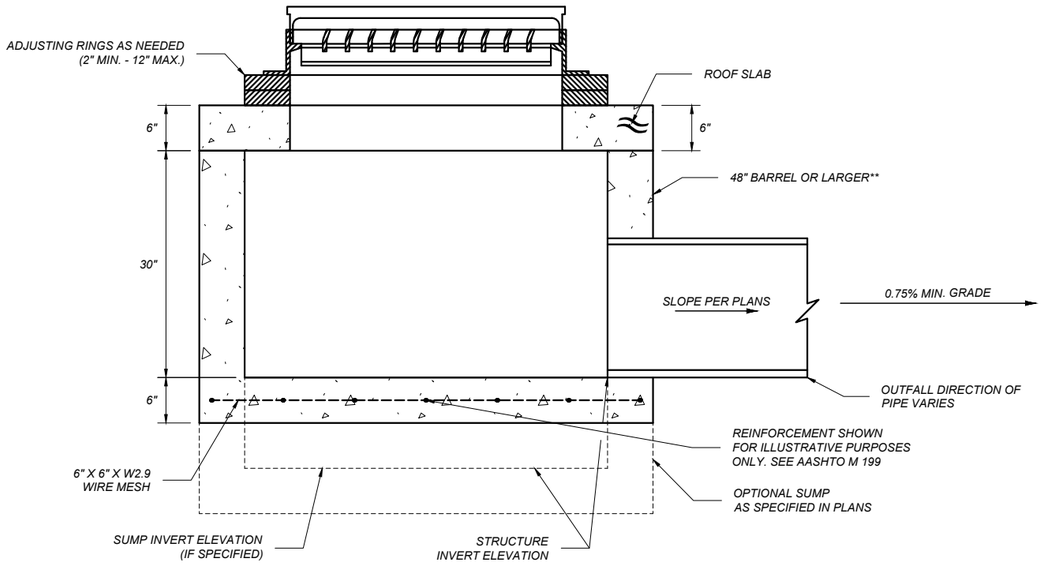
EFFECTIVE: JAN 23, 2020

--REVISED--
JAN 15, 2026

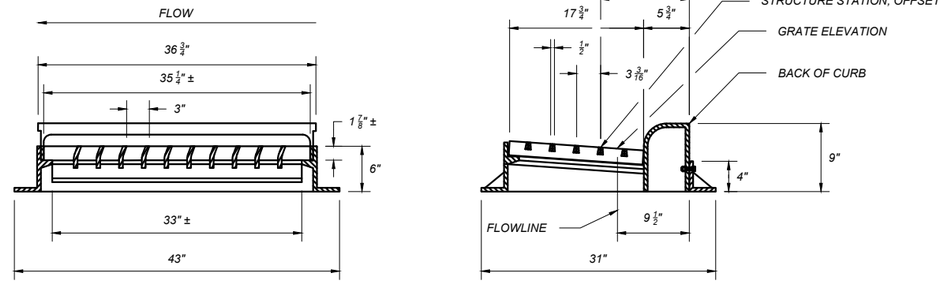
MONTANA
Department of Transportation

9/24/2025 11:25 AM

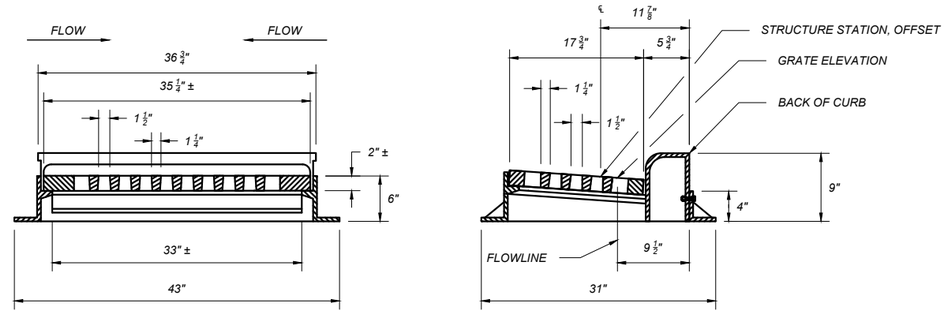
STDDRD604016.DWG



SECTION VIEW (TYPE B SHOWN)

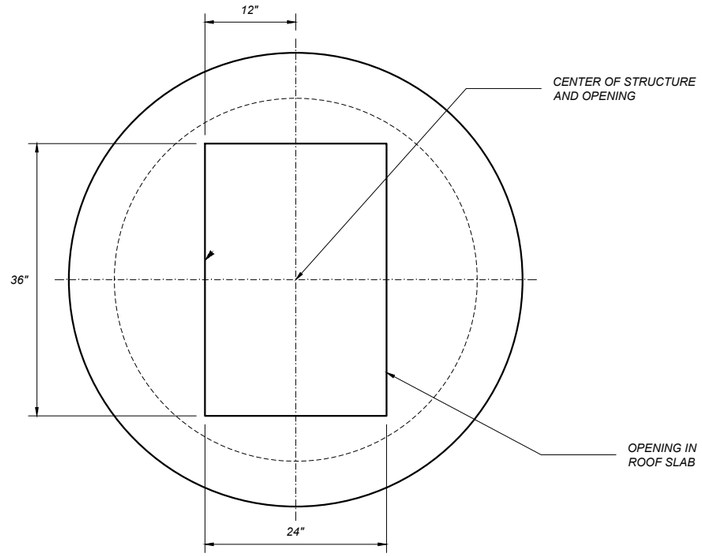


TYPE B
CURVED VANE STYLE *



TYPE A
STRAIGHT BAR STYLE *

Removed Section A-A detail. Added note regarding qualified products list. Miscellaneous format and label revisions.



ROOF SLAB

NOTE: SEE DETAIL DRAWING NO.604-02
FOR REINFORCING REQUIREMENTS

NOTES:

SEE PLANS FOR LOCATIONS AND QUANTITIES.

SET ALL FINAL INLET GRATE ELEVATIONS TO ENSURE THAT POSITIVE DRAINAGE IS PROVIDED FROM THE FLOWLINE OF THE CURB AND GUTTER SECTION INTO THE INLET.

ALL CONCRETE IS CLASS GENERAL OR APPROVED EQUAL.

* SEE QUALIFIED PRODUCTS LIST FOR APPROVED GRATES. DIMENSIONS SHOWN BASED ON NEENAH R-3067 AND R-3067-L

SET ALL FINAL INLET GRATE ELEVATIONS TO ENSURE THAT POSITIVE DRAINAGE IS PROVIDED FROM THE FLOWLINE OF THE CURB AND GUTTER SECTION INTO THE INLET.

WHEN USED AS A COMBINATION M.H. AND THE DEPTH IS GREATER THAN 4', OFFSET THE ACCESS HOLE/GRATE OVER THE M.H. STEPS.

** SEE DETAILED DRAWING NO. 604-02 FOR DIAMETER, SLAB THICKNESS AND REINFORCING REQUIREMENTS. CENTER THE RECTANGULAR 36"X24" ROOF SLAB OPENING FOR ALL BARREL DIAMETERS.

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 604

DWG. NO. 604-18

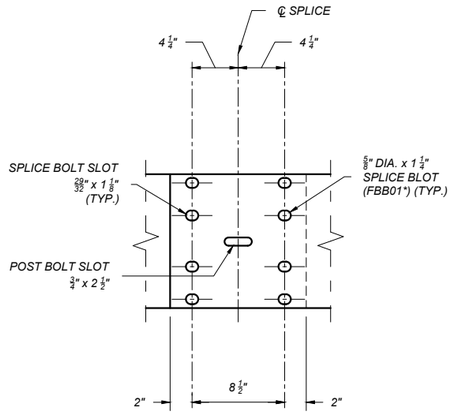
TYPE A AND B CURB INLETS

EFFECTIVE: JAN 23, 2020

MONTANA
Department of Transportation

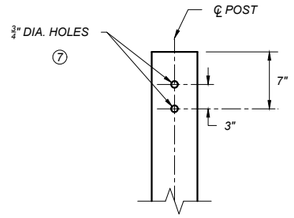
--REVISED--
JAN 15, 2026

9/24/2025 11:29 AM STDDRD604018.DWG

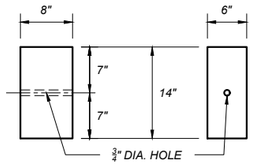


BEAM SPLICE

(LAP IN DIRECTION OF ADJACENT TRAFFIC)

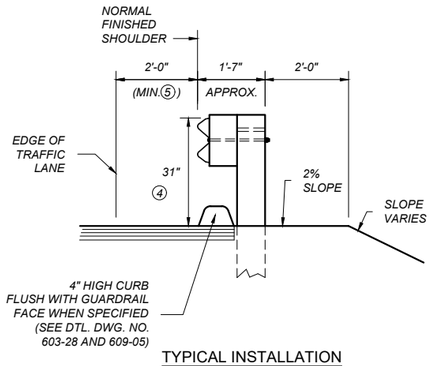


POST HOLE DETAIL

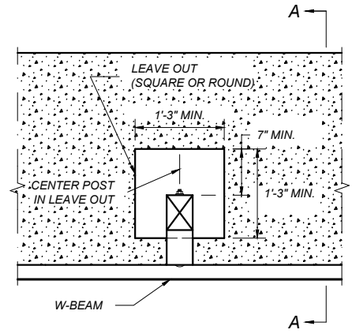


WOOD BLOCK

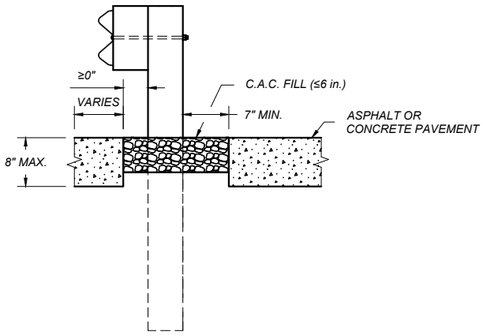
PDB01*



TYPICAL INSTALLATION



POST DETAIL IN
PAVEMENT APPLICATIONS



SECTION A-A

Minimum clearance to obstacle revised for consistency with Road Design Manual. Reflector sheeting revised to reference Section 704.

NOTES:

① INSTALL ALL BOLTS WITH HEADS ON TRAFFIC SIDE OF INSTALLATION.

② USE WOOD BLOCKS OR OTHER "MASH" APPROVED BLOCKS. AFFIX BLOCKS TO POSTS WITH TWO 16 PENNY GALV. NAILS OR 14 GAUGE WIRE WRAP.

③ ATTACH REFLECTORS TO POSTS EVERY 25 FEET, INCLUDING TERMINAL SECTIONS, WITH THE REFLECTORIZED SURFACE FACING ADJACENT TRAFFIC. FABRICATE REFLECTORS FROM 0.063" THICK ALUMINUM ALLOY PER SECTION 704 OR PLASTIC REFLECTORS WITH A URETHANE HINGE. FASTEN REFLECTOR TO WOOD POST USING TWO 16 PENNY RING-SHANKED GALVANIZED NAILS AND TWO 3/16" DIA. WASHERS IN PRE-DRILLED HOLES.

④ ON EXISTING GUARDRAIL INSTALLATIONS, THE MINIMUM RAIL HEIGHT IS 27 3/4"

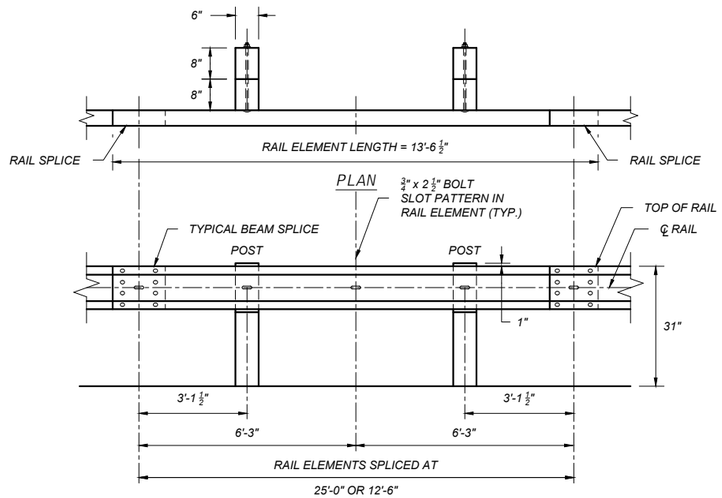
⑤ WIDENING IS REQUIRED IF FINISHED SHOULDER IS LESS THAN 2'-0" FROM THE TRAFFIC LANE.

⑥ DO NOT INSTALL W-BEAM GUARDRAIL FOR OBSTACLES WITHIN 5.5' OF THE FACE OF THE RAIL.

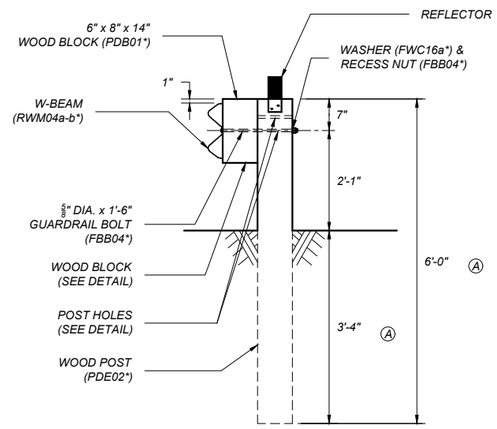
⑦ USE LOWER HOLE ON NEW CONSTRUCTION INSTALLATIONS.

⑧ USE 6' POSTS FOR STANDARD INSTALLATIONS.

* SEE DTL. DWG. NO. 606-80 FOR SCHEDULE OF GUARDRAIL HARDWARE.

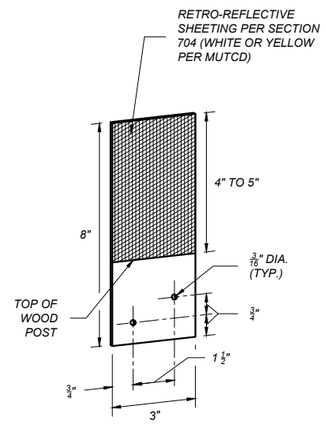


ELEVATION



WOOD POST AND MOUNTING DETAIL

Ⓐ STANDARD UNLESS SPECIFIED OTHERWISE IN PLANS.



REFLECTOR

(SEE NOTE 3)

--REVISED--
JAN 15, 2026

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 606,704

DWG. NO. 606-05A

METAL GUARDRAIL - WOOD POSTS (MGS)

EFFECTIVE: JAN 23, 2020

MONTANA Department of Transportation

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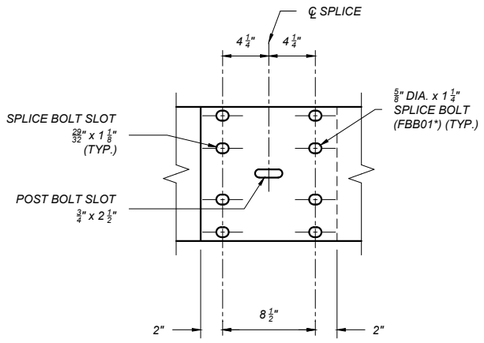
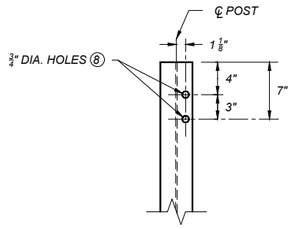
9/24/2025 11:43 AM STDDRD606005A.DWG

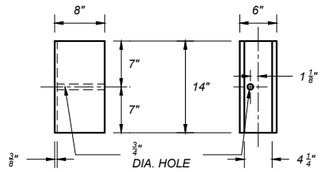


BEAM SPLICE

(LAP IN DIRECTION OF ADJACENT TRAFFIC)

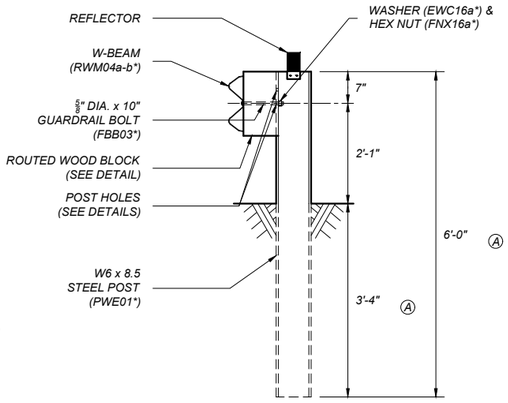


POST HOLE DETAIL



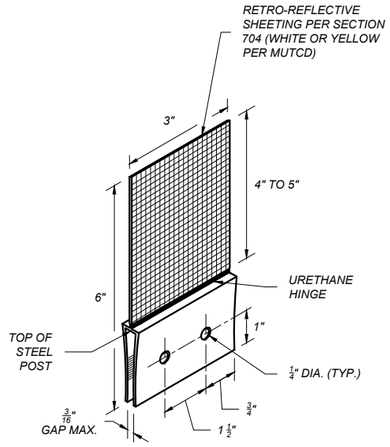
ROUTED WOOD BLOCK

PDB01*



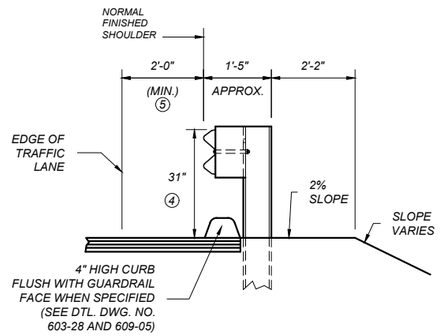
STEEL POST AND MOUNTING DETAIL

Ⓐ STANDARD UNLESS SPECIFIED OTHERWISE IN PLANS.

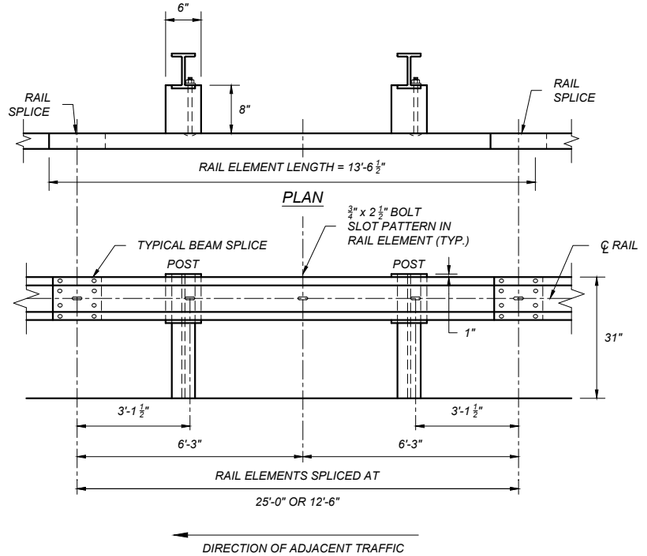


REFLECTOR

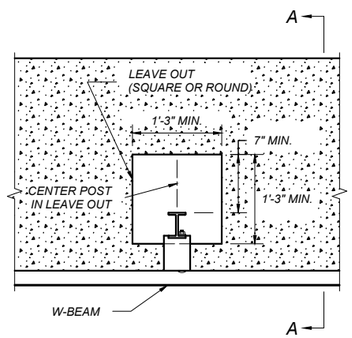
(SEE NOTE 3)



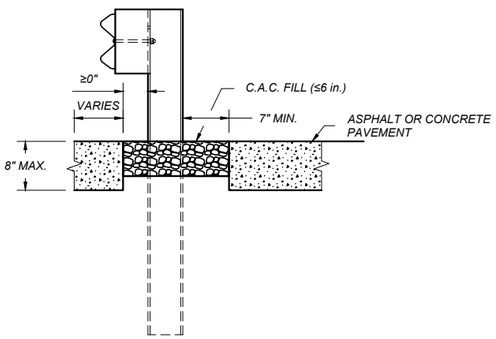
TYPICAL INSTALLATION



ELEVATION



POST DETAIL IN PAVEMENT APPLICATIONS



SECTION A-A

NOTES:

① INSTALL ALL BOLTS WITH HEADS ON TRAFFIC SIDE OF INSTALLATION.

② USE ROUTED WOOD BLOCKS OR OTHER "MASH" APPROVED BLOCKS.

③ ATTACH REFLECTORS TO POSTS EVERY 25 FEET, INCLUDING TERMINAL SECTIONS, WITH THE REFLECTORIZED SURFACE FACING ADJACENT TRAFFIC. FASTEN REFLECTOR TO STEEL POST USING AN APPROVED ADHESIVE. REFLECTORS MAY BE BOLTED TO POSTS PROVIDED HOLES IN POSTS ARE DRILLED BEFORE BEING GALVANIZED.

④ ON EXISTING GUARDRAIL INSTALLATIONS, THE MINIMUM RAIL HEIGHT IS 27 3/4".

⑤ WIDENING IS REQUIRED IF FINISHED SHOULDER IS LESS THAN 2'-0" FROM THE TRAFFIC LANE.

⑥ STEEL POSTS WITH OTHER POST HOLE CONFIGURATIONS MAY BE ACCEPTED, PROVIDED THEY HAVE AT LEAST THE HOLES DETAILED ON THIS DRAWING AND THEY MEET AASHTO'S PUBLICATION, "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE" AND "MASH" REQUIREMENTS.

⑦ DO NOT INSTALL W-BEAM GUARDRAIL FOR OBSTACLES WITHIN 5.5' OF THE FACE OF THE RAIL.

⑧ USE LOWER HOLE ON NEW CONSTRUCTION INSTALLATIONS.

⑨ USE 6' POSTS FOR STANDARD INSTALLATIONS.

* SEE DTL. DWG. NO. 606-80 FOR SCHEDULE OF GUARDRAIL HARDWARE.

Minimum clearance to obstacle revised for consistency with Road Design Manual. Reflector sheeting revised to reference Section 704.

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 606, 704

DWG. NO. 606-05B

METAL GUARDRAIL - STEEL POSTS (MGS)

EFFECTIVE: JAN 23, 2020

--REVISED--
JAN 15, 2026

MONTANA
Department of Transportation

9/23/2025 9:34 AM STDDRD606005B.DWG

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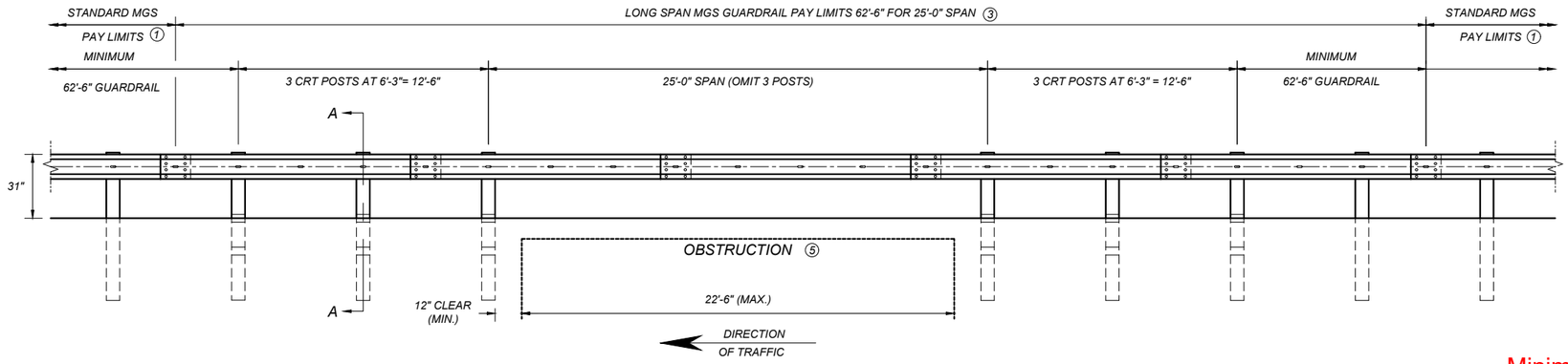
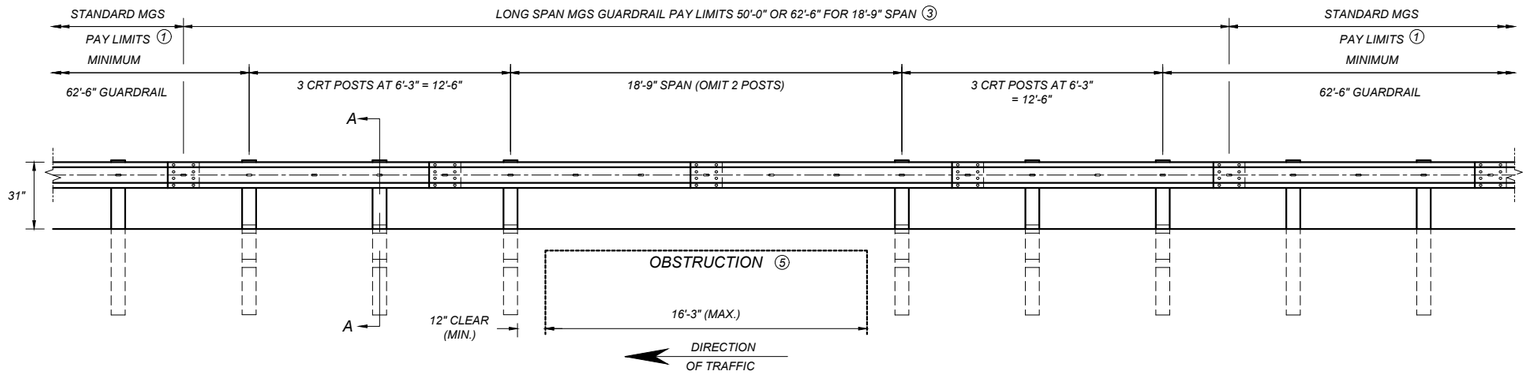
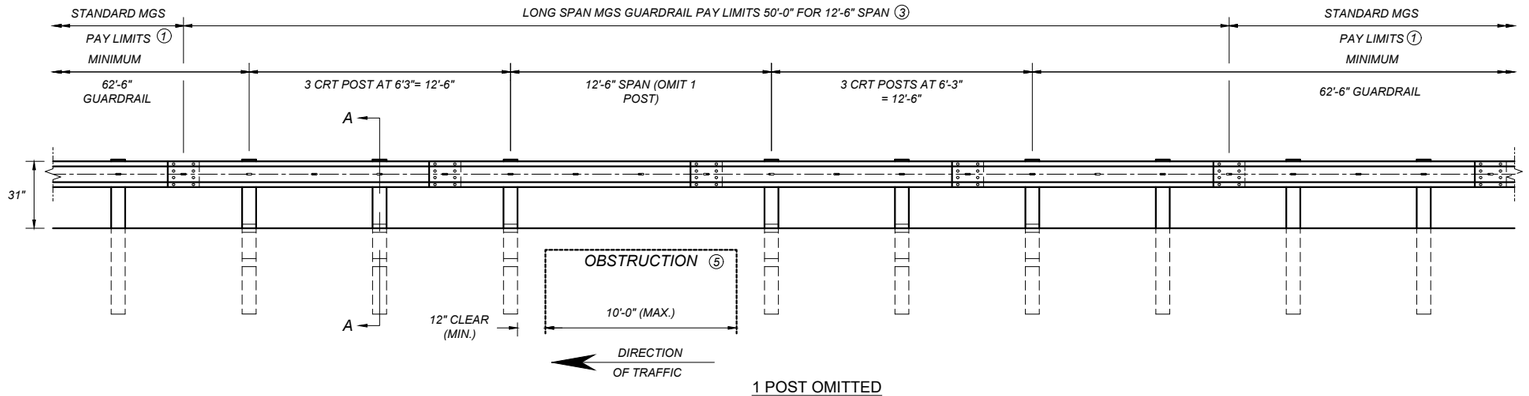


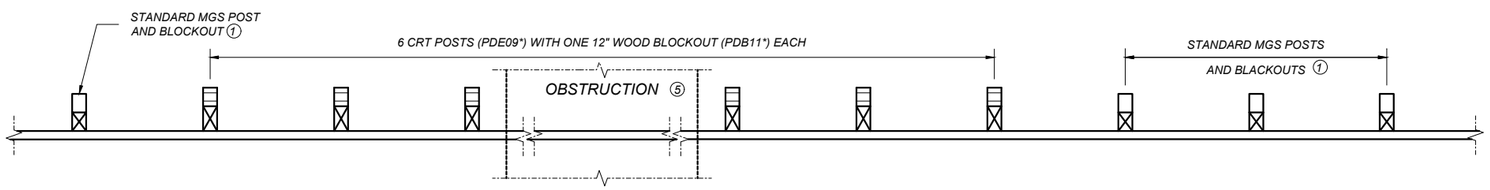
3 POSTS OMITTED



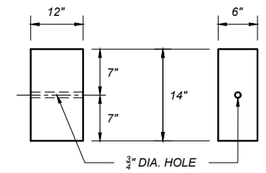
2 POSTS OMITTED



1 POST OMITTED



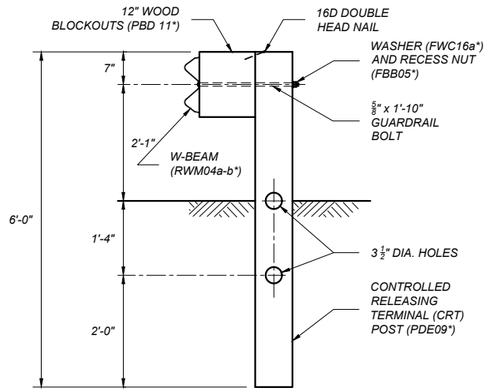
PLAN VIEW



12" WOOD BLOCK

PDB11*

Minimum clearance to obstacle revised for consistency with Road Design Manual.



SECTION A-A

NOTES:

(1) SEE DTL. DWG. NO. 606-05A AND 606-05B FOR STANDARD MGS GUARDRAIL AND ASSOCIATED HARDWARE.

(2) LAP ALL RAIL IN THE DIRECTION OF ADJACENT TRAFFIC.

(3) TYPICAL SPLICE LOCATIONS SHOWN, MAY VARY BASED ON ACTUAL RAIL SEGMENTS INSTALLED. PAY LIMITS NOT DEPENDENT ON SPLICE LOCATION.

(4) DO NOT INSTALL MGS LONG SPAN GUARDRAIL FOR ABOVE-GRADE OBSTACLES WITHIN 9.7' OF THE FACE OF THE RAIL.

(5) THE OBSTRUCTION (CULVERT OPENING OR EDGE OF BRIDGE DECK) MUST BE LOCATED AT OR BEYOND THE BACK OF THE CRT POSTS.

* SEE DTL. DWG. NO. 606-80 FOR SCHEDULE OF GUARDRAIL HARDWARE.

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 606

DWG. NO. 606-09

LONG SPAN GUARDRAIL (MGS)

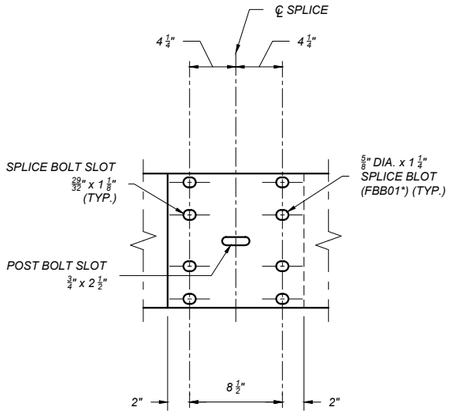
EFFECTIVE: JAN 23, 2020

--REVISED--
JAN 15, 2026

MONTANA
Department of Transportation

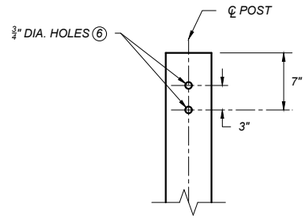
DRAFT

9/24/2025 11:57 AM STDDRD606009.DWG

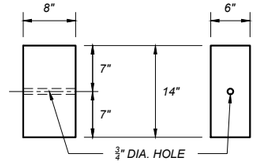


BEAM SPLICE

(LAP IN DIRECTION OF ADJACENT TRAFFIC)

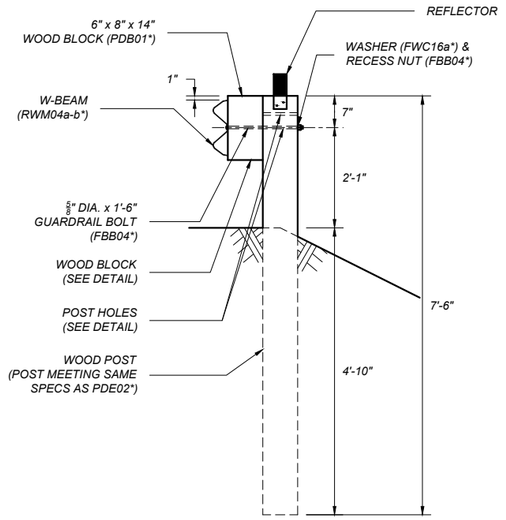


POST HOLE DETAIL

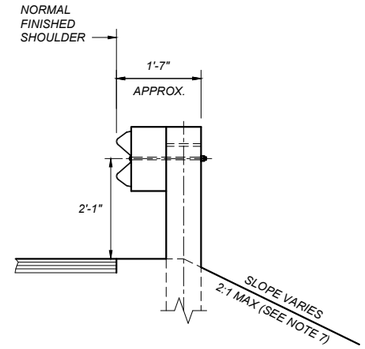


WOOD BLOCK

PDB01*

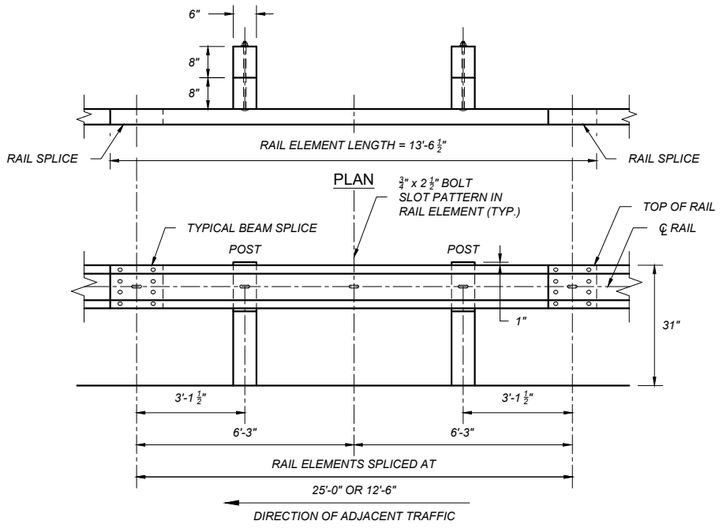


WOOD POST AND MOUNTING DETAIL



NOTE:
THIS GUARDRAIL SYSTEM IS USED WHEN THE 2'-0" WIDENING BEHIND THE POSTS CANNOT BE PROVIDED, AS PER DTL. DWG. NO. 606-05A & 606-05B.

PROFILE



ELEVATION

Minimum clearance to obstacle revised for consistency with Road Design Manual.
Reflector sheeting revised to reference Section 704.

NOTES:

① INSTALL ALL BOLTS WITH HEADS ON TRAFFIC SIDE OF INSTALLATION.

② USE WOOD BLOCKS OR OTHER "MASH" APPROVED BLOCKS. AFFIX BLOCKS TO POSTS WITH TWO 16 PENNY GALV. NAILS OR 14 GAUGE WIRE WRAP.

③ ATTACH REFLECTORS TO POSTS EVERY 25', INCLUDING TERMINAL SECTIONS, WITH THE REFLECTORIZED SURFACE FACING ADJACENT TRAFFIC. FABRICATE REFLECTORS FROM 0.063" THICK ALUMINUM ALLOY PER SECTION 704 OR PLASTIC REFLECTORS WITH A URETHANE HINGE. FASTEN REFLECTOR TO WOOD POST USING TWO 16 PENNY RING-SHANKED GALVANIZED NAILS AND TWO 3/16" DIA. WASHERS IN PRE-DRILLED HOLES.

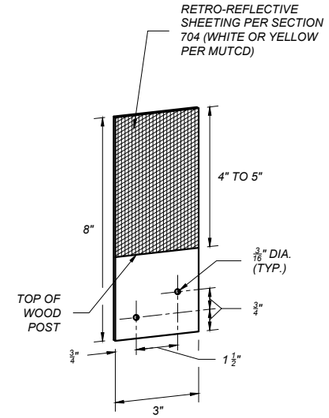
④ ON EXISTING GUARDRAIL INSTALLATIONS, THE MINIMUM RAIL HEIGHT IS 27 3/4".

⑤ DO NOT INSTALL LONG POST W-BEAM GUARDRAIL FOR OBSTACLES WITHIN 5.9' OF THE FACE OF THE RAIL.

⑥ USE LOWER HOLE ON NEW CONSTRUCTION INSTALLATIONS.

⑦ BEGIN INSLOPE BREAK AT CENTER OF POST.

* SEE DTL. DWG. NO. 606-80 FOR SCHEDULE OF GUARDRAIL HARDWARE.



REFLECTOR

(SEE NOTE 3)

--REVISED--
JAN 15, 2026

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 606,704

DWG. NO. 606-11A

METAL GUARDRAIL - LONG POSTS - WOOD (MGS)

EFFECTIVE: JAN 23, 2020

MONTANA Department of Transportation

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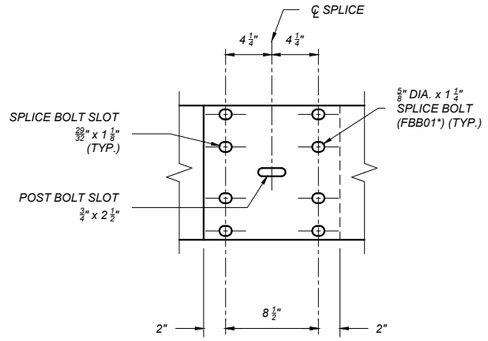
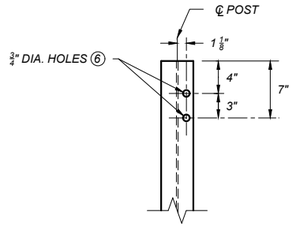
9/24/2025 12:32 PM STDDRD606011A.DWG

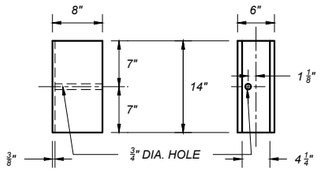


BEAM SPLICE

(LAP IN DIRECTION OF ADJACENT TRAFFIC)

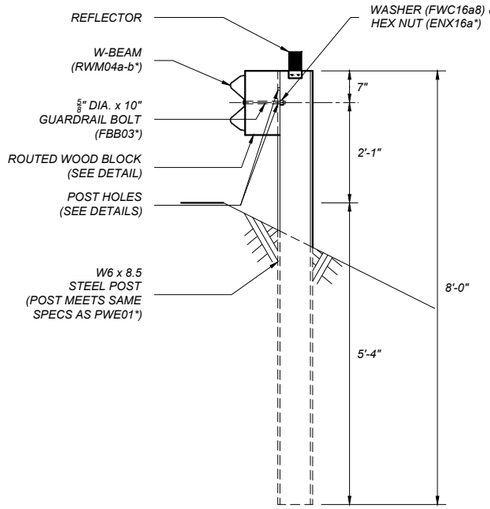


POST HOLE DETAIL

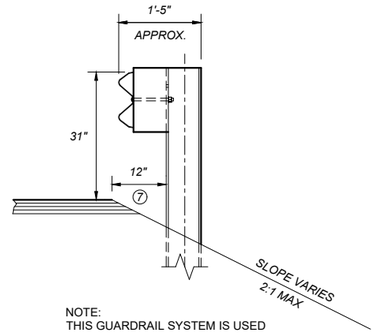


ROUTED WOOD BLOCK

PDB01*

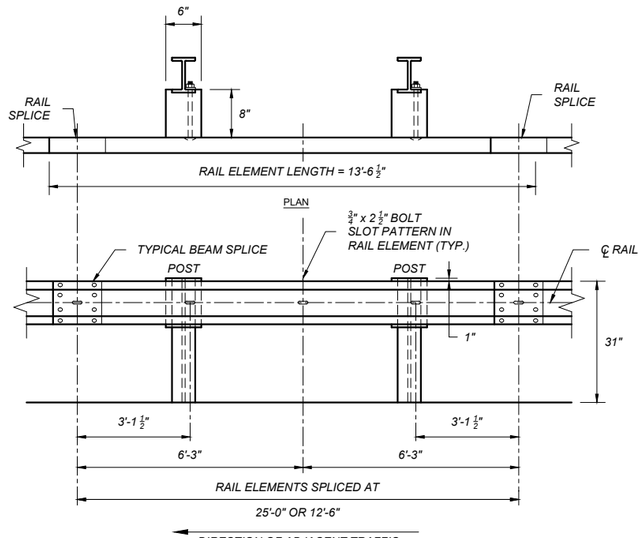


STEEL POST AND MOUNTING DETAIL



NOTE:
THIS GUARDRAIL SYSTEM IS USED WHEN THE 2'-0" WIDENING BEHIND THE POSTS CANNOT BE PROVIDED, AS PER DTL. DWG. NO. 606-05A & 606-05B.

PROFILE



ELEVATION

NOTES:

① INSTALL ALL BOLTS WITH HEADS ON TRAFFIC SIDE OF INSTALLATION.

② USE ROUTED WOOD BLOCKS OR OTHER "MASH" APPROVED BLOCKS.

③ ATTACH REFLECTORS TO POSTS EVERY 25', INCLUDING TERMINAL SECTIONS, WITH THE REFLECTORIZED SURFACE FACING ADJACENT TRAFFIC. FASTEN REFLECTOR TO STEEL POST USING AN APPROVED ADHESIVE. REFLECTORS MAY BE BOLTED TO POSTS PROVIDED HOLES IN POSTS ARE DRILLED BEFORE BEING GALVANIZED.

④ ON EXISTING GUARDRAIL INSTALLATIONS, THE MINIMUM RAIL HEIGHT IS 27 3/4".

⑤ DO NOT INSTALL LONG POST W-BEAM GUARDRAIL FOR OBSTACLES WITHIN 5.9' OF THE FACE OF THE RAIL.

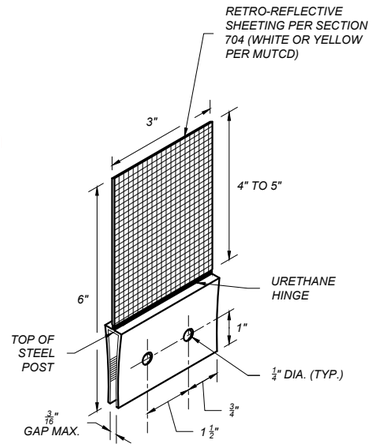
⑥ USE LOWER HOLE ON NEW CONSTRUCTION INSTALLATIONS.

⑦ LOCATE POST 12" (MAXIMUM) FROM INSLOPE BREAK.

⑧ STEEL POSTS WITH OTHER POST HOLE CONFIGURATIONS MAY BE ACCEPTED, PROVIDED THEY HAVE AT LEAST THE HOLES DETAILED ON THIS DRAWING AND THEY MEET AASHTO'S PUBLICATION, "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE" AND "MASH" REQUIREMENTS.

* SEE DTL. DWG. NO. 606-80 FOR SCHEDULE OF GUARDRAIL HARDWARE.

Minimum clearance to obstacle revised for consistency with Road Design Manual. Reflector sheeting revised to reference Section 704.



REFLECTOR

(SEE NOTE 3)

--REVISED--
JAN 15, 2026

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 606, 704

DWG. NO. 606-11B

METAL GUARDRAIL - LONG POSTS - STEEL (MGS)

EFFECTIVE: JAN 23, 2020

MONTANA
Department of Transportation

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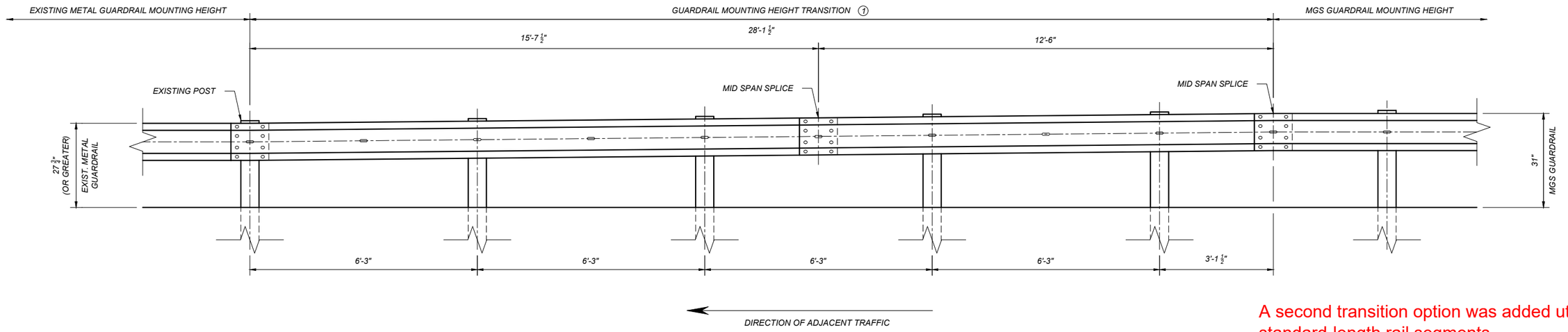
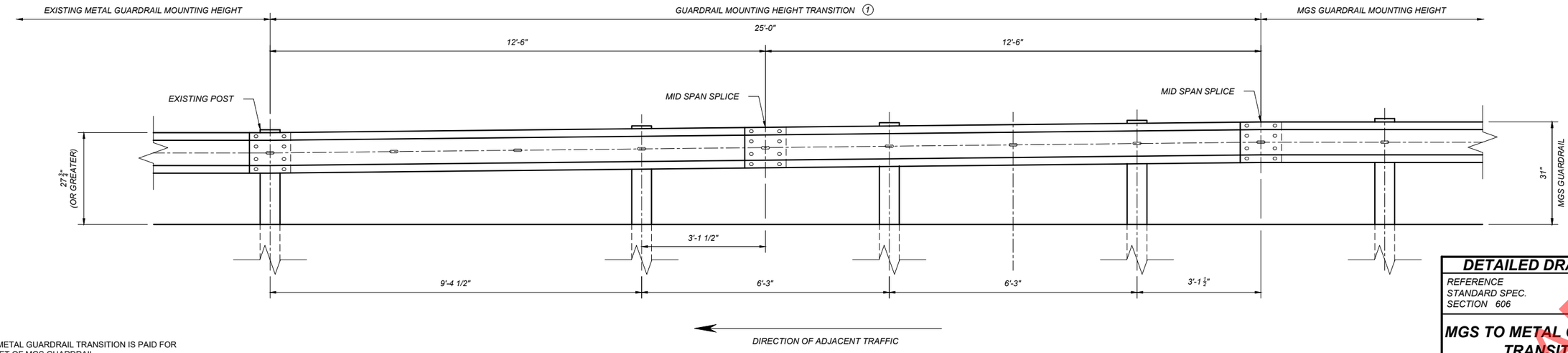
9/24/2025 12:36 PM STDDRD606011B.DWG



A second transition option was added utilizing standard-length rail segments.

HEIGHT TRANSITION DETAIL - IRREGULAR RAIL OPTION

(TRANSITION FROM 27 3/4" (OR GREATER) TO 31" GUARDRAIL MOUNTING HEIGHT)



NOTES:

(1) THE MGS TO METAL GUARDRAIL TRANSITION IS PAID FOR AS LINEAR FEET OF MGS GUARDRAIL.

(2) SEE DTL. DWG. NO. 606-05A, 606-05B, 606-11A, AND 606-11B FOR MGS GUARDRAIL AND ASSOCIATED HARDWARE.

(3) LAP ALL W-BEAM RAIL IN THE DIRECTION OF ADJACENT TRAFFIC.

HEIGHT TRANSITION DETAIL - IRREGULAR POST SPACING OPTION

(TRANSITION FROM 27 3/4" (OR GREATER) TO 31" GUARDRAIL MOUNTING HEIGHT)

--REVISED--
JAN 15, 2026

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 606 — DWG. NO. 606-20

MGS TO METAL GUARDRAIL TRANSITION

EFFECTIVE: JAN 23, 2020

MONTANA Department of Transportation

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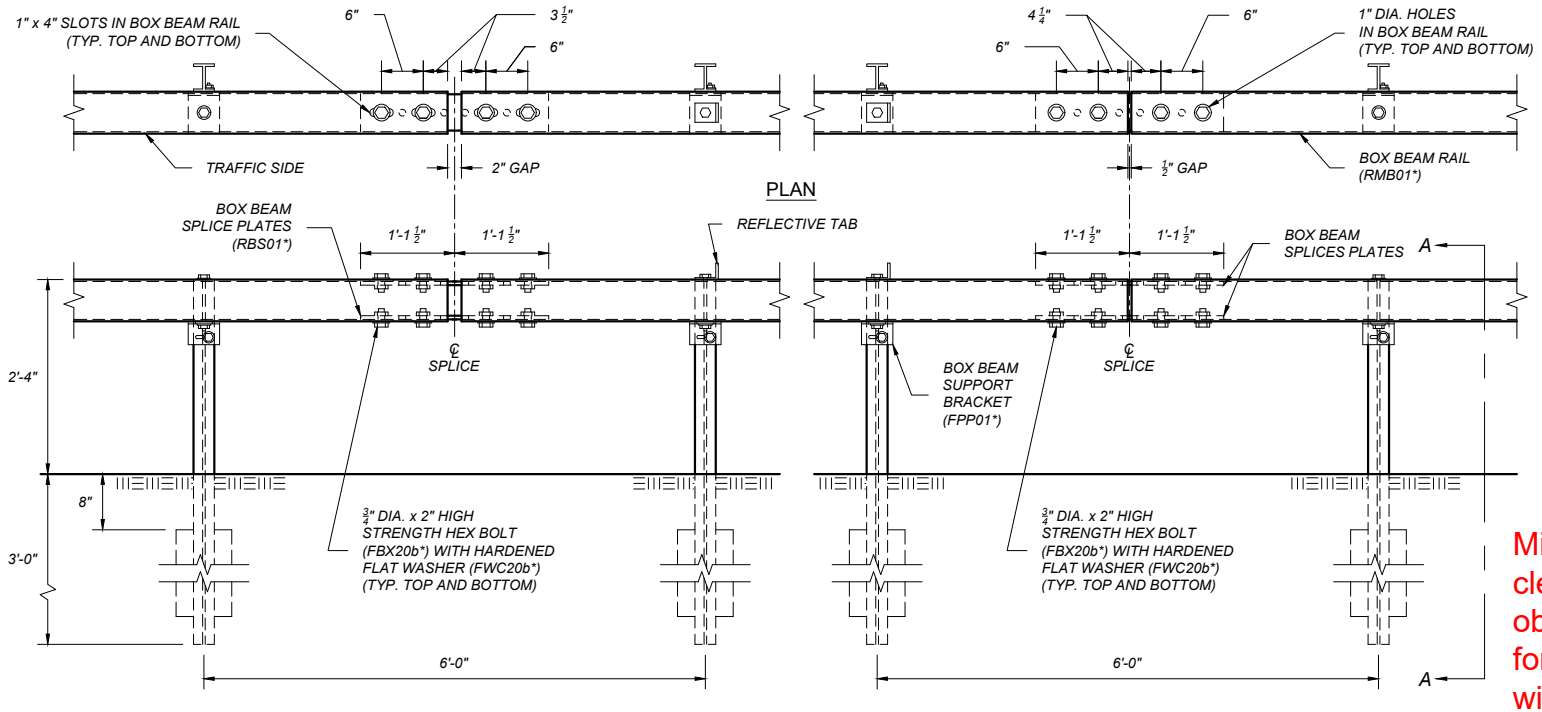
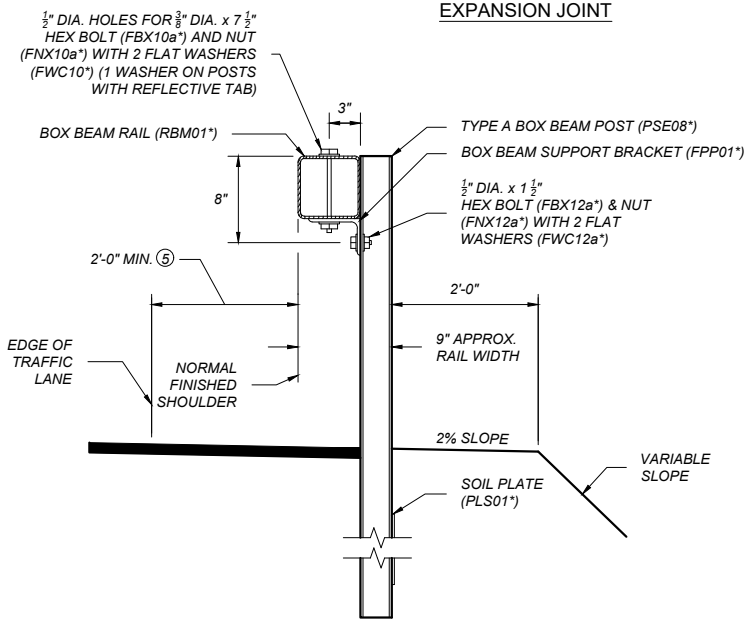
9/24/2025 12:39 PM STDDRD606020.DWG



EXPANSION JOINT

ELEVATION

SPLICE DETAIL



SECTION A-A

NOTES:

(1) USE BOX BEAM RAIL IN MINIMUM NOMINAL LENGTHS OF 18 FEET UNLESS APPROVED BY THE PROJECT MANAGER.

(2) INSTALL EXPANSION JOINTS ON ALL BOX BEAM GUARDRAIL INSTALLATIONS GREATER THAN 300 FEET IN LENGTH AT INTERVALS NOT TO EXCEED 500 FEET.

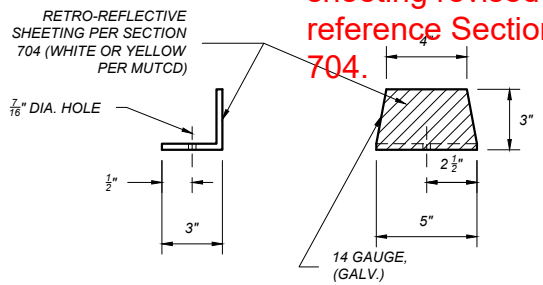
(3) ATTACH REFLECTIVE TABS TO EVERY FOURTH POST (24 FEET TYP.). ANGLE TABS SLIGHTLY TOWARDS TRAFFIC. DO NOT USE REFLECTIVE TABS ON WY-BET TERMINALS. WY-BET TERMINALS RECEIVE REFLECTIVE CHANNELS.

(4) DO NOT INSTALL BOX BEAM GUARDRAIL FOR OBSTACLES WITHIN 5.6' OF THE FACE OF THE RAIL.

(5) WIDENING IS REQUIRED IF FINISHED SHOULDER IS LESS THAN 2'-0" FROM THE TRAFFIC LANE.

(6) PROVIDE SHOP BENT BOX BEAM RAIL FOR ROADWAY CURVATURE WITH RADII OF LESS THAN 715 FEET.

* SEE DTL. DWG. NO. 606-80 FOR SCHEDULE OF GUARDRAIL HARDWARE.



REFLECTIVE TAB

Minimum clearance to obstacle revised for consistency with Road Design Manual. Reflector sheeting revised to reference Section 704.

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 606, 704

DWG. NO. 606-50

BOX BEAM GUARDRAIL

EFFECTIVE: JAN 23, 2020

--REVISED--
JAN 15, 2026

MONTANA
Department of Transportation

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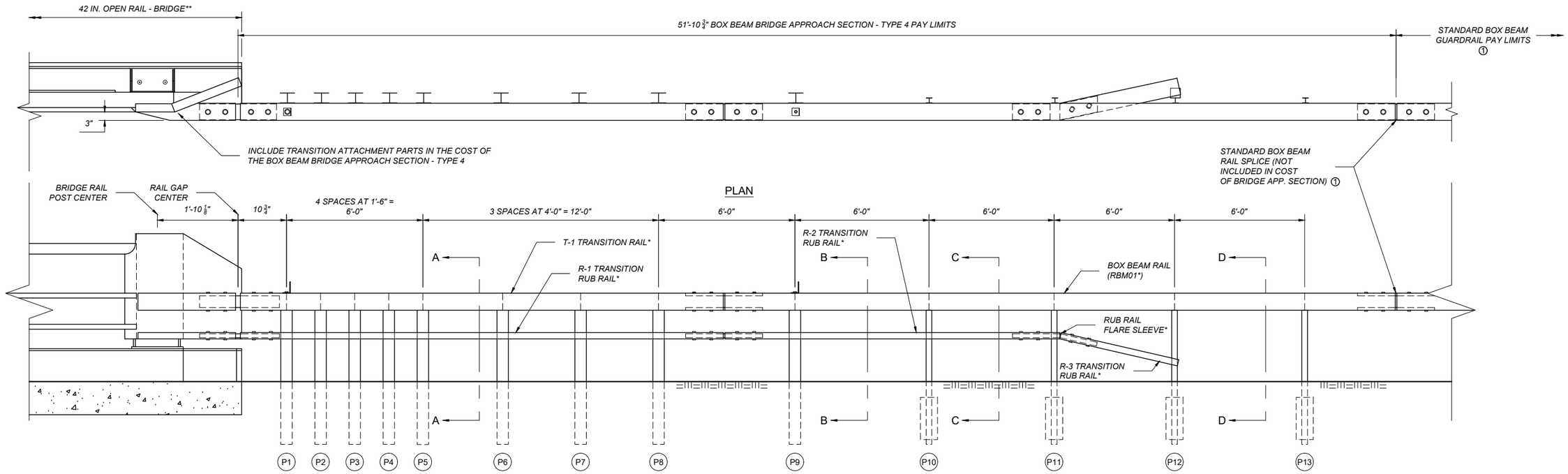
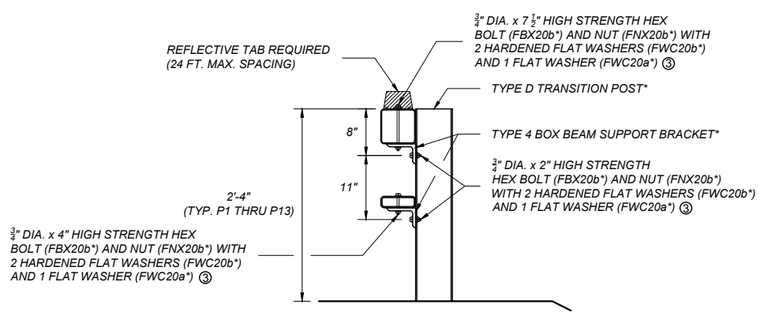
9/24/2025 12:41 PM STDDRD606050.DWG

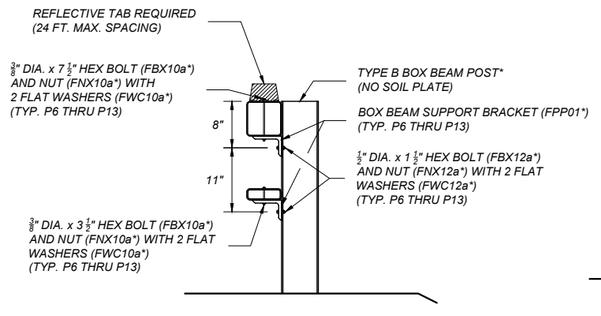


Multiple component and dimension revisions.



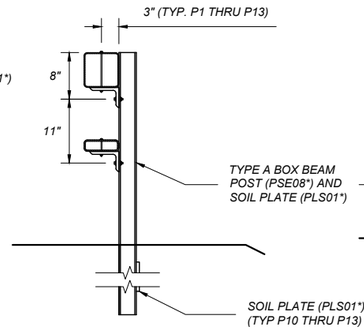
SECTION A-A

(TYP. AT POSTS P1 - P5)



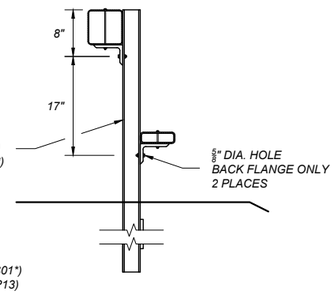
SECTION B-B

(TYP. AT POSTS P6 - P9)



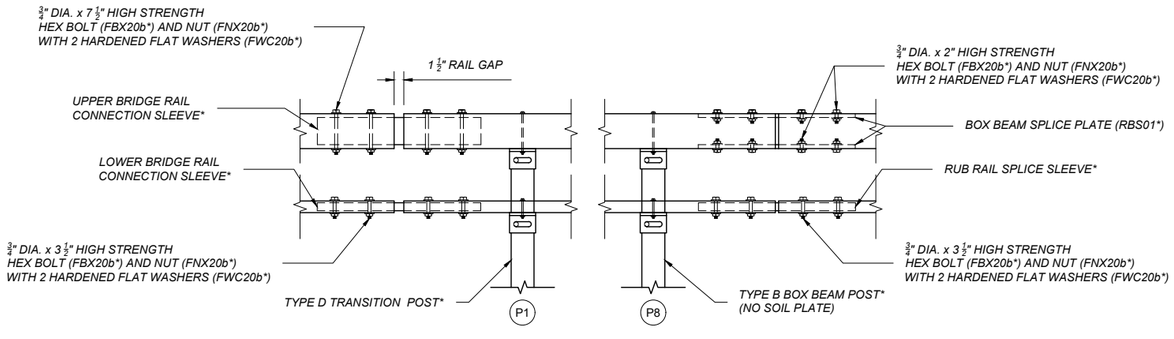
SECTION C-C

(TYP. AT POSTS P10 & P11)

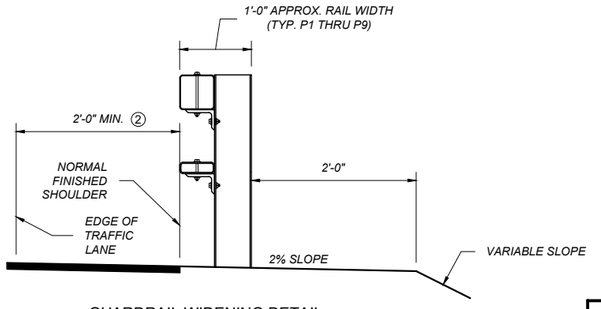


SECTION D-D

(TYP. AT POST P12)



T-1 & R-1 RAIL CONNECTION DETAIL



GUARDRAIL WIDENING DETAIL

NOTES:

① SEE DTL. DWG. NO. 606-50 FOR STANDARD BOX BEAM AND ASSOCIATED DETAILS.

② WIDENING IS REQUIRED IF FINISHED SHOULDER IS LESS THAN 2'-0" FROM THE TRAFFIC LANE.

③ PLACE HARDENED WASHERS (FWC20b*) UNDER BOLT HEAD AND NUT. ADD LARGER DIAMETER WASHER (FWC20a*) AGAINST BRACKET SLOT.

*SEE DTL. DWG. NO. 606-80 FOR SCHEDULE OF GUARDRAIL HARDWARE.

**SEE BRIDGE PLANS

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 606

DWG. NO. 606-53B

BOX BEAM BRIDGE APPROACH SECTION - TYPE 4

EFFECTIVE: JUN 27, 2024

DRAFT

MONTANA Department of Transportation

--REVISED--
JAN 15, 2026

9/23/2025 9:51 AM STDDRD606053B.DWG

SCHEDULE OF GUARDRAIL HARDWARE

DESIGNATION ①	DESCRIPTION	DTL.DWG.NO. (606-###)	GUARDRAIL TYPE ②	DTL. DWGS. WHERE PARTS USED																			
				606-05A	606-05B	606-07	606-09	606-11A	606-11B	606-18	606-23A	606-23B	606-24A	606-24B	606-25A	606-25B	606-46	606-50	606-52	606-53	606-53A	606-53B	606-54	606-58
FBB01-05	5/8" DIA. GUARDRAIL BOLT & RECESS NUT	82	W	X			X	X		X		X					X							X
FBB01-05	5/8" DIA. GUARDRAIL BOLT	82	W		X				X															
FBB06-07	5/8" DIA. GUARDRAIL BOLT & RECESS NUT	82	W								X	X												
FBX10a	3/8" DIA. HEX BOLT	82	B															X	X	X	X	X		X
FBX12a	1/2" DIA. HEX BOLT	82	B															X	X	X	X	X		X
FBX14a	9/16" DIA. HEX BOLT	82	B																					X
FBX16a	5/8" DIA. HEX BOLT	82	W							X							X							
FBX20a	3/4" DIA. HEX BOLT	82	W														X							
FBX20b	3/4" DIA. HIGH STRENGTH HEX BOLT*	82	B															X		X	X	X	X	X
FBX22a	7/8" DIA. HEX BOLT	82	W							X														
FBX22b	7/8" DIA. HIGH STRENGTH HEX BOLT*	82	W								X	X	X	X										
FBX24b	1" DIA. HIGH STRENGTH HEX BOLT*	82	B																		X			
FCA01	CABLE ASSEMBLY	84	W							X							X							
FMM01	CABLE WEDGE	94	C																					X
FMM02	POST SLEEVE	84	W							X							X							
FNS20	3/4" DIA. SQUARE NUT	82	C																					X
FNX10a	3/8" DIA. HEX NUT	82	B															X	X	X	X	X		X
FNX12a	1/2" DIA. HEX NUT	82	B															X	X	X	X	X		X
FNX14a	9/16" DIA. HEX NUT	82	B																					X
FNX16a	5/8" DIA. HEX NUT	82	W		X				X	X							X							
FNX20a	3/4" DIA. HEX NUT	82	C,W														X							X
FNX20b	3/4" DIA. HIGH STRENGTH HEX NUT	82	B																	X	X	X	X	X
FNX22b	7/8" DIA. HIGH STRENGTH HEX NUT	82	B								X	X	X	X										
FNX24a	1" DIA. HEX NUT	82	W							X							X							
FNX24b	1" DIA. HIGH STRENGTH HEX NUT	82	B																		X			
FPA01	GUARDRAIL ANCHOR BRACKET & END PLATE	84	W							X							X							
FPB01	BEARING PLATE	18 & 46	W							X							X							
FPP01	BOX BEAM SUPPORT BRACKET	97	B															X	X	X	X	X		X
FRH20a	3/4" DIA. HOOKED ANCHOR ROD	82	C																					X
FWC10a	3/8" DIA. FLAT WASHER	82	B															X	X	X	X	X		X
FWC12a	1/2" DIA. FLAT WASHER	82	B															X	X	X	X	X		X
FWC14a	9/16" DIA. FLAT WASHER	82	B																					X
FWC16a	5/8" DIA. FLAT WASHER	82	W	X	X		X	X	X	X	X	X					X							
FWC20a	3/4" DIA. FLAT WASHER	82	C,W														X					X		X
FWC20b	3/4" DIA. HARDENED FLAT WASHER	82	B															X		X	X	X	X	X
FWC24a	1" DIA. FLAT WASHER	82	W							X							X							
FWR03	RECTANGULAR PLATE WASHER	84	W							X														
PDB01	8" WOOD BLOCKOUT	05A & 05B, 11A & 11B	W	X	X			X	X															
PDB11	12" WOOD BLOCKOUT	09, 23A & 23B	W				X				X	X												
PDE02	WOOD GUARDRAIL POST	05A & 11A	W	X				X																
PDE09	CRT POST	46	W				X										X							
PDF01	WOOD BREAKAWAY POST	46	W							X							X							
PFP01	STRUT AND YOKE ASSEMBLY	18	W							X														
PLS01	SOIL PLATE	92 & 97	B															X	X	X		X		
PLS03	SOIL PLATE	46	W														X							
PSE05	TYPE D BOX BEAM POST	97	B																X					
PSE08	TYPE A BOX BEAM POST	97	B															X		X		X		X
PTE05	STEEL TUBE	46	W														X							
PTE06	STEEL TUBE	18	W							X														
PWE01	STEEL GUARDRAIL POST	05B	W		X				X					X										
RBM01	BOX BEAM RAIL	98	B															X		X		X	X	X
RBM05	BOX BEAM TERMINAL RAIL	98	B																X					
RBS01	BOX BEAM SPLICE PLATE	98	B															X				X		
RCE03	CABLE END ASSEMBLY	94	C																					X
RCM01	3/4" DIA. CABLE	94	C																					X
RTE01b	THRIE-BEAM TERMINAL CONNECTOR	23A & 23B	W								X	X												
RTM01a-b	4-SPACE THRIE-BEAM (6'-3" LENGTH)	23A & 23B	W								X	X												
RTM02a-b	8-SPACE THRIE-BEAM (12'-6" LENGTH)	23A & 23B	W								X	X												
RWE01a-b	W-BEAM END SECTION (FLARED)	88	W							X														
RWE02a-b	W-BEAM TERMINAL CONNECTOR	88	W										X	X	X	X	X							
RWE06a-b	W-BEAM END SECTION (BUFFER)	88	W														X							
RWM02a-b	2-SPACE W-BEAM (12'-6" LENGTH)	88	W																					X
RWM04a-b	4-SPACE W-BEAM (12'-6" LENGTH)	88	W	X	X		X	X	X	X	X	X												
RWM08a-b	8-SPACE W-BEAM (12'-6" LENGTH)	88	W			X																		
RWM14a	BCT TERMINAL RAIL SECTION	18	W							X														
RWM22a-b	W-BEAM (25'-0" LENGTH)	88	W	X	X		X	X	X	X														
RWT02a-b	W-BEAM TO THRIE-BEAM TRANSITION SECTION (7'-3 1/2" LENGTH)	23A & 23B	W								X	X												

* FURNISH HIGH STRENGTH BOLTS IN ACCORDANCE WITH ASTM F3125 GRADE A325

Multiple updates per revisions to the Box Beam Bridge Approach Section - Type 4 system.

NOTES:

① SEE AASHTO-AGC-ARTBA JOINT COMMITTEE TASK FORCE 13 REPORT "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE" PUBLICATION FOR ADDITIONAL AND DETAILED HARDWARE SPECIFICATIONS.

② GUARDRAIL TYPE CODES:

W = W-BEAM METAL GUARDRAIL
C = CABLE GUARDRAIL
B = BOX BEAM GUARDRAIL

--REVISED--
JUN 27, 2024
JAN 15, 2026

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 606

DWG. NO. 606-80

SCHEDULE OF GUARDRAIL HARDWARE

EFFECTIVE: JAN 23, 2020

MONTANA Department of Transportation

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9/23/2025 9:56 AM STDDRD606080.DWG

SCHEDULE OF GUARDRAIL HARDWARE

DESIGNATION ①	DESCRIPTION	DTL.DWG.NO. (606-###)	GUARDRAIL TYPE ②	DTL. DWGS. WHERE PARTS USED																			
				606-05A	606-05B	606-07	606-09	606-11A	606-11B	606-18	606-23A	606-23B	606-24A	606-24B	606-25A	606-25B	606-46	606-50	606-52	606-53	606-53A	606-53B	606-54	606-58
N/A	TYPE B BOX BEAM POST	97	B																	X		X		
N/A	TYPE 4 BOX BEAM SUPPORT BRACKET	97	B																			X		
N/A	SUPPORT BRACKET WITH TS6 x 6 x 3/16 BLOCKOUT	97	B																		X			
N/A	TRANSITION POST	97	B																		X			
N/A	TYPE D TRANSITION POST	97	B																			X		
N/A	TS6 x 6 x 3/16 BR. APP. SECT. UPPER RAIL NO. 1	98	B																	X				
N/A	TS6 x 2 x 1/4 BR. APP. SECT. LOWER RAIL NO. 1	98	B																	X				
N/A	TS6 x 2 x 1/4 BR. APP. SECT. LOWER RAIL NO. 2	98	B																	X				
N/A	TS6 x 2 TO TS6 x 6 CONNECTION SLEEVE	98	B																	X				
N/A	TS6 x 2 CONNECTION SLEEVE	98	B																	X				
N/A	TS6 x 6 x 3/16 TRANSITION RAIL	98	B																		X			
N/A	T-1 TRANSITION RAIL	98A	B																			X		
N/A	R-1 TRANSITION RUB RAIL	98A	B																			X		
N/A	R-2 TRANSITION RUB RAIL	98A	B																			X		
N/A	R-3 TRANSITION RUB RAIL	98A	B																			X		
N/A	UPPER BRIDGE RAIL CONNECTION SLEEVE	98A	B																			X		
N/A	LOWER BRIDGE RAIL CONNECTION SLEEVE	98A	B																			X		
N/A	RUB RAIL SPLICE SLEEVE	98A	B																			X		
N/A	RUB RAIL FLAIR SLEEVE	98A	B																			X		
N/A	1/4" SHIM PLATE	99	B																		X			
N/A	ANCHOR RAIL SECTION	99	B																		X			
N/A	RUB RAIL ANCHOR BRACKET (JERSEY RAIL)	99	B																		X			
N/A	RUB RAIL ANCHOR BRACKET (VERTICAL BRIDGE RAIL)	99	B																		X			
N/A	TS6 x 2 x 3/16 RUB RAIL	99	B																		X			
N/A	RUB RAIL FLARE SLEEVE	98A	B																			X		
N/A	TYPE 4 TRANSITION ATTACHMENT (BENT PLATE)	99A	B																			X		
N/A	TYPE 4 TRANSITION ATTACHMENT (TOP STIFFENER)	99A	B																			X		
N/A	TYPE 4 TRANSITION ATTACHMENT (SIDE STIFFENER)	99A	B																			X		
N/A	TYPE 4 TRANSITION ATTACHMENT (BOTTOM STIFFENER)	99A	B																			X		
N/A	TYPE 4 TRANSITION ATTACHMENT (UPPER RAIL ATTACHMENT)	99A	B																			X		
N/A	TYPE 4 TRANSITION ATTACHMENT (RUB RAIL ATTACHMENT)	99A	B																			X		
N/A	TYPE 4 TRANSITION ATTACHMENT (MOUNTING TAB)	99A	B																			X		
N/A	TYPE 4 TRANSITION ATTACHMENT (GUSSET)	99A	B																			X		

* FURNISH HIGH STRENGTH BOLTS IN ACCORDANCE WITH ASTM F3125 GRADE A325

Multiple updates per revisions to the Box Beam Bridge Approach Section - Type 4 system.

NOTES:

① SEE AASHTO-AGC-ARTBA JOINT COMMITTEE TASK FORCE 13 REPORT "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE" PUBLICATION FOR ADDITIONAL AND DETAILED HARDWARE SPECIFICATIONS.

② GUARDRAIL TYPE CODES:

W = W-BEAM METAL GUARDRAIL
C = CABLE GUARDRAIL
B = BOX BEAM GUARDRAIL

--REVISED--
JAN 15, 2026

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 606

DWG. NO. 606-80A

SCHEDULE OF GUARDRAIL HARDWARE

EFFECTIVE: JUN 27, 2024

MONTANA Department of Transportation

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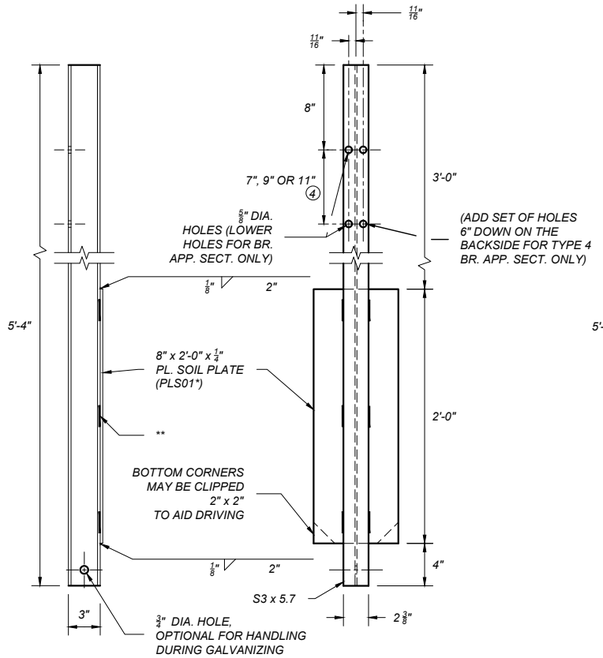
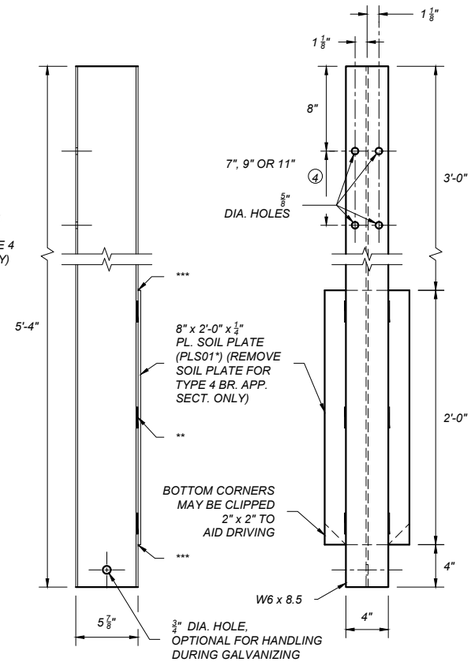
9/23/2025 10:07 AM STDDRD606080.DWG



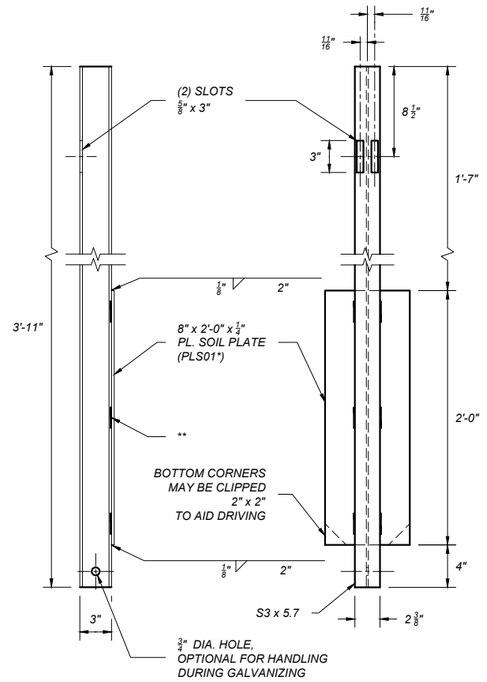
TYPE A BOX BEAM POST AND SOIL PLATE

PSE08* AND PLS01*



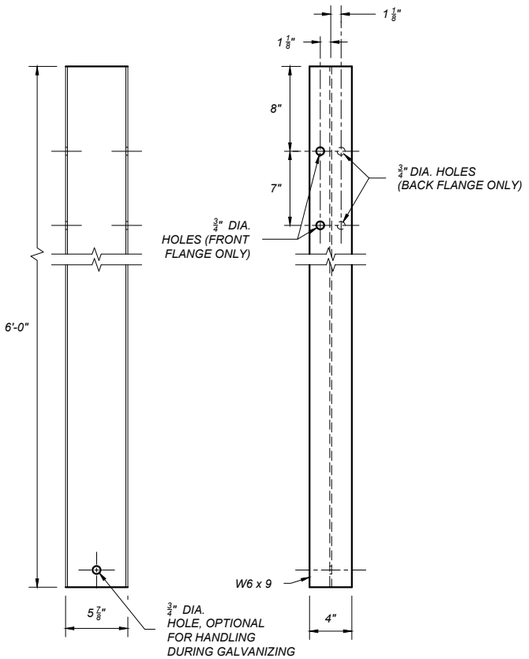
TYPE B BOX BEAM POST AND SOIL PLATE

PLS01*

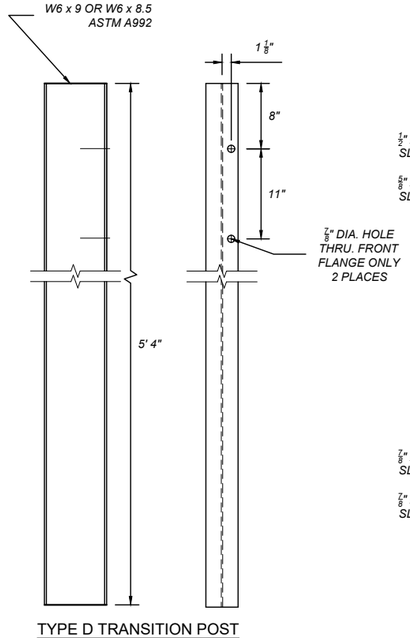


TYPE D BOX BEAM POST AND SOIL PLATE

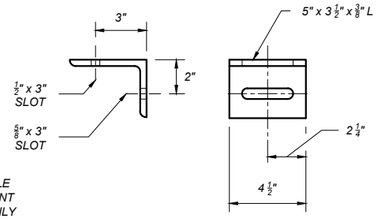
PSE05* AND PLS01*



TRANSITION POST

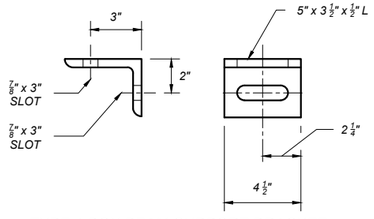


TYPE D TRANSITION POST

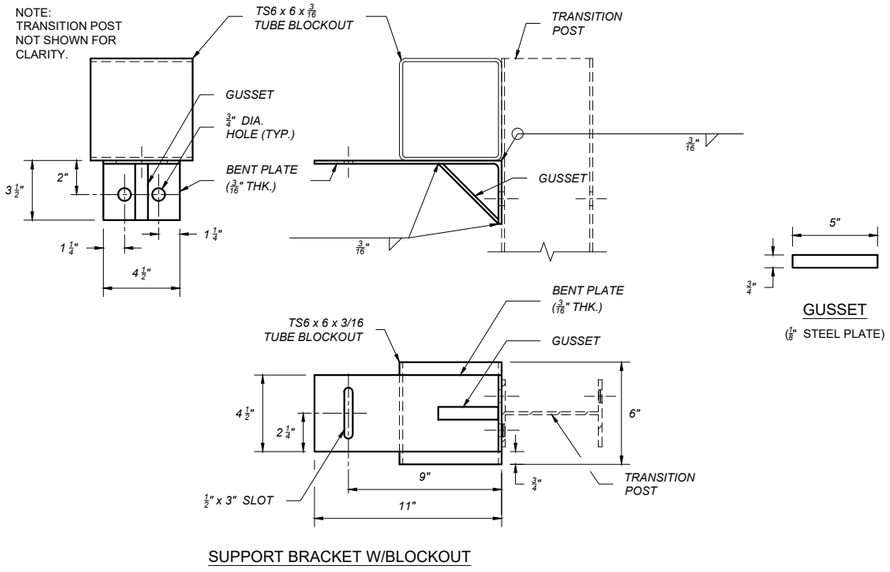


BOX BEAM SUPPORT BRACKET

FPP01*



TYPE 4 BOX BEAM SUPPORT BRACKET



SUPPORT BRACKET W/BLOCKOUT

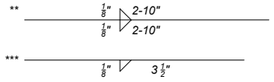
GUSSET

(3/8" STEEL PLATE)

NOTES:

1. MANUFACTURE POSTS USING STEEL CONFORMING TO AASHTO M 183 (ASTM A 36). MANUFACTURE SOIL PLATES, SUPPORT BRACKETS AND MISC. COMPONENTS USING AASHTO M 270 (ASTM A 709) GRADE 36 STEEL. ALL WELDING IS TO CONFORM TO THE APPLICABLE AWS CODE.
2. MANUFACTURE BLOCKOUTS FROM EITHER ASTM A 500 GRADE B COLD-ROLLED TUBING, ASTM A 501 HOT-ROLLED TUBING OR AUTOMOTIVE ROLLOVER PROTECTIVE STEEL (ROPS). WHEN ASTM A 500 GRADE B STEEL IS USED, TEST THE MATERIAL PER ASTM E 436.
3. GALVANIZE FABRICATED POSTS, BLOCKOUTS, BRACKETS AND MISC. COMPONENTS IN ACCORDANCE WITH SUBSECTION 711.08. DO NOT PUNCH, DRILL, OR CUT AFTER GALVANIZING.
4. SEE DTL. DWG. NO. 606-53 OR 606-53B (BOX BEAM BR. APP. SECT.) FOR REQUIRED LOCATION OF LOWER HOLES IN TYPE A AND B POSTS.

* SEE DTL. DWG. NO. 606-80 FOR SCHEDULE OF GUARDRAIL HARDWARE.



Dimension revisions to the Type 4 Box Beam Support Bracket.

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 606

DWG. NO. 606-97

BOX BEAM GUARDRAIL HARDWARE

EFFECTIVE: JAN 23, 2020

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MONTANA Department of Transportation

--REVISED--
JUN 27, 2024
JAN 15, 2026

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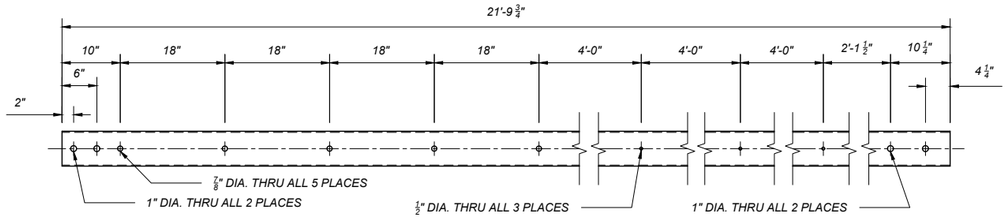
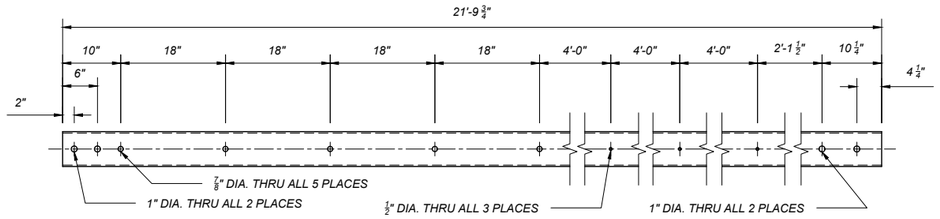


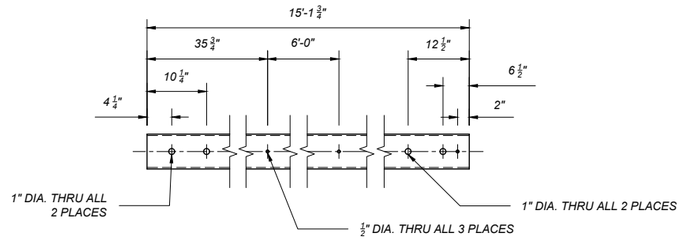
T-1 TRANSITION RAIL

HSS 6x6x$\frac{3}{16}$
ASTM A500 GRADE B



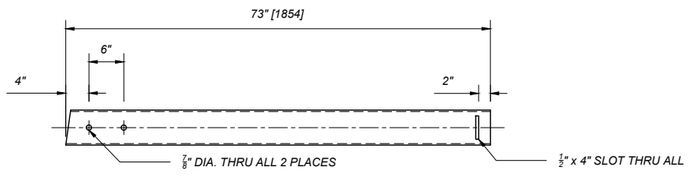
R-1 TRANSITION RUB RAIL

HSS 6x2x$\frac{1}{4}$
ASTM A500 GRADE B



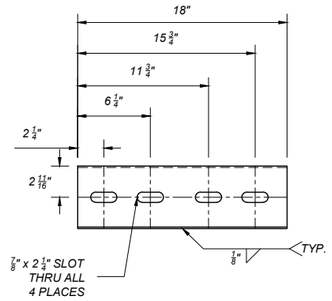
R-2 TRANSITION RUB RAIL

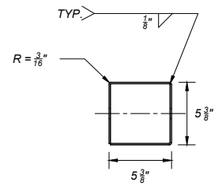
HSS 6x2x$\frac{1}{4}$
ASTM A500 GRADE B



R-3 TRANSITION RUB RAIL

HSS 6x2x$\frac{1}{4}$
ASTM A500 GRADE B

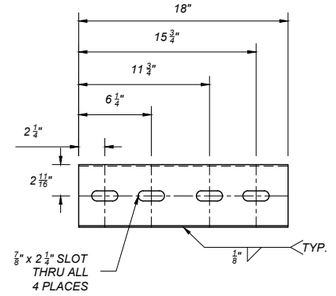


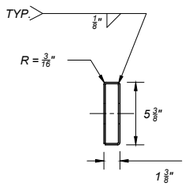


NOTE:
WELD & GRIND SMOOTH TO FIT
INSIDE 6" x 6" x $\frac{3}{16}$"

UPPER BRIDGE RAIL CONNECTION SLEEVE

ASTM A36 PLATE, 18" x $\frac{3}{16}$"
$\frac{3}{4}$" DIA. x 7 $\frac{1}{2}$" HIGH STRENGTH HEX BOLT (FBX20b*)
AND NUT (FNX20b*) WITH 2 HARDENED FLAT
WASHERS (FWC20b*)

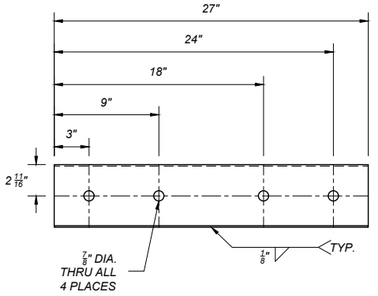


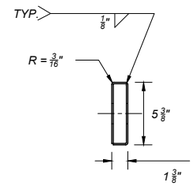


NOTE:
WELD & GRIND SMOOTH TO FIT
INSIDE 6" x 2" x $\frac{1}{4}$"

LOWER BRIDGE RAIL CONNECTION SLEEVE

ASTM A36 PLATE, 18" x $\frac{3}{16}$"
$\frac{3}{4}$" DIA. x 3 $\frac{1}{2}$" HIGH STRENGTH HEX BOLT (FBX20b*)
AND NUT (FNX20b*) WITH 2 HARDENED FLAT
WASHERS (FWC20b*)

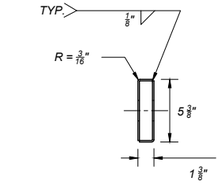




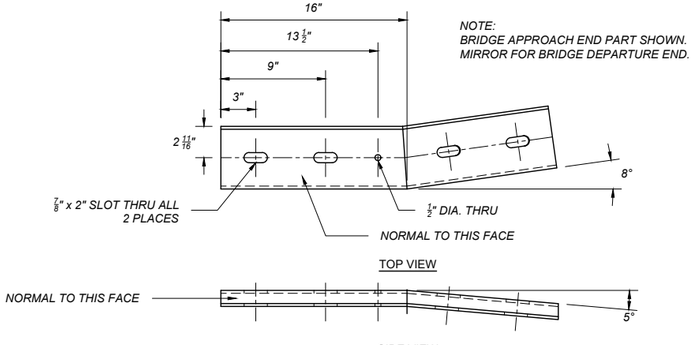
NOTE:
WELD & GRIND SMOOTH TO FIT
INSIDE 6" x 2" x $\frac{1}{4}$"

RUB RAIL SPLICE SLEEVE

ASTM A36 PLATE, 27" x $\frac{3}{16}$"
$\frac{3}{4}$" DIA. x 3 $\frac{1}{2}$" HIGH STRENGTH HEX BOLT (FBX20b*)
AND NUT (FNX20b*) WITH 2 HARDENED FLAT
WASHERS (FWC20b*)

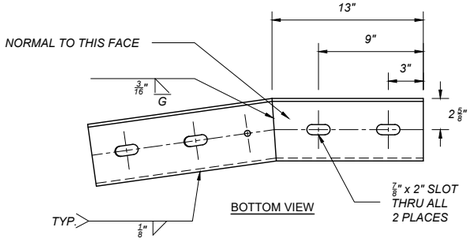


NOTE:
WELD & GRIND SMOOTH
TO FIT INSIDE 6" x 2" x $\frac{1}{4}$"



NOTE:
BRIDGE APPROACH END PART SHOWN.
MIRROR FOR BRIDGE DEPARTURE END.

Dimension revisions to the T-1, R-1, and R-2 Transition Rail components. Addition of the Rub Rail Splice Sleeve component.



RUB RAIL FLARE SLEEVE

$\frac{3}{16}$" ASTM A36 PLATE
$\frac{3}{4}$" DIA. x 3 $\frac{1}{2}$" HIGH STRENGTH HEX BOLT (FBX20b*)
AND NUT (FNX20b*) WITH 2 HARDENED FLAT
WASHERS (FWX20b*)

NOTES:

*SEE DTL. DWG. NO. 606-80 FOR SCHEDULE OF GUARDRAIL HARDWARE.

--REVISED--
JAN 15, 2026

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 606 — DWG. NO. 606-98A

BOX BEAM GUARDRAIL HARDWARE

EFFECTIVE: JUN 27, 2024

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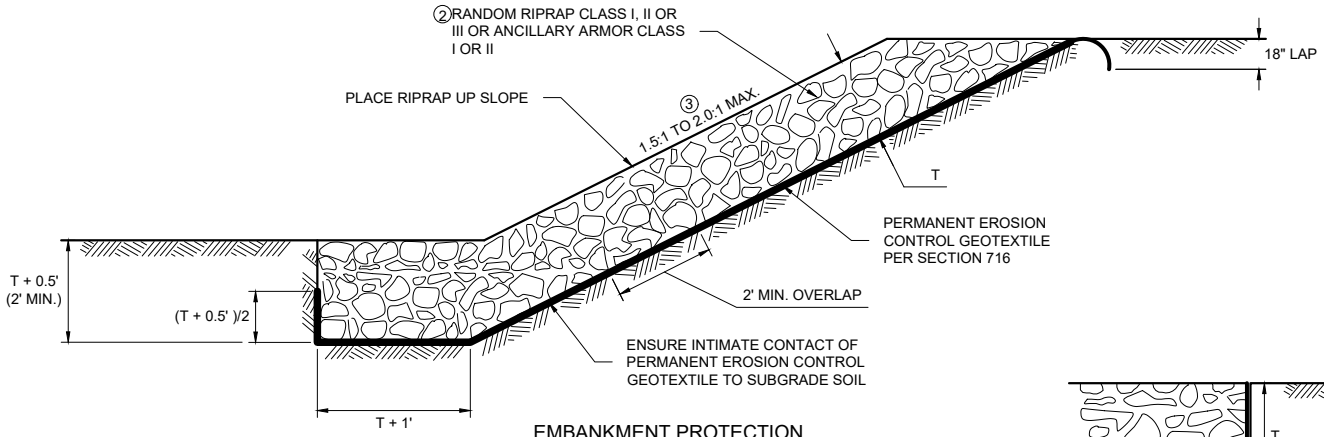
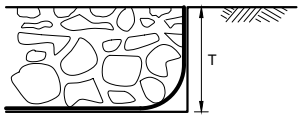
9/23/2025 9:59 AM — STDDRD606098A.DWG

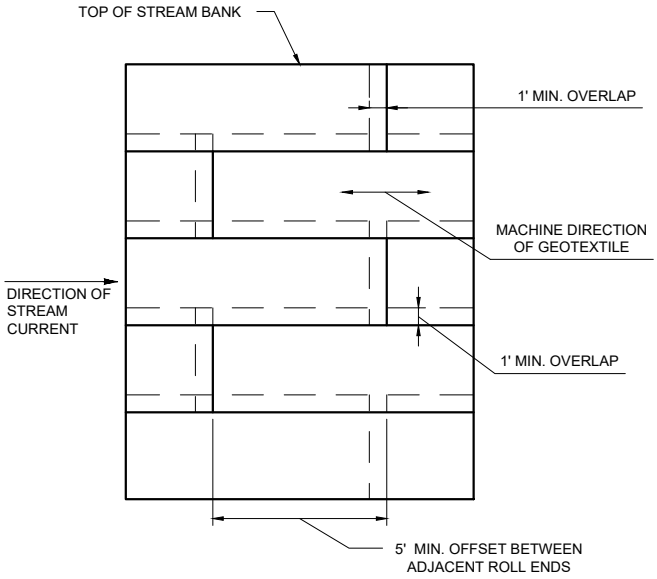


EMBANKMENT PROTECTION

MINIMUM T FOR:
CLASS I RIPRAP OR ANCILLARY ARMOR = 1.5'
CLASS II RIPRAP OR ANCILLARY ARMOR = 2.5'
CLASS III RIPRAP = 3.0'

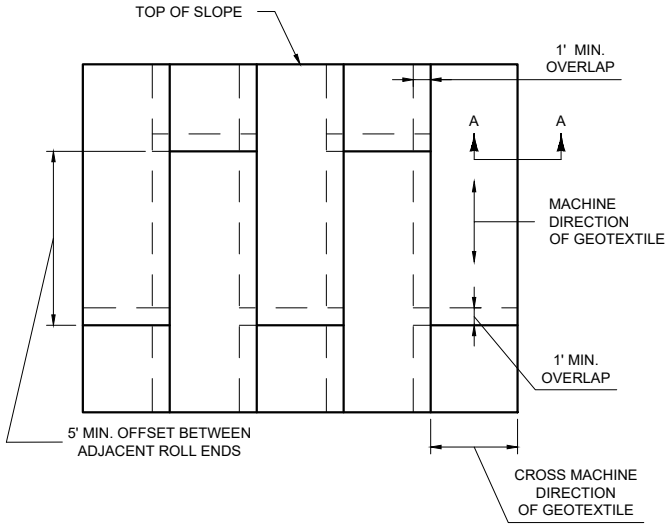


SECTION A-A



GEOTEXTILE PLACEMENT DETAIL

METHOD FOR PLACING PERMANENT EROSION CONTROL GEOTEXTILE FOR PROTECTION OF STREAM BANKS



GEOTEXTILE PLACEMENT DETAIL

METHOD FOR PLACING PERMANENT EROSION CONTROL GEOTEXTILE FOR PROTECTION OF CUT AND FILL SLOPES

Added note for maximum allowed riprap slope protection at bridges.

NOTES:

① INSTALL PERMANENT EROSION CONTROL GEOTEXTILE PER SECTION 622.

② ONLY RANDOM RIPRAP CLASS II OR LARGER IS ALLOWED FOR RIPRAP SLOPE PROTECTION AT BRIDGES.

③ 2.0:1 MAX ALLOWED FOR RIPRAP SLOPE PROTECTION AT BRIDGES.

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 613, 622

DWG. NO. 613-16

RIPRAP SLOPE PROTECTION

EFFECTIVE: JAN 23, 2020

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--REVISED--
JAN 15, 2026

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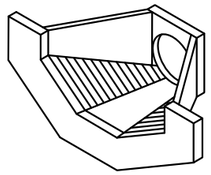
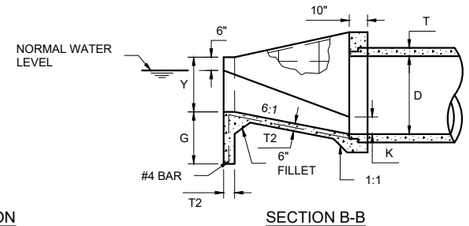
INLET AND OUTLET TRANSITION



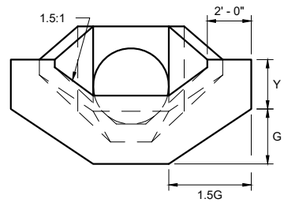
ISOMETRIC VIEW OF TRANSITION

PLACE REBAR IN CENTER OF WALLS, SLAB, ETC. UNLESS OTHERWISE SPECIFIED.

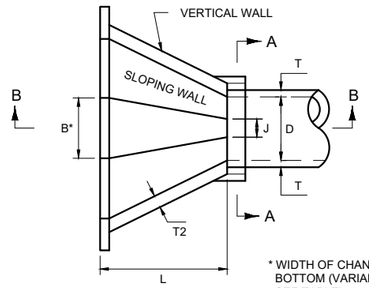


SECTION B-B

SPACE REINFORCING BARS APPROX. 12" EACH WAY THROUGHOUT STRUCTURE. USE CONTINUOUS BARS IN FLOORS AND WALLS WHENEVER POSSIBLE. WHEN SPLICES ARE MADE, LAP REINFORCING BAR 1'-6".

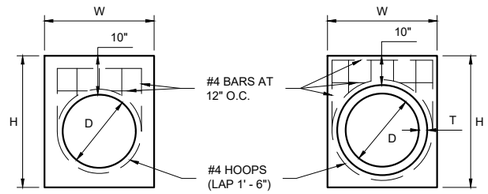


ELEVATION



* WIDTH OF CHANNEL BOTTOM (VARIABLE - SEE TABLE)

PLAN VIEW



SECTION A-A
FOR CSP

SECTION A-A
FOR RCP

CHAMFER ALL EXPOSED CORNERS TO 1".

Revised dimensions and quantities in the tables for 18” CSP and RCP. Added note regarding alternate designs. Miscellaneous format and label revisions.

INLET AND OUTLET CONCRETE TRANSITIONS FOR CSP

CULVERT		DIMENSIONS								QUANTITIES								
										B = D			B = D + 1'-0"			B = D + 2'-0"		
DIA. D	AREA (SQ. FT.)	J	H	L	T2	W	K	Y	G	B	CL GEN CONC. (C.Y.)	#4 REBAR (LB.)	B	CL GEN CONC. (C.Y.)	#4 REBAR (LB.)	B	CL GEN CONC. (C.Y.)	#4 REBAR (LB.)
18"	1.77	0.61'	4'-0"	4'-0"	6"	3'-3"	0.46'	1'-6"	2'-0"	2'-0"	1.2	94	3'-0"	1.3	103	4'-0"	1.4	112
24"	3.14	0.61'	4'-0"	4'-0"	6"	3'-3"	0.46'	1'-6"	2'-0"	2'-0"	1.2	94	3'-0"	1.3	103	4'-0"	1.4	112
30"	4.91	0.76'	4'-6"	5'-0"	6"	3'-9"	0.58'	1'-9"	2'-0"	2'-6"	1.6	124	3'-6"	1.7	134	4'-6"	1.8	144
36"	7.07	0.91'	5'-1"	6'-0"	6"	4'-3"	0.70'	2'-0"	2'-6"	3'-0"	2.1	162	4'-0"	2.2	173	5'-0"	2.3	184
42"	9.62	1.10'	5'-8"	7'-0"	6"	4'-9"	0.81'	2'-3"	2'-6"	3'-6"	2.6	200	4'-6"	2.7	212	5'-6"	2.9	225
48"	12.57	1.20'	6'-3"	8'-0"	8"	5'-3"	0.93'	2'-6"	2'-6"	4'-0"	4.1	245	5'-0"	4.3	259	6'-0"	4.4	272

INLET AND OUTLET CONCRETE TRANSITIONS FOR RCP

CULVERT		DIMENSIONS									QUANTITIES								
											B = D			B = D + 1'-0"			B = D + 2'-0"		
DIA. D	AREA (SQ. FT.)	J	H	L	T	T2	W	K	Y	G	B	CL GEN CONC. (C.Y.)	#4 REBAR (LB.)	B	CL GEN CONC. (C.Y.)	#4 REBAR (LB.)	B	CL GEN CONC. (C.Y.)	#4 REBAR (LB.)
18"	1.77	0.61'	4'-3"	4'-0"	3"	6"	3'-9"	0.46'	1'-6"	2'-0"	2'-0"	1.2	98	3'-0"	1.3	107	4'-0"	1.4	116
24"	3.14	0.61'	4'-3"	4'-0"	3"	6"	3'-9"	0.46'	1'-6"	2'-0"	2'-0"	1.2	98	3'-0"	1.3	107	4'-0"	1.4	116
30"	4.91	0.76'	4'-10"	5'-0"	3 1/2"	6"	4'-4"	0.58'	1'-9"	2'-0"	2'-6"	1.7	128	3'-6"	1.8	138	4'-6"	1.9	149
36"	7.07	0.91'	5'-6"	6'-0"	4"	6"	4'-11"	0.70'	2'-0"	2'-6"	3'-0"	2.2	168	4'-0"	2.3	179	5'-0"	2.4	190
42"	9.62	1.10'	6'-1"	7'-0"	4 1/2"	6"	5'-6"	0.81'	2'-3"	2'-6"	3'-6"	2.7	212	4'-6"	2.8	224	5'-6"	2.9	237
48"	12.57	1.20'	6'-8"	8'-0"	5"	8"	6'-1"	0.93'	2'-6"	2'-6"	4'-0"	4.2	254	5'-0"	4.3	267	6'-0"	4.6	280

NOTES:

1. INSTALL STRUCTURES OUTSIDE THE CLEAR ZONE.
2. PROVIDE TRASHGUARDS WHEN REQUIRED. SEE DTL. DWG. NO. 615-02.
3. ALTERNATIVE DESIGNS TO BE CONSIDERED FOR PIPES 30" DIAMETER AND LARGER.

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 615

DWG. NO. 615-06

CONCRETE IRRIGATION INLET AND OUTLET TRANSITION FOR RCP AND CSP PIPES

EFFECTIVE: JAN 23, 2020

MONTANA Department of Transportation

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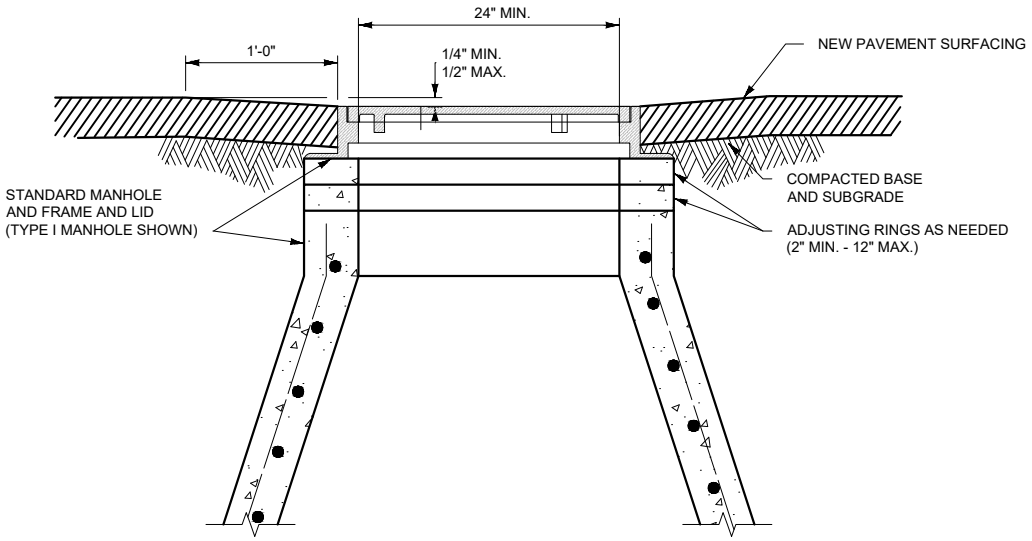
--REVISED--
JAN 15, 2026

9/22/2025 1:45 PM STDDRD615006.DWG



NOTES:

① RAISE MANHOLE LID FRAME ASSEMBLY TO NEEDED ELEVATION USING VERTICAL ADJUSTMENT RINGS.

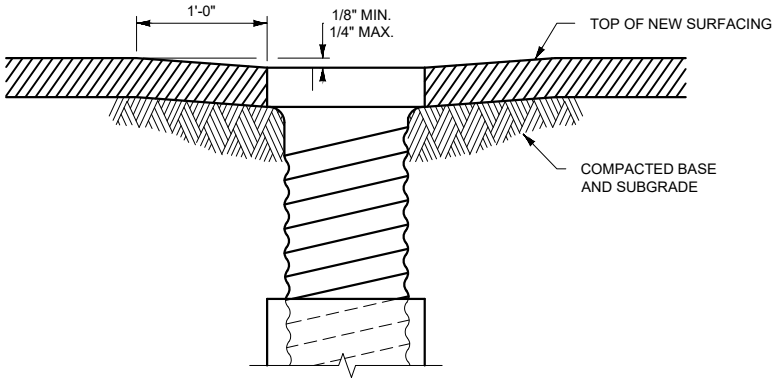
② LOWER MANHOLE BY REPLACING CONE AND BARREL SECTION LENGTHS WITH SHORTER LENGTHS AS NEEDED.

③ SLOPE MANHOLE FRAME TO MATCH FINISHED SURFACING CROSS SLOPE.

④ MAKE FINAL MANHOLE ADJUSTMENTS BEFORE PAVING.

Miscellaneous label revisions for manhole frame, lid, adjustment rings and surfacing.

MANHOLE ADJUSTMENT DETAIL



NOTES:

① ADJUST WATER VALVES UPWARD OR DOWNWARD AS REQUIRED.

② MAKE FINAL ADJUSTMENT BEFORE PAVING.

VALVE BOX ADJUSTMENT DETAIL

--REVISED--
APR 28, 2022
JUN 27, 2024
JAN 15, 2026

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 604, 621

DWG. NO. 621-00

MANHOLE AND VALVE BOX ADJUSTMENT DETAILS

EFFECTIVE: JAN 23, 2020

MONTANA Department of Transportation

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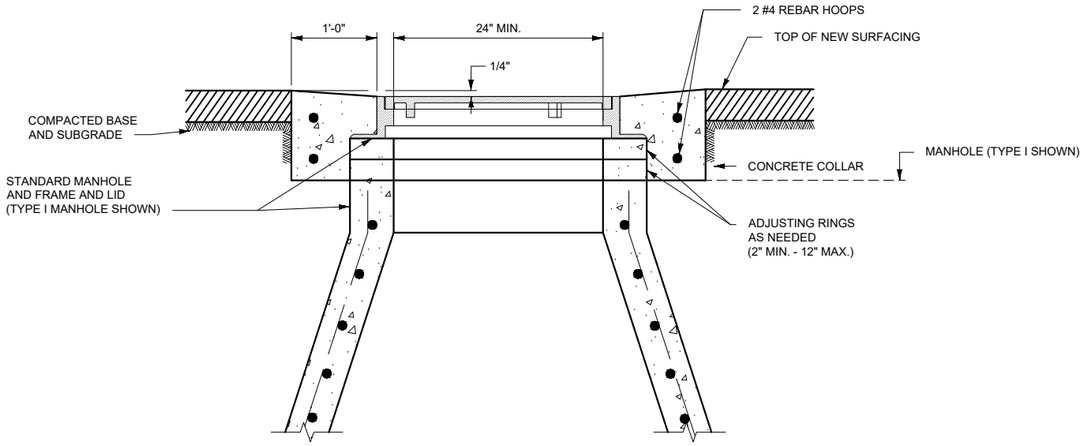
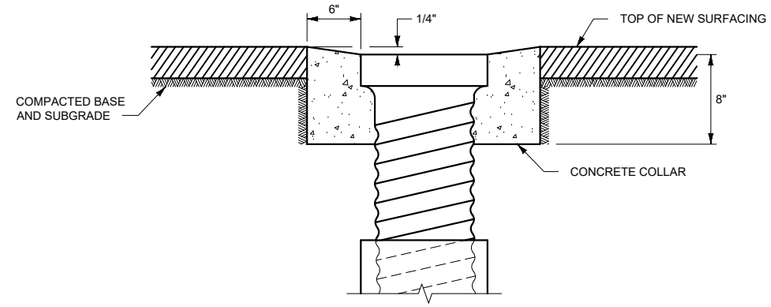


NOTES:

1. RAISE MANHOLE LID FRAME ASSEMBLY TO NEEDED ELEVATION USING VERTICAL ADJUSTMENT RINGS.
2. LOWER MANHOLE BY REPLACING CONE AND BARREL SECTION LENGTHS WITH SHORTER LENGTHS AS NEEDED.
3. SLOPE MANHOLE FRAME TO MATCH FINISHED SURFACING CROSS SLOPE.
4. CONSTRUCT CONCRETE COLLAR USING CLASS GENERAL CONCRETE OR APPROVED EQUAL.

MANHOLE ADJUSTMENT DETAIL

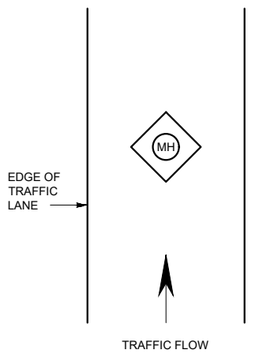


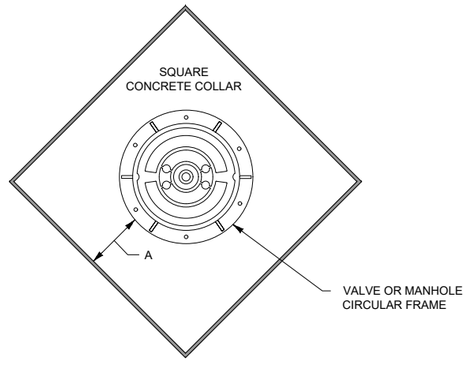
NOTES:

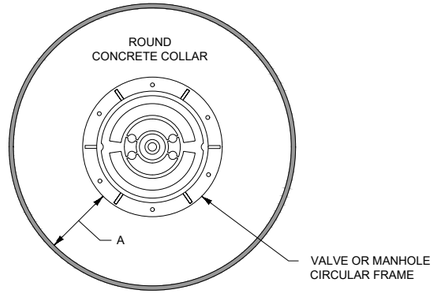
1. ADJUST WATER VALVES UPWARD OR DOWNWARD AS REQUIRED.
2. CONSTRUCT CONCRETE COLLAR OF CLASS GENERAL CONCRETE OR APPROVED EQUAL.

VALVE BOX ADJUSTMENT DETAIL

Miscellaneous label revisions for manhole frame, lid, adjustment rings and surfacing.







TYPE	DIMENSIONS	SQUARE COLLAR QUANTITIES	ROUND COLLAR QUANTITIES
	A	CLASS GENERAL CONCRETE	CLASS GENERAL CONCRETE
MANHOLE	1'-0"	0.5 C.Y.	0.4 C.Y.
VALVE	0'-6"	0.2 C.Y.	0.1 C.Y.

CONCRETE COLLAR DETAIL

--REVISED--
APR 28, 2022
JUN 27, 2024
JAN 15, 2026

DETAILED DRAWINGS

REFERENCE STANDARD SPEC. SECTION 604, 621

DWG. NO. 621-05

OPTIONAL MANHOLE AND VALVE BOX ADJUSTMENT DETAILS

EFFECTIVE: JAN 23, 2020

MONTANA
Department of Transportation

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