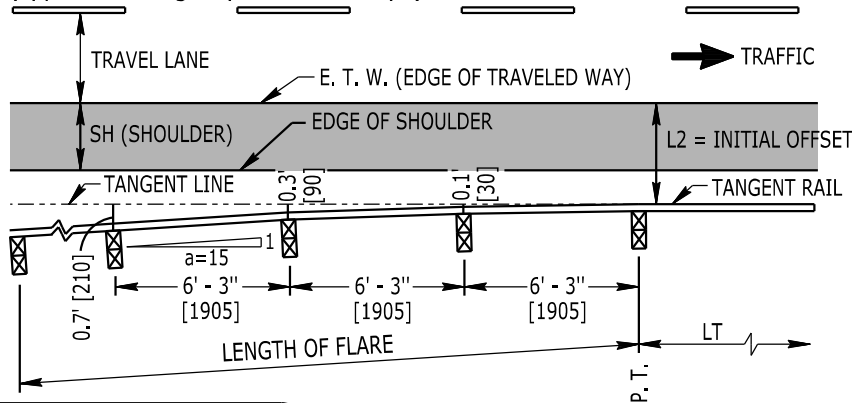


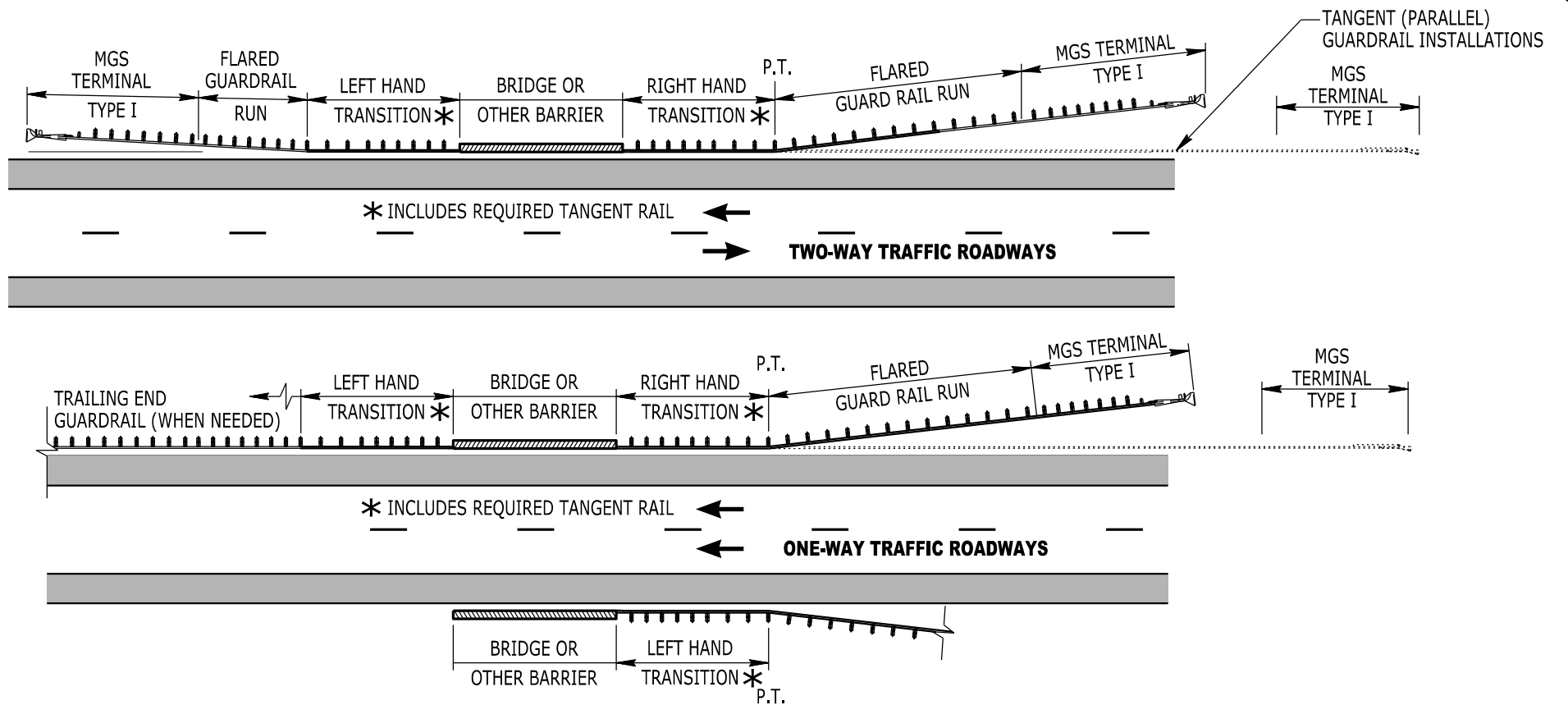
**MGS GUARDRAIL STANDARD PLAN
INDEX OF SHEETS**

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1	General Requirements
2	Guardrail Placement Around Fixed Object Hazards
3	Grading Requirements
4	Grading Requirements (continued)
INSTALLATION DETAILS	
5	Standard Run of MGS Guardrail
6	Transition A - F Approach Guardrail Layout
7	Transition A 29-2ST Bridge Rail, Transition B 33-2ST Bridge Rail Connection Details
8	Transition C Conc. NJ Shape, Transition D Conc. SS Shape Connection Details
9	Transition E Conc. Vertical Shape, Transition F 42-3ST Bridge Rail Connection Details
10	Terminal Type I (Option 1 - MSKT MGS, Sheet 1 of 2)
11	Terminal Type I (Option 1 - MSKT MGS, Sheet 2 of 2)
12	Terminal Type I (Option 2 - SOFTSTOP, Sheet 1 of 2)
13	Terminal Type I (Option 2 - SOFTSTOP, Sheet 2 of 2)
14	MGS Terminal Type II (MFLEET Flared Steel Post Terminal, Sheet 1 of 2)
15	MGS Terminal Type II (MFLEET Flared Steel Post Terminal, Sheet 2 of 2)
16	MGS Long Span
17	MGS Half Post Spacing, MGS Quarter Post Spacing, MGS Long Post - Constricted Slope Grading, MGS 8" [205] Blocks
18	Post Placement in Pavements and Rock

Initiating a straight guardrail flare - Initiate a 1W:15L guardrail flare (typical for high speed roadways) as shown below:

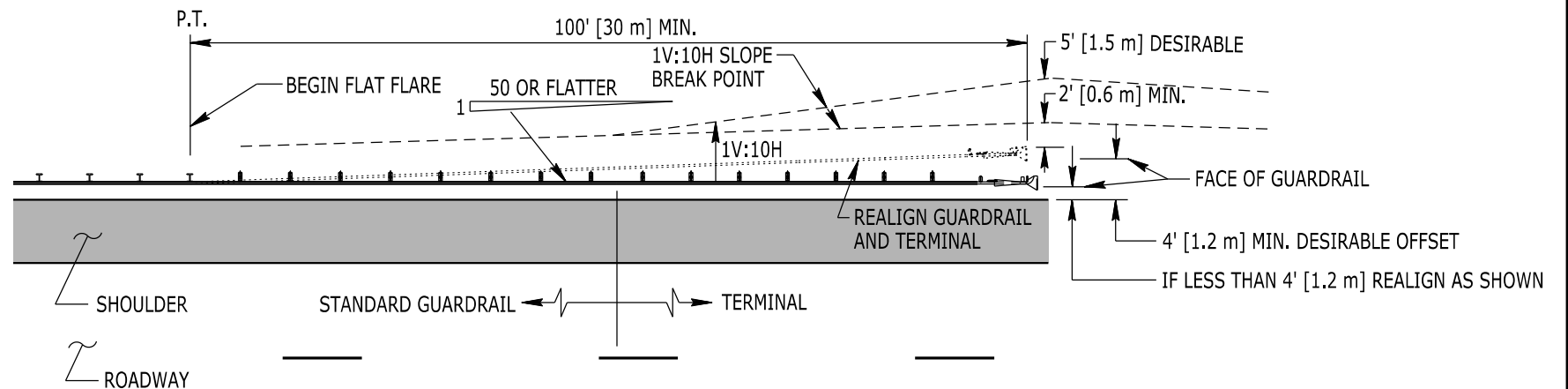


TYPICAL 1W:15L FLARE LAYOUT



CONNECTIONS TO BRIDGE RAILING AND OTHER TRAFFIC BARRIERS

Connect MGS guardrail to bridge rail and/or concrete barrier using the appropriate transition section at all ends receiving guardrail.



TANGENT (PARALLEL) GUARDRAIL INSTALLATIONS WHERE FACE OF GUARDRAIL IS LESS THAN 4 FEET [1.2 m] FROM THE EDGE OF SHOULDER

For tangent (parallel) guardrail installations within 4 feet [1.2 m] of the edge of the shoulder, realign a minimum of the last 100 feet [30 m] of guardrail on a flat flare to obtain up to a 4 foot [1.2 m] offset at the terminal, assuming adequate grading can be provided behind the guardrail and terminal. Maintain 1V:10H slopes from the shoulder to a minimum of 2 feet [0.6 m] behind the terminal or more desirably to 5 feet [1.5 m] behind the terminal.

Designed by: WBW
Drawn by: GLD
Checked by: WBW
Previous Dwg. No. 606-2A

GENERAL REQUIREMENTS



MGS GUARDRAIL

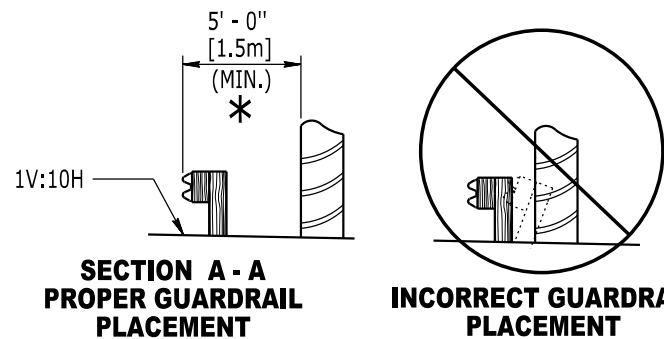
STANDARD PLAN

STANDARD PLAN NUMBER
606-2B
SHEET 1 of 18
Issued by: ENGINEERING SERVICES
Date Issued: SEPTEMBER 2023

Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.

NOTES

① **Shielding Fixed Object Hazards** - Do not place the guardrail any closer than the working width of the system to fixed object hazards which extend above ground line behind. Working width is the minimum distance from front face of the guardrail to the closest exposed face of a fixed object hazard located behind the guardrail.

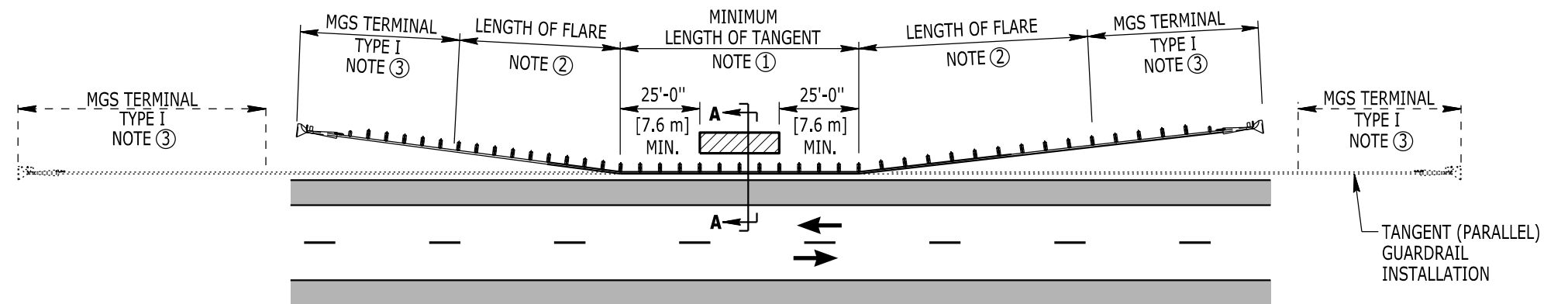


For fixed object hazards within close proximity of the guardrail (up to 1 1/2 ft. [0.5 m] plus the working width of the system), place a minimum of 25 ft. [7.6 m] of guardrail tangent (parallel) to the roadway on both the upstream and downstream end of the guardrail before flaring. When using reduced post spacing, extend the reduced spacing 25 ft. [7.5 m] upstream and downstream of the hazard and place tangent (parallel) to the roadway.

System	Post Spacing	Working Width *
Standard MGS	6' - 3" [1905]	5 ft. [1.5 m]
MGS Half Post Spacing	3' - 1 1/2" [950]	4 ft. [1.2 m]
MGS Quarter Post Spacing	1' - 6 3/4" [475]	3 ft. [0.9 m]
MGS with Long Post & Steep Slope Behind	6' - 3" [1905]	5 1/2 ft [1.7 m]
MGS Long Span	Up to 25' [7.6 m]	8 ft. [2.4 m]

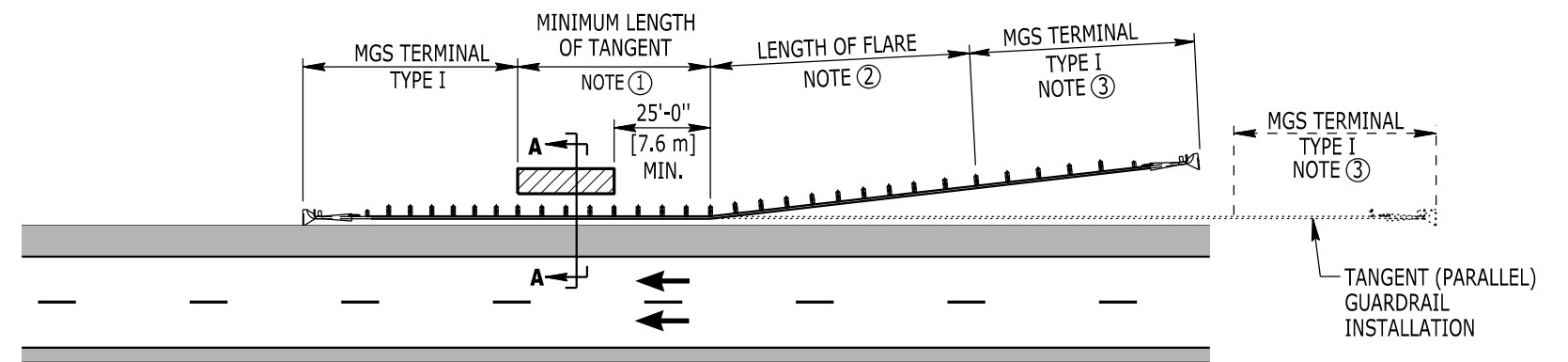
② **Flared vs. Tangent (Parallel) Installation** - Drawing depicts flared guardrail runs with solid lines and tangent (parallel) installations in dashed lines.

③ **Flared Terminals** - If Terminal Type II is specified, provide the required terminal offset flare in addition to any guardrail flare or to a tangent alignment.



TYPICAL GUARDRAIL PLACEMENT AROUND A FIXED OBJECT

TWO WAY TRAFFIC ROADWAYS



TYPICAL GUARDRAIL PLACEMENT AROUND A FIXED OBJECT

ONE WAY TRAFFIC ROADWAYS SUCH AS DIVIDED HIGHWAYS

Designed by: WBW
Drawn by: GLD
Checked by: WBW
Previous Dwg. No. 606-2A

GUARDRAIL PLACEMENT AROUND FIXED OBJECT HAZARDS

Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



MGS GUARDRAIL

STANDARD PLAN

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GRADING NOTES

If necessary, modify the earthwork shown in the plans and as staked to provide these minimum grading requirements at guardrail installations. The engineer will pay for this work using standard grading bid items as provided in the plans.

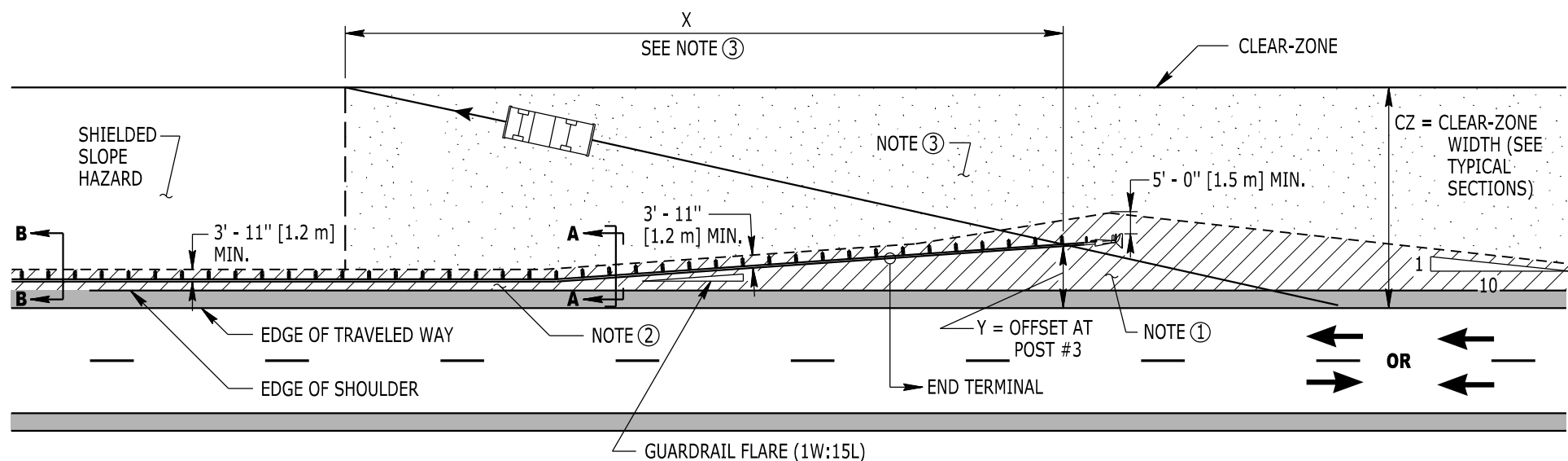
- ① Ensure the cross-slope of the earthwork in the area approaching a guardrail installation, the area around the terminal and the area of the guardrail flare is a 1V:10H surface or flatter.
- ② Ensure cross slope of grading from roadway to the barrier face is 1V:10H or flatter. Extend 1V:10H a minimum of 2 ft. [610] behind the guardrail posts. The department may specify 1V:8H for the guardrail installation where drainage and/or snow accumulation must be mitigated.
- ③ Ensure the area immediately behind and beyond the terminal is traversable and free from fixed object hazards or at least similar in character to upstream, unshielded slopes located within the clear-zone. Ensure a slope of 1V:4H or flatter; if not practical, use a maximum slope of 1V:3H. Extend the traversable slope for a distance X beyond post 3 of the end terminal.

If not shown in the plans, calculate X from the formula below:

$$X = (CZ - Y) (L_R) / (CZ)$$

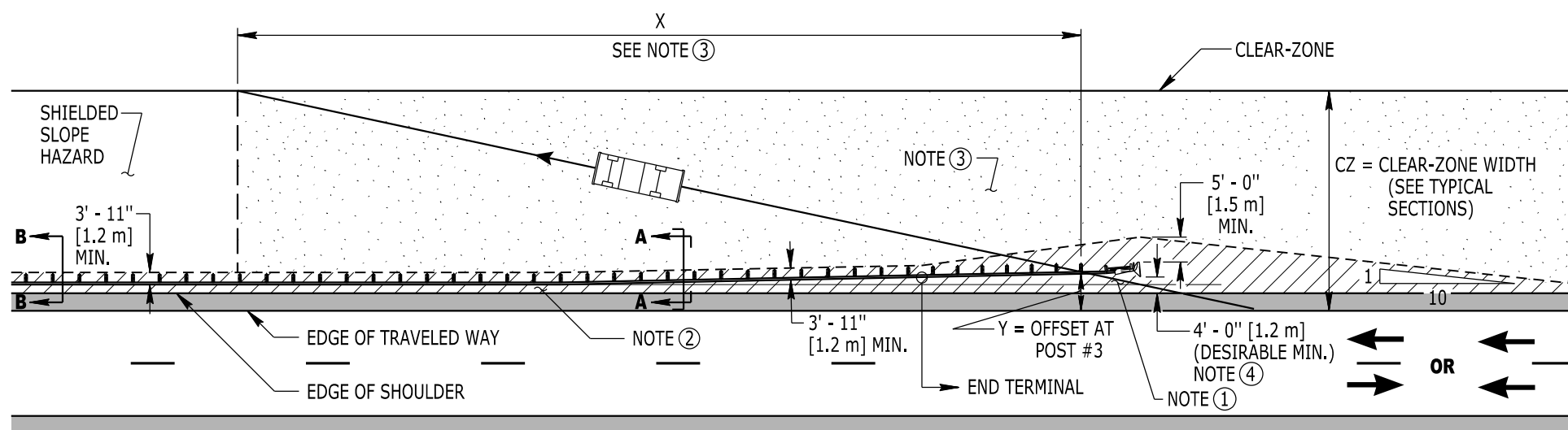
DESIGN SPEED		L _R Runout Length							
		ADT OVER 10,000		ADT 5,000 to 10,000		ADT 1,000 to 5,000		ADT Under 1000	
mph	[km/h]	ft	[m]	ft	[m]	ft	[m]	ft	[m]
80	130	470	143	430	131	380	116	330	101
70	110	360	110	330	101	290	88	250	76
60	100	300	91	250	76	210	64	200	61
50	80	230	70	190	58	160	49	150	46
40	60	160	49	130	40	110	34	100	30
30	50	110	34	90	27	80	24	70	21

- ④ For tangent guardrail installations where the face of the guardrail at the impact head of the terminal is less than 4 ft. [1.2 m] from the shoulder break point, realign the guardrail and terminal as shown in detail on **SHEET 1** of this standard plan.



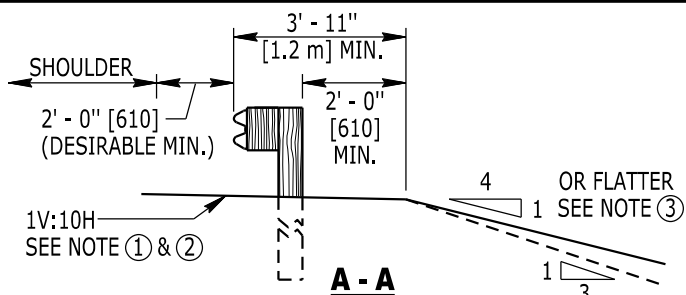
APPROACH END GRADING - FLARED GUARDRAIL INSTALLATION

(APPLIES TO TWO WAY TRAFFIC AND ONE WAY TRAFFIC ROADWAYS SUCH AS DIVIDED HIGHWAYS)

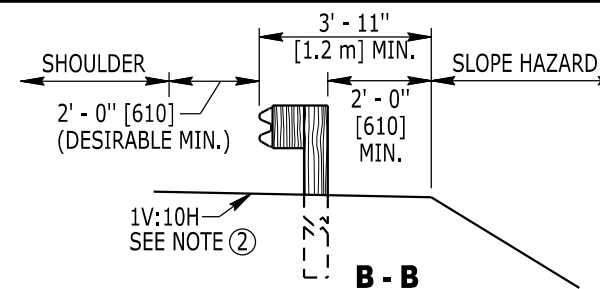


APPROACH END GRADING - TANGENT (PARALLEL) GUARDRAIL INSTALLATION

(APPLIES TO TWO WAY TRAFFIC AND ONE WAY TRAFFIC ROADWAYS SUCH AS DIVIDED HIGHWAYS)



RUNOUT GRADING BEHIND GUARDRAIL



FILL SLOPE HAZARD PROTECTION

Designed by: WBW
 Drawn by: GLD
 Checked by: WBW
 Previous Dwg. No. 606-2A

GRADING REQUIREMENTS

Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



MGS GUARDRAIL

STANDARD PLAN

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 Date Issued: SEPTEMBER 2023

GRADING NOTES

If necessary, modify the earthwork shown in the plans and as staked to provide these minimum grading requirements at guardrail installations. The engineer will pay for this work using standard grading bid items as provided in the plans.

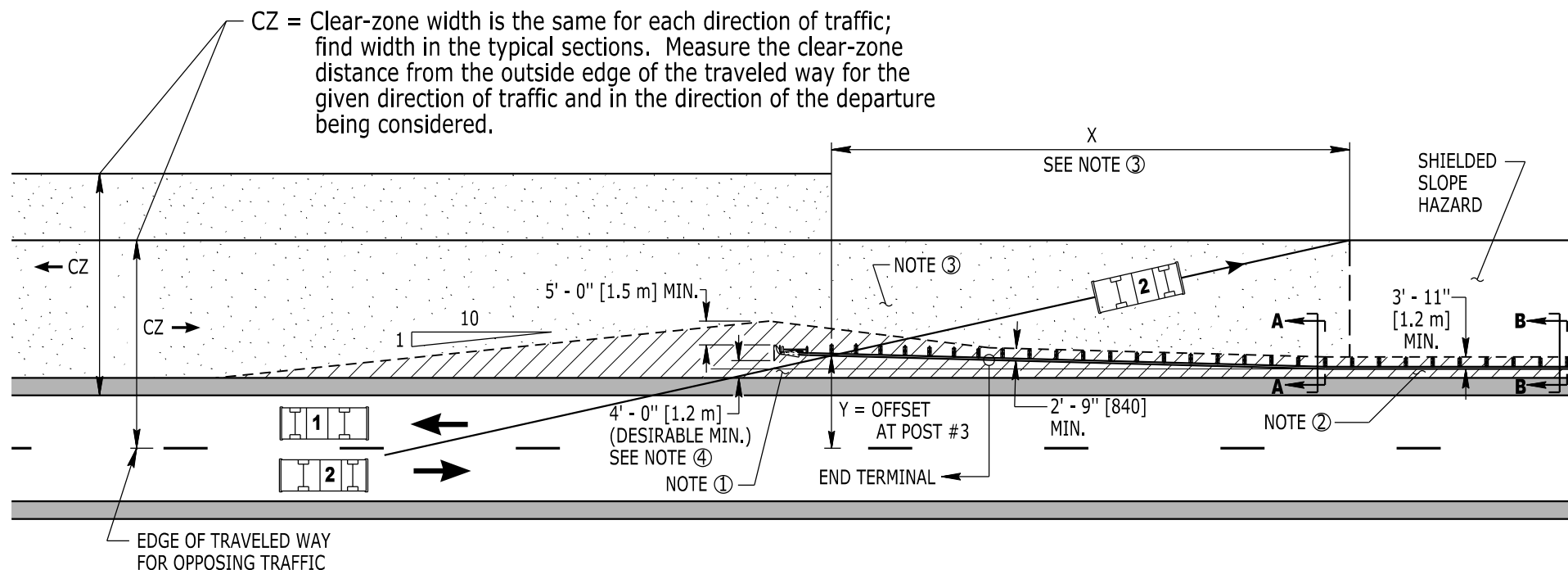
- ① Ensure the cross-slope of the earthwork in the area approaching a guardrail installation, the area around the terminal and the area of the guardrail flare is a 1V:10H surface or flatter.
- ② Ensure cross slope of grading from roadway to the barrier face is 1V:10H or flatter. Extend 1V:10H a minimum of 2 ft. [610] behind the guardrail posts. The department may specify 1V:8H for the guardrail installation where drainage and/or snow accumulation must be mitigated.
- ③ Ensure the area immediately behind and beyond the terminal is traversable and free from fixed object hazards or at least similar in character to upstream, unshielded slopes located within the clear-zone. Ensure a slope of 1V:4H or flatter; if not practical, use a maximum slope of 1V:3H. Extend the traversable slope for a distance X beyond post 3 of the end terminal.

If not shown in the plans, calculate X from the formula below:

$$X = (CZ - Y) (L_R) / (CZ)$$

DESIGN SPEED		L _R Runout Length							
		ADT OVER 10,000		ADT 5,000 to 10,000		ADT 1,000 to 5,000		ADT Under 1000	
mph	[km/h]	ft	[m]	ft	[m]	ft	[m]	ft	[m]
80	130	470	143	430	131	380	116	330	101
70	110	360	110	330	101	290	88	250	76
60	100	300	91	250	76	210	64	200	61
50	80	230	70	190	58	160	49	150	46
40	60	160	49	130	40	110	34	100	30
30	50	110	34	90	27	80	24	70	21

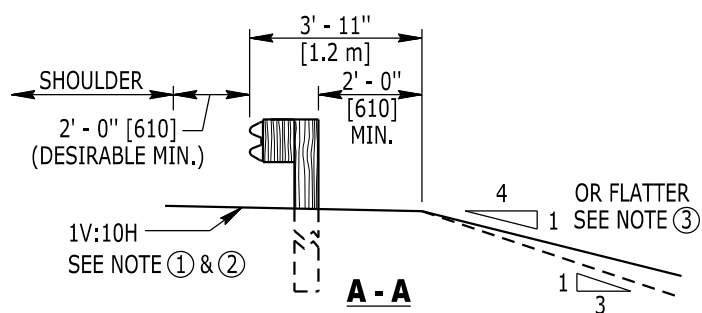
- ④ For tangent guardrail installations where the face of the guardrail at the impact head of the terminal is less than 4 ft. [1.2 m] from the shoulder break point, realign the guardrail and terminal as shown in detail on **SHEET 1** of this standard plan.



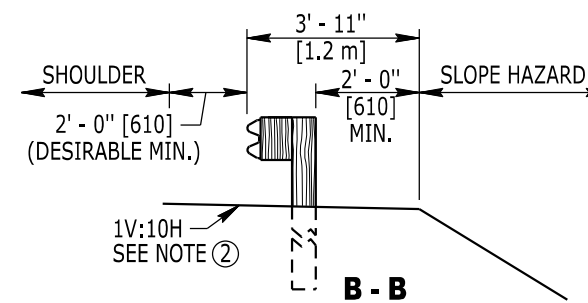
APPROACH END GRADING FOR OPPOSING TRAFFIC LANES

(APPLIES TO TWO WAY TRAFFIC ROADWAYS)

Note: Tangent installation shown, apply same concept for flared installations



RUNOUT GRADING BEHIND GUARDRAIL



FILL SLOPE HAZARD PROTECTION

Designed by: WBW
 Drawn by: GLD
 Checked by: WBW
 Previous Dwg. No. 606-2A

GRADING REQUIREMENTS (CONTINUED)

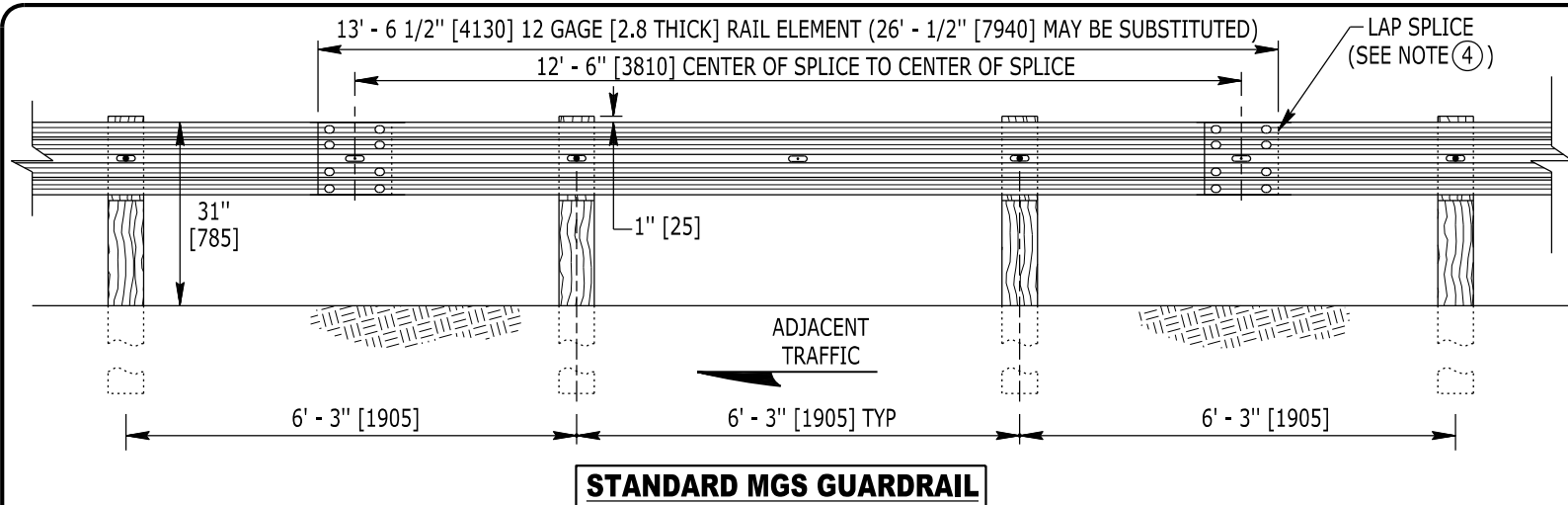
Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



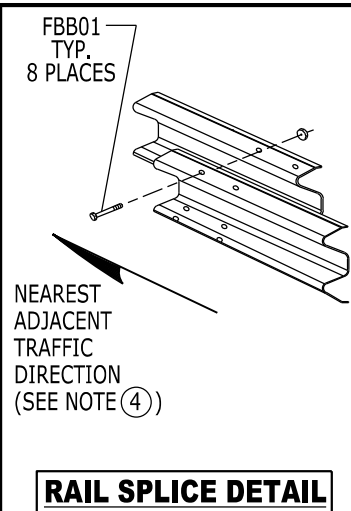
MGS GUARDRAIL

STANDARD PLAN

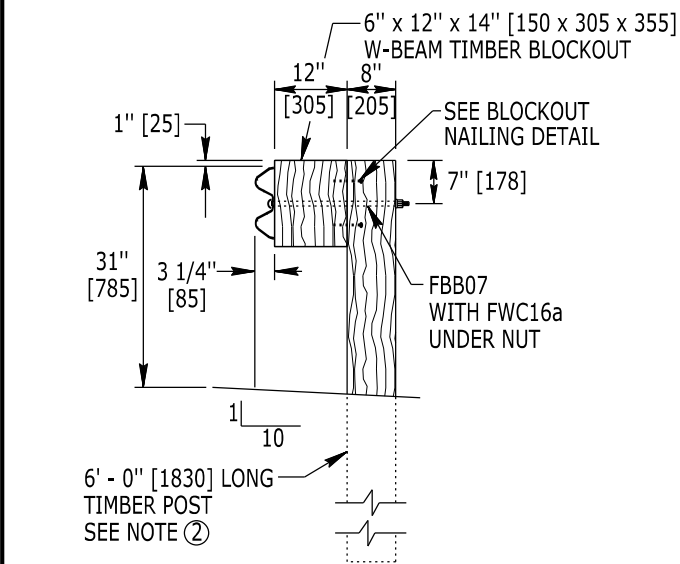
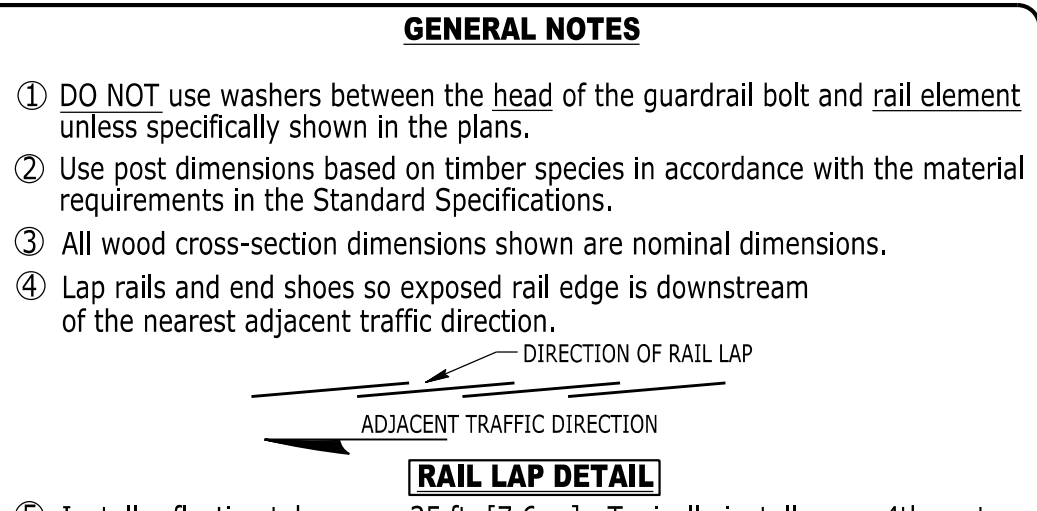
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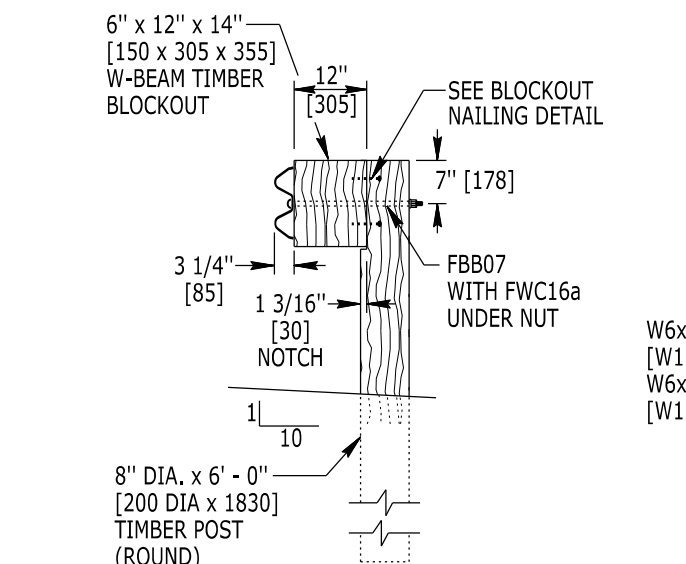
STANDARD MGS GUARDRAIL



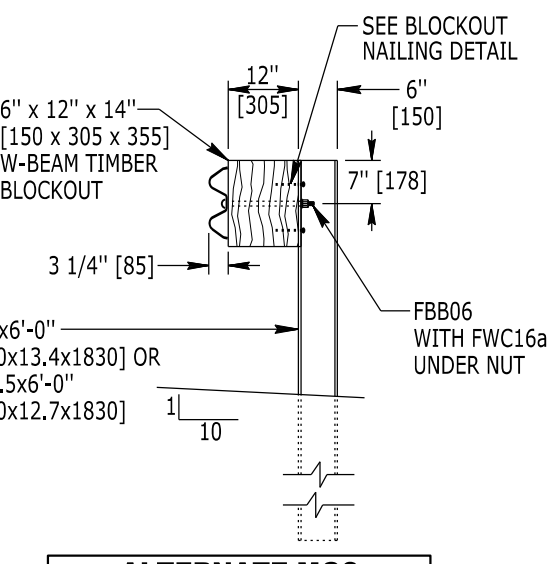
RAIL SPLICE DETAIL



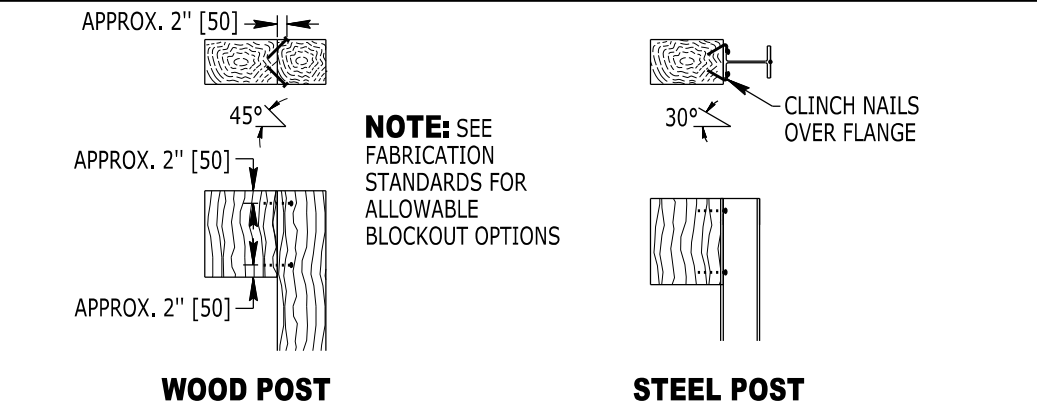
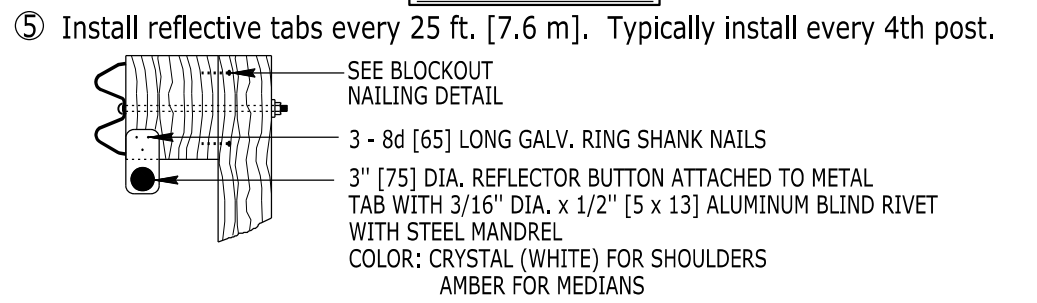
STANDARD MGS WOOD POST DETAIL



ALTERNATE MGS ROUND WOOD POST DETAIL

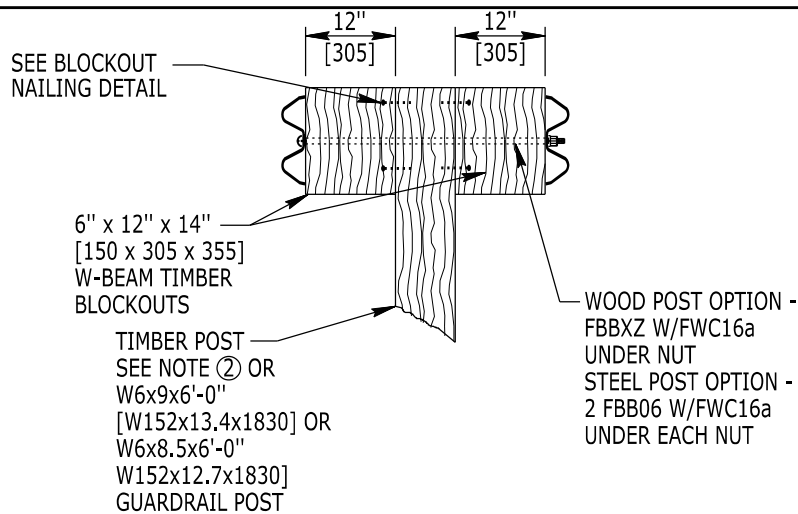


ALTERNATE MGS WITH STEEL POST DETAIL



Nail blockout (to prevent rotation) to post, top & bottom, both sides, (4 locations) using 20d [105 long] galvanized nails. If blockouts are two piece design, nail first blockout to second blockout in similar fashion as wood post detail.

BLOCKOUT NAILING DETAIL



TYPICAL MEDIAN POST DETAIL

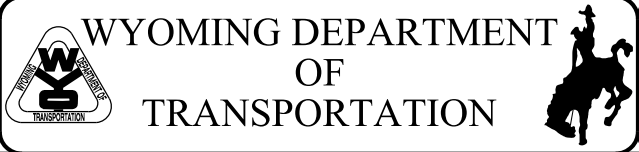
STANDARD GUARDRAIL BOLTS	
* DESIGNATOR	
FBB01	5/8" x 1 1/4" [16 x 32] BUTTON HEAD GUARDRAIL BOLT WITH NUT
FBB06	5/8" x 14" [16 x 355] BUTTON HEAD GUARDRAIL BOLT WITH NUT
FBB07	5/8" x 21" [16 x 535] BUTTON HEAD GUARDRAIL BOLT WITH NUT
FBBXZ	5/8" x 34" [16 x 865] BUTTON HEAD GUARDRAIL BOLT WITH NUT
FWC16a	ROUND WASHER FOR 5/8" [16] GUARDRAIL BOLT

*TASK FORCE13 STANDARD BARRIER GUIDE

Designed by: WBW
 Drawn by: GLD
 Checked by: WBW
 Previous Dwg. No. 606-2A

STANDARD RUN OF MGS GUARDRAIL

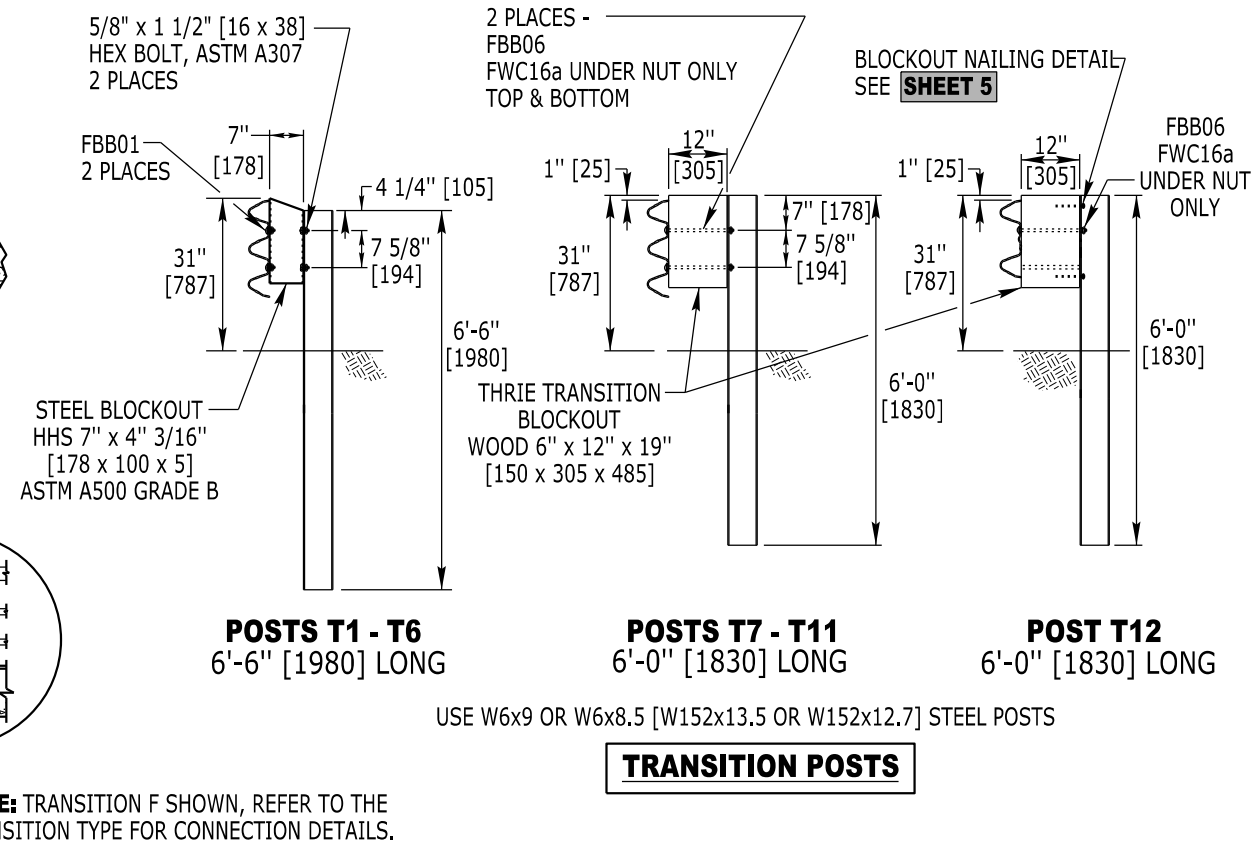
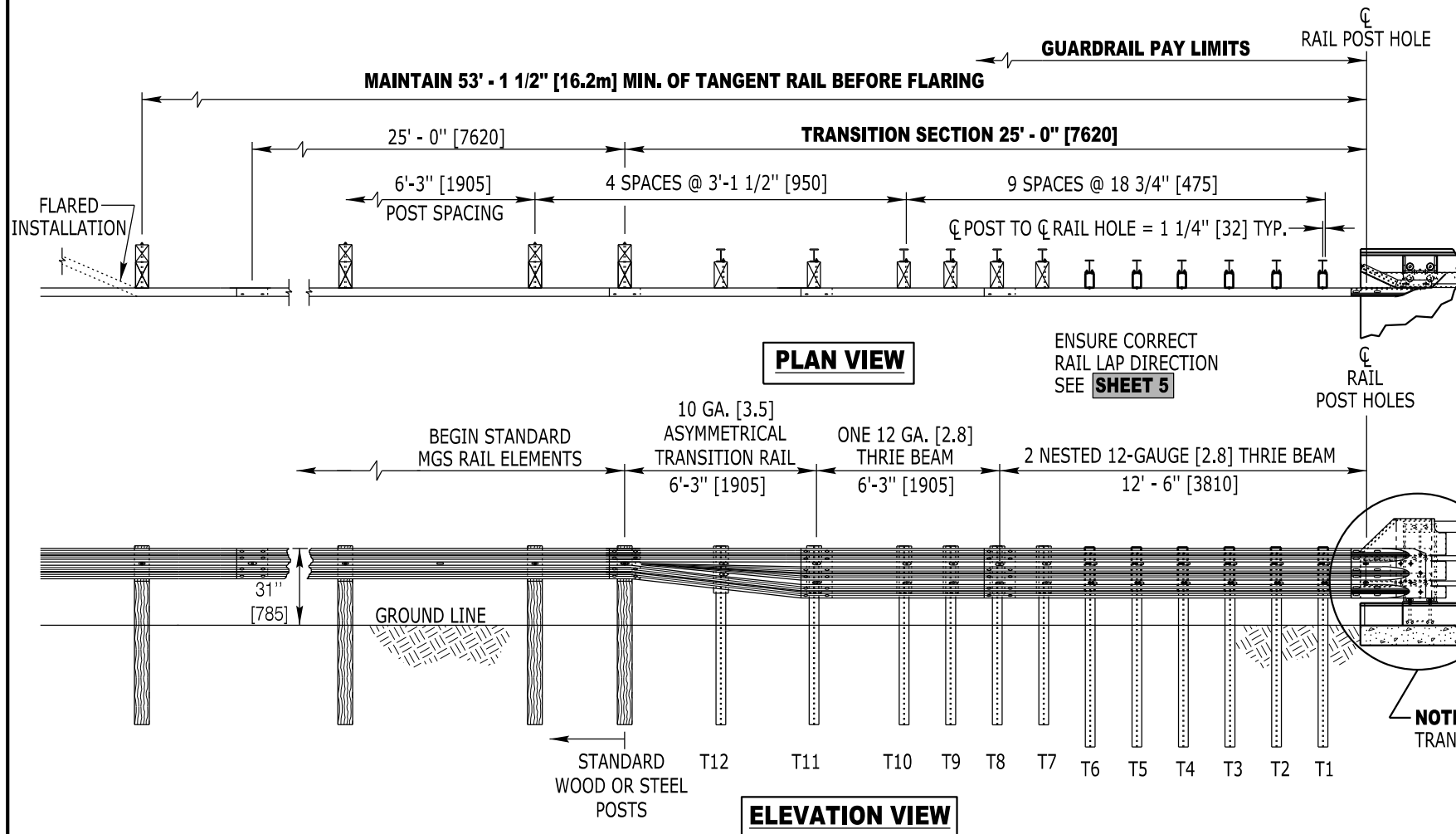
Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



MGS GUARDRAIL

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STANDARD GUARDRAIL BOLTS	
* DESIGNATOR	
FBB01	5/8" x 1 1/4" [16 x 32] BUTTON HEAD GUARDRAIL BOLT W/NUT
FBB06	5/8" x 14" [16 x 355] BUTTON HEAD GUARDRAIL BOLT W/NUT
FWC16a	ROUND WASHER FOR 5/8" [16] BOLT

* TASK FORCE 13 STANDARD BARRIER GUIDE

Designed by: WBW
 Drawn by: GLD
 Checked by: WBW
 Previous Dwg. No. 606-2A

TRANSITION A - F APPROACH GUARDRAIL LAYOUT

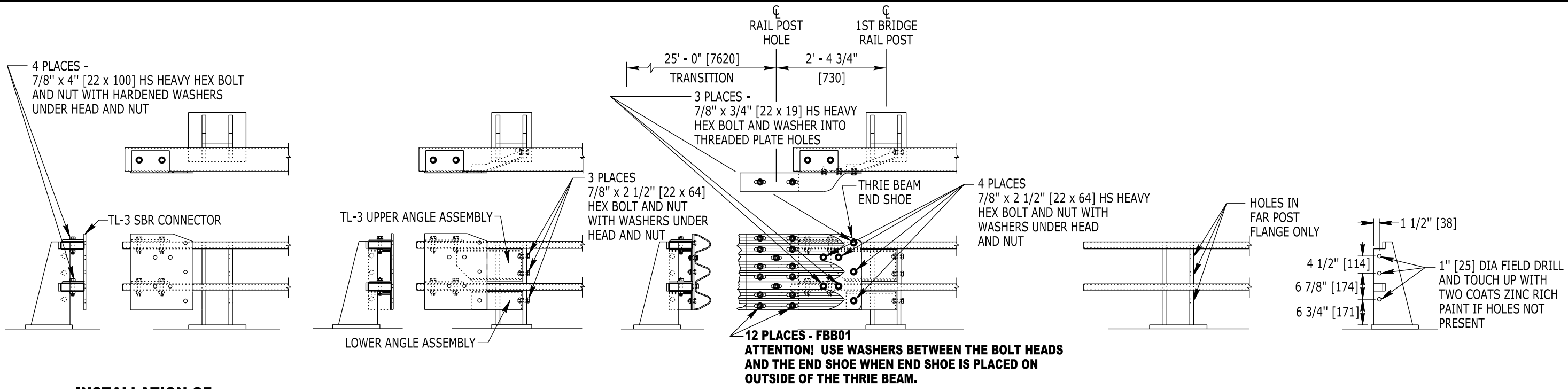
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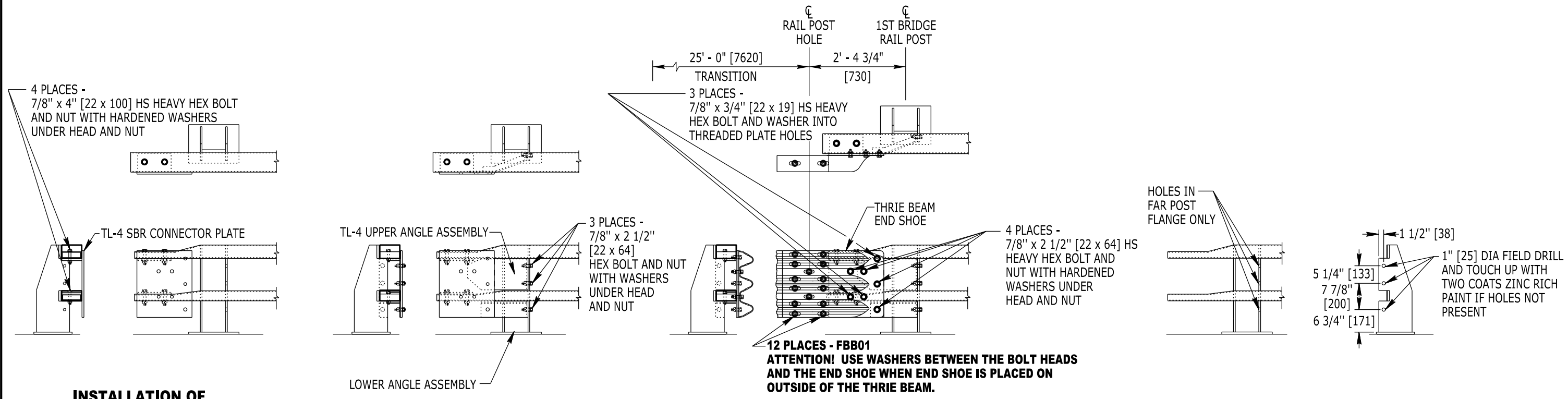
INSTALLATION OF TL-3 SBR CONNECTOR

INSTALLATION OF ANGLE ASSEMBLIES

INSTALLATION OF THRIE-BEAM END SHOE

ANGLE PLATE MOUNTING HOLES

TRANSITION A 29-2ST BRIDGE RAIL (29in. [740] - 2 STEEL TUBE BRIDGE RAIL)



INSTALLATION OF TL-4 SBR CONNECTOR

INSTALLATION OF ANGLE ASSEMBLIES

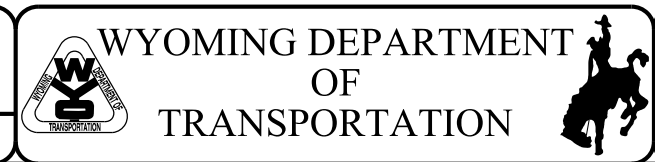
INSTALLATION OF THRIE-BEAM END SHOE

ANGLE PLATE MOUNTING HOLES

TRANSITION B 33-2ST BRIDGE RAIL (33in. [840] - 2 STEEL TUBE BRIDGE RAIL)

Designed by: WBW
Drawn by: GLD
Checked by: WBW
Previous Dwg. No. 606-2A

TRANSITION A 29-2ST BRIDGE RAIL,
TRANSITION B 33-2ST BRIDGE RAIL
CONNECTION DETAILS



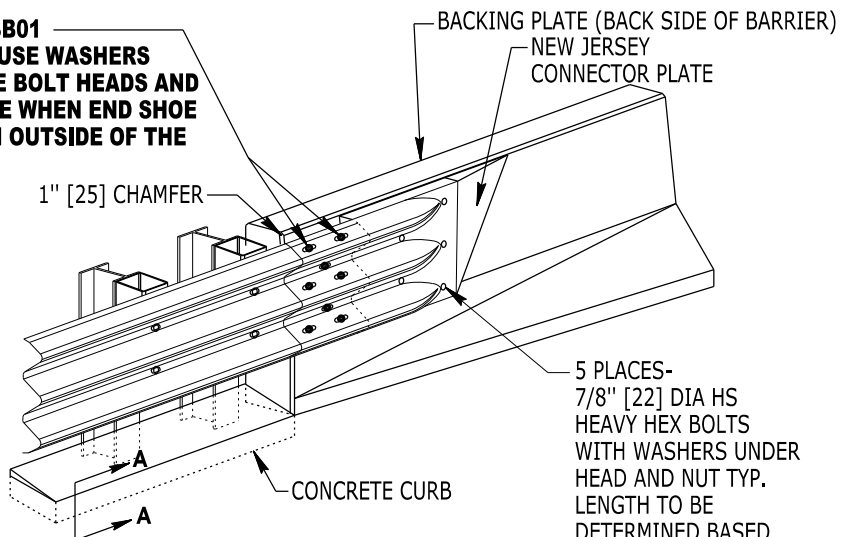
MGS GUARDRAIL

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SHEET 7 of 18
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Date Issued: SEPTEMBER 2023

Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.

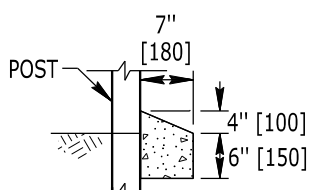
STANDARD PLAN

12 PLACES-FBB01
ATTENTION! USE WASHERS
BETWEEN THE BOLT HEADS AND
THE END SHOE WHEN END SHOE
IS PLACED ON OUTSIDE OF THE
THRIE BEAM.

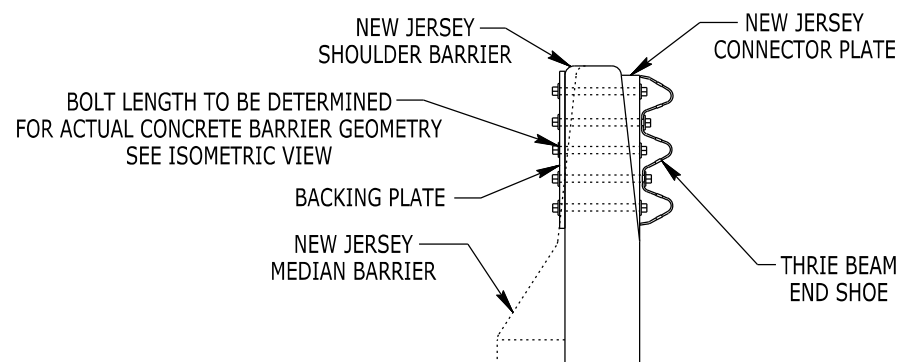


ISOMETRIC VIEW

5 PLACES-
 7/8" [22] DIA HS
 HEAVY HEX BOLTS
 WITH WASHERS UNDER
 HEAD AND NUT TYP.
 LENGTH TO BE
 DETERMINED BASED
 ON BARRIER
 CROSS-SECTION



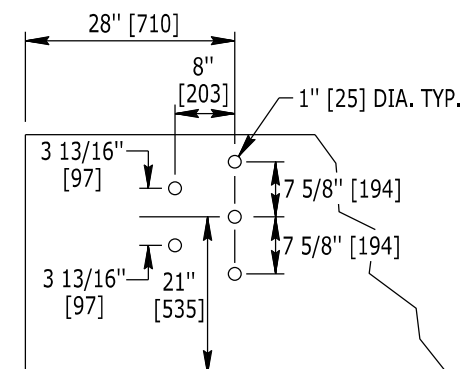
CONCRETE CURB DETAIL
SECTION A-A



END VIEW

NEW JERSEY CONCRETE BARRIER

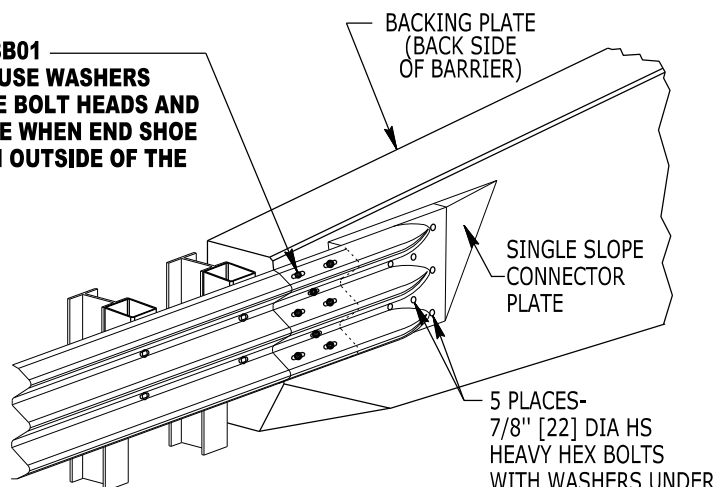
BOLT LENGTH TO BE DETERMINED
 FOR ACTUAL CONCRETE BARRIER GEOMETRY
 SEE ISOMETRIC VIEW



HOLE DRILLING PATTERN
FOR CONCRETE BARRIER

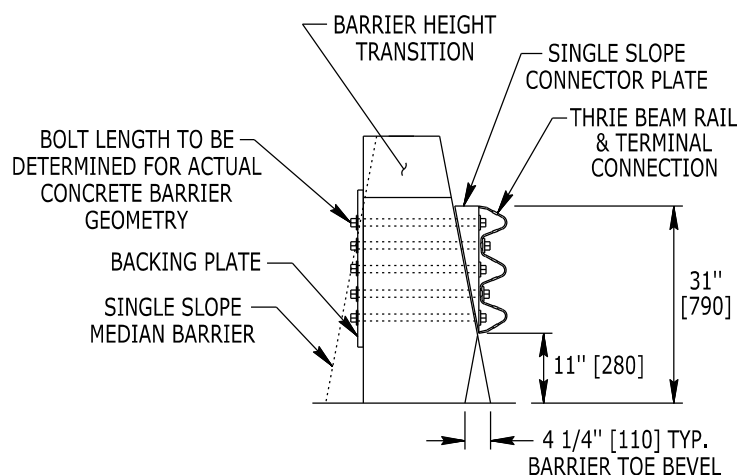
TRANSITION C NJ SHAPE (CONCRETE NEW JERSEY SHAPE)

12 PLACES-FBB01
ATTENTION! USE WASHERS
BETWEEN THE BOLT HEADS AND
THE END SHOE WHEN END SHOE
IS PLACED ON OUTSIDE OF THE
THRIE BEAM.



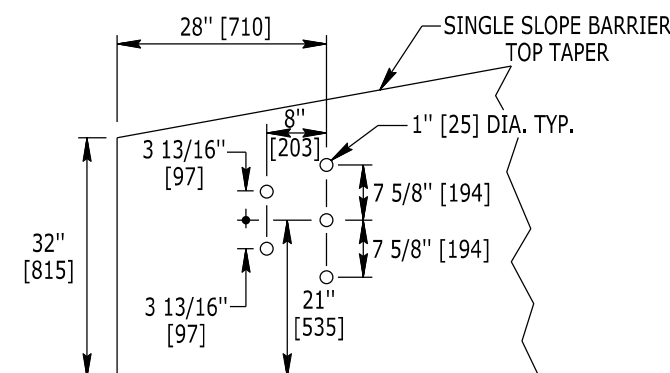
ISOMETRIC VIEW

5 PLACES-
 7/8" [22] DIA HS
 HEAVY HEX BOLTS
 WITH WASHERS UNDER
 HEAD AND NUT TYP.
 LENGTH TO BE
 DETERMINED BASED
 ON BARRIER
 CROSS-SECTION



END VIEW SINGLE SLOPE
CONCRETE BARRIER

BOLT LENGTH TO BE
 DETERMINED FOR ACTUAL
 CONCRETE BARRIER
 GEOMETRY



HOLE DRILLING PATTERN
FOR CONCRETE BARRIER

TRANSITION D SS SHAPE (CONCRETE SINGLE SLOPE SHAPE)

Designed by: WBW
 Drawn by: GLD
 Checked by: WBW
 Previous Dwg. No.
 606-2A

TRANSITION C CONC. NJ SHAPE,
 TRANSITION D CONC. SS SHAPE
 CONNECTION DETAILS

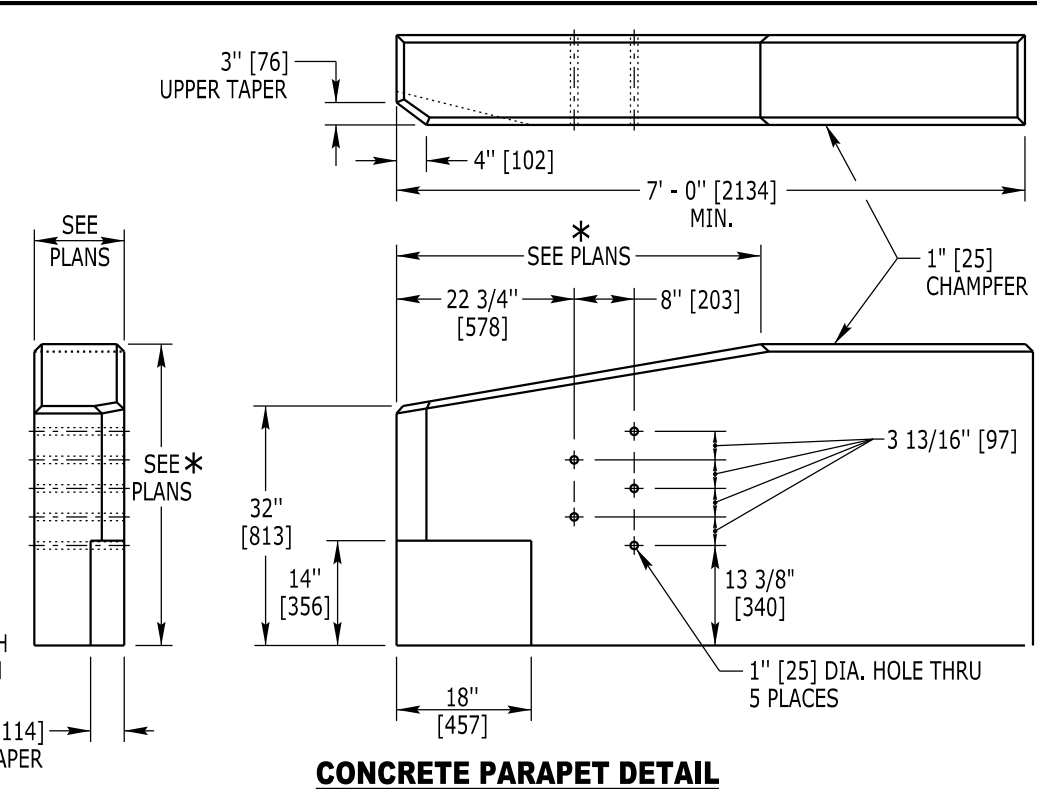
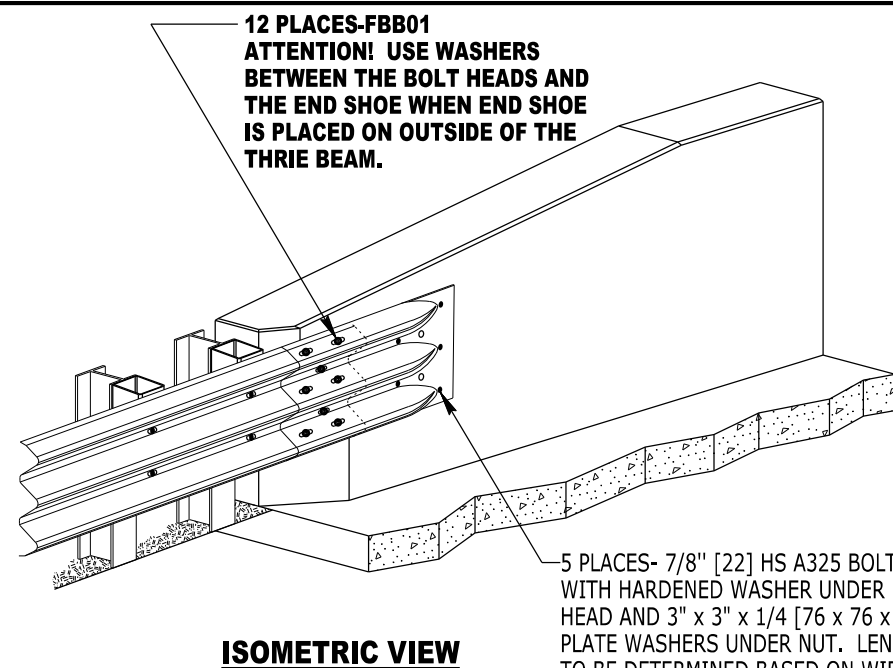
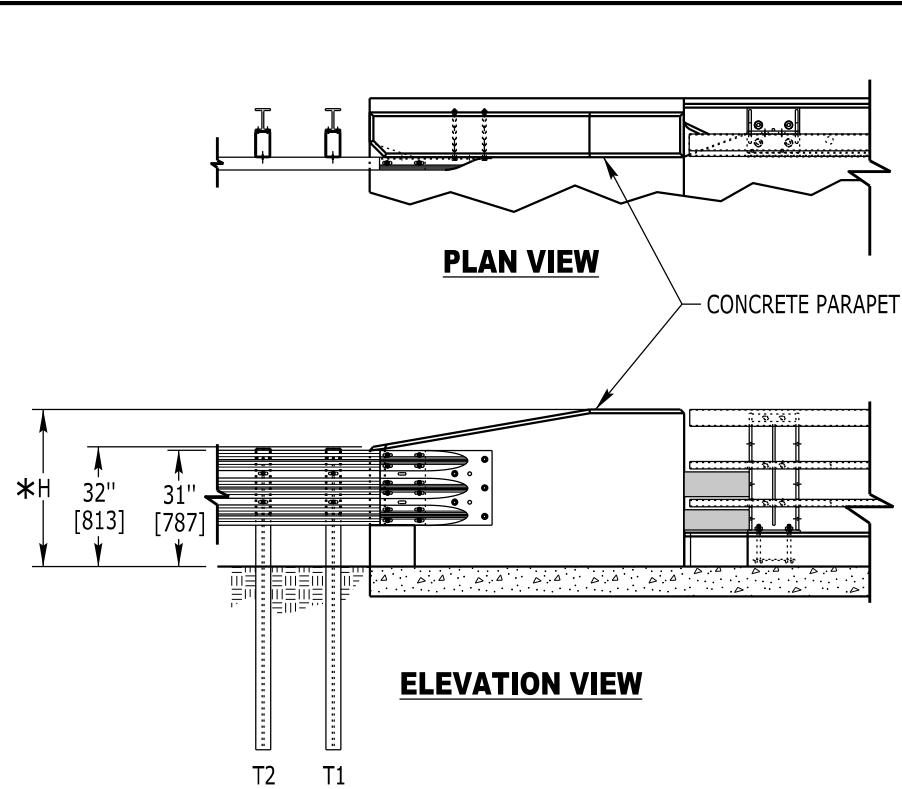
Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



MGS GUARDRAIL

STANDARD PLAN

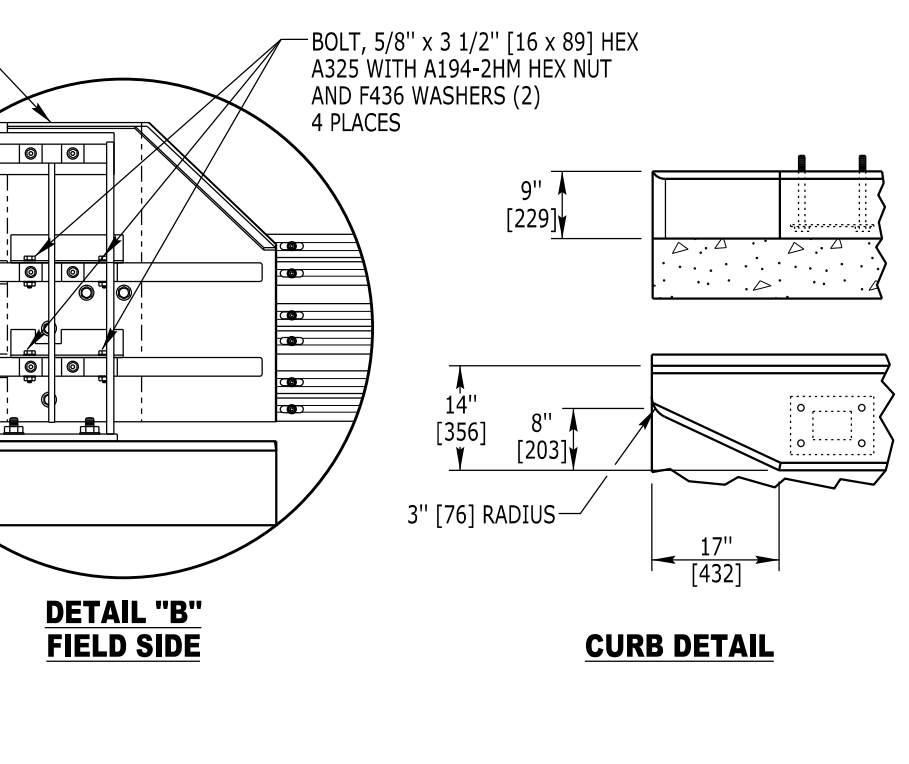
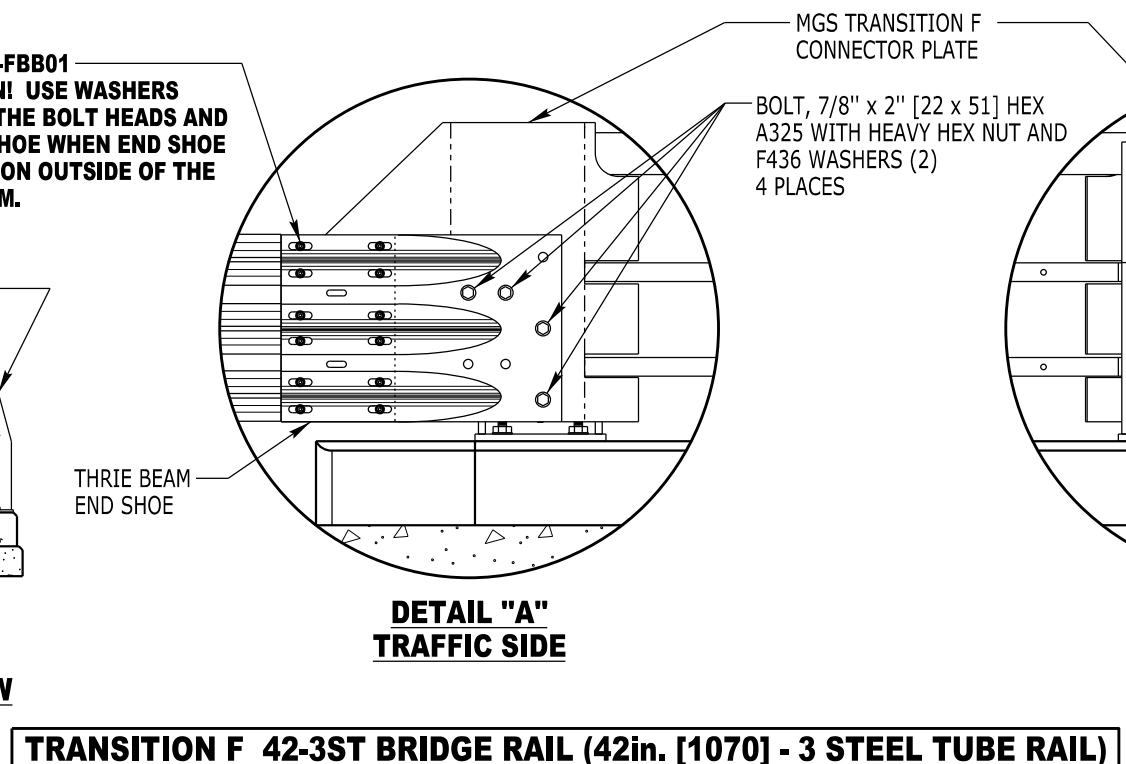
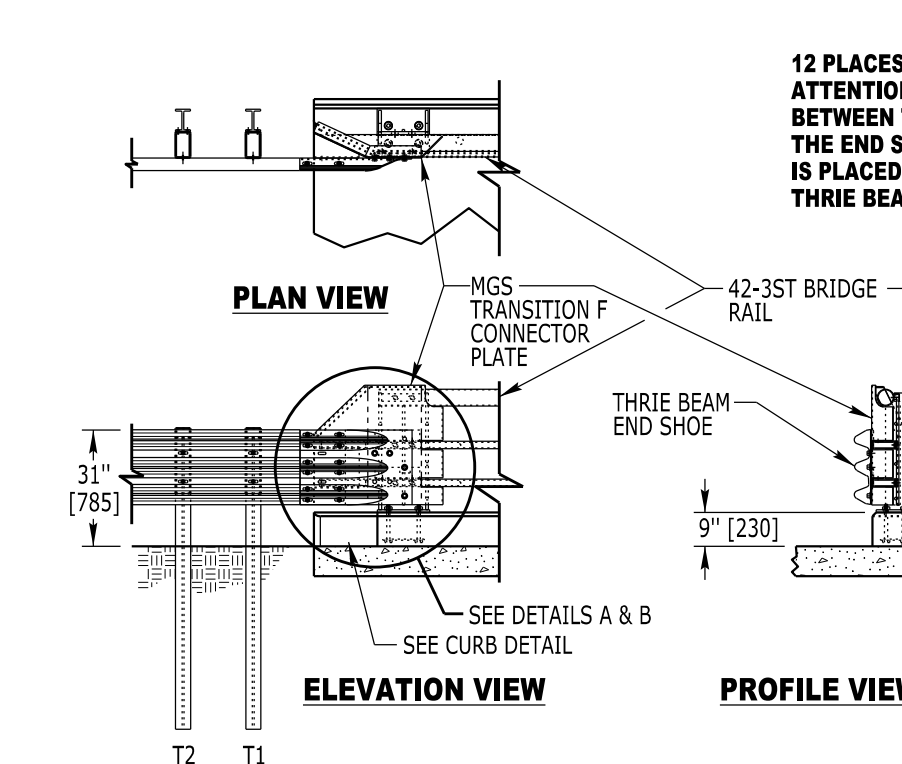
STANDARD PLAN NUMBER
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 SHEET 8 of 18
 Issued by: ENGINEERING SERVICES
 Date Issued: SEPTEMBER 2023



TRANSITION E CONC. VERTICAL SHAPE (CONCRETE VERTICAL SHAPE)

Note: Details depict a typical Vertical Parapet. See plans for actual configuration.

* Concrete Parapet height transition - Maintain 6:1 vertical taper until desired height is reached.

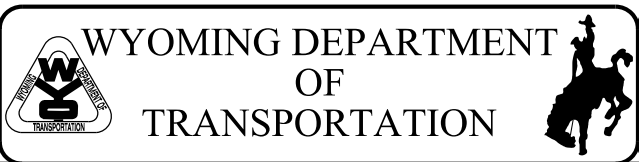


TRANSITION F 42-3ST BRIDGE RAIL (42in. [1070] - 3 STEEL TUBE RAIL)

Designed by: WBW
 Drawn by: GLD
 Checked by: WBW
 Previous Dwg. No. 606-2A

TRANSITION E CONC. VERTICAL SHAPE,
 TRANSITION F 42-3ST BRIDGE RAIL
 CONNECTION DETAILS

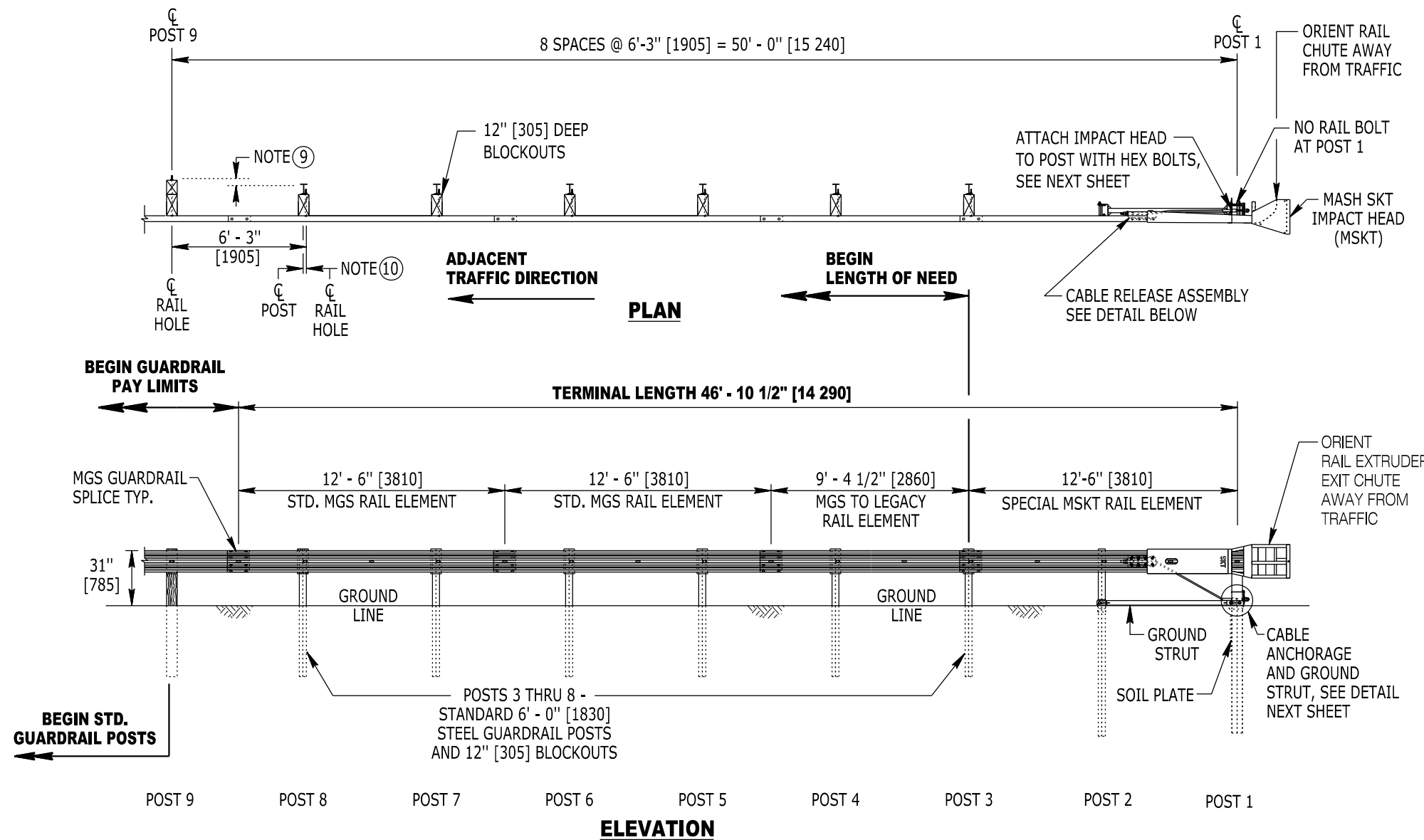
Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



MGS GUARDRAIL

STANDARD PLAN

STANDARD PLAN NUMBER
606-2B
 SHEET 9 of 18
 Issued by: ENGINEERING SERVICES
 Date Issued: SEPTEMBER 2023

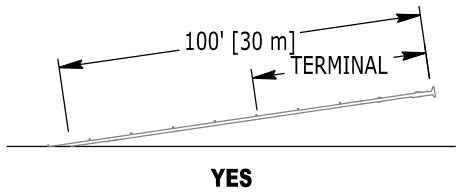
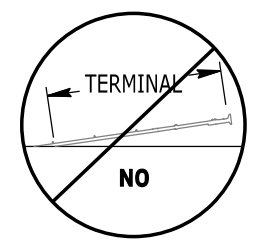
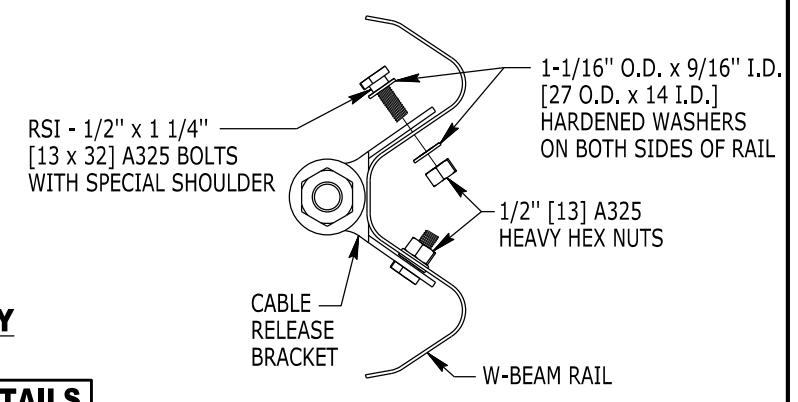
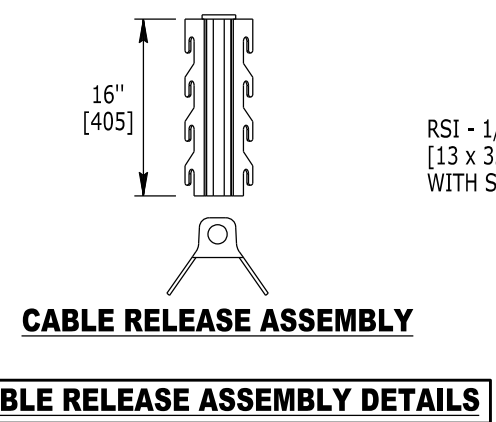
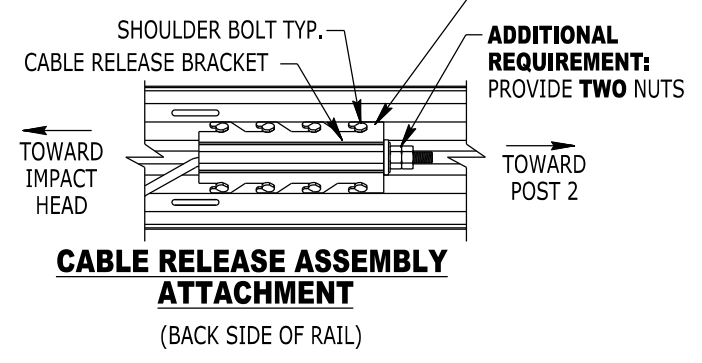


NOTES

- ① MSKT MGS (for MGS 31" [785] Guardrail) = MASH Tested, TL-3, redirective, gating terminal. This is an approved option for "MGS Terminal Type I." Provide terminal with steel posts. This terminal may be attached to standard guardrail runs having either wood or steel posts.

The MSKT MGS Terminal shown herein is proprietary and can only be manufactured and sold by Road Systems Inc. or its duly authorized representative. Details shown herein are approximate. Install in strict accordance with the manufacturer's installation manual. Provide and install any items shown herein as an "additional requirement."
Summary of "Additional requirements:" Double nut each end of the cable anchor.
- ② Lap the upstream rail (for the adjacent traffic direction) over the downstream rail element at each splice. See rail lap detail on **SHEET 5**.
- ③ Attach impact head to post 1 as shown. Do not attach rail to post 1.
- ④ Do not place any type of washer or delineation under the head of the rail/post bolts.
- ⑤ The lower section of the hinged post should not be driven with the upper post attached. If the post is placed in a drilled hole, the backfill material must be satisfactorily compacted to prevent settlement.
- ⑥ The lower sections of posts 1 & 2 shall not protrude more than 4 inches [100] above the ground line. Correct site grading when necessary as directed by the engineer.
- ⑦ Ensure the cable anchor assembly is taut.
- ⑧ Ensure all hardware and assemblies are galvanized or coated to prevent corrosion.
- ⑨ Note the lateral offset to the back of posts changes from the terminal section with 12 inch [305] blockouts and steel posts to the standard guardrail section with 12 inch [305] blockouts if wood posts are provided.
- ⑩ The first spacing from the centerline of steel posts in the terminal section to the centerline of wood post (if provided) in the standard guardrail section will be 6' - 3" [1905] plus or minus 1 1/8" [30] to account for bolt holes being offset in steel posts.
- ⑪ **Placing Terminal on Flare:** If the terminal is placed on a flare steeper than 1:25 (for example, if it is placed on a 1:15 flare), provide at least 100 ft. [30 m] of guardrail including the terminal length on the same flared alignment.

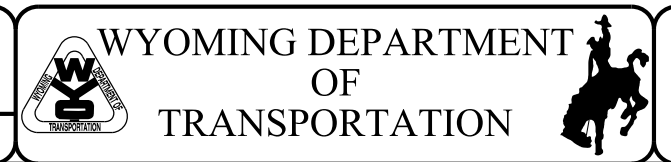
ENSURE THIS ORIENTATION OF SLOTS SO IMPACT HEAD CAN DRIVE BRACKET OFF BOLTS WHEN IMPACTED



Designed by: WBW
 Drawn by: GLD
 Checked by: WBW
 Previous Dwg. No. 606-2A

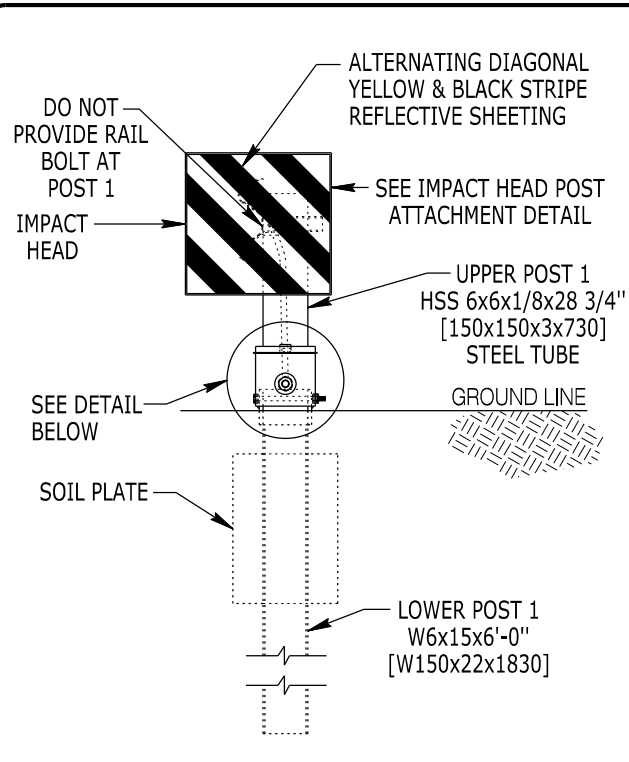
TERMINAL TYPE I (OPTION 1 - MSKT MGS, SHEET 1 OF 2)

Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.

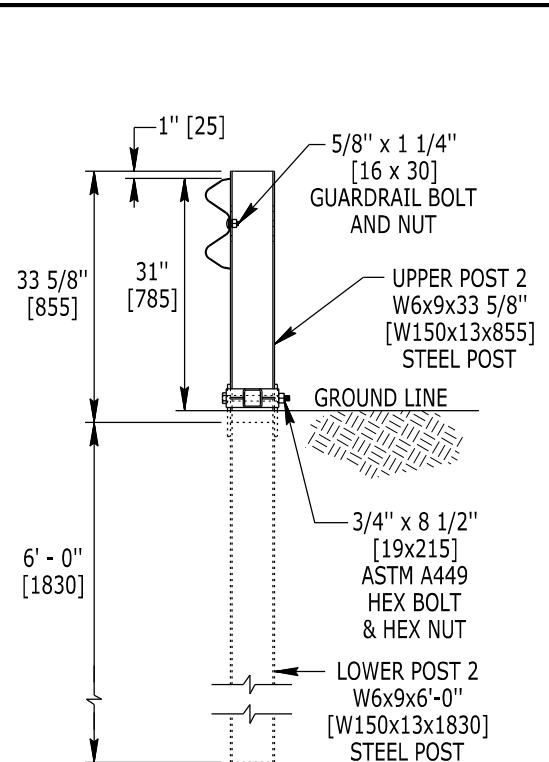


MGS GUARDRAIL
 STANDARD PLAN

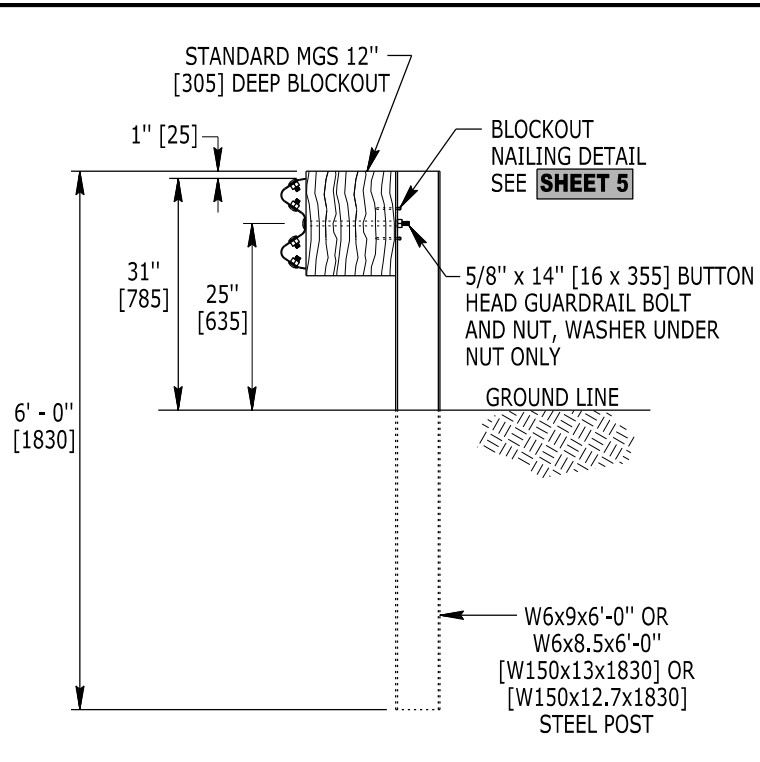
STANDARD PLAN NUMBER
606-2B
 SHEET 10 of 18
 Issued by: ENGINEERING SERVICES
 Date Issued: SEPTEMBER 2023



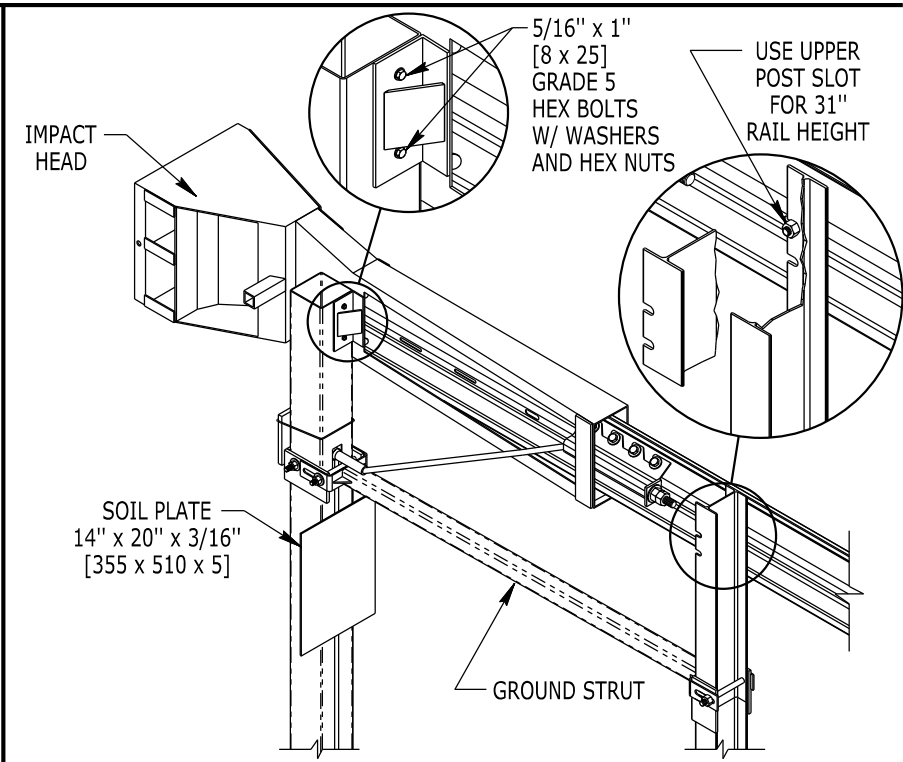
POST 1



POST 2

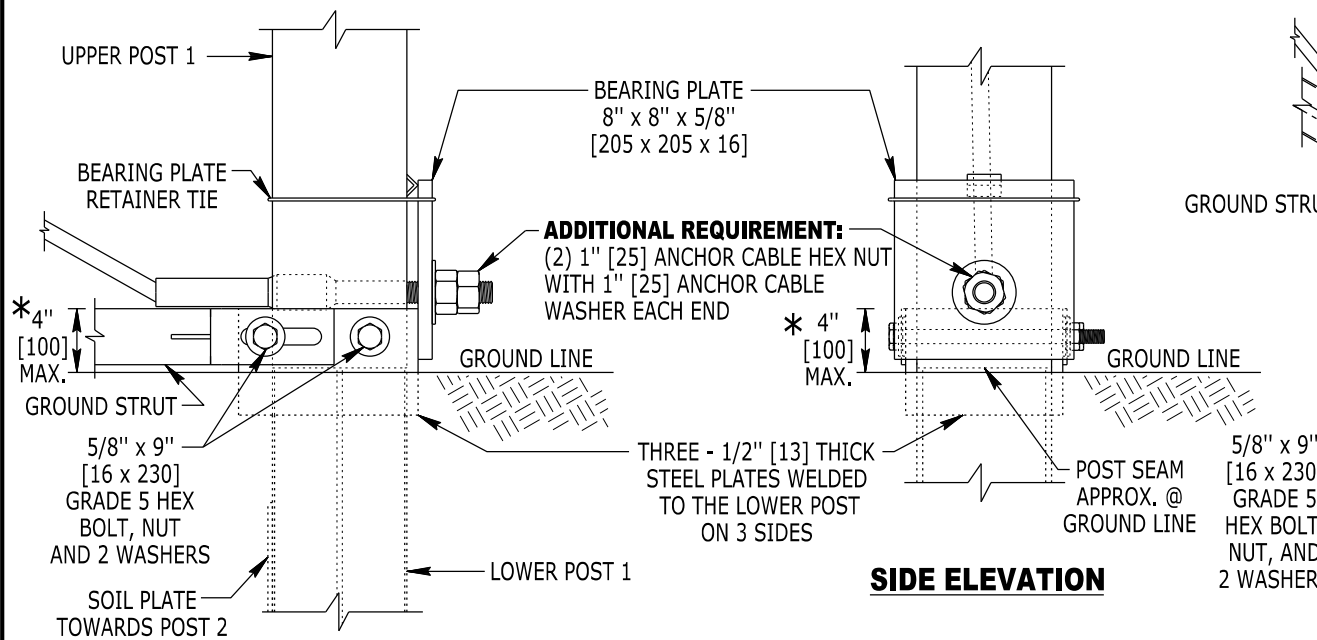


POST 3 THRU 8



ISOMETRIC VIEW

MSKT IMPACT HEAD POST ATTACHMENT DETAIL



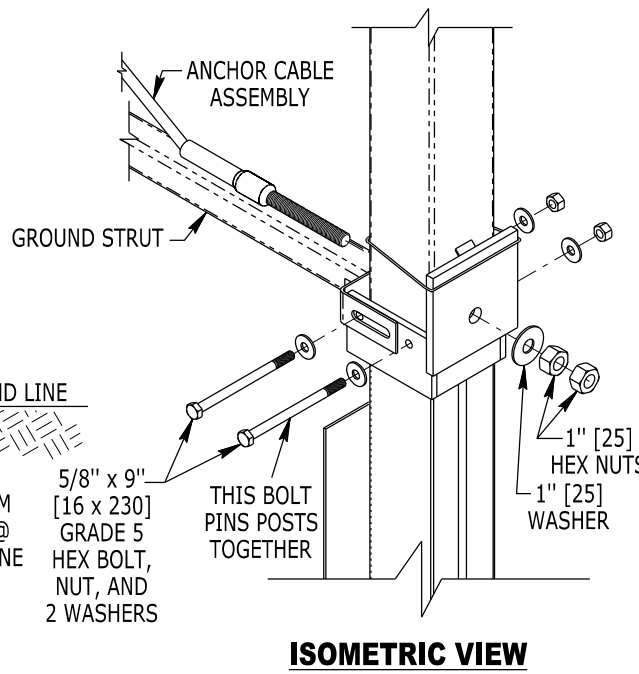
FRONT ELEVATION

SIDE ELEVATION

ISOMETRIC VIEW

POST 1 CABLE ANCHORAGE AND GROUND STRUT DETAILS

* ATTENTION, IF THIS DIMENSION EXCEEDS 4" [100] CONSULT THE ENGINEER AS THERE MAY BE A GRADING ISSUE



FRONT ELEVATION

ISOMETRIC VIEW

POST 2 GROUND STRUT DETAILS

Designed by: WBW
 Drawn by: GLD
 Checked by: WBW
 Previous Dwg. No. 606-2A

TERMINAL TYPE I (OPTION 1 - MSKT MGS, SHEET 2 OF 2)

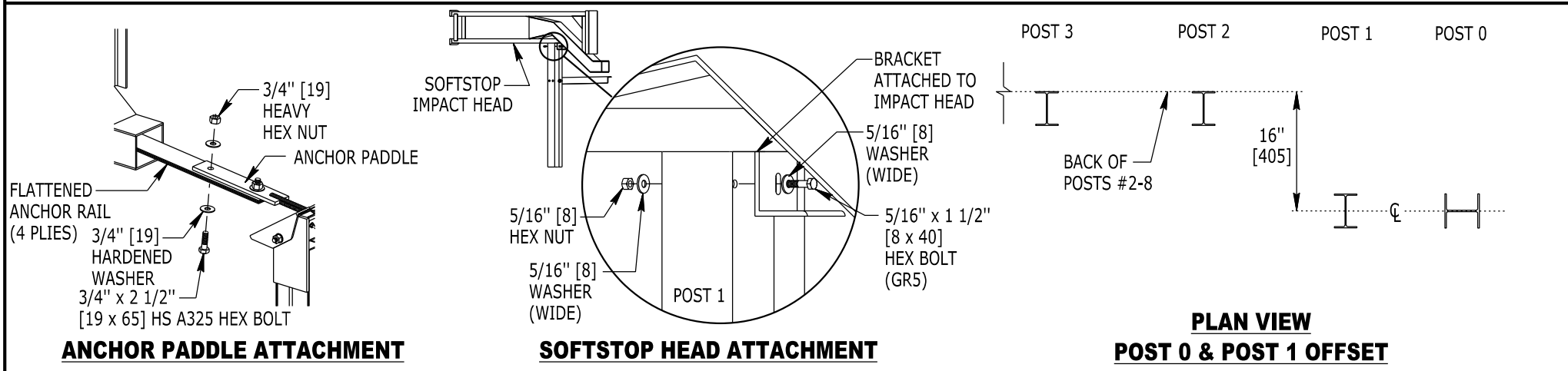
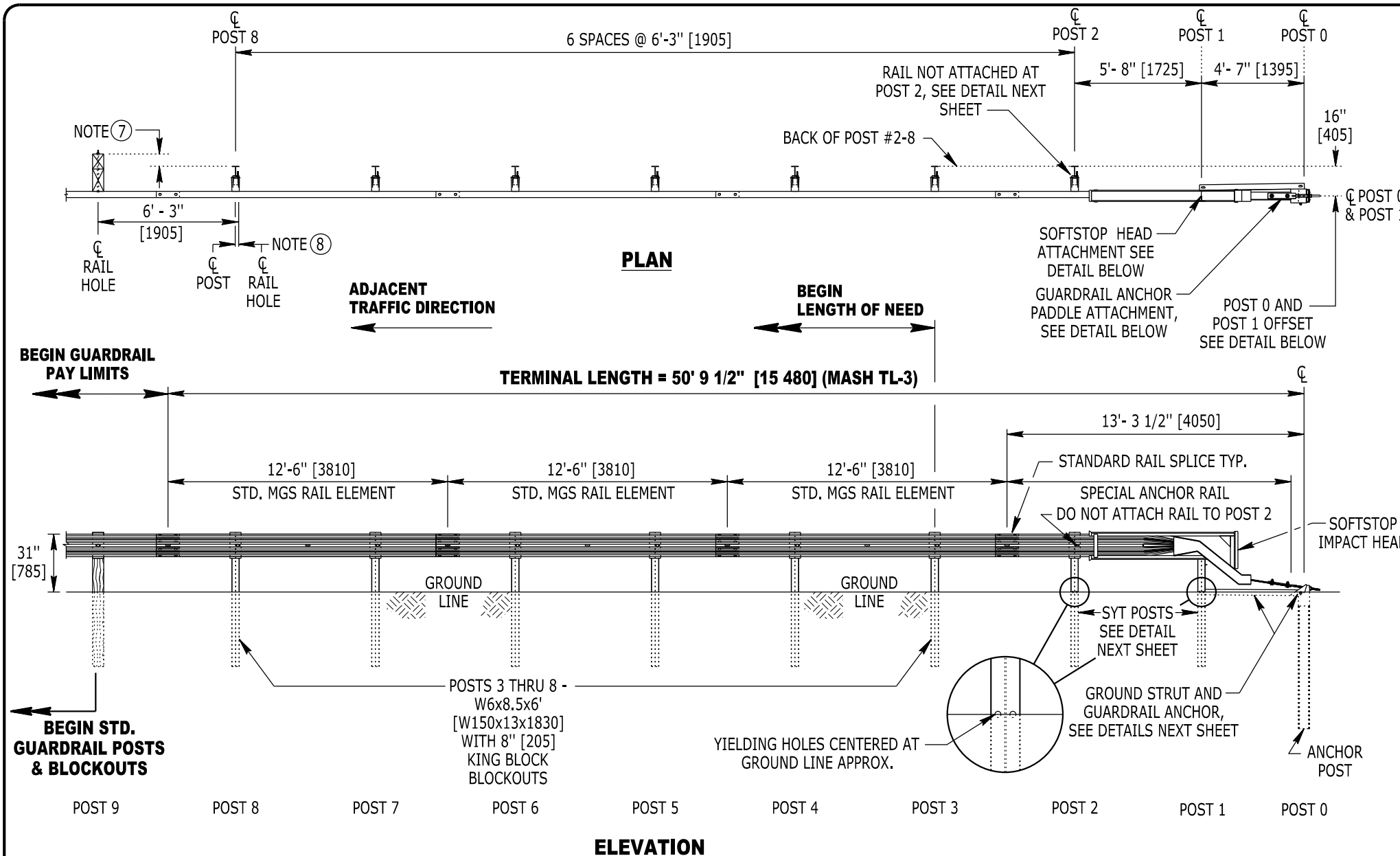
Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



MGS GUARDRAIL

STANDARD PLAN

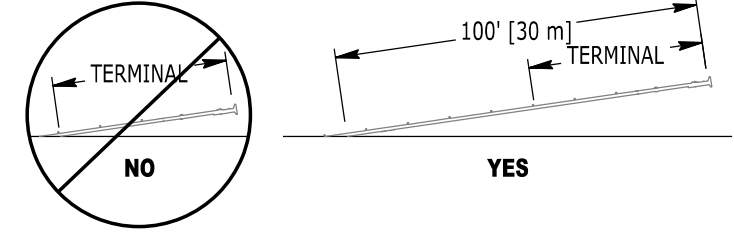
STANDARD PLAN NUMBER
606-2B
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 Issued by: ENGINEERING SERVICES
 Date Issued: SEPTEMBER 2023

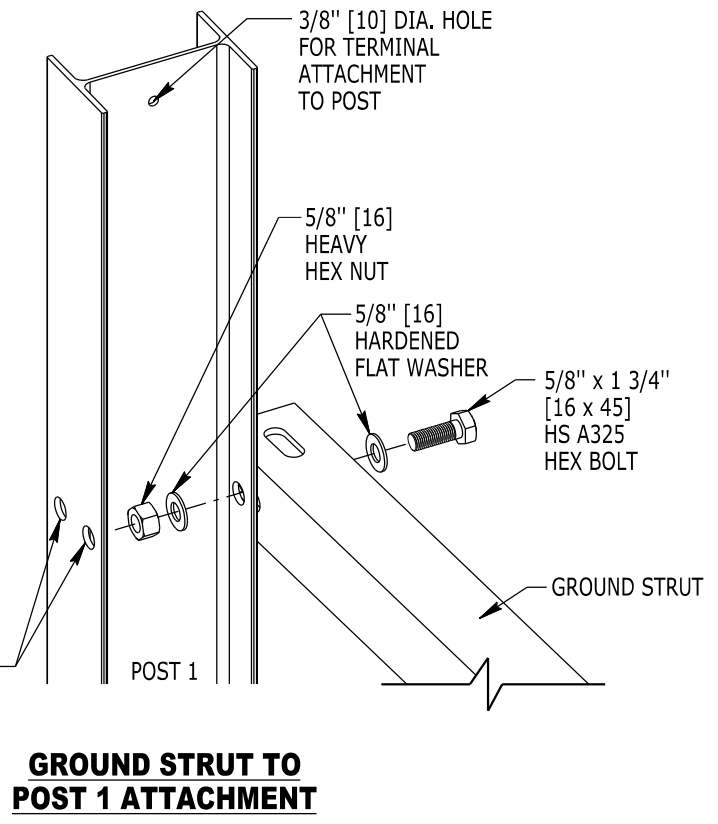
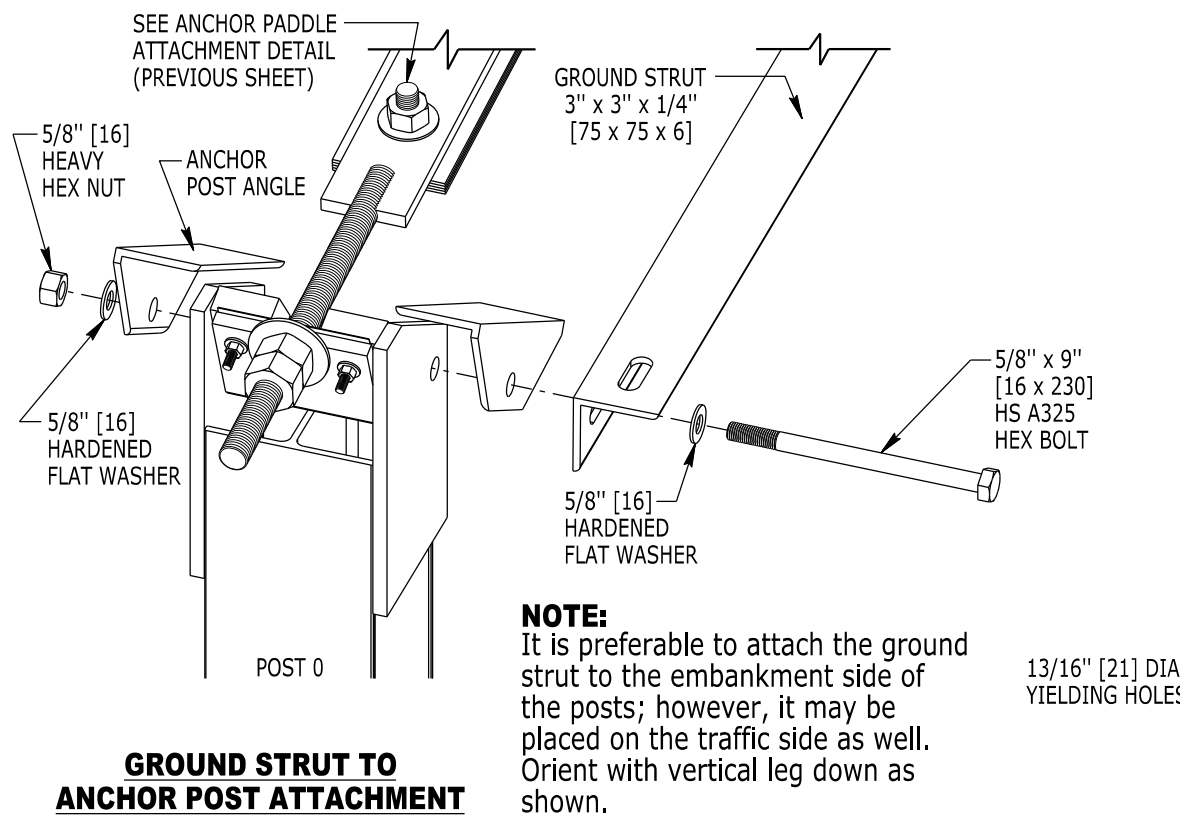
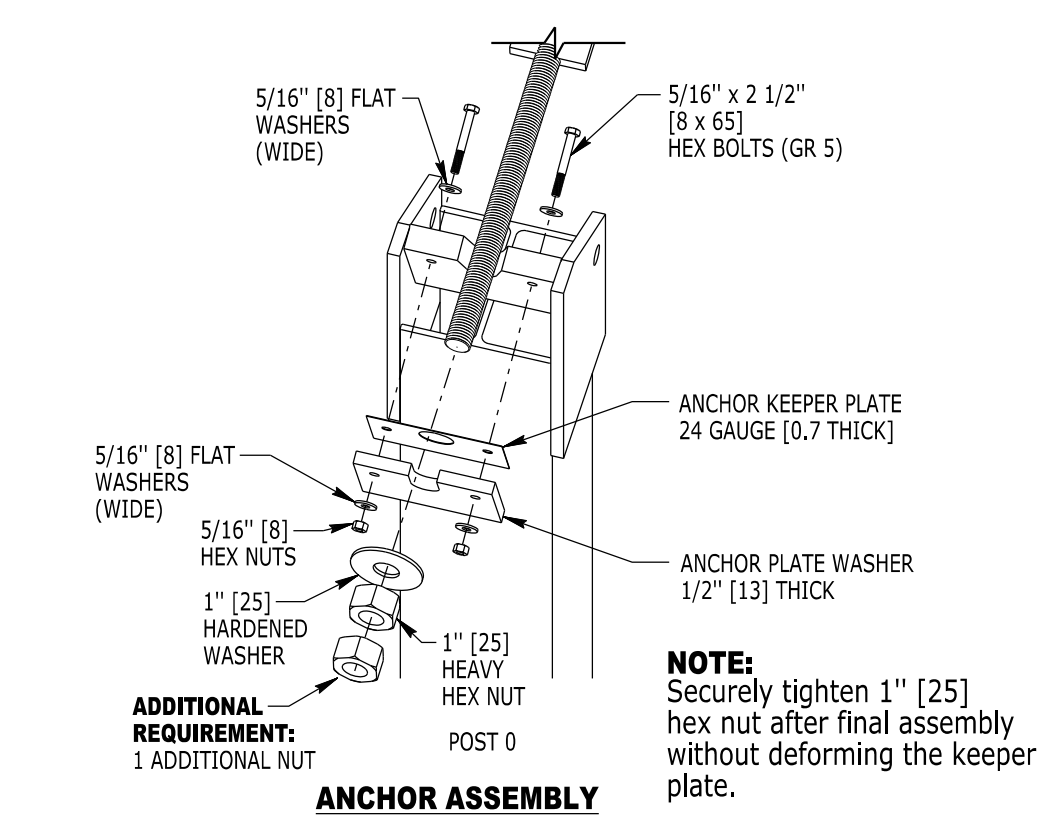
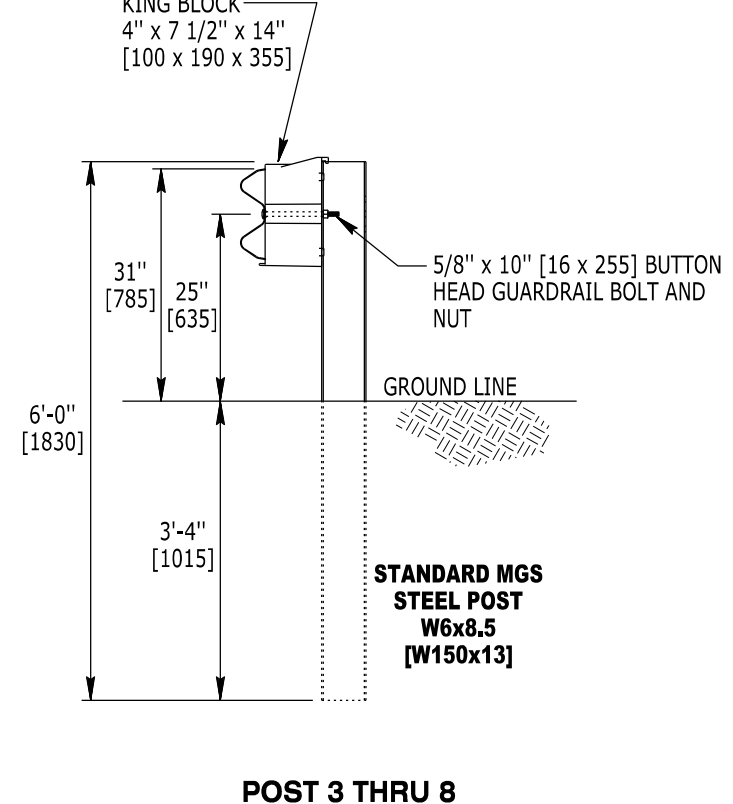
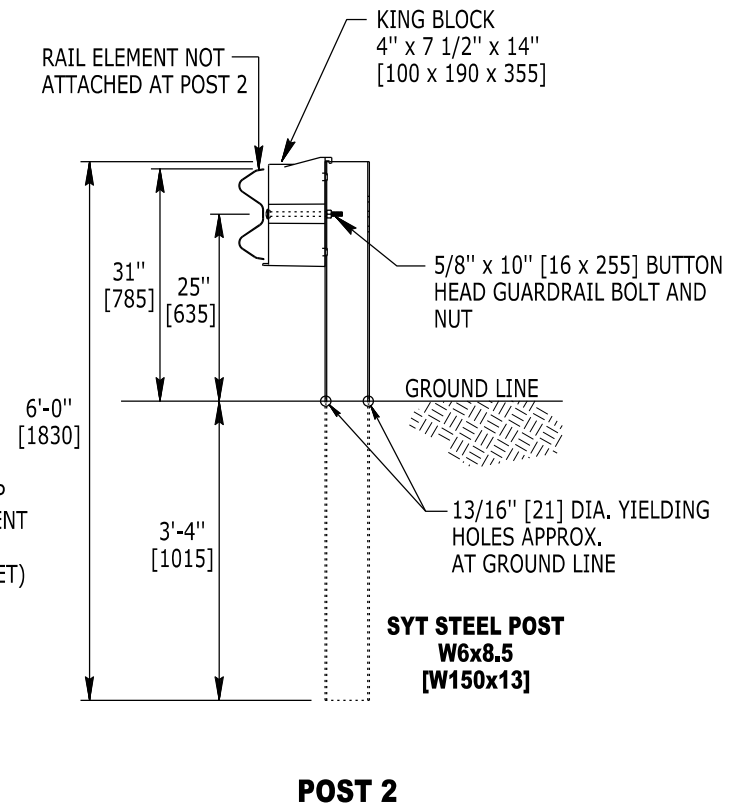
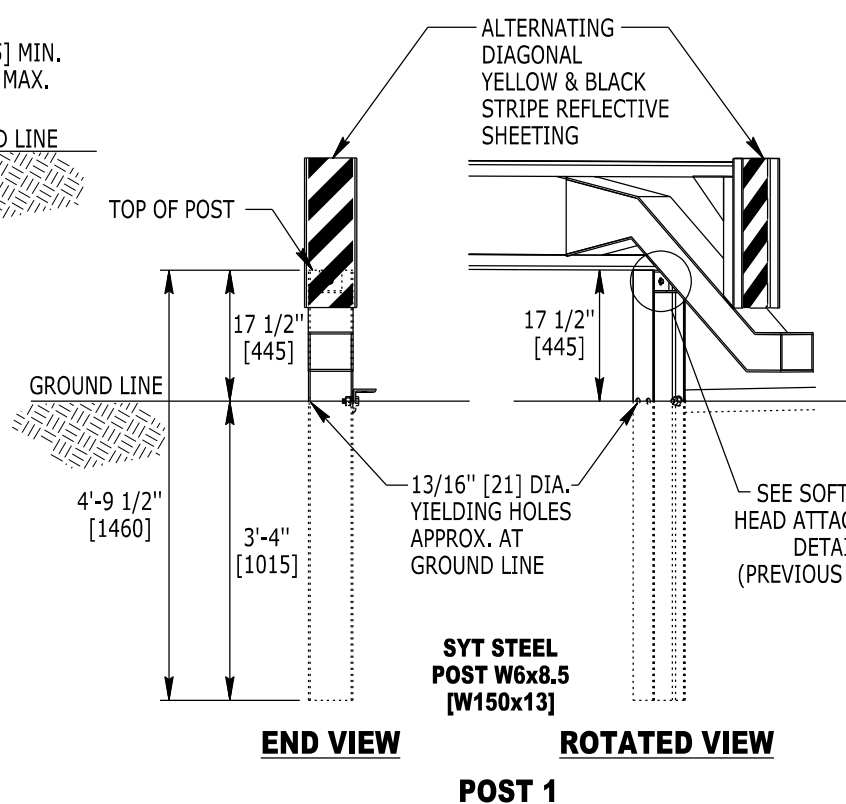
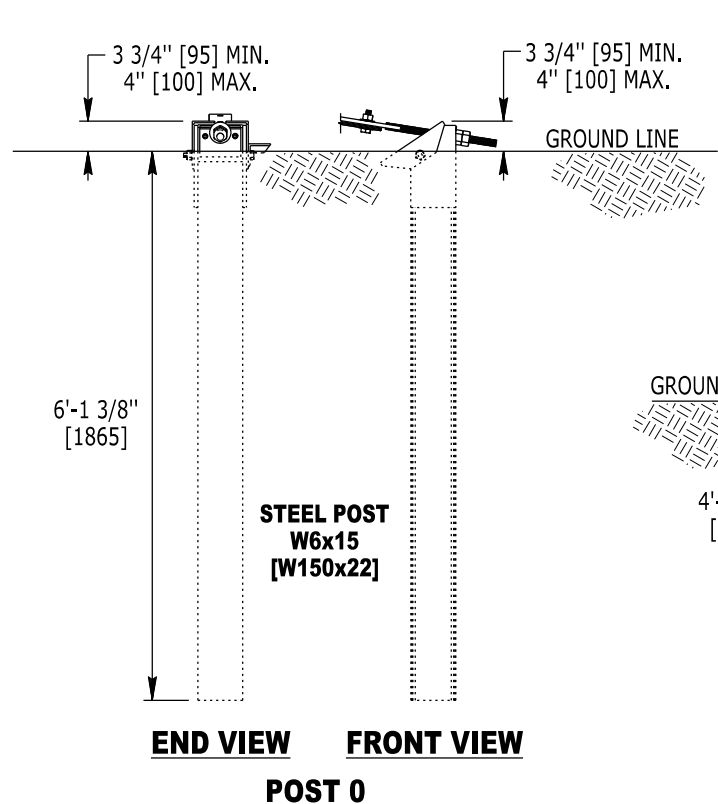


NOTES

- ① SoftStop (for MGS 31" [785] Guardrail) = MASH Tested, TL-3, redirective, gating terminal. This is an approved option for "MGS Terminal Type I." Provide terminal with steel posts. This terminal may be attached to standard guardrail runs having either wood or steel posts.

The SoftStop Terminal shown herein is proprietary and can only be manufactured and sold by Trinity Industries or its duly authorized representative. Details shown herein are approximate. Install in strict accordance to the manufacturer's installation manual. Provide and install any items shown herein as an "additional requirement."
Summary of "Additional Requirements:" Double nut end of anchor paddle.
- ② Lap the upstream rail (for the adjacent traffic direction) over the downstream rail element at each splice. See rail lap detail on **SHEET 5**.
- ③ Do not attach the rail element to the post/blockout at post 2.
- ④ Do not place any type of washer or delineator under the head of the rail post bolts.
- ⑤ If the anchor guardrail and SoftStophead are assembled in the field, select one method, approved by Trinity Highway Products, LLC. See assembly manual or assembly video for details on properly pulling the anchor rail through the impact head to the correct position.
- ⑥ Ensure all hardware and assemblies are galvanized or coated to prevent corrosion.
- ⑦ Note the lateral offset to the back of posts changes from the terminal section with 8 inch [205] blockouts and steel posts to the standard guardrail section with 12 inch [305] blockouts and either wood or steel posts.
- ⑧ The first spacing from the centerline of steel posts in the terminal section to the centerline of wood post (if provided) in the standard guardrail section will be 6' - 3" [1905] plus or minus 1/8" [30] to account for bolt holes being offset in steel posts.
- ⑨ **Placing Terminal on Flare:** If the terminal is placed on a flare steeper than 1:25 (for example, if it is placed on a 1:15 flare), provide at least 100 ft. [30 m] of guardrail including the terminal length on the same flared alignment.

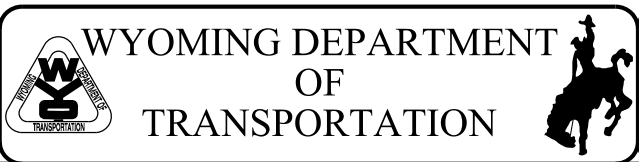




Designed by: WBW
 Drawn by: GLD
 Checked by: WBW
 Previous Dwg. No. 606-2A

TERMINAL TYPE I (OPTION 2 - SOFTSTOP, SHEET 2 OF 2)

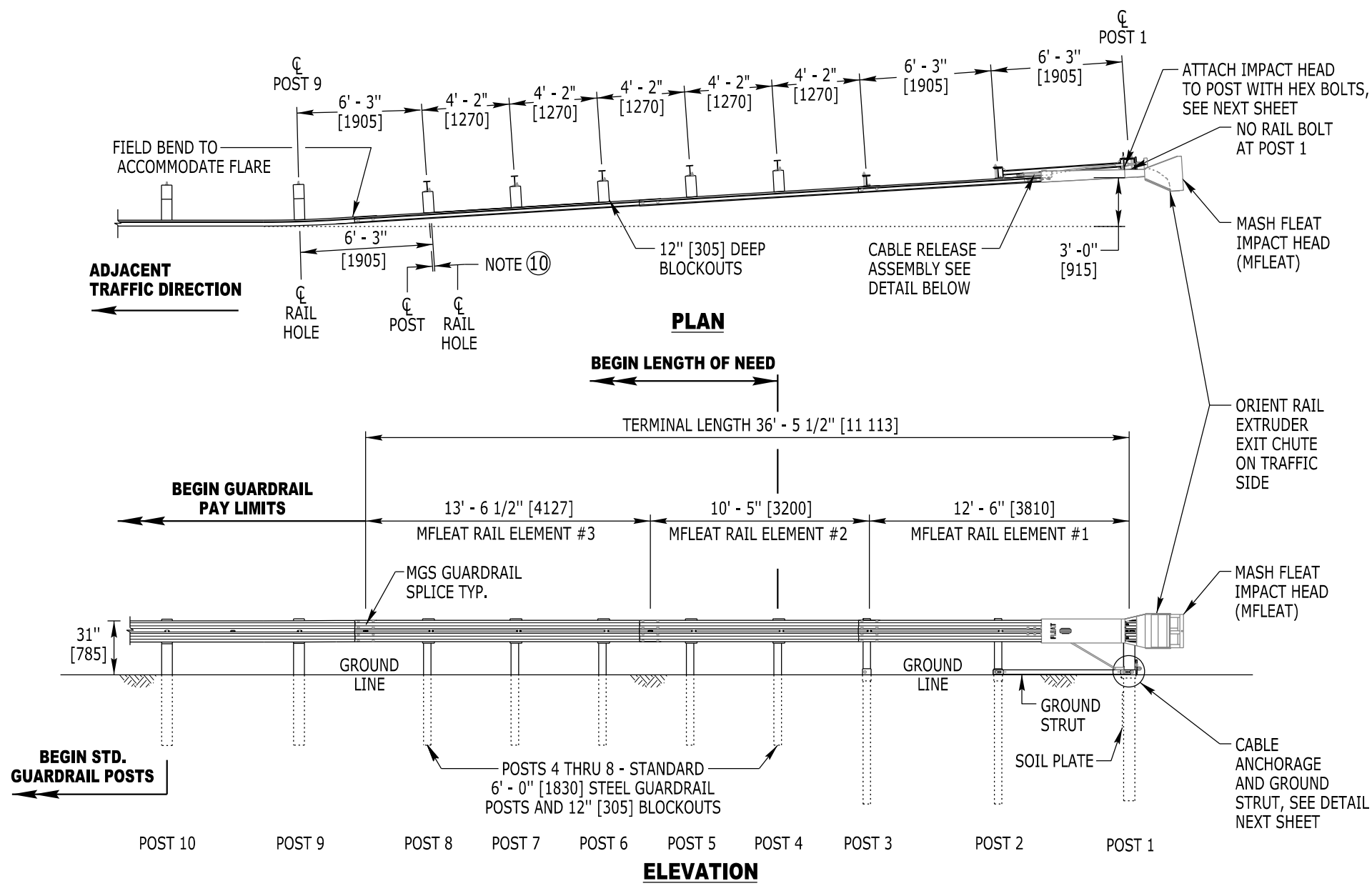
Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



STANDARD PLAN NUMBER
606-2B
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 Issued by: ENGINEERING SERVICES
 Date Issued: SEPTEMBER 2023

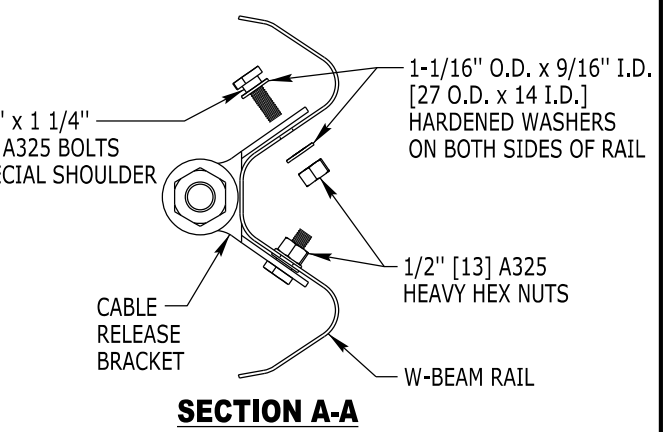
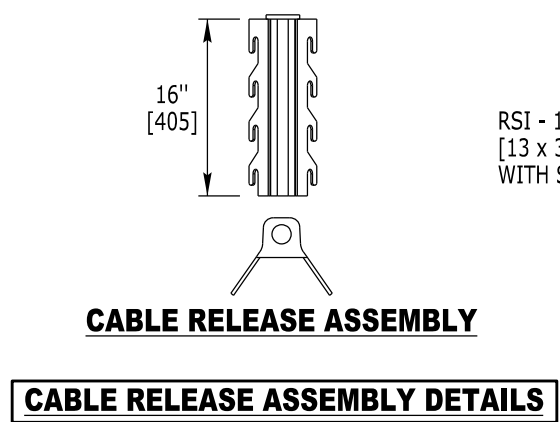
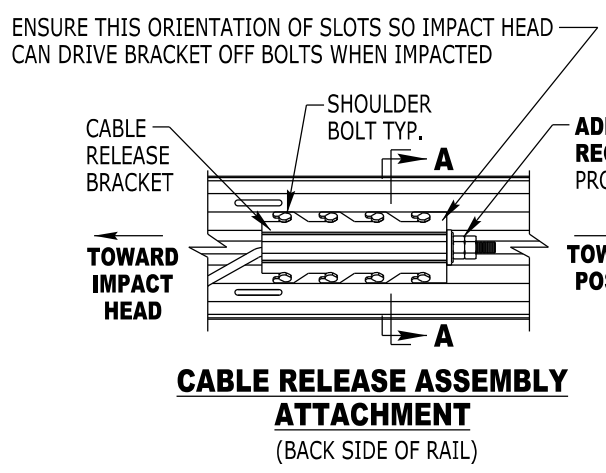
MGS GUARDRAIL

STANDARD PLAN



NOTES

- ① MFLEAT MGS (for MGS 31" [785] Guardrail) = MASH Tested, TL-3, redirective, gating terminal. This is an approved option for "MGS Terminal Type I." Provide terminal with steel posts. This terminal may be attached to standard guardrail runs having either wood or steel posts.
- The MFLEAT MGS Terminal shown herein is proprietary and can only be manufactured and sold by Road Systems Inc. or its duly authorized representative. Details shown herein are approximate. Install in strict accordance with the manufacturer's installation manual. Provide and install any items shown herein as an "additional requirement." Summary of "Additional requirements:" Double nut each end of the cable anchor.
- ② Lap the upstream rail (for the adjacent traffic direction) over the downstream rail element at each splice. See rail lap detail on **SHEET 5**.
- ③ Attach impact head to post 1 as shown. Do not attach rail to post 1.
- ④ Do not place any type of washer or delineation under the head of the rail/post bolts.
- ⑤ The lower section of the hinged post should not be driven with the upper post attached. If the post is placed in a drilled hole, the backfill material must be satisfactorily compacted to prevent settlement.
- ⑥ The lower sections of posts 1 & 2 shall not protrude more than 4 inches [100] above the ground line. Correct site grading when necessary as directed by the engineer.
- ⑦ Ensure the cable anchor assembly is taut. Use a locking device (vice grips or channel locking pliers) to prevent twisting or untwisting of the cable when tightening nuts.
- ⑧ Ensure all hardware and assemblies are galvanized or coated to prevent corrosion.
- ⑨ Note the lateral offset to the back of posts changes from the terminal section with 12 inch [305] blockouts and steel posts to the standard guardrail section with 12 inch [305] blockouts if wood posts are provided.
- ⑩ The first spacing from the centerline of steel posts in the terminal section to the centerline of wood post (if provided) in the standard guardrail section will be 6' - 3" [1905] plus or minus 1 1/8" [30] to account for bolt holes being offset in steel posts.



Designed by: WBW
 Drawn by: GLD
 Checked by: WBW
 Previous Dwg. No. 606-2A

MGS TERMINAL TYPE II - MFLEAT FLARED STEEL POST TERMINAL

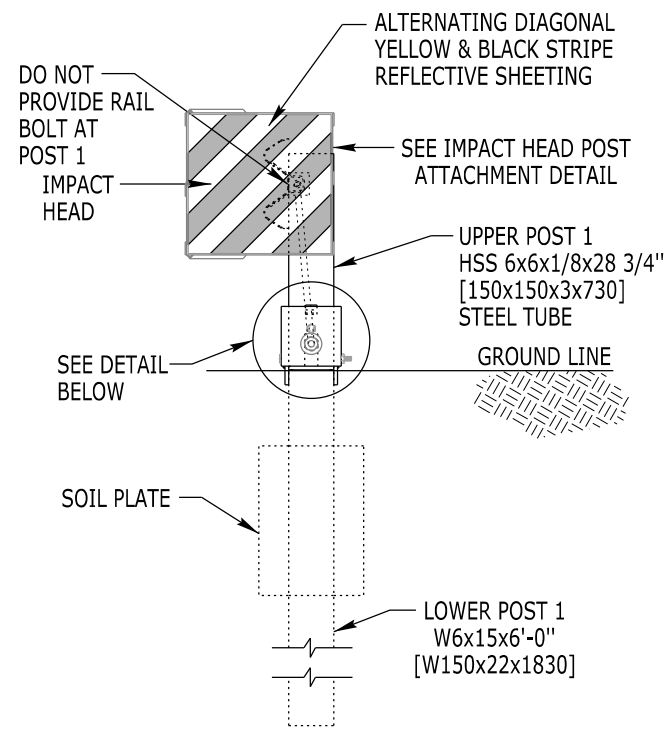
Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.

WYOMING DEPARTMENT OF TRANSPORTATION

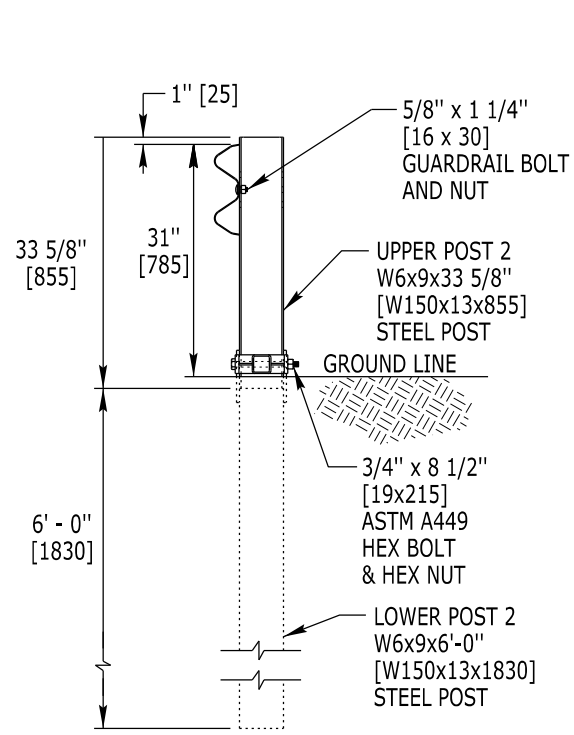
MGS GUARDRAIL

STANDARD PLAN

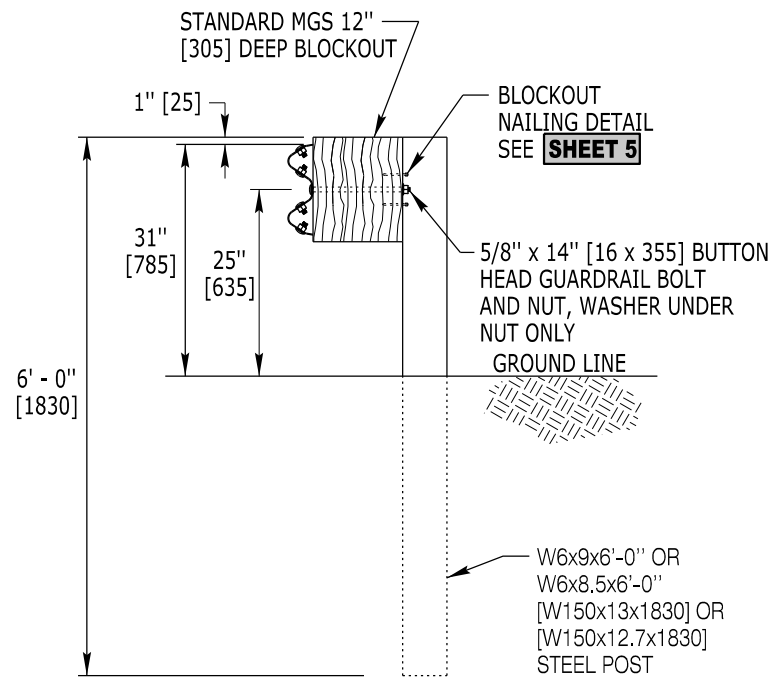
STANDARD PLAN NUMBER
606-2B
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 Issued by: ENGINEERING SERVICES
 Date Issued: SEPTEMBER 2023



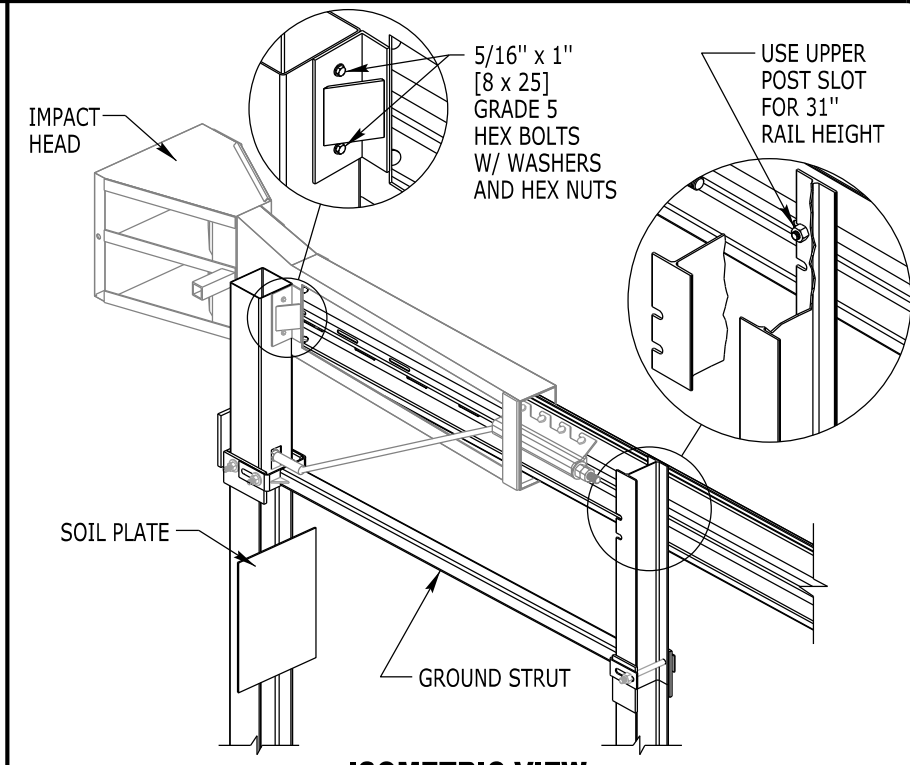
POST 1



POST 2

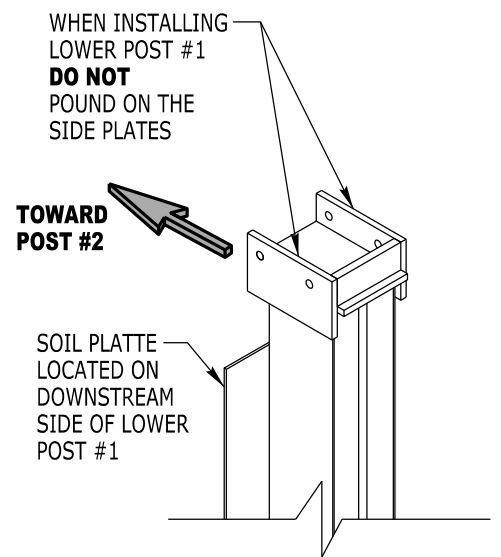


POST 3 THRU 8

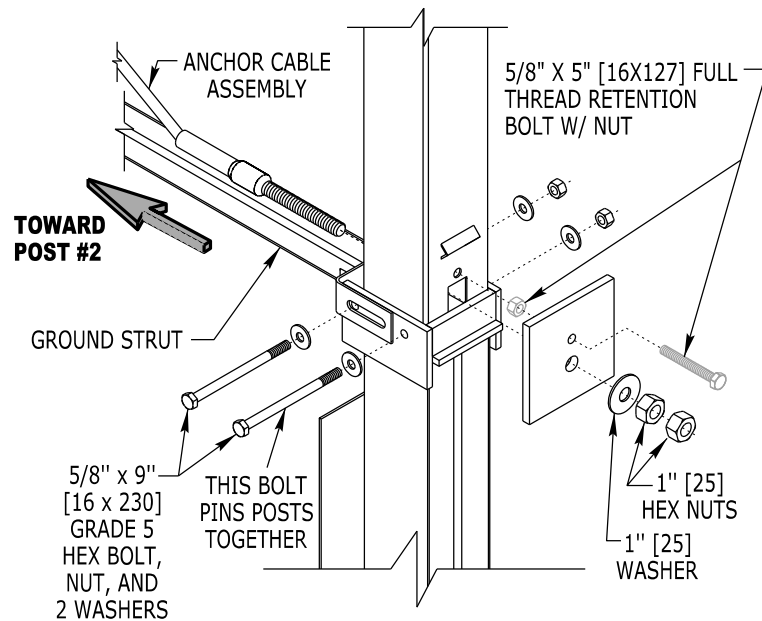


ISOMETRIC VIEW

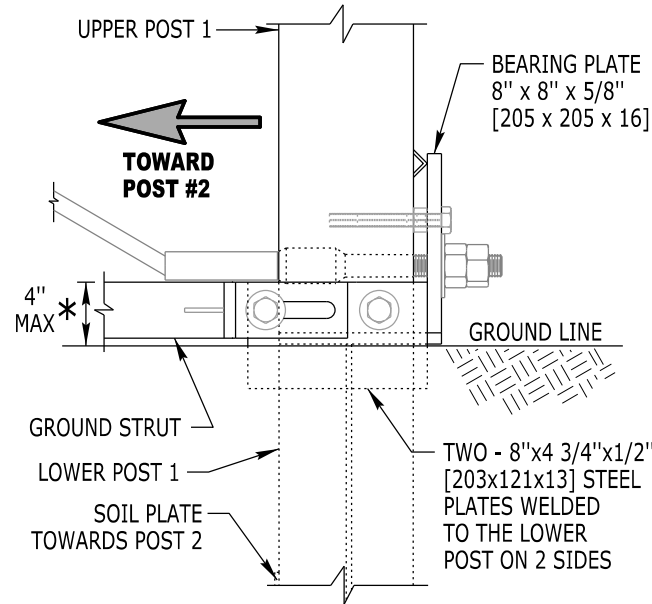
MFLEAT IMPACT HEAD POST ATTACHMENT DETAIL



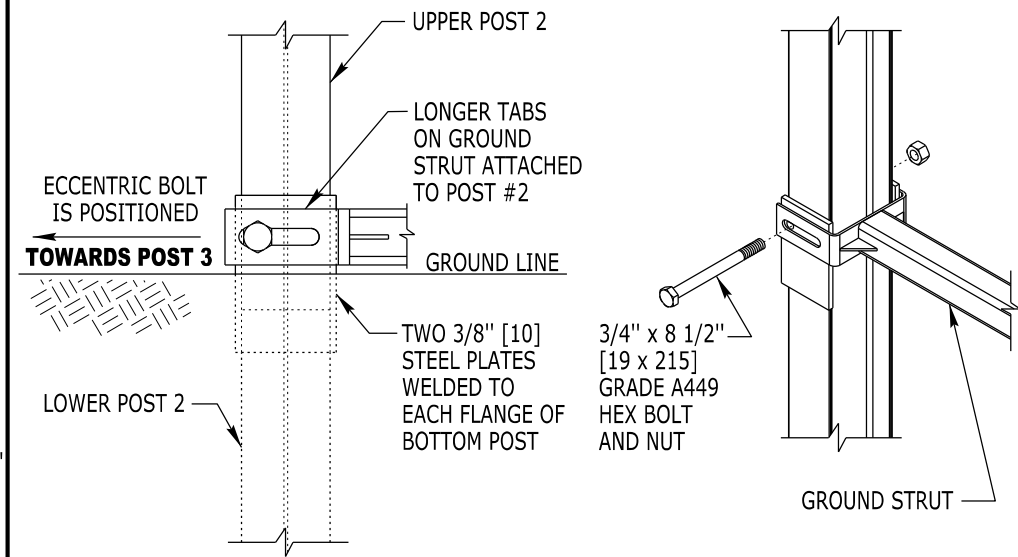
ISOMETRIC VIEW FRONT OF LOWER POST #1



ISOMETRIC VIEW FRONT OF POST #1



FRONT ELEVATION



FRONT ELEVATION

ISOMETRIC VIEW

POST 1 CABLE ANCHORAGE AND GROUND STRUT DETAILS

POST 2 GROUND STRUT DETAILS

* ATTENTION, IF THIS DIMENSION EXCEEDS 4" [100] CONSULT THE ENGINEER AS THERE MAY BE A GRADING ISSUE

Designed by: WBW
Drawn by: GLD
Checked by: WBW
Previous Dwg. No. 606-2A

MGS TERMINAL TYPE II - MFLEAT FLARED STEEL POST TERMINAL (CONTINUED)

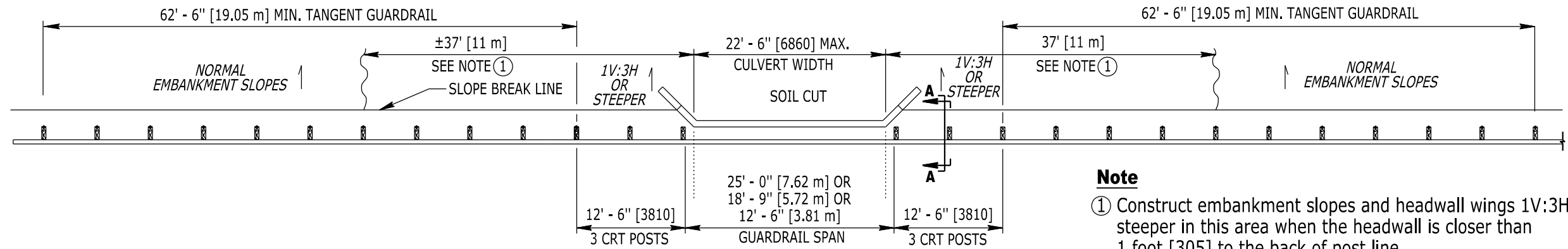
Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



MGS GUARDRAIL

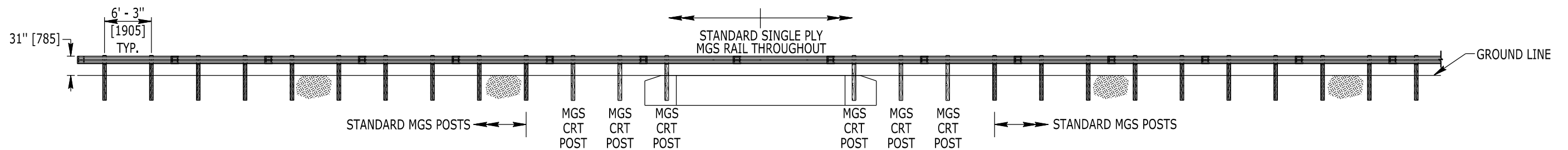
STANDARD PLAN

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606-2B
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Issued by: ENGINEERING SERVICES
Date Issued: SEPTEMBER 2023

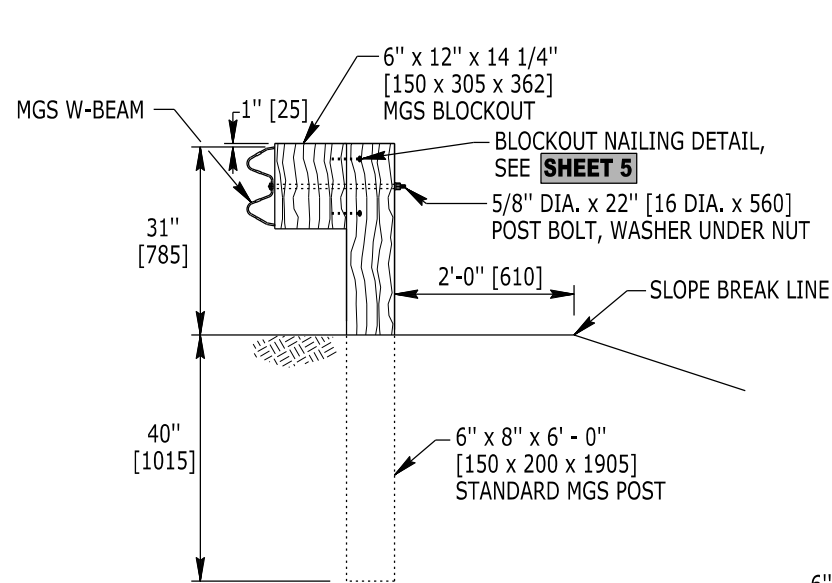


Note
 ① Construct embankment slopes and headwall wings 1V:3H or steeper in this area when the headwall is closer than 1 foot [305] to the back of post line.

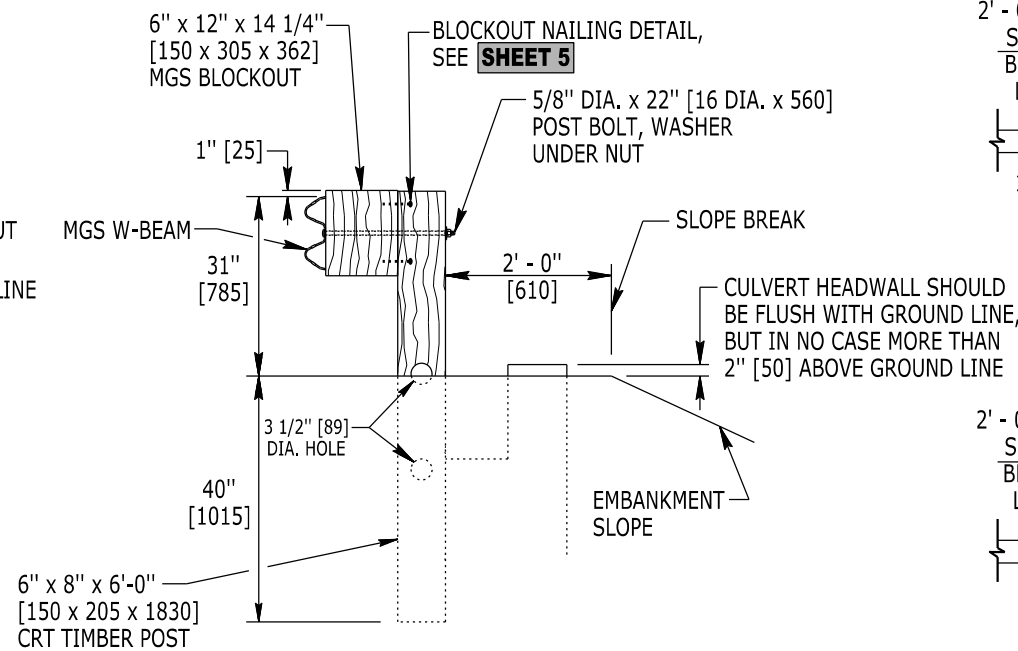
PLAN VIEW



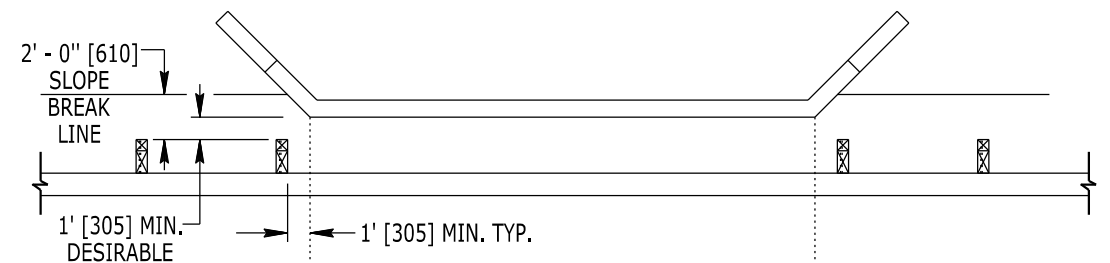
ELEVATION VIEW



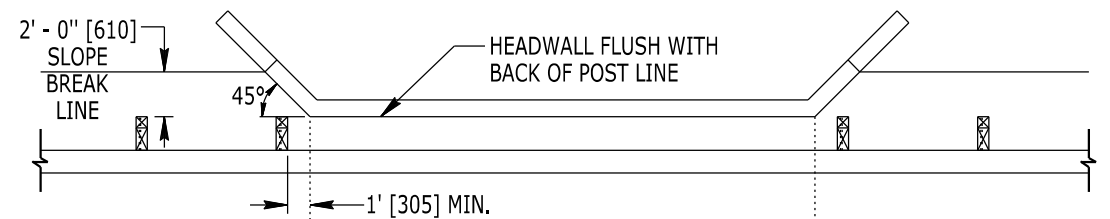
STANDARD MGS POST



SECTION A-A CRT POSTS TYP.



PREFERRED HEADWALL TO GUARDRAIL SEPARATION



MINIMUM HEADWALL TO GUARDRAIL SEPARATION

Designed by: WBW
 Drawn by: GLD
 Checked by: WBW
 Previous Dwg. No. 606-2A

MGS LONG SPAN

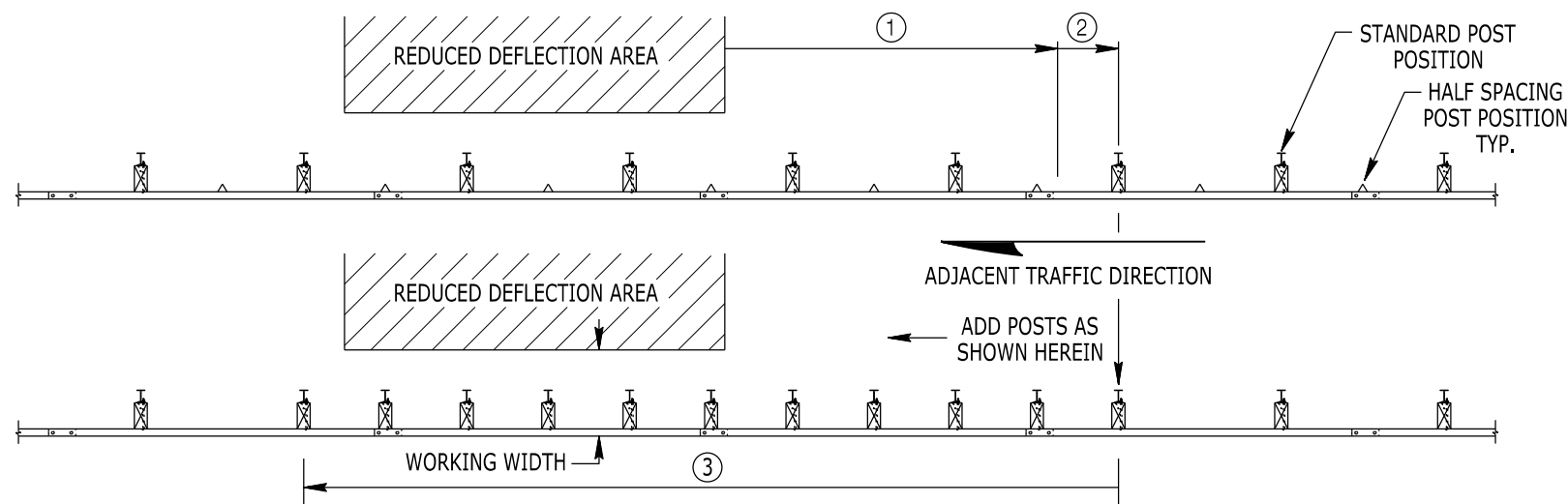


MGS GUARDRAIL

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606-2B
 SHEET 16 of 18
 Issued by: ENGINEERING SERVICES
 Date Issued: SEPTEMBER 2023

Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.

STANDARD PLAN



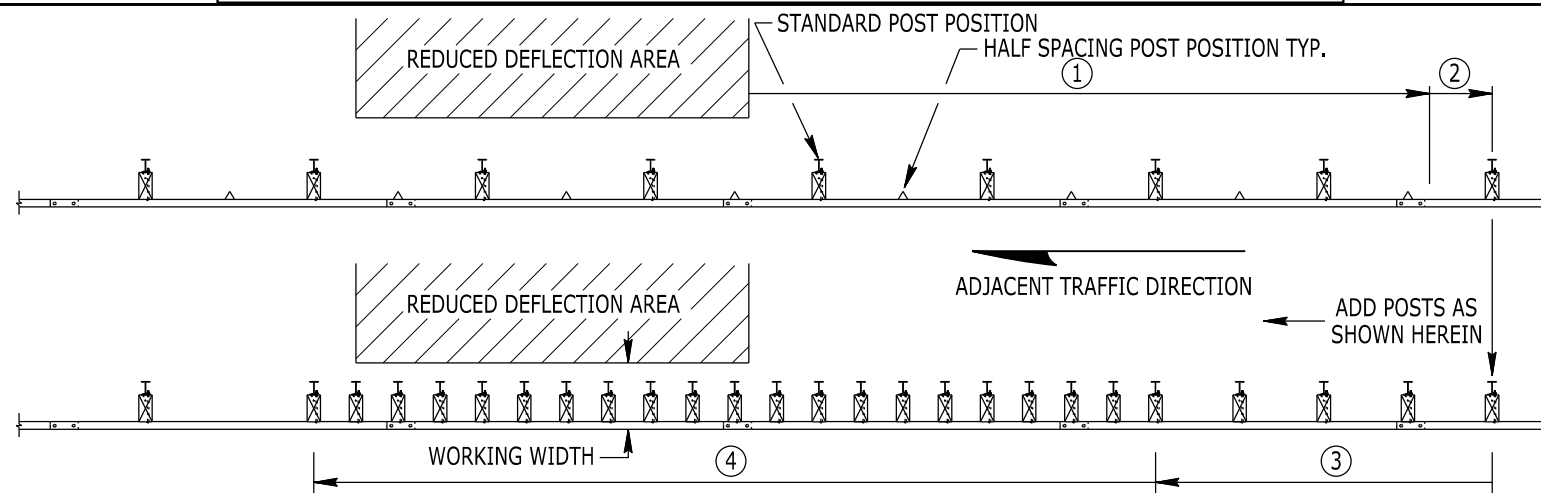
PROVIDE ADDITIONAL POSTS AT THE POST SPACING SPECIFIED BELOW:

- ① Measure 12'-6" [3810] upstream of the area where the reduced deflection is desired.
- ② Continue upstream until reaching the next standard post location or a half post position location.
- ③ Provide spaces downstream from this position at half post spacing (3'-1 1/2" [950]). Continue with half post spaces until past the area of reduced deflection, before resuming standard spacing.

GENERAL NOTE:

Use standard 6' - 0" [1830] long posts, wood or steel unless specified otherwise.

MGS HALF POST SPACING - PROVIDES A WORKING WIDTH DOWN TO 4'-0" [1220]



PROVIDE ADDITIONAL POSTS AT THE POST SPACING SPECIFIED BELOW:

- ① Measure 25 feet [7620] upstream of the area where the reduced deflection is desired.
- ② Continue upstream until reaching the next standard post location or a half post position location.
- ③ Provide 4 spaces downstream from this position at half post spacing (3'-1 1/2" [950]).
- ④ Provide spaces downstream of this position at quarter post spacing (18 3/4" [475]). Continue with quarter post spacing until past the area of reduced deflection, before resuming standard spacing.

GENERAL NOTE:

Use standard 6' - 0" [1830] long posts, wood or steel unless specified otherwise. Factory punch holes at quarter post spacing in rail.

MGS QUARTER POST SPACING - PROVIDES A WORKING WIDTH DOWN TO 3'-0" [915]

GENERAL NOTE:

- ① Requirements on **SHEET 5** apply herein except where in conflict with these details.

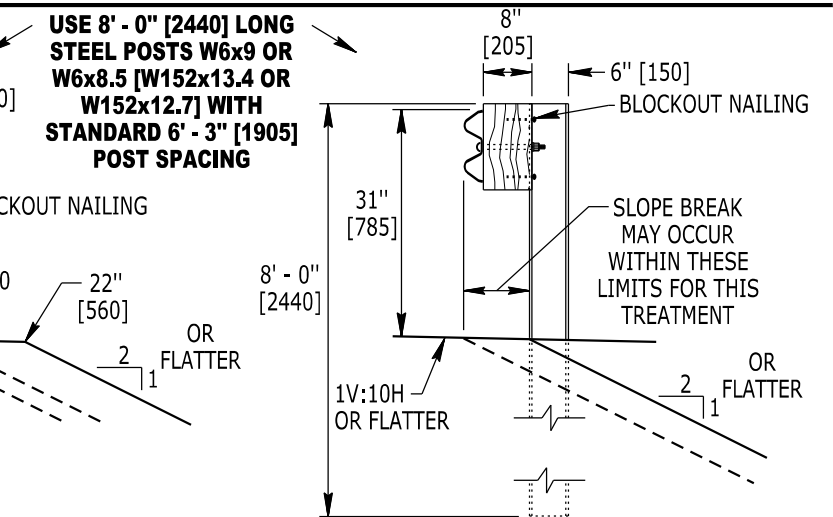
Designed by: WBW
 Drawn by: GLD
 Checked by: WBW
 Previous Dwg. No. 606-2A

MGS HALF POST SPACING, MGS QUARTER POST SPACING,
 MGS LONG POST-CONSTRICTED SLOPE GRADING, MGS 8" [205] BLOCKS

Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



WYOMING DEPARTMENT
 OF
 TRANSPORTATION



SLOPE BREAK OCCURS -6" [-150] TO 22" [560] FROM BACK OF POST

Use 8' - 0" [2440] Steel Posts and 12" [305] Blockouts.

SLOPE BREAK OCCURS IN FRONT OF POST

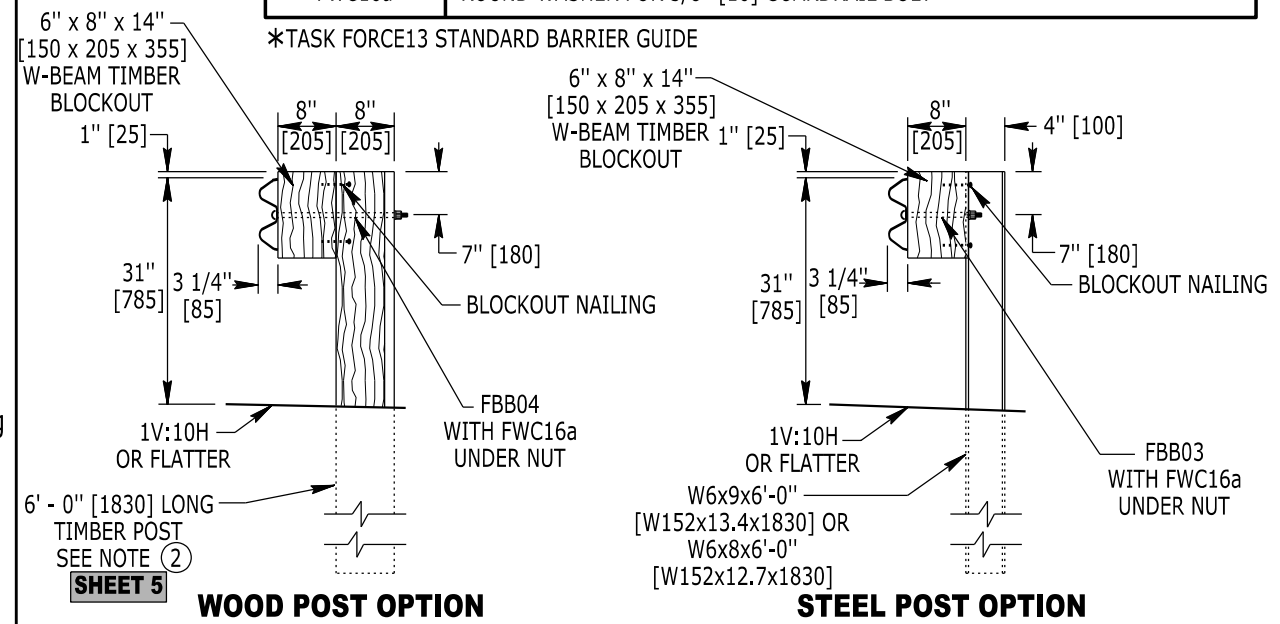
Use 8' - 0" [2440] Steel Posts and 8" [205] Blockouts. Do not place post so the rail face is beyond the slope break line.

MGS LONG POST - CONSTRICTED SLOPE GRADING

For locations where the slope break point is less than 22" [560] behind the guardrail posts.

STANDARD GUARDRAIL BOLTS	
* DESIGNATOR	
FBB03	5/8" x 10" [16 x 255] BUTTON HEAD GUARDRAIL BOLT WITH WASHER UNDER NUT
FBB04	5/8" x 18" [16 x 455] BUTTON HEAD GUARDRAIL BOLT WITH WASHER UNDER NUT
FWC16a	ROUND WASHER FOR 5/8" [16] GUARDRAIL BOLT

*TASK FORCE13 STANDARD BARRIER GUIDE



WOOD POST OPTION

STEEL POST OPTION

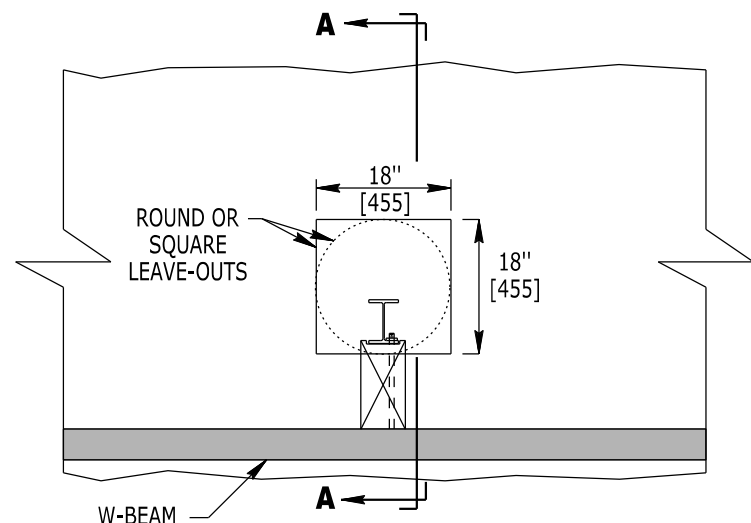
MGS 8" [205] BLOCKS

To be used only when specified on narrow roadways where 12" [305] blockouts will not fit!

MGS GUARDRAIL

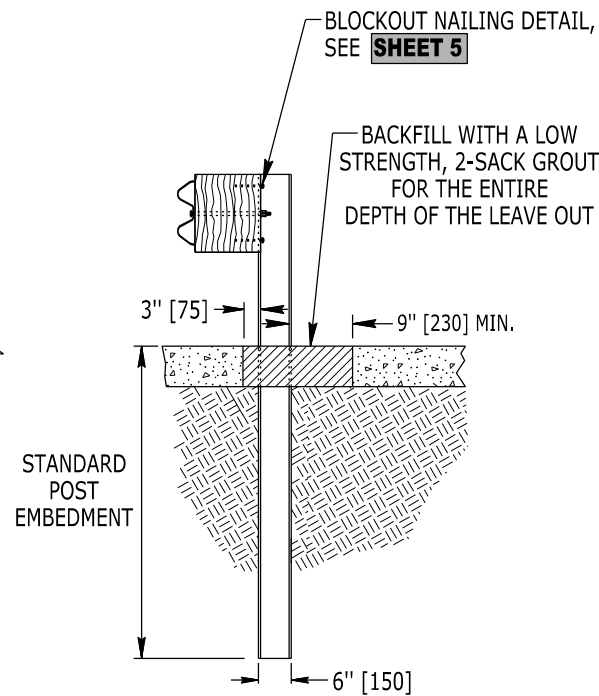
STANDARD PLAN

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 SHEET 17 of 18
 Issued by: ENGINEERING SERVICES
 Date Issued: SEPTEMBER 2023

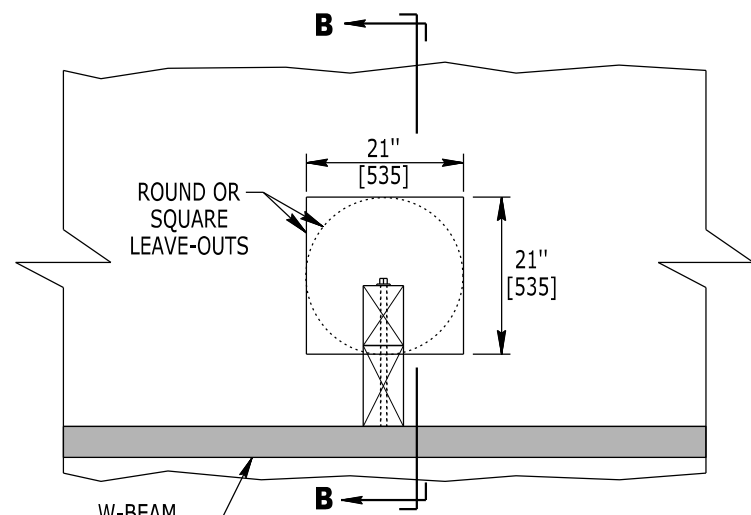


PLAN VIEW

STEEL POST DETAIL

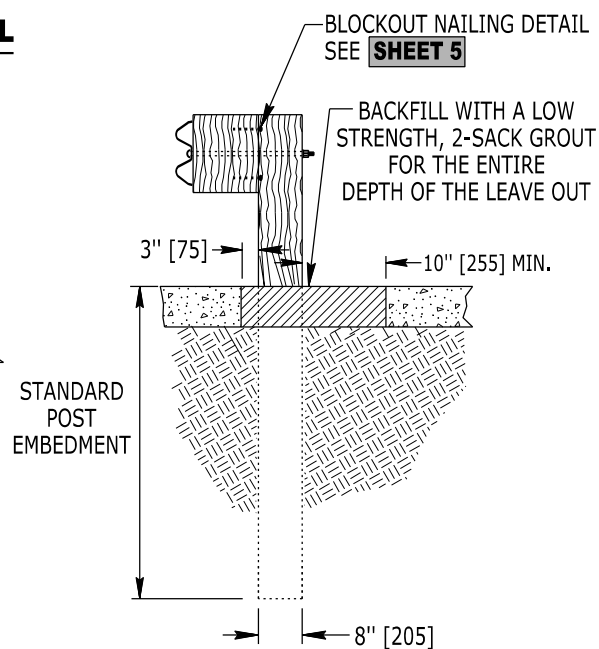


SECTION A-A



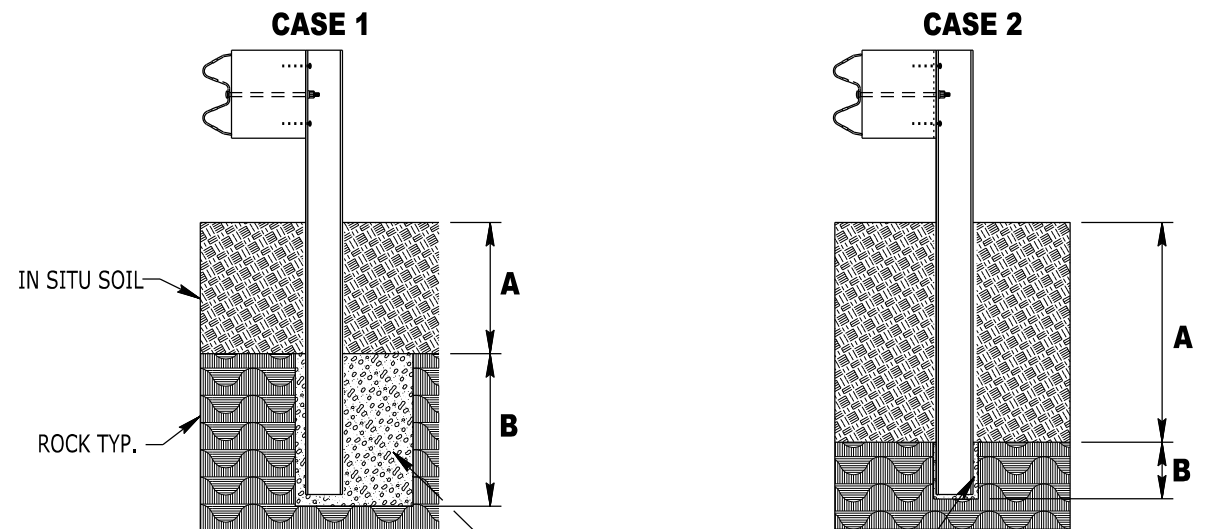
PLAN VIEW

WOOD POST DETAIL



SECTION B-B

POST PLACEMENT IN ASPHALT OR CONCRETE PAVEMENTS



PLAN VIEW STEEL POSTS
EITHER HOLE CONFIGURATION
ACCEPTABLE

PLAN VIEW WOOD POSTS
EITHER HOLE CONFIGURATION
ACCEPTABLE

EXCAVATE ROCK AND
REPLACE WITH ASTM C33
COURSE AGGREGATE
SIZE NO. 57
BACKFILL MATERIAL
TYP.

CASE 1 - $A \leq 18'' [455]$

For overlying soil depths (A) ranging from 0 to 18" [0 to 455], the depth of required drilling (B) is equal to 24" [610].

CASE 2 - $A > 18'' [455]$

For overlying soil depths (A) ranging from > 18" [455], to the embedment depth of the post, depth of required drilling (B) is equal to either 12" [305] or the standard embedment depth minus the depth of soil whichever is less.

POSTS IN ROCK

Designed by: WBW
Drawn by: GLD
Checked by: WBW
Previous Dwg. No. 606-2A

POST PLACEMENT IN PAVEMENTS AND ROCK

Note: Units shown in brackets [] are metric and are in millimeters (mm) unless other units are shown.



MGS GUARDRAIL

STANDARD PLAN

STANDARD PLAN NUMBER
606-2B
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