
ORIGINATION FORM

Proposed Revisions to a Standard Plans Index
(Please provide all information — Incomplete forms will be returned)

Contact Information:

Date: July 26, 2020
Originator: Richard Stepp
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Standard Plans:

Index Number: 536-001
Sheet Number (s): 6, 7, 9, and 17
Index Title: Guardrail

Summary of the changes:

Sheet 6: Removed some 1:10 max. slope labels to clarify that this doesn't alter FDM and drainage slope requirements. Added additional text to note 1 to further clarify.

Sheet 7: Removed some 1:10 max. slope labels (similar to Sheet 6)

Sheet 9: Add Trailing Anchor. Sta. callout at post 1

Sheet 17: Added additional notes to guardrail bolt connection to concrete rigid barrier in order to accommodate nearby sidewalk or shared use path.

Commentary / Background:

Clarified 1:10 max. slope based on industry feedback of misunderstandings.
Added Trailing Anchorage callout for consistency with other Index sheets and corresponding plans callouts.
Added bolt modification to handle additional case of nearby sidewalk by reducing protrusion of mounting bolts.

Other Affected Offices / Documents: (Provide name of person contacted)

Yes	No	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other Standard Plans –
<input type="checkbox"/>	<input checked="" type="checkbox"/>	FDOT Design Manual –
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Basis of Estimates Manual –
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Standard Specifications –
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Approved Product List –
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Construction –
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Maintenance –

Origination Package Includes:

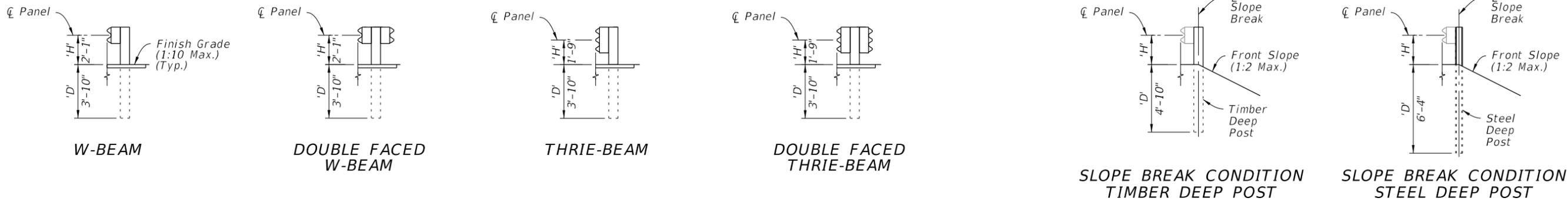
(Email or hand deliver package to Rick Jenkins)

Yes	N/A	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Redline Mark-ups
<input type="checkbox"/>	<input type="checkbox"/>	Proposed Standard Plan Instruction (SPI)
<input type="checkbox"/>	<input type="checkbox"/>	Revised SPI
<input type="checkbox"/>	<input type="checkbox"/>	Other Support Documents

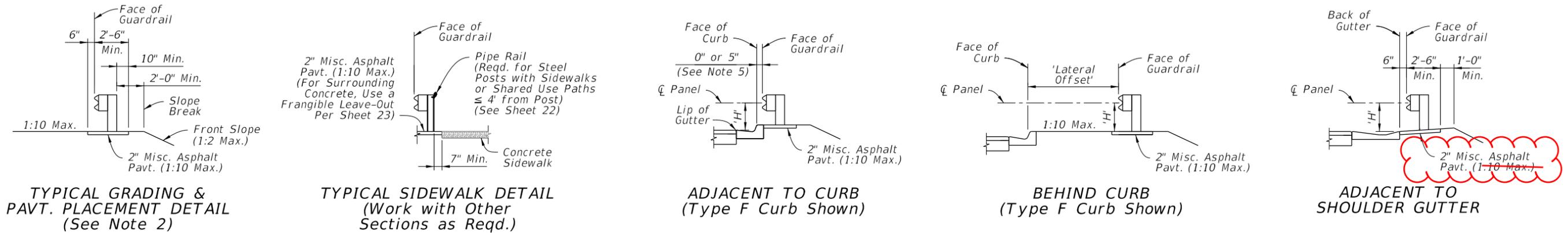
Implementation:

<input type="checkbox"/>	Design Bulletin (Interim)
<input type="checkbox"/>	DCE Memo
<input type="checkbox"/>	Program Mgmt. Bulletin
<input checked="" type="checkbox"/>	FY-Standard Plans (Next Release)

Contact the Roadway Design Office for assistance in completing this form

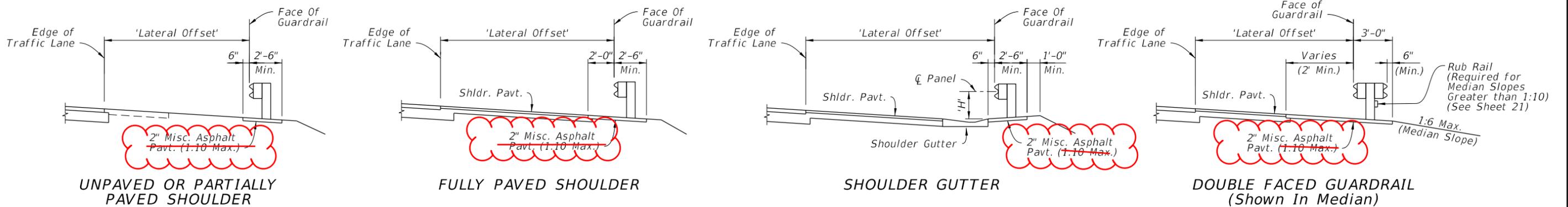


GUARDRAIL TYPES - MOUNTING HEIGHTS & POST DEPTHS



GUARDRAIL SECTIONS - TYPICAL

GUARDRAIL SECTIONS - CURB & GUTTER



GUARDRAIL SECTIONS - SHOULDERS

Added language to explain that additional design criteria governs flatter cross slope

GUARDRAIL HEIGHT SUMMARY TABLE:			
Type:	Min. Depth 'D':	Mounting Height 'H':	Post Length 'L':
W-Beam (Single and Double Faced)	3'-10"	2'-1"	6'-6"
Thrie-Beam (Single and Double Faced)	3'-10"	1'-9"	6'-6"
Timber Deep Post	4'-10"	See Above	7'-6"
Steel Deep Post	6'-4"	See Above	9'-0"

NOTES:

1. GUARDRAIL SECTIONS: Construct Sections as indicated in the plans. The details shown herein depict W-Beam Guardrail, but are applicable to the other defined Guardrail Types placed at the corresponding height, 'H'. Use components per Sheets 4 & 5. Steel and timber post types are interchangeable unless otherwise defined. The 1:10 Max. cross slope shown is the maximum slope permitted for proper guardrail function, but project-specific cross slope requirements are governed per the plans.
2. TYPICAL GRADING & PAVEMENT PLACEMENT DETAIL: Construct features as depicted except where superseded by specific Guardrail Sections or the plans. Place the Slope Break a Minimum of 2' behind the post. For Deep Posts, the slope break may be placed at the \bar{C} Post with the 2" Miscellaneous Asphalt Pavement omitted.
3. SLOPE BREAK CONDITION: Install Deep Posts only where called for in the plans. Deep Posts are only permitted where post spacing is 6'-3" or less.
4. LATERAL OFFSETS: The Lateral Offsets shown are governed by the station and offset call outs for Face of Guardrail, as shown in the plans.
5. ADJACENT TO CURB: Place the Face of Guardrail consistently offset either flush with the Face of Curb or 5" behind the Face of Curb, as indicated by the plans station and offset callout. For offset changes, transition the Face of Guardrail as shown in the plans.

GUARDRAIL SECTIONS

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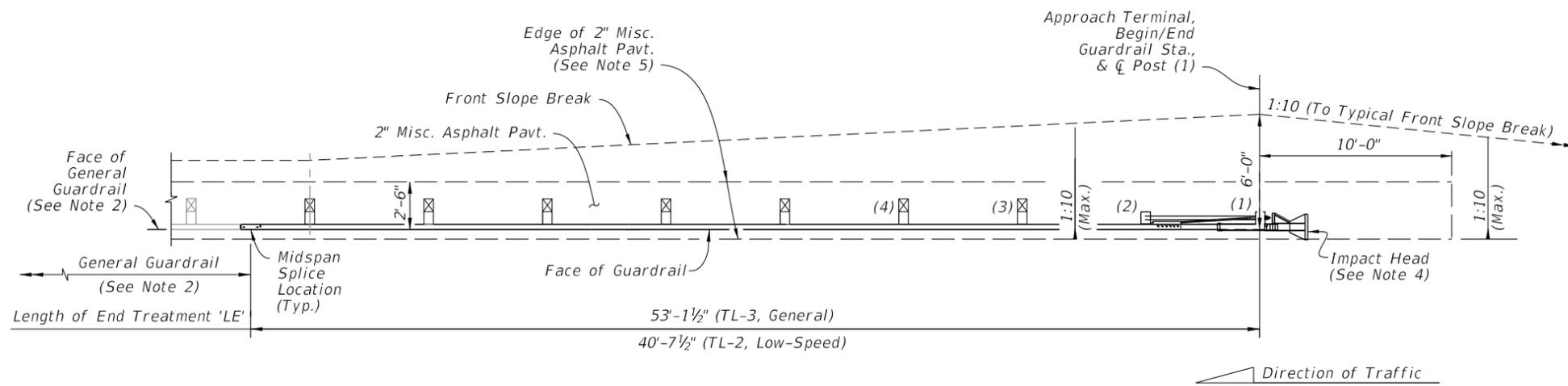
LAST REVISION	DESCRIPTION:
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FY 2020-21
STANDARD PLANS

GUARDRAIL

INDEX SHEET
536-001 6 of 24



APPROACH TERMINAL ASSEMBLY
'PARALLEL' TYPE - PLAN VIEW

NOTES:

1. **INSTALLATION:** Locate Approach Terminals where called for in the plans, with the Post (1) placed at the Begin/End Guardrail Station indicated in the plans.

The Plan Views shown herein are schematic only, showing basic geometry for Approach Terminals listed on the APL. The predefined Length of End Treatment, 'LE', includes the proprietary portion of various Approach Terminals and provides for more consistent planning of assembly installations across the differing Approach Terminal types. Forward-anchoring style Approach Terminals may vary from the planned lengths shown by up to 3'-0".

Construct Approach Terminals as shown in the APL and in accordance with the manufacturer's unique drawing details, procedures, and specifications.

Install posts in accordance with the manufacturer's drawings. The Special Posts on Sheet 23, including Special Steel Posts, Encased Posts, and Frangible Leave-Outs, are not permitted within the Approach Terminal segment unless otherwise called for in the plans.

Align panel lap splices in accordance with the manufacturer's drawings, regardless of the direction of traffic.

Install adjacent grading, gutters, and/or curbing as shown herein.

2. **GENERAL GUARDRAIL:** General Guardrail typically includes Panels and Post Spacing as shown on Sheet 2, including parallel and tapered segments.

Approach Transitions, Low-Speed Guardrail, or Reduced Post Spacing Guardrail segments may be substituted for the General Guardrail shown herein if indicated in the plans.

3. **APPROACH TERMINAL TEST LEVEL:** Install either a Test Level 3 (TL-3) or Test Level 2 (TL-2) Approach Terminal as specified in the plans. TL-3 Approach Terminals may substitute for TL-2 Approach Terminals unless the substitution is specifically prohibited in the plans. TL-2 Approach Terminals may not substitute for TL-3 installations.

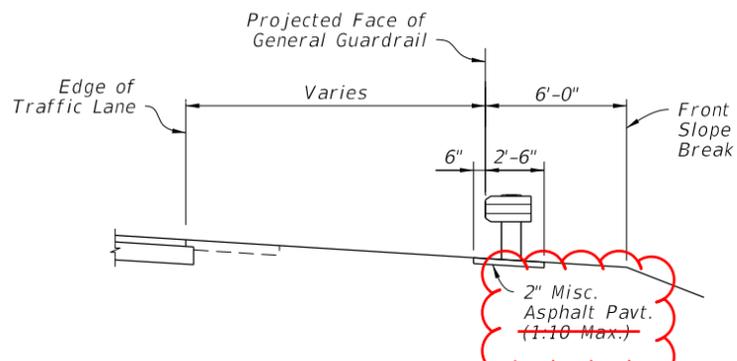
4. **IMPACT HEAD END DELINEATOR:** Apply Yellow Retroreflective Sheeting to the nose of the End Terminal in accordance with Specification 536.

5. **2" MISCELLANEOUS ASPHALT PAVEMENT:** The Plan View depicts the Unpaved Shoulder condition. For Fully Paved Shoulder and Shoulder Gutter conditions, extend the 2" Misc. Asphalt Pavement as shown in the corresponding 'Section at Post (1)' details below.

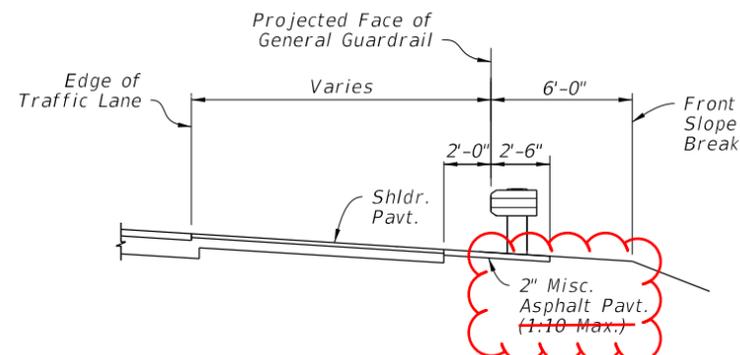
The 2" Misc. Asphalt Pavement shown upstream of Post (1) may be substituted with a different pavement type where called for in the Plans.

6. **CLEAR AREA REQUIREMENT:** Do not place any permanent aboveground installations within the areas shown with 1:10 maximum grading. For the finished condition, keep this area free of all aboveground obstructions, including dense vegetation and trees.

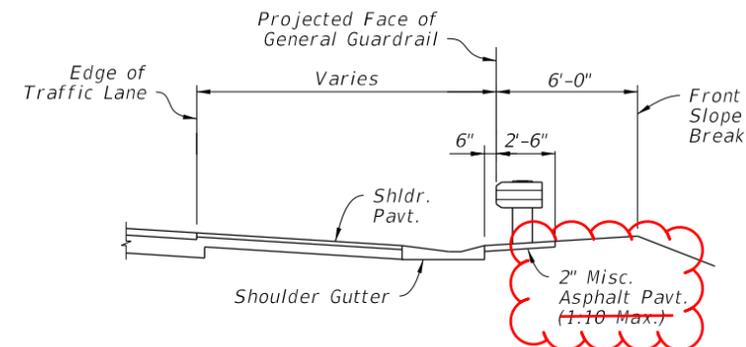
7. **'CURBED' AND 'DOUBLE FACED' GUARDRAIL SEGMENTS:** See Sheet 8.



SECTION AT POST (1)
WITH UNPAVED SHOULDER



SECTION AT POST (1)
WITH FULLY PAVED SHOULDER



SECTION AT POST (1)
WITH SHOULDER GUTTER

END TREATMENT -
APPROACH TERMINAL
GEOMETRY - PARALLEL

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11/01/19	11/01/20



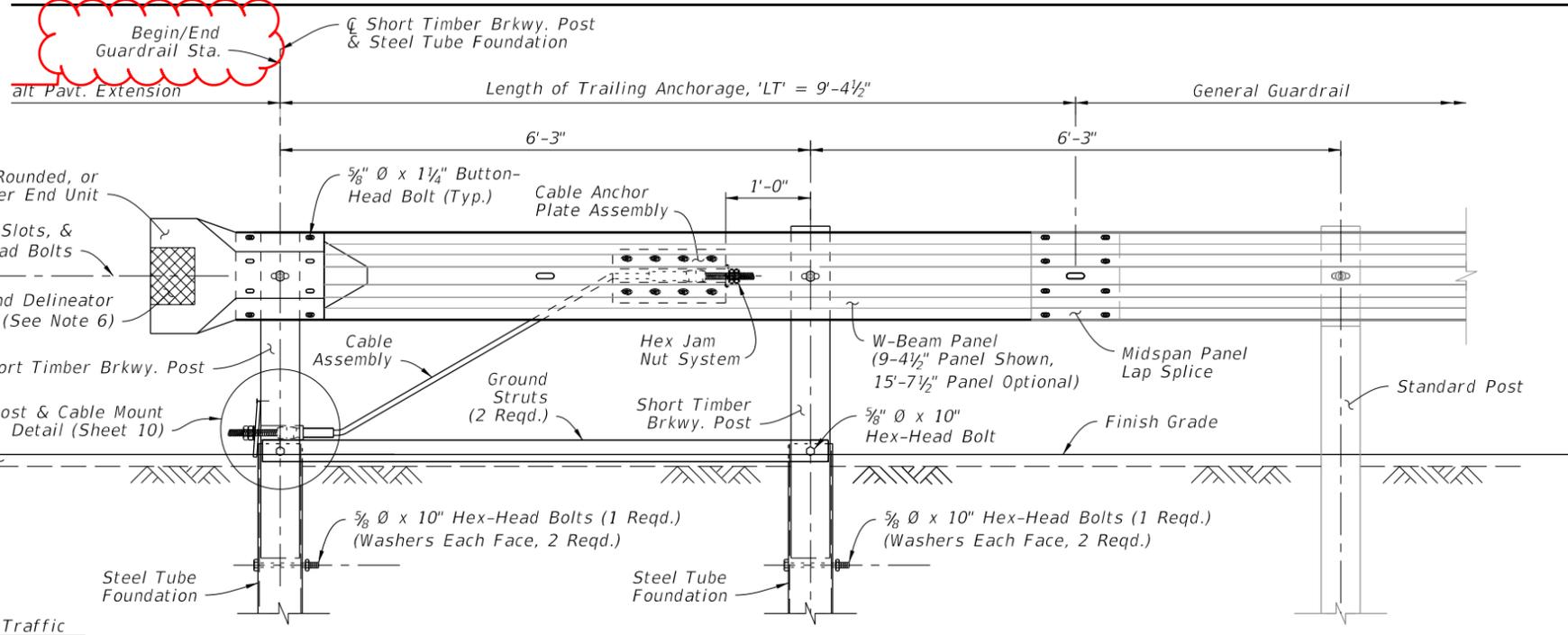
FY 2020-21
STANDARD PLANS

GUARDRAIL

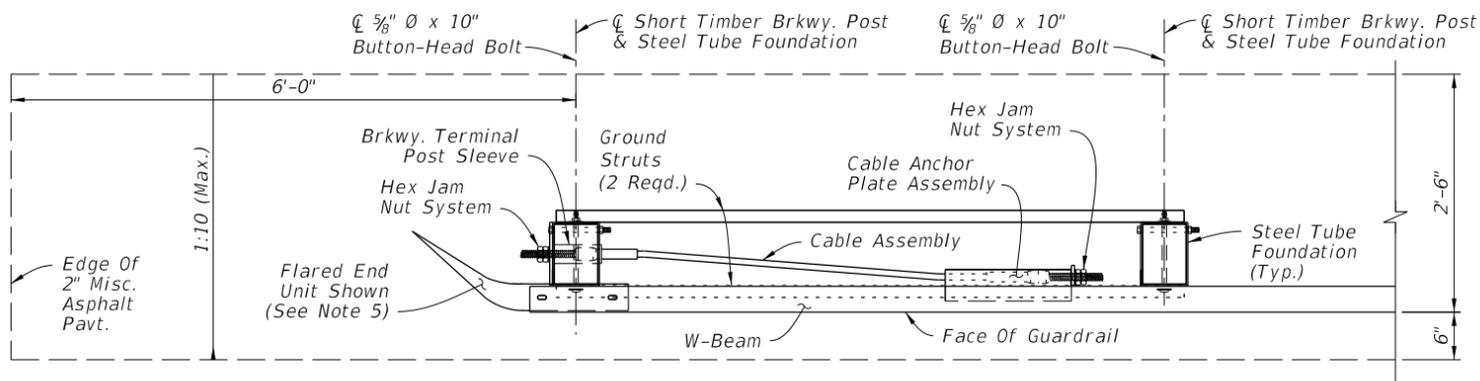
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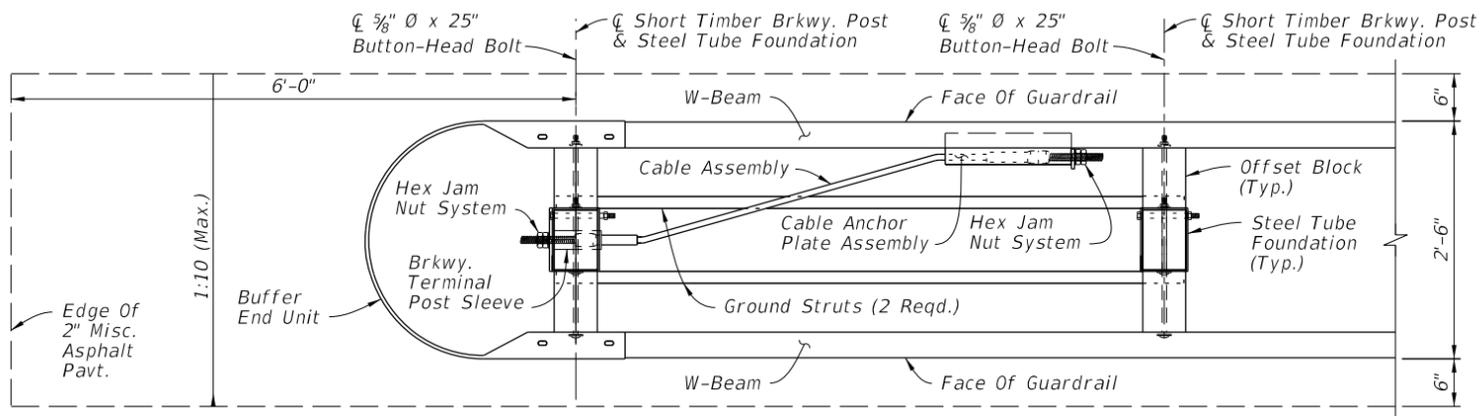
Added Trailing Anchorage Callout Station for Consistency with Plans and Other Segment Callouts



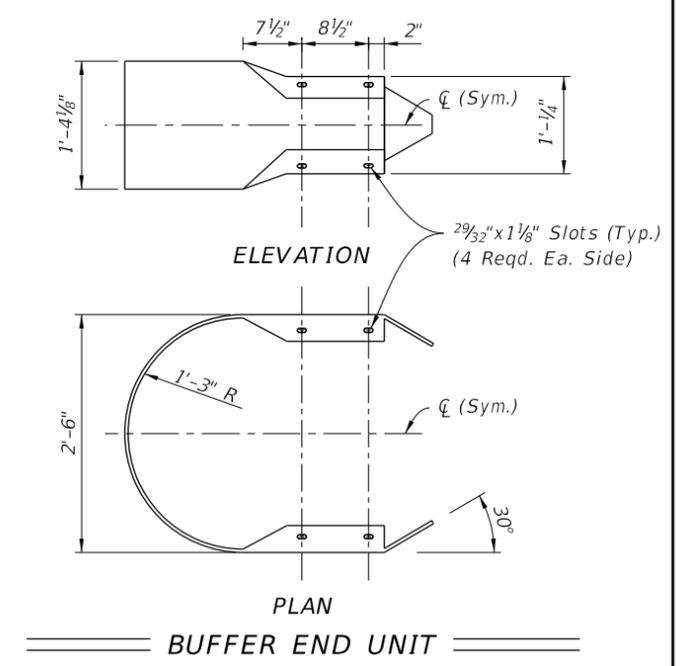
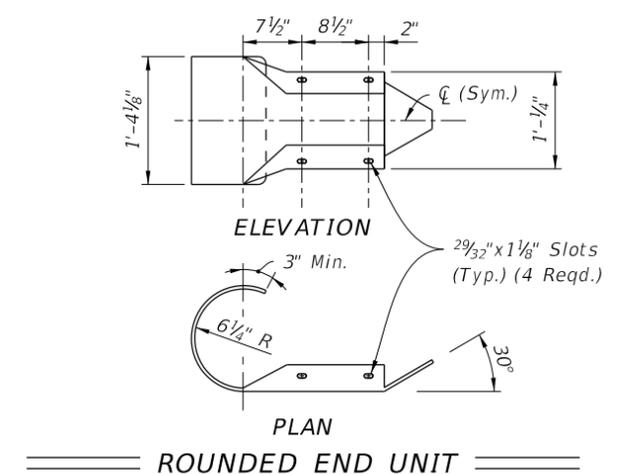
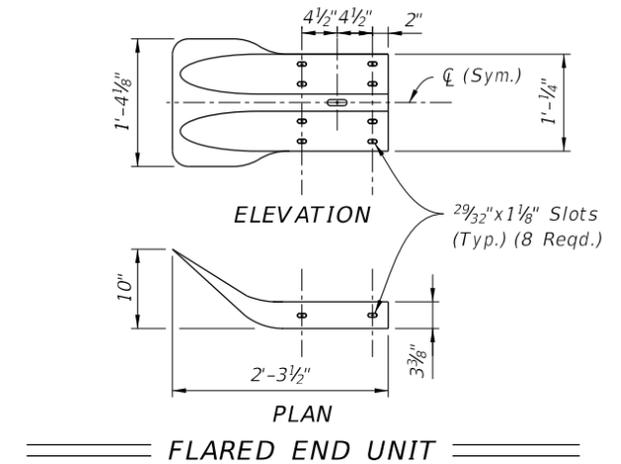
INSTALLED ELEVATION



SINGLE FACE TRAILING ANCHORAGE INSTALLED PLAN



DOUBLE FACE TRAILING ANCHORAGE INSTALLED PLAN



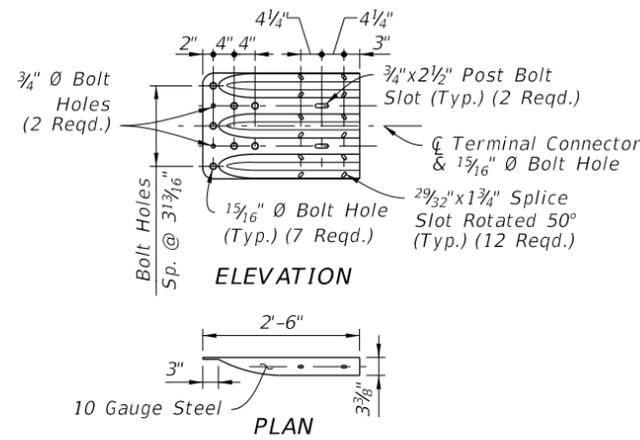
NOTES:

- COMPONENT DETAILS:** For additional component details, See Sheet 10.
- END UNITS:** Use materials for end units as defined in Specifications Section 967. End Units are referred to as "End or Buffer Sections" in AASHTO M180.
Lap the Flared End Unit behind the W-Beam; lap the Rounded and Buffered End Units over the face of the W-Beam.
- FOUNDATIONS:** Install Steel Tubes by either of the following methods:
 - Excavate, backfill, and compact material to provide full passive soil resistance to the surface of the Tube.
 - Drive the Tube using a dummy timber post to prevent damage to the Breakaway Post.
- GENERAL GUARDRAIL:** General Guardrail typically includes Panels and Post Spacing as shown on Sheet 2, including parallel and tapered segments. Transitions, Low-Speed Guardrail, or Reduced Post Spacing Guardrail segments may be substituted for the General Guardrail shown herein if indicated in the plans.
- SIDEWALK REQUIREMENTS:** When sidewalks are located adjacent to the End Treatment, install a Rounded End Unit (Flared End Unit not permitted for this case).
- END DELINEATOR:** Mount retroreflective sheeting to the approach face of the End Unit in accordance with Specification Sections 536 and 967.

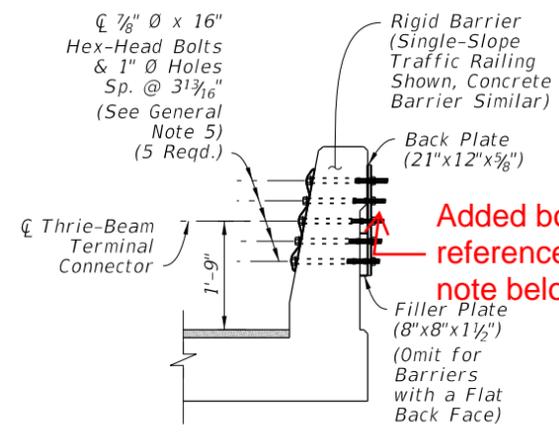
END TREATMENT - TRAILING ANCHORAGE

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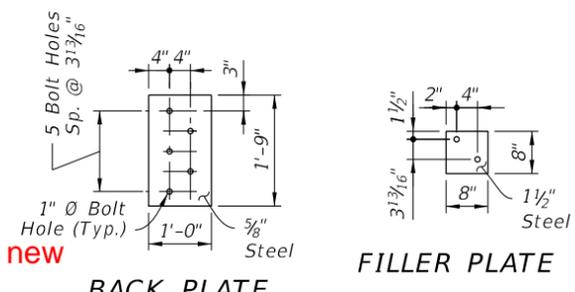
LAST REVISION	DESCRIPTION:
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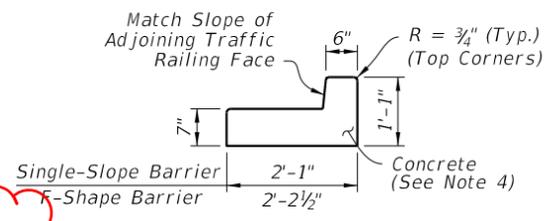
THRIE-BEAM TERMINAL CONNECTOR DETAIL



SECTION A-A RIGID BARRIER TERMINAL CONNECTOR MOUNT



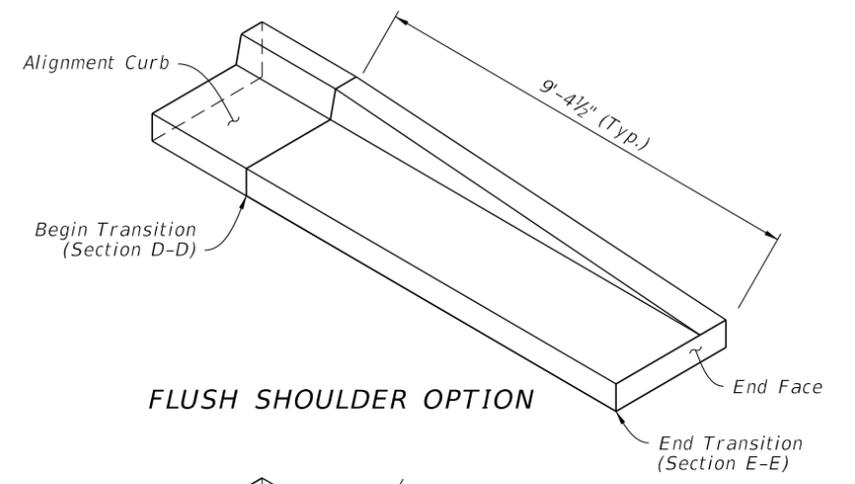
BACK PLATE FILLER PLATE



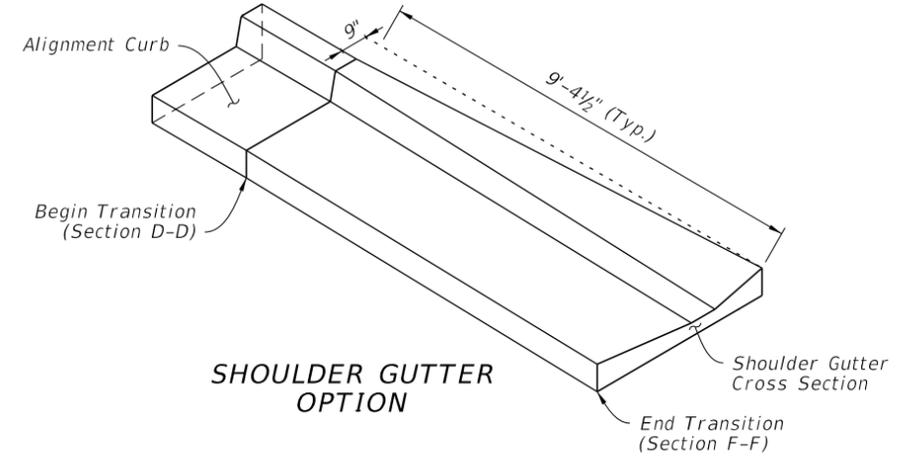
ALIGNMENT CURB SECTION

Added bolt reference to new note below...

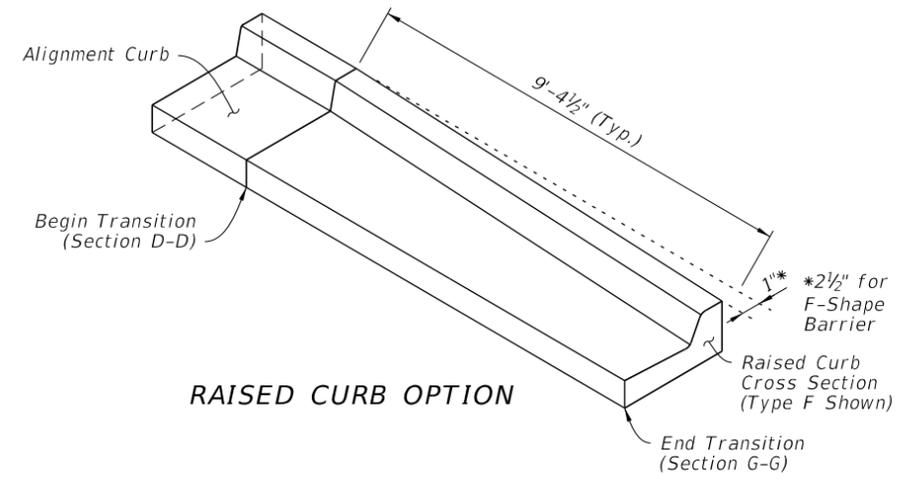
Added note to accommodate nearby sidewalk or shared use path



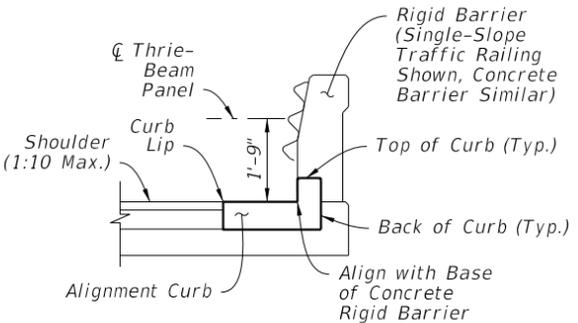
FLUSH SHOULDER OPTION



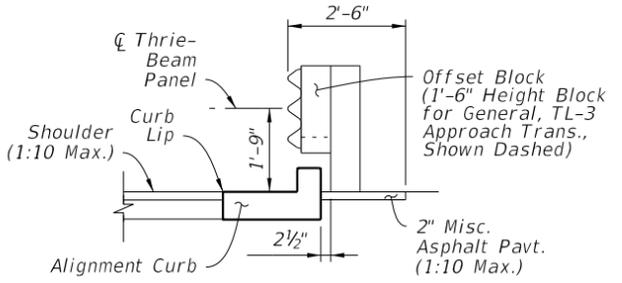
SHOULDER GUTTER OPTION



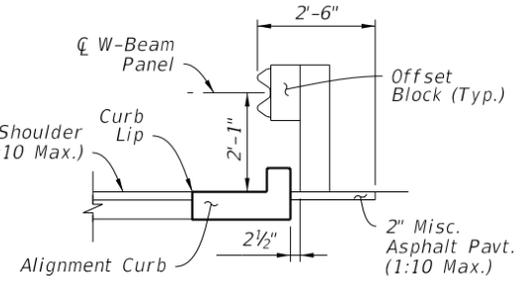
RAISED CURB OPTION



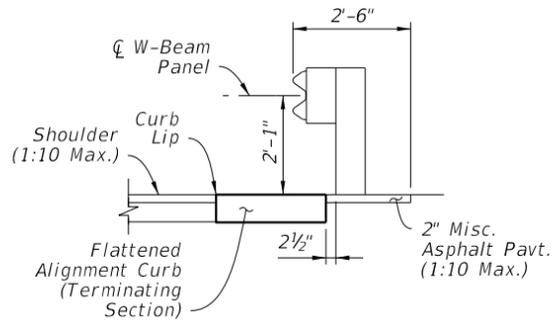
SECTION B-B BEGIN ALIGNMENT CURB (Mate to Rigid Barrier)



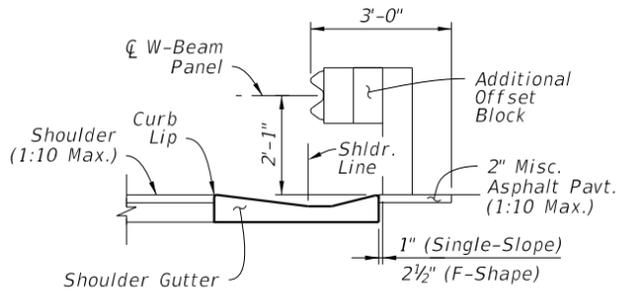
SECTION C-C ALIGNMENT CURB (Intermediate)



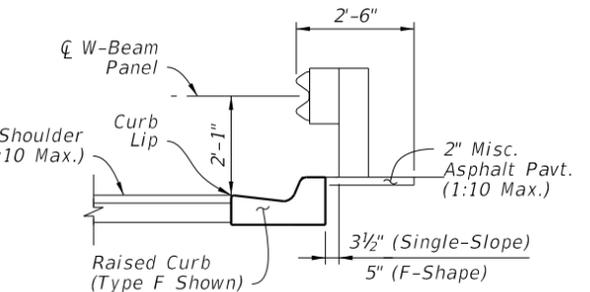
SECTION D-D BEGIN TRANSITION (End Alignment Curb)



SECTION E-E END TRANSITION FLUSH SHOULDER OPTION



SECTION F-F END TRANSITION SHOULDER GUTTER OPTION



SECTION G-G END TRANSITION RAISED CURB OPTION

CURB TYPICAL SECTIONS

CURB TRANSITION ISOMETRIC VIEWS

- NOTES:**
1. PLAN AND ELEVATION VIEWS: Work with Sheets 13 thru 16.
 2. END TRANSITION OF CURB OPTION: Install one of the three End Transition types shown per Section E-E as indicated by the plans.
 3. GRADING BEHIND POSTS: Place Slope Break a Min. 2'-0" behind the post, per Sheet 6.
 4. MATERIALS & CONSTRUCTION: Construct the concrete Aligning Curb and Curb transition in accordance with Specification 520. Use steel Plates and Thrie-Beam Terminal Connectors in accordance with Specification 967.

APPROACH TRANSITION CONNECTION - DETAILS

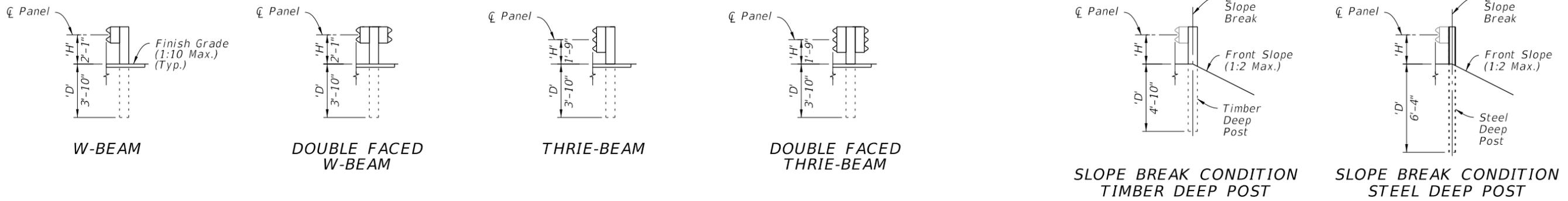
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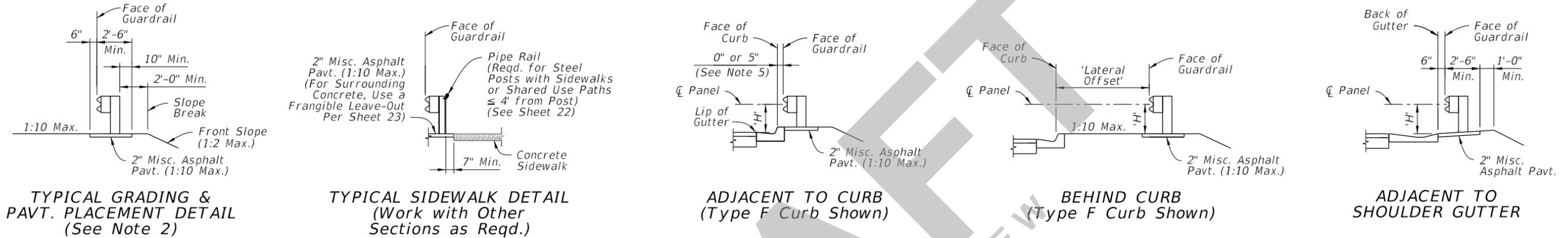
FY 2020-21 STANDARD PLANS

GUARDRAIL

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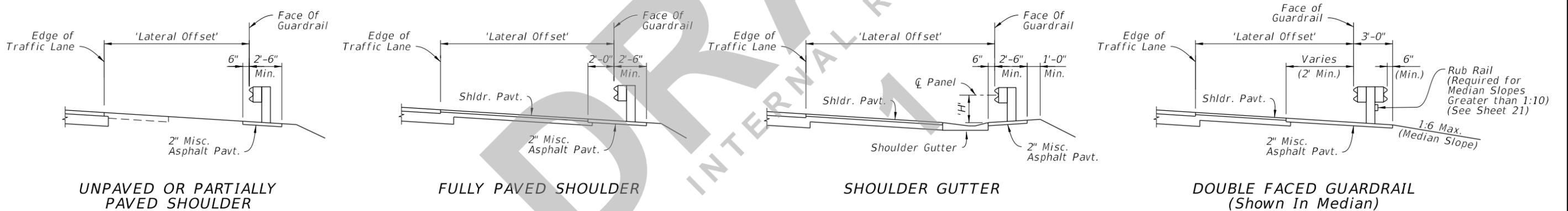


GUARDRAIL TYPES - MOUNTING HEIGHTS & POST DEPTHS



GUARDRAIL SECTIONS - TYPICAL

GUARDRAIL SECTIONS - CURB & GUTTER



GUARDRAIL SECTIONS - SHOULDERS

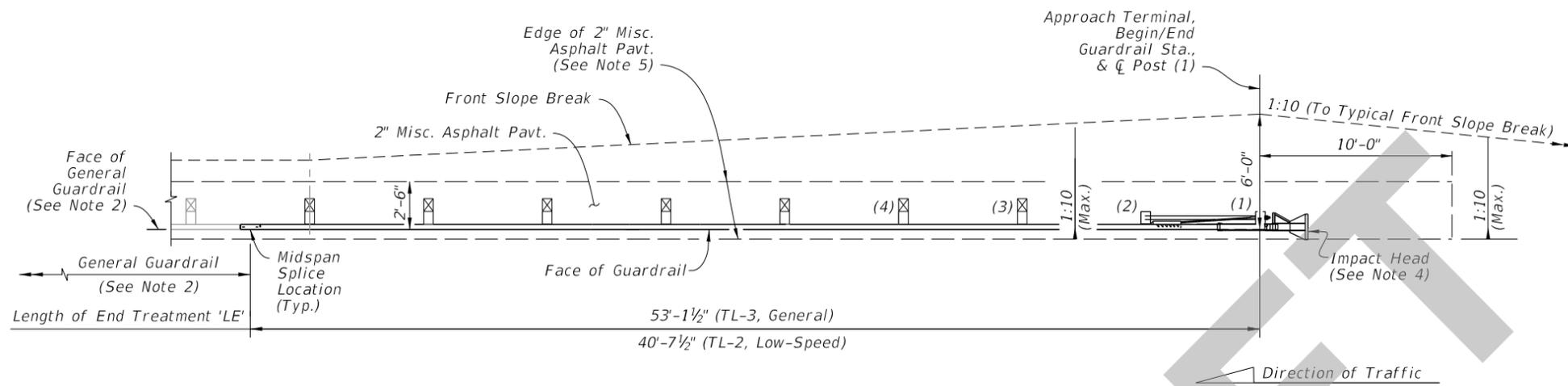
GUARDRAIL HEIGHT SUMMARY TABLE:			
Type:	Min. Depth 'D':	Mounting Height 'H':	Post Length 'L':
W-Beam (Single and Double Faced)	3'-10"	2'-1"	6'-6"
Thrie-Beam (Single and Double Faced)	3'-10"	1'-9"	6'-6"
Timber Deep Post	4'-10"	See Above	7'-6"
Steel Deep Post	6'-4"	See Above	9'-0"

NOTES:

- GUARDRAIL SECTIONS: Construct Sections as indicated in the plans. The details shown herein depict W-Beam Guardrail, but are applicable to the other defined Guardrail Types placed at the corresponding height, 'H'. Use components per Sheets 4 & 5. Steel and timber post types are interchangeable unless otherwise defined. The 1:10 Max. cross slope shown is the maximum slope permitted for proper guardrail function, but project-specific cross slope requirements are governed by additional design criteria, per the plans.
- TYPICAL GRADING & PAVEMENT PLACEMENT DETAIL: Construct features as depicted except where superseded by specific Guardrail Sections or the plans. Place the Slope Break a Minimum of 2' behind the post. For Deep Posts, the slope break may be placed at the \bar{C} Post with the 2" Miscellaneous Asphalt Pavement omitted.
- SLOPE BREAK CONDITION: Install Deep Posts only where called for in the plans. Deep Posts are only permitted where post spacing is 6'-3" or less.
- LATERAL OFFSETS: The Lateral Offsets shown are governed by the station and offset call outs for Face of Guardrail, as shown in the plans.
- ADJACENT TO CURB: Place the Face of Guardrail consistently offset either flush with the Face of Curb or 5" behind the Face of Curb, as indicated by the plans station and offset callout. For offset changes, transition the Face of Guardrail as shown in the plans.

GUARDRAIL SECTIONS

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APPROACH TERMINAL ASSEMBLY
'PARALLEL' TYPE - PLAN VIEW

NOTES:

1. **INSTALLATION:** Locate Approach Terminals where called for in the plans, with the Post (1) C placed at the Begin/End Guardrail Station indicated in the plans.

The Plan Views shown herein are schematic only, showing basic geometry for Approach Terminals listed on the APL. The predefined Length of End Treatment, 'LE', includes the proprietary portion of various Approach Terminals and provides for more consistent planning of assembly installations across the differing Approach Terminal types. Forward-anchoring style Approach Terminals may vary from the planned lengths shown by up to 3'-0".

Construct Approach Terminals as shown in the APL and in accordance with the manufacturer's unique drawing details, procedures, and specifications.

Install posts in accordance with the manufacturer's drawings. The Special Posts on Sheet 23, including Special Steel Posts, Encased Posts, and Frangible Leave-Outs, are not permitted within the Approach Terminal segment unless otherwise called for in the plans.

Align panel lap splices in accordance with the manufacturer's drawings, regardless of the direction of traffic.

Install adjacent grading, gutters, and/or curbing as shown herein.

2. **GENERAL GUARDRAIL:** General Guardrail typically includes Panels and Post Spacing as shown on Sheet 2, including parallel and tapered segments.

Approach Transitions, Low-Speed Guardrail, or Reduced Post Spacing Guardrail segments may be substituted for the General Guardrail shown herein if indicated in the plans.

3. **APPROACH TERMINAL TEST LEVEL:** Install either a Test Level 3 (TL-3) or Test Level 2 (TL-2) Approach Terminal as specified in the plans. TL-3 Approach Terminals may substitute for TL-2 Approach Terminals unless the substitution is specifically prohibited in the plans. TL-2 Approach Terminals may not substitute for TL-3 installations.

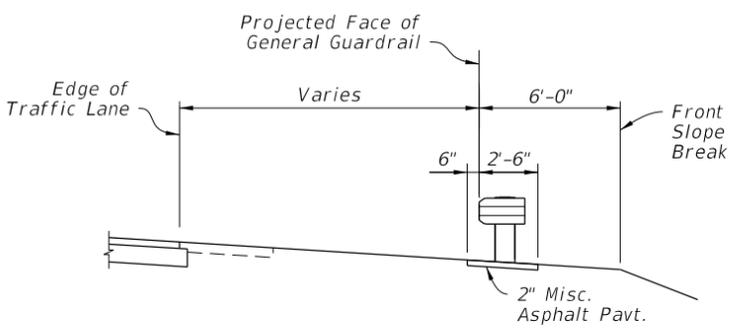
4. **IMPACT HEAD END DELINEATOR:** Apply Yellow Retroreflective Sheeting to the nose of the End Terminal in accordance with Specification 536.

5. **2" MISCELLANEOUS ASPHALT PAVEMENT:** The Plan View depicts the Unpaved Shoulder condition. For Fully Paved Shoulder and Shoulder Gutter conditions, extend the 2" Misc. Asphalt Pavement as shown in the corresponding 'Section at Post (1)' details below.

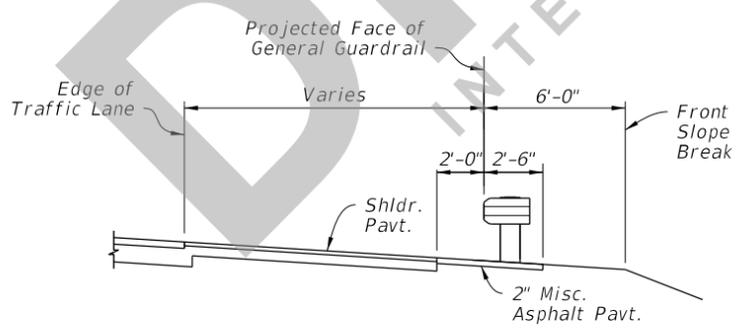
The 2" Misc. Asphalt Pavement shown upstream of Post (1) may be substituted with a different pavement type where called for in the Plans.

6. **CLEAR AREA REQUIREMENT:** Do not place any permanent aboveground installations within the areas shown with 1:10 maximum grading. For the finished condition, keep this area free of all aboveground obstructions, including dense vegetation and trees.

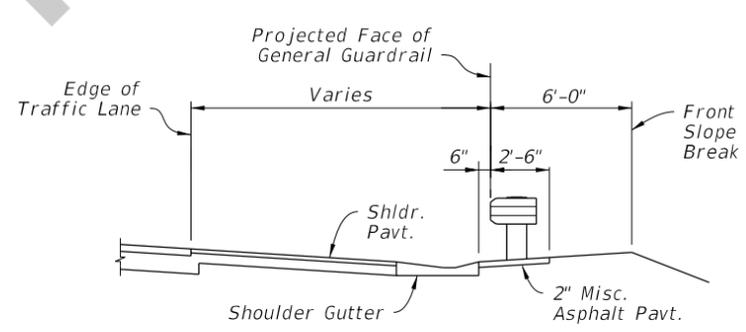
7. **'CURBED' AND 'DOUBLE FACED' GUARDRAIL SEGMENTS:** See Sheet 8.



SECTION AT POST (1)
WITH UNPAVED SHOULDER



SECTION AT POST (1)
WITH FULLY PAVED SHOULDER

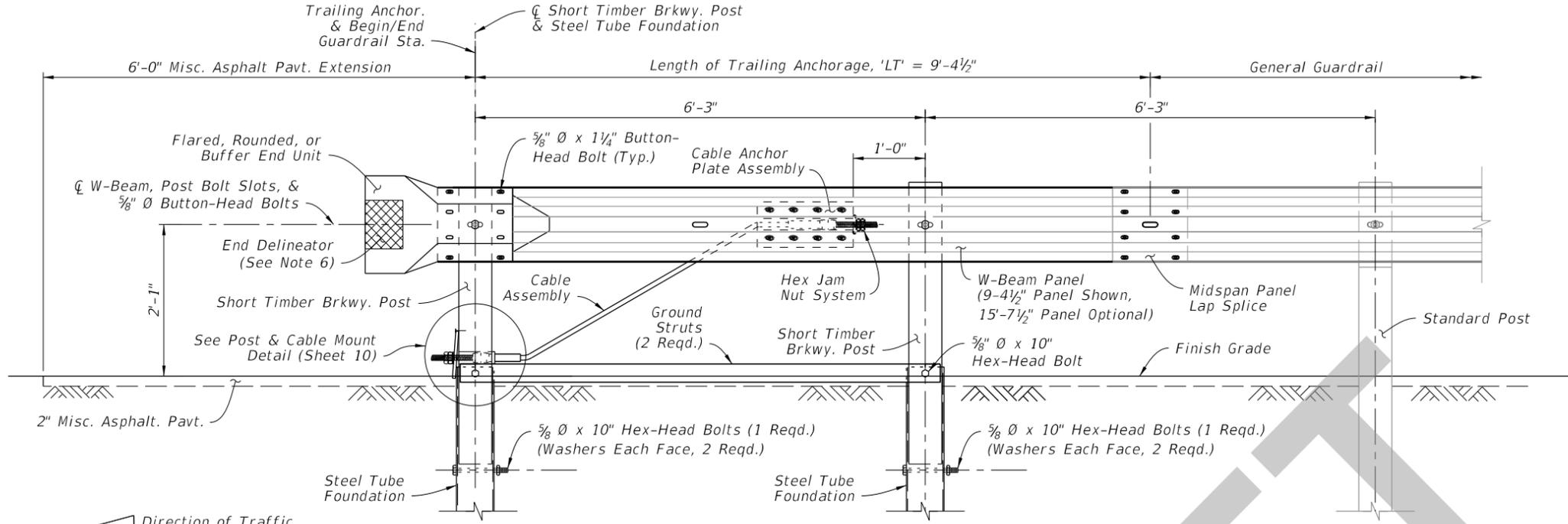


SECTION AT POST (1)
WITH SHOULDER GUTTER

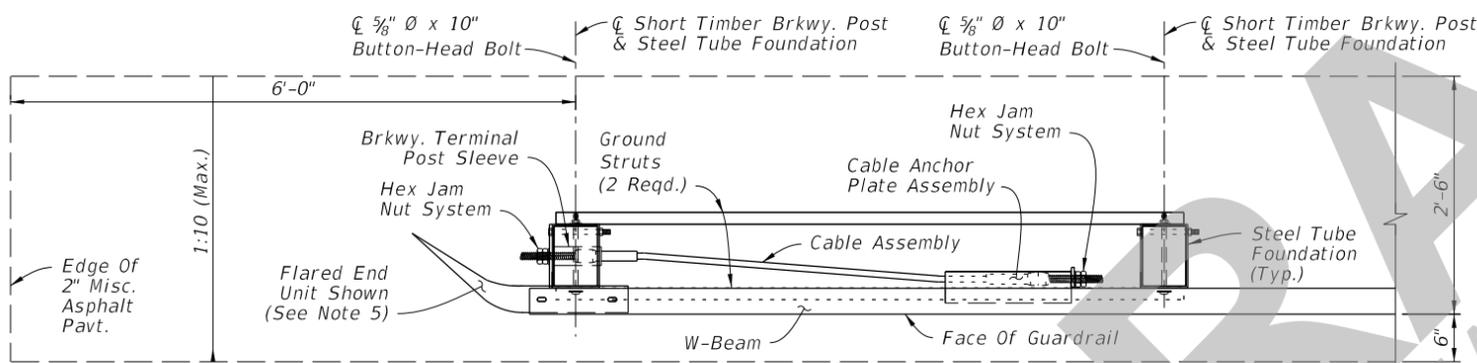
END TREATMENT -
APPROACH TERMINAL
GEOMETRY - PARALLEL

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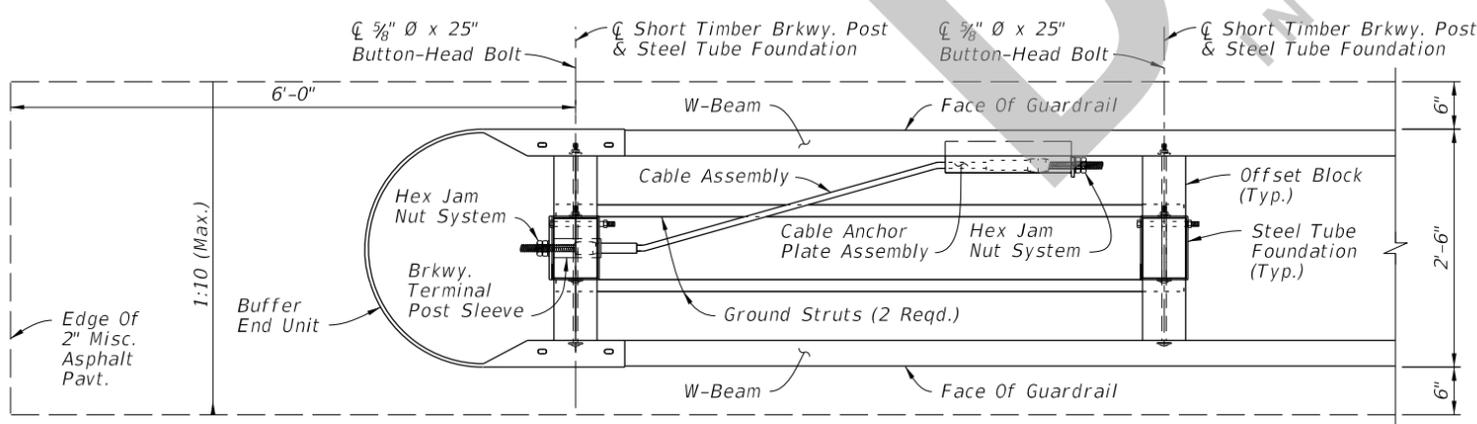
LAST REVISION 11/01/20	REVISION	DESCRIPTION:		FY 2021-22 STANDARD PLANS	GUARDRAIL	INDEX 536-001	SHEET 7 of 24
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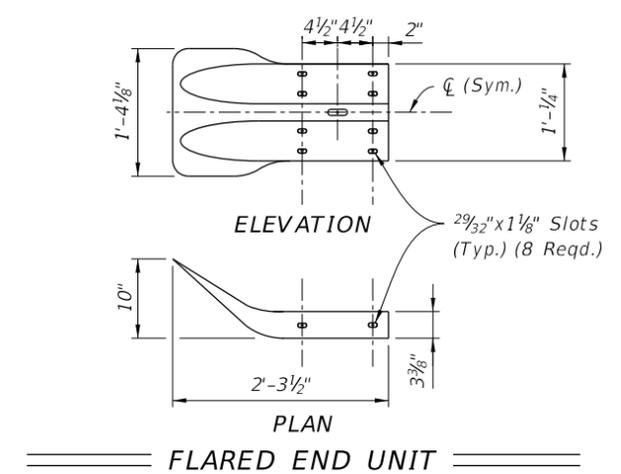
INSTALLED ELEVATION



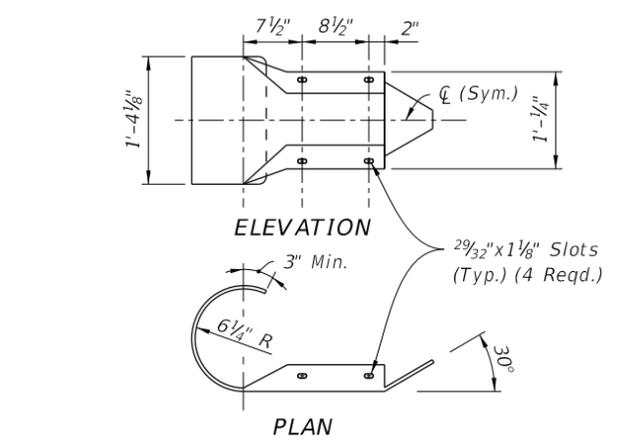
SINGLE FACE TRAILING ANCHORAGE INSTALLED PLAN



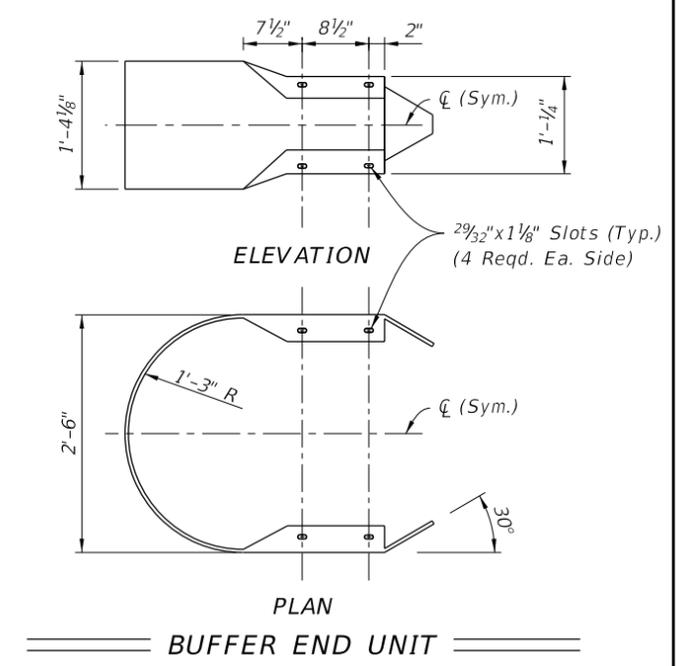
DOUBLE FACE TRAILING ANCHORAGE INSTALLED PLAN



FLARED END UNIT



ROUNDED END UNIT



BUFFER END UNIT

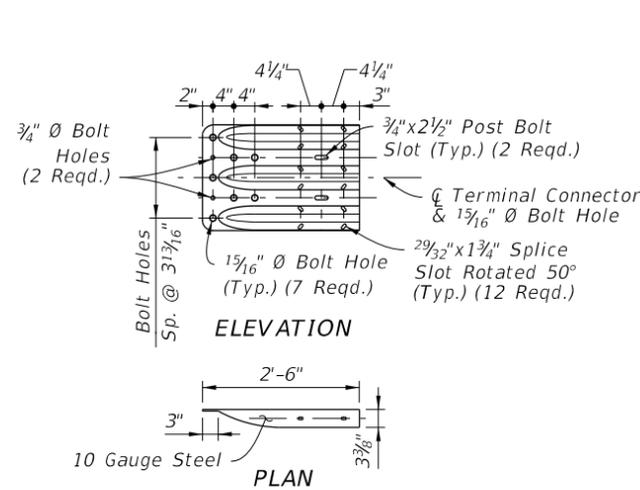
NOTES:

- COMPONENT DETAILS:** For additional component details, See Sheet 10.
- END UNITS:** Use materials for end units as defined in Specifications Section 967. End Units are referred to as "End or Buffer Sections" in AASHTO M180.
Lap the Flared End Unit behind the W-Beam; lap the Rounded and Buffered End Units over the face of the W-Beam.
- FOUNDATIONS:** Install Steel Tubes by either of the following methods:
 - Excavate, backfill, and compact material to provide full passive soil resistance to the surface of the Tube.
 - Drive the Tube using a dummy timber post to prevent damage to the Breakaway Post.
- GENERAL GUARDRAIL:** General Guardrail typically includes Panels and Post Spacing as shown on Sheet 2, including parallel and tapered segments. Transitions, Low-Speed Guardrail, or Reduced Post Spacing Guardrail segments may be substituted for the General Guardrail shown herein if indicated in the plans.
- SIDEWALK REQUIREMENTS:** When sidewalks are located adjacent to the End Treatment, install a Rounded End Unit (Flared End Unit not permitted for this case).
- END DELINEATOR:** Mount retroreflective sheeting to the approach face of the End Unit in accordance with Specification Sections 536 and 967.

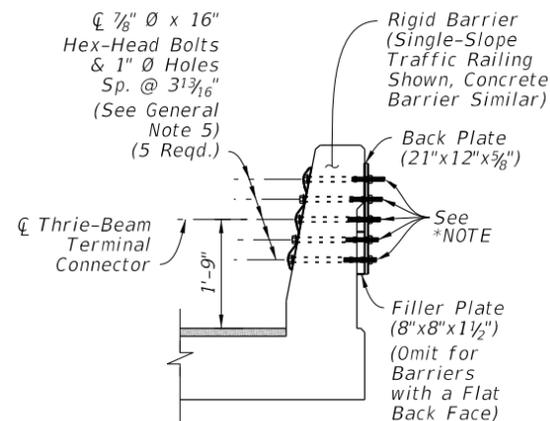
END TREATMENT - TRAILING ANCHORAGE

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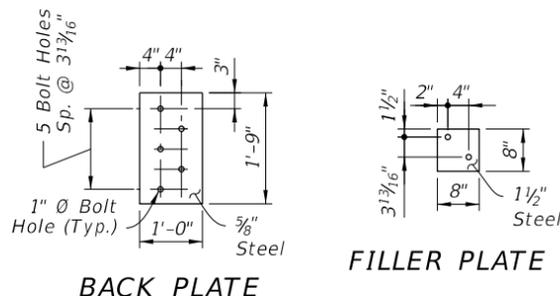


THRIE-BEAM TERMINAL CONNECTOR DETAIL



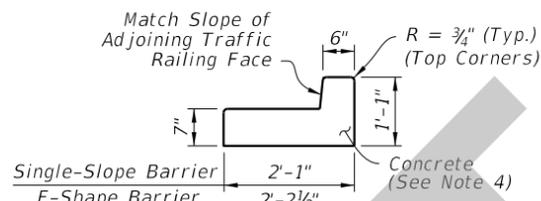
SECTION A-A RIGID BARRIER TERMINAL CONNECTOR MOUNT

*NOTE: For locations within 4'-0" of a sidewalk or shared use path, trim bolts down to within 1/4" of tightend nut. Deform exposed threads. File down sharp edges and burrs.

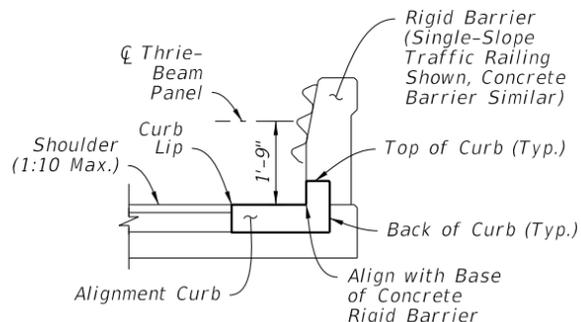


BACK PLATE

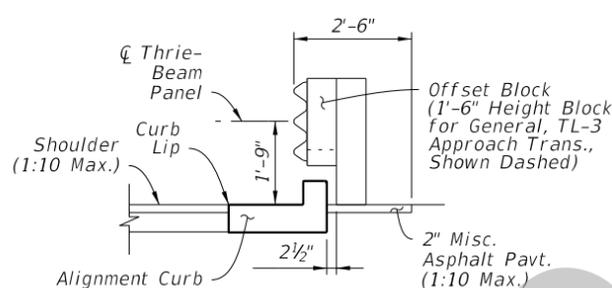
FILLER PLATE



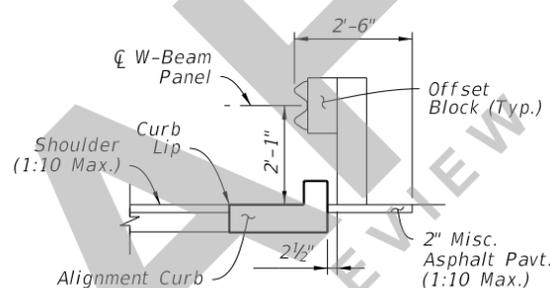
ALIGNMENT CURB SECTION



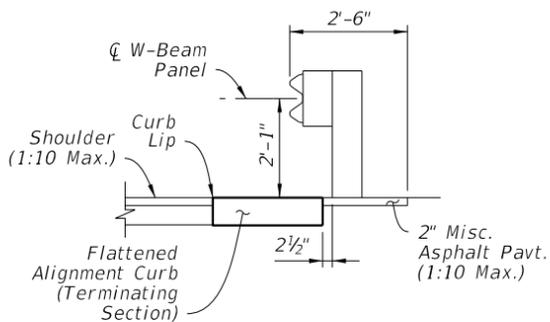
SECTION B-B BEGIN ALIGNMENT CURB (Mate to Rigid Barrier)



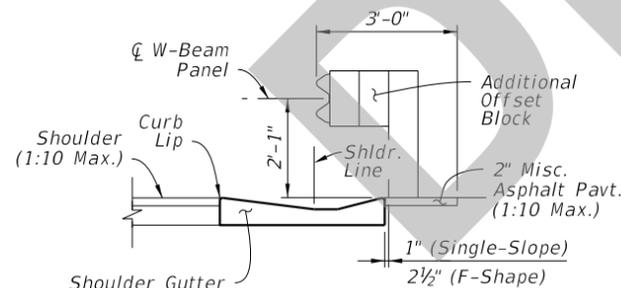
SECTION C-C ALIGNMENT CURB (Intermediate)



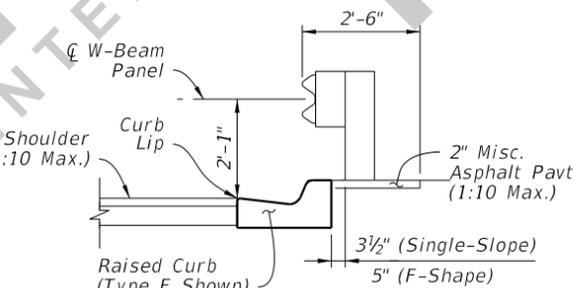
SECTION D-D BEGIN TRANSITION (End Alignment Curb)



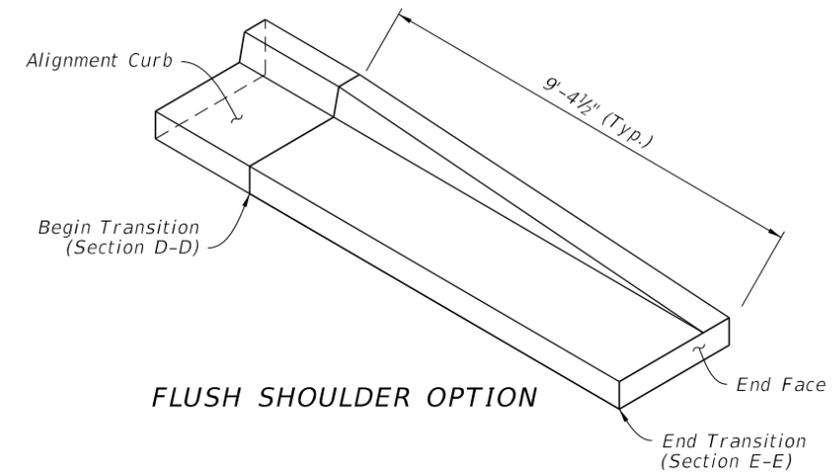
SECTION E-E END TRANSITION FLUSH SHOULDER OPTION



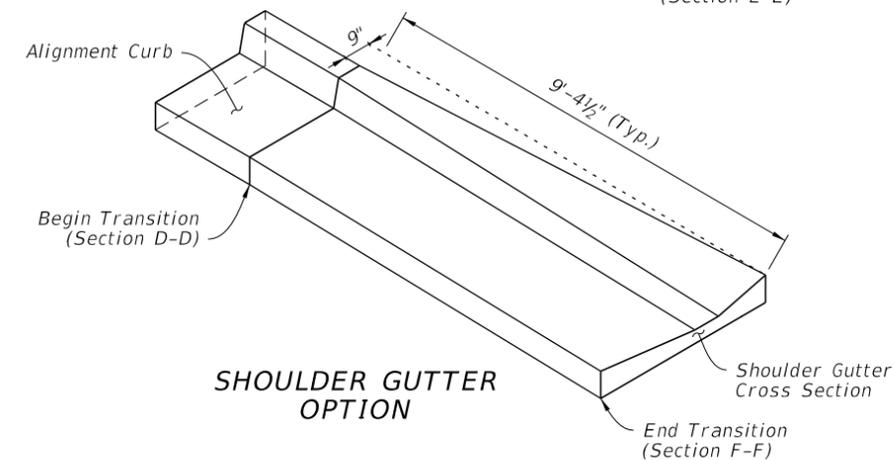
SECTION F-F END TRANSITION SHOULDER GUTTER OPTION



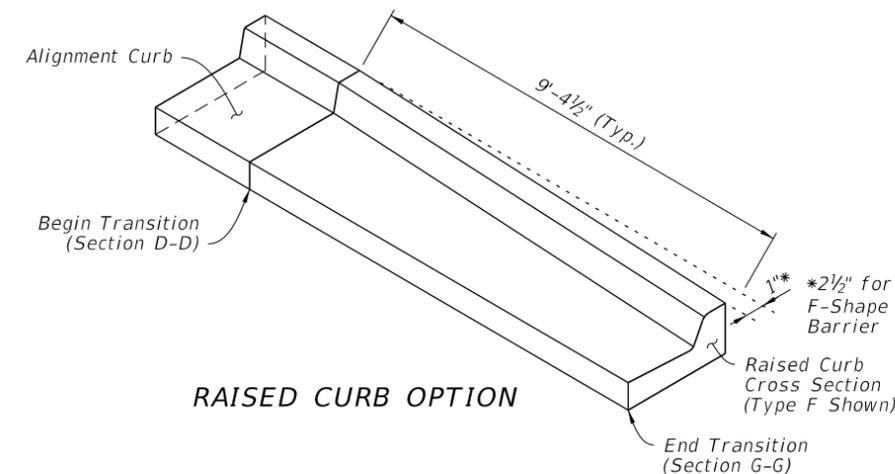
SECTION G-G END TRANSITION RAISED CURB OPTION



FLUSH SHOULDER OPTION



SHOULDER GUTTER OPTION



RAISED CURB OPTION

CURB TRANSITION ISOMETRIC VIEWS

NOTES:

1. PLAN AND ELEVATION VIEWS: Work with Sheets 13 thru 16.
2. END TRANSITION OF CURB OPTION: Install one of the three End Transition types shown per Section E-E as indicated by the plans.
3. GRADING BEHIND POSTS: Place Slope Break a Min. 2'-0" behind the post, per Sheet 6.
4. MATERIALS & CONSTRUCTION: Construct the concrete Aligning Curb and Curb transition in accordance with Specification 520. Use steel Plates and Thrie-Beam Terminal Connectors in accordance with Specification 967.

CURB TYPICAL SECTIONS

APPROACH TRANSITION CONNECTION - DETAILS

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