DelDOT Standard Details Update for MASH 2016

MASH Implementation Timeline

Report 350 SUNSET

MASH Compliance Timeline

Dec. 31, 2017	June 30, 2018	Dec. 31, 2018	Dec. 31, 2019
W-beam & cast-in-place concrete barriers	W-beam terminals	Cable barriers, & their terminals, crash cushions	Bridge rails, transitions, all other longitudinal barriers including portable barriers installed permanently, all other terminals, sign supports, & other breakaway hardware

Tangent Terminals Only

MASH SUNRISE

MASH 2016 Update Committee

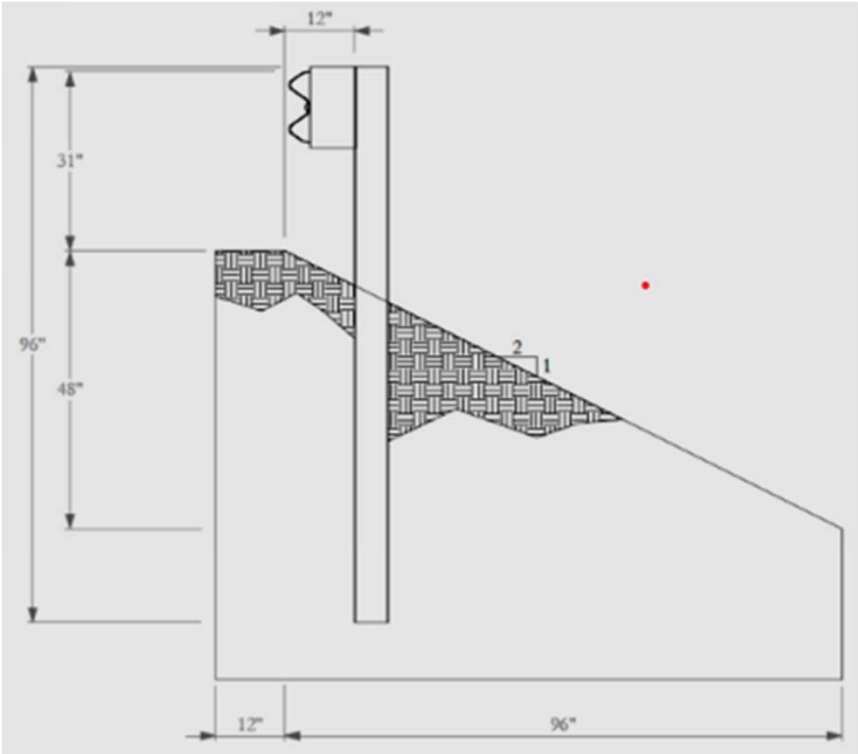
- Started late 2018
- Consists of members from Bridge, Project Development, Construction, Maintenance, Consultants.
- Intent is to update the Standard Details to MASH compliant designs.
- Department wide effort.

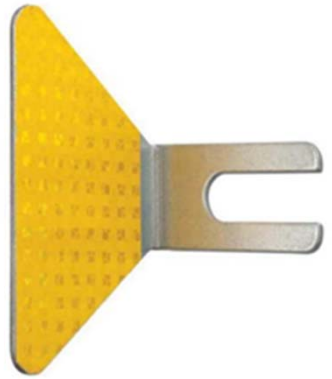
Standard B-1: Types 1-31, 2-31, and 3-31 Guardrail Applications

Sheet 1 of 3 – minor revisions to existing sheet

Sheet 2 of 3 – no changes anticipated

Sheet 3 of 3 – revisions to existing sheet to reflect MASH tested devices





Standard B-1 Types 1-31, 2-31, and 3-31 Guardrail Applications Additions

- **Adding Guardrail on 2:1 Slope**
- **Guardrail with a one post omission**
- **Note for butterfly reflectors to be placed at the guardrail splice point**

Passing MASH Guardrail Test 3-11

Standard B-2 Grading for Guardrail End Treatment Attenuator, Types 1, 2, and 3

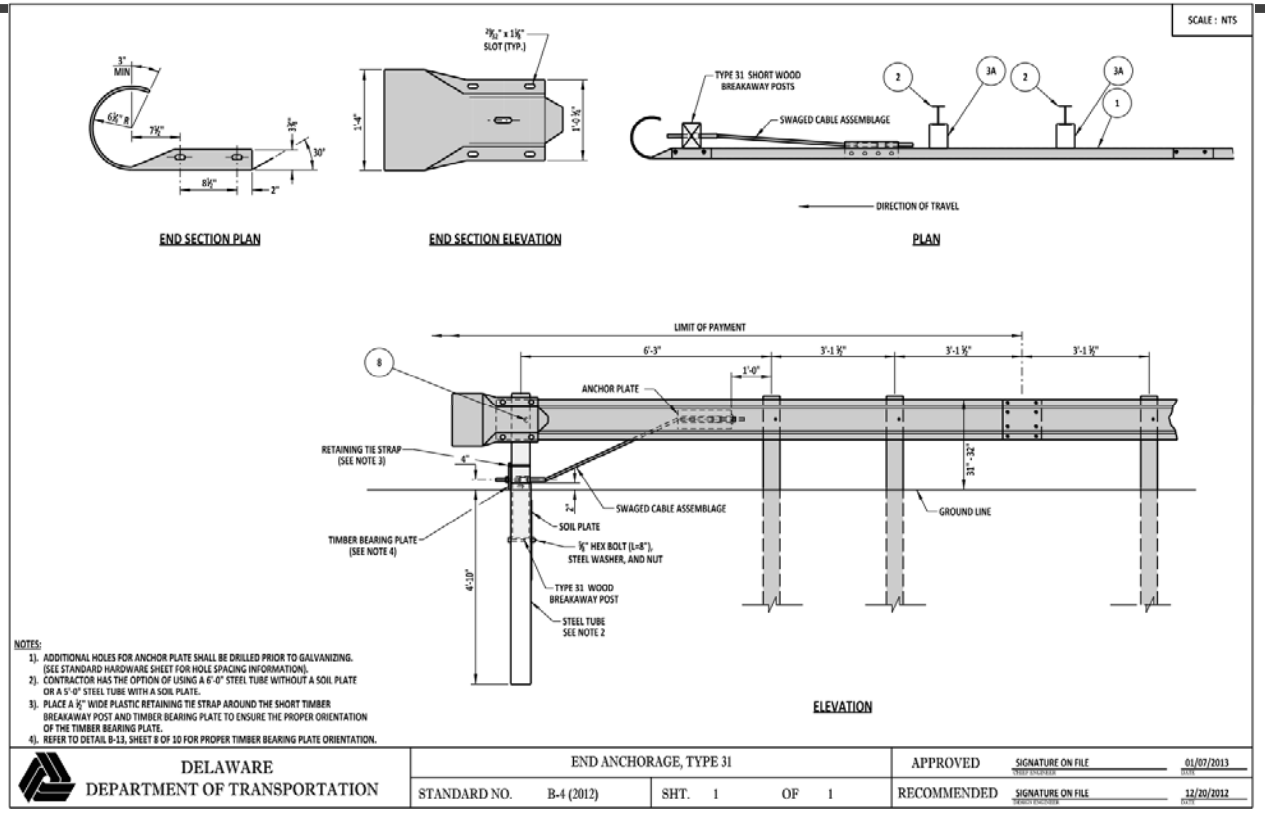
Standard B-2 Grading for Guardrail End Treatment Attenuator, Types 1, 2, and 3 (3 sheets)

- Sheets 1, 2 and 3 – minor revisions to existing sheet
- Access the Approved Product List.
- Use the grading detail OR FOLLOW THE MANUFACTURERS RECOMMENDATIONS.

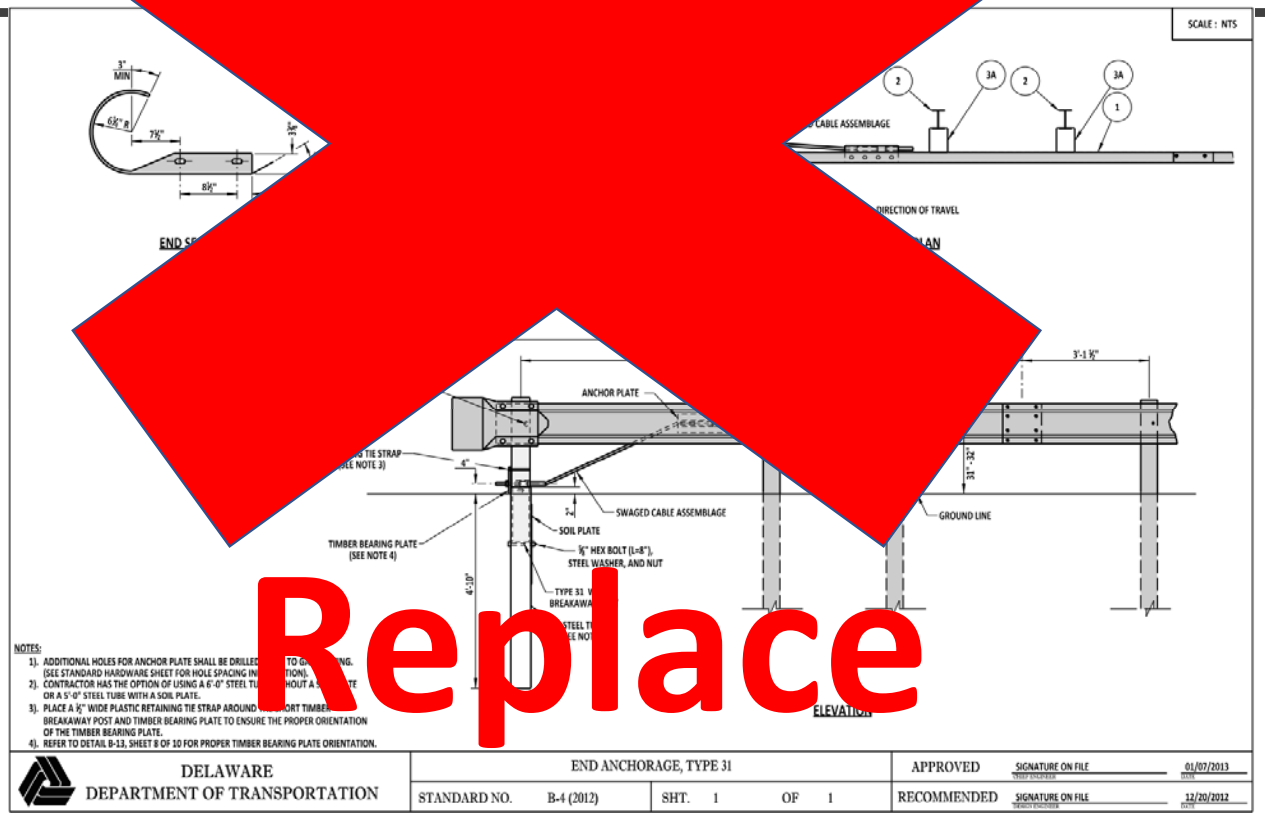
Standard Guardrail over Culverts Types 1-31, 2-31, and 3-31

- Minor changes to the Standard Details
- Maximum span length of 25 feet.
- Test failed for span length over 25 feet.

Standard Detail Sheet B-4 End Anchorage, Type 31



Standard Deta[illegible]eet B-4 End A[illegible]horage, Type 31



Replace

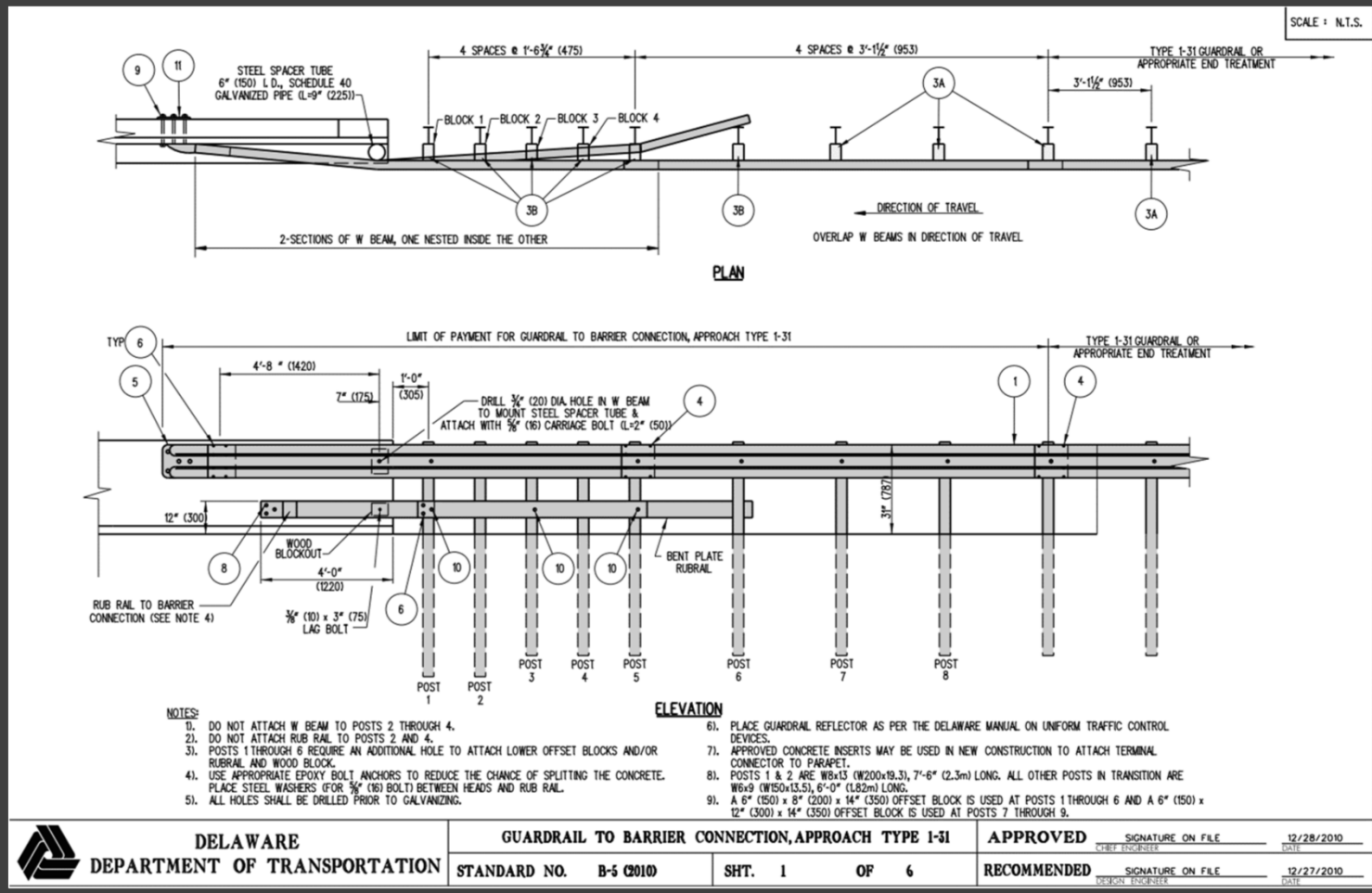
Standard B-5 Guardrail to Barrier Connection, Approach Type 1-31 and 2-31

- Approach Type 2-31, Sheets 4 and 5 will be replaced.
- Sheet 6 of 6 will remain with minor revisions to existing sheet
- In lieu of the Approach Type 2-31, new details for Guardrail to Barrier Connection Approach will be developed:
  - 34” Tall Thrie Beam Transition to Concrete Buttress
  - 31” Tall Thrie Beam to Barrier Connection

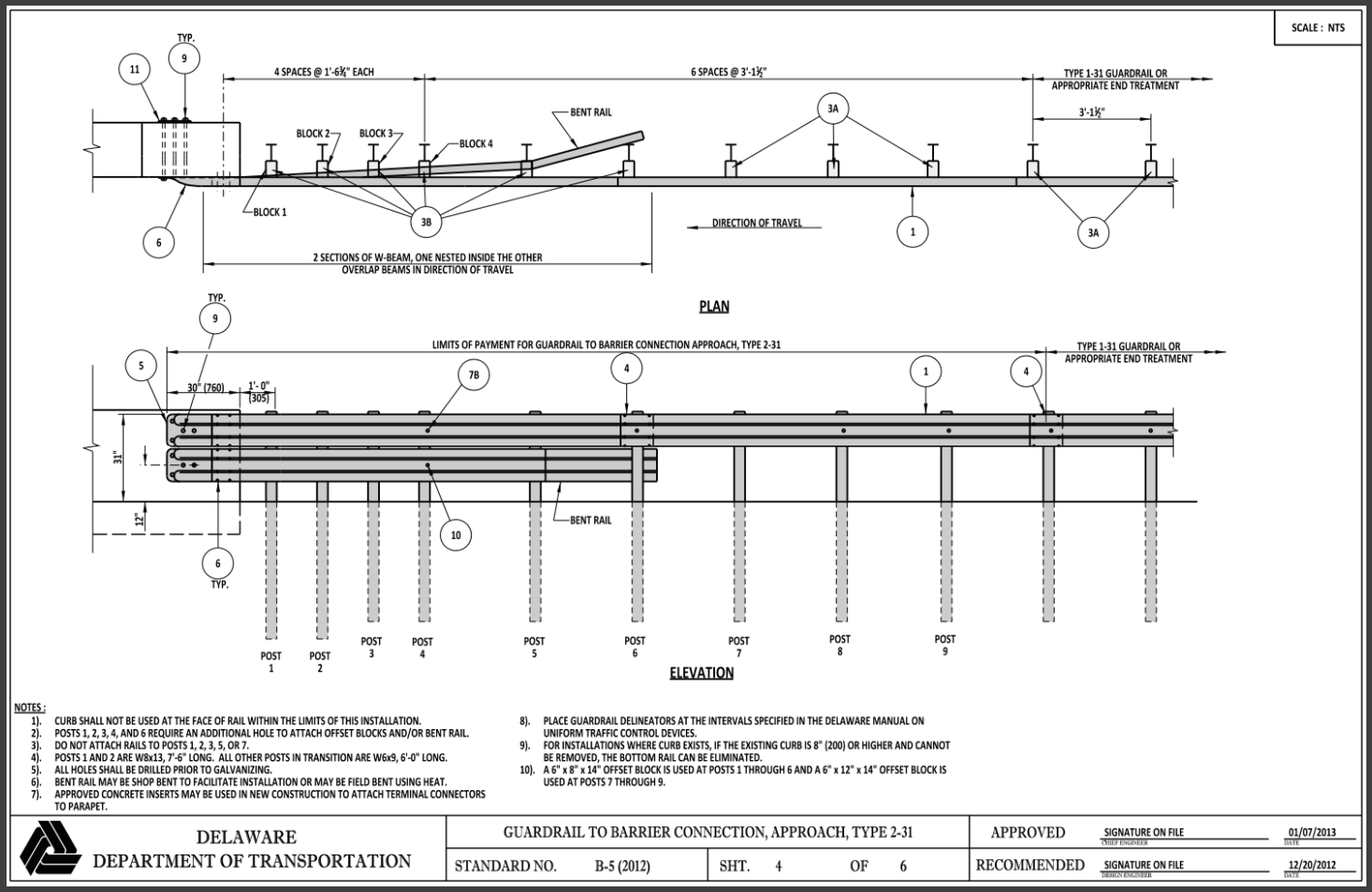

GOSH
DANGIT

Guardrail to Barrier Connection, Approach Type 1-31

- Tested with no curb.
- Utilize with 2” curb to assist with runoff



Standard B-5: Guardrail to Barrier Connection, Approach, Type 2-31



NOTES :

1). CURB SHALL NOT BE USED AT THE FACE OF RAIL WITHIN THE LIMITS OF THIS INSTALLATION.
2). POSTS 1, 2, 3, 4, AND 6 REQUIRE AN ADDITIONAL HOLE TO ATTACH OFFSET BLOCKS AND/OR BENT RAIL.
3). DO NOT ATTACH RAILS TO POSTS 1, 2, 3, 5, OR 7.
4). POSTS 1 AND 2 ARE W8x13, 7'-6" LONG. ALL OTHER POSTS IN TRANSITION ARE W6x9, 6'-0" LONG.
5). ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.
6). BENT RAIL MAY BE SHOP BENT TO FACILITATE INSTALLATION OR MAY BE FIELD BENT USING HEAT.
7). APPROVED CONCRETE INSERTS MAY BE USED IN NEW CONSTRUCTION TO ATTACH TERMINAL CONNECTORS TO PARAPET.
8). PLACE GUARDRAIL DELINEATORS AT THE INTERVALS SPECIFIED IN THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
9). FOR INSTALLATIONS WHERE CURB EXISTS, IF THE EXISTING CURB IS 8" (200) OR HIGHER AND CANNOT BE REMOVED, THE BOTTOM RAIL CAN BE ELIMINATED.
10). A 6" x 8" x 14" OFFSET BLOCK IS USED AT POSTS 1 THROUGH 6 AND A 6" x 12" x 14" OFFSET BLOCK IS USED AT POSTS 7 THROUGH 9.

DELAWARE DEPARTMENT OF TRANSPORTATION	GUARDRAIL TO BARRIER CONNECTION, APPROACH, TYPE 2-31		APPROVED	SIGNATURE ON FILE (CHIEF ENGINEER)	01/07/2013 (DATE)
	STANDARD NO. B-5 (2012)	SHT. 4 OF 6	RECOMMENDED	SIGNATURE ON FILE (DESIGN ENGINEER)	12/20/2012 (DATE)

MASH 2016 Test on Stacked W-Beam

Standard B-5 Guardrail to Barrier Connection

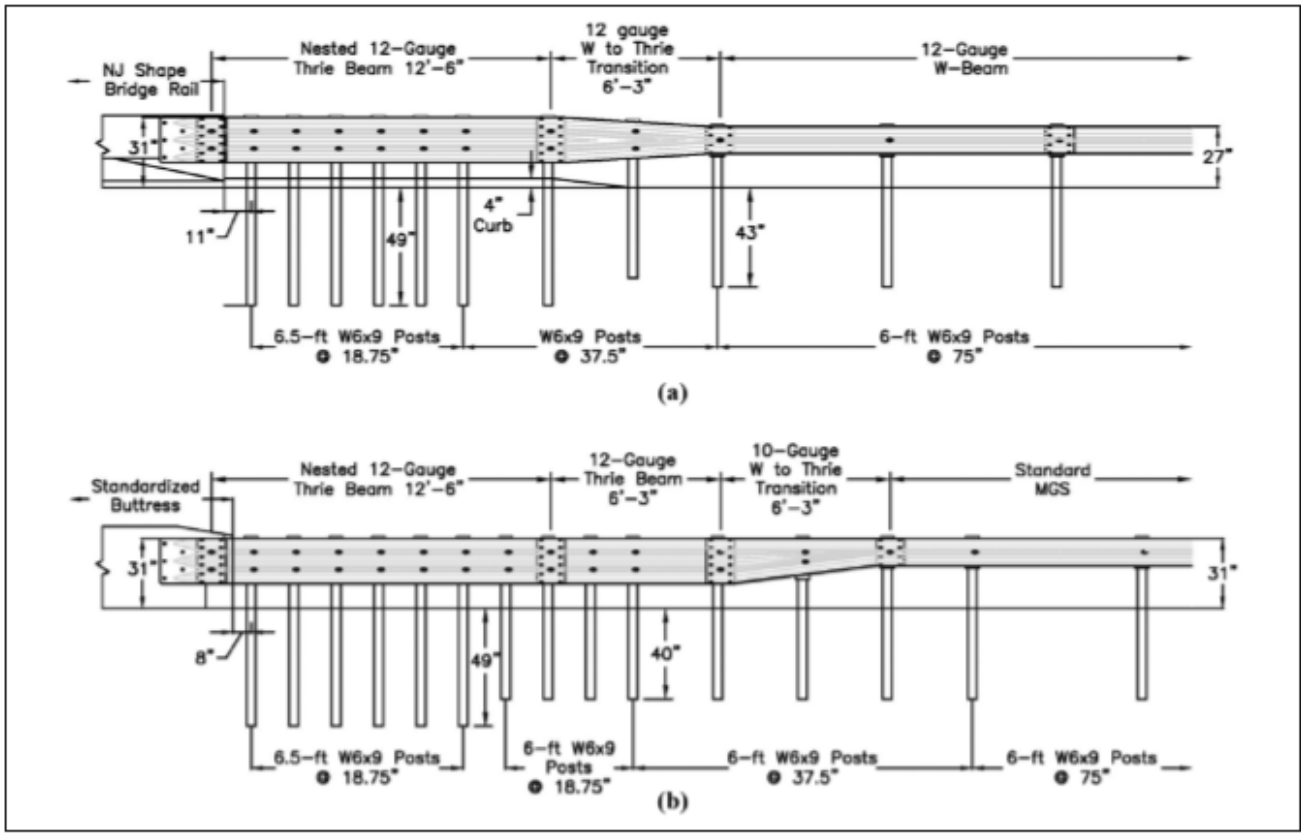


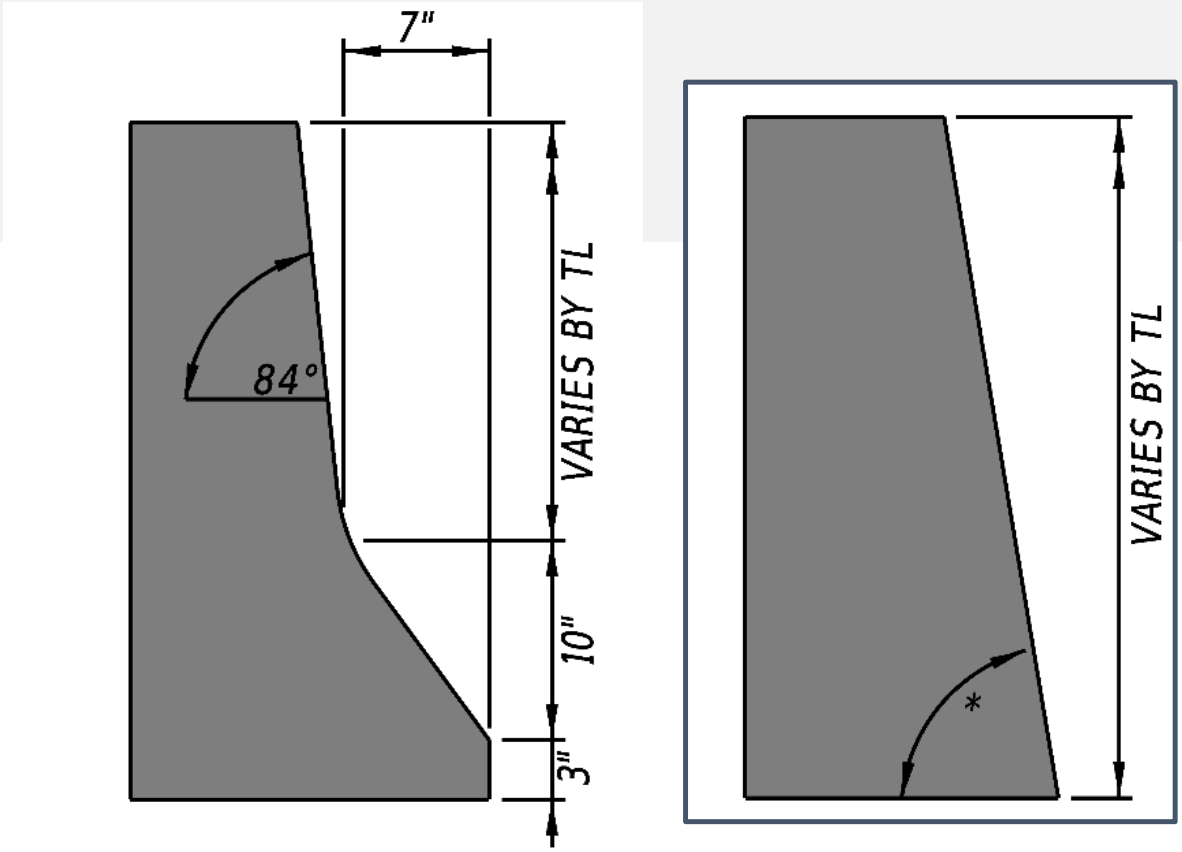
Figure 3. Selected AGT design: (*a*) original as-tested configuration and (*b*) critical configuration for evaluating the standardized buttress.

Standard B-6
Bridge Rail Retrofit

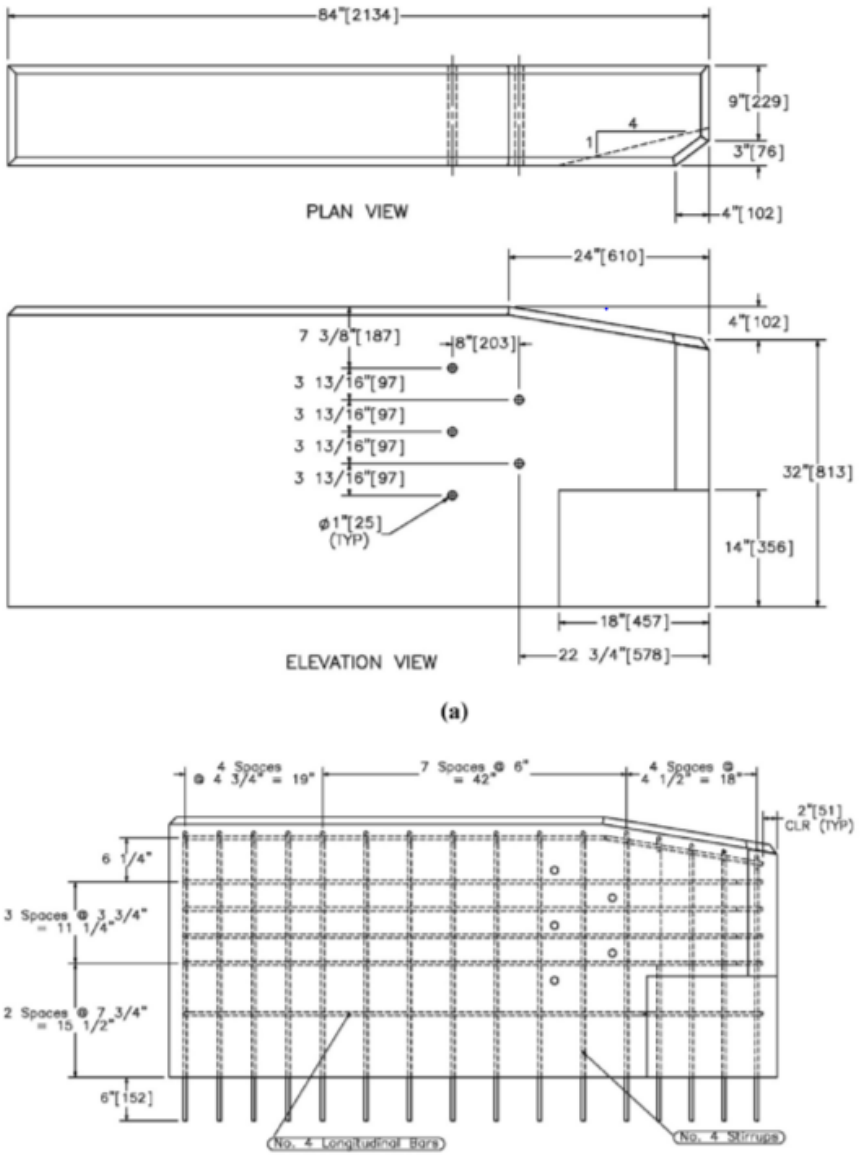
- All 5 sheets will be deleted.
- Any bridge retrofit will be designed specific to the bridge

Section B-14: Concrete Safety Barrier

- 36” F-Shaped Barrier for TL-4
- 42” F-Shaped Barrier for TL-5
- 42” Single Slope Barrier for TL-5
- Approach Guardrail Transition (AGT) for Bridge Parapet & Concrete Barrier



AGT: Approach Guardrail Transition



Temporary Traffic Control Devices

- Utilize the DelDOT Approved Product List for Temporary/Permanent Impact Attenuators.
- Developing sunset dates for NCHRP 350 devices.
- No more 350 packets?
- Special Thanks to Traffic Safety for developing the list.

Resources

- FHWA Eligibility Site
- TRB: Transportation Research Board
- Texas A&M Transportation Institute (TTI) www.roadsidepooledfund.org
- Special Thanks to GPI and WRA for assisting in updating the DelDOT Standard Details.