

Guardrail in Concrete Mow-Strip

Objective:

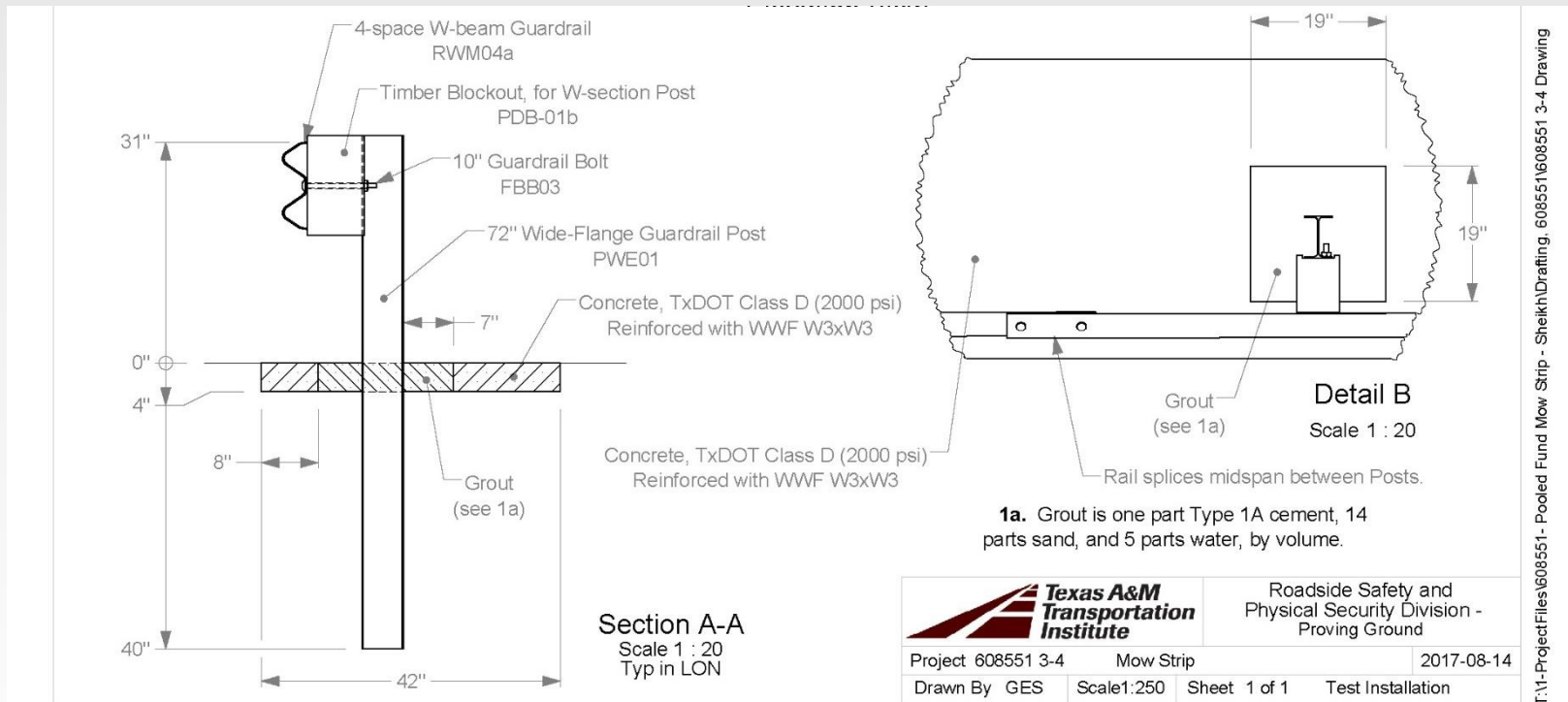
Determine MASH TL-3 compliance of the W-beam guardrail installed in concrete mow-strip

Scope:

- Steel post guardrail
 - Test 3-10 and Test 3-11
- Wood post guardrail
 - Test 3-10 and Test 3-11

Guardrail in Concrete Mow-Strip

Design Details (Steel Post):



Guardrail in Concrete Mow-Strip

Test Installation (Steel Post):

181'-3" installation length (including terminals)

100' concrete mow-strip in the center



Guardrail in Concrete Mow-Strip

Test Installation (Steel Post):

Same installation and mow strip length as steel

Low-strength grout properties

- Specified as: 1 part Type 1A cement, 14 parts sand, and 5 parts water, by volume
- Achieves maximum strength approximately ranging from 120 psi to 200 psi



Guardrail in Concrete Mow-Strip

Steel Post (Test 3-10):



Guardrail in Concrete Mow-Strip

Steel Post (Test 3-11):



Guardrail in Concrete Mow-Strip

Test Installation (Steel Post):

Max. deflection:

3-10: 27.4" dynamic / 17.0" perm.

3-11: 50.8" dynamic / 21.0" perm.

Both tests passed MASH



Guardrail in Concrete Mow-Strip

Wood Post (Test 3-10):



Guardrail in Concrete Mow-Strip

Wood Post (Test 3-11):



Guardrail in Concrete Mow-Strip

Test Installation (Steel Post):

Max. deflection:

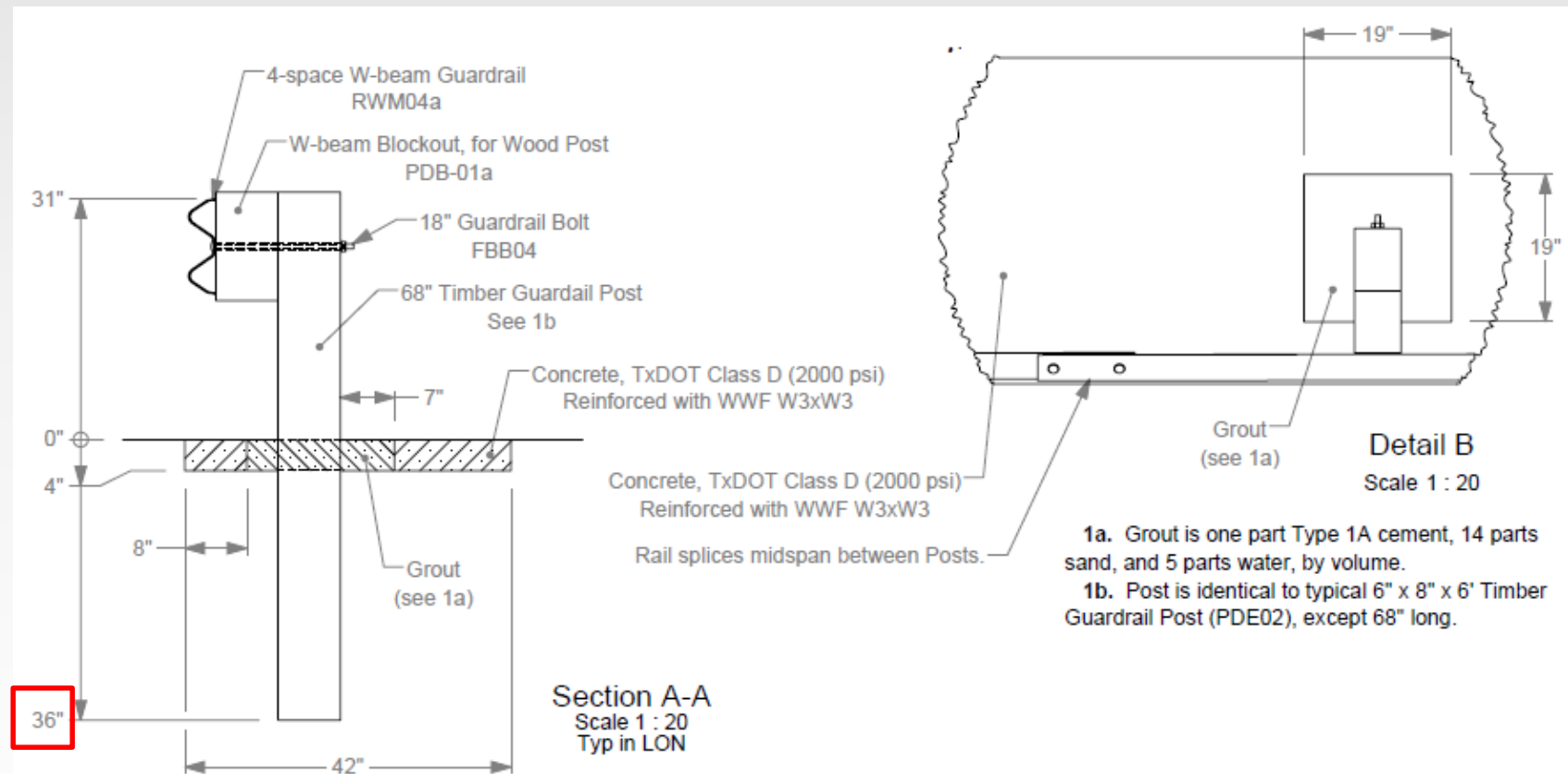
3-10: 27.4" dynamic / 17.0" perm.

Test 3-10 passed but 3-11 failed
MASH



Guardrail in Concrete Mow-Strip

Modified Wood Post with 36-inch Embedment



Guardrail in Concrete Mow-Strip

Wood Post Embedded 36 inches (Test 3-11):



Guardrail in Concrete Mow-Strip

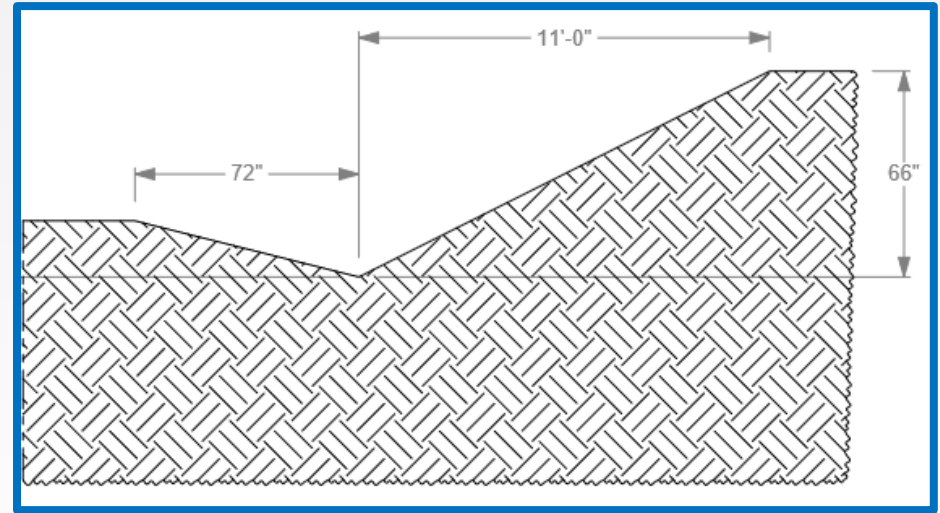
Summary:

- Steel post W-beam guardrail passed MASH TL-3
- Wood post W-beam guardrail
 - Passed Test 3-10
 - Failed Test 3-11 with 40-inch and 36-inch post embedment

MASH TL-3 Testing of 31-inch Buried-in-Backslope Terminal Compatible with MGS Guardrail

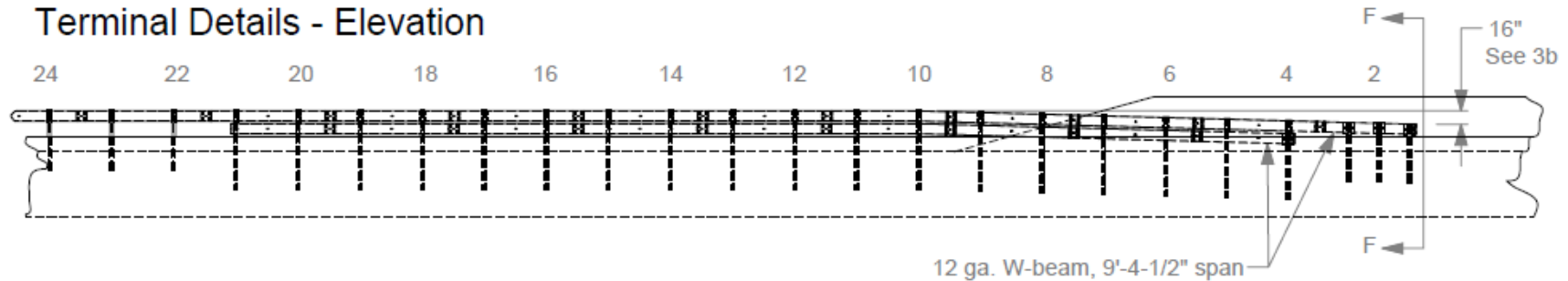
Purpose

- Test 31-in BIB terminal compatible with MGS, under MASH16 TL-3 criteria (Tests 3-34 and 3-35);
- 4:1 Foreslope, 2:1 Backslope, 13:1 Guardrail flare
- Rubrail



MASH TL-3 Testing of 31-inch Buried-in-Backslope Terminal Compatible with MGS Guardrail

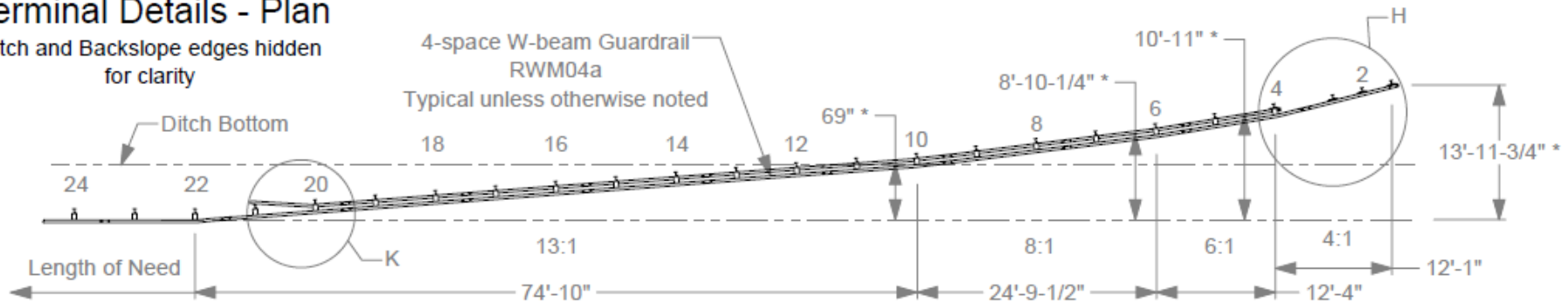
Terminal Details - Elevation



Terminal Details - Plan

Ditch and Backslope edges hidden for clarity

4-space W-beam Guardrail
RWM04a
Typical unless otherwise noted



MASH TL-3 Testing of 31-inch Buried-in-Backslope Terminal Compatible with MGS Guardrail



MASH TL-3 Testing of 31-inch Buried-in-Backslope Terminal Compatible with MGS Guardrail



MASH TL-3 Testing of 31-inch Buried-in-Backslope Terminal Compatible with MGS Guardrail

Conclusions and Implementation

- BIB Terminal performed acceptably for MASH Tests 3-34 and 3-35 for non-gating terminals
- It is considered suitable for implementation at V-ditch locations with a 4:1 or flatter foreslope where a MASH TL-3 BIB Terminal is needed /desired

Final Report

<https://www.roadsidepooledfund.org/wp-content/uploads/2017/04/TRNo608431-12-Final-2018-10-03.pdf>

Pending Eligibility Letter