

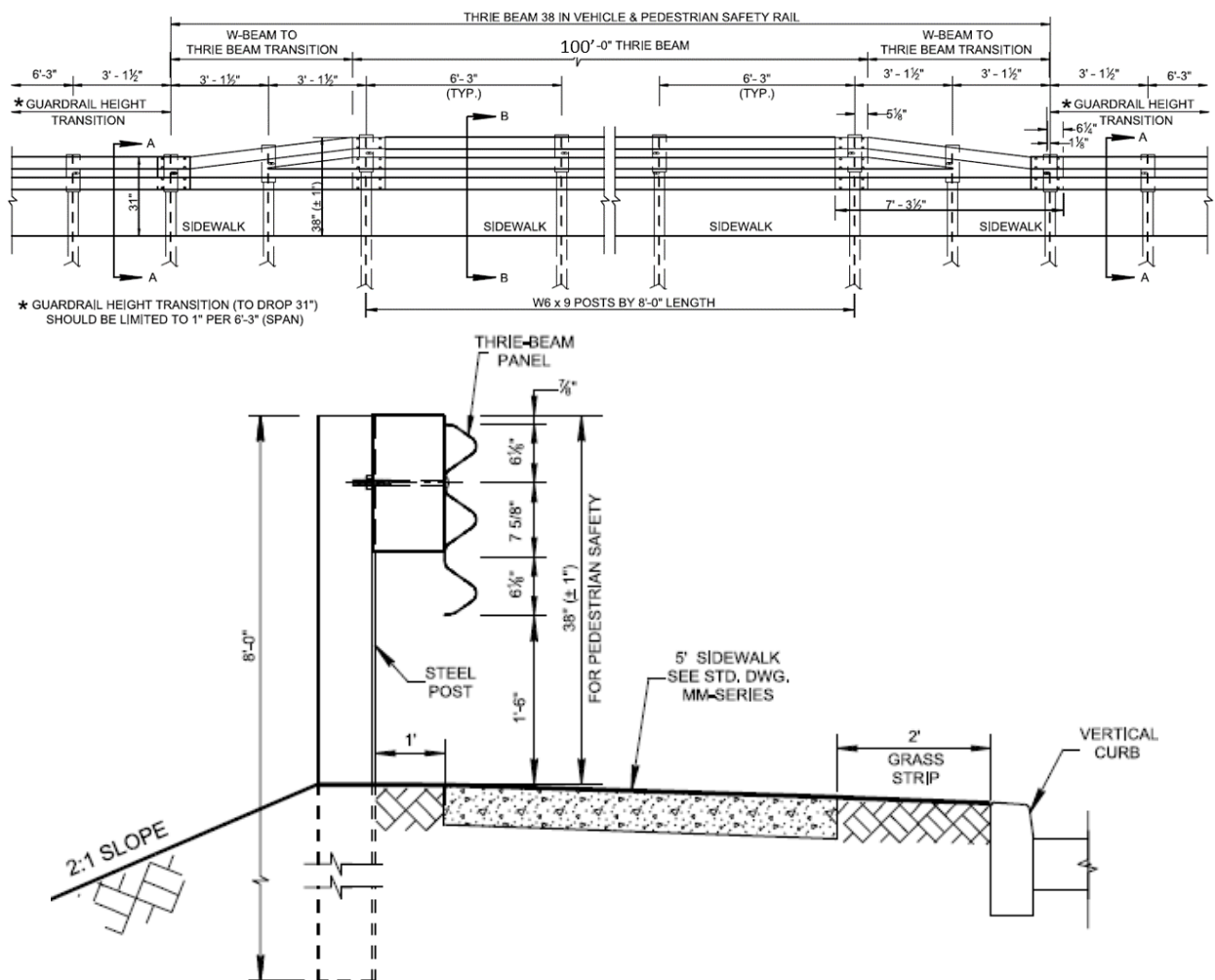
Project Title:

MASH TL-3 Compliant Thrie -beam Guardrail System for Vehicle and Pedestrian Safety (LSRB).—Phase I

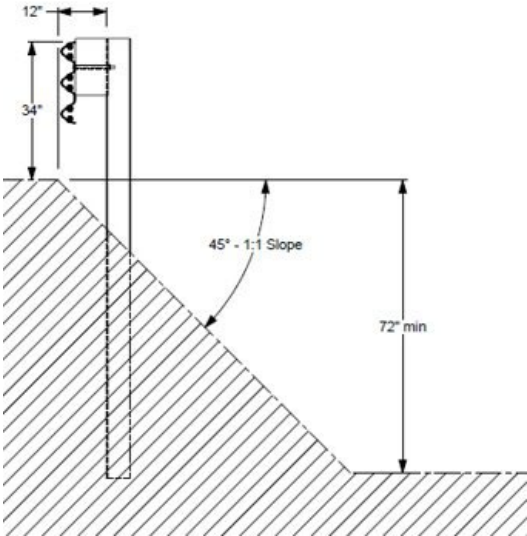
Project Synopsis:

During the development of rehabilitation/reconstruction of roadway projects (widening, multimodal accommodation) for an existing W-beam guardrail system located in urban or suburban context requires to be reevaluated to offer a fall protection for pedestrians using the new sidewalk in addition to continue serve for the vehicles. Locations often maintains a ditch section offering non traversable clear zone behind the new sidewalk also drop-off height enough, so it warrants for pedestrian safety rail.

To offer a low-cost solution, TDOT is proposing to raise the conventional thrie-beam system by 3 inches to meet the minimum of 38-inch height (37-inch with ± 1 inch construction tolerance) rail height requirement to serve pedestrians while offering re-directive capacity for an errand vehicle. Practice may also improve the performance of the existing thrie-beam system placed near the curb and cutter section. While the modification is minimal, the raised thrie-beam design needs to be evaluated for *MASH* crashworthiness.


Project Goal(s):

- 1.) Develop a design detail and simulation model to validate the concept.
- 2.) Evaluate 38-inch thrie-beam guardrail system under *MASH* Test 3-11.
- 3.) Upon successful outcome, further test to evaluate the performance of the eccentric height transition section may be required.

<p>Project Background:</p>	<p>In earlier pool fund project, a thrie-beam guardrail system with 34-inch height at 1:1 slope has been evaluated and successfully passed <i>MASH</i> TL-3 evaluation.</p>  <p><u>34-inch height thrie beam system at 1:1 slope</u></p> <p>Based on the experiences gained by this project, a thrie-beam at 37-inch height system placed along with sidewalk and/or curb and gutter roadway section could offer an effective performance as a combined system serving as a pedestrian safety rail and a vehicle guardrail rail applicable <i>MASH</i> TL-3 compliant system. Therefore, developing and evaluating such systems would provide several benefits in terms of safety, cost-effective, and constructability. To be an applicable <i>MASH</i> TL-3 compliant system, the system should be evaluated under <i>MASH</i> TL-3 evaluation criteria and pass full-scale LON and transition tests.</p>
<p>Proposed Work Plan:</p>	<ol style="list-style-type: none"> 1.) Task 1 – Literature Review <ul style="list-style-type: none"> • Review <i>MASH</i> compliant thrie-beam systems installed along with curb and/or sidewalk. • Review NCHRP 22-39 • Review standard guidelines for pedestrian rail design. 2.) Task 2 – Develop a design detail and perform LS-DYNA simulation <ul style="list-style-type: none"> • Modify and improve system designed by TDOT to meet design standards. • Develop FE model for the thrie-beam system. • Evaluate the system and determine CIP under <i>MASH</i> TL-3 criteria using LS-DYNA. 3.) Task 3 – Conduct full-scale <i>MASH</i> Test 3-11 on the thrie-beam system <ul style="list-style-type: none"> • Design and conduct full-scale <i>MASH</i> Test 3-11 to determined LON and evaluate the system.
<p>Deliverables:</p>	<p>Final report providing design details for a <i>MASH</i> TL-3 compliant thrie-beam guardrail system for vehicle and pedestrian safety.</p>
<p>Urgency and Expected Benefit:</p>	<p>The results of the project would provide member states with a <i>MASH</i> TL-3 compliant thrie-beam guardrail system for vehicle and pedestrian safety in suburban context.</p>
<p>Problem Funding and Research Period:</p>	<p>Total Estimated Cost = \$189,671</p>
<p>Developer(s) of the Problem Statement:</p>	<p>Name: Ali Hangul, Tennessee Department of Transportation Email: Ali.Hangul@tn.gov Phone: 615-741-0840</p>