

Project Title:	MASH TL-3 Evaluation of F-shape Concrete Barrier on 1V:6H Slope
Project Synopsis:	The 32-inch tall F-shape concrete barrier was tested under NCHRP Report 350 criteria to determine that it can contain and redirect test vehicles when installed on, or adjacent to 1V:6H slopes. This allowed placing the barrier on median slopes at any lateral offset from the shoulder. Due to use of heavier design vehicles with higher center of gravity in MASH testing criteria, there is a need to determine if the F-shape barrier can still contain and redirect MASH vehicles when placed on 1V:6H slopes.
Project Goal(s):	This project will determine if the 32-inch tall F-shape concrete barrier, placed on 1V:6H slope, is MASH compliant. The research will provide guidance if the barrier can be placed at any lateral offset from the travelway, or if there are only certain range of offsets where the barrier can be MASH compliant.
Project Background:	<p>Under TxDOT projects 0-5210-3 and 0-5210-1, the 32-inch tall F-shape barrier was tested on 1V:6H slope under NCHRP Report 350 criteria. By being on the slope, the pickup truck interacts with the barrier at the higher point compared to when the barrier is placed on flat terrain. In the past research, the researchers had performed simulations of the vehicle impact with the barrier at different lateral offsets. The barrier was then tested at the most critical lateral offset from the travel way. At this offset, the vehicle interacted with the barrier the highest point. Successful crash testing at the critical lateral offset allowed placement of the F-shape at any lateral offset from the slope.</p> <p>Vehicle's center of gravity and mass have increased under MASH. This is likely to influence the height at which the vehicle interacts with the barrier placed on the slope. For this reason, there can be lateral offsets at which the barrier on 1V:6H slope is not able to contain and redirect the MASH pickup. Research is needed to update the guidance on placement of the F-shape barrier on 1V:6H slope.</p> <p>Other than the TxDOT projects described above, some limited work was done under NCHRP Project 22-22, but no tests were performed.</p>
Proposed Work Plan:	Vehicle encroachments on 1V:6H slope will be simulated to determine critical offset locations for placement of the F-shape and the single slope concrete median barriers on slope. Impact simulations will then be performed with the barrier. The barrier will be placed at critical offset(s) to determine the likelihood of it successfully containing and redirecting the MASH vehicles on the slope. Finally, full-scale crash test will be performed with the barrier placed at the critical offset determined through the simulations. If the barrier contains and redirects the vehicle at the critical offset, it will allow placement of the barrier at any offset on the slope, or at a range of offsets from the roadway, as per the findings of the testing and simulation.
Deliverables:	A final report documenting the work and testing performed will be prepared. The report will include guidance on placement of the F-shape concrete barrier on 1V:6H roadside or median slope.
Urgency and Expected Benefit:	This project will determine if the current practice of placing the F-shape concrete barrier on 1V:6H slope is MASH compliant and safe. If not, this project will provide range of offsets from the travel way where the barrier can be placed on 1V:6H slope while meeting the MASH testing criteria.

Problem Funding and Research Period	<i>Research Period: 12-18 months</i>	
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