

TTI Responds to Release of Non-Standard Crash Tests Performed by Virginia 12-17-15

Sloppy test installations and out-of-criteria impact conditions render the results of six tests of the ET Plus® guardrail end-terminal system (ET Plus) ordered by the Virginia Department of Transportation (VDOT) essentially meaningless. More troubling is the fact that VDOT and the Virginia Attorney General's Office chose to ignore these documented flaws and proceed with the tests anyway.

None of the six tests, which were conducted by a private testing facility in California, complied with the National Cooperative Highway Research Program (NCHRP) Report 350 national testing criteria to which the ET Plus and other guardrail end-terminal systems of its kind were designed. Prior to each of the tests, on-site inspections by experts from the Texas A&M Transportation Institute (TTI) and Trinity Industries, Inc. identified significant deviations from standard testing protocols and specific problems with the test installations. Instead of correcting the flaws, VDOT chose to proceed with the arbitrary, non-standard tests in order to support litigation.

Among the most egregious violations of the nationally accepted NCHRP Report 350 testing criteria during the VDOT tests include:

- **VDOT did not use standard testing protocols, but instead “made up” new tests that are not part of any testing protocols, including two shallow-angle tests.** The accepted national standard, NCHRP Report 350, for which this class of end terminals was designed, does not require shallow-angle tests. The fact that the ET Plus alone was held to these “made-up” standards by VDOT belies any claim that “public safety” concerns were behind these tests. Were this not so, all roadside safety products in this category would be evaluated according to the same criteria.
- **All six test installations were set up in soft, non-standard soil conditions.** The accepted national standard, NCHRP Report 350, clearly specifies the type of soil required and the required soil placement and compaction conditions. None of these requirements was met in any of the VDOT tests. NCHRP Report 350 states that soft soil conditions can cause or contribute to unsuccessful performance of a safety feature. In post-test observations, excessive post movement during the tests was attributed to the non-standard soil conditions.
- **All three pickup truck test vehicles had extensive parts removed, including tailgates, rear bumpers, mufflers, spare tires, fuel tanks, catalytic converters and the entire exhaust system.** This caused the trucks to ride high and substantially changed the weight distribution, balance and stability of the vehicles. The accepted national standard, NCHRP Report 350, states that test vehicles should be in good condition and free of major body damage and missing structural parts. It further states that the bumpers should be unmodified and the test weight of the vehicle should not vary significantly from the initial curb weight.
- **VDOT did not properly mount the accelerometer, which is the instrument used to capture important vehicle data during the test.** The accepted national standard, NCHRP Report 350, states that accelerometers should be mounted on a major structural element of the test vehicle. In the VDOT tests, they were mounted on a small plate attached directly to sheet metal on the

floor of the vehicle, which is a practice known to produce erroneous readings due to vibrations and localized deformations.

- **VDOT attempted to use a test vehicle for one of the non-standard, shallow-angle tests that had obvious prior front-end collision damage.** The damage was easily confirmed through a Carfax report. The accepted national standard, NCHRP Report 350, states that test vehicles should be in good condition and free of major body damage and missing structural parts. VDOT already had a replacement vehicle on site at the private testing facility, but never explained why it originally selected the previously damaged car for the test rather than the replacement vehicle, which was not damaged.

Virginia's testing approach calls into serious question the credibility of the tests and reinforces suspicions about the real motive for the testing. Quite simply, when a device is tested under conditions outside the national standard, NCHRP Report 350, which these types of guardrail end-terminal systems were designed to meet, the testing outcome is meaningless. Standards exist for a reason. Without them, there is no objective mechanism for evaluating the design, effectiveness and performance of any roadside safety device.

In September, after months of reviewing real-world crash data from around the country, a joint task force of federal and state transportation safety experts found no reason for further testing of the ET Plus or other NCHRP Report 350-compliant extruding w-beam guardrail end-terminal systems. The task force was comprised of individuals from the Federal Highway Administration (FHWA), various state departments of transportation, the American Association of State Highway and Transportation Officials (AASHTO), and three independent experts. FHWA called the task force's efforts "the most thorough evaluation ever conducted of this particular roadside safety hardware."

The ET Plus has undergone the most rigorous testing ever applied to any guardrail end-terminal system and has an unbroken chain of eligibility for federal-aid reimbursement from the FHWA. It has repeatedly passed NCHRP Report 350 test criteria. This, plus 15 years of roadside experience, vindicate and reinforce our confidence in the ET Plus.

For more information:

FHWA Task Force Report: <http://www.fhwa.dot.gov/guardrailsafety/isptf.cfm>

TTI ET Guardrail Resources: <http://tti.tamu.edu/etguardrailresources/>

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