Roadway Departure Technical Brief No. 2

Pre-Installation Field Review

CATEGORY: Design

ISSUE: When roadside safety systems (e.g., traffic barriers and terminals) are installed exactly as shown on project plans, which may have been based on assumed site conditions, the end result can often be an installation that may not be needed, may not effectively shield the primary hazard, may be too short or too long, or may not shield obvious "secondary" hazards in its immediate vicinity.

OBJECTIVE: Encourage all highway agencies to adopt a process and procedures that ensure all proposed barrier installations are reviewed on site by trained and experienced personnel who can identify and authorize any immediate adjustments needed to guarantee an optimal installation.

METHODOLOGY: Implement a mandatory field review of planned installations by a team consisting of a prime contractor representative and/or the guardrail installation superintendent/supervisor, Project Supervisor and FHWA Transportation Engineer (when appropriate). The state inspector or other state participant must be familiar with barrier design and with terminal crash performance.

Suggested Standard Special Provision
for Pre-Installation Reviews

- Contractor to notify project Project Supervisor of the proposed barrier installation schedule.
- Project Supervisor to assemble review team and schedule pre-installation review.
- Prior to review, contractor to mark planned locations for barrier, terminals and crash cushions.
- No installation to be done without authorization from the Project Supervisor following the review.
- Pre-installation review costs are considered incidental to construction.

A pre-installation review should have found that this placement of two end terminal resulted in a gap in the median shielding and recommended an overlapping design treatment.

U.S. Department of Transportation
Federal Highway Administration

TDOT

EXPECTED RESULTS:

Barrier installations that are warranted and effectively shield all potential hazards behind them and have terminals selected and located to minimize occupant injuries to the extent practicable if impacted.

By understanding that an angle hit on the nose of an energy absorbing terminal can result in a vehicle travelling more than 100 feet behind and beyond the terminal, a review team could have recommended extending this barrier.

PROCESS:

1. Pre-installation reviews should be conducted on all projects that include barrier installation, including, but not limited to, federal oversight , freeway, and expressway projects and maintenance/force account work.
2. The contracting authority will notify the prime contractor at the pre-construction conference that a traffic barrier pre-installation review must take place before any permanent barrier is installed on the project.
3. Prior to the review, the contractor (or the guardrail subcontractor) will be requested to place temporary markers designating the proposed limits of all barrier, terminals, and crash cushions that are to be installed on the project. Traffic control will be implemented as needed for this activity.
4. Once the temporary markers are in place, the review team, as identified above, will schedule the field review. This review must be made early enough to allow sufficient time to make any necessary adjustments before the contractor begins work. Note: When practical, activities 3 and 4 should be combined as a single inspection.
5. The pre-installation review will consider the following items:

    a. Is the barrier warranted or can the identified hazard be removed, relocated, or modified to eliminate the need for a barrier?
    b. If warranted, is the barrier the appropriate length to shield the primary hazard effectively?
    c. If underground utilities are present, these must be located and marked prior to or in conjunction with the field review in case barrier modifications become necessary to avoid them.
    d. Are there secondary hazards in the immediate vicinity of the proposed barrier terminal that could be shielded by extending the barrier a reasonable distance?
    e. Is the appropriate terminal type (i.e., energy-absorbing or non energy-absorbing) specified?
    f. Are the approaches to the terminal graded to ensure maximum vehicle stability prior to an impact with the terminal?
    g. Is there a minimum run-out area behind and beyond the terminal?
    h. If a buried in backslope terminal is specified, is the backslope steep enough to reduce the likelihood of a vehicle getting behind the terminal? If encroachment behind the terminal is a possibility, does an adequate clear and traversable runout area exist behind the terminal?
    i. Is the barrier properly located on a slope to minimize the probability of vehicular override?
    j. If barrier is to be installed behind or in line with a curb, is it adequately located or designed to minimize the probability of vehicular override or under ride?
    k. Is there any existing barrier within the project limits that should be removed?
    l. Are there other hazardous terrain features or fixed objects that warrant shielding but were overlooked in the original project scope?

6. As noted above, the composition of the inspection team must include contractor or subcontractor personnel who are directly responsible for installing barrier on the project, the construction project's Project Supervisor, and an FHWA Transportation Engineer (on federal oversight projects). It is critical that the decision-maker on the team be thoroughly familiar with barrier and terminal design principles and performance characteristics and have the authority to make on-the-spot modifications as needed.
7. All review findings must be documented in writing and signed by all members of the review team. Major modifications (e.g., a different barrier type than originally specified) will be processed through existing procedures. These types of modifications should be extremely rare.
8. Review findings should be relayed to appropriate design personnel so they can be used as lessons learned for future project designs.