

Tech Brief

November 2017

Pre-Installation Field Review Team

CATEGORY: Design/Installation/Inspection

ISSUE: When crews install barrier systems (e.g., traffic barriers and terminals) exactly as shown on project plans, which may have been based on a limited survey of the site, the result can often be an installation that may not effectively shield the obstacle(s), may be too short or too long, may not shield obvious "secondary" obstacles in its immediate vicinity, or may not even be needed.

OBJECTIVE: Encourage all highway agencies to adopt a state-specific process and procedure to achieve the onsite review of a proposed barrier installations by a trained and experienced personnel who can identify and authorize any immediate adjustments needed to provide 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 ADOT inspector or other ADOT participants should be knowledgeable with barrier design and the crash performance of terminals.

Suggested Special Provision for Pre-Installation Reviews

- Contractor to notify the construction Project Supervisor of the proposed barrier installation schedule.
- Project Supervisor to assemble review team and schedule pre-installation review.
- Prior to review, contractor or installer 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 the traffic barrier items.



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



A pre-installation review should have found that this placement of two terminals created a situation where neither one could perform effectively if hit.



EXPECTED RESULTS:

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

By understanding that an impact into a non-energy-absorbing terminal can result in a vehicle travelling more than 150 feet behind and beyond the terminal, a review team could have recommended extending this barrier.

PROCESS:

1. Conduct pre-installation reviews on all projects that include barrier installation in the scope of work, including, but not limited to, federal oversight, freeway and expressway projects, and rehabilitation/maintenance/force account work as appropriate. Include a special provision for the pre-installation reviews in the project's contract documents.
2. The contracting agency will notify the prime contractor at the pre-construction conference that a traffic barrier pre-installation review should take place before installing any permanent barrier on the project.
3. Prior to the review, request that the contractor (or the guardrail subcontractor) place temporary markers designating the proposed limits of all barrier, terminals, and crash cushions to be installed on the project. Traffic control will be implemented as needed for this and the following activities.
4. Once the temporary markers are in place, the review team (see Methodology) will schedule the field review. Conduct this review early enough to allow sufficient time to make any necessary adjustments before the contractor begins work. Note: When practical, combine activities 3 and 4 as a single action.
5. The pre-installation review will consider the following items:
 - Is the barrier warranted or can the identified obstacle(s) be removed, relocated, or modified to eliminate the need for a barrier?
 - If warranted, is the barrier the appropriate length to shield the obstacle(s) effectively? Are there other hazardous terrain features or fixed objects that warrant shielding but were not considered in the original project scope?
 - Are there secondary obstacles in the immediate vicinity of the proposed barrier terminal that could be shielded by extending the barrier a reasonable distance?
 - If underground utilities are present, locate and mark them prior to or in conjunction with the field review in case barrier modifications become necessary to avoid them.
 - Is the appropriate terminal type (i.e., energy-absorbing or non-energy-absorbing) specified?
 - Are the approaches to the terminal properly graded to provide for maximum vehicle stability prior to an impact with the terminal?
 - Is there a minimum run-out area behind and beyond the terminal?
 - If on a side slope, is the barrier properly located to minimize the probability of vehicular override or underride?
 - If barrier is to be installed behind or in line with a curb, is it properly located or designed to minimize the probability of vehicular override or underride?
 - Is there any existing barrier within the project limits that should be removed?
 - If there is a gap in barrier runs of 200 feet or less; consider the field conditions and if it would be reasonable to close the gap?
6. As noted above, the composition of the review team should, at a minimum, include contractor or subcontractor personnel directly responsible for installing barrier on the project, the construction Project Supervisor, an ADOT roadside barrier expert, and an FHWA Transportation Engineer (on federal oversight projects). Participation by the agency's construction and design units is also encouraged. The final decision-maker on the team should 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. Document all review findings in writing and signatures by all members of the review team. Use existing procedures to process major modifications (e.g., a different barrier type than originally specified). These types of modifications should become more infrequent after implementation of the review process.
8. Relay review findings to appropriate design and central office personnel so they can be used as lessons learned for future project designs.