

**New Jersey Department of Transportation
QUALITY IMPROVEMENT ADVISORY**

QUALITY MANAGEMENT SERVICES

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QIA No. QIA017

**Approved: B. Strizki
Date: 3/31/99**

Process Affected:

Scope Design Right of Way Utilities Environmental Historic Construction

Bureaus Affected: All CPM Units
All Design Consultants

Procedure(s) Affected: Design Development
Construction

Route & Section: NA

County/Municipality: NA

Project Summary: A statewide quality audit to evaluate various requirements of the installation of beam guide rail and related components was performed by the Bureau of Construction Engineering. These audits were made on seventeen contracts during the 1998 construction season. Both maintenance beam guide rail contracts and CPM administered contracts were visited.

Nature of Problem(s):

Major observations found during the field inspections include:

Guide rail posts either cut from the top or cut from the flange in rocky areas. The contractor failed to observe the Construction Detail for the proper method of beam guide rail post installation in rock resulting in the undermining of the post. The posts were removed and replaced at no cost to the department after discovery.

Rub-rail for safety was not provided though the location of the guide rail is well within the specified distance from the curb where it is required by design standards. Rub-rail was provided and incorporated at the appropriate locations by change order.

Proposed guide rail end treatments on a few contracts were not appropriate for the conditions in the field. This necessitated changes of plans resulting in extra cost and delays.

Recommendation(s):

Rework and the associated costs could have been avoided if the designer identified the correct end-treatments on appropriate situations. As a quality improvement to the design plans and a means to reduce costs due to rework and change orders, the following are recommended:

- Designers are reminded to upgrade the entire run of guide rail whenever an existing guide rail run is improved. This requirement is found in Section 8-03.5 of the NJDOT Design Manual-Roadway.
- To accomplish the requirements of Section 8 of the NJDOT Design Manual, field investigations including accurate measurements and the identification and location of hazards, obstructions and field conditions **must** be performed before designing the guide rail for a particular location.

In addition, to compensate contractors' additional effort which is necessary to install guide rail posts in rock, a separate pay item is being considered. Until it's incorporation to the NJDOT Standard Specifications, Resident Engineers are advised to make sure that contractors follow the proper procedures when installing guide rail and related components as specified in the Construction Details.

It should be noted that these issues, are the same as many of the issues identified in QIA008 dated February 23, 1998. These actions must be carried out in order to reduce construction costs due to rework and to ensure proper installations.

Implementation: Immediately

Impact Assessment:

Schedule Quality Cost Scope

Cost Impact: