

New Jersey Department of Transportation
QUALITY IMPROVEMENT ADVISORY

QUALITY MANAGEMENT SERVICES

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QIA No. QIA009

Approved: Brian Strizki
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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: N/A

County/Municipality: N/A

Project Summary: N/A

Nature of Problem(s):

High strength, low alloy weathering steel was studied as part of an NJDOT research project which began in 1972 and has provided data for a 16 years period. Manufacturers claimed that the steel will develop a patina of rust which will inhibit further corrosion. The research indicated that the claim is true only if the steel is exposed to years of wet/dry cycles without the effect of corrosive salts. Guide rail posts experience corrosion and at a faster rate than normal due to the following:

- The posts are always submerged underground, hence they are exposed to moisture continuously (no dry cycles).
- During snow removal, snow is plowed up against the guide rail. Since the snow contains a very high salt concentration (from the salt trucks), the chlorides will seep down to the submerged posts and accelerate the corrosion process.

The accelerated corrosion rate causes a much quicker section loss of the posts, hence reducing their capacity to resist impact loads. Outside agencies such as FHWA and NJHA have also identified similar problems. For instance, the NJHA has discovered that weathering steel posts are weakened due to corrosion, to the point that when struck, the posts simply snap off. In addition, the FHWA indicates that there is a concern when using this material in industrial areas and areas where the guiderail comes in contact with salt. In these situations, the beam guide rail element continues to oxidize (rust) reducing its effectiveness at points where the guide rail element overlaps and attaches to the post.

Recommendation(s):

The current Standard Specifications (Section 612 and Section 902) allow only the use of galvanized steel beam guide rail on NJDOT construction projects. Weathering steel beam guide rail provides a "rusty" aesthetic look which is pleasant to the eye. **However, it is not an approved product and cannot be substituted for the standard galvanized steel beam guide rail on NJDOT construction projects.** Until material improvements or design modifications eliminate the above mentioned problems, **only** galvanized steel beam guide rail shall be used on NJDOT Construction Projects.

Implementation: Effective immediately

Impact Assessment:

Schedule Quality Cost Scope

Cost Impact:

