



10-6 USE OF PRE-FABRICATED EPOXY COATED REINFORCEMENT IN MARINE ENVIRONMENT

Marine Environment

Structures or structural components are considered to be exposed to marine environment in each of the following conditions:

- a) Where they are in direct contact with corrosive water which may be either brackish or marine water.
- b) Where they are within the “splash zone.” This zone is bounded by a horizontal plane that is 20 feet above the mean higher high water (MHHW) elevation of corrosive water and vertical planes that are 20 feet from the edge of corrosive water on the shore. Structures or structural components within the splash zone are likely to be exposed to corrosive water spray.
- c) Where they are within 1000 feet from corrosive water, and are outside the splash zone, but are likely to be exposed to salt fog (marine atmosphere).

Brackish waters typically have chloride content between 500 ppm and 9400 ppm, while marine waters have a chloride content that is greater than 9400 ppm.

Refer to MTD 10-5 for different zones in marine environment.

Pre-fabricated Epoxy Coated Reinforcement

Pre-fabricated epoxy coated reinforcement (ECR) shall be specified in reinforced concrete as required by Table 5.12.3-1 in Caltrans' Amendments to AASHTO LRFD Specifications.

Pre-fabricated ECR specified for use on Caltrans projects shall have epoxy coating conforming to ASTM A 934/ A 934M. In pre-fabricated ECR, the reinforcing bar is fabricated prior to being coated with a protective fusion bonded epoxy coating. Generally, pre-fabricated ECR has better corrosion resistance properties than post-fabricated ECR.

The Design Engineer should obtain the approval from the Deputy Chief, Division of Engineering Services, Structure Design, before specifying prefabricated ECR in conditions other than those listed in Table 5.12.3-1.

If adequate protection to reinforcement as specified in Table 5.12.3-1 cannot be provided due to design and/or construction constraints, contact the Corrosion Technology Branch, Materials Engineering and Testing Services, Caltrans.



General Guidelines

For structures that are exposed to a marine environment, the Design Engineer should ensure the following:

- a) Plans should clearly identify locations where pre-fabricated ECR is used. In addition, this information shall be furnished to the Specifications Engineer through a “Memo to Specifications Engineer/ Estimator.”
- b) The Design Engineer should specify pre-fabricated ECR in the “splash zone.” If site specific information indicates that corrosion of reinforcement, from exposure to corrosive water spray, is a concern outside the “splash zone,” then the extent of pre-fabricated ECR should be increased accordingly.
- c) Mechanical splices and butt-welded splices in pre-fabricated ECR should be adequately protected from corrosive environment using products and procedures that are currently approved by the Corrosion Technology Branch.

References:

AASHTO LRFD Specifications and Caltrans Ammendments to AASHTO Specifications,
Memo to Designers 8-2 and 10-5

Original signed by Kevin J. Thompson

Kevin Thompson

Deputy Chief,

Division of Engineering Services

Structure Design