



Document Change Announcement

2007 Design Manual

DCA2011-DM-05

DATE: June 29, 2011

Subject: Revision to Subsection 2.2.2.3.10 of the Design Manual

Description of Change

This DCA is essentially a relocation of section 2.2.4.1.11 from "Superstructure Design" to "Modifications to Current Codes" so it is more clear that the desired thermal effects are to be applied for all aspects of bridge design.

Instructions to Designers and Consultants

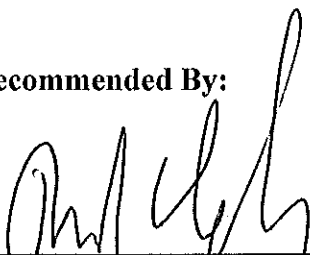
Effective immediately, the revisions contained in this announcement shall be applied to all projects that have not reached Phase C of design. Contact your NJTA Project Manager for instructions. Attached revision is noted in italics.

Designers may access these revisions in the NJTA Design Manual, which is available on the Authority's Web Page: <http://www.state.nj.us/turnpike/professional-services.html>.

Information for In-House Staff

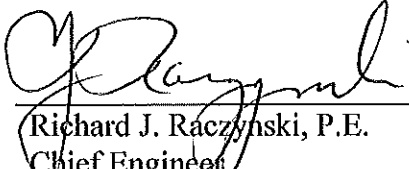
The revisions have been incorporated into the Design Manual, which is available on the S drive @ S:\Project Files\Design-Procedure Manual. Please distribute the information to your respective Project Managers and have them direct their consultants appropriately.

Recommended By:



Robert J. Fischer, P.E.
Assistant Chief Engineer, Design

Approved By:

 6/30/11

Richard J. Raczynski, P.E.
Chief Engineer

cc: Senior Staff Engineering, Operations & Maintenance Departments, All Prequalified Consultant Firms, File

New Jersey Turnpike Authority

DOCUMENT UPDATE REQUEST

Forward to Assistant Chief Engineer, Design

Initiator	Rich Schaefer	Submittal Date	06/27/11
Firm	HNTB Corporation	Telephone	973-237-1650

Document (check one)

- Procedures Manual
- Design Manual
- Sample Plans
- Standard Drawings
- Standard Specifications

Description of Change

Add the following after 2.2.2.3.10:

3.12 Force Effects Due to Superimposed Deformations

Design thermal force effects, deformations, and displacements shall be determined as per the AASHTO LRFD Bridge Design Specifications, current ed., Subsection 3.12 using Procedure A for Moderate Climate conditions. The load factor for all thermal force effects, deformations, and displacements shall be 1.20 for all applicable limit states. When considering thermal force effects between substructures and superstructures, only the gross moment of inertia of concrete columns or piers shall be considered unless a more detailed analysis is performed to verify that the partially cracked moment of inertia can be mobilized.

Forces from thermal effects, such as superstructure expansion between adjacent fixed piers, can cause large moments on pier elements. These moments are carried by the un-cracked gross moment of inertia of the concrete element until internal stress in the bare concrete exceeds the modulus of rupture (f_r). After the stresses exceed this limit, the partially cracked moment of inertia may be used for stiffness and thermal force effect computation. The partially cracked moment of inertia may be conservatively assumed at 50% of the gross moment of inertia unless a more detailed analysis is performed. Before a partially cracked moment of inertia may be utilized for design, the designer shall verify that thermal force effects are adequate to exceed the modulus of rupture in the gross moment of inertia of the pier or column.

Delete the first paragraph of Section 2.2.4.1.11

Reason for Change

This DCA is essentially a relocation of section 2.2.4.1.11 from "Superstructure Design" to "Modifications to Current Codes" so it is more clear that the desired thermal effects are to be applied for all aspects of bridge design. Wording has been modified to reinforce the holistic intent of the section. Additional instructional commentary has been

added to more fully explain the force effect interaction between superstructures and concrete substructures. The original language in Section 2.2.4.1.11 is deleted as it is now redundant.