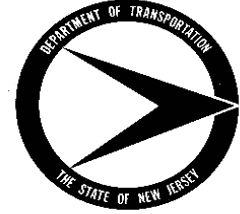


***New Jersey Department of Transportation***

1035 Parkway Avenue, PO Box 600, Trenton, New Jersey 08625-0600



***Baseline Document Change Announcement***

**Bridges & Structures Design Manual, Third Edition, 1998  
BDC98MB-001**

**July 1, 1998**

**Subject: Release of the Metric Bridges and Structures Design Manual**

The Department has released the Bridges and Structures Design Manual, Third Edition, 1998. The Design Manual shall be the vehicle by which the policy for the Design and the Evaluation and Rating of Bridges and Structures, in the State of New Jersey, is established.

This Third Edition supersedes the previous Edition dated 7/87 and all Engineering Instructions issued to date. Baseline Document Change Memorandum BDC96MB-001, "Noise Barrier - Wind Load Table" is also superseded by this Third Edition. Engineering Instructions as Baseline Document Changes, to amend the policies stated herein, will be issued when warranted.

**Instructions to Designers**

The use of this manual is effective immediately and shall apply to all design projects that have not been advertised, except those projects where the implementation of the changes to bridge design policy stated above will require significant cost or schedule changes. In such cases, the Designer shall contact the Department's Project Manager to determine how to proceed.

For projects that have not been advertised but have reached Initial Design submission, changes listed below in Sections 15, 24, 25 and 45 have the potential to significantly affect your design schedule. The decision to implement changes in Section 45 concerning the seismic design and retrofit policy will be determined by the Project Manager and FHWA on a case by case basis with the assistance of the Structural Engineering Unit.

For projects that have not yet been advertised, changes listed below in Section 19 (Subpart 2.), 20 (Subpart 3. and 4.), 23, 45 and 46 have the potential to significantly affect project design and construction cost. The decision to implement changes in Section 46 concerning scour at bridges will be determined by the Project Manager with the assistance of the Structural Engineering Unit and the Drainage Unit.

The new criteria in Section 15 will potentially increase the life of bridges when Integral Abutment type bridges are constructed.

All New Jersey Bridge Structure parapets in design projects being advertised after October 1, 1998 shall meet Test Level 4 criteria as defined in NCHRP Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features." See Section 1.23.2, Types of Parapets, Bridge Railings, for the types of parapets that meet these crash test standards.

The changes listed below in Section 24 (Subpart 1 and 3) and 25 (Subpart 1.) should reduce construction costs.

The Manual, in addition to the use of metric units, contains changes to and the adoption of new bridge design policies in New Jersey. Such changes include, but are not limited to, the following:

## **Division 1 - Policies**

### **Section 3**

Change made to the required minimum vertical underclearances requirements. The required values are now consistent with the requirements of the AASHTO Geometric Design of Highways and Streets Manual.

### **Section 5**

1. Criteria added for submission of a Life Cycle Cost Analysis.
2. Criteria for submission of proprietary retaining walls added.

### **Section 7**

1. Guidance for preliminary submissions of proprietary walls added.
2. Guidance as to required plan notes when the Wave Equation Analysis program and the CAPWAP analysis are used for pile foundations is added.

### **Section 12**

Section created to provide Bridge Deck Repair Design guidelines.

### **Section 13**

Section created to provide guidance as to Bridge Attachment Permits.

### **Section 15**

Section created to provide design and construction guidance for Integral Abutment type bridges.

### **Section 17**

Conditions added for the design of proprietary retaining wall systems.

### **Section 19**

1. Guidance as to the alternate use of epoxy coated or galvanized reinforcement added.
2. Concrete cover for pile bents in a salt intrusion or salt splash zone increased to 65 mm (2 ½ inches). Use of a corrosion inhibitor now permitted in pile bents that are located in a salt splash/intrusion zone.

### **Section 20**

1. Conditions as to the permitted use of a concrete deck overlay protective system (2 course deck) provided.
2. Use of a corrosion inhibitor admixture in a full course deck now permitted as an alternate to a 2 course deck. Guidance provided.

3. Epoxy coated or galvanized reinforcement now permitted for deck slab protection. Both top and bottom mats are to be epoxy coated. Controls established for use of galvanized reinforcement.
4. Guidance as to the provision of approach slabs provided.

### **Section 23**

1. The use of crash tested bridge railings is established.
2. A 4 bar tubular steel open railing introduced to replace the aluminum railing system.

### **Section 24**

1. Use of structural steel Grades 250, 345 and 345W now permitted. Use of higher strength steel to be approved by Manager, Structural Engineering.
2. Use of current ANSI/AASHTO/AWS Bridge Welding Code emphasized in welded steel fabrication.
3. Design and fabrication requirements for Pot, Elastomeric and Seismic Isolation bearing assemblies provided.

### **Section 25**

1. Use of 13 mm or 15 mm strands permitted in prestressed concrete design/fabrication.
2. Statement added that drilling into prestressed member is not permitted.

### **Section 32**

1. Criteria established for the design of Variable Message Sign (VMS) structures.
2. Guidance provided for sign support structure bolt connection installations.
3. Alternate foundation design criteria for sign support structures provided.

### **Section 35**

Section re-written to clarify requirements in the use of Cofferdams, Sheeting Left In Place and Temporary Sheeting.

### **Section 41**

Highway Bridge Evaluation program criteria contained herein.

### **Section 42**

Railroad Bridge Evaluation program criteria contained herein.

### **Section 43**

1. Section re-titled as “Highway Signs, Luminaires and Traffic Signal Structural Supports”. Guidance for the design of these type structures provided.
2. Fatigue design guidance provided.

## **Section 45**

Seismic design and retrofit policy provided.

## **Section 46**

Bridge scour criteria clarified.

## **Section 47**

Noise barrier designs clarified.

## **Division 2 - Standard Drawings**

The following new drawings are provided:

1. Crash tested open steel railing details (Plate 2.2-1 and 2.2-2).
2. Elastomeric, Multi-rotational and Seismic Isolation bearing assembly details (Plate 2.5-1 through 2.5-3).
3. Noise wall barrier drawings (Plate 2.12-1 through 2.12-4).
4. Integral Abutment detail drawings (Plate 2.13-1 through 2.13-5).
5. Control Plan for proprietary retaining wall standard drawings (Plate 2.14-1 and 2.14-2).

## **Division 3 - Guide Plates**

Various plates have been re-drawn to provide proper detailing for structural components.

## **Distribution to In-House Staff and Various Public Agencies**

This memorandum along with a copy of the Manual will be distributed to our In-House Staff and various Public Agencies in accordance with the NJDOT Design Manual for Bridges and Structures distribution list by the Office of Document Control.

Extra copies of the Manual can be obtained by contacting:

Engineering Documents Unit  
E&O Building, 1<sup>st</sup> Floor  
1035 Parkway Avenue, CN600  
Trenton, New Jersey 08625  
Phone: (609) 530-5587  
Fax: (609) 530-6626  
Cost: Free for In-House staff  
\$48.00 (mailed) or \$42.00 (picked up) for  
Public Agencies (Township, Municipal and County)

In-House Staff can download the electronic files in zipped format of the "Division 1 - Policies" and the "Division 3 - Guide Sheets" from the QM shared area of CPMSRV02. To access this area use your File Manager. Go to the drop down menu labeled Disk, then pick Connect or Map Network Drive. In the path box type in \\cpmsrv02\QM, then pick OK. Look in the QM\Reference Documents\Design Manual Bridge folder.

The electronic files of the BDC Announcement, "Division 1 - Policies" and "Division 3 - Guide Sheets" can also be downloaded in zipped format from the NJDOT Web Page at <http://www.state.nj.us/transportation>. Click on framed version. Click on "Capital Project Management", then click on "CPM T. O. C." Bookmark this site and check regularly. For unzipping of zip format files, a links to unzip sites are provided.

"Division 2 - Standard Drawings" CADD files and all other NJDOT CADD files can be downloaded from the NJDOT Web Page at <http://www.state.nj.us/transportation>. Click on framed version. Click on "Design Services" site, then under "Places to visit", click on "CADD" Support", then continue to click on "Download CADD files" until you reach the "CADD File Download Section" for the various CADD files presented.

**Distribution to Other Outside Agencies (Consultants, Contractors, etc.)**

This memorandum is posted on the NJDOT's Electronic Bulletin Board System under Conference number 10 - Highway Design, File Area 56 - Baseline Document Change Memorandums. "Division 1 - Policies" and "Division 3 - Guide Sheets" of the Manual are in the Design Manual Bridge file area. Hard Copies of the Manual can be purchased for \$48.00 (mailed) or \$42.00 (picked up) by contacting the Engineering Documents Unit shown above, the price includes the cost of future revisions.

The electronic files of the Manual including the "Division 2 - Standard Drawings" CADD files can also be downloaded in zipped format from the NJDOT Web Page by using the instructions shown above.

Recommended by:

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Original signed by Russell D. Tong

Russell D. Tong  
Assistant Commissioner  
Capital Program Management

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