MODIFIED BY EI 97-018
EFFECTIVE 1/15/98

SUPERSEDED
BY EB 98-014
EFFECTIVE 4/24/98

ENGINEERING INSTRUCTION

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

SUBJECT: "STANDARD DETAILS FOR HIGHWAY BRIDGES MANUAL" - MONOLITHIC BRIDGE DECKS

Subject Code: 7.35 - 1

Distribution: 30 Main Office 32 Regions 31, 34 Special

Code: EI - 92-043

Date: 09/10/92

Supersedes:

APPROVED: 9/14/92

ARUN M. SHIROLE, DEPUTY CHIEF ENGINEER (STRUCTURES)

This Engineering Instruction establishes a 9½" slab thickness for the Department's reinforced concrete monolithic bridge decks. The top mat cover will increase from 2½" to 3½".

This change in design practice results in part from an ongoing evaluation of ways to improve the durability of bridges. The increased slab thickness will result in a superstructure that is stiffer and more resistant to possible load induced deterioration. Also, a major cause of spalling and delamination of bridge decks is the corrosion of the top mat reinforcement. Chloride intrusion is a primary contributor to this corrosion. By increasing the concrete cover over the top reinforcement mat, the time required for the chlorides to reach a destructive concentration is increased.

Based on comparative analysis of simple span steel bridges, the impact of the proposed increased slab thickness averages less than 1% of the initial bridge cost. Increasing the top mat cover 1" extends the service life of the deck by a minimum of five years.

The design slab thickness shall equal 8" for the composite girder design, including shear connector design. A 7" design slab shall be used to design the deck reinforcement. The current Standard Specifications for all work and materials associated with the deck are not affected by this Engineering Instruction.

All new and replacement highway bridges shall be designed using a 9½" deck.

For deck replacements on existing bridges, the existing superstructure steel girders should not be upgraded solely to supply the added strength needed to support the additional dead load due to the 9½" deck. Similarly, the existing substructure shall not be modified solely to accommodate the weight of the 9½" deck. If a 9½" replacement deck causes overstressing to the

superstructure or substructure, an alternate 8½" replacement deck system shall be used. The Structures Division and the Materials Bureau are currently investigating the use of corrosion inhibitors, higher strength concrete (lower water/cement ratio), and a 7" slab with a 1½" microsilica overlay as possible alternatives when a 9½" deck is not feasible. When selecting an alternate deck system, contact the D.C.E.S. for assistance.

For approach slabs, the top mat reinforcement shall have 3½" of cover.

Questions regarding this Engineering Instruction should be directed to the Structures Design and Construction Division, Design Section at (518) 485-7256.

In order to implement the above, the Standard Details For Highway Bridges Manual shall be amended as follows:

Section 3.1.1 - Monolithic Decks
Delete the first paragraph and replace it with:

NEW AND REPLACEMENT STRUCTURES:
Structural concrete deck slabs shall have a thickness of 9½", which includes a monolithic wearing surface. The top 1½ inch monolithic wearing surface shall be neglected in the composite section design. The top 2½ inches of the monolithic deck shall be neglected in the structural deck reinforcement design.

The cover to the top steel shall be 3½ inches, which includes a permitted construction tolerance of plus or minus ¼ inch in the finished slab profile. The bottom cover shall be 1 inch.

REHAB STRUCTURES AND DECK REPLACEMENTS:
A 9½" deck (see NEW AND REPLACEMENT STRUCTURES:) is the preferred choice. Nevertheless, overstressing the existing structure solely to accommodate the 9½" deck shall not be allowed. If overstressing will occur, another deck system shall be used. The deck system selected shall be approved by the D.C.E.S.

Section 3.1.3
Make the following changes to the "SLAB DESIGN TABLE" on page 54:

1. On the sketch, replace the top reinforcement cover note (cover 2½") with:
   "Cover 2½" for 8½" decks
   Cover 3½" for 9½" decks".

2. On the sketch, replace the deck thickness note (8½" Total Slab Thickness) with:
   "8½" or 9½" total slab thickness, see EI 92-043.".

3. Add the following note to the table:
   "The reinforcement shown shall be used for both 8½" and 9½" MONOLITHIC BRIDGE DECKS".

Section 4.18
On Figure-A, page 70M, replace the approach slab top reinforcement cover note (2½" cover) with 3½" cover.

Section 4.19
On Figure-A, page 70U, replace the approach slab top reinforcement cover note (2½" cover) with 3½" cover.

Section 5.3
Make the following changes to the table on page 76:

1. Replace the note (Top of slab with integral wearing surface.....2½"*) with:
   Top of slab with integral wearing surface...3½ in.*

2. Add the following:
   Approach slab (top).....3½ in.
   Approach slab (bottom).....3 in.

This E.I. is effective immediately for all projects which have not yet received Design Approval and/or an Approved Preliminary. Exceptions will require written approval by the D.C.E.S.