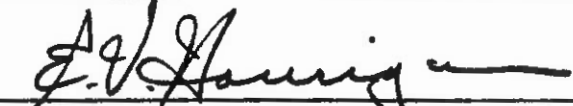


TO:  <b>SUPERSEDED BY EI 77-031 EFFECTIVE 5/1/1977</b>	<b>ENGINEERING INSTRUCTION</b> NEW YORK STATE DEPARTMENT OF TRANSPORTATION
Distribution: <input type="checkbox"/> Main Office <input type="checkbox"/> Regions <input checked="" type="checkbox"/> Special	Code: <u>  EI 76-5  </u>
APPROVED:  <hr/> Deputy Chief Engineer (Structures)	Date: <u>  1/12/76  </u> Supersedes:

Pages 79-83 Section 23 - Retyped completely. Section name revised.  
 Article Headings renumbered and in some cases revised.  
 Art. 23.1.1 - Formerly 23.1 - No change.  
 Art. 23.1.2 - New Article  
 Slab Design Table - Revised by Art. 23.1.2  
 Art. 23.1.3 - Formerly 23.2 - No change  
 Art. 23.1.4 - Formerly 23.3 - Minor editorial change.  
 Art. 23.1.5 - Formerly 23.4 - No change.

Article 23.1.2 specifies that 8-1/4-inch monolithic slabs with epoxy-coated reinforcing steel be used on continuous bridges.

This revision is made because experience has shown that deck slabs on continuous bridges are more likely to crack than those on simple spans. The cracks allow the penetration of chlorides to the reinforcement. The additional protection of the reinforcement provided by the epoxy coating is warranted to avoid spalling of the concrete.

This instruction is effective immediately. Projects under design with 9-1/4-inch continuous monolithic decks shall be revised if practical to do so.

SECTION 23 - DECK SYSTEMS

23.1 - CONCRETE DECK SLABS

23.1.1 - SIMPLE SPAN BRIDGES

Structural concrete deck slabs shall have a thickness of 9-1/4 inches, including a monolithic wearing surface. The top 2-1/4 inches of the concrete shall be neglected in the design. The cover on the top steel shall be 3-1/4 inches, and on the bottom steel, one inch.

The structural deck slab shall be placed under the monolithic slab, Item 601.0301.

23.1.2 - CONTINUOUS SPAN BRIDGES

Structural concrete deck slabs shall have a thickness of 8-1/4 inches, including a monolithic wearing surface. The top 1-1/4 inches of concrete shall be neglected in the design. The cover on the top steel shall be 2-1/4 inches and on the bottom steel, one inch. Epoxy-coated reinforcing bars shall be used in the top mat. In special cases, galvanized reinforcing bars for all reinforcement may be specified with the approval of the Deputy Chief Engineer (Structures).

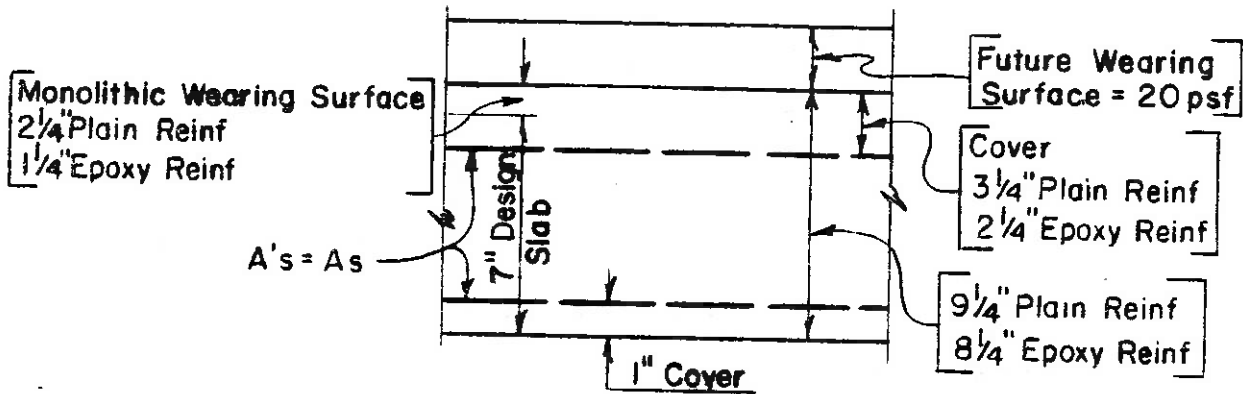
# SLAB DESIGN TABLE

CONCRETE REINFORCEMENT ASTM A615 GRADE 60

$f_s = 24,000$  psi

$f_c = 1200$  psi

$n = 10$



BAR SIZE AND SPACING	MAXIMUM DESIGN SPAN		MAXIMUM OVERHANG	
	BARS $\perp$ TRAFFIC	BARS $\parallel$ TRAFFIC	TYPES I, II, III, VII SECTIONS	TYPES IV & VI SECTIONS
#6 @ 5"	10'-3"	7'-7"	4'-0"	3'-9"
#6 @ 5 1/4"	10'-1"	7'-5"	3'-11"	3'-8"
#6 @ 5 1/2"	9'-10"	7'-3"	3'-11"	3'-8"
#6 @ 5 3/4"	9'-8"	7'-2"	3'-10"	3'-7"
#6 @ 6"	9'-6"	7'-0"	3'-10"	3'-7"
#6 @ 6 1/4"	9'-4"	6'-10"	3'-9"	3'-6"
#6 @ 6 1/2"	9'-2"	6'-9"	3'-9"	3'-6"
#5 @ 5"	9'-1"	6'-8"	3'-9"	3'-6"
#5 @ 5 1/4"	8'-10"	6'-6"	3'-8"	3'-5"
#5 @ 5 1/2"	8'-8"	6'-5"	3'-8"	3'-5"
#5 @ 5 3/4"	8'-5"	6'-2"	3'-7"	3'-4"
#5 @ 6"	8'-1"	6'-0"	3'-6"	3'-4"
#5 @ 6 1/4"	7'-9"	5'-9"	3'-6"	3'-3"
#5 @ 6 1/2"	7'-6"	5'-6"	3'-5"	3'-3"
#5 @ 6 3/4"	7'-2"	5'-4"	3'-4"	3'-2"
#5 @ 7"	6'-11"	5'-2"	3'-4"	3'-2"
#5 @ 7 1/4"	6'-9"	5'-0"	3'-4"	3'-1"
#5 @ 7 1/2"	6'-6"	4'-10"	3'-3"	3'-1"
#4 @ 5"	6'-4"	4'-9"	3'-3"	3'-1"

TYPES I, II, III, IV, VI & VII SECTIONS ARE SHOWN ON BDD 73-70.  
 MAXIMUM OVERHANG SHALL BE MEASURED FROM CENTER LINE OF WEB OF  
 FASCIA STRINGER.  
 REINFORCEMENT PLACED ON A SKEW SHALL HAVE ITS  $\perp$  SPACING REDUCED  
 BY THE COSINE SQUARED OF THE SKEW ANGLE.

23.1.3 - REINFORCEMENT IN DECK SLABS

For skews up to and including 30-deg, the reinforcement shall be placed parallel to the skew. For skews over 30-deg, the reinforcement shall be placed normal to the beams or girders.

Design span is defined as the distance between stringers less one-half the width of the top flange, these distances being measured along the longitudinal axis of the bar.

Longitudinal reinforcement on top of slab and bottom of slab outside the middle half of the bay shall be No. 5 bars at 1'-6" centers, except that no steel need be placed in the bottom of the slab over supporting members.

23.1.4 - HAUNCHES

All steel stringer bridges with monolithic deck slabs shall be provided with a haunch over each stringer, poured monolithically with the slab. The minimum depth of haunch shall be two inches as measured at the centerline of web from the top of steel to the theoretical bottom of slab. A deeper minimum haunch may be required when the top flange exceeds 16 inches in width to allow for pavement slope.

For simple span bridges, the depth of the haunch at the centerline of bearings shall be the minimum depth, plus the difference in thickness between the maximum and minimum top flange plates, plus the correct allowance for horizontal curvature.

Haunches on fascia beams of multispan bridges shall be set so that the top of the webs of fascia beams in adjacent spans line up.

The depth of the haunches shall be labeled on the plans only at the centerline of bearings. This is necessary to enable the Contractor to verify the pedestal elevations. The depth of the haunch at other locations along the span shall be computed by the Contractor after the superstructure steel has been erected, as per Superstructure Note SUP-1.

Haunches in excess of four inches in depth shall be reinforced with No. 5 stirrups at 1'-6" centers.

#### 23.1.5 - FORMING

The type of form system to be used in the construction of a concrete deck slab shall be indicated on the Contract Drawings.

The selection of the type of form system, whether removable or metal stay-in-place, shall be made by the Project Engineer. This selection shall be based on an evaluation of the project conditions and probable costs. Some of the guideline criteria which should be considered in determining the type of deck forms to be used are as follows:

- A. Accessibility of stringers for forming purposes.
- B. Ease in placing or removing forms.
- C. Difficulties inherent in erection and stripping of removable forms over waterways and railroads.
- D. Risks and safeguards involved in inspection.
- E. When the height of the superstructure is 25 feet or more above ground or water surface, corrugated metal forms shall be used to avoid use of construction nets.

In projects where more than one bridge is to be constructed, the evaluation shall be made on an individual bridge basis.

The form system selected shall be indicated on the structure drawings and the design shall take into consideration any increase in dead load that may occur due to the form system.

It shall be assumed that the weight of the form, plus the additional weight of concrete lying in the corrugations, will amount to sixteen (16) lbs per square foot. Stringers of bridges where stay-in-place forms are specified, shall be so designed that they will not be overstressed due to this additional load.

When corrugated metal forms are specified, a small detail shall be made indicating the presence of corrugations on the bottom of the structural slab and that the bottom row of reinforcement shall be placed with a one-inch cover above the crest of the corrugations.