TO:

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ENGINEERING INSTRUCTION

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

SUBJECT: STANDARD DETAILS FOR HIGHWAY BRIDGES, REVISION TO

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Deputy Chief Engineer (Structures)

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Supersedes:

The attached pages are revisions to Standard Details for Highway Bridges and should be immediately inserted in the Manual.

Page		
I		No Change
II		Revised Index Page
79	Art. 23.1.2	Revised "a.", "b." and deleted "c."
79-1	Art. 23.1.2	Revised Note (2)
79-1	Art. 23.1.2 (a)	Deleted
79-2		Revised, Slab Design Table
80	Art. 23.1.3	Added, First Paragraph
81		Reset page - No change in text
82		Reset page - No change in text
83		Reset page - No change in text Blank on back of sheet

Revised April 1976

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SECTION 23 - DECK SYSTEMS

23.1 - Concrete Deck Slabs:

23.1.1 - Monolithic Decks

Structural concrete deck slabs shall have a thickness of 8-1/2 inches, including a monolithic wearing surface. The top 1-1/2 inches shall be neglected in the design. The cover to the top steel shall be 2-1/2 inches, which includes a 1/2-inch construction tolerance. The bottom cover shall be one inch.

Epoxy-coated reinforcing bars shall be used in the top mat.

23.1.2 - Two-Course Bridge Decks

Two-course construction for new bridge decks may be used only when specifically authorized by the Deputy Chief Engineer (Structures).

The structural concrete deck slab shall have a thickness of 7-1/2 inches. The cover to the top steel shall be 1-1/2 inches, which includes a 1/2-inch construction tolerance. The bottom cover shall be one inch. Uncoated reinforcing bars shall be used. The overlay shall consist of one of the following systems, applied as noted:

a. Asphalt Concrete. Asphalt concrete wearing surface 2-1/2 inches thick. An approved membrane system shall be used.

b. Portland Cement Concrete. An optional item of 1-1/2 inches of Latex Modified Concrete or 2 inches of High Density-Low Slump Portland Cement Concrete.

Note (1): Specified thicknesses of latex modified and high density-low slump concretes include 1/4-inch extra for tined finishing.

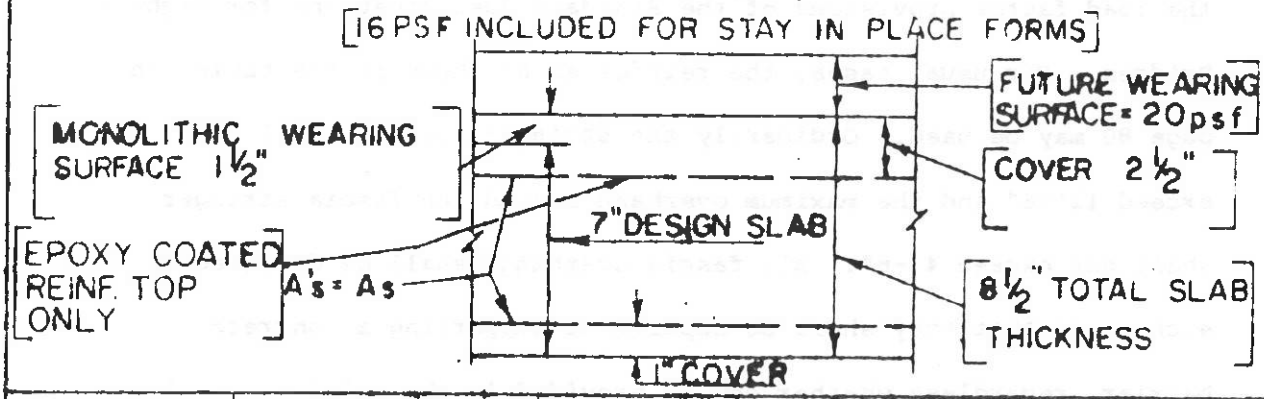
Note (2): In special cases, the Deputy Chief Engineer (Structures) may determine that either 1-1/2 inches of latex modified concrete or 2 inches of high density-low slump portland cement concrete shall be specified instead of the optional item.

REVISED NOV. 1976 L. Smith

SLAB DESIGN TABLE

CONCRETE REINFORCEMENT ASTM A615 GRADE 60

fs = 60,000psi fc 3,000psi n = 10



BAR SIZE AND SPACING	MAXIMUM DESIGN SPAN		MAXIMUM OVERHANG FOR FASCIA SECTION UP TO 500*/LF
	BARS ⊥ TRAFFIC	BARS ∥ TRAFFIC	
7 @ 5 1/2"		12'-6"	
7 @ 5 3/4"		12'-0"	
7 @ 6"		11'-6"	* - SEE ARTICLE 23.1.3
7 @ 6 1/4"		11'-2"	
7 @ 6 1/2"		10'-10"	
7 @ 6 3/4"		10'-6"	
6 @ 5"		10'-4"	
6 @ 5 1/4"		10'-0"	
6 @ 5 1/2"		9'-7"	
6 @ 5 3/4"	13'-0" *	9'-3"	5'-6" *
6 @ 6"	12'-6" *	8'-10"	5'-4" *
6 @ 6 1/4"	12'-0" *	8'-6"	5'-2" *
6 @ 6 1/2"	11'-6" *	8'-2"	5'-0" *
6 @ 6 3/4"	11'-2" *	7'-11"	4'-10" *
6 @ 7"	10'-11" *	7'-8"	4'-8" *
5 @ 5"	10'-6"	7'-6"	4'-6"
5 @ 5 1/4"	10'-2"	7'-3"	4'-5"
5 @ 5 1/2"	9'-10"	6'-11"	4'-4"
5 @ 5 3/4"	9'-6"	6'-7"	4'-3"
5 @ 6"	9'-2"	6'-4"	4'-3"
5 @ 6 1/4"	8'-7"	6'-0"	4'-2"
5 @ 6 1/2"	8'-3"		4'-1"
5 @ 6 3/4"	7'-11"		4'-0"
5 @ 7"	7'-8"		3'-10"
5 @ 7 1/4"	7'-5"		3'-9"
5 @ 7 1/2"	7'-2"		3'-8"
5 @ 7 1/2"	7'-0"		3'-7"
5 @ 8"	6'-9"		3'-6"
5 @ 8 1/2"	6'-6"		3'-5"
5 @ 8 3/4"	6'-3"		3'-4"
5 @ 9"	6'-0"		3'-3"

REINFORCEMENT PLACED ON A SKEW SHALL HAVE ITS' ⊥ SPACING REDUCED BY THE COSINE SQUARED OF THE SKEW ANGLE. 79-2

23.1.3 - REINFORCEMENT IN BRIDGE DECKS

The Deck Slab Reinforcement shall be designed in accordance with the load factor provisions of the Standard Specifications for Highway Bridges. For usual cases, the reinforcement shown in the tables on page 80 may be used. Ordinarily the stringer spacing shall not exceed 11'-6" and the maximum overhang beyond the fascia stringer shall not exceed 4'-6". All fascia overhangs shall be designed in such a way that they shall be capable of supporting a concrete barrier, regardless whether one is provided in the original construction. Larger stringer spacings and overhangs are possible, but they shall be used only in special cases, and only with the approval of the Deputy Chief Engineer (Structures).

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.

When No. 4 Main Steel is required, use No. 4 Distribution Steel.

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.