TO:

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ENGINEERING INSTRUCTION

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

SUBJECT: BRIDGE DESIGN MANUAL
DESIGN CRITERIA FOR BRIDGES
ELIMINATION OF CLASS B CONCRETE

Subject Code: 7.35-6 and 7.27-1-555

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APPROVED:

for E.V. HOURIGAN, Deputy Chief Engineer (Structures)

After considerable discussion and thorough review both within the Department and with concrete industry representatives, it has been mutually agreed by the Structures Division and the Technical Services Division that Class B Concrete for Structures is no longer to be used. This prohibition goes into effect beginning with the letting of May 9, 1985 (P.S.& E. February 14, 1985).

Class B concrete has a very high water-cement ratio (.50) and also requires No. 3 stone. The high w-c ratio results in Class B testing below design strength far more often than other classes of concrete. No. 3 stone is becoming increasingly difficult to obtain and, as a result, many concrete suppliers do not stockpile it. Consequently Class B concrete has become something of a liability.

During the 1983 construction season, Class B concrete was divided into two items:

Item 555.0201 for general placements
and
Item 555.0202 for footing placements

This procedure resulted in substantial money savings over the past two construction seasons. In order not to lose the potential benefit of split pay items, Class A concrete will be specified by four pay items. They are:

1. ITEM 555.0101 - CONCRETE FOR STRUCTURES, CLASS A (LARGE-SIZED PLACEMENTS; ABUTMENTS, WINGWALLS, ETC.) This item replaces Item 555.0201 - Concrete for Structures, Class B.

2. ITEM 555.0102 - CONCRETE FOR STRUCTURES, CLASS A (MID-SIZED PLACEMENTS; PIER COLUMNS, PIER CAPS, ETC.) This item is to be used in place of Item 555.01 - Concrete for Structures, Class A.

3. ITEM 555.0103 - CONCRETE FOR STRUCTURES, CLASS A (SMALL-SIZED PLACEMENTS; PEDESTALS, BACKWALLS ETC.) This item is also to be used in place of Item 555.01.

4. ITEM 555.0104 - FOOTING CONCRETE-CLASS A (NO CONCRETE CLASS SUBSTITUTIONS PERMITTED.) This item replaces Item 555.0202 - Footing Concrete - Class B.

The designer may use the following as general guidelines for stipulating the specific items on the plans:

A. Item 555.0101. Specify this item if the placement is characterized by relatively simple forming requirements and placement conditions. Most abutments, wingwalls, retaining walls, pier plinths, etc. will fall into this category. Take reinforcement spacing into account. Generally, it should not be less than six inches (6") c. to c. Individual concrete placements will rarely be less than 10 c.y.

B. Item 555.0102. Specify this item if forming and placement conditions appear to present difficulty. Often, the reinforcement spacing will be less than six inches (6") c. to c. Most pier columns, pier caps, culverts, backwalls, etc. will fall within these parameters. Individual concrete placements may occasionally be less than 10 c.y.

C. Item 555.0103. Specify this item if placement appears particulary difficult. Frequently, locations specified under this item will require considerably accurate finishing procedures. Concrete volumes will often be 1 to 3 c.y. per placement, or even less. Most pedestals, headers, joint blockouts, etc. would be covered by this item.

D. Item 555.0104. Specify this item for all footings, except footings that are greater than 6'-0" in depth, regardless of other dimensions.

Footings in excess of 6'-0" in depth are to be constructed with a special mix design supplied by the Materials Bureau.

In addition to the elimination of Class B concrete, this Engineering Instruction also transmits new allowable air contents, revised slump values, new mix criteria for Class G (tremie), and all other necessary specification changes. All changes become effective with the letting of May 9, 1985.

If there are any questions regarding the concrete mix design contact T. Wolschied at 518-453-6152.

Questions regarding the pay items should be directed to R. Ecuyer at 518-453-6113.

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Delete TABLE 501-1, CONCRETE CLASS OPTIONS, replace with the following:

TABLE 501-1
CONCRETE CLASS OPTIONS

Concrete Class Specified	Allowable Class Options
A	C,E,F* or H
C	F*
D	None
E	F* or H
F	None
G	None
H	None
I	J
J	None

Delete TABLE 501-2, COARSE AGGREGATE GRADATIONS and replace with the following:

TABLE 501-2
COARSE AGGREGATE GRADATIONS

Sieve Sizes	Type CA 1 General Limits % Passing	Type CA 2 General Limits % Passing
1½"	-	100
1"	100	93-100
½"	90-100	27-58
¼"	0-15	0-8

Delete TABLE 501-3, CONCRETE MIXTURES and replace with the following:

TABLE 501-3
CONCRETE MIXTURES
MIX CRITERIA

Concrete Class	Cement lbs/cy	Sand % Total Agg. (solid vol.)	Water/cement (weight)	Air Content %	Slump Range (ins.)	Type of Coarse Agregate Gradation	Primary Use
A	606.	36.2	0.46	7.0	2½-3½	CA 2	general purpose structural
C	605	35.8	0.44	7.0	1½-2½	CA 2	pavement: slipform paving, form paving
D	725	45.8	0.44	7.5	2½-3½	CA 1	thin structural applications
E	648	35.8	0.44	7.0	3-4	CA 2	structural slabs and structural approach slabs
F	716	34.6	0.38	7.0	2-3	CA 2	high early strength for pavement or structural slabs
G	727	45.0	0.45	6.0	6-7	CA 2	tremie
H	675	40.0	0.44	7.0	3-4	CA 2	pumping applications
I	640	41.0	0.44	6.0	½-1½	CA 2	slipforming highway median barriers
J	680	45.8	0.44	6.0	½-1½	CA 1	slipforming structural median barriers, parapet walls and curbs

NOTE: The criteria are given for design information and the data is based on fine aggregate fineness modulus of 2.80. The mixture proportions shall be determined using actual conditions for fineness modulus and bulk specific gravities (saturated surface dry for aggregates). The proportions shall be computed according to Department written instructions.

Delete TABLE 501-5 SLUMP VALUES and accompanying note and replace with the following:

TABLE 501-5
SLUMP VALUES

Concrete Placement	Design Slump Range, Inches	Maximum Slump, Inches
Pavement		
Slipform Paving	1½-2½	2½
Form Paving	1½-2½	3
Structural Slabs	3-4	4
Piers, Pedestals, Rigid Frames or Arches, Box Culverts throughout, Footings and Headwalls, general purpose structural	2½-3½	4
Cast-in-Place Piles	2½-3½	5
Tremie Concrete 6 inch minimum slump	6-7	8
High early strength pavement slabs or structural sections	2-3	3
Structural placement 3 inches thick or less	2½-3½	3½
Slipformed median barriers. parapet walls, curbs	½-1½	1½

NOTES: 1. Maximum slump for pumping applications shall be 4 inches.

2. When a slump test is conducted on concrete produced by a mobile mixing unit, the slump shall be measured 3 to 5 minutes after discharge from the unit.

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Subsection 607-2.01

Change the second line to read:

...Class A conforming to the requirements of Section 501 Portland Cement Concrete...

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Subsection 555-5.03

Delete the following from the list of pay items:

555.01	Concrete for Structures, Class A	Cubic Yard
555.0201	Concrete for Structures Class B	Cubic Yard
555.0202	Footing Concrete, Class B	Cubic Yard

Replace with the following pay items

555.0101	Concrete for Structures Class A (Mass Placements)	Cubic Yard
555.0102	Concrete for Structures, Class A (Primary Stress Placements)	Cubic Yard
555.0103	Concrete for Structures, Class A (Appurtenant Placements)	Cubic Yard
555.0104	Footing Concrete, Class A (No Concrete Class Substitutions Permitted)	Cubic Yard