To:

n-30-1-87728-

Design Quality Assurance Bureau
EIIS Administrator
Bldg. 5, Rm. 408
MC 0750,

New York State Department of Transportation
ENGINEERING BULLETIN

EB 97-010

Expires one year after issue unless replaced sooner

Title: **DRAINAGE STRUCTURES: PRECAST DRAFT AND NEW SIZES FOR TYPES WITHOUT TOP SLABS**

Distribution:

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Approved:

P. J. Bellair, Director, Design Quality Assurance Bureau

2-7-97
Date

ADMINISTRATIVE INFORMATION. This Bulletin modifies information issued by EI 90-27. It takes effect with the letting of 4/24/97; however, drainage structures conforming to these changes have been and should be accepted prior to the effective date. This Bulletin issues two shelf notes, and announces a change to existing shelf note 78. One shelf note modifies portions of Standard Sheets 604-5 and 604-8. The other modifies Standard Sheets M604-5 and M604-8 and §706-04 of the January 2, 1995 Standard Specifications. The metric Standard Sheets issued by EI 96-19 incorporated all but one of the changes to the Standard Sheets. Standard Sheets M604-5R1 and M604-8R1 with the minor change will be issued in the future. The Standard Specifications of January 2, 1995 will be revised with an Addendum or by the next edition.

BACKGROUND. Sheets standardizing drainage structures were issued under Engineering Instruction 90-27. Sheets 604-5, -6 and-7 show sixteen basic sizes having top slabs, designated A through P, made up of the combinations attainable from four standard wall dimensions. Sheet 604-8 shows five additional "topless" sizes without top slab, designated as sizes Q through U. The dimensions of these five units were selected to match the openings of Frames F2, F3, 11, 16, 22, 10PCB, 11PCB, and 12PCB.

These five sizes cause the precast industry difficulties because they are close in size to products used by others, but not exactly the same. In addition, because of the custom dimensions of these units, commercially available standard modular forms need special modification. The precasters have requested that the dimensions of the Q through U drainage structures be changed to even-inch dimensions close to the fractional dimensions originally selected. Initially, the Department was reluctant to accept this proposal because of the potential loss of bearing between the frame and the concrete walls of the structure. However, for ease of meeting finish grade in the field, contractors order drainage units for fabricated frames with a separate top section ("collar") which can be set to the proper elevation with mortar and concrete pavers. Fabricated frames are cast directly into the collars. These top sections have openings which match the frame size so even and full bearing underneath the frames is assured. The small mismatch between the actual frame opening and the inside opening of the even-inch drainage structure sizes requested by New York's precast industry is mitigated by this separate collar.

NEW SIZE AGREEMENT. The Department has agreed to change the standard dimensions to the proposed alternate even-inch dimensions, but will accept the present fractional-inch and some precaster-specific dimensions under terms previously agreed to between the precasters and the Materials Bureau. If the contractor elects to cast the drainage structure in place, then the structure's inside dimensions will be the same as the frame's openings. The U.S. Customary unit standard sheets will be modified by means of the attached notes. The metric sheets reflect these dimensions as soft conversions, except for the width of types Q and R, which are on the attached shelf note.

DRAFT AND TOLERANCES. In addition to the changed dimensions, a specified "draft" of ½ inch will be allowed on interior dimensions to facilitate form removal. This could lead to reduced space for mortar between the outside of the pipe and the side of the knockout. Notes 8A and 7A are being added to the customary and metric 604 Standard Sheets 1 of 4 to explain the draft and reduce the minimum clearance between the pipe and the side of the knockout when needed.

A tolerance of ½ inch for internal dimensions and ¼ inch for other dimensions has been added to the Standard Specifications by an addition to note 78 which already modifies section 706-04. The tolerance in the metric Specifications has been changed to 10 mm and 5 mm, respectively.

In choosing drainage structures, including skew of pipes, continue to use the tables in Engineering Instruction 90-27. Any shortfall from the new sizes and the draft will be taken up in the mortar between the pipe and the side of the knockout.

ATTACHMENTS. The attached are shelf notes that modify the Standard Sheets and both the 1990 (English) and 1995 (Metric) Standard Specifications to accomplish the dimension changes indicated above. They will take effect with the letting of 04/24/97.

CONTACT PERSONS. J. Reidy of the Materials Bureau at (518) 457-5956 or Larry Brown of the Design Quality Assurance Bureau at (518) 457-4093.

DRAINAGE UNITS TYPE Q, R, S, T & U, DIMENSIONS AND DRAFT

Make the following ***changes*** to Standard Sheets 604-5 and 604-8:

On Standard Sheet 604-5, ***add*** the following notes:

"3.D. When job site conditions require a drainage structure to be installed to a depth greater than that shown on the contract plans, an installation tolerance of up to one foot for precast structures only is permitted without requiring an increase in wall thickness or reinforcing steel, as required by the DRAINAGE STRUCTURE WALL THICKNESS & REINFORCING table."

"8a. Monolithic and integral bases may have a maximum vertical draft of ½" on all interior dimensions, to facilitate form removal. For wall knockouts that extend the full width or length of the structure, the minimum clearance between the outside of the pipe and the wall knockout shall be $1^3/_4$"."

On Standard Sheet 604-8, ***add*** the following:
"

RECTANGULAR DRAINAGE STRUCTURE PRECAST TYPES Q THROUGH U***			
ITEM	TYPE	WIDTH	LENGTH
604.301772	Q	2'-10"	3'-0"
604.301873	R	2'-10"	3'-10"
604.301911	S	2'- 0"	2'-8"
604.301990	S	2'- 0"	2'-8"
604.302016	T	2'- 2"	3'-6"
604.302091	T	2'- 2"	3'-6"
604.302122	U	2'-10"	3'-2"
604.302192	U	2'-10"	3'-2"

***Precast types S, T and U require a separate collar, cast with the frame. The frame collar shall have inside dimensions as shown in the "Cast-in-Place" table, outside dimensions to match the precast riser, and be 8" high minimum. "

Also ***replace*** the second line of the table titled, "**RECTANGULAR DRAINAGE STRUCTURE TYPE Q THRU U**" with the following:
"CAST-IN-PLACE TYPES Q THROUGH U".

DRAINAGE STRUCTURE TYPE Q, R, S, T & U
DIMENSIONAL TOLERANCES, DRAFT and WIDTH

Make the following ***changes*** to the Standard Specifications, dated January 2, 1995:

Page 7-64

Under **§706-04 1. Drawings.** ***replace*** the second sentence with the following:

"Unless otherwise shown in the contract plans, internal unit dimensions shall have a tolerance of ± 10 mm, all other dimensions, including reinforcing steel location, shall have a tolerance of ± 5 mm."

Make the following changes to metric Standard Sheets M604-5 and M604-8:

On Standard Sheet M604-5, ***add*** the following note:

"7a. Monolithic and integral bases may have a maximum vertical draft of 15mm on all interior dimensions, to facilitate form removal. For wall knockouts that extend the full width or length of the structure, the minimum clearance between the outside of the pipe and the wall knockout shall be 40 mm."

On Standard Sheet M604-8, RECTANGULAR DRAINAGE STRUCTURE table, ***change*** the WIDTH of PRECAST structures TYPEs Q and R from "815" mm to "865" mm.
Also, ***change*** the width indicated in SECTION A-A RECTANGULAR DRAINAGE STRUCTURE TYPE Q AND R from "815 If precast" to "865 If precast".