To: SUPERSEDED BY EB 06-057 EFFECTIVE 5/3/07		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 05-004

Title: **REVISED SECTION 558 LONGITUDINAL SAWCUT GROOVING OF STRUCTURAL SLAB SURFACE**

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Approved:

G. A. Christian

George Christian, Deputy Chief Engineer, Structures Division

2/15/05
Date

ADMINISTRATIVE INFORMATION:

- Effective Date: This Engineering Instruction (EI) is effective beginning with projects submitted for the letting of 9/8/05.
- Superseded Issuances: No EIs or EBs are superseded by this issuance.
- Disposition of Issued Materials: The Standard Specifications Revisions issued by this EI will be incorporated into a future update of the Standard Specifications.

PURPOSE: Revise the Standard Specifications for sawcutting of bridge decks.

TECHNICAL INFORMATION:

- Sawcutting of bridge decks will now be done in the longitudinal direction, rather than transverse. The spacing will change to 19 mm from 40 mm, and the depth of cut will be 4 mm rather than 6 mm.
- Cost Impact: The cost of sawcutting is expected to increase due to the reduction of the spacing. This is expected to be partially offset by the shallower depth of sawcutting and fewer setups needed for sawing longitudinally.

IMPLEMENTATION: The revised specification will be inserted into contract proposals by DQAB.

TRANSMITTED MATERIALS: A shelf note containing the revised Standard Specification Section 558.

BACKGROUND: To provide adequate wet-weather friction, a concrete wearing surface must have sufficient macrotexture and microtexture. *Macrotexture* is the visible texture, provided by manipulating the concrete surface during or after construction (e.g., artificial turf drag and sawcut grooving). *Microtexture* is the texture on the surface of the exposed aggregate particles.

The Department has continuously worked to improve its requirements for microtexture since the 1960s. The Department had no requirements for macrotexture until 1979 when the FHWA issued Technical Advisory T5140.10 *Texturing and Skid Resistance of Concrete Pavements and Bridge Decks.* The state-of-the-practice for texturing PCC wearing surfaces in 1979 was transverse tining at a spacing of ¾ inch. This was implemented as the standard texture in New York State. Due to constructibility and durability problems, the requirement for structural slabs was eventually changed to transverse sawcut grooving at a spacing of 1.5 inches, later 40 mm.

During the 1970s, California (CalTrans) began experimenting with longitudinal tining, spaced at ¾ inch, as a texture for PCC pavements. Longitudinal tining provides equivalent macrotexture with significantly reduced noise levels as compared to transverse texture. After extensive testing, CalTrans

determined that longitudinal tining provided equivalent safety. More recently, in 1999, Marquette University completed a research study for Wisconsin DOT, *Noise and Texture on PCC Pavements, Results of a Multi-state Study,* in which they confirmed CalTrans findings. Currently several states including New York, California, Colorado, and Minnesota use longitudinal textures as their standard for PCC Pavements.

Given the difficulty of constructing a tined surface on a structural slab without sacrificing slab durability, the Department will continue to impart macrotexture to structural slabs by sawcut grooving. The specifications transmitted by this EI change the requirement for groove orientation and spacing to meet the current state-of-the-practice for safe, quiet, PCC wearing surfaces.

CONTACT: Direct questions regarding this EI to Duane Carpenter of the Structures Design and Construction Division at 518-457-5715 or via e-mail at dcarpenter@dot.state.ny.us.

Make the following changes to the Standard Specifications dated January 2, 2002.

Pages 5-87 to 5-89, Section 558 - Transverse Sawcut Grooving of Structural Slab Surface, delete the entire Section and replace it with the following.

"SECTION 558
LONGITUDINAL SAWCUT GROOVING OF STRUCTURAL SLAB SURFACE

558-1 DESCRIPTION. Sawcut grooves into the surface of a portland cement concrete structural slab at the locations indicated in the contract documents.

The Contractor is hereby notified that concrete curing requirements, combined with structural slab loading restrictions, may have a significant effect upon the specific time, relative to concrete placement, at which sawcut grooving may be performed. The Contractor shall be familiar with the limits imposed by these factors and conduct operations accordingly.

558-2 MATERIALS. Use multibladed wet saw cutting equipment using circular saw blades. The Engineer may allow the use of single blade, circular saw equipment, where it is determined such equipment is necessary to complete the work as required. The equipment the Contractor proposes to use will be subject to the approval of the Engineer, prior to use.

Use water which meets the requirements of §712-01.

558-3 CONSTRUCTION DETAILS. Sawcutting concrete produces silica dust. Include sawcutting of concrete in the Health and Safety Plan in accordance with the silica safety requirements of §107-05 L.4.

Start sawcutting only after the specified curing period has elapsed, unless otherwise allowed by the applicable specification.

Cut longitudinal grooves parallel to the centerline of roadway using a single pass. Space the center-to-center of grooves at 19 mm ±2 mm. Cut all grooves rectangular in shape conforming to the following dimensions:

Width 2.5 mm (+ 0.5 mm, - 0.0 mm) Depth 4 mm ±2 mm

During the grooving operations, the Engineer will verify, at random, that the minimum groove depth is being achieved. Should the Engineer determine that minimum groove depth is not being achieved, the Contractor shall stop grooving operations and make all adjustments necessary to achieve the minimum depth.

Supply the Engineer with two (2) accurate, easily readable gauges with which to verify groove depth. Deliver the gauges and applicable manufacturer's instructions for use, if necessary, no later than one week prior to the anticipated beginning of grooving operations.

Terminate grooves within the following limits unless otherwise indicated on the contract documents:

Location	Closest Allowable Distance	Farthest Allowable Distance
Drainage structure	100 mm	380 mm
Vertical face (curb or parapet), or face of railing (no curb)	100 mm	380 mm
Joint System (Dimension measured perpendicular to the centerline of the joint system)	100 mm	380 mm

Using a self-contained system, continuously collect any slurry or debris created by the grooving operation such that it does not accumulate on the surface.

558-4 METHOD OF MEASUREMENT. The quantity will be measured as the number of square meters of structural slab satisfactorily grooved, measured between the faces of barrier, curb, or rail, and between the ends of the slabs, computed to the nearest whole square meter. No deduction will be made for areas left ungrooved near curbs, barriers, rails, joints, drainage structures, or other objects embedded in the slab.

558-5 BASIS OF PAYMENT. The unit price bid per square meter shall include the cost of all labor, materials, and equipment necessary to complete the work.

Payment will be made under:

Item No.	Item	Pay Unit
558.02 M	Longitudinal Sawcut Grooving of Structural Slab Surface	Square Meter"