

IOWA DEPARTMENT OF TRANSPORTATION

To Office Bridges and Structures Date November 23, 2005
Attention All Employees Ref No. 521.1
From Gary Novey
Office Bridges and Structures
Subject Method's Memo No. 143(Longitudinal Grooving for Bridge Decks, Bridge Approaches, Bridge Deck Overlays, & Overlay of Bridge Approaches)

Currently the Bridge Office includes a bid item for longitudinal grooving of the bridge decks in the bridge Estimate of Quantities. The Bridge Office also places a note in the plan, E/M 202 (See Attachment A), which overrides the standard specification concerning transverse tining of the bridge deck. The note describes the parameters for the longitudinal grooving. Due to coordination issues with the Office of Design involving the timing of approach pavement placement and any additional paving operation, a revised policy for plan preparation has been developed.

The Bridge Office will continue to require the cutting of longitudinal grooves in the hardened concrete of the bridge decks. Transverse tining will not be allowed. The longitudinal grooving will also be extended to include bridge approach sections, bridge deck overlays, and any PC overlay of bridge approaches. The limits of grooving in the bridge approach will be the same width as the bridge deck (ie: 2 foot shy of the gutter line) for the double reinforced approach panel. The rest of the bridge approach pavement will have the longitudinal grooves cut in the 12 foot wide lanes only (i.e.: 23 foot wide on a typical two-lane roadway [6 inches shy of the edge of travelled way]) and the grooving will terminate 6 inches from any bridge joint.

The Office of Design will provide a Standard Tabulation to be included with their road plans which documents quantities involved for bidding (See Attachment B). As a result, the Office of Bridges & Structures will no longer be including a bid item for longitudinal grooving in the bridge Estimate of Quantities. The notes describing the longitudinal grooving parameters (See Attachment "C") will also be included in the roadway plan details until the Standard Specifications are updated to include this information.

Bridge notes E/M 202, 203, and 204 will no longer be used. The notes documented in this Methods memo will replace these bridge notes.

Coordination of this item with the Office of Design is necessary. For most bridge plans it will be the responsibility of the Office of Bridges & Structures to provide the Office of Design with the area of the bridge deck, bridge approaches, bridge deck overlays, and overlay of bridge approaches to be grooved.

The following Cases (I, II, and III) define how longitudinal grooving will be addressed as a result of packaging of the bridge and roadway work. The notes address typical bridge

decks and bridge floor overlays, bridge approaches, and overlay of bridge approaches. Two course bridge decks will be addressed on a case-by-case basis.

Case I: Some or all the paving required to open this bridge to traffic is to be done by others. (Bridge will not be opened to traffic until additional contracts have been completed which will then allow traffic access to the structure)

When bridge decks (and bridge approaches) are a separate contract, but will be followed by a paving contract responsible for opening the road to traffic, the Bridge Office shall calculate the quantity of longitudinal grooving necessary for the bridge project (i.e.: bridge deck only or bridge deck and approach pavement if the bridge plans include a bridge approach section) for inclusion in the paving plan. This quantity shall be forwarded to the Office of Design for their use in developing quantities for the paving project. Be specific in the information describing the bridge involved and how much grooving is for the bridge deck and how much for the bridge approach section.

The bridge plans shall include the following note: E/M 205

TRANSVERSE GROOVING OR TILING IN THE PLASTIC CONCRETE OF THE BRIDGE DECK (AND BRIDGE APPROACH SECTIONS) IS NOT ALLOWED. LONGITUDINAL GROOVES WILL BE CUT IN THE HARDENED CONCRETE USING A MECHANICAL CUTTING DEVICE. LONGITUDINAL GROOVING WILL NOT BE A PART OF THIS CONTRACT, BUT WILL BE DONE BY OTHERS PRIOR TO OPENING THE BRIDGE TO TRAFFIC.

Case II: All paving necessary to open the bridge to traffic is included in the bridge contract. (Bridge will be opened to traffic upon completion of the Contract)

When the contract includes bridge decks, bridge approaches and paving operations, which will result in opening the bridge to traffic, the Bridge Office shall calculate the quantity of longitudinal grooving necessary for the bridge deck. This quantity shall be forwarded to the Office of Design for their use in developing quantities for the roadway portion of the project (including paving details). Note: the Office of Design will calculate the quantity for longitudinal grooving of the bridge approach since they will be developing the bridge approach details and the bridge office will not typically see these details until the total road design package is submitted to the bridge office for review and final turn in to the Office of Contracts.

The bridge plans shall include the following note: E/M 206

TRANSVERSE GROOVING OR TILING IN THE PLASTIC CONCRETE OF THE BRIDGE DECK AND BRIDGE APPROACH SECTIONS IS NOT ALLOWED. LONGITUDINAL GROOVES WILL BE CUT IN THE HARDENED CONCRETE USING A MECHANICAL CUTTING DEVICE. THE BID ITEM FOR "LONGITUDINAL GROOVING IN CONCRETE" IS A PART OF THIS CONTRACT AND WILL BE INCLUDED IN THE ROADWAY QUANTITIES ASSOCIATED WITH THIS CONTRACT.

Case III: Existing Bridges requiring redecking or overlays

When bridge decks and bridges approaches are in a project where the paving exists or the existing road is not hard surfaced and the road is not planned for replacement/resurfacing, it is assumed the contract will involve all bridge and roadway work including any bridge approach pavement. In this case the Bridge Office shall calculate the quantity of longitudinal grooving necessary for the bridge deck. This quantity shall be forwarded to the Office of Design for their use in developing quantities for the roadway portion or the project. See note above concerning the calculation of grooving for the approach pavement.

The bridge plans shall include the following note: E/M 207

TRANSVERSE GROOVING OR TILING IN THE PLASTIC CONCRETE OF THE BRIDGE DECK (BRIDGE DECK OVERLAY) AND BRIDGE APPROACH SECTIONS (OVERLAY OF THE BRIDGE APPROACH) IS NOT ALLOWED. LONGITUDINAL GROOVES WILL BE CUT IN THE HARDENED CONCRETE USING A MECHANICAL CUTTING DEVICE. THE BID ITEM FOR "LONGITUDINAL GROOVING IN CONCRETE" IS PART OF THIS CONTRACT AND WILL BE INCLUDED IN THE ROADWAY QUANTITIES ASSOCIATED WITH THIS CONTRACT.

The following cases (A and B) define special circumstances involving longitudinal grooving of the bridge deck.

Case A: Bridge Decks Using High Performance Concrete or Improved Durability Concrete

When bridge plans specify the use of High Performance Concrete (Developmental Specification DS-1033) or Improved Durability Concrete (Developmental Specification DS-1030) the plan shall make reference to the appropriate Developmental Specification. This Developmental Specification refers to the bid item "Longitudinal Grooving in Concrete".

If the bridge project will not include this bid item, based on the cases stated above, the following plan note shall be placed in the bridge plans: E/M 208

THE DEVELOPMENTAL SPECIFICATION, DS-_____, FOR _____ INCLUDES REFERENCE TO A BID ITEM FOR "LONGITUDINAL GROOVING IN CONCRETE". AS NOTED IN THIS PLAN, THIS BID ITEM IS NOT PART OF THE BRIDGE PROJECT, BUT WILL BE DONE BY OTHERS.

Case B: Interim Coarse Broom Texture On Stage Bridge Projects

For staged bridge projects the contractor will be allowed the option to provide an interim coarse broom texture to the bridge deck, bridge deck overlay, bridge approach, and overlay of bridge approach. This will allow the contractor to mobilize the equipment for cutting

longitudinal grooving only one time at the completion of all stages in lieu of mobilizing the equipment at the completion of each stage of the project.

Bridge plans shall include the following notes: E/M 209

THE CONTRACTOR WILL HAVE THE OPTION OF CUTTING LONGITUDINAL GROOVES IN THE HARDENED CONCRETE AT THE END OF EACH STAGE OF CONSTRUCTION OR WAITING UNTIL ALL STAGES HAVE BEEN COMPLETED. IF THE CONTRACTOR ELECTS TO DELAY CUTTING OF THE LONGITUDINAL GROOVES UNTIL COMPLETION OF ALL STAGES, THE CONCRETE DECK/OVERLAY SURFACE FOR ANY STAGE OPENED TO TRAFFIC SHALL RECEIVE AN INTERIM COARSE BROOM FINISH DURING PLACEMENT.

WITHIN 30 CALENDAR DAYS FOLLOWING COMPLETION OF THE LAST STAGE OF THE PROJECT, THE CONTRACTOR WILL BE REQUIRED TO ESTABLISH TEMPORARY LANE CLOSURES TO ACCOMPLISH LONGITUDINAL GROOVING FOR ALL STAGES. COST OF THE TEMPORARY LANE CLOSURES IS TO BE INCLUDED IN THE PRICE BID FOR "TRAFFIC CONTROL". THE INTERIM BROOM FINISH WILL NOT BE ALLOWED AS A SURFACE TEXTURE WHEN OPENED TO TRAFFIC OVER A WINTER SEASON. IF THE INTERIM COARSE BROOM TEXTURE IS PRESENT AND THE CONTRACTOR IS NOT IN A POSITION TO FINISH ALL STAGES OF THE PROJECT, LONGITUDINAL GROOVING WILL BE CUT INTO THE HARDENED CONCRETE IN ORDER TO ESTABLISH AN ACCEPTABLE DRIVING SURFACE TEXTURE FOR THE WINTER SEASON.

Sometimes an area of the bridge deck will have roadway traffic during staging and become a sidewalk surface in the final cross section. In this case, do not give the contractor the option to cut longitudinal grooves in the portion of the bridge deck which will eventually be the sidewalk, but require the use of the interim coarse broom finish in that stage.

The Office of Design will prepare the traffic control plan. This plan will include appropriate road standards to address the traffic control requirements in the event the contractor elects to do longitudinal grooving after all stages of the project is complete. These would generally include RS-3, RS-63A and RS-63B, or RS-64A and RS-64B. In addition, the staging notes or traffic control notes for staged projects should include the following note "For staged bridge projects, the contractor will be allowed the option to provide an interim coarse broom texture to the bridge deck, bridge deck overlay, bridge approach and overlay of bridge approach. If the contractor elects this option to reduce mobilization costs, all traffic control required will be incidental to the traffic control bid item."

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Attachments

E202: Longitudinal grooving, bridge decks

TRANSVERSE GROOVING OR TILING IN THE PLASTIC CONCRETE OF THE BRIDGE DECK OR BRIDGE FLOOR OVERLAY WILL NOT BE ALLOWED. LONGITUDINAL GROOVES SHALL BE CUT INTO THE HARDENED CONCRETE SURFACES USING A MECHANICAL CUTTING DEVICE. LONGITUDINAL GROOVING SHALL BE DONE AFTER ANY SURFACE CORRECTION GRINDING IS DONE AND BEFORE TRAFFIC IS ALLOWED ON THE SURFACE. EACH GROOVE SHALL BE 1/8 INCH \pm 1/64 INCH IN WIDTH, 1/8 INCH + 1/32 INCH OR - 1/16 INCH IN DEPTH, AND THE GROOVES SHALL BE UNIFORMLY SPACED AT 3/4 INCH INTERVALS MEASURED FROM CENTER OF GROOVE TO CENTER OF GROOVE. LONGITUDINAL GROOVING SHALL NOT BE WITHIN THE AREA APPROXIMATELY 2 FEET ADJACENT TO THE CURBS AND SHALL TERMINATE APPROXIMATELY 6 INCHES FROM ANY JOINTS. THE QUANTITY OF LONGITUDINAL GROOVING IN CONCRETE, IN SQUARE YARDS, WILL BE THE QUANTITY SHOWN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR WILL BE PAID THE CONTRACT UNIT PRICE FOR LONGITUDINAL GROOVING IN CONCRETE PER SQUARE YARD.

Provide this note along with the bid item "Longitudinal Grooving in Concrete" [Notes in OBS MM No. 128 supersede notes in OBS MM No. 118].

M202: Longitudinal grooving, bridge decks

TRANSVERSE GROOVING OR TILING IN THE PLASTIC CONCRETE OF THE BRIDGE DECK OR BRIDGE FLOOR OVERLAY WILL NOT BE ALLOWED. LONGITUDINAL GROOVES SHALL BE CUT INTO THE HARDENED CONCRETE SURFACES USING A MECHANICAL CUTTING DEVICE. LONGITUDINAL GROOVING SHALL BE DONE AFTER ANY SURFACE CORRECTION GRINDING IS DONE AND BEFORE TRAFFIC IS ALLOWED ON THE SURFACE. EACH GROOVE SHALL BE 3 mm \pm 0.5 mm IN WIDTH, 3 mm + 1 mm OR - 1.5 mm IN DEPTH, AND THE GROOVES SHALL BE UNIFORMLY SPACED AT 20 mm INTERVALS MEASURED FROM CENTER OF GROOVE TO CENTER OF GROOVE. LONGITUDINAL GROOVING SHALL NOT BE WITHIN THE AREA APPROXIMATELY 600 mm ADJACENT TO THE CURBS AND SHALL TERMINATE APPROXIMATELY 150 mm FROM ANY JOINTS. THE QUANTITY OF LONGITUDINAL GROOVING IN CONCRETE, IN SQUARE METERS, WILL BE THE QUANTITY SHOWN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR WILL BE PAID THE CONTRACT UNIT PRICE FOR LONGITUDINAL GROOVING IN CONCRETE PER SQUARE METER.

Provide this note along with the bid item "Longitudinal Grooving in Concrete" [Notes in OBS MM No. 128 supersede notes in OBS MM No. 118].

E203/M203: Longitudinal grooving, paving contractor, improved durability concrete

LONGITUDINAL GROOVING OF THE BRIDGE DECK WILL BE DONE BY THE PAVING CONTRACTOR. THEREFORE, THE PORTION OF DEVELOPMENTAL SPECIFICATION FOR IMPROVED DURABILITY CONCRETE FOR BRIDGE DECKS CONCERNING THE GROOVING IS NOT APPLICABLE.

Provide this note if the bridge deck is constructed with improved durability concrete and the District decides to include the grooving in the paving plan rather than the bridge plan [OBS MM No. 121].

E204/M204: Longitudinal grooving, paving contractor, high performance concrete

LONGITUDINAL GROOVING OF THE BRIDGE DECK WILL BE DONE BY THE PAVING CONTRACTOR. THEREFORE, THE PORTION OF THE DEVELOPMENTAL SPECIFICATION FOR HIGH PERFORMANCE CONCRETE FOR BRIDGE DECKS CONCERNING THE GROOVING IS NOT APPLICABLE.

Provide this note if the bridge deck is constructed with high performance concrete and the District decides to include the grooving in the paving plan rather than the bridge plan [OBS MM No. 121].

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Transverse grooving or tining in the plastic concrete of the bridge deck, bridge floor overlay, or bridge approach section will not be allowed. Longitudinal grooves shall be cut into the hardened concrete surfaces using a mechanical cutting device. Longitudinal grooving shall be done after any surface correction grinding is complete and before traffic is allowed on the surface except as noted for staged construction. Each groove shall be $1/8$ inch \pm $1/64$ inch in width, $1/8$ inch + $1/32$ inch or $-1/16$ inch in depth, and the grooves shall be uniformly spaced at $3/4$ inch intervals measured from center of groove to center of groove. Longitudinal grooving shall terminate approximately 6 inches from any bridge joints or expansion joints. On the bridge deck and on curbed areas of the approach pavement, grooving shall terminate approximately 2 feet from the gutter line. On areas of the approach pavement without curbs, grooving shall terminate approximately 6 inches inside the edge of the traveled way.

The quantity of longitudinal grooving in concrete, in square yards, will be the quantity shown in the contract documents. The contractor will be paid the contract unit price for longitudinal grooving in concrete per square yard.