Memorandum

To: DEPUTY DISTRICT DIRECTORS, Construction
   DEPUTY DIVISION CHIEF, Structure Construction
   CONSTRUCTION MANAGERS
   SENIOR CONSTRUCTION ENGINEERS
   RESIDENT ENGINEERS

From: MARK LEJA
   Chief
   Division of Construction

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File: Division of Construction
   CPD 11-4

Subject: Smoothness Specification Requirements for Thin Hot Mix Asphalt Overlays

Section 39, “Hot Mix Asphalt,” (HMA) of the Amendments to the 2006 Standard Specifications requires that HMA overlays with planned thickness of less than 0.25 foot meet the must-grind smoothness requirement of no deviations exceeding 0.3 inches in height within 25 feet of roadway. Deviations in pavement surface that affect smoothness include both dips in the pavement profile and bumps. Bumps are typically corrected by grinding the pavement surface, while dips may require other corrective work.

Since the smoothness of the underlying pavement surface may affect the smoothness of the finished pavement, contractors should not be responsible for the cost of meeting the must-grind smoothness requirement for the finished pavement when they place a thin overlay of less than 0.25 foot on a rough or bumpy existing pavement that does not meet the must-grind requirement before HMA overlay placement.

Caltrans has developed new standard special provision (SSP) 39-025, “Prepaving Must-Grinds,” that requires the contractor to profile the existing pavement, determine locations of must-grinds, and notify the resident engineer of must-grinds that grinding cannot correct. The resident engineer may order extra work to correct those locations. The SSP requires the contractor to correct prepaving must-grinds by grinding before placing an overlay. Two contract bid items, Prepaving Profilograph and Prepaving Grinding Day, are included in the SSP for prepaving must-grinds work.

This directive allows for implementing the new requirements for prepaving smoothness in SSP 39-025 for ongoing projects and provides direction on how to address pre-existing must-grinds on existing pavement before the placement of HMA with a planned thickness of less than 0.25 foot when no leveling course of HMA is specified for the project.

Existing Specification

Section 39-1.12, “Smoothness,” of the Amendments to the 2006 Standard Specifications requires that the contractor determine the smoothness of the finished HMA surface with a profilograph and a straightedge. The profilograph has been used to determine the locations of must-grinds (deviations exceeding 0.3 inch within 25 feet length of roadway) and to determine a profile index (measurement of pavement roughness). The contractor has to repair the must-grinds in accordance with Section 39-1.12D, “Smoothness Correction,” of the Amendments to the 2006 Standard Specifications.
Procedure for Implementing New Specification on Ongoing Projects

If the contractor believes that the surface of the existing pavement is too rough and may have existing must-grinds that cannot be corrected by the automatic screed controls of the paver and planned HMA overlay thickness, the contractor may request a change order to produce profilograms for the existing pavement.

The resident engineer will issue a contractor-requested change order authorizing the contractor to perform California Test 526, “Operation of California Profilograph and Evaluation of Profiles,” on the existing pavement to determine the presence and locations of must-grinds before placement of the thin HMA overlay. The change order will compensate the contractor for the cost of necessary traffic control and performing California Test 526 on the existing pavement surface. If work completion is delayed because of the change order work, adjust payment and contract time under Section 8-1.09, "Delays," of the Amendments to the 2006 Standard Specifications.

Upon completion of profiling, the resident engineer must ensure that the contractor provides the following:

• Written notification to the resident engineer of roadway locations with deviations exceeding 0.3 inch in height within 25 feet length of pavement and the respective height and length of those deviations.

• A cost estimate for correcting areas with deviations exceeding 0.4 inch in height within 25 feet length before HMA overlay.

• Preparing profilograms.

The resident engineer reviews the information provided by the contractor to determine the severity of the must-grinds on the existing pavement surface and whether a supplemental change order is necessary.

Supplemental Change Order

Based on the severity of the must-grinds and available contract contingency funds, the resident engineer chooses one of following options:

Option A

It is preferable to correct the existing pavement must-grind corrections before HMA overlay placement, but—based on the additional cost of mobilizing the profile grinder and potential delays to the project—it is acceptable to correct the locations with existing pavement must-grind by bump-grinding the completed HMA surface. When contract contingency funds are available to address existing pavement must-grinds, the resident engineer writes a change order to correct existing pavement locations identified on the pre-paving profilogram that do not meet the must-grind deviation requirement of 0.4 inch within 25 feet.

Compensation for change orders for smoothness correction should be paid in accordance with Section 4-1.03D of the Standard Specifications. The change order should include profile grinder mobilization, grinding time, pavement profilographing to indicate must-grinds have been removed, and necessary traffic control. If must-grinds are the result of dips in the existing roadway, the change orders should include HMA leveling to correct the dips rather than grinding the must-grind at each end of the dip. If must-grinds are the result of a failed structural section in the existing roadway, the
change orders should include removing and replacing the asphalt concrete to correct the must-grind. If work completion is delayed because of the change order work, adjust payment and contract time under Section 8-1.09, "Delays," of the Amendments to the 2006 Standard Specifications.

The specifications recommend not correcting prepaving must-grinds between 0.3 inch and 0.4 inch before paving because a HMA paver operating with automatic screed controls using a ski device as mobile reference to determine existing pavement surface should be able to eliminate must-grinds up to 0.4 inch. The change order should provide for grinding the finished HMA surface if must-grinds are identified at the same locations as the prepaving must-grinds between 0.3 inch and 0.4 inch.

If the smoothness corrections are performed before HMA overlay, the contractor must meet the must-grind and straight-edge smoothness requirements on the completed HMA overlay surface.

Option B

When contract contingency funds are not available to address existing pavement must-grinds, the resident engineer writes a no-cost change order to exclude locations identified on the prepaving profilogram that do not meet the must-grind deviation requirement of 0.3 inch within 25 feet from corrective grading if the locations are identified as must-grind locations after paving.

A sample change order memorandum, a sample change order, and a Federal Highway Administration (FHWA) blanket prior approval are attached to this directive. The FHWA has granted prior approval for a change order for correcting existing pavement locations not meeting the must-grind deviation requirement identified on the prepaving profilogram. This directive serves as delegation of authority from the Division of Construction and the approval from the FHWA of change orders when implemented under its requirements. According to CPB 06-5, “CCO Approval Delegation,” division and FHWA approvals for high-profile projects are required if the change order language is altered or has a total absolute value exceeding $200,000. FHWA approval is required on high-profile projects if the change order extends contract time by more than 20 days.

If you have questions regarding pavement smoothness, please contact Ebi Fini at (916) 227-5396 or ebi.fini@dot.ca.gov or Chuck Suszko at (916) 227-7314 or chuck.suszko@dot.ca.gov.

Attachments:  Sample Contract Change Order Memorandum
Sample Contract Change Order
Sample Supplemental Contract Change Order Memorandum
Sample Supplemental Contract Change Order
FHWA Form CA-358 (c), “Record of Blanket Prior Approval for Major Contract Change Order”