State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

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

Date: September 23, 2013

File: Division of Construction
CPD 13-8

From: MARK LEJA, Chief
Division of Construction

Subject: Contractor Option to use Inertial Profiler to Determine Pavement Smoothness

This directive provides guidance for the implementation of measuring pavement smoothness with the inertial profiler in lieu of the California Profilograph when requested by the contractor for ongoing projects. The California Department of Transportation (Caltrans) has developed a new standard special provision (SSP) 39-1.12 for asphalt pavement to replace *Standard Specifications* Section 39-1.12 and revised SSP 40-1 for concrete pavement that requires the contractor to determine pavement smoothness profiles using the inertial profiler.

Technological advancements in pavement profile measuring have prompted Caltrans to transition to a high-speed inertial profiler for pavement smoothness acceptance. The inertial profiler provides accurate pavement smoothness measurement at highway speed, collects profiles for both wheel paths at the same time, and eliminates the need for lane closures and employee exposure to traffic. The inertial profiler measures pavement smoothness using the international roughness index (IRI) which is the same index Caltrans uses to report annual network pavement smoothness. Data collected by the inertial profiler is analyzed through the Federal Highway Administration's (FHWA's) free engineering software application, ProVAL, which provides reports of IRI pavement smoothness by wheel track and lane pavement smoothness as mean roughness index (MRI). The program can also identify areas of localized roughness which replaces the existing must-grind requirements.

Refer to Construction Policy Bulletin 13-2, "Inertial Profiler Construction Inspection Guidance," for administering pavement smoothness requirements when using an inertial profiler.

Attached to this directive for concrete pavement is an edited version of SSP 40-1 that includes only the portions for pavement smoothness. Attached for hot mix asphalt (HMA) pavement is an edited version of SSP 39-1.12 that matches the current specification requirements. The following edits have been made to SSP 39-1.12:

- Initial profiling is not required except for projects with prepaving profiling and prepaving grinding bid items.
- HMA thickness less than 0.25 foot requires only areas of localized roughness to be corrected and no correction of pavement smoothness to meet new MRI requirements. For projects implementing inertial profiler by change order, MRI will be reported only for HMA thickness 0.20 foot or less and for open graded friction course.

Cost savings should be based on reduced number of lane closures required to profile pavement and reduced operational cost of using an inertial profiler versus using the California Profilograph. Backup calculations

to support the credit or zero adjustment of compensation must be filed in the project records. An example for backup calculations is attached.

There should be a credit to the state or no cost for implementing this contractor-initiated change order. No extension of contract time should be included in the change order. A sample change order memorandum, sample change order, and Federal Highway Administration (FHWA) Form CA-358(c), "Record of Blanket Prior Approval for Major Contract Change Order," for allowing inertial profilers to determine pavement smoothness are attached to this directive. This directive serves as delegation of authority from the Division of Construction and approval from the FHWA for this change order, except when any of the following apply to the change order:

- The language is altered.
- The total absolute value exceeds $200,000.
- Contract time is extended by more than 20 days.

Refer to Section 5-311A, "Division of Construction Approval," of the *Construction Manual* for more information on the Division of Construction's approval of change orders and Section 5-308, "Federal Highway Administration Change Order Requirements," for additional FHWA requirements for high-profile projects.

If you have questions or comments regarding this directive, please contact Rupinder Dosanjh, Division of Maintenance, at rupinder.dosanjh@dot.ca.gov or (916) 274-6078; or Ebi Fini, Division of Construction, at ebi.fini@dot.ca.gov or (916) 227-5396.

Attachments:
1. Sample Change Order Memorandum
2. Example Force Account Analysis Backup Calculations
3. Sample Change Order
4. Change Order Attachment—2010 Hot Mix Asphalt Pavement Smoothness Specification
5. Change Order Attachment—2010 Concrete Pavement Smoothness Specification
6. FHWA Form 358(c), "Record of Blanket Prior Approval for Major Contract Change Order"