

# Caltrans DES-SC Contractors Liaison Meeting

## September 2013

### **Friction Coefficient of Concrete surfaces Testing and Specification update**

#### **Background:**

Structure Construction is currently cooperating with other Caltrans units to implement alternative methods to measure required surface friction on concrete bridge decks. The ongoing effort focuses on test methods, tools, and QC/QA specifications ensuring acceptable Friction Coefficient. This effort has two goals:

1. Update current specifications to reflect Caltrans practice.
2. Develop alternate quality control testing methods.

#### **Testing Requirements per Current Specifications:**

##### **A. Concrete Decks & Approach Slabs:**

The Engineer (Caltrans) is required to test the coefficient of friction of concrete surfaces of decks and approach slabs under (California Test 342). Standard Specification 51-1.01D(4)(c) specifies that the coefficient of friction must not be less than 0.35.

##### **B. Polyester Concrete overlay:**

The Engineer (Caltrans) determines the acceptability of the trial overlay. QC/QA per Standard Specification 15-5.06A(3). The trial overlay is to be completed before production overlay activities.

##### **C. Bridge Deck Methacrylate Resin Treatment:**

The Engineer (Caltrans) performs (California Test 342) on treated deck surfaces. The coefficient of friction must be at least 0.35 per Standard Specification 15-5.05A(3). A test area is required to be completed before starting production treatment activities.

#### **Proposed Plan:**

Structure Construction is proposing a plan to modify the current testing requirements and QC/QA specifications in three stages:

1. **Stage I:** Acceptance of test area and trial tests for polyester concrete overlay and methacrylate resin treatment of bridge deck (items B & C above) in lieu of complete surface testing. Keep current testing requirement for Concrete bridge decks (item A above). Modify the Standard Specification to reflect this change.
2. **Stage II:** Introduce the Sand Patch test as test method for acceptance of polyester concrete overlay work on bridge decks, and allow contractors to perform the test.
3. **Stage III:** Develop a QC/QA plan to reflect moving the testing requirement responsibility to the contractors.

The time frame to implement the proposed plan has not been finalized. However, implementation of **Stage I** can take effect once current specifications are revised.

### Proposed Specifications modification:

- **Concrete Decks & Approach Slabs; Standard Specification 51-1.01D(4)(c):**  
No Change
- **Polyester Concrete overlay; Standard Specification 15-5.05A(3):**  
Complete a test area before starting deck treatment activities. Notify the Engineer at least 15 days before treating the test area.  
The test area must be:
  1. At least 500 sq ft
  2. Within the project limits outside the traveled way at an authorized location
  3. Constructed (1) using the same materials, equipment, and construction methods to be used in the work and (2) under conditions similar to those anticipated when the work will be performed.

The completed test area must demonstrate (1) compliance with these specifications and (2) that the work will be completed within the time allowed

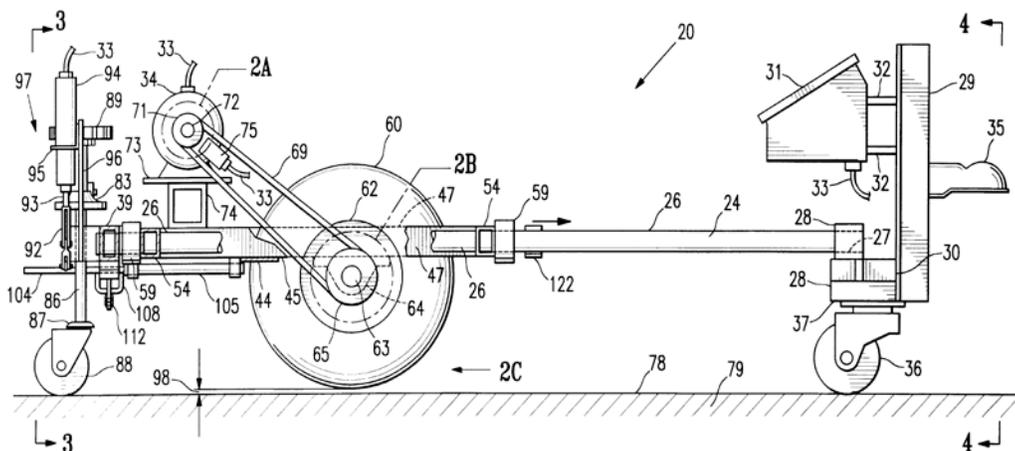
The Engineer performs friction testing of the treated test area under California Test 342. Allow 10 days after completion of the test area for the Engineer to perform the test.

Do not perform deck treatment activities until the test area is authorized.
- **Bridge Deck Methacrylate Resin Treatment; Standard Specification 15-5.06A(4):**  
In Progress...similar to 15-5.05A(3) above.

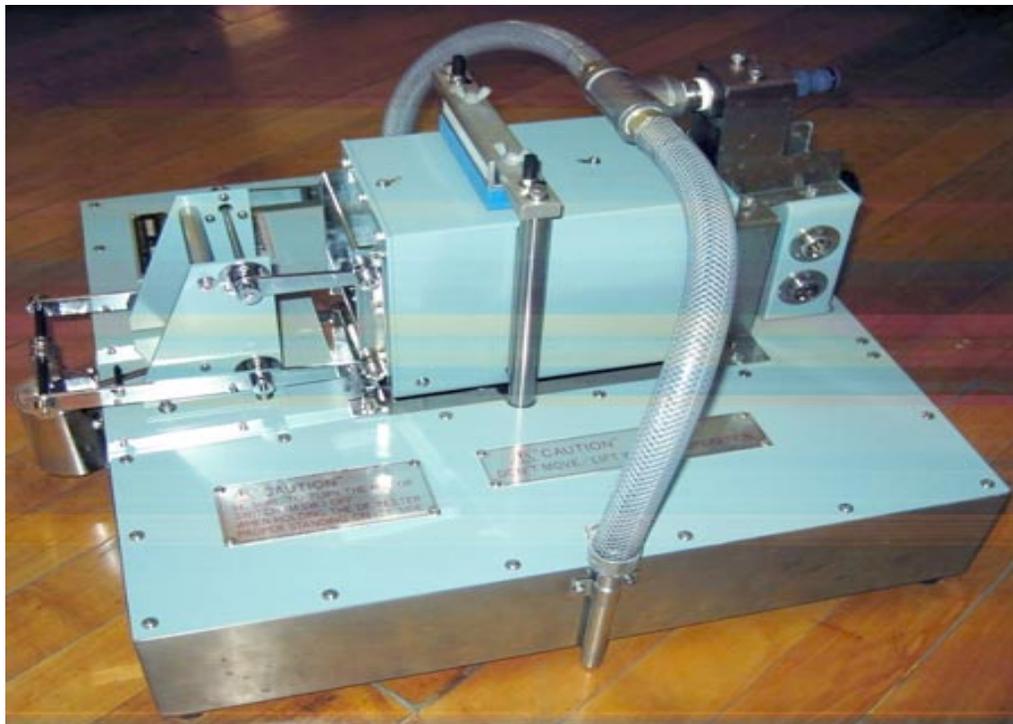
### Friction Coefficient Test Methods:

#### A. Friction Measurement Devices:

- **California Portable Skid Test, California Test 342**



- Dynamic Friction Test, ASTM E1911-02



**A close-up view of the Dynamic Friction Tester, which can measure pavement surface friction as a function of speed and under various conditions**

- **British Pendulum Test, ASTM E303-93**



## B. Texture Measurement Methods:

- Volumetric "Sand Patch" Test ASTM E965-96

