

REVISION OF SECTIONS 106 AND 601
CONCRETE SAMPLING AND PUMPING

Sections 106 and 601 of the Standard Specifications are hereby revised for this project as follows:

In subsection 106.03, delete the fifth paragraph and replace with the following:

Samples will be taken by the Department except that the Contractor shall take samples of Portland Cement Concrete in accordance with CP 61; samples of asphalt cement, in accordance with AASHTO T 40; hot mix asphalt, in accordance with CP 41 and a composite of aggregates for hot bituminous mixtures, in accordance with CP 30. The Engineer will determine the sampling locations, and the samples shall be taken in the presence of the Engineer. The Contractor may retain a split of each sample.

Delete subsection 601.08 and replace with the following:

601.08 Air Content Adjustment. When a batch of concrete delivered to the project does not conform to the minimum specified air content, an air entraining admixture conforming to subsection 711.02 may be added in accordance with subsection 601.17. After the admixture is added, the concrete shall be re-mixed for a minimum of 20 revolutions of the mixer drum at mixing speed. The concrete will then be re-tested by QC.

Subsection 601.12(d) shall include the following:

The Contractor shall not use pipes, chutes, troughs, spouts, or tremies that are fabricated of aluminum materials for pumping, conveying, or placing concrete.

Subsection 601.12(g) shall include the following:

When concrete is placed by pumping, the pumping equipment shall be thoroughly cleaned prior to concrete placement. Excess form release agent shall be removed from the hopper. The pump shall be primed at the Contractor's expense by pumping and discarding enough concrete to produce a uniform mix exiting the pump. At least 0.25 cubic yard of concrete shall be pumped and discarded to prime the pump. Water shall not be added directly into the concrete pump hopper after placement has commenced. If water is added to the concrete pump hopper, all concrete in the concrete pump hopper and the line shall be discarded and the pump re-primed at the Contractor's expense.

The pump operator shall have a valid operator's certification from the American Concrete Pumping Association. Boom pumps shall have a current Concrete Pump Manufacturers Association's CPMA27-2000 certification. Equipment added to the pump shall meet the pump manufacturer's specifications. The Contractor shall submit the specifications of the pumping equipment and the qualifications of the operator to the Engineer for review at least two weeks prior to pumping concrete. Equipment and operators rejected by the Engineer shall be replaced at the Contractor's expense.

The pump shall be operated so that a continuous stream of concrete is produced. The pump equipment shall use a minimum of one of the following to maintain concrete uniformity:

- (1) A 360 degree loop immediately prior to the delivery end of the pump line.
- (2) A minimum one inch reducer installed at the entry to the delivery hose.
- (3) A minimum one inch reducing delivery hose.
- (4) A cable attached to the pump boom creating a minimum 90 degree bend in the steel braded flexible hose. The point of discharge from the flexible hose at the end of the boom shall be at or above the lowest point of the bend.
- (5) On horizontal pours a 10-foot minimum horizontal delivery system placed on the deck.
- (6) Other approved methods.

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Metal pump lines or couplings shall not rest directly on epoxy coated reinforcing steel.

The point of discharge of the pump shall be as close to the bridge deck elevation as possible.

Subsection 601.17 shall include the following:

The Contractor shall sample 601 pay items for both QC and QA in accordance with CP 61. The Engineer will witness the sampling and take possession of the QA samples at a mutually agreed upon location.

Delete subsection 601.17(a) and replace with the following:

(a) *Air Content.* The first three batches at the beginning of production shall be tested by QC and QA for air content. When air content is below the specified limit, it may be adjusted in accordance with subsection 601.08. Successive batches shall be tested by QC and witnessed by the Engineer until three consecutive batches are within specified limits. After the first three batches, CDOT will follow the random minimum testing schedule. Air content shall not be adjusted after a QA test.

At any time during the placement of the concrete, when a QA test on a batch deviates from the minimum or maximum percent of total air content specified, the following procedure will be used to analyze the acceptability of the concrete.

1. A batch that deviates from the specified air content by more than 1 percent and all Class D, DT, HT and H concrete placed in bridge decks with air content exceeding 8 percent will be rejected. Portions of loads incorporated into structures prior to determining test results which indicate rejection as the correct course of action shall be subject to acceptance at reduced price, no payment, or removal as determined by the Engineer.
2. A batch that deviates from the specified air content by 1 percent or less may be accepted at a reduced price using Table 601-3.