

FIELD SAMPLING AND TESTING MANUAL

SECTION 600

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Section 602

CONCRETE STRUCTURES

602.01 DESCRIPTION.

This work consists of the construction of bridges, cast-in-place box culverts, retaining walls, or portions thereof as shown on the Plans.

602.02 REQUIRED TESTS AND FREQUENCY.

A. Acceptance Samples and Tests--Field Laboratory Testing. Perform one moisture test on the aggregate before the first pour each day (see Section 816.04 of this manual for procedure).

Perform one slump and one air test the first load each day (see Sections 802.03 A and 802.03 B. of this manual for procedure). After the initial load, perform air, slump, and yield tests each time a set of compression test cylinders are cast.

Cast compression test cylinders as indicated in Table 1 (see Section 802.03 E. of this manual for casting procedure). The engineer/manager decides when to cast cylinders. Perform sieve analysis tests as directed by the project engineer/manager with a minimum of two tests per project (see Section 816.04 of this manual for test procedures).

Perform sieve analysis tests (see Section 816.04 of this manual for test procedures) on both the coarse and fine aggregate at the following frequencies: three tests for the first 250 cubic yards (C.Y.) of concrete, two tests for the next 250 C.Y., and one test for each 250 C.Y. thereafter. If aggregate sources change, the testing frequency reverts back to the initial frequency of three tests for the first 250 C.Y. of concrete, two tests for the next 250 C.Y., and one test for each 250 C.Y. thereafter. Perform a minimum of two tests per project. Perform additional sieve analysis tests as directed by the project engineer/manager.

Perform aggregate sampling according to Section 816.01 of this manual.

Submit a minimum of one random sample of cement per project to the Materials and Research Division (see Section 804.02 of this manual for procedure).

B. Independent Assurance Samples and Tests.

- 1. District Laboratory Testing.** The District Materials Coordinator or a designated representative must obtain these samples and conduct these tests. Perform Independent assurance tests with equipment other than that used by the project personnel.

Obtain one sieve analysis and physical properties sample of both coarse and fine aggregate for the first 250 C.Y. of concrete and one sample for each 500 C.Y. thereafter (see Sections 816.01 and 816.04 of this manual for procedure). Obtain a minimum of one sample per project.

An alternative testing procedure for testing shale content of coarse and fine aggregate may be used when the pit from which the aggregate samples are obtained has at least a ten-year history of no prior test results which exceed 50% of the specification limit.

If this criteria is met, perform an initial shale test at the beginning of the construction season with three more random tests performed during the remainder of the construction season. If any shale test exceeds 50% of the specification limit or a new portion of the pit is utilized, revert testing to the frequency mentioned previously. The Department requires Materials Coordinators to keep a file on pits utilizing this testing procedure. Document the testing performed each year in the file.

Record the results of air, slump, 28-day cylinder and yield tests on SFN 10069 (see Section 802.03 of this manual for procedure). The frequency for air, slump, and yield tests is one test for every five field tests with a minimum of one test per project. Cast one set of 28-day cylinders for each 250 C.Y. of concrete with a minimum of one set per project. Additionally, perform a minimum of one set of tests per bridge deck.

- 2. Materials and Research Division Testing.** Submit one sample from every source of water used. If the water is known to be of potable quality, it may be used without testing.

Submit one sample of both coarse and fine aggregate per project.

- C. Miscellaneous Testing.** Cast one set of seven-day cylinders from the first pour of a plant setup for each mix design. In addition to the following cylinder frequency for each pour, cast additional cylinders from the last deck pour for determining when the deck can be opened to traffic.

TABLE 1	
Cubic Yards of Concrete	Number of 28-Day Cylinder Sets
0-25	1
26-50	2
51-75	3
76-100	4
101-150	5
151-200	6
201-250	7

Contact the Materials and Research Division for cylinder requirements on pours exceeding 250 C.Y.

There are a number of situations where small amounts of concrete are required for specification compliance, e.g., apron of a pipe. There is no particular requirement covering the sampling and testing in these situations. Therefore, the requirement is that the engineer/manager notify the District Laboratory to confirm that the materials used are approved materials tested in other phases of the work.

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Section 650

REPAIR AND OVERLAY OF PORTLAND CEMENT CONCRETE BRIDGE DECKS WITH LOW SLUMP CONCRETE OR LATEX-MODIFIED CONCRETE.

650.01 DESCRIPTION.

This work consists of removing unsound concrete or chloride contaminated sound concrete with mechanical or hydro-demolition equipment and replacing and resurfacing the bridge deck with low-slump concrete or latex-modified concrete.

650.02 REQUIRED TESTS AND FREQUENCY.

A. Acceptance Samples and Tests--Field Laboratory Testing. Perform one moisture test on the coarse and fine aggregate before the first pour of the day (see Section 816.04 of this manual for procedure).

Obtain one sieve analysis sample of each coarse and fine aggregate per 75 C.Y. of concrete.

Perform one slump, air, and yield test from the first load each day (see Sections 802.03 A., 802.03 B., and 802.03 C. of this manual for procedure). After the initial load, perform two air, slump, and yield tests per day. Cast one set of each seven- and 28-day compression test cylinders per lane or per 500 S.Y. of overlay, whichever is less (see Section 802.03 E. of this manual for procedure). A set is defined as two cylinders. Cast these cylinders from concrete placed at approximately the 1/3 and the 2/3 points of the placement area.

Submit one random sample of cement per project to the Materials and Research Division (see Section 804.02 of this manual for procedure).

For latex modified concrete, the latex modifier is accepted by certification.

B. Independent Assurance Samples and Tests.

1. District Laboratory Testing. The District Materials Coordinator or a designated representative must obtain these samples and conduct these tests.

Submit one sieve analysis and physical properties sample of both coarse and fine aggregate for every 1,000 S.Y. of overlay.

Perform Independent Assurance tests with equipment other than that used by project personnel. Record the results of air, slump, and yield tests on SFN 10069. The frequency for the Independent Assurance tests is one air, slump, and yield test per deck overlay.

- 2. Materials and Research Division Testing.** Submit one sample of both coarse and fine aggregate per project.