



**Florida Method of Test for
STATIC SEGREGATION OF HARDENED
SELF-CONSOLIDATING CONCRETE
(SCC) CYLINDERS**

Designation: FM 5-615

1. SCOPE

- 1.1. This method covers procedures for determining the static segregation resistance (stability) of self-consolidating concrete (SCC) using hardened test specimens.
- 1.2. The concrete used to make the molded specimens shall be sampled after all on-site adjustments have been made to the mixture proportions, including the addition of mix water and admixtures.
- 1.3. The text of this method references notes and footnotes that provide explanatory information. Notes and footnotes (excluding those in tables and figures) shall not be considered as requirements for this method.
- 1.4. The values stated in SI units are to be regarded as the method.
- 1.5. This method does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. REFERENCED DOCUMENTS

- 2.1. AASHTO Standards:
 - M 205 Molds for Forming Concrete Test Cylinders Vertically
 - R 60 Sampling Freshly Mixed Concrete
 - T 22 Compressive Strength of Cylindrical Concrete Specimens
 - T 24 Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
- 2.2. ASTM Standards:
 - C 470 Molds for Forming Concrete Test Cylinders Vertically
 - C 172 Sampling Freshly Mixed Concrete
 - C 39 Compressive Strength of Cylindrical Concrete Specimens
 - C 42 Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

3. SIGNIFICANCE AND USE

- 3.1. This method provides a visual assessment of static segregation resistance of SCC using a Hardened Visual Stability Index (HVSI) to evaluate molded or cored hardened concrete cylinders cut lengthwise in two.
- 3.2. If the specimens are made and cured as specified herein, the resulting static



segregation test data are able to be used for the following purposes:

- 3.2.1. Acceptance testing for specified static segregation limits;
- 3.2.2. Checking the adequacy of mixture proportions to resist static segregation and Quality control.

4. APPARATUS

- 4.1. Molds, Cylinder—150-by-300-mm (6-by-12-in.) cylinder molds.
- 4.2. Small Tools—Handheld wood or metal float or trowel.
- 4.3. Saw - The saw shall have a diamond or silicon-carbide cutting edge and shall be capable of cutting specimens without excessive heating or shock.
- 4.4. Core Drill - for obtaining cylindrical core specimens with diamond impregnated bits attached to a core barrel.
- 4.5. A suitable container for filling specimen molds with SCC.

Note 1: Experience has shown pails and plastic cylinder molds to be suitable containers.

5. SAMPLING CONCRETE

- 5.1. Samples of freshly mixed SCC used to fabricate test specimens under this test method shall be obtained in accordance with ASTM C 172.
- 5.2. Cored test specimens taken from hardened self-consolidating concrete shall be obtained in accordance with ASTM C 42, except for the following:
 - 5.2.1. Cored test specimens may be taken so that the axis is perpendicular or parallel to the concrete as it was originally placed.
 - 5.2.2. Cored test specimens shall have a minimum diameter of 50 mm (2 in.) and sufficient length to assess extent of static segregation resistance.
- 5.3. Record the identification of the test specimens with respect to the location of the concrete represented and the time of casting.

6. MOLDING AND CURING SPECIMENS OF FRESHLY MIXED SCC

- 6.1. Making Specimens:
 - 6.1.1. A minimum of two fresh test specimens shall be molded as near as practicable to the place where they are to be stored. If it is not practicable to mold the specimens where they will be stored, move them to the place of storage immediately after strike off. Place molds on a rigid surface free from vibration and



other disturbances. The supporting surface shall be level to within 20 mm/m (0.25 in. /ft.).

6.1.2. Specimen molds shall be filled in one lift, without vibration, rodding, or tapping.

6.1.3. Strike off the surface of the concrete level with the top of the mold using a float or trowel.

6.2. Curing:

6.2.1. Immediately after molding and finishing, the specimens shall be capped with a plastic cylinder lid and stored for a period up to 24 h at a minimum temperature of 16°C (60°F).

7. PROCEDURE

7.1. Before subjecting the specimens to sawing, they either shall have a minimum curing period of 24 h or shall attain a minimum compressive strength of 900 PSI (6200 kPa) according to ASTM C 39.

7.2. Specimens shall be sawn lengthwise down the center. If a specimen cannot be satisfactorily sawed smooth for lack of curing, then the remaining specimen(s) shall remain undisturbed for an additional minimum curing period of 24 h before being subjected to sawing.

7.3. Make a visual assessment of the cut planes of the hardened concrete cylinder or core using the criteria in Table 1 and illustrated in Figures 1 through 8. The cut planes shall be wetted to facilitate visual inspection. For cores taken perpendicular to the concrete as it was originally placed, the “top” and “bottom” of the cut plane shall be oriented parallel to the direction of placement.

Table 1—Hardened Visual Stability Index (HVSI)

- | | | |
|----|------------|---|
| 0, | stable - | No mortar layer at the top of the cut plane and/or no variance in size and percent area of coarse aggregate distribution from top to bottom. |
| 1, | stable - | Slight mortar layer, less than or equal to 6 mm (1/4 in.) tall, at the top of the cut plane and/or slight variance in size and percent area of coarse aggregate distribution from top to bottom. |
| 2, | unstable - | Mortar layer, less than or equal to 25 mm (1 in.) and greater than 6mm (1/4 in.) tall, at the top of the cut plane and/or moderate variance in size and percent area of coarse aggregate distribution from top to bottom. |
| 3, | unstable - | Clearly segregated as evidenced by a mortar layer greater than 25 mm (1 in.) tall and/or considerable variance in size and percent area of coarse aggregate distribution from top to bottom. |



8. REPORT

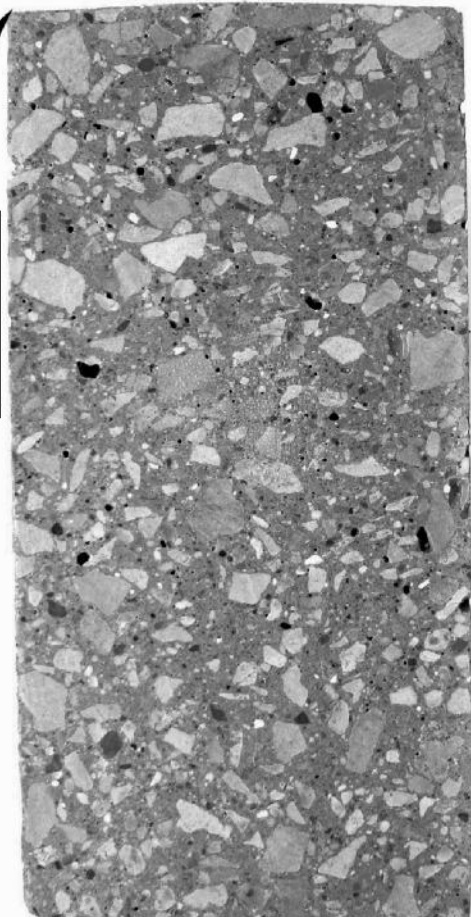
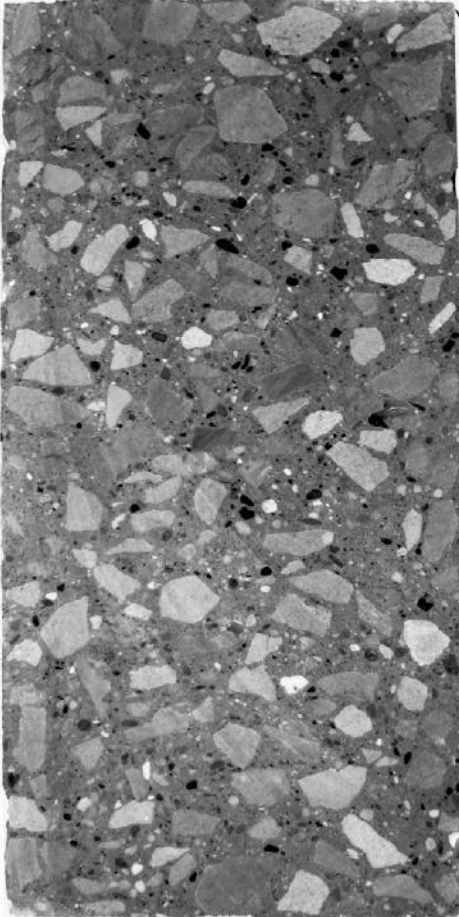
8.1. *Report the following information:*

- 8.1.1. Identification number;
- 8.1.2. Location of concrete represented;
- 8.1.3. Date and time of molding;
- 8.1.4. HVSI for each hardened specimen; and
- 8.1.5. Results of any other tests on the fresh concrete and any deviations from the standard test methods.

**Single Coarse Aggregate Mixture
Aggregate**

Uniformly Graded Coarse

Mixture

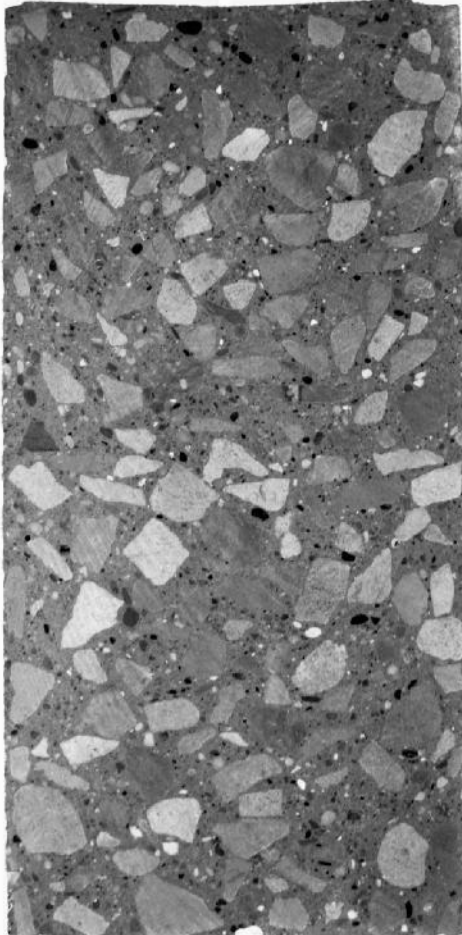


No mortar layer,
Uniform distribution
of coarse aggregate
from top to bottom

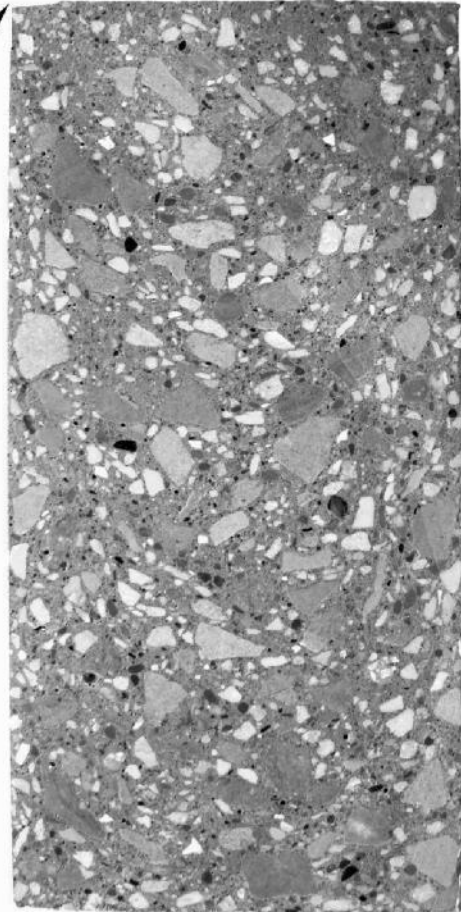
Figure 1—HVSI = 0, Stable

Figure 2—HVSI = 0, Stable

Single Coarse Aggregate Mixture



Uniformly Graded Coarse Aggregate Mixture



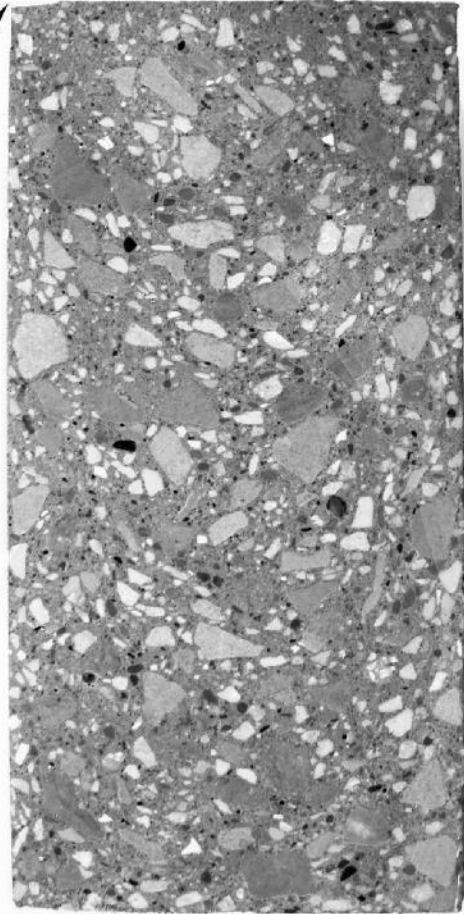
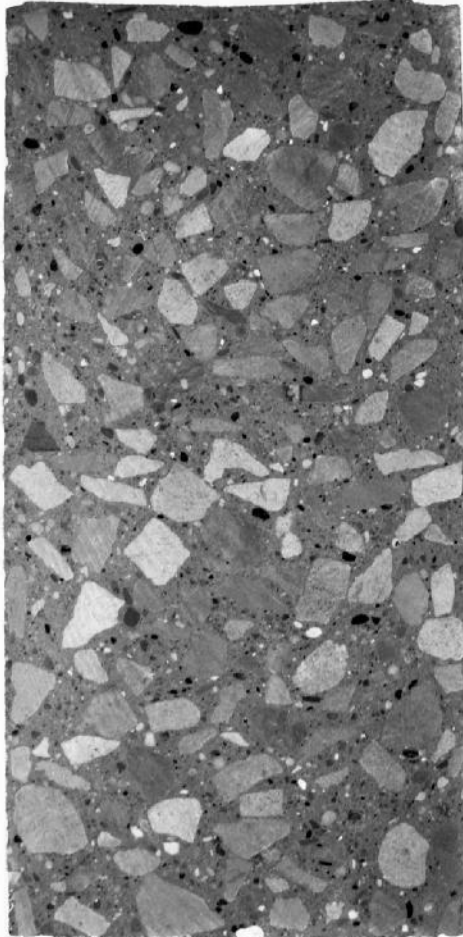
Slight mortar layer,
 ≤ 6 mm, ($\frac{1}{4}$ in.), and
slight variance of
coarse aggregate
distribution from top
to bottom

Figure 3—HVSI = 1, Stable

Figure 4—HVSI = 1, Stable

Single Coarse Aggregate Mixture

Uniformly Graded Coarse Aggregate Mixture



Moderate mortar layer,
>¼ in., (6 mm) and
≤1 in , (25 mm.)
Moderate variance
of
coarse aggregate
distribution from top

Figure 5—HVSI = 2, Unstable

Figure 6—HVSI = 2, Unstable

**Single Coarse Aggregate Mixture
Aggregate**

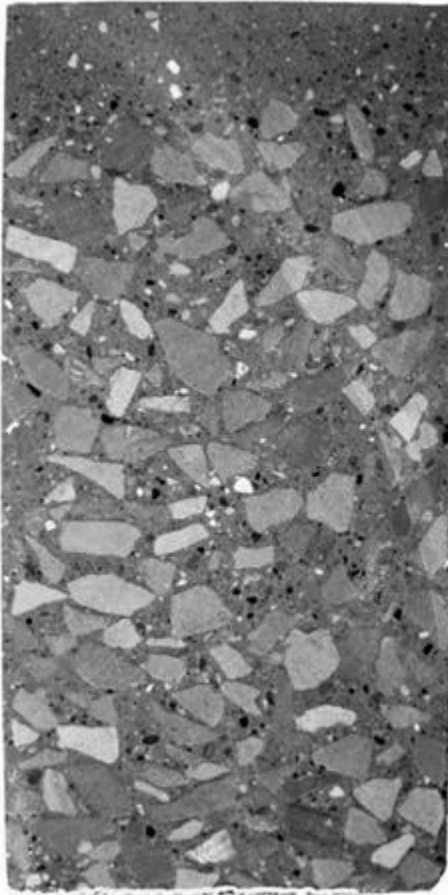


Figure 7—HVSI = 3, Unstable
Unstable

**Uniformly Graded Coarse
Mixture**

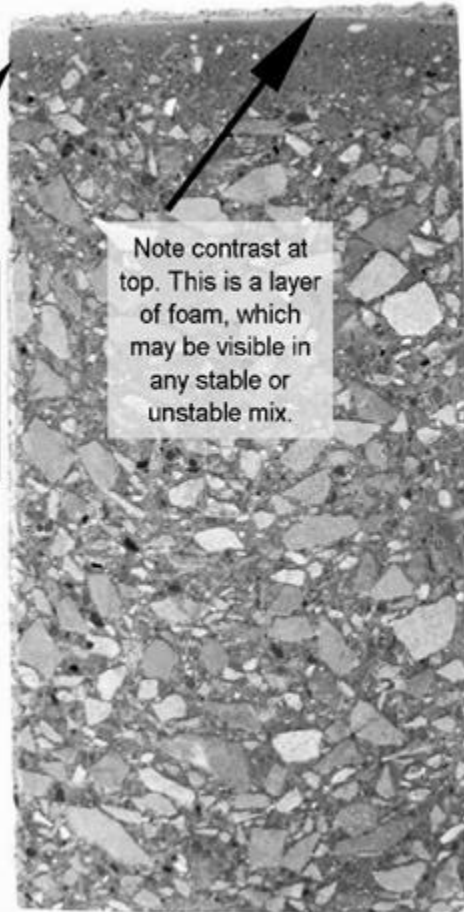


Figure 8—HVSI = 3,