

Method of Test for Slump Flow and Visual Stability Index of Self-Consolidating Concrete

1. Scope:

The test is for determining the slump flow and visual stability index (VSI) of self-consolidating concrete (SCC).

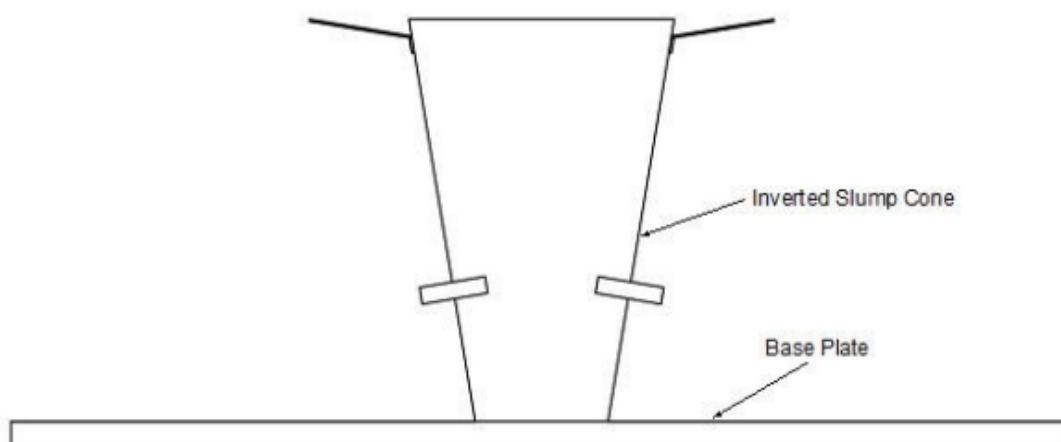
2. Apparatus:

- 2.1 Slump Cone Mold conforming to AASHTO T 119.
- 2.2 Base plate of stiff non-absorbing material, at least 32 inches square and marked with both a circle indicating the central location for the slump cone and a concentric circle with a diameter of 20 inches.
- 2.3 Strike-off Bar - A flat straight bar of steel at least 1/8 in. thick and 3/4 in. wide by 12 in. long.
- 2.4 Measuring tape capable of measuring to 1/4".
- 2.5 Scoop or shovel.

3. Procedure:

- 3.1 Obtain a sample of fresh concrete in accordance with SD 402.
- 3.2 Dampen the inside of the mold and the base plate just prior to use.
- 3.3 Place the base plate on a level, stable surface.
- 3.4 Invert the mold and place it in the center of the base plate (Figure 1). Hold firmly in place.

Figure 1- Mold (Inverted) and Base Plate



- 3.5 Using a shovel or hand scoop, fill the mold in one lift without vibrating, rodding, or tamping.
- 3.6 Use the strike-off bar to strike off the SCC level with the top of cone.
- 3.7 Remove any concrete from around the base of the cone.
- 3.8 Raise the cone in a vertical direction 9 in. $3 \pm$ above the base plate with no lateral or torsional motion within 3 ± 1 seconds.

Complete the entire test from the start of the filling through removal of the mold without interruption within an elapsed time of 2 1/2 minutes.

- 3.9 After the concrete flow has stopped, measure the diameter in two directions, the largest diameter (d_1) and the diameter perpendicular to the largest diameter (d_2), to the nearest 1/4". Include any border without coarse aggregate or a bleed water 'halo' in the diameter measurement. the slump flow diameter. The average of the two measurements will be the slump flow.

If the diameter of the two measurements differs by more than 2 inches, the test will be considered invalid and must be repeated.

$$\text{Slump Flow} = (d_1 + d_2) / 2$$

- 3.10 By visual examination, rate the visual stability index (VSI) of the SCC using the criteria in Table 1 and the illustrations in Figures 2 thru 8.

Table 1
Criteria of Visual Stability Index

Rating	Criteria
0	No evidence of segregation in slump flow patty or mixer drum or wheelbarrow
1	No border of mortar without coarse aggregate in the slump flow patty, but some slight bleed or air popping on the surface of the concrete in the mixer drum or wheelbarrow.
2	A slight border of mortar without coarse aggregate (<10 mm (3/8 in.)) or aggregate pile in the slump flow patty, or both, and highly noticeable bleeding in the mixer drum or wheelbarrow.
3	Clearly segregating by evidence of a large border of mortar without coarse aggregate (>10 mm (3/8 in.)) or large aggregate pile in the center, or both, of the slump flow patty and a thick layer of paste on the surface of the resting concrete in the mixer drum or wheelbarrow.

Figure 2
Visual Index = 0

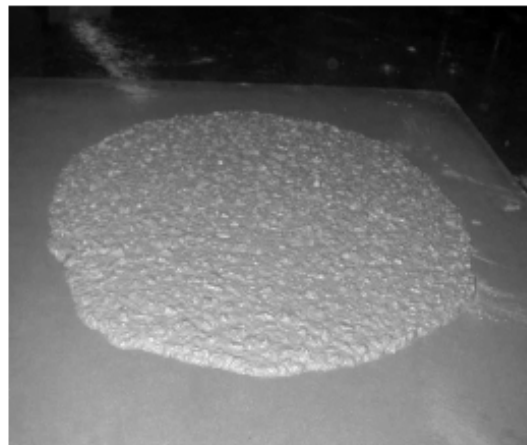
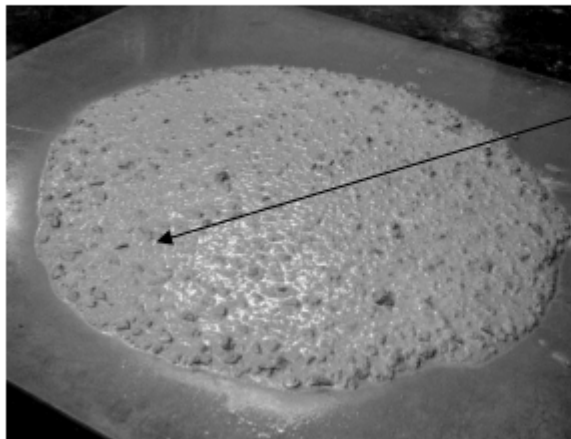


Figure 3
Visual Stability Index = 1



Some slight
bleed or air
popping on
the surface

Figure 4
Visual Stability Index = 1



Some slight
bleed or air
popping on
the surface

Figure 5
Visual Stability Index = 2



Border of
mortar without
coarse
aggregate and
bleeding

Figure 6
Visual Stability Index = 2

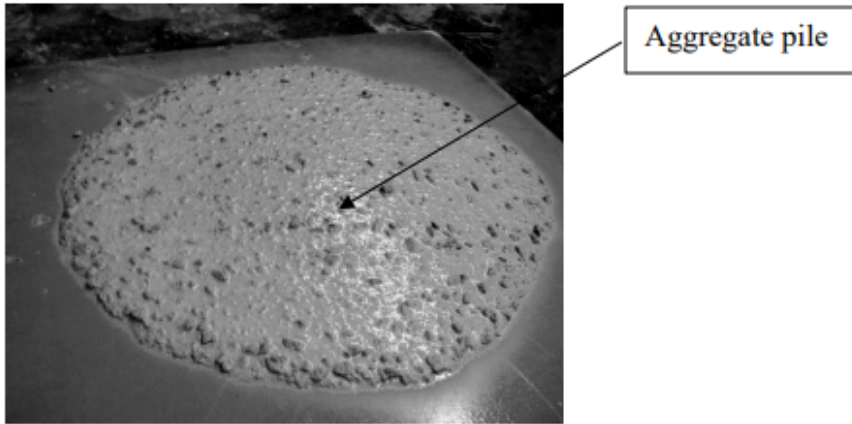


Figure 7
Visual Stability Index = 3

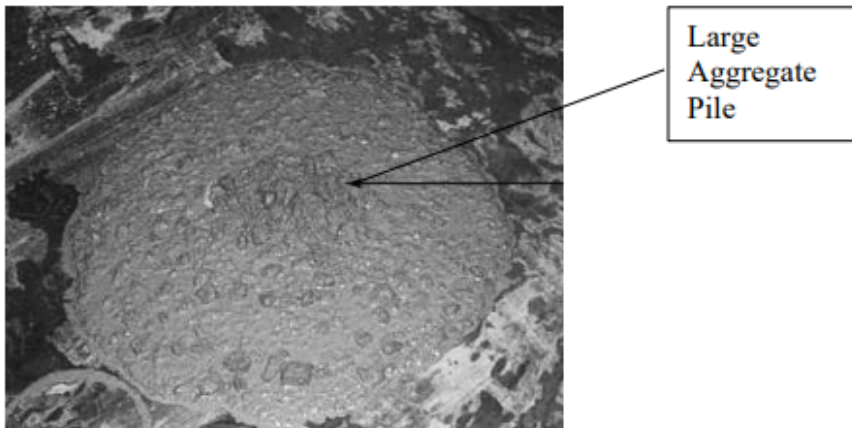
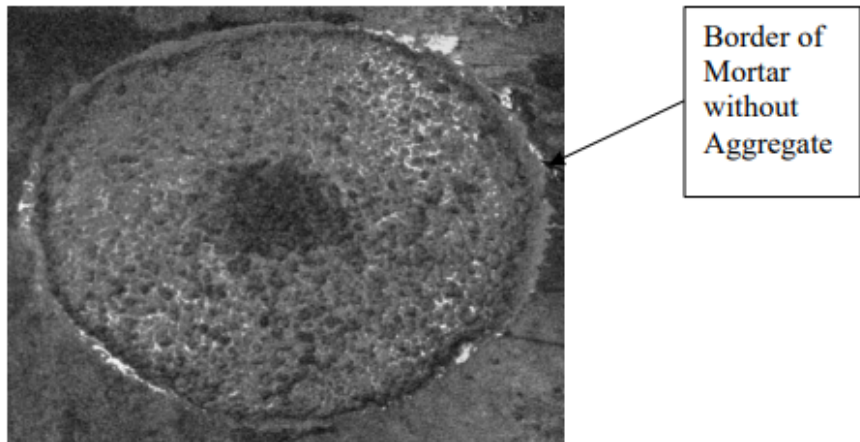


Figure 8
Visual Stability Index = 3



4. Report:

Report the slump flow to the nearest 1/4" and the VSI rating on a DOT-23.

5. References:

AASHTO T 119
SD 402
DOT-23