

State of Nevada
Department of Transportation
Materials Division

**METHOD OF TEST FOR PASSING ABILITY OF HYDRAULIC-CEMENT
SELF-CONSOLIDATING CONCRETE BY J-RING AND SLUMP CONE**

SCOPE

This test method covers the determination of the flow-ability and stability of fresh hydraulic-cement self-consolidating concrete using the j-ring and slump cone. The diameter of the unobstructed slump flow versus the obstructed slump flow passing through the j-ring, is a measure of the j-ring value and the passing ability rating of self-consolidating concrete (SCC).

APPARATUS

1. J-Ring, with smooth bars (See Figure 1).
2. Slump cone mold and tamping rod, shall conform to Test Method Nev. T438.
3. Base plate, smooth, rigid, nonabsorbent sealed or laminated plywood, rigid plastic or steel, and be at least 914 mm (36 in.) in diameter.
4. Trowel and hand scoop.
5. Measuring tape, have a minimum graduation of 10 mm (0.5 in.).

SAMPLING

Sampling shall be performed in accordance with Test Method Nev. T416.

PROCEDURE

1. Place the base plate on level, stable ground. Dampen the j-ring, slump cone mold and base plate. Wipe away any excess water with a moist cloth or damp sponge.
2. Center the j-ring on the base plate. The slump cone mold shall be centered within the j-ring with the smaller diameter opening facing down (See Figure 2).
3. Using a hand scoop, fill the slump cone mold in one lift without vibrating, rodding or tamping.

4. Strike off the surface of the concrete, level with the top of the slump cone mold using a trowel or by means of a screeding or rolling motion using a tamping rod. Remove excess concrete from around the base of the slump cone mold and base plate.
5. Raise the slump cone mold in a vertical direction, making sure the mold clears the j-ring in 3 ± 1 second without any lateral or torsional motion. Complete the test procedure from filling the slump cone mold to removal of the slump cone mold, without any interruption, and within 2.5 minutes.

When the concrete has stopped flowing, with the j-ring still in place measure the maximum diameter of the resulting obstructed slump flow and then measure the diameter perpendicular to the maximum diameter. If the difference between the two obstructed slump flow diameters is more than 50 mm (2 in.), the test is invalid. Check to make sure the base plate is level and flat, and run the test again ensuring that the slump cone is raised in a vertical direction within 3 ± 1 seconds.

CALCULATIONS

1. Calculate the average of the two measured diameters. This is the j-ring flow.

Example: $560 \text{ mm (22 in.)} + 530 \text{ mm (21 in.)} = 1090 \text{ mm (43 in.)}$
 $1090 \text{ mm (43 in.)} / 2 = 546 \text{ mm (21.5 in.)} = 550 \text{ mm (21.5 in.) j-ring flow}$

2. Calculate the difference between the unobstructed slump flow (determined per Test Method Nev. T417) and the j-ring flow, of the same representative sample. This is the j-ring value. Rate the Passing Ability of SCC using the criteria in Table 1.

Example: $535 \text{ mm (21 in.) unobstructed slump flow} - 510 \text{ mm (20 in.) j-ring flow} = 25 \text{ mm (1 in.) j-ring value}$

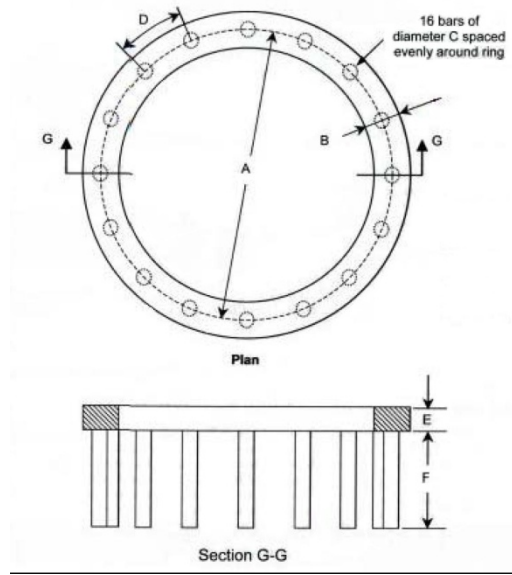
Table 1 - Passing Ability Rating

<u>J-Ring Value</u>	<u>Passing Ability Rating</u>	<u>Remarks</u>
0 to 25 mm (0 to 1 in.)	0	High passing ability
> 25 to 50 mm (> 1 to 2 in.)	1	Moderate passing ability
> 50 mm (> 2 in.)	2	Low passing ability

Example: $25 \text{ mm (1 in.) j-ring value} = 0 \text{ (Passing Ability Rating)} = \text{High Passing Ability}$

REPORT

1. Report the j-ring flow and j-ring value to the nearest 10 mm (0.5 in.).
2. Report the j-ring flow value and corresponding passing ability rating on NDOT form 040-056.



<u>Dimension</u>	<u>mm</u>	<u>in.</u>
A	300 ± 3.3	12.0 ± 0.13
B	38 ± 1.5	1.5 ± 0.06
C	16 ± 3.3	0.625 ± 0.13
D	58.9 ± 1.5	2.36 ± 0.06
E	25 ± 1.5	1.0 ± 0.06
F	100 ± 1.5	4.0 ± 0.06

Figure 1. J-Ring

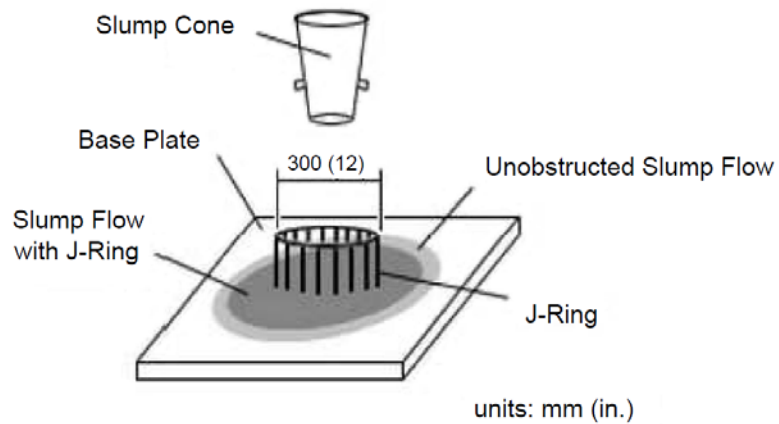


Figure 2. J-Ring Test