Concrete Atlantic béton Atlantique

Concrete Tech-Tip #25

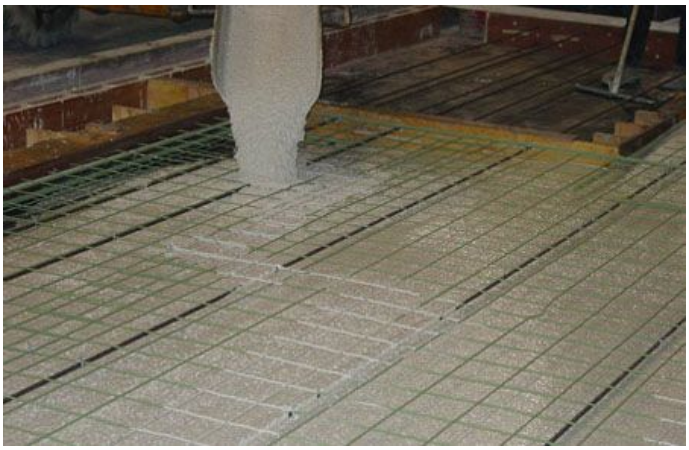
Curling Self-Consolidated Concrete (SCC)

What is Self-Consolidated Concrete (SCC)?

Self Consolidated Concrete (SCC) is a highly flowable concrete that spreads under its own weight and fully consolidates without the need for mechanical vibration. It is designed to flow easily through congested reinforcement and complex formwork while maintaining uniformity and stability.

Key Characteristics

- High flowability allowing complete filling of forms
- Passing ability to move through closely spaced reinforcing steel
- Stability to resist segregation and bleeding
- Smooth surface finish with reduced bugholes



Placement of SCC

Typical Applications

SCC is commonly used in heavily reinforced structural elements, architectural concrete, precast members, and repairs, where access for vibration is limited. It is also beneficial where improved surface finish, and reduced noise from vibration, are desired.

SCC is also commonly used in precast applications.

Quality Control Considerations

Fresh concrete testing for self-consolidating concrete (SCC) differs from conventional concrete. Common tests include the slump-flow test to assess filling ability, the L-box or J-ring to evaluate passing ability, and visual stability assessments to check for segregation. These tests should be conducted in accordance with CSA A23.1:24 Table 22, which provides guidance on the recommended test methods and acceptance criteria for SCC. Proper testing is essential to ensure that field performance aligns with design intent.

It is recommended that any testing agency performing quality control on SCC be certified for SCC testing, as its properties and test procedures differ from conventional concrete.

Benefits and Cautions

SCC can improve placement quality, reduce labor, and speed construction. However, it requires careful mix design, batching, and placement practices. Formwork must be tight, and capable of resisting higher lateral pressures, and placement rates should be controlled.

When properly designed and placed, Self Consolidated Concrete can significantly improve constructability and finished quality, while maintaining long term performance and durability.

References

1. CSA A23.1 A23.2 2024. Concrete materials and methods of concrete construction Test methods and standard practices for concrete. CSA Group

2. Design and Control of Concrete Mixtures. 9th Edition. Cement Association of Canada