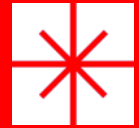


Problem Advisory: Bleed Water Void Delaminations



The Concrete Floor Contractors Association of Canada represents the concrete finishing industry.

Technical Bulletins are designed to provide state of the art information to owners, specifiers and contractors to both improve quality and reduce problems.

We hope that this information will assist you in this goal.

If you have any questions, or comments, please feel free to contact us at 905-582-9825 or by e-mail at info@concretefloors.ca

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Background

Over the past 5 years there have been increasing reports of surface delaminations in new concrete floors across Canada. The issue seems to be related to the entrapment of excess bleed water within the cement paste which in sufficient quantity can lead to the development of surface delaminations.



These delaminations become apparent within the first few weeks after slab placement, are approximately 10-20 mm in depth and vary from 600 mm in size to full bays. These problems seem to relate to a combination of:

- High water / low hydraulic cement content concrete mixes.
- Fine cement paste mixes (high SCM cement replacement or low sand FM).
- Slow set / cold weather conditions (<10°C).
- Polycarboxylate mid range plasticizers (old type air entraining).

While the textbook answer to entrapped bleed water also includes “early finishing”, this problem does not seem to be related to the methods of construction. In accordance with ACI Concrete Flatwork Finisher Certification Manual, the standard procedure for the commencement of concrete finishing occurs “...when the bleed water sheen is gone, and a finisher can walk on the slab, leaving only about a ¼” indentation”. Accordingly, It is impossible for a cement finisher to know if the concrete mix is entrapping bleed water voids at the time of finishing. Furthermore, successful concrete floor installations, finished by the same concrete floor contractor, using the same methodology, are constructed before, during and after these types of failures without the development of delaminations.

Recommendations:

It is essential that the concrete mix be discussed very carefully at the Pre-construction meeting. In accordance with CSA A23.1-09 Concrete “Mix proportions shall be selected to provide workable concrete consistent with the placement and finishing requirements”. Concrete and granular bases shall be maintained at $\geq 10^{\circ}\text{C}$ throughout the placing and curing period.

Concrete mixes with low cement contents, high water content, incorporating high SCM cement replacement, pozzolan type SCM's, and/or fine sand should be carefully scrutinized for use in concrete floor construction.

Concrete supplied by others shall conform to the Position Statement on Concrete Purchasing.

Further References:

- [CFCA Technical Library & Bulletins](#)

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