

Dear Friends,

The onset of summer and the end of winter will be accompanied by several changes in the nature of construction. Adapting to those changes, necessary precaution and care will be taken, as per seasonal demands.

In this issue, we shall continue providing our inputs towards smart home building practices and other construction related information. Also with respect to our previous issue's discussion, on shrinking concrete, we shall present a write up on plastic settlement cracks and how effective fiber can be for shrinking concrete.

We hope you have a good read and find the required solutions to your queries. We also request you to continue sending your valuable feedback and suggestions for our further improvement. We sincerely extend our gratitude to our readers who have previously advised us and given their individual suggestions, helping us enrich our existing knowledge.

Happy reading, keep well, keep safe.

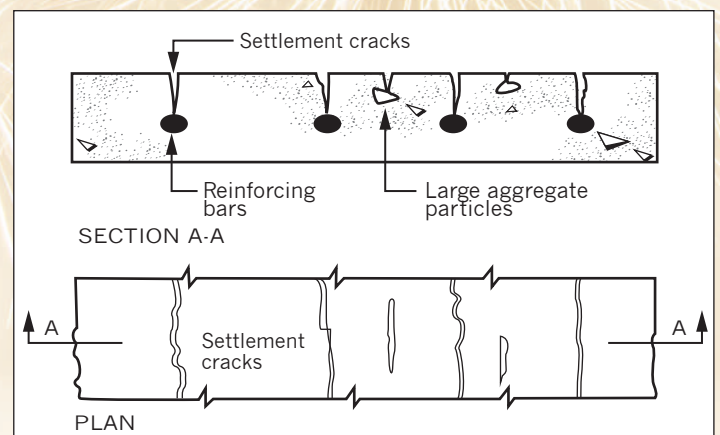
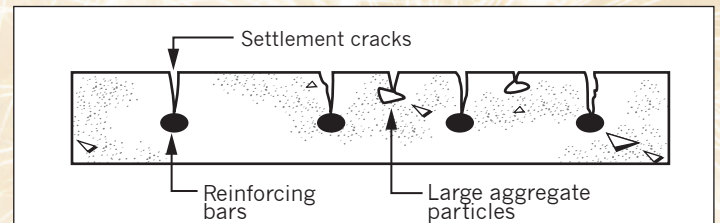
Plastic Settlement Crack

When does it form?

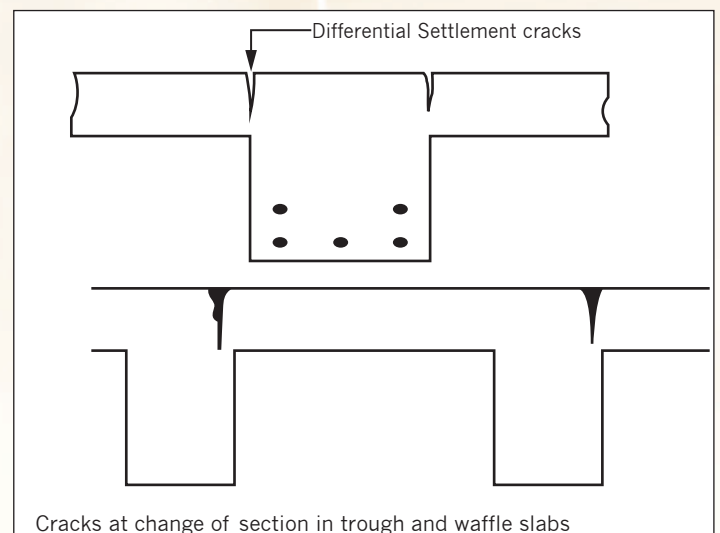
When the concrete is in the plastic state, due to the bleeding, the aggregate settles and cement water rises up. If there are no restraining elements, things go as expected and the concrete surface slightly lowers down. But if a portion is restrained by a reinforcement bar or a larger aggregate, while the adjacent concrete is settling, then there is a scope of crack formation above the restraining points. These can be distinguished from plastic shrinkage cracks by its patterns which mirror the restraining elements.

Causes: The primary cause is excessive bleeding i.e. the solid settles down and mixed water rises up to the surface. If there is no restraint, then it merely results in slight lowering of the surface. However, if the concrete while settling, is locally restrained by elements like rebar, it develops over the surface causing cracks.

Time of Appearance: At the early stage when the concrete is still in its plastic form. Usually ranging from 10 mins to 3 hours.



Type 1: Cracks over reinforcement in deep sections.



Cracks at change of section in trough and waffle slabs

Type 2: Cracks at change of section in trough and waffle slabs

How do fibers work in the plastic stage of concrete?

In the initial stages, the change in volume of concrete weakens surfaces and results in the formation of cracks. This is because the stress developed in the concrete body exceeds its tensile strength at that particular time.

The growth of these micro shrinkage cracks is inhibited by the mechanical blocking action of both synthetic and steel fibers. The internal support system of the fibers inhibits the formation of plastic

settlement cracks. The uniform distribution of fibers throughout the concrete discourages the development of large capillaries, caused by bleeding water which migrates to the surface.

Fibers, thus **lower the permeability** of concrete through display of its combined characteristics of plastic crack reduction and reduced bleeding thereby making the structures stronger and durable.



Construction up to plinth and other important points

After construction of the foundation, plinth beams and the first column lifts, so it is always advisable to complete the back fill up to the plinth level. These are basically due to the following reasons-

- Gives a better organized and cleaner site.
- Allows ample time for the back fill to get well consolidated alongside the progress of the superstructure.
- Provides utility space for material storage and other activities.

It is required to give special attention while constructing the subsoil structures, foundation, footing, etc. to prevent the damaging effects of the ground water/moisture. These are the building components which remains

exposed to water/moisture 24x7 for 365 days. Any weakness in these components may promote capillary water to ingress and create problems thereof – starting from rusting in the bars, dampness, oozing of floors, to saltpetre action on brick works resulting in lower service life of the structure. Also once caused, most of these are irreparable. Therefore, special care needs to be taken on all aspects related to qualitative material selection and undertaking right construction practices. It can be better understood from its close resemblance to the English proverb – “A stitch in time, saves nine”.



Corporate & Registered Office: Nuvoco Vistas Corp. Ltd.

Equinox Business Park, Tower-3, East Wing, 4th floor, LBS Road, Kurla-West, Mumbai - 400070.

Disclaimer: The information in this newsletter is only indicative. No liability is assumed for any inconsistency and/or deviation.

Write-up contributed by panel of experts from our Construction Development & Innovation Centre, Mumbai.

For technical assistance, do call our Toll Free No.: 1800 345 6666 | Whatsapp 'NUVOCO' to 98300 17272