

Case Study – 2

USING CRF for plastering – Cracks

Site: One of our potential customers in Bangalore was building High Rise building using river sand. Due to non-availability of river sand had to move to Crushed Rock Fines (CRF). More details like name and address are withheld for obvious reasons.

Problem: Internal walls plastered with CRF were having cracks in less than 5 days of curing. Few cracks appeared on the first day before curing started. While curing, above cracks extended and more cracks formed every day.

What is this kind of cracking?

Cracks formed on the first day are due to plastic shrinkage and cracks formed later on are due to drying shrinkage.

How Plastic Shrinkage crack forms?

Rapid evaporation of water from the plaster within 24 hours of the plaster causes plastic shrinkage. When evaporation takes place, water from the inner layers come up to keep the surface wet in a plaster. Curing shall start very early to prevent plastic shrinkage – in less than 24 hrs.

Plastic shrinkage is aggravated by high water-cement ratio, high water content and high powder content. In this case, the CRF is very fine and has high water demand.

How drying shrinkage contributes to cracking?

Depending on the porosity, plaster absorbs water during curing. This water reaches the gel pores inside the plaster. However, due to ambient temperature and wind, all this water dries up very soon, demanding more water for curing. This leads to an alternate wetting and drying of the plaster.



Wall done with CRF, cracked in less than 5 days

The gel pores expand when water is absorbed into them and contract when water is released due to drying. This expansion and contraction of water from the gel pores leads to drying shrinkage. Drying shrinkage is also aggravated by porosity due to high water-cement ratio, high water content and high powder content, alternate wetting and curing conditions.

How RenderCon '5S' addressed the problem?

Understanding the problem: RenderCon team visited the site and concluded that the problem is due to high fines in the CRF. The customer tried with single coat plastering, upon cracking, patched it up with another coat, which also cracked eventually. They were building a big complex, volume of plastering was huge, and availability of river sand is a concern. They had no choice but to continue with CRF, which was leading to cracks in the plaster.

Addressing the problem: We requested the customer for a sample wall, for which he readily agreed. We changed nothing there, except for adding RenderCon '5S'. We have demonstrated the hydrophobicity the next day and waited for 20 days to check for any cracks.

We have a happy customer, who called up and said that the wall was very good. Nice surface finish with no discrepancies on the wall.



Wall with RenderCon 5S after 10-days (picture taken closely to show the finish)