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External plaster for building

J.J. Shah

This is further to my point of view on the same subject in the June' 1999 issue of *The Indian Concrete Journal*. Since then I have had the opportunity to discuss the topic with many experts. The reaction was mixed. My suggestion of using a suitable retarder in the first coat of the external plaster was tried with success by a few. However, there are many doubts.

In India, the use of ready-to-use plaster is just starting in big cities. However, on a majority of the sites, this is at best considered to be a "mason's job", with no control on proportioning, mixing, water-cement ratio, grading, etc.

Requirements

In my opinion, plaster to any building should satisfy the following.

- It should be without any cracks.

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- The first coat of the plaster should have good adhesion to the substrate. This could be achieved with a bond coat. Similarly, the second coat of the plaster should have good adhesion to the first coat.
- The plaster should be impermeable.
- The mortar need not have high strength.

Practical constraints

In these competitive times it is necessary to be economical. Therefore,

- one can not afford to block the scaffolding for additional 7 days which is usually the gap specified between the first coat of the plaster and the second coat
- this practice requires "double" curing; once to the first coat of the plaster and later to the second coat of the plaster. This doubles the requirement of the water

- such practice results in delay.

Considering the requirements (functions) of the plaster and the practical considerations discussed above the following methodology is suggested.

Methodology

Use blended cement: Blended cement with even higher percentage of blending material (say upto 60 percent or so) may prove to be suitable for the plaster work.

Sand: Use well-graded sand with permissible silt content.

Water: Water suitable for construction work should be used.

Proportions : In my earlier point of view the proportion of the first coat of the plaster was specified as 1:3 and the proportion of the second coat of the plaster was specified as 1:4. Now, richer mixes must be specified to achieve impermeable plaster matrix. Presently, the mix specified for the first coat

and that for the second coat is 1:3. The writer strongly feels that we must switch over to leaner mixes but at the same time, control the water-cement ratio with a suitable combination of different admixtures in proper dosages with the objective of having durable plaster.

Free water-cement ratio of 0.4 or less: This is an important aspect of the plaster as this helps in achieving nearly impermeable mortar mix for the plaster. This can be best achieved with the help of a suitable combination of bonding agent, superplasticiser-cum-retarder and air-entraining admixture in proper dosages.

On many sites, finished plaster used to be sponged by cement water. This practice is now discouraged with success.

Use of retarder in the first coat of the plaster: A suitable superplasticiser-cum-retarder with maximum nine hours retardation can be used in the first coat and the second coat can be taken up within nine hours of completion of the first coat before the first coat sets.

For a particular job, the client wanted a retarder with 16 to 24 hours of retardation to avoid over-time on the job. This could not be achieved because with high retardation the mix could not set for days.

If the retarder is used in the first coat of the plaster and that the second coat of the plaster can not be taken up within nine hours –

in certain situations – there is no harm – as this helps in reduction of heat of hydration for the first coat of the plaster. It helps in minimising cracks in the plaster, though the advantage of the good adhesion of the second coat to the first coat is not achieved. Another advantage noticed in the use of superplasticiser-cum-retarder in the mortar mix of the plaster is that the mix can be comfortably used for long hours. Hence the use of retarder in the mortar mix of both the first coat and the second coat is suggested.

Curing

Another important aspect in achieving the desired plaster is curing. It must start within hours of completion of the plaster (say within 2 to 3 hours) – initially by sprinkling water and later by the usual methods – for all the 24 hours of the day for a minimum period of 7 days. This is an area where co-operation of the clients and that of the contractors is essential. Today, this important aspect is totally neglected. In fact the curing starts after a gap of nearly 12 to 15 hours after completion. Further, this is done intermittently. Curing during night-time is something new to the building industry. On the safer side, curing by curing compounds is found best specially for all external faces exposed to sun and wind.

The author requests the technical community to respond – give valuable suggestions/comments to further improve the quality of the plaster to the buildings.

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