

# Coatings Consultants Inc.

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## WATER, WATER EVERYWHERE

By Bob Cusumano

All reputable painting contractors make their best attempt to provide quality work to their customers. However, no matter how careful you are, there are times when disputes will arise and they can be quite costly. In this article there are several lessons that can be learned to protect your assets in these uncomfortable situations.

A Florida painting contractor was the successful bidder on a new apartment complex. The project consisted of 18 two and three story buildings, with the exteriors constructed principally of cement plaster or stucco (photo #1). The project was completed without incident. Within the first year, the owner/developer of the project began receiving complaints from several tenants concerning water intrusion into the apartments. A consulting firm made a site inspection and then the fur started flying. Several subcontractors that had worked on the project were sued, including the painting contractor. The allegations against the painting contractor included defective workmanship resulting in an unacceptable appearance, failure to apply the specified paint coats, thus allowing water infiltration through the stucco walls, and failure to apply caulking to adequately waterproof the buildings. Several hundred thousand dollars in damages was alleged. The painting contractor's insurance company became involved in the case and contacted our firm for consultation.

Upon visiting the project, it was apparent that there indeed had been extensive water intrusion. Many areas of the building had visible indications such as efflorescence, alkali burn and rusting of metal stucco accessories (photo #2).



Photo 1



Photo 2

Efflorescence is the formation of crystalline salt deposits on a surface due to the migration of water through a cementitious substrate like stucco, concrete, or block. The vertical rundown pattern obvious in the photo #3 is typical of this condition. In some instances, this will cause the paint to delaminate, however when the affected paint film is very permeable, or when voids exist in the coating film, then the occurrence of efflorescence does not cause delamination of the paint.

All cementitious materials have alkali present. When moisture migrates through the stucco, the alkali salts concentrate immediately beneath the paint film. This condition results in a degradation of the resin and/or pigment in the paint film and occurs when the paint is in contact with an alkaline substrate. Alkali burn occurs when the resin and/or pigment in the paint degrade and "bleach out". The affected area has a blotchy, mottled appearance (photo #4).



Photo 3



Photo 4

We requested various paperwork on the job including the painting contractor's estimate, the project specifications, and the contract between the owner/developer and the painting contractor. A review of the painting contractor's estimate revealed that pricing was provided for interior and exterior painting as well as exterior perimeter caulking of doors and windows. There was a book of formal specifications for the project with separate division sections addressing painting and caulking. Exterior stucco was scheduled to receive one coat of acrylic primer and two coats of exterior acrylic flat. The contract indicated that the painting contractor would provide interior and exterior painting and related caulking in accordance with the plans and specifications.

A pH survey was conducted on the buildings. It was found that at areas where the paint was mottled and discolored, the stucco immediately beneath the paint was highly alkaline, being in the range of 11 through 13. At other areas where the paint was not discolored, the pH was in the expected range of 8 to 10. This indicates that the discoloration of the paint is indeed due to alkali burn caused by water intrusion, rather than a defect in the paint itself.

The thickness of the exterior paint that had been applied was measured at one hundred locations and compared to the manufacturer's recommendations for the number of coats specified. It was determined that the thickness met or exceeded the range specified.

Next, the tendency for the painted stucco to absorb water was tested. Rilem tubes, clear plastic tubes with graduated volumetric markings, were attached to the buildings using a special putty (photo #5). The Rilem tubes were filled with distilled water and the time of the day was noted. A piece of plastic wrap was placed over each container so that the water could not evaporate nor could water enter by rainfall or from the sprinkler system. The amount of water that had

penetrated from the Rilem tubes into the wall was recorded after specific time interval and the absorption rates were calculated. All absorption rates on stucco surfaces where no cracks were present were found to be extremely low and at locations where stucco cracks were present, were found to be high. These tests proved that the water is not penetrating through the painted stucco but is instead intruding through defects in the exterior building envelope.



Photo 5



Photo 6

The caulking at the perimeter of doors and windows was examined and although some crazing was evident, there was no adhesive failure or splitting that would allow water penetration. The water intrusion experienced at these locations could instead be readily attributed to stucco cracks adjacent to the windows such as shown in photograph #6.

The testing performed exonerated the painting contractor from claims that his defective workmanship caused the unacceptable appearance, that he had failed to apply the specified paint coats, and that the caulking applied to window and door perimeters was allowing water intrusion. However, the claim that the painting contractor failed to apply caulking to adequately waterproof the buildings was more difficult to defend.

That's because even though the painting contractor's estimate only priced out caulking the perimeter of exterior doors and windows, there was a caulking section in the specifications that indicated that additional locations needed to be caulked including all junctures of dissimilar materials, all building penetrations, and all 90 degree junctures. Further, the painting contractor signed a contract indicating that all painting work and related caulking would be performed. Unfortunately, this vague term caused the painting contractor to assume some liability for water intrusion. For example, as shown in photo #7, water would puddle on some concrete floors. Since the wall to floor intersections had not been caulked, water could penetrate into the buildings.



Photo 7

The lessons to be learned are ....

1. Contractors spend an awful lot of time bidding and then producing a job. They sometimes miss the step of reading and amending a contract that is presented to them. Never sign a contract that implies more work than you intend or refers to the work in vague terms. Make it perfectly clear what scope of work you have included including a listing of the specification sections included.
2. When you cannot avoid a dispute, you can take measures to protect yourself. Testing by an independent source is available to help defend you if you have been unjustly accused.