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## About the Author

### Jeff Hoch

Architect and Field Consultant

Jeff Hoch received his architectural degree from New School of Architecture in San Diego, California. He is a State of California licensed architect and also holds several certifications including, but not limited to:

- ICC Certified Residential Inspector
- InterNACHI Certified
  - Professional Inspector
  - Energy Inspector
  - Renovator Inspector
  - Lead Inspector
- OSHA
  - 30 Hour certified
  - Scaffold Safety
  - Ladder Safety
- IAC2 Certified Mold Inspector

Jeff has been involved in the inspection industry and related fields for over 23 years. He has inspected thousands of properties ranging from small single-family home remodels to 50-story apartment buildings and large commercial properties performing QA inspections on projects during construction for builders in Southern California as well as Risk Assessment inspections across the country.

Jeff has performed forensic testing per standards promulgated by various organizations including, but

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## Two problems with every 1-coat installation

One-coat stucco, as an exterior cladding for residential homes provides both labor and material savings and helps builders meet the expanding energy code requirements. Because of these benefits, one-coat installations are increasing while traditional three-coat stucco is declining despite the fact that three-coat is a more durable system.

Quality Built inspects hundreds of homes each week clad with one-coat stucco. Let's start by clearing up possible misconceptions about one-coat stucco. Originally one-coat stucco was literally one coat of stucco. The original system had drawbacks, in terms of the finish of the product, with uneven color distribution and a coarse texture due to fibers in the plaster mix (Photo 1). Because of this, most one-coat being installed on the projects inspected today is actually two coats of stucco. This system uses one-coat to replace the scratch and brown coats of a traditional three-coat system. One-coat is most often applied over a foam board, not be confused with EIFS (Exterior Insulation Finishing System). However, this foam board does play a role in the problems that arise when installing one-coat. Unlike barrier EIFS, a one-coat system includes a drainage plane behind the foam board (usually a house-wrap or building paper) and metal lath. The foam provides backing for installing the plaster and a semi-flexible support for the life of the plaster. One-coat plasters often include modifiers to increase crack resistance which will allow some flexing of the stucco cladding during wind loads, etc. However, this does not mean that the one-coat stucco system will not crack (Photo 2).

not limited to, ASTM, AAMA and APA. Along with other types of testing, Jeff has performed water-intrusion testing on thousands of assemblies on national projects. Jeff is trained on the ASTM E2018 Standard Guide for Property Condition Assessment, Baseline Property Condition Assessment Process and has performed inspections following this standard for clients nationally.

Jeff has performed hundreds of peer plan reviews for projects nationwide in order to reduce builders risk by checking plans for completeness, compliance with manufacturers' recommendations and best construction practices.

Jeff has been involved in hundreds of defect litigation cases as an inspector and/or a consultant for cases in various states. He has, on several occasions, been designated as the architectural expert witness for cases in California and Kansas.

Jeff and Quality Built's goal is to improve the quality of construction thereby reducing builders risk and improving the home purchasers' experience. Jeff is proud to be part of a team that is working hard to achieve this goal.

Jeff can be reached at the QB San Diego office at (800) 547-5125 or cell (858) 220-0538 or through email at [jhoch@qualitybuilt.com](mailto:jhoch@qualitybuilt.com).

### Quality Built's Commitment

Quality Built is committed to being a visionary leader in the insurance, financial and construction industry by providing reliable and innovative Third Party Quality Assurance Services to our clients and by providing those services in the



Photo 1



Photo 2

While inspecting homes across the country for various builders and different sub-contractors, I have documented several common problems on all job sites where one-coat stucco is being utilized. Two of these problems came to my attention while performing construction defect litigation and forensic work.

The first problem we will discuss is overdriven fasteners. This problem is related to the foam board and can result in cracking of the stucco. Not that these issues are all of the reasons stucco cracks, but this article will focus on the type of cracking that is related to the overdriven fastener problem. These cracks are caused by shrinkage of the cementitious material during the curing process. If care is not taken to cure the stucco, per the manufacturer's recommendations, the risk of shrinkage cracks increases. Shrinkage cracks are most likely to occur at areas of weakness within the stucco, including areas with improper lath embedment.

Secondly, one-coat stucco is applied over lath which is installed over the foam and attached to the framing. The lath is often attached to the framing using a pneumatic staple gun as this is a time-efficient tactic to attach the lath. The problem is that the foam offers very little resistance to the staple. If the wood framing is not of the proper density or if the gun is over-pressurized, the staple pulls the lath into the foam. When the lath is pulled tight against or into the foam, the lath is not furred off the foam and not properly embedded in the stucco (Photos 3&4). This lack of embedment stems from the first problem which is the overdriven fasteners.



Photo 3



Photo 4

This lack of embedment caused by the overdriven fasteners is a serious problem. Stucco is a cementitious product which means that it is structurally weak in tension and the shrinkage which occurs during curing creates tension within the stucco. Lath is made of metal which is strong in tension and is why we install stucco with lath embedded in it -- to resist the tension forces. Thus, if the lath is not properly

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embedded in the stucco, it creates a weak spot. Test sections of stucco removed on several hundred structures with cracks proves many of the cracks were located at areas where the lath was not properly embedded (Photos 5&6).

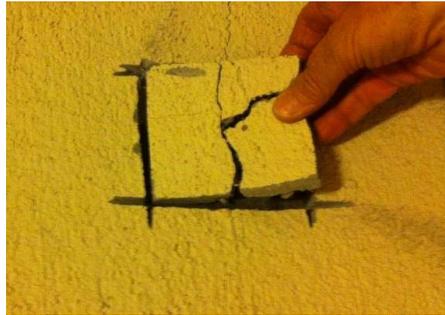


Photo 5



Photo 6

This overdriven staple condition is rarely seen on an occasional home with one-coat; this is a condition noted at every home inspected with one-coat. The extent of the overdriven staples on any given house will vary in relation to the house right next door. In published specifications and testing reports, manufacturers such as Sacramento Stucco Co., Inc. address this overdriven fastener issue. Sacramento Stucco indicates in their ICC ESR report for Western 1-Kote that, "Care must be taken to avoid over-driving fasteners." As alluded to previously, there are two main variables affecting whether or not the staple is overdriven. The first variable has to do with the framing into which the staple will be driven. The less dense this member, the less resistance it will have to the penetration of the staple. The other variable is the air pressure of the pneumatic staple gun; this is the one variable that the installer has control over.

While stucco cracking looks bad and may upset homeowners, it does not mean that the house will leak or experience water intrusion. This second common problem creates a risk that water intrusion will occur and the foam board application increases this risk. The problem: holes in the weather-resistive barrier can result in water intrusion. In a three-coat stucco system, the weather-resistive barrier is open and visible for inspection when sealant can be applied to patch minor holes in the barrier right up until the first/scratch coat of stucco is applied. In a one-coat application, the barrier is covered with the foam board before the staples for the lath are applied. In many cases, unless the builder specifically requires a delay in foam application to allow for inspection of the barrier, the foam is applied within hours - if not minutes - of the barrier application (Photos 7&8).



Photo 7

Photo 8

Following the installation of the lath, the one-coat installer is supposed to go inside the unit and seal all visible holes in the barrier (Photo 9). He cannot, however, see or seal holes that occur over wood framing members or wood sheathing. In some cases he may try to seal fasteners that missed from the inside by sealing the fastener at the sheathing which will not work as the seal will not be at the weather resistive barrier (Photo 10). If the installer misses the mark with the gun on open stud framing, the damage can be seen and corrected. It is when the damage cannot be seen that the risk is greatest. Water leaking through the weather-resistive barrier to the OSB sheathing may go unnoticed until the sheathing and other components are deteriorated. The sequence of installing the lath after the foam is inherently necessary in a one-coat application; however, it is this activity that increases the risk to the builder.

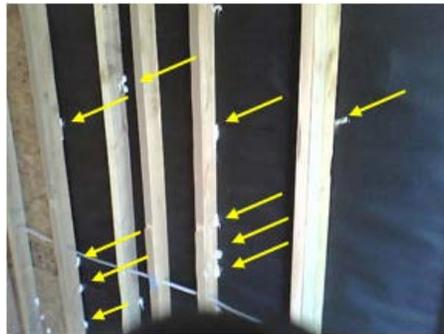


Photo 9



Photo 10

Both of these problems can result in expensive repairs and possible litigation. To reduce the risk associated with the installation of one-coat stucco, QB recommends using nails instead of staples as well as the use of third party QA provider. The QA inspections of the weather-resistive barrier should occur at two stages. The first should be prior to the installation of the foam and the second prior to the application of the stucco. The fasteners should be of a corrosion-resistant material, the type of which should be based on the other components to prevent galvanic corrosion from dissimilar metal contact. The fastener length will be a consideration because of the foam, which means a longer fastener will be required than for traditional three-coat stucco system. The nails shall be a minimum of 1-gauge roofing nails and shall penetrate the framing to a depth of one inch. Nails should be installed at the self-furring crimps of the lath and not overdriven. Hand nailing reduces the risk that the lather will not be aware of missing the framing or over-drive the fastener. By following these methods, the labor and material savings may be non-existent. However the energy requirements will be met and your risk will be reduced.

### About Quality Built

Quality Built, headquartered in Fort Lauderdale, Florida, is a leading national construction quality assurance and inspection management

company. Quality Built provides third-party quality assurance services and a full spectrum of quality and risk management solutions such as property condition assessments, tainted drywall assessments, building evaluations, data collection tools, collateral inspection services, reporting and support services on high-quality residential and commercial construction projects nationwide.

Quality Built is well known for its work in Total Quality Management and was one of first firms to transition from using a traditional quality assurance approach into implementing a proven, user-friendly and fully automated, online inspection system. Quality Built's proprietary software is cost efficient, paperless, fully customizable and completely scalable to handle the demands of most inspection and quality assurance protocols.

**Quality Built's Quality Management System is ISO 9001:2008 registered**

For more information about Quality Built and its services, contact Beth R. Michaelis, President, at [bmichaelis@qualitybuilt.com](mailto:bmichaelis@qualitybuilt.com). Quality Built, 401 SE 12th Street, Suite 200, Ft. Lauderdale, FL, 33316, 954.358.3500, [www.qualitybuilt.com](http://www.qualitybuilt.com).

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