Ram Builders Guide to Understanding and Solving Stucco Problems
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Introduction To Stucco

By Dennis McCoy , CEO of RAM Builders, Inc.

In the neighborhoods of coastal California where I grew up, stucco was the most common exterior cladding. As a kid helping my father on projects, and then as a construction supervisor and contractor myself, I have been around stucco for most of my life. Nowadays, the kind of stucco I grew up with is known as “conventional stucco,” or “traditional stucco.” When I was a kid, we only knew it as, just plain stucco.

Conventional stucco is still around, but it’s not alone. There are now at least 35 different modified, proprietary hard-coat stucco systems on the market and more than 30 varieties of exterior insulation & finish systems (EIFS) that have the look of stucco. With products continually leaving and entering the market, and new hybridized systems coming along that combine the characteristics of EIFS and hard-coat systems, it’s hard to keep track, much less understand them all.

All these new systems are penetrating markets where traditional stucco is largely unknown, and where the details that make stucco work are not part of the local tradition. In place of the standard, generic water management details that governed traditional stucco, which you could look up in the body of the building code, these new systems are regulated through evaluation reports (“ER reports”) and proprietary specifications that you have to locate and study individually.

Without the base of experience and knowledge, and without simple references for proper detailing, installers have made a lot of mistakes with hard-coat and EIFS stucco in new markets. Over many years in California, in the course of remodeling or adding on, I’ve opened up hundreds of homes clad with traditional stucco without finding significant mold or rot. But in recent years in Utah and Texas, I’ve been called in to remediate hundreds of homes clad with newer modified systems, where the lack of proper water management details has caused major decay problems in homes that are practically new.

The good news is that any kind of stucco – traditional three-coat, proprietary one-coat systems, and even EIFS – can work well if you apply the flashing and drainage plane principles that have always been part of traditional stucco. But before we get into those details, let’s look at the differences between traditional “three-coat” stucco, the new proprietary “one-coat” systems, and EIFS (the polystyrene foam -based exterior insulation finish system).

What is traditional or “three-coat” stucco, and how is it installed?

In order to understand and solve your stucco problems, it’s important to gain an understanding of what has been used successfully in residential construction for the last 90 years – namely, traditional, or “three-coat” stucco, which in some markets is referred to as conventional stucco. It’s often called “three-coat” stucco because it is put on in three separate layers.

This system starts with a drainage plain based on some type of building paper over the wood framing of the home. Building codes call for two layers of Grade D Kraft paper, which is made with virgin wood fibers which are saturated with asphaltic emulsion (i.e., tar). The paper is there to drain water, so it has to be carefully tied into flashings around all windows and doors. Metal flashing systems are also installed to divert roof water away from the stucco system, and to protect any penetrations. The paper and flashings have to overlap each other in a way that creates a shingle effect.

Over the papers and flashings, a stucco netting or metal lath is fastened to the wall with staples. Stucco netting looks like chicken wire, but it is actually a heavier-gauge galvanized steel wire. Expanded metal lath has the look of a more dense metal netting , but it serves essentially the same purpose which is to hold a cement base coat onto the wall.

Next comes the base coat, which is comprised of a 3/8-inch scratch coat, a second 3/8-inch brown coat, and a thin “color coat” on top, for a total system thickness of about an inch. The scratch coat is troweled into the lath mesh and tooled with grooves while wet, to provide keys for the second coat to lock into. The 3/8-inch thick second coat is applied and tooled flat, and both must cure for a minimum of 7 days before the color coat gets troweled on. All three coats are a mix of Portland cement, sand, water, and some lime for workability; the top coat has a colored powder added to it and may include some polymer additives. Like all cement, stucco will shrink and crack. Many traditional contractors will wait 14 days to make sure the first coats have completely “cracked out,” before the color finish is put on so that latent cracks won’t telegraph through the top coat.

Traditional stucco, because it is basically made up of sand and cement, is porous. The base and color coats repel rain for long periods of time but will eventually become saturated. The one inch of cementitious material is designed to continually drain with the help of gravity out the bottom of the system through a metal flange called a weep screed. These materials are the first components of the drainage plane and provide primary water management. Because of saturation a means of secondary water management is required and is absolutely essential for a stucco system to work. If it rains long enough water reaches the back side of the base coat and is ultimately directed away from the wood framing of the home by properly installed building papers and flashings. These materials provide for secondary water management, yet are equally vital components of the drainage plane. They are vital because they are what ultimately protects the house – without them, water will reach the wood framing members and create conditions for rot and mold growth. The aforementioned is common knowledge in any market where stucco has been around for years, and the proper installation of these components is vigorously inspected by local building officials.

It is no coincidence that we find ourselves in Texas and Utah. The circumstances in both places regarding the introduction of stucco are almost identical. In the “nineties” stucco displaced brick and siding as the primary cladding in the Houston/Dallas corridor and along the Wasatch Front. Builders were requesting it, stucco subs were installing it, suppliers were providing materials, and building officials were allowing it without understanding the basics of how it worked. The newer systems which are inherently more complicated than conventional stucco were destined to fail. Failure was not as much a result of poor design as it was of faulty workmanship.

Pro’s and con’s to traditional “three-coat” stucco

This stucco system has been an effective, attractive, and affordable exterior cladding for many years. It is more cost effective than brick and an appealing alternative to wood siding. However, it does have its own limitations. Because traditional stucco is cementitious, it can crack, and requires periodic maintenance.

In areas of the country where freeze and thaw cycles are common place the stucco will become saturated, freeze, and then break off the wall. For this reason, traditional stucco systems are used primarily in the southwest where temperatures and climates are mild. In areas of the country where traditional stucco can be successfully applied, it is a popular exterior that lasts for the life of the home. (To maintain traditional three-coat stucco, a new color coat is applied every 30 to 50 years.)

New stucco systems begin to be developed, marketed, and sold --- **“one - coat” and exterior insulation finish system**

During the 1980’s, new synthetic stucco systems were developed that were freeze, thaw, and crack resistant. They could be sold in an expanded market and remain a less expensive alternative to brick and wood siding. There are two primary systems: one is known as the “one coat” system, and the other is known as “EIFS” stucco (exterior insulation finish system).

One – coat stucco

A handful of manufacturers have introduced thin-coat stucco products that collectively are called “one-coat” (or sometimes “two-coat”) stucco. One-coat is nearly identical to traditional stucco in concept and design, except that the base coat is applied in one layer instead of the original two-step scratch and brown coat process. The base coat is mostly sand and Portland cement, as in traditional stucco, but it also includes synthetic polymers and fiberglass reinforcing strands that increase both the tensile and the compressive strength. The required total thickness is just 3/8-inch instead, of the standard 3/4-inch total for the three-coat base.

The idea behind one-coat systems was to save labor and time in the schedule, and that the fiberglass and polymer additives help the stucco withstand the winter freeze-thaw cycles. With the added components, base coat could be applied in just one layer, with no second plastering and no wait in between. In practice, it's not sure whether one-coat is all that economical. The required special detailing and extra mix ingredients involved with one-coat, can add cost and complexity. With only 3/8-inch of thickness, it is harder to achieve a superior, uniform finish over the usual irregularities in a house frame. A common defect we see in one-coat installations is a base coat much thinner than the required 3/8-inch, at least in spots. (Remember, a properly installed and cured base coat is an essential component of an effective drainage plane)

The thinner base coat is still applied over wire lath or expanded metal, and over a system of papers and flashing, the same you would need for traditional stucco. The same screeds and expansion joints are also part of this system, although at different thicknesses. But unlike three-coat stucco, one-coat systems require only a 48-hour moist cure. The applicator is responsible for keeping the base coat moist for the first 48 hours after application. The color finish is also required to go on within 72 hours of the base coat application. Proper curing is more critical with one-coat than with traditional stucco, because the acrylics tend to isolate cement particles from water in the mix. If the coat isn't kept moist, it may dry out before the cement has a chance to react with water (hydrate), which it must do to form the strong bond that gives the cladding its strength. Without the correct moist cure, the base coat is likely to be weak and crumbly. A recent development, particularly in drier climates like Utah, is to let the base coat cure and "crack out" for six days before applying the color finish. If this is done, however, a particular bonding agent must be applied to the base coat before the finish can be applied. Only certain manufacturers have made provisions for this practice with their systems.

One-coat stucco usually receives one of the new acrylic color finishes, instead of traditional stucco's purely cementitious, textured color coat. It has a smoother and less porous look, because acrylics instead of cement bind the aggregates together – it's like sand mixed with latex paint. Many people perceive this acrylic top coat as the defining characteristic of one-coat stucco, but synthetic finishes are not really an essential component of a one-coat system – they just happened to be developed around the same time that one-coat was widely marketed. One-coat base coat systems got code approval in ER reports without mention of any particular color finish. As long as the base coat is applied at least 3/8-inch thick, you can apply either conventional cement color finish or a synthetic acrylic color finish over it.

An acrylic coating's higher plasticity gives more resistance to cracking and creates a more closed, water and stain resistant surface. But one-coat stucco finishes are still porous enough to let rain enter the system – ***the perception that one-coat systems completely repel water at the surface is incorrect.*** Even if the coatings were waterproof, one-coat systems do crack, and they can leak at all the joints and penetrations at windows and doors etc., so water is sure to get behind them. At the same time, they are less breathable and slower to dry out than traditional stucco. So a one-coat system with an acrylic finish will be less forgiving of any defect in the proper placement of building papers, flashing, and lathing staples – if water reaches the wood structure of the house, it is less able to escape by evaporation.

We have seen many failed stucco systems, that others have tried to repair by applying a sealer or paint over the existing stucco, and by surface caulking windows and other joints. This is worse than useless – it actually accelerates the damage. Water will still enter the system somewhere, and then it's trapped next to the house. A home we worked on that was just four years old, had its framing and sheathing completely rotted out because of that kind of attempted "repair." Damage that might have taken 10 or 20 years to develop under normal, breathable stucco, in turn happened in 1 to 2 years after the sealer was applied.

Advantages to "one – coat" stucco or hard coat

Compared to the traditional or three-coat system, the one-coat system allows less water to travel through the stucco. This means that fewer stains and cracks will develop.

This system can be applied in areas of the country that have freeze-thaw cycles, since there is less water in the base and finish coats. The additives, as well, serve to strengthen the base and finish coats against the cycles of a freeze and thaw climate. This type of stucco system can also be applied in a more timely fashion, since the base coat is applied in just one coat and requires only 48 hours to cure and crack out.

Eifs – exterior insulation and finish systems

Exterior Insulation and Finish Systems (EIFS) use a thin (1/16-inch to 1/8-inch) synthetic top coat over a substrate of expanded polystyrene foam. Originally designed as a "barrier system" with no water management behind the foam, EIFS in the residential market **now** has to have reliable paper and flashing assemblies behind it to allow water to drain. However, EIFS still requires complex caulking details at all wall penetrations such as at windows and doors (caulking is not part of a typical hard-coat stucco system).

The detailed procedures for EIFS systems are all specified by the respective manufacturers in their proprietary specification/data sheets as well as in evaluation reports (i.e., ER reports) and acceptance criteria (i.e., AC reports) which are supplied by the International Conference of Building Officials (ICBO). These reports which govern EIFS installation are not included in the main body of the building code. The volume, complexity, and obscurity of these reports make it hard for local building inspectors to enforce them. Because there is no third party enforcement of the complex application procedures, we find that EIFS applicators often mix and match products in the field, leave critical system components out, and lack a basic understanding of how an EIFS stucco system is supposed to work. The real kicker is that all of the parts of an EIFS system that make it work , that is those components which protect a home from the elements, can't be seen from the surface by the untrained eye.

Even the new water-managed EIFS systems use sealing top coats, so they lack the easy path for moisture escape that traditional stucco has. With EIFS, any water in the system has to make its way to weep exits – it can't readily bleed or evaporate out the face of the wall. If water penetrates the system through window or other joint connections it can act like a wet blanket around your home.

The problems with an EIFS system are similar to those of the one-coat system. The faulty assumption that the acrylic color coat would keep out the water, made it a simple decision for contractors to leave out the caulking detail (the groove for backer rod and caulking around windows and doors). This omission leaves an easy point for water to enter with no provisions for water management behind the foam, causing dry rot, mold, and decay.

Let's review the contributing factors to our nation-wide stucco problem

- A new product has become extremely popular in a relatively short period of time. Not just in markets with a history of stucco, but just about everywhere.
- Accompanying this rapid growth is a lack of experience and understanding about how stucco works.
- The application of the new and more complex stucco systems is not inspected by local non bias building inspectors.
- Compounding the problem, this new system has been introduced into a market that lacks sophistication because it competes on price rather than quality. The contractors who understand the importance of performing caulking details and paper tie-ins properly cannot compete with other contractors who skip these details – details that can easily add 30% to the cost of the job.

Because of this neglect and misunderstanding, water is getting to the wood structure of homes. And to make matters worse, the same qualities of the acrylic color coat that make it more water and crack resistant are in turn trapping the water behind it.

Why can't I sell my "eifs" stucco home?

Even though both one-coat and EIFS stucco systems have a history of improper installations, EIFS systems have received the majority of bad press. On EIFS systems, an inappropriate or missing caulking detail around windows, doors, vents, and other similar joints produces an illegal and incomplete stucco system – one which will fail over time.

Such deficiencies are often overlooked and aren't discovered until the damage behind the system has become severe. Cracking and discolorations are not as easily identifiable with an EIFS system; problems can remain hidden for longer periods of time. The uncertainty associated with this situation causes home buyers to shy away from purchasing an EIFS home.

Much has been said in the media about the problems faced by those who own stucco homes; including the mold and rot happening behind them. Because of this media coverage, most people have reached the limited understanding that if they have stucco on their home, they might have a problem. This understanding often remains uncertain or unclear until the home owner, when trying to sell their home, is informed through a real estate agent or a home inspection report, that there is a problem.

Because of the negative media coverage, real estate agents, home buyers, and home inspectors have become more wary of the problems and liabilities associated with EIFS systems. As a result, most homes will have to be either fixed at a substantial cost, or sold below market value.

As previously mentioned an illegal EIFS system can be identified by the missing backer rod and caulking detail (known as a "positive connection") around the doors and windows. Other problems may include the absence of caulking or sealants at lights, vents, pipes, and other components that penetrate through the stucco system. The lack of properly placed control joints in the required areas can cause uneven stress management across the surface of the home.

One common problem is that the stucco does not terminate at the required distance above the roof or ground. There are times when the stucco terminates at or below the soffit line and is not installed behind it or the freeze board like it should. Others may be missing or have improper kick-out flashings at the roof-to-wall connections which is designed to divert water away from the stucco, and into the rain gutters.

Another problem is that if the home was built after January of 1997 and an EIFS "barrier" system was put on it, which is one without secondary water management, then it is a non approved system. Even if all of the components are in place and it was installed perfectly, it is a system which lost code approval prior to its installation.

Solutions for homeowners with eifs

There are several solutions to these common problems. One solution is to go forward with the repairs, identified to you in the home inspection report or by your real estate agent. Another solution is to remove the existing EIFS on your home and install siding or a one-coat stucco system.

Repairing the stucco could be the least expensive option to a homeowner. If done correctly, these repairs, though extensive, would allow you to sell your home at a much higher value. However, the repairs would have to follow very specific guidelines and installation methods.

While these repairs can be tedious and extensive, they can also be cost effective because they are isolated and don't require the entire wall to be refinished. This advantage can be lost if mold and dry rot are discovered during the isolated repairs; such a discovery would require more areas of stucco to be removed, reinstalled, and refinished. Another drawback to performing EIFS stucco repairs is that in the end you still have an EIFS system on your home. People enter the home buying arena hearing the buzz, "Make sure you don't buy a home with EIFS stucco." This is due to the fact that prospective home buyers and real estate agents avoid EIFS stucco rather than taking the time to understand it.

If you want to avoid the problems of EIFS repair altogether, the answer is to remove the existing EIFS system and install siding or hard coat stucco. However, there are some problems that exist with installing siding. In neighborhoods where homes are built with stucco and brick, removing stucco and installing siding lowers the property value of all the homes in that neighborhood. Of course the home whose value has depreciated the most is the one that has installed siding.

Many of the same costs that apply to installing a new hard-coat system apply to a home that has replaced their EIFS stucco with siding. It costs the same to remove the existing EIFS system, install the proper building paper and flashings, install the kick outs at the roof, and to complete the job clean-up. By installing a hard-coat stucco system you have restored the home to full market value. With siding, you have probably lost as much value in the home as you saved by deciding to install siding rather than hard-coat stucco.

Solutions for homeowners with failed one-coat, hard-coat stucco

The same class of concealed dry rot and wood damage found behind a failed or incomplete EIFS stucco system can also be found behind failed one-coat systems, as well. We have repaired or replaced the stucco on over 900 homes (as of this printing), the majority of these being one-coat systems.

Hard-coat stucco failure is usually caused by improperly installed building paper and flashings behind the cement base coat. This kind of failure does not always result in water leaking into the home, often there are outward indications of failure, like discolored cracks, stains in the colored finish, and bulged or flaking stucco. These indicators are more obvious in a hard-coat system than they are in an EIFS system. Because problems are often detected early, isolated repairs are possible.

Unlike a failed EIFS system, hard-coat stucco failure is not always system wide. In localized repairs, we remove only a portion of the stucco system, repair the drainage plane, and patch the stucco system back in. However, there are cases where improperly installed building paper or missing roof or window flashings can cause such widespread failure of the drainage plane that the only responsible repair is to completely remove and replace the old stucco system.

What are the details that need to be in place, for a stucco system to function properly?

Drainage detailing for critical spots

To make stucco work, you have to back it up with a drainage plane based on the shingle effect: water-resistant papers and flashings that direct the water down, out, and away from the wood structure of the home. The failures that we see in hard-coat stucco are usually traced to a few common mistakes in the drainage plane details.

Proprietary one-coat stucco systems and drainable ("water-managed") EIFS systems come with water-handling details supplied by the manufactures. Some are better than others, but reading and understanding all the evaluation reports and company specs out there would be a daunting task for anyone – by now, the details for all the varieties of stucco systems amount to thousands of pages.

The good news is that every stucco system – even EIFS – can be made to work by applying the same principles that have always applied to traditional stucco. Stucco is a porous, drainable system. Rain penetrates it and drains through it.

Weep screed

Hard-coat installations start with the application of a "weep screed" at the bottom edge of all walls. This flashing, which is perforated at the bottom, defines the bottom edge of the stucco coats. It goes on first because it is lowest: The other papers will lap over it to begin the shingle style layering.

Weep screed is a standard item in markets where stucco is well established. In new markets, people may not have even heard of it. However, it is vital to the performance of the system. Rain will soak into any stucco coating; the water will head downwards, and it must escape at the bottom. The weep screed lets water out through its perforations, and it stops the stucco from bonding to the cement foundation and creating a dam where water might pool. The screed should span between the wood framing or sheathing and the concrete foundation, and it should terminate at least 8 inches above grade.

Other flashing assemblies are acceptable. In some places we use a perforated J-channel above a Z-flashing for a bottom termination. The key principle is just that water must be allowed to escape and must be directed away from the building.

A common mistake is to pour a slab, patio, or step after the stucco is applied, and to trap the weep screed and the bottom edge of the stucco between the slab and the house. This traps water in the stucco at the bottom and ponds it against the building paper, which will eventually let moisture through. Of course, if there are reverse laps in the paper and flashings above this point, the water will already be behind the paper and in contact with the wood. This scenario can quickly destroy sills, wall plates, and studs.

Building paper

Lapping over the weep screed, as it must lap over all other flashings, is the water-repellent building paper, installed shingle fashion from the bottom up. Code minimum is two layers of Grade D building paper. Grade D paper is a tar-impregnated kraft paper that comes in different thicknesses with different minute ratings, based on the time it takes for water to penetrate in standard tests.

The most common varieties are 15-minute and 30-minute papers. You can pull two layers off the roll at once; because of the space between them, paired sheets of 15-minute paper installed on the wall offer more than 30 minutes of weather protection, and doubled 30-minute paper provides more than 60 minutes. There is even 60-minute Grade D paper, which, doubled, gives more than 2 hours of water resistance. Rain takes a long time to soak into the stucco itself before reaching the papers, too; so the combination of good papering under a properly applied base coat and finish offers many hours of weather protection.

Housewraps have approval for use under stucco, but we don't recommend any of them in single-sheet applications. Our experience shows that whatever sheet comes in direct contact with the stucco base coat will lose water repellency and break down over time. We use housewrap, but only with Grade D paper over it.

The latest building codes do not specify a "minute rating" requirement for paper under stucco. We adjust our paper choice to local climate conditions. In interior Southern California, we use double 15-minute paper. In the Salt Lake Valley, we use double 30-minute paper. In the Galveston Bay area of Texas, we use double 60-minute paper. In some remedial work, where everyone is eager to be absolutely sure, we will install a stucco housewrap first, then two layers of 30-minute or 60-minute paper – all lapped over or under any flashings as appropriate to achieve the shingle effect.

Metal lath

Good installation of the metal lath over the papers and flashings is critical. Stapling is a big concern: We have seen bad leaks develop when the only mistake was that the lath was over stapled or stapled in the wrong places.

Lathing staples should be placed only at studs, plate lines, headers, or other solid framing members. In new construction the Code requires the fasteners to penetrate 1 inch into the framing, so if the sheathing is 1/2-inch plywood, you need staples with a 1 ½ -inch leg. A wide-crown staple is the appropriate fastener, and the only way to get both legs of a 7/8-inch or 15/16 –inch crown staple to consistently hit a 1 ½-inch stud is to orient the staple vertically (this also prevents the staple from creating a water trap in the papers).

The staples should be placed ***no closer than 6 inches*** to each other. If a staple is used between studs – for instance, to fasten the edge of the lath near a vent penetration – short staples are used, so that the staples do not penetrate through the plywood. Laps in the wire lath should be located over studs or other solid framing members.

We've seen cases where poorly trained applicators have placed a hundred or more staples in a 1-square-foot area between studs, to pull lathing flat or close a joint. The results can be disastrous. It seems to take a certain number of staples to break apart the wood flakes in a sheet of OSB plywood, enough to create a channel for water flow. Once you get above that critical mass of staples, you've opened a path. In heavy storms with turbulent winds, water in the saturated stucco gets forced through the paper and the OSB along paths created by the staples, and flows down the inside of the OSB within the stud cavity. We've opened up walls from the inside and watched water stream in. No wall system in the industry is designed to drain water out of the stud bays – when that area gets soaked, your wall is doomed. When we tear apart walls like that after four or five years in service, what we often find is a compost pile.

Window flashing

Many one-coat manufacturers supply window flashing details, but they aren't necessarily good ones. The key, as always, is to establish good overlapping for the shingle effect. We see many houses in Utah and Texas where the paper has been applied well, but the window flashings dump under the paper. Invariably this leads to rot.

Where window flashings dump under the paper, it's probably because the window installers put the flashings in before the stucco installers came to paper the building. The paper has to go on first, then the flashings, then the window, and finally the lath. It must be a coordinated effort, or you have to figure out a way to leave the flashings hanging so they can be integrated into the building paper later. The bottom window flashing must be lapped over the building paper.

Roof-to-wall joints

The most damaging leakage we see in our work takes place where roofs intersect walls, either because a one-story roof meets a two-story wall, or because a chimney chase meets the roof. Coordination between roofers and stucco applicators can be a daunting task.

Every roof needs some kind of L-shaped flashing where a lower roof abuts an upper story wall. Metal step flashing, or "step shingles," is typical for asphalt or shake roofs; tile roofs usually get a continuous piece of metal J-flashing.

Where stucco is new in the market, the appropriate metal step shingles for stucco application can be hard to find. Folded flashings intended for use with asphalt shingles and vinyl siding are too small for stucco. In some areas, the typical step shingles on the shelf are 8 inches long, with a 2 inch vertical leg for the wall and a 4 inch leg for the roof. Stucco requires a 2 inch reveal between the bottom termination of the stucco and the roof surface (many EIFS systems need a 3-inch reveal), and a 2 inch lap of building paper over the metal, so step flashings must have at least a 6 inch vertical leg. Since you can't be sure of finding the right size metal flashings in all markets, we always use rubberized asphalt sheet material like Ice and Water Shield as a backup.

However, the flashings are still important, particularly the water diverter or "kick-out flashing" at the bottom of the roof, which kicks roof runoff away from the wall system. Where this is not installed, water from the roof will overwhelm the stucco system and cause at the least a visual problem, but more commonly a major structural problem.

Penetrations

Every penetration in the stucco, like a hose bib, dryer vent, combustion air intake, or other type, is a potential leakage point. Our solution for those spots is to use custom bent metal shrouds, like hoods that cover dryer vents, in various sizes to meet the most common needs. We caulk the back side of the shroud to the paper below it, and caulk the paper above it to the shroud's top and side flanges. Then we terminate the stucco at a casing bead.

About RAM Builders, Inc.

RAM Builders has been a remedial contractor since 1987. This means we are in the business of repairing homes that were built incorrectly during original construction. Sine 1996, we have dedicated the majority of our business to repairing or replacing the stucco on over 900 homes in Utah, Texas, and California. We have seen and understand the frustration homeowners feel when they realize they have a stucco problem. They are often confused about what to do and which avenues to pursue. Our approach is to educate homeowners about their stucco problems so they can make informed decisions.

The purpose of this guide has been to help homeowners understand that stucco is a great product, but one that in many cases, has been installed incorrectly. We have mentioned the negative buzz about EIFS stucco, in the home buying market. That same buzz exists, but in a positive sense, about hard-coat systems. Hard-coat stucco can be the answer to current stucco problems, but it must be installed correctly. If improperly installed, it has as much potential for failure as EIFS stucco.

Thank you for taking the time to learn about stucco systems. Making important decisions about your home can be difficult and may leave you with many unanswered questions. We have been through this process with many homeowners and can provide several references to help with these decisions. Please feel free to give us a call with any questions. We will be happy to provide you with any information and recommendations for all of your remedial construction needs.

Ram builders, inc.

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Glossary

Acrylic finish – A colored exterior stucco finish which is used in both hard-coat and EIFS stucco systems. The color of the finish depends on the color of the acrylic tint (similar to latex paint) that is added to the stucco mix. It's available in a variety of textures.

Acrylics – A synthetic (latex) additive used to produce an unlimited variety of colors in the colored stucco finish. Acrylics also increase the flexibility of the finish and make it more water resistant, but not waterproof.

Backer rod – A foam rod (a 3/8-inch or 1/2-inch tubular soft foam rod is usually used in stucco applications) that is placed between the stucco system and the edge of a wall penetration (e.g. a window edge) in order to insure a two-point adhesion of the caulking sealant which is placed over the foam rod.

Barrier system – An EIFS, or foam-based, stucco system where foam insulating panels are directly applied to the wall sheathing using glue or mechanical fasteners. No provisions for water management (e.g. building papers and flashings) are installed behind the foam panels.

Base coat – In a hard-coat stucco system, the base coat is the cement coating (a 3/4-inch thick double-layered surface in traditional stucco and a 3/8-inch thick single-layered surface in one-coat stucco) that is placed over the metal wire lath and building papers. With EIFS stucco, the base coat is about 1/8-inch thick and is applied over a fiberglass mesh which is then placed over foam panels.

Bituthane- A brand name which is pronounced, "bich-you- thane", which is a black sticky tar (rubberized asphalt) which comes on a roll of varying width and is often used as a window flashing. Other common brands of rubberized asphalt widow flashing are "ice and water shield", "peal and seal", and "jiffy seal". A common misconception is that because of their stickiness these type of flashings don't have to be interlaced into the building papers as do craft paper type window flashing.

Color coat – The colored exterior finish of a stucco system.

Conventional stucco – See Traditional Stucco

Cricket- Built up area of a roof used to eliminate or reduce a flat spot . Crickets are most commonly needed at a chimney chase to roof connection.

Diverter – A metal L-shaped flashing used at the conjunction of a lower roof and an adjacent higher wall or chimney chase. Its purpose is to divert roof water away from the stucco system.

Drainage plane – The building components that, collectively or individually, comprise the vehicle intended to direct water away from the structural components of exterior walls.

EIFS (exterior insulation and finish system) – An exterior stucco system, in which a thin cementitious coating (with synthetic additives) is applied over fiberglass mesh, which has been placed over foam panels. The foam panels are intended to provide added insulation. Engineered positive connections are provided at all wall penetrations. In an EIFS system, all water is intended to travel on the outside surface of the stucco.

ER reports – Evaluation Reports are regulations provided by the International Conference of Building Officials (ICBO),and in turn the International Code Council and are considered to be part of the International Building Code (IBC) and the International Residential Code (IRC). Each approved stucco system whether hardcoat or EIFS has its own ER report.

Finish coat – The finish coat is the last coat of stucco applied to the wall and thus determines the exterior color and texture of the stucco system.

Flashing – Flashings are composed of metal or other approved materials designed to intercept and redirect the flow of water across a stucco system. Their purpose is to

prevent water from entering the building. Flashing is a general term that can be used when referring to a diverter, a kick out flashing, a window flashing, or a Z-bar flashing.

Hard-coat – A stucco system with a base coat that is primarily sand and cement. Metal lath (see definition below) is used to secure the hardcoat stucco materials to the wall.

Kick out flashing – Sometimes called a diverter (see Diverter).

Mesh – A reinforced woven mesh composed of fiberglass that is usually applied over the foam in an EIF system.

Metal lath (stucco netting) – The component of a hard-coat stucco system that is placed over the building papers and into which the base coat is troweled. It comes in a form resembling "chicken wire", or "diamond" expanded metal. It is stapled to the wood framing of the home.

Moist (wet) cure – A procedure whereby the base coat is sprayed with water during the curing process in order to prevent the base coat from drying out to quickly in hot or dry weather.

One-coat – Often referred to as "hard-coat," one-coat stucco is a system where the base coat is applied in one layer that is at least 3/8-inch thick. In this system, the base and finish coats have additives (acrylics and polymers) that make it freeze-thaw resistant, crack resistant, and that reduce the amount of water that can travel through the stucco system. The origin of the term one-coat comes from the brand name "Western One-Kote" which was the first one-coat base coat that was widely distributed.

Polymers – Synthetic bonding agents that are added to the stucco base and finish coats in order to provide better adhesion, cohesion, and flexibility within the mixture.

Positive termination (connection) – An engineered sealant detail involving backer rod and caulking that is used around doors, windows, lights, etc.

Proprietary – Owned, made, and sold by companies holding a trademark or patent.

Reveal -- 2 inch space between stucco termination and roof, required by code, which leaves the metal flashing exposed.

Sealant – A caulking material that is used to seal the edge of an EIFS stucco system to a window, door, light, etc.

Synthetic stucco – Any finish or base coat that has additives beyond sand, lime, or cement. One-coat and EIFS are synthetic stucco systems because polymers and acrylics are added to the base and finish coats.

Three-coat stucco – Another name for traditional stucco. Its name derives from the three-step installation process.

Traditional stucco – A stucco system that has been used for over 90 years. It is composed of 2 layers of a sand, lime, and cement mixture that are installed over stucco netting (metal lath) and building papers. Also known as conventional stucco or three-coat stucco.

Weep screed – A metal screed that is placed just below the top of the foundation and is the base termination point for stucco. Weep holes are provided so that water can drain out the bottom of the stucco system.

Window flashing – A reinforced paper (6 or 9 inches wide) which is placed behind the bottom and side window fins. Its purpose is to maintain the shingle effect by providing the building papers a way to tie into the window.

z-bar (flashing) – A metal flashing that is placed at the tops of windows, doors, and deck ledgers. It is designed to interface with the building papers, to intercept and redirect the flow of water away from the building.