Stucco Inspection Report

For the Property Located At:

1114 Randolph Dr
Yardley, PA 19067

Report Prepared For:

Ellen Friedman

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TABLE OF CONTENTS

INTRODUCTION

I. Overview:

The subject property located at 1114 Randolph Dr was inspected, thermal scanned, and tested on: 10/19/2020 for: proper stucco installation detail, maintenance details, substrate rigidity, dampness or failure. The Moisture readings were taken in areas where substrate failure is most likely to occur. These readings were taken with a Delmhorst BD-2100 moisture meter through 1/4" probe holes which were drilled through the stucco and into the substrate wood (sheathing or studs as appropriate). These readings provide information about the condition of the substrate tested, and evaluation of the measurements is further outlined below. It is important to note that all observations and moisture readings represent the conditions present at the time of the inspection. Additionally, the structure was evaluated for confirmation of current installation details. It is important to note that codes have been updated over the years, and homes built prior to 2003 were constructed under a different set of codes and standards. This report is for the sole use of the person it was prepared for. It should not be used or relied upon by any other person or entity.

Investigation:

Stucco cladding is a multi-layered system of components, such as weather resistive barriers, flashings, sealants, and drainage plains, that all contribute to the durability and performance of the system as a whole. Codes and standards have evolved in reaction to stucco system failures, and I evaluated the structure for the presence (or lack there of) of currently applied standards and ASTM guidelines. Such details include;

1. Weepscreed - Weepscreed was not installed on this residence. A weepscreed is a horizontal strip of metal or plastic that isolates the stuccoed house walls from the foundation and allows moisture to be released from behind the stucco system. Weepscreeds also isolate the stucco from the soil and therefore inhibit the wicking effect of moisture into the stucco which may cause moisture damage to the framing.

2. System thickness - The thickness of the system was measured either by core sampling or the removal of an attachment or by moisture probing. The system thickness on this home was found to be a thickness of about 3/4". This system thickness is an approximation based on the limited sampling taken. While this typically does not contribute to leakage, thickness is a function of durability and can have an adverse effect on the anticipated longevity of the stucco system. This is typical of homes of this age, and changing it is impractical at this point unless a wall is to be removed and reclad as part of a remedial repair plan. Typical system thickness can vary greatly. The ASTM minimum standard for traditional hardcoat stucco is 7/8".

3. Expansion control joints - This home did not have expansion control joints. Control joints and expansion/contraction joints are installed in a stucco system to relieve stresses caused by this movement. There are number of variables that determine the quantity and configuration of installed control joints in a system including: the type of construction materials to which the stucco will be applied, the orientation of the construction, and whether the surface is curved or

angular. All adhered cladding systems should have control joints and expansion joints to prevent/control cracking, bulging, and delamination. Typically, the stucco is divided by the expansion control joints in to sections that are 144 square feet or less for code compliance.

4. Termination to Roof - The roof termination is improper on this home. Industry standards require a 2" separation between the roof shingles and the stucco and/or stone cladding. There should also be an integral weep system at the base of the adhered stucco/stone system. The stucco system should not be in contact w/ roof covering.

5. Head Flashing - Head flashing was not installed on the windows and doors. The purpose of a head flashing above a window or door is to allow moisture to escape and prevent potential pockets of high moisture concentration around the windows.

6. Soft/Caulk joints - Soft joints were installed around the windows and doors. All transitions and penetrations should be caulked with a low modulus sealant. The windows should have a proper soft joint installed that creates a 1/4" separation between the window and stucco. This is to allow for the differential expansion and contraction of dissimilar materials and to provide a seal between the cladding and the window. This is also the cause of many hairline cracks we see in stucco around windows and doors, as the system is unable to absorb the movement between the differing materials.

7. Soffit/Fascia/Rake Intersections - The stucco intersection with soffit and fascia/rake board was not adequately sealed. Stucco industry details require fascia/rake boards to lap over stucco a minimum 1". If stucco is abutted to fascia/rake it should be sealed to prevent moisture intrusion due to wind-driven rain this is especially important in areas where there is a Gable "A" design. Any area or wall that is peaked is more susceptible to moisture infiltration without the proper details.

8. Kickouts - Kickout diverters were not required on this residence. Kickout diverters must be either (a) powdercoated aluminum to prevent a chemical reaction with the stucco or (b) a preformed plastic kickout diverter by dryflekt or equal. Many stucco-related water intrusion problems result from the lack of installed kickout flashing or improperly installed kickout flashing. Kickout flashing should be installed where a roof line terminates or intersects with a vertical wall. If no kickout diverter flashing is installed or if it is improperly installed, rainwater and/or snow melt can run down the edge of the roof next to the stucco wall and enter behind the stucco at the point where the roof terminates into the stucco. This will allow substantial moisture accumulation that will eventually cause decay and structural deterioration. Properly installed kickout flashing should be installed at all primary and secondary kickout locations.

9. Window Pan Flashings: It is impossible to view proper window pan flashing details through the scope of this inspection. Window pan flashings prevent moisture from entering the building envelope through the base of an installed window. These provide critical protection from a common point of water entry behind the stucco system. Windows must be removed to install pan flashing details that meet current codes.

Understanding Moisture Readings:

Outlined below are the moisture readings from the testing. Thermo-ply (T-ply) was used on this home. According to the manufacturer moisture readings above 15% are an indication that outside moisture is getting behind the moisture resistant barrier and will promote failure of the structure over time.

Conclusions and Suggestions:

All of the moisture readings were within the ideal moisture range and no signs of wood rot or damage were detected. It is recommended that kickouts be installed and the sealing guidelines be followed and maintained to help prevent future issues.

Sealing Guidelines:

1. Kerf Cut as necessary to install a bond breaking joint around all windows, doors, penetrations and transitions to dissimilar material (except for roofing shingles). This cut should be 1/4 to 3/8 inch in width.
2. Apply a low modulus sealant into bond breaking joints and transitions and all penetrations. A Dow Corning 790 or similar material should be used. Also, remove down spouts and shutters and apply sealant to the fastening systems, prior to their re-attachment.
3. Omitted kickout diverters, or improperly functioning diverters as noted, must be installed and integrated into the building envelope. This applies to both Primary and Secondary locations.
4. Apply a sealant over the surface of the stucco such as Siloxane PD Weather Seal Or an elastomeric paint. This inhibits moisture entry through the stucco.
5. Clear mulch and landscaping as needed, so that there is a minimum 4" gap between the top of the landscape surface and the bottom of the stucco

1.1 PURPOSE: Enclosed is your Stucco Moisture Inspection. The purpose of this moisture inspection is to help assess the condition of the stucco system by looking for visible installation flaws, inadequate water diversion and sealant failures and conduct random moisture readings using electronic moisture scan devices. Please note that the provision of a scope of work for remedial repairs is not the purpose of this inspection. *Further investigation may be needed to determine the extent of water damage, if any, and how best to modify your home to address any moisture problems that may be indicated by this inspection.*

1.2 SCOPE OF INSPECTION: This is a basic, stucco inspection limited to the following:

1. A visual examination of the condition of the stucco, exterior sealants, flashing, windows, doors, roof-to-stucco transitions, parapets, gutters, deck-to-building connections, stucco terminations and any penetrations through the stucco.
2. Conducting of *random* electronic moisture scanning of the building envelope.
3. Preparing a report of our observations of potential problem areas and recording any

high readings found.

4. Providing detailed information on typical moisture-related problems in stucco homes to assist you in maintaining the value of your home.

1.3 LIMITATIONS OF LIABILITY: Because this is a limited inspection, we can make no guarantee, express or implied, that our observations and random moisture readings offer conclusive evidence that no installation or moisture problems exist, or that problems found are all-inclusive. This inspection company, its employees and any divisions shall not be liable for non-visual defects, unseen defects, unspecified defects or hidden damage and conditions existing on the subject property and hereby disclaims any liability or responsibility thereof. All parties concerned agree to hold harmless and indemnify this inspection company involving any liabilities that may result.

1.4 FURTHER TESTING / INVESTIGATION: Our policy is to rely on moisture meter readings as an indicator of relative moisture values between different test spots, not as an absolute value of water content in the substrate. It is difficult to determine if the structural wood of your home has been damaged in areas of high readings without 'probing' and/or removing a core sample of the stucco to allow for visual inspection. Should we feel that further investigation is needed this will be indicated in the summary. section of the report.

1.5 REPAIR FOLLOW-UP AND ANNUAL INSPECTIONS: A repair follow-up inspection should be conducted within three months after completion of the repairs to assess the effectiveness of the moisture modifications. This is extremely important. Annual inspections should also be scheduled to ensure that your stucco system remains dry. This way any sealant failures, stucco cracks, etc. can be caught and repaired promptly. Testing and maintaining your home on a regular basis is the best way to prevent costly repairs associated with moisture damage. Also, should you decide to sell your home, annual inspections and maintenance documentation will be a valuable selling tool, providing evidence to show that your home has been inspected and maintained on a regular basis by a reputable and qualified firm.

Project Information

OWNER INFORMATION		BUYER INFORMATION	
Owners	Ellen Friedman	**Buyers**	
Property Address	1114 Randolph Dr	**Buyers Address**	
City, State, ZIP	Yardley, PA 19067	**City, State, ZIP**	
Phone		**Phone**	
Owner's Email		**Buyer's Email**	
Owners Realtor		**Buyers Realtor**	
Realty Company		**Realty Company**	
Phone		**Phone**	
FAX		**FAX**	
Realtor's Email		**Realtor's Email**	
PROPERTY INFORMATION		**INSPECTION INFORMATION**	
Type of Exterior	Stucco, Siding, and Brick	**Date of Inspection**	10/19/20
Substrate (if known)	T-ply	**Inspector**	Matt Woutersz
Age of Property	42	**Present at Inspection**	Ellen
Square Footage	3,204	**Temperature/Humidity**	70/30%
Stories	2	**Weather Conditions**	Cloudy
Type of Windows		**Last Rain**	3 days prior

Inspection Test Equipment					
Test Equipment Description		**Test Range**			**Setting**
		Low	**Medium**	**High**	
A	**Tramex Interior Moisture Encounter**	**10-14**	**15-18**	**> 19**	**2**
B	**Tramex Exterior Wet Wall Detector**	**10 - 20**	**21-50**	**51-100**	**4.5**
C	**Delmorst Moisture Probe Meter**	**10-14**	**15-18**	**> 19**	**1**
D	**Structural Resistance Tester (SRT)**	**>44 = Pass**	**<44 = Fail**	**Higher is better**	

NOTE: The test equipment is used to help locate problem areas. It must be understood that the test equipment is not an exact science but rather good tools used as indicators of possible problems. At times, because of hidden construction within the wall cavity, the meters get false readings or no readings at all. Some meters will pick up on metals, wiring, unique wall finishes, etc. Positive readings do not always mean there is a problem, nor do negative readings necessarily mean there is not a problem. We do not use the equipment to obtain exact moisture content, but rather to obtain relative readings between suspected problem areas and non problem areas. This information is then used to help determine potential problem areas which may warrant more investigation.
Typically, the wood in a functioning wall will read between 6%-14%.
Readings from 15%-17% are regarded as Elevated. Water is getting in, but is not likely to cause extensive harm.
All readings above 17% are drilled an additional time and rechecked to set the probe deeper into the substrate. This insures the moisture has saturated the wood.
At 18% and above, it is imperative that we must do something. Unchecked this level of moisture already has, or likely will cause structural damage to the wood sheathing.
At 29% and above, it has extended well beyond sheathing issues and structural framing members have likely been compromised, the extent of which can not be truly assessed until such times as the stucco has been removed.
A notation of "S or soft" means the substrate could be penetrated with the probes. This means it has begun to lose strength.
A notation of NR" no resistance" means the probe hit nothing behind the stucco. This could be the result of the deterioration of the substrate. There may be some there however it is too weak to pick up with the probes.

Front Elevation

Photo4.1

Item	Item Description	Applies to Entire Bldg	Observations / Comments
	General		No Elevated moisture readings measured on this elevation.
	Weepscreed		Weepscreed was not present.
	Soft Joints/Caulk Details		Soft joints were not installed.

Front Elevation

Photo5.1

Item	Item Description	Applies to Entire Bldg	Observations / Comments
	General		No Elevated moisture readings were measured on this elevation.
	Weepscreed		Weepscreed was not present.
	Soft Joints/Caulk Details		Soft joints were installed.
	Core		Core revealed T-ply substrate over dry wood framing.

Right Elevation

Photo6.1

Item	Item Description	Applies to Entire Bldg	Observations / Comments
	General		No Elevated moisture readings measured on this elevation.
	Weepscreed		Weepscreed was not present.
	Soft Joints/Caulk Details		Soft joints were not installed.

Details

Photo7.1

Head flashing was not installed on the windows and doors.

Photo7.2

Soft joints were installed around windows and doors.

Photo7.3

Termination to slab is improper. Should have 2" gap.

Photo7.4

Termination to roof is improper. Should have 2" gap.

Photo7.5

Unsealed penetrations. All penetrations should be properly sealed.

Photo7.6

Sealant joint should be installed at intersection of stucco and rake board.

Details

Photo8.1

Core revealed T-ply substrate over dry wood framing.

The Remainder of this report is general information which is a standard guide and photos do not represent the subject property.

3.1 Water Intrusion Problems Related to Unsealed Stucco Penetrations

Any penetration through the stucco that is left unsealed will allow entry of moisture. Even an average size home can have an extreme number of penetrations, including:

1. electrical boxes
2. exterior receptacles
3. light fixtures
4. plumbing lines and faucets
5. cable TV lines
6. satellite dish mounts
7. security systems
8. gutter straps
9. shutter brackets
10. deck rail penetrations
11. gas lines
12. dryer vents
13. telephone lines
14. damaged or punctured areas of stucco

All penetrations must be sealed with a compatible sealant as recommended by the stucco system manufacturer and required by Model Codes. Damaged areas of stucco must be properly repaired to prevent water intrusion.

Fig. 1 Unsealed penetration

Fig. 2 Sealed pipe penetration

Fig. 3: Sealed gutter-strap and receptacle

Fig. 4 Deck Penetration Sealed

3.2 Water Intrusion Problems Related to Doors and Windows

Doors and windows are one of the most common leak areas in stucco buildings. Leaks can occur in these areas for a variety of reasons, including:

No caulking around perimeter of window or doorframes and thresholds. Stucco applicators are supposed to leave a 1/2" gap between the stucco and the frame to allow for a proper joint consisting of backer rod and manufacturer's recommended sealant. If no sealant is installed, a crack will eventually result, due to expansion and contraction, through which moisture or water can enter behind the stucco system. If the stucco installer did not leave the required 1/2" joint, the situation will have to be reviewed to determine the best repair method. Some possible post construction details are shown in the following pages.

Fig. 1: Damage caused by No sealants

Improper or failed joints. Some common reasons for joint failure include improper cleaning or joint preparation, lack of backer rod when needed to control joint depth, improper joint width (should be at least 1/2"), use of inappropriate sealant, or failure to tool the joints. Tooling the joint to a concave surface presses the caulk up against the joint sides to help ensure good adhesion and provides a consistent and neat appearance (Figure 3). Even if joints are properly installed, the life of the sealant is 5 to 20 years depending on the type and quality of sealant used. Sealants should be inspected annually and repairs made promptly.

Fig. 2: Example of unsealed window perimeter

Fig. 4: Damage caused by Alarm sensor

Fig. 3: Serious damage caused by no sealants

3.2 Water Intrusion Problems Related to Doors and Windows (cont'd)

Inadequate or missing flashing. Many windows/doors are installed without the head or sill flashing which is required for EIFS installations by many manufacturers and by Model codes for protection of veneered wall openings). If the leakage cannot be corrected with caulking, corrective repairs may be required to properly install flashing. There are also post construction systems on the market that sometimes can be installed without requiring measures such as removal of the EIFS at the perimeter of the window/door or the removal of the units themselves for repairs/replacement.

Improper house wrap application around windows and doors. If house wrap is not properly lapped and wrapped in the correct sequence around window and door penetrations, any water that intrudes through these areas will be funneled behind the house wrap and saturate the wall cavity causing damage.

Obstructed weep holes. Many windows have tracks with weep holes that are designed to catch any incidental water and weep the water to the outside of the window frame. However, situations are sometimes encountered where the stucco applicator has brought the stucco up past the weep holes causing the water to "dam" up and eventually leak into the walls. These weep holes must be kept clear of stucco, caulk, etc. to allow them to fully and freely function.

Punctured window tracks or frames from security system installation. This may also void your window warranty. Sealing these penetrations will many times correct the leakage.

Fig.4 Door casing and threshold sealed

Many window and door units themselves leak through gaps in the door or window frame, sills, tracks and/or at the center mullion where two double hung windows join. This can sometimes be corrected by wet glazing (sealing the frame to glass) or by caulking the gaps in the frames or by making minor modifications to the window. If these measures are not effective, the windows or doors will have to be repaired or replaced with a higher quality window.


Fig. 5 Unsealed security sensor

Doors: In areas that are prone to strong, gusting winds, in-swing doors seem to be more prone to leakage. Door thresholds should be raised a minimum of two inches and should be sealed to prevent water intrusion. Second floor doors should incorporate "pan flashing" to prevent leakage and potential damage to the areas below. Weather stripping can be used to help ensure water tightness.

3.2 Typical Window Detail (cont'd)

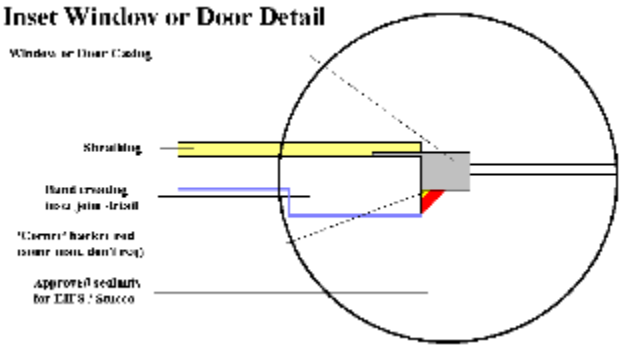


Figure 1: Typical inset window detail (sealed)

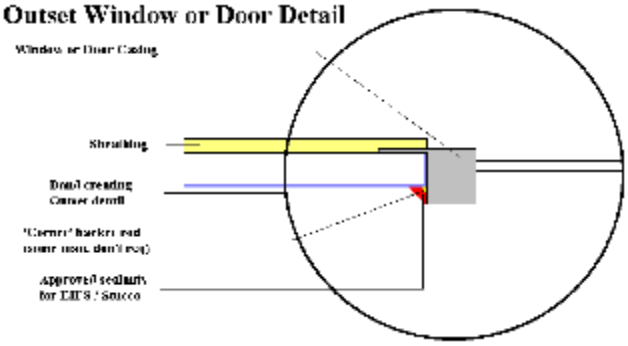


Figure2: Typical outset window detail (sealed)

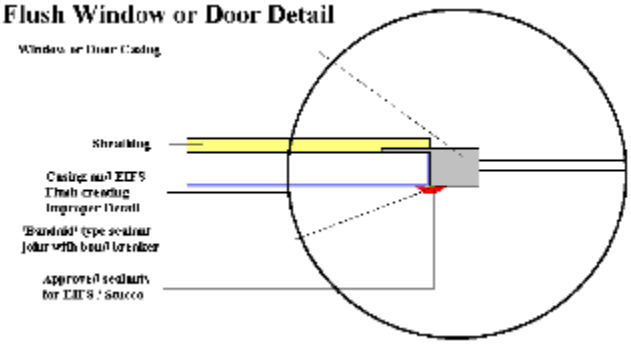


Fig.3: Sealed 'flush' window detail (band-aid join

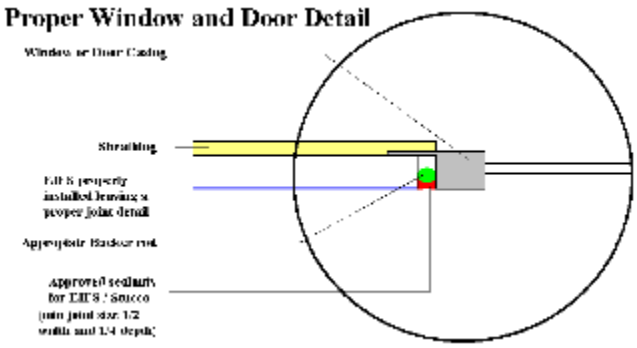


Fig. 4: Window sealed using backer rod at bottom

3.3 Water Intrusion Problems Related to Stucco Termination at Grade Level

According to the Model Codes, as well as many state and county codes, all synthetic stucco homes with foam board insulation must be terminated eight inches above the ground. The reasons for this requirement are:

1) To prevent wicking, a process in which standing water is absorbed by the EPS foam board, which leads to mold and mildew behind EIFS. Figure 1 shows an example of a home where the stucco system was not backwrapped and extended below grade. Water wicked up behind the stucco, causing mold, mildew and decay of the underlying sheathing. Wicking can also occur when stucco is terminated at grade level as seen in Figure 4.

2) To eliminate a direct path for termites through the EPS board as well as establish easy access for termite inspectors.

Termite problems associated with stucco systems that extended below grade were recognized in 1996 and various code bodies began to change code requirements. Because of the increased risk of termite infestation, many pest control companies won't issue termite warranties for buildings with below grade stucco terminations including 'hard coat' stucco systems in many cases. One way this problem can be resolved by cutting the stucco eight inches above grade and adding a PVC accessory trim to "lock" the EPS board in place (Figure 2). The PVC accessory trim is an optional item that looks nice and eliminates the need for backwrapping the EIFS. The trim is then sealed with a high-quality sealant. Finally, a textured coat is applied to the bare foundation wall and colored to match the existing EIFS. The pictures below show a cutback with accessory trim. Once landscaping is in place, the modification is hardly noticeable (Figure 3).


Fig. 2 Cutback finished using PVC trim


Fig. 1 Moisture caused by the wicking process


Fig. 3 Cutback complete with landscaping


Fig. 4 Moisture at improper termination

3.4 Water Intrusion Problems Related to Improper Kickout and Other Roof Flashing

Kickout Flashing: Many water intrusion problems in stucco or EIFS homes are the result of improper kickout flashing installation or the lack of kickout flashing. Kickout flashing should be installed where a roof line terminates or intersects with a vertical wall. The word kickout means exactly that; it kicks the water out and away from the stucco system.

If no kickout is installed Figure 1) or if it is improperly installed/sealed (Figure 2), the water can run down the edge of the roof next to the stucco wall and enter behind the stucco at the point where the roof terminates into the stucco. This will allow substantial moisture accumulation that will eventually cause decay as seen in Figure 3.


Figure 1: No kickout flashing


Fig 2: Improper installation (unsealed)


Figure 3: Failed flashing


Fig.4: Proper repair kickout installation

Properly installed kickout flashing is absolutely essential. An example of a proper installation can be seen in Figure4.

Installation of a kickout flashing in an existing stucco system involves cutting out the stucco to reveal the step flashing, inserting the kickout flashing under and behind the step flashing. New stucco base, mesh and finish coat is then applied to blend in with the adjacent stucco as closely as possible. Application of bond breaker and sealant is then required as shown in Figure 5. If stucco color cannot be closely matched, it may be necessary to coat the area to a corner if possible.

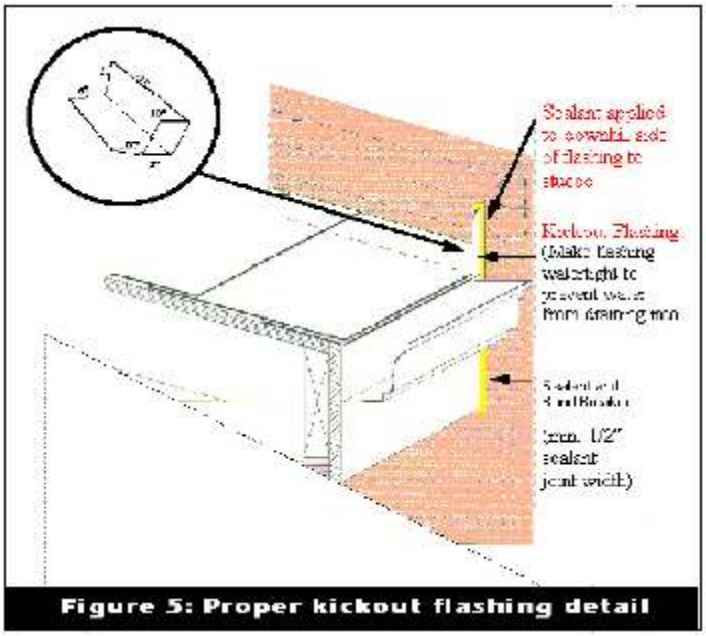
Figure 5: Proper kickout flashing detail

Other Roof Flashing: Since many stucco homes have complex roofing de signs, other critical flashing areas may also be improperly detailed. Any roofline that terminates into stucco may pose a problem.

3.5 Water Intrusion Problems Related to Improper Deck and Balcony Terminations (Cont'd)

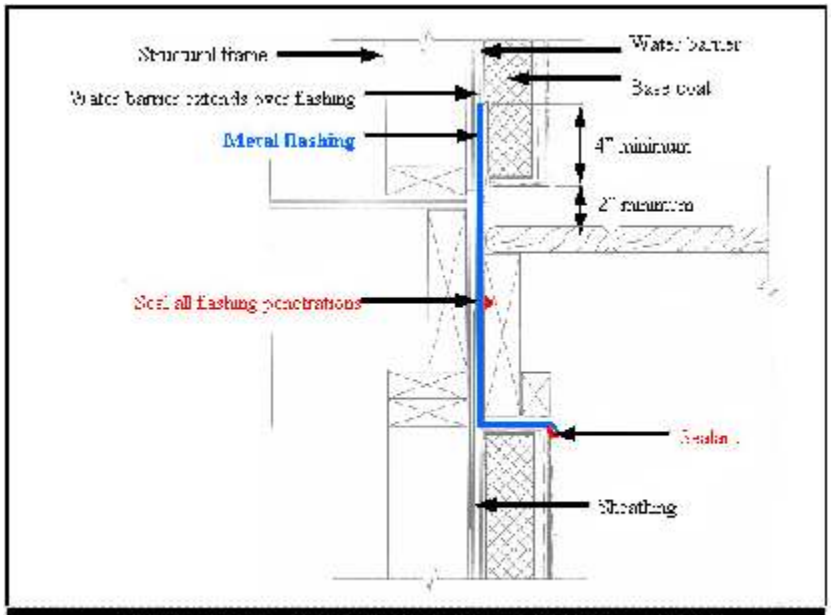

Figure 5: Possible Deck Detail - New

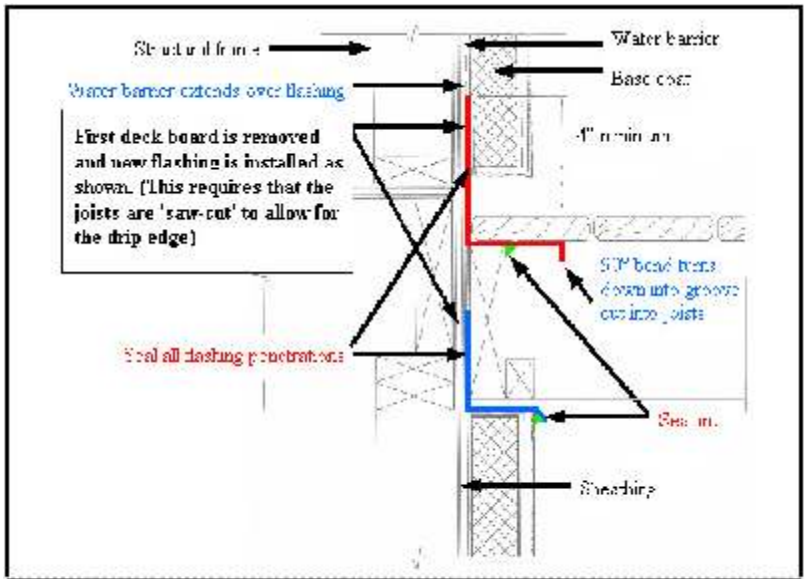

Figure 6: Possible Deck Detail - Post Construction

3.6 Water Intrusion Problems Related to Cracks and Breaches in the Stucco

It does not take a very big crack to allow water intrusion. In fact, a crack as small as 1/16" of an inch wide can permit water to enter behind the stucco, especially with a stucco system that has no moisture barrier. All cracks 1/16" wide or larger and all damaged areas of stucco should be properly repaired as per manufacturers guidelines. Many times the patched areas will still be slightly noticeable even with a good repair application. Extreme cracking will sometimes require the reapplication of EIFS base, mesh, and finish to prevent more cracking and provide a consistent appearance. Cracking is common in hard coat stucco systems, therefore expansion joints are called for every 144 sf, as well as between floorlines and extending vertically from window and door corners to help control cracking. One reason EIFS is so popular, is that these expansion joints, which many feel are unsightly, are not usually necessary with EIFS. The exception to this is that they are needed between floorlines to compensate for the cross-grain shrinkage of wood. As seen in Figure 1, the lack of an expansion joint between floorlines will result in a compression crack in this area. Again, consult with manufacturer for specific requirements of expansion joints.

The most common areas that experience cracking in EIFS are at the corners of windows or roof terminations as seen in Figures 2 and 3. To prevent cracking in this area, most manufacturer and EIMA details specify that an additional layer of reinforcement mesh be applied diagonally at the corners of all windows, doors and other openings. This is called "butterfly" mesh.

Another common cause for cracking in EIFS is the failure of the stucco applicator to stagger the insulation boards or filling gaps in the EPS boards with basecoat rather that "slivers" of foam as required by manufacturers.


Fig. 1: Example of cracks at floorlines


Fig. 2: Example of crack at window corner

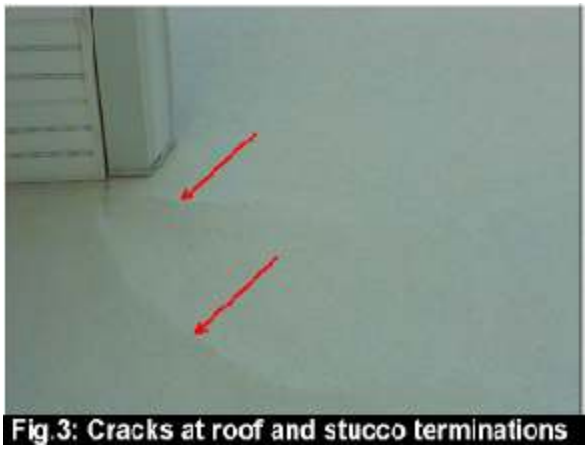
Fig.3: Cracks at roof and stucco terminations

3.7 Water Intrusion Problems Related to Stucco Accents and Flat Stucco Surfaces

Flat stucco surfaces, whether conventional hard coat stucco or EIFS, collect and hold water in its rough texture, softening the finish coat, damaging the system and promoting leaks, mildew and discoloration. A good EIFS design will call for bands, quoins, and other accents to have a slope to prevent water accumulation.

The easiest corrective measure would be to coat all flat surfaces with an elastomeric waterproofing coating tinted to match the existing stucco color as closely as possible. Large flat areas, such as a parapet wall, can be capped with metal and sealed.

The joint area where quoins, bands and accents meet the vertical wall surface should be checked for cracks and separation. Cracks and gaps are most likely to occur in this area if these accents have not been properly backwrapped. Backwrapping is bringing the mesh and basecoat around the back of the EPS foam accent. Cracks and gaps should be sealed with an appropriate sealant.

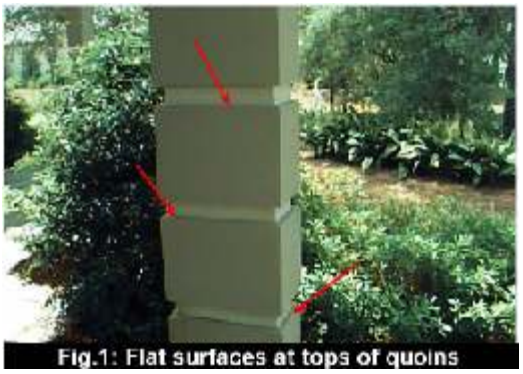
Fig.1: Flat surfaces at tops of quoins


Fig. 2: Flat surfaces on top of beams


Fig. 3: Flat surfaces collect water

3.8 Water Intrusion Problems Related to Stucco Chimneys

No matter whether the exterior cladding is brick, stucco, or vinyl siding, chimneys are a prime area for water intrusion since 1) they intersect with the roof and 2) they're subjected to extreme expansion and contraction due to the hot and cold temperature fluctuations when the chimney is used during the winter. This extreme expansion and contraction can fatigue the sealant joints around the chimney and cause cracks or gaps to form around the edge of the stucco where the stucco terminates into the chimney structure, allowing water to enter. Therefore, water diversion through the use of flashing and properly sealed chimney caps are very important.

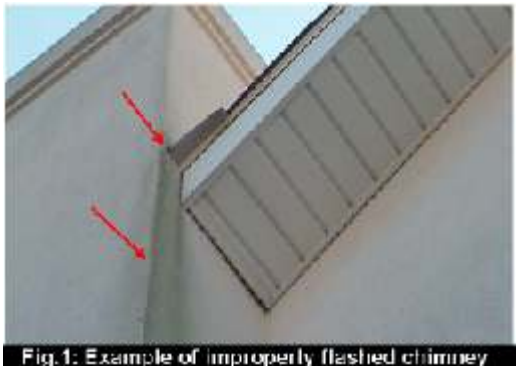

Fig 1: Example of improperly flashed chimney

A properly designed chimney cap (coping) will shed water away from the stucco to metal joint (Figure 2) and help prevent leaks in this area. The flue should be properly sealed to the "storm flashing" and the chimney cap (coping) sealed to the stucco.

Fig 2: Chimney cap to stucco should be sealed

Figure 1 shows a chimney that was not properly flashed (sidewall and kickout flashing see section 3.4) which resulted in wood rot and termite infestation. Figure 2 shows a chimney coping that was not sealed to the stucco which has now separated and will allow water into the chimney chase.

3.10 Water Intrusion Problems Related to Improper Transitions

Many buildings incorporate two or more exterior finishes in their design, such as stucco and brick, stucco and stone, stucco and tile, stucco and wood, stucco and vinyl or aluminum siding, etc.

Different materials expand and contract at different rates. This expansion and contraction causes a crack or gap to form where the two materials join.

If left unsealed, or if sealed improperly, this area will allow water to enter the wall cavity. Examples of this would include stucco to wood trim, stucco to brick (Figure 1), stucco to stone (see Figure 2), stucco to concrete, etc. All areas such as these should be sealed with quality sealants and appropriate bond breakers.


Fig 1: Stucco to brick transition needs sealing


Fig.2: Stucco to stone needs to be sealed

Hardcoat systems are also susceptible to moisture damage if not properly applied, caulked and flashed. In this respect, it is no different than EIFS. Again systems with OSB (oriented strand board) sheathing tend to experience more severe damage when leakage occurs. One disadvantage of traditional hard coat stucco is that it is more susceptible to cracking than synthetic stucco due to expansion and contraction. For this reason, ASTM calls for expansion joints every 144 square feet, as well as between floor lines and at the corners of windows.

C. Water Management or Drainable EIF Systems:

Water management systems typically use a drainage plane behind the stucco coupled with perforated starter strips at the bottom of the walls and under windows to allow any incidental moisture to weep to the outside of the wall. Once the moisture drainage system is properly installed the installation of the EIFS is less critical. Problems can still occur however, if the drainage system is not properly installed (difficult to verify after completion of EIFS application).

4.2 IS STUCCO A GOOD CLADDING SYSTEM? Yes, as long as any construction defects, if any, are properly repaired and the system is well maintained, it should provide good long-term performance. There is no such thing as a permanently maintenance free cladding system. Leak problems occur in all types of cladding systems, including brick and vinyl siding. The only difference is that with stucco, the maintenance is more critical. The sealant joints are your first line of defense against water intrusion, and sometimes it's the only line of defense. Water intrusion must be prevented at all costs due to its destructive nature.

4.3 CARE AND MAINTENANCE: The beautiful architectural designs made possible by synthetic stucco systems make these homes very desirable and marketable. It is critical, however, to carefully maintain these systems to prevent water intrusion and deterioration. With the proper care and maintenance, your stucco system should give you many years of beauty and function. It is very important that the five following steps be followed to protect your investment.

(1) Semi-annually (at least annually) inspect all sealant around windows, doors, penetrations through the stucco, stucco transitions (such as stucco to brick, stucco to stone), and stucco terminations (at roof, at grade, at patios or walkways). Arrange for prompt repair of any areas of caulk that is split, cracking, crazing or is losing adhesion. Also, promptly repair any cracks in the stucco.

(2) Any leaks, cracks, areas of discoloration, mold or mildew should be promptly investigated by a certified EIFS inspector. Repairs should be proper and prompt.

(3) Anytime you make a penetration though the stucco such as to mount a satellite dish, add shutters, new wiring, cables, plumbing, security systems, etc., the perimeters must be sealed with a quality sealant approved for EIFS.

(4) Modifications, additions or renovations (including roof replacement) to the structure of any kind should be inspected by a qualified EIFS inspector to ensure waterproofing of critical details is properly performed.

(5) Periodic cleaning of the stucco is necessary to maintain its appearance and prevent permanent staining. Pressure cleaning equipment must be calibrated to the stucco manufacturer's recommended pressure level (low) to prevent damage to your stucco. Select a firm with experience in cleaning these EIFS systems.