



Rockwell Contractors Inc.

EIFS Moisture Inspection Report

For the Property Located At:

1318 White Oak
Murfreesboro, TN 37130

Report Prepared For:

Frank Drowota



Rockwell Contractors Inc. 109 Andover Green, Franklin, TN 37069
Phone: 615-403-8667 Email: rjiroch@hotmail.com



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Project Information

OWNER INFORMATION		BUYER INFORMATION	
Owners	Frank Drowota	Buyers	
Property Address	1318 White Oak	Buyers Address	
City, State, ZIP	Murfreesboro, TN 37130	City, State, ZIP	
Phone		Phone	
FAX		FAX	
Owners Realtor		Buyers Realtor	
Realty Company		Realty Company	
Phone		Phone	
FAX		FAX	
PROPERTY INFORMATION		INSPECTION INFORMATION	
Type of Exterior Cladding	EIFS	Date of Inspection	07/12/17
System Manufacturer	Dryvit	Inspector	Rockwell Jiroch
Mesh Color	Blue	Present at Inspection	myself.
Underlying Substrate	not known	Temperature / Humidity	93/48
Age of Property	23 Years	Weather	Sunny
Square Footage	2858 sq.ft.	Last Rain	None within 24 hours

Inspection Test Equipment					
Test Equipment Description		Test Range			Setting
		Low	Medium	High	
A	Tramex Interior Moisture Encounter	10-14	15-19	> 19	2
B	Tramex Exterior Wet Wall Detector	10 - 20	21-50	51-100	4.5
C	Delmorst Moisture Probe Meter	10-14	15-19	> 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.



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Summary Checklist

Caulking	Good	Not Adequate	N/A	Comments
Caulking Around Window Frame		X		Windows have metal cladding over wood. The caulk is not visible, but most have caulk beneath metal.
Caulking At Window Joints / Miters		X		Window are the vinyl replacement window with welded seams
Caulking Around Door Frame		X		need caulking.
Caulking At Door Joints / Miters		X		Caulk all door joints or miter joints, including thresholds.
Caulking Around Other Breaches		X		All utility breaches, including hose bibs, light fixtures and vents, need to be caulked or re-caulked.
Flat Accents Caulked or Angled	X			
Soffit, Frieze & Facia Boards Caulked		X		Exposed gaps where stucco meets another material need to be caulked.
Flashings / Diverters	Good	Not Adequate	N/A	Comments
Kickout Flashings / Roof / Wall		X		A kickout flashing is missing over the front entrance. It needs to be installed.
Deck Flashings			X	
Other Attachment Flashings			X	
Porches / Stoop Flashing			X	
Chimney Cap	X			
Chimney Cricket				
Window Head Flashing			X	
Door Head Flashing			X	
Column Flashing			X	
Terminations	Yes	No	N/A	Comments
EIFS Is Terminated Above Grade	X			
EIFS Is Sealed At Bottom	X			
EIFS Is Terminated At Porches		X		



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Summary Checklist Continued

Miscellaneous	Yes	No	N/A	Comments
Evidence Of Sprinkler Overspray		X		
Gutters Clean & Functioning	X			
Down Spout Fasteners Sealed		X		All downspout fasteners need to be sealed.
Cracks Or Impact Damage	X			see photos.
Delaminating At Foam / Substrate		X		
Exterior Evidence Of Pest Infestation		X		
Adequate Slope Of Grade Away	X			
Crawlspace Inspection Made		X		
Property Located Near Body of Water If Yes, Describe	X			Small drainage ditch on right side of house.



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Moisture Inspection Summary

Summary Observations:

A complete full probe and visual moisture inspection was done on the home following all current guidelines and protocol for the the moisture inspection of stucco homes as specified by Moisture Warranty Corporation, the leading authority in the inspection, remediation and warranty of EIFS and stucco clad homes.

Windows and kickout flashing locations were probed with a Delmhorst moisture meter .

The acceptable range for moisture in the substrate behind the system in stucco clad homes is from 6.0 to 19.0. All readings detected over 19.0 denotes an elevated moisture reading and indicates that moisture is getting in behind the system.

The main causes of moisture entering behind the system can mainly be attributed to any or all of the following:

Lack of adequate caulk on window frames and on the inside window construction. On door frames and door threshold construction and on utility breach locations such as light fixtures, vents and outlet boxes. Missing or failing roof kickout flashing locations outlet boxes. Missing or failing roof kickout flashing locations, rotted or damaged window / door construction or gaps or damage in the Stucco.

Elevated Moisture

There were 4 locations with high moisture readings. (See photo elevations for locations) Sources of leaks need to be addressed and repairs need to be made.

General Observations

This is a EIFS (exterior insulation finishing system)cladded home. It is in generally good condition. Mold and dirt need to be cleaned off the front of the house.

Caulking

Touch up caulking needs to be completed on some of the window with elevated readings. All lights, hose bibbs, and utilities need to be caulked.

Roof Kickout Locations

A kickout flashing needs to be installed over the front entrance.



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Wood Rot

Wood rot was noted on the pedestrian door to the garage. The the rotted wood should be replaced .

Damage/Cracks

See photo page for locations of EIFS damage.

Compression Wrinkles

No bulges were noted.

EIFS Above Grade Level

The bottom of the stucco is properly terminates above the grade level around the perimeter of the house.

Conclusion

Please note that the moisture readings included in this report are the raw data recorded by the Delmhorst probe meter. Moisture levels are affected by the ambient weather conditions and other factors, and this can result in variations between the readings taken on one day and readings taken in the same area on another day. The readings provided in this report are accurate indicators of the presence of retained moisture at the surface of the substrate or framing wood in the area tested at that given moment in time. These readings are not represented to be the absolute moisture content of the full thickness of the substrate or framing wood.

This report only reports on the condition of the structure at the specific locations indicated. Locations were determined by the inspector according to probable areas of possible moisture intrusion and in accordance with accepted industry standards. No judgment is intended or given for any areas not reported on.

Recommendations:

1. Caulking is needed for elevated moisture reading on windows, door thresholds and mitered corners need to be caulked, All lights, utilities and hose bibbs need to be caulked(see photos for locations)
2. Repair damaged EIFS noted on the photo pages
3. A Kickout need to be installed on the front of the house (see photos for locations)
4. Bird holes need to be repaired.
5. Replace or repair damaged wood on garage door.
6. Repair EIFS below back door and caulk.
7. recommend cutting the EIFS 1 1/2 inches off the roofline at bottom of chimney.
8. Repair Chip on right side of house.

Sincerely,

Rockwell Jiroch,

EIFS Inspector, Moisture Analysis, EIFS QC Inspector, Building Envelope Inspector

Exterior Design Institute- Certification # TN-34



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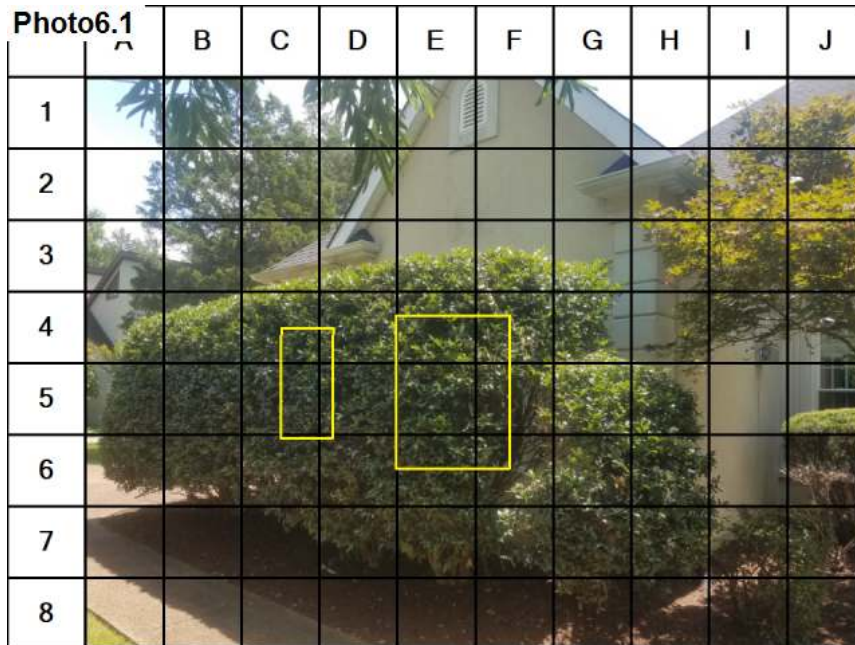


Photo6.4

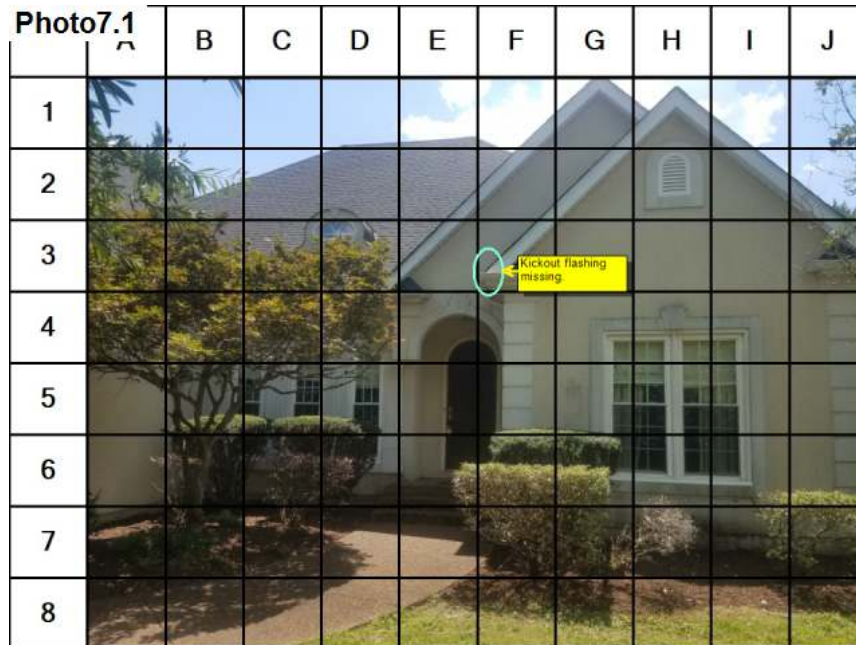


this a photo of the typical metal cladding over wood windows.

Grid Location	Item Description	Moisture Readings	Substrate Condition	Observations	Chapter Reference
C6	Windows	40-10.1	Firm	Elevated reading on the left side of this window	
EF6	Windows	21.2,8.9,8.1	Firm	This a double window behind bush.	



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Kickout should be installed here.



Porch needs caulking, theshold needs caulking and electrical socket



All lights need caulking.

Grid Location	Item Description	Moisture Readings	Substrate Condition	Observations	Chapter Reference
BC-6	Windows	10.8-12.2	Firm	Readings are front left to right below the windows.	
C6	Windows	9.1-7.5	Firm		
D6	Windows	12.1-18.1	Firm		
F4	Kickout	24.6	Firm	Kickout is missing and needs to be installed.	
GH6	Windows	10.1-11.4	Firm		
H16	Windows	11.4-12.2	Firm		



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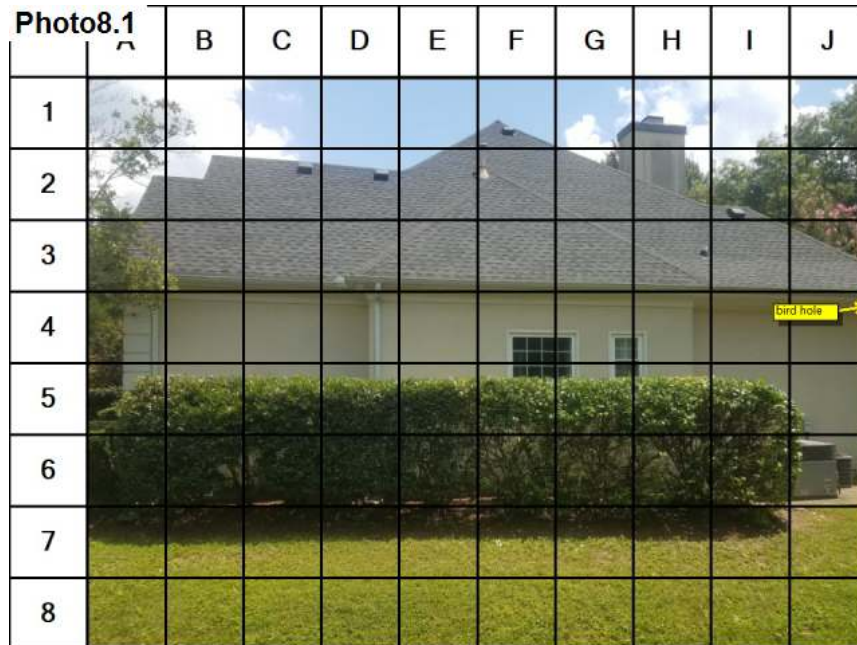


Photo8.4



Crawlspace door needs to be caulked.

Photo8.5



Bird hole needs to be repaired.(J4)

Photo8.6

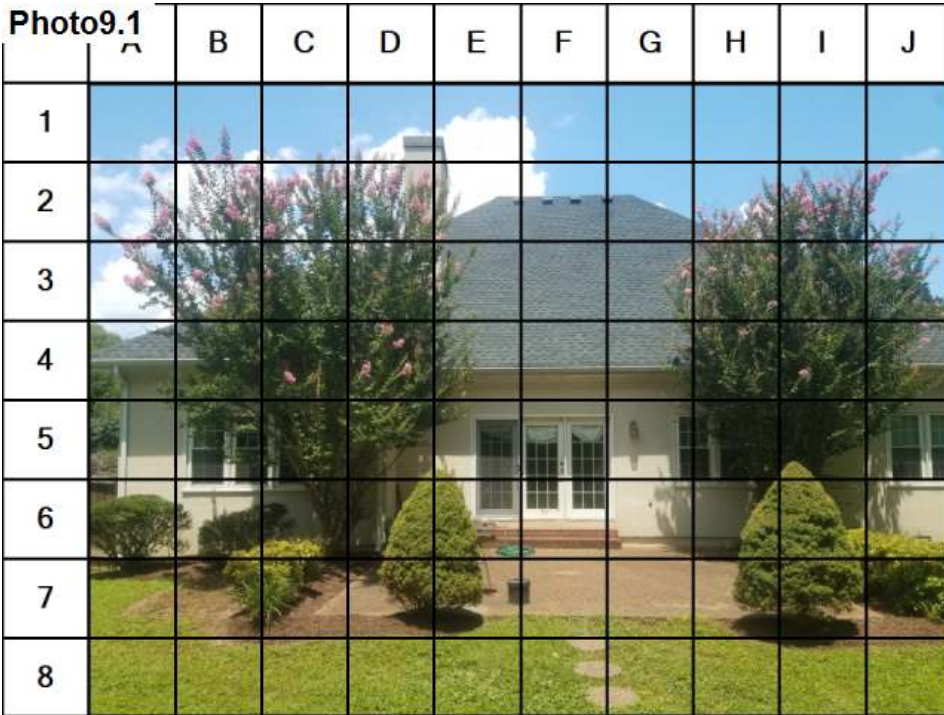


Finish need to be added to this chipped area.(G5)

Grid Location	Item Description	Moisture Readings	Substrate Condition	Observations	Chapter Reference
FG5	Windows	10.2-6.6	Firm		
GH5	Windows	6.7-7.2	Firm		



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Crack notice below door. Needs repair.



Area below door is delaminated and needs repair.



Small Crack at J5.



Bottom of chimney needs repair.

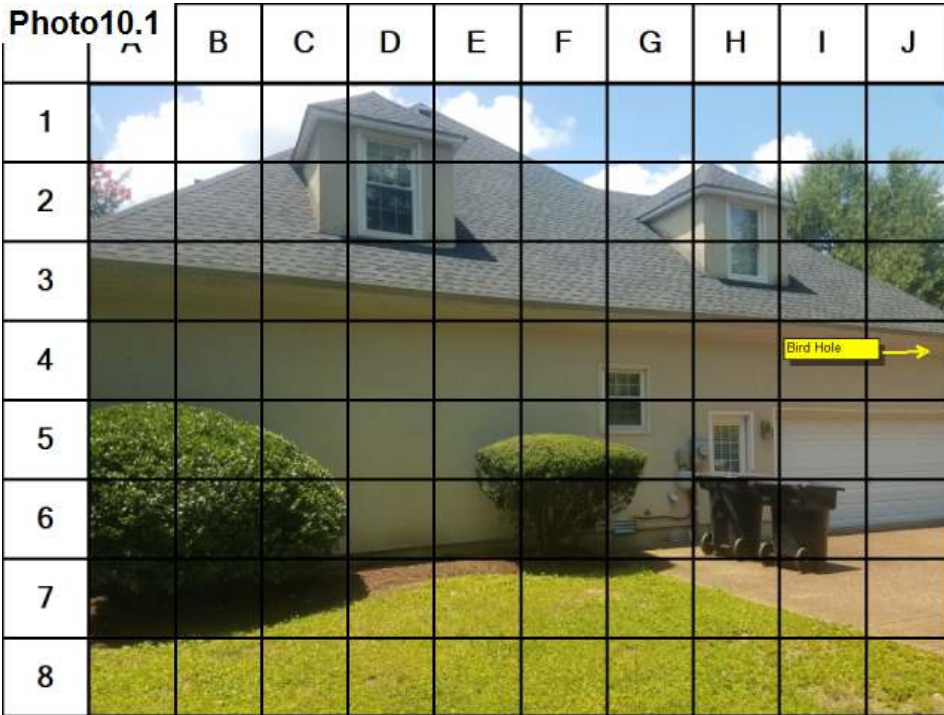


Bottoms of these door are rotting.

Grid Location	Item Description	Moisture Readings	Substrate Condition	Observations	Chapter Reference
B6	Windows	15.8-7.7	Firm	Area where moisture reading was obtained.	
B6	Windows	7.7-7.0	Firm		
C6	Windows	7.0-8.9	Firm		
E6	Doors	27.3-20.5	Firm	elevated reading below the doors.	
F6	Doors	9.1-7.7	Firm		
GH6	Windows	7.7-7.5	Firm		
H6	Windows	7.5-8.8	Firm		
J6	Windows	10.4-7.5	Firm		



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Bird Hole at J4.



Hose bibbs need caulking.



Brick mold at bottom of door needs replacing.



Brick mold at bottom of door needs replacing.



Utility boxes need caulking.

Grid Location	Item Description	Moisture Readings	Substrate Condition	Observations	Chapter Reference
G5	Windows	8.6-8.5	Firm	Readings are front left to right below the windows.	
H6	Door			Wood rot at bottom of door.	



4. Stucco Information, Care and Maintenance

4.1 TYPES OF STUCCO

A. Exterior Insulation and Finish Systems

Sometimes referred to as synthetic stucco, the materials used to form EIFS vary from manufacturer to manufacturer. EIFS is broken down into two classes, Class PB (polymer based) and Class PM (polymer modified). Class PB is the most commonly used of the two, especially on residential. Figure 1 shows the typical makeup of an EIFS system, although this can vary. The EIFS can be adhered directly to the substrate or mechanically fastened.

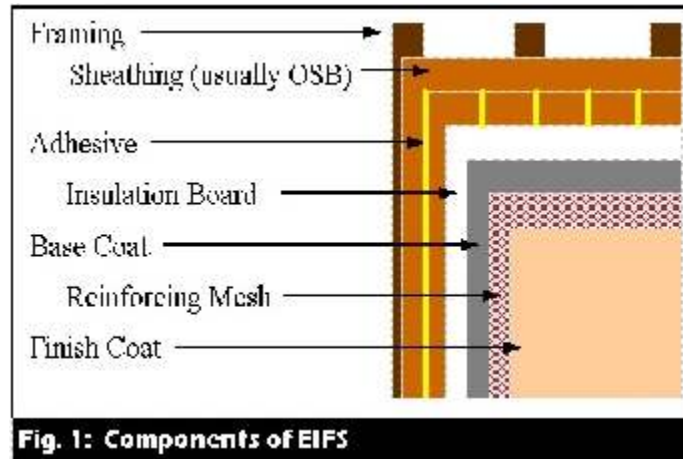


Fig. 1: Components of EIFS

An adhered EIFS is typically considered a "barrier" type cladding system. These systems do not have any built-in drainage capabilities for incidental moisture. Rather, the design intent was that **no** moisture should **ever** get behind the stucco. If water does leak behind the stucco, it can become trapped. The only way out many times is through evaporation—a slow process for an enclosed wall cavity with EPS foam. In a wet climate, it may never have a chance to dry out between rains as long as the leaks continue. Mold, mildew, wallboard damage, rotten sheathing and studs, carpenter ants, and termites can all result—depending upon how long it has been leaking. When these systems utilize oriented strand board (OSB) as the substrate for the stucco, which is common in the residential market, the potential for more serious water damage increases. EIFS that are **mechanically fastened** can have some 'drainage' capability if a properly installed moisture barrier system is present and adequately tied into critical details such as windows, doors, flashings, penetrations, etc. (this is difficult to verify after EIFS installation is complete). However structures with **improperly** installed barrier systems tend to experience the same damages of a structure without any barrier system. Some EIFS have been found to leak from construction onward due to improper installation stucco, flashings and sealants and/or leaky windows and doors. Not all EIFS buildings leak, but they do all require that critical details be properly maintained for continued protection from water intrusion. Even small amounts of leakage over time can cause significant damage to the structure, many times hidden until the damage is severe. Each manufacturer publishes details to guide the stucco applicator, sealant contractor, builder and architect. These details may vary slightly from manufacturer to manufacturer. EIMA, the EIFS Industry Manufacturers Association, publishes a detail guide for the entire EIFS industry.

B. Traditional Hard Coat Systems:

Although these systems have been in use for many decades, in recent years it has become popular to place these systems over wood sheathing and studs. The systems makeup is generally studs, sheathing, felt paper or other moisture barrier, reinforcing lath, scratch, brown and finish coat. The scratch, brown and finish coat are usually cementitious (many use acrylic finishes), mixed in the field, and applied to a thickness of about one inch.



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Hard coat 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 through 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.



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Caulking Materials

There are hundreds of different caulking materials on the market which claim to be designed for use on the exterior of homes. However, stucco homes and specifically EIFS homes require special types of caulking which must be applied using proper techniques to ensure the longest possible service life. Caulking is not intended to be a permanent solution to moisture intrusion, but rather a component of the home's weather barrier which will require repair and replacement from time to time. Properly caulked joints should last anywhere from three years up to 15 or 20 years. Proper selection and application of the caulking material is critical to a long service life.

The following brand names and types of sealants have been used successfully on many stucco homes.

<u>Manufacturer</u>	<u>Sealant</u>
Dow Corning	Dow Conning 790, 791, 795
Tremco	Dymeric 511
Tremco	Spectrem 3
Pecora Corp.	Dynatrol II
Pecora Corp.	890 Silicone
Mameco International	Vulken 922
Sika Corp.	Sikaflex 2C or 1A
GE	Silpruf LM (SCS 2700)
Chemrex	Sonneborn- Sonolastic NP 1
Bostik	Chem-Caulk 915



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.

Properly installed kickout flashing is absolutely essential. An example of a proper installation can be seen in Figure 4.

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.

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



Figure 1: No kickout flashing



Fig 2: Improper installation (unsealed)



Figure 3: Failed flashing



Fig 4: Proper repair kickout installation

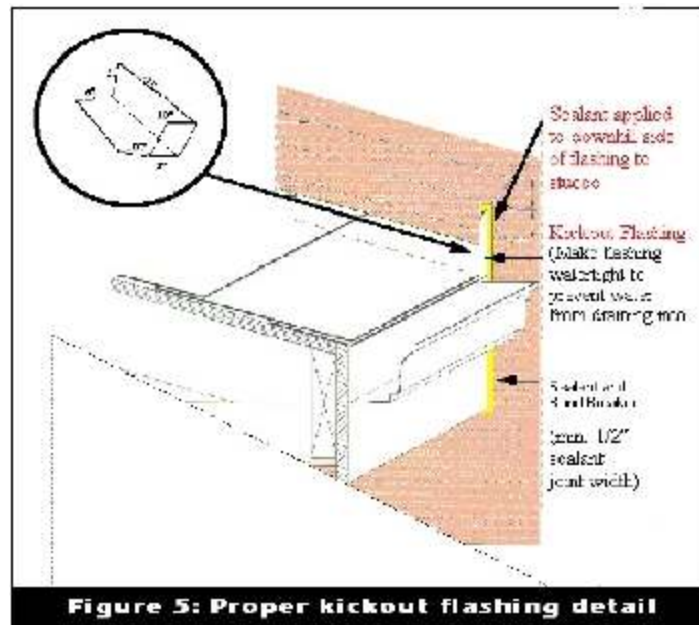
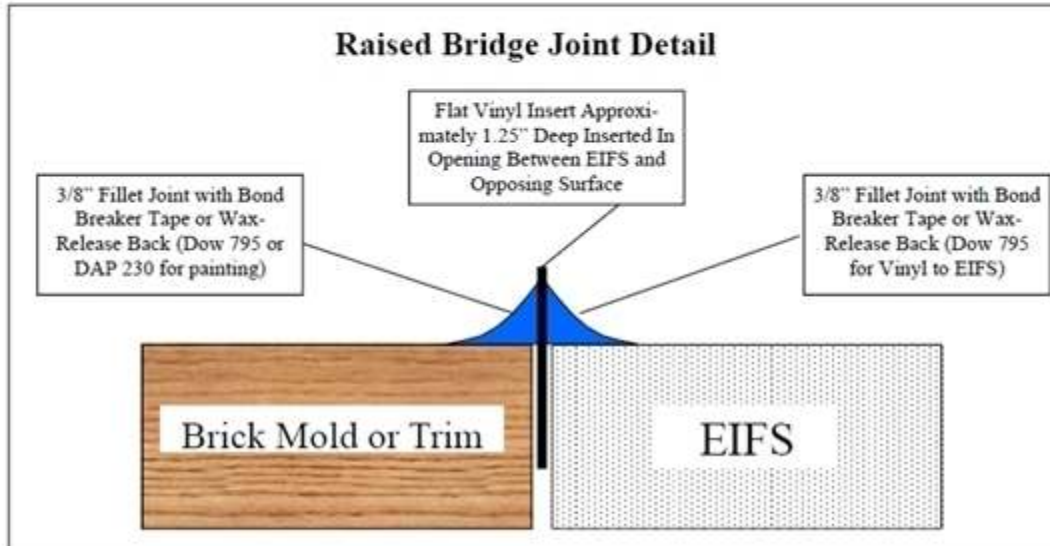


Figure 5: Proper kickout flashing detail



Installation of a Raised Bridge Joint

Raised Bridge Joint Detail



The raised bridge joint is a good solution when the opposing surface to the EIFS is metal, vinyl, or wood that would be difficult to modify. The floating vinyl shim allows for the installation of the opposing fillet joints. Also, the vinyl shim itself is flexible giving extra movement to the joint.