Report No. 05-123

EIFS Moisture Intrusion Inspection Report

Prepared for: John Homebuyer
Property Location: 125 Waterfront Way.
The Shore, NJ 00000
Date: June 2005

Prepared by: 

Peter G. Engle, PE

for:

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EIFS Installation Details At-A-Glance

No.	Description	Present?		Correct?	
		Yes	No	Yes	No
1	Window Head Flashings		X		X
2	Window Sill Flashings		X		X
3	Window Joint Detail (backwrap, backer rod, caulk)		X		X
4	Door Head Flashings		X		X
5	Door joint detail (backwrap, backer rod, caulk)		X		X
6	Roof/Wall Intersections: step flashings	X		X	
7	Roof/Wall Intersections: EIFS 1"-2" above roof surface	X		X	
8	Roof/Wall Intersections: Kickout flashings		X		X
9	Gutter Ends Spaced away from EIFS	X		X	
10	Joints at Dissimilar Materials (backwrap, backer rod, caulk)		X		X
11	EIFS Terminates Above Grade		X		X
12	Deck & Other Ledger Flashings	X		X	
13	Control Joint at Floor Bands		X		X
14	Seals Around Utility Penetrations		X		X
15	Fixture Attachment (sealed, not nailed/screwed directly)		X		X
16	Beveled Tops on Architectural Accents		X		X
17	Is Mesh Covered by Base Coat (should not be visible)	X		X	
18	Drainage Plane, Track, Accessories	N/A			
19	Mechanical Damage	X			X
20	Visible Cracks	X			X
21	Telegraphing Joints		X	X	
22	Loose / Bulging Material	X			X
23	Trapped Moisture and Damage Detected	X			X

NOTES:

1. These are comparisons against EIMA and Sto installation requirements. See full discussion inside for complete details.

2. Improper installation details and/or damage to the system can result in leakage. Any significantly elevated moisture readings are listed in the data sheets in Appendix B

Table of Contents

Executive Summary

This house was built approximately in 1988, and the EIFS is original. The house is clad with EIFS on all four sides, and the system appears to be a barrier style EIFS. The system appears to use primarily Sto materials. Overall, the cladding on the house is in cosmetically poor physical condition, and the system was not installed properly on the house, even by the standards of the day. There is water leakage that has damaged large sections of the house on two faces, and smaller areas on a third side. Due to the age of the system, the use of barrier style EIFS, and the generally poor cosmetic and moisture performance, we recommend replacement at this time.

Background and Scope

Traditional EIFS (Exterior Insulated Finish Systems) are face-sealed or barrier type claddings for buildings. Because they rely on a perfect seal at the exterior surfaces, they are susceptible to entrapment of moisture inside the system. Water can enter the system where seams and seals fail, where moisture migrates from inside the building and where punched openings (windows, doors, etc.) are present. Because of the low permeability of the finish, water trapped behind the EIFS cannot dry out quickly toward the outside of the wall. Depending on the rest of the wall system design and installation, there may also be limited drying potential to the inside. Limited drying potential in combination with high leakage potential can lead to moisture buildup inside the wall, and eventually to mold growth and structural decay.

Water-managed (or drainable) EIFS was developed in the 1990's to address the water management problems inherent in the barrier-type systems. By 1995, the leakage problems were well-documented in the trade press, and most manufacturers have required the use of drainable EIFS since 1997. The drainable systems include a backup drainage plane of water-resistant building paper behind the system and drainage details to allow water to drain out of the system. Drainable systems can exhibit dramatically enhanced performance, if the backup drainage plane and drainage details are properly installed. If these details are improperly installed, the drainable systems exhibit the same failure modes as barrier-type systems.

The primary goal of this inspection is to determine the overall condition of the cladding and where possible, the condition of the sheathing and framing inside. Additional goals of this inspection are to locate specific areas where the installation details may make the system prone to leakage, and to further investigate the actual moisture content of the wall system behind the EIFS. We follow the testing protocol developed by the Georgia Association of Home Inspectors (GAHI).

Additional destructive investigations are required to determine the actual amount of structural damage caused by high moisture levels detected during this inspection. This inspection cannot identify as defective any areas which are dry at the time of the inspection, nor where hidden damage may be present which has no visual clues. Please note that long periods of dry weather can allow trapped moisture to dry out, and that this is difficult to determine during the inspection.

Admittedly, one of the inherent flaws in EIFS wall systems is their lack of redundancy in being able to tolerate moisture penetration in the field of a system or at sealant joints and "weep" it to the exterior without damage to the system or substrate.

Tom Remmele [Sto Technical Director] on October 17, 1991

Property Description

The home is a wood framed, single-family structure. The EIFS was installed when the house was built in 1988. The EIFS applicator and builder were not identified for this inspection. The EIF system appears to be a Sto system, with predominantly yellow mesh being the identifying factor, though some red (Finestone) mesh was visible near the soffits in back. The system is installed on 3/4" thick EPS foam. The EIFS is installed on all four sides of the house. The front of the house faces approximately south. There is approximately 5000 sf of EIFS on the building.

The weather during the inspection was mostly sunny and approximately 80 degrees. The weather recently has been dry, with only occasional light rain. There has been no heavy rain for several weeks. The surfaces were dry during the inspection.

Visual Inspection - Observations

The exterior of the home was carefully inspected for general condition, deviations from manufacturer's installation requirements (past and current), and damage that may have occurred subsequent to the installation of the EIFS. The current standards for installation of barrier EIFS from Sto and the EIFS Industry Manufacturer's Association (EIMA) will be used in the discussion below, as the most appropriate predictor of future performance. Most manufacturers have similar standards. Deviation from these standards has been shown to increase the risk of leakage and damage.

Note that the current standards published by Sto for barrier EIFS do not differ significantly from those published in the 1980's, except for the clarity of definition in some cases.

The house exhibited a number of installation defects. See our at-a-glance page for an overview of the installation details. Some common areas of deviation from the standards include: improper flashings at windows and doors, improper joints between dissimilar materials; lack of expansion joints, improper roof flashings, lack of proper seals at roof flashings, and unsealed fixtures and penetrations. In the local climate, these installation defects can cause moisture penetration of the EIFS and subsequent damage inside the walls.

1-5. Window and Door Joints: These joints should be constructed by backwrapping the mesh and basecoat around the end of the EPS foam boards, and leaving a gap between the EIFS and the window or door. This gap is then filled with a foam backer rod and sealant. Window head flashings are required both by manufacturers and local building codes. Door requirements are similar.

There are no caulk joints at most windows, with the EIFS butted directly against the frames (photos 10-13). Some windows have had minor amounts of caulk subsequently applied to the joints.

There are no head flashings above the windows and doors (Photo 12, 13), and no sill pan flashings below them. While head flashings are required by Code and manufacturer's specifications, sill pan flashings are not. However, sill pan flashings are now required by most manufacturers in their current standards.

The windows on the house are seamless vinyl-framed windows. These windows are often considered to be self-flashing, and they are generally not prone to leakage through the frames. These are the best style of window to use with EIFS because of these features. Still, the use of proper flashings and seals is very important to keeping water out of the walls.

6-9. Roof & Gutter Details:
The standard details for residential construction primarily address step-pitched roofs with shingles. This house has tile roof with wide flashings that appear to be lead-coated copper. Ideally, the interfaces between the flashings and the EIFS would still meet the standards for weather protection.

In fact, the roof details are generally well done. There are some very difficult architectural details in front, where different roof slopes intersect with balcony railings, scuppers, gutters and other details. It seems that the flashings were well planed and installed, and we found little moisture intrusion in these locations.

The only roof detail that is missing is the required kickout flashing at the gutter ends where the lower eave edge of the roof intersects with a sidewall. Photo 8 shows this missing detail at the back chimney. Missing kickout flashings are the cause of most of the damage associated with EIFS leakage.

10. Dissimilar Materials: Expansion type joints are required where EIFS meets dissimilar materials, or where the underlying materials change. On this house, there are no joints at dissimilar materials.

11. Lower Edge Termination & Grading: EIFS should always be terminated above grade. Terminating it below grade can allow moisture to wick up behind the system. It also creates conditions conducive to termite and carpenter ant infestations, and these can be difficult to locate due to the shelter provided by the EIFS.

The EIFS has been installed below grade all around the house, and well below the front steps, which appear to have been placed against the EIFS (Photo 14, 15).

Where EIFS terminates above a roof or other surface, the lower edge should be backwrapped to protect it from damage. There are some open and unfinished edges above the roof details in front around the edges of the balcony railings.

The grading around the house is generally flat, and in some areas, the soil is graded towards the house. This concentrates moisture against the EIFS and foundations, and it can increase insect activity and water damage to the finishes at grade. Heavy shrubbery and trees growing against the house (Photo 23) decrease light and ventilation, and reduce drying potentials.

12. Deck Flashings: It appears that the deck ledgers are properly attached to the house, with flashings both above and behind the ledgers (Photo 17). Some of the flashings have been damaged over time, and some appear to have been bent during construction. Still, the deck ledger flashings were well done and appear to be functioning properly.

13. Control (Expansion) Joints: Expansion joints are required at each floor level to accommodate house shrinkage and settlement, and seasonal expansion. This house has no expansion joints between the first and second floors or at the foundation line. There are stress cracks and wrinkles in the system that are typically caused by this lack of expansion joints.

14-15 Utilities & Fixtures: All other penetrations of the EIFS should at least be sealed with caulk. Most of the major utility penetrations and minor fixture penetrations are not sealed (Photo 20, 21).

16. Architectural Accents: Architectural accents must have sloped upper edges so that water drains off of them properly. There are few locations where this is an issue on this house.

17, 18. Basecoat, Mesh, Drainage Details: There were no areas where the mesh was visible, or where it appeared that there was inadequate mesh coverage or bedding.

This house has no drainage details installed. Drainage of these systems has been found to be very important to good performance on wood-framed buildings, but most manufacturers and building codes did not require them until the late 1990's. This house was built well before the building industry was beginning to recognize the problems with barrier-style EIFS.

19-22. Damage and Loose Material: There is some minor mechanical damage near the garage doors, and generally around the house at the base of the system. The damage at grade level consists of a combination of damage from lawn maintenance and water damage to the finishes.

There is severe moisture damage to the EIFS wrapping the deck beams in back (Photo 18). The water is entering through the top flashings on the beams, because these flashings were improperly installed as 2-piece flashings with cutouts for the beams. It appears that the flashings were an afterthought, and they are not functioning to shed water from the beams.

There is EIFS installed on the soffits in back, and this EIFS has detached from the soffits so that it is hanging from the surfaces (Photo 19).

Moisture Testing Results

The weather over the past month or so has been drier than average, and there has been no heavy rain for over a week. The last extended period of rain was several weeks ago. It is entirely possible that areas that experience leakage during rain storms have dried out prior to the inspection. Also, depending on exposure and wind conditions, not all areas that experience leakage will do so in all weather. Areas inside the walls where we locate high moisture levels or damage, or both, are listed in our report. Scanning and probing for moisture cannot identify all areas that have been wet in the past, or all areas where damage exists that may be dry at this time. Any areas with high moisture levels or damage are identified in the data sheets and discussed below.

We initially search for high levels of moisture using a remote moisture scanner – the Tramex Wet Wall Detector. Where excessive levels of moisture are detected by the WWD, the cladding is punctured and the sheathing behind the cladding is probed with a Delmhorst moisture meter to directly measure its moisture level. Any readings that indicated moisture levels in excess of 20% or where damage was noted are listed below. Other readings are listed for information purposes. Our data sheets are reproduced in Appendix B.

With the recent weather conditions and the drying potentials available in general in this house, acclimated moisture levels in areas not exposed to leakage are in the 6%-12% range. Any moisture readings above 12% indicate that the areas have recently experienced at least some leakage and moisture accumulation. Moisture levels between 12%-20% indicate that there has been leakage and moisture accumulation, but if the wood moisture content stays below 20%, there is generally no damage done by rot and mold. Of course, our inspection is just a “snapshot” in time. Areas that are in this range at the time of the inspection may be wetter or dryer at other times. When moisture levels exceed 20%, mold begins to grow and the wood starts to decay. Above 30%, mold growth and decay occur rapidly. Building experts agree that readings above 20% generally justify local removal of the EIFS for inspection of the wood and replacement of any damaged areas.

With the scanner and probe, we found readings at or above 30% in a number of areas, and there is water damage in most of them. There is serious leakage from the missing kickout flashings on the back chimney and possibly from the chimney cap. There is also substantial leakage on the right side of the house from either the upstairs windows or the chimney. There is damage across broad areas of the right side of the house and the back chimney. There is also damage on the left side of the house, but more localized around the windows.

Discussion:

The EIF system was not installed properly on the house. It did not meet standard installation guidelines at the time of installation, and it does not meet them now. However, the deviations from standards were typical at the time of installation. Still, deviation from the standards tends to make an EIFS application more prone to leakage.

NJ building codes currently require that “alternate materials” like EIFS be installed in accordance with their manufacturer’s instructions and qualification requirements. This approach invokes the manufacturer’s requirements as code requirements for new construction. In addition to the potential impact on the performance of the system, failure to install the product properly may void the manufacturer’s warranty, and it may adversely impact the market value of the home. It is also worth noting that some insurance companies are no longer writing new policies or renewing existing ones for EIFS-clad homes, especially barrier EIFS-clad homes, and some mortgage companies are now restricting mortgages to only water-managed (drainable) EIFS. These issues affect the marketability of the home, and may force the replacement of a system, even if it is performing well.

There is clearly serious damage to the sheathing on the back and right side of the house, and there is probably damage to the studs and other structural members as well in these locations. In other areas, there has clearly been leakage from the windows and other penetrations, but there appears to be less damage to the walls.

In back, it is not clear whether there is damage to the deck supporting beams and columns or not. Our moisture testing indicated that they are currently wet, and the physical condition of the EIFS on the beams clearly shows long-term leakage and moisture entrapment. However, if these beams and columns were made with preservative-treated wood, they may have sustained no structural damage form the constant moisture. In fact, if they had been this wet for 17 years, we would expect serious structural damage at this point, and the wood still seems solid. Regardless, it will be necessary to remove the EIFS for inspection if not simply to repair the EIFS. At that time, the beams can be directly examined for damage and repaired as necessary.

Recommendations:

We recommend complete removal and replacement of the EIFS on this house. While it is often possible to repair and upgrade deficient barrier EIFS claddings, the end result is a repaired system that still does not meet all of its original requirements, and it is an obsolete system compared to the drainable systems being installed now. In addition, 17 years is nearing the end of the expected useful life of an EIF system. In order to get the best system performance and maximum reduction of risk, and to locate and correct all of the structural damage, replacement is probably the better option. The decision of repair versus replacement must be made with all of the performance and marketplace risks in mind.

We recommend using drainable EIFS, traditional 3-coat stucco, or one of the newer One-Coat stucco products for the recladding, paying careful attention to Codes, Standards, and manufacturer's specifications for the new application.

When the EIFS is removed from any area, all rotten or insect damaged wood or saturated insulation and other porous materials should be removed and replaced. Remaining mold infected or stained structural materials should be HEPA vacuumed, cleaned with detergents, and treated with appropriate fungicide to reduce future mold growth. We recommend the use of Borate type sprays as safe and appropriate fungicides for this application. Borates also provide residual protection against fungus and wood destroying insects. Cleaning mold infected materials and application of residual fungicides is important to prevent regrowth of the mold and reduce potential adverse health effects from mold exposures. After the wall is allowed to dry, it should be reinsulated and a new cladding system applied, paying careful attention to water sealing and drainage details.

Note that this recommendation contains some prudent steps to take to remove any visible mold growth, and to reduce the chances of regrowth. Understand that some molds are unhealthy, especially for sensitive people, and evaluation of any potential mold hazards is beyond the scope of this inspection. If any severely moldy conditions are encountered or if you have any known sensitivities to molds, an Industrial Hygienist familiar with residential mold testing and remediation should be engaged to provide guidance.

Appendix A
Photographs

		
Photo 1. Front Left Corner		**Photo 2. Front Right Corner**
		
Photo 3. Right Side		**Photo 4. Back Right Corner**
		
Photo 5. Back Left Corner		**Photo 6. Left Side**

		
Photo 7. Back Chimney		**Photo 8. Missing Kickout Flashing**
		
Photo 9. Metal Cricket		**Photo 10. Door & Window Area**
		
Photo 11. Window Sill		**Photo 12. Window Head**

		
Photo 13. Door Head		**Photo 14. EIFS at Door and Stoop**
		
Photo 15. EIFS Below Grade		**Photo 16. Stress Cracks**
		
Photo 17. Deck Flashings		**Photo 18. Moisture Damage to EIFS**

		
Photo 19. Sagging Soffit		**Photo 20. Poorly Sealed Fixtures**
		
Photo 21. Unsealed Utilities		**Photo 22. Difficult Scupper and Roof Detailing**
		
Photo 23. Vegetation Against House		

Appendix B
Data Sheets

Feature Identification/Location Key

Example:

FL1W1LL 0”,-8”

F: Front, also Back, Right, Left
L1: Level 1 is ground floor, 0 is basement, etc.
W1: Window 1, counting from left end of this face.
LL: Lower Left, also Lower Right, Upper Right, Upper Left, Center (ctr.)
0”, -8”: Location of test probe in x,y coordinates:
First coordinate positive is right of indicated corner, negative is left
Second coordinate positive is up, negative is down.

Water Intrusion Report Worksheet

Component Details

Report No. 05-019		**FX File No. 2714**	**Date: 6/22/05**
Builder:		**Age of Home: 17**	
Installer:		**Age of EIFS: 17**	
Manufacturer of EIFS: Dryvit		**Significant Repairs: minor repairs, painting**	

Acclimated Moisture - Sheathing Moisture Not Near Any Opening or Flashing

Area	Reading #1		
1	11%	Left Side, Front Corner, at band joist near steps	
2	13%	Left Side, Front Corner, 3' above band jc	
3			
4			

Windows

Window ID	Location	Reading	Comments	Type	Flashing	Joint	**Window Type**
LL1W1	LR 0,-6"	23%	soft sheathing	V	N	N	Aluminum = A
LL1W2	LL 0,-6"	>30%	rotten sheathing	V	N	N	Aluminum Clad = AC
	LR 0,-6"	28%	soft sheathing	V	N	N	Wood Field Finished = WF
FL1W3	LL -1',-1'	30%	soft sheathing	V	N	N	Wood Factory Fin. = WC
FL1W4	LR -1',6"	13%		V	N	N	Vinyl = V
RL1W1	LL 0,-1'	>30%	Rotten, detached, ants	V	N	N	Vinyl Clad = VC
BL2W2	LL 0,-1'	>30%	rotten	V	N	N	Welded Seam = WS
BL2W3	LL 0,-1'	17%	detached EIFS	V	N	N	
							Window Flashing At:
							Sill = S
							Head = H
							None = N
							Joint @ Frame & Siding
							Backer Rod & Caulk = J
							Surface Caulk Only = S
							Cove (Fillet) Caulk = C
							Bead Caulk = B
							None = N

Meter Type: Delmhorst	Calibration Date: 6/22/05		Insulated Pins? **Y** or N
Page 1 of 2	Inspector:	Peter G. Engle	

Water Intrusion Report Worksheet

Component Details

Report No. 05-019	FX File No. 2714		Date: 6/22/05	

Doors

Door ID	Location	Reading	Location Description	Flashing	Joint	Comments/Definitions	
LL1D1	LL 0,-6"	12%	slightly soft sheathing	N	N	**Door Type**	**Joint Style**
						Wood = W	Backer & Caulk = J
						Metal = M	Surface Caulk = S
						Alum. Clad = AC	Cove (Fillet) = C
						Vinyl = V	Bead = B
							None = N
						Flashing	
						Head = H Sill=S	None+N

Other Flashing Points - Roofs, Decks, Chimney

Area	Reading	Comments
1	>30%	Broad Area of wall behind chimney right side of house, rotten sheathing
2	>30%	Most of back chimney below deck level. Rotten sheathing, probable structural damage
3	>30%	Base of back deck columns, relatively solid wood
4	>30%	Back deck beams, relatively solid wood
5	17%	Left side of back chimney, below missing kickout
6	16%	Right side of back chimney, below missing kiskout. Soft sheathing
7	13%	Near base flashings inside and outside front balcony railings, several locations
8		
9		
10		
11		
12		
13		
14		
15		

Hose Bibb Penetrations

Bibb #1	Bibb #2	Bib#3	Bibb#4

Electrical Fixtures/Boxes/Cables

Fixture ID	Reading#1	Reading#	Reading#3	Description	Comments

Appendix C
GAHI Standards of Practice for EIFS Inspections

THE GAHI PROTOCOL FOR
EXTERIOR INSULATION FINISHING SYSTEMS (EIFS)
MOISTURE INTRUSION INSPECTIONS
ONE & TWO FAMILY HOMES

This Protocol has been developed in an effort to help both the Consumer, as well as the Home Inspectors who are involved in the testing of EIFS for moisture intrusion.

The North Carolina EIFS Task Force adopted the first recognized standards regarding the testing of EIFS. The GAHI Protocol was developed to allow for differences in construction, as well as advances in equipment available. For instance, North Carolina building code requires solid sheathing-plywood or OSB. Every probe on a house in North Carolina will hit wood. Georgia does not have this requirement. Corners are typically sheathed with plywood or OSB, but the balance of the sheathing is typically gypsum.

(NOTE from Almost Home: Homes in NJ are generally sheathed with plywood, with some being sheathed with OSB. This protocol is appropriate for these construction techniques as well.)

The advent of the Tramex Wet Wall Detector has eased the process of inspection. This tester will indicate areas with high or elevated moisture content. This tester will not provide specific moisture content information. An intrusive probe is required for the determination of specific moisture content.

A Moisture Intrusion Test consists of the following:

1. Visual inspection of the house

The object is to identify and note any problem areas or details that vary from EIFS Industry Member Association (EIMA) standards for inclusion in the report.

These items should be noted in the report, as well as referencing the proper EIMA Standards. Inform the client that it is important that they determine the Manufacturer of their EIFS installation. Specifications for installation do vary slightly among the Manufacturers.

The general condition of the construction of the house and stucco (EIFS) wall-cladding should be determined.

Terminations:

Foam should be backwrapped, have an expansion type joint where EIFS terminates on a driveway, patio, sidewalk, etc. This is typically not done, because the flow of residential construction does not allow for this. The exterior concrete flatwork is usually done late in the schedule.

Roof termination

Should be held off of roof a minimum of two (2) inches and backwrapped.

Below grade termination

Foam should not terminate below grade. The foam substrate should be backwrapped and sealed to the foundation approximately 6-8 inches above grade. This mainly serves two purposes; it prevents wicking action of the foam and eliminates a termite path into the structure. The foam creates an ideal environment for the termite, which is impossible to treat.

Backwrapping:

Where the foam substrate terminates, it should be backwrapped, in order to provide for proper protection of the foam. Backwrapping also provides for improved attachment of the substrate to the sheathing.

Backer Rod / Sealant: Windows - Expansion Joints - Grade Terminations

The usage of backer rod and sealant is necessary for the proper construction of an isolation type of joint. Flexible and waterproof.

Expansion Joints: Dissimilar Materials - Floor Bands

Expansion joints should be used where EIFS terminates, or meets a dissimilar material. The typical expansion joint is a flexible, watertight joint utilizing backer rod and sealant. Expansion joints at the floor bands are usually 3/4 inch in width; typical joint at windows and doors is 1/2 inch.

Horizontal Surfaces: Trim Bands, Quoins

There should be no horizontal (flat) surfaces. All surfaces should slope away from the structure.

Flashing:

Flashing should be utilized to properly direct water away from the structure. Doors, windows and deck attachments are the most typical areas where flashing is used. Although flashing has been required for several years, many builders felt that flashing on stucco-type exteriors was not necessary. Check for proper flashing details. Flashing points, where a gutter meets a side wall, are one of the most common areas for excessive moisture intrusion.

Penetrations

Penetrations should be properly sealed. No foam should be exposed. Look for any penetration, not only the obvious. In addition to pipe penetrations, look for fasteners, lights or any object that passes through the EIFS wall-cladding materials.

Damaged Areas

Damaged areas should be noted in the report. Areas that are cracked or damaged should be repaired. The finish coat and base coat material should be removed. If the insulation board is not damaged, the base coat, mesh and finish coat can be reapplied. If there is damage to the insulation board, remove and replace the damaged section of insulation board, reapply base coat, mesh and finish coat.

2.Test Probe

The inspector should prepare a test probe and the holes filled with a sealant labeled in compliance with ASTM-C920, or of a type recommended by the EIFS Manufacturer. The test probe and the color of the sealant should be approved by the homeowner/client.

3. Moisture Detector

The house should be scanned with a Tramex Wet Wall Detector or equivalent. The idea is to scan, or test, every area where moisture is obvious, but also those areas that might not be so obvious. Including, but not limited to, and easy to exceed:

Corners, outside and inside, both faces - minimum every 2 ft.

Around doors and windows, and below.
At the band, each floor level, every 3 ft.
At flashing points - sidewall and gutter return areas.
Around all wall penetrations.

It should be emphasized that the scanners available at this time do not provide adequate information for rendering a conclusive Moisture Intrusion Inspection Report. The technology is limited to providing a basic indication of a possible elevated level of moisture in the area indicated. The areas which the scanner indicates an elevated level of moisture should then be probed using a reliable moisture meter with probes of an adequate length.

The use of a scanner is not mandatory. If the individual doing the testing wishes to probe the entire house, this is acceptable. If this is the case, the amount of probing required is extensive.

4. Reporting

The high readings, along with the specific location of the readings, should be noted in the report. This is necessary so that in the future, the readings can be referenced for a follow up test. A reference for future testing should be indicated in the report. Time frame should be approximately 6-18 months.

The report should indicate the following concerning the readings:

10-19% - Moisture is present in the wall. Additional sealant at the specific area should be sufficient.
20-29% - The source of the water intrusion should be identified, if possible. Appropriate corrective action should be taken to stop the entrance of the water. In many cases, a particular detail may be corrected, or additional sealant installed as a satisfactory corrective measure.
30%+ - This is the fiber saturation point of wood, the level at which decay rapidly begins to occur. The EIFS at these areas should be removed so that the framing can be inspected for indications of rot or decay. Any damaged areas should be repaired or replaced, as necessary.

The problem areas should be clearly identified in the report. There should be a system for identifying the probed areas. This is necessary so that the house can be effectively re-tested. Another inspector may be doing the re-testing.

OTHER TYPES OF INSPECTIONS

It is possible to do a mostly visual inspection of a house and observe conditions that do not meet current EIMA Installation Standards. This form of Inspection, or Consulting Service, should not be confused with, or claimed as, an EIFS Moisture Intrusion Inspection. To do so would be a breach of the Standards and Ethics of the Georgia Association of Home Inspectors.

Contact Information
Georgia Association Of Home Inspectors
P. O. Box 83303 Conyers, Ga. 30013
800-521-5193 (GA Only) or 770-989-2524

Last modified: September 17, 1998

Appendix D
EIFS Maintenance Guide

EIFS Care 101

If you have an EIFS clad home, you're going to need to take care of it. I didn't write this, but I have edited it a little. I think it was produced by EIMA. If you know otherwise, please let me know so I can give proper credit.

HOMEOWNER MAINTENANCE GUIDELINES

PART I - MOLD/MILDEW

General

Mold and mildew are a black/gray, green, red or purple growth that can form at certain locations on the building exterior. The growth of mold can occur in any climate.

Description

Mildew is a fungus that spreads as microscopic spores are carried by the wind. When the spores land on a surface, they feed either on the surface itself or on organic airborne dirt that has accumulated on the surface. The growth of mildew/mold is encouraged by moisture, warmth, organic nutrients, and darkness. (North elevations of buildings are susceptible in particular.) Since the spores travel through the air, their behavior tends to be erratic. During rainy periods, the mildew can appear on previously unaffected areas. To the unaided eye, mildew frequently resembles dirt.

Mildew and mold like warm, moist, shady locations, such as under eaves, near or behind bushes, shrubbery and trees and on soffits and walls that are frequently shaded from the sun. However, during humid and/or rainy periods, mil-dew/mold can obtain a foothold on virtually any exterior area.

Cleaning Recommendations

Option No.1 - Pre-wet the area with clean water and wash with a solution of three (3) parts water to one (1) part household bleach. Apply solution and let set of 15-20 minutes. Do not let solution dry on the surface. (A mild liquid detergent or soap may be added to this solution to improve cleaning ability.)

Use a soft bristle brush (non-metal) and gently scrub the affected areas. Rinse thoroughly (use low pressure lawn and garden type hose) and repeat as needed. Note: Water down all shrubbery, trees, and flowers near areas where the solution is being used. Wear protective eyewear and protect your hands and arms with gloves and a long sleeve shirt as necessary. Before adding a liquid detergent to any household bleach solution read the labels to see If they contain ammonia or ammonium compounds. Bleaches should never be mixed with any detergents or cleaners containing ammonia. These-mixtures can cause harmful vapors. Follow all instructions on the label.

Option No. 2 - Use available commercial cleaners specifically formulated to clean mold and mildew from Exterior Insulation and Finish Systems.

NOTE: We do not recommend the use of pressure washers for cleaning because of the danger of forcing additional water into the walls. Low pressure, hose-end sprayers are acceptable.

Recommendations to Avoid Mildew

1. Mildew/mold is an organic growth supported by warm, moist, shady conditions with the following contributing factors:

    A. Climatic conditions: mold/mildew is more significant in a warm humid environment.

    B. Texture of finish: coarse textures will collect more airborne dirt with potential organic nutrients than finer textures.

C. The proximity of shrubbery and trees: creates shade and reduces air circulation. This reduces natural evaporation.

D. Poor drainage from roofs: will maintain a high level of moisture in designated areas.

E. Internal moisture within Exterior Wall Systems: will maintain a high level of moisture at the surface. This may be from internal condensation or physical leakage.

Each of these conditions contributes to mold/mildew. The climatic condition is an environmental issue, however, trees and shrubbery may be positioned away from the building, particularly the north elevation, to promote natural air circulation for natural evaporation.

PART 2 - AIRBORNE DIRT

General

The accumulation of dust and dirt in many locations can be a constant maintenance problem. Some contributing factors are as follows:

A. Site conditions - sources of dirt

B. Soil splashing against the system

C. Climatic conditions (sun, rain, wind, or temperature extremes)

D. Building location

1. City (high density- significant vehicular traffic and manufacturing with resultant airborne pollution)

2. Suburbs (low density- minor airborne pollution)

3. Near industrial manufacturing facilities

E. Amount of precipitation or rain (insufficient rainfall to be effective for normal self-cleaning action).

F. Exhaust venting onto finished areas.

In general wind born dust and dirt is an inert accumulation that can possibly contribute to the discoloration of EIFS. Typically, this is an aesthetic issue and will not affect the overall performance of the EIFS.

If it is suspected that a "chemical contamination" is a contributing factor to the discoloration then a sample should be forwarded to an independent test lab to determine the contaminate. This information should then be reviewed with the EIFS manufacturer.

Cleaning and Prevention Recommendations

*The cleaning solution should consist of a household liquid detergent mixed with water.

1. Pre-wet the affected areas

2. Apply soapy water with soft bristle brush, scrub gently, let set for 15-20 minutes. (Do not let solution dry on surface.)

3. Rinse off thoroughly with low pressure garden type hose.

*Try the cleaning procedure in a small inconspicuous area to make sure it does not adversely affect the EIFS.

For more stubborn stains, it may be necessary to use a stronger cleaner formulated for EIFS.

Prevention of splash-back: Remove a layer of soil next to the foundation and replace with a layer of crushed stone or other mulch material to prevent splash-back of water onto the building.

PART 3 - LAWN SPRINKLER OVERSPRAY

General

Reddish colored staining typically originates as a metallic stain from excessive chemicals or iron oxides, contained in the local water supply. This discoloration is a result of a stain from sprinkler overspray on the exterior wall system.

Description

These areas of discoloration generally are an aesthetic issue only. They can be removed with a commercial cleaner formulated for EIFS.

The longer these types of stains remain, the more difficult they will be to remove. In two-three years, these stains may become permanent. If the stains are permanent, it is necessary to neutralize the stains to prevent bleed-through and re-coat the affected area.

Recommendations to Avoid Lawn Sprinkler Overspray

I . Readjust or relocate the sprinklers that are the cause of the overspray.

PART 4 - SEALANT JOINTS

General

EIFS is a monolithic, barrier wall-type system, sometimes also referred to as a face sealed system.

The integrity of this barrier must be maintained with a correctly performing sealant joint at all dissimilar materials (i.e., windows, doors, louvers, etc.), to prevent moisture intrusion.

If the sealant is not maintained through some type of minimum Preventative Maintenance Program, water infiltration problems may occur over time.

The life expectancy of a quality, correctly installed sealant material is 3-5 years under severe ultra-violet (sunlight) and weather extremes. In less than severe conditions, 8-10 years is likely before replacement should be considered. (Consult the sealant manufacturer for the additional information.)

Recommendations for Observation of Sealant Joint Performance

EIFS when correctly detailed and properly installed does not allow water migration through the wall.

The water migration (leaks) will typically occur at one of the following:

1. Failure of sealant at building expansion joints.

2. Failure of sealant at transitions to dissimilar materials

    A. Flashing component

    B. Window/head, jamb or sill

    C. Louver/Head, jamb or sill

    D. Penetrations through EIF System

        1. Handrail connection details

        2. Electrical conduit

        3. Utility Piping

        4. Etc.

All leaks inside the building should be documented as to their location and whether they appear in gentle rains, or wind driven rains and from what wind direction. Also, determine how long the leak continues after the rain stops.

This information, in conjunction with a thorough observation of the exterior wall system, will assist in quickly locating the source of the leak for remedial repairs.

Field "Trouble Shooting" Guide

1. Observe the joint. There should be a uniform bead of sealant (uniform in width and appearance.)

2. Observe any separation within the sealant joint.

    A. Adhesive failure - separation of sealant from dissimilar material.

    B. Cohesive failure - separation of the sealant internally.

3. Observe aging. This is a progressive, natural change in the chemical and physical properties of the sealant material. Two-part Polyurethane type sealants are self-sacrificing. The surface is constantly wearing away and appears as a chalking or oxidation type film that is constantly washed away by rainstorms. This is normal for this material and does not indicate failure.

4. Observe any discoloration and/or bleeding. This may indicate a material defect with the sealant.

5. Observe deformation. This is any change of form or shape produced in a body by a stress or force.

6. Observe cracking, crazing or "alligatoring". These conditions represent degradation of the sealant joint induced by either excessive movement or aging.

Please contact the EIFS manufacturer for any additional information.