FINEGAN INSPECTION SERVICES, INC.
TERRY FINEGAN
27 LAURELWOOD COURT
MILFORD, OHIO 45150
683-0733-PHONE

CLIENT
Mr. and Ms. Smith **Date of inspection:**

RESIDENCE
1234 Anystreet, Cincinnati, Ohio

The purpose of this example report is to show how the reports are constructed. The readings and photos are from multiple houses that have been inspected over the past 20 years. The information in our normal report will be detailed in similar fashion. The exact moisture readings in this example do not always align with the photos because the photos are from various homes in the Tristate area.

INSPECTION TYPE
EIFS moisture testing inspection

OVERVIEW
This EIFS report is based on visual observations of the residence as well as the use of electronic hand held moisture detectors. The inspection was made without removing any existing covering surfaces or materials. This is an **EIFS certification inspection report** for the exterior building envelope. This report will discuss the moisture readings of EIFS systems only that are applied to the exterior walls on this house.

There were elevated readings found on the front and rear wall locations on the EIFS clad surfaces.

IMPORTANT NOTICE:

The moisture analysis survey of this home was conducted by an Exterior Design Institute certified inspector, and following the protocols of the Exterior Design Institute. Right and left will be determined as one faces the front door from the exterior of the house. All moisture readings were low and within the normal range.

The **two meters** used to accomplish the testing were:

The **Delmhorst Probe** is a meter which has probes that are inserted through the EIFS into the substrate to test for the level of moisture in the substrate. Readings above 17 are damp, readings above 24 are wet, and any reading from the upper 20s to 40 is high moisture; 40 being saturation of the wood with water.

The **Tramex meter** is an impedance meter that uses an electronic signal to penetrate the EIFS through to the substrate. The rate at which the electronic signal is returned to the meter face gives an indication that there could moisture present behind the EIFS. This is used as a survey meter and when elevated readings are discovered by this meter, the Delmhorst probe is used in order to check the wall area and verify if the signal is reading moisture or something else like metal or electrical wiring.

Basic glossary of most commonly used terms for EIFS. Systems

There are several terms that are most often used when discussing an EIFS system. The term EIFS, for example, is an acronym for **Exterior Insulating and Finishing System.** The EIFS system is often referred to as Dryvit because one of the largest manufacturers of this type of system is Dryvit Inc. However, there are dozens of other manufacturers of EIFS systems and dozens more who manufacture other related components used in the application of the various systems or their components.

Glossary of the common terms used when discussing an EIFS system

AESTHETIC JOINT-This is a joint in the surface of the EIFS that is installed for appearance reasons. It is not intended as an expansion point in the EIFS surface.

ATTACHMENT SYSTEM- The materials used to secure the EPS boards to the substrate. These could be of adhesive type or else mechanical fasteners. They resist gravity, wind suction, and the shearing effects of EIFS thermal movement so as to keep the boards secured to the walls.

BACKER ROD -Around virtually all windows, doors and other wall penetrations, there must be a gap of approximately ½" in which a flexible closed -cell type of foam plastic rod is inserted into the joint cavity at a specific distance from the outside face of the joint. This is accomplished prior to application of the caulking so as to provide proper expansion and contraction and limit the depth of the sealant application.

BACK WRAP -This is the process of bonding the base coat to the face of the substrate at the ends of the EPS boards. All EPS boards need to be sealed with a base coat at the ends where they are exposed or interface with another surface.

BASE COAT- This is a cementitious coating that is applied to the expanded polystyrene board exterior surfaces. The EPS boards are secured to the substrate on the walls/ceilings prior to base coat application. The base coat adhesive is mixed with Portland cement and is applied in a thin, continuous layer to the EPS board. While the base coat is still wet, reinforcing mesh is embedded into it.

BASE FLASHING- At the bottoms of some window systems and doors as well as at deck and awning installations there are flashing systems that are recommended by some manufacturers of some EIFS systems. These may also be referred to as APRON FLASHINGS.

DIFFERENTIAL EXPANSION- All exterior walls have some type of covering, (called the building envelope), to keep water and weather away from the interior of the wall structure. Often times the exterior components vary and are made of different materials. These different materials have physical properties that allow them to expand and contract with the heat and cold temperatures at different rates. Where two different materials intersect, (i.e., brick and EIFS), the expansion and contraction differential of the building components must be taken into account when design of a wall is considered. There must be some type of allowance built into the installation of the various components allowing material intersections to provide for the different materials' expansion rates, while keeping water and weather out of the wall assemblies.

DIRECT APPLIED SYSTEM- The majority of EIFS cladding is known as a 'direct applied system'. This means that the EPS foam boards that are attached to the substrate of the building are done so directly without any space between the back of the foam and the surface of the substrate. The way that these EPS foam boards were secured was to either glue the boards to the substrate or screw the EPS foam boards to the substrate. The EPS was applied DIRECTLY to the substrate.
See ATTACHMENT SYSTEMS

DIVERTER FLASHING- At locations where lower roofs intersect the vertical plane of a wall surface at the eave line, there must be a specific type of flashing installed at the intersection location of the eave and the wall. The flashing looks like a bent "L" on its side. It is installed prior to the EPS board installation. It is intended to push roof water away from the wall surface and into

the gutter. Because this area is a significant water entry point behind the EIFS systems, the diverter must be accomplished properly so as to direct water away from the EIFS surfaces.

DRAINAGE SYSTEM- In the late 1990s and early 2000s, the development of a drainage gap between the back of the EPS boards and/or other approved components such as polyisouratic boards, and the face of the substrate were developed. Various systems with various technical details were created by manufacturers. Collectively, these systems were designed to allow water to "drain" behind the EIFS system and not be trapped against the substrate.

EIFS- The entire "system" of expanded polystyrene boards, (or other approved materials), attachment systems, fiberglass mesh, base and finish acrylic co-polymer coatings, is known as Exterior Insulating and Finishing System. Things like caulking and flashing systems associated with the application of the EIFS products were hotly debated as to whether these components were or were not a part of the EIFS system. Most manufacturers draw a line at these related components as to their responsibility for the correct or incorrect installation of those components.

EIMA- An acronym for EIFS Industry Members Association. The companies that produce and install the various products in the EIFS industry created this association. The association establishes uniform minimum standards relative to the product installation specifications of the various components that compose the EIFS system. EIMA standards are recognized industry-wide by all professional installation contractors and suppliers.

END DAM FLASHING- Where there is an opening in the EIFS material to allow a horizontal flashing installation, there should be a vertical termination at the ends of the horizontal flashings. This is done to contain any horizontal water flow behind the EIFS at these terminations that may be caused by wind - driven rain. An end dam is mostly discussed when referring to a roof system or deck ledger flashing system.

EPS BOARD- Expanded Polystyrene Boards that are secured to the substrate of the building either mechanically or with an adhesive which is then covered with a fiberglass mesh. The foam boards form the base of the EIFS "system". They should be properly sanded and the joints have specific allowable tolerance. There should be no exposed edges or surfaces on any EPS board in the EIFS system.

EXPANSION JOINT- Because of expansion and contraction cycles as well as thermal and wind shear characteristics of the EIFS system, there must be specific expansion and contraction relief joints in the EIFS system. The location, size, and profile of the various joints are critical to the overall performance of the EIFS system. The lack of an expansion joint, or an expansion joint that is improper in terms of width or depth, can damage the EIFS system and make it vulnerable to leakage.

HEAD FLASHING- Above windows and doors there are "head" flashings required in modern EIFS. systems. The specific manufacturer of the EIFS. system will detail the need for and the type of as well as the installation of the head flashing needed. It is not required in all applications, but recommended. At the ends of any head flashings, an end dam is often a modern requirement

LAMINA- The exterior "coating" of the EIFS system. It is an acrylic co-polymer, (plastic) that is troweled onto the base coating in a specific texture and color. It is intended as the outside "shell" of the entire EIFS. system. The lamina expands and contracts with the specific heat and wind and other environmental stresses that are placed on the surface. It is intended as a **weather-tight barrier** system in most EIFS installations. Cracks or holes in the lamina are water infiltration access points and must be professionally repaired.

LEDGER FLASHING- At most locations where a deck is attached to an exterior wall that has an EIFS clad system, there must be an 'L' shaped flashing installed at the location where the board that attaches to the house wall and supports the deck is fastened. The ledger flashing must be installed prior to the EIFS installation. It is installed at the skyward facing surface of the ledger board and is intended to capture all water that may come down the EIFS cladding and to drain it safely way from the wall. This ledger flashing often needs an END DAM at the horizontal termination points.

PAN FLASHING- Under all doors with or without EIFS a drain pan system should be installed between the top of the sub floor and the bottom of the door threshold. This is generally known as a pan flashing. It can take multiple forms from a membrane that is formed into a proper shape to a metal-soldered profile. The exterior door is set into the rough opening of the wall and is set into this "pan". This pan that has upturned sides and the interior side is also turned upward so that this pan can capture any moisture that may drain around or below the door and direct that moisture out of the door threshold area to the exterior.

P.B. SYSTEM- The P.B. system stands for Polymer Based system. There are several other types of EIFS. systems such as Polymer Modified and Direct applied systems. Type PB systems are the most common place and consist of adhesively-attached expanded polystyrene insulation and glass-reinforced synthetic surface coatings.

REINFORCING MESH- This is the woven fiberglass that is applied with the cement-based base coat adhesive on to the surface of the EPS board. It is applied in a specific method so as to provide stability and strength to the EPS board/lamina interface and the EIFS system as a whole. The mesh and the joints are overlapped. It should not be exposed at any location.

SUBSTRATE- This is the exterior building surface to which the EIFS is applied. It could be oriented strand boards, plywood, cement board or other

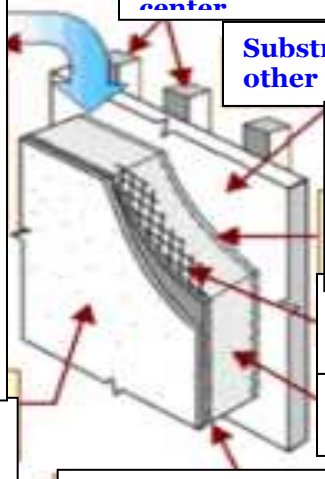
approved materials. The substrate is the surface to which the EIFS adhesive bonds, not the wall structure itself. This is an important distinction.

SEALANT- The caulking applied to the various gaps in the EIFS systems caused by wall penetrations such as, but not limited to, windows, doors, vents and expansion joints. Most are wet applied and must be carefully installed. These are the areas of highest EIFS system failures. The products are often silicone based with one or two parts urethanes and some with polysulfide. Many sealants require a bonding primer applied to the joint cavity prior to the application of sealant.

SILL DRAIN- In recent years the development of components to aid in the restoration of the EIFS have been developed by various companies. It has been proven that most windows leak water at the bottoms of the units, called the sill. Because many EIFS systems do not have a drainage system behind their surfaces, the water that leaks from the windows often times becomes trapped between the back of the EPS board and the wall substrate. The way to prevent this from occurring was the development of a hard plastic material that is approximately 1" thick and is slightly wider than the window opening. The EIFS is cut open below the window and the framing is notched so that this component can be set into the area below the window. It captures water under the window and drains it out of the wall. It works on the same principle as the PAN FLASHING that is placed under doors.

Sectional View Of A Typical

S Application



Because the EIFS is a "barrier system", meaning that it is designed to prevent any moisture from accessing behind the outside lamina coating, if water should get behind the outside coating,(via cracks in the coating, gaps around wall penetrations or missing flashings), water cannot drain away and can cause rot of the wall assembly.

Wall Studs, typical 16" on center

Substrate material. Plywood, OSB or other material

For the past 20 years, most EPS board is fastened with screws with large plastic washers. This is known as a"mechanicaly fastened" EPS system.

Fiberglass reinforcing mesh embedded in the base coating

Typically Expanded Polystyrene board known as E.P.S.

The finish coating is a co-polymer that is called the lamina. This coating applies in liquid form and drys into a water repellant barrier. There are multiple types of textures

The base coating is cement material with additives that make it very strong. It is about 1/8" thick and is applied over the EPD with the fiberglass mesh embedded during application

Legend

Any sill drain recommendation will be noted with a blue line

Any kick out flashing will be noted with a green box ☐

All areas that have water damage will have a red box at the areas on the wall.

Any EIFS repair items that need modification will be noted with bold print and a highlight over those areas.

Caulking locations will be identified with a yellow line_____

1). Front Left wall

There are no elevated moisture readings below the front left windows. There is **caulking that is adhesively failing. It is no longer attached to the surfaces intended to be sealed and should be replaced**.

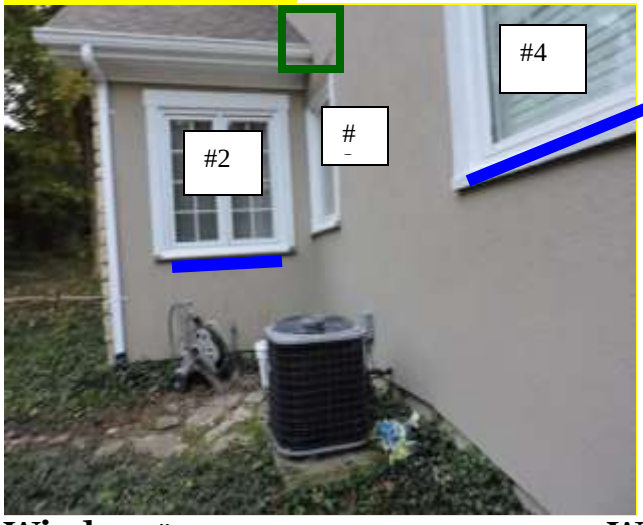
Removal of all old caulking and the installation of new backer rod and caulking are necessary here

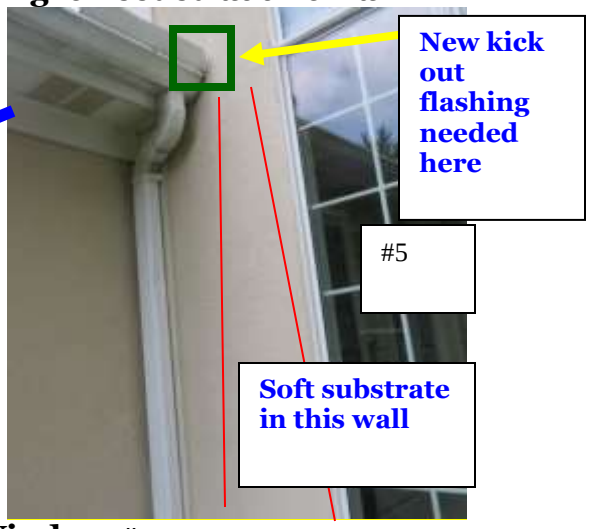
Moisture readings in the walls noted below the windows
Window #1-

Wall below the cornice terminations and vent

2). Front wall, left of front porch

Most moisture readings at the front left wall areas were elevated with several above 20 on the impedance meter. **Sill drains and new caulking is needed at these windows.** **A new kick out flashing is needed at this wall**

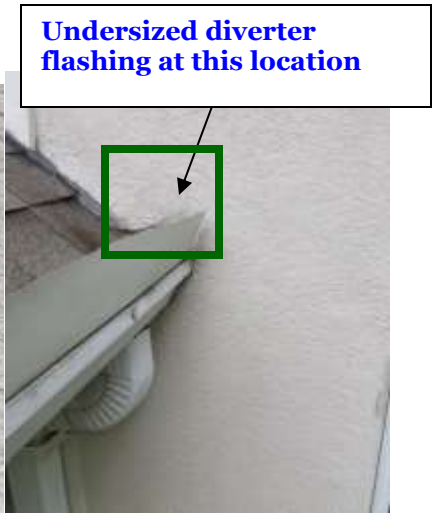




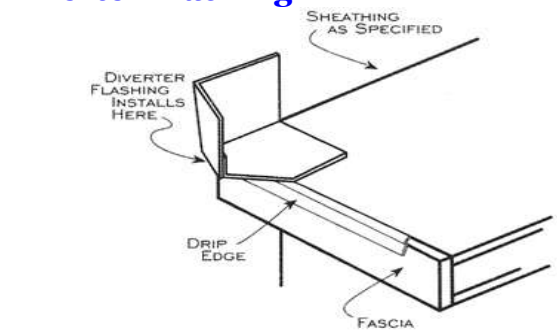
Window #3 **Window #4**

Notice: In all EIFS reports compiled by Finegan Inspection Services, Inc. you will see all the moisture readings that are taken with the Tramex or Delmhorst meters whereever there are elevated moisture readings. There will always be full disclosure on all of the reports so that you know the information is true to the conditions found on the exterior walls of the home.

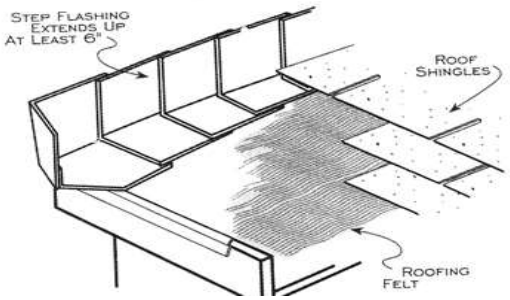
Wall below kick out



Diverter Flashing



Intended Purpose: Accumulating water runoff should be directed out and away from the structure. Roof-to-wall flashing requires a kickout/ diverter at its termination to insure that water is directed to the outside.

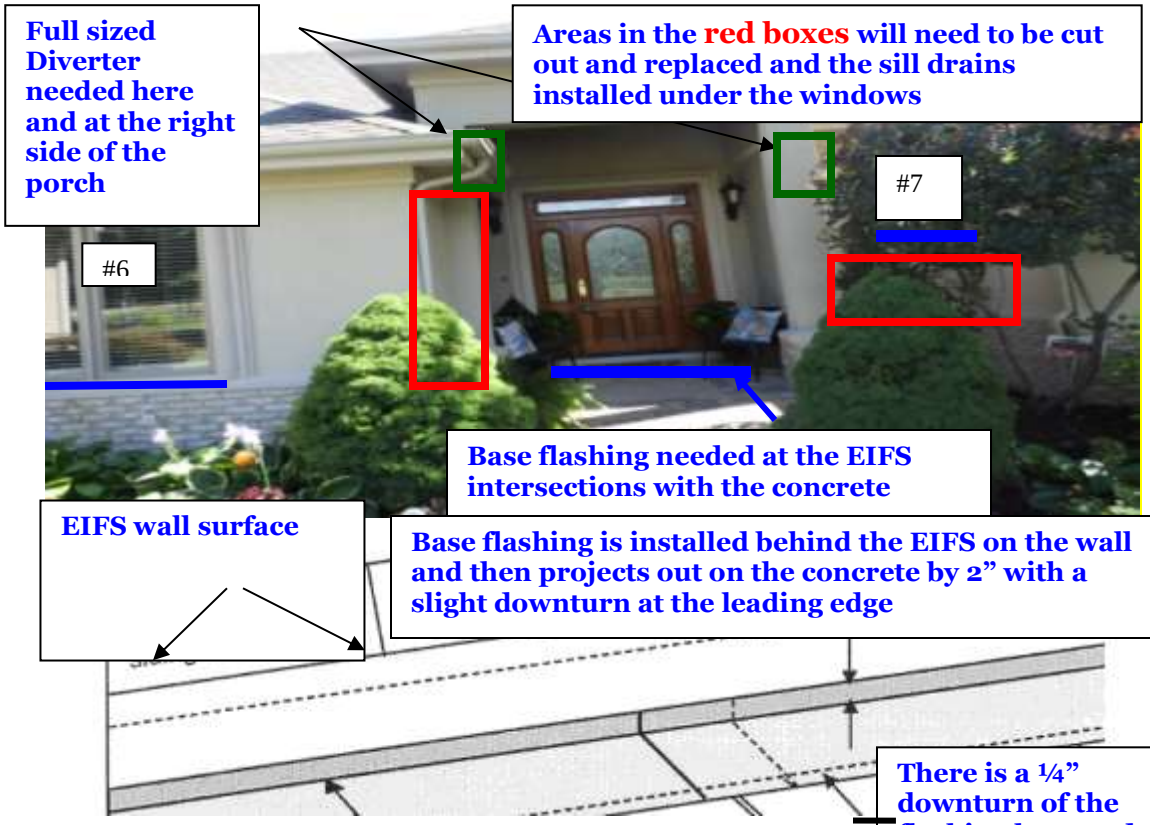


Window #5

Slight elevation here. New caulking should solve this

3). Front Porch Walls

At the front porch and at the right side of the porch water has accessed behind the EIFS at the left side of the archway and between the windows #6 and #7. There is very high moisture noted at these locations from the upper walls down to the first story floor line.



Window #6

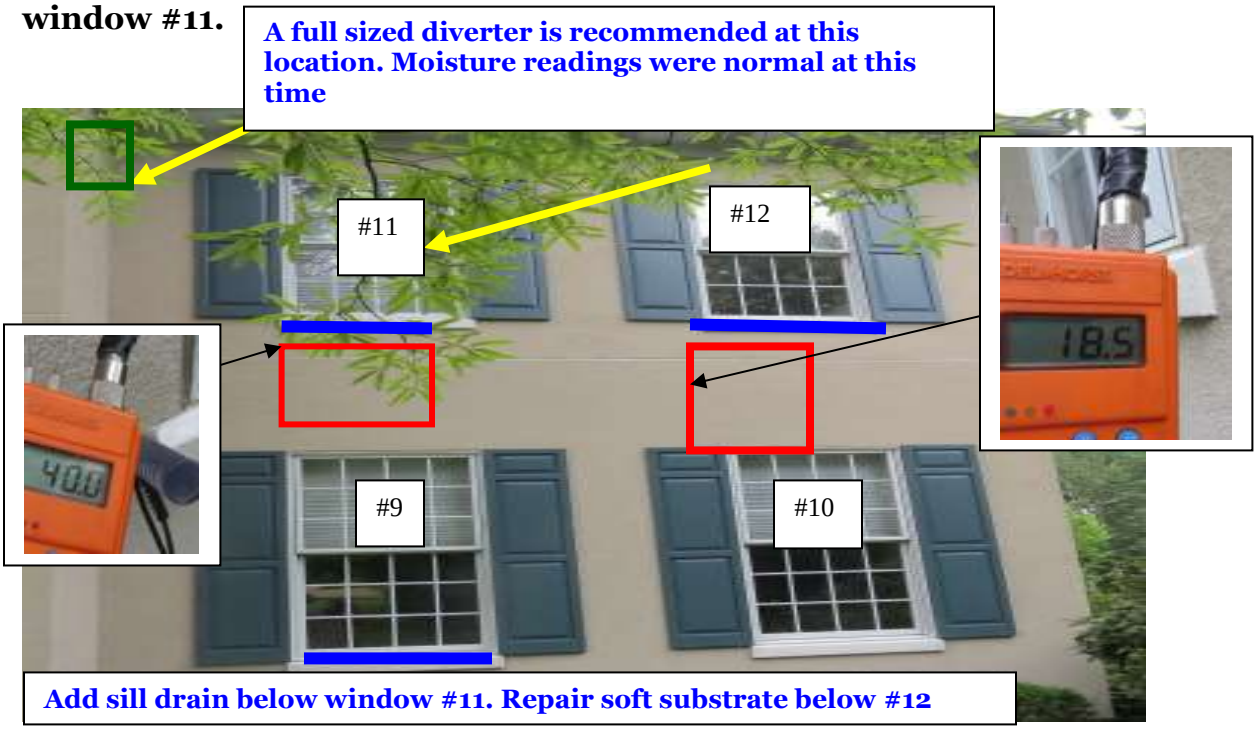
Window #7

The moisture readings are exceedingly elevated and the substrate is very soft below these windows and next to these windows #6 and #7.

Window #8

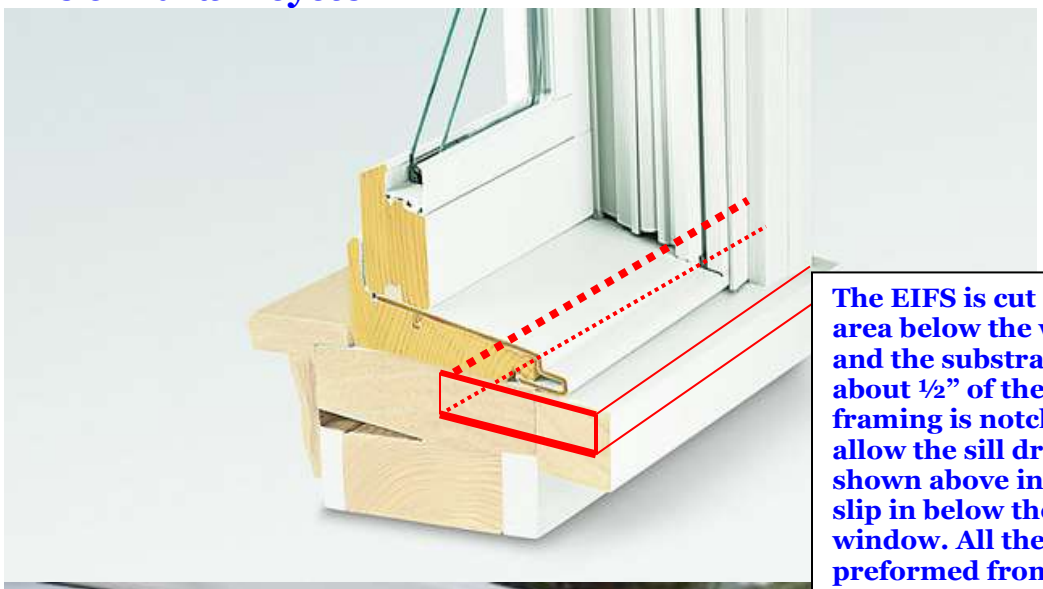
5). Front Right Wall

There was some elevation at the window #12. A sill drain is needed at these windows and to balance this, a sill drain is needed at the window #11.



NOTE: A sill drain is installed by opening the wall below the window and installing a manufactured drain pan. The system collects water leaks from the window and drains the water outside the EIFS surface. See the details of a sill drain on the next page.

The sill drain system



The EIFS is cut at the area below the window and the substrate and about ½" of the framing is notched to allow the sill drain shown above in red to slip in below the window. All the work is preformed from the exterior.

EIFS modified and back wrapped ready to accept the sill drain system

When finished the sill drain has an aluminum cap placed over the plastic drain to provide a finish look.

Sill drain installed and finish trim complete

Moisture readings for Front Right Wall

Window #9


Window #10


Window #11

Window #12

6). Right Rear Wall

Elevated readings and soft substrate below window #15. The rest of the windows and wall penetrations need new caulking but there are no other issues.

Window #13

Window #14

Window #15

7). Rear Left Walls

There are **elevated moisture readings on the rear wall below one window** and along the length of the rear deck. The window can get a sill drain and some wall repair and be repaired. **The rear porch however will need more significant repairs**. **The post surfaces below the porch are very soft.**

The horizontal sections and vertical columns are all showing elevated moisture readings at all surfaces

8). Left side wall

Wall replacement will be needed below window #25. There is soft substrate and high moisture readings at all tested locations. The repair of the wall and replace any water damaged studs and substrate will be needed. To prevent future moisture intrusion, a sill drain system should be installed below the window.

Conclusion

The above modifications to the EIFS are needed in order to stop the water access and to prevent further deterioration. Sill drains and new flashings installations, and replacement of the rotted wall assembly components are necessary. There are structural concerns at the rear porch wall and the floor areas and the installation of the proper flashing and drain systems are needed here. There will also need to be new caulking at all walls shown in the report, (windows, doors, and all other locations where caulking is now in place). The moisture intrusion problems with this EIFS can be solved but the above noted repairs are desirable at this time.

END OF REPORT

FINEGAN INSPECTION SERVICES INC.
by Terrence P. Finegan, EDI (Exterior Design Institute)- OH-17;
ASHI (American Society of Home Inspectors)- 033511
Phone: (513) 683-0733