



## Real Estate Inspections

### Confidential Stucco Inspection Report

This Property Inspection was completed on August 11, 2017

Prepared for: Client Sample



### Prepared by: Pete Ciliberto, Certified Inspector

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*Certified Inspector – Certifications from the Exterior Design Institute (EDI) #PA128:*

- *Level 1 EIFS/Stucco Inspector Certification – Exterior Design Institute (EDI)*
- *Level 1 Building Envelope Moisture Analysis Certification – Exterior Design Institute (EDI)*
- *Level 2 Building Envelope Inspector Certification – Exterior Design Institute (EDI)*
- *Level 2 Building Envelope Quality Control Inspector Certification – Exterior Design Institute (EDI)*

*Certified Inspector – GAF Commercial Flat Roof & Residential Steep Roof Certified Inspector*

**For questions about this report please call Pete Ciliberto directly at (484) 748-0288**

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**Report:** 1234 Not A Real Street, Philadelphia, PA, 19101

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## REPORT LIMITATIONS

This report is intended only as a general guide to help the client make their own evaluation of the overall condition of the home, and is not intended to reflect the value of the premises, nor make any representation as to the advisability of purchase. The report expresses the personal opinions of the inspector, based upon the inspector's visual impressions of the conditions that existed at the time of the inspection only. The inspection and report are not intended to be technically exhaustive, or to imply that every component was inspected, or that every possible defect was discovered. No disassembly of equipment, opening of walls, moving of furniture, appliances or stored items, or excavation was performed. All components and conditions which by the nature of their location are concealed, camouflaged or difficult to inspect are excluded from the report. The inspection is performed in compliance with generally accepted standard of practice, a copy of which is available upon request.

Systems and conditions which are not within the scope of the inspection include, but are not limited to: formaldehyde, lead paint, asbestos, toxic or flammable materials, and other environmental hazards; pest infestation, playground equipment, efficiency measurement of insulation or heating and cooling equipment, internal or underground drainage or plumbing, any systems which are shut down or otherwise secured; water wells (water quality and quantity) zoning ordinances; intercoms; security systems; heat sensors; cosmetics or building code conformity. Any general comments about these systems and conditions are informational only and do not represent an inspection.

The inspection report should not be construed as a compliance inspection of any governmental or non-governmental codes or regulations. The report is not intended to be a warranty or guarantee of the present or future adequacy or performance of the structure, its systems, or their component parts. This report does not constitute any express or implied warranty of merchantability or fitness for use regarding the condition of the property and it should not be relied upon as such. Any opinions expressed regarding adequacy, capacity, or expected life of components are general estimates based on information about similar components and occasional wide variations are to be expected between such estimates and actual experience.

We certify that our inspectors have no interest, present or contemplated, in this property or its improvement and no involvement with tradespeople or benefits derived from any sales or improvements. To the best of our knowledge and belief, all statements and information in this report are true and correct.

Any dispute, controversy, interpretation, or claim including claims for, but not limited to, breach of contract, any form of negligence, fraud, or misrepresentation arising out of, from or related to, this agreement or arising out of, from or related to the inspection or inspection report shall be submitted first to a Non-Binding Mediation conference and absent a voluntary settlement through Non-Binding Mediation to be followed by final and Binding Arbitration, if necessary, as conducted by Construction Dispute Resolution Services, LLC or Resolute Systems, Inc. utilizing their respective Rules and Procedures. If the dispute is submitted to Binding Arbitration, the decision of the Arbitrator appointed there under shall be final and binding and the enforcement of the Arbitration Award may be entered in any Court or administrative tribunal having jurisdiction thereof.

NOTE: THE CLIENT AND REAL ESTATE INSPECTIONS (REI) WOULD HAVE A RIGHT OR OPPORTUNITY TO LITIGATE DISPUTES THROUGH A COURT AND HAVE A JUDGE OR JURY DECIDE THE DISPUTES BUT HAVE AGREED INSTEAD TO RESOLVE DISPUTES THROUGH MEDIATION AND BINDING ARBITRATION.

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## GENERAL INFORMATION

### ***Client & Site Information:***

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**Inspection Date:**

August 11, 2017 9:00 AM.

**Client:**

Client Sample.

**Inspection Site:**

1234 Not A Real Street  
Philadelphia PA 19101.

**Property Occupied?**

Yes.

**People Present:**

Homeowner.

### ***Building Characteristics:***

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**Main Entry Faces:**

Northeast.

**Building Style & Type:**

1 Family, Townhouse.

**Estimated age of Structure:**

The house is 15 - 20 years old.

**Estimated age of Cladding System:**

The cladding system appears to be 15 - 20 years old.

**Stories:**

2

**Space Below Grade:**

Basement, The basement was finished. All visibility of the floor framing system including the floor joists, rim joist, sill plates and subfloor (decking) was obstructed. The inspector could not view any wood framing from the basement level.

### ***Climatic Conditions:***

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**Weather:**

Clear.

**Soil Conditions:**

Dry.

**Outside Temperature (F):**

70-80.



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## INSPECTION DETAILS

**A. PURPOSE:** *The purpose of an independent third party adhered cladding system moisture inspection is to give an unbiased opinion as to the condition of the system as applied on the structure as well as to help assess the condition of the cladding system by looking for visible installation flaws, inadequate water diversion, sealant failures and to conduct moisture readings using electronic moisture scanning devices. Please note that the provision of a scope of work and or estimates for remedial repairs is not the purpose of this inspection. Competitive estimates for repairs should be obtained from at least three qualified contractors.*

*Further investigation may be needed to determine the extent of water damage, if any, and how best to modify the structure to address any moisture problems that may be indicated by this inspection.*

**B. SCOPE OF INSPECTION:**

**Level 1 Visual Inspection includes -**

- *A visual examination of the condition of the adhered cladding system, exterior sealants, flashings, windows, doors, roof-to-wall transitions, parapets, gutters, deck-to-building connections, cladding terminations and any penetrations through the cladding system.*
- *A visual interior including the basement and all interior walls with exterior cladding applied.*
- *Interior scanning with Infrared Thermal Imaging Technology and Surface Moisture Scanners on the interior of the structure to help identify the severity of any existing stucco moisture problems.*

**Level 2 Moisture Inspection includes -**

- *Drilling of probe sites is necessary for measuring the moisture levels and firmness of the substrate behind the cladding system. The probe sites will be filled with a suitable caulking material. Typical areas of probing include: windows, doors, primary and secondary kickout locations, patio wall/porch/concrete slab intersections, chimneys at eave and gable locations as well as other locations deemed necessary to evaluate the system.*

**Inspection Reporting -**

- *Preparation of a report of our observations of potential problem areas and moisture mapping of all moisture levels measured during the inspection. The readings provided in the 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. (Note: These readings are not represented to be the absolute moisture content of the full thickness of the substrate or framing wood. The inspection provides information on specific areas of problems and defects. Moisture content in wood of **19%** or more over a sustained period of time can cause wood and other organic materials to deteriorate.)*
- *The report only reports on the condition of the structure at the specific locations indicated. Locations are determined by the inspector according to probable areas of possible moisture intrusion and in accordance with The Exterior Design Institute & MoistureFree Warranty Corporation protocol. No judgment is intended or given for any areas not reported on. This report is not a structural engineering inspection report.*

**Please note that it is not the purpose of this inspection to bring the structure up to code, but to evaluate and note visible deficiencies and make best recommendations to help protect the structure from future moisture intrusion and damage. This will include the recommendations to install additional details and flashings that are necessary to improve the performance of the system. The application and maintenance of approved sealants is critical in the performance of the system.**

**C. 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 report was not a technically exhaustive study of its subject matter and its purpose was to alert the client to major deficiencies in the condition of the property. We assume no liability or responsibility for the cost of repairing or replacing any unreported defects or deficiencies, either current or arising in the future, or for any property damage, consequential damage or bodily injury of any nature. 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*

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*harmless and indemnify this inspection company involving any liabilities that may result.*

**D. 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. Additional charges will apply.*

**E. 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 & repairs. **This is extremely important.** Bi-Annual inspections should also be scheduled to ensure that the cladding system remains dry. This way any sealant failures, system cracks, etc. can be caught and repaired promptly. Testing and maintaining the structure on a regular basis is the best way to prevent costly repairs associated with moisture damage.*

### **Inspector:**

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#### **Inspector Name & Certification:**

##### **Pete Ciliberto, Certified Inspector**

*ASHI Certified Inspector (ACI) - American Society of Home Inspectors (ASHI) #252734*

*Pennsylvania State Licensed Home Inspector*

*New Jersey State Licensed Home Inspector # 24GI00138700*

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### **Inspection Details:**

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#### **Cladding Type:**

Traditional Hardcoat Stucco - Hard-coat stucco is typically applied either by hand to exterior wall surfaces in two or three coats. It may be applied directly to a solid base such as masonry or concrete walls, or it can be applied to a metal lath attached to wood frame construction, solid masonry, or concrete construction. Applied directly to concrete masonry, hard-coat stucco provides a tough finish that is integrally bonded with the masonry substrate. When applied to metal lath, two to three coats of stucco are applied. A vapor-permeable, water-resistant building paper separates the plaster and lath from water sensitive sheathing or framing. Hard-coat stucco has high impact resistance, sheds water but breaths, allowing water vapor to escape.

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**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 was found to be 1/2" - This is considerably less than the ASTM minimum standard. This system thickness is an approximation based on the limited sampling taken. The system thickness can vary greatly. The ASTM minimum standard for traditional hardcoat stucco is 7/8". The ASTM minimum standard for the base of an adhered stone veneer system is 3/4". EIFS and other synthetic system each have a minimum standard based on the type of system and substrate utilized.



**Weather-Resistive Barrier Type:**

When stucco is installed over a wood-framed structure with wood-based sheathing, it is required that a water-resistive vapor-permeable barrier with a performance at least equivalent to two (2) layers of water-resistive barrier complying with ASTM E 2556, Type 1, (e.g. Two layers of 30 lb. felt paper) or a water-resistive barrier which is separated from the stucco by an intervening, substantially nonwater-absorbing layer or drainage space.



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**Substrate/Sheathing Type:**

Oriented Strand Board - Oriented strand board (OSB), also known as sterling board, sterling OSB, and aspenite, is an engineered wood particle board formed by adding adhesives and then compressing layers of wood strands (flakes) in specific orientations.



**Inspection Type:**

**Level 2 - Stucco/EIFS/Stone Veneer Moisture Inspection** - The primary purpose of this inspection is to evaluate the current performance of the cladding system on this structure. The secondary purpose is to offer the client the best remedial options available. The entire stone and stucco systems were inspected visually. Installation defects were noted, and moisture probe readings were performed at the discretion of the survey professional. These probe readings are typically performed at all areas of potential moisture penetration based on the previous visual inspection.

**Understanding Moisture Readings -**

Our inspection protocol requires that the entire adhered masonry cladding system be inspected visually. Because of the nature of the components utilized in Stone or Hard-Coat Stucco Systems, such as metal lath and Portland cement, the Tramex Wet Wall Detector (surface scanner), which is commonly used to detect moisture behind Exterior Insulation & Finish Systems, cannot be effectively utilized; therefore detection of moisture intrusion can only be conducted through the use of a penetrating probe meter.

In most cases moisture readings are recorded in wood scale as determined by the substrate material being tested. If it is determined that the substrate is a product other than wood-based moisture testing will be adjusted accordingly. Wood scale moisture readings may vary slightly based on regional considerations and which moisture meter is being utilized and should be should be interpreted as follows:

In all areas where moisture readings are in excess of 29% consideration should be given to the removal of the Stone or Stucco System to allow the assessment and repair of the damaged substrate and affected structural members. Experience data has shown that when moisture levels are above 29%, there is frequently damaged substrate, if not at the exact probe location, in the adjacent sheathing and/or framing. It is believed that most damage can be repaired, and with proper remediation and ongoing maintenance should prevent future moisture intrusion.

Occasionally moisture readings will indicate "acceptable" levels, however, upon probing; the substrate is soft or will offer little or no resistance. This may be an indication of "dry rot", a condition that can occur when wood is exposed to excessive





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moisture over an extended period of time and the wood fibers have decayed to the point that the wood can no longer hold moisture. When this condition is discovered the Stone System should be removed to allow the inspection and repair of the damaged substrate and affected structural members.

In areas of the system where moisture readings are between 21% and 29% and probing has indicated that the substrate was in sound condition, although some moisture penetration has occurred, it is believed that through proper remediation, containment and isolation of points of moisture entry, would allow the previous effects of moisture to dry, producing no negative impact to the structure.

**\*In general, we interpret moisture readings in the following manner:**

**6% to 15% with a firm substrate = Low Moisture Level**

**16% to 28% with a firm substrate = Elevated Moisture Level**

**29% or above = High Moisture Level (usually associated with structural damage)**

*\*Other variables may be present that may alter our recommendations.*

Important 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.

Inspection Test Equipment				
Test Equipment Description		Test Range		
		Low	Elevated	High
A	Extech Pinless Moisture Meter (Interior)	6 to 14	15 to 28	29 to 65
B	Tramex Wetg Wall Detector (Exterior)	10 to 20	21 to 50	51 to 100
C	Delmorst Moisture Probe Meter (Exterior Hardcoat)	6 to 14	15 to 28	29 to 40
D	Delmorst Moisture Probe Meter (Exterior EIFS)	6 to 14	15 to 28	29 to 40
E	Structural Resistance Tester (SRT)	>44 = Pass		<43 = Fail

## ELEVATION PHOTOS

### ***Front Elevation:***

**Type(s) of Cladding on this Elevation:**

Hardcoat Stucco, Adhered Manufactured Stone Veneer.

**Was This Elevation Inspected?**

Yes - This entire elevation was inspected.



### ***Rear Elevation:***

**Type(s) of Cladding on this Elevation:**

Hardcoat Stucco.

**Was This Elevation Inspected?**

Yes - This entire elevation was inspected.





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## INTERIOR MOISTURE OBSERVATIONS

*If an interior inspection was performed during this inspection any visual evidence of interior moisture will be noted in this section. During the interior inspection, the inspector will typically survey the interior surfaces visually looking for signs of moisture intrusion. Typically this inspection also includes the use of Infrared Thermal Imaging Technology and Surface Moisture Scanners on the interior of the structure to help identify the severity of any existing stucco moisture problems.*

*The photos included in this report are intended to facilitate the understanding of the defects cited herein. They are a sample representation of said defects, and may not include all the deficiencies cited in the body of this report.*

### ***Evidence of Interior Moisture Intrusion:***

#### **Interior Inspection Results:**

The inspector inspected the basement (*if present*) and interior wall surfaces and other interior surfaces adjacent to the exterior walls where the adhered masonry cladding system is installed. There was no visible signs of significant moisture intrusion. Thermal imaging and surface moisture scanning did not detect any anomalies or high moisture readings related to the application of the masonry cladding system at the time of the inspection.

## MOISTURE PROBING & MAPPING

### **Moisture Mapping:**

#### **Front Elevation - Moisture Mapping**

Although there were no HIGH moisture readings on this elevation, the substrate was noted to be soft and/or non-existent at the locations outlined by the white boxes. Probing in these areas does indicate that the substrate has some degree of deterioration. This deterioration has been caused by continuous moisture intrusion due to lack of proper flashing details and/or a lack of proper system sealants at penetrations in the system. The system should be opened up and the stucco removed until clean, dry substrate is found. Structural repairs should be made as needed and the system should be re-installed as per ASTM standards.

Action should be taken immediately to correct these conditions before further moisture intrusion and/or damage occurs. Specific prescriptions for remediation are outlined in the Repair & Remediation Recommendations to follow.



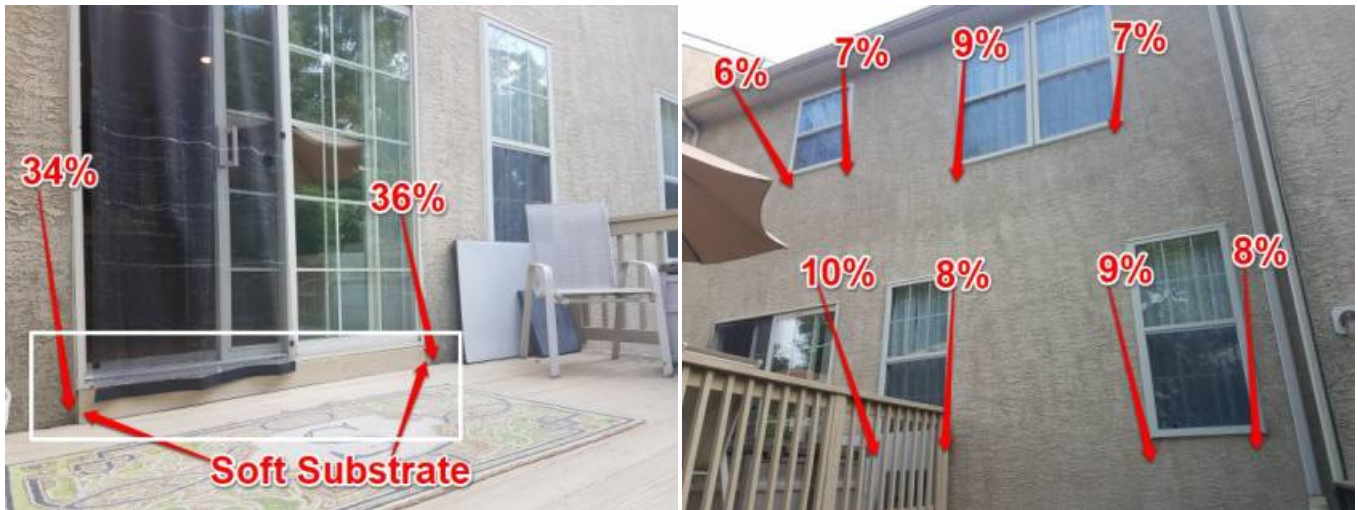


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**Rear Elevation - Moisture Mapping**

There were ELEVATED & HIGH moisture readings on this elevation below the rear sliding glass door which leads from the kitchen to the rear deck. The substrate was noted to be soft and/or non-existent, indicating the likelihood of structural damage at the areas that are noted with a white box. This deterioration has been caused by continuous moisture intrusion due to lack of proper flashing details and/or a lack of proper system sealants at penetrations in the system. The system should be opened up and the stucco removed until clean, dry substrate is found. Structural repairs should be made as needed and the system should be re-installed as per ASTM standards.

Action should be taken immediately to correct these conditions before further moisture intrusion and/or damage occurs. Specific recommendations for remediation are outlined in the Evaluation Summary and narratives on the photos to follow.



## REPAIR & REMEDIATION RECOMMENDATIONS

This report is an overview of the system as applied on the building and the compliance with current building standards and the American Society for Testing and Materials (ASTM) standard specifications for the installation of stucco. 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. This report is not a structural engineering inspection report.

Please refer to IBC 2001, IRC 2004-2014, ASTM Standard Specification for Application of Stucco, Adhered Stone, and EIFS applications, local building codes and manufacturers details for information on required detailing and installation of the stucco system. In addition refer to the appropriate ASTM standards for wire lath installation and fastenings, as well as the required thickness of the stucco application, and the method of installation of the building wrap and overlaps that should be adhered to. Additional information and details can be obtained from the Association for Lath and Plaster and AWCI.

The following list are items that are required to be repaired to repair any damage, correct any deficiencies in the system, and ensure the long-term integrity of the system.

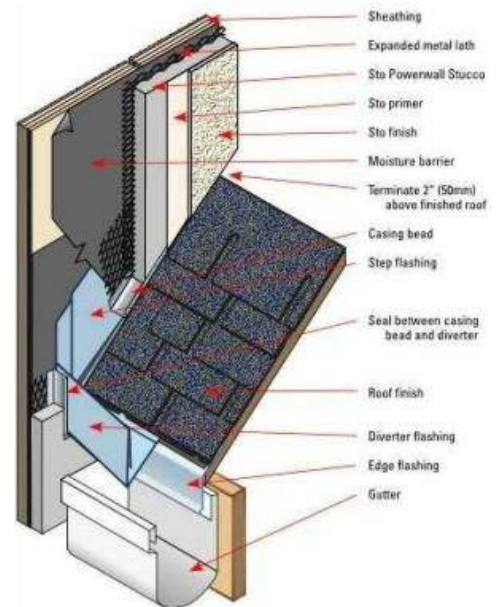
### Prescription for Remedial Action & Repairs:

#### Partial Tear-Off Recommended:

The locations where high moisture readings or soft substrate were noted (outlined with a white box) should be removed in a progressive manner until clean dry substrate is found. Structural repairs should be made as required and the system should be re-installed as per ASTM standards outlined herein.

#### Kickout Flashing Installation/Retrofit Recommended:

Kickout flashing should be installed into the system according to the specifications noted herein. Kickout flashing should be installed at all primary and secondary kickout locations (secondary locations include chimneys stacks and washes, bay windows, etc). When installing kickout flashing/diverters use DryFlekt® type or equivalent. Kickout flashing should at least 6" x 6" x 12" in size. Kickout flashing should penetrate the stucco cladding and be set against the substrate with the system applied over it. The base of the kickout should be set on the roof deck with the roof coverings and tar paper set over the top of the base of the kickout. On completion both the front and back of the kickout bucket should be caulked.

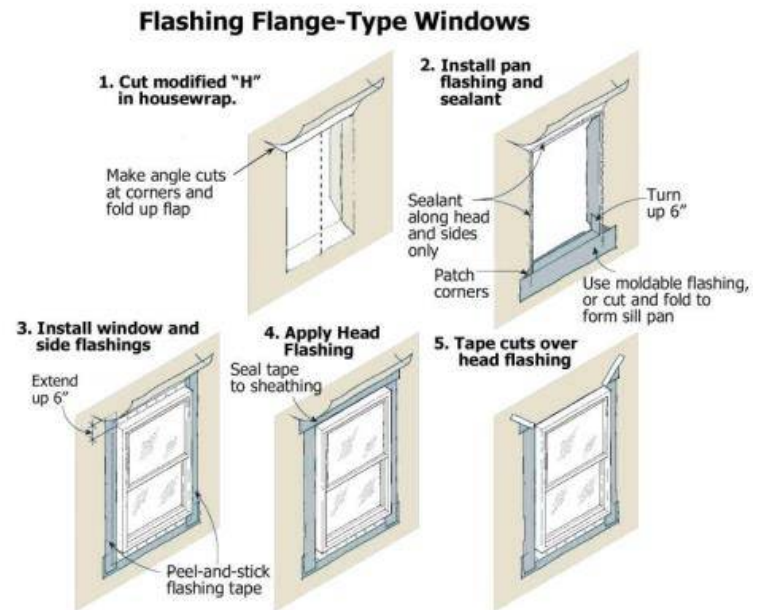


#### Grade Termination Recommendations:

Although an integral weep system is not present and/or the cladding system does not terminate at grade in accordance with industry and ASTM standards, we do not recommend any remedial action to retrofit weepscreed or flashing because there is not any evidence of moisture intrusion and because opening up the system to retrofit flashing could be more problematic than beneficial.

**Window and/or Door Pan Flashing Retrofit Recommended:**

The rear sliding glass door, with high moisture readings and/or soft substrates, should be removed to expose the structural components. Structural repairs should be made to replace any rotted members and sheathing. New pan flashing should be installed on the rough opening frame. The pan flashing should be sloped to allow proper water runoff and should provide a weep system. The pan flashing should be water-tight. After the pan flashing is installed, the door system should be reinstalled as per manufacturers installation details. The perimeter of the frame(s) should be sealed using self-adhered butyl flashing. The stucco system should be reinstalled in accordance with ASTM standards.



**Window and/or Door Perimeter Bond-Breaking Joint Retrofit Recommended:**

Locations where the caulking was not applied correctly, where the bead was too thin or where there is adhesion failure should be repaired. Any sealant that was poorly installed or in failure should be removed and new caulking applied as per details outlined herein. The minimum width and depth of any sealant application should be ¼" by ¼". The depth of sealant may be equal to the width of joints that are less than 1/2" wide. For joints ranging from ½" to 1" wide, the sealant depth should be approximately one-half of the joint width. The maximum depth of any sealant application should be 1/2" (13 mm). If the joints are larger than 1" contact the caulking manufacturer for guidance. Backer rods or bond breaker tape should be used for all joint applications.

Window and door frames should have bond-breaking joints installed around the perimeter of the frames. This is applicable for the cladding/window/door frame intersection (including garage doors), as well as any trim detail that surrounds any window or door frames (e.g. wood/plastic trim, decorative raised panels, pediments, etc.). A bond-breaking joint is constructed by installing a closed-cell backer rod, bond-breaker tape or triangular backer rod and sealant along stucco/stone intersection with doors. This can be accomplished by applying bond breaker tape or triangular backer rod along stucco/stone intersection with trim boards and/or siding, and then apply a fillet bead of approved sealant over the bond breaker (Note: There should be enough bearing area on each adjoining surface to adhere a minimum 1/4 inch width of sealant to each surface).

We recommend using high sealants that are a single component silicone formulation that cures in the presence of atmospheric moisture to produce a durable, flexible and ultra-low-modulus silicone rubber building joint seal, such as Dow Corning® 790 Silicone Building Sealant, Pecora 890NST, and Sikaflex 15 LM sealant. These sealants can be purchased online at <https://www.amazon.com> or <https://www.kenseal.com>. Caulk joints should be installed per industry standards and manufacturer's specifications.

**Window Jamb/Sill Intersection Remedial Action Required:**

No remedial action recommended.

**Wet Glazing Recommendation:**

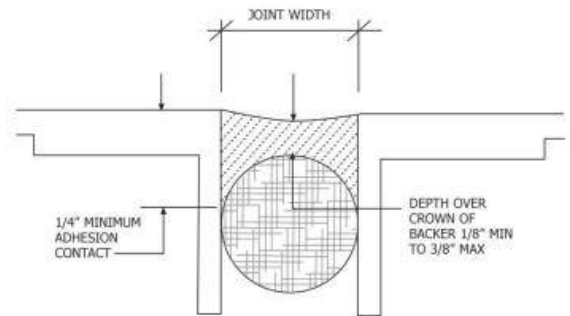
No remedial action recommended.

**Concrete Porch/Patio Flashing Recommendation(s):**

Stucco/stone is improperly terminated on concrete porch patio. Stucco/stone industry details require flashing at the base of the wall or, alternatively, a 2" clearance above hard surface grade with an integrated weep screed. Because the concrete porch/patio is covered with a roof system, the only requirement for remediation is to properly seal the porch/wall intersection applying a properly sized fillet bead of approved sealant.

**Caulking & Sealant Recommendations:**

Comprehensive Sealant Application - All joints and gaps between stucco and dissimilar materials must be sealed (i.e. stucco to wood, metal, concrete, stone, vinyl, etc.). All utility breach locations around the building need to be caulked. This includes, but is not limited to, pipe and wire penetrations, outlets, vent covers, HVAC penetrations, utility boxes and any other type of penetration. Seal the perimeter of all light fixtures leaving an opening at the bottom of the mounting plate for weepage. Seal ALL penetrations including downspout fasteners and the holes for the shutter plugs which attach the shutters to the cladding system.



Stucco industry details require soffits/fascia/rake boards to lap over the masonry cladding by a minimum of 1". If this standard is not met, these terminations with the cladding system must be sealed to prevent moisture intrusion due to wind-driven rain.

The minimum width and depth of any sealant application should be ¼" by ¼". The depth of sealant may be equal to the width of joints that are less than 1/2" wide. For joints ranging from ½" to 1" wide, the sealant depth should be approximately one-half of the joint width. The maximum depth of any sealant application should be 1/2" (13 mm). If the joints are larger than 1" contact the caulking manufacturer for guidance. Backer rods or bond breaker tape should be used for all joint applications.

We recommend using high sealants that are a single component silicone formulation that cures in the presence of atmospheric moisture to produce a durable, flexible and ultra-low-modulus silicone rubber building joint seal, such as Dow Corning® 790 Silicone Building Sealant, Pecora 890NST, and Sikaflex 15 LM sealant. These sealants can be purchased online at <https://www.amazon.com> or <https://www.kenseal.com>. Caulk joints should be installed per industry standards and manufacturer's specifications.

**Roof/Wall Recommendations for Proper Termination:**

Although the flashing at the roof wall intersections is not present or installed according to ASTM standards, because there is not any evidence of moisture intrusion and because opening up the system to retrofit flashing could be more problematic than beneficial, we do not recommend any remedial action related to the flashing at the roof/wall intersection (this does not apply to kickoff flashing).





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**Deck Flashing Recommendations:**

No remedial action recommended.

**Rainwater Collection and Foundation Grading Recommendations:**

The rainwater conductors (gutters and downspouts) were not functioning properly. The gutters were clogged with debris. All gutters must be installed properly and be free of debris. The downspouts must be properly attached to the structure. All gutter and downspouts joints should be secure and leak-free. The downspouts should terminate at grade either in an underground impervious water collection system or onto splashblocks that can disperse the water at least 6 feet away from the foundation.

**Recommendations for Repairing Cracks:**

All cracks in the system should be repaired. Prior to repairing the cracks, the cause of the cracking should be determined and remedial action should be taken to prevent future cracking. Small structural cracks such as these, less than 1/32" (approximately the width of a dime) can be bridged with an elastomeric coating. General application guide is 12-14 wet mil thickness per coat. Coating should be applied up to an architectural break or to the full elevation as necessary to obtain a satisfactory aesthetic appearance.



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**General Notes for Remediation:**

**We recommend that ALL repairs and remedial actions outlined herein, be performed by a qualified competent stucco remediation contractor. This even applies to the caulking and sealing that needs to be performed. There are techniques that need to be employed and standards that need to be met to ensure the long-term integrity of the cladding system and a novice or tradesman unfamiliar with this type of cladding system will generally not be able to perform to an acceptable standard.**

When caulking and or re caulking, remove all old caulking and clean and prep area with an appropriate cleaner and priming agent. Use Pecora 890NST, Sikaflex 15LM, Dow 790 series or equivalent sealant product that is suitable for stucco/stone/EIFS applications. Have a stucco repair company or qualified stucco / EIFS sealant company perform the caulking on your building. The minimum width and depth of any sealant application should be 1/4" by 1/4". The depth of sealant may be equal to the width of joints that are less than 1/2" wide.

For joints ranging from 1/2" to 1" wide, the sealant depth should be approximately one-half of the joint width. The maximum depth of any sealant application should be 1/2". If the joints are larger than contact the caulking manufacturer for guidance. Backer rods or bond breaker tape should be used for all joint applications.

Window header flashing for older existing systems, should be caulked both above and below the flashing to prevent moisture intrusion. Make sure that the ends of the flashings are fully caulked. For drainable systems caulk only below the flashing; leave upper edge open for drainage of the system. However caulk end dams to prevent moisture from entering into the sides of the windows.

For new systems with proper flashing details and moisture barriers caulk below flashings and at upper end dam locations.

When caulking double or single hung window's caulk all window construction, mullions, miter joints and behind sash tracks. Take care not to block sash track drainage or window screen drain slots.

When caulking casement window's caulk all window construction, mullions and miter joints. Windows with crank handle plates need to have the fasteners and plate perimeters caulked to help prevent moisture entry.

ALL window sashes should be wet-glazed to reseal the joints.

When caulking, surfaces must be sound, clean, and dry. All release agents, existing waterproofing, dust, loose mortar, laitance, paints, or other finishes must be removed. This can be accomplished with a thorough wire brushing, grinding, sand-blasting, or solvent washing, depending on the contamination. It is recommended that surface temperatures be 40F or above at the time the sealant is applied. The 40F should be maintained for at least a minimum of 12 hrs after the application.

All repairs should be made in accordance with the manufacturers recommended methods of repair in conjunction with any up-to-date industry improvements.

All exterior building cladding materials (i.e. stucco system, metal siding, metal roofing, fiberglass roofing system, etc.), doors, windows must be installed in accordance with manufacturer's specifications and be watertight. This applies to all materials irrespective of their intersection with the stucco cladding system.



## GLOSSARY OF TERMS

### *Glossary:*

#### **Definitions & Terms:**

**Adhered Concrete Masonry Veneer (ACMV):** Masonry veneer, secured to and supported through adhesion to an approved backing, which is typically a wood-framed structure, with a plywood or OSB sheathing. It should be noted that "Natural Stone" can also be applied adhesively, if cut dimensionally (less than 2.5 inches thick) to meet the necessary load requirements.

**Admixture:** Material other than water, aggregate or basic cementitious material added to the batch before or during job mixing.

**Aggregates:** A granular material such as sand.

**Anchor:** A corrosion resistant metal fastener used for securing dimension stone to a structure or adjacent stone units.

**Anchored Masonry Veneer:** Masonry veneer, secured to and supported laterally by the backing through anchors and supported vertically by the foundation or other structural element. This type of Stone is also referred to as "Real Stone", or "Full Dimensional Stone" and is typically a "Natural" or "Quarried" stone product.

**ASTM:** American Society for Testing and Materials. An independent organization that is involved with setting standards and practices for all materials, including those used in EIFS and stucco. ASTM standards have recently been developed specifically for EIFS and hardcoat stucco construction.

**Backer Rod:** Closed cell, flexible, polyethylene foam rod. It is sized for specific joint widths and is inserted into a joint cavity to a specific depth from the face of the joint. The rod limits the depth of the sealant joint, helps produce an hourglass sealant shape that helps to distribute stresses in the sealant, and prevent three-sided adhesion of the sealant.

**Basecoat:** The total of all stucco coats applied prior to application of the finish coat. Any stucco coat applied before the application of the finish coat. The combined scratch and brown coats make up the basecoat.

**Bonds:** Adhesion of stucco to other surfaces that it is applied against.

**Bonding Agent:** A compound applied as a coating to a suitable substrate to enhance a bind between it and the next layer, as between a subsurface and a succeeding stucco application.

**Brown Coat:** In multiple coat work, the second coat applied over the scratch coat. In two-coat work, brown coat refers to the double-up basecoat. The brown coat is the coat directly beneath the finish coat.

**Building Paper:** Also referred to as tar paper or black paper it comes in different ratings such as 30 minute or 60 minute. The minute rating refers to the time it takes for water sitting on the paper to pass through it.

**Casing Bead:** Also referred to, by the industry, as a "plaster stop" because it is used to terminate plaster or stucco. Some casing beads are designed with a built-in flexible strip for uniform spacing around window and door frames or any other point where stucco meets a dissimilar material (e.g., soffits, fascia board, etc.). This flexible spacing strip is lined with a bond breaking tape that allows for two-sided adhesion, eliminating the need for backer rod.



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**Cementitious:** Made of or from cement.

**Checking:** Development of shallow cracks at closely spaced but irregular intervals in the plaster surface. (Also known as craze cracks.)

**CMU:** Concrete masonry unit

**Coat:** A thickness of stucco applied in a single operation.

**Cold Joint:** The juncture of fresh stucco application adjustment to set plaster.

**Control Joints:** A flexible metal component designed to control the shrinkage of cement plaster. It is usually placed at each floor break of a building.

**Craze Cracks:** Fine, random cracks or fissures that may appear in a plaster surface, caused by shrinkage.

**Cured:** The process of cement hydrating and chemically changing to become hard.

**Delamination:** Coming unglued or un-bonded from something.

**Dens Glass Gold:** Trade name for resinous coated, glass-fiber mat-faced, water-resistant core gypsum sheathing board.

**Diversion or Diverter Flashings:** A flashing that is used to redirect the flow of rainwater.

**Dry Stack:** Stone masonry technique of fitting and trimming to construct free-standing walls, veneer walls, or structural walls, with little or no mortar showing.

**Eaves Troughs:** Plastic or metal troughs that redirects rainwater from the roof to the ground.

**Efflorescence:** A deposit of soluble salts or bases, usually white, formed on the plaster surface of stone, brick, concrete or mortar when moisture moves through and evaporates from the masonry. Water-soluble substances emerge in solution from within the plaster and are deposited during evaporation.

**EPS:** Expanded Polystyrene. Type I Rigid EPS insulation board is typically used in Class PB EIFS. Thickness ranges from ¾ inch to 4 inches. EPS is also used for decorative detailing on stucco installations.

**Expansion Joints:** Gaps that extend through the entire depth of the EIFS or stucco and allow movement of the wall system without damage to the EIFS or stucco. They are usually coincidental with expansion joints in the substrate and are sealed with the proper sealant to prevent water intrusion into or behind the system.

**Face Seal Wall Assemblies:** Refers to the strategy of rain penetration control, which relies on the elimination of holes in the exposed exterior face of the assemblies.

**Fascia:** Any flat horizontal member, generally between moldings, most frequently used when referring to elements of a classical architecture cornice, adjacent to roof/soffit.



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**Finish Coat:** The final layer of stucco (job-site mixed or pre-manufactured) applied over basecoats or direct to concrete, comprised of either cementitious or acrylic material

**Flashing:** A thin, usually metal or plastic material used to prevent water entry or to direct the flow of water in a desired direction between two or more materials or surfaces. They are used at parapet tops, window and door heads, windowsills, kickout locations and the like.

**Floating:** Act of compacting and leveling a stucco basecoat; act of bringing the aggregate to the surface of finish-coat stucco.

**Framing:** Structural members such as studs, joists, headers, beams, columns, girders, trusses, etc of wood or steel.

**FogCoat:** A fine mist of cement based paint color used to provide uniformity on the integral colored cement finish coats.

**Gable:** The exterior triangular section of a wall extending upward from the level of the eaves to the apex. Also, a member resembling the triangular end of a roof.

**House Wrap:** (See Weather Resistive Barrier).

**Isolation Joint:** A joint provided around penetrations through the exterior cladding system such as window and door openings, scuppers, etc. It may or may not incorporate flashings and is sealed with the appropriate backer rod and sealant.

**Kickout Flashing:** A diverter flashing that is installed as the first piece of flashing at the end of the roof where it intersects the wall. Intended to prevent channeling of moisture behind system at roof/wall or roof/chimney intersections.

**Lintel:** A horizontal beam or stone over the opening of a door or window that carries the weight of the wall above it. Lintels are a required component of full dimension stone installations, and are usually not present in adhered or thin veneer installations.

**Lath:** Generally the reinforcement base to which plaster is applied, secured to a substrate with appropriate fasteners. Commonly a welded wire mesh, woven wire or an expanded metal mesh.

**Manufactured Stone Veneer (MSV):** Also known as "Cast Stone". A precast concrete building stone manufactured to simulate dimension stone.

**Mortar:** A workable paste mixture of cementitious material, water, and aggregate used to bond masonry construction materials together and fill spaces between.

**Non-Load Bearing Wall:** A wall that supports no load other than its own weight.

**Oriented strand board (OSB):** It has replaced plywood as wood sheathing and is made from logs that are chipped and glued together.

**Parging:** The application of a thin portland cement coat over a solid concrete or masonry wall, generally without lath reinforcement, to improve the aesthetic appearance of the exposed wall area.

**Primer:** A material that may be used to prepare surfaces prior to the application of another system component.



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**Quarried Stone:** A natural stone which has been extracted from the earth by means of man power and machines.

**Rainscreen:** A method of handling water penetration, enhancing venting and improve the drying capacity of wall assembly, consisting of a water resistant outer cladding, a measurable drained and vented cavity and a water impermeable back-up wall.

**Scoring:** Grooving by scoring, usually horizontal, of the scratch coat to provide mechanical keys for the brown coat.

**Sealant (also referred to as caulk):** A specially designed sealant used with backer rod to fill joints and make them waterproof. The sealant used must be flexible enough to expand and contract with the wall system while maintaining its bond to both sides of the sealant joint.

**Soffit:** The underside of a structural component, such as a beam, arch, staircase, or cornice.

**Substrate:** Same as sheathing. The surface to which a cladding is attached.

**Terminations:** Any place a wall system ends. Terminations can be window or door openings, the bottom or top of a wall or both sides of an expansion joint. In any case, all terminations must be totally encapsulated with base coat and mesh and a sealant or flashing with appropriate backer rod installed to prevent water infiltration.

**Tyvek:** Trade name for a house wrap that is made from fine, high-density polyethylene fibers. Tyvek is more tear resistant than building paper.

**Wainscot:** A veneer of stone or other finish that only covers the lower portion of an exterior or interior wall.

**Weather Resistive Barrier (WRB, House Wrap, Building Paper):** Also referred to as "House Wrap" or "Building Paper". Material used to restrict the transmission of moisture to the surface behind.

**Weep Holes:** Small holes in the bottom of windows that allows water to drain out. Opening placed in mortar joints of facing material at the level of flashing to permit the escape of moisture.

**Weep Screed:** A building accessory, usually made of galvanized steel or thermoplastic material, installed along the base of an exterior stone or stucco wall. Most commonly on roofs and above grade, the weep screed allows incidental moisture to escape. Generally, stone or stucco industry guidelines and/or local building codes specify where these screeds should be placed in relation to the ground or roof to ensure sufficient drainage.

## GRADE TERMINATIONS

*Stucco and adhered stone veneer systems should not extend over the foundation and terminate below grade. When the cladding system terminates below grade, this can provide a path for moisture and wood destroying insects. ASTM C1063, Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster, indicates that the bottom edge of the foundation weep screed should be located not less than 1 in. (25 mm) below the joint formed by the foundation and framing and that the nose of the screed is to be placed not less than 4 in. (102 mm) above raw earth or 2 in. (51 mm) above paved surfaces.*

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### **Grade Terminations:**

#### **Stucco Grade Terminations**

Stucco industry details require a minimum ground clearance of 4" above landscaping. Stucco is properly terminated above grade as depicted in the attached photos.



#### **Stone Veneer Grade Terminations**

Stone industry details require a minimum ground clearance of 4" above soft grade/landscaping. Stone is in close proximity to soft grade. Improper ground clearance provides means of conveyance for moisture and wood-destroying insect egress to the structure. Additionally, a weep screed or other means of drainage is required at the base of the system and was not visible.





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## CONTROL & EXPANSION JOINTS

*Control joints and expansion/contraction joints are installed in a stucco system to relieve stresses caused by movement, expansion and contraction of the structure. 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.*

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### **Expansion Joints & Control Joints:**

#### **Expansions Joints**

Expansion joints are NOT installed in the stucco/adhered stone system. Expansion joints, installed at the floor lines, allow for compression of the building and helps prevent cracking and or delamination due to shrinkage of the building materials. The IRC Section R703 and specifically the ASTM Standards C1063.12.a, requires expansion joints shall be used to accommodate some degree of movement in the stucco membrane caused by movement of the building or its components to minimize damage to the stucco and weather resistive barrier.

#### **Controls Joints**

Vertical control joints are NOT installed. Control joints are needed to minimize cracking and allow for different rates of expansion and contraction between the components of the system.



## KICKOUT FLASHING

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. The term "kickout" is used to denote that water from the roof is "kicked out" away from the 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 **MUST** be installed at all primary and secondary kickout locations.

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### **Kickout Flashing:**

#### **Kickout Diverter Flashing @ Primary Locations**

There is kickout flashing installed at all primary kickout locations; however, the kickout flashings are poorly installed and not compliant with standard kickout flashing installation. It is recommended that the kickout flashing be removed and replaced with either a plastic Dry-Flekt type kickout flashing or a PBZ type Powder-Coated type kickout flashing and installed in accordance with manufacturer's specification and compliant with the industry guidelines as depicted on the architectural drawings containing herein.



## WINDOW TERMINATIONS & WEATHER SEALS

*All windows within the stucco or adhered stone veneer system should be properly sealed. All windows should have head flashing. All windows should have bond-breaking joints installed around the window perimeters. The window systems must be functional and the weather drainage system and weeps holes must be intact and unobstructed. The sill / jamb intersection must be sealed and weather-tight.*

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### Windows:

#### Vinyl Window Frames

The window frames are not sealed properly. There is no bond-breaking joint or sealant around the window frames. The window frames are susceptible to moisture intrusion. The IRC Section R703.1 & R703.4 and the ASTM Standards C1063 & E2112.7 require the exterior wall envelope shall be designed and constructed in a manner that prevents the accumulation of water within the wall assembly by providing a water-resisitant barrier behind the exterior veneer and a means of draining water, to the exterior, any that enters the wall assembly. All wall assemblies must be able to prevent moisture intrusion from wind-driven rain through testing of the exterior wall envelope, including joints, penetrations and intersections with dissimilar materials in accordance with ASTM E331 (test for wind-driven rain at system penetrations).

Flashing at exterior window/door openings shall extend to the surface of the exterior wall finish (for face-sealed wall assemblies such as stucco on solid masonry) or to the water-resistive barrier (commonly behind siding/ cladding). Flashing at exterior window/door openings shall be installed according to the window/ door manufacturer installation instructions or those of a flashing manufacturer. Where not addressed by the manufacturer, pan flashing shall be installed at the sill of exterior window and door openings, be sealed or sloped to direct water out, and shall incorporate flashing or protection at the head and sides. Products used as flashing must comply with specific standards: self-adhered membranes with AAMA 711; fluid-applied membranes with AAMA 714; mechanically attached flexible flashing with AAMA 712. Head flashing is properly installed over the window frames.





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## DOOR TERMINATIONS

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### **Entrance Doors:**

#### **Door Frames Intersecting Stucco/Stone**

The door frames are sealed with new caulking, but the application of sealant was not in accordance with the prescribed remedial recommendation. There is no bond-breaking joint around the door frames. The caulking is too thin and was not applied in accordance with ASTM standards for sealing door perimeters. The sealant is susceptible to premature adhesion failure which can lead to future moisture intrusion.

### **Garage Doors:**

#### **Door Frames Intersecting Stucco/Stone**

The garage door frames are not sealed properly. There is no bond-breaking joint or sealant around the door frames. The door frames are susceptible to moisture intrusion. Head flashing is properly installed over the door frames.



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## PORCH / PATIO TERMINATIONS

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### **Porch/Patio Intersections:**

#### **Porch/Wall Flashing NOT Installed Properly**

Stucco/stone is improperly terminated on concrete porch as depicted in the attached photos. Stucco industry details require flashing at the base of the wall or, alternatively, a 2" clearance above hard surface grade with an integrated weep screed. The stucco/stone either terminates behind the concrete porch without meeting the minimum standard for proper flashing. The IRC Section R703.6.2.1 and specifically the ASTM Standard C1063.7.11.5 requires a foundation weep screed to be installed at the bottom of the wood framed exterior walls where a masonry cladding system has been applied. The bottom edge of the foundation weep screed should be not less than 1 in. below the joint formed by the foundation and framing. The nose of the screed should be placed not less than 2 in. above paved surfaces (hard grade). The weather resistive barrier and lath should entirely cover the vertical attachment flange and terminate at the top edge of the nose or ground flange.



## ROOF INTERSECTIONS

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### **Roof Intersections:**

#### **No Separation @ Roof**

Industry standards require a 2" separation between the roof covering and the stucco/stone cladding. There should also be an integral weep system at the base of the adhered stucco/stone system. There is not a 2" separation between the roof & stucco/stone system. The stucco system should not be in contact w/ roof covering. The IRC Section R703.6.2.1 and specifically the ASTM Standard C1063.7.11.5 requires an integral weep screed to be installed at the bottom of the wood framed exterior walls where a masonry cladding system has been applied and intersects with a roof surface. The nose of the screed should be placed not less than 2 in. above roof surfaces. The weather resistive barrier and lath should entirely cover the vertical attachment flange and terminate at the top edge of the nose or ground flange. There is not an integral weep system installed.



## ATTACHMENTS & PENETRATIONS

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### **Attachments & Penetrations:**

#### **Attachments & Penetrations:**

All attachments and/or penetrations are not properly sealed with approved sealant and in a manner that is in accordance with industry standards. All system penetrations such as light fixtures, electrical outlets, and utility conduit or utility boxes should be properly attached and/or sealed with a manufacturer-approved sealant to prevent moisture intrusion. A proper fillet bead of sealant should be applied at ALL penetrations and attachments. The sealant should exhibit a minimum surface contact area of 1/4" onto each surface and have a depth of at least 1/2". The IRC Section R703 and the ASTM Standard C926 and C1063 require design considerations that provide sealing or caulking at all penetrations, attachments, and intersections with dissimilar materials to prevent the entry of water.





## OTHER SIDING

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### ***Other Siding(s):***

#### **Intersection @ Other Siding NOT Sealed Properly**

The intersection with other types of siding is not sealed properly. Vertical joints with other types of siding should be sealed with a bond-breaking joint that allows for expansion and contraction of the dissimilar materials while ensuring a water tight seal. The IRC Section R703 and the ASTM Standard C926 and C1063 require design considerations that provide sealing or caulking at all penetrations, attachments, and intersections with dissimilar materials to prevent the entry of water.



## DECK ATTACHMENT

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### ***Deck Attachment:***

#### **Deck Flashing:**

The deck ledger is a surface mounted deck system. The deck bolts penetrate through the ledger board and into the rim joist of the structure.



## SOFFIT / FASCIA / FRIEZE / RAKE INTERSECTIONS

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### **Soffit/Fascia/Rake Intersections:**

#### **Soffit/Fascia/Rake Intersections:**

The stone/stucco intersection with fascia/rake board is not adequately sealed. Stucco industry details require fascia/rake boards to lap over stucco a minimum 1". Or alternatively, if stucco is abutted to fascia/rake it should be sealed to prevent moisture intrusion due to wind-driven rain.



## GUTTERS & DOWNSPOUTS

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### ***Rainwater Conductors & Grading:***

#### **Rainwater Conductors:**

The rainwater conductors (gutters and downspouts) were not functioning properly. All gutters must be installed properly and be free of debris. The downspouts must be properly attached to the structure. All downspouts joints should be secure and the downspouts should terminate at grade either in an underground impervious water collection system or onto splashblocks that can disperse the water at least 6 feet away from the foundation.



## CRACKING

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### **Cracking:**

#### **Cracks in Stucco:**

Cracking was noted at numerous locations throughout the system. Compression cracking in stucco systems is usually related to the absence of proper control joints. The stucco system should be inspected regularly and any cracks that are found should be sealed to prevent further moisture intrusion.



## STAINING

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### Staining:

#### Staining:

Staining on the stucco/stone surface may or may not indicate a problem exists. When staining is present further investigation is always required. We highly recommend a Level 2 Stucco/Stone/EIFS Inspection with moisture probing and mapping.

