

# Preferred Home Inspections, Inc.

713-249-8581

## MOISTURE AND STUCCO REPORT

Date: February 13, 2012

Date of Inspection: February 12, 2012

Prepared For: *Wendy Matson*

Concerning: *6455 Bell Drive, Dallas, Texas*

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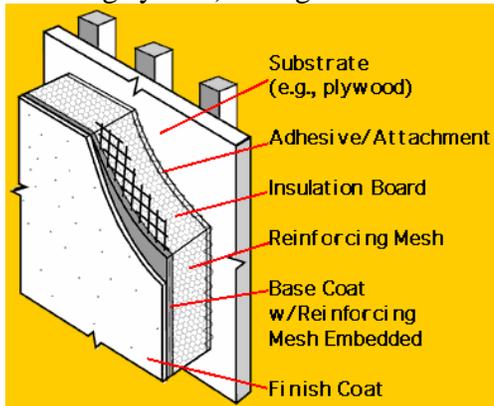
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## 1. Exterior Visual Examination of Cladding:

The inspector was called to the home at the above address to inspect the present condition of the stucco in relation to water penetration. The inspector examined the exterior of the house to determine the present condition of the building envelope and surveyed the surface for signs that show him where moisture may be allowing moisture penetration to the interior wall structure. During this initial visual inspection, flashing installations, rooflines, cracks in the surface, window installation and many other factors are taken into consideration to assure that if any potential high-moisture compromised areas exist they will be assessed.

- A. Type of stucco** - the home had conventional “three coat” 7/8-1” stucco on all sides with polystyrene banding. The entrance area and raised upper building on three sides were composed of polystyrene stucco, or EIFS (exterior insulating finishing system). Diagram of EIFS installation below:



## **B. Surface conditions**

Surface cracks were seen on all surfaces, except the raised area and lower area of EIFS. Conventional stucco must have control joints every 144 sq. ft. for expansion and contraction relief. There were no control joints at the front elevation, left and right areas. The rear elevation stucco had control joints (at exactly 144 sq. ft.) as did the left and right sides, however, cracking was still evident. (Note that EIFS area of the upper front does not require control joint.)



Above photos show where control joints are needed



At the rear elevation stucco crack area, inspector pressed on the stucco to show that there is “give”, indicating a likelihood of not enough nailing and stapling or gap between the OSB sheets.

Cracks seen on conventional stucco surface can be the result of one or more of the following scenarios, although removing the stucco for examination is the only sure way to know:

1. Not installing substrate horizontally and/or staggered.
2. No 1/8” space between substrate panels during installation.
3. Improper substrate nailing pattern, 6” at edges with minimum 2” #6D nails and 12” in center.
4. Improper overlap of wire lath during installation.
5. Improper stapling of lath, 6” on center to the substrate.
6. Improper curing between scratch and brown coats during stucco installation, Timing between application of brown and scratch coats.
7. Hanging gypsum on the interior must be performed before the stucco is applied.
8. Mix of stucco sand to Portland Cement must be in proper proportions.
9. Water penetration causing shrinkage or deterioration of the interior wood framing and/or sheathing
10. Missing or improperly placed expansion or control joints.

**C. Type of Substrate:** OSB “Oriented Strand board” was determined to be the substrate upon which two layers of moisture barrier should be applied prior to installation of the stucco assembly (lathe, scratch coat, brown coat and finish coat).

**D. Visibility of foundation, porches and roof surfaces** This type of stucco should and does have a “weep screed” on the lower edge of the stucco to complete the “water drainage system”. There was good slab visibility and drainage at the front and right elevation grading but not at the left elevation and rear elevation, where 2” or less was found at the grade. Areas of porches did not have good visibility - 2” of visibility at paved areas of 4” at grade are required.

**& THE TEXAS BUREAU FOR LATHING AND PLASTERING  
Systems Manual**

Issue –

The finished edge of the stucco wall should be located not less than 4 inches (102 mm) above raw earth or 2 inches (51 mm) above paved surfaces.



Left elevation porch



Front porch

Due to the high grade between the home on the left side and high grade at the foundation of this home, wicking of moisture into the substrate and rusting of the weepscreed is inevitable. To obtain more distance between the stucco and grade, the inspector recommends regrading the existing area by removing 6" of soil, then reinstall sod. Regrading so that rainwater flows to the street is needed. \*IRC code ref Grading



**E. Windows and Doors – proper seal around dissimilar materials:**

A quality seal between the dissimilar materials of metal window edges and wood door casings is required where polystyrene is installed. This seal consists of a 1/2" gap at the edge, into which a closed cell backer rod is inserted, and then the joint covered with a good low modulus caulking, such as NP1. The entire system, as described above prevents water penetration from occurring between the window frames and door casings. There wasn't a proper seal, as described, on the dissimilar materials of this home.



Next best seal is a well-kept properly applied caulk seal using good caulk, such as NP1. The existing caulk on the dissimilar materials of this home was in poor condition where found and some areas were not caulked.

A window with Juliette style railings has been installed on the upper level, front elevation, which had no access from the attic (note).



#### F. Visible flashings

The front entry roof lines had specialized flashings installed, called “kickout” flashing. However, on the front elevation, right roofline, the kickout was insufficient or improperly installed and the gutter below was butted up against the stucco therefore water penetration could be due to either protrusion.

In the photos below, the photo on the left shows a builder grade kickout, which is job built, bent and caulked at the joint, like the one on this house. The kickout on the right is a quality kickout, manufactured to be seamless and composed of stainless steel, a recommended choice.



Above photo, left, shows existing flashing; above photo, right shows examples of job-built flashing such as found on this home compared with factory built flashing

The left side kickout flashing was not verifiable as to water penetration due to the lack of permission to drill as per the builder.

**G. Wall penetrations (Utilities, water faucets, lamps, etc.)**

There were many wall protrusions seen on the exterior of the house and none had caulking. It is very likely that all are allowing moisture penetration into the structure. Photos below show examples of protrusions:



**2. Methodology of Exterior Invasive Testing:** exterior invasive testing was not performed, instead a visual inspection only was performed (note).

**3. Findings of Moisture on the Exterior (photos):**

A. At the front elevation entryway, right side, glue from water penetration to the oriented strandboard was seen piled up underneath the edge of the entry in addition to lower wall staining. The inspector was able to reach up and into the area to feel for substrate and found deteriorated OSB, which came out brown and flaky, indicating wood rot. This moisture penetration was likely due to job-made kickout flashing.



No testing was performed on the exterior, as agreed to with the builder.

**4. Findings of Visual Inspection With Regard to Probable Water Penetration on the Exterior:**

A. No gap/closed cell backer rod/low modulus caulking was found at any window protrusion

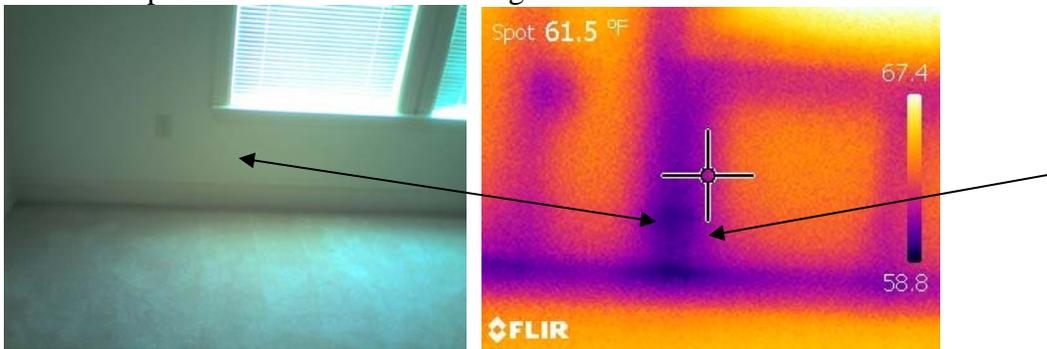
- B. No low modulus caulking was found at any service panel box
- C. No low modulus caulking was found at any protrusion, such as railings at Juliette wrought iron balcony, water faucets, light fixtures, etc.
- D. High grade on left and rear elevation
- E. Deteriorated substrate at front elevation entryway

**5. Findings of Moisture in the Interior Using the Flir Infra red camera with Photos:**

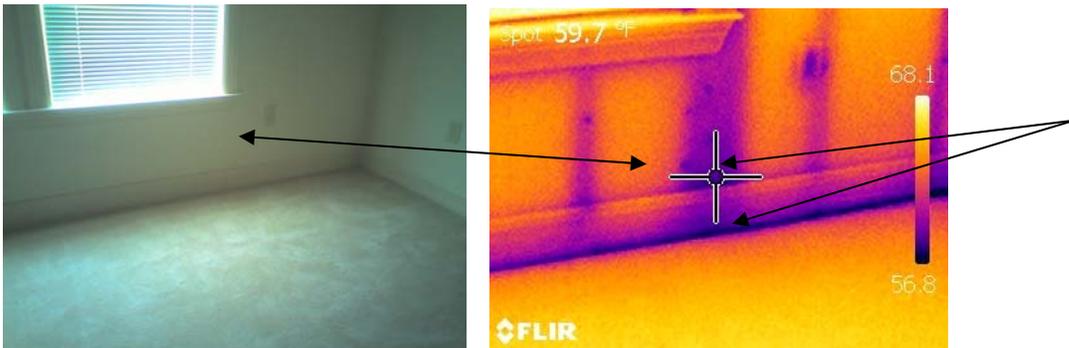
Inspector started in the front elevation, left bedroom, using the Flir B200 Infra-red camera. Prior to his arrival, the heat was turned on to 74F in order to obtain the maximum thermal differential. Inspector then proceeded to diagnose each window in turn.

Infra red detects temperature difference between substances. In the case of this home, water penetrating past the moisture barrier finds its way to the inner wall structure and widens at the bottom of the studs on each side of the window. The inspector agreed to restrictions by the builder to not perform invasive testing which is the only method of determining the exact moisture content of a wall cavity. Most windows showed moisture within the wall cavity where blue/purple thermal signature radiated outward from vertical studs

1. Front elevation, left bedroom, window facing street, left side had water penetration on the left and right corners:

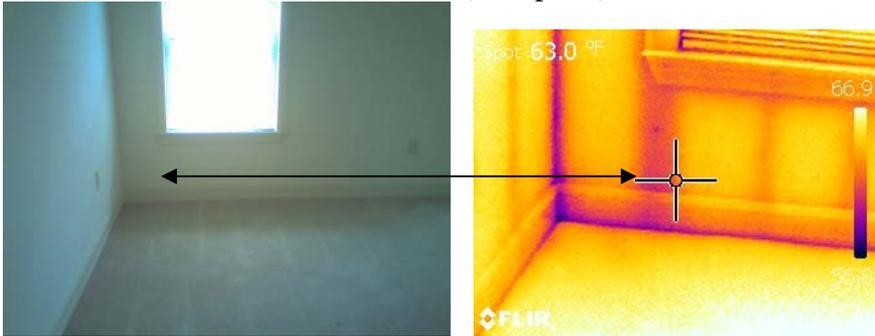


Left of window in front elevation bedroom shows moisture at lower left area of window where dark blue shows moisture spreading out from stud



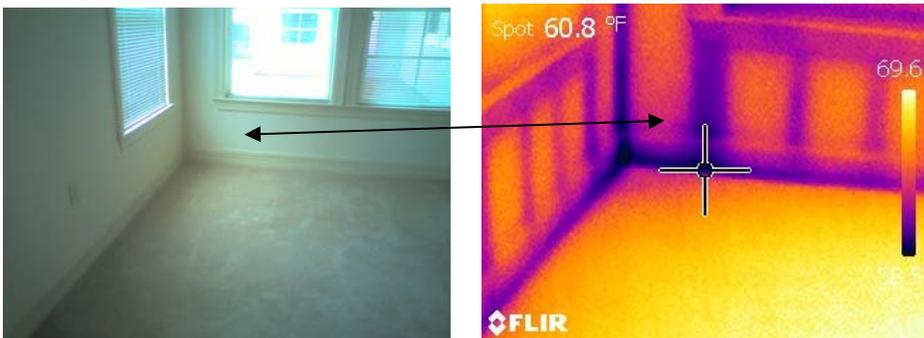
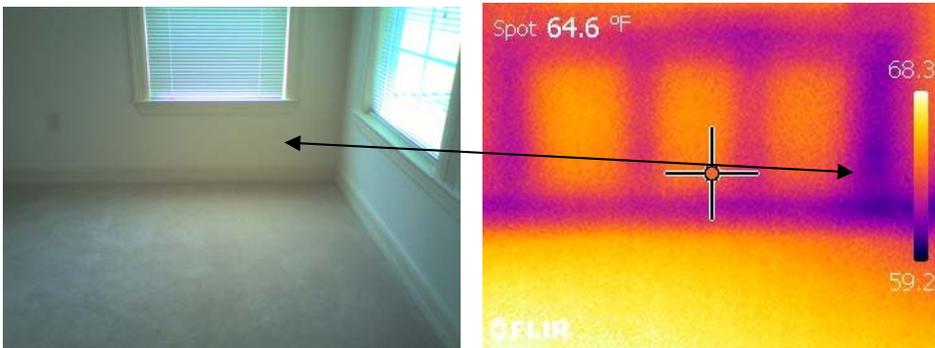
Right of window in front elevation bedroom shows moisture at lower right area

2. Left elevation bedroom (near patio)



Left side of left window shows moisture penetration

3. Left elevation bedroom, window facing left elevation:



Above photo depicts left and rear facing window of second bedroom showing moisture penetration coming in on right side of left window and left side of rear facing window.

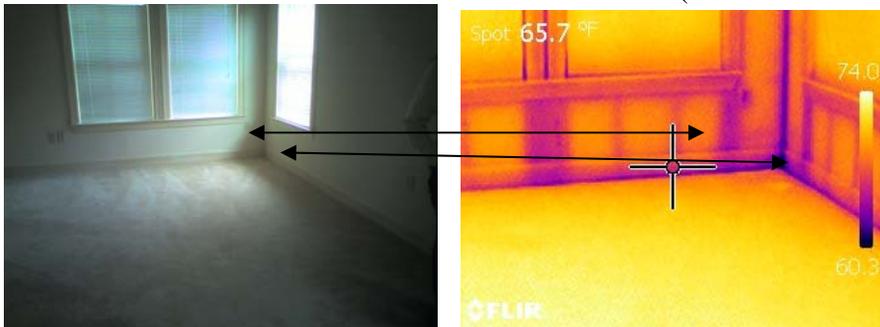
4. In the diningroom, window facing right elevation patio showed moisture



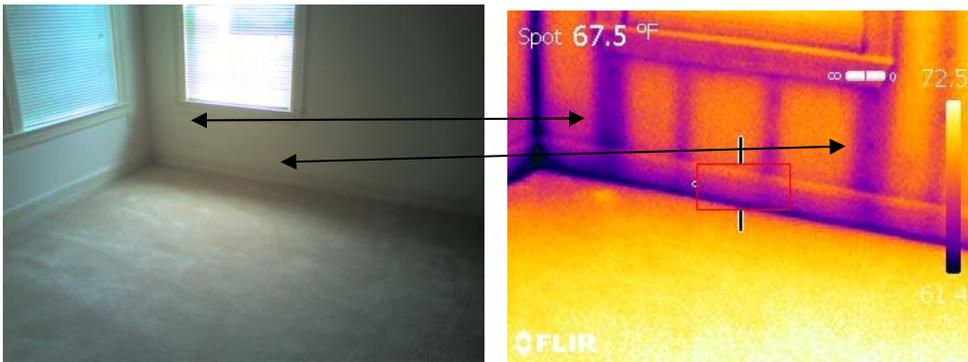
5. Door facing patio on right elevation only appears to show cold air as dark blue/purple



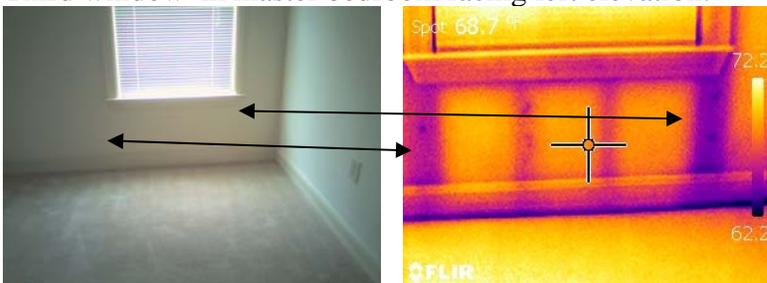
6. Left elevation master bedroom windows (no windows facing rear)



Above photo shows windows on left facing patio and window on right facing left elevation (note that entire window would not fit into same image)



Third window in master bedroom facing left elevation:



**6 Summary:**

The home at the above address experiences water penetration due to a number of sources:

- a. No proper seal (with 1/2" gap/closed cell backer rod/low modulus caulking) around dissimilar materials – window and door frames, walls (on EiFS stucco). The existing caulking seal was deteriorated in most locations
- b. Kickout flashings insufficient or improperly installed on the right side of entry roof line and most likely on the left
- c. No caulking around protrusions
- d. Wicking up of moisture at areas of high grade and porches

**5. Recommendations:**

- 1. Removal of the front wall, from bottom upwards kickout flashing, continuing until no rot is found on the right elevation and “exploratory” on the left side where second kickout is located. This would be cutting open an area approximately 1’x1’ at and below the kickout. Replace kickouts with manufactured type.
- 2. Removal of all window and door banding so that it can be re-installed with the “proper” 1/2” gap/closed cell backer rod
- 3. Regrading of land at rear and left elevation
- 4. Removal of stucco and substrate and repair of rotted studs at all windows, 1” along left and rear elevation
- 5. Using fiberglass mesh to cover and refinish cracks
- 6. Caulking around all protrusions with NP1; remove bolts from Juliette balcony, insert caulking, reinstall bolts.

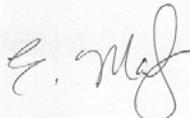
**6. Other considerations:**

- 1. Continual inspection and repair/caulking of vinyl covered aluminum window frames is needed.
- 2. Finally, recommend that a licensed and certified inspector be hired to assure that the removal and re-installation process be performed properly.

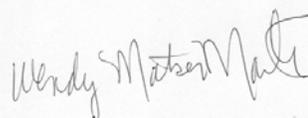
Respectfully submitted,



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Consultant #MAC 1002  
by Texas Department of State Health  
Services, expiration 3/13/2013  
Stucco Certified by EDI(exterior  
design institute)TX133

Professional Apprentice  
Inspector # 10940  
Professional Mold  
Assessment Consultant  
#1137  
By Texas Department of State  
Health Services Expires 9/17/2013

TREC Professional Licensed  
Inspector #3666  
And  
Professional Mold Assessment  
Consultant #1136  
By Texas Department of State Health  
Services, Expires 9/16/2013  
Stucco Certified by Exterior  
Design Institute (EDI)

R401.3 Drainage. Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection so as to not create a hazard. Lots shall be graded so as to drain surface water away from foundation walls. The grade away from foundation walls shall fall a minimum of 6 inches (152 mm) within the first 10 feet (3048 mm).

Exception: Where lot lines, walls, slopes or other physical barriers prohibit 6 inches (152 mm) of fall within 10 feet (3048 mm), drains or swales shall be provided to ensure drainage away from the structure.

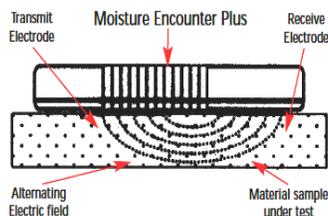
Member of Indoor Air Quality Association

Member of BBB in good standing

Recommended by Angie's List, 2007, 2008, 2009 , 2010 2011 "Super Service Award"



#### About the Tramex MRH:



The Moisture Encounter Plus Operates on the principal of non-destructive impedance measurement. Coplanar electrodes are fitted on the base of the instrument from which low frequency signals are transmitted into the material being tested, measuring the change in impedance caused by the presence of moisture. This reading is translated by the instrument into a moisture content reading.

#### About the Flir Camera:

INFRA-RED CAMERA is a non-contact device that detects infrared energy (heat) and converts it into an electronic signal, which is then processed to produce a thermal image on a video monitor and perform temperature calculations. Heat sensed by an infrared camera can be very precisely quantified, or measured, allowing you to not only monitor thermal performance, but also identify and evaluate the relative severity of heat-related problems. Recent innovations, particularly detector technology, the incorporation of built-in visual imaging, automatic functionality, and infrared software development, deliver more cost-effective thermal analysis solutions than ever before.

Quoted from the Flir website

For more information regarding our tools, please go to [www.preferredinspectionstx.com](http://www.preferredinspectionstx.com) or [www.moldconsultanttx.com](http://www.moldconsultanttx.com) and look for "tools we use" on the left side.

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