

**Almeria Park Condominium
357 Almeria Avenue
Coral Gables, FL 33134**

Testing Report

**Raul Schwerdt, P.E.
RAS Engineers and Consultants, Inc.**



2013

July 10th, 2013

Almeria Park Condominium
Attn: Board of Directors
357 Almeria Avenue
Coral Gables, FL 33134

Re: Moisture Scanning

Dear Board:

Raul Schwerdt, P.E., and Sebastian Seidita, F.T. performed a deluge testing on 6/27/13. This report is based on testing and inspection performed at the premises.

PURPOSE AND PROCEDURE:

The primary purpose was to find the source of leaks on the bathroom of the unit located at the SE corner of the building at the fifth floor level. Testing and Investigation followed ASTM E2128 Standard Guide for Evaluating Water Leakage of Building Walls.

We have briefly reviewed details of the wall on the original design drawings and attach them to this report in Exhibit C. Product Specifications, related repairs purchase orders, or contract for building maintenance or repair were not available for review.

The interior sides of the walls were scanned with infrared thermal imaging, and impedance testing before spraying water on the exterior side. The same procedure was performed after spraying the water. The areas with increased moisture were labeled in the actual picture shown on Exhibit A "Testing Reports".

FINDINGS:

The original specifications show 8-inch CMU concrete block, with concave tooled joints covered with 5/8" thick stucco. The interior side is covered with 3/8" gypsum board moisture resistant on 7/8" galvanized steel furring channels @ 16" o.c. with foil insulation. There isn't a specific instruction on the number of layers, of stucco, and maximum thickness on the drawing.

The building was built in 2003 and per Mr. Jorge Fernandez, manager. It is the first time moisture was observed coming from the exterior walls of the building. The leaks were observed by the homeowner thereafter heavy rains regardless wind direction, and leaks continue for a period of time after the rain ends. Coating was previously applied on the tested area however, the repair was ineffective.

DISCUSSION:

The exposed exterior wythe of masonry provides the first layer of water resistance for the wall system. The masonry units and mortar may permit water movement by diffusion, but leakage due to this property alone is unlikely. Water is more likely to penetrate at the interface between the units and the mortar and physical deficiencies such as cracks or open joints. Several physical properties of the units can have an effect on the water resistance of a wall including:

1. Compatibility of the unit's absorption characteristics and the properties of the mortar.

2. Bonding surface conditions, such as surface roughness and irregularities that might interfere with proper mortar bond, or the presence of contaminants and residues from the manufacturing process, handling and storing procedures.
3. Fissures or voids that extend through the body or face shell of a unit.
4. Mortar- the properties of mortar that relate to workability and durability can affect the leakage resistance of a wall. Mortar that has good workability allows masons to achieve optimal performance. Poor workability properties of mortar can result in poor bond, voids within the mortar, ineffective tooling, and premature deterioration. Mortar properties that should be considered in assessing bond and leakage resistance include:
 - 4.1 Absorption and water penetration resistance of the mortar and the mortar-unit interface.
 - 4.2 Compatibility with the masonry unit suction properties.
 - 4.3 Proper mix proportions
 - 4.4 Carbonation along the unit/mortar interface.
 - 4.5 Proportions and type of colorants and additives.
5. Coating and Sealants- The water resistance of barrier layer must be sufficient to interrupt the movement of water through a wall. The required resistance will depend on the absorption and penetration properties of the wall assembly, and the cumulative water resistance of all of the layers.

The barrier layer, painting and coating should be continuous. Voids in the barrier layer can result in localized water penetration of the wall.

The successful installation of masonry is a craft as well as a technology, dependent on the skill and experience of the individual mason. The subjective aspects of the mason's skill are demonstrated by the appearance and water penetration resistance of the finished masonry. There are also objective aspects of a mason's skill that can be assessed in a systematic way, including:

1. Using proper techniques appropriate to the materials involved.
2. Adequately filling mortar joints, which are less likely to permit water penetration than partially filled or furrowed joints.
3. Using good joint tooling technique, executed at the appropriate mortar hardness.
4. Achieving optimal bond and water penetration resistance for the materials involved.
5. Providing a clean cavity without mortar bridging and with minimal mortar droppings.
6. Providing parge coats and grouted or mortared barrier layers that are free of voids.

After reading all of the potential sources of failures, you may conclude that the cause may not be found by observing the painted surface.

In addition, the Florida Building Code requires for Miami-Dade County 1/2 inch minimum stucco thickness applied on two coats over bonding agent. ASTM C-926 specifically referred by FBC states that the first coat to be minimum 3/8" and the finish coat minimum 1/8". Another requirement from the Florida Building Code includes:

"Masonry a surface on which all stucco is applied shall be clean, free from efflorescence, damp and sufficiently rough, or coated with an approved bonding agent, to insure proper bond."

"All concrete surfaces shall be coated with an approved bonding agent or shall be effectively roughened."

"The first coat shall be well forced into the pores of the masonry, shall be brought out to grounds, straightened to a true surface and left rough enough to receive the finish coat."

"The first coat shall be rodded and waterfloated to a true surface approximately one-half the total thickness."

"The base coat shall be damp cured for a period of not less than 24 hours."

"The stucco shall be kept damp for a period of not less than 48 hours after application of the finish coat."

RECOMMENDATIONS:

The areas showing moisture and water intrusions during the test are away from the windows. Three of the spots are surrounding columns, and the other spot by the center span on the slab edge.

We conclude that the water is penetrating through the exterior stucco. In order to know more specific details, the applied white coating has to be removed by heavy pressure cleaning to expose the stucco's surface. Thereafter, we propose to test the permeability of the surface in different spots, scan the thickness of the stucco and layers, echo sound testing, and survey the thickness of the original coatings on the wall panes, columns, and the reveals on the wall. We suspect those reveals are one of the sources of the leak.

As a routine matter, in order to avoid possible misunderstanding, nothing in this report should be construed directly or indirectly as a guarantee for any portion of the structure. To the best of my knowledge and ability, this report represents an accurate appraisal of the present condition of the existing building, based upon careful evaluation of observed conditions, to the extent possible.

Please call me if there is any question.

Very truly yours,

Raul Schwerdt, P.E.
Florida Registration, P.E. # 50093
RS/bs
Exhibit "A": Picture Log
Exhibit "B": Picture Album
Exhibit "C": Field Testing Reports
Exhibit "D": Drawings

CERTIFICATION OF INDEPENDENCE:

1. RAS Engineers doesn't have, nor does it intend to acquire or will it acquire, a financial interest in any construction company manufacturing or distributing products it evaluates.
2. RAS Engineers is not owned, operated or controlled by any construction company manufacturing or distributing products it evaluates.
3. Raul Schwerdt, PE does not have, nor will acquire, a financial interest in any other entity involved in the approval process or application of the product.

Picture Log

Pic	Location	Findings
1	Bathtub's Wall	Concrete block with metal furring paneling was removed prior to the inspection
2	Bathroom Shower Wall	Rusted metal furring. However, at the time of the test no moisture was found on concrete block wall
3	Exterior wall	Setting the spray rack for deluge test
4	Exterior wall	Water sprayed on the white coated area of the exterior side of the wall
5	Bathroom Wall next to window	60 % of moisture tested on the inside after applying spray water on the exterior side of the wall
6	Bathroom Shower Wall	No moisture shown after spraying water on this area
7	Bathroom's Ceiling	Visible moisture on the underside of the concrete slab of the unit above
8	Bathtub's Wall	Rusted rebar and concrete spall
9	Bathroom Wall under window sill	No moisture Tested after spraying water on the exterior
10	Bathtub's Wall	We found 60 % of moisture on the concrete blocks surface
11	Column	50 % of moisture was tested on the concrete column at the corner of the unit
12	Bathroom Shower Floor	Dial shows 60 % of moisture on the shower's floor.

Picture 1



Picture 2



Picture 3



Picture 4



Picture 5



Picture 6



Picture 7



Picture 8



Picture 9



Picture 10



Picture 11



Picture 12



ENGINEERS AND CONSULTANTS, INC.

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ENGINEERING

MIAMI-DADE COUNTY CERTIFIED LABORATORY

374 Ansin Blvd. Hallandale, FL 33009 PH: (954)455-2454 Fax:(954)455-2453

TEST: Evaluation of Water Leakage through Walls (ASTM E 2128)

REPORT

CLIENT: Almeria Park Condominium
357 Almeria Avenue
Coral Gables FL 33134

JOB N*: 130601
DATE: 06/27/13
TIME: 2:30PM

PROJECT: Almeria Park Condominium
ADDRESS: 357 Almeria Avenue Coral Gables FL 33134

Test Area N*: 1
PAGE # 1 of
Control Copy N* of

Tested by: Sebastian Seidita
Equipment: Concrete Encounter CM100

Test Location: SE Corner 5th floor

Approved: RAS
Date: 0

Reference drawing:

RAS Protocol #: MAS-DEL

OUTSIDE HUMIDITY: 85 % OUTSIDE TEMPERATURE: 83 °F

Low Readings RM : 10% Low RM Area: 60%

Medium Readings RM : 40% Medium RM Area: 30%

High Readings RM : 60% High RM Area: 10%

Area: 70 SF % of Wall w/ High RM : 10%



60% Moisture on Concrete block Wall

Raul A. Schwerdt, P.E.
Florida Registration P.E. # 50093



ENGINEERING

MIAMI-DADE COUNTY CERTIFIED LABORATORY

374 Ansin Blvd. Hallandale, FL 33009 PH: (954)455-2454 Fax:(954)455-2453

TEST: Infrared Thermal Scanning on Wall (TAS-0126)

REPORT

CLIENT: Almeria Park Condominium
357 Almeria Avenue
Coral Gables FL 33134

JOB N*: 130601
DATE: 06/27/13
TIME: 2:30PM

PROJECT: Almeria Park Condominium
ADDRESS: 357 Almeria Avenue Coral Gables FL 33134

Test Area N*: 1
PAGE # 1 of
Control Copy N* of

Tested by: Sebastian Seidita

Test Location: Bathroom Wall

Approved: RAS

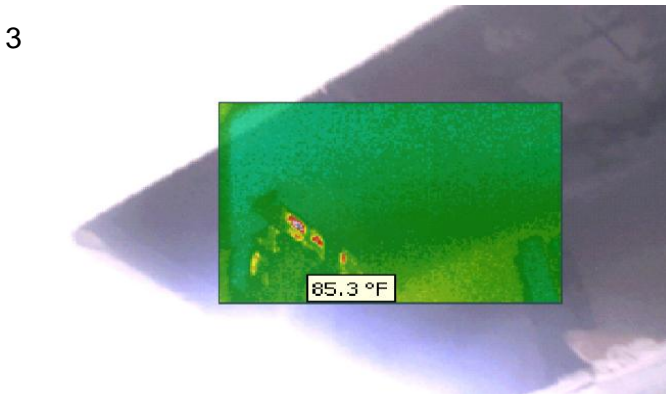
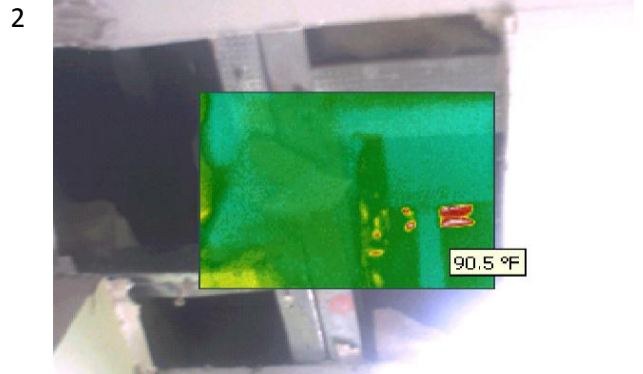
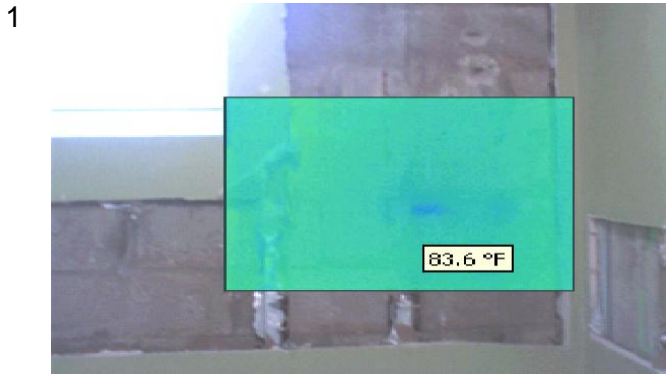
Equipment: Infrared Camera

Date:

Reference drawing:

RAS Protocol #: WALL-IR

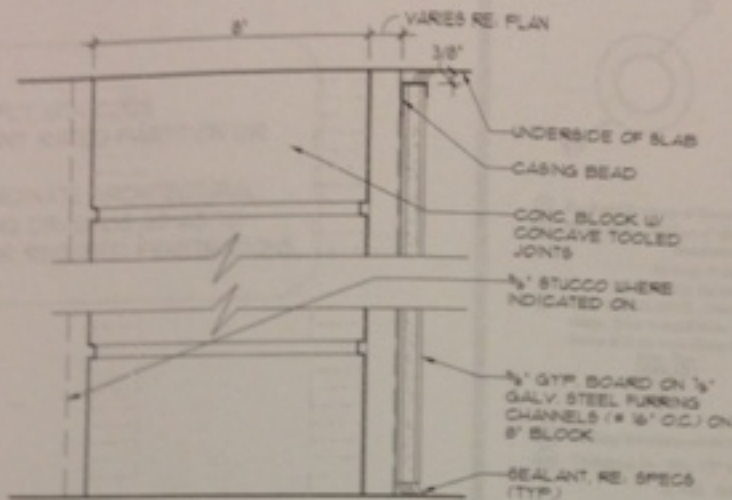
TEST N*	1	2	3	Comments
Dimention SF	2	2	2	
Relative Humidity %	60	60	60	
Temperature *F	83.6	90.5	85.3	
Exterior temperature*F	81	81	81	
Exterior Humidity %	85	85	85	



Raul A. Schwerdt, P.E.
Florida Registration P.E. # 50093

... TO RATING ONLY 1 HR
PARTITION REQUIRED.

WT30



- WT7
- 2 HR RATED - UL*505
- WT7a
- $\frac{1}{2}$ " MOISTURE RESISTANT GYP. BOARD ON $\frac{1}{2}$ " GALV. STEEL FURRING CHANNELS (# 16" O.C.) ON 8" BLOCK.
- WT7b
- $\frac{1}{2}$ " GYP. BOARD ON $\frac{1}{2}$ " GALV. STEEL FURRING CHANNELS (# 16" O.C.) ON BOTH SIDES OF 8" BLOCK WALL.
- WT7c
- $\frac{1}{2}$ " MOISTURE RESISTANT GYP. BOARD ON "WET" SIDE AND $\frac{1}{2}$ " GYP. BOARD ON "DRY" SIDE ON $\frac{1}{2}$ " GALV. STEEL FURRING CHANNELS (# 16" O.C.) ON 8" BLOCK.
- WT7d
- $\frac{1}{2}$ " MOISTURE RESISTANT GYP. BOARD ON $\frac{1}{2}$ " GALV. STEEL FURRING CHANNELS (# 16" O.C.) ON BOTH SIDES OF 8" BLOCK WALL.
- WT7e
- TO WT7d ADD R42 (R-FOL) INSULATION.
- WT7f
- TO WT7e ADD R42 (R-FOL) INSULATION.
- WT7g
- TO WT7b ADD R42 (R-FOL) INSULATION.
- WT7h
- TO WT7c ADD R42 (R-FOL) INSULATION.
- WT7i
- TO WT7d ADD R42 (R-FOL) INSULATION.
- WT7j
- NO RATING - $\frac{1}{2}$ " GYP. BOARD ON $\frac{1}{2}$ " GALV. STEEL FURRING CHANNELS (# 16" O.C.) ON 8" BLOCK WITH R42 (R-FOL) INSULATION.
- WT7k
- NO RATING - $\frac{1}{2}$ " MOISTURE RESISTANT GYP. BOARD ON $\frac{1}{2}$ " GALV. STEEL FURRING CHANNELS (# 16" O.C.) ON 8" BLOCK WITH R42 (R-FOL) INSULATION.

WT

WT8

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