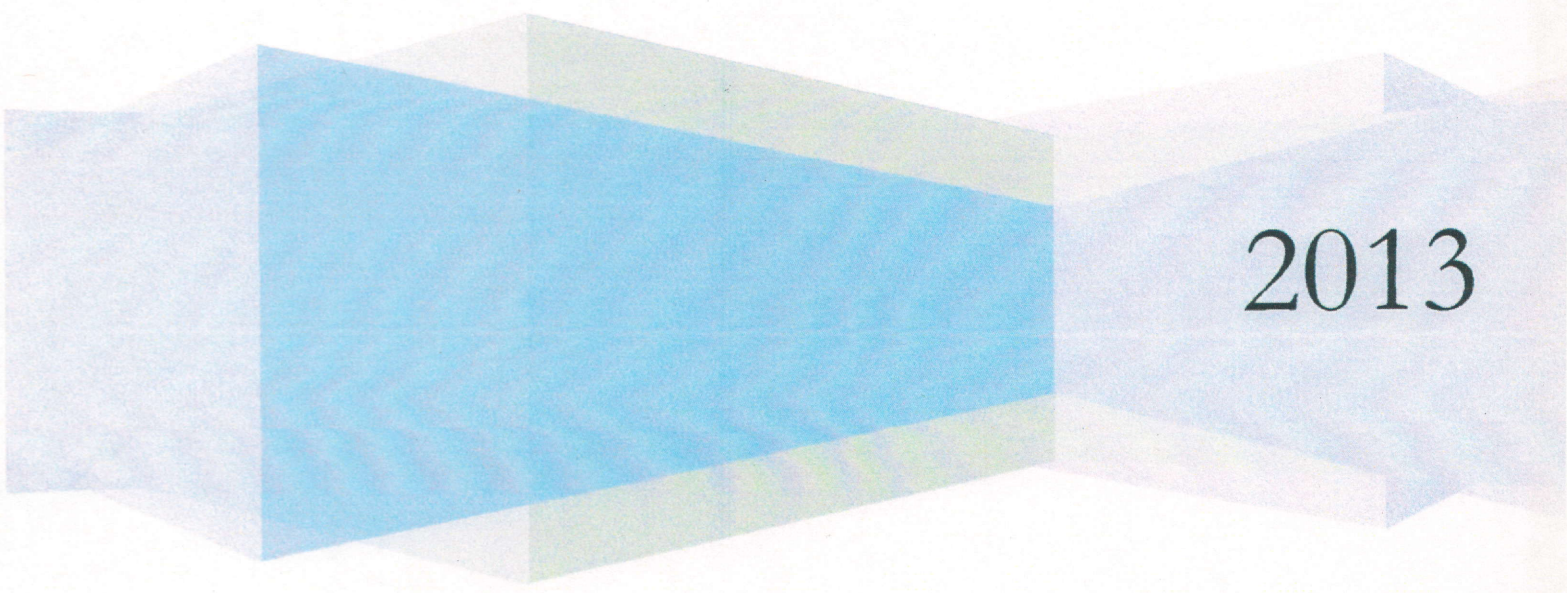


**Almeria Park Condominium  
357 Almeria Avenue  
Coral Gables, FL 33134**

## **Testing Report**

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



2013

August 19,2013

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

**Re: Moisture Scanning and Stucco Testing**

Dear Board:

Raul Schwerdt, P.E., and Sebastian Seidita, F.T. performed a deluge testing on 6/27/13. In addition, on a second visit additional testing was performed on the stucco to prepare specifications for repairs. This report is based on testing and inspection performed at the premises during both visits.

**PURPOSE AND PROCEDURE:**

The primary purpose was to find the source of leaks on the bathroom of the unit 505 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".

During the second visit, we performed a permeability test, alkali-silica reaction, and sound testing. Two small holes were performed on the wall and column to investigate the condition of the sub-surface.

**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.

The testing results during the second visit showed coincidentally high water permeability see pictures 1, 2, and 3. Also, there is hollow stucco in two locations, see pictures 5 and 6. Thereafter, the stucco was cut and grinded to reach the masonry blocks surface. See holes cut on picture 9 on the 8/14/2013 picture album. A large crack on the stucco was previously repaired, see picture 4. The crack is located on the final coat of the stucco. We have

performed alkali-silica reaction test to determine any adverse reaction from the aggregates, see picture 5. As result, we determined that alkali-silica reaction is not a detrimental factor for the deficiency.

#### 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.

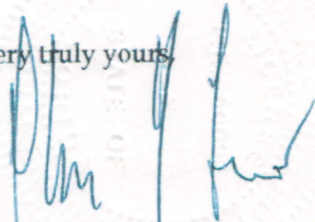
We conclude that the water is penetrating through the exterior stucco. In order to know more specific details, the applied white coating has to be removed by heavy pressure cleaning to expose the stucco's surface. Thereafter, we propose to test the permeability of the surface in different spots, scan 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.

After our second visit, we confirmed the source of water by testing. We prepared specifications for repairs along with this report. It is recommended, leaving the interior walls uncovered until water testing after repairs confirms dry condition.

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 tested areas, 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



**ENGINEERS AND CONSULTANTS, INC.**

374 ANSIN BOULEVARD. HALLANDALE BEACH, FL 33009  
PH: (954) 455-2454      [www.RASengineers.com](http://www.RASengineers.com)



Picture Log

Pic	Location	Findings
1	5th Floor By East South Wall between column and window	Masonry Absorption Test
2	5th Floor By East South column	Water intrusion on Masonry Wall
3	Wall next to window	Water intrusion on Masonry Wall
4	Wall next to window	Visible Large Crack repaired behind the paint
5	Wall next to window	No Alkali silica reaction was observed at the time of the test
6	5th Floor By East South side	Hollow Column with moisture inside
7	column	1 inch stucco on column and 1/4 in plastic trim mold
8	5th Floor By East South	the exploratory inspection was at 10 feet up to the 6 th floor slab
9	5th Floor By East South	Exploratory holes cover with provisory cement



# ENGINEERS and Consultants, Inc

MIAMI-DADE COUNTY CERTIFIED LABORATORY NOA # 06-0428.02

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

TEST: Testing of Alkali Silica Reaction on Dry Concrete (ASTM C- 289)

REPORT

CLIENT: Almeria Park Condominium  
357 Almeria Ave  
Coral Gables FL

JOB N°: 130601  
DATE: 08/14/13  
TIME: 1:00PM

PROJECT: Almeria Park Condominium  
ADDRESS: 357 Almeria Ave Coral Gables FL

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

Tested by: Sebastian Seidita

Test Location: 5 th Floor

Approved: RAS

Equipment: ASR Test Kit

Date: 0

Reference drawing: N/A

RAS Protocol #: CONC- ASR

TEST N*	1	2	3	Comments
Location	EAST SOUTH Wall			
Structural Member	Wall			
Material Type	Stucco			
Exposed to Chloride in Service	NO			
Dry or Protected from Moisture	NO			
Other Reinforced Concrete Construction	CIP			
Advanced ASR	NO			
ASR Present	NO			

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

# RAS ENGINEERS and Consultants, Inc

MIAMI-DADE COUNTY CERTIFIED LABORATORY NOA # 06-0428.02  
 374 Ansin Blvd. Hallandale, FL 33009 PH: (954)455-2454 Fax:(954)455-2453

TEST: Echo Sound Testing of Concrete (ASTM D4580)

REPORT

CLIENT: Almeria Park Comdominium  
 357 Almeria Ave  
 Coral Gables FL

JOB N°: 130601  
 DATE: 08/14/13  
 TIME: 2:00PM

PROJECT: Almeria Park Comdominium  
 ADDRESS: 357 Almeria Ave Coral Gables FL

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

Tested by: Sebastian Seidita

Test Location: 5th Floor

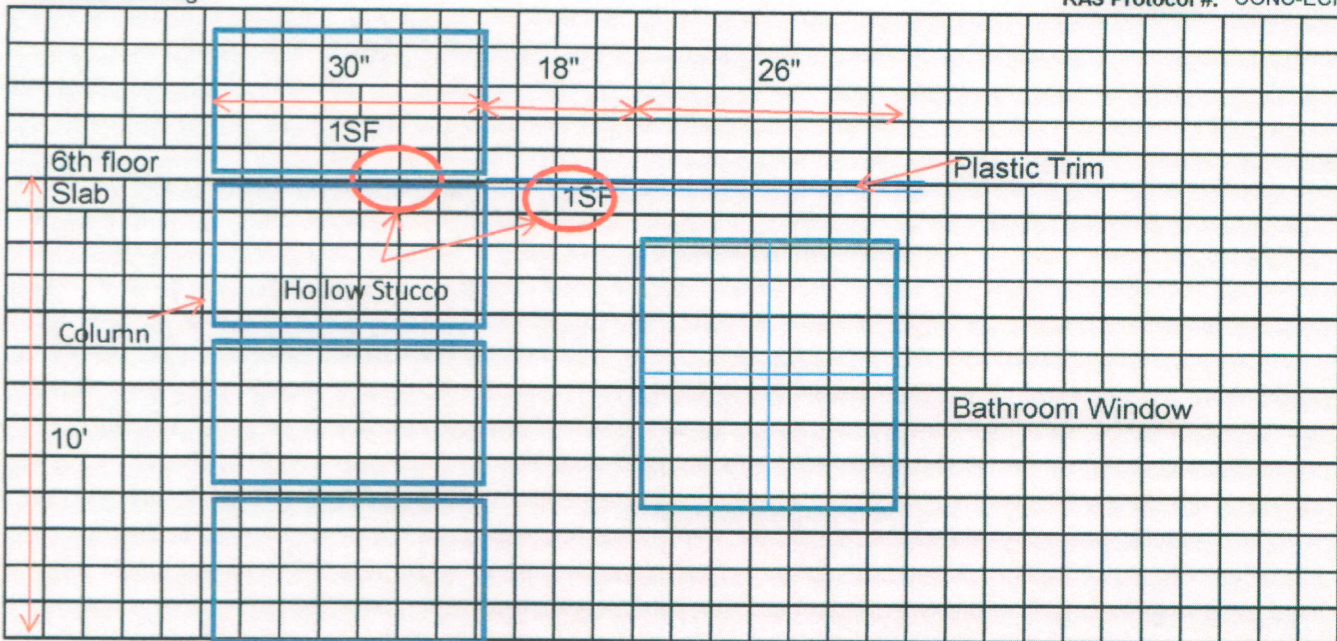
Approved: RAS

Equipment:

Date: 0

Reference drawing:

RAS Protocol #: CONC-ECHO



TEST N*	1	2	3	Comments
Location	5th Floor			
Structural member	Wall			
Area of the Structural member (SF)	100			
Area delaminated (SF)	2			
% of the Structural member delaminated	2			

*[Signature]*  
**Raul A. Schwerdt, P.E.**  
 Florida Registration P.E. # 50093



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MIAMI-DADE COUNTY CERTIFIED LABORATORY NOA # 06-0428.02  
374 Ansin Blvd. Hallandale, FL 33009 PH: (954)455-2454 Fax:(954)455-2453

TEST:	Testing of Water Permeability thru Painting (ASTM E0514)	REPORT
CLIENT:	Almeria Park Condominium 357 Almeria Ave Coral Gables FL	JOB N°: 130601 DATE: 08/14/13 TIME: 2:00PM
PROJECT:	Almeria Park Condominium	Test Area N°: 1
ADDRESS:	357 Almeria Ave Coral Gables FL	PAGE # 1 of
Tested by:	Sebastian Seidita	Control Copy N° of
Equipment:	M.A.T.	Approved: R
Reference drawing:	N/A	Date: 0
		RAS Protocol #: PAINT-PERM

No.	Location	Absorption (millimeters)	Time (minutes)	Surface Condition
1	A	0	5	Good
2	B	0	5	Good
3	C	0	5	Good
4	D	5	5	Good
5	E	0	5	Good
6	F	0	5	Good
7	G	5	5	Good
8	H	0	5	Good
9	I	0	5	Good

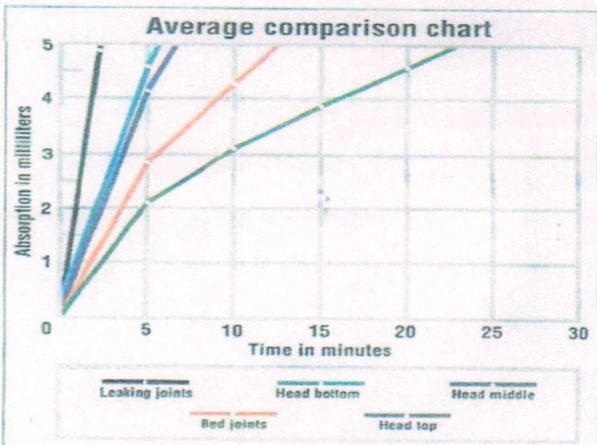


Figure 2. Absorption graphs show the volume of water absorbed in milliliters versus time. The more permeable the masonry, the faster 5 ml of water will be absorbed.

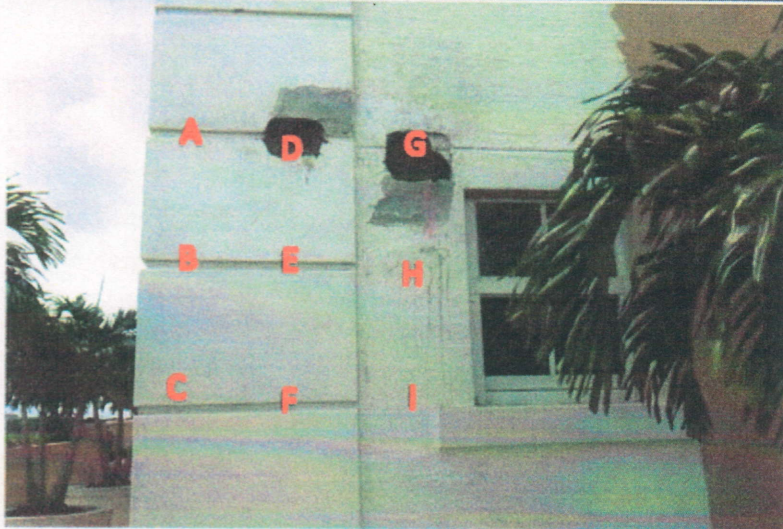
*Raul A. Schwerdt*  
**Raul A. Schwerdt, P.E.**  
 Florida Registration P.E. # 50093



# ENGINEERS *and Consultants, Inc*

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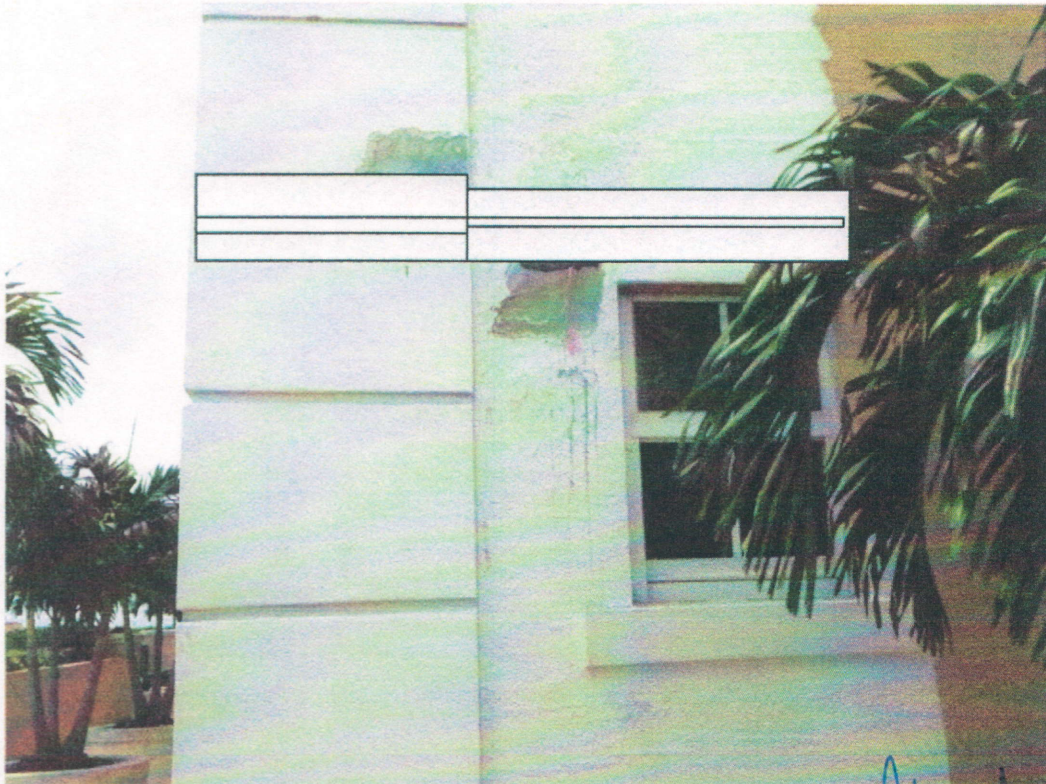
TEST:	<b>Testing of Water Permeability thru Painting (ASTM E0514)</b>	<b>REPORT</b>
	<b>357 Almeria Ave Coral Gables FL</b>	DATE: <b>08/14/13</b> TIME: <b>2:00PM</b> Test Area N°: <b>0</b> PAGE # <b>1</b> of <b>0</b> Control Copy N° of Date: RAS Protocol #: <b>0</b>
PROJECT:	<b>Almeria Park Condominium</b>	
ADDRESS:	<b>357 Almeria Ave Coral Gables FL</b>	

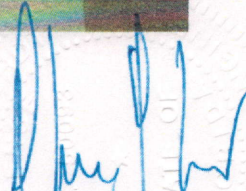


<b>RAS Engineering</b> 374 Ansin Blvd. Hallandale, FL 33009 Phone: (954) 455-2454 Fax: (954) 455-2456 <a href="mailto:ras@RAScompany.com">ras@RAScompany.com</a> <a href="http://www.RASCompany.com">www.RASCompany.com</a>	<b>Project</b> <b>Almeria Park Condominium Unit 505</b>				<b>Job Number:</b> <b>130601</b>	
	<b>Part of Structure</b> <b>Exterior Wall</b>				<b>Sheet no./rev:</b> <b>1 Rev.0</b>	
	<b>Reported by:</b> <b>SS</b>	<b>Date:</b> <b>8/12/13</b>	<b>Drawn by:</b> <b>GS</b>	<b>Date:</b> <b>8/13/13</b>	<b>Specs by:</b> <b>RAS</b>	<b>Date</b> <b>8/19/13</b>
<b>Detail</b>	<b>Repair faulty stucco</b>					

Specifications for Repairs

1. Cut 8" horizontal strip of stucco, four inches over and below the reveal groove. Extend the cut where indicated in the picture to reach the concrete block.
2. Remove stucco entirely and the plastic reveal form.
3. After opening, call the engineer for inspection.
4. Repair large cracks if necessary by injecting epoxy. Assume 3 LF for bidding, final quantities will be determined by the engineer after demolition.
5. Apply bonding to the masonry block, and one coat of stucco, maximum 5/8" thick.
6. Next day apply second coat of stucco. Make a reveal on the surface matching existing dimension, by pushing wood shim on the fresh stucco. Note the reveal on the column must be larger than the one on the wall.
7. Wait for a couple of days and apply sealer on the new stucco.
8. Call Engineer for final water deluge testing before applying two coats of painting and approval of the work.



  
 PAUL SCAWORT  
 PE # 5053.  
 8/19/13