



# ASSOCIATES

ENGINEERS & ARCHITECTS

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## PENTHOUSE TOWERS CONDOMINIUMS

### HIGHLAND BEACH MILESTONE STRUCTURAL INSPECTION REPORT



Architecture  
Structural  
MEP/FP  
Restoration  
Parking

Exterior Envelope  
Energy  
Studies  
Expert Witness  
Regulatory & Compliance

SEPTEMBER 11, 2023

Submitted By:

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Submitted To:

**Penthouse Towers Condominiums**  
3101 S. Ocean Blvd  
Highland, FL 33487  
C/O Elaine



September 11, 2023

Sent Via Electronic Mail

**Penthouse Towers Condominiums**  
3101 S. Ocean Blvd  
Highland Beach, FL 33487  
**Folio #:** 24-43-46-33-3307-0000-XXX

C/O Elaine  
Property Manager  
561.278.8092  
[officepenthouse@comcast.net](mailto:officepenthouse@comcast.net)

**Re: Penthouse Towers Condominiums  
Highland Beach Milestone Inspection Structural Report**

Dear Ms. Elaine:

O&S Associates, Inc. has completed the Highland Beach Milestone Inspection of Penthouse Towers Condominiums. This report was prepared in accordance with the scope of work and limitations included in this report.

Please review the attached findings and contact us at your convenience to discuss the report or any questions you may have.

Respectfully,  
O&S Engineers & Architects

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## INSPECTION SUMMARY REPORT

Penthouse Towers Condominiums retained O&S Associates, Inc. to perform a structural inspection of the residential building. Pursuant to the requirement of the Highland beach new building recertification inspection, ordinance No. 2022-008 Our site visit included visual inspection and acoustic impact testing from the ground, the roof, catwalks, staircase and thirty-four of the balconies.

Florida statute 558.88 (3)(a), defines substantial structural deterioration as *substantial structural distress that negatively affects a building's general structural integrity. The term does not include surface imperfections such as cracks, distortions, sagging, deflections, misalignment, signs of leakage, or peeling of finishes unless the licensed engineer or architect performing the phase one or phase two inspection determines that such surface imperfections are a sign substantial structural deterioration.* During the milestone inspection we did not observe substantial structural deterioration and no phase two inspection is required.

Overall, the building and roof are in fair condition. Structural concrete and stucco repairs are needed to return the building to good condition. The most critically deteriorated areas were discovered in the retaining wall of the cooling tower on the north elevation. As well, in the fire room in the middle of the ground floor, a beam was discovered to be spalled or to have been cut. This was to allow a pipe to pass through. The harmful effects of salt-laden air are most prevalent and potential water intrusion that has deteriorated the reinforcement may have affected the retaining wall. The least amount of visual deterioration was inside the protected spaces of the residential units. There were also deficiencies in the catwalk slab and balconies.

Structural concrete repairs are recommended on the balcony edge and additional waterproofing measures are recommended at the catwalk and balconies to mitigate potential future deterioration. We recommend a comprehensive restoration, maintenance, and waterproofing program be planned by the community to address the issues observed. The program should include the identified concrete repairs, maintenance of the stucco cladding, and waterproofing of the balcony floors, and catwalks.

## INTRODUCTION

### AUTHORIZATION

O&S Associates, Inc. (O&S) was retained by Penthouse Towers Condominiums to perform the Highland Beach structural evaluation of the building per our proposal dated August 10, 2022.

### OBJECTIVE

O&S understands that Penthouse Towers Condominiums community is aware of some deterioration at the buildings of the community and desires a structural engineering consultant to complete an evaluation of the building and provide an opinion of the building condition and offer recommendations for a repair program. This report provides a condition assessment of the structural and waterproofing elements of the building. The observed conditions were evaluated to the extent required to develop a conceptual repair program and opine the associated probable costs.

Note that we did not observe 100% of the building structure, or façade. Our are extrapolated from the results of our observations of a portion of the building.

### SCOPE

The scope of work performed to date of the structural evaluation of Penthouse Tower Condominiums includes:

1. Review documents made available to O and S Associates including the existing plans, engineering and testing reports, and construction, repair, or maintenance information.
2. Visually observe the project structural components or conditions, and other incidental appurtenances related to determining the condition of the structure, in accordance with the guideline issued by the Town of Highland Beach.
  - a. Building Roof, Parapets.
  - b. 34-unit balconies, Catwalks, and Staircase.
  - c. Exterior building façade.
3. Perform acoustic impact testing (hammer sounding) of representative areas of the building façade.
4. Compile a report with recommendations, and photographic documentation.

### REVIEWED DOCUMENTS

O&S relied on the following documents for information throughout the preparation of this condition assessment report:

1. "136 Unit Apartment Building Penthouse Towers A Condominium "Richard W Dodge AIA Architecture, drawings submitted for permit generated by Sam Engel JR. AIA.

## GENERAL PROPERTY DESCRIPTION

Penthouse Towers Condominiums is a 10-story concrete/masonry “C” shape structure separated by expansion joints built-in 1969. The property contains one hundred and thirty-six residential units in Highland Beach, Florida. The community includes on-grade and elevated deck parking that has direct access to the lobby and has several site features and amenities. Building's roof is waterproofed with a built-up asphalt roof with ballast, while its exterior is finished with stucco.

## VISUAL OBSERVATIONS & RECOMMENDATIONS

### INTRODUCTION

This section of the report contains a summary of our visual observations and recommendations for the building. The structural evaluation of Penthouse Towers Condominiums followed accepted assessment practices and industry standards. The building structural components were evaluated with respect to both structural integrity and weathertightness.

In addition, acoustic impact testing was performed in accordance with ACI 364.1-94 by “hammer tapping” and “delaminated tool” select unobstructed areas of the stucco cladding and concrete slab surface. This acoustic testing is used to audibly detect deteriorated/delaminated locations that are not visibly observable. Our field observations were made based on our understanding of accepted industry standards as set forth in voluntary specifications. Photographs were used to document the various conditions and distressed areas (Appendix A – Photographic Documentation).

We did not evaluate the building with respect to hazardous materials, zoning/code compliance, or accessibility to disabled persons.

### STRUCTURAL DESCRIPTION

Penthouse Towers Condominium is a concrete-framed ten-story building in Highland Beach. The building has 136 cantilevered balconies and cantilevered egress catwalks at the front of the building. The concrete super structure consists of cast in place concrete slabs supported on concrete beams and columns. The superstructure is supported on a deep pile foundation system. Lateral resistance of the structure is provided by masonry shear walls at column lines and the stair and elevator towers.

### BUILDING SUPER STRUCTURE CONCRETE

The Building at Penthouse Towers Condominiums is composed of cast-in-place concrete slabs supported on cast-in-place concrete beams and columns. We identified multiple spots of debonded stucco and spalled concrete on balconies and catwalk. It is likely that additional concrete repairs would be discovered during a repair program. As discussed later, some observed areas of debonded stucco and concrete were observed on the exterior of building elevations. When the stucco is removed it may expose deteriorated concrete that will need to be repaired before the stucco is replaced. We recommend the known areas of concrete deterioration be repaired by a contractor experienced with concrete restoration and the work be completed per accepted industry standards and recommendations. We also recommend an allowance for additional concrete repairs be included in the repair program scope of work.

#### RETAINING WALL AT COOLING TOWER

We observed horizontal cracks, step cracks, and debonded concrete on the north elevation of the cooling tower, as well as on the staircase during our walkthrough of the building. By hammer tapping and observing the horizontal cracks, we found that they were in unsound conditions. It is possible that the cracks, and debonding were caused by water intrusion, shrinkage and expansion caused by heat exposure to the concrete. Another possible effect may be caused by exposure to salt in the sea air. In order to properly repair the retaining wall, the rails need to be removed. An experienced contractor should be hired to perform this task to facilitate better access. In addition to repairing existing concrete, all surfaces should also be painted and coated after all repairs have been made.

#### BEAM REPAIR AT FIRE ALARM ROOM

It was observed that the concrete beam in the fire alarm room on the first floor was in poor condition and had spalled. We observed that the beam was cut to fit a pipe through the beam, resulting in the surrounding areas spalling. This is a safety concern, and it should be addressed. A contractor experienced in restoring overhead concrete beams should carefully remove the damaged concrete. During the repair work, the beam will need to be shored up or temporarily supported with a supplemental structure. In addition to repairing the existing concrete, a new coating should be applied to all the exterior surfaces exposed to the elements.

#### CONCRETE SLAB AT CATWALKS

We observed unsound areas and concrete cracks on the catwalk slab throughout the building. The observed deterioration is likely due to water sitting on the catwalk slab or that it was not properly repaired before the catwalk was waterproofed. We recommend that the damaged stucco/concrete be carefully removed by a contractor experienced with slab restoration and repaired per industry standards.

We recommend the waterproofing membrane be maintained, as this will prevent water from penetrating the slab and will extend the useful life of the catwalk. The waterproofing will not eliminate corrosion that has already happened. Stopping the water from accessing the reinforcing steel will slow down or stop the rate of corrosion going forward. The waterproofing membrane has an expected useful life so the association should plan to maintain the waterproofing membrane approximately every seven to ten years.

#### CANTILEVER CONCRETE BALCONIES

Each unit on the second floor and above includes a cantilevered concrete balcony. We inspected the balconies at 34 of the 136 units and observed that the balconies are in generally fair condition. There were many balconies with tile floors which prevented us from inspecting the balcony slabs and assessing their condition. As a result of our observations, ten units require overhead repairs and on the vertical walls of fifteen of the units we observed debonded stucco.

We recommend that the damaged concrete be carefully removed by a contractor experienced with soffit concrete and vertical wall repair. Following we recommend a waterproofing membrane be installed on the balcony floors. The waterproofing membrane will prevent water from penetrating the slab and will extend the useful life of the balcony. The waterproofing will not eliminate corrosion that has already happened. Stopping the water from accessing the reinforcing steel will slow down or stop the rate of corrosion going forward. The waterproofing membrane has an expected useful life so the association should plan to maintain the waterproofing membrane approximately every seven years.

### BALCONY GUARDRAILS

The balcony guardrails at Penthouse Tower Condominiums are comprised of aluminum picket rails. The aluminum picket style guardrails are in generally in sound condition. We noticed many of the guardrails have been coated with paint and it has now failed, and it will be recommended for all guardrails to be cleaned and repainted to preserve the life of the aluminum rails.

### VERTICAL WALL REPAIR

During our walk-through of the building, we physically sounded with our delaminating tool the walls and observed multiple areas of debonding stucco. This may occur due to the stucco losing its bond to the concrete and allowing moisture to penetrate the concrete, resulting in spalling. Some hairline cracks were also observed but they were all in sound condition. We recommend that the vertical wall repair be performed by an experienced contractor and the walls be repainted and coated once all the repairs have been completed.

### PARKING GARAGE

Penthouse Towers Condominiums includes one level of elevated parking. The parking level is comprised of precast concrete girders and joists on cast in place concrete columns. The upper level of parking includes two areas of covered parking. The covered parking areas are comprised of cast in place concrete columns supporting cast in place concrete girders and precast concrete hollow core plank.

We observed several areas of concrete deterioration of the hollow core plank at the covered parking areas. These should be repaired by restoration contractors experienced with restoration of hollow core precast planks. These repairs usually require replacement of deteriorated bonded pre-tension tendons with equivalent mild steel reinforcing. Careful attention must be paid when lapping the new mild steel with the existing bonded tendons.

### STUCCO CLADDING

The façade of Penthouse Condominiums is comprised of cement stucco applied over the concrete framing and masonry partition and infill walls. Once cured the stucco is coated with a weatherproofing coating and the two layers act together as part of the waterproofing envelope of the building. As the stucco ages and deteriorates cracks can form which project through the coating. The stucco can also de-bond from the concrete and masonry walls. Left untreated, water can infiltrate through the cracks in the coating and stucco and leak into the building. The infiltrating water accelerates the deterioration of the remaining stucco, can leak into the occupied spaces of the building damaging interior finishes, and eventually cause portions of the stucco to fall from building.

Debonded stucco happens due to multiple reason this may occur due stucco losing its bond to the concrete and allowing moisture to penetrate the concrete, resulting in spalling. Soffit spalling can be occurring due to water sitting on balconies slab and it can be due to coating failing.

We performed visual observations of the stucco exterior and performed acoustic impact testing of portions of the wall to locate areas of deteriorated and de-bonded stucco. We determined that there is de-bonded stucco present on the façade and visible cracks as well. The deterioration is mostly concentrated around the windows, and balconies slab/wall. Finally, we observed locations where storm shutters had been removed from the façade. The shutter anchors were not properly removed, and the stucco was not repaired.

The cracked, de-bonded and deteriorated stucco should be repaired by a contractor experienced with stucco restoration. The damaged stucco should be carefully removed in a manner that does

not damage the substrate and will allow for the replacement stucco to be blended into the adjacent stucco that was in good condition. The substrate of the removed stucco should be treated with a bonding agent and new stucco placed in the patch area in lifts or as recommended by the stucco manufacturer.

Once the existing stucco has been repaired a new coating should be applied to the entire façade and surfaces exposed to weather.

#### SEALANTS JOINTS

The condominium building includes aluminum windows and sliding doors in all facades. We observed locations where the perimeter sealant joint has expired, failed, or had not been properly installed.

The sealant joints on a building are a critical part of the building waterproofing element. A sealant joint is required wherever two dissimilar materials come together in a construction project. The most common sealant joints are between the stucco or concrete wall and the aluminum window frame and between the aluminum window light and the glass panes. The sealant joints should be repaired by fully removing the existing sealants, cleaning the substrate, and installing new sealant joint material with the proper dimensional geometry and tooled profile.

#### EXPANSION JOINT

The condominium forms a "C" shape with an expansion joint joining the three structures. Each floor has a vertical joint on its north and south elevations. In addition, in both the north and south elevations of the building, a vertical expansion joint follows the building's height. As we observed, the vertical expansion joints have expired and need to be replaced.

The expansion joint on the building is a critical part of the building's waterproofing element. Additionally, it is necessary when there is a transition between two surfaces to transfer movement and reduce stress. Expansion joint glands should be replaced to maintain the waterproofing envelope of the building.

#### BUILDING ROOF

The roof at Penthouse Towers Condominiums is comprised of a ballasted modified bitumen roof. We observed areas of ponding throughout the roof as well as areas of peeling paint on the soffit of the top floor catwalks and balconies. These are signs of water infiltration and deterioration of the roof membrane. We recommend that the association plan to replace the roof with a new roofing system in the next 5-7 years. If leaks become common, or roof repairs frequent, the association may desire to replace the roof sooner than 5 years.

The roofing system at Penthouse Towers includes metal coping over top of the parapet walls. We observed that the joints in the metal coping have expired. The joints should be watertight for the coping to perform as originally designed. We recommend that the joints be waterproofed immediately with silicone based sealant, and that the association include replacement of the metal coping as part of the roof replacement.

## ACCURACY, LIMITATIONS, AND DISCLOSURES

This report contains professional opinions based on conditions observed as of the dates of inspection. This report is believed to be accurate with the limitations of the stated methods for obtaining information. Nothing in this report shall be interpreted as any kind of guarantee or warrantee because we have no control over future events. This report is not intended to be a discourse on safety, nor shall it be used as a specification.

We developed this report to assist in the budgeting for repairs and maintenance related to long-term ownership. Critical statements made in this report on the condition of the property may not be used to justify criticism of previous design professionals, contractors, or anyone responsible for the building. This inspection does not include the examination of building areas for hazardous materials, or for building code, fire, or safety violations.

A review of the facility for ADA compliance was not included in the scope of this project since ADA compliance is a legal determination and not an architectural or engineering finding.

The evaluation required that certain assumptions be made regarding existing conditions, and some of these assumptions cannot be verified without expending additional sums of money or destroying otherwise adequate or serviceable portions of the building. The extent of our evaluation was limited to visual observations and the scope of work indicated in this report. We cannot guarantee that the appraisal discovered or disclosed all possible latent conditions.

The project repair costs are based on available information and from our experience with similar projects.

The report is not for the benefit of or use by others without the written permission of O&S ASSOCIATES. We summarized the evaluation and recommendations in this report for use with additional fiscal and technical judgment. Use of this report without our permission and guidance may lead to erroneous action for which the user shall bear full responsibility.

## ATTACHMENT LIST

ATTACHMENT A – PHOTOGRAPHIC DOCUMENTATION

# PENTHOUSE TOWERS CONDOMINIUMS

## REPORT PHOTOGRAPHIC DOCUMENTATION



SEPTEMBER 11, 2023.

Photo #1:



Front Elevation of  
Penthouse Towers.

Photo #2:



East Elevation of Penthouse  
Towers

# PENTHOUSE TOWERS CONDOMINIUMS

## REPORT PHOTOGRAPHIC DOCUMENTATION



SEPTEMBER 11, 2023.

Photo #3:



South Elevation of  
Penthouse Towers.

Photo #4:



North Elevation of  
Penthouse Towers.

# PENTHOUSE TOWERS CONDOMINIUMS

## REPORT PHOTOGRAPHIC DOCUMENTATION



SEPTEMBER 11, 2023.

Photo #5:



Built-up asphalt roof with ballast. Some spots showed that were worn off.

Photo #6:



Water ponding on the roof.

**PENTHOUSE TOWERS CONDOMINIUMS**

**REPORT PHOTOGRAPHIC DOCUMENTATION**



SEPTEMBER 11, 2023.

Photo #7:



Debonded stucco at stair tower on the roof.

Photo #8:



Horizontal Cracks at parapet wall.

SEPTEMBER 11, 2023.

Photo #9:



Drainage in poor condition.

Photo #10:



Spall concrete at staircase.

SEPTEMBER 11, 2023.

Photo #11:



Expansion Joint has cracked and failing.

Photo #12:



Concrete crack at catwalk.

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Photo #13:



Deteriorated stucco at head of sliding door

Photo #14:



Spalled overhead concrete

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Photo #15:



Closet room door located at balconies are in bad condition.

Photo #16:



Step crack at parapet wall

# PENTHOUSE TOWERS CONDOMINIUMS

## REPORT PHOTOGRAPHIC DOCUMENTATION



SEPTEMBER 11, 2023.

Photo #17:



Cooling tower at north elevation has horizontal and concrete step crack.

Photo #18:



Metal capping at the parapet wall not properly covered.