



October 8, 2018

Champlain Towers South
8777 Collins Avenue
Surfside, FL 33154

Attention: Ms. Maggie Manrara
Treasurer

**Re: Champlain Towers South Condominium
Structural Field Survey Report
MC Job# 18217**

Dear Ms. Manrara:

Morabito Consultants, Inc. (MC) is pleased to submit this structural engineering report of the Field Survey completed at the existing Champlain Towers South Condominium Complex (CTS) in Surfside, FL. The scope of this project includes a review of the existing 12 story plus penthouse 136-unit residential building, below-grade parking garage and at-grade exterior entrance drive, pool and recreation area. MC reviewed a representative sample of ~68 condominium units (half of the total units found in the building) along with the roof, exterior façade (observed from the balconies surveyed), parking garage, pool deck, and general common areas. The goal of our study was to understand and document the extent of structural issues that require repair and/or remediation in the immediate and near future. As a part of this report, MC has prepared an estimate (that is attached to this report) of the probable construction cost to construct the required structural repairs & maintenance that MC recommends being completed. These documents will enable the Condominium Board to adequately assess the overall condition of the building, notify tenants on how they may be affected, and provide a safe and functional infrastructure for the future.

To assist our office in the review of this project, MC has reviewed the following documents:

- Architectural contract drawings A1-A30 prepared by William M. Friedman & Associates Architects, Inc. last revised 11/27/1979.
- Structural contract drawings S1-S14 prepared by Breiterman Jurado & Associates, Consulting Engineers dated 08/22/1979.
- Various HVAC, Plumbing, Electrical, Plumbing and Landscape drawings.

The following conditions that require future repairs and maintenance were observed.

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- A. MC understands some unit owners have complained of flooding into the interior space of their unit during a hurricane event. MC has concluded that this infiltration is occurring through the balcony sliding glass doors & windows due to the lack of proper flashing at the sill of these doors & windows and deteriorated exterior perimeter sealant between the window/door frames and masonry/concrete walls. MC recommends that the exterior sealant be removed / replaced at the sliding glass door & window perimeter to assist in providing a water-tight condition. Unfortunately, the new sliding doors in unit 209 and above were not installed properly and were fabricated too tall to allow the base flashing to be properly installed, so these unit owners have no choice but to discard the newly purchased doors and have them completely refabricated.



Figure A1: Exterior sealant past its serviceable lifespan at sealant between the window/door frames and masonry/concrete walls & balcony floors



Figure A2: Newly installed sliding door at unit 209 that was not properly flashed

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- B. MC observed that the majority of the balconies were furnished with tile or some other floor covering by choice of the tenant, making it impossible to observe the condition of the topside of the balcony slabs. Several instances were noted where balcony tile was damaged, such as in Unit 1008. Based on MC experience, cracked tile usually means structural damage exists to the balcony slab that must be repaired per the requirements of the International Concrete Repair Institute (ICRI) prior to the installation of a pedestrian waterproofing membrane.

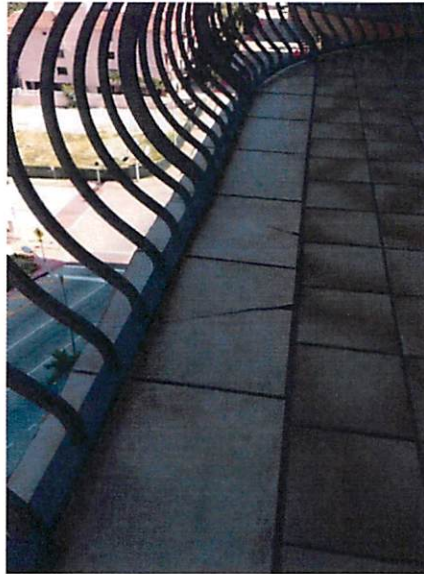


Figure B: Damaged balcony tile that must be removed to fix structural damage

- C. MC found it fairly typical that the concrete slab edges of the balconies are experiencing concrete spalling or cracking. MC sees this as a common source of water infiltration and a main cause of the commonly found, sub-surface deterioration at the exterior soffits under the railings. MC requires that the balcony slab edges be further investigated and repaired in accordance with the recommendations of the ICRI to prevent future water penetration.



Figure C: Concrete spall at balcony slab edge in units 1008 & 211

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- D. Approximately half of the balcony soffits reviewed by MC show evidence of deterioration under the painted finished surface. These areas were identified by sounding the concrete with a golf club, checking for solidarity. In some cases, the paint finish had formed a bubble or pocket that was retaining water, while in other areas the painted soffit was peeled away leaving the concrete surface exposed. The extensive soffit damage is a systemic issue that can only be repaired by removing all of the balcony tile, repairing the damaged concrete surfaces at the top and bottom of the slab and protecting the slab by installing a pedestrian waterproofing membrane on all top-side balcony surfaces. Partial/full depth concrete repairs in these areas shall be performed in accordance with the recommendations of ICRI. It is important to note that installing tile on top of the concrete balcony surfaces results in the railing having inadequate height to meet the minimum guardrail height of 42" required by the Florida Building Code.



Figure D: Balcony Soffit paint spalling in units 208, 703, & 1301.

- E. Several areas of the entrance drive soffits under the second floor were observed by MC to have deteriorated black plywood. This condition was also observed at several light fixtures in the entrance soffit. MC could not get access into the soffit areas to observe the extent of the deteriorated soffits and support framing as CTS maintenance was too busy to assist us. MC is concerned that mold exists above these soffit areas and the soffit support framing is deteriorated which will require the complete removal and replacement of the entrance suspended soffit. Further investigation into this area is warranted.

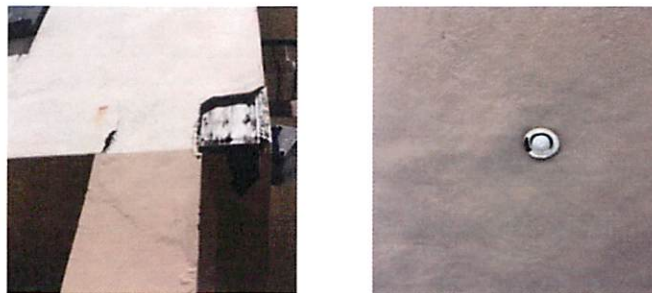


Figure E: Deteriorated plywood soffit above entrance drive.

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- F. It was brought to MC's attention that several units are experiencing water infiltration through the window frames and glazing as the windows are near the end of their functional lifespan. It is recommended that the window frame glazing (metal to glass), and perimeter sealant (metal to metal or metal to masonry/concrete) be removed and replaced for the entirety of the building to reduce future water penetration and minimize damage during hurricane events. MC recommends that the BOD strongly consider the replacement of all exterior windows and doors with impact resistant units.



Figure F: Exterior sealant at window frame that has aged past its serviceable lifespan

- G. Significant cracking in the stucco exterior façade often occurs at the mortar bed joint between the top of the concrete floor slab and first block masonry course. Although MC does not see this crack as a source of water infiltration into the condominium units, such cracks need to be routed and repointed to prevent future water permeation. All significant façade stucco cracking is to be repaired in accordance with the recommendations of ICRI.

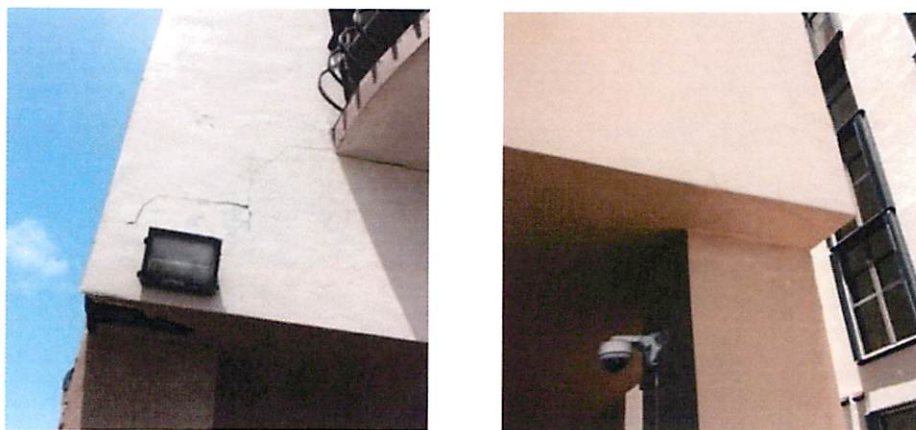


Figure G: Typical cracking in the stucco exterior facade.

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- H. MC observed the non-existence of window washing / suspension hooks that should have been installed face-mounted to the underside of the top-level balconies and spread throughout the roof of this building structure. This failure to have suspension hooks is a violation of the present-day **Occupational Safety and Health Administration (OSHA) Rules and Regulations 29 CFR Part 1910 "Walking-Working Surfaces and Personal Protective Equipment (Fall Protection systems)"** requirements and **ANSI/IWCA I-14.1-2001 "Window Cleaning Safety Standard"**. MC recommends that new hooks be installed and waterproofed on the roof structural slab and underside of the top-level balcony slabs that meet the requirements of **OSHA 29 CFR Part 1926.502 "Fall Protection Systems Criteria and Practices"** and **ANSI/IWCA 1-14.1** prior to the commencement of façade and balcony restoration. Furthermore, MC recommends that our office meet with the contractor who is to perform the façade restoration work and the present window washing contractor so that the new fall protection system anchor quantity and location can be agreed upon to assure adequate anchor coverage for all future contractors who will be suspended on the exterior of the Champlain Towers South Condominium.



Figure H: No suspension hooks at the underside of the balconies and on the roof.

- I. MC understands that the BOD plans to pressure wash and paint the entire building façade to improve the building's aesthetics. MC recommends this work be performed following the conclusion of the aforementioned structural façade repairs.

MC was able to briefly survey the roof of the building at the 13th/14th level. The roof levels appear to be in satisfactory condition, and MC was told by maintenance personal that no present roof leaks are known to exist. The only damage noted was minor cracking at the parapet walls and some minor spalling at the stair tower walls. All identified cracking shall be routed and sealed with a urethane sealant, and all spalls repaired per the recommendations of ICRI. In addition, all mechanical equipment support steel shall be cleaned and coated with a zinc-rich galvanizing paint.

The Pool Deck and Entrance Drive areas were reviewed to observe the condition of the concrete knee walls, planters, pavers, decorative stamped concrete and railings. Minor cracking in the knee walls was found around the pool deck, which shall be routed and sealed with a urethane sealant. The handrails and rail post connections at the pool deck knee walls did not appear to be damaged and are not in need of repair at this time. Many of the existing pavers on the pool deck are cracked and showing moderate wear and tear from years of being exposed to the elements. The pavers do not appear to pose any hazard to the building occupants and are currently not in need of replacement. The joint sealant was

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observed to be beyond its useful life and are in need of complete replacement. However, the waterproofing below the Pool Deck & Entrance Drive as well as all of the planter waterproofing is beyond its useful life and therefore must all be completely removed and replaced. The failed waterproofing is causing major structural damage to the concrete structural slab below these areas. Failure to replace the waterproofing in the near future will cause the extent of the concrete deterioration to expand exponentially. MC approach to the repair of this structure is different from what is specified in contract documents in numerous aspects, which are briefly described below.

- a. The main issue with this building structure is that the entrance drive/pool deck / planter waterproofing is laid on a flat structure. Since the reinforced concrete slab is not sloped to drain, the water sits on the waterproofing until it evaporates. This is a major error in the development of the original contract documents prepared by William M. Friedman & Associates Architects, Inc. and Breiterman Jurado & Associates, Consulting Engineers.
- b. It is also important to note that the replacement of the existing deck waterproofing will be extremely expensive as removal of the concrete topping slab to gain access to the waterproofing membrane will take time, be disruptive and create a major disturbance to the occupants of this condominium building. Please note that the installation of deck waterproofing on a flat structure is a systemic issue for this building structure.

MC correct repair approach includes removing all pavers, decorative concrete paving, setting beds, concrete topping slab and waterproofing down to the reinforced concrete structure; repairing the concrete structure as deemed necessary; pouring a sloped bonded concrete overlay that will be sloped to drain; installing a new waterproofing membrane, protection board and drainage panels on the new sloped surface; and placing new pavers/decorative concrete slabs over a sand setting bed. New stainless-steel dual-level drains will be installed at all existing drain locations that will collect rain water at the surface of the pavers and at the waterproofing level. This system will assure that all water that penetrates to the waterproofing layer will be able to flow freely to the deck drains, resulting in an extended life for the replacement waterproofing membrane. This system also provides extra protection for the existing reinforced concrete structure and allows future membrane repair/replacement to be completed more economically. The repairs to all planters will be completed in a similar manner.

The condition of the Parking Garage levels was reviewed specifically noting any cracked or spalled concrete members, condition of the concrete slabs and joint sealant conditions. MC was able to identify the presence of previous epoxy injections and patch repairs which were evaluated for their long-term effectiveness. MC's review of the Parking Garage revealed signs of distress/fatigue as described below:

- J. Abundant cracking and spalling of varying degrees was observed in the concrete columns, beams, and walls. Several sizeable spalls were noted in both the topside of the entrance drive ramp and underside of the pool/entrance drive/planter slabs, which included instances with exposed, deteriorating rebar. Though some of this damage is minor, most of the concrete deterioration needs to be repaired in a timely fashion. All cracking and spalling located in the parking garage shall be repaired in accordance with the recommendations of ICRI.

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Figure J1: Typical cracking and spalling at parking garage columns



Figure J2: Spalling with exposed steel reinforcement at topside of garage deck.

- K. MC visual observations revealed that many of the previous garage concrete repairs are failing resulting in additional concrete cracking, spalling and leaching of calcium carbonate deposits. At the underside of Entrance/Pool deck where the slab had been epoxy-injected, new cracks were radiating from the originally repaired cracks. The installed epoxy is not continuous as observed from the bottom of the slab, which is evidence of poor workmanship performed by the previous contractor. The injection ports were not removed, and the surfaces were not ground smooth at the completion of the injection. Leaching of calcium carbonate deposits in numerous areas has surely caused CTS to pay to repaint numerous cars. This leaching will continue to increase until proper repairs are completed. MC is convinced that the previously installed epoxy injection repairs were ineffective in properly repairing the existing cracked and spalled concrete

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slabs. MC recommends that the Entrance/Pool deck concrete slabs that are showing distress be removed and replaced in their entirety. Unfortunately, all of these failed slab areas are under brick pavers, decorative stamped concrete and planters which require completed waterproofing replacement. All repaired concrete slabs located in the parking garage are to be repaired in accordance with the recommendations of ICRI.

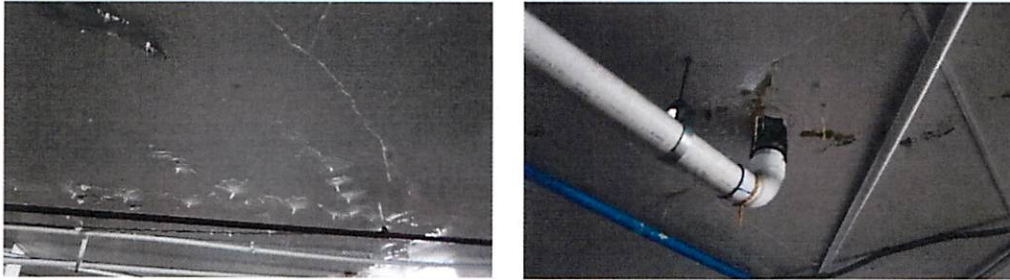


Figure K1: Previously installed failed injection repairs with leaching forming



Figure K2: More previously installed failed injection repairs with leaching forming

MC trusts this initial report will assist the Costa Brava Condominium in understanding the required maintenance that is needed to properly maintain this existing residential property. MC is available to further discuss the recommended repair work and how it coincides with the owner's desires and constraints. We look forward to working with you in maintaining the structural integrity of the Champlain Towers South Condominium.

Very truly yours,

MORABITO CONSULTANTS, INC.

Frank Morabito, PE, SECB
President

FPM/18217/Documents/MC/MC-CTS-SurveyReport_181008.pdf

