

Port Royal Condominium

1700 North Atlantic Avenue Cocoa Beach, Florida 32931

Balconies, Walkways and Exterior Building Condition Survey Report

Prepared By James E. Emory, P.E. Florida Registered Professional Engineer and Special Inspector #60965

January 20, 2023

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Port Royal Condominium Condition Survey Report

Table of Contents

1. Executive Summary

2. Written Report

Facility Description Project History Investigation Methodology Concrete Damage General Discussion General Industry Methodology Major Project Considerations Recommendations Summary The Corrosion Process with Chloride Contaminated Concrete Conclusion

<u>3. Budget and Estimated Quantities</u>

4. Example Photos

5. Survey Maps



January 20, 2023

Port Royal Condominium 1700 North Atlantic Avenue Cocoa Beach, FL 32931

Re: Condition Survey Report

EXECUTIVE SUMMARY

Keystone Engineering was contracted to provide an engineering inspection of the balconies and walkways at the Port Royal Condominium. The inspection was completed August 30, 2021 by the principal engineer of Keystone, and trained assistants.

The **balcony inspection** revealed a significant and severe amount of structural damage on the balcony slabs, beams and columns. The **walkways inspection** also revealed a significant level of structural damage. The damage to the balconies and walkways are primarily due to the aged and deteriorated cored railings, tile and other improper floor coatings. Additionally, we noted aged sliding glass doors, as well as storm shutters that do not allow water to drain from the balconies.

Consideration should be given to a comprehensive balcony and walkway restoration project for needed concrete repairs and improved waterproofing. The project would include stripping all balcony and walkway floor finishes and proper structural repairs to the horizontal balcony and walkway slabs, and other areas of the structure as needed. The aged and deteriorated cored railings would be replaced with new, properly installed, surface-mounted versions. The new floor finish would be a decorative, waterproof coating system, designed for easy future repair and recoating.

The structural repairs will affect and continue under sliding glass doors in some cases. The concrete repairs and coating will require the removal, reinstallation or replacement of many of the shutters. New sliding glass doors will be needed in many cases and are recommended for better weatherproofing.

The following report provides additional details, as well as the described budgets, estimated quantities, and example photos. We strongly recommend initiating a competitive bid process for a comprehensive structural restoration project in early 2023.

Sincerely.

James E. Emory P.E., S.I FL # 60965 President Keystone Engineering and Consulting, Inc.



January 20, 2023

Port Royal Condominium 1700 North Atlantic Avenue Cocoa Beach, FL 32931

Re: Condition Survey Report

Dear Board and Association Members:

Keystone Engineering was contracted to perform an inspection of the exterior building, balconies and walkways of Port Royal Condominium in Cocoa Beach, Florida. This inspection took place on August 30 and September 1, 2022. Within this report you will find a description of our inspection process, our findings, and recommendations, as well as budget estimates and options for the completion of a restoration project. Once this document is reviewed, Keystone can meet with the Association and provide more depth of information and facilitate a dialogue of the specific project issues and options.

Facility Description

Port Royal Condominium consists of two (connected by an expansion joint), fivestory, residential buildings, totaling 55 units. The units each have one private balcony. Access to the units is by the elevator and/or external walkways and stairs.

The building plans provided were prepared in August of 1983, suggesting it is approximately 40 years old. The horizontal structural slabs appear to be conventionally reinforced concrete. They are supported by structural load bearing beams and columns. The exterior walls are a masonry construction with a painted stucco finish. The balconies have a variety of coatings and tile, while the walkways have a floor coating system finish. Fall protection railings are an aged, cored aluminum picket system.

The inspection revealed a significant amount of structural concrete damage to the horizontal balcony and walkway slabs. This concrete damage is due to reinforcing steel corrosion and is being exacerbated by non-protective floor finishes, aged and deteriorated cored railings and aged sliding glass doors.

Project History

Keystone is unaware of the restoration work history at Port Royal, but we suspect that no comprehensive project has ever been completed. It appears some "patching" work has been completed on an as needed, reactive basis over the years. The quality of the work varied, but was generally not in accordance with industry standards set forth by the International Concrete Repair Institute (ICRI). It is our understanding that the buildings were painted about six years ago. It appears the painting project included "patching" the visible concrete spalls and cracking with "elastomeric patch" and other materials as a temporary measure. "Patched" concrete repairs involving reinforcing steel corrosion are short-term cosmetic solutions and spalling damage will worsen exponentially with time. Comprehensive structural repairs are needed at this time.

Investigation Methodology

The inspection process was completed on a visual, acoustical and hands-on basis by the undersigned Florida Registered Professional Engineer and Certified Special Inspector #60965 and trained assistants. Generally, the inspection of a coastal condominium focuses on the existing and potential for future concrete damage that occurs due to chloride-induced reinforcing steel corrosion. This electrochemical phenomenon is normally the driving force in coastal building maintenance and repair efforts. As a result of the actual and potential concrete damage, affected building components such as floor finishes, safety railings, glass doors, windows and storm shutters are also evaluated as applicable.

The inspection process was completed in a non-destructive manner by the project engineer. The concrete damage evaluation was achieved by visual inspection, chain-drag and hammer sounding. These devices, when utilized by personnel with appropriate experience, prove to be a cost-effective means of evaluating corrosion induced concrete damage and the overall condition of the structure. The inspection process described and completed are acceptable means in accordance with the International Concrete Repair Institute (ICRI) and the American Concrete Institute (ACI). The concrete evaluation performed is generally in accordance with:

ACI 201.1R-92 Guide for Making a Condition Survey of Concrete in Service

ACI 364.1R-07 Guide for Evaluation of Concrete Structures Before Rehabilitation

The results of the inspection and evaluation will generate an anticipated and recommended scope of work. It must be considered and understood that many work items identified are interrelated and therefore not easily or cost-effectively addressed separately. For example, in order to repair or protect the balcony concrete slabs, a common project item, railings, floor finishes and possibly

shutters and sliding glass doors, will be affected and therefore must be considered as part of the repair process.

It should also be well understood that portions of the work anticipated are estimated quantities, while other items are fixed quantities. In general, all of the concrete repair work is an estimated quantity due to the number of variables involved and the high likelihood for hidden damage. Therefore, the concrete work is typically bid on a unit cost basis, since we can establish the necessary concrete repair task items accurately but cannot estimate the exact quantities. Unit cost basis provides the fairest basis for both owner and contractor, as the contractor is paid only for the number of each units completed at the unit rate bid, whether the quantities are higher or lower than the engineer's estimate. The remainder of the bid items will generally be at fixed cost, as they are directly measurable quantities and known scope of work. Railing work, waterproofing of walls and floors, screened enclosure, window replacement and door replacement are examples of fixed items as both the task and quantities can be generally established accurately in advance.

It should also be clear that the estimates provided are for budgetary purposes only. Actual bids will need to be solicited for cost purposes. Also, there is a high likelihood for additional damage and hidden conditions to be found during the work that will increase the units of work and the project budget. Proper contingency estimates need to be considered and factored into the project budget estimate.

Concrete Damage General Discussion

Port Royal is currently experiencing a significant and severe amount of corrosion induced concrete spalling damage on the balconies. Significant concrete damage also exists on the walkways and exterior walls. This is due to a combination of factors including the age of the building, proximity to the corrosive salt air, and the lack of previous comprehensive and proper restoration projects. There are also conditions that exist at the condominium that are known to lead to and exacerbate spalling as the building ages. These include the use of tile on balconies and the deteriorating condition of the floor protective coating system and perimeter sealants, the aged and deteriorating cored railings, lack of drainage at some sliding glass door tracks due to tile flooring, the lack of positive drainage at shutter frames, and aged fenestrations (sliding glass doors).

Concrete spalling is due to the long-term exposure to the coastal salt air, whereby chlorides will migrate through the concrete and reach the reinforcing steel. Once the chlorides accumulate at the steel level within the slab, the corrosion process will accelerate in an exponential fashion, resulting in delamination of the stucco finishes, cracking and spalling of the surrounding concrete. Left unabated, this process will lead to increasingly costly building repair projects.



One of the most significant factors in the time and magnitude of reinforcing steel corrosion induced concrete damage is the ease of access for the chlorides to enter the concrete. Properly sealing and waterproofing the building, including all openings, penetrations, and achieving positive drainage, will greatly minimize chloride intrusion and corrosion. As part of a restoration project for an aged building, both existing and future chloride contamination must be considered and reduced. Initial concrete spalling typically becomes noticeable as the building approaches 15 to 25 years of age, and then cyclically thereafter depending on the level and quality of repairs and protective measures.

Quality, long lasting repairs are crucial in controlling future maintenance costs. Additionally, the control of the corrosion rate is the primary factor in reducing the rate and magnitude of future repair projects and costs. Proper structural concrete repairs should not become cyclic type repairs and should last for 20 to 30 years or more depending upon the level of protection from the elements employed. Original cyclic structural repairs to areas of the structure outside of past repairs can be controlled through corrosion mitigation. There are several corrosion mitigation strategies available, each with varying costs, performance and life expectancies.

Taking steps to reduce the cyclic nature of corrosion induced structural concrete damage is proven to be a good investment of maintenance dollars. Eliminating the redundancy of repairs to the same area can be achieved by ensuring proper industry standard structural repairs are accomplished during the restoration project. Protecting the newly repaired areas from saltwater exposure and slowing/mitigating the corrosion in the surrounding areas will greatly reduce future maintenance costs, increase the time between repair cycles and lessen the magnitude of each repair cycle.

From a cost perspective, the structural concrete repair costs alone are significant. However, additional costs need to be considered, and strategically avoided as best possible, including the many collateral building components and aspects of a restoration project. The engineering costs, access to the building via scaffolding/staging, building permits, storage, equipment and manpower mobilization all add to the actual costs of accomplishing concrete repairs. Additionally, floor finishes, railings, screens, sliding glass doors and shutters can be impacted during a restoration project, including the removal, reinstallation and/or replacement of these elements. The removal of these items to complete concrete repairs may require the owner to upgrade to newer models that are compliant with current building codes.

In severe cases of concrete damage occurring under and due to the door/window assemblies encroaching the interior space, they may need to be removed and a temporary barricade installed to accomplish the structural repairs. This type of repair can also affect the interior flooring and finishes of the unit. Lastly a concrete restoration project causes a disruption to the quality of living at the facility, loss of use and rental income, noise, vibration, dust and limited balcony access and reduced view can all be expected.

Because of these direct structural issues, collateral and lifestyle issues and substantial costs, a restoration project should be given due consideration to implement the most cost-effective use of skilled labor, proper materials and methods along with technology to extend the time between repair projects and reduce the magnitude of the corrosion induced damage in the future. Poorly executed restoration projects, with improper repairs and inadequate consideration for future protection will inevitably cost the Association significantly more in terms of dollars, inconvenience and time.

General Industry Methodology

There are several basic aspects to concrete spalling and restoration that must be understood and accepted to allow for the findings and recommendations to be discussed productively. The following represents some basic industry positions that dictate the consultant's thought process:

Spalling-Concrete spalling is delamination of the concrete from the expansive effects of reinforcing steel corrosion. Spalling occurs when chlorides migrate to the reinforcing steel, which changes the chemistry of the concrete and creates a corrosive environment. Spalling can be detected visually and/or acoustically and requires an experienced eye to distinguish between spalling and non-spalling and to extrapolate findings into estimated quantities.

Contractor Selection-Concrete restoration is a small, specialized, yet mature industry. While the work must be performed by a licensed general contractor

under the supervision of an experienced professional engineer, not all general contractors are experienced in restoration. There is a relatively short, but high-quality list of local qualified restoration contractors. Restoration contractors generally perform best in their local region.

Repair Methods-Concrete restoration methods and materials are well established over the last 30 years, and the procedures and repairs followed in the industry follow the International Concrete Repair Institute (ICRI) standards and have proven to be both reliable and durable. There are no magic or permanent solutions. Concrete restoration/experience is learned "on the job". By utilizing experienced restoration contractors, you will avoid having an unexperienced team "practice" on your building. These are structural repairs and can eventually affect the building viability.

Cyclic Nature-Spalling will be cyclic on an older building (more than 20 years old) and should be planned for accordingly. Repaired areas should be semipermanent repairs, as the chlorides have been removed in that area, and future spalling will occur in other areas where chlorides remain. A recommended repair cycle is 7 to 10 years to coordinate with painting cycles. A cycle of this time frame will keep spalling damage manageable.

Corrosion is Exponential-Once initiated on a building, spalling will worsen exponentially with time, with an acceleration after a 10-year cycle. Taking care of spalling on a 7 to 10-year cycle, coordinated with painting, and using maintenance friendly balcony finishes, has proven to be a cost-effective time frame and procedure. Allowing the spalling to continue beyond the 7 to 10-year time frame will result in accelerated damage and project costs.

Project Timing-Project timing will be dictated by the decision-making process and contractor availability. However, the lowest cost project is one that is done today, as a single-phase project. Unnecessarily delaying a project or doing it in multiple phases will increase the project costs due to increased corrosion damage and rate, inflation of costs, and mobilization costs. Financing is available to allow for payments over time, while getting the work done in a single, lower cost, lower impact project.

Balcony Floor Finishes-Exposed balcony (and walkway/stair) floor finishes should be a protective coating system that is aesthetically pleasing and easy to repair and renew during future repair cycles. <u>Tile is an improper choice for</u> <u>exposed balconies. Tile does not provide protection from saltwater, keeps</u> <u>the balcony wetter, does not allow for waterproofing details, creates</u> <u>drainage issues at the sliders, hides damage longer, and makes the repair</u> <u>more difficult. Combining the two buildings, 35% of the balcony surface is</u> <u>tile.</u>

Sliding Glass Doors and Windows-The choice of sliding glass doors and windows for a coastal application must be given proper consideration. "Coastal

Quality" products are recommended and should consider corrosion resistance, coating finish performance, superior water resistance, the use of all stainless-steel hardware, concealed/sealed stainless-steel fasteners, energy efficiency and proper tint. Many of these are not achieved with a "minimum" code compliant door. Lastly, proper installation is a must, for any door quality level.

Having new glass doors or panels installed over existing spalled concrete is becoming a common issue. Most door installers are either not going to recognize these issues, or purposely overlook them in order to not delay the installation. Buildings that have a concrete spalling history should have an inspection performed by an experienced individual before new glass is installed, either at the opening or perimeter of the balcony.

Many times, concrete spalling occurs under a sliding glass door due to long term, chronic water intrusion at the door track. This spalling can encroach on the interior space and affect interior finishes during the repairs.

Drainage- Shutter systems, screen enclosures, floor finishes and sliding glass door installations should all be designed such that water readily drains off the balcony.

Shutters-When installing shutters, the area of installation should be inspected in advance to ensure no concrete repairs are needed that would necessitate the future removal and reinstallation of the shutter. The shutter should be installed to the proper building code and with stainless steel fasteners and appropriate drainage shims.

Water Intrusion-If water can get in, the salt can get in, which leads to concrete spalling. Sliding glass doors, floor finishes, railings, shutters, fasteners-should all be designed and installed such that water intrusion is minimized.

Project Considerations-Project considerations are primarily safety, asset preservation and aesthetics. It is up to the Association to decide on what level of asset preservation and aesthetics they wish to employ. The engineer can only make recommendations and explain consequences of the decisions. Safety is the only area where the engineer has to insist on a solution. **The Association can decide to adopt all, some or none of the engineer's recommendations.**

Comprehensive Solution-A long-term comprehensive solution provided is the most effective at minimizing future restoration cycles and providing the most aesthetic result. It is the lowest cost over time, and considers proactive protective measures and maintainable coating finishes, and overall protection of the structure from the elements. **This is the highest reasonable level of consideration.**

Decision-Making- Not everyone wants the same level of building maintenance, aesthetic considerations or maintenance budget funding. Everyone will have their individual opinion of what is appropriate or acceptable. That is one of the challenges of providing consultation to a condominium, as we cannot provide any solution that will please all parties. Each of you has the discretion to agree or disagree with our recommendations.

Project Phasing- While project phasing is feasible, phasing the project into multiple activities will add significantly to the overall cost, as contractors fees will increase for multiple mobilizations, and conditions will worsen with time. Contractors are also experiencing significant backlogs at this time. It would be advisable to strongly consider a single-phase project and either assess for the finds needed, or consider long-term association bank financing if necessary.

Florida Statute SB 4-D- Recently, the State of Florida has adopted this statute in reaction to the Champlain Towers South building collapse. This statute has several requirements you should become familiar with. One of the requirements is a "structural milestone inspection" which should be covered by this report. There are other requirements, such as the Structural Integrity Reserve Study (SIRS), which requires the structural milestone inspection and many other items. Structural repairs and other maintenance aspects, including funding reserves, are being required, and no longer optional. We feel this is going to create a significant backlog and bottleneck of structural restoration work over the next several years.

Major Project Considerations for Port Royal

Balconies –The balconies, are experiencing a severe and significant level of concrete spalling due to reinforcing steel corrosion. The concrete spalling is found on the balcony slab edges, floor surfaces, slab ceilings and under the sliding glass doors. Several factors are contributing to this high level of concrete spalling includes the age and coastal location of the buildings, the lack of previous proper repairs allowing the damage to grow exponentially, the high number of locations vulnerable to saltwater intrusion including the railings, floor finishes, shutters and sliding glass doors. Also potentially the wind tunnel effect of the two complexes to the east.

The floor coatings varied from unit to unit to include coatings and tile. They had various levels of wear and aging. The balcony floor finish is the first line of defense against the corrosive elements of the salt air. The lack of proper waterproof floor finishes are exacerbating the concrete damage, and will also be significantly affected by the concrete repairs. It is recommended that the coatings and tile be stripped from the balconies prior to concrete repairs. The tile, which lacks waterproofing qualities, generally conceals concrete damage until it becomes advanced. Advanced concrete spalling under tile is indicated by cracking and lifting of the tile.

<u>The recommended floor coating finish as considered in the budget is a multilayer, high-performance acrylic high build, single color, textured (knockdown)</u> finish, with a faux grout line finish pattern. This system provides very good protection to the slab surface, while considering the ease of future structural repairs and the ability to repair the coating texture and recoat the surface with relative ease, and without the need to fully strip the floors for several future repair cycles.

Railings-The existing railing system is a typical aluminum picket system. The railings are badly deteriorated and need to be replaced. The attachment method is the undesirable cored-in-place style. It is well established that cored in place railings allow saltwater intrusion both internally and externally at the cores, and greatly exacerbates concrete spalling at the balcony and walkway edges. Surface mounted railings, properly installed using stainless steel anchors set in predrilled holes, filled with sealant can eliminate this situation. The existing railings are also beyond their service life and showing deterioration at the picket to bottom rail attachment, as well as the coating finish deterioration. The new railings would be a fully welded system with the PVDF (Kynar) finish appropriate for longevity in an oceanfront application. Surface mounted railings are also easily removed and reinstalled for future project needs.

Shutters-The current shutter installations have two fundamental and predominant issues; One is many lack proper drainage shims and are blocking water from existing the balcony. This is causing staining of the floor finish due to

dirt build up, deterioration of the floor coatings, which are not designed to tolerate standing water, slab saturation under the tile, and ultimately, structural damage to the concrete slab. The other issue is the numerous corroded fasteners used for the shutters, including abandoned fasteners. The corroding fasteners weaken the installation and also are staining the buildings finishes. There are numerous abandoned corroding shutter fasteners and many of the current corroding shutter fasteners will break during removal and require extraction. The shutters are also likely hiding concrete spalling from visual or acoustical detection.

The project recommends that all balcony shutters (an individual owner item) attached to the balcony slab floor or at the balcony edge floor or ceiling, be fully removed for the project. Once all concrete repairs are completed, and floor coatings installed, depending on their age and condition, the shutters can be reinstalled, or replaced, by a qualified shutter company. It is preferable to utilize a shutter contractor for this work contracted directly with the Association or unit owner, and not the restoration contractor. Since the shutter work removal can occur in phases, before the restoration work begins, and the shutter reinstallation/replacement can also occur in phases, once the restoration contractor has completed all work, a subcontractor is both feasible and preferred. One factor is the scarcity of resources, including labor, and handling the shutters it too taxing on the restoration contractors' resources as a non-core activity.

One aspect of the shutter to consider is its existing condition and the changes to the building codes since it was originally installed. It should first be determined by the shutter vendor whether a shutter can be simply removed and reinstalled, needs refurbishment to be reinstalled or must be replaced due to deterioration or building code changes. All reinstalled/replaced shutters need to include proper drainage shims, and stainless-steel fasteners set in predrilled holes filled with sealant.

Sliding Glass Doors (and windows)-The majority of the sliding glass doors appear to be from original construction. Many of them have corroded fasteners and do not properly drain due to the tile flooring being higher than the weep holes. Some of the sliding glass doors appear to have concrete spalling that extends under the door and into the interior space, and likely originated under the door, due to chronic saltwater intrusion. Doors that have concrete damage under the thresholds will likely need to be removed and then either reinstalled or replaced. If it is an original door, and/or a door in poor condition, replacement with a new code compliant model will be needed. A significant number of doors have visible spalling under the door track that likely extends to the interior space. There is also visible interior spalling at the doors in several units.

Sliding glass doors, like the shutters, are an individual owner item. However, it is recommended to consider replacing any aged or original sliding glass door as part of the restoration project. Properly specified and installed, new sliding glass doors, appropriate for an oceanfront exposure and performance, will provide

better protection for the structure and spalling, and also better performance for water resistance, storms, wind driven rain, high pressure differentials during tropical storms and thermal/energy considerations.

For sliding glass door replacements, it is advisable to have the doors and installation provided by the restoration contractor, and not a 3rd party subcontractor, as with the shutters. This is due to the fact that the most appropriate time to install a new slider is during the project (not before or after) especially if there is concrete repairs needed under the doors. It is best to install the doors before final floor coatings and sealants are installed. Doors installed after the project; many times damage the new floor finishes. Also, doors installed during the project will be inspected by the engineering team to ensure the installation meets the manufacturer's requirements. During a restoration project, logistically, is an ideal time for owners to replace sliding glass doors.

Walkways – The walkways also have a significant amount of concrete spalling. They do not have the detrimental factors of tile flooring and shutters with blocked drainage and corroding fasteners or aged sliding glass doors. They do have the aged and deteriorated cored railings and both concrete and water damage was evident near many of the rail posts. The coating system on the walkways will be significantly impacted during repairs and should be stripped and replaced.

The walkways budget considers making the needed structural concrete repairs. It includes replacement of the railings with a surface mounted system and floor coating system as described for the balconies.

Below is a photo example of a single color, knockdown texture, tile pattern coating system recommended for the balconies and walkways.



Recommendations Summary for a Restoration Project

- Discuss the proposed and recommended repairs and scope of work. Keystone will participate in discussion, and answers questions.
- Once decisions are made, put the project out for competitive sealed bids among the local restoration contractors.
- Determine project phases for budget considerations and logistics.
- Improve water intrusion resistance after repairs are completed

Structural Considerations

- In addition to the needed structural repairs due to concrete spalling, some additional measures should be considered. Substantial deflection was noted in the unit 136 balcony. That stack should have temporary shoring installed until the restoration project can be implemented.
- The installation of a corner column and beam for additional support at the large diagonal span for all four of the corner stacks' balconies should also be considered

Balconies/Sliding Glass Doors

- Strip existing coatings
- Remove existing railings
- Repair damaged concrete and stucco
- Replace floor coating system
- Remove/reinstall or replace shutters as needed to make concrete repairs and apply the new floor coating
- Replace aged sliding glass doors with proper coastal rated units, especially those with visible concrete damage
- Ensure positive drainage at sliding glass doors and shutter tracks
- Replace railings with Kynar coated, surface mounted railings

<u>Walkways</u>

- Strip existing coatings
- Remove existing railings
- Repair damaged concrete and stucco
- Replace floor coating system
- Ensure positive drainage
- Replace railings with Kynar coated, surface mounted railings

Exterior Walls

• Make stucco repairs and fully paint/seal exterior walls

The Corrosion Process with Chloride Contaminated Concrete

Since we cannot undo the cyclic corrosive effects of decades of exposure to salt air unless we fully remove all of the concrete slabs, we must consider other available techniques to minimize or at least slow the damage due to corrosion.

The concrete "spalling" damage occurring on the building is primarily caused by reinforcing steel corrosion. The reinforcing steel corrosion is due to ongoing exposure to salt air and eventual saturation with chlorides. It is helpful to have some basic understanding of this phenomenon when faced with decision-making responsibilities for repair of such structures.

Uncontaminated reinforced concrete provides a natural corrosion-inhibiting environment due to the protective nature of high alkalinity concrete surrounding the reinforcing steel. However, in salt-water environments, the chloride intrusion eventually breaks down the concrete's natural ability to inhibit corrosion by creating corrosion cells throughout the concrete. A corrosive environment is created whereby corrosion cells are created due to slight variations in corrosion potential throughout the structure. This is due to the slight inconsistency of the chloride intrusion. Therefore, areas with higher levels of chlorides have higher corrosion potential versus adjacent areas with lower potentials. These higher potential areas (called anodes or anodic areas) corrode and spall, while lower potential areas (called cathodes) do not.

The proper understanding of the corrosion process allows for a project to address the problem of rebar corrosion as well as the symptom of concrete spalling. It is therefore an important aspect of the project to take measures to mitigate the corrosion of the reinforcing steel while also repairing the damaged concrete. Effective corrosion mitigation can delay or eliminate future concrete spalling from rebar corrosion.

For the specific situations on this project, the most effective solutions available to us involve reducing the exposure of the structural components of the building to the corrosive atmospheric elements along with the use of corrosion mitigation products. This is best accomplished by the elimination of the current cracking due to concrete spalling (by repairing the concrete structural spall to ICRI standards), reducing exposure at railing posts, fasteners, shutter tracks, glass doors and horizontal surfaces by utilizing proper fasteners, methods, sealants and coatings. While these efforts will not fully stop the effects of corrosion on the building structure, they can greatly reduce the magnitude and rate of their effects over time. This will save the Association substantially in terms of maintenance costs, future assessments, the inconvenience and loss of use as a result of construction and the collateral costs of construction including removing, reinstalling and/or replacing components such as railings, coatings, shutters and doors.

Conclusion

Once the information in this report is reviewed, discussed, and understood, the Association can reach conclusions as to the planning and timing of the recommended repair work. Keystone Engineering can provide valuable input and services towards this discussion and decision-making process. Keystone can also provide the necessary services for the subsequent solicitation of bids for the work from qualified contractors as well as the oversight of the construction phase to ensure the work is properly executed, including control of the budget, quality of work, contractor payments and warranties.

It is our intention to assist and guide you to complete a quality and cost-effective project that will both enhance the value of your building, lower future maintenance costs and provide extended service life. Enclosed you will find survey summary quantities, survey results and project budget estimates. The actual survey maps are also enclosed. We look forward to meeting and discussing the project further in order to assist with the ongoing decision process.

Sincerely,

James E. Emory, P.E., S.I. Special Inspector PE60965 President Keystone Engineering & Consulting, Inc.

Balconies

	А	В	С	D	E	F						
1		Budget - Port Royal Building 1 Balconies										
2		ltem	<u>Est. Qty.</u>	<u>Units</u>	<u>Estimated</u> Unit Cost	Estimated Extended Cost						
3	1	Mobilization	1	EA	\$ 30,000.00	\$ 30,000.00						
4	2	Floor Coating										
5		a. Coating Strip	3411	SF	\$ 5.00	\$ 17,055.00						
6		b. Tile and Coating Strip	3219	SF	\$ 8.00	\$ 25,752.00						
7	3	Concrete Repairs										
8		a. Floor Surface	597	SF	\$ 185.00	\$ 110,445.00						
9		b. Slab Edge	277	LF	\$ 285.00	\$ 78,945.00						
10		c. Slab Full Depth	799	SF	\$ 275.00	\$ 219,725.00						
11		d. Column/Beam	3	CF	\$ 500.00	\$ 1,500.00						
12		e. Small Repairs Allowance-Spots	\$ 22,500.00									
13		f. Ceiling Spalls	\$ 2,700.00									
14		g. Profiling Mortar	\$ 59,670.00									
15		h. Sealant Joints	40	LF	\$ 18.00	\$ 720.00						
16		i. Remove Abandoned Fasteners-allowance	500	EA	\$ 12.00	\$ 6,000.00						
17	4	Int. Weather Barricade/Door Removal	155	LF	\$ 85.00	\$ 13,175.00						
18		(interior finishes by others)				\$ -						
19		a. Sliding Glass Door Reinstall-Panels	20	EA	\$ 500.00	\$ 10,000.00						
20	5	Stucco Over Masonry Repairs Allowance	200	SF	\$ 38.00	\$ 7,600.00						
21	6	Window Sill Allowance Est.	12	LF	\$ 85.00	\$ 1,020.00						
22	7	Railings										
23		a. Remove & Replace with New Surface Mount Railings	760	LF	\$ 90.00	\$ 68,400.00						
24	8	Screen Enclosures										
25		a. Remove and Replace with New	153	LF	\$ 130.00	\$ 19,890.00						
26	9	Balcony Floor Coating System-										
27		a.New Full System	6630	SF	\$ 8.00	\$ 53,040.00						
28		Building 1 Balco	nies Estim	ated	Budget Total	\$ 748,137.00						
29		Other Alternatives and Costs to Consider										
	10	Shutter R&R by others Incl. Fasteners	as needed	to ac	cess needed rep	pairs and apply						
30			protective	coat	ings							
31	11	New Sliding Glass Door										
32		a. 6' x 6'-8" 1 EA TBD										
33		b. 8' x 6'-8" 1 EA TBD										
34		c. 9' x 6'-8"	1	ΕA	TBD							
35	12	Exterior Walls Painting	1	LS	TBD							
36		Contingencies need to be added to budget for increased costs	s that are p	roba	ble due to hidd	en conditions and						
3/		additional concrete damage that may	exist or oc	cur o	over time							
38		*Roof Work may require additional efforts and a roofing contractor if it goes beyond a surface repair depth										

Balconies

	А	В	C	D	E	F		
1		Budget - Port Royal Buildir	ng 2 Balc	onie	25	All New Coatings and Railings		
2		ltem	Est. Qty.	<u>Units</u>	<u>Estimated</u> Unit Cost	Estimated Extended Cost		
3	1	Mobilization	1	ΕA	\$ 30,000.00	\$ 30,000.00		
4	2	Floor Coating						
5		a. Coating Strip	4846	SF	\$ 5.00	\$ 24,230.00		
6		b. Tile and Coating Strip	1184	SF	\$ 8.00	\$ 9,472.00		
7	3	Concrete Repairs						
8		a. Floor Surface	567	SF	\$ 185.00	\$ 104,895.00		
9		b. Slab Edge	302	LF	\$ 285.00	\$ 86,070.00		
10		c. Slab Full Depth	50	SF	\$ 275.00	\$ 13,750.00		
11		d. Column/Beam	3	CF	\$ 500.00	\$ 1,500.00		
12		e. Small Repairs Allowance-Spots	300	EA	\$ 75.00	\$ 22,500.00		
13		f. Ceiling Spalls	20	SF	\$ 225.00	\$ 4,500.00		
14		g. Profiling Mortar	6030	SF	\$ 9.00	\$ 54,270.00		
15		h. Sealant Joints	40	LF	\$ 18.00	\$ 720.00		
16		i. Remove Abandoned Fasteners-allowance	400	ΕA	\$ 12.00	\$ 4,800.00		
17	4	Int. Weather Barricade/Door Removal	88	LF	\$ 85.00	\$ 7,480.00		
18		(interior finishes by others)				\$-		
19		a. Sliding Glass Door Reinstall-Panels	12	ΕA	\$ 500.00	\$ 6,000.00		
20	5	Stucco Over Masonry Repairs Allowance	200	SF	\$ 38.00	\$ 7,600.00		
21	6	Window Sill Allowance Est.	12	LF	\$ 85.00	\$ 1,020.00		
22	7	Railings						
		c. Remove & Replace with New Surface Mount						
23		Railings	704	LF	\$ 90.00	\$ 63,360.00		
24	8	Screen Enclosures						
25		a. Remove and Replace with New	164	LF	\$ 130.00	\$ 21,320.00		
26	9	Balcony Floor Coating System-						
27		a.New Full System	6030	SF	\$ 8.00	\$ 48,240.00		
28		Building 2 Balco	onies Estim	ated	d Budget Total	\$ 511,727.00		
29		Other Alternatives and Costs to Consider						
	10	Shutter R&R by others Incl. Fasteners	as needed	to ac	ccess needed re	pairs and apply		
30			protective	coat	ings			
31	11	New Sliding Glass Door						
32		a. 6' x 6'-8"	1	EA	TBD			
33		b. 8' x 6'-8"	1	EA	TBD			
34		c. 9' x 6'-8"	1	ΕA	TBD			
35	12	Exterior Walls Painting	1	LS	TBD			
36		Contingencies need to be added to budget for	increased of	costs	that are probal	ole due to hidden		
37		conditions and additional concrete da	mage that	may	exist or occur o	ver time		
38		*Roof Work may require additional efforts and a	roofing co	ntrac	tor if it goes bey	ond a surface repa		

Walkways

	А	В	С	D	E			F		
1		Port Royal Condominium Estimated	lin	g 1 & 2						
			_	Estimated						
2		Item	<u>Qty.</u>	<u> </u>		Cost		<u>extended Cost</u>		
3	1	Mobilization	1	EA ar	Ş	20,000.00	Ş	20,000.00		
4	2	Floor Coating Strip	8400	SF	Ş	4.00	Ş	33,600.00		
5	3	Concrete Repairs			4					
6		a. Floor Surface	1230	SF	Ş 	160.00	Ş _	196,800.00		
7		b. Slab Edge	438	LF	Ş	225.00	Ş	98,550.00		
8		c. Slab Full Depth	30	SF	Ş	240.00	Ş	7,200.00		
9		d. Column/Beam/Header/Wall		CF	<u>Ş</u>	475.00	Ş	-		
10		e. Small/Spot Repairs Allowance		EA	Ş	75.00	Ş	-		
11		f. Ceiling Spalls	24	SF	Ş	195.00	Ş	4,680.00		
12	4	Sealant								
13		a. Em-Seal Joint Replacement	24	LF	\$	45.00	\$	1,080.00		
14	5	Walkway Railings		LF	\$	28.00	\$	-		
15		a. Remove & Replace with New Surface Mount Railings	1252	LF	\$	90.00	\$	112,680.00		
16		b. Fill Core Holes	20	EA	\$	35.00	\$	700.00		
17	6	Walkway Floor Coating System								
18		a. New Full System	8400	SF	\$	8.00	\$	67,200.00		
19	7	Stairwell Floor Coating System								
20		a. Strip Existing Coating	1860	SF	\$	4.00	\$	7,440.00		
21		b. New Full System	1860	SF	\$	8.00	\$	14,880.00		
22	8	Walkway Railings		LF	\$	28.00	\$	-		
23		a. Remove & Replace with New Surface Mount Railings	360	LF	\$	90.00	\$	32,400.00		
24		b. Fill Core Holes	20	EA	\$	35.00	\$	700.00		
25	9	Stucco Over Masonry Repairs Allowance	200	SF	\$	32.00	\$	6,400.00		
26	10	Window Sill Allowance	12	LF	\$	75.00	\$	900.00		
27		Building 1 & 2 Walkwa	iys Estir	nate	d Bu	udget Totals	\$	605,210.00		
28										
29		Contingencies need to be added to budget for increase	d costs t	hat a	are p	robable due t	o hi	idden conditions		
30		and additional concrete damage th	at may e	exist	or oc	cur over time	9			

August 2022

	А	В	С	D	E	F	G	н	I	J	К	L	М	N	0	Р
1						E	stimated B	alcony Rep	air Quantit	ies-Port Ro	yal Buildin	g 1				
2	Unit #	<u>Balcony</u> <u>Surface</u> Area (SF)	<u>Railings/</u> Screen (LF)	<u>Screen</u> Shimmed	Floor Finish	<u>Concrete Spall</u> Surface (SF)	Concrete Spall Edge (LF)	<u>Concrete Spall</u> Full Depth (SF)	<u>Concrete Spall</u> Column- Beam (CF)	Small Repairs	Ceiling Spall	Weather Wall	<u>Window Sill</u> (LF)	<u>Sliding Glass</u> Door Condition	Shutters	<u>Shutters</u> Shimmed
3	151	315	52	NA	Coating	60	16	0	0	0	0	8	0	Newer/Fair	Roll Down at Door	Yes
4	141	315	52	NA	Tile	20	26	0	0	0	0	10	0	Older	Accord at Door	Yes
5	131	315	52	NA	Coating	72	36	0	0	0	0	10	0	Older	Roll Down at Door	Yes
6	121	315	52	NA	Coating	0	0	315	0	0	0	0	0	Older	None	NA
7	111	315	Screen 52	No	Tile	0	20	0	0	0	0	0	0		Roll Down at Door	Yes
8	152	118	15	NA	Coating	18	0	0	0	0	0	0	0	Older	Roll Down at Edge	No
9	142	118	15	NA	Tile	0	0	0	0	0	0	0	0	Older	Roll Down at Edge	Yes
10	132	118	15	NA	Coating	60	0	0	0.5	0	0	0	0	Newer	Roll Down at Edge	Yes
11	122	118	15	NA	Tile	0	0	0	0	0	0	0	0	Older	Roll Down at Edge	Yes
12	112	118	Screen 15	No	Coating	0	0	0	0	0	0	0	0	Newer	None	NA
13	153	205	24	NA	Coating	34	16	0	0	0	0	8	0	Newer/Fair	Roll Down at Edge	No
14	143	205	24	NA	Tile	0	0	0	0	0	0	0	0	Older	Roll Down at Edge	No
15	133	205	24	NA	Coating	45	24	0	0	0	0	12	0	Older	Roll Down at Edge	Yes
16	123	205	24	NA	Coating	34	8	0	0	0	0	12	0	Older	Roll Down at Edge	Yes
17	113	205	Open	NA	Coating	0	0	0	0	0	0	0	0	Older	Roll Down at Edge	Yes
18	154	205	24	NA	Tile	0	8	0	0	0	0	0	0	Older	Roll Down at Edge	No
19	144	205	24	NA	Coating	20	0	4	0	0	4	14	0	Older	Roll Down at Edge	Yes
20	134	205	24	NA	Coating	14	0	0	0	0	0	0	0	Newer	Roll Down at Edge	Yes
21	124	205	24	NA	Coating	62	0	0	0	0	0	18	0	Older	Roll Down at Edge	Yes
22	114	205	Screen 24	NA	Tile	0	0	0	0	0	0	0	0	Older	Roll Down at Edge	No
23	155	97	13	NA	Coating	30	4	0	0	0	0	8	0	Older	Roll Down at Door	Yes
24	145	97	13	NA	Coating	18	6	0	0	0	0	0	0	Older	None	NA
25	135	97	13	NA	Tile	0	6	0	0	0	0	0	0	Older	Roll Down at Edge	Yes
26	125	97	13	NA	Coating	30	13	0	0	0	0	0	0	Older	Roll Down at Edge	Yes
27	115	97	Open	NA	Tile	0	0	0	0	0	0	0	0	Newer	None	NA
28	156	386	62	NA	Tile	38	14	16	0	0	8	24	0	Older	Roll Down at Door	Yes
29	146	386	62	NA	Tile	0	48	14	0	0	0	0	0	Older	Accord at Edge	Yes
30	136	386	62	NA	Coating	0	0	386	0	0	0	18	0	Older	Roll Down at Door	Yes
31	126	386	62	NA	Tile	42	32	64	0	0	0	13	0	Older	Accord at Edge	No
32	116	386	Screen 62	No	Tile	0	0	0	0	0	0	0	0		Roll Down at Door	Yes
33	<u>Totals</u>	<u>6630</u>	<u>760</u>	<u>o</u>		<u>597</u>	<u>277</u>	<u>799</u>	<u>0.5</u>	<u>o</u>	<u>12</u>	<u>155</u>	<u>0</u>			

Balcony Quantities

								1									
	A	В	С	D	E	F	G	Н	I	J	K	L	М	Ν	0	Р	Q
1		Estimated Balcony Repair Quantities-Port Royal Building 2															
2	<u>Unit #</u>	<u>Balcony</u> <u>Surface</u> <u>Area (SF)</u>	<u>Railings/</u> Screen (LF)	<u>Screen</u> Shimmed	<u>Floor Finish</u>	Concrete Spall Surface (SF)	<u>Concrete Spall</u> Edge (LF)	Concrete Spall Full Depth (SF)	Concrete Spall Column-Beam (CF)	Concrete Spall Column- Beam (CF)	Small Repairs (EA)	Ceiling Spall	<u>Weather Wall</u> (LF)	<u>Window Sill</u> <u>(LF)</u>	<u>Sliding Glass</u> Door Condition	<u>Shutters</u>	<u>Shutters</u> Shimmed
3	251	386	62	NA	Coating	90	18	20	0	0	0	0	18	0	Older	Accord at Edge	No
4	241	386	62	NA	Coating	36	12	0	0	0	0	0	12	0	Older	Accord at Edge	No
5	231	386	62	NA	Coating	58	48	18	0	0	0	0	12	0	Older	Accord at Edge	No
6	221	386	62	NA	Coating	62	24	12	0	0	0	10	0	0	Older	Accord at Edge	No
7	211	386	Screen 62	No	Coating	0	16	0	0	0	0	0	0	0	Newer	Roll Down at Door	Yes
8	252	205	24	NA	Tile	0	0	0	0	0	0	0	0	0	Older	Roll Down at Edge	Yes
9	242	205	24	NA	Coating	36	18	0	0	0	0	0	16	0	Older	Roll Down at Edge	Yes
10	232	205	24	NA	Tile	0	10	0	0	0	0	0	0	0	Older	Roll Down at Edge	No
11	222	205	24	NA	Coating	24	0	0	0	0	0	0	0	0	Older	Roll Down at Edge	Yes
12	212	205	Screen 24	No	Tile	0	0	0	0	0	0	0	0	0	Newer	None	NA
13	253	118	15	NA	Coating	19	15	0	0	0	0	0	0	0	Older	Roll Down at Edge	Yes
14	243	118	15	NA	Coating	0	12	0	0	0	0	0	0	0	Older	None	NA
15	233	118	15	NA	Tile	0	0	0	0	0	0	0	0	0	Older	Roll Down at Edge	No
16	223	118	15	NA	Coating	22	0	0	0	0	0	0	0	0	Older	Roll Down at Edge	No
17	213	118	Screen 15	No	Tile	0	12	0	0	0	0	0	0	0	Newer	None	NA
18	254	111	13	NA	Coating	24	13	0	0	0.5	0	0	14	0			
19	244	111	13	NA	Tile	0	8	0	0	0	0	0	0	0	Older	Roll Down at Edge	No
20	234	111	13	NA	Tile	0	4	0	0	0	0	0	0	0	Older	Roll Down at Edge	No
21	224	111	13	NA	Coating	18	0	0	0	0	0	0	0	0	Older	Roll Down at Edge	Yes
22	214	111	Screen 13	No	Tile	0	0	0	0	0	0	0	0	0	Newer	Roll Down at Edge	
23	255	386	62	NA	Coating	42	20	0	0	0	0	0	0	0	Older	Accord at Edge	Yes
24	245	386	62	NA	Coating	46	20	0	0	0	0	0	8	0	Older	Accord at Edge	No
25	235	386	62	NA	Coating	28	34	0	0	0	0	0	0	0	Older	Roll Down at Door	Yes
26	225	386	62	NA	Coating	62	18	0	0	0	0	10	8	0	Older	None	NA
27	215	386	Screen 62	No	Coating	0	0	0	0	0	0	0	0	0	Older	None	NA
28	<u>Totals</u>	<u>6030</u>	<u>704</u>			<u>567</u>	<u>302</u>	<u>50</u>	<u>o</u>	<u>0.5</u>	<u>o</u>	<u>20</u>	<u>88</u>	<u>0</u>			

			<i>.</i>		-	-	6									
	A	В	C	D	E	F	G	H		J	K	L	M	N		
1		Building 1 and 2 Walkway Quantities - Port Royal														
2	Area	Walkway Floor Surface Area (SF)	<u>Walkway</u> <u>Railings (LF)</u>	<u>Stairwell</u> Floors Surface <u>Area (SF)</u>	<u>Stairwell</u> <u>Railings (LF)</u>	<u>Concrete Spall</u> <u>Surface (SF)</u>	<u>Concrete Spall</u> <u>Ceiling (SF)</u>	<u>Concrete Spall</u> <u>Edge (LF)</u>	<u>Concrete Spall</u> Full Depth (SF)	Concrete Spall Column- Beam (CF)	<u>Crack (LF)</u>	<u>Small Repair</u> (EA)	Expansion Joint LF)	<u>Window Sill</u> (LF)		
3	Level 5	1680	313	372	72	171	0	12	0	0	0	0	0	0		
4	Level 4	1680	313	372	72	108	8	32	10	0	0	0	0	0		
5	Level 3	1680	313	372	72	93	0	88	0	0	0	0	0	0		
6	Level 2	1680	313	372	72	38	0	14	0	0	0	0	0	0		
7	Level 1	1680	0	372	72	0	0	0	0	0	0	0	0	0		
8	Estimated Totals	<u>8400</u>	<u>1252</u>	<u>1860</u>	<u>360</u>	<u>410</u>	<u>8</u>	<u>146</u>	<u>10</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>		
9																
10																
11																
12																

PORT ROYAL

Example Photos



Column spall due to reinforcing steel corrosion (Unit 151)



Concrete damage at foam-filled rail post

PORT ROYAL

AUGUST 2022



Drainage inhibited by tiles and hurricane shutters without any shims under tracks



Drainage inhibited by hurricane shutters and tile holding moisture allows vegetation to grow.



Corroded fasteners in sliding glass door track, allowing saltwater intrusion and structural damage



Corroded fasteners in sliding glass door track, allowing saltwater intrusion and structural damage



Floor spall due to reinforcing steel corrosion at blocked shutter drainage



Example view of floor concrete spalling at sliding glass door due to reinforcing steel corrosion (Unit 203)

AUGUST 2022

PORT ROYAL



Floor surface concrete spalling due to reinforcing steel corrosion



Past spall repair in failure

AUGUST 2022

PORT ROYAL



Balcony slab edge spall repair in failure



Balcony slab edge spall repair in failure

PORT ROYAL

AUGUST 2022



Edge spall along roof



Cracking tile is often an indication of concrete spalling below

AUGUST 2022



Corroded fasteners on sliding glass door and shutter tracks; cracking tile indicative of spalling below



Example view of ceiling spall due to reinforcing steel corrosion



Edge spalls at the ceiling due to reinforcing steel corrosion



Edge spalls at the ceiling due to reinforcing steel corrosion

PORT ROYAL



Interior tile cracking indicative of spalling below



Window sill spall on building exterior



Shutter track with installed shims to promote positive drainage



Concrete spalling at sliding glass door



Concrete spalling at sliding glass door



Concrete spalling at sliding glass door

AUGUST 2022

PORT ROYAL



Railing deterioration



Railing deterioration
AUGUST 2022



Example view cored railings



Railing core starting to fail

AUGUST 2022



Cored railing causing edge spalling



Edge spall due to reinforcing steel corrosion

AUGUST 2022



Edge spall on ceiling due to reinforcing steel corrosion



Edge concrete spalling due to reinforcing steel corrosion



Concrete spalling along balcony edge due to reinforcing steel corrosion



Concrete spalling due to reinforcing steel corrosion at balcony edge

PORT ROYAL

AUGUST 2022



Surface spall along walkway



Deteriorated railing pickets along walkway

PORT ROYAL

AUGUST 2022





Edge spall on walkway



Example view of apparent water intrusion at walkway ceiling



Overview of complex



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1635 South Ridgewood Avenue, Suite 201, South Daytona, FL 32121
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KEYSTONE

CONSULTING, INC.

ENGINEERING &

Site Map

Port Royal 1700 North Atlantic Avenue Cocoa Beach, FL 32931







CONSULTING. INC.

11

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KEYSTONE Engineering & Consulting, Inc.

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25 North Brevard Avenue, Suite 101, Cocoa Beach, FL 32931 . FL 32931 • 1635 South Ridgewood Avenue, Suite 201, South Daytona, FL 32121 • KeystoneEngineeringPE.com • Fax: 321.459.2888 Office: 321.454.7300 **Balcony Survey Map** Unit # 1 Project: Port Royal Building 1 Date: August 30, 2022 LEGEND Railings **Sliding Doors** Vinyl Aluminum Spall **Code Compliant: Yes** No **Code Compliant:** Yes No 888 Above Condition: Good Fair Condition: Poor Good Fair Poor Type: Cored Surface Mount Screen Age: Older Newer Spall Screen Shimmed: Yes No > forda Corroded Fasteners: Yes Below No N. Holes In Threshold: Yes No Shutters Yes No Crack Shimmed No Yes Flooring Rust Spot Туре Accordion Roll Down Type: Tile Coating Pattern Location Edge Door 50 10 6.0 89 m (12) ADD) COANER ·4-4 $(\mathbf{1})$ 20-0 BEAM **Survey Quantities** Floor Surface (SF) COLUMN LIVING Slab Edge (LF) 20 Slab Full Depth (SF) Column/Beam/ Header (CF) Small Repair (EA) Tile 9 Ceiling Spall (SF) Haden **Profiling Mortar (SF)** cond Window Sill (LF) Railing Length = 52 Linear Feet Floor Surface (SF) PT Lock Offs (EA) 315 Square Feet Balcony Area = Weather Walls (LF)





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Balcony Survey Map



Balcony Area =

118 Square Feet

Weather Walls (LF)





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Railing Length = 1

15 Linear Feet

Survey Quantities		
Floor Surface (SF)		
Slab Edge (LF)		
Slab Full Depth (SF)		
Column/Beam/ Header (CF)		
Small Repair (EA)		
Ceiling Spall (SF)		
Profiling Mortar (SF)		
Window Sill (LF)		
Floor Surface (SF)		
PT Lock Offs (EA)		
Weather Walls (LF)		





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Balcony Survey Map



15 Linear Feet

Floor Surface (SF) PT Lock Offs (EA)

Weather Walls (LF)

Ø





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Balcony Survey Map



PT Lock Offs (EA)

Weather Walls (LF)





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Railing Length =

15 Linear Feet

Floor Surface (SF)	
Slab Edge (LF)	
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (EA)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	
Floor Surface (SF)	
PT Lock Offs (EA)	
Weather Walls (LF)	





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Railing Length =

24 Linear Feet

Balcony Area =

205 Square Feet

Profiling Mortar (SF) Window Sill (LF) Floor Surface (SF) PT Lock Offs (EA) Weather Walls (LF)





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25 North Brevard Avenue, Suite 101, Cocoa Beach, FL 32931 1635 South Ridgewood Avenue, Suite 201, South Daytona, FL 32121 Office: 321.454.7300 KeystoneEngineeringPE.com Fax: 321.459.2888 **Balcony Survey Map** 9/1 Unit # 123 Project: Port Royal Building 1 Date: August 30, 2022 LEGEND Railings **Sliding Doors** Vinyl Aluminum Spall **Code Compliant: Yes** No Code Compliant: Yes No 888 Above Condition: Good Fair Poor Condition: Good Fair Poor Type: Cored Surface Mount Screen Age: Older Newer Spall Screen Shimmed: Yes No **Corroded Fasteners:** Below Yes No Holes In Threshold: Yes No **Shutters** Yes No Crack Shimmed Yes No Flooring Rust Spot Type Accordion Roll Down Type: Tile Coating Pattern Location Edge Door 11-6 5.0 Quit. Ely Myan -(10) STTS. 6 10 **Survey Quantities** Floor Surface (SF) 34 в Slab Edge (LF) Slab Full Depth (SF) Column/Beam/ Header (CF) Small Repair (EA) Ceiling Spall (SF) Profiling Mortar (SF) Window Sill (LF) Railing Length = 24 Linear Feet Floor Surface (SF) PT Lock Offs (EA) Balcony Area = 205 Square Feet 12 Weather Walls (LF)





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Balcony Survey Map



Weather Walls (LF)





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Railing Length =

24 Linear Feet

Balcony Area =

205 Square Feet

Slab Full Depth (SF)	4
Column/Beam/ Header (CF)	
Small Repair (EA)	
Ceiling Spall (SF)	4
Profiling Mortar (SF)	
Window Sill (LF)	
Floor Surface (SF)	
PT Lock Offs (EA)	
Weather Walls (LF)	14





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Balcony Area =

205 Square Feet

PT Lock Offs (EA) Weather Walls (LF)





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Balcony Area =

205 Square Feet

Floor Surface (SF)

PT Lock Offs (EA)

Weather Walls (LF)

9





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Balcony Survey Map



Weather Walls (LF)





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Balcony Survey Map





Railing	Length	=

13 Linear Feet

Balcony Area =

97 Square Feet

ondo coBe (ci)	T
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (EA)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	_
Window Sill (LF)	
Floor Surface (SF)	
PT Lock Offs (EA)	
Weather Walls (LF)	9

Survey Quantities

30

Λ

Floor Surface (SF)

Slah Edge (LE)





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15

Office: 321.454.7300 KeystoneEngineeringPE.com Fax: 321,459,2888 **Balcony Survey Map** 45 **Project: Port Royal** Unit # Building 1 Date: August 30, 2022 LEGEND Railings **Sliding Doors** Vinvl Aluminum Spall Code Compliant: Yes No Code Compliant: Yes No 888 Above Condition: Good Fair Poor Condition: Good Fair Poor Type: Cored Surface Mount Screen Age: Older Newer Spall Screen Shimmed: Yes No Corroded Fasteners Below Yes No Holes In Threshold: Yes No **Shutters** No Yes Crack Shimmed Yes No Flooring **Rust Spot** Type Accordion **Roll Down** Type: Tile Coating Pattern Location Edge Door 3-4 0-2 2-8 9 L 10 CIT LI ALLA **Survey Quantities** 18 Floor Surface (SF) Slab Edge (LF) 6 Slab Full Depth (SF) Column/Beam/ Header (CF) Small Repair (EA) Ceiling Spall (SF) Profiling Mortar (SF) Railing Length = 13 Linear Feet Window Sill (LF) Floor Surface (SF) Balcony Area = 97 Square Feet PT Lock Offs (EA) Weather Walls (LF)





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Balcony Survey Map

Unit # 135 **Project: Port Royal** Building 1 Date: August 30, 2022 LEGEND Railings **Sliding Doors** Vinyl Aluminum Code Compliant: Yes Spall No Code Compliant: No Yes ∞ Above Condition: Good Fair Poor Condition: Good Fair Poor Type: Cored Surface Mount Screen Age: Older Newer Spall Screen Shimmed: Yes No **Corroded Fasteners:** Below Yes No Holes In Threshold: Yes No **Shutters** Yes No Crack Shimmed Yes No Flooring Type Rust Spot Accordion 1 Roll Down Type: Tile Coating Pattern Location Edge Door 3-4 0-0 2-8 10 STITP: APPR (\mathbf{I}) **Survey Quantities**



6

Railing Length =

13 Linear Feet

Balcony Area = 97

97 Square Feet





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Balcony Survey Map

Project: Port Royal Unit # Building 1 Date: August 30, 2022 LEGEND Railings **Sliding Doors** Vinyl Aluminum Spall **Code Compliant: Yes** No Code Compliant: Yes No Above Condition: Good Fair Poor Condition: Good Fair Poor Type: Cored Surface Mount Screen Age: Older Newer Spall Screen Shimmed: Yes No **Corroded Fasteners**: Yes No Below Holes In Threshold: Yes No Yes Shutters No Crack Yes Shimmed No **Flooring** Rust Spot Type Accordion Roll Down Type: Tile Coating Pattern Location Edge Door 3-2 0.0 £-8 9 D



Survey Quantities		
Floor Surface (SF)	30	
Slab Edge (LF)	13	
Slab Full Depth (SF)		
Column/Beam/ Header (CF)		
Small Repair (EA)		
Ceiling Spall (SF)		
Profiling Mortar (SF)		
Window Sill (LF)		
Floor Surface (SF)		
PT Lock Offs (EA)		
Weather Walls (LF)		

Sumou Quantitian



13 Linear Feet

Balcony Area =

M

97 Square Feet





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Balcony Survey Map



Balcony Area =

97 Square Feet

Window Sill (LF) Floor Surface (SF)

PT Lock Offs (EA) Weather Walls (LF)





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Weather Walls (LF)

313 9.3



16

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21

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21

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Weather Walls (LF)



















22

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Railing Length =

24 Linear Feet

Balcony Area =

205 Square Feet



HUDUN

10







Railing Length =

24 Linear Feet

Balcony Area =

205 Square Feet

Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (EA)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	
Floor Surface (SF)	
PT Lock Offs (EA)	
Weather Walls (LF)	

10

Floor Surface (SF)

Slab Edge (LF)







Unit # 22B Project: Port Royal Building 12 Date: August 30, 2022 LEGEND Railings **Sliding Doors** Vinyl Aluminum Spall **Code Compliant: Yes Code Compliant:** No Yes No *** Above Good Fair Poor Condition: Condition: Good Fair Poor Type: Cored Surface Mount Screen Older Newer Age: Spall Screen Shimmed: Yes No Corroded Fasteners Yes No Below Holes In Threshold: Yes No Yes No Shutters Crack Shimmed Yes No. Flooring Roll Down Accordion Type Type: Tile Coating Rust Spot Pattern Location Edge Door Franchy hl 11 me 7- 4 5.6 **MINTINI** (10) 1 THE (0) 10 **Survey Quantities** 24 Floor Surface (SF)

Railing Length =

24 Linear Feet

Balcony Area =

205 Square Feet

Slab Edge (LF)	
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (EA)	
Ceiling Spali (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	
Floor Surface (SF)	
PT Lock Offs (EA)	
Weather Walls (LF)	



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Balcony Survey Map



22





73

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Balcony Survey Map



Railing Length =

Balcony Area =

15 Linear Feet

118 Square Feet

Floor Surface (SF) PT Lock Offs (EA)

Weather Walls (LF)



Survey Quantities	
Floor Surface (SF)	
Slab Edge (LF)	12
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (EA)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	
Floor Surface (SF)	
PT Lock Offs (EA)	
Weather Walls (LF)	

Railing Length =

15 Linear Feet



Railing	Length =
---------	----------

Small Repair (EA) Ceiling Spall (SF) Profiling Mortar (SF) Window Sill (LF)

Floor Surface (SF) PT Lock Offs (EA)

Weather Walls (LF)





Balcony Survey Map



Railing Length =

15 Linear Feet

118 Square Feet

Survey Quantities	
Floor Surface (SF)	22
Slab Edge (LF)	
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (EA)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	
Floor Surface (SF)	
PT Lock Offs (EA)	
Weather Walls (LF)	





73

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Railing Length =

15 Linear Feet

Ceiling Spall (SF) Profiling Mortar (SF) Window Sill (LF)

Floor Surface (SF) PT Lock Offs (EA)

Weather Walls (LF)



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7Δ

25 North Brevard Avenue, Suite 101, Cocoa Beach, FL 32931 . 1635 South Ridgewood Avenue, Suite 201, South Daytona, FL 32121 Office: 321.454.7300 KeystoneEngineeringPE.com Fax: 321.459.2888 **Balcony Survey Map** Unit # 254 **Project: Port Royal** Building 2 Date: August 30, 2022 LEGEND Railings **Sliding Doors** Vinyl Aluminum Spall Code Compliant: Yes **Code Compliant:** No Yes No Above Condition: Good Fair Poor Condition: Good Fair Poor Type: Cored Surface Mount Screen Age: Older Newer Spall Screen Shimmed: Yes No **Corroded Fasteners:** Yes No Below Holes In Threshold: Yes No **Shutters** Yes No 🔨 Crack Shimmed Yes No Flooring Type Accordion **Roll Down** Rust Spot Coating Type: Tile Pattern Location Edge Door 5-4 10-4 3-0 W. Sor 6×6-19 MALLINIA 1 ++ +++ **Survey Quantities** 804-8 Floor Surface (SF) 24 B Slab Edge (LF) Slab Full Depth (SF) Column/Beam/ Header (CF) Small Repair (EA) Ceiling Spall (SF) Profiling Mortar (SF)

Railing Length = 1

13 Linear Feet

Window Sill (LF)

Floor Surface (SF) PT Lock Offs (EA)

Weather Walls (LF)

14





Balcony Survey Map



Railing Length =

Survey Quantities	
Floor Surface (SF)	
Slab Edge (LF)	9
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (EA)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	
Floor Surface (SF)	
PT Lock Offs (EA)	
Weather Walls (LF)	



Survey Quantities	
Floor Surface (SF)	
Slab Edge (LF)	4
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (EA)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	
Floor Surface (SF)	
PT Lock Offs (EA)	
Weather Walls (LF)	







32931 • 1635 South Ridgewood Avenue, Suite 201, South Daytona, FL 32121 KeystoneEngineeringPE.com • Fax: 321.459.2888 25 North Brevard Avenue, Suite 101, Cocoa Beach, FL 32931 Office: 321.454.7300 • **Balcony Survey Map** 9/1 Unit # 214 Date: August 30, 2022 **Project: Port Royal** Building 2 BRINNA Aluminum LEGEND Railings **Sliding Doors** Vinyl Spall **Code Compliant:** No **Code Compliant: Yes** No Yes ∞ Above Poor Condition: Fair Poor Condition: Good Fair Good Older Newer Type: Cored Surface Mount Screen Age: Spall Screen Shimmed: Yes **Corroded Fasteners:** Yes No No Below Holes In Threshold: Yes No Yes No **Shutters** Crack Shimmed Yes No Flooring Accordion Roll Down Туре Type: Tile Coating Pattern Rust Spot Location Edge Door 5-4 10-4 3-0 ic NIN HEAT (1) **Survey Quantities** Floor Surface (SF)

> Railing Length = 13 Linear Feet Balcony Area = 111 Square Feet



























Site Map

Port Royal 1700 North Atlantic Avenue Cocoa Beach, FL 32931







Coaty Cored Quils

Survey Quantities	
Floor Surface (SF)	X
Slab Edge (LF)	
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (ea)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	









Survey Quantities	
Floor Surface (SF)	8
Slab Edge (LF)	
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (ea)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	





















Date: <u>August 30, 2022</u>

Survey Quantities	
Floor Surface (SF)	19
Slab Edge (LF)	
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (ea)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	







Survey Quantities	
Floor Surface (SF)	29
Slab Edge (LF)	
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (ea)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	

Date: August 30, 2022







Date: August 30, 2022

Project: Port Royal



> MISSING bREVE M FLOWS B 154/144

Survey Quantities	
Floor Surface (SF)	
Slab Edge (LF)	
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (ea)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	








Missing Nea MI Atoos 144 shak

Survey Quantities	
Floor Surface (SF)	10
Slab Edge (LF)	
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (ea)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	













2-2

Match Line D



Walkway Survey Map

Project: Port Royal

Floor # 4m



Survey Quantities	
Floor Surface (SF)	22
Slab Edge (LF)	
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (ea)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	





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Survey Quantities	
Floor Surface (SF)	
Slab Edge (LF)	6
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (ea)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	

Date: <u>August 30, 2022</u>







Project: Port Royal

Floor #



Survey Quantities	
Floor Surface (SF)	12
Slab Edge (LF)	
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (ea)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	







Survey Quantities	
Floor Surface (SF)	19
Slab Edge (LF)	B
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (ea)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	











30

LEGEND

88

Spall

Above

Spall Below

Crack

Rust Spot







Survey Quantitie	es
Floor Surface (SF)	
Slab Edge (LF)	34
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (ea)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	











5-0"





Project: Port Royal

Floor # Z



Massin Astan

Survey Quantities	
Floor Surface (SF)	16
Slab Edge (LF)	
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (ea)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	









Missing Ashall

Survey Quantities	
Floor Surface (SF)	10
Slab Edge (LF)	
Slab Full Depth (SF)	
Column/Beam/ Header (CF)	
Small Repair (ea)	
Ceiling Spall (SF)	
Profiling Mortar (SF)	
Window Sill (LF)	





















