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June 30, 2026

9400 Condominium Association
9400 Coastal Highway
Ocean City, Maryland 21842

ATTENTION: Mr. Ken Mullinix, Jr.

SUBJECT: Report of Replacement Reserve Study
9400 Condominium
Ocean City, Maryland
ETC Project: M5-5283

Dear Mr. Mullinix:

Engineering and Technical Consultants, Inc. (ETC) respectfully submits this report of our reserve study at the above-referenced project. This work was performed in accordance with our proposal (PM2-8083rrs) dated February 14, 2025. Written authorization to proceed with the work (signed by Mr. Ken Mullinix, Jr.) was received in our office on March 19, 2025.

Our inspection services were intended to assist you in:

- Evaluating existing conditions;
- Determining immediate or short-term repair needs; and
- Generating a practical repair/replacement reserve schedule.

Our work was confined to the following elements:

1. Roof systems;
2. Exterior facing systems;
3. Balconies;
4. Swimming pool and associated equipment;
5. Parking garage;
6. Elevators;
7. HVAC systems;

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8. Plumbing systems;
9. Electrical distribution systems;
10. Trash compaction system;
11. Fire alarm systems;
12. Access control systems;
13. Lighting systems;
14. Interior finishings and furnishings;
15. Pavement;
16. Concrete site elements;
17. Entrance sign; and
18. Fence.

This report includes a brief summary of background information and, for each component inspected, discussions of our findings, comments, and recommendations. Also attached (in Appendix A) are some photographs to help illustrate certain findings. Additionally, we have compiled (in Appendix B) a tabular summary of future capital reserve requirements. Finally, some pertinent technical information (in Appendix C) regarding some of the items discussed in this report.

BACKGROUND INFORMATION

The 9400 Condominium consists of a twenty-two-story building that encloses 164 residential units. The structure is faced with precast concrete panels. The roofs are low-sloped (flat) and covered with conventional modified bitumen membrane assemblies. The building was constructed in the 1970s.

ROOFING SYSTEMS

The main and penthouse roofs are low-sloped (flat) and covered with modified bitumen membrane assemblies (see Photographs 1 and 2). Removal of water from the main roof is facilitated by the slope of the roof and interior drains. Removal of water from the penthouse roof is facilitated by the roof's slope and a gutter and downspout assembly. The main and penthouse roofs house exhaust fans, telephone communications equipment, and miscellaneous pipe and vent penetrations. The main roof assembly was replaced, and the penthouse roof was coated with a silicone coating in 2024.

Observations

The roof coverings appeared to be in relatively good condition. No issues were noted during our inspection, nor were any reported to us.

Conclusions

Based on our visual observations and experience with similar systems, we believe the main and penthouse roof assemblies should remain serviceable for another 20 years. Periodic repairs should be anticipated.

Recommendations

In our opinion, general maintenance and repairs should be done on an as-needed basis to maximize the life expectancy of the roof systems. Drains should be cleaned periodically to maintain proper function.

EXTERIOR FACING SYSTEMS

The building is faced with concrete panels coated with an elastomeric finish (see Photographs 3 and 4). Color-coated aluminum windows and doors are situated in building openings. Steel doors are utilized to access the utility rooms.

Observations

At the time of our inspection, the concrete panels appeared to be in good condition. No significant issues were noted.

The windows and doors appeared to be in fair condition. The color-coat was debonded along the base of the windows in some areas (see Photograph 5). Additionally, the color coat on the window frames was faded in numerous instances (see Photograph 6). Corrosion (rust) was evident on several steel doors (see Photograph 7).

Conclusions

With proper maintenance and repairs, the exterior elements should remain serviceable for the life of the building. Repair and recoating of the exterior should be anticipated every 10 years. The sealants should be replaced during the recoating work. The windows could remain serviceable for another 9 to 14 years. The aluminum doors could remain serviceable for up to 14 years, while the steel doors could remain serviceable for another 5 to 15 years.

BALCONIES

The unit balconies are extensions of the concrete floor slabs. Elastomeric coatings are applied to the decks. Painted metal railings define the balconies' perimeters.

Observations

We inspected five balconies as part of our study. The balconies appeared to be in fair condition at the time of the inspection. The following items were noted.

1. Several repairs were noted in the balcony coatings (see Photograph 8). The areas of new coating were typically visible due to the age of the existing coating.
2. Staining or vegetation growth was noted on a few of the balconies (see Photograph 9).

3. The color-coat on the balcony railings was debonded along the top rail in some instances (see Photograph 10).
4. Even though the railings are grandfathered in, the spacing between the pickets is greater than four inches, which does not meet the current safety requirements of the building code.

Conclusions

Properly designed and constructed balconies of this type should generally be expected to remain serviceable for the life of the building. Repairs and recoating of the balconies should be anticipated every 10 years. The railings should remain serviceable for another 3 to 6 years; however, consideration should be given to starting replacement of the railings within the next 3 years to bring them into compliance with the current building code and allow for a phased approach.

Recommendations

Consideration should be given to a full balcony restoration project, including concrete repairs, recoating, and replacement of railings with code-compliant railings.

SWIMMING POOL AND TERRACE

The outdoor swimming pool is located at the northeast corner of the property (see Photograph 11). The equipment consists of a sand filter system and various pumps. The pool equipment is housed in a room beneath the pool. The swimming pool deck consists of a raised concrete structure coated with an elastomeric pedestrian coating. Sundecks (terraces) of similar construction extend along the rear and sides of the building. Metal picket-style railings delineate the decks and provide fall protection. A landing and stair assembly, constructed of pressure-treated wood and composite decking, extends from the sundeck and provides access to the beach. Composite railings with aluminum handrails delineate the assembly.

We were informed that the pool's white coat and waterline tile were redone in 2023, and the deck was recoated in 2020. A portion of the sundeck was recoated in 2024.

Observations

The swimming pool, sundeck, and related features (deck, equipment, etc.) ranged in condition from good to poor at the time of our inspections. Cracks were noted in the pool deck coating in numerous areas (see Photograph 12). Similar cracks were evident in the sundeck coating as well (see Photograph 13). Additionally, sealants in the sundeck control joints were split and debonded in a few instances (see Photograph 14). Calcium deposits were noted in the garage (see Photograph 15), possibly related to water intrusion through debonded sealants and cracks. Corrosion was observed on the gate push bar providing access from the swimming pool to the sundeck (see Photograph 16).

The stair and landing assembly appeared to be in good condition. The handrail was loose at one of the attachment points (see Photograph 17). Additionally, the color-coat on the handrail was debonded and missing in a few instances (see Photograph 18).

Conclusions

Based on observable conditions, the outdoor pool shell should remain serviceable for another 20 to 25 years. The interior of the pool will need to be coated every five years. The pool and sundecks could remain serviceable for another 30 to 40 years. They will need to be recoated every 10 years. Periodic repairs should be anticipated in the interim. The fencing and railings could remain serviceable for another 15 to 20 years. The stair and landing assembly should remain serviceable for another 20 to 25 years.

Recommendations

The cracks and split/debonded sealants in the pool deck and terrace should be repaired. The loose handrail connection on the beach access stair assembly should be properly repaired. The swimming pool and associated elements should be inspected annually by a qualified contractor.

PARKING GARAGE

A parking garage is featured below the building and terrace. The structure consists of 8-inch-thick hollow-core precast concrete planks. A cast-in-place concrete topping slab, reinforced with welded wire fabric, is placed over the precast planks. The deck planks are supported by a system of concrete beams, columns, and foundation walls. The parking surface is paved with bituminous concrete (asphalt). The concrete was refurbished in 2025.

Observations

The garage appeared to be in good condition at the time of our inspections. No major issues were noted.

Conclusions

Property constructed garages of this type should remain serviceable for the lifespan of the building. Occasional major repairs should be anticipated.

ELEVATORS

Vertical transportation is provided by three overhead traction elevators. We understand that they were replaced in 2003.

Observations

No visual problems were noted with the elevators and their equipment. No problems were reported to us, and we understand that they perform reliably.

Conclusions

With proper maintenance, equipment could remain serviceable for up to 38 more years; however, a scarcity of replacement parts in the future could render them obsolete before then. The controllers and cabs could remain serviceable for another 8 years.

Recommendations

Elevators should be inspected annually by a certified technician.

HVAC SYSTEMS

The building's common areas are conditioned by three air source split systems.

Observations

The split systems appeared to be in fair condition. No issues were noted, and none were reported to us.

Conclusions

Based on current conditions, the HVAC system should remain serviceable for 1 to 2 years.

Recommendations

As a maintenance item, the HVAC systems should be thoroughly inspected and serviced every three years by a qualified electrical contractor.

PLUMBING

Plumbing systems consist of copper water lines and cast-iron waste lines. Booster pumps help direct water to the elevated units.

Our inspections of the common-area mechanical systems were limited to visual examinations of accessible external elements. Our opinions are based on observable conditions, typical operating characteristics, and life-cycle performance.

Observations

The plumbing systems appeared to be in fair condition overall. No issues were noted.

Conclusions

The booster pump system should remain serviceable for another 9 years. The domestic water and sanitary waste lines could remain serviceable for another 50 to 60 years. Some repairs should be anticipated in the interim.

ELECTRIC DISTRIBUTION SYSTEMS AND EMERGENCY GENERATOR

The major elements of electric distribution systems include main, secondary, and branch disconnects, load centers, transformers, buses, and conductors. The major components of the electric distribution system feature interlock devices that prevent them from being opened for inspection without service interruption; therefore, our inspection was restricted to an external visual examination. An emergency generator provides limited electricity during power outages.

Observations

The electric distribution system appeared to be in fair condition. All inspection tags were up to date.

Conclusions

Unless parts availability renders them obsolete, the electrical distribution systems could remain serviceable (provided they are properly maintained) for another 14 to 20 years. The emergency generator should remain serviceable for another 15 to 20 years.

Recommendations

As a maintenance item, the electrical distribution systems should be thoroughly inspected and serviced every three years by a qualified electrical contractor.

TRASH COMPACTION SYSTEM

The trash compaction system was located on the building's northwest side.

Observations

The trash compaction system, at the time of our inspection, appeared to be in fair condition. Some corrosion was noted on the compactor (see Photograph 19)

Conclusions

A properly designed and constructed trash compactor of this type should normally remain serviceable for 10 to 15 years.

FIRE ALARM AND SPRINKLER SYSTEMS

The fire alarm system primarily consists of a central control module, a graphic annunciator panel, audible alarms, and activation devices. The alarm system utilizes manual pull stations, sprinkler system flow switches, and flame/smoke detectors as alarm activators. Fire protection in the building interior is provided by a fire suppression (sprinkler) system that uses water as the suppressant.

Observations

At the time of our inspection, the fire alarm system appeared to be functioning properly. No problems were observed; however, it should be noted that we did not test any system components.

Conclusions

The major elements of the fire alarm system could remain serviceable for another 24 years; however, the system likely uses some proprietary, non-repairable sub-assemblies, and difficulty in obtaining replacement parts in the future could render the system prematurely obsolete. The major elements of the fire suppression system could remain serviceable for 30 to 40 years. Some major repairs and component replacements should be anticipated over the life cycles of the fire protection systems. The fire sprinkler pump should remain serviceable for another 28 years. The pump controller could remain serviceable for 50 years.

ACCESS CONTROL SYSTEM

Visitor access to the buildings is primarily controlled by keypad entry systems. The systems are equipped for keypad or code access and electric door strike operation for actual entry.

Observations

The access control and surveillance systems were in good condition at the time of our inspections. No apparent problems were noted with regard to the systems.

Conclusions

Based on a visual examination of external, observable conditions and our experience with similar systems, the access control and security systems should have a serviceable life of 20 to 25 more years.

COMMON AREA LIGHTING

The common hallways are illuminated by recessed LED light fixtures. The swimming pool, terrace, and parking lot are illuminated by pole-mounted light fixtures. Utility rooms and the parking garage are illuminated by ceiling-mounted light fixtures.

Observations

The light fixtures ranged from fair to poor condition. Corrosion was noted on the bases of the terrace light poles.

Conclusions

The lighting fixtures can probably be expected to function for another five to ten years; however, performance can vary widely. Some fixtures may need to be replaced within the next year, while others may last more than 10 years.

Recommendations

The lighting fixtures should be inspected periodically and repaired as needed.

INTERIOR COMMON FINISHES AND FURNISHINGS

The flooring in the common hallways includes carpet and ceramic tile. Carpet is featured in front of the residential units, and tile is featured outside the elevators. Ceramic tile flooring is featured throughout the ground floor level. Sitting areas are situated throughout the ground floor and feature various furniture. Acoustical drop ceilings are installed in the hallways.

A fitness center is situated on the ground floor. The fitness center houses various exercise equipment and features rubber flooring. A glass mirror covers one wall. Two laundry rooms are situated in the building. The flooring in the rooms consists of an epoxy coating. The pool bathrooms feature vinyl tile flooring, toilets, showers, and sinks.

Observations

The interior finishes ranged from good to poor condition at the time of our inspection. Some of the tiles in the bathrooms were debonded (see Photograph 20). Several tiles had been replaced but were mismatched (see Photograph 21).

We were informed that the fitness room becomes hot and humid when the door is closed, and someone is working out.

Conclusions

Serviceable life for flooring and furnishings is as much a function of aesthetics as it is of functionality. In terms of simple function, they can remain serviceable for 20 to 30 years, or longer. Soiling, interior design trends, and other factors generally dictate life cycles of 10 to 15 years.

Recommendations

The fitness room should be evaluated by a mechanical engineer to determine the how to reduce the humidity and temperatures in the room.

PAVEMENT

The property's parking lot beneath and adjacent to the building is paved with bituminous concrete (asphalt). Drainage is primarily facilitated by the pavement slope, which directs surface water away from the property.

Observations

The asphalt pavement beneath the parking garage appeared, at the time of our inspection, to be in reasonably good condition. The uncovered pavement was in relatively good condition as well. A few items of concern were noted.

1. Cracks were present in the pavement in several areas (see Photograph 22). Most were single cracks; however, interconnected cracking was observed in some instances (see Photograph 23).
2. Ponded water was present on some areas of the pavement (see Photograph 24). This could pose a slip hazard during freezing temperatures.

Conclusions

The primary factors to consider in projecting the pavement's life-cycle performance are the construction profile (composition and thickness), substrate stability (bearing capacity), and the loads to which it will be subjected. In the absence of specific information regarding these factors, we can only surmise that the pavement and pavers were designed and installed in accordance with industry standards. In our opinion, the pavement and pavers should remain serviceable for another five to eight years.

Based on observable conditions and anticipated short-term repairs and replacements, we project a remaining serviceable life of approximately 2 to 3 years for the asphalt not covered by the garage and 12 to 15 years for the asphalt covered by the parking garage.

Recommendations

The cracks in the pavement should be sealed. For asphalt pavement to achieve maximum life-cycle performance, it must be adequately maintained. Presented in Appendix D are some general guidelines for placing an asphalt overlay as well as general maintenance guidelines.

CONCRETE SITE ELEMENTS

Concrete sidewalks and miscellaneous pads are situated around the building. These elements are constructed of conventional, cast-in-place concrete.

Observations

The concrete site elements appeared to be in fair condition overall. Cracks were noted in the raised concrete walkways and trash enclosure apron (see Photographs 25 and 26).

Conclusions

Based on observable conditions, the concrete site elements should remain serviceable for another 20 to 30 years. Some elements may fail within the next five years, while others may remain serviceable well beyond thirty years. Accordingly, repairs and replacements should be anticipated every five to eight years. Life-cycle estimates are intended only to help ensure that funds in reserve will meet ongoing needs.

Recommendations

The concrete sidewalk should be inspected at least twice a year for cracks, spalled surfaces, displacement, evidence of substrate erosion (voids), and other defects. Seriously distressed areas should be mapped and clearly marked (for repairs).

Correction of the most obvious (and potentially hazardous) conditions should be deemed imperative. Cracks, settlement, or other defects that result in a height disparity of one-half (1/2) inch or more present potential tripping hazards. These conditions indicate severe damage that should be repaired appropriately. Surface treatments, patching, and other expedient methods are not recommended, as they generally prove ineffective in the long term. Therefore, the entire damaged concrete section should be replaced.

Unit costs for concrete replacement tend to decrease as quantity increases; therefore, the inclination is to defer minor repairs. It can be financially advantageous to delay (and accumulate) repairs to minor cracks, cosmetic flaws, and moderate spalling; however, most defects tend to be progressive. Such marginal conditions should be monitored and promptly corrected if they deteriorate to potentially hazardous states.

ENTRANCE SIGN

A pole-mounted metal sign delineates the property's entrance on Coastal Highway (see Photograph 27).

Observations

At the time of our inspection, the entrance monument appeared to be in good condition. No issues were observed during our inspection.

Conclusions

Based on observable conditions, we project a remaining serviceable life of approximately 20 to 25 years.

FINAL COMMENTS

The attached photographs (in Appendix A) and repair/replacement reserve schedule (in Appendix B) should help to delineate more clearly the conditions found and our recommendations for this project. The supplementary technical information (in Appendix C) is provided to assist the Condominium Association with future repairs and maintenance.

As with all projects, we recommend that a comprehensive preventive maintenance program be designed and implemented on a regular basis. Without question, preventive maintenance affords substantial financial benefits, and qualified specialty consultants should be retained for this project to:

- Identify and inventory all maintenance-worthy elements;
- Specify explicit procedures (tasks);
- Specify material;
- Specify task frequency; and
- Develop a periodic schedule.

In addition, timely corrective maintenance is generally less costly in the long term than deferred repairs. Moreover, if repairs are made as needed before they accumulate, the expenses should be incremental and easier to absorb.

For all major repair or replacement work, a qualified engineer should be retained to provide technical assistance in the following areas.

- Where feasible (such as for pavement, concrete, soil, etc.), samples should be obtained to better determine in-place conditions.
- Specifications, plans, details, etc. should be developed for repair and/or replacement work.

- Bids should be solicited from contractors that are qualified and have performed similar work in the past.
- The work should be inspected to help ensure that it complies with contract documents and applicable industry standards.

Due to the nature of our work, no responsibility can be assumed for latent defects that may appear in the future, for items that were not examined, or for differing opinions of others. Our services do not constitute a certification, guarantee, or warranty of the property (or any of its components) or compliance with applicable codes, standards, safety requirements, building plans, offering statements, etc.

We appreciated this opportunity to be of service. Please contact us if any questions arise or if we can be of further assistance.

Very truly yours,

ENGINEERING AND TECHNICAL
CONSULTANTS, INC.



Kyle P. Parsons, RS, RRC
Senior Project Manager

APPENDICES: A - Photographs
 B - Repair/Replacement Reserve Schedule
 C - Supplementary Technical Information

APPENDIX A
PHOTOGRAPHS

**APPENDIX A
PHOTOGRAPHS
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283**



Photograph 1 – Main roof.



Photograph 2 – Penthouse roof.

**APPENDIX A
PHOTOGRAPHS
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283**



Photograph 3 – North elevation of the building.



Photograph 4 – East elevation of the building.

**APPENDIX A
PHOTOGRAPHS
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OCEAN CITY, MARYLAND
ETC PROJECT M5-5283**



Photograph 5 – Debonded color-coat at base of window.



Photograph 6 – Faded color-coat on window.

**APPENDIX A
PHOTOGRAPHS
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283**



Photograph 7 – Corrosion on steel door

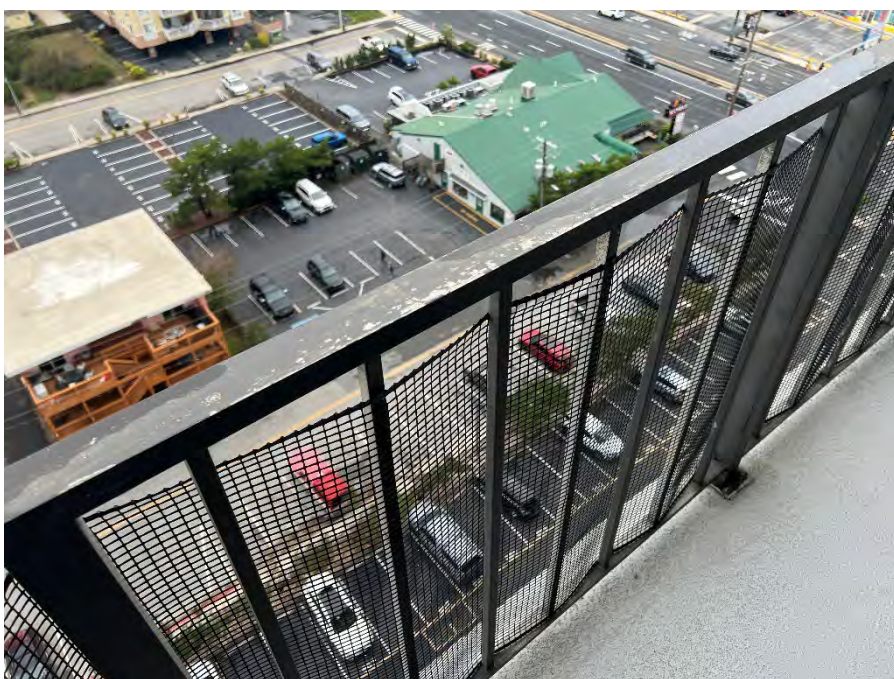


Photograph 8 – Balcony coating repair.

**APPENDIX A
PHOTOGRAPHS
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283**

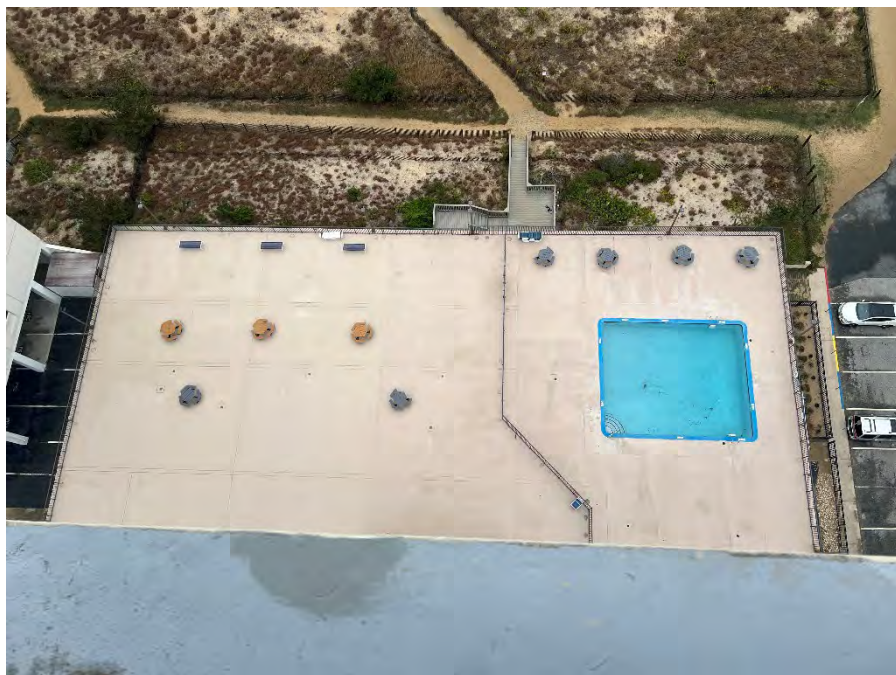


Photograph 9 – Staining on balcony.



Photograph 10 – Debonded color-coat on balcony railing.

**APPENDIX A
PHOTOGRAPHS
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OCEAN CITY, MARYLAND
ETC PROJECT M5-5283**



Photograph 11 – Outdoor swimming pool and sundeck.



Photograph 12 – Crack in swimming pool deck coating.

**APPENDIX A
PHOTOGRAPHS
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OCEAN CITY, MARYLAND
ETC PROJECT M5-5283**



Photograph 13 – Cracks in terrace coating.

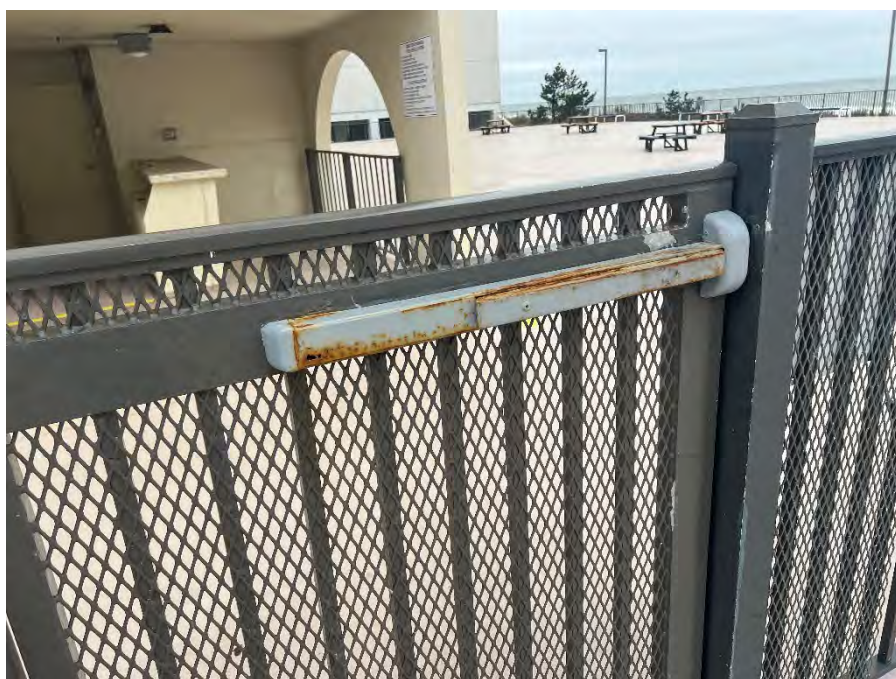


Photograph 14 – Debonded control joint sealant in terrace.

**APPENDIX A
PHOTOGRAPHS
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OCEAN CITY, MARYLAND
ETC PROJECT M5-5283**

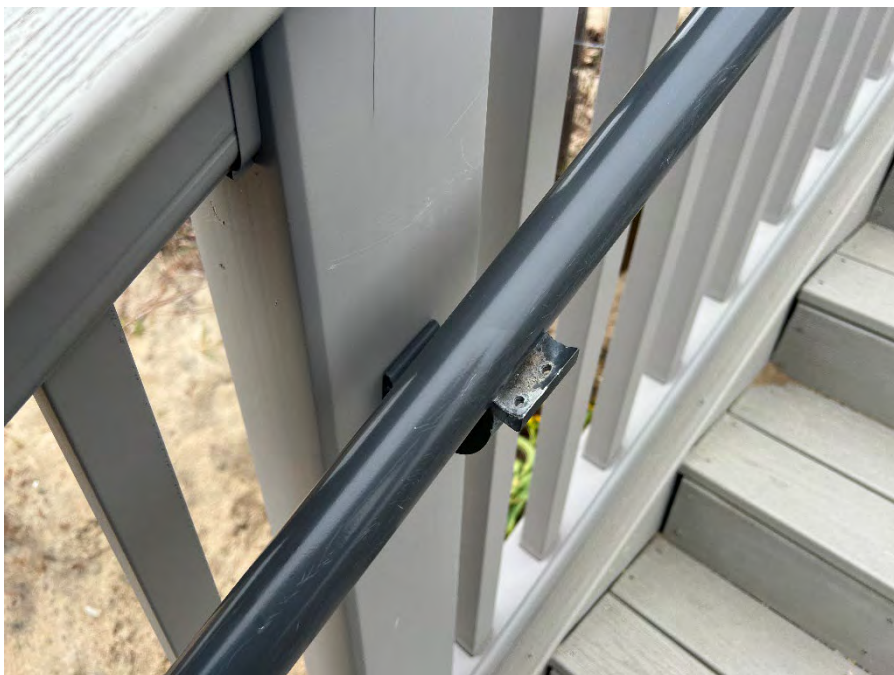


Photograph 15 – Calcium deposit in the soffit of the parking garage.



Photograph 16 – Corrosion on the gate push bar between the swimming pool and sundeck.

**APPENDIX A
PHOTOGRAPHS
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Photograph 17 – Loose handrail connection on stair assembly leading to the beach.



Photograph 18 – Debonded color-coat on stair assembly handrail leading to the beach.

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PHOTOGRAPHS
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ETC PROJECT M5-5283**



Photograph 19 – Corrosion on trash compactor.



Photograph 20 – Debonded tile in the pool bathrooms.

**APPENDIX A
PHOTOGRAPHS
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283**



Photograph 21 – Mismatched tiles in the.

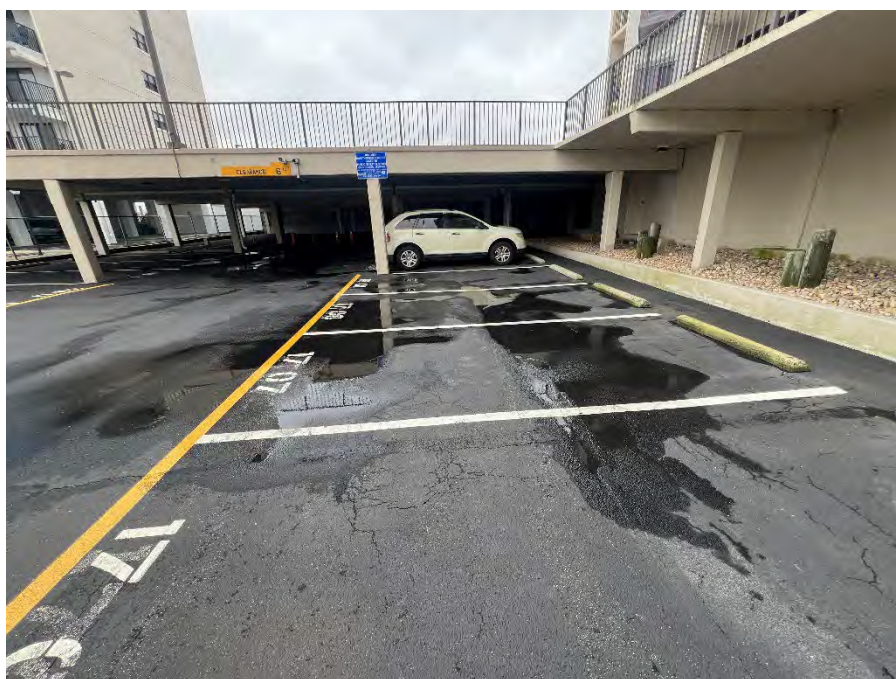


Photograph 22 – Simple cracks in asphalt pavement.

**APPENDIX A
PHOTOGRAPHS
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283**



Photograph 23 – Interconnected cracks in asphalt pavement.



Photograph 24 – Ponded water on asphalt pavement.

**APPENDIX A
PHOTOGRAPHS
9400 CONDOMINIUM
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ETC PROJECT M5-5283**



Photograph 25 – Crack in raised concrete walkway.



Photograph 26 – Cracks in trash enclosure concrete apron.

**APPENDIX A
PHOTOGRAPHS
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283**



Photograph 27 – Entrance sign.

APPENDIX B

REPAIR/REPLACEMENT RESERVE SCHEDULE AND CASH FLOW CHART

APPENDIX B1
REPAIR/REPLACEMENT RESERVE SCHEDULE AND CASH-FLOW CHART
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283
JUNE 30, 2026

The recommended reserve requirements outlined in the attached schedule are based on our opinions of current conditions and costs for materials, equipment, labor, etc. These opinions are based upon:

- Methods and materials that generally comply with accepted industry standards;
- Perceived existing conditions as noted during our limited visual inspections;
- Information provided to us; and
- Our experience with similar circumstances.

CAI Best Practices Report #1: Reserve Studies & Reserve Management provides two major funding plan methods: the cash flow method and the component method.

- **Component Method:** A reserve funding plan where the total contribution is based on the sum of the contributions for the individual components. Prior to the adoption of the CAI National Standards, the term widely used was “Straight Line.” This is a very conservative approach to funding reserves. It requires that each item on the component inventory is established as its own account, so the yearly funding covers the total cost of replacement. Simply stated, you take the total cost of the component (less any existing reserve amount) and divide it by the remaining life of the component.
- **Cash Flow Method:** A method of developing a reserve funding plan where contributions to the reserve fund are designed to offset the variable annual expenditures from the reserve fund. Different reserve funding plans are tested against the anticipated schedule of reserve expenses until the desired funding goal is achieved. This method has also been called “pooling” and, depending on the funding goal, can be less or more conservative than the component method.

In addition to these funding methods, there are three major funding goals: baseline, threshold, and full funding (outlined below). These goals exist regardless of which funding method is used and are listed below.

- **Baseline Funding:** Establishing a reserve funding goal of allowing the reserve cash balance to be at or near zero during the cash flow projection. This is the funding goal with the greatest risk due to the variabilities encountered in the timing of component replacements and repair and replacement costs.
- **Threshold Funding:** Establishing a reserve funding goal of keeping the reserve balance above a specified dollar or percent funded amount. Depending on the threshold selected, this funding goal may be weaker or stronger than “fully funded” with respective higher risk or less risk of cash problems.
- **Full Funding:** Setting a reserve funding goal to attain and maintain reserves at or near 100 percent funded. This is often the most conservative funding goal.

APPENDIX B1
REPAIR/REPLACEMENT RESERVE SCHEDULE AND CASH-FLOW CHART
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283
JUNE 30, 2026

Repair/replacement costs and suggested annual contributions have been calculated using several basic assumptions. They are suggested budget figures, not guaranteed costs. These amounts are estimated in current (2025) U.S. dollars. Accordingly, some accommodation should be made for normal cost increases by either factoring in annual increases at a reasonable rate (such as 3% per year) or allowing interest on deposited funds to accumulate and remain in reserves.

Typical labor and material costs were used to estimate dollar amounts for repairs and replacements. Incidental costs (such as necessary modifications, rigging, etc.) are factored in as very rough approximations. The balances shown on the cash-flow chart reflect an annual inflationary factor of three percent (3%). Annual balances incorporate income of two percent (2%) for funds held in interest-bearing instruments.

According to the information provided to us, an approximate balance of \$ 208,897 was available in the reserve account on January 1, 2026. That amount was distributed proportionally among the elements on the reserve schedule, based on available funds. The attached cash flow table delineates anticipated contributions and disbursements relative to replacement reserves between 2026 and 2045. Reserves were funded at \$200,000 in 2026. In our opinion, continued funding at this rate will not meet funding needs. The funding rate should be increased by \$130,00 annually in 2027, 2028, 2029, and 2030, and by 1% annually thereafter.

The proposed reserve analysis should be reevaluated regularly. Real property is inherently dynamic, and economic conditions are often subject to significant fluctuations. Therefore, we strongly recommend conducting a comprehensive study every 3 to 5 years to assess changes in the physical condition of the various systems and their related components.

Financial information should be assessed annually to accurately reflect pertinent economic changes. Without these regular assessments, long-range planning may not be effective and critical needs may not be properly met.

APPENDIX B2
REPAIR/REPLACEMENT RESERVE SCHEDULE
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283
JUNE 30, 2026

Items	Comments/ Notes	Model/Type	Unit	Estimated Quantity	General Condition	Typical Design Life (years)	Estimated Remaining Useful Life (years)	Estimated Replacement		Available Funds	Annual Contribution
								Unit Cost	Total Cost		
Roofing Systems											
Main roof		Mod. Bit.	sf	10,000	Good	20	18	\$ 50	\$ 500,000	\$ 9,575	\$ 27,246
Penthouse		Mod. Bit./Coating	sf	1,700	Good	20	18	\$ 50	\$ 85,000	\$ 1,628	\$ 4,632
Exterior Facing Systems											
Phase 1											
Repairs	B	Concrete	sf	200	Fair	10	7	\$ 150	\$ 10,000	\$ 191	\$ 1,401
Coating		Acrylic	sf	20,025	Fair	10	7	\$ 12	\$ 240,300	\$ 4,602	\$ 33,671
Unit Windows - Bay		Aluminum	ea	67	Fair	40	9	\$ 3,968	\$ 265,856	\$ 5,091	\$ 28,974
Phase 2											
Repairs	B	Concrete	sf	200	Fair	10	8	\$ 150	\$ 30,000	\$ 574	\$ 3,678
Coating		Acrylic	sf	20,025	Fair	10	8	\$ 12	\$ 240,300	\$ 4,602	\$ 29,462
Unit Windows - Bay		Aluminum	ea	67	Fair	40	10	\$ 3,968	\$ 265,856	\$ 5,091	\$ 26,077
Phase 3											
Repairs	B	Concrete	sf	200	Fair	10	9	\$ 150	\$ 30,000	\$ 574	\$ 3,270
Coating		Acrylic	sf	20,025	Fair	10	9	\$ 12	\$ 240,300	\$ 4,602	\$ 26,189
Unit Windows - Bay		Aluminum	ea	67	Fair	40	11	\$ 3,968	\$ 265,856	\$ 5,091	\$ 23,706
Phase 4								\$ 100			
Repairs	B	Acrylic	sf	200	Fair	10	10	\$ 150	\$ 30,000	\$ 574	\$ 2,943
Coating		Acrylic	sf	20,025	Fair	10	10	\$ 12	\$ 240,300	\$ 4,602	\$ 23,570
Unit Windows - Bay		Aluminum	ea	67	Fair	40	12	\$ 3,968	\$ 265,856	\$ 5,091	\$ 21,730
Phase 5											
Repairs	B	Acrylic	sf	200	Fair	10	11	\$ 150	\$ 30,000	\$ 574	\$ 2,675
Coating		Acrylic	sf	20,025	Fair	10	11	\$ 12	\$ 240,300	\$ 4,602	\$ 21,427
Unit Windows - Bay		Aluminum	ea	68	Fair	40	13	\$ 3,968	\$ 269,824	\$ 5,167	\$ 20,358
Unit Windows - Flat		Aluminum	ea	21	Fair	40	13	\$ 2,444	\$ 51,324	\$ 983	\$ 3,872
Common Windows and Doors											
Ground and Second Floor Windows		Aluminum	ea	21	Fair	40	14	\$ 2,444	\$ 51,324	\$ 983	\$ 3,596
West Elevation Common Hallway Doors		Aluminum	ea	21	Fair	40	14	\$ 8,129	\$ 170,709	\$ 3,269	\$ 11,960
Common Entrance Doors - Storefront		Aluminum	ea	16	Fair	40	14	\$ 6,800	\$ 108,800	\$ 2,083	\$ 7,623
Common Entrance Doors - Steel		Steel	al		Fair	5	5		\$ 5,000	\$ 96	\$ 981
Balconies											
Phase 1											
Coating - decks		Urethane	sf	3,362	Fair	10	2	\$ 10	\$ 33,620	\$ 644	\$ 16,488
Deck Repairs		Concrete	al		Fair	10	2		\$ 20,000	\$ 383	\$ 9,809
Railings		Aluminum	lf	1,034	Fair	30	2	\$ 227	\$ 234,718	\$ 4,495	\$ 115,112
Phase 2											
Coating - decks		Urethane	sf	3,362	Fair	10	3	\$ 10	\$ 33,620	\$ 644	\$ 10,992
Deck Repairs		Concrete	al		Fair	10	3		\$ 20,000	\$ 383	\$ 6,539
Railings		Aluminum	lf	1,034	Fair	30	3	\$ 227	\$ 234,718	\$ 4,495	\$ 76,741
Notes: A. Cost/life cycle estimates assume immediate completion of recommended short-term repair/replacement B. Estimated cost for cyclical repairs, not total replacement C. Cost assumes a two-inch mill and overlay General Conditons Rating System: Good = Isolated minor deficiencies Fair = Several deficiencies ranging from minor to moderate Poor = Widespread deficiencies ranging from moderate to severe								Abbreviations: sf = square feet lf = linear feet ls = lump sum sy = square yards al = allowance			

APPENDIX B2
REPAIR/REPLACEMENT RESERVE SCHEDULE
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283
JUNE 30, 2026

Items	Comments/ Notes	Model/Type	Unit	Estimated Quantity	General Condition	Typical Design Life (years)	Estimated Remaining Useful Life (years)	Estimated Replacement		Available Funds	Annual Contribution
								Unit Cost	Total Cost		
Balconies											
Phase 3											
Coating - decks		Urethane	sf	3,362	Fair	10	4	\$ 10	\$ 33,620	\$ 644	\$ 8,244
Deck Repairs		Concrete	al		Fair	10	4		\$ 20,000	\$ 383	\$ 4,904
Railings		Aluminum	lf	1,034	Fair	30	4	\$ 227	\$ 234,718	\$ 4,495	\$ 57,556
Phase 4											
Coating - decks		Urethane	al	3,362	Fair	10	5	\$ 10	\$ 33,620	\$ 644	\$ 6,595
Deck Repairs		Concrete	al		Fair	10	5		\$ 20,000	\$ 383	\$ 3,923
Railings		Aluminum	lf	1,034	Fair	30	5	\$ 227	\$ 234,718	\$ 4,495	\$ 46,045
Phase 5											
Coating - decks		Urethane	al	3,362	Fair	10	6	\$ 10	\$ 33,620	\$ 644	\$ 5,496
Deck Repairs		Concrete	al		Fair	10	6		\$ 20,000	\$ 383	\$ 3,270
Railings		Aluminum	lf	1,034	Fair	30	6	\$ 227	\$ 234,718	\$ 4,495	\$ 38,371
Promenade											
Phase 1											
Coating		Urethane	sf	12,400	Fair	10	8	\$ 10	\$ 124,000	\$ 2,375	\$ 15,203
Repairs	B	Concrete	sf	125	Fair	10	8	\$ 150	\$ 18,750	\$ 359	\$ 2,299
Phase 2											
Coating		Urethane	sf	3,900	Fair	10	9	\$ 10	\$ 39,000	\$ 747	\$ 4,250
Repairs	B	Concrete	sf	40	Fair	10	9	\$ 150	\$ 6,000	\$ 115	\$ 654
Railings		Aluminum	lf	700	Good	30	18	\$ 380	\$ 266,000	\$ 5,094	\$ 14,495
Swimming Pool											
Pool Shell		Concrete	sf	1,080	Good	70	22	\$ 150	\$ 162,000	\$ 3,102	\$ 7,223
Pool Shell Whitecoat		Elastomeric	sf	1,080	Good	10	9	\$ 16	\$ 17,280	\$ 331	\$ 1,883
Pool Tile		Ceramic	lf	130	Good	25	24	\$ 45	\$ 5,850	\$ 112	\$ 239
Sundeck Repairs	B	Concrete	sf	80	Good	10	9	\$ 125	\$ 10,000	\$ 191	\$ 1,090
Sundeck Coating		Elastomeric	sf	8,000	Good	10	9	\$ 8	\$ 64,000	\$ 1,226	\$ 6,975
Equipment			ls		Fair	20	10		\$ 15,000	\$ 287	\$ 1,471
Fencing		Aluminum	lf	220	Fair	30	18	\$ 380	\$ 83,600	\$ 1,601	\$ 4,556
Pool Cover		Vinyl	ls		Good	10	10		\$ 7,000	\$ 134	\$ 687
Furniture			al		Good	10	10		\$ 5,000	\$ 96	\$ 490
Garage											
Soffit		Concrete	al		Good	15	12		\$ 50,000	\$ 957	\$ 4,087
Columns		Concrete	al		Good	15	12		\$ 20,000	\$ 383	\$ 1,635
Notes: A. Cost/life cycle estimates assume immediate completion of recommended short-term repair/replacement B. Estimated cost for cyclical repairs, not total replacement C. Cost assumes a two-inch mill and overlay General Conditions Rating System: Good = Isolated minor deficiencies Fair = Several deficiencies ranging from minor to moderate Poor = Widespread deficiencies ranging from moderate to severe								Abbreviations: sf = square feet lf = linear feet ls = lump sum sy = square yards al = allowance			

APPENDIX B2
REPAIR/REPLACEMENT RESERVE SCHEDULE
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283
JUNE 30, 2026

Items	Comments/ Notes	Model/Type	Unit	Estimated Quantity	General Condition	Typical Design Life (years)	Estimated Remaining Useful Life (years)	Estimated Replacement		Available Funds	Annual Contribution
								Unit Cost	Total Cost		
HVAC Systems											
Lobby			ea	1	Fair	15	8	\$ 9,000	\$ 9,000	\$ 172	\$ 1,103
Elevator Room			ea	1	Fair	15	1	\$ 9,000	\$ 9,000	\$ 172	\$ 8,828
Rental Office			ea	1	Fair	15	9	\$ 9,000	\$ 9,000	\$ 172	\$ 981
Managers Apartment			ea	1	Fair	15	10	\$ 9,000	\$ 9,000	\$ 172	\$ 883
Elevators											
Cabs			ea	3	Fair	25	8	\$ 80,000	\$ 240,000	\$ 4,596	\$ 29,426
Equipment		Traction Control	ea	3	Fair	60	38	\$ 125,000	\$ 375,000	\$ 7,181	\$ 9,679
Controllers			ea	3	Fair	25	8	\$ 100,000	\$ 300,000	\$ 5,745	\$ 36,782
Plumbing Systems											
Pumps		Duplex	ea	1	Good	25	9	\$ 50,000	\$ 50,000	\$ 957	\$ 5,449
Water Heater		200 Gallon	ea	1	Good	25	15	\$ 18,000	\$ 18,000	\$ 345	\$ 1,177
Water Pipes	B	Copper	al		Unknown	70	25		\$ 800,000	\$ 15,320	\$ 31,387
Waste Pipes	B	Cast Iron	al		Unknown	70	25		\$ 800,000	\$ 15,320	\$ 31,387
Electric Distribution											
Panels			ls		Fair	60	14		\$ 280,000	\$ 5,362	\$ 19,617
Emergency Generator		100 KW	ls		Fair	30	18		\$ 50,000	\$ 957	\$ 2,725
Trash Disposal Systems											
Compactor			ea	1	Fair	30	6	\$ 35,000	\$ 35,000	\$ 670	\$ 5,722
Chutes	B		al		Fair	10	10		\$ 10,000	\$ 191	\$ 981
Fire Alarm Systems											
Control Panel			ea	1	Good	25	24	\$ 40,000	\$ 40,000	\$ 766	\$ 1,635
Pump		75 HP	ea	1	Fair	50	28	\$ 80,000	\$ 80,000	\$ 1,532	\$ 2,802
Pump Controller			ea	1	Good	50	49	\$ 45,000	\$ 45,000	\$ 862	\$ 901
Emergency Devices			al		Fair	5	5		\$ 25,000	\$ 479	\$ 4,904
Interior Finishings											
Hallways and Lobby											
Hallway Flooring - Carpet		Carpet	sy	2,260	Good	30	21	\$ 115	\$ 259,900	\$ 4,977	\$ 12,139
Hallway Flooring - Tile		Tiles	sf	10,260	Good	30	25	\$ 40	\$ 410,400	\$ 7,859	\$ 16,102
Lobby Flooring		Tiles	sf	1,800	Good	30	25	\$ 40	\$ 72,000	\$ 1,379	\$ 2,825
Ceilings		Acoustical Tiles	sf	32,250	Fair	30	14	\$ 12	\$ 387,000	\$ 7,411	\$ 27,114
Painting		Latex	sf	84,200	Fair	15	14	\$ 2	\$ 168,400	\$ 3,225	\$ 11,798
Mailboxes			ea	165	Fair	40	5	\$ 120	\$ 19,800	\$ 379	\$ 3,884
Furnishings		Various	al		Fair	20	12		\$ 30,000	\$ 574	\$ 2,452
Fitness Center											
Equipment		Various	al		Good	5	5		\$ 10,000	\$ 191	\$ 1,962
Renovation			al		Fair	25	15		\$ 12,000	\$ 230	\$ 785
Notes: A. Cost/life cycle estimates assume immediate completion of recommended short-term repair/replacement B. Estimated cost for cyclical repairs, not total replacement C. Cost assumes a two-inch mill and overlay General Conditions Rating System: Good = Isolated minor deficiencies Fair = Several deficiencies ranging from minor to moderate Poor = Widespread deficiencies ranging from moderate to severe								Abbreviations: sf = square feet lf = linear feet ls = lump sum sy = square yards al = allowance			

APPENDIX B2
REPAIR/REPLACEMENT RESERVE SCHEDULE
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283
JUNE 30, 2026

Items	Comments/ Notes	Model/Type	Unit	Estimated Quantity	General Condition	Typical Design Life (years)	Estimated Remaining Useful Life (years)	Estimated Replacement		Available Funds	Annual Contribution
								Unit Cost	Total Cost		
Interior Finishings											
Miscellaneous Common Areas											
Party Room Renovation			al		Fair	25	15		\$ 50,000	\$ 957	\$ 3,270
Pool Restrooms Renovation			al		Poor	25	2		\$ 25,000	\$ 479	\$ 12,261
Manager Apartment Renovation			al		Unknown	15	5		\$ 40,000	\$ 766	\$ 7,847
Washers and Dryers			Pair	9	Fair	8	5	\$ 1,750	\$ 15,750	\$ 302	\$ 3,090
Common Area Lighting											
Walkways		LED	ls		Fair	10	5		\$ 4,500	\$ 86	\$ 883
Balconies		LED	ls		Fair	10	5		\$ 4,500	\$ 86	\$ 883
Garage		LED	ls		Fair	10	5		\$ 3,500	\$ 67	\$ 687
Site Elements											
Pavement											
Rehabilitation	C	Asphalt	sy	6,200	Fair	20	12	\$ 25	\$ 155,000	\$ 2,968	\$ 12,669
Repair		Asphalt	sy	620	Fair	5	2	\$ 30	\$ 18,600	\$ 356	\$ 9,122
Concrete site elements											
Wheel stops	B	Precast	ea	10	Good	5	5	\$ 150	\$ 1,500	\$ 29	\$ 294
Walkways		Concrete	al		Fair	5	5		\$ 2,000	\$ 38	\$ 392
Other											
Stairs/Ramps Railings		Metal	ls		Good	25	12		\$ 32,500	\$ 622	\$ 2,656
Entrance Sign		Metal	ls		Good	25	12		\$ 5,000	\$ 96	\$ 409
Fence		Aluminum	lf	540	Good	10	7		\$ 25,000	\$ 479	\$ 3,503
Dunes			al		Good	10	8	\$ 350	\$ 350	\$ 7	\$ 43
Totals									\$ 10,908,775	\$ 208,897	\$ 1,139,796
Notes: A. Cost/life cycle estimates assume immediate completion of recommended short-term repair/replacement B. Estimated cost for cyclical repairs, not total replacement C. Cost assumes a two-inch mill and overlay General Conditions Rating System: Good = Isolated minor deficiencies Fair = Several deficiencies ranging from minor to moderate Poor = Widespread deficiencies ranging from moderate to severe								Abbreviations: sf = square feet lf = linear feet ls = lump sum sy = square yards al = allowance			

APPENDIX B3
REPAIR/REPLACEMENT RESERVE CASH FLOW CHART
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283
JUNE 30, 2026

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Roofing Systems										
Main roof	-	-	-	-	-	-	-	-	-	-
Penthouse	-	-	-	-	-	-	-	-	-	-
Exterior Facing Systems										
Phase 1										
Repairs	-	-	-	-	-	-	10,000	-	-	-
Coating	-	-	-	-	-	-	240,300	-	-	-
Unit Windows - Bay	-	-	-	-	-	-	-	-	265,856	-
Phase 2										
Repairs	-	53,000	-	-	-	-	-	30,000	-	-
Coating	-	-	-	-	-	-	-	240,300	-	-
Unit Windows - Bay	-	-	-	-	-	-	-	-	-	265,856
Phase 3										
Repairs	-	-	-	-	-	-	-	-	30,000	-
Coating	-	-	-	-	-	-	-	-	240,300	-
Unit Windows - Bay	-	-	-	-	-	-	-	-	-	-
Phase 4										
Repairs	-	-	-	-	-	-	-	-	-	30,000
Coating	-	-	-	-	-	-	-	-	-	240,300
Unit Windows - Bay	-	-	-	-	-	-	-	-	-	-
Phase 5										
Repairs	-	-	-	-	-	-	-	-	-	-
Coating	-	-	-	-	-	-	-	-	-	-
Unit Windows - Bay	-	-	-	-	-	-	-	-	-	-
Unit Windows - Flat	-	-	-	-	-	-	-	-	-	-
Common Windows and Doors										
Ground and Second Floor Windows	-	-	-	-	-	-	-	-	-	-
West Elevation Common Hallway Doors	-	-	-	-	-	-	-	-	-	-
Common Entrance Doors - Storefront	-	-	-	-	-	-	-	-	-	-
Common Entrance Doors - Steel	-	-	-	-	5,000	-	-	-	-	5,000
Balconies										
Phase 1										
Coating - decks	-	33,620	-	-	-	-	-	-	-	-
Deck Repairs	-	20,000	-	-	-	-	-	-	-	-
Railings	-	234,718	-	-	-	-	-	-	-	-
Phase 2										
Coating - decks	-	-	33,620	-	-	-	-	-	-	-
Deck Repairs	-	-	20,000	-	-	-	-	-	-	-
Railings	-	-	234,718	-	-	-	-	-	-	-
Phase 3										
Coating - decks	-	-	-	33,620	-	-	-	-	-	-
Deck Repairs	-	-	-	20,000	-	-	-	-	-	-
Railings	-	-	-	234,718	-	-	-	-	-	-
Phase 4										
Coating - decks	-	-	-	-	33,620	-	-	-	-	-
Deck Repairs	-	-	-	-	20,000	-	-	-	-	-
Railings	-	-	-	-	234,718	-	-	-	-	-
Phase 5										
Coating - decks	-	-	-	-	-	33,620	-	-	-	-
Deck Repairs	-	-	-	-	-	20,000	-	-	-	-
Railings	-	-	-	-	-	234,718	-	-	-	-
Promenade										
Phase 1										
Coating	-	-	-	-	-	-	-	124,000	-	-
Repairs	-	-	-	-	-	-	-	18,750	-	-
Phase 2										
Coating	-	-	-	-	-	-	-	-	39,000	-
Repairs	-	-	-	-	-	-	-	-	6,000	-
Railings	-	-	-	-	-	-	-	-	-	-
Swimming Pool										
Pool Shell	-	-	-	-	-	-	-	-	-	-
Pool Shell Whitecoat	-	-	-	-	-	-	-	-	17,280	-
Pool Tile	-	-	-	-	-	-	-	-	-	-
Sundeck Repairs	-	-	-	-	-	-	-	-	10,000	-
Sundeck Coating	-	-	-	-	-	-	-	-	64,000	-
Equipment	-	-	-	-	-	-	-	-	-	15,000
Fencing	-	-	-	-	-	-	-	-	-	-
Pool Cover	-	-	-	-	-	-	-	-	-	7,000
Furniture	-	-	-	-	-	-	-	-	-	5,000
Garage										
Soffit	-	-	-	-	-	-	-	-	-	-
Columns	-	-	-	-	-	-	-	-	-	-

APPENDIX B3
REPAIR/REPLACEMENT RESERVE CASH FLOW CHART
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283
JUNE 30, 2026

	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Roofing Systems										
Main roof	-	-	-	-	-	-	-	500,000	-	-
Penthouse	-	-	-	-	-	-	-	85,000	-	-
Exterior Facing Systems										
Phase 1										
Repairs	-	-	-	-	-	-	10,000	-	-	-
Coating	-	-	-	-	-	-	240,300	-	-	-
Unit Windows - Bay	-	-	-	-	-	-	-	-	-	-
Phase 2										
Repairs	-	-	-	-	-	-	-	30,000	-	-
Coating	-	-	-	-	-	-	-	240,300	-	-
Unit Windows - Bay	-	-	-	-	-	-	-	-	-	-
Phase 3										
Repairs	-	-	-	-	-	-	-	-	30,000	-
Coating	-	-	-	-	-	-	-	-	240,300	-
Unit Windows - Bay	265,856	-	-	-	-	-	-	-	-	-
Phase 4										
Repairs	-	-	-	-	-	-	-	-	-	30,000
Coating	-	-	-	-	-	-	-	-	-	240,300
Unit Windows - Bay	-	265,856	-	-	-	-	-	-	-	-
Phase 5										
Repairs	30,000	-	-	-	-	-	-	-	-	-
Coating	240,300	-	-	-	-	-	-	-	-	-
Unit Windows - Bay	-	-	269,824	-	-	-	-	-	-	-
Unit Windows - Flat	-	-	51,324	-	-	-	-	-	-	-
Common Windows and Doors										
Ground and Second Floor Windows	-	-	-	51,324	-	-	-	-	-	-
West Elevation Common Hallway Doors	-	-	-	170,709	-	-	-	-	-	-
Common Entrance Doors - Storefront	-	-	-	108,800	-	-	-	-	-	-
Common Entrance Doors - Steel	-	-	-	-	5,000	-	-	-	-	5,000
Balconies										
Phase 1										
Coating - decks	-	33,620	-	-	-	-	-	-	-	-
Deck Repairs	-	20,000	-	-	-	-	-	-	-	-
Railings	-	-	-	-	-	-	-	-	-	-
Phase 2										
Coating - decks	-	-	33,620	-	-	-	-	-	-	-
Deck Repairs	-	-	20,000	-	-	-	-	-	-	-
Railings	-	-	-	-	-	-	-	-	-	-
Phase 3										
Coating - decks	-	-	-	33,620	-	-	-	-	-	-
Deck Repairs	-	-	-	20,000	-	-	-	-	-	-
Railings	-	-	-	-	-	-	-	-	-	-
Phase 4										
Coating - decks	-	-	-	-	33,620	-	-	-	-	-
Deck Repairs	-	-	-	-	20,000	-	-	-	-	-
Railings	-	-	-	-	-	-	-	-	-	-
Phase 5										
Coating - decks	-	-	-	-	-	33,620	-	-	-	-
Deck Repairs	-	-	-	-	-	20,000	-	-	-	-
Railings	-	-	-	-	-	-	-	-	-	-
Promenade										
Phase 1										
Coating	-	-	-	-	-	-	-	124,000	-	-
Repairs	-	-	-	-	-	-	-	18,750	-	-
Phase 2										
Coating	-	-	-	-	-	-	-	-	39,000	-
Repairs	-	-	-	-	-	-	-	-	6,000	-
Railings	-	-	-	-	-	-	-	266,000	-	-
Swimming Pool										
Pool Shell	-	-	-	-	-	-	-	-	-	-
Pool Shell Whitecoat	-	-	-	-	-	-	-	-	17,280	-
Pool Tile	-	-	-	-	-	-	-	-	-	-
Sundeck Repairs	-	-	-	-	-	-	-	-	10,000	-
Sundeck Coating	-	-	-	-	-	-	-	-	64,000	-
Equipment	-	-	-	-	-	-	-	-	-	-
Fencing	-	-	-	-	-	-	-	83,600	-	-
Pool Cover	-	-	-	-	-	-	-	-	-	7,000
Furniture	-	-	-	-	-	-	-	-	-	5,000
Garage										
Soffit	-	50,000	-	-	-	-	-	-	-	-
Columns	-	20,000	-	-	-	-	-	-	-	-

APPENDIX B3
REPAIR/REPLACEMENT RESERVE CASH FLOW CHART
9400 CONDOMINIUM
OCEAN CITY, MARYLAND
ETC PROJECT M5-5283
JUNE 30, 2026

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
HVAC Systems										
Lobby	-	-	-	-	-	-	-	9,000	-	-
Elevator Room	9,000	-	-	-	-	-	-	-	-	-
Rental Office	-	-	-	-	-	-	-	-	9,000	-
Managers Apartment	-	-	-	-	-	-	-	-	-	9,000
Elevators										
Cabs	-	-	-	-	-	-	-	240,000	-	-
Equipment	-	-	-	-	-	-	-	-	-	-
Controllers	-	-	-	-	-	-	-	300,000	-	-
Plumbing Systems										
Pumps	-	-	-	-	-	-	-	-	50,000	-
Water Heater	-	-	-	-	-	-	-	-	-	-
Water Pipes	-	-	-	-	-	-	-	-	-	-
Waste Pipes	-	-	-	-	-	-	-	-	-	-
Electric Distribution										
Panels	-	-	-	-	-	-	-	-	-	-
Emergency Generator	-	-	-	-	-	-	-	-	-	-
Trash Disposal Systems										
Compactor	-	-	-	-	-	35,000	-	-	-	-
Chutes	-	-	-	-	-	-	-	-	-	10,000
Fire Alarm Systems										
Control Panel	-	-	-	-	-	-	-	-	-	-
Pump	-	-	-	-	-	-	-	-	-	-
Pump Controller	-	-	-	-	-	-	-	-	-	-
Emergency Devices	-	-	-	-	25,000	-	-	-	-	25,000
Interior Finishings										
Hallways and Lobby										
Hallway Flooring - Carpet	-	-	-	-	-	-	-	-	-	-
Hallway Flooring - Tile	-	-	-	-	-	-	-	-	-	-
Lobby Flooring	-	-	-	-	-	-	-	-	-	-
Ceilings	-	-	-	-	-	-	-	-	-	-
Painting	-	-	-	-	-	-	-	-	-	-
Mailboxes	-	-	-	-	19,800	-	-	-	-	-
Furnishings	-	-	-	-	-	-	-	-	-	-
Fitness Center										
Equipment	-	-	-	-	10,000	-	-	-	-	10,000
Renovation	-	-	-	-	-	-	-	-	-	-
Miscellaneous Common Areas										
Party Room Renovation	-	-	-	-	-	-	-	-	-	-
Pool Restrooms Renovation	-	25,000	-	-	-	-	-	-	-	-
Manager Apartment Renovation	-	-	-	-	40,000	-	-	-	-	-
Washers and Dryers	-	-	-	-	15,750	-	-	-	-	-
Common Area Lighting										
Walkways	-	-	-	-	4,500	-	-	-	-	-
Balconies	-	-	-	-	4,500	-	-	-	-	-
Garage	-	-	-	-	3,500	-	-	-	-	-
Site Elements										
Pavement										
Rehabilitation	-	-	-	-	-	-	-	-	-	-
Repair	-	18,600	-	-	-	-	18,600	-	-	-
Concrete site elements										
Wheel stops	-	-	-	-	1,500	-	-	-	-	1,500
Walkways	-	-	-	-	2,000	-	-	-	-	2,000
Other										
Stairs/Ramps Railings	-	-	-	-	-	-	-	-	-	-
Entrance Sign	-	-	-	-	-	-	-	-	-	-
Fence	-	-	-	-	-	-	25,000	-	-	-
Dunes	-	-	-	-	-	-	-	350	-	-
Miscellaneous	450	19,247	14,417	14,417	20,994	16,167	14,695	48,120	36,572	31,283
Total Expenditures	9,450	404,185	302,755	302,755	440,882	339,505	308,595	1,010,520	768,008	656,939

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	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
HVAC Systems										
Lobby	-	-	-	-	-	-	-	-	-	-
Elevator Room	-	-	-	-	-	9,000	-	-	-	-
Rental Office	-	-	-	-	-	-	-	-	-	-
Managers Apartment	-	-	-	-	-	-	-	-	-	-
Elevators										
Cabs	-	-	-	-	-	-	-	-	-	-
Equipment	-	-	-	-	-	-	-	-	-	-
Controllers	-	-	-	-	-	-	-	-	-	-
Plumbing Systems										
Pumps	-	-	-	-	-	-	-	-	-	-
Water Heater	-	-	-	-	18,000	-	-	-	-	-
Water Pipes	-	-	-	-	-	-	-	-	-	-
Waste Pipes	-	-	-	-	-	-	-	-	-	-
Electric Distribution										
Panels	-	-	-	280,000	-	-	-	-	-	-
Emergency Generator	-	-	-	-	-	-	-	50,000	-	-
Trash Disposal Systems										
Compactor	-	-	-	-	-	-	-	-	-	-
Chutes	-	-	-	-	-	-	-	-	-	10,000
Fire Alarm Systems										
Control Panel	-	-	-	-	-	-	-	-	-	-
Pump	-	-	-	-	-	-	-	-	-	-
Pump Controller	-	-	-	-	-	-	-	-	-	-
Emergency Devices	-	-	-	-	25,000	-	-	-	-	25,000
Interior Finishings										
Hallways and Lobby										
Hallway Flooring - Carpet	-	-	-	-	-	-	-	-	-	-
Hallway Flooring - Tile	-	-	-	-	-	-	-	-	-	-
Lobby Flooring	-	-	-	-	-	-	-	-	-	-
Ceilings	-	-	-	387,000	-	-	-	-	-	-
Painting	-	-	-	168,400	-	-	-	-	-	-
Mailboxes	-	-	-	-	-	-	-	-	-	-
Furnishings	-	30,000	-	-	-	-	-	-	-	-
Fitness Center										
Equipment	-	-	-	-	10,000	-	-	-	-	10,000
Renovation	-	-	-	-	12,000	-	-	-	-	-
Miscellaneous Common Areas										
Party Room Renovation	-	-	-	-	50,000	-	-	-	-	-
Pool Restrooms Renovation	-	-	-	-	-	-	-	-	-	-
Manager Apartment Renovation	-	-	-	-	-	-	-	-	-	40,000
Washers and Dryers	-	-	15,750	-	-	-	-	-	-	-
Common Area Lighting										
Walkways	-	-	-	-	4,500	-	-	-	-	-
Balconies	-	-	-	-	4,500	-	-	-	-	-
Garage	-	-	-	-	3,500	-	-	-	-	-
Site Elements										
Pavement										
Rehabilitation	-	155,000	-	-	-	-	-	-	-	-
Repair	-	18,600	-	-	-	-	18,600	-	-	-
Concrete site elements										
Wheel stops	-	-	-	-	1,500	-	-	-	-	1,500
Walkways	-	-	-	-	2,000	-	-	-	-	2,000
Other										
Stairs/Ramps Railings	-	32,500	-	-	-	-	-	-	-	-
Entrance Sign	-	5,000	-	-	-	-	-	-	-	-
Fence	-	-	-	-	-	-	25,000	-	-	-
Dunes	-	-	-	-	-	-	-	350	-	-
Miscellaneous	26,808	31,529	19,526	60,993	9,481	3,131	14,695	69,900	20,329	18,790
Total Expenditures	562,964	662,105	410,044	1,280,846	199,101	65,751	308,595	1,467,900	426,909	394,590

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Current Funding - \$200,000 annually

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Beginning Balance	208,897	403,625	195,387	78,375	(50,061)	(343,849)	(534,280)	(698,422)	(1,721,151)	(2,473,481)
Total Expenditures	9,450	404,185	302,755	302,755	440,882	339,505	308,595	1,010,520	768,008	656,939
Annual Contributions	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Interest (2%)	4,178	8,072	3,908	1,567	-	-	-	-	-	-
Inflation (3%)	-	12,126	18,165	27,248	52,906	50,926	55,547	212,209	184,322	177,373
Remaining Balance	403,625	195,387	78,375	(50,061)	(343,849)	(534,280)	(698,422)	(1,721,151)	(2,473,481)	(3,107,793)

Component Method - see reserve table

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Beginning Balance	208,897	1,343,421	2,093,776	2,954,527	3,823,411	4,545,888	5,386,171	6,269,549	6,312,007	6,625,714
Total Expenditures	9,450	404,185	302,755	302,755	440,882	339,505	308,595	1,010,520	768,008	656,939
Annual Contributions	1,139,796	1,139,796	1,139,796	1,139,796	1,139,796	1,139,796	1,139,796	1,139,796	1,139,796	1,139,796
Interest (2%)	4,178	26,868	41,876	59,091	76,468	90,918	107,723	125,391	126,240	132,514
Inflation (3%)	-	12,126	18,165	27,248	52,906	50,926	55,547	212,209	184,322	177,373
Remaining Balance	1,343,421	2,093,776	2,954,527	3,823,411	4,545,888	5,386,171	6,269,549	6,312,007	6,625,714	7,063,712

Recommended Funding - \$200,000 in 2026, \$130,000 increases annually from 2027 through 2030, and 1% annual increases starting in 2031

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Beginning Balance	208,897	403,625	325,387	470,975	740,391	981,411	1,337,808	1,734,894	1,288,680	1,111,359
Total Expenditures	9,450	404,185	302,755	302,755	440,882	339,505	308,595	1,010,520	768,008	656,939
Annual Contributions	200,000	330,000	460,000	590,000	720,000	727,200	734,472	741,817	749,235	756,727
Interest (2%)	4,178	8,072	6,508	9,419	14,808	19,628	26,756	34,698	25,774	22,227
Inflation (3%)	-	12,126	18,165	27,248	52,906	50,926	55,547	212,209	184,322	177,373
Remaining Balance	403,625	325,387	470,975	740,391	981,411	1,337,808	1,734,894	1,288,680	1,111,359	1,056,001

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Current Funding - \$200,000 annually

	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Beginning Balance	(3,107,793)	(3,639,646)	(4,320,245)	(4,677,905)	(6,258,280)	(6,341,004)	(6,236,343)	(6,493,063)	(8,509,592)	(8,967,032)
Total Expenditures	562,964	662,105	410,044	1,280,846	199,101	65,751	308,595	1,467,900	426,909	394,590
Annual Contributions	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Interest (2%)	-	-	-	-	-	-	-	-	-	-
Inflation (3%)	168,889	218,495	147,616	499,530	83,622	29,588	148,126	748,629	230,531	224,916
Remaining Balance	(3,639,646)	(4,320,245)	(4,677,905)	(6,258,280)	(6,341,004)	(6,236,343)	(6,493,063)	(8,509,592)	(8,967,032)	(9,386,539)

Component Method - see reserve table

	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Beginning Balance	7,063,712	7,612,930	8,024,385	8,767,010	8,301,771	9,324,879	10,555,834	11,450,027	10,602,294	11,296,697
Total Expenditures	562,964	662,105	410,044	1,280,846	199,101	65,751	308,595	1,467,900	426,909	394,590
Annual Contributions	1,139,796	1,139,796	1,139,796	1,139,796	1,139,796	1,139,796	1,139,796	1,139,796	1,139,796	1,139,796
Interest (2%)	141,274	152,259	160,488	175,340	166,035	186,498	211,117	229,001	212,046	225,934
Inflation (3%)	168,889	218,495	147,616	499,530	83,622	29,588	148,126	748,629	230,531	224,916
Remaining Balance	7,612,930	8,024,385	8,767,010	8,301,771	9,324,879	10,555,834	11,450,027	10,602,294	11,296,697	12,042,921

Recommended Funding

	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Beginning Balance	1,056,001	1,109,562	1,023,092	1,265,551	297,940	816,503	1,540,775	1,926,184	567,606	749,140
Total Expenditures	562,964	662,105	410,044	1,280,846	199,101	65,751	308,595	1,467,900	426,909	394,590
Annual Contributions	764,295	771,937	779,657	787,453	795,328	803,281	811,314	819,427	827,621	835,898
Interest (2%)	21,120	22,191	20,462	25,311	5,959	16,330	30,816	38,524	11,352	14,983
Inflation (3%)	168,889	218,495	147,616	499,530	83,622	29,588	148,126	748,629	230,531	224,916
Remaining Balance	1,109,562	1,023,092	1,265,551	297,940	816,503	1,540,775	1,926,184	567,606	749,140	980,514

APPENDIX C

SUPPLEMENTARY TECHNICAL INFORMATION

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<u>PAGES</u>	<u>SUBJECT</u>	<u>REFERENCES</u>
C1	Pavement	Various Sources
C2-C4	Roof Maintenance	Kirk Parsons
C5-C9	Exterior Maintenance	Kyle P. Parsons

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PAVEMENT

Broken Pavement Repairs - Network (interconnected) cracking, potholes, and other forms of seriously distressed pavement should be repaired in accordance with the full-depth patching methods presented below.

- The patch outline should be saw-cut to a regular (squared) shape that extends at least one foot beyond the distressed area. The shape should align with traffic patterns, and the faces should be straight and vertical.
- All broken and unstable material should be excavated to a depth necessary to establish a firm base. The bed should be compacted in order to enhance support.
- A tack coat of emulsified or liquid-asphalt should be applied to the vertical surfaces to enhance adhesion between the patching and existing materials.
- Hot-mix asphaltic concrete should be placed into the excavation starting at the perimeter (rather than center-filling and raking to the edges). The composition of the patching material and depth of the excavation will dictate compaction procedures; however, most patches (for this project) could be accomplished in a single lift (operation) followed by compaction.
- The completed patch should be at the same level as the surrounding pavement (with full compaction). If hand tamping or light compaction techniques are used, the patch should be slightly higher than the surrounding pavement to allow for further compression by traffic.

Resurfacing - When the existing pavement nears the end of its serviceable life, the system should be overlain with a new asphaltic concrete wearing surface. Properly executed, resurfacing could extend the system's serviceable life by 10 to 15 years. Proper application should include the following preparation and execution methods.

- Prior to repaving, the substrate (existing pavement) must be stabilized by complete removal and replacement (patching) of broken and severely cracked sections.
- Minor cracks should be sealed against water intrusion, prior to repaving.
- Existing pavement should be milled to a depth of 2 inches. This method helps assure a uniform two-inch surface and a smooth transition at the gutter joint.
- The surfacing should be reasonably clean and free of debris and contaminants.
- Installation of a paving fabric (optional) over the existing surface would help to stabilize the structure and inhibit the transmission of faults (cracks) to the new surface.
- The new surface should be seal-coated with an asphalt emulsion within two to four years after placement. The seal coat will help protect against both water intrusion and attack by automotive fluids.

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ROOF MAINTENANCE

Competent inspection and repair can dramatically extend the serviceable life of a roof system. With proper guidance, minimal effort and expense can yield big dividends in the form of significantly reduced long-term costs and roof-related problems.

Routine inspections should be performed at least once a year by properly qualified personnel. Independent contractors or consultants can be used. However, management or maintenance staff can also be readily trained to conduct the inspections. To supplement these routine surveys, a special detailed inspection of the roof should be performed at least every three years by an independent qualified contractor or consultant.

Some basic items to inspect are listed below. It is important to remember that a special listing of items should be developed for each roof.

SLOPED ROOFS

Surface

- Debris - No trash, leaves, branches, or other debris should be allowed to remain on the roof.

Systems

- Drainage - Gutters, downspouts, etc., should be clean and operable.
- Wall Flashings - All should be tight and fully sealed.
- Shingles and Shakes - All should be securely fastened, and any damaged, loose, or missing units should be replaced.

Miscellaneous

- Roof Penetrations - Pipes, vents, etc., should be tightly sealed.
- Hips and Ridges - All should be tightly fastened and sealed.
- Decks - These should be reasonably firm and free of deformity.

FLAT OR SLIGHTLY SLOPED

Surface

- Aggregate Distribution - There should be no bare spots, and the surfacing or ballast should be well distributed.
- Debris - No trash, debris, or abandoned equipment should be allowed to remain on the roof.

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- Ponded Water - No roof should retain water, and all water should be gone within 48 hours after rainfall.

Systems

- Drainage - Drains, gutters, downspouts, etc., should be clean and operable.
- Membrane - There should be no blisters or tears.
- Wall Flashing - All should be tight and fully sealed.
- Metal Wall Coping and Counterflashing - All should be tight, with firmly set nails and sealed joints.

Supports

- Walk Areas - Commonly used paths across the roof should have tight, well-bonded, walkway pads.
- Mechanical Units - All supports for these units should be properly sealed; blocks of wood or bricks should not be used for support.
- Roof Penetrations - Pipes, vents, etc., should be tightly sealed, and any pitch pockets should be fully packed.

Miscellaneous

- Roof Penetrations - Pipes, vents, etc., should be tightly sealed.
- Hips and Ridges - All should be tightly fastened and sealed.
- Decks - These should be reasonably firm and free of deformity.

This partial list of items requiring periodic inspection should be a helpful starting point. It would be impossible to list all the items requiring inspection for all of the roofs and systems that exist. If assistance is needed in compiling a complete list for a particular roof, a qualified engineer/consultant or roofing contractor should be asked to inspect the roof and prepare a detailed checklist for specific needs and conditions.

Roof maintenance/repair costs typically average up to \$0.10 per square foot per year. A qualified contractor or consultant can provide more precise information for annual budgeting at a particular property; however, if more than \$0.10 per square foot per year is being spent, replacement of the roof systems should be seriously considered.

Finally, good roofing files should be kept. This will assist contractors and consultants in providing their best possible advice regarding future maintenance and replacement needs. Roofing files should include the following items.

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- Copies of design plans and specifications for roof.
- A list of all materials used in the construction of the roof system. This should include all accessory items such as metal edging, gutters, roof vents, etc., and manufacturer's information such as specifications and brochures on all materials.
- Copies of construction inspection reports and construction records.
- A list of roof maintenance work including:
 - o Results of all inspections;
 - o Location of all repair work;
 - o Materials used for repair work;
 - o Repair costs; and
 - o A history of all problems and complaints involving the roof system.
- Copies of all warranties, guarantees and/or bonds that were issued for the roof.

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EXTERIOR MAINTENANCE

Exterior components require relatively little effort to keep them in good condition; however, routine inspection and repair are vital. Periodic correction of minor defects is very inexpensive and helps prevent the development of severe deterioration/problems which are very costly to repair and can cause significant damage to building interiors and components.

Exterior building components should be inspected regularly (at least annually) by qualified individuals. Properly trained management or maintenance staff can normally perform these inspections.

At least once every five years, a qualified engineer, consultant, or contractor should be retained to perform a more in-depth survey of the exterior. This will normally involve examination from the vantage points of balconies, ladders, and/or scaffolding in order to perform an up-close inspection. Observed defects should subsequently be repaired.

Presented below is a brief discussion of noteworthy items.

- Stains - Discoloration or staining frequently indicates that a problem exists. All such instances should be identified, and the cause(s) determined.
 - o Regular cleaning of the masonry also helps to expose hidden defects.
 - o There are many cleaning techniques that can be used. Guidance from a qualified restoration contractor or consultant is required, as some cleaning techniques can be very harmful if improperly executed or applied to certain exterior materials. In any case, any cleaning program should be carefully planned and tested before implementation.
- Growths - Ivy, algae, or other growths penetrate into the exterior components, causing damage and allowing water penetration into the wall system. All such growths should be regularly removed, and any damage found should be immediately repaired.
- Sealant Replacement - Areas of missing, cracked, or deteriorated sealant (caulk) should be properly repaired.
 - o Special attention should be paid to areas around windows, doors, and building corners since defects in the sealants at these locations generally result in significant water penetration into the wall or building.
 - o New sealant should never be applied over old and/or deteriorated sealant. Such an application is a complete waste of time and money. Bad sealant should always be removed, and the area cleaned before any new sealant is applied.
- Flashings - Most walls are designed with both exposed and concealed flashings, which help control and manage water infiltration.

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- o Visual inspection of the exterior cannot fully determine the conditions of concealed flashings within the wall. If interior leakage problems are being experienced, samples should be removed in a few areas so that the flashings can be inspected and needed repairs made.
- Coatings/Sealers – Stucco, EIFS, siding, etc., normally require coatings or sealers to make them watertight. Periodic recoating or resealing will be required. This should only be done with extreme caution, under the guidance of a qualified restoration consultant or contractor, and after test samples prove effective.

The previous guidelines serve only as a general list of items to be inspected, maintained, and repaired. A qualified contractor, engineer, or consultant can provide invaluable assistance in developing a detailed inspection checklist tailored to a specific property.

Properly designed cleaning programs are task and material-specific. Appropriate and effective methods vary widely depending on the nature and concentration of the soiling agents, as well as the condition, composition, and configuration of the structure to be cleaned. Presented below are typical soiling problems and the methods commonly employed to address them.

CLEANING

- Efflorescence - Crystallized mineral salts can be difficult to remove, particularly from the masonry substrate. Some non-specific techniques will displace the surface salts; however, the masonry can draw some of the salts deeper into the substrate by capillary action.

One method of removing efflorescence utilizes surface-active poultices to extract the salts. Typically, a layer of absorbent material (such as clay minerals, paper pulp, etc.) is applied to the surfaces, wetted, permitted to dry, and removed. Successive applications remove salts near the surface; however, the procedure tends to be ineffective at extracting them from deeper regions.

One method in development for the deep removal of soluble salts is mechanical extraction. The process involves soaking the masonry and drawing the water (and water-soluble salts) out with suction. The results of laboratory tests on small specimens indicate that the procedure has merit; however, it has not yet been effectively adapted for large-scale application.

- Environmental Soiling - Buildings are constantly exposed to the soiling effects of atmospheric pollutants, air-borne particulate matter, microvegetation, and chemical reaction. In light industrial regions, the process is often gradual and goes unnoticed; however, appearance is only one consideration. A dirty exterior can adversely influence the life-cycle performance of a building. Soiling can impede a structure's ability to expel water, result in destructive chemical reactions, and provide a hospitable environment for the growth of microvegetation that produce corrosive secretions.

Most procedures for removing environmental soiling agents use water, abrasives, chemicals, or combinations of these. Presented below are brief discussions of some of these restoration methods and their variations.

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- Steam Cleaning - Steam cleaning utilizes a portable boiler to heat water to a vapor state and conductors to deliver the steam (at low to moderate pressure) to the soiled surface. The principal properties of steam (heat and water) will cause some soiling material to swell and loosen the bond that secures it to the surface.

Steam is no longer widely used for cleaning large structures. The procedure tends to be time- and energy-intensive. It is inherently hazardous, and the vapor makes it difficult to monitor work in progress. Steam cleaning, however, can be an effective method for cleaning intricate or fragile features.

- Water Soaking - This procedure utilizes water, delivered in a mist or low-pressure streams, to saturate a structure for extended periods. Prolonged exposure to the water causes (some of) the soiling agents to swell and loosen the bonds to the substrate. The accumulated water cascades down the structure's face, carrying the dislodged material.

Water soaking can be an effective cleaning method for structures that may be too fragile to withstand high-pressure cleaning or on materials that cannot be safely cleaned with chemicals. The procedure is time-consuming and costly, and it can contribute to the crystallization of mineral salts within the structure.

- High-Pressure Cleaning - Most high-pressure cleaning techniques utilize pumping devices to deliver water to the surface at pressures ranging from 300 psi to 2500 psi (nozzle pressure). Delivery rates are generally in the range of three (3) to eight (8) gpm (gallons per minute).

The concussive force of the water striking the surface acts to dislodge the staining materials. Water cascading down the face tends to flush the dislodged material away.

Chemical agents can be added to the spray to enhance the solvent properties of the water. The combined actions of high-pressure water and chemical agents can be effective in some applications; however, the chemicals can be forced deeply into the structure, where they cannot be readily flushed out. The long-term effects of the retained substances could be destructive and/or defacing in some instances.

The force of the water (at sufficient pressure) can also dislodge exterior elements, sealants, etc., and the process is abrasive. The delivery pressures should be appropriate to the characteristics of the exterior elements. For example, water pressure that would have a negligible abrasive effect on a hard material (such as granite) could severely damage a softer material (such as sandstone).

Heated water can be used in both simple and chemically-assisted procedures. In simple (water-only) techniques, elevated temperatures enhance the process by softening the soiling agents further, thereby weakening their bond to the masonry surface. Warmer fluids do tend to be more readily absorbed by porous construction materials, with possible deleterious effects. Extreme temperatures can also damage some materials and should be avoided.

In chemically-assisted procedures, the elevated temperatures tend to accelerate some chemical reactions, thereby increasing the desired effect of the agent. Some chemicals can change state

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(flash to gas) in response to sufficient heat, resulting in diminished cleaning capacity, discolorations, and inconsistent appearance. Water temperature should be controlled and appropriate for specific applications and materials.

- Abrasive Cleaning - The most familiar abrasive cleaning technique utilizes grits of various composition (such as silica sand, crushed slag, etc.) delivered by pressurized air (grit or sand blasting) or water (hydro blasting). Conventional blasting techniques are non-selective and tend to remove layers of the masonry substrate with the soiling materials.

Abrasive cleaning is not generally recommended due to its inherently destructive nature. Furthermore, the procedures are potentially hazardous. Misdirected streams of blasting media can cause grievous personal injury, and dry blasting techniques (particularly sand blasting) introduce potentially hazardous airborne dust into the atmosphere.

There are variations on conventional techniques that use softer materials (such as crushed nut shells, corn cobs, and glass beads). This process (micropeening) may be practicable for some limited applications; however, it tends to be costly, time-consuming, and ill-suited to large-scale operations.

- Chemical Cleaning - Chemical cleaning procedures are generally used in conjunction with some form of water cleaning or utilize water as a rinsing agent. The cleaning agents dissolve soiling materials and hold them in suspension so they can be flushed away with water. Chemical cleaning procedures fall into one (1) of three (3) major classifications.
 - o Detergents - Detergents enhance the solvent properties of water by weakening its surface tension. The "softened" water is better able to penetrate and dissolve some soiling agents. Detergent cleaning is usually accompanied by brushing or scrubbing to break and dislodge the staining material.

The procedure tends to be labor-intensive and ineffective at removing many types of soiling agents. It is not widely used on large-scale projects.

- o Acids - Acidic cleaners function by disintegrating the soiling agents or their interface with the exterior surface. The intensity of the chemical reaction is a function of solution strength (dilution) and the composition of contacted substances. Water is utilized to rinse away the dislodged and dissolved soils and the acid solution.

The acid most commonly used in restoration cleaning is hydrofluoric acid (HF). It is particularly desirable as a cleaning agent because it is effective against a wide range of soiling materials at relatively low concentrations. Another advantage is that it tends to leave fewer potentially harmful residues in masonry than other acids.

Extreme caution must be exercised when using any acidic cleaner. Hydrofluoric acid can be particularly hazardous because it tends to be readily absorbed through the skin, causing deep tissue injuries.

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At sufficiently high concentrations, hydrofluoric acid can damage masonry and other building materials. Calcium materials (such as limestone) can be particularly susceptible, and hydrofluoric acid is one of the few substances that will readily attack (etch) glass and siliciferous glazes. Concentrations must be closely controlled, and windows should be protected (by masking with film, water, etc.).

Hydrochloric (muriatic) acid (HCl) is occasionally used as a cleaning agent; however, it is not generally recommended for restoration programs. Relatively high concentrations are necessary for effective soil removal, and at sufficiently high concentrations, hydrochloric acid can cause ferrous chloride staining. It can also result in (or exacerbate) efflorescence problems by introducing soluble salts into the masonry.

- o Alkaline Cleaners - Alkaline solutions are chemically reactive with a wide range of soiling agents and exploit those reactions by disrupting the soil's bond to exterior surfaces. Water rinsing is employed to remove the dislodged materials and the alkaline residue. Among the more commonly used alkaline chemicals are sodium hydroxide (NaOH), potassium hydroxide (KOH), and ammonium hydroxide (NH₄ OH).

Alkaline cleaners can be effective and useful in restoration cleaning programs; however, there are some limitations to consider.

- In undiluted form or in strong concentrations, alkaline chemistry can be extremely hazardous.
- Inadequate rinsing can result in or contribute to efflorescence or chemical staining problems by introducing soluble salts into the masonry structure.
- Exterior components with high iron content (such as some limestone, granites, and sandstones) can react with alkaline materials to create ferric hydroxide staining.