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June 25, 2018

North Shore at Canton Condominium
c/o Village Management, Inc.
P.O. Box 20921
Baltimore, Maryland 21209

ATTENTION: Mr. George Bereska

SUBJECT: Report of Level 1 Replacement Reserve Study
North Shore at Canton Condominium
2300 Block of Boston Street
Baltimore, Maryland
ETC Project M6-3011

Dear Mr. Bereska:

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 (PM6-5791), dated October 28, 2016. Written authorization was received in our office on November 16, 2016.

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 common and limited common elements:

1. Roofing systems;
2. Exterior facing systems (including exterior garage and entrance doors);
3. Unit balconies/patios;
4. Roadways and parking spaces (including driveway aprons, curb and gutter assemblies, and bollards);
5. Sidewalks (including entrance landings);
6. Promenade (including bulkhead);

EXTERIOR FACING SYSTEMS

The buildings are primarily faced with brick and precast stone masonry. Projecting window bays at some buildings and rising walls above roof level are clad with Exterior Insulation Facing Systems (EIFS). Cellular PVC trim is utilized at door and window perimeters and along the edges of the roofs. Access to the units is provided by solid wood entrance doors. Two (2) car garages are situated on the ground floors of each unit, which are accessed by automated garage doors.

Observations

The brick masonry appeared to be generally in good condition; although the following deficiencies or items of concern were observed during our inspections.

1. Some isolated mortar defects (cracks, bond breaks, etc.) were evident in the masonry (see Photograph 4).

2. What appeared to be a dryer vent was missing at 2319-3 Boston Street (see Photograph 5).

3. Ivy growth was noted on the several building end walls (see Photograph 6). Such plant growth can dislodge mortar joints as well as masonry units in some extreme cases. Additionally, plant growth tends to trap moisture against walls, which can lead to efflorescence or staining of the wall. Both of these conditions can reduce the life expectancy of brick masonry walls.

The precast stone masonry appeared to be in fair condition. A number of deficiencies were noted during our inspections.

1. Isolated mortar defects (cracks, bond breaks, etc.) were evident in in the precast stone masonry in several areas (see Photograph 7). Vertical cracks in the masonry were observed in a few building end walls (see Photograph 8). These cracks typically extended the full height of the precast walls. This could be an indication that proper provisions were not provided to allow for expansion and contraction of the masonry in these areas.

2. A few cracked units were noted in the stone masonry (see Photograph 7).

3. The faces of the precast stone units at ground level were severely deteriorated throughout the community (see Photograph 9). This condition was typically noted adjacent to sidewalks and is most likely caused by the deicing salts utilized on the sidewalks.

4. The paint on the steel lintels supporting the masonry was debonded and peeling in a few instances (see Photograph 10). This could allow corrosion to form on the steel reducing the life expectancy of the lintels.

The EIFS cladding was generally in good condition; although a few items of concern were noted during our inspection. Minor cracking in the EIFS was noted in a few areas (see Photographs 11 and 12). Additionally, staining was evident on the EIFS throughout the community (see Photograph 12).

Painting of the cellular PVC where debonded paint was noted could be delayed until a full painting project is undertaken. As for the deteriorated precast stone units along the sidewalks, they should be monitored for worsening conditions. Additionally, the Community should utilize a deicing agent on the sidewalks that is less destructive to concrete and masonry elements. Provided in Appendix D are some guidelines for maintaining and cleaning masonry.

UNIT BALCONIES

The buildings feature wood-framed, cantilever balconies with wrought iron guards as fall protection. The balcony configurations vary from the second and third/fourth levels, and feature a combination of engineered wood cantilever beams and dimensional lumber.

Discussions

The Association retained the services of ETC to evaluate the balconies separate from the reserve study. Although, the evaluation of the balconies included the pressure treated and railings, the main object of the evaluation was to determine the existing condition of the engineered wood cantilevered beams and to provide our recommendations to extend the life of the beams. The engineered wood beams were found to vary in condition from fair to poor while the railings and pressure-treated wood components were found to be generally in good condition. Deficiencies found typically included delamination in the engineered wood beams, failed sealants around the cantilevered beams where they penetrated the walls, and backed out or missing fasteners in the deck boards and railings. Additionally, HVAC support platforms were attached to the side of some of the balconies, which has caused the cantilevered beams to twist. Please see our balcony evaluation report for more specific information on our findings.

Conclusions

Provided the repairs recommended in our balcony evaluation report are performed, the cantilevered engineered wood beams should remain serviceable for the life of the building. Minor repairs to the metal flashings and removal and replacement of the sealants at the beam wall penetrations will be required in ten (10) year cycles. The pressure-treated wood components should remain serviceable for another sixteen (16) to twenty (20) years. Occasional major repairs to balconies should be anticipated in the interim. The railings should have remaining serviceable lives of up to twenty-six (26) more years. The railings will require painting every seven (7) years.

Recommendations

The repairs recommended in ETC's balcony evaluation report should be performed, which include the following work.

1. Installing missing or replacing improperly installed nails at joist hangers.
2. Removing and replacing all severely deteriorated wood decking and joists.
3. Installing missing or replacing improperly installed lag screws.
4. Replacing wood components where split at the post base connections.
5. The railings should be cleaned to remove surface rust and chipped/worn paint, and touchup paint should be applied as needed.
6. Remove all heat pumps and support platforms from the second level balconies.

The HVAC equipment support pads were generally in good condition. In a few locations, the brick pavers had sunken.

The concrete curb and gutter assemblies were in good condition as well. Minor cracks and scaling were observed in a few areas (see Photographs 25 and 26).

Discussion

There are many factors that could impact on the serviceable lives of the pavement and brick paver and concrete elements, and all should be considered when projecting life-cycle estimates. Foremost among those factors is the construction profile (thickness, reinforcement, and concrete mix). No information regarding profile was provided to us, and our inspections did not include any sampling or analysis of the concrete. Therefore, our projections are based only on assumed "typical" construction practices.

The long-term stability of the substrate (soil) is also a major factor. Movement (settlement) and/or inadequate compaction of the substrate can result in cracks and/or uneven displacement. These conditions could present potential tripping hazards as well as accelerated erosion of the substrate.

Site drainage characteristics (such as water discharge onto the concrete systems from improperly routed roof downspouts and/or inadequate site drainage provisions) will also influence the useful lives of the concrete elements. Deficient drainage will contribute to undermining of the substrate as well as frost-heaving.

Improper ice removal procedures could damage all concrete elements and diminish serviceable life. The most commonly used ice-control agents contain chemical compounds that tend to attack concrete. Calcium chloride is particularly effective as a control agent; however, it can be highly destructive to concrete when applied in heavy concentrations.

The most critical factor in assessing conditions is the potential for personal injury (hazards). This potential and the Association's exposure to liability can become significant, particularly with respect to those isolated areas of the sidewalk and curb/gutter systems that exhibit conditions which could currently be considered hazardous or could deteriorate to hazardous condition in the near future.

Care should be taken with ice-control measures to minimize damage from de-icing agents. If destructive materials are used (such as calcium chloride), they should be broadcast evenly and sparingly over the concrete to melt ice and thin layers of snow. Chemicals should not be used for snow removal. When conditions permit, the residual chemicals should be rinsed or swept from the concrete surfaces.

Conclusions

Based on the assumed design profile and our experiences in similar circumstances, we project a remaining serviceable life of up to another six (6) years for the asphalt pavement. The pavement should be seal coated every five (5) years. The brick paver driveway aprons and HVAC equipment pads as well as the bollards should remain serviceable for another thirty-six (36) to forty (40) years. Some repairs should be anticipated in the interim.

We project the concrete site elements will remain serviceable for another thirty-five (35) to forty-five (45) years. Some elements may fail within the next five (5) years; others may remain serviceable well beyond forty-five (45) years. Interim repairs and replacements should be anticipated.

Recommendations

The brick paver elements should be inspected annually for displacement and evidence of substrate erosion (voids). Seriously distressed areas should be mapped and clearly marked (for repairs). Correction of the most obvious (and potentially hazardous) conditions should be deemed imperative. 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 serious damage, which should be repaired properly.

PROMENADE AND BULKHEAD

A brick paver promenade extends along the waterfront. The brick pavers are bordered with concrete bands. A concrete bulkhead extends along the front of the promenade, which is intended to retain the soils and materials of the promenade.

Observations

The promenade was generally in good condition during our inspection; although a few deficiencies or items of concern were noted during our inspection. Sunken/heaved areas of brick pavers were evident in a few locations along the promenade (see Photographs 28 and 29). This condition created an uneven surface, which could present a potential trip hazard. Additionally, this condition indicates a possible issue with erosion of the soils below the pavers. This is of more concern in this area due to the high traffic from runners and walkers outside the community. We were informed that the community had to undertake a major repair at the north end of the promenade previously where a large area if brick pavers had sunken. One of the sunken areas observed during our inspection was located in the area or the previous repair. Cracks and deterioration (spalls) in the concrete bands were observed in some areas (see Photographs 30 and 31).

The visible areas of the bulkhead appeared to be in good condition. No issues were noted and none were reported to us.

Conclusions

The promenade brick pavers and concrete elements should remain serviceable for another thirty-six (36) years or longer. Some elements may fail within the next five (5) years; others may remain serviceable well beyond thirty-six (36) years. The bulkhead should have a remaining life expectancy of twenty-six (26) to thirty (30) years. Interim repairs and replacements should be anticipated.

Recommendations

Due to the high activity of others outside of the community, we recommend that sunken/heaved sections brick pavers in the promenade be repaired as soon as possible. The repairs should include removal of the brick pavers and the underlying materials to assist in determining the source of the erosion underneath the pavers. The cracks in the concrete elements should be routed and sealed. Any delaminated areas in the concrete elements should be properly repaired.

The promenade and bulkhead elements should be inspected annually for cracks, displacement and evidence of substrate erosion (voids). Seriously distressed areas should be mapped and clearly marked (for repairs). Correction of the most obvious (and potentially hazardous) conditions should be deemed imperative. 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 serious damage, which should be repaired properly.

ENTRANCE MONUMENT

A brick masonry monuments with precast concrete signage is located at the northeast corner of the property.

Observations

The brick masonry monument and signage appeared to be in good condition at the time of our inspection. Cracked mortar joints were evident in a few areas. Vertical cracks were note along each side of the precast signage (see Photograph 35). Such cracking can allow excessive amounts of water to penetrate he brick masonry, which can prematurely deteriorate the mortar joints and brick units due to freeze/thaw conditions.

Staining and vegetative growth was evident on some of the column cap stones as well as the brick masonry (see Photograph 36). Staining and vegetation growth such as this can prematurely deteriorate masonry components.

Conclusions

In our opinion, the entrance monument should remain serviceable for the life of the property, provided it is properly maintained. Occasional major repairs and maintenance should be anticipated in the interim.

Recommendations

The following repairs should be performed on the entrance monument.

1. All cracked mortar joints should ground out and repointed.

2. The joints between the precast concrete signage and the brick masonry should be routed and sealed with an elastomeric sealant.

3. The monument should be power-washed to remove any staining and vegetation growth.

MAILBOX KIOSKS

Individual mailboxes are clustered in aluminum enclosures (kiosks). The kiosks are mounted on small concrete pads.

Observations

The mailbox kiosks appeared at the time of our inspection to be in good condition. No operational problems were noted or reported to us.

Conclusions

In strictly functional terms, the mailbox clusters could remain serviceable for another sixteen (16) years, or longer. Appearance is likely to worsen with time, possibly to unacceptable levels.

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

- Where feasible 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 assure 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 times that were not examined, for the identification of hazardous materials (such as asbestos), 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 of compliance with applicable codes, standards, safety requirements, building plans, offering statements, etc.

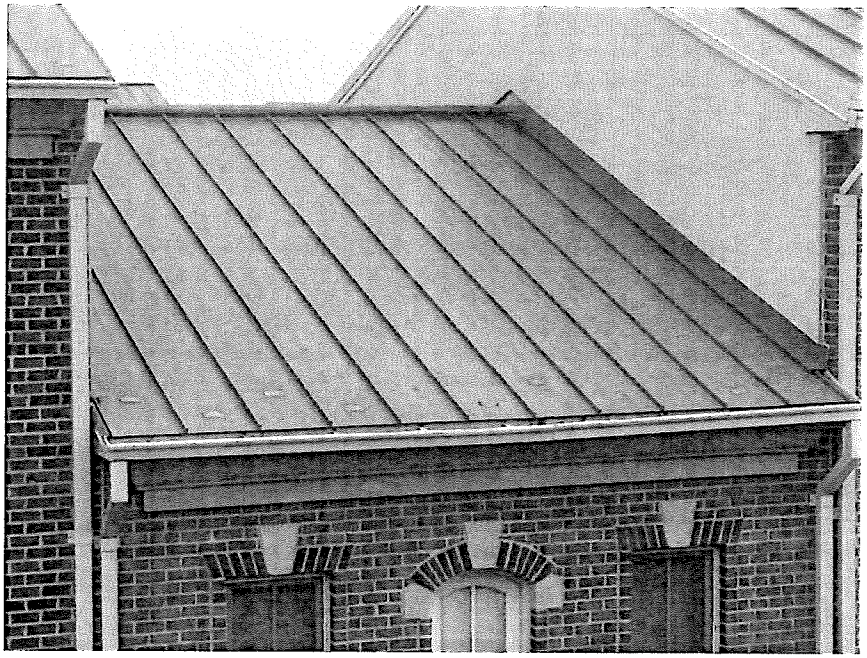
We appreciate this opportunity to be of service. Please contact us if any questions arise, or if we can be of further assistance.

Very truly yours,

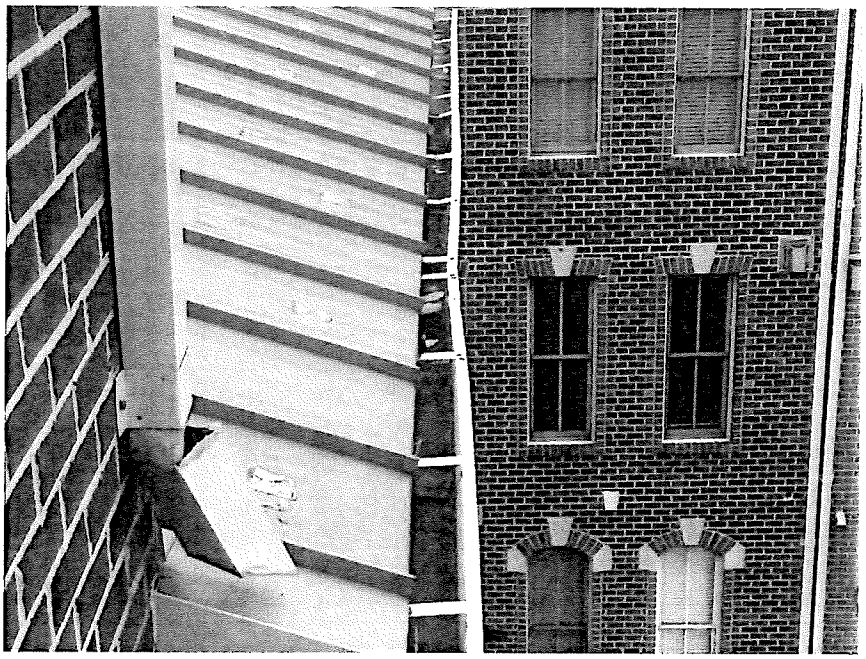
ENGINEERING AND TECHNICAL
CONSULTANTS, INC.

Kyle P. Parsons, RS, RRC
Project Manager

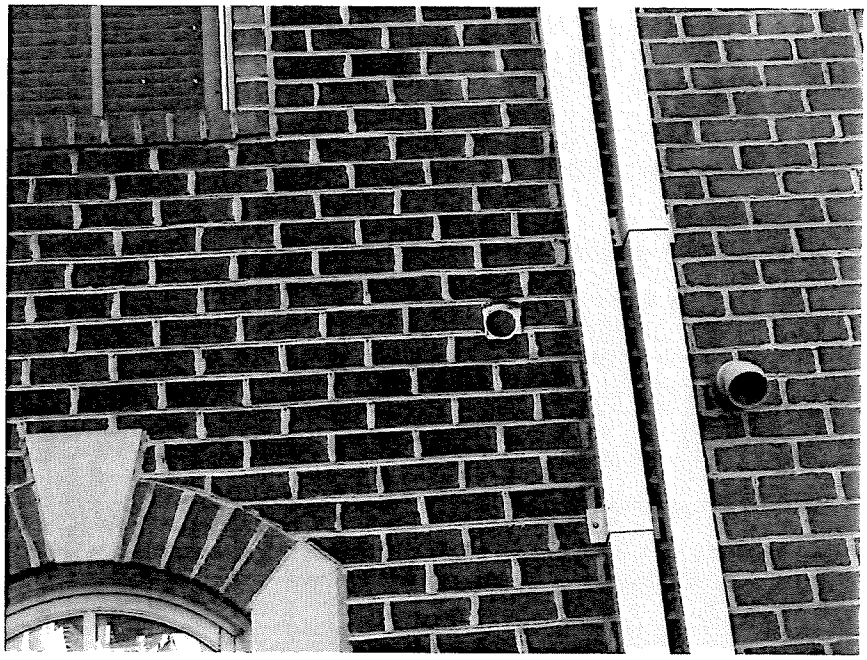
APPENDICES:
A - Photographs
B- Short-Term Repair Summary
C - Repair/Replacement Reserve Schedule
D - Supplementary Technical Information



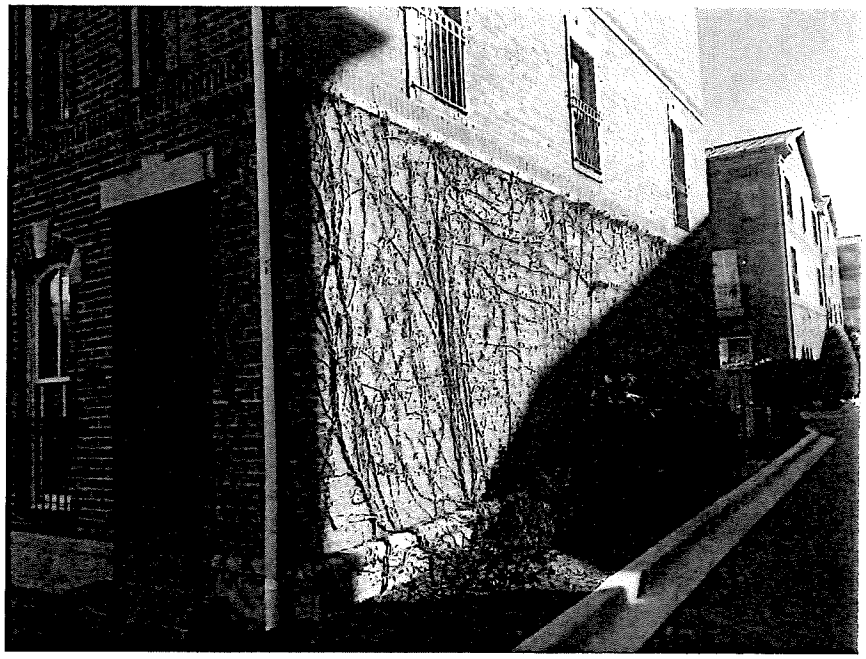
Photograph 1 – Missing snow guards on metal roof



Photograph 2 – Dislodged section of downspout

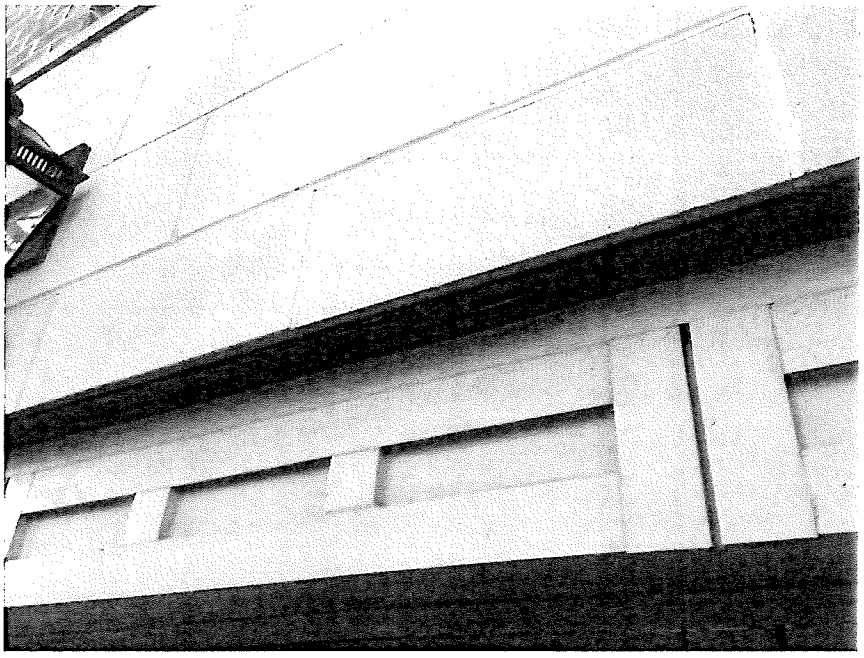


Photograph 5 – Missing dryer vent at 2319-3 Boston Street



Photograph 6 – Ivy growth on brick masonry

Photograph 9 – Deteriorated precast stone masonry units at ground level



Photograph 10 – Debonded paint on steel lintel

Photograph 13 – Deteriorated sealant at perimeter of door

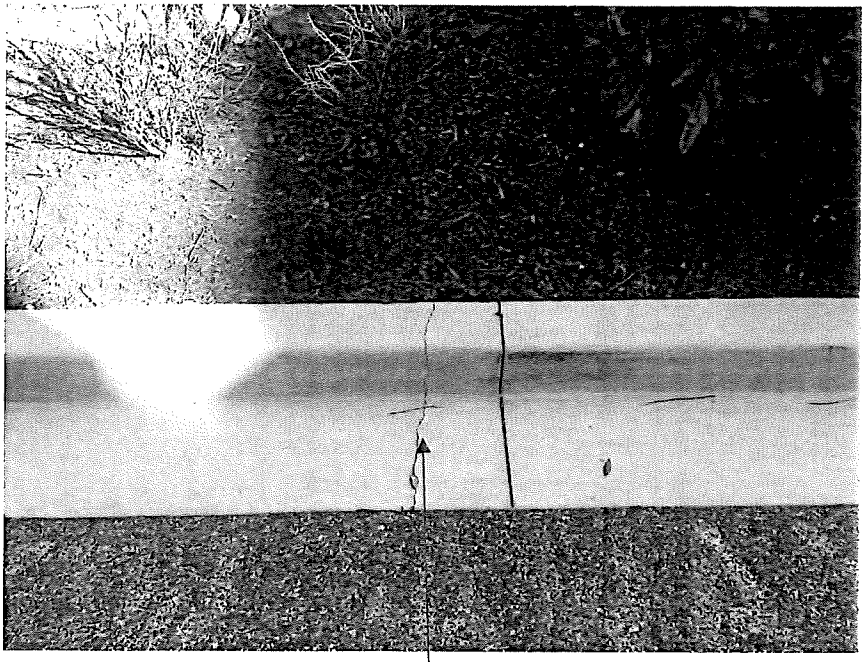
Photograph 14 – Broken trim at garage at 2323-5 Boston Street

Photograph 17 – Simple crack in asphalt pavement

Photograph 18 – Deteriorated pavement along simple crack in asphalt pavement

Photograph 21 – Area of ponded water in asphalt pavement

Photograph 22 – Sunken area of brick pavers in driveway apron – note utility covers elevated above level of brick pavers



Photograph 25 – Crack in concrete curb and gutter assembly

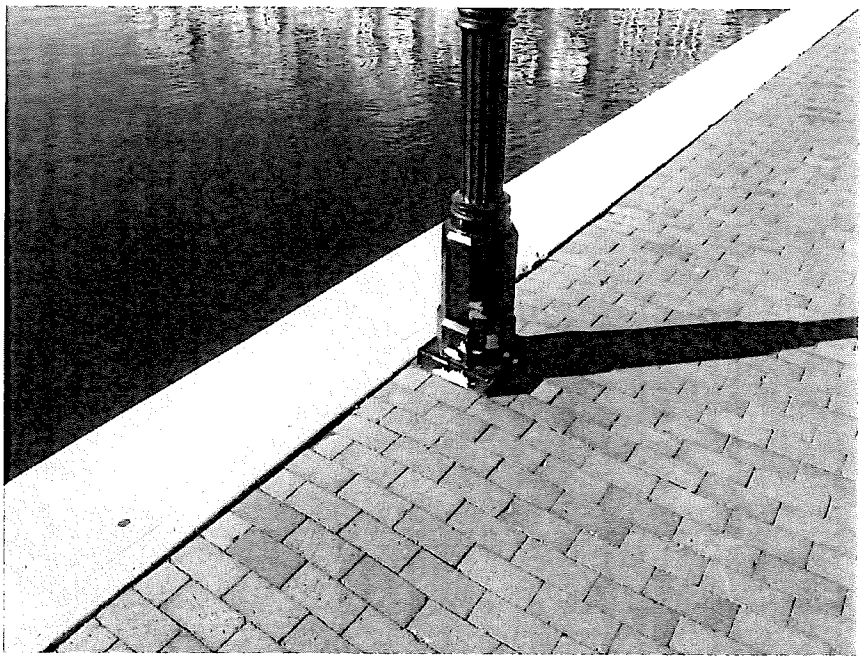
Photograph 26 – Scaled section of concrete curb and gutter assembly

Photograph 29 – Sunken area of brick pavers in promenade at the north corner of the property

Photograph 30 – Crack in promenade concrete boarder

Photograph 33 – Debonded paint on fencing attachment components

Photograph 34 – Missing fencing post cap



Photograph 37 – Debonded paint on promenade light post

APPENDIX B
SHORT-TERM REPAIR ESTIMATES
NORTH SHORE AT CANTON CONDOMINIUM
2300 BLOCK OF BOSTON STREET
BALTIMORE, MARYLAND
ETC PROJECT M6-3011
FEBRUARY 27, 2017

As delineated in the formal report, there are several systems and components, which, in our opinion, require repair or improvement. The attached summary outlines our opinions of probable costs for recommended repairs, and improvements pertinent to these items. The need for these actions is considered rather immediate. If possible, such actions should be implemented within the current fiscal year or shortly thereafter.

It should be noted that the short-term cost summary is merely an abstract of the information contained in the narrative text of our report. It is not intended to be an autonomous, independent document.

All costs represent our opinions, based on current knowledge and our experience with similar conditions. They are suggested budget figures, not guaranteed costs that should be considered preliminary until actual bids/quotes are obtained.

TASK	PROBABLE COST
ROOFING SYSTEMS	
Install new snow guards, where missing	$2,600
Repair dislodged downspout sections	$1,200
EXTERIOR FACING SYSTEMS	
Remove and replace building sealants	$130,000
Repoint deteriorated mortar joints in masonry.	$1,400
Route and seal vertical cracks in precast stone masonry	$1,400
Repair cracks and recoat EIFS	$55,400
Replace missing dryer vent at 2319-3 Boston Street	$600
Remove and replace damaged trim around garage door at 2323-5 Boston Street	$500

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SHORT-TERM REPAIR ESTIMATES
NORTH SHORE AT CANTON CONDOMINIUM
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FEBRUARY 27, 2017

TASK	PROBABLE COST
ENTRANCE MONUMENT	
Repoint deteriorated mortar joints, rout and seal joint around precast concrete signage, and power wash monument	$1,000

APPENDIX C
REPAIR/REPLACEMENT RESERVE SCHEDULE
NORTH SHORE AT CANTON CONDOMINIUM
2300 BLOCK OF BOSTON STREET
BALTIMORE, MARYLAND
ETC PROJECT M6-3011
FEBRUARY 27, 2017

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.

It must be noted that no laboratory tests or analyses were performed on any elements and our conclusions are based solely on visual examinations. Unless otherwise noted, our life cycle projections are based on the assumptions that construction materials (such as asphalt, concrete, etc.) generally comply with accepted industry standards and that the listed elements will be properly maintained.

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 (2016) U.S. dollars. Accordingly, some accommodation should be made for normal cost increases, by either factoring in annual increases at some reasonable rate 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 a half percent (.5%) for funds held in interest bearing instruments.

According to information provided to us, a total of $359,423.39 was available in reserves on January 1, 2017. That amount was distributed proportionally as available funds among the elements on the reserve schedule. The attached cash flow table delineates anticipated contributions and disbursements relative to replacement reserves between 2017 and 2036. Reserves are currently funded at the rate of $48,000.00 per year. In our opinion, funding at this rate could result in substantial shortfalls 2032. Accordingly, we recommend increasing the annual funding rate to $77,000.00 to prevent the amount in the reserve account from falling below $336,728.00, which 10% of the total estimated replacement cost for all of the limited common and common elements in the community.

We strongly recommend that a comprehensive study be conducted every three to five years to assess changes in the physical condition of the various systems and related components. Financial requirements should be revised annually if pertinent economic changes are to be accurately reflected as well. Without these regular assessments, long-range planning may not be effective and critical needs may not be properly met.

APPENDIX C
REPLACEMENT RESERVE CHART
NORTH SHORE AT CANTON CONDOMINIUM
2300 BLOCK OF BOSTON STREET
BALTIMORE, MARYLAND
ETC PROJECT M6-3011
FEBRUARY 27, 2017

Items	Comments/ Notes	Model/Type	Unit	Estimated Quantity	General Condition	Typical Design Life (years)	Estimated Remaining Useful Life (years)	Estimated Replacement		Existing Funds	Annual Contribution
								Unit Cost	Total Cost		
Roofing Systems											
Roof Assembly	B	Metal	sf	57,500	Good	50	36	$ 20	$ 1,150,000	$ 122,751	$ 28,535
Gutter and Downspout Assemblies		Aluminum	al	2,600	Good	50	36	$ 15	$ 39,000	$ 4,163	$ 968
Exterior Facing Systems											
Masonry Repair	B,C	Brick/Stone	al		Good/Fair	20	20		$ 150,000	$ 16,011	$ 6,699
EIFS Repair	B,C	EIFS	al		Fair	10	2		$ 14,000	$ 1,494	$ 6,253
EIFS Coating		Elastomeric	sf	8,900	Fair	10	2	$ 6	$ 53,400	$ 5,700	$ 23,850
Trim		PVC	ls		Good	50	36		$ 130,000	$ 13,876	$ 3,226
Garage Doors		PVC	ea	63	Good	50	36	$ 2,500	$ 157,500	$ 16,812	$ 3,908
Entrance Doors		Wood	ea	63	Good	50	36	$ 1,000	$ 63,000	$ 6,725	$ 1,563
Sealants		Elastomeric	ls		Good	15	2		$ 130,000	$ 13,876	$ 58,062
Painting		Latex	lf	2,500	Good	10	2		$ 26,000	$ 2,775	$ 11,612
Unit Balconies											
Beams	B,C	Eng. Wood	al		Fair/Poor	10	1		$ 12,000	$ 1,281	$ 10,719
Decking/Framing	B,C	P.T. Wood	sf	6,800	Fair	30	16	$ 12	$ 81,600	$ 8,710	$ 4,556
Railing Painting		Wrought Iron	sf	7,500	Good	7	2	$ 1.80	$ 13,500	$ 1,441	$ 6,030
Railing Replacment	B	Wrought Iron	lf	2,500	Good	40	26	$ 40	$ 100,000	$ 10,674	$ 3,436
Pavement											
Pavement Seal Coat		Asphalt	sy	3,600	N/A	5	11	$ 1.80	$ 6,480	$ 692	$ 526
Pavement Overlay	A,B	Asphalt	sy	3,600	Fair	20	6	$ 18	$ 64,800	$ 6,917	$ 9,647
Curb and Gutter Assemblies	C	Concrete	al		Good	20	20		$ 10,000	$ 1,067	$ 447
Driveway Aprons											
Aprons	C	Brick	al		Good	50	36		$ 100,000	$ 10,674	$ 2,481
HVAC Pads	C	Brick/Conc.	ea	4	Fair	50	36	$ 700	$ 2,800	$ 299	$ 69
Bollards	B	Steel/Cond.	ea	10	Fair	40	26	$ 1,300	$ 13,000	$ 1,388	$ 447
Sidewalks	B,C	Brcik	al		Good	20	20		$ 36,000	$ 3,843	$ 1,608
Entrance Landings		Concrete	al		Good	20	20		$ 8,000	$ 854	$ 357
Promenade											
Walkway	B,C	Brick.Conc.	al		Fair	20	20		$ 120,000	$ 12,809	$ 5,360
Bulkhead		Concrtete	lf	780	Good	75	59	$ 1,000	$ 780,000	$ 83,257	$ 11,809
Fencing											
6 Ft. Tall Fencing	B	Aluminum	lf	200	Good	40	26	$ 60	$ 12,000	$ 1,281	$ 412
2 Ft. Tall Fencing	B	Aluminum	lf	1,000	Good	40	26	$ 45	$ 45,000	$ 4,803	$ 1,546
Masonry Columns		Wood	al		Good	20	20		$ 2,500	$ 267	$ 112
Retaining Wall		Segmental	lf	130	Good	50	36	$ 200	$ 26,000	$ 2,775	$ 645
Entrance Monument	B,C	Brick	ls	400	Fair	50	15		$ 2,800	$ 299	$ 167
Mailbox Kiosks		Aluminum	ea	2	Good	30	16	$ 2,200	$ 4,400	$ 470	$ 246
Lighting Systems											
Pole-mounted	C	Pole-mounted	al		Good	20	20		$ 12,500	$ 1,334	$ 558
Wall-mounted	C	Wall-mountd	al		Fair	20	20		$ 1,000	$ 107	$ 45
Total									$ 3,367,280.00	$ 359,423	$ 205,897.53

Notes:
A. Estimate cost for milling of pavement and placement of 2-inch overlay
B. Cost/life cycle estimates assume immediate completion of recommended short-term repair/replacement
C. Estimated cost for cyclical repairs, not total replacement

Abbreviations
sf = square feet
lf = linear feet
ls = lump sum
al = allowance
sy = square yards

APPENDIX C
CASH FLOW ANALYSIS
NORTH SHORE AT CANTON CONDOMINIUM
2300 BLOCK OF BOSTON STREET
BALTIMORE, MARYLAND
ETC PROJECT M6-3011
FEBRUARY 27, 2017

	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Roofing Systems										
Roof Assembly										
Gutter and Downspout Assemblies										
Exterior Facing Systems										
Masonry Repair	75,000									75,000
EIFS Repair	7,000									7,000
EIFS Coating	53,400									53,400
Trim										
Garage Doors										
Entrance Doors										
Sealants						130,000				
Painting						26,000				
Unit Balconies										
Beams										12,000
Decking/Framing										
Railing Painting						4,500				
Railing Replacement										
Pavement										
Pavement Seal Coat	6,480					6,480				
Pavement Overlay										
Curb and Gutter Assemblies	2,500					2,500				
Driveway Aprons										
Aprons										50,000
HVAC Pads										
Bollards										
Sidewalks					9,000					9,000
Entrance Landings					2,000					2,000
Promenade										
Walkway					30,000					30,000
Bulkhead										
Fencing										
6 Ft. Tall Fencing										
2 Ft. Tall Fencing										
Masonry Columns										1,250
Retaining Wall										
Entrance Monument										1,400
Mailbox Kiosks						4,400				
Lighting Systems										
Pole-mounted										7,500
Wall-mounted										500
Total Expenditures	144,380	-	-	-	41,000	173,880	-	-	-	249,050

Current Funding - $48,000 Annually

Starting Balance	148,797	(20,153)	(2,254)	15,735	33,814	(6,237)	(240,394)	(223,596)	(206,714)	(189,748)
Annual Contributions	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Assessments										
Interest (.5%)	744	(101)	(11)	79	169	(31)	(1,202)	(1,118)	(1,034)	(949)
Inflation (3%)	43,314	-	-	-	17,220	78,246	-	-	-	141,959
Remaining Balance	(20,153)	(2,254)	15,735	33,814	(6,237)	(240,394)	(223,596)	(206,714)	(189,748)	(563,705)

Component Method - see reserve table

Starting Balance	1,763,777	1,790,800	2,005,651	2,221,577	2,438,582	2,598,453	2,565,217	2,783,940	3,003,757	3,224,674
Annual Contributions	205,898	205,898	205,898	205,898	205,898	205,898	205,898	205,898	205,898	205,898
Assessments										
Interest (.5%)	8,819	8,954	10,028	11,108	12,193	12,992	12,826	13,920	15,019	16,123
Inflation (3%)	43,314	-	-	-	17,220	78,246	-	-	-	141,959
Remaining Balance	1,790,800	2,005,651	2,221,577	2,438,582	2,598,453	2,565,217	2,783,940	3,003,757	3,224,674	3,055,686

Recommended Funding Method - $77,000 Annually to prevent existing funds from going below $336,728

Starting Balance	445,410	336,943	415,628	494,706	574,179	595,830	423,683	502,802	582,316	662,227
Annual Contributions	77,000	77,000	77,000	77,000	77,000	77,000	77,000	77,000	77,000	77,000
Assessments										
Interest (.5%)	2,227	1,685	2,078	2,474	2,871	2,979	2,118	2,514	2,912	3,311
Inflation (3%)	43,314.00	-	-	-	17,220.00	78,246.00	-	-	-	141,958.50
Remaining Balance	336,943	415,628	494,706	574,179	595,830	423,683	502,802	582,316	662,227	351,530

APPENDIX D
SUPPLEMENTARY TECHNICAL INFORMATION
NORTH SHORE AT CANTON CONDOMINIUM
2300 BLOCK OF BOSTON STREET
BALTIMORE, MARYLAND
ETC PROJECT M6-3011
FEBRUARY 23, 2017

PAGE(S)	SUBJECT	REFERENCES
2	PAVEMENT	Various sources, including the Virginia Asphalt Association and The Asphalt Institute.
3-4	MASONRY MAINTENANCE	Joseph D. Shuffleton, P.E.
5-7	MASONRY CLEANING	Various sources including "Cleaning Stone and Masonry", ASTM special technical publication.
8-9	ROOFING MAINTENANCE	Joseph D. Shuffleton, P.E.

MASONRY MAINTENANCE

Exterior masonry requires relatively little effort to keep it 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 up-close inspection. Observed defects should subsequently be repaired.

Presented below is a brief discussion of noteworthy items.

1. Stains - Discoloration or staining frequently indicates that a problem exists. All such instances should be identified and the cause(s) determined.

    a. Regular cleaning of the masonry also helps to expose hidden defects.

    b. There are many cleaning techniques that can be used. Guidance from a qualified masonry restoration contractor or consultant is required because some cleaning techniques can be very harmful if improperly executed or if performed on certain types of exterior materials. In any case, any cleaning program should be very carefully planned and tested prior to implementation.

2. Growths - Ivy, algae or other growths penetrate into the masonry, 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.

3. Sealant Replacement - Areas of missing, cracked, or deteriorated sealant (caulk) should be properly repaired.

    a. 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.

    b. New sealant should never be applied over old deteriorated sealant. Such an application is a complete waste of time and money. Bad sealant should always be removed and the area cleaned prior to any placement of new sealant.

4. Repointing - Deteriorated, cracked, or open mortar joints should be cut out and properly refilled (repointed) with mortar.

    a. The cause of the problem should always be determined so that proper repairs can be made. Mortar deterioration may sometimes be an indication of a more severe defect that requires special attention. Simple repointing of the joints may only result in recurrence of the problem.

    b. Proper exterior cleaning will normally help identify areas requiring repointing.

MASONRY CLEANING

Properly designed cleaning programs are task and material specific. Appropriate and effective methods vary widely according to 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 some typical soiling problems and some of the methods that are commonly employed to address them.

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 materials (such as clay minerals, paper pulp, etc.) are applied to the masonry surfaces, wetted, permitted to dry, and removed. Successive applications will remove salts from near the surface; however, the procedure tends to be ineffective at extracting salts from the 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, the procedure has not yet been effectively adapted to large-scale application.

ENVIRONMENTAL SOILING - Buildings (particularly those in urban environments) are constantly exposed to the soiling effects of atmospheric pollutants, air-borne particulate matter, microvegetation, and chemical reaction. In light industrial regions, the process tends to be fairly gradual and tends to go unnoticed; however, the 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; it can result in destructive chemical reactions and affords a hospitable environment for the growth of microvegetation that produce corrosive secretions.

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

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 principle 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 as a cleaning technique for large structures. The procedure tends to be costly in terms of time and energy. It is inherently hazardous, and the vapor makes it difficult to monitor work in progress. Steam cleaning can, however, be an effective method of 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 waters cascade down the face of the structure, carrying with them the dislodged material.

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 act to dissolve soiling materials and hold them in suspension so that they can be flushed away with water. Chemical cleaning procedures fall into one (1) of three (3) major classifications.

1. 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.

2. Acids - Acidic cleaners function by disintegrating the soiling agents or their interface with the masonry 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 the masonry than other types of acid.

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.

In sufficient concentrations, hydrofluoric acid can damage masonry as well as other building features. Calculus 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, in sufficient concentration, hydrochloric acid can cause ferrous chloride staining. It can also result in (or exacerbate) efflorescence problems by introducing soluble salts into the masonry.

3. 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 masonry surfaces. Water rinsing is employed to remove the dislodged materials and the alkaline residue. Among the more commonly used alkaline chemicals are: sodium hydroxide (N_aOH); potassium hydroxide (KOH); and ammonium hydroxide (NH_4OH).

Alkaline cleaners can be effective and useful in restoration cleaning programs; however, there are some limitations that should be considered.

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

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.

1. Copies of design plans and specifications for the roof.

2. 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.

3. Copies of construction inspection reports and construction records.

4. A list of all roof maintenance work including:

   a. Results of all inspections;

   b. Location of all repair work;

   c. Materials used for repair work;

   d. Repair costs; and

   e. A history of all problems and complaints involving the roof system.

5. Copies of all warranties, guarantees and/or bonds that were issued for the roof.