Reserve Study
Condominiums at Kirkpatrick Farms (The)

ETC
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January 31, 2013

Cardinal Management Group, Inc.
4330 Prince William Parkway, Suite 201
Woodbridge, Virginia 22192

ATTENTION: Mr. John Adams

SUBJECT: Report of Replacement Reserve Study
Condominiums at Kirkpatrick Farms
Aldie, Virginia
ETC Proposal: M0-1639

Dear Mr. Adams:

Engineering and Technical Consultants, Inc. (ETC) respectfully submits this report of our evaluation services at the above referenced property. This work was performed in accordance with our proposal (PM2-4158), dated July 30, 2012. Written authorization to proceed with the study (signed by Gregory Moulthrop, President of the Board of Directors) was received in our office on August 27, 2012.

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 and cash-flow chart.

Our work was confined to the following elements:

1. Exterior facing systems;
2. Roof coverings;
3. Unit balconies;
4. Fire suppression (sprinkler) systems;
5. Pavement;
6. Foot path;

7. Sidewalks; and,

8. Curb and gutter assemblies.

This report includes a brief summary of background information and, for each of the components inspected, discussions of our findings, comments and recommendations. Some photographs are attached to this report (in Appendix A) to help illustrate certain findings. Compiled in Appendix B is a tabular summary of future capital reserve requirements and a twenty-year cash-flow chart. Included in Appendix C is some general technical information regarding certain elements of the property.

BACKGROUND INFORMATION

The subject property is a residential community comprised of one hundred fifty-eight (158) townhomes. The property was constructed between 2008 and 2010. In 2010 we performed a warranty/transition inspection of the condominium. A written report of that study was submitted on October 29, 2010.

Our findings for this study are based on physical inspections of the property, conducted by staff representatives in September, 2012. Our work did not include sampling or testing of any components and no building plans were provided for our review. Consequently, some evaluations/opinions expressed in this report are based on assumptions regarding such matters as concealed details, construction profile, condition of internal components, etc.

EXTERIOR FACING SYSTEMS

The buildings are primarily faced with brick masonry and vinyl siding. Both natural and synthetic wood is utilized as trim at various locations (windows, doors, fascia and rake boards, etc.). Projecting window bays are clad with panels of unknown composition. Synthetic moldings and architectural embellishments (pediments, pilasters, cornices, etc.) were installed in places.

Observations

The exterior facing systems appeared overall to be in fair condition. The following potential problems and areas of concern were noted.

1. It was determined during our earlier study that leakage had occurred through the exterior facing systems in the vicinity of some window openings. Questionnaires were distributed as part of that study and eleven (11) respondents reported episodes of leakage through window openings under conditions of normal rainfall. It is unknown what, if any steps have been taken to correct those problems.

2. The transitions between brick masonry and the siding, panel cladding and windows are defined by brick rowlocks (ledges) that were partly covered with sheet metal cap flashings. It could not be determined how the cap flashings were terminated behind the external components (masonry, cladding and windows). Most were caulked along both top and bottom interfaces. Normally, the flashings would be counterflashed by building felts/wraps and upper interfaces would provide avenues for water to escape the system. As such, they should not be sealed.

Proper cap flashings (typically fabricated of fairly heavy gauge metal) should have been installed along the tops and at least one inch down the vertical faces of the ledges and be fastened with cleats. A continuous slope away from the wall should be maintained.

3. The siding exhibited planar irregularities (bulges, waviness, etc.) at a few locations. It could not be determined whether these conditions reflect irregularities in the underlying sheathing, improper installation and/or fastening or a combination thereof.

   Vinyl siding moves (expands and contracts) considerably in response to temperature changes and the most common cause of bulging is failure by the installer to allow for such movement. Fasteners (nails) should be located within the center of the elongated nail holes and they should be driven such that a gap remains between the nail head and the siding. That procedure permits unrestricted movement and failure to do so can result in distortion.

4. Some trim elements were clad with sheet metal and it was improperly installed in areas. At some building rakes lower sections of cladding were lapped over the upslope sections (see Photograph 1). That configuration will collect rather than shed water.

5. A number of sealant joints were in poor condition. Cohesive failures (tears) and adhesive failures (bond breaks) were noted in areas (see Photographs 2 and 3). Cohesive failures are usually caused by improperly sized joints (which should be approximately half as deep as they are wide) and/or three-point bonding. Adhesive failures are usually the result of improper preparation (especially cleaning) of the substrate.

Conclusions

Masonry exterior facing systems can generally be expected to remain serviceable for the life of the structure. Periodic major repairs are usually required to assure proper performance and maintain watertight integrity.

Provided that the deficiencies are corrected and that they are properly maintained, the vinyl siding elements should remain serviceable for another twenty (20) twenty-five (25) years. The defective building sealants have reached the end of their serviceable life. The remainder should remain serviceable for another ten (10) to fifteen (15) years. Occasional repairs should be anticipated in the interim.

Recommendations

The issues of leakage at window openings and siding irregularities should be investigated further. That work should include spray testing of problematic areas and removal of involved exterior facing elements (masonry, siding, trim, etc.) to permit inspection of internal components.

Proper cap flashings should be installed at the masonry rowlock ledges. All improperly installed metal cladding on trim elements should be removed and replaced in the proper orientation.

Defective sealants should be removed and replaced with new elastomeric sealant. The new joints should be properly sized with respect to width and depth and appropriate measures should be employed to prevent three-point bonding.

In order for exterior facing systems to achieve maximum life-cycle performance, they must be properly maintained. Presented in Appendix C are some general guidelines for maintaining brick masonry.

ROOF COVERINGS

The main building roofs are double-sloped with a pitch (slope) of approximately six (6) to eight (8) inches per linear foot. Those roof coverings generally consist of asphalt-impregnated, fiberglass-reinforced shingles over fifteen (15) pound felt underlayment. Drainage of surface water is facilitated by gutter and downspout assemblies mounted along the roof edges. Attic ventilation is provided by screened openings (inlets) along the soffits (eaves) and passive outlets mounted along the ridges (peaks) of the roofs.

Water tables (sloped ledges at the gable ends) and the tops of projecting window bays are covered with standing-seam metal.

It was determined during our earlier study that leakage had occurred through some roof coverings. Questionnaires were distributed as part of that study and ten (10) respondents reported episodes of leakage under conditions of normal rainfall. It is unknown what, if any steps have been taken to correct those problems.

Observations

The roof coverings appeared overall to be in relatively good condition. The following potential problems and areas of concern were noted.

1. Shingles were improperly installed and/or damaged at numerous locations.

    a. Numerous shingles were face-nailed, rendering them vulnerable to water intrusion (see Photograph 4).

    b. A number of fasteners were improperly positioned. The involved fasteners were improperly located within or above the self-sealing strip, rendering the shingles vulnerable to wind damage. The fasteners should have been placed below the sealing strips and above the cutouts. Shingle tabs were missing in areas, probably due to improper fastening (see Photograph 5).

    c. The shingle overhang was excessive (as much as three to four inches) in areas (see Photograph 6). The proper overhang is between one-quarter to three-eighths of an inch, which helps protect the roof edges and renders overhanging shingles less susceptible to distortion, wind damage, etc.

2. The flashings around many of the penetrations were not installed in accordance with industry standards (see Photograph 7).

    a. The flashings featured exposed fasteners.

b. The flashings were generally not set in cement.

c. In some instances shingle edges or keyways were aligned with the edges of flashing flanges, rendering them open to possible water intrusion.

The standing-seam metal coverings at the projecting window bays did not appear to be properly flashed at the top edges. The top edges appeared to have been surface-mounted and sealed (caulked) in place. They should have been protected with throughwall or regleted counterflashings. Improperly protected window bay coverings could be the sources of the water intrusion discussed in the Exterior Facing System section of this report. The water tables appeared to be in relatively good condition.

Conclusions

Provided that the deficiencies noted in our transition study inspections were corrected and that the systems are properly maintained, the shingle roof coverings should remain serviceable for up to another fifteen (15) to twenty (20) years. With proper repairs, the standing-seam metal roof coverings could have serviceable lives of up to forty (40) years, or longer. Occasional repairs to all roofs should be anticipated in the interim.

Recommendations

As previously delineated, many roof-related details require repair and/or replacement. Noted deficiencies notwithstanding, we believe that the shingle and metal roof coverings are essentially repairable. Detailed specifications should be developed and the work should be monitored to help assure an appropriate level of workmanship and system performance.

Necessary roof repairs would generally include the following:

1. Removal and replacement of improperly installed, fastened, damaged and/or missing shingles;

2. Trimming of shingles with over three-eighths-inch overhang;

3. Removal and replacement of defective/deficient penetration flashings; and,

4. Installation of proper counterflashings at the utility rooms and projecting window bays.

In order for roofing systems to achieve maximum life-cycle performance, they must be properly maintained. Presented in Appendix C are some general guidelines for maintaining roof coverings.

UNIT BALCONIES

The units feature wood-framed balconies. The decks are comprised of dimensional lumber (wood planks). Fall protection is provided by surface-mounted, wood guardrails. The undersides of the balconies are covered with perforated soffits. What appeared to be clothes dryer vents discharge through the soffits.

Observations

The balcony structures and decking appeared at the time of our inspection to be in good condition. Some dryer vent outlets were loose and/or do not align with the soffit openings, which probably introduces considerable water and lint into the spaces between the balcony decks and the soffits (see Photograph 8). Most of the vented soffits were stained with algae (see Photograph 9).

Soffits below open plank decking can accumulate substantial debris over time and are generally not recommended. The weight of accumulated debris could eventually be sufficient to dislodge panels. Furthermore, wet organic materials in the cavities could foster the growth of mold and other undesirable organisms.

Conclusions

Provided the balconies were properly constructed (particularly with respect to the use of preservative treated lumber) they could remain serviceable for up to twenty-five (25) years. Occasional repairs should be anticipated in the interim.

Recommendations

In our opinion the balcony soffits should be permanently removed and the dryer vents should be relocated to discharge through the exterior walls. At a minimum, the misaligned and loose dryer vent outlets should be remounted.

FIRE PROTECTION SYSTEMS

The fire alarm systems primarily consist of central control modules, graphic annunciator panels, audible alarms and activation devices. The fire alarm systems utilize manual pull stations, sprinkler system flow switches, and flame/smoke detectors as alarm activators. During alarm episodes, annunciator panels display the location of the activated device(s).

Fire protection in conditioned building interiors and unit balconies is provided by fire suppression (sprinkler) systems, which employ water as the suppressant. The systems appeared to have been installed in a "wet-pipe" configuration, wherein water is present in the conductors at all times.

Our inspections of the fire alarm and suppression systems were limited to visual examinations of accessible external elements. No intrusive inspections or system tests were performed.

Observations

At the time of our inspections, no apparent problems were noted with regard to the fire protection systems and none were reported to us. It should be noted, however, that we did not test any system components.

Conclusions

The major elements (conductors) of the sprinkler systems could remain serviceable for up to seventy-five (75) years, or longer. Replacement of water pumps, heads, activation devices, etc. should be anticipated in the interim.

Recommendations

The fire protection systems should be periodically inspected by a qualified service provider. At a minimum, the systems should be serviced annually.

The Condominium Association should establish a policy regarding heating of interior spaces. Specifically, residents should be advised that heating systems should never be turned off or thermostats set too low to provide freeze protection for sprinkler and other water conductors. In our opinion, temperatures below sixty-five (65) degrees, Fahrenheit would be potentially problematic. It is not uncommon for occupants to turn heating systems off or set activation temperatures below safe levels during periods of prolonged absence (such as vacations).

We also recommend that arrangements be made with the electric service provider that the Association be notified of impending service termination (such as for non-payment, unit abandonment or foreclosure, etc.). In such an event, the Association should take steps necessary to ensure continued service and adequate heating of the space to prevent freezing.

ASPHALT PAVEMENT AND FOOT PATH

Vehicular access and surface parking are provided by asphalt paved roadways, alleys, and parking areas. No information was provided to us regarding the construction profile, substrate conditions or other design considerations. An asphalt foot path extends through a portion of the community.

Observations

The asphalt pavement appeared overall to be in good condition. No significant cracking, raveling, slippage or other patent defects were noted; however, problems associated with substandard/deficient design may not manifest for a number of years.

The foot path appeared overall to be in fair condition. Cracks were noted in a number of areas, particularly along path edges (see Photograph 10).

Conclusions

The primary factors to consider in projecting life-cycle performance of the pavement are 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 soil properties and other design factors, we can only surmise that the pavement was properly designed and placed. Accordingly, the pavement should have a remaining serviceable life of fifteen to twenty years.

Significant repairs should be anticipated in the interim. This assessment is also based on the premise that rehabilitation (overlayment) will be performed at a financially advantageous time. The cost to place a properly executed overlay depends upon the condition of the existing pavement.

Distressed areas must be repaired prior to placement and the cost of proper repairs can be as much as twice the cost (per square yard) of that to place the overlay. Therefore, the more repairs that are necessary, the more the overall cost for the overlay. Accordingly, pavements are normally rehabilitated at a time when substantially less than fifty percent of the asphalt exhibits significant distress.

Asphalt foot paths of the type at this property typically have serviceable lives of ten (10) to fifteen (15) years. The edge cracking is likely progressive; therefore, a life cycle at the lower end of that range is projected.

In order for asphalt pavement to achieve maximum life-cycle performance, it must be properly maintained. Presented in Appendix C are some general guidelines for maintaining asphalt pavement.

SIDEWALKS AND CURB AND GUTTER ASSEMBLIES

Concrete sidewalks extend around the perimeter of the paved elements and lead to building entrances. Drainage of surface water in the paved areas is facilitated by concrete curb and gutter assemblies that discharge into a stormwater management system.

Observations

The concrete sidewalk and curb and gutter assemblies appeared overall to be in fair to good condition. Cracked/broken sections of concrete were noted in areas (see Photograph 11) and substandard repairs were executed in some instances. What appeared to be an elastomeric sealant was applied at sections of broken/chipped concrete and the material does not match the concrete with respect to color or texture (see Photograph 12).

Discussion

There are many factors that could have an impact on the serviceable lives of the concrete paved elements and all should be considered when projecting life-cycle estimates. Foremost among those factors is the construction profile (thickness, reinforcement and concrete mix). Our inspections did not include any sampling or analysis of the concrete, nor were we provided any information regarding profile; therefore, our projections are based only on "typical" construction practices.

The stability of the substrate (soil) is also a major factor. Movement (settlement) of the substrate can result in cracks and/or uneven displacement. Site drainage characteristics could also influence the useful lives of the concrete and asphalt components. Deficient drainage could contribute to undermining of the substrate as well as frost heaving.

Improper ice removal procedures could damage concrete 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.

Tree roots can severely damage concrete and asphalt. As the roots expand they can exert sufficient pressure to break and/or heave sidewalks, curb and gutter assemblies, pavement, etc. It is common practice to remove tree roots during concrete replacement projects; however, caution should be exercised. Removing or damaging major roots (particularly those within the drip line of the tree canopy) could render trees unstable and vulnerable to toppling. An arborist should be consulted before removing structural roots.

Conclusions

Based on observable conditions, we project a remaining serviceable life of approximately forty-five (45) to fifty (50) years for the concrete sidewalks. Some elements may fail within the first five (5) years; others may remain serviceable well beyond fifty (50) years.

Recommendations

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

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.

Care should be taken with ice-control measures to minimize damage from deicing agents. If destructive materials are used (such as calcium chloride), they should be broadcast evenly and sparingly over the sidewalks to partially melt ice and thin layers of compacted snow so that it can be easily removed by mechanical methods (shovel, scraper etc.).

Chemicals should not be used for snow removal. When conditions permit, the residual chemicals should be rinsed or swept from the surface. It should be noted that many control agents can also damage plant life and contaminate the soil for a year or longer.

FINAL COMMENTS

Although our evaluation was confined to visual examination of exposed surfaces, we believe it was sufficient for us to form a reasonable judgment of the existing general conditions. In addition, our findings regarding specific defects do not include locations of all similar conditions throughout the project.

The attached photographs (Appendix A) and repair/replacement reserve schedule and cash-flow chart (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 Association with future repairs and maintenance.

We strongly recommend that a comprehensive preventive maintenance program be designed and implemented as soon as possible. Without question, preventive maintenance affords substantial financial benefits. Qualified specialty consultants should be retained for this project to:

- Identify and inventory all maintenance worthy elements;

- Specify explicit procedures (tasks);
- Specify materials;
- Specify task frequency; and
- Develop a periodic schedule.

To be effective, any program must be routinely monitored by management. This can be accomplished either directly or through specialty services.

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 are allowed to 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), 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 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 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.

Patrick E. Gray, RS
Senior Project Manager

APPENDICES: A – Photographs
B - Repair/Replacement Reserve Schedule and Cash-Flow Chart
C - Supplementary Technical Information

APPENDIX A

PHOTOGRAPHS

Photograph 1 – Improperly lapped trim cladding.

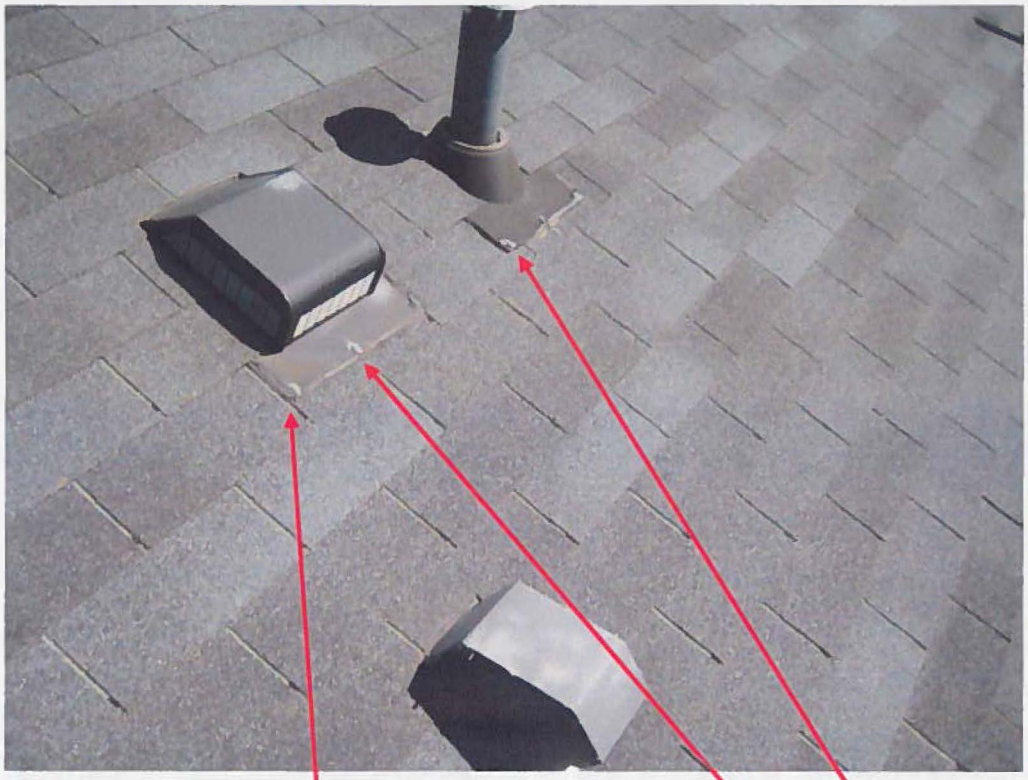
Photograph 2 – Torn sealant.

Photograph 3 – Debonded sealant.

Photograph 4 – Face-nailed shingle.

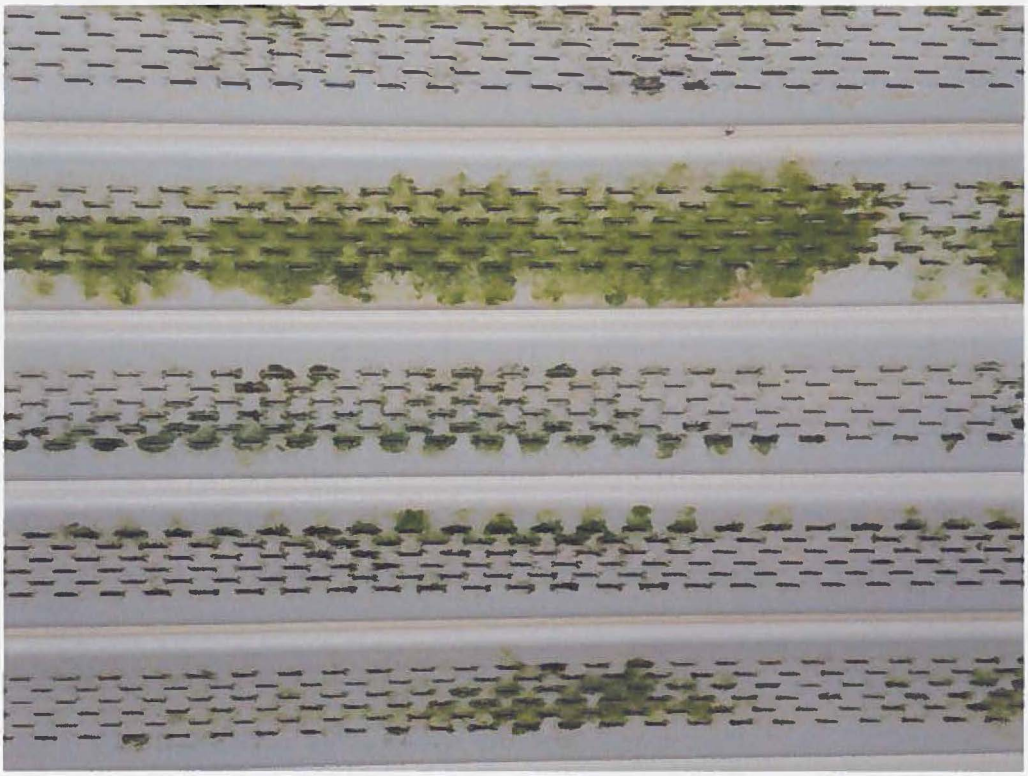
Photograph 5 – Wind damaged shingles.

Photograph 6 – Shingles distorted due to excessive overhang.



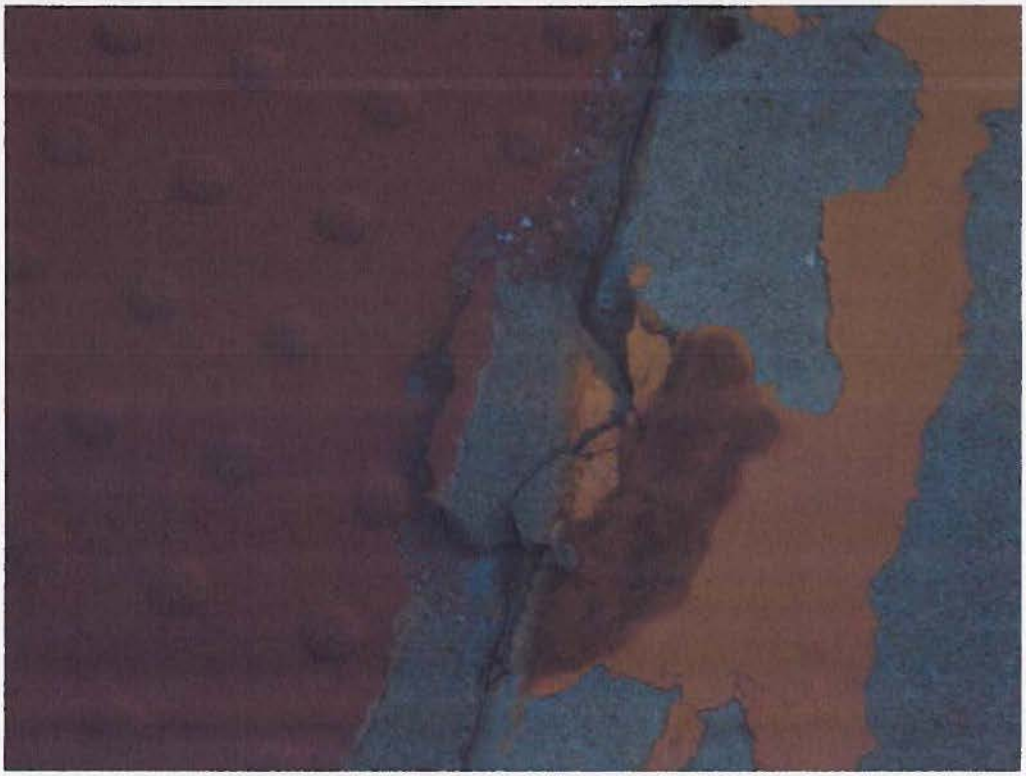
Photograph 7 – Improperly aligned and face-nailed penetration flashings.

Photograph 8 – Loose dryer vent at balcony soffit.



Photograph 9 – Algae staining on balcony soffit.

Photograph 10 – Cracked asphalt at foot path.



Photograph 11 – Broken concrete sidewalk.

Photograph 12 – Substandard/unsightly repair at concrete sidewalk.

APPENDIX B

REPAIR/REPLACEMENT RESERVE SCHEDULE AND CASH-FLOW CHART

REPAIR/REPLACEMENT RESERVE SCHEDULE AND CASH-FLOW CHART

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 (2013) U.S. dollars. 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 amounts shown on the reserve schedule and cash-flow chart reflect no inflationary factors.

According to information provided to us, a total of $146,901.00 was available in reserves as of August 31, 2012. 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 2013 and 2032. Reserves are currently funded at the rate of $55,000.00 per year. Balances do not include any interest income for funds held in interest bearing instruments.

The proposed reserve analysis should be reevaluated on a regular basis. Real property is dynamic by nature and economic conditions are often subject to vast fluctuations. Therefore, 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.

Finally, it should be noted that the reserve schedule and cash-flow chart are not intended to be autonomous documents. They are key elements of our investigative report and represent a partial summation of our conclusions. Taken out of context, the information contained solely within the reserve schedule and cash-flow chart must be considered incomplete.

APPENDIX B
REPAIR/REPLACEMENT RESERVE SCHEDULE
CONDOMINIUMS AT KIRKPATRICK FARMS
ALDIE, VIRGINIA
ETC PROJECT M0-1639

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		
I. Roof Coverings											
- Main	A	Shingle	sf	155,000	Good	25	21	$ 5	$ 775,000	$ 32,343	$ 35,365
- Bay/Water Table	A	Metal	sf	5,000	Good	50	46	$ 25	$ 125,000	$ 5,217	$ 2,604
II. Exterior Facing Systems											
- Masonry	B	Brick	ls		Good	50	46		$ 395,000	$ 16,485	$ 8,229
- Siding		Vinyl	ls		Good	30	26		$ 475,000	$ 19,823	$ 17,507
- Sealants	A	Elastomeric	ls		Good	20	16		$ 160,000	$ 6,677	$ 9,583
III. Balconies		Wood	ea	148	Good	50	46	$ 5,000	$ 740,000	$ 30,883	$ 15,416
IV. Fire Protection Systems											
- Alarm		Annunciator	ls		Unknown	25	21		$ 50,000	$ 2,087	$ 2,282
- Suppression		Water	ls		Unknown	75	71		$ 800,000	$ 33,387	$ 10,797
V. Pavement		Asphalt	sy	12,000	Good	20	18	$ 20	$ 240,000	$ 10,016	$ 12,777
VI. Foot Path		Asphalt	sy	1,000	Fair	10	8	$ 25	$ 25,000	$ 1,043	$ 2,995
VII. Sidewalks	B	Concrete	sf	8,500	Good	50	46	$ 10	$ 85,000	$ 3,547	$ 1,771
VIII. Curb and Gutter	B	Concrete	lf	6,500	Good	50	46	$ 28	$ 182,000	$ 7,595	$ 3,791
Totals									$ 3,520,000	$ 146,901	$ 101,781

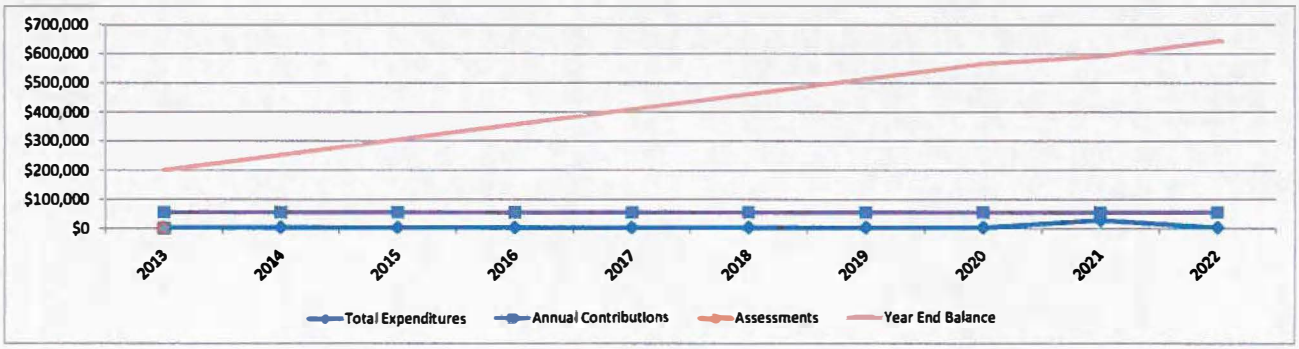
Notes:

A. Cost/life cycle estimates assume immediate completion of recommended short-term repair/replacement/modifications.

B. Estimated cost for cyclical repairs, not total replacement

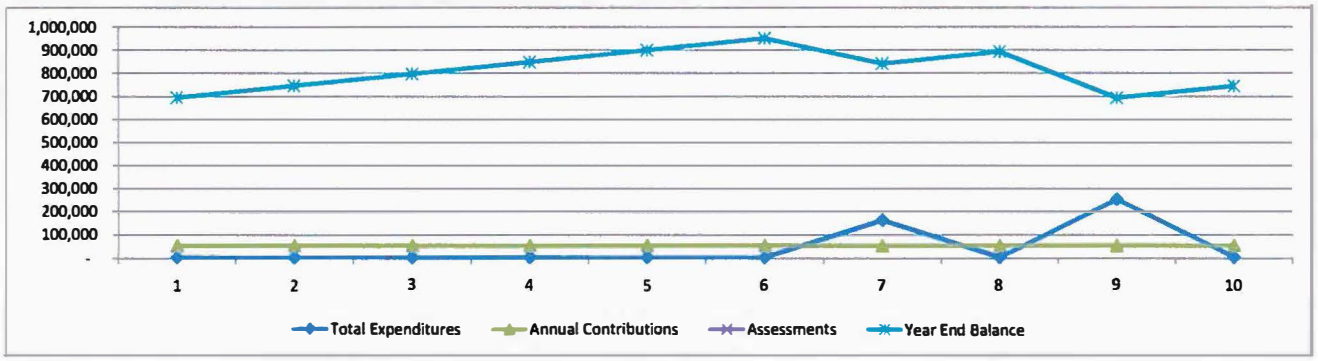
APPENDIX B
CASH FLOW CHART
KIRKPATRICK FARMS CONDOMINIUM
ALDIE, VIRGINIA
ETC PROJECT M0-1639
1/31/2013

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
ROOF COVERINGS										
EXTERIOR FACING										
BALCONIES										
FIRE ALARMS										
SPRINKLER SYTEMS										
PAVEMENT										
FOOT PATH									25,000	
SIDEWALK										
CURB AND GUTTER										
MISCELLANEOUS	2,500	2,575	2,652	2,732	2,814	2,898	2,985	3,075	3,167	3,262
Total Expenditures	2,500	2,575	2,652	2,732	2,814	2,898	2,985	3,075	28,167	3,262
Beginning Balance	146,901	199,401	251,826	304,174	356,442	408,628	460,730	512,745	564,670	591,503
Annual Contributions	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000
Assessments										
Year End Balance	199,401	251,826	304,174	356,442	408,628	460,730	512,745	564,670	591,503	643,241



APPENDIX B
CASH FLOW CHART
KIRKPATRICK FARMS CONDOMINIUM
ALDIE, VIRGINIA
ETC PROJECT M0-1639
1/31/2013

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ROOF COVERINGS										
EXTERIOR FACING							160,000			
BALCONIES										
FIRE ALARMS										
SPRINKLER SYTEMS										
PAVEMENT									240,000	
FOOT PATH									5,000	
SIDEWALK									5,000	
CURB AND GUTTER										
MISCELLANEOUS	3,360	3,461	3,564	3,671	3,781	3,895	4,012	4,132	4,256	4,384
Total Expenditures	3,360	3,461	3,564	3,671	3,781	3,895	164,012	4,132	254,256	4,384
Beginning Balance	643,241	694,882	746,421	797,857	849,185	900,404	951,509	842,497	893,365	694,109
Annual Contributions	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000
Assessments										
Year End Balance	694,882	746,421	797,857	849,185	900,404	951,509	842,497	893,365	694,109	744,725



APPENDIX C

SUPPLEMENTARY TECHNICAL INFORMATION

APPENDIX C
SUPPLEMENTARY TECHNICAL INFORMATION

PAGE(S)	SUBJECT	REFERENCES
2-4	Roof Maintenance	Joseph D. Shuffleton, P.E.
5-6	Masonry Maintenance	Joseph D. Shuffleton, P.E.
7	Pavement	Various sources including the Maryland Asphalt Association Association and The Asphalt Institute.

ROOF MAINTENANCE

Competent inspection and repair can dramatically extend the serviceable life of a roof system. With proper guidance, minimal efforts and expense can yield big dividends in terms of greatly 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 readily be trained to do 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 of the basic items that should be inspected are listed below. It is important to remember that a special listing of items should be developed for each individual roof.

SHINGLE OR SHAKE ROOFS - SLOPED

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.

BUILT-UP OR SINGLE-PLY ROOFS - 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.
- 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

1. Roof Penetrations - Pipes, vents, etc., should be tightly sealed.
2. Hips and Ridges - All should be tightly fastened and sealed.
3. 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.

- 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:
    - Results of all inspections;

- Location of all repair work;
- Materials used for repair work;
- Repair costs; and
- 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.

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.

- Stains - Discoloration or staining frequently indicates that a problem exists. All such instances should be identified and the cause(s) determined.
    - Regular cleaning of the masonry also helps to expose hidden defects.
    - 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.
- 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.
- Sealant Replacement - Areas of missing, cracked, or deteriorated sealant (caulk) should be properly repaired.
    - 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.
    - 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.
- Repointing - Deteriorated, cracked, or open mortar joints should be cut out and properly refilled (repointed) with mortar.
    - 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.

- Proper exterior cleaning will normally help identify areas requiring repointing.
- that the color of the mortar will match the existing conditions.
- design and existing mortar properties.

- Broken Units - All cracked, broken, or loose masonry units should be removed and replaced as soon as possible. In addition to allowing water penetration (which will inevitably cause more damage), the possibility of falling debris obviously presents a significant risk exposure.
  - The cause of the deterioration should always be determined so that proper repairs can be made. Simply replacing the affected units may just lead to recurrence of the problem.
  - Samples of replacement units should always be provided before work is started so that one can be certain that the appearance of the new units will match existing conditions.

- Flashings and Weepholes - Most walls are designed with a type of gutter (flashing) system to collect and discharge miscellaneous water (through holes, called weeps) that gets into the wall system.
  - Visual inspection of the exterior cannot fully determine the conditions of flashings within the wall. If interior leakage problems are being experienced, masonry units should be removed in a few areas so that the flashings can be inspected and needed repairs made.
  - Weepholes should be checked regularly and, if they are blocked or clogged, they should be carefully opened. Extreme caution must be taken not to damage the flashing inside the wall.

- Coatings/Sealers - Masonry walls do not normally require coatings or sealers to make them watertight. In a few rare cases, it may be desirable to use a coating or sealer. However, this should only be done with extreme caution, under the guidance of a qualified masonry restoration consultant or contractor, and after test samples prove effective.

These guidelines serve as only a general listing of items to be inspected, maintained and repaired. A qualified contractor, engineer or consultant can provide invaluable assistance in developing a detailed inspection checklist for specific use on a particular property.

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 (1) 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 accompanied 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 that 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 serviceable life of the system an additional ten (10) to fifteen (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 two (2) inches along the gutter joints, tapering to zero (0) inches five (5) feet in toward the center. This method helps assure a uniform two (2) 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 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 a coal-tar emulsion as soon as possible after the asphalt has cured (60 to 90 days). The seal coat will help to protect against both water intrusion and attack by automotive fluids.