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March 30, 2015

Birchfield Woods Cluster Association
1560 Poplar Grove Drive
Reston, Virginia 20194

ATTENTION: Mr. Mike Madden

SUBJECT: Report of Replacement Reserve Study
Birchfield Woods Cluster Association
Reston, Virginia
ETC Project M4-2419

Dear Mr. Madden:

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 (PM4-4868) dated June 16, 2014. Written authorization to proceed with the work (signed by you) was received in our office on June 19, 2014.

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. Pavement;
2. Concrete site elements;
3. Foot Path;
4. Tot-lot;
5. Retaining walls;
6. Entrance sign; and,
7. Exterior common area lighting.

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. We have also compiled (in Appendix B) a tabular summary of future capital reserve requirements and a cash-flow chart that tracks anticipated disbursements and contributions to reserves. Provided in Appendix C is some general technical information regarding certain elements of the property.

BACKGROUND INFORMATION

Birchfield Woods Cluster Association is a residential community consisting of nineteen (19) buildings that enclose a total of one hundred (100) townhomes. We understand the community was developed around 1986.

Our findings are based on physical inspections of the property conducted between June and August 2014. Our services did not include any intrusive inspection or analysis and no construction plans were provided for our review. Consequently, some evaluations/opinions expressed in this report are based upon assumptions regarding such matters as concealed construction details, construction profile, condition of internal components, etc.

PAVEMENT

Vehicular access and parking are provided by asphalt-paved roadways and parking areas. Surface drainage is facilitated by concrete curb and gutter assemblies that discharge into the storm sewer.

Observations

The asphalt pavement appeared at the time of our inspection to be in fair to poor condition. Simple (unconnected) cracking was noted in numerous locations areas and interconnected cracking was widespread (see Photograph 1). Interconnected cracks typically constitute broken pavement and the broken pieces will eventually dislodge, forming potholes.

Damage from petroleum-based automotive fluids (gasoline, oil, diesel fuel, etc.) was noted in numerous locations throughout the community (see Photograph 2). Asphalt is a byproduct of crude oil refinement and vulnerable to attack by other petroleum products.

Conclusions

In our opinion, the pavement is nearing the end of its serviceable life. It can possibly be utilized for up to another three (3) to four (4) years; however, the added expense to do so could be considerable. 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 two (2) to three (3) times higher (per square yard) than the cost 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 (50%) of the asphalt exhibits significant distress. When the extent of deterioration passes a certain point, there are no financial advantages in overlayment.

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 placing an asphalt overlay as well as general maintenance guidelines.

Recommendations

In our opinion, the paved elements should be overlain in the within the next three (3) to five (5) years. This work could be deferred for another six (6) to eight (8) years; however, the expense to do so could be considerable. It should be noted that some interim repairs (such as filling potholes as they occur) could be necessary to limit potential for personal injury and vehicle damage.

CONCRETE SIDEWALKS AND CURB AND GUTTER ASSEMBLIES

Concrete sidewalks extend around the perimeter of the paved elements and individually-owned sidewalks lead to unit entrances. Concrete curb and gutter assemblies surround the asphalt-paved areas and facilitate drainage of surface water in those locations.

Observations

The concrete sidewalks appeared overall to be in reasonably good condition. Cracked and chipped concrete was observed in a number of locations throughout the property (see Photograph 3). Sections of concrete sidewalk were also displaced (sunken or heaved) and some of those conditions present potential tripping hazards.

The concrete curb and gutter assemblies appeared overall to be in relatively good condition. Broken concrete was noted in areas (see Photographs 4 and 5). At least some of that damage could have been inflicted by snow plowing operations.

The curb and gutter assembly and nearby pavement was settled at one location (between Units 1618 and 1622) that corresponds to a storm water inlet (see Photograph 6). That displacement could be due to sub-surface erosion through defects in the storm water collection vault.

Discussion

There are many factors that could impact on the serviceable lives of the 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 assessments 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.

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.

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, curb/gutter, and/or landing systems that exhibit conditions which could currently be considered hazardous or could deteriorate to hazardous in the near future.

Conclusions

Based on observable conditions and anticipated short-term repairs and replacements, we project a remaining serviceable life of approximately twenty to (20) to twenty-five (25) years for the concrete elements. Some elements may fail within the first five (5) years; others may remain serviceable well beyond twenty-five (25) years. Interim repairs and replacements should be anticipated. Life-cycle estimates are only intended to help assure that funds in reserve will meet ongoing needs.

Recommendations

The concrete sidewalk and curb and gutter assemblies 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).

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 serious damage that should be properly repaired. Surface treatments, patching, and other expedient methods are not recommended, as they generally prove ineffective in the long term. Therefore, total replacement of damaged concrete sections should be undertaken.

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.

FOOT PATHS

Asphalt foot paths extend through portions of the community. A timber stair assembly extends from a public sidewalk along Lake Newport Road and leads to the path.

Observations

The asphalt foot paths were in fair condition overall. Some sections were uplifted by tree roots, creating potential tripping hazards (see Photograph 7). The asphalt was also cracked/broken in areas (see Photograph 8). Plant growth was noted in some cracks (see Photograph 9). Plant growth can exert sufficient pressure to widen cracks.

The timber stair assembly appeared to be in relatively good condition. Sounding of the timbers with a hammer indicated possible early stages of internal decay (rotting) of some timbers.

Conclusions

In our opinion, the foot path pavement is nearing the end of its serviceable life. It can possibly be utilized for up to another six (6) to eight (8) years; however, some conditions (such as trip hazards created by root uplift) are likely to worsen over that time. The timber stair assembly could remain serviceable for another five (5) to seven (7) years.

Recommendations

The foot path should be routinely inspected and repaired as needed. Of particular concern are potential tripping hazards. Where tree roots intrude beneath the path, they should be cut and root barrier should be installed. An arborist should be consulted before cutting major roots. Plants should be removed from cracks and the cracks should be sealed to discourage future growth.

TOT-LOT

The tot-lot features timber-framed equipment, including a climbing apparatus, with a steel sliding board, along with a teeter-totter, and a freestanding swing set. The area is enclosed by landscaping timbers.

Observations

The tot-lot equipment appeared overall to be in poor condition. A number of timbers exhibited decay (see Photograph 10) and some timbers were splintered. The equipment was also aged and lacking in certain safety features found in newer equipment.

The resilient surfacing (wood chips) was missing in most areas. Wood chips, mulch, or other materials are normally placed around tot-lot equipment to provide some cushioning in the event of a fall.

The landscaping timbers enclosing the tot-lot were in poor condition. Advanced decay was noted on most (see Photograph 11) and some sections were displaced (uplifted) by tree roots (see Photograph 12).

Conclusions

In our opinion, the tot-lot equipment has reached the end of its serviceable life. Some conditions (such as splintering) are potentially hazardous.

Recommendations

The tot-lot equipment should be removed and replaced at the earliest opportunity. The new equipment should be periodically inspected and maintained. Presented in Appendix C are some general inspection and maintenance guidelines. Additional information can be obtained from the Consumer Products Safety Commission.

RETAINING WALLS

There are timber retaining walls at some locations. Some retaining walls appeared to be at least twenty (20) years old and others appeared to be relatively new (less than five years old). No information was provided to us regarding retaining wall design. No legible stamps were noted identifying the wood as preservative-treated.

Observations

The visible elements of the older retaining walls were in fair condition. Severe checking and splintering were noted in areas (see Photograph 13). Some minor rotation (deviation from plumb) was also observed. The newer walls appeared to be in reasonably good condition.

Conclusions

The older retaining walls could remain serviceable for another five (5) to ten (100) years. Provided they were properly designed and constructed, the newer retaining walls should remain serviceable for another twenty-five (25) to thirty (30) years.

ENTRANCE SIGN

The main entrance to the community is defined by a wood sign. The legend was created by sand-blasting away the background.

Observations

The entrance sign appeared overall to be in good condition. The assembly appeared to be fairly new (less than five years old).

Conclusions

Provided that it is properly maintained, the entrance sign could remain serviceable for up to another twenty (20) years, or longer. The assembly should be repainted every three (3) to five (5) years.

EXTERIOR COMMON AREA LIGHTING

The parking lots and primary pedestrian areas are illuminated by pole-mounted luminaires that utilize high-intensity-discharge (HID) sources. The devices appear to be controlled by photovoltaic cells.

Observations

The exterior lighting provisions were inspected during non-operational (daylight) hours and we cannot comment on the operation of individual fixtures. The lighting system appeared to provide reduced illumination in areas, due in part to obstruction by leaves of nearby trees.

Paint coverage on the posts was poor and corrosion (rusting) of posts was widespread (see Photograph 14). Galvanized steel electrical conduits serving the lights were also corroded.

Conclusions

Luminaires of the type installed at this property can normally be expected to have useful lives of up to thirty (30) to forty (40) years; however, improvements in energy efficiency have rendered most HID devices economically obsolete. Light-emitting-diode (LED) luminaires are among the most efficient currently available and represent a substantial improvement over HID lighting. In addition to better efficacy (more lumens per watt of energy), the lamps are far longer-lived and do not require ballasts.

Recommendations

In our opinion, the HID luminaires should probably be removed and replaced with LED fixtures. The services of a lighting engineer should be retained to better evaluate the financial benefits and design an appropriate system. The electrical conduits and conductors should probably be replaced at the same time.

SITE DRAINAGE/EROSION

Wooded areas are located at the rears of the buildings, the terrain of which is steeply sloped (see Photograph 15). Gutter and downspout assemblies deposit storm water on grade in most areas. Swales direct storm water towards the steeply sloped areas at the rears of the buildings.

Observations

Bare areas of ground were observed in numerous locations and were typically observed in areas shaded by trees (see Photograph 16). The ground in these areas was moderately eroded and tree roots were exposed in most instances. The erosion in these areas is probably due to the lack of vegetation and the flow of storm water.

Steeply sloped terrain was located close to backyards in some instances. Overtime, the grounds adjacent to these areas could erode due to the lack of ground cover and the flow of storm water.

Recommendations

Ground cover that thrives in shady conditions (such as periwinkle) should be planted in the bare areas and on the faces of the steeply sloped areas to help reduce erosion. The installation of a subsurface drainage system, of which all downspouts, condensate lines, sump pump piping, etc. are tied into would be beneficial as it would reduce the flow of storm water.

If erosion adjacent to the steeply sloped terrain worsens then construction of retaining walls may be required in the future. These areas should be inspected periodically to determine whether erosion is occurring.

FINAL COMMENTS

The attached photographs (in Appendix A), repair/replacement reserve schedule and cash-flow charts (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 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 material;
- 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.

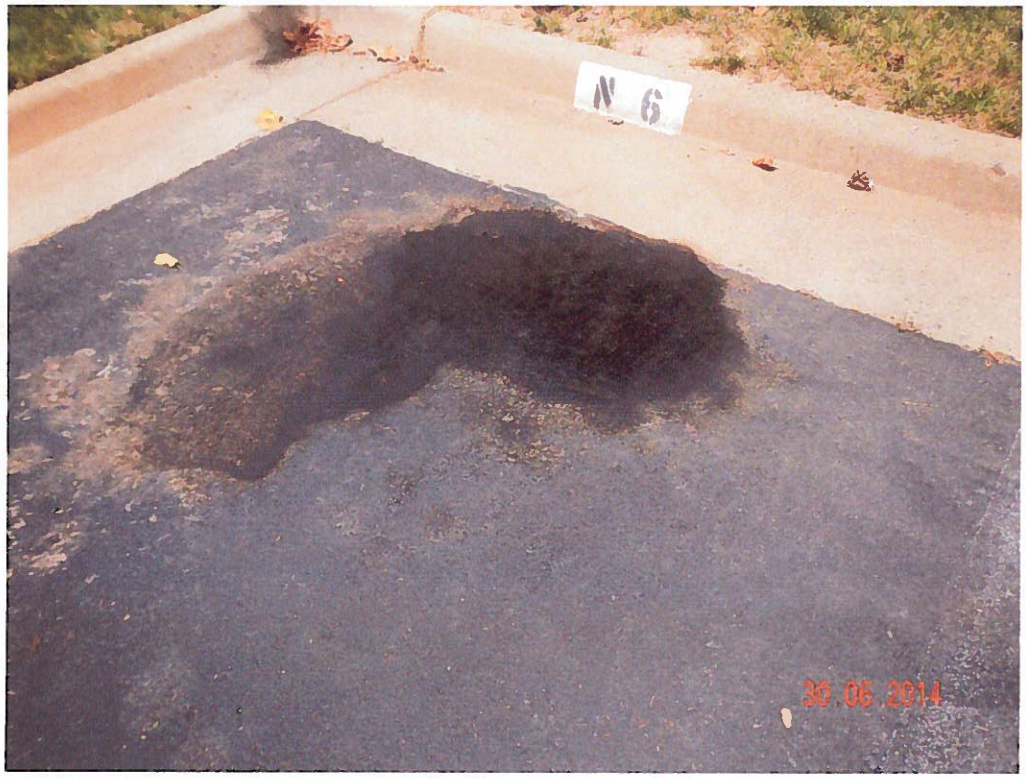
Kyle P. Parsons, RS
Project Manager

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

APPENDIX A

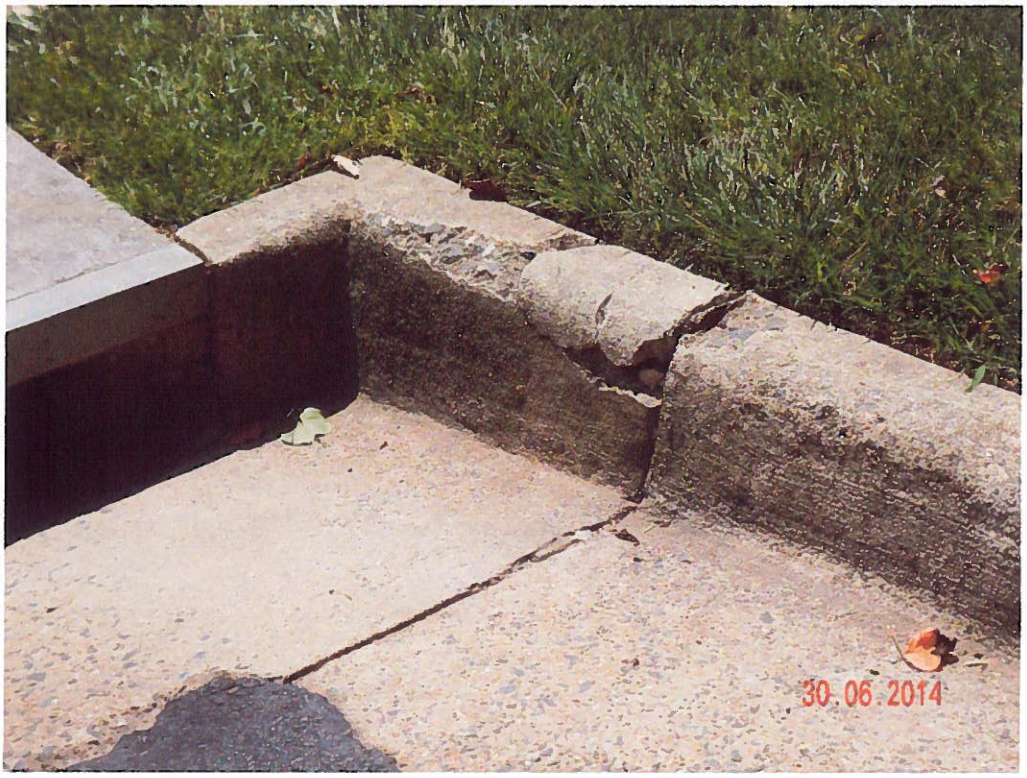
PHOTOGRAPHS

Photograph 1 – Interconnected cracking in asphalt pavement.



Photograph 2 – Automotive fluid on asphalt pavement.

Photograph 3 - Crack in concrete sidewalk.



Photograph 4 – Broken curb and gutter assembly.

Photograph 5 – Broken curb and gutter assembly.

Photograph 6 – Sunken pavement and curb and gutter at storm water inlet.

Photograph 7 – Asphalt foot path uplifted by tree root.

Photograph 8 – Cracked, broken asphalt foot path.

Photograph 9 – Plants in cracked asphalt foot path.

Photograph 10 – Decayed equipment support timber at tot-lot.

Photograph 11 – Decayed landscaping timber at tot-lot.

Photograph 12 – Uplifted landscaping timber at tot-lot.

Photograph 13 – Severely checked/splintered retaining wall timber.

Photograph 14 – Typical rusted light post and electrical conduit.

Photograph 15 – Steeply sloped terrain at the rears of the buildings.

Photograph 16 – Bare areas in terrain.

APPENDIX B

REPAIR/REPLACEMENT RESERVE SCHEDULE

APPENDIX B
REPAIR/REPLACEMENT RESERVE SCHEDULE AND CASH-FLOW CHART
BIRCHFIELD WOODS CLUSTER ASSOCIATION
ETC PROJECT M4-2419

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 (2014) U.S. dollars. Accordingly, some accommodation should be made for normal cost increases, by either factoring in annual increases at some reasonable rate (such as three percent 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 information provided to us, approximately $97,724.62 was available in reserves as of July 31, 2014. That amount was distributed as available funds among the elements on the reserve schedule.

The attached cash flow table delineates recommended minimum contributions and anticipated disbursements relative to replacement reserves between 2015 and 2034. Reserves are currently funded at the rate of $13,964.00 per year. In our opinion, continued funding at that rate could result in substantial shortfalls beginning around fiscal year 2025. Alternate A reflects the July 31, 2014 balance and continued funding at current levels. Alternate B assumes funding according to the component method. Alternate B assumes annual five percent (5.0%) increases through 2024.

APPENDIX B
REPAIR/REPLACEMENT RESERVE SCHEDULE AND CASH-FLOW CHART
BIRCHFIELD WOODS CLUSTER ASSOCIATION
ETC PROJECT M4-2419

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 information should be assessed annually if pertinent economic changes are to be accurately reflected. 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
BIRCHFIELD WOODS CLUSTER ASSOCATION
RESTON, VIRGINIA
ETC PROJECT M4-2419

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. Pavement	A, B	Asphalt	sy	9,200	Poor	20	8	$ 15	$ 138,000	$ 39,900	$ 12,263
II. Curb and Gutter	C	Concrete	al		Good	50	20	$ 28	$ 20,000	$ 5,783	$ 711
III. Sidewalks	C	Concrete	al		Good	50	20	$ 8	$ 30,000	$ 8,674	$ 1,066
IV. Foot Paths											
- Pavement		Asphalt	sy	200	Fair	15	8	$ 30	$ 6,000	$ 1,735	$ 533
- Stair Assembly		Timber	ls		Fair	20	8	$ 2,500	$ 2,500	$ 723	$ 222
V. Tot-Lot		Timber	ls		Poor	30	3		$ 20,000	$ 5,783	$ 4,739
VI. Retaining Walls											
- Older Walls	A	Timber	lf	200	Fair	30	10	$ 250	$ 50,000	$ 14,456	$ 3,554
- Newer Walls		Timber	lf	200	Good	30	25	$ 250	$ 50,000	$ 14,456	$ 1,422
VII. Entrance Sign		Wood	ls		Good	25	22		$ 1,500	$ 434	$ 48
VIII. Exterior Lighting	C	HID	al		Fair	35	20		$ 20,000	$ 5,783	$ 711
Totals									$ 338,000	$ 97,725	$ 25,270

A. Cost/life cycle estimates assume immediate completion of recommended short-term repair/replacement/modifications.
B. Estimated cost to place two (2) inch thick (compacted) asphalt overlay
C. Estimated cost for cyclical repairs, not total replacement

APPENDIX B
CASH FLOW CHART
BIRCHFIELD WOODS CLUSTER ASSOCIATION
RESTON, VIRGINIA
ETC PROJECT M4-2419
3/30/2015

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Pavement	10,000							77,000	77,000	
Curb and Gutter								1,500	1,500	
Sidewalk								1,500	1,500	
Foot Path									6,000	
Tot-lot	20,000									
Retaining Walls										25,000
Entrance Sign										
Exterior Lighting					5,000					5,000
Miscellaneous										
Total Expenditures	30,000	-	-	-	5,000	-	-	80,000	86,000	30,000

Alternate A - Current Funding

Beginning Balance	102,499	86,463	100,427	114,391	128,355	137,319	151,283	165,247	99,211	27,175
Annual Contributions	13,964	13,964	13,964	13,964	13,964	13,964	13,964	13,964	13,964	13,964
Assessments										
Year End Balance	**86,463**	**100,427**	**114,391**	**128,355**	**137,319**	**151,283**	**165,247**	**99,211**	**27,175**	**11,139**

Alternate B - Component Method Funding

Beginning Balance	102,499	86,463	111,733	137,002	162,272	182,542	207,811	233,081	178,350	117,620
Annual Contributions	13,964	25,270	25,270	25,270	25,270	25,270	25,270	25,270	25,270	25,270
Assessments										
Year End Balance	**86,463**	**111,733**	**137,002**	**162,272**	**182,542**	**207,811**	**233,081**	**178,350**	**117,620**	**112,890**

Alternate C - Funding - Ongoing annual increases of 5% through 2024

Beginning Balance	102,499	86,463	101,125	116,521	132,686	144,659	162,481	181,194	120,843	55,474
Annual Contributions	13,964	14,662	15,395	16,165	16,973	17,822	18,713	19,649	20,631	21,663
Assessments										
Year End Balance	**86,463**	**101,125**	**116,521**	**132,686**	**144,659**	**162,481**	**181,194**	**120,843**	**55,474**	**47,137**

APPENDIX B
CASH FLOW CHART
BIRCHFIELD WOODS CLUSTER ASSOCIATION
RESTON, VIRGINIA
ETC PROJECT M4-2419
3/30/2015

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Pavement										
Curb and Gutter			4,000					4,000		4,000
Sidewalk			3,000					3,000		3,000
Foot Path										
Tot-lot										
Retaining Walls	25,000									
Entrance Sign										
Exterior Lighting					5,000					5,000
Miscellaneous	-	-	-	-	-	-	-	-	-	-
Total Expenditures	25,000	-	7,000	-	5,000	-	-	7,000	-	12,000

Alternate A - Current Funding

Beginning Balance	11,139	103	14,067	21,031	34,995	43,959	57,923	71,887	78,851	92,815
Annual Contributions	13,964	13,964	13,964	13,964	13,964	13,964	13,964	13,964	13,964	13,964
Assessments										
Year End Balance	**103**	**14,067**	**21,031**	**34,995**	**43,959**	**57,923**	**71,887**	**78,851**	**92,815**	**94,779**

Alternate B - Component Method Funding

Beginning Balance	112,890	113,159	138,429	156,699	181,968	202,238	227,508	252,777	271,047	296,317
Annual Contributions	25,270	25,270	25,270	25,270	25,270	25,270	25,270	25,270	25,270	25,270
Assessments										
Year End Balance	**113,159**	**138,429**	**156,699**	**181,968**	**202,238**	**227,508**	**252,777**	**271,047**	**296,317**	**309,586**

Alternate C - Funding - Ongoing annual increases of 20% through 2019

Beginning Balance	47,137	68,696	76,292	76,924	63,592	41,295	5,035	(45,189)	(102,377)	(173,530)
Annual Contributions	21,663	21,663	21,663	21,663	21,663	21,663	21,663	21,663	21,663	21,663
Assessments										
Year End Balance	**68,696**	**76,292**	**76,924**	**63,592**	**41,295**	**5,035**	**(45,189)**	**(102,377)**	**(173,530)**	**(246,646)**

APPENDIX C

SUPPLEMENTARY TECHNICAL INFORMATION

APPENDIX C
SUPPLEMENTARY TECHNICAL INFORMATION

PAGE(S)	SUBJECT	REFERENCES
1	Pavement	Various sources, including the Virginia Asphalt Association Association and The Asphalt Institute.
2	Tot-Lots	Patrick E. Gray

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.

TOT LOTS

Presented below are some general guidelines for inspection and maintenance of the tot lots and associated equipment. These recommendations do not constitute a "safety program" and should not be construed as such.

Grounds - The tot lot grounds should be frequently and closely inspected for and cleared of potential hazards. Visible hazards (glass, nails, etc.) should obviously be removed immediately and the mulch beds should be periodically raked and turned to reveal any hidden hazards. The grounds (and surrounds) should also be inspected for and cleared of potentially harmful plant life (certain fungi, poison ivy, brambles, etc.). The surfacing material (wood chips, mulch, etc.) should be maintained at appropriate depths.

Fasteners - All bolts, screws or other fasteners should be closely inspected and periodically retorqued. Machine bolts should be installed with flat and lock washers. Fasteners should be installed in a manner that presents no projections or sharp edges in the accessible portions of the equipment.

Metal Components - Surfaces should be inspected for irregularities (such as gouges, breaks, cracks, etc.) or exposed sharp edges that could present cutting hazards. All metal components should be inspected for rust, fatigue or other conditions that could compromise the structural integrity.

The painted surfaces should be periodically recoated with rust inhibiting paint. Any existing rust should be removed with a wire brush prior to painting.

Wood Components - Wooden frames, steps, benches, etc. should be inspected for rot or other forms of deterioration as well as overall soundness of assembly. The surfaces should be inspected for irregularities (such as splinters) that could present possible puncture hazards.

Anchors - All apparatus should be periodically inspected to ensure that they are firmly anchored.