

FULL RESERVE STUDY

The Lakes of Woodbridge Condominium Association



Portage, Michigan
October 21, 2015



This Report contains intellectual property developed by Reserve Advisors, Inc. and cannot be reproduced or distributed to those who conduct reserve studies without their written consent.



TABLE OF CONTENTS

1. RESERVE STUDY EXECUTIVE SUMMARY	1.1
2. RESERVE STUDY REPORT	2.1
3. RESERVE EXPENDITURES and FUNDING PLAN	3.1
4. CONDITION ASSESSMENT.....	4.1
Exterior Building Elements.....	4.1
Chimney Caps, Metal.....	4.1
Doors, Front Entrances	4.1
Doors, Garage	4.2
Gutters and Downspouts, Aluminum.....	4.2
Light Fixtures.....	4.3
Roofs, Asphalt Shingles.....	4.4
Windows and Doors.....	4.10
Property Site Elements.....	4.14
Asphalt Pavement, Crack Repair and Patch	4.14
Asphalt Pavement, Repaving.....	4.15
Concrete Sidewalks.....	4.18
Irrigation System.....	4.19
Landscape, Partial Replacements.....	4.20
Light Poles and Fixtures	4.20
Mailbox Stations	4.21
Ponds.....	4.21
Retaining Walls, Timber	4.25
Reserve Study Update.....	4.26

5. PHOTOGRAPHS	5.1
6. METHODOLOGY	6.1
7. DEFINITIONS	7.1
8. PROFESSIONAL SERVICE CONDITIONS.....	8.1
9. CREDENTIALS.....	9.1

1. RESERVE STUDY EXECUTIVE SUMMARY

Client: The Lakes of Woodbridge Condominium Association (The Lakes of Woodbridge)

Location: Portage, Michigan

Reference: 94261

Property Basics: The Lakes of Woodbridge Condominium Association is a townhome style development of 186 units in 46 buildings. The exteriors of the buildings comprise vinyl siding and asphalt shingle roofs. The buildings were built from 1983 to 1991. The development contains asphalt pavement, concrete sidewalks, timber retaining walls, ponds and an irrigation system.

Reserve Components Identified: 25 Reserve Components.

Inspection Date: October 21, 2015. We conducted the original Reserve Study in 1994.

Funding Goal: The Funding Goal of this Reserve Study is to maintain reserves above an adequate, not excessive threshold during one or more years of significant expenditures. Our recommended Funding Plan recognizes this threshold funding year in 2029 for continued replacement of the asphalt shingle roofs.

The Reserve Funding Plan recommends 2045 year end accumulated reserves of approximately \$2,999,000. We judge this amount of accumulated reserves in 2045 desirable or necessary, to fund the likely continued replacement of the asphalt shingle roofs and replacement of the vinyl siding after 2045. Future replacement costs beyond the next 30 years for the vinyl siding are likely to more than double the current cost of replacement, now estimated at approximately \$1,123,600 (280,900 square feet multiplied by \$4.00 per square foot). These future needs, although beyond the limit of the Cash Flow Analysis of this Reserve Study, are reflected in the amount of accumulated 2045 year end reserves.

Cash Flow Method: We use the Cash Flow Method to compute the Reserve Funding Plan. This method offsets future variable Reserve Expenditures with existing and future stable levels of reserve funding. Our application of this method also considers:

- current and future local costs of replacement
- 1.2% annual rate of return on invested reserves
- 2.6% future Inflation Rate for estimating Future Replacement Costs

Sources for Local Costs of Replacement: Our proprietary database, historical costs and published sources, i.e., R.S. Means, Incorporated.

Cash Status of Reserve Fund: \$140,608 as of August 31, 2015.

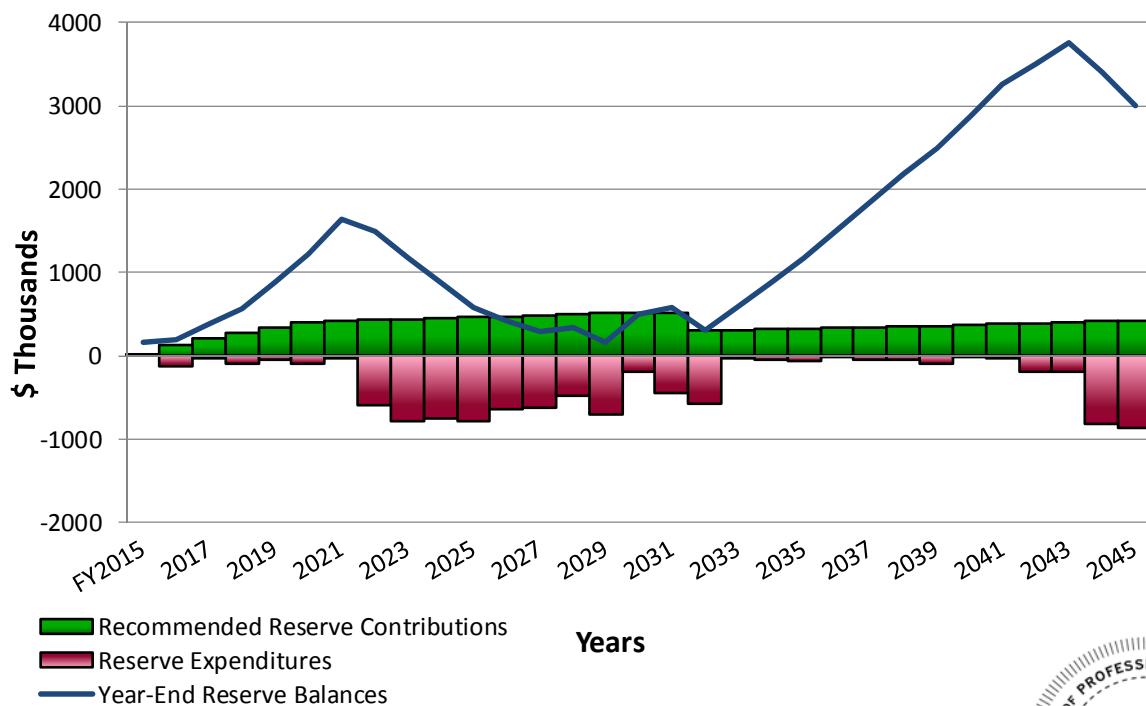
Recommended Reserve Funding: The Association budgeted \$72,000 for Reserve Contributions in 2015. We recommend the Association budget annual phased increases in Reserve Contributions of \$67,600 from 2016 through 2020. Afterwards, the Association should budget gradual annual increases in reserve funding, that in part consider the effects of inflation through 2029. After replacement of the asphalt shingle roofs in 2029, we recommend the Association budget stable contributions of \$516,500 from 2030 to 2031. The Association may adopt a reduced reserve budget of \$305,000 in 2032. Afterwards, the Association should again budget gradual annual increases in reserve funding, that in part consider the effects of inflation through 2045, the limit of this study's Cash Flow Analysis. The initial adjustment in Reserve Contributions of \$67,600 represents about a sixteen percent (15.5%) adjustment in the 2015 total Operating Budget of \$437,448. This initial adjustment of \$67,600 is equivalent to an increase of \$30.29 in the monthly contributions per unit owner.



Certification: This *Full Reserve Study* exceeds the Community Associations Institute (CAI) and the Association of Professional Reserve Analysts (APRA) standards fulfilling the requirements of a “Level I Full Reserve Study.”

The Lakes of Woodbridge
Recommended Reserve Funding Table and Graph

Year	Reserve Contributions (\$)	Reserve Balances (\$)	Year	Reserve Contributions (\$)	Reserve Balances (\$)	Year	Reserve Contributions (\$)	Reserve Balances (\$)
2016	139,600	191,108	2026	478,200	421,610	2036	337,900	1,515,000
2017	207,200	377,880	2027	490,600	296,222	2037	346,700	1,845,687
2018	274,800	564,814	2028	503,400	332,012	2038	355,700	2,181,083
2019	342,400	880,441	2029	516,500	155,491	2039	364,900	2,482,674
2020	410,000	1,214,826	2030	516,500	491,084	2040	374,400	2,870,002
2021	420,700	1,631,534	2031	516,500	572,066	2041	384,100	3,255,601
2022	431,600	1,487,559	2032	305,000	310,227	2042	394,100	3,502,589
2023	442,800	1,171,767	2033	312,900	600,024	2043	404,300	3,757,446
2024	454,300	883,777	2034	321,000	889,913	2044	414,800	3,395,887
2025	466,100	571,671	2035	329,300	1,178,180	2045	425,600	2,998,716



Respectfully submitted on November 17, 2015 by
RESERVE ADVISORS, INC.



Alan M. Ebert, PRA¹, RS², Associate Director of Quality Assurance

Reviewed by: Matthew P. Ksionzyk, PRA, RS, Associate Director of Quality Assurance

Visual Inspection and Report by: Nicholas M. Johanning



¹ PRA (Professional Reserve Analyst) is the professional designation of the Association of Professional Reserve Analysts. Learn more about APRA at <http://www.apra-usa.com>.

² RS (Reserve Specialist) is the reserve provider professional designation of the Community Associations Institute (CAI) representing America's more than 300,000 condominium, cooperative and homeowners associations.

2. RESERVE STUDY REPORT

At the direction of the Board that recognizes the need for proper reserve planning, we have conducted a *Full Reserve Study* of

The Lakes of Woodbridge Condominium Association

Portage, Michigan

and submit our findings in this report. The effective date of this study is the date of our visual, noninvasive inspection, October 21, 2015. We conducted the original Reserve Study in 1994.

We present our findings and recommendations in the following report sections and spreadsheets:

- **Identification of Property** - Segregates all property into several areas of responsibility for repair or replacement
- **Reserve Expenditures** - Identifies reserve components and related quantities, useful lives, remaining useful lives and future reserve expenditures during the next 30 years
- **Reserve Funding Plan** - Presents the recommended Reserve Contributions and year-end Reserve Balances for the next 30 years
- **Condition Assessment** - Describes the reserve components, describes our recommendations for repairs or replacement, and includes detailed solutions and procedures for replacements for the benefit of current and future board members
- **Photographs** - Documentation of Condition of various property elements
- **Methodology** - Lists the national standards, methods and procedures used, financial information relied upon for the Financial Analysis of the Reserve Study
- **Definitions** - Contains definitions of terms used in the Reserve Study, consistent with national standards
- **Professional Service Conditions** - Describes Assumptions and Professional Service Conditions
- **Credentials and Resources**

IDENTIFICATION OF PROPERTY

The Lakes of Woodbridge Condominium Association is a townhome style development of 186 units in 46 buildings. The exteriors of the buildings comprise vinyl siding and asphalt shingle roofs. The buildings were built from 1983 to 1991. The development contains asphalt pavement, concrete sidewalks, timber retaining walls, ponds and an irrigation system. We identify 25 major reserve components that are likely to require capital repair or replacement during the next 30 years.

Our investigation includes Reserve Components or property elements as set forth in your Declaration. Our analysis begins by segregating the property elements into several areas of responsibility for repair and replacement. Our process of identification helps assure that future boards and the management team understand whether reserves, the operating budget or Unit Owners fund certain replacements and assists in preparation of the annual budget. We derive these segregated classes of property from our review of the information provided by the Association and through conversations with Management and the Board. These classes of property include:

- Reserve Components
- Long-Lived Property Elements
- Operating Budget Funded Repairs and Replacements
- Property Maintained by Unit Owners

We advise the Board conduct an annual review of these classes of property to confirm its policy concerning the manner of funding, i.e., from reserves or the operating budget.

The Reserve Study identifies Reserve Components as set forth in your Declaration or which were identified as part of your request for proposed services. Reserve Components are defined by CAI as property elements with:

- The Lakes of Woodbridge responsibility

- Limited useful life expectancies
- Predictable remaining useful life expectancies
- Replacement cost above a minimum threshold

Long-Lived Property Elements do not have predictable Remaining Useful Lives. The operating budget should fund infrequent repairs. Funding untimely or unexpected replacements from reserves will necessitate increases to Reserve Contributions. Periodic updates of this Reserve Study will help determine the merits of adjusting the Reserve Funding Plan. We identify the following Long-Lived Property Elements as excluded from reserve funding at this time.

- Bridge, Concrete
- Electrical Systems, Common
- Foundations
- Pipes, Subsurface Utilities
- Pond, Liner, Clay, South
- Retaining Walls, Stone
- Structural Frames
- Walls, Vinyl Siding (2009)

The operating budget provides money for the repair and replacement of certain Reserve Components. Operating Budget Funded Repairs and Replacements relate to:

- General Maintenance to the Common Elements
- Expenditures less than \$4,000 (These relatively minor expenditures have a limited effect on the recommended Reserve Contributions.)
- Catch Basins
- Irrigation System, Controllers
- Paint Finishes
- Railings, Wood, Bridge
- Walls, Masonry, Inspections and Capital Repairs
- Other Repairs normally funded through the Operating Budget

Certain items have been designated as the responsibility of the unit owners to repair or replace at their cost. Property Maintained by Unit Owners, including items billed back to Unit Owners, relates to unit:

- Balconies, Decks and Patios
- Staircases
- Electrical Systems
- Heating, Ventilating and Air Conditioning (HVAC) Units
- Interiors
- Pipes, Interior Building, Water and Sewer
- Skylights

Certain items have been designated as the responsibility of others to repair or replace. Property Maintained by Others relates to:

- Golf Course Elements (The Moors Golf Club)

3. RESERVE EXPENDITURES and FUNDING PLAN

The tables following this introduction present:

Reserve Expenditures

- Line item numbers
- Total quantities
- Quantities replaced per phase (in a single year)
- Reserve component inventory
- Estimated first year of event (i.e., replacement, application, etc.)
- Life analysis showing
 - useful life
 - remaining useful life
- Unit cost of replacement
- 2015 local cost of replacement
- Total future costs of replacement anticipated during the next 30 years
- Schedule of estimated future costs for each reserve component including inflation

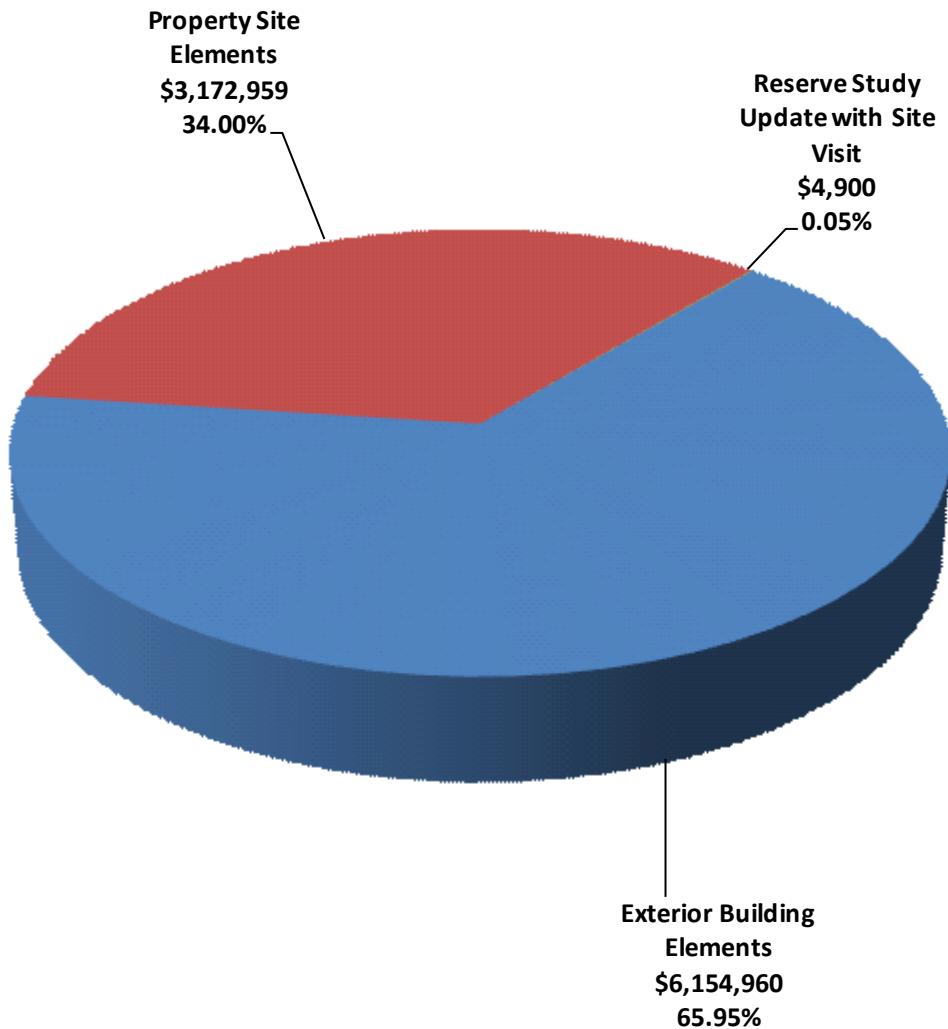
Reserve Funding Plan

- Reserves at the beginning of each year
- Total recommended reserve contributions
- Estimated interest earned from invested reserves
- Anticipated expenditures by year
- Anticipated reserves at year end

Financial statements prepared by your association, by you or others might rely in part on information contained in this section. For your convenience, we have provided an electronic data file containing the tables of ***Reserve Expenditures*** and ***Reserve Funding Plan***.

The following chart illustrates the relative importance of the categories noted in ***Reserve Expenditures*** and relative funding during the next 30 years.

The Lakes of Woodbridge
Future Expenditures Relative Cost Illustration



RESERVE EXPENDITURES

The Lakes of Woodbridge Condominium Association

Explanatory Note

1) **2.6%** is the estimated future Inflation Rate for estimating Future Replacement Costs.

2) FY2015 is Fiscal Year beginning January 1, 2015 and ending December 31, 2015.

RESERVE EXPENDITURES

The Lakes of Woodbridge Condominium Association

Line Item	Total Quantity	Per Phase Quantity	Units	Reserve Component Inventory	Estimated 1st Year of Event	Life Analysis, Years		Costs, \$				16 2031	17 2032	18 2033	19 2034	20 2035	21 2036	22 2037	23 2038	24 2039	25 2040	26 2041	27 2042	28 2043	29 2044	30 2045					
						Useful	Remaining	Unit (2015)	Per Phase (2015)	Total (2015)	30-Year Total (Inflated)																				
<u>Exterior Building Elements</u>																															
1.140	145	36 Each	Chimney Caps, Metal, Phased		2026	to 25	11 to 14	400.00	14,500	58,000	79,973																				
1.180	186	62 Each	Doors, Front Entrances, Phased		2023	to 30	8 to 10	1,000.00	62,000	186,000	234,388																				
1.200	186	62 Each	Doors, Garage, Phased		2030	to 25	15 to 17	1,250.00	77,500	232,500	350,652	116,858	119,897																		
1.240	10,000	2,500 Linear Feet	Gutters and Downspouts, Aluminum, Phased		2026	15 to 20	11 to 14	9.00	22,500	90,000	220,058																			47,365	48,596
1.260	750	750 Each	Light Fixtures		2020	to 25	5	90.00	67,500	67,500	222,532																			145,789	
1.280	3,100	775 Squares	Roofs, Asphalt Shingles, Phased		2026	15 to 20	11 to 14	375.00	290,625	1,162,500	2,842,425																			611,796	627,702
1.980	44,300	11,075 Square Feet	Windows and Doors, Phased		2022	to 40	7 to 10	40.00	443,000	1,772,000	2,204,932																				
<u>Property Site Elements</u>																															
4.020	20,800	20,800 Square Yards	Asphalt Pavement, Crack Repair and Patch		2018	3 to 5	3	0.70	14,560	14,560	152,963																			29,117	
4.041	4,200	4,200 Square Yards	Asphalt Pavement, Mill and Overlay, Kirkaldy And Tartan		2044	15 to 20	29	15.70	65,940	65,940	138,811																			138,811	
4.045	7,650	7,650 Square Yards	Asphalt Pavement, Total Replacement, Driveways		2031	15 to 20	16	24.00	183,600	183,600	276,841	276,841																			
4.046	1,550	1,550 Square Yards	Asphalt Pavement, Total Replacement, Blackmar		2029	15 to 20	14	30.00	46,500	46,500	66,606																				
4.047	4,200	4,200 Square Yards	Asphalt Pavement, Total Replacement, Kirkaldy And Tartan		2026	15 to 20	11	30.00	126,000	126,000	167,106																				
4.048	7,400	7,400 Square Yards	Asphalt Pavement, Total Replacement, Moors Point, Vernard And Woodbridge		2032	15 to 20	17	30.00	222,000	222,000	343,446	343,446																			
4.140	31,000	1,330 Square Feet	Concrete Sidewalks, Partial		2019	to 65	4 to 30+	10.50	13,965	325,500	150,526	21,057																	28,653		
4.420	250	63 Zones	Irrigation System, Phased		2023	to 40	8 to 14	1,500.00	93,750	375,000	498,158																				
4.500	1	1 Allowance	Landscape, Partial Replacements		2016	ongoing	1	10,000.00	10,000	10,000	457,687	15,078	15,471	15,873	16,285	16,709	17,143	17,589	18,046	18,516	18,997	19,491	19,998	20,518	21,051	21,598					
4.560	31	31 Each	Light Poles and Fixtures		2018	to 25	3	2,000.00	62,000	62,000	194,172																		127,209		
4.600	46	46 Each	Mailbox Stations		2022	to 25	7	400.00	18,400	18,400	22,022																				
4.700	11	3 Each	Ponds, Aerators, Phased		2017	10 to 15	2 to 8	2,900.00	7,975	31,900	134,892	12,025																15,544	16,363	17,225	
4.710	3,350	505 Linear Feet	Ponds, Erosion Control, Middle and North, Partial		2024	to 15	9	50.00	25,250	25,250	78,564																		46,752		
4.711	2,100	420 Linear Feet	Pond, Erosion Control, Rip Rap, South, Phased		2022	to 30	7	25.00	10,500	10,500	82,565																		20,998		
4.720	3,380	3,380 Square Yards	Pond, Liner, Middle		2030	to 20	15	7.00	23,660	23,660	34,772																				
4.721	8,380	8,380 Square Yards	Pond, Liner, North		2024	to 20	9	7.00	58,660	58,660	191,210																		117,306		
4.730	6,640	1,660 Square Yards	Pond, Sediment Removal, South, Partial		2032	to 30	17	30.00	49,800	49,800	77,043	77,043																			
4.760	2,940	2,940 Square Feet	Retaining Walls, Timber (Replace with Masonry)		2016	15 to 20	1	35.00	102,900	102,900	105,575																				
1 Allowance				Reserve Study Update with Site Visit	2017	2	2	4,900.00	4,900	4,900	4,900																				
Anticipated Expenditures, By Year												\$9,332,819	441,859	572,101	28,532	39,997	53,368	17,143	36,057	44,321	91,125	18,997	35,035	187,419	192,743	819,023	860,910				

RESERVE FUNDING PLAN

CASH FLOW ANALYSIS
The Lakes of Woodbridge
Condominium Association

		<u>Individual Reserve Budgets & Cash Flows for the Next 30 Years</u>																
		FY2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
	Portage, Michigan																	
	Reserves at Beginning of Year (Note 1)	140,608	165,218	191,108	377,880	564,814	880,441	1,214,826	1,631,534	1,487,559	1,171,767	883,777	571,671	421,610	296,222	332,012	155,491	
	Total Recommended Reserve Contributions (Note 2)	24,000	139,600	207,200	274,800	342,400	410,000	420,700	431,600	442,800	454,300	466,100	478,200	490,600	503,400	516,500	516,500	
Plus	Estimated Interest Earned, During Year (Note 3)	610	2,125	3,394	5,622	8,620	12,497	16,976	18,603	15,861	12,260	8,681	5,924	4,281	3,747	2,908	3,856	
Less	Anticipated Expenditures, By Year	0	(115,835)	(23,822)	(93,488)	(35,393)	(88,112)	(20,968)	(594,178)	(774,453)	(754,550)	(786,887)	(634,185)	(620,269)	(471,357)	(695,929)	(184,763)	
	Anticipated Reserves at Year End		<u>\$165,218</u>	<u>\$191,108</u>	<u>\$377,880</u>	<u>\$564,814</u>	<u>\$880,441</u>	<u>\$1,214,826</u>	<u>\$1,631,534</u>	<u>\$1,487,559</u>	<u>\$1,171,767</u>	<u>\$883,777</u>	<u>\$571,671</u>	<u>\$421,610</u>	<u>\$296,222</u>	<u>\$332,012</u>	<u>\$155,491</u>	<u>\$491,084</u>
																		(NOTE 5)

(continued)

Individual Reserve Budgets & Cash Flows for the Next 30 Years, Continued

		2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	
	Reserves at Beginning of Year	491,084	572,066	310,227	600,024	889,913	1,178,180	1,515,000	1,845,687	2,181,083	2,482,674	2,870,002	3,255,601	3,502,589	3,757,446	3,395,887	
	Total Recommended Reserve Contributions	516,500	305,000	312,900	321,000	329,300	337,900	346,700	355,700	364,900	374,400	384,100	394,100	404,300	414,800	425,600	
Plus	Estimated Interest Earned, During Year	6,341	5,262	5,429	8,886	12,335	16,063	20,044	24,017	27,816	31,925	36,534	40,307	43,300	42,664	38,139	
Less	Anticipated Expenditures, By Year	(441,859)	(572,101)	(28,532)	(39,997)	(53,368)	(17,143)	(36,057)	(44,321)	(91,125)	(18,997)	(35,035)	(187,419)	(192,743)	(819,023)	(860,910)	
	Anticipated Reserves at Year End		<u>\$572,066</u>	<u>\$310,227</u>	<u>\$600,024</u>	<u>\$889,913</u>	<u>\$1,178,180</u>	<u>\$1,515,000</u>	<u>\$1,845,687</u>	<u>\$2,181,083</u>	<u>\$2,482,674</u>	<u>\$2,870,002</u>	<u>\$3,255,601</u>	<u>\$3,502,589</u>	<u>\$3,757,446</u>	<u>\$3,395,887</u>	<u>\$2,998,716</u>
																	(NOTE 4)

Explanatory Notes:

- 1) Year 2015 starting reserves are as of August 31, 2015; FY2015 starts January 1, 2015 and ends December 31, 2015.
- 2) Reserve Contributions for 2015 are the remaining budgeted 4 months; 2016 is the first year of recommended contributions.
- 3) **1.2%** is the estimated annual rate of return on invested reserves; 2015 is a partial year of interest earned.
- 4) Accumulated year 2045 ending reserves consider the need to fund for continued replacement of the asphalt shingle roofs and replacement of the vinyl siding shortly after 2045, and the age, size, overall condition and complexity of the property.
- 5) Threshold Funding Year (reserve balance at critical point).

4. CONDITION ASSESSMENT

The Condition Assessment of this *Full Reserve Study* includes *Enhanced Solutions and Procedures* for select significant components. These narratives describe the Reserve Components, document specific problems and conditions, and may include detailed solutions and procedures for necessary capital repairs and replacements for the benefit of current and future board members. We advise the Board use this information to help define the scope and procedures for repair or replacement when soliciting bids or proposals from contractors. *However, the Report in whole or part is not and should not be used as a design specification or design engineering service.*

Exterior Building Elements

Chimney Caps, Metal - The Lakes of Woodbridge maintains 145 metal chimney caps. The chimney caps are original and in good overall condition based on our visual inspection from the ground. We note isolated rust as shown on Page 5.4 of **Photographs**. Chimney caps of this type have useful lives of up to 25 years. Based on condition, we recommend the Association anticipate replacement of the chimney caps and related flashing beginning by 2026 and concluding by 2029 in coordination with roof replacement. We depict this information on Line Item 1.140 of **Reserve Expenditures**.

Doors, Front Entrances - The Lakes of Woodbridge maintains 186 metal front entrance doors. These doors are in good overall condition at various ages. The useful life of these doors is up to 30 years. We suggest the Association budget for an aggregated replacement of the doors beginning by 2023 and concluding by 2025. This type of replacement will ensure the availability of similar hardware and maintain aesthetic continuity throughout the community. We include this information on Line Item 1.180 of **Reserve Expenditures**.

Doors, Garage - The Association maintains the 186 metal single and double garage doors. The garage doors are in good overall condition at various ages. We note isolated dents and finish deterioration as shown on Page 5.5 of **Photographs**. The garage doors have a useful life of up to 25 years. We recommend the Association anticipate a phased replacement of the garage doors beginning by 2030 and concluding by 2032. We note this information on Line Item 1.200 of **Reserve Expenditures**. We recommend replacement with insulated doors to provide structural rigidity to the panels. The Lakes of Woodbridge should aggregate replacement of the garage doors to ensure their availability and to maintain aesthetic continuity throughout the community. Unit owners maintain the electric operators.

Gutters and Downspouts, Aluminum - Approximately 10,000 linear feet of aluminum six-inch seamless gutters and three-inch by four-inch downspouts drain storm water from the roofs of The Lakes of Woodbridge. These gutters and downspouts are in good overall condition at an unknown age. These gutters and downspouts have a useful life of 15- to 20-years. We include the following solutions and procedures for gutter and downspout maintenance and replacements for present and future board members.

The most common and economical type of gutter profile is the metal roll-formed seamless K-style. The five-inch wide K-style gutter is standard but six-inch wide K-style gutters should be used on larger roofs. The size of the gutter is determined by the roof's watershed area, a roof pitch factor and the rainfall intensity number of the Association's region. We recommend sloping gutters 1/16 inch per linear foot and providing fasteners a maximum of every three feet.

Downspouts can drain 100 square feet of roof area per one square inch of downspout cross sectional area. Downspouts should be of the same material as the gutters. We recommend

the use of downspout extensions and splash blocks at the downspout discharge to direct storm water away from the foundations. Downspouts that discharge directly onto roofs cause premature deterioration of the roofs due to the high concentration of storm water. We recommend either routing these downspouts directly to the ground, connecting the downspouts to the gutters of the lower roof or distributing the storm water discharge over a large area.

Maintenance of the gutters and downspouts should include semiannual inspections, repairs at seams and fastening points, verification that the downspouts discharge away from foundations and cleaning. More frequent maintenance may be required for gutters and downspouts in areas of concentrated landscape growth. The Association should fund these expenses through the operating budget. A lack of maintenance resulting in misdirected storm water will result in deterioration of soffits, fascia, siding, foundations, and the gutters and downspouts themselves.

The useful life of gutters and downspouts coincides with that of the asphalt shingle roofs at 15- to 20-years. Therefore, we recommend the Association budget for the phased replacement of the gutters and downspouts in conjunction with the roof replacement beginning by 2026 and concluding by 2029. This will result in the most economical unit price and minimize the possibility of damage to other roof components as compared to separate replacements. A subsequent phased replacement is likely beginning by 2044. We depict this information on Line Item 1.240 of ***Reserve Expenditures***. We base our cost on replacement with .027-inch thick aluminum.

Light Fixtures - The Lakes of Woodbridge maintains approximately 750 exterior wall mounted metal light fixtures to accent the garages, and the front and rear entries. The light

fixtures are in good overall condition at various ages. The useful life of exterior light fixtures of this type and quality is up to 25 years. We recommend the Association plan for replacement of the light fixtures by 2020 and again by 2045. The Association should aggregate the replacement of the light fixtures to ensure their availability and to maintain aesthetic continuity throughout the community. We include this information on Line Item 1.260 of **Reserve Expenditures**. Our cost does not include an allowance for replacement of electrical wiring.

Roofs, Asphalt Shingles - Approximately 3,100 *squares*¹ of asphalt shingles comprise the roofs of The Lakes of Woodbridge. The roofs are in good overall condition at an age of six years. Management and the Board do not report history of leaks. Our visual inspection from the ground notes shingle lift, sheathing deflection, shingle discoloration and organic growth as shown on pages 5.6 through 5.8 of **Photographs**. The existing roof assembly comprises the following:

- Laminate shingles
- Boston style ridge caps
- Rubber seal with plastic base boot flashing at waste pipes
- Soffit and ridge vents
- Metal drip edge
- Enclosed half weaved valleys

The useful life of asphalt shingle roofs in Portage is from 15- to 20-years. We include the following solutions and procedures pertaining to the components of an asphalt shingle roof system, times of replacement, recommended method of replacement, and coordination of other related work for the benefit of present and future board members.

Insulation and ventilation are two major components of a sloped roof system. Together, proper insulation and ventilation help to control attic moisture and maintain an energy efficient

¹ We quantify the roof area in *squares* where one square is equal to 100 square feet of surface area.

building. Both insulation and ventilation prevent moisture buildup which can cause wood rot, mold and mildew growth, warp sheathing, deteriorate shingles, and eventually damage building interiors. Sufficient insulation helps to minimize the quantity of moisture that enters the attic spaces and adequate ventilation helps to remove any moisture that enters the attic spaces. These two roof system components also help to reduce the amount of energy that is required to heat and cool a building. Proper attic insulation minimizes heat gain and heat loss between the residential living spaces and attic spaces. This reduces energy consumption year-round. Proper attic ventilation removes excessive heat from attic spaces that can radiate into residential living spaces and cause air conditioners to work harder. Properly installed attic insulation and ventilation work together to maximize the useful life of sloped roof systems.

In addition to moisture control and energy conservation, proper attic insulation and ventilation are essential components to prevent the formation of ice dams. Ice dams occur when warm air accumulates at the peak of an attic while the roof eaves remain cold. Warm air from the attic melts the snow at the ridge of the roof and the water runs down the slope of the roof. At the cold roof eaves, the water refreezes and forms a buildup of snow and ice. This buildup often traps water that can prematurely deteriorate asphalt shingles and ultimately seep under the shingles and cause water damage to the roof deck and building interiors. Proper insulation minimizes the amount of heat that enters attic spaces in the winter and adequate ventilation helps to remove any heat that enters the attic spaces. Together, these components prevent ice dams with a cold roof deck that melts snow and ice evenly.

The Association should periodically ensure that the vents are clear of debris and are not blocked from above by attic insulation. If the soffit vents are blocked from above, the Association should install polystyrene vent spaces or baffles between the roof joists at these

locations to ensure proper ventilation. The Lakes of Woodbridge should fund this ongoing maintenance through the operating budget.

Certain characteristics of condition govern the times of replacement. Replacement of an asphalt shingle roof becomes necessary when there are multiple or recurring leaks and when the shingles begin to cup, curl and lift. These conditions are indications that the asphalt shingle roof is near the end of its useful life. Even if the shingles are largely watertight, the infiltration of water in one area can lead to permanent damage to the underlying roof sheathing. This type of deterioration requires replacement of saturated sections of sheathing and greatly increases the cost of roof replacement. Roof leaks may occur from interrelated roof system components, i.e., flashings. Therefore, the warranty period, if any, on the asphalt shingles, may exceed the useful life of the roof system.

Warranties are an indication of product quality and are not a product guarantee. Asphalt shingle product warranties vary from 20- to 50-years and beyond. However, the scope is usually limited to only the material cost of the shingles as caused by manufacturing defects. Warranties may cover defects such as thermal splitting, granule loss, cupping, and curling. Labor cost is rarely included in the remedy so if roof materials fail, the labor to tear off and install new shingles is extra. Other limitations of warranties are exclusions for "incidental and consequential" damages resulting from age, hurricanes, hail storms, ice dams, severe winds, tornadoes, earthquakes, etc. There are some warranties which offer no dollar limit for replacement at an additional cost (effectively an insurance policy) but again these warranties also have limits and may not cover all damages other than a product defect. We recommend a review of the manufacturers' warranties as part of the evaluation of competing proposals to replace a roof system. This evaluation should identify the current costs of remedy if the roof were to fail

in the near term future. A comparison of the costs of remedy to the total replacement cost will assist in judging the merits of the warranties.

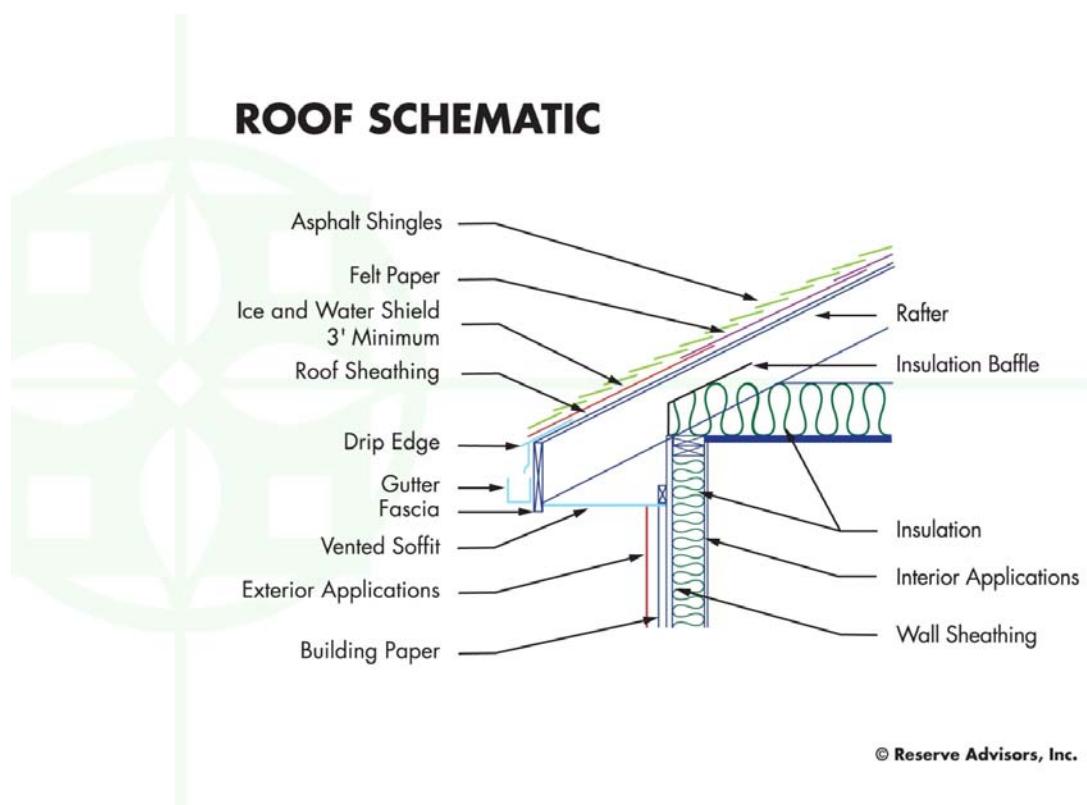
Our estimate of remaining useful life considers this possibility and the Association should anticipate the need for capital repairs to the shingles and other roof system components to achieve or maximize the remaining useful life of the roofs. The Association should fund ongoing roof repairs as normal maintenance from the operating budget.

Contractors use one of two methods of replacement for sloped roofs, either an overlayerment or a tear-off. Overlayerment is the application of new shingles over an existing roof. Although this method is initially more economical, the following disadvantages exist for this type of replacement:

1. Overlaid shingles hide condition defects of the roof system and do not allow for replacement of critical flashings, underlayments and ventilation.
2. Additional layers of shingles absorb and store more heat resulting in premature deterioration of the new shingles and continued deterioration of the underlying shingles and other roof system components.
3. New shingles installed over deteriorated shingles may result in an uneven appearance.

The disadvantages above result in a shorter useful life of 10- to 15-years for overlaid roofs. This shortened useful life and the inevitable eventual replacement of both shingle layers will actually result in increased long-term replacement costs. The costs of an eventual total replacement are deferred onto future unit owners thereby conflicting with the purpose of a reserve study to ensure unit owners pay their “fair share” of the weathering and aging of this commonly owned property. Therefore, we recommend only the tear-off method of replacement. The advantages of the tear-off method include the correction of hidden or latent defects and extend the useful life of the new roof.

The tear-off method of replacement includes removal of the existing shingles, flashings if required and underlays. The contractor should then inspect the roof sheathing for areas of water damage and partially replace the sheathing as needed. Once the roof sheathing is repaired, the contractor can begin installation of the new underlays, flashings and shingles. The following cross-sectional schematic illustrates an asphalt shingle roof system:



The two types of underlayment most often used in an asphalt shingle roof system are ice and water shield membrane, and organic felt paper of varying weights depending on local building codes. Both types of underlayment protect the roof sheathing from moisture damage and wind-driven ice and snow. They have a low vapor resistance that impedes the accumulation of moisture between the underlayment and the roof sheathing. Ice and water shield membrane is thicker than organic paper and is used in areas that are subject to ice dams and standing water.

The contractor should install ice and water shield membranes (often a modified bitumen product) at the outer 36 inches of the gutter and rake edge roof eaves, and in the roof valleys. Standard 15-pound organic felt paper should provide sufficient protection over the remaining portions of the roof. Underlays work in conjunction with flashings to form a watertight roof system.

The function of flashing is to provide a watertight junction between the roofing material and the other parts of the structure and between roof sections. Flashing material is usually galvanized metal, although some roofs use copper or synthetic rubber. The Association should require the contractor to augment existing flashings or replace deteriorated flashings at the time of roof replacement at the following locations:

- Changes in the slope
- Valleys
- Roof intersections with a wall, vertical structure, roof penetration, i.e., vent stacks
- Rakes (sloped edges of the roof) and soffits (lower roof edges)

Another critical type of flashing is drip edge flashing. This important flashing sheds water off the edges of the roofs. The drip edge flashing allows storm water to run off the roof into the gutters without coming into contact with the underlayment and eave board. The special profile of a metal drip edge also prevents or minimizes the possibility of rain water blowing back under the shingles. The contractor should install this flashing at the gutter edge before the installation of underlayment and at the rake edge *after* the installation of underlayment.

Asphalt shingles include both fiberglass shingles and organic mat shingles. Both shingle types are made with asphalt. Fiberglass shingles use a fiberglass reinforcing mat while organic shingles use a wood based cellulose fiber mat. Fiberglass shingles are thinner, lighter and carry a better fire rating than organic shingles. Organic mat shingles are more durable and stay more flexible in cold weather. The contractor should install the shingles atop the underlayment and in

conjunction with flashing. Based on a better fire rating, we suggest The Lakes of Woodbridge use a standard strip, fiberglass, Class A, minimum weight class of 210 pounds per square self-sealing shingle at the time of replacement. The self-sealing strip affixes to the lower exposed edges of the shingles. Heat from ambient weather and sunlight activates the shingle adhesive material and seals the two adjacent courses of shingles together. Contractor proposals should specify the types of proposed materials and types of proposed fasteners. The Association should require the use of nail fasteners, not staples, at the time of replacement. Nail guns are acceptable. Staples are of lesser quality and might not withstand wind forces as well as nails.

The Association should plan to coordinate the replacement of gutters and downspouts with the adjacent roofs. This will result in the most economical unit price and minimize the possibility of damage to other roof components as compared to separate replacements.

Based on the age and condition of the roofs, we recommend The Lakes of Woodbridge budget for a phased replacement beginning by 2026 and concluding by 2029. A subsequent phased replacement is likely beginning by 2044. We note this information on Line Item 1.280 of ***Reserve Expenditures***. We base our cost on replacement with standard laminate Class A 240-260-pounds per square shingles. The Association should fund any repairs prior to the complete replacement of the roofs through the operating budget.

Windows and Doors - The Lakes of Woodbridge maintains approximately 44,300 square feet of windows and sliding glass doors. We discuss our recommendations for replacement of the front entrance doors in a previous narrative, "**Doors, Front Entrances**". These components are original and in good overall condition. We note window frame

deterioration as shown on Pages 5.9 of **Photographs**. Construction of the windows and doors at The Lakes of Woodbridge includes the following:

- Vinyl frames
- Dual pane glass
- Sliding windows with screens
- Sliding doors with screens

Properly maintained vinyl frame windows and doors have a useful life of up to 40 years.

The useful life of the windows and doors is dependent on the occurrence of water infiltration, thermal inefficiencies compared to present technology, type of frame, availability of replacement parts and aesthetics. We include the following discussion pertaining to replacement of windows and doors for the benefit of present and future board members.

Properly designed window and door assemblies anticipate the penetration of some storm water beyond the gaskets. This infiltrated storm water collects in an internal drainage system and drains, or exits, the frames through weep holes. These weep holes can become clogged with dirt or if a sealant is applied, resulting in trapped storm water. We recommend The Lakes of Woodbridge periodically verify that weep holes are unobstructed as normal maintenance.

The thermal efficiencies of the window and door assemblies are affected by their design and construction components. These components include glazings, thickness of air space between glazings, low-conductivity gas, tinted coatings, low-e coatings and thermal barriers. We discuss each component of an effective design below.

Glazing - Glazing is the glass surface, or pane, in the assembly. An increase in the number of glazings results in an increase in thermal efficiency. Dual glazing insulates nearly twice as well as single glazing. Adding a third or fourth layer of glazing results in further improvement but also increases the cost of the system. We recommend the use of dual glazing (dual pane windows) as the most cost effective and thermal efficient replacement system. An additional layer of glass, often as storm windows, provides increased thermal efficiencies and additional protection from storm water.

Thickness of Air Space - As the thickness of the air space between dual panes increases, the thermal efficiency of the system also increases. The ideal air space thickness is about one-half inch or more. However, if the air space is too wide a convection loop between the layers of glazing occurs. An air space thickness beyond approximately one inch does not result in an increased energy performance.

Low Conductivity Gas - The use of a denser, lower conductivity gas, such as argon, in the space between dual panes results in an increase in thermal efficiency. Argon is the most cost effective type of low conductivity gas. Argon is inexpensive, nontoxic, nonreactive, clear and odorless. Krypton is also a low conductivity gas occasionally used in window and door assemblies. Krypton is more thermally efficient. However, it is also more expensive to produce.

Tinted Glass Coatings - Tinted glass coatings reduce solar heat gain without reducing visibility. These coatings are typically used in climates with a need for building cooling.

Low-e Coatings - The use of thin, transparent coatings of silver or tin oxide permit visible light to pass through the glazings and reflect infrared heat radiation back into the building. A variety of types of low-e (low emissivity) glass are available to suit different climate zones. Low-e glass with high solar heat gain coefficients are appropriate for northern climates while low-e glass with low solar heat gain coefficients are appropriate for southern climates.

Thermal Barriers - Thermal barriers are typically comprised of rigid polyurethane, silicone foam or butyl rubber. Conductivity is a primary concern with aluminum frame windows. Aluminum has extremely high conductivity and therefore provides a thermal bridge for the exchange of heated or cooled air between the inside and outside temperatures. Thermal barriers interrupt this thermal bridge and improve the thermal efficiency of the aluminum assembly.

A combination of the above design and construction components will greatly increase the thermal efficiency of the assembly. The Association should thoroughly investigate these component options at the time of replacement. Some manufacturers may include these components as part of the standard product and other manufacturers may consider these components as options for an additional cost. The Lakes of Woodbridge should review the specifications provided by the manufacturers to understand the thermal design and construction components of the proposed assemblies. For reserve budgetary purposes, we assume replacement with systems that achieve generally accepted construction practices.

The frames of windows and doors are typically constructed of wood, vinyl, aluminum and fiberglass. We discuss the advantages and disadvantages of these frame types in the following narrative.

Wood - Wood is the traditional frame material because of its availability and ease of milling into complex shapes. Wood is typically preferred in wood frame, low rise residential applications because of its appearance and traditional place in home design. Wood frame assemblies offer good thermal qualities but require periodic paint applications to maximize their useful life. Vinyl or aluminum cladding, or coverings, can be applied to the exterior of the wood frame to minimize maintenance.

Vinyl - Vinyl, or polyvinyl chloride (PVC), frames have good insulating values. Vinyl frames are resistant to moisture and are maintenance free. Normal deterioration mainly relates to discoloration of the exterior finish from exposure to sunlight, weathering and air pollutants. Vinyl frames are also susceptible to damage, primarily as the frames age and become brittle.

Aluminum - Aluminum frames are light, strong, durable and can be extruded into complex shapes. These frames are available in anodized and factory-baked enamel finishes that are durable and low-maintenance. However, these types of frames do not offer good thermal qualities due to aluminum's high conductivity. Thermal barriers within the frames increase the thermal efficiencies of the system as discussed in a previous narrative.

Fiberglass - Fiberglass frames are the most energy efficient frames available. Fiberglass frames are resistant to moisture, are maintenance free and can also be painted. In addition, fiberglass frames expand and contract at nearly the same rate as the glass, minimizing seal failures. However, fiberglass frames are relatively new, are not yet widely available, their long term performance is unknown and they are more expensive than the previously listed frames.

Smooth operation of the sliding glass doors relies on rollers. Exposure of the rollers to dust and debris causes deterioration of the rollers and difficult door operation. As the doors age, scarcity of parts due to obsolescence makes replacement of the entire door more desirable. Therefore, the sliding glass doors may have a potentially shorter useful life than the windows. However, for budgetary purposes, we currently anticipate a coordinated replacement of the windows and doors. Updates of this Reserve Study would consider possible changes in the anticipated time of door replacement. The Association should fund replacement of the rollers,

maintenance of the door operable components, reattachment of handles and other maintenance activities through the operating budget.

Aesthetics can be the primary reason for replacement of windows and doors. The windows and doors will eventually appear outdated and worn. The frame finish will eventually deteriorate, resulting in an unpleasant appearance. This discretionary time of replacement can have a significant impact on the remaining useful life.

Based on the above factors, we recommend the Association budget for a phased replacement beginning by 2022 and concluding by 2025. We note this information on Line Item 1.980 of ***Reserve Expenditures***. We base this estimate of remaining useful life in part on the continued periodic replacement of joint sealants at the windows and doors.

Property Site Elements

Asphalt Pavement, Crack Repair and Patch - Asphalt pavement comprises approximately 7,650 square yards of driveways and 13,150 square yards of streets throughout the community. The following table depicts the conditions and years of last of replacement:

Location	Quantity (SY)	Notes
Driveways	7,650	Replaced in 2013, good condition
Blackmar	1,550	Replaced in 2011, good condition
Kirkaldy and Tartan	4,200	Unknown age, good to fair condition
Moors Point, Vernard and Woodbridge	7,400	Replaced in 2014, good condition

We note cracks, deterioration and settlement. To maximize the life of the pavement, the Association should plan for repairs every three- to five-years. These activities reduce water infiltration and the effects of inclement weather. We elaborate on solutions and procedures necessary for the optimal maintenance of asphalt pavement in the following discussion.

Asphalt pavement is susceptible to isolated areas of accelerated deterioration in areas that experience freeze-thaw cycles, at the centerlines of streets and at high traffic areas such as intersections. Depressions often appear at areas where vehicles park such as driveways and parking areas. Isolated areas of depressions, cracks and deterioration indicate the need for crack repairs and patching. The contractor should patch areas that exhibit potholes, alligator or spider web pattern cracks, and areas of pavement that are severely deteriorated from oil and gasoline deposits from parking vehicles. Area patching requires total replacement of isolated areas of pavement. The contractor should mechanically rout and fill all cracks with hot emulsion. Crack repair minimizes the chance of the cracks transmitting through the pavement.

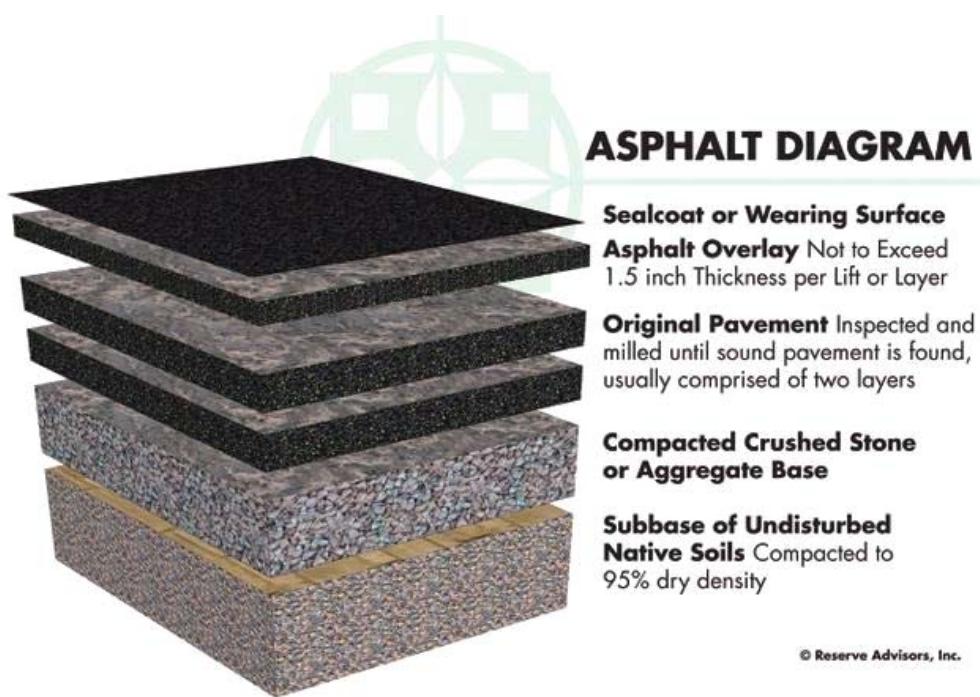
The Lakes of Woodbridge should budget for crack repairs and patching by 2018 and subsequent events every four years thereafter. Line Item 4.020 of ***Reserve Expenditures*** notes our estimate of future costs and anticipated times of these activities.

Asphalt Pavement, Repaving – As mentioned previously, asphalt pavement comprises approximately 7,650 square yards of driveways and 13,150 square yards of streets throughout the community. The following table depicts the conditions and years of last of replacement:

Location	Quantity (SY)	Notes
Driveways	7,650	Replaced in 2013, good condition
Blackmar	1,550	Replaced in 2011, good condition
Kirkaldy and Tartan	4,200	Unknown age, good to fair condition
Moors Point, Vernard and Woodbridge	7,400	Replaced in 2014, good condition

We note cracks, deterioration and settlement as shown on Pages 5.10 through 5.13 of ***Photographs***. The useful life of pavement in Portage is from 15- to 20-years. We include the following repaving solutions and procedures for the benefit of the present and future board members.

Components of asphalt pavement include native soil, aggregate and asphalt. First the contractor creates a base course of aggregate or crushed stone and native soil. The base course is individually compacted to ninety-five percent (95%) dry density prior to the application of the asphalt. Compaction assures a stable base for the asphalt that reduces the possibility of settlement. For street systems, the initial installation of asphalt uses at least two lifts, or two separate applications of asphalt, over the base course. The first lift is the binder course. The second lift is the wearing course. The wearing course comprises a finer aggregate for a smoother more watertight finish. The following diagram depicts these components:



The manner of repaving is either a *mill and overlay* or *total replacement*. A mill and overlay is a method of repaving where cracked, worn and failed pavement is mechanically removed or milled until sound pavement is found. A new layer of asphalt is overlaid atop the remaining base course of pavement. Total replacement includes the removal of all existing

asphalt down to the base course of aggregate and native soil followed by the application of two or more new lifts of asphalt. We recommend mill and overlayer on asphalt pavement that exhibits normal deterioration and wear. We recommend total replacement of asphalt pavement that exhibits severe deterioration, inadequate drainage, pavement that has been overlaid multiple times in the past or where the configuration makes overlayer not possible. Based on the apparent visual condition and configuration of the driveway pavement and street pavement along Blackmar, Moors Point, Vernard and Woodbridge, we recommend the total replacement method of repaving. Based on the apparent visual condition and configuration of the street pavement along Kirkaldy and Tartan, we recommend the total replacement method for initial repaving followed by a mill and overlay method for subsequent repaving.

A variety of repairs are necessary to deteriorated pavement prior to the application of an overlay. The contractor should use a combination of area patching, crack repair and milling before the overlayer. Properly milled pavement removes part of the existing pavement and permits the overlay to match the elevation of adjacent areas not subject to repaving. Milling also allows the contractor to make adjustments to the slope of the pavement to ensure proper drainage. The contractor should clean the milled pavement to ensure proper bonding of the new overlayer. We recommend an overlayer thickness that averages 1½ inches (not less than one inch or more than two inches). Variable thicknesses are often necessary to create an adequate slope for proper drainage. The contractor should identify and quantify areas of pavement that require area patching, crack repair and milling to help the Association compare proposed services.

Total replacement requires the removal of all existing asphalt. For area patching, we recommend the contractor use a rectangular saw cut to remove the deteriorated pavement. For

larger areas such as entire parking areas or driveways, we recommend the contractor grind, mill or pulverize the existing pavement to remove it. The contractor should then augment and compact the existing aggregate and native soil to create a stable base. Finally the contractor should install the new asphalt in at least two lifts.

The time of replacement is dependent on the useful life, age and condition of the pavement. The useful life is dependent in part on the maintenance applied to the pavement, the amounts and concentration of auto solvents that penetrate the pavement, the exposure to sunlight and detrimental effects of inclement weather. The Lakes of Woodbridge should repair any isolated areas of deteriorated pavement periodically. The following table depicts the method and recommended years of repaving:

Location	Method	Recommended Year(s)
Driveways	Total Replacement	2031
Blackmar	Total Replacement	2029
Kirkaldy and Tartan	Total Replacement	2026
Moors Point, Vernard and Woodbridge	Total Replacement	2032
Kirkaldy and Tartan	Mill and Overlay	2044

We depict this information on Line Items 4.041 through 4.048 of ***Reserve Expenditures***.

Concrete Sidewalks - The Association maintains 31,000 square feet of concrete sidewalks along Moorsbridge Road and at the entrances to the units. We include the concrete porches in this quantity. The sidewalks are in good to fair overall condition. We note cracks, settlement and spalled concrete as shown on Pages 5.14 and 5.15 of ***Photographs***. These applications of concrete have useful lives of up to 65 years although isolated deterioration of limited areas of concrete is common. Inclement weather, inadequate subsurface preparation and

improper concrete mixtures or finishing techniques can result in premature deterioration such as settlement, chips, cracks and spalls. Variable conditions like these result in the need to plan for periodic partial replacements of the concrete sidewalks throughout the next 30 years.

We estimate that up to 9,310 square feet of concrete sidewalks, or thirty percent (30%) of the total, will require replacement during the next 30 years. We recommend the Association budget for replacement of 1,330 square feet of concrete sidewalks every four years beginning by 2019. Line Item 4.140 of ***Reserve Expenditures*** notes our estimate of future costs and anticipated times of replacements. We base our estimate of replacement on four-inch thick, 3,000 psi (pounds per square inch) concrete with 6x6 - W1.4xW1.4 steel reinforcing mesh. The times and costs of these replacements may vary. However, the estimated expenditures detailed in ***Reserve Expenditures*** are sufficient to budget appropriate reserves. We recommend an annual inspection of the sidewalks to identify potential trip hazards. We suggest the Association grind down or mark these hazards with orange safety paint prior to replacement and fund this ongoing activity through the operating budget.

Irrigation System - An irrigation system waters the lawn and landscaped areas throughout the community. The system includes approximately 25 controllers and 250 zones. The system is original and reported in good condition. Management and the Board do not report any deficiencies. Irrigation systems typically include the following components:

- Electronic controls (timer)
- Impact rotors
- Network of supply pipes
- Pop-up heads
- Valves

The system as a whole has a useful life of up to 40 years. The system network supply pipes will dislodge as tree roots grow and soil conditions change. The Lakes of Woodbridge

should anticipate interim and partial replacements of the system network supply pipes and other components as normal maintenance to maximize the useful life of the irrigation system. The Association should fund these ongoing seasonal repairs through the operating budget. In addition, we recommend The Lakes of Woodbridge budget for a complete phased replacement of the system beginning by 2023 and concluding by 2029. We note this information on Line Item 4.420 of ***Reserve Expenditures***.

Landscape, Partial Replacements - The Association contains a large quantity of trees, shrubbery and other landscape elements. Replacement of these elements is an ongoing need. Many associations budget for these replacements as normal maintenance. Other associations fund ongoing replacements from reserves. Large amounts of landscape may need replacement due to disease, drought or other forces of nature. If the cost of removal and replacement is substantial, funding from reserves is logical. The Association may also desire to periodically update the appearance of the community through major improvements to the landscape. In consideration of these factors and at the request of Management and the Board, we include an annual, ongoing landscape allowance beginning in 2016 to ensure the accumulation of sufficient reserves for partial replacements of the landscape. The times and costs of these replacements may vary. However, we judge the amounts shown on Line Item 4.500 of ***Reserve Expenditures*** sufficient to budget appropriate reserves.

Light Poles and Fixtures - The Association uses 31 metal light fixtures atop wood poles to illuminate the property. These elements are original, in fair condition and have useful lives of up to 25 years. We note wood deterioration as shown on Page 5.16 of ***Photographs***. The Association should anticipate the need for replacement by 2018 and again by 2043. We note this information on Line Item 4.560 of ***Reserve Expenditures***.

Mailbox Stations - The Association maintains 46 mailbox stations throughout the property that contain the 186 individual mailboxes. The mailbox stations are original, in good condition and have a useful life of up to 25 years. The Lakes of Woodbridge should budget for replacement of the mailbox stations by 2022. We depict this information on Line Item 4.600 of ***Reserve Expenditures***. The Association should verify the new mailboxes meet the specifications of the *United States Postal Service*.

Ponds - The Association maintains three ponds located throughout the community. The health or condition of a pond is reflected in the clarity of the water, balance of plant life, the ability of the water to retain life giving gases and the health of the fish in larger bodies of water. Three factors which affect the health of ponds are erosion, buildup of silt and algae blooms. We note shoreline erosion, vegetation growth, loss of rip rap and debris accumulation as shown on Pages 5.18 and 5.19 of ***Photographs***. Management and the Board do not report any problems with algae blooms. The following table depicts the size of the ponds, length of shorelines and additional notes:

Location	Quantity (SY)	Perimeter (LF)	Notes
South Pond	6,640	2,100	Clay lined, stone rip rap
Middle Pond	3,380	1,050	Vinyl lined, natural vegetation
North Pond	8,380	2,300	Vinyl lined, natural vegetation

We include the following solutions and procedures as a summary of the minimum requirements for successful pond management for present and future board members.

Eutrophication is a process in which a pond becomes shallower and more biologically productive. Human or animal activity often increases the rate of eutrophication. Erosion and storm water deposit fines or silt into the pond and affect the rate of eutrophication. The amount

and intensity of rainfall, soil saturation levels and ground cover all affect the amount of deposits into the pond. Run-off from construction excavations is another contributor to changes in the depth of the pond. Lawn fertilizers are another source of nutrients that contribute to eutrophication. Fertilizers often contain nitrogen and phosphorous which exacerbate nutrient loads into the water system. We advise that The Lakes of Woodbridge consider the use of fertilizers with low or no phosphorus content for areas adjacent to the pond.

Another method to slow eutrophication is the use of algae-killing chemical treatments. Introduction of metal compounds, such as copper sulfate, to the water renders the nutrients inactive to the algae. If necessary, we recommend the Association fund the use of chemical treatments to control algae growth in the pond through the operating budget. The Association should first obtain all permits necessary for the use of chemical treatments.

There are several methods with which the Association can manage the pond and limit algae blooms and slow the eutrophication process. We discuss each management method below.

Aeration - The use of small pumps, motors and aerators circulates pond water and increases the amount of entrained oxygen in the water, increasing water quality and reducing algae growths. The Lakes of Woodbridge utilizes 11 aerators. The aerators are in good condition at various ages. Aerators have a useful life of 10- to 15-years. Based on age and condition, we recommend the Association anticipate a phased replacement beginning by 2017, concluding by 2023, and every 12 years thereafter. Line Item 4.700 of ***Reserve Expenditures*** notes our estimate of future costs and anticipated times of replacements

Erosion Control - The middle and north pond shorelines comprise 3,350 linear feet of natural vegetation. The south pond shoreline comprises 2,100 linear feet of stone rip rap. Shorelines are subject to fluctuations in water levels, increased plant growth and migrating storm and ground water resulting in the need for erosion control measures up to every 15 years for natural vegetation shorelines and every 30 years for rip rap shorelines. The steep shoreline embankments are likely to exacerbate soil movement and erosion. The use and maintenance of landscape, natural vegetation and/or stone rip rap along the pond shorelines will help maintain an attractive appearance and prevent soil erosion.

Shoreline plantings are referred to as buffer zones. Buffer zones provide the following advantages:

- Control insects naturally
- Create an aesthetically pleasing shoreline
- Enhance water infiltration and storage
- Filter nutrients and pollutants
- Increase fish and wildlife habitat
- Reduce lawn maintenance
- Stabilize shoreline and reduce erosion
- Trap sediments

We recommend the Association plan to install a combination of plantings and rip rap around the middle and north ponds along 505 linear feet, or approximately fifteen percent (15%), of the shorelines every 15 years beginning by 2024. We recommend that the Association plan to augment up to 420 linear feet, or approximately twenty percent (20%) of the existing stone rip-rap around the south pond beginning by 2022 and every five years thereafter. We note this information on Line Items 4.710 and 4.711 of **Reserve Expenditures**.

Pond Liners – The liner at the middle pond lies beneath approximately 3,380 square yards of water surface area. The liner at the north pond lies beneath approximately 8,380 square yards of water surface area. Synthetic pond liners prevent the exchange of nutrients from the bottom of a pond into the above water and therefore decrease the ability of algae to grow. A pond liner can trap air or other dissolved gases beneath the liner. This can cause the liner to float to the surface, although liners are available with pores for gas migration. The use of a pond liner offers good temporary control, but requires the periodic removal and clearing of any growth. The middle pond liner is in good overall condition at an age of approximately three- to four-years. The north pond liner is in good to fair overall condition at an unknown age. We anticipate a useful life of up to 20 years and recommend the Association budget for replacement of the middle pond liner by 2030 and the north pond liner by 2024 and again by 2042. We depict this information on Line Items 4.720 and 4.721 of **Reserve Expenditures**. The clay liner at the south pond has an indeterminately long useful life and we do not anticipate its replacement during the next 30 years. Future updates of this study may include replacement of this liner based on condition.

Sediment Removal – The south pond is approximately 6,640 square yards of water surface area. The gradual build-up of natural debris, including tree leaves, branches and silt, may eventually change the topography of areas of the pond. Silt typically accumulates at inlets, outlets and areas of shoreline erosion. Sediment removal of ponds becomes necessary if this accumulation alters the quality of pond water or the functionality of the ponds as storm water management structures. Sediment removal is the optimal but also the most capital intensive method of pond management. Excavation equipment used for sediment removal includes clamshells, draglines and suction pipe lines. Sediment removal can also include shoreline regrading. Regrading includes removal of collapsed and eroded soil, and redefining the shoreline. The clay liner at the

south pond has an indeterminately long useful life and we do not anticipate its replacement during the next 30 years. Future updates of this study may include replacement of this liner based on condition.

Determining the amount of silt to remove is difficult to estimate but is dependent on the surface area of the body of water and depth of sediment to remove. The surface area of a body of water can be easily estimated with relatively reasonable accuracy. However, difficulties arise in determining the depth of removal, where to remove and the cost per cubic yard. We discuss each of these three factors in the following three paragraphs.

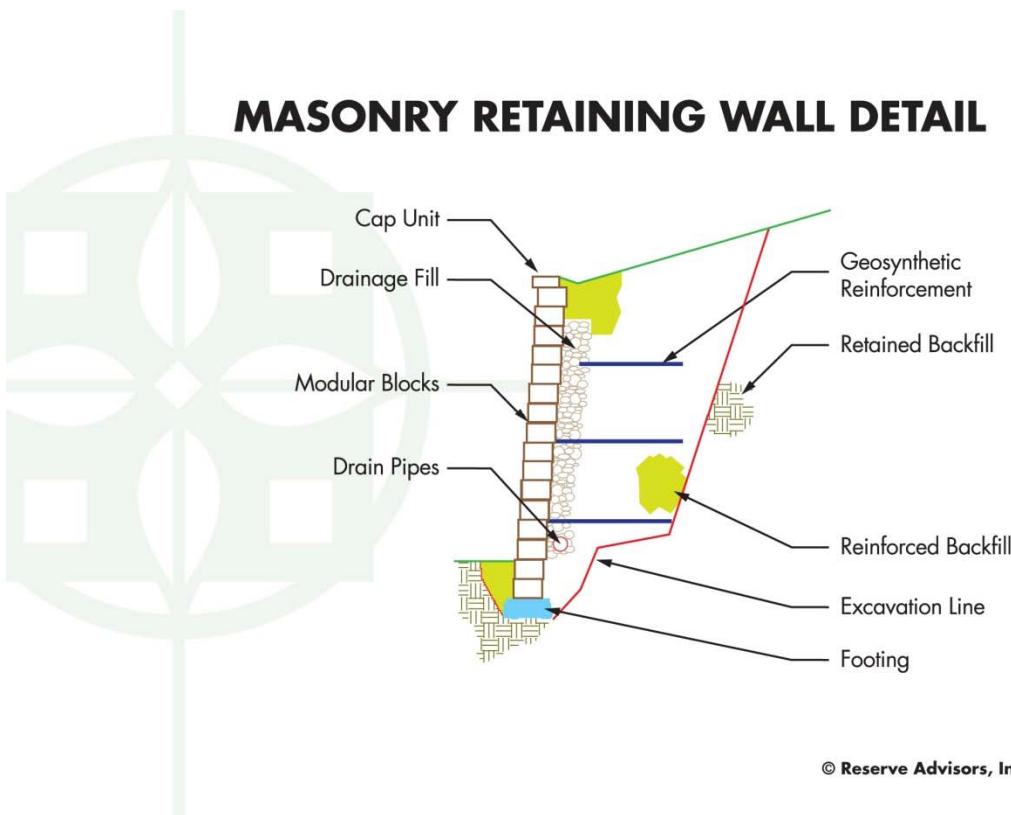
A visual inspection of a body of water cannot reveal the amount of accumulated silt. This is especially true on larger bodies of water. It is therefore inaccurate to assume an entire body of water will require sediment removal. It is more cost effective to spot remove in areas of intense silt accumulation as noted through bathymetric surveys. The amount or depth of silt is determined through prodding into the silt until a relatively solid base is found or through bathymetric surveys. A bathymetric survey establishes a base of data about the depth of the body of water over many locations against which the data of future surveys is compared. These invasive procedures are beyond the scope of a Reserve Study and require multiple visits to the site. We recommend The Lakes of Woodbridge contract with a local engineer for periodic bathymetric surveys. Future updates of the Reserve Study can incorporate future anticipated expenditures based on the results of the bathymetric surveys.

Unit costs per cubic yard to remove can vary significantly based on the type of equipment used, quantity of removed material and disposal of removed material. Sediment removal costs must also include mobilization, or getting the equipment to and from the site. Mobilization costs to position the equipment on the water surface are much higher compared to removal with a back hoe from the shoreline. Also, the portion of the overall cost to remove associated with mobilization varies based on the volume removed. Costs for sediment disposal also vary depending on the site. Compact sites will require hauling and in some cases disposal fees.

Based on the visual condition, adjacent deciduous trees and visibly apparent erosion, we recommend the Association anticipate the need to remove pond sediment every 30 years. For reserve budgeting purposes, we estimate the need to remove twenty-five percent (25%), or 1,660 square yards of the surface area an average depth of one yard. However, the actual volume of material to remove may vary dependent upon an invasive analysis at the time of removal. We conservatively recommend the Association budget for this variable but probable activity by 2032. The time and cost of this maintenance activity may vary. However, we judge the amount shown on Line Item 4.730 of **Reserve Expenditures** sufficient to budget appropriate reserves.

The above management methods will help to maintain the ponds and potentially reduce more costly future maintenance expenditures.

Retaining Walls, Timber - The Association maintains multiple retaining walls which comprise approximately 2,940 square feet of wood timbers. The retaining walls are original and in poor overall condition. We note wood damage as shown on Page 5.20 of **Photographs**. Timber retaining walls have a useful life of 15- to 20-years. We recommend the Association anticipate replacement in 2016. We advise The Lakes of Woodbridge replace with a modular, interlocking *dry-set masonry retaining wall* system. The following schematic depicts this type of retaining wall:



© Reserve Advisors, Inc.

The cost of *dry-set masonry retaining walls* is similar to the cost of timber walls. However, dry-set masonry retaining walls offer a longer useful life of up to 35 years and lower total maintenance costs. We include this information on Line Item 4.760 of **Reserve Expenditures**.

Reserve Study Update

An ongoing review by the Board and an Update of this Reserve Study in two- to three-years are necessary to ensure an equitable funding plan since a Reserve Study is a snapshot in time. Many variables change after the study is conducted that may result in significant overfunding or underfunding the reserve account. Variables that may affect the Reserve Funding Plan include, but are not limited to:

- Deferred or accelerated capital projects based on Board discretion
- Changes in the interest rates on reserve investments
- Changes in the *local* construction inflation rate
- Additions and deletions to the Reserve Component Inventory
- The presence or absence of maintenance programs
- Unusually mild or extreme weather conditions
- Technological advancements

Periodic updates incorporate these variable changes since the last Reserve Study or Update.

The Association can expense the fee for an Update with site visit from the reserve account. This fee is included in the Reserve Funding Plan. We base this budgetary amount on updating the same property components and quantities of this Reserve Study report. Budgeting for an Update demonstrates the Board's objective to continue fulfilling its fiduciary responsibility to maintain the commonly owned property and to fund reserves appropriately.

5. PHOTOGRAPHS

Photographs document the conditions of various property components as of the date of our visual inspection, October 21, 2015. The Condition Assessment contains references to these photographs.

The following is an overview image of the subject property:



The next pages contain the photographs related to the Condition Assessment.



Front elevation



Alternate front elevation



Alternate front elevation



Rear elevation



Alternate rear elevation



Alternate rear elevation



Chimney cap rust



Metal garage door



Metal garage door



Garage door damage at 7687 Blackmar Circle



Finish deterioration at 3662 Tartan Circle



Typical light fixture

Asphalt shingle roof overview



Shingle lift at 3689 Woodbridge Lane



Shingle lift at 3740/3742 Tartan Circle



Shingle lift at 7623 Blackmar Circle



Sheathing deflection at 7563/7565
Woodbridge Lane



Shingle discoloration at 7692 Vernard
Circle



Shingle discoloration at 3744 Tartan Circle



Organic growth at 7478/7450 Tartan Circle



Typical window



Typical patio door



Window frame deterioration at 7671
Blackmar Circle



Window frame deterioration at 3770
Tartan Circle



Asphalt pavement street overview



Asphalt pavement driveway overview



Cracks at Tartan Circle



Cracks at Tartan Drive



Cracks at Kirkaldy Circle



Driveway deterioration at 7647/7651
Blackmar Circle



Crack at Woodbridge Lane



Driveway settlement at 3762/3764 Tartan Circle



Driveway cracks at 3601 Tartan Circle



Driveway cracks at 7679/7683 Blackmar Circle



Cracks at parking area located along Woodbridge Lane



Concrete sidewalk overview



Sidewalk crack



Sidewalk Cracks



Sidewalk settlement



Spalled concrete



Sidewalk crack at 7063 Woodbridge Lane



Sidewalk crack at 3518 Kirkaldy Circle



Light pole and fixture



Wood deterioration at light pole



Mailbox station



South pond



Middle pond



North pond



Shoreline erosion at north pond



Shoreline erosion and vegetation growth at north pond



Loss of stone rip rap at south pond



Pond liner at middle pond



Debris accumulation at north pond



Timber retaining wall overview



Wood damage



Wood damage



Wood damage

6. METHODOLOGY

Reserves for replacement are the amounts of money required for future expenditures to repair or replace Reserve Components that wear out before the entire facility or project wears out. Reserving funds for future repair or replacement of the Reserve Components is also one of the most reliable ways of protecting the value of the property's infrastructure and marketability.

The Lakes of Woodbridge can fund capital repairs and replacements in any combination of the following:

1. Increases in the operating budget during years when the shortages occur
2. Loans using borrowed capital for major replacement projects
3. Level monthly reserve assessments annually adjusted upward for inflation to increase reserves to fund the expected major future expenditures
4. Special assessments

We do not advocate special assessments or loans unless near term circumstances dictate otherwise. Although loans provide a gradual method of funding a replacement, the costs are higher than if the Association were to accumulate reserves ahead of the actual replacement. Interest earnings on reserves also accumulate in this process of saving or reserving for future replacements, thereby defraying the amount of gradual reserve collections. We advocate the third method of *Level Monthly Reserve Assessments* with relatively minor annual adjustments. The method ensures that Unit Owners/Unit Owners pay their "fair share" of the weathering and aging of the commonly owned property each year. Level reserve assessments preserve the property and enhance the resale value of the homes.

This Reserve Study is in compliance with and exceeds the National standards¹ set forth by the Community Associations Institute (CAI) and the Association of Professional Reserve Analysts (APRA) fulfilling the requirements of a "Full Reserve Study." These standards require a Reserve Component to have a "predictable remaining Useful Life." Estimating Remaining Useful Lives and Reserve Expenditures beyond 30 years is often indeterminate. Long-Lived Property Elements are necessarily excluded from this analysis. We considered the following factors in our analysis:

¹ Identified in the APRA "Standards - Terms and Definitions" and the CAI "Terms and Definitions".

Information Furnished by the Association	
2015 unaudited Cash Status of the Reserve Fund	140,608
2015 Remaining Budgeted Reserve Contribution	24,000
Anticipated Interest on Reserve Fund	610
Less Anticipated Reserve Expenditures	0
Projected 2015 Year-End Reserve Balance	\$165,218

The Cash Flow Method to compute, project and illustrate the 30-year Reserve Funding Plan

Local² costs of material, equipment and labor

Current and future costs of replacement for the Reserve Components

Costs of demolition as part of the cost of replacement

Local economic conditions and a historical perspective to arrive at our estimate of long term future inflation for construction costs in Portage, Michigan at an annual inflation rate of 2.6%. Isolated or regional markets of greater construction (development) activity may experience slightly greater rates of inflation for both construction materials and labor.

The past and current maintenance practices of The Lakes of Woodbridge and their effects on remaining useful lives

The Funding Plan excludes necessary operating budget expenditures. It is our understanding that future operating budgets will provide for the ongoing normal maintenance of Reserve Components.

The anticipated effects of appreciation of the reserves over time in accord with an anticipated future return or yield on investment of your cash equivalent assets at an annual rate of 1.2% (We did not consider the costs, if any, of Federal and State Taxes on income derived from interest and/or dividend income).

Interest rates on reserves are steady or increasing in concert with the certificates of deposit and money market rates. Slight increases exist in the savings rates of one, two or three-year CDs. Without significant differences in these savings rates, shorter term investments are the choice of many investors.

We recommend consultation with a professional investment adviser before investing reserves to determine an appropriate investment strategy to maximize a safe return on reserve savings. The following

² See Credentials for addition information on our use of published sources of cost data.



table summarizes rates of inflation and key rates for government securities, generally considered as safe investment alternatives.

Interest Rate and Inflation Data	2014				2015			
	2014:1 (A)	2014:2 (A)	2014:3 (A)	2014:4 (A)	2015:1 (A)	2015:2 (A)	2015:3 (E)	2015:4 (E)
1-Year Treasury Bill	0.13%	0.15%	0.13%	0.01%	0.25%	0.27%	0.30%	0.35%
10-Year Treasury Note	2.80%	2.65%	2.40%	2.25%	1.90%	2.50%	2.70%	2.80%
30-Year Treasury Bond	3.90%	3.50%	3.35%	3.00%	2.55%	3.20%	3.40%	3.50%
Consumer Price Index (annualized rate)	1.50%	2.00%	2.40%	2.60%	0.00%	0.00%	1.00%	1.80%
Residential Construction Producer Price Index-Inflation Rate, Bureau of Labor Statistics (Year over Year to YE 2014 Showing no meaningful change)								0.0%
Savings Rates Results RANGE as found in http://www.bankrate.com	0.10 to 1.10% Money Market Savings 0.23 to 1.25% 1-Year Certificate of Deposit				0.5 to 1.5% for 2-Year Certificate of Deposit 0.6 to 1.5% for 3-Year Certificate of Deposit			
Estimated Near Term Yield Rate for Reserve Savings			1.2%					
Est. Near Term Local Inflation Rate for Future Capital Expenditures			2.6%					<u>06/10/2015</u>

Updates to this Reserve Study will continue to monitor historical facts and trends concerning the external market conditions.

7. DEFINITIONS

Definitions are derived from the standards set forth by the Community Associations Institute (CAI) representing America's 305,000 condominium and homeowners associations and cooperatives, and the Association of Professional Reserve Analysts, setting the standards of care for reserve study practitioners

Cash Flow Method - A method of calculating Reserve Contributions where contributions to the reserve fund are designed to offset the variable annual expenditures from the reserve fund. Different Reserve Funding Plans are tested against the anticipated schedule of reserve expenses until the desired funding goal is achieved.

Component Method - A method of developing a Reserve Funding Plan with the total contribution is based on the sum of the contributions for individual components.

Current Cost of Replacement - That amount required today derived from the quantity of a *Reserve Component* and its unit cost to replace or repair a Reserve Component using the most current technology and construction materials, duplicating the productive utility of the existing property at current *local* market prices for *materials, labor* and manufactured equipment, contractors' overhead, profit and fees, but without provisions for building permits, overtime, bonuses for labor or premiums for material and equipment. We include removal and disposal costs where applicable.

Fully Funded Balance - The Reserve balance that is in direct proportion to the fraction of life "used up" of the current Repair or Replacement cost similar to Total Accrued Depreciation.

Funding Goal (Threshold) - The stated purpose of this Reserve Study is to determine the adequate, not excessive, minimal threshold reserve balances.

Future Cost of Replacement - *Reserve Expenditure* derived from the inflated current cost of replacement or current cost of replacement as defined above, with consideration given to the effects of inflation on local market rates for materials, labor and equipment.

Long-Lived Property Component - Property component of The Lakes of Woodbridge responsibility not likely to require capital repair or replacement during the next 30 years with an unpredictable remaining Useful Life beyond the next 30 years.

Percent Funded - The ratio, at a particular point of time (typically the beginning of the Fiscal Year), of the actual (or projected) Reserve Balance to the Fully Funded Balance, expressed as a percentage.

Remaining Useful Life - The estimated remaining functional or useful time in years of a *Reserve Component* based on its age, condition and maintenance.

Reserve Component - Property elements with: 1) The Lakes of Woodbridge responsibility; 2) limited Useful Life expectancies; 3) predictable Remaining Useful Life expectancies; and 4) a replacement cost above a minimum threshold.

Reserve Component Inventory - Line Items in *Reserve Expenditures* that identify a *Reserve Component*.

Reserve Contribution - An amount of money set aside or *Reserve Assessment* contributed to a *Reserve Fund* for future *Reserve Expenditures* to repair or replace *Reserve Components*.

Reserve Expenditure - Future Cost of Replacement of a Reserve Component.

Reserve Fund Status - The accumulated amount of reserves in dollars at a given point in time, i.e., at year end.

Reserve Funding Plan - The portion of the Reserve Study identifying the *Cash Flow Analysis* and containing the recommended Reserve Contributions and projected annual expenditures, interest earned and reserve balances.

Reserve Study - A budget planning tool that identifies the current status of the reserve fund and a stable and equitable Funding Plan to offset the anticipated future major common area expenditures.

Useful Life - The anticipated total time in years that a *Reserve Component* is expected to serve its intended function in its present application or installation.



8. PROFESSIONAL SERVICE CONDITIONS

Our Services - Reserve Advisors, Inc. will perform its services as an independent contractor in accordance with our professional practice standards. Our compensation is not contingent upon our conclusions.

Our inspection and analysis of the subject property is limited to visual observations and is noninvasive. We will inspect sloped roofs from the ground. We will inspect flat roofs where safe access (stairs or ladder permanently attached to the structure) is available. The report is based upon a "snapshot in time" at the moment of our observation. Conditions can change between the time of inspection and the issuance of the report. Reserve Advisors does not investigate, nor assume any responsibility for any existence or impact of any hazardous materials, structural, latent or hidden defects which may or may not be present on or within the property. Our opinions of estimated costs and remaining useful lives are not a guarantee of the actual costs of replacement, a warranty of the common elements or other property elements, or a guarantee of remaining useful lives.

We assume, without independent verification, the accuracy of all data provided to us. You agree to indemnify and hold us harmless against and from any and all losses, claims, actions, damages, expenses or liabilities, including reasonable attorneys' fees, to which we may become subject in connection with this engagement, because of any false, misleading or incomplete information which we have relied upon as supplied by you or others under your direction, or which may result from any improper use or reliance on the report by you or third parties under your control or direction. Your obligation for indemnification and reimbursement shall extend to any controlling person of Reserve Advisors, Inc., including any director, officer, employee, affiliate, or agent. Liability of Reserve Advisors, Inc. and its employees, affiliates, and agents for errors and omissions, if any, in this work is limited to the amount of its compensation for the work performed in this engagement.

Report - Reserve Advisors, Inc. will complete the services in accordance with the Proposal. The Report represents a valid opinion of our findings and recommendations and is deemed complete. However, we will consider any additional information made available to us in the interest of promptly issuing a Revised Report if changes are requested within six months of receiving the Report. We retain the right to withhold a Revised Report if payment for services is not rendered in a timely manner. All files, work papers or documents developed by us during the course of the engagement remains our property.

Your Obligations - You agree to provide us access to the subject property during our on-site visual inspection and tour. You will provide to us to the best of your ability and if reasonably available, historical and budgetary information, the governing documents, and other information that we request and deem necessary to complete our Study. You agree to pay our actual attorneys' fees and any other costs incurred in the event we have to initiate litigation to collect on any unpaid balance for our services.

Use of Our Report and Your Name - Use of this Report is limited to only the purpose stated herein. Any use or reliance for any other purpose, by you or third parties, is invalid. Our Reserve Study Report in whole or part is not and cannot be used as a design specification, design engineering services or an appraisal. You may show our report in its entirety to those third parties who need to review the information contained herein. The Client and other third parties viewing this report should not reference our name or our report, in whole or in part, in any document prepared and/or distributed to third parties without our written consent. ***This report contains intellectual property developed by Reserve Advisors, Inc. specific to this engagement and cannot be reproduced or distributed to those who conduct reserve studies without the written consent of Reserve Advisors, Inc.***

We reserve the right to include our client's name in our client lists, but we will maintain the confidentiality of all conversations, documents provided to us, and the contents of our reports, subject to

legal or administrative process or proceedings. These conditions can only be modified by written documents executed by both parties.

Payment Terms, Due Dates and Interest Charges - The retainer payment is due upon authorization and prior to shipment of the report. The final payment of the fee is due immediately upon receipt of the Report. Subsequent changes to the report can be made for up to six months from the initial report date. Any outstanding balance after 30 days of the invoice date is subject to an interest charge of 1.5% per month. Any litigation necessary to collect an unpaid balance shall be venued in Milwaukee County Circuit Court in the State of Wisconsin.

CONDITIONS OF OUR SERVICE ASSUMPTIONS

To the best of our knowledge, all data set forth in this report are true and accurate. Although gathered from reliable sources, we make no guarantee nor assume liability for the accuracy of any data, opinions, or estimates identified as furnished by others that we used in formulating this analysis.

We did not make any soil analysis or geological study with this report; nor were any water, oil, gas, coal, or other subsurface mineral and use rights or conditions investigated.

Substances such as asbestos, urea-formaldehyde foam insulation, other chemicals, toxic wastes, environmental mold or other potentially hazardous materials could, if present, adversely affect the validity of this study. Unless otherwise stated in this report, the existence of hazardous substance, that may or may not be present on or in the property, was not considered. Our opinions are predicated on the assumption that there are no hazardous materials on or in the property. We assume no responsibility for any such conditions. We are not qualified to detect such substances, quantify the impact, or develop the remedial cost.

We have made a visual inspection of the property and noted visible physical defects, if any, in our report. Our inspection and analysis was made by employees generally familiar with real estate and building construction; however, we did not do any invasive testing. Accordingly, we do not opine on, nor are we responsible for, the structural integrity of the property including its conformity to specific governmental code requirements, such as fire, building and safety, earthquake, and occupancy, or any physical defects that were not readily apparent during the inspection.

Our opinions of the remaining useful lives of the property elements do not represent a guarantee or warranty of performance of the products, materials and workmanship.

9. CREDENTIALS

HISTORY AND DEPTH OF SERVICE

Founded in 1991, Reserve Advisors, Inc. is the leading provider of reserve studies, insurance appraisals, developer turnover transition studies, expert witness services, and other engineering consulting services. Clients include community associations, resort properties, hotels, clubs, non-profit organizations, apartment building owners, religious and educational institutions, and office/commercial building owners in 48 states, Canada and throughout the world.

The **architectural engineering consulting firm** was formed to take a leadership role in helping fiduciaries, boards, and property managers manage their property like a business with a long range master plan known as a Reserve Study.

Reserve Advisors employs the **largest staff of Reserve Specialists** with bachelor's degrees in engineering dedicated to Reserve Study services. Our principals are founders of Community Associations Institute's (CAI) Reserve Committee, that developed national standards for reserve study providers. One of our principals is a Past President of the Association of Professional Reserve Analysts (APRA). Our vast experience with a variety of building types and ages, on-site examination and a historical analyses are keys to determining accurate remaining useful life estimates of building components.

No Conflict of Interest - As consulting specialists, our **independent opinion** eliminates any real or perceived conflict of interest because we do not conduct or manage capital projects.

TOTAL STAFF INVOLVEMENT

Several staff members participate in each assignment. The responsible advisor involves the staff through a Team Review, exclusive to Reserve Advisors, Inc., and by utilizing the experience of other staff members, each of whom has served hundreds of clients. We conduct Team Reviews, an internal quality assurance review of each assignment, including: the inspection; building component costing; lifting; and technical report phases of the assignment. Each Team Review requires the attendance of several engineers, a Review Coordinator, Director of Quality Assurance and other participatory peers. Due to our extensive experience with building components, we do not have a need to utilize subcontractors.

OUR GOAL

To help our clients fulfill their fiduciary responsibilities to maintain property in good condition.

VAST EXPERIENCE WITH A VARIETY OF BUILDINGS

Reserve Advisors, Inc. has conducted reserve studies for a multitude of different communities and building types. We've analyzed thousands of buildings, from as small as a 3,500 square-foot day care center to the 100-story John Hancock Center in Chicago. We also routinely inspect buildings with various types of mechanical systems such as simple electric heat, to complex systems with air handlers, chillers, boilers, elevators, and life safety security systems.

We're familiar with all types of building exteriors as well. Our well versed staff regularly identifies optimal repair and replacement solutions for such building exterior surfaces such as adobe, brick, stone, concrete, stucco, EIFS, wood products, stained glass and aluminum siding, and window wall systems.

OLD TO NEW

Reserve Advisors experience includes ornate and vintage buildings as well as modern structures. Our specialists are no strangers to older buildings. We're accustomed to addressing the unique challenges posed by buildings that date to the 1800's. We recognize and consider the methods of construction employed into our analysis. We recommend appropriate replacement programs that apply cost effective technologies while maintaining a building's character and appeal.

QUALIFICATIONS
THEODORE J. SALGADO
Principal Owner

CURRENT CLIENT SERVICES

Theodore J. Salgado is a co-founder of Reserve Advisors, Inc., which is dedicated to serving community associations, city and country clubs, religious organizations, educational facilities, and public and private entities throughout the United States. He is responsible for the production, management, review, and quality assurance of all reserve studies, property inspection services and consulting services for a nationwide portfolio of more than 6,000 clients. Under his direction, the firm conducts reserve study services for community associations, apartment complexes, churches, hotels, resorts, office towers and vintage architecturally ornate buildings.



PRIOR RELEVANT EXPERIENCE

Before founding Reserve Advisors, Inc. with John P. Poehlmann in 1991, Mr. Salgado, a professional engineer registered in the State of Wisconsin, served clients for over 15 years through American Appraisal Associates, the world's largest full service valuation firm. Mr. Salgado conducted facilities analyses of hospitals, steel mills and various other large manufacturing and petrochemical facilities and casinos.

He has served clients throughout the United States and in foreign countries, and frequently acted as project manager on complex valuation, and federal and state tax planning assignments. His valuation studies led to negotiated settlements on property tax disputes between municipalities and property owners.

Mr. Salgado has authored articles on the topic of reserve studies and facilities maintenance. He also co-authored *Reserves*, an educational videotape produced by Reserve Advisors on the subject of Reserve Studies and maintaining appropriate reserves. Mr. Salgado has also written in-house computer applications manuals and taught techniques relating to valuation studies.

EXPERT WITNESS

Mr. Salgado has testified successfully before the Butler County Board of Tax Revisions in Ohio. His depositions in pretrial discovery proceedings relating to reserve studies of Crestview Estates Condominium Association in Wauconda, Illinois, Rivers Point Row Property Owners Association, Inc. in Charleston, South Carolina and the North Shore Club Associations in South Bend, Indiana have successfully assisted the parties in arriving at out of court settlements.

EDUCATION - Milwaukee School of Engineering - B.S. Architectural Engineering

PROFESSIONAL AFFILIATIONS/DESIGNATIONS

American Association of Cost Engineers - Past President, Wisconsin Section

Association of Construction Inspectors - Certified Construction Inspector

Association of Professional Reserve Analysts - Past President & Professional Reserve Analyst (PRA)

Community Associations Institute - Member and Volunteer Leader of multiple chapters

Concordia Seminary, St. Louis - Member, National Steering Committee

Milwaukee School of Engineering - Member, Corporation Board

Professional Engineer, Wisconsin, Registered in 1982

Ted continually maintains his professional skills through American Society of Civil Engineers, ASHRAE, Association of Construction Inspectors, and continuing education to maintain his professional engineer licenses.

JOHN P. POEHLMANN, RS
Principal

John P. Poehlmann is a co-founder of Reserve Advisors, Inc. He is responsible for the finance, accounting, marketing, and overall administration of Reserve Advisors, Inc. He also regularly participates in internal Quality Control Team Reviews of Reserve Study reports.

Mr. Poehlmann directs corporate marketing, including business development, advertising, press releases, conference and trade show exhibiting, and electronic marketing campaigns. He frequently speaks throughout the country at seminars and workshops on the benefits of future planning and budgeting for capital repairs and replacements of building components and other assets.



PRIOR RELEVANT EXPERIENCE

Mr. Poehlmann served on the national Board of Trustees of Community Associations Institute. An international organization, Community Associations Institute (CAI) is a nonprofit 501(c)(3) trade association created in 1973 to provide education and resources to America's 335,000 residential condominium, cooperative and homeowner associations and related professionals and service providers.

He is a founding member of the Institute's Reserve Committee. The Reserve Committee developed national standards and the Reserve Specialist (RS) Designation Program for Reserve Study providers. Mr. Poehlmann has authored numerous articles on the topic of Reserve Studies, including Reserve Studies for the First Time Buyer, Minimizing Board Liability, Sound Association Planning Parallels Business Concepts, and Why Have a Professional Reserve Study. He is also a contributing author in Condo/HOA Primer, a book published for the purpose of sharing a wide background of industry knowledge to help boards in making informed decisions about their communities.

INDUSTRY SERVICE AWARDS

- CAI Wisconsin Chapter Award
- CAI National Rising Star Award
- CAI Michigan Chapter Award

EDUCATION

- University of Wisconsin-Milwaukee - Master of Science Management
- University of Wisconsin - Bachelor of Business Administration

PROFESSIONAL AFFILIATIONS

- Community Associations Institute (CAI)** - Founding member of Reserve Committee; former member of National Board of Trustees; Reserve Specialist (RS) designation; Member of multiple chapters
- Association of Condominium, Townhouse, & Homeowners Associations (ACTHA)** – member



ALAN M. EBERT, P.E., PRA, RS
Associate Director of Quality Assurance

CURRENT CLIENT SERVICES

Alan M. Ebert, a Geological Engineer, is an Advisor for Reserve Advisors, Inc. Mr. Ebert is responsible for the inspection and analysis of the condition of clients' properties, and recommending engineering solutions to prolong the lives of the components. He also forecasts capital expenditures for the repair and/or replacement of the property components and prepares technical reports on assignments. He is responsible for conducting Life Cycle Cost Analyses and Capital Replacement Forecast services and the preparation of Reserve Study Reports for condominiums, townhomes and homeowner associations.

The following is a partial list of clients served by Alan Ebert demonstrating his breadth of experiential knowledge of community associations in construction and related buildings systems.

Brownsville Winter Haven Located in Brownsville, Texas, this unique homeowners association contains 525 units. The Association maintains three pools and pool houses, a community and management office, landscape and maintenance equipment, and nine irrigation canals with associated infrastructure.

Rosemont Condominiums This unique condominium is located in Alexandria, Virginia and dates to the 1940's. The two mid-rise buildings utilize decorative stone and brick masonry. The development features common interior spaces, multi-level wood balconies and common asphalt parking areas.

Stillwater Homeowners Association Located in Naperville, Illinois, Stillwater Homeowners Association maintains four tennis courts, an Olympic sized pool and an upscale ballroom with commercial-grade kitchen. The community also maintains three storm water retention ponds and a detention basin.

Birchfield Community Services Association This extensive Association comprises seven separate parcels which include 505 townhome and single family homes. This Community Services Association is located in Mt. Laurel, New Jersey. Three lakes, a pool, a clubhouse and management office, wood carports, aluminum siding, and asphalt shingle roofs are a few of the elements maintained by the Association.

Oakridge Manor Condominium Association Located in Londonderry, New Hampshire, this Association includes 104 units at 13 buildings. In addition to extensive roads and parking areas, the Association maintains a large septic system and significant concrete retaining walls.

Memorial Lofts Homeowners Association This upscale high rise is located in Houston, Texas. The 20 luxury units include large balconies and decorative interior hallways. The 10-story building utilizes a painted stucco facade and TPO roof, while an on-grade garage serves residents and guests.

PRIOR RELEVANT EXPERIENCE

Mr. Ebert earned his Bachelor of Science degree in Geological Engineering from the University of Wisconsin-Madison. His relevant course work includes foundations, retaining walls, and slope stability. Before joining Reserve Advisors, Inc., Mr. Ebert was an oilfield engineer and tested and evaluated hundreds of oil and gas wells throughout North America.

EDUCATION

University of Wisconsin-Madison - B.S. Geological Engineering

PROFESSIONAL AFFILIATIONS/DESIGNATIONS

Reserve Specialist (RS) - Community Associations Institute

Professional Reserve Analyst (PRA) - Association of Professional Reserve Analysts

Professional Engineering License - Wisconsin 2012

CURRENT CLIENT SERVICES

Matthew P. Ksionzyk, a Civil Engineer, is an Associate Director of Quality Assurance for *Reserve Advisors* Mr. Ksionzyk is responsible for the management, review and quality assurance of reserve studies. In this role, he assumes the responsibility of stringent report review analysis to assure report accuracy and the best solution for Reserve Advisors' clients. Mr. Ksionzyk has been involved with hundreds of Reserve Study assignments. The following is a partial list of clients served by Matthew Ksionzyk demonstrating his breadth of experiential knowledge of community associations in construction and related buildings systems.

Four Seasons Place - Located next to Boston Common, this condominium shares many common elements with the Four Seasons Hotel Boston. Built in 1985, this 16-story high-rise building includes 88 unique units with a brick masonry façade, flat roof systems, a health club and a parking garage.

Saint Mary's Catholic Church - This Jesuit parish is located in Lancaster, Pennsylvania and includes church/sacristy, rectory and school/convent buildings. Established in 1741, the present-day buildings were built from the mid-19th - to early 20th-centuries and comprise brick masonry façades and sloped slate and asphalt shingle roofs.

Azure - This 32-story high-rise was constructed from 2004 to 2007 and is located in Dallas, Texas. The building exterior comprises concrete balconies, flat roofs, glass/metal curtain walls and a panelized stone masonry façade. The development includes plaza decks, a pool, water features and a five-story subterranean parking garage.

Skyline Plaza - Located in northern Virginia, this community includes 957 units in twin 27-story buildings. Constructed from 1972 to 1977, the exteriors comprise concrete balconies, flat roofs and concrete/brick masonry façades. The community includes common social/recreation rooms, a plaza deck, a pool and a four-story parking garage.

Ronald McDonald House Toronto - Established in 1981, this Ronald McDonald House provides a "home away from home" for seriously ill children and their families. The current building was constructed from 2009 to 2011 and includes 81 guest suites, the largest of its kind in the world. The four-story building comprises a flat roof, fiber cement siding, brick masonry, extensive interior common areas, a school and playground equipment.

Linden - This five-story, mixed-use residential/commercial property is located in Hartford, Connecticut, was constructed from 1892 to 1893, and was converted to a condominium from 1979 to 1981. The development includes a brick and brownstone masonry façade, flat roofs, detached garage buildings, asphalt pavement and an elevated garden.

Guard Hill - This townhome-style development is located in Westchester County, New York and consists of 212 units in 45 buildings. The buildings comprise asphalt shingle roofs, wood balconies and wood siding. This community includes private roads, three ponds, tennis and basketball courts, and a pool.

The Village of Kiln Creek - Located in southeast Virginia, this large-scale master association is responsible for the common elements shared by 31 subsidiary associations that comprise 2,918 residences. The community was built from 1988 to 2001 and consists of a clubhouse, pools, recreation facilities, maintenance facilities, an administrative office, asphalt walking paths, an irrigation system and lakes.

PRIOR RELEVANT EXPERIENCE

Before joining Reserve Advisors, Mr. Ksionzyk attended Clarkson University, in Postdam, New York, where he specialized in Infrastructure Engineering. After college, he was commissioned as an officer in the U.S. Army and served four years on active duty, including a 13-month deployment in support of Operation Iraqi Freedom. While in the Army, Mr. Ksionzyk served as an infantry and a logistical transportation officer.

EDUCATION

Clarkson University - B.S. Civil Engineering

PROFESSIONAL AFFILIATIONS / DESIGNATIONS

Engineer In Training (E.I.T.) Registration - New York 2002

Professional Reserve Analyst (PRA) - Association of Professional Reserve Analysts

Reserve Specialist (RS) - Community Associations Institute



NICHOLAS M. JOHANNING, E.I.T.
Responsible Advisor

CURRENT CLIENT SERVICES

Nicholas M. Johanning, a Civil Engineer, is an Advisor for **Reserve Advisors, Inc.** Mr. Johanning is responsible for the inspection and analysis of the condition of clients' properties, and recommending engineering solutions to prolong the lives of the components. He also forecasts capital expenditures for the repair and/or replacement of the property components and prepares technical reports on assignments. He is responsible for conducting Life Cycle Cost Analysis and Capital Replacement Forecast services on townhomes, homeowners associations, planned unit developments and recreational associations.

The following is a partial list of clients served by Nicholas Johanning demonstrating his breadth of experiential knowledge of community associations in construction and related buildings systems.

The Landing at Egg Harbor Resort Condominium Owners Association Located in picturesque Egg Harbor, Wisconsin, this apartment style development of 61 units within two buildings features an indoor and outdoor pool, and picnic and playground areas for entertainment.

Breckinridge Station Community Association This inviting community, located in Duluth, Georgia maintains 229 townhome style buildings and 121 single family homes. The development also features an upscale clubhouse and pool featuring an aqua dome water feature.

The Demarest Court Condominium Situated in New City, New York, this 10 unit apartment style building was built in the early 2000's and comprises of vinyl siding and an asphalt roof. The interior of the building features garage parking, tile and carpet floor coverings and an elevator. The development also includes masonry retaining walls, vinyl and chain link fences, and asphalt pavement.

Ridge Point Condominium Association Located in Oak Forest, Illinois, this midrise community consists of 60 units within five buildings. The Association maintains intercom panels, life safety systems, and several staircases. The site consists of five detached garages, asphalt pavement and an irrigation system.

The Lakes at Highland Lakes Condominium Association This townhome style development of 92 units in 23 buildings and is located in Westerville, Ohio. Exterior features of the buildings include vinyl siding, brick masonry and asphalt shingle roofs. The site contains asphalt pavement streets and driveways, concrete flatwork, two ponds and retaining walls.

Pierce Place Condominium Association Built in 2009, this midrise community of 15 units in three buildings is located in Itasca, Illinois. These uniquely shaped buildings feature masonry veneer walls, balconies and modified bitumen roofs. The property includes an asphalt pavement street and access driveways, masonry retaining walls and an inviting entrance monument.

PRIOR RELEVANT EXPERIENCE

Before joining **Reserve Advisors, Inc.**, Mr. Johanning attended the University of Toledo in Toledo, Ohio where he attained his Bachelor of Science degree in Civil Engineering. During his time at the University of Toledo, Mr. Johanning helped his senior design group develop a water reduction plan for the buildings on the University of Toledo's campus. This project included designs for improving fixture efficiencies within selected buildings and estimations of water reduction and financial savings. Mr. Johanning also interned for The Douglas Company and R.A. Plumbing and Heating as an estimating engineer.

EDUCATION

University of Toledo - B.S. Civil Engineering

PROFESSIONAL AFFILIATIONS / DESIGNATIONS

Engineer In Training (E.I.T.) Registration



HEATHER M. CHRISTENSEN, RS
Review Coordinator

CURRENT CLIENT SERVICES

Heather M. Christensen, a Structural Engineer, is an Advisor for *Reserve Advisor*. Ms. Christensen is responsible for the inspection and analysis of the condition of clients' properties, and recommending engineering solutions to prolong the lives of the components. She also forecasts capital expenditures for the repair and/or replacement of the property components and prepares technical reports on assignments. She is responsible for conducting Life Cycle Cost Analysis and Capital Replacement Forecast services on townhomes, homeowner associations, planned unit developments and recreational associations. Ms. Christensen frequently serves as the *Quality Assurance Review Coordinator* for all types of developments.

The following is a partial list of clients served by Heather Christensen demonstrating her breadth of experiential knowledge of community associations in construction and related buildings systems.

Lawrence Square Townhomes Association A townhome association in Chicago, Illinois with 30 units in four buildings, this development displays uniqueness with shaped EIFS, vinyl siding, masonry walls and flat roofs. These buildings are connected with two bridges at the second stories, overlooking individual garages and private asphalt parking and streets.

3110 Wisconsin Condominium Association This high rise condominium located in downtown Washington, DC comprises 30 units in a nine-story building. The two-story units comprise concrete balconies, and the unit owners share a common lobby, elevators, hallways, parking garage and parking lot.

Ronald McDonald House Charity of San Diego Located in San Diego, California, the Charity provides 47 guest rooms to families. Built atop a seven story parking garage, the exteriors comprise masonry, stucco and a thermoplastic polyolefin roof with solar panels. The development includes a landscaped courtyard plaza located with the building footprint.

Pembroke North Homeowners Association Located in Wayne, Pennsylvania, this development contains 54 units in three LEED buildings. The building exteriors comprise flat membrane roofs, masonry siding and elevated garden plazas. The development contains a parking structure, asphalt pavement, finished interior lobbies and hallways, and a geothermal system.

The Valdosta-Lowndes County Conference Center and Tourism Authority This institutional development located in Valdosta, Georgia comprises metal awnings, metal and modified bitumen roofs, brick veneer and metal siding. The interiors included conference rooms and partitions, and the property includes a patio, pond and parking areas.

St. Philip the Apostle Catholic Church This church in Lancaster, Pennsylvania comprises five buildings, including classrooms, offices, a gym, a lobby and a rectory from 1849. The exteriors include masonry and EIFS wall systems, and asphalt, EPDM and slate roofs.

PRIOR RELEVANT EXPERIENCE

Before joining *Reserve Advisor*, Ms. Christensen attended the Milwaukee School of Engineering in Milwaukee, Wisconsin where she attained her Master of Science degree in Structural Engineering and her Bachelor of Science degree in Architectural Engineering. She also worked for Computerized Structural Design, Inc. where she worked on structural design projects for steel structures. Heather's previous involvement with Engineers Without Borders includes the design and construction of bridges in Guatemala.

EDUCATION

Milwaukee School of Engineering - M.S. Structural Engineering
Milwaukee School of Engineering - B.S. Architectural Engineering

PROFESSIONAL AFFILIATIONS

Engineer In Training (E.I.T.) Registration - Wisconsin
Reserve Specialist (RS) - Community Associations Institute
American Society of Civil Engineers - Associate Member

RESOURCES

Reserve Advisors, Inc. utilizes numerous resources of national and local data to conduct its Professional Services. A concise list of several of these resources follows:

Association of Construction Inspectors, (ACI) the largest professional organization for those involved in construction inspection and construction project management. ACI is also the leading association providing standards, guidelines, regulations, education, training, and professional recognition in a field that has quickly become important procedure for both residential and commercial construction, found on the web at www.iami.org. Several advisors and a Principal of Reserve Advisors, Inc. hold Senior Memberships with ACI.

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., (ASHRAE) the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., devoted to the arts and sciences of heating, ventilation, air conditioning and refrigeration; recognized as the foremost, authoritative, timely and responsive source of technical and educational information, standards and guidelines, found on the web at www.ashrae.org. Reserve Advisors, Inc. actively participates in its local chapter and holds individual memberships.

Community Associations Institute, (CAI) America's leading advocate for responsible communities noted as the only national organization dedicated to fostering vibrant, responsive, competent community associations. Their mission is to assist community associations in promoting harmony, community, and responsible leadership.

Marshall & Swift / Boeckh, (MS/B) the worldwide provider of building cost data, co-sourcing solutions, and estimating technology for the property and casualty insurance industry found on the web at www.msbinfo.com.

R.S. Means CostWorks, North America's leading supplier of construction cost information. As a member of the Construction Market Data Group, Means provides accurate and up-to-date cost information that helps owners, developers, architects, engineers, contractors and others to carefully and precisely project and control the cost of both new building construction and renovation projects found on the web at www.rsmeans.com.

Reserve Advisors, Inc., library of numerous periodicals relating to reserve studies, condition analyses, chapter community associations, and historical costs from thousands of capital repair and replacement projects, and product literature from manufacturers of building products and building systems.