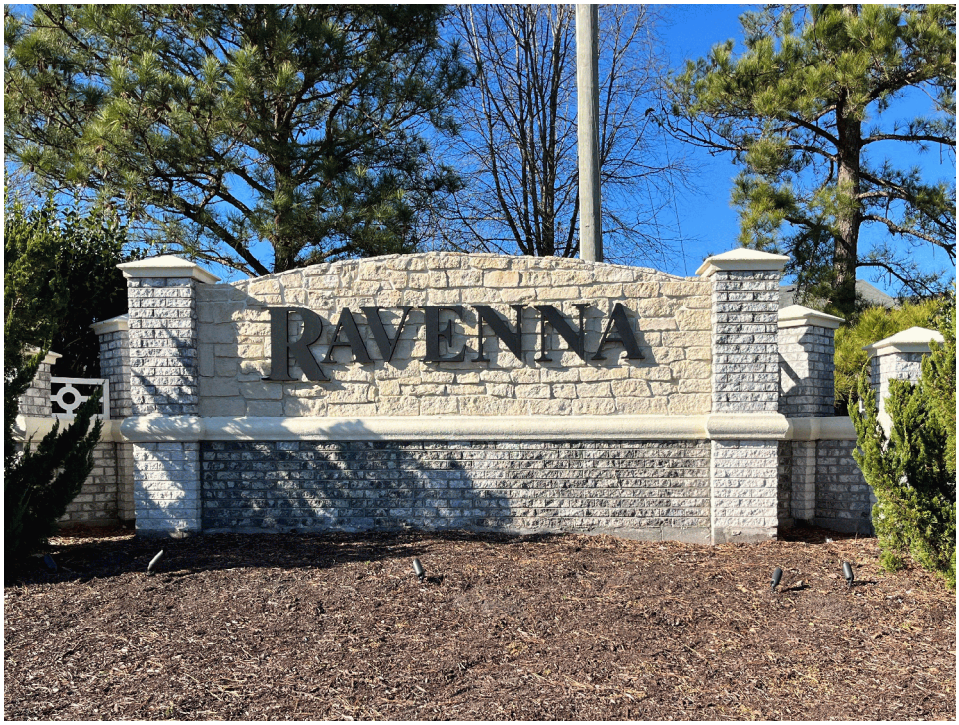
RESERVE STUDY

RAVENNA HOMEOWNERS ASSOCIATION, INC.

CHESAPEAKE, VIRGINIA



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INTRODUCTION

DLM Architects is pleased to present this replacement reserve study for *Ravenna Homeowners Association, Inc.* Ravenna HOA is a 195-lot homeowner association in Chesapeake, Virginia. DLM Architects has been requested by the Association Manager, André Towe with Community First Management and authorized by the Board of Directors to prepare this reserve study. The study aids the Association in determining the annual funding required for the Replacement Reserve Account. This study is limited to the reservable components of common ownership anticipated to last between four and thirty years. These reservable components are defined by the Declaration and agreed upon in the proposal by DLM Architects initiated on August 25, 2022, and signed by Mark Riedy, President. The components covered by this replacement reserve study are identified on page three.

The conditions presented in this study are as accurate as reasonably possible at the time this study was prepared. These conditions are assumed to be fairly accurate for one year. It must be noted that these conditions will change and conditions discovered in the future may be considerably different from those reported herein. Furthermore, rates of inflation and interest will change which will affect the future financial projections of this study. It is our recommendation that the information contained in this study must be reviewed, and updated accordingly, once a year.

REQUIREMENT FOR THE REPLACEMENT RESERVE ACCOUNT

One of the principal objectives of CIRA (Common Interest Realty Associations) is to maintain the community's common property. Paragraph 3.03 of the AICPA guide states that, “CIRAs may accumulate funds for future major repair and replacement of the common property through the following ways:

1. Funding through periodic assessments over the estimated life of common property.
2. Funding through special assessments at the time a major repair or replacement of common property is needed.
3. Borrowing.
4. Seeking grants or other kinds of programs from governmental entities (such as, energy retrofits, landscape plantings, etc.)
5. Seeking assistance from governmental agencies, for example, financial programs geared toward low to moderate income homeowners, are sometimes available.
6. A combination of those options.”

A replacement reserve study addresses item #1 in the list above. A replacement reserve study is advantageous for the long-term security of the homeowners by establishing the annual contributions to the Replacement Reserve Account necessary to provide adequate funds for the future major repair and replacement projects. The replacement reserve study is also an essential tool for determining compliance with requirements of FHA regulations requiring a replacement reserve study to determine whether the Association is adequately funded before a resale to their borrower. See FASB ASC 972-235-50-2, and the Association Declarations. Furthermore, The Code of Virginia § 55.1-1965. requires the following: "*Reserves for capital components: Except to the extent otherwise provided in the condominium instruments, the executive board shall: Conduct a study at least once every five years to determine the necessity and amount of reserves required to repair, replace and restore the capital components*." The Code of Virginia "§ 55.1-1900. Definitions; defines 'capital components' thus: "*As used in this chapter, unless the context requires a different meaning: "Capital components" means those items, whether or not a part of the common elements, for which the unit owners' association has the obligation for repair, replacement or restoration and for which the executive board determines funding is necessary.*"

Without a replacement reserve study, an alternative for accumulating funds would have the Association guess at what people are willing to pay without objection and charge them that amount. This method would please some unit owners, because monthly fees for them may be somewhat lower; however, the community would run the risk of deterioration if the appropriate funds are not available to cover necessary major repairs or replacement of the common elements when the need arises.

The other alternative for accumulating funds would be for the Association to levy a special assessment. The unit owners will be required to pay the cost of necessary repairs or replacement of deteriorated common elements as they occur. While this might raise the exact amount of money for the major repair or replacement project, it would inequitably assess future unit owners for costs associated with current depreciation of the common elements. Practically, a special assessment would depress resale values ahead of the assessment. This could be a financial burden on some unit owners, since it would have to be paid over a short period of time.

The proper method to accumulate funds for a Replacement Reserve Account is to estimate the future costs of major repair or replacement projects and annually set aside funds in advance to cover these costs when they occur. That is exactly the purpose of this replacement reserve study. If the recommendations of the replacement reserve study are followed, then this method estimates everyone's contribution into the Replacement Reserve Account, which means that adequate funds will be available when major repair or replacement of the common elements is necessary. This method also ensures that

those who are using the facilities are responsible for the depreciation of those facilities while they are being used.

DETERMINATION OF RESERVABLE COMPONENTS

DLM Architects conducted a visual survey of the grounds and related components, examined documents and spoke with André Towe, Association Manager. We estimated conditions, quantities, and ages of the various common elements included in this study. A contractor was consulted to confirm some of our conclusions as to the age and condition of this component.

The common elements are as defined by the Declaration and, therefore, must have the appropriate funds reserved to cover the expense of their major repair or replacement in the future. The common elements included in this study are as follows:

SITE AREA	COMMON BUILDING AREA	DWELLING UNIT BUILDINGS
Site Lighting	n/a	n/a
Monument Signs (2)		
Irrigation System		
Well		
BMP		
Fountain		

ANNUAL FUNDING REQUIREMENT

It would seem that the annual funding required for a particular reservable component could be established by determining the cost to replace the component and dividing it by its remaining useful life. This over simplifies the formula, so it is important to know that many other factors affect the accuracy of the annual funding requirement.

The estimated replacement costs of various components, is determined from the quantities of each component. This was accomplished by actual field measurements obtained by DLM Architects. After the quantities are ascertained, costs can be estimated through the extensive database that DLM Architects has available to them. Some of these costs are then verified similar projects that were recently completed. They are also modified based on the project size, location, schedule and the difficulty of work; however, it should be noted that these costs are estimated and actual price quotations will vary.

Costs of replacement can also vary greatly due to fluctuation in the cost of materials, availability of replacement materials, status of the labor market, status of the economy as a whole and cost of

contractor overhead, and insurance costs at the time the replacement work is done. All costs estimated in this replacement reserve study are based on our recommendation that the Association contract directly with a contractor who specializes in the appropriate trade of the work to be done. In other words, we have not included costs for the overhead and profit of a general contractor to oversee and coordinate the work of different trades because it is our assumption that each item of major repair or replacement work will be accomplished non-simultaneously with other items of replacement work.

According to information provided by André Towe, construction began in 2005. We have used an average of eighteen (18) years for the present age of all common elements unless otherwise noted. The anticipated life span of a common element is more difficult to estimate. To estimate its performance, we rely on historical experiences with similar products used in the same way.

Additional factors that affect the performance of a component include the proper detailing of the materials, the quality of the workmanship with which it was installed, its current condition and its exposure to the surrounding environment. The other big factor that helps project the remaining life of a component is the quality and frequency of maintenance it receives. Better and more frequent maintenance can greatly extend the remaining life of a component. Regular exterior painting, caulking, landscaping, cleaning of storm drains, gutters, and roof drains by the homeowners are important for extending the component's remaining life as well as keeping the community looking good.

In some sections of this study, the current condition of the component is described using terms based upon the USACERL (United States Army Construction Engineering Research Laboratories) Condition Rating System. An explanation of that system follows:

USACERL CONDITION DESCRIPTION (per sample unit)

Condition Rating	Category	Amount of Distress	Functionality	Type of Maintenance and Repair
86 – 100	Excellent	Minimal deterioration	Not Impaired	Preventive or minor maintenance or minor repair
71 – 85	Very Good	Minor deterioration	Slightly Impaired	Preventive or minor maintenance or minor repair
56 – 70	Good	Moderate deterioration	Somewhat Impaired	Moderate maintenance or minor repair
41 – 55	Fair	Significant deterioration	Seriously impaired	Significant maintenance or minor repair
26 – 40	Poor	Severe deterioration over a small portion of the sample unit	Critically Impaired	Major repair with short term return on investment
11 – 25	Very Poor	Severe deterioration over a moderate portion of the sample unit	Barely exists	Major restoration with no return on investment
0 - 10	Failed	Severe deterioration over a large portion of the sample unit	Lost	Total replacement

The quantity, anticipated service life and existing condition of the common elements that comprise the reservable components at *Ravenna HOA* are presented on the following pages.

RESERVABLE ITEM:	**SITE LIGHTING**		
TOTAL QUANTITY:	30 EA.	**% OF REPLACEMENT:**	100%
PRESENT AGE:	18 YRS.	**REMAINING LIFE:**	2 YRS.

EXISTING CONDITIONS:

There are thirty (30) low voltage (12V) light fixtures at the front entrance to the community on Ravenna Course. They are mounted on short metal spikes directly into the ground. They were manufactured/installed in 2005. The traditional fixtures are aluminum with a black painted finish with lights of 12 watts.

The fixtures are in poor repair (41-55) showing indications of damage or distress to the finish and damage to a number of the units. The lenses on the lamps show indications of clouding. There is no indication of electrical or mechanical problems such as breakage or shorting with the exception of two (2) of the fixtures. None of the lights were on during the day indicating that the photo cells don't need to be adjusted or replaced; however, the Association informed us after they received the 'Draft' of the reserve study that the lighting along Mt. Pleasant is currently inoperable. The Association is currently seeking proposals for the replacement/repair of the system. Preliminary cost from one estimate is about $23,000 for total replacement.

Damage that occurs should be addressed at the time that it happens. Damaged areas will need to be repaired to improve appearance and then care should be taken to avoid future damage from string trimmers and other yard maintenance equipment. String trimmers are especially a problem as they can damage the finish and dislodge the fixtures. Instead of using string trimmers for grass and weed control, it is recommended that a herbicidal control be sparingly applied by the lawn maintenance crews to extend their remaining life.

Eventually, the light fixtures will need to be replaced due to corrosion, clouding of the lenses and the development of more efficient lighting standards. Routine painting and replacement of the lamps should be handled as part of the preventive maintenance program and funded from the operating budget.

RESERVABLE ITEM:	**MONUMENT SIGNS**		
TOTAL QUANTITY:	2 EA.	**% OF REPLACEMENT:**	20%
PRESENT AGE:	18 YRS.	**REMAINING LIFE:**	INDEFINITE

EXISTING CONDITIONS:

There are two (2) monument signs at the entrance to the community at Ravenna Course. There is no other signage on the community. The community signage consists of two (2) masonry sign walls. Each masonry wall is twenty-seven feet (27') in length by eight feet (8') in height flanked by six (6) brick columns. The walls are composed of brick and masonry block with a face similar to Mountain Shadow Faux Stone Veneer. Each wall is anchored on a footing. The tops of the masonry columns have a decorative cap, shaped to shed water. The columns do not have pre-cast concrete caps and need to have them added to prevent long-term moisture intrusion.

Each sign has metal lettering spelling the name of the community. The lettering is anchored into the walls with anchors that are metal. The letters are 24" x 24" for the first letter and 18" x 18" for the remaining lettering. The condition of the signs appears to be very good (71-85) with no structural problems.

As with any type of masonry, the life expectancy should exceed the life of the community. Cracking of the walls can be expected in the future as the brick expands and contracts from changes in moisture levels and temperature. While this cracking is not serious, it provides a path of moisture penetration into the walls. To prevent deterioration, the mortar on the sign bases should be periodically inspected and repointed as needed. Such repairs should be an ongoing maintenance responsibility and should be funded from the maintenance budget along with repair of minor defects in the masonry work.

If it occurs, black mold (cyanobacteria) on the exposed faces of the masonry would be an indication of long-term moisture intrusion into the interior of these walls. While cracking is not present at this time, this condition, when it occurs, may result in cracks occurring in the masonry at a future date. In addition, the normal movement in the walls from freezing and thawing will cause cracks in the signs due to the expansion of the masonry. This cracking will result in loose mortar as well as fractured masonry.

To prevent deterioration, the mortar on the walls should be periodically inspected, cleaned, repointed and sealed with masonry sealer as needed. We recommend applying a clear penetrating masonry sealer to the upper surface of the caps to prevent moisture intrusion into the sloped top of the columns. Such repair should be an ongoing maintenance responsibility and should be funded from the maintenance budget along with repair of minor defects in the brick work.

We have set the life expectancy to exceed thirty (30) years based on the type of construction. It is estimated that over a thirty-year period, twenty percent (20%) of the masonry walls will need repointing and repair.

RESERVABLE ITEM:	**IRRIGATION SYSTEM**		
TOTAL QUANTITY:	100 L.F.	**% OF REPLACEMENT:**	100%
PRESENT AGE:	2 YRS.	**REMAINING LIFE:**	23 YRS.

EXISTING CONDITIONS:

The irrigation system is a Hunter product with a controller, about forty (40) sprinkler heads and nine controller boxes, one for each zone. The overall condition is excellent (86-100) as the Association replaced the system in 2021 at a cost of $70,000, with labor being over $30,000 of the total.

This was a complete retro installation of the irrigation system. The major components include a Hunter A2C-75D-P Plastic Cabinet Decoder Controller, a Hunter I-20 4" Gear Drive Head Hunter PGV-151, a Globe/angle Valve with Flow Control, and a Hunter 1 Station decoder ICI-100. These components were about $20,000 in cost.

The common irrigation system runs throughout the front entrance area at Ravenna Course. The irrigation system consists of ½" polyethylene piping with standard brass fittings. There appeared to be no leaks, although the system was not operating at the time of inspection.

The major causes of damage to this type of system are heads broken by yard maintenance equipment and freezing. Since the heads should be repaired from the operating budget, they should not require a reserve. We have established a replacement reserve for the irrigation controllers.

A preventive maintenance program of regular inspections and periodic flushing of the system should be funded from the regular operating budget. The life of the system is indefinite except for the controllers, which have an anticipated service life of 25 years.

The system is fed by two (2) wells that are installed behind the sign on the northeast side of the entrance.

RESERVABLE ITEM:	**WELLS**		
TOTAL QUANTITY:	2 EA.	**% OF REPLACEMENT:**	10%
PRESENT AGE:	18 YRS.	**REMAINING LIFE:**	INDEFINITE

EXISTING CONDITIONS:

The system is fed by two (2) wells that are installed behind the sign on the northeast side of the entrance. The depth of the wells is unknown. It is not known why two wells are this close together unless one of the wells is no longer functioning. The overall condition is variably good (56-70).

The pumps are likely heavy-wall stainless steel pump shells with 1 HP, 3 Wire 230 Volt motors rated at 11 GPM. Siltation of the wells and cleaning of the filters on the pumps should be part of an annual maintenance program and funded from the operating budget. The reserve has been established to replace the pumps. Replacement of the well casings is beyond the 30-year time horizon of this reserve study.

Well pumps are either above ground or submersible. A submersible well pump is used for landscape irrigation. As the name implies, submersible pumps are used under water in wells. A small electric motor (called a driver) is installed in the well shaft, usually below the pump, and an electric cable is attached to the motor. Piping is then fitted from the pump, through the length of the shaft and into the irrigation system. Unlike their shallow-end counterparts, submersible well pumps may be set hundreds of feet beneath the water in a well. When the pump is activated, the motor, which consists of a number of impellers and diffusers which spin on a common shaft (called stages), pushes water up out of the well.

RESERVABLE ITEM:	**BMP**		
TOTAL QUANTITY:	30,100 S.F.	**% OF REPLACEMENT:**	10%
PRESENT AGE:	18 YRS.	**REMAINING LIFE:**	INDEFINITE

EXISTING CONDITIONS:

There is one (1) retention BMP in the community. It is off of Riviara Place at the north side of the community. The BMP has a surface area of 30,100 S.F. and drains to a lake in Waterway Estates. There is significant erosion on the side of the BMP without bulkhead.

There is no mention of the BMP in the declaration other than in Article 6.01(s) titled Lake Use which states: "No permanent or temporary dock or structure shall be placed in area adjacent to or overhanging any lake or retention pond without prior written approval of the Declarant or its authorized agent. No motorized vehicles, boats, jet skis, or other type motor craft fueled by petroleum products are permitted within the lakes or on the lake banks. Additionally, boats, rafts, or other floating devices shall not be docked or left unattended at the waterfront portion of any Lot for a period in excess of three (3) hours. It is the intention of this restriction to maintain an unobstructed and uncluttered waterfront view of lakes and retention ponds." Based upon the plats obtained from the City of Chesapeake, the lot lines for the lots adjoining the BMP are platted to the center of the BMP. This indicates the lakes are not common area, but are the sole responsibility of the abutting property owners. According to Notes 9 and 10 on the cover plat labeled Subdivision of Ravenna Phase Two, "Drainage Easements shown hereon are hereby dedicated to the City of Chesapeake granting the right to construct, operate and maintain a drainage ditch or structure upon and across the lands and property of the grantor and including the right of ingress to same. The right is granted to inspect the said drainage ditch or structures and to cut and clear undergrowth and other obstructions in and along the said drainage or adjacent thereto that may in any way endanger or interfere with the proper use of the same."

"Private drainage easements shown hereon are for the purpose of conveying stormwater drainage from upstream and adjacent lots. Maintenance shall be the responsibility of adjacent property owners unless the city expressly accepts the easement for public use."

This is an additional indication that the BMP is not a common element and may be removed from the reserve study. We recommend that the Association have their Attorney review the necessary documents and provide the Association with a written opinion determining whether the BMP is the responsibility of the Association or the adjacent owners.

There is rip-rap along the north and east sides of the BMP in conjunction with a concrete walk and retaining wall built adjacent to the BMP by a previous owner of lot 40.

(Note: The following information is provided by the reserve specialist to the Association if it is determined that the Association is responsible for the maintenance of the BMP and not the responsibility of the abutting homeowners.)

There was no indication of algae growth at the time of the inspection. The BMP is not under a maintenance contract.

The retention BMP's primary function is to provide stormwater retention for the streets in the community. It was not possible to determine the exact water depth, but it appears to range from one (1) foot at the bank to approximately twenty (20) feet. The overall condition of the BMP is good (56-70).

It is estimated that the BMP may require periodic dredging in order to maintain the water depth but less so than would occur with a shallower BMP design. The Association continues to be responsible for the preventive maintenance program to repair erosion funded through the operating budget. Particular emphasis should be placed on instituting a landscaping program for the banks which will improve the erosion control.

The BMP banks without bulkhead have not been allowed to naturalize and have only grass which is mowed down to the water's edge. This provides no barrier to erosion. There was minor erosion due to the lack of landscaping. The water's condition was clear and the bottom was visible.

Native water related plants, such as reeds, native grasses and water loving trees, such as willows, should be planted or allowed to naturalize.

As fall and the cold of winter approach each year, there are many things that should be done to maintain the health of the BMP as the algae and unwanted aquatic vegetation, that often times plagues a BMP during the warmer months of spring and summer, fades away and goes dormant for the winter. What is done, or not done, during these months can be just as important as what is done with this body of water during the warmer months of the year.

One of the most significant contributors to water quality problems in a BMP is the mass loading of that BMP with nutrients that flow in with storm water runoff from yards, sidewalks, driveways, streets, roofs, and other impervious surfaces within a community. Most people tend to rely very heavily on fertilizers for lawns and shrubs during the fall. Improper or over application of these products can have very damaging effects on the water to which they flow. The Association should pay very close attention to label directions and make sure that a minimal amount of fertilizer is applied each year.

Additionally, much research has been done over recent years to develop beneficial microbes that are effective in the breakdown of nutrients and organic buildup in BMPs, even during cooler weather. These products work very well in conjunction with aeration to rid the BMPs and ponds of the excess nutrient and organic buildup, thus bringing the pond back into an ecological balance and helping to prevent many potential water quality problems.

As the regulatory climate in the United States regarding aquatic pesticides becomes more stringent, it is becoming increasingly important to find alternatives to algaecides and herbicides for our algae and nuisance vegetation management programs. The continual and repetitive release of pesticides into the environment for vegetation control is not sustainable or effective and more environmentally-friendly methods have become necessary.

Integrated Pest Management (IPM) is a comprehensive approach to pest management that includes the use of many alternative strategies prior to or in conjunction with the use of pesticides. The implementation of a long-term, proactive IPM Program for BMP and pond management helps to reduce the use of treatment products, while still providing for a healthy and aesthetically pleasing water body.

One of the most commonly recommended Integrated Pest Management strategies for water quality restoration is the installation of an aeration or circulation system. Aeration improves the health of a water body by adding oxygen to the system, which facilitates the conversion of phosphorus to forms that are not usable by algae as food. It also alters pH and other related water quality parameters to favor the growth of healthy green phytoplankton at the base of the food chain rather than potentially toxic cyanobacteria species. The end result is a healthier BMP or pond with fewer harmful algae blooms, and a reduction in the need for algaecide treatments.

The two most common types of aeration systems are submersed diffused air systems and surface aerators. While both types can be extremely effective, each type has certain features that would make it the appropriate choice depending on the characteristic of a particular water body. The determination of which type to use should be done in consultation with a BMP management specialist.

In most cases, a combination of subsurface and surface aeration would provide the greatest benefit, but it is important to consider the goals of the stakeholders, the size, depth and water quality of the BMP or pond, and the installation and operating budgets of the facility when selecting the optimal aeration strategy. Whatever system is implemented, the long-term result will be a more balanced water body that requires fewer applications of algaecides to maintain it in a healthy and aesthetically pleasing state.

Finally, the prevention of sunlight penetration into the water column through the application of dye will help to insure that unwanted vegetation that sits dormant on the bottom during the winter will be unable

to come out of that winter dormancy in the spring. Most important, pay attention to this BMP and the environmental practices that surround and affect it. The flow of contaminants into the BMP does not stop just because the weather gets cold. Responsible BMP management is a year-round endeavor.

Virginia Stormwater Management Handbook provided the source of our reserve study recommendations:

Vegetation Management:

Vegetative cover serves several purposes in BMPs: slows the velocity of the runoff; filters sediment from runoff as it is collected in the BMP; and prevents erosion of the banks and bottom of the facility. Grass is generally used around retention basins, infiltration trenches and in and around dry detention basins. It must be mowed and maintained. Mowing requirements can be tailored to the specific needs of a site and the neighboring properties. The grass in a BMP may be hardiest if maintained as an upland meadow, cutting no shorter than 6-8 inches. Maintaining a more manicured expanse of grass decreases the effectiveness of the BMP, as well as increasing its maintenance costs. Wetland plants may also be used along the fringe of the BMP in areas where conditions are favorable. Some of these types of plants may inhabit the area naturally. Plants along the edges of BMPs filter pollutants. The Virginia Stormwater Management Handbook provides even more detail:

MINIMUM STANDARD 3.05 CHAPTER 3

Plant selection should be based on the planting zones within the BMP. Various zones exist within a stormwater impoundment and each represents a different inundation frequency and soil moisture condition. The planting zones can be classified as follows:

Zone 1: Deep Water Areas: This zone is submerged beneath 18 inches to 6 feet of water. It supports submerged aquatic vegetation such as pondweed, coontail, wild celery, etc., and floating vegetation such as duckweed. Plants can actively remove metals from the water and provide food and habitat for invertebrates at the bottom of the food cycle. This zone may be present in retention basins, constructed wetlands, and in sediment forebays and micro-pools of extended-detention and enhanced extended-detention basins.

Zone 2: Shallow Water Area: This zone is 0 to 18 inches in normal depth and is the primary area for the establishment of emergent wetland plants. It may be present in retention basins, constructed wetlands, and enhanced extended-detention basins. This zone is divided into low-marsh and highmarsh sub-zones.

The low-marsh extends from 6 to 18 inches in depth below the normal water surface. The high-marsh ranges from 6 inches below the normal water surface and up to the normal water surface. Vegetation in this zone can serve the following purposes:

1. enhances nutrient uptake,
2. reduces flow velocities to increase the rate of sediment deposition,
3. reduces resuspension of bottom sediments,
4. provides food and cover for wildlife,
5. provides habitat for predatory insects and to serve as a check for mosquitoes,
6. reduces shoreline erosion, and
7. improves aesthetics.

Suggested plants for this zone include common three-square, soft-stem bulrush, pickerelweed, arrow arrum, sedges, and others.

Zone 3: Shoreline Fringe: This zone is regularly inundated during runoff-producing storm events and may remain saturated due to the proximity of the permanent pool. However, plants must be tolerant of periodic drying, especially during the summer months. This zone extends from the normal water surface to about 1 foot above the normal water surface for retention basins and constructed wetlands. It also continues up to the maximum extended-detention volume elevation for extended detention and enhanced extended-detention basins. The vegetation in this zone may serve the following purposes:

1. stabilizes the shoreline,
2. improves aesthetics,
3. limits shoreline access by people and animals (geese),
4. provides food, cover, and nesting for wildlife, and
5. provides shade.

Recommended species for this zone include herbaceous vegetation such as soft-stem bulrush, pickerelweed, rice cutgrass, sedges, and others. It also includes trees such as black willow and river birch and shrubs such as chokeberry.

Zone 4: Riparian Fringe Area: This zone is only briefly inundated during storms. It generally includes the upper storage areas of extended-detention basins (above the water quality or channel erosion control volume) and the lower basin areas of dry detention basins. It experiences both wet and dry soil conditions and periodic inundation. The vegetation in this zone may serve the following purposes:

1. reduce resuspension of newly deposited sediments,

2. prevent erosion, and

3. provide habitat and food for wildlife.

A variety of trees, shrubs, and ground covers can be used in this zone, including black willow, river birch, red chokeberry, green ash, sweetgum and others.

RESERVABLE ITEM:	**FOUNTAIN**		
TOTAL QUANTITY:	0 EA.	**% OF REPLACEMENT:**	0%
PRESENT AGE:	0 YRS.	**REMAINING LIFE:**	0 YRS.

EXISTING CONDITIONS:

No fountain was found within the community or in the BMP. An electrical receptacle and timer were found on the east bank adjacent to the BMP.

Other components indicated as common elements have a life span coincident with the life span of the structures, and should not need replacement or repair unless subjected to catastrophic conditions (fire, lightning, hail, hurricanes, earthquakes, etc.), which should be covered under an adequate property insurance policy. It should be noted that problems that may arise and are not addressed by the Association maintenance program and repaired in a timely manner, may cause further deterioration.

CONCLUSION

The association is facing a large project (site lighting) in the near future. Construction costs are anticipated to escalate because of the economic times during that period. As a result, the recommended annual contribution to the Replacement Reserve Account is $8,500.00. Furthermore, in order to have sufficient funds on hand for future projects, we recommend increasing the annual contribution by 3% per year for each year thereafter (Option 'D' in the Table below). If the Association chooses another rate of increase, the change to the recommended annual contribution is shown in this Table below:

OPTION ▼	RATE OF INCREASE IN THE ANNUAL CONTRIBUTION	RECOMMENDED ANNUAL CONTRIBUTION
A	0%	$13,750.00
B	1%	$11,500.00
C	2%	$10,250.00
D	3%*	$8,500.00*
E	4%	$7,500.00
F	5%	$6,750.00

*The 3% per year projected increase in the recommended annual contribution (highlighted) is illustrated in the graph at the end of this replacement reserve study.

These projections are illustrated in the graph at the end of this replacement reserve study. It must be noted that unplanned expenses for items outside the scope of a replacement reserve study (landscape replacement, painting, insurance deductibles, community upgrades, etc.) can be major expenses and without an adequate operating reserve, a special assessment may be required.

INFLATION

Other factors must be considered when allocating funds for projects of this nature. One of the biggest factors and possibly the most difficult to predict is inflation and the interest rate on invested replacement reserve funds. We have allowed for a **3% annual inflation rate** in our calculations. Given the economic patterns over the past decade, we feel this is a conservative figure and will ensure that the return on the fund keeps pace with inflation on an annual basis. Keep in mind that a replacement reserve study cannot accommodate changes to the interest rates on a year-to-year basis because it looks at changes over a 30 year time horizon. Please note; construction cost inflation rates differ from the Consumer Price Index (CPI) and can be obtained from the RSMeans Construction Costs book.

Because the fund is receiving interest on the current balance on the Replacement Reserve Account and not on the entire cost of the project, it is further necessary to update the replacement cost and therefore the annual contributions based on inflation of construction cost once a year. This assures the Association over the life of the project that the necessary funds are available as the particular components conclude their useful life. See the table on this page for a comparison of a hypothetical $100,000 project cost inflated over five years to a non-adjusted reserve contribution and an inflation adjusted contribution to the Replacement Reserve Account.

COMPARATIVE EXAMPLE FOR A HYPOTHETICAL RESERVE FUND

	COLUMN 1	COLUMN 2	COLUMN 3
YEAR	RESERVE REQUIRED FOR A $100,000 PROJECT AT 7% ANNUAL INFLATION OF CONSTRUCTION COST	ACCUMULATED BALANCE IN THE RESERVE BASED ON THE ANNUAL CONTRIBUTION AS A CONSTANT AMOUNT* PLUS A 7% ANNUAL RETURN	ACCUMULATED BALANCE IN THE RESERVE BASED ON AN INFLATION ADJUSTED ANNUAL CONTRIBUTION** PLUS A 7% ANNUAL RETURN
1	$100,000	$21,400	$21,400
2	$107,000	$44,298	$45,796
3	$114,490	$68,799	$73,503
4	$122,504	$95,015	$104,864
5	$131,080	$123,066	$140,255

* The Annual Contribution as a Constant Amount uses the first year's construction cost divided by the 5 year life of this hypothetical component plus a 7% return on each years' contributions. This approach does not consider the inflation of the construction costs. As a result, in the fifth year, the accumulated funds are approximately $8,000 short of the amount required in column 1.

** Inflation adjusted annual contribution uses the result of the current year's inflation adjusted construction cost divided by the 5 year life of the component. This allows the Replacement Reserve Account to keep pace with inflation.

Column 3 shows that inflating the current year's annual contribution by the previous year's inflation rate provides the financial resources available to keep pace with the inflation rate of the construction cost shown in column 1.

VIRGINIA STATUTORY REQUIREMENTS FOR RESERVES

The Code of Virginia § 55.1-1965. requires the following: Annual budget; reserves for capital components.

"A. Except to the extent provided in the condominium instruments, the executive board shall, prior to the commencement of the fiscal year, make available to unit owners either (i) the annual budget of the unit owners' association or (ii) a summary of such annual budget.

B. Except to the extent otherwise provided in the condominium instruments, the executive board shall:

1. Conduct a study at least once every five years to determine the necessity and amount of reserves required to repair, replace, and restore the capital components as defined in § 55.1-1900;

2. Review the results of that study at least annually to determine if reserves are sufficient; and

3. Make any adjustments the executive board deems necessary to maintain reserves, as appropriate.

C. To the extent that the reserve study conducted in accordance with this section indicates a need to budget for reserves, the unit owners' association budget shall include:

1. The current estimated replacement cost, estimated remaining life, and estimated useful life of the capital components as defined in § 55.1-1900;

2. As of the beginning of the fiscal year for which the budget is prepared, the current amount of accumulated cash reserves set aside to repair, replace, or restore the capital components and the amount of the expected contribution to the reserve fund for that fiscal year;

3. A statement describing the procedures used for estimation and accumulation of cash reserves pursuant to this section; and

4. A statement of the amount of reserves recommended in the study and the amount of current cash for replacement reserves."

PREVIOUSLY ACCUMULATED FUNDS

According to an account statement furnished by the Association Manager, André Towe, there are currently accumulated funds in the Replacement Reserve Account for a total of $2,666.92 as of January

31, 2023. This value is used in the Capital Repair and Replacement Reserve Summary as "TOTAL PRIOR ACCUMULATION." The funds are in NCB Money Market earning an interest rate of 0.75%, which was used in the calculation to estimate the hypothetical accumulated Replacement Reserve Account balance at year thirty (30) at the end of this study.

EXCLUSIONS

Because FASB ASC 972-235-50-2 does not allow the accumulation of monies for routine maintenance and minor repair components to be included in a Replacement Reserve Account, we don't include them in this study; however, it should be noted that these components such as painting, termite treatment and repair, power washing, wood preservative treatment, replacement reserve study fees and landscape replacement have the possibility of being major expenses and the Association should plan for them accordingly in their operating budget. This comes from IRS rulings and audit filings which state that these are “maintenance” components and not “contributions to capital." Note that these are IRS definitions, and these are only issues if the association is filing Federal Tax Form 1120 (Corporation Tax Return) rather than form 1120-H (Homeowners Association Tax Form). Therefore, by IRS definitions the assessments collected for these types of future expenses aren't deductible from taxable income under the “contributions to capital” definition. Even if the association chooses to file Form 1120, there are ways that your accountant can adjust for these tax differences. It is not uncommon to have differences between generally accepted accounting principles and tax laws. With regards to non-capital reserves, your accountant should suggest that the cash set aside be segregated from other accounts.

The replacement reserve study is predicated on replacing each component in kind. As a result, there are not enough monies anticipated to ‘upgrade’ the common element to a better grade or product. While a better grade or different product may perform significantly longer than the existing product, the replacement reserve study cannot plan for that upgrade since it would be the decision of the Board to make that change at the time of replacement. Should the Association choose to upgrade the common elements in whole or in part, then the proper funding method is through the Association’s operating reserve. Throughout this study we have made notations of components that could be enhanced at the time of replacement which in our opinion would not constitute an ‘upgrade’.

REPLACEMENT RESERVE FUNDING OPTIONS

The financial analysis portion of the reserve study is at the end of this study and is broken down into two sections; Capital Repair/Replacement Reserve Summary (on a Component Basis), Capital Repair/Replacement Reserve Schedule (on a Cash Flow Basis) followed by a graph of the future projected Replacement Reserve Account balances. Cash Flow and Component Basis are the two most common funding objectives. Funding on a Component Basis is typically the most conservative funding

objective because the calculations for the Replacement Reserve Account contribution include a contingency. Cash Flow Basis means establishing an objective of keeping the Replacement Reserve Account balance above zero, with no contingency for unanticipated expenses. Unfortunately, due to having little or no "margin for error" this funding objective exposes the association to the risk of special assessments should the future predictions vary from actual performance or cost. Threshold Basis is an alternate funding objective which keeps the Replacement Reserve Account above a predetermined dollar or Percent Funded amount (a kind of "middle ground" objective). Statutory Basis (setting the specific minimum amount of Reserves required by state statutes) is one specific form of Threshold Basis, where the threshold is set to that required by state statute. This is not desirable because it gives the Association little say over their funding objectives and therefore Virginia doesn't have a threshold statute.

Because replacement reserve income and expenses never occur exactly as projected, decide in advance your risk strategy, and your tolerance for special assessment before determining an appropriate Reserve Funding Objective for your association.

REPLACEMENT RESERVE STUDY NOTE

The existence of any environmental hazard such as the presence of hydrocarbon contamination, radon gas, lead based paint, mercury, asbestos-containing materials, ureaformaldehyde insulation, chromated copper arsenate (CCA), polychlorinated biphenyls (PCB's), toxins, fly ash, mold and other materials hazardous to human health which may or may not be present in or on the subject community or any site within the vicinity of the community, was not observed by the reserve specialist has no knowledge of any such environmental hazard. The reserve specialist is not qualified to detect such substances. All responsibility is disclaimed for any such conditions, or for any expertise or engineering knowledge required to discover them.

The presence of such substances may affect the value of the replacement reserve in the future. The replacement reserve estimate is predicated on the assumption that there is no such material on or in the community and the regulations governing the presence of these substances remains unchanged.

The reserve specialist has not taken into consideration any consequence that the Clean Air Act of 1963 (Air Quality Act of 1967 and Amendments passed in 1970, 1977 and 1990) and the Federal Water Pollution Control Act of 1948 (Federal Water Pollution Control Act Amendments of 1972 and Clean Water Act of 1977, Water Quality Act of 1987 and Federal Water Pollution Control Act of 2002), the 2014 FEMA Coastal Study of the Flood Insurance Rate Maps and/or the Chesapeake Bay Preservation

Act may have on the community since an Environmental Impact Study or Environmental Site Assessment was not provided.

The Association may wish to retain an expert in these fields to make an accurate determination concerning the existence of such hazardous materials and their impact due to possible existence of environmentally protected property.

The existence of polybutylene pipe was not reviewed because it is not a common element. The replacement reserve estimate is predicated on the assumption that there is no such material on or in the community.

The reserve specialist has not taken into consideration any consequence that the Fair Housing Act of 1991 may have on the community, because the buildings presumed to be in compliance with the Act's design and construction requirements due to their first occupancy occurring after the Act's effective date of March 13, 1991.

It should be noted that any problem with the common elements that may arise and are not addressed by the Association maintenance program and repaired in a timely manner, may cause further deterioration and significantly higher replacement costs than anticipated in this study.

As a result of various projected outcomes from the COVID-19 coronavirus, economic uncertainties may arise which may negatively impact the association's ability to collect assessments. Therefore, the related financial impact on the association's replacement reserves cannot be reasonably estimated at this time.

APPENDIX 'A'

The appendix contains the replacement reserve summary, schedules and chart which begin on the next page.

CAPITAL REPLACEMENT RESERVE SUMMARY FOR:

RAVENNA HOMEOWNERS ASSOCIATION, INC.

COMPONENT BASIS **SHEET A1**

BASED ON DATA CURRENT AS OF: APRIL 13, 2023 DATE PREPARED: 31-Mar-23

ITEM	PRESENT AGE*	REMAINING LIFE*	YEAR TO REPLACE	QUANTITY	UNIT COST	COST OF REPLACEMENT (IN CURRENT $)	PERCENTAGE OF COST OF REPLACEMENT	PRIOR ACCUMULATION	FUTURE REQUIREMENT (IN CURRENT $)	ANNUAL CON-TRIBUTION
MONUMENT SIGNS (20%)	18	17	2040	2 EA.	$12,500.00	$25,000	13.81%	$368	$24,632	$1,449
IRRIGATION SYSTEM (Controllers)	2	23	2046	9 EA.	$3,500.00	$31,500	17.40%	$464	$31,036	$1,349
WELLS (10%)	18	12	2035	2 EA.	$5,500.00	$11,000	6.07%	$162	$10,838	$903
BMP (10%)	18	22	2045	3,010 S.F.	$7.00	$21,070	11.64%	$310	$20,760	$944
SITE LIGHTING	18	2	2025	30 EA.	$750.00	$22,500	12.43%	$331	$22,169	$11,084
IRRIGATION SYSTEM	2	28	2051	1 EA.	$70,000.00	$70,000	38.66%	$1,031	$68,969	$2,463

TOTAL COST OF PROJECTS:	$181,070	**ANNUAL CONTRIBUTION (COMPONENT BASIS)**	**$18,193**
TOTAL PRIOR ACCUMULATION:	$2,667	**ANNUAL CONTRIBUTION (CASH FLOW BASIS)**	**$8,500**
PERCENTAGE OF TOTAL COST:	1.47%	**RECOMMENDED INCREASE TO THE ANNUAL CONTRIBUTION**	**3%/YEAR**

ABBREVIATIONS: B.F.= BOARD FEET EA.= EACH L.F.= LINEAR FEET L.S.= LUMP SUM S.F.= SQUARE FEET S.Y.= SQUARE YARD SQ.= SQUARE 10'x10'

*NOTE - WHEN THE SUM OF COMPONENT AGES IN COLUMNS 'C' AND 'D' EXCEEDS 30 - YRS, THE NET DIFFERENCE HAS BEEN USED.

CAPITAL REPAIR/REPLACEMENT RESERVE SCHEDULE FOR: **SHEET A2**

RAVENNA HOMEOWNERS ASSOCIATION, INC. CASH FLOW BASIS

ITEM	2023 YEAR 1	2024 YEAR 2	2025 YEAR 3	2026 YEAR 4	2027 YEAR 5	2028 YEAR 6	2029 YEAR 7	2030 YEAR 8	2031 YEAR 9	2032 YEAR 10
MONUMENT SIGNS (20%)										
IRRIGATION SYSTEM (Controllers)										
WELLS (10%)										
BMP (10%)										
SITE LIGHTING			$22,500							
IRRIGATION SYSTEM										
TOTAL COST IN 2023 DOLLARS			$22,500							
TOTAL INFLATION ADJUSTED DOLLARS @ 3.0% INFLATION RATE			$23,870							
CONTRIBUTION PER UNIT	$44	$45	$46	$48	$49	$51	$52	$54	$55	$57
TOTAL ANNUAL CONTRIBUTION ADJUSTED @ 3.0% ANNUALLY	$8,500	$8,755	$9,018	$9,288	$9,567	$9,854	$10,149	$10,454	$10,768	$11,091
TOTAL ACCUMULATED BALANCE	$11,167	$19,922	$5,069	$14,357	$23,924	$33,778	$43,928	$54,382	$65,149	$76,240
ACCUM. BALANCE W/INTEREST AT 0.8% INTEREST RATE	$11,251	$20,156	$5,343	$14,741	$24,490	$34,601	$45,086	$55,957	$67,225	$78,903

CAPITAL REPAIR/REPLACEMENT RESERVE SCHEDULE FOR: **SHEET A3**

RAVENNA HOMEOWNERS ASSOCIATION, INC. CASH FLOW BASIS

ITEM	2033 YEAR 11	2034 YEAR 12	2035 YEAR 13	2036 YEAR 14	2037 YEAR 15	2038 YEAR 16	2039 YEAR 17	2040 YEAR 18	2041 YEAR 19	2042 YEAR 20
MONUMENT SIGNS (20%)								$25,000		
IRRIGATION SYSTEM (Controllers)										
WELLS (10%)			$11,000							
BMP (10%)										
SITE LIGHTING										
IRRIGATION SYSTEM										
TOTAL COST IN 2023 DOLLARS			$11,000					$25,000		
TOTAL INFLATION ADJUSTED DOLLARS @ 3.0% INFLATION RATE			$15,683					$41,321		
CONTRIBUTION PER UNIT	$59	$60	$62	$64	$66	$68	$70	$72	$74	$76
TOTAL ANNUAL CONTRIBUTION ADJUSTED @ 3.0% ANNUALLY	$11,423	$11,766	$12,119	$12,483	$12,857	$13,243	$13,640	$14,049	$14,471	$14,905
TOTAL ACCUMULATED BALANCE	$87,663	$99,429	$95,864	$108,347	$121,204	$134,447	$148,087	$120,815	$135,285	$150,190
ACCUM. BALANCE W/INTEREST AT 0.8% INTEREST RATE	$91,004	$103,540	$100,726	$114,057	$127,866	$142,167	$156,976	$130,677	$146,236	$162,349

CAPITAL REPAIR/REPLACEMENT RESERVE SCHEDULE FOR: **SHEET A4**

RAVENNA HOMEOWNERS ASSOCIATION, INC. CASH FLOW BASIS

ITEM	2043 YEAR 21	2044 YEAR 22	2045 YEAR 23	2046 YEAR 24	2047 YEAR 25	2048 YEAR 26	2049 YEAR 27	2050 YEAR 28	2051 YEAR 29	2052 YEAR 30
MONUMENT SIGNS (20%)										
IRRIGATION SYSTEM (Controllers)				$31,500						
WELLS (10%)										
BMP (10%)			$21,070							
SITE LIGHTING			$22,500							
IRRIGATION SYSTEM									$70,000	
TOTAL COST IN 2023 DOLLARS			$43,570	$31,500					$70,000	
TOTAL INFLATION ADJUSTED DOLLARS @ 3.0% INFLATION RATE			$83,485	$62,168					$160,155	
CONTRIBUTION PER UNIT	$79	$81	$84	$86	$89	$91	$94	$97	$100	$103
TOTAL ANNUAL CONTRIBUTION ADJUSTED @ 3.0% ANNUALLY	$15,352	$15,813	$16,287	$16,775	$17,279	$17,797	$18,331	$18,881	$19,447	$20,031
TOTAL ACCUMULATED BALANCE	$165,542	$181,355	$114,157	$68,764	$86,043	$103,840	$122,171	$141,052	$345	$20,376
ACCUM. BALANCE W/INTEREST AT 0.8% INTEREST RATE	$179,034	$196,308	$130,078	$85,321	$103,369	$122,075	$141,459	$161,543	$20,991	$41,330

IMPACT OF INFLATION/INTEREST ON ACCUMULATED BALANCE W/INTEREST FOR: **SHEET A5**

RAVENNA HOMEOWNERS ASSOCIATION, INC.

ASSUMES ADJUSTMENT IN THE ANNUAL CONTRIBUTION = 3.0%

		INFLATION RATE - percent (%)										
	******	0	1	2	3	4	5	6	7	8	9	10
INTEREST RATE - percent (%)	1	$243,235	$192,551	$128,959	$49,178	($50,891)	($176,357)	($333,589)	($530,512)	($776,975)	($1,085,207)	($1,470,371)
	2	$291,532	$237,595	$170,078	$85,553	($20,256)	($152,676)	($318,340)	($525,492)	($784,373)	($1,107,683)	($1,511,157)
	3	$350,310	$292,804	$220,998	$131,307	$19,268	($120,677)	($295,439)	($513,603)	($785,818)	($1,125,282)	($1,548,335)
	4	$421,939	$360,507	$284,001	$188,672	$69,855	($78,252)	($262,854)	($492,892)	($779,451)	($1,136,253)	($1,580,272)
	5	$509,339	$443,573	$361,901	$260,399	$134,188	($22,791)	($218,056)	($460,928)	($762,946)	($1,138,388)	($1,604,895)
	6	$616,097	$545,531	$458,164	$349,884	$215,586	$48,938	($157,911)	($414,680)	($733,394)	($1,128,912)	($1,619,582)
	7	$746,628	$670,725	$577,057	$461,311	$318,143	$140,928	($78,534)	($350,388)	($687,169)	($1,104,354)	($1,621,034)
	8	$906,359	$824,501	$723,836	$599,840	$446,912	$258,118	$24,884	($263,383)	($619,761)	($1,060,377)	($1,605,108)
	9	$1,101,964	$1,013,433	$904,970	$771,825	$608,123	$406,601	$158,289	($147,883)	($525,565)	($991,577)	($1,566,623)
	10	$1,341,646	$1,245,606	$1,128,418	$985,090	$809,453	$593,897	$329,028	$3,272	($397,631)	($891,231)	($1,499,110)

( ) = NEGATIVE NUMBER

IT IS VERY IMPORTANT TO NOTE THE IMPACT THAT THE INFLATION RATE HAS ON THE AMOUNT OF INVESTED FUNDS AVAILABLE FOR FUTURE PROJECTS. THE TABLE ABOVE GRAPHICALLY DISPLAYS THE INFLATION RATE FOR A GIVEN RATE OF INTEREST ON THE ADJUSTED ANNUAL CONTRIBUTION. TO USE THIS TABLE, SELECT AN INTEREST RATE FOR YOUR INVESTED FUNDS IN THE LEFT-HAND COLUMN AND READ ACROSS TO THE RIGHT TO SEE HOW THE "ACCUMULATED BALANCE W/INTEREST " IN YEAR 30*, DECREASES WITH THE INCREASE IN THE INFLATION RATE. FOR EXAMPLE: IF THE ASSOCIATION WERE TO INVEST THE ANNUAL CONTRIBUTIONS IN AN INTEREST BEARING ACCOUNT AT 4% INTEREST, THE RESERVE FUND WOULD HAVE AN ACCUMULATED BALANCE W/ INTEREST OF $69855 IN YEAR 30 IF THE INFLATION RATE STAYED A CONSTANT 4%. HOWEVER, THAT BALANCE OF $69855 WOULD BECOME A BALANCE OF $-262854 IF THE INFLATION RATE CLIMBS JUST 2%. THIS IS WHY RESERVE STUDIES PREPARED BY DLM ARCHITECTS RECOMMEND INCREASING THE ANNUAL CONTRIBUTION BY THE CURRENT DIFFERENCE BETWEEN THE INFLATION RATE AND THE INTEREST RATE TO PROVIDE ADEQUATE FUNDS FOR FUTURE PROJECTS.

* THIS IS THE VALUE IN THE LOWER RIGHT OF SHEET 3

ANTICIPATED MAJOR REPAIR AND REPLACEMENT CALENDAR FOR: **SHEET A6**

RAVENNA HOMEOWNERS ASSOCIATION, INC.

2023	2024	2025	2026	2027	2028
		SITE LIGHTING,			

2029	2030	2031	2032	2033	2034

2035	2036	2037	2038	2039	2040
WELLS (10%),					MONUMENT SIGNS (20%),

2041	2042	2043	2044	2045	2046
				BMP (10%), SITE LIGHTING,	IRRIGATION SYSTEM (Controllers),

2047	2048	2049	2050	2051	2052
				IRRIGATION SYSTEM,	

RAVENNA HOMEOWNERS ASSOCIATION, INC.