

---

**UPDATED**  
**CAPITAL RESERVE ANALYSIS**  
FOR  
**AUSTIN LAKE SUBDIVISION**  
SMYRNA, GEORGIA

PREPARED FOR:

AUSTIN LAKE HOMEOWNERS ASSOCIATION, INC.  
C/O LEANNE ALLEN  
2000 AUSTIN LAKE DRIVE  
SMYRNA, GEORGIA 30082

PREPARED BY: MICHAEL W. MOREY, R.S.



3985 STEVE REYNOLDS BLVD.  
BUILDING A  
NORCROSS, GEORGIA 30093  
(770) 923-1122 • (770) 923-0099 FAX



FEBRUARY 2021

---

---

## TABLE OF CONTENTS

---

<b>I. CAPITAL RESERVE DETERMINATION.....</b>	<b>1</b>
A. Methodology and Assumptions.....	1
B. Summary of Replacement Reserve Needs .....	3
1. Technical Definitions .....	3
C. Executive Summary .....	5
D. Replacement Reserve Requirements .....	7
E. Notes .....	8
<b>II. RESERVE CASH FLOW ANALYSIS .....</b>	<b>19</b>
A. Introduction .....	19
1. Formulas.....	20
2. Definitions.....	20
B. Projected Cash Flow Graph and Chart.....	20
C. Recommendations and Conclusions.....	21
<b>III. RECOMMENDED MAINTENANCE SCHEDULE .....</b>	<b>24</b>
A. Asphalt Pavement.....	24
B. Concrete Curbing .....	25
C. Sidewalks .....	25
D. Storm Drainage Systems .....	25
1. Catch Basins.....	25
2. Drainage Swales .....	26
E. Landscaping .....	26
F. Concrete Masonry Retaining Walls .....	26
G. Segmental Block Walls .....	27
H. Lawn Sprinkler System .....	27
I. Playground .....	27
J. Roofs • Pitched.....	28
K. Gutters and Downspouts .....	29
L. Concrete Decks .....	29
M. Balconies/Wood Decks .....	30
N. Wood Railings.....	30
O. Wood Siding .....	30
P. Brick Veneer .....	30
Q. Mechanical Equipment.....	31
<b>DISCLOSURES.....</b>	<b>35</b>
<b>BIOGRAPHY .....</b>	<b>36</b>
<b>LIMITATION OF RESPONSIBILITY.....</b>	<b>37</b>
<b>GLOSSARY OF TERMS .....</b>	<b>39</b>
<b>BIBLIOGRAPHY .....</b>	<b>40</b>
<b>PHOTOGRAPHS.....</b>	<b>41</b>

---

## I. CAPITAL RESERVE DETERMINATION

### A. METHODOLOGY AND ASSUMPTIONS

A Capital Reserve Analysis is a report giving an estimate of the amount of money which must be put aside to replace or restore the common elements and building components that will require replacement before the community's use expires. Typically, the items included are limited to those with a useful life of 30 years or less.

The commonly accepted guidelines as established by governing statutes, the Community Associations Institute, and our engineering judgment and experience have been used as a basis for the reserve schedule in this report. The schedule, when implemented in conjunction with a well-planned preventive maintenance program, will provide adequate funds for the replacement of the community's common elements as they reach the end of their useful lives. In order to assure that this schedule remains current, a reassessment of the existing condition and replacement costs for each item is necessary at a regular interval as recommended within the report. Updating of the schedule, reduction of the useful lives, and inflation of the replacement costs may be executed with the benefit of re-inspection. The schedule must also be adjusted as common elements are added or modified.

It is important to note that a reserve item is a common element component which will require replacement on a recurring basis using a similar cost item. If an upgrade is necessitated due to a cost change or other extraordinary reason, the cost over and above the replacement cost is considered to be a capital improvement rather than a capital replacement. Capital improvements should not be funded from the reserves. After it has been upgraded, the item will then become part of the reserve schedule.

#### Method of Accounting

The Method used in the Capital Reserve Analysis is the "Cash Flow" Method and the funding plan utilized is the Baseline Funding. The goal of this funding method is to keep the reserve cash balance above zero. This means that while each individual component may not be fully funded, the reserve balance does not drop below zero during the projected period.

Level of Service

This reserve analysis was completed utilizing a Level II, Full Service Study as defined under the National Reserve Standards that have been adopted by the Community Association Institute. The common component inventory was established based on information provided by the association's representative, field measurements and/or drawing take-offs. The Full Service Study includes a review of the common property components and preparation of this report.

## B. SUMMARY OF REPLACEMENT RESERVE NEEDS

### 1. TECHNICAL DEFINITIONS

This page is a summary of each of the different categories within the detailed schedule. It shows the total dollar amounts for each category and is based on the full funding of each item.

Following are descriptions of the different variables, which are shown on the reserve schedule in the order in which they appear.

#### Description

This column on the schedule lists all the components for which we recommend that reserves be accumulated. The basis for the selection of these items includes:

- Review of the governing documents regarding the common and limited common elements.
- Review of all available maintenance contracts.
- The type of component and its anticipated full useful life and condition.
- A review of applicable statutes dealing with reserve requirements.

#### Quantity

The quantities which are used as a basis for this report are calculated from field measurements and drawings which have been supplied to Ray Engineering, Inc. Ray Engineering, Inc. has not made extensive as-built measurements, and the quantities used are based primarily on the reference materials provided.

#### Unit Cost

The construction and replacement costs used in this report are based primarily on the various publications written by the R.S. Means Company and construction related experience of Ray Engineering. The publications are listed in the Bibliography.

### Reserve Requirements Present Dollars

This is calculated by multiplying the “quantity” by the “unit costs.”

### Existing Reserve Fund

This is an allocation of the total existing reserve funds to the individual line items using a weighing factor which is based on the total “reserve requirement present dollars,” the “estimated remaining life,” and other factors. An existing balance was submitted to Ray Engineering, Inc. This balance was used in developing our Reserve Analysis.

### Estimated Useful Life

The useful life values that are part of this report come from a variety of sources, some of which are listed in the Bibliography. In order to ensure that all items attain their anticipated useful lives, it is imperative that a well-planned maintenance schedule be adhered to. If an existing item is replaced with an upgraded product, the estimated remaining life has been listed for the new product.

### Estimated Remaining Life

The estimated remaining life is based on both the age of the component and the results of the field inspections conducted in February 2021.

### Annual Reserve Funding

The reserve requirement present value was converted to the future value for the time in which each replacement will occur. A 3% compounded inflation rate has been assumed. The future value was then converted to an annual reserve fund value. The arithmetic calculations and formulas are indicated later in this report.

## C. EXECUTIVE SUMMARY

Austin Lake Subdivision is a single-family home community containing 103 single family homes with one amenity area. It is the Consultant's understanding the development of the subdivision began in or around 1993 and was completed in 2015. The property is located off North Cooper Lake Road, south of its intersection with Concord Road in Cobb County, Georgia. The amenity area consists of a clubhouse, pool with surrounding concrete deck, two tennis courts, a playground, parking lot, and amenity area irrigation, landscaping, and drainage. The common elements site consists of brick veneer entry monuments and signs flanked by pre-finished aluminum fencing installed between brick veneer pilasters along North Cooper Lake Road, and a five-acre lake and adjoining three-acre green area that borders the east side of the community.

The clubhouse is a one-story structure constructed over a full basement level. The basement level appears to consist of reinforced masonry foundation walls at the front and side elevations with a wood framed bearing wall at the rear elevation. The framing of the first floor and basement level is conventional wood framing. The first floor contains a great room with a vaulted ceiling, a kitchenet, and a stairway leading to the basement level. The basement level contains a hall that provides access to separate men's and women's restroom, a small mechanical room that contains the water heater, and a large storage/mechanical room that contains the pool equipment and air handler. Interior finishes generally consist of painted gypsum board walls and ceiling and painted wood trim. Floor coverings consist of laminate wood floors at the great room and kitchenette, with carpet at the stairs and landings, and ceramic tile floors at the basement hall and restrooms. Exterior finishes consist of painted manufactured wood siding in combination with painted wood trim, eaves, columns, railings, decking and porch ceiling. The roof is a steep pitched pyramid roof system sheathed with fiberglass-based asphalt shingles. Roof runoff is controlled by pre-finished aluminum gutters and downspouts installed around the perimeter of the building roof eave.

This reserve analysis was completed utilizing the "Full" level of service, which included a review of the property and preparation of this report. This reserve analysis is prepared for the fiscal year starting on January 1, 2021. It is our understanding that the reserve account for the community has a balance of approximately \$57,279, with an average annual contribution of \$20,000, which is equivalent to \$17.01 per month. Based on the Capital Reserve Analysis, the current annual contribution for reserves has been found to

be inadequate to provide for the future expenses as projected by this analysis. It is our recommendation that the Association dues be increased, so an annual contribution of \$40,000 is achieved. This sum that should be sufficient until the end of the term of this analysis. If funded as recommended, sufficient funds should be available to maintain projected future expenses as shown in the “Cost and Funding Recap” included as part of this analysis.

**D. REPLACEMENT RESERVE REQUIREMENTS**

**SCHEDULE I**

Sitework

**SCHEDULE II**

Exterior/Interior Building Maintenance

**SCHEDULE III**

Electrical/Mechanical/Plumbing Maintenance

**YEAR BY YEAR FUNDING RECAP - ALL ITEMS**

**COST AND FUNDING RECAP**

**ITEMIZED PROJECT COSTS BY YEAR**

## E. NOTES

The accompanying notes are an integral part of the reserve schedule contained in this report. When reviewing the schedule, please be sure to read all notes pertaining to a particular line item. This will provide the most complete explanation of each line item and will provide any clarification where necessary.

1. These items were found to be in good condition and well maintained. The useful life reflects the age and overall condition of the respective item.
2. **Amenity Area Parking Lot** – Our observation of the asphalt pavement found it to be in poor condition, with numerous wide cracks, distressed pavement at both entrances and separation between the asphalt curb due to shrinkage (reference photographs). Based on our review, it is our opinion the asphalt has reached the end of its useful service life. It is our recommendation consideration be given to restoring the asphalt pavement within the next two years or sooner, if desired. The budget allocated for minor repair and sealcoating of the pavement has been increased due to current industry costs. The schedule has been revised to show the next sealcoating being completed in 2029, which is six years after the pavement is recommended to be restored, which is in 2023 or sooner. The budget allocated for resurfacing of the amenity area parking lot has been increased to \$25,228 based on current industry costs. The budget is based on repairing all distressed areas of pavement and then removing 2" of the asphalt and replacing it with 2" of new asphalt.
3. **Concrete Curb and Sidewalks** - Our current observation of the amenity area sidewalks and curb bordering the parking lot found them to be in average condition, but in need of some repair (reference photographs). From our review, we noted the following:
  - At the left side of the clubhouse, there is a displaced section of sidewalk that is recommended to be repaired, as it represents a potential trip and liability hazard.
  - The sidewalks at the front, left side of the clubhouse that connects to the porch has settled. The sidewalk is recommended to be repaired, as it represents a potential trip and liability hazard.

- At the sidewalk at the right side of the clubhouse that leads down to the pool area, we noted two sections of displaced sidewalk that are recommended to be repaired, as they represent a potential trip and liability hazard.
- At the entrance to the amenity area off Whiteoak Circle, we noted a damaged section of curb that is recommended to be repaired.

It is our recommendation the amenity area sidewalks and curb be repaired as outlined above in 2021. The allowance allocated to provide for repair of the amenity area sidewalks and curb has been increased to \$1,200 based on current industry costs. The estimated useful life has been increased from five to ten years based on the overall condition of the sidewalks and curb, and the next repair cycle has been adjusted to show the sidewalks and curb being repaired in 2021.

4. **Site Retaining Walls** – The site retaining walls consist of the painted wall at the tennis courts and the two segmental block walls at the left side of the clubhouse, which were installed in 2019 to replace the original wood retaining walls. The wall at the tennis court, as we understand, was last painted in 2015. Our current observation of the walls found them to be in good condition with no remedial work noted to be required. All of the site retaining walls have an unlimited useful service life and should not need to be replaced within the term of this analysis; therefore, a replacement budget has not been provided for this analysis. The allowance of \$1,800 allocated to provide for minor repair and painting of the tennis court wall as needed every eight years should still be sufficient and remains unchanged. The schedule has been revised to show the next repair/painting cycle being completed in 2025.
5. **Site Fencing** – The site fencing consists of the painted steel and aluminum fencing at the amenity area, including the fence around the pool, and fence along North Cooper Lake Road. Our observation of the site fencing found it to be in fair condition, but in need of some repair. From our review, we offer the following:
  - At the left side of the clubhouse, the lock sets of the gate between the tennis courts and clubhouse, and the lock set at the pool gate, were difficult to open due to damaged and worn hardware, and a bent key. We recommend new

lock sets be installed for both gates.

- At the fence along North Cooper Lake Road, we noted its painted finish is faded and worn and there are several missing finial tops. We recommend the fence be painted and new finial tops be installed as needed.

It is our recommendation the site fencing be restored as outlined above in 2021. The allowance of \$3,000 allocated to provide for the repair and partial replacement of the worn and damaged fence components, and for painting, as needed, every ten years, should still be sufficient and remains unchanged. The schedule has been adjusted to show the next repair/painting cycle being completed in 2021.

6. **Pool and Water Level Tile** – It is our understanding the pool was last resurfaced in 2015. At the time of our review, the pool cover was in place; therefore, the condition of its plastered surface and water level tile were not visible for review, nor were we made aware of any problems regarding the pool. Assuming the surface of the pool and water level tile are experiencing normal wear and tear, resurfacing, based on a ten-year service life, may be required within the next four to five years. The budgets allocated to provide for resurfacing of the pool every ten years and for replacing the water level tile every 20 years have been increased to \$12,000 and \$3,713, respectively, based on current industry costs. The schedules have been adjusted to show the next resurfacing being completed in 2025 and the next tile replacement being completed in 2035.
7. **Pool Furniture** – Our observation noted that new pool furniture, consisting of tables, chairs, and trash receptacles, was in place on the pool deck. The furniture, as we understand, was purchased in 2019 and was found to be in very good condition. However, the strapping of the vinyl lounges, currently being stored in the basement level mechanical/storage room, was found to be in poor condition and is recommended to be replaced in 2021 (reference photographs). The other plastic furniture in storage was in average condition with no replacements noted to be required at this time. The allowances for repair and replacement of the pool furniture have been revised. Two budgets have been provided, one is an allowance of \$12,000 allocated every 15 years for replacement of the polywood furniture, and the second is an allowance of \$3,000 allocated every five years for

repair and partial replacement of the vinyl and plastic furniture as needed.

8. **Pool Cover** - It is our understanding that the pool cover was last replaced in 2015. Our observation of the pool cover found it to be in fair to good condition and experiencing normal wear and tear. Based on its current condition, we believe the cover will perform for another four to five years before replacement is required. The allowance for replacement of the pool cover has been increased to \$4,000 based on current industry costs. The schedule has been adjusted to show the cover being replaced in 2025.
9. **Pool Deck** – It is our understanding the pool deck was painted in 2019. Our observation of the pool deck found it to be in average condition with no remedial work noted to be required. The allowance allocated to provide for repair of cracked, settled, or damaged section of the pool deck as needed every ten years has been increased to \$3,000 based on current industry costs. The schedule has been adjusted to show the next repair/painting cycle being completed in 2028.
10. **Tennis Courts** – It is our understanding the tennis courts were fully replaced in 2015. Our current observation of the courts found them to be in good condition with only a few minor cracks noted. Because the cracks are minor and do not appear to affect play, it is our opinion repair is not required at this time. Statistically, a tennis court should last an average of 25 years; and based on age and overall condition of the courts, we believe that with proper maintenance, they should perform for another 19 to 20 years or more before a second replacement is required. The budget allocated for resurfacing the courts every seven years should still be sufficient and remains unchanged. Based on the condition of the playing surface, we believe the acrylic coating may perform for another two to three years before restoration is required. The budget allocated for replacement of the tennis courts has been increased to \$70,000 (\$35,000 per court) based on current industry costs. *(The cost is based on removal and replacement of the asphalt, the installation of additional stone base as needed; and replacement of the fencing and net posts.)* The schedule has been adjusted to show the court being replaced in 2040.
11. **Tennis Court Light Poles** - It is our understanding consideration is being given

to installing a light system at the tennis courts. Based on our discussions with members of the Board, a one-time allowance of \$25,000 has been allocated to provide for installation of the tennis court light poles and fixtures with the work scheduled to be completed in 2022.

12. **Wood Arbor** - Our observation of the arbor was limited due to the overgrowth of vines, but it appeared to be in fair to good condition with no obvious evidence observed that would suggest repair was required. The allowance of \$800 allocated every eight years for repair and painting as needed, should still be sufficient and remains unchanged. Based on the current condition of the arbor, we believe painting will be required within the next two to three years. To provide for replacement of the wood arbor at the end of its useful service life, which is typically every 20 to 25 years if properly maintained, an allowance of \$10,000 has been allocated. Based on its condition, we believe it may perform for another ten years or more before replacement is required.
  
13. **Playground and Equipment** – It is our understanding the playground equipment was replaced in 2019. Our observation found it to be in good condition and experiencing normal wear and tear, except for its stained finish (reference photographs). The finish was found to be faded and worn. It is our recommendation the playground equipment be cleaned and stained in 2021. An allowance of \$1,000 has been allocated to provide for repair and staining of the playground equipment as needed every six years, with the next repair/staining cycle scheduled to be completed in 2021. We would also recommend consideration be given to installing play mulch around the play equipment so that it conforms to current playground safety requirements. For replacement of the play equipment, an allowance of \$1,500 has been allocated every 15 years, with the next replacement scheduled to be completed in 2034.
  
14. **Entry Monuments, Pilasters and Signs** – Our observation of the brick veneer monument and signs at the main entrance and the brick pilasters along North Cooper Lake Road found the pilasters be in average condition with no remedial work noted to be required. However, the brick veneer monuments and signs at the main entrance were found to be in need of some repair (reference photographs). From our review, we offer the following:

- At the brick monument at the exit side of the entrance, we observed a vertical crack that extends the fully height of the wall that appears to be due to settlement or underlying tree root growth. We recommend the wall be stabilized. After which, the crack should be repaired as needed.
- The finish of the signs at both sides of the entry were found to be dirty, faded and worn. We recommend the signs be cleaned and painted.

It is our recommendation the monuments and signs be restored as outlined above in 2021. For maintaining the monuments, pilasters, and sign, and for periodic cleaning, repair and painting of the signs, an allowance of \$2,500 has been allocated every eight years with the next repair cycle scheduled to be completed in 2021. In addition, a one-time allowance of \$3,500 has been allocated and is intended to be combined with the \$2,500 general repair allowance, to provide a total of \$6,000, which we estimate will be required for restoring the finish of the signs and for stabilizing the displaced monument wall as recommended above. In addition, a budget of \$4,000 has been allocated every 20 years to provide for replacement of the community signs at the end of their useful service life. Based on the condition of the signs, we believe they may perform for another eight years or more before replacement is required.

15. **Lake and Spillway Maintenance** – It is our understanding accumulated silt was removed from the lake in 2013. Our observation of the access path, lake, dam, and spillway found them to be in generally good condition, but in need of some repair (reference photographs). From our review, we offer the following:

- The spillway is partially blocked by accumulated debris. To ensure the proper flow of excess storm water runoff and to prevent damage to the dam and the potential flooding problems, we recommend the accumulated debris be removed.
- At the center and end of the spillway, we noted several tress growing within the stone gabions or growing close to or against the stone gabions that make up the spillway. To prevent damage and displacement of the gabions, we

recommend that all trees or shrubbery growing within the spillway or within 10 feet of the sides of the spillway be removed.

- At the outflow pipe, we noted erosion and undermining of the pipe beginning to occur due to scour from uncontrolled flow. There is also a large bowl-shaped area in front of the pipe where the original stone rip rap has been washed away. Without the stone rip rap, the erosion and undermining of the pipe is greatly increased. To stabilize the erosion, we recommend enough additional stone riprap be installed to fill the washed-out bowl area.
- Regarding the spillway, it is our understanding there is a problem with leakage during periods of high-water levels that is in need of repair. An allowance of \$15,000 has been allocated and is based on pricing from contractors who have submitted bids for the repair. Based on our discussion with members of the Board, the repair has been scheduled to be completed in 2026.
- Regarding the future removal of accumulated silt for the lake, we would recommend a sediment survey be conducted a minimum of every five years. The purpose of conducting periodic surveys is to determine the relative rate of silt accumulation so more accurate budgets and time frames can be developed for removing the accumulated silt. It is often more economical to remove accumulated silt more frequently.

It is our recommendation the spillway and out flow pipe be restored as outlined above in 2021. The allowance allocated for dam and spillway maintenance has been increased to \$8,000 based on its current condition and industry costs. The schedule has been adjusted to show the next maintenance cycle being completed in 2021. An allowance of \$2,000 has been allocated to provide for conduction sediment surveys of the lake ever five years with the next survey scheduled to be completed in 2021. Regarding the lake, since a relative rate of accumulation is not known, we have provided an allowance of \$85,000 every 15 years for removal of accumulated silt. The schedule has been adjusted to show the next silt removal cycle being completed in 2029. It should be noted that this allowance and time frame may need to be adjusted based on the next sediment survey that has been recommended to be completed in 2021.

16. **Common Area Irrigation** – At the time of our review, the irrigation systems appeared to have been winterized and were not in operation. From our general observation of the irrigated areas of the amenity area and entrance, we did not observe any obvious evidence that would suggest there was a problem with the system, nor were we made aware of any problems with the system; therefore, we assume it is in good operating condition and will function adequately when put into operation in the spring. The allowance of \$2,500, allocated to provide for repair and replacement of damaged and worn irrigation system components, as needed, every five years should still be sufficient and remains unchanged. The scheduled has been adjusted to show the next repair cycle being completed in 2026.
17. **Common Area Landscaping** – The landscaping at the entry and amenity area appeared to be in generally good condition and well maintained. The appearance of the community landscaping is very subjective, as is the allotment of funds for improvements. From our experience, upgrading the landscaping is typically completed every three to five years. Based on the existing landscaping, the previous allowance of \$8,000 allocated every five years for landscape improvements as needed, should still be sufficient and remains unchanged. The scheduled has been adjusted to show the next improvement cycle being completed in 2026.
18. **Common Area Drainage** – Our observation of the drainage at the amenity area found it be functioning adequately; however, it is our understanding there is poor drainage at the playground and at the gate at the right side of the pool area. As we understand, the Board has received pricing for correcting the problem with the intent of completing the work this year. To provide for repair of common area drainage problems as they occur, an allowance of \$3,500 has been allocated.
19. **Clubhouse Roof and Gutter/Downspouts** - Our observation of the roof shingles and gutter/downspouts found them to be in average condition with no remedial work noted to be required. Based on the age and condition of the shingles, we believe they may perform for another three to four years or more before replacement will be required. The gutters and downspouts may perform for

another eight to ten years. The budgets for replacement of the roof shingles and gutter downspouts have both been increased based on current industry costs. The schedules have been adjusted as noted above. For budgets and schedules, please reference Scheduled IIa, Line Items 1 and 2 on Page 7d above.

20. **Clubhouse Exterior** – It is our understanding the exterior of the clubhouse was cleaned and painted in 2019. Our observation of the exterior finishes found them to be in generally good condition with no remedial work required at this time. The allowance allocated to provide for repair and replacement of deteriorated siding and trim components, as needed, and for painting has been increased to \$8,500 based on the cost of the recently completed work. The estimated useful life has been increased from seven to ten years based on our experience and on the better quality of paints currently available. Based on the current condition of the finishes, we believe they should perform for another seven years or more before restoration is required.
  
21. **Clubhouse Wood and Composite Decks** – The wood decks and railings at the front, right side and rear of the clubhouse are partially protected from the weather by the main building roof which extends over the decks. The decks and railings have been well maintained and, as a result, they are in good condition and no remedial work was noted to be required. For that reason, a full replacement cost will not be provided. For repair and partial replacement of the wood deck and railing components as needed, an allowance of \$3,000 has been allocated every ten years, with the next repair cycle being scheduled to be completed in 2026. The composite wood decking at the left side of the clubhouse was installed in 2007. Our observation of the composite deck found the deck boards to be in poor to fair condition with some deterioration occurring at the tops of the boards, bowed boards, possibly as a result of improperly spaced joists, and split ends due to the improper installation of screws and deterioration of the board ends (reference photographs). From our review, we believe the composite deck may need to be replaced within the next three years. For replacement of the composite deck boards and railings, an allowance of \$8,400 has been allocated every 20 years.
  
22. **Clubhouse Interior** - The clubhouse interior was renovated in 2019. The work

generally included the following:

- New laminate wood floors
- New furniture and area rugs
- New ceiling fan
- The interior walls, ceiling, doors, and trim were painted.
- At the basement level, the bathrooms and hall were updated. The work consisted of installation of new floor tile and base through out, new vanities, tops, fixtures, and accessories. The toilet partitions appear to have been painted, but not replaced.
  
- An allowance of \$5,000 has been allocated every 20 years to provide for upgrading the kitchen as needed. It is our understanding upgrading of the kitchen is being considered for 2021.
  
- An allowance of \$12,000 has been allocated to provide for replacement and upgrading of the clubhouse windows and full lite glass doors. Pricing is based on good quality vinyl windows, single-hung with insulated glazing, with replacement scheduled to be completed in 2023.

The budgets for replacement and upgrading of the clubhouse interior finishes, fixtures, flooring, furnishings, and accessories have been revised based on the recent renovation. Please reference Schedule IIa, Line Items 15 through 19 on Page 7d of this report.

23. **Common and Amenity Area Mechanical, Electrical and Plumbing** – Ray Engineering, Inc., did not conduct an extensive in-depth review of the building mechanical, electrical and plumbing systems, as that was not intended as part of our scope of services. However, we did observe all the equipment that was readily accessible. From our observation, there have been several equipment replacements completed since our previous review that will be addressed below. All the equipment appeared to be in average condition. We were not made aware of any problems with the equipment and therefore assume that it is functioning adequately with no immediate replacements required. Based on our review, we offer the following:

- The motor for the pool filtration equipment was replaced in 2020.
- The clubhouse ceiling fan was replaced.
- The clubhouse water heater was replaced in 2020.
- The clubhouse HVAC system has been replaced.
- A budget for replacement of the power attic roof fan has been provided.
- The accent lighting for the entry monuments and signs has been upgraded to LED fixtures.

For budgets and replacement schedules, please reference Schedule IIIa, Line Items 1 through 9 on Page 7f of this report.

## II. RESERVE CASH FLOW ANALYSIS

### A. INTRODUCTION

The enclosed chart and graph contain a 20-year cash flow projection of the reserve requirements for the Association. The budget should be adjusted at the end of the 20-year period to readjust for changes in remaining life, inflation, and current costs of replacements. This cash flow analysis is based on the assumption that all the items that make up the schedule are fully funded. By this we mean that each item will accumulate its full replacement cost during its life span. At the end of this life, each item would be replaced, and the funding would start aging for items with a long life. For items with a short useful life, the funding for the first replacement is budgeted in addition to future replacements due to the short life span. The future replacement funding is started in the first year; however, payments are less than the first replacement due to the extended time period allowed to accumulate funds. Taking all the components that make up the reserve schedule, using this full funding analysis, there is typically an ongoing surplus in the reserve fund. This ensures that the Association will have a surplus at the end of the 10-year period. This is called the “pooling effect” and is represented by the upper line on the cash flow chart, which is designated as the “Net Cumulative Fund.” The “Net Cumulative Fund” is calculated by taking the existing amount in the reserve fund at the time the reserve schedule is prepared, adding to it the yearly contribution, and subtracting from it the annual expenditures.

The annual reserve funding required has been calculated by estimating the useful remaining life based on the current condition, age, and all other known factors of each item description. The present value replacement cost was estimated by either past quotations or other listed methods of estimation. The present value replacement cost was then converted to future value using a 3% annual compounded inflation rate. The future cost was calculated for the projected time when replacement will be required.

The future cost was then broken down into annual installments while still considering the 3% compounded annual inflation rate. The monthly reserve funding was calculated by a further breakdown of the annual reserve funding required.

1. Formulas

The following economic formulas were used in our calculations:

<b>DISCOUNTING FACTOR</b>	<b>FUNCTIONAL NOTATION</b>	<b>FORMULA</b>
Single Payment Compound Amount	(F/P, i %, n)	$(1+i)^n$
Uniform Series Sinking Fund	(A/F, i %, n)	$i/[(1+i)^{n-1}]$

2. Definitions

Definitions of the above-mentioned terms are as follows:

<b>TERM</b>	<b>DEFINITION</b>
Single Payment Compound Amount	Conversion of present worth to future value
Uniform Series Sinking Fund	Conversion of future value to annual value
F	Future worth of item in <i>n</i> years from present
P	Present Worth
A	Annual worth
I	Interest Rate (0.01% used)
N	# of years until each calculated replacement

B. PROJECTED CASH FLOW GRAPH AND CHART

The projected cash flow for the Capital Reserve Analysis is illustrated by the bar graph and line chart on the following pages.

C. RECOMMENDATIONS AND CONCLUSIONS

Based on our review, we would make the following recommendations. The Association should set aside the following amount for the specified year into the reserve fund:

**COST AND FUNDING RECAP**

Year	Annual Funds	Future Expenses	Net Accumulated Funds
Current Funds			\$57,279
2021	\$20,000	\$32,900	\$44,385
2022	\$30,000	\$25,750	\$48,639
2023	\$40,000	\$47,770	\$40,874
2024	\$40,000	\$21,691	\$59,187
2025	\$40,000	\$27,856	\$71,337
2026	\$40,000	\$39,183	\$72,161
2027	\$40,000	\$1,433	\$110,735
2028	\$40,000	\$25,827	\$124,919
2029	\$40,000	\$118,763	\$46,168
2030	\$40,000	\$11,286	\$74,887
2031	\$40,000	\$54,160	\$60,734
2032	\$40,000	\$0	\$100,740
2033	\$40,000	\$18,820	\$121,930
2034	\$40,000	\$2,203	\$159,740
2035	\$40,000	\$45,457	\$154,299
2036	\$40,000	\$45,726	\$148,588
2037	\$40,000	\$21,202	\$167,400
2038	\$40,000	\$28,925	\$178,492
2039	\$40,000	\$31,989	\$186,521
2040	\$40,000	\$147,295	\$79,246

The Association should update the reserve schedule a minimum of once every two years. It is especially important to update the schedule when using average contribution due to the fact that even a minor change in the estimated useful life can have a significant impact on adequate funding.

The Association should review each of the individual line items that make up the reserve schedule to make sure that there is no overlap between what is indicated in the schedule and any other portion of the budget. For example, we may show on the reserve schedule the replacement of fencing, but at the same time, the Association may be replacing the fencing out of their operating budget. If duplication like this exists, the item should either be removed from the reserve schedule or the operation budget. It should not be funded in two different locations.

The Association should review the items on the schedule to assure that their replacement is not covered under a maintenance contract. An example would be reserving for the replacement of mechanical equipment components while the Association has a maintenance contract for the item at the same time. The reserve schedule should be carefully reviewed to be sure that it does not fund the replacement of any portion of any item whose replacement is covered under a maintenance contract.

The Association should review the items on the schedule to be sure that they are all the Association's responsibility. As an example, if we have included site lighting on the reserve schedule, but at the same time the local municipality is responsible for the maintenance and repair of these connections, they should be removed from the schedule.

The Association should review the individual line items on the reserve schedule carefully to determine if a number of the smaller individual components can be consolidated into one line item which can be continuously funded.

For example, if there are five or six components with a total replacement cost of \$1,000 each, rather than reserving the full \$5,000 or \$6,000 for all of these items, the Association may want to consider funding all six components under one line item for a total of \$1,000. Should one of these six items have to be replaced, that line item would have to be brought current within a year or so after its expenditure. By doing this rather than

funding the full \$6,000, only a portion of the total would be funded. This would reduce the overall yearly contribution to reserves.

Depending on the size of the overall operating budget, the Association may decide that any line item of less than the given amount will be funded directly through the operating budget rather than through the reserve schedule. If this is the case, any item with the given value or less should be removed from the schedule. The schedule would then be footnoted accordingly.

### **III. RECOMMENDED MAINTENANCE SCHEDULE**

The following guidelines are intended to ensure that a program of preventive maintenance is implemented in order to assure that, as a minimum, the predicted useful lives of the major common elements is attained. A preventive maintenance program is made up of “a system of periodic inspections of existing facilities to uncover conditions leading to breakdown or harmful depreciation and the correction of these conditions while they are still minor.” It should be noted that experience has shown that a proper maintenance program can add 50% to the expected useful life of some items.

In any case, the proper determination of the useful lives of the items which make up your common elements is critical to the proper updating of the reserve schedule. The items included will only attain their anticipated useful lives if a proper maintenance program is implemented. For this reason, it is recommended that the reserve schedule be updated every two years to assure that all items are being properly maintained.

#### **A. ASPHALT PAVEMENT**

The early detection and repair of minor defects is the most important consideration in the preventive maintenance of pavements. Cracks and other surface breaks, which in their first stages are almost unnoticeable, may develop into serious defects if not repaired in a timely manner. For this reason, walking inspections of the pavement should be conducted in the fall and spring of each year, as a minimum.

The inspections should note small cracks or other surface breaks in the pavement. In addition, there are other signs, such as mud or water on the pavement surface or soil erosion along the edges of the pavement, which may indicate possible future problem areas.

Most small cracks or surface breaks can be repaired by sealing them with a good commercial-grade caulk. Areas which have settled and pose a possible trip hazard should be cut out and replaced to prevent a potential liability problem, as well as to prevent further deterioration of the surface. If large areas are observed

to be cracking or breaking up, this may be an indication of a problem with the base material and/or subsoils and would require further investigation to determine the cause and proper method of repair.

B. CONCRETE CURBING

Any soil erosion behind the curbing should be noted, and possible problems such as broken pipes, malfunctioning sprinkler heads, and/or improper grading should be investigated, and any necessary repairs made.

C. SIDEWALKS

Sidewalks should be inspected at least twice a year (spring and fall). The inspection should note any cracked sections, uneven settlement between sections (which may result in tripping hazards), and surface damage. Undermining of sidewalks (caused by soil erosion) should also be noted. Proper replacement of any sections with the above noted problems is necessary to eliminate safety hazards and potential liability problems. These repairs will also allow the curbing to achieve its full useful life.

D. STORM DRAINAGE SYSTEMS

All storm drainage systems should be routinely inspected to ensure proper operation. Inspections should be scheduled for all facilities after major storms for routine maintenance. In addition, bi-annual structural inspections should be performed. The following are the recommended maintenance schedules for each individual section of a storm system:

1. Catch Basins

All catch basins should be routinely inspected after a major storm to ensure

that they are working properly. During these inspections, any sediment buildup or debris should be removed from catch basins to ensure that they continue to function properly.

## 2. Drainage Swales

The five most prevalent maintenance problems with swales are:

- Weed growth
- Grass maintenance
- Sediment control
- Soil deterioration
- Mosquito control

Drainage swales should be inspected on a routine basis to ensure that they are functioning properly. The grass located within the swales should be mowed on a weekly basis to prevent the accumulation of debris, which may impede the flow of the drainage. The trash racks attached to the outlet structures should be periodically checked and cleaned of debris to prevent blockage. The outlet structures should also be checked for deterioration and/or cracking of concrete.

## E. LANDSCAPING

A discussion regarding the preventive maintenance of the landscaped areas of the development would require an entire report. For this reason, it is recommended that a professional service specializing in this area be consulted. It should be noted that landscaping is not included as a reserve schedule item since, with proper maintenance, large-scale replacement should not become necessary.

## F. CONCRETE MASONRY RETAINING WALLS

Retaining wall surfaces should be inspected every spring as part of a preventive

maintenance program. Areas should be checked for signs of cracking or spalling of the surface and staining from moisture migrating through the wall. Additionally, the walls should be checked for soil erosion and/or voids forming at the tops and bases of the walls. Small cracks and spalled areas should be cleaned, caulked or patched and touched up with paint, if applicable. Wide cracks may be an indication of possible movement and should be reviewed by a structural engineer. Seepage is not uncommon at retaining walls and often results in staining of the wall. In many cases, caulking of the cracks where seepage occurs is all that is required to remedy the problem; however, if it continues after caulking, it may be an indication of a problem, such as excessive hydrostatic pressure, and should again be reviewed by an engineer.

#### G. SEGMENTAL BLOCK RETAINING WALLS

Retaining wall surfaces should be inspected every spring as part of a preventive maintenance program. Areas should be checked for signs of cracking blocks or missing cap blocks. Seepage is not uncommon at retaining walls and often results in staining of the wall. Additionally, the walls should be checked for soil erosion and/or voids forming at the top and base of the wall.

#### H. LAWN SPRINKLER SYSTEM

The preventive maintenance of the lawn sprinkler system would require an extensive report concerning the operation and servicing of the control valve, pumps, sprinkler heads, and water lines. For this reason, it is recommended that a professional sprinkler system contractor be consulted to provide the necessary services to properly maintain the sprinkler system.

#### I. PLAYGROUND

Playgrounds should be looked at a minimum of twice a year, with one inspection in the spring and one in the fall. Any splintering or cracking wood should be

repaired or replaced as necessary to prevent any injury. Exposed bolts must not have sharp edges. The bolts should not be protruding excessively so as to cause unnecessary injuries.

## J. ROOFS • PITCHED

The standard asphalt/fiberglass shingles available on the market today have an expected useful life of approximately 20 years. Proper maintenance in order to achieve this useful life requires periodic inspections to detect the need for repair or changes in the roof surface. In order to reduce maintenance and replacement costs, it is vital to detect problems when they are minor and prevent them from escalating into major problems.

Roof inspections should be conducted at least twice a year. These inspections should preferably occur in the early fall to prepare for winter and in the spring to assess any winter damage and prepare for the hot summer sun. In addition to these seasonal inspections, the roofs should be carefully checked after violent rain or windstorms or nearby fires or after workmen have been on the roof.

The roof inspections should include:

- Examination of exterior walls for settlement.
- Checking interior walls and the underside of roofs for leakage. This is necessary since the majority of roof problems may not be detected by inspecting the outside roof surface.
- Inspection of the roof surface for missing, loose, lifted, cracked or deteriorated shingles.
- A review of the roof drainage, including any change in the roof and the condition and operation of roof drains, gutters, and scuppers.
- Examination of flashed areas. Most water infiltration problems are caused by flashing defects. Lifted, loose, torn, or missing flashing require immediate repair.
- A review of ventilation, since improper ventilation can cause ice damming

conditions and accelerates the deterioration of the roof shingle.

#### K. GUTTERS AND DOWNSPOUTS

The key to maintaining gutters and downspouts is to make sure they are kept clear of debris. A buildup of leaves and other plant material will block downspouts and prevent proper drainage. If this occurs, trapped water could weigh down the gutters and cause them to loosen or fall. Blocked gutters will also overflow along their length, resulting in the washing away of the mulch and/or soils adjacent to the sides of a building, which could result in premature deterioration of a building's exterior finish over time. Ice damming will also be evident in the winter if gutters are not able to drain.

At least twice a year, the gutters should be cleaned and inspected for damage. This should be done in late spring and late fall. Any loose or misaligned gutters should be corrected at this time to prevent further damage. Splash blocks and downspout extension pipes should also be adjusted to prevent erosion and to direct water away from the building.

As the gutters age, the paint coating will oxidize and dull. When this occurs, an aluminum paint product should be used to restore the finish, or the gutters should be power washed to prevent deterioration.

#### L. CONCRETE DECKS

Concrete decks should be inspected twice a year in the fall and spring. Minor cracks or cracks with vertical displacement should be noted and repaired where necessary. Sections should also be inspected for signs of surface deterioration.

Note: Salts used to eliminate ice during winter months can cause concrete to deteriorate. Only products rated safe for use on concrete should be applied for de-icing purposes.

M. BALCONIES/ DECKS

Deck surfaces should be inspected every spring as part of a preventive maintenance program. Areas should be checked for signs of major cracking. Railings and handrails should be inspected for signs of damage. They should also be checked to ensure that they are still sturdy and safe.

N. WOOD RAILINGS

All exterior wood surfaces should be inspected every spring as part of a preventive maintenance program. Areas should be checked for signs of major cracking, splitting and warping. Railings and handrails should be inspected for signs of damage. They should also be checked to ensure that they are still sturdy and safe.

O. WOOD SIDING

The proper maintenance of siding is critical to keeping a building waterproof and weather tight. Prior to painting, all siding should be checked for delamination or deterioration and should be properly replaced or restored as required. All loose siding should be renailed and caulked prior to painting. All joints and penetrations in the siding should be caulked or sealed. Any loose, damaged, or missing trim should also be restored or replaced during siding restoration. During the siding review, any evidence of termite or pest infestation should be checked and treated as necessary. Lack of maintenance of siding and trim can result in water infiltration problems, as well as a poor appearance.

P. BRICK VENEER

Brick veneer is subject to cracking and loosening from a variety of environmental and construction causes. Veneers on all buildings should be thoroughly inspected in early spring and late fall. The inspections should include checking for chipped,

loose, cracked, deteriorated, and missing bricks. Cracked and missing bricks should be replaced. Cracked mortar should be repointed and caulked at intersections. Other surfaces should be repaired where necessary. Any evidence of moisture on an interior wall surface may indicate water absorption through the brick veneer. This condition may be corrected by applying a sealant to the exterior brick face.

Excessive settlement of the foundation may be evidenced by open cracks, especially around window and doorframes. Significant amounts of loose brick or bulging wall areas may indicate structural deficiencies or that large amounts of differential settlement have taken place at the foundation. These conditions should be investigated by a professional and the appropriate action taken to correct uncovered problems.

#### Q. MECHANICAL EQUIPMENT

A well-established plan of preventive maintenance is essential to obtaining the maximum performance and life from your mechanical equipment. All work should be performed by qualified technicians specializing in the particular equipment.

The following guidelines are considered to be minimal procedures for maintaining the equipment:

##### 1. FURNACES

###### *Surrounding Areas:*

The flow of combustion and ventilating air must not be obstructed from reaching the furnace. Air openings provided in the casing of the furnace must be kept free of obstructions, which would restrict airflow, thereby affecting efficiency and safe operation of the furnace. Furnaces must have air for proper performance. In addition, warm air furnaces should not be operated in a corrosive atmosphere. Paint solvents, cleaning chemicals,

spray propellants, and bleaches should not be used in the vicinity of the furnace during normal operation.

*Thermostat:*

The thermostat is the heart of a warm air furnace center. Its operation depends on the surrounding air temperatures; therefore, it should be mounted on a draft-free inside wall for best operation. Because the thermostat is sensitive to heat, devices such as radios, televisions, or lamps should not be placed near it. The thermostat also accumulates lint, which affects its accuracy. For best operation, the thermostat should be cleaned annually.

*Filters:*

The filters remove dust and debris from the air before it is heated and circulated to the living spaces. Filters must be changed when dirty. Inspections of the filters should be made on a monthly basis.

*Blowers:*

The blower size and speed determine the air volume delivered by the furnace. The blower bearings are permanently lubricated and usually do not require servicing. Annual cleaning of the blower wheel and housing is recommended for maximum air output. It is recommended to consult a qualified service technician for this procedure.

*Burners:*

Gas burners do not normally require scheduled servicing; however, accumulation of lint may cause a yellowing flame or delay ignition. Either condition indicates that a service call is required. For best operation, burners must be cleaned annually using a brush and vacuum cleaner. It is recommended to consult a qualified service technician for this procedure.

*Flue Pipe:*

For best operation, these items should be inspected for signs of corrosion and/or deterioration and cleaned, if necessary, at the beginning of each

heating season by a qualified service technician.

## 2. WATER HEATERS

The area near the water heater should be kept free of flammable liquids, such as gasoline, paint thinners, adhesives, and other combustible materials. Make certain that the flow of air to the water heater for adequate combustion (proper burner operation) and ventilation is not obstructed.

A water heater's tank can act as a settling basin for solids suspended in the water. It is, therefore, not uncommon for hard water deposits to accumulate in the bottom of the tank. It is suggested that a few quarts of water be drained from the water heater's tank every month to prevent this condition from occurring.

At least once a year, lift and release the level handle on the temperature pressure relief valve (located near the top of the water heater) to make certain that the valve operates freely, and allow several gallons to flush through discharge lines. Make certain that the discharge is directed to an open drain.

Visually inspect the burner annually, while firing, and pilot burner flame with the main burner off. If any unusual burner operation is noted, the water heater should be shut off until professional service assistance can be obtained.

The water heater's internal flue should be inspected annually to be certain that it is clean by removing the draft hood and flue baffle. When reinstalling the flue baffle, make certain that it is hung securely by its hanger at the top of the flue. Remove any scale that may have fallen on the burner or flood shield. Reinstall the draft hood. It is recommended that a professional service be consulted for this procedure.

## DISCLOSURES

Ray Engineering, Inc. does not have any other involvement with the association, which could result in actual or perceived conflicts of interest.

During our review of the property, visual review and field measurements, as needed, of each common element was performed. No destructive testing or drawing take-offs were performed.

Material issues which, if not disclosed, would cause a distortion of the association's situation.

Information provided by the official representative of the association regarding financial, physical, quantity, or historical issues will be deemed reliable by the consultant.

The Reserve Analysis will be a reflection of information provided to the consultant and assembled for the association's use, not for the purpose of performing an audit, quality/forensic analyses, or background checks of historical records.

Ray Engineering, Inc. did not perform an audit of the current or past budgets of the association.

Client is considered to have deemed previously developed component quantities as accurate and reliable.

Ray Engineering, Inc. assumes that the prior Reserve Analysis component quantities were accurate and reliable.

Information provided to Ray Engineering, Inc. by the association representative about reserve projects will be considered reliable. Any on-site inspection(s) by Ray Engineering, Inc. should not be considered a project audit or quality inspection.

## **BIOGRAPHY**

**MICHAEL W. MOREY, R.S.**

**PROJECT ENGINEER**

---

Mr. Morey has a Bachelor of Science degree in Civil Engineering from the University of South Florida. His construction career began with an owned subsidiary of General Electric Company, Trafalgar Developers of Florida, where he served for over ten years as project engineer and owner's representative. He was involved in all aspects of project development from directing land development operations on large tract planned unit developments to managing construction of mid-rise commercial office buildings. He has also worked for a large commercial lender providing in-house construction support services for their asset management group. At Ray Engineering, Inc., Mr. Morey is currently employed as a contractor providing pre-construction analysis, existing property evaluations, physical need assessments, construction and forensic inspections and contract administrations services for various local, state and commercial institutions. Mr. Morey has earned his Reserve Specialist designation.

## LIMITATION OF RESPONSIBILITY

The report represents a statement of the physical condition of the common elements of the property based upon our visual observation, professional analysis and judgment. The report applies only to those portions of the property and/or items and equipment which were capable of being visually observed. Unless specifically stated otherwise, no intrusive testing was performed nor were any materials removed or excavations made for further inspection. Drawings and specifications were available only to the extent described in the report.

The following activities are not included in the scope and are excluded from the scope of the reserve analysis described in the National Reserve Study Standards:

- *Utilities* – Operating condition of any underground system or infrastructure; accessing manholes or utility pits; the reserve analysis does not include any infrastructure with an estimated useful life of more than 30 years, unless specified otherwise in the report;
- *Structural Frame and Building Envelope* – Unless specifically defined in the proposal, entering of crawl, attic or confined space areas (however, the field observer will observe conditions to the extent easily visible from the point of access to the crawl or confined space if the access is at the exterior of the building or common space); determination of previous substructure flooding or water penetration unless easily visible or unless such information is provided;
- *Roofs* – Walking on pitched roofs or any roof areas that appear to be unsafe or roofs with no built-in access; determining roofing design criteria;
- *Plumbing* – Verifying the condition of any pipes underground, behind walls or ceilings; determining adequate pressure and flow rate, verifying pipe size or verifying the point of discharge for underground systems;
- *HVAC* – Observation of fire connections, interiors of chimneys, flues or boiler stacks, or tenant owned or tenant maintained equipment;
- *Electrical* – Removal of any electrical panels or device covers, except if removed by building staff; providing common equipment or tenant owned equipment.

- *Vertical Transportation* – Examining of cable, shears, controllers, motors, inspection tags or entering elevator/escalator pits;
- *Life Safety/Fire Protection* – Determining NFPA hazard classifications; classifying or testing fire rating of assemblies;
- Preparing engineering calculations to determine any system's components or equipment's adequacy or compliance with any specific or commonly accepted design requirements or building codes; preparing designs or specifications to remedy any physical deficiencies;
- Reporting on the presence or absence of pests or insects unless evidence of such presence is readily apparent during the field observer's walk-through survey or such information is provided to the Consultant;
- Entering or accessing any area of the property deemed by the engineer to pose a threat to the safety of any individual or to the integrity of the building system or material;
- Providing an opinion on the operation of any system or component that is shut down or not properly operating;
- Evaluating any acoustical or insulating characteristics of the property;
- Providing an opinion on matters regarding security and protection of its occupants or users;
- Providing an environmental assessment or opinion of the presence of any environmental issues such as asbestos, hazardous wastes, toxic materials, radon or the location of designated wetlands, unless specifically defined within the scope of work;
- Any representations regarding the status of ADA Title III Compliance.

The report is not a compliance inspection or certification for past or present governmental codes or regulations of any kind. Any reference made to codes in this report is to assist in identification of a specific problem.

## GLOSSARY OF TERMS

<u>Abbreviation</u>	<u>Definition</u>	<u>Abbreviation</u>	<u>Definition</u>
Allow	Allowance	L.F.	Linear Foot
Avg.	Average	Lg.	Long Length
B.F.	Board Feet	L.S.	Lump Sum
Bit/Bitum.	Bituminous	Maint.	Maintenance
Bldg.	Building	Mat., Mat'l	Material
Brk.	Brick	Max	Maximum
Cal	Calculated	MBF	Thousand Board Feet
C.C.F.	Hundred Cubic Feet	M.C.F.	Thousand Cubic Feet
C.F.	Cubic Feet	Min.	Minimum
C.L.F.	Hundred Linear Feet	Misc.	Miscellaneous
Col.	Column	M.L.F.	Thousand Linear Feet
Conc.	Concrete	M.S.F.	Thousand Square Feet
Cont.	Continuous, continued	M.S.Y.	Thousand Square Yards
C.S.F.	Hundred Square Feet	NA	Not applicable/available
Cu. Ft.	Cubic Feet	No.	Number
C.Y.	Cubic Yard, 27 cubic feet	O.C.	On Center
DHW	Domestic Hot Water	P.E.	Professional Engineer
Diam.	Diameter	Ply.	Plywood
Ea.	Each	Pr.	Pair
Est.	Estimated	PVC	Polyvinyl Chloride
Ext.	Exterior	Pvmt.	Pavement
Fig.	Figure	Quan. Qty.	Quantity
Fin.	Finished	R.C.P.	Reinforced Concrete Pipe
Fixt	Fixture	Reinf.	Reinforced
Flr.	Floor	Req'd	Required
FRP	Fiberglass Reinforced Plastic	Sch., Sched.	Schedule
Ft.	Foot, Feet	S.F.	Square Foot
Galv.	Galvanized	Sq.	Square, 100 Square Feet
Ht.	Height	Std.	Standard
Htrs.	Heaters	Sys.	System
HVAC	Heating, Ventilation, A/C	S.Y.	Square Yard
HW	Hot Water	T&G	Tongue & Groove
In.	Inch	Th, Thk.	Thick
Int.	Interior	Tot.	Total
Inst.	Installation	Unfin.	Unfinished
Insul.	Insulation	V.C.T.	Vinyl Composition Tile
lb.	Pound	Vent.	Ventilator
		Yd.	Yard

## BIBLIOGRAPHY

Architectural Drawings  
by N/A

Declaration of Covenants, Conditions, and Restrictions  
by N/A

Site Work Cost Data  
by R.S. Means Company, Inc.

Mechanical Cost Data  
by R.S. Means Company, Inc.

Electrical Cost Data  
by R.S. Means Company, Inc.

Open Shop Cost Data  
by R.S. Means Company, Inc.

# PHOTOGRAPHS