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Dear Board of Directors of Ann Arbor District Library:

At the direction of the Board that recognizes the need for proper reserve planning, we have conducted a Full Reserve Study of Ann Arbor District Library in Ann Arbor, Michigan and submit our findings in this report. The effective date of this study is the date of our visual, noninvasive inspection, October 9, 2017.

This Full Reserve Study exceeds the Association of Professional Reserve Analysts (APRA) standards fulfilling the requirements of a “Level I Full Reserve Study.”

An ongoing review by the Board and an Update of this Reserve Study are necessary to ensure an equitable funding plan since a Reserve Study is a snapshot in time. We recommend the Board budget for an Update to this Reserve Study in two years. We look forward to continuing to help Ann Arbor District Library plan for a successful future.

As part of our long-term thinking and everyday commitment to our clients, we are available to answer any questions you may have regarding this study.

Respectfully submitted on October 27, 2017 by

Reserve Advisors, Inc.

Visual Inspection and Report by: Stephen E. Breski, RS2
Review by: Alan M. Ebert, PRA1, RS, Director of Quality Assurance

1 PRA (Professional Reserve Analyst) is the professional designation of the Association of Professional Reserve Analysts. Learn more about APRA at http://www.apra-usa.com.
2 RS (Reserve Specialist) is the reserve provider professional designation of the Community Associations Institute (CAI) representing America’s more than 300,000 condominium, cooperative and homeowners associations.
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1. RESERVE STUDY EXECUTIVE SUMMARY

**Client:** Ann Arbor District Library (AADL)
**Location:** Ann Arbor, Michigan
**Reference:** 171439

**Property Basics:** Ann Arbor District Library is a four-story library. The original building was built in 1957 with additions in 1975 and 1991.

**Reserve Components Identified:** 51 Reserve Components.

**Inspection Date:** October 9, 2017.

**Funding Goal:** The Funding Goal of this Reserve Study is to maintain reserves above an adequate, not excessive threshold during one or more years of significant expenditures. Our recommended Funding Plan recognizes these threshold funding years in 2021 due to replacement of the chillers and a portion of the displays for library materials and 2043 due to subsequent replacement of the boilers.

**Cash Flow Method:** We use the Cash Flow Method to compute the Reserve Funding Plan. This method offsets future variable Reserve Expenditures with existing and future stable levels of reserve funding. Our application of this method also considers:
- Current and future local costs of replacement
- 1.4% annual rate of return on invested reserves
- 1.6% future Inflation Rate for estimating Future Replacement Costs

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

**Cash Status of Reserve Fund:**
- $0 projected as of December 31, 2017
- 2017 budgeted Reserve Contributions of $0

**Project Prioritization:** We recommend the Library prioritize the following projects in the next five years based on the conditions identified:
- Replacement and restorations of the roofs
- Replacement of a portion of the carpet floor coverings
- Replacement of a portion of the displays for library materials
- Replacement of a portion of the furnishings
- Replacement of the boilers
- Replacement of the pumps
- Replacement of the building automation system
- Replacement of the chillers

**Recommended Reserve Funding:** We recommend the following in order to achieve a stable and equitable Funding Plan:
- Increase to $900,000 in 2018
- Stable contributions of $560,000 from 2019 through 2021
- Reduced reserve budget of $298,000 in 2022 due to fully funded for near term expenditures
- Inflationary increases from 2023 through 2047, the limit of this study's Cash Flow Analysis
# AADL

## Recommended Reserve Funding Table and Graph

<table>
<thead>
<tr>
<th>Year</th>
<th>Reserve Contributions ($)</th>
<th>Reserve Balances ($)</th>
<th>Year</th>
<th>Reserve Contributions ($)</th>
<th>Reserve Balances ($)</th>
<th>Year</th>
<th>Reserve Contributions ($)</th>
<th>Reserve Balances ($)</th>
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<td>2019</td>
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<td>322,776</td>
<td>2029</td>
<td>333,000</td>
<td>773,420</td>
<td>2039</td>
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<td>2020</td>
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<td>326,364</td>
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<td>312,500</td>
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<td>913,166</td>
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<td>496,337</td>
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<td>348,751</td>
<td>2046</td>
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<td>2027</td>
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<td>378,200</td>
<td>637,408</td>
<td>2047</td>
<td>443,200</td>
<td>1,458,553</td>
</tr>
</tbody>
</table>

![Graph showing reserve contributions and balances over years](chart.png)
2. RESERVE STUDY REPORT

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

Ann Arbor District Library

Ann Arbor, Michigan

and submit our findings in this report. The effective date of this study is the date of our visual, noninvasive inspection, October 9, 2017.

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

- **Identification of Property** - Segregates all property into several areas of responsibility for repair or replacement
- **Reserve Expenditures** - Identifies reserve components and related quantities, useful lives, remaining useful lives and future reserve expenditures during the next 30 years
- **Reserve Funding Plan** - Presents the recommended Reserve Contributions and year-end Reserve Balances for the next 30 years
- **Reserve Component Detail** - Describes the reserve components, includes photographic documentation of the condition of various property elements, describes our recommendations for repairs or replacement, and includes detailed solutions and procedures for replacements for the benefit of current and future board members
- **Methodology** - Lists the national standards, methods and procedures used to develop the Reserve Study
- **Definitions** - Contains definitions of terms used in the Reserve Study, consistent with national standards
- **Professional Service Conditions** - Describes Assumptions and Professional Service Conditions
- **Credentials and Resources**
IDENTIFICATION OF PROPERTY

The Expenditure tables in Section 3 list the elements contained in this study. Our analysis begins by segregating the property elements into several areas of responsibility for repair and replacement.

Our process of identification helps assure that future boards and the management team understand whether reserves, the operating budget or the AADL fund certain replacements and assists in preparation of the annual budget. We derive these segregated classes of property from our review of the information provided by the Library and through conversations with O’Neal Construction. These classes of property include:

- Reserve Components
- Long-Lived Property Elements
- Operating Budget Funded Repairs and Replacements

We advise the Library conduct an annual review of these classes of property to confirm its policy concerning the manner of funding, i.e., from reserves or the operating budget. The Reserve Study identifies Reserve Components as set forth in your governing documents or which were identified as part of your request for proposed services. Reserve Components are defined by CAI as property elements with:

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

Long-Lived Property Elements may not have predictable Remaining Useful Lives or their replacement may occur beyond the 30-year scope of the study. The operating budget should fund infrequent repairs. Funding untimely or unexpected replacements from reserves will necessitate increases to Reserve Contributions. Periodic updates of this Reserve Study will help determine the merits of adjusting the Reserve Funding Plan. We identify the following Long-Lived Property Elements as excluded from reserve funding at this time.
The operating budget provides money for the repair and replacement of certain Reserve Components. The Library may develop independent criteria for use of operating and reserve funds. For purposes of calculating appropriate Reserve Contributions, we identify the following list of Operating Budget Funded Repairs and Replacements:

- General Maintenance to the Common Elements
- Expenditures less than $6,000 (These relatively minor expenditures have a limited effect on the recommended Reserve Contributions.)
- Air Handling Unit, Make-Up Air, Maintenance
- Appliances, Interim Replacements
- Concrete Retaining Wall, Rear of Building, Inspections and Repairs
- Floor Coverings, Vinyl
- Furnishings, Interim Replacements
- Irrigation System
- Landscape
- Light Fixtures, Exterior
- Light Fixtures, Interior (Except Public Library Areas)
- Paint Finishes, Exterior, Soffits
- Paint Finishes, Interior, Meeting Rooms
- Pumps Less Than Five-HP (horsepower)
- Radiators
- Unit Heaters
- Valves (We assume replacement as needed in lieu of an aggregate replacement of all small diameter valves as a single event.)
- Water Heaters
- Other Repairs normally funded through the Operating Budget
3. RESERVE EXPENDITURES and FUNDING PLAN

The tables following this introduction present:

**Reserve Expenditures**
- Line item numbers
- Total quantities
- Quantities replaced per phase (in a single year)
- Reserve component inventory
- Estimated first year of event (i.e., replacement, application, etc.)
- Life analysis showing
  - useful life
  - remaining useful life
- Unit cost of replacement
- 2017 local cost of replacement
- Total future costs of replacement anticipated during the next 30 years
- Schedule of estimated future costs for each reserve component including inflation

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

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

**Ann Arbor District Library**

## Reserve Component Inventory

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Total Quantity</th>
<th>Per Phase Quantity</th>
<th>Units</th>
<th>Reserve Component</th>
<th>Life Analysis, Years</th>
<th>Estimated 1st Year of Event</th>
<th>Costs, $</th>
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<td></td>
<td></td>
<td>2017-2032</td>
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### Exterior Building Elements

#### 1.180 Doors, Main Entrance

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<th>Unit</th>
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#### 1.300 Roofs, Built-up, Section B, Replacement

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<th>Unit</th>
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#### 1.380 Roofs, EPDM, Sections A, AA and C, Replacement

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<th>Total</th>
<th>Unit</th>
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<th>Unit</th>
<th>Per Phase</th>
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<td></td>
<td>15 to 20</td>
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### Interior Building Elements

#### 2.200 Ceilings, Acoustical Tiles, Grid and Lighting

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<th>Item</th>
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<th>Unit</th>
<th>Per Phase</th>
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<th>Unit</th>
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<th>Per Phase</th>
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<tbody>
<tr>
<td></td>
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#### 2.250 Floor Coverings, Carpet, Phased

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### Miscellaneous Areas

#### 2.300 Ceilings, Acoustical Tiles, Grid and Lighting

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### Offices

#### 2.400 Ceilings, Acoustical Tiles, Grid and Lighting

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### Public Library Areas

#### 2.600 Ceilings, Acoustical Tiles, Grid and Lighting

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### Building Services Elements

#### 2.800 Air Handling Unit, AHU-1, 14,520-CFM, Capital Repairs

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### Explanatory Notes:

1. 1.6% is the estimated future Inflation Rate for estimating Future Replacement Costs.

2. FY2017 is Fiscal Year beginning January 1, 2017 and ending December 31, 2017.
## RESERVE EXPENDITURES

### Ann Arbor District Library
Ann Arbor, Michigan

### Estimated Life Analysis, Costs, $ Line

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Quantity</th>
<th>Per Phase</th>
<th>Unit</th>
<th>Life Analysis, Years</th>
<th>Costs, $</th>
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#### Exterior Building Elements

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Quantity</th>
<th>Per Phase</th>
<th>Unit</th>
<th>Life Analysis, Years</th>
<th>Costs, $</th>
<th>Reserve Component Inventory</th>
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<td>1.300</td>
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<td>105</td>
<td>Squares</td>
<td>Roof, Brick, Section B, Replacement</td>
<td>2039 to 2047</td>
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<td>1.380</td>
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<td>Squares</td>
<td>Roof, EPDM, Sections A, AA and C, Replacement</td>
<td>2039 to 2047</td>
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<td>1.381</td>
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<td>12</td>
<td>Squares</td>
<td>Roof, EPDM, Sections D and E, Restoration</td>
<td>2039 to 2047</td>
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#### Interior Building Elements

<table>
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<th>Unit</th>
<th>Life Analysis, Years</th>
<th>Costs, $</th>
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<td>2.200</td>
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<td>Square Feet</td>
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<td>2.201</td>
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<td>400</td>
<td>Square Yards</td>
<td>Floor Coverings, Carpet, Phased</td>
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<td>2.202</td>
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<td>Allowance</td>
<td>Furnishings, Phased</td>
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<td>2.203</td>
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<td>Square Feet</td>
<td>Wall Coverings</td>
<td>2039 to 2047</td>
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#### Miscellaneous Areas

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<th>Total Quantity</th>
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<th>Unit</th>
<th>Life Analysis, Years</th>
<th>Costs, $</th>
<th>Reserve Component Inventory</th>
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<tbody>
<tr>
<td>2.221</td>
<td>2</td>
<td>Each</td>
<td>Elevator Cab Finishes</td>
<td>2039 to 2047</td>
<td>10</td>
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<tr>
<td>2.250</td>
<td>18</td>
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<td>2.251</td>
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<td>Secret Lab, Renovations</td>
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#### Offices

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<th>Unit</th>
<th>Life Analysis, Years</th>
<th>Costs, $</th>
<th>Reserve Component Inventory</th>
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<tbody>
<tr>
<td>2.300</td>
<td>18,000</td>
<td>18,000</td>
<td>Square Feet</td>
<td>Ceilings, Acoustical Tiles, Grid and Lighting</td>
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<tr>
<td>2.301</td>
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<td>1,870</td>
<td>Square Yards</td>
<td>Floor Coverings, Carpet, Phased</td>
<td>2039 to 2047</td>
<td>10</td>
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<tr>
<td>2.302</td>
<td>1</td>
<td>Allowance</td>
<td>Furnishings, Phased</td>
<td>2039 to 2047</td>
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#### Public Library Areas

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<tr>
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<th>Costs, $</th>
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<td>2.400</td>
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<td>40,600</td>
<td>Square Feet</td>
<td>Ceilings, Acoustical Tiles, Grid and Lighting</td>
<td>2039 to 2047</td>
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<td>2.401</td>
<td>4</td>
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<td>Displays for Library Materials, Phased</td>
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<td>25</td>
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<tr>
<td>2.402</td>
<td>4,800</td>
<td>4,800</td>
<td>Square Yards</td>
<td>Floor Coverings, Carpet, Phased</td>
<td>2039 to 2047</td>
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<td>2.403</td>
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<td>Furnishings, Phased</td>
<td>2039 to 2047</td>
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<td>2.404</td>
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<td>Each</td>
<td>Light Fixtures</td>
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#### Building Services Elements

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<th>Costs, $</th>
<th>Reserve Component Inventory</th>
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<td>3.011</td>
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<td>Each</td>
<td>Air Handling Unit, AHU-1, 21,000 CFM, Capital Repairs</td>
<td>2039 to 2047</td>
<td>4</td>
<td>20,000.00</td>
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</table>
# Reserve Expenditures

## Ann Arbor

### Reserve Component Inventory

<table>
<thead>
<tr>
<th>Line Item</th>
<th>Quantity</th>
<th>Phase of Event</th>
<th>Reserve Component Inventory</th>
<th>Estimated Life Analysis</th>
<th>Costs, $</th>
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<tr>
<td>3.022</td>
<td>1</td>
<td>Each</td>
<td>Air Handling Unit, AHU-2, 2,830 CFM, Replacement</td>
<td>2018 to 20 1</td>
<td>$13,000.00</td>
</tr>
<tr>
<td>3.024</td>
<td>1</td>
<td>Each</td>
<td>Air Handling Unit, AHU-3, 11,445 CFM, Capital Repairs</td>
<td>2021 to 30 4</td>
<td>$32,000.00</td>
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<tr>
<td>3.025</td>
<td>1</td>
<td>Each</td>
<td>Air Handling Unit, AHU-4, 33,565 CFM, Capital Repairs</td>
<td>2021 to 40 14</td>
<td>$95,000.00</td>
</tr>
<tr>
<td>3.028</td>
<td>1</td>
<td>Each</td>
<td>Air Handling Unit, AHU-5, 28,240 CFM, Capital Repairs</td>
<td>2021 to 40 14</td>
<td>$82,000.00</td>
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<tr>
<td>3.070</td>
<td>3</td>
<td>Each</td>
<td>Air Handling and Condensing Units, Split Systems and Packaged Unit</td>
<td>2019 to 20 2</td>
<td>$8,500.00</td>
</tr>
<tr>
<td>3.105</td>
<td>4</td>
<td>Each</td>
<td>Boilers, Heating Unit</td>
<td>2020 to 25 3</td>
<td>$49,500.00</td>
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<tr>
<td>3.170</td>
<td>1</td>
<td>Allowance</td>
<td>Building Automation System</td>
<td>2018 to 15 1</td>
<td>$90,000.00</td>
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<tr>
<td>3.200</td>
<td>2</td>
<td>Each</td>
<td>Chillers, 125-tons, Capital Repairs</td>
<td>2031 to 10 14</td>
<td>$26,000.00</td>
</tr>
<tr>
<td>3.205</td>
<td>2</td>
<td>Each</td>
<td>Chillers, 125-t ons, Replacement</td>
<td>2021 to 25 4</td>
<td>$131,000.00</td>
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<td>3.210</td>
<td>2</td>
<td>Each</td>
<td>Elevators, Hydraulic Pumps and Controls</td>
<td>2026 to 35 9</td>
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<tr>
<td>3.212</td>
<td>2</td>
<td>Each</td>
<td>Elevators, Hydraulic Cylinders</td>
<td>2036 to 45 19</td>
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<tr>
<td>3.585</td>
<td>1</td>
<td>Each</td>
<td>Life Safety System, Control Panel</td>
<td>2018 to 25 1</td>
<td>$30,000.00</td>
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<tr>
<td>3.590</td>
<td>1</td>
<td>Allowance</td>
<td>Life Safety System, Emergency Devices</td>
<td>2018 to 25 1</td>
<td>$45,000.00</td>
</tr>
<tr>
<td>3.600</td>
<td>1</td>
<td>Allowance</td>
<td>Pipes, Domestic Water, Sanitary Waste and Building Heating and Cooling</td>
<td>2020 to 60+ 3</td>
<td>$26,000.00</td>
</tr>
<tr>
<td>3.700</td>
<td>2</td>
<td>Each</td>
<td>Pumps, Building Cooling, 10-HP</td>
<td>2018 to 15 1</td>
<td>$18,500.00</td>
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<tr>
<td>3.701</td>
<td>2</td>
<td>Each</td>
<td>Pumps, Building Heating, 7.5-HP</td>
<td>2018 to 15 1</td>
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<tr>
<td>3.702</td>
<td>5</td>
<td>Each</td>
<td>Pumps, Sewage Ejector, 10-HP</td>
<td>2018 to 15 1</td>
<td>$14,500.00</td>
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<tr>
<td>3.800</td>
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<td>Allowance</td>
<td>Security System, Phase I</td>
<td>2023 to 15 6 to 13</td>
<td>$44,500.00</td>
</tr>
</tbody>
</table>

### Property Site Elements

| 4.045     | 1,020   | 3,023 | Square Yards | Asphalt Pavement, Total Replacement | 2018 to 20 1 | $35,000 | $89,065 |
| 4.111     | 1        | Allowance | Flagpoles | 2040 to 25 23 | $6,000 | $2,870 |
| 4.222     | 1        | Allowance | Hotel Sidewalk System | 2040 to 25 23 | $60,000 | 89,408 |
| 4.580     | 4        | Each    | Light Poles and Fixtures | 2027 to 25 10 | $2,600 | 12,189 |

### Anticipated Expenditures, By Year

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
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<td>850,000</td>
<td>280,604</td>
<td>563,764</td>
<td>646,500</td>
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<td>325,405</td>
<td>121,503</td>
<td>276,594</td>
<td>372,242</td>
<td>130,044</td>
<td>548,685</td>
<td>51,720</td>
<td>453,684</td>
<td>285,987</td>
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</table>
### Reserve Expenditures

**Ann Arbor District Library**  
**Ann Arbor, Michigan**

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Quantity</th>
<th>Per Phase Quantity</th>
<th>Reserve Component Inventory</th>
<th>Estimated Life Analysis, Years</th>
<th>Costs, $</th>
<th>1st Year of Event</th>
<th>Life Analysis, Use/Remain</th>
<th>30-Year Total (Inflated)</th>
<th>30-Year Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.022</td>
<td>1 Each</td>
<td>3.022</td>
<td>Air Handling Unit, AHU-2, 2,830-CFM, Replacement</td>
<td>2018 to 20</td>
<td>13,000.00</td>
<td>13,000</td>
<td>13,000</td>
<td>31,351</td>
<td>31,351</td>
</tr>
<tr>
<td>3.024</td>
<td>1 Each</td>
<td>3.024</td>
<td>Air Handling Unit, AHU-3, 33,445-CFM, Capital Repairs</td>
<td>2021 to 30</td>
<td>32,000.00</td>
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<td>32,000</td>
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<td>34,098</td>
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<tr>
<td>3.026</td>
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<td>3.026</td>
<td>Air Handling Unit, AHU-4, 33,445-CFM, Capital Repairs</td>
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<td>95,000</td>
<td>95,000</td>
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<td>3.028</td>
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<td>3.070</td>
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<td>25,500</td>
<td>25,500</td>
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<td>1 Each</td>
<td>3.170</td>
<td>Building Automation System</td>
<td>2018 to 15</td>
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<td>90,000</td>
<td>90,000</td>
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<tr>
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<td>3.200</td>
<td>Chillers, 125-toms, Capital Repairs</td>
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<td>26,000</td>
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<td>3.205</td>
<td>Chillers, 125-toms, Replacement</td>
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<td>131,000</td>
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<tr>
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<td>3.302</td>
<td>Elevators, Hydraulic, Pumps and Controls</td>
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<td>Elevators, Hydraulic, Cylinders</td>
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<tr>
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<td>3.701</td>
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<td>3.702</td>
<td>Pumps, Sewage Ejector, 10HP</td>
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<td>15,000.00</td>
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</table>

**Property Site Elements**

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Quantity</th>
<th>Per Phase Quantity</th>
<th>Reserve Component Inventory</th>
<th>Estimated Life Analysis, Years</th>
<th>Costs, $</th>
<th>1st Year of Event</th>
<th>Life Analysis, Use/Remain</th>
<th>30-Year Total (Inflated)</th>
<th>30-Year Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.045</td>
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<td>4.045</td>
<td>1,020 Square Yards, Asphalt Pavement, Total Replacement</td>
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<td>35,000</td>
<td>35,000</td>
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<td>49,824</td>
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<td>4.111</td>
<td>Flagpoles</td>
<td>2040 to 25</td>
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<td>6,000</td>
<td>6,000</td>
<td>8,644</td>
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<tr>
<td>4.222</td>
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<td>Heated Sidewalk System</td>
<td>2040 to 25</td>
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<td>60,000</td>
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<tr>
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<td>Light Poles and Fixtures</td>
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<td>35,000</td>
<td>35,000</td>
<td>50,422</td>
<td>50,422</td>
</tr>
</tbody>
</table>

**Anticipated Expenditures, By Year**

| Years | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
### Reserve Funding Plan

#### Cash Flow Analysis

**Ann Arbor District Library**

**Ann Arbor, Michigan**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
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<td>Reserves at Beginning of Year (Note 1)</td>
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<td>$0</td>
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<td>$322,776</td>
<td>$326,364</td>
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<td>$501,179</td>
<td>$544,103</td>
<td>$485,337</td>
<td>$696,992</td>
<td>$483,711</td>
<td>$734,411</td>
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<tr>
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<td>$560,000</td>
<td>$560,000</td>
<td>$560,000</td>
<td>$298,000</td>
<td>$302,800</td>
<td>$307,600</td>
<td>$322,500</td>
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<tr>
<td>Plus Estimated Interest Earned, During Year (Note 3)</td>
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<td>$2,502</td>
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<td>Less Anticipated Expenditures, By Year</td>
<td>$(850,000)</td>
<td>$(290,064)</td>
<td>$(560,764)</td>
<td>$(646,500)</td>
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<td>$(396,608)</td>
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**Explanatory Notes:**

2. 2018 is the first year of recommended contributions.
3. 1.4% is the estimated annual rate of return on invested reserves.
4. Accumulated year 2047 ending reserves consider the age, size, overall condition and complexity of the property.
5. Threshold Funding Years (reserve balance at critical point).
4. RESERVE COMPONENT DETAIL

The Reserve Component Detail of this Full Reserve Study includes enhanced solutions and procedures for select significant components. This section describes the Reserve Components, documents specific problems and condition assessments, and may include detailed solutions and procedures for necessary capital repairs and replacements for the benefit of current and future board members. We advise the Board use this information to help define the scope and procedures for repair or replacement when soliciting bids or proposals from contractors. However, the Report in whole or part is not and should not be used as a design specification or design engineering service.

Exterior Building Elements

Front elevation overview  Side elevation overview

Rear elevation overview
Doors, Main Entrance

Line Item: 1.180

Quantity: The main entrance of the library comprises three doors and sidelights at the west side of the building.

History: Replaced in 2015

Condition: Good overall

Main entrance door system

Useful Life: Up to 30 years

Priority/Criticality: Defer only upon opinion of independent professional or engineer

Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. Our estimate of cost is based on historical information furnished to us by Management.

Roofs, Built-up, Section B

Line Item: 1.300

Quantity: 105 squares\(^1\) of built-up roofing comprises the roof at Section B. The following image, provided by Tremco Roofing & Building Maintenance, depicts each section of roof at the Library:

---

\(^1\) We quantify the roof area in squares where one square is equal to 100 square feet of surface area.
History: The roof is at an age of approximately 30 years

Useful Life:  15- to 20-years

Component Detail Notes:  Built-up roofing provides a durable system due to its multi-layer protection.  Built-up roofs are composed of asphalt coated roofing sheets installed in layers to add strength to the roofing system.  Built-up roofs are an economical option for flat and low-sloped roofs.

Contractors can install a new built-up roof in one of two ways: tear-off or an overlay.  An overlay is the application of a new roof membrane over an existing roof.  This method, although initially more economical, often covers up problems with the deck, flashing and saturated insulation.  The tear-off method of replacement includes removal of the existing roofing, flashings and insulation, and installation of a new roofing system.

Priority/Criticality:  Defer only upon opinion of independent professional or engineer

Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3.  Our estimate of cost is based, in part, on historical information furnished to us by O’Neal Construction.
Roofs, EPDM, Sections A, AA, C, D and E

**Line Item:** 1.380, 1.381 and 1.382

**Quantity:** 185 squares of ethylene propylene diene monomer (EPDM) roofing comprise the roofs at sections A, AA and C. 12 squares of EPDM roofing comprise the roofs at Sections D and E. See the previous narrative, "Roofs, Built-Up, Section B" for the image which depicts the sections of roofing found at the library.

**History:** The roofs at Sections A, AA and C are at an age of approximately 25 years. The roofs at sections D and E are at an age of approximately 20 years.

**Condition:** The roofs at Sections A, AA and C are reported in fair to poor condition with a history of leaks. The roofs at Sections D and E are reported in fair to poor condition with wet insulation evident.

**Useful Life:** 15- to 20-years
**Component Detail Notes:** EPDM membrane roofing is a synthetic-rubber compound that provides outstanding physical performance properties and weathering characteristics. EPDM is a single-ply roof membrane which is used on flat and low-pitch roofs. Unlike built-up roofing systems, EPDM roofs require a less labor intensive installation.

Over time, exposure to ultraviolet light, heat and weather degrade the membrane. This degradation results in membrane damage from thermal expansion and contraction, adverse weather and pedestrian traffic. The aging process makes the membrane less pliable and more difficult to maintain. Ponding water on the roof can increase the effects of ultraviolet light on the membrane and contaminants in ponded water can cause the membrane to deteriorate prematurely.

Contractors can install a new EPDM roof in one of two ways: tear-off or an overlay. An overlay is the application of a new roof membrane over an existing roof. This method, although initially more economical, often covers up problems with the deck, flashing and saturated insulation. The tear-off method of replacement includes removal of the existing roofing, flashings and insulation, and installation of a new roofing system.

The following detail depicts a typical EPDM roof although it may not reflect the actual configuration at AADL:

**Priority/Criticality:** Defer only upon opinion of independent professional or engineer
Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. Based on the roof analysis performed by Tremco Roofing & Building Maintenance dated July 9th, 2014, we recommend the Library anticipate replacement of the roofs at Sections A, AA and C. We recommend the Library anticipate near term restoration of the roofs at Section D and E with a subsequent replacement. Our estimates of cost are based, in part, on historical information furnished to us by O’Neal Construction.

Sealants, Windows, Doors and Control Joints

Line Item: 1.540

Quantity: 4,800 linear feet of exterior sealants or caulk

History: Unknown

Condition: Poor overall with deterioration evident

2 The terms sealant and caulk are used interchangeably throughout this text and throughout the industry.
Useful Life: Up to 20 years

Component Detail Notes: The rate of deterioration of the sealants is not uniform due to the different exposures to sunlight and weather. The Library should anticipate gradual dispersed deterioration as the sealants age.

Priority/Criticality: Defer only upon opinion of independent professional or engineer

Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. We recommend AADL replace up to fifty percent (50%), or 2,400 linear feet of joint sealant in conjunction with other façade repairs.

Walls, Masonry

Line Items: 1.819 and 1.820

Quantity: Approximately 30,900 square feet of the exterior walls

History: Limited history of repairs

Condition: Fair overall with the following evident:

- Minimal previous repairs evident
- Efflorescence is not visible
- Lintels exhibit rust
- Masonry exhibits cracks
- Spalled masonry is evident
- Mortar deterioration is evident
- Mortar joints are tooled
- Buckling on south elevation
Masonry façade overview

Mortar deterioration

Metal lintel rust

Masonry deterioration at former light fixture location
**Useful Life:** We advise a complete inspection of the masonry and related masonry repairs every 8- to 12-years to forestall deterioration.

**Component Detail Notes:** We recommend an inspection, repair and replacement of the steel lintels. Lintels are structural supports or beams above windows and doors. Fatigued lintels also allow the direct penetration of storm water into the wall assembly. These inspections should locate areas of rust on the lintels and cracks or other structural damage to the walls around lintels. The contractor should remove any areas of rust, prime and paint these lintels. Paint protects and maximizes the remaining useful life of the lintels and therefore the exterior wall systems. Structural damage can eventually lead to costly replacements of lintels and surrounding wall systems.

We also recommend inspection and repairs of the steel shelf angles. Shelf angles are steel angles which support the weight of masonry veneer between floors and transfers that weight onto the main structural system. Shelf angles require through-wall flashing and weeps to ensure proper elimination of water from the masonry system. The following diagram details a typical metal lintel and weep system, however, this detail is similar to construction at shelf angles and may not reflect the actual configuration at AADL:
**Priority/Criticality:** Defer only upon opinion of independent professional or engineer

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. We include a significantly larger near term expenditure in order to repair the conditions depicted above. Our cost for subsequent repairs includes the following activities:

- Complete inspection of the masonry
- Repointing of up to ten percent (10%) of the masonry
- Replacement of up to two percent (2%) of the masonry
- Partial replacement of up to two percent (2%) of the sills and lintels
- Paint applications to the metal lintels (approximately 410 linear feet)

**Windows and Doors**

**Line Item:** 1.980

**Quantity:** 4,540 square feet of windows and door at the library. This quantity excludes the main entrance doors.

**History:** Installed in 1991

**Condition:** Good to fair overall
Useful Life: Up to 40 years

Component Detail Notes: Properly designed window and door assemblies anticipate the penetration of some storm water beyond the gaskets. This infiltrated storm water collects in an internal drainage system and drains, or exits, the frames through weep holes. These weep holes can become clogged with dirt or if a sealant is applied, resulting in trapped storm water. We recommend AADL periodically verify that weep holes are unobstructed concurrent with facade repairs. However, as window frames, gaskets and sealants deteriorate, leaks into the interior can result. The windows and doors will eventually need replacement or major capital repairs to prevent water infiltration and damage from wind driven rain.

Priority/Criticality: Defer only upon opinion of independent professional or engineer

Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3.
Interior Building Elements

Meeting Rooms

Fourth floor meeting room

Lower level meeting room

Ceilings, Acoustical Tiles, Grid and Lighting

**Line Item:** 2.200

**Quantity:** 7,800 square feet at the meeting rooms

**History:** Unknown

**Condition:** Fair overall with tile damage evident

**Useful Life:** Up to 30 years

**Priority/Criticality:** Per Board discretion
**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3.

**Floor Coverings, Carpet**

**Line Item:** 2.201

**Quantity:** 880 square yards at the meeting rooms (Contractor measurements will vary from the actual floor area due to standard roll lengths, patterns and installation waste.)

**History:** Unknown

**Condition:** Varied good to poor condition with stains evident

![Carpet stain](image)

**Useful Life:** 8- to 12-years

**Priority/Criticality:** Per Board discretion

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3.

**Furnishings**

**Line Item:** 2.202

**History:** Various unknown ages

**Condition:** Varied good to fair overall
Meeting room furnishings

Useful Life: Varies significantly up to 20 years

Component Detail Notes: Furnishings at the meeting rooms include:

- Appliances (at the 4th floor kitchenette)
- Cabinets
- Chairs
- Computers
- Countertops
- Desks
- File cabinets
- Plumbing fixtures
- Tables
- Televisions

Priority/Criticality: Per Board discretion

Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. We estimate the present replacement cost of these elements at approximately $192,000. Due to varied uses, ages and useful lives, we recommend the Library budget $48,000 plus inflation for phased replacements of up to twenty-five percent (25%) of the furnishings per event.

Wall Coverings

Line Item: 2.203

Quantity: Approximately 7,000 square feet at the meeting rooms (Contractor measurements will vary from the actual area due to standard roll lengths, patterns and installation waste.)

History: Unknown
**Condition:** Fair overall with adhesion failure and scuff marks evident

![Wall covering adhesion failure](image1) ![Scuff mark](image2)

**Useful Life:** Up to 20 years

**Priority/Criticality:** Per Board discretion

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3.

---

**Miscellaneous Areas**

**Elevator Cab Finishes**

**Line Item:** 2.222

**Quantity:** Two elevators

**History:** Unknown

**Condition:** Good to fair overall
Useful Life: Up to 20 years

Priority/Criticality: Per Board discretion

Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3.

Rest Rooms

Line Item: 2.250

Quantity: 18 rest rooms located throughout the library

History: Components are at various unknown ages. The Library recently renovated and updated the first floor main entrance rest rooms.

Condition: Varied good to fair overall
Vinyl tile damage

Rest room overview – Note: missing ceiling tiles

Recently renovated 1st floor rest room

Recently renovated 1st floor rest room

**Useful Life:** Renovations up to 20 years

**Component Detail Notes:** Components include:

- Vinyl and tile floor coverings
- Tile wall coverings on a portion of the walls
- Acoustical ceiling tile and grid ceiling finishes on a portion of the ceilings
- Paint finishes on a portion of the walls and ceilings
- Light fixtures
- Plumbing fixtures

**Priority/Criticality:** Per Board discretion

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the *Reserve Expenditures* table in Section 3. Renovation should include paint finish applications and replacement of all the remaining components listed above. Our estimate of cost does not include any allowances for code compliancy. Future updates to this reserve
study will consider the need for additional funds based upon requirements to compliancy with certain building codes at that time.

Secret Lab, Renovations

Line Item: 2.251

History: At an age of less than two years

Condition: Excellent overall

Useful Life: Renovations every 20 years

Component Detail Notes: Components of the secret lab include:

- Tile floor coverings
- Paint finishes of the walls
Acoustical ceiling tile, grid and lighting
Furnishings
Cabinets
Countertops
Plumbing fixtures

**Priority/Criticality:** Defer only upon opinion of independent professional or engineer

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the **Reserve Expenditures** table in Section 3. Renovation should include paint finish applications and replacement of all the remaining components listed above.

---

**Offices**

**Ceilings, Acoustical Tiles, Grid and Lighting**

**Line Item:** 2.300

**Quantity:** 19,000 square feet at the offices

**History:** Unknown

**Condition:** Fair overall with tile stains evident

![Tile stains](image-url)

**Useful Life:** Up to 30 years

**Priority/Criticality:** Per Board discretion

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the **Reserve Expenditures** table in Section 3.
Floor Coverings, Carpet

**Line Item:** 2.301

**Quantity:** 1,870 square yards at the offices (Contractor measurements will vary from the actual floor area due to standard roll lengths, patterns and installation waste.)

**History:** Unknown

**Condition:** Varied good to poor condition with stains evident

[Image: Carpet stain]

**Useful Life:** 8- to 12-years

**Priority/Criticality:** Per Board discretion

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3.

Furnishings

**Line Item:** 2.302

**History:** Various unknown ages

**Condition:** Varied good to fair overall
Useful Life: Varies significantly up to 20 years

Component Detail Notes: Furnishings at the offices include:

- Appliances (at the kitchenettes)
- Bookcases
- Cabinets
- Chairs
- Computers
- Countertops
- Cubicles
- Desks
- File cabinets
- Lockers
- Plumbing fixtures
- Tables
Priority/Criticality: Per Board discretion

Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. We estimate the present replacement cost of these elements at approximately $220,000. Due to varied uses, ages and useful lives, we recommend the Library budget $55,000 plus inflation for phased replacements of up to twenty-five percent (25%) of the furnishings per event.

Paint Finishes

Line Item: 2.303

Quantity: Approximately 18,400 square feet at the offices

History: Unknown

Condition: Varied good to fair condition with scuff marks evident

[Image: Scuff mark]

Useful Life: 6- to 10-years

Priority/Criticality: Per Board discretion

Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3.

Wall Coverings

Line Item: 2.304

Quantity: Approximately 3,600 square feet at the offices (Contractor measurements will vary from the actual area due to standard roll lengths, patterns and installation waste.)
History: Unknown

Condition: Fair overall with adhesion failure evident

Useful Life: Up to 20 years

Priority/Criticality: Per Board discretion

Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3.

Public Library Areas

Ceilings, Acoustical Tiles, Grid and Lighting

Line Item: 2.400

Quantity: 40,600 square feet at the public library areas

History: Unknown

Condition: Good to fair overall
Public library area overview

**Useful Life:** Up to 30 years

**Priority/Criticality:** Per Board discretion

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the *Reserve Expenditures* table in Section 3.

---

**Displays for Library Materials**

**Line Item:** 2.401

**History:** Various unknown ages

**Condition:** Varied good to fair condition

---

Bookshelves  
Game tables
Useful Life: Up to 30 years

Priority/Criticality: Per Board discretion

Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. We estimate the present replacement cost of these elements at approximately $880,000. Due to varied uses, ages and useful lives, we recommend the Library budget $220,000 plus inflation for phased replacements of up to twenty-five percent (25%) of the furnishings per event.

Floor Coverings, Carpet

Line Item: 2,402

Quantity: 4,830 square yards at the public library areas (Contractor measurements will vary from the actual floor area due to standard roll lengths, patterns and installation waste.)
History: Unknown

Condition: Varied good to poor condition with stains evident

Useful Life: 8- to 12-years

Priority/Criticality: Per Board discretion

Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3.

Furnishings

Line Item: 2.403

History: Various unknown ages

Condition: Varied good to fair overall
Public library area furnishings

Useful Life: Varies significantly up to 20 years

Component Detail Notes: Furnishings at the public library areas include:

- Attendants’ stations
- Benches
- Cabinets
- Chairs
- Computers
- Countertops
- Desks
- File cabinets
- Sofas
- Stools
- Tables

Priority/Criticality: Per Board discretion
**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the *Reserve Expenditures* table in Section 3. We estimate the present replacement cost of these elements at approximately $230,000. Due to varied uses, ages and useful lives, we recommend the Library budget $57,500 plus inflation for phased replacements of up to twenty-five percent (25%) of the furnishings per event.

---

**Light Fixtures**

*Line Item:* 2.404

*Quantity:* Approximately 50 interior light fixtures located at the public library areas

*History:* Unknown

*Condition:* Reported satisfactory

---

**Paint Finishes**

*Line Item:* 2.405

*Quantity:* Approximately 38,200 square feet at the public library areas

*History:* Unknown

*Condition:* Varied good to fair condition
Useful Life: 6- to 10-years

Priority/Criticality: Per Board discretion

Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3.

Building Services Elements

Air Handling Units

Line Items: 3.021 through 3.028

Quantity, History and Condition:

- AHU-1, capacity of 14,520 cubic feet per minute (CFM), installed in 1991, reported in fair condition
- AHU-2, capacity of 2,830-CFM, installed in 1995, reported in fair condition
- AHU-3, capacity of 11,445-CFM, installed in 1991, reported in fair condition
- AHU-4, capacity of 33,960-CFM, installed in 1991, reported in good to fair condition
- AHU-5, capacity of 29,340-CFM, installed in 1991, reported in good to fair condition
Useful Lives:

- AHU-1, capital repairs every 30 years
- AHU-2, replacement every 15- to 20-years
- AHU-3, capital repairs every 30 years
- AHU-4, capital repairs every 40 years
- AHU-5, capital repairs every 40 years

Component Detail Notes: Capital repairs may include replacement of the coils, motors, fans, controls, dampers, etc.

Priority/Criticality: Defer only upon opinion of independent professional or engineer

Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3.
Air Handling and Condensing Units, Split Systems and Packaged Unit

**Line Item:** 3.070

**Quantity:** Two split systems and one packaged unit

**History:** Unknown ages

**Condition:** O’Neal Construction reports the packaged unit is undersized. The split systems are in satisfactory reported condition.

---

**Useful Life:** 15- to 20-years

**Component Detail Notes:** A split system air conditioner consists of an outside condensing unit, an interior evaporator coil, refrigerant lines and an interior air handling unit.

**Priority/Criticality:** Defer only upon opinion of independent professional or engineer

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. The split system condensing unit may require replacement prior to replacement of the related interior forced air unit. For purposes of this Reserve Study, we assume coordination of replacement of the interior forced air unit, evaporator coil, refrigerant lines and exterior condensing unit.

---

Boilers, Building Heat

**Line Item:** 3.105

**Quantity:** Three Bryant and One Bryan gas-fired boilers

**History:** Installed in 1989
**Condition:** Reported satisfactory

**Bryant hot water boilers overview**

**Bryan steam boiler overview**

**Useful Life:** 18- to 25-years

**Component Detail Notes:** Three of the boilers have an input capacity of 1,500-MBH (thousand British Thermal Units per hour) each and one of the boilers has an input capacity of 1,200-MBH for the building heat system. The boilers have an efficiency of eighty percent (80%). The lack of replacement parts, increased efficiencies of new units, increased maintenance costs and corrosion of components will eventually justify complete replacement.

**Priority/Criticality:** Defer only upon opinion of independent professional or engineer

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. Our estimate of cost includes an allowance for replacement of the controls.

**Building Automation System**

**Line Item:** 3.170

**History:** Unknown age

**Condition:** Reported unsatisfactory

**Useful Life:** Up to 15 years

**Component Detail Notes:** The building automation system (or energy management system) monitors and controls the mechanical systems.

**Priority/Criticality:** Defer only upon opinion of independent professional or engineer
**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the **Reserve Expenditures** table in Section 3. Our estimate of cost is based, in part, on conversations with *O’Neal Construction* to upgrade the existing system.

**Chillers**

**Line Items:** 3.200 and 3.205

**Quantity:** Two *McQuay* 125-ton capacity chillers

**History:** Installed in 1991

**Condition:** Reported satisfactory

![Chillers overview](image-url)

**Useful Life:** Replacement every 25- to 35-years with capital repairs up to every 10 years

**Component Detail Notes:** The air cooled chillers provide chilled water for air conditioning the building and use R-410A refrigerant.

Proper maintenance includes interim component replacements, including replacement of compressors, to maximize the remaining useful life. We recommend the Library budget for interim component replacements up to every 10 years.

**Priority/Criticality:** Defer only upon opinion of independent professional or engineer

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the **Reserve Expenditures** table in Section 3.
Elevators, Hydraulic

**Line Items:** 3.320 and 3.330

**Quantity:** Two hydraulic elevators

**History:** Components are mostly original to 1991 with pistons replaced in 2009 at the service elevator and in 2014 at the public elevator.

**Condition:** Reported satisfactory and service interruptions are reportedly infrequent.

**Useful Life:** Pumps and controls have a useful life of up to 35 years. Cylinders have a useful life of up to 45 years.

**Component Detail Notes:** Major components in a hydraulic elevator system include the pump, controls, cylinder, fluid reservoir and a valve between the cylinder and reservoir. Once activated by the elevator controls, the pump forces hydraulic fluid from the reservoir into the cylinder. The piston within the cylinder rises lifting the elevator cab. The elevator cab lowers at a controlled rate when the controls open the valve.

**Priority/Criticality:** Defer only upon opinion of independent professional or engineer

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. We anticipate the following hydraulic elevator system components will require replacement:

- Cab control panels
- Door operators
- Hallway panels/buttons
- Microprocessor based controllers
- Pumps (Power Unit)

These costs may vary based on the desired scope of the actual replacements, changes in technology and requirements of local codes or ordinances at the actual times of replacements. However, we judge our estimated costs sufficient to budget appropriate reserves at this time. The Library should require the contractor to verify that elevator component replacements include all of the necessary features for the latest in elevator code compliance.

Life Safety System

**Line Items:** 3.555 and 3.560

**Quantity:** The life safety system at AADL includes the following components:

- Audio/visual fixtures
- Control panel
- Detectors
- Emergency light fixtures
- Exit light fixtures
- Pull stations
- Wiring

**History:** Installed in 1991

**Conditions:** Reported in fair operational condition

**Useful Life:** Up to 25 years for the devices and up to 15 years for the control panel

**Priority/Criticality:** Defer only upon opinion of independent professional or engineer

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the *Reserve Expenditures* table in Section 3. Changes in technology or building codes may make a replacement desirable prior to the end of the functional life. Our estimate of future cost considers only that amount necessary to duplicate the same functionality. Local codes or ordinances at the actual time of replacement may require a betterment as compared to the existing system. A betterment could result in a higher, but at this time unknown, cost of replacement. Our estimates of cost are based on historical information furnished to us by O’Neal Construction.

**Pipes**

**Line Items:** 3.600 and 3.605

**History:** Various unknown ages

**Conditions:** O’Neal Construction reports issues with the main sanitary waste pipes

**Component Detail Notes:** The Library is responsible for maintenance and replacement of the piping systems arranged in vertical and horizontal segments. These pipes comprise the following:
- Building heating, cooling and condensate
- Domestic cold water
- Domestic hot water
- Sanitary waste disposal

The exact locations and conditions of the pipes were not ascertained due to the nature of their location and the non-invasive nature of our inspection. We comment on the respective quantities and conditions of the piping systems in the following sections of this narrative.

**Building Heating, Cooling and Condensate** - The building heating, cooling and condensate system at AADL utilizes a four-pipe system. These pipes have a useful life of up to and sometimes beyond 80 years.

**Domestic Water** - Copper piping is the predominant type of pipe used in new construction for domestic water piping. With low mineral content in the water, the useful life of copper domestic water pipes is up to and sometimes beyond 80 years. However, there is recent evidence that copper piping prematurely develops pinhole leaks. Studies have shown that changes in water treatment practices, recently required in response to U.S. Environmental Protection Agency regulations, are dramatically increasing the risk of pitting corrosion in many geographic locations. Utility companies are implementing higher chloride levels to prevent outbreaks of waterborne disease. These higher chloride levels can accelerate corrosion of copper pipes and indeterminately reduce their useful life.

In the event that numerous pinhole leaks develop or occur throughout the system of pipes, AADL should also consider “in-place” pipe restoration technology. This process includes drying, sandblasting away interior pipe occlusions and applying an epoxy lining to the interior surfaces of the pipes. Future updates of this study will consider the possibility of the pipe restoration process in lieu of pipe replacement at AADL. Restoration technology can extend the useful life of a pipe system thus avoiding a system pipe replacement.

**Sanitary Waste Disposal** - These pipes typically deteriorate from the inside out as a result of sewer gases, condensation and rust.

**Pipes, Remaining** – We anticipate a useful life of up to and sometimes beyond 100 years for the fire standpipes and interior sprinkler pipes. Therefore, we do not foresee the need to budget for replacement of these pipes within the 30-year scope of this study. Future updates of this study will revisit the need to include partial replacement of these pipes.

**Priority/Criticality:** Defer only upon opinion of independent professional or engineer

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. We recommend the Library fund interim pipe replacements, prior to more aggregate replacements identified in the following paragraphs, from the operating budget. We also recommend the Library contract for an
invasive investigation of the condition of the piping system prior to beginning more aggregate replacements, funded through the operating budget.

An invasive analysis of the piping systems will provide various replacement options. Replacement of the systems as an aggregate event will likely require the use of special assessments or loans to fund the replacements.

Although it is likely that the times of replacement and extent of repair costs may vary from the budgetary allowance, AADL could budget sufficient reserves for the beginning of these pipe replacements and have the opportunity to adjust its future reserves up or down to meet any changes to these budgetary estimates. Updates of this Reserve Study would incorporate changes to budgetary costs through a continued historical analysis of the rate of deterioration and actual pipe replacements to budget sufficient reserves.

We recommend the Library budget for replacement of the following items through the operating budget:

- Replacement of valves on an as-needed basis
- Minor pipe repairs and replacements
- invasive investigation of the condition of the piping system prior to beginning more aggregate replacements
- Rodding of waste pipes

**Pumps**

*Line Items:* 3.700 through 3.702

*Quantity, History and Conditions:*

- Building cooling - 10-HP, two each, 1991, reported unsatisfactory
- Building heating - 7.5-HP, two each, 1991, reported unsatisfactory
- Sewage ejector - 10-HP, five each, unknown age, reported unsatisfactory
Useful Lives:

- Building cooling, useful life of up to 15 years
- Building heating, useful life of up to 15 years
- Sewage ejector, useful life of up to 15 years

Component Detail Notes: Major pumps included in this Reserve Study are those with a motor drive of at least five-HP. The Library should replace or repair all pumps with motor drives less than five-HP as needed and fund this ongoing maintenance activity through the operating budget. The Library may choose to rebuild pumps prior to complete replacement. However, this activity becomes less desirable as pumps age due to the scarcity of parts. We regard interim replacements of motors and component parts as normal maintenance and base our estimates on complete replacements. An exact replacement time for each individual pump is difficult, if not impossible, to estimate.

Priority/Criticality: Defer only upon opinion of independent professional or engineer

Expenditure Detail Notes: Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. Our costs include an allowance for variable frequency drives (VFD) and controls.

Security System

Line Item: 3.820

Quantity: AADL utilizes the following security system components:

- Automated card reading system
- Cameras
- Recorders

History: Installed in 2016
**Condition:** Reported satisfactory

![Security camera](image)

**Useful Life:** Up to 15 years

**Priority/Criticality:** Per Board discretion

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the *Reserve Expenditures* table in Section 3. The Library should anticipate replacement of up to fifty percent (50%) of the security system components per event.

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**Property Site Elements**

**Asphalt Pavement, Repaving**

**Line Item:** 4.045

**Quantity:** Approximately 1,020 square yards of a parking lot at the rear of the building

**History:** Unknown age

**Condition:** Poor overall with cracks and deterioration evident
Asphalt pavement parking lot overview

Asphalt pavement cracks and deterioration

Useful Life: 15- to 20-years

Component Detail Notes: The initial installation of asphalt uses at least two lifts, or two separate applications of asphalt, over the base course. The first lift is the binder course. The second lift is the wearing course. The wearing course comprises a finer aggregate for a smoother more watertight finish. The following diagram depicts the typical components although it may not reflect the actual configuration at AADL:
The manner of repaving is either a mill and overlay or total replacement. A mill and overlay is a method of repaving where cracked, worn and failed pavement is mechanically removed or milled until sound pavement is found. A new layer of asphalt is overlaid atop the remaining base course of pavement. Total replacement includes the removal of all existing asphalt down to the base course of aggregate and native soil followed by the application of two or more new lifts of asphalt. We recommend mill and overlayment on asphalt pavement that exhibits normal deterioration and wear. We recommend total replacement of asphalt pavement that exhibits severe deterioration, inadequate drainage, pavement that has been overlaid multiple times in the past or where the configuration makes overlayment not possible. Based on the apparent visual condition and configuration of the asphalt pavement, we recommend the total replacement method of repaving at AADL.

**Priority/Criticality:** Defer only upon opinion of independent professional or engineer

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. We recommend the Library budget for crack repairs, patching, seal coat applications and striping as needed through the operating budget.

**Flagpoles**

**Line Item:** 4.111

**History:** Installed in 2015

**Condition:** Good overall
**Useful Life:** Up to 25 years

**Priority/Criticality:** Defer only upon opinion of independent professional or engineer

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. Our estimate of cost is based on historical information furnished to us by O’Neal Construction.

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### Heated Sidewalk System

**Line Item:** 4.222

**History:** The heated sidewalk system was installed at the main entrance located at the east elevation of the building in 2015.

**Condition:** Reported satisfactory

**Useful Life:** Up to 25 years

**Priority/Criticality:** Defer only upon opinion of independent professional or engineer

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3. Our estimate of cost is based on historical information furnished to us by O’Neal Construction.

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### Light Poles and Fixtures

**Line Item:** 4.560

**Quantity:** Four each located at the parking lot

**History:** Unknown

**Condition:** Fair overall
Light pole and fixture overview

**Useful Life:** Up to 25 years

**Priority/Criticality:** Per Board discretion

**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the Reserve Expenditures table in Section 3.

### Railings, Metal

**Line Items:** 4.777

**History:** The railings were installed in 2015

**Condition:** Good overall

**Useful Life:** Up to 35 years

**Priority/Criticality:** Per Board discretion
**Expenditure Detail Notes:** Expenditure timing and costs are depicted in the *Reserve Expenditures* table in Section 3. Our estimate of cost is based on historical information furnished to us by *O'Neal Construction*. We recommend the Library anticipate replacement of the railings in conjunction with replacement of the heated sidewalk system.

**Reserve Study Update**

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

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

Periodic updates incorporate these variable changes since the last Reserve Study or Update. We recommend the Board budget for an Update to this Reserve Study in two years. Budgeting for an Update demonstrates the Board's objective to continue fulfilling its fiduciary responsibility to maintain the commonly owned property and to fund reserves appropriately.
5. METHODOLOGY

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

AADL can fund capital repairs and replacements in any combination of the following:

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

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

This Reserve Study is in compliance with and exceeds the National standards\(^1\) set forth by the Community Associations Institute (CAI) and the Association of Professional Reserve Analysts (APRA) fulfilling the requirements of a “Full Reserve Study.” These standards require a Reserve Component to have a “predictable remaining Useful Life.” Estimating Remaining Useful Lives and Reserve Expenditures beyond 30 years is often indeterminate. Long-Lived Property Elements are necessarily excluded from this analysis. We considered the following factors in our analysis:

- The Cash Flow Method to compute, project and illustrate the 30-year Reserve Funding Plan
- Local\(^2\) costs of material, equipment and labor
- Current and future costs of replacement for the Reserve Components
- Costs of demolition as part of the cost of replacement
- Local economic conditions and a historical perspective to arrive at our estimate of long term future inflation for construction costs in Ann Arbor, Michigan at an annual inflation rate. Isolated or regional markets of

\(^1\) Identified in the APRA “Standards - Terms and Definitions” and the CAI "Terms and Definitions”.
\(^2\) See Credentials for addition information on our use of published sources of cost data.
greater construction (development) activity may experience slightly greater rates of inflation for both construction materials and labor.

- The past and current maintenance practices of AADL and their effects on remaining useful lives
- Financial information provided by the Library pertaining to the cash status of the reserve fund and budgeted reserve contribution
- The anticipated effects of appreciation of the reserves over time in accord with a return or yield on investment of your cash equivalent assets. (We did not consider the costs, if any, of Federal and State Taxes on income derived from interest and/or dividend income).
- The Funding Plan excludes necessary operating budget expenditures. It is our understanding that future operating budgets will provide for the ongoing normal maintenance of Reserve Components.

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

HISTORY AND DEPTH OF SERVICE

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

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

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

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

TOTAL STAFF INVOLVEMENT

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

OUR GOAL

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

VAST EXPERIENCE WITH A VARIETY OF BUILDINGS

Reserve Advisors has conducted reserve studies for a multitude of different communities and building types. We've analyzed thousands of buildings, from as small as a 3,500-square foot day care center to the 2,600,000-square foot 98-story Trump International Hotel and Tower in Chicago. We also routinely inspect buildings with various types of mechanical systems such as simple electric heat, to complex systems with air handlers, chillers, boilers, elevators, and life safety and security systems.

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

OLD TO NEW

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

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

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

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

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

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

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

PROFESSIONAL AFFILIATIONS/DESIGNATIONS
American Association of Cost Engineers - Past President, Wisconsin Section
Association of Construction Inspectors - Certified Construction Inspector
Association of Professional Reserve Analysts - Past President & Professional Reserve Analyst (PRA)
Community Associations Institute - Member and Volunteer Leader of multiple chapters
Concordia Seminary, St. Louis - Member, National Steering Committee
Milwaukee School of Engineering - Member, Corporation Board
Professional Engineer, Wisconsin (1982) and North Carolina (2014)

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

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

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

PRIOR RELEVANT EXPERIENCE

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

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

INDUSTRY SERVICE AWARDS

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

EDUCATION

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

PROFESSIONAL AFFILIATIONS

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

Stephen E. Breski, a Civil engineer, is an Advisor for Reserve Advisors. Mr. Breski is responsible for the inspection and analysis of the condition of clients’ properties, and recommending engineering solutions to prolong the lives of the components. He also forecasts capital expenditures for the repair and/or replacement of the property components and prepares technical reports on assignments. He is responsible for conducting Life Cycle Cost Analyses and Capital Replacement Forecast services and the preparation of Reserve Study Reports for condominiums, townhomes, planned unit developments and homeowner associations. Mr. Breski frequently serves as the Quality Assurance Review Coordinator for all types of developments.

The following is a partial list of clients served by Stephen Breski demonstrating the breadth of experiential knowledge of community associations in construction and related buildings systems.

**Council of Unit Owners of GrandView at Annapolis Towne Centre Condominium** This 13-story high rise is located in Annapolis, Maryland. The 150 unit owners are responsible for the common elements and amenities of this property which include the social and fitness rooms, two bar areas, and a rooftop pool.

**Gateway Business Center Condominium** A unique commercial property located in Gainesville, Virginia, this four-building condominium project comprises approximately 190,000 square feet of retail space and provides users sale or lease opportunities.

**LeMarin Unit Owner’s Association** Located on Lake Erie in Port Clinton, Ohio. This unique association maintains the common elements for 117 condominium owners. Amenities within this gated community include a clubhouse with an indoor pool, kitchen, fitness and social rooms, tennis courts, and a Marina.

**Grosvenor Park II Condominium Council of Unit Owners** This 19-story high rise is located near the border of Maryland and the District of Columbia. Built in 1965 and converted to condominiums in 1979, this building is called home by 422 unit owners. Common amenities included are an on-site laundry facility, fitness center, concierge services, surface level parking and three levels of garage parking.

**Biltmore Lake Association, Incorporated** A vintage community nestled within the wooded suburbs of Asheville, North Carolina, Biltmore Lake maintains over seven miles of asphalt pavement roads, a lake with approximately 325,000 square yards of surface area, a dam structure and six-and one-half miles of walking trails.

**Camelot Condominium Owners Association, Inc.** This three building, four-story complex is located in the suburbs of Akron, Ohio. Built in the late 1960’s to the early 1970’s, this property is home to 70 condominium owners. Features of this community include indoor pools, a parking garage beneath the central courtyard and a community room.

PRIOR RELEVANT EXPERIENCE

Before joining Reserve Advisors, Mr. Breski worked for a private construction management company in Pittsburgh, Pennsylvania, where he was working as a cost estimator. Prior to working as an estimator, Mr. Breski also worked for the nation’s largest provider of wireless infrastructure, where he assisted in the structural analysis of cell phone towers. Mr. Breski attended the Swanson School of Engineering at the University of Pittsburgh where he attained his Bachelor of Science degree in Civil and Environmental Engineering. His studies focused on structural engineering.

EDUCATION

University of Pittsburgh - B.S. Civil and Environmental Engineering

PROFESSIONAL AFFILIATIONS

* Reserve Specialist (RS) – Community Association Institute
* Engineer in Training (E.I.T.) – State of Maryland
ALAN M. EBERT, P.E., PRA, RS
Director of Quality Assurance

CURRENT CLIENT SERVICES

Alan M. Ebert, a Professional Engineer, is the Director of Quality Assurance for Reserve Advisors. Mr. Ebert is responsible for the management, review and quality assurance of reserve studies. In this role, he assumes the responsibility of stringent report review analysis to assure report accuracy and the best solution for Reserve Advisors’ clients.

Mr. Ebert has been involved with thousands of Reserve Study assignments. The following is a partial list of clients served by Alan Ebert demonstrating his breadth of experiential knowledge of community associations in construction and related buildings systems.

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

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

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

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

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

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

PRIOR RELEVANT EXPERIENCE

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

EDUCATION

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

PROFESSIONAL AFFILIATIONS/DESIGNATIONS

Professional Engineering License – Wisconsin, North Carolina, Illinois
Reserve Specialist (RS) - Community Associations Institute
Professional Reserve Analyst (PRA) - Association of Professional Reserve Analysts
RESOURCES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Our Services - Reserve Advisors, Inc. (RA) performs its services as an independent contractor in accordance with our professional practice standards and its compensation is not contingent upon our conclusions. The purpose of our reserve study is to provide a budget planning tool that identifies the current status of the reserve fund, and an opinion recommending an annual funding plan to create reserves for anticipated future replacement expenditures of the property.

Our inspection and analysis of the subject property is limited to visual observations and is noninvasive. RA inspects sloped roofs from the ground and inspects flat roofs where safe access (stairs or ladder permanently attached to the structure) is available. The report is based upon a “snapshot in time” at the moment of inspection. RA may note visible physical defects in our report. The inspection is made by employees generally familiar with real estate and building construction but in the absence of invasive testing RA cannot opine on, nor is RA responsible for, the structural integrity of the property including its conformity to specific governmental code requirements for fire, building, earthquake, and occupancy, or any physical defects that were not readily apparent during the inspection.

RA is not responsible for conditions that have changed between the time of inspection and the issuance of the report. RA does not investigate, nor assume any responsibility for any existence or impact of any hazardous materials, such as asbestos, urea-formaldehyde foam insulation, other chemicals, toxic wastes, environmental mold or other potentially hazardous materials or structural defects that are latent or hidden defects which may or may not be present on or within the property. RA does not make any soil analysis or geological study as part of its services; nor does RA investigate water, oil, gas, coal, or other subsurface mineral and use rights or such hidden conditions. RA assumes no responsibility for any such conditions. The Report contains opinions of estimated costs and remaining useful lives which are neither a guarantee of the actual costs of replacement nor a guarantee of remaining useful lives of any property element.

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

Report - RA completes the services in accordance with the Proposal. The Report represents a valid opinion of RA’s findings and recommendations and is deemed complete. RA, however, considers any additional information made available to us within 6 months of issuing the Report if a timely request for a revised Report is made. RA retains the right to withhold a revised Report if payment for services was not tendered in a timely manner. All information received by RA and all files, work papers or documents developed by RA during the course of the engagement shall remain the property of RA and may be used for whatever purpose it sees fit.

Your Obligations - You agree to provide us access to the subject property for an on-site visual inspection You agree to provide RA all available, historical and budgetary information, the governing documents, and other information that we request and deem necessary to complete the Report. You agree to pay actual attorneys’ fees and any other costs incurred to collect on any unpaid balance for RA’s services.

Use of Our Report and Your Name - Use of this Report is limited to only the purpose stated herein. You hereby acknowledge that any use or reliance by you on the Report for any unauthorized purpose is at your own risk and you shall hold RA harmless from any consequences of such use. Use by any unauthorized third party is unlawful. The Report in whole or in part is not and cannot be used as a design specification for design engineering purposes or as an appraisal. You may show our Report in its entirety to the following third parties: members of your organization, your accountant, attorney, financial institution and property manager who need to review the information contained herein. Without the written consent of RA, you shall not disclose the Report to any other third party. The Report contains intellectual property developed by RA and shall not be reproduced or distributed to any party that conducts reserve studies without the written consent of RA. RA will include your name in our client lists. RA reserves the right to use property information to obtain estimates of replacement costs, useful life of property elements or otherwise as RA, in its sole discretion, deems appropriate.

Payment Terms, Due Dates and Interest Charges - Retainer payment is due upon authorization and prior to inspection. The balance is due net 30 days from the report shipment date. Any balance remaining 30 days after delivery of the Report shall accrue an interest charge of 1.5% per month. Any litigation necessary to collect an unpaid balance shall be venued in Milwaukee County Circuit Court for the State of Wisconsin.