# FULL RESERVE STUDY

## First Congregational Church of Glen Ellyn

**Glen Ellyn, Illinois**

**December 12, 2014**

RESERVE™ ADVISORS

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Corporate Office
Reserve Advisors, Inc.
735 N. Water Street, Suite 175
Milwaukee, WI 53202

# 1. RESERVE STUDY EXECUTIVE SUMMARY

**Client:** First Congregational Church of Glen Ellyn (First Congregational Church)
**Location:** Glen Ellyn, Illinois
**Reference:** 132011

**Property Basics:** First Congregational Church of Glen Ellyn is a three-story building. The exterior of the building comprises brick masonry, and asphalt shingle, clay tile and flat roofs. The original church was built in the late 1800s. The main church was built in approximately 1927 with addition in the 1960s and 2000. The development contains an asphalt pavement parking area, fences, and light poles and fixtures.

**Reserve Components Identified:** 48 Reserve Components.

**Inspection Date:** December 12, 2014.

**Funding Goal:** The Funding Goal of this Reserve Study is to maintain reserves above an adequate, not excessive threshold during one or more years of significant expenditures. Our recommended Funding Plan recognizes this threshold funding year in 2020 due to replacement of building services equipment and interior renovations.

**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
- 1.1% annual rate of return on invested reserves
- 2.7% 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:** Zero dollars ($0) projected by Management as of June 30, 2015.

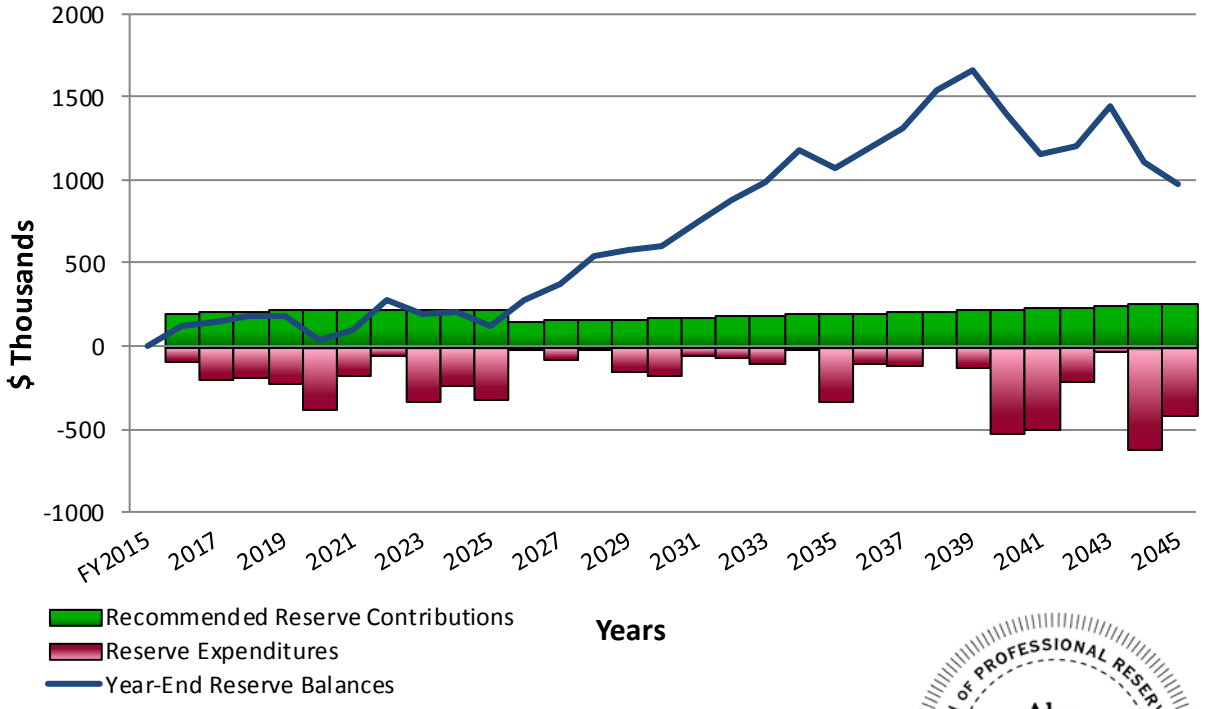
**Recommended Reserve Funding:** The Church did not budget for Reserve Contributions in 2015[1]. We recommend the Church adopt a reserve budget of $207,000 in 2016. Afterwards, the Church should budget gradual annual increases in reserve funding, that in part consider the effects of inflation through 2020. We recommend the Church budget stable contributions of $230,300 from 2021 through 2025. By 2026, the Church will have fully funded for replacement of the roofs and air handling units. Therefore, the Church may anticipate a decrease in the annual Reserve Contribution to $160,000. Afterwards, the Church should budget gradual annual increases in reserve funding, that in part consider the effects of inflation through 2045, the limit of this study's Cash Flow Analysis. These contributions will maintain a Reserve Fund for the major expenditures as identified in the ***Reserve Funding Plan***. The ***Reserve Funding Plan*** enumerates the details regarding recommended annual Reserve Contributions and projected year end reserve balances.

**Certification:** This *Full Reserve Study* exceeds the Association of Professional Reserve Analysts (APRA) standards fulfilling the requirements of a "Level I Full Reserve Study."

[1] The Fiscal Year (FY 2015) for First Congregational Church begins July 1, 2014 and ends June 30, 2015. For brevity, we refer to the Fiscal Year by its ending year, i.e. Fiscal Year 2014-15 is FY 2015 or simply 2015.

**First Congregational Church**
Recommended Reserve Funding Table and Graph

| Year | Reserve Contributions ($) | Reserve Balances ($) | Year | Reserve Contributions ($) | Reserve Balances ($) | Year | Reserve Contributions ($) | Reserve Balances ($) |
|---|---|---|---|---|---|---|---|---|
| 2016 | 207,000 | 124,494 | 2026 | 160,000 | 274,571 | 2036 | 208,800 | 1,188,092 |
| 2017 | 212,600 | 141,101 | 2027 | 164,300 | 372,681 | 2037 | 214,400 | 1,306,880 |
| 2018 | 218,300 | 180,961 | 2028 | 168,700 | 542,300 | 2038 | 220,200 | 1,542,667 |
| 2019 | 224,200 | 184,922 | 2029 | 173,300 | 580,310 | 2039 | 226,100 | 1,661,199 |
| 2020 | 230,300 | 40,646 | 2030 | 178,000 | 596,983 | 2040 | 232,200 | 1,396,259 |
| 2021 | 230,300 | 102,770 | 2031 | 182,800 | 742,697 | 2041 | 238,500 | 1,152,929 |
| 2022 | 230,300 | 280,943 | 2032 | 187,700 | 878,013 | 2042 | 244,900 | 1,204,596 |
| 2023 | 230,300 | 191,943 | 2033 | 192,800 | 981,543 | 2043 | 251,500 | 1,449,529 |
| 2024 | 230,300 | 199,563 | 2034 | 198,000 | 1,174,748 | 2044 | 258,300 | 1,105,439 |
| 2025 | 230,300 | 119,121 | 2035 | 203,300 | 1,065,564 | 2045 | 265,300 | 975,818 |




Respectfully submitted on January 15, 2015 by
RESERVE ADVISORS, INC.

Alan M. Ebert, PRA[1], RS[2], Associate Director of Quality Assurance
Visual Inspection and Report by: Stephanie A. Mueller, RS and Heather M. Christensen, RS

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

## 2. RESERVE STUDY REPORT

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

**First Congregational Church of Glen Ellyn**

**Glen Ellyn, Illinois**

and submit our findings in this report. The effective date of this study is the date of our visual, noninvasive inspection, December 12, 2014.

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

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

## IDENTIFICATION OF PROPERTY

First Congregational Church of Glen Ellyn is a three-story building. The exterior of the building comprises brick masonry, and asphalt shingle, clay tile and flat roofs. The original church was built in the late 1800s. The main church was built in approximately 1927 with addition in the 1960s and 2000. The development contains an asphalt pavement parking area, fences, and light poles and fixtures. We identify 48 major reserve components that are likely to require capital repair or replacement during the next 30 years.

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 or the operating budget 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 Church and through conversations with Management Staff. These classes of property include:

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

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

- First Congregational Church responsibility
- Limited useful life expectancies
- Predictable remaining useful life expectancies
- Replacement cost above a minimum threshold

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

- Bell Tower, Bells
- Electrical System, Wiring (Management does not report active problems with the wiring. Updates to the reserve study will consider the need for partial replacements.)
- Foundations
- Pipes, Interior Building, Fire Suppression (2000-2001)
- Stainless Steel Sinks, Counters and Preparation Tables (2004)
- Structural Frames
- Windows, Glass Block

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

- General Maintenance to the Common Elements
- Expenditures less than $7,000 (These relatively minor expenditures have a limited effect on the recommended Reserve Contributions.)
- Concrete Flatwork
- Electrical System, Thermoscans
- Elevator, Freight (abandoned)
- Exhaust Fans
- Furnishings
- Information Technology Equipment
- Landscape
- Office Equipment
- Organ, Annual Maintenance
- Paint Finishes, Interior
- Paint Finishes, Touch Up
- Pipes, Interior Building, Water and Sewer
- Pipes, Subsurface Utilities
- Pumps Less Than Five-HP (horsepower)
- Radiators
- Rest Room, Pilgrim Hall

- Retaining Walls
- Security System
- Split System, Ductless, Kitchen
- Valves, Small Diameter (we assume replacement as needed in lieu of an aggregate replacement of all the small diameter valves as a single event)
- Water Heater
- 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 replaced during the next 30 years
- 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
- 2014 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

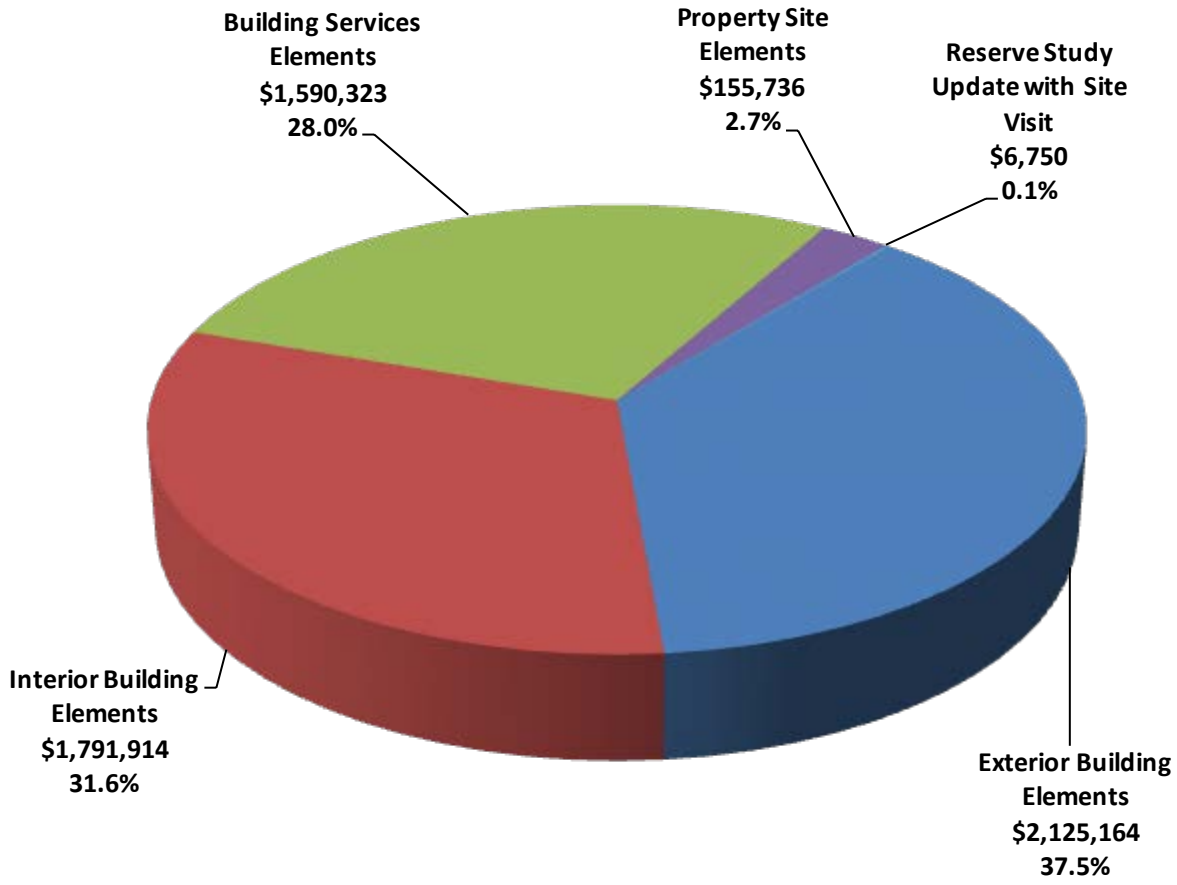
**Reserve Funding Plan**

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

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

**First Congregational Church**
Future Expenditures Relative Cost Illustration



# RESERVE EXPENDITURES

First Congregational Church
of Glen Ellyn
Glen Ellyn, Illinois

**Explanatory Notes:**

**1) 2.7% is the estimated future Inflation Rate for estimating Future Replacement Costs.**

**2) FY2015 is Fiscal Year beginning July 1, 2014 and ending June 30, 2015.**

| Line Item | Quantities: 30-Year Total | Quantities: Per Phase | Units | Reserve Component Inventory | Estimated 1st Year of Event | Life Analysis, Years: Useful | Life Analysis, Years: Remaining | Unit Cost, $ | 2015 Cost per Phase, $ | Total Future Costs, $ | RUL = 0 FY2015 | 1 2016 | 2 2017 | 3 2018 | 4 2019 | 5 2020 | 6 2021 | 7 2022 | 8 2023 | 9 2024 | 10 2025 | 11 2026 | 12 2027 | 13 2028 | 14 2029 | 15 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Exterior Building Elements | | | | | | | | | | | | | | | | | | | | | | |
| 1.180 | 8 | 8 | Each | Doors, Entrances | 2021 | to 30 | 6 | 2,000.00 | 16,000 | 18,773 | | | | | | | 18,773 | | | | | | | | | |
| 1.240 | 310 | 310 | Linear Feet | Gutters and Downspouts, Copper | 2023 | to 50+ | 8 | 60.00 | 18,600 | 23,018 | | | | | | | | | 23,018 | | | | | | | |
| 1.260 | 2 | 1 | Allowance | Light Fixtures, Bell Tower and Wall Mounted | 2018 | to 25 | 3 | 10,000.00 | 10,000 | 31,917 | | | | 10,832 | | | | | | | | | | | | |
| 1.280 | 60 | 30 | Squares | Roof, Asphalt Shingles, Original Chapel (incl. gutters and downspouts) | 2017 | 15 to 20 | 2 | 540.00 | 16,200 | 46,199 | | | 17,087 | | | | | | | | | | | | | |
| 1.282 | 12 | 6 | Each | Roofs, Asphalt Shingles, Dormers at Clay Tile Roofs | 2017 | 15 to 20 | 2 | 1,300.00 | 7,800 | 22,244 | | | 8,227 | | | | | | | | | | | | | |
| 1.360 | 115 | 115 | Squares | Roofs, Clay Tiles, Underlayment and Partial Tile Replacement | 2023 | to 35 | 8 | 2,100.00 | 241,500 | 298,869 | | | | | | | | | 298,869 | | | | | | | |
| 1.530 | 110 | 55 | Squares | Roofs, Thermoplastic, CPE, 2001 | 2021 | 15 to 20 | 6 | 1,600.00 | 88,000 | 279,174 | | | | | | | 103,254 | | | | | | | | | |
| 1.531 | 120 | 60 | Squares | Roofs, Thermoplastic, TPO, 2007 | 2024 | 15 to 20 | 9 | 1,550.00 | 93,000 | 319,584 | | | | | | | | | | 118,200 | | | | | | |
| 1.580 | 8 | 4 | Each | Skylights | 2021 | to 20 | 6 | 10,000.00 | 40,000 | 126,896 | | | | | | | 46,933 | | | | | | | | | |
| 1.820 | 64,000 | 16,000 | Square Feet | Walls, Masonry, Inspections and Repairs | 2017 | 8 to 12 | 2 | 3.10 | 49,600 | 296,334 | | | 52,315 | | | | | | | | 64,742 | | | | | |
| 1.940 | 5 | 1 | Allowance | Walls, Wood Trim, Paint Finishes (includes sealants) | 2018 | 4 to 6 | 3 | 30,000.00 | 30,000 | 229,448 | | | | 32,496 | | | | | | 38,129 | | | | | | 44,738 |
| 1.980 | 1,520 | 1,520 | Square Feet | Windows, Aluminum Frames, Addition | 2045 | to 45 | 30 | 50.00 | 76,000 | 169,016 | | | | | | | | | | | | | | | | |
| 1.981 | 5 | 1 | Allowance | Windows, Stained Glass, Refurbishment, Phased | 2016 | to 60 | 1 | 30,000.00 | 30,000 | 171,861 | | 30,810 | | 32,496 | | 34,275 | | 36,151 | | 38,129 | | | | | | |
| 1.982 | 1,100 | 220 | Square Feet | Windows, Wood Frames, Phased | 2020 | to 45 | 5 | 55.00 | 12,100 | 91,831 | | | | | | 13,824 | | | | | 15,794 | | | | | 18,044 |
| | | | | Interior Building Elements | | | | | | | | | | | | | | | | | | | | | | |
| 2.060 | 44,400 | 11,100 | Square Feet | Ceilings, Acoustical Tiles and Grid, Phased | 2019 | to 25 | 4 | 4.50 | 49,950 | 331,880 | | | | | 55,567 | 57,067 | | | | | | | | | | |
| 2.100 | 2 | 1 | Each | Elevator Cab Finishes | 2020 | to 20 | 5 | 7,000.00 | 7,000 | 21,623 | | | | | | 7,997 | | | | | | | | | | |
| 2.200 | 7,680 | 1,280 | Square Yards | Floor Coverings, Carpet, Common Areas, Phased | 2017 | 8 to 12 | 2 | 55.00 | 70,400 | 642,993 | | | 74,253 | 76,258 | | | | | | | | | | | 102,225 | 104,985 |
| 2.201 | 1,350 | 450 | Square Yards | Floor Coverings, Carpet, Sanctuary and Narthex | 2019 | 10 to 15 | 4 | 65.00 | 29,250 | 143,595 | | | | | 32,539 | | | | | | | | | | | |
| 2.240 | 60 | 60 | Square Yards | Floor Coverings, Tile, Common Areas | 2025 | to 25 | 10 | 120.00 | 7,200 | 9,398 | | | | | | | | | | | 9,398 | | | | | |
| 2.300 | 460 | 230 | Square Yards | Floor Coverings, Vinyl Tile, Common Areas | 2018 | 10 to 15 | 3 | 52.00 | 11,960 | 32,275 | | | | 12,955 | | | | | | | | | | | | |
| 2.519 | 3 | 1 | Allowance | Kitchen Equipment, Phased | 2017 | 18 to 25 | 2 | 25,000.00 | 25,000 | 105,711 | | | 26,368 | | | | | | | | | 34,418 | | | | |
| 2.520 | 1 | 1 | Allowance | Kitchen, Finishes and Cabinetry, Renovations | 2029 | to 25 | 14 | 27,000.00 | 27,000 | 39,206 | | | | | | | | | | | | | | | 39,206 | |
| 2.560 | 1 | 1 | Allowance | Light Fixtures, Classrooms and Temple of Light | 2026 | to 25 | 11 | 5,000.00 | 5,000 | 6,703 | | | | | | | | | | | | 6,703 | | | | |
| 2.561 | 21 | 21 | Each | Light Fixtures, Can and Pendant, Atrium and Chapel | 2019 | to 35 | 4 | 275.00 | 5,775 | 6,424 | | | | | 6,424 | | | | | | | | | | | |
| 2.562 | 3 | 1 | Allowance | Light Fixtures, Sanctuary, Refurbishment | 2024 | to 10 | 9 | 10,000.00 | 10,000 | 50,954 | | | | | | | | | | 12,710 | | | | | | |
| 2.563 | 28 | 14 | Each | Light Fixtures, Sanctuary, Narthex and Stairs, Dome | 2019 | to 25 | 4 | 200.00 | 2,800 | 9,178 | | | | | 3,115 | | | | | | | | | | | |
| 2.601 | 1 | 1 | Allowance | Organ Restoration, Electrical | 2025 | 35 to 40 | 10 | 55,000.00 | 55,000 | 71,791 | | | | | | | | | | | 71,791 | | | | | |
| 2.602 | 1 | 1 | Allowance | Organ Restoration, Pneumatic Leather Valves | 2035 | 45 to 50 | 20 | 100,000.00 | 100,000 | 170,376 | | | | | | | | | | | | | | | | |
| 2.651 | 3 | 1 | Allowance | Pew Restoration | 2018 | to 15 | 3 | 14,000.00 | 14,000 | 66,922 | | | | 15,165 | | | | | | | | | | | | |
| 2.900 | 6 | 6 | Each | Rest Rooms, Multiple Stalls, Renovations | 2025 | to 25 | 10 | 8,500.00 | 51,000 | 66,569 | | | | | | | | | | | 66,569 | | | | | |
| 2.901 | 5 | 5 | Each | Rest Rooms, Single Stall and Shower Rooms, Renovations, Remaining | 2025 | to 25 | 10 | 2,500.00 | 12,500 | 16,316 | | | | | | | | | | | 16,316 | | | | | |

# RESERVE EXPENDITURES

First Congregational Church
of Glen Ellyn
Glen Ellyn, Illinois

| Line Item | Quantities: 30-Year Total | Quantities: Per Phase | Units | Reserve Component Inventory | Estimated 1st Year of Event | Life Analysis, Years: Useful | Life Analysis, Years: Remaining | Unit Cost, $ | 2015 Cost per Phase, $ | Total Future Costs, $ | 16 2031 | 17 2032 | 18 2033 | 19 2034 | 20 2035 | 21 2036 | 22 2037 | 23 2038 | 24 2039 | 25 2040 | 26 2041 | 27 2042 | 28 2043 | 29 2044 | 30 2045 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Exterior Building Elements | | | | | | | | | | | | | | | | | | | | | |
| 1.180 | 8 | 8 | Each | Doors, Entrances | 2021 | to 30 | 6 | 2,000.00 | 16,000 | 18,773 | | | | | | | | | | | | | | | |
| 1.240 | 310 | 310 | Linear Feet | Gutters and Downspouts, Copper | 2023 | to 50+ | 8 | 60.00 | 18,600 | 23,018 | | | | | | | | | | | | | | | |
| 1.260 | 2 | 1 | Allowance | Light Fixtures, Bell Tower and Wall Mounted | 2018 | to 25 | 3 | 10,000.00 | 10,000 | 31,917 | | | | | | | | | | | | | 21,085 | | |
| 1.280 | 60 | 30 | Squares | Roof, Asphalt Shingles, Original Chapel (incl. gutters and downspouts) | 2017 | 15 to 20 | 2 | 540.00 | 16,200 | 46,199 | | | | | | | 29,112 | | | | | | | | |
| 1.282 | 12 | 6 | Each | Roofs, Asphalt Shingles, Dormers at Clay Tile Roofs | 2017 | 15 to 20 | 2 | 1,300.00 | 7,800 | 22,244 | | | | | | | 14,017 | | | | | | | | |
| 1.360 | 115 | 115 | Squares | Roofs, Clay Tiles, Underlayment and Partial Tile Replacement | 2023 | to 35 | 8 | 2,100.00 | 241,500 | 298,869 | | | | | | | | | | | | | | | |
| 1.530 | 110 | 55 | Squares | Roofs, Thermoplastic, CPE, 2001 | 2021 | 15 to 20 | 6 | 1,600.00 | 88,000 | 279,174 | | | | | | | | | | | 175,920 | | | | |
| 1.531 | 120 | 60 | Squares | Roofs, Thermoplastic, TPO, 2007 | 2024 | 15 to 20 | 9 | 1,550.00 | 93,000 | 319,584 | | | | | | | | | | | | | | 201,384 | |
| 1.580 | 8 | 4 | Each | Skylights | 2021 | to 20 | 6 | 10,000.00 | 40,000 | 126,896 | | | | | | | | | | | 79,963 | | | | |
| 1.820 | 64,000 | 16,000 | Square Feet | Walls, Masonry, Inspections and Repairs | 2017 | 8 to 12 | 2 | 3.10 | 49,600 | 296,334 | | | 80,122 | | | | | | | | 99,155 | | | | |
| 1.940 | 5 | 1 | Allowance | Walls, Wood Trim, Paint Finishes (includes sealants) | 2018 | 4 to 6 | 3 | 30,000.00 | 30,000 | 229,448 | | | | | | 52,493 | | | | | | 61,592 | | | |
| 1.980 | 1,520 | 1,520 | Square Feet | Windows, Aluminum Frames, Addition | 2045 | to 45 | 30 | 50.00 | 76,000 | 169,016 | | | | | | | | | | | | | | | 169,016 |
| 1.981 | 5 | 1 | Allowance | Windows, Stained Glass, Refurbishment, Phased | 2016 | to 60 | 1 | 30,000.00 | 30,000 | 171,861 | | | | | | | | | | | | | | | |
| 1.982 | 1,100 | 220 | Square Feet | Windows, Wood Frames, Phased | 2020 | to 45 | 5 | 55.00 | 12,100 | 91,831 | | | | | 20,616 | | | | | 23,553 | | | | | |
| | | | | Interior Building Elements | | | | | | | | | | | | | | | | | | | | | |
| 2.060 | 44,400 | 11,100 | Square Feet | Ceilings, Acoustical Tiles and Grid, Phased | 2019 | to 25 | 4 | 4.50 | 49,950 | 331,880 | | | | | | | | | | | | | | 108,163 | 111,083 |
| 2.100 | 2 | 1 | Each | Elevator Cab Finishes | 2020 | to 20 | 5 | 7,000.00 | 7,000 | 21,623 | | | | | | | | | | 13,626 | | | | | |
| 2.200 | 7,680 | 1,280 | Square Yards | Floor Coverings, Carpet, Common Areas, Phased | 2017 | 8 to 12 | 2 | 55.00 | 70,400 | 642,993 | | | | | | | | | | | 140,736 | 144,536 | | | |
| 2.201 | 1,350 | 450 | Square Yards | Floor Coverings, Carpet, Sanctuary and Narthex | 2019 | 10 to 15 | 4 | 65.00 | 29,250 | 143,595 | | 46,007 | | | | | | | | | | | | | 65,049 |
| 2.240 | 60 | 60 | Square Yards | Floor Coverings, Tile, Common Areas | 2025 | to 25 | 10 | 120.00 | 7,200 | 9,398 | | | | | | | | | | | | | | | |
| 2.300 | 460 | 230 | Square Yards | Floor Coverings, Vinyl Tile, Common Areas | 2018 | 10 to 15 | 3 | 52.00 | 11,960 | 32,275 | | | 19,320 | | | | | | | | | | | | |
| 2.519 | 3 | 1 | Allowance | Kitchen Equipment, Phased | 2017 | 18 to 25 | 2 | 25,000.00 | 25,000 | 105,711 | | | | | | | 44,925 | | | | | | | | |
| 2.520 | 1 | 1 | Allowance | Kitchen, Finishes and Cabinetry, Renovations | 2029 | to 25 | 14 | 27,000.00 | 27,000 | 39,206 | | | | | | | | | | | | | | | |
| 2.560 | 1 | 1 | Allowance | Light Fixtures, Classrooms and Temple of Light | 2026 | to 25 | 11 | 5,000.00 | 5,000 | 6,703 | | | | | | | | | | | | | | | |
| 2.561 | 21 | 21 | Each | Light Fixtures, Can and Pendant, Atrium and Chapel | 2019 | to 35 | 4 | 275.00 | 5,775 | 6,424 | | | | | | | | | | | | | | | |
| 2.562 | 3 | 1 | Allowance | Light Fixtures, Sanctuary, Refurbishment | 2024 | to 10 | 9 | 10,000.00 | 10,000 | 50,954 | | | | 16,590 | | | | | | | | | | 21,654 | |
| 2.563 | 28 | 14 | Each | Light Fixtures, Sanctuary, Narthex and Stairs, Dome | 2019 | to 25 | 4 | 200.00 | 2,800 | 9,178 | | | | | | | | | | | | | | 6,063 | |
| 2.601 | 1 | 1 | Allowance | Organ Restoration, Electrical | 2025 | 35 to 40 | 10 | 55,000.00 | 55,000 | 71,791 | | | | | | | | | | | | | | | |
| 2.602 | 1 | 1 | Allowance | Organ Restoration, Pneumatic Leather Valves | 2035 | 45 to 50 | 20 | 100,000.00 | 100,000 | 170,376 | | | | | 170,376 | | | | | | | | | | |
| 2.651 | 3 | 1 | Allowance | Pew Restoration | 2018 | to 15 | 3 | 14,000.00 | 14,000 | 66,922 | 21,441 | | | | | | | | | | | | | 30,316 | |
| 2.900 | 6 | 6 | Each | Rest Rooms, Multiple Stalls, Renovations | 2025 | to 25 | 10 | 8,500.00 | 51,000 | 66,569 | | | | | | | | | | | | | | | |
| 2.901 | 5 | 5 | Each | Rest Rooms, Single Stall and Shower Rooms, Renovations, Remaining | 2025 | to 25 | 10 | 2,500.00 | 12,500 | 16,316 | | | | | | | | | | | | | | | |

# RESERVE EXPENDITURES

First Congregational Church
of Glen Ellyn
Glen Ellyn, Illinois

**Explanatory Notes:**

**1) 2.7% is the estimated future Inflation Rate for estimating Future Replacement Costs.**

**2) FY2015 is Fiscal Year beginning July 1, 2014 and ending June 30, 2015.**

| Line Item | Quantities: 30-Year Total | Per Phase | Units | Reserve Component Inventory | Estimated 1st Year of Event | Life Analysis, Years Useful | Remaining | Unit Cost, $ | 2015 Cost per Phase, $ | Total Future Costs, $ | RUL = 0 FY2015 | 1 2016 | 2 2017 | 3 2018 | 4 2019 | 5 2020 | 6 2021 | 7 2022 | 8 2023 | 9 2024 | 10 2025 | 11 2026 | 12 2027 | 13 2028 | 14 2029 | 15 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **Building Services Elements** | | | | | | | | | | | | | | | | | | | | | | |
| 3.050 | 1 | 1 | Each | Air Handling Unit, Make-up Air | 2024 | 20 to 25 | 9 | 11,000.00 | 11,000 | 13,981 | | | | | | | | | | 13,981 | | | | | | |
| 3.060 | 8 | 4 | Each | Air Handling Units, Rooftop Heating and Cooling Units | 2020 | 15 to 20 | 5 | 20,500.00 | 82,000 | 253,299 | | | | | | 93,684 | | | | | | | | | | |
| 3.070 | 3 | 1 | System | Air Handling and Condensing Units, Split Systems, Phased | 2017 | 15 to 20 | 2 | 11,800.00 | 11,800 | 49,896 | | | 12,446 | | | | | | | | | | 16,245 | | | |
| 3.088 | 3 | 1 | Allowance | Audio Visual Equipment, Phased | 2022 | to 20 | 7 | 15,000.00 | 15,000 | 70,246 | | | | | | | | 18,075 | | | | | | | | |
| 3.105 | 8 | 4 | Each | Boilers, Building Heat | 2019 | 18 to 25 | 4 | 28,000.00 | 112,000 | 367,122 | | | | | 124,595 | | | | | | | | | | | |
| 3.300 | 1 | 1 | Allowance | Electrical System, Main Panels, Partial | 2039 | to 70+ | 24 | 66,000.00 | 66,000 | 125,093 | | | | | | | | | | | | | | | | |
| 3.320 | 1 | 1 | Each | Elevator, Hydraulic, Pump and Controls | 2035 | to 35 | 20 | 68,500.00 | 68,500 | 116,708 | | | | | | | | | | | | | | | | |
| 3.330 | 1 | 1 | Each | Elevator, Hydraulic, Cylinder | 2045 | to 45 | 30 | 27,500.00 | 27,500 | 61,157 | | | | | | | | | | | | | | | | |
| 3.333 | 1 | 1 | Each | Elevator, Lift | 2035 | to 35 | 20 | 10,000.00 | 10,000 | 17,038 | | | | | | | | | | | | | | | | |
| 3.341 | 10 | 5 | Systems | Energy Recovery and Condensing Units, Systems | 2020 | 15 to 20 | 5 | 29,000.00 | 145,000 | 447,908 | | | | | | 165,661 | | | | | | | | | | |
| 3.560 | 1 | 1 | Allowance | Life Safety System (Control Panel and Emergency Devices) | 2025 | to 25 | 10 | 52,000.00 | 52,000 | 67,875 | | | | | | | | | | | 67,875 | | | | | |
| | | | | **Property Site Elements** | | | | | | | | | | | | | | | | | | | | | | |
| 4.020 | 10,200 | 1,700 | Square Yards | Asphalt Pavement, Crack Repair, Patch and Seal Coat | 2020 | 3 to 5 | 5 | 1.70 | 2,890 | 27,490 | | | | | | 3,302 | | | | 3,673 | | | | 4,086 | | |
| 4.040 | 1,700 | 1,700 | Square Yards | Asphalt Pavement, Mill and Overlay | 2036 | 15 to 20 | 21 | 15.50 | 26,350 | 46,106 | | | | | | | | | | | | | | | | |
| 4.045 | 1,700 | 1,700 | Square Yards | Asphalt Pavement, Total Replacement | 2016 | 15 to 20 | 1 | 30.00 | 51,000 | 52,377 | | 52,377 | | | | | | | | | | | | | | |
| 4.220 | 150 | 150 | Linear Feet | Fence, Chain Link | 2027 | to 25 | 12 | 20.00 | 3,000 | 4,130 | | | | | | | | | | | | 4,130 | | | | |
| 4.285 | 310 | 310 | Linear Feet | Fences, Wood | 2027 | 15 to 20 | 12 | 35.00 | 10,850 | 14,937 | | | | | | | | | | | | 14,937 | | | | |
| 4.560 | 4 | 4 | Each | Light Poles and Fixtures | 2032 | to 25 | 17 | 1,700.00 | 6,800 | 10,696 | | | | | | | | | | | | | | | | |
| | 1 | 1 | Allowance | Reserve Study Update with Site Visit | 2017 | 2 | 2 | 6,750.00 | 6,750 | 6,750 | | | 6,750 | | | | | | | | | | | | | |
| | | | | Anticipated Expenditures, By Year | | | | | | $5,669,887 | 0 | 83,187 | 197,446 | 180,202 | 222,240 | 375,810 | 168,960 | 54,226 | 321,887 | 224,822 | 312,485 | 6,703 | 69,730 | 4,086 | 141,431 | 167,767 |

# RESERVE EXPENDITURES

First Congregational Church
of Glen Ellyn
Glen Ellyn, Illinois

| Line Item | Quantities: 30-Year Total | Per Phase | Units | Reserve Component Inventory | Estimated 1st Year of Event | Life Analysis, Years Useful | Remaining | Unit Cost, $ | 2015 Cost per Phase, $ | Total Future Costs, $ | 16 2031 | 17 2032 | 18 2033 | 19 2034 | 20 2035 | 21 2036 | 22 2037 | 23 2038 | 24 2039 | 25 2040 | 26 2041 | 27 2042 | 28 2043 | 29 2044 | 30 2045 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **Building Services Elements** | | | | | | | | | | | | | | | | | | | | | |
| 3.050 | 1 | 1 | Each | Air Handling Unit, Make-up Air | 2024 | 20 to 25 | 9 | 11,000.00 | 11,000 | 13,981 | | | | | | | | | | | | | | | |
| 3.060 | 8 | 4 | Each | Air Handling Units, Rooftop Heating and Cooling Units | 2020 | 15 to 20 | 5 | 20,500.00 | 82,000 | 253,299 | | | | | | | | | | 159,615 | | | | | |
| 3.070 | 3 | 1 | System | Air Handling and Condensing Units, Split Systems, Phased | 2017 | 15 to 20 | 2 | 11,800.00 | 11,800 | 49,896 | | | | | | | 21,205 | | | | | | | | |
| 3.088 | 3 | 1 | Allowance | Audio Visual Equipment, Phased | 2022 | to 20 | 7 | 15,000.00 | 15,000 | 70,246 | 22,973 | | | | | | | | | 29,198 | | | | | |
| 3.105 | 8 | 4 | Each | Boilers, Building Heat | 2019 | 18 to 25 | 4 | 28,000.00 | 112,000 | 367,122 | | | | | | | | | | | | | | 242,527 | |
| 3.300 | 1 | 1 | Allowance | Electrical System, Main Panels, Partial | 2039 | to 70+ | 24 | 66,000.00 | 66,000 | 125,093 | | | | | | | | | 125,093 | | | | | | |
| 3.320 | 1 | 1 | Each | Elevator, Hydraulic, Pump and Controls | 2035 | to 35 | 20 | 68,500.00 | 68,500 | 116,708 | | | | | 116,708 | | | | | | | | | | |
| 3.330 | 1 | 1 | Each | Elevator, Hydraulic, Cylinder | 2045 | to 45 | 30 | 27,500.00 | 27,500 | 61,157 | | | | | | | | | | | | | | | 61,157 |
| 3.333 | 1 | 1 | Each | Elevator, Lift | 2035 | to 35 | 20 | 10,000.00 | 10,000 | 17,038 | | | | | 17,038 | | | | | | | | | | |
| 3.341 | 10 | 5 | Systems | Energy Recovery and Condensing Units, Systems | 2020 | 15 to 20 | 5 | 29,000.00 | 145,000 | 447,908 | | | | | | | | | | 282,247 | | | | | |
| 3.560 | 1 | 1 | Allowance | Life Safety System (Control Panel and Emergency Devices) | 2025 | to 25 | 10 | 52,000.00 | 52,000 | 67,875 | | | | | | | | | | | | | | | |
| | | | | **Property Site Elements** | | | | | | | | | | | | | | | | | | | | | |
| 4.020 | 10,200 | 1,700 | Square Yards | Asphalt Pavement, Crack Repair, Patch and Seal Coat | 2020 | 3 to 5 | 5 | 1.70 | 2,890 | 27,490 | | 4,546 | | | | | | | | 5,625 | | | | 6,258 | |
| 4.040 | 1,700 | 1,700 | Square Yards | Asphalt Pavement, Mill and Overlay | 2036 | 15 to 20 | 21 | 15.50 | 26,350 | 46,106 | | | | | | 46,106 | | | | | | | | | |
| 4.045 | 1,700 | 1,700 | Square Yards | Asphalt Pavement, Total Replacement | 2016 | 15 to 20 | 1 | 30.00 | 51,000 | 52,377 | | | | | | | | | | | | | | | |
| 4.220 | 150 | 150 | Linear Feet | Fence, Chain Link | 2027 | to 25 | 12 | 20.00 | 3,000 | 4,130 | | | | | | | | | | | | | | | |
| 4.285 | 310 | 310 | Linear Feet | Fences, Wood | 2027 | 15 to 20 | 12 | 35.00 | 10,850 | 14,937 | | | | | | | | | | | | | | | |
| 4.560 | 4 | 4 | Each | Light Poles and Fixtures | 2032 | to 25 | 17 | 1,700.00 | 6,800 | 10,696 | | | | | | | | | | | | | | | |
| | 1 | 1 | Allowance | Reserve Study Update with Site Visit | 2017 | 2 | 2 | 6,750.00 | 6,750 | 6,750 | | | | | | | | | | | | | | | |
| | | | | Anticipated Expenditures, By Year | | | | | | $5,669,887 | 44,414 | 61,249 | 99,442 | 16,590 | 324,738 | 98,599 | 109,259 | 0 | 125,093 | 513,864 | 495,774 | 206,128 | 21,085 | 616,365 | 406,305 |

# RESERVE FUNDING PLAN

CASH FLOW ANALYSIS
First Congregational Church
of Glen Ellyn
Glen Ellyn, Illinois

Individual Reserve Budgets & Cash Flows for the Next 30 Years

| | | FY2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Reserves at Beginning of Year (Note 1) | N/A | 0 | 124,494 | 141,101 | 180,961 | 184,922 | 40,646 | 102,770 | 280,943 | 191,943 | 199,563 | 119,121 | 274,571 | 372,681 | 542,300 | 580,310 |
| | Total Recommended Reserve Contributions (Note 2) | N/A | 207,000 | 212,600 | 218,300 | 224,200 | 230,300 | 230,300 | 230,300 | 230,300 | 230,300 | 230,300 | 160,000 | 164,300 | 168,700 | 173,300 | 178,000 |
| Plus | Estimated Interest Earned, During Year (Note 3) | N/A | 681 | 1,453 | 1,762 | 2,001 | 1,234 | 784 | 2,099 | 2,587 | 2,142 | 1,743 | 2,153 | 3,540 | 5,005 | 6,141 | 6,440 |
| Less | Anticipated Expenditures, By Year | N/A | (83,187) | (197,446) | (180,202) | (222,240) | (375,810) | (168,960) | (54,226) | (321,887) | (224,822) | (312,485) | (6,703) | (69,730) | (4,086) | (141,431) | (167,767) |
| | Anticipated Reserves at Year End | $0 | $124,494 | $141,101 | $180,961 | $184,922 | $40,646 (NOTE 5) | $102,770 | $280,943 | $191,943 | $199,563 | $119,121 | $274,571 | $372,681 | $542,300 | $580,310 | $596,983 |

(continued)

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

| | | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Reserves at Beginning of Year | 596,983 | 742,697 | 878,013 | 981,543 | 1,174,748 | 1,065,564 | 1,188,092 | 1,306,880 | 1,542,667 | 1,661,199 | 1,396,259 | 1,152,929 | 1,204,596 | 1,449,529 | 1,105,439 |
| | Total Recommended Reserve Contributions | 182,800 | 187,700 | 192,800 | 198,000 | 203,300 | 208,800 | 214,400 | 220,200 | 226,100 | 232,200 | 238,500 | 244,900 | 251,500 | 258,300 | 265,300 |
| Plus | Estimated Interest Earned, During Year | 7,328 | 8,865 | 10,172 | 11,795 | 12,254 | 12,327 | 13,647 | 15,587 | 17,525 | 16,724 | 13,944 | 12,895 | 14,518 | 13,975 | 11,384 |
| Less | Anticipated Expenditures, By Year | (44,414) | (61,249) | (99,442) | (16,590) | (324,738) | (98,599) | (109,259) | 0 | (125,093) | (513,864) | (495,774) | (206,128) | (21,085) | (616,365) | (406,305) |
| | Anticipated Reserves at Year End | $742,697 | $878,013 | $981,543 | $1,174,748 | $1,065,564 | $1,188,092 | $1,306,880 | $1,542,667 | $1,661,199 | $1,396,259 | $1,152,929 | $1,204,596 | $1,449,529 | $1,105,439 | $975,818 (NOTE 4) |

Explanatory Notes:

1) Year 2015 ending reserves are projected by Management Staff as of June 30, 2015; FY2015 starts July 1, 2014 and ends June 30, 2015.
2) 2016 is the first year of recommended contributions.
3) 1.1% is the estimated annual rate of return on invested reserves.
4) Accumulated year 2045 ending reserves consider the age, size, overall condition and complexity of the property.
5) Threshold Funding Year (reserve balance at critical point).

## 4. CONDITION ASSESSMENT

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

### Exterior Building Elements

**Doors, Entrances** - First Congregational Church maintains eight wood entrance doors. These doors are in fair overall condition at an unknown age. We note wood deterioration. The useful life of these doors is up to 30 years. We suggest that the Church budget for an aggregated replacement of the doors by 2021. We include this information on Line Item 1.180 of ***Reserve Expenditures***. We include paint finishes on a separate line item, "**Walls, Wood Trim, Paint Finishes**".

**Gutters and Downspouts, Copper** - Approximately 310 linear feet of copper gutters and downspouts drain storm water from the clay tile roofs of First Congregational Church. These gutters and downspouts are possibly original and in fair overall condition. The gutters and downspouts exhibit dented sections. Page 5.3 of ***Photographs*** depicts this condition. Copper gutters and downspouts have a long useful life of up and beyond 50 years with periodic maintenance.

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

We recommend the Church budget for the replacement of the gutters and downspouts by 2023 in coordination with the clay tile roofs. We depict this information on Line Item 1.240 of ***Reserve Expenditures***.

**Light Fixtures** - First Congregational Church maintains approximately 20 exterior metal light fixtures to accent the Church entrances and Bell Tower. The light fixtures are in fair overall condition. The four Bell Tower light fixtures are approximately 30 years of age and the remaining light fixtures vary in age. The useful life of exterior light fixtures of this type and quality is up to 25 years. We recommend that the Church plan for replacement of the light fixtures by 2018 and again by 2043. We include this information on Line Item 1.260 of ***Reserve Expenditures***. Our cost *does not* include an allowance for replacement of electrical wiring.

**Roofs, Asphalt Shingles** - Approximately 30 *squares*[1] of asphalt shingles and 145 linear feet of aluminum gutters and downspouts comprise the roof of the original Chapel at First Congregational Church. The roof was replaced in 1995 and is in fair overall condition. In

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

addition, the main clay tile roofs comprise six dormers with asphalt shingles. The dormer roofs were also replaced in 1995. Our visual inspection from the ground notes granular loss, and loose, weathered and cupped shingles. Pages 5.4 and 5.5 of ***Photographs*** depict these conditions.

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

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

In addition to moisture control and energy conservation, proper attic insulation and ventilation are essential components to prevent the formation of ice dams. Ice dams occur when

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

The Church should periodically ensure that the vents are clear of debris and are not blocked from above by attic insulation. If the soffit vents are blocked from above, the Church should install polystyrene vent spaces or baffles between the roof joists at these locations to ensure proper ventilation. First Congregational Church should fund this ongoing maintenance through the operating budget.

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

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

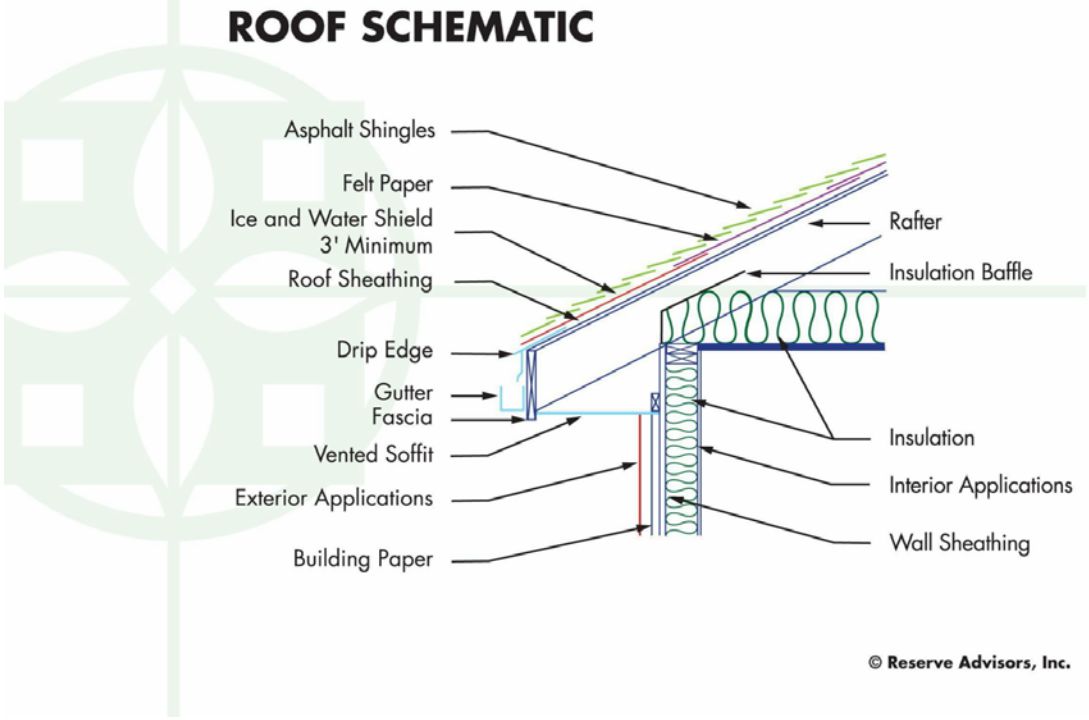
Our estimate of remaining useful life considers this possibility and the Church should anticipate the need for capital repairs to the shingles and other roof system components to achieve or maximize the remaining useful life of the roofs. The Church should fund ongoing roof repairs as normal maintenance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

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

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

The above disadvantages result in a shorter useful life of 10- to 15-years for overlaid roofs. This shortened useful life and the inevitable eventual replacement of both shingle layers will actually result in increased long-term replacement costs. Therefore, we recommend only the tear-off method of replacement. The advantages of the tear-off method include the correction of hidden or latent defects and extend the useful life of the new roof.

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




The two types of underlayment most often used in an asphalt shingle roof system are ice and water shield membrane, and organic felt paper of varying weights depending on local building codes. Both types of underlayment protect the roof sheathing from moisture damage and wind-driven ice and snow. They have a low vapor resistance that impedes the accumulation of moisture between the underlayment and the roof sheathing. Ice and water shield membrane is thicker than organic paper and is used in areas that are subject to ice dams and standing water. The contractor should install ice and water shield membranes (often a modified bitumen product) at the outer 36 inches of the gutter and rake edge roof eaves, and in the roof valleys. Standard 15-pound organic felt paper should provide sufficient protection over the remaining portions of the roof. Underlayments work in conjunction with flashings to form a watertight roof system.

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

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

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

Asphalt shingles include both fiberglass shingles and organic mat shingles. Both shingle types are made with asphalt. Fiberglass shingles use a fiberglass reinforcing mat while organic shingles use a wood based cellulose fiber mat. Fiberglass shingles are thinner, lighter and carry a better fire rating than organic shingles. Organic mat shingles are more durable and stay more flexible in cold weather. The contractor should install the shingles atop the underlayment and in conjunction with flashing. Based on a better fire rating, we suggest First Congregational Church use a standard strip, fiberglass, Class A, minimum weight class of 210 pounds per square self-sealing shingle at the time of replacement. The self-sealing strip affixes to the lower exposed edges of the shingles. Heat from ambient weather and sunlight activates the shingle adhesive

material and seals the two adjacent courses of shingles together. Contractor proposals should specify the types of proposed materials and types of proposed fasteners. The Church should require the use of nail fasteners, not staples, at the time of replacement. Nail guns are acceptable. Staples are of lesser quality and might not withstand wind forces as well as nails.

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

Based on the age and condition of the roofs, we recommend that First Congregational Church budget for replacement by 2017 and again by 2037. We note this information on Line Items 1.280 and 1.282 of ***Reserve Expenditures***. We base our cost on replacement with standard laminate Class A 240-260-pounds per square shingles. The Church should fund any repairs prior to the complete replacement of the roofs through the operating budget.

**Roofs, Clay Tiles** - Approximately 115 squares of clay tiles comprise the main sanctuary roof and original church roof of First Congregational Church. The clay tiles are primarily original to the 1920s and in good to fair overall condition. However, the age of the underlayment was not available at the time of our inspection. The Church completed repairs in approximately 1988 following damage caused by a fire. Management Staff informs us of a history of leaks. Our visual inspection from the ground notes flashing rust, replaced tiles, minor cracked tiles and a location of loose tiles at the original church. Pages 5.5 and 5.6 of ***Photographs*** depict these conditions. We include the following solutions and procedures pertaining to replacement of clay tile roofs for the benefit of present and future board members.

We anticipate the need for removal and partial replacement of the tiles, replacement of the underlayment, and partial sheathing replacement every 35 years. A tile roof rarely fails at all points of application simultaneously. Rather, occurrences of roof leaks will increase as more clay tiles crack, break and dislodge. This deterioration will result in increased maintenance costs such that replacement becomes the least costly long-term alternative as compared to ongoing repairs.

A clay tile roof system comprises sheathing, underlayments, battens and the tiles themselves. The following narrative briefly discusses these components.

*Sheathing* - We recommend a minimum of 15/32 inch thick plywood sheathing. We do not recommend the use of oriented strand board (OSB) due to its poor performance in high wind conditions or in the event of becoming saturated due to eventual roof leaks.

*Underlayments* - We recommend a double layer of 30-pound felt paper, modified bitumen sheet or self adhered ("peel and stick") sheet.

*Battens* - Battens are wood or composite strips that elevate the tile off the underlayment allowing for air and storm water flow between the underlayment and tiles.

*Tiles* - Traditional roof tiles include clay and concrete. Depending on their composition, tiles are hand pressed or machine extruded, are fired or cured and come in multiple finishes. The tiles are mechanically fastened, adhesive set, foam applied or mudded onto the sheathing.

We could not confirm the type of underlayment due to the noninvasive, nondestructive nature of our visual inspection. However, replacement standards should conform to the local building code and manufacturer’s specifications at the time of actual replacement. The manner of construction is such that the underlayment is the primary line of defense from water infiltration. The tiles act to shade the underlayment from harmful sunlight and to protect the roof from heavy winds. Most storm water is shed from the roof tiles into the gutters or over the edge of the roof. However, this tile style is meant to allow water to pass between the tiles onto the

underlayment. The underlayment thus sheds any remaining water into the gutters. In fact, horizontal driving rains will force their way up and under the tile only to be shed at some other point.

The function of flashing is to provide a watertight junction between the roofing materials and roof penetrations. Plumbing vent stacks are one example where counter flashing and collars are often used. A short list of these points is the interface of sloped and flat roofs, at the leading edges of all roofs *(as drip edge flashing)*, and any openings in the sloped roof such as plumbing stack vents and roof vents.

There are three general considerations for the maintenance of clay tile roofs that we discuss in the following narratives.

*Eradication of Pests* - It is common for birds or animals to nest in the cavities of the edge tiles. These conditions are most common in shaded areas. As trees around the roofs continue to mature and encroach on the roofs, the Church should watch for the problem of infestation and prune back the trees as normal maintenance.

*Removal of Mildew* - Mildew build-up is a common aesthetic concern for homeowners. If the Church chooses to clean the roofs of mildew and any related stains, we advise the Church use a mild solution of anti-fungal chemicals and water, such as a ten percent (10%) chlorine to water solution. Personnel can apply the solution by walking across the roofs or by a remote aerial boom spray nozzle. The latter is the safest but more costly method. Use of personnel on the roofs will result in some tile damage. However, the additional cost of an aerial boom may outweigh the potential repair costs. We advise the Church to obtain bids for both methods and weigh the overall cost options. In any event, the contractor should include the cost to repair any broken tiles that result from the cleaning operation.

*Ongoing Repairs* - Ongoing repairs, if conducted in a timely manner, should help maximize and achieve the long anticipated useful life inherent in clay roofing tiles. The Church should retain a maintenance company for inspections of the roofs semiannually and after significant storms, and conduct repairs and partial replacements as necessary.

The Church should fund these maintenance activities through the operating budget.

The Church should employ the above procedures as they relate to maintenance and normal repairs to achieve a long useful life for the clay tile roofs. In consideration of the age and visual condition, we advise the Church prepare for removal of existing tiles, replacement of the underlayment and reinstallation of the existing tiles, and partial replacement of damaged tiles by 2023. We depict this information on Line Item 1.360 of ***Reserve Expenditures***. Due to the age and complexity of the tiles, the cost of replacement tiles may be a premium cost and require additional reserve funds. Updates to the reserve study will consider the need for higher replacement costs.

**Roofs, Thermoplastic** - The roofs at First Congregational Church consist of 55 squares of thermoplastic roofing replaced in 2001 and 60 squares of thermoplastic roofing replaced in 2007. The older roofs have a material and contractor warranty of 20 years. The newer roofs have a 20 year material warranty but the contractor warranty expired after five years. The older roofs are in fair overall condition and the newer roofs are in good to fair condition. Management Staff informs us of a history of leaks, and one active leak at the transition between the original church and sanctuary. Our visual inspection notes standing water and bulges in the membrane. Pages 5.6 and 5.7 of ***Photographs*** depict these conditions. Thermoplastic roofs include the following:

- Polyvinyl Chloride (PVC or simply vinyl)
- PVC Alloys or Compounded Thermoplastics
- Thermoplastic Olefin (TPO)
- Chlorinated Polyethylene (CPE)

The roofs dating to 2001 are CPE type roofs and the roofs dating to 2007 are TPO type roofs. We summarize the flat roofs by location, type and age:

| Location | Type | Year(s) of Replacement |
|---|---|---|
| Original Courtyard/Gathering Area | CPE | 2001 |
| Stair (South of Library) | CPE | 2001 |
| Single-Story Offices | CPE | 2001 |
| Library | CPE | 2001 |
| Patio | CPE | 2001 |
| Parking Lot Entrance | CPE | 2001 |
| Bell Tower | TPO | 2007 |
| Southwest Sanctuary Tower | TPO | 2007 |
| Northwest Sanctuary Tower | TPO | 2007 |
| Transition between Original Church & Sanctuary | TPO | 2007 |
| Southeast Sanctuary Tower | TPO | 2007 |
| West Original Church Tower | TPO | 2007 |
| Classroom | TPO | 2007 |

The useful life of thermoplastic roofs in Glen Ellyn is from 15- to 20-years. We include the following solutions and procedures pertaining to replacement of thermoplastic roofs for the benefit of present and future board members.

The following characteristics define most thermoplastic roofs:

- Attachment to the roof deck is either fully adhered, mechanical or ballasted
- Membranes are commonly white and reinforced with polyester
- Seams are sealed with heat or chemical welding
- Sheet widths range from 6- to 12-feet wide
- Sheets are typically 40- to 100-mils thick
- Single ply (one layer)

The white material of thermoplastic roofs provides high solar reflectance and high thermal emittance. Therefore, thermoplastic roofs are considered "cool roofs." These membranes can be repeatedly softened by heating to conduct repairs. Thermoplastic roof systems are highly resistant to tears, impacts and punctures.

Reroofing is always more labor intensive than an original installation. Removal and disposal are a problem in multistory buildings because of problems conveying the materials off

and onto the roof. To maximize the remaining useful life of the roof, the Church should conduct periodic repairs as necessary and fund these expenses through the operating budget. The Church retains a maintenance company for inspections of the roofs semiannually. We concur with this preventive maintenance practice and recommend the Church continue to fund these inspections through the operating budget.

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. Thermoplastic roofs (especially TPO) are relatively new and their long term performance is not well defined.

Contractors can install a new thermoplastic 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 contractor should follow the manufacturer's directions and specifications upon installation of the roof. The contractor should remove the original insulation if saturated or compacted and apply a new layer of insulation from ½ inch to one inch thick per the manufacturer's instructions. The insulation should fit loosely with gaps no greater than ¼ inch. Gaps will cause failure of the membrane later. Mechanical fastening of the insulation is the best manner of installation.

The time or need to replace the roofs becomes apparent with multiple or recurring leaks. The Church should determine whether the origin of the leaks is from the membrane or flashings. Repairs of the flashings may be more cost-effective than replacement of the entire roof. However, because of the difficulty in finding several or many breaks in a roof, replacement eventually becomes the more economical option rather than repair. We recommend First Congregational Church prepare for a complete tear-off at the time of replacement at the CPE roofs by 2021 and again by 2041. Based on the condition of the TPO roofs and the limited warranty, we recommend replacement by 2024 and again by 2044. We depict this information on Line Items 1.530 and 1.531 of ***Reserve Expenditures***. The Church should monitor outside vendors when they service any elements on the roofs to minimize unreported roof damage.

**Skylights** - First Congregational Church maintains four skylights located at the original courtyard roof and stair roof. The skylights were replaced in approximately 2002 and are in fair overall condition. We recommend the Church anticipate a useful life of up to 20 years for the skylights. Skylights have considerably shorter lives when compared to windows and doors of similar construction due to an increased exposure to weather elements. Snow drifts and wind driven rains cause excessive wear to the seals and frames. Failed seals or glass are common occurrences as the skylights age and approach the end of their useful lives. We recommend the Association budget for replacement by 2021 in conjunction with replacement of the CPE roofs and again by 2041**.** We depict this information on Line Item 1.580 of ***Reserve Expenditures***. The Church should fund interim repairs through the operating budget.

**Walls, Masonry** - Masonry comprises approximately 16,000 square feet of the exterior walls. The overall condition of the masonry is good. The Church completed extensive repairs

and total façade repointing in 2006 and 2007. We note the following components and conditions of the masonry:

- Extensive previous repairs evident
- Efflorescence is not visible
- Masonry exhibits isolated cracks
- Masonry exhibits isolated spalls
- Minimal mortar deterioration is evident
- Mortar joints are tooled

Pages 5.9 and 5.10 of ***Photographs*** depict these conditions. We advise a complete inspection of the masonry, and partial repointing with related masonry repairs every 8- to 12-years to forestall deterioration. We elaborate on solutions and procedures necessary for the optimal maintenance of masonry walls in the following discussion.

Masonry generally requires less maintenance than other types of exteriors. However, masonry is not maintenance free. Masonry exteriors should last the life of the building with proper maintenance. First Congregational Church should plan for the periodic inspection of the masonry to identify and repair areas of deterioration. Common types of masonry deterioration include efflorescence, spalling and cracking.

The primary cause of *efflorescence, cracks* and *face spall* is water infiltration, therefore prevention of water infiltration is the principal concern for the maintenance of masonry applications. Masonry walls normally shed storm water and condensate from behind the wall through weep holes. However, trapped water within masonry walls can cause corrosion of metal masonry ties, studs, structural members and potentially damage building interiors. The first sign of water infiltration is usually a water stain. Eventually, water infiltration can lead to deterioration of the masonry. If left unrepaired, water infiltration can lead to efflorescence, cracks and face spall as described below.

Trapped water can also migrate through areas of cracked mortar or other points within the cavity of a masonry wall. This moisture then typically migrates to the exterior face of the masonry where it evaporates. As the moisture evaporates, it deposits soluble white salts either on the surface as efflorescence or below the surface as subflorescence. Efflorescence mars the appearance of the masonry, is typically harmless but can also indicate a harmful condition known as subflorescence. Subflorescence within a masonry unit can create pressure that will eventually spall the masonry face. In addition, accumulated (trapped) storm water within or behind mortar joints in conjunction with inclement weather can also gradually spall masonry, create mold or damage adjacent components, i.e., windows or interior finishes. Spalling is a form of deterioration where small fragments of masonry break away from the wall system. Spalls can also occur as a result of a chemical reaction or from movement of a building structure. Spalled masonry may eventually dislodge individual masonry units.

*Repointing* is a process of raking and cutting out defective mortar to a depth of not less than ½ inch nor more than ¾ inch and replacing it with new mortar. *Face grouting* is the process of placing mortar over top of the existing mortar. We advise against face grouting because the existing, often deteriorated mortar does not provide a solid base for the new mortar. New mortar spalls at face grouted areas will likely occur. One purpose of a mortar joint is to protect the masonry by relieving stresses within the wall caused by expansion, contraction, moisture migration and settlement. Repointed mortar joints are more effective if the mortar is softer and more permeable than the masonry units, and no harder or less permeable than the existing mortar. The masonry contractor should address these issues within the proposed scope of work.

The contract for repairs should also include attention to other related activities such as repair and partial replacement of window sills, lintel beams and deteriorated masonry. We recommend the contract for masonry repairs include a thorough inspection of horizontal masonry such as copings or sills as these areas are prone to accelerated deterioration. Together, these aggregated capital repairs maximize the useful life of a masonry wall system.

A complete inspection of the exterior walls can only identify the exact scope of masonry repairs and replacements. Based on the age and condition of the masonry, we recommend the Church budget for the following activities:

- Complete inspection of the masonry (including the towers)
- Repointing of up to ten percent (10%) of the masonry
- Replacement of up to one percent (1%) of the masonry
- Replacement of up two percent (2%) of the sills

We recommend the Church anticipate this work by 2017 and every eight years thereafter. The times and extent of the masonry repointing and related work may vary. However, we judge at this time the estimated amounts noted on Line Item 1.820 of ***Reserve Expenditures*** appropriate to estimate sufficient reserves.

**Walls, Wood Trim, Paint Finishes** - The buildings include paint finish applications on the wood trim, including the wood windows and doors. Periodic application of a protective finish of paint or stain is an essential maintenance activity to maintain the physical appearance and integrity of these elements. The Church applied a finish in 2012 and it is in good to fair condition. We note wood rot and chipped paint finish.

The Board is likely familiar with many of the requirements for the periodic application of *paint*[2] products. We include the following solutions and procedures as a summary of the minimum requirements for a successful paint finish application for present and future board members.

Correct and complete *preparation* of the surface before application of the paint finish maximizes the useful life of the paint finish and surface. The contractor should remove all loose, peeled or blistered paint before application of the new paint finish. The contractor should then power wash the surface to remove all dirt or chalking of the prior paint finish.

Summarizing the minimum requirements of the proposed scope of work, all bids should include the following:

1. Name of paint finish product
2. The contractor will involve manufacturer representatives to ensure specifications and warranty
3. The contractor will apply the paint to clean and dry surfaces at the manufacturer's recommended spreading rates
4. The contractor will apply successive coats of the paint finish, with sufficient time elapse between coats, as necessary to ensure uniform appearance
5. The contractor will replace deteriorated or damaged materials prior to the application of the paint finish
6. The contractor will replace deteriorated sealants or caulk prior to the application of the paint finish

The useful life of protective paint finishes in Glen Ellyn is from four- to six-years. Based on the condition of the paint finishes, we recommend the Church budget for the following activities by 2018:

- Paint finish applications

[2]The term *paint* is a generic reference to a specialized mixture of solid pigment in a liquid solution that results in a clear, opaque or solid color protective finish. Product types are too numerous to list but include latex, oil, acrylic and elastomeric based products.

- Replacement of trim as needed (The exact amount of material in need of replacement will depend on the actual future conditions and desired appearance. We recommend replacement wherever holes, cracks and deterioration impair the ability of the material to prevent water infiltration.)
- Replacement of sealants as needed

First Congregational Church should budget subsequent applications and associated replacements every six years thereafter based on their historical practices. We depict this information on Line Item 1.940 of ***Reserve Expenditures***.

**Windows, Aluminum Frames** - First Congregational Church maintains approximately 1,520 square feet of windows at the addition. These components date to 2000 and are in good overall condition. Construction of these windows includes aluminum frames and dual pane glass.

Properly maintained aluminum frame windows have a useful life of up to 45 years. The useful life of the windows and doors is dependent on the occurrence of water infiltration, thermal inefficiencies compared to present technology, type of frame, availability of replacement parts and aesthetics. We include the following discussion pertaining to replacement of windows and doors for the benefit of present and future board members.

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

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

layer of glass, often as storm windows, provides increased thermal efficiencies and additional protection from storm water.

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

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

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

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

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

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

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

> ***Wood*** - Wood is the traditional frame material because of its availability and ease of milling into complex shapes. Wood is typically preferred in wood frame, low rise residential applications because of its appearance and traditional place in home design. Wood frame assemblies offer good thermal qualities but require periodic paint applications to maximize their useful life. Vinyl or aluminum cladding, or coverings, can be applied to the exterior of the wood frame to minimize maintenance.
>
> ***Vinyl*** - Vinyl, or polyvinyl chloride (PVC), frames have good insulating values. Vinyl frames are resistant to moisture and are maintenance free. Normal deterioration mainly relates to discoloration of the exterior finish from exposure to sunlight, weathering and air pollutants. Vinyl frames are also susceptible to damage, primarily as the frames age and become brittle.
>
> ***Aluminum*** - Aluminum frames are light, strong, durable and can be extruded into complex shapes. These frames are available in anodized and factory-baked enamel finishes that are durable and low-maintenance. However, these types of frames do not offer good thermal qualities due to aluminum's high conductivity. Thermal barriers within the frames increase the thermal efficiencies of the system as discussed in a previous narrative.
>
> ***Fiberglass*** - Fiberglass frames are the most energy efficient frames available. Fiberglass frames are resistant to moisture, are maintenance free and can also be painted. In addition, fiberglass frames expand and contract at nearly the same rate as the glass, minimizing seal failures. However, fiberglass frames are relatively new, are not yet widely available, their long term performance is unknown and they are more expensive than the previously listed frames.

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

Based on the above factors, we recommend the Church budget for replacement by 2045. We note this information on Line Item 1.980 of ***Reserve Expenditures***. We base this estimate of remaining useful life in part on the continued periodic replacement of joint sealants at the windows. We discuss our recommendations for joint sealants in a previous narrative, "**Walls, Wood Trim, Paint Finishes**".

**Windows, Stained Glass** - First Congregational Church maintains stained glass windows at primarily the sanctuary. These windows are original and in fair overall condition. We note frame finish deterioration and evidence of warped/bowed frames. Stained glass windows have an indeterminate useful life with the benefit of refurbishment up to every 60 years. Refurbishment may include any combination of the following:

- Complete removal of windows, including packing and transportation to restoration facility
- Replacement and relocation of reinforcement bars as needed, including painting
- Complete disassembly and washing of glass
- Replacement of all broken glass
- Replacement of all damaged or worn lead joints

Based on the above factors, we recommend the Church budget for a phased refurbishment of the stained glass windows beginning by 2016 and concluding by 2024. We note this information on Line Item 1.981 of ***Reserve Expenditures***.

**Windows, Wood Frames** - First Congregational Church maintains approximately 1,100 square feet of windows, excluding the addition and stained glass. These components vary significantly in age and condition. We note broken glass and frame deterioration. Construction of these windows includes wood frames and single pane glass. Wood frame windows have a useful life of up to 45 years. See the previous narrative "**Windows, Aluminum Frames**" for details on window replacement. Based on the above factors, we recommend the Church budget for a phased replacement beginning by 2020 and concluding by 2040. We note this information on Line Item 1.982 of ***Reserve Expenditures***.

## Interior Building Elements

**Ceilings, Acoustical Tiles and Grid** - The common areas use a suspended metal grid and a two-foot by two-foot and two-foot by four-foot decorative acoustical tile assembly that comprises approximately 22,200 square feet of ceiling finish. This quantity includes the direct applied tiles. The assemblies date to the 1960s and to the 2001 renovation. The tiles are in poor overall condition. We note stained tiles. Pages 5.14 and 5.15 of ***Photographs*** include these conditions. This ceiling finish assembly has a useful life of up to 25 years. However, damaged and soiled tiles due to leaks from plumbing pipes and at air supply grills may result in a shortened useful life. The Church should coordinate the replacement of this assembly with a major renovation of the interiors to help achieve a consistent appearance. We recommend First Congregational Church plan for the aggregate phased replacement of the assembly beginning by 2019 and concluding by 2020. A subsequent replacement is likely beginning by 2044 and concluding by 2045. We depict this information on Line Item 2.060 of ***Reserve Expenditures***. The Church should fund interim replacements of the tiles through the operating budget.

**Elevator Cab Finishes** - One passenger elevator serves the building. The elevator cab finishes consist of:

- Carpet floor covering
- Laminate wall coverings
- Acrylic ceiling finish

The finishes are original to 2000 and are in good condition. The useful life of the elevator cab finishes is up to 20 years. Based on the existing condition of the cab finishes, we recommend the Church budget for renovation of the cab finishes by 2020 and again by 2040. We include this information on Line Item 2.100 of ***Reserve Expenditures***. First Congregational

Church should fund interim elevator cab floor covering replacements through the operating budget.

**Floor Coverings, Carpet** - Carpet comprises 2,560 square yards of the common area floor coverings, including the lobby, offices, hallways, classrooms and Pilgrim Hall. Contractor measurements will vary from the actual floor area due to standard roll lengths, patterns and installation waste. The majority of the loop pile carpet was replaced in 2000 and is in good overall condition. We note worn carpet at the offices and stains at the Youth Room carpet. Pages 5.14 and 5.15 of ***Photographs*** depict these conditions. We suggest the Church budget to replace the carpet every 8- to 12-years to maintain a positive appearance of the common areas.

The sanctuary and narthex carpet comprises approximately 450 square yards. The sanctuary carpet was installed in approximately 1987 and is in poor overall condition. We note worn carpet and ridges from loose carpet. Pages 5.15 and 5.16 of ***Photographs*** show these conditions. Based on the use and quality of the sanctuary and narthex carpet, we anticipate a longer useful life of 10- to 15-years. We include the following solutions and procedures pertaining to replacement of the carpet for the benefit of present and future board members.

The appearance, texture and longevity of carpet are determined by the type of fiber, pile and color. There are many types of fibers available. Due to the high volume of traffic in the common areas, we suggest the use of a nylon fiber as it is durable, resilient and stain resistant. There are also multiple types of carpet piles available. Loop piles, such as berber, or angle cut piles with woven patterns are ideal for high traffic areas. We suggest the use of mid-tone colors to mask traffic patterns and stains. The contractor should follow the manufacturer's installation

guidelines and the Standard for Installation of Commercial Carpet as provided by the Carpet and Rug Institute.

We advise the Church anticipate the phased replacement of the common area carpet beginning by 2017, concluding by 2018 and every 12 years thereafter. In addition, we recommend the Church replace the sanctuary and narthex carpet by 2019 and every 13 years thereafter. We include this information on Line Items 2.200 and 2.201 of ***Reserve Expenditures***. First Congregational Church should continue to fund vacuuming, spot removal and schedule periodic cleanings through the operating budget to maximize the life of the carpet.

**Floor Coverings, Tile, Common Areas** - Tile comprises 60 square yards of the common area vestibule and hallway floor coverings. This quantity excludes the rest room tile. The majority of the tile was installed in 2000 and is in good overall condition. We anticipate a useful life of up to 25 years for the tile. Replacement of tile is often based on discretionary redecorating prior to the tile reaching the end of its useful life.

Tile commonly comes in one of three common vitrified clay floor finish products. Ceramic tile usually has a glazed finish. Porcelain tile is fired at a higher temperature than ceramic tile and is therefore denser and harder. Quarry tile is fired at a lower temperature than ceramic tile and is therefore more porous. We comment on the application process of installing new floor tile to assist Management in obtaining the best design and replacement proposals in the bid process.

An important criteria in selecting tile is *slip resistance*. Rest rooms and high traffic areas require high slip resistance. We recommend use of a tile with high slip resistance at First Congregational Church.

Installation of the tiles includes floor layout, application of *thinset* or *thickset* (bonding material), installation of tiles and application of grout. The thinset or thickset requires time to set. Typically 24- to 48-hours is sufficient. The final installation step is *grouting*. Grout is a cementitious material to fill joints between tiles. A damp sponge is then used to remove excess grout. Management should require the contractor to adhere to all product manufacturer's installation specifications and the above guideline parameters of installation.

We recommend First Congregational Church anticipate replacement of the tile by 2025. We note this information on Line Item 2.240 of ***Reserve Expenditures***. The Church should fund regrouting of the tiles through the operating budget if necessary.

**Floor Coverings, Vinyl Tile, Common Areas** - Vinyl comprises 230 square yards of the floor coverings in the common area classrooms, hallways, staircases and the Resource Room. The majority of the vinyl floor coverings were replaced in 2000. The vinyl tile is in fair overall condition. First Congregational Church should anticipate a useful life of 10- to 15-years for the vinyl floor coverings in these medium-traffic common areas. Based on the age and condition of the vinyl floor coverings, we recommend the Church budget for their replacement by 2018 and again by 2033. We depict this information on Line Item 2.300 of ***Reserve Expenditures***.

**Kitchen** - The Church maintains a kitchen located on the lower level. The kitchen contains a commercial dishwasher, a six-burner stove with ovens, stacked convections ovens, a two-door refrigerator and one-door freezer. The kitchen also contains a microwave and an ice machine. These components were replaced in 2004, with the exception of the dishwasher, which was replaced in 2012. The components are in good to fair condition. The useful lives of these components vary from 18- to 25-years. We recommend the Church budget for replacement of up

to fifty percent (50%) of the equipment by 2017 and every 10 years thereafter. We note this information on Line Item 2.519 of ***Reserve Expenditures***.

The finish and cabinetry components of the kitchen include:

- Vinyl tile floor coverings
- Laminate wall coverings
- Acoustical ceiling tile assembly
- Paint finishes on the walls
- Cabinets and countertops

The components were renovated in 2004 and are in good overall condition. The useful life of kitchen components varies up to 25 years. Periodic renovations of the kitchen are an astute practice to maintain a positive overall appearance of the Church. We recommend the Church budget for renovation of the kitchen by 2029. We note this information on Line Item 2.520 of ***Reserve Expenditures***.

**Light Fixtures** - The common area interiors utilizes several different styles of light fixtures. There are 19 interior ceiling mounted fluorescent light fixtures located at the classrooms, including the up-lighting at the Temple of Light, 21 ceiling mounted metal can and pendant style fixtures at the atrium and the chapel, 24 pendant and wall sconce fixtures with single and/or multiple bulbs at the sanctuary, and 14 wall and ceiling mounted glass dome fixtures located at the narthex and staircases. We anticipate useful lives of up to 25 years for the fluorescent, up-lighting and dome-style fixtures, up to 35 years for the can and pendant style fixtures at the atrium and chapel, and an indeterminate useful life for the sanctuary pendant and wall fixtures dependent on periodic refurbishment. The Church refurbished the sanctuary fixtures in 2014. We recommend the Church budget for refurbishment of the sanctuary fixtures up to every 10 years beginning by 2024.

First Congregational Church may desire common area light fixture replacement for aesthetic reasons or to coordinate their replacement with more significant renovations or paint applications. We consider the times of such replacements discretionary. For the purposes of this study, we recommend a total replacement of the classroom and the Temple of Light light fixtures by 2026, the atrium and chapel fixtures by 2019, the dome fixtures by 2019 and again by 2044. We include this information on Line Items 2.560 through 2.563 of ***Reserve Expenditures***. To reduce energy consumption, First Congregational Church should consider the use of fluorescent or light-emitting diode (LED) lighting and motion sensors at the hallways and classrooms.

**Organ Restoration** - The Church utilizes an organ at the sanctuary. The organ was replaced in 1990 following a fire at the Church and is reported in good condition. Organs have an indeterminate useful life with the benefit of restorations. Based on information provided by Management, we include replacement of the electrical components every 35- to 40-years, or by 2025. In addition, we include replacement of the pneumatic leather valves every 45- to 50-years or by 2035. We include this information on Line Items 2.601 and 2.602 of ***Reserve Expenditures***.

**Pew Restoration** - First Congregational Church maintains approximately 40 wood pews and 40 choir chairs at the sanctuary. Well maintained wood pews have an indeterminate useful life and we do not anticipate *replacement* during the next 30 years. Instead, we recommend the Church budget to *refinish* the pews every 15 years to maximize their remaining useful lives. We include an allowance to strip, sand and refinish the wood pews and chairs by 2018 in coordination with replacement of the sanctuary and narthex carpet, and again every 13 years

thereafter. Pew restoration may include replacement of the pew and chair cushions. We depict this information on Line Item 2.651 of ***Reserve Expenditures***.

**Rest Rooms** - The Church maintains six multiple stall rest rooms, four single stall rest rooms and two shower rooms. Components of the rest rooms include:

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

The components were renovated in 2000, except for the Pilgrim Hall single stall rest room which was renovated in 2014. The rest rooms are in good overall condition. The useful life of rest room components varies up to 25 years. Periodic renovations are an astute practice to maintain a positive overall appearance of the Church. We recommend the Church budget for renovations of the six multiple stall rest rooms, and renovations of the remaining single stall and shower rooms by 2025. We note this information on Line Items 2.900 and 2.901 of ***Reserve Expenditures***. The Church should verify the rest room renovations comply with the Americans with Disabilities Act (ADA). The Church should budget for interim renovation of the Pilgrim Hall rest room through the operating budget.

## Building Services Elements

**Air Handling Unit, Make-up Air** - The Church utilizes one *Reznor* make-up air unit to provide outdoor air to the Church. The unit was replaced in approximately 2000, is reported in good condition and has a useful life of 20- to 25-years. We recommend the Church budget for replacement by 2024. We note this information on Line Item 3.050 of ***Reserve Expenditures***.

The Church should fund interim repairs and replacements of the burners and filters through the operating budget.

**Air Handling Units, Rooftop Heating and Cooling Units** - The Church utilizes four *Trane* rooftop air handling units to provide heated or cooled air, depending on the season, to various areas in the Church. The cooling capacities include 7.5-tons, 10-tons and 15-tons. The units were replaced in approximately 2000 and are in good operational condition. The useful life of units of this type is 15- to 20-years with proper maintenance. Rooftop heating and cooling units consist of various combinations of heating, ventilating and air conditioning components enclosed in a sheet metal cabinet. Typical units in this application contain various combinations of the following elements: filters, heating coils, cooling coils and fans. Based on the age and condition, we recommend the Church budget for replacement by 2020 and again by 2040. We depict this information on Line Item 3.060 of ***Reserve Expenditures***.

**Air Handling and Condensing Units, Split Systems** - The Church maintains two *Trane* split system air conditioners to provide heated or cooled air, depending on the season. One system serves the lower level all-purpose room and chapel. The second system serves the main floor offices, and second floor Temple of Light and adjacent rooms. A split system air conditioner consists of an outside condensing unit, an interior evaporator coil, refrigerant lines and an interior air handling unit. Each condensing unit has a cooling capacity of 10-tons. The split systems were replaced in approximately 2000 and 2007, and are reported in fair condition. Management staff informs us they cannot find replacement parts for the controls.

With periodic maintenance, the useful life of these units is from 15- to 20-years. We base the time of replacement of a split system on its anticipated useful life and frequency of service

interruptions. The condensing unit may require replacement prior to replacement of the related interior forced air unit. However, First Congregational Church should coordinate the replacement of the interior forced air unit, evaporator coil, refrigerant lines and exterior condensing unit. We recommend the Church anticipate replacement of one system by 2017, 2027 and 2037. We base our costs on Line Item 3.070 of Reserve Expenditures on a 13 Seasonal Energy Efficiency Ratio (SEER) as required by The Department of Energy since January of 2006.

**Audio Visual Equipment -** First Congregational Church maintains audio visual equipment at the chapel, cinema, music room and sanctuary. The equipment includes various controls, projectors and speakers. The equipment varies in age and condition. Equipment at the chapel was replaced since 2011. As the equipment ages, service interruptions will increase in frequency. Audio visual equipment has a useful life of up to 20 years. We recommend the Church budget for replacement of up to fifty percent (50%) of the equipment by 2022 and every nine years thereafter. We depict this information on Line Item 3.088 of ***Reserve Expenditures***. The Church should anticipate interim replacements of a limited quantity of components as normal maintenance.

**Boilers, Building Heat** - The Church utilizes four *Utica* gas-fired boilers with an *input* capacities of 800- and 1,000-MBH (thousand British Thermal Units per hour) each to generate hot water for building heat. The boilers were replaced in approximately 1994 and are in good to fair operational condition. The useful life of boilers of this capacity is from 18- to 25-years. The lack of replacement parts, increased efficiencies of new units and corrosion of the exterior shell will eventually justify complete replacement of the boilers. Based on the age and reported

operational condition, we recommend the Church budget for replacement by 2019 and again by 2044. Our cost on Line Item 3.105 of ***Reserve Expenditures*** includes an allowance for replacement of the controls. The Church should fund replacement of expansion tanks, valves and circulation pumps less than five-HP through the operating budget as needed.

**Electrical System** - The electrical system at First Congregational Church varies in age up to original construction. However, the main panels were likely upgraded within the last 30 years and uses breaker type circuit protection panels. The Based on our conversations with the Management Staff, the system is in reported satisfactory condition. The Church should conduct periodic thermoscans and funds this expense along with minor repairs through the operating budget.

The exact locations and conditions of all the electrical system components were not ascertained due to the nature of their location and the non-invasive nature of our inspection. For purposes of this Reserve Study, we exclude the electrical systems within the units based upon information from the Management Staff. We give a brief overview of electrical system components in the following sections of this narrative.

***Primary Switchgear*** - The primary switchgear is located where the electric supply comes into the building. Switchgear can include associated controls, regulating, metering and protective devices, and is used for the transmission, distribution and conversion of electric power for use within the building. Switchgear components have a useful life of up to and sometimes beyond 70 years. Replacement is often determined by a desired upgrade of the entire electrical system.

***Transformer*** - A transformer is an electric device with two or more coupled windings used to convert a power supply from one voltage to another voltage. Transformers within a building lower the supplied electrical voltage to a level that can be utilized by the building's equipment and unit owners. Transformers do not utilize mechanical components and therefore have a long useful life. However, the Church should anticipate periodic replacement of a limited quantity of transformers.

***Distribution Panel*** - The distribution panel is an electric switchboard or panel used to control, energize or turn off electricity in total or for individual circuits. The panel also distributes electricity to individual and controllable circuits. One or more distribution panels may exist and

further distribute electricity to individual panel boards for each unit. The distribution panel is enclosed in a box and contains circuit breakers, fuses and switches. Distribution panels have a useful life of up to and sometimes beyond 70 years.

***Circuit Protection*** - Once electricity is distributed throughout the building and is at a usable voltage level, the electricity is divided into circuits. Each circuit requires circuit protection. Circuit protection is necessary to prevent injury and fires, and minimize damage to electrical components and disturbances to the electrical system. Abnormalities in the circuit can include overloads, short circuits and surges. Circuit protection devices are commonly referred to as circuit breakers and fuses. For the protection of the circuits in the units and common areas, we recommend the use of only circuit breakers as they are safer than fuses. However, the use of fuses is common for equipment like emergency systems and individual items of equipment. Fuses with a low capacity rating can easily be replaced with fuses of a higher rating resulting in an unprotected, overloaded and unsafe circuit. The circuit protection panels have a useful life of up to and sometimes beyond 70 years.

***Conductors*** - Conductors are the electrical wires that convey electricity to the units, light fixtures, receptacles and appliances. The type of conductors was not available at the time of our inspection. Copper conductors have an indefinite useful life. Aluminum conductors in high capacity service have an indeterminate useful life. Aluminum conductors in low capacity service have a useful life of up to 50 years. Aluminum conductors are problematic due to two factors: 1) Aluminum oxide can form at the connections of aluminum wiring and can act as an insulator resulting in overheating of the connection and circuit, and 2) Aluminum is relatively soft and expands during temperature increases, resulting in loose connection points. These conditions can result in overheating and fires. Buildings with aluminum conductors may find it more difficult to obtain property insurance.

***Conductor Insulation and Conduit*** - Conductor insulation provides protection against the transfer of electricity. Conductor insulation can eventually become brittle and damaged from rodents or heat from many years of service. Conductor conduit is a pipe or tube used to enclose insulated electric wires to protect them from damage. Steel conductor conduit, although galvanized, will eventually rust if used in damp conditions. The useful life of conductor insulation and conduit is indeterminate.

Changes in service loads over time can cause arcing conductor connection points and line overloads within a system. Periodic thermoscans of primary switchgear and distribution panels are advisable and can detect defective or prematurely aging electrical system components. We recommend the Church conduct thermoscans of the distribution panels and circuit protection panels, and inspections of the transformers for any indications of arcing, burning or overheating on a regular basis, funded through the operating budget. Verification of the integrity of all connection points minimizes the potential for arcing and fires. The Church should repair or replace all loose and corroded parts at that time.

Due to the limited amount of mechanical components, electrical system components have a long, often indeterminate, useful life. The Church may find it necessary to replace individual components of the electrical system due to service load changes and changes in building code requirements. However, future changes in service loads and the requirements of future building code changes are indeterminate.

We recommend the Church budget to replace up to thirty-three percent (33.3%) of the main switchgear, disconnect and circuit protection panels by 2039. Updates of this Reserve Study will consider possible changes in the scope and times of component replacements based on the conditions, including the need for replacement of the wires. We note this information on Line Item 3.300 of ***Reserve Expenditures***.

**Elevator, Hydraulic** - First Congregational Church utilizes one *Otis* hydraulic passenger elevator. The hydraulic elevator system components were installed in 2000 and 2001, and are in reported good condition. Management Staff inform us that service interruptions are infrequent. We include the following solutions and procedures for hydraulic elevator component replacements for present and future board members.

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.

Hydraulic elevator pumps and controls of this type provide many years of service and, when cared for by a maintenance contract, can have useful lives of up to 35 years. We anticipate that the following hydraulic elevator system components will require replacement:

- Cab control panel
- Door operator
- Hallway panels/buttons
- Microprocessor based controller
- Pump

Based on the age and condition, we recommend the Church budget for replacement of these components by 2035. We depict this information on Line Item 3.320 of ***Reserve Expenditures***.

A hydraulic elevator cylinder resides in a pit immediately beneath the elevator cab and has a useful life of up to 45 years. We recommend the Church budget for cylinder replacement by 2045. We include this information on Line Item 3.330 of ***Reserve Expenditures***.

An elevator cab and shaft have an indefinite useful life and therefore we do not include replacement during the next 30 years. The Church should fund all other elevator component replacements through the operating budget.

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 Church should require the contractor to verify that elevator component replacements include all of the necessary features for the latest in elevator code compliance. In addition, the design should meet or exceed accessibility standards as defined by the Americans with Disabilities Act (ADA).

**Elevator, Lift -** First Congregational Church maintains an elevator lift. The lift was installed in 2000 and 2001, and is reported in good condition. Based on the reported light use, we anticipate the need for replacement up to every 35 years and recommend the Church budget for replacement by 2035. We depict this information on Line Item 3.333 of ***Reserve Expenditures***.

**Energy Recovery and Condensing Units, Systems -** The Church maintains five *Berner* energy recovering units and related condensing units to provide conditioned air to a majority of the Church. The systems were replaced in approximately 2000 and 2001, and are reported in good condition. With periodic maintenance, the useful life of these units is from 15- to 20-years. We base the time of replacement of a system on its anticipated useful life and frequency of service interruptions. We recommend the Church anticipate replacement of the systems by 2020 and again by 2040. We include this information on Line Item 3.341 of ***Reserve Expenditures***.

**Life Safety System -** The life safety system at First Congregational Church includes the following components:

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

The system was upgraded in 2000 and 2001, and is in good operational condition. The digital display on the central panel read “System Normal” at the time of our inspection. Life safety systems have useful lives of up to 25 years with proper maintenance. Changes in technology or building codes may make a replacement desirable prior to the end of the functional

life. With consideration of the operational condition and age, we recommend the Church budget for replacement by 2025. 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 greater cost of replacement than the future amount shown on Line Item 3.560 of ***Reserve Expenditures***. Our cost assumes reuse of the existing wiring.

**Property Site Elements**

**Asphalt Pavement, Crack Repair, Patch and Seal Coat -** Asphalt pavement comprises 1,700 square yards of parking areas. The pavement is in poor overall condition at an unknown age. We note alligator cracks, patches and potholes. Management Staff inform us that the Church applied a seal coat in 2013 and conducted pavement repairs in approximately 2009. The Church should plan future applications and repairs every three- to five-years. These activities reduce water infiltration and the effects of inclement weather. We elaborate on solutions and procedures necessary for the optimal maintenance of asphalt pavement in the following discussion.

We recommend periodic seal coat applications, crack repairs and patching to maintain the pavement. These activities minimize the damaging effects of vehicle fluids, maintain a uniform and positive appearance, and maximize the useful life of the pavement. Asphalt pavement is susceptible to isolated areas of accelerated deterioration in areas that experience freeze-thaw cycles, at the centerlines of streets and at high traffic areas such as intersections. Depressions often appear at areas where vehicles park such as driveways and parking areas. Isolated areas of depressions, cracks and deterioration indicate the need for crack repairs and patching. The

contractor should patch areas that exhibit potholes, alligator or spider web pattern cracks, and areas of pavement that are severely deteriorated from oil and gasoline deposits from parking vehicles. Area patching requires total replacement of isolated areas of pavement. The contractor should mechanically rout and fill all cracks with hot emulsion. Crack repair minimizes the chance of the cracks transmitting through the pavement.

There are four main types of seal coats available: fog coat, acrylic sealer, chip seals and asphaltic emulsion. A *fog coat* is a simple mixture of water and asphalt. *Acrylic sealers* include an acrylic additive to the water and asphalt mixture for greater resistance to abrasion. *Fog coats* and *acrylic sealers* are typically spray applied and are only for aesthetic purposes. *Chip seal* is the most substantial type of seal coat which involves placement of oil and aggregate on the driving surface. Either a roller or normal vehicular traffic works the gravel into the oil. *Asphaltic emulsions* combine a sharp sand mixture or mineral fibers, and an emulsifying agent with the water and asphalt mixture. *Asphaltic emulsions* are typically hand applied with squeegees to ensure that the sealer fills surface abrasions and minor cracks. This prevents the infiltration of water through cracks into the underlying pavement base. Seal coats therefore minimize the damaging effects of water from expansion and contraction. We regard *asphaltic emulsions* as the most effective and economical type of seal coat.

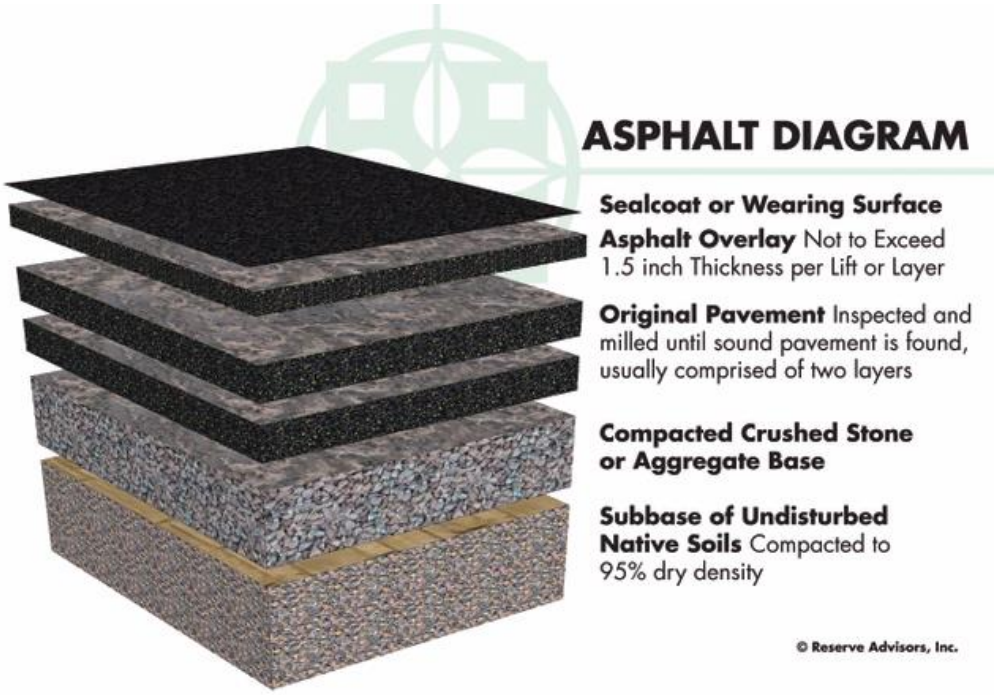
First Congregational Church should repair any isolated areas of deteriorated pavement prior to seal coat applications. Proposals for seal coat applications should include crack repairs and patching. The contractor should only apply seal coat applications after repairs are completed. A seal coat does not bridge or close cracks, therefore, unrepaired cracks render the

seal coat applications useless. Our future estimates of cost include an allowance for repair activities.

We recommend that First Congregational Church plan the next application of seal coat by 2020 and subsequent applications every four years thereafter except when repaving occurs. Line Item 4.020 of ***Reserve Expenditures*** notes our estimate of future costs and anticipated times of these activities.

**Asphalt Pavement, Repaving** - As previously stated, asphalt pavement comprises 1,700 square yards of parking areas. The pavement is in poor condition at an unknown age. We note alligator cracks, patches and potholes. Pages 5.23 and 5.24 of ***Photographs*** depict these conditions. The useful life of pavement in Glen Ellyn is from 15- to 20-years. We include the following repaving solutions and procedures for the benefit of the present and future board members.

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




The manner of repaving is either a *mill and overlay* or *total replacement*. A mill and overlay is a method of repaving where cracked, worn and failed pavement is mechanically removed or milled until sound pavement is found. A new layer of asphalt is overlaid atop the remaining base course of pavement. Total replacement includes the removal of all existing asphalt down to the base course of aggregate and native soil followed by the application of two or more new lifts of asphalt. We recommend mill and 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 for initial repaving followed by the mill and overlay method for subsequent repaving at First Congregational Church.

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

Total replacement requires the removal of all existing asphalt. For area patching, we recommend the contractor use a rectangular saw cut to remove the deteriorated pavement. For larger areas such as entire parking areas or driveways, we recommend the contractor grind, mill or pulverize the existing pavement to remove it. The contractor should then augment and compact the existing aggregate and native soil to create a stable base. Finally the contractor should install the new asphalt in at least two lifts.

The time of replacement is dependent on the useful life, age and condition of the pavement. The useful life is dependent in part on the maintenance applied to the pavement, the amounts and concentration of auto solvents that penetrate the pavement, the exposure to sunlight and detrimental effects of inclement weather. First Congregational Church should repair any isolated areas of deteriorated pavement concurrent with periodic seal coat applications. We

recommend the Church plan for total replacement by 2016. In addition, we recommend the Church plan for a milling and overlayment of the pavement with area patching of up to ten percent (10%) by 2036. We depict this information on Line Items 4.040 and 4.045 of ***Reserve Expenditures***.

**Fence, Chain Link** - Approximately 150 linear feet of chain link fence are found at the parking lot perimeter. The fence is in good overall condition at an unknown age. Chain link fences have useful lives of up to 25 years. We recommend the Church anticipate replacement by 2027. We suggest the Church install vinyl coated fence at the time of replacement. We depict this information on Line Item 4.220 of ***Reserve Expenditures***.

**Fences, Wood** - Approximately 310 linear feet of stockade-style and split rail wood fences are found at the parking lot and east property perimeter. The fences are in good overall condition at an unknown age. Wood fences of this type have useful lives of 15- to 20-years. The Church should anticipate periodic partial replacements due to the nonuniform nature of wood deterioration. Along with these partial replacements, the Church should apply periodic paint applications as needed and fund these activities through the operating budget. We suggest the Church plan for replacement by 2027. We depict this information on Line Item 4.285 of ***Reserve Expenditures***.

**Light Poles and Fixtures** - The Church uses four light-emitting diode (LED) fixtures atop metal poles to illuminate the property. These fixtures were replaced in 2012 and are in good condition. The poles are original and in fair condition. These elements have useful lives of up to 25 years. The Church should anticipate the need for replacement by 2032. We note this information on Line Item 4.560 of ***Reserve Expenditures***.

## Reserve Study Update

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

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

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

The Church can expense the fee for an Update with site visit from the reserve account. This fee is included in the Reserve Funding Plan. We base this budgetary amount on updating the same property components and quantities of this Reserve Study report.

## 5. PHOTOGRAPHS

Photographs document the conditions of various property components as of the date of our visual inspection, December 12, 2014. The Condition Assessment contains references to these photographs.

The following is an overview image of the subject property:

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

South elevation

West elevation

North elevation

Wood rot at entrance door

Dented copper gutter

Tower light fixtures

Replaced shingles at original chapel roof

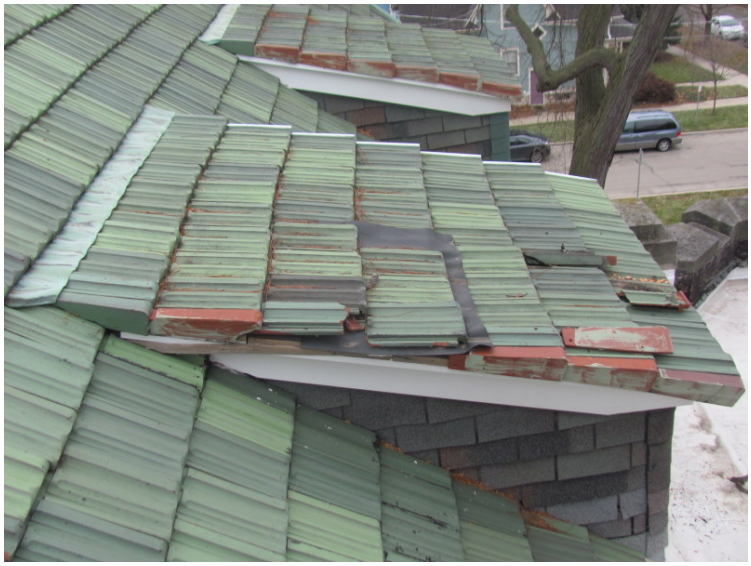
Cupped shingles at original chapel roof

Clay tile roof

Loose shingles at dormer roof, note flashing rust at main roof

Replaced tiles

Example of hairline crack and edge deterioration



Cracked and loose tiles at west roof of 1800s original church

Standing water at stair roof

Standing water at single story office roof

Bulges in membrane at classroom roof

Transition roof between original church and sanctuary, note location with history of leaks

Skylights

Open seam and previous repairs

Masonry wall

Masonry wall and newer window

Bell tower

Mortar deterioration

Spalled concrete

Damaged wall at southwest entrance

Cracked sealant and paint finish over rotted wood

Aluminum frame windows

Sanctuary windows

Warped stain glass at sanctuary balcony

Wood frame window

Cracked glass panes

Main lobby overview

Atrium

Classroom with carpet and acoustical ceiling tile

Classroom with vinyl tile and acoustical ceiling tile

Acoustical ceiling stains

Acoustical ceiling tile stains at classroom

Evidence of water infiltration at narthex staircase

Worn carpet at offices

Carpet stains at youth  room

Sanctuary overview

Worn carpet at narthex staircase

Ridges at sanctuary balcony carpet

Commercial dishwasher

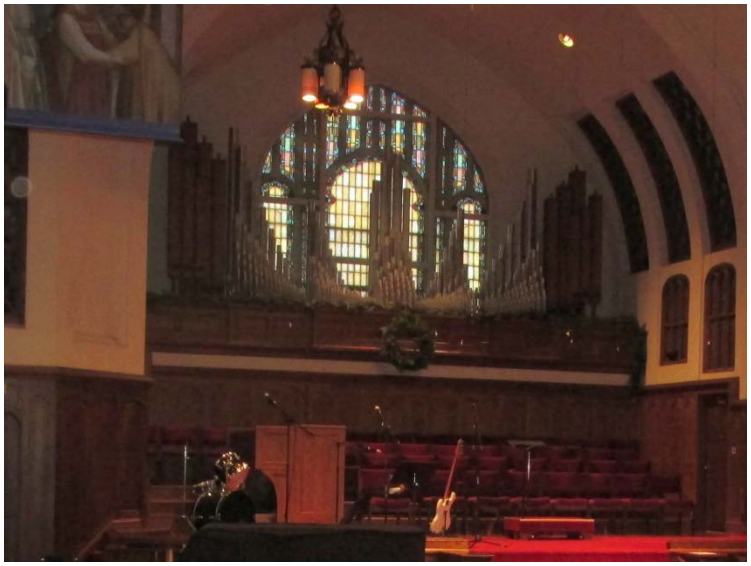
Commercial kitchen equipment

Chapel pendant light fixtures

Refurbished sanctuary wall light fixtures

Refurbished sanctuary ceiling light fixtures

Dome light fixture at narthex staircase



Organ

Multiple stall rest room

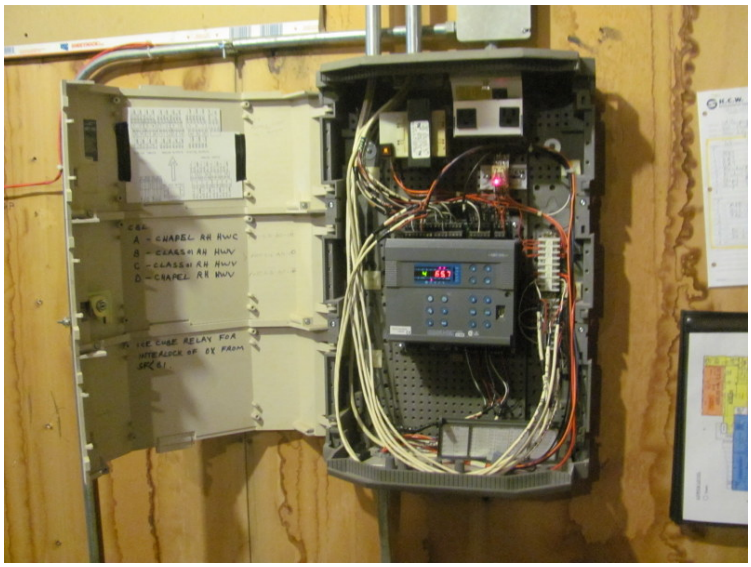
Recently renovated single stall rest room

Make-up air handling unit

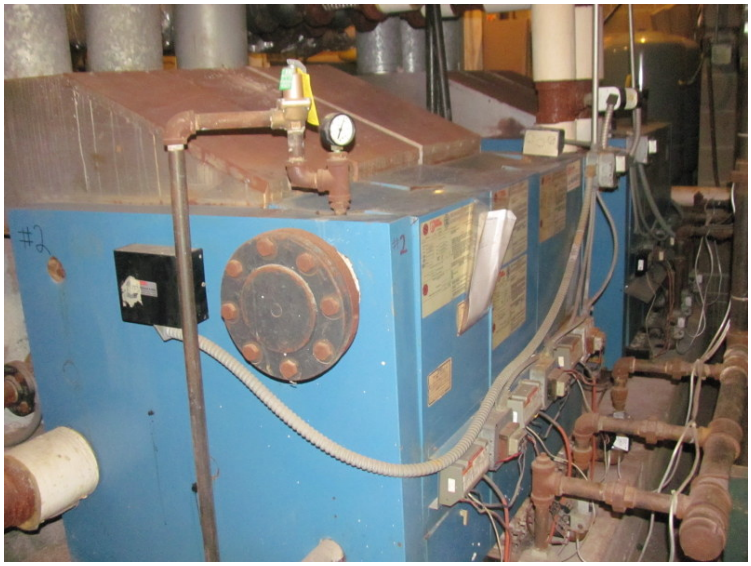
10-ton rooftop heating and cooling unit

10-ton condensing unit

Air handling unit serving chapel and all-purpose room



Controls for air handling unit



Building heat boilers

Electrical main disconnect

Circuit breaker panel

Elevator equipment

Lift

Energy recovery unit

Life safety system

Parking lot asphalt pavement overview, note cracks

Pavement cracks, previous patches and potholes

Pavement alligator cracks

Chain link perimeter fence and light poles with LED fixtures

Wood perimeter fence

## 6. METHODOLOGY

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

First Congregational Church can fund capital repairs and replacements in any combination of the following:

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

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 Church 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.

This Reserve Study is in compliance with and exceeds the National standards[1] set forth by 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:

A 2015 year end reserve balance of zero dollars as of June 30, 2015

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

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 Glen Ellyn, Illinois at an annual inflation rate of 2.7%. Isolated or regional markets of greater construction (development) activity may experience slightly greater rates of inflation for both construction materials and labor.

The past and current maintenance practices of First Congregational Church and their effects on remaining useful lives

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

The anticipated effects of appreciation of the reserves over time in accord with an anticipated future return or yield on investment of your cash equivalent assets at an annual rate of 1.1% (We did not consider the costs, if any, of Federal and State Taxes on income derived from interest and/or dividend income).

Interest rates on reserves are steady or increasing in concert with the certificates of deposit and money market rates. Slight increases exist in the savings rates of one, two or three-year CDs. Without significant differences in these savings rates, shorter term investments are the choice of many investors. We recommend consultation with a professional investment adviser before investing reserves to determine an appropriate investment strategy to maximize a safe return on reserve savings. The following table summarizes rates of inflation and key rates for government securities, generally considered as safe investment alternatives.

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

| Interest Rate and Inflation Data | 2013 | | | | 2014 | | | |
|---|---|---|---|---|---|---|---|---|
| Average or Last Actual = (A) | 2013:1 (A) | 2013:2 (A) | 2013:3 (A) | 2013:4 (A) | 2014:1 (A) | 2014:2 (A) | 2014:3 (A) | 2014:4 (E) |
| 1-Year Treasury Bill | 0.15% | 0.13% | 0.13% | 0.12% | 0.13% | 0.15% | 0.13% | 0.01% |
| 10-Year Treasury Note | 1.86 | 1.86 | 2.65 | 2.70% | 2.80% | 2.65% | 2.40% | 2.25% |
| 30-Year Treasury Bond | 3.10 | 3.08 | 3.70 | 3.85% | 3.90% | 3.50% | 3.35% | 3.00% |
| Consumer Price Index (annualized rate) | 3.21% | -1.68% | 1.30% | 1.50% | 1.50% | 2.00% | 2.40% | 2.60% |
| Residential Construction" Producer Price Index-Inflation Rate, Bureau of Labor Statistics (Year over Year to April 2014 ) | | | | | | | | 2.0% |
| National Market Savings Rates as found in | 0.40% | for Money Market Savings | | | 0.90% | for 2-Year Certificate of Deposit | | |
| http://www.bankrate.com | 0.80% | for 1-Year Certificate of Deposit | | | 1.10% | for 3-Year Certificate of Deposit | | |
| Estimated Near Term Yield Rate for Reserve Savings . . . . . | | | | 1.1% | | | | |
| Est. Near Term Local Inflation Rate for Future Capital Expenditures . . . . . | | | | 2.7% | | | | **10/21/2014** |

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

# 7. DEFINITIONS

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

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

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

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

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

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

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

**Long-Lived Property Component** - Property component of First Congregational Church 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) First Congregational Church responsibility; 2) limited Useful Life expectancies; 3) predictable Remaining Useful Life expectancies; and 4) a replacement cost above a minimum threshold.

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

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

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

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

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

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

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

## 8. PROFESSIONAL SERVICE CONDITIONS

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

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

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

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

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

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

We reserve the right to include our client's name in our client lists, but we will maintain the confidentiality of all conversations, documents provided to us, and the contents of our reports, subject to legal or administrative process or proceedings. These conditions can only be modified by written documents executed by both parties.

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

**CONDITIONS OF OUR SERVICE ASSUMPTIONS**

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

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

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

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

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

# 9. CREDENTIALS

## HISTORY AND DEPTH OF SERVICE

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

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

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

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

## TOTAL STAFF INVOLVEMENT

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

## OUR GOAL

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

## VAST EXPERIENCE WITH A VARIETY OF BUILDINGS

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

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

## OLD TO NEW

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

**QUALIFICATIONS**
**THEODORE J. SALGADO**
**Principal Owner**

**CURRENT CLIENT SERVICES**

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

**PRIOR RELEVANT EXPERIENCE**

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

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

Mr. Salgado has authored articles on the topic of reserve studies and facilities maintenance. He also co-authored

**EXPERT WITNESS**

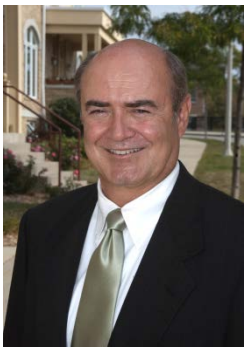
Mr. Salgado has testified successfully before the Butler County Board of Tax Revisions in Ohio. His depositions in pretrial discovery proceedings relating to reserve studies of Crestview Estates Condominium Association in Wauconda, Illinois, Rivers Point Row Property Owners Association, Inc. in Charleston,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

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

**PROFESSIONAL AFFILIATIONS/DESIGNATIONS**

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

**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 exhibiting, and direct mail promotions. 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.

Mr. Poehlmann served on the national Board of Trustees of Community Associations Institute. Community Associations Institute (CAI) is a national, nonprofit 501(c)(6) trade association created in 1973 to provide education and resources to America's 305,000 residential condominium, cooperative and homeowner associations and related professionals and service providers. The Institute is dedicated to fostering vibrant, responsive, competent community associations that promote harmony, community, and responsible leadership.

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 Planning for Replacement of Property Doesn't Have to Be Like a Trip to the Dentist, Reserve Studies for the First Time Buyer, Sound Association Planning Parallels Business Concepts, and Reserve Studies Minimize Liability. He has worked with a variety of publications, including the Chicago Tribune, The Milwaukee Journal/Sentinel, Common Ground, Common Interest, and Condo Management. He also co-authored "Reserves", an educational videotape produced by Reserve Advisors on the subject of Reserve Studies and the benefits of maintaining appropriate reserves.

**INDUSTRY SERVICE AWARDS**

CAI National Rising Star Award - To an individual whose leadership abilities and professional contributions have earmarked them for even greater accomplishments in the future.

CAI Michigan Chapter Award - "Given to the individual who contributed their time, expertise, and resources toward improving the quality of services offered by the chapter. Mr. Poehlmann was unanimously selected as the winner of the CAI Michigan Chapter Award."

**EDUCATION**

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

**PROFESSIONAL AFFILIATIONS**

**Community Associations Institute (CAI)** - Founding member of Reserve Committee; former member of National Board of Trustees; Reserve Specialist (RS) designation; Member of multiple chapters

**Association of Condominium, Townhouse, & Homeowners Associations (ACTHA)** – member

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

## CURRENT CLIENT SERVICES

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

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

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

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

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

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

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

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

## PRIOR RELEVANT EXPERIENCE

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

## EDUCATION

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

## PROFESSIONAL AFFILIATIONS/DESIGNATIONS

*Reserve Specialist (RS)* - Community Associations Institute
*Professional Reserve Analyst (PRA)* - Association of Professional Reserve Analysts
*Professional Engineering License* - Wisconsin 2012

**STEPHANIE A. MUELLER, RS**
**Responsible Advisor**

## CURRENT CLIENT SERVICES

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

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

**Caswell Lofts** Situated in lively Austin, Texas, five loft-style buildings comprise 42 condominiums. The buildings comprise brick masonry, fiber cement siding and flat roof assemblies. Homeowners can enjoy the fresh air on the extended open balconies.

**Palazzo Tornabuoni Associazione** Located in the heart of Florence, Italy, this 15th century palace includes 38 luxury residences. The ground floor includes upscale retail spaces and a restaurant. The building features many historic details such as the tile roofs and original fresco paintings. Members enjoy the private lounge, sauna and steam room.

**Village at Washington's Landing** This picturesque community on Herrs Island overlooks downtown Pittsburgh. The 85 townhomes and 3 single family homes feature asphalt shingle and metal roofs, brick masonry and wood composite siding.

**Carriage Manor RV Resort** This attractive resort in Mesa, Arizona offers 911 recreational vehicle lots. The clubhouse and crafts building feature a banquet hall, billiards room, commercial kitchen and various club rooms. The buildings' exteriors comprise stucco walls, modified bitumen roofs and concrete tile roofs. Located throughout the resort are tennis courts, a pool, golf driving cages, putting greens and a dog park.

**Beechnut Woods** Located in Grafton, Wisconsin, this quaint community comprises 68 townhomes. The buildings feature brick masonry, vinyl siding and asphalt shingle roofs. The development contains a gazebo, pond, retaining walls and concrete flatwork.

**Sonoma Homeowners Association** This expansive community of 1,000 homeowners is located in Round Rock, Texas. Homeowners enjoy the use of two pools, splash area, water slide, playgrounds and a pavilion. Located throughout the property are perimeter fences, ponds and an irrigation system.

**Holly Creek** Located in Plymouth, Minnesota, this inviting community comprises 108 townhomes in 21 buildings. The buildings feature vinyl siding and asphalt shingle roofs. The development includes asphalt driveways and concrete sidewalks.

## PRIOR RELEVANT EXPERIENCE

Before joining ***Reserve Advisors, Inc.***, Ms. Mueller attended the University of Wisconsin in Madison, Wisconsin where she attained her Bachelor of Science degree in Civil Engineering. Her studies focused on structural engineering. At the University of Wisconsin, she managed a team responsible for the design of a new drinking water facility for a rural Wisconsin town.

## EDUCATION

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

## PROFESSIONAL AFFILIATIONS

*Engineer In Training (E.I.T.) Registration* - Wisconsin 2009
*Reserve Specialist (RS)* - Community Associations Institute

**HEATHER M. CHRISTENSEN, RS**
**Responsible Advisor**

## CURRENT CLIENT SERVICES

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

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

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

**Brighton Commons Condominium Association** This row style townhome development in Manassas, Virginia includes 87 units in nine buildings which comprise asphalt shingle roofs and mansard roofs, vinyl siding, bay windows and streets and parking.

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

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

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

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

## PRIOR RELEVANT EXPERIENCE

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

## EDUCATION

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

## PROFESSIONAL AFFILIATIONS

*Engineer In Training (E.I.T.) Registration* - Wisconsin
*Reserve Specialist (RS)* - Community Associations Institute

**MATTHEW P. KSIONZYK, PRA, RS**
**Review Coordinator**

## CURRENT CLIENT SERVICES

Matthew P. Ksionzyk, a Civil Engineer, is an Advisor for ***Reserve Advisors, Inc***. Mr. Ksionzyk is responsible for the inspection and analysis of the condition of clients' property, and recommending engineering solutions to prolong the lives of common components. He also forecasts capital expenditures for the repair and/or replacement of the property components and prepares technical reports on assignments. He is responsible for conducting Life Cycle Cost Analysis and Capital Replacement Forecast services for condominiums, townhomes, homeowner associations and commercial/institutional facilities. Matthew Ksionzyk frequently serves as the ***Quality Assurance Review Coordinator*** for all types of developments.

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

**Winterhaven at Country Club** Estates This gated master association was constructed from 1997 to 2005, consists of 617 large single family homes and is located within Cochise County in southeast Arizona. This gated community comprises two clubhouses and two pools with over 10 miles of asphalt streets.

**Cypress Landing** This secluded master association, located on the "Inner Banks" of North Carolina, consists of three homeowner associations. The development comprises a clubhouse, a fitness center, two pools, four clay tennis courts, secured recreational vehicle and boat storage areas, six ponds and three earthen dams.

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

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

**Lake Chelan United Methodist Church** This religious facility is located in central Washington State. The church contains a sanctuary, offices, classrooms, social rooms, a kitchen, rest rooms and a separate parsonage. The church was built in 1891 and additions were completed in the 1950's.

**The Condominiums at Center Court** This unique 13-story high-rise is located within New Haven, Connecticut and comprises 93 units. The building includes a masonry façade, flat roofs and common mechanical systems. The building originally served as headquarters for the Southern New England Telephone Company. Construction of the first ten-stories was conducted from 1916 to 1918 and stories 11 through 13 were added in the mid-1920's. A three-story, ground level addition was erected in the early 1980's.

## PRIOR RELEVANT EXPERIENCE

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

## EDUCATION

Clarkson University - B.S. Civil Engineering

## PROFESSIONAL AFFILIATIONS / DESIGNATIONS

*Engineer In Training (E.I.T.) Registration* - New York 2002
*Professional Reserve Analyst (PRA)* - Association of Professional Reserve Analysts
*Reserve Specialist (RS)* - Community Associations Institute

## 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 http://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 http://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 http://www.msbinfo.com

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