



Wilmette Public Library

Capital Reserves Study

WORKING DOCUMENT - AUGUST 5, 2020





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Contents

The primary product of this study is an active workbook. This report is a simplified set of filtered data to summarize major conclusions and illustrate the ways in which the workbook can be used to assess the building and plan for future investments.

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Process, Context, & Limitations

Process

Wilmette Public Library commissioned this study to

- Better understand the condition of the building,
- Prioritize needed repairs or replacements,
- Coordinate capital maintenance projects with service-based improvements to the building and
- Identify appropriate funding levels to replace those building systems or components using designated reserve funds.

A multi-step process was used to address these goals.

- In preparation for the systems evaluations we reviewed available documentation including construction or record drawings and specifications as provided by the Library.
- Next, we convened a group of engineers and architects familiar with library building systems for a one-day walk-through of the facility. IMEG Consulting Engineers was engaged for the mechanical and electrical engineering assessment. Eriksson Engineering Associates was retained for site evaluations. As part of this session we met with building maintenance personnel and management staff to identify areas of known or suspected issues related to building performance.
- The results of these conversations and the walk through became the basis for development of specific life-expectancy and replacement cost schedules included in the workbook.
 - The workbook contains 595 individual line entries.
 - General notes relating to abnormal wear or deterioration in the condition of the components were included for each line.
- Each component or system occurs once in the tracking file. This is typically not an issue with long-lived systems or components. Shorter-lived components or parts are typically not considered a capital expense. For systems that fall in between, painting as an example (with a lifespan of 3 to 5 years) are tallied at their first occurrence only. Depending on the timing and nature of the action taken at that first occurrence, the interval to the next scheduled action could vary. Maintenance efforts and fiscal planning requires keeping the workbook current.
 - A snapshot of a representative section of the workbook is shown at the end of this section.
- These schedules were constructed from established industry standards, consultation with system or component vendors/suppliers, and our individual experience.
- Any discernable violations of life safety, plumbing, mechanical or electrical codes were identified to the Library. This does not constitute a whole building code review or accessibility review.
- Building systems that appear to warrant more intensive investigation or inspection are identified in this report.
- Furnishings and Information technology systems were not be included in the evaluation.
- The replacement schedules were submitted to the Library in draft form for review and comment. A final version included modifications as the Library deems appropriate.

This narrative summarizes the findings.





Context

This Capital Repairs Study is one element of a comprehensive evaluation and planning processes necessary to maintain the facility in proper condition and tuned to the service needs of the Library. Major maintenance and renewal/replacement are part of a series of maintenance programs and budgets associated with long term stewardship of the facility. A full range of building related maintenance programs consists of:

- **Custodial Care:** Day to day periodic cleaning, painting and replacement of disposable supplies to keep the facility in safe, clean and orderly condition. Such efforts, while essential to the smooth operation and long-term care of the facility are not part of this study and are addressed by other means by the Library.
- **Preventative Maintenance:** Regularly scheduled activities that carry out the diagnostic and corrective actions necessary to prevent premature failure or maximize or extend the useful life of a facility or its components. This includes a program of inspection, servicing, testing and replacement of systems and components that is cost effective on a life-cycle basis. Annual service agreements and testing regimens are not included in the study.
- **Major Maintenance:** Larger repair or rehabilitation efforts to protect the building and correct building code deficiencies. Major Maintenance is differentiated from Capital Repairs by the scale of the repair or replacement. Major Maintenance consists of activities less than \$5,000 in aggregate expense or with product life cycles less than 10 years.
- **Capital Repair or Replacement:** Scheduled and anticipated systematic upgrading of a system or component to a renewed functioning standard.

Unlike most plans, this is not a static document. The chief product of this study is a series of interconnected detailed schedules are provided as an excel workbook for the Library's use. The schedules include opinions of both anticipated repair or replacement dates and probable cost. Entries related to condition are the result of the observations made by the review team and are an overview of wear at the time of the observation. Each item requires ongoing monitoring to assess the impact of continued building use, maintenance procedures, exposure and other factors that will influence the longevity of products and assemblies.

Within the workbook, Major Maintenance is differentiated from Capital Repairs by the scale of the repair or replacement. Capital Repairs consists of items greater than \$10,000 in aggregate expense or with product life cycles greater than 10 years. Because the schedule offers a finer level of differentiation than most studies, many of the individual items by their extent will fall below the "Capital Repair" threshold. Aggregation of the individual items into likely groups shifts the activity into the capital category. As an example, resealing the perimeter of a window is a small expense. Resealing all the soft joints on a building is a major endeavor and has a capital scale cost.

In the course of development, the schedule has evolved to include a number of items that the library may deem to be more appropriately scheduled as preventative maintenance or custodial care (painting is an example). In the interest of being inclusive, such items are included in the schedule and can be reassigned as appropriate to the library's management and budgeting model.

Other items may be deemed to be facility renewal to keep the building effective in its ability to support modern library service (upgrades to power and data networks and furnishings systems are an example).





Prioritization

A second layer of definition is added to each evaluation. Items are designated for repair or replacement based on a priority basis:

- Priority 1: Life Safety or Building Code. Repairs or replacements are needed to meet the requirements of the code.
- Priority 2: Occupant Health - Normal. Repairs or replacements not required by the building code but prudent by virtue of institutional obligations to public and staff health and safety. This category addresses repairs or replacements as they wear out and are no longer conducive to maintaining a healthy environment.
- Priority 3: Building/ System Integrity is at risk. This is typically related to
 - Water or moisture penetration into the building and includes roofs, walls, windows and other building enclosure systems.
 - Primary building systems other than enclosure. Heating, cooling, ventilation, electrical, elevators, and other systems are found here unless there is a code related issue driving a higher priority rating.
- Priority 4: Obsolescence. This is wear to the point that the item or system in question is diminishing the effectiveness of the building but has not yet become a safety or code issue.
- The priority rating for an item is not static. Carpet, as an example, can move from priority 4 because of its worn look, to priority 3 because multiple repairs are needed to keep edges smooth, to priority 1 because the edges have deteriorated to the point where repairs can no longer prevent those edges from becoming a tripping hazard.

It is important to note that a priority 1 item scheduled for repairs in 2030 is not a life safety or code related issue until the it wears past the condition predicted for 2030.

Aligning Service, Maintenance, and Public Health

While the drawing review and physical assessment tour were conducted prior to the wide spread of the Covid-19 virus and the closing of the building to the public, the report does incorporate Covid-19 related considerations. Those considerations are primarily in the form of prioritizations related to building finishes and systems, upgrading the priority rating for these items from “Obsolescence” to “Occupant Health”.

Because this study is premised on a “replace in kind” repair or replacement approach, it does not consider changes the Library may want to consider in response to the on-going COVID-19 pandemic. Some of the building systems or materials may in some instances fall short of improvements or changes needed within the building to be better able to respond to similar public health crises. Systematic evaluation of ventilation, indoor air quality, pathogen resistant or maintenance-friendly materials and cleaning processes is appropriate as part of any projects that develop from this study. Determining any changes in the Library’s expectations and obligations with respect to occupant comfort and health and the ability of existing systems or materials to meet those standards can shift the focus of those projects from replacement to enhancement. If such shifts are deemed necessary, budgets will need to be adjusted based on those decisions.

Given the extent to which the current crisis has impacted society at large (as well as library service) and the advice of public health officials citing the importance of ventilation, physical separation, and aggressive cleaning in mitigating the spread and impact of various pathogens, we recommend that the Library contemplate allocating funds above those recommended in this study until such time as a more





detailed assessment of the COVID-related aspects of the general layout, staff and public seating arrangements, building systems and materials can be addressed.

Fit within Strategic Evaluations and Planning

The projected costs are based on the current service models and delivery methodology. These are aspects of the building other than general wear and particular use that need to be considered in order to assure that the building is meeting the library's needs in serving the community. Repairs or replacements are typically one for one unless there has been a service or other paradigm described that suggests a different approach is required. An example is the replacement of large fixed service desks with smaller, more interactive staff/public service points. This report does not replace a Strategic Plan, a Facilities Plan, a Space/Needs Assessment or Program. Aesthetic quality, fit with programmatic requirements, and comparisons with other facilities in the Library's peer group are outside the scope of this study. Just as the Library has recently completed extensive renovations of the public spaces on the first and second floors, it is important that the same underlying evaluations are made periodically for other areas of the library.

Maximizing Resources

In addition to representing a potential source of additional expense as it relates to building condition, the recent closures and currently limited public access to the building presents opportunities to reduce the cost of completing the recommended repairs or replacements. Costs of working in a fully operation building can be significantly higher than completing the same work in a partially occupied facility.

The current study has identified a number of projects that would be significantly easier (and therefore less expensive) as well as less disruptive if they were

completed during a partial or full closure of the building.

- Switchgear and incoming service replacements
- Electrical feeders, branch panels and wiring, and end device replacement on the lower level and first floor
- Foundation drainage failures/water penetration at lower level
- Main entry curtainwall repair/replacement
- Pervious paver replacement
- Terrazzo flooring repair/replacement or stair replacement

Absent the pandemic, the Library should consider expenditures in a broader context, aligning repairs / replacements with each other, service based improvements, or other enhancements. Managing the timing of any work, within the limits defined, can

- spread out the financial impact,
- limit the impact of overhead expenses, or
- reduce the extent of "lost effort" associated remodeling of spaces that were recently torn up by repairs.

Code Violations and Additional Investigations

One of the components of the study process is to identify discernable violations of life safety, plumbing, mechanical or electrical codes. Two violations were noted by the electrical engineer:

- During recent mechanical upgrade, 600A loose disconnect was installed due to the limited bus space in the switchboard. This installation does not comply with NEC Article 230.72. We recommend replacing switchboard and incoming feeders.





- Multiple distribution and branch panels located on the lower and first floor are past their rated life. We recommend replacing these and associated feeders, branch wiring and end devices.

Another component of the study process to identify building systems that appear to warrant more intensive investigation or inspection.

- The hidden nature of foundation drainage systems and the complex interconnection between site work and building construction limited the ability of the study team to clearly identify a cause and solution to the water infiltration at the lower level. More invasive investigation is recommended.
- The ongoing cracking of the terrazzo stair is likely a result of flexure of the framing that supports the terrazzo. While not a safety issue in the traditional sense (the stair does not appear to be in danger of collapse), there is enough movement in the framing to induce cracking in the brittle terrazzo. The cracking, which does have a tendency to trap dirt and water, can be addressed by changing flooring materials or by stiffening the stair structure to the point where terrazzo repairs will not crack again. The Library should consider its preferences and whether to commission a structural assessment of the stair framing that the cost to provide stiffening can be determined.

Limitations

The appended schedules include opinions of both anticipated repair or replacement dates and probable cost. All costs have a subjective component and require ongoing monitoring to assess the impact of continued building use, maintenance procedures, weather and other factors that will influence the longevity of products and assemblies.

All costs and anticipated budgets are based on 2019 data and escalated at a rate of 3% per annum. Cost

data is assembled from Library records, industry standards and current construction cost review by local construction and construction management firms. Unit costs include allowances for installation, removal of existing components or material, preparation of substrates, overhead expenses associated with public sector projects, engineering or architectural design costs, permitting and other “ancillary” expenses. With these components added to the basic cost of the material, many unit costs will appear to be higher than many observers might expect. This is intentional.

Within this framework, it is important to remember that:

- No unit cost can anticipate all of the circumstances associated with procuring a specific repair or replacement.
- Many decisions regarding material selection, system development and project parameters have yet to be defined.
- Market conditions, as always, are beyond the control of the architect or estimator and will vary over time.

Thus, no guarantee can be given nor inferred that costs will not vary from these schedules. In order to ensure conformance with projected costs it is imperative that additional estimates are prepared, or specific proposals sought from potential vendors or contractors as the projected replacement or repair date nears.

Finally, the Library should review projected replacement dates based on both condition and reasonable financial planning parameters. Structuring repairs and replacements to coincide with major strategic planning initiatives, building renovations or replacements and revenue streams will maximize the community's return on its investment.





Sample Worksheet

The primary product of this study is an active workbook. Because the workbook is an active file, it provides WPL with a “living document” that can be kept current as repairs are made and used for future planning. This report presents a set of filtered data to summarize major conclusions and illustrate the ways in which the workbook can be used to assess the building and plan for future investments. The excerpt on this page and the next are offered to illustrate the level of detail in the “living document.”

Capital Repair Assessment														
Wilmette Public Library Engberg Anderson ©2019														
Clear Filters			Floor Level Key Plans			Elevation Zone Keys								
KEY:		Additional	Reno	Facade/Roof Zone	Building Project									
CR Capital Repair	Site/Exterior	1951	1988	1	1967	1951 New Construction; 1964 Childrens Room		1987			-1	Compared to		
MM Major	Common	1964	1993	2	1934	Expansion; 1967 Addition; 1970 LL Stacks; 1978		Repaired, replaced, or remodeled zinc			Number of years to replacement date	predicted		
	Public LL	1967	1995	3	1978	Expansion; 1986 Expansion; 1988 Fire Protection; 1988					System is			
	Public 1	1978	2002	4	1951	Wood Stacks; 1993 Parking Lot; 1994 Vestibule; 1995					System is			
1 Life Safety, Code	Public 2	1987	2004	5	1987	Parking Lot; 1997 Addition; 2002 Lighting; 2004					System is			
2 Occupant Health	Public 3	1997	2007	6	1951	Landscape; 2007 Fire Alarm; 2009 Interior Reno; 2015					System is			
3 Building System	Staff		2009	7	1987	2nd Flr Reno								
4 Operational	Support		20015	8	1997									
Key Sort														
Location & Category														
Product Data/Life Expectancy														
Evaluate														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CR	Major	Category	Zone	Room Number or Area / Zone	Building Year	CSI#	System	System Location	Component	Installed Date	Planned Service Life	Replace Year - This	Remaining Life - This	Evaluation Year
447	CR	3	SITE	Exterior	1987	32	Site	Linear On-site Sidewalk	Sidewalk - replace	1987	40	2027	7	2020
448	CR	3	SITE	Exterior	1987	32	Site	Linear On-site curb & gutter	Curb & Gutter - replace	1987	50	2037	17	2020
449	CR	3	SITE	Exterior	2019	32	Site	West Main Plaza	Sidewalk - replace	2019	40	2059	39	2020
450	CR	3	SITE	Exterior	2019	33	Utilities	West/South Side Building	Install Drainage structures and under drains	2019	20	2039	19	2020
451	CR	3	SITE	Exterior	1987	33	Utilities	On Site	Sanitary Sewer - replace	1987	50	2037	17	2020
452	CR	3	SITE	Exterior	1987	33	Utilities	On Site	Water Service - replace	1987	50	2037	17	2020
453	M	3	SITE	Exterior	1987	33	Utilities	On Site	Site Sanitary and Storm Sewers - Televising/Cleaning	1987	10	1997	-23	2020
454	CR	3	Building	Exterior	1987	33	Utilities	South Side of Building	Investigate Old remnant foundation and backfill materials	1987	50	2037	17	2020
455	CR	3	1	South Façade	1967	07C	Cladding	Walls	EIFS - Repair	1967	25	1992	-28	2020
456	CR	3	4	Roof	1951	07R	Roof		Roof, EPDM Membrane - replace, fully adhered	2008	25	2033	13	2020
457	CR	3	6	Roof	1951	07R	Roof		Roof, EPDM Membrane - replace, fully adhered	2008	25	2033	13	2020
458	CR	3	4	Roof	1951	07R	Roof		Stone - reseat joints	1951	20	1971	-49	2020
459	M	3	6	Roof	1951	07R	Roof		Metal Coping - reseat	2008	8	2016	-4	2020
460	M	3	6	Roof	1951	07R	Roof		Metal Coping - reseat	2008	8	2016	-4	2020
461	M	3	4	Roof	1951	07R	Roof		Roof, remedial maintenance	2008	10	2018	-2	2020
462	M	3	6	Roof	1951	07R	Roof		Roof, remedial maintenance	2008	10	2018	-2	2020
461	CR	3	1	Roof	1967	07R	Roof		Roof, EPDM Membrane - replace, fully adhered	2016	25	2041	21	2020
462	M	3	1	Roof	1967	07R	Roof		Metal Coping - reseat	2016	8	2024	4	2020
463	M	3	1	Roof	1967	07R	Roof		Metal Coping - reseat	2016	8	2024	4	2020
464	M	3	1	Roof	1967	07R	Roof		Metal Coping - reseat	2016	8	2024	4	2020



↓	2020	2020	2020
normal or, Better than normal, Normal, Wearing faster than normal and needs replacing	Evaluated - Theoretical	Approximate cart in Evaluation Year	Approximate cart in a particular year by entering year above.

16 Condition	17 Remain's Life - Evalua	18 Equipment Cost from Vendors		20 Opinion of Estimated Cost Data										29 Escalated Cart at Budget Year - Plan	30 Comments
		19 Probable Install Cart	20 Budget Year - Ther	21 Budget Year - Plan	22 Qty	23 Unitz	24 Pre-Ration	25 Base Unit Cost	26 Purchase Price	27 Adjusted Installed Cart	28 Adjusted Cart Selected Year (enter ab				
Normal	7		2027	2027	250	SY	100%	\$ 50	\$ 12,500	\$ 15,625	\$ 15,625	\$ 15,625	\$ 19,217	Cost is for replacing entirety of sidewalk along sides of building and leading to doors (not walks in road right-of-	
Normal	17		2037	2037	1,000	LF	100%	\$ 40	\$ 40,000	\$ 46,000	\$ 46,000	\$ 46,000	\$ 76,031	Cost is for replacing curb & gutter throughout site (not in road right-of-way)	
Normal	39		2059	2059	250	SY	100%	\$ 50	\$ 12,500	\$ 15,625	\$ 15,625	\$ 15,625	\$ 49,485	Cost is for replacing entirety of sidewalk from Main Entry to Park Ave (not walks in road right-of-way)	
Used Up	-1		2020	2020	1	EA	100%	\$ 30,000	\$ 30,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	Cost is for installation of drainage structures, under drain piping and connection to municipal sewer	
Normal	17		2037	2037	100	LF	100%	\$ 250	\$ 25,000	\$ 31,250	\$ 31,250	\$ 31,250	\$ 51,651	Cost is for cured-in-place pipe lining	
Normal	17		2037	2037	50	LF	100%	\$ 500	\$ 25,000	\$ 32,500	\$ 32,500	\$ 32,500	\$ 53,718	Cost is for replacement of water service, valves, vents to connection to municipal main	
Used Up	-23		2020	2020	600	LF	100%	\$ 5	\$ 3,000	\$ 3,300	\$ 3,300	\$ 3,300	\$ 3,300	Cost is for televising to assess sewer condition	
Used Up	-1		2020	2020	1	EA	100%	\$ 5,000	\$ 5,000	\$ 5,500	\$ 5,500	\$ 5,500	\$ 5,500	Cost is for the investigation of remnant buried foundation walls and evaluation of backfill materials	
Used Up	-28		2020	2020	120	SF	100%	\$ 7.00	\$ 840	\$ 1,050	\$ 1,050	\$ 1,050	\$ 1,050		
Normal	13		2033	2033	3,497	SF	100%	\$ 30.00	\$ 104,910	\$ 131,138	\$ 131,138	\$ 131,138	\$ 192,580		
Normal	13		2033	2033	2,015	SF	100%	\$ 30.00	\$ 60,450	\$ 75,563	\$ 75,563	\$ 75,563	\$ 110,966		
Used Up	-49		2020	2020	119	LF	100%	\$ 9.00	\$ 1,071	\$ 1,339	\$ 1,339	\$ 1,339	\$ 1,339		
Used Up	-4		2020	2020	114	LF	100%	\$ 4.12	\$ 470	\$ 587	\$ 587	\$ 587	\$ 587		
Used Up	-4		2020	2020	21	LF	100%	\$ 4.12	\$ 87	\$ 108	\$ 108	\$ 108	\$ 108		
Used Up	-2		2020	2020	3,497	SF	100%	\$ 1.50	\$ 5,246	\$ 6,557	\$ 6,557	\$ 6,557	\$ 6,557		
Used Up	-2		2020	2020	2,015	SF	100%	\$ 1.50	\$ 3,023	\$ 3,778	\$ 3,778	\$ 3,778	\$ 3,778		
Normal	21		2041	2041	4,210	SF	100%	\$ 30.00	\$ 126,300	\$ 157,875	\$ 157,875	\$ 157,875	\$ 293,694		
Normal	4		2024	2024	173	LF	100%	\$ 4.12	\$ 713	\$ 891	\$ 891	\$ 891	\$ 1,003		
Normal	4		2024	2024	38	LF	100%	\$ 4.12	\$ 157	\$ 196	\$ 196	\$ 196	\$ 220		
Normal	4		2024	2024	26	LF	100%	\$ 4.12	\$ 107	\$ 134	\$ 134	\$ 134	\$ 151		





Anticipated Annual Capital Repair & Major Maintenance (CR & M) Costs, 2020-2039

	1 Life Safety	2 Occupant Health	3 Building / System Integrity	4 Obsolescence	Sum 1-4	Average per year within 5 year period
2020	\$720,000	\$575,515	\$618,477	\$55,935	\$1,969,927	\$452,686
2021	\$0	\$0	\$116,173	\$0	\$116,173	
2022	\$0	\$0	\$123,639	\$48,976	\$172,615	
2023	\$0	\$0	\$0	\$0	\$0	
2024	\$0	\$0	\$4,714	\$0	\$4,714	
5 Year Group	\$720,000	\$575,515	\$863,002	\$104,911	\$2,263,429	
2025	\$0	\$0	\$217,364	\$0	\$217,364	\$326,606
2026	\$0	\$0	\$86,829	\$0	\$86,829	
2027	\$485,800	\$27,672	\$787,965	\$0	\$1,301,437	
2028	\$0	\$0	\$0	\$0	\$0	
2029	\$0	\$0	\$27,400	\$0	\$27,400	
5 Year Group	\$485,800	\$27,672	\$1,119,558	\$0	\$1,633,031	
2030	\$0	\$121,401	\$0	\$0	\$121,401	\$521,525
2031	\$77,863	\$48,448	\$735,374	\$0	\$861,686	
2032	\$0	\$71,288	\$0	\$0	\$71,288	
2033	\$0	\$0	\$872,584	\$0	\$872,584	
2034	\$47,268	\$0	\$633,397	\$0	\$680,665	
5 Year Group	\$125,132	\$241,138	\$2,241,356	\$0	\$2,607,625	
2035	\$0	\$0	\$0	\$0	\$0	\$246,658
2036	\$0	\$0	\$522,088	\$0	\$522,088	
2037	\$0	\$0	\$272,823	\$0	\$272,823	
2038	\$0	\$0	\$0	\$0	\$0	
2039	\$0	\$0	\$438,377	\$0	\$438,377	
5 Year Group	\$0	\$0	\$1,233,288	\$0	\$1,233,288	
TOTAL	\$1,330,932	\$844,325	\$5,457,204	\$104,911	\$7,737,372	

Approximately \$7.7 million is needed over the next 20 years to maintain the physical integrity and appearance of the building. This is an average of just over \$386,000 per year. Based on the evaluation, and the anticipated timing of the various systems reaching the end of their anticipated lifespan, a more filtered assessment indicates spikes in the near future as masonry, roofs, building sealants, electrical systems and site paving need repair or replacement.

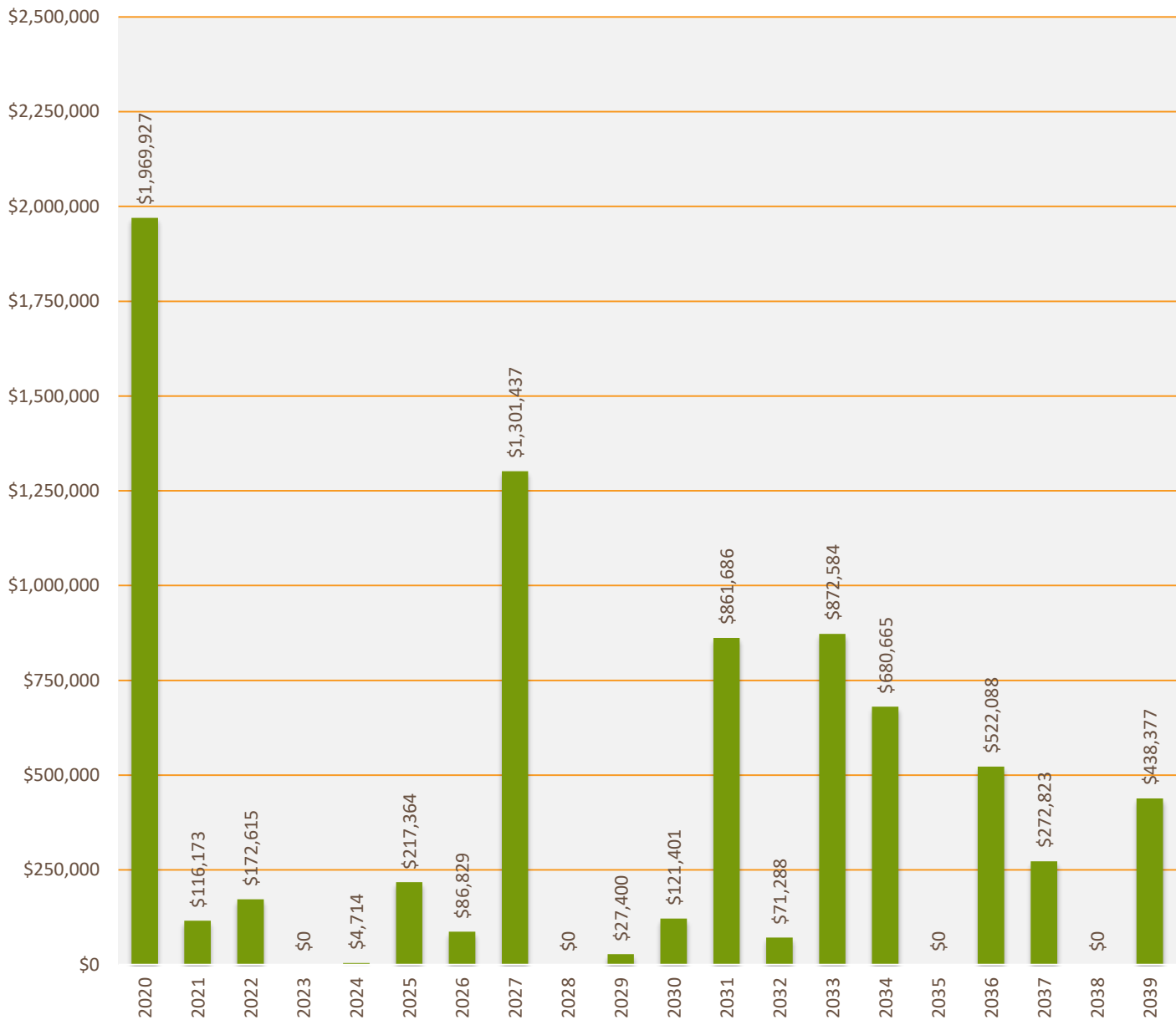
Notes:

Costs are for repairs and replacements only. Many repairs will precipitate ancillary work (removal of ceilings, walls, floor or other intervening construction) that will add to the scheduled cost of the work.

Short lifespan repairs (interior painting with a 3-5 year lifespan as an example) are included in the workbook only at the initial occurrence. Actual expenses will recur within the 20 year window.



20-Year Anticipated CR & M Costs by Year



Major expenses occur in predictable patterns. Near term expenses (2020) are reflective of the age of the building and the need to continue the Library’s efforts to keep the various portions of the building in good working order. Mid-term expenses (2027) reflect the aging of systems installed or repaired in recent renovations, many of which will have 20- to 25-year lifespans. Longer term expenses are associated with building systems that are inherently more robust, less prone to damage, or less exposed to wear.

Notes:

Costs are for repairs and replacements only. Many repairs will precipitate ancillary work (removal of ceilings, walls, floor or other intervening construction) that will add to the scheduled cost of the work.

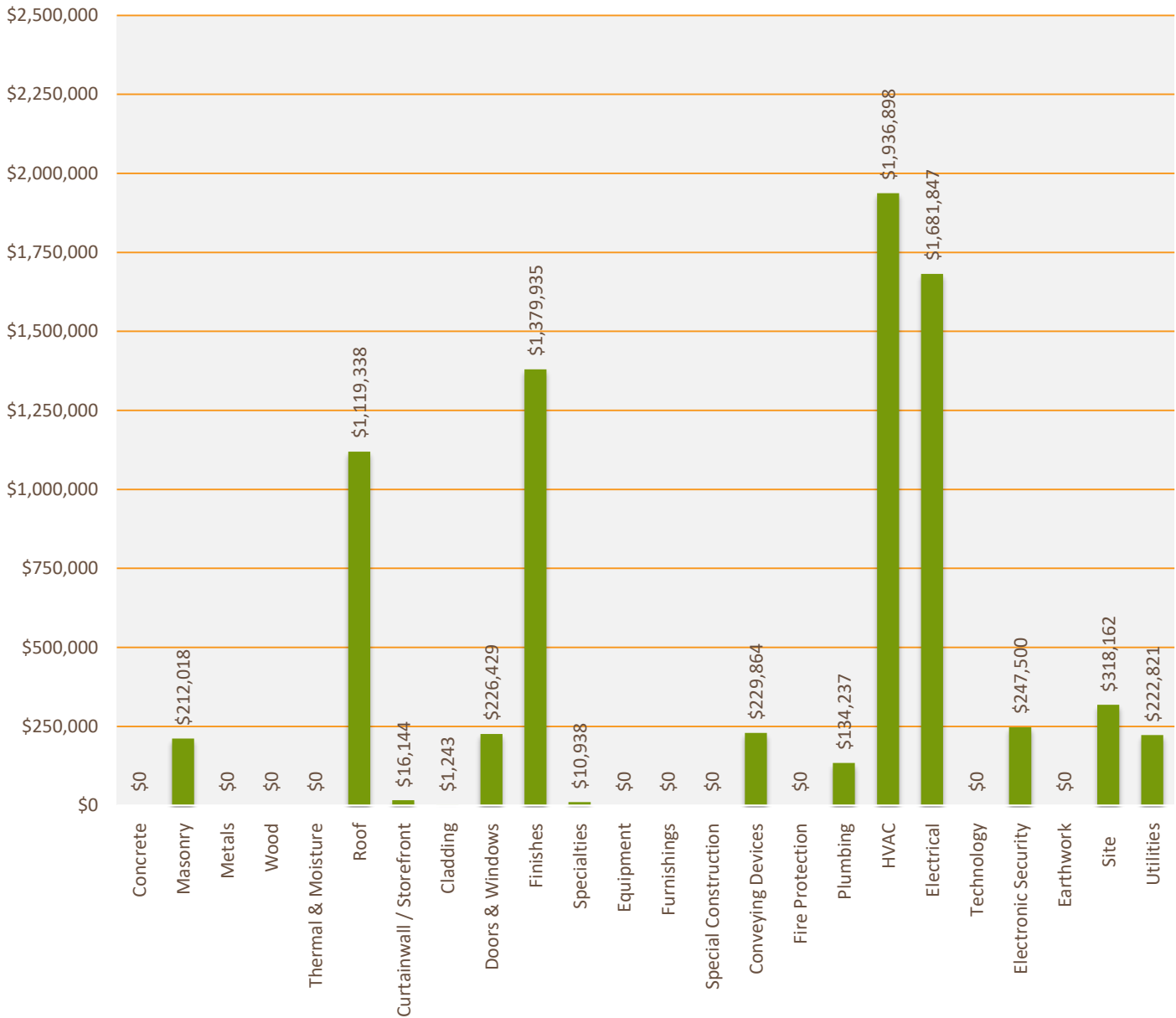
Short lifespan repairs (interior painting with a 3-5 year lifespan as an example) are included in the workbook only at the initial occurrence.

Actual expenses will recur within the 20 year window.





20-Year Anticipated CR & M Costs by Category



Major expenses align with typical lifecycle milestones for the two parts of the building (original, additions, and major renovations). The last major renovation occurred in 2016 and those installations will be 20 years old in 2036 and major systems will be in need of repair or replacement. Similar cycles are driving the projected expenses in 2016/2017. The bulk of repairs need in 2020 will reduce the size of the projected repairs until 2040.

The significant investment in 2020 is the cumulative effect of multiple systems wearing to the point of near failure. More detail is shown in the next graph.

Notes:

Costs are for repairs and replacements only. Many repairs will precipitate ancillary work (removal of ceilings, walls, floor or other intervening construction) that will add to the scheduled cost of the work.

Short lifespan repairs (interior painting with a 3-5 year lifespan as an example) are included in the workbook only at the initial occurrence.

Actual expenses will recur within the 20 year window.

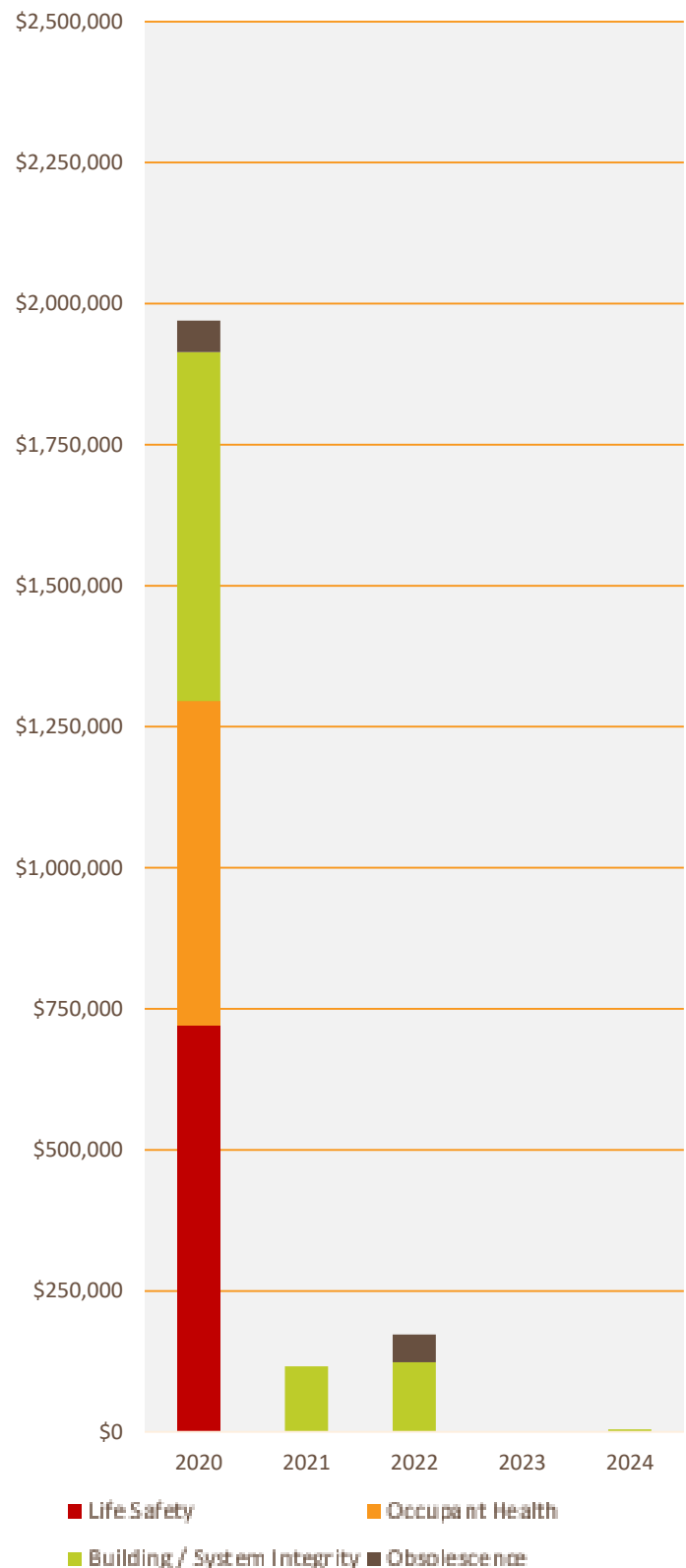


5-Year Anticipated Costs by Priority 2020-2024

Of the major costs identified for the 2020 to 2024 planning period, 2 groups of expenses stand out.

The critical life safety items relate to the replacement of various electrical components: aged wiring, devices, panels and switchboards. These are items untouched by previous renovations, items configured in ways that do not meet current codes, and suffer from general degradation of electrical components over time.

The roof, exterior walls, exterior sealants, front entry storefront, planters and grade adjacent to building need work to reduce the movement of water to and into the building.



Notes:

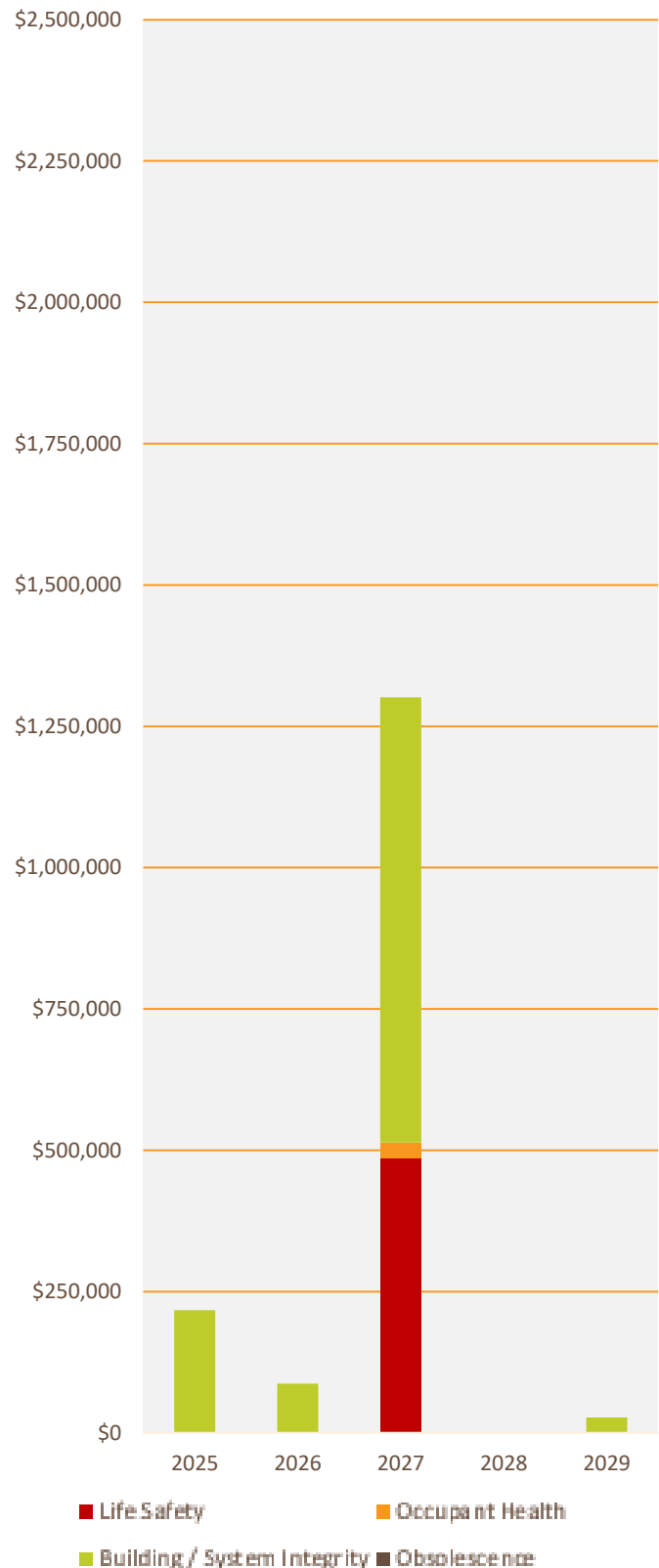
Costs are for repairs and replacements only. Many repairs will precipitate ancillary work (removal of ceilings, walls, floor or other intervening construction) that will add to the scheduled cost of the work.

Short lifespan repairs (interior painting with a 3-5 year lifespan as an example) are included in the workbook only at the initial occurrence. Actual expenses will recur within the 20 year window.



5-Year Anticipated Costs by Priority 2025-2029

Electrical systems are the major expense in the 2025-2029 timeframe. Power and lighting systems will need updating. Accelerating the lighting and lighting control replacement will see energy savings, reduced load on cooling systems, and better light quality.



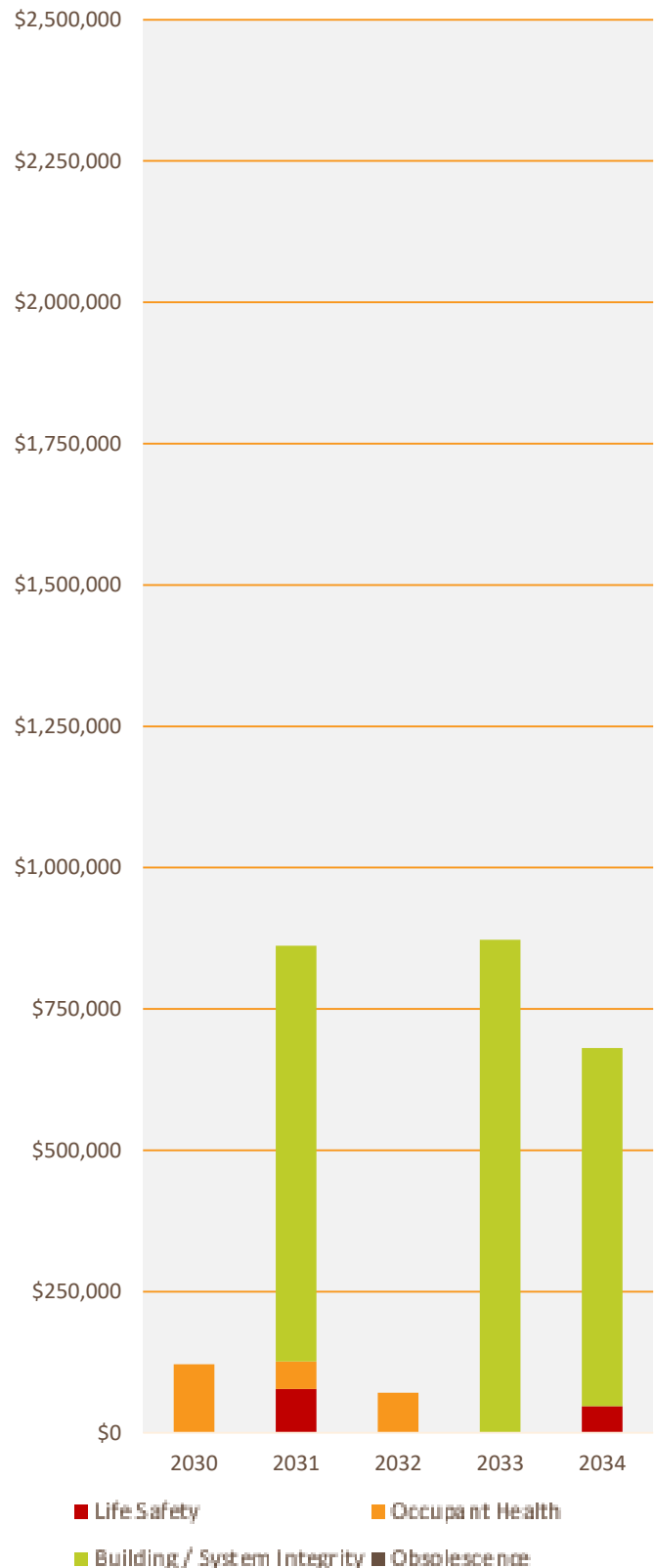
Notes:

Costs are for repairs and replacements only. Many repairs will precipitate ancillary work (removal of ceilings, walls, floor or other intervening construction) that will add to the scheduled cost of the work. Short lifespan repairs (interior painting with a 3-5 year lifespan as an example) are included in the workbook only at the initial occurrence. Actual expenses will recur within the 20 year window



5-Year Anticipated Costs by Priority 2030-2034

In the 2030-2034 timeframe the major expenses are envisioned to be roof repair, and most notably, HVAC system replacements.



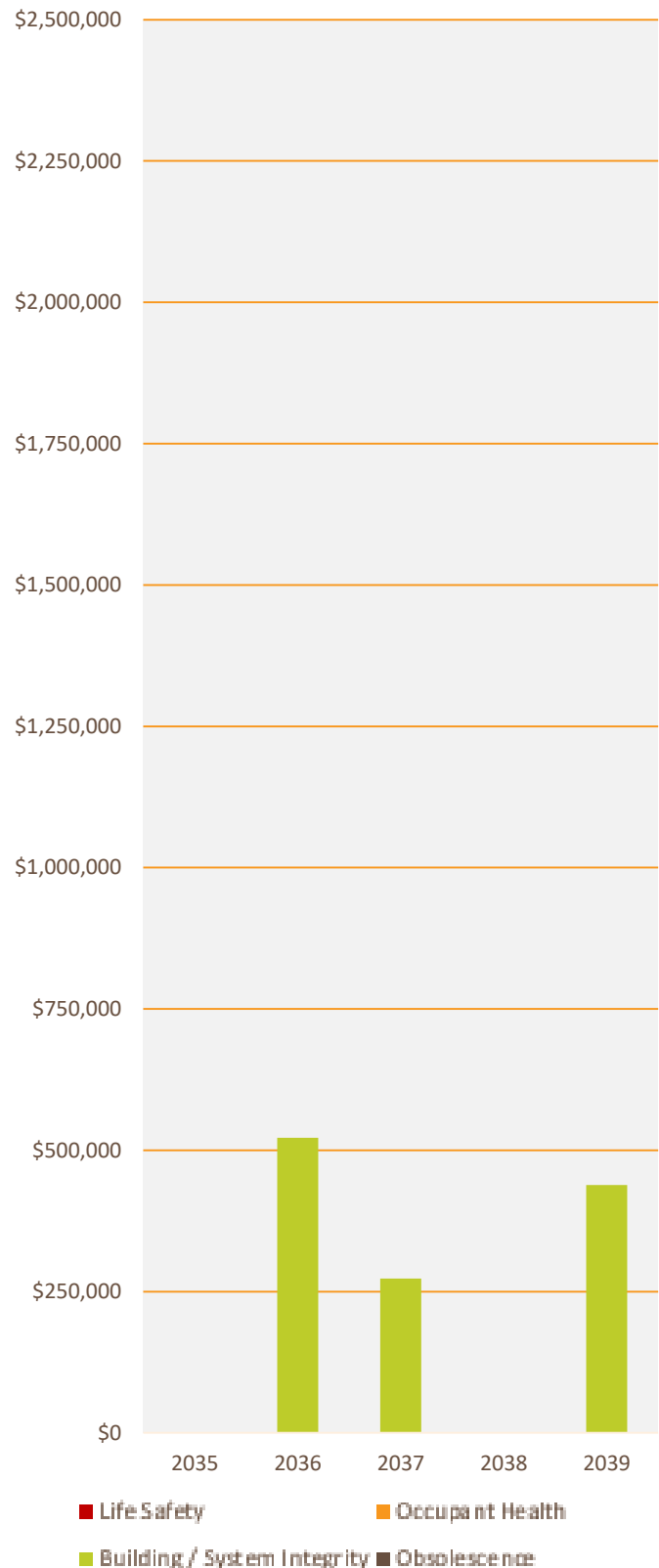
Notes:

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5-Year Anticipated Costs by Priority 2035 -2039

At the end of the twenty year period encompassed by this study, the renovations completed in 2009 and 2016 will be aging out. Investments in interior finishes, mechanical systems and utilities should be considered.

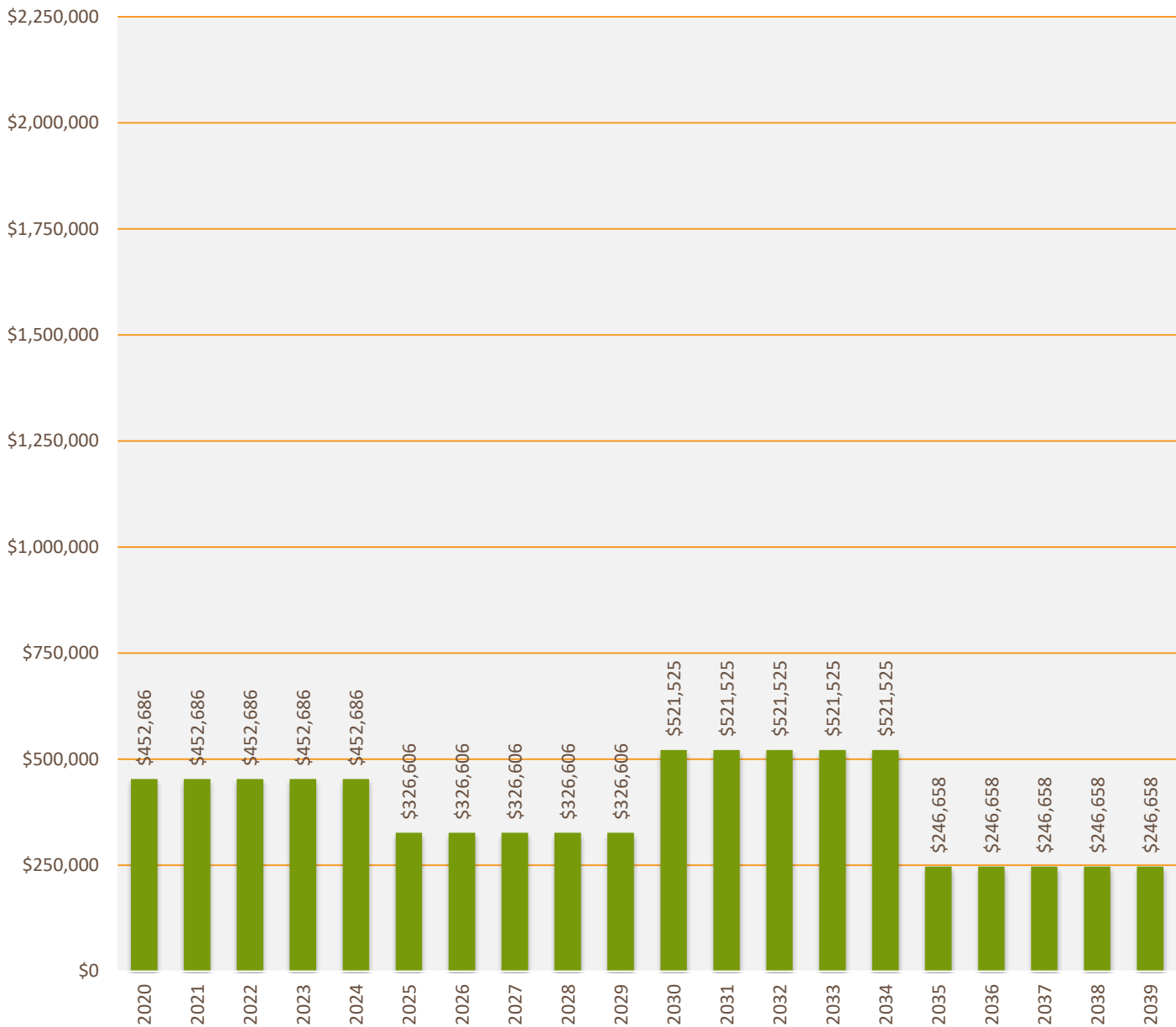


Notes:

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CR & M Costs Averaged Over 5 Year Periods



Spikes in the repair / replacement costs can be mitigated by budgeting and expenditure strategies that look at 5 year planning periods. While there is merit in grouping as many repairs as practical into a single larger project (lower cost, less interference with public use of the building) there is value in separating the budgeting process from these larger expenditures. Setting aside smaller more manageable reserves over a series of years can be arranged to fund a major repair project. This graph illustrates the Capital Repair & Maintenance expenses averaged over a series of 5-year planning periods.



Site Conditions

Eriksson Engineering Associates, Ltd. (EEA) was retained by Engberg Anderson Architects (EA) on behalf of Wilmette Public Library (WPL) to assess parking lots, driveways, sidewalks, and associated drainage issues as part of a Capital Reserve Study (CRS) at their facility located at the intersection of Park Avenue and Wilmette Avenue in Wilmette, IL.

Objective

The objective of the assessment was to observe the existing conditions of the site, locate areas in need of repair, evaluate what type of repairs may be appropriate, prioritize repairs by area and type, and provide a ballpark opinion of probable cost on the repair for budget and future planning purposes. The main focus was to identify issues that, in our opinion, constituted safety concerns or might be contributing to building drainage issues.

Records Review

In order to gain a holistic understanding of the existing conditions and what might be contributing to any issues, available site surveys and aerial imagery were reviewed. Relevant survey records and historic aerial photographs can be found in Appendix A. The following is a summary of the records reviewed.

2007 Aerial Imagery

- Baseline site conditions
- Parking lot repaved (overlay or full-depth replacement unknown)

2010 Aerial Imagery

- Evidence of parking asphalt deterioration – more severe east side of lot

2012 Aerial Imagery

- Evidence of parking asphalt deterioration – more severe east side of lot

2013 Aerial Imagery

- Parking lot asphalt replaced with permeable pavers
- 2018 Aerial Imagery
- Current condition with exception of main entry plaza

2019 As-built documents

- Topographic data of 2019 sidewalks and main plaza reconstruction project

Site Observations and Recommendations

EEA visited the site in mid-December 2019 to visually observe existing conditions in the field. Details of site and associated building issues were discussed with library staff. Photographs were taken of the interior and exterior areas of concern of library staff to provide supporting documentation for reporting purposes.

They can be found in Appendix B. Topographic surveying and geotechnical investigation (soil borings and pavement cores) were not performed as part of this assessment.

Building Perimeter

Over the years, several building expansion projects have taken place. In each instance, different perimeter conditions resulted relative to the interface between the building foundations and the exterior site. At this time, the priority issue involves correction of the leakage that is experienced within the basement, primarily along the south side of the building. The following is a list of issues observed and discussed with WPL staff:

There are specific locations in which area wells require modification due to elevation issues.

- Leakage into basement results in wet carpet areas and damage to shelving units and walls and was also evident in crawl space





Site Conditions

- Basement floor appears to slope toward area of primary saturation (rolling ball tests)
- Drainage and ground water issues outside the building are likely the primary contributing factor
- Staff indicated an existing foundation was left in place when demolition occurred south of the library
- The old foundation could be holding water, thereby increasing water pressure, against the current foundation
- Elevated planter area along south side of building may be contributing to water infiltration as brick flashing is in disrepair
- No foundation drainage is installed per staff's knowledge
- Irrigation lines may need to be tested/checked for leaks
- Landscaping along south and west sides of building appears to be at and in some location above the finished floor/brick ledge
- Downspouts at south side of building discharge to splash blocks that are back-pitched toward the building – portions of exterior landscaping also flow back toward building walls
- The top of the area wells along the west side of the building are below adjacent landscape and sidewalk elevations
- Retaining wall and door associated with exterior stairway to basement (east side of building) exhibit signs of water damage/infiltration
- There is a general lack of drainage structures south and west of the building

Prior to development of measures to remediate the basement leakage issues, we recommend further investigation as to the condition of the foundation waterproofing, possible influence of the old foundation

wall, and type and condition of building backfill materials. Input from a geotechnical engineer is recommended.

Relative to exterior surface drainage issues, lowering the landscape elevations along the building walls below the brick ledge/flashing is recommended. If necessary, perimeter under drainage and drainage structures could be considered, as well.

Parking Lot

The parking lot was either repaved full-depth or milled and over-laid sometime near 2007. In 2013, the asphalt pavement was replaced with a permeable paver surface. Records of the paver design (section, drainage course, under drains, etc.) were not reviewed. The following is a list of issues observed:

- Bollards at Book Drop appear to have been hit numerous times
- Staff indicated they experience an icy situation at Book Drop regularly
- Staff indicated when sidewalks and parking lot were reconstructed drainage has been non-apparent in the area
- A drainage structure is located within the lot, but surface does not appear to slope toward the structure
- Car travel paths throughout parking lot exhibit rutting/settlement and separation of pavers
 - Rutting is most severe at turns (east end of parking lot near Book Drop) and at Entrance/Exit drives to Park Avenue
- Multiple pedestrian crossings exist into the paver parking lot from the west, which have impacted landscaping





Site Conditions

Based on the rutting and separation of pavers observed within the parking lot, it is our opinion the sub-grade and/or pavement section is insufficient for the repeated loadings experienced. Sub-surface and surface drainage issues are also evident.

We recommend WPL contract a geotechnical engineering firm to collect initial subgrade samples of the parking lot areas recommended for remediation. The results of this type of investigation will help determine the likely source of failures (underlying material, saturation, etc.). This, in turn, will assist in the design of replacement paver sections and remediation measures, such as undercutting unsatisfactory soils, geotextiles, and sub-surface under drainage.

Other options to consider pending results of the geotechnical investigation are; 1) adding concrete banding to confine laterally the pavers at the turns near the Book Drop or replacing pavers with a concrete pad at the Book Drop. A covered area at the Book Drop might reduce icing conditions.

Dedicated crossing points and crosswalks from the west parking lot into the site might reduce the multiple crossing points created by pedestrians.

Sidewalks and Curbs

The majority of the on-site sidewalks were removed and replaced in 2019. Although some minor hairline cracks were observed, no repairs are recommended as the cracks fall within standard tolerances. There are deficiencies in the sidewalks in the public right-of-way areas of Park Avenue and Wilmette Avenue. In particular, there are settled sidewalk areas near the Pace Bus stop enclosure. In addition, the ADA ramp from the Main Plaza to Park Avenue exhibits the potential for drainage issues. The adjacent ADA parking stall in Park Avenue is Non-Compliant.

The curbs within the parking lot are in good condition, generally. Regular maintenance to remove and replace cracked and deteriorated sections can be expected.

Utilities

Water Main/Service:

Staff did not report issues with the existing potable water supply. We offer no recommendations at this time.

Sanitary Sewer Service:

Staff did not report issues with the existing sanitary sewer service. However, there are no records of inspections associated with the sewers. Therefore, it is recommended the lines be televised in order to assess their condition and to establish a baseline for future monitoring, maintenance, and repair.

Storm Sewers:

Staff did not report issues with the existing storm sewers specifically. However, due to reports of standing water on the surface of the parking lot, there may be deficiencies in the drainage structures or pipes. There are also no records of inspections associated with the sewers. Therefore, it is recommended the lines be televised in order to assess their condition and to establish a baseline for future monitoring, maintenance, and repair.

Site Conditions

*Top: Stained carpet in basement
Bottom: Water damage along south foundation wall*



*Top: Water staining at location of area well
Bottom: Top of area wells below sidewalk*





Site Conditions

Top: Landscaping along west wall above brick ledge and area well
Bottom: Landscaping above brick ledge south side of building



Top: Elevated planter wall extending past raised foundation wall and flashing in disrepair
Bottom: Sidewalk at door east of elevated planter above brick ledge



Site Conditions

Top: Splash blocks and landscaping pitched toward south side of building (section of sidewalk at door potentially pitched to door)

Bottom: Water infiltration (east exterior stairway)



Top: Water damage at bottom of door (east exterior stairway)

Bottom: Rutting of pavers at Exit to Park Avenue

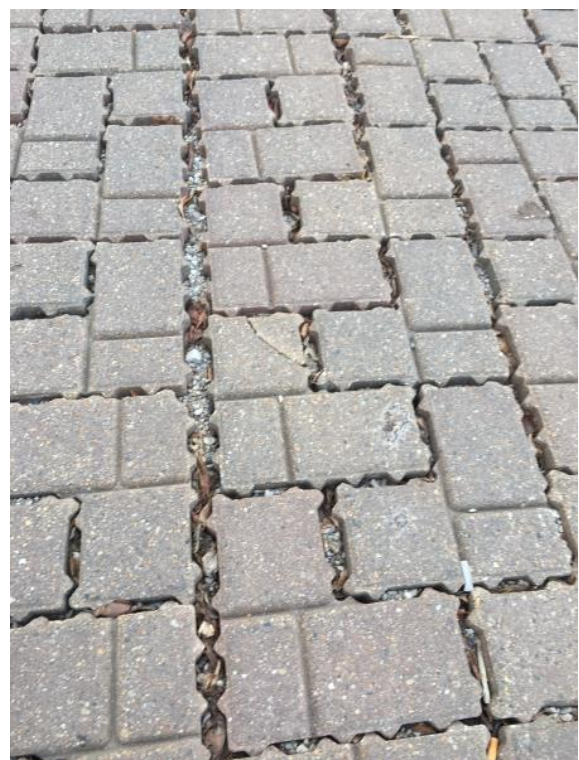


Site Conditions

*Top: Rutting of pavers along west drive lane
Bottom: Rutting and separation of pavers at Book Drop*



*Top: Rutting of pavers at turn adjacent to Book Drop
Bottom: Typical separation of pavers at rutting locations*





Roof Assemblies

Roof 01

- Roof 01 appears to be a multi-layer modified bitumen roof membrane material manufactured by Siplast. This roof appears to be in good/fair condition. The perimeter is metal coping and is in good condition. All metal coping sealants should be replaced. Roof drains were clear of debris.
- A fairly large uneven spot in the roof was noted on the drawings. There are signs that water ponds in this area.
- Flashing Along East Roof / Wall Transition
- The sealant at the top of the roof wall flashing along the east wall is failing or cupping. All flashing sealants should be schedule for replacement.

Roof 01a

- This is a small area just above Roof 1 and below Roof 6. This roof appears to be a multi-layer modified bitumen roof membrane material manufactured by Siplast and is in good condition. The perimeter is metal coping and is in good condition. All metal coping sealants should be replaced. Roof drains were clear of debris.

Roof 01b

- This is a small area just below Roof 1 which forms a roof pit. (all sides are lower than the adjacent roofs which could form a bath tub) it is important to keep the roof drain clear at all times. Roof drain was not clear. This roof appears to be a multi-layer modified bitumen roof membrane material manufactured by Siplast and is in good condition. The perimeter is metal coping and is in good condition. All metal coping sealants should be replaced. There are (3) mechanical units on this roof. It was noted that some of the mechanical piping insulation is damaged. This should be replaced.

- It is recommended that a roof walkway pad be added between the access door, mechanical units, and roof ladders.

Flashing Along East Roof / Wall Transition

- The sealant at the top of the roof wall flashing along the east wall is failing or cupping. All flashing sealants should be schedule for replacement.

Roof 02

- Roof 02 appears to be a multi-layer modified bitumen roof membrane material manufactured by Siplast. This roof appears to be in poor condition. There is visible signed of cracking and weathering. In addition, the roof has waves between membrane seams. The perimeter is metal coping and is in good condition. All metal coping sealants should be replaced. There is a unique building detail with intricate flashing. This should be monitored annually for sealant integrity. Roof drains were clear of debris.

Roof 03

- Roof 03 appears to be a multi-layer modified bitumen roof membrane material manufactured by Siplast. This roof appears to be in good condition. The perimeter is metal coping and is in good condition. All metal coping sealants should be replaced. Roof drains were clear of debris.



Roof Assemblies

Roof 04

- Roof 04 appears to be a multi-layer modified bitumen roof membrane material manufactured by Siplast. This roof appears to be in fair condition. Some cracking and wear was observed. The perimeter is stone coping. Roof drains were clear of debris. This roof have (1) mechanical unit.
- It is recommended that a roof walkway pad be added between the access door, mechanical units, and roof ladders.

Roof 05

- Roof 05 appears to be a multi-layer modified bitumen roof membrane material manufactured by Siplast. This roof appears to be in fair condition. Some cracking and wear was observed. The perimeter is stone coping. Roof drains were clear of debris.

Roof 06

- Roof 06 appears to be a multi-layer modified bitumen roof membrane material manufactured by Siplast. The roof appears to be in good condition. The roof perimeter is primary metal coping except for Roof 6a which has some stone coping. This roof has 1 piece of mechanical equipment, a short pipe railing, (2) chimneys, and the main access door to the building. Roof drains were clear of debris.
- Refer to Lower Roof North Chimney. Refer to Lower Roof South Chimney
- It is recommended that a roof walkway pad be added between the access door, mechanical units, and roof ladders.

Flashing Along East Roof / Wall Transition →

- The sealant at the top of the roof wall flashing along the east wall is failing or cupping. All flashing sealants should be schedule for replacement.

Roof 06a

- This is a small area at the same level as Roof 06. This roof appears to be a multi-layer modified bitumen roof membrane material manufactured by Siplast and is in fair condition. The material has some cracking and has signs of wear.
- It is recommended that a roof walkway pad be added between the access door, mechanical units, and roof ladders.

Scupper

- Roof 06a is drained to Roof 04 through a scupper. The membrane flashing around the scupper is failing. This should be repaired immediately. Scupper was clear of debris.





Roof Assemblies

Roof 07

- Roof 07 appears to be a multi-layer modified bitumen roof membrane material manufactured by Siplast. This roof appears to be in fair/poor condition. Some cracking and wear was observed. The perimeter is stone coping. Roof drains were clear of debris. This roof has (2) mechanical units, a railing, a skylight and a chimney.
- See South Skylight. See Upper Chimney.
- It is recommended that a roof walkway pad be added between the access door, mechanical units, and roof ladders.
- Several locations were noted with standing water.



Roof 08

- Roof 08 appears to be a multi-layer modified bitumen roof membrane material manufactured by Siplast. This roof appears to be in fair/poor condition. Some cracking and wear was observed as well as some spongy roof areas. The perimeter is stone coping. Roof drains were clear of debris. This roof has (1) mechanical unit, and a skylight.
- See North Skylight
- It is recommended that a roof walkway pad be added between the access door, mechanical units, and roof ladders.

Stone Coping

- All stone coping locations need to be cleaned.
- All vertical and horizontal joints are sealant. Sealant needs to be replaced.



Upper Roof Chimney

- The metal flashing at the North Chimney requires the sealant to be replaced. The sealant is either failing or is cupping allowing water to pool.
- The brick should be tuck pointed. (20%)





Roof Assemblies

Lower Roof North Chimney

- The metal flashing at the North Chimney requires the sealant to be replaced. The sealant is either failing or is cupping allowing water to pool.
- The brick should be tuck pointed. (75%-80%)



South Skylight

- The south skylight is square and is in good condition. The skylight should be reviewed annually for sealant integrity and signs of wear.



Lower Roof South Chimney and/or Elevator Overrun:

- The metal flashing at the North Chimney requires the sealant to be replaced. The sealant is either failing or is cupping allowing water to pool.
- The brick should be tuck pointed. (50%)



North Skylight:

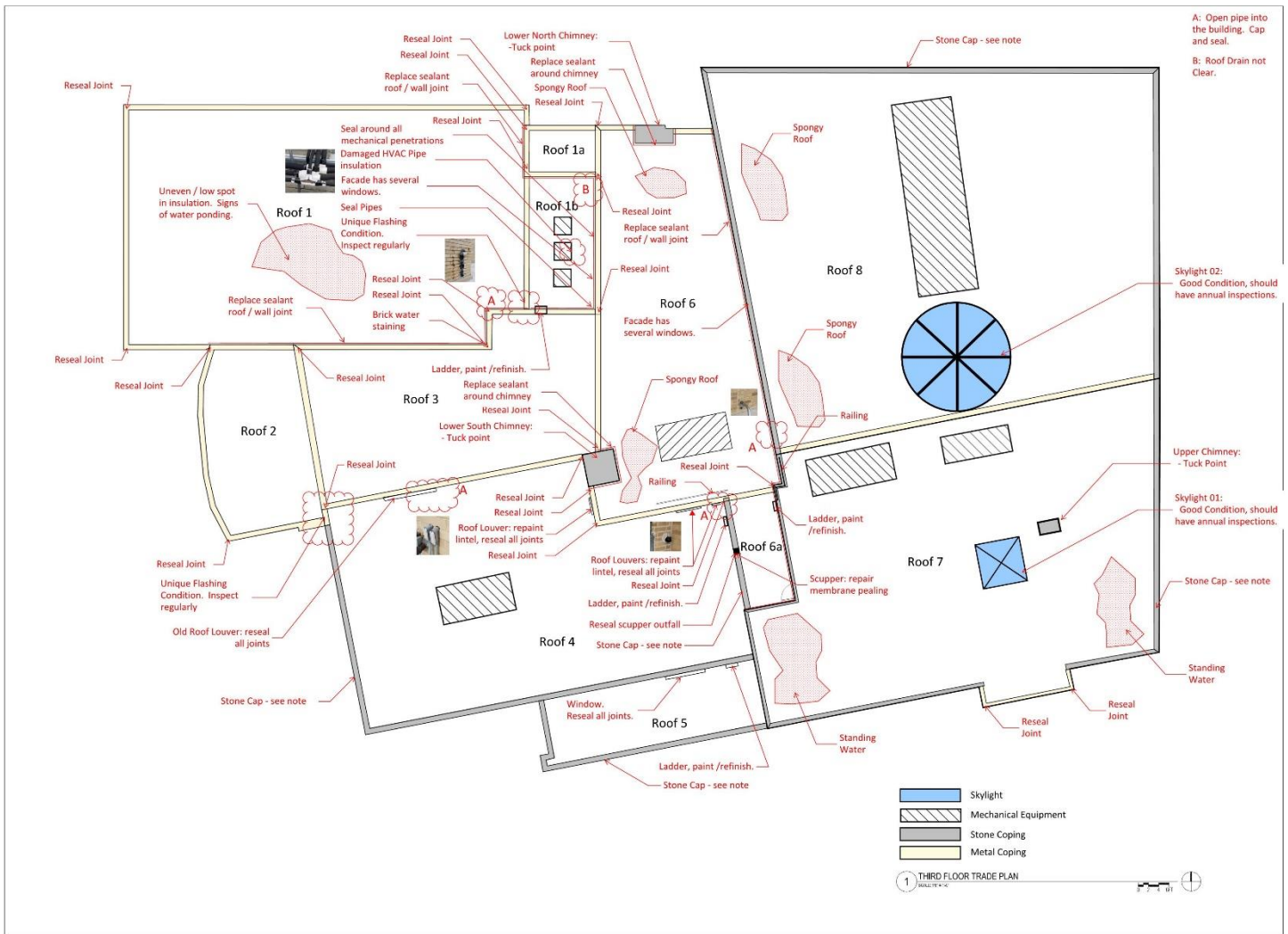
- The south skylight is a segmented circle and is in good condition. The skylight should be reviewed annually for sealant integrity and signs of wear.



Metal Roof Ladders

- All metal ladders should be repainted with a high performance exterior grade paint.

Roof Assemblies





Exterior Wall Assemblies

Specific notes are shown on the elevations on the next page.

Masonry

Stone/Cast Stone

Cleaning is required to remove particulates that can, over time, in combination with rainwater, create acids that will eat at the underlying materials, etching the surface and accelerating the rate of deterioration and discoloration.

Skyward facing joints in the stone coping should be changed from mortar to a soft joint. Refer to the Roof Assembly section for notes on stone coping.

Brick

Tuck-pointing is needed at about 5% of the brick surface area.

Control joints in the masonry veneer have performed well but have reached the age where they are in need of replacement.

Metal

Cleaning is required to remove particulates that can, over time, in combination with rainwater, create acids that will eat at the underlying materials, etching the surface and accelerating the rate of deterioration and discoloration.

Painting of grates, ladders and other ferrous metal items is needed.

Windows & Doors

Some repair and replacement of aged metal doors and frames is needed. The service zone is in particular need of repair. Exterior hardware is due to be replaced. Improvements from the existing level of security to an access control system should be considered.

Perimeter sealants are in need of replacement.

Storefront / Curtainwall at Main Entry





Building Systems

IMEG was retained by Engberg Anderson Architects on behalf Wilmette Public Library to assess mechanical and electrical systems at their facility located at the intersection of Park Avenue and Wilmette Avenue in Wilmette, IL.

HVAC System

The HVAC system is in very good condition as the majority of it has been recently been replaced in 2016.

The HVAC system consists of multiple systems throughout the building.

- An air cooled Variable Refrigerant Flow system serves predominately the 1978 wing with an extension over to the 1987 portion of the building. The system works fairly well with the exception of the airflow of the study rooms is distracting to users. A ceiling cassette unit would improve the air distribution and could be considered. There are some issues with temperature control of this system in extreme conditions. This could be addressed by additional VRF units or cabinet heaters run off of the heating water system for additional winter heating.
- A water cooled heat pump system serves the west side of the basement and is tied to a geothermal field with 4 wells. The system is reliable but the users complain that the airflow is not consistent. This can typically be addressed by having the heat pump supply fans run during all occupied periods whether the temperature setpoint is met or not. It appears that they shut off when the setpoint has been met.
- A variable air volume system serves the east side of the building. This system utilizes three separate rooftop units and multiple fan powered variable air volume boxes in each zone for temperature control. This system utilizes three condensing boilers in the basement for heating water.

The building has a snowmelt boiler and circulation pump that was installed in 2019 and is in good condition.

The facility has a Building Automation System installed by Integrated Control Technologies.

Plumbing System

The plumbing system is in very good condition as the majority of the piping is copper piping with a fairly new water heater installed in 2014.

Toilet Room 108 still has galvanized piping and should be replaced.

The plumbing fixtures seem to be well maintained and in good working order.

Fire Protection Systems

The entire building is sprinkled and appears to be in good working order.

The backflow preventer that serves the building has been properly inspected and certified.

Fire Alarm System

Fire alarm system consists of horn/strobe annunciating devices. Initiation devices include manual pull stations, area smoke and heat detectors. Mechanical RTUs are provided with duct smoke detector and shutdown relays. Carbon monoxide CO detectors were observed as standalone type. Wiring is installed as open cable. Current system doesn't comply with IBC 2015. We recommend upgrading system to the voice notification style and providing new CO detectors and connecting them to the fire alarm system for monitoring.





Building Systems

Lighting System

Majority of interior and all exterior lights are LED type. Fixtures on second and third floor are true LED type. Most of the lighting fixtures located on the lower and first floor have been retrofitted with LED bulbs.

Exterior lights are controlled via built-in photocells.

Interior lights in open spaces on lower level and first floor are controlled via relay panel (Leviton Z-Max) with local low voltage wall controllers. Lights on second and third floor and in most of the offices are controlled by occupancy sensors and toggle switches.

Exit signs and emergency lighting wall packs are LED type with integral battery.

Power Distribution System

Building is served by overhead pole mounted transformers. Feeders are routed via poles down to the lower level on the exterior of the building to the main service switchboard. The switchboard was installed during 1987 addition and was configured with 4 service disconnect switches.

During recent mechanical upgrade, 600A loose disconnect was installed due to the limited bus space in the switchboard. This installation does not comply with NEC Article 230.72. We recommend replacing switchboard and incoming feeders.

Multiple distribution and branch panels located on the lower and first floor are past their rated life. We recommend replacing these and associated feeders, branch wiring and end devices.

A 20 KW, 208/120V natural gas generator located in the mechanical room on lower level is serving sump pumps via automatic transfer switch.

