Precision 20/20
Full Reserve Study
for
Milwaukee County
War Memorial Center
Milwaukee, Wisconsin
December 8, 2011

RESERVE ADVISORS

Long-term thinking. Everyday commitment.

RESERVE ADVISORS

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RESERVE ADVISORS
Long-term thinking. Everyday commitment.

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

RESERVE STUDY EXECUTIVE SUMMARY

Client: Milwaukee County War Memorial Center (War Memorial Center)
Location: Milwaukee, Wisconsin
Reference: 111820

Property Basics: Milwaukee County War Memorial Center comprises a war memorial and art museum. The War Memorial, or Saarineen, was built in 1956 and includes the Veterans Gallery on the main floor, three lower floors of offices, lobbies and basement areas, and two upper floors of offices. Veterans Courtyard is an elevated, open-air pedestrian plaza surrounding Veterans Gallery. The Art Museum, or Kahler Addition, was added in 1976 and includes the elevated, open air pedestrian Fitch Plaza adjacent to Veterans Courtyard. Beneath Fitch Plaza is the art museum and two basement levels.

Reserve Components Identified: 65 Reserve Components.

Inspection Date: December 8 , 2011.

Funding Goal: The Funding Goal of this Reserve Study is to maintain reserves above an adequate, not excessive threshold during one or more years of significant expenditures. Our recommended Funding Plan recognizes these threshold funding years in 2012 and 2013.

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
- 1.2% annual rate of return on invested reserves
- 1.8% future Inflation Rate for estimating Future Replacement Costs

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

Cash Status of Reserve Fund: $0 as of January 1, 2012.

Recommended Reserve Funding: We recommend that the War Memorial Center adopt a reserve budget of $2,900,000 in 2012, $2,400,000 in 2013, $830,000 from 2014 through 2017 and $395,000 in 2018. Afterwards, the War Memorial Center should budget gradual annual increases in reserve funding, that in part consider the effects of inflation.

Certification: This *Precision 20/20 Full Reserve Study* exceeds the Community Associations Institute (CAI) and Association of Professional Reserve Analysts (APRA) standards fulfilling the requirements of a "Level I Full Reserve Study."

Management identifies 13 items that require near term repairs or replacements (War Memorial - Capital Building Needs). The following is the list of these items (as they appear in the spreadsheet ***Reserve Expenditures***):

1. Air Intake and Exhaust Chambers, Rebuild
2. Expansion Joints, East and West
3. Roof Ledges, Copper, Coating and Repairs
4. Roof, Loading Dock, Concrete and Waterproof Membrane
5. Stairs, Bird Cage
6. Stairs, Courtyard
7. Stairs, South Entrance
8. Walls, Granite, Restoration
9. Water Penetration Remediation, Kahler Basement
10. Waterproof Membrane, Veterans Courtyard (including lighting)
11. Windows and Doors, War Memorial, South, East and West Entrances
12. Elevators
13. Life Safety System, War Memorial

Due to water infiltration as a result of the deterioration of these components, and the potential for damage to art work and adjacent components, we consider the following elements of most critical concern requiring repair or replacement in 2012 (in order of concern):

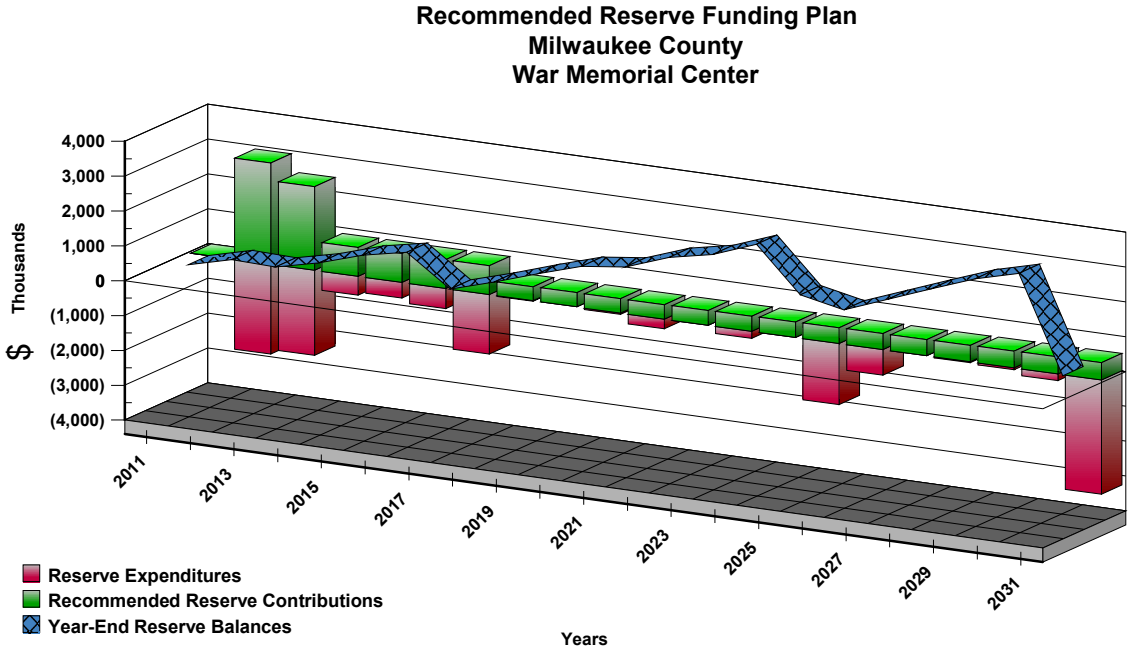
1. Roof Ledges, Copper, Coating and Repairs
2. Waterproof Membrane, Veterans Courtyard (including lighting)
3. Expansion Joints, East and West
4. Stairs, Bird Cage
5. Water Penetration Remediation, Kahler Basement
6. Walls, Granite, Restoration

Due to their poor condition and potential safety hazards as a result of continued deterioration of these components, we consider the following elements of critical concern requiring repair or replacement by 2013 (in order of concern):

1. Stairs, Courtyard
2. Stairs, South Entrance
3. Roof, Loading Dock, Concrete and Waterproof Membrane
4. Air Intake and Exhaust Chambers, Rebuild
5. Windows and Doors, War Memorial, South, East and West Entrances
6. Elevators
7. Life Safety System, War Memorial

War Memorial Center
Recommended Reserve Funding Table and Graph

Year	Reserve Contributions ($)	Reserve Balances	Year	Reserve Contributions ($)	Reserve Balances ($)
2012	2,900,000	321,142	2022	424,200	2,138,077
2013	2,400,000	286,011	2023	431,800	2,398,741
2014	830,000	581,033	2024	439,600	2,869,763
2015	830,000	969,125	2025	447,500	1,592,142
2016	830,000	1,229,510	2026	455,600	1,330,741
2017	830,000	356,094	2027	463,800	1,813,293
2018	395,000	737,221	2028	472,100	2,285,462
2019	402,100	1,150,580	2029	480,600	2,742,281
2020	409,300	1,534,800	2030	489,300	3,072,581
2021	416,700	1,691,039	2031	498,100	313,327



Respectfully submitted on December 20, 2011 by
RESERVE ADVISORS, INC.

\ Michelle A. Stephans

Michelle A. Stephans, PRA[1], Associate Director of Quality Assurance
Visual Inspection and Report by: Justin J. Maier, PRA

[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.

RESERVE STUDY REPORT

At the direction of Management that recognizes the need for proper reserve planning, we have conducted a *Precision 20/20 Full Reserve Study* of certain property exhibited to us as that of

Milwaukee County War Memorial Center

Milwaukee, Wisconsin

and submit our findings in this report. The effective date of this study is the date of our visual, noninvasive inspection, December 8 , 2011.

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 20 years
- **Reserve Funding Plan** - Presents the recommended Reserve Contributions and year-end Reserve Balances for the next 20 years
- **Condition Assessment** - Describes the reserve components, documents conditions with photographs, describes our recommendations for repairs or replacement, and includes detailed solutions and procedures for replacements for the benefit of current and future board members
- **Supplementary Information for Financial Statements** - Contains significant unaudited information about existing reserves from the Reserve Components and Expenditures, and estimated current and future replacement costs
- **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
- **Conditions of our Service -** Describes Assumptions and Professional Service Conditions
- **Credentials**
- **Resources**

IDENTIFICATION OF PROPERTY

Milwaukee County War Memorial Center comprises a war memorial and art museum. The War Memorial, or Saarineen, was built in 1956 and includes the Veterans Gallery on the main floor, three lower floors of offices, lobbies and basement areas, and two upper floors of offices. Veterans Courtyard is an elevated, open-air pedestrian plaza surrounding Veterans Gallery. The Art Museum, or Kahler Addition, was added in 1975 and includes the elevated, open air pedestrian Fitch Plaza adjacent to Veterans Courtyard. Beneath Fitch Plaza is the art museum and two basement levels. We identify 65 major common elements that are likely to require capital repair or replacement during the next 20 years.

Our investigation includes Reserve Components or property elements as described by Management. Our analysis begins by segregating the property elements into several areas of responsibility for repair and replacement. Our process of identification helps assure that future boards and the management team understand whether reserves, the operating budget or others 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 Management. These classes of property include:

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

The Reserve Study identifies Reserve Components as set forth in your Declaration or which were identified as part of your request for proposed services. Reserve Components are defined by CAI as property elements with:

- War Memorial Center 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.

- Fire Alarm Panel (installed in 2011)
- Foundations
- Light Poles and Fixtures (replaced in 2011)
- Pipes, Subsurface Utilities
- Pipes, Building Heat, Kahler
- Stairs, South Entrance, Main Landing (replaced in 2011)
- Stairs, North Entrance (replaced in 2006)
- Storage Tank, Oil, Underground (installed in 1992)
- Structural Frames
- Windows and Doors, Lower North Entrance (installed in 2011)
- Windows, War Memorial in Granite Facade (replaced in 2000)
- Windows, Courtyard (replaced in approximately 1995)

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 $8,000 (*These relatively minor expenditures have a limited effect on the recommended Reserve Contributions*.)
- Air Compressors
- Doors, Loading Dock
- Exhaust Fans, Rooftop

- Heat Exchanger, Domestic Hot Water
- Interior Finishes (excluding rest rooms)
- Pipes, Domestic Water
- Pumps Less Than Five-HP (horsepower)
- Roofs, North and South Entrances
- Storage Tank, Domestic Hot Water
- Other Repairs normally funded through the Operating Budget

Certain items have been designated as the responsibility of others to repair or replace. Property Maintained by Others relates to:

- Kahler Sculpture Court Enclosure (Art Museum)
- Life Safety System, Kahler (Art Museum)
- Oil Tank Upgrade (County)
- Security System (maintenance contract)

RESERVE EXPENDITURES and FUNDING PLAN

The tables following this introduction present:

Reserve Expenditures

- Line item numbers
- Total quantities replaced during the next 20 years
- Quantities replaced per phase (in a single year)
- Reserve component inventory
- Estimated first year of replacement
- Life analysis showing
  - useful life
  - remaining useful life
- Unit cost of replacement
- 2011 local cost of replacement
- Total future costs of replacement anticipated during the next 20 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 reserves at year end

Reserve Advisors, Inc.

RESERVE EXPENDITURES

for
Milwaukee County
War Memorial Center
Milwaukee, Wisconsin

Explanatory Notes:
1) 1.8% is the estimated future Inflation Rate for estimating Future Replacement Costs.
2) FY 2011 is Fiscal Year beginning January 1 and ending December 31.

Line Item	Quantities: 20-Year Total	Per Phase	Units	Reserve Component Inventory	Estimated 1st Year of Replacement	Life Analysis, Years Useful	Remaining	Unit Cost, $	2011 Cost of Replacement per Phase, $	Total Future Costs of Replacement, $	(See Notes 1 & 2) RUL = 0 FY2011	1 2012	2 2013	3 2014	4 2015	5 2016	6 2017	7 2018	8 2019	9 2020	10 2021	11 2022	12 2023	13 2024	14 2025	15 2026	16 2027	17 2028	18 2029	19 2030	20 2031
				Exterior Building Elements																											
1.017	2	**2**	Each	Air Intake and Exhaust Chambers, Rebuild	2013	to 65	2	95,000.00	190,000	**196,902**			196,902																		
1.217	320	**320**	Linear Feet	Expansion Joints, East and West	2012	to 20	1	250.00	80,000	**81,440**		81,440																		
1.260	90	**90**	Each	Light Fixtures, Roof Ledges	2031	to 35	20	500.00	45,000	**64,294**																				64,294
1.271	1,500	**1,500**	Linear Feet	Railings, Plaza and Courtyard	2031	to 60	20	80.00	120,000	**171,450**																				171,450
1.272	700	**700**	Linear Feet	Railings, Rooftop	2014	to 60	3	80.00	56,000	**59,079**				59,079																
1.300	265	**265**	Squares	Roof, Built-up, War Memorial	2014	15 to 20	3	1,500.00	397,500	**419,354**				419,354																
1.453	18	**18**	Squares	Roof Ledges, Copper, Coating and Repairs	2012	to 20	1	2,230.00	40,140	**40,863**		40,863																		
1.457	18	**18**	Squares	Roof Ledges, Copper, Replacement	2031	to 80	20	4,000.00	72,000	**102,870**																				102,870
1.458	6,000	**6,000**	Square Feet	Roof, Loading Dock, Concrete and Waterproof Membrane	2013	25 to 35	2	70.00	420,000	**435,256**			435,256																	
1.500	26	**26**	Squares	Roof, Modified Bitumen, Penthouse	2014	15 to 20	3	1,500.00	39,000	**41,144**				41,144																
1.540	10,800	**5,400**	Linear Feet	Sealants, Windows, Doors and Control Joints, Phased	2015	to 20	4	6.00	32,400	**76,389**					34,797									41,592					
1.600	1	**1**	Allowance	Stairs, Bird Cage	2012	45 to 55	1	800,000.00	800,000	**814,400**		814,400																		
1.601	1	**1**	Allowance	Stairs, Courtyard	2013	to 65	2	90,000.00	90,000	**93,269**			93,269																	
1.602	2	**2**	Each	Stairs, Fitch Plaza	2016	25 to 35	5	35,000.00	70,000	**76,531**					76,531															
1.603	1	**1**	Allowance	Stairs, South Entrance (excluding intermediate landing)	2012	25 to 35	1	150,000.00	150,000	**152,700**		152,700																		
1.660	90,000	**45,000**	Square Feet	Walls, Concrete, Inspections and Restorations	2015	10 to 15	4	2.50	112,500	**265,239**					120,821									144,418					
1.665	20,000	**20,000**	Square Feet	Walls, Concrete, Waterproof Coatings, War Memorial	2015	15 to 20	4	5.00	100,000	**107,397**					107,397															
1.740	13,200	**6,600**	Square Feet	Walls, EIFS, Paint Finishes and Capital Repairs, Courtyard	2015	8 to 10	4	2.30	15,180	**35,790**					16,303									19,487					
1.767	6,000	**6,000**	Square Feet	Walls, Granite, Restoration	2012	N/A	1	60.00	360,000	**366,480**		366,480																		
1.768	6,000	**6,000**	Square Feet	Walls, Granite, Repointing	2030	to 20	19	23.00	138,000	**193,681**																				193,681
1.827	1,300	**1,300**	Square Feet	Walls, Metal Siding, Penthouse	2014	to 60	3	15.00	19,500	**20,572**				20,572																
1.968	375	**375**	Linear Feet	Water Penetration Remediation, Kahler Basement, Remaining	2012	N/A	1	600.00	225,000	**229,050**		229,050																		
1.971	33,300	**33,300**	Square Feet	Waterproof Membrane, Fitch Plaza	2025	25 to 35	14	35.00	1,165,500	**1,496,171**														1,496,171					
1.973	22,000	**22,000**	Square Feet	Waterproof Membrane, Veterans Courtyard (including lighting)	2012	25 to 35	1	40.00	880,000	**895,840**		895,840																		
1.980	6,000	**6,000**	Square Feet	Windows and Doors, Kahler	2026	45 to 55	15	50.00	300,000	**392,047**															392,047					
1.981	3,800	**3,800**	Square Feet	Windows and Doors, War Memorial, South, East and West Entrances	2013	45 to 55	2	50.00	190,000	**196,902**			196,902																	
				Interior Building Elements																											
2.900	4	**4**	Each	Rest Rooms, Renovation, 3rd and 4th Floors	2021	to 20	10	30,000.00	120,000	**143,436**										143,436										
2.901	2	**2**	Each	Rest Rooms, Renovation, South Entrance	2013	to 20	2	36,000.00	72,000	**74,615**			74,615																	
				Building Services Elements																											
3.040	1	**1**	Each	Air Handling Unit, Electrical Room, Replacement	2031	to 25	20	22,000.00	22,000	**31,432**																				31,432
3.041	6	**6**	Each	Air Handling Units, Kahler, Museum, Capital Repairs	2031	to 25	20	25,000.00	150,000	**214,312**																				214,312
3.042	1	**1**	Each	Air Handling Unit, Kahler, Offices, Capital Repairs	2031	to 25	20	25,000.00	25,000	**35,719**																				35,719
3.105	1	**1**	Each	Boiler, Building Heat, 6,277-MBH (back-up)	2016	to 60	5	92,000.00	92,000	**100,583**						100,583														
3.160	1	**1**	Each	Boiler, Domestic Hot Water, 5,590-MBH (back-up)	2026	to 30	15	80,000.00	80,000	**104,546**															104,546					
3.200	4	**2**	Each	Chillers, 400-tons, Capital Repairs	2016	to 10	5	45,000.00	90,000	**216,011**						98,397									117,614					
3.205	2	**2**	Each	Chiller, 400-tons, Replacement	2031	25 to 35	20	420,000.00	840,000	**1,200,148**																				1,200,148

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RESERVE EXPENDITURES

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Explanatory Notes:
1) **1.8%** **is the estimated future Inflation Rate for estimating Future Replacement Costs.**
2) **FY 2011 is Fiscal Year beginning January 1 and ending December 31.**

Line Item	Quantities: 20-Year Total	Quantities: Per Phase	Units	Reserve Component Inventory	Estimated 1st Year of Replacement	Life Analysis, Years Useful	Life Analysis, Years Remaining	Unit Cost, $	2011 Cost of Replacement per Phase, $	Total Future Costs of Replacement, $	(See Notes 1 & 2) RUL = 0 FY2011	1 2012	2 2013	3 2014	4 2015	5 2016	6 2017	7 2018	8 2019	9 2020	10 2021	11 2022	12 2023	13 2024	14 2025	15 2026	16 2027	17 2028	18 2029	19 2030	20 2031
3.237	1	**1**	Each	Condensate Return System	2031	to 25	20	15,000.00	15,000	**21,431**																				21,431
3.260	2	**1**	Each	Cooling Tower, 400-tons, Capital Repairs	2016	10 to 15	5	35,000.00	35,000	**84,004**						38,265									45,739					
3.265	1	**1**	Each	Cooling Tower, 400-tons, Replacement	2031	25 to 35	20	180,000.00	180,000	**257,175**																				257,175
3.300	3	**1**	Allowance	Electrical System, Inspections and Partial Replacements	2015	to 8	4	160,000.00	160,000	**598,630**					171,835							198,195								228,600
3.320	1	**1**	Each	Elevator, Hydraulic, Kahler Freight	2013	to 35	2	180,000.00	180,000	**186,538**			186,538																	
3.321	2	**2**	Each	Elevators, Hydraulic, Kahler Passenger	2013	to 35	2	130,000.00	260,000	**269,444**			269,444																	
3.322	2	**2**	Each	Elevators, Hydraulic, War Memorial Freight	2013	to 35	2	135,000.00	270,000	**279,807**			279,807																	
3.360	2	**2**	Each	Elevators, Traction, East and West War Memorial, Modernization	2031	to 40	20	155,000.00	310,000	**442,912**																				442,912
3.380	1	**1**	Each	Exhaust Fan, Rest Rooms, South Entrance	2031	to 30	20	30,000.00	30,000	**42,862**																				42,862
3.413	1	**1**	Allowance	Filtration System, Lake Water	2031	to 25	20	115,000.00	115,000	**164,306**																				164,306
3.440	1	**1**	Each	Generator, Emergency	2016	25 to 35	5	86,000.00	86,000	**94,024**						94,024														
3.460	1	**1**	Each	Heat Exchanger, Building Heat	2021	20 to 25	10	40,000.00	40,000	**47,812**											47,812									
3.461	1	**1**	Each	Heat Exchanger, Lake Water	2021	20 to 25	10	35,000.00	35,000	**41,836**											41,836									
3.467	1	**1**	Each	Heat Recovery Unit	2031	to 25	20	30,000.00	30,000	**42,862**																				42,862
3.560	1	**1**	Allowance	Life Safety System, War Memorial, Remaining Devices	2013	to 25	2	150,000.00	150,000	**155,449**			155,449																	
3.587	1	**1**	Each	Make-up Air Unit, Kahler, Museum, Capital Repairs	2031	to 25	20	40,000.00	40,000	**57,150**																				57,150
3.588	1	**1**	Each	Make-up Air Unit, Kahler, Offices, Capital Repairs	2031	to 25	20	40,000.00	40,000	**57,150**																				57,150
3.600	3,000	**3,000**	Linear Feet	Piping, Building Heat, War Memorial	2017	to 75	6	500.00	1,500,000	**1,669,467**						1,669,467														
3.700	2	**2**	Each	Pumps, Chilled Water	2031	to 30	20	18,000.00	36,000	**51,435**																				51,435
3.701	2	**2**	Each	Pumps, Chiller	2026	to 20	15	7,800.00	15,600	**20,386**															20,386					
3.702	2	**2**	Each	Pumps, Condenser	2026	to 20	15	11,300.00	22,600	**29,534**															29,534					
3.703	1	**1**	Each	Pump, Heat Recovery	2026	to 20	15	8,800.00	8,800	**11,500**															11,500					
3.704	2	**2**	Each	Pumps, Lake Water	2031	to 30	20	22,000.00	44,000	**62,865**																				62,865
3.793	80	**80**	Each	Reheat Coils	2016	to 40	5	2,000.00	160,000	**174,928**						174,928														
3.800	1	**1**	Each	Rooftop Heating and Cooling Unit, Bird Cage, 108-MBH	2026	to 20	15	10,000.00	10,000	**13,068**															13,068					
				Property Site Elements																												
4.020	60,000	**15,000**	Square Yards	Asphalt Pavement, Crack Repair, Patch and Seal Coat	2017	3 to 5	6	2.60	39,000	**193,856**						43,406				46,617				50,065				53,768		
4.045	15,000	**15,000**	Square Yards	Asphalt Pavement System, Total Replacement	2013	15 to 20	2	35.00	525,000	**544,070**			544,070																	
4.606	1	**1**	Each	Maintenance Equipment, Fork Lift	2031	to 20	20	20,000.00	20,000	**28,575**																				28,575
4.607	2	**1**	Each	Maintenance Equipment, Recreation Utility Vehicle	2018	to 10	7	18,000.00	18,000	**44,771**								20,394										24,377		
4.608	1	**1**	Each	Maintenance Equipment, Skid Steer	2020	to 30	9	35,000.00	35,000	**41,096**										41,096										
		1	Allowance	**Reserve Study Update with Site Visit**	2013	2	2	6,500.00	6,500	**6,500**			6,500																	
				Anticipated Expenditures, By Year						$14,881,355	0	2,580,773	2,438,752	540,149	451,153	582,728	1,712,873	20,394	0	41,096	279,701	0	198,195	0	1,751,733	734,434	0	24,377	53,768	193,681	3,277,548

Reserve Advisors, Inc.

RESERVE FUNDING PLAN

CASH FLOW ANALYSIS
Milwaukee County
War Memorial Center
Milwaukee, Wisconsin

Individual Reserve Budgets & Cash Flows for the Next 20 Years

		FY2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
	Reserves at Beginning of Year (Note 1)	$0	0	321,142	286,011	581,033	969,125	1,229,510	356,094	737,221	1,150,580	1,534,800
	Total Recommended Reserve Contributions (Note 2)	**0**	**2,900,000**	**2,400,000**	**830,000**	**830,000**	**830,000**	**830,000**	**395,000**	**402,100**	**409,300**	**416,700**
Plus	**Estimated Interest Earned, During Year (Note 3)**	0	1,915	3,621	5,171	9,245	13,113	9,457	6,521	11,259	16,016	19,240
Less	**Anticipated Expenditures, By Year**	0	(2,580,773)	(2,438,752)	(540,149)	(451,153)	(582,728)	(1,712,873)	(20,394)	0	(41,096)	(279,701)
	Anticipated Reserves at Year End	$0	321,142 **(NOTE 5)**	286,011 **(NOTE 5)**	581,033	969,125	1,229,510	356,094	737,221	1,150,580	1,534,800	1,691,039

(continued)

Individual Reserve Budgets & Cash Flows for the Next 20 Years, Continued

		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
	Reserves at Beginning of Year	1,691,039	2,138,077	2,398,741	2,869,763	1,592,142	1,330,741	1,813,293	2,285,462	2,742,281	3,072,581
	Total Recommended Reserve Contributions	**424,200**	**431,800**	**439,600**	**447,500**	**455,600**	**463,800**	**472,100**	**480,600**	**489,300**	**498,100**
Plus	**Estimated Interest Earned, During Year**	22,838	27,059	31,422	26,612	17,433	18,752	24,446	29,987	34,681	20,194
Less	**Anticipated Expenditures, By Year**	0	(198,195)	0	(1,751,733)	(734,434)	0	(24,377)	(53,768)	(193,681)	(3,277,548)
	Anticipated Reserves at Year End	2,138,077	2,398,741	2,869,763	1,592,142	1,330,741	1,813,293	2,285,462	2,742,281	3,072,581	313,327 **(NOTE 4)**

Explanatory Notes:

1) Year 2011 reserves are as of January 1, 2012; FY 2011 starts January 1 and ends December 31.

2) Reserve Contributions for 2011 are budgeted; 2012 is the first year of recommended contributions.

3) 1.2% is the estimated annual rate of return on invested reserves.

4) Accumulated year 2031 ending reserves consider the age, size, overall condition and complexity of the property.

5) Threshold Funding Years (reserve balance at critical points).

CONDITION ASSESSMENT

The Condition Assessment of this *Precision 20/20 Full Reserve Study* includes *Enhanced Solutions and Procedures* (*ESP*) 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 Management 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

Air Intake and Exhaust Chambers - The War Memorial Center maintains two concrete structures in the north parking lot that serve as the air intake and exhaust chambers. These structures are in poor condition at an age of 55 years with significant concrete deterioration evident, primarily at the exhaust chamber. Pages 5.3 and 5.4 of ***Photographs*** depict these conditions. We anticipate a useful life of up to 65 years for the chambers. It may be possible to repair the air intake chamber. However, for budgetary purposes, we assume total replacement of both chambers by 2013. We depict this information on Line Item 1.017 of ***Reserve Expenditures***. We were unable to determine the condition of the concrete below grade or the condition of the below-grade shaft that connects the building and the chambers. The condition of these below-grade components could affect our estimated cost of replacement significantly.

Expansion Joints - The War Memorial Center maintains approximately 320 linear feet of expansion joints at Veterans Courtyard. This quantity includes 200 linear feet at the west entrance along Mason Street and 120 linear feet at the intersection of Veterans Courtyard and Fitch Plaza. The joint at the west entrance is in very poor condition with significant deterioration evident. Pages 5.4 and 5.5 of ***Photographs*** depict these conditions. Both joints allow water infiltration into the finished spaces beneath. These joints have a useful life of up to 20 years. We recommend War Memorial Center budget for replacement of the joints and adjacent deteriorated concrete in 2012. We include this information on Line Item 1.217 of ***Reserve Expenditures***.

Light Fixtures - War Memorial Center maintains approximately 90 exterior light fixtures at the roof ledges on the outer perimeter of the War Memorial. We are unaware of any operational deficiencies associated with these fixtures. The useful life of exterior light fixtures of this type and quality is up to 35 years. We recommend that the War Memorial Center plan for replacement of the light fixtures by 2031 in conjunction with replacement of the roof ledge roofing. We include this information on Line Item 1.260 of ***Reserve Expenditures***.

Railings - The War Memorial Center maintains approximately 1,500 linear feet of stainless steel railings at the plaza and courtyard. This quantity includes the railings at the War Memorial west elevation balcony and the loading dock. These railings are in good overall condition at an age of 36 years. War Memorial Center also maintains approximately 700 linear feet of steel railings at the War Memorial rooftop. These railings are in fair to poor condition at an age of 55 years with deterioration evident. Page 5.5 of ***Photographs*** depicts this condition. We anticipate a useful life of up to 60 years for the railings. The War Memorial Center should

budget for replacement of the railings at the plaza and courtyard by 2031, and the railings at the rooftop by 2014 in conjunction with replacement of the main War Memorial roof. We depict this information on Line Items 1.271 and 1.272 of ***Reserve Expenditures***. The War Memorial Center should fund paint applications to the steel railings through the operating budget.

Roof, Built-up - The main War Memorial roof at War Memorial Center consists of 265 *squares*[1] of built-up roofing. The roof is reported in need of near term replacement. The useful life of built-up roofs in Milwaukee is from 15- to 20-years. We include the following solutions and procedures pertaining to replacement of built-up roofs for the benefit of present and future board members.

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. Replacement costs are proportionally higher and make replacement less economically viable. Repairs are a lower cost alternative. However, we regard repairs as normal maintenance. The War Memorial Center should retain a maintenance company for inspections of the roof semiannually and fund these inspections through the operating budget.

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

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

Contractors can install a new built-up roof in one of two ways: tear-off or an overlay. An overlay is the application of a new roof membrane over an existing roof. This method, although initially more economical, often covers up problems with the deck, flashings, and saturated insulation. 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 contractor applies the base sheet of roofing over the insulation board. This sheet is normally 30-pound material. The contractor should start the installation of a roof membrane from the lowest points of the roof. Mechanical fastening and embedding the base sheet in a flood coat of hot asphalt is the best manner of installation. Felt or glass fiber plies saturated with asphalt are usually used for level or low-pitch roofs because of their greater resistance to standing water. A membrane of three- or four-plies is common, the more plies used, the more durable a roof.

The time or need to replace the roof becomes apparent with multiple or recurring leaks. The War Memorial Center should determine whether the origin of the leaks is from the membranes 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 War Memorial Center prepare for a complete tear-off at the time of replacement by 2014. We base our cost on Line Item 1.300 of ***Reserve Expenditures*** on the Association's bid cost. The

War Memorial Center should monitor outside vendors when they service any elements on the roof to minimize unreported roof damage.

Roof Ledges, Copper - War Memorial Center maintains approximately 18 squares of copper clad roof ledges at the outer perimeter of the War Memorial. We were informed that near term repairs and a coating application are necessary at the roof ledges. We include the Association's bid cost for this work in 2012 on Line Item 1.453 of ***Reserve Expenditures***.

We anticipate a useful life of up to 80 years for the copper cladding and recommend the War Memorial Center budget for replacement by 2031. We note this information on Line Item 1.457 of ***Reserve Expenditures***.

Roof, Loading Dock - The loading dock roof comprises approximately 6,000 square feet of both exposed concrete and concrete below grade. The concrete roof is in poor condition with significant deterioration evident. A surface applied waterproof coating has completely failed. We also note deterioration of the loading dock concrete walls. Pages 5.7 and 5.8 of ***Photographs*** depict these conditions. The roof and waterproof membrane have a useful life of 25- to 35-years assuming the membrane is installed beneath the concrete. We recommend the War Memorial Center budget for total replacement of the concrete roof, repairs to the concrete walls and application of a waterproof membrane by 2013. We note this information on Line Item 1.458 of ***Reserve Expenditures***. If the waterproof membrane is a liquid coating applied to the topside of the concrete, War Memorial Center should fund subsequent coating applications every 10 years thereafter through the operating budget.

Roof, Modified Bitumen - The penthouse roof at the War Memorial consists of 26 squares of modified bitumen roofing. We identify areas of standing water at this roof. Page 5.8 of ***Photographs*** depicts this condition. As with the built-up roof, the useful life of modified bitumen roofs in Milwaukee is from 15- to 20-years.

Modified bitumen roofing systems are composed of factory manufactured sheets of polymer-modified bitumen with polyester and/or fiberglass reinforcements. The bitumen adds a waterproof characteristic to the system and the reinforcements add strength and puncture resistance. These factory assembled roofing systems offer the advantages of a built-up roofing system through a less labor intensive installation.

We recommend War Memorial Center budget for replacement of the penthouse roof in conjunction with replacement of the main War Memorial roof by 2014. We depict this information on Line Item 1.500 of ***Reserve Expenditures***.

Sealants - The perimeters of the window and door frames, and exterior *control joints*[2] throughout the building use approximately 10,800 linear feet of exterior sealants or *caulk*.[3] Sealants are flexible, allow for differential movement between dissimilar materials and prevent water infiltration into the building. The ages and conditions of the sealants vary. We note isolated locations of deterioration. The periodic inspection and replacement of deteriorated sealants is essential to maximize the useful life of the window and door systems and prevent water infiltration. The War Memorial Center should anticipate a useful life of up to 20 years for

[2] A control joint is a formed or sawed groove in a wall system that allows for thermal expansion and contraction of the building materials without damage.

[3]The terms sealant and caulk are used interchangeably throughout this text and throughout the industry.

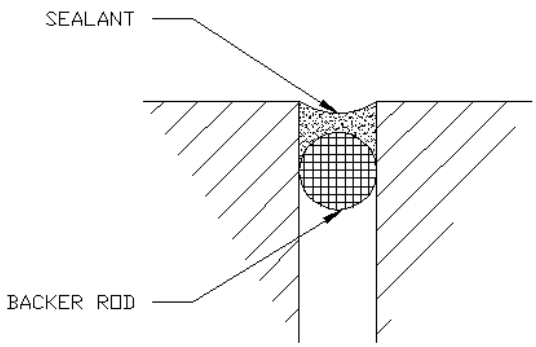
exterior caulk used for this application. We discuss solutions and procedures related to replacement of sealants in the following narrative.

Sealant failure allows for the infiltration of water into the building. There are three types of joint sealant failure. *Adhesion failure* occurs when sealant pulls away from the sides of the joint due to improper surface preparation or too much joint movement. *Cohesive failure* occurs when sealant tears down the center of the joint due to inadequate sealant thickness or too much joint movement. Finally, *reversion* occurs when sealant traps water behind the joint and is identified by dark and dirty sealant, typically on a horizontal joint.

Correct preparation of the joint surfaces before re-application of a sealant is important to ensure proper adhesion. The surfaces must be removed of all contaminants, including the previous sealant material, paint, rust and other corrosion, water, grease, etc. The surfaces should also be dry and free from dust and grit, which can be removed using dry compressed air or brushes. The War Memorial Center should ensure the manufacturer's instructions are followed in determining if the substrate is compatible with the sealant and that the chemical cleaners and solvents used to prepare the surfaces are also compatible with the sealant.

The contractor's bid should note the type of caulk proposed and indicate that installation will follow the manufacturer's specifications. The manufacturer of the joint sealant usually has specifications that govern the use or application of flexible backer rods to seal wide gaps in the joint before caulk is applied. The contractor's bid or proposal should address this possible application noting the adherence to the sealant manufacturer's specification for the proposed sealant product. Backer rods reduce the volume of caulk required and minimize the chance of

cohesion failure. The following detail depicts a control joint with sealant and a flexible backer rod:



Several types of caulk are available with significantly different weathering and elongation properties. We recommend a silicone-based or polyurethane-based caulk. The major advantage of polyurethane-based caulks is their ability to bond to most construction surfaces without special preparation, such as primer application, as is required for alternate materials like silicone caulk. With proper surface preparation, i.e., removing surface contaminants, silicone-based caulks perform better than most other caulk materials. The weathering and elongation properties of silicone-based caulk give it a much longer useful life than other caulk materials.

The rate of deterioration of the sealants is not uniform due to the different exposures to sunlight and weather. The War Memorial Center should anticipate gradual dispersed deterioration as the sealants age. We recommend War Memorial Center replace up to fifty percent (50%), or 5,400 linear feet of joint sealant, by 2015 and every 10 years thereafter. We note this information on Line Item 1.540 of ***Reserve Expenditures***.

Stairs - The War Memorial Center maintains six stairs of various construction throughout the development. We comment on these stairs in the following sections of this narrative.

Bird Cage - The bird cage stairs is an enclosed stairway at Veterans Courtyard. These stairs are comprised of metal frame, single pane window systems, a copper roof, terrazzo floor coverings, heating and air conditioning ductwork, and light fixtures. The window system is in poor condition at an age of 55 years. We note significant metal deterioration and the majority of the windows are cracked. Pages 5.9 and 5.10 of ***Photographs*** depict these conditions. We were informed that due to condensation the stairs become slippery and unusable. We anticipate a useful life of 45- to 55-years for the window system. The War Memorial Center anticipates total replacement of the bird cage stairs. We include an allowance for this replacement in 2012. We base our cost on Line Item 1.600 of ***Reserve Expenditures*** on a budgetary cost provided by the War Memorial Center.

Courtyard - The courtyard stairs are an open-air stairway at Veterans Courtyard. These stairs are constructed of concrete steps and landings, and metal railings. The concrete and railings are in poor condition at an age of 55 years with significant deterioration evident. Pages 5.10 and 5.11 of ***Photographs*** depict these conditions. We anticipate a useful life of up to 65 years for concrete stairs of this type. Therefore, these stairs are experiencing premature deterioration. We recommend War Memorial Center budget for total replacement of the courtyard stairs by 2013. We note this information on Line Item 1.601 of ***Reserve Expenditures***.

Fitch Plaza - War Memorial Center maintains two sets of open-air stairs at Fitch Plaza. These stairs are constructed of concrete stairs and landings, and metal railings. We assume these stairs have an underlying waterproof membrane to prevent water infiltration into the finished spaces beneath. The stairs are in good to fair condition at an age of 36 years with minor concrete deterioration evident. Page 5.12 of ***Photographs*** depicts this condition. We anticipate a useful life of 25- to 35-years for concrete stairs with an underlying waterproof membrane. Based on their condition, we recommend the War Memorial Center budget for total replacement of the Fitch Plaza stairs by 2016. We include this information on Line Item 1.602 of ***Reserve Expenditures***.

South Entrance - The south entrance stairs descend from Veterans Courtyard to the south entrance doors with an intermediate landing. These stairs are constructed of concrete stairs and landing, and metal railings. We assume these stairs have an underlying waterproof membrane to prevent water infiltration into the finished spaces beneath. The concrete exhibits deterioration. Page 5.13 of ***Photographs*** depicts this condition. We were informed that the War Memorial Center experiences water infiltration into the spaces beneath. The intermediate landing is comprised of a concrete paver pedestal system atop an underlying waterproof membrane. War Memorial Center replaced the intermediate landing in 2011 at a cost of approximately $50,000. We do not anticipate a subsequent replacement during the next 20 years. We anticipate a useful life of 25- to 35-years for concrete stairs with an underlying waterproof membrane. We recommend the War Memorial Center budget for replacement of the south entrance stairs, including the south entrance door concrete landing but excluding the intermediate

landing, in 2012. We depict this information on Line Item 1.603 of ***Reserve Expenditures***. The War Memorial Center rebuilt the north entrance stairs, including the intermediate landing, in 2011. We do not anticipate a subsequent replacement during the next 20 years.

Walls, Concrete - The War Memorial Center exterior includes 45,000 square feet of exposed concrete structural members and facade. This includes 25,000 square feet of unfinished concrete at the Kahler addition, loading dock, and the concrete at the air intake and exhaust chambers, and 20,000 square feet of colored concrete stone facade at the Veterans Gallery at the War Memorial. The War Memorial Center conducted a concrete facade restoration in the mid 1990's. The concrete is in good overall condition with only isolated locations of minor deterioration. Pages 5.15 and 5.16 of ***Photographs*** depict these conditions. The exception is the underside of the War Memorial as seen when looking upward from Veterans Courtyard. The original design of the War Memorial did not incorporate a drip edge to prevent water cascading down the facade from penetrating the concrete at the underside of the building, resulting in concrete deterioration. War Memorial Center has remediated this condition at the courtyard facade of the War Memorial by extending the EIFS beyond the underside of the building. We recommend the installation of a metal drip edge at the outer perimeter of the War Memorial to remediate this condition. We discuss solutions and procedures related to concrete restoration in the following narrative.

Over time, continual exposure from weather and wind creates dispersed concrete spalls and cracks. The location and amount of deterioration is variable due to the non-uniform nature of the concrete pours and different weather exposures. The continued exposure of the concrete to weather creates deterioration of the building exterior in a random but progressive manner.

Repairs to the deteriorated concrete include *cleaning* all areas of debris and dirt, the selective *cutout* and *replacement* of all deteriorated concrete and reinforcing steel (rebar), and crack repairs. Replacements should use a nonchloride high strength concrete repair mix to minimize future deterioration. War Memorial Center should also require the contractor to specify the use of epoxy coated reinforcement bars when replacements are necessary. The use of epoxy coated reinforcement bars minimizes future metal deterioration or rust.

Periodic liquid-applied waterproof coatings serve to inhibit deterioration of the exterior concrete. Waterproof coatings on concrete must allow entrained moisture in the concrete to migrate to the concrete surface and evaporate. A non-permeable coating traps this moisture and increases concrete spalling and eventual degradation of the coating. Waterproof coatings have a useful life of 15- to 20-years with the benefit of interim touch up coatings. Two common manufacturers of waterproof coatings are *Modac™* and *Sonneborn™*[4].

We recommend the War Memorial Center coordinate waterproof coating applications with other exterior concrete repairs to provide the most economical unit price for the work and minimize the possibility of damage to other exterior building components as compared to

[4] Reserve Advisors, Inc. does not have any financial or other interest in this company and includes this reference for informational purposes only.

performing the repairs independently. The exterior coating both protects the concrete elements and establishes the overall aesthetic impression of the building for residents and the community at large. *Failure to replace an existing coating in a timely manner will result in increased concrete deterioration*.

War Memorial Center should budget for concrete restorations every 10- to 15-years. We recommend that the War Memorial Center budget for a restoration of the concrete facade by 2015 and every 10 years thereafter. We recommend the War Memorial Center budget for the following work:

- Partial depth replacement of up to one percent (1%) of the concrete facade
- Crack repairs
- Installation of a metal drip edge at the outer perimeter of the War Memorial (2015 only)

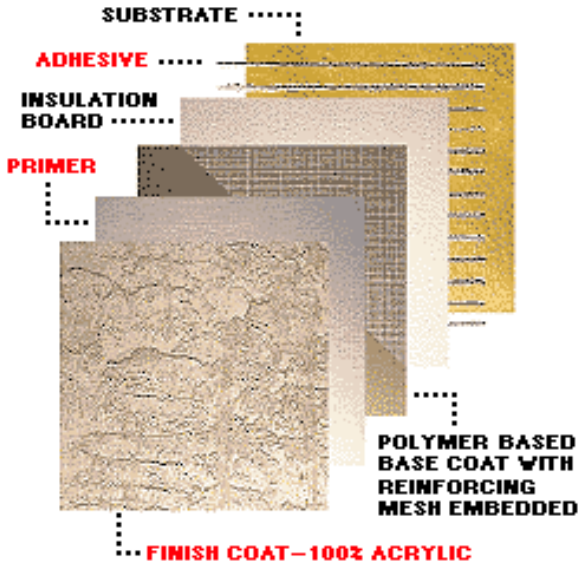
We depict this information on Line Item 1.660 of ***Reserve Expenditures***. *The costs of these exterior renovations will vary based on the actual amount of concrete replacements and repairs identified as necessary from the invasive pre-restoration phase of the project*.

In addition, we recommend the War Memorial Center budget for a waterproof coating application to the War Memorial by 2015 to enhance the appearance and prevent water infiltration. We include this information on Line Item 1.665 of ***Reserve Expenditures***.

Walls, EIFS - The Exterior Insulation Finish System (EIFS) of the War Memorial courtyard facade comprises approximately 6,600 square feet. EIFS is commonly referred to as synthetic stucco. For brevity, we refer to this architectural finish as EIFS. We elaborate on

solutions and procedures necessary for the optimal maintenance of EIFS in the following discussion.

EIFS wall systems have indefinitely long useful lives with periodic finish applications and proper maintenance. The useful life of these finish applications is from 8- to 10-years. The EIFS is fair condition with minor cracks evident. Page 5.17 of ***Photographs*** depicts this condition. The EIFS paint finish is in good condition. Periodic paint finish applications on EIFS help prevent water infiltration and spalling from weather exposure, maintain a good appearance and extend the useful life of the panels. The useful life is dependent on varying amounts of exposure to sunlight and weather conditions. The following graphic details the components of an EIFS wall panel.



We include the following commentary 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 environment and normal settlement can cause minor deterioration of the EIFS wall panels. Prior to the application of the new finish coat, the contractor should remove and replace all loose, cracked or deteriorated sections of the EIFS walls. The contractor should then wash the surface to remove all dirt or chalking of the prior paint finish. Options for cleaning include the following:[5]

The War Memorial Center should clean EIFS finishes that become *soiled with mildew or algae* with the following cleaning solution:

1 gallon warm water
1 quart household bleach
1 cup of trisodium phosphate (TSP)
Apply the solution to the entire area and lightly agitate with a soft bristle brush.
Use of hard scrubbing action or a hard bristle brush will damage the finish.
Rinse thoroughly with clean water.

The War Memorial Center should contact an EIFS manufacturer or qualified contractor to determine a suitable exterior finish product for initial and subsequent applications to the siding. Prior to the initial application, the contractor should test a small area of EIFS to evaluate the performance and color rendition of the exterior finish product. The contractor should follow the manufacturer's specifications for application to the siding. The most common methods of paint application are by brush, roller and spray. Brushing is the slowest method. Roller coating is much faster while spraying is usually the fastest and least costly. The contractor should specify the proposed method of application in their bids. We recommend brushing for smaller or irregular shaped surfaces. Roller coating is most effective on large flat surfaces. Spray

[5] This information was made available through Dryvit Systems, Inc. Additional information pertaining to Dryvit Systems is located at http://www.dryvit.com. Another useful source relating to EIFS is Senergy Inc. at http://www.senergyeifs.com.

applications require tight control of the equipment, personnel and preparation of the paint product which may prohibit a cost-effective spray application of paint. Regardless of the method of application, the contractor should protect surrounding elements.

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

1) Method of application
2) Name of *paint*[6] finish product
3) The contractor will apply paint during periods of favorable weather as required and specified by the manufacturer of the paint
4) The contractor will apply the paint to clean and dry surfaces at the manufacturer's recommended spreading rates
5) The contractor will apply successive coats of the paint finish, with sufficient time elapse between coats, as necessary to ensure uniform appearance
6) The contractor should repair or replace deteriorated or damaged EIFS prior to each application of the paint

In consideration of the above recommended maintenance, useful life and age of the exterior wall finishes, we advise that the War Memorial Center budget for paint applications and partial EIFS replacements by 2015 and every 10 years thereafter. Our estimate of cost anticipates repair or replacement of up to five percent (5%) of the EIFS walls in coordination with each paint finish application. The exact amount of area in need of repair will be discretionary based on the actual future conditions and the desired appearance. Each paint product has the limited ability to bridge (cover and seal) cracks but we recommend repair of all cracks which exceed the ability of

[6] 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.

the paint product to seal. Line Item 1.740 of ***Reserve Expenditures*** notes our estimate of future costs and anticipated times of paint finish applications and capital repairs.

Walls, Granite - Granite comprises approximately 6,000 square feet of the exterior walls at the north and south elevations of the War Memorial. The granite has been problematic due to the slight slope of the facade, lack of continuous waterproofing behind the granite, and the incompatibility of the granite and mortar. Remediation will require total removal of the granite, installation of waterproofing and a flashing system at the window heads and wall bases, and reinstallation of the granite with a compatible mortar. We include an allowance for remediation of the granite in 2012 on Line Item 1.767 of ***Reserve Expenditures***.

Subsequent to this remediation, we recommend the War Memorial Center budget for total repointing of the granite every 20 years, or next by 2030. The times and extent of the granite repointing and related work may vary. However, we judge at this time the estimated amount noted on Line Item 1.768 of ***Reserve Expenditures*** appropriate to estimate sufficient reserves. Updates of this Reserve Study will again consider the need to modify the anticipated scope and estimated cost of future repointing.

Walls, Metal Siding - War Memorial Center maintains approximately 1,300 square feet of metal siding at the War Memorial penthouse. The siding is in fair to poor condition at an age of 55 years. Metal siding in this application has a useful life of up to 60 years. We recommend the War Memorial Center budget for replacement of this siding by 2014 in conjunction with replacement of the adjacent roofs. This will result in the most economical unit price and

minimize the possibility of damage to other roof components as compared to separate replacements. We depict this information on Line Item 1.827 of ***Reserve Expenditures***.

Water Penetration Remediation - War Memorial Center has a history of water infiltration into the basement of the Kahler addition. This water is likely from the lake and may be a result of water penetration past the lake sheet pilings. The War Memorial Center excavated the south wall, and installed waterproofing and a dewatering system in 2010 at a cost of approximately $90,000. This remediation appears to have been successful. We recommend War Memorial Center conduct similar repairs to the 375 linear feet of basement walls at the north and east elevations in 2012. We base our cost on Line Item 1.968 of ***Reserve Expenditures*** on the Association's historical cost plus inflation. Our cost also include an allowance for replacement of the on-grade concrete sidewalks at these locations.

Waterproof Membranes - Fitch Plaza is a pedestrian area atop an underlying concrete structure. This elevated area comprises approximately 33,300 square feet. Due to the noninvasive nature of our inspection, we are unable to determine the exact composition of Fitch Plaza. Based on our visual inspection, experience with similar construction and knowledge of replacement/capital repair projects of this type, we surmise Fitch Plaza comprises the following elements:

- Concrete paver pedestal system
- Underlying waterproof membrane atop the structure
- Elevated structural concrete

Fitch Plaza is in good overall condition at an age of 16 years. We anticipate a useful life of 25- to 35 years for the pavers and waterproof membrane. We recommend that the War

Memorial Center plan to repair the concrete structure as necessary, and replace the membrane and concrete pavers by 2025. We include this information on Line Item 1.971 of ***Reserve Expenditures***.

The Veterans Courtyard is a pedestrian area atop an underlying concrete structure. This elevated area comprises approximately 22,000 square feet. Due to the noninvasive nature of our inspection, we are unable to determine the exact composition of Veterans Courtyard. Based on our visual inspection, experience with similar construction and knowledge of replacement/capital repair projects of this type, we surmise Veterans Courtyard comprises the following elements:

- Concrete topping
- Canned light fixtures at the underside of the War Memorial as seen when looking upward from Veterans Courtyard.
- Underlying waterproof membrane atop the structure
- Elevated structural concrete

A concrete topping protects the subsurface structure from the infiltration of storm water. We surmise a waterproof membrane separates and protects the garage structure from the migration of storm water through surface cracks in the concrete topping. Over time, the development of surface cracks is a normal occurrence in the topping, allowing storm water to come in contact with and wear the waterproof membrane. As the membrane ages and deteriorates, water infiltration through the structure and leaks into the garage will become more frequent and widespread. Deterioration of the concrete garage structure beneath the membrane is also probable due to membrane leaks and normal aging of the concrete.

Veterans Courtyard is in poor overall condition at an age in excess of 20 years with concrete deterioration evident and reports of water infiltration into the finished spaces beneath.

Pages 5.20 through 5.22 of ***Photographs*** depict these conditions. We anticipate a useful life of 25- to 35 years for the concrete topping and waterproof membrane. We recommend that the War Memorial Center plan to repair the concrete structure as necessary, and replace the membrane, concrete topping and light fixtures in 2012. We include this information on Line Item 1.973 of ***Reserve Expenditures***.

Windows and Doors - War Memorial Center maintains approximately 6,000 square feet of metal frame windows and doors at the Kahler addition. These components are in good condition at an age of 36 years. The War Memorial Center also maintains approximately 3,800 square feet of metal frame windows and doors at the south, and east and west entrances (Veterans Gallery) of the War Memorial. These components are in fair to poor condition at an age of 55 years with frame deterioration evident. Page 5.22 of ***Photographs*** depicts this condition. Properly maintained metal frame windows and doors have a useful life of 45- to 55-years. Therefore, the windows and doors at the War Memorial entrances are beyond their anticipated useful life. 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.

Properly designed window and door assemblies anticipate the penetration of some storm water beyond the gaskets. This infiltrated water collects in an internal drainage system and drains, or exits, the frames through *weep holes*. Occasionally these weep holes become clogged with dirt or are improperly diagnosed as a source of water infiltration and purposely, but

inappropriately, sealed. We recommend War Memorial Center periodically verify all weep holes are unobstructed and fund this expense through the operating budget. However, as window frames, gaskets and sealants deteriorate, leaks become more frequent. The windows and doors will eventually need replacement or major capital repairs to prevent water infiltration and damage from wind driven rain.

The thermal efficiencies of the window and door 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.

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 and door 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 War Memorial Center 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. War Memorial Center 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 use a unit cost for replacements with typical thermal efficiencies and quality of construction to achieve a useful life of 45- to 55-years.

The frames of windows and doors 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.

The frames of the windows and doors at War Memorial Center are constructed of aluminum. This type of frame is necessary at War Memorial Center to resist strong wind forces. We only recommend replacement with aluminum frames in this type of environment.

Aesthetics can be the primary reason for replacement of windows and doors. With a useful life of 45- to 55-years, the windows and doors 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 War Memorial Center budget for replacement of the windows and doors at the Kahler addition by 2026, and at the War Memorial south, east and west entrances by 2013. We note this information on Line Items 1.980 and 1.981 of ***Reserve Expenditures***. We base this estimate of remaining useful life in part on the continued

periodic replacement of joint sealants at the windows and doors. We discuss our recommendations for joint sealants in a previous narrative, "**Sealants**".

Interior Building Elements

Rest Rooms - The War Memorial Center maintains four common area rest rooms located on floors three and four of the War Memorial. Components of the rest rooms include tile floor and wall coverings, paint finishes, light fixtures and plumbing fixtures. The components are in good to fair overall condition at an age of 10 years.

War Memorial Center also maintains two rest rooms at the south entrance. Components of the rest rooms include tile floor coverings, paint finishes, light fixtures and plumbing fixtures. The components are in fair to poor condition.

Periodic renovations of the rest rooms are an astute practice to maintain a positive overall appearance of the War Memorial Center. The useful life of rest room components varies up to 20 years. For funding purposes, we recommend the War Memorial Center budget for renovation of the rest rooms on the third and fourth floors by 2021, and at the south entrance in 2013. We include this information on Line Items 2.900 and 2.901 of ***Reserve Expenditures***. The War Memorial Center should verify the rest room renovations comply with the Americans with Disability Act (ADA).

Building Services Elements

Air Handling Units - The War Memorial Center maintains eight air handling units that provide heated or cooled air, depending on the season, to the building. This includes one air handling unit that serves the electrical room in the War Memorial, six air handling units that serve the Kahler museum (including the supply and return fans) and one air handling unit that serves the Kahler offices. War Memorial Center replaced four of the air handling units in 2006 and repaired four of the air handling units located in the Kahler museum in 2006. Air handling 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. All units are reported in satisfactory operational condition. Based on its smaller size, we anticipate a useful life of up to 25 years for the unit serving the electrical room in the War Memorial and recommend the War Memorial Center budget for its replacement by 2031. Based on their larger size, we do not anticipate replacement of the remaining seven air handling units. Instead, we recommend the War Memorial Center budget an allowance of $25,000 plus inflation for capital repairs to these units, include replacement of coils, drives, motors, etc., by 2031. We note this information on Line Items 3.040 through 3.042 of ***Reserve Expenditures***.

Boiler, Building Heat - The War Memorial Center utilizes one gas-fired boiler with an *input* capacity of 6,277-MBH (thousand British Thermal Units per hour) to generate hot water for building heat as back-up to city supplied steam. The boiler is reported in satisfactory operational condition at an age of 55 years. This boiler receives minimal use but is tested monthly. Based on its minimal use, we anticipate a useful life of up to 60 years for the boiler. 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 War Memorial Center budget for replacement by 2016. We depict this information on Line Item 3.105 of ***Reserve Expenditures***.

Boiler, Domestic Hot Water - One gas-fired boiler with an *input* capacity of 5,590-MBH generates domestic hot water for the building as back-up to city supplied steam. This boiler is reported in satisfactory operational condition at an age of 15 years. Based on its minimal use, we anticipate a useful life of up to 30 years for this boiler. We recommend War Memorial Center budget for replacement of the domestic hot water boiler by 2026. We depict this information on Line Item 3.160 of ***Reserve Expenditures***.

Chillers - The building utilizes two 400-ton capacity chillers to provide chilled water for air conditioning the building. The chillers are in good condition at an age of five years, use R-134A refrigerant and have a useful life of 25- to 35-years.

The chillers utilize a refrigeration cycle to produce cold, or *chilled*, water for circulation throughout the building. A chiller contains four major components: compressor, condenser, evaporator and expansion device. The refrigerant is compressed, condensed and expanded as a means of removing heat which is then rejected through the cooling tower. Tube bundles within the chiller transfer heat from one liquid cooling media (freon) to another (typically water).

Proper maintenance includes 1) periodic eddy current tests and 2) a tear down or partial machine disassembly (invasive inspection of interior machine components) to evaluate the condition of the chiller tubes for defects such as permeability and cracks. The eddy current test compares known discontinuities in the magnetic fields between a known calibration tube and the actual tube being tested. The test probes create the two necessary magnetic fields in each tube for the comparison. The War Memorial Center should conduct a tear down inspection of the chillers by 2016 and every 10 years thereafter except when replacement occurs. We include this information on Line Item 3.200 of ***Reserve Expenditures***.

The refrigerant is a major factor in determining the remaining useful life of the chillers. The Environmental Protection Agency (EPA) has developed regulations to reduce the emissions of environmentally harmful refrigerants into the environment during the servicing and disposal of air conditioning and refrigeration equipment. Under the Clean Air Act, the EPA established regulations regarding the sale of refrigerants used in air conditioning and refrigeration equipment.

We recommend War Memorial Center budget to replace the chillers by 2031. We include this information on Line Item 3.205 of ***Reserve Expenditures***.

Condensate Return System - The condensate return system is a package system which consists of a tank, two pumps, and a float switch that is used to pump condensate back to the boiler. The system was installed in 2006, is reported in good operational condition and has a useful life of up to 25 years. We recommend the War Memorial Center fund interim

replacements of the pumps through the operating budget and anticipate complete replacement of the system by 2031. Line Item 3.237 of ***Reserve Expenditures*** notes our estimate of future cost and anticipated time of replacement.

Cooling Tower - One back-up cooling tower with a capacity of 400-tons works in conjunction with the chillers to provide air conditioning to the building. Lake water serves as the primary source for rejecting heat from the chillers. The cooling tower is good condition at an age of four years. The useful life of large cooling towers is from 25- to 35-years if properly maintained. Proper maintenance includes the following:

- Keeping all areas free of debris and build-up
- Effective water treatment program
- Seasonal testing of valves and controls for proper operation
- Inspection, adjustment and repairs of mechanical components as recommended by the manufacturer
- Annual inspection of components for corrosion or decay
- Capital repairs every 10- to 15-years

We recommend the War Memorial Center budget for capital repairs to the cooling tower by 2016 and again by 2026. Capital repairs include a complete inspection of the cooling tower, pumps, motor drives and controls, replacement of the fill media, spray nozzles and any corroded areas, application of an internal protective coating and structural repairs. In addition, capital repairs may include partial or complete replacement of the motors, pumps, controls and valves. The War Memorial Center should ensure that any motor replacements utilize motors rated for use in cooling towers. We also recommend the War Memorial Center anticipate the eventual complete replacement of the cooling tower by 2031. We include this information on Line Items 3.260 and 3.265 of ***Reserve Expenditures***. The War Memorial Center should fund the general maintenance and any interim repairs through the operating budget.

Electrical System - The ages of the electrical system components at War Memorial Center varies. The War Memorial Center has periodically upgraded the electrical equipment in conjunction with major renovations, such as the during the mechanical equipment renovation in 2006. Based on our conversations with the building engineer, the equipment is in satisfactory operational condition. Electrical systems have useful lives of up to and sometimes beyond 65 years with periodic maintenance. Partial or ongoing component replacements may help to extend its remaining useful life. 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. 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. This component has an indefinite useful life and is not likely to require replacement in total at one time. 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 War Memorial Center 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 condominium unit. The distribution panel is enclosed in a box and contains circuit breakers, fuses and switches. This component has an indefinite useful life and would rarely require replacement.

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.

Conductors - Conductors are the electrical wires that convey electricity to the light fixtures, receptacles and appliances. Conductors in typical low ampacity circuits are copper, as we assume is the case at War Memorial Center.

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. The building engineer does not report any incidents of wiring overloads. Periodic *thermoscans* of primary switchgear and distribution panels are advisable and can detect defective or prematurely aging electrical system components. We recommend the War Memorial Center conduct thermoscans of the distribution panels and circuit protection panels, and inspections of the transformers for any indications of arcing, burning or overheating. Verification of the integrity of all connection points minimizes the potential for arcing and fires. The War Memorial Center should repair or replace all loose and corroded parts at that time.

Due to the limited amount of mechanical components and minimal exposure to weather, if any, electrical system components within a building have a long, often indeterminate, useful life extending beyond 65 years. The War Memorial Center 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 include an allowance of $160,000 plus inflation for periodic invasive inspections via thermoscans and replacement of limited electrical

system components, including transformers, switchgear and distribution panels, every eight years beginning by 2015. Updates of this Reserve Study would consider possible changes in the scope and times of partial replacements. We note this information on Line Item 3.300 of ***Reserve Expenditures***.

Elevators, Hydraulic - War Memorial Center utilizes the following hydraulic elevators:

- One Art Museum freight elevator that serves six floors.
- Two Art Museum passenger elevators that serve four floors.
- Two War Memorial freight elevators. One elevator serves four floors and the other serves six.

The elevators are reported as original to their respective buildings. Based on their ages, the elevators are in need of modernization. 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.

Each elevator cylinder resides in a pit immediately beneath the elevator cab. Therefore, the hydraulic elevators at War Memorial Center are considered *in-ground* elevators. The hydraulic elevator cylinders have a useful life of up to 45 years. The in-ground elevator cylinders are in a corrosive environment. Corrosion of the cylinders can result in potential oil leaks and

elevator failures, posing safety and environmental risks. The ASME/ANSI A17.1-2000 elevator safety code requires replacement of single bottom cylinders with double bottom cylinders and PVC protection.

Hydraulic elevator pumps, controls and cylinders 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 *modernization* of the elevators will include replacement of the following hydraulic elevator system components:

- Cab control panels
- Cylinders
- Door operators
- Hallway panels/buttons
- Microprocessor based controllers
- Pumps

Based on the age and condition of the elevators, we recommend the War Memorial Center budget for replacement of these components by 2013. We depict this information on Line Items 3.320 through 3.322 of ***Reserve Expenditures***.

The elevator cabs and shafts have an indefinite useful life and therefore we do not include their replacement during the next 20 years. The War Memorial Center 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 War Memorial Center should require the contractor to verify that elevator modernization

includes 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).

Elevators, Traction - The building utilizes two passenger traction elevators that provide service to seven floors in the War Memorial. The major elevator system components are in fair condition at an age of 10 years. Elevator system components of this type provide many years of service and when cared for by a maintenance contract, can have useful lives of up to 40 years. However, the scarcity of parts and the potential frequency and duration of service interruption makes *modernization* more desirable as the components age. We include the following solutions and procedures for traction elevator component modernization for present and future board members.

Traction elevators are raised and lowered by woven steel cables, or hoisting ropes. The ropes are attached to the elevator car and wound around a sheave. The sheave is connected to an electric motor. As the motor turns one way or the other, the sheave either raises or lowers the elevator car. The ropes that lift the car are also connected to a counterweight to ease the load on the motor.

Three basic types of traction elevators include gearless, geared and machine-roomless (MRL). In gearless elevators, the motor rotates the sheaves directly while in geared elevators, the motor turns a gear train that rotates the sheave. For gearless and geared elevators, the sheave, motor and controls are located in a machine room above the elevator shaft. MRL elevators are

relatively new elevator systems that use smaller sheaves than conventional traction elevators. The smaller sheave size allows the lifting components to be mounted within the hoistway itself, eliminating the need for a machine room.

We anticipate that modernization of the elevators will include replacement of the following traction elevator system components:

- Cab control panels
- Door operators
- Hallway panels/buttons
- Hoists and motors
- Microprocessor based controllers

Based on the age and condition of the elevators, we recommend the War Memorial Center budget for modernization by 2031. We depict this information on Line Item 3.360 of ***Reserve Expenditures***.

Exhaust Fan - One exhaust fan removes air from the south entrance rest rooms. This fan is in good condition at an age of five years. The useful life of exhaust fans of this type is up to 30 years. We recommend the War Memorial Center budget for replacement by 2031. We include this information on Line Item 3.380 of ***Reserve Expenditures***.

Filtration System - War Memorial Center maintains a filtration system to filter incoming lake water for free cooling. The War Memorial Center installed this system in 2006. We anticipate a useful life of up to 25 years and recommend War Memorial Center budget for its replacement by 2031. We depict this information on Line Item 3.413 of ***Reserve Expenditures***.

Generator, Emergency - A 150-kW (kilowatt) natural gas generator provides power to the critical electrical systems during power supply interruptions or outages. The generator is reported in good condition at an age of 36 years. War Memorial Center should continue to test the emergency generator periodically and conduct repairs as needed. We suggest the War Memorial Center fund these periodic tests and repairs from the operating budget. This type of generator has a useful life of 25- to 35-years. Therefore, the generator is beyond its anticipated useful life. Based on its condition, we recommend the War Memorial Center anticipate replacement of the generator by 2016. We include this information on Line Item 3.440 of ***Reserve Expenditures***.

Heat Exchangers - The building utilizes one tube heat exchanger to exchange heat between the city supplied steam and the building heating system, and one plate heat exchanger to exchange heat between the lake water and the building cooling system. The War Memorial Center replaced the heat exchangers in 2006 and they are in good condition. The useful life of heat exchangers is from 20- to 25-years. We recommend the War Memorial Center plan to replace the two heat exchangers by 2021. We note this information on Line Items 3.460 and 3.461 of ***Reserve Expenditures***. We recommend the War Memorial Center periodically inspect the heat exchangers and conduct repairs as needed from the operating budget.

Heat Recovery Unit - The War Memorial Center maintains one heat recovery unit in the War Memorial penthouse to reclaim heat from the third and fourth floor rest room exhausts. This unit is in good condition at an age of five years and has a useful life of up to 25 years. We

recommend War Memorial Center budget for its replacement by 2031. We include this information on Line Item 3.467 of ***Reserve Expenditures***.

Life Safety System - The life safety system at War Memorial Center includes the following components:

- Annunciators
- Control panel
- Detectors
- Emergency lights
- Exit lights
- Pull stations
- Wiring

The War Memorial Center installed a new panel and devices at the north entrance lobby in 2011. The ages of the remaining devices vary. 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 War Memorial Center budget for replacement of the remaining devices in the War Memorial by 2013. 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***. We advise the War Memorial Center periodically test the batteries of the emergency devices to confirm the appropriate amount of operational time. The War Memorial Center should replace the batteries as needed when operational times decrease to an unacceptable limit and fund this ongoing activity through the operating budget.

Make-up Air Units - The War Memorial Center utilizes two make-up air units that precondition the air before it enters the air handling units. These units also provide humidity control. Make-up air 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. The make-up air units are in good condition at an age of five years. Based on their larger size, we do not anticipate replacement of the make-up units. Instead, we recommend the War Memorial Center budget an allowance of $40,000 plus inflation for capital repairs to these units, include replacement of coils, drives, motors, etc., by 2031. We note this information on Line Items 3.587 and 3.588 of ***Reserve Expenditures***.

Piping - War Memorial Center maintains building heat piping in the concrete floor slabs at the perimeter of the War Memorial. Based on a recent repair, the building engineer informs us that these pipes are in fair to poor condition at an age of 55 years. We estimate that there exists 3,000 linear feet of horizontal building heat pipes throughout the War Memorial. These pipes have a useful life of up to 75 years. The War Memorial Center should budget for their replacement by 2017. We depict this information on Line Item 3.600 of ***Reserve Expenditures***.

Although it is likely that the times of replacement and extent of repair costs may vary from the budgetary allowance, War Memorial Center could budget sufficient reserves for the beginning of these pipe replacements and have the opportunity to adjust its future reserves up or down to meet any changes to these budgetary estimates. Updates of this Reserve Study would

incorporate changes to budgetary costs through a continued historical analysis of the rate of deterioration and actual pipe replacements to budget sufficient reserves.

Pumps - War Memorial Center utilizes nine major pumps for the building heat, air conditioning and domestic water. Major pumps included in this Reserve Study are those with a motor drive of at least five-HP. The War Memorial Center should replace or repair all pumps with motor drives less than five-HP as needed and fund this ongoing maintenance activity through the operating budget. The following table depicts the name, capacity and quantity of each pump type. The War Memorial Center replaced all these pumps in 2006 and they were operational at the time of our inspection.

Name	Capacity (HP)	Quantity
Chilled water	40	2
Chiller	7.5	2
Condenser	20	2
Heat recovery	15	1
Lake water	50	2

Pumps with motor drives in excess of 20-HP have useful lives of up to 30 years. The useful life of smaller capacity pumps of 5- to 20-HP is up to 20 years. The War Memorial Center may choose to rebuild pumps prior to complete replacement. However, this activity becomes less desirable as pumps age due to the scarcity of parts. We regard *interim* replacements of motors and component parts as normal maintenance and base our estimates on *complete* replacements. An exact replacement time for each individual pump is difficult, if not impossible,

to estimate. We recommend the War Memorial Center anticipate replacements of the pumps with a capacity of 20-HP or less by 2026 and the pumps with a capacity greater than 20-HP by 2031. We depict this information on Line Items 3.700 through 3.704 of ***Reserve Expenditures***. Our costs include allowances for replacement of the variable frequency drives (VFD's).

Reheat Coils - The War Memorial Center maintains 80 reheat coils in the basement of Kahler. These coils are in fair condition at an age of 36 years and have a useful life of up to 40 years. We recommend the War Memorial Center budget for their replacement by 2016. We depict this information on Line Item 3.793 of ***Reserve Expenditures***.

Rooftop Heating and Cooling Unit - The War Memorial Center utilizes one rooftop air handling unit to provide heated or cooled air, depending on the season, to the bird cage stairs. 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. The unit has a gas-fired heating capacity of 108-MBH and is in good condition at an age of five years. The useful life of units of this type is up to 20 years with proper maintenance. Based on the age and condition, we recommend the War Memorial Center budget for replacement by 2026. We depict this information on Line Item 3.800 of ***Reserve Expenditures***.

Property Site Elements

Asphalt Pavement, Crack Repair, Patch and Seal Coat - Asphalt pavement comprises approximately 15,000 square yards of parking areas and driveway from the security gate south.

The pavement is in poor overall condition with cracks and settlement evident throughout. We also note settlement at the catch basins and deterioration of the asphalt curbs. The War Memorial Center has replaced a limited portion of the pavement at the north entrance and has also installed concrete curbs and gutters at the War Memorial parking area. Parked vehicles leak motor oil and other fluids that can damage asphalt pavement. We recommend periodic *seal coat* applications to maintain the pavement. Seal coat applications minimize the damaging effects of these vehicle fluids, maintain a uniform and positive appearance, and maximize the useful life of the pavement. The War Memorial Center should plan future applications every three- to five-years. We elaborate on solutions and procedures necessary for the optimal maintenance of asphalt pavement in the following discussion.

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.

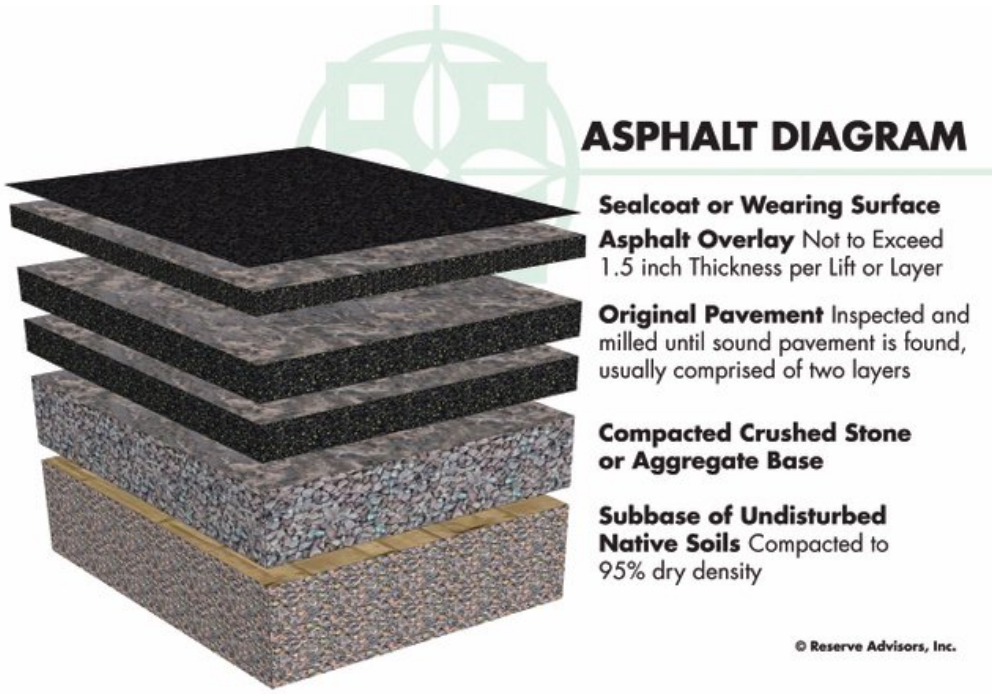
War Memorial Center should repair any isolated areas of deteriorated pavement prior to seal coat applications. Proposals for seal coat applications should include both crack repair and area patching. These activities reduce water infiltration and the effects of inclement weather. The contractor should only apply seal coat applications after remedial crack and surface 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 both crack repair and area patching.

We recommend the War Memorial Center defer the initial application of seal coat until 18 months after the near term asphalt repaving. This initial application of seal coat usually does not require crack repair or area patching. Therefore, we recommend the War Memorial Center fund this initial application through the operating budget. War Memorial Center should plan subsequent applications of seal coat that include crack repair and area patching beginning by 2017 and every four years thereafter except when subsequent repaving occurs. Line Item 4.020 of ***Reserve Expenditures*** notes our estimate of future costs and anticipated times of these subsequent seal coat applications. Our costs include allowances for striping of the parking areas.

Asphalt Pavement System - As previously state, asphalt pavement comprises 15,000 square yards of parking areas and driveway from the security gate south. The pavement is in poor overall condition with cracks and settlement evident throughout. We also note settlement at the catch basins and deterioration of the asphalt curbs. Pages 5.36 and 5.37 of ***Photographs*** depict these conditions. The War Memorial Center has replaced a limited portion of the pavement at the north entrance, and has also installed concrete curbs and gutters at the War

Memorial parking area. We assume that War Memorial Center will replace the remaining asphalt curbs with concrete curbs and gutters. The useful life of pavement in Milwaukee is from 15- to 20-years. We include the following solutions and procedures pertaining to ***components*** of the pavement, the ***manner of repaving***, ***time*** of repaving and ***coordination*** of other possible replacements with the repaving 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 of the asphalt pavement, we recommend the *total replacement* method of repaving at War Memorial Center.

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 of 15- to 20-years 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. War Memorial Center should repair any isolated areas of deteriorated pavement concurrent with periodic seal coat applications. We recommend the War Memorial Center plan for total replacement of the asphalt pavement by 2013. Our cost on Line Item 4.045 of ***Reserve Expenditures*** includes an allowance for replacement of the asphalt curbs with concrete curbs and gutters, and repairs and partial replacements of the catch basins.

Maintenance Equipment - Major maintenance equipment at the property includes a forklift, recreation utility vehicle and a skid steer. The forklift is in good condition at an age of less than one year and has a useful life of up to 20 years. We recommend the War Memorial Center budget for its replacement by 2031. The recreation utility vehicle is in good condition at an age of three years and has a useful life of up to 10 years. We recommend the War Memorial Center budget for its replacement by 2018 and again by 2028. The skid steer is in fair condition.

The War Memorial Center purchased this vehicle used. We anticipate a useful life of up to 30 years for the skid steer and recommend the War Memorial Center budget for its replacement by 2020. We depict this information on Line Items 4.606 through 4.608 of ***Reserve Expenditures***.

Reserve Study Update - An ongoing review by Management 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 Management 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

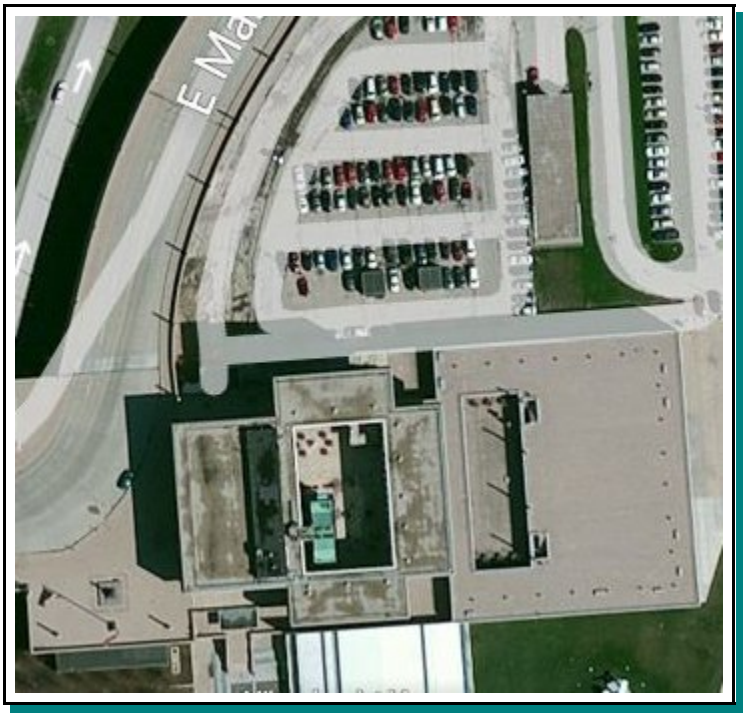
Periodic updates incorporate these variable changes since the last Reserve Study or Update.

The War Memorial Center 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. Budgeting for an Update demonstrates the Board's objective to continue fulfilling its fiduciary responsibility to maintain the commonly owned property and to fund reserves appropriately.

PHOTOGRAPHS

Photographs document the conditions of various property components as of the date of our visual inspection, December 8 , 2011. The Condition Assessment contains references to these photographs.

The following is an overview image of the subject property:

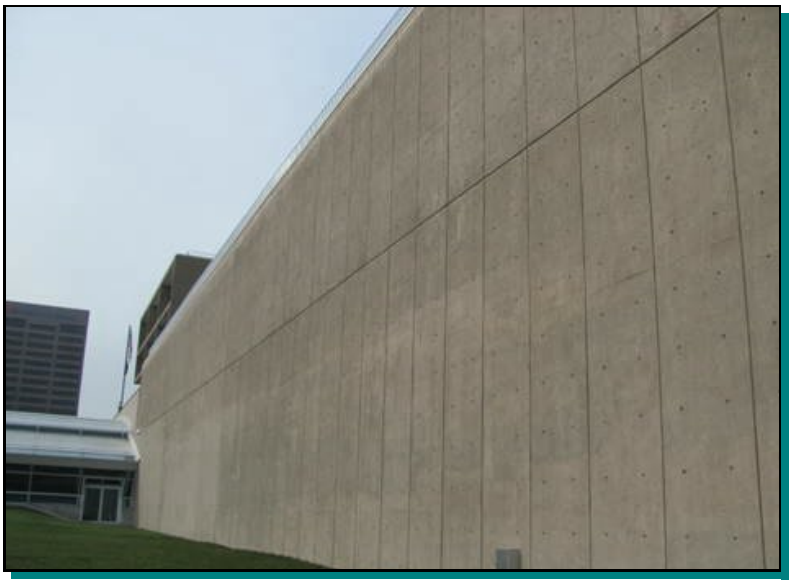


The next pages contain the photographs related to Section 4 - Condition Assessment

War Memorial east elevation

War Memorial west elevation

Kahler east elevation



Kahler south elevation

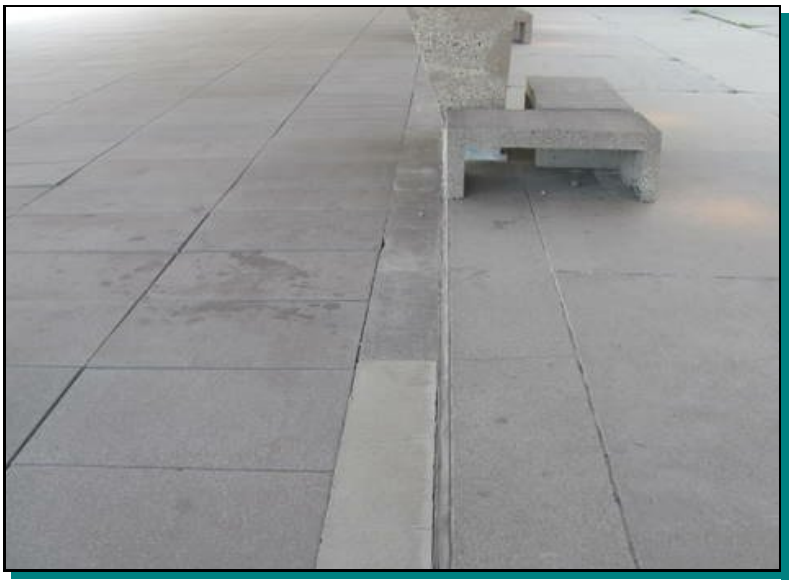
North elevation

Concrete deterioration at exhaust chamber

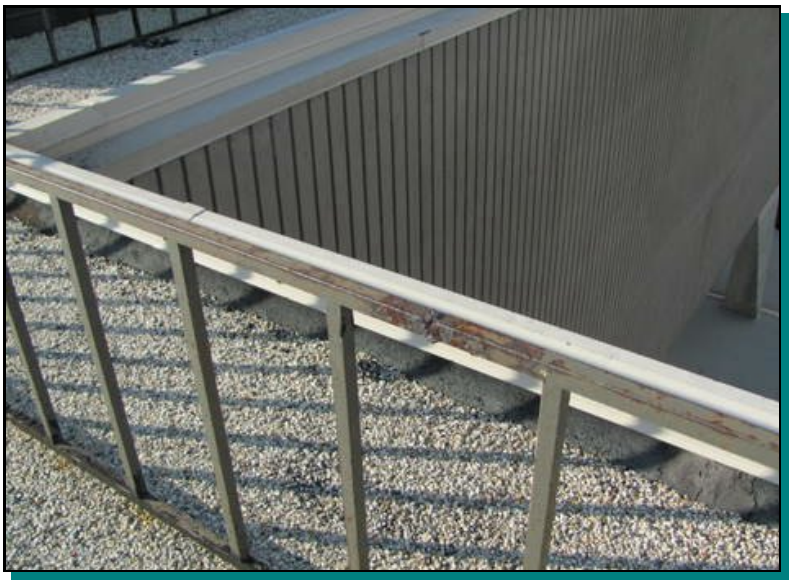
Significant concrete deterioration

Significant concrete deterioration

Deterioration at west expansion joint

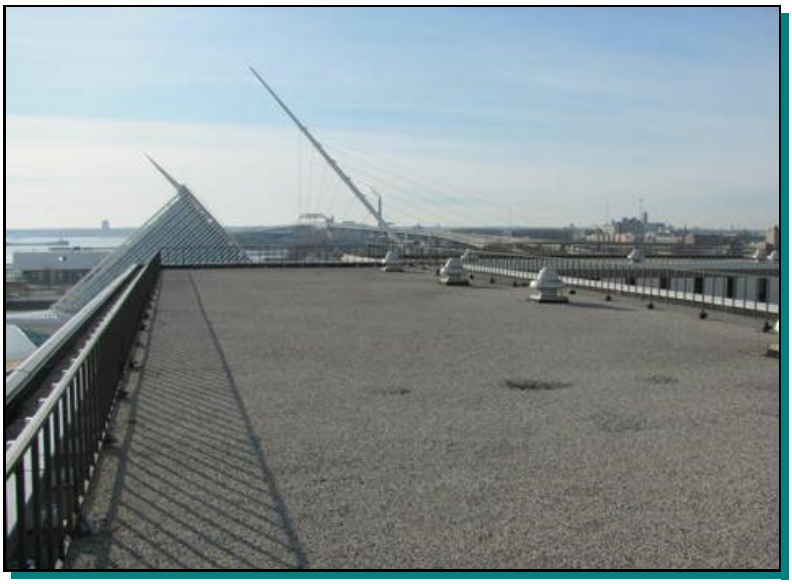


East expansion joint



Deterioration of rooftop railing

War Memorial built-up roof



War Memorial built-up roof

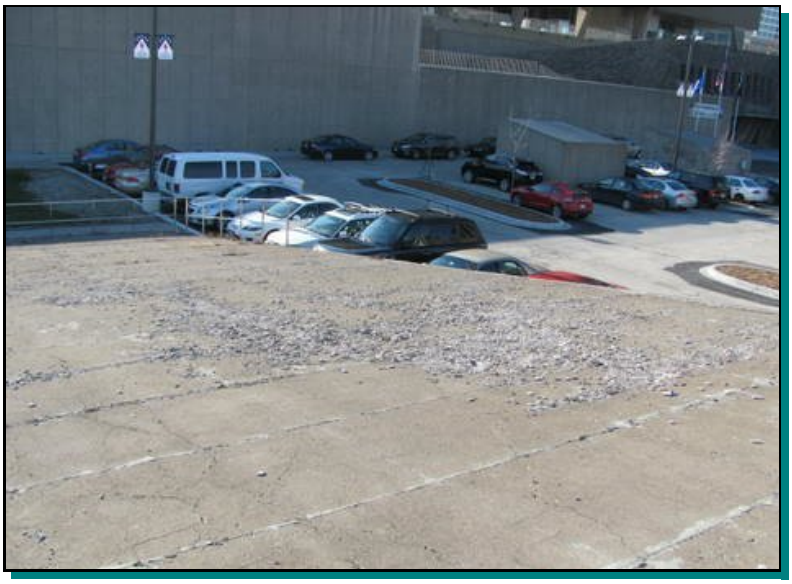
Roof ledge and light fixture

Loading dock roof

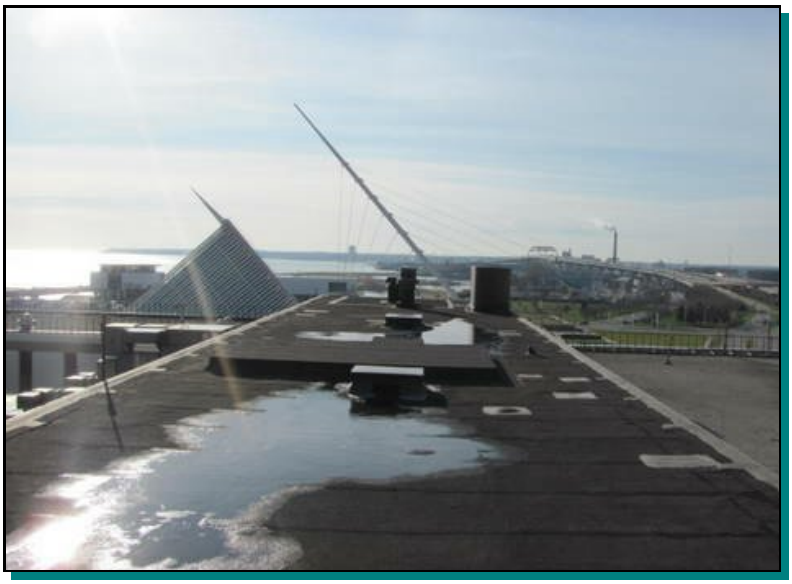
Significant concrete deterioration

Significant concrete deterioration

Significant concrete deterioration



Significant concrete deterioration



Penthouse modified bitumen roof

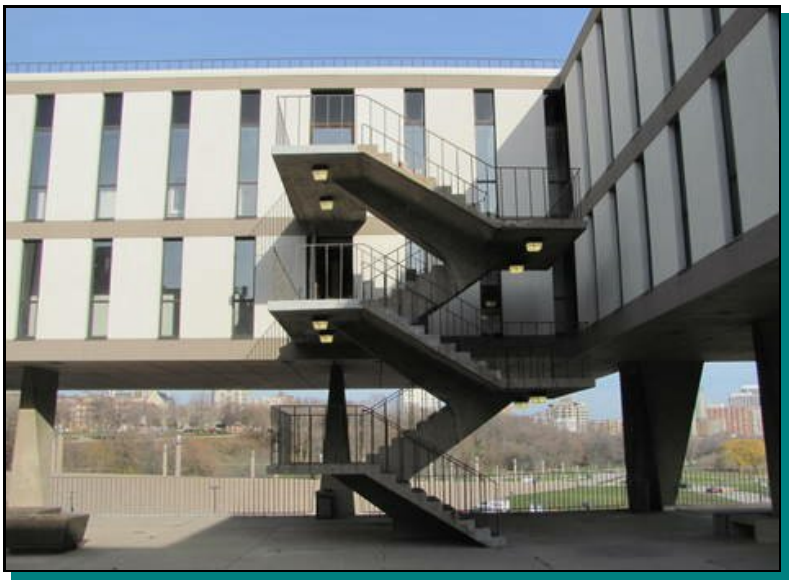
Bird cage stairs

Cracked glass

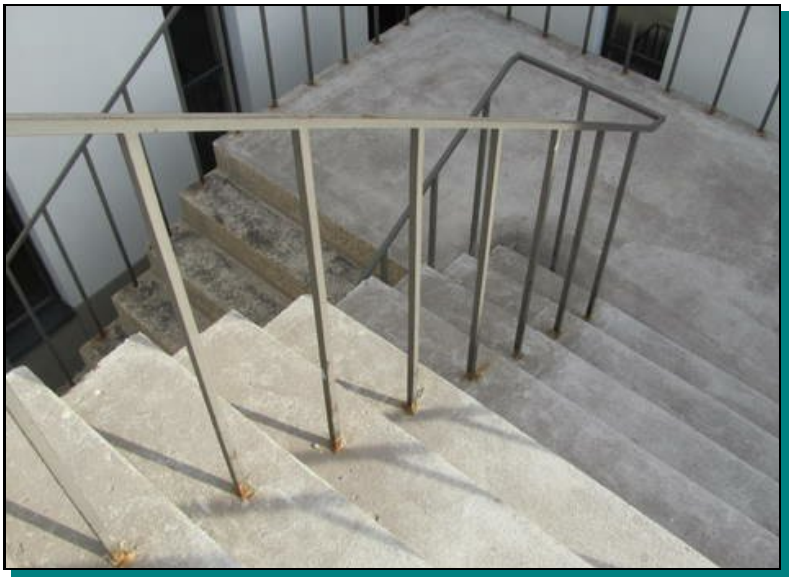
Cracked glass

Frame deterioration

Frame deterioration

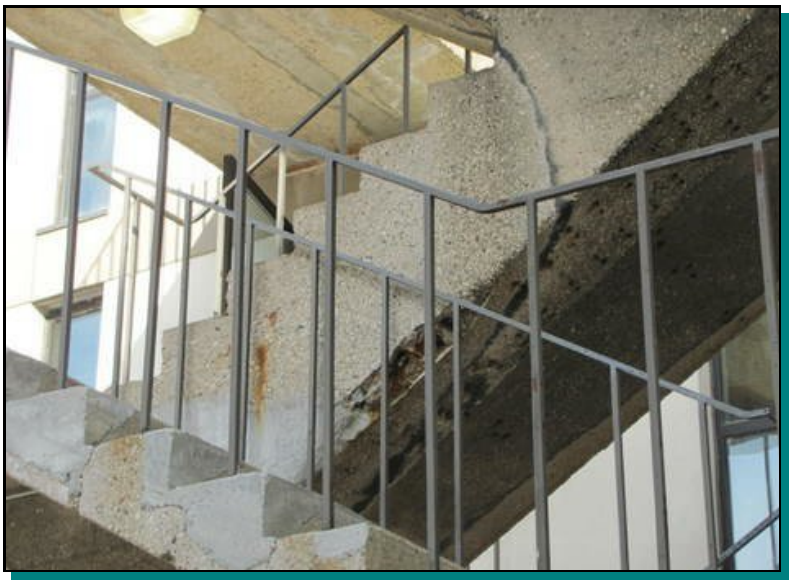


Courtyard stairs

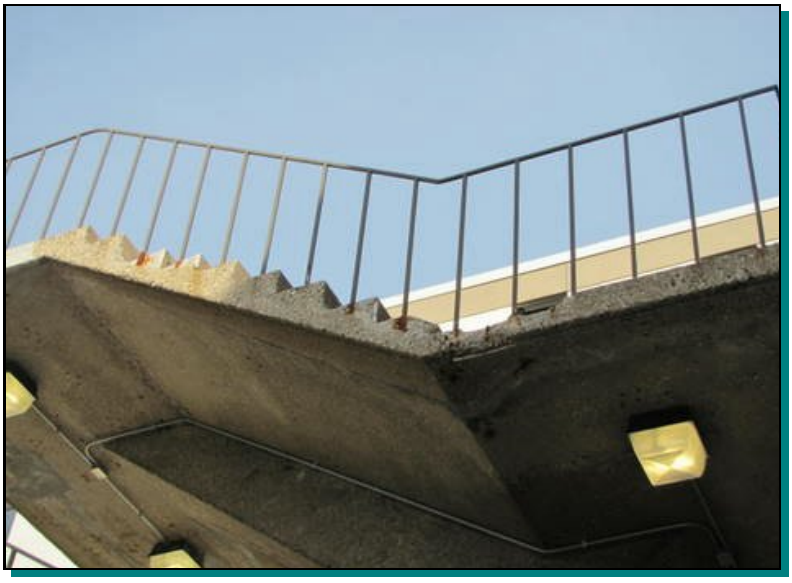


Railing deterioration

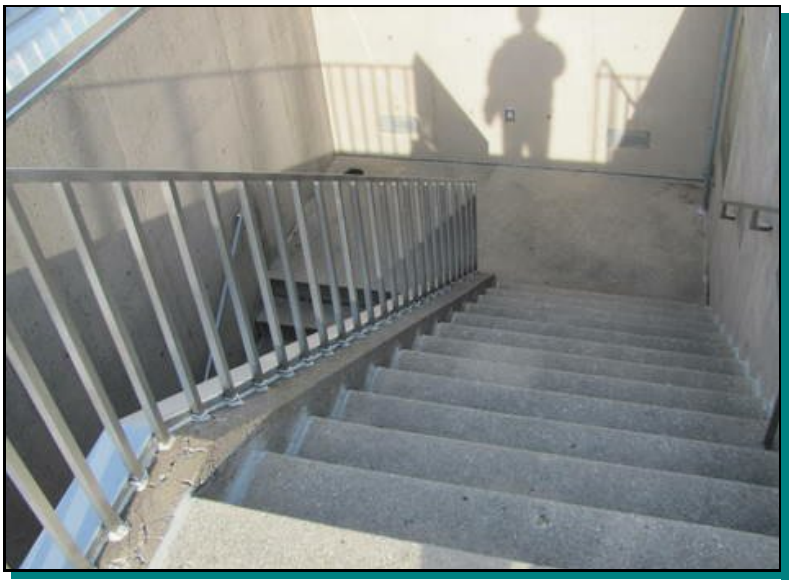
Railing deterioration



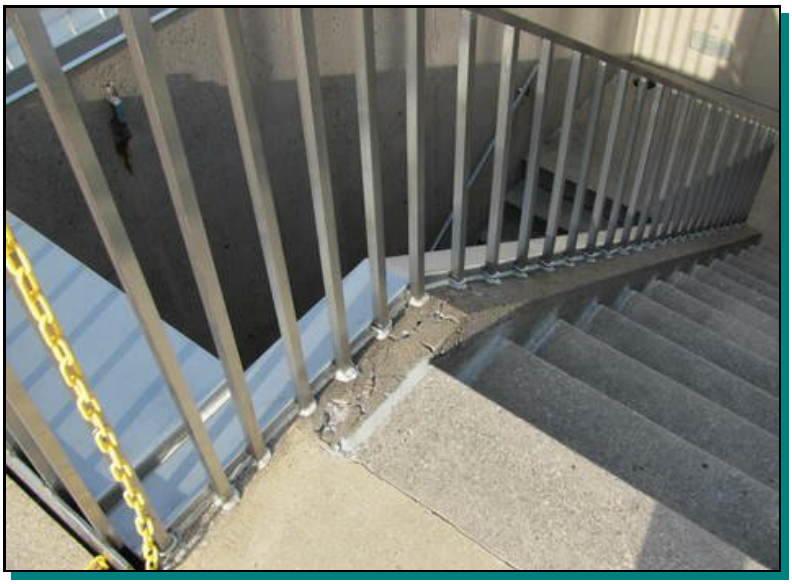
Concrete deterioration



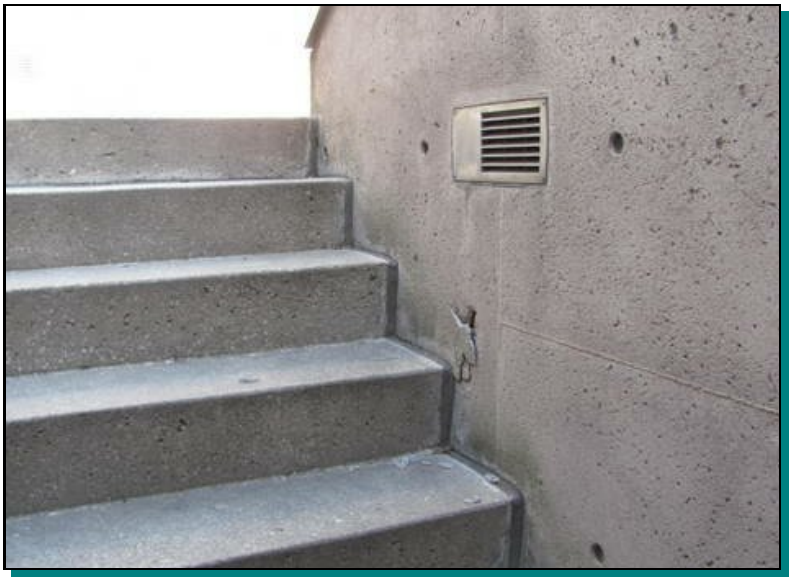
Concrete deterioration



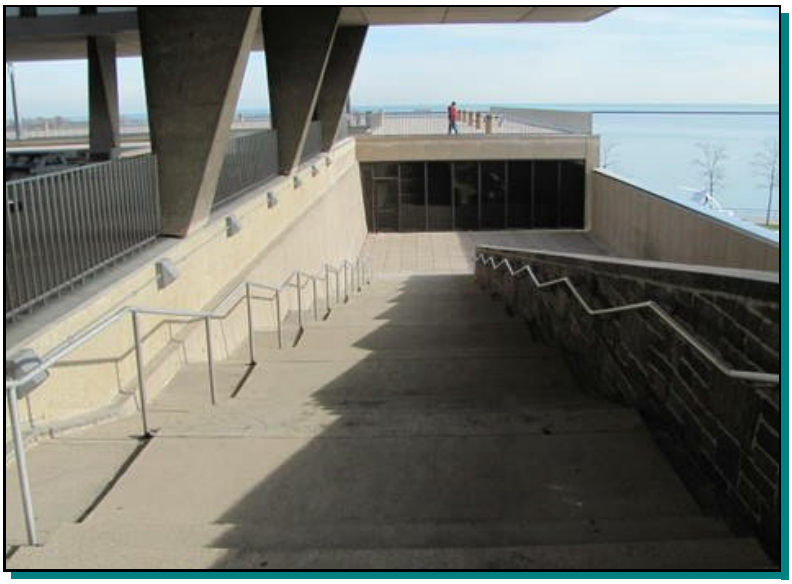
Stairs at Fitch Plaza



Concrete deterioration



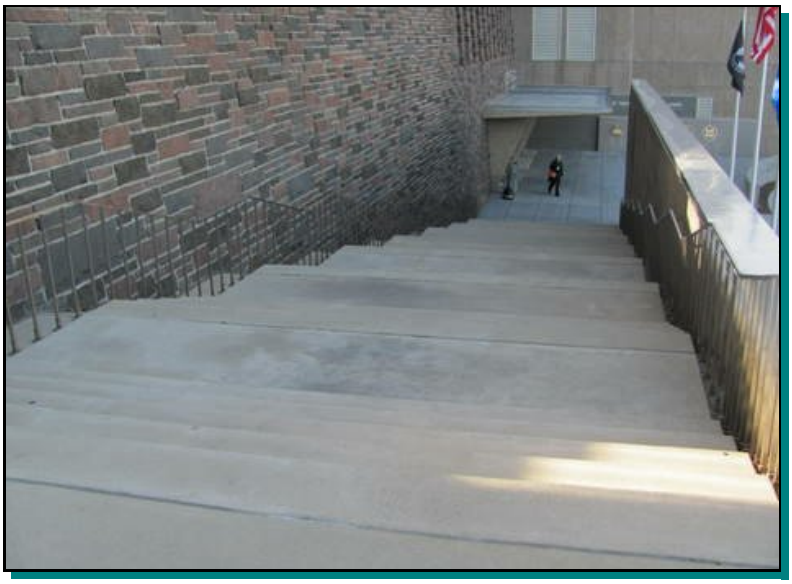
Concrete deterioration



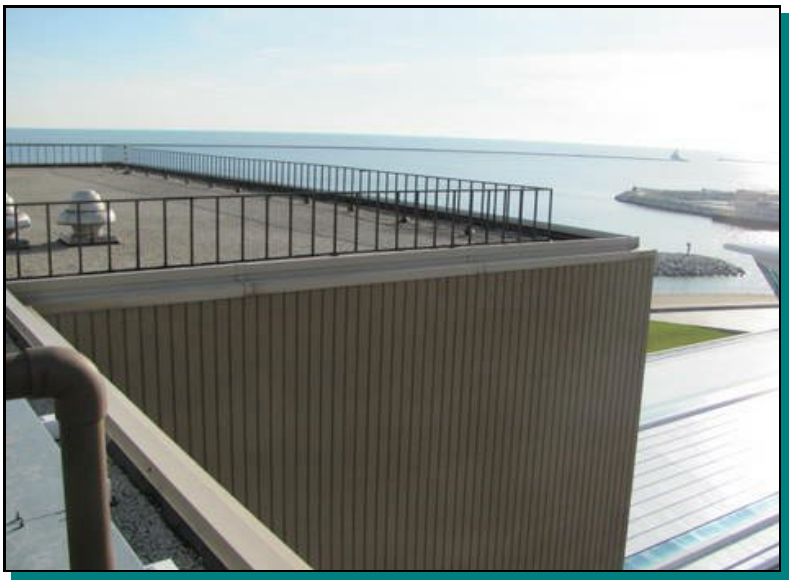
South entrance stairs

South entrance stairs

Concrete deterioration



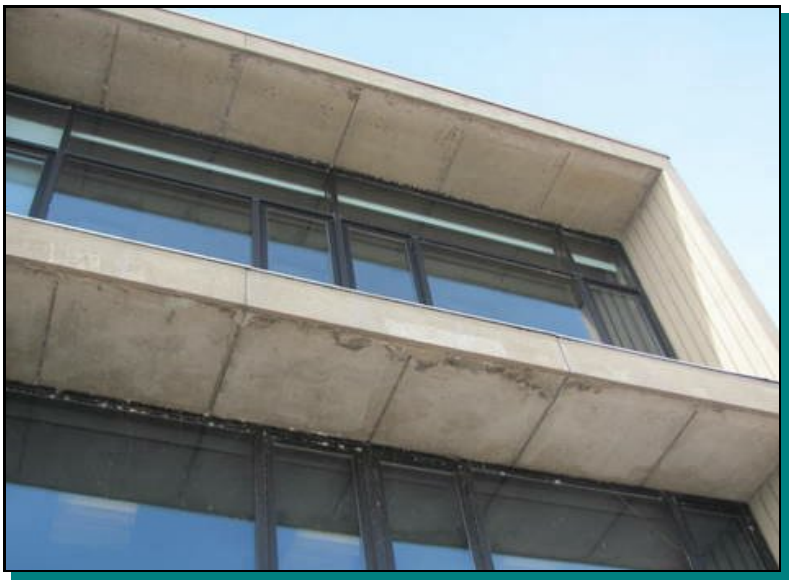
North entrance stairs - replaced in 2006



Concrete facade

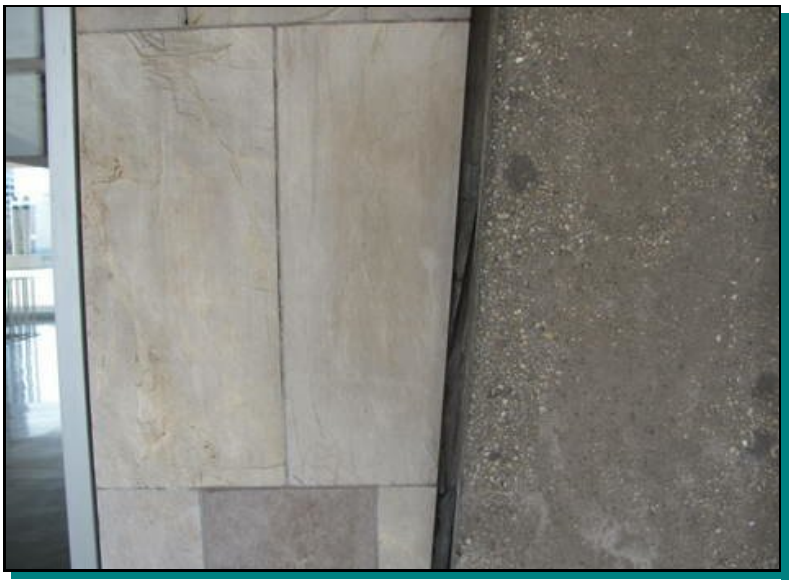
Concrete facade

Concrete deterioration

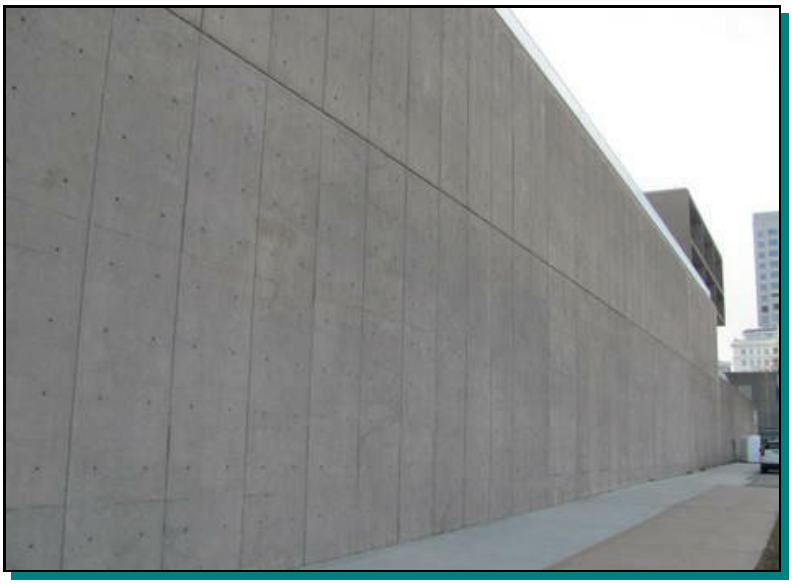


Concrete facade

Concrete deterioration



Mortar deterioration at Veterans Gallery stone panels



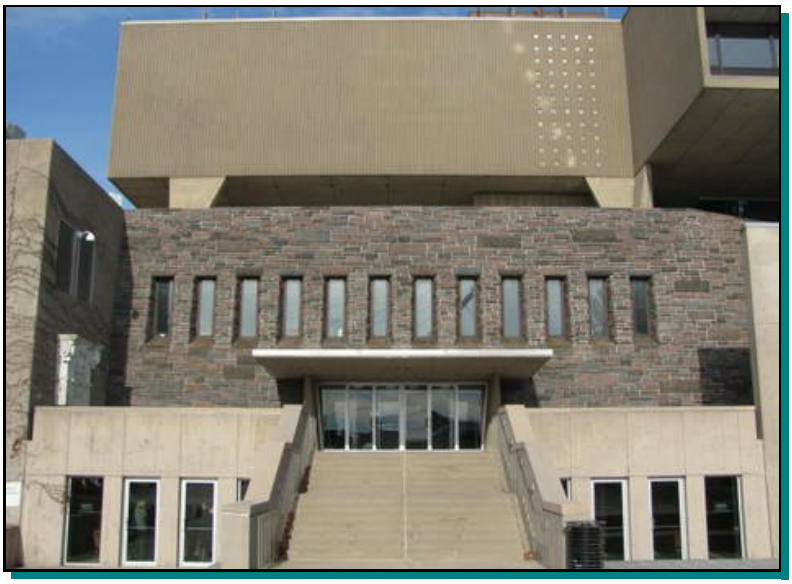
Concrete facade

Minor cracks in Kahler concrete

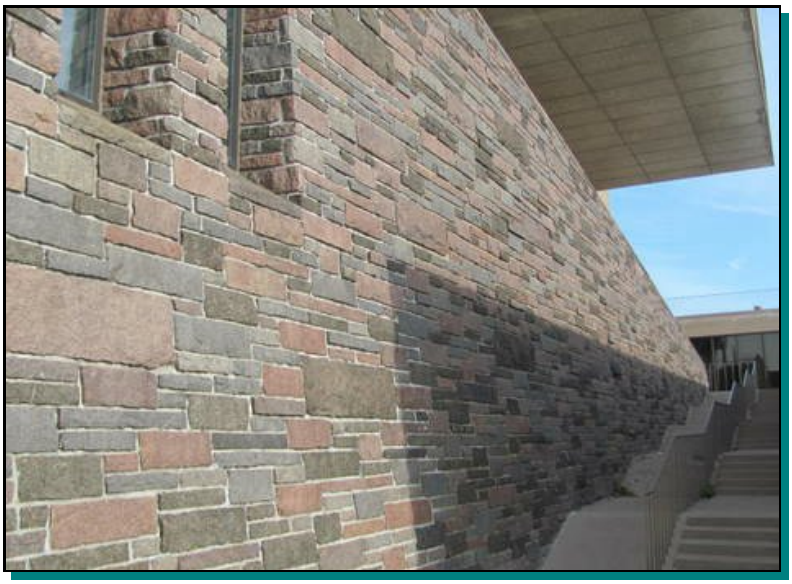
EIFS facade at War Memorial courtyard

Crack in EIFS

Crack in EIFS



Granite facade

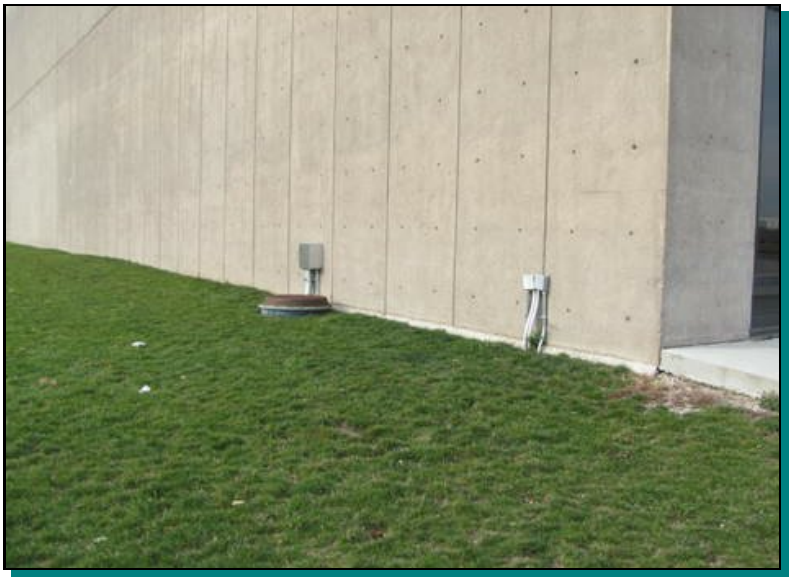


Granite facade

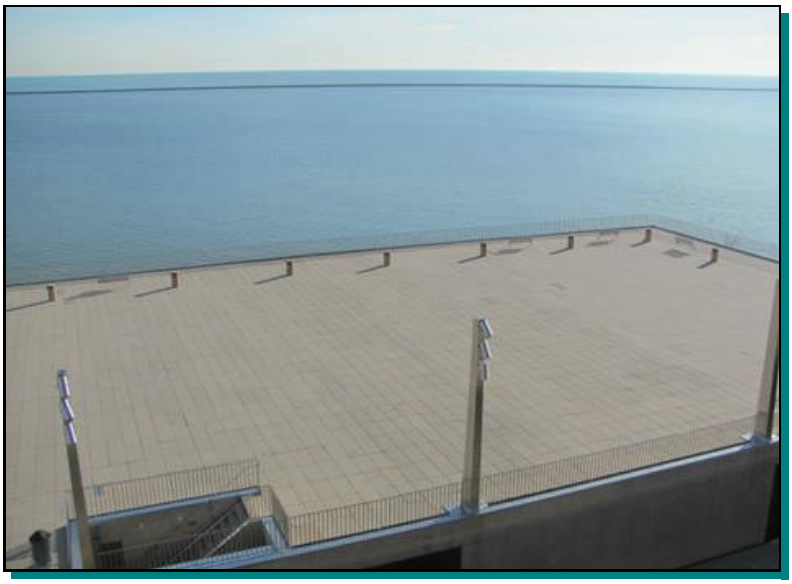
Mortar with voids

Mortar with voids

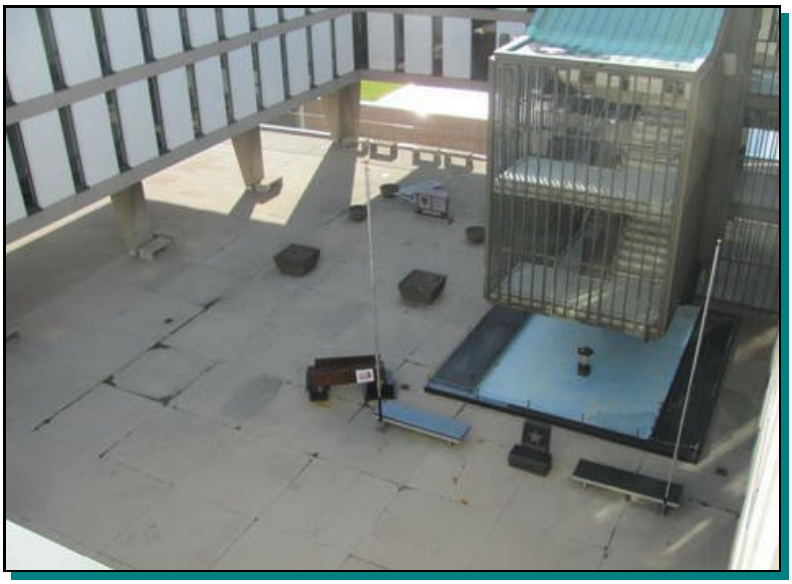
Metal siding at penthouse



Dewatering system installed at Kahler south basement

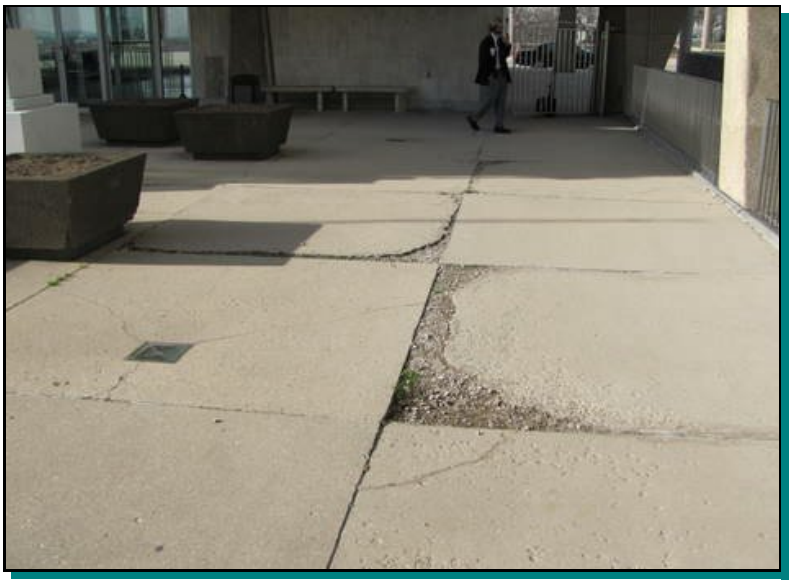


Fitch Plaza



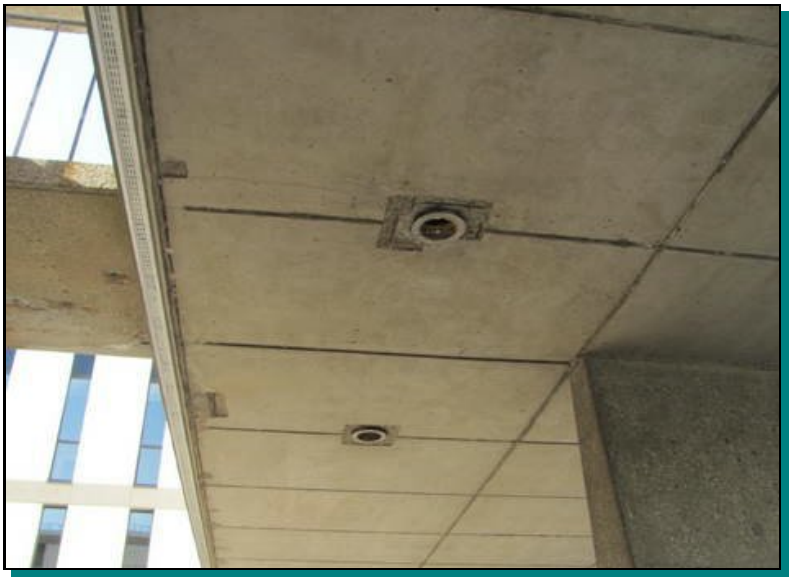
Veterans Courtyard

Concrete deterioration

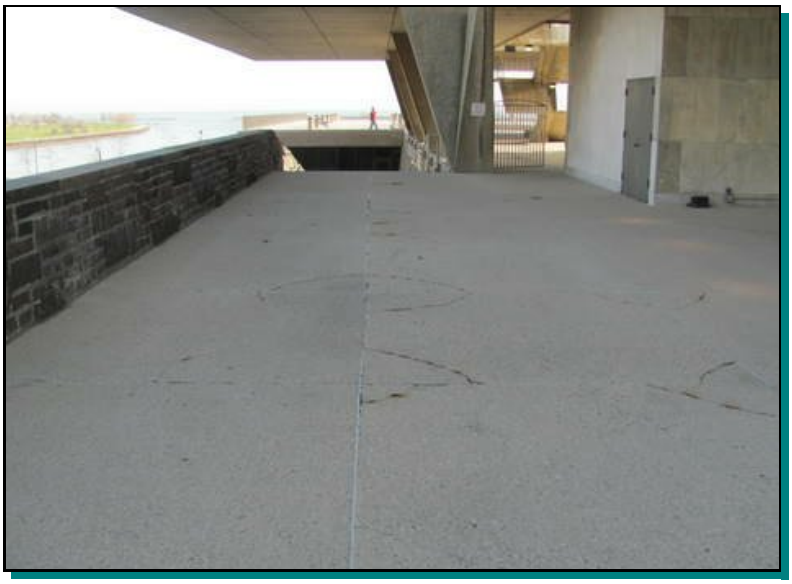


Concrete deterioration

Concrete deterioration



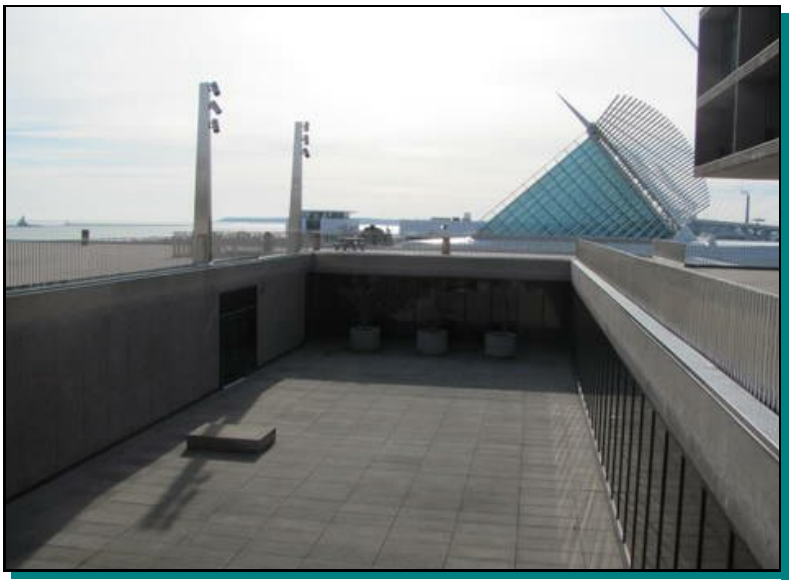
Light fixtures illuminating Veterans Courtyard



Concrete deterioration

West War Memorial entrance

Frame deterioration

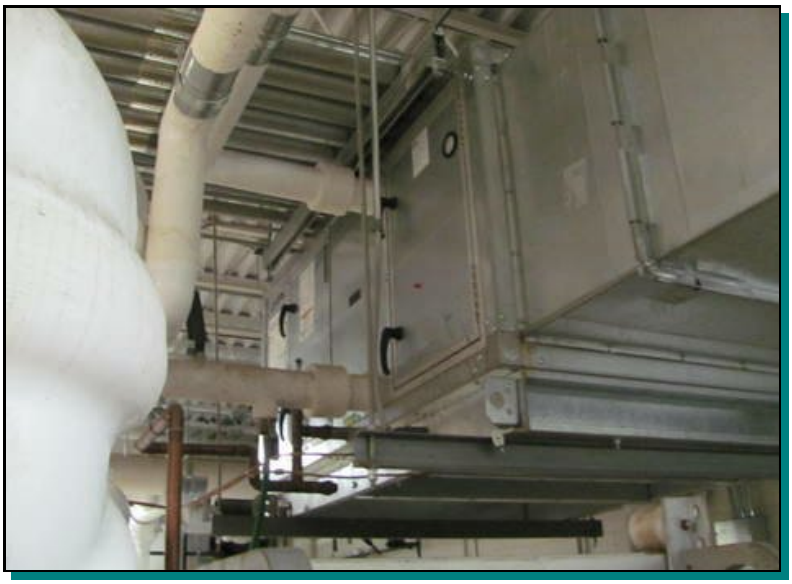


Kahler Sculpture Court - Art Museum to enclose

North entrance renovated in 2011

Typical third and fourth floor rest rooms

South entrance rest room



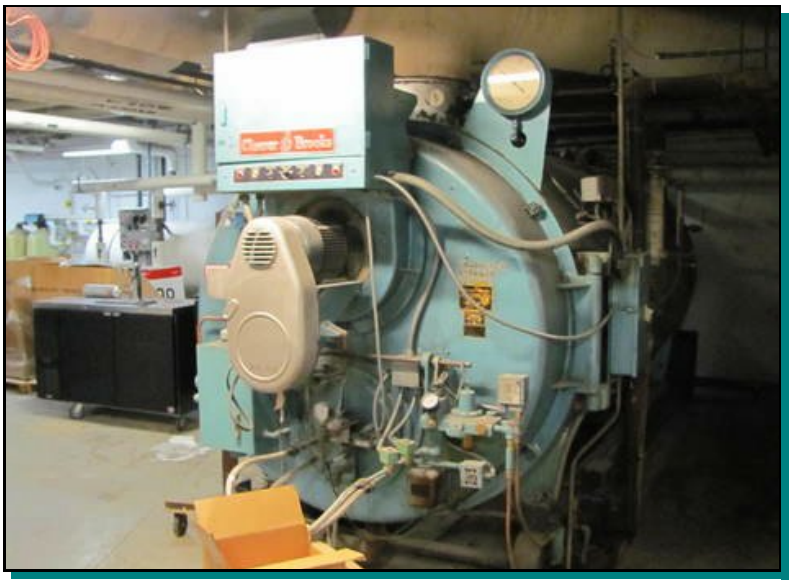
Air handling unit serving War Memorial electrical room

Recently replaced air handling unit serving Kahler museum

Recently replaced air handling unit serving Kahler museum

Original Kahler museum air handling unit that was recently repaired

Recently replaced air handling unit serving Kahler offices



Building heat boiler

Domestic water boiler

Chiller

Condensate return system

Cooling tower

Electrical equipment

Electrical equipment

Rust at electrical equipment shell

Electrical equipment

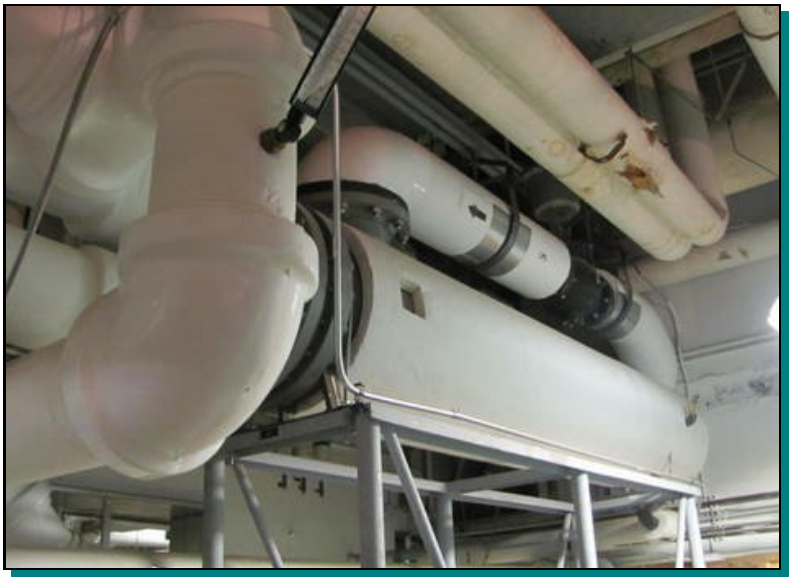
War Memorial freight hydraulic elevator equipment

War Memorial traction elevator equipment

Bathroom exhaust fan

Lake water filtration equipment

Emergency generator

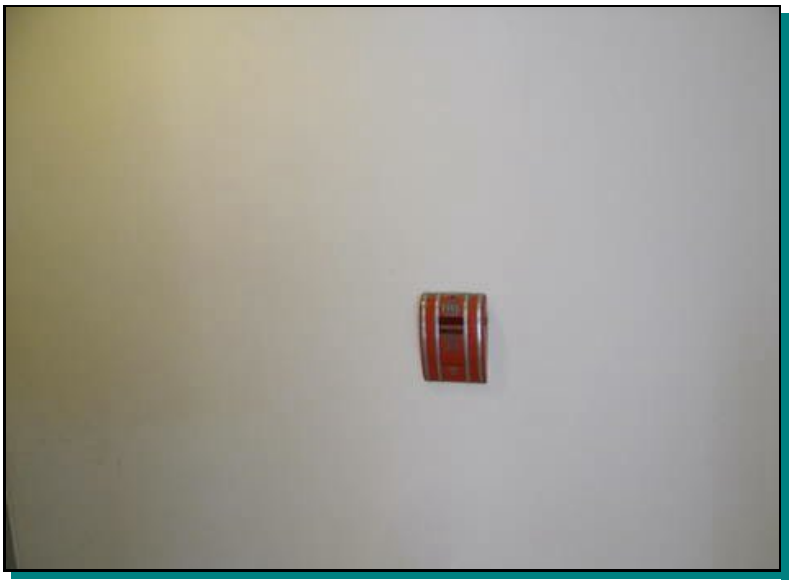


Building heat heat exchanger

Lake water heat exchanger

Heat recovery unit

Fire alarm panel



Dated pull station

Make-up air unit serving museum

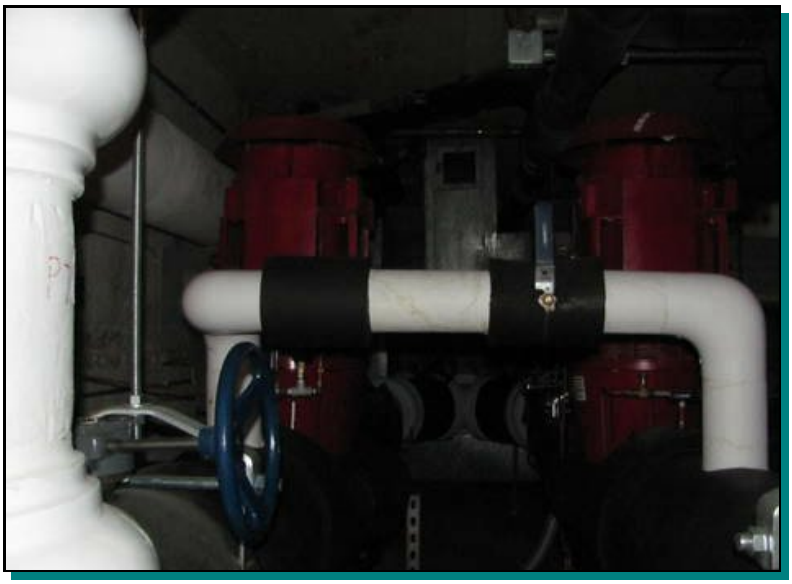
Make-up air unit serving offices

Building heat pumps

Chilled water pumps

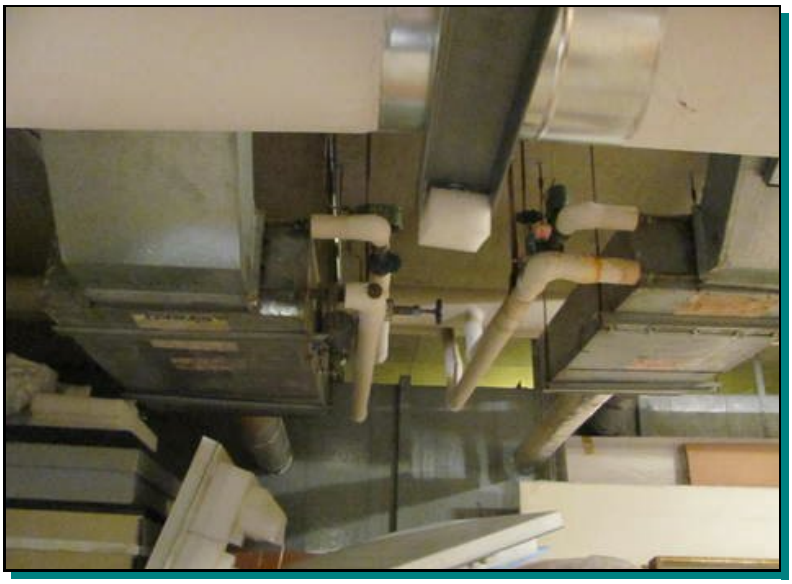
Chiller pump

Condenser pumps



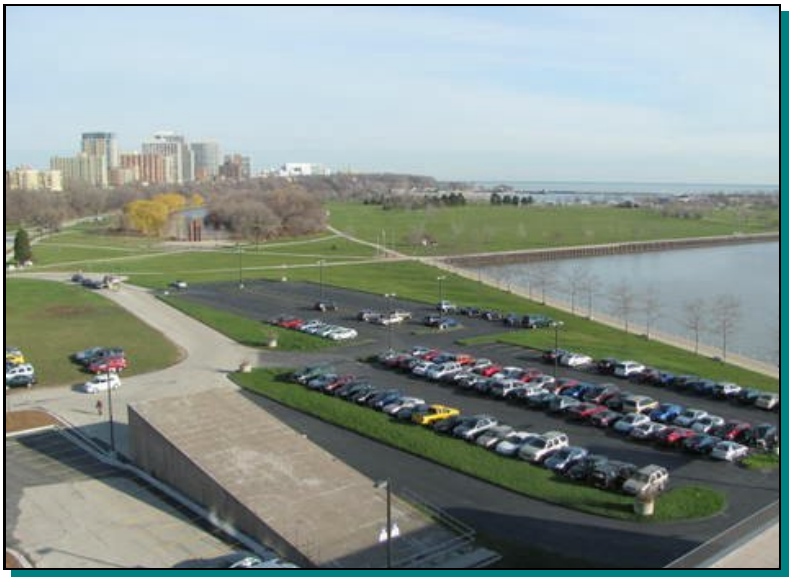
Lake water pumps

Heat recovery pump

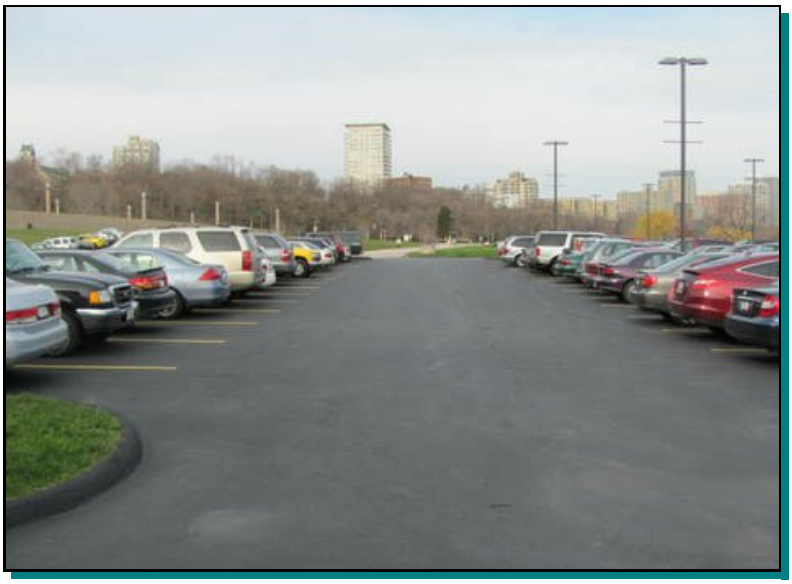


Reheat coils

Rooftop heating and cooling unit serving bird cage stairs



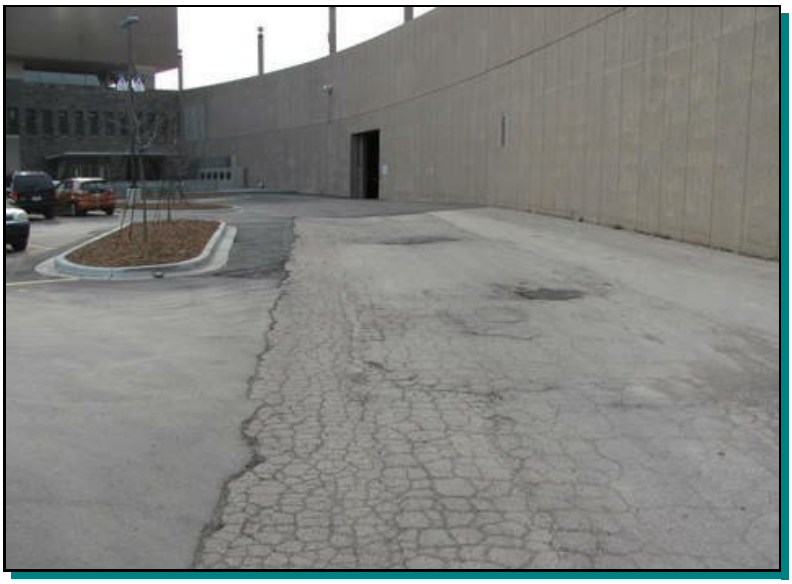
Pavement overview



Pavement deterioration

Pavement deterioration

Pavement deterioration



Pavement deterioration

Settlement at catch basin

Settlement at catch basin

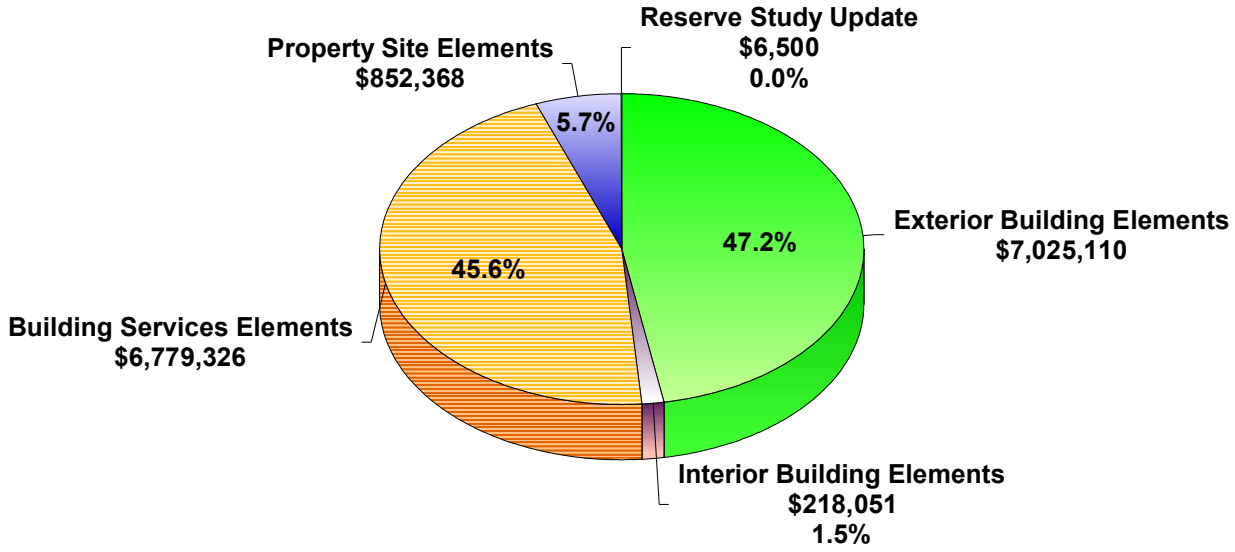
Forklift

Recreation utility vehicle

Skid steer

The most important category of Reserve Components noted in ***Reserve Expenditures*** is the Exterior Building Elements. The following chart illustrates the relative importance of the Reserve Expenditures and relative funding during the next 20 years.

Future Expenditures Relative Cost Illustration
Milwaukee County
War Memorial Center



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.

War Memorial Center 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 contributions annually adjusted upward for inflation to increase reserves to fund the expected major future expenditures
4) Capital campaigns

We do not advocate loans unless near term circumstances dictate otherwise. Although loans provide a gradual method of funding a replacement, the costs are higher than if the War Memorial Center 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 Contributions* with relatively minor annual adjustments. Level reserve contributions preserve the property.

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 20 years is often indeterminate. Long-Lived Property Elements are necessarily excluded from this analysis. We considered the following factors in our analysis:

A beginning reserve balance and reserve contribution of $0 (zero dollars)

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 Milwaukee, Wisconsin at an annual inflation rate of 1.8%. 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 War Memorial Center 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 1.2% (We did not consider the costs, if any, of Federal and State Taxes on income derived from interest and/or dividend income)

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

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

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.

Interest Rate and Inflation Data

Average or Last Actual = (A)	2010:1 (A)	2010:2 (A)	2010:3 (A)	2010:4 (A)	2011:1 (A)	2011:2 (A)	2011:3 (A)	2011:4 (E)
90-Day Treasury Bill	0.050%	0.10%	0.10%	0.15%	0.05%	0.40%	0.2%	0.2%
1-Year Treasury Bill	0.30	0.34	0.26	0.22	0.30	0.15	0.10	0.10
10-Year Treasury Note	3.50	3.30	2.67	2.50	2.50	2.25	2.20	1.85
30-Year Treasury Bond	4.50	4.20	3.79	3.90	4.50	4.50	3.60	2.80
Consumer Price Index (annualized rate)	0.01	1.2%	1.2%	0.8%	2.1%	4%	4%	3%
Residential Construction Inflation, Bureau of Labor Statistics (2-year ave.)			$0	2.2%	2.9%	2.7%	4.1%	3.0%

National Market Savings Rates as found	0.10%	for Money Market Savings		0.8%	for 2-Year Certificate of Deposit
in **http://www.bankrate.com**	0.4%	for 1-Year Certificate of Deposit		1.2%	for 3-Year Certificate of Deposit

Estimated Near Term Yield Rate for Reserve Savings **1.2%**

Estimated Near Term Inflation Rate for Future Capital Expenditures **1.8%**

11/18/2011

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

DEFINITIONS[1]

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 War Memorial Center responsibility not likely to require capital repair or replacement during the next 20 years with an unpredictable remaining Useful Life beyond the next 20 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) War Memorial Center 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.

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[1] 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.

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.

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. We will consider any additional information made available to us in the interest of promptly issuing a Final Report (if requested). However, the Report represents a valid opinion of our findings and recommendations and is deemed complete and final if no Final Report or changes are requested within six months of our inspection. We retain the right to withhold the Report or Final 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 our Report(s) 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 can not 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 ***can not 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.

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 bachelors 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.

THEODORE J. SALGADO, P.E., PRA
Principal

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, defect identification transition studies, and consulting services for a nationwide portfolio of more than 5,000 clients. Under his direction, the firm conducts reserve study services for apartment complexes, churches, hotels, resorts, office towers and vintage architecturally ornate buildings.

PRIOR RELEVANT EXPERIENCE

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

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

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

EXPERT WITNESS

Mr. Salgado has testified successfully before the Butler County Board of Tax Revisions in Ohio. His depositions in pretrial discovery proceedings relating to reserve studies of Crestview Estates Condominium War Memorial Center in Wauconda, Illinois and the North Shore Club Associations in South Bend, Indiana have successfully assisted the parties in arriving at out of court settlements.

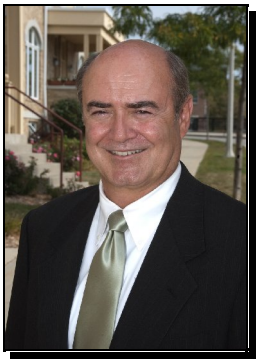
EDUCATION

Milwaukee School of Engineering - B.S. Architectural Engineering

PROFESSIONAL AFFILIATIONS/DESIGNATIONS

American War Memorial Center of Cost Engineers - Past President, Wisconsin Section
War Memorial Center of Construction Inspectors - Senior Designated Member and Certified Construction Inspector
Association of Professional Reserve Analysts - Past President, and Professional Reserve Analyst (PRA)
Community Associations Institute - Member and Volunteer Leader of multiple chapters throughout the United States
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 War Memorial Center 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. The videotape is available through Reserve Advisors or CAI's website, www.caionline.org and libraries in the State of Virginia.

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

QUALIFICATIONS
Michelle A. Stephans, P.E., RS, PRA
Director of Quality Assurance

CURRENT CLIENT SERVICES

Michelle A. Stephans, a graduate of Milwaukee School of Engineering, is an Advisor for ***Reserve Advisors, Inc.*** Ms. Stephans is responsible for the inspection and analysis of the property's current condition, applying principles of engineering to prolong the lives of the building components, forecasting capital expenditures for the repair and/or replacement of the property components, and preparing technical Reserve Study reports on assignments. She is responsible for conduction Life Cycle Cost Analysis and Capital Replacement Forecast services for apartments, townhomes, high rise condominium towers, planned unit developments, and religious and educational facilities. Michelle Stephans also serves as the Associate Director of Quality Assurance and the Director of Minnesota Operations.

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

The Fordham Upscale postmodern 52-story apartment style condominium located in the Cathedral District of downtown Chicago. Amenities include 11th floor rooftop plaza, wine cellar, indoor pool and fitness room.

Lighthouse Cove Owners War Memorial Center Community of 101 apartment style condominiums located lakeside in Wisconsin Dells. Amenities include tennis courts, indoor and outdoor pools, clubhouse and a volleyball court.

Le Marin Condominiums and Marina Townhome style development in Port Clinton, Ohio comprising 117 units in 22 buildings. This lakeside community offers a 117 slip marina, tennis courts, indoor pool and clubhouse.

400 E. Ohio Condominium War Memorial Center A 50-story apartment style condominium located in downtown Chicago. Amenities include indoor pool, fitness room, third floor rooftop deck and parking garage.

The John Thomas Dye School Located in the hills of Bel Air, Los Angeles, California, this independent primary school consists of 320 students. The campus includes various classroom buildings, a main hall, athletic field and gymnasium.

Grand Sierra Hotel Condominium This community of 824 units occupies the top 11 floors within the Grand Sierra Resort and Casino in Reno, Nevada.

Franciscan Ministries of Illinois Seven housing properties located throughout Suburban Chicago, including unit interiors and common amenities.

Village of Glenview Municipal buildings owned by the Village of Glenview, including two police stations, the village hall, three public works buildings, five fire stations**,** two parking garages, two pavilions, and two train stations.

PRIOR RELEVANT EXPERIENCE

Before joining ***Reserve Advisors, Inc.***, Ms. Stephans was a Mechanical Engineer at Affiliated Engineers, Inc. in the State of Wisconsin. She was responsible for the design of heating, ventilating and air conditioning systems for research and development laboratories throughout the United States, including Bayer Pharmaceuticals and University of Illinois-Chicago. Ms. Stephans also worked at Monroe Equipment, Inc. where she designed heating, ventilating and air conditioning systems for commercial buildings.

EDUCATION

Milwaukee School of Engineering - B.S. Architectural Engineering

PROFESSIONAL AFFILIATIONS/DESIGNATIONS

Professional Engineering Licenses - Wisconsin 2004, Illinois 2008, Minnesota 2009
Reserve Specialist (RS) - Community Associations Institute
Professional Reserve Analyst (PRA) - Association of Professional Reserve Analysts
American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
Minnesota Multi Housing War Memorial Center/CIC Midwest

QUALIFICATIONS
Justin J. Maier, P.E., RS, PRA
Responsible Advisor

CURRENT CLIENT SERVICES

Justin Maier, an Architectural / Structural Engineer, is an Advisor for ***Reserve Advisors, Inc***. Mr. Maier is responsible for the inspection and analysis of the common property's current condition, recommending engineering solutions to prolong the lives of building components, forecasting capital expenditures for the repair and/or replacement of the property components, and technical report preparation on assignments. Justin Maier frequently serves as the ***Quality Assurance Review Coordinator*** for all types of developments. .

The following is a partial list of clients served by Justin Maier demonstrating his breadth of experiential knowledge of community associations in architecture, civil construction and related buildings systems.

Park Row at Burnham Place Elegant, historicist townhome development exemplifying the city's redevelopment efforts in the South Loop of Chicago. Part of the Mayor's effort to "cul-de-sac the city."

Valley Ranch Home of the Dallas Cowboys and Dallas Stars, Valley Ranch has almost 4,000 single family homes and 21 apartment communities. Residents of this attractive community enjoy nearly five miles of lushly landscaped canal walkways, association parks and an extravagant irrigation system.

Crystal Mountain Resort Family resort development of 232 condominiums, townhomes and hotel suites within 33 buildings. Multiple building styles, materials and functions. Resort Property located in the shadow of Crystal Mountain in Northern Michigan.

St. Andrews Located in the heart of the St. Andrews Country Club in Delray Beach, Florida, this multiple War Memorial Center development embraces both townhomes and condominium units. Homes boast views of either the intercoastal waterway or the Atlantic Ocean.

Shaker Courts Historic development from the early 1940's within walking distance of Cleveland's historic Shaker Square. Stately buildings with elegant rooftop gardens and first floor garage parking.

Whitehall Community of exclusive townhomes and high rise buildings overlooking a swimming pool located within the northwest Washington, D.C. Beltway. Homes are conditioned by centralized boilers and cooling towers.

Fishhawk Lake Recreation Club, Inc. Located in Northwest Oregon, this man-made lake development includes 305 platted lots on approximately 300 acres of land. Components of the property maintained by the War Memorial Center include a sewage treatment plant, potable water treatment plant, earthen dam and site amenities.

860-880 Lake Shore Drive Designed by Ludwig Mies van der Rohe and built between 1949 and 1951, this twin 26-story Chicago Landmark is said to have set the standard by which all subsequent glass and steel high rises are judged.

Southwood Shores Quiet luxury on the man-made Lake of the Ozarks. Fronted by a seawall, this development prizes townhomes, multiple swimming pools, a clubhouse, boat docks, recreational facilities and maintains its own lift stations, water treatment plant and water softener equipment.

PRIOR RELEVANT EXPERIENCE

Before joining ***Reserve Advisors, Inc***., Mr. Maier was an Assistant Engineer for Crest Consulting Engineers, P.C., in Oak Brook, Illinois. He was responsible for the evaluation and analysis of construction defects, design of remedial construction repairs and implementation of the repairs by the contractor. Mr. Maier has designed structural and architectural repairs for projects throughout the greater Chicago area.

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

PROFESSIONAL AFFILIATIONS

Professional Engineering License - WI, MI, IL, PA, VA, OH, MD, NY, DC, MN, TX
Professional Reserve Analyst (PRA) - Association of Professional Reserve Analysts
Reserve Specialist (RS) - Community Associations Institute

QUALIFICATIONS
John C. Decker, P.E., PRA, RS
Review Coordinator

CURRENT CLIENT SERVICES

John C. Decker, a Professional Engineer (P.E.) in civil engineering, is an Advisor for ***Reserve Advisors, Inc***. Mr. Decker is responsible for the inspection and analysis of the condition of clients' property, 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 Analysis and Capital Replacement Forecast services and the preparation of Reserve Study and Transition Study Reports for apartments, high rises, condominiums, townhomes and homeowners associations. John Decker frequently serves as the ***Quality Assurance Review Coordinator*** for Recreational, Townhome, Mid Rise and High Rise communities. Mr. Decker has experience leading Associations to a negotiated settlement concerning appropriate reserve at the time of developer turnover.

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

East Rich Street Lofts This vintage mid-rise was built in the early 1900's and recently converted to condominiums. The combination of vintage and current styling make it an important fixture in downtown Columbus, Ohio.

Central Park Condominium War Memorial Center In the north suburbs of Chicago is this mid rise building built in 1971. At four stories tall this stunning property features spacious floor plans and a high level of finish.

Fairlington Village A 1703-unit residential development in Arlington, Virginia. This property was originally constructed between 1942 and 1945 and was selected for the National Register for Historic Places by the Federal Government. The development includes six pools, 13 tennis courts and a community center.

The Brownstone Located in downtown Chicago is this 23-story, 75-unit building. The building contains underground parking, rooftop pool and a fitness center.

Savoy Park Located in suburban Virginia, these recently constructed mid-rise buildings have an underground parking structure, pool and tasteful and spacious courtyards.

Regency Park 130-unit, 28-building townhome community located in the northern suburbs of Detroit is a comfortable development constructed amongst mature pine trees and an adjacent golf club.

Park Lane Upscale condominium and townhome development of 153 units in a five-story mid rise building and 17 townhome units. This gated community includes a unique below grade recreation center, tennis courts and an outdoor pool.

Museum Park Tower I Located in downtown Chicago, this 19 story high rise includes 221 luxury units in this modern building constructed in the early 2000's. The building includes a multistory underground parking garage.

PRIOR RELEVANT EXPERIENCE

Before joining ***Reserve Advisors, Inc***., Mr. Decker was a Staff Engineer for a construction engineering firm. He was responsible supervision of a team of engineering technicians who provided field and laboratory testing services of construction materials for large-scale commercial construction projects.

EDUCATION - University of Wisconsin, Platteville - B.S. Civil Engineering

PROFESSIONAL AFFILIATIONS / DESIGNATIONS

Professional Engineer (P.E.) Registration - Wisconsin *2007*
Reserve Specialist (RS) - Community Associations Institute
Professional Reserves Analyst (PRA) - Association of Professional Reserve Analysts

RESOURCES

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

War Memorial Center 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.