RDH BUILDING SCIENCE INC.
JUNE 2021

Reserve Studies

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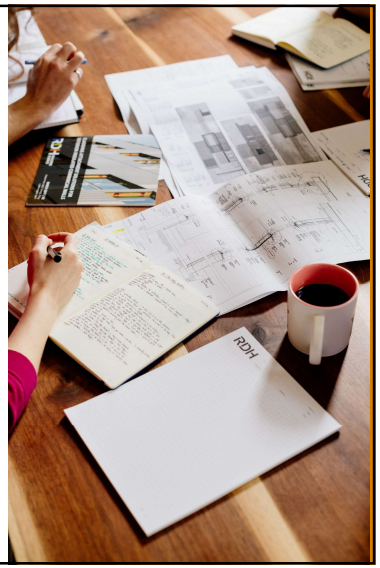

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An Introduction to What We Do at RDH

- New Buildings
- Existing Buildings
  - Condition Assessments
  - Maintenance Reviews
  - Repair/Rehabilitation Design & Field Review
  - Construction Management: managing all repairs
- Maintenance and Planning
  - Reserve Studies
  - Maintenance Manuals
  - Small Project Support
- Litigation Support
- Forensic Investigation
- RDH is in CAN, WA, OR, CA, MA

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Challenges in Managing and Maintaining Condominiums

- Deferred Maintenance
- Aging systems and components
- Lack of knowledge
- Inadequate reserves
- Focused on other matters
- Board turnover/continuity

A well prepared and managed reserve study can help!

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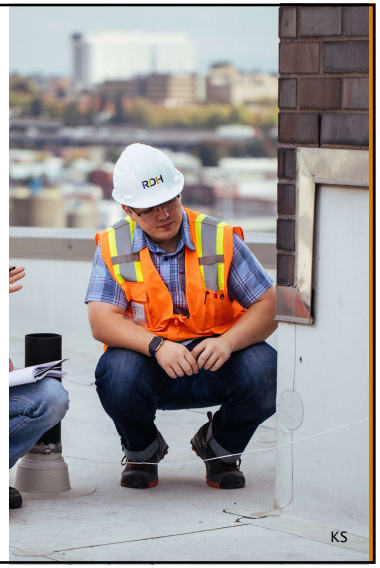

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What is a Reserve Study?

- 30-year evaluation of property and components
- Sets an initial baseline of knowledge
- Provides a funding plan to accommodate anticipated future major common area repair & replacement
- Helps Associations make informed decisions about the allocation of monies

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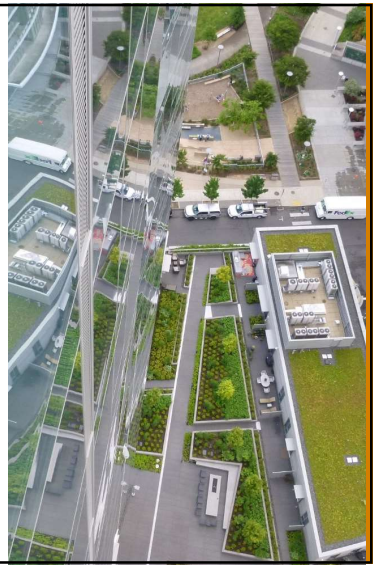

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Contents of a Reserve Study

Description	Washington	Oregon
Timeline	30 years	More than one and less than 30 years
Components	Common Elements List items not included and why	Common Elements
Components	Major Maintenance, Repair and Replacement	Major Maintenance, Repair and Replacement
Components	Estimates for the useful life of each reserve component, remaining useful life of each reserve component	Useful life, Estimated remaining life
Updates	Three-year cycle	Each year*
Components	quantities and … current repair and replacement cost for each component;	Estimated cost of maintenance, repair and replacement at the end of useful life
Exclusion Threshold	"items that cost more than 1% of the operational budget for major maintenance, repair or replacement	"items that can easily be funded from general budget"

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Contents of a Reserve Study

Description	Washington	Oregon
Funding models	Series of four: Baseline, Actual percent of fully funded, Funding plan to establish 100% of fully funded in the 30-year plan and Recommended funding plan	"A reserve account shall be established to fund major maintenance repair or replacement of common elements…"
Funding models	The percentage of the fully funded balance to which the reserve account is funded; Special assessments already implemented or planned;	
Reserve Funding Deficiency Tabulation	Yes	No
Reserve Study Budget Disclosure Statement	Yes	No

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Note: Oregon requires a Maintenance Plan!

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Contents of a Reserve Study – RCW 64.90.550

2019 Reserve Funding Deficiency Tabulation - In compliance with RCW 64.90.550 (2)(l)
December 5, 2018

2019 Beginning Balance	**$**	**67,735.54**
Fully Funded Balance	**$**	**800,000.00**
Defficiency as of 1/1/2019	**$**	**732,264.46**

Unit	Square Footage	% of Ownership	Difficency Balance Responsibility
101	821	3.481%	$ 25,491.40
102	606	2.570%	$ 18,815.82
103	606	2.570%	$ 18,815.82
104	606	2.570%	$ 18,815.82
105	612	2.595%	$ 19,002.11
106	608	2.578%	$ 18,877.92
107	608	2.578%	$ 18,877.92
108	608	2.578%	$ 18,877.92
109	821	3.481%	$ 25,491.40
201	821	3.481%	$ 25,491.40
202	606	2.570%	$ 18,815.82
203	606	2.570%	$ 18,815.82

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Contents of a Reserve Study

WASHINGTON

- RCW 64.90 (Common Interest Community)
  - replaces RCW 64.34 Condo act and 64.38 HOA Act for communities created after 07 01 18
- RCW 64.90.550 lists contents for reserve studies (similar to previous requirements)
- RCW 64.34 – Condominium Act
- RCW 64.38 – Homeowners' Associations

OREGON

- ORS 100.175
- ORS 100.655 (Condo Conversions)

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Contents of a Reserve Study Budget Disclosure Statement - Reserve

Current Funding Contribution Below Threshold Information	
$57,000	Owners Chosen
$108,000	Baseline
$108,000	100% Fully Funded
$95,000	Recommended (70% Funded)
36	Number of units in the Association

Additional Regular or Special Assessment Information Based on Current Funding	
See table	Proposed additional regular or special assessments
See table	Date additional assessments are due
See table	Average assessment per unit per month
See table	Average assessment per unit per year
See table	Purpose of additional assessments
No	Will projected reserve account balances (associated with Current Contribution) be sufficient to fund reserve for the next 30 years without a special assessment?

Estimates based on Owners Chosen Model

Owners Chosen Annual Funding: $57,000
Proposed Average Annual Funding Per Unit: $1,583.33

	2019	2020	2021	2022	2023
Projected Account Balance at End of Fiscal Year	$59,023	$110,874	$167,716	$206,995	$222,619
Percent Funded	7%	13%	18%	21%	22%

Estimates Based on the Baseline

Baseline Annual Funding: $108,000
Proposed Average Annual Funding Per Unit: $3,000

	2019	2020	2021	2022	2023
Projected Account Balance at End of Fiscal Year	$110,024	$213,871	$323,529	$416,234	$485,640
Percent Funded	14%	25%	35%	42%	48%

Estimates Based on the 100% of Fully Funded

100% Annual Funding: $108,000
Year that 100% of Fully Funded Will be Achieved: 2019
Recommended Average Annual Funding Per Unit: $3,000.00

	2019	2020	2021	2022	2023
Projected Account Balance at End of Fiscal Year	$110,024	$213,871	$323,529	$416,234	$485,640
Percent Funded	14%	25%	35%	42%	48%

Estimates Based on the Recommended

Recommended Annual Funding: $95,000
Recommended Average Annual Funding Per Unit: $2,638.00

	2019	2020	2021	2022	2023
Projected Account Balance at End of Fiscal Year	$97,024	$190,836	$293,997	$384,392	$456,405
Percent Funded	12%	22%	31%	39%	45%

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What Makes an Effective Reserve Study?

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Effective Reserve Studies

Plan ahead: *Time to Plan. Time to Save*

1. Understand our Building
   - → We need a complete inventory list
   - → What are our building's special needs?
     - → Size, construction, deferred maintenance, complexity
2. Condition of our assets / components?
   - → Age and remaining service life?
   - → Premature Failure?
   - → Will repair or maintenance extend life?
3. Reserve Event Costs
   1. Accuracy
   2. Inflation
   3. Future year cost

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Effective Reserve Studies

1. Understanding – Is our reserve fund adequate to address our future needs?
2. How can we improve our reserve savings?
3. Plan Important Projects Using the Reserve Study
   - → Prioritization
   - → Bundle similar work
4. Update Reserve Plan to capture more accurate information

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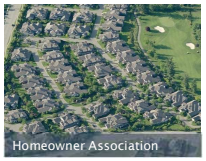
Building Types Result in Many Variations in Reserve Needs



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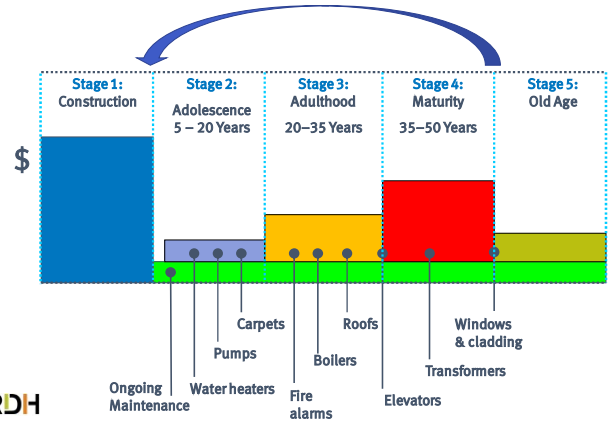
Life Cycle of a Building and Assets



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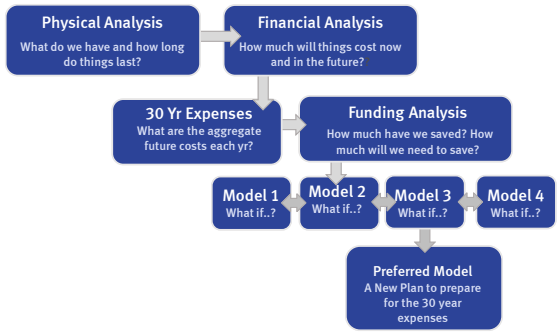
How to Build a Reserve Study



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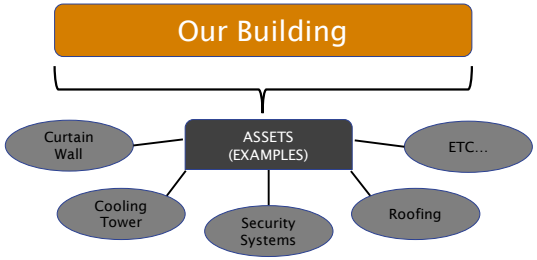
Physical Analysis – The Whole Picture



EACH ASSET MAY HAVE A DIFFERENT TYPE OF LIFE CYCLE EVENT

Minor Maintenance (Operating) | Major Maintenance (Reserve) | Replacement (Reserve)

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Physical Analysis – Asset Inventory / Component List

- Location
- Description
- Quantity
- Condition
- Service Life
- Remaining Service Life

Mech 06 — Solar Water Heating System - Pumps
Location: SPHWP-1 and-2 Basement / Garage
Description: Packaged system that boosts pressure in hydronic systems.
Chronological Age: 10 | Service Life: 15
Effective Age: 10 | Remaining Service Life: 5
Last Review Rating: | Observation Count: 0

Mech 07 — Plumbing Distribution
Location: Through out building
Description: Various sized pipes, connections and accessories for water supply to various appliances and components.
Chronological Age: 10 | Service Life: 40
Effective Age: 10 | Remaining Service Life: 30
Last Review Rating: | Observation Count: 0

Mech 08 — Domestic Water Heaters & Storage
Location: Water distribution room - Parking garage: WH-1 x4, 1st Level WH-2 and -3
Description: Heating and storage of domestic hot water.
Chronological Age: 10 | Service Life: 12
Effective Age: 10 | Remaining Service Life: 2
Last Review Rating: | Observation Count: 0

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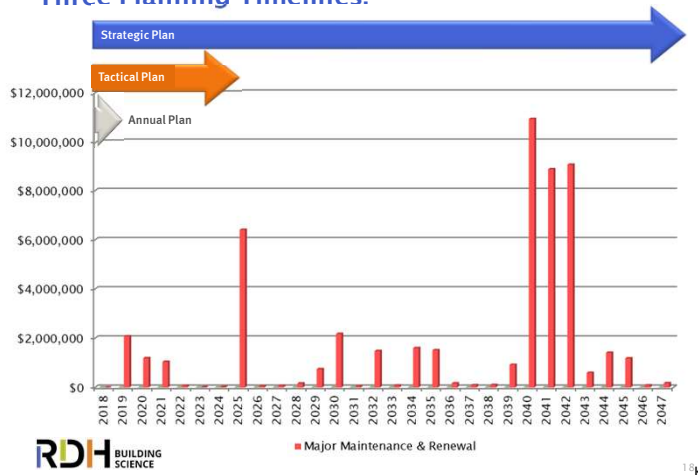
Three Planning Timelines:



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Annual Plan

Done	Deferred		Maintenance Task	Description	Findings	Cost	Date	Name
Enclosure								
Encl 01 - Metal Cornice and Roof Flashing								
		M02	Annualized Cost	Annualized Cost for Metal Cornice and Roof Flashing				
		M03	Maintenance Level 1	Clean cornice and roof flashing of seasonal debris, pollutants, dust, dirt and other materials with a mild detergent that is biodegradable with a soft brush or cloth material. Visually review flashing surfaces, interfaces and transitions for signs of distress and discoloration. Inspect sealant at transitions. Touch up paint metal cornice and roof flashing. Refer to O&M's Vol I - 076200 and closeout submittal for specific details.				
Encl 02 - Eco Roof								
		M02	Annualized Cost	Annualized Cost for Eco Roof				
		M03	Maintenance Level 1	If leaking or breaching of water proofing is of concern, contact E.F.V.M. certified inspector to provide Potentiometer triangulations. Refer to O&M's - 075216 and closeout submittal for specific details.				
		M04	Maintenance Level 2	Visually check that the plant material has not been uprooted by wind, erosion or birds. Replace any plants that have been displated. Conduct weed control to limit uncontrolled or unwanted plant growth. Remove any foreign objects or debris from roof area. Replace any planting media lost to wind or erosion. Replace plantings at locations where plants are weak or dead.				

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Tactical Plan – Five Year Look-Ahead

Mechanical		Next Event	Backlog	2018	2019	2020	2021	2022
Mechanical								
0	Mech 01 - **Custodial Equipment**							
0	R01 Replace various floor cleaning equipment	2025						
Controls and End Devices								
0	Mech 02 - **VRF System - Central Controller / BACnet**							
0	J01 Arrange for a mechanical consultant / engineer to review project mechanical operation and function. Rebalance system as require.	2026						
0	R01 Replace HVAC Control System	2028						
0	Mech 03 - **Controls - Variable Frequency Drives - HVAC**							
0	R01 Replace variable frequency drives. Note - this task is set on a short cycle to allow for ongoing replacement as required.	2021					$11,000	
0	Mech 04 - **Controls - VRF Branch Selector**							
0	R01 Replace VRF branch selectors. Note - this task is set on a short cycle to allow for ongoing replacement as required.	2021					$27,000	
0	Mech 05 - **Gas Detection - Parking Garage**							
0	R01 Allowance for replacement of gas sensors through out the garage as failure occurs	2018		$1,000		$1,100		$1,100
0	R02 Replace gas detection control panel and any failing sensors.	2026						
0	Mech 06 - **HVAC Water Treatment (Liquid Pump System)**							
0	R01 Replace aging or failing components of water treatment equipment.	2026						
0	Mech 07 - **Controls - Variable Frequency Drives - Pumps**							
0	R01 Replace variable frequency drives. Note - this task is set on a short cycle to allow for ongoing replacement as required.	2021					$6,600	

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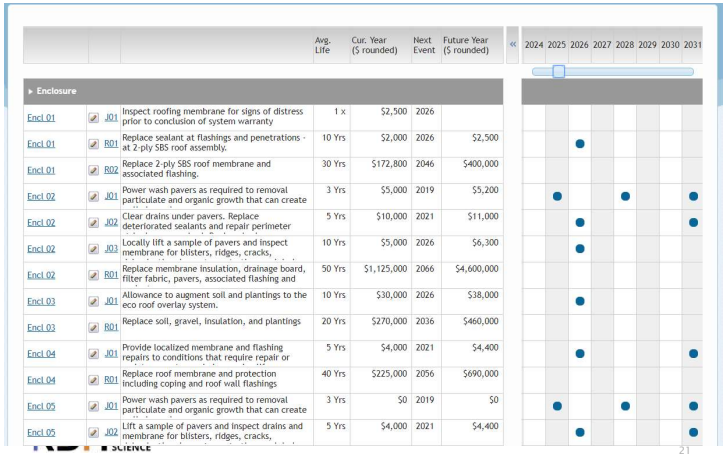
Strategic Plan – 30 Year Look-Ahead



			Avg. Life	Cur. Year ($ rounded)	Next Event	Future Year ($ rounded)
▸ Enclosure						
Encl 01	J01	Inspect roofing membrane for signs of distress prior to conclusion of system warranty	1 x	$2,500	2026	
Encl 01	R01	Replace sealant at flashings and penetrations - at 2-ply SBS roof assembly.	10 Yrs	$2,000	2026	$2,500
Encl 01	R02	Replace 2-ply SBS roof membrane and associated flashing.	30 Yrs	$172,800	2046	$400,000
Encl 02	J01	Power wash pavers as required to removal particulate and organic growth that can create	3 Yrs	$5,000	2019	$5,200
Encl 02	J02	Clear drains under pavers. Replace deteriorated sealants and repair perimeter	5 Yrs	$10,000	2021	$11,000
Encl 02	J03	Locally lift a sample of pavers and inspect membrane for blisters, ridges, cracks,	10 Yrs	$5,000	2026	$6,300
Encl 02	R01	Replace membrane insulation, drainage board, filter fabric, pavers, associated flashing and	50 Yrs	$1,125,000	2066	$4,600,000
Encl 03	J01	Allowance to augment soil and plantings to the eco roof overlay system.	10 Yrs	$30,000	2026	$38,000
Encl 03	R01	Replace soil, gravel, insulation, and plantings	20 Yrs	$270,000	2036	$460,000
Encl 04	J01	Provide localized membrane and flashing repairs to conditions that require repair or	5 Yrs	$4,000	2021	$4,400
Encl 04	R01	Replace roof membrane and protection including coping and roof wall flashings	40 Yrs	$225,000	2056	$690,000
Encl 05	J01	Power wash pavers as required to removal particulate and organic growth that can create	3 Yrs	$0	2019	$0
Encl 05	J02	Lift a sample of pavers and inspect drains and membrane for blisters, ridges, cracks,	5 Yrs	$4,000	2021	$4,400

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Reserve Study Funding Plan – How Much is Enough?

An Association must consider different influencers in establishing an acceptable reserve plan:

- → Past contribution?
- → Large projects eminent?
- → Goals for the future?
- → How much can we afford?
- → Tolerance for risk?
- → Special Assessments?
- → What are our neighbors contributing?
- → Recommended Contribution Rate?

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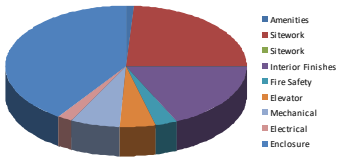
Financial Analysis

An analysis of various numerical factors that impact the financial predictions of the reserve study:

- → Interest Rate – Provided by the Association
- → Inflation Rate – To predict future costs
- → Cost estimates – based on similar properties, published and historic data, vendors bids, good practice, etc.
- → Reserve Balance Carried Forward – Provided by association
- → Exclusion Threshold
- → Funding Models – Required and Recommended.



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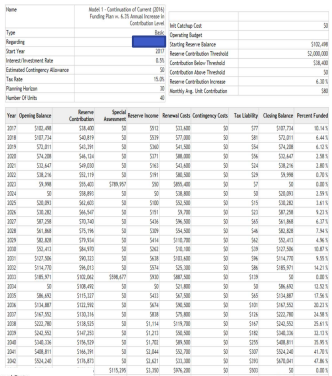
Funding Model Example

A cash flow table to help establish a savings plan for the 30-year planning window by assembling the year-by-year predicted reserve expenses and compares that to the current reserve balance and yearly contributions.



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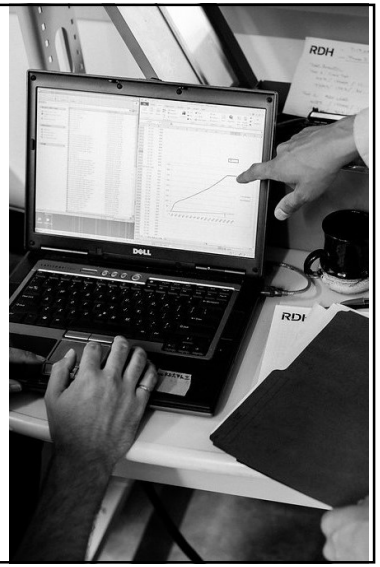
Reserve Studies Level of Funding

- Ideal level of reserve saving – not defined by Oregon
- Stronger Direction included in Washington
- Industry Standard – Basic Depreciation Calculation:

  Ideal Reserve Amount = Age of Component ÷ (Useful life x Current replacement cost)
- Consider inflation and interest
- Underfunding will result in future hardship:
  - Deferred Maintenance
  - Decline in Property Value and Condition
  - Special Assessments



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Establishing a Target Funding Level

- Setting a Target Funding Level:
  - Threshold Model?
  - Cash Flow Model?
  - Percent of Ideal Reserve (100%, 70%, 30% of full funding)
    - This approach is OK for Oregon, maybe not so much for Washington

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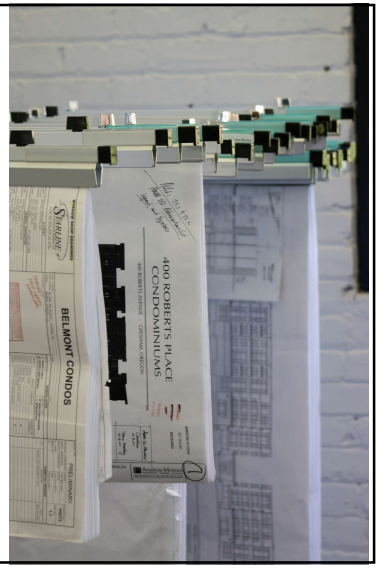
Reserve Study Events - Things to Understand

- Sometimes assets lasts longer (or shorter) than expected
  - Diligent maintenance extends service life.
  - Unforeseen events can shorten service life.
    - Premature failure, disasters, obsolescence
- Actual events may occur before or after the reserve study prediction.
- If it's not broken (or failing) don't fix it. Undertake work if it is necessary not because the reserve study indicate



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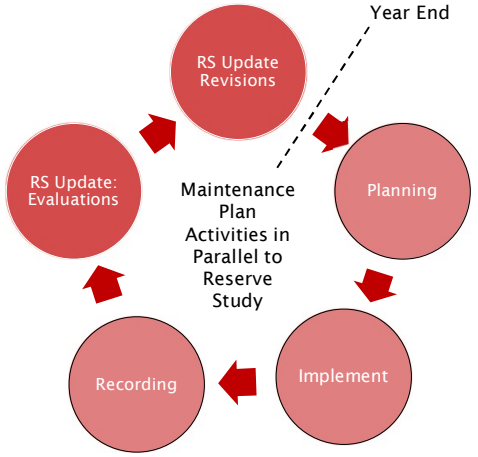
Reserve Study Update – Cycle of Activities:



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Reserve Study Updates

- Living Document and gains strength and validity over time
- Ideally involves a meeting between the Association and the Reserve Study Provider
- Update the study to include your new knowledge
- Look at planned projects – especially the next five years.
- Looking farther out with a little more certainty
- Maximize your financial planning
- Optimizing funding models each year

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Reserve Study Update – WA Requirement, OR Guideline (good practice)

Step 1: Initial Study (2018 Start)
Step 2: Two years of Level 3 updates (2019, 2020)
Step 3: Level 2 Update in the 3rd year after the initial study (2021)

Cycle resets to Step 2

YEAR-BY-YEAR UPDATE SCHEDULE				
Level 1 Initial Study	**Level 3 Update Study** – No Visual Site Inspection	**Level 3 Update Study** – No Visual Site Inspection	**Level 2 Update Study** – Visual Site Inspection	**Level 3 Update Study** – No Visual Site Inspection
Initial Year (2018)	Update Year 1 (2019)	Update Year 2 (2020)	Update Year 3 (2021)	Update Year 4 (2022) Update Cycle Restarts

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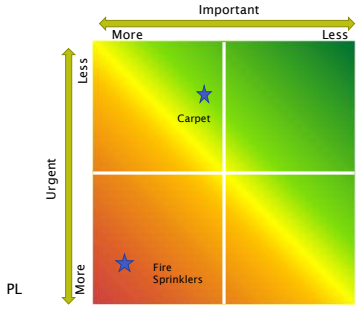
Revise the Plan – Setting Priorities

- Some projects are more urgent & important than others
  - Determine the Urgency (objective)
  - Determine the Importance (subjective)
  - Use the Urgency / Importance matrix



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Considerations for Urgency - Guidelines

Life safety
Could someone get hurt?
Could some's health be at risk?

Durability
Will the asset age more quickly?
Will something else be at risk of damage?
Will something be out of service?

Energy & Optimization
Will the building use more gas, electricity or water?
Could an asset perform better?

Aesthetics & Quality of Life
Will it look or feel better?
Property Value

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How Can we Make the Reserve Study More Relevant?

- Discuss and explore alternate solutions and approaches
- No missing components
- Accurate cost and service life estimates
- Record history and work complete
- Keep up with the needs of the building

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What Makes an Effective Reserve Study - Recap

- Get educated: for a better understanding of your building, the study contents and implementation of the plan.
- Understand, adopt and implement - The Association board of directors / committees etc.
- Engage and guide in implementation - Community Manager
- Interact with the reserve study provider for better clarity and planning
- Using the maintenance plan and reserve study for yearly project planning allows the association better control and certainty.

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MAINTENANCE PLAN AND RESERVE STUDY

Discussion + Questions

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Learn more at

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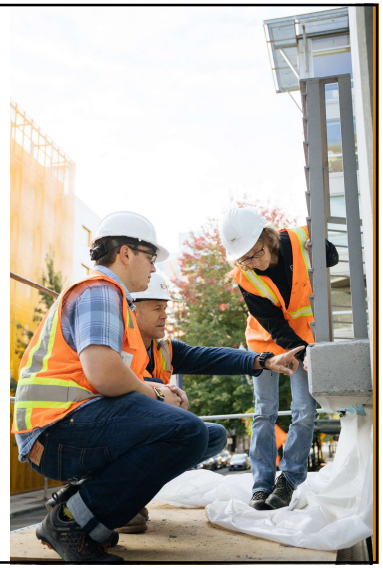

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