


RDH BUILDING SCIENCE INC.
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Tools for Condominium and Homeowner Associations: Maintenance Plan, Reserve Study, and Condition Assessment

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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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What is a Reserve Study?

- A long-range financial planning tool
- 30 year evaluation of property and components
- 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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Contents of a Reserve Study

- Oregon: ORS 100.175 / 94.955
- 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

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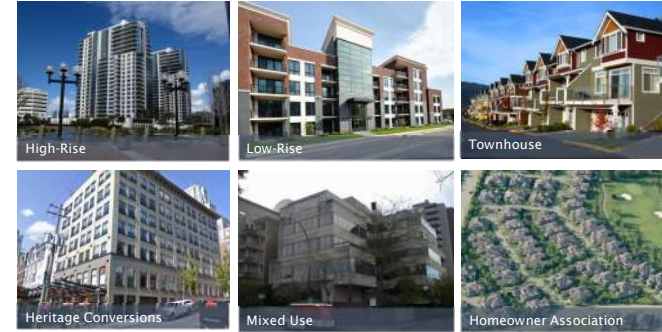
Contents of a Reserve Study

- Reserve component list - common property: Visual walk through for Initial
- Estimates for useful life and remaining life of components
- Quantities of components
- Current repair and replacement cost for each component
- Major Maintenance, Repair, Replacement of common property - 30 Years
- Various disclosure language and statements(WA)
- Special assessments: planned or required?
- Interest and inflation assumptions
- Current and recommended contribution rates (WA)
- Baseline funding plan + Recommended funding plan + Owners Plan (WA)
- Percent of fully funded - 100% at some point in (WA)
- Reserve Funding Deficiency Tabulation (WA - 2019)
- Maintenance Plan (OR)



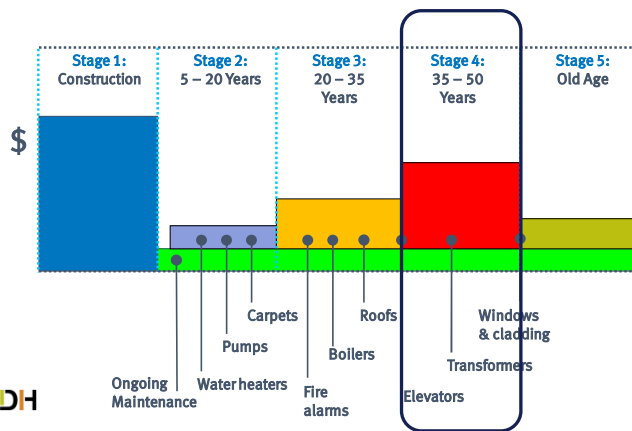
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Building Types – Significantly Effect a Reserve Study



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Why is a Reserve Study Important?



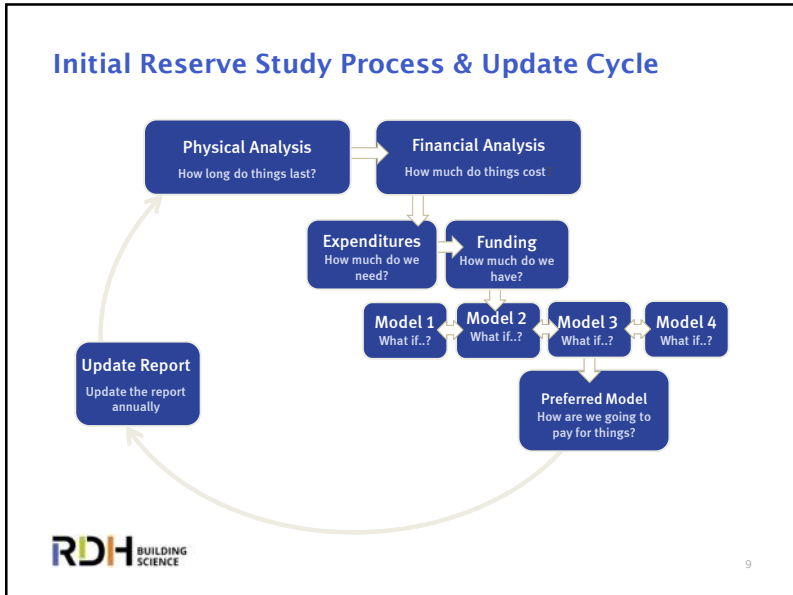
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Some of the Challenges for Condominium Building Owners

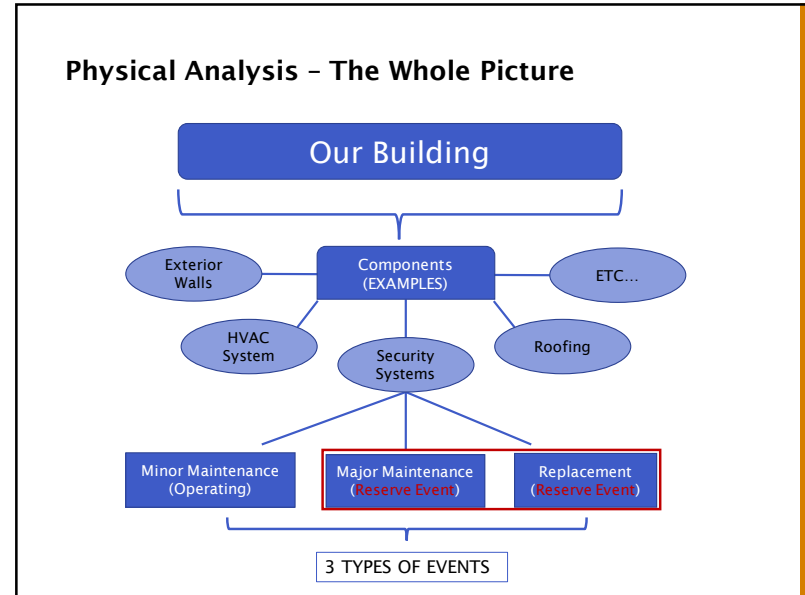
- Deferred Maintenance
- Aging systems and components
- Lack of knowledge
- Inadequate reserves
- Focused on other matters
- Board turnover/continuity



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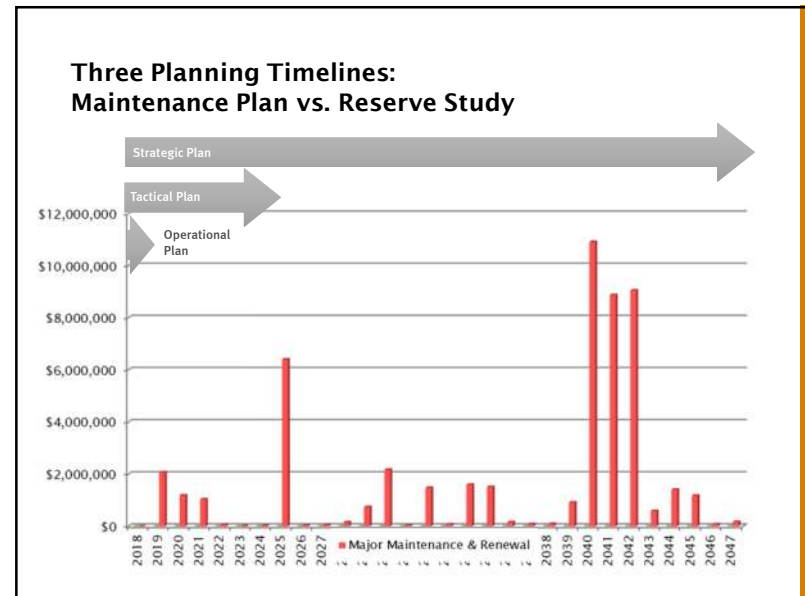


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Physical Analysis - Component List

Category	Item	Location	Description	Chronological Age	Effective Age	Last Review Rating	Service Life	Remaining Service Life	Observation Count
Controls	Fire 01	Fire Room	Central and remote processing units for all fire detection devices and fire suppression devices connected to the fire alarm system.	8	1		15	12	0
	Fire Control Panels	Fire Room	Central and remote processing units for all fire detection devices and fire suppression devices connected to the fire alarm system.	8	1		15	12	0
Detection	Fire 02	Mounted to walls and ceilings in strategic locations throughout the building	Various fixed devices to detect fire and smoke conditions and initiate timely response.	8	8		15	7	0
	Fire Detection & Alarm	Mounted to walls and ceilings in strategic locations throughout the building	Various fixed devices to detect fire and smoke conditions and initiate timely response.	8	8		15	7	0
Suppression	Fire 03	Pump rooms on parking levels 1 and 2.	A pump that supplies water flow and pressure to a sprinkler system or standpipe system. (3 pumps)	8	8		20	12	
	Fire & Jockey Pumps	Pump rooms on parking levels 1 and 2.	A pump that supplies water flow and pressure to a sprinkler system or standpipe system. (3 pumps)	8	8		20	12	

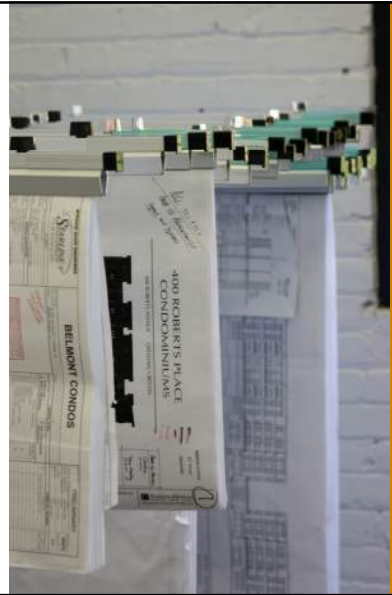
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Reserve Study Events - Things to Understand

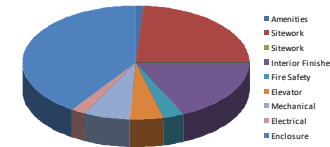
- Reserve Study is a Plan - not a budget!
- Cost predictions are based on similar properties, published and historic data, BUT accuracy over 30 years can be very difficult.
- Sometimes assets lasts longer (or shorter) than expected:
 - Diligent maintenance extends service life.
 - Unforeseen conditions can shorten service life.
- Actual events may occur before or after the reserve study prediction.
- In some cases - Don't fix it if it's not broken.
- In some cases - Preventative replacement is needed - Fire life safety, elevators, or large / long lead items



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Financial Analysis - What You Need to Know

- Operating Budget Threshold - Chosen by association with recommendations by RDH.
- Reserve Balance Carried Forward - Provided by association and can involve some in accuracy as it is a projection to year end.
- Interest Rate - On YE Balance - Provided by the Association.
- Replacement and Renewal Costs - taken from public sources, historic records, vendors, similar projects, etc.
- Inflation Rate - to more accurately predict future costs.
- Cash Flow Models - Required and Recommended.



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Funding Model or Plan - What is it?

A Funding model depicts all the anticipated expenditures in the 30-year reserve planning and models cash flow options that address the planned expenditures :

- Yearly reserve contribution.
- Expected yearly reserve expenditures.
- Yearly reserve closing balance.
- Inflation and interest assumptions.
- Indicates anticipated or predicted special assessment events on the horizon.



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Funding Model Example

Building - Funding Model

Name	Contribution of Current Model - 2020 w/ 7.5% Increase		Unit Catchup Cost	\$0
Type	Basic		Operating Budget	\$137,917
Start Year	2020	Operating Reserve Balance	\$700,000	
Current Assessment Rate	0.5%	Reserve Contribution Threshold	\$15,000,000	
Anticipated Contingency Allowance	\$0	Contribution #	5193,500	
Tax Rate	15.0%	Contribution Above Threshold	\$0	
Planning Horizon	30	Reserve Contribution Increase	5.50%	
Number Of Units		Monthly Avg. Unit Contribution	\$209	

Year	Operating Balance	Reserve Contribution	Special Assessment	Reserve Increase	Renewal Costs	Contingency Costs	Tax Liability	Closing Balance	Percent Funded
2020	\$700,000	\$193,500	\$0	\$3,700	\$304,400	\$0	\$325	\$992,075	30.33 %
2021	\$992,075	\$208,013	\$0	\$2,960	\$33,700	\$0	\$444	\$786,904	26.01 %
2022	\$786,904	\$223,613	\$0	\$3,840	\$118,800	\$0	\$577	\$884,480	27.02 %
2023	\$884,480	\$240,384	\$0	\$4,385	\$790,000	\$0	\$658	\$131,087	17.44 %
2024	\$131,087	\$258,413	\$0	\$1,655	\$107,900	\$0	\$248	\$483,017	22.34 %
2025	\$483,017	\$277,794	\$0	\$2,415	\$626,800	\$0	\$382	\$158,084	8.12 %
2026	\$158,084	\$298,629	\$0	\$294	\$38,200	\$0	\$199	\$421,145	18.27 %
2027	\$421,145	\$321,026	\$0	\$2,106	\$32,800	\$0	\$194	\$711,181	26.75 %
2028	\$711,181	\$345,303	\$0	\$3,354	\$245,000	\$0	\$333	\$814,307	28.81 %
2029	\$814,307	\$370,986	\$0	\$4,075	\$396,200	\$0	\$411	\$1,090,253	34.98 %
2030	\$1,090,253	\$398,490	\$0	\$5,460	\$110,800	\$0	\$491	\$1,396,104	39.40 %
2031	\$1,396,104	\$428,721	\$0	\$6,908	\$45,900	\$0	\$1,039	\$1,773,813	45.30 %
2032	\$1,773,813	\$460,875	\$0	\$8,869	\$93,800	\$0	\$1,320	\$1,728,427	44.42 %
2033	\$1,728,427	\$495,440	\$0	\$8,443	\$1,202,900	\$0	\$1,296	\$1,028,313	32.34 %
2034	\$1,028,313	\$532,988	\$0	\$5,142	\$118,300	\$0	\$771	\$1,426,981	41.13 %
2035	\$1,426,981	\$572,543	\$0	\$7,133	\$86,400	\$0	\$1,070	\$1,918,189	50.30 %
2036	\$1,918,189	\$613,484	\$0	\$9,396	\$38,400	\$0	\$1,439	\$2,516,430	59.18 %
2037	\$2,516,430	\$661,645	\$0	\$12,360	\$96,300	\$0	\$1,887	\$3,132,470	67.26 %
2038	\$3,132,470	\$711,389	\$0	\$15,442	\$697,400	\$0	\$2,549	\$3,798,452	76.99 %
2039	\$3,798,452	\$764,414	\$0	\$19,798	\$840,300	\$0	\$3,270	\$5,092,394	74.37 %
2040	\$5,092,394	\$821,960	\$0	\$25,463	\$174,000	\$0	\$4,319	\$5,793,497	81.70 %
2041	\$5,793,497	\$881,697	\$0	\$33,593	\$391,000	\$0	\$5,813	\$6,609,194	80.89 %
2042	\$6,609,194	\$944,878	\$0	\$44,500	\$646,400	\$0	\$7,781	\$7,524,189	102.49 %
2043	\$7,524,189	\$1,021,118	\$0	\$59,421	\$1,426,200	\$0	\$10,443	\$8,912,589	110.89 %
2044	\$8,912,589	\$1,097,702	\$0	\$79,363	\$49,000	\$0	\$13,884	\$9,990,166	121.89 %
2045	\$9,990,166	\$1,180,230	\$0	\$107,811	\$817,300	\$0	\$18,490	\$11,274,238	133.33 %
2046	\$11,274,238	\$1,268,512	\$0	\$144,812	\$194,400	\$0	\$24,971	\$12,544,211	152.18 %
2047	\$12,544,211	\$1,363,472	\$0	\$197,021	\$395,500	\$0	\$33,728	\$14,402,576	162.94 %
2048	\$14,402,576	\$1,465,948	\$0	\$267,073	\$1,022,400	\$0	\$45,320	\$16,881,825	187.57 %
2049	\$16,881,825	\$1,578,894	\$0	\$364,469	\$1,828,200	\$0	\$60,661	\$19,487,177	198.20 %
		\$20,007,802	\$0		\$18,607,000				

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Strategic Plan – 30 Year Look-Ahead

			Avg. Life	Cur. Year (5 rounded)	Next Event	Future Year (5 rounded)		2024	2025	2026	2027	2028	2029	2030	2031
Enclosure															
Encl.01	401	Inspect roofing membrane for signs of distress prior to conclusion of system warranty	1 yr	\$2,500	2026										
Encl.01	401	Replace sealant at flashings and penetrations - at 2 ply SBS roof assembly.	10 Yrs	\$2,000	2026	\$2,500									
Encl.01	402	Replace 2 ply SBS roof membrane and associated flashing.	30 Yrs	\$172,800	2048	\$400,000									
Encl.02	402	Power wash pavers as required to remove particulate and organic growth that can create	3 Yrs	\$5,000	2019	\$5,200									
Encl.02	402	Clear drains under pavers. Replace deteriorated sealants and repair perimeter	5 Yrs	\$10,000	2021	\$11,000									
Encl.02	403	Locally lift a sample of pavers and inspect membrane for blisters, ridges, cracks.	10 Yrs	\$5,000	2026	\$6,300									
Encl.02	401	Replace membrane insulation, drainage board, fiber fabric, pavers, associated flashing and	50 Yrs	\$1,125,000	2066	\$4,600,000									
Encl.03	401	Allowance to augment soil and plantings to the eco roof overlay system.	10 Yrs	\$30,000	2026	\$38,000									
Encl.03	401	Replace soil, gravel, insulation, and plantings	20 Yrs	\$270,000	2036	\$460,000									
Encl.04	401	Provide localized membrane and flashing repairs to conditions that require repair or	5 Yrs	\$4,000	2021	\$4,400									
Encl.04	401	Replace roof membrane and protection including coping and roof wall flashings.	40 Yrs	\$225,000	2056	\$690,000									
Encl.05	401	Power wash pavers as required to remove particulate and organic growth that can create	3 Yrs	\$0	2019	\$0									
Encl.05	402	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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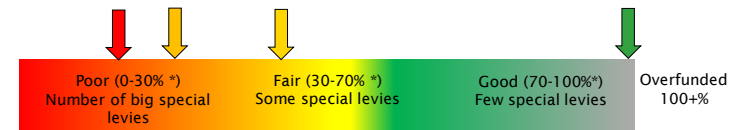
Establishing a Target Funding Level or Percent of Fully Funded

→ Setting a Target Level:

→ Threshold Model?

→ Cash Flow Model?

→ Percent of Ideal Reserve (100%, 70%, 30%?)



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Funding Models- Level of Funding or Percent of Full Funded

→ Level of reserve saving - not defined by ORS 100, by is described by RSW.

→ Underfunding will result in future hardship:

- Deferred Maintenance
- Decline in Property Value and Condition
- Special Assessments



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Reserve Study Funding Levels – How Much is Enough?



How does an Association establish an appropriate funding level?

- 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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Reserve Study Updates

- Typically involves a meeting between the Association and the Reserve Study Provider
- Yearly: Level 3, every 3rd year – site visit
- Update the study to include your new knowledge
- Capture Planned Projects – especially the next five years.
- Looking farther out with a little more certainty
- Maximize your Financial Planning
- Optimizing Funding Models



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How to get the Most from your Reserve Study?

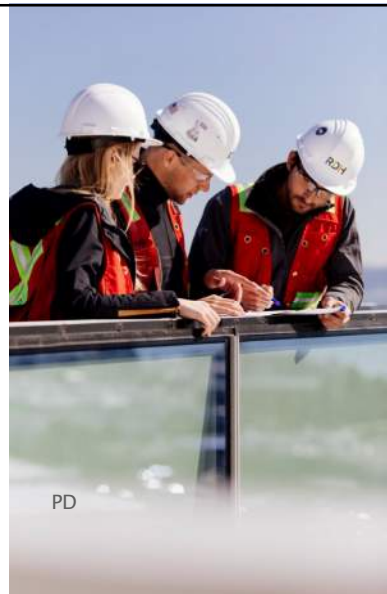


- Understand, adopt and implement: Get involved and understand the tool.
- Engage your Community Manager for implementation and planning
- Accurate cost estimates
- Complete annual updates
- Capture history and work completed
- Reserve Study is a living document, keeping it current helps you plan and keep up with the needs of your property.
- Consider Condition Assessments for More Certainty...

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Condition Assessments

- A more detailed / in-depth evaluation of a building system and/or assemblies – to confirm condition, performance and remaining life.
- Can be focused on certain systems or be multi-system encompassing.
- Visual review of componets
- Often includes testing, sampling, measurements or calculations
- Useful in validating the reserve study projections especially for large cost events that are eminent.



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Why Is a Condition Assessment Needed?



A Reserve Study is a high-level study that can't "see" beyond the surface. A Condition Assessment can inform at a deeper level for better accuracy to Reserve Planning or to identify problems.

- Evaluate hidden conditions – Moisture in walls, mold in attics, condition of piping (domestic water, fire sprinklers, waste and vent, storm, HVAC)
- Evaluate complex systems (mechanical, plumbing, elevators, HVAC, electrical)
- Confirm the need for an activity or remaining service life (especially expensive ones) described in the reserve study – Elevator replacement, Roof replacement, Plumbing systems
- Diagnose performance issues and repairs needed – HVAC equipment, elevators

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Biggest & Most Expensive Projects

High-Rise	Low-Rise	Townhouse
→ Glazing / Windows	→ Roofing	→ Roofing
→ Cladding	→ Glazing / Windows	→ Cladding
→ Mechanical Systems	→ Cladding	→ Buried services
→ Plumbing System	→ Mechanical Systems	→ Roadways
→ Elevators	→ Plumbing System	→ Landscaping
→ Electrical System	→ Elevators	→ Fences
→ Other		



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Condition Assessments

- Where needed a Structural Engineer can be brought in to review conditions of concern.
- Building Enclosure Consultants review windows, walls, roofs, caulking, membranes, etc.
- Other engineering designations may also be called upon (Fire Life Safety, Elevators, Mechanical, Electrical, Energy).
- Through this analytical process, we verify overall condition and identify areas that may need renewals or repairs.
- Better information for reserve study.



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ASTM E 2018 Standard Guide for Property Condition Assessments

- Utilize *ASTM E 2018 – Standard Guide for Property Condition Assessment: Baseline Property Condition Assessment Process* as a basis.
- PCAs may be inclusive of all building systems or specific to systems along (i.e. Building Enclosure).
- Allows the consultant leeway in scope tailoring efforts to meet the needs of the project

Non-Invasive Assessment

Visual-only method of accessible locations to provide a general understanding of the existing conditions. The PCA is non-comprehensive and does not speculate as to the condition or performance of concealed conditions.

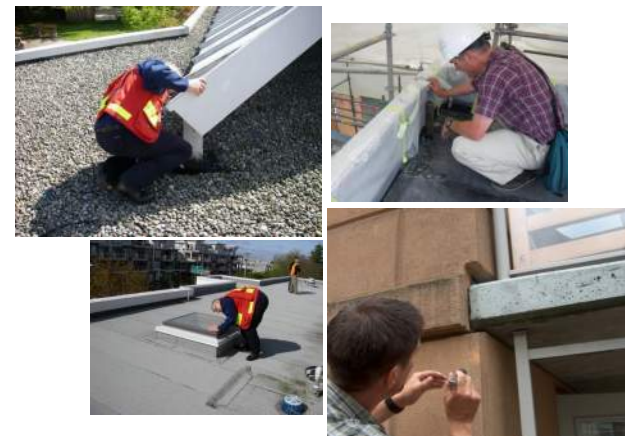
Invasive Assessment

Visual observations with aspects of testing to better understand the as-built conditions and performance of components. The invasive or testing technique allows the consultant to gain a better understanding of the underlying system condition and performance.



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Building Enclosure – A Closer Look



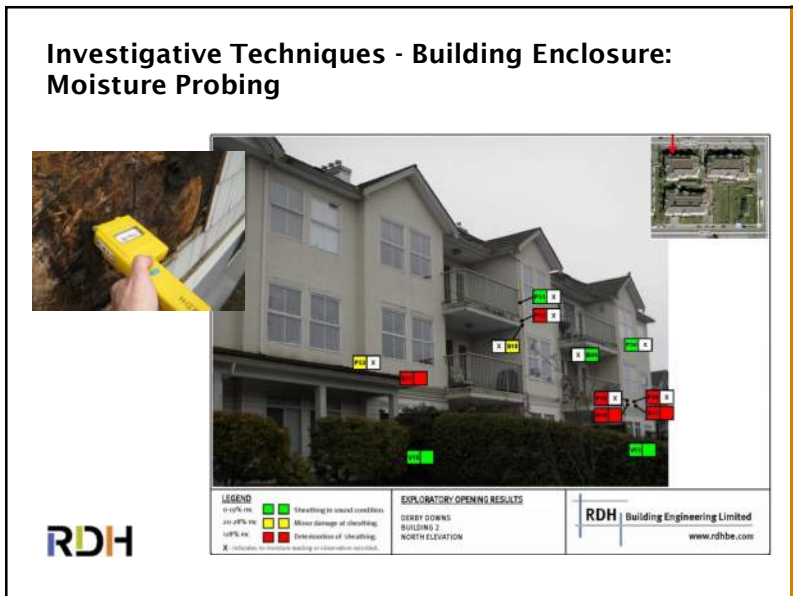
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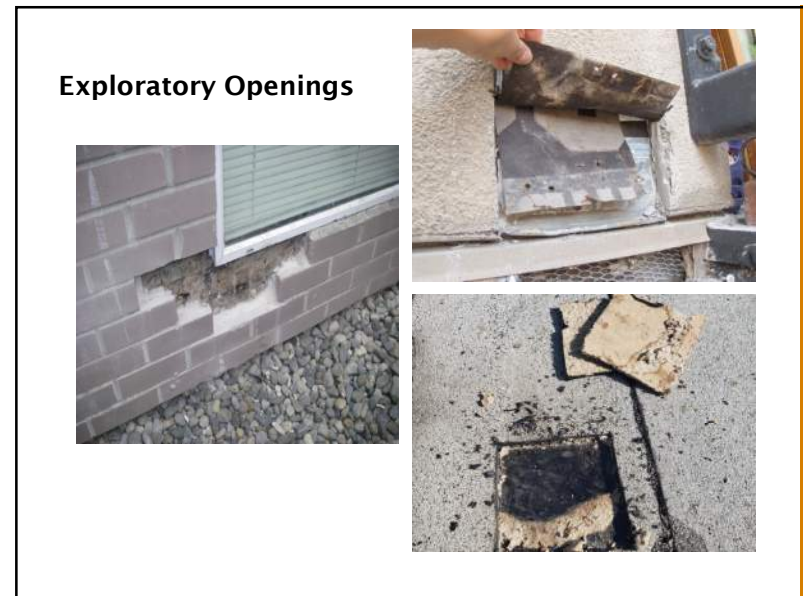
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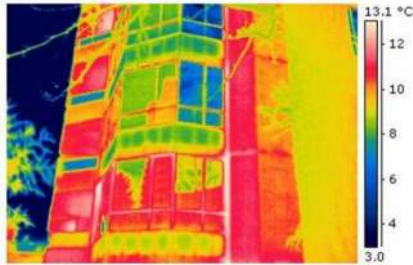


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Building Enclosure - Scanning Tools:



Thermographic Scanning

Impedance Scanning



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Fire Life Safety - Testing and Evaluation per Code



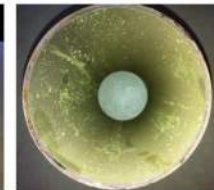
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Investigative Techniques: Camera Scoping



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Investigative Techniques: Pipe Sampling for Plumbing Systems



A 2-1/2" diameter hot water pipe was removed from the outlet of the roof-level storage tank. Minor mineral deposits were noted, but generally the sample pipe is in good condition and would not be anticipated to reduce flow. The piping is suitable for substantial continued service life.

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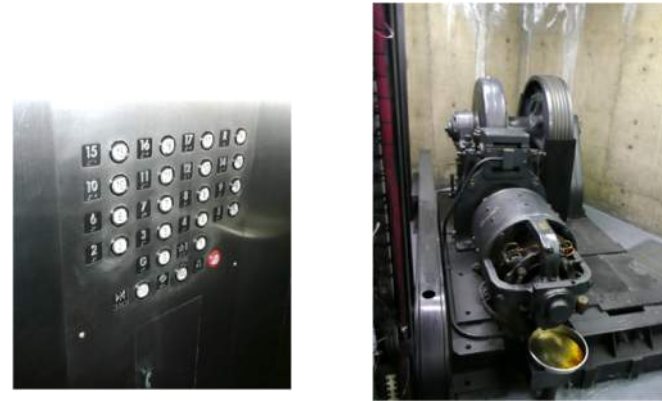
Electrical and Mechanical: Assess Condition, System, Service Life and Performance



TAB - Testing and Balancing: Plumbing and HVAC Systems

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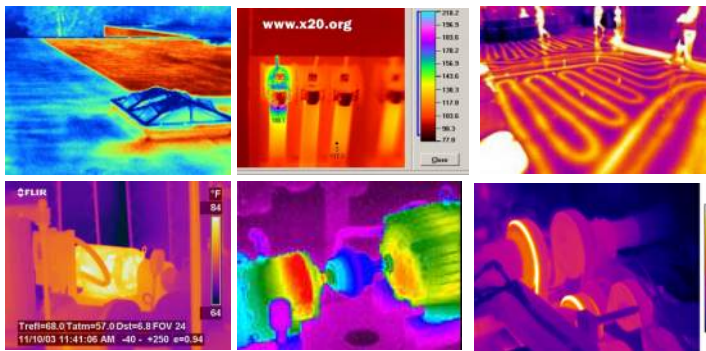
Elevator Systems Consultant Code Evaluation, Service Life, Condition



38 of Total

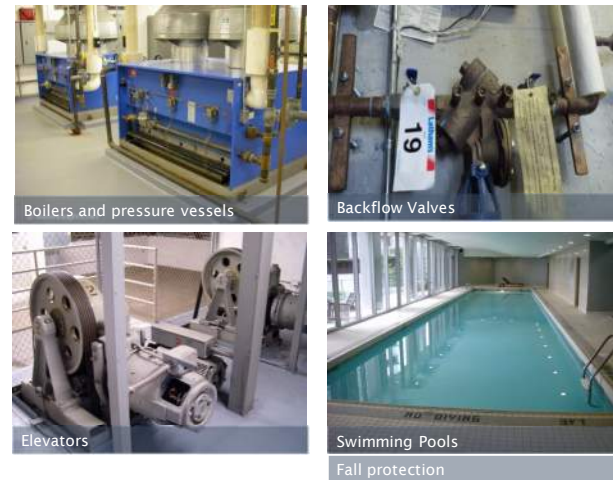
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Thermographic Scans



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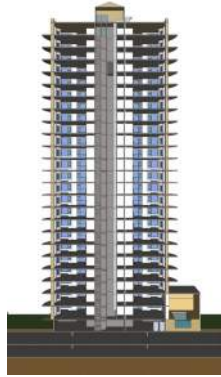
Assets that Require Certificates



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Energy Performance Evaluation

- Energy Audits are a form of Condition Assessment - identify opportunities for Owners to improve energy performance or to reduce greenhouse gas emissions
- Local jurisdictions - code changes that will require replacement to meet new performance standards
- When replacing equipment - opportunities to improve performance and energy usage
- Identify applicable incentive options that may be available



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Condition Assessment: After Field Work

- Consultant prepares report:
 - Describes investigative efforts and systems reviewed
 - Lists observations, testing conducted and findings
 - Should include photographs
 - May include some analysis / data calculations, etc.
- Include Recommendations:
 - Major maintenance needs
 - Assets that are approaching end of life and replacement timelines
 - Premature failure, obsolescence or other condition concerns
 - Additional evaluation needs
 - Costs (?)
 - Prioritization
 - Next steps



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With New Information in Hand...

- If this is **construction defect** - work with attorney to resolution
- **More accurate information for reserve study planning** - next update
- **Repair scope of work** (if needed) is conceptually defined
- Can direct further **Project planning** for the immediate and near future
- Repeat the condition assessment in **five to seven years**.



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MAINTENANCE PLAN, RESERVE
STUDY AND CONDITION
ASSESSMENTS

Discussion + Questions

ksmith@rdh.com

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