Strata Engineering Inc.
Absolute Building Science

PARKADE CONDITION ASSESSMENT

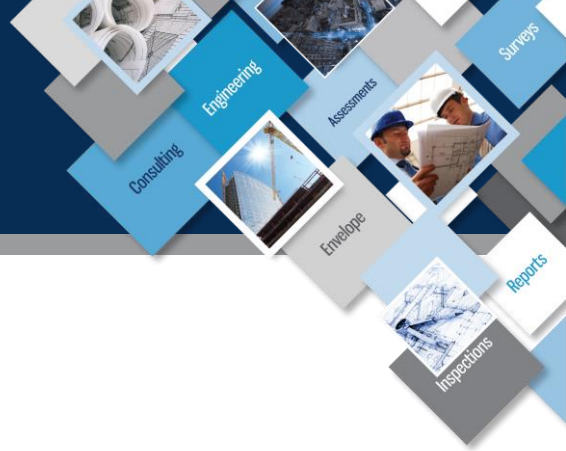
LMS280 – Chateau Comox

INTRODUCTION

OBJECTIVES

- Summarize the Parkade Condition Assessment findings, results and recommendations
- Answer questions regarding the project and future steps

ABOUT US



STRATA ENGINEERING IS A CONSULTING ENGINEERING FIRM

- Our role is to observe, advise, and design solutions for the strata ownership
- We help provide technical advice so you can make the best choices around construction work at your property
- We conduct investigations, create designs, obtain permits, provide quality assurance, and administer construction contracts

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BUILDING OVERVIEW

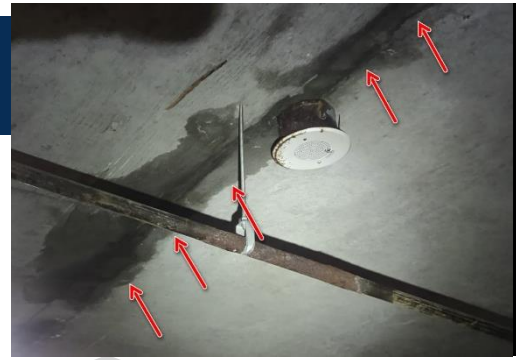
PROPERTY DESCRIPTION

- Chateau Comox at 1272 Comox Street, Vancouver
- 8-storey Mid-Rise Residential Apartment constructed in 1992.
- Parkade consists of 3 level underground, cast-in-place reinforced concrete.
- Investigation conducted January 24, 2024

PARKADE STRUCTURE

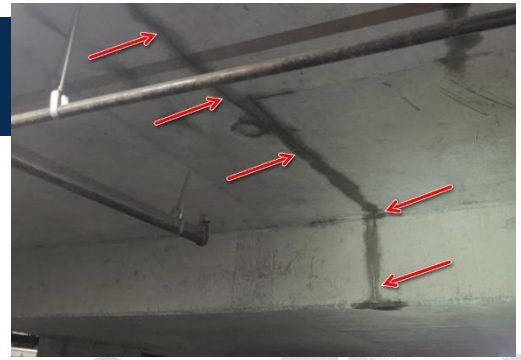
ACTIVE WATER INGRESS

1



Active water ingress originating from Level 1, and rusted speaker.

2



Active water ingress originating from Level 1, with no traffic coating.

3

Water ingress at wall and ceiling transition, from level above.

4

Water infiltrating through exterior foundation walls.

5

Water infiltrating through planters, slab into the 3rd level below.

6

Water infiltrating parkade slab due to insufficient coating and trickling down ramps to other levels.

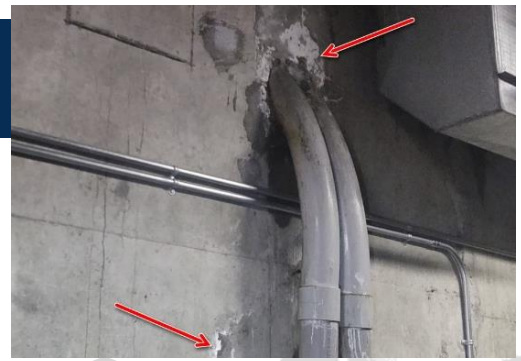
PARKADE STRUCTURE

PENETRATION DETERIORATION AND EFFLORESCENCE

7

Efflorescence deposits indicates prolonged ingress and failed waterproofing membrane.

8

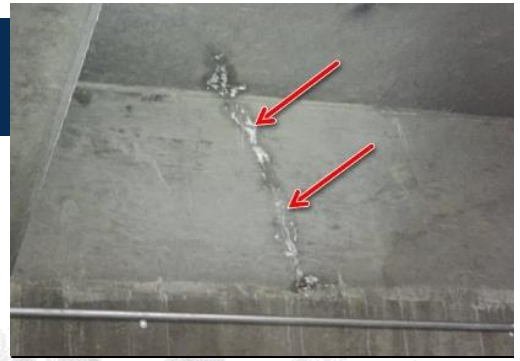


Efflorescence deposits indicates prolonged ingress and failed waterproofing membrane.

9

Corroded piping indicating possible prolonged water ingress in the area.

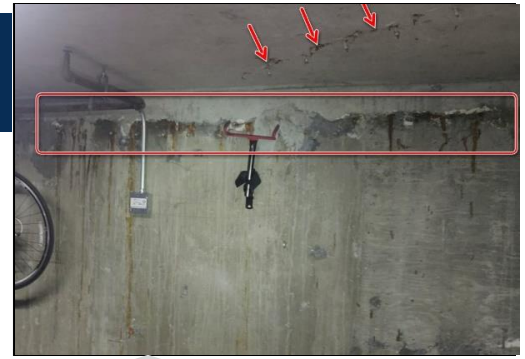
10



Efflorescence deposits indicating moisture penetrating foundation wall.

PREVIOUS REPAIRS

11



Previous repairs indicate failed membrane. Some repairs have since failed while other are still effective.

12

Leaks sealed by polyurethane injections appear to be effective (Electrical Room).

PARKADE MEMBRANE

PLANTERS

13

Membrane in unit planter insufficient installation and deterioration.

14

Membrane below planters has failed due to water ingress in parkade.

PATIOS

15

Membrane under patio pavers observed to be in poor condition.

16

Membrane under pavers observed to have failures throughout.

OTHER OBSERVATIONS

17

Elevated moisture readings indicating failed membrane allowing water to travel under front door.

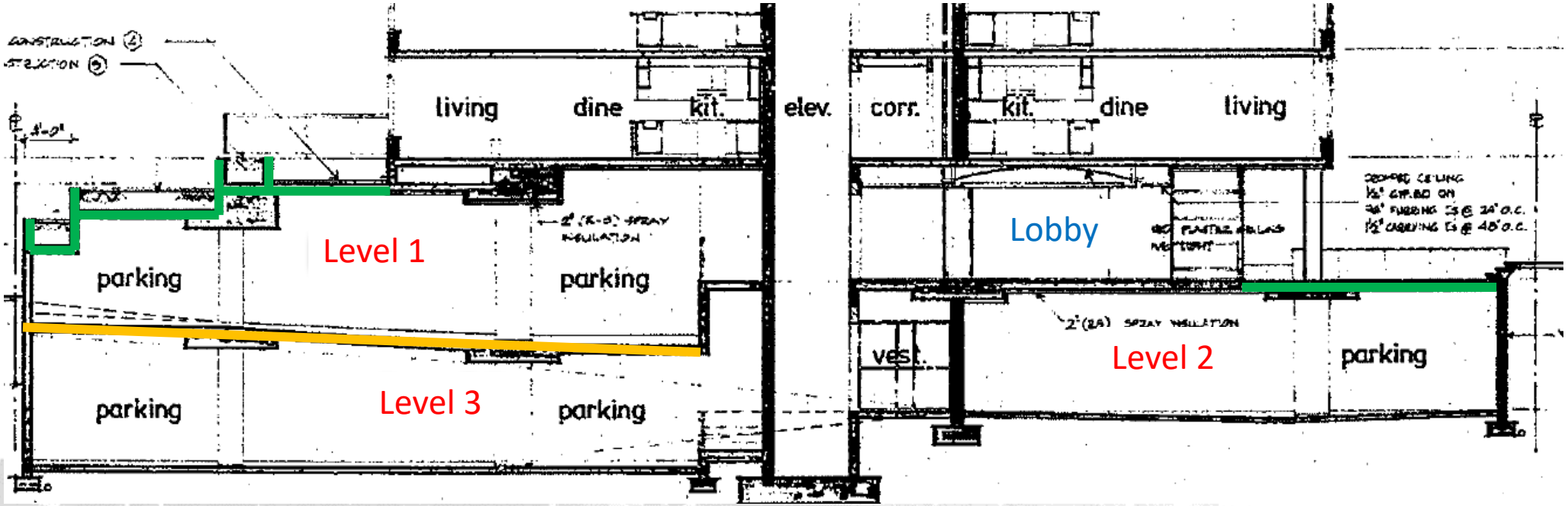
18

Failed membrane allowing water ingress behind concrete wall, causing paint blisters.

WHAT IS A MEMBRANE?

Why is it important?

- 2 categories discussed in this report and recommendations
  - SBS – Bitumen based membrane, goes on top of parkade slab, underneath patios, planters, etc. This prevents water ingress into parkade.
  - Traffic coating – applied inside the parkade on horizontal surfaces to prevent water seeping to floors below. Less exposed to weather but exposed to wear and tear from vehicle traffic.



WHAT IS A MEMBRANE?

Choices of Membrane?

- Dependent on the application – for example SBS is use for the exterior surfaces of the parkade, while traffic coating will be used for the interior surfaces.
- The Engineer will provide specifications to contractors indicating which products are acceptable for each application. The specified products will be selected from the most reliable products on the market to date.
- Any products selected by the contractor not included in the specifications, will need to be approved by the Engineer to ensure proper codes/guidelines are met.

RECOMMENDATIONS

Comprehensive Membrane Replacement

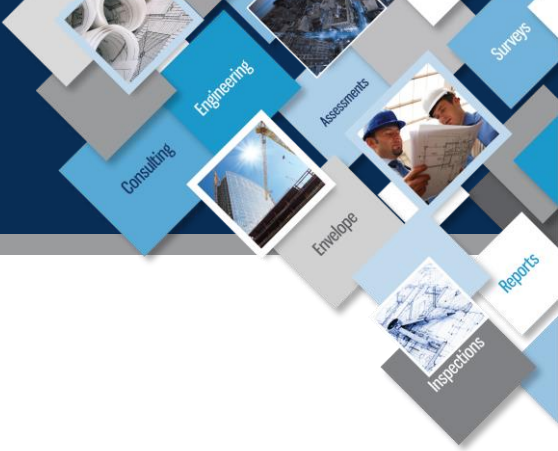
This project would include waterproofing membrane replacement throughout the footprint of the parkade (SBS), penetration repair and sealing, traffic coating installation on the first floor and stairs as well as interior foundation wall leak repair, as necessary. This will include membranes under planters and patios.

Targeted repairs are not recommended due to the degree of deterioration and water ingress observed throughout the membrane and parkade.

CLARIFICATIONS

1. **What is the usual life span of a membrane – SBS, traffic coating?**
2. **Can the project be deferred? If so, how long? Clarify 2 to 5-year time frame.**
3. **What are the consequences of not repairing the membrane?**
4. **Are there phasing options possible with this project?**
5. **Are there other types of repairs possible – i.e. injections?**
6. **Can vertical walls be repaired from the inside due to inaccessibility on the outside?**
7. **How will this project affect parking arrangements?**
8. **Membrane protection from tree/plant roots? How is the landscaping handled for this sort of project?**
   - *Please defer to your landscaper for plant replacement options.*
9. **Efflorescence is an indication that water has migrated through concrete, likely for some time; however, there are no "age tests" to determine the exact amount of time the leaks have been active.**
10. **Project Summaries of previous projects can be provided to your Property Manager.**

NEXT STEPS



STAGE 1

Project Design

Fixed Fee Service

STAGE 2

Permitting & Tendering

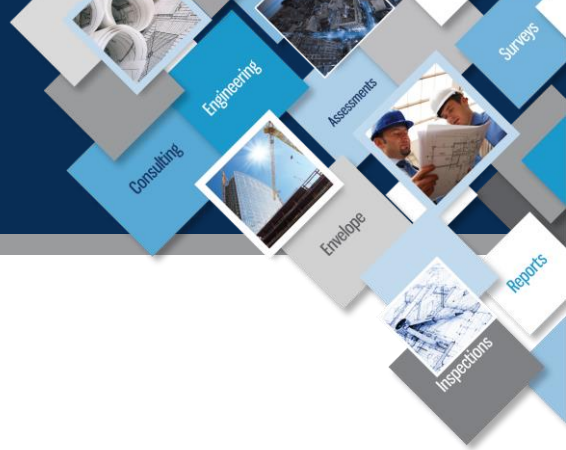
Fixed Fee Service

STAGE 3

Construction Administration

% of Construction Costs

STAGE 1: DESIGN



DESIGN PROCESS

Feasibility

- Review municipality requirements
- Additional Investigations, Hazmat analyses etc.
- Review Existing Drawings, plans, and budgets
- Stakeholder review and discussion

Conceptual Design

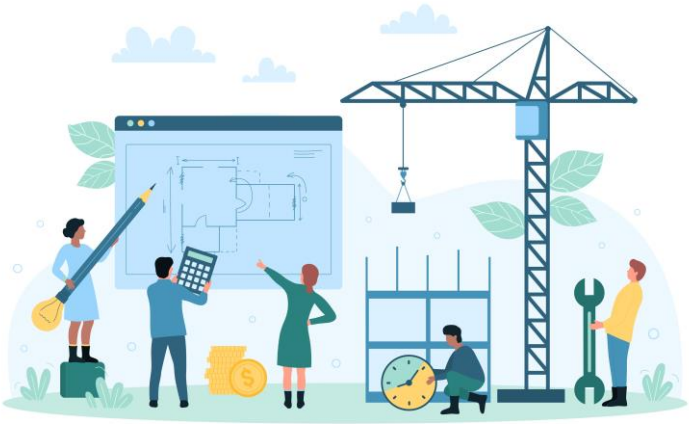
- Preliminary details and specifications.
- Options & Cost-Benefit analyses
- Design brief & Stakeholder discussion

Detailed Design

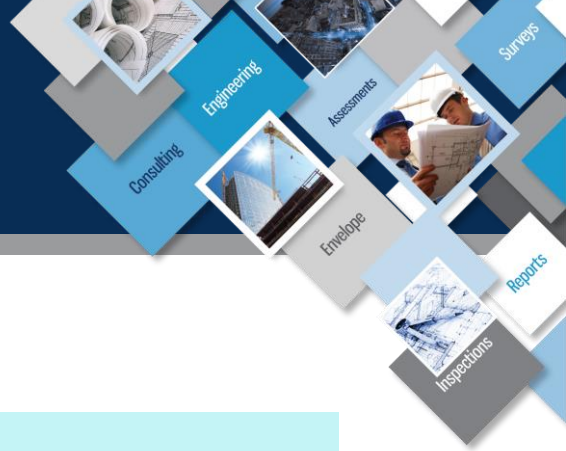
- Finalize Design, Implement final feedback
- Complete construction/permit/tender drawings & specifications
- Preparation for Next Steps

DESIGN GOALS

Cost-Effective ☑ | Durable ☑ | Efficient ☑



STAGE 2: PERMITS



BEST PRACTICES/CONSIDERATIONS

- **Verify** municipality requirements
- **Prepare and submit** Permit package
- **Communicate** with Municipality regarding project considerations.
- **Provide** revisions and support as required.
- Building Permit Issued

- **Key:** Timing, start permit process as early as possible.

STAGE 3: TENDERING

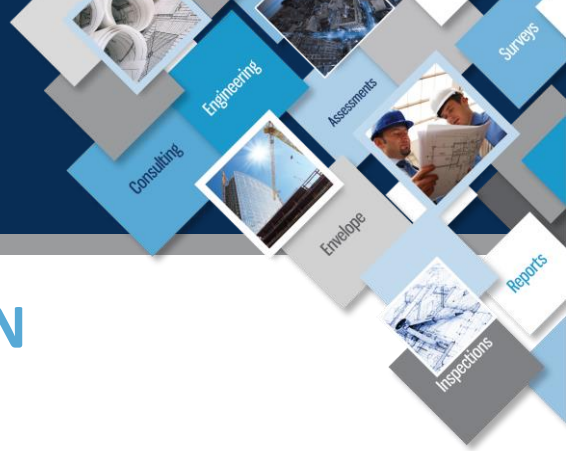
TENDERING PROCESS

- **Tender invitation**
  - Compile tender package, including design and bidding conditions
- **Contractor qualification**
  - Experience/Expertise – references
  - Bonding & Insurance – CCDC 41 review
- **Bidding Period**
  - Site Meeting
  - Clarifications and Addenda
- **Tender Analysis**
  - Bid qualification
  - Complete submission
  - Scope understanding
  - Base bid & Options pricing & timeline
  - Unit/hourly rate review

BUDGETING AND FUNDING STRATEGIES

- **Budget Projections**
  - Managing impact of uncertainties
  - Reasonable **contingency** amounts within context of individual project requirements
  - Comprehensive analysis of known and *potential* diligence and consulting fees
  - Effective implementation of feedback
- **Finalization**
  - Contractor selection by Client
- **Close**
  - Communication with owners and stakeholders.
  - Funding approval

STAGE 4: CONSTRUCTION



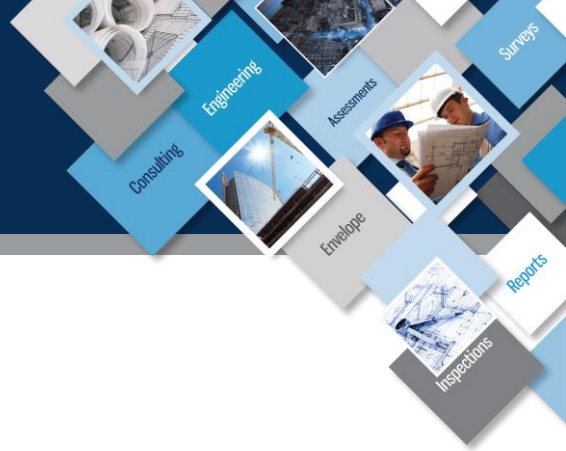
ENGINEERING OVERSIGHT

- **Field Reviews**
  - Review at specific Milestones
  - Installation to industry best practices
  - Design compliance
- **RFI & Scope Changes**
  - Technical clarifications
  - Additional instructions
  - Evaluation of unknown conditions
- **Deficiency**
  - Review of rectified work
  - Substantial Completion Certification

CONTRACT ADMINISTATION

- **Document Control**
  - Preparation, distribution & management of contract documents
- **Change Management**
  - Change Orders, options
  - Change Directives, required
- **Communication and review**
  - Hold regular(biweekly) site meetings for progress updates
  - Support with daily communication
- **Budget control**
  - Payment certification
  - Updated budget projections
  - Holdbacks – builder’s lien and deficiency

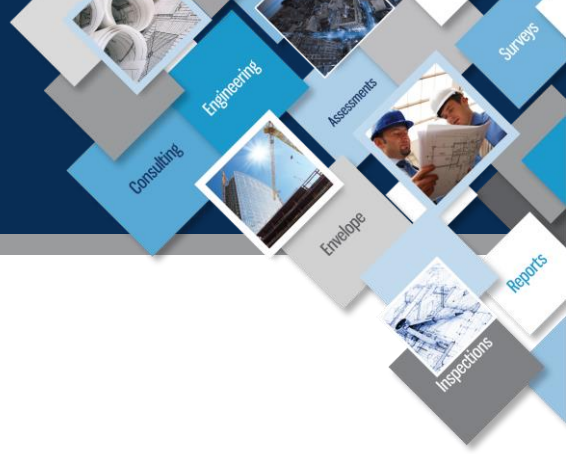
CLARIFICATIONS CONTINUED



<u>Estimated</u> timeline for this project: *Depends on several factors*

- Design: 8 to 12 weeks depending on scope of repairs
- Permitting: 8 to 12 weeks depending on the City processing rates, requirements
- Tendering: 6 to 10 weeks
- Construction: 8 months depending on selected contractor, scope of work, site conditions, weather, etc.
- Recommended start: Spring

Cost estimates provided in the report are **Class D Estimates.** They are based on similar projects in size and scope, at the time the report was written. The estimates provide Ownership an order of magnitude of costs for planning purposes. Tendering will provide the accurate/to date pricing for the project. Tendering prices are valid for 90 days after tender. Prices have been very volatile over the last few years, and we have seen significant increases in only a few months.


Surveys
Engineering
Assessments
Consulting
Envelope
Reports
Inspections

QUESTIONS?

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THANK YOU FOR YOUR TIME!