

**BUILDING ENVELOPE REVIEW**

FOR

**THE VINE**

**2228, 2268, & 2288 WEST BROADWAY  
VANCOUVER, B.C.**

**Presented to:**

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## 1. EXECUTIVE SUMMARY

The Vine is a concrete residential complex that includes three mid-rise residential towers constructed upon a large single-storey commercial structure. The complex also includes townhouse units contiguous with the towers, several retail suites on the ground storey, and a three-storey, below-grade parkade. In general, the building envelope components appear to be in good condition and functioning properly. Sealants are noted to be in sound condition throughout, with the few exceptions specifically. Balcony coatings are in satisfactory condition, though defects in the urethane membrane are noted on the concrete eyebrows. Flashings throughout the building are properly installed and appear to effectively control moisture movement. Apart from small areas specifically noted in this report, the paint coating appears to be well-adhered and performing adequately. Membranes, sealants, and wall surfaces are all performing well with minor maintenance and warranty items identified within the body of this report.

Concrete buildings like The Vine experience normal shrinkage and settlement related cracking through the exterior of the building. As the mass concrete wall is the primary barrier to moisture infiltration, cracking represents a discontinuity in the building envelope and is the single largest risk to this wall system. Annual monitoring and maintenance of the exterior concrete surfaces is necessary to maintain the integrity of the face-seal.

Precast concrete windowsills and caps are installed over the elevations of brick cladding through the complex. Broken mortar joints between precast sections are permitting moisture migration to the cladding below, and the evaporating moisture is depositing large amounts of efflorescence and calcium carbonate. Previous work to alleviate this condition has included coating some of the precast concrete with urethane waterproofing, caulking a small number of the precast joints, and cleaning large amounts of salt deposits from the cladding surface, with only limited success at alleviating the problem.

The window system appears to be performing satisfactorily at this time, with no reported leaks through these components to the interior, and no evidence of failures observed during this review. The exterior sealants are in good condition and have a typical lifespan of approximately 10 years. Annual review of the exterior sealant is recommended in order to maintain the face-seal. At this time, there are no apparent failures within the double-glazed panels which would be evident with condensation forming between the panes of glass. Replacement of double-glazing seals typically begins at year 8, at which point the replacement of approximately 5% of the glazing units should be anticipated annually.

Roof surfaces on The Vine are constructed with a protected roof membrane, installed below the landscaping materials, pavers or gravel ballast. Filter fabric, rigid insulation, and a drainage medium are typically installed over the membrane. The roof membranes appear to be performing satisfactorily with no areas of water infiltration observed or reported. Protected roof membranes of this type generally have a life expectancy in excess of 25 years before replacement becomes necessary. Targeted repairs can be expected as the membrane ages and the building settles during the lifespan of the membrane.

In summary, the condition of The Vine building and parkade structure is generally very good. Minor maintenance-related building improvements are noted throughout this report, and continued proactive building maintenance will maintain the condition of this development.

## **2. SCOPE OF WORK**

- 2.1. At the request of Crosby Property Management Ltd., Spratt Emanuel Engineering Ltd. (SEE) has conducted a review of the building envelope components to assist the Strata property owners with maintenance planning and to ascertain the present condition of the Building Envelope.
- 2.2. A visual review of the building envelope components was conducted by Messrs Richard Osborne and Clifford Sutton by means of Bosun chair drops on the building elevations and visual review of accessible roof and parkade areas. The review was conducted under partly cloudy and mostly cloudy skies with ambient temperatures ranging from approximately 6°C to 10°C. This report is intended to be read with the attached colour photographs, taken at the time of review.
- 2.3. The building condition review undertaken was a visual, unobtrusive inspection to reduce the probability of finding, at a later date, any major defects. It is not the intent of the writer to outline each and every defect which may or may not be present in the building, within the scope of this limited review. Comments relating to waterproof membranes and the performance of the same identify visible evidence in the interior of the building such as efflorescence staining or moisture where water ingress is or was at some time present.
- 2.4. Spratt Emanuel Engineering Ltd. prepared this report to the account of Crosby Property Management Ltd. The material in it reflects the best judgment of the writer in light of the information available at the time of preparation. Any use that a third party makes of this report, and any reliance on decisions made based upon this report, are the responsibility of such third parties. SEE accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based upon this report.
- 2.5. It is assumed that the building was designed and built completely with proper Permits and approvals and in accordance with all applicable Codes at the time, and that all subsequent work was done in a similar manner. No attempt has been made to analyze the design of the building or its components and no detailed zoning or Building Code review has been conducted.

### 3. GENERAL DESCRIPTION

<b>Building Address</b>	2228, 2268, & 2288 West Broadway, Vancouver, B.C.
<b>Property Manager</b>	Crosby Property Management Ltd.
<b>Builder</b>	Scott Construction Group
<b>Architect</b>	IBI Group
<b>Building Type</b>	Mass concrete mid-rise
<b>Principal Occupancy</b>	Residential
<b>Other Occupancy</b>	Commercial
<b>Date of Construction</b>	2006-2007
<b>Applicable Building Code</b>	Vancouver Building Bylaw 8057 (1999)
<b>Number of Suites</b>	130
<b>Type of Construction</b>	Non combustible concrete
<b>Sprinklered</b>	Yes
<b>Window Type</b>	Thermally broken aluminium with double glazing
<b>Window Colour</b>	Metallic
<b>Number of Storeys</b>	Tower 1: 8 Tower 2: 7 Tower 3: 5
<b>Parking</b>	Four-storey, below-grade parkade

- 3.1. The Vine is a residential development consisting of 130 suites in three mid-rise towers that are constructed upon a single storey of retail suites (**Photos No. 1 – 4**). The towers share a common outdoor space on the fourth storey, which is a roof deck constructed over the third storey. The development includes commercial retail units on the north elevation of the ground storey.
- 3.2. The development is constructed with poured concrete structural elements. Exposed concrete with paint coating constitutes the bulk of the exterior walls, and brick is the other main cladding element. Small amounts of metal panel cladding are installed at the roof level mechanical rooms at the top of each tower.
- 3.3. In general terms, the exterior wall assemblies from interior to exterior:
  - 3.3.1. Interior gypsum wallboard with vapour-inhibiting paint finish
  - 3.3.2. Metal studs with rigid fibreglass batt insulation
  - 3.3.3. Cast-in-place concrete wall
  - 3.3.4. Exterior paint coating or brick cladding
- 3.4. In general terms, the roof assemblies throughout the building from top down:
  - 3.4.1. Gravel ballast, concrete pavers, or landscape fill
  - 3.4.2. Geotextile filter layer
  - 3.4.3. Rigid XPS insulation
  - 3.4.4. Liquid-applied roofing membrane
  - 3.4.5. Poured concrete slab

#### 4. OBSERVATIONS

The following items are grouped by tower (except for the common areas) and a depiction of each drop location is included on the plans and elevations of Appendix B. This legend applies to the tables that follow:

**Item:** Each item is numbered and grouped by tower  
**Level:** Indicates which floor, or multiple if repeated instances  
**Description:** Observations include both defects and normal conditions  
**Photo:** Please refer to the colour photographs in Appendix A  
**Action:** Additional information in the Conclusions section of this report  
**Priority:** Items are prioritised as simply High, Medium, or Low  
**Type:** O = Observation only  
W = Warranty item  
M = Maintenance item

##### 4.1. TOWER 1

##### 4.1.1. Bosun Chair Drop #1 – East Elevation, Centre (Photo No. 5)

Item	Level	Description	Photo	Action	Priority	Type
4.1.1.1.	8	Poor quality concrete finishing along the reveal aligned with the window jamb. Sealant application is continuous and remains intact.	6 & 7	Monitor for premature failure	Low	O
4.1.1.2.	8	Form-tie hole patch on window upstand transmitting through exterior coating due to poor finishing.	8	Grind & patch	Low	W
4.1.1.3.	8	Waterproofing membrane at base of walls is visible through exterior paint; coating is either thin or single-coat. Noted repeatedly along this drop.	9 & 10	Paint touch-up	Low	W
4.1.1.4.	7	Heavy efflorescent staining on surface of brick cladding beneath window unit, with cracked mortar joints in precast concrete sill above. Noted repeatedly along this drop.	11 & 12	Caulk joints in precast caps	Medium	W
4.1.1.5.	7	Window sealants are noted to be in good condition with no failures noted throughout the complex.	13 & 14	-	-	O
4.1.1.6.	7	Balcony guardrail mounting plates are caulked on three sides with the exterior joint open to permit drainage.	15	-	-	O
4.1.1.7.	7	On the eyebrow at the base of the wall, the top coat of urethane waterproofing is applied up to the mortar joint, and it is unknown if the base coat extends under the cladding.	16	-	-	O
4.1.1.8.	6 & 4	Urethane waterproofing on eyebrows is applied up to mortar joint, confirming detail above is typical.	17 & 18	-	-	O
4.1.1.9.	6	Urethane waterproofing on eyebrow is applied over dirt and debris, and the substrate demonstrates poor preparation.	19	Monitor for premature failure	Low	O
4.1.1.10.	4	Urethane waterproofing at sill of the window opening is transmitting through the coating, indicating the paint is thin or single-coat. Noted repeatedly along this drop.	20	Paint touch-up	Low	W

4.1.1.11.	4	Cracked mortar joints between sections of precast concrete capping the brick elevations are common throughout.	21	Caulk joints in precast caps	Medium	W
4.1.1.12.	3	Concrete shrinkage cracks on the wing-wall transmitting through the paint coating.	22	Monitor for rust or staining	Low	O

#### 4.1.2. Bosun Chair Drop #2 – East Elevation, Northeast Corner (Photo No. 23)

Item	Level	Description	Photo	Action	Priority	Type
4.1.2.1.	-	Window frames are thermally broken aluminium with double glazing that is installed from the interior.	24	-	-	O
4.1.2.2.	8	Waterproofing membrane at base of walls is visible through exterior paint; coating is either thin or single-coat. Noted repeatedly along this drop.	25 & 26	Paint touch-up	Low	W
4.1.2.3.	8	Window weep holes are provided in the sealant joint between the window frame and the sill flashing. Typical throughout complex.	27	-	-	O
4.1.2.4.	7	Brick cladding under window unit has not been cleaned of mortar. Broken mortar joint noted between sections of precast cap with damage to cladding below.	28 – 30	Caulk joints in precast caps	Medium	W
4.1.2.5.	7	Delamination of urethane waterproofing noted at transition from eyebrow to balcony surface. Waterproofing is applied overtop of peel-and-stick.	31 & 32	Remove peel-and-stick, repair membrane	Medium	W
4.1.2.6.	7	On the eyebrow at the base of the wall, the top coat of urethane waterproofing is applied up to the mortar joint, and it is unknown if the base coat extends under the cladding.	33	-	-	O
4.1.2.7.	5	Missing flashing at the window sill between frame and precast concrete. Peel-and-stick membrane is exposed.	34 (Refer to #28)	Provide and install missing flashing	Low	W
4.1.2.8.	5	Urethane waterproofing at sill of the window opening is transmitting through the coating, indicating the paint is thin or single-coat. Noted repeatedly along this drop.	35	Paint touch-up	Low	W
4.1.2.9.	5	Urethane membrane on the concrete eyebrow appropriately extends to the drip edge at the underside. Typical.	36	-	-	O
4.1.2.10.	4	Sealant joints between brick cladding and concrete wall appear to be in good condition.	37	-	-	O
4.1.2.11.	3	Concrete shrinkage cracks on the wing-wall transmitting through the paint coating.	38	Monitor for rust or staining	Low	O

#### 4.1.3. Bosun Chair Drop #3 – North Elevation, Centre (Photo No. 39)

Item	Level	Description	Photo	Action	Priority	Type
4.1.3.1.	9	Channel steel is not bolted to the concrete eyebrow at the top where fastening holes are provided.	40 (Refer to 175)	Install steel per specifications	Low	W

4.1.3.2.	9	Windows installed at the stairwell on the roof level have weep holes drilled into the frame members, unlike the rest of the windows.	41	-	-	O
4.1.3.3.	9	Damaged paint under the windows on the stairwell, which is promoting delamination in that area.	42 & 43	Paint touch-up	Low	W
4.1.3.4.	9	Poor concrete finishing at the eyebrow over the 8 <sup>th</sup> storey. Urethane waterproofing is applied over dirt and debris without a tape-line finish.	44 & 45	Monitor for premature failure	Low	O
4.1.3.5.	9	Poor finishing of form-tie holes at the eyebrow over the 8 <sup>th</sup> storey	46	Grind & patch	Low	W
4.1.3.6.	8	Urethane membrane dripped onto the window frame during application above.	47	Clean	Low	W
4.1.3.7.	7	Poor finishing of form-tie holes at the eyebrow on the 7 <sup>th</sup> storey. Noted repeatedly along this drop.	48	Grind & patch	Low	W
4.1.3.8.	5	Precast concrete window sills adjoin precast concrete wall caps with large amounts of staining on the cladding underneath. Urethane waterproofing is applied to the window sill but not the wall cap.	49 – 51	Caulk joints in precast caps	Medium	W
4.1.3.9.	4	Urethane membrane applied to the 4 <sup>th</sup> storey eyebrow is coated over dirt and debris. Multiple small coating delaminations are noted.	52 – 54	Repair membrane	Low	W
4.1.3.10.	4	Behind the steel superstructure, sealant application is discontinuous.	55	Sealant renewal	Low	W
4.1.3.11.	3	Urethane membrane on the 3 <sup>rd</sup> storey eyebrows is coated over a poorly prepared substrate with accumulated dirt and debris.	56 & 57	Monitor for premature failure	Low	O
4.1.3.12.	1	SBS roofing applied to the top of the canopy appears well-installed with proper bleed-out and continuous adhesion	58	-	-	O

#### 4.1.4. Bosun Chair Drop #4 – North Elevation, Northwest Corner (Photo No. 39)

Item	Level	Description	Photo	Action	Priority	Type
4.1.4.1.	9	Vertical shrinkage crack on the exterior side of the roof parapet. Crack is not transmitting through paint coating but is visible above.	59	Monitor for rust or staining	Low	O
4.1.4.2.	8	Delaminating paint coating from the balcony parapet wall. Poor adhesion noted for the paint surrounding the damaged area.	60 & 61	Paint touch-up	Low	W
4.1.4.3.	7	Small coating delaminations noted on the upstand under the window unit.	62	Paint touch-up	Low	W
4.1.4.4.	7	At the sealant joint between brick and concrete, the first coat of paint and areas of bare concrete are visible.	63	Paint touch-up	Low	W
4.1.4.5.	6	Poorly applied sealant along the horizontal expansion joint aligned with the window head. Second photo shows proper sealant.	64 & 65	Sealant renewal	Low	W



4.1.4.6.	5	Beginning at the 5 <sup>th</sup> storey, several window units along this drop have an extra flashing piece installed along the jamb.	66 & 67	-	-	O
4.1.4.7.	5	Poor finishing at the jamb/sill of the punch window unit that leaves urethane waterproofing exposed on the wall area.	68	Paint touch-up	Low	W
4.1.4.8.	5	Precast concrete caps installed at the top of the brick cladding and the efflorescent staining on the brick below. Refer to 4.1.3.8	69 & 70	Caulk joints in precast caps	Medium	W
4.1.4.9.	4	Poor detailing of urethane waterproofing at the base of brick cladding on the return wall. Fabric reinforcement is fish-mouthed and delaminating from the wall.	71 & 72	Repair membrane	Low	W
4.1.4.10.	3	Efflorescent staining on brick cladding and broken mortar joints in the precast concrete wall caps.	73 & 74	Caulk joints in precast caps	Medium	W
4.1.4.11.	3	Inappropriate shims installed under the guardrail mounting plates.	75 & 76	-	-	O
4.1.4.12.	1	Hole cored into the brick cladding directly above the retail canopies exposes all layers of the wall assembly and provides a path to the building interior	77 & 78	Cladding repair	Medium	W

#### 4.1.5. Bosun Chair Drop #5 – East Elevation, Centre (Photo No. 79)

Item	Level	Description	Photo	Action	Priority	Type
4.1.5.1.	8	Urethane waterproofing at window sills and base of walls is visible through exterior paint; coating is either thin or single-coat.	80	Paint touch-up	Low	W
4.1.5.2.	8	Poor substrate preparation on the concrete eyebrow is marked by large pocks and bug-holes. Coating appears continuous over defects.	81	Monitor for premature failure	Low	O
4.1.5.3.	7	Poor concrete substrate preparation with waterproofing applied over dirt and loose debris on eyebrow.	82	Monitor for premature failure	Low	O
4.1.5.4.	6	Painter's tape left on wall where urethane membrane extends up from eyebrow	83	Remove tape, touch-up paint	Low	O
4.1.5.5.	5	Loose concrete debris sitting upon eyebrow, and membrane applied over dirty substrate.	84	Clean and monitor	Low	O

#### 4.1.6. Bosun Chair Drop #6 – East Elevation, Southwest Corner (Photo No. 85)

Item	Level	Description	Photo	Action	Priority	Type
4.1.6.1.	9	Vertical concrete crack on roof parapet is transmitting through paint coating and depositing efflorescence.	86	Crack repair	Low	M
4.1.6.2.	8	Poor concrete finishing noted along window sill, marked by large bug holes.	87	-	-	O
4.1.6.3.	5	Incomplete paint coverage adjacent to exhaust vent cover.	88	Paint touch-up	Low	W

4.1.6.4.	5	Large fold in the reinforcing layer of the urethane membrane visible on the eyebrow where it meets the wall.	89	Repair membrane	Low	W
4.1.6.5.	4	Incomplete paint coverage adjacent to exhaust vent cover. Noted in various locations throughout complex.	90	Paint touch-up	Low	W

#### 4.1.7. Bosun Chair Drop #7 – South Elevation, Southwest Corner (Photo No. 91)

Item	Level	Description	Photo	Action	Priority	Type
4.1.7.1.	8	Slight adhesive failure is noted along the sealant bead applied to the reglet flashing at the base of walls on the roof deck.	92 & 93	Sealant renewal	Low	M
4.1.7.2.	8	Along the edge of the eyebrow at the roof level, there is an area of cementitious repair completed overtop of the urethane coating.	94 & 95	-	-	O
4.1.7.3.	8	Poor finishing and cleaning of the brick on the roof deck parapet wall, including an XPS wedge under the concrete cap.	96 & 97	Cleaning	Low	W
4.1.7.4.	8	Where the eyebrow extends into the brick cladding, there is heavy efflorescent staining on the face of the slab edge. Moisture may be migrating along the eyebrow, under the cladding.	98 – 100	Sealant at base of brick on return wall & new weep holes	Low	W
4.1.7.5.	7	Efflorescent staining on eyebrow slab edge where it extends into brick cladding. Similar to above, no weep holes or sealant at base of brick cladding.	101	Sealant at brick base on return & new weeps	Low	W
4.1.7.6.	6	Eyebrow demonstrates reduced staining at this level, but no weep holes at the base of the cladding.	102	Sealant at brick base on return & new weeps	Low	W
4.1.7.7.	5	Weep hole present at the base of brick cladding on eyebrow extension.	103	-	-	O
4.1.7.8.	5	Poor concrete finishing along slab edge of eyebrow with many bug holes.	104	-	-	O
4.1.7.9.	5	Poor detailing of urethane membrane on balcony with discontinuities along floor-wall joint.	105	Repair membrane	Low	W
4.1.7.10.	4	Incomplete paint application around exhaust vent cover.	106	Paint touch-up	Low	W
4.1.7.11.	3	Previous repair of mortar joints appears to be completed around eyebrow extension, depositing mortar on the cladding below.	107 – 109	Cleaning	Low	M

#### 4.1.8. Bosun Chair Drop #8 – South Elevation, Centre (Photo No. 91)

Item	Level	Description	Photo	Action	Priority	Type
4.1.8.1.	8	Awnings installed above the window units do not include a sealant bead along the horizontal joint with the building wall.	110	Sealant application (recommended)	Low	O

4.1.8.2.	8	Channel steel is providing a perch for birds, who are depositing guano on the concrete edge below. Concrete is not coated with urethane waterproofing.	111	Membrane application	Low	W
4.1.8.3.	8	Precast concrete window sills are not joined to the building walls with a sealant joint (which should be continuous from the window jamb to the concrete reveal)	112 – 114	Sealant renewal	Medium	W
4.1.8.4.	8	Bitumen bleed-out (from P&S membrane) noted at the base of the sealant joint between brick and concrete under window	115	Cleaning	Low	M
4.1.8.5.	8	Efflorescent staining on brick surface underneath cracked mortar joint in precast concrete windowsill.	116	Caulk joints in precast caps	Medium	W
4.1.8.6.	8	Large amounts of mortar on the brick surface underneath the concrete cap, and wooden shim left in place.	117	Cleaning	Low	W
4.1.8.7.	8	Brickwork above the window unit is unlevel and out of plumb, finished with a very large sealant joint at the floor level.	118	-	-	O
4.1.8.8.	7	Concrete debris has not been cleaned from the exhaust vent cover above the window.	117 & 118	Cleaning	Low	W
4.1.8.9.	7	Precast concrete window sill includes polyurethane sealant between pieces, which is dissimilar from the bulk of the building. Referencing 8.3 above, the sill also includes a caulk joint to the adjacent wall.	119 & 120	-	-	O
4.1.8.10.	6	One window includes sealant at joints in the precast sill and the other window does not. None of the windows below include sealant.	121 & 122	Caulk joints in precast caps	Medium	W
4.1.8.11.	6	Poor quality concrete finishing on the sill of the window opening.	123	-	-	O
4.1.8.12.	4	Paint application to the concrete lintel above the window opening is thin and sloppy. Coverage is incomplete, and the paint is smudged on the adjacent brickwork.	124 – 126	Paint touch-up	Low	W

## 4.2. TOWER 2

### 4.2.1. Bosun Chair Drop #9 – East Elevation, Centre (Photo No. 127)

Item	Level	Description	Photo	Action	Priority	Type
4.2.1.1.	6	Cracked mortar joint between sections of precast concrete windowsill.	128	Caulk joints in precast caps	Medium	W
4.2.1.2.	5	Evidence of previous grinding on the precast concrete windowsill. Loose debris remains on the concrete surface.	129	Concrete sacking	Low	W
4.2.1.3.	4	Saddle connection for the balcony parapet does not include a sealant bead and the concrete is demonstrating minor separation.	130	Sealant application	Low	M
4.2.1.4.	4	Cracked mortar joint between sections of precast concrete windowsill.	131	Caulk joints in precast caps	Medium	W
4.2.1.5.	4	Thin and patchy paint coating on the balcony parapet that is transmitting the grey waterproofing membrane.	132	Paint touch-up	Low	W

### 4.2.2. Bosun Chair Drop #10 – North Elevation, Centre (Photo No. 133)

Item	Level	Description	Photo	Action	Priority	Type
4.2.2.1.	8	Weep holes drilled into the window frame members on the roof level stairwell.	134	-	-	O
4.2.2.2.	5	Joint between precast concrete windowsill and wall cap includes sealant, but joint between precast pieces and wall and precast pieces themselves are unsealed. Organic staining noted on the brick below.	135 – 138	Caulk joints in precast caps, caulk caps to building wall	Low	W
4.2.2.3.	4	Peel-and-stick membrane is visible extending from under the brick cladding onto the concrete eyebrow, partially covered with urethane waterproofing.	139	Remove P&S and repair urethane	Low	W
4.2.2.4.	3	Efflorescent staining on brick surface below fastening point of decorative channel steel.	140	Caulk fastener penetrations	Low	W
4.2.2.5.	3	Sealant joints around the window frame are unusually large, up to 1½" in width, but appear intact and functional.	141 & 142	-	-	O
4.2.2.6.	1	Ponding water noted on the retail canopy for London Drugs.	143	Clear drains	Low	M

### 4.2.3. Bosun Chair Drop #11 – West Elevation, Northwest Corner (Photo No. 144)

Item	Level	Description	Photo	Action	Priority	Type
4.2.3.1.	7	Parapet tops are finished with unreinforced urethane membrane, thickness unknown. Typical throughout complex.	145	-	-	O
4.2.3.2.	7	Line of urethane membrane termination on window sills is visible through paint coating. Paint appears to be adequate thickness.	146	-	-	O
4.2.3.3.	7	Urethane membrane is applied up the exterior face of the balcony parapet, whereas this location is painted elsewhere.	147	-	-	O

4.2.3.4.	4	On the roof of the townhouse, there is an unsealed plumbing penetration through the concrete wall.	148	Sealant application	Medium	W
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#### 4.2.4. Bosun Chair Drop #12 – South Elevation, Centre (Photo No. 149)

Item	Level	Description	Photo	Action	Priority	Type
4.2.4.1.	7	Cracks in the eyebrow extending from the roof level are marked by efflorescent staining on the underside.	150 – 152	Repair membrane on top-side	Low	W
4.2.4.2.	6	Efflorescent staining on the brick cladding originating from either the precast cap above or the eyebrow extension into the cladding.	153 & 154	Refer to following two items	Low	W
4.2.4.3.	7	Cracked mortar joint between sections of precast wall cap with mortar and efflorescence on brick surface below.	155	Caulk joints in precast caps	Low	W
4.2.4.4.	7	Eyebrow extension into brick cladding is not complete with weep holes or sealant between eyebrow and cladding.	156 & 157	Provide weeps & seal brick-concrete joint	Low	W
4.2.4.5.	6	Extra piece of gum-lip flashing installed along the west jamb of the window opening, compared to the east jamb.	158 & 159	-	-	O
4.2.4.6.	5	At the top of this storey, a masonry joint replaces the rod-and-caulk expansion joint noted at all other floor levels.	160	None – expansion joints satisfactory at every 2 <sup>nd</sup> storey	-	O
4.2.4.7.	4	Sealant joint between floor levels appears to be installed after routing a previous grout joint. Sealant demonstrates poor adhesion with the bricks above.	161 & 162	Sealant renewal	Low	W

### 4.3. TOWER 3

#### 4.3.1. Bosun Chair Drop #13 – East Elevation, Northeast Corner (Photo No. 163)

Item	Level	Description	Photo	Action	Priority	Type
4.3.1.1.	5	Paint coating does not extend the full height of the concrete walls, up to the eyebrow extending from the roof level.	164 & 165	Paint touch-up	Low	W
4.3.1.2.	5	Along the sill of the window opening, paint application is thin and reveals the urethane waterproofing.	166	Paint touch-up	Low	W
4.3.1.3.	5	Poor concrete finishing on the window upstand reveals large bug holes.	167	-	-	O
4.3.1.4.	4	Flashing missing at the sill of the corner window unit. Paint is applied over the waterproof membrane.	168	Provide proper flashing	Low	W
4.3.1.5.	4	Poor cleaning and finishing at the north-facing window where the sill adjoins the brick cladding. Discontinuous sealant and mortar debris noted.	169	Cleaning & sealant renewal	Low	W
4.3.1.6.	4	At the exposed concrete ledge along the north elevation, there is a large amount of concrete debris.	170	Cleaning & repair membrane	Low	W
4.3.1.7.	3	Viewing down the North elevation from the northeast corner of the tower, there is a large gap between the concrete wall and the precast caps over the ground storey brick.	171	New flashing to cover joint	Medium	W
4.3.1.8.	3	Viewing down the north elevation again, the joint between precast concrete and brick cladding is completed with urethane membrane, which is not typical.	172	-	-	O

#### 4.3.2. Bosun Chair Drop #14 – North Elevation, Centre (Photo No. 173)

Item	Level	Description	Photo	Action	Priority	Type
4.3.2.1.	6	Damage to urethane membrane on eyebrow at roof level noted along edge where there are slight delaminations.	174	Repair membrane	Low	W
4.3.2.2.	6	Channel steel bolted to the underside of the eyebrow on the roof mechanical room. Compare to Tower 1, Item 4.1.3.1.	175	-	-	O
4.3.2.3.	5	Poor concrete finishing on the eyebrow projecting from the roof level, marked by large bug holes.	176	-	-	O
4.3.2.4.	5	Sealant applied overtop of the form-tie hole patches along the eyebrow at the floor level. Bug holes and poor finishing noted.	177	Grind & patch, paint touch-up	Low	W
4.3.2.5.	4	Precast wall caps joined to precast window sills with large areas of staining on cladding below. Application of urethane partially completed on some sections of precast.	178 – 181	Caulk joints in precast caps, seal caps to building wall	Medium	W
4.3.2.6.	3	Concrete ledges below the windows are covered with large amounts of debris and have not been coated with urethane.	182	Cleaning & membrane application	Medium	W

4.3.2.7.	3	At the jamb of the ledge described above, there is a small amount of urethane membrane protruding from under the brick. Indeed, paint is not applied down to the ledge, anticipating membrane extending up.	183	Membrane application	Medium	W
4.3.2.8.	3	Small membrane delaminations noted on the eyebrow under the windows. Membrane appears to be applied over dirt and debris.	184	Repair membrane	Low	W
4.3.2.9.	3	Same location as above, sealant applied overtop of form-tie holes	184	Grind & patch, paint touch-up	Low	W

#### 4.3.3. Bosun Chair Drop #15 – West Elevation, Centre (Photo No. 185)

Item	Level	Description	Photo	Action	Priority	Type
4.3.3.1.	5	Streaking water stains on balcony parapet where there is no flashing with drip edge to direct moisture away. Typical detail.	186	-	-	O
4.3.3.2.	5	Saddle connection at balcony parapet where urethane does not extend up building wall, as per typical saddle detail.	187	Sealant application	Low	W

#### 4.3.4. Bosun Chair Drop #16 – South Elevation, Centre (Photo No. 188)

Item	Level	Description	Photo	Action	Priority	Type
4.3.4.1.	5	Discontinuous sealant application around scupper drain through the roof level parapet.	189	Sealant renewal	Low	W
4.3.4.2.	5	Intersection of precast concrete caps on brick cladding with balcony parapet wall.	190 & 191	-	-	O
4.3.4.3.	5	Heavy efflorescent staining on brick cladding under the precast caps appears to result from broken mortar joints.	192 – 194	Caulk joints in precast caps	Medium	W
4.3.4.4.	4	Weep holes included in brick where eyebrow extends into cladding. Horizontal joint on eyebrow with brick not sealed.	195	Sealant application	Low	W
4.3.4.5.	4	Precast windowsill demonstrates rough edge at jamb where it appears to be cut or broken to fit opening.	196	-	-	O

#### 4.4. COMMON AREA

Item	Location	Description	Photo	Action	Priority	Type
4.4.1.1.	3 <sup>rd</sup> storey, throughout	Broken mortar joints are commonly noted between sections of precast concrete windowsill.	197 & 198	Caulk joints in precast caps	Medium	W
4.4.1.2.	3 <sup>rd</sup> storey, throughout	Dripping water from roof-level eyebrows lands in soil landscaping in many locations, staining the adjacent walls.	199 & 200	Replace soil w/ paver or rock	Low	O
4.4.1.3.	3 <sup>rd</sup> storey, South elev.	Reveals in the concrete walls appear to be controlling shrinkage cracking; several cracks extending from the caulked reveals are beginning to transmit through the urethane coating.	201	Repair membrane	Low	M
4.4.1.4.	3 <sup>rd</sup> storey, South elev.	Several precast concrete caps are coated with urethane waterproofing. Broken mortar joints are noted transmitting through the coating.	202 – 204	Caulk joints in precast caps	Medium	W
4.4.1.5.	Tower 2, West elev.	Outdoor electrical outlet installed on the underside of the 3 <sup>rd</sup> storey eyebrow is missing the appropriate cover.	205	Provide outdoor electric box cover	Low	W
4.4.1.6.	Tower 2, West elev.	Single rusted fastener on the hose bib assembly – appears not to be appropriate stainless steel.	206	Provide stain-less steel fastener	Low	W
4.4.1.7.	Tower 3, Southwest corner	Incomplete application of urethane waterproofing membrane along slab edge of 5 <sup>th</sup> storey balcony.	207	Membrane application	Low	W

#### 4.5. ROOF AREAS

Item	Location	Description	Photo	Action	Priority	Type
4.5.1.1.	ALL	Concrete shrinkage cracks transmitting through urethane waterproofing on perimeter eyebrow in many locations. Includes perimeter eyebrow on mech. enclosure.	208	Repair membrane	Low	M
4.5.1.2.	ALL	Shrinkage cracks also noted extending up perimeter parapet, transmitting through coating on sloped concrete sill.	209	Repair membrane	Low	M
4.5.1.3.	ALL	Several scupper drains not installed, or, do not extend fully through parapet wall. Drain should be sealed to concrete.	210	Install scupper & sealant, repair roofing	Medium	W
4.5.1.4.	ALL	Gravel ballast is small enough to bypass area drain covers and is noted in the drain body.	211 & 212	Provide appropriate drain screens	Low	W
4.5.1.5.	T1 South Elev	One scupper drain body is missing with roofing installed over core hole. Membrane is visible with open path for moisture to bypass.	213	Install scupper & sealant, repair roofing	Medium	W
4.5.1.6.	T1 East	Small concrete spall at base of wall along joint with metal panel cladding.	214	Concrete patch	Low	W
4.5.1.7.	T1	Discrete rust stain on the south wall of the mechanical room	215	Grind and patch	Low	M



4.5.1.8.	T1	Cracked and spalling concrete on top of the mechanical enclosure at the southwest corner of the parapet.	216 & 217	Crack repair	Low	M
4.5.1.9.	T1	Failed sealant joint around light fixture on south wall of mech. room.	218	Sealant renewal	Low	M
4.5.1.10.	T1	Damaged flashing and sealants at base of wall of door jamb to mech. enclosure.	219 & 220	Cleaning, concrete patch, sealant renewal	Low	W
4.5.1.11.	T3	Sanitary vent is missing cap that prevents moisture entry between pipe and sleeve.	221	Provide missing vent cap	Low	W
4.5.1.12.	T3	Light fixture on south wall of mechanical room is collecting and retaining large amounts of moisture.	222	Provide appropriate outdoor fixture	Low	W
4.5.1.13.	T3	Pipe penetration through south wall of mechanical room is not sealed.	223	Sealant application	Low	W

**4.6. PARKADE**

Item	Level	Description	Photo	Action	Priority	Type
4.6.1.1.	P1	Spray-applied cellulose insulation installed on parkade ceiling at entrance ramp where there is residential space above.	224	-	-	O
4.6.1.2.	P1, East	Moisture ingress and rust staining noted at the cold joint between the parkade entry ramp and the wall above.	225	Injection repair, sealant along topside of joint	Low	W
4.6.1.3.	P1, East	Same location as above, hole cored through parkade ramp is filled firestop caulking and emanating moisture and rust staining.	226 & 227	Patch with KIM concrete	Low	W
4.6.1.4.	ALL	Concrete shrinkage cracks noted throughout walls of parkade. All cracks dry at the time of review – efflorescence noted in several locations.	228 – 230	Monitor - injection repair of weeping cracks only	Low	W
4.6.1.5.	P3	Routing and patching of a wall crack has been completed at a single location. Crack has transmitted through patch with no moisture ingress noted.	231 & 232	-	-	O
4.6.1.6.	P1 & P2	Urethane traffic membrane applied to suspended slabs appears good. Small areas of repair appear to correspond with cracks noted on the ceiling below.	233 & 234	-	-	O
4.6.1.7.	P2 & P3	Cracks in ceiling of suspended slabs are emanating efflorescence and rust stains in several locations. Active ceiling cracks appear to correspond with cracks transmitting through urethane on topside.	235 & 236	Repair membrane	Low	M
4.6.1.8.	P2 & P3	Injection repair of ceiling cracks previously completed at two locations on P3 level. Injection locations appear to correspond to membrane repairs on topside.	237 & 238	-	-	O
4.6.1.9.	P2	Southwest corner demonstrating multiple points of moisture ingress. Cracks extending between cored holes demonstrate rust stains and efflorescence.	239 & 240	Repair membrane, injection	Low	W

4.6.1.10.	P2	Same location as above, penetration actively dripping moisture with rust stains on pipe.	241	Topside sealant repair	Low	W
4.6.1.11.	P2	Same location as above, cored penetration through slab not repaired and actively dripping moisture.	242	Patch with KIM concrete	Low	W
4.6.1.12.	ALL	Parkade ceiling on P1 and P2 levels is painted white and unpainted on P3 level.	-	-	-	O

## 5. DISCUSSION AND RECOMMENDATIONS

5.1. In general, the building envelope components appear to be in good condition and functioning properly. With continued regular inspections and a pro-active maintenance plan, this development should easily achieve a long service life. This section describes the remedial action recommended for the above observations. All of the items are considered "Low Priority" because they pose little risk of promoting active water ingress in the immediate future. SEE has also attempted to distinguish between defects that require regular maintenance and defects that are covered by the construction warranty.

5.2. The mass concrete walls of this structure rely upon a face-sealed waterproofing strategy where all moisture entry is resisted at the exterior plane. The exterior paint coating is an important envelope component to resist moisture infiltration into the mass concrete. For maintaining these concrete walls, SEE recommends the following:

5.2.1. **All discontinuities in the paint coating should be touched-up.** Moisture entering the concrete at damaged areas of paint will encourage the surrounding area to delaminate from the wet substrate. Mostly, the paint coating demonstrates good adhesion throughout the building, and areas of repair are specifically identified above. Touch-ups covered by the warranty should include all areas where the original paint application was incomplete and where the original application is thin or single-coat.

5.2.2. **Concrete cracks exhibiting efflorescence or rust staining should be repaired.** Where regular shrinkage cracks have transmitted through the paint, they are susceptible to moisture ingress, which is typically evidenced by rust stains or efflorescence. Repair is completed by routing the length of the crack and tooling-in polyurethane sealant. Shrinkage cracks are common in the first years of a building as the material completes curing and the structure settles; only problematic cracks should be repaired as the "fix" is obvious and unsightly. Normal shrinkage cracks are typically not covered by the warranty.

5.2.3. **Areas of discrete rust staining should be chipped, patched, and repainted.** Rust staining on the surface of the concrete wall indicates that moisture is deteriorating the reinforcing steel, and repair is required in order to prevent further damage. The affected area should be chipped away, the steel should be ground free of rust and coated with a rust-inhibiting paint, and new cementitious mortar should be applied overtop and repainted. These defects should be covered within the first year of the warranty as they are clearly remnants of the original construction.

5.2.4. **Poor concrete finishing at form-tie hole patches should be ground, patched, and repainted.** These defects remain from the formwork used to construct the concrete walls, and the holes are continuous to the interior of the concrete. Improper patching during sacking of the concrete is the cause, and repair should be covered by the warranty. Other areas of noted poor concrete finishing (bug holes, pock

marks, etc.) are not recommended for repair as they do not pose the same risk of permitting moisture ingress.

- 5.3. Liquid-applied urethane waterproofing membrane has been installed on most of the horizontal and low-slope concrete surfaces throughout the building, including eyebrows, ledges, and balconies. There are several recommendations relating to the exposed waterproofing membrane:

5.3.1. **All areas of discontinuous waterproofing should be repaired with additional urethane application.** This includes damaged and delaminating areas on eyebrows and ledges, and locations of poor or incomplete membrane application.

5.3.2. **Urethane waterproofing applied overtop of dirt and debris, or poorly prepared substrate, should be monitored for premature failure.** Currently, the membrane is demonstrating good adhesion even on poor substrates. The risk of premature failure is increased with the inadequate substrate preparation, so only monitoring of this condition is recommended at this time.

5.3.3. **Cracks transmitting through the urethane waterproofing on eyebrows and overhangs require membrane repair.** Application directions for urethane membrane typically require patching of cracks greater than 1/16", such that most of the observed defects will require stripping the membrane, patching the substrate, and reapplying the membrane. Likely, these cracks were present on the substrate prior to membrane application and should be covered by the warranty due to the premature failure of the membrane.

5.3.4. **Cracks transmitting through waterproofing on parapet walls require membrane repair.** The membrane extending over the top and down the sloped concrete surface of the roof parapets is mostly covered by metal flashing. Where it is exposed on the sloped concrete surface, it appears to be thinly applied and does not demonstrate the expected elasticity; it is possible that the applied membrane is only the base-coat of a two-coat system and is not intended for UV exposure. The observed membrane is either not appropriate for this location or it is not properly installed, so repairs should be included with the warranty. At the very least, membrane repair should be completed at each crack according to the procedure described in the above item. It may be more effective to remove the flashing and reapply the membrane over the entire length of parapet.

5.3.5. **Sealant should be applied to the joint between horizontal eyebrow and brick cladding.** In the locations where eyebrows extend into brick cladding, it appears that moisture is travelling along the eyebrow, under the brick, and appearing as efflorescence on the cladding surface. A sealant bead is needed to block this path and direct moisture away from the building. Weep holes at the base of the brick on the eyebrows are also recommended.

- 5.4. Efflorescent staining on the surface of brick cladding below precast concrete wall caps and windowsills is a pervasive problem throughout the complex. The brick shows evidence of previous cleaning of calcium deposits, and the attempts at preventing further efflorescence do not appear effective. Though the unsightly condition poses little risk to the building envelope, these components are not performing as intended and repair should be covered by the warranty.

5.4.1. Previously, urethane membrane has been applied over a limited amount of the precast concrete pieces, primarily along the south elevation of the third storey.

Cracks in the mortar joints between pieces are transmitting through the urethane, and efflorescence is noted on the walls below.

- 5.4.2. A small number of windowsills have been caulked at the joint between pieces of precast, but it is unclear if this was performed during construction or as a remediation. The sealant appears well-adhered and there is no sign of efflorescence below the joint.
- 5.4.3. **SEE recommends sealant application at the joints between pieces of precast concrete windowsill and wall cap.** The existing mortar should be routed from the joints to facilitate sealant application. It is equally important to ensure that sealant is applied to the joint between the precast concrete and the adjacent concrete wall, where applicable.
- 5.4.4. **Sealant should be applied to the joint between precast concrete caps and the concrete wall.** Separate from the item above, the horizontal joint along the precast pieces and building wall should be sealed to prevent moisture ingress. In particular, this joint was noted on the south elevation of each tower where the brick cladding is terminated at the fifth storey.
- 5.5. Moisture ingress in the parkade shall be addressed separately for the below-grade walls and the suspended slabs. As with other concrete cracks, only locations demonstrating active moisture ingress, rust staining, or efflorescence require attention.
- 5.5.1. **Shrinkage cracks in the below-grade walls should be repair by injecting epoxy or urethane from the interior.** Similar to the rest of the structure, shrinkage cracks are common during the first few years following construction as the concrete fully cures and the building settles. Moisture migration through the below-grade walls indicates that the exterior membrane has failed to bridge the crack and should be covered by the warranty.
- 5.5.2. **Cracks in the suspended slabs should be repaired by patching the urethane membrane on the topside.** Only locations with active moisture and/or rust stains require attention. Membrane repair on the top of the suspended slab should be sufficient to halt moisture migration; if the crack cannot be located on the topside, urethane or epoxy injection to the ceiling is an alternate methodology. Membrane failures are premature at this time and the repair should be covered by the warranty.

Should you have any question regarding the content of this report, please do not hesitate to contact the undersigned.

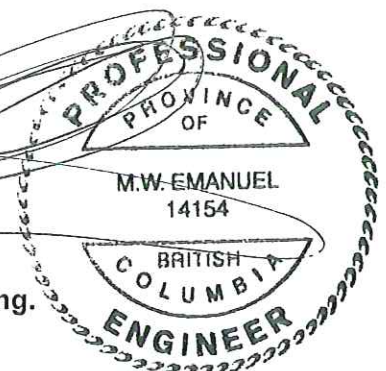
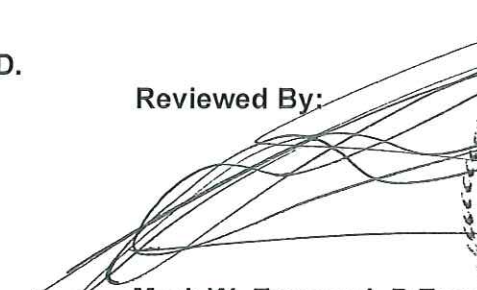
Yours truly,  
**SPRATT EMANUEL ENGINEERING LTD.**  
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