

May 12, 2008



Owners of Strata Plan VR 264  
c/o Ms. Angela Uruski Girard, President  
Monarch Strata Ventures  
263 East 11<sup>th</sup> Street  
North Vancouver, B.C. V7L 2G8

Dear: Ms. Uruski

**Re: Strata Plan VR 264 – 1234 Pendrell Street, Vancouver, B.C.  
Balcony Condition Survey and Investigation of Parking Garage and Patios  
(Units 103 & 104)**

McArthur Vantell Limited (MVL) was retained by Ms. Angela Uruski Girard, President, to conduct a Balcony Condition Survey and Investigation of the Parking Garage and Patios (Units 103 & 104 only) at the building located at 1234 Pendrell Street in Vancouver. The investigation was authorized, in writing, by Ms. Girard on March 5, 2008.

Mr. Ikjot Minhas, A.Sc.T. of MVL conducted the balcony condition survey and investigation of the patios at Units 103 & 104 on April 24, 2008. The investigation of the parking garage was conducted on April 28, 2008, during a period of rainfall.

Drawings obtained by MVL, from Vancouver City Hall, included:

- a) General Notes (5 pages) – not dated or labeled
- b) Detail Drawings (4 pages) – not dated or labeled
- c) Plans and Elevations (6 pages), from Lort & Lort Architects (dates and drawing # not legible)
- d) Structural Drawings, S1-S2 (2 pages), from W.A. Walrond & Associates, dated January 1975.

**Existing Conditions & Observations:**

It was reported to MVL that the age of the building was approximately 32 years.

**Patios (Units 103 & 104)**

It was reported to MVL that a small planter between Units 103 & 104 (west elevation) was located against the building wall and was causing mold inside Unit 104. MVL did not observe any mold inside the unit, when reviewed. There appeared to be a waterproofing membrane inside the planter, but it's likely that the membrane is near the

end of its life span (Photo 1). This planter is approximately 10ft<sup>2</sup> in size with an 8" concrete wall on either side.

### Balconies

The building has 24 balconies with 12 on the north elevation, 3 on the west elevation, 6 on the south elevation and 3 on the east elevation. All balconies are open with some protection from the balconies above or from the main flat roof. The balcony doors are well protected from the elements. All balconies are cantilevered.

The architectural drawings do not show the typical construction of the balconies or guard walls. It was reported to MVL that the age of the balcony membranes is unknown, however, it was reported that a number of balconies have been repaired throughout the years.

The balconies of nine units were reviewed thoroughly (Units 203(n), 204(n), 205(s), 304(n), 305(s), 308(s), 403(n), 404(n) and 406(w)). Access to these balconies was provided through the units.

The deck membrane on the balconies observed was a PVC deck membrane and is assumed to be representative of the remainder balconies. The only exception MVL is aware of is Unit 403, which was re-built in 2004 using a pedestrian traffic liquid membrane. The PVC membrane upturn on the balcony guard walls, along the sides of the balconies, is approximately 1-1/2" and is adhered to the underside of the stucco stop (Photo 2). At the sliding door, the membrane runs over the door flange (Photo 3). At the deck edges (outside face only), the membrane is sloped to the outer edge and continues down the outside face, over a drip edge flashing.

The outside faces of the balconies consist of an 18" high planter on a 25" high picket railing (Photo 4). The planter is secured to the top of the railing and the railing is fastened through the top of the deck and into the structure. The planters appear to have a liquid waterproofing membrane installed, however, this membrane has deteriorated. Numerous holes have been drilled into the underside of the planter boxes, assumingly for drainage for the planter.

The sides of the guard walls are clad in stucco. The guard walls are, typically, 42"-43" high above the finished deck surface.

The existing caps on the guard walls are painted wood. These caps butt into the stucco wall and are caulked (Photo 5). The Strata reported that the caps on some of the north elevation balconies had been replaced with a metal cap flashing in 2001 (Photo 6). This flashing is not sloped and butts into the stucco wall and caulked (Photo 7). A section of cap flashing was slightly lifted to review the waterproofing details below. Although no waterproofing membrane was observed directly underneath the flashings, there did appear to be a membrane installed under the wood blocking below the cap flashing.

The balcony soffits are stucco. A 1" wide vent strip is installed in the soffit, running the length of the balcony, for venting the balcony structure (Photo 8). No staining, sagging, cracks or other damage of the soffits was observed.

The following observations were also noted during the investigation:

1. The wood framing inside the planter box of Unit 305 was deteriorated (Photo 9).
2. Heavy water staining and some wood rot was observed along the underside of some of the planter boxes (Photo 10).
3. Cracking and staining of the stucco was observed on the outside faces of some balconies, at the deck edge flashing/stucco interface (Photo 11).
4. Sealant around some of the guardrail brackets have hardened and/or deteriorated (Photo 12).
5. A few hairline cuts were observed in the membrane on the balcony of Unit 305. These cuts did not appear to penetrate through the entire membrane.
6. The deck membrane on some balconies, which runs down the outside face of the balconies, has delaminated from the deck edge flashing (Photo 13).
7. Some of the sealant at the cap flashing/wall interface and wood cap/wall interface.
8. Sections of wood cap at the balcony of Unit 308 are deteriorated.
9. Some of the stucco guard walls, which have wood caps, are less than the required height of 42" above the finished deck surface.

There have been no reports of current or ongoing leakage activity into the units, believed to be associated with the balconies.

### Parking Garage

The parking garage has a single level of underground parking. The building footprint covers approximately 1/2 of the parking garage. Those areas not covered are located on all elevations. These areas are covered with patios and landscaping. According to the architectural drawings, the parking garage waterproofing membrane is "3-ply felt & asphalt waterproofing".

Efflorescence was observed at numerous soffit and wall locations throughout the parkade. Efflorescence is caused when water has time to absorb lime and salts from the concrete leaving deposits. This is a relatively slow process of seepage rather than flow through cracks.

The following active leaks were observed during the investigation of the parkade:

	Observation	Description	Size
1	Active leak (Photo 14)	Soffit at Stall 4	6"
2	Active leak	Soffit at Stall 4	6"
3	Active leak	Wall at Stall 7 (pipe penetration)	-
4	Active leak	Soffit at Stall 19 (pipe penetration)	-
5	Active leak	Soffit of parkade ramp at Stall 24	20'
6	Active leak	Soffit of parkade ramp at Stall 26	1'
7	Active leak	Soffit of parkade ramp at Stall 27	1'
8	Active leak	Soffit at Stall 28	10'
9	Active leak	Soffit of parkade ramp, adjacent to Stall 28	1'
10	Active leak	Soffit/wall interface of parkade ramp	8'

### **Discussions & Recommendations:**

During the course of our investigation, a number of defects and potential problems were identified. However, the investigation was not exhaustive, therefore it is possible that not all existing deficiencies were discovered. Furthermore, dormant and/or latent deficiencies, which are time dependent, may not have resulted in visible defects at the time of this investigation. The deficiencies discussed are based on a sampling and are not intended to present a total listing of all locations with similar deficiencies; nor is it intended to imply that all similar locations or items are deficient. However, the investigation was seen as reasonable to support the following opinions.

All estimates are preliminary budget estimates and may require further investigation and quantification. However, the estimates are considered suitable for reflecting the relative scope of the required work. The construction estimates do not include allowances for Consultant Fees.

#### Patios (Units 103 & 104)

No water ingress was observed inside the units, however, MVL suggests that the Strata may want to consider removing this planter (including soil and concrete walls) and installing new membrane and concrete topping, to match the rest of the patios, as opposed to keeping the planter and replacing the existing waterproofing membrane. The planter area can be replaced with potted plants. MVL recommends that the Strata allow a budget of \$1,300 (plus GST) to complete this work. The Strata may also want to consider completing the same repair to the planter on the adjacent patio, between Units 104 & 105, for the same budget, for a total budget of \$2,600 (plus GST).

#### Balconies

Based on our observations, MVL recommends that the outside faces of the balconies be addressed, particularly the planter boxes. The Strata has expressed some interest in removing the existing planter boxes and railings and substituting them with either a solid guard wall or full height railings. MVL concurs that these would be the best options at this point in time. In addressing the outer faces of the balconies, however, other work would also be affected such as stucco and deck membrane replacement (due to tie-in issues with the existing components).

Therefore, MVL proposes the following scope of work for all balconies in the building:

1. Remove the existing planter boxes, metal guardrails and stucco (from the outside faces of the balconies and 12" high on the inside perimeter of the balconies).
2. Remove the existing deck membranes and re-slope the deck sheathing as required.
3. Remove all stucco soffits.
4. Complete all structural repairs as required and as directed by the Consultant.

5. Install new PVC deck membranes (up the building walls min. 8" above the finished deck surface and under the sliding door flanges). Existing sliding doors are to remain in place, however, the bottom track mitre joints of the doors are to be re-sealed and all drain holes cleaned.
6. Install a new top mount metal picket or glass panel guardrail system (full height), leaving the existing side stucco guard walls in place (Option 1). Install new cap and saddle flashings as required.
7. Install a new top mount metal picket or glass panel guardrail system (full height), wrapping around the entire balcony and tie into the building walls (Option 2).
8. Install a solid stucco-clad guard wall on the outside faces of the balconies (full height – no guardrails) (Option 3). Install new cap and saddle flashings as required.
9. Install new perforated soffits (to provide adequate ventilation of the deck spaces).

MVL proposes the following options and budget estimate for the above-mentioned work:

**Option 1**

	<b>Item</b>	<b>Cost</b>
1.	Re-build balconies with metal picket or glass panel guardrails (leave existing side stucco guard walls in place)	\$ 230,000
2.	Structural Contingency (15%)	\$ 34,500
3.	Subtotal	\$ 264,500
4.	GST	\$ 13,225
5.	<b>Total</b>	<b>\$ 277,725</b>

**Option 2**

	<b>Item</b>	<b>Cost</b>
1.	Re-build balconies with metal picket or glass panel guardrails (wrapping around the entire balcony)	\$ 210,000
2.	Structural Contingency (15%)	\$ 31,500
3.	Subtotal	\$ 241,500
4.	GST	\$ 12,075
5.	<b>Total</b>	<b>\$ 253,575</b>

**Option 3**

	<b>Item</b>	<b>Cost</b>
1.	Re-build balconies with new solid stucco-clad guard walls on the outside face.	\$ 220,000
2.	Structural Contingency (15%)	\$ 33,000
3.	Subtotal	\$ 253,000
4.	GST	\$ 12,650
5.	<b>Total</b>	<b>\$ 265,650</b>

### Parking Garage

Typically, leaks into parking garages occur through cracks in the walls, wall/slab cold joints, cracks in the structural slab, and at pipe penetrations. Ten active leaks were observed during our investigation. These leaks are located under the parkade ramp and believed to be associated with isolated failure of the existing waterproofing membrane under the landscaping, patios, etc. around the building.

The efflorescence indicates that the water has time to absorb lime and salts from the concrete, so that this is a relatively slow process of seepage rather than flow through some cracks. The effect of constant, slow seepage of water through the reinforced concrete slab depends on the protection of the reinforcing steel and the chemical components in the water. It takes continual water seepage to dissolve the chemicals in the concrete and reduce the alkalinity to the point where steel corrosion will begin. Chemicals in the water such as salt or fertilizers may speed up this process. However, there are instances of buildings in the Lower Mainland having leaking ceiling slabs for many years with minimal corrosion of reinforcing steel. If the water seepage is minimized or stopped, the period before structural damage starts would be much extended.

The most effective long term solution for parking garage leakage problems is to renew the waterproofing membrane. However, as this membrane is located under the landscaping, it is a costly repair (approximately \$35-\$40 per sf) and we will try to defer this expense as long as it is prudent and practical to do so. Based on our rough take-off, the approximate area of membrane replacement @ \$40/sf with a contingency (12%) would be approximately \$375,000 - \$400,000.

In the meantime, MVL recommends the Strata consider completing crack repairs to the active leaks. Although this repair method is considered temporary compared to the option of replacing the entire waterproofing membrane, completing crack repairs will help prevent further deterioration of the parking garage concrete slabs and walls. Using a product such as Kryton system reacts with the water to form crystals, which chemically combine and grow within the concrete and seal the water passages. It does not rely on mechanical bond and is not as quickly affected by continuing water pressure. In our opinion, it is a worthwhile option to attempt this type of repair and monitor the results over this coming fall.

Based on the active leaks observed, MVL recommends that the Strata budget \$3,000 to complete the crack repairs. After the repairs are completed with this product, it may necessary for the Contractor to return to re-address some of the sealed cracks and/or address additional leaks which may have occurred as a result of the initial repairs (eg. leakage that forms from another crack).

The following table is a summary of the recommended maintenance & repair costs (excluding GST):

<b>Item</b>	<b>Cost of repairs (excluding GST)</b>
<b>Patios (Units 103/104 and 104/105) - Replace concrete planters with concrete topping</b>	\$ 2,600
<b>Balconies – Option 1</b>	\$ 264,500
<b>Balconies – Option 2</b>	\$ 241,500
<b>Balconies – Option 3</b>	\$ 253,000
<b>Parking Garage – Crack repairs</b>	\$ 3,000

We trust that this report is satisfactory and look forward in assisting you to complete the required work. If you have any questions please do not hesitate to call the undersigned.

**McARTHUR VANTELL LIMITED**

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**Ikjot Minhas, A.Sc.T.**  
Building Technologist

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**Art McArthur, P.Eng**  
Principal