Chateau Comox

Memo

To: ALL OWNERS

From: Kevin Wice, Strata Council President

CC: Brian Slater, Property Manager

Date: November 28, 2007

Re: SERIOUS WATER INGRESS PROBLEM

I am writing on behalf of the Strata Council to update everyone regarding the serious water ingress problem we are having with our building.

As many of you will know we have been having some serious water ingress problems with our building for sometime now, in particular suites, 601, 701, 801, and 802. Based on the advice of several contractors / consultants over the years, many inexpensive options have been tried, including an immense amount of caulking and sealants, and even weep hole covering.

None of these past actions have worked, and the water ingress problems seem to be getting worse. Several water ingress / building specialists, such as Canada Waterproofing, Cornerstone Inspections, and Adair Building Maintenance, have strongly suggested that our problem is larger than can be address by a "quick fix" solution. All of them recommended that we seek out the advice of an engineering company that specializes in building envelopes.

To that end, we hired Spratt Emanuel Engineering Ltd. to do a thorough review and investigation into our Building Envelope Leak problem. Their report and recommendations are attached for your review, and as you can see, those specialists were right: The problem is quite serious and must be addressed immediately.

We will be having Mark Emanuel, one of the Spratt Emanuel Engineering partners, come to our Special General Meeting in a few weeks. He will be available then for further discussion and specific questions any of you may have. We would like to hire Spratt Emanuel to begin the process of detailing the specifications and design of the building envelope repairs, the contract management, bidding tender process, and quality assurance. Council will be seeking your approval to do this.

We are looking to start this process as quickly as possible, to keep costs down and prevent any further deterioration from happening. It goes without saying that our homes are huge investments for all of us, and we need to keep up with the maintenance to protect our investments. This water ingress problem affects us all, and must be properly addressed and permanently fixed.

Best Regards,

Kevin Wice
Strata Council President
Strata.President@krw.ca

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Our File No.: S07-262
8 November 2007

Southview Property Management
110 - 7580 River Road
Richmond, B.C. V6X 1X6
(Fax: 604-270-8811)
(Email: brianslater@telus.net)

Attention: Mr. Brian Slater

Dear Sir:

Re: Strata Plan LMS 280 - "Chateau Comox" 1272 Comox Street, Vancouver, B.C. – Building Envelope Leak Investigation

1 SCOPE OF WORK

1.1 Spratt Emanuel Engineering Ltd. (SEE) was retained to conduct a leak investigation at the residential property located at 1272 Comox Street, Vancouver. B.C.

1.2 Mr. Clifford Sutton of SEE attended the site on 5 November 2007 to review the affected suites with the Strata President, and again on 6 November 2007 with Mr. Richard Osborne of SEE under cloudy skies with an ambient temperature of approximately 9°C to perform an exterior review via bosun chair. This report should be read in conjunction with the attached colour photographs, taken during these reviews.

1.3 The leak investigation undertaken was a visual, unobtrusive inspection of the interior and exterior components related to the areas affected by moisture infiltration. 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.

1.4 Spratt Emanuel Engineering Ltd. prepared this report to the account of Southview Property Management. The material in it reflects the best judgement 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, excepting the owners of Strata Plan LMS 280. 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.

1.5 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 analyse the design of the building or its components and no detailed zoning or Building Code review has been conducted.

2 GENERAL DESCRIPTION

Building Address	1272 Comox Street, Vancouver, B.C.
Owner	Strata Plan LMS 280
Building Type	Concrete Mid Rise
Principal Occupancy	Strata-titled condominiums
Other Occupancy	None
Date of Construction	Approximately 1993
Applicable Building Codes	Vancouver Building Bylaw, 6134
Type of Construction	Non-combustible caste-in-place concrete
Sprinklered	Yes
Lot Size	Approximately 100'x120'
Window Type	Double glazed, Aluminium framed
Window Colour	White
Number of Storeys	Eight
Number of Suites	21
Parking	2-level underground

2.1 The property located at 1272 Comox Street, Vancouver, B.C. is an eight-storey, high rise concrete building with approximately 21 residential suites. The building is constructed with poured concrete foundations and floor slabs; the walls are a combination of poured concrete sections and steel-stud infill sections.

2.2 Portions of the building constructed with steel-stud infill walls were re-clad with new rainscreen stucco in response to previous leaks. The rainscreen portions are predominately on the east and west elevations. The wall area behind the flagpole on the centre of the north elevation is constructed with a double steel-stud wall, and it was reportedly not included in the re-cladding work.

2.3 The interior review included an inspection of water infiltration in suites 601, 701, 801, and 802. The '01 suites are aligned on the north elevation, and substantial moisture ingress has been reported at the large windows just east of the flagpole on levels six and seven. Observations made during the interior review of each suite are contained below.

2.4 Double-glazed, non-thermally-broken, aluminium-framed window units are installed throughout the building. The window units are installed upon a poured concrete upstand curb or a punch window opening. Windows are original to the building construction.

2.5 Photographs taken by the owners of suites 601 and 701 depicting the active water infiltration have been included as **Appendices A & B**.

3 OBSERVATIONS

3.1 Suite 701

3.1.1 The leak investigation began in this unit where water accumulation was visible in the sill collection track of the window directly east of centre on the north elevation. Long-term moisture damage was visible on the wooden window sill which appeared swollen with delaminating paint **(Photos No. 5 - 7)**. The owner reported that previously the exterior caulking has been renewed around the window frame, caulking was applied to the joint between the glazing and the

glazing stops on the exterior, and the exterior weep holes were closed with tape. Exterior observation by bosun chair (see below) confirms this report.

3.1.2 Standing water was also observed in the sill collection track of the north-facing punch window unit in the eastern bedroom. Both the external weep holes and the internal weep holes have been closed with tape. On the awning-style opening lite of this window, the glazing tape is in a deteriorated condition such that the glazing is slightly loose in the frame. From the interior the window sill flashing appears back-sloped towards the building **(Photos No. 8 - 10)**.

3.1.3 Photographs provided by the owner, and attached as **Appendix A**, depict the interior of the wall assembly directly behind the flagpole on the north elevation. The construction as a double steel-stud wall is visible in the photos, along with extensive rust on the studs and mould on the back of the gypsum board.

3.2 **Suite 601**

3.2.1 Examination of the large window assembly just east of the centre flagpole in this suite again revealed moisture in the window sill track and damage to the wooden window sill. Photographs provided by the owner depict moisture infiltration during recent renovations, and they are attached as **Appendix B**.

3.3 **Suite 801**

3.3.1 The same window as the two previous suites is similarly affected with accumulation of moisture in the window sill track.

3.3.2 The owner described previous moisture ingress through the swing doors in the northeast corner bedroom. Crack repair (by routing and caulking) was completed on the concrete wall adjacent to the north-facing swing door, and no further moisture ingress has been reported **(Photo No. 11)**. There was no active moisture ingress at the east-facing door during this review, but the owner's description of moisture accumulation on the door sill suggests water entry through the door unit **(Photos No. 12 & 13)**.

3.4 **Suite 802**

3.4.1 Moisture accumulation in the window sill track and associated damage on the wooden window sill were reviewed on the south-facing window, east of the building centre. This window is essentially identical to the problematic window examined in the three suites on the north elevation.

3.4.2 The owner also reported moisture damage to the wood floor in the bedroom on the west elevation of the suite. Buckling of the floor boards and bubbling of the coating were noted adjacent to the east wall of the room, which adjoins the elevator shaft and the washroom **(Photos No. 14 & 15)**.

3.4.3 On the east and west corners of the south elevation, there is water damage on the concrete overhangs above the balconies. The west balcony overhang is marked by salt deposits accumulating on the concrete surface adjacent to the drip **(Photo No. 16)**. On the east balcony the concrete damage is above the

overhang and marked by salt deposits and rust stains emanating from a crack that runs horizontally from the horizontal reveal at the joint between the roof slab and the parapet wall upstand **(Photos No. 17 & 18)**.

3.5 Bosun Chair Drop #1

3.5.1 Drop #1 was performed on the centre of the north elevation, directly east of the flagpole **(Photo No. 1)**.

3.5.2 Sections of parging have delaminated from the concrete parapet walls at the roof level **(Photos No. 19 & 20)**.

3.5.3 At the eighth storey window unit, the sealants applied between the window frame and the cladding have been renewed and appear to be in good condition. The sealants are properly applied and demonstrate good adhesion. At the corner of the window, the sealant is thickly applied to cover a large joint between the window and the stucco, and possibly to cover the flat, horizontal section at this joint **(Photos No. 21 & 22)**. The window frame is aged and showing signs of deterioration with discolouration and opening joints between the aluminium pieces. Weep holes on this window have not be closed with tape.

3.5.4 The seventh storey window unit is in similar deteriorating condition with a newer sealant application around the perimeter of the frame. Weep holes on this window have been covered with tape, and sealant has been applied around each glazing unit at the joint between the glass and the glazing stop **(Photos No. 3 - 28)**.

3.5.5 The sixth storey window unit has also been re-sealed around the perimeter joint with the cladding, and the weep holes have been blocked with tape **(Photo No. 29)**.

3.5.6 On the windows below the sixth storey to the west of the flagpole, and all the windows to the east of the flag pole, there has been no remedial sealant application at the perimeter of the windows. There are large, open joints on the window sills between the aluminium frame and the concrete upstand where staining and organic growth is accumulating **(Photos No. 30 - 34)**. The window weep holes have not been taped on the windows west of the flagpole, nor on the windows below the fifth floor. The one exception is the second floor where a small aluminium channel has been caulked to the window frame to cover the weep hole **(Photo No. 35)**.

3.5.7 At the steel stud wall in the centre of the elevation, the flagpole mounting plates are fastened to the concrete slab edge. The infill wall construction extends from the jamb of each concrete window upstand and between each floor slab. On the top three storeys where sealant has been reapplied around the window frames, the same sealant has been applied to the horizontal reveal aligned with the window head and around each flagpole mounting plate **(Photos No. 36 - 40)**.

3.5.8 On the fourth storey window, movement of the glazing is evident by displacement of the glazing tape on the interior of the window **(Photo No. 41)**.

3.6 Bosun Chair Drop #2

3.6.1 Drop #2 was performed on the northeast corner of the building along the line of punch windows and adjacent to the balcony edge **(Photo No. 2)**.

3.6.2 The north-facing punch windows are in a deteriorated condition with large, open joints in the frame members. Organic growth is present on the window frames, indicating that they are retaining moisture. Sealant has been applied to the joint between the glazing and the glazing stops on the lites of the seventh storey window unit **(Photos No. 42 - 46)**. On this same window, the glazing tape and weatherstripping have deteriorated to the point that the glazing of the awning-style opener is loose in the frame.

3.6.3 Metal window sill flashing is demonstrating a visible back-slope toward the building on the punch windows of this elevations. Remedial sealant application has been attempted on several window sills, likely in an attempt to prevent ponded water from infiltrating the window assembly **(Photos No. 47 - 52)**. On most of the windows of this elevation, the weep holes have been closed with tape.

3.6.4 At least two failed sealed units were noted on the punch windows of this elevation **(Photos No. 53 & 54)**.

3.7 Roof

3.7.1 The roof assembly on this building consists of a waterproof membrane applied to the concrete slab, approximately 1.5" of XPS insulation, filter cloth, and gravel ballast. Digging through the gravel to inspect the membrane was futile in the wet conditions on the day of review **(Photo No. 55)**.

3.7.2 There is a large amount of organic growth on the roof surface, including moss and many small weeds **(Photos No. 56 - 59)**.

3.7.3 Guardrails installed along the pedestrian walkway on the roof have been mounted through the roof membrane into the concrete slab **(Photos No. 60 & 61)**. The exact method of installation was not available for review, but the bolt fasteners can be felt extending from the roof membrane.

3.7.4 Sealants applied around the base of the vent stack are demonstrating adhesive failure where the cast iron pipe exits the sleeve **(Photos No. 62 & 63)**.

3.7.5 There is a capped gas line running adjacent to the skylight on the south side of the roof area that is heavily rusted and beginning to deteriorate **(Photos No. 64 & 65)**.

3.7.6 The small sloped roof areas with semi-circular landings on the east and west sides of the roof are retaining large volumes of water **(Photo No. 66)**.

3.7.7 Heavy staining is noted on the parapet walls at the roof level, and also on the walls of the elevator machine roof, directly below the standing seam connections for the cap flashing pieces **(Photos No. 67 & 68)**.

3.7.8 Evidence of moisture infiltration was noted at the stairwell landing on the roof level. On the exterior side there is a saddle connection between the parapet wall and the stairwell wall where the cap flashing is poorly sealed to the concrete wall **(Photos No. 69 - 72)**.

3.7.9 In the same stairwell, there is evidence of moisture infiltration at the glass block windows on the east wall at the roof level **(Photo No. 73)**.

3.7.10 On the roof of the elevator machine room there is thick organic growth that nearly obscures the stone ballast **(Photos No. 74 & 75)**.

3.7.11 The walls of the elevator machine room appear to have been coated with an elastomeric paint and sealing tape along the concrete joints **(Photo No. 76)**.

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 **The water accumulation in the sill collection tracks of the window units of Suites 601, 701, 801, and 802 is attributable to moisture infiltration through the aluminium window frame.**

4.1.1 There are only two possible sources for this moisture: condensation on the window frame (which is intended to be collected in the sill track), and water infiltration through the window frame. **The volume of water observed and reported by the owners is too large to be generated by condensation and is certainly caused by rain water.**

4.1.2 The deteriorated state of the aluminium window frames renders them vulnerable to moisture infiltration. Large gaps were observed in the frame members and at the opening lites. The aluminium frame relies upon small joint sealant to prevent water entry through the butt joints and mitre joints; it is likely that these sealant joints (which are otherwise difficult to manufacture) have failed.

4.1.3 Water entry through the window units is limited to the upper storeys where the windows are buffeted by the highest force of wind driven rain. It would appear that the windows are in sufficiently good condition to resist the lessened environmental forces at the lower levels.

4.1.4 Closing the weep holes on the exterior of the windows has likely exacerbated the water accumulation. Normally these weep holes would provide a drainage path for water that enters the window frame; with these holes closed, the water is directed out the weep holes on the interior of the window sill track. Closing the weep holes on the interior of the window may limit the amount of moisture draining along that path; however, if both the interior and exterior weep holes are closed, the moisture trapped in the window frame must find an exit path.

4.1.5 Back-sloped flashing on the punch windows in the rainscreen stucco elevations is also likely contributing to the moisture accumulation in the window track. Evidence of ponded water on the flashing surface indicates that moisture is held against the joint with the window frame.

4.1.6 Unsuccessful attempts to seal the exterior of the windows have focused on the joints between the glazing and the frame, and the joints between the frame and adjacent cladding. SEE does not recommend continuing to address this problem with sealant application; to effectively prevent moisture migration through these window frames, every joint on the interior and exterior of the window would require careful attention.

4.1.7 SEE recommends that the only effective way of resolving this water ingress problem is replacement of the leaking window units; the existing units are clearly not of sufficient quality, or else not in suitable condition, to resist the environmental forces. Window replacement should include: the large picture windows on both sides of the flagpole on the north elevation; the entire line of punch window units along the northeast corner; and the east window on the south elevation of the eighth storey. Additional benefit would accrue by replacement of these windows due to:

i) Increased energy efficiency resulting from thermally broken frames and Low E glass. Capital cost recovery by reduced heating bills.

ii) Higher water penetration resistance ratings.

iii) New frames and window seals would eliminate the need for replacement at 25 year estimated design life.

iv) New windows would have a 10-year warranty.

4.2 Moisture migration observed by the owners along the base of the walls is likely originating from the window units. Water accumulation that overflows the sill track will immediately drain to the base of the walls and then migrate laterally along the sill track.

4.2.1 A thorough visual examination of the cladding elevation behind the flagpole revealed no obvious point of water entry. The flagpole mounting plates are adequately sealed on the upper floors, and sealants in the joint between the steel stud infill walls and the adjacent concrete walls and floors appear to be good condition.

4.2.2 This wall elevation appears to constructed with two rows of steel stud framing and an exterior-grade gypsum board (based upon the owners' photographs), and it is clear from the lack of through-wall flashings and other details that the cladding is not installed with a rainscreen cavity.

4.2.3 Further (destructive) investigation would reveal the exact wall assembly. It is likely a stucco parging applied directly on the exterior-grade gypsum board. While no obvious points of water entry were located, this cladding system is extremely vulnerable to small cracks and discontinuities permitting moisture migration. The mould growth noted on the back of the exterior gypsum is likely deriving moisture through the wall coating.

4.2.4 SEE recommends that this wall section should be re-clad with rainscreen stucco, in conjunction with the window replacement. When removing and

reinstalling windows, it would be a sensible time to re-clad the wall section between the windows.

4.3 The roofing membrane in the protected assembly was mostly unavailable for review. In the areas where the gravel ballast and XPS insulation were dug away, by touch the membrane was determined to be a liquid applied product. With the protected membrane assembly, an approximate lifespan of 30 years would be anticipated. **While there were no serious defects noted in the roofing assembly, SEE makes the following recommendations for maintenance at the roof level:**

4.3.1 Organic growth should be regularly cleaned from the roof surface. Most of the material can be removed by raking the gravel, and a diluted bleach solution should be suitable for killing anything that remains.

4.3.2 The guardrails on the roof surface are mounted with bolts penetrating the roof membrane; dynamic forces on the guardrails pose a serious risk of creating discontinuities in the membrane at these locations. While SEE recommends replacing the guardrails, that work should be completed in conjunction with a re-roofing project. Until such time as re-roofing is necessary, the bolt penetrations should be caulked and regularly inspected.

4.3.3 Sealant application at the standing seam connections of the roof parapet cap flashing would alleviate the wall staining directly below. Normally the flashing directs water away from the wall surface, but at these connections moisture is bypassing the flashing and draining down the wall. Staining on the wall surface should come clean with a dilute solution of TSP and a soft bristle brush.

4.3.4 Sealant renewal should be completed around the vent penetrations at the roof level. Moisture that bypasses the waterproofing termination on the pipe is able to migrate along the pipe into the walls below.

4.3.5 Exposed gas lines on the roof level should be regularly inspected as rusting slowly deteriorated the metal. If the capped lines are not necessary, they should be removed. Waterproofing terminations on the gas pipe penetrations should also be renewed as the gas pipes pose the same risk of allowing moisture migration into the walls below.

4.3.6 Moisture observed in the stairwell at the roof level appears to originate from the concrete joint between the walls of the stairwell and the roof slab. Moisture appears to bypass the roofing membrane through the saddle connection with the parapet wall; renewing the sealant joint in the gum pocket of the cap flashing saddle and sealing the vertical concrete joint between the parapet and the stairwell wall down to the roof membrane, should alleviate the moisture migration.

4.3.7 Ponded water on the flat roofs at the base of the sloped sections on the east and west elevations does not appear to drain because the scupper is several inches above the roof surface. Additional drainage should be added in conjunction with a re-roofing project. Until such time, the locations should be monitored for water ingress and roofing repairs completed as-needed.

4.4 **Moisture damage to the wood floor in the bedroom of Suite 802** is difficult to pinpoint; the location is removed from the exterior wall of the room which would indicate that moisture migration through the wall is unlikely. The east bedroom wall adjoins both the elevator shaft and the en suite washroom. In the absence of visible roof leaks, the moisture source must be related to this wall. SEE suspects that water from the roof level is following a drain pipe (or sanitary vent, gas line, rainwater leader, etc.) that runs through the east wall of the bedroom and accumulating at the floor level. **Further investigation is recommended by removing drywall to determine which pipes are routed through this wall and investigate for moisture accumulation within the wall assembly.**

4.5 Elevations of concrete walls on the building rely upon the concrete itself and the paint coating to resist moisture migration; any cracks in the concrete that transmit through the paint pose a risk of permitting moisture in the wall assembly. Concrete crack repair is completed by routing the length of the crack to a depth of ¼" and tooling a smooth sealant bead along the routed channel. **For the water damage on the balcony overhangs on the east and west patios of Suite 802, SEE recommends repair of the concrete walls.**

4.5.1 On the east side, the crack is visibly weeping rust and efflorescent stains. In addition to routing and caulking the crack, sealant application should extend up the vertical corner joint to the flashing in order to close the path of moisture entry.

4.5.2 On the west side, there is no visible crack that is leading to efflorescent deposits on the balcony side; the cement plaster applied to the concrete walls is effective at concealing underlying cracks. Repair of the crack aligned with the door head is recommended, but the efflorescence may continue. Eventually the crack permitting moisture migration into concrete will evidence itself; SEE does not recommend removing the cement plaster in attempt to locate any cracks as these efflorescent deposits pose little risk at this time.

4.6 **Reported water entry at the patio swing door of Suite 801 was not observed during this review.** The first recommendation for resolving any issues with this door would be refurbishment of the weatherstripping. If moisture problems persist, SEE can perform an AAMA nozzle spray test in an attempt to isolate the location of the moisture infiltration.

5 Cost Estimates

5.1 Please refer to the following table for cost estimates associated with the repairs described above. All cost estimates are order of magnitude only as building dimensions have not been included with this review, and a detailed design has not been undertaken. Estimates are expressed in 2007 dollars and are intended to include contractor overhead and profit, 10% design contingency, plus professional services and permits. Differentiation between operating costs and capital improvements is attempted only to present a possible scenario for building maintenance. This assessment has not used GAAP or CCRA criteria in cost accounting or depreciation calculations. Interest costs, inflation, and tax implications have not been accounted for, and amortization expenses assume straight line depreciation over the indicated assembly life. In cases where recommended repair/replacement of the building systems can occur over several years, the assumed time interval is noted.

No.	Scope	Priority	Cost Estimate	Possible Categorization	Ammortization Period	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1	Window Replacement: North elevation picture windows, northeast corner punch windows, east window of suite 802	H	$250,000	Capital	50	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000
2	Stucco re-cladding for north elevation wall behind flagpole	H	$50,000	Capital	50	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
3	Sealant renewal: roof penetrations, roof guardrails, cap flashings	M	$1,500	Operating	-											
4	Concrete crack repair	M	$1,500	Operating	-											
5	Roof cleaning: organic surface growth and wall stains	L	$1,000	Operating	-											
	Subtotal :															
	High Priority Items	H	$300,000			$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000
	Medium Priority Items	M	$3,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Low Priority Items	L	$1,000			$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	TOTAL :		$304,000			$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000

5.2 Spratt Emanuel Engineering Ltd. offers the following recommended repair budget with description of relevant components for review by the owners:

5.2.1 **Wall Claddings:** All wall claddings behind the flag pole should be stripped and reinstated as rainscreen wall cladding systems, including rainscreen stucco complete with new flashings and wall penetration detail, and new north-facing window systems as described elsewhere in this report.

5.2.2 **Professional Errors and Omissions Liability Insurance:** SEE is actively involved in building science engineering as our primary activity. Members of this firm have been engaged in building envelope engineering in Vancouver since 1964. We are insured with Lloyd's of London to a maximum claim amount of $1 million dollars.

5.2.3 **City Building Permits:** Vancouver city building permits are typically assigned a value of zero dollars for the purpose of premature building envelope failure, as this project would easily be classified.

5.2.4 **Federal Goods and Services Tax (GST):** The Federal Government has, as of this date, refused any liability for the problem and has not extended any relief for the problem of premature building envelope failure in British Columbia. Therefore, the GST is fully payable at 6% of all project costs.

5.2.5 **Provincial Sales Tax Rebate:** A Provincial Sales Tax Rebate in the amount of 40% of hard construction costs multiplied by 7% may be available upon completion of the project.

5.2.6 **HPO Warranty Costs:** In accordance with provincial regulations, the owner must purchase an HPO warranty at an additional cost of up to approximately 8% of hard construction value.

5.2.7 **Construction Budget:** The following is an order of magnitude construction budget, rounded to the nearest $1,000. Exact pricing is subject to market conditions for labour and materials, as well as the final design configuration. Construction costs are rising in the order of 10% per annum and are projected to rise at 10%, 9% and 8% over the next three years according to a recent survey. We advise that if repairs are contemplated that quick action is required to secure a contractor at current pricing.

6 RECOMMENDED REPAIR BUDGET

Strata Plan LMS 280 – "Chateau Comox"
(Order of magnitude rounded to nearest $1,000)

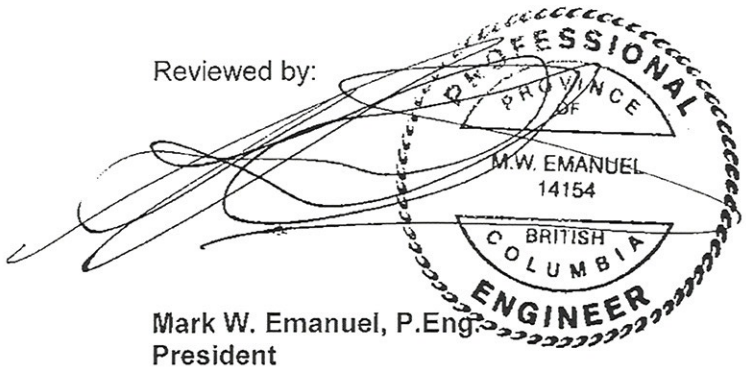
REPAIR BUDGET	COST
Building Recladding – full scale remediation to north elevation of building exterior walls and all features including new windows, new flashings, new rainscreen claddings and miscellaneous repairs.	$300,000
Sub-total A:	**$300,000**
Engineering Consultant: Building envelope engineering design, structural engineering, contract management, tender, quality assurance and coordinating professional services @ 15% of Sub-total A:	$45,000
Sub-total B:	**$345,000**
Plus GST @ 6% of Sub-total B	$21,000
HPO Door Fees 16 @ $25	$400
Warranty estimated @ 8% of Sub-total A	$24,000
City of Vancouver permit fees	$0
PST Rebate @ 40% of Sub-total A x 7%	($8,400)
TOTAL:	**$382,000**
RECOMMENDED BUDGET:	**$382,000**

Please do not hesitate to contact us if you have any questions regarding the content of this report.

Yours truly,
Spratt Emanuel Engineering Ltd.
Per:

Clifford Sutton, M.Eng., E.I.T.
Project Consultant

Reviewed by:



Mark W. Emanuel, P.Eng.
President

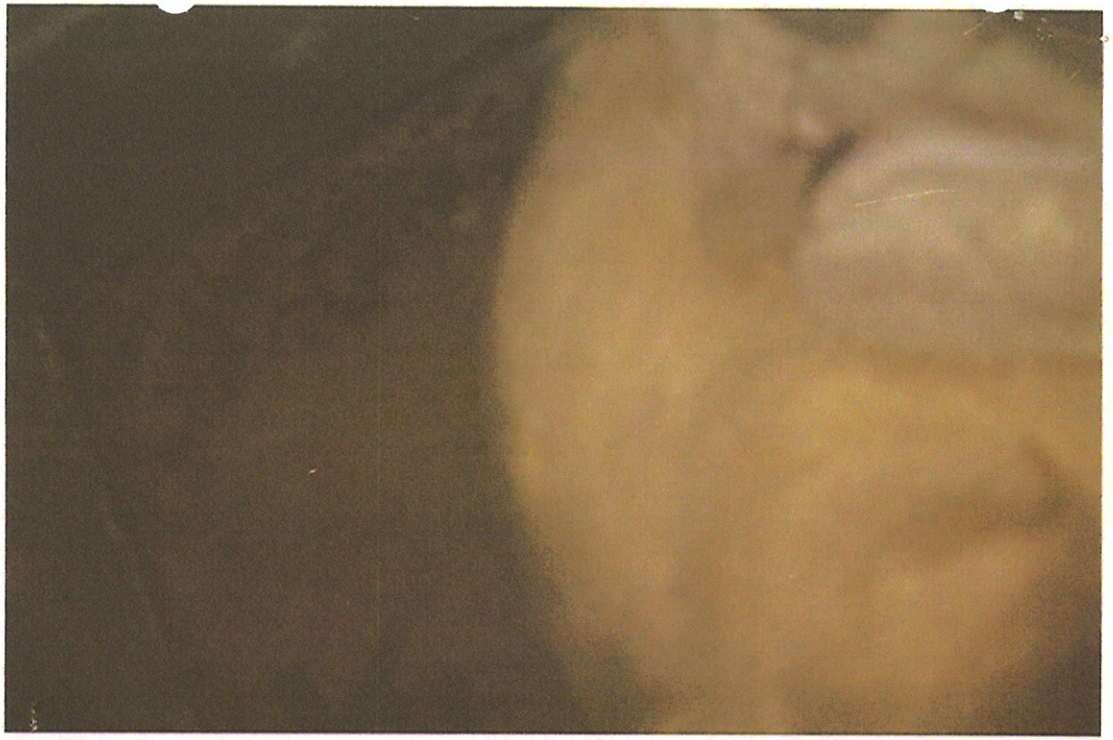
CS/cs/Encl.

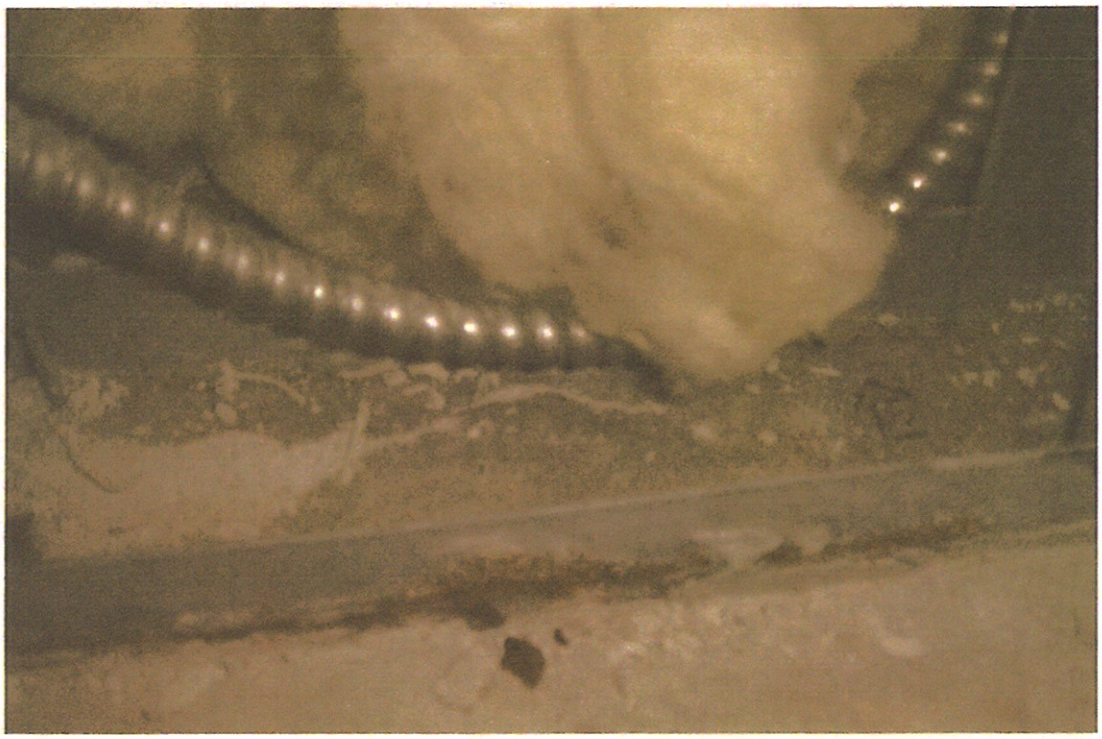
Cc: Kevin Wice, Strata President (Email: krw@krw.ca)

APPENDIX A

Photographs providing by the owner of Suite 701 depicting the interior wall assembly behind centre flagpole on the north elevation

Inside Wall Pics
of Suite #701
August 2007





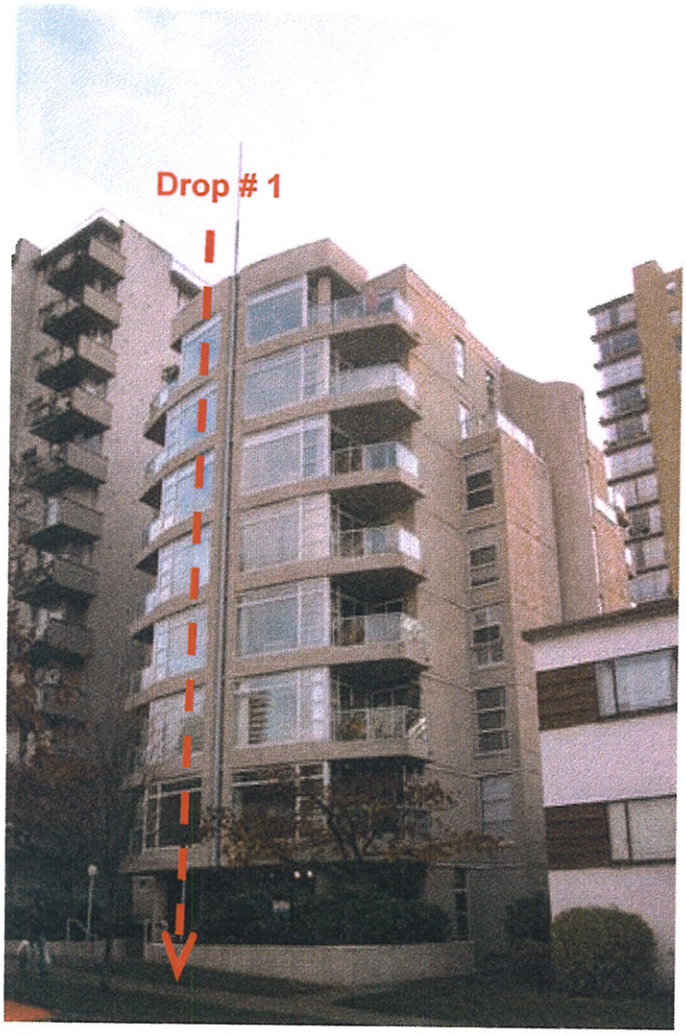
APPENDIX B

Photographs providing by the owner of Suite 601 water infiltration observing during renovations

Water Ingress – Suite 601

Our File No. S07-262

STRATA PLAN LMS 280 – CHATEAU COMOX, 1272 COMOX STREET, VANCOUVER, BC
PHOTOGRAPHS TAKEN BY CLIFFORD SUTTON, M.ENG. ON NOVEMBER 5 - 7, 2007



Photos No. 1 and 2

Our File No. S07-262

November 5-7, 2007

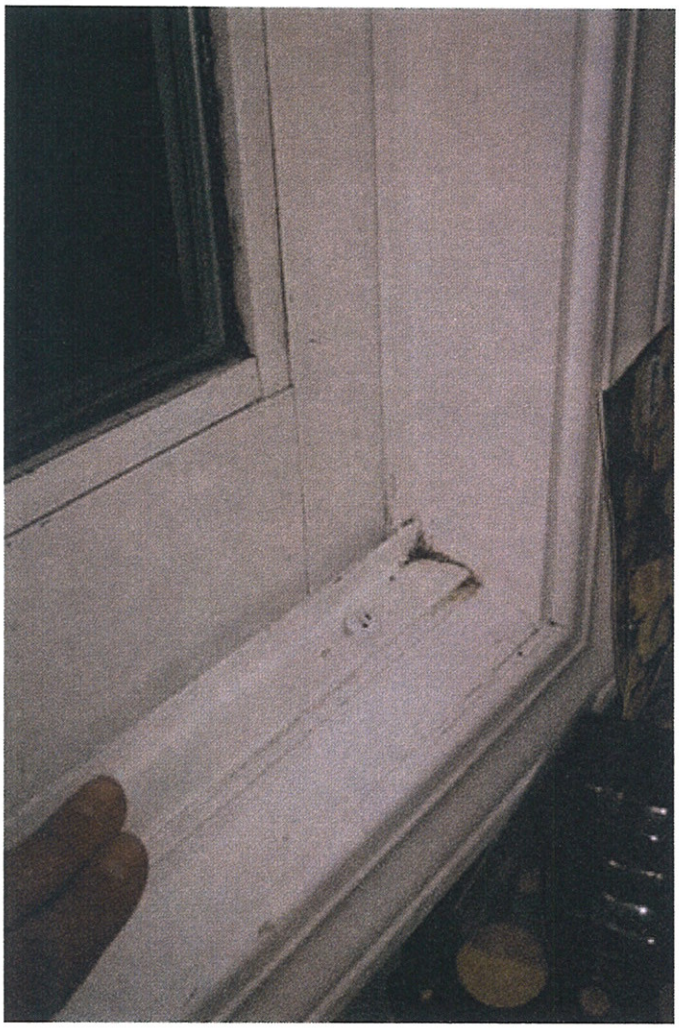
Photos No. 3 and 4

Photos No. 5 and 6

Photos No. 7 and 8

Photos No. 9 and 10

Photos No. 11 and 12



Photos No. 13 and 14

Our File No. S07-262

November 5-7, 2007

Photos No. 15 and 16

Photos No. 17 and 18

Photos No. 19 and 20

Our File No. S07-262

November 5-7, 2007

Photos No. 21 and 22

Photos No. 23 and 24

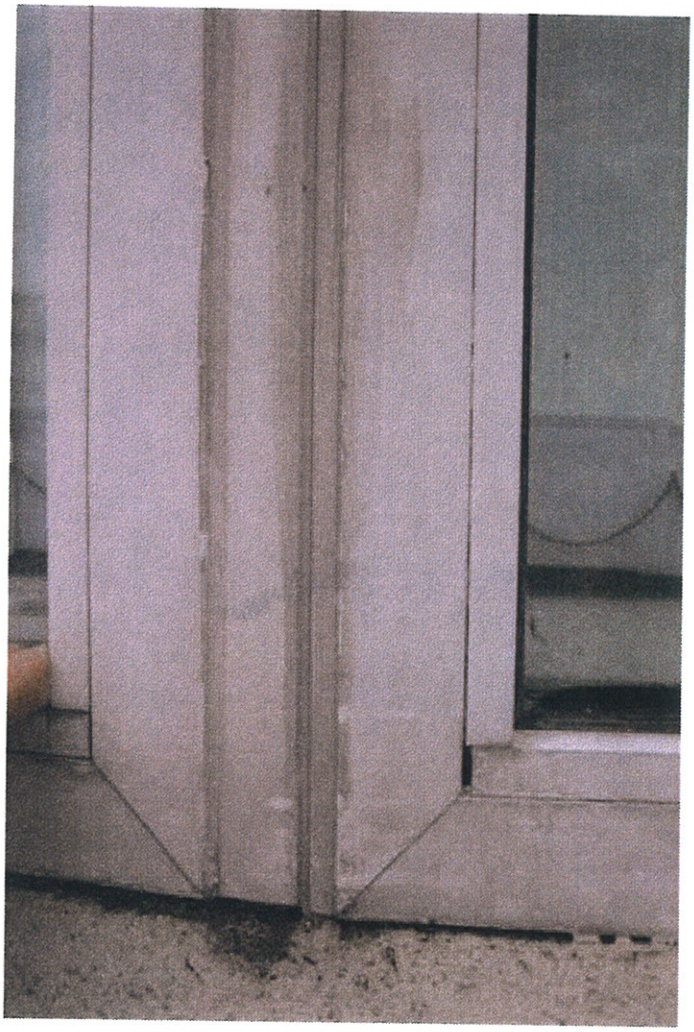
Our File No. S07-262

November 5-7, 2007

Photos No. 25 and 26

Photos No. 27 and 28

Photos No. 29 and 30



Photos No. 31 and 32

Photos No. 33 and 34

Photos No. 35 and 36

Photos No. 37 and 38

Our File No. S07-262

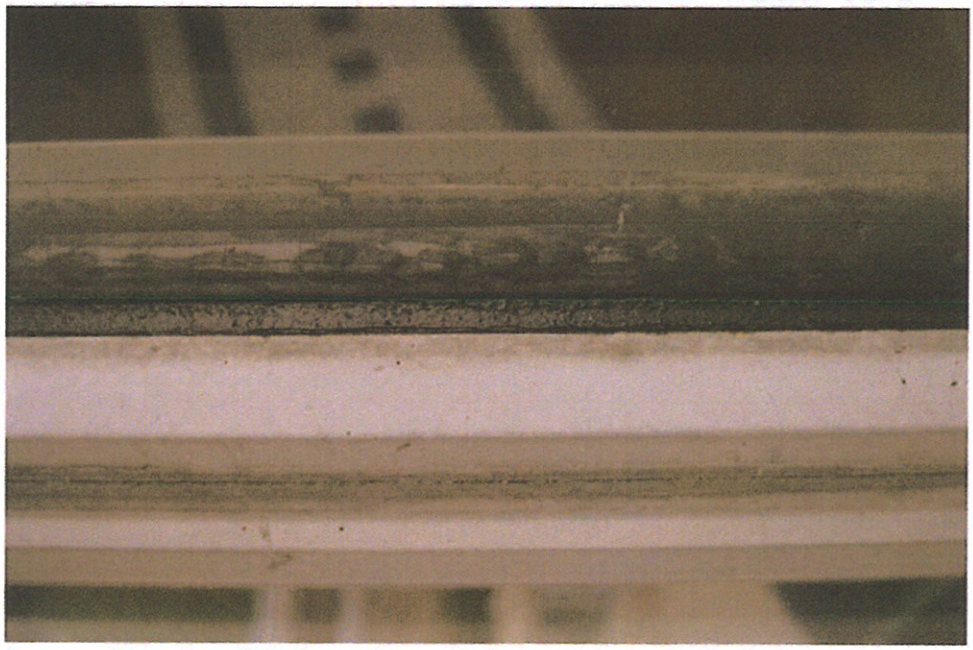
November 5-7, 2007

Photos No. 39 and 40

Photos No. 41 and 42

Photos No. 43 and 44

Photos No. 45 and 46



Photos No. 47 and 48

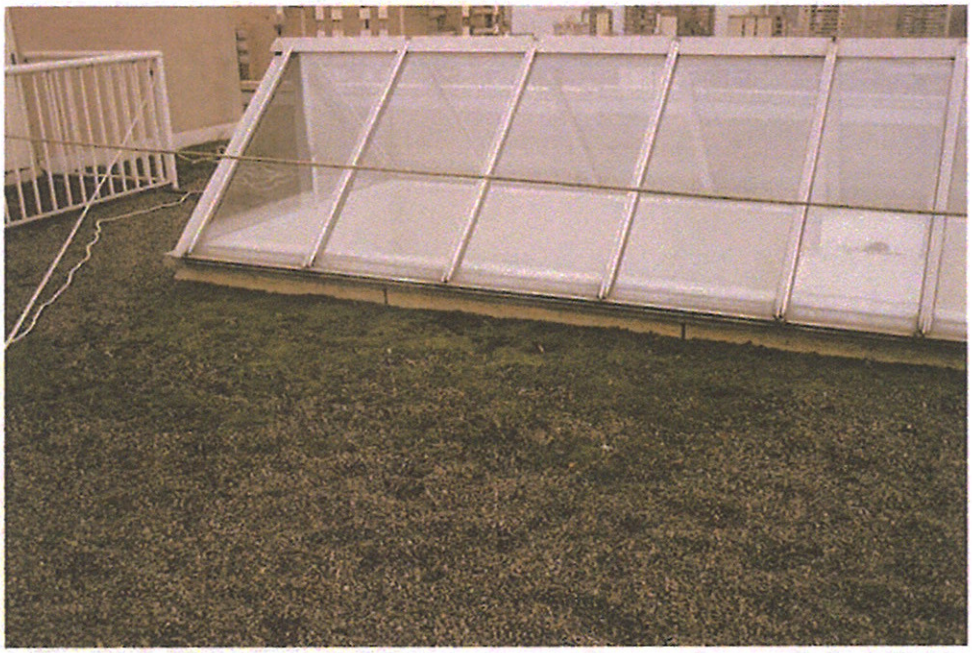
Photos No. 49 and 50

Photos No. 51 and 52

Photos No. 53 and 54

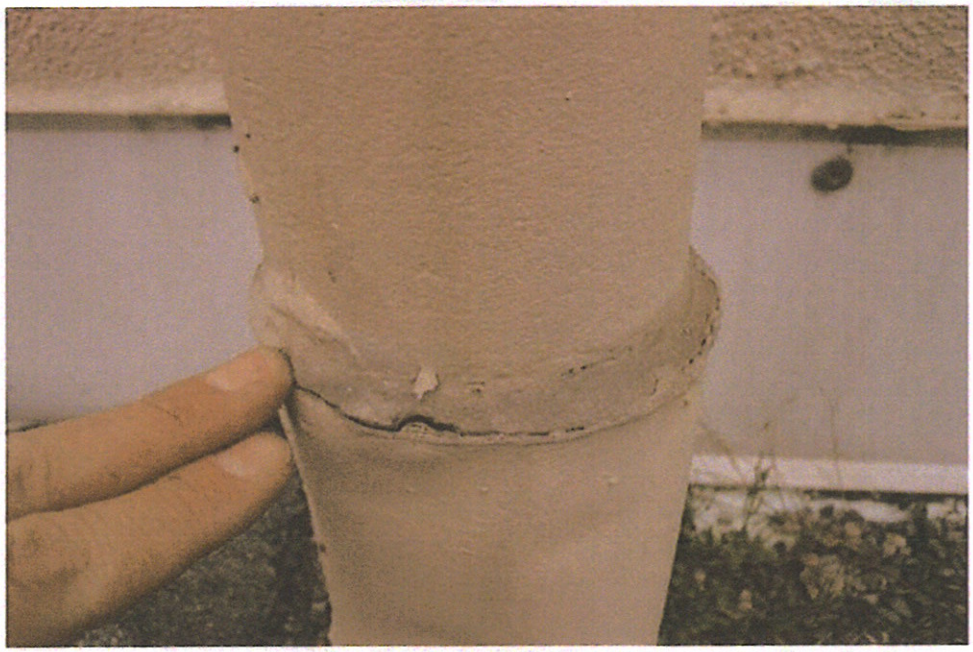
Photos No. 55 and 56

Photos No. 57 and 58



Photos No. 59 and 60

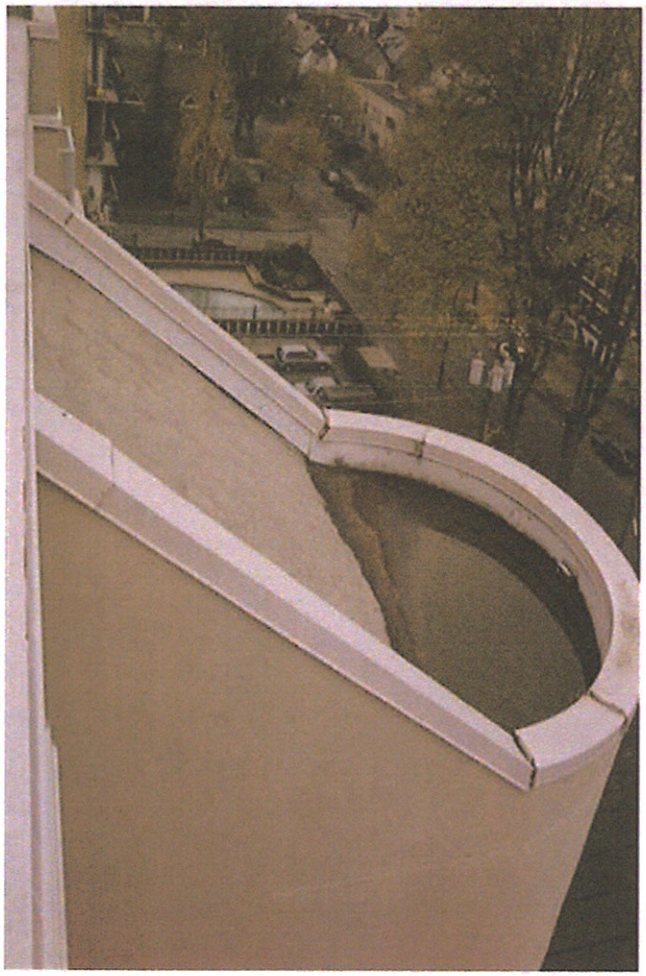
Photos No. 61 and 62



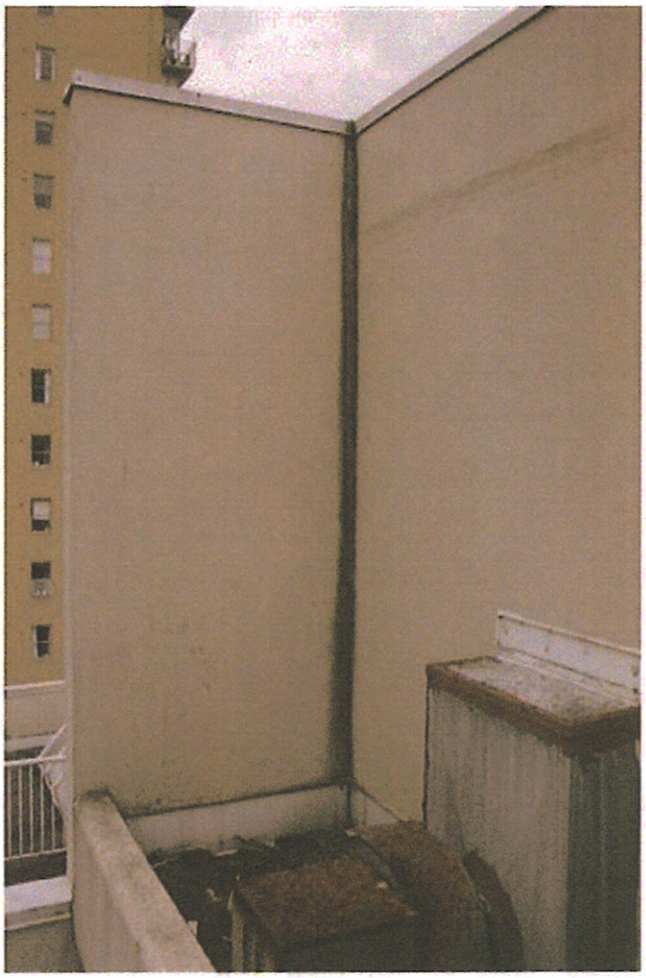
Photos No. 63 and 64

Our File No. S07-262

November 5-7, 2007



Photos No. 65 and 66



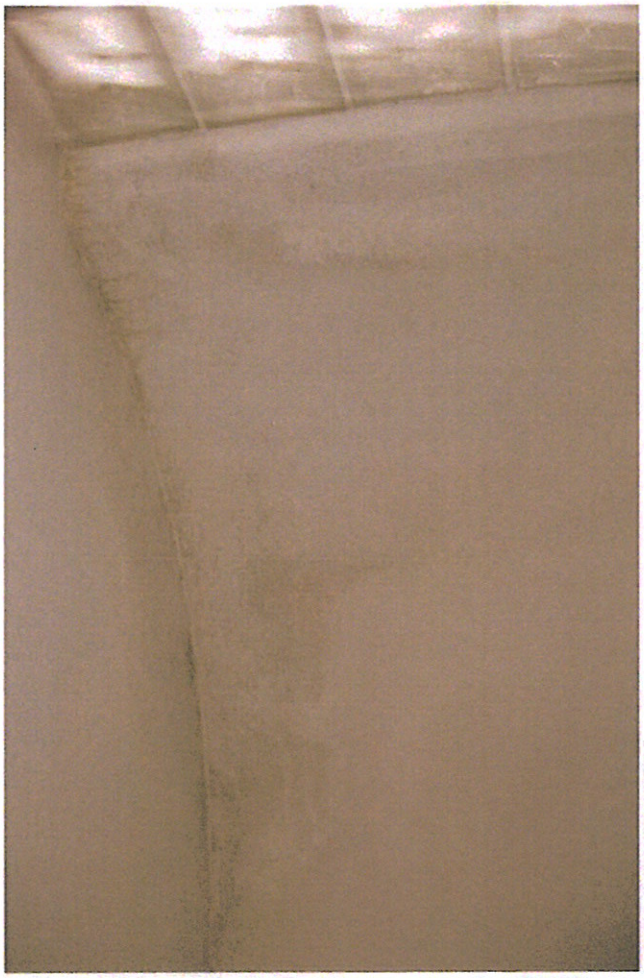
Photos No. 67 and 68

Photos No. 69 and 70

Photos No. 71 and 72

Our File No. S07-262

November 5-7, 2007



Photos No. 73 and 74

Our File No. S07-262

November 5-7, 2007

Photos No. 75 and 76

File# 358

ADAIR

PROPERTY MAINTENANCE

Est. 1979

FAXED 3 PAGES

July 17, 2007

TO/ BRIAN SLATER

To: Strata LMS280
1272 Comox St,
Vancouver, BC

c/o Southview Property Management
Attention: Brian Slater

Chateau Comox
1272 Comox St.
Vancouver, BC

Water Ingress Evaluation
Suite # 601, # 701, # 801

On Site: July 14th, 2007.

Weather: Sunny

Building Description: 8 Storey concrete hi-rise, approximately 20 years old.

Complaints:

- Long term leaks reported # 601, # 701 bedroom window / floor areas. Also centre area between living room windows in both suites.
- # 801 – Water leak reported under laminate flooring at deck door area.

Visual Observations:

- # 601 and # 701 windows are not performing as per design? I.e. drainage, failed glazing units etc.
- Window factory drainage provisions sealed with tape on interior condensate track.
- Back-sloped exterior metal sills on both levels.

- # 801 south side door area (moisture tested – flooring dry).
- Roof vent stack above suite is loose.
- Gum edge roof flashing caulking failure visible.
- Concrete curb walls beneath living room windows appear to be in good condition and not a cause of a leak source.
- Saw cut / gum edge visible at front transition from concrete to steel stud.

Recommendations:

- # 601 , # 701 living room leaks – requires window / frame upgrade or Re & re windows to install proper back flashing / peel & stick and proper window cavity drainage provision.
- # 601, # 701 Bedroom windows. Apparently these windows were removed 9 years ago to accommodate the retro fitted rain-screen. Window detailing plans may be available.
- Water test window detailing # 601, # 701 (same day) to ascertain sill detailing possible failures and/or isolate window framing member suspected.
- A typical window i.e. # 701 bedroom may have to be dismantled to determine failure component.
- A short term solution may be to silicone caulk entire glass to frame etc. but is not recommended.
- 8th floor ceiling stain (leak) appears from a metal conduit located above on elevator roof. Check roof penetration area and reseal as required.
- # 801 – Leak is suspected from a lead vent pipe roof leak (loose) located directly above deck door. Re-patch roof membrane pipe penetration. Re-caulk gum edge flashing (failed) at same area.
- # 601, # 701 – Mould / rust may also be present in the steel stud double wallboard located between the living room windows. Remove / upgrade as required.

- Due to the severity of the water ingress it is recommended strata engage services of city approved building envelope engineers to complete entire process required.
- Best overall solution would be to upgrade the windows to a higher performance rated window cladding.

Completed by: Kevin Adair
Adair Property Maintenance
July 17th 2007

KA/nr

E.O.E.

Schedule C

Cornerstone

BUILDING INSPECTIONS AND CONSULTING SERVICES

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North Vancouver, B.C. V7L 3K5
email: cornerstoneinsp@hotmail.com
www.bcbuildinginspections.ca

Office: 604 986-6658
Mobile: 604 618-6870
Fax: 604 986-8820

March 25, 2007

Kevin Wice
701 – 1272 Comox St.
Vancouver, B.C. V6E 1K7

Via email: kwice@xynyth.com

Dear Kevin:

Re: Inspection conducted at #701 – 1272 Comox St., Vancouver, B.C.

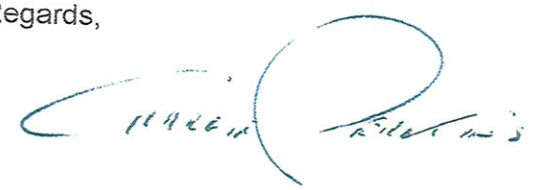
As per your request, an inspection was completed at the above–referenced address on February 17, 2007, at 2:00 P.M. The nature of the inspection was to determine the physical and mechanical condition of Unit #701, prior to purchasing. In general, our on-site report was relatively favourable other than stated on Page 9 (windows) and Page 2 (#8 of our Final Notes). Our comments related to the excessive water ingress, which is occurring through the living room window assembly. We are of the understanding that you took possession of the unit on March 1, 2007. Since possession, you state that the water ingress has increased considerably due to the heavy March rains.

During our inspection the inspector lifted the carpet directly below the windows and noted excessive water infiltration on the concrete floor surfaces and carpet tack. Water accumulations within the bottom condensation track of the windows was also exceptional. We expressed to you that the lower weep holes positioned in the condensation track are designed to allow water to bleed through the lower window assembly to the exterior of the building, and should never be restricted. The placed duct tape over the weep holes is contributing to the general deficiencies.

It is our professional opinion that the entire window assembly and installation is in question. The building envelope can best be described as a face-sealed system (no provision for a drained, vented cavity). The face-sealed system changed to a rain-screened system in 1999-2000. Numerous, similar buildings throughout the Lower Mainland are experiencing water ingress relating to failed window assemblies. We strongly advise there is no quick fix solution. Strata Council should seriously consider engaging the services of an engineering company who specializes in potential failed window and wall assemblies in high-rise buildings.

Past history has proven to our company that water ingress issues within wall and window assemblies should be addressed as soon as possible. Spiraling labour and material costs suggest a 25% increase per annum and can be anticipated if Strata Council procrastinates. Should your Strata Council President wish to contact us, I can be reached directly on my mobile phone at 604 618-6870. For the record, please keep us informed of ongoing events as it is our duty to document and keep files on your behalf for a period of 12 months.

Regards,



Charlie Perkins, CPI
Certified Property Inspector

CP/bms