

Thomas

Bradley :

Project

Management

Ltd.

#45 15959 82 Avenue, Surrey, B.C. V3S 8X4

Date

11-Sep

Inspection Report
Vintage Eastside
688 East 16th Avenue

Roof Inspection:

Design:

Generally this roof system was well designed. There is good slope to most drains. All equipment sleepers are suitably framed and electrical and plumbing penetrations are well executed. Perimeter flashings are of an industry standard with standing seams.

Roof Membrane:

The roof sections are roofed with a 2-ply Modified Bitumen Type Membrane System. Generally the workmanship was good. All membranes are fully fused and all manufacturers recommended practices have been observed. This membrane should provide 15+ years of reliability with regular inspections and minor maintenance.

Deficiencies:

- 1.0 The roof drains are sumped (lowered) , this is good practice as it helps with the drainage of heavy rainfall much better if the leaf guard gets clogged. (see Photo)
- 2.0 Some of the overflow spouts are set high, in the event of a blocked roof drain the volume of water would be huge before the overflow drains became useful.
Ensure roof drains are kept free of obstruction.
- 3.0 Roof Mechanical room contains some cardboard boxes, this area should be kept free of flammable materials.
- 4.0. The lower parkade level electrical room contains misc. items.
This is area must be kept free of any materials not related to power supply.
The materials need to be removed as they could pose an obstruction in an emergency.

5.0 First floor hallway shows repair work going on. This needs to be completed.

6.0 The landscaping shrubs should be kept away from the siding. Yearly pruning should keep them in check. Large vines and shrubs have been known to damage siding if closeby.

Metal Flashing

Perimeter flashings are of a suitable gauge and workmanship was good. Joints were constructed with a standing seam, and mechanical attachment was adequate to prevent wind damage.

Building Exterior:

The exterior siding is well designed giving the building a good exterior shield from the elements. The siding will need staining every 3 to 5 years to keep it intact. Some locations are missing siding. See Photos. Some locations show cracked siding this should eventually be replaced or repaired. Over all the rain screen system has been used in this building giving the building a second line of defense even with siding missing.

Water Proof Membrane Concrete Slabs

The waterproof membrane is holding out well and should provide good service for several years. This membrane is a two phase coating consisting of a base coat and protective top coat.

Recommendations:

- 1 regular maintenance of flashing and caulking locations should be checked yearly.
- 2 no storage of items in electrical or mechanical rooms.

For further clarification contact: Thomas Bradley Project Management Ltd. At 604-597-6872.

Carrie Mak

From: "Tom Cop" <thomas_bradley@telus.net>
 To: "KK Yuen (CML)" <cmlmanagement@hotmail.com>
 Sent: 2002年12月3日 下午 06:59
 Subject: RE: Vintage quotation

Thomas
Bradley
Project
Management Ltd.

→ #45 15959 82 Avenue, Surrey, B.C. V3S 8X4

Date	Dec 2, 200
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Quote No. 316
 Vintage
 Eastside
 688 East 16th Avenue

Quote for following work

The following is an outline of work that should be completed in order:

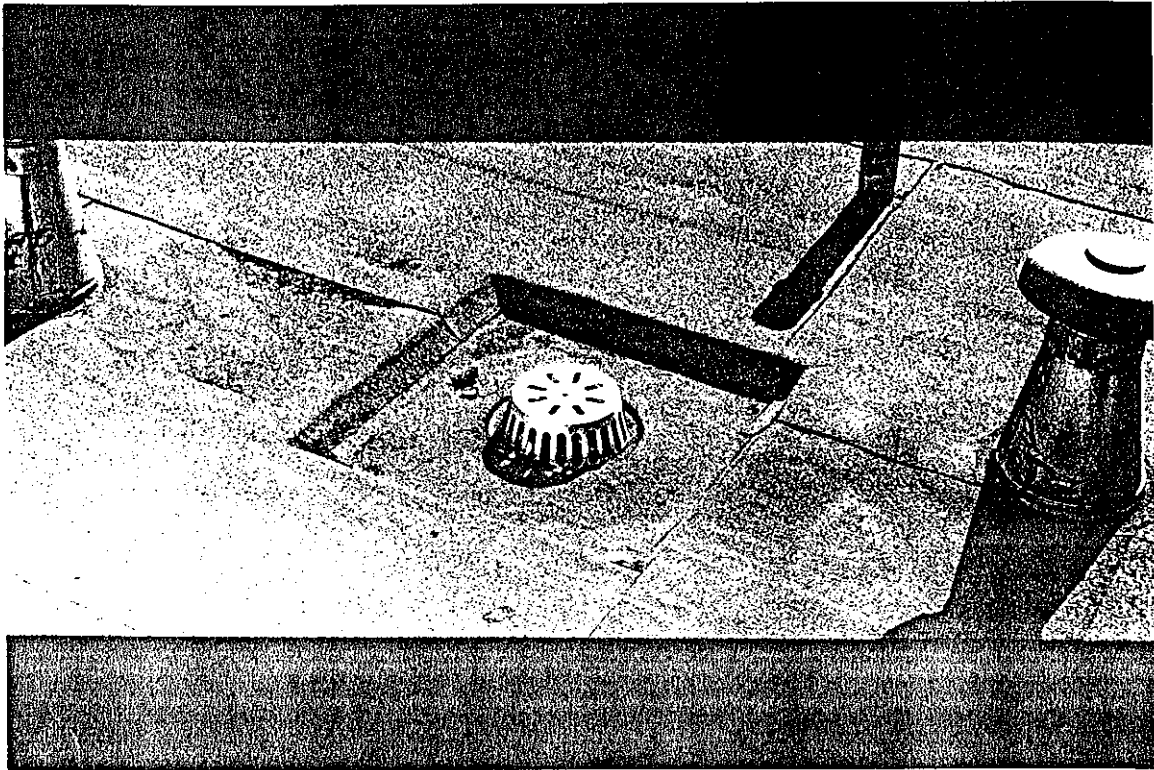
- | | | |
|----|--|--------------------|
| 1) | repair to missing siding in walls near hose bibs | \$ 500.00 |
| 2) | replacement of cracked siding pieces at rear of building | \$ 1,500.00 |
| 3) | monthly inspection of roof drains | should be d |
| 4) | trimming of shrubs away from walls at rear of building | ? \$ 500.00 (done) |
| 5) | recaulk seams and joints every 2-5 years on roof and around windows
some caulking will last longer and this is just a guideline | \$ 3,800.00 |

Gst extra

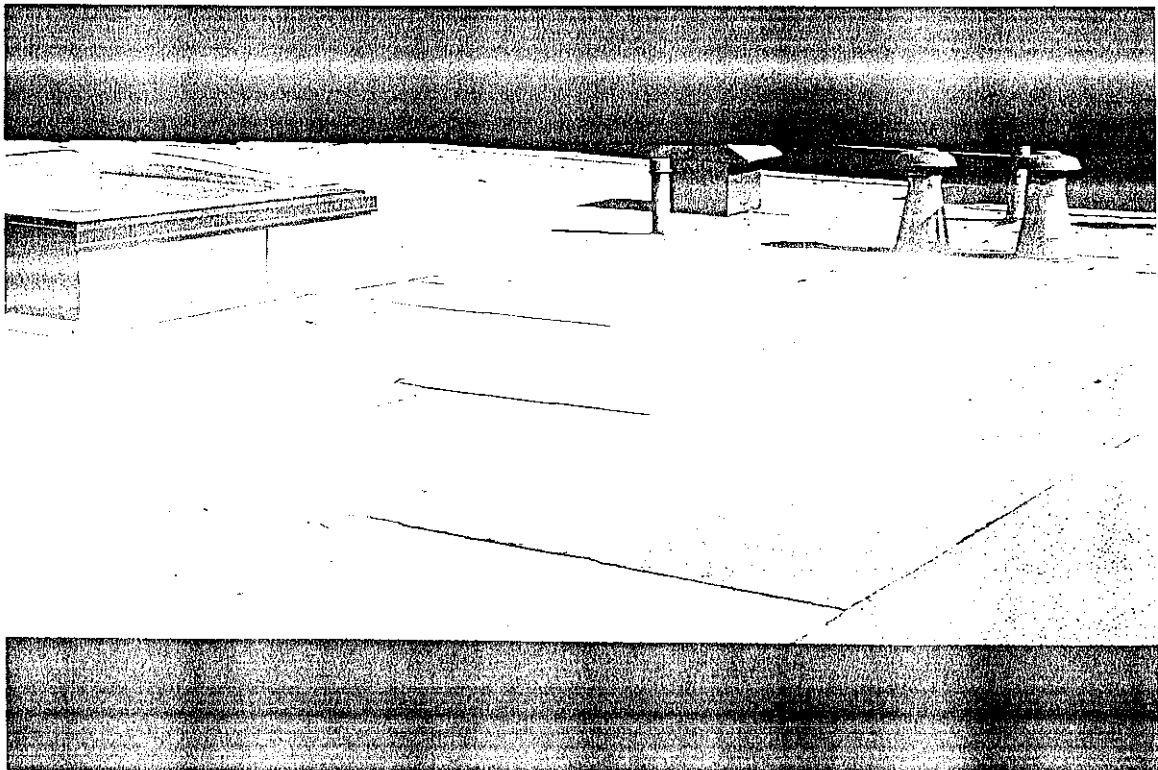
Thank You for this Bid Opportunity

Thomas Bradley Project Management
 #45 15959 82
 avenue

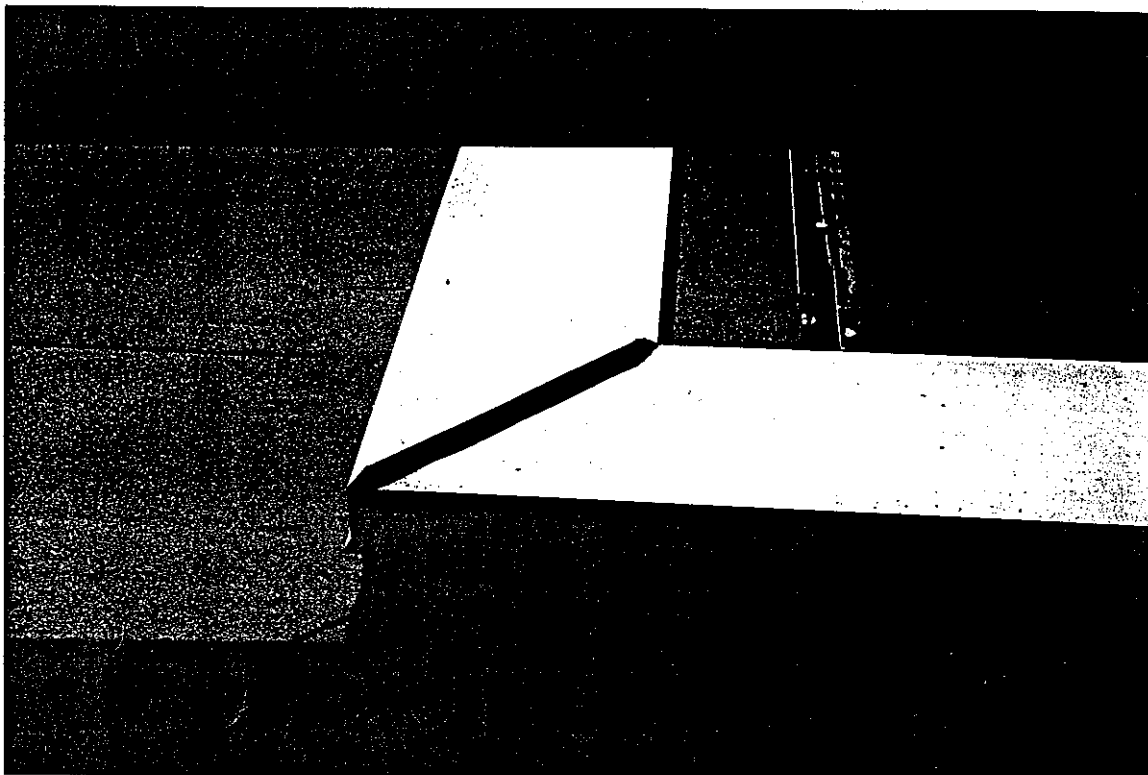
Surrey, B.C. V3S 8X4
 Phone/Fax: 597-6872
 Pager: 641-7601



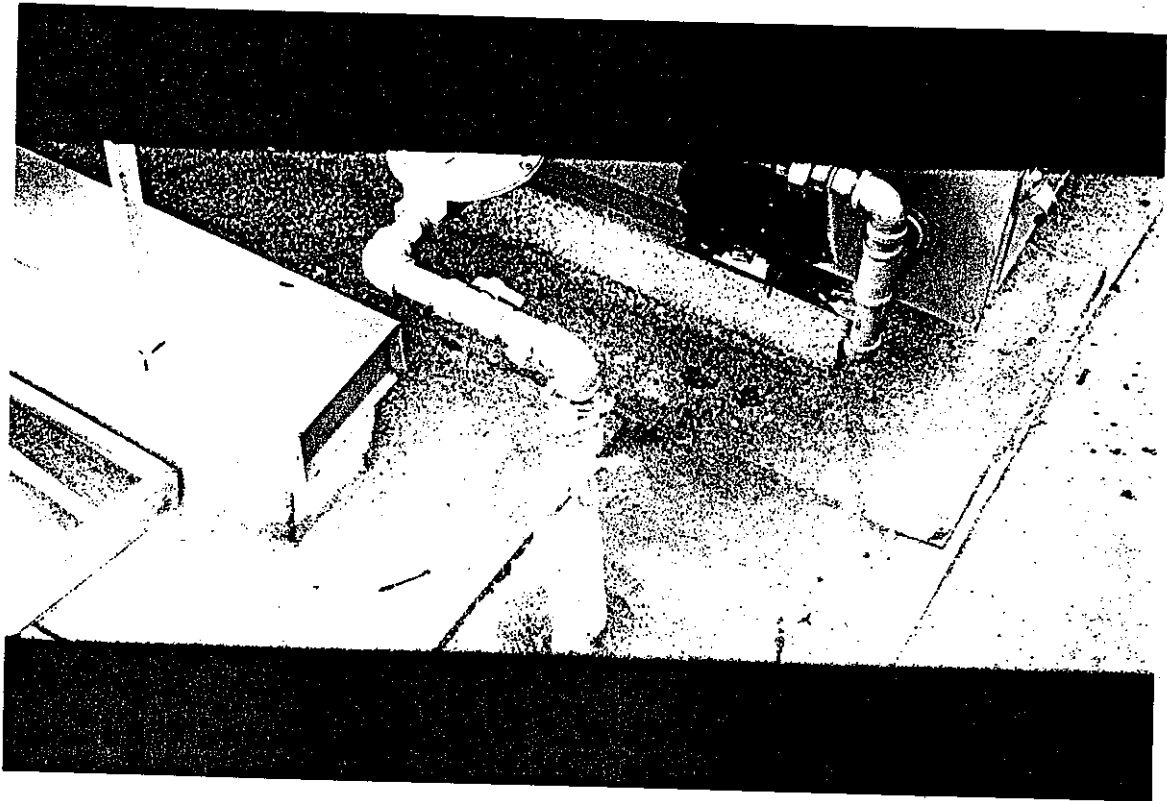
GOOD DETAIL



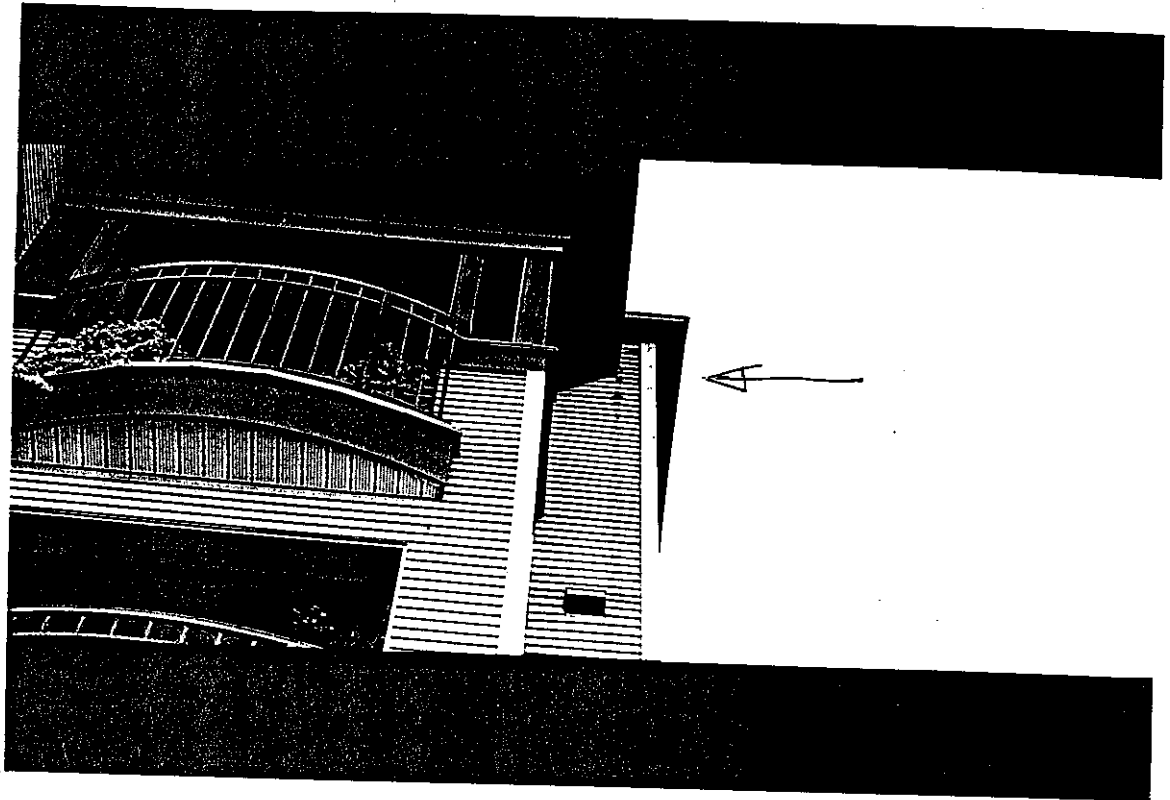
ROOF MEMBRANE - GOOD DETAIL



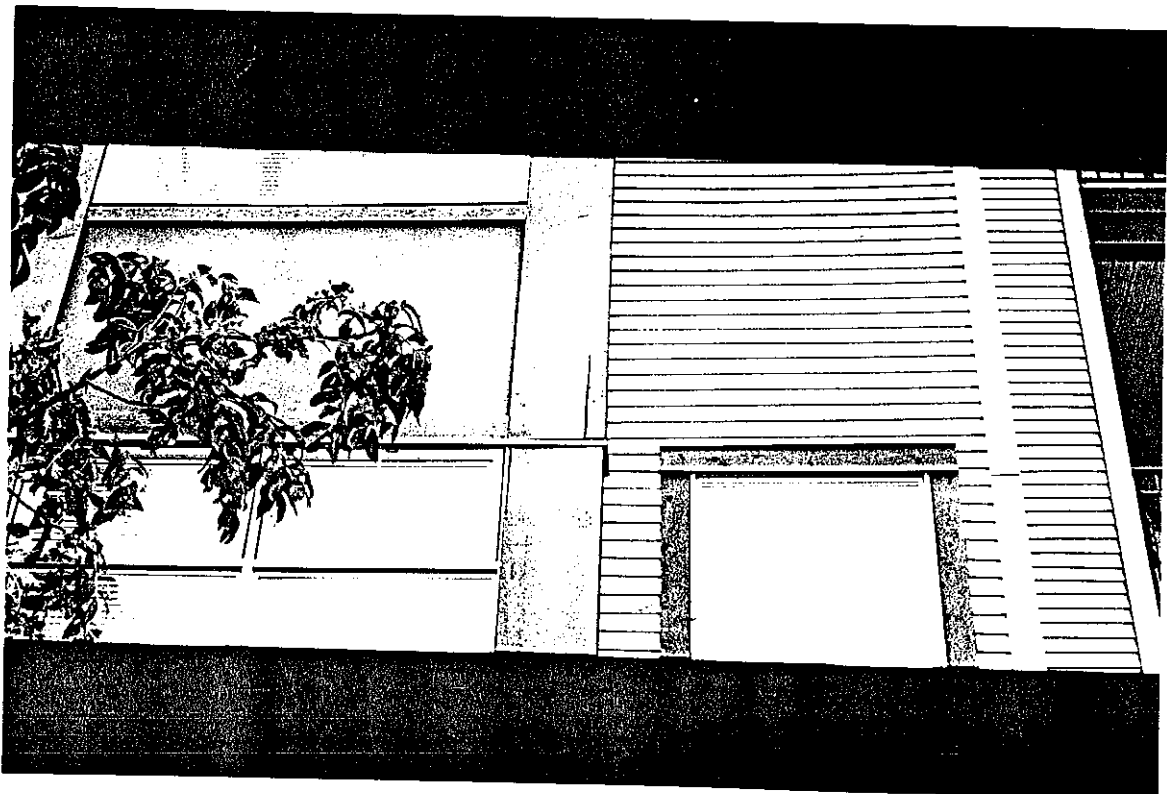
STANDING SEAM — GOOD



NEED CAULKING

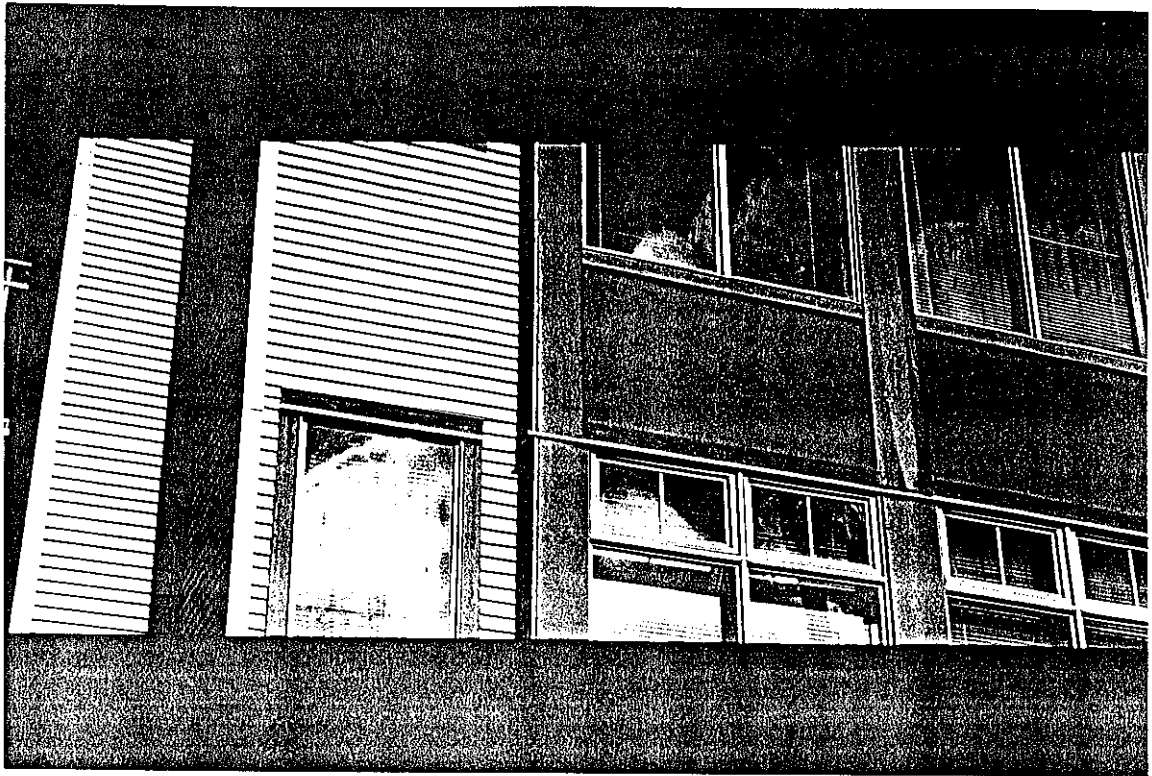


GUTTER OVERFLOW — STAINING



SIDING CRACKS

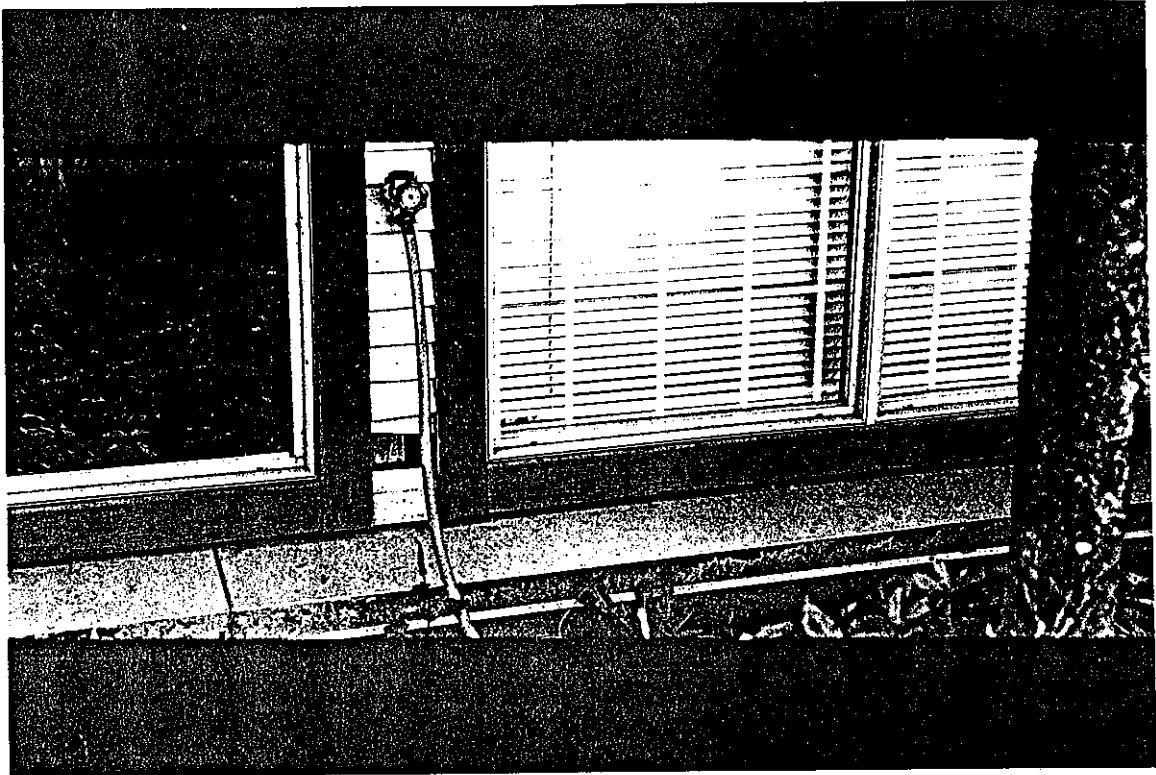
WILL BE FINISHED IN MAY/4
(BY CAROL CONSTRUCTION)



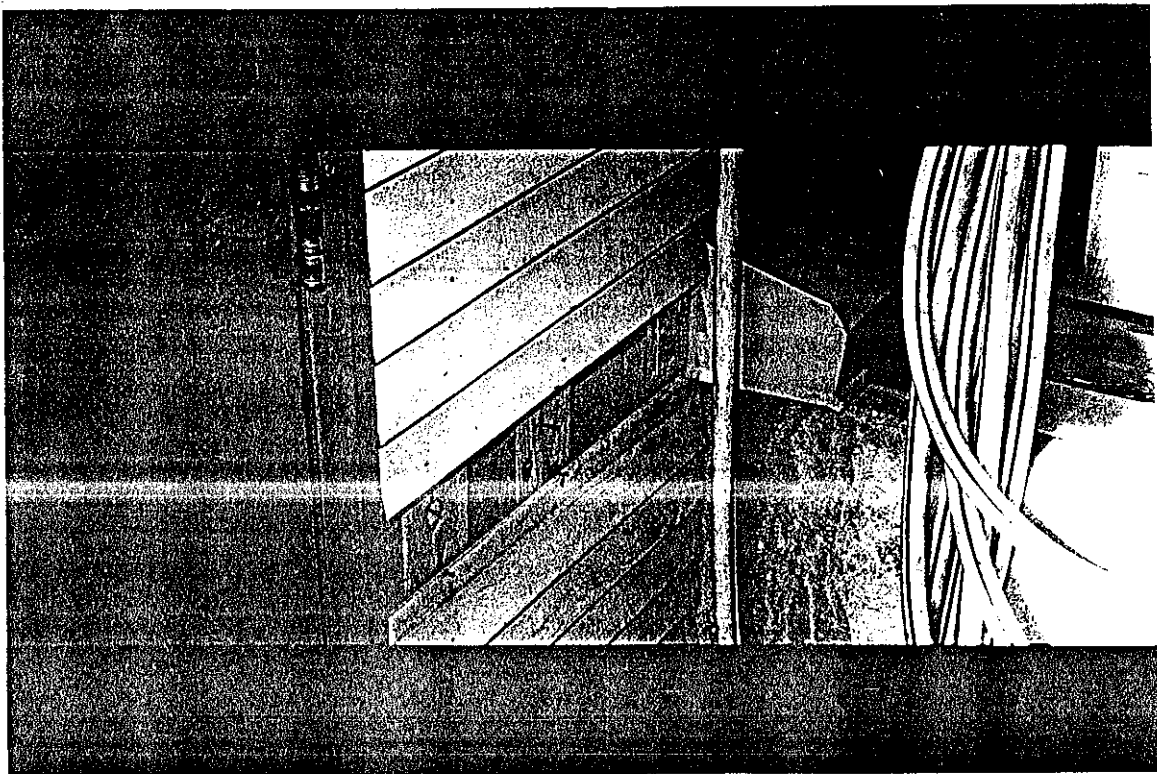
SIDING GAP



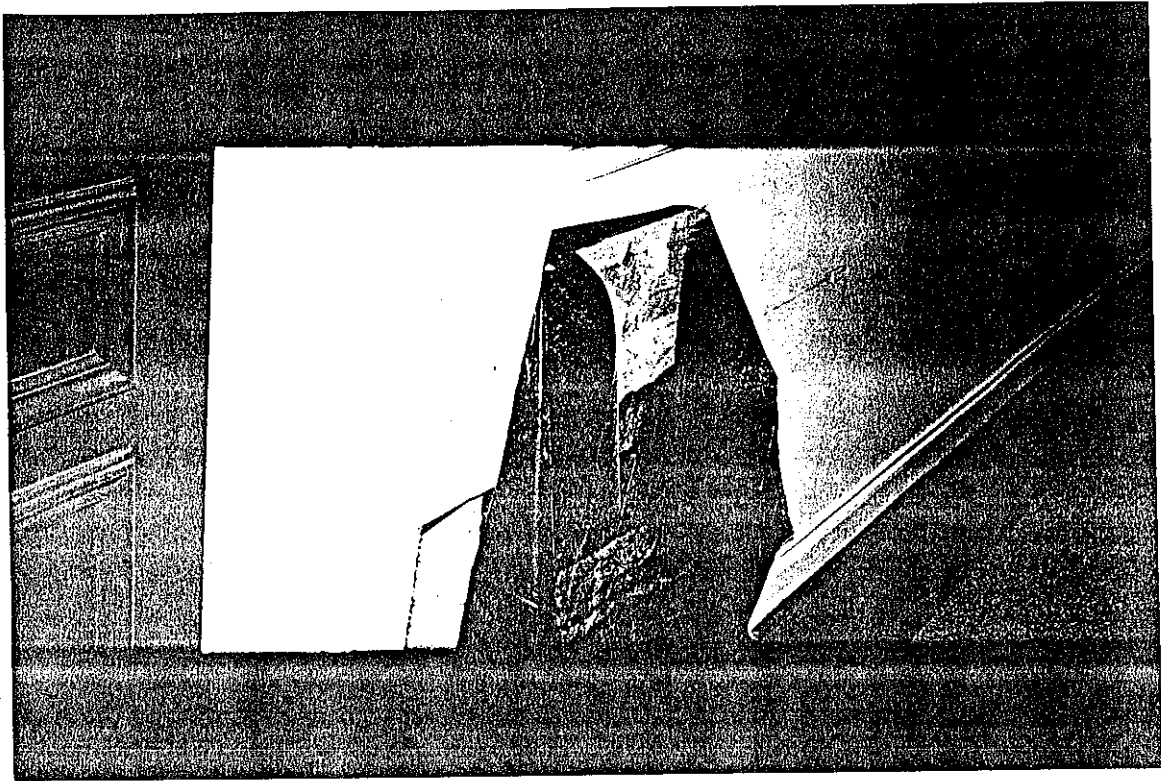
MINOR CRACKS IN TRIM



MISSING SIDING

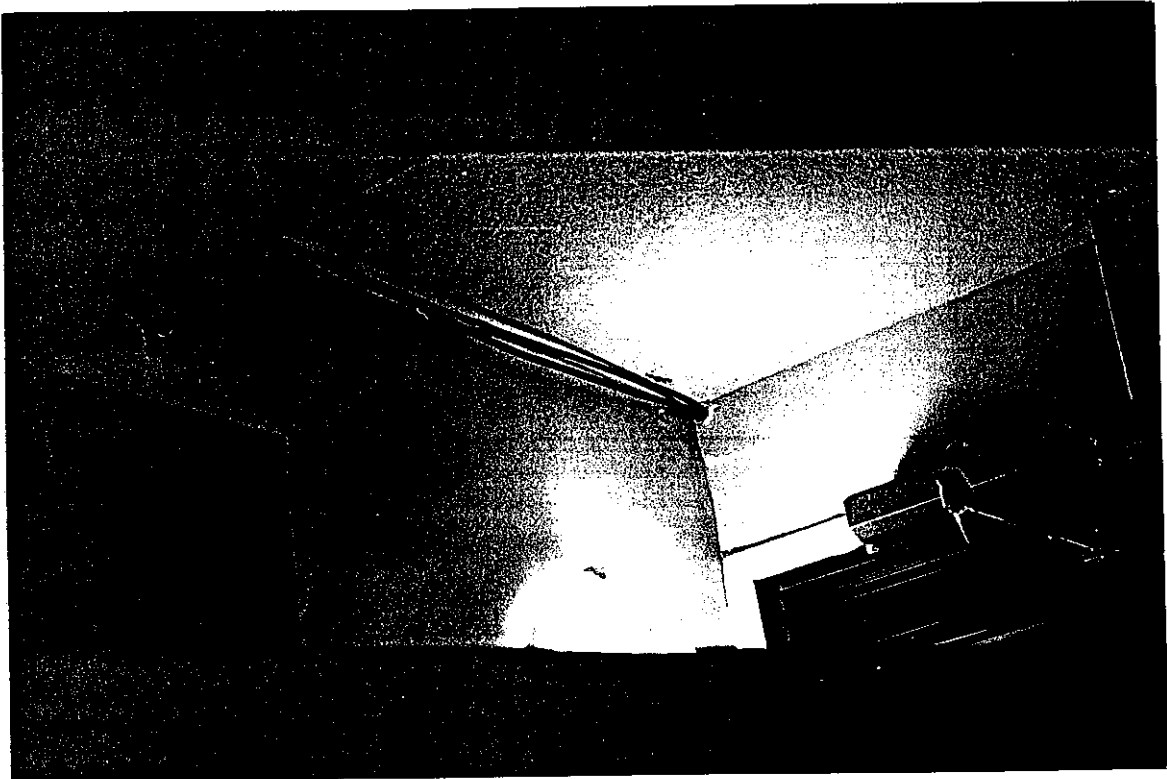


MISSING SIDING

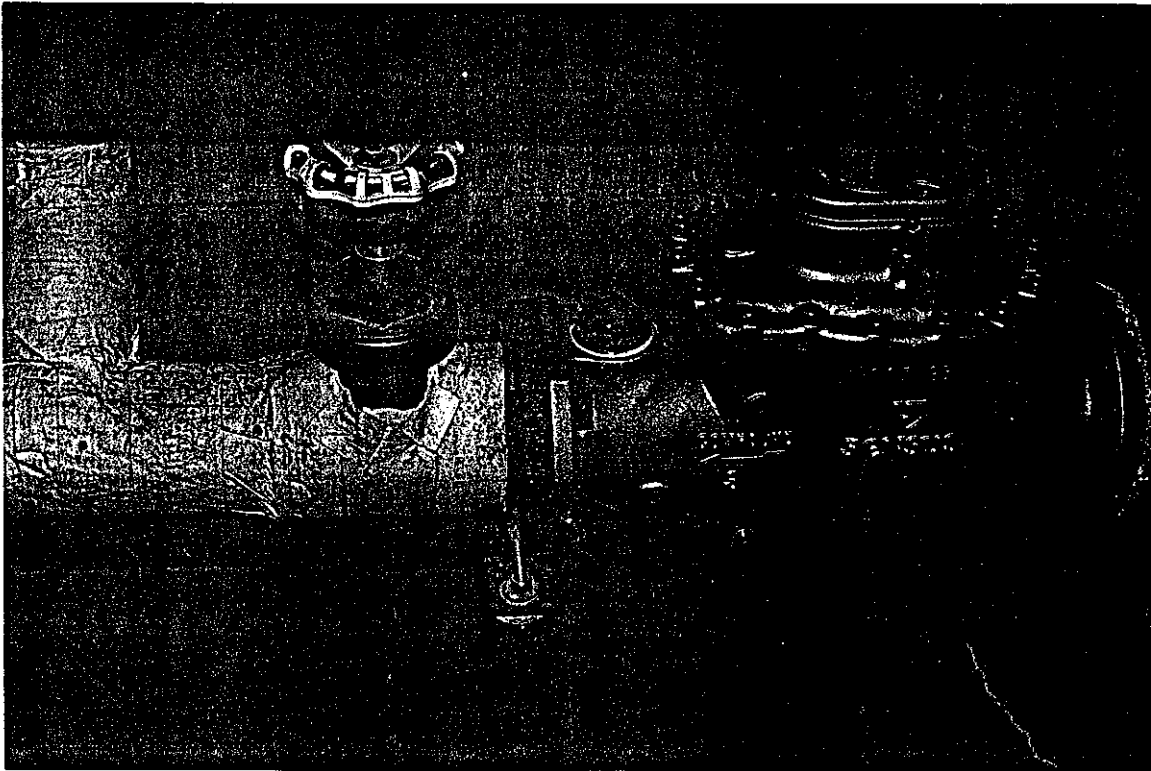


HALLWAY WORK — NEED COMPLETION ✓
by 11:00 AM
2000

Handy Handy



EXPOSED WIRES



NEED PAINT - RUSTING

McCormack Company

Legal Services

Suite 430
789 West Pender Street
Vancouver, B.C.
V6C 1H2

cc: Sue
Perry
8/6/2000

File: 175.00

Via Courier

June 7, 2000

Lenny Moy, President
Aragon Properties Ltd.
Suite 201 -- 1628 West 1st Avenue
Vancouver, British Columbia
V6J 1G1

RECEIVED JUN - 7 2000

Dear Sir:

Re: **Workmanship and Materials**

I am the solicitor for The Owners, Strata Plan LMS 3866 and act on their behalf with respect to repair and warranty issues. I understand that Aragon Properties Ltd. will repair any defects in the workmanship and materials that occur during the first year of occupancy. This letter is meant to be in addition to any other information given by the Strata Council or individual owners concerning defects in workmanship and materials.

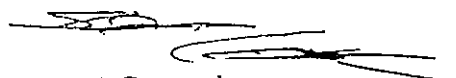
Please find enclosed a list of deficiencies from JRS Engineering Limited summarizing a visual inspection of the building and the observations arising from that visual inspection. Also enclosed are pictures taken by a Strata Council member outlining deficiencies in workmanship and materials within the building.

Kindly contact the writer so that arrangements can be made for Aragon Properties Ltd. to address the issues set out in the list.

Yours truly,

McCormack & Company

Per:


Elaine McCormack

ETM/fs

Encl.

cc: The Owners, Strata Plan LMS 3866



**JRS
ENGINEERING
LIMITED**
BUILDING ENVELOPE CONSULTANTS

110 - 3893 HENNING DRIVE
BURNABY, B.C. V5C 6N5

TEL: (604) 320-1999 FAX: (604) 320-1991
WWW.JRSENGEERING.COM

Project 00100

June 6, 2000

McCormack and Company
Suite 430 - 789 West Pender Street
Vancouver B.C.
V6C 1H2 (Fax: 688-0945)

Attention: Ms. Elaine T. McCormack

Dear Madam:

Re: Vintage East Side, Strata Plan LMS 3868
688 East 16th Avenue, Vancouver B.C.
- 1 Year Deficiency Review - Deficiency List

Further to our conversations regarding the above noted project we have enclosed a separate list of deficiencies.

If you have any questions or we can be of further assistance, please do not hesitate to contact the undersigned.

Prepared by

JRS ENGINEERING LTD.

Per:

Joel R. Schwartz, P.Eng., BEP

c.c. Allan Chitty (Fax: 875-1120)



DEFICIENCIES

Project: Vintage East Side, Strata Plan LMS 3866,
688 East 16th Avenue,
Vancouver B.C.

1.0 INTRODUCTION

- .1 The review undertaken by JRS did not include destructive testing to verify the condition and composition of underlying or hidden elements.
- .2 The review undertaken by JRS relies solely on visual observations and a review of available construction documents.
- .3 The mechanical and electrical systems were not included in our review.

2.0 ROOFING

- .1 Water ingress problem around skylight, suite 406.

3.0 WALL CLADDING

- .1 Most exterior wood cladding including siding, corner trim and window trim has not been primed or painted at the end cuts or backside.
- .2 There is no evidence of caulk sealant at joints between dissimilar materials such as windows, trim, and projections.
- .3 Siding nails are covered with paint but are exhibiting signs of rusting. Paint coverage appears very thin.

4.0 SELECTED DECKS

- .1 No over-flow scupper noted on deck with a full height wall surrounding the deck.
- .2 At the termination at the vertical wall the flashing abutted the siding and was caulked with what appears to be silicone (clear) sealant. Three-dimensional continuous (welded) saddle flashing has not been provided.

5.0 PARKADE WATERPROOFING

- .1 Leakage was observed at the base of the vertical construction joint at parkade entranceway ramp.

JUNE 6, 2000



JRS ENGINEERING LTD.

- .2 Leakage consisting of rust coloured efflorescence in a vertical crack (adjacent to vertical reveal) and diagonal crack from corner of slab-band parking stall # 1.
- .3 Evidence of efflorescence leakage and past repairs at the northwest corner of the electrical room, which corresponds roughly to the location of leakage at the vertical construction joint noted at the entrance way ramp. A material appears to have been applied to the inside surface of the walls in an effort to reduce moisture leakage.

6.0 INTERIOR HALLWAYS

- .1 Exit lights burnt out at different locations.
- .2 Minor patching and drywall filling compound noted - minor repainting required.

7.0 WINDOWS

- .1 Framing - Noticeable and sometimes excessive deformations of extruded PVC framing were observed at several locations. The following was recorded:
 - .1 Noticeable deformation of sill profile at windows with the coupling mullion, may be related missing proper support for weight of glass unit or shims missing at the vertical coupler itself.
 - .2 Noticeable deformation of head flashing, may be related to deflection of wall / floor structure above the windows. Further movements, ultimately, may result in unacceptable load bearing on vinyl framing, malfunction of operable vents, damage of framing and glass units.
 - .3 Excessive deformations at jamb and vent profiles at the 2' vent casement windows was typically observed. The deficiency may be related to the quality of window assembly itself, to installation methods / techniques or post-construction deformations of the building wall structure at specific locations.
 - .4 It was observed that the above casement windows could not be sealed / closed on sash lock side at lower corner, providing no compression of the interior gasket. Up to 1/2" inconsistency of the frame-vent joint was measured.
- .2 Window assembly seals
 - .1 Butt joints were typically observed at all 2 and 4 light windows. These joints must be sealed with compatible sealants or adhesives, as they could not be heat weld joined / sealed.
 - .2 It was observed that some of these joints were not fully sealed. Open gaps on outside and inside faces were noted.



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Project 00100

May 30, 2000

Vintage East Side LMS 3866
688 East 16th Avenue
Vancouver, B.C.
V5T 2V4 (Fax: 875-1120)

COPY

Attention Mr. Alan Chitty

Dear Sir:

Re: Strata Plan LMS 3866, Vintage East Side
688 East 16th Avenue, Vancouver, B.C.
- 1 Year Deficiency Review

1.0 INTRODUCTION

1.1 TERMS OF REFERENCE

- .1 JRS Engineering Ltd. (JRS) was retained by Strata Corporation LMS 3866 to provide an opinion regarding the current condition and performance of the building envelope with respect to water penetration.
- .2 This report was also commissioned to determine the appropriateness of the existing construction relative to the condition expected, following one year of service. Based on the building components and materials as constructed, their current condition, and the history of the building envelope problems, the required maintenance or replacement of these items can be estimated.
- .3 The review undertaken by JRS did not include destructive testing to verify the condition and composition of underlying or hidden elements.
- .4 The review undertaken by JRS relies solely on visual observations and a review of available construction documents.
- .5 The mechanical and electrical systems were not included in our review.

1.2 SITE VISITS AND MEETINGS

- .1 JRS attended the site on May 9, 2000 to undertake the field review as outlined in this report.
- .2 The weather at the time of the site visit was approximately 5° C and raining.



- .3 JRS examined select areas of the building to determine and familiarize ourselves with the typical construction details.
- .4 JRS met with Mr. Alan Chitty from Strata Corporation LMS 3866 to review historical problems and information related to the complex.
- .5 Mr. Chitty informed JRS that there had been no reported leaks into the building with the exception of a leak in the vicinity of a roof skylight in suite 406.

.3 BASIC INFORMATION

- .1 The subject building is a 45 unit, three-storey wood frame residential building built over a concrete parking garage structure.
- .2 Roof cornices shelter approximately 50 percent of walls.
- .3 The building is approximately 1 year old.
- .4 JRS Engineering Ltd. was provided with the following documentation:
 - .1 Architectural drawings as produced by Burrowes Huggins Architects. Architectural drawing sheets A0.01 - A0.02, A1.01 - A1.02, A2.01, A3.01 - A3.05, A5.01 - A5.02, A7.01 - A7.03, A7.06.
 - .2 "Vintage East Side" disclosure statement (including first and second amendments).
 - .3 Roofing Contractors Association 5 year guarantee certificate for main roof level membrane assembly.
 - .4 JRS did not review, nor were we provided with Architectural specifications.

2.0 ROOFING

.1 VISUAL OBSERVATIONS

- .1 The waterproofing protecting the top floor of the building is modified asphalt "torch on" membrane assembly, with a slate granule finish.
- .2 The architectural plans describe a 2 ply-SBS membrane assembly applied to the sloped roof decking.
- .3 The membrane for the most part is adequately and properly installed, in accordance with current roofing and building envelope practice.
- .4 The roof deck has been adequately sloped to the roof drains however, there are small areas that have standing water on the membrane surface.



- .5 Some large profile horizontal sheet metal parapet cap flashing is not positively sloped to drain and permits water to accumulate on the top horizontal surface.
- .6 Roof flashings observed are all seamed using proper standing seams or S-locks. All flashing joints have been caulked.
- .7 The perimeter membrane stripping terminated at the outside of the roof parapets thereby ensuring the roof membrane covered the top horizontal surface of the same.
- .8 Clay based material used for temporary roof repairs was observed surrounding the skylight above suite 406. There were no obvious defects or deficiencies in the membrane assembly in the affected area.
- .9 The roof membrane was observed to be tenting at the base of most plumbing stacks.
- .10 The upturned sheet metal flange surrounding projections through the caps have been sealed at the horizontal surface with caulking as opposed to solder. Sheet metal chimney caps are positively sloped to allow water to drain away.
- .11 Small amounts of sharp construction debris were observed on the roof membrane surface.

.2 DISCUSSION AND RECOMMENDATIONS

- .1 The membrane roofing is not currently exhibiting signs of deterioration or any significant defects.
- .2 The source of the water ingress into suite 406 is not clearly evident. We suspect the skylight or the skylight installation may be the most likely source.
- .3 A 5-year Roofing Contractors Association of B.C. guarantee covers the roof assembly. We recommend that a claim be filed under the guarantee program if this problem should occur again in the future.
- .4 The surface elements of the roof examined by JRS generally appear to conform to R.C.A.B.C. 5-year guarantee standards.
- .5 The tenting observed surrounding plumbing stacks should not affect the performance of the roof unless the severity of the tenting increases. We recommend the owners monitor this situation and report the problem should the tenting become more pronounced.
- .6 Minor ponding water on flashings and the membrane is not a concern with this type of membrane assembly.



- .7 Chimney caps are vulnerable to standing water since the seal surrounding the projection relies on caulking. This detail will require regular and ongoing maintenance.
- .8 Based on our examinations we believe that the roof design is consistent with current building science practice. The membrane itself appears to have been properly applied and should provide good long-term performance provided the prescribed maintenance (as described by the R.C.A.B.C. guarantee) is conducted.

3.0 WALL CLADDING

.1 VISUAL OBSERVATIONS

- .1 Bevelled wood siding is the primary wall cladding on the building. We did not observe any indications of back-priming or end-priming.
- .2 A large roof cornice shelters approximately 50 to 60 % of wall areas.
- .3 The siding has been applied to vertical wooden strapping to create an approximately $\frac{3}{4}$ " air space between the sheathing paper and the siding.
- .4 Insect screening has been installed at the base of the drainage cavity.
- .5 The wall sheathing paper (moisture barrier) assembly is described on the architectural drawings as consisting of 2 layers of 30 minute rated sheathing paper. This was not verified by JRS.
- .6 The architectural drawings generally describe the use of properly integrated membrane flashings in accordance with current building science practice.
- .7 Horizontal through-wall flashings have been placed in some areas but they have not been consistently placed at each floor level.
- .8 The through system flashing above the 1st floor (2nd floor level) is noted to have a flat lap seam, which was open; and to be not continuous at the end leaving a gap.
- .9 Most corner trim and window trim is formed from 1x4 wood material. The end cuts on this material has not been primed or painted.
- .10 There is no evidence of caulk sealant at joints between dissimilar materials such as windows, trim, and projections.
- .11 Siding nails are covered with paint but are exhibiting signs of rusting.



.2 DISCUSSION

- .1 As noted there are many open joints and gaps in the cladding assembly that have not been caulked or sealed. These may permit moisture to penetrate the siding and contact the sheathing paper.
- .2 Through-wall flashings have not been placed at each floor level. Water that penetrates in some areas may have to travel in excess of 20' prior to finally being discharged.
- .3 Wood siding or trim that is not fully back-primed or painted may cause several different problems. The wood siding will absorb moisture through the unprotected surface of the panel. Thermal cycling can cause moisture in the siding to permeate to, or through, the exterior paint. This in turn may cause a premature failure of the surface paint.
- .4 The cap flashings and through-wall flashings have not been fabricated with end-dams or continuous welded flanges at the termination locations also referred to as saddle points. The City of Vancouver Bulletin 96-02, which was issued on July 30, 1996 and came into effect on September 1, 1996, specifically indicates that these flashing details are often overlooked, and states additional emphasis must be placed on "the provision for field fabrication and welding at three-dimensional connections"
- .5 The lack of continuous welded flanges reduces the redundancy of the building envelope system placing a greater importance on the correct installation of the membranes immediately beneath the metal flashings.
- .6 Although there are many open gaps and joints which are not sealed, the use of 2 layers of 30 minute sheathing paper, membrane flashings, and the presence of a $\frac{3}{4}$ " drainage cavity should provide sufficient drainage and drying capability for water which does penetrate the siding.
- .7 It must be noted that even a drained cavity wall assembly relies on caulking and proper installation of the cladding to deflect water and maintain the moisture barrier (sheathing papers and membranes) in as dry a condition as possible.
- .8 With respect to moisture penetration issues, this system should perform adequately provided that the moisture barrier is continuous and properly lapped and integrated with other elements such as flashings, windows, etc.



4.0 SELECTED DECKS

.1 VISUAL OBSERVATIONS

- .1 The membrane used to protect the horizontal deck surface appears to be a cold liquid applied urethane pedestrian traffic membrane.
- .2 Minor ponding was observed immediately around the drain where build-up of material on drain flange has created minor high point.
- .3 Aluminum railings are top mounted through the curve flashing. Sealant is apparent around the screw penetrations between the screw head and the mounting plate and the underside of the mounting plate and the metal flashing. Caulking application at these locations was inconsistent. In some locations no caulking was observed and in other locations a generous amount was noted.
- .4 No over-flow scupper was noted on one deck with a full height wall surrounding the deck. Other decks with open railings and a low curb perimeter configuration do not have overflow drains, however the height of the curb appears to be lower than the threshold of the door.
- .5 All cap flashings covering the top of the deck up-stand wall are flat lap seam. A waterproof "peel & stick" type membrane was identified beneath the flashing.
- .6 At the termination at the vertical wall the flashing abutted the siding and was caulked with what appears to be silicone (clear) sealant. Three-dimensional saddle flashing has been provided.
- .7 The wood cladding boards applied to the post have been caulked around the base flashing, however the vertical joints are open.
- .8 A single overflow scupper has been provided in addition to the active drain, which is located in the gutter running along the north side of the balcony.
- .9 The membrane appears to have been extended up and beneath the sill flange of the sliding door.

.2 DISCUSSION

- .1 The most significant concern is the absence of three dimensional saddle flashings. Although there is a membrane underlayment we are not able to verify the integrity or complete installation of the same. We recommend these areas be closely monitored for any signs of water ingress problems.
- .2 Decks surrounded by high up-stand walls as opposed to open railings must have a primary drain as well as an over-flow drain. This is to prevent the back up of water on the decks should the primary drain become blocked. Some decks do not appear to have overflow drains.



- .3 Typically the balance of the deck assembly has been designed and installed in a fashion consistent with current building science practice.

5.0 PARKADE WATERPROOFING

.1 VISUAL OBSERVATIONS

- .1 The specific type of roof membrane used on the slab over the parking garage has not been described in the architectural drawings.
- .2 Leakage was observed at the base of the vertical construction joint at parkade entranceway ramp.
- .3 Leakage evidenced by rust coloured efflorescence in a vertical crack (adjacent to vertical reveal) and diagonal crack from corner of slab-band parking stall # 1.
- .4 The sprinkler pump room had no observable signs of any obvious problems.
- .5 Evidence of efflorescence and past repairs at the northwest corner of the electrical room, which corresponds roughly to the location of leakage at the vertical construction joint noted at the entrance way ramp. A material appears to have been applied to the inside surface of the walls in an effort to reduce moisture leakage.
- .6 The ventilation fan in the electrical room is connected to the light and therefore only operates when switched on. It is not known whether this should be connected to a thermostat or other automatic switching device.
- .7 Minor cracking, which is to be expected, is noted in the slab on grade. No unusual settlement cracks or depressions noted around any columns or perimeter foundation walls.

.2 DISCUSSION

- .1 The parking area is displaying signs of minor leakage problems. It is difficult to tell whether the staining caused by the water ingress is current or whether it occurred during construction. The weather at the time of our examinations was overcast and raining.
- .2 Defects in the slab membrane or below grade damp-proofing are extremely difficult and costly to resolve. This is primarily due to the excavation of landscaping and backfill covering the membrane or damp-proofing in order to gain access to the same.
- .3 Complete repairs will require excavation of the fill above the affected area to access the membrane or damp-proofing and complete repair or replacement of all defective areas.



- .4 An alternate method of addressing the leakage which may be considered is urethane crack injection. This will effectively stop leakage only through the cracks where it is applied. Water migration past the membrane or damp-proofing will not necessarily be stopped, and other cracks not currently exhibiting signs of leakage may begin to leak.
- .5 The architectural drawings and design describing the slab membrane are consistent with current building science practice.

6.0 INTERIOR HALLWAYS

- .1 No evidence of any significant problems noted.
- .2 Very minor patching and drywall filling compound noted - minor repainting required.
- .3 Exit lights burnt out at different locations.

7.0 WINDOWS

.1 REFERENCES

- .1 There is one conventional residential, extruded vinyl frame, glazing system used at the complex. It is commonly used at siding and stucco clad walls. Description of the existing window system is attached in Appendix B.
- .2 We concluded that the window suppliers manufactured the units. The integration flashing at the window head typically complements this system.
- .3 JRS focussed on areas where any deficiencies and undesired conditions would occur and could be observed.

.2 VISUAL OBSERVATIONS

- .1 In general, the framing, PVC material, hardware, glass, glazing stops and gasketing were in good condition. Our specific observations and comments are as follows:
- .2 Framing - Noticeable and sometimes excessive deformations of extruded PVC framing were observed at several locations. The following was recorded:
 - .1 Noticeable deformation of sill profile at windows with the coupling mullion, may be related missing proper support for weight of glass unit or shims missing at the vertical coupler itself.
 - .2 Noticeable deformation of head flashing, may be related to deflection of wall / floor structure above the windows. Further movements, ultimately,



may result in unacceptable load bearing on vinyl framing, malfunction of operable vents, damage of framing and glass units.

- .3 Excessive deformations at jamb and vent profiles at the 2' vent casement windows was typically observed. The deficiency may be related to the quality of window assembly itself, to installation methods / techniques or post-construction deformations of the building wall structure at specific locations.

- .4 It was observed that the above casement windows could not be sealed / closed on sash lock side at lower corner, providing no compression of the interior gasket. Up to 1/2" inconsistency of the frame-vent joint was measured.

.3 Window assembly seals

- .1 Butt joints were typically observed at all 2 and 4 light windows. These joints must be sealed with compatible sealants or adhesives, as they could not be heat weld joined / sealed.

- .2 It was observed that some of these joints were not fully sealed. Open gaps on outside and inside faces were noted.

.4 Water tightness / Moisture Presence

- .1 The windows were not tested for air or water tightness.

- .2 At all locations reviewed, no water stain marks were observed on the interior finishes in the area of window jamb-sill junction.

- .3 No signs of water leakage related deterioration was observed on the exposed finishes.

- .4 We did not observe signs of inner condensation on windows.

.5 Glass Units

- .1 No failure of glass unit seal was observed or reported. References to the failure of glass unit seals are included in Appendix C.

.3 DISCUSSION

- .1 The thermal movement of PVC window framing is greater than these made of wood or metal. Only glazing sealants that are able to accommodate such degree of movement can perform satisfactorily.

- .2 For windows, the design, fabrication, assembly, installation and integration with other parts of the building envelope are all equally important.

- .3 The window design was found to fall into the industry standard.



- .4 A window performing well through the first three years after constructing should be able to remain water tight for as long as the lifetime of sealants and gaskets.
- .5 The following items should be considered important in design, workmanship and construction:
 - .1 The window and associated components.
 - .2 Any discontinuities within the system as the assembly joints exist and may contribute to uncontrolled water ingress.
 - .3 The window's interface / integration with other parts of the building envelope and allowances for anticipated movements between parts involved.
- .6 The continuity of the window depends on a large number of parts or components forming the air barrier at all vinyl-to-vinyl, vinyl-to-gasket-to-glass, or other, where the requirement for air / water tight joints applies.
- .7 The window components can be divided into categories depending on their durability and aging characteristics:
 - .1 Glass itself – Very durable.
 - .2 Metal parts – Very durable.
 - .3 Extruded PVC framing elements – Relatively durable, however heat sensitive specifically in sustained load conditions, subject to aging related to UV radiation and ozone.
 - .4 PVC, rubber, silicone / polyurethane / mastic sealants or similar nature products - Age and break relatively quickly when subject to UV radiation, ozone, chemically active air pollutants and imposed mechanical stresses from handling, transportation, thermal expansion / contraction, live loads (i.e. wind pressure or seismic forces) or excessive movements of building structure.

8.0 SUMMARY

- .1 The overall condition of the building is satisfactory. The building envelope is generally performing in a fashion that should provide the life expectancy anticipated by the owners.
- .2 Typically the architectural details and construction are consistent with current building science practice and as such, are suitable for use in medium exposure areas in our coastal environment.



- .3 There is evidence of relatively minor leakage problems in the parkade and on the roof. As noted above, these problems should be monitored for leakage. In the event they are determined to be active leaks that require remedial work we suggest the owners establish a budget reserve in the amount of:

.1	Roof repair -suite 406	\$1,500.00
.2	Repairs to membrane over parkade slab	\$20,000.00 - \$40,000.00

9.0 CLOSURE

- .1 This report was prepared by JRS Engineering Ltd. for Strata Plan LMS 3866. Any use which a third party makes of this report, or any reliance or decisions to be made based on it, are the responsibility of such third parties.
- .2 A 1-year deficiency review is a visual survey to reduce the probability of finding any major defects at a later date. We cannot guarantee that all defects will be identified, but every reasonable effort is made to identify potential problems within the scope of our review.
- .3 The material in this report reflects the best judgement of JRS Engineering Ltd. in light of the information available at the time of preparation.
- .4 Please contact the undersigned if you require any additional information.

Prepared by

JRS ENGINEERING LTD.

Per:

Robert Lepp

Joel R. Schwartz, P.Eng.

MAY 30 2000

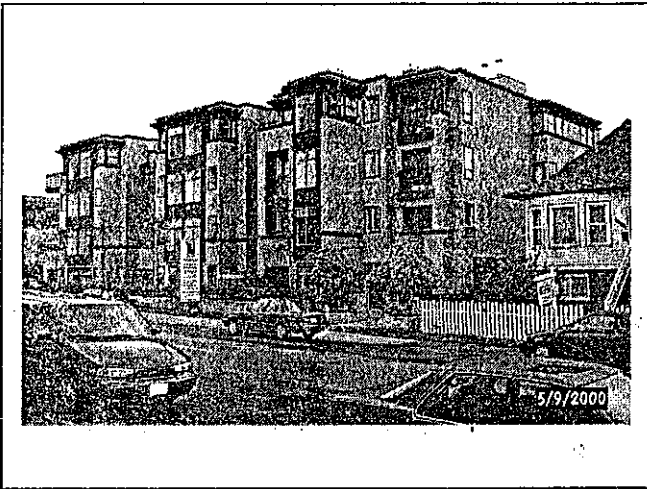


Photo # 1

Typical building elevation showing general roof overhang, deck and cladding configuration.

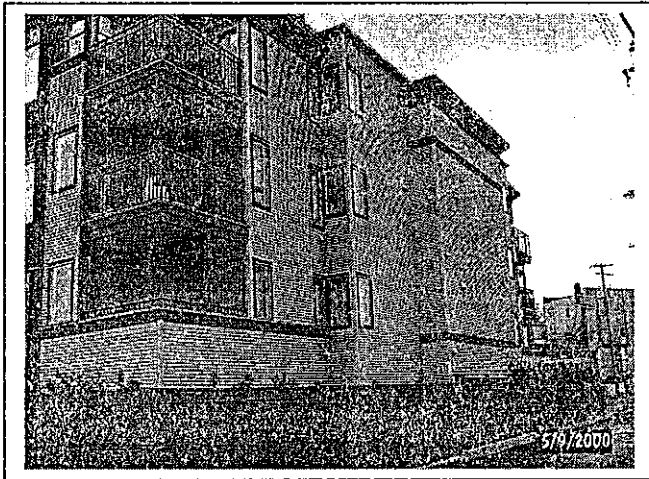


Photo # 2

Typical to photo # 1

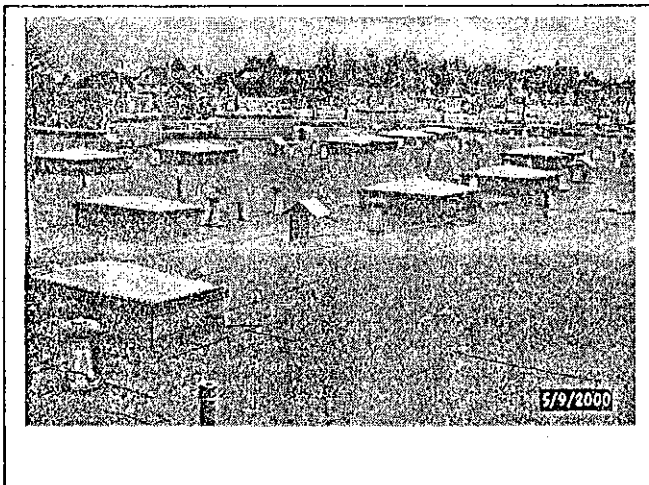


Photo # 3

Typical roof membrane, showing minor standing water.

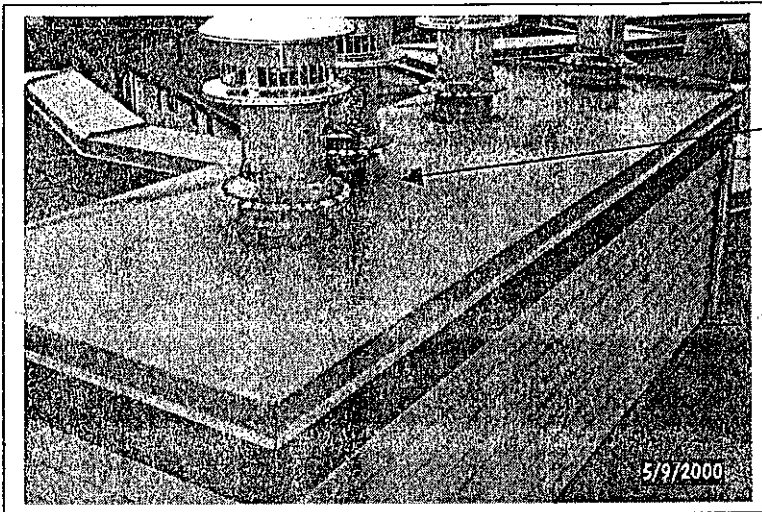


Photo # 4

Typical sloped chimney cap flashing.

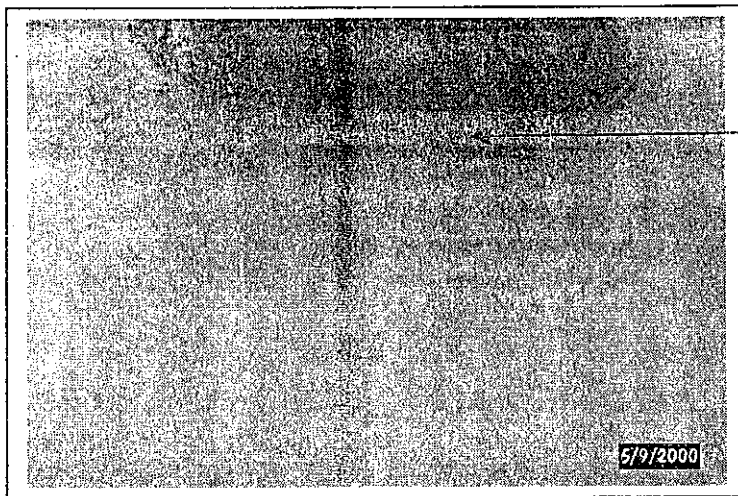


Photo # 5

Typical caulk joint at the base of projections through chimney cap. This joint as opposed to a solder joint will require maintenance.

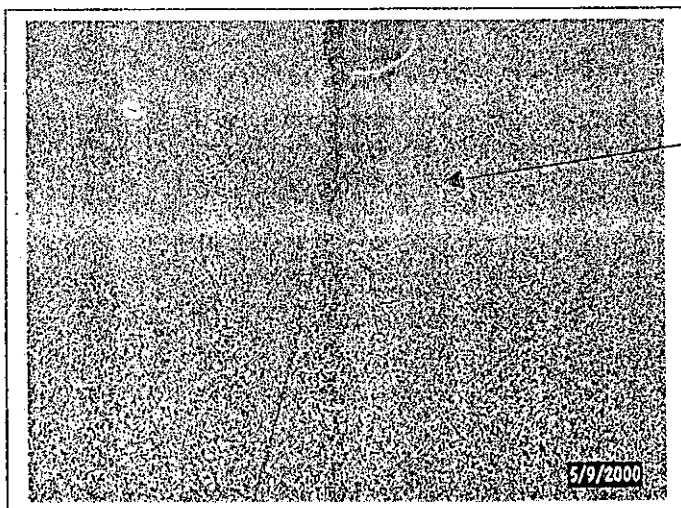


Photo # 6

Tenting in membrane at the base of plumbing stack flashings.

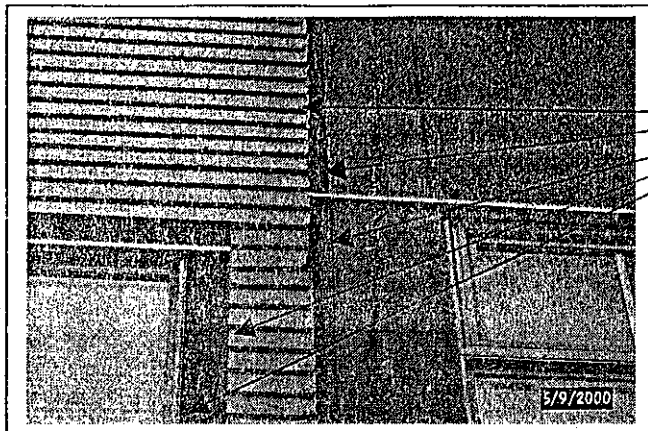


Photo # 7

Typical non-sealed gaps or opening in trim boards that may permit water penetration.

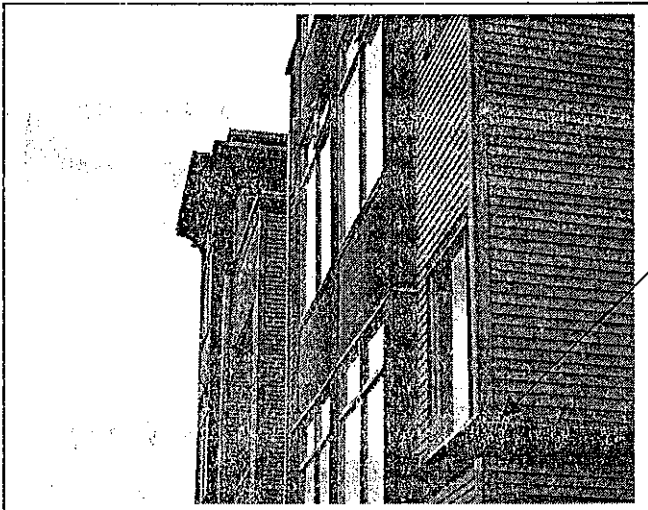


Photo # 8

Typical through system flashing at first floor level used to discharge moisture in the cavity behind the siding.

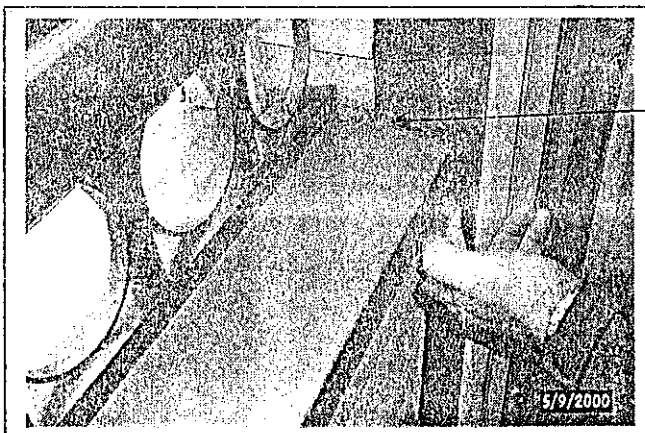


Photo # 9

Typical saddle flashing detail that does not incorporate an up-turned flange behind the cladding.

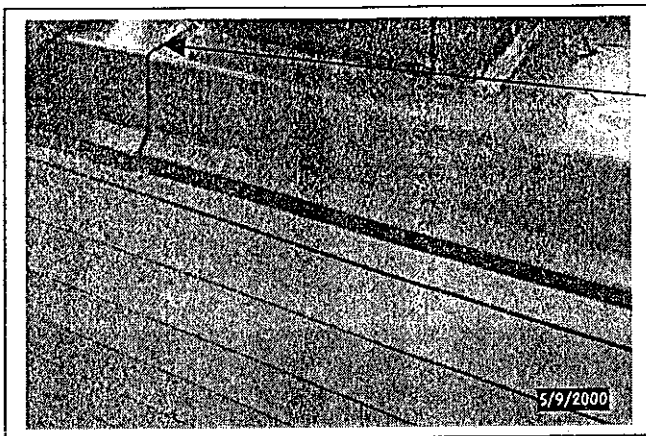


Photo # 10

Typical flat lapped joint
/ seam in sheet metal
cap flashing.

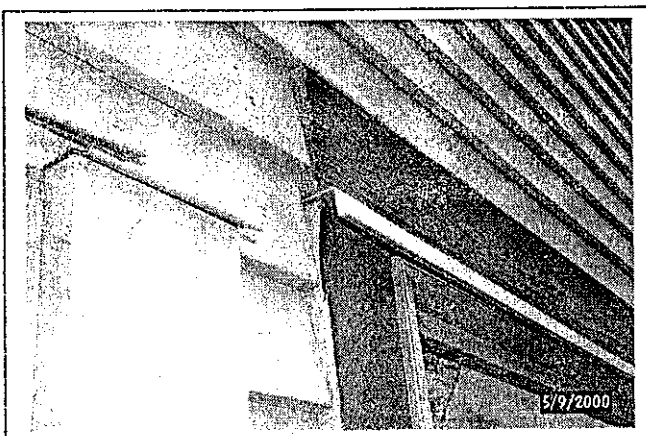


Photo # 11

Typical window trim at
head and double
flashing detail.

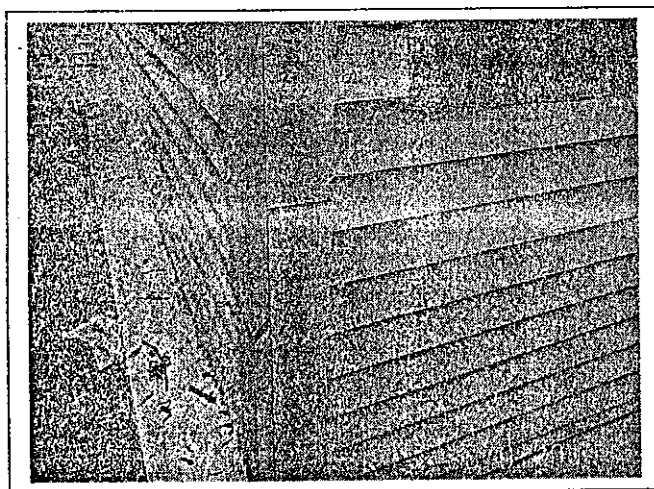


Photo # 12

Typical corner trim
detail.

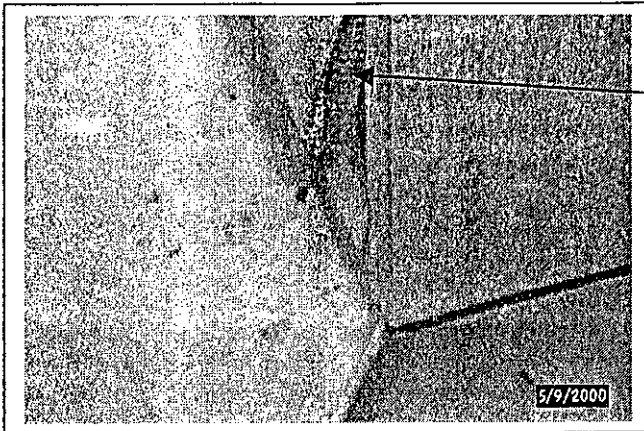


Photo # 13

Typical non-primed cut end of wood siding.

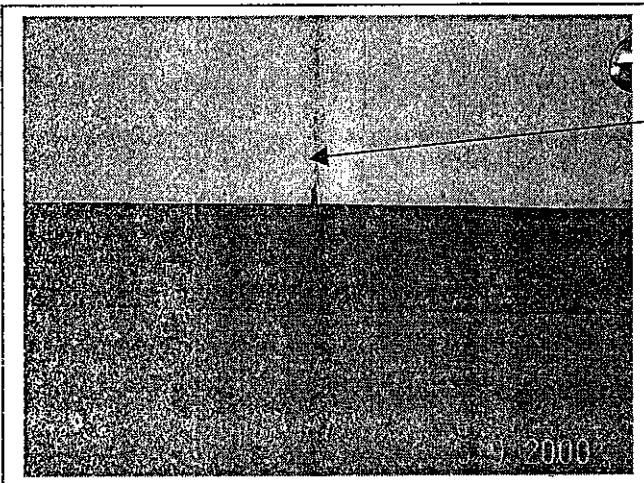


Photo # 14

Water staining and efflorescence visible on wall of parking garage.

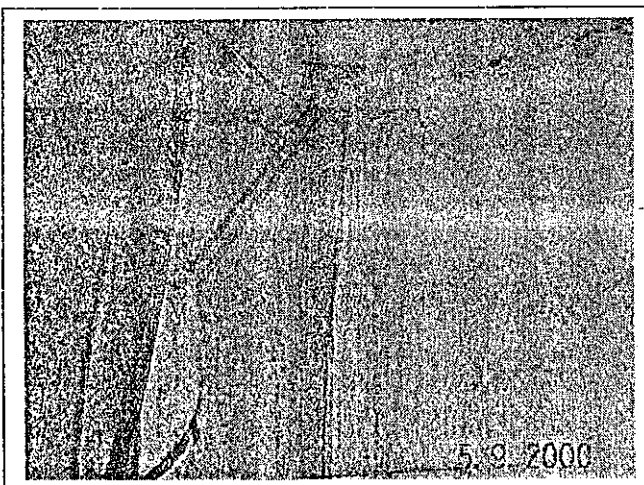


Photo # 15

Water staining and efflorescence visible on wall of parking garage.

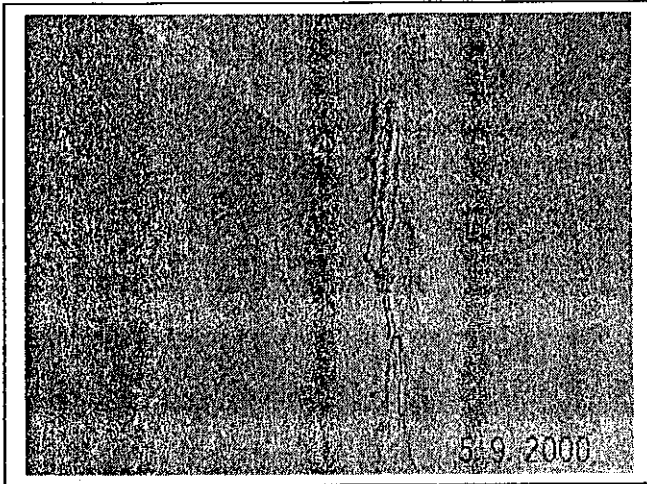


Photo # 16

Water staining and efflorescence visible on wall of parking garage.

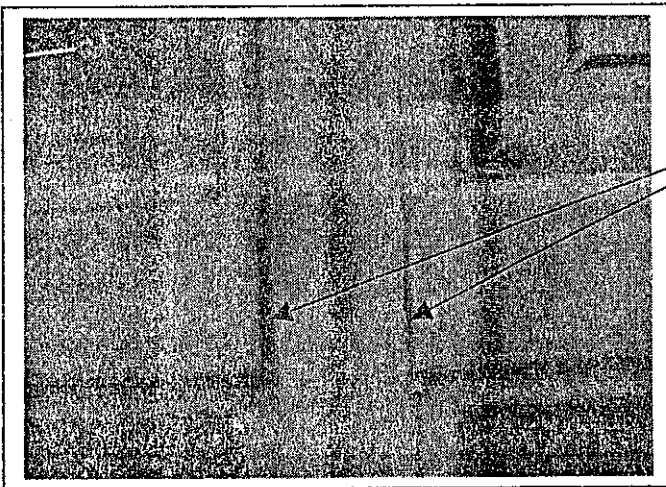


Photo # 17

Window exterior. Unsealed butt joints at transom-mullion interfacing.

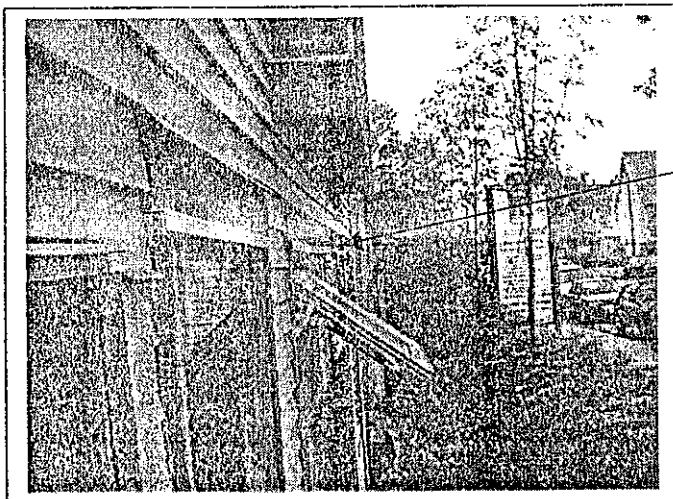


Photo # 18

Typical deformation of head flashing.

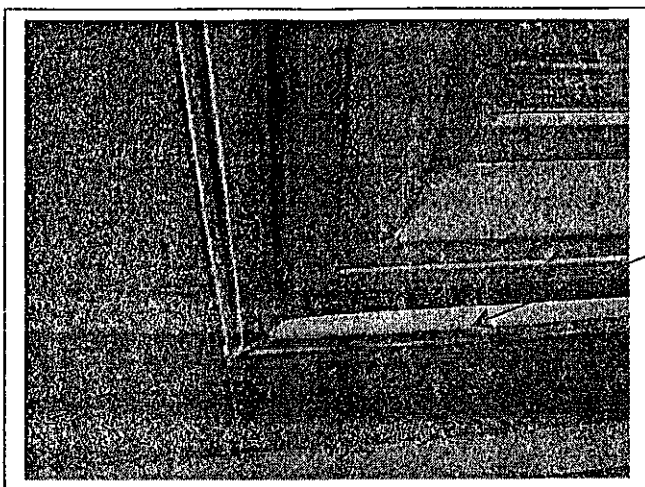


Photo # 19

Casement window. Sill at hinge side. Appropriate $\frac{1}{2}$ " offset between frame and edge of exterior gasket.

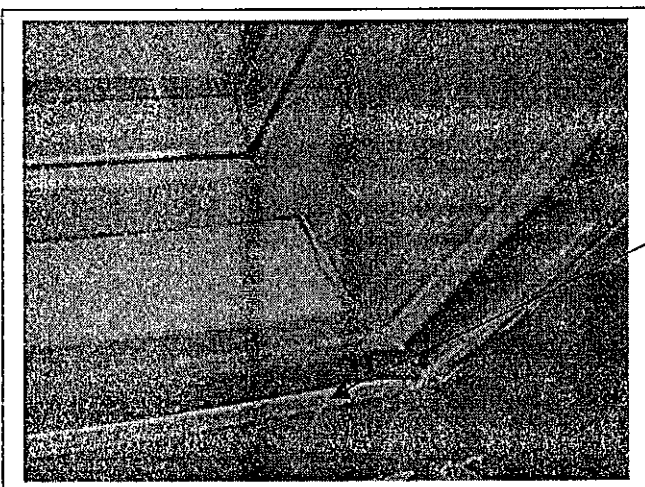


Photo # 20

Casement window. Sill at sash lock side. No or inappropriate offset between frame and edge of exterior gasket.

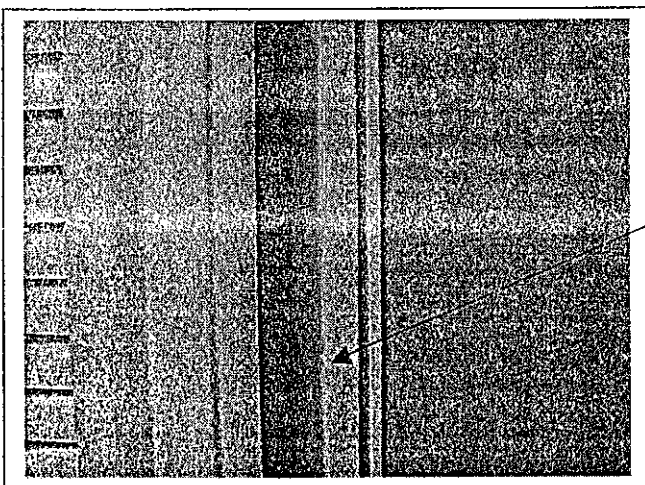


Photo # 21

Casement window. Jamb. Excessive offset between mainframe and operable vent.

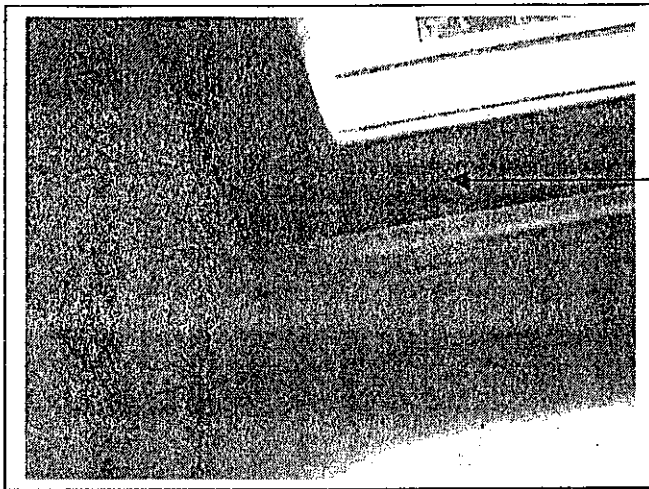


Photo # 22

Casement window. Sill at sash lock side. Open gap at inner gasket-to-operable vent interfacing.

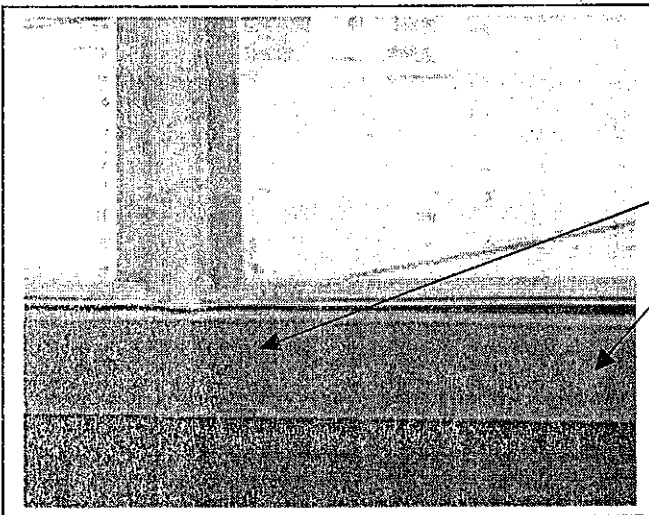


Photo # 23

Noticeable deformations of sill profile.

ARCHITECTURAL DRAWINGS – REFERENCES TO GLAZING SYSTEMS

Detail/Drawing	Date	Description	As-built
Schedules A0.02	March 1998	Window and patio door schedule. No description of window frame material.	As per window review below.
Elevations A5.02	September 1997	Exterior materials specified E10 – ALUMINUM WINDOWS	Extruded vinyl windows and patio doors utilised.
Details 1 – 15 A7.02	February 1998	Section details: Details 11 and 12 – VINYL WINDOWS – Specified. Single flashing at window head – Specified and detailed.	In place. Double flashing installed.
Details 2, 6, 8, 9 A7.02	February 1998	Plan details – window jamb conditions.	
Details 1 – 3 A7.06	March 1998	Window details at sill and head: Nail-on flange framing – Detailed. Double flashing at window head - Included. Head caulking at frame to sheathing - Specified. Caulking at perimeter trims - Specified.	In place. In place. Not verified. Missing.



Details 1 - 3 A7.06	March 1998	Membrane at rough opening - Detailed. Nail-on flange framing - Detailed. Lower flashing at window head - Specified 1/2" extent beyond window frame at all jambs.	
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AS-BUILT WINDOWS - GENERAL DESCRIPTION OF PARTS AND ASSEMBLIES	
1. Manufacturer	WILLMAR WINDOWS – Chilliwack, B.C
2. Installer	Unknown – Refer to general contractors
3. Year of Manufacture	1999
2. Window Frame Grid	As per architectural drawing A0.02 - SCHEDULES
3. Material	Extruded PVC in uniform beige colour.
4. Frame	Standard 3" depth suitable for size of stud wall construction.
5. Type	Nail-on-flange perimeter profile, for outside glazing with extruded stop, double-glazed, residential, with fixed lights and operable awning and casement vents.
6. Sash/Vent	Owning and casement types, top or jamb hinged, projecting out.
7. Seals	Corner joints (mitres) heat welded. No visible caulking at butt joints.
8. Finish	Uniform colour of extruded PVC material.
9. Weep Holes	Outer face of vent frame - 2. Outer face of main frame at each glazing compartment - 2.
10. Gasketing at fixed lights	Manufacturers' standard.
11. Weather-Stripping at Vents	Extruded rubber gaskets at interior and exterior faces designed to be compressed and to provide continuous air seal when in 'locked' position.
12. Vent Hardware	Manufacturer's standard - Arm hinges, crank handle and 2 sash locks.
13. Screens	N/A

14. Glass	Clear glass – Manufacturers' sealed insulating double glass units w metal (aluminum) spacer filled with desiccant.
15. Glass unit warranty	Extent of warranty – Unknown.
16. Glass Thickness	Not verified.
17. Air Space	Not verified.
18. Aluminum Spacer Identification Stamp	WILLMAR WINDOWS IGMAC #109609 – 1999
19. Setting Blocks	Not reviewed.
20. Sill	N/A
21. Head Flashing	Double flashing extending 6" past edge of window frame. Note: Additional, second flashing protects wood trim above window head.
22. Perimeter Caulking	No caulking at window frame-to-perimeter trim joints.
23. Anchoring	Most likely nails applied through nailing flanges of window frame to directly wall wood framing.
24. Shop Drawings	Unavailable.
25. Standard Catalogue Details	Unavailable.

Glass Unit Seals – Review

- .1 Typically, glass units are covered by a 5-to-10-year manufacturer's warranty related to the performance of their seals.
- .2 Condensation on 2nd surface between the panes of sealed glass unit is caused by either unit seal failure or glass breakage, allowing for uncontrolled volume of moist air to access the cavity, which is followed by inability of the desiccant to absorb such moisture.
- .3 Sealants play the most important role in the manufacture of sealed glass units. In factory sealed glass units the objective is to seal hermetically the space between the panes and to remove moisture left during manufacture by introducing desiccant.
- .4 The useful life of the unit will, in general, be limited by the time required to cause seal failure and accumulation of condensation between glass panes as noted above.
- .5 Changes in atmospheric air pressure and temperature produce substantial pressure differences between the glass unit air space and outside. Wind loads affect both the glass and seals.
- .6 For different materials, changes in temperature followed by different thermal expansion/contraction, cause distortion of glass and spacers and cause stress in the glass unit seals. The seals are thus subject to flexing and stress.
- .7 Air pressure and temperature changes, in the case of glass unit seal failure, induce airflow through every, even small, opening. This breathing action is an important mechanism for moving water vapour into the air space of the unit. As a result, the condensation occurs whenever the temperature of the second surface is below the dew point temperature of the air space.
- .8 It should be noted that the performance of glass unit seal may be related to other factors than those mentioned above. Usually, the adhesion/cohesion and UV resistance of sealants involved, type of spacer, quality of manufacturing processes, glass unit handling and setting in a frame, exposure to solar radiation, compatibility of cleaners and care / protection or preventing from abuse during washing will affect the longevity of the seals.
- .9 Status of glass unit seals should be reviewed during dry and relatively cold seasons. Otherwise, condensation on 2nd surface (the inside of the outer glass panel) might be confused with rain drops on outside surface present during an inspection in wet weather. In addition, it should be verified that the inside face of glass remains condensation free.