National
Home Warranty™
AN AVIVA COMPANY

JAN 21 2010

January 19, 2010

Via: Mail

Strata Plan LMS 280
c/o Southview Property Management Inc.
110 – 7580 River Rd.
Richmond, BC V6X 1X6

Attn: Jenny Liu

Dear Jenny,

Re: 1272 Comox St., Vancouver, BC – Chateau Comox

Enclosed please find the following for the above captioned project:

- Original warranty certificate
- Commissioning Letter

Please have the Strata sign the commissioning letter and mail back to our office at their earliest convenience.

Should you have any questions, please do not hesitate to call.

Regards,

Laurie-Ann Larabie
Executive Assistant to V.P. Technical Services
National Home Warranty Group Inc.

Encl.

VANCOUVER
1100, 1125 Howe Street, Vancouver, BC, V6Z 2Y6
Tel: (604) 608-6678 Fax: (604) 408-1001
Toll Free: 1-888-243-8807

CLOVERDALE
17685 - 57 Avenue, Cloverdale, BC, V3S 1H1
Tel: (604) 575-9155 Fax: (604) 575-9156
Toll Free: 1-888-243-8807

www.nationalhomewarranty.com

National Home Warranty™
AN AVIVA COMPANY

Date: January 19, 2010

Strata Plan LMS 280
"Chateau Comox"
1272 Comox St.
Vancouver, BC V6E 1K7

RE: COMMISSIONING MEETING

Dear Strata:

We are pleased to deliver the original warranty insurance policy for your records and trust that the Strata has received their copy of the owners' maintenance manual.

The manual outlines maintenance procedures and will serve as a guideline to monitoring the building performance. Use of this manual as a maintenance tool will contribute to the perpetual working ability of the various building components for years to come. The strata should regularly update the capital budget using current information acquired during maintenance inspections.

We encourage the council to establish a maintenance committee in order to check/identify and resolve any building maintenance issues as they arise.

Truly,

National Home Warranty Group Inc.

Art Doyle
Vice-President, Technical Services

Encl.

RECEIPT

Please confirm by signing below that the strata council has received the warranty and reviewed the maintenance manual. Please note that failure to satisfy maintenance requirements as provided in the HPA regulations may invalidate the warranty.

STRATA MEMBER

STRATA MEMBER

WITNESS/DATE 01/25/10

WITNESS/DATE

National Home Warranty™
AN AVIVA COMPANY

NATIONAL HOME RENOVATION WARRANTY

POLICY #: NHWRA08-079

DECLARATION PAGE

1.	CONTRACTOR:	OCEAN WEST CONSTRUCTION LTD.
2.	INSURED:	THE OWNERS OF STRATA PLAN LMS 280
3.	PROJECT:	CHATEAU COMOX
4.	INSURED SITE:	1272 COMOX STREET, VANCOUVER, BC, V6E 1K7
5.	INTEREST INSURED:	THE LABOUR & MATERIAL COST OF: THE CONTRACTED RENOVATION WORK
6.	POLICY PERIODS:	LABOUR & MATERIAL WARRANTY – PARTIAL REPAIRS EFFECTIVE DATE: MAY 6, 2009 EXPIRY DATE: MAY 6, 2011. 12:01 A.M. PACIFIC STANDARD TIME BUILDING ENVELOPE WARRANTY – FULL REPAIRS EFFECTIVE DATE: MAY 6, 2009 EXPIRY DATE: MAY 6, 2014. 12:01 A.M. PACIFIC STANDARD TIME
7.	COVERAGE:	AS PER RIDERS ATTACHED
8.	LIMIT OF LIABILITY:	$ 835,832.53 (125% OF CONTRACT PRICE)
9.	CONTRACT PRICE:	$ 668,666.02
10.	WARRANTY COST:	$ 53,493.28 (0.080)
11.	INSURER:	AVIVA INSURANCE COMPANY OF CANADA 2200 EGLINTON AVENUE EAST, SCARBOROUGH ON, M1L 4S8

DATE: NOVEMBER 25, 2009

Per: _____
Authorized Representative of Insurer

VANCOUVER
1100, 1125 Howe Street, Vancouver, BC, V6Z 2Y6
Tel: (604) 608-6678 Fax: (604) 408-1001
Toll Free: 1-888-243-8807

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SCHEDULE A

LIST OF RIDERS

1.	DESCRIPTION OF WORK/TERM OF WARRANTY	-1 page
2.	REPAIR ITEMS UNDER WARRANTY	-1 page
3.	FINAL INVOICE #NHWRA08-079ADJ	-1 page
4.	CERTIFICATE OF SUBSTANTIAL COMPLETION	-1 page
5.	BUILDING ENVELOPE RENOVATION – "AGREEMENT"	-5 pages
6.	CO-INSURANCE CLAUSE	-1 page
7.	COMMISSIONING LETTER	- 1 page

Attached to and forming part of policy #NHWRA08-079

DESCRIPTION OF WORK/COVERAGE AND TERM OF WARRANTY

It is understood and agreed that the warranty herein applies only to the approved design and specifications filed with National Home Warranty Group Inc. with regard to exterior repair work designed by Spratt Emanuel Engineering Ltd. and completed by Ocean West Construction Ltd.

Term of warranty:

2-YEAR LABOUR AND MATERIALS WARRANTY
5-YEAR WATER INGRESS WARRANTY

Area of coverage:

The above warranty terms apply to all repair work completed on the targeted vertical wall assemblies of the apartment building which provide the interior/exterior environmental separation as identified in the Spratt Emanuel Engineering Ltd.'s Specification, Elevations and Details Booklet dated February 21, 2008 and drawings S08-273-1 to S08-273-A17 dated February 21, 2008 and as required by Contract Change Order during construction.

General Description of work:

- Removal of face sealed wall cladding and replacement with a rainscreen stucco system and EIFS systems
- Replace/repair or re-enforce, clean and prime steel stud framing members
- Detailing to window openings in targeted areas
- New wall flashing.
- New aluminum windows and doors in targeted areas
- Install new polyurethane traffic membranes on balconies

Excluded from coverage under this warranty is the following:

- Reused windows and doors.
- Reused top mounted handrailings
- Gutters and downspouts/pipes.
- Horizontal waterproofing membranes.
- Roofing and associated flashing.
- Areas untouched by the remedial work.
- Owner supplied items.

Attached to and forming part of policy # NHWRA08-079

REPAIR ITEMS UNDER WARRANTY

CHATEAU COMOX - reconciliation of construction costs related to items requiring warranty

October 16, 2009

SCHEDULE A
ORIGINAL CONTRACT VALUE

General Conditions	$	94,677.00	
Demolition	$	23,805.00	
Fire place vent & Handrailing	$	9,575.00	
Rough Carpentry	$	19,875.00	
Building rain screen	$	40,600.00	
Window/door install	$	40,594.00	
Windows / Door	$	108,750.00	
Stucco	$	43,742.00	
Flashing/sheet metal	$	83,650.00	
Wall Painting	$	22,500.00	
Cash Allowance	$	3,000.00	
SUB-TOTAL			**$ 490,768.00**

SCHEDULE B - CHANGE ORDERS

Change Order #1 - Rot repair	$	10,598.33	
Change Order #2 - Rot repair	$	15,652.52	
Change Order #3 - Rot repair	$	17,112.38	
Change Order #4 - Rot repair	$	29,094.05	
Change Order #6 - Rot repair	$	25,284.30	
Change Order #7 - Rot repair	$	12,702.04	
Change Order #8 - Rot repair	$	34,135.75	
Change Order #9	$	9,092.84	
Change Order #10 - Acrylic over coat	$	7,560.00	
Change Order #11	$	16,665.81	
SUB-TOTAL			**$ 177,898.02**

Schedule A - Building Envelope Repairs	**$**	**490,768.00**	
Schedule B - Change Orders	**$**	**177,898.02**	
Subtotal :			**$ 668,666.02**
Subtotal of Schedule A and B: Warrantable Construction			**$ 668,666.02**
Policy Limit @ 125%			**$ 835,832.53**

Spratt Emanuel Engineering Ltd.

"on file"

signed

INVOICE #	NHWRA08-079ADJ

Date: November 3, 2009

To: **Owners of Strata Plan LMS 280**

C/O: **Southview Property Management Inc.**
110 - 7580 River Road
Richmond, BC
V6X 1X6

RE: **Chateau Comox**
1272 Comox Street
Vancouver, BC
V6E 1K7

Policy #	as per Policy
Effective Date:	as per Policy
Expiry Date:	as per Policy
Term:	5 years full rain screen elevations
Insurer:	Aviva Insurance Company of Canada

			Amount
Estimate Contract Price		$	464,917.65
Actual Contract Price		$	668,666.02
Adjustment Rate:			8.00%
Total Premium Cost:		$	53,493.28
Less Payment Received:	10/28/08	$	37,193.41
	Balance Due:	**$**	**16,299.87**

* Payment Terms: Due upon receipt

SPRATT EMANUEL
ENGINEERING LTD.

2348 Yukon Street
Vancouver, BC
Canada V5Y 3T6
Phone 604 872-1211
Fax 604 872-1274

BUILDERS LIEN ACT
(Section 7 (10))

Certificate of Substantial Completion

Spratt Emanuel Engineering Ltd., of 2348 Yukon Street, Vancouver, British Columbia, certify that, for the purposes of the Builders' Lien Act, the following contract or subcontract was completed on **May 6, 2009:**

Window Replacement, Re-Cladding and Associated Work

In connection with an improvement on land described as follows:

Strata Plan LMS 280 – Chateau Comox
1272 Comox Street,
Vancouver, B.C.

For provision of:

Work *generally* comprising window restoration, re-cladding and associated maintenance work.

Brief description of the contract or subcontract, including the date of the contract and the names of the parties to it:

Description	Window Replacement, Re-Cladding and Associated Work
Dated	September 1, 2008
Owner	Strata Plan LMS 280 – Chateau Comox
General Contractor	Ocean West Construction Ltd.

This represents Substantial Performance of the Contract.

Signed: _____
Mark W. Emanuel, P.Eng.
Spratt Emanuel Engineering Ltd.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
M.W. EMANUEL
14154

Dated: May 6, 2009

Our File No. S07-273

AVIVA Insurance Company of Canada

Represented by its Agent, National Home Warranty Group Inc.

17685 – 57th Avenue, Cloverdale, BC, V3S 1H1
Tel (604) 575-9155 Fax (604) 575-9156

Building Envelope Renovation Limited Warranty Certificate

Address of the Building: 1272 Comox St., Vancouver, BC

Policy Number: NHWRA08-079

Name of the Insured: The Owners of Strata Plan LMS 280

INSURING AGREEMENT. In consideration of the payment of the premium the Insurer, through National Home Warranty Group Inc., will provide the benefits described in this Home Warranty Insurance agreement (hereinafter called the "Agreement"), subject to the terms and conditions set forth or added hereto for the insured who is insured for and entitled to such benefits by its provisions, and conditions. No such terms and conditions shall be considered to be waived by the Insurer in whole or in part unless the waiver is in writing signed by a person authorized for that purpose by the Insurer. Provided always that this Agreement contains the essential elements of insurable interest, indemnity and utmost good faith under the law of insurance contracts, this Agreement shall be in accordance with the Building Envelope Renovation Regulation of the Province of British Columbia, Canada; and that where any other part of this Agreement conflicts with such Building Envelope Renovation Regulation, this Agreement shall be changed to meet the minimum requirements of that Regulation.

This policy, all schedules, forms, riders, endorsements, pertaining or attached hereto and the Application and the Declarations (including any Declarations issue in substitution) shall be considered one document. Collectively these documents are evidence of the contract between the Insured and the insurer.

SECTION I DEFINITIONS

Any word or expression to which a specific meaning has been attached shall bear such meaning wherever it appears, and such definitions shall include the plural and possessive form thereof. For the purposes of this Agreement, the following terms will be defined as follows, however, where a word used in this Agreement is not defined below, it shall have the same meaning as that defined in the Homeowner Protection Act Regulations.

"act" means the *Homeowner Protection Act ("H.P.A.")*

"application" means the information form completed together with any additional information supplied by or on behalf of the Insured.

"building code" means, as applicable:

(a) the British Columbia Building Code established under the Municipal Act, or

(b) the Vancouver Building Bylaw established under the *Vancouver Charter*,

in force at the time that the building permit was issued or, in jurisdictions where a building permit is not required, in force when construction commences.

"building envelope" means the assemblies, components and materials of a building that are intended to separate and protect the interior space of the building from the adverse effects of exterior climatic conditions.

"building envelope consultant" means a person, including an architect or professional engineer, who investigates defects in the building envelope of a residential building and provides plans, specifications or other advice on the design, evaluation or construction of a building envelope renovation or who is engaged to supervise the work of a building envelope renovator making a building envelope renovation.

"building envelope renovation" means the design and construction work on a residential building

(a) to repair defects or deficiencies in the building envelope which allow unintended water penetration, or

(b) to repair damage caused by unintended water penetration.

"building envelope renovator" means a residential renovator who is licensed under the H.P.A. to engage in, arrange for or manage all, or substantially all, of a building envelope renovation.

"common property" has the same meaning as in the *Strata Property Act*, but does not include land.

"cooperative" means a building, or portion of a building provided for residential occupancy purposes to members of an association incorporated or continued under the *Cooperative Association Act.*

"declaration page" means the personalized document provided to the Insured attached to and forming part of the policy which identifies the residential building covered under this Home warranty Insurance Agreement.

"defect" or "defects" means any design or construction, that (a) is contrary to the building code, or (b) requires repair or replacement due to the default or negligence of: (i) a Building Envelope Renovator or person for whom the Building Envelope Renovator is responsible at law, or (ii) a building envelope consultant or person for whom the building envelope consultant is responsible at law.

"defects in the building envelope" means any design or construction that results in the failure of the building envelope to perform its' intended function; namely, to protect all structural elements, exterior finish elements and interior finish elements from the effects of unintended water ingress into the building envelope.

"holder", when used in reference to a residential building, means

(a) if a strata plan respecting the land on which the building is situated has been deposited with the registrar of the land title office for the district in which that land is situated, the strata corporation for the strata plan,

(b) a person who has a life interest in the residential building and whose interest is registered against the title to the land on which the residential building is situated in the land title office for the district in which the land is situated,

(c) a person registered in the land title office for the district in which that land is situated as the purchaser under the last registered agreement for sale of the land on which the residential building is situated, or

(d) if none of paragraph (a), (b) or (c) apply, the person registered in the land title office as the registered owner in fee simple of the land on which the residential building is situated.

"home warranty insurance" has the same meaning as in section 189.1 (1) of the *Insurance Act* and includes "material and labour warranty" and "water penetration warranty".

"insured" means the entity or party named on the Declaration page.

"materials and labour warranty" means home warranty insurance, as defined in section 189.1 (1) of the Insurance Act, covering defects in materials or labour used in a building envelope renovation.

"multi-unit building" means a building containing 2 or more dwelling units together with associated common property, if any.

"policy" means the documents provided to the Insured evidencing the Home Warranty Insurance Agreement consisting of the Application, Declarations and all forms, riders and endorsements pertaining or attached hereto.

"residential building" means a structure or that portion of a structure that is used or intended to be used for residential purposes.

"substantially completed" has the same meaning as in B.C. Reg. 240/2000 O.I.C 1010/00.

"unintended water penetration" does not include water penetration caused by flooding.

"water penetration warranty" means home warranty insurance, as defined in section 189.1 (1) of the Insurance Act, on a building envelope renovation, which covers defects in a building envelope that cause or permit unintended water penetration and damage caused by that unintended water penetration.

SECTION II COVERAGE

The Insurer agrees to pay, on behalf of the Insured, for all building envelope renovation defects arising from the coverage outlined below in Parts A, B, C and/or D of this Section II, subject to the limits, terms, conditions, exclusions and warranties outlined in this Agreement. Nothing in this warranty Agreement is intended to exclude errors or omissions in the design, inspection or supervision of a building envelope repair from the water penetration warranty provided herein.

Part A – Two Year Materials & Labour Warranty

(1) Despite section 1 of Schedule 3 to B.C. Reg. 29/99, [the HPA Regulation], the minimum coverage for the materials and labour warranty on a building envelope renovation is 2 years for any defect in material and labour and for non-compliance with the building code described in subsection (2).

(2) Non-compliance with the building code is considered a defect covered by home warranty insurance if the non-compliance: (i) constitutes an unreasonable health or safety risk, or (ii) has resulted in, or is likely to result in, material damage to the residential building.

Part B – Water Penetration Warranty

Water penetration warranty herein coverages defects in both the design and the construction of a building envelope renovation for a period of five(5) years after the date on which the building envelope renovation was substantially completed, including a defect which permits unintended water penetration that causes material damage to the residential building.

Part C – Living Out Allowance

The labour and materials warranty or water penetration warranty will cover actual accommodation expenses for a hotel, motel or other rental accommodation to a limit of $100 per day for the holder, or, in the case of a strata corporation or other corporation, members of that strata corporation or other corporation; if the repairs render the residential building or a portion of it uninhabitable until 24 hours after the residential building or portion of it is ready for occupancy.

Part D – Warranty On Repairs And Replacements

(1) All repairs and replacements made under a materials and labour warranty or water penetration warranty will be warranted against defects in materials and labour until the later of:

(a) The first anniversary of the date of completion of the repair or replacement, or;

(b) The expiry of the applicable labour and materials warranty or water penetration warranty coverage

(2) All repairs and replacements made under a labour and materials warranty or water penetration warranty insurance must be completed in a reasonable manner using materials and labour conforming to the building code and industry standards.

Limits on home warranty insurance coverage

The Insurer's limit of liability under this contract shall be for the common property in a strata titled building or a multi-unit building that is not strata-titled and shall not exceed 125% of the total actual cost of repairs of the insured building envelope renovation.

SECTION III EXCLUSIONS

This Home Warranty Insurance does not cover:

(a) Weather, normal wear and tear, deterioration or deflection consistent with normal industry standards;

(b) Any damage to the extent that it is caused or made worse by an owner, holder or third party, including by negligent or improper maintenance by anyone other than the building envelope renovator or its employees, agents or subcontractors;

(c) Any damage caused by the unreasonable failure of a holder to take timely action to prevent or minimize loss or damage, including the failure to give prompt notice to the warranty provider of a defect or discovered loss or a potential defect or loss;

(d) Any damage caused by insects or rodents and other animals, unless the damage results from non-compliance with the building code by the building envelope renovator or its employees, agents or subcontractors;

(e) Accidental loss or damage from acts of nature including, but not limited to, fire, explosion, smoke, water escape, glass breakage, windstorm, hail, lightning, falling trees, aircraft, vehicles, flood, earthquake, avalanche, landslide, and changes in the level of the underground water table which are not reasonably foreseeable by the building envelope renovator;

(f) Any defects in, or caused by, materials or work supplied by anyone other than the building envelope renovator, building

envelope consultant or the employees, agents or subcontractors or either;

(g) Bodily injury or damage to personal property or real property which is not part of the residential building;

(h) Any damage that is caused or contributed to by the holder of this warranty Agreement or any other third party other than the building envelope consultant or other design professional involved in the design, supervision or inspection of the building envelope repair.

SECTION IV WARRANTY TERMS

This Home Warranty Insurance includes the following provisions:

(a) If the insurer make a payment or assumes liability for any payment or repair under home warranty insurance,
  i) The insurer is subrogated to all rights of recovery of a holder against any person or persons who may have caused or contributed to the requirement for the payment or repair under home warranty insurance,
  ii) The insurer may bring an action at its own expense, in the name of the holder or of the insurer, to enforce such rights, and,
  iii) The holder must fully support and assist the insurer in the pursuit of those rights if the insurer pursues such subrogated rights;

(b) implied or expressed warranties or representations made by a Building Envelope Renovator to a holder are not binding on the Insurer except as set out in the act or regulation or as set out in the applicable home warranty Insurance,

(c) a holder must permit the insurer or Building envelope Renovator, or both, to enter the residential building at all reasonable times, on the giving of reasonable notice to the holder;
  i) to monitor the residential building or its components,
  ii) to inspect for required maintenance,
  iii) to investigate complaints or claims, or
  iv) to undertake repairs under the home warranty insurance;

(d) if any reports are produced as a result of any of the activities referred to in paragraph (c), the reports must be provided to the holder on request;

(e) a holder must provide to the Insurer all information and documentation the holder has available, as reasonably required by the insurer, in order to investigate a claim or maintenance requirement, or to undertake repairs under the home warranty insurance;

(f) to the extent that damage to a residential building is caused by the unreasonable refusal of a holder or occupant to permit the insurer or Building Envelope Renovator access to the residential building for the reasons set out in paragraph (c) or to provide the information required by paragraph (e), such damage is excluded from the home warranty insurance.

SECTION V WARRANTY CONDITIONS

Mediation

Definitions specific to this section:

"mediation" means a collaborative process in which 2 or more parties meet and attempt, with the assistance of a mediator, to resolve issues in dispute between them;

"mediation session" means a meeting between two or more parties to a dispute during which they are engaged in mediation;

"mediator" means a neutral and impartial facilitator with no decision making power who assists parties in negotiating a mutually acceptable settlement of issues in dispute between them;

"roster organization" means any body designated by the Attorney General to select mediators for the purpose of this regulation.

(1) If a dispute between an insurer and a holder arising under home warranty insurance cannot be resolved by informal negotiation within reasonable time, the holder may, at the holder's sole election, require that the dispute be referred to mediation by delivering to the warranty provider a written request to mediate.

(2) If the holder delivers a request to mediate under subsection (1) above, the insurer and the holder must attend mediation session in relation to the dispute.

(3) In addition to the requirements of subsection (2) above, an insurer or a holder may invite to participate in the mediation any other party to the dispute who may be liable.

(4) Within 21 days after the holder has delivered a request to mediate under subsection (1) above, the parties must, directly or with thel assistance of an independent neutral person or organization, jointly appoint a mutually acceptable mediator.

(5) If the parties do not jointly appoint a mutually acceptable mediator within the time required by subsection (4) aove, the holder may apply to a roster organization which must appoint a mediator taking into account:
  (a) the need for the mediator to be neutral and independent,
  (b) the qualifications of the mediator,
  (c) the mediator's fees,
  (d) the mediator's availability, and
  (e) any other consideration likely to result in the selection of an impartial, competent and effective mediator.

(6) Promptly after a roster organization selects the mediator under subsection (5) above, the roster organization must notify the parties in writing of the selection.

(7) The mediator selected by a roster organization is deemed to be appointed by the parties effective the date of the notice sent under subsection (6) above.

(8) The date, time and place of the first mediation session must be scheduled by the mediator, and the first mediation session must occur within 21 days of the appointment of the mediator.

(9) Despite subsection (2) above, a party may attend a mediation session by representative if:
  (a) the party is under legal disability and the representative is that party's guardian ad litem,
  (b) the party is not an individual, or
  (c) the party is a resident of a jurisdiction other than British Columbia and will not be in British Columbia at the time of the mediation session.

(10) A representative who attends a mediation session in the place of a party referred to in subsection (9):
  (a) Must be familiar with all relevant facts on which the party on whose behalf the representative attends, intends to rely, and
  (b) Must have full authority to settle, or have immediate access to a person who has full authority to settle, on behalf of the party on whose behalf the representative attends.

(11) A party or a representative who attends the mediation session may be accompanied by counsel.

(12) Any other person may attend a mediation session if that attendance is with the consent of all parties or their representatives.

(13) At least 7 days before the first mediation session is to be held, each party must deliver to the mediator a statement briefly setting out:

(14) Promptly after receipt of all of the statements, required to be delivered under subsection (13) above, the mediator must send each party's statement to each of the other parties.

(15) Before the first mediation session, the parties must enter into a retainer with the mediator which must:
  (a) disclose the cost of the mediation services, and
  (b) provide the costs of the mediation will be paid
    i) equally by the parties, or
    ii) on any other specified basis agreed by the parties.

(16) The mediator may conduct the mediation in any manner he or she considers appropriate to assist the parties to reach a resolution that is timely, fair and cost effective.

(17) A person must not disclose, or be compelled to disclose, in any proceeding oral or written information acquired or an opinion formed, including without limitation, any offer or admission made in anticipation of or during a mediation session.

(18) Nothing in subsection (17) above precludes a party from introducing into evidence in a proceeding any information or records produced in the course of the mediation that are otherwise producible or compellable in those proceedings.

(19) A mediation session is concluded when
  (a) All issues are resolved,
  (b) The mediator determines the process will not be productive and so advises the parties or their representatives, or
  (c) The mediation session is completed and there is no agreement to continue.

(20) If the mediation resolves some but not all issues, then at the request of all parties the mediator may complete a report setting out any agreements the parties to the mediation have made as a result of the mediation, including without limitation, any agreements made by the parties on any of the following:
  (a) facts;
  (b) issues;
  (c) future procedural steps.

Transfer of Warranty

(1) Home warranty insurance pertains solely to the residential building for which it provides coverage and no notice to the warranty provider is required on a change of ownership.

(2) All of the applicable unused benefits under home warranty insurance are automatically transferred to any subsequent holder on a change of ownership.

CLAIMS PROCEDURE

Notice of Claim

(1) Within a reasonable time after the discovery of a defect and before the expiry of the applicable home warranty insurance coverage, a holder must give to the insurer and the Building Envelope Renovator written notice in reasonable detail that provides particulars of any specific defects covered by the home warranty insurance. Written notice for the insurer must be sent to :

National Home Warranty Group Inc.
17685 – 57th Avenue,
Cloverdale, BC,
V3S 1H1

Telephone: 604-575-9155
Facsimile: 604-575-9156

(2) The Insurer will require the notice under subsection (1) above, to include:
  (a) The home warranty insurance number, and
  (b) Copies of any relevant documentation and correspondence between the holder and the Building Envelope Renovator.

Handling of Claims

(1) The Insurer shall, on receipt of a notice of a claim under home warranty Insurance promptly make reasonable attempts to contact the holder to arrange an evaluation of the claim.

(2) The Insurer shall make all reasonable efforts to avoid delays in responding to a claim under home warranty insurance, evaluating the claim and scheduling any required repairs.

(3) If following evaluation of a claim under home warranty Insurance, the Insurer determines the claim is not valid or not covered under the home warranty insurance, the Insurer must notify the holder of the decision in writing, setting out the reasons for the decision.

(4) The notice under subsection (3) above, must also set out the rights of the parties under the third party dispute resolution process referred to in Section V, Warranty Conditions.

(5) Repairs must be undertaken in a timely manner with reasonable consideration given to weather conditions and the availability of materials and labour.

(6) On completion of any repairs, the Insurer must deliver a copy of the repair specification to the holder along with a letter confirming the date the repairs were completed subject to the warranty conditions contained in the warranty on repairs and replacement section.

Disclosure of Claims History

(1) On receipt of an inquiry from a holder of a residential building covered by home warranty insurance regarding the claims experience of that residential building, an Insurer must provide the holder with a history of claims. The history of claims must include, for each claim, not less than the following information for both the dwelling unit and if applicable, the associated common property:
  (a) The type of claim that was made;
  (b) The resolution of the claim;
  (c) The type of repair performed;
  (d) The date of the repair; and
  (e) The cost of the repair.

(2) The Insurer will charge a holders fee of $25 to provide the history of claims.

Duty to Mitigate

(1) The Insurer will require a holder to mitigate any damage to a residential building including damage caused by defects or water penetration, as set out in the home warranty insurance.

(2) Subject to subsection (3) below, for defects covered by the home warranty insurance, the duty to mitigate is met through timely notice in writing to the insurer.

(3) The holder must take all reasonable steps to restrict damage to the residential building if the defect requires immediate attention.

(4) To the extent that damage to a residential building is caused or made worse by the failure of a holder to take reasonable steps to mitigate as set out in this section, such damage will be excluded from home warranty insurance coverage.

Co-Insurance Clause

It is understood and agreed that the amount of the "contract price" as show on the final invoice attached and policy declarations is at least equal to the actual contract price paid to the building envelope renovator less allowable exemptions. Any lesser amount will cause the insured to be a co-insurer of any loss to the extent that the amount of insurance bears to the stipulated contract price.

Protecting Your Privacy
For Privacy information, please see www.avivacanada.com, or call Aviva Insurance Company of Canada at 1-800-387-4518

Attached to and forming part of policy # NHWRA08-079

National Home Warranty™
AN AVIVA COMPANY

NATIONAL HOME RENOVATION WARRANTY

POLICY #: NHWRA08-079

DECLARATION PAGE

1.	CONTRACTOR:	OCEAN WEST CONSTRUCTION LTD.
2.	INSURED:	THE OWNERS OF STRATA PLAN LMS 280
3.	PROJECT:	CHATEAU COMOX
4.	INSURED SITE:	1272 COMOX STREET, VANCOUVER, BC, V6E 1K7
5.	INTEREST INSURED:	THE LABOUR & MATERIAL COST OF: THE CONTRACTED RENOVATION WORK
6.	POLICY PERIODS:	LABOUR & MATERIAL WARRANTY – PARTIAL REPAIRS EFFECTIVE DATE: MAY 6, 2009 EXPIRY DATE: MAY 6, 2011. 12:01 A.M. PACIFIC STANDARD TIME BUILDING ENVELOPE WARRANTY – FULL REPAIRS EFFECTIVE DATE: MAY 6, 2009 EXPIRY DATE: MAY 6, 2014. 12:01 A.M. PACIFIC STANDARD TIME
7.	COVERAGE:	AS PER RIDERS ATTACHED
8.	LIMIT OF LIABILITY:	$ 835,832.53 (125% OF CONTRACT PRICE)
9.	CONTRACT PRICE:	$ 668,666.02
10.	WARRANTY COST:	$ 53,493.28 (0.080)
11.	INSURER:	AVIVA INSURANCE COMPANY OF CANADA 2200 EGLINTON AVENUE EAST, SCARBOROUGH ON, M1L 4S8

DATE: NOVEMBER 25, 2009

Per: _____
Authorized Representative of Insurer

VANCOUVER
1100, 1125 Howe Street, Vancouver, BC, V6Z 2Y6
Tel: (604) 608-6678 Fax: (604) 408-1001
Toll Free: 1-888-243-8807

CLOVERDALE
17685 - 57 Avenue, Cloverdale, BC, V3S 1H1
Tel: (604) 575-9155 Fax: (604) 575-9156
Toll Free: 1-888-243-8807

www.nationalhomewarranty.com

SCHEDULE A

LIST OF RIDERS

1.	DESCRIPTION OF WORK/TERM OF WARRANTY	-1 page
2.	REPAIR ITEMS UNDER WARRANTY	-1 page
3.	FINAL INVOICE #NHWRA08-079ADJ	-1 page
4.	CERTIFICATE OF SUBSTANTIAL COMPLETION	-1 page
5.	BUILDING ENVELOPE RENOVATION – "AGREEMENT"	-5 pages
6.	CO-INSURANCE CLAUSE	-1 page
7.	COMMISSIONING LETTER	- 1 page

Attached to and forming part of policy #NHWRA08-079

DESCRIPTION OF WORK/COVERAGE AND TERM OF WARRANTY

It is understood and agreed that the warranty herein applies only to the approved design and specifications filed with National Home Warranty Group Inc. with regard to exterior repair work designed by Spratt Emanuel Engineering Ltd. and completed by Ocean West Construction Ltd.

Term of warranty:

2-YEAR LABOUR AND MATERIALS WARRANTY
5-YEAR WATER INGRESS WARRANTY

Area of coverage:

The above warranty terms apply to all repair work completed on the targeted vertical wall assemblies of the apartment building which provide the interior/exterior environmental separation as identified in the Spratt Emanuel Engineering Ltd.'s Specification, Elevations and Details Booklet dated February 21, 2008 and drawings S08-273-1 to S08-273-A17 dated February 21, 2008 and as required by Contract Change Order during construction.

General Description of work:

- Removal of face sealed wall cladding and replacement with a rainscreen stucco system and EIFS systems
- Replace/repair or re-enforce, clean and prime steel stud framing members
- Detailing to window openings in targeted areas
- New wall flashing.
- New aluminum windows and doors in targeted areas
- Install new polyurethane traffic membranes on balconies

Excluded from coverage under this warranty is the following:

- Reused windows and doors.
- Reused top mounted handrailings
- Gutters and downspouts/pipes.
- Horizontal waterproofing membranes.
- Roofing and associated flashing.
- Areas untouched by the remedial work.
- Owner supplied items.

Attached to and forming part of policy # NHWRA08-079

REPAIR ITEMS UNDER WARRANTY

CHATEAU COMOX - reconciliation of construction costs related to items requiring warranty

October 16, 2009

SCHEDULE A
ORIGINAL CONTRACT VALUE

General Conditions	$	94,677.00	
Demolition	$	23,805.00	
Fire place vent & Handrailing	$	9,575.00	
Rough Carpentry	$	19,875.00	
Building rain screen	$	40,600.00	
Window/door install	$	40,594.00	
Windows / Door	$	108,750.00	
Stucco	$	43,742.00	
Flashing/sheet metal	$	83,650.00	
Wall Painting	$	22,500.00	
Cash Allowance	$	3,000.00	
SUB-TOTAL			**$ 490,768.00**

SCHEDULE B - CHANGE ORDERS

Change Order #1 - Rot repair	$	10,598.33	
Change Order #2 - Rot repair	$	15,652.52	
Change Order #3 - Rot repair	$	17,112.38	
Change Order #4 - Rot repair	$	29,094.05	
Change Order #6 - Rot repair	$	25,284.30	
Change Order #7 - Rot repair	$	12,702.04	
Change Order #8 - Rot repair	$	34,135.75	
Change Order #9	$	9,092.84	
Change Order #10 - Acrylic over coat	$	7,560.00	
Change Order #11	$	16,665.81	
SUB-TOTAL			**$ 177,898.02**

Schedule A - Building Envelope Repairs	$	**490,768.00**	
Schedule B - Change Orders	$	**177,898.02**	
Subtotal :			**$ 668,666.02**
Subtotal of Schedule A and B: Warrantable Construction			**$ 668,666.02**
Policy Limit @ 125%			**$ 835,832.53**

Spratt Emanuel Engineering Ltd.

"on file"

signed

INVOICE #	NHWRA08-079ADJ

Date: November 3, 2009

To: Owners of Strata Plan LMS 280

C/O: **Southview Property Management Inc.**
110 - 7580 River Road
Richmond, BC
V6X 1X6

RE: **Chateau Comox**
1272 Comox Street
Vancouver, BC
V6E 1K7

Policy #	as per Policy
Effective Date:	as per Policy
Expiry Date:	as per Policy
Term:	5 years full rain screen elevations
Insurer:	Aviva Insurance Company of Canada

			Amount
Estimate Contract Price		$	464,917.65
Actual Contract Price		$	668,666.02
Adjustment Rate:			8.00%
Total Premium Cost:		$	53,493.28
Less Payment Received:	10/28/08	$	37,193.41
	Balance Due:	**$**	**16,299.87**

* Payment Terms: Due upon receipt

SPRATT EMANUEL
ENGINEERING LTD.

2348 Yukon Street
Vancouver, BC
Canada V5Y 3T6
Phone 604 872-1211
Fax 604 872-1274

BUILDERS LIEN ACT
(Section 7 (10))

Certificate of Substantial Completion

Spratt Emanuel Engineering Ltd., of 2348 Yukon Street, Vancouver, British Columbia, certify that, for the purposes of the Builders' Lien Act, the following contract or subcontract was completed on **May 6, 2009:**

Window Replacement, Re-Cladding and Associated Work

In connection with an improvement on land described as follows:

Strata Plan LMS 280 – Chateau Comox
1272 Comox Street,
Vancouver, B.C.

For provision of:

Work *generally* comprising window restoration, re-cladding and associated maintenance work.

Brief description of the contract or subcontract, including the date of the contract and the names of the parties to it:

Description	Window Replacement, Re-Cladding and Associated Work
Dated	September 1, 2008
Owner	Strata Plan LMS 280 – Chateau Comox
General Contractor	Ocean West Construction Ltd.

This represents Substantial Performance of the Contract.

Signed: _____
Mark W. Emanuel, P.Eng.
Spratt Emanuel Engineering Ltd.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
M.W. EMANUEL
14154

Dated: May 6, 2009 (Today)

Our File No. S07-273

AVIVA Insurance Company of Canada

Represented by its Agent, National Home Warranty Group Inc.

17685 – 57th Avenue, Cloverdale, BC, V3S 1H1
Tel (604) 575-9155 Fax (604) 575-9156

Building Envelope Renovation Limited Warranty Certificate

Address of the Building: 1272 Comox St., Vancouver, BC

Policy Number: NHWRA08-079

Name of the Insured: The Owners of Strata Plan LMS 280

INSURING AGREEMENT. In consideration of the payment of the premium the Insurer, through National Home Warranty Group Inc., will provide the benefits described in this Home Warranty Insurance agreement (hereinafter called the "Agreement"), subject to the terms and conditions set forth or added hereto for the insured who is insured for and entitled to such benefits by its provisions, and conditions. No such terms and conditions shall be considered to be waived by the Insurer in whole or in part unless the waiver is in writing signed by a person authorized for that purpose by the Insurer. Provided always that this Agreement contains the essential elements of insurable interest, indemnity and utmost good faith under the law of insurance contracts, this Agreement shall be in accordance with the Building Envelope Renovation Regulation of the Province of British Columbia, Canada; and that where any other part of this Agreement conflicts with such Building Envelope Renovation Regulation, this Agreement shall be changed to meet the minimum requirements of that Regulation.

This policy, all schedules, forms, riders, endorsements, pertaining or attached hereto and the Application and the Declarations (including any Declarations issue in substitution) shall be considered one document. Collectively these documents are evidence of the contract between the Insured and the insurer.

SECTION I DEFINITIONS

Any word or expression to which a specific meaning has been attached shall bear such meaning wherever it appears, and such definitions shall include the plural and possessive form thereof. For the purposes of this Agreement, the following terms will be defined as follows, however, where a word used in this Agreement is not defined below, it shall have the same meaning as that defined in the Homeowner Protection Act Regulations.

"act" means the *Homeowner Protection Act ("H.P.A.")*

"application" means the information form completed together with any additional information supplied by or on behalf of the Insured.

"building code" means, as applicable:

(a) the British Columbia Building Code established under the Municipal Act, or

(b) the Vancouver Building Bylaw established under the *Vancouver Charter*,

in force at the time that the building permit was issued or, in jurisdictions where a building permit is not required, in force when construction commences.

"building envelope" means the assemblies, components and materials of a building that are intended to separate and protect the interior space of the building from the adverse effects of exterior climatic conditions.

"building envelope consultant" means a person, including an architect or professional engineer, who investigates defects in the building envelope of a residential building and provides plans, specifications or other advice on the design, evaluation or construction of a building envelope renovation or who is engaged to supervise the work of a building envelope renovator making a building envelope renovation.

"building envelope renovation" means the design and construction work on a residential building

(a) to repair defects or deficiencies in the building envelope which allow unintended water penetration, or

(b) to repair damage caused by unintended water penetration.

"building envelope renovator" means a residential renovator who is licensed under the H.P.A. to engage in, arrange for or manage all, or substantially all, of a building envelope renovation.

"common property" has the same meaning as in the *Strata Property Act*, but does not include land.

"cooperative" means a building, or portion of a building provided for residential occupancy purposes to members of an association incorporated or continued under the *Cooperative Association Act*.

"declaration page" means the personalized document provided to the Insured attached to and forming part of the policy which identifies the residential building covered under this Home warranty Insurance Agreement.

"defect" or "defects" means any design or construction, that (a) is contrary to the building code, or (b) requires repair or replacement due to the default or negligence of: (i) a Building Envelope Renovator or person for whom the Building Envelope Renovator is responsible at law, or (ii) a building envelope consultant or person for whom the building envelope consultant is responsible at law.

"defects in the building envelope" means any design or construction that results in the failure of the building envelope to perform its' intended function; namely, to protect all structural elements, exterior finish elements and interior finish elements from the effects of unintended water ingress into the building envelope.

"holder", when used in reference to a residential building, means

(a) if a strata plan respecting the land on which the building is situated has been deposited with the registrar of the land title office for the district in which that land is situated, the strata corporation for the strata plan,

(b) a person who has a life interest in the residential building and whose interest is registered against the title to the land on which the residential building is situated in the land title office for the district in which the land is situated,

(c) a person registered in the land title office for the district in which that land is situated as the purchaser under the last registered agreement for sale of the land on which the residential building is situated, or

(d) if none of paragraph (a), (b) or (c) apply, the person registered in the land title office as the registered owner in fee simple of the land on which the residential building is situated.

"home warranty insurance" has the same meaning as in section 189.1 (1) of the *Insurance Act* and includes "material and labour warranty" and "water penetration warranty".

"insured" means the entity or party named on the Declaration page.

"materials and labour warranty" means home warranty insurance, as defined in section 189.1 (1) of the Insurance Act, covering defects in materials or labour used in a building envelope renovation.

"multi-unit building" means a building containing 2 or more dwelling units together with associated common property, if any.

"policy" means the documents provided to the Insured evidencing the Home Warranty Insurance Agreement consisting of the Application, Declarations and all forms, riders and endorsements pertaining or attached hereto.

"residential building" means a structure or that portion of a structure that is used or intended to be used for residential purposes.

"substantially completed" has the same meaning as in B.C. Reg. 240/2000 O.I.C 1010/00.

"unintended water penetration" does not include water penetration caused by flooding.

"water penetration warranty" means home warranty insurance, as defined in section 189.1 (1) of the Insurance Act, on a building envelope renovation, which covers defects in a building envelope that cause or permit unintended water penetration and damage caused by that unintended water penetration.

SECTION II COVERAGE

The Insurer agrees to pay, on behalf of the Insured, for all building envelope renovation defects arising from the coverage outlined below in Parts A, B, C and/or D of this Section II, subject to the limits, terms, conditions, exclusions and warranties outlined in this Agreement. Nothing in this warranty Agreement is intended to exclude errors or omissions in the design, inspection or supervision of a building envelope repair from the water penetration warranty provided herein.

Part A – Two Year Materials & Labour Warranty

(1) Despite section 1 of Schedule 3 to B.C. Reg. 29/99, [the HPA Regulation], the minimum coverage for the materials and labour warranty on a building envelope renovation is 2 years for any defect in material and labour and for non-compliance with the building code described in subsection (2).

(2) Non-compliance with the building code is considered a defect covered by home warranty insurance if the non-compliance: (i) constitutes an unreasonable health or safety risk, or (ii) has resulted in, or is likely to result in, material damage to the residential building.

Part B – Water Penetration Warranty

Water penetration warranty herein coverages defects in both the design and the construction of a building envelope renovation for a period of five(5) years after the date on which the building envelope renovation was substantially completed, including a defect which permits unintended water penetration that causes material damage to the residential building.

Part C – Living Out Allowance

The labour and materials warranty or water penetration warranty will cover actual accommodation expenses for a hotel, motel or other rental accommodation to a limit of $100 per day for the holder, or, in the case of a strata corporation or other corporation, members of that strata corporation or other corporation; if the repairs render the residential building or a portion of it uninhabitable until 24 hours after the residential building or portion of it is ready for occupancy.

Part D – Warranty On Repairs And Replacements

(1) All repairs and replacements made under a materials and labour warranty or water penetration warranty will be warranted against defects in materials and labour until the later of:

(a) The first anniversary of the date of completion of the repair or replacement, or;

(b) The expiry of the applicable labour and materials warranty or water penetration warranty coverage

(2) All repairs and replacements made under a labour and materials warranty or water penetration warranty insurance must be completed in a reasonable manner using materials and labour conforming to the building code and industry standards.

Limits on home warranty insurance coverage

The Insurer's limit of liability under this contract shall be for the common property in a strata titled building or a multi-unit building that is not strata-titled and shall not exceed 125% of the total actual cost of repairs of the insured building envelope renovation.

SECTION III EXCLUSIONS

This Home Warranty Insurance does not cover:

(a) Weather, normal wear and tear, deterioration or deflection consistent with normal industry standards;

(b) Any damage to the extent that it is caused or made worse by an owner, holder or third party, including by negligent or improper maintenance by anyone other than the building envelope renovator or its employees, agents or subcontractors;

(c) Any damage caused by the unreasonable failure of a holder to take timely action to prevent or minimize loss or damage, including the failure to give prompt notice to the warranty provider of a defect or discovered loss or a potential defect or loss;

(d) Any damage caused by insects or rodents and other animals, unless the damage results from non-compliance with the building code by the building envelope renovator or its employees, agents or subcontractors;

(e) Accidental loss or damage from acts of nature including, but not limited to, fire, explosion, smoke, water escape, glass breakage, windstorm, hail, lightning, falling trees, aircraft, vehicles, flood, earthquake, avalanche, landslide, and changes in the level of the underground water table which are not reasonably foreseeable by the building envelope renovator;

(f) Any defects in, or caused by, materials or work supplied by anyone other than the building envelope renovator, building

envelope consultant or the employees, agents or subcontractors or either;

(g) Bodily injury or damage to personal property or real property which is not part of the residential building;

(h) Any damage that is caused or contributed to by the holder of this warranty Agreement or any other third party other than the building envelope consultant or other design professional involved in the design, supervision or inspection of the building envelope repair.

SECTION IV WARRANTY TERMS

This Home Warranty Insurance includes the following provisions:

(a) If the insurer make a payment or assumes liability for any payment or repair under home warranty insurance,
  i) The insurer is subrogated to all rights of recovery of a holder against any person or persons who may have caused or contributed to the requirement for the payment or repair under home warranty insurance,
  ii) The insurer may bring an action at its own expense, in the name of the holder or of the insurer, to enforce such rights, and,
  iii) The holder must fully support and assist the insurer in the pursuit of those rights if the insurer pursues such subrogated rights;

(b) implied or expressed warranties or representations made by a Building Envelope Renovator to a holder are not binding on the Insurer except as set out in the act or regulation or as set out in the applicable home warranty Insurance,

(c) a holder must permit the insurer or Building envelope Renovator, or both, to enter the residential building at all reasonable times, on the giving of reasonable notice to the holder;
  i) to monitor the residential building or its components,
  ii) to inspect for required maintenance,
  iii) to investigate complaints or claims, or
  iv) to undertake repairs under the home warranty insurance;

(d) if any reports are produced as a result of any of the activities referred to in paragraph (c), the reports must be provided to the holder on request;

(e) a holder must provide to the Insurer all information and documentation the holder has available, as reasonably required by the insurer, in order to investigate a claim or maintenance requirement, or to undertake repairs under the home warranty insurance;

(f) to the extent that damage to a residential building is caused by the unreasonable refusal of a holder or occupant to permit the insurer or Building Envelope Renovator access to the residential building for the reasons set out in paragraph (c) or to provide the information required by paragraph (e), such damage is excluded from the home warranty insurance.

SECTION V WARRANTY CONDITIONS

Mediation

Definitions specific to this section:

nediation" means a collaborative process in which 2 or more parties meet and attempt, with the assistance of a mediator, to resolve issues in dispute between them;

"mediation session" means a meeting between two or more parties to a dispute during which they are engaged in mediation;

"mediator" means a neutral and impartial facilitator with no decision making power who assists parties in negotiating a mutually acceptable settlement of issues in dispute between them;

"roster organization" means any body designated by the Attorney General to select mediators for the purpose of this regulation.

(1) If a dispute between an insurer and a holder arising under home warranty insurance cannot be resolved by informal negotiation within reasonable time, the holder may, at the holder's sole election, require that the dispute be referred to mediation by delivering to the warranty provider a written request to mediate.

(2) If the holder delivers a request to mediate under subsection (1) above, the insurer and the holder must attend mediation session in relation to the dispute.

(3) In addition to the requirements of subsection (2) above, an insurer or a holder may invite to participate in the mediation any other party to the dispute who may be liable.

(4) Within 21 days after the holder has delivered a request to mediate under subsection (1) above, the parties must, directly or with the assistance of an independent neutral person or organization, jointly appoint a mutually acceptable mediator.

(5) If the parties do not jointly appoint a mutually acceptable mediator within the time required by subsection (4) aove, the holder may apply to a roster organization which must appoint a mediator taking into account:
  (a) the need for the mediator to be neutral and independent,
  (b) the qualifications of the mediator,
  (c) the mediator's fees,
  (d) the mediator's availability, and
  (e) any other consideration likely to result in the selection of an impartial, competent and effective mediator.

(6) Promptly after a roster organization selects the mediator under subsection (5) above, the roster organization must notify the parties in writing of the selection.

(7) The mediator selected by a roster organization is deemed to be appointed by the parties effective the date of the notice sent under subsection (6) above.

(8) The date, time and place of the first mediation session must be scheduled by the mediator, and the first mediation session must occur within 21 days of the appointment of the mediator.

(9) Despite subsection (2) above, a party may attend a mediation session by representative if:
  (a) the party is under legal disability and the representative is that party's guardian ad litem,
  (b) the party is not an individual, or
  (c) the party is a resident of a jurisdiction other than British Columbia and will not be in British Columbia at the time of the mediation session.

(10) A representative who attends a mediation session in the place of a party referred to in subsection (9):
  (a) Must be familiar with all relevant facts on which the party on whose behalf the representative attends, intends to rely, and
  (b) Must have full authority to settle, or have immediate access to a person who has full authority to settle, on behalf of the party on whose behalf the representative attends.

(11) A party or a representative who attends the mediation session may be accompanied by counsel.

(12) Any other person may attend a mediation session if that attendance is with the consent of all parties or their representatives.

(13) At least 7 days before the first mediation session is to be held, each party must deliver to the mediator a statement briefly setting out:

(14) Promptly after receipt of all of the statements, required to be delivered under subsection (13) above, the mediator must send each party's statement to each of the other parties.

(15) Before the first mediation session, the parties must enter into a retainer with the mediator which must:
- (a) disclose the cost of the mediation services, and
- (b) provide the costs of the mediation will be paid
  - i) equally by the parties, or
  - ii) on any other specified basis agreed by the parties.

(16) The mediator may conduct the mediation in any manner he or she considers appropriate to assist the parties to reach a resolution that is timely, fair and cost effective.

(17) A person must not disclose, or be compelled to disclose, in any proceeding oral or written information acquired or an opinion formed, including without limitation, any offer or admission made in anticipation of or during a mediation session.

(18) Nothing in subsection (17) above precludes a party from introducing into evidence in a proceeding any information or records produced in the course of the mediation that are otherwise producible or compellable in those proceedings.

(19) A mediation session is concluded when
- (a) All issues are resolved,
- (b) The mediator determines the process will not be productive and so advises the parties or their representatives, or
- (c) The mediation session is completed and there is no agreement to continue.

(20) If the mediation resolves some but not all issues, then at the request of all parties the mediator may complete a report setting out any agreements the parties to the mediation have made as a result of the mediation, including without limitation, any agreements made by the parties on any of the following:
- (a) facts;
- (b) issues;
- (c) future procedural steps.

Transfer of Warranty

(1) Home warranty insurance pertains solely to the residential building for which it provides coverage and no notice to the warranty provider is required on a change of ownership.

(2) All of the applicable unused benefits under home warranty insurance are automatically transferred to any subsequent holder on a change of ownership.

CLAIMS PROCEDURE

Notice of Claim

(1) Within a reasonable time after the discovery of a defect and before the expiry of the applicable home warranty insurance coverage, a holder must give to the insurer and the Building Envelope Renovator written notice in reasonable detail that provides particulars of any specific defects covered by the home warranty insurance. Written notice for the insurer must be sent to :

National Home Warranty Group Inc.
17685 – 57th Avenue,
Cloverdale, BC,
V3S 1H1

Telephone: 604-575-9155
Facsimile: 604-575-9156

(2) The Insurer will require the notice under subsection (1) above, to include:
- (a) The home warranty insurance number, and
- (b) Copies of any relevant documentation and correspondence between the holder and the Building Envelope Renovator.

Handling of Claims

(1) The Insurer shall, on receipt of a notice of a claim under home warranty Insurance promptly make reasonable attempts to contact the holder to arrange an evaluation of the claim.

(2) The Insurer shall make all reasonable efforts to avoid delays in responding to a claim under home warranty insurance, evaluating the claim and scheduling any required repairs.

(3) If following evaluation of a claim under home warranty Insurance, the Insurer determines the claim is not valid or not covered under the home warranty insurance, the Insurer must notify the holder of the decision in writing, setting out the reasons for the decision.

(4) The notice under subsection (3) above, must also set out the rights of the parties under the third party dispute resolution process referred to in Section V, Warranty Conditions.

(5) Repairs must be undertaken in a timely manner with reasonable consideration given to weather conditions and the availability of materials and labour.

(6) On completion of any repairs, the Insurer must deliver a copy of the repair specification to the holder along with a letter confirming the date the repairs were completed subject to the warranty conditions contained in the warranty on repairs and replacement section.

Disclosure of Claims History

(1) On receipt of an inquiry from a holder of a residential building covered by home warranty insurance regarding the claims experience of that residential building, an Insurer must provide the holder with a history of claims. The history of claims must include, for each claim, not less than the following information for both the dwelling unit and if applicable, the associated common property;
- (a) The type of claim that was made;
- (b) The resolution of the claim;
- (c) The type of repair performed;
- (d) The date of the repair; and
- (e) The cost of the repair.

(2) The Insurer will charge a holders fee of $25 to provide the history of claims.

Duty to Mitigate

(1) The Insurer will require a holder to mitigate any damage to a residential building including damage caused by defects or water penetration, as set out in the home warranty insurance.

(2) Subject to subsection (3) below, for defects covered by the home warranty insurance, the duty to mitigate is met through timely notice in writing to the insurer.

(3) The holder must take all reasonable steps to restrict damage to the residential building if the defect requires immediate attention.

(4) To the extent that damage to a residential building is caused or made worse by the failure of a holder to take reasonable steps to mitigate as set out in this section, such damage will be excluded from home warranty insurance coverage.

Co-Insurance Clause

It is understood and agreed that the amount of the "contract price" as show on the final invoice attached and policy declarations is at least equal to the actual contract price paid to the building envelope renovator less allowable exemptions. Any lesser amount will cause the insured to be a co-insurer of any loss to the extent that the amount of insurance bears to the stipulated contract price.

Protecting Your Privacy
For Privacy information, please see www.avivacanada.com, or call Aviva Insurance Company of Canada at 1-800-387-4518

Attached to and forming part of policy # NHWRA08-079

National
Home Warranty™
AN AVIVA COMPANY

Date: January 19, 2010

Strata Plan LMS 280
"Chateau Comox"
1272 Comox St.
Vancouver, BC V6E 1K7

RE: COMMISSIONING MEETING

Dear Strata:

We are pleased to deliver the original warranty insurance policy for your records and trust that the Strata has received their copy of the owners' maintenance manual.

The manual outlines maintenance procedures and will serve as a guideline to monitoring the building performance. Use of this manual as a maintenance tool will contribute to the perpetual working ability of the various building components for years to come. The strata should regularly update the capital budget using current information acquired during maintenance inspections.

We encourage the council to establish a maintenance committee in order to check/identify and resolve any building maintenance issues as they arise.

Truly,

National Home Warranty Group Inc.

Art Doyle
Vice-President, Technical Services

Encl.

RECEIPT

Please confirm by signing below that the strata council has received the warranty and reviewed the maintenance manual. Please note that failure to satisfy maintenance requirements as provided in the HPA regulations may invalidate the warranty.

STRATA MEMBER _____ WITNESS/DATE _____

STRATA MEMBER _____ WITNESS/DATE _____

Strata Plan LMS – 280
Chateau Comox
c/o Kevin Wice
701 – 1272 Comox Street
Vancouver, BC. V6E 1K7

Email: krw@krw.ca

Mark Emanuel
Spratt Emanuel Engineering Ltd.
2348 Yukon Street
Vancouver, BC. V5Y 3T6

VIA COURIER

RE: Window Replacement, Re-Cladding and Associated Work – PST Relief Grant

Dear Mark:

Please find enclosed the signed copy of the PST Relief Grant for Leaky Building Repairs for you to file appropriately.

I trust you will find the enclosed straight forward, however, should you have any questions, please do not hesitate to give me a call.

Regards,

Kevin Wice
Day PH: 604-473-9343

SPRATT EMANUEL
ENGINEERING LTD.

2348 Yukon Street
Vancouver, BC
Canada V5Y 3T6
Phone 604 872-1211
Fax 604 872-1274

Our File No. S08-273
January 14, 2010

Strata Plan LMS 280 – Chateaux Comox
c/o Mr. Kevin Wice
Suite #701 – 1272 Comox Street
Vancouver, BC V6E 1K7
(Email: krw@krw.ca)

Attention: Mr. Kevin Wice, Strata President

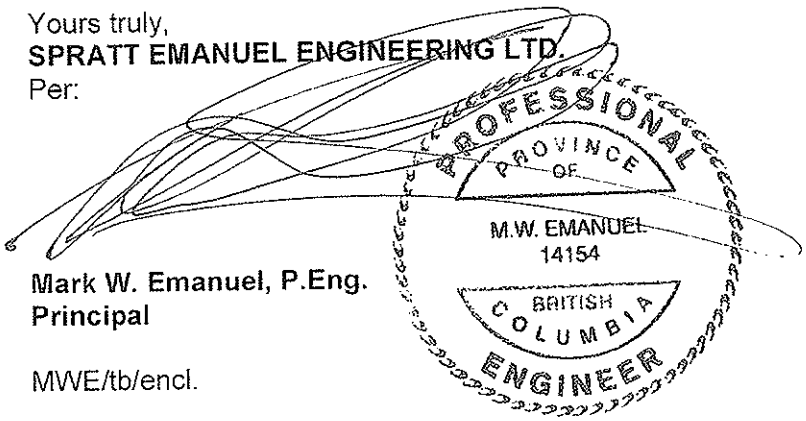
Dear Sir:

Re: Strata Plan LMS 280 – Chateaux Comox
1272 Comox Street, Vancouver, BC
Window Replacement, Re-Cladding and Associated Work
– Homeowner Protection Office
– PST Relief Grant for Leaky Building Repairs – Application

We enclose for your signature, as well as that of one more representative of the Strata Council, the Homeowner Protection Office Application for PST Relief Grant for Leaky Building Repairs. After signing this document, kindly return the original to this office for compilation with other application documents so that we may complete this application on your behalf.

Should you have any questions, please do not hesitate to contact the undersigned.

Yours truly,
SPRATT EMANUEL ENGINEERING LTD.
Per:



Mark W. Emanuel, P.Eng.
Principal

MWE/tb/encl.

cc: Ms. Jenny Liu, Southview Property Management (email: jennyliu@telus.net)

ABOUT THE REPAIRED BUILDING

Name of original Developer/Builder: Unknown

Date originally built (mm/yy): 1992

Name of original Architect: F. Adab Architects

ABOUT THE REPAIR PROJECT (for phased repair projects please provide details for the current phase only)

Date repairs started (mm/dd/yy): 08/01/08 Date repairs completed (mm/dd/yy): 05/06/2009

Name of building envelope consultant: Spratt Emanuel Engineering Ltd.

Name of contractor who completed the repairs: Ocean West Construction Ltd.

Total cost of repairs net of GST: $715,553.38

3. APPLICANT

A. MULTI-UNIT BUILDINGS:

Name of building or housing co-operative: CHATEAU COMOX

Strata corporation number: Strata Plan LMS 280

Name of strata corporation chair or housing co-operative president: Kevin Wice, Strata President Phone: (H) ( ) (W) (604) 473-9343

Name of property manager: Jenny Liu Phone: (W) (604) 270-8811

Name of property management firm: Southview Property Management Phone: (W) (604) 270-8811

Total number of units in building 21 (give breakdown of units below)

Bachelor ____ Two bedrooms 7 4+ bedrooms ____

One bedroom 7 Three bedrooms 7 Commercial ____

B. SINGLE FAMILY DWELLING OR DUPLEXES:

Name of each registered owner: Phone: (H) ( ) (W) ( )

Phone: (H) ( ) (W) ( )

Phone: (H) ( ) (W) ( )

WHO SHOULD WE CONTACT TO DISCUSS THIS APPLICATION?

Name: Mark W. Emanuel, P.Eng.

Telephone: Home: ( ) Work: (604) 872-1211

Our File No. S08-273

Application
PST Relief Grant for Leaky Building Repairs

Homeowner Protection Office

1. ELIGIBLE REPAIRS

Provincial Sales Tax (PST) grants are only available for repairs needed as a result of a premature building envelope failure where the repairs were completed on or after July 28, 1998. An engineer or architect must complete the certificate included with this application and will confirm that the damage to your home resulted from a premature building envelope failure.

Is the PST grant you are requesting solely for the PST paid on eligible repairs? ☒ Yes ☐ No

Applications for the PST grant must be made after the repairs are complete, and paid for (except the hold back required under the *Builders Lein Act*, if applicable). The contractor who completed the repairs must sign the statutory declaration included with the application and will confirm that the repairs are complete and will certify that the total cost of the repairs has been paid.

Have the eligible repairs to your home been completed and paid for? ☒ Yes ☐ No

Only one PST grant will be provided for a building, except in the case of a phased repair (see below).

Is this the first PST grant application for this building? ☒ Yes ☐ No

For a phased repair project to qualify for multiple PST Relief Grants the following criteria must be met:

1. Each grant application must be for repairs totaling a minimum of $500,000 (before GST) except the last application which can be less, but will be considered the final submission for the project.
2. At least three months must have elapsed since the latest submission.
3. Each subsequent submission will require a new application package to be completed which provides information on the phase of repairs currently being submitted for the grant.
4. All repair work being submitted must be completed and the total cost of repairs paid (except for the hold back required under the *Builders Lien Act*).

Is this the final/only phase of repair for this building? ☒ Yes ☐ No

Note: The PST grant is determined by the following formula: Total cost of repairs x 40% x 7%.
Where 40% is the approximate cost of repairs subject to PST (only materials are subject to PST, labour is not)

2. REPAIRED BUILDING

WHAT IS THE ADDRESS WHERE THE WORK WAS DONE?

Street Address: 1272 Comox Street

City/Town:	Province:	Postal Code:
Vancouver	British Columbia	V6E 1K7

Mailing Address: 1272 Comox Street (attention: Kevin Wice) Apt. No.: #701

City/Town:	Province:	Postal Code:
Vancouver	British Columbia	V6E 1K7

CHECK THE TYPE OF HOME THAT WAS REPAIRED

☐ 001 Single ☐ 003 Duplex ☒ 006 Condominium / Apartment
☐ 002 Semi-detached ☐ 004 Townhouse ☐ 009 Other

4. DECLARATION AND AGREEMENT

I/We declare that all information on this application is accurate and complete in all respects.

I/We authorize the Homeowner Protection Office (HPO) to inspect all information, documents, books and records in connection with the PST grant application and to provide the HPO with copies of such documents, books and records as the HPO may direct.

I/We acknowledge that the HPO is subject to the provision of the *Freedom of Information and Protection of Privacy Act.*

I/We acknowledge that the British Columbia Assessment Authority requires the Homeowner Protection Office to report strata corporations that have received PST Relief Grants so the assessed values of these buildings can be adjusted to reflect that repairs have been performed to the building envelopes.

Signature	KEVIN WICE	Date (mm/dd/yy)	01/25/10.
Signature		Date (mm/dd/yy)	
Signature		Date (mm/dd/yy)	
Signature		Date (mm/dd/yy)	

Note: In the case of multi-unit buildings, this application must be signed by at least two representatives of the strata council or co-operative housing society board as appropriate.

In the case of single family dwellings or duplexes, this application must be signed by each registered owner.

SPRATT EMANUEL
ENGINEERING LTD.

2348 Yukon St
Vancouver, BC
Canada V5Y 3T6
Phone 604 872-1211
Fax 604 872-1274

STATEMENT OF ACCOUNT

Jenny Liu
Strata Plan LMS 280 - Chateau Comox
c/o Southview Property Mgmt
110 - 7580 River Road
Richmond, BCV6X 1X8

Client ID#: S273

Statement As Of: January 19, 2010

Transaction Type	Invoice	Date	Amount	Total
S08-273 Strata Plan LMS 280 - Chateau				
Issued invoice	14160	11/30/2009	498.75	
	Balance Due:			**498.75**

Project LMS280
Date Rec'd JAN 25 2010
Price Check
Ext. Checked
H.B.
Disc.
A/C Amt.
A/C Amt.
A/C Amt.
Approved
Date Paid
Cheque #

Outstanding	Current	31-60 Days	61-90 Days	Over 90 Days
498.75	0.00	498.75	0.00	0.00

SE | SPRATT EMANUEL
ENGINEERING LTD.

2348 Yukon Street
Vancouver, BC
Canada V5Y 3T6
Phone 604 872-1211
Fax 604 872-1274

Our File No. S08-273
November 23, 2009

Strata Plan LMS 280 – Chateau Comox
Southview Property Management
110 - 7580 River Road
Richmond, B.C. V6X 1X6
(Email: jennyliu@telus.net)

Attention: Jenny Liu

Dear Ms.:

Re: Strata Plan LMS 280 – Chateau Comox
1272 Comox Street, Vancouver, BC
- Window Replacement, Re-Cladding and Associated Work
- Outstanding Deficiencies

At the request of Mr. Kevin Wice, Spratt Emanuel Engineering Ltd. (SEE) has been in contact with Mr. Graham Finn of Ocean West Construction Ltd. (OWC) to get his input on the final list of Deficiencies, as compiled by Mr. Wice. The list, along with the comments of both OWC and SEE are as follows:

1. Unit# 802 - Awaiting the replacement of a scratched Insulated Glazing Unit.
    1. OWC has indicated that this window unit was replaced during the week of November 16th.
2. Unit #801 - Requesting $200 for broken planter pots.
    1. OWC claims that the pots were handled exclusively by the roofing contractor, and as such any claims should be brought to their attention.
    2. SEE has no way of knowing who moved, and subsequently broke them. Without proof it is not reasonable to expect OWC to pay for damages.
3. Unit #501 - Awaiting the replacement of a damaged door screen that was removed and reinstalled by OWC.
    1. OWC has agreed to either have the screen replaced, or send the owner a check for $200, which ever the owner prefers.
    2. SEE feels that this is a reasonable solution. Please send OWC the owners contact information such that the matter may be resolved.
4. Leaking scupper catch basin at penthouse, south elevation.
    1. OWC claims that they have been on site 2 or 3 times to clean out the scupper catch basin of organic matter, i.e. leaves etc. They also claim that a permanent fix has been described to the owner. The fix involves the installation of a screen over the balcony scupper, or alternatively, the insertion of a stainless steel brillo pad into it.

OWC took the opportunity to bring up the fact that the Lien hold back is 145 days overdue, as of today's date, and that interest is payable on overdue accounts.

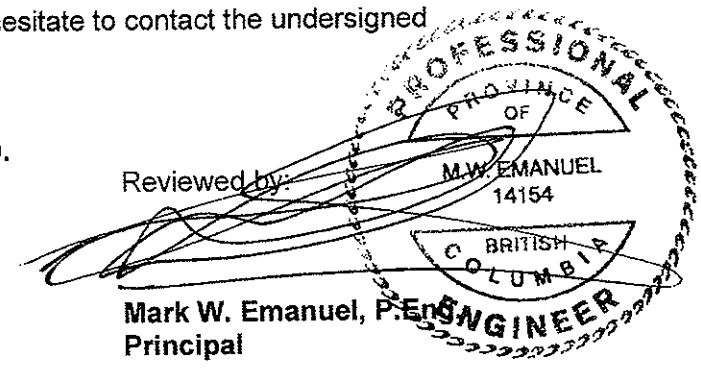
As describe in SEE's letter of September 29th. 2009, the Lien Holdback may not be used as a Deficiency Holdback. They are entirely separate entities. SEE advises that the full amount of **$75,133.10** for the Lien Holdback must be paid without delay.

If you have any questions, please do not hesitate to contact the undersigned

Yours truly,
SPRATT EMANUEL ENGINEERING LTD.
Per:

Richard Osborne, B.Eng., E.I.T.
Project Consultant

Reviewed by:



Mark W. Emanuel, P.Eng.
Principal

RO

cc:
Kevin Wice, Strata Owner. (Email: krw@krw.com)
Graham Finn, Ocean West Construction Ltd. (Email: gfinn@oceanwestconstruction.com)

Terry Ireland

From: Jenny Liu [jennyliu@telus.net]
Sent: November 20, 2009 2:34 PM
To: krw@krw.ca; pfrancis_1@shaw.ca; brucesquared@shaw.ca; gbalaski@telus.net; jalord@shaw.ca; jmcv@telus.net; beancntr77@shaw.ca; strata.president@krw.ca; tireland@telus.net
Cc: rosborne@sprattemanuel.com
Subject: RE: Recommend Paying Ocean West Holdback...
Attachments: 2009 09 Sep 280FS.pdf; 2009 09 02 280building envelope.pdf

Thanks Kevin. Yes, we are illegally holding the cheque after October and I have realized it and informed Jeff in our office. Our accounting department has cancelled the cheque because it waited for the completion and approval so long time and the bank will not recognized it. The PST rebate will be at least one month available after Ocean West and Spratt Emanuel has been fully paid. Now we are in shortfall of paying these bills until the PST refund is available.

Best Regards,

Jenny

From: Kevin Wice [mailto:krw@krw.ca]
Sent: Thursday, November 19, 2009 5:41 PM
To: Jenny Liu; pfrancis_1@shaw.ca; brucesquared@shaw.ca; gbalaski@telus.net; jalord@shaw.ca; jmcv@telus.net; beancntr77@shaw.ca; strata.president@krw.ca; tireland@telus.net
Cc: rosborne@sprattemanuel.com
Subject: Recommend Paying Ocean West Holdback...

Greetings Everyone.....

I am pleased to report that everything is almost finished in the deficiency list with Ocean West.

I am recommending that Council request Southview to release the hold back monies to Ocean West, except for $5000.

The following items appear to still be outstanding.

1. A cheque is owed to Stan Bennet, for $200 for the planter pots that were damaged by Ocean West during contruction.

2. Two screen doors on the outside patio doors, in suite #501 were damaged by Ocean West during the contruction. They still need to be replaced or repaired.

3. Two glass panes still need to be replaced in #802, (although I think this has been done now)

I was informed by Ocean West, that we are actually holding back the monies unlawfully, and that Spratt Emanuel, the engineer, was suppose to have done a value assessment on the deficiency list and we should only be holding this amount.

Nonetheless, everything is basically complete accept for what is noted above, which is why I suggest

that we reduce the hold back to only $5000.00

Could I please ask council to respond to this email, to authorize Jenny to release these funds.

I have cc'd Richard, from Spratt Emanuel on this email as well, so he knows that this is being done.

It is nice to know that now that the rain is here, we will all finally be dry.

Thanks everyone,

Cheers
Kevin.

PS. Please note I will be leaving for China on Saturday, and will be gone for two weeks with limited access to email. Thx.

XYNYTH
Manufacturing Corp.

Memo

To: Kevin Wice

From: William Ng, CGA

CC: File

Date: 10/15/2009

Re: Audit report for Strata Chateau Comox

As per your instruction, I went to Southview Property Management to do an audit review for the Strata Chateau Comox's Account on October 8, 2009. I reviewed the ledger accounts for the following 3 special projects: Building Envelope Restorations, Roof Replacement and the Sealed Window Replacement. Please find below with my audit procedures and the results of my findings.

1. **Vendors' invoices are matched with general ledger**

   I went through and verified all the vendors' invoices, which were submitted to Lisa at Southview, and confirmed that they matched and were correctly entered in the general ledger

2. **Southview Commissions being charged correctly**

   I went through all the commissions which were paid to Southview Property to ensure they were being charged properly (3% plus GST on all vendor invoices). I found out two commissions were recorded incorrectly.

   i) on one invoice I found the GST was recorded incorrectly. So total commission (including GST) should be $113.81 instead of $169.76 – a difference owing to the strata corp of $55.95

   ii) on a second invoice I found a another error. Instead of charging 3%, Southview charged the strata in error 30%. So total commission on this given invoice (including GST) should be $1,340.52 instead of $1,489.53 - a difference owing to the strata corp of $1,340.52

3. **Special Levy Schedules payments matched with General Ledger**

   I checked the five special levy payment schedules to ensure that all the monies owed by the owners were collected correctly and they did in fact match with the General Ledger.

4. **PST Rebate**

   I spoke to Lisa regarding the PST filing and the rebate amount. She told me that I need to talk to Jeff to find out how much the rebate was for and whether they have filed it or not.

Corporate Office:
122 – 3989 Henning Drive
Burnaby, BC. Canada
V5C 6N5
Tel. (604) 473-9343
Fax. (604) 473-9399

5. **Outstanding balance on each account**

I noticed that the following deficit has been noted on the following special projects.

- Building Envelop Restoration - shortfall of $20,434.44 (likely close to the amount of the PST rebate)

- Roof Replacement – shortfall of $868.77

- Sealed Window Replacement – shortfall of $3,657.86 – not aware of this?
– was supposed to be fixed Price
Judy

6. **Balance transferred to cover shortfall**

I noticed that Southview transferred $25,000 on August 17th to cover the shortfall, as opposed to the amount of $20,000, that Kevin mentioned was agreed upon at the SGM. It was noted that this was a temporary loan which is to be paid back once the PST refund comes in.

CONCLUSION.

I went through all the above issue with Lisa and she said she will deposit the commission difference for the amount of $1,396.47 to the strata account.

I would suggest that the Strata Council might want to check to ensure the $25,000 borrowed from the reserve account is put back when the PST funds are received.

All in all the records were kept in very good shape.

LMS 280 Chateau Comox

Window Replacement Project Deficiency List

As at: October 1st, 2009

Suite #	Details of Deficiency	Date Completed	Rec'd Owner Sign Off	Comments
201	[illegible]		DONE	
202	[illegible]		DONE	
301	pillar in living room - marked up from construction			
	Blinds are not proper			
401	[illegible]		DONE	owner has now agreed this acceptable
	[illegible]		DONE	owner has now agreed this acceptable
	[illegible]		DONE	owner has now agreed this acceptable
	[illegible]		DONE	owner has now agreed this acceptable
	[illegible]		DONE	owner has now agreed this acceptable
	[illegible]		DONE	
	Outside of the living room and balcony door there are quite a few screw holes without any screws. This would leave me to wonder if the windows are sealed properly. I believe these holes give access to tehe lements and we could end up getting moisture in.			
	new window has several scratch marks			
	[illegible]		DONE	
402	Livingroom blinds missing - not put back			
	new window has a scratch mark			
501	See June 11 e-mail			
601	Living room blinds - not sized			
701	[illegible]		DONE	owner confirms issue has been corrected.
702	[illegible]		DONE	
801	[illegible]		DONE	
	[illegible]		DONE	
	4 broken pots $50.00 / each			
	Patio door lock - not working			
802	[illegible]		DONE	
	[illegible]		DONE	

	Two windows have spray and small dots etched into them			
	[illegible]		**DONE**	
	East original balcony door that was removed and replaced leaked at the centre seam			
	East & West original balcony doors - screws were not replaced, there are holes in the frame			
	East Balcony Door - leaked at the center seam			
EXTRAS	[illegible]		**DONE**	issue has been corrected
	[illegible]		**DONE**	contractor had a photo showing this was missing
	The real estate sign post has not been re-installed in it's original location.			
	There is a bracket mounted on the building in the westside stairwell that was used to support the electrical cable.			
	The 8th floor scupper drains should be water tested to ensure there are no leaks. A couple of weeks ago there was an excessive amount of water coming from the southwest copper enclosure. Was it plugged or not properly soldered			
	New downspout on the south west corner of Suite 802 is not working properly during rain fall water is overflowing.			
	Two areas of stucco that were requested to be re-stuccoed on the back of the building -- 5th floor and the 8th floor - are not done.			

LMS 280 Chateau Comox

Window Replacement Project Deficiency List

As at: September 8th, 2009

Suite #	Details of Deficiency	Date Completed	Rec'd Owner Sign Off	Comments
201	extension cord left on balcony			
202	new window has a scratch mark			
301	pillar in living room - marked up from construction			
	Blinds are not proper			
401	The balcony railings - when they removed the old railings they had to cut off two of the lower legs. When they reinstalled the new ones they bracketed (huge) two pieces together and the other piece they inserted a thinner piece of metal. The new metal is newly painted and it plainly shows a difference. It is my understanding that when all is said and done,			owner has now agreed this acceptable
	we should have everything as was. This is shoddy workmanship, unsightly, and not what was originally there. They should either repaint the whole railing or replace new railings (perhaps painting them black).			owner has now agreed this acceptable
	Previous balcony electrical outlet covers were metal - new ones are plastic			owner has now agreed this acceptable
	Balcony support legs - not right			owner has now agreed this acceptable
	deck flooring has a noticeable indentation (dip)			owner has now agreed this acceptable
	Bedroom window - bottom flashing pulled away from the wall and is dented and bent			
	Outside of the living room and balcony door there are quite a few screw holes without any screws. This would leave me to wonder if the windows are sealed properly. I believe these holes give access to tehe lements and we could end up getting moisture in.			owner has now agreed this acceptable
	new window has several scratch marks			
	living room drapes not returned and hung			
402	Livingroom blinds missing - not put back			
	new window has a scratch mark			
501	See June 11 e-mail			
601	Living room blinds - not sized			
				owner confirms issue has been corrected.
701	Exterior Balcony Plug - not working			
702	Balcony rainling glass - is stained from stucco work residue from Suite 802's work			
801	Living room blinds - not sized			
	Balcony Glass - not re-installed			
	4 broken pots $50.00 / each			
	Patio door lock - not working			
802	Balcony Glass - not re-installed			
	East balcony - six inch strip that has not been repaired or painted			

	Two windows have spray and small dots etched into them			
	Patio door lock - not working			
	East original balcony door that was removed and replaced leaked at the centre seam			
	frame			
	East Balcony Door - leaked at the center seam			
EXTRAS	The drain pipe in front of the builiding is not connected - picture attached			
	Fire stand pipe at the front of the builiding is missing 'Fire Dept' ring			issue has been corrected
	The real estate sign post has not been re-installed in it's original location.			
	There is a bracket mounted on the building in the westside stairwell that was used to support the electrical cable.			
	The 8th floor scupper drains should be water tested to ensure there are no leaks. A couple of weeks ago there was an excessive amount of water coming from the southwest copper enclosure. Was it plugged or not properly soldered			
	New downspout on the south west corner of Suite 802 is not working properly during rain fall water is overflowing.			
	Two areas of stucco that were requested to be re-stuccoed on the back of the building -- 5th floor and the 8th floor - are not done.			

Building Envelope Deficiency List

SUITE	Deficiency List	Done		Done
201	extension cord left on balcony			
202	new window has a scratch mark			
301	pillar in living room - marked up from construction			
	Blinds are not proper			
302				
401	The balcony railings - when they removed the old railings they had to cut off two of the lower legs. When they reinstalled the new ones they bracketed (huge) two pieces together and the other piece they inserted a thinner piece of metal. The new metal is newly painted and it plainly shows a difference. It is my understanding that when all is said and done,		we should have everything as was. This is shoddy workmanship, unsightly, and not what was originally there. They should either repaint the whole railing or replace new railings (perhaps painting them black).	
	Previous balcony electrical outlet covers were metal - new ones are plastic		**Balcony support legs - not right**	
	new window has several scratch marks			
	living room drapes not returned and hung		deck flooring has a noticeable indentation (dip)	
	Bedroom window - bottom flashing pulled away from the wall and is dented and bent		Outside of the living room and balcony door there are quite a few screw holes without any screws. This would leave me to wonder if the windows are sealed properly. I believe these holes give access to tehe lements and we could end up getting moisture in.	
402	Livingroom blinds missing - not put back			
	new window has a scratch mark			
501	See June 11 e-mail			
601	Living room blinds - not sized			
701	Exterior Balcony Plug - not working			
702	**Balcony rainling glass - is stained from stucco work residue from Suite 802's work**			
801	Living room blinds - not sized		4 broken pots $50.00 / each	
	Balcony Glass - not re-installed		Patio door lock - not working	
802	Balcony Glass - not re-installed		East balcony - six inch strip that has not been repaired or painted	
	Two windows have spray and small dots etched into them		Patio door lock - not working	
	East original balcony door that was removed and replaced leaked at the centre seam		East & West original balcony doors - scrwes were not replaced, there are holes in the frame	

Building Envelope Deficiency List

	East Balcony Door - leaked at the center seam			
EXTRAS				
	The drain pipe in front of the builiding is not connected - picture attached			
	Fire stand pipe at the front of the builiding is missing 'Fire Dept' ring		The real estate sign post has not been re-installed in it's original location.	
	There is a bracket mounted on the building in the westside stairwell that was used to support the electrical cable.		There are two broken concrete slabs north of the sidewalk in front of the building that were broken eraly on during a delivery.	
	The 8th floor scupper drains should be water tested to ensure there are no leaks. A couple of weeks ago there was an excessive amount of water coming from the southwest copper enclosure. Was it plugged or not properly soldered		**New downspout on the south west corner of Suite 802 is not working properly during rain fall water is overflowing.**	
	Two areas of stucco that were requested to be re-stuccoed on the back of the building – 5th floor and the 8th floor - are not done.			

CHATEAU COMOX

Strata Plan LMS 280

1272 Comox Street, Vancouver, BC

BUILDING ENVELOPE MAINTENANCE MANUAL

Produced by:
SPRATT EMANUEL ENGINEERING LTD.
2348 Yukon Street
Vancouver, B.C., V5Y 3T6
Tel: 604-872-1211
Fax: 604-872-1274

Date: June 12, 2009

File No. S08-273

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7.0 APPENDIX A: CMHC – Condensation

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10.0 APPENDIX D: Inspection Record Forms

10.1 Homeowner Inspection Check List (10 copies)
10.2 Common Area Inspection Check List (10 copies)
10.3 Maintenance Report Form (10 copies)

This document has been produced for Strata Plan LMS 280, by Spratt Emanuel Engineering Ltd. The contents of this manual are intended to assist the owners and their agents in the care and maintenance of the building located at 1272 Comox Street, Vancouver, BC only. Spratt Emanuel Engineering Ltd. is not responsible for the implementation of a maintenance program nor does it assume responsibility for the effectiveness of such a program.

The information in this Manual is intended for the sole use of Strata Plan LMS 280, who further agree to indemnify and hold harmless Spratt Emanuel Engineering Ltd. from any and all liability, which Strata Plan LMS 280 may incur as a result of the use or misuse of this information.

1.0 INTRODUCTION

1.1 TERMS OF REFERENCE

Spratt Emanuel Engineering Ltd. was retained by Strata Plan LMS 280 to provide Building Envelope Consulting Services for the construction of The Chateau Comox, which is located at 1272 Comox Street, Vancouver, B.C. Chateau Comox is an 8-storey concrete high-rise building comprised of 21 residential units and an underground concrete parkade.

The objective of this maintenance manual is to assist the Owners of Chateau Comox with the design and implementation of a maintenance program for the building exterior. As outlined in the Homeowner Protection Act of British Columbia, damages that occur as a result of a lack of proper maintenance can be excluded from coverage. Therefore, it is important for the Owners of Chateau Comox to follow the maintenance program, which is intended to keep the building in good and serviceable repair and to maximize the expected life span of exterior building systems and materials.

This manual includes specific information relative to the materials utilized in the construction of the building located at 1272 Comox Street. In addition, an estimate of projected costs associated with normal building maintenance and repairs is provided.

1.2 SCOPE OF SERVICES

The scope of our services was to provide engineering design, drawings, and quality assurance during remediation construction. As part of those responsibilities, we are providing information relating to the necessary maintenance functions for the building envelope material. This manual is intended to assist the owners in developing an item specific maintenance program that would include:

- ***Verification of building materials utilized in the construction of the building***
- ***Annual maintenance requirements of the various building components***
- ***Life expectancy of building materials***
- ***Schedule of estimated expenditures for budget purposes***

1.3 TERMINOLOGY

There are a number of building construction terms which are used in this manual that may not be familiar to the layman; therefore they are described below for reference purposes.

Balcony – refers to a horizontal surface generally exposed to the outdoors and projected from the building so that it is not located over interior areas.

Cladding – refers to a material or assembly that forms the exterior skin of a building wall.

Deck – refers to a horizontal surface area designed for pedestrian traffic, which is exposed to the outdoors and located over an enclosed interior area.

Efflorescence – refers to the dissolved mineral salts, which appear as a white dusty stain on the surface of cementitious materials such as concrete, brick and stucco. Water collects these mineral salts as it passes through the material and deposits them on the surface when it evaporates.

Envelope – refers to the exterior portion of those parts of a building, which separate interior areas from the exterior atmosphere and include such things as windows, doors, walls, and roofs.

Flashing – refers to sheet metal or other material used in roof and wall construction, which is designed to shed water. Different types of flashing are:

- **Cap flashing** – installed on top of a wall, pier, column or chimney
- **Saddle flashing** – a right angle piece of flashing installed at the transition of a horizontal to vertical surface.
- **Head or sill flashing** – installed at head or sill of a window or other through-wall penetration such as an exhaust vent.
- **Base flashing** – installed at the base of a wall.
- **Step flashing** – installed under one material and lapped overtop of another material below in a shingle fashion.
- **Through-wall flashing** – installed in a rain-screen wall system typically at each floor level. This flashing is intended to shed water from the moisture barrier plane of the cavity to the exterior face of the wall in addition to providing weather protection at the top of each cavity.

Gum-lip – refers to a method of sealing a metal flashing to a wall surface whereby the top edge of the metal flashing is bent outwards to form a lip that accommodates a caulking sealant.

Lite – refers to an individual glazing unit of a window assembly.

Low E Soft Coat – refers to a coating applied to glass, which is extremely effective at reflecting thermal radiation from the sun back out to keep the interior cool in the summer and to reflect internal radiation back in during the winter to keep the interior warm.

Maintenance – refers to a regular process of inspection, repair and renewal of aging and deteriorating materials, products and building systems.

Membrane – typically refers to a continuous waterproof material used to prevent water penetration.

Movement Joint – refers to a joint in the building envelope that allows differential movement of portions of the building structure (expansion joint), or prevents or localizes cracking of brittle materials, such as stucco, where movement needs to be controlled (control joint).

Penetration – refers to a hole passing through the building envelope in which ducts, electrical wires, pipes, and fasteners are run between inside and outside.

Parapet – the part of any wall entirely above the roof.

Rain-Screen – refers to a building cladding system installed in such a way as to provide a space between it and the wall sheathing beneath. The space, or cavity, is usually vented at each floor level and provides a path for air circulation and drainage for any incidental water that may enter the wall system.

Saddle – refers to the transition of small horizontal surfaces, such as the top of a balcony guardrail or parapet wall, with a vertical surface, such as a wall.

Scupper – refers to a horizontal drain, which generally passes through a wall. They are typically made up of a piece of pipe or a metal trough.

Sheathing – refers to a sheet material such as plywood, which is used to cover the framing assemblies of a roof or wall system. The sheathing provides structural stiffness in addition to providing backing for the cladding or roofing.

Substrate – refers to an underlying material, which is often relied on for adhesion of the covering material.

UV – refers to ultra violet radiation (from the sun), which has a degenerative affect on many building materials.

1.4 BUILDING DESCRIPTION

The renovated building, The Chateau Comox, located at 1272 Comox Street is an 8-storey residential building of non-combustible concrete construction.

Building Summary	
Building Name	Chateau Comox
Building address	1272 Comox Street, Vancouver, B.C.
Builder	Unknown
Lot Zoning	High-rise residential
Architect	F. Adab Architects
Developer	Unknown
Owner	Strata Plan LMS 280
Building Type	Concrete high-rise
Number of Units	21
Principal Occupancy	Residential
Other Occupancy	None
Date of Construction	1992
Applicable Building Code	Vancouver Building By-Law, 6134
Type of Construction	Non-combustible construction: Cast-in-Place Concrete
Sprinklered	Yes
Site Area	Unknown
Floor Area	Unknown
Window Type	Thermally broken aluminium frames with insulated glazing units
Window Colour	White
Number of Stories	8 Levels
Parking	1-level underground parkade

The exterior walls at Chateau Comox are composed of concrete with stucco cladding. The building components of the exterior walls are as follows:

Wall Type 1:

Exterior Concrete Walls:

- Imasco Flexcoat Acrylic Finish
- Exterior concrete
- 3 5/8" structural steel studs @ 16" O.C.
- R-14 fiberglass batt insulation
- 6 mil UV – rated polyethylene vapour / air barrier
- ½" interior gypsum wallboard

Wall Type 2:

Exterior Infill Walls with Rainscreen Stucco Cladding:

- Imasco Flexcoat Acrylic Finish
- ¾" Imasco Greatwall base coat
- 2" – Z-girts
- 1" Roxul exterior insulation
- Tyvek commercial wrap
- Dens-Glass Gold exterior gypsum wallboard sheathing
- 6" steel studs
- R-20 fibreglass batt insulation
- 6 mil – rated polyethylene vapour / air barrier
- ½" interior gypsum wallboard

Windows: The windows installed at 1272 Comox Street are aluminium framed, 45 Series manufactured by Allied Windows. The sliding doors are also 45 Series by Allied Windows. The windows utilize argon-filled insulated glazing units, with Low E coatings. The windows units have both fixed and opening "lites", which are either of casement or awning construction. They are installed in rough concrete openings with concrete curbs at the sills. All window sills and jambs are detailed with 40-mil peel-and-stick waterproof membrane and at the window heads a deflection header is back-caulked to the substrate. All windows are fastened with screws into aluminium mounting angles.

The roof system is comprised of:

- Gravel ballast
- Filter fabric
- SBS torch-on membrane
- Concrete slab sloped to drain

The balcony surfaces are coated with Urelastic 5000 polyurethane base coat complete with Urelastic 6000 topcoat. All balconies are sloped to drain.

2.0 MAINTENANCE OVERVIEW

2.1 GENERAL

The maintenance of building exteriors has long been recognized as an important factor in the overall performance of building structures. The exterior Building Envelope consists of roofing, exterior wall claddings, windows, insulation and waterproofing membranes. In the British Columbia Homeowner Protection Act, building envelope maintenance is stated as a requirement of the building owners. It is also described, in a number of technical publications, as being crucial to the long-term performance of the building envelope assemblies and materials.

Regardless of the design or the materials used, all exterior building envelope assemblies require maintenance in order to realize their full service life. Building exteriors are subjected to harsh environmental conditions such as wind-driven rain and snow, in addition to extreme temperature variations and air-borne contaminants. These conditions breakdown the building materials; therefore, building inspection and repair is a continuous requirement of building owners if they expect to realize longevity from their buildings and cost effectiveness from their operating budgets.

Building exteriors are made up of a variety of building materials and components attached together through various means into what are commonly referred to as assemblies or systems. They are designed and constructed to provide separation of the interior and exterior environments. They control a number of factors such as temperature, humidity, air pressure and moisture. Thus, the exterior building system is instrumental in providing the comfortable atmospheres that we enjoy in modern buildings today. The relentless task of maintaining the serviceability of these assemblies requires a basic understanding of their function and the prudent implementation of a program that regularly addresses the requirements of each component in the assembly. An exterior maintenance program should include: a review process to identify the condition of materials and the potential for problems; a repair process to renew damaged and deteriorated materials; and a replacement process to replace entire systems, such as roofs, when their expected service life has been achieved.

2.2 BUILDING REVIEW

In order to assess the condition of exterior building materials and identify items requiring repair, visual inspections should be carried out at regular intervals. The frequency of inspections varies depending on the nature of the components being reviewed. Components that are critical to the performance of a waterproofing system or moisture barrier, such as sealants or roof drains, require more frequent inspections to minimize the potential of their failure. In contrast, components that are associated more with the aesthetics of a building, such as paint, are less critical and their inspection frequency is longer.

The deterioration of building materials is often identifiable during a brief visual inspection by a change in their appearance. Fading, discolouration, cracking and separation can all be signs of potential problems in certain building materials. When items are identified as needing repair or replacement, proper documentation of the specifics is fundamental to a successful maintenance program. Recording the date and exact location of the observation, in addition to the nature of the abnormality are all-important aspects of the inspection process. The function of a particular material and the importance of that material to the performance of the building assembly are covered in more detail later in this manual. Additionally, abnormalities, associated with specific materials are also covered in greater detail later in this manual.

Accessibility to the building exterior is also an important issue. Inspection of limited common areas such as balconies should be part of every homeowner's responsibilities. Homeowners cannot reasonably conduct inspections of roofs and high wall areas so an alternate means must be sought. Contractors that perform regular building maintenance functions, such as window cleaners, can sometimes be utilized in the maintenance review process. However, there can be drawbacks from utilizing contractors that may not be experienced or knowledgeable in a certain area, or from contractors that stand to benefit from repair work that they may recommend. Periodic inspection by a qualified, independent party, such as a building envelope engineer is necessary to ensure maintenance requirements are correctly identified.

2.3 BUILDING REPAIR

When repair requirements on building assembly items that are critical to moisture protection have been identified through the inspection process, remedial action should be taken at the earliest opportunity. Repairs may take the form of a temporary or interim fix, they may be of a more permanent nature depending on what point in time in the life expectancy of the assembly the repair requirement becomes evident. Repair requirements on less critical exterior building components should be recorded for scheduling and future reference purposes. Keeping record of what remedial action is required or has been taken on the building, and frequency of when it was performed, will prove extremely helpful in evaluating annual maintenance requirements and budget expenditures. The scheduling of major renewal projects will be greatly influenced by the information contained in the maintenance records. For an example, increased frequency in minor roof membrane repairs is an indication that roof system is nearing the end of its life expectancy and scheduling for replacement should be planned.

2.4 MATERIAL REPLACEMENT

A regular program of building care includes maintenance and repair as well as a plan for replacement. Replacement planning refers to the regular replacement or renewal of components such as roof or deck membranes or paint, which have finite life expectancies.

Renewal projects are generally of a large scale and should therefore be scheduled and budgeted for well in advance of their requirement. It is important to recognize that even minor repair items can have a significant impact on the eventual cost of replacement projects. Additionally, the timeliness of replacement projects can also significantly impact the cost. Water ingress could result from a simple repair item, such as sealant failure at the edge of the balcony membrane or from cracks in the membrane material as it nears the end of its life expectancy, if replacement is postponed.

2.5 BUDGETING

Budgeting for exterior building maintenance should be categorized as a separate line item in the operating budget for a strata-titled property so that the significance of this requirement is not overlooked. The complexity of the building exterior maintenance function, which includes the eventual renewal of major building components such as roofs, requires advanced planning to estimate the long term costs associated with this budget category. A good understanding of the costs associated with building renewals and replacements, in addition to the life expectancy of the different materials, is beneficial for accurately forecasting major expenditures. Amortizing these expenditures over a long period of time mitigates their financial impact on the building owners and insures that funds are available for repairs when they are most needed. A schedule of costs associated with building maintenance is included later in this manual.

3.0 MAINTENANCE OPERATIONS

3.1 INSPECTION

Inspections of the building exterior need to be performed by each individual owner and a designated maintenance body. Homeowners have easy access to the building exterior via their balconies to assist in this maintenance function. Typically, the changing of the seasons presents an excellent opportunity to review exterior building components and assess the impact of the latest environmental conditions on their performance. It is important to be aware of the age of specific building materials as each has its own life expectancy. Signs of aging include fading or discolouration, blistering, peeling, cracking and separation, which are all things that an inexperienced homeowner can easily identify. Cleaning the building exterior is a good means of providing an opportunity to observe building materials up-close.

Accessibility to the building exterior is also an important issue. Inspection of limited common areas such as balconies should be part of every homeowner's responsibilities. Homeowners cannot reasonably conduct inspections of roofs and high wall areas and therefore designated strata members or contractors must be used to review these areas. Contractors that perform regular building maintenance functions, such as window cleaners, can sometimes be utilized in the maintenance review process. However, there can be drawbacks from utilizing contractors that may not be experienced or knowledgeable in a certain area, or from contractors that stand to benefit from repair work that they may recommend.

Independent consultants specializing in building maintenance and investigation are often equipped to access difficult areas and can provide detailed information and an objective opinion.

3.2 SCHEDULING

The following table outlines the minimum frequency of inspections that should be done in order to assess the condition of noted building components. It is not possible to itemize all the specific areas on a building where a potential problem may develop or the scenarios that may constitute a potential problem; therefore, it is important to utilize qualified personnel in the maintenance review process periodically.

MAINTENANCE SCHEDULE

Component	Items to Review	Frequency
Sealant	Inspect sealant for cracking, loss of adhesion, bulging or lack of flexibility.	Annually
Windows and Balcony Doors	Inspect weather-stripping, seals, weep holes and especially perimeter sealant and flashing slope.	Annually
Exhaust Vents	Inspect for lint accumulation in screens, corrosion, and perimeter sealants.	Semi-Annually
Doors	Inspect hardware, weather-stripping and alignment.	Annually
Flashings	Inspect for corrosion, proper slope and joint sealant failure.	Annually
Deck Membranes	Inspect for damage, wear, blistering, peeling, splitting or drain blockage.	Annually
Roof Systems	Inspect for exposed waterproofing membrane, loss of ballast, drain blockage.	Annually
Concrete	Inspect for cracking, spalling or staining.	Annually
Paint	Inspect for staining, discolouration, fading, chalking, peeling, cracking or blistering.	Annually

4.0 SCHEDULE OF COSTS

Budgeting for exterior building envelope maintenance should be categorized as a separate line item in the operating budget for a strata property so that the significance of this requirement is not overlooked. The complexity of the building envelope exterior maintenance function, which includes the eventual renewal of major building envelope components such as roofs, requires advanced planning to estimate the long term costs associated with this budget category. A good understanding of the costs associated with building envelope renewals and replacements, in addition to the life expectancy of the different materials, is beneficial to accurately forecast major expenditures. Amortizing building envelope expenditures over a long period of time mitigates their financial impact on the building owners and ensures that funds are available for repairs when they are most needed. The schedule of costs associated with building maintenance outlined below is intended to provide a guideline for budget purposes. Actual costs will depend on the frequency and thoroughness of the regular maintenance procedures.

DESCRIPTION	ANNUAL AMORTISED COST	FREQUENCY	REPLACEMENT COST
Inspections by qualified personnel	$4,000	1 Year	---
Cleaning dryer exhaust vents	$1,000	1 Year	---
Sealant renewal	$6,000	10 Years	$60,000
Replacement of insulated glazing units	$5,000	Annually after 10 Years for 40 years	$200,000
Miscellaneous repairs e.g. flashings	$1,000	50 Years	$50,000
Cleaning wall surfaces	$3,000	10 Years	$30,000
Replacement of deck membranes	$4,000	10 Years	$40,000
Parkade concrete maintenance	$5,000	50 Years	$250,000
Roof membrane replacement	$2,000	40 Years	$80,000
Deck Guardrail Replacement	$1,000	50 Years	$50,000
Paint Finish	$6,000	10 Years	$60,000
Total	**$38,000/an**		

5.0 INSPECTION RECORD FORMS

To assist in performing the noted inspections, a series of checklists have been prepared. These checklists serve to ensure that the regular maintenance reviews address each of the building components covered in the manual, and will help to identify areas of the building which may require further action or the involvement of a specialized professional.

5.1 Homeowner Inspection Check List

5.2 Common Area Inspection Check List

5.3 Maintenance Report Form

HOMEOWNER INSPECTION CHECK LIST

Suite #:_____ **Inspection Date:**_____

Conducted by:_____ **Phone:**_____

Component	Items to Review	Condition	
		Acceptable	Not Acceptable
Sealant	Inspect sealant for cracking, loss of adhesion, bulging or lack of flexibility.		
Windows, Skylights and Balcony Doors	Inspect weather-stripping, seals, weep holes and especially perimeter sealant and flashing slope.		
Exhaust Vents	Inspect for lint accumulation in screens, corrosion and perimeter sealant and flashing slope.		
Doors	Inspect hardware, weather-stripping and alignment.		
Flashings	Inspect for corrosion, proper slope and joint sealant failure.		
Deck Membranes	Inspect for damage, wear, blistering, peeling or splitting.		
Roof Systems	Inspect for exposed waterproofing membrane, loss of ballast, drain blockage.		
Concrete	Inspect for cracking, spalling or staining.		
Paint	Inspect for staining, discolouration, fading, chalking, peeling, cracking or blistering.		

Any component deemed not acceptable should be explained in detail on the reverse of this form.

COMMON AREA INSPECTION CHECK LIST

Building Elevation:_____ **Inspection Date:**_____

Floor Number:_____ **Suite #:**_____

Conducted by:_____ **Phone:**_____

Component	Items to Review	Condition	
		Acceptable	Not Acceptable
Sealant	Inspect sealant for cracking, loss of adhesion, bulging or lack of flexibility.		
Windows, Skylights and Balcony Doors	Inspect weather-stripping, seals, weep holes and especially perimeter sealant and flashing slope.		
Exhaust Vents	Inspect for lint accumulation in screens, corrosion and perimeter sealant and flashing slope.		
Doors	Inspect hardware, weather-stripping and alignment.		
Flashings	Inspect for corrosion, proper slope and joint sealant failure.		
Deck Membranes	Inspect for damage, wear, blistering, peeling or splitting.		
Roof Systems	Inspect for exposed waterproofing membrane, loss of ballast, drain blockage.		
Concrete	Inspect for cracking, spalling or staining.		
Paint	Inspect for staining, discolouration, fading, chalking, peeling, cracking or blistering.		

Any component deemed not acceptable should be explained in detail on the reverse of this form.

MAINTENANCE REPORT FORM

Date:_____

Maintenance Required:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Location:

_____

_____

_____

Reported by: **Suite Number:**

_____

_____

_____

Action Taken:

_____

_____

_____

_____

_____

Date Completed:_____ **Approval:**_____

6.0 PRODUCTS & ASSEMBLY INFORMATION

This section of the manual describes in more detail the different materials used in the construction of the exterior building assemblies. This information is accompanied by photographs of specific areas of the building to assist owners in recognizing the different materials.

6.1 CONCRETE

Concrete was used to construct the foundation walls, parkade exterior walls, floors, exterior stairs and walkways, and structural components of Chateau Comox. Concrete is a strong, durable and versatile product. It can be finished to give a variety of architectural appearances, from patterned and coloured to exposed aggregate. A common feature to all concrete is cracking, regardless of the surface finish or whether it is a vertical surface or a horizontal slab. Concrete is weak in tension, and stresses are relieved by cracking. Most cracking occurs early in the service life, usually in the first year.

Cracking occurs during the curing process of the concrete and continues due to normal loading stresses and expansion and contraction brought on by climatic conditions. Very thin cracks (thinner than a hair) are common to all concrete and do not normally represent a defect, or a structural problem. However, visible cracks in exterior concrete walls can contribute to water penetration and water ingress into buildings.

Concrete walls that are not accessible on the exterior, such as below-grade foundation or parkade walls, can be repaired using injection methods. Common injection sealant materials include epoxy and urethane grout. Injection ports are inserted into holes drilled along the crack on the interior side of the wall. The sealant material is then injected into the backside of the crack under high pressure until it is seen spilling out at the front. The material is allowed to cure, the crack is checked for further signs of leaking, and further injection may be required. Once the leaking has been halted, the injection ports are removed and the wall is cleaned.

Concrete surfaces are also subject to attack from chemical agents and salts. Patterned concrete is especially vulnerable to damage because of the reduced aggregate near its surface. Sand can be used as an alternative to de-icing agents for areas prone to icing during the winter months. De-icing agents, typically salt, are highly detrimental to most concrete. De-icing agents should be avoided as much as possible.

CONCRETE – CONTINUED

Where concrete cracks are accessible on the exterior surface (e.g. above-grade walls), they can be repaired by routing and caulking. In this process the concrete is routed to a depth of ¼" by ¼" width, extending a minimum of ½" beyond the length of the crack in either direction. After cleaning dust and concrete debris from the routed crack, it should then be filled with polyurethane sealant and tooled smooth. The repaired area must then be repainted with a compatible wall coating. Usually a larger wall section is recoated to avoid sharp colour and finish texture transitions. This type of repair must only be used on cracks wider than 1/16 of an inch. Repairs can be highly visible if texture and colour are not exactly matched.

CHATEAU COMOX
1272 COMOX STREET, VANCOUVER, B.C.

CONCRETE

6.2 BALCONY RAILINGS

Although the deck railings, or guardrails, are not part of the building envelope, they are an exterior component of the building critical to the life-safety of the building occupants, and they are fastened through the building envelope. Aluminium deck guardrails are bolted down to the concrete decks with stainless steel sleeve anchors. Guardrails will benefit from regular maintenance.

The aluminium railings have an electrostatically applied paint finish, referred to as a 'powder coating'. This type of paint finish resists cracking, chipping or peeling more effectively than other types of paint finishes on aluminium products. Tempered glass panes have been installed in the railings, which are supported by rubber gaskets on the top and bottom. The glass panes can be easily removed by lifting them straight up and then pulling out at the bottom. Replacement glass should be stored on a cushioned surface to protect against breakage. Tempered glass is susceptible to shattering if struck on its edge.

Maintenance of the aluminium railings should consist of cleaning glass and metals to remove any mold, mildew or foreign matter. A visual inspection should also be done whenever deck areas are being cleaned in order to assess the condition of the sealant used around the screws, fastening plates, and edge flashings.

CHATEAU COMOX
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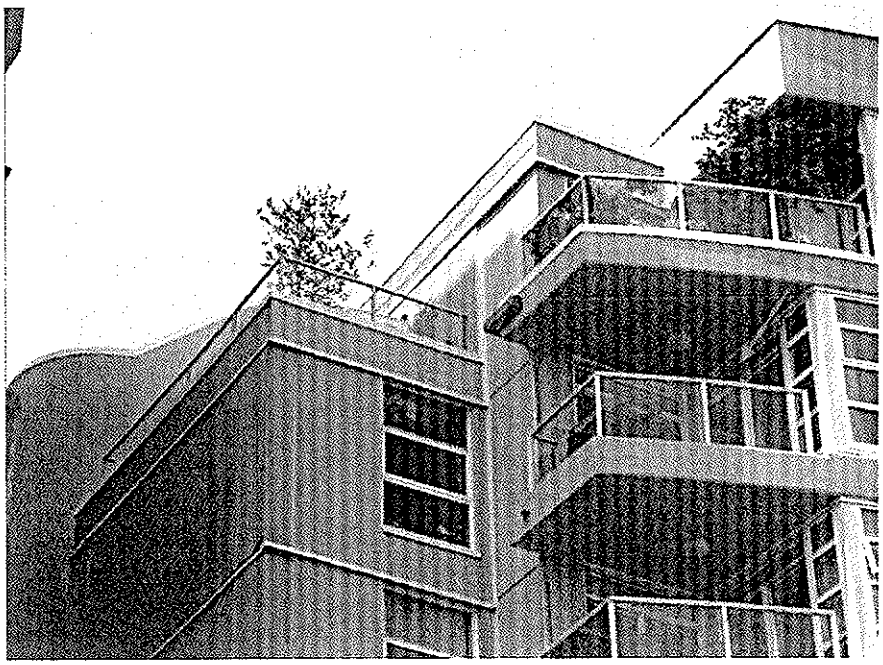
BALCONY GUARDRAILS



6.3 FLASHINGS

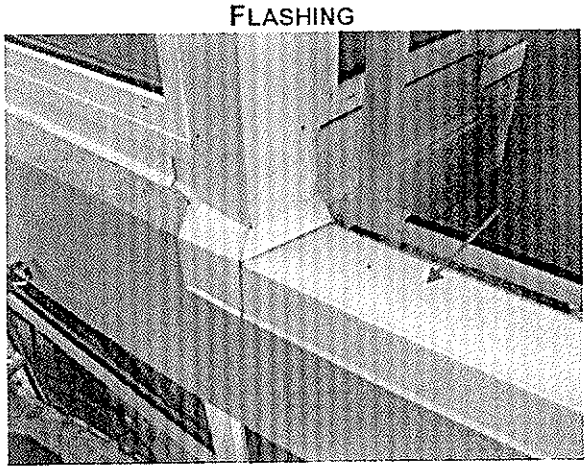
Flashings refer to sheet metal or other material, used in roof or wall construction, which is designed to deflect water away from interfaces and joints of walls and roof assemblies. They play an important role in the water management of a building exterior by directing moisture to controlled or designated areas. Different types of flashing include; cap, saddle, head, sill, base, step, through-wall and gum-lip flashings.

Metal flashings have a relatively large coefficient of thermal expansion and are required to accommodate expansion and contraction associated with large temperature fluctuations. The correct slope of a flashing is crucial to its ability to perform properly. Flashing slope is not static, but can be altered by building movement or physical damage, such that water is redirected to unwanted or vulnerable areas of the building exterior. Since flashings are generally located in those areas of a building most susceptible to moisture ingress, it is important that they be inspected annually for indications of performance problems. Properly installed flashings are not reliant on renewable sealants and should perform without service or notable deterioration for in excess of 50 years

Flashings installed at The Chateau Comox are segmented and are connected with standing seam or 'S' lock joints. Joints, ends, and edges of the flashings commonly utilize folds in the flashing to assist with the control of moisture by providing a seal to adjacent materials. In the past, many building failure problems were attributable in part to flashing problems, which allowed concentrated amounts of water to penetrate wall surfaces due to incorrect slope or inadequate seals to adjacent materials. For this reason it is critically important to the integrity of the roof and wall systems that the flashing slopes and detailing be correctly designed and installed so that reliance on sealants is avoided.

CHATEAU COMOX
1272 COMOX STREET, VANCOUVER, B.C.

FLASHING

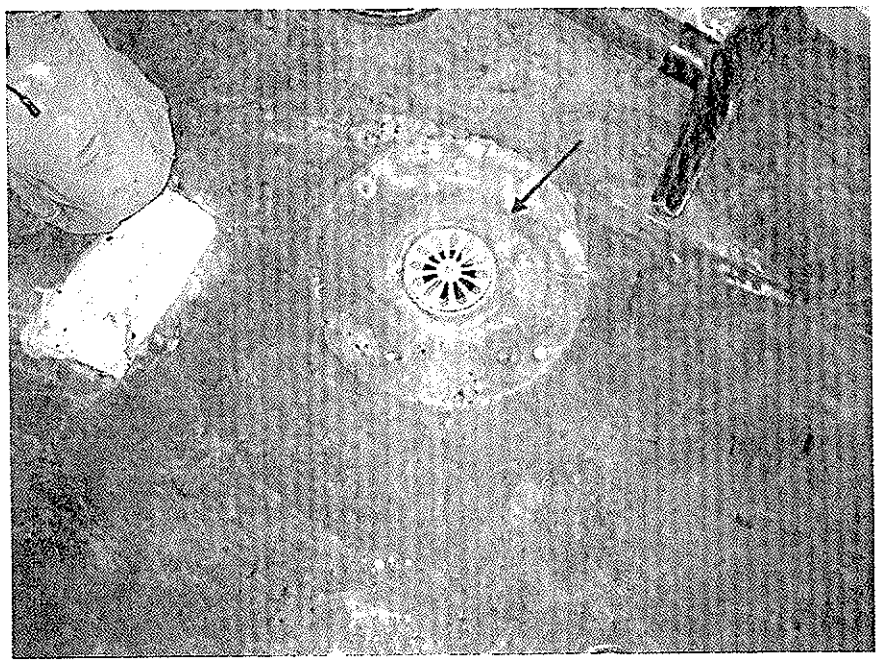


6.4 DRAINS

Drains on pedestrian deck areas (deck drains) are typically protected from foreign material by grills. If deck drains become clogged, water can build up but will not leak into unintended areas since emergency overflow is possible over the deck edges without distress to the building interior or building envelope.

CHATEAU COMOX
1272 COMOX STREET, VANCOUVER, B.C

DRAIN



6.5 ROOFING SYSTEM

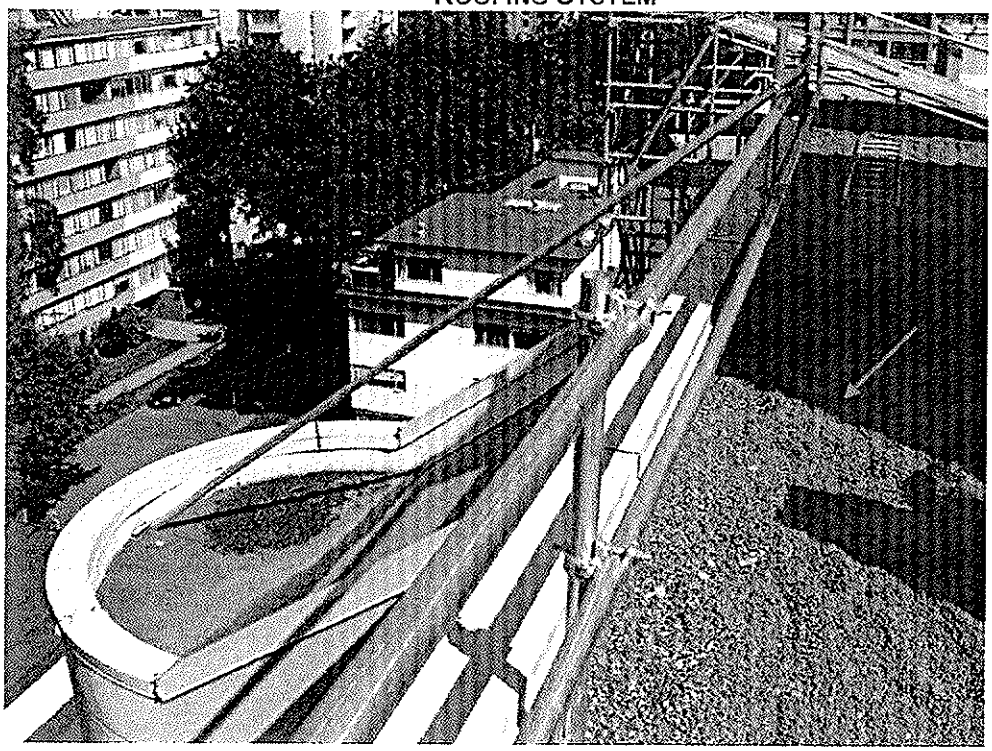
The basic principle of roofing is to eliminate the ability of water to vertically penetrate the building envelope. This is accomplished by either closing all the openings or neutralizing the driving force of the water. Most sloped roofs depend on gravity to offset the forces pushing water inward by moving the water downward and out. Flat or low slope roofs depend on a continuous waterproof membrane to keep water out. Most roof systems depend on a combination of these two design principals.

Leaks can occur on a roof when the wind force driving the rain into the openings of sloped roofing is greater than the gravitational pull downward or when there is a gap in the waterproof membrane of flat roofing. The most vulnerable areas on a roof are the transition areas of differing materials such as at perimeter walls, equipment or drains. These areas often rely on flashings, sealant and caulking compounds to control movement and are prone to failure if not properly maintained.

Maintenance of roof areas should include clearing drains and performing an annual inspection of the condition of membrane surfaces (where visible), focusing on drain penetrations, perimeter sealant and flashing details.

CHATEAU COMOX
1272 COMOX STREET, VANCOUVER, B.C.

ROOFING SYSTEM



6.6 BALCONY MEMBRANES

Balconies of the buildings at 1272 Comox Street have sloped concrete decks that are coated with Urelastic 5000 basecoat complete with Urelastic 6000 topcoat. The word membrane typically refers to a continuous waterproof material used to prevent water penetration. The membrane is applied directly onto the substrate and sloped to drain. The membrane extends over the horizontal surface and terminates with an eight inch up-leg on the adjacent vertical surface.

The membrane surfaces are tough and durable for normal pedestrian use; however, sharp objects, such as some outdoor furniture can damage the membrane. Since this membrane is adhered directly to the concrete, a single penetration could allow moisture to contact the concrete. If the concrete absorbs moisture, the membrane will begin to delaminate and bubbles or wrinkles in the membrane surface will likely appear. Regular inspections should be carried out on the balcony surfaces to look for signs of damage or de-lamination. Because of the limited access to balconies, individual suite occupants should perform these inspections. Any deficiencies identified should be reported to the property manager immediately for repair services.

6.7 SEALANT

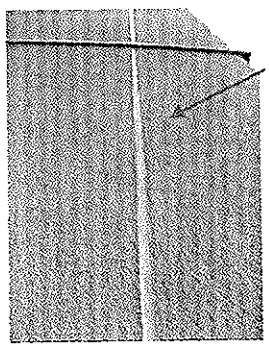
Caulking is a material used for sealing cracks and joints. Caulking is a generic term for a multitude of materials used on the interior and exterior of buildings to seal joints, junctures, gaps and cracks. It is relied on to provide a variety of functions including air and moisture barriers, in addition to an aesthetic finish. Caulking is generally installed in areas on the building most vulnerable to water penetration, and therefore **maintaining caulking is an important exterior maintenance function.**

The life expectancy of sealants can vary greatly because they are affected by numerous factors. Joint design, material selection, substrate preparation, workmanship, and exposure conditions all affect the longevity of a sealant material. Because sealants provide an integral function in the overall performance of the building exterior, it is important that they be monitored and repaired on a regular basis. Sealant material is prone to failure in part because of UV exposure and because it is generally installed at dynamically moving joints between dissimilar materials. Therefore, frequent inspections (annual) should be carried out on wall areas and repairs made immediately to deficient areas.

Sealant failure is not necessarily something that can be positively identified by a visual inspection. A caulk joint must often be subjected to an adhesion test to determine if it has lost its bond with the substrate. Caulking joints may appear to be failed to someone conducting a visual inspection because of a dark line at the edge of the sealant bead. This dark line results as dirt and/or mildew collects in the small gap that is formed by separation of the caulking from the substrate. This is a good indication that a failure is beginning, or has taken place.

The bulk of the exterior caulking used during construction was Dow Corning 790 silicone sealant. This product was used between dissimilar materials on the exterior, such as on joints between windows and concrete.

CHATEAU COMOX
1272 COMOX STREET, VANCOUVER, B.C.
SEALANT



6.8 WINDOWS

All windows installed for this project incorporate hermetically sealed, double-glazed units referred to as insulated glazing units (IGUS). This is a system where two glass panes are sealed together with a thermal separation between them to form insulated glazing units. This airtight seal prevents moisture accumulation between the glass panes so the unit does not fog. The thermal separation improves the insulation properties of the glass, which reduces the probability of condensation forming on the interior during cold weather. These sealed units typically carry a 10-year guarantee from the manufacturer against failure of the seals. Window seals have a normal life expectancy of between 20 and 40 years, depending on the sizes of the windows and their exposure conditions.

Allied Windows manufactured all 45 Series aluminum windows and sliding doors at 1272 Comox Street. The windows installed utilize thermally broken aluminium frames, with argon filled insulated glazing units. The units have both fixed and opening "lites," which are either of casement or awning construction. They are installed in rough concrete openings with curbs at the sill, fixed to aluminum back angles with screens, and detailed with Protecto Wrap peel-and-stick waterproofing membrane at the sills and jambs. Caulking has been used as a sealant on the interior sill. The window head deflection track has been sealed to the concrete substrate.

Aluminium window frames are generally joined together at their corners with a sealed butt joint, and intermediate frame members are held in place by screw fasteners through the perimeter frame. These joint areas are sealed at the time of manufacturing to prevent leaking. The small joint sealant material used to seal the frames may periodically require replacement.

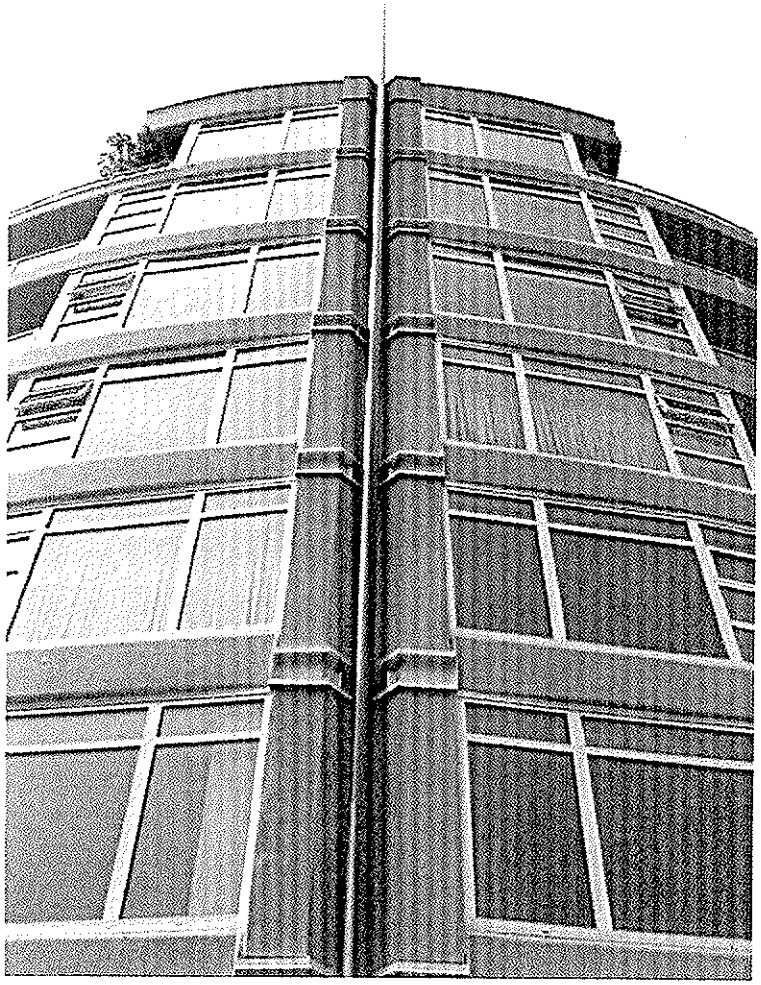
WINDOWS - CONTINUED

Maintenance requirements for the windows at Chateau Comox will involve regular inspection to identify evidence of water penetration at windowsill areas. Water stains at the bottom corners of the window frames may be an indication that leaking is occurring at the mitre joints. Replacing the sealant on a window frame must be done from both the interior and exterior. This requires that the exterior glass stops be removed to access the exterior portion of the frame mitre joint.

Other maintenance requirements for windows include replacing worn or damaged weather-stripping on opening vents, replacing failed sealant around the frame perimeter or installing sealant where none exists. Ensuring the small drain holes on the exterior, called weep holes, are maintained free of blockages is also necessary.

CHATEAU COMOX
1272 COMOX STREET, VANCOUVER, B.C.

WINDOWS



6.9 EXTERIOR WALL SYSTEMS

Since the building is a concrete high-rise, all of the exterior walls are composed of concrete. The majority of the concrete walls are covered with a three coat stucco system (scratch, brown, and finish). The interior walls are constructed with steel studs. The space between the studs, referred to as the stud cavity, is insulated with fibreglass batt insulation. The materials used in the construction of the exterior walls are listed in order starting from the outside:

Wall Type 1:

Exterior Concrete Walls:

- Imasco Flexcoat Acrylic Finish
- Exterior concrete
- 3 5/8" structural steel studs @ 16" O.C.
- R-14 fiberglass batt insulation
- 6 mil UV – rated polyethylene vapour / air barrier
- ½" interior gypsum wallboard

Wall Type 2:

Exterior Infill Walls with Rainscreen Stucco Cladding:

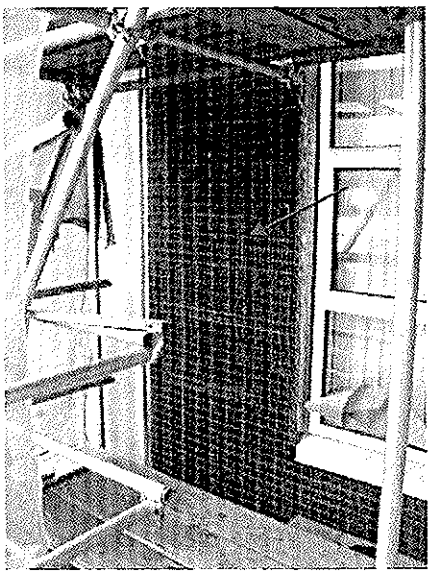
- Imasco Flexcoat Acrylic Finish
- ¾" Imasco Greatwall base coat
- 2" – Z-girts
- 1" Roxul exterior insulation
- Tyvek commercial wrap
- Dens-Glass Gold exterior gypsum wallboard sheathing
- 6" steel studs
- R-20 fibreglass batt insulation
- 6 mil – rated polyethylene vapour / air barrier
- ½" interior gypsum wallboard

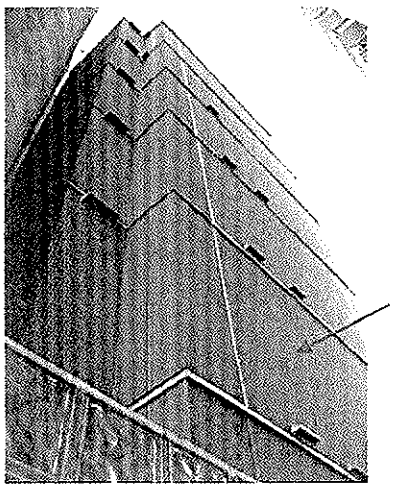
Maintenance of the wall systems: Regular cleaning and removal of dirt, mould or mildew can extend the life of the caulking and wall coating. Cleaning is most often performed by washing with a scrub brush. It is generally advisable to use the least amount of water pressure and restrict cleaning agents as necessary for the job at hand. Mild TSP cleaning solution and detergent are normally sufficient. Failed caulking should be renewed annually and replaced as necessary.

EXTERIOR WALL SYSTEMS - CONTINUED

CHATEAU COMOX
1272 COMOX STREET, VANCOUVER, B.C.

EXTERIOR WALL SYSTEMS





6.10 PAINT

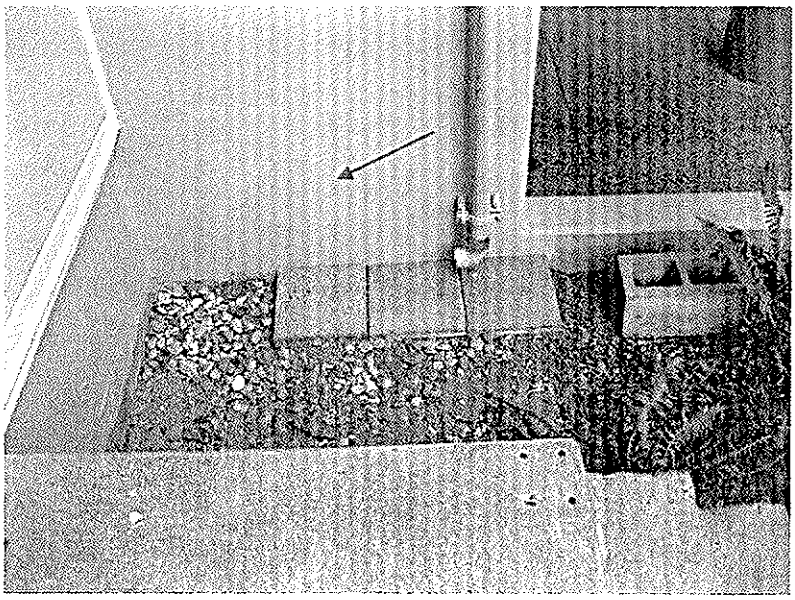
Dow Corning AllGuard silicone coating system was used to coat the exterior concrete walls at The Chateau Comox. Coatings, like sealants, have a life expectancy that will vary depending on exposure conditions. In this case, the coating has a life expectancy in excess of 20 years.

Coatings should be inspected as part of the regular maintenance review. There can be a substantial reward for detecting coating problems early. Coatings that have deteriorated to the point of exposing the substrate can substantially increase the amount of surface preparation required before recoating. As labour is generally a large portion of the cost of a coating project, minimizing preparation work will prove to be a cost-effective means of controlling maintenance budgets.

Cleaning coated surfaces of dirt and/or mildew build-up will improve the appearance of the building and also increase the life of the coating. The method of cleaning should consist of a low-pressure spray of water, mild TSP solution and a soft scrub brush. It is generally advisable to use the least amount of pressure and cleaning agents as necessary for the job at hand. Abrasive materials should always be avoided when cleaning painted surfaces.

CHATEAU COMOX
1272 COMOX STREET, VANCOUVER, B.C.

PAINT



APPENDIX A

CANADA MORTGAGE AND HOUSING CORPORATION
CMHC - (CONDENSATION)

CONDENSATION IN THE HOME:
Where, Why and What to Do About it

CMHC
Canada Mortgage
and Housing Corporation

SCHL
Société canadienne
d'hypothèques et de logement

Condensation in the Home: Where, Why, and What to Do About It

NHA 5319 80/03

AIR MOISTURE IN THE HOME

Stained ceilings, water streaming from windows and mould on walls, the villain is a common one, excessive water vapour in the air. Cracking furniture, static electricity build-up and dry, scratchy throats are symptoms of the reciprocal problem, too little water vapour in the air.

Both these problems can be corrected although it is more difficult to control excessive humidity (the term used to indicate the amount of water in the air), than it is to add moisture to the air.

A few basic principles will serve to simplify a complex problem and make you a condensation trouble shooter.

What Is Condensation?

Condensation problems arise because air can hold only a limited amount of water vapour, an amount that varies with temperature, cold air being able to hold less water than warm air.

When air at a given temperature contains all the water vapour it can hold, it is said to have a relative humidity of 100 per cent. If it contains only half the water vapour it can hold at that temperature, then the relative humidity is 50 per cent. If the temperature changes, but no water vapour is added or removed, then the relative humidity will also change and will increase as the temperature falls. The relative humidity will continue to rise with the falling temperature until the dew point is reached, that is, the temperature at which the relative humidity becomes 100 per cent (dew point temperature). Any further decrease in temperature will force some of

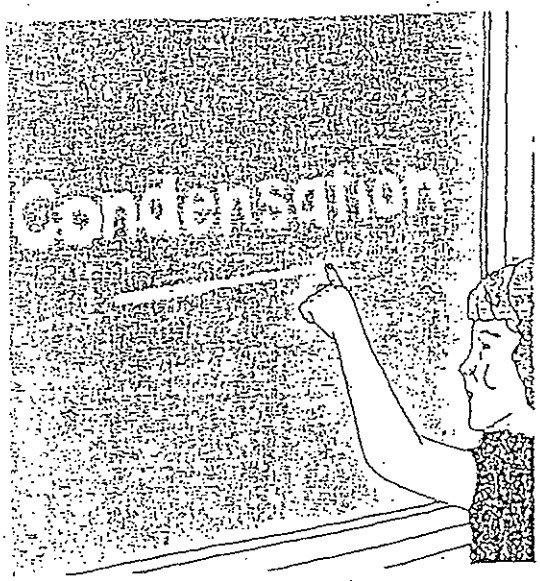


Figure 1 Condensation

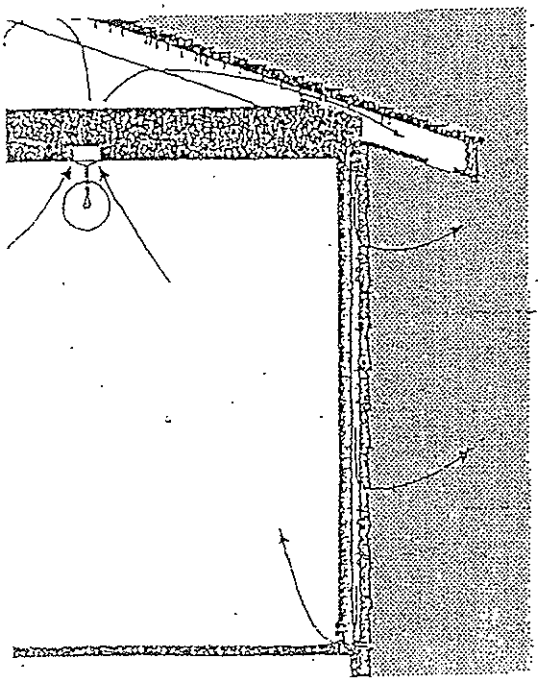


Figure 2 Structural causes of excessive condensation.

the vapour to condense as water (Figure 1), (when the temperature is above freezing), or as frost (when the temperature is below freezing). Air cooled by contact with cold surfaces such as windows will therefore deposit some of its water vapour on the glass or the metal sash whenever it has more water vapour than it can hold at its new temperature. This surface condensation is an indication of excessive water vapour in the air.

Basically there are two types of problems resulting from the moisture in the air: those from surface condensation on the interior of the building components, such as walls, windows, ceilings or floors, and those from concealed condensation within the building assembly, such as exterior wall cavities and attics. The major factors contributing to the amount of moisture in the two problem areas, surface or concealed are different. Interior surface condensation is caused by high humidity in the building and can occur even if it is well built. Concealed condensation on the other hand is caused mainly by the movement of moist air into the building envelope. Water vapour is also able to diffuse through the materials which make up the building envelope, but this is generally not as important as air leakage.

Surface Condensation

Where surface condensation is evident it should be considered as a warning sign. However, each person has his or her own level of personal comfort and the amount of condensation they are willing to accept, to maintain that level. If the occupants insist on a high level of humidity within the house, surface condensation must be expected when outside temperatures are low. Some indications of surface condensation are illustrated in Figure 4.

First Floor

1 Frost on door handles and hinges, or door frozen shut
2 Water or ice on windows
3 Damp spots or mildew on walls and ceiling
4 Damp spots or mildew on closet walls
5 Moisture on light fixtures
6 Moisture on water closets

Basement

7 Moisture on cold water pipes, walls and floors.

If you have too much surface condensation, the problem can usually be rectified by following the simple corrective action listed in this booklet.

Figure 3 Set your own comfort level.

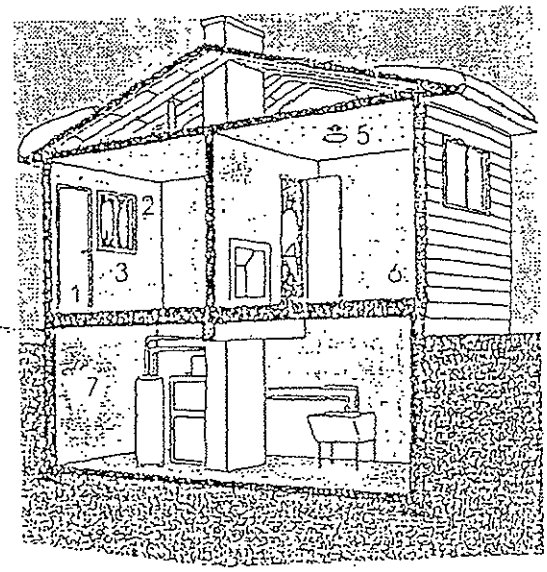


Figure 4 Surface condensation.

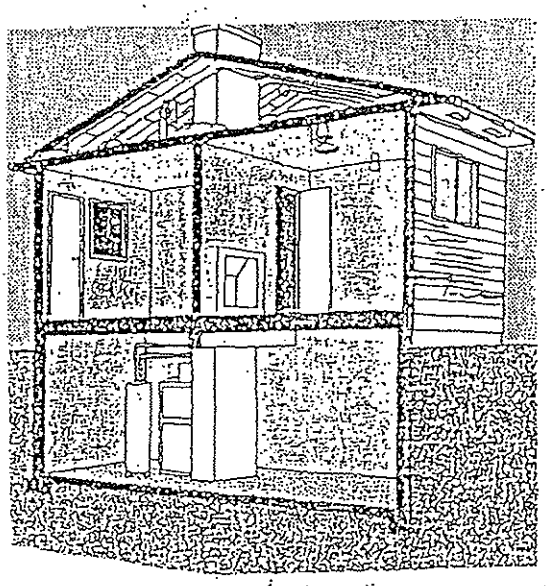


Figure 5 Concealed condensation.

Concealed Condensation

Concealed condensation problems, when identified, require remedial action, since serious damage can result to the structure. Some indications of concealed condensation resulting from excessive air leakage from inside the structure are:

Attic Unheated

1 Apparent leaky roof
2 Frost on underside of roof sheathing, over interior partitions, and where services penetrate the ceiling membrane
3 Frost or water on soil, vent or waste-pipes
4 Frost or water on nails penetrating roof sheathing
5 Frost on cold surfaces over soffit
6 Moisture or mildew staining of roof sheathing as observed from attic.

Storey Above Grade

7 Paint peeling.
8 Damp spots on walls and ceilings
9 Water or ice forming near soffit vents
10 Damp spots around light fixtures or water collecting in light fixtures.

One difficulty in identifying the source of these problems is that some of them may be caused by a leaky roof or water penetrating the wall cladding.

A key factor in the amount of air leakage is the tightness of the exterior building envelope. A vapour barrier is used to reduce moisture entering the wall or ceiling by diffusion. It also acts as a barrier against air movement from within the house into the wall or ceiling cavity and is therefore an air barrier. In most instances the amount of moisture entering the wall cavity by air leakage is far greater and more damaging than that from vapour diffusion.

Sources of Moisture

The principal sources of moisture in the home are household activities. These vary with the living habits of the family. Some idea of the quantities of moisture released by these activities in a family of four is given in Table I.

Approximately 7 to 9 kg of moisture per day may be introduced into a small house under normal living conditions rising to as much as 18 to 23 kg per day on wash days, amounting to almost 64 kg per week. Heavy use of the moisture producing utilities will increase this amount considerably.

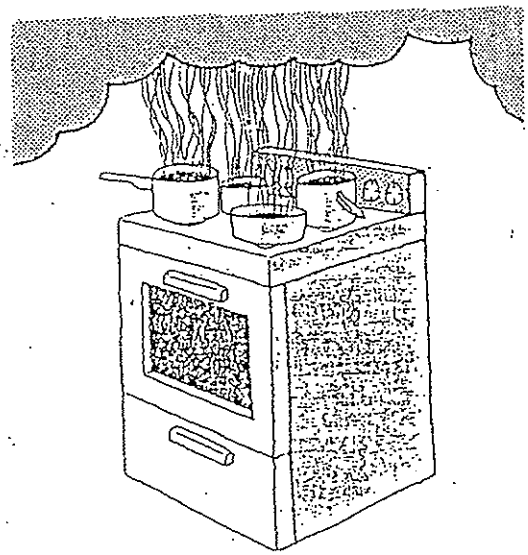


Figure 7 Cooking three meals a day releases 90 kg of moisture.

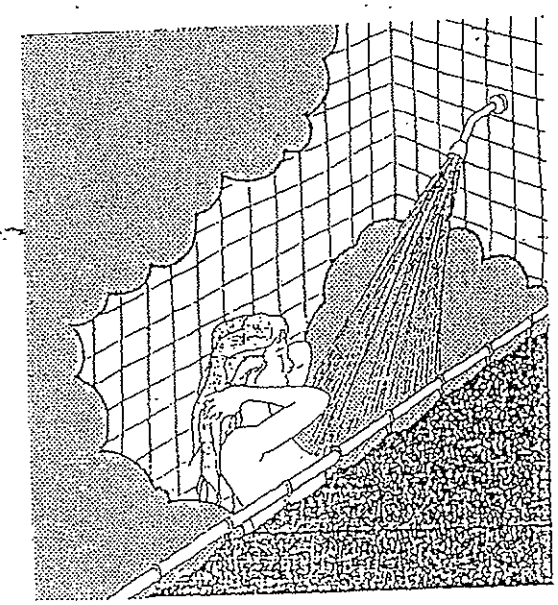


Figure 6 Showering releases 45 kg of humidity into the atmosphere.

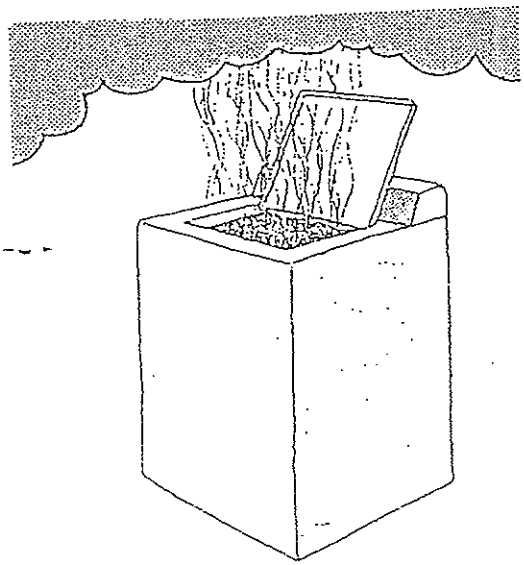


Figure 8 Moisture given off by a washing machine can amount to 1.81 kg per week.

Table 1

Moisture Produced by Various Household Activities for a Family of Four

Activity	Moisture Produced Kilograms
Cooking (3 meals per day)	.90
Dishwashing (3 meals per day)	.45
Bathing — Shower	.45
Bathing — Tub	.045
Clothes washing (per week)	1.81
Clothes drying indoors or within unvented dryer (per week)	11.8
Floor mopping (per 10 m^2)	1.36
Occupants (family of 4 per day)	5.45

This table shows how the living habits of a family of four may produce up to 23 kilograms of moisture per day. As liquid water this would be 23 litres. If a container holding 23 litres were suddenly spilt on the floor there would be a lot of mopping up to do. Yet this much moisture can be added to a household atmosphere almost daily without the occupants being aware of it — simply because it cannot be seen.

In addition to the activities shown in Table 1, if there are pets, plants, aquariums, self-defrosting refrigerators or freezers in the residence, much more moisture will be generated.

What we are talking about is excessive condensation, that is, condensation that covers windows with moisture or frost, or water that runs off to stain woodwork and walls. If this kind of condensation exists, then corrective action is necessary. A balance between desired comfort and surface condensation must be reached. Recommended steps are offered in this booklet to reduce surface condensation to an acceptable level.

The first step in solving condensation problems in your home is a willingness to reduce humidity.

The Great Humidity Myth

Some humidity is necessary for comfort and health. With many houses it is a struggle to keep enough moisture inside the house and maintain an acceptable comfort level for the occupants. Frequently humidifiers are installed to add moisture to the air but their use must be controlled or surface condensation problems may result. Unfortunately a dry house may indicate a high leakage rate, (depending on the amount of moisture added by the householder) and, this in turn, contributes to concealed condensation.

In some of the newer homes, however, air leakage has been controlled to such an extent that the problem really is how to get rid of moisture. Yet many householders go on adding moisture to the air. They aren't discouraged by the danger signal of condensation on windows, mould growth, or the damp spots on ceilings and room-side surfaces of exterior walls.

Because windows do not provide much resistance to heat loss, they are often the coldest component of a building enclosure, and can be an indicator of humidity problems. As condensation occurs on inside window surfaces, whenever surface temperature falls below the dew point temperature of the room air, it may be a warning signal to reduce the humidity in your residence.

Table 2

Inside Relative Humidity for 21°C with Double Glazing

Outside Air Temp.	Indoor Relative Humidity
-28°C or below	not over 15%
-28°C to -23°C	not over 20%
-22°C to -17°C	not over 25%
-16°C to -12°C	not over 30%
-11°C to -6°C	not over 35%
-5°C to 4°C	not over 40%

If moisture can be reduced to the humidities shown above, it may help cure troublesome surface condensation problems.

PRACTICAL STEPS TO CONTROL SURFACE CONDENSATION

Here are the steps you should take to reduce surface condensation in your home.

1. If the furnace is equipped with a humidifier or if you operate a separate humidifier, turn it off until the amount of condensation is reduced.

2. Crawl spaces under the home should have the floor covered with a watertight membrane.

3. Use the kitchen exhaust fan while cooking pots are emitting steam (Figure 9).

4. Make certain the clothes dryer is vented to the exterior and not into your home, the basement or crawl space. Avoid hanging wet clothes inside the house; they contribute a substantial amount of moisture to the air (Figure 10).

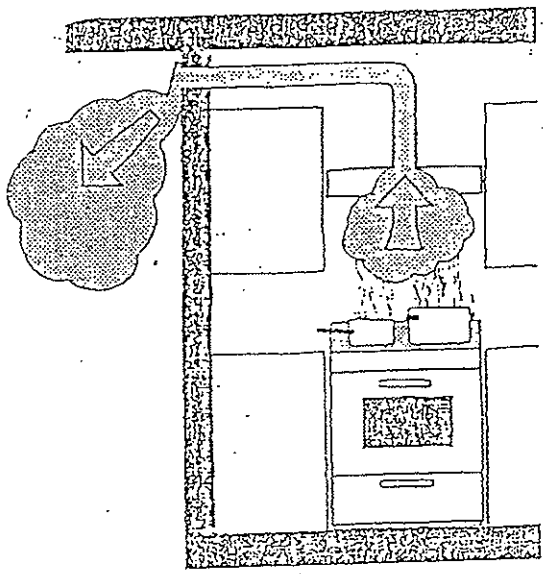


Figure 9 Kitchen exhaust fan.

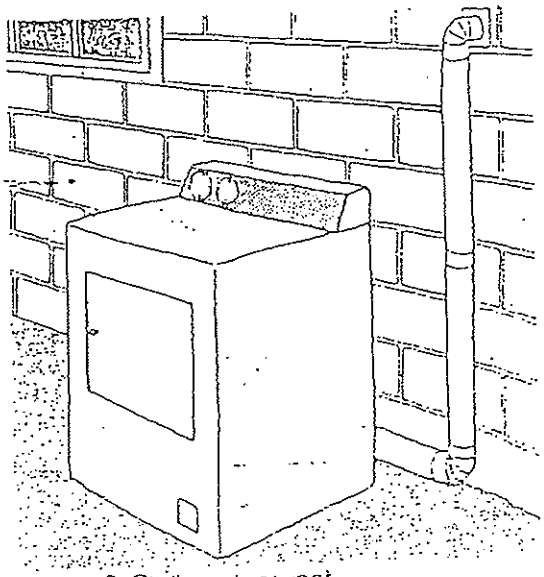


Figure 10 Clothes dryer vent.

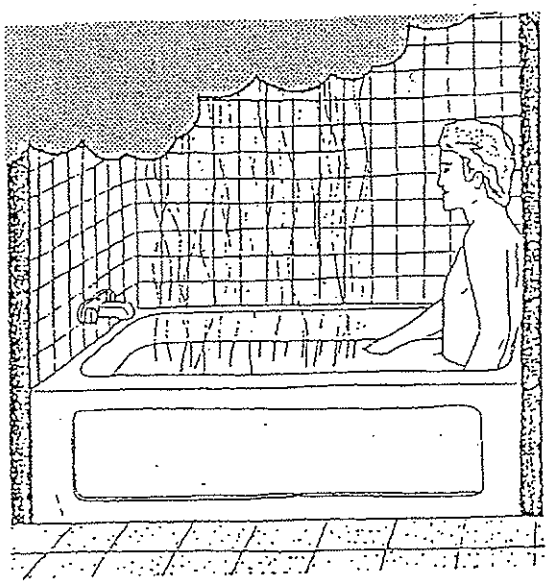


Figure 11 A bathroom exhaust fan can help reduce condensation in the house.

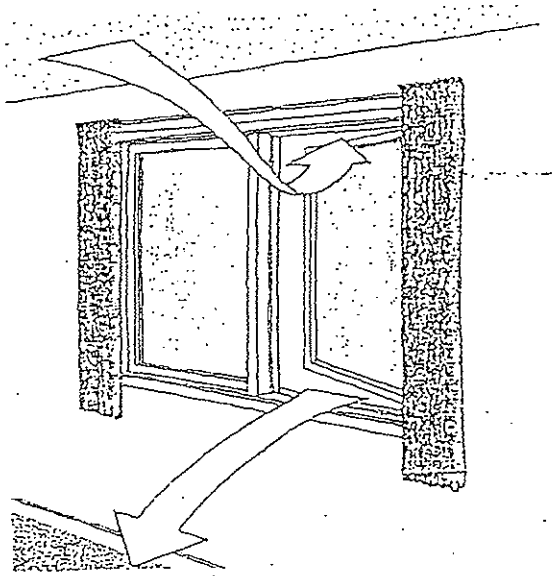


Figure 12 Opening a window helps reduce localized condensation

5 The bathroom can be a troublesome area (Figure 11). If the bathroom door is closed during and after the use of a bath or shower, the excess humidity can be dispersed by:

(a) using a bathroom exhaust fan to the exterior
(b) using the furnace circulating fan if there is a return air register in the bathroom
(c) opening the bathroom window until the room is cleared.

If these suggestions are not effective, the bathroom door should be left open after completion of the bath or shower, and the circulating fan on the furnace run continuously until the excess humidity is reduced.

6 Leave radiator pans empty until humidity decreases.

7 Install storm windows and storm doors.

8 The free circulation of air is important. Leave drapes open as much as possible so the air can circulate freely over the windows or put your furnace on circulating fan for a few hours each day.

9 If necessary you can open your window to reduce localized condensation (Figure 12).

10 Do not leave basement windows open during hot humid weather

11 Caulk the perimeter of doors and windows to reduce air leakage

PRACTICAL STEPS TO REDUCE CONCEALED CONDENSATION

1 Ensure that vents in the attic and basement crawl spaces are open and free from obstruction. In extremely cold regions it may be necessary to have vents that can be closed during cold dry periods (Figure 13).

2 Seal all holes in the air barrier, i.e. attic hatches, over interior partitions, and around chimneys, plumbing stacks, and electrical wiring.

3 Increase the attic ventilation.

4 Consult with local specialists.

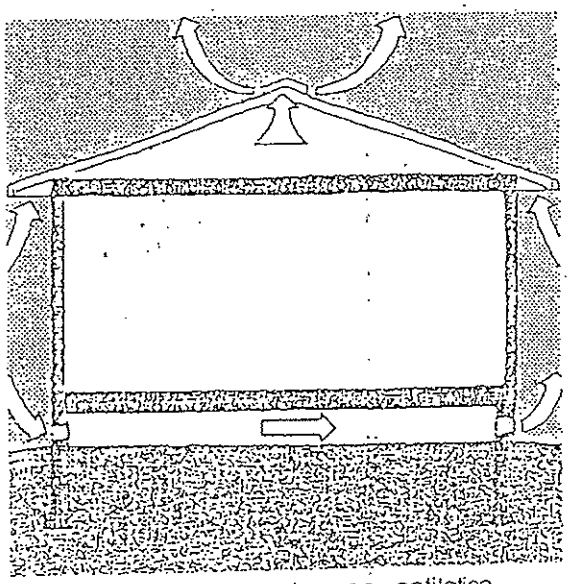


Figure 13 Attic and crawl space ventilation.

Canadian Home Builders' Association

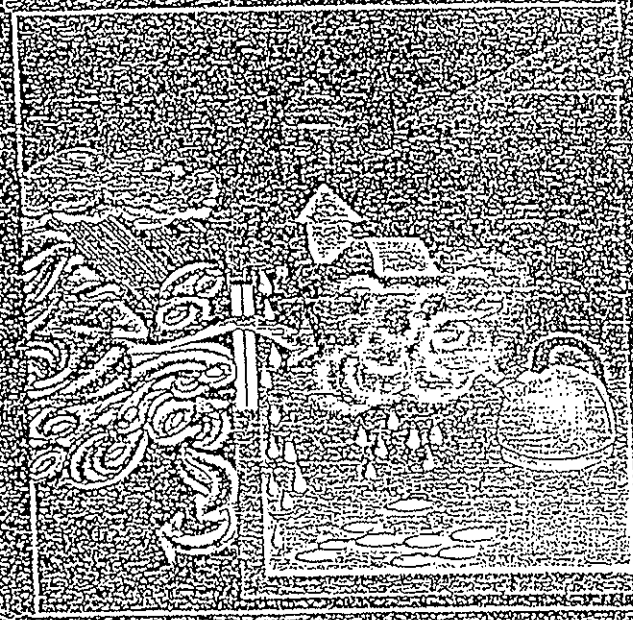
Association canadienne des constructeurs d'habitations

CMHC SCHL

Helping to house Canadians

MOISTURE AND AIR

PROBLEMS AND REMEDIES



HOUSEHOLDER'S GUIDE

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Canada Mortgage and Housing Corporation supports the Government of Canada policy on access to information for people with disabilities.

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Cette publication est aussi disponible en français sous le titre L'air et l'humidité, LINH 5969.

Canada

This booklet is intended to help you find some of the typical signs of moisture and air quality problems in your house, to identify the probable causes and to propose practical solutions.

Many household problems can be solved if a householder does one or more of the following:

— change practices
— perform maintenance or minor repairs
— have a professional contractor make major repairs

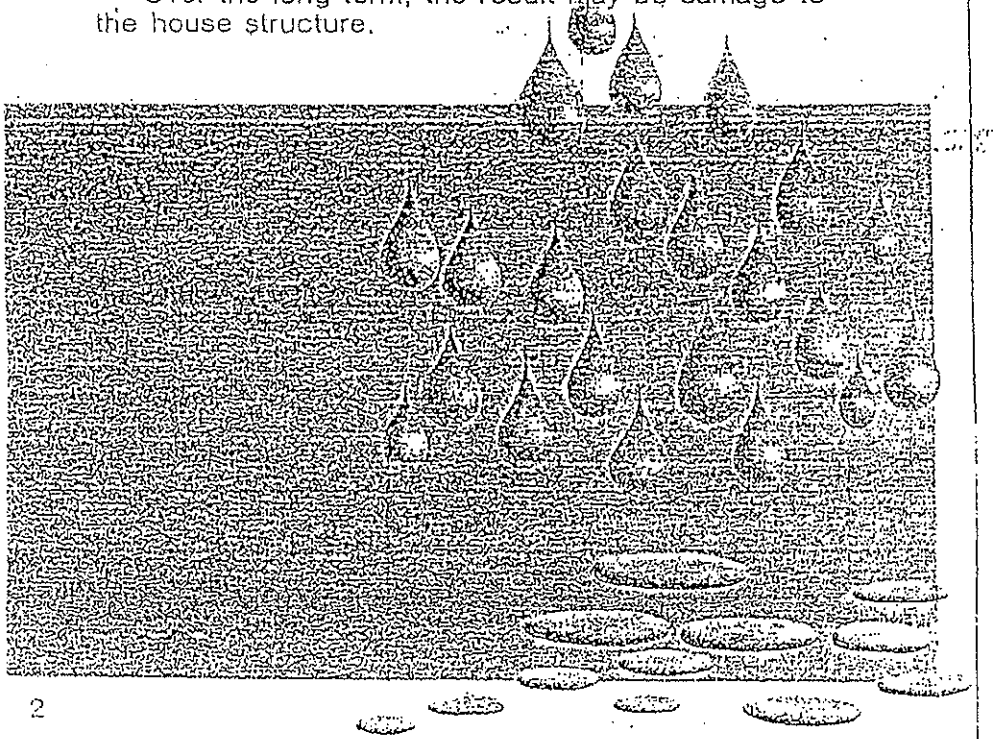
MOISTURE PROBLEMS

If the air in your house is too moist, your house structure and your personal possessions may be damaged. Air can hold only so much water.

When warm, moist air comes into contact with a surface that is too cold, it releases condensation. The water and frost that you see collecting on windows is a visible example.

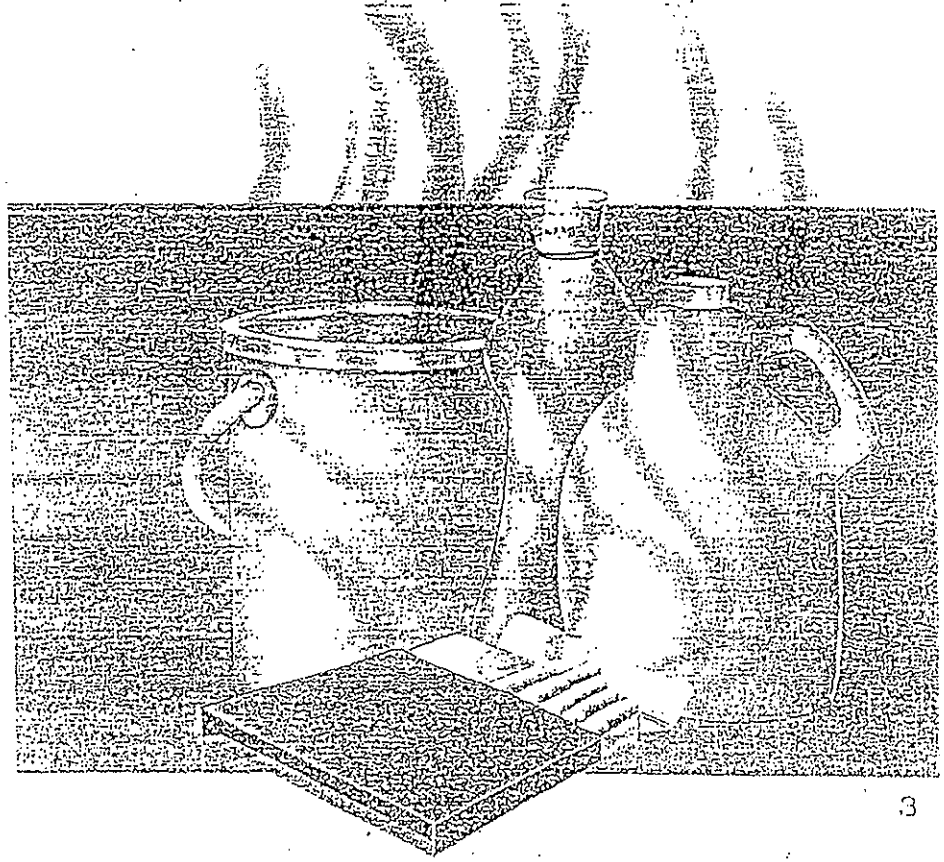
Condensation may also be soaking into your roof sheathing, exterior walls and insulation, where hidden leaks are releasing humid house air to the outside.

Over the long term, the result may be damage to the house structure.



AIR QUALITY PROBLEMS

Stale air is a health hazard. For the health of everyone in your home, your house (like you) should breathe properly. If it doesn't, the air in your home can become polluted with harmful chemicals released from synthetic fabrics, furnishings, household products, cigarette smoke and improperly maintained or vented combustion devices, such as cooking stoves, furnaces, water heaters, wood stoves and fireplaces.



MOULD AND MILDEW

Problems

Mould and mildew fungi can cause:
— unsightly stains;
— damaged paint, wood, drywall and fabrics;
— allergies; and
— illness

Some symptoms

- Musty smells
- Green or black marks on the inside surface of outer walls or ceilings
- Stains in wet areas of carpets
- Mildew on drapes and backs of furniture

Prevention

Fungi (such as the wood rot, mould and mildew varieties) require high humidity levels to survive.

Some fungi require condensation to start growing.

Certain fungi actually generate moisture and then continue growing even when condensation stops.

TO AVOID MOST MOULD AND MILDEW PROBLEMS, *KEEP MATERIALS DRY.*

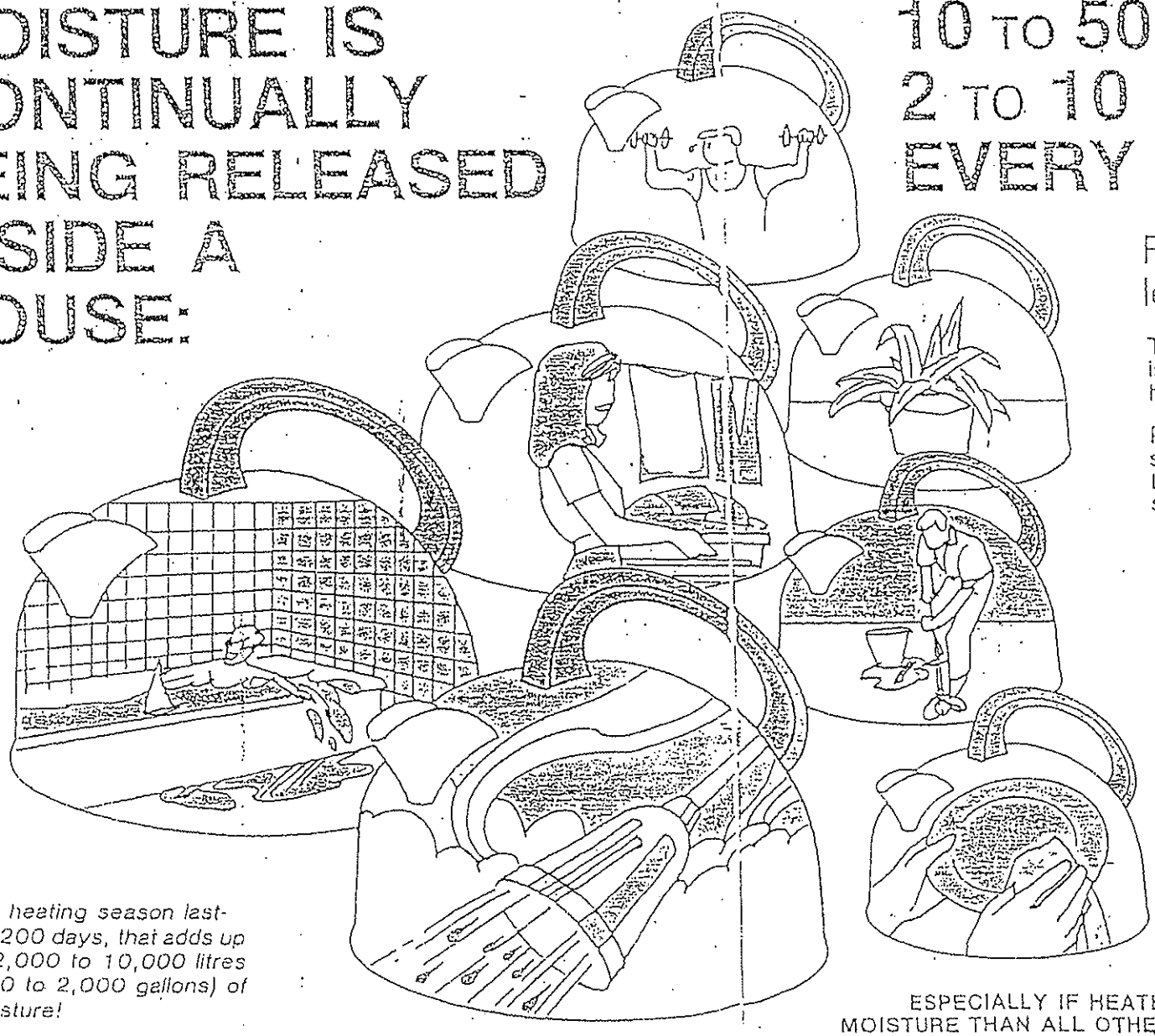
Clean-up methods

Mould and mildew on surfaces can be cleaned up with a solution of one part chlorine bleach in four parts of water.

When applying:
— ventilate well;
— use gloves;
— let stand 10—15 minutes;
— rinse well, then
— keep surfaces dry.

Mould and mildew-stained fabrics should be removed and discarded.

MOISTURE IS CONTINUALLY BEING RELEASED INSIDE A HOUSE:



10 TO 50 LITRES OR 2 TO 10 GALLONS EVERY DAY *

Find the moisture level in your house

The amount of moisture in the air is normally measured as its relative humidity.

Purchase a relative humidity sensor (hygrometer) at your local hardware store or building supply store.

Inside your house, the relative humidity should be brought down to approximately 45% during the winter heating season.

In very cold weather, a level of 30% may be needed to prevent window condensation.

Upgraded windows can support a higher level of relative humidity without condensation occuring.

If you reduce the amount of moisture released in your house each day, you can reduce ventilation and save energy.

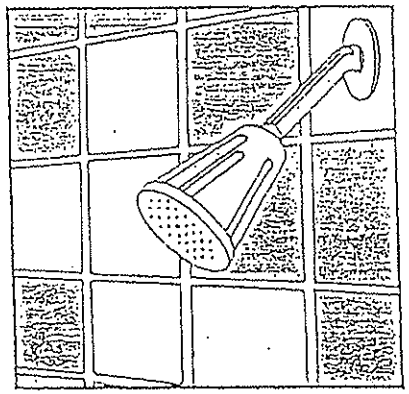
A WET OR DAMP BASEMENT, ESPECIALLY IF HEATED, MAY GENERATE MUCH MORE MOISTURE THAN ALL OTHER FAMILY ACTIVITIES COMBINED

* *In a heating season lasting 200 days, that adds up to 2,000 to 10,000 litres (400 to 2,000 gallons) of moisture!*

PROBLEMS IN YOUR

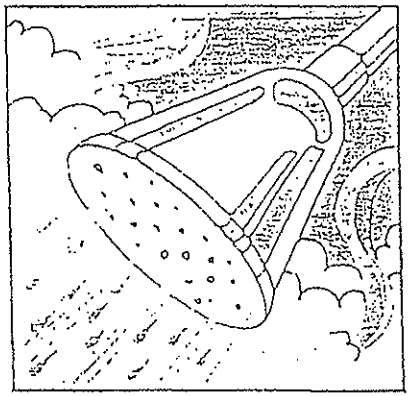
BATHROOM?

CHECK IF YOU HAVE ANY OF THESE PROBLEMS



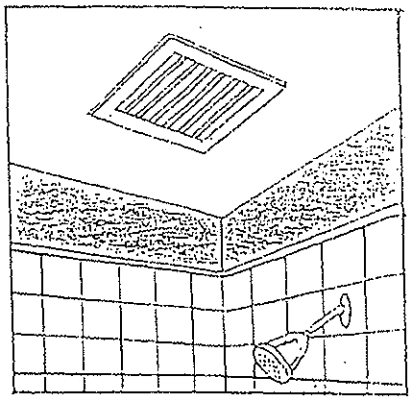
TYPICAL SIGNS

- ☐ Steady streaming of water from windows.
- ☐ Condensation on toilet tank and bathroom fixtures.
- ☐ Mould and mildew between ceramic tiles.
- ☐ Condensation on walls.
- ☐ Peeling paint or wallpaper.
- ☐ Rotting window sills.
- ☐ Damaged gypsum board under windows.
- ☐ Mould or mildew in corners of interior surfaces of outside walls or ceiling.
- ☐ Curling floor tiles.
- ☐ Musty smells from inside walls.
- ☐ Water dripping from vents.



PROBABLE CAUSES

- Excessive house humidity levels.
- Moisture from hot baths and showers.
- Dampness from wet bath mats, towels and drying clothes.
- Inadequate ventilation.
- Uninsulated vent ducts.
- Paint or wallpaper not designed for use in bathrooms.
- Cold outside air leaking through or past insulation.



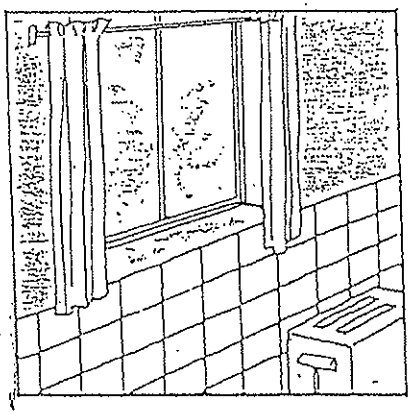
PRACTICAL SOLUTIONS

- Close bathroom door when using shower or bathtub and turn on fan.
- Install a powered or unpowered ceiling vent exhausting to outside.
- Dry very wet clothes or bath mats and towels in a vented electrical dryer, or hang them to dry outside.
- Use moisture-proof paint and wallpaper.
- Properly insulate walls and ceilings.

PROBLEMS IN YOUR

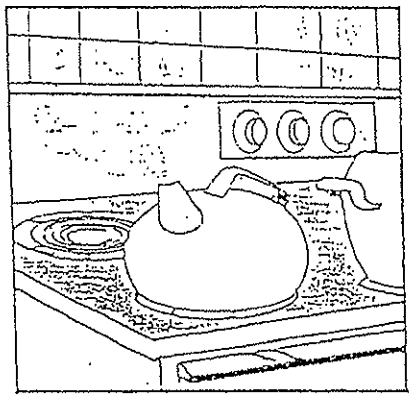
KITCHEN?

CHECK IF YOU HAVE ANY OF THESE PROBLEMS



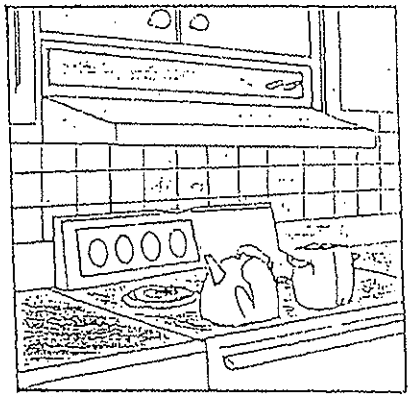
TYPICAL SIGNS

- ☐ Water streaming off windows.
- ☐ Condensation on walls.
- ☐ Damaged walls under windows.
- ☐ Moisture under sinks or kitchen counters.
- ☐ Peeling paint or curling tiles.
- ☐ Mould in cupboards and corners of interior surfaces of outside walls.
- ☐ Doors difficult to open and close.



PROBABLE CAUSES

- Excessive house humidity levels.
- Inadequate ventilation.
- Leaks around sinks and fittings.
- Cooking food (especially simmering and boiling of foods).
- Washing dishes.
- Washing the floor.
- Leaking water pipes.
- Cold outside air leaking through or past insulation.
- Combustion moisture from gas ranges.



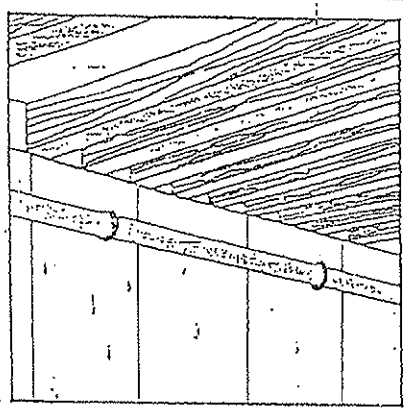
PRACTICAL SOLUTIONS

- Operate *vented* exhaust over oven range when cooking. (If your existing fan is too noisy, replace with a quieter fan.)
- Install a ceiling vent.
- Don't let liquids and food simmer uncovered for unnecessary lengths of time.
- Trim cupboard doors so that air can circulate.
- Properly insulate walls and ceiling.
- Caulk sink and fittings to counter.

PROBLEMS IN YOUR

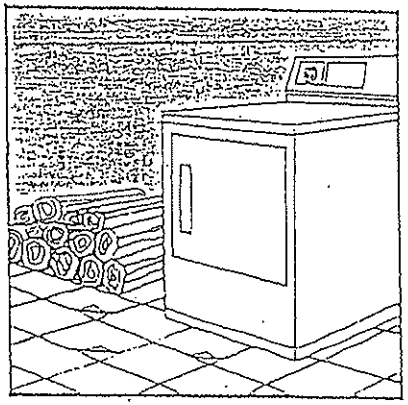
BASEMENT?

CHECK IF YOU HAVE ANY OF THESE PROBLEMS



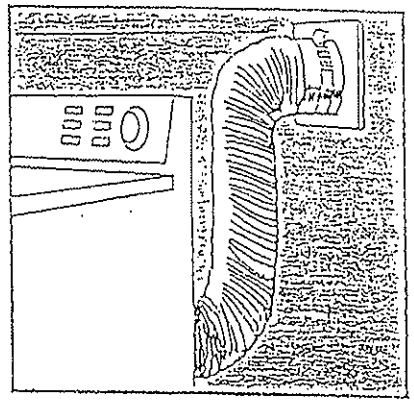
TYPICAL SIGNS

- ☐ Wet or damp floors or walls.
- ☐ Groundwater running down walls and across floors into sump.
- ☑ White powdery stains on exposed concrete walls or floor.
- ☐ Condensation on windows.
- ☐ Condensation dripping from cold water pipes.
- ☐ Mould on joists behind insulation.
- ☐ A stuffy, damp smell.
- ☐ Water seeping through cracks in chimney.



PROBABLE CAUSES

- Humidifying device on your furnace.
- Drying firewood.
- Unvented dryer.
- Wet clothes on line.
- Moisture from new concrete.
- Cracks in walls.
- Blocked footing drains.
- Improper exterior grading of ground near basement walls.
- Flue gas condensation leaking from chimney.
- Rain entering wall.
- Exposed soil in crawl space or basement.
- Spillage of combustion gases from furnace or water heater.



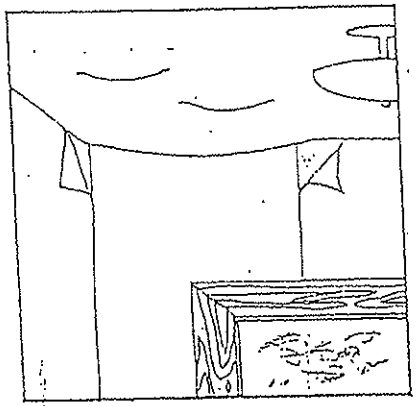
PRACTICAL SOLUTIONS

- If you have a humidifier on your furnace, permanently disconnect or remove it.
- Dry and store firewood outside the house.
- Install dryer vent to outside.
- Connect washer water outlet directly to drain pipe.
- Insulate cold water pipes.
- Cover exposed soil in crawl space or basement with an air or vapour barrier.
- Caulk cracks in walls and chimney.
- Moisture-seal basement floor and walls.
- Caulk along edge where wall joins floor.
- Insulate basement walls.
- Cover and vent the sump to outdoors.
- Provide fresh air intake to basement.

PROBLEMS IN YOUR

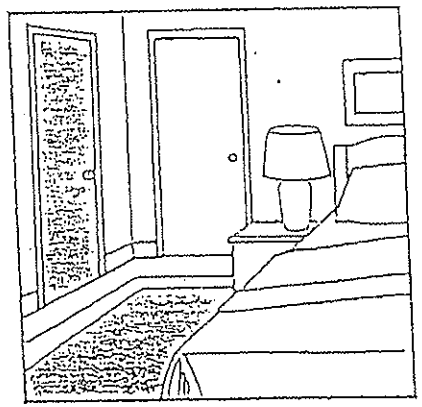
BEDROOM?

CHECK IF YOU HAVE ANY OF THESE PROBLEMS



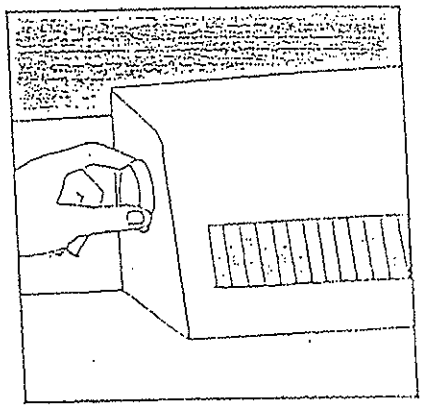
TYPICAL SIGNS

- ☐ Water streaming from windows.
- ☐ Rotting window sills.
- ☐ Damaged gypsum wallboard.
- ☐ Cracked or bulging ceiling.
- ☐ Peeling paint or wallpaper on interior surfaces of outside walls.
- ☐ A damp, stuffy clothes closet.
- ☐ Mould in closets, corners of interior surfaces of outside walls, behind furniture, etc.



PROBABLE CAUSES

- Excessive house humidity levels.
- Lack of air circulation throughout the house.
- Closed door.
- Lack of air circulation in closet.
- Bedroom temperature much lower than in other rooms.
- Ineffective insulation in outer walls or attic.
- Furniture too close to outside walls.
- Closed drapes.
- Use of unvented ranges or combustion heaters in other rooms.



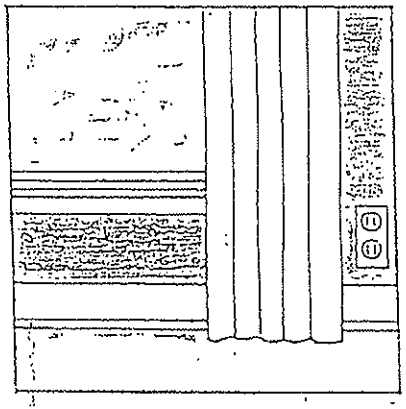
PRACTICAL SOLUTIONS

- Increase bedroom temperature.
- Open drapes.
- Install a central circulating fan and ducting.
- Leave bedroom door open to allow better circulation, or trim bottom of door to create a gap.
- Trim top and bottom of closet door to allow air to circulate, or install louvered doors.
- Properly insulate cold outer walls and ceiling.
- Keep furniture away from outside walls.
- Discontinue use of unvented heaters.
- Install or use ventilation systems.

PROBLEMS IN ALL

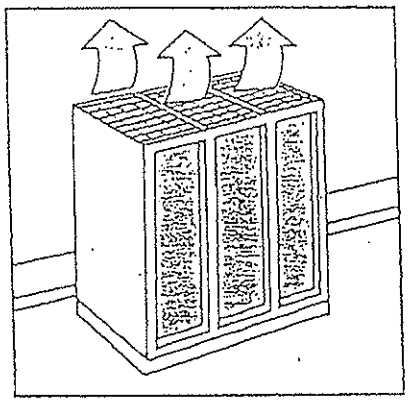
LIVING AREAS?

CHECK IF YOU HAVE ANY OF THESE PROBLEMS



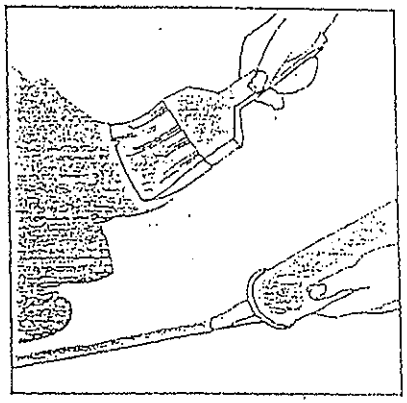
TYPICAL SIGNS

- ☐ Excessive condensation on windows.
- ☐ Rotting windows sills and door jambs.
- ☐ Damaged gypsum board.
- ☐ Mould and mildew in corners of interior surfaces of outside walls.
- ☐ Mould and mildew in closets.
- ☐ Mouldy drapes, carpets or furniture near outside walls.



PROBABLE CAUSES

- Operation of humidifiers.
- Excessive moisture gains in basement or crawl spaces.
- Excessive boiling of food.
- Inadequate ventilation with fresh air.
- Poor air circulation between rooms or within a room.
- Cold surfaces due to ineffective insulation.
- Large air leaks at electrical fixtures, window frames, etc.
- Closed drapes.



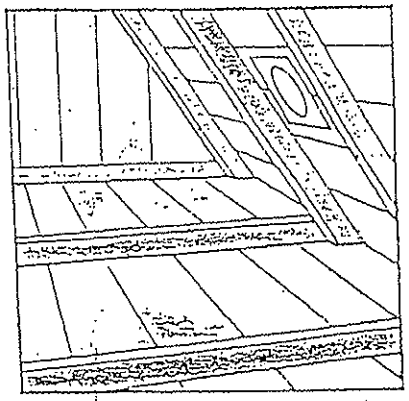
PRACTICAL SOLUTIONS

- Discontinue use of humidifiers.
- Moisture-seal basement walls and floors.
- Caulk basement floor to wall joint.
- Install a balanced ventilation system — and use it regularly.
- Circulate air between rooms.
- Open drapes.
- Properly insulate cold surfaces.
- Seal large air leaks.

PROBLEMS IN THE

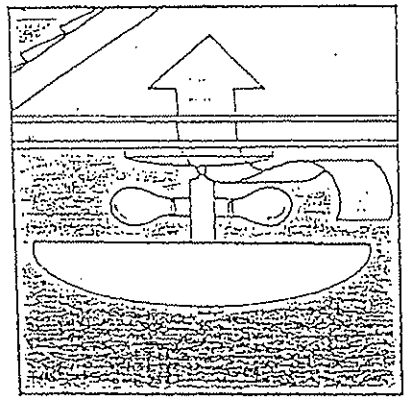
ATTIC AND ROOF?

CHECK IF YOU HAVE ANY OF THESE PROBLEMS



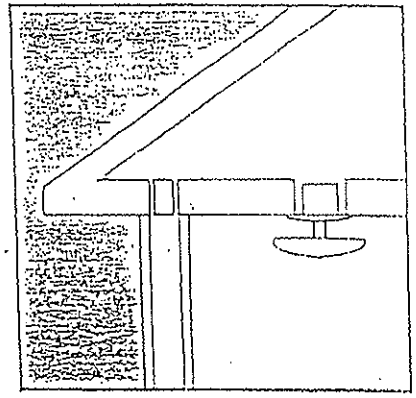
TYPICAL SIGNS

- ☐ Extreme condensation, frost and dark mould on roof trusses and sheathing.
- ☐ Condensation near vents or waste pipes.
- ☐ Condensation near wiring or electric fixtures.
- ☐ Water draining from soffit vents.
- ☐ Stained ceilings.
- ☐ Water draining from ceiling fixtures.



PROBABLE CAUSES

- Holes and cracks in ceiling.
- Incomplete air barrier.
- Unsealed electrical or plumbing fixtures, vents, etc.
- Kitchen and bathroom exhaust fans vented into attic.
- Uninsulated and unsealed attic hatch.
- Poor ventilation in attic.
- Missing chimney firestop.
- Leaking roof.



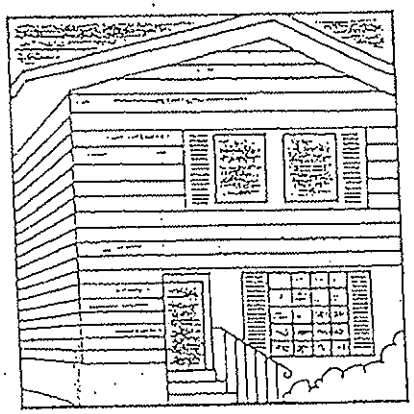
PRACTICAL SOLUTIONS

- Repair holes and cracks in ceiling.
- Reduce excess humidity levels in the house.
- Repair air barrier in ceiling (at interior and exterior walls, fixtures, etc.).
- Seal and insulate attic hatch.
- Install and seal chimney firestop.
- Seal light fixtures.
- Exhaust all vents directly to outside. Carefully seal and insulate attic ducts.
- Repair roof and flashings.

PROBLEMS IN THE

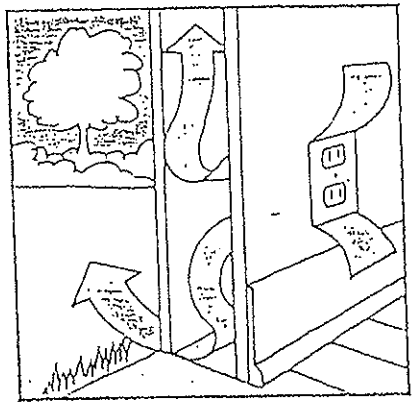
EXTERIOR WALL?

CHECK IF YOU HAVE ANY OF THESE PROBLEMS



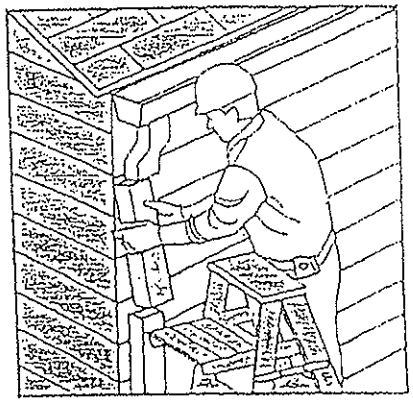
TYPICAL SIGNS

- ☐ Bulging, buckled or rotting siding.
- ☐ Blistering or flaking paint.
- ☐ Dark stains from behind siding.
- ☐ Puddles next to foundation.
- ☐ Wet stains or chalky deposits on brick or stucco.
- ☐ Light markings on brick or stucco.



PROBABLE CAUSES

- Warm moist, inside air leaking out through air barrier in wall.
- Wind-driven rain causing water to penetrate the wall cladding from outside.
- Inadequate or missing flashings.
- Poor drainage and grading and missing splash block.
- Broken downspout.



PRACTICAL SOLUTIONS

- Reduce excess moisture in the house.
- Improve house ventilation.
- Seal all openings into outer walls.
- Install or repair flashing to lead rain out of wall.
- Regrade ground to drain surface water away from building.
- Hire an experienced contractor to inspect your house to identify the cause of the problem and make the necessary repairs.

NOTE: Poor surface drainage around your house may cause dampness inside your basement.

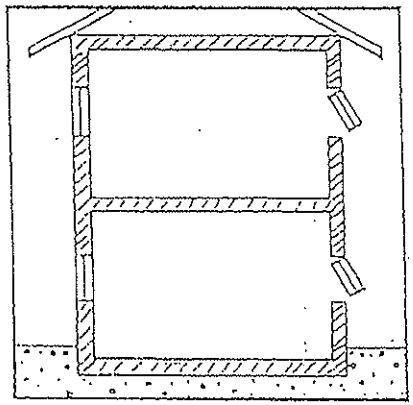
VENTILATON ALTERNATIVES

After reduction of moisture sources, ventilation may be used to improve indoor air quality.

All ventilation systems should be balanced, i.e., air in = air out, with intakes sized to allow easy entry of enough air to supply all exhaust devices.

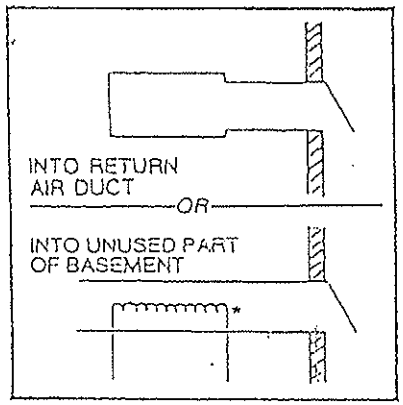
Temporary passive ventilation

On the same wall, open upper or lower section of windows slightly to get temporary relief and prove to yourself that ventilation helps.



Combined active/passive ventilation

Add passive intakes to complement existing exhaust fans, heaters, stoves, fireplaces, etc.

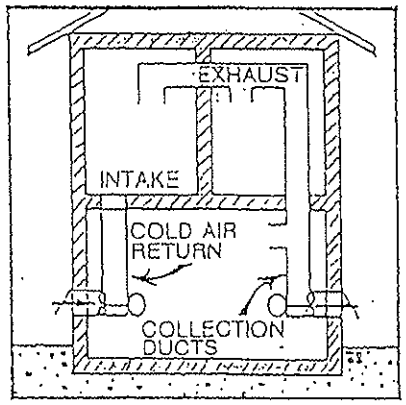


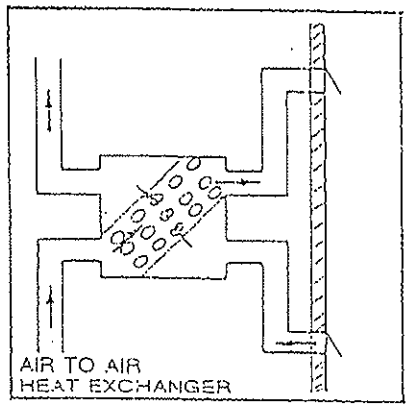
* *Duct heaters are now available to prevent cold drafts.*

Balanced active ventilation

Heat recovery ventilation

Balanced ventilation systems (with matched intakes and exhausts) do not upset combustion appliances. However, combustion and draft openings are still required for furnaces, water heaters, cooking stoves, fireplaces, etc.





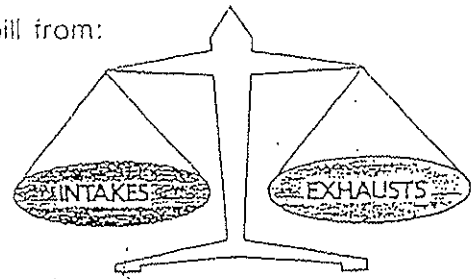
NOTE: In some houses that employ combustion devices gas, oil or wood furnaces, water heaters, firplaces, etc., a fresh air supply may be required to match the flows of exhaust-only ventilation systems.

COMBUSTION SPILLAGE

CAUSES

Combustion gases can spill from:

- furnaces.
- water heaters.
- wood stoves.
- fireplaces.



Gases always spill from unvented cooking devices and space heaters.

Use of unvented combustion devices is not recommended in tightly built houses.

Spillage from vented devices with chimneys can still occur when:

— Chimney and flue pipes are poorly designed, built or maintained.
— Powerful exhaust fans are used in tightly built houses. (Some older Canadian homes are quite tightly built.)
— Adequate air supply capacity is not provided to match exhaust capacity.

SOLUTIONS

- Inspect appliances, flue pipes and chimneys at least once a year.
- Flue pipes and chimneys must be gastight and should be insulated to suit the combustion appliance they serve.
- Provide well-insulated flue pipes and chimneys to mid and high-efficiency appliances.

NOTE: Powerful exhaust devices may require powered fresh air supplies to be safe and effective.

CMHC and others are studying ways to provide draft-free fresh air to match the flows of exhaust devices such as:

- *kitchen range hoods;*
- *bathroom fans;*
- *clothes dryers;*
- *"whole house" vacuum cleaners;*
- *fireplaces;*
- *wood stoves; and*
- *"whole house" ventilators.*

FREQUENT SPILLAGE FROM COMBUSTION APPLIANCES CAN BE A HEALTH HAZARD

HIGHLIGHT SUMMARY

CAUSES

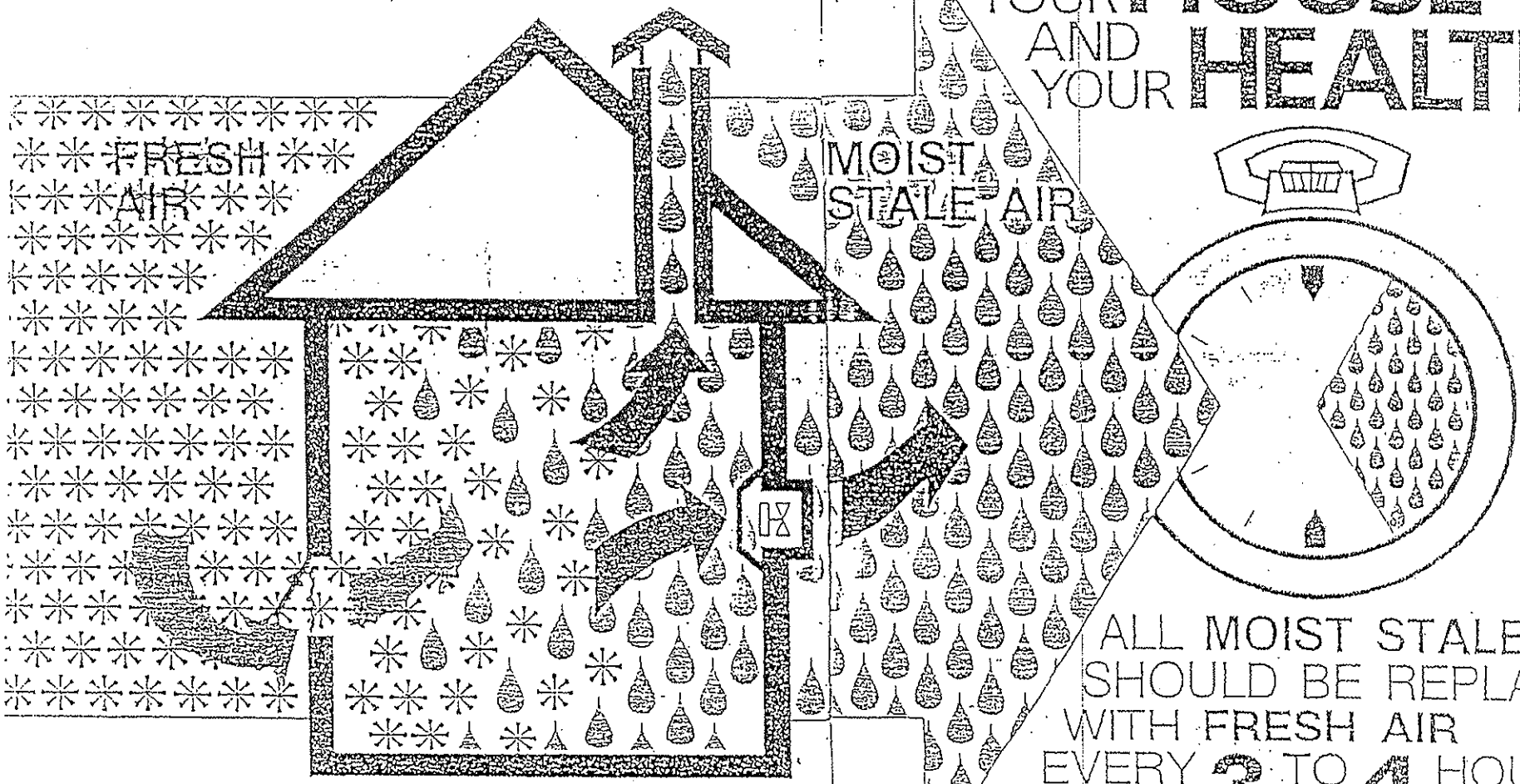
Condensation occurs on surfaces because they are too cold for the amount of moisture present in the indoor air. That results from:

- excessive moisture production:
  - — by ventilation with muggy warm and humid outdoor air (a common climatic problem in spring or fall and in coastal areas);
  - — by evaporation from wet floors, dishes, cooking, people, plants and damp basements; and
  - — from inappropriate use of humidifiers.
- inadequate ventilation with outdoor air.
- inadequate circulation of indoor air.
- unusually cold surfaces because of:
  - — insufficient glazing layers in windows;
  - — inadequate insulation levels in ceilings and walls;
  - — cold air penetrating insulation (a typical cold-climate winter problem); or
  - — a cool basement in summer.

SOLUTIONS

- Reduction of excess moisture production is the first priority:
  - — Control evaporation.
  - — Keep the basement dry.
  - — Discontinue use of humidifiers if window condensation is common.
- Keeping surfaces warm is the second priority:
  - — Window glazing should be appropriate to the climate (triple glazing in cold regions)
  - — Well-insulated walls and ceilings keep indoor surface temperatures high; *but*
  - — cold outside air must be prevented from penetrating insulation (wind barriers, attic air deflectors, etc.).
- A reasonable ventilation rate, plus good circulation of indoor air, are important and effective methods to help prevent all indoor air quality problems.

PROTECT YOUR HOUSE AND YOUR HEALTH



ALL MOIST STALE AIR SHOULD BE REPLACED WITH FRESH AIR EVERY 3 TO 4 HOURS

APPENDIX B

PRODUCT DATA & WARRANTIES

Dow Corning – AllGuard	4 Pages
Dow Corning – 790 Silicone Sealant	3 Pages
Protecto Wrap – 40	3 Pages
Sonolastic – NP1	2 Pages
Imasco Great Wall	2 Pages
Imasco Flexcoat Acrylic	2 Pages
Urelastic 5000-6000	6 Pages

Product Information

Silicone Coatings

Dow Corning® AllGuard Silicone Elastomeric Coating

FEATURES

- Provides long-term waterproofing protection
- Maintains water protection properties even when exposed to sunlight, rain, snow or temperature extremes
- Available in 55 standard colors and unlimited custom colors

COMPOSITION

- One-component, pigmented, water-based silicone elastomer

Water-based silicone elastomer for waterproofing above-grade exterior masonry substrates

APPLICATIONS

Dow Corning® AllGuard Silicone Elastomeric Coating is designed to waterproof above-grade exterior masonry substrates, such as concrete block, fluted block, brick, stucco, synthetic stucco, poured concrete, precast concrete, exterior insulation finish systems (EIFS) and previously coated masonry substrates.

TYPICAL PROPERTIES

Specification Writers: Please contact your local Dow Corning Sales Application Engineer or Dow Corning Customer Service before writing specifications on this product.

Method	Test	Unit	Result
As Supplied			
ASTM D 2369	Solids Content	percent by weight	58.6
		percent by volume	50.1
ASTM D 1475	Specific Gravity	lb/gal (kg/L)	9.64 (1.155)
ASTM D 2196	Viscosity[1]	cps (Pa·s)	63,000 (63)
ASTM D 1849	High Temperature Stability, (no change in viscosity)	days	>28
ASTM D 3960	Volatile Organic Content[2] (VOC)	lb/gal (g/L)	0.459 (<55)
As Cured			
ASTM D 2240	Durometer Hardness, Shore A	points	38
ASTM D 412	Tensile Strength	psi (MPa)	>145 (1.00)
ASTM D 412	Elongation	percent	600
ASTM D 1653	Permeance	English perms	43.2
		(ng/(m²·Pa·s))	(2480)
ASTM D 1737	Room Temperature Flex, 1/8" mandrel		Pass
ASTM C 711	Low Temperature Flex, 1/8" mandrel		Pass
ASTM D 3274	Fungus Resistance		No growth
ASTM D 3273	Mold Resistance		No growth
TT-C-555B	Wind-Driven Rain[3], 98 mph		Pass
NCHRP-244	Chloride Ion Intrusion, effectiveness	percent	90
TT-C-555B	Alkali Resistance		Good

[1]Brookfield HAV, spindle #3, 2 rpm.
[2]VOC reported includes minus water calculation of ASTM D 3960.
[3]Measured on coating system with two coats of *Dow Corning* AllGuard Silicone Elastomeric Coating.

DESCRIPTION

Dow Corning AllGuard Silicone Elastomeric Coating is a one-part, 100 percent water-based silicone elastomer supplied in 3 tint bases for pigmenting at distributor locations. The coating is typically applied in two coats over *Dow Corning*® AllGuard Primer. The coating can be roller, brush or spray applied. It cures to form a flexible membrane that is impervious to water but has the ability to "breathe," allowing water vapor to escape from inside the substrate. Its attractive matte finish minimizes brush and roller marks. The controlled

SEALANT WATERPROOFING & RESTORATION INSTITUTE

Issued to: Dow Corning Corp.

Product: All Guard Silicone Elastomeric Coating

ASTM D 6904: Resistance to Wind Driven Rain
Weight Gain: 1.0 oz. Water Leaks: none
Pass ✓

ASTM E 96: Moisture Vapor Transmission
WVT (grains/ft²,h): 13.1oz. Perms (grains/ft²,h,in.Hg): 29.4
Pass ✓

ASTM D 412: Tensile Properties
Tensile Strength: 600 psi Elongation: 580%
Pass ✓

ASTM C 1305: Crack Bridging Ability
Results: No cracking
Pass ✓

ASTM D 2697: Solids Content by Volume
Results: 51.1% Density: 9.7 lbs/gal.
Pass ✓

Validation Date: 5/21/04 – 5/21/09

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WALLCOATINGS VALIDATION
www.swrionline.org

flow properties of the coating allow a continuous, even film to be applied, even on rough surfaces. Once cured, the coating forms a tough, flexible silicone rubber membrane. The coating provides long-term waterproofing protection, withstanding hurricane-force, wind-driven rain, normal movement imposed by seasonal thermal contraction and expansion, ultraviolet radiation and the elements. The coating maintains its water protection properties even when exposed to sunlight, rain, snow or temperature extremes.

Once pigmented, it is a ready-to-use material that can be applied between 5°C (40°F) and 38°C (100°F) to a clean, dry surface. The average drying time is 4 to 8 hours, depending upon temperature, humidity and wind conditions. *Dow Corning* AllGuard Silicone Elastomeric Coating will attain full adhesion and physical properties in 7 to 14 days.

Dow Corning AllGuard Silicone Elastomeric Coating is available in over 55 standard colors or can be custom colored to order.

HOW TO USE

When properly applied and cured, *Dow Corning* AllGuard Silicone Elastomeric Coating provides a fast, easy and effective method of keeping exterior above-grade surfaces waterproof.

Design Considerations

In many building designs, areas such as ledges and windowsills allow airborne dirt and soot to accumulate. Surfaces exposed to concentrated water run-down may appear dirty or streaky over time and the coating may become difficult to clean. In those areas, drip edges should be installed before the coating is applied to rechannel water away from the surface to protect the long-term appearance of the facade. The success of a drip edge is achieved by moving the runoff water away from the wall onto the drip edge, creating a non-uniform runoff.

A drip edge can be fabricated from the same material as the windowsills or from other formable composites. The drip edge can be mechanically adhered to the substrate or attached with *Dow Corning*® 795 Silicone Building Sealant (see Figure 1).

Surface Preparation

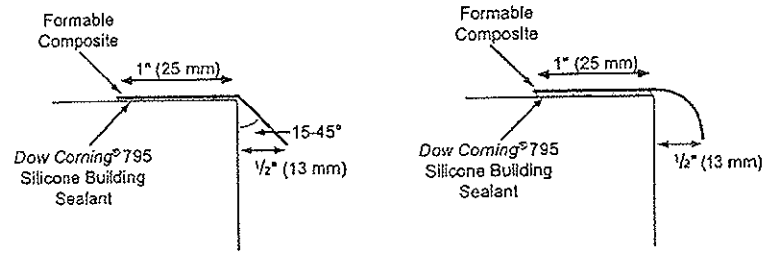
All surfaces to be coated with *Dow Corning* AllGuard Silicone Elastomeric Coating must be prepared as described in the most recent *Dow Corning AllGuard Silicone Elastomeric Coating Application and Maintenance Guide* (Form No. 62-617). The following is a short reference guide for surface preparations.

All surfaces must be clean and free of dirt, frost, dust, oil, grease, mold, fungus, efflorescence, laitance, peeling coating, chalking coating and any other foreign material. Pressure clean, wire brush or grind the wall surface to remove all of the above materials. Repair any damaged concrete, stucco, block, brick, masonry or EIFS. Repair cracks larger than 1/16-inch (1.6-mm) with a material that is compatible with the substrate and *Dow Corning* AllGuard Silicone Elastomeric Coating. *Dow Corning*® 790 or 795 Silicone Building Sealant or *Dow Corning*® 791 Silicone Perimeter Sealant can be used for crack repairs.

Application

Gently hand-stir *Dow Corning* AllGuard Silicone Elastomeric Coating before using to ensure uniformity. Product should be used as supplied. Do not add water. The coating can be applied with a roller, brush or spray. The roller should have a 3/4-inch to 1 1/2-inch (19-mm to 38-mm) nap. The brush should have nylon bristles. Spray application can be by airless or air-assisted spray. When applying the coating with a roller, apply it in a fan pattern to achieve uniform millage. The actual application rate for the coating will vary depending on the texture and porosity of the substrate, but typically an application rate of 80 square feet per gallon (1.96 square meters per liter) on a smooth surface will yield the minimum 10-mil (0.25-mm) dry film thickness required. Two coats of *Dow Corning* AllGuard Silicone Elastomeric Coating are required to provide the

Figure 1. Drip Edge Design Considerations



10-mil (0.25-mm) void-free dry film thickness recommended for waterproofing and required to obtain the warranty. Dow Corning recommends a mock-up be performed on the job site to more accurately estimate material usage requirements. A pinhole-free, void-free surface must be achieved. Refer to the *Dow Corning AllGuard Silicone Elastomeric Coating Application and Maintenance Guide* for more detailed information on application rates.

Dow Corning AllGuard Silicone Elastomeric Coating was developed to obtain good adhesion to the substrate without the need of a primer. To verify that this adhesion is sufficient, field adhesion tests must be performed as described in the *Dow Corning AllGuard Silicone Elastomeric Coating Application and Maintenence Guide*. If adhesion does not meet requirements, a field adhesion test with primer should be performed. To obtain a project specific warranty, field adhesion testing, meeting the requirements, must be performed and documented. Surface adhesion tests on each type of substrate and each face of the structure must be field adhesion tested and acceptable per the *Dow Corning AllGuard Silicone Elastomeric Coating Application and Maintenence Guide.*

Maintenance

Walls should be inspected at least once a year. If coating becomes damaged, repair damaged portion to maintain weatherproofing performance. Any touch-ups or repairs to the coating can be completed by applying *Dow Corning* AllGuard Silicone Elastomeric Coating to the clean, dry area in accordance to the recommendations in this data sheet and the *Dow Corning AllGuard Silicone Elastomeric Coating Application and Maintenance Guide.*

Accumulation of dirt or other contaminants deposited on the facade may cause a deterioration in visual appearance. Dow Corning recommends routine cleaning to minimize this accumulation, following these guidelines:

1. Abrasive cleaners and cleaning equipment should never be used.

2. Clean using pressurized water and a basic cleaning agent such as TSP (trisodium phosphate)[1] or *Simple Green*™[2]. Water pressure should not exceed 1,500 psi (10.3 MPa) to clean the surface without removing the coating material from the wall surface. A small test patch should be done first to determine how long the cleaning agent should be left on the surface before rinsing.

3. Removal of stubborn marks may require the use of a soft bristle brush with the cleaning solution. Avoid stiff brushes that may abrade the coating.

4. If scrubbing with a soft bristle brush using a TSP solution is ineffective, *Citri-Solve*™[3] (rather than TSP) may be applied directly to the surface or brush. A small test patch should be completed to determine the product's effectiveness.

HANDLING PRECAUTIONS

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND MATERIAL SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE MATERIAL SAFETY DATA SHEET IS AVAILABLE ON THE DOW CORNING WEBSITE AT WWW.DOWCORNING.COM, OR FROM YOUR DOW CORNING SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CORNING CUSTOMER SERVICE.

USABLE LIFE AND STORAGE

Protect *Dow Corning* AllGuard Silicone Elastomeric Coating and *Dow Corning* AllGuard Primer from freezing. Store in a cool, dry place out of the weather. When properly stored in its original, unopened container above 1°C (34°F) and below 32°C (90°F), *Dow Corning* AllGuard Silicone Elastomeric Coating and *Dow Corning* AllGuard Primer have shelf lives of 12 months and 18 months, respectively, from date of manufacture. Refer to product packaging for "Use By Date."

PACKAGING

Dow Corning AllGuard Silicone Elastomeric Coating and *Dow Corning* AllGuard Primer are available in 5-gal (19-L) pails (42-46 lb [19-21 kg] per pail depending on color).

LIMITATIONS

Dow Corning AllGuard Silicone Elastomeric Coating should not be applied:

- When the ambient or surface temperature is expected to fall below 5°C (40°F) within 24 hours of application
- When there is a threat of rain within the next 24 hours or the relative humidity is in excess of 90 percent (because conditions would not permit complete surface drying)
- On below-grade applications
- On non-masonry substrates such as metal, wood, plastic or asphaltic materials, or on tar-contaminated masonry

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

HEALTH AND ENVIRONMENTAL INFORMATION

To support customers in their product safety needs, Dow Corning has an extensive Product Stewardship organization and a team of Product Safety and Regulatory Compliance (PS&RC) specialists available in each area.

[1] Follow solvent manufacturer's recommended safe handling instructions and applicable federal, state and local laws.
[2] *Simple Green* is a trademark of Sunshine Makers, Inc.
[3] *Citri-Solve* is a trademark of Omega Laboratories, Inc.

For further information, please see our website, www.dowcorning.com, or consult your local Dow Corning Sales Application Engineer.

AVAILABILITY

Dow Corning AllGuard Silicone Elastomeric Coating and *Dow Corning* AllGuard Primer are marketed throughout North America. For the location of the distributor nearest you or for additional product information, contact Dow Corning Customer Service at 1-800-322-8723 or (989) 496-6000.

LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

Unless Dow Corning issues a project-specific written warranty, Dow Corning warrants only that the goods meet Dow Corning's sales specifications at the time of shipment. **DOW CORNING EXPRESSLY DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** The buyer's exclusive remedy and Dow Corning's sole responsibility for any claim arising out of the purchase or use of these goods is expressly limited to either replacement of the nonconforming goods or refund of the purchase price within 90 days of the date of purchase.

Dow Corning offers a project-specific 10-Year Limited Waterproof Performance Warranty when the *Dow Corning* AllGuard Silicone Elastomeric Coating is applied in accordance with Dow Corning's published application guidelines. Contact your Dow Corning Sales Application Engineer for details or to apply for a project-specific warranty.

Under this Limited Warranty, for a period of ten years from the date of purchase, Dow Corning will be responsible for the cost of replacement coating for any areas in which the *Dow Corning* AllGuard Silicone Elastomeric Coating fails to protect the above-grade substrate from through-water penetration and for the cost of labor to apply such replacement coating, up to a maximum of five times the cost of the replacement coating. Dow Corning's warranty is subject to certain restrictions and does not cover faults attributable to workmanship or the appearance of the coating.

NOTE: No warranty is available when *Dow Corning* AllGuard Silicone Elastomeric Coating is used on a single-family residential dwelling.

Printed in USA
Form No. 62-048K-01

AGP7200

Product Information

Silicone Sealants

Dow Corning® 790 Silicone Building Sealant

FEATURES

- Excellent performance even in building joints that experience extreme movement
- Suitable for new and remedial construction
- Extension/compression capability of +100/-50 percent

BENEFITS

- Excellent weathering properties and resistance to sunlight, rain, snow, and temperature extremes
- Excellent unprimed adhesion to masonry, concrete substrates
- Easy application over a wide temperature range

COMPOSITION

- Ultra-low-modulus, one-part, neutral-cure silicone sealant

Ultra-low-modulus sealant for new and remedial construction joint sealing applications

APPLICATIONS

Dow Corning® 790 Silicone Building Sealant offers outstanding unprimed adhesion to masonry and is particularly effective for sealing expansion and control joints, precast concrete panel joints, Exterior Insulation and Finish Systems (EIFS) joints, curtainwall joints, mullion joints, stone pavers, and many other construction joints. When used in accordance with Dow Corning application and testing recommendations, the sealant forms a durable, flexible, watertight bond with many common building materials, including combinations of stone, concrete, masonry, granite, marble, aluminum, painted substrates, and glass.

TYPICAL PROPERTIES

Specification Writers: Please contact your local Dow Corning Sales Application Engineer or Dow Corning Customer Service before writing specifications on this product.

Method	Test	Unit	Result
As Supplied			
ASTM C 679	Tack-Free Time, 50% RH	hours	1
	Curing Time, 50% RH, at 25°C (77°F), 3/8" depth	days	7-14
	Full Adhesion, cured joint	days	14-21
ASTM D 2202	Flow, Sag, or Slump		None
CTM[1] 98 B	Working Time	minutes	10-20
EPA Method 24	VOC Content[2], maximum	g/L	43
As Cured – After 7 days at 25°C (77°F) and 50% RH			
ASTM C 661	Durometer Hardness, Shore A	points	15
ASTM D 412	Tensile Strength, maximum	psi (kg/mm²)	100 (0.070)
ASTM C 794	Peel Strength	lb/in (kg/cm)	25 (4.46)
ASTM C 1135	Tensile,		
	at 25% extension	psi (kg/mm²)	15 (0.010)
	at 50% extension	psi (kg/mm²)	20 (1.015)
ASTM C 719	Joint Movement Capabilities		
	Extension/Compression	percent	+100/-50
ASTM C 1248	Staining, various substrates		None

[1]CTMs (Corporate Test Methods) correspond to standard ASTM tests in most instances. Copies of CTMs are available upon request.

[2]Based on South Coast Air Quality Management District of California. Maximum VOC is listed both inclusive and exclusive of water and exempt compounds. For a VOC data sheet for a specific sealant color, please send your request to product.inquiry@dowcorning.com.

DESCRIPTION

Suitable for new construction or remedial applications, *Dow Corning* 790 Silicone Building Sealant provides excellent performance, even in building joints that experience extreme movement. It places a low stress on the sealant/substrate bond line to minimize failures in moving joints.

Dow Corning 790 Silicone Building Sealant is available in 11 colors: black, precast white, gray, natural stone, bronze, adobe tan, blue spruce, rustic brick, sandstone, charcoal, and dusty rose. Custom colors are available upon request.

APPROVALS/ SPECIFICATIONS

This sealant meets or exceeds the requirements of:

- ASTM Specification C 920, Type S, Grade NS, Class 100/50, Use T, NT, M, G, A, and O
- Many UL wall/floor fire designs, some without a protective cover plate (see www.ul.com for current listing)
- Fire Tests of Building Construction and Materials, UL 263 (ASTM E 119)

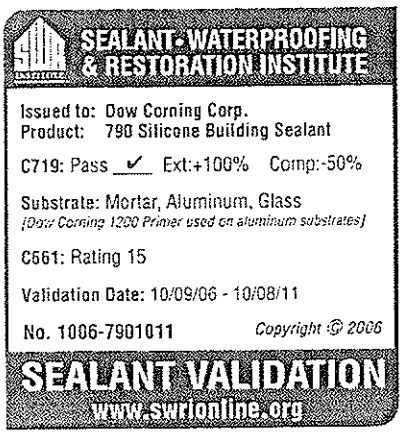
Data from an independent test lab and Sealant, Waterproofing and Restoration Institute validation are available from Dow Corning and the SWR Institute. A complete product specification sheet for this product is available upon request.

HOW TO USE

Consult the current version of the *Dow Corning Americas Technical Manual*, Form No. 62-1112, (available from www.dowcorning.com/construction) for detailed information on application methods, joint design, field testing, and warranty requirements when using *Dow Corning*® brand sealants. Please contact your local Dow Corning Sales Application Engineer for specific advice.

HANDLING PRECAUTIONS

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND MATERIAL SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE MATERIAL SAFETY DATA SHEET IS AVAILABLE ON THE DOW CORNING WEBSITE AT WWW.DOWCORNING.COM, OR FROM YOUR DOW CORNING SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CORNING CUSTOMER SERVICE.



USABLE LIFE AND STORAGE

When stored at or below 32°C (90°F), *Dow Corning* 790 Silicone Building Sealant has a shelf life of 12 months from date of manufacture. Refer to product packaging for "Use By" date.

PACKAGING

Dow Corning 790 Silicone Building Sealant is packaged in 10.3-fl oz (305-mL) disposable cartridges that fit ordinary caulking guns, 20-fl oz (590-mL) E-Z Pak foil sausages that fit caulking guns, and also in 2.0- and 4.5-gal (7.5- and 17-L) bulk pails. It can be dispensed by many air-operated guns and most types of bulk dispensing equipment.

LIMITATIONS

Dow Corning 790 Silicone Building Sealant should not be applied:

- In structural applications.
- Below grade or to materials that outgas, which can cause bubbling in curing sealant.
- On brass or copper or other similar material that can be corroded.
- To surfaces that are continuously immersed in water.
- For use as an interior penetration firestop sealing system.
- To building materials that bleed oils, plasticizers, or solvents – materials such as impregnated wood, oil-based caulks, green or partially vulcanized rubber gaskets, or tapes or bituminous below-grade waterproofing and asphalt-impregnated fiberboard.
- In totally confined spaces because the sealant requires atmospheric moisture for cure.
- To surfaces that will be painted after application. The paint film will not stretch with the extension of the sealant and may crack and peel and most likely will not adhere to the sealant.
- To surfaces in direct or indirect contact with food.
- To wet or frost-laden surfaces.
- In applications where solvents or primers are not fully dried prior to sealant application. Uncured sealant is very sensitive to many solvents, primers, and cleaning agents; these may cause the sealant to remain uncured or tacky.

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

HEALTH AND ENVIRONMENTAL INFORMATION

To support customers in their product safety needs, Dow Corning has an extensive Product Stewardship organization and a team of Product Safety and Regulatory Compliance (PS&RC) specialists available in each area.

For further information, please see our website, www.dowcorning.com, or consult your local Dow Corning Sales Application Engineer.

LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that Dow Corning's products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent.

Dow Corning's sole warranty is that the product will meet the Dow Corning sales specifications in effect at the time of shipment.

Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted.

DOW CORNING SPECIFICALLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY.

DOW CORNING DISCLAIMS LIABILITY FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

A 20-year Weatherseal Limited Warranty is available. Some testing may be required. Consult your Dow Corning Sales Application Engineer for details.

Printed in USA
Form No. 61-884M-01

AGP8453

Protecto Wrap Co.

Protecto Wrap
Premium Building Products That Protect

1. Product Name

PW-100/40 Air/Vapor Barrier

Primers
- No. 100 Primer
- No. 100 VOC Primer
- No. 6000 Water-Based Primer
- No. JS160H Mastic

2. Manufacturer

Protecto Wrap Co.
1955 South Cherokee St.
Denver, CO 80223
(800) 759-9727
(303) 777-3001
Fax: (303) 777-9273
E-mail: info@protectowrap.com
www.protectowrap.com

3. Product Description

BASIC USE

Protecto Wrap's Air/Vapor Barrier is a peel-and-stick membrane for use as a positive air/vapor stop in everyday construction. PW-100/40 AVB is compatible with and will adhere to steel, wood, concrete, building paper, block wall, drywall and insulation board. PW-100/40 AVB' s paper release backing, and the variety of available roll widths, contributes to the ease of application. There are multiple uses that utilize the aggressive adhesive characteristics of the membrane, including:
- As a full building wrap in envelope applications in cavity wall construction
- Sealing window and door perimeters to the building substrates
- Sealing around skylights
- As a vapor barrier in mechanically fastened roofing systems
- Sealing joints in exterior gypsum board
- Sealing joints in outsilation systems
- Sealing penetrations in roof and wall systems

COMPOSITION & MATERIALS

PW-100/40 AVB is a 40 mil (1 mm) SBS modified, rubberized asphalt sheet waterproofing membrane that fully bonds to most substrates through the primer course. The polyethylene-topped membrane has excellent conforming capabilities to irregular surfaces.

Note - The membrane is also available in a 60 mil (1.5 mm) version - PW-100/60.

PACKAGING

See Table 1.

LIMITATIONS
- PW-100/40 is not recommended for applications where the membrane will be exposed to continuous sunlight
- Do not apply primer or membrane to wet, damp, frosty or contaminated surfaces
- Do not apply primer or membrane to frozen concrete
- Do not apply over sealants containing tar. If bitumen modified materials are encountered, consult a Protecto Wrap representative for guidance

ACCESSORY MATERIALS

JS160H Mastic and Protecto Wrap primers are specially formulated for use with PW-100/40 AVB.

No. 100 Primer is a high tack SBS rubber base primer. It is used on all vertical surfaces before application of the membrane and on all surfaces with temperatures between 25 and 40 degrees F (-4 and 4 degrees C).

No. 100 VOC Primer is a VOC compliant version of Protecto Wrap's standard No. 100 Primer.

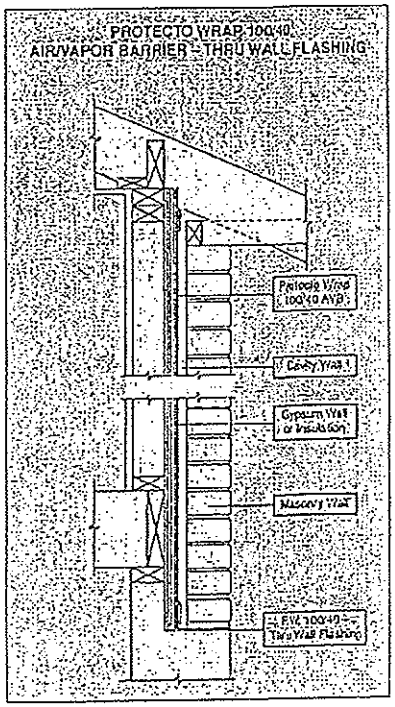
No. JS160H Mastic is a rubberized blend of bituminous and synthetic resins used for sealing detail cuts, membrane terminations and penetrations such as masonry ties.

No. 6000 Water-Based Primer is a water-based primer that contains no VOCs. The No. 6000 Primer comes in a 1 gallon (3.8 L) concentrate. Mix the concentrate at a ratio of 1 part water to 1 part concentrate for a vertical application and 2 parts water to 1 part concentrate for a horizontal application.

4. Technical Data

APPLICABLE STANDARDS

ASTM International
- ASTM C836 Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
- ASTM D146 Standard Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing
- ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension
- ASTM E96/E96M Standard Test Methods for Water Vapor Transmission of Materials



Application details

- ASTM E154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
- ASTM E283 Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

APPROVALS

Consult manufacturer for current information on approvals by code bodies and other industry entities.

PHYSICAL PROPERTIES

See Table 2.

5. Installation

STORAGE & HANDLING

Store all material inside in a dry space at temperatures between 50 and 90 degrees F (10 and 32 degrees C). Do not store in direct sunlight. Do not remove material from box until ready to use. For cold weather applications, store PW- 100/40 AVB in a heated airspace at a temperature of 50 degrees F (10 degrees C) or higher for at least 2 days prior to application. Remove only

the material that can be applied within 2 hours. Store materials away from flames or sparks.

PREPARATORY WORK

Handle and store product according to manufacturer's recommendations.

Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

Verify that site conditions are acceptable for installation. Do not proceed with installation until unacceptable conditions are corrected.

Surface Preparation

Prior to application, ensure that all surfaces are clean, dry and free of dirt and other foreign matter. Apply PW-100/40 AVB at a temperature above 40 degrees F (4 degrees C). Should application below this temperature be necessary, consult a Protecto Wrap representative.

APPLICATION

The application surface must be cleaned using a broom, a vacuum or an air compressor dispensing clean, dry air so that all dust and foreign matter are removed.

Thinning of No. 100 Primer is not recommended. When not in use, seal open containers to prevent evaporation of the solvents.

Prime the area to be sealed with No. 100 Primer and allow it to dry to a tacky state. Apply primer to all surfaces by roller or brush, at a rate of 150 - 250 ft²/gal (3.8 - 6.3 m²/L), depending on the porosity of the surface. Primed surface must be free of runs, puddles or excessive primer, as the presence of these conditions can result in blistering.

Protecto Wrap No. 6000 Water-Based Primer may be used in lieu of No. 100 Primer when application temperatures are above 50 degrees F (10 degrees C). Side laps should be a minimum of 2" (51 mm) and end laps should be a minimum of 4" (102 mm). All membrane terminations should be sealed with a 1" (25.4 mm) wide troweled bead of JS160H Mastic.

Test the primer using the "rule of thumb" method. Press thumb firmly on the primed surface and twist. If the primer feels pliable but does not adhere to thumb, the primed surface is ready for membrane application.

Unroll the PW-100/40 AVB to the desired length and begin applying the membrane by removing the release paper and smoothing it into place. Apply a bead of SBS Mastic over any brick tie cuts and at all membrane terminations.

TABLE 1 PRODUCT PACKAGING (PRIMER AND MASTIC)

	No. 100 Primer	No. 80 Primer	JS160H Mastic
36 10.5 oz tubes, lb (kg)	-	-	24 (18.6)
4 - 1 gallon can, lb (kg)	38 (17.2)	38 (17.2)	40 (26)
5 gallon pail, lb (kg)	46 (21)	46 (21)	50 (31)
55 gallon drum, lb (kg)	485 (220)	485 (220)	-

TABLE 2 TYPICAL PHYSICAL PROPERTIES

Property	Value	Test Method
Thickness	40 mil (1 mm)	-
Color	Grey	-
Pliability 180° bend over 1" (25.4 mm) mandrel at -25°F (-32°C)	Unaffected	ASTM D146
Tensile strength (membrane)	250 psi (1.7 MPa)	ASTM D412 (Die C) modified
Elongation - Ultimate failure of rubberized asphalt	300% min	ASTM D412 (Die C) modified
Cycling over crack at -15°F (-26°C)	No effect, 100 cycles	[1]
Cycling over 1" (25.4 mm) joint at -15°F (-26°C)	No effect, 1000 cycles	[1]
Peel adhesion - 28 days wet (submerged aging)	4.7 lb/in (5.7 N/m) width	[2]
Puncture resistance - PW 100/40 Through wall flashing (stretched by blunt object)	40 lb (178 N) min	ASTM E154
Puncture resistance - Polyethylene film (mm N tear - impact from sharp object)	250 in oz (1746.25) min	ASTM D781
Air permeance of "in-place" system (pressure difference of 75 Pa)	Less than 0.25 cfm/ft² (0.01 l/s/m²)	ASTM E283 [3]
Resistance to 2 kPa air pressure difference	No increase in equivalent leakage area	ASTM E283 [3]
Permeance - Metric perms	0.009 perms (0.517) max	ASTM E96 (Method B)
Water absorption - 72 hours % of weight	0.25 max	ASTM D1228

[1] Membrane is applied across 2 primed blocks with no separation between blocks. At -15 degrees F (-26 degrees C), blocks are pulled apart 1/4" (6.4 mm), then returned to original position. Cycle is repeated 100 times. For joint cycling, the blocks are double covered with membrane separated by 1" (25.4 mm), then cycled at -15 degrees F (-26 degrees C) between 3/4" and 1 1/4" (19.1 and 32 mm) for a minimum of 1000 cycles.

[2] Membrane is applied to primed blocks and rolled. Blocks are then stored for 28 days under water. Membrane is then peeled from the concrete at a 90° angle.

[3] Membrane is adhered to concrete block wall and penetrated by mechanical fasteners. System is tested with both positive and negative pressure differentials (independent certified laboratory test figures).

Note - It is very important in full envelope applications that the PW-100/40 AVB be tightly sealed into roofing and below-grade waterproofing systems and perimeter flashings to retain the integrity of the vapor barrier throughout the entire structure. In full building envelope applications, the dew point must be engineered to conditions outside of the building.

PW-100/40 AVB is available with a serrated release liner 4" (102 mm) from the top edge for ease of application. In this application, remove the 4" (102 mm) top release paper and adhere the PW-100/40 AVB to the wall. Once in place, remove the bottom release paper and adhere the PW-100/40 AVB to the surface being sealed.

PRECAUTIONS

Protecto Wrap solvent-based primers/mastic are flammable. Avoid exposure to open flames, sparks, etc. Use only in areas with adequate ventilation. Refer to MSDS for additional information and warnings.

6. Availability & Cost

AVAILABILITY

PW-100/40 AVB is manufactured in Denver, CO, and is available worldwide through a network of Protecto Wrap distributors. For detailed product information or to find a local representative or distributor, contact the Protecto Wrap Co.

COST

PW-100/40 AVB is competitively priced. Contact a local representative or the corporate office for information.

7. Warranty

Protecto Wrap Co. expressly warrants, subject to the Exclusion Of Warranties provision, that its products shall be fit for the ordinary purposes for which such products are intended for a period of 5 years. Contact the manufacturer for complete warranty details.

8. Maintenance

None required, if installed in accordance with manufacturer's recommendations.

9. Technical Services

Complete technical assistance and information are available from Protecto Wrap field representatives and distributors or by contacting the manufacturer.

10. Filing Systems

- MANU-SPEC®
- Additional product information is available from the manufacturer.

BASF

The Chemical Company

SONOLASTIC® NP1™

Polyurethane joint sealant

DESCRIPTION

Sonolastic NP 1 is a versatile moisture-curing high performance polyurethane sealant with permanent elasticity.

COMPLIANCES

- Federal Specification TT-S-00230C, Type II, Class A
- Corps of Engineers CRD-C-541, Type II, Class A
- ASTM C 920, Type S, Grade NS, Class 25, Use NT, M, A, G and I
- Canadian Specification CAN/CGSB-19 13-M87, Classification MCG-2-25-A-N, No.81026
- USDA approved for use in meat and poultry areas
- Canadian approval for use in establishments that handle food
- SWRI validated
- ISO 11600 F-25LM

RECOMMENDED USE

Active, vertical and horizontal interior, exterior joints. Including expansion wall joints, floor and pavement joints, curtain walls, panel walls, precast walls, window frames, structural components, dams, spillways and stormwater drains. Substrates include concrete, masonry, aluminium and wood.

FEATURES AND BENEFITS

- *Joint movement capability ± 35%*
  Excellent flexibility for keeping moving joints tight
- *Available in pro-pack sausages*
  Reduces job-site waste, lowers disposal costs
- *Easy to gun and tool*
  Speeds application and makes neater joints
- *Variety of colours*
  Matches common substrates
- *Bonds to most construction materials without a primer*
  Lowers installation costs
- *One component*
  No mixing, less labour
- *Weather resistant*
  Long-lasting weathertight seals
- *Wide temperature application range*
  Suitable for all climates
- *Paintable polyurethane sealant*
  Best choice for structures that may be repainted
- *Low VOC content*
  User friendly for applicators
- *Suitable for non-chlorinated water immersion*
  Potable water approved

PERFORMANCE DATA

Property	Test Method	Value (Average)
Movement capability (MAF)	ASTM C 719	± 35%
Tensile strength	ASTM D 412	2.4 MPa
Ultimate elongation at break	ASTM D 412	800%
Hardness at standard conditions (Shore A)	ASTM C 661	25-30
Hardness after heat aging, max. Shore A:50	ASTM C 661	25
Tack-free time (maximum 72 hrs.)	ASTM C 679	Passes
Stain and colour change	ASTM C 510	None
Volatile Organic Compounds (VOC)	SCAQMD Method 304-91	48g/litre
Service temperature range (°C)		-40 to 82
Potable water certified	AS/NZS 4020	1000m²/L

The above data represents the information typically required to verify performance. For the full and comprehensive list of performance data, refer to "Application Guide & Performance Data for Sonolastic® Polyurethane Sealants" available from your local BASF Construction Chemicals representative.

APPLICATION DIRECTIONS

For information on joint design, surface preparation and priming, refer to Technical Note 17 "Application Guide & Performance data for Sonolastic Polyurethane Sealants" available from your local BASF Construction Chemicals representative.

Application

- Sonolastic NP 1 comes ready to use. Apply by professional caulking gun. Do not open sausages until preparatory work has been completed.
- Fill joints from deepest point to the surface by holding a properly sized nozzle against the back of the joint.
- Dry tooling is recommended. DO NOT use soapy water when tooling. Tooling results in the correct bead shape, a neat joint, and maximum adhesion.

For Best Performance

- Protect unopened containers from heat and direct sunshine.
- In cool or cold weather, store container at room temperature for at least 24 hours before using.
- Do not apply over freshly treated wood; treated wood must have weathered for at least 6 months.
- UV exposure may cause white Sonolastic NP 1 to discolour – this does not effect sealant performance; where maintaining a true white appearance is critical, use Sonolastic Ultra Sealant.
- Temperatures below 5°C will extend curing times.

BASF

The Chemical Company

SONOLASTIC® NP1™

- Sonolastic NP 1 should not come in contact with oil-base caulking, silicone sealants, polysulfides, fillers impregnated with oil, asphalt, or tar.
- Sonolastic NP1 can be painted over provided it is fully cured and cleaned. When painting over any elastomeric sealant, use a paint that is also elastomeric.
- Do not allow uncured Sonolastic NP1 to come into contact with alcohol-based materials or solvents.
- When Sonolastic NP1 is to be used in areas subject to continuous water immersion, cure for 21 days at 23°C and 50% relative humidity. Allow longer cure times at lower temperatures and humidities. Always use Primer 733.
- Do not use in swimming pool or other submerged conditions where the sealant will be exposed to strong oxidizers.
- Avoid submerged conditions where water temperatures will exceed 50°C.

CURING

The cure of Sonolastic NP 1 varies with temperature and humidity. The following times assume 24°C, 50% relative humidity, and a joint 12mm width by 6mm depth.

- Skins overnight or within 24 hours.
- Functional within 3 days,
- Full cure in approximately 1 week.

Note: Deeper joints require longer curing period.
Lower temperatures and humidities will extend curing times.

CLEANING

- Immediately after use, clean equipment with Sonoshield Thinner. Use proper precautions when handling solvents.
- Remove cured sealant by cutting with a sharp-edge tool.
- Remove thin films by abrading.

COLOURS

A complete line of standard colours is available including white, limestone, tan, aluminium grey, and black.

PACKAGING

Sonolastic NP 1 is packaged in 590 mL ProPack sausages, 20 sausages to a carton.

ESTIMATING DATA

Joint Size (mm)	Metres per litre
5 x 5	40
10 x 10	10
12 x 12	6.95
15 x 7.5	8.88
20 x 10	5.00
25 x 12.5	3.20
30 x 15	2.22

SHELF LIFE

Shelf life is 12 months when stored away from heat and direct sunshine.

PRECAUTIONS

KEEP OUT OF REACH OF CHILDREN. Use only with adequate ventilation. Prevent contact with skin, eyes, and clothing. Wash thoroughly after handling. Use impervious gloves, eye protection and if used in a poorly ventilated area, use approved respiratory protection.

First Aid

In case of eye contact, flush thoroughly with water at least 15 minutes. SEEK IMMEDIATE MEDICAL ATTENTION. In case of skin contact, wash affected areas with soap and water. If irritation persists, seek medical attention. Remove and wash contaminated clothing. If inhalation causes physical discomfort, remove to fresh air. If discomfort persists or any breathing difficulty occurs, or if swallowed, SEEK IMMEDIATE MEDICAL ATTENTION. Refer to Material Safety Data Sheet (MSDS) for further information.

All BASF Construction Chemicals Australia & New Zealand data sheets are updated on a regular basis, it is the user's responsibility to obtain the most recent issue

ASonNP1/11/0608

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GREATWALL BASECOAT CONCENTRATE

For ¾" Two Coat Application – Double Back Method

DATA SHEET

DESCRIPTION

IMASCO GREATWALL BASECOAT CONCENTRATE is a factory blend of portland cement, fibers and proprietary ingredients. IMASCO GREATWALL BASECOAT CONCENTRATE has improved workability, excellent coverage, compressive and flexural strength and resistance to shrinkage cracking. When mixed with sand and water it produces a fiber-reinforced stucco basecoat that provides a high quality substrate for a finish coat. Finishes such as Imasco Premix, Premix 1000 and Artisan Premix cementitious stuccos, or Perfector and FlexCoat Acrylic stuccos, can be applied as early as 7 days.

PACKAGING

80lb (36.4kg) moisture protective bag, 25 bags per pallet.

COVERAGE

At ¾" (19mm) thickness–6-8yds^2 (approx. 4.9-6.5m^2) per bag of concentrate.

PREPARATION

Always ensure that installation of lath and accessories are in accordance with local Building Code Standards.

MIXING

Use approximately 5-6gal (19-23L) of clean water with approximately 220lb (100kg) of clean, washed plaster sand (complying with ASTM C144) per 80lb bag of IMASCO GREATWALL BASECOAT CONCENTRATE.

Sand Aggregate for BaseCoat

Sand must be clean and free from deleterious amounts of loam, clay, silt, soluble salts and organic matter. Sand must comply with NBC 9.28.2.2.

Mixing Procedures (1 Bag)

- Measure 4gal (15L) of water
- Add 10 shovels of sand
- Add 1 bag of GREATWALL CONCENTRATE
- Mix until even consistency
- Add 10 shovels of sand
- Add water to the right consistency

(Do not mix for longer than 2 to 3 minutes)

Approximate measurements for sand:
1 shovel = 11lb (using size 2 shovel)
5 shovels = one 5gal level pail

Mixer must be clean and free of contamination to ensure quality mix. Avoid excessive additions of water to the mixture, as this will cause slumping.

Do not add soap, plasticizer or any other admixtures.

APPLICATION

Apply with a stainless steel trowel or proper spraying equipment. Consult equipment manufacturer for proper spray / pump application.

Material to be applied in two ⅜" (9.5mm) coats (scratch and brown) for a total thickness of ¾" (19mm). For best results, apply scratch and brown coats on the same day. The surface of the first coat (scratch coat) shall be scored to provide a key with the second coat(brown coat). Allow scratch coat to stiffen then ensure there is adequate moisture on wall before applying brown coat.

Note: when applying GreatWall over a cavity drainage system Imasco does not recommend using the double back method. In order to reduce deflection and ensure the bond between the scratch coat and wire is not compromised Imasco recommends the brown coat be applied the following day.

The lath must be fully embedded and cannot be exposed.

Product must be applied in accordance with Imasco specifications (conforming to ICC-ES Evaluation Report #5047, NBC, BCBC, ABC, UBC, AWCA, AWCI and NWCB guidelines.)

The surface shall be brought to a true even plane by rodding and surface defects and scratches shall be filled with plaster. The surface shall be floated and left uniformly rough to provide a bond for the finish coat. The surface shall have no variation greater than ¼" (6.35mm) in any direction under a 5' straight edge.

CURING

Take special precautions on days of extreme weather (hot, cold and windy) to prevent rapid drying and cracking of plaster.

During hot, dry, or dry windy conditions keep stucco moist for at least 48 hours by lightly misting walls. For best results, moist cure the stucco at the beginning and end of the day. Keep misting after the plaster takes its initial set. Do not spray the walls with high-pressure water for at least 72 hours. Finish coat may be applied after a minimum of 7 days. See the Imasco Guide Specifications for further information.

During the cold season special precautions should be taken. The basecoat should be applied above 4°C (39°F) and should remain above 4°C (39°F) for a minimum of 48 hours. Use insulated tarps, additional heating and air circulation as required. Refer to Imasco technical bulletin on techniques for Hoarding Stucco Work (TB001) and technical bulletin on Cold Weather Application (TB002).

SAFETY PRECAUTIONS

Contains portland cement. Avoid contact with eyes or prolonged contact with skin. In case of eye contact, flush with plenty of water for at least 15 minutes. Get prompt medical attention. In case of skin contact, wash thoroughly with water. Wear eye protection and non-toxic particle mask. Do not take internally. KEEP OUT OF REACH OF CHILDREN.

Continued on the back of this page...

IMASCO

IMASCO MINERALS INC. 19287 98A Avenue, Surrey, BC Canada V4N 4C8
t: 604.888.3848 f: 604.888.5671 www.imascominerals.com

GREATWALL BASECOAT CONCENTRATE
For ¾" Two Coat Application – Double Back Method

STORAGE
Store in a dry area protected from the weather.

SHELF LIFE
Use as soon as possible and protect from moisture. Normal shelf life is 6 months provided it is properly stored.

WARRANTY
IMASCO GREATWALL BASECOAT CONCENTRATE is manufactured to strict quality standards using the highest quality ingredients. Imasco Minerals Inc. fully guarantees its products and will refund or replace any product found to be defective. Liability is limited to replacement or refund only and no other warranty is expressed or implied. For individual products, Imasco Minerals Inc. offers a 5 year material defect warranty. Please see written warranties for further details.

Some cracking and efflorescence are inherent to portland cement, and are not a reflection of product quality.

Imasco Minerals Inc. is unable to accept responsibility for job conditions, workmanship, climate, or damages due to transport. IMASCO GREATWALL BASECOAT CONCENTRATE is to be applied in accordance with all manufacturers' specifications.

If further information is required, please contact your IMASCO dealer.

IMASCO MINERALS INC. 19287 98A Avenue, Surrey, BC Canada V4N 4C8
t: 604.888.3848 f: 604.888.5671 www.imascominerals.com

FLEXCOAT ACRYLIC FINISH STUCCO

Fine Sandfloat, Medium Sandfloat, Medium Scroll XL

DATASHEET

DESCRIPTION

IMASCO FLEXCOAT ACRYLIC is a flexible 100% acrylic based coating that is weather resistant and bridges hairline cracks in stucco. IMASCO FLEXCOAT ACRYLIC FINISH is designed for application over Imasco CoreFactor EIFS, Imasco GreatWall, portland cement plaster, cast-in-place concrete, and other approved substrates. It is available in a variety of colors and textures to satisfy the most imaginative designer. IMASCO FLEXCOAT ACRYLIC FINISH is integrally colored and UV resistant.

ADVANTAGES

- Allows cladding system to breath.
- Mold and fungus resistant.
- Dirt pickup resistant.
- Resists peeling, fading, blistering, and cracking.
- Maintains performance through numerous thermal cycles and exposure to hot and cold climates.
- Higher elongation than regular acrylic.
- More resilient to weathering than regular acrylic.

TEXTURES

IMASCO FLEXCOAT ACRYLIC FINISH is available in Fine Sandfloat, Medium Sandfloat and Medium Scroll XL textures. The sandfloat finishes produce a sand-like or positive texture, while scroll finish produces a negative or rilled texture.

PACKAGING

70lb plastic pails, 24 pails per pallet.

COVERAGE

Fine Sandfloat	160–170ft² (14.86–15.79m²)*
Medium Sandfloat	130–140ft² (12.08–13.01m²)*
Medium Scroll XL	155–165ft² (14.40–15.33m²)*

*Coverages given are approximate and will vary depending on substrate, details and individual application technique.

PREPARATION

In cool/moist conditions cure times longer than the recommended 24 hours might be needed for the basecoat. Surface must be fully cured, dry and free of dust prior to the application of finish coat. Application of finish coat to basecoat that is not fully cured may result in color variation in the finish coat. For best floating and texture definition, remove all protruding brown coat greater than 1/16" (1.6mm). A smooth surface free from protrusions and pits greater than 1/16" (1.6mm) will allow for easier floating and a more uniform texture pattern.

Primer Application

ImascoPrime is recommended as a pigmentable surface preparation for acrylic finishes. Priming provides uniform substrate absorption, enhances finish color and inhibits efflorescence in cementitious substrates. The primer can be applied with a paint roller or brush to the substrate.

MIXING

When using Imasco Custom or Specialty Colourants use one (1) bottle of colorant per pail of IMASCO FLEXCOAT ACRYLIC FINISH or ImascoPrime.

1. Using an electric drill with a drywall mixing paddle attachment, thoroughly mix the contents of the colorant bottle into the acrylic finish.
2. Refill bottle once with clean water, shake and pour into center of pail while mixing. **Do not add more than 8oz. of water.**
3. Mix well – approximately 2 to 3 minutes until all colorant is evenly distributed. **Do not over mix.**

Specialty Deep Tint Base

All Imasco pigments are conveniently supplied in plastic bottles containing exactly the right amount of fade resistant pigments for one 70lb pail of Acrylic finish. Note that for some rich tones a deep tint base (DTB) may be required. Please ensure that you always use the correct tint base and one bottle of color per pail.

APPLICATION

1. Plan the finish application so enough workers are available to finish entire sections of wall area at one time, uninterrupted. Inspect the cement substrate and correct all imperfections before applying the finish.
2. Work in pairs with the first person applying the finish to the wall and the second person floating the finish to the desired texture.
3. Apply finish in a continuous application, always working away from a wet edge.
4. Avoid installing separate batches of finish side-by-side.
5. Interrupt application at natural breaks in construction, i.e. expansion joints, changes of plane, system terminations, etc.
6. Avoid applications in direct sunlight and excessive wind whenever possible.
7. When spreading finish, apply only pressure required so that thickness is gauged by the largest aggregate particles.
8. To achieve desired texture, we recommend the use of a plastic float in a figure-8 or irregular pattern.

Note: Can be used as an interior product with proper ventilation.

Surface temperature must be above 4°C (39°F). Avoid applications late in the day if dew is imminent or if temperatures below 4°C (39°F) are expected within 24 hours.

Do not apply below grade.

Continued on the back of this page...

FLEXCOAT ACRYLIC FINISH STUCCO

Fine Sandfloat, Medium Sandfloat, Medium Scroll XL

DRYING
Drying of IMASCO FLEXCOAT ACRYLIC FINISH depends upon air temperature and movement, relative humidity, and coating thickness. During average weather conditions, 15°C (59°F) 55% RH, the drying time will be approximately 24 hours. A lower temperature and/or a higher humidity will extend the drying time. Protect work from rain during this period of time. Do not allow the wall to freeze.

CLEAN–UP
Clean tools with warm, soapy water. Do not allow acrylic to harden on tools.

STORAGE
Avoid direct sunlight. Keep in a cool, dry place. Do not allow to freeze.

SHELF LIFE
Shelf life is approximately 8 to 12 months if stored properly.

SAFETY PRECAUTIONS
Use in well ventilated area. Do not take internally. Avoid skin & eye contact. KEEP OUT OF REACH OF CHILDREN. Please refer to M.S.D.S. for additional information.

WARRANTY
IMASCO FLEXCOAT ACRYLIC FINISH is manufactured to strict quality standards using the highest quality ingredients. Imasco Minerals Inc. fully guarantees its products and will refund or replace any product found to be defective. Liability is limited to replacement or refund only and no other warranty is expressed or implied. For individual products, Imasco Minerals Inc. offers a 5 year material defect warranty. Please see written warranties for further details.

Imasco Minerals Inc. is unable to accept responsibility for job conditions, workmanship, climate, or damages due to transport. IMASCO FLEXCOAT ACRYLIC FINISH is to be applied in accordance with all manufacturers' specifications.

If further information is required, please contact your IMASCO dealer.

National Research Council Canada
Conseil national de recherches Canada

Institute for Research in Construction
Institut de recherche en construction

CCMC 12224-R

CCMC *EVALUATION REPORT*

DIVISION 07562
Issued 1991-03-05
Re-evaluated 2005-07-28
Re-evaluation due 2008-03-05

Re-Evaluation in process

Urelastic 5000-6000

Universal Polymers Inc.
1635 MacDonald Avenue
Burnaby, British Columbia
V5C 4P1

Tel.: (604) 299-4228
Fax: (604) 299-5322

Plant: Pacific Polymers Inc.
12271 Monarch Street
Garden Grove, California
U.S.A. 92641

1. *Purpose of Evaluation*

The proponent sought confirmation from the Canadian Construction Materials Centre (CCMC) that "Urelastic 5000-6000" can serve as an exposed cold-applied elastomeric roofing membrane that can withstand exposure to light pedestrian traffic, in compliance with the intent of the National Building Code of Canada (NBC) 1995.

2. *Opinion*

Subject to the limitations and conditions stated in this report, test results and assessments provided by the proponent show that "Urelastic 5000-6000" complies with CCMC's Technical Guide for Cold-Applied, Fluid, Elastomeric Roofing (Exposed to Light, Pedestrian Traffic), Masterformat number 07562, dated 1999-04-07, and provides a level of performance equivalent to that required in:

- NBC 1995, Subsection 9.26.2.

Canada Mortgage and Housing Corporation permits the use of this product in construction financed or insured under the National Housing Act.

3. *Description*

"Urelastic 5000-6000" is a liquid, cold-applied elastomeric polyurethane roofing system (see Figure 1). The exposed roofing system consists of "Urelastic 5000" base coat (light grey) and a "Urelastic 6000" top coat (dark grey or tan). It is available in either regular or slope grade and can incorporate a slip-resistant type of finish, if required.

Whether for slope grade or regular grade, the base coat is applied at least 1.0 mm thick; the top coat, at least 0.5 mm thick with sand broadcast on the top coat (for slip resistance).

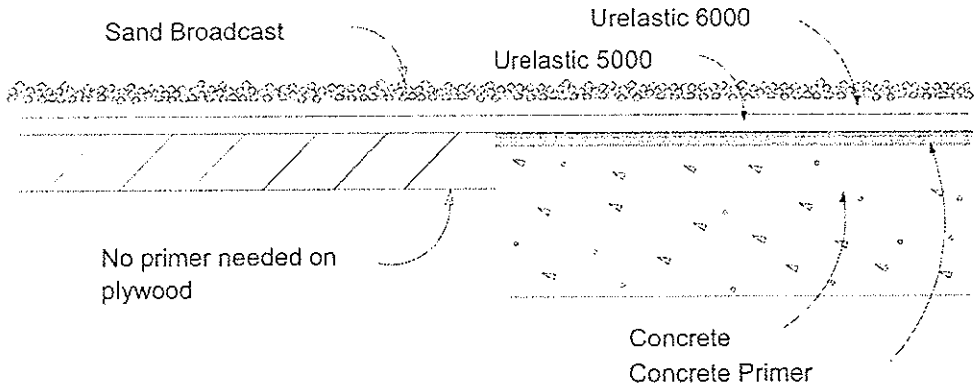

Figure 1. Urelastic 5000-6000

4. *Usage and Limitations*

"Urelastic 5000-6000" is intended for use in roofing of both new and retrofit installations subject to the following conditions.

- The system must be installed either on concrete or on plywood substrate that provides positive drainage.
- "Urelastic 5000-6000" regular grade can be used on slopes ranging from 1 in 50 to 1 in 20; for steeper slopes, "Urelastic 5000-6000" slope grade is required.
- "Urelastic 5000-6000" must be installed to a minimum thickness of 1.5 mm, exclusive of slip-resistant finish.
- Where "Urelastic 5000-6000" is used on buildings other than those described in Part 9 of the NBC 1995, it must undergo testing to determine its classification (A, B or C) according to CAN/ULC-S107-M, "Standard Method of Fire Testing of Roof Coverings."
- If "Urelastic 5000-6000" will be part of a rated system, it must also be rated according to CAN/ULC-S101-M, "Fire Endurance Tests of Building Construction and Materials."
- "Urelastic 5000-6000" is for use in roofing applications, where the pedestrian traffic excludes pressures from mechanical equipment, such as snow blowers, etc.
- "Urelastic 5000-6000" must be installed by installers that are trained and certified by Universal Polymers Inc. in strict conformance with the manufacturer's installation instructions.
- The packaging for the containers of "Urelastic 5000-6000" shall be clearly marked with the following information:
  - Urelastic 5000-6000
  - date of manufacture
  - the phrase, "See CCMC Evaluation Report No. 12224."

5. *Performance*

Testing was conducted at an independent laboratory recognized by CCMC.

The test results are shown in Table 1.

Table 1. Test results for "Urelastic 5000-6000"

Property Tested	Requirements	Results
Dimensional Stability max. dimensional change	5	System 1[1] - 0.28 System 1a[2] - 0.58 System 2[3] - 0.07 System 2a[4] - 0.34
Water Absorption (%) max. change in mass	3	System 1[1] - 1.6 System 1a[2] - 2.6 System 2[3] - 1.1 System 2a[4] - 1.0
Adhesion-in-Peel (N·m) min. adhesion to concrete: min. adhesion to plywood:	 875 525	 passed (both systems) passed (both systems)
Crack Bridging	No visual evidence of cracking, splitting or total loss of adhesion when tested on concrete and plywood substrate	Passed
Low-Temperature Flexibility	No cracking	No cracking (both systems)
Sagflow • "Regular Grade" Top coat tested at manufacturer's recommended thickness of 0.254 mm (10 mil.) • Base coat tested at thickness of 0.75 mm (30 mil.) • Base coat of "Slope Grade"	0.75 mm	 Passed for 1-in-20 slope Passed for 1-in-20 slope Passed [1.7 mm (68.5 mil.) on vertical surface]

Table 1. Test results for "Urelastic 5000-6000" (cont'd)

Property Tested	Requirements	Results	
Dynamic Impact	Shall pass watertightness test after an impact of 4.9J	Passed (all systems)	
Static Puncturing	Shall pass watertightness test 245 N at 23 ± 2°C for 1 h	Passed (all systems)	
Watertightness	No evidence of leakage	Passed (Both systems)	
		System 1	System 2
Weathering Resistance and Recovery min.	90	100	100
Elongation after 1 000 h (%) [ASTM G 53 weathering cycle (4-h UV, 8-h condensation)]	Min. tensile retention: 80	117	87
	Min. elongation retention: 90	110	98
Chemical Resistance min. (%)	Tensile retention: 70	100	88
Abrasion Resistance max. (mg)	Wt. loss: 50	9	28

Note:

(1) System 1 Base coat 1.0 mm thick
Top coat 0.5 mm thick

(2) System 1a Same as System 1, but using slope grade 5 000

(3) System 2 Same as System 1 with the addition of fine grit sand applied to the top coat before curing

(4) System 2a Same as System 2, but using slope grade 5 000

The manufacturer provides a limited warranty against faults in material and workmanship for a period of five years.

Issued by the Institute for Research in Construction under the authority of the National Research Council

Note: Readers are asked to refer to limitations imposed by NRC on the interpretation and use of this report. These limitations are included in the introduction to CCMC's Registry of Product Evaluations, of which this report is part.

Readers are advised to confirm that this report has not been withdrawn or superseded by a later issue by referring to http://irc.nrc.gc.ca/ccmc, or contacting the Canadian Construction Materials Centre, Institute for Research in Construction, National Research Council of Canada, Montreal Road, Ottawa, Ontario, K1A 0R6; Telephone (613) 993-6189, Fax (613) 952-0268.

APPENDIX C

DRAWINGS

Allied Windows - Shop Drawings 28 Pages

CHATEAU COMOX

1272 COMOX STREET, VANCOUVER, B.C.

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Architect: N/A Address: Phone:(604) Fax:(604)	Contact:
Envelope Consultant: Spratt Emanuel Engineering Ltd. Address: 2348 Yukon Street, Vancouver, B.C., V5Y 3T6 Phone: (604) 872-1211 Fax: (604) 872-1274	Contact:Mark Emanuel
Glazing Engineer: Layton Consulting Ltd. Address: 301-19978 72nd Avenue, Langley, B.C. V2Y 1R7 Phone: (604)-530-6611 Fax: (604)-530-6101	Contact: Mark Layton
Site: Chateau Comox Address: 1272 Comox Street, Vancouver, B.C. Phone:(604) 830-0514	Contact:(P.M.) Daryl Oulette

Site Information:

Legal Description
(-From Page _On Architecturals)

Site Address
1272 Comox Street, Vancouver, B.C.
(-From Page _ On Architecturals)

Drawing List:

Page	Contents
T1-T2 (2 Pages)	Title Pages
S1-S2 (2 Pages)	Specifications
Test Report (20 Pages)	Test Data
E1 (1 Page)	Elevations
D1-D3 (3 Pages)	Details
Total Pages:	28 Pages

Revisions:

NO.	REVISION	DATE
1		
2		
3		

GLAZING ENGINEER STAMP

ENGINEERING INFORMATION

-Layton Consulting Ltd. Project _____
-Engineering to conform to the 2006 British Columbia Building Code
- # Floors (Structural) ___

FOR USE BY ALLIED WINDOWS ONLY

- ☐ Internal Review Set
- ☐ Pre-Engineered Set
- ☐ Customer Preliminary Review Set ☐ #1 ☐ #2 ☐ #3
- ☐ Final Set

- ☐ Coordination ..... Date
- ☐ Sales ..... Date
- ☐ Drafting ..... Date

- ☐ General Contractor Stamp:
- ☐ Architect Stamp:
- ☐ Envelope Detail Consultant Stamp:

SPRATT EMANUEL ENGINEERING LTD.
DRAWING REVIEW
REVIEWED BY SPRATT EMANUEL ENGINEERING LTD.
FOR GENERAL CONFORMITY WITH THE DESIGN
CONCEPT ONLY. THE SOLE RESPONSIBILITY OF
THE DRAWINGS INCLUDING CORRECTNESS
DETAILS, NOTES, DIMENSIONS AND CONFIRMATION
OF SITE CONDITIONS AND DIMENSIONS, LIES SOLELY
THE PARTY SUBMITTING SAME.

☐ NO EXCEPTIONS NOTED
☐ NOTE MARKS
☐ REVISE & RESUBMIT

REVIEWED BY: _____
DATE: _____

CONTRACTOR:
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ENVELOPE DETAIL CONSULTANT:
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ALLIED WINDOWS
(Gloucester Industrial Park)
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Tel: (604) 856-3311
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PROJECT:
Chateau Comox
1272 Comox Street
Vancouver, BC

DATE: June 30, 2008
SCALE: N.T.S.
DRAWN BY: AMB
CHECKED BY: AD

PROJECT NO. L-257

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PAGE NO. T1

CHATEAU COMOX

1272 COMOX STREET, VANCOUVER, B.C.

WINDOW SERIES

SERIES: ALLIED 45 SERIES WINDOWS
CUSTOM COLOUR: WHITE "K1285"
GLAZING: SEE SCHEDULE

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GLASS LEGEND	
(3) -3mm Low E² 270/Argon Gas/3mm Clear Float	(4t) -3mm Clear Temp/Air Space/3mm Clear Temp
	(5t) -5mm Clear Temp/Air Space/5mm Clear Temp

GENERAL NOTES:

1. DRAIN HOLES PROVIDED IN THE FRAME AT THE FACTORY
2. ALL WINDOWS SIZES TO BE FIELD MEASURED OR MANUFACTURED TO SIZES AGREED UPON BY ALLIED WINDOWS AND OCEAN WEST CONSTRUCTION
3. WINDOW DIMENSIONS SHOWN ARE ROUGH OPENING SIZES VERTICALLY AND HORIZZONTALLY FROM CONCRETE TO CONCRETE.
5. POLYSHIM 2 GLAZING TAPE AND EXTRUDED GLAZING BEAD
6. GLAZING WILL BE CLEAR FLOAT / CLEAR FLOAT DUAL PANE SEALED UNITS (THICKNESS TO MEET CODE)
7. SEALED UNITS ARE MANUFACTURED USING "WARM EDGE TECHNOLOGY" (DUAL SEAL P.I.B. AND SILICONE)
8. WINDOWS ARE MANUFACTURED TO MEET OR EXCEED A CSA-A440 A3, B5 & C5 RATING (PER USER SELECTION GUIDE)
9. OPERABLE WINDOW DESIGN TO MEET OR EXCEED SASH STRENGTH, STIFFNESS & EASE OF OPERATION IN ACCORDANCE WITH CSA-A440
10. ALLIED WINDOWS TECHNICAL SPECIFICATION & INDEPENDANT LAB TESTING ATTACHED HEREIN
11. DEFLECTION HEADER & CLIP SUPPLIED IN STOCK LENGTHS
12. WARRANTY WILL BE 2 YEAR (SYSTEM PARTS AND LABOUR) 5 YEAR WATER PENETRATION (FRAME ONLY) AND 20 YEAR SEALED UNIT (SUPPLY ONLY)

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ALLIED WINDOWS - TECHNICAL SPECIFICATION - 45 SERIES "BUTT JOINTED" WINDOW

AWNING: (Top Hung, Open Out) CASEMENT: (Side Hung, Open Out) FIXED: (Non-operable)

SPEC NOTE: *This combined metric and imperial specification is written in accordance with Construction Specifications Canada (CSC) Three - Part Section format.*

PART 1 - GENERAL

WORK INCLUDED

Supply Only all factory assembled and prefinished extruded aluminum thermally broken windows, complete with glass and glazing, operable hardware and weather-stripping.

QUALITY ASSURANCE

Manufacturer Qualifications:

Work of this section shall be executed by an ISO certified company with a minimum of five years proven experience in this type of work having adequate equipment and skilled personnel to expediently complete the work to an agreed schedule and in an efficient and very best workmanlike manner.

Source Quality Control:

A representative sample of the Windows supplied under this specification shall have been tested by and independent testing agency for compliance with the performance requirements of CAN/CSA-A440-M98 and A440.1-M1998. Windows must also comply with National and Local Building Codes. These qualifications shall be prerequisites for tendering.

SUBMITTALS - PRE-TENDER

Test Reports:

Submit test reports from independent testing laboratories indicating compliance with the performance levels specified herein.

Samples:

Submit one representative model and one cut away corner sample of each type of window to be used in this tender.

SUBMITTALS - POST TENDER

Shop Drawings:

Submit shop drawings, where required, clearly indicating materials and details of head, jamb and sill, profiles of components, waterproofing, elevation of units, anchorage details, specifications of related components and exposed finishes. Where necessary drawings will carry the stamp of an independent professional engineer to verify compliance with specified requirements, standards and codes.

PART 2 - PRODUCTS

MATERIALS

Aluminum projecting windows:

High Performance 45 Series Awning (top hung, projecting out) or Casement (side hung, projecting out) window units with continuous thermal break to CAN/CSA-A440-M98 and A440.1-M1998.

Fixed Windows:

High Performance 45 Series Fixed window units with continuous thermal break to CAN/CSA-A440-M98 and A440.1-M1998.

Sash and Frame Members:

Extruded aluminum alloy 6063-T5, minimum 1.42 mm (0.057") wall thickness.

Glazing: Provide sash and frame members that will permit glass replacement without the use of special tools.

Thermal Break:

High Density Polyurethane. Pour and debridge type. Continuous thermal barrier to be integral and structural part of the window assembly.

Sealant:

[1 part silicone][1 part polyurethane] "Small Joint Sealant" to CGSB and suitable for job conditions.

Glass and Glazing Materials:

Factory sealed double glazed units, using "XL Edge" stainless steel "Warm Edge" spacer, c/w structural silicone and polyisobutylene "Dual Seal", nominal 22mm(7/8") overall thickness to CAN/CGSB-12.20-M, and certified with Insulated Glass Manufacturer's Association of Canada (IGMAC), glazed in accordance with manufacturer's instructions. Glass thickness to National and Local Building Code Requirements and climatic conditions of project.

Weather-stripping:

"Q-Lon" bulb seal to ASTM C509-84 11.77/53.

Tape:

1/16" x 3/8" Polyshim 2 Shimmed Butyl glazing tape.

Fasteners:

Zinc coated plated steel, stain and corrosion resistant screws to ASTM E-149.

FABRICATION

GENERAL

Fabricate extruded window frame and sash components as follows:

- -Assemble all joints in frame and sash, neatly, in a weather-tight manner.
- -Secure with plated steel screws anchored into integral screw ports or shear blocks specifically designed for this purpose.
- -Seal all joints with die cut polyethylene gaskets with minimal use of small joint sealant.
- -Debur and make smooth all sharp edges.
- -Provide extruded sections to all sash members designed not to exceed 1/125 deflection as per CAN/CSA-A440-M98 requirements.
- -Provide extruded Tbar mullions and two or three part couplings designed Not to exceed 1/175 Deflection as per CAN/CSA-A440-M98 requirements.
- -Provide pressure equalized drainage system to fixed lites, and operable windows that will facilitate drainage of any water accumulation in the pressure equalized areas of the assembly to the exterior
- -Fabricate entire window in a manner that will facilitate the replacement of any worn or defective components, hardware and weather-stripping without the use of special tools.

Operation:

[Projected windows] [Casement windows]

Position ventilators on main frame to provide direction of opening specified. Provide free and smooth operation without binding or sticking against main frame. Provide restricted opening to 4". Provide 24 spare restrictors.

Thermal Break:

Provide complete metal separation within all components to eliminate metal to metal contact to minimize heat transfer. Do not use screws or other devices that would bridge the barrier in any of the thermally broken components.

Glass Stops:

Extruded aluminum glass stops with extruded "Poly-Chlor" glazing spline of sufficient size and strength to securely hold the glass in place. Stops designed to snap fit into window components.

Weather-stripping:

Full perimeter weather-strip window vent units at all interior sash perimeters. Full perimeter (minus sill location) weather-strip window vent units at all exterior sash perimeters. Install all weather-stripping in extruded ports in a manner that will prevent shrinkage and movement.

Window System Performance Requirements:

Air infiltration

Operable Windows:

Maximum 0.08 (m^3/h)m-1 (0.01 cfm) of crack length when tested to ASTM E283-93. Window to exceed CAN/CSA-A440-M98 A3 requirement maximum allowable air leakage of 0.55 (m^3/h) m-1 (0.03 cfm) of crack length.

Fixed Windows:

Maximum 0.00 (m^3/h)m-1 (0.00 cfm) of crack length when tested to ASTM E283-93. Window to exceed CAN/CSA-A440-M98 fixed requirement maximum air leakage of 0.25 (m^3/h)m-1 (0.05 cfm) of crack length.

Water Resistance:

No water leakage or penetration through the glazing system at maximum cycle pressure when to ASTM E547-75, test pressure differential 400 Pa., B4 rating. The entire glazing system, including couplers and deflection header to exceed DRWP specific rating as specified in A440.1-M1998.

Wind Load Resistance:

The windows shall comply with C4 rating. Window to exceed specific ratings as specified in A440.1-M1998.

Sash Strength:

Sash will exceed the following design criteria for deflection in this category [awning, (top hung, projecting out)] [illegible] [casement (side hung, open out)] 5 mm, (0.2") as specified in CAN/CSA A440-M98.

Ease of Operation:

Windows will exceed the following operational criteria in this category. [Awning (top hung, projecting out)] [Casement (side hung, open out)] initiate motion <200N. (45 lbf.), maintain motion <100N., (22.5 lbf.).

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☐ ... EXCEPTIONS NOTED
REVIEWED BY:
☐ REVISE & RESUBMIT

FINISHES

Provide thermo setting acrylic enamel finish to CGSB 1-GP-71 and CAN/CSA-A440-M98 requirements. Colour: DURACRON WHITE "K1285".

HARDWARE

Equip each unit with two stainless steel friction hinges of sufficient size and strength to ensure smooth operation. Friction adjustment to be controlled by a set screw, metal to metal contact to be prevented by the use of a thermoplastic resin friction pad under the set screw.

Equip all projecting out operable windows with black cam handles and matching strikes. Fasten to sash and frame with plated steel screws. [Units <36" one per sash] [Units >36" two per sash].

WARRANTY

Provide Allied Windows' standard 2/5/20 year warranty. Full labour and materials coverage against manufacturer's defects for 2 years and shall be free from water leakage of the frames for five (5) years. Supply only coverage on sealed units for an additional 15 years (total of 20 years on sealed units). See warranty certificate for limitations.

Note: Section 072700 calls for an air barrier mockup with a window. See 072700-1.5.2.

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ALLIED WINDOWS - TECHNICAL SPECIFICATION - 45 SERIES "MITRED" PATIO DOOR

SLIDING (Operable and Non operable)

SPEC NOTE: This *combined metric and imperial specification is written in accordance with Construction Specifications Canada (CSC) Three-Part Section format.*

PART 1 - GENERAL

WORK INCLUDED
Supply Only all factory assembled and prefinished extruded aluminum thermally broken patio doors, complete with glass and glazing, operable hardware and weather-stripping.

QUALITY ASSURANCE
Manufacturer Qualifications:
Work of this section shall be executed by an ISO certified company with a minimum of five years proven experience in this type of work having adequate equipment and skilled personnel to expediently complete the work to an agreed schedule and in an efficient and very best workmanlike manner.

Source Quality Control:
A representative sample of the Doors supplied under this specification shall have been tested by and independent testing agency for compliance with the performance requirements of CAN/CSA-A440-M98 and A440.1-M1998. Doors must also comply with National and Local Building Codes. These qualifications shall be prerequisites for tendering.

SUBMITTALS
PRE-TENDER
Test Reports:
Submit test reports from independent testing laboratories indicating compliance with the performance levels specified herein.

Samples:
Submit one representative model and one cut away corner sample of each type of door to be used in this tender.

POST TENDER
Shop Drawings:
Submit shop drawings, where required, clearly indicating materials and details of head, jamb and sill, profiles of components, waterproofing, elevation of units, anchorage details, specifications of related components and exposed finishes. Where necessary drawings will carry the stamp of an independent professional engineer to verify compliance with specified requirements, standards and codes.

PART 2 - PRODUCTS

MATERIALS

Sliding Doors:
High Performance 45 Series sliding patio door units with continuous thermal break to CAN/CSA-A440-M98 and A440.1-M1998.

Sash and Frame Members:
Extruded aluminum alloy 6063-T5, minimum 1.42 mm (0.057") wall thickness.

Glazing: Provide sash and frame members that will permit glass replacement without the use of special tools.

Thermal Break:
High Density Polyurethane. Pour and debridge type. Continuous thermal barrier to be integral and structural part of the window assembly.

Sealant:
[1 part silicone][1 part polyurethane] "Small Joint Sealant" to CGSB and suitable for job conditions.

Glass and Glazing Materials:
Factory sealed double glazed units, using "XL Edge" stainless steel "Warm Edge" spacer, c/w structural silicone and polyisobutylene "Dual Seal", nominal 22mm(7/8") overall thickness to CAN/CGSB-12.20-M, and certified with Insulated Glass Manufacturer's Association of Canada (IGMAC), glazed in accordance with manufacturer's instructions. Glass thickness to National and Local Building Code Requirements and climatic conditions of project.

Weather-stripping:
Polypropylene with integral fin prime and secondary seal to ASTM C509-84 11.77/53.

Tape:
Arlon AWT2021 1/16" x 3/8" double-sided foam glazing tape.

Fasteners:
Zinc coated plated steel, stain and corrosion resistant screws to ASTM E-149.

FABRICATION

GENERAL:
Fabricate extruded door frame and sash components as follows:
-Assemble all joints in frame and sash, neatly, in a weather-tight manner.
-Secure with plated steel screws anchored into integral screw ports or shear blocks specifically designed for this purpose.
-Seal all joints with use of small joint sealant.
-Debur and make smooth all sharp edges.
-Provide extruded sections to all sash members designed not to exceed 1/125 deflection as per CAN/CSA-A440-M98 requirements.
-Provide extruded Tbar mullions and two or three part couplings designed
Not to exceed 1/175 Deflection as per CAN/CSA-A440-M98 requirements.
-Provide pressure equalized drainage system to fixed lites, and operable doors that will facilitate drainage of any water accumulation in the pressure equalized areas of the assembly to the exterior
-Fabricate entire door in a manner that will facilitate the replacement of any worn or defective components, hardware and weather-stripping without the use of special tools.

Operation:
[Sliding Patio Door]
Position vents on main frame to provide direction of opening specified. Provide free and smooth operation without binding or sticking against main frame.

Thermal Break:
Provide complete metal separation within all components to eliminate metal to metal contact to minimize heat transfer. Do not use screws or other devices that would bridge the barrier in any of the thermally broken components.

Glass Stops:
Roll Formed aluminum glass stops of sufficient size and strength to securely hold the glass in place. Stops designed to snap fit into door components.

Weather-stripping:
Full perimeter weather-strip door vent units at all sash perimeters. Install all weather-stripping in extruded ports in a manner that will prevent shrinkage and movement.

Patio Door System Performance Requirements:
Sliding patio door system performance tested in accordance to CAN/CGSB 82.1-M89

Air infiltration
Operable Doors:
Maximum 0.08 (m^3/h)m-1 (0.01 cfm) of crack length when tested to ASTM E283-93. Doors to exceed CAN/CSA-A440-M98 A3 requirement maximum allowable air leakage of 0.55 (m^3/h) m-1 (0.03 cfm) of crack length.

Water Resistance:
No water leakage or penetration through the glazing system at maximum cycle pressure when tested to ASTM E547-75 test pressure differential 400 Pa., B4 rating when doors are altered in shop as evidence by field testing. The entire glazing system, including couplers and deflection header to exceed DRWP specific rating as specified in A440.1-M1998.

Wind Load Resistance:
The doors shall comply with C3 rating. Door to exceed specific ratings as specified in A440.1-M1998.

Sash Strength:
Sash will exceed the following design criteria for deflection in this as specified in CAN/CSA-A440 M98.

Ease of Operation:
Doors will exceed the following operational criteria in this category. Initiate motion <200N. (45 lbf.), maintain motion <100N., (22.5 lbf.).

FINISHES

Provide thermo setting acrylic enamel finish to CGSB 1-GP-71 and CAN/CSA-A440-M98 requirements. Custom colour range; WHITE "K1285"

HARDWARE

Equip each unit with two stainless steel frictionless rollers of sufficient size and strength to ensure smooth operation. Equip all operable doors with black handles and matching strikes. Fasten to sash and frame with plated steel screws.

WARRANTY

Provide Allied Windows' standard 2/5/20 year warranty. Full labour and materials coverage against manufacturer's defects for 2 years and shall be free from water leakage of the frames for five (5) years. Supply only coverage on sealed units for an additional 15 years (total of 20 years on sealed units). See warranty certificate for limitations.

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PROJECT: Chateau Comox
1272 Comox Street
Vancouver, BC

DATE: June 30, 2008
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WINDOW PERFORMANCE TESTING REPORT

1000 mm x 1000 mm '4500 SERIES' THERMALLY-BROKEN ALUMINUM AWNING WINDOW

Submitted To:

Allied Windows Inc.
Aldergrove, B.C.

Submitted By:

AMEC Earth & Environmental Limited
Calgary, Alberta

CA-15052.418

March 2001

21 March 2001
CA-15052.418

Allied Windows Inc.
3193 – 262nd Street
Aldergrove, B.C. V4W 2T8

Attention: Mr. Paul Arnold

Dear Sir:

RE: **1000 mm x 1000 mm '4500 Series'**
Thermally-Broken Aluminum Awning Window
Performance Testing to CSA-A440-00 "Windows" Standard

Allied Windows Inc. (Allied) requested AMEC Earth & Environmental Limited (AMEC) to conduct standard window performance tests on the above noted window. The window was manufactured and submitted by Allied, and was tested at your manufacturing facility using our Mobile Window Performance Laboratory (MWPL), which is accredited by the Standards Council of Canada for the tests listed. This report contains 15 pages including all appendices.

The window was tested in accordance with sections 10 and 11 of the CSA-A440-00 "Windows" standard. Details of the window construction and test results are shown in Appendix 'A'. The drawings supplied by Allied and verified by AMEC for the window tested are in Appendix 'B'.

AMEC completed tests on the window listed above on March 8th, 2001. The following summarizes the results of the tests conducted on this window.

CSA-A440-00 Section	Test	Rating/Passed
10.2	Air Tightness	A3
10.3	Water Tightness	B7
10.4	Wind Load Resistance	C3
10.5	Safety Drop	N/A
10.6	Blocked Operation	N/A
10.7	Sash Strength and Stiffness, Casement	N/A
10.8	Sash Strength and Stiffness, Projecting	Pass
10.9	Ease of Operation	Pass
10.10	Screen Strength	N/R
10.11	Sash Pull-Off	N/A
10.12	Thermal Break Index	N/R
10.13	Resistance to Forced Entry	F2

(N/A Not Applicable, N/R Not Requested)

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Thank you for the opportunity to assist you with this project. If we may be of any further service, please contact the undersigned.

Yours truly,

AMEC Earth & Environmental Limited

Grant Pidwerbesky, C.Tech.
Building Sciences Technician
Materials Engineering Division

Reviewed by,

Jim Helten, P. Eng.
Quality Assurance Manager
Mobile Window Performance Lab.

APPENDIX 'A'

WINDOW CONSTRUCTION AND PERFORMANCE TEST RESULTS

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☐ NO EXCEPTIONS NOTED ☐
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Window Construction

Window Type:	'4500 Series' Thermally-Broken Aluminum Awning
Window Size:	1000 mm x 1000 mm
Manufacturer:	Allied Windows Inc.
Test Date:	8 March 2001
Lab Sample No.	418
Construction:	-See drawings

Frame:

-Size	1000 mm x 1000 mm
-Materials	Thermally Broken Aluminum profile.
-Assemble method	Corners butted together at 90°, with a gasket between members. Screwed together using 2 - #8 x 1 1/4" long pan head screws per corner. All joints sealed with small joint sealant.
-Reinforcing	None.
-Weather stripping	None.

Sash:

-Size	980 mm x 984 mm
-Materials	Thermally Broken Aluminum profile.
-Assemble method	45° mitered corners joined together using 2 – #8 x 1 1/4" long pan head screws per corner. Seams sealed with small joint sealant.
-Reinforcing	None.
-Weather stripping	Primary (interior): "Q-Lon" bulb seal #Q190 x 250. (not continuous). Exterior perimeter edge: "UltraFab" single-fin mohair seal #8319 (not continuous).

Stops:

-Materials	Extruded Aluminum bead with "Poly-Chlor" glazing gasket #2679.
-Assemble method	Snap-On, verticals butted to horizontals.
-Head, sill, jambs	3/4" glazing bead.

Window Construction, Continued

Glazing:

-Type	Double-glazed unit.
-Method of glazing	Exterior glazed using "Tremco Polyshim II" butyl glazing tape (1/8" x 1/2") on the interior side running continuous with butt joint at top corner.
-Total thickness	19 mm (3/4").
-Glass thickness	3 mm (interior & exterior).
-Type of spacer	12.7 mm (1/2") "TruSeal Swiggle".
-Gas in cavity	Air.
-Setting blocks	2 – 22 mm x 32 mm x 4 mm located 45 mm from both inside bottom corners

Drainage:

2 – 20 mm x 3 mm slots in the bottom exterior face of the frame located approximately 80 mm from both ends. No drainage covers.

2 – 5 mm diameter holes in the bottom sash rail into the glazing channel at approximately 60 mm from both ends.

Hardware:

2 – "D & S Hardware" white bronze cast cam handle locks #2810365 located on the bottom sash rail approximately 300 mm in from both sash corners. Locks fastened using 2 - #8 x 1/8" flat head machine screws with backing nuts per lock with caulking in the screw holes to prevent leakage. 1/4" thick striker plates #2810366 screwed onto the frame sill using 2 – #8 flat head screws per striker plate with caulking in the screw holes to prevent leakage. Screws grinded down flush to the aluminum.

1 – pair "Pacific Stainless" 12" long hinges #DS8300 fastened to the frame head and sill using 3 - #8 x 1/2" long pan head screws per hinge and to both sash rails using 3 - #8 x 1/2" long pan head screws per hinge.

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☐ NO EXCEPTIONS NOTED
☐ NOTE MARKS
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PROJECT:
Chateau Comox
1272 Comox Street
Vancouver, BC

DATE: June 30, 2008
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Window Performance Results

Test Specification: CSA-A440-00 "Windows"

10.2 Air Tightness Test - ASTM E283

Window Unit Assembly - As stated in the Window Construction section.

Infiltration:

Metered Air Flow @ 75 Pa [1]	= 0.234 m^3/h [2]
Crack Length	= 3.730 m [3]
Air Infiltration Rate @ 75 Pa [1]	= 0.063 $m^3/h/m$ [2][3]

Exfiltration:

Metered Air Flow @ 75 Pa [1]	= 0.288 m^3/h [2]
Crack Length	= 3.730 m [3]
Air Exfiltration Rate @ 75 Pa [1]	= 0.077 $m^3/h/m$ [2][3]

Window Air Rating: (Average)

Air Infiltration Rate = 0.063 $m^3/h/m$

Air Exfiltration Rate = 0.077 $m^3/h/m$

0.140 $m^3/h/m \div 2 = 0.070$ $m^3/h/m$

Passes Air Tightness Test Rating – A3

Notes: **Instrument Precision**

[1] ± 0.3 Pa
[2] ± 1.00% of full scale
[3] ± 0.001 m

CA15052.418 ('4500 Series' Thermally-Broken Aluminum Awning Window)

Window Performance Results Continued

10.3 Water Tightness Test - ASTM E547

Window Unit Assembly - As stated in the Window Construction section.

Maximum test pressure without water penetration = 700 Pa [4]

Passes Water Tightness Test Rating – B7

10.4 Wind Load Resistance Tests

Window Unit Assembly - As stated in the Window Construction section.

10.4.1 Wind Load Resistance to Deflection Test – ASTM E330

Maximum test pressure without excessive deflection = 2000 Pa [5]

Sash Member	Maximum Deflection[6]	Max. Allowable Deflection
Head Rail	2.24 mm	7.84 mm
Left Stile	2.56 mm	7.87 mm

10.4.2 Wind Load Resistance to Blow-out Test – ASTM E330

Maximum test pressure without failure = 3000 Pa [5]

Failure: Handle locks bent over the striker plates at approximately -3700 Pa.

Passes Combined Wind Load Resistance Rating – C3

Notes: **Instrument Precision**

[4] ± 1 Pa
[5] ± 2.5 Pa
[6] ± 0.1% of full scale

CA15052.418 ('4500 Series' Thermally-Broken Aluminum Awning Window)

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Window Performance Continued

10.5 Safety Drop

Not Applicable

10.6 Blocked Operation

Not Applicable

10.7 Sash Strength and Stiffness – Operable Casement Windows Only

Not Applicable

10.8 Sash Strength and Stiffness – Projecting Windows Only

Passes Test

10.9 Ease of Operation

	Open	Close	Maximum Allowable
Force to initiate	32 N	5 N	200 N
Force to maintain	7 N	4 N	100 N

Passes Test

10.10 Screen Strength

Not Tested – No Screen

10.11 Sash Pull-Off Test

Not Applicable

10.12 Thermal Break - Condensation Resistance

Temperatures: Not Requested

10.13 Resistance to Forced Entry

Passes Test Rating – F2

Window Ratings - Tables of Minimum Requirements from CSA-A440-00 "Windows" Standard

Table 1
Air Tightness

Window Rating	Maximum Air Leakage Rate $(m^3/h)/m^{-1}$
Storm	8.35 (max)
	5.00 (min)
A1	2.79
A2	1.65
A3	0.55
Fixed	0.25

Table 2
Water Tightness

Window Rating		
For use in small buildings	For use in other buildings	Pressure Differential (Pa)
Storm	-	0
B1	B1	150
B2	B2	200
B3	B3	300
-	B4	400
-	B5	500
-	B6	600
-	B7	700

Table 3
Wind Load Resistance

Window Rating		Pressure Differential, Pa		
		Deflection		Blowout
For use in small buildings	For use in other buildings	Sash (L/125)	Mullions (L/175)	
Storm	-	-	-	750
C1	C1	500	1000	1500
C2	C2	750	1330	2000
C3	C3	1200	2000	3000
-	C4	1600	2600	4000
-	C5	2000	3330	5000

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PAGE NO. W5

WINDOW PERFORMANCE TESTING REPORT

700 mm x 1600 mm '4500 SERIES' THERMALLY BROKEN ALUMINUM CASEMENT WINDOW

Submitted To:

Allied Windows Inc.
Aldergrove, B.C.

Submitted By:

AMEC Earth & Environmental Limited
Calgary, Alberta

CA-15052.410U

February 2001

28 February 2001
CA-15052.410U

Allied Windows Inc.
3193 – 262nd Street
Aldergrove, B.C. V4W 2T8

Attention: **Mr. Paul Arnold**

Dear Sir:

RE: **700 mm x 1600 mm '4500 Series'**
Thermally-Broken Aluminum Casement
Performance Testing to CSA A440-98 "Windows" Standard

Allied Windows Inc. (Allied) requested AMEC Earth & Environmental Limited (AMEC) to conduct standard window performance tests on the above noted window. The window was manufactured and submitted by Allied; and was tested at your manufacturing facility using our Mobile Window Performance Laboratory (MWPL), which is accredited by the Standards Council of Canada for the tests listed. This report contains 16 pages including all appendices.

The window was tested in accordance with sections 10 and 11 of the CSA-A440-98, entitled, "Windows" specification. Details of the window construction and test results are shown in Appendix 'A'. The drawings supplied by Allied and verified by AMEC for the window tested are shown in Appendix 'B'.

AMEC completed tests on the window listed above on February 14th, 2001. The following summarizes the results of the tests conducted on this window.

CSA-A440-98 Section	Test	Rating/Passed
10.2	Air Tightness (see test details p. 7 & 8)	
	Test #1: Sash with Q-Lon bulb seal	A3
	Test #2: Sash with UltraFab 3-fin mohair	A2
10.3	Water Tightness (see page 9)	
	Test #1: Sash with Q-Lon bulb seal	B7
	Test #2: Sash with UltraFab 3-fin mohair	B2
10.4	Wind Load Resistance	C3
10.5	Safety Drop	N/A
10.6	Blocked Operation	N/A
10.7	Sash Strength and Stiffness, Casement	Pass
10.8	Sash Strength and Stiffness, Projecting	N/A
10.9	Ease of Operation	Pass
10.10	Screen Strength	N/R
10.11	Sash Pull-Off	N/A
10.12	Thermal Break Index	N/R
10.13	Resistance to Forced Entry	F2

(N/A Not Applicable, N/R Not Requested)

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Thank you for the opportunity to assist you with this project. If we may be of any further service, please contact the undersigned.

Yours truly,

AMEC Earth & Environmental Limited

Grant Pidwerbesky, C.Tech.
Building Sciences Technician
Materials Engineering Division

Reviewed by,

Jim Helten, P. Eng.
Quality Assurance Manager
Mobile Window Performance Lab

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REVIEWED
DATE:

APPENDIX 'A'

WINDOW CONSTRUCTION AND PERFORMANCE TEST RESULTS

PERFORMANCE TEST RESULTS

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Window Construction

Window Type:	'4500 Series' Thermally-Broken Aluminum frame
Window Size:	700 mm x 1600 mm
Manufacturer:	Allied Windows Inc.
Test Date:	14 February 2001
Lab Sample No.	410
Construction:	-See drawings

Frame:

-Size	700 mm x 1600 mm
-Materials	Thermally Broken Aluminum profile.
-Assemble method	Corners butted together at 90°, with a gasket between members. Screwed together using 2 - #8 x 1 1/4" long pan head screws per corner. Seams sealed with small joint sealant.
-Reinforcing	None.
-Weather stripping	None.

Sash:

-Size	675 mm x 1581 mm
-Materials	Thermally Broken Aluminum profile.
-Assemble method	45° mitered corners joined together using 2 – #8 x 1 1/4" long pan head screws per corner. Seams sealed with small joint sealant.
-Reinforcing	None.
-Weather stripping	Primary (interior): "Q-Lon" bulb seal #Q190 x 250 Exterior perimeter edge: "UltraFab" single-fin mohair seal #8319

Stops:

-Materials	Extruded Aluminum bead with "PolyChlor" glazing gasket #2679.
-Assemble method	Snap-On, verticals butted to horizontals.
-Head, sill, jambs	3/4" glazing bead.

Window Construction, Continued

Glazing:

-Type	Dual-sealed double-glazed unit.
-Method of glazing	Exterior glazed using "Arlon" AWT2021 (1/16" x 3/8") double sided foam glazing tape on the interior side running continuous with butt joint at top corner and with bottom corners caulked.
-Total thickness	19 mm (3/4").
-Glass thickness	3 mm (interior & exterior).
-Type of spacer	12.7 mm (1/2") "TruSeal Swiggle".
-Gas in cavity	Air.
-Setting blocks	2 – 22 mm x 32 mm x 4 mm located 45 mm from both inside bottom corners

Drainage:

2 – 20 mm x 3 mm slots in the bottom exterior face of the frame located approximately 80 mm from both ends. No drainage covers.

2 – 5 mm diameter holes in the bottom sash rail into the glazing channel at approximately 60 mm from both ends.

Hardware:

2 – "D & S Hardware" cam handle locks #801 located approximately 300 mm from the top and bottom on the sash stile opposite the hinged side. Locks fastened using 4 - #8 flat head screws per lock. Screws grinded down flush to the aluminum for the glazing unit. 1/4" thick striker plates snapped into frame jamb through 2 – 1/4" diameter holes per plate.

1 – pair "Pacific Stainless" 12" long hinges #DS8300 fastened to the frame head and sill using 3 - #8 x 1/2" long pan head screws per hinge and to both sash rails using 3 - #8 x 1/2" long pan head screws per hinge.

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☐ NO EXCEPTIONS NOTED
☐ NOTE MARKS
☐ REVISE & RESUBMIT

BY: _____
REVIEWED BY: _____
DATE: _____

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Window Performance Results

Test Specification: CSA-A440-98 "Windows"

10.2 Air Tightness Test - ASTM E283

Test #1 Window Unit Assembly - As stated in the Window Construction Report, using a Q-Lon bulb seal #190x250 for the sash primary weather stripping.

Infiltration:

Metered Air Flow @ 75 Pa (1)	= 1.500 m^3/h (2)
Crack Length	= 4.326 m (3)
Air Infiltration Rate @ 75 Pa (1)	= 0.347 $m^3/h/m$ (2) (3)

Exfiltration:

Metered Air Flow @ 75 Pa (1)	= 1.902 m^3/h (2)
Crack Length	= 4.326 m (3)
Air Exfiltration Rate @ 75 Pa (1)	= 0.440 $m^3/h/m$ (2) (3)

Window Air Rating: (Average)

Air Infiltration Rate = 0.347 $m^3/h/m$

Air Exfiltration Rate = 0.440 $m^3/h/m$

0.787 $m^3/h/m \div 2 = 0.394$ $m^3/h/m$

Passes Air Tightness Test Rating – A3

Notes: Instrument Precision

(1) ± 0.3 Pa
(2) ± 1.00% of full scale
(3) ± 0.001 m

Window Performance Results Continued

10.2 Air Tightness Test - ASTM E283

Test #2 Window Unit Assembly - As stated in the Window Construction Report except using "UltraFab" triple-fin mohair weather stripping, 187-190 HT, for the primary sash seal; instead of a Q-Lon bulb seal #Q190 x 250.

Infiltration:

Metered Air Flow @ 75 Pa (1)	= 6.960 m^3/h (2)
Crack Length	= 4.326 m (3)
Air Infiltration Rate @ 75 Pa (1)	= 1.609 $m^3/h/m$ (2) (3)

Exfiltration:

Metered Air Flow @ 75 Pa (1)	= 7.296 m^3/h (2)
Crack Length	= 4.326 m (3)
Air Exfiltration Rate @ 75 Pa (1)	= 1.687 $m^3/h/m$ (2) (3)

Window Air Rating: (Average)

Air Infiltration Rate = 1.609 $m^3/h/m$

Air Exfiltration Rate = 1.687 $m^3/h/m$

3.296 $m^3/h/m \div 2 = 1.648$ $m^3/h/m$

Passes Air Tightness Test Rating – A2

Notes: Instrument Precision

(1) ± 0.3 Pa
(2) ± 1.00% of full scale
(3) ± 0.001 m

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Window Performance Results Continued

10.3 Water Tightness Test - ASTM E547

Test #1 Window Unit Assembly - As stated in the Window Construction Report. (as for Air Tightness Test #1)

Maximum test pressure without water penetration = 700 Pa [4]

Passes Water Tightness Test Rating – B7

10.3 Water Tightness Test - ASTM E547

Test #2 Window Unit Assembly - As stated in the Window Construction Report except using "UltraFab" triple fin mohair weather stripping, 187-190 HT for the primary seal instead of the "Q-Lon" bulb seal #Q190 x 250.

Maximum test pressure without water penetration = 200 Pa [4]

Passes Water Tightness Test Rating – B2

Notes: **Instrument Precision**

[4] ± 1 Pa

Window Performance Results, Continued

10.4 Wind Load Resistance Tests

Window Unit Assembly - As stated in the Window Construction Report.

10.4.1 Wind Load Resistance to Deflection Test – ASTM E330

Maximum test pressure without excessive deflection = 2000 Pa [5]

Sash Member	Maximum Deflection[6]	Max. Allowable Deflection
Head	0.76 mm	5.40 mm
Right Stile	5.18 mm	12.65 mm

10.4.2 Wind Load Resistance to Blow-out Test – ASTM E330

Maximum test pressure without failure = 3000 Pa [5]

Failure: Handle lock broke away from sash stile at approximately -3600 Pa.

Passes Combined Wind Load Resistance Rating – C3

Notes: **Instrument Precision**

[5] ± 2.5 Pa
[6] ± 0.1% of full scale

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Window Performance Continued

10.5 **Safety Drop**

Not Applicable

10.6 **Blocked Operation**

Passes Test

10.7 **Sash Strength and Stiffness – Operable Casement Windows Only**

Passes Test

10.8 **Sash Strength and Stiffness – Projecting Windows Only**

Not Applicable

10.9 **Ease of Operation**

	Open	Close	Maximum Allowable
Force to initiate	6 N	6 N	200 N
Force to maintain	3 N	3 N	100 N

Passes Test

10.10 **Screen Strength**

Not Tested – No Screen

10.11 **Sash Pull-Off Test**

Not Applicable

10.12 **Thermal Break - Condensation Resistance**

Temperatures: Not Requested

10.13 **Resistance to Forced Entry**

Passes Test Rating – F2

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SLIDING DOOR PERFORMANCE TESTING REPORT

1820 mm x 2000 mm THERMALLY BROKEN ALUMINUM SLIDING DOOR

Submitted To:

Allied Windows
Aldergrove, B.C.

Submitted By:

AMEC Earth & Environmental Limited
Calgary, Alberta

CA-15052.504

August 2002

6 August 2002
CA-15052.504

Allied Windows Inc.
3193 – 262nd Street
Aldergrove, B.C. V4W 2T8

Attention: Mr. Paul Arnold

Dear Sir:

RE: **1820 mm x 2000 mm Thermally Broken Aluminum Sliding Door Performance Testing to Canadian General Standards Board (CGSB) 82.1-M89 "Sliding Doors" Specification**

Allied Windows Inc. (Allied) requested AMEC Earth & Environmental Limited (AMEC) to conduct standard sliding door performance tests in accordance to the CGSB 82.1-M89, section numbers 6 excluding sections 6.11 (thermal break – condensation resistance) on the above noted sliding door. The sliding door was manufactured and submitted by Allied, and was tested at your manufacturing facility on July 20, 2001, using our Mobile Window Performance Laboratory (MWPL). This lab is accredited by the Standards Council of Canada for the tests listed in this report. This report contains 19 pages including all appendices.

Specifications of the sliding door's construction and performance test results are shown in Appendix 'A'. The drawings supplied by Allied for the sliding door unit tested are shown in Appendix 'B'.

The following summarizes the results of tests conducted (see Appendix A) on the submitted sliding door unit.

CGSB-82.1-M89 Section	Test	Rating/Passed
6.2	Ease of Operation	E3
6.3	Air Infiltration	A3
6.4	Water Penetration	B4
6.5	Wind Load Resistance to Deflection	C3
6.6	Wind Load Resistance to Blow-out	C3
6.7	Blocked Operation	Pass
6.8	Parallel Load	Pass
6.9	Roller Assembly Operations	N/T
6.10	Resistance to Forced Entry	F1
6.11	Thermal Break	N/R

(N/T Not Tested, N/R Not Requested)

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Thank you for the opportunity to assist you with this project. If we may be of any further service, please contact the undersigned.

Yours truly,

AMEC Earth & Environmental Limited

Grant Pidwerbesky, C.Tech.
Building Sciences Technician
Materials Engineering Division

Reviewed by,

PROFESSIONAL ENGINEER 25311 ALBERTA 2002

W.R. (Bill) Lenz, P. Eng.
Quality Assurance Manager
Mobile Window Performance Lab

APPENDIX 'A'

SLIDING DOOR CONSTRUCTION AND PERFORMANCE TEST RESULTS

SPRATT EMANUEL ENGINEERING LTD.
DRAWING REVIEW
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☐ NO EXCEPTIONS NOTED
☐ NOTE EXCEPTIONS NOTED
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Sliding Door Construction

Sliding Door Type:	Thermally Broken Aluminium Sliding Door
Sliding Door Size:	1820 mm x 2000 mm
Manufacturer:	Allied Windows Inc.
Test Date:	20 June 2002
Lab Sample No.	504
Construction:	-See drawings

Frame:

-Size	1820 mm x 2000 mm.
-Materials	Thermally Broken Aluminium.
-Assemble method	Mitred corners, fastened using 3 - #6 x 1 1/4" pilot point screws and sealed with 'Tremco' small joint sealant.
-Snap-in Sill track	None.
-Step-up bar	Thermally Broken Aluminium fastened using #8 x 2" flathead screws.
-Interior water dam	1820 mm x 35 mm x 3.18 mm thick pre-finished bar fastened to the interior side of the frame sill using 'Arlon' AWT 2W-2-08 glazing tape (1/16" x 1/2"), caulked and screwed using 5 - #7 x 9/16" screws.
-Reinforcing	None.
-Weather stripping	'Hope-Webbing' fin seal, 0.190" pile height, 0.270" slot width.

T-bar:

-Materials	Thermally Broken Aluminium.
-Assemble method	Fastened to frame using 2 - #8 x 2" pan head screws per end and caulked to frame.
-Reinforcing	None.
-Weather stripping	'Hope-Webbing' fin seal, 0.190" pile height, 0.270" slot width.

Operable Panel:

-Size	922 mm x 1982 mm.
-Materials	Thermally Broken Aluminium.
-Assemble method	Mitred corners, fastened using 1 - #8 x 1 1/4" pan head screw with 'Tremco' small joint sealant.
-Reinforcing	None.
-Weather stripping	'Hope-Webbing' fin seal, 0.190" pile height, 0.270" slot width. 'Schlegel' peal and stick fin seal #7525, located vertically on the bottom rail, interlock side.

Sliding Door Construction Continued

Stops:

-Materials	Aluminium roll formed stop.
-Assemble method	Snap-On, verticals butted to horizontals.

Glazing:

-Type.	Double pane, tempered, dual sealed unit.
-Method of glazing	Fixed Panel: Exterior glazed using 'Arlon' AWT 2W-2-08 glazing tape (1/16" x 1/2"), ends butted and caulked at the corners. Operable Panel: Channel glazed using glazing gasket, #PT 159.
-Total thickness	22.3 mm.
-Glass thickness	4 mm (interior & exterior).
-Type of spacer	14.3 mm (9/16") 'TruSeal – Swiggle'.
-Gas in cavity	Air.

Drainage:

Sill track rail and exterior vertical leg notched out 13 mm wide, located approximately 30 mm from both ends.

2 – 13 mm x 5 mm slots in the fixed light bottom set-up bar.

Hardware:

1 – 'Vanguard' patio door handle with latch #101-319B-Bl and 101-312B located at the mid-point on the sash jamb stile with strike plate #101-110S.

1 pair 'Adams' tandem rollers

1 - "Vanguard" foot lock #101-305R-BL

1 - "Vanguard Plastics" bumper #101-533-GR

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Sliding Door Performance Results

Test Specification: CGSB-82.1-M89

6.2 Ease of Operation Test

Sliding Door Assembly: -As submitted in Sliding Door Construction Report

	Open	Close	Maximum Allowable
Force to initiate	36 N	36 N	100 N
Force to maintain	29 N	32 N	60 N

Passes Test Rating – E3

6.3 Air Leakage Test - ASTM E283

Sliding Door Assembly: -As submitted in Sliding Door Construction Report

Infiltration:

Metered Air Flow @ 75 Pa [1] = 5.310 m^3/h [2]

Crack Length = 5.650 m [3]

Air Infiltration Rate @ 75 Pa [1] = 0.940 $m^3/h/m$ [2][3]

Passes Air Infiltration Test Rating – A3

Notes: **Instrument Precision**

[1] ± 0.3 Pa
[2] ± 1.00% of full scale
[3] ± 0.001 m

Sliding Door Performance Test Results Continued

6.4 Water Leakage Test - ASTM E547

Sliding Door Assembly: -As submitted in Sliding Door Construction Report

Maximum test pressure without water penetration = 400 Pa [4]

Passes Water Tightness Test Rating – B4

6.5 Wind Load Resistance to Deflection Test - ASTM E330

Sliding Door Assembly: - As stated in the Sliding Door Construction Report

Maximum test pressure without excessive deflection = 1000 Pa [5]

Operable Panel Member	Maximum [6] Deflection	Max. Allowable Deflection
Head	0.13 mm	5.27 mm
Meeting Stile	4.45 mm	11.33 mm

Passes Wind Load Resistance to Deflection Rating – C3

6.6 Wind Load Resistance to Blow-Out Test - ASTM E330

Sliding Door Assembly: - As stated in the Sliding Door Construction Report

Maximum test pressure without failure = 2500 Pa [5]

Passes Wind Load Resistance to Blow-Out Rating – C3

Notes: **Instrument Precision**

[4] ±1 Pa
[5] ± 2.5 Pa
[6] ± 0.1% of full scale

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Sliding Door Performance Test Results Continued

6.7 **Blocked Operation Test**

Passes Test

6.8 **Parallel Load Test**

Passes Test

6.9 **Roller Assembly Operation Test**

Not Tested

6.10 **Resistance to Forced Entry Test**

Passes Test Rating – F1

6.11 **Thermal Break – Condensation Resistance Test**

Not Requested

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☐ NO EXCEPTIONS NOTED

☐ NOTE MARKS

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amec

WINDOW PERFORMANCE TESTING REPORT

2000 mm x 2000 mm THERMALLY BROKEN ALUMINIUM TWO FIXED LIGHTS COMBINATION WINDOW

Submitted To:

Allied Windows
3193 – 262nd Street
Aldergrove, B.C.

Submitted By:

AMEC Earth & Environmental Limited
221 – 18th Street S.E.
Calgary, Alberta

AMEC File No.: CA-15052.520

November 2002

amec

14 November 2002
AMEC File No.: CA-15052.520

Allied Windows Inc.
3193 – 262nd Street
Aldergrove, B.C. V4W 2T8

Attention: Mr. Paul Arnold

RE: **2000 mm x 2000 mm Thermally Broken Aluminium Two Fixed Light Combination Window Air and Water Tightness Performance Testing to ASTM Standards**

Allied Windows Inc. (Allied) requested AMEC Earth & Environmental Limited (AMEC) to conduct air infiltration and water penetration performance tests in accordance with the ASTM E 283 and ASTM E 331, respectively, on the window noted above. The window was manufactured and submitted by Allied, and was tested at your manufacturing facility on October 28, 2002, using our Mobile Window Performance Laboratory (MWPL). This lab is accredited by the Standards Council of Canada for the tests listed in this report. This report contains 20 pages including all appendices.

Specifications of the window's construction and performance test results are shown in Appendix 'A'. The drawings supplied by Allied for the window unit tested, are shown in Appendix 'B'.

The following summarizes the results of tests conducted (see Appendix A) on the submitted window unit. It should be noted that these test results are applicable to this test unit only.

ASTM Standard	Test	Passing Result
E 283	Air Tightness	0.275 l/sec/m^2
E 331	Water Penetration	15 min at 700 Pa

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P:/Materials People/Grant Pidwerbecky/My Documents /Window Client Reports/Allied Windows/CA15052.520

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Thank you for the opportunity to assist you with this project. If we may be of any further service, please contact the undersigned.

Yours truly,

AMEC Earth & Environmental Limited

Grant Pidwerbesky, C.Tech.
Building Sciences Technician
Materials Engineering Division

Reviewed by,

PROFESSIONAL ENGINEER
W.R. LENZ
25311
14 NOVEMBER 2002

W.R. (Bill) Lenz, P. Eng.
Quality Assurance Manager
Mobile Window Performance Lab

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APPENDIX 'A'

WINDOW CONSTRUCTION AND PERFORMANCE TEST RESULTS

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Window Construction

Window Type:	Thermally Broken Aluminium Two Fixed Light Combination
Window Size:	2000 mm x 2000 mm
Manufacturer:	Allied Windows Inc.
Test Date:	October 28, 2002
Lab Sample No.	520
Construction:	(See drawings)

2 Frames:

-Size	975 mm x 1930 mm.
-Materials	Thermally Broken Aluminium profile.
-Assemble method	Butt joint fastened using 1 - #8 x 1 ¼" PH "Arrow" screw and 1 - #8 x ¾" PH "Arrow" screw with a closed cell foam gasket between aluminium extrusions.
-Sill flashing	Aluminium profile fastened to frame sill using ¾" x #10 screws every 12" O.C. with polyurethane caulking seal.
-Reinforcing	None.
-Weather stripping	None.

Coupler:

-Materials	Thermally Broken Aluminium profile.
-Assemble method	Snap-in with polyurethane caulking 6" up the jambs.
-Reinforcing	None.
-Weather stripping	"Ultrafab" fin seal, 0.187" x 0.150".

Deflection Header:

-Materials	Thermally Broken Aluminium profile.
-Assemble method	Floats independently from the frame head.
-Reinforcing	None.
-Weather stripping	"Ultrafab" bulb seal, 0.187" x 0.290".

Stops:

-Materials	Extruded aluminium profile with glazing spline gasket, "Polychlor" #2679.
-Assemble method	Snap-On, verticals butted to horizontals.

Window Construction Continued

Glazing:

-Type	Dual-sealed double-glazed unit.
-Method of glazing	Exterior glazed using "Arlon" AWT2 2021 (3/32" x 1/2") double sided foam glazing tape on the interior side with corners caulked.
-Total thickness	20.7 mm.
-Glass thickness	4 mm (interior & exterior).
-Type of spacer	12.7 mm (1/2") "TruSeal Swiggle".
-Gas in cavity	Air.

Drainage:

Each fixed frame contains 2 – 3/4" x 1/8" slot drainage holes in the exterior face of the frame with no drainage covers.

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Window Performance

Test Specification:

Air Infiltration Test - ASTM E283

Window Unit Assembly - As stated in the Window Construction section.

Metered Air Flow @ 75 Pa [1]	= 1.1 l/sec [2] (3.96 m^3/hr)
Window Area	= 4.0 m^2 [3]
Air Infiltration Rate @ 75 Pa [1]	= 0.275 l/sec/m^2 [2] [3] (0.99 m^3/hr/m^2)

Please note that the measurement units expressed above are listed as per job specifications. The measurement units as per ASTM E 283 are following in brackets.

Water Penetration Test - ASTM E331

Window Unit Assembly - As stated in the Window Construction section.

Maximum test pressure without water penetration after 15 minutes = 700 Pa [4]

Addition test run at 1000 Pa with water penetrating through the vertical coupler after 6 minutes.

Notes: **Instrument Precision**

[1] ± 0.3 Pa
[2] ± 1.00% of full scale
[3] ± 0.001 m
[4] ±1 Pa

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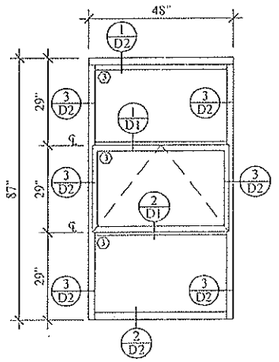

W1

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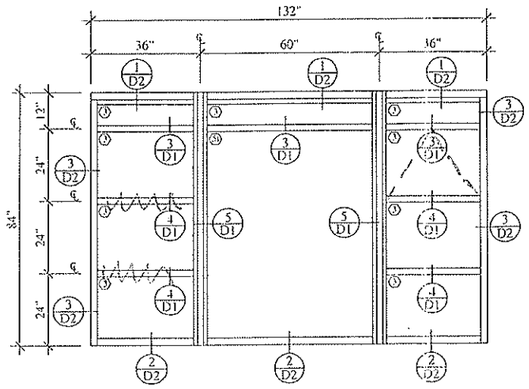

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Note: Lvl 2-8		

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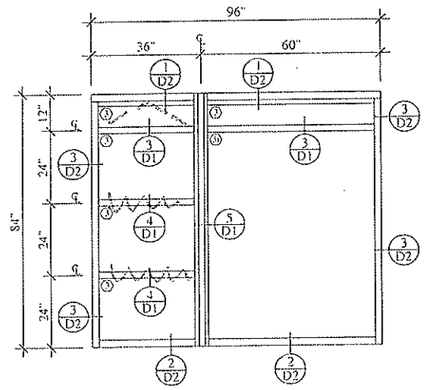

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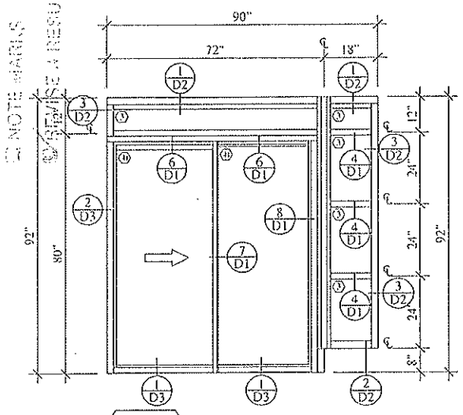

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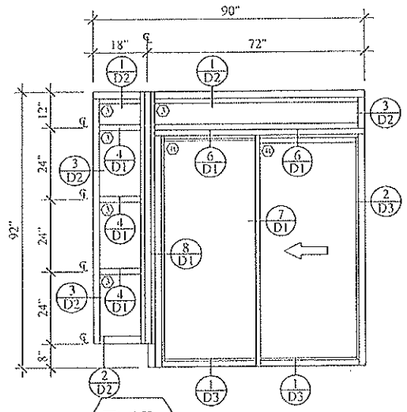

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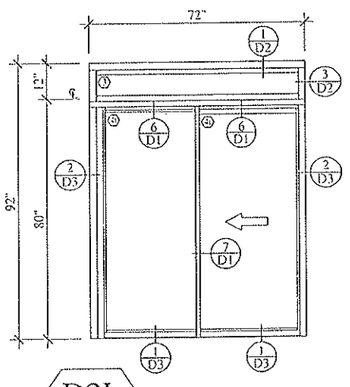

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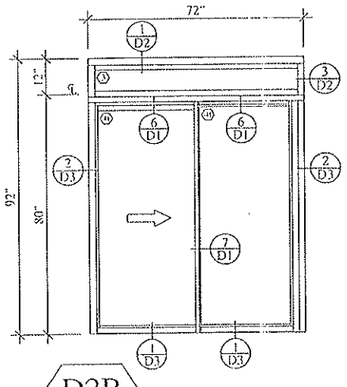

D2R

Series: 45 Series	Total:	1
Note: Lvl 8		

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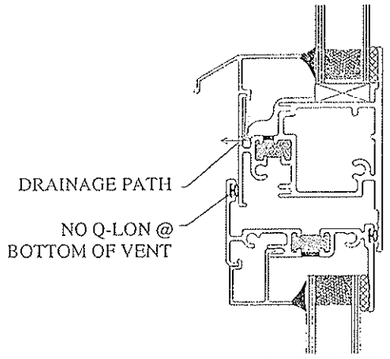

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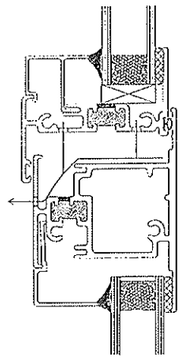

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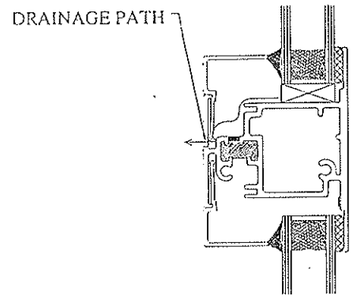

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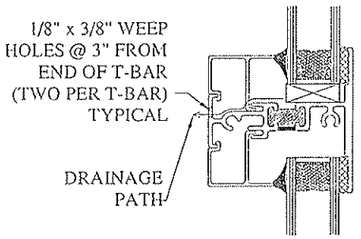

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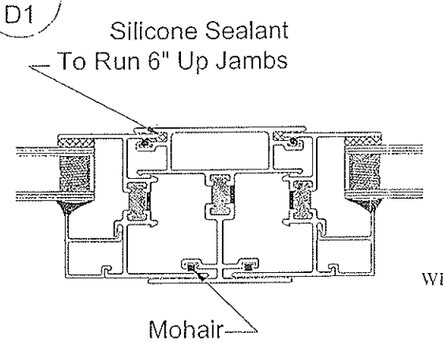

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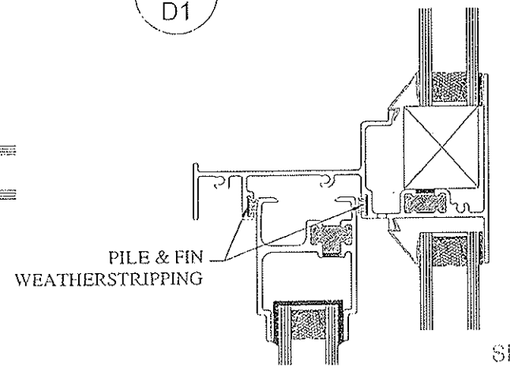
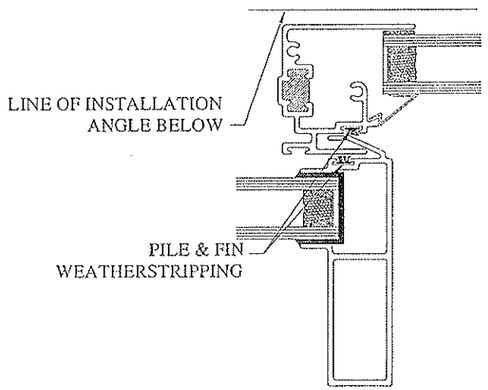
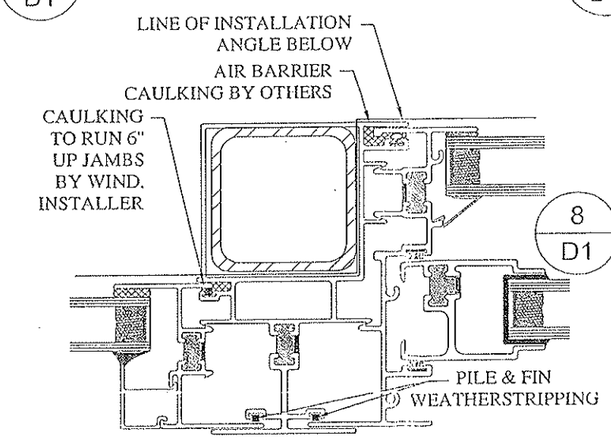


6 / D1 PATIO DOOR TRANSOM SECTION



7 / D1 PATIO DOOR INTERLOCK SECTION



8 / D1 PATIO DOOR / FIXED LITE AT 180° COUPLER SECTION

Windows are "Supply Only" by **Allied Windows**. These drawings are for structural purposes only and MUST be read in conjunction with the Envolope Consultants details.

SPRATT EMANUEL ENGINEERING LTD.
DRAWING REVIEW
REVIEWED BY SPRATT EMANUEL ENGINEERING LTD. FOR GENERAL CONFORMITY WITH THE DESIGN CONCEPT ONLY. THE SOLE RESPONSIBILITY FOR THE DRAWINGS INCLUDING CORRECT DESIGN DETAILS, NOTES, DIMENSIONS AND CONFIRMATION OF SITE CONDITIONS AND DIMENSIONS REST WITH THE PARTY SUBMITTING SAME
☐ NO EXCEPTIONS NOTED
☐ NOTE MARKS
☐ REVISE & RESUBMIT
REVIEWED BY:
DATE:

CONTRACTOR:
Ocean West Construction
Phone: (604) 324-3531
Fax: (604) 324-3532

ENVELOPE DETAIL CONSULTANT:
Spratt Emanuel Engineering Ltd.
Phone: (604) 872-1211
Fax: (604) 872-1274

Allied
ALLIED WINDOWS
(Gloucester Industrial Park)
5690 268th Street
Langley, B.C., V4W 3X4
Tel: (604) 856-3311
Fax: (604) 856-2356

PROJECT:
Chateau Comox
1272 Comox Street
Vancouver, BC

DATE: June 30, 2008
SCALE: 6" = 1'-0"
DRAWN BY: ANB
CHECKED BY: AD

PROJECT NO. L-257

REVISION	DATE
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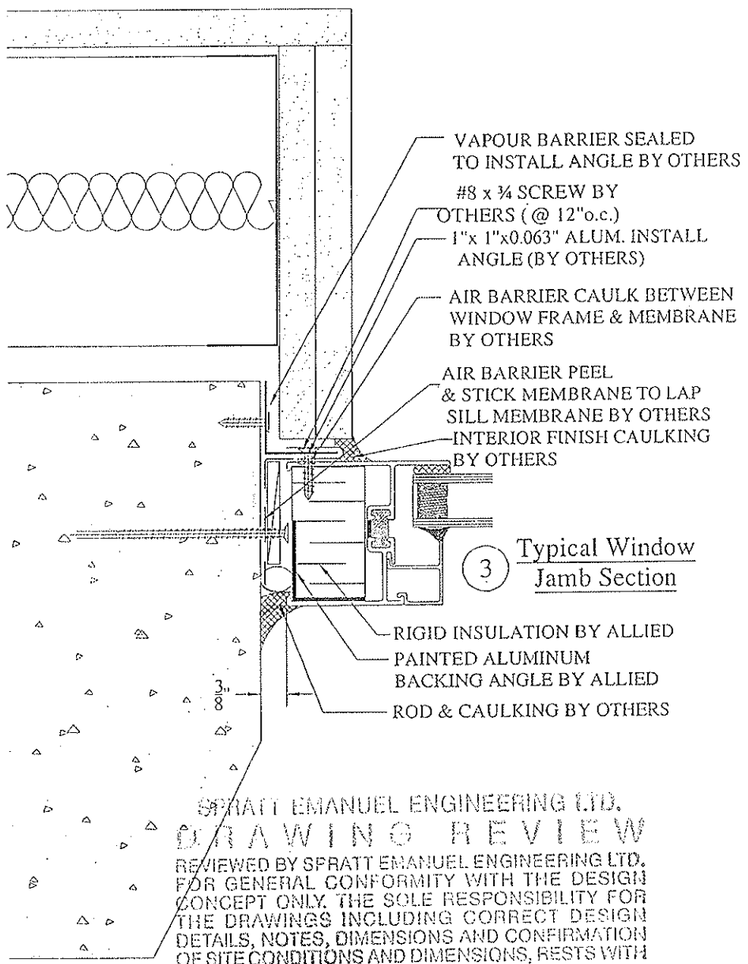
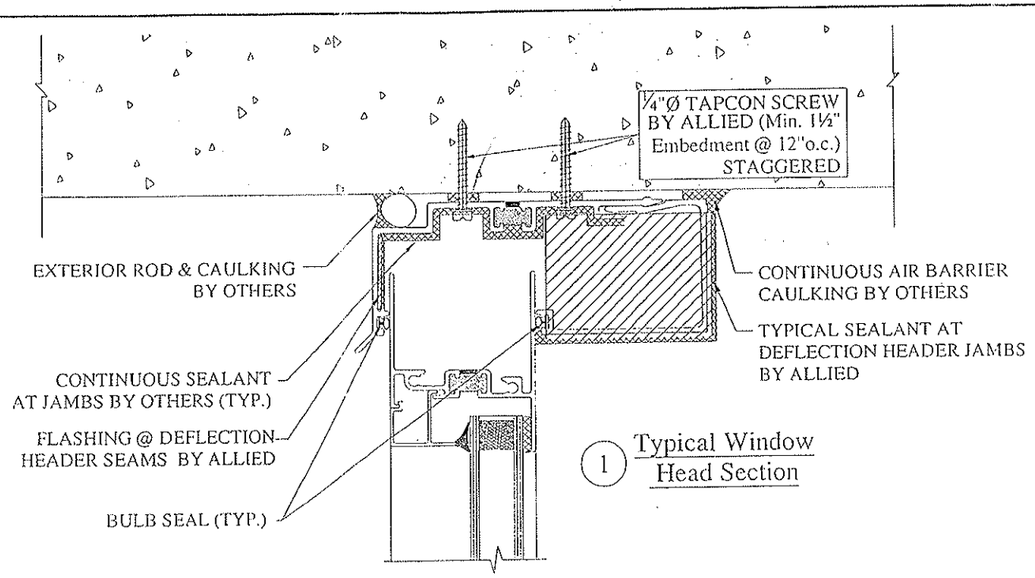
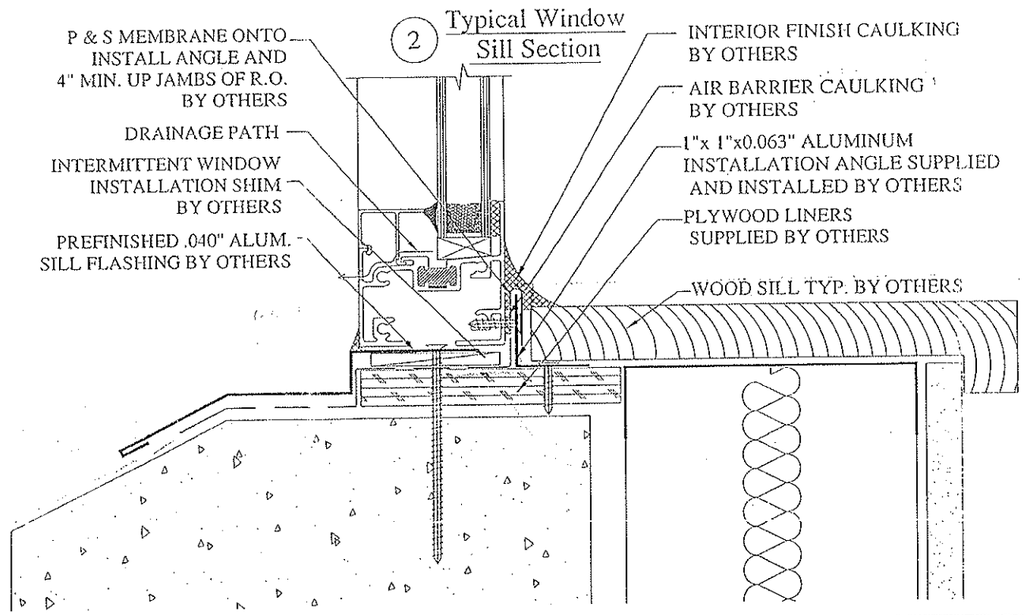


3 Typical Window Jamb Section



1 Typical Window Head Section



2 Typical Window Sill Section

SPRATT EMANUEL ENGINEERING LTD.
DRAWING REVIEW
REVIEWED BY SPRATT EMANUEL ENGINEERING LTD. FOR GENERAL CONFORMITY WITH THE DESIGN CONCEPT ONLY. THE SOLE RESPONSIBILITY FOR THE DRAWINGS INCLUDING CORRECT DESIGN DETAILS, NOTES, DIMENSIONS AND CONFIRMATION OF SITE CONDITIONS AND DIMENSIONS, RESTS WITH THE PARTY SUBMITTING SAME.

☐ NO EXCEPTIONS NOTED ☐ REVIEWED
☐ NOTE MARKS ☐ REVISE & RESUBMIT BY:

Windows are "Supply Only" by: **Allied Windows**. These drawings are for structural purposes only and MUST be read in conjunction with the Envolope Consultants details.

CONTRACTOR:
Ocean West Construction
Phone: (604) 324-3531
Fax: (604) 324-3532

ENVELOPE DETAIL CONSULTANT:
Spratt Emanuel Engineering Ltd.
Phone: (604) 872-1211
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ALLIED WINDOWS
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5690 268th Street
Langley, B.C., V4W 3X4
Tel: (604) 856-3311
Fax: (604) 856-2356

PROJECT:
Chateau Comox
1272 Comox Street
Vancouver, BC

DATE: June 30, 2008
SCALE: 6" = 1'-0"
DRAWN BY: AMB
CHECKED BY: AD

PROJECT NO. L-257

REVISION	DATE
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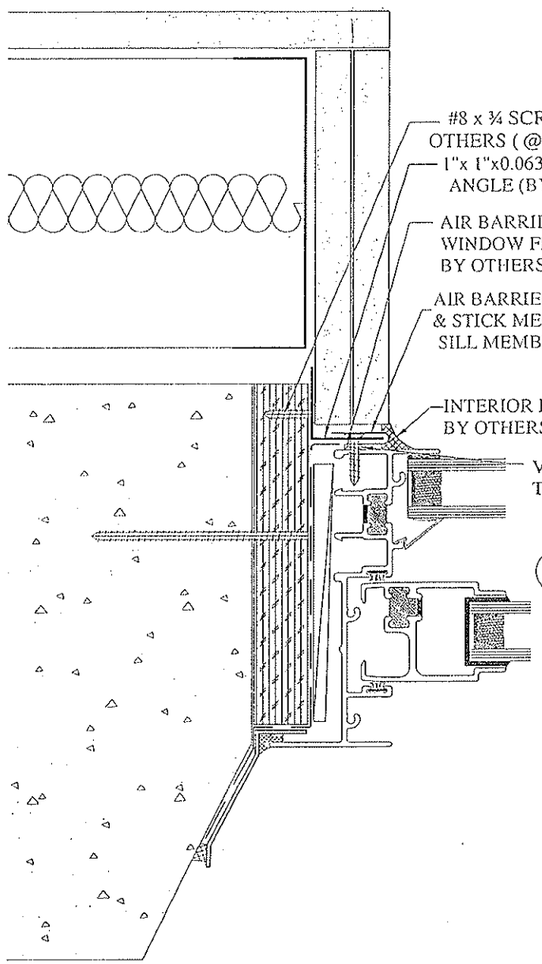
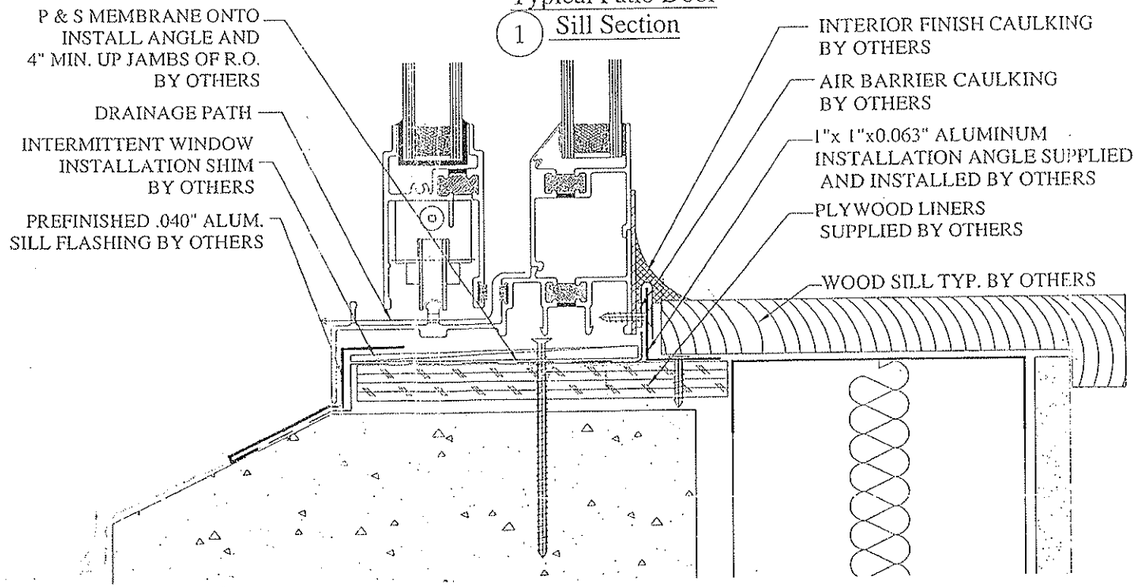
Patio Doors are "Supply Only" by **Allied Windows**. These drawings are for structural purposes only and MUST be read in conjunction with the Envolope Consultants details.



2 Typical Window Jamb Section



1 Typical Patio Door Sill Section

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DRAWING REVIEW

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☐ NO EXCEPTIONS NOTED
☐ NOTE MARKS
☐ REVISE & RESUBMIT

☐ REVIEWED BY:
DATE:

CONTRACTOR:
Ocean West Construction
Phone: (604) 324-3531
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ENVELOPE DETAIL CONSULTANT:
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PROJECT:
Chateau Comox
1272 Comox Street
Vancouver, BC

DATE: June 30, 2008
SCALE: 6" = 1'-0"
DRAWN BY: AMB
CHECKED BY: AD

PROJECT No. L-257

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APPENDIX D

INSPECTION RECORD FORMS

10.1	Homeowner Inspection Check List	10 Pages
10.2	Common Area Inspection Check List	10 Pages
10.3	Maintenance Report Form	10 Pages

HOMEOWNER INSPECTION CHECK LIST

Suite #:_____ **Inspection Date:**_____

Conducted by:_____ **Phone:**_____

Component	Items to Review	Condition	
		Acceptable	Not Acceptable
Sealant	Inspect sealant for cracking, loss of adhesion, bulging or lack of flexibility.		
Windows, Skylights and Balcony Doors	Inspect weather-stripping, seals, weep holes and especially perimeter sealant and flashing slope.		
Exhaust Vents	Inspect for lint accumulation in screens, corrosion and perimeter sealant and flashing slope.		
Doors	Inspect hardware, weather-stripping and alignment.		
Flashings	Inspect for corrosion, proper slope and joint sealant failure.		
Deck Membranes	Inspect for damage, wear, blistering, peeling or splitting.		
Roof Systems	Inspect for exposed waterproofing membrane, loss of ballast, drain blockage.		
Concrete	Inspect for cracking, spalling or staining.		
Paint	Inspect for staining, discolouration, fading, chalking, peeling, cracking or blistering.		

Any component deemed not acceptable should be explained in detail on the reverse of this form.

MAINTENANCE REPORT FORM

Date:_____

Maintenance Required:

Location:

Reported by: Suite Number:

Action Taken:

Date Completed:_____ Approval:_____

SPRATT EMANUEL
ENGINEERING LTD.

2348 Yukon Street
Vancouver, BC
Canada V5Y 3T6
Phone 604 872-1211
Fax 604 872-1274

Warranty Summary

Project Description: **Window Replacement, Re-Cladding and Associated Work**
Strata Plan LMS 280 – Chateau Comox
1272 Comox Street, Vancouver, B.C.

Building Envelope Consultant: Spratt Emanuel Engineering Ltd.
2348 Yukon Street, Vancouver, B.C. V5Y 3T6

Contractor: Ocean West Construction Ltd.
#113 – 1083 East Kent North
Vancouver, B.C. V5K 4V9

Date of Substantial Completion: May 6, 2009
(Warranty Commencement Dates)

Warranty Provider: National Home Warranty
Phone: 604-575-9155, Fax: 604-575-9156

Warranty Expiry Date:

Building	Labour & Materials	Water Ingress
Chateau Comox	May 6, 2011	May 6, 2014

In accordance with the Homeowner Protection Act of British Columbia, Chateau Comox Maintenance Manual has been reviewed and approved by the following parties:

Building Envelope Consultant: Spratt Emanuel Engineering Ltd.
2348 Yukon Street, Vancouver, B.C. V5Y 3T6

Signature: June 24/09
Date
Mark W. Emanuel, P.Eng., Principal

Contractor: Ocean West Construction Ltd.
#113 – 1083 East Kent North Vancouver, B.C. V5K 4V9

Signature: 6-17-09
Date

Warranty Provider: National Home Warranty
17685 57th Avenue, Cloverdale, B.C. V3S1H1

Signature: June 25/09
Date

SE | SPRATT EMANUEL
ENGINEERING LTD.

2348 Yukon Street
Vancouver, BC
Canada V5Y 3T6
Phone 604 872-1211
Fax 604 872-1274

Our File No. S08-273
June 17, 2009

Ocean West Construction Ltd.
#113 – 1083 East Kent North
Vancouver, B.C.
V5K 4V9

Attention: Mr. Gorm Damborg

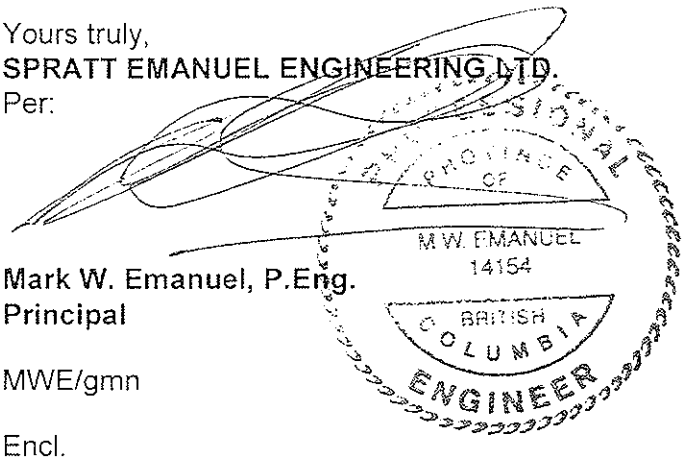
Dear Sir:

Re: Strata Plan LMS 280 – Chateau Comox
1272 Comox Street, Vancouver, B.C.
– Warranty Summary – Maintenance Manual

Please find enclosed for your review one copy of the Maintenance Manual for the above-noted project. Should you find that all is in order, please return the copy of the Maintenance Manual and the three signed original Warranty Summaries.

Should you have any questions, please do not hesitate to contact the undersigned.

Yours truly,
SPRATT EMANUEL ENGINEERING LTD.
Per:



Mark W. Emanuel, P.Eng.
Principal

MWE/gmn

Encl.

SPRATT EMANUEL
ENGINEERING LTD.

2348 Yukon Street
Vancouver, BC
Canada V5Y 3T6
Phone 604 872-1211
Fax 604 872-1274

Our File No. S08-273
June 23, 2009

National Home Warranty Group Inc.
17679 57th Avenue
Cloverdale, B.C.
V3S 1H1

Attention: Mr. Art Doyle

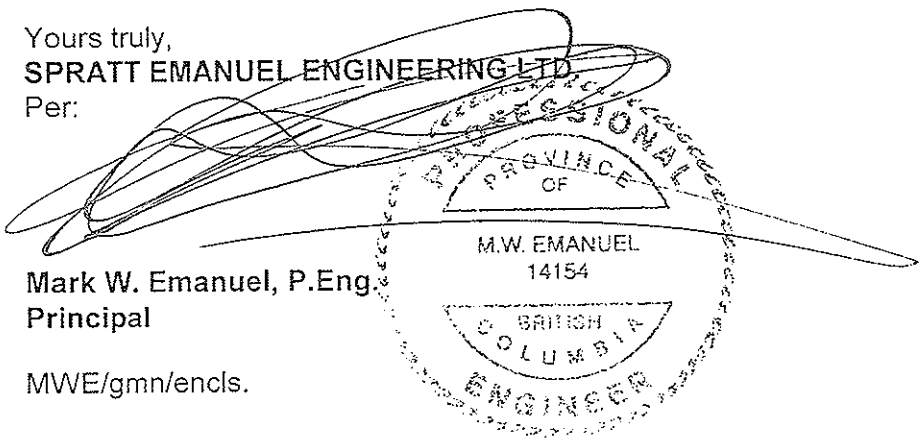
Dear Sir:

Re: Strata Plan LMS 280 – Chateau Comox
1272 Comox Street, Vancouver, B.C.
Window Replacement, Re-Cladding and Associated Work
– Warranty Summary – Maintenance Manual

Please find enclosed for your review one copy of the Maintenance Manual for the above-noted project. Should you find that all is in order, please retain the copy of the Maintenance Manual and return two signed original Warranty Summaries, and retain one for yourselves.

Should you have any questions, please do not hesitate to contact the undersigned.

Yours truly,
SPRATT EMANUEL ENGINEERING LTD.
Per:



Mark W. Emanuel, P.Eng.
Principal

MWE/gmn/encls.

SPRATT EMANUEL
ENGINEERING LTD.

2348 Yukon Street
Vancouver, BC
Canada V5Y 3T6
Phone 604 872-1211
Fax 604 872-1274

Warranty Summary

Project Description: **Window Replacement, Re-Cladding and Associated Work**
Strata Plan LMS 280 – Chateau Comox
1272 Comox Street, Vancouver, B.C.

Building Envelope Consultant: Spratt Emanuel Engineering Ltd.
2348 Yukon Street, Vancouver, B.C. V5Y 3T6

Contractor: Ocean West Construction Ltd.
#113 – 1083 East Kent North
Vancouver, B.C. V5K 4V9

Date of Substantial Completion:
(Warranty Commencement Dates) May 6, 2009

Warranty Provider: National Home Warranty
Phone: 604-575-9155, Fax: 604-575-9156

Warranty Expiry Date:

Building	Labour & Materials	Water Ingress
Chateau Comox	May 6, 2011	May 6, 2014

In accordance with the Homeowner Protection Act of British Columbia, Chateau Comox Maintenance Manual has been reviewed and approved by the following parties:

Building Envelope Consultant: Spratt Emanuel Engineering Ltd.
2348 Yukon Street, Vancouver, B.C. V5Y 3T6

PROFESSIONAL ENGINEER 14154 PROVINCE OF BRITISH COLUMBIA

June 24/09
Signature: Date
Mark W. Emanuel, P.Eng., Principal

Contractor: Ocean West Construction Ltd.
#113 – 1083 East Kent North Vancouver, B.C. V5K 4V9

6-17-09
Signature: Date

Warranty Provider: National Home Warranty
17685 57th Avenue, Cloverdale, B.C. V3S1H1

Signature: Date

OCEANWEST CONSTRUCTION

Record of Transmittal

June 22, 2009

Spratt Emanuel Engineering
2348 Yukon St.
Vancouver, BC V5Y 3T6

Re: Maintenance Manual for Chateau Comox

Please find the attached maintenance manual for Chateau Comox

Thank you,

Cyrille Perez

M:\Office Info\Record of Transmittal.doc