

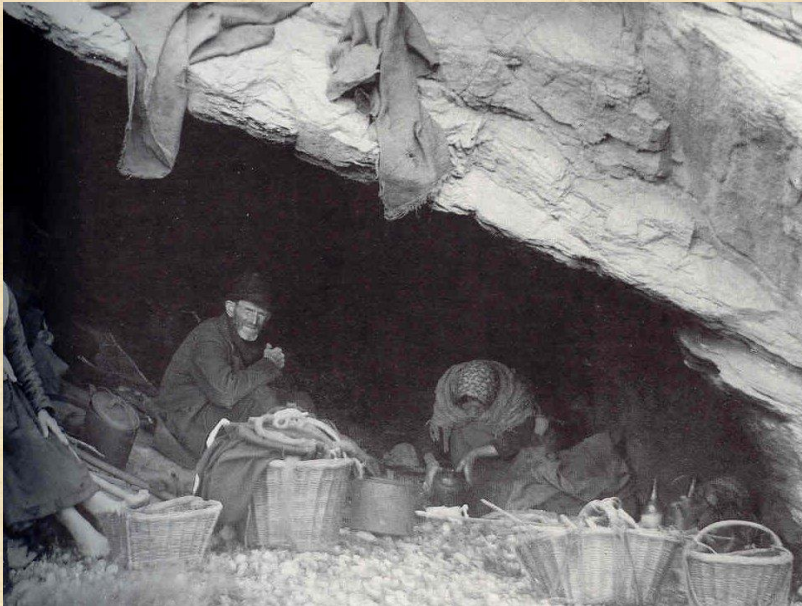
MBOA Fall Seminar

Window Installation are we Meeting Code?

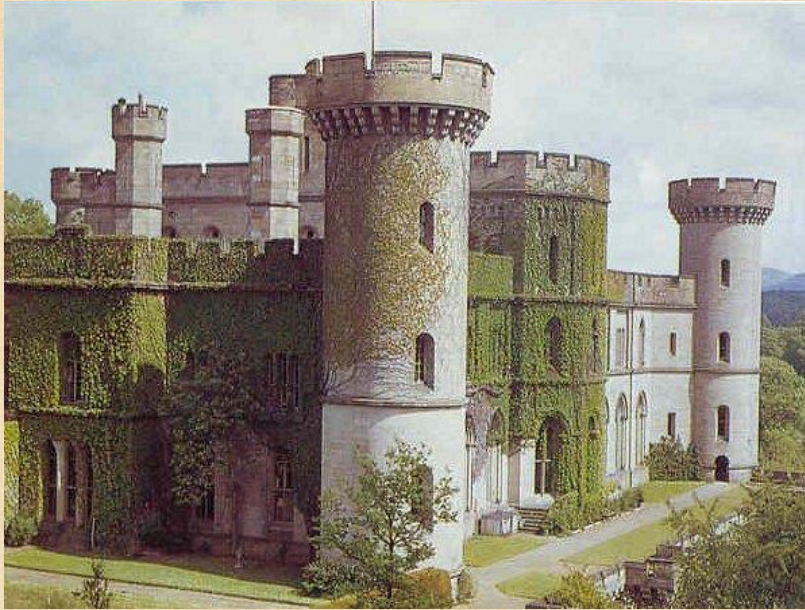
Kevin Knight
Tower Engineering
Building Envelope Practitioner
Email: kknight@towereng.ca
204 612 0654

Gary Proskiw,
Proskiw Engineering
Email: pel@mymts.net
204 633 1107

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In England 1696 window tax was introduced as a property tax based on the number of windows in a house. To avoid the tax some houses from the period have bricked-up the window,

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Today windows and doors are an integral part of the Building Envelope with Code requirements for air and water leakage, thermal and structural performance.

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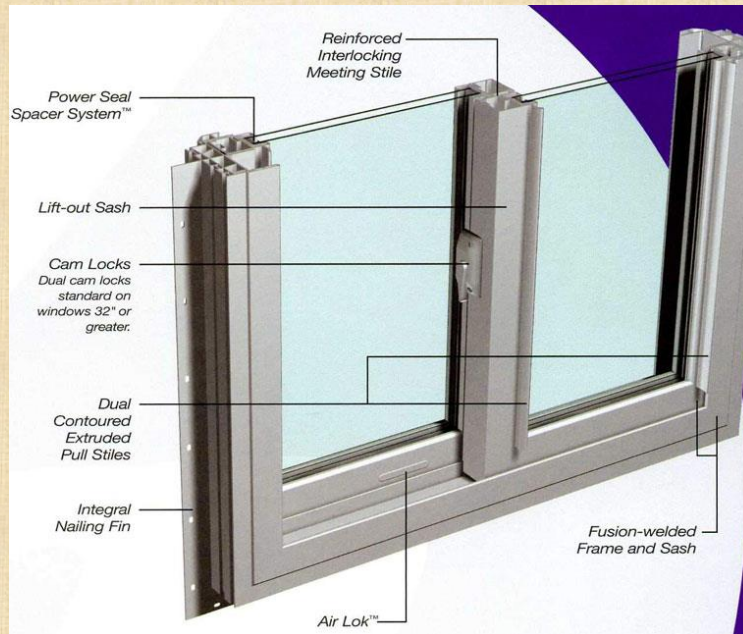
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**Window Performance
Frame Edge IN**

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CSA A440S1, Canadian Supplement to AAMA/WDMA/CSA 101/1.S.2/A440, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.

General testing requirements Air, Water and Structural

Does not apply to field testing

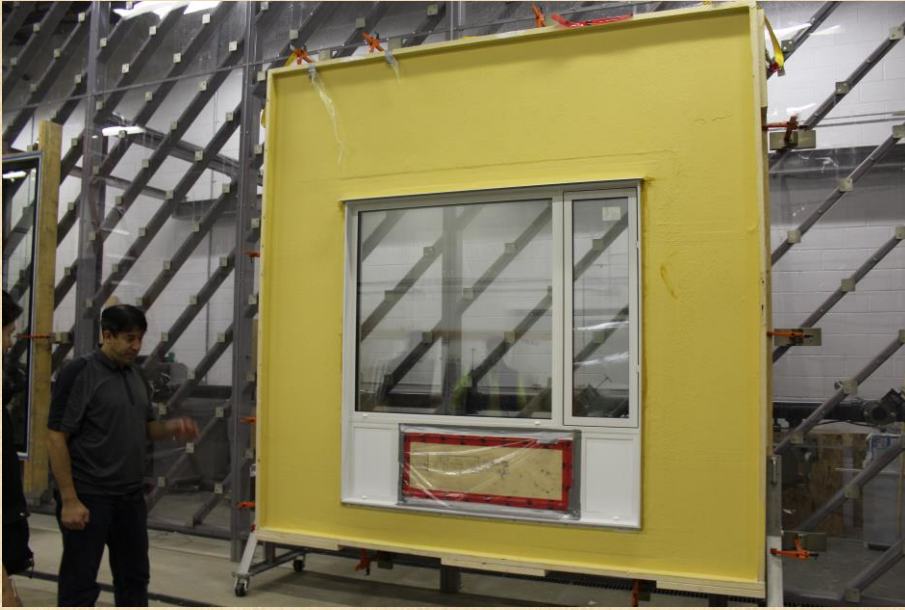
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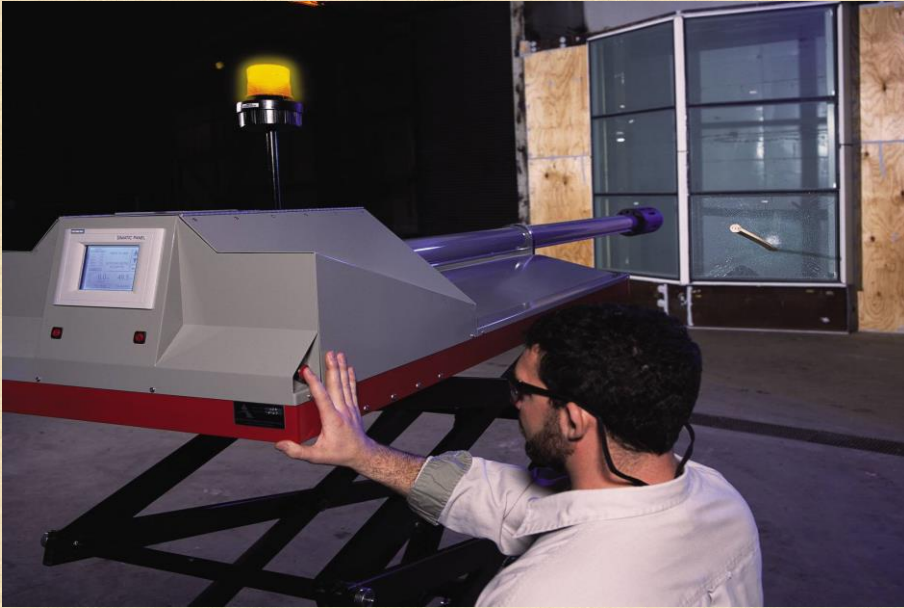
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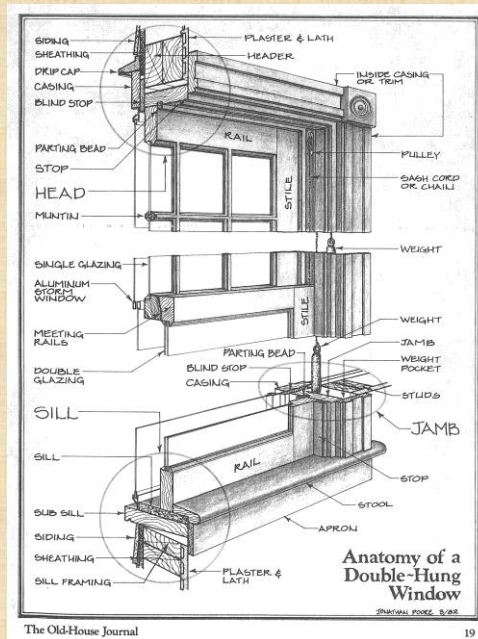
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**Window Installation
Frame Edge Out**

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NBCC 2010 9.27. 4 Sealants

9.27. 4.1 Required Sealants

- 1) Sealant shall be provided where required to prevent the entry of water into the structure
- 2) Sealant shall be provided between masonry, siding or stucco and the adjacent door and window frames or trim including sills, unless such locations are completely protected from entry of rain

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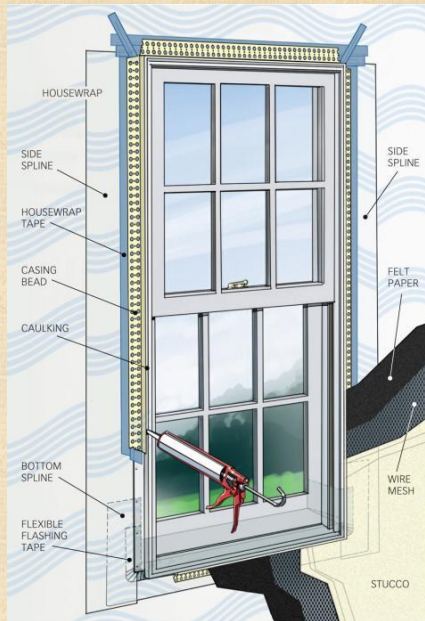
NBCC 2010 10.2.5 Exterior Sealants

10. 2.5.1 The exterior perimeter of a window or door frame shall be sealed to the exterior cladding to minimize penetration of water into the rough opening gap and behind the cladding sealant shall not interfere with the drainage holes in the window or the door frame or the cladding

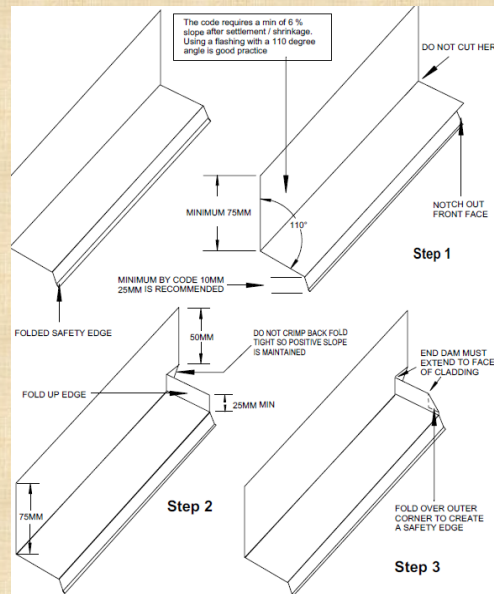
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9.27. 3.8 Flashing

- 4) Terminate at each end with an end dam
 - i) with a height in millimeters not less than 25 millimeters or 1/10 the value of the 1-in-5 driving rain wind pressure in Pa, and
 - ii) at a height defined in subclause (c)(i), extending to the face of the adjacent cladding

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NBCC 2010

9.7.6.1 Installation of windows, doors, and skylights.

- 1) The installation of windows doors and skylights shall conform to CAN/CSA A 440.4 Window Door and Skylight installation.
- 2) The installation of manufactured and pre-assembled windows, doors and skylights and the field assembly of manufactured windows and doors combination units shall conform to the manufacturer's instruction.
- 3) Windows doors and skylights shall be sealed to the air barriers and vapor barriers

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CSA 440.4

A.2.4.2

Critical barriers may be defined as follows:

- (a) Vapour barrier — elements installed to control the diffusion of water vapour.
- (b) Air barrier — the assembly installed to provide a continuous barrier to the movement of air.
- (c) Water-resistive barrier — the water-resistive barrier refers to the surface farthest into an assembly from the exterior that can accommodate some exterior moisture (in the form of liquid water) without causing damage to interior finishes or materials within the assemblies.

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CSA 440.4

A.2.4

Identify the critical barriers in the adjacent wall and window assemblies

A.2.4.1

Critical barrier refers to materials and components that together perform a specific function within a wall or window assembly. All of these functions are critical to the successful performance of the assembly and must be maintained across the interface between the window and the wall.

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CSA 440.4

Thermal barrier — the assembly installed to provide a continuous barrier to the flow of heat.

Note: *For clarity, the thermal barrier is described in the text but is not shown graphically on the drawings.*

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CSA 440.4

10.2.5.1 Exterior Sealants

The exterior perimeter of a window or door frame shall be sealed to the exterior cladding to minimize the penetration of water into the rough opening gap and behind the cladding.

Sealant shall not interfere with drainage holes in the window or door frames or in the cladding

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CSA 440.4

10.2.5.4

Exterior sealants shall be applied over the backer rod in a continuous manner to provide an even unbroken sealant bead sufficient to fill the gap between the fenestration product and the adjacent construction the shape of the sealant be shall be appropriate for the type of joint In accordance with ASTM C1193

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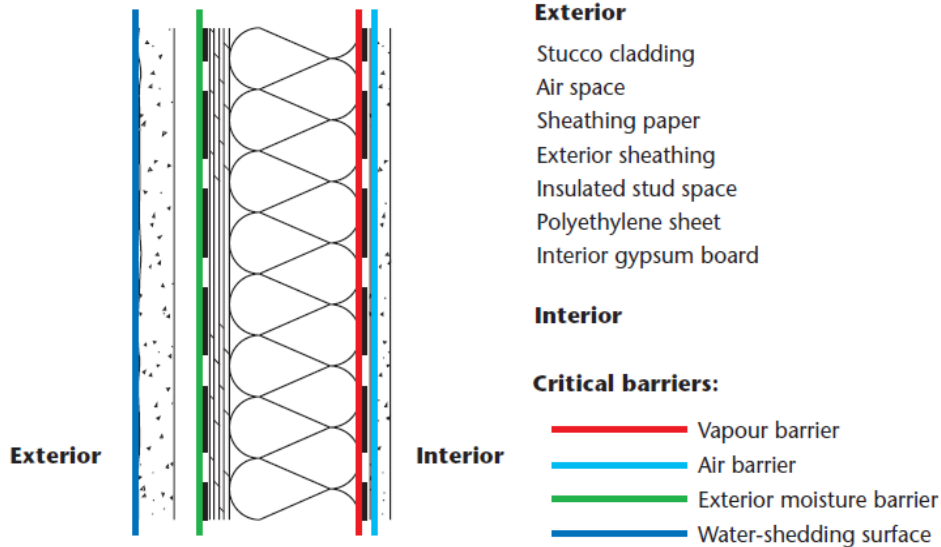
CSA 440.4

A. 8.6.6

The installation of one-component polyurethane foam requires that the foam material comply with CAN/ULC-S710.1 and be installed in accordance with CAN/ULC-S710.2.

CAN/ULC-S710.1 no longer includes one-component polyurethane foam as an air barrier material but is used only as an insulation in the rough opening.

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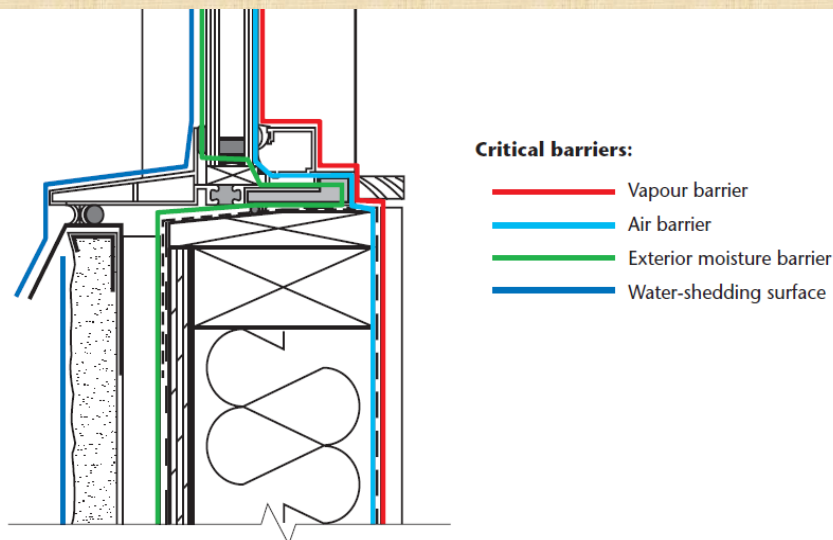
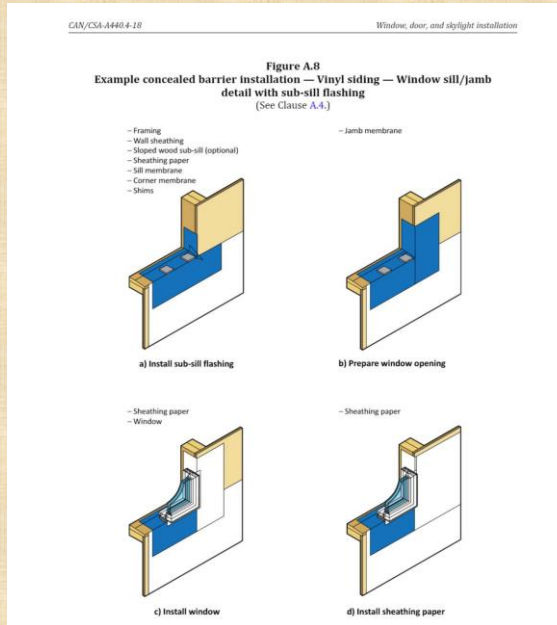


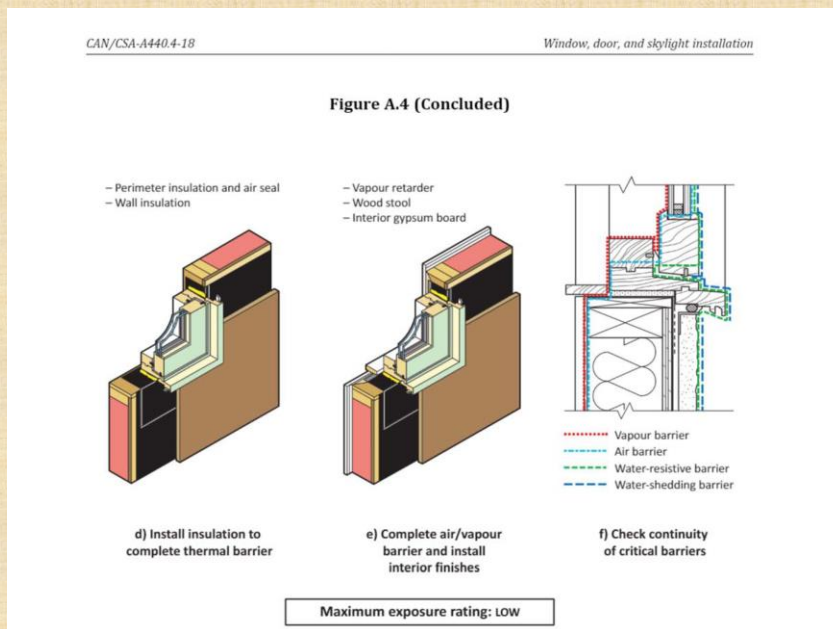
Figure A.3

Critical barriers at a window-to-masonry wall interface

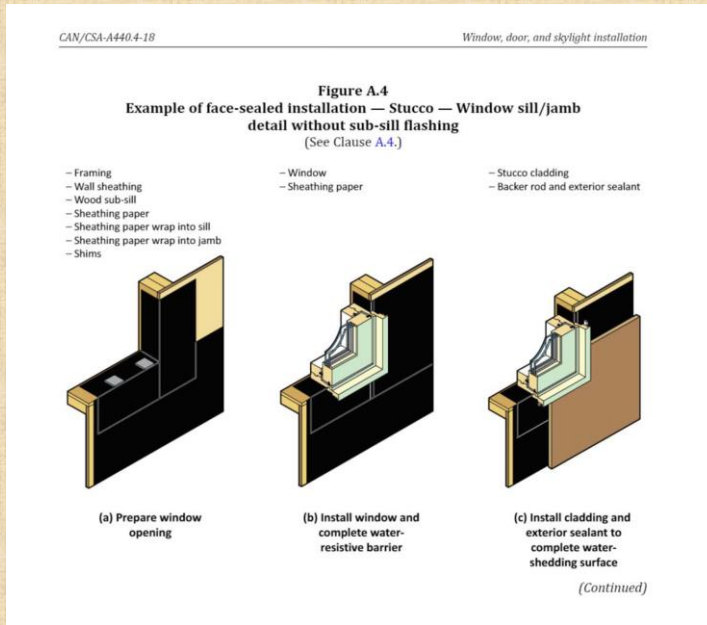
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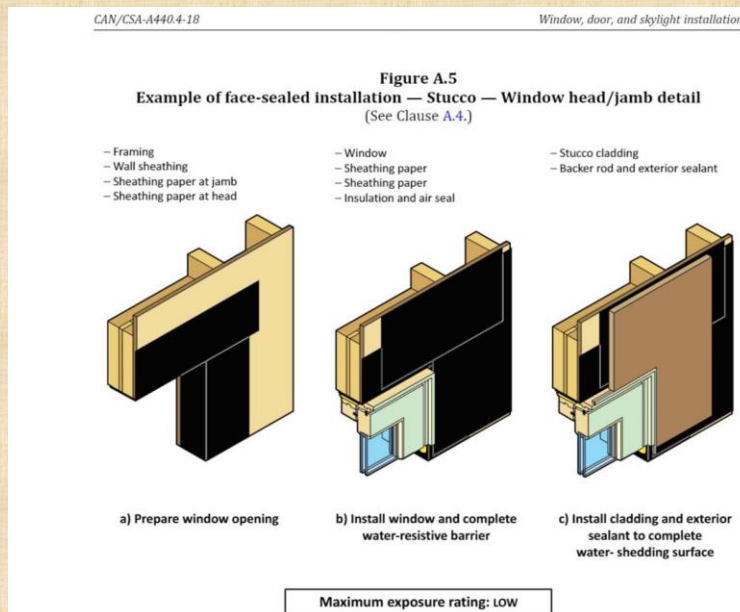
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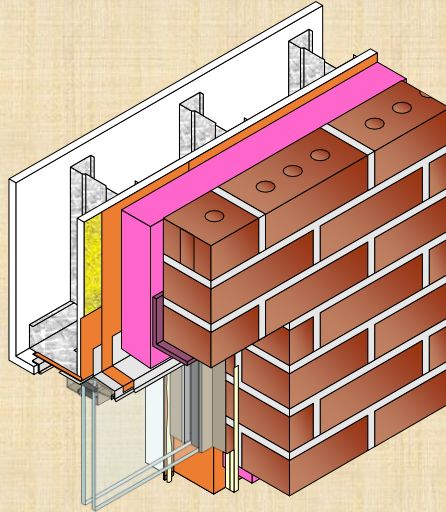


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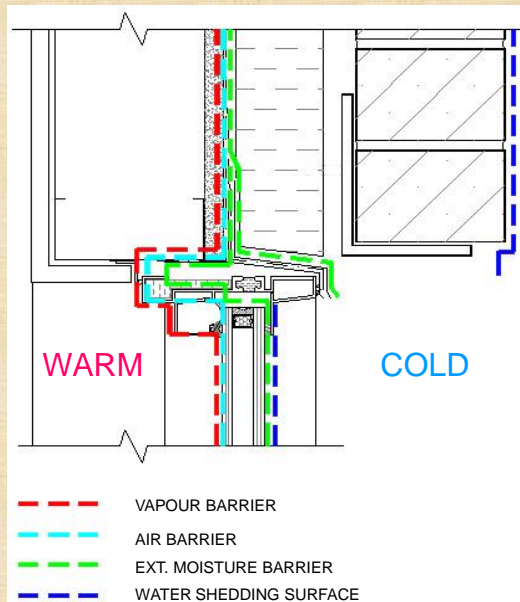


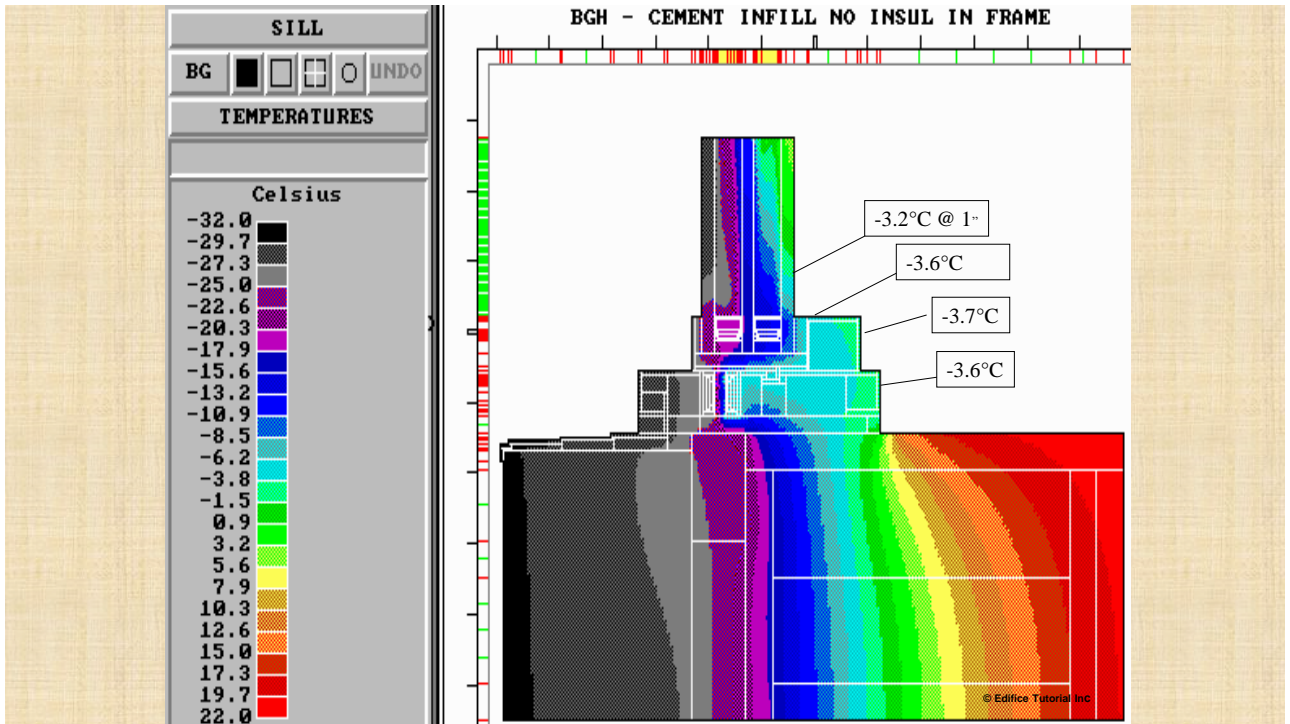
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Steel Stud Framing
 Dens-Glass Wall Sheathing
 Metal Angle on Sealant at Jamb
 Jamb Membrane
 Head Membrane
 Deflection Head
 Sealant at Jamb
 Window
 Self Adhered Membrane
 Self Adhered Membrane
 Metal Head Flashing
 Exterior Rigid Insulation
 Brick, Ties & Lintel
 Backer Rod and Exterior Sealant
 Deflection Head Closure
 Interior Gypsum Board



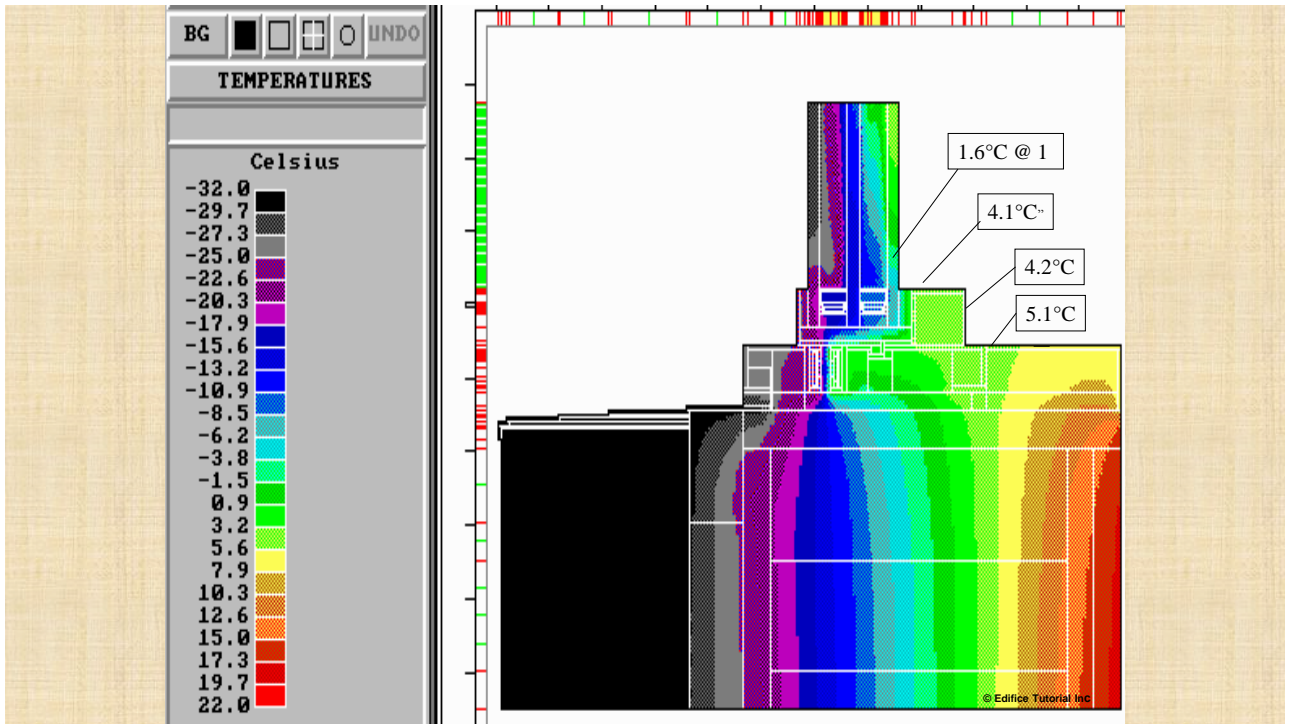
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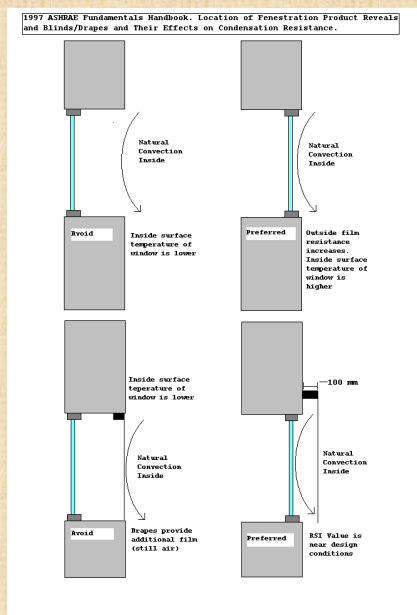


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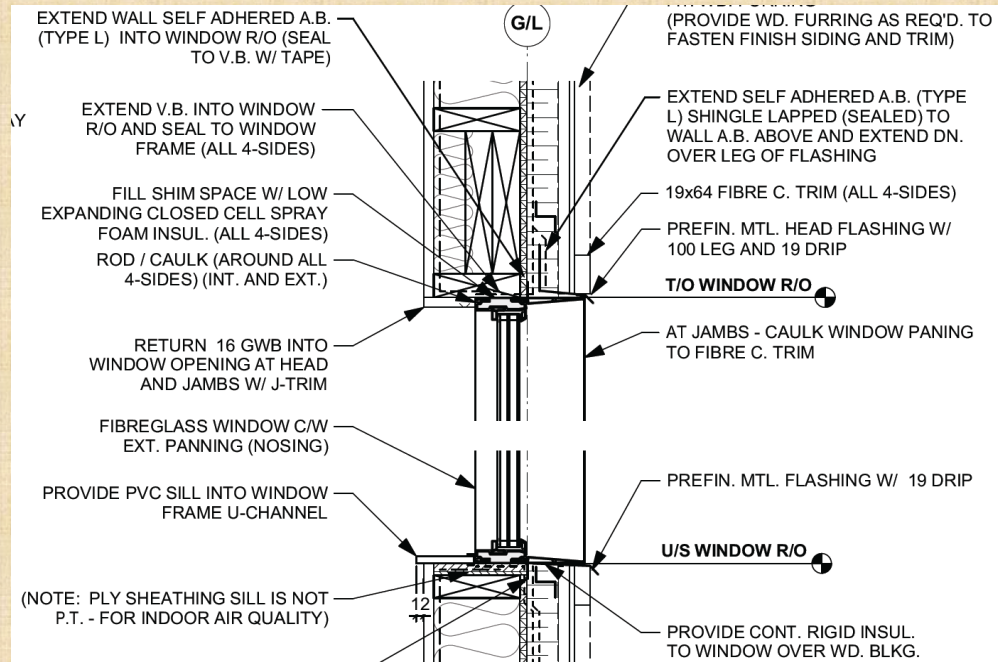




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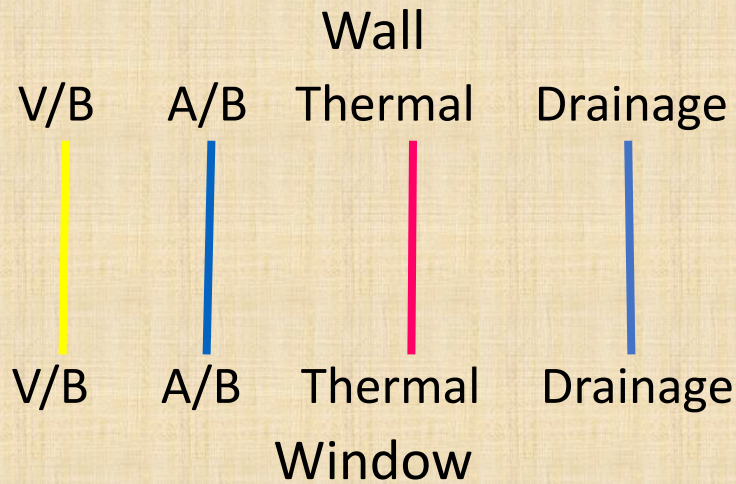
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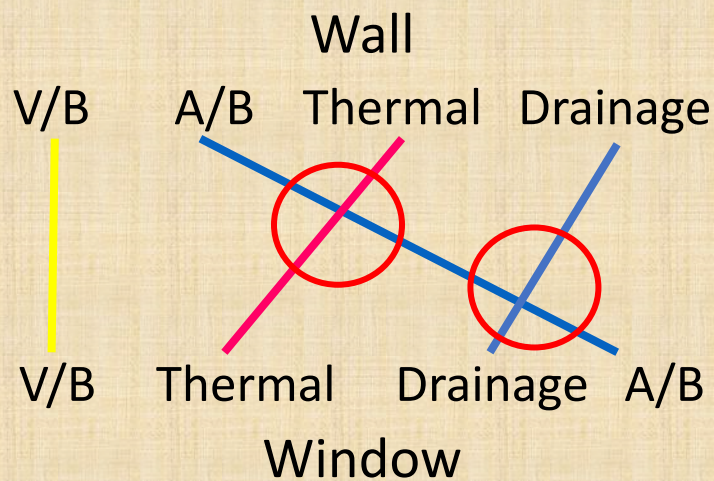
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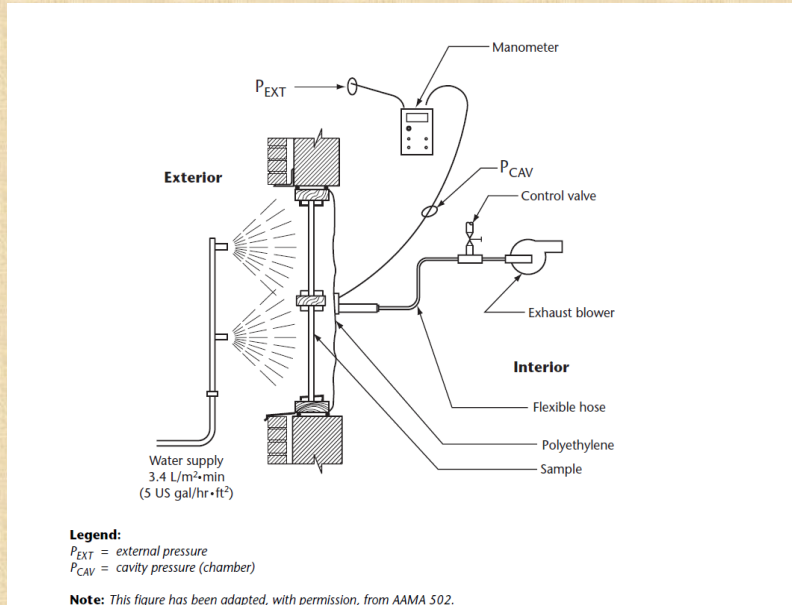
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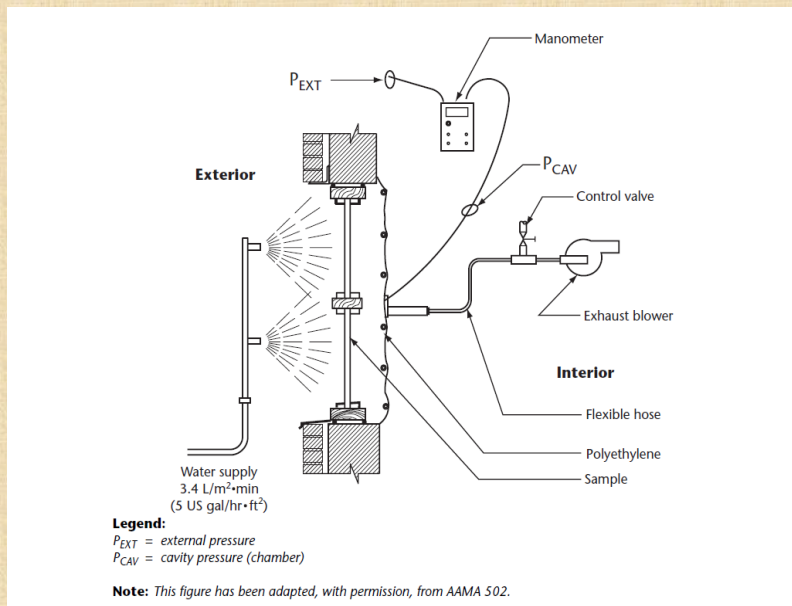
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What is the Current State of the Art

Are we Meeting NBCC Code and
CSA Requirements

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The following slides are not a reflection on the performance of the individual materials but the installation and sequencing of construction

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“Except For Structural Errors, About 90% Of All Building Problems Are Associated With Water In Some Way.” (ASTM)



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But With Proper Design & Construction, Moisture Damage Can Be Minimized



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This lead to....

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This....

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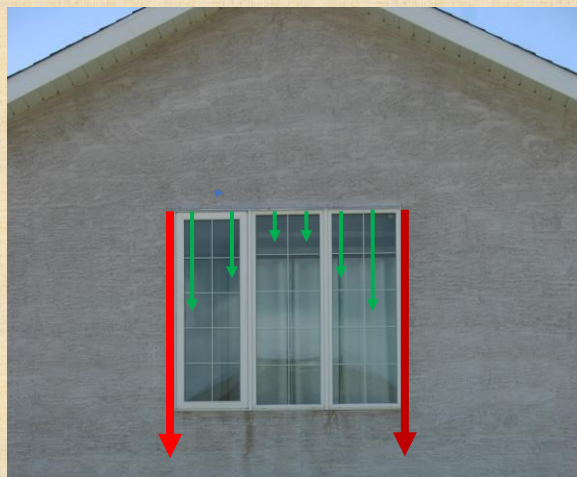
And This....



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What Do End Dams Do?

Water Flow
With
No End dams



Water Flow
With
End dams



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Lack of adhesion to the Window flange.



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To drain or not to drain That is the Question?

Two Systems

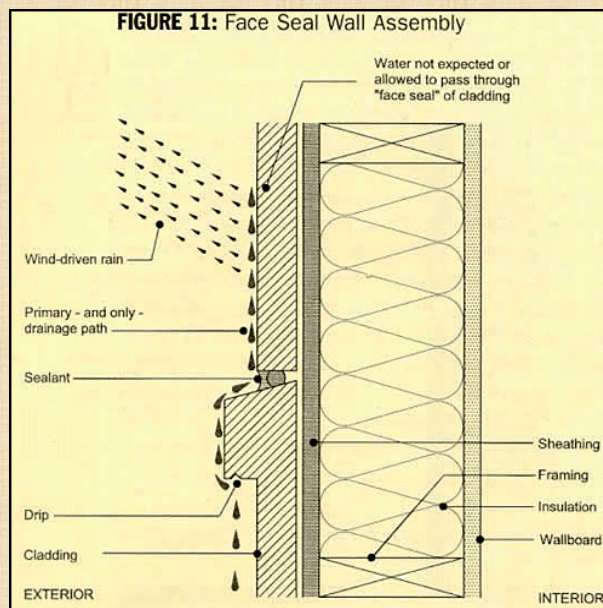
Face sealed

- Designed to block water penetration, otherwise, it's trapped. Water trapped behind walls finds its way to the interior.

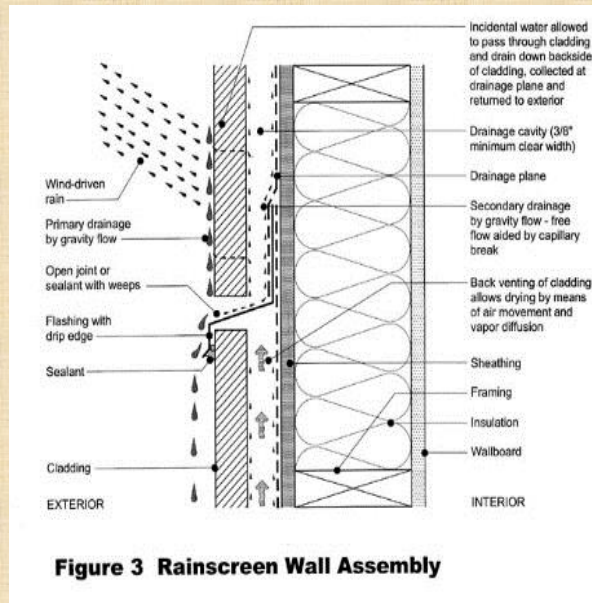
Weeped walls

- Allows limited water in and sheds that water to the exterior
- Expect details to see water
- Drainage plane and flashing

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A Further Complication - *Acrylic Stucco*

- Acrylic/synthetic stucco is a manufactured product which can have widely varying permeabilities.
- Acrylic Stucco is a very different material than traditional stucco
- Traditional stucco has as relatively high permeability to water vapour.
- If water gets into an acrylic stucco-covered wall, can it dry??

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To Summarize – these are the Critical NBC Window Installation Requirements:

1. **Rough openings** – required to be fully protected from water, (NBC 9.7.6.1/A440.4).
2. **End dams** – required because they keep water away from the window/wall interface, (NBC 9.27.3.8.4).
3. **Window/wall interface** – required to be sealed (with a sealant!), (NBC 9.27.4.1).

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It's not Rocket Science, but this is



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Questions and Discussion

Kevin Knight
Tower Engineering
Building Envelope Practitioner
204 612 0654
Email: kknight@towereng.ca

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Proskiw Engineering
204 633 1107
Email: pel@mymts.net