

## Introducing Baywest Projects Sill Pan Protection System: Ensuring Long-Term Window Performance

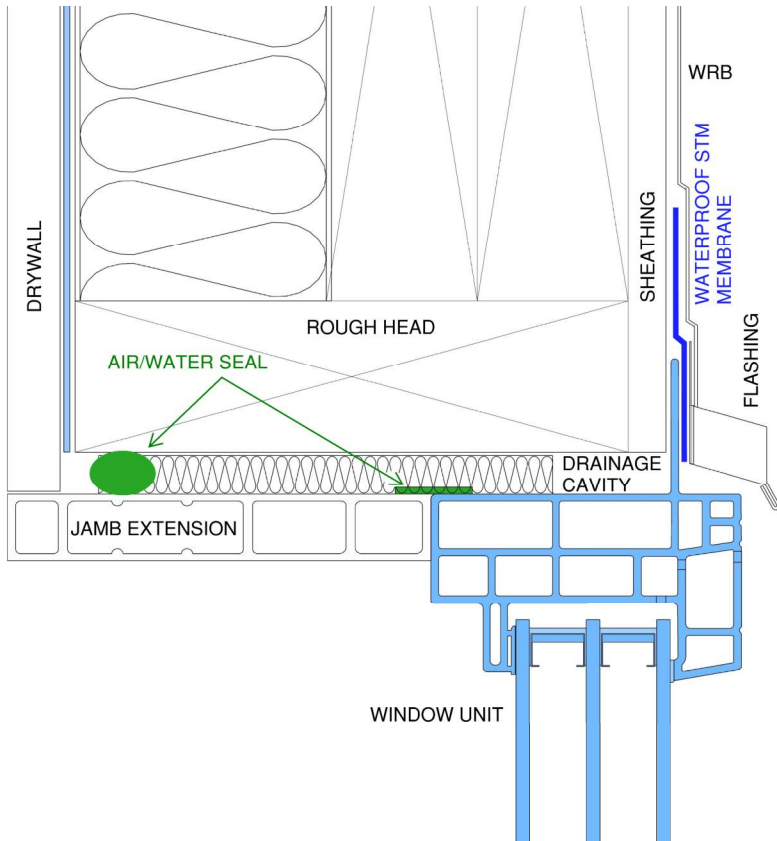


In the realm of residential wood frame wall assemblies, the 2019 National Building Code (NBC) for Alberta stipulates that windows must meet the standards set forth by CSA A440.4. This document uses the version updated in 2007, which outlines the minimum requirements for effective window installations. However, adhering to the building code minimums doesn't guarantee optimal performance and can sometimes lead to issues down the road.

At Baywest Projects, we understand the importance of not just meeting the building code but exceeding it to ensure the longevity and efficiency of window installations. Our Sill Pan Protection System is designed to address the principles outlined in the CSA A440.4 and building code objectives.

**The main objective is clear:** create a protective pocket within the wall assembly that can accept, hold, and safely redirect water to the exterior, preventing damage to the interior wall assembly and moisture-sensitive components. To achieve this, we treat the rough opening space as if it were going to be exposed to water, preparing it to defend against moisture while allowing for proper drainage and drying.

Our system takes into account the requirements of both the building code and the CSA A440.4, providing a comprehensive solution for moisture management. The standard emphasizes the protection



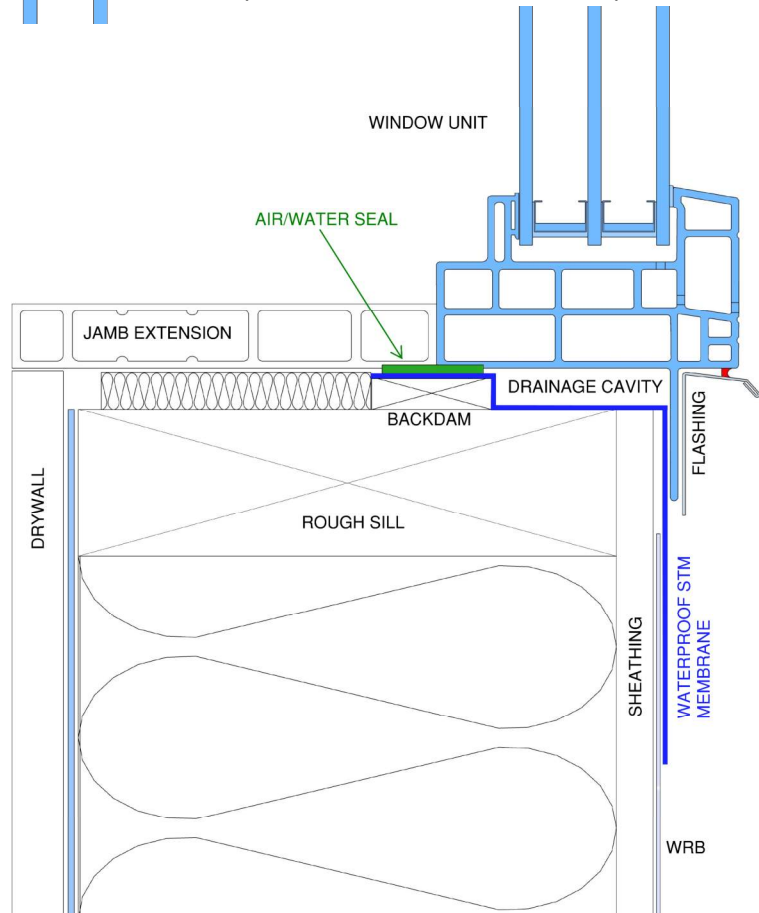
of the inner rough opening and the implementation of a method to drain water back to the outside. Baywest Projects ensures these criteria are met consistently and effectively.

When it comes to options for draining water, the CSA A440.4 allows for either a sloped sill or a back dam. Through extensive research, we have found that a back dam performs equally well when installed correctly. Instead of leaving the installation details to framers, who may vary in their understanding of these principles, based on instructions for various builders who may or may not base their methods on either code or building science, we take charge to ensure consistency and reliability in our system.

At Baywest Projects, our guiding principles prioritize the installation of sill pans in all

windows, regardless of exposure levels. While the 2019 CSA A440.4 relaxed the requirements, allowing sill pans to be omitted unless windows are combined (mull) units, we believe in treating every rough opening as if it will be exposed to moisture. Our approach is rooted in the understanding that relying solely on surface sealing is not effective, especially with the industry's push towards energy efficiency, net zero standards, increased insulation, and airtightness, which reduce drying potential in these assemblies.

The Baywest Projects Sill Pan Protection System goes beyond the minimum requirements of the building code and the CSA A440.4, providing a consistent and reliable solution for addressing potential moisture accumulation within wall assemblies.





By treating every rough opening as a potential source of water exposure and implementing drainage and drying methodologies, our system ensures the long-term performance of window installations in residential wood frame wall assemblies. Choose Baywest Projects for a robust and comprehensive solution to safeguard your windows against the elements.

## Enhancing Protection: Baywest Projects Windowsill Protection System

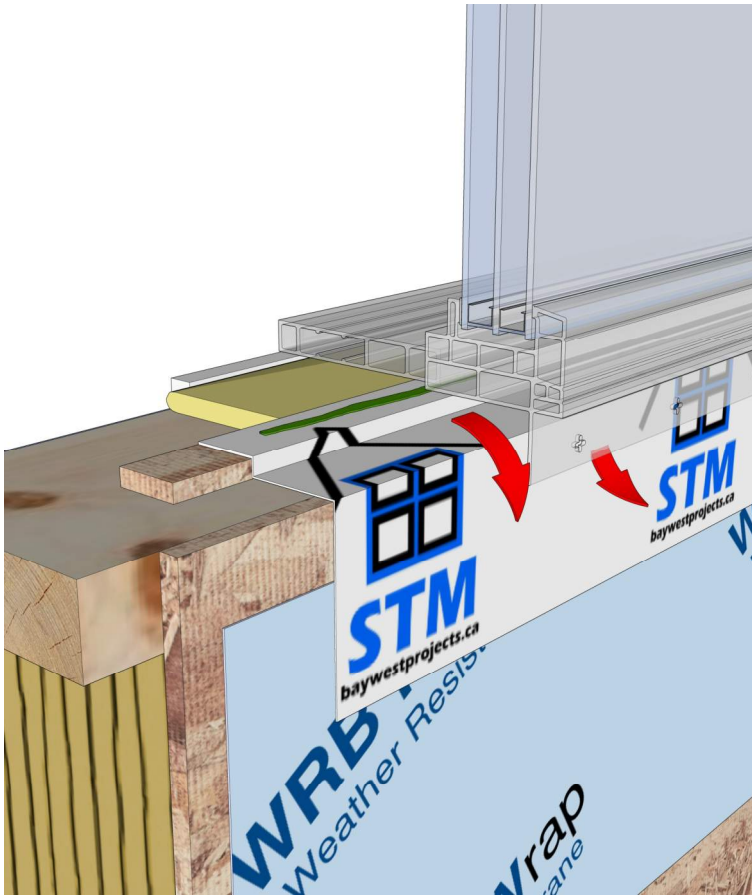
Your wood frame home's exterior consists of two crucial planes of protection, and CSA A440.4 mandates that these planes align with the chosen window installation method.

First plane is deflection and the inner boundary is for drainage.

Baywest Projects takes window protection to the next level by precisely matching your wall assembly system to these planes of protection.

### Tailored Solutions for Every Need

**1. Basic System:** For standard protection, our basic system ensures compliance with CSA A440.4 and building code requirements. This option is suitable for various wall assembly types and provides a solid foundation for window installations.



**2. Robust Protection:** When enhanced protection or insurance against potential leakage is paramount, Baywest Projects offers robust systems. This is especially valuable for cladding types that are challenging to remove for repairs, such as stucco, adhered stone, and other custom cladding systems.

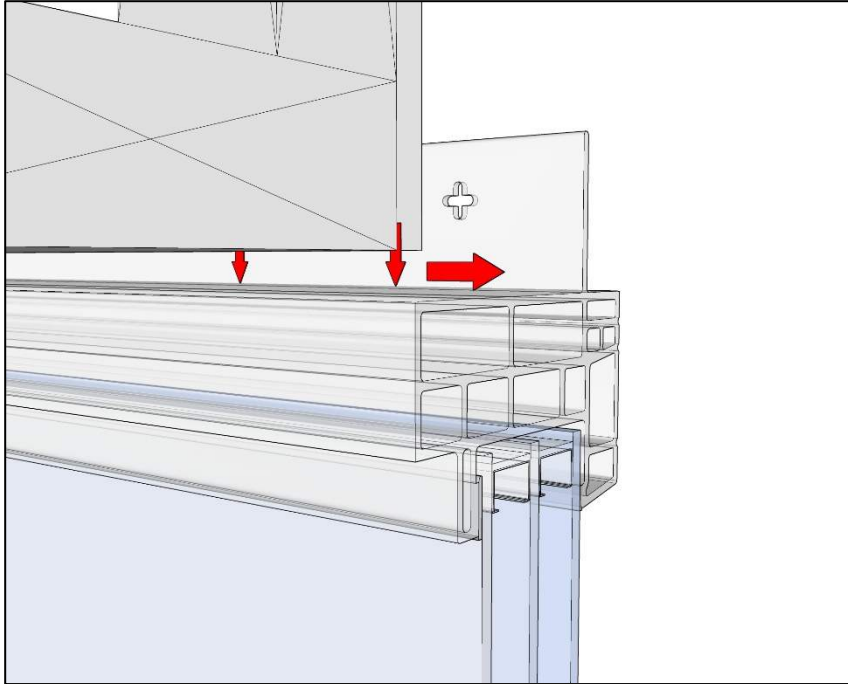
**CSA A440.4 2019  
6.1.3**

The protection provided by the water-resistant barrier shall be continuous with the fenestration product.

**10.2.1.7**

Sub-sill flashing may be sealed to a jamb extension only if joints between the

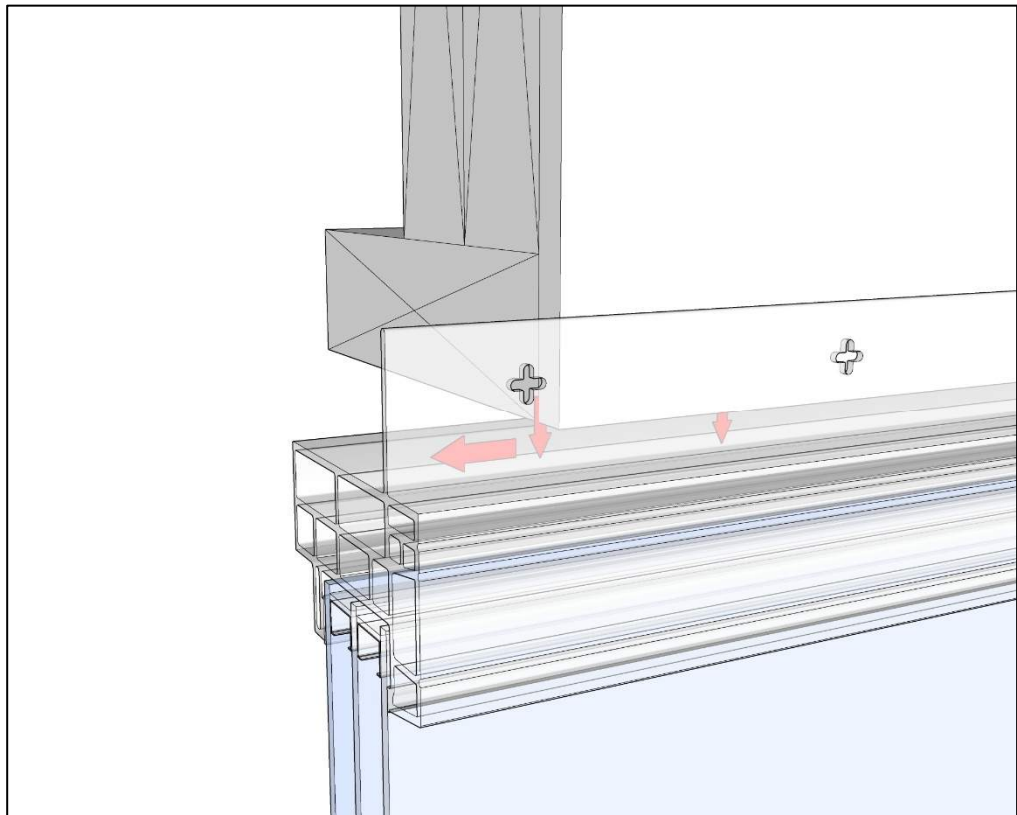
fenestration product frame and jamb extension and joints within the jamb extension are sealed to prevent both air and water leakage.



Inside view

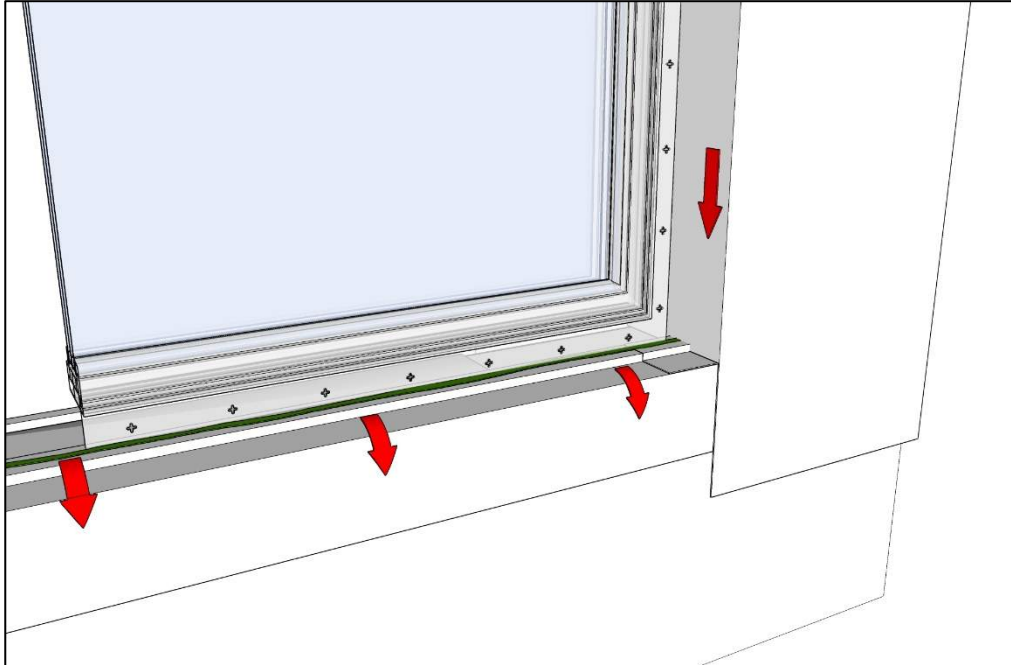
Experience shows that water ingress into window rough openings often occurs from a source above the window which shows the leakage and the pathway is often identified as entry at an upper locations such as an upper window, rim joist, electrical or soffit location.

Providing a drainage path reduces the risks associated with accumulation of water next to moisture sensitive materials.



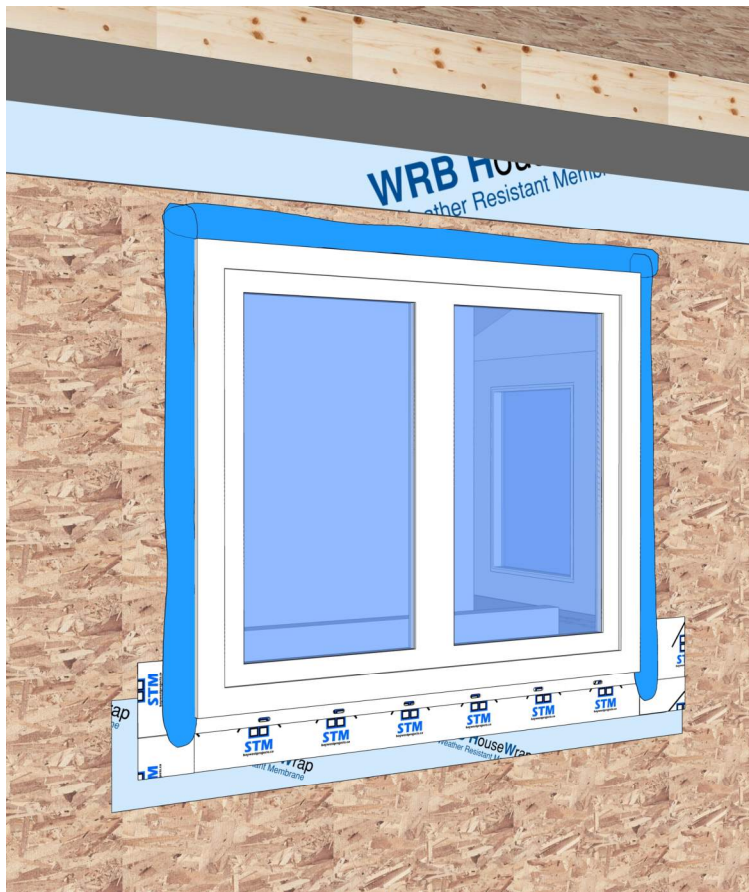
Exterior view





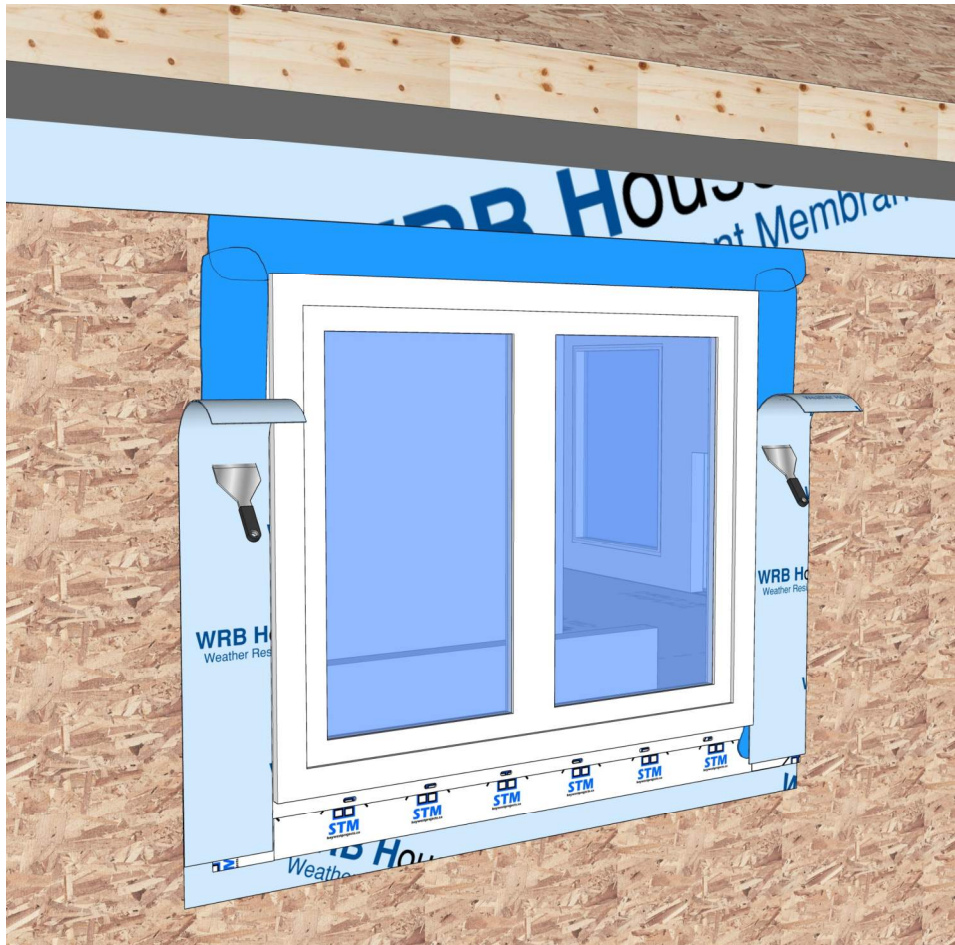
Because of the drainage channel and backdam at the base sealed to the waterproof membrane, backdam and window, all incidental water ingress which occurs is safely removed and prevented from accumulating in the insulation or on any moisture sensitive materials.

Exterior view



## Enhancing Exterior Protection: Sealing for Maximum Water Resistance

While safeguarding the interior components is a top priority, CSA A440.4 underscores the importance of sealing exterior flanges to mitigate water ingress and maintain the continuity of the water-resistive barrier (drainage plane).



## Key Sealing Requirements According to CSA A440.4:

- 1. Exterior Flange Sealing:** The exterior perimeter of a window or door frame must be meticulously sealed to the exterior cladding. This sealing process plays a crucial role in minimizing the penetration of water into the rough opening gap and preventing water from infiltrating behind the cladding.
- 2. Maintaining Continuity:** Our system is designed to ensure the continuity of the water-resistive barrier, also known as the drainage plane. This barrier acts as a safeguard, directing water away from vulnerable areas and preventing potential damage to the interior wall assembly.
- 3. Sealant Considerations:** Sealants used in the process are carefully chosen to not interfere with drainage holes in the window or door frame or in the cladding. This meticulous approach ensures that water is effectively managed without compromising the functionality of the drainage system.

## Why Exterior Sealing Matters?

- 1. Preventing Water Ingress:** Sealing the exterior flanges acts as a proactive measure against water penetration, safeguarding the structural integrity of the window and preventing potential damage to the surrounding wall assembly.
- 2. Continuity for Long-Term Performance:** By maintaining continuity in the water-resistive barrier, our system ensures

long-term performance, reducing the risk of water-related issues and contributing to the overall durability of the window installation.

3. **Compliance with Industry Standards:** Baywest Projects goes beyond the minimum requirements, aligning with CSA A440.4 to provide a comprehensive solution that exceeds industry standards.



## Why choose liquid applied sealant system over tapes, and self-adhered membranes?

### 1. Seamless Application:

Liquid membranes are applied as a liquid and then cured to form a seamless, monolithic barrier. This eliminates the need for seams, which are potential weak points in a waterproofing system. Seams are where water can potentially infiltrate, and their absence reduces the risk of leaks.

### 2. Adaptability to Complex

#### Surfaces:

Liquid membranes can conform to irregular and complex surfaces better than tapes or self-adhered membranes. This flexibility makes them suitable for various architectural designs and challenging substrates.

### 3. Customization and Thickness Control:

Liquid membranes allow for precise control over the thickness of the applied coating. This ability to customize the thickness can be important in achieving specific performance requirements and durability.

### 4. Ease of Repairs and Maintenance:

In the event of damage or the need for repairs, liquid-applied membranes can be easily patched or recoated. This flexibility simplifies maintenance and extends the life of the waterproofing system.

### 5. Bonding to Substrate and WRB:

Liquid membranes form a strong bond with the substrate, creating a durable and long-lasting seal. By embedding the WRB into the liquid membrane, a tenacious bond is created allowing for movement and shifting of materials. This bonding is crucial for preventing water intrusion and ensuring the effectiveness of the waterproofing system.



**6. Application in Various Conditions:**

Liquid-applied membranes can be applied in a variety of weather conditions, including low temperatures and high humidity, depending on the specific product. This flexibility can be an advantage over some other membrane types that may have temperature or moisture limitations.

**7. Versatility:**

Liquid membranes can be used for both above-grade and below-grade applications, offering versatility in different construction scenarios.



In this photo, Tyvek™, a robust spun bonded polyolefin material, is seamlessly embedded into a liquid-applied rubberized waterproofing layer bonded securely to OSB. Attempting to remove the WRB causes Tyvek layers to delaminate, with some staying embedded in the rubber, showcasing the strong, cohesive bond between Tyvek, liquid rubber, and OSB. The image demonstrates the effective integration and resilience of the waterproofing system (liquid applied, OSB base and synthetic WRB).

## Special Considerations for Basement Windows

**Basement Windows:** In cases where basement windows rely on a mass wall that is face sealed, Baywest Projects ensures a meticulous match between the window installation method and the wall assembly system. By closely adhering to CSA A440.4 installation principles and meeting specific requirements, our system provides optimal protection against potential moisture issues.

### Why Choose Baywest Projects?

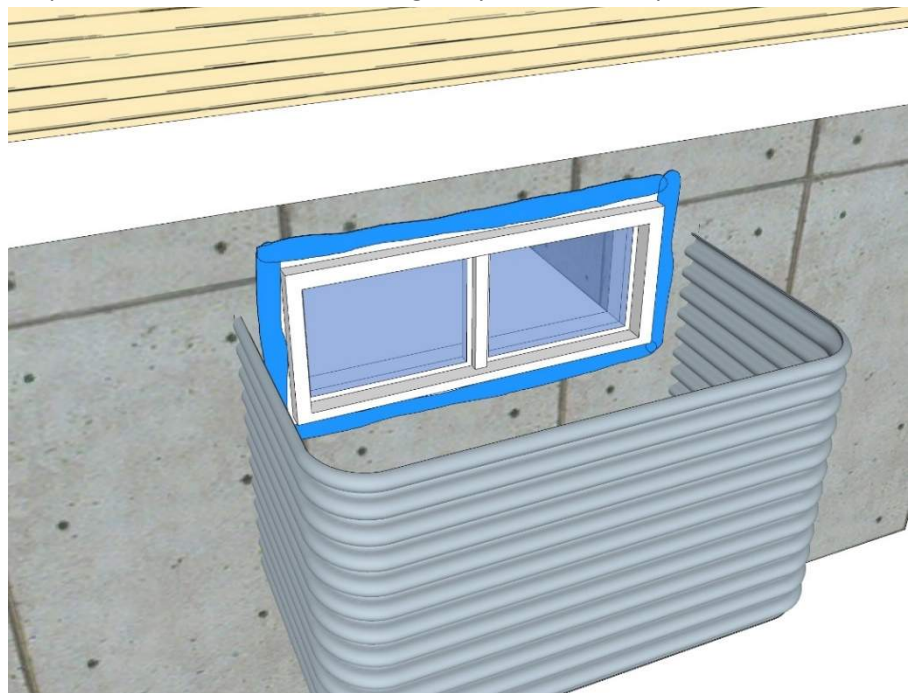
1. **Precision Match:** Our system aligns seamlessly with the planes of protection in your wood frame home, as dictated by CSA A440.4. This precision ensures that your windows are shielded effectively.
2. **Versatile Solutions:** Whether you opt for the basic system or the robust protection, our solutions cater to diverse wall assembly types, offering versatility and reliability.
3. **Specialized Expertise:** Dealing with challenging cladding systems or unique configurations? Baywest Projects has the expertise to tailor solutions that go beyond standard protection.

4. **Basement Window Expertise:**

Understanding the nuances of basement window installations, we align our system with face-sealed mass walls, providing comprehensive protection for below-grade windows.

Choose Baywest Projects for a windowsill protection system that not only meets but exceeds industry standards. Our tailored solutions and commitment to excellence ensure that your wood frame

home is safeguarded against potential moisture issues, providing peace of mind for years to come.



### 6.1.3

The protection provided by the water-resistive barrier shall be continuous with the fenestration product.

**Water-resistive barrier (WRB)** — the surface that is farthest into an assembly from the exterior and that can accommodate some exterior moisture (in the form of liquid water) without causing damage to interior finishes or materials within the assemblies. Two common means of providing such a surface include:

- a) **Membrane-type** — using a material complying with the performance requirements of CAN/CGSB-51-32 or otherwise complying with *NBC 2015*, Part 5, Section 5.5, or *NBC 2015*, Part 9, Section 9.25.5. It is installed to provide a second plane of protection against rain penetration (continuous drainage plane), inboard of the cladding (water-shedding surface). Membrane-type materials can include sheet goods (adhered or mechanically fastened) and fluid- or spray-applied systems, including joint-sealing materials and methods, approved for such application.
- b) **Sheathing-type** — using a material complying with applicable standards for the sheathing material and applied in accordance with *NBC 2015*, Part 5, Section 5.5, or Part 9, Subsection 9.25.5 and Article 9.27.3.4. It is installed to provide a second plane of protection against rain penetration (continuous drainage plane) on the exterior surface of the sheathing material, inboard of the cladding (water-shedding surface). Sheathing-type materials can include structural or non-structural sheathing products, including joint-sealing materials and methods, approved for such application.

Window installation and the Alberta Building Code

Current: **2019 National Building Code** (Alberta Edition) (corresponds to 2015 NBCC)

Uses the 2007 version of the CSA A440.4

Division B 9.7.6.1. Installation of Windows, Doors and Skylights

- 1) The installation of windows, doors and skylights shall conform to CAN/CSA-A440.4, "Window, Door, and Skylight Installation," except that
  - a) shims used to support windows, doors and skylights are permitted to be made of treated plywood, and
  - b) protection from precipitation for walls incorporating windows or doors and for roofs incorporating skylights, and the interfaces of these walls with windows or doors and of roofs with skylights, shall conform to Section 9.27.

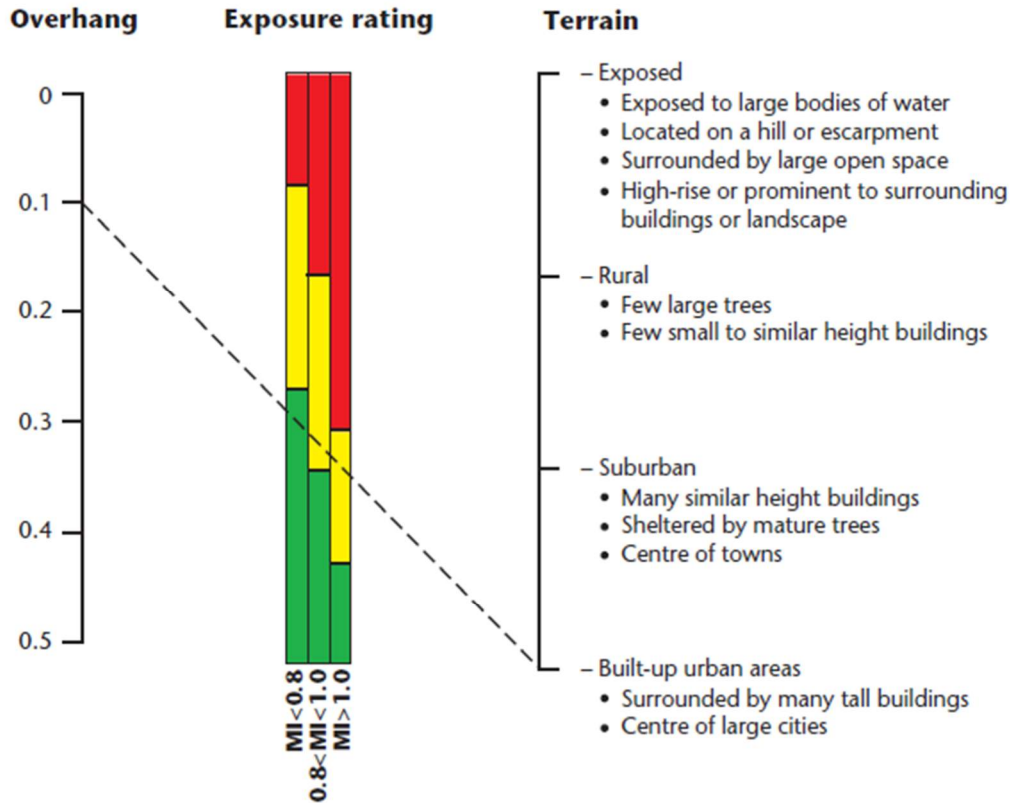
Release of the next Alberta building code called **2023 National Building Code** (Alberta Edition)  
(corresponds to 2022 NBCC) anticipated release Mid 2024

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$$\text{Overhang ratio} = \frac{\text{Overhang width}}{\text{Wall height}}$$

Where: Horizontal distance between the outer surface of the cladding or window or door and the outer surface of the overhang  
OVER  
Height of the overhang above the sill of the window or door

**Moisture index (MI):** See Table A.1.

**Exposure rating**

- High exposure
- Moderate exposure
- Low exposure

**Figure A.1**  
**Building exposure nomograph**  
(See Clause A.2.2.)

Above grade walls

Mass walls

Basement walls – cast in place installed in a sub frame – 8” clearance.

This Standard sets forth methods for both new installation and replacement installation of factory assembled windows, exterior doors, and unit skylights that are intended for installation in low-rise buildings and buildings used primarily for residential occupancy where

Above grade walls which employ first and second plane of protection

Foundation walls / Mass walls use the face seal principle.

Plumb, level and flat

Tolerances of R.O. important

Sill protection Clause 10

integrated into the adjacent wall so that the underlying water management principles of the wall carried through the intersection to the appropriate components in the window

Two parallel beads of sealant shall be applied below door thresholds to the wall or floor construction below.

Sub-sill drainage shall be installed

moderate- to high-exposure rating Nomograph

2019 Version

Covers Mounting flanges – 2007 was silent

**10 Precipitation ingress control** NBC 2015 recognizes four design approaches: mass walls, face-sealed walls, concealed barrier walls, and rain screen walls.

Major revision:

All Doors

Combination windows ( mullied)

All windows and doors greater than 3 storeys

- water-impermeable membrane or flashing applied across the full width of the bottom of the window opening and turned up a minimum of 150 mm (6 in) on the jambs
- be sealed continuously to the fenestration product frame at the inside face of the fenestration product to prevent water leakage into the wall below or into the building interior;
- be installed over a sloped rough sill or onto a back dam to prevent drainage to the interior and drain; and
- Installation of fasteners through the sill of the window or door shall not penetrate sub-sill flashing.
- Sub-sill flashing may be sealed to a jamb extension only if joints between the fenestration product frame and jamb extension and joints within the jamb extension are sealed to prevent both air and water leakage.

#### **10.2.4 Connection of the window or door perimeter to the water-resistive barrier**

The perimeter of the window or door frame shall be sealed to the water-resistive barrier. The seal may be made at the exterior perimeter or the interior perimeter of the frame, provided continuity of the water-resistive barrier (drainage plane) is maintained.

#### **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 the penetration of water into the rough opening gap and behind the cladding. Sealants shall not interfere with drainage holes in the window or door frame or in the cladding.