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Proposed Change 1950

Code Reference(s):	NBC20 Div.B 9.7.6.1. (first printing) NBC20 Div.B 9.27.2. (first printing) NBC20 Div.B 9.27.3. (first printing)
Subject:	Building Envelope - General
Title:	Protection from Precipitation of the Rough Opening Sills for Windows and Doors
Description:	This proposed change clarifies the requirements for protection from precipitation of rough opening sills for windows and doors to more closely align these requirements with established building science principles and standards.

This change could potentially affect the following topic areas:

- | | |
|--|---|
| <input type="checkbox"/> Division A | <input checked="" type="checkbox"/> Division B |
| <input type="checkbox"/> Division C | <input checked="" type="checkbox"/> Design and Construction |
| <input type="checkbox"/> Building operations | <input checked="" type="checkbox"/> Housing |
| <input checked="" type="checkbox"/> Small Buildings | <input type="checkbox"/> Large Buildings |
| <input type="checkbox"/> Fire Protection | <input type="checkbox"/> Occupant safety in use |
| <input type="checkbox"/> Accessibility | <input type="checkbox"/> Structural Requirements |
| <input checked="" type="checkbox"/> Building Envelope | <input type="checkbox"/> Energy Efficiency |
| <input type="checkbox"/> Heating, Ventilating and Air Conditioning | <input type="checkbox"/> Plumbing |
| | <input type="checkbox"/> Construction and Demolition Sites |

Problem

The lack of clarity in Section 9.27. of the National Building Code of Canada (NBC) has contributed to the improper installation and detailing of the rough openings for windows and doors, particularly regarding water ingress. This issue is of even greater concern when additional insulation is installed and drying potential is reduced, as would be required for compliance with higher energy performance tiers.

The current wording of the NBC states that windows and doors should be sealed to the second plane of protection, similar to pipes and ducts. This wording has resulted in a misalignment of the location where the second plane of protection should be sealed to windows and doors, which has led to the face-sealing of windows and doors that prevents, rather than allows, drainage of the cavity.

The second plane is intended to intercept and drain back to the exterior incidental water that penetrates the first plane. However, the NBC is often interpreted as treating windows and doors the same as pipes and ducts. This approach of treating the rough openings for windows and doors the same as those for simple pipe penetrations causes several issues:

1. **Limited water management:** The wording in the NBC 2020 on how to seal the second plane to the window or door face does not currently align with the water management design of window and door units, which incorporates drainage pathways that divert water back to the exterior.
2. **Potential damage:** Without a proper drainage pathway, water ingress from above a window or door can accumulate below the window and cause damage to the wall assembly.
3. **Lack of clarity:** The requirements for the second plane of protection for rough openings are not effectively explained or defined in the NBC, neither are the requirements for the drainage of the sill. Instead, the NBC primarily provides requirements for walls.

Justification

This proposed change clarifies the current acceptable solutions to more reasonably align them with the requirements for the second plane of protection, ensuring the intended use of the second plane of protection for water diversion is maintained into the rough openings for windows and doors.

1. Align with water management guidelines for rough openings: This proposed change clearly defines the second plane of protection as extending to the interior face of the rough opening sill of a window or door. This protection ensures that any rainwater or meltwater that penetrates the first plane, at or above the window or door, is effectively collected and drained to the exterior, in accordance with NBC Article 9.27.2.3. This protection can be accomplished by:

- a. Using a self-adhered, liquid-applied, or non-adhesive membrane to protect the sill. This membrane should extend upward on the side jambs and be sealed to the wood-frame side jambs to reduce water ingress behind the sill protection. Where a non-adhesive membrane is used for sill protection, the sheathing membrane of the side jambs should extend into the rough opening and create a drainage plane by extending downward over the lower non-adhesive sill protection membrane. This setup helps divert water from above, down the sides, and into the sill protection membrane, effectively channeling it back to the exterior; and
- b. Maintain an open window head to allow drainage of incidental water ingress down onto the window unit, down the side jambs, and onto the sill to be diverted back to the exterior.

By implementing these guidelines, we can ensure that water is effectively managed around windows and doors, preventing damage and enhancing the overall durability and performance of the building envelope, which would be more in line with good

building science principles and standards such as the CSA A440.4, "Window, door, and skylight installation." This approach is particularly important as higher energy efficiency requirements increase insulation values and airtightness, reducing the potential for natural drying in the event of unintended water ingress.

2. Enhance protection against potential damage: By providing clear wording on creating effective drainage paths for incidental water ingress into a rough opening from above or around a window or door, this proposed change could help prevent subsequent damage to the wall assembly if and when incidental water ingress occurs. This change would improve the durability and performance of the building envelope, particularly in high-efficiency buildings where drying potential is reduced.

3. Improve clarity and consistency: This proposed change revises Code wording to clarify that the rough opening is part of the second plane of protection. This clarity would help builders and inspectors apply consistent and effective water management practices, reducing the risk of misinterpretation and improper installation.

In conclusion, this proposed change to wording in NBC Section 9.27 is necessary to address issues of limited water management, potential damage, and lack of clarity. Aligning NBC requirements with current best practice and enhancing requirements for sealing and drainage would improve building envelope performance and durability, especially in high-efficiency constructions. Clarifying that window and door rough openings are part of the second plane of protection, in accordance with the CSA A440.4, would promote effective building science practices in energy-efficient homes with limited drying ability.

PROPOSED CHANGE

[9.7.6.1.] 9.7.6.1. Installation of Windows, Doors and Skylights

- [1] 1)** The installation of manufactured and pre-assembled windows, doors and skylights shall conform to CSA A440.4, "Window, door, and skylight installation". ~~except that~~
 - ~~[a] a) shims used to support windows, doors and skylights are permitted to be made of treated plywood, and~~
 - ~~[b] 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 also conform to Section 9.27.~~
- [2] 2)** The installation ~~of manufactured and pre-assembled windows, doors and skylights~~ and the field assembly of manufactured window and door combination units shall conform to the manufacturer's instructions and include protection of rough opening sills as described in Section 9.27.
- ~~**[3] 3)** Windows, doors and skylights shall be sealed to air barriers.~~

[9.27.2.] 9.27.2. Required Protection from Precipitation

(See Note A-9.27.2.)

[9.27.2.1.] 9.27.2.1. Minimizing and Preventing Ingress and Damage**[9.27.2.2.] 9.27.2.2. Minimum Protection from Precipitation Ingress****[9.27.2.3.] 9.27.2.3. First and Second Planes of Protection**

- [1] 1)** Where walls required to provide protection from precipitation comprise cladding assemblies with first and second planes of protection,
- [a] a) the first plane of protection shall
 - [i] i) consist of cladding with appropriate trim, accessory pieces and fasteners, and
 - [ii] ii) be designed and constructed to minimize the passage of rain and snow into the wall by minimizing holes and managing precipitation ingress caused by the kinetic energy of raindrops, surface tension, capillarity, gravity, and air pressure differences (see Subsection 9.27.4.),
 - [b] b) the second plane of protection shall be designed and constructed to (see Subsection 9.27.3.)
 - [i] i) intercept all rain and snow that gets past the first plane of protection, and
 - [ii] ii) effectively dissipate any rain or snow to the exterior, and
 - [c] c) the protection provided by the first and second planes of protection shall be maintained
 - [i] --) at the rough opening sills of windows and doors,
 - [ii] i) at wall penetrations created by the installation of components and services such as ~~windows, doors,~~ ventilation ducts, piping, wiring and electrical outlets, and
 - [iii] ii) at the interface with other wall assemblies.

[9.27.2.4.] 9.27.2.4. Protection of Cladding from Moisture**Note A-9.27.2. Required Protection from Precipitation.**

Part 5 and Part 9 of the NBC recognize that mass walls and face-sealed, concealed barrier and rainscreen assemblies have their place in the Canadian context.

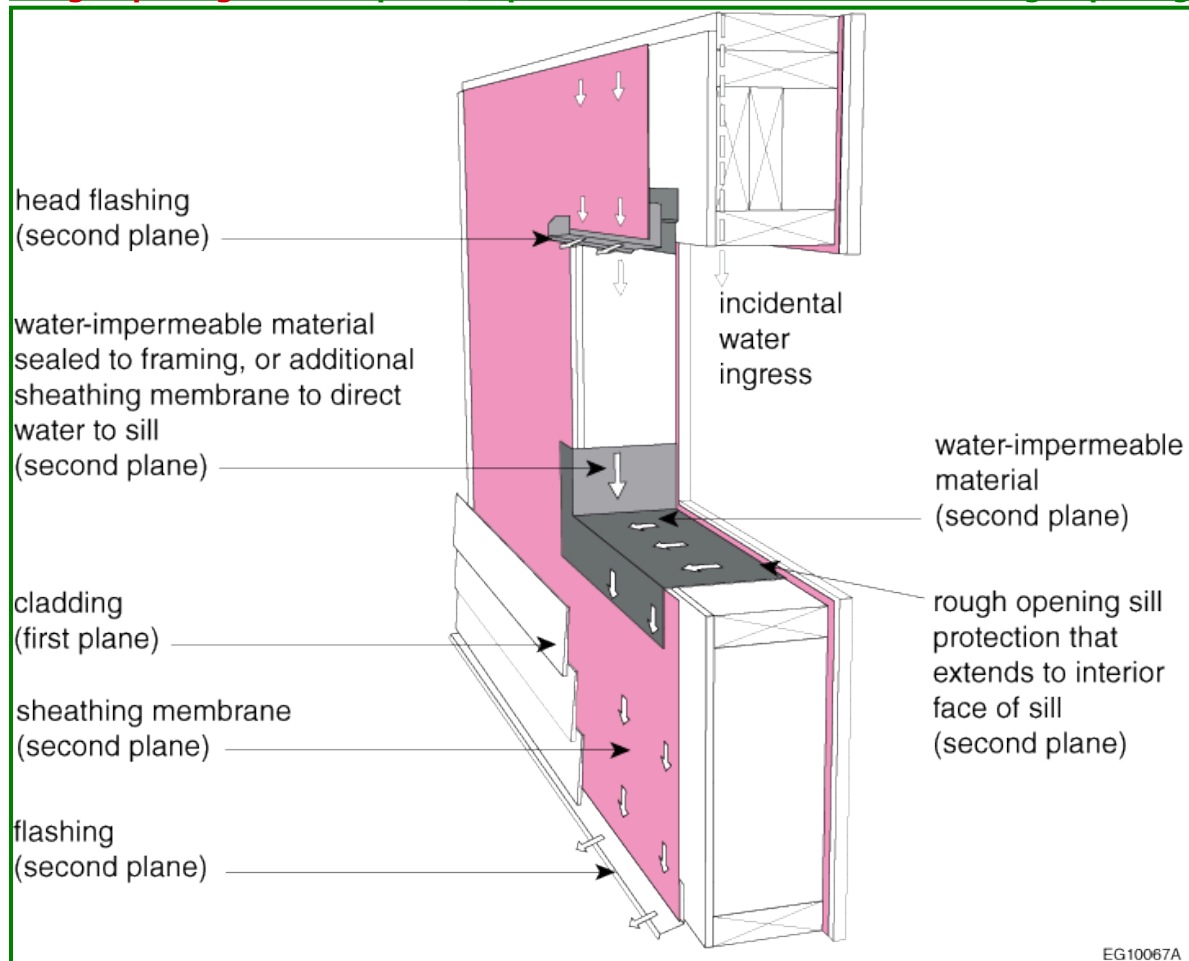
Mass walls are generally constructed of cast-in-place concrete or masonry. Without cladding or surface finish, they can be exposed to precipitation for a significant period before moisture will penetrate from the exterior to the interior. The critical characteristics of these walls are related to thickness, mass, and moisture transfer properties, such as shedding, absorption and moisture diffusivity.

Face-sealed assemblies have only a single plane of protection. Sealant installed between cladding elements and other envelope components is part of the air barrier system and is exposed to the weather. Face-sealed assemblies are appropriate where it can be demonstrated that they will provide acceptable performance with respect to the health and safety of the occupants, the operation of building services, and the provision of conditions suitable for the intended occupancy. These assemblies, however, require more intensive, regular and ongoing maintenance, and should only be selected on the

basis of life-cycle costing considering the risk of failure and all implications should failure occur. Climate loads such as wind-driven rain, for example, should be considered. Face-sealed assemblies are not recommended where the building owner may not be aware of the maintenance issue or where regular maintenance may be problematic.

Concealed barrier assemblies include both a first and second plane of protection. The first plane comprises the cladding, which is intended to handle the majority of the precipitation load. The second plane of protection is intended to handle any water that penetrates the cladding plane. ~~It allows for the dissipation of this water, primarily by gravity drainage, and provides a barrier to further ingress.~~ by using flashings to allow for the dissipation and drainage of this water. The flashings have upstand legs that extend behind the second plane of protection and provide a barrier to further water ingress.

For windows or doors, the rough opening that penetrates the cladding system plays a crucial role as part of the concealed barrier assembly or second plane of protection. Incidental water may penetrate the first plane of protection or may enter from areas above or around a window or door (e.g., as the result of a failed window or door unit). Extending the second plane of protection into the rough opening at the sill, as shown in Figure 9.27.2.-A, ensures that this incidental water is collected and diverted back to the exterior over the protected sill. Thus, the rough opening, as a distinct feature, contributes to the effective management of water ingress and enhances overall performance. These characteristics are particularly important as insulation and airtightness levels increase at higher energy performance tiers, since higher levels reduce drying potential in the event of unintended water ingress.

Figure [A-9.27.2.-A]**Rough opening - Second plane of protection maintained into the rough opening**

Like concealed barrier assemblies, rainscreen assemblies include both a first and second plane of protection. The first plane comprises the cladding, which is designed and constructed to handle virtually all of the precipitation load. The second plane of protection is designed and constructed to handle only very small quantities of incidental water; composition of the second plane is described in Note A-9.27.3.1. In these assemblies, the air barrier system, which plays a role in controlling precipitation ingress due to air pressure difference, is protected from the elements. (See [Figure A-9.27.2](#), [Figures A-9.27.2.-B to A-9.27.2.-D.](#))

Figure [A-9.27.2.-B] A-9.27.2.

Generic Rainscreen control assemblies with second plane of protection composed of a drained and vented air space system

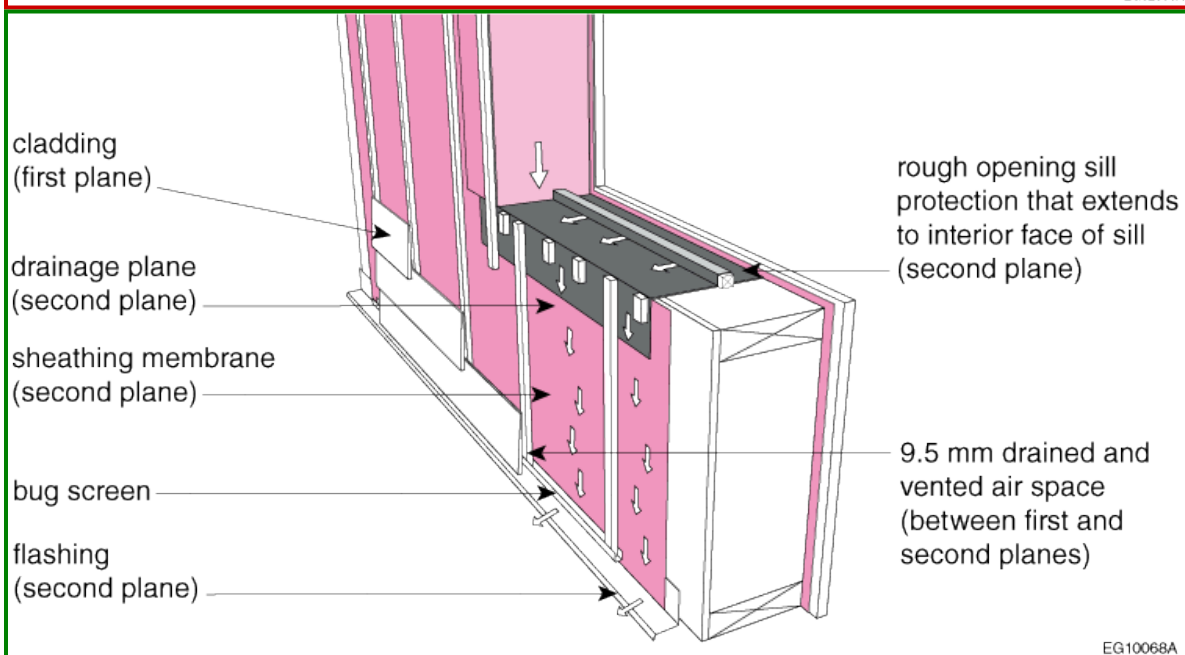
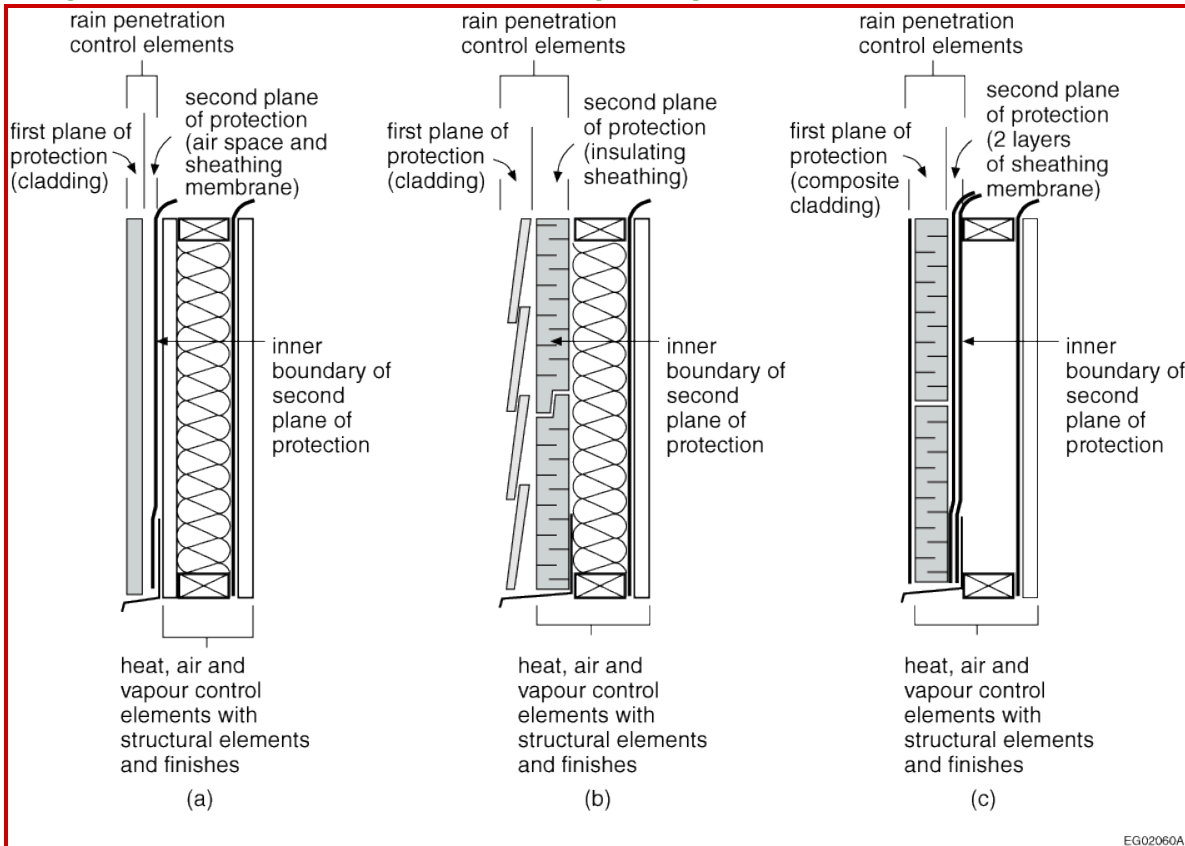


Figure [A-9.27.2.-C]
Rain control assembly with second plane of protection composed of insulating sheathing

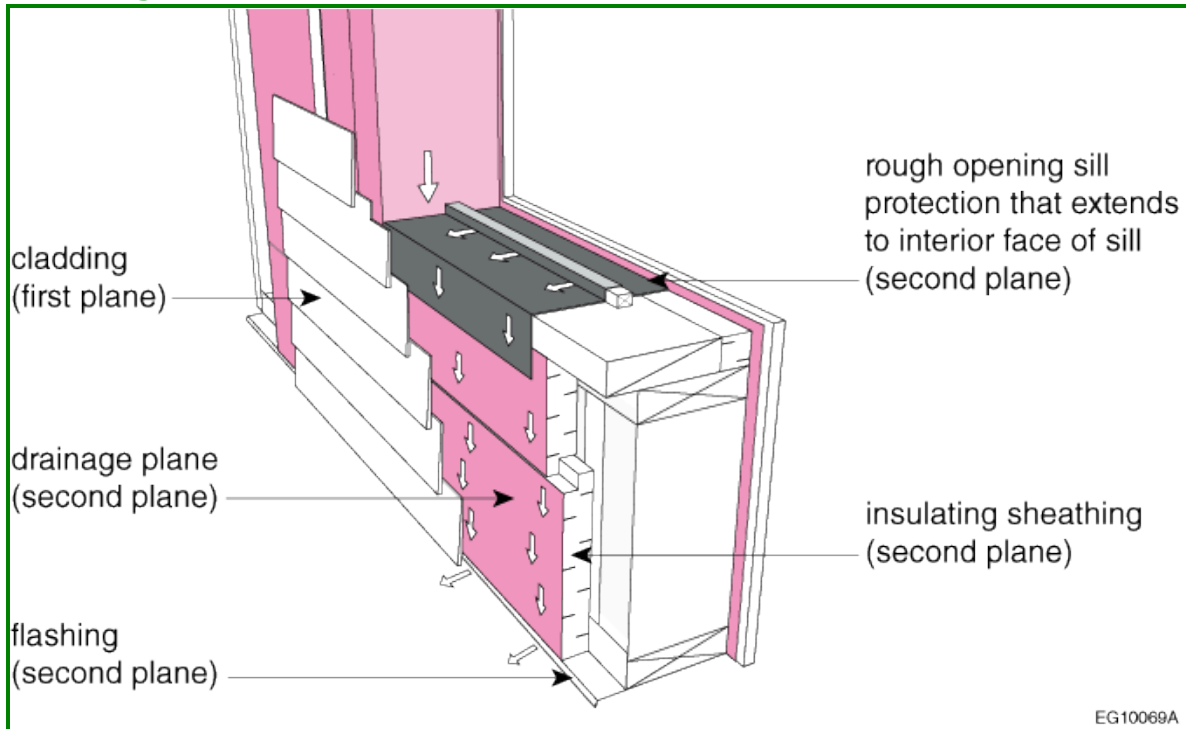
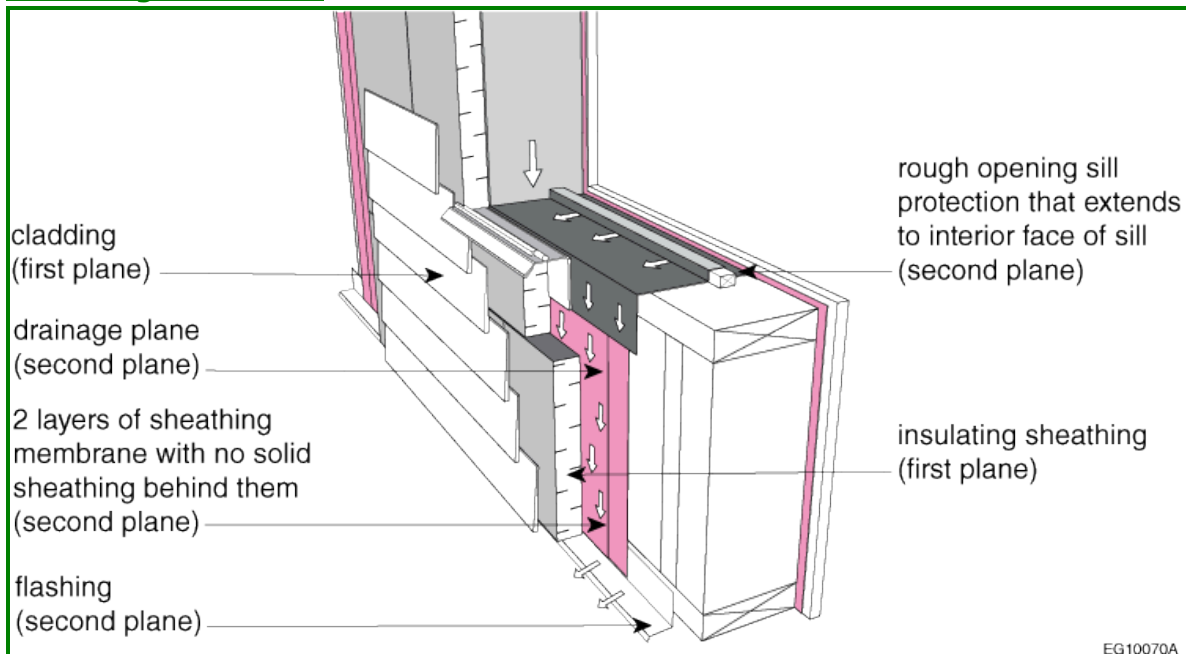


Figure [A-9.27.2.-D]
Rain control assembly with second plane of protection composed of 2 layers of sheathing membrane



The cladding assembly described in Sentence 9.27.2.2.(4) is a basic rainscreen assembly. This approach is required for residential buildings where a higher level of

ongoing performance is expected without significant maintenance. This approach, however, is recommended in all cases.

The cladding assemblies described in Sentence 9.27.2.2.(5) are also rainscreen assemblies. The assembly described in Clause 9.27.2.2.(1)(c) is again a basic rainscreen assembly. A wall with a capillary break as described in Clause 9.27.2.2.(1)(a) is an open rainscreen assembly. Walls with a capillary break as described in Clause 9.27.2.2.(1)(b) have been referred to as drainscreen assemblies.

[9.27.3.] 9.27.3. Second Plane of Protection

[9.27.3.1.] 9.27.3.1. Elements of the Second Plane of Protection

(See Note A-9.27.3.1.)

- [1] 1)** The second plane of protection shall consist of a drainage plane having an appropriate inner boundary and flashing to dissipate rainwater to the exterior.
- [2] 2)** Except for cladding systems conforming to Subsection 9.27.14., the inner boundary of the drainage plane shall comply with Articles 9.27.3.2. to 9.27.3.6.
- [3] 3)** The protection provided by the second plane of protection shall be maintained
 - [a] --)** at the rough opening sills of windows and doors in conformance with Sentences (4) and (5),
 - [b] a)** at wall penetrations created by the installation of components and services such as ~~windows, doors,~~ ventilation ducts, piping, wiring and electrical outlets, and
 - [c] b)** at the interface with other wall assemblies.
- [4] --)** The protection of rough opening sills required by Clause (3)(a) shall
 - [a] --)** conform to Article 9.7.6.1., and
 - [b] --)** extend to the interior face of the rough opening sill of the window or door.
- [5] --)** The protection of rough opening sills required by Clause (3)(a) shall be of water-impermeable material that
 - [a] --)** is liquid-applied or self-adhering to wood framing members extending up each side of the sill by 150 mm and is securely adhered to the side jambs, or
 - [b] --)** is non-adhesive, where the sheathing membrane of the second plane of protection on the wall face extends into the rough opening to the interior face of the rough opening and down over the non-adhesive sill protection to create a drainage path to the sill.
- [6] 4)** Flashing material and its installation shall comply with Articles 9.27.3.7. and 9.27.3.8.

[\[9.27.3.2.\]](#) 9.27.3.2. Sheathing Membrane Material Standard**[\[9.27.3.3.\]](#) 9.27.3.3. Required Sheathing Membrane and Installation****[\[9.27.3.4.\]](#) 9.27.3.4. Insulating Sheathing in lieu of Sheathing Membrane****[\[9.27.3.5.\]](#) 9.27.3.5. Sheathing Membranes in lieu of Sheathing****[\[9.27.3.6.\]](#) 9.27.3.6. Face Sealed Cladding****[\[9.27.3.7.\]](#) 9.27.3.7. Flashing Materials****[\[9.27.3.8.\]](#) 9.27.3.8. Flashing Installation**

Impact analysis

This proposed change is not expected to result in significant cost impacts compared to the current Code requirements and installation methods used across the country. The installation method used by most builders would remain unchanged. The primary objective is to clarify the location of the second plane of protection in relation to the rough opening for a window or door, making the requirements easier to comprehend, comply with, and enforce.

While the direct material requirements for installation would remain unchanged, there are potential indirect benefits beyond better understanding. By clarifying the purpose of both the first and second planes of protection and incorporating the rough opening as part of the concealed barrier assembly, there is a lower probability of incidental water ingress leading to damage.

This improved water management system could contribute to enhanced protection against moisture-related issues, reducing the risk of water infiltration and potential damage to the building envelope. Thus, besides facilitating better understanding, the proposed change could also bolster the overall performance of the wood wall interface with windows and doors by mitigating water intrusion.

Benefits of providing clarification include:

- Prevention of misinterpretation by authorities having jurisdiction, leading to consistent application and enforcement of building regulations, particularly in relation to specific installation standards, such as CSA A440.4. This would result in clarity and consistent standards for window and door installation.
- Alignment with other scholarly techniques for water management and standards for window and door installation, avoiding confusion.
- Adequate clarification of the Code provisions, contributing to proper installation practices and ensuring the performance and integrity of window and door systems. This could lead to benefits such as preventing air and water infiltration, increasing energy efficiency, and avoiding potential structural problems.

- Sufficient protection against water accumulation, which avoids the risk of moisture damage that can degrade building materials, promote mould growth, and compromise indoor air quality. This in turn could also lead to increased energy efficiency and lower operational costs.

Additionally, as buildings move towards higher standards of energy performance, involving higher insulation levels and lower air leakage rates, the drying potential of the building envelope is limited. Therefore, it becomes even more crucial to have robust methods and clear Code requirements to effectively protect rough openings. Updating the Code language could promote the achievement of energy performance goals and improve the overall performance and durability of buildings.

Enforcement implications

The proposed change is expected to simplify enforcement for authorities having jurisdiction.

By clarifying the rough opening and differentiating it from other penetrations without rough openings, this proposed change would facilitate enforcement. As a result, the proposed change should not require additional resources and could be enforced using the existing Code enforcement infrastructure.

Who is affected

This proposed change would impact designers, engineers, architects, manufacturers, builders, specification writers, and building officials in a positive manner. It aligns more closely with established building science principles and current methods stated in CSA A440.4, promoting better understanding and facilitating the discussion related to first and second planes of protection.

Supporting Document(s)

[PCF 1951 \(pcf_1951.pdf\)](#)

OBJECTIVE-BASED ANALYSIS OF NEW OR CHANGED PROVISIONS

[\[9.7.6.1.\]](#) 9.7.6.1. ([1] 1) [F20,F54,F55,F61,F63-OH1.1,OH1.2,OH1.3]

[\[9.7.6.1.\]](#) 9.7.6.1. ([1] 1) [F20,F61,F63-OS2.3]

~~[\[9.7.6.1.\]](#) 9.7.6.1. ([1] 1) no attributions~~

~~Intent 1:-~~

~~To clarify that treated plywood shims are acceptable and that other Code requirements (Article 9.27.3.8.) for the preparation of the rough opening and the installation of flashing govern over requirements in the standard.~~

[9.7.6.1.] 9.7.6.1. ([2] 2) [F54,F55,F61,F63-OH1.1,OH1.2,OH1.3]

Intent 1:

To limit the probability that the installation of field-assembled, ~~manufactured or pre-assembled~~ windows, ~~and~~ doors ~~combination units,~~ ~~and skylights~~ will fall significantly below expectations.

This is to limit the probability of:

- premature deterioration of materials and components used for the installation,
- condensation on the surface of building elements and within assemblies,
- precipitation into interior space, or
- leakage of air induced by air pressure difference due to wind loads.

This is to limit the probability of:

- structural damage due to snow loads on skylights or where windows have sloped or near-horizontal components,
- the ingress of insects and vermin,
- excessive force required for operation of windows, doors and skylights, which could lead to inadequate ventilation, where windows are required for non-heating season ventilation
- the inadequate control of temperatures of interior spaces, drafts, relative humidity, or water accumulation,
- the generation of pollutants from biological growth or from materials that become unstable on wetting, or
- deterioration, which could lead to compromised integrity of assemblies acting as environmental separators.

This is to limit the probability of:

- negative effects on the air quality of indoor spaces,
- the inadequate thermal comfort of persons, and
- contact with moisture.

This is to limit the probability of harm to persons.

[9.7.6.1.] 9.7.6.1. ([2] 2) [F61,F63-OS2.3]

Intent 1:

To limit the probability that the installation of field-assembled, ~~manufactured or pre-assembled~~ windows, ~~and~~ door ~~combination units,~~ ~~and skylights~~ will fall significantly below expectations.

This is to limit the probability of:

- premature deterioration of materials and components used for the installation,
- condensation on the surface of building elements and within assemblies,
- precipitation into interior space, or
- leakage of air induced by air pressure difference due to wind loads.

This is to limit the probability of:

- structural damage due to snow loads on skylights or where windows have sloped or near-horizontal components, and
- condensation or water accumulation, which could lead to deterioration, which could lead to compromised structural integrity of assemblies acting as environmental separators.

This is to limit the probability of harm to persons.

~~[9.7.6.1.] 9.7.6.1. ([3] 3) [F55,F61,F63-OS2.3]~~

~~Intent 1:-~~

~~To limit the probability of uncontrolled air leakage between walls and windows or doors, and between ceilings and skylights, which could lead to condensation on the surface of building elements and within assemblies, which could lead to deterioration, which could lead to compromised structural integrity of assemblies acting as environmental separators, which could lead to harm to persons.~~

~~[9.7.6.1.] 9.7.6.1. ([3] 3) [F55,F61,F63-OH1.1,OH1.2,OH1.3]~~

~~Intent 1:-~~

~~To limit the probability of uncontrolled air leakage between walls and windows or doors, and between ceilings and skylights, which could lead to~~

- ~~condensation on the surface of building elements or within building elements,~~
- ~~excessive heat loss or gain,~~
- ~~precipitation ingress, or~~
- ~~ingress of insect and vermin.~~

~~This is to limit the probability of:~~

- ~~the inadequate control of temperatures of interior spaces, drafts, relative humidity, or water accumulation,~~
- ~~the generation of pollutants from biological growth or from materials that become unstable on wetting, or~~
- ~~deterioration, which could lead to compromised integrity of assemblies acting as environmental separators.~~

~~This is to limit the probability of:~~

- ~~negative effects on the air quality of indoor spaces,~~
- ~~the inadequate thermal comfort of persons, and~~
- ~~contact with moisture.~~

~~This is to limit the probability of harm to persons.~~

~~[9.27.2.1.] 9.27.2.1. ([1] 1) [F61-OS2.3]~~

- [\[9.27.2.1.\]](#) 9.27.2.1. ([\[1\]](#) 1) [F61-OH1.1,OH1.2,OH1.3]
- [\[9.27.2.1.\]](#) 9.27.2.1. ([\[2\]](#) 2) [F80,F81-OS2.3]
- [\[9.27.2.1.\]](#) 9.27.2.1. ([\[2\]](#) 2) [F80,F81-OH1.1,OH1.2,OH1.3]
- [\[9.27.2.2.\]](#) 9.27.2.2. ([\[1\]](#) 1) no attributions
- [\[9.27.2.2.\]](#) 9.27.2.2. ([\[2\]](#) 2) no attributions
- [\[9.27.2.2.\]](#) 9.27.2.2. ([\[3\]](#) 3) [F62-OS2.3]
- [\[9.27.2.2.\]](#) 9.27.2.2. ([\[3\]](#) 3) [F62-OH1.1,OH1.2,OH1.3]
- [\[9.27.2.2.\]](#) 9.27.2.2. ([\[4\]](#) 4) [F61,F62-OS2.3]
- [\[9.27.2.2.\]](#) 9.27.2.2. ([\[4\]](#) 4) [F61,F62-OH1.1,OH1.2,OH1.3]
- [\[9.27.2.2.\]](#) 9.27.2.2. ([\[5\]](#) 5) [F61,F62-OS2.3]
- [\[9.27.2.2.\]](#) 9.27.2.2. ([\[5\]](#) 5) [F61,F62-OH1.1,OH1.2,OH1.3]
- [\[9.27.2.2.\]](#) 9.27.2.2. ([\[6\]](#) 6) no attributions
- [\[9.27.2.3.\]](#) 9.27.2.3. ([\[1\]](#) 1) [F61,F62-OS2.3]

Intent 1:

To limit the probability of:

- precipitation or meltwater ingress
 - through the first and second planes of protection,
 - [at the rough opening sills of windows and doors, and](#)
 - at [wall](#) penetrations through the first and second planes of protection [created by the installation of components and services](#), and
 - at interfaces with other wall assemblies, and
- an inadequate dissipation to the exterior of precipitation or meltwater that does bypass the first plane of protection.

This is to limit the probability of deterioration, which could lead to structural failure of exterior walls or elements supported or protected by exterior walls, which could lead to harm to persons.

- [\[9.27.2.3.\]](#) 9.27.2.3. ([\[1\]](#) 1) [F61,F62-OH1.1,OH1.2,OH1.3]
- [\[9.27.2.4.\]](#) 9.27.2.4. ([\[1\]](#) 1) [F61,F80-OS2.3]
- [\[9.27.2.4.\]](#) 9.27.2.4. ([\[1\]](#) 1) [F61,F80-OH1.1,OH1.2,OH1.3]
- [\[9.27.2.4.\]](#) 9.27.2.4. ([\[2\]](#) 2) [F61,F80-OS2.3]
- [\[9.27.2.4.\]](#) 9.27.2.4. ([\[2\]](#) 2) [F61-OH1.1,OH1.2,OH1.3]
- [\[9.27.3.1.\]](#) 9.27.3.1. ([\[1\]](#) 1) [F61,F62-OS2.3]
- [\[9.27.3.1.\]](#) 9.27.3.1. ([\[1\]](#) 1) [F61,F62-OH1.1,OH1.2,OH1.3]
- [\[9.27.3.1.\]](#) 9.27.3.1. ([\[2\]](#) 2) no attributions

[9.27.3.1.] 9.27.3.1. ([3] 3) [F61,F62-OS2.3]

Intent 1:

To limit the probability of:

- precipitation or meltwater ingress through the second plane of protection, ~~and~~
- at wall penetrations through the first and second planes of protection created by installation of components and services other than windows and doors,
and
- an inadequate dissipation to the exterior of precipitation or meltwater that does bypass the first plane of protection.

This is to limit the probability of deterioration, which could lead to the structural failure of exterior walls or elements supported or protected by exterior walls, which could lead to harm to persons.

[9.27.3.1.] 9.27.3.1. ([3] 3) [F61,F62-OH1.1,OH1.2,OH1.3]**[9.27.3.1.] -- ([4] --) no attributions**

Intent 1:

To direct Code users to Article 9.7.6.1. for requirements applicable to the installation of windows, doors and skylights.

[9.27.3.1.] -- ([5] --) no attributions

Intent 1:

To limit the probability of

- precipitation or meltwater ingress through the second plane of protection,
- negative effects on the air quality of indoor spaces,
- the inadequate thermal comfort of persons, or
- contact with moisture.

This is to limit the probability of harm to persons.

[9.27.3.1.] 9.27.3.1. ([6] 4) no attributions**[9.27.3.2.] 9.27.3.2. ([1] 1) [F20,F61,F62,F55-OS2.3]****[9.27.3.2.] 9.27.3.2. ([1] 1) [F20,F61,F62,F55-OH1.1,OH1.2,OH1.3]****[9.27.3.3.] 9.27.3.3. ([1] 1) [F61,F55-OS2.3]****[9.27.3.3.] 9.27.3.3. ([1] 1) [F61,F55-OH1.1,OH1.2,OH1.3]****[9.27.3.3.] 9.27.3.3. ([2] 2) [F61,F55-OS2.3]****[9.27.3.3.] 9.27.3.3. ([2] 2) [F61,F55-OH1.1,OH1.2,OH1.3]****[9.27.3.3.] 9.27.3.3. ([3] 3) [F61-OS2.3]****[9.27.3.3.] 9.27.3.3. ([3] 3) [F61-OH1.1,OH1.2,OH1.3]**

- [9.27.3.4.] 9.27.3.4. ([1] 1) no attributions**
- [9.27.3.4.] 9.27.3.4. ([2] 2) [F61,F55-OS2.3]**
- [9.27.3.4.] 9.27.3.4. ([2] 2) [F61,F55-OH1.1,OH1.2,OH1.3]**
- [9.27.3.5.] 9.27.3.5. ([1] 1) [F61,F55-OS2.3]**
- [9.27.3.5.] 9.27.3.5. ([1] 1) [F61,F55-OH1.1,OH1.2,OH1.3]**
- [9.27.3.5.] 9.27.3.5. ([2] 2) [F61,F55-OS2.3]**
- [9.27.3.5.] 9.27.3.5. ([2] 2) [F61,F55-OH1.1,OH1.2,OH1.3]**
- [9.27.3.5.] 9.27.3.5. ([3] 3) no attributions**
- [9.27.3.6.] 9.27.3.6. ([1] 1) no attributions**
- [9.27.3.6.] 9.27.3.6. ([2] 2) [F20,F61,F55-OS2.3]**
- [9.27.3.6.] 9.27.3.6. ([2] 2) [F20,F61,F55-OH1.1,OH1.2,OH1.3]**
- [9.27.3.6.] 9.27.3.6. ([3] 3) [F61,F55-OS2.3]**
- [9.27.3.6.] 9.27.3.6. ([3] 3) [F61,F55-OH1.1,OH1.2,OH1.3]**
- [9.27.3.7.] 9.27.3.7. ([1] 1) [F61,F62,F80-OS2.3]**
- [9.27.3.7.] 9.27.3.7. ([1] 1) [F61,F62,F80-OH1.1,OH1.2,OH1.3]**
- [9.27.3.8.] 9.27.3.8. ([1] 1) ([a] a),([b] b),([c] c)([i] i) [F61-OS2.3]**
- [9.27.3.8.] 9.27.3.8. ([1] 1) ([a] a),([b] b),([c] c)([i] i) [F61-OH1.1,OH1.2,OH1.3]**
- [9.27.3.8.] 9.27.3.8. ([1] 1) ([c] c)([ii] ii) [F61,F62-OS2.3]**
- [9.27.3.8.] 9.27.3.8. ([1] 1) ([c] c)([iii] iii) [F61,F62-OH1.1,OH1.2,OH1.3]**
- [9.27.3.8.] 9.27.3.8. ([2] 2) ([a] a),([b] b)([ii] ii),([c] c)([i] i) [F61-OS2.3]** Applies to detailing of horizontal joints.
- [9.27.3.8.] 9.27.3.8. ([2] 2) ([a] a),([b] b)([ii] ii),([c] c)([i] i) [F61-OH1.1,OH1.2,OH1.3]** Applies to detailing of horizontal joints.
- [9.27.3.8.] 9.27.3.8. ([2] 2) ([b] b)([i] i),([c] c)([ii] ii) [F61,F62-OS2.3]** Applies to cladding installed outboard of a drained and vented air space.
- [9.27.3.8.] 9.27.3.8. ([2] 2) ([b] b)([i] i),([c] c)([ii] ii) [F61,F62-OH1.1,OH1.2,OH1.3]** Applies to cladding installed outboard of a drained and vented air space.
- [9.27.3.8.] 9.27.3.8. ([3] 3) [F61,F62-OS2.3]**
- [9.27.3.8.] 9.27.3.8. ([3] 3) [F61,F62-OH1.1,OH1.2,OH1.3]**
- [9.27.3.8.] 9.27.3.8. ([4] 4) [F61,F62-OS2.3]**

[9.27.3.8.] 9.27.3.8. ([4] 4) [F61,F62-OH1.1,OH1.2,OH1.3]

[9.27.3.8.] 9.27.3.8. ([5] 5) [F61,F62-OS2.3]

[9.27.3.8.] 9.27.3.8. ([5] 5) [F61,F62-OH1.1,OH1.2,OH1.3]