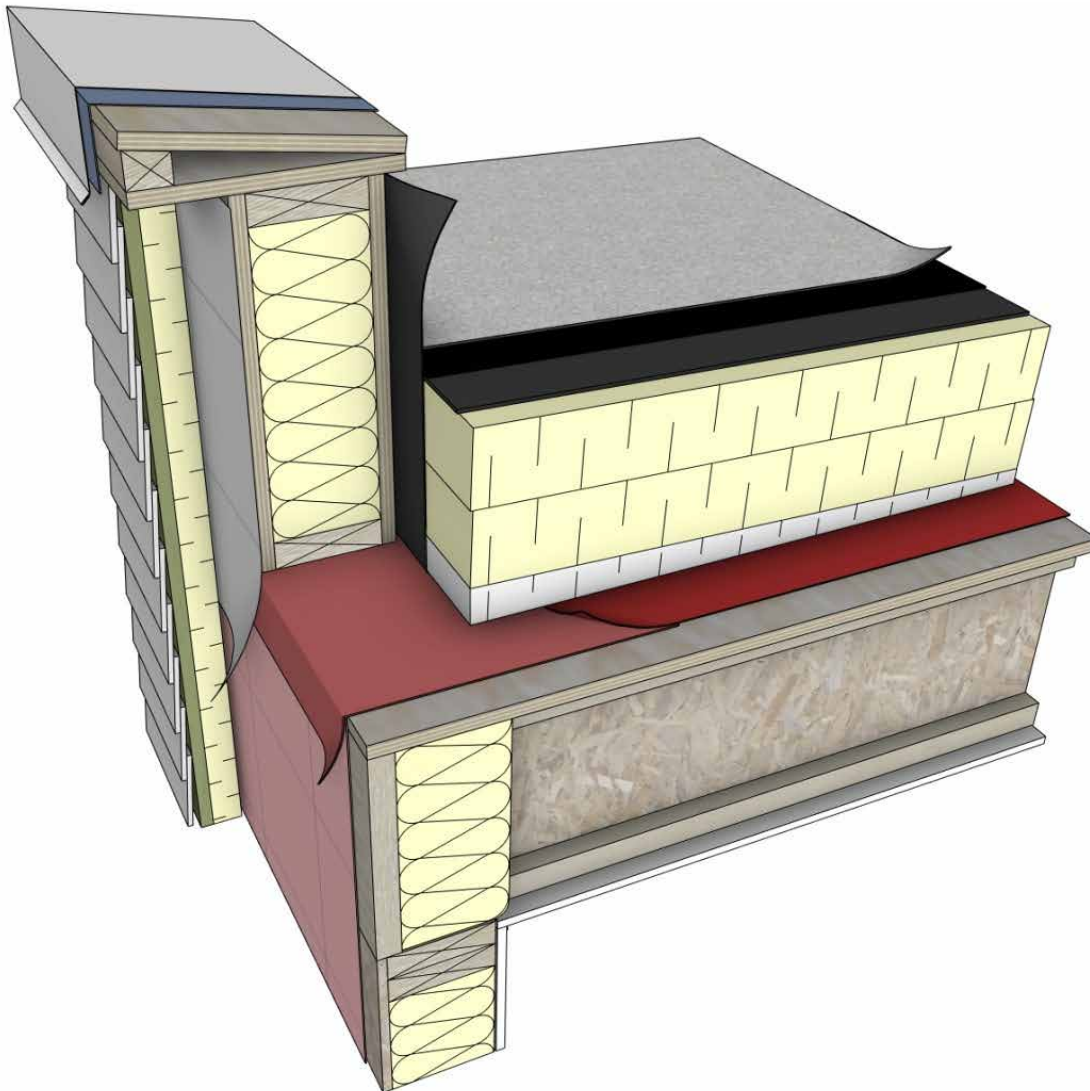




Developed by Natural Resources Canada's
Local Energy Efficiency Partnerships (LEEP) team

**LEEP Net Zero Energy Roof Guide #5
Conventional Flat Roof Assembly**

M154-221/5-2026E-PDF (On-line) ISBN 978-0-662-71988-5

Aussi disponible en français sous le titre:

«LEEP ENZ Guide #5 sur les toits : Assemblage de toit plat conventionnel»

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Acknowledgments

The Local Energy Efficiency Partnerships (LEEP) team at CanmetENERGY would like to express appreciation to the many Canadian builders, designers, and industry partners who participate in LEEP programs across the country. Builders are invited through their regional Home Builders Associations to take part in technical forums, workshops, and training. Their input has consistently identified the need for practical, building science based resources, including this updated guide series focused on foundation and roof assemblies for high-performance homes.

We would like to acknowledge RDH Building Science for leading the development and illustration of these guides, for coordinating the technical analysis, and for integrating the broad range of industry feedback received during the review process. We also thank our technical reviewers whose comments and technical insights strengthened the clarity and accuracy of this material.

We would like to acknowledge the valuable support of the many regional partners who help deliver and support LEEP initiatives and make this work possible. We also recognize the provincial and local Home Builders Associations whose participation has been essential, along with ongoing leadership and support from CHBA National.

This Foundation and Roof Guide Series was developed by the team at RDH Building Science under the direction of Graham Finch. This project, *LEEP guides for Net Zero Energy Construction*, was led by Clarice Kramer from the NRCan LEEP team at CanmetENERGY Ottawa. Funding for this work was provided by Natural Resources Canada through the Green Infrastructure Fund.

Disclaimer

This document does not provide assurances or information related to structural systems, seismic performance, or fire safety. It is intended only as a guide on building enclosure science and foundation and roof assembly selection, detailing, materials and performance. The aim of this publication is to provide builders and designers with a framework for making decisions on the type of foundation and roof assemblies to use for individual homes and for new communities.

Natural Resources Canada assumes no liability for injury, property damage, or loss resulting from the use of information contained in this publication. This guide is intended to provide information only and does not express views of the Government of Canada nor does it constitute an endorsement of any commercial product, manufacturer or any individual.

Building science, related products, and construction practices change and improve over time. It is advisable to regularly consult up-to-date technical publications on building science, products, and practices rather than relying solely on this publication. Seek specific information on the use of products, the requirements of good design and construction practices and the requirements of the applicable building codes before undertaking a construction project. Consult the manufacturer's instructions for construction products and also speak with and retain professional consultants who hold a valid license and have appropriate engineering or architectural qualifications. Work with your municipality or local authority having jurisdiction to ensure compliance with issues of design, zoning and construction practices, including life and fire safety.

The effective R-value ranges and assemblies illustrated in this guide represent potential strategies to reach high-performance targets including the upper tiers of the National Building Code of Canada. As with any performance-based energy target, energy modeling must be used to determine appropriate designs for each individual project. Compliance strategies may be influenced by design choices such as building form, window placement, orientation, mechanical systems, and equipment efficiency.

The information included in this guide is generic in nature and is not tied to any specific voluntary labeling program. Builders and renovators looking to qualify their homes under the Canadian Home Builders' Association Net Zero Home Labeling Program must ensure their homes meet all the Technical Requirements of that Program.

LEEP Context

The LEEP Team at CanmetENERGY works with groups of builders, through their Home Builders Associations (HBAs). LEEP programs offer opportunities to identify barriers and gaps in technology and to discuss and evaluate Net Zero Energy (NZE) and high-performance home building strategies. Builders use forums and workshops to identify key technology challenges and invite experts and manufacturers to respond by proposing solutions, innovations and direction on how to integrate these ideas into construction practices. Through their HBAs, builders use LEEP to define and solve technology challenges, and to connect with design professionals who can help them deliver the homes of tomorrow. The goal is builder-driven enhancement to local building practices.

The Need

There is a need for fundamental change in roof design and construction. Canadian builders are moving beyond typical wood-framing practices to roof assemblies that reach higher levels of performance. LEEP technical forums have been delivered in many locations across Canada. Regional LEEP builder groups have consistently identified high-performance roofs as a key technological challenge. They have requested information on:

- › Increased effective R-values; continuous insulation and reduced thermal bridging
- › Continuous air barrier systems and airtight building enclosures; improved thermal performance, reduced heating and cooling loads, reduced risk of condensation within cavities
- › Water-protection systems; reduced risk of water intrusion from rain and snow using reliable water control details
- › Effective vapour control; reduced risk of trapping moisture within the assembly

There is great diversity in Canadian light wood construction. Roof details and assembly types vary by region and climate zone. Local construction practices can also vary, along with access to reliable technical information and training. Coordination with trades and consultants is critical when introducing new technology and this should not be overlooked. It is our hope that by providing these guidelines for roof assemblies with construction details, we will help builders select, plan and construct robust roof assemblies with success. Project-specific details should always be developed to account for the unique conditions of each project.

We see the LEEP guides for Net Zero Energy Construction not as the end goal, but as an essential tool for the next generation of high-performance buildings.

Documents in This Series

The following is a list of the documents in the LEEP Net Zero Energy Foundation and Roof Technical Guide series:

- › **Foundation Guide #1:** Basement Below-Grade Assemblies
- › **Foundation Guide #2:** Crawl Space and At-Grade Assemblies
- › **Foundation Guide #3:** Exposed Floor Assemblies
- › **Roof Guide #1:** Vented Attic Roof Assembly
- › **Roof Guide #2:** Vented Vaulted Roof Assembly
- › **Roof Guide #3:** Exterior-Insulated Sloped Roof Assembly
- › **Roof Guide #4:** Vented Flat Roof Assembly
- › **Roof Guide #5:** Conventional Flat Roof Assembly

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Conventional Flat Roof Assembly Overview

This roof assembly consists of waterproof roofing membrane installed directly over continuous rigid insulation above the roof deck. High effective R-values are achieved by using continuous insulation outboard of the sheathing with thermally efficient attachment or adhesive. A vapour barrier membrane on the structural roof deck beneath the insulation provides the exterior air barrier and vapour control layer.

By placing continuous insulation outside the framing, this assembly achieves high effective R-values and keeps the moisture-sensitive structural wood components warm and dry. The roofing membrane must be installed on a compatible substrate above the insulation, such as asphalt protection board or fiberglass-mat-faced gypsum panels.

Waterproof Membrane (Roof Finish)

The waterproof roofing membrane serves as both the water-shedding surface (WSS) and the primary water control layer. A fully adhered multi-ply bitumen-based roof membrane system is recommended in most cases. Refer to [Risk Management for Flat Roofs on page 13](#) for further guidance. Water drains across the membrane to roof drains and/or perimeter scuppers. Additional roof layers above the membrane such as pavers or decorative finishes can be used to protect the membrane from foot traffic, ultraviolet exposure, and direct rainfall, but the membrane performs all water-control functions.

Effective roof drainage is key to long-term assembly durability. A consistent positive roof slope, well-placed and adequately sized drains, and robust perimeter overflow scupper details help prevent ponding and direct water off the roof effectively.

Roof sloping can be provided by sloped sheathing on tapered strapping or roof joists, or with a tapered insulation layer within the roof insulation. Tapered insulation is typically provided as a custom prefabricated “taper package” by the insulation manufacturer, based on the roof layout and drain locations.

Uninterrupted roof drainage is the key to reducing the potential for roof leaks and maintaining roof performance. Flashings, perimeter control layer tie-ins, and penetration detailing are also critical for controlling water on flat roofs.

Roof Assembly #5

Exterior

Pavers for roof decks

Waterproof roof membrane system

Substrate board

Rigid insulation including tapered layer

Self adhesive vapour barrier membrane

Roof sheathing

Uninsulated flat roof structure

Finished gypsum board

Interior

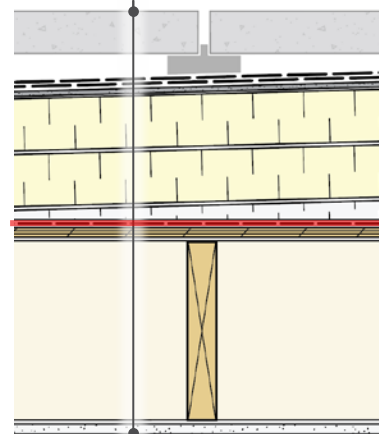


Figure 1 Typical assembly layers of the conventional flat roof assembly.

Air Control Layer (Air Barrier System)

This assembly uses an exterior air barrier system over the structural roof deck. It is typically a self-adhered or heat-welded membrane at the roof sheathing. This air control layer relies on robust air barrier detailing at exterior roof penetrations and adequate tie-in to the wall air barrier system below. The exterior air barrier system can help provide very low air leakage because ceiling penetrations at fixtures and penetrations through top plates do not penetrate the air barrier. [See Air Barrier Best Practices on page 12](#) for more information.

Vapour Control Layer (Vapour Barrier)

The self-adhered vapour barrier membrane on the roof deck controls vapour flow through the roof assembly. With vapour control provided at the roof deck, an interior polyethylene vapour barrier is not required. Because moisture-sensitive components are located on the interior side of the vapour barrier and insulation, the risk of moisture damage to the wood components is limited.

Thermal Control Layer (Insulation)

Roof insulation can use a range of rigid board materials. The insulation is either adhered or fastened in place. Refer to [Roofing Attachment Requirements on page 11](#) for additional guidance on insulation attachment.

High density rigid mineral wool, XPS, EPS, GPS, and polyisocyanurate are commonly used in flat conventional roofs. Insulation must have adequate compressive strength and be suitable for the elevated temperatures expected within roof assemblies. Multiple insulation layers are offset in both directions to create a continuous thermal barrier. Organic types of insulation are not recommended for this application, due to their high sensitivity to moisture and limited long-term moisture durability data in Canada.

Airtightness is essential for high-performance NZE roof assemblies. NZE homes target very low air leakage, verified through testing at completion. Strong airtightness improves energy performance and reduces condensation risk in roof cavities. Continuity at transitions and penetrations is critical.

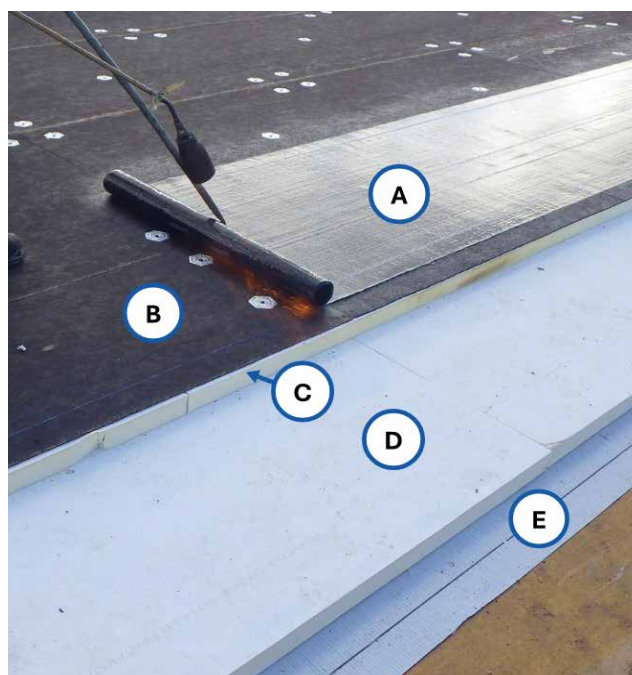


Figure 2 Conventional flat roof construction:
(A) Torch-on two-ply SBS modified bitumen base sheet
(B) insulation cover board
(C) polyisocyanurate insulation
(D) EPS sloped insulation package
(E) self-adhered vapour barrier membrane

The roof joist cavity is typically not insulated. If supplemental insulation such as batt insulation is used, involvement of a qualified professional and project-specific hygrothermal analysis is typically needed to confirm condensation control and moisture performance.

Parapet Insulation

As outlined in Air Barrier Best Practices on page 13, a dedicated pre-strip membrane installed over the roof deck and tied continuously into the wall air barrier provides a robust air barrier transition. This approach limits the potential for warm interior air to enter the parapet cavity and reduces condensation risk.

With a continuous pre-strip in place, the parapet cavity can be fully insulated using moisture tolerant insulation. The adjacent roof rim joist spaces are also insulated and provided with appropriate vapour control.

For taller parapets, a hybrid configuration can be used. Approximately 2 ft. of insulation is installed at the base of the parapet, with the upper portion vented to the exterior. This configuration can support drying of the upper cavity where parapet height is significant, provided the pre-strip air barrier remains continuous.

Where a pre-strip air barrier is not used, the portion of the parapet above the roof insulation line remains uninsulated and vented to the exterior. This reduces the likelihood of moisture becoming trapped within the cavity. However, this approach carries higher air leakage risk and reduced thermal performance compared to a fully insulated parapet detailed with a dedicated pre-strip air barrier.

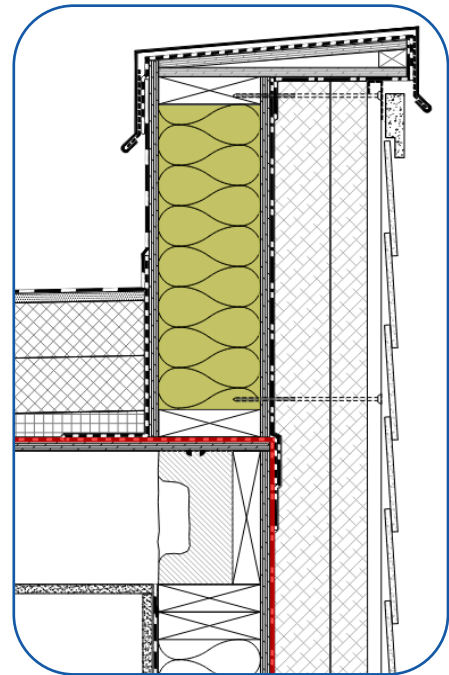


Figure 3 Fully insulated parapet with membrane pre-strip beneath parapet framing.

Roofing Attachment Requirements

Note: This guidance is for reference only and does not replace project-specific roofing attachment design.

Roofing components must be securely fastened or adhered in place to provide adequate wind uplift resistance. **Flat roofing systems are installed by qualified roofing professionals in accordance with the manufacturer's written installation instructions for each layer.**

Adhesive Applied Roofing Systems use chemical adhesive or heat welding to attach insulation and protection board layers. Two-component chemical adhesives are the most common approach. Because no mechanical fasteners are used, the risk of air leakage through fastener penetrations is reduced. This approach relies on compatible substrates and on adequate adhesion of the vapour barrier membrane to the roof deck. Adhered assemblies are typically provided as a coordinated system of compatible materials from a single manufacturer.

Mechanically Attached Roofing Systems use long fasteners to secure insulation and protection board layers to the roof structure. Performance depends on appropriate fastener spacing and embedment into the supporting deck. The fasteners penetrate the vapour barrier membrane, which increases the potential for air leakage and thermal bridging compared to fully adhered systems. Mechanically attached assemblies do not rely on interlayer adhesion and can accommodate a broader range of material combinations.

Both adhered and mechanically attached roofing assemblies can provide reliable performance in a conventional flat roof assembly when installed in accordance with the manufacturer's instructions by a qualified roofing professional.

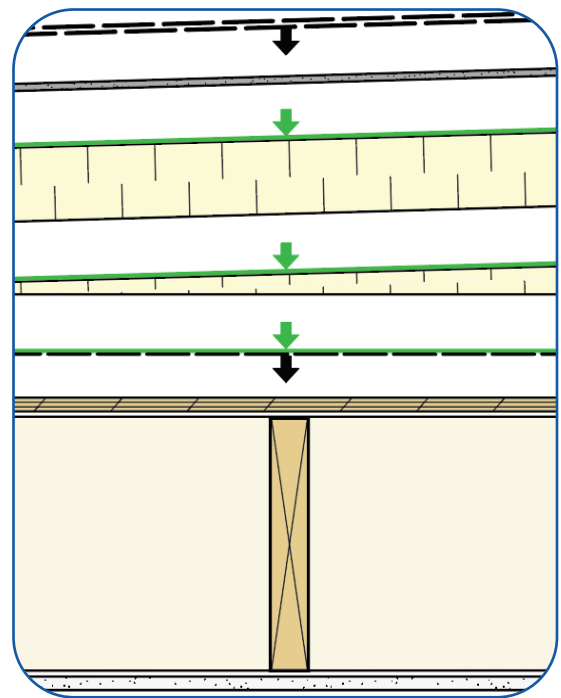


Figure 4 Adhesive Applied Roofing System: All layers are adhered in place to resist wind uplift.

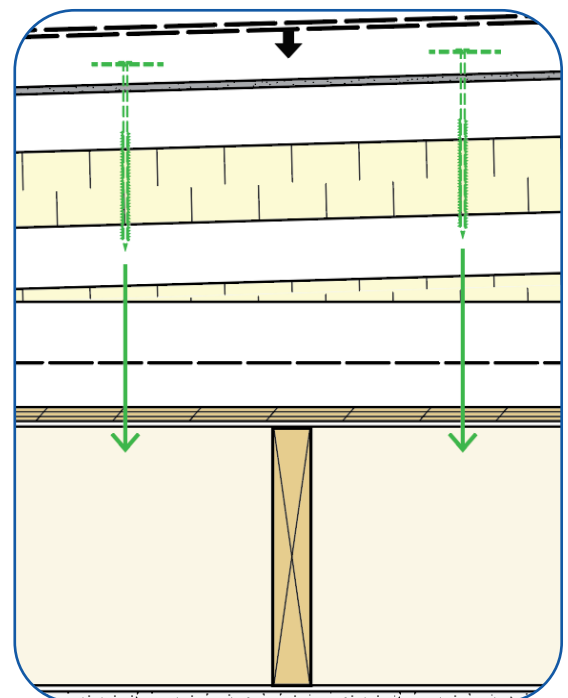


Figure 5 Mechanically Attached Roofing System: Long screws are installed through the protection board and insulation into the roof structure.

Thermal Performance Considerations

Under Part 9 of the applicable building code, thermal bridging from fasteners typically does not need to be included in effective R-value calculations. Therefore, the effective R-value of conventional flat roofs typically includes the full nominal R-value of the insulation layers, including the sloping package where applicable.

Air Barrier Best Practices

This approach uses a fully adhered membrane as the primary air barrier element. Self-adhered membranes rely on adhesion to both the substrate and at membrane laps. Epoxy primer is typically used to achieve strong adhesion.

This approach is considered an exterior air barrier system because the air barrier is outside the roof structure. It offers several advantages compared to roof assemblies with an interior air barrier system. The key benefit is that there are far fewer penetrations and interruptions from ceiling fixtures and intersecting partition walls. This eliminates the need for either a dedicated service cavity or air barrier detailing at wire penetrations, pot lights, and ceiling electrical boxes. Interior services can be run within the roof joist space without impacting airtightness. The most common roof air barrier penetration is typically the plumbing vent stack.

Roof to Wall Interface

This roof-to-wall air barrier transition uses a continuous exterior air barrier approach to maintain airtightness between the flat roof and the wall. For overhanging roofs, the transition follows the same approach as described in Roof Guide #3 (sealed blocking approach). For parapet roofs, the membrane is run beneath the parapet structure as a pre-strip to directly transfer the roof air barrier membrane to the wall exterior air barrier membrane. This approach relies on a platform-framed parapet (i.e., framing on top of the roof sheathing) rather than continuous balloon framing from the exterior wall below. Refer to the [Construction Details on page 15](#) for further guidance on air sealing around structural ties within the parapet. The following figure shows the key steps for this detail.

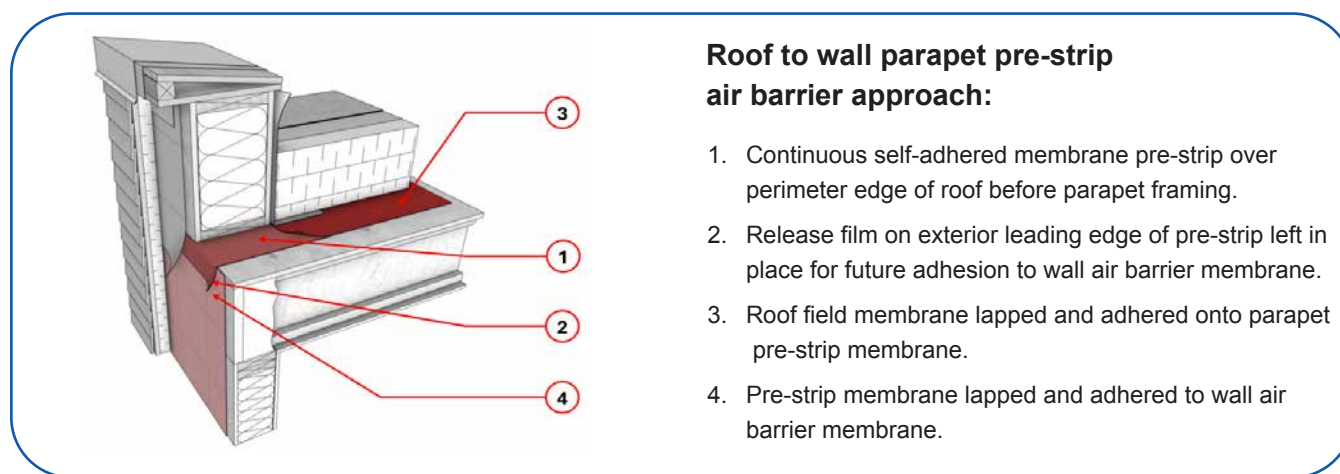


Figure 6 Overview of the key steps to achieving a continuous air barrier connection between the exterior roof air barrier and the exterior wall air barrier using the parapet pre-strip approach.

Roof Deck Penetrations

Penetrations through the roof air barrier need clear and inspectable air barrier detailing to maintain continuity. The recommended approach is to use an EPDM gasket. During rough-in, the pre-formed EPDM gasket is installed around each penetration so the gasket is located on the roof deck air barrier membrane. The perimeter of the gasket is taped or set into a continuous bead of sealant. This provides a durable and visible air seal. High-performance tape or sealant works as well.

Risk Management for Flat Roofs

Fully adhered multi-ply bitumen-based roof membrane systems are typically the most appropriate for flat roofs. They provide durability and redundancy because they include multiple layers. Thorough detailing at interfaces and penetrations also plays a crucial role in the long-term performance of flat roof assemblies. Flat roofing systems are installed by qualified roofing professionals in accordance with the manufacturer's written installation instructions. Refer to the [Construction Details on page 15](#) for further guidance.

Penetrations and Drains

Roof decks include drains, scuppers, guard posts, and service penetrations that interrupt the waterproofing layer and present an increased risk of leakage. These locations require robust detailing using compatible roofing grade materials. Penetrations through the roof membrane are detailed using prefabricated boots, liquid-applied transition membranes, or other components intended for roofing applications. Transition materials must be compatible with the primary roofing membrane and installed in accordance with the manufacturer's recommendations. Drain bodies with an integrated clamping ring and strainer help provide long-term durability and reduce the risk of clogged drains.

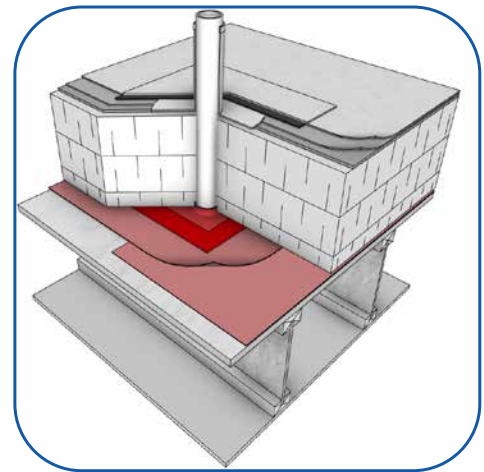


Figure 7 Air seal at plumbing vent penetration using EPDM gasket and perimeter tape.

Roof Decks

Providing as much vertical separation as practical between the door sill and the roof deck surface reduces the potential for water ingress from ponding water, splashback, or snow melt. Accessibility requirements must also be considered when establishing sill heights and transitions. Achieving a raised door sill requires the roof deck framing to be set lower than the adjacent interior floor framing so the structure allows adequate sill height and positive slope away from the door.

Any portion of the curb or framing located within 8 inches of the finished horizontal roof deck surface, including the top surface of the pavers or tiles, is made waterproof with roofing grade materials. This is typically done by extending the roofing membrane from the deck surface up into the door sill, using liquid-applied membrane around complex interfaces including onto a back dam behind the door threshold. Roof deck membranes are protected from traffic and mechanical damage using flashings, pavers, tiles, and other protective surfacing.

Overflow Scuppers

Overflow scuppers provide a secondary drainage path if primary roof drains become blocked by debris. Setting the overflow scupper lower than the lowest door sill limits the maximum ponding depth and reduces the risk of water reaching the threshold or entering the building. Locating the overflow with a visible discharge (i.e., parapet scupper) allows occupants to recognize that water levels are rising and that the primary drainage system requires attention. This simple measure is a key aspect of risk management for flat roofs.

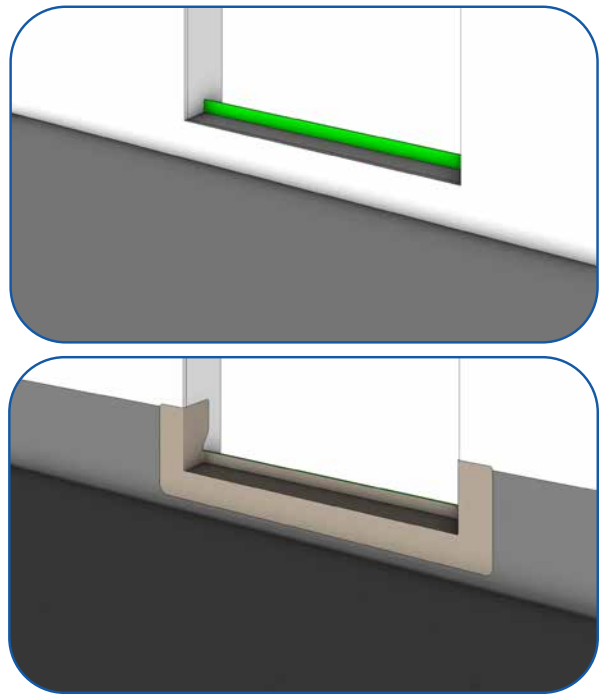


Figure 8 Roof deck door sill rough opening detailing sequence showing the back dam (green) positioned behind where the threshold will be, and the roofing membrane and liquid-applied membrane onto the back dam.

Construction Details

The example details in the following pages establish a common level of detailing for Conventional Flat Roof Assembly Guide #5. Each guide in this series provides a similar set of details for its respective assembly. Builders may replicate or adapt these details to meet Net Zero Energy or other high-performance targets, provided the core principles of air barrier continuity, water-resistive barrier continuity, and insulation continuity are maintained.

The assemblies shown were selected through LEEP initiatives where builder groups requested a focus on practical, regionally appropriate high-performance solutions. Building-science experts reviewed these assemblies based on climate, local construction practices, and code requirements. The details highlight key transition strategies, with red “AB” and “AB/WRB” icons identifying air barrier and water-resistive-barrier components.

These illustrations represent best practices. Project-specific work may require additional details, cladding-specific adjustments, and coordination with structural, mechanical, electrical, and life-safety systems. Any modifications should be prepared or reviewed by qualified professionals, as provincial requirements vary.

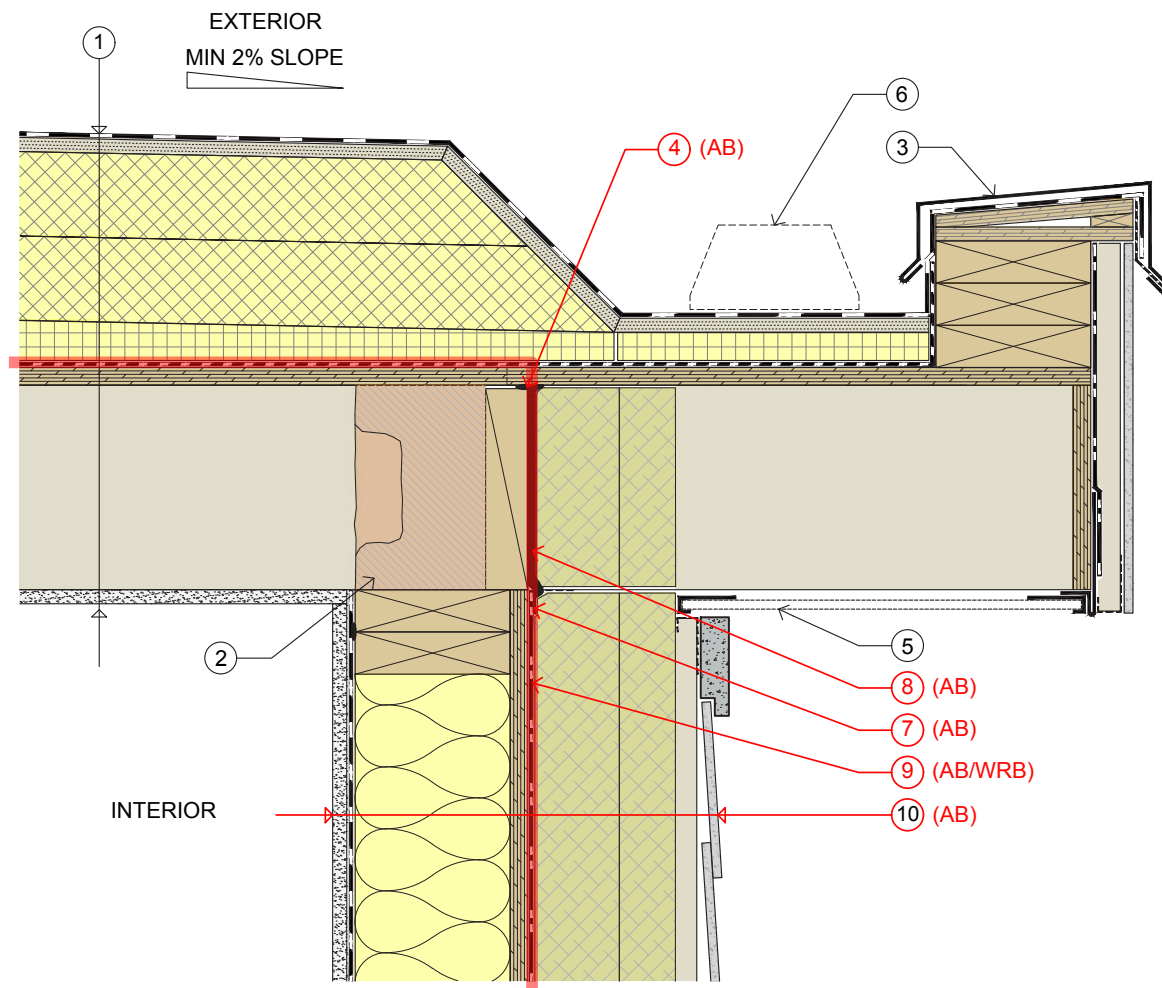
To reduce the risk of water penetration, mould, or other deficiencies, builders are encouraged to review details with a building-science engineer or architect, and to practice installation techniques using full-scale mockups for training and quality control.

Each unique project will require the development of specific details and construction documents to address the varied conditions found in each building and the capacity of local construction trades. In addition, each builder must provide quality control and assume liability for the work they complete. Reliable technical information and training are critical to your success. We recommend that builders take advantage of technical guides and training opportunities offered by credible sources and share this training with everyone on your crew. Work with your local Home Builders Association to find more information and to build local capacity.

For more guidance and example detailing for net zero energy roof assemblies, refer to the following additional resources:

- › Illustrated Guide—R30+ Effective Vaulted & Flat Roofs in Residential Construction, BC Housing
- › Building Envelope Guide for Houses, BC Housing
- › Canadian Home Builders’ Association of BC Building Science for New Homes, CHBA BC
- › BC Energy Step Code Builder Guide, BC Housing
- › Building Enclosure Design Guide, BC Housing

Detail 5.01 Above-Grade Wall at Overhanging Flat Roof

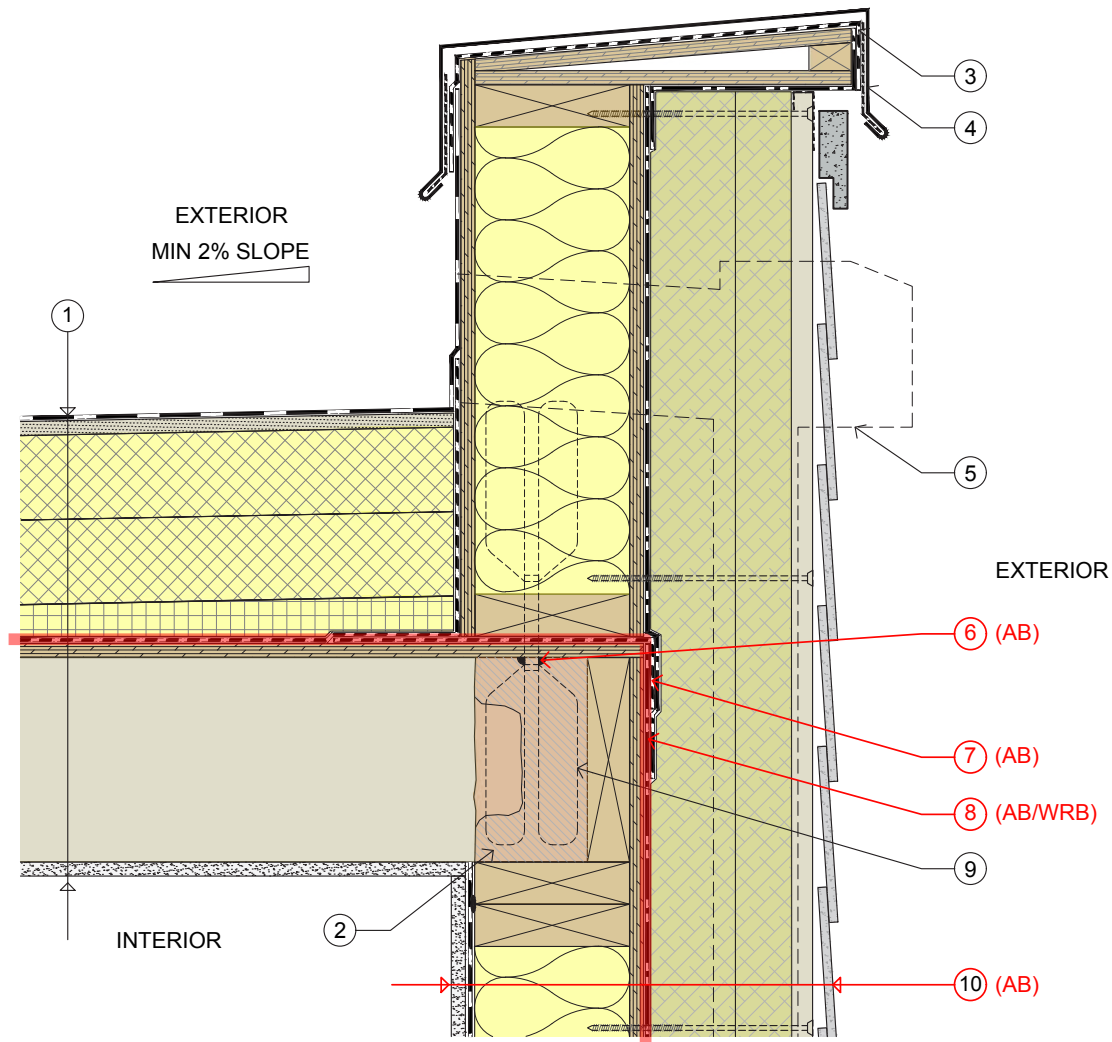


LEGEND

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| <p>① Conventional flat roof assembly</p> <ul style="list-style-type: none"> • Waterproof roofing membrane including perimeter edge detailing • Roof protection board • 2 layers 3" polyiso insulation • Tapered insulation for sloping • Self-adhesive vapour barrier membrane (AB) • Sheathing • Wood framing • Ceiling gypsum board <p>② Spray foam insulation or batt and poly</p> <p>③ Parapet cap flashing c/w fastening cleats</p> | <p>④ Roof sheathing set into continuous sealant bead on rim blocking/joists and at sheathing joints (AB)</p> <p>⑤ Flat roof venting through soffit</p> <p>⑥ Roof drain beyond</p> <p>⑦ High performance tape between blocking/joists and wall sheathing membrane (AB)</p> <p>⑧ Continuous sealant around rim blocking and onto high performance tape (AB)</p> <p>⑨ VP sheathing membrane (AB/WRB)</p> <p>⑩ Above-grade wall assembly with exterior air barrier system (AB)</p> |
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ABOVE-GRADE WALL AT OVERHANGING FLAT ROOF | D5.01 ROOF #5 - CONVENTIONAL FLAT ROOF

Detail 5.02 Above-Grade Wall at Roof Parapet Wall

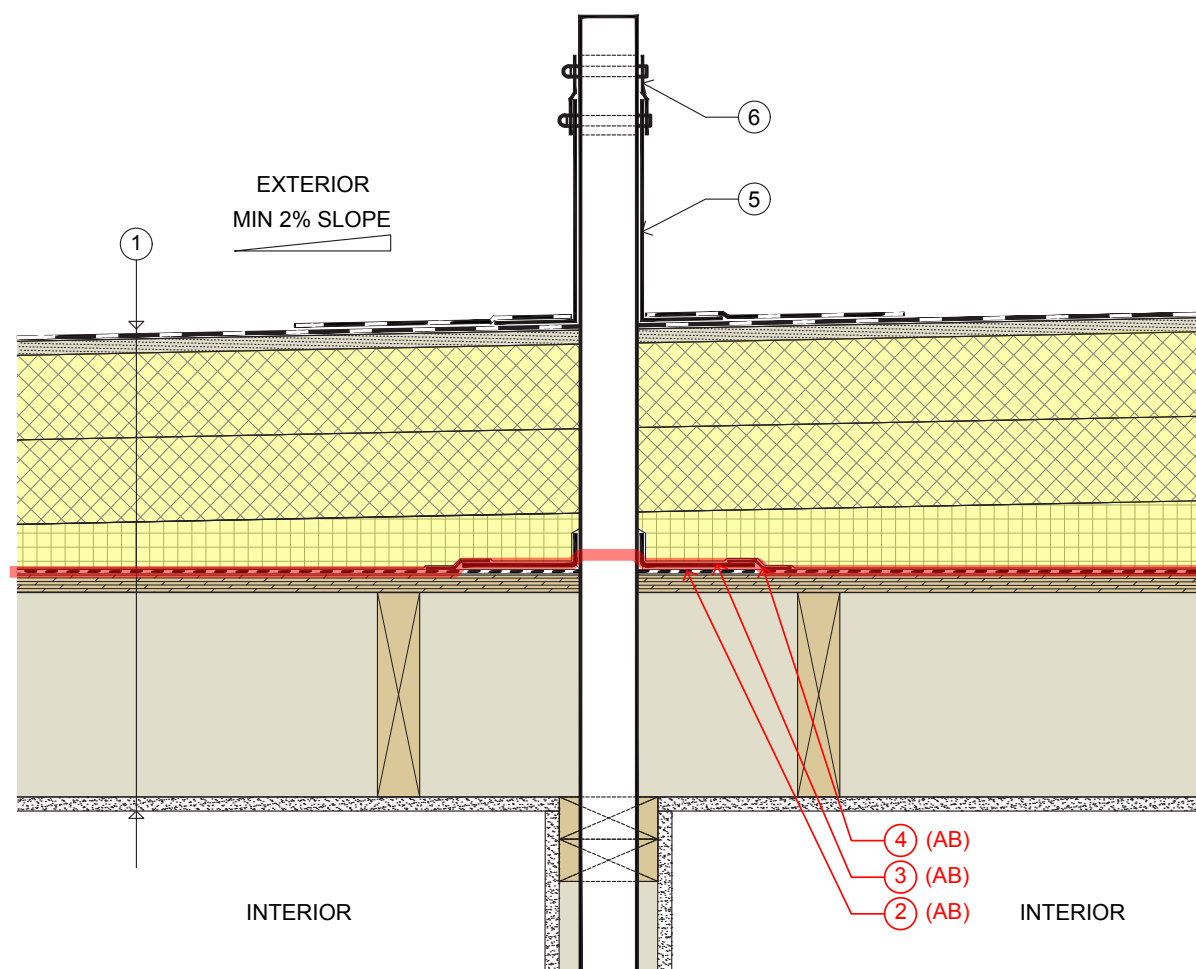


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ABOVE-GRADE WALL AT ROOF PARAPET WALL | D5.02 ROOF #5 - CONVENTIONAL FLAT ROOF

Detail 5.03 Service Penetration Through Top Plates at Roof

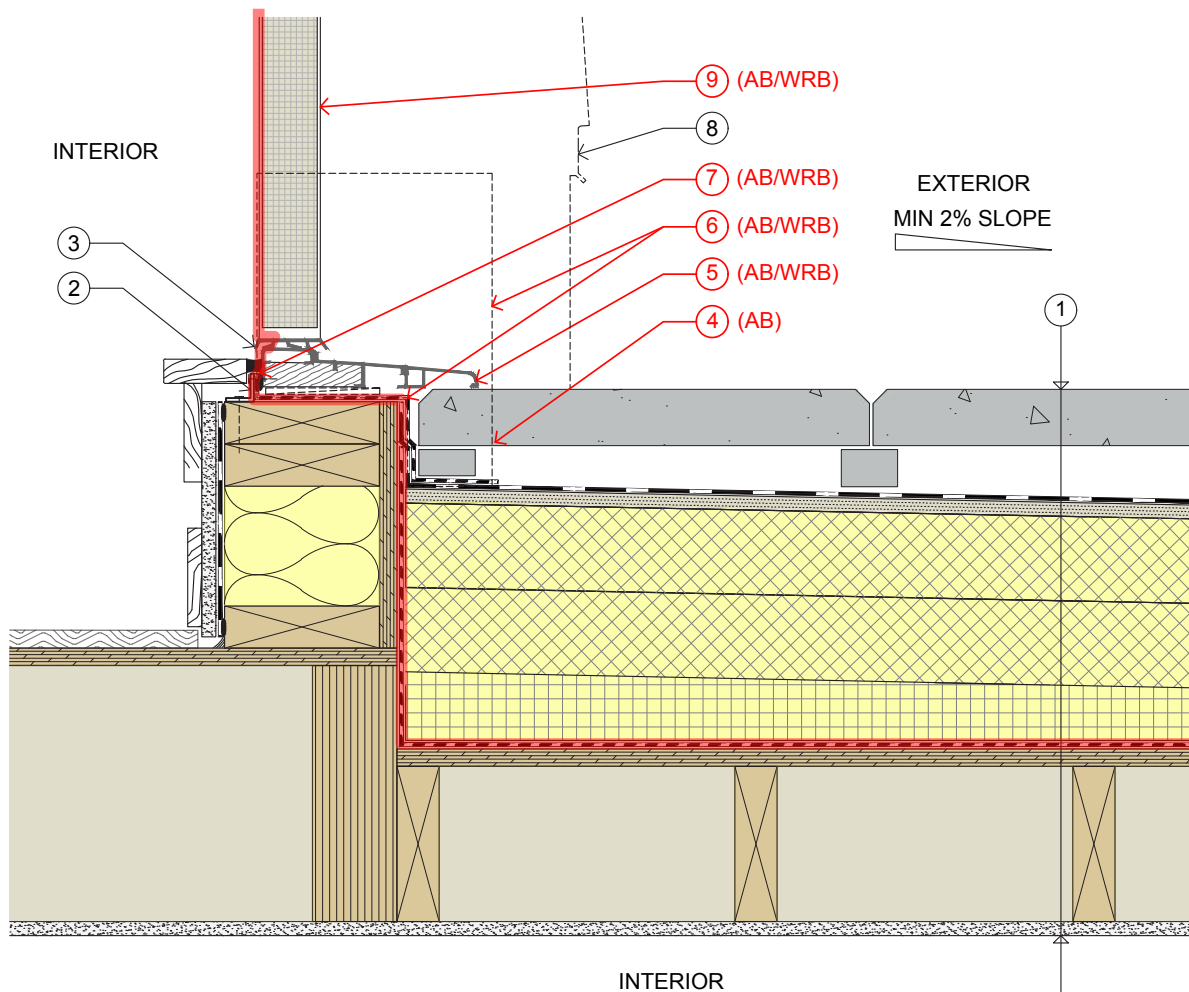


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| <p>① Conventional flat roof assembly</p> <ul style="list-style-type: none"> • Waterproof roofing membrane including perimeter edge detailing • Roof protection board • 2 layers 3" polyiso insulation • Tapered insulation for sloping • Self-adhesive vapour barrier membrane (AB) • Sheathing • Wood framing • Ceiling gypsum board <p>② Self-adhesive vapour barrier membrane (AB)</p> <p>③ EPDM gasket around penetrating component (AB)</p> | <p>④ High performance tape around EPDM gasket (AB)</p> <p>⑤ Spun aluminum roof jack</p> <p>⑥ Flexible pipe coupling with stainless steel clamps</p> |
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SERVICE PENETRATION THROUGH TOP PLATES AT ROOF | D5.03
ROOF #5 - CONVENTIONAL FLAT ROOF

Detail 5.04 Roof Deck at Access Door Sill

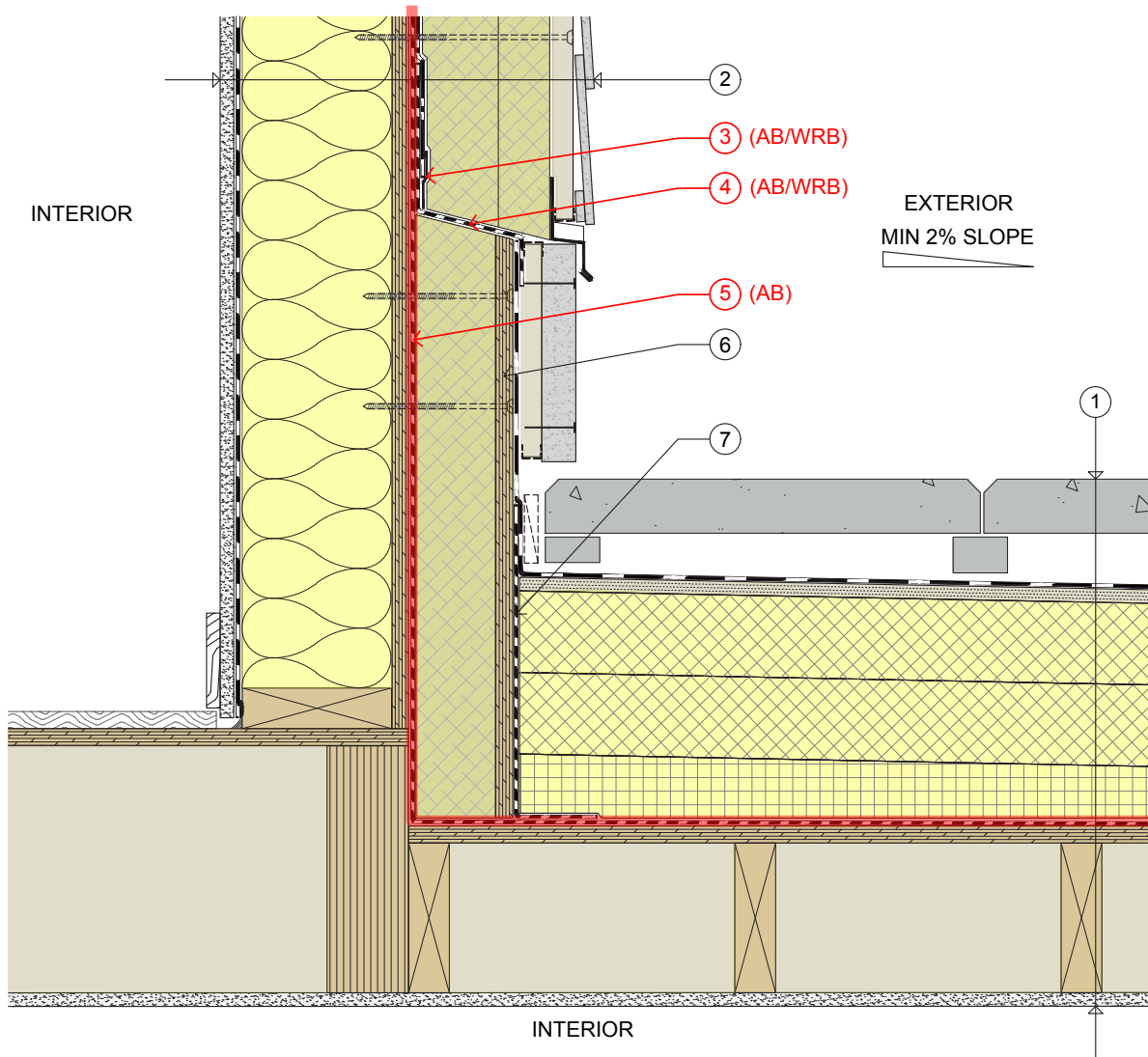


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| <p>① Conventional flat roof assembly</p> <ul style="list-style-type: none"> • Concrete pavers • Waterproof roofing membrane including perimeter edge detailing • Roof protection board • 2 layers 3" polyiso insulation • Tapered insulation for sloping • Self-adhesive vapour barrier membrane (AB) • Sheathing • Wood framing • Ceiling gypsum board <p>② Continuous aluminum sill angle</p> <p>③ Sealant cap bead</p> | <p>④ Self-adhesive vapour barrier membrane up to door opening (AB)</p> <p>⑤ Door threshold with 2" sill extender set on shims (AB/WRB)</p> <p>⑥ Liquid-applied reinforced roofing membrane over sill onto sill angle and minimum 8" up jambs and onto adjacent starter curbs (AB/WRB)</p> <p>⑦ Door threshold set into continuous sealant bead at sill angle and fastened through from interior (AB/WRB)</p> <p>⑧ Line of adjacent wall beyond (see D5.05)</p> <p>⑨ NAFS-rated entry door (AB/WRB)</p> |
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ROOF DECK AT ACCESS DOOR SILL | D5.04
ROOF #5 - CONVENTIONAL FLAT ROOF

Detail 5.05 Renewable Roof Deck at Base of Above-Grade Wall

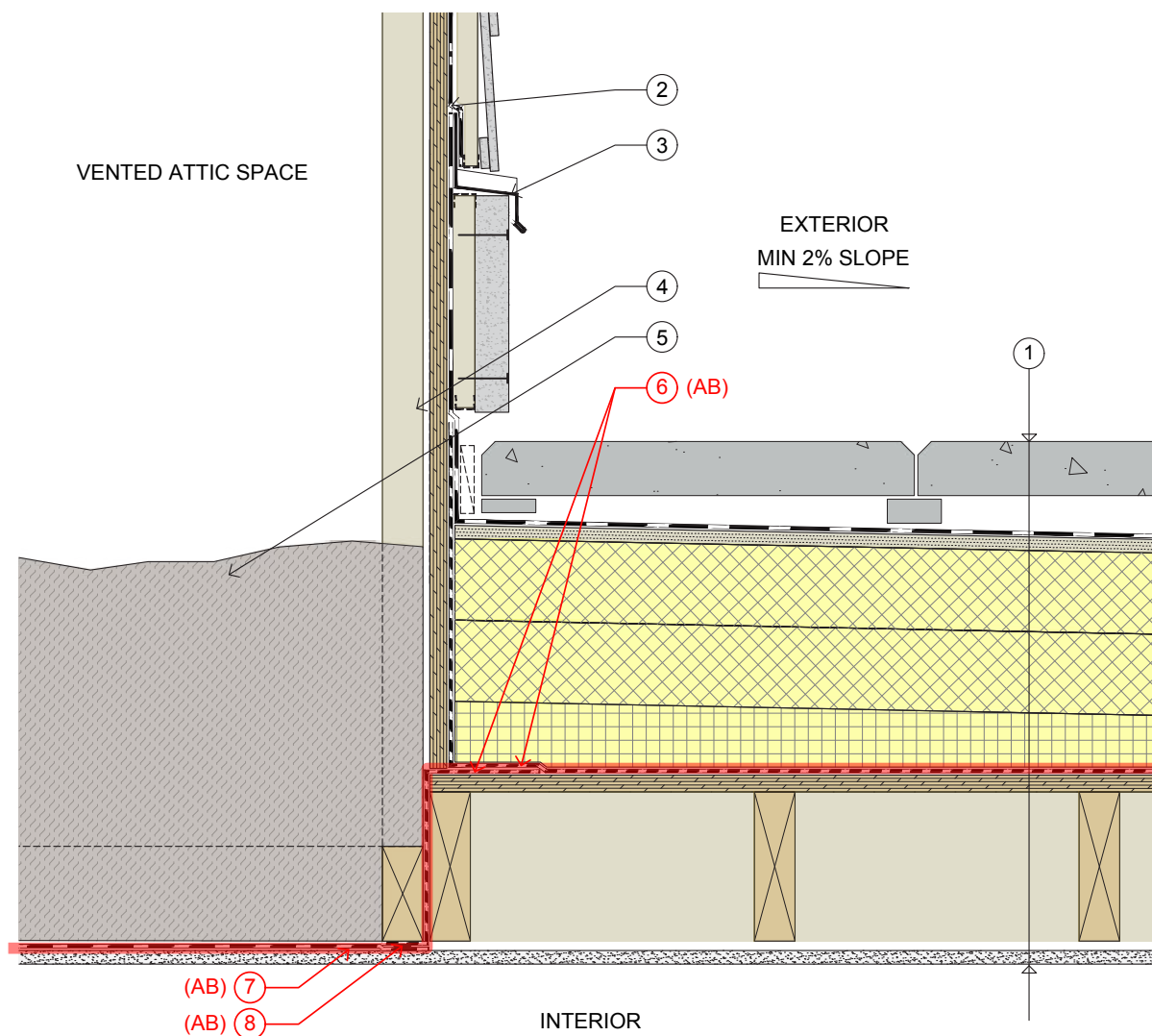


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| <p>① Conventional flat roof assembly</p> <ul style="list-style-type: none"> • Concrete pavers • Waterproof roofing membrane including perimeter edge detailing • Roof protection board • 2 layers 3" polyiso insulation • Tapered insulation for sloping • Self-adhesive vapour barrier membrane (AB) • Sheathing • Wood framing • Ceiling gypsum board <p>② Above-grade wall assembly with exterior air barrier system (AB)</p> | <p>③ VP sheathing membrane lapped and taped to through wall membrane (AB/WRB)</p> <p>④ Self-adhesive through-wall membrane lapped onto roofing membrane (AB/WRB)</p> <p>⑤ Self-adhesive vapour barrier membrane wall prestrip adhered to roof vapour barrier membrane (AB)</p> <p>⑥ Starter curb for roof renewals</p> <p>⑦ Self-adhesive vapour barrier membrane starter curb prestrip adhered to roof vapour barrier membrane</p> |
|---|---|

RENEWABLE ROOF DECK AT BASE OF ABOVE-GRADE WALL | D5.05 ROOF #5 - CONVENTIONAL FLAT ROOF

Detail 5.06 Renewable Roof Deck at Base of Attic Gable Wall



LEGEND

- | | |
|---|--|
| <p>① Conventional flat roof assembly</p> <ul style="list-style-type: none"> • Concrete pavers • Waterproof roofing membrane including perimeter edge detailing • Roof protection board • 2 layers 3" polyiso insulation • Tapered insulation for sloping • Self-adhesive vapour barrier membrane (AB) • Sheathing • Wood framing • Ceiling gypsum board <p>② VP sheathing membrane</p> | <p>③ Pre-finished metal flashing</p> <p>④ Gable wall framing as required</p> <p>⑤ Attic insulation</p> <p>⑥ Self-adhesive vapour barrier membrane (AB)</p> <p>⑦ Ceiling poly (AB)</p> <p>⑧ Continuous sealant at ceiling poly (AB)</p> |
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RENEWABLE ROOF DECK AT BASE OF ATTIC GABLE WALL | D5.06
ROOF #5 - CONVENTIONAL FLAT ROOF

Glossary

Air control layer	The control layer designed to resist the flow of air through the building enclosure. Also referred to as the air barrier system.
Air leakage	Uncontrolled airflow through openings in the building enclosure.
Air permeance	The degree to which a material allows air to flow through it.
Vapour control layer (vapour barrier / vapour retarder)	The control layer that manages the diffusion of water vapour through materials and resists movement of water vapour across the enclosure.
Vapour diffusion	The movement of water vapour through a material.
Water control layer	The innermost boundary against liquid water intrusion.
Water-resistive barrier (WRB) membrane	A sheathing membrane capable of resisting non-hydrostatic water pressure and deflecting water off vertical or high-sloped conditions.
Water load	The liquid water the enclosure manages, including precipitation, runoff, groundwater, and ice melt.
Water-shedding surface (WSS)	The outer surface of the building enclosure that deflects most exterior precipitation away from inner layers.
Thermal control layer	The control layer designed to primarily resist heat flow through the building enclosure.
R-value / RSI value	The measure of the thermal resistance of a material or assembly of materials.
Service cavity	An intentional space between interior finishes and the air barrier designed to contain services that would otherwise penetrate the air barrier.
Penetration	Any intentional opening through an assembly to allow ducts, wires, pipes, or fasteners to pass.
Condensation	The change of water vapour to liquid water.
Continuity (of control layers)	Control layers that span across different material types, transitions, interfaces, and joints without breaks.

Notes



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