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# Walkable PVC Roof Deck Membranes



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# Walkable PVC Roof Deck Membranes

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Presented by: Duradek Ltd.

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**Description:** Provides an overview of walkable roof deck membranes and includes discussions on: system characteristics, components, and installation; moisture management: deflection and drainage; design considerations; and how to specify roof deck membrane systems.

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# Purpose and Learning Objectives

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**Purpose:** Provides an overview of walkable roof deck membranes and includes discussions on: system characteristics, components, and installation; moisture management: deflection and drainage; design considerations; and how to specify roof deck membrane systems.


## **Learning Objectives:**

At the end of this program, participants will be able to:

- describe a walkable roof deck membrane system, its characteristics, advantages, and applications
- outline the basic installation process of a walkable roof deck membrane system mentioning key waterproofing details
- discuss the importance of water/moisture management and the appropriate deflection, drainage, and design measures that should be taken to ensure a durable project, and
- recall key considerations that should be part of the specification of a walkable roof deck membrane system.

# How to Use This Online Learning Course

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- To **print or exit** the course at any time, press the **ESC** key on your keyboard. This will minimize the full-screen presentation and display the menu bar.
- Within this course is an  **exam password** that you will be required to enter in order to proceed with the online examination. Please be sure to remember or write down this exam password so that you have it available for the test.
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Click on title to view





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## Walkable Membrane Overview

# Walkable Roof Decks

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A walkable roof deck is a roof deck subject to pedestrian traffic only, not vehicular traffic.

We are going to discuss three types of protected roof membranes (PRM) in the following slides.





# Protected Membrane Assemblies

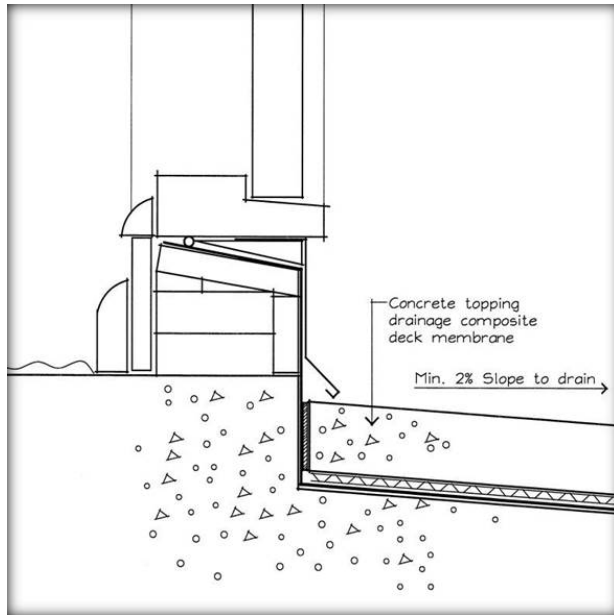
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Protected membrane assemblies:

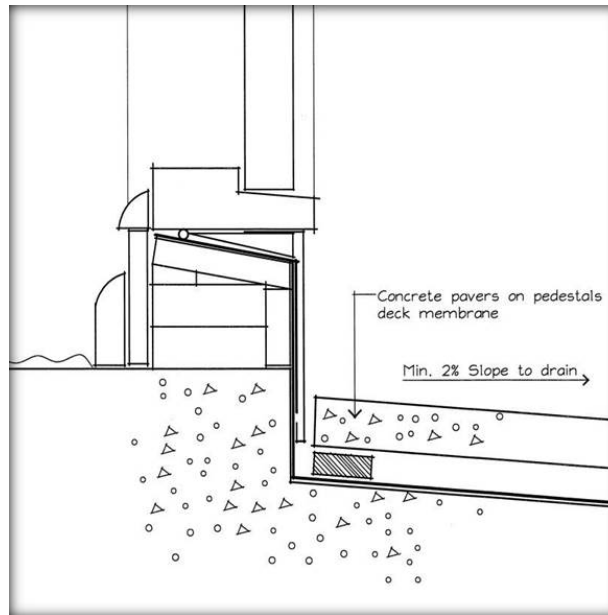
- can be suitable for heavy traffic
- provide protection from mechanical damage
- provide protection from environment
- come in a variety of attractive toppings
- must be carefully considered because of their weight
- can be costly to repair or replace, and
- can look industrial.



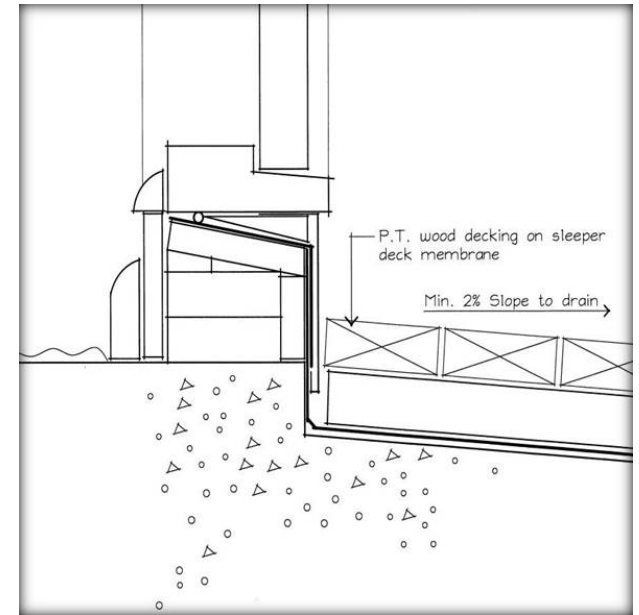
# Protected Membrane Assemblies



Poured concrete topping (often called split slab construction when installed over another concrete slab) can create quite a dead load that a building must support.



Concrete pavers require maintenance to keep water flowing through and under pavers. Basic concrete pavers can look industrial.

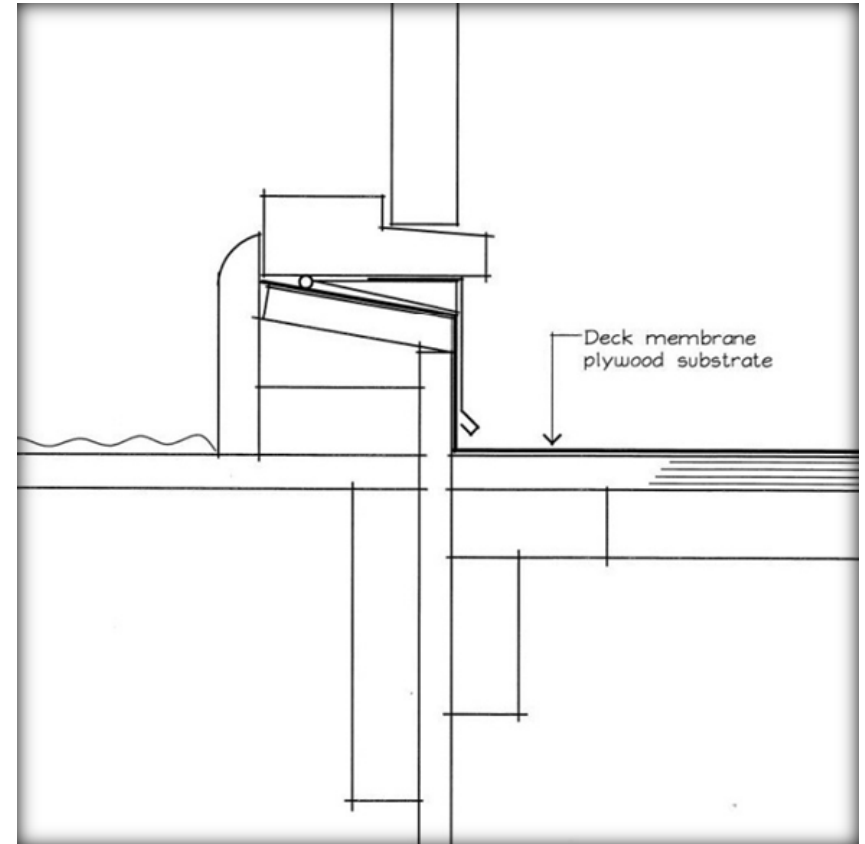


Wood decking on sleepers requires maintenance to maintain its appearance and could be a fire risk in dry areas.

# Exposed Membrane Assemblies

Exposed membrane assemblies are:

- available in attractive finishes
- light weight
- cost effective
- easy to maintain and repair
- for light pedestrian use only
- exposed to the environment
- dependent on the application and workmanship, and
- dependent on the subsurface.



The Canadian Construction Materials Centre (CCMC), which is similar to International Code Council Evaluation Services (ICC-ES) in the United States, defines “light pedestrian traffic as—limited to residential applications, without exposure to mechanical equipment such as snow blowers.”

# Types of Light Pedestrian Systems

**Coatings:** According to ICC-ES AC39 Acceptance Criteria for Walking Decks, there are three types of traffic coatings defined as either: a cementitious coating; an elastomeric coating; or, a membrane system.

The traffic coating market includes various product types like: urethane rubber, poly modified magnesite, rubber cement, and poly and acrylic modified cements to name a few. As with any coating, onsite conditions during installation can dictate its long-term performance. They also require scheduled re-coating, which is dependent on traffic exposure.



Cementitious Coating



Elastomeric Coating

# Types of Light Pedestrian Systems

**Membrane Systems:** Membrane systems, as defined by ICC-ES, are traditionally vinyl membranes. In most cases, vinyl membranes are roof grade products with color, pattern, and texture built in at the time of manufacturing. To maintain the appearance of the product, it is very important that the installer is fully trained in the installation of the membrane and proper preparation of the subsurface.



ICC-ES requires membrane systems to meet AC75 Acceptance Criteria for Membrane Roof Covering Systems.

A key question the specifier has to ask of any of these systems is: Does this product have the appropriate approval(s) for the specific job?

# Walkable Vinyl Membranes

Performance qualities are dictated by applicable code standards. Walkable vinyl roof membranes have the following qualities manufactured into the product:

- pre-manufactured rolls
- hot air weldable seams
- contemporary colors and patterns
- slip resistant textures
- UV and heat stabilizers
- cold weather flexibility
- mildew inhibitors
- chemical resistance
- excellent fire resistance



# Characteristics of Walkable Vinyl Membranes

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Vinyl membranes are available in 72" width, and 45 mil and 60 mil thicknesses. The minimum membrane thickness required for exposed walkable roof membrane applications is 60 mil (1.5mm).

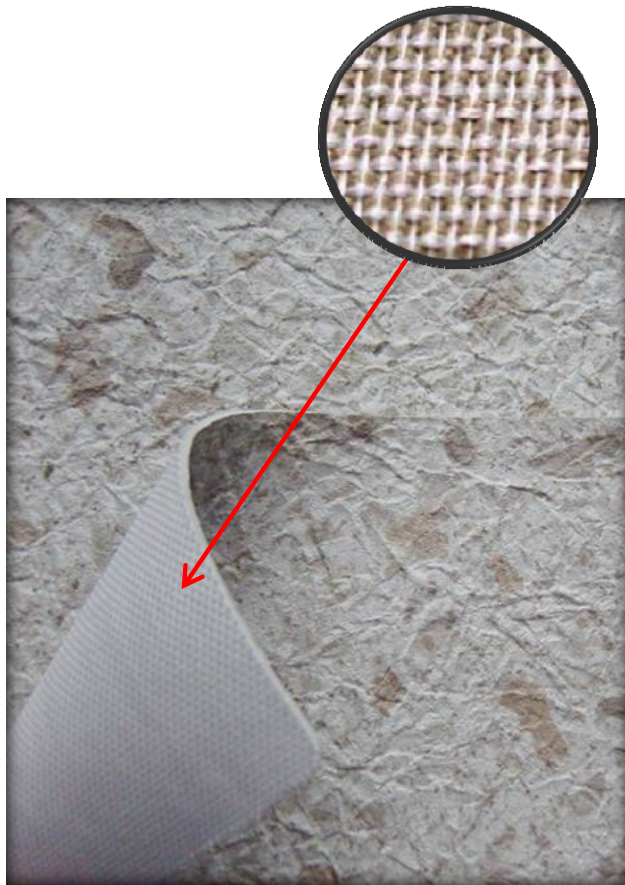
Waterproof walkable vinyl membranes are pre-manufactured and can be fabric-reinforced to provide added stability and multi-directional strength. The type of fabric reinforcing is usually how the product is described in specifications. They are:

- Woven polyester non-embedded backing: offers good adhesion to subsurface and seam weld ability qualities.
- Vinyl backed with embedded fabric: offers average adhesion to subsurface and excellent seam weld ability qualities. Heat forming is required for 90-degree corners.
- Non-woven polyester non-embedded backing: offers excellent adhesion to subsurface and average seam weld ability qualities.

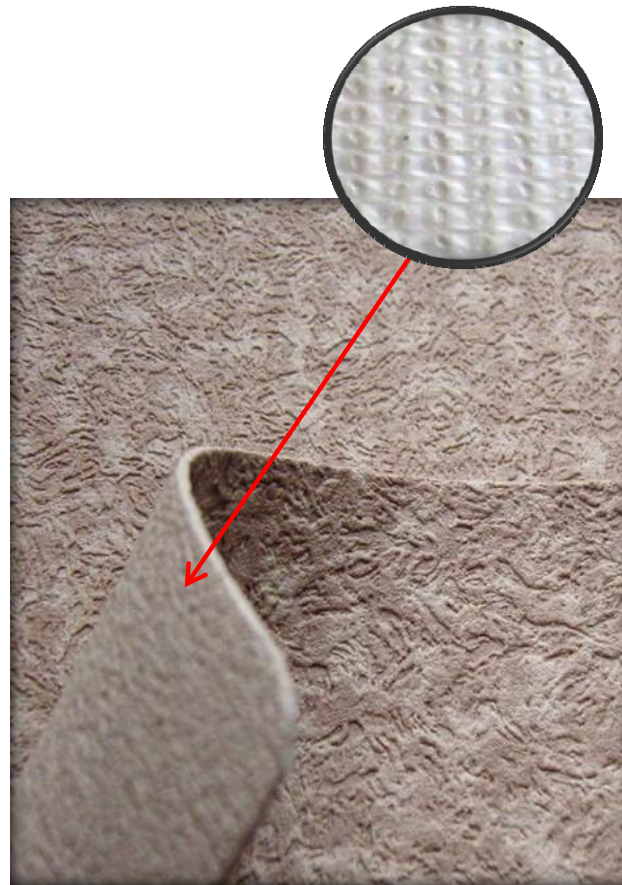
Examples of these three types are pictured on the following slide.

# Walkable Vinyl Membranes

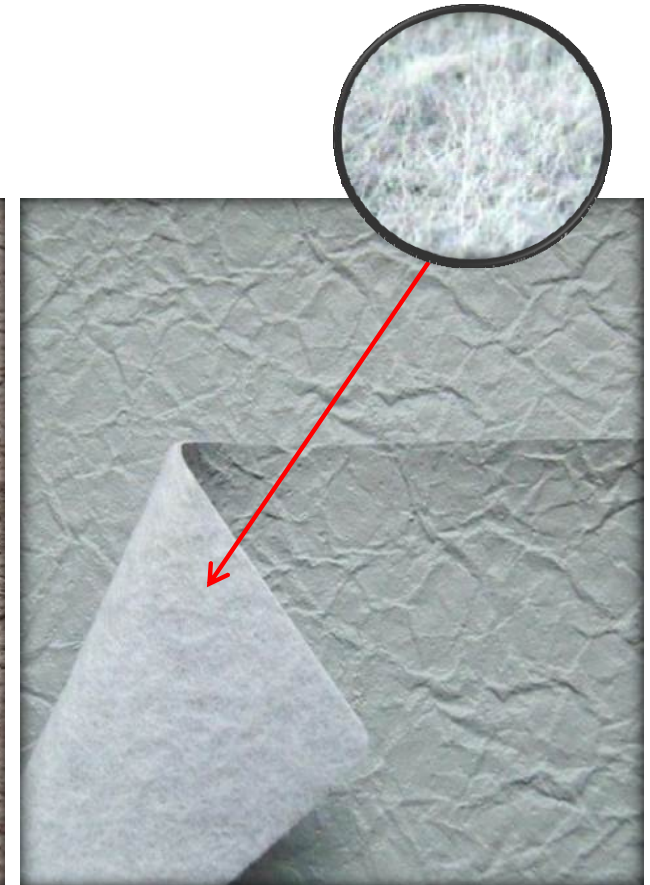
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Woven Polyester Backing



Embedded Fabric Backing



Non-woven Polyester Backing



# Substrate: Plywood

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It is important to have the thickest flooring grade plywood possible to reduce deflection. The better the subsurface is, the better the finished product will be.

Country:	United States	Canada
Profile:	APA T&G Sturd-I-Floor	CanPly Easy T&G
Exposure:	Exterior	Exterior
Thickness:	23/32" (18.5mm) over joists @ 16" (400mm) o.c. or 19/32" (15.5 mm) over joists @ 16" (400mm) o.c.	23/32" (18.5mm) over joists @ 16" (400mm) o.c. or 19/32" (15.5 mm) over joists @ 16" (400mm) o.c.
Grade:	Sturd-I-Floor (T&G)	Easy T&G – Floor
	B - C Grade or B - C Underlayment Plugged: T&G or square edge with blocking secured under all panel joints	Select Tight Face (SEL TF) B - C Grade
Species:	Group 1 – Douglas Fir (DFP) or Group 1	Douglas Fir (DFP) or Canadian Softwood (SPF)

Note: Recommended and acceptable characteristics are noted, e.g. 23/32" (recommended) or 19/32" (acceptable).

# Substrate: Plywood

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A test conducted by Huber at their Atlanta facility showed that most water resistant structural panels treated with petroleum-based products, including those that were also treated with a field applied sealer/blocker, had chemicals leach through after one year of exposure to the sun. OSB panels can lose their structural integrity if exposed to moisture, and poplar plywood is not suitable for a walkable roof deck service.

Structural panels not acceptable:

- pressure treated
- any treated panel—factory or field applied
- orientated strand board (OSB)
- poplar plywood



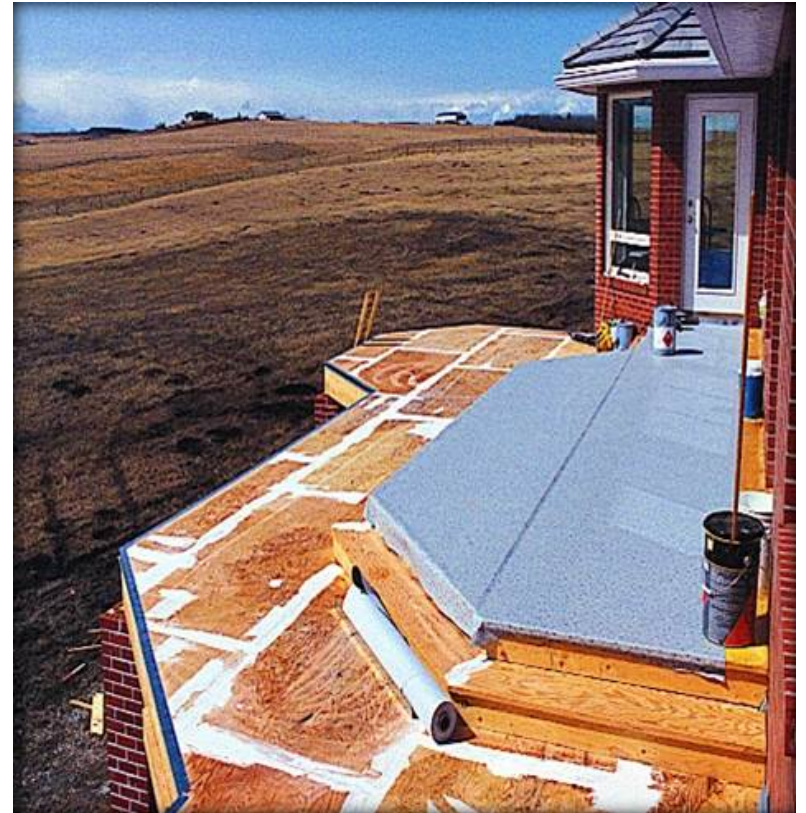
# Preparation: Plywood

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Moisture content of the plywood substrate at the time of membrane installation is a very important consideration in this industry.

When the moisture content of the plywood is conditioned to 12–14%, it has reached its ultimate size. Do not fill gaps  $\frac{3}{32}$ " wide or less. Double-fill gaps that are greater than that.

If the moisture content is less than 12% (unconditioned plywood from the plant usually has a moisture content in the 6% range), it is suggested that you not fill any gaps. When the plywood's moisture content does increase, usually due to seasonal conditions, the panel will expand. Plywood ridging could occur due to expansion, forcing the panel's "groove" shoulder upwards, or the infill could be compressed, causing a ridge at the tongue and groove seam.



# Substrate: Concrete

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A fresh concrete surface must be fully cured (28 days minimum), and have undergone moisture testing before membrane application.

For existing concrete surfaces, it is strongly recommended that all surfaces be dry, clean, smooth, structurally sound, and free of chemicals, coating, sealants, foreign matter or other contaminants that can affect membrane adhesion, discoloration and/or premature aging. If the existing sealer, coating, etc. cannot be completely removed, an adhesion test must be conducted to determine if the existing finish will be adversely affected by the contact glue. If an adverse reaction occurs, the coating must be removed. If there is no adverse reaction, the membrane can be applied, but membrane discoloration may occur due to long-term compatibility issues.



# Walkable Membrane Installation

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A typical vinyl deck membrane installation includes the following:

1. **Heat Welded Seams** - Hot air welding equipment is used to fuse the overlapped sheets together, creating a watertight seam.
2. **Water Diverter** - A diverter, placed below the membrane, can be used to deflect water away from critical details.
3. **Deck Meets Wall** - Flashing membrane is bonded vertically up the wall sheathing and outward from the deck/wall intersection, allowing for proper installation sequencing of the finished wall system.
4. **Door Detail** - Rough opening sill and jamb are waterproofed before the door is installed.
5. **Folded Inside Corner** - Inside corner detail is created by folding and fusing the membrane in place without the use of relief cuts.

# Walkable Membrane Installation

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6. **Welded Corner Detail** - Watertight corner patches are installed at outside corner details.
7. **Replacement Flashing** - Removable trim boards allow for easy repair or replacement of membranes.
8. **Through Wall Flashing** - Through wall flashing is required at brick veneered walls.
9. **Fascia Mount Railing** - Fascia mounted railing systems allow for attachment of the railing without penetrating the vinyl membrane.
10. **Edge Detail** - Edge detail is created by folding and fusing the membrane in place without the use of relief cuts.

# Installation Details

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The images on the following slide are of the four basic welds that are performed to waterproof most walkable roof membrane systems.

**#1 Field Seam Weld:** Membrane is overlapped  $\frac{3}{4}$ ".

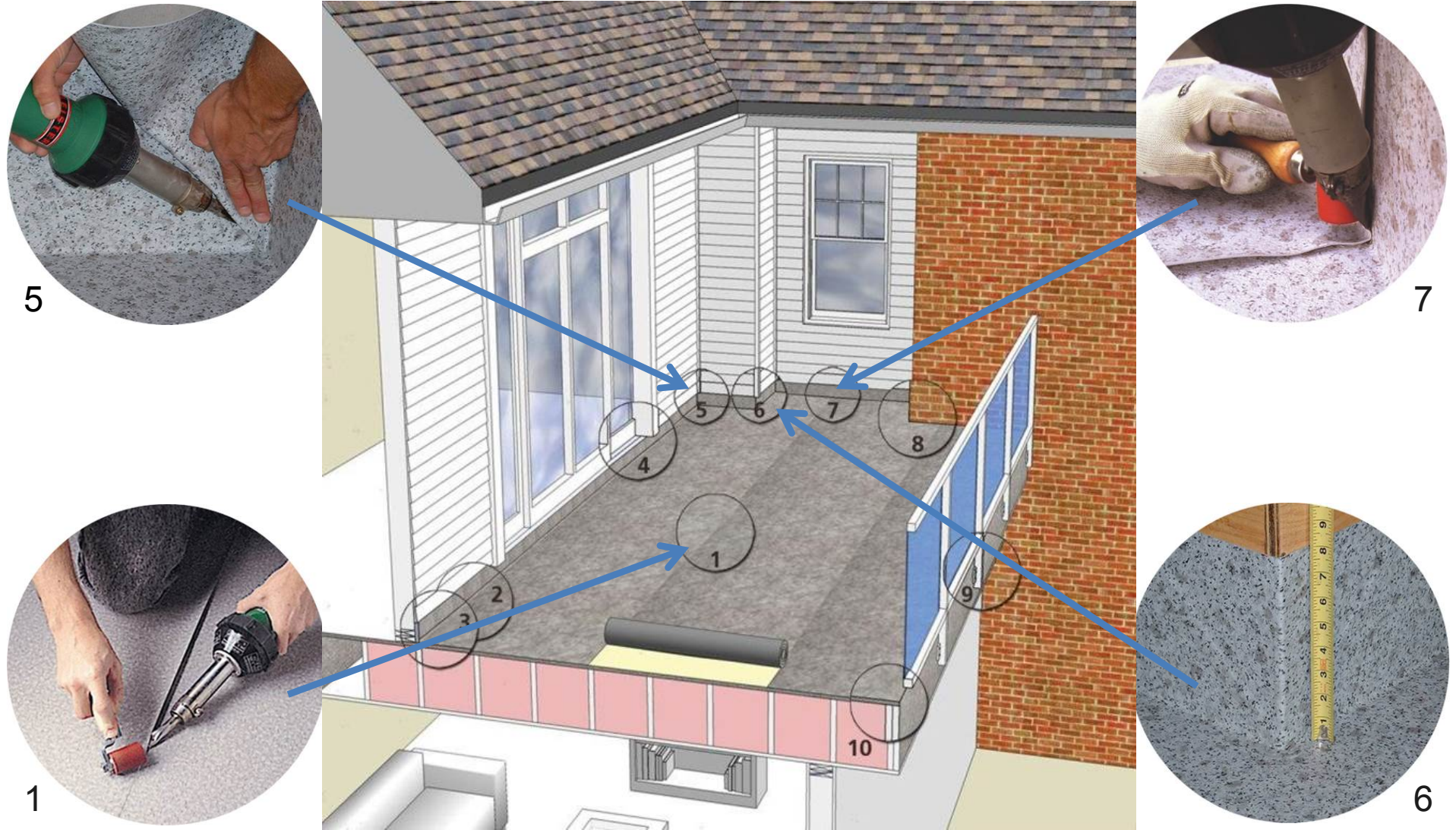
**#5 Inside Corner:** Membrane is not cut to relieve bulk but folded into a “dog’s ear,” compressed, and hot air welded tight to the flashing membrane.

**#6 Corner Detail:** Used at corners or where the membrane has to be relieved. It involves welding a patch to create a waterproof detail. The patch is  $\frac{3}{4}$ " larger all around than the void it is waterproofing.

**#7 Seam at Wall:** Usually a continuation of the field seam with membranes overlapped  $\frac{3}{4}$ ".

Most other waterproofing details are variations of these basic ones.

# Details





# Moisture

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Moisture exists in our environment in three states: solid, liquid, and vapor. There are unique challenges in designing and constructing a building envelope in a manner that effectively manages each of these states.



# Sources of Moisture

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## **Solid:**

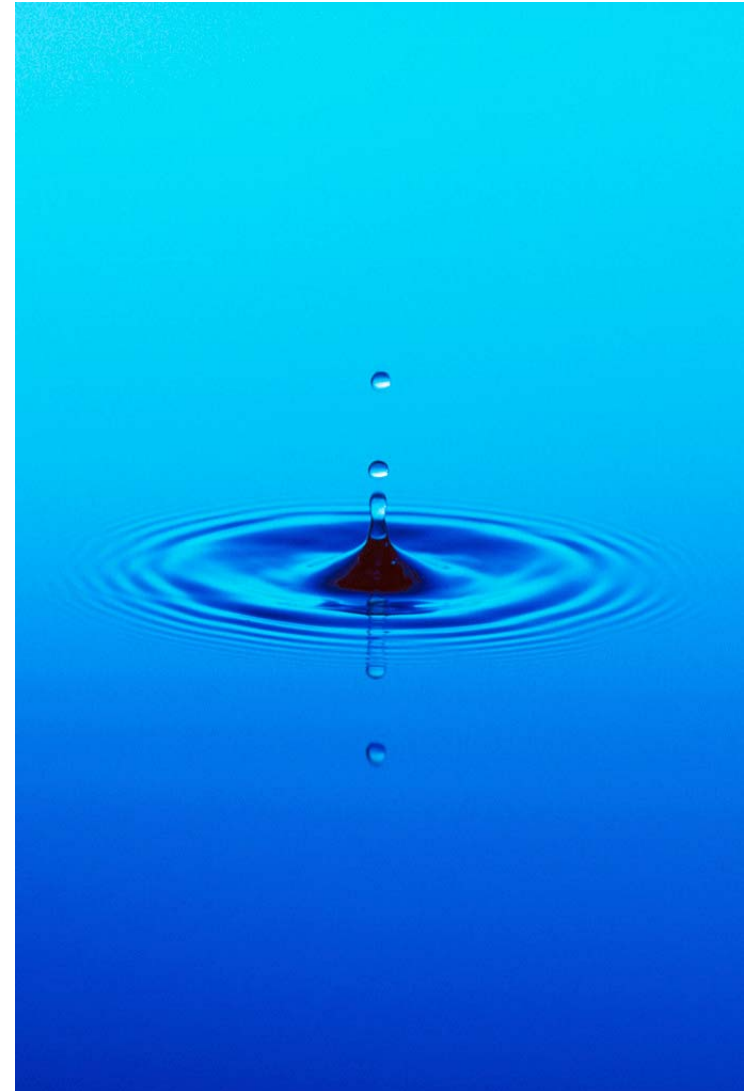
- Drifting Snow
- Ice Damming

## **Liquid:**

- Hydrostatic Pressure
- Run-off
- Rainwater Penetration
- Swelling Soils
- Construction Moisture

## **Vapor:**

- Air Leakage
- Diffusion
- Vapor Related



# Water Management

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We will concentrate on moisture issues that directly affect walkable decks in particular:

- **Surface Rainwater:** How do we design and construct walkable decks so surface water travels where we want it to go?
- **Ice:** Ice cells on pedestrian surfaces are dangerous. How do we eliminate them?
- **Rainwater Penetration:** Water will enter all building envelopes. How do we drain it back outward?
- **Water Vapor:** Vapor does not directly affect the membrane but can affect the roof structure the membrane is applied to. How do we reduce water vapor so it does not cause truss uplift, plywood ridging, and building shrinkage among other things?





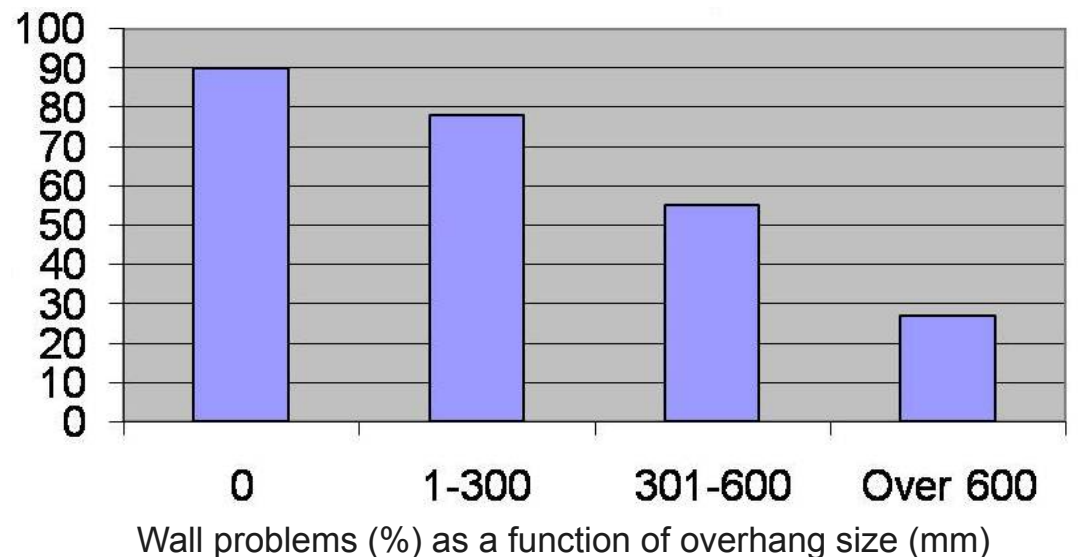
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# Deflection

# Overhangs

The purpose of deflection is to get the water to go where you need it to go. Architectural features like overhangs and soffits help reduce the amount of water that is absorbed into the wall system as well as the amount of surface water the deck has to handle.

This graph shows the relationship between the frequency of problems and the width of the overhang. An overhang of 24" (600 mm) will have more than three times fewer wall problems than a wall with no overhang.



Graph Source: "Wood-Frame Envelopes in the Coastal Climate of British Columbia." Canada Mortgage and Housing Corporation. 2001.  
<http://www.boabc.org/assets/Latest~News/BCCOASTA.pdf> Accessed July 2013.

# Deck Slope

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Sufficient deck slope deflects the water to where you want it to go.

Deck slope should be:  $\frac{1}{4}$ " per 12" or 2%.



# Frame Shrinkage

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## Frame shrinkage:

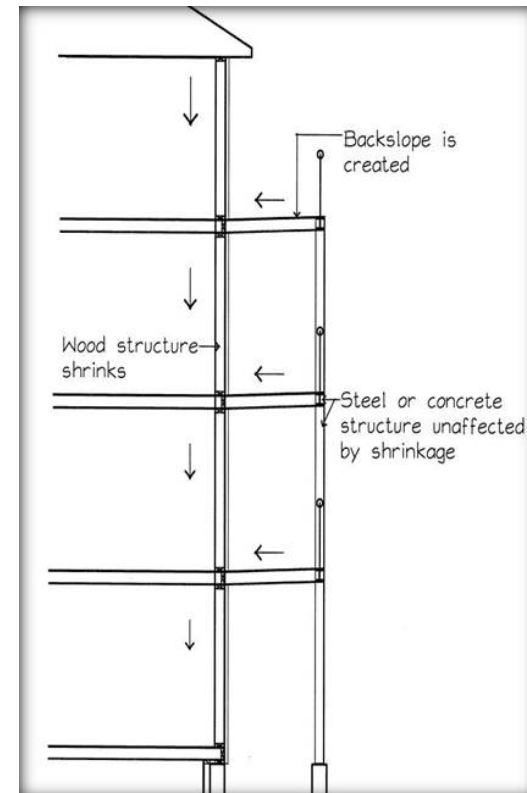
- Wood framed buildings should be designed to accommodate frame shrinkage.
- Allow  $\frac{1}{2}$ " per floor for frame shrinkage.
- Post supported balconies should be supported on a wood structure which exhibits the same shrinkage as the wall structure, or
- Provide sufficient slope in the wood balcony framing to ensure positive drainage after shrinkage has occurred.
- Wood decks should be designed with a slope of  $\frac{1}{4}$ " per 12" or 2% slope.

## Example:

- With a  $\frac{1}{4}$ " per 12" or 2% slope, an 8ft.-wide balcony would have 2" elevation difference from wall to drip edge.
- With a  $\frac{1}{8}$ " per 12" or 1% slope, the same deck would have a 1" differential.
- At  $\frac{1}{2}$ " shrinkage per floor, the wall framing total shrinkage at the third-story floor elevation could have shrunk  $1\frac{1}{2}$ " compared to the original elevation.
- With an  $\frac{1}{8}$ " per 12" original slope, there would be back slope issues.

# Frame Shrinkage

The photo below shows a very large and expensive custom built home in Florida. If you look closely in the glass reflection, you will notice that poured concrete columns were used to support the outer edge of the deck. Shrinkage, frame shrinkage, and too little slope to begin with created a problem that cost a very substantial amount of money to correct.





# Diverters

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Once the deck has been designed with the proper slope, it is critical that water be deflected away from deck transitions at adjoining walls.

Even a rain screen wall system may have difficulty handling the volume of water flowing from a deck surface that is not diverted properly.

Simple, pre-manufactured diverters can be installed on the deck surface and waterproofed to easily deflect water away from any critical areas.



# Diverters

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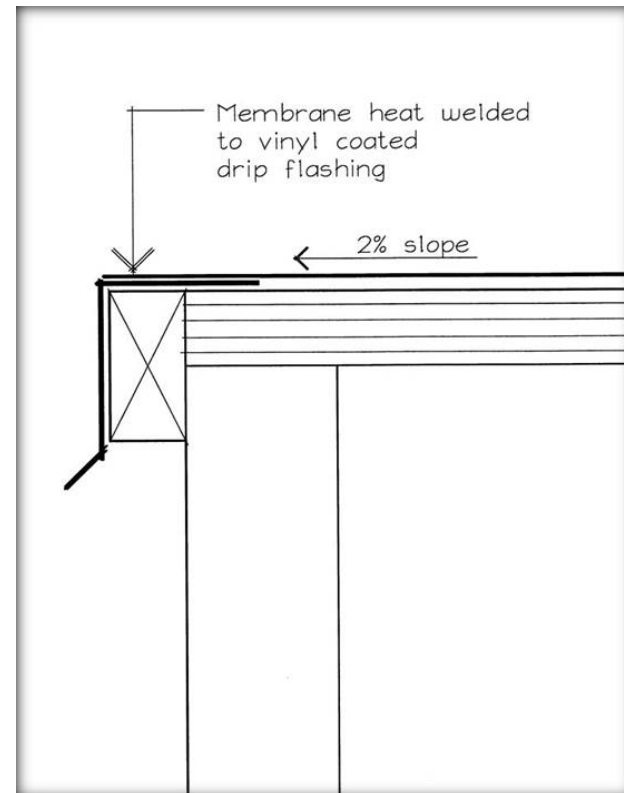
As shown here, although there was design consideration to deflect the water away from deck structure with a generous drip edge overhang, there was no thought of diverting the water away from the critical wall/deck intersection. There was also an issue with the sequencing of trades, and the stucco was applied directly over the decking membrane, helping to trap water run-off. Diverting the run-off will prevent unsightly stains.



# Drip Flashing

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Diverting deck water run-off away from the building's wall system with a generous drip flashing and overhang, or into a gutter system, greatly reduces the drainage requirements of the wall system and improves its drying mechanism capabilities.





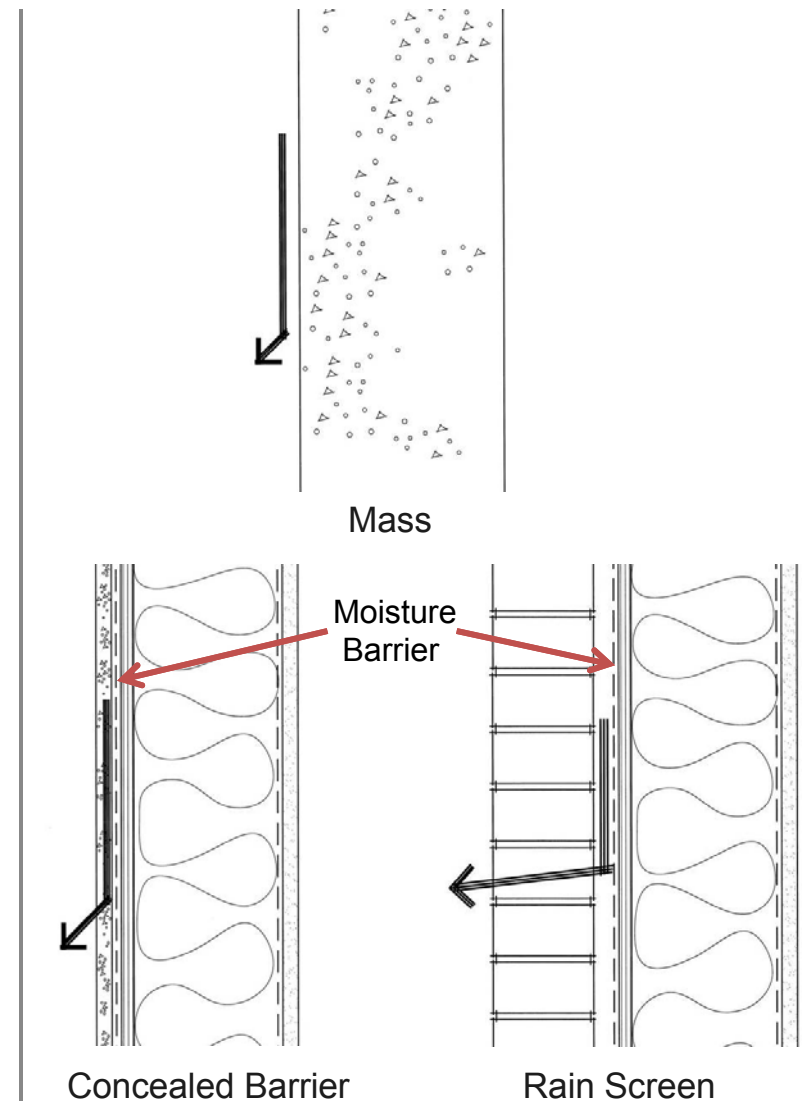
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# Drainage

# Wall Assemblies

There are many ways to describe basic wall systems. This presentation describes the basic wall systems frequently encountered. They are:

- **Mass Wall:** For example, cast-in-place concrete walls.
- **Concealed Barrier:** This is the typical residential wall design with different exterior cladding fenestrations.
  - Typical moisture barriers include time rated building paper and various air seal membranes now in the marketplace.
- **Rain Screen:** This is your typical masonry veneer wall system, but we are seeing this system used with conventional wall cladding systems. Rain screen wall systems are a code requirement in some jurisdictions.

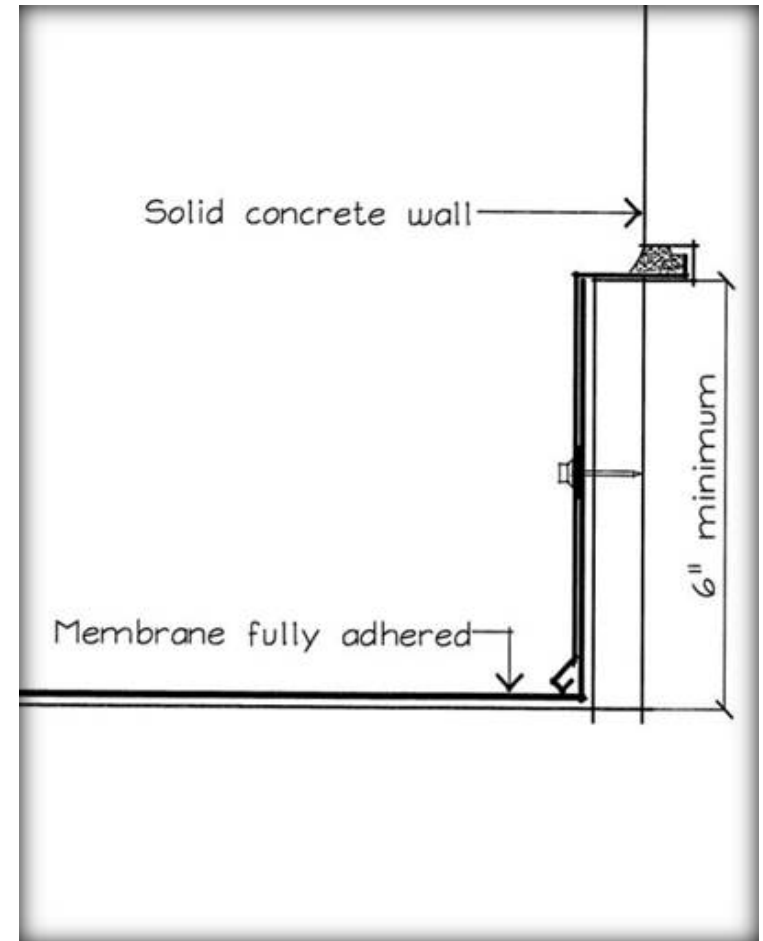


# Wall Assemblies: Flashing

## Wall Assemblies and Importance of Sequencing

### Flashing to mass wall systems:

- The preferred method is flashing off into a reglet that is either cast or cut into the poured concrete wall 6" minimum above the deck surface.
- It is preferable to use 6" as the minimum upturn of the membrane up any vertical surface. Some consultants prefer 8". This height can also vary depending on local code requirements.



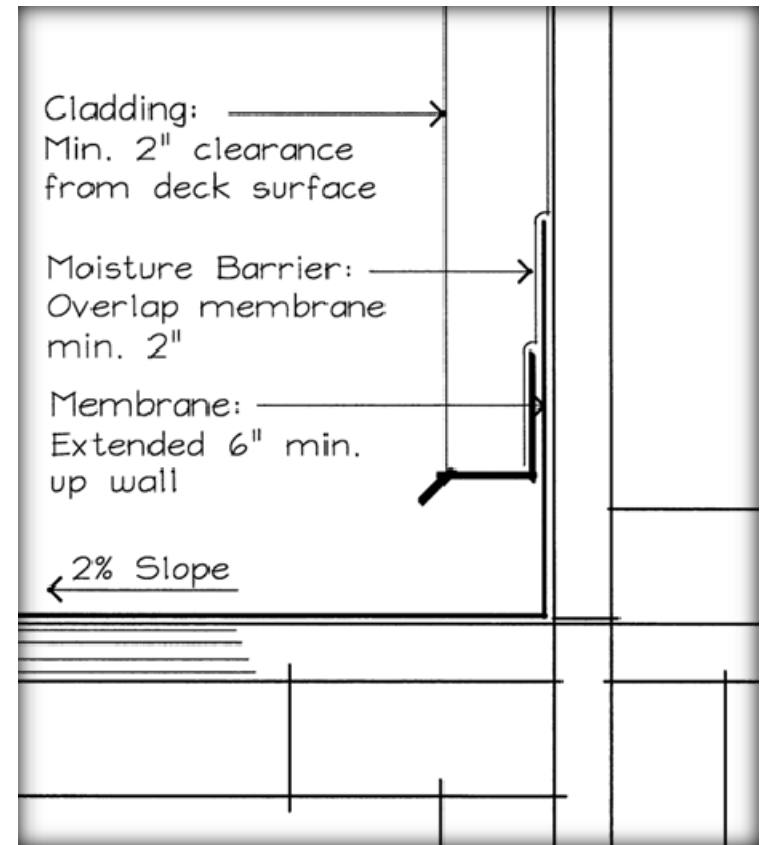
Mass Wall

# Wall Assemblies: Flashing

## Wall Assemblies and Importance of Sequencing

### Flashing to concealed barrier wall systems:

- The membrane extends a minimum of 6" up the wall and moisture barrier (MB) then overlaps it by 2". All cladding or stucco is kept 2" clear of the deck membrane surface.
- Note that a face sealed stucco wall is flashed the same way as the concealed barrier.



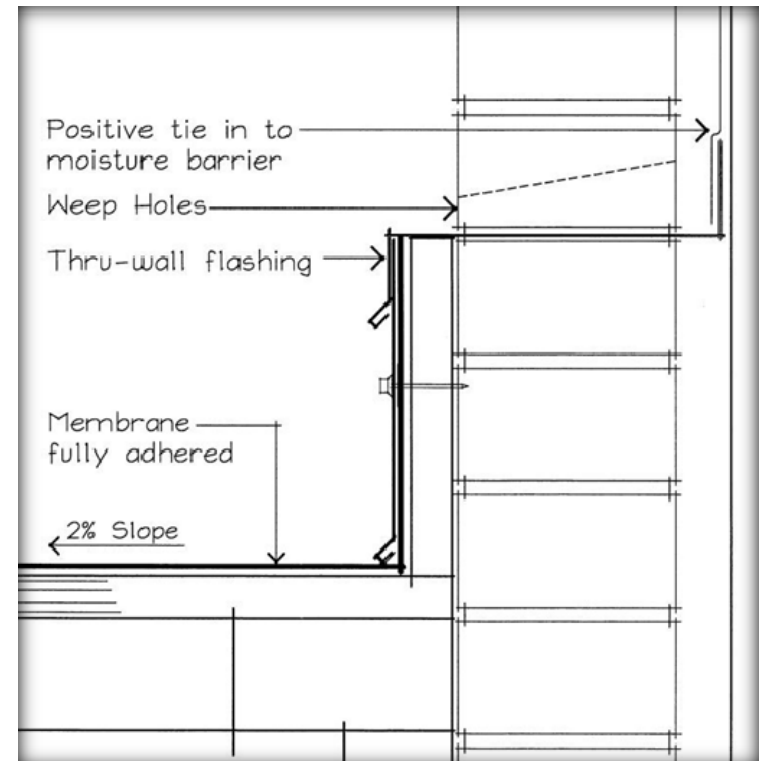
Concealed Barrier Wall

# Wall Assemblies: Flashing

## Wall Assemblies and Importance of Sequencing

### Flashing to rain screen wall systems:

- Masonry veneer: membrane extends 6" minimum up wall and is overlapped by through wall flashing which is placed by the masonry contractor. Through wall flashing should be properly lapped by the moisture barrier. Weep holes should be provided for wall drainage.
- Siding veneer: flashed the same as the concealed barrier system.





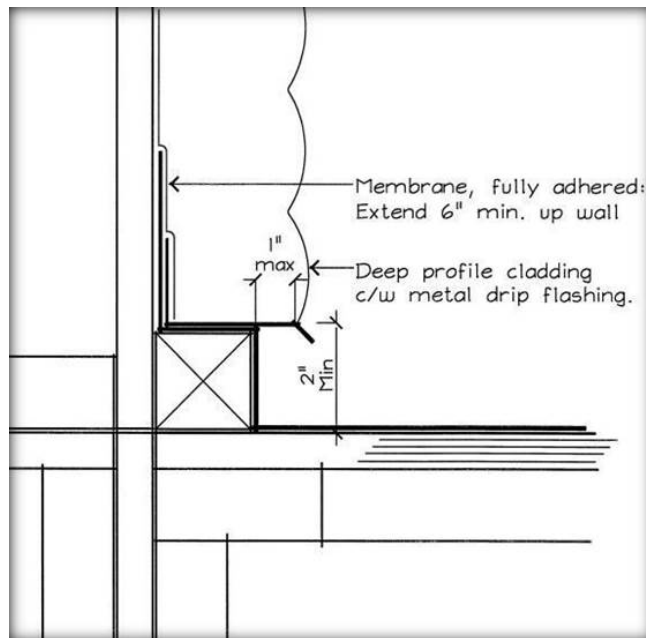
# Wall Assemblies: Faux Finishes

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Some of the new “faux” wall finishes look great but are not particularly functional when it comes time to waterproof or consider the eventual necessity of replacement.

For future deck membrane remedial work, it is recommended to use a wood block “plinth” to extend the face of the flashing membrane to within 1" of the cladding's exterior finish.

As with all systems, it is recommended to take the membrane 6" minimum up the vertical surface and overlap MB 2" minimum—keeping wall finishes 2" from the deck surface.

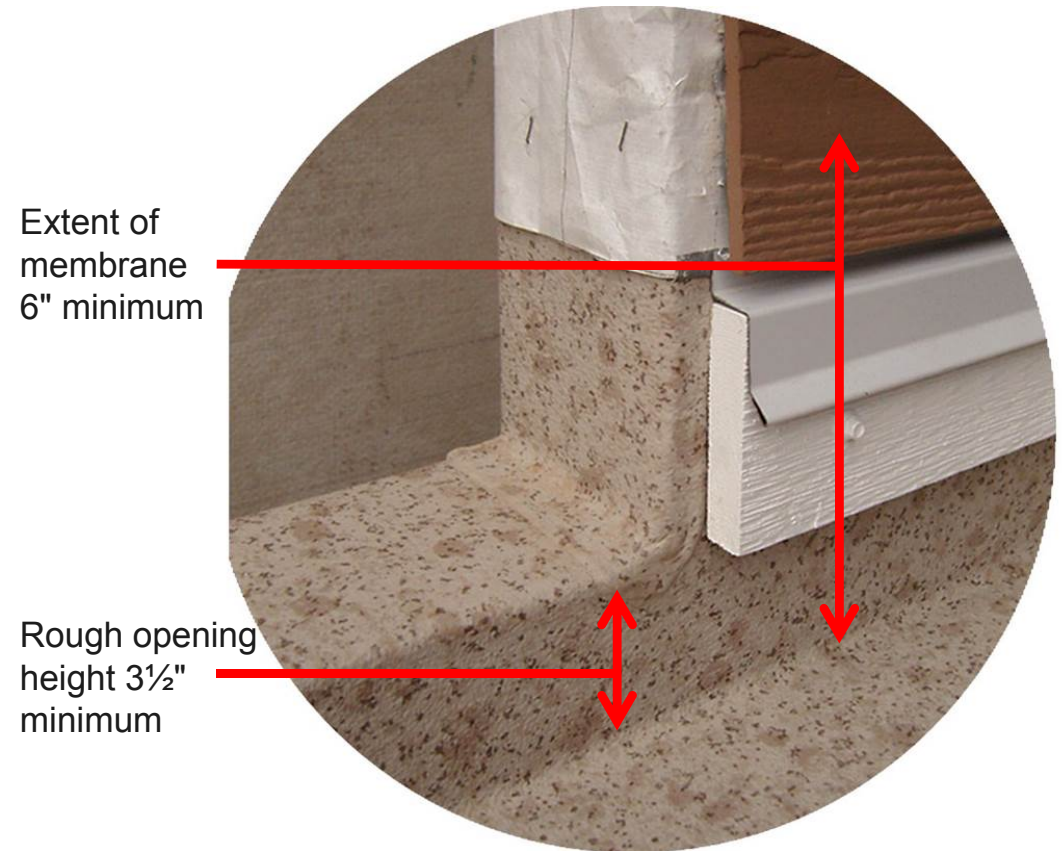


# Door Openings

The membrane extends 6" minimum up the wall and then extends, at the same height, into a rough door opening, creating a watertight door flashing "boot."

It is important to note that installing 6" up a wall or penetration plane is a minimum requirement. Many local codes, designers, and roofing associations prefer 8" and some require 12".

A 3½" rough door opening height should be sufficient. This allows for a wood sill plate and a shimmed wood sub sill plate for slope.



# Door Openings

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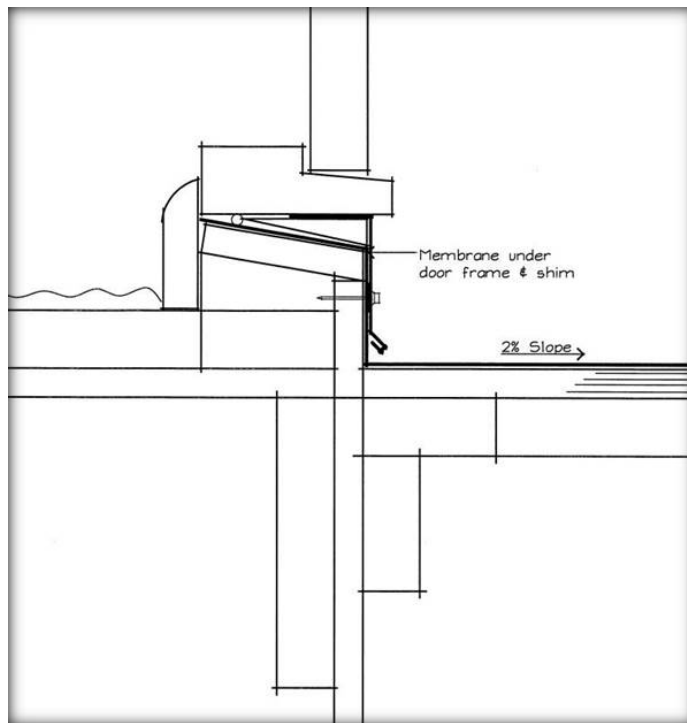
Some authorities require the door sill height to be 6" above finished deck/patio heights. This requirement can be relaxed to 3"–4" for roofed over decks and entrances. A 2' overhang is not considered roofed over.

Higher sill heights are harder to step over. Lowering the finished deck height in relationship to the floor elevation is another option, but is costly on multi-story, multi-family structures.

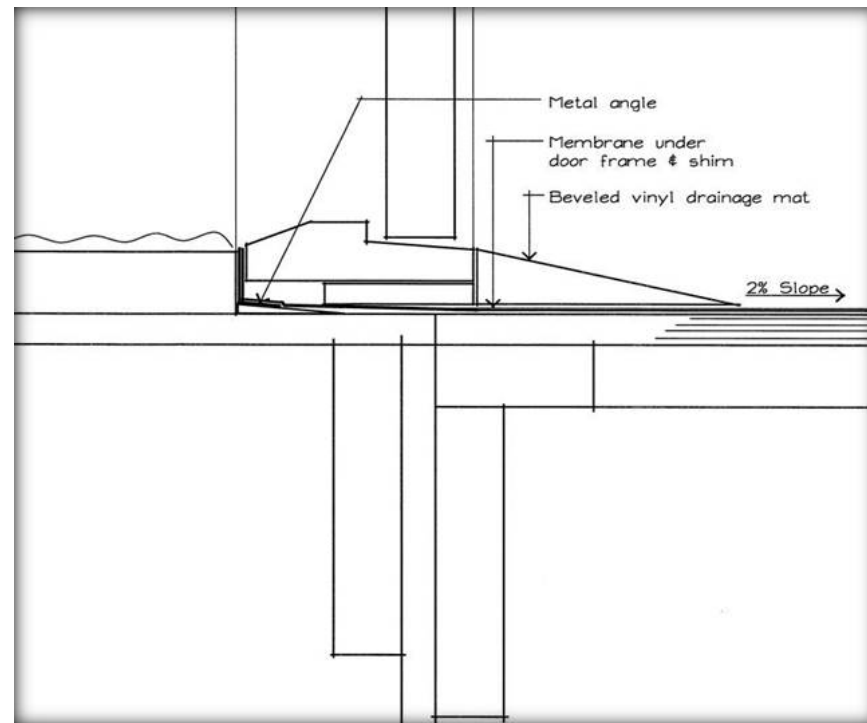
The practice of not removing the doors on retro jobs, because of costs, should be avoided. Doors cannot be relied on to be watertight.

# Door Openings

Pictured here are the two typical door opening details often seen in the industry. Waterproofers generally do not prefer the accessible door concept on the right. To make accessible doors more water resistant, there should be a generous deck slope away from the door opening, the doors should be sheltered from driving rain, and if possible, placed on the leeward side of the building.



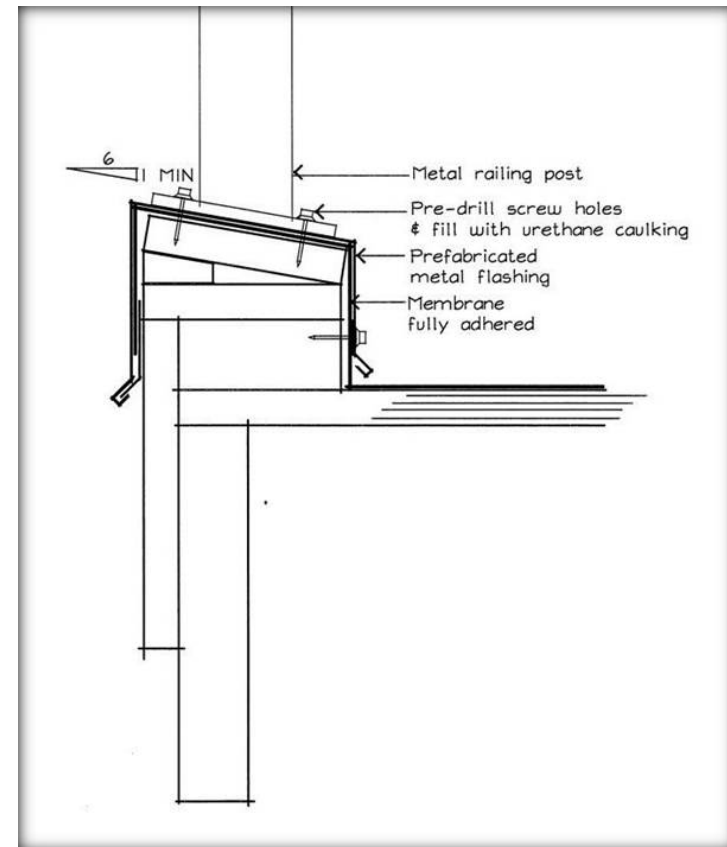
Raised Door



Accessible Door

# Curbs

The membrane extends over the curb to the drip flashing and overlaps the starter strip. The blocked and sloped curb deflects the water back onto the deck. Additionally, the generous wood trim and drip flashing divert the water away from the exterior wall finishes.

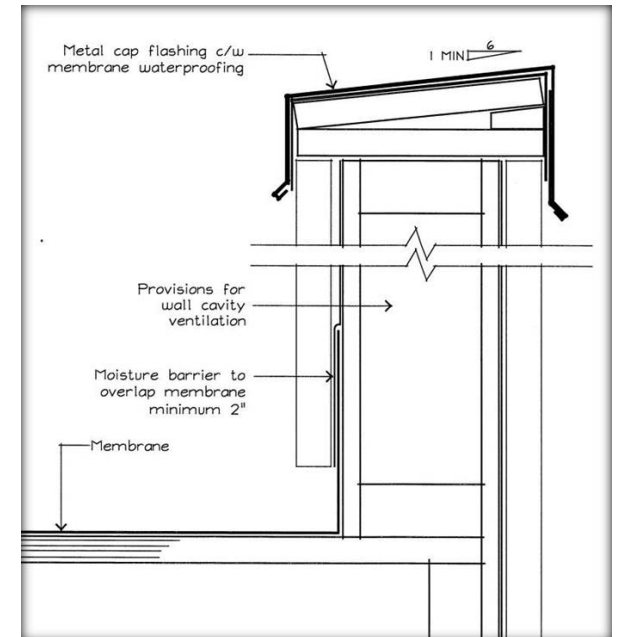


# Free-Standing Walls

The first image depicts what happens with a free-standing “pony” wall. They should be built and waterproofed in the same manner as the building’s wall system. This second image shows the proper sequencing of materials.

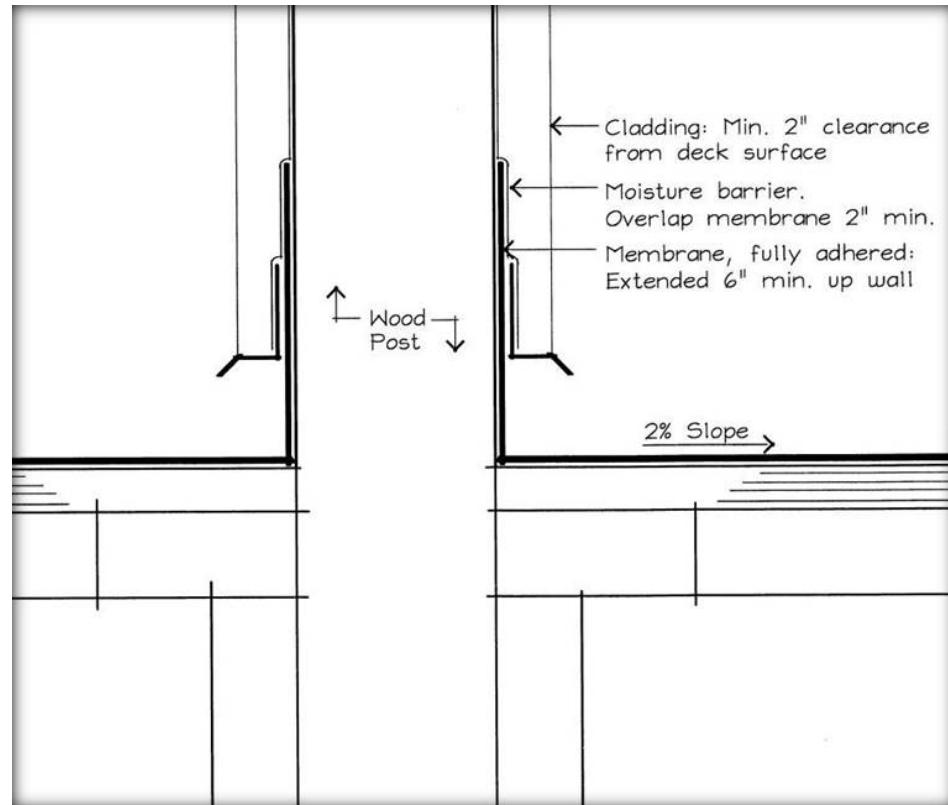
Note that the moisture barrier—in this case, building paper—is a water “shedding” membrane to be used on vertical surfaces; peel and stick type of “waterproofing” membrane is used on horizontal surfaces with special attention for saddle and other transition details.

As with any wall system, the cladding should finish 2" off the deck surface to reduce the possibility of water wicking.



# Wood Post

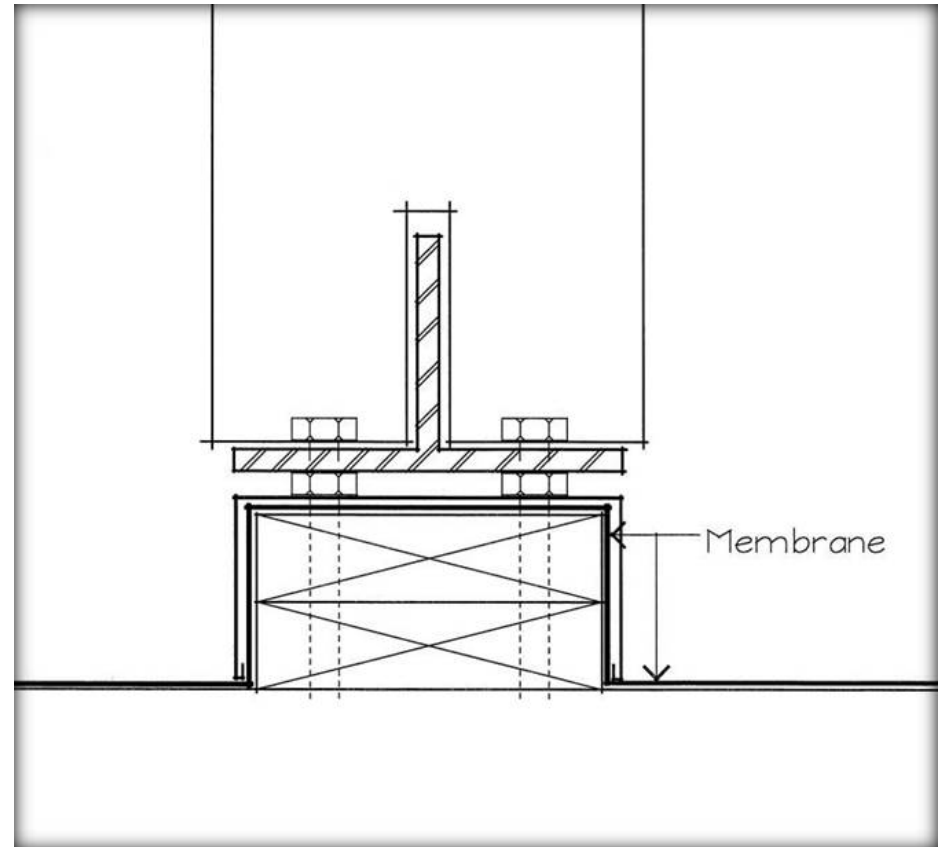
No exposed wood-posted post can be waterproofed. Shrinkage cracks will allow water to penetrate to the structure over time, even with a diligent caulking maintenance program. When it comes to waterproofing, treat a post like a wall—the membrane extends up the post 6" minimum, and then the post is clad with a waterproof finish.



# Exposed Wood Post

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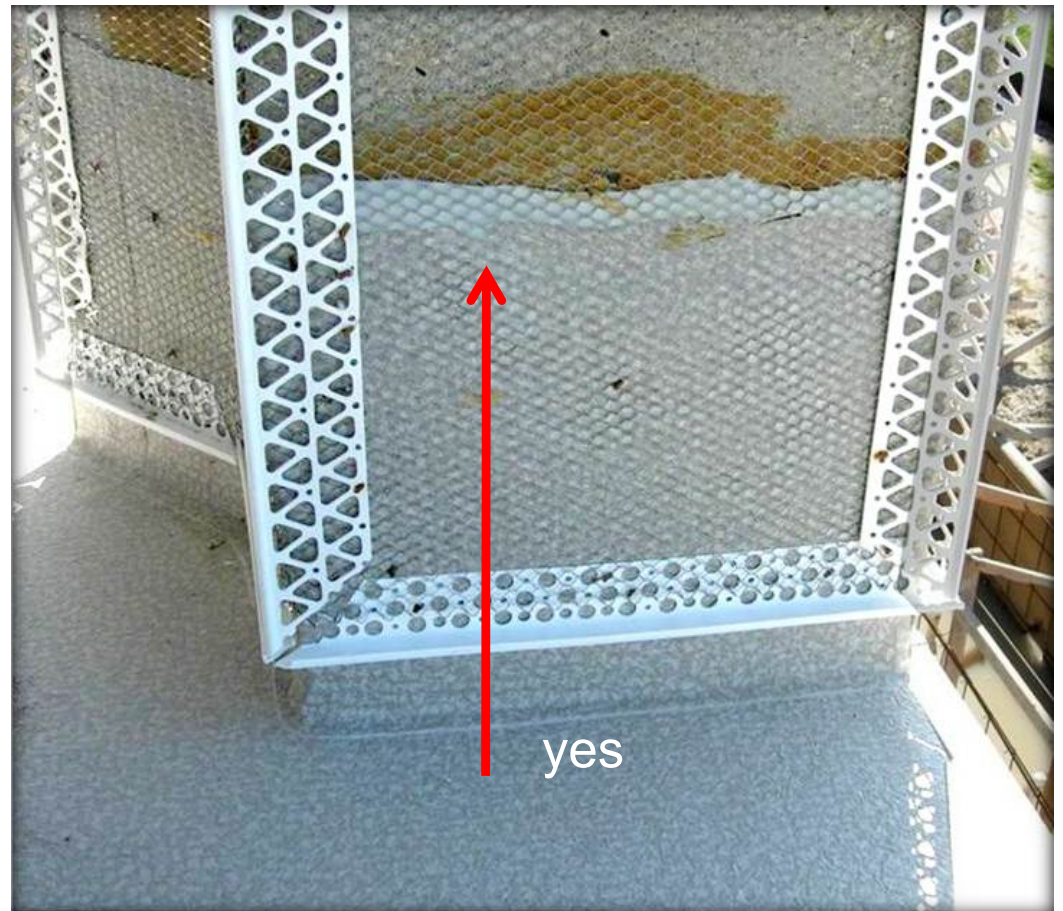
If the look of a rough hewn wood post is required, then look at waterproofing a raised base and making the post connections through the top of the curb. Seal the membrane at the curb penetrations with urethane caulking.





# Stucco Clad Column

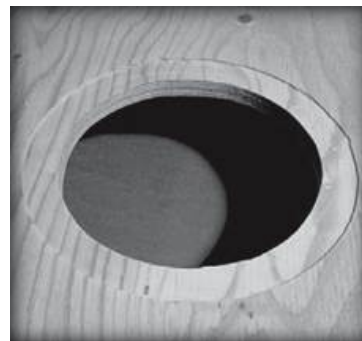
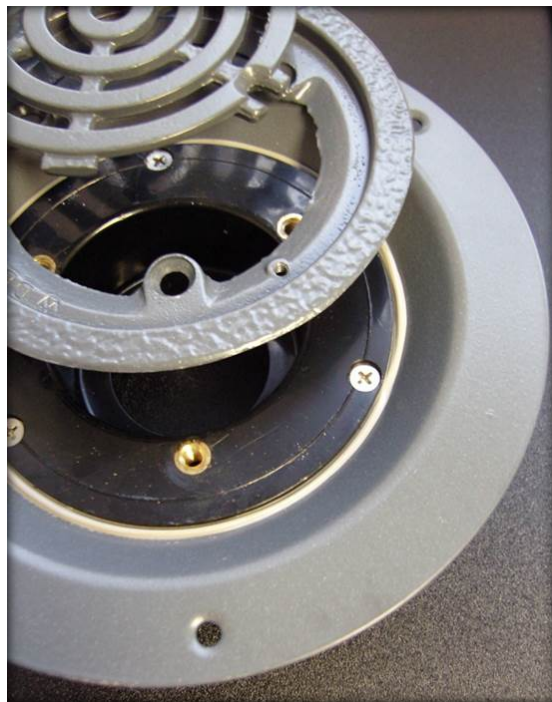
The column in the left image cannot be properly waterproofed. The membrane would be terminated at the column base and caulking used to “flash off.”



# Roof Deck Drains

We have discussed diverting rainwater on the surface of the membrane to where you want it to go and how to drain rainwater that has penetrated the building envelope. For trapped decks, it is important to manage ponded water with the use of drains and overflow devices.

This is a commonly used drain in our industry. The membrane is positively, mechanically fastened with a clamping flange, as shown in image #5.



1



2



3



4



5



6

# Coated Overflow Drains

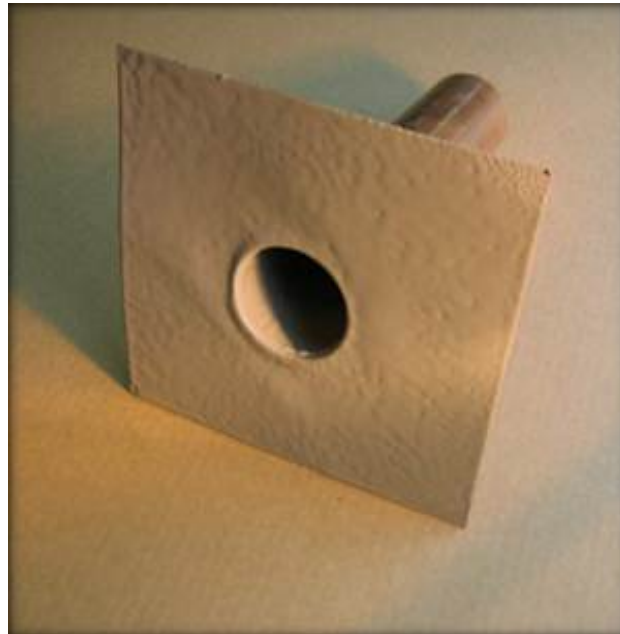
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The overflow should be located in the approximate area of the roof drain. The opening height should be lower than any building opening but no higher than 2" above deck height.

A plastisol coating allows for the vinyl membrane to be hot air welded directly to the drain surface.

The drain pipe should be installed with a slight slope downwards to allow for possible wood frame shrinkage.

Overflow devices are installed in case the deck drain gets clogged with leaves, towels, mats, or other debris. They should be visible to allow for easy access should they need to be unclogged. The overflow requirements are dictated by local plumbing codes.

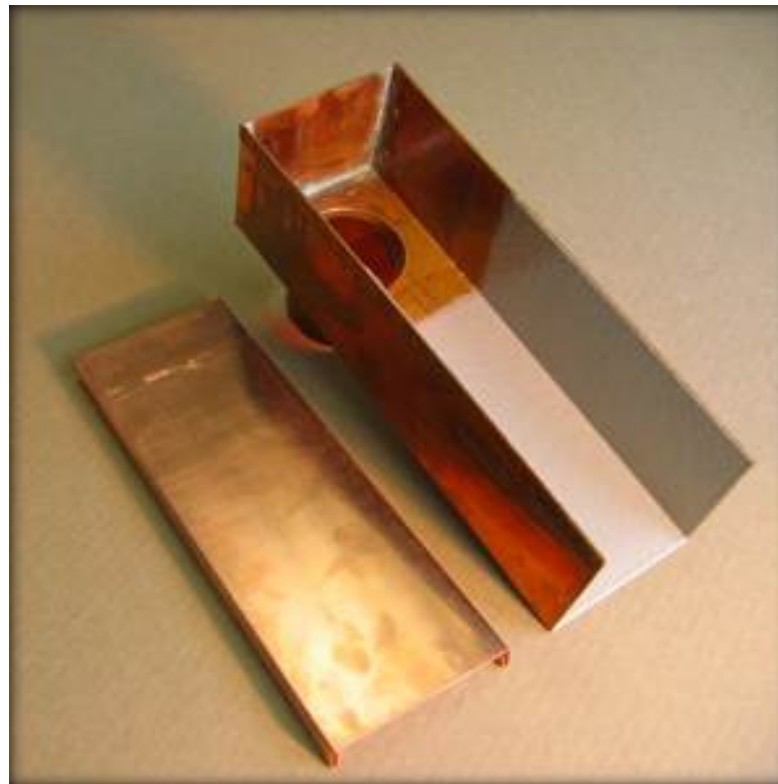


# Coated Box Scupper

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Coated box scuppers are sometimes used in lieu of drains and overflows—check with the local plumbing authority for acceptance in their jurisdiction. A plastisol coating allows for the membrane to be hot air welded to the scupper flange. The scupper should be installed with the slope downwards to accommodate possible wood frame shrinkage.

Note the lid for the scupper box; it keeps the water from “splashing back” into the wall system and keeps birds, insects, and rodents out, as well.





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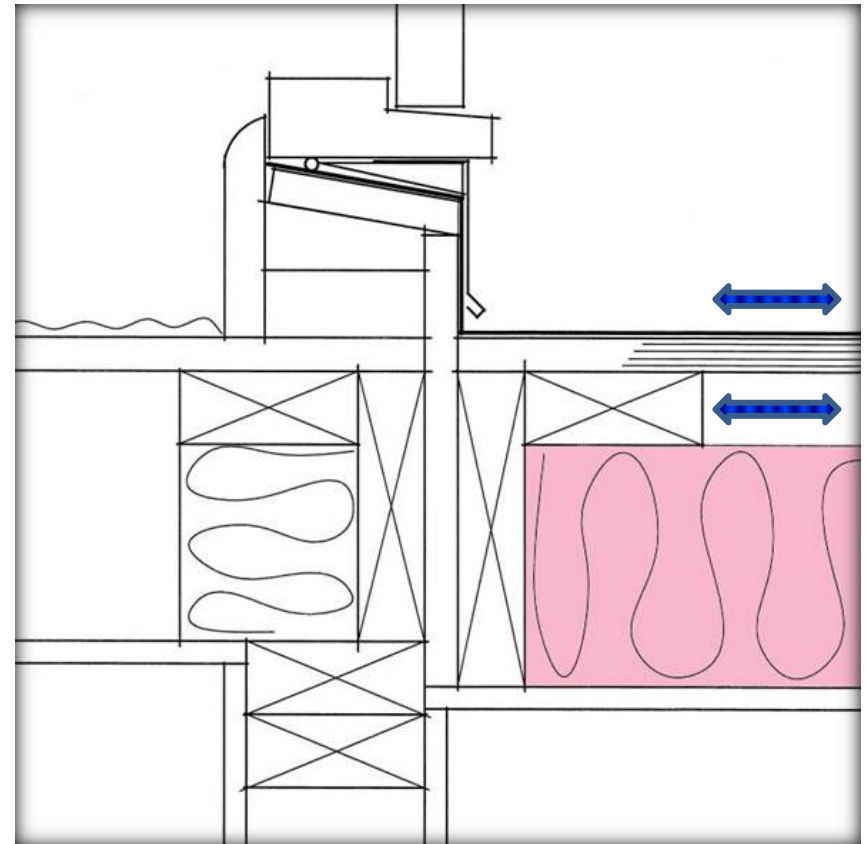
## Other Design Considerations

# Ventilation: Roof Decks

Another source of moisture that affects the long-term performance of walkable roof deck systems is ventilation. Ventilation helps to reduce vapor build-up.

Most wood framed roof decks we see are “cold” roof assemblies. The underside of the deck is vented to the exterior. Amount of ventilation is dictated by governing building code.

Each joist run should be vented at both ends. If this is not possible, then wood strapping/ purlins should be used to create cross-ventilation. This is referred to as a cold roof assembly, as the membrane temperature is not affected by convection or radiant heat from the building below.

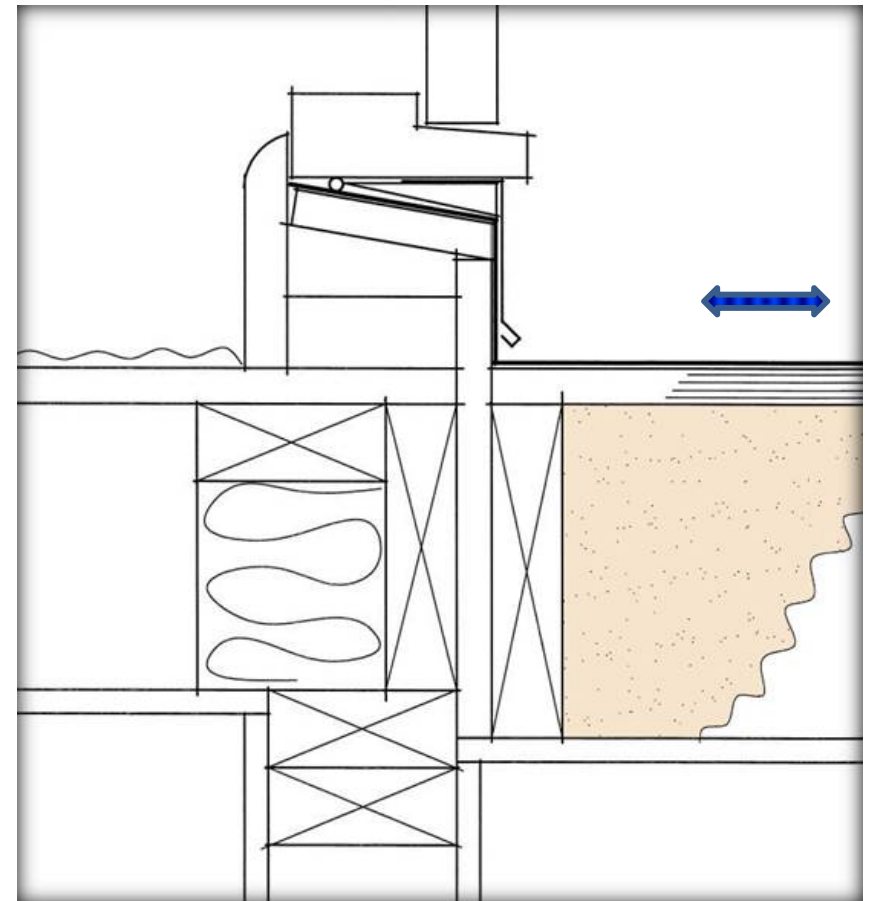


Cold Roof Assembly

# Ventilation: Roof Decks

The use of open and closed cell foams sprayed into the joist cavity is on the increase. This is referred to as a “warm” roof assembly, as the roof membrane is warmed by heat transfer from the structure below.

The concern is, with any assembly, that an excess vapor drive can cause the substrate to lift, buckle, or otherwise deform due to seasonal building moisture content cycles. Such irregularities can telegraph through the membrane.



Warm Roof Assembly

# Ventilation: Balconies

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These images show what can happen when, over a period of time, a poorly sealed dryer vent leaks warm, moist air into a finished balcony soffit area.

Balconies are defined as decks supported on one or two sides only. The balcony support joists are cantilevered interior floor joists or “outriggers.” Sources of warm, moist air can be air leakage at joist pockets or poorly fitted vent ducts located in joist space. Here, the underside of the balcony deck is un-insulated, becoming a “cold plane.”

Warm, moist air that comes in contact with a “cold plane” during cold periods can condensate. Consider using a closed cell spray-in foam insulation at joist pockets. Also, seal and insulate mechanical services running in the balcony deck assembly. Even with fire rated balcony soffits, allowances should be made for ventilation.







# Railing Attachment

Railings can be attached directly on the deck assembly (called surface mounted) or on a raised baseplate (with waterproof flashing).

In Canada, 2005 NBC does not allow for surface mounted railings with or without a raised baseplate on any waterproofed deck or balcony attached to a wood framed structure. Check with local building officials for their ruling, as rulings vary by jurisdiction.

Railings can also be fastened to curbs and low partition walls. When fastening through a vinyl membrane, pre-drill a pilot hole and apply urethane caulking into the hole or to the screw threads.

Caulking of screw heads or caulking at baseplate/membrane interface does not provide long-term waterproofing solutions. Using a gasket under a post baseplate is also ineffective.



Raised Post Baseplate



Curb/Parapet

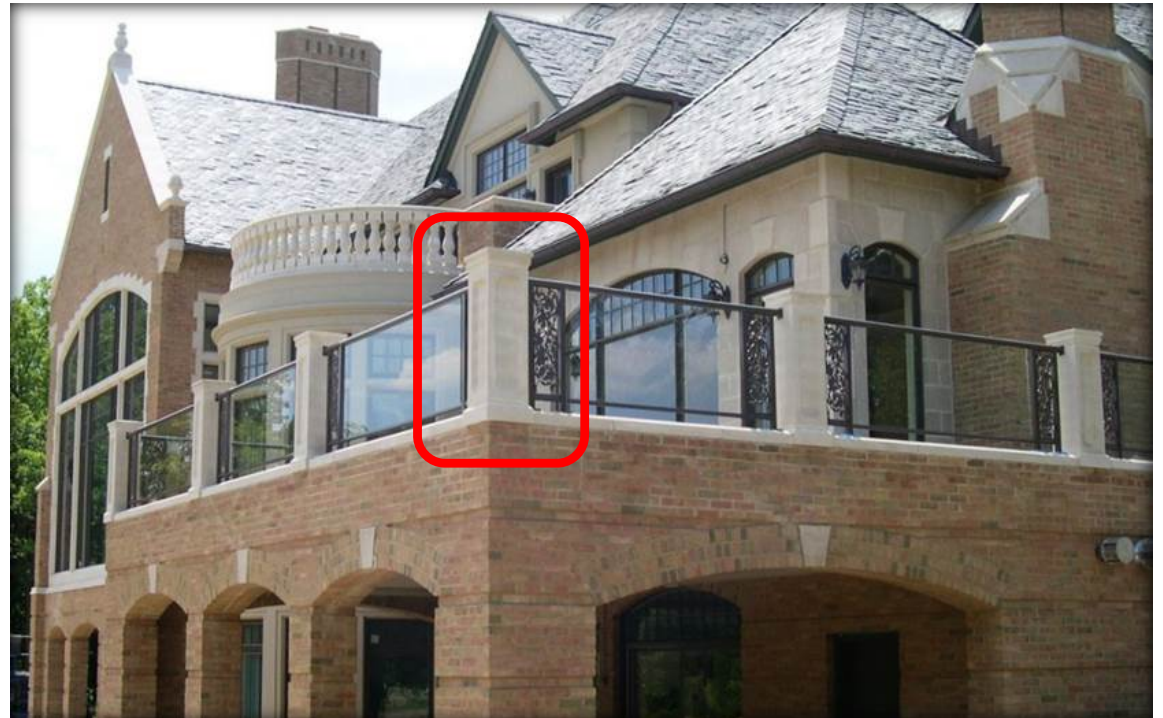
# Railing Attachment

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For a fascia mount, consider protecting the baseplate connection to the fascia from deck water run-off by designing a generous drip edge overhang or by installing (thin profile) gutters.



Fascia Mounted



Post/Wall Mounted

# Compatibility

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Most flat roofing membranes are petroleum-based. Just like you would not think of topping up your crankcase with transmission fluid, you should avoid trying to mix and match roofing membranes. Asphalt is not compatible with vinyl, which is not compatible with coal tar pitch, which is not compatible with EPDM, modified bitumen, TPO, etc.

- Vinyl membranes contain plasticizers that can affect both butyl-based and rubberized asphalt-based self-adhesive membranes.
- Peel and stick (P&S) membranes are used as a flashing membrane around doors, windows, and other building openings.
- Vinyl membranes should be separated from the peel and stick membrane with a product that also works as a vapor stop.
- You can use aluminum foil duct tape (do not use fabric-based duct tape), thin sheet metal, or asphalt compatible membranes.



# Protection

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Walkable deck membranes should be protected during the construction process; the level of protection depends on traffic and exposure. In this image, the deck is also used as a staging area for work above, but since it is well protected from the environment, plain fiberboard was used because the deck was subject to debris from remedial stucco work. A continuous poly sheet was installed under the protection board. The panels were taped together to help prevent the panels from slipping. Protection of the deck membrane should be written into the specification and the cost borne by the general contractor.

## Service duty:

- light traffic
  - corrugated plastic sheet
- heavy traffic - no exposure to weather
  - plain fiberboard
- heavy exposure to traffic, weather and contamination
  - non-treated plywood, panels are taped and secured complete with 6 mil poly underlayment




# Future Replacement

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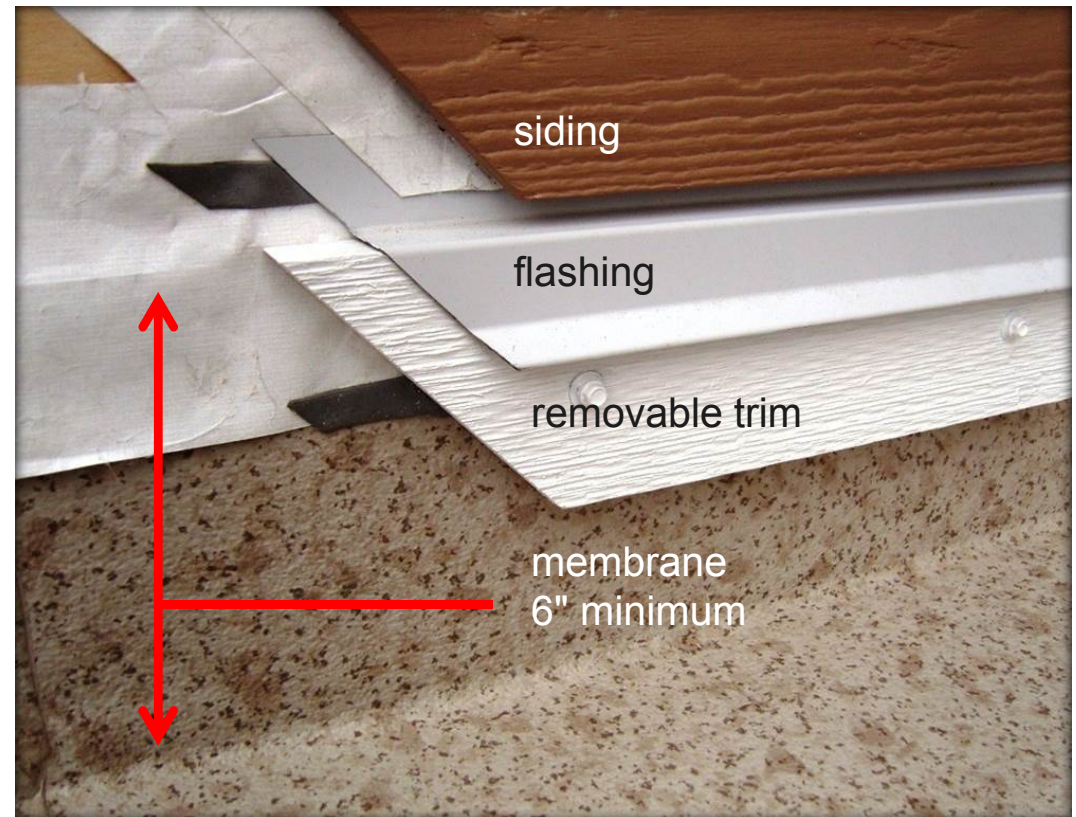
A major consideration for the sustainability of a walkable roof deck membrane system is how easy it will be to replace in the future.

Vinyl membranes can be easily removed from the substrate and at drip flashings. At vertical surfaces, consider incorporating a removable trim board into the wall flashing detail. The trim board can simply be removed, the existing membrane can then be removed and replaced, and new trim board installed. It is now common to see extruded plastic deck boards used as trim boards.

 Please remember the **exam password FLASHING**. You will be required to enter it in order to proceed with the online examination.

# Future Replacement

Using a removable trim board limits what building elements will have to be disturbed, like doors and siding. For example, if this were a stucco wall system, the stucco would have to be cut and removed, new membrane installed behind existing wall moisture barrier, new stucco patched in, and the complete wall surface would have to be cleaned and painted.



# Durability

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The test of time is a good yardstick to gauge the durability of any product. How many warranty cycles their products have been subjected to is a good way to gauge the durability of the manufacturer.

Over 25 years ago, a first generation 20 mil vinyl deck membrane was installed on the common deck area over the parking garage of this senior's residence in Kelowna, British Columbia. It is still functioning as a walkable waterproof membrane.



Senior's Residence, Kelowna, BC

Since that time, 60 mil walkable vinyl roof membranes were introduced. The first generation of these roofing membranes required they pass 600 hours of UV light testing; current codes now require walkable roof deck membranes pass 5000 hours of accelerated weathering. Note, cementitious and elastomeric coatings require only 2,000 hours of accelerated weathering.



# Maintenance

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A typical maintenance schedule should do the following:

- inspect once per year
- repair if required
- maintain caulking
- clean four times a year (dish soap and brush or power wash, rinse with clean water)

The example on the right shows a ten-year-old membrane with west facing exposure. It was cleaned with dish soap and a soft brush, and rinsed with clean water.

Air pollutants can stain. Clean decks are safe decks and are more reflective, reducing a/c loads.



Before

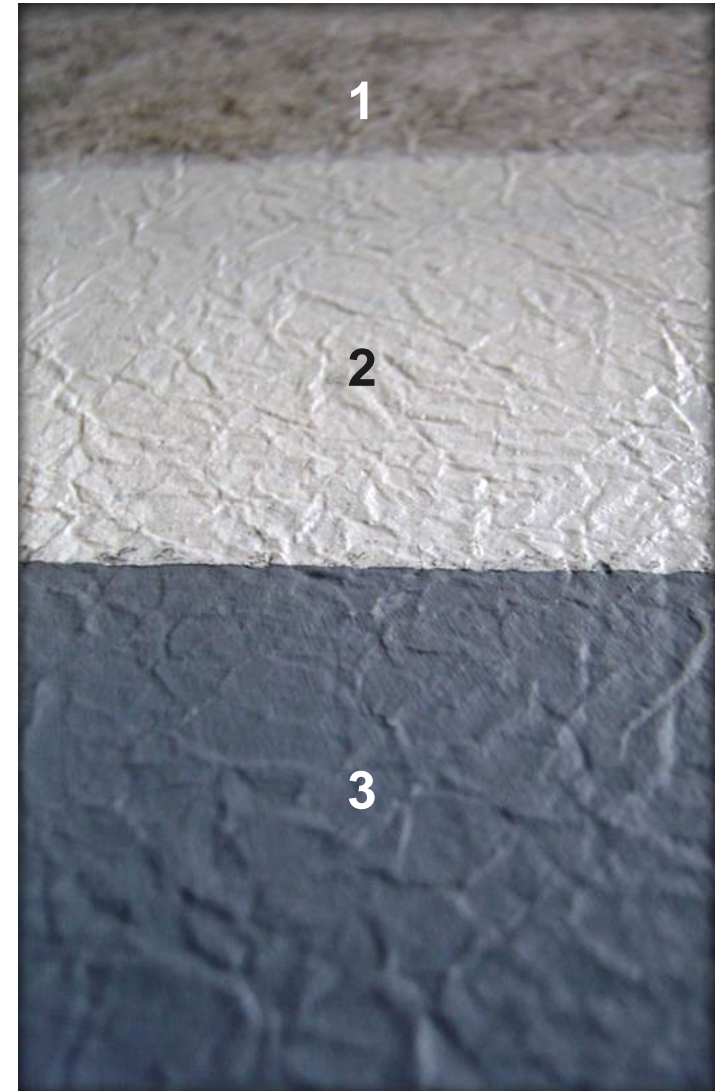
After

# Recoating

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Recoating process:

1. clean existing membrane, repair as required
2. apply two light coats of primer/sealer
3. apply acrylic latex deck paint



# Sustainability

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How sustainable are walkable vinyl roof membranes?

These members don't require harsh cleaning chemicals; produce little product installation waste; are easy to maintain; can be recoated to prolong life; are easily repaired; offer a lightweight assembly, a reflective finish, and a long life; and therefore, are quite sustainable.

Provided there is a requirement for a waterproof walking deck roof, there are no "super green" choices to make. All low slope roofing membranes are synthetic products produced from oil. Of all the choices available, vinyl is likely the greenest.





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## Specifying Roof Deck Systems

# Specifying Roof Deck Systems

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## Part 1: General

- Submit installation and seaming plans, showing joints, termination details, and material interfaces, along with two labeled samples (8½" x 11") of the specified PVC membrane showing finish, pattern, color, and backing.
- Manufacturer to have 25 years experience with products in use. Installers to be trained and approved by manufacturer.
- A pre-installation meeting involving the client's representative, manufacturer's representative, contractor, and installer should be held at least one week prior to the start of installation to discuss pedestrian deck waterproofing practices, as well as any precautions applicable to the specific project.
- For larger, multiple deck projects, as part of the pre-installation meeting, the decking contractor to: waterproof and detail a complete typical deck, review installation with owner's representative and other associated trades. Have owner's representative agree and sign off on typical installation.

# Specifying Roof Deck Systems

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## Part 2: Products

- Model building codes are designed to ensure that buildings are structurally sound, safe from fire, free from health hazards, and accessible.
- Walkable roof deck membrane requirements include:
  - Provide class A, B or C fire protection classification.
    - ASTM E-108 (United States)
    - ULC-S107 (Canada)
  - Conform to CAN/CGSB – 37.54 polyvinyl chloride roofing and waterproofing membrane.
  - Suitability of product as a walkable roof membrane. The following agencies conduct these evaluations:
    - ICC Evaluation Service (United States)
    - CCMC (Canada)
- Product listed by accredited quality control provider. It is very important that the vinyl deck membrane is under a QC program. Having the membrane subjected to a third-party QC program will ensure the product sold out the back door is of the same quality as that which initially passed product approval tests and evaluations.

# Specifying Roof Deck Systems

## Part 3: Execution

- Walkable roof deck membrane system installed by factory trained technicians.

Even if you supply well thought out documents for tender, all is for naught if the installation of the walkable roof deck membrane system is awarded to contractors who aren't trained in the installation of the product. The most important aspect of a good roof deck membrane system is to have it installed by factory trained technicians. It's all in the details!





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# Applications



# Applications

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## Commercial / Multi-Residential



# Applications

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## Commercial / Multi-Residential



# Applications

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## Multi-Residential



# Applications

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## Sundecks



# Applications

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## Porches and Stairs



# Conclusion

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