



# Up the Ladder to the Roof:

## Standards for safety, quality and resilience

January 31, 2020

IIBEC Western Chapter, AGM & Conference



ROOFING CONTRACTORS  
ASSOCIATION OF  
BRITISH COLUMBIA



**RoofStar**  
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## On Deck

### ☆ Exposure Control Plan

- Laurence Matzek, Director, RoofStar Guarantee Program

### ☆ The Roofing Practices Manual (RPM) (Updates) and the Future of Code Development

- James Klassen, RoofStar Technical Advisor

*Thank you for supporting the RoofStar Guarantee Program!*

# Exposure Control Plan

## Agenda

- ☆ Project Overview
- ☆ Chemical Exposure by Roof System
- ☆ Impact to the Roofing Industry
- ☆ Next Steps

# Exposure Control Plan - Overview

☆ WorkSafeBC OHS Regulation

☆ Mandate is to protect workers:

- Injury Prevention
- **Disease Prevention**

# Exposure Control Plan - Overview

## ☆ WorkSafeBC OHS Regulation

### Part 5: Chemical Agents and Biological Agents

- 5.48 Exposure limits
- 5.54 Exposure control plan

## ☆ Pre-2017 WorkSafeBC focused its attention to enclosed spaces

## ☆ In 2017, WorkSafeBC turned its attention to roofing

## ► Exposure Control Plan - Overview

- ★ RCABC was asked to develop an Exposure Control Plan (ECP) tool to assist the roofing industry
- ★ Hired hygienist for the project

**ARCOSE**  
CONSULTING LTD

- ★ Engaged with
  - membrane manufacturers
  - RCABC contractors

# ► Exposure Control Plan - Overview

## ☆ Roofing products containing hydro-carbon

- Primers
- Adhesives
- Cleaners
- Mastics

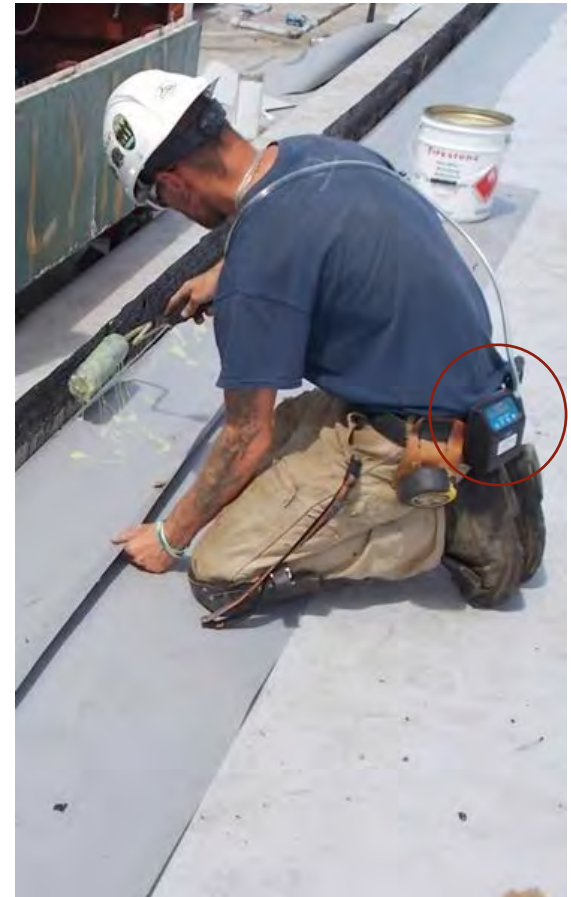
## ☆ 540+ Product SDS Collected & Evaluated





# Exposure Control Plan - Overview

- ★ Measured the workers' exposure during the application



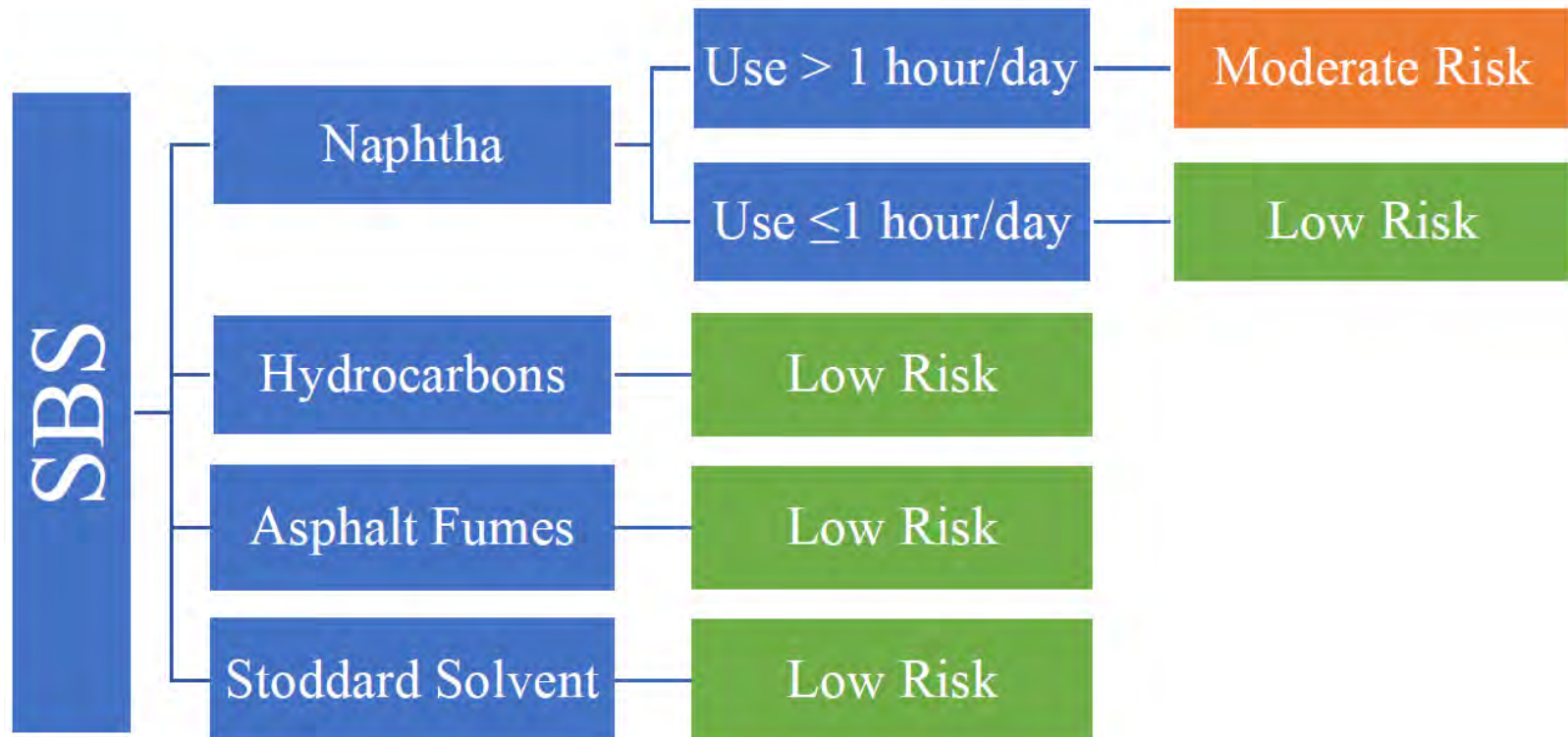


# Exposure Control Plan - Overview

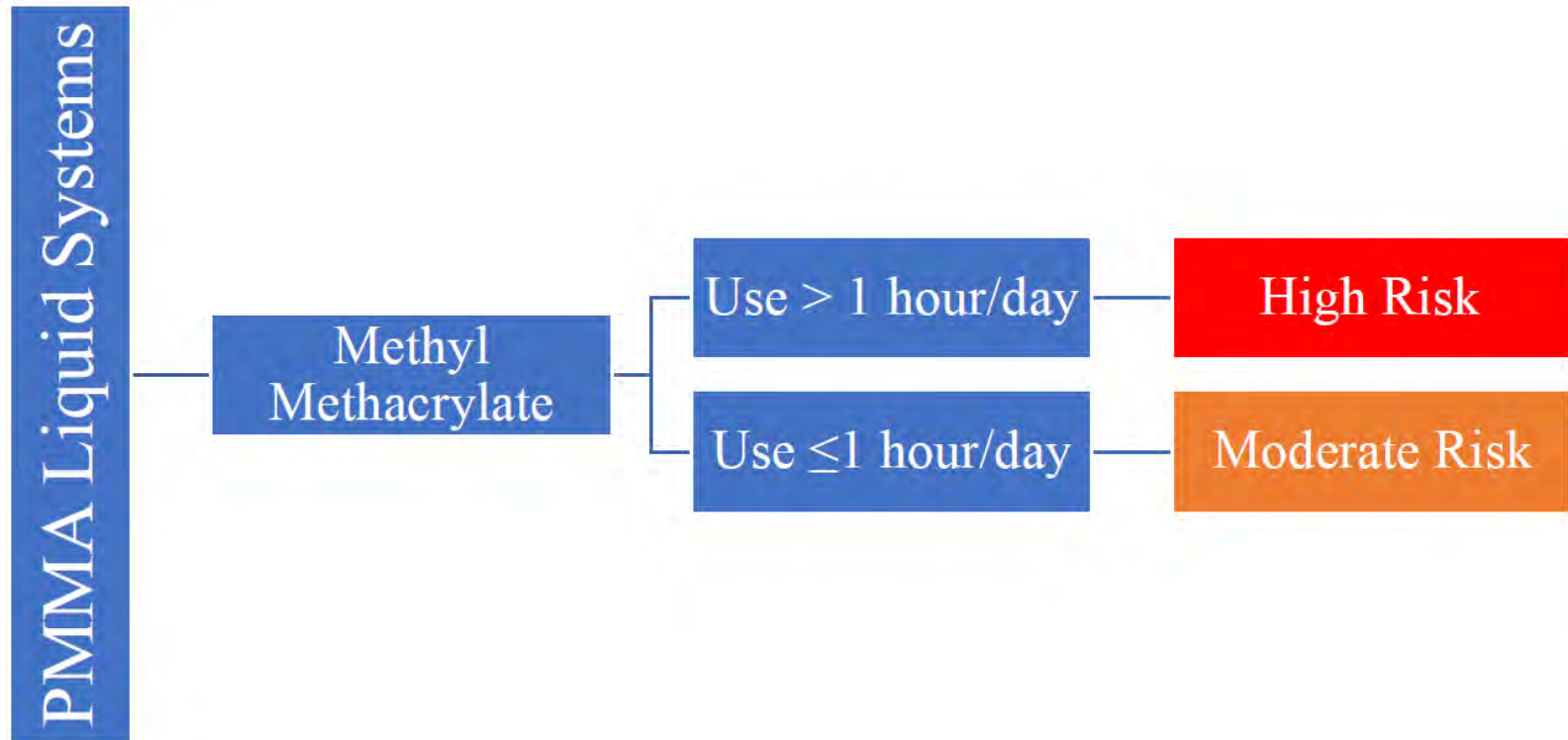
Charts Developed:

- ☆ Membrane type and application
- ☆ Chemical with exposure risk
- ☆ Time of application
- ☆ Risk level

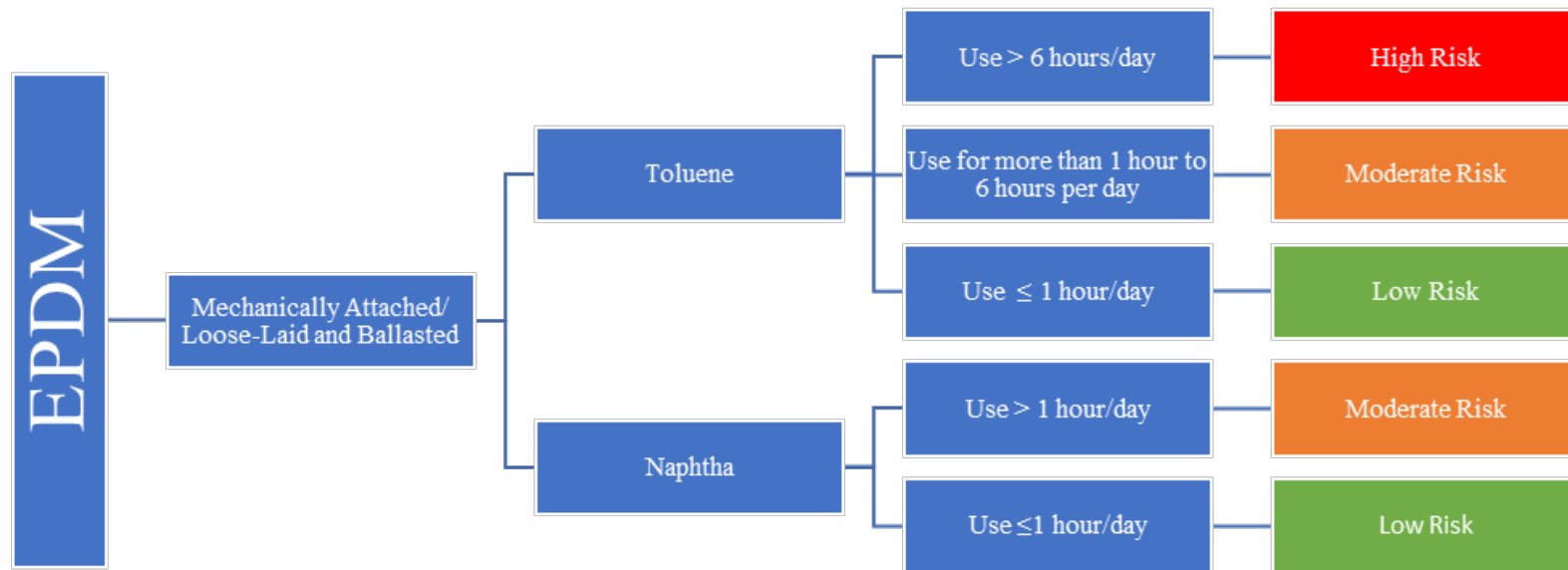
# Chemical Exposure by Roof System



# Chemical Exposure by Roof System



# Chemical Exposure by Roof System



# Chemical Exposure by Roof System



# Chemical Exposure by Roof System

Roof Systems not tested:

☆ PVC

☆ Hot Rubber





# Risk Summary

## ★ Low Risk Operating Procedures

- Eye Protection
- Gloves

## ★ Medium Risk Operating Procedures

- Low risk protection +
- Coveralls / Protective Suit
- Half-mask respirator

## ★ High Risk Operating Procedures

- Medium risk +



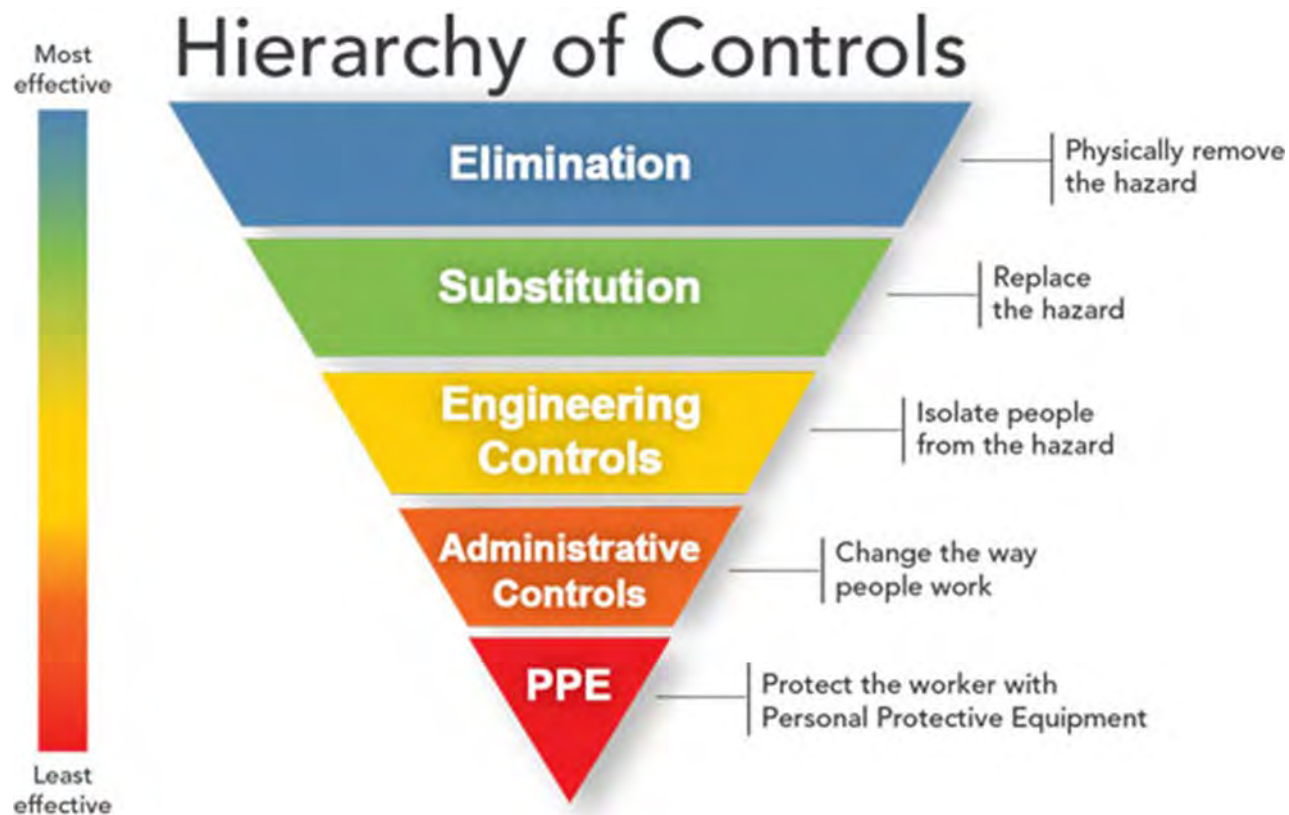
# Impact to the Industry

- ☆ Roofing Contractor
- ☆ Observers
- ☆ Design Authority / Specifier
- ☆ Roof Membrane Manufacturers



# Impact to the Roofing Contractor

☆ OHS 5.55 provides Types of Controls



# Impact to the Roofing Contractor

☆ Program awareness

☆ Regulation Compliance

- Exposure Control Plan
- Site Specific Risk Assessment

☆ Employee Training and Equipping

☆ Project Planning

- Request for alternate membrane applications
- Cost out higher risk applications
- System risk-cost analysis

# Impact to the Roof Observer

## ☆ Protection from Chemical Exposure

- Aware of products at risk
- Time on site
- Proximity to application



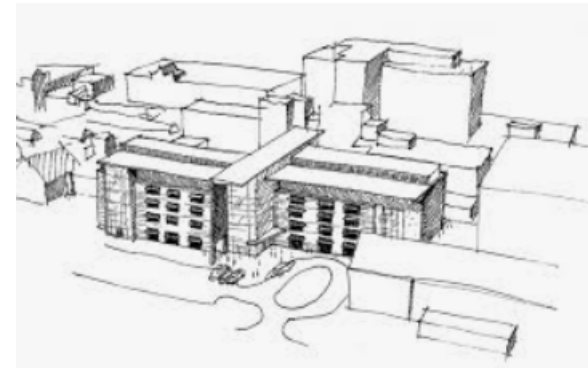
# Impact to the Design Authority

☆ Processing requests for Change Orders

☆ Answering health related inquiries

☆ Project specifications

- Alternate applications options
  - must be considered
  - may become the most economical



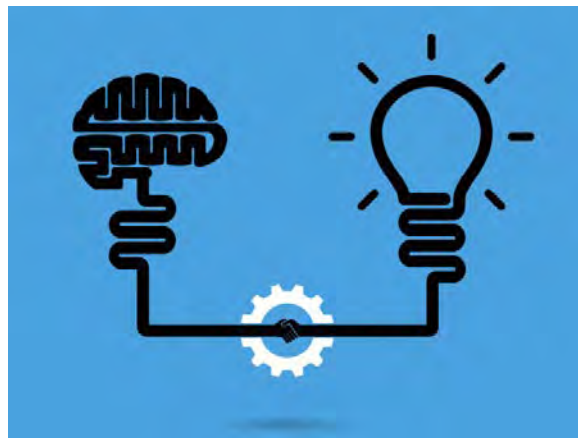
☆ Project Budget Impact

- Costs likely will increase



# Impact to the Roof Manufacturer

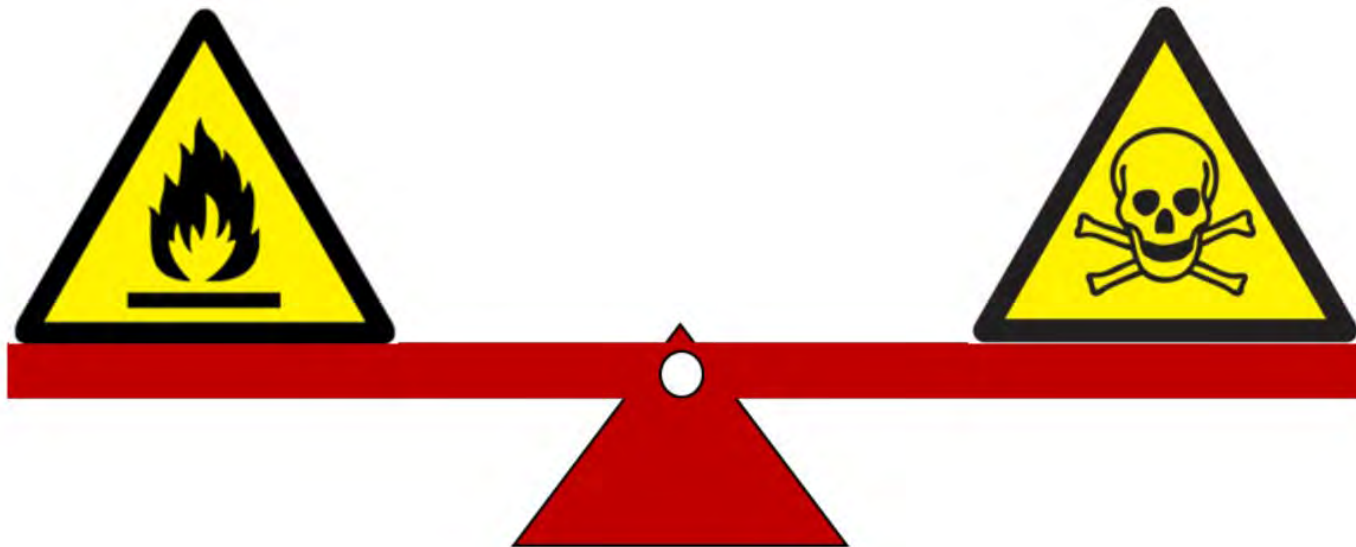
- ☆ Alternate membrane applications
  - Eliminate / low hydro-carbon products
- ☆ Drive innovation towards new applications
  - Compliance and testing to meet product standards is time consuming



# Balancing Risk:

## Hot Works and Chemical Exposure

A risk-cost analysis will guide you in making good roof system decisions



## Next Steps

### ★ Training for RCABC Contractor Safety Officers and Site Safety Assessors

- Langley      February 11 & March 5
- Victoria      February 18
- Kelowna      February 25

### ★ Final Review with WorkSafeBC

### ★ More Information

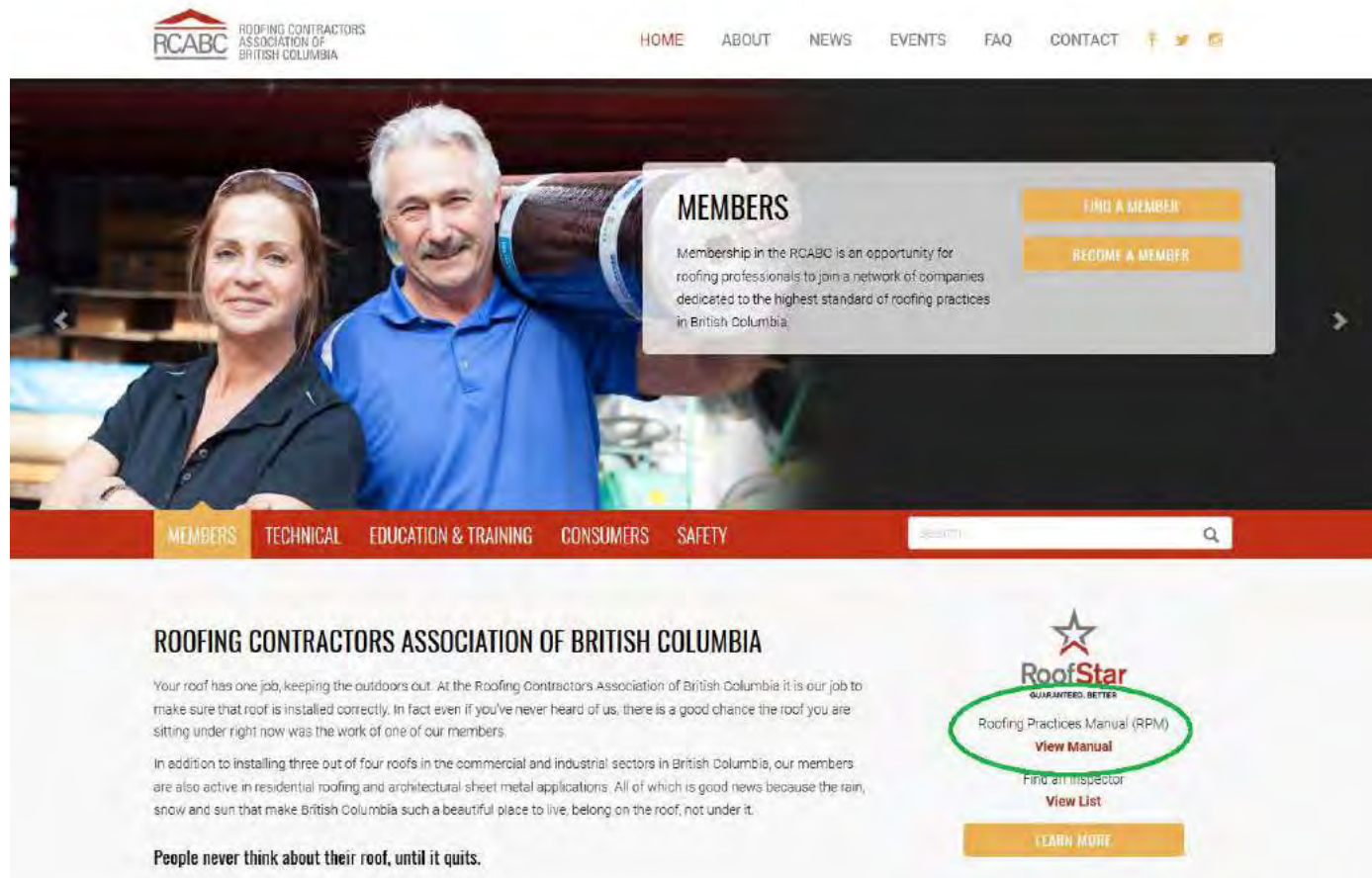
- RCABC
- WorkSafeBC
- Roofing BC Magazine – Winter 2020

# Questions?

## ☆ RCABC Contacts

- Bryan Wallner, CEO
- Rob Scales, Director, Education and Training
- Laurence Matzek, Director, RoofStar Guarantee Program
- James Klassen, RoofStar Guarantee Advisor
- Doug Wells, RoofStar Guarantee Advisor

# The Roofing Practices Manual (RPM)



RCABC ROOFING CONTRACTORS  
ASSOCIATION OF  
BRITISH COLUMBIA

HOME ABOUT NEWS EVENTS FAQ CONTACT

## MEMBERS

Membership in the RCABC is an opportunity for roofing professionals to join a network of companies dedicated to the highest standard of roofing practices in British Columbia.

FIND A MEMBER  
BECOME A MEMBER

MEMBERS TECHNICAL EDUCATION & TRAINING CONSUMERS SAFETY

SEARCH

### ROOFING CONTRACTORS ASSOCIATION OF BRITISH COLUMBIA

Your roof has one job, keeping the outdoors out. At the Roofing Contractors Association of British Columbia it is our job to make sure that roof is installed correctly. In fact even if you've never heard of us, there is a good chance the roof you are sitting under right now was the work of one of our members.

In addition to installing three out of four roofs in the commercial and industrial sectors in British Columbia, our members are also active in residential roofing and architectural sheet metal applications. All of which is good news because the rain, snow and sun that make British Columbia such a beautiful place to live, belong on the roof, not under it.

**People never think about their roof, until it quits.**

RoofStar  
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Roofing Practices Manual (RPM)  
**View Manual**

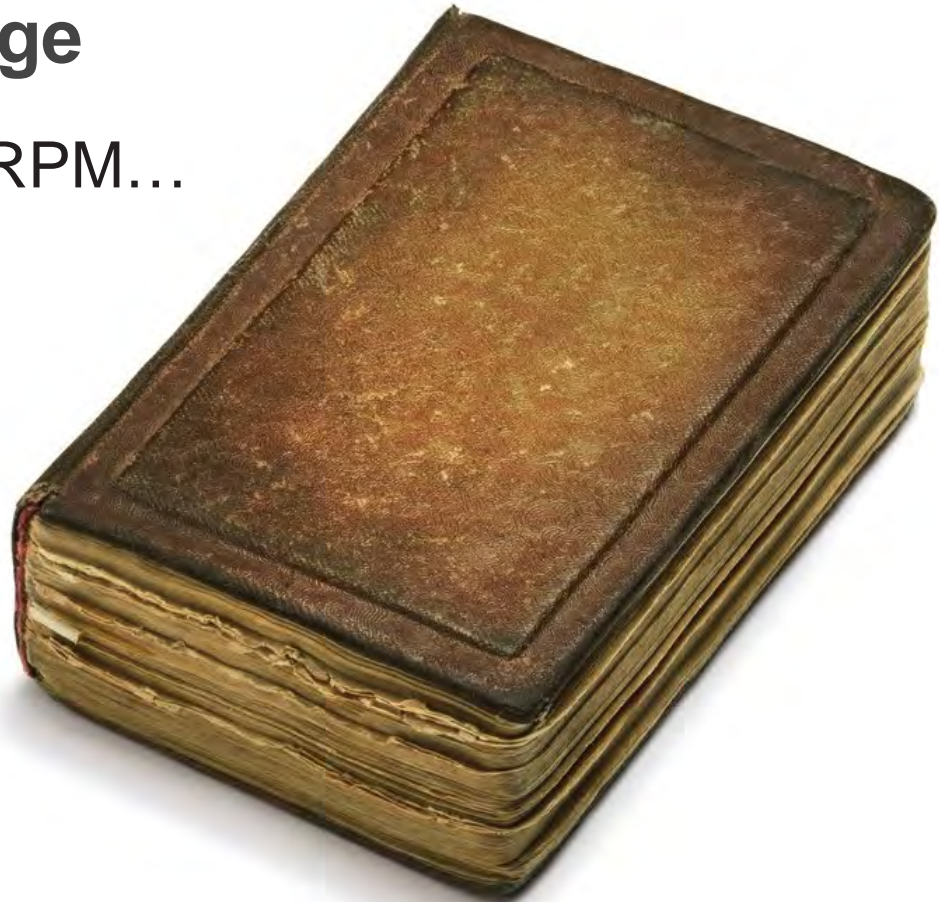
Find an Inspector  
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# Roofing Practices Manual (RPM)

**Some things change**

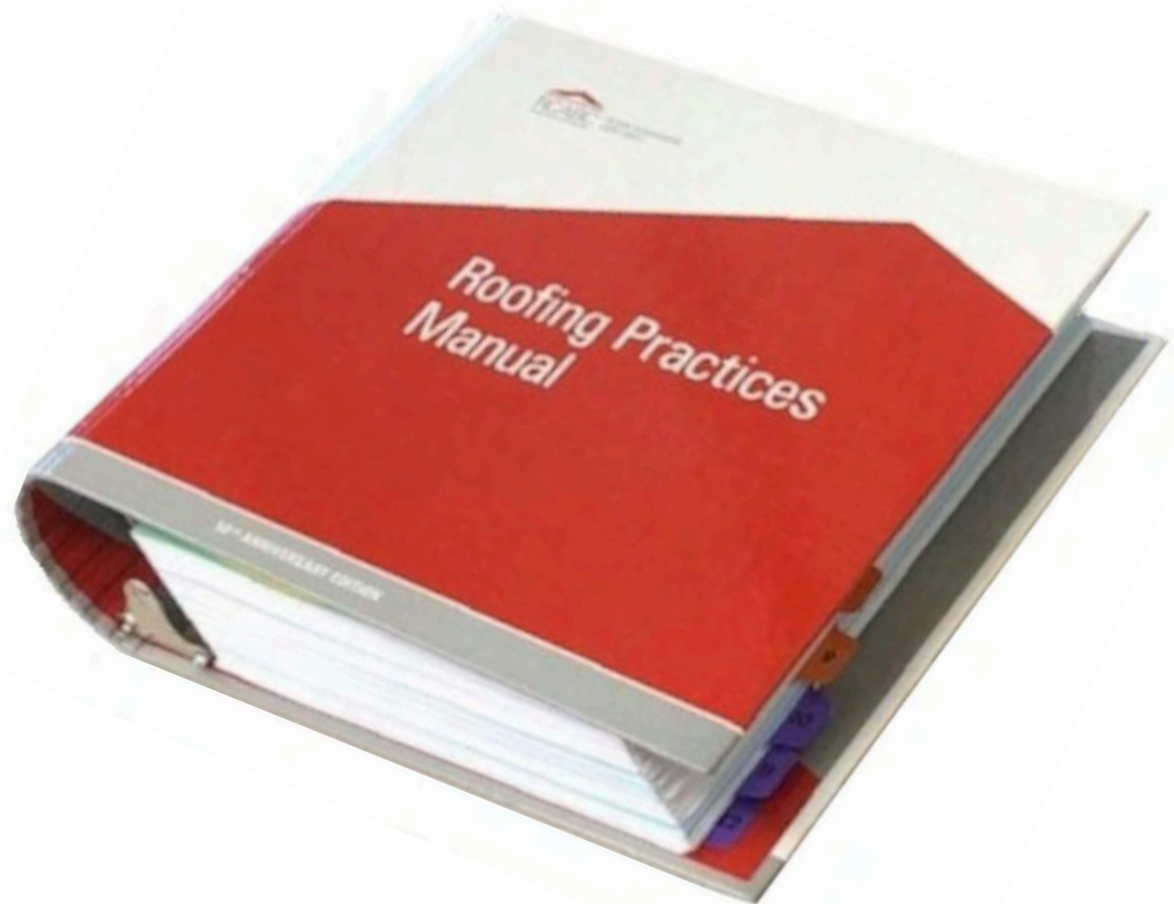
Once upon a time the RPM...





# Roofing Practices Manual (RPM)

looked like this...



# Roofing Practices Manual (RPM)

Today it looks like this...

**Welcome to the RCABC RoofStar Roofing Practices Manual (RPM)**

This is the official version of the Roofing Practices Manual and supersedes all other printed versions which may be in circulation.

The Roofing Practices Manual is the official guide for RCABC Members, Approved Inspectors, designers, architects and specification writers designing or specifying roofing and waterproofing systems, and describe the RoofStar Guarantee Standards. Guiding principles and Recommendations are necessary to qualify for a RoofStar Guarantee. The RPM meets or exceeds the current national and provincial standards for construction and will assist design professionals. See the Table of Contents index, or see any of the following quick links:

- Accepted Materials
- Construction details
- Design guidelines
- Wind Uplift Moments
- Best Practices
- Reference materials

[Click HERE](#) for a brief introduction to the Roofing Practices Manual

**Technical Updates**

Notice to Members: This online presentation of the Roofing Practices Manual is a restructuring of its original format. All updates to the older version of this manual have been incorporated into the present version. **Roofing Updates** will include all changes to the manual within the past 12 months. Watch for changes to either of both Accepted Materials and RoofStar Guarantee Standards, highlighting updates in effect for 365 days. Consult the Technical Updates for a list of changes since 2010.

Last Update: November 9, 2025 (see Technical Updates for details)

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  - Requesting and Specifying a RoofStar Guarantee
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  - Membrane Systems
  - Protected and Unprotected Membrane Systems
  - Roof Details
  - Roof Drains
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  - Water-Resisting Structures
- C. Accepted Materials**
  - By product category
  - By product name
  - By Manufacturer
  - By System

Specify Criteria and Application to Acceptance
- D. Waterproofing Systems**
  - Water Uplift Design**
    - Water Uplift Calculator
    - Wind-Driven Uplift Calculator (D)
  - WDRS Systems
  - WDRS Systems
  - WDRS Systems
  - 2025 Technical Updates: New Systems**
    - 2025 Membrane Systems
    - TPD Membrane Systems
    - PVC Membrane Systems
    - Multi-layered Membrane Systems (TDA)
    - FRMA Liquid Systems (TDA)
    - Multi-layered Membrane Systems
- E. Water shedding Systems**
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- G. Construction Details**
- H. General Information**
  - Roof Maintenance
  - Conversion Tables and Charts
  - Notes and General Measurements (Systems and Components)
  - Approved Materials for Materials
  - Notes & Charts
  - Other
  - Other
  - Other

**Learn more about...**

**Construction Details**

# Roofing Practices Manual (RPM)

The official Manual for the *RoofStar Guarantee Program...online only.*

- ★ Standards for every type of system, which support or exceed the
  - BCBC
  - NBCC and CSA Standards (roofing)
  - VBBL



# Roofing Practices Manual (RPM)

## Restructuring

★ Completed and launched in 2016

★ Includes

- Separate Accepted Materials division
- Guarantee Standards specific to each roof system
- Generic construction details
- Highlights that alert the reader to recent changes

# Roofing Practices Manual (RPM)

## Rewriting the content

### ★ November 2018

- SBS Membrane Systems
- Architectural Sheet Metal (ASM) Roofing

### ★ November 2019

- Asphalt Shingles
- Single Ply Membranes (EPDM, TPO, PVC)

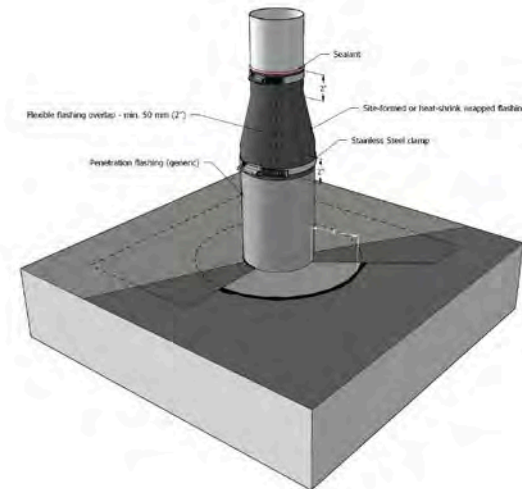
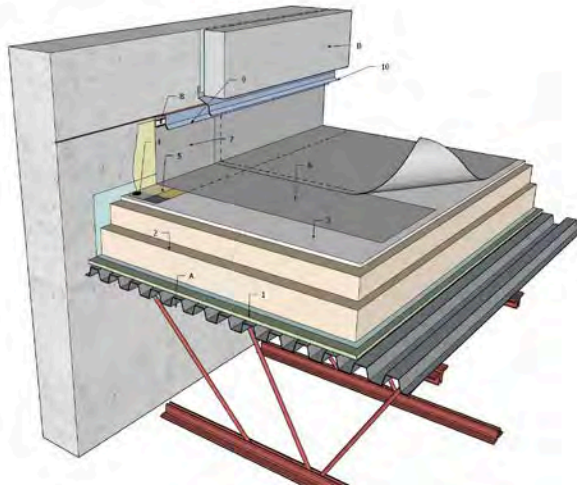
### ★ Slated for 2020

- Hot Rubberized Asphalt

# Roofing Practices Manual (RPM)

## Updating drawings

- ★ Coloured 3D drawings for improved clarity
- ★ CAD (for ASM)
  - Produced in-house, as we are able

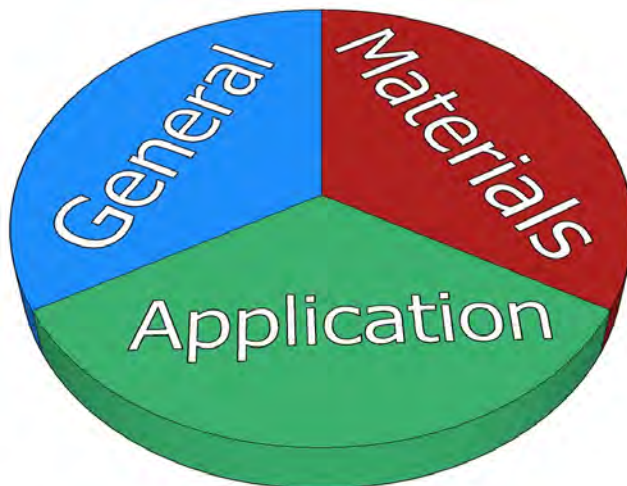




# Roofing Practices Manual (RPM)

## A new (ish) structure

- ☆ 14 Parts in each Standard
- ☆ 3 Sections per Part
  - General (including Design)
  - Materials
  - Application



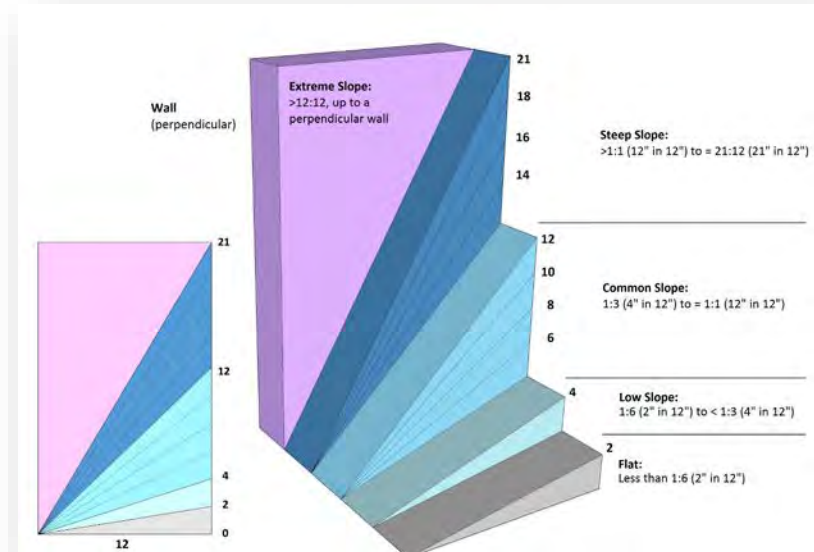
### RoofStar Guarantee Standards for TPO Membrane Systems

- 1 GENERAL
- 2 SUPPORTING STRUCTURES: Decks and Walls
- 3 SECURING the ROOF ASSEMBLY
- 4 MATERIALS
- 5 DECK and WALL OVERLAYS
- 6 AIR & VAPOUR CONTROLS
- 7 INSULATION
- 8 INSULATION OVERLAYS
- 9 FIELD MEMBRANES
- 10 PERIMETERS and WALLS
- 11 DRAINS and PENETRATIONS
- 12 PROTECTED MEMBRANES and OTHER DETAILS
- 13 METAL FLASHINGS
- 14 THE ROOF as a PLATFORM: Coverings, Living Spaces and Structures

# RPM –System Standards Structure

## ☆ New nomenclature:

- Systems defined by function rather than slope
- Slopes redefined and represented graphically
- Numbering structure resembles BCBC
  - Division
  - System
  - Standard
  - Part
  - Section
  - ...



# Asphalt Shingle Systems: highlights



Salvation Army Chilliwack  
Community Church, Chilliwack



# How to find the Standard

[www.rcabc.org](http://www.rcabc.org)

Table of Contents	
<b>A. About</b>	<b>D. Waterproofing Systems (Roofs)</b>
<ul style="list-style-type: none"> <li>How to Use the Roofing Practices Manual</li> <li>The RoofStar Guarantee Program</li> <li>Independent Observations</li> <li>Requesting and Specifying a RoofStar Guarantee</li> </ul>	<ul style="list-style-type: none"> <li>Wind Uplift Design</li> <li>Wind-RCI calculator</li> <li>Wind-MVRA calculator</li> <li>MARS Systems</li> <li>PARS Systems</li> <li>AARS Systems</li> <li>SBS Modified Bitumen Membrane Systems</li> <li>EPDM Membrane Systems</li> <li>TPO Membrane Systems</li> <li>PVC Membrane Systems</li> <li>Hot-applied Rubberized Asphalt Systems (TBA)</li> <li>PMMA Liquid Systems (TBA)</li> <li>Built-up Roof (BUR) Systems</li> </ul>
<b>B. Essential Elements</b>	<b>E. Water-shedding Systems</b>
<ul style="list-style-type: none"> <li>Air and Vapour Control</li> <li>Building Ventilation</li> <li>BUR Materials</li> <li>Deck and Wall Overlays</li> <li>Design Considerations</li> <li>Eave Protection</li> <li>Fasteners &amp; Fastening Requirements</li> <li>Insulating the Roof</li> <li>Insulation Joints and Overlays</li> <li>Membrane Surfaces</li> <li>Protected and Modified Protected Roof Systems</li> <li>Roof Classes</li> <li>Roof Decks</li> <li>Roof Plans</li> <li>Waterproofing Materials</li> <li>Water-shedding Materials</li> </ul>	<ul style="list-style-type: none"> <li>Architectural Sheet Metal (ASM) Systems</li> <li>Asphalt Shingle Systems</li> <li>Cedar Shake and Shingle Systems</li> <li>Tile &amp; Slate Systems</li> </ul>
<b>C. Accepted Materials</b>	<b>F. Grade-level Waterproofing</b>
<ul style="list-style-type: none"> <li>By Product Category</li> <li>By Product Name</li> <li>By Manufacturer</li> <li>By System</li> <li>Material Criteria and Application for Acceptance</li> </ul>	<b>G. Construction Details</b>
	<b>H. General Information</b>
	<ul style="list-style-type: none"> <li>Roof Maintenance</li> <li>Conversion Tables and Charts</li> <li>Metric and Standard Measurements (Symbols and Guidelines)</li> <li>Additional Standards for Materials</li> <li>Health &amp; Safety</li> <li>Glossary</li> <li>Bibliography and References</li> </ul>

## E. Water-shedding Systems

- ★ Architectural Sheet Metal (ASM) Systems
- ★ Asphalt Shingle Systems
- ★ Cedar Shake and Shingle Systems
- ★ Tile & Slate Systems

# Asphalt Shingle Systems: highlights

## A. Top to bottom update of all standards

★ Launched in late 2019, revisions reflect

- 14-Part format
- CSA-A123.51 Standards for application
- One set of standards for all slope designs
- Considerable development of design guidelines and standards
- A stronger emphasis on materials
- Expanded application requirements
- Illustrations embedded in the Standard

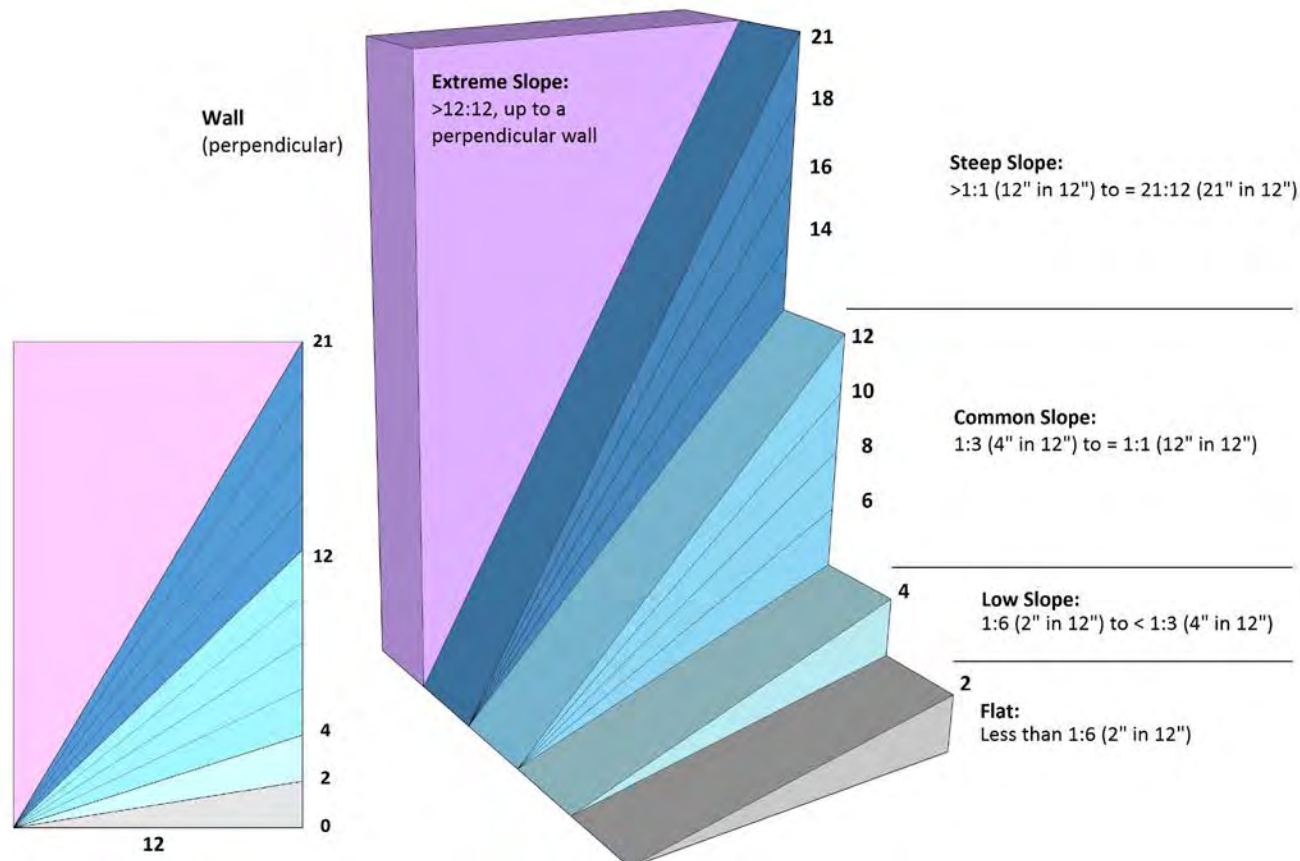
# Asphalt Shingle Systems: highlights

## Part 1: General

- ☆ 1.3 Design Considerations
  - High snow conditions
  - Hot works (yes, even on asphalt shingle projects)
- ☆ 1.4 Scope addresses both new construction and replacement roofing
- ☆ 1.6 RoofStar Guarantee: Coverage and Limitations

# Asphalt Shingle Systems: highlights

## Part 2: Supporting Structures





# Asphalt Shingle Systems: highlights

## Part 2: Supporting Structures

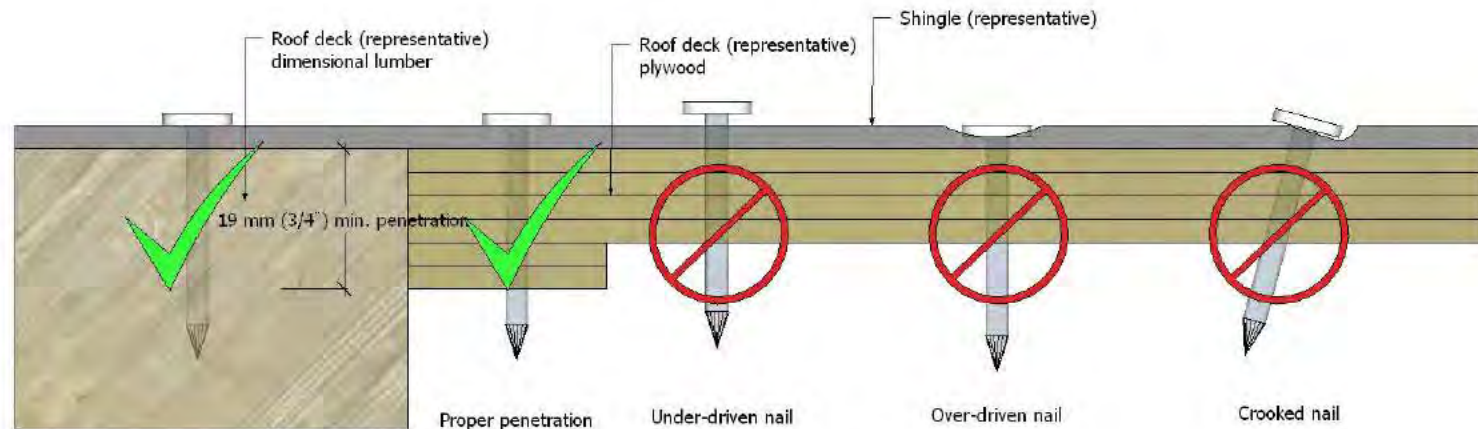
- ☆ Suitable decks must be 'nailable'
- ☆ Wood decks: min. 12.7 mm (1/2")



# Asphalt Shingle Systems: highlights

## Part 3: Securing the Roof Assembly

- ★ Standards for systems insulated above a sub-deck
- ★ Minimum fastener types, numbers and penetration requirements
- ★ Illustration of proper fastening



# Asphalt Shingle Systems: highlights

## Part 6: Air and Vapour Controls

- ☆ Identical to Part 6 in Waterproofing (roofs)
- ☆ Includes attic ventilation standards
- ☆ Cross-referenced with Part 11 (see sub-Section 11.2.3)

# Asphalt Shingle Systems: highlights

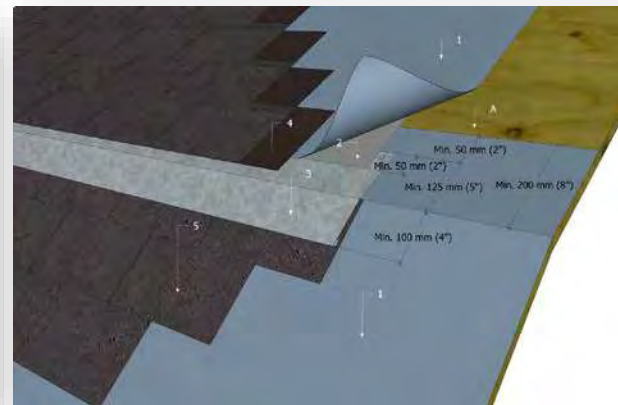
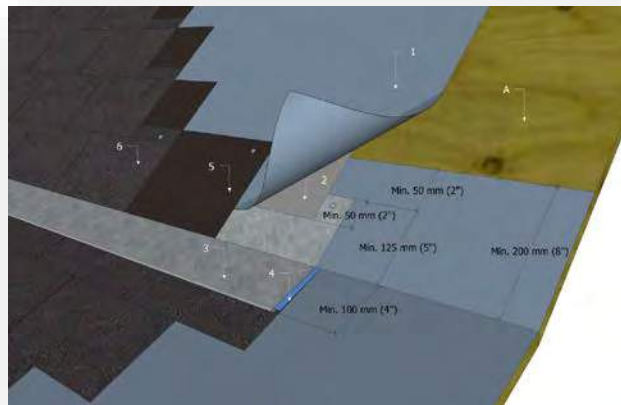
## Part 8: Eave Protection and Underlayments

- ☆ Clarified standards for materials (see table also)
- ☆ Underlayment as a separation layer is a good design idea
- ☆ Expanded application standards
  - End and side laps
  - Material orientation

# Asphalt Shingle Systems: highlights

## Part 9: Field Shingles

- ☆ Material requirements grounded in *CSA A123.5*
- ☆ Clarified standards for materials (see table in Accepted Materials)
- ☆ Expanded application standards
- ☆ Standards to clearly address changes in slope



# Asphalt Shingle Systems: highlights

## Part 10: Perimeters and Walls

- ☆ New subsection on Design parameters
- ☆ Expanded application standards that include
  - Perimeter metal flashings



# Asphalt Shingle Systems: highlights

## Part 10: Perimeters and Walls

- ☆ Expanded application standards that include
  - Revised and detailed standards for valleys, including dead valleys

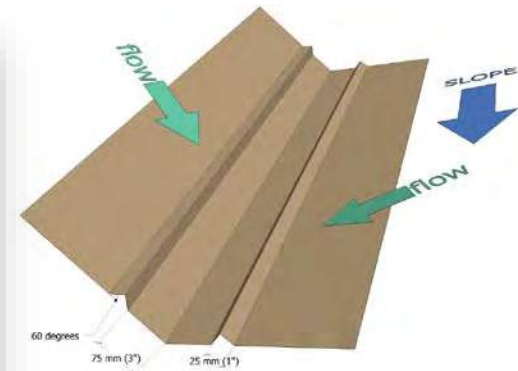




# Asphalt Shingle Systems: highlights

## Part 10: Perimeters and Walls

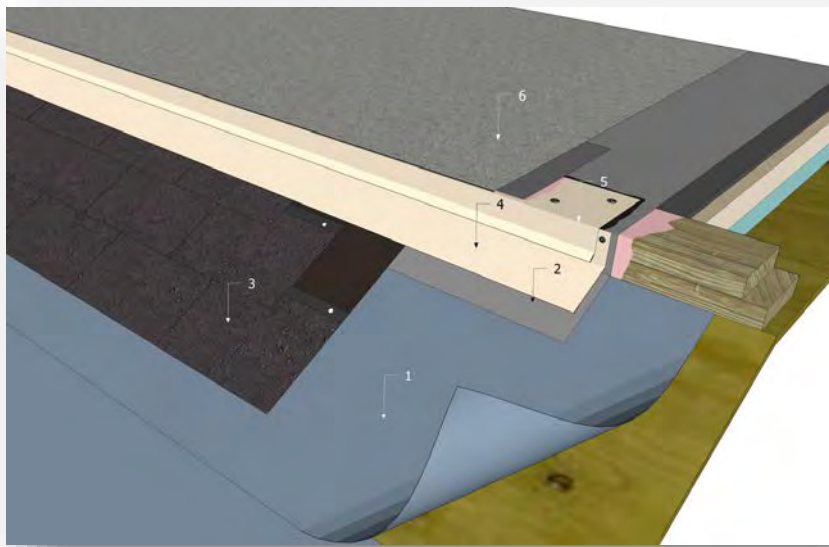
- ☆ Expanded application standards that include
  - How to handle valley transitions



# Asphalt Shingle Systems: highlights

## Part 10: Perimeters and Walls

- ☆ Expanded application standards that include
  - How to design and construct junctions with Waterproofing Systems

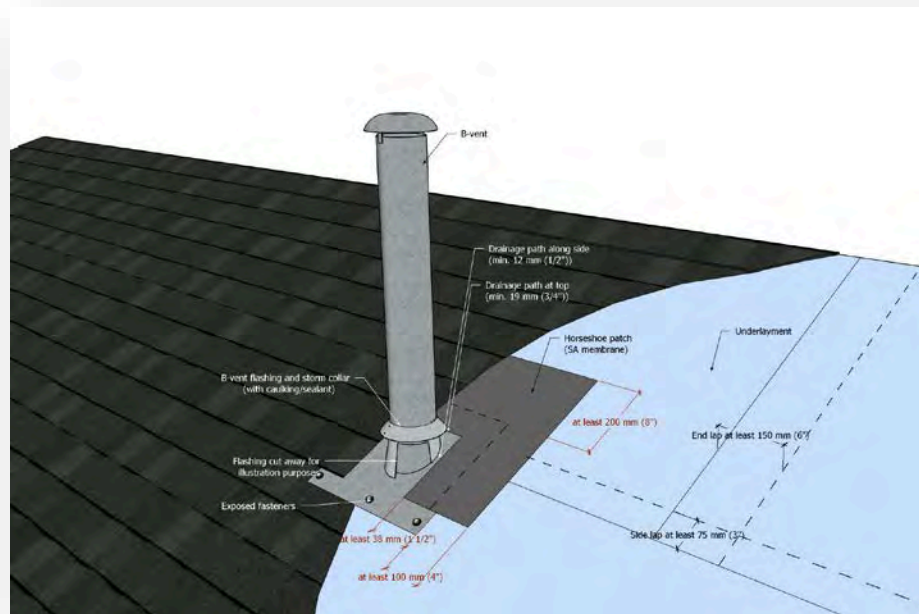




# Asphalt Shingle Systems: highlights

## Part 11: Drains and Penetrations

- ★ Expanded and improved standards for penetration flashings and curbs



# Asphalt Shingle Systems: highlights

## Part 12: Other Details (Built-in Gutters)

### ☆ Gutter membranes:

- Extend up the slope at least
  - 150 mm (6")
  - 300 mm (12") in regions with typical heavy snow

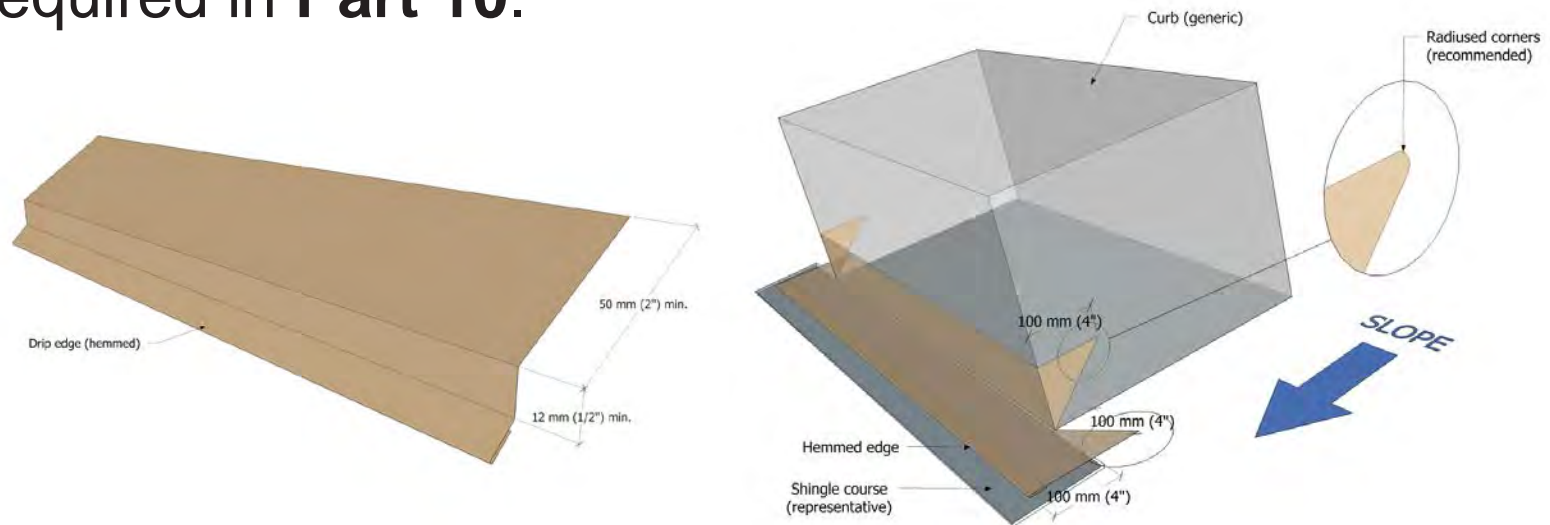
### ☆ New gutters:

- At least 300 mm (12") wide
- No higher than the gutter width
- Designed with an overflow

# Asphalt Shingle Systems: highlights

## Part 13: Metal Flashings

- ☆ Principally focused on materials and application
- ☆ Addresses fabrication and application of the flashings required in **Part 10**.



# Single-ply Roof Systems: highlights



**Grandview Heights Aquatic  
Centre, Surrey**



# Single Ply Roof Systems: highlights

## Part 1: General

- ☆ For all Waterproofing Roof Systems:
  - RoofStar 15-year Guarantee Standards (coming soon)



# Single Ply Roof Systems: highlights

## Part 1: General

- ☆ For all Waterproofing Roof Systems :
  - RoofStar 15-year Guarantee Standards (coming soon)
  - General requirements for Designers and Applicators
    - Design considerations
    - replacement roofing
    - Hot Works (for both designers and Contractors)
    - Workmanship
    - RoofStar Guarantee: Coverage and Limitations

# Single Ply Roof Systems: highlights

## Part 1: General

### ☆ For all Waterproofing Roof Systems :

- RoofStar 15-year Guarantee Standards (coming soon)
- General requirements for Designers and Applicators
- Integrity Scans
  - Required when overburdens
    - exceed 150 mm (6") in depth, regardless of who installed them
    - of any depth are installed by someone other than an RCABC Member Contractor



# Single Ply Roof Systems: highlights

## Part 1: General

### ☆ For all Waterproofing Roof Systems :

- RoofStar 15-year Guarantee Standards (coming soon)
- General requirements for Designers and Applicators
- Integrity Scans
- Electronic Leak Detection (ELD)
  - optional for roofs (mandatory for grade-level waterproofing)
  - *strongly recommended* when the space below the roof are sensitive and highly vulnerable to damage
    - Examples: hospitals, fire stations, police stations, data centres (High Importance buildings)

# Single Ply Roof Systems: highlights

## Part 1: General

### ★ Integrity Scans and ELD



Photo Credits: SMT



# Single Ply Roof Systems: highlights

## Part 2: Supporting Decks and Walls

☆ For all Waterproofing Roof Systems:

- New: minimum thickness of 12.7 mm (1/2") for wood decks, unless the roof is designed for wind resistance (see **Part 3**)



# Single Ply Roof Systems: highlights

## Part 2: Supporting Decks and Walls

### ☆ Electrical conduit and roof systems

- Roofing fasteners can wreak havoc with energized electrical circuits
- Charged wiring damaged by roofing fasteners may
  - injure workers
  - result in a structure fire, often years after the injury to the wire

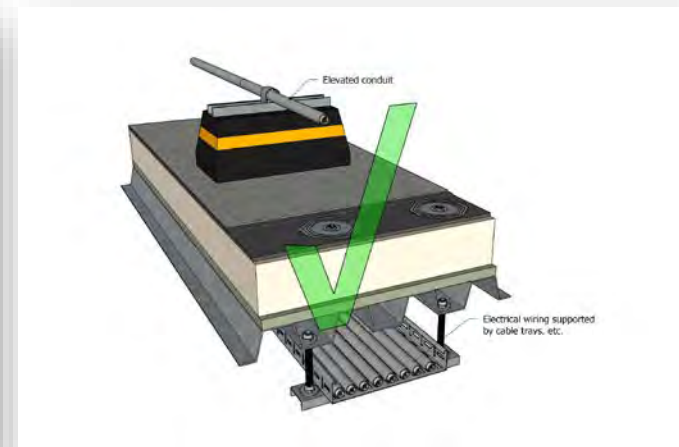
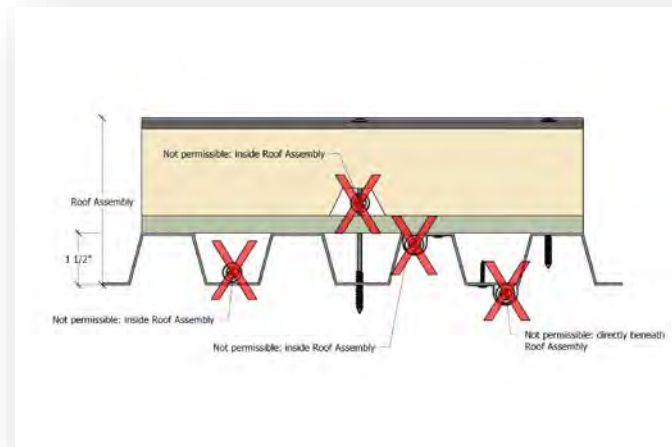


# Single Ply Roof Systems: highlights

## Part 2: Supporting Decks and Walls

### ☆ Electrical conduit and roof systems

- New Construction – RGC Standards require placement of electrical circuits well away from roof assemblies
  - Improves building safety
  - Makes it possible to replace even a portion of the roof system without damaging the electrical system

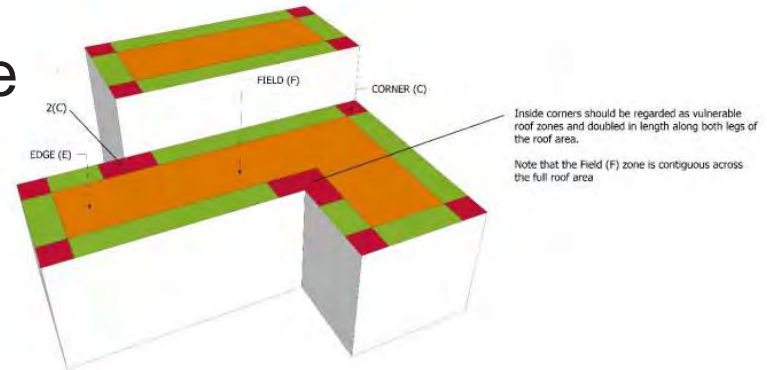




# Single Ply Roof Systems: highlights

## Part 3: Securing the Roof Assembly

- ★ Focused on the wind resistance requirements of the BC Building Code (2018) (Parts 4 and 5)
  - Applicable to new and replacement roofing
  - Articulates three principal pathways for compliance:
    - a Tested Assembly
    - an Assembly with Proven Past Performance
    - a custom-engineered Assembly
- ★ Help with interpreting the Code
- ★ Links to system test reports



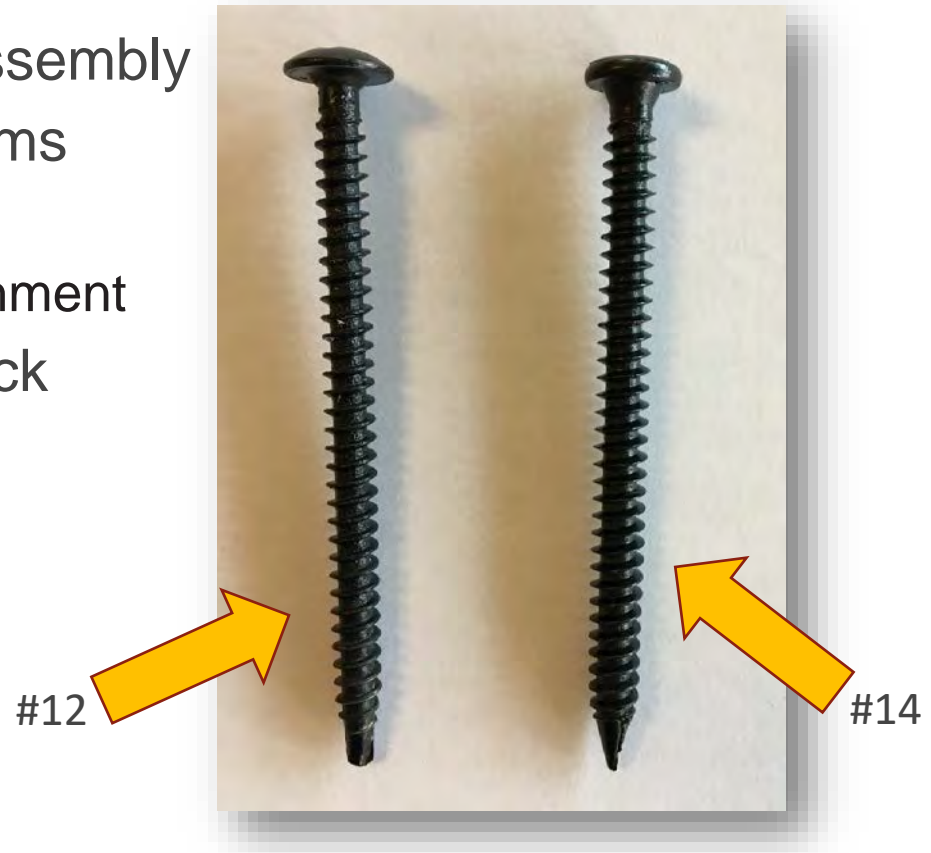
Call us for help

# Single Ply Roof Systems: highlights

## Part 3: Securing the Roof Assembly

### ☆ Fasteners

- Gauge – see Tested Assembly
- RGC Standard minimums
  - #12 - Insulation
  - #14 – Membrane attachment
- Penetration into the deck
  - Steel –  $\frac{3}{4}$ "
  - Plywood –  $\frac{3}{4}$ "
  - Wood – 1"





# Single Ply Roof Systems: highlights

## Part 3: Securing the Roof Assembly

### ☆ Fasteners

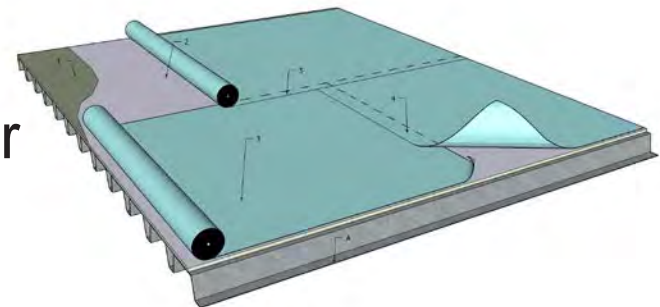
- Gauge – see Tested Assembly
- RGC Standard minimums
  - #12 - Insulation
  - #14 – Membrane attachment
    - the ‘linebacker’ fastener:  
thicker shoulders & neck
- Penetration into the deck
  - Steel –  $\frac{3}{4}$ "
  - Plywood –  $\frac{3}{4}$ "
  - Wood – 1"



# Single Ply Roof Systems: highlights

## Part 6: Air and Vapour Controls

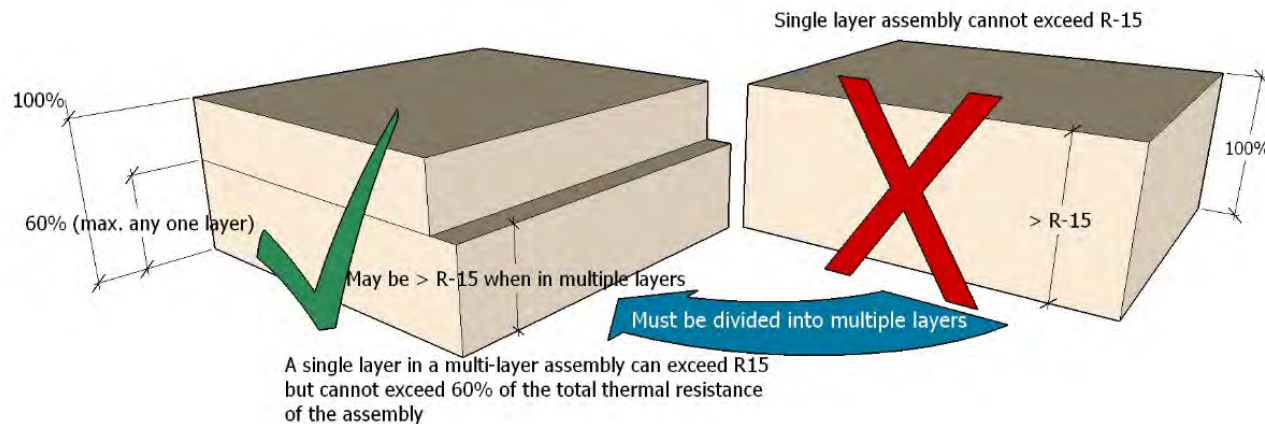
- ☆ Supports designs complying with Parts 5 and 10 of the BC Building Code (Energy Step Code)
- ☆ Focused on the designer's concerns
  - Limits material choices based on constructability
  - Affirms that the choice to use air or vapour controls remains with the Design Authority
- ☆ min. 2 mm thickness for temp. roof
- ☆ Includes guidance for the Contractor



# Single Ply Roof Systems: highlights

## Part 7: Insulation

- ☆ Supports designs intended to meet the Energy Step-Code requirements (including Passive House)
  - Requirements for layering when effective thermal resistance exceeds R-15
  - Required staggered and offset joints



# Single Ply Roof Systems: highlights

## Part 7: Insulation

- ☆ Our standards are supported by research projects we fund and directly participate in
  - Working with the NRC to determine *Effective R-values*
    - Conventional roofs by late 2020
      - **Lost heat energy can be as much as 15%**
    - PMRAs by 2024
  - CSA Committee work:
    - Commercial roof energy performance
    - Roof resiliency (includes long-term thermal performance)

# Single Ply Roof Systems: highlights

## Part 7: Insulation

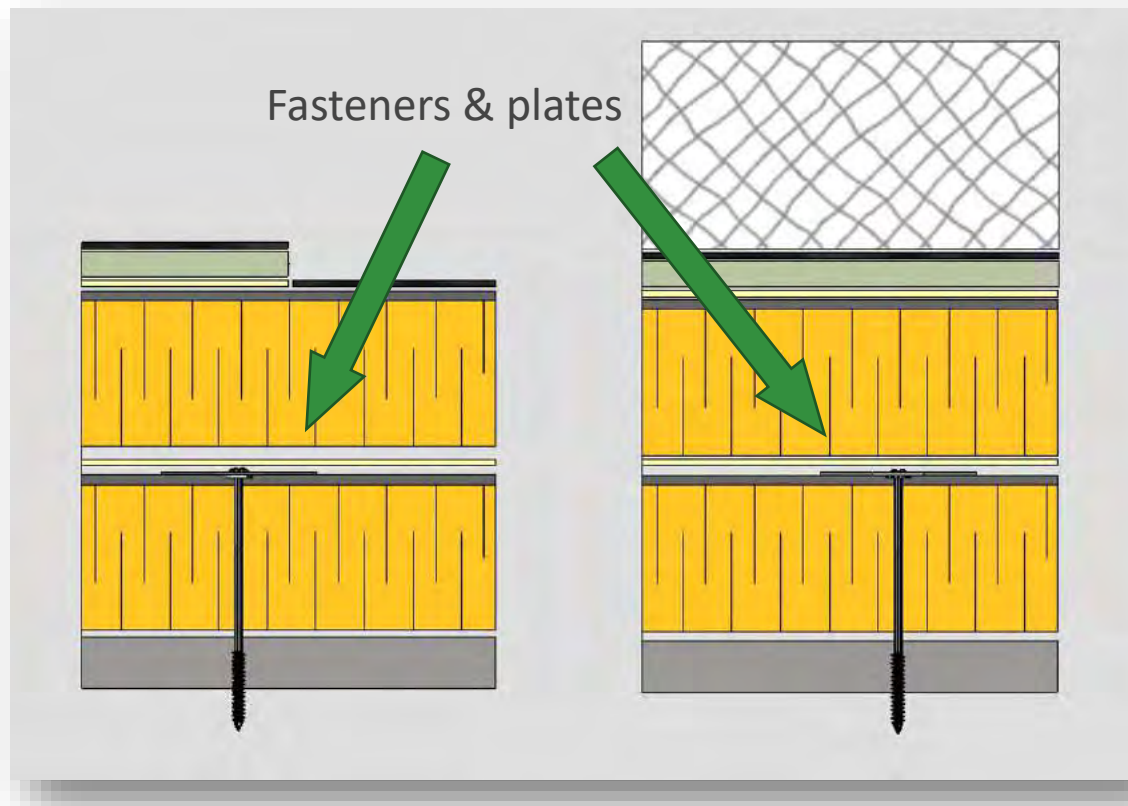


FYI, not a *Beauty Queen™* mattress...  
as much as 15%  
thermal loss due to  
bridging  
(NRC study)

Thermal bridging revealed in snow cover

# Single Ply Roof Systems: highlights

## Part 7: Insulation



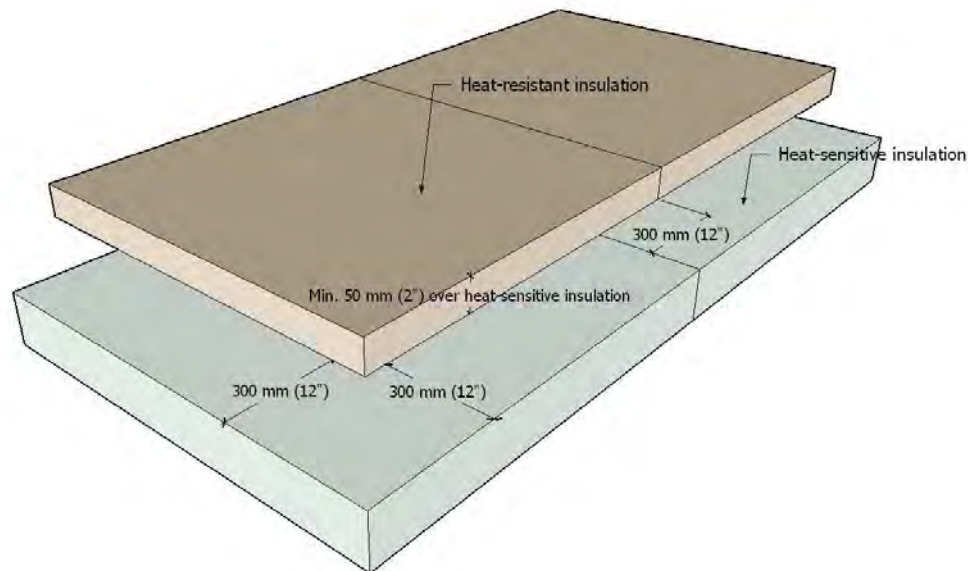
Thermal bridging can be mitigated by designing a hybrid system of securement, also called PARS (Partially Adhered Roof System)



# Single Ply Roof Systems: highlights

## Part 8: Insulation overlays

- ☆ Protection for heat-sensitive insulation
  - Ensures great membrane performance
  - Enhances the thermal performance of the roof system

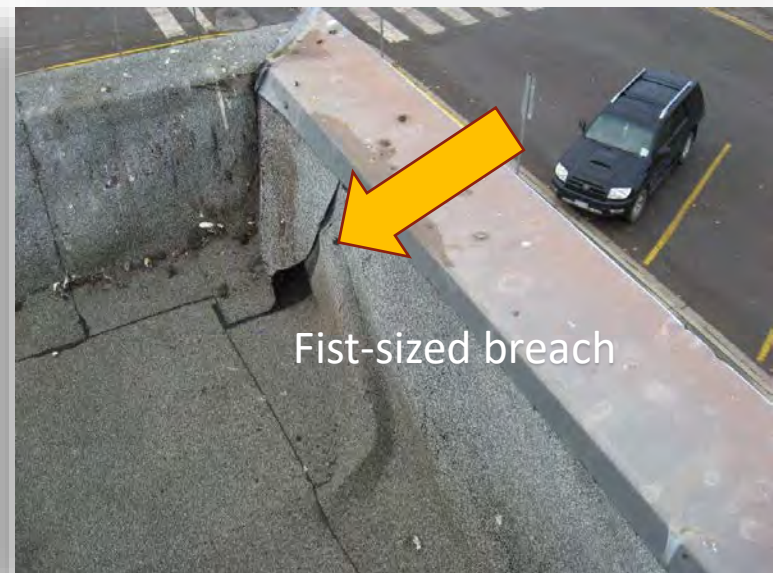




# Single Ply Roof Systems: highlights

## Part 8: Insulation overlays

☆ This can happen when heat-sensitive insulation deforms and melts from solar gain...



EPS, one type of heat-sensitive foam insulation, has a 'service temperature' of 70-75°C. When it shrinks under high temperatures, membranes can "rack" and tear.

# Single Ply Roof Systems: highlights

## Part 9: Field membranes

- ★ Thickness requirements based on assembly type
- ★ Additional RoofStar 15-year Standards (separate table)

**Table 9.1 Single-ply Membranes: RoofStar 5 and 10-Year Guarantee**

All thicknesses shown are in mm

Membrane Type, Reinforcement & Grade	Conventionally Insulated or Uninsulated Waterproofing Systems (Roofs)					Gutters	Roof as a Platform	Grade-level Water-proofing
	Loose-laid	Mechanically Fastened	Self-adhered	Adhered (Compact or PMRA)	Adhered (Fleece-backed)	Adhered	All applications	Adhered
	mm (mils)	mm (mils)	mm (mils)	mm (mils)	mm (mils)	mm (mils)	mm (mils)	mm (mils)
EPDM (reinforced)	1.143 (45)	1.524 (60)	1.52 (60)	1.143 (45)	N/A	1.524 (60)	1.524 (60)	N/A
EPDM (unreinforced)	1.143 (45)	N/A	1.524 (60)	1.143 (45)	2.79 (110)	1.524 (60)	1.524 (60)	N/A
TPO	1.143 (45)	1.143 (45)	1.524 (60)	1.143 (45)	2.79 (110)	1.524 (60)	1.524 (60)	N/A
PVC	1.27 (50)	N/A	1.27 (50)	2.67 (105)	N/A	1.524 (60)	1.524 (60)	1.524 (60)

# Single Ply Roof Systems: highlights

## Part 9: Field membranes

- ☆ Designated walkways – required when serviceable equipment must be accessed at least once per month



# Single Ply Roof Systems: highlights

## Part 10: Perimeters and Walls

- ☆ Parapets are not mandatory – a roof edge may be finished flush with the field surface (metal edge flashing)
- ☆ When parapets are specified, they must be at least 125 mm (5") high
- ☆ When parapets are designed to contain ballast or overburden, the minimum height increases to 200 mm (8")

# Single Ply Roof Systems: highlights

## Part 11: Drains and Penetrations

- ☆ Expanded standards for the design of drainage
  - Overflows highlighted – used primarily to keep the roof from collapsing
  - Cross-references the BC Plumbing Code and BC Building Code





# Single Ply Roof Systems: highlights

## Part 11: Drains and Penetrations

So this doesn't happen...



Photo Credit:  
Chamberlin Roofing & Waterproofing

# Single Ply Roof Systems: highlights

## Part 12: Protected Membrane Roofs / Gutters

- ☆ Expanded standards for design and construction
- ☆ PMRAs
  - Drainage required beneath insulation
  - Air space required above insulation
  - Detailed application standards for constituent materials

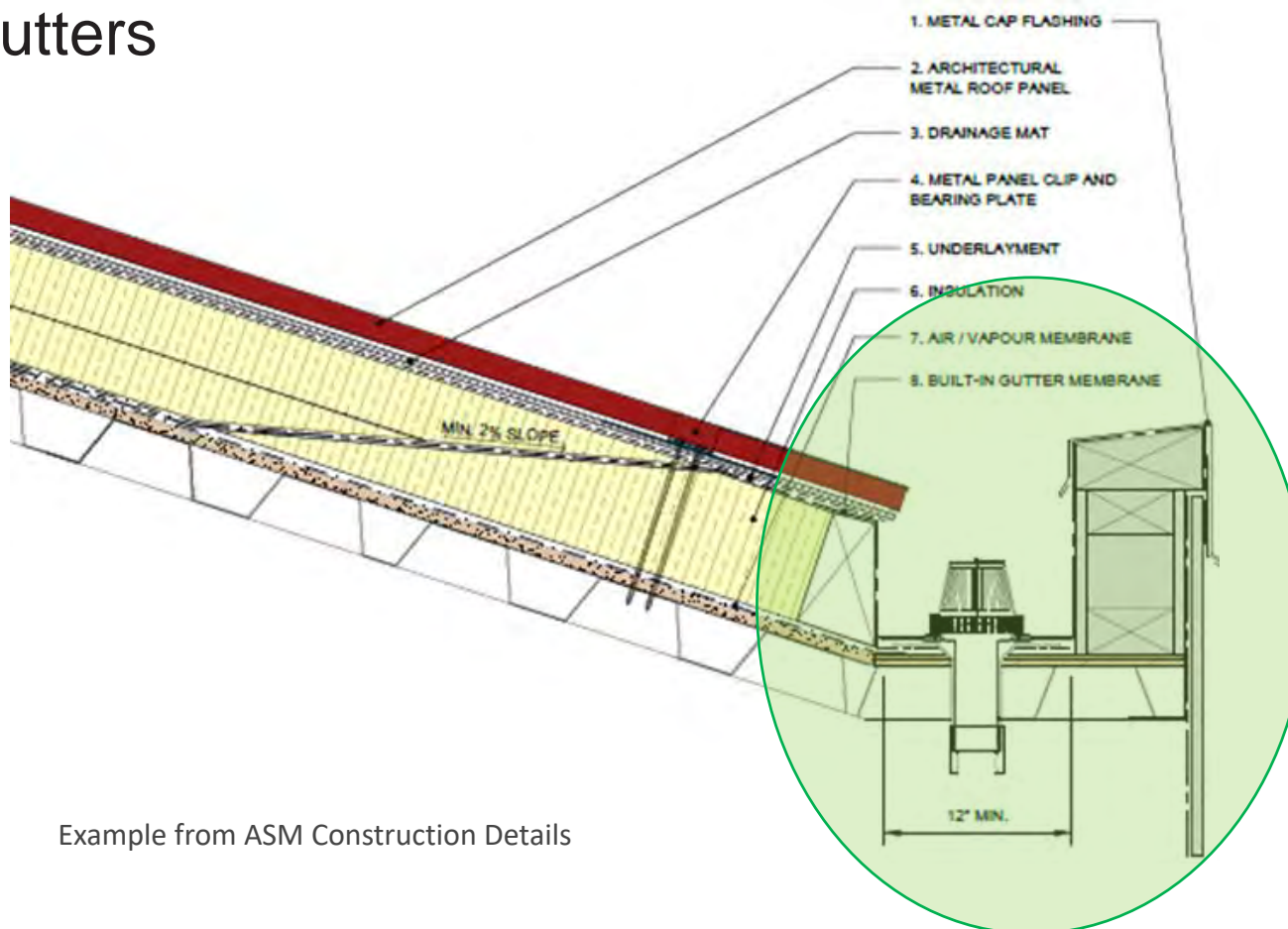




# Single Ply Roof Systems: highlights

## Part 12: Protected Membrane Roofs / Gutters

### ☆ Gutters



Example from ASM Construction Details

# Single Ply Roof Systems: highlights

## Part 14: The Roof as a Platform

### ☆ Vegetated roofs



# Single Ply Roof Systems: highlights

## Part 14: The Roof as a Platform

★ Urban rooftop farms



# Single Ply Roof Systems: highlights

## Part 14: The Roof as a Platform

### ★ Amenity spaces





# Single Ply Roof Systems: highlights

## Part 14: The Roof as a Platform

### ☆ Recreation areas



# Single Ply Roof Systems: highlights

## Part 14: The Roof as a Platform

### ★ Pools and water features



# Single Ply Roof Systems: highlights

## Part 14: The Roof as a Platform

### ★ Photovoltaics





# Single Ply Roof Systems: highlights

## Part 14: The Roof as a Platform

- ☆ The RCABC supports vegetated roofs
  - involved with the City of Vancouver to develop policy and standards
  - collaborators with Green Roofs for Healthy Cities
  - a member of the BC Chapter of GRiT (Green Roof Information Think-tank)
  - a member of Canada Green Building Council
  - Expanding Association membership that includes qualified installers
  - Design and Construction Standard for 'Green' Roofing (in development)

# Hot Works and Fire Risk Mitigation

## Expanding safety on the roof



# Hot Works and Fire Risk Mitigation

- ☆ RCABC has been a leader for over 10 years in addressing Torch Safety through prescriptive application methods reinforced by Policy
- ☆ That policy is now enhanced by a mandatory Hot Works Program that applies to all system types
- ☆ Launched in 2019, the Program constitutes 5 key components:

# Hot Works and Fire Risk Mitigation

## 1. Policy

- ☆ Policy drives the Hot Works Program, which is a compulsory requirement of membership

# Hot Works and Fire Risk Mitigation

## 2. Education

- ★ Enhanced education and training that goes beyond the basics

# Hot Works and Fire Risk Mitigation

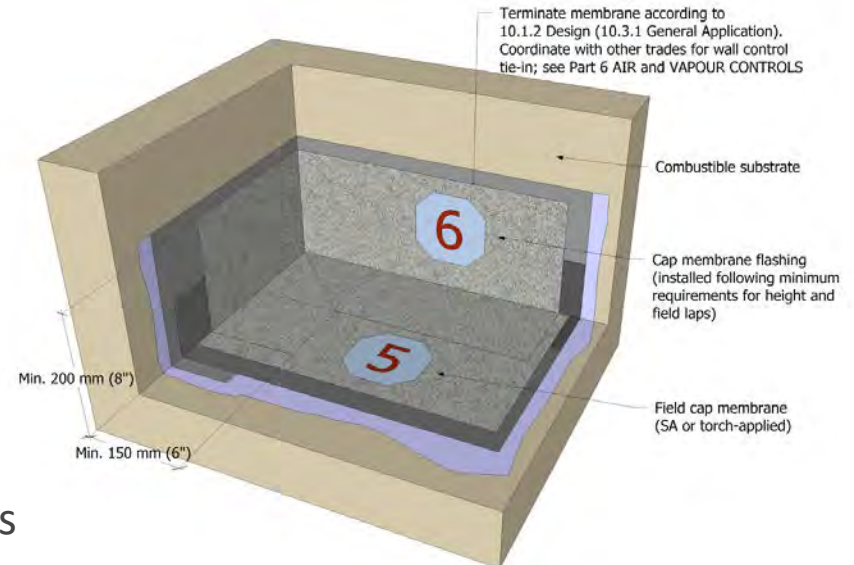
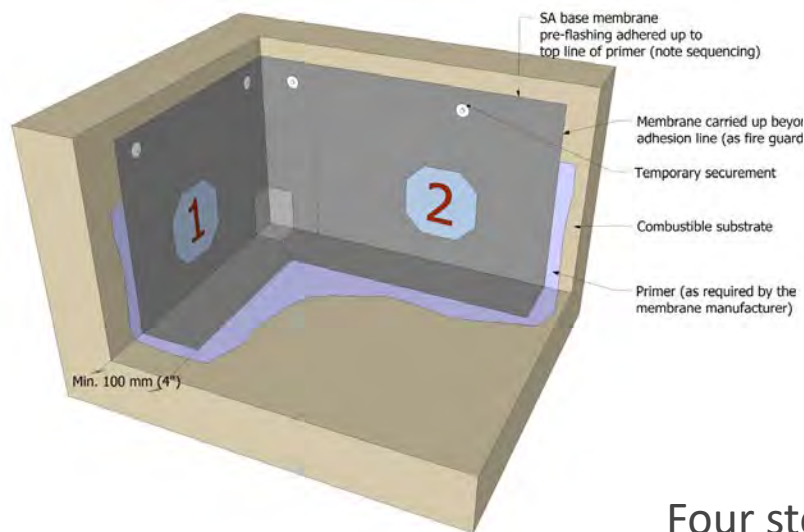
## 3. Standards and application alternatives

- ☆ Material and application guidance for sensitive roof details that require alternative measures to protect vulnerabilities from heat
- ☆ Part 10 of the SBS Standard includes Alternative Membrane Flashing Approaches
  - Pre-flashing
  - Picture-framing

# Hot Works and Fire Risk Mitigation

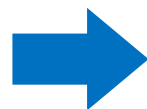
## 3. Standards and application alternatives

### ★ Example #1: pre-flashing approach



Four steps

Step 1



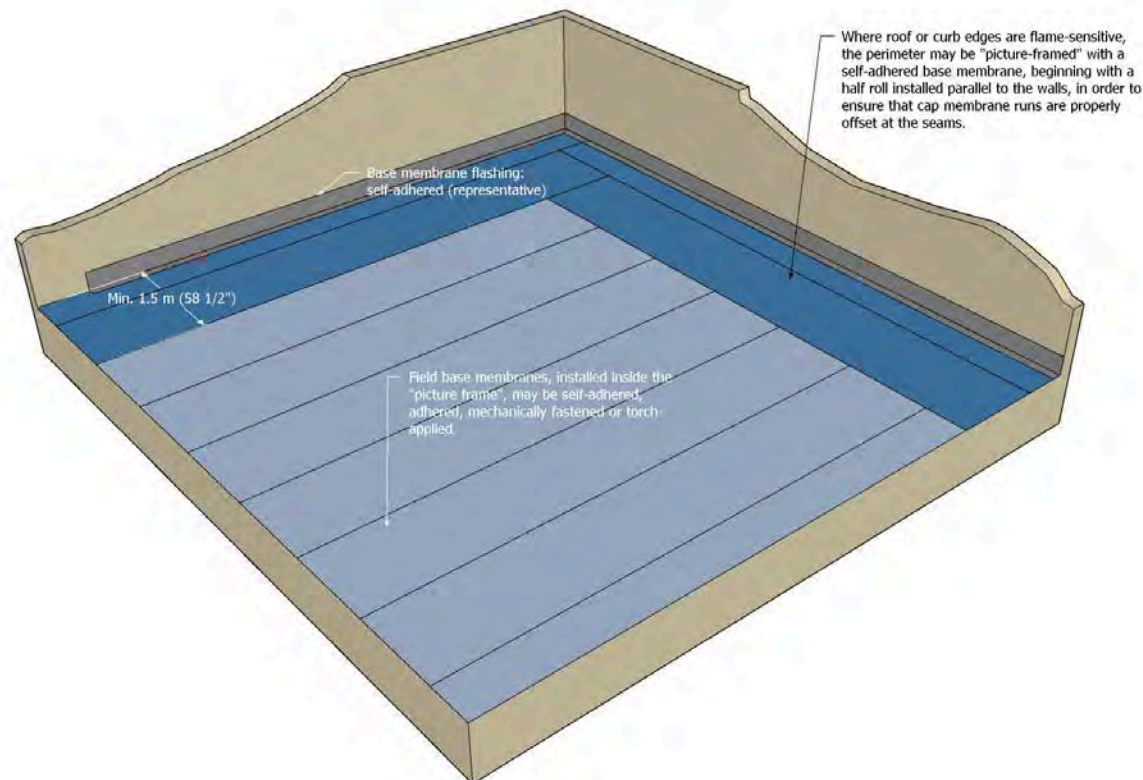
Step 4



# Hot Works and Fire Risk Mitigation

## 3. Standards and application alternatives

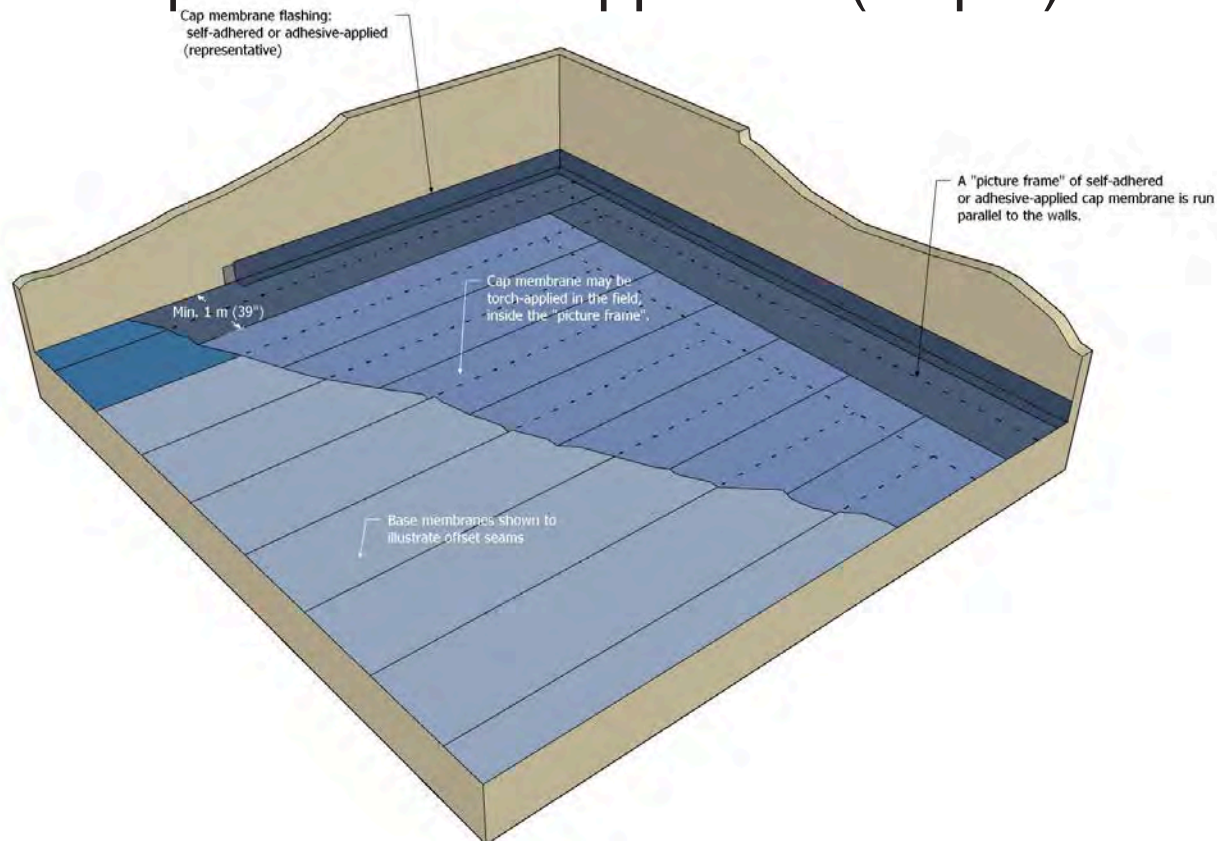
### ☆ Example #2: picture-frame approach (step 1)



# Hot Works and Fire Risk Mitigation

## 3. Standards and application alternatives

### ☆ Example #2: picture-frame approach (step 2)



# Hot Works and Fire Risk Mitigation

## 4. Enhanced insurance requirements

# Hot Works and Fire Risk Mitigation

## 5. Membership accountability

### ★ RCABC Member accountability

- Enforced through random site visit compliance audits conducted by competent, trained RCABC staff
- Focused on general site safety with a specific focus on Hot Works risk management
- Real-time feedback for the Contractor
- Supported by established disciplinary policy

# On the horizon: Codes and the future of roof performance



# We have our eyes on the future

## The RCABC on the national stage

- ★ We work closely with the National Research Council (NRC), funding and participating in numerous working committees
  - Photovoltaic wind resistance
  - Asphaltic cover board standards
  - SIDGERS (the originators of CSA-A123.21)
  - Energy efficient commercial roof design
  - Climate resilience standards (wind, precipitation and thermal performance)
- ★ This committee work often turns into standards that are developed by CSA Standards Committees...

# We have our eyes on the future

## The RCABC on the national stage

- ★ We participate in numerous CSA Standards committees
  - A123 roofing committee (oversight for all CSA standards)
  - Performance/Application Standards
    - A123.21 Dynamic Wind Resistance
    - A123.24 Wind resistance of Modular Vegetated Roof Systems
    - A123.51/52 Asphalt Shingles
  - Material Standards
    - A123.1/A123.5 Asphalt Shingles
    - A123.22 Eave Protection Membrane
    - A123.23 Modified Bitumen Membranes



# We have our eyes on the future

## We want to make a difference

- ★ When Building Codes are behind the times and allow the lowest common denominator to prevail, no one wins
  - We are at the table on numerous fronts to improve roofing standards across the country
  - It's coming! The National Building and Energy Codes will eventually reflect the work we are engaged in, together with the NRC and the CSA Group, to raise the bar for roofing
  - When you specify a RoofStar Guarantee, you support our work beyond British Columbia's borders to see this vision through to fruition

# We're here to help

## RCABC resources

☆ pro bono project reviews

☆ technical support for

- Design Authorities
- Member Contractors
- Roof Observers
- General Contractors

Call us for assistance: **(604) 882-9734**

- Laurence Matzek – Director, RoofStar Guarantee Program
- Doug Wells – RoofStar Technical Advisor
- James Klassen – RoofStar Technical Advisor

Roofing.

*It's what we do.*

Technical Department



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