

RoofStar Guarantee Standards for SBS Roofs

Presented to IIBEC Western Canada Chapter November 5 & 6, 2025











Introduction

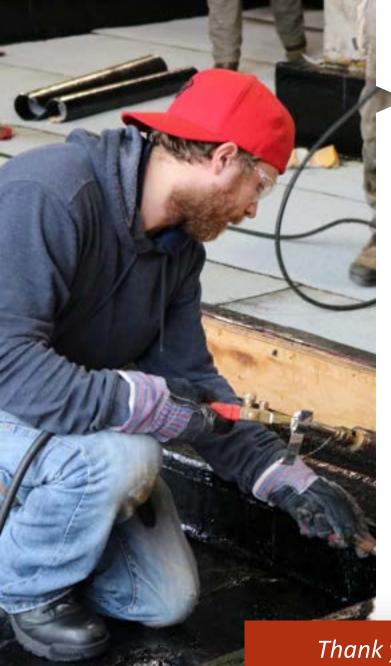
Douglas (Doug) Wells, RRO

RoofStar Technical Advisor

- ★ 35+ years in the roofing industry
- ★ 14 years as a Roofing Consultant, Registered Roof Observer (RRO) and Accepted Observer for the RoofStar Guarantee program
- ★ Previously worked as a roofer, technical representative for 2 different manufacturers (single ply and SBS) and various suppliers. 7 years at RCABC as Technical Advisor
- ★ Proud Dad of three











Agenda

- **★RCABC** Overview
- ★Navigating the Roofing Practices Manual
- **★**SBS Modified Bitumen Standards
- ★Liquid Membranes
- **★**Hot Works
- **☆**Question Period

Thank you for supporting the RoofStar Guarantee Program!





RCABC

- ★ Representing the roofing industry for 65 years
- ★ Writing Guarantees for 50+ years
- ★ Developing Guarantee Standards for 35+ years
 - 52 Member Contractors around BC
 - 35 Accepted Observer Firms
 - 66 Manufacturers and Suppliers







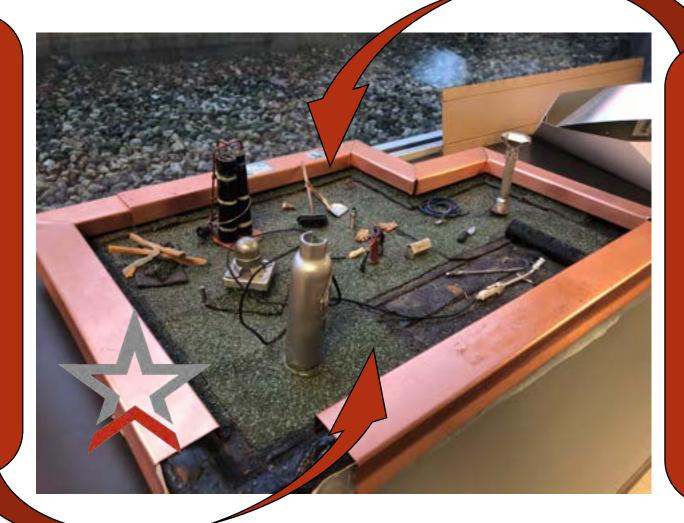
Member Contractors

Policy driven Membership

Trade Qualified & Apprentice applicators

Accepted Materials

Installed to Guarantee
Standards



Accepted Observers

Third party independent reviews during construction and at project milestones

Registered Roof Observers (RRO) or better in the field

Reviewed to meet Guarantee Standards





The RoofStar Guarantee – Third Party

- ★ Available for 5, 10 or 15 year terms, from the RCABC Guarantee Corp (RGC)
 - All Guarantees include a 2 year performance review
 - A 10 year includes further performance reviews at year 5 and 8
 - A 15 year includes an additional performance review at year 12
- ★ The RoofStar Guarantee is a promise to repair leaks from workmanship or materials installed by the Member Roofing Contractor.
- ★ 15-year not currently offered for hot rubber or asphalt shingle systems







The RoofStar Guarantee – Cost

★ Owner pays Observer for course of construction field reviews directly, so not included in contract value of the Work.

RoofStar Guarantee	5 year	10 year	15 year	VRS 2 year
Guarantee Fee (Administration & Reserve)	2.00%	3.00%	3.75%	1.50%
Performance Reviews (at milestones below)	.50%	1.50%	2.10%	.50%
★ 1 Year Performance Review				*
★ 2 Year Performance Review	*	*	*	
★ 5 Year Performance Review		*	*	
★ 8 Year Performance Review		*	*	
★ 12 Year Performance Review			*	
Course of Construction Observation Fees	N/A	N/A	N/A	N/A
Total Cost:	2.50%	4.50%	5.85%	2.0%





The RoofStar Guarantee – Cost

★ Roofing Contractor includes for Observer for course of construction field reviews in the contract value of the Work.

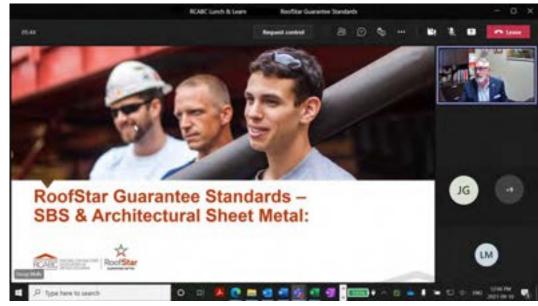
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★ 1 Year Performance Review				*
★ 2 Year Performance Review	*	*	*	
★ 5 Year Performance Review		*	*	
* 8 Year Performance Review		*	*	
★ 12 Year Performance Review			*	
Course of Construction Observation Fees	2.50%	3.25%	3.25%	2.5%
Total Cost:	5.00%	7.75%	9.10%	4.5%





The RoofStar Guarantee - Cost

- ★ Specifying a RoofStar Guarantee supports:
 - Ongoing development of Technical Standards (Roofing Practices Manual)
 - Research projects related to and in advance of roofing science
 - Pro-bono technical assistance
 - Education of both installers and designers across BC via seminars, courses, and lunch & learns like this one
 - RCABC Education Foundation (The roofing school)







The RoofStar Guarantee - Cost

- ★ The RoofStar Guarantee funds education and research for the benefit of the roofing industry.
- ★ We expanded the largest roofing training facility in North America.
- ★ Our annual support towards the apprenticeship program ensures trained installers for the next generation in BC.







- ☆ Provides depreciation-free coverage against leaks through the roof system caused by
 - Primary material failure (inherent flaw; premature loss of integrity)
 - Workmanship failure
- ★ What isn't covered Refer to Article 3.2.1.2., Div. A (RPM), including...
 - Air leakage
 - Overloading and consequential damage or leaks
 - Condensation
 - Wind damage (even though Standards require a design to address wind-resistance)
 - More (see Article 3.2.1.2. of Division A, RPM)







★ Primary Materials

- Membranes and membrane flashing
- Metal panels and associated flashing
- Asphalt shingles
- Cedar shingles and shakes
- Linear metal flashings for all roof coverings
- Drains and roof penetration flashings
- ★ Note These items are only included when supplied and installed by the RCABC member







★ Secondary Materials include:

- Deck overlays
- Insulation panels
- Insulation overlays
- Underlayments and eave protection membranes
- Adhesives and fasteners

★ Accessories include:

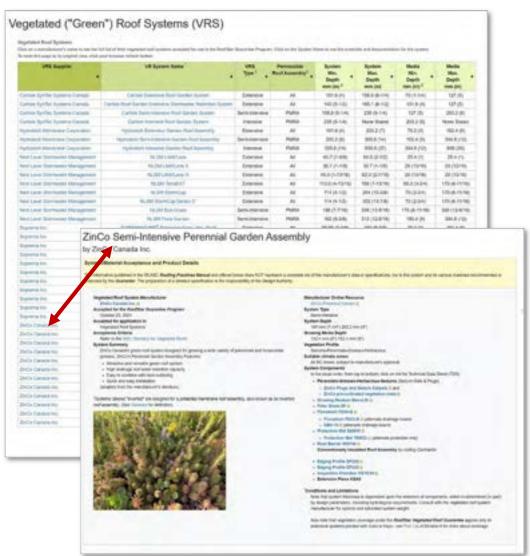
- Primers
- Mastics
- Sealants







- ★ Accepted green roof systems may be manufactured by an RCABC Associate Member or by an approved Affiliate Member.
- ☆ Green roofs are built by system, not by component materials.
- ★ Material substitution is not permitted unless written authorization is provided by the manufacturer







- ★ More about Independent Observations
- ★ Ensures that the project (roof, vegetated roof, or waterproofing at grade) meets or exceeds the RGC Standard and the project specifications so that the RGC can issue a RoofStar Guarantee.
- ☆ Provides a professional link (acceptable to both the owner and the RGC) between the Design Authority and the RCABC Active Member.
- ★ Fosters an opportunity for problem-solving during construction rather than after the work is done.

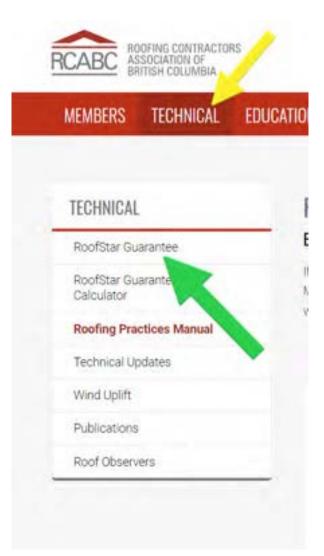






The RoofStar Guarantee – Third Party

- ★ More information on the benefits and value of a RoofStar Guarantee are available online at rcabc.org
 - Select the Technical button
 - Then RoofStar Guarantee button
- ★ More information on the role of the Observer and quality assurance on the roof:
 https://www.reminetwork.com/articles/achieving-quality-roofing/







- ★ RGC Standards support or exceed:
 - NBCC
 - BCBC and VBBL
 - CSA A-123 Standards (roofing)





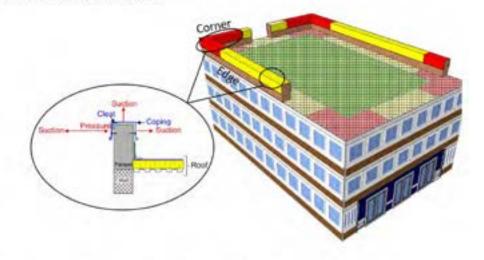


- Note that NBC 2020 introduced wind resistance factors for edge metal attachment
- ★ BC Building Code has adopted these same requirements for 2024, in 4.1.7.5 under External Pressure Coefficients
- ★ Example from NRC Wind load calculators for roof cladding and vegetated roof assembly
- ★ The industry is not ready, with testing of edge details anticipated to take 2+ years

Factored wind loads for parapet cladding and metal edge components

Parapet location on roof area	Wind load
Corner (suction)	-83 psf *
Edge (suction)	-59 psf *
Corner & edge (pressure)	41 psf *

*Worst of windward and leeward

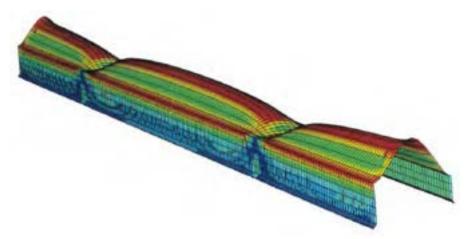


(Conversion Unit: 1 ft = 0.3048 m, 1 psf = 47.88 Pa, 1lb/ft² = 4.8824 kg/m²)





- ★ We can provide you with some guidance:
 - Use 24 gauge steel, and 22 gauge clips. The thicker the better
 - The cap flashing profile makes a difference. Max 127mm outside face and the narrower the width will have better results. For example, a 300 mm wide cap flashing will perform 3X better than a 1200 mm wide cap
 - Install the clips with fasteners max. 45 mm above the bottom of the clip. The shorter the length, the better the result
 - Use screws not nails. This is an RGC requirement.
 Also see the RGC spacing requirement
- ★ In 2008 RCABC adopted the changes to use clips, modified the fasteners and the use of clips based on problems experienced across the continent. Since then we experienced 1 claim for metal failure...improper securement was the cause







- ★ Canadian General Standards Board (CGSB) CGSB 37-GP-56M-1985 standard was withdrawn in 2015.
- ★ CSA 123.23-15 was adopted and is now referenced in the 2020 NBC and the 2024 BCBC adopted Mar 8, 2024. It is a "Product specification for polymer modified bitumen sheets, prefabricated and reinforced".
- ★ These references can be found in Part 5 Environmental Separation
 - Table 5.9.1.1.
 - Table 9.26.2.1.-B







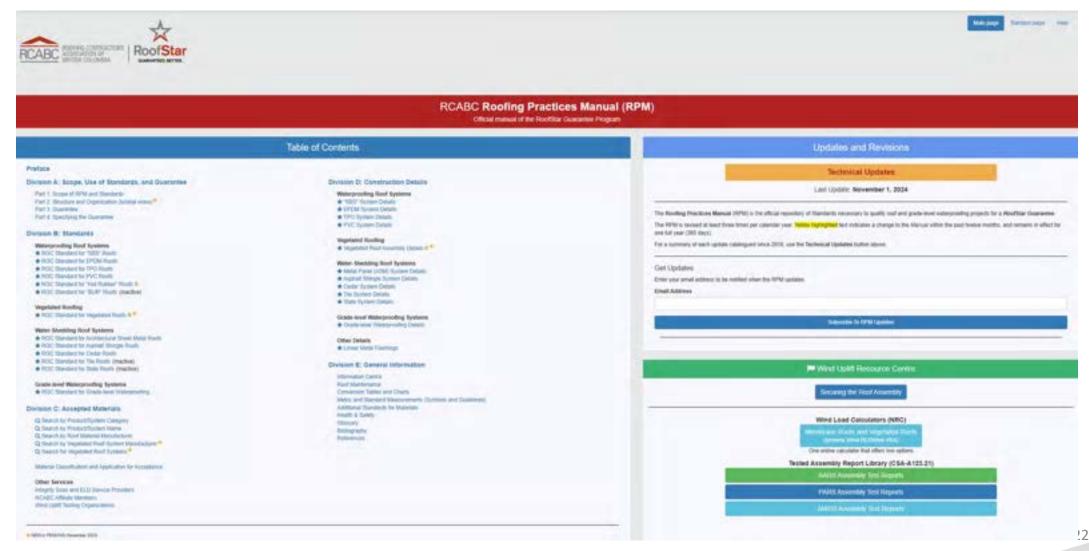
- ★ Manual Structure and Layout
- ★ Accepted Materials
- ★ Guarantee Standards and Details

www.rcabc.org =







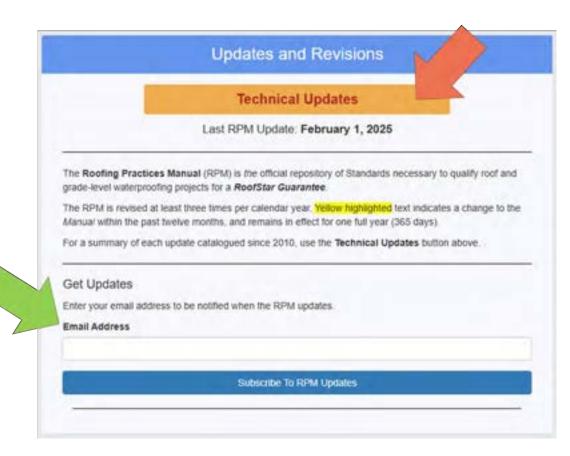






Technical Updates:

- ★ The RGC reviews Standards and accepts materials at least 3X per calendar year.
- ★ Changes are always indicated by yellow highlighting (remains for 12 months after change)
- ★ Click the link (orange arrow) to view in a different window; then click each tab for a summary.
- ★ Sign up for the latest updates before they're posted.







Technical Updates

- ★ The RGC regularly published Technical Updates here: LINK
- ★ Updates may include product bulletins, such as October 29th 2024, restricting the use of plastic pipe boots on asphalt shingle projects













★ Specifying a RoofStar Guarantee? Wording is available in the Roofing Practices Manual under Division A

Division A: Scope, Use of Standards, and Guarantee *

- » Part 1 Scope of RPM and Standards
- » Part 2 Structure and Organization
- » Part 3 Guarantee
- » Part 4 Specifying the Guarantee





- ★ More information on the Structure and Organization of the RPM, found in Division A:
 - Link to Part 3 Guarantee

- ★ Describes the purpose of the Guarantee program
- ★ Of note is the Terms and Limitations of Coverage for the RoofStar Guarantee are shown in 3.2
- ★ Also describes the quality assurance portions of the Guarantee, as well as the performance reviews





RPM –System Standards Structure

- ★ 14 Parts in each Standard
- ★ Parts parallel other system standards
- ★ Each Part has 3 sections
 - General (Design)
 - Material
 - Application

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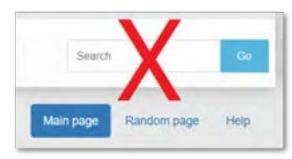
- Part 1 General
- Part 2 Supporting Structures: Decks and Walls
- Part 3 Securing the Roof Assembly
- Part 4 Materials
- Part 5 Deck and Wall Overlays
- Part 6 Air and Vapour Controls
- Part 7 Insulation
- Part 8 Insulation Overlays
- Part 9 Roof Field (Membrane Systems)
- Part 10 Perimeters and Walls
- Part 11 Drainage
- Part 12 Penetrations and Curbs
- Part 13 Linear Metal Flashing
- Part 14 The Roof as a Platform





- ★ If you want to find something quickly but you're not sure which Part to find it in, don't use the search window at the top of an RPM page (it searches the internet)
- ★ Use CTRL+F if using a PC
- ★ Use CMD+F if using a Mac





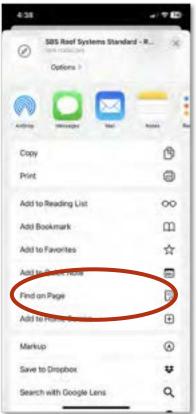






- ★ Using a mobile device? No problem...
 - For iPhones, select the "share" button (bottom)
 - For Android users, select the ellipsis at the top right corner.
 - Select "Find on Page"
 - Type in search term
 - Scroll through the highlighted terms

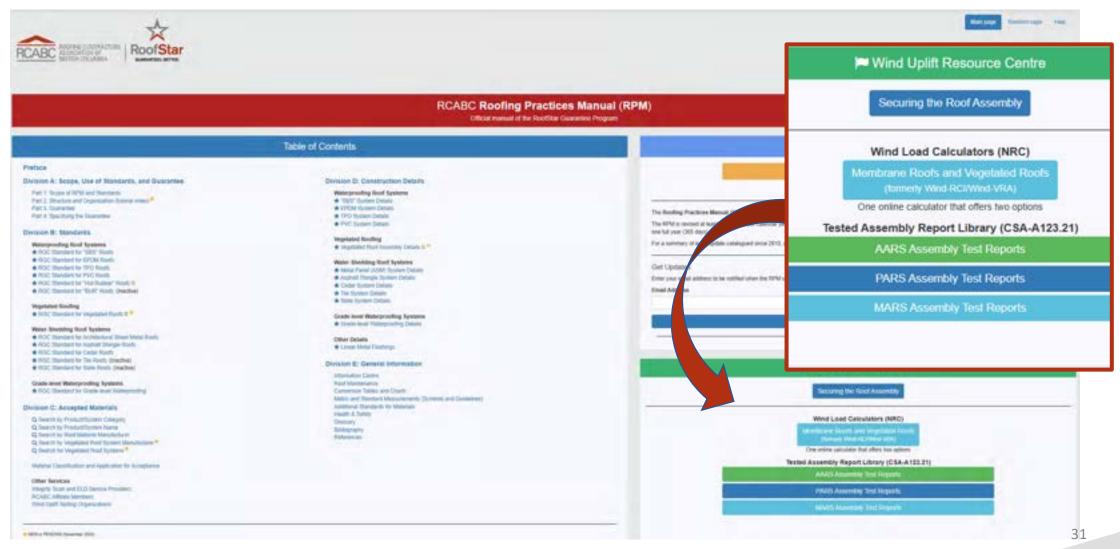








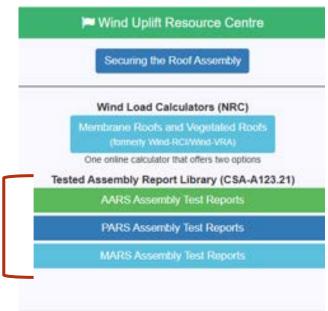








- ★ CSA 123.21-14 is a test method, not a wind standard:
 - Standard Test Method for the Dynamic Wind Uplift Resistance of Membrane-Roofing Systems
- ★ Attachment methods identified as:
 - AARS Adhesive Attached Roof System
 - PARS Partially Adhered Roof System
 - MARS Mechanically Attached Roof System



^{**}Ballasted and steep roofs require different calculations and planning.





SBS Modified Bitumen Membrane Roof Systems



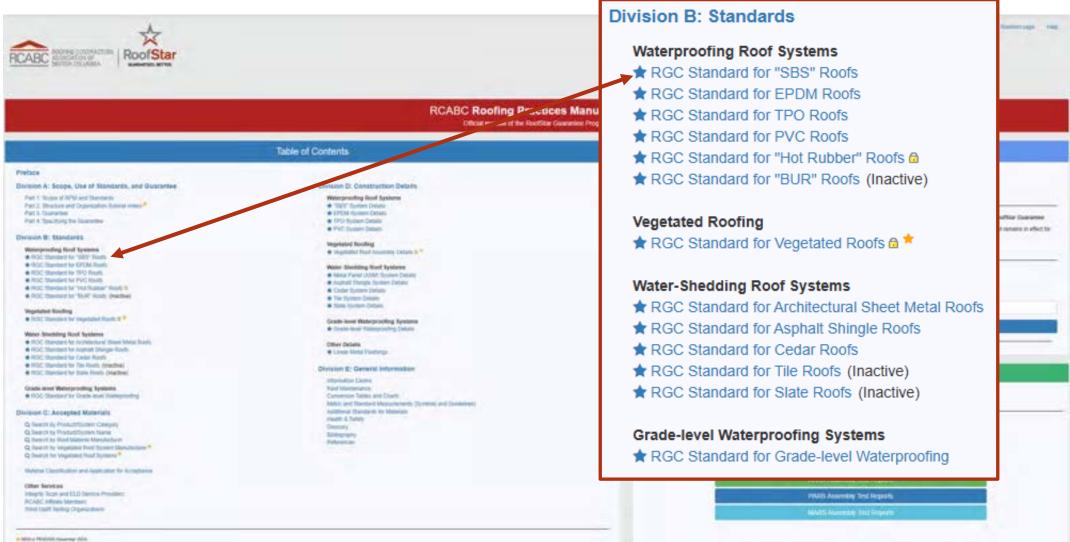
Inlet Fire Hall Port Moody







How to Find It







SBS Roof Systems - CLT

Part 2 Decks

- ★ CLT is a common roof deck in construction
 - Conventionally Insulated
 - Protected Membranes
 - Etc.
- ★ A big challenge is keeping the deck components dry until the roof can be installed



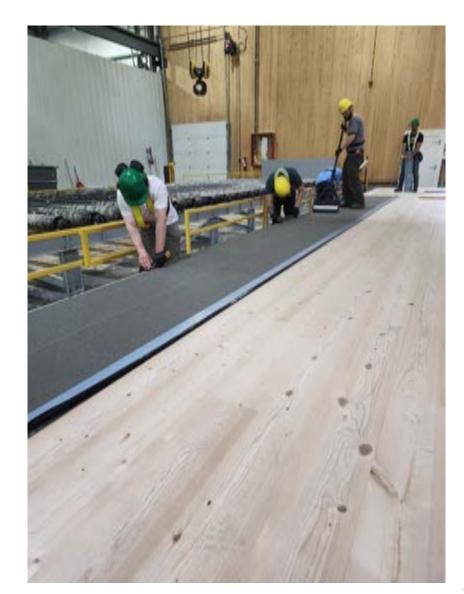




SBS Roof Systems - CLT

Part 2 Decks

- ★ Some manufacturers are installing membranes at the factory
- ★ Those membranes may not be part of a tested assembly so should be confirmed
- ★ Membranes installed by others do not qualify for coverage under the RoofStar Guarantee, so a PARS or MARS attachment is required







Part 2 Decks

- ★ Aside from safety, continuity of the air / vapour barrier is important
- ★ Rigid conduit casing is not air tight
- ★ It's also not watertight, and can lead to ingress at night seals during construction





Part 2 Decks

12-022 Cables or raceways installed in roof decking systems

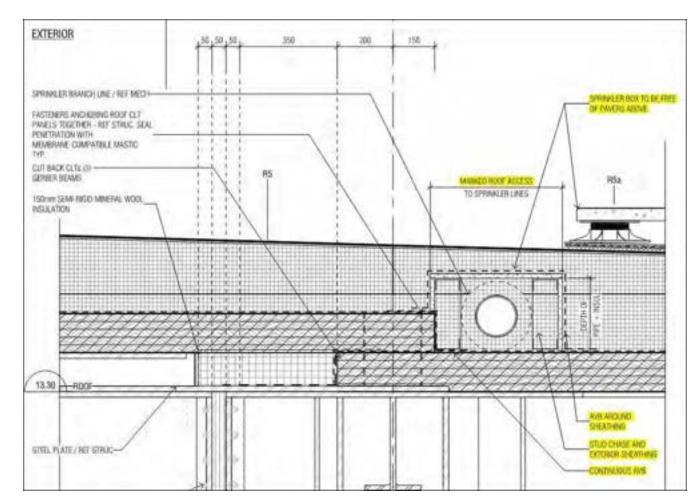
- 1) Cables or raceways installed in accordance with this Section shall not be installed in locations concealed within a roof decking system, where the roof systems utilizes screws or other metal penetrating fasteners.
- 2) Notwithstanding Subrule 1) the following circuits shall be permitted for installations in locations concealed within a roof decking system:
 - a) Class 2 circuits in which the open-circuit voltage does not exceed 30 V; and
 - b) embedded trace heat.
- 3) Where wiring is concealed within the roof deck system in accordance with Subrule 2), a warning label shall be installed
 - a) at all permanently installed roof access points where provided; and
 - b) in a conspicuous location in the roof area where the cabling is installed.





Part 2 Decks

- ★ Conduits above deck are now typically routered and covered with a 5.0 mm steel plate, or curbed around and capped with a 5.0 mm steel plate
- ★ Added benefit to this is the conduit and all the potential air loss is now below the vapour retarder

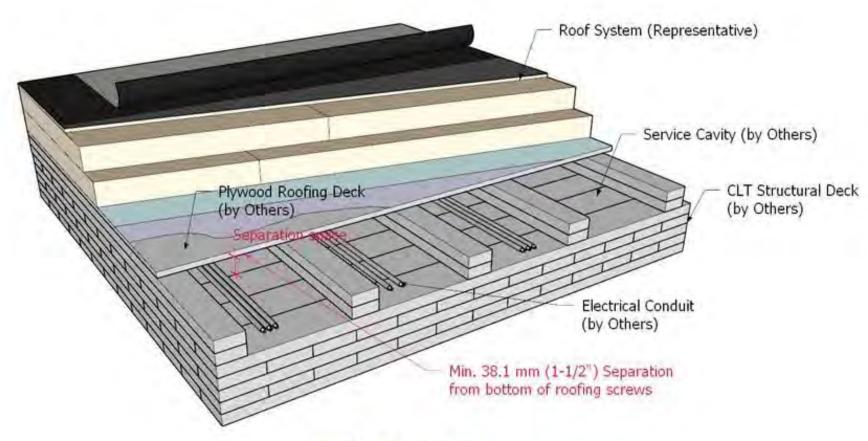






Part 2 Decks

Alternatively, RGC is promoting the use of a sub deck as shown here:



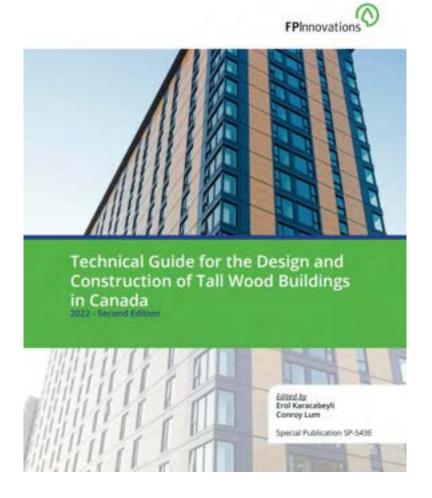
Service Cavity concept only (subject to engineering and Design Authority)





Part 2 Decks

- ★ CLT resources outside of the RGC:
 - https://www.apawood. org/cross-laminatedtimber
 - https://web.fpinnovati ons.ca/tallwood/





Part 6 Air and Vapour Controls – All systems

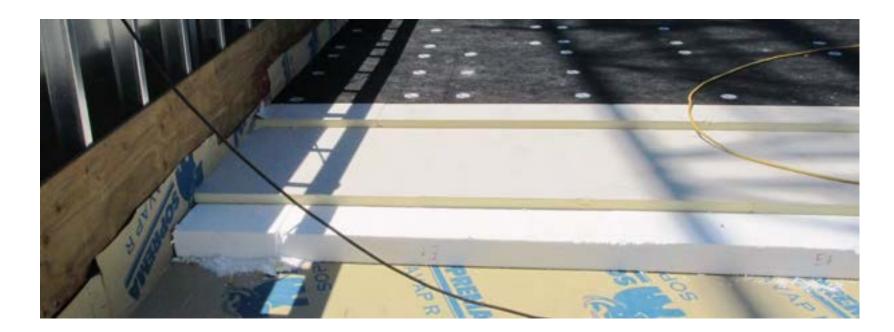
- ★ The decision to specify air and vapour control layers is the sole responsibility of the Design Authority.
 - Polyethylene and Kraft Laminates are no longer acceptable in the RoofStar Guarantee program due to their susceptibility to physical damage and difficulty sealing at penetrations
- ★ Material with a puncture resistance rating of 150 N (34 lbf) is a Guiding Principle
- ★ Should be minimum 2mm thick when used as a temporary roof





Part 7 Insulation

★ Heat-Sensitive insulation (plastic based) must be covered with a heatresistant insulation at least 50mm (2") thick





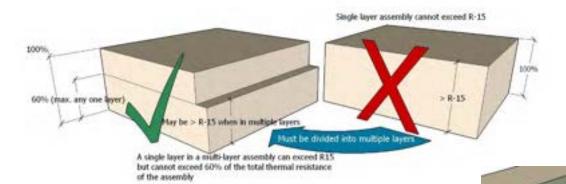
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SBS Roof Systems

Part 7 Insulation

★ Heat-Sensitive Multi-layers of Insulation >R15







Single Ply Roof Systems

Part 7 Insulation

- ★ Thermal bridges from fasteners and plates
- ★ Further reading:
 - Codification of Energy
 Losses from Fasteners



Case	Lost R-Value	Fastener Cost	Lost R-Value Cost	Value of Lost E	nergy Efficiency	Total Net Cost		
				Chicago	Miami	Chicago	Miami	
Mechanically Attached	14.5%	\$15,633	\$44,757	\$15,000	\$24,375	\$75,390	\$84,765	
Inductively Welded	11.6%	\$19,217	\$35,802	\$13,125	\$20,625	\$68,144	\$75,644	
Buried Fasteners	3.2%	\$5,189	\$9,981	\$5,625	\$7,500	\$20,795	\$22,670	
All Layers Adhered	0%	\$0	\$0	\$0	\$0	\$0	\$0	

Table 1. Costs associated with various attachment strategies for a 125,000-ft.2 (11,613-m2) big-box-style building in Chicago and Miami.





Part 7 Insulation

★ Thermal bridges from board movement







Flat Roof Systems

Part 7 Insulation

- ★ NRC has created an effective R-Value calculator:
 - https://nrc.canada.ca/en/research-development/productsservices/software-applications/energy-rci
 - Protected Membrane Roof Assemblies (expected 2024)

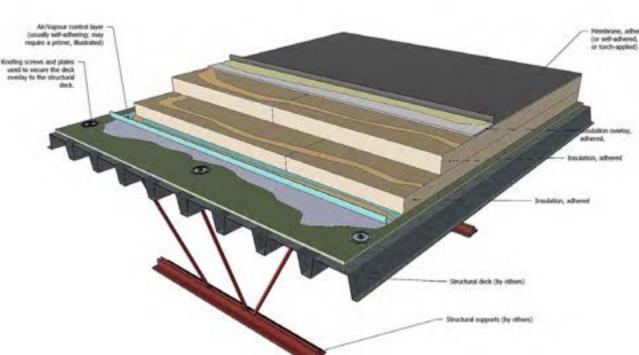




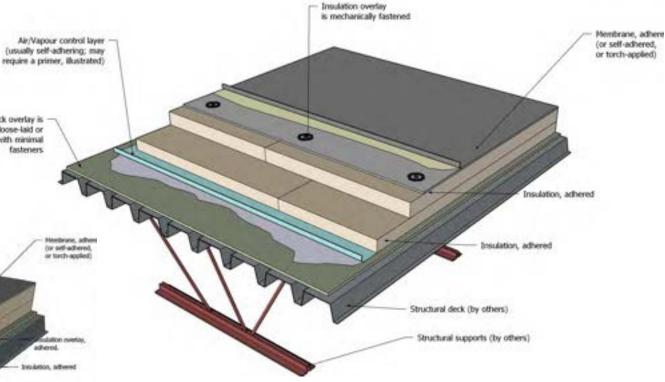


Part 7 Insulation

★ Examples of PARS assembly held in place with relational fasterners.



Deck overlay is commonly loose-laid or







Part 9 Field Membrane

- ★ Only PARS or AARS Assemblies when the roof supports any type of load
 - Photo Voltaic
 - Vegetated Roofs
 - Other overburdens (except for ballasted systems)







Part 9 Field Membrane

★ Thickness & puncture resistance requirements based on assembly type

		Exposed Roof Systems					75	Protected Roof Systems		Grade-level	
		Conventio	ventionally insulated / Uninsulated Systems				Bull-in Outlets	PMIII Systems		Water- proofing	
		Mechanic- ally tastened	Heat- welded mm	Adhered			Heat- weided	Heat-	Puntue	Heat	Pundus
				Self- adhered	Hot- mopped	Adhesive- applied	Adhesive- applied, Self- adhered mm	weided, Adhered	e Residante (N)	weided, Adhered	3
Type, Reinforcement, Grade	Guarantee Term			mm	mm	mm					
	5/10			-	.00			6.00	N/A	6.00	NA
Minimum Combined 2-ply Thickness	15	6.50					6.50	N/A	6.50	N/A	
Base (Floregrass) - Gr 3	5/10	2.30	2.30	2.30	2.20	2.20	×	×	X	×	×
	15	×	2.50	2.50	2.50	2.50	×	×	X	×	×
Base (Composite fibreglass) - Gr. 3	5/10	2.50	2.30	2.30	2.20	2.20	2.50	2.20	X	2.20	×
	.15	×	2.50	2.50	2.50	2.50	2.90	2.50	X.	2.50	×
Base (Polyester) - Gr. 3	5/10	2.50	2.50	2.50	2.20	2.20	2.50	2.20	X	2.20	×
	15	×	2.50	2.50	2.50	2.50	2.90	2.50	X	2.50	×
Base (Composte) - Gr. 3	5/10	2.50	2.30	2.30	2.20	2.20	2.50	2.20	×	2.20	ж.
	15	×	2.50	2.50	2.50	2.50	2.90	2.50	ж.	2.50	×
Factory Laminated Base (panel)	5/10	2.20 X				2.20	N/A	. X.	NA		
	15	2.20 X				2.20	NA	×	N/A		
Film Cap (Fibreglass) - Gr 2	5/10	×	4.00	3.30	3.30	3.30	×.	×	X	×	×
	15	×	×	×	×	×	×	×	×	×	×
Film Cap (Polyester) - Gr. 2	5/10	×	4.00	3.50	3.50	3.50	3.00	3.00	400	3.00	400
	15	×	4.00	4.00	4.00	4.00	4.00	3.00	400	3.50	400
Film Cap (Composite) - Gr 2	5/10	× .	4.00	3.30	3.30	3.30	3.00	3.00	400	3.00	400
	15	×	4.00	4.00	4.00	4.00	4.00	3.00	400	3.50	400
Granule Cap (Fibreglass) - Gr. 1	5/10	×	4.00	3.30	3.30	3.30	×	×	×	×	×-
	15	×	X	X	Х.	×	X	×	X	×	×
Granule Cap (Polyester) - Gr. 1	5/10	X)	4.00	3.50	3.50	3.50	3.50	3.00	400	3.00	800
	15	× .	4.00	4.00	4.00	4.00	4.00	3.00	400	3.50	400
Granule Cap (Composite) - Gr. 1	8/10	×	3.30	4.00	3.30	3.30	3.50	3.00	400	3.00	400
	15	X	4.00	4.00	4.00	4.00	4.00	3.00	400	3.50	400



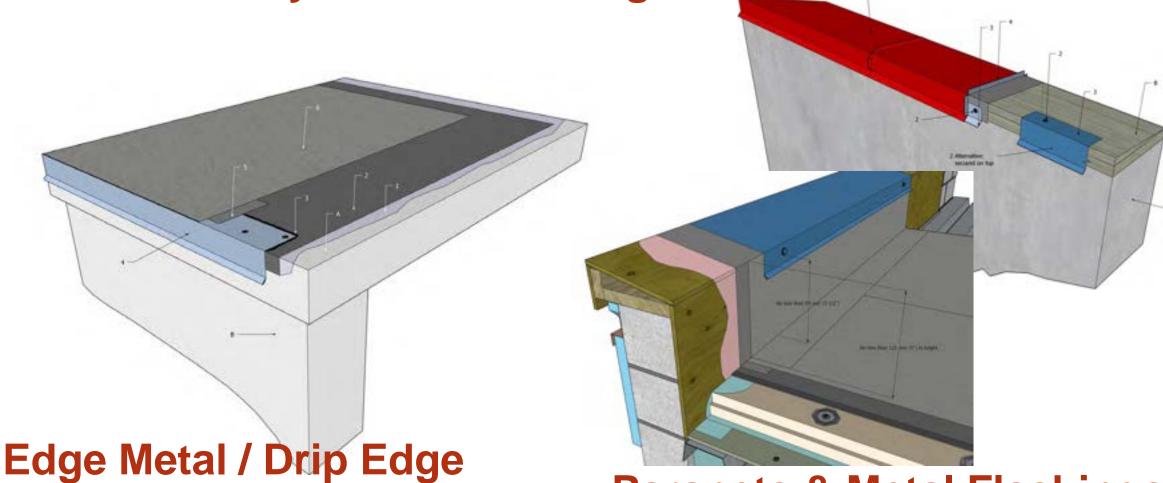
Part 10 Perimeters and Walls

- ★ A roof edge can utilize a drip edge type design
- ★ If a parapet is incorporated into a design, it must be a minimum 127mm (5") in height, measured from the top of the roof surfacing
 - If a ballasted / overburden roof assembly, it must be a minimum 200mm (8") in height, measured from the top of the ballast





SBS Roof Systems – Drawings



Parapets & Metal Flashings





Part 11 Drainage

- ★ Overflow drains ("overflows")
 - Primary function is to keep the roof from collapsing
- ★ Size and frequency dictated by British Columbia Building Code and Plumbing Code
- ★ 15 Year RoofStar Standards require overflows on each roof area







Part 12 Penetrations and Curbs

- New for the RPM: Part 12 is now Penetrations and Curbs, used to be dedicated to Protected Membrane Assemblies, which is now in Part 14
- ★ Penetrations such as electrical conduit are required to have a weatherhead
- ★ Membrane Gutter
 - Minimum 300mm (12") in width
 - Depth not to exceed width
 - Include Overflow Drain







Hot Rubber Systems





... can prevent bad detailing on new construction





Hot Rubber Systems

Part 12 Penetrations and Curbs

★ This is an example of how not to do it, it would not be considered a valid

claim and quite often is done by others







Liquid Membranes

Part 12 Penetrations and Curbs

- ★ You may hear the term "liquid membranes". Note there is a big difference between a *coating* and a *liquid membrane*.
- ★ RGC currently issues Guarantees for the following:
 - Hot Fluid Applied Rubberized Asphalt Membranes (Hot Rubber)
 - Catalyzed 2-Component PMMA
 - Polyurethane Membranes
- ★ These materials are found in Division C Accepted Materials. The easiest way to find them is to search by Product Category: Link



Liquid Membranes

Part 12 Penetrations and Curbs

- ☆ Catalyzed 2-Component PMMA is one that comes up most often, as it is used very commonly now for odd shaped protrusions. With over a 10 year performance history in BC, it's considered to be proven technology.
- ★ As it is mixed in the field, and sensitive to changing climatic conditions, it can be challenging to install correctly, and its use should be carefully considered.

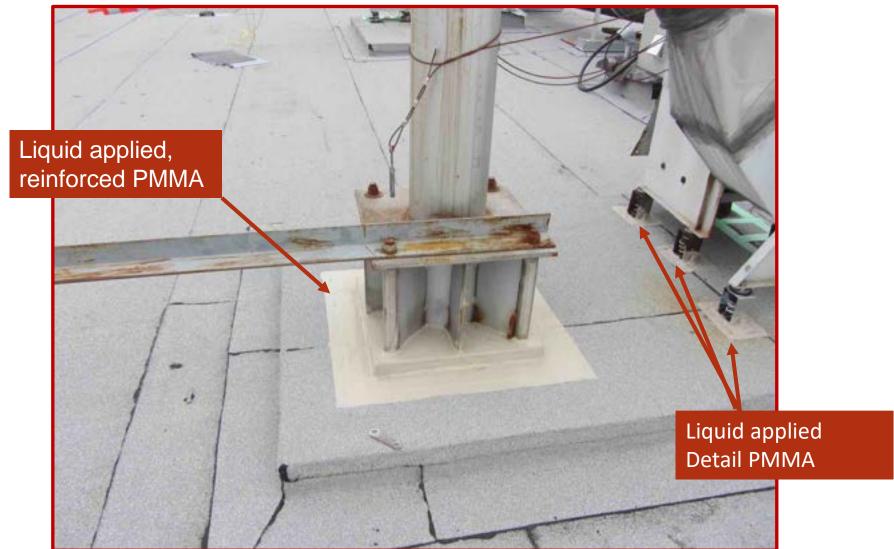


PMMA used in drain sump





Liquid Membranes

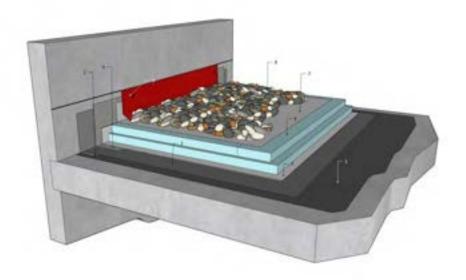






Part 14 The Roof as a Platform: Coverings, Living Spaces and Structures

- ★ Protected & Modified Protected Systems
 - Airspace above XPS insulation to maintain vapour open assembly
 - Airspace beneath XPS insulation to improve drainage







Part 14 The Roof as a Platform: Coverings, Living Spaces and Structures

- ★ Design Considerations
 - Load-bearing Capacity of Insulations (minimum 110 Kpa / 20 psi)
 - Membrane Thickness and Puncture Resistance
 - Membrane Protection Layer (shovel-guard)
 - Drainage Layer



All Roof Systems

Protected Membrane Roof Assemblies are a Great Option,

sometimes the only one...



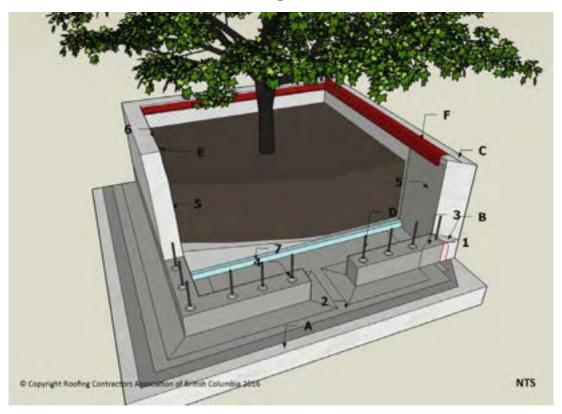
^{*}RCABC Member Contractor installs all waterproofing / roofing membranes





All Roof Systems

Pre-curbs roofed in for Exposed Concrete Structures



http://rpm.rcabc.org/index.php?title=WP_Details:F1.7.6_(Walls_-_Planter_Pre-Curb_Wall)





Hot Works Program

- ★ RCABC Member Contractors voluntarily prescribe to a collective hot works program. Although predominantly affecting SBS Modified Bitumen Roofing, it applies to all roofing activity
- ★ Through COR Certification and a commitment to employee training, Member Contractors have a 5-part plan begun in 2019 and carrying forward;
 - 1 Education
 - 2 Technical Standards
 - 3 Insurance
 - 4 Member Policy
 - 5 Member Support & Compliance

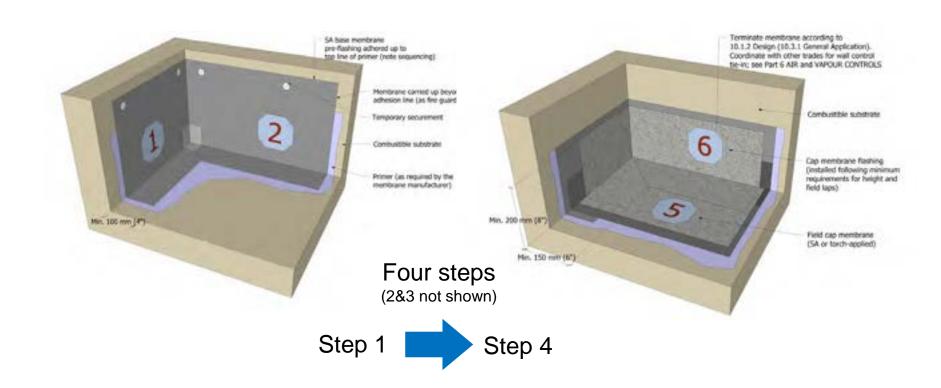




Hot Works and Fire Risk Mitigation

Part 2 Standards and application alternatives

★ Example: pre-flashing approach to normalize alternate risk reduced methods







RCABC Resources Available

- ★ Review Roof specifications on RCABC Guarantee Projects
- ★ Provide technical support to Design Authorities, Member Contractors, Roof Observers, General Contractors, and Owners
- ★ Education seminars
- ★ Staff available to assist:
 - Laurence Matzek, Director, RoofStar Guarantee Program
 - James Klassen, RoofStar Technical Advisor
 - Doug Wells, RoofStar Technical Advisor
 - technical@rcabc.org goes to all three

Roofing.

It's what we do.

RGC Technical Department









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Any questions?