BCBEC CONFERENCE & AGM NOVEMBER 8, 2019

# Vented Roofs: More Venting is Better Right?

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### **Influence of Solar Radiation & Night Sky**



## A Localized Problem...

High Risk Climate for
 Night Sky Radiation
 Vented Roof Moisture
 Issues



### Joist-Insulated Vented Flat Roof



# **Study Overview**

 $\rightarrow$  Task 1: Literature Review

- $\rightarrow$  Task 2: Survey of Roof Renewals
- $\rightarrow$  Task 3: In-Situ Field Monitoring and Testing
- $\rightarrow$  Task 4: Controlled Field Exposure Monitoring
- $\rightarrow$  Task 5: HAM and Energy Simulations
- $\rightarrow$  Task 6: Industry Guidance







# **Roof Surveying Overview**

- ightarrow Survey of roof conditions
- ightarrow 70 projects identified, 37 of which had sufficient data
- $\rightarrow$  Factors evaluated:
  - ightarrow Building location
  - ightarrow Exposure of building
  - ightarrow Indoor humidity / building use / occupant load
  - ightarrow Air barrier strategy
  - $\rightarrow$  Vapour barrier strategy
  - ightarrow Insulation type
  - $\rightarrow$  Ventilation strategy
  - ightarrow Membrane type
  - ightarrow Thermal mass of roof assembly

## **Roof Surveying – Venting**

Ventilation Strategy	Number of Roofs in Sample	Percentage of Sample with Air Leak/Condensation Issues
Not vented	4	0%
Doghouse vents	9	11%
Strip vents	10	<b>EXAMP</b> 20%
Doghouse and strip vents	6	50%



# **Roof Surveying – Thermal Mass**

Factor	Indicator	Number of Roofs in Sample	Percentage of Sample with Air Leak/Condensation Issues
Ballast	Used	12	0%
	Not used	25	28%
Coverboard	Used	12 DD	ΛΕΤ 0%
	Not used	25	28%
"Thermal Mass"	High thermal mass	7	0%
	Low thermal mass	16	38%



### **Study Sites**







#### MURB in North Vancouver, BC







#### **Roof Sheathing Moisture Content**





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# **Building Code Context**

#### $\rightarrow$ BCBC Clause 9.19.1.1

"Except where it can be shown to be unnecessary, where insulation is installed between a ceiling and the underside of the roof sheathing, a space shall be provided between the insulation and the sheathing, and vents shall be installed to permit the transfer of moisture from the space to the exterior"

→ Sensible for roofs without good airtightness, but modern assemblies can provided excellent airtightness, and venting has also been shown to be detrimental in some circumstances



### **Relative Risk of Wood-Frame Roof Assemblies**

Could debate this for hours... and it depends...



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## **Next Steps**

#### $\rightarrow$ PFT & Airtightness Testing



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Sources

RDH



**Blower Doors** 

 $\rightarrow$  Hygrothermal Modelling



**Guide to follow!** 

**VENTED ROOFS: MORE VENTING IS BETTER RIGHT?** 

# Discussion + Questions

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Learn more at rdh.com

