

# Are you still air sealing your building envelope from the interior?



Presenters:

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Technical Solutions & Architectural Services Director  
Owens Corning Canada

&

Jennifer Weatherston  
Director of Innovation & Integration  
Reid's Heritage Homes



## #BuildingGenius

- Exterior Air Barrier System vs Interior Air Barrier System
- Critical details to achieve continuity with Owens Corning's CodeBord Exterior Air Barrier System
- System performance & certifications
- Advantages to the builder
- Builder support and tools
- Builder experience and insight with exterior air sealing (Jennifer Weatherston, Reids Heritage Homes)
- Q & A

# Path Towards Affordable Net Zero Housing



CONSERVATION FIRST

Optimize insulation in walls, attics & basements

Add continuous insulation (eliminate thermal bridges)

**Control air leakage (durability, comfort and EF)**

Better windows and window distribution (orientation)

More efficient mechanicals (heating & cooling)

More efficient ventilation (HRVs and ERVs)

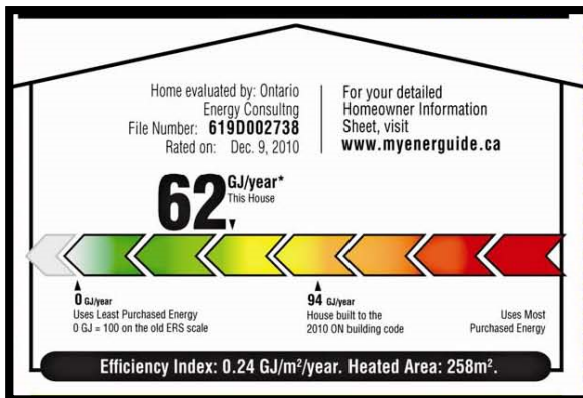
More efficient hot water generation

Drain water heat recovery systems

LED lights

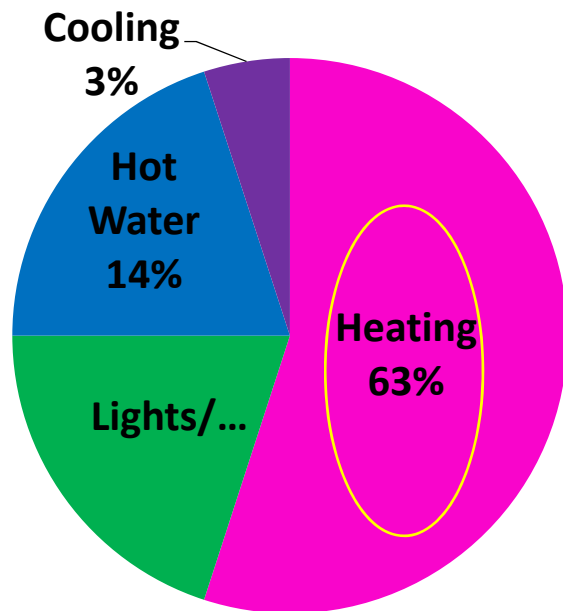
GENERATION

Renewables (solar, wind.....)



## Energy Use in a Typical 2 Storey Single Family Home

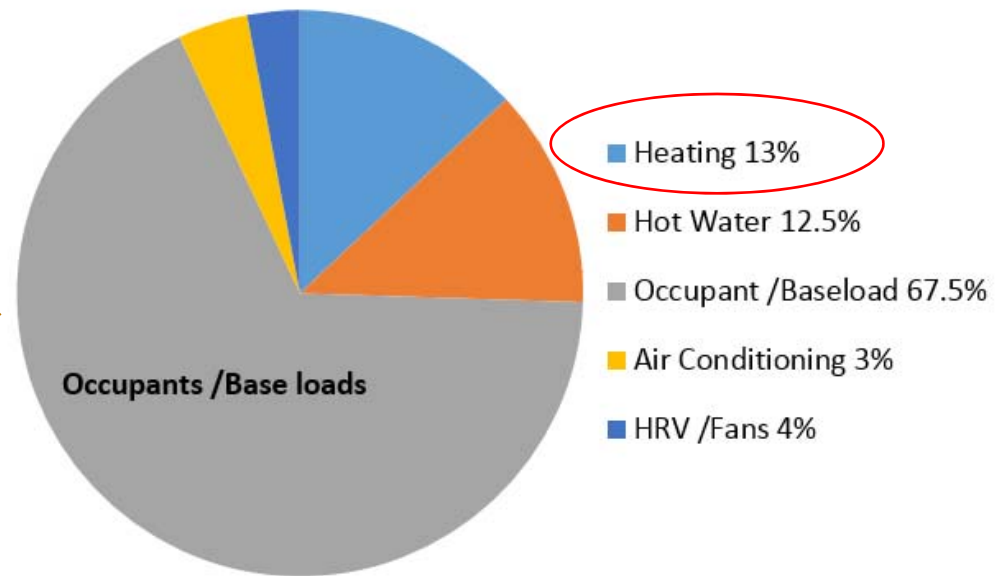
Code Today



ERS 80

135GJ/year (37 000 Kwh)

Net Zero



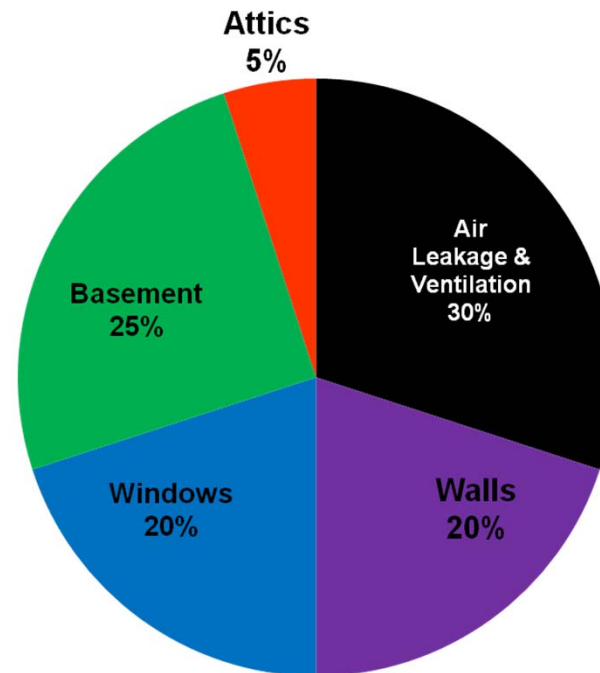
ERS 93

70 GJ/year (19 000 Kwh)

# Heating Energy Typical Code Built Home

What would you do first?

1. Much Tighter
2. Better Basements
3. Better Walls
4. Better Windows
5. Optimized mechanicals



NZE: Electric Heating w/ ASHP

NZE<sub>r</sub>: Natural Gas

***The More Insulation You Add in Your Walls the More Air Leakage Control Becomes CRITICAL!***



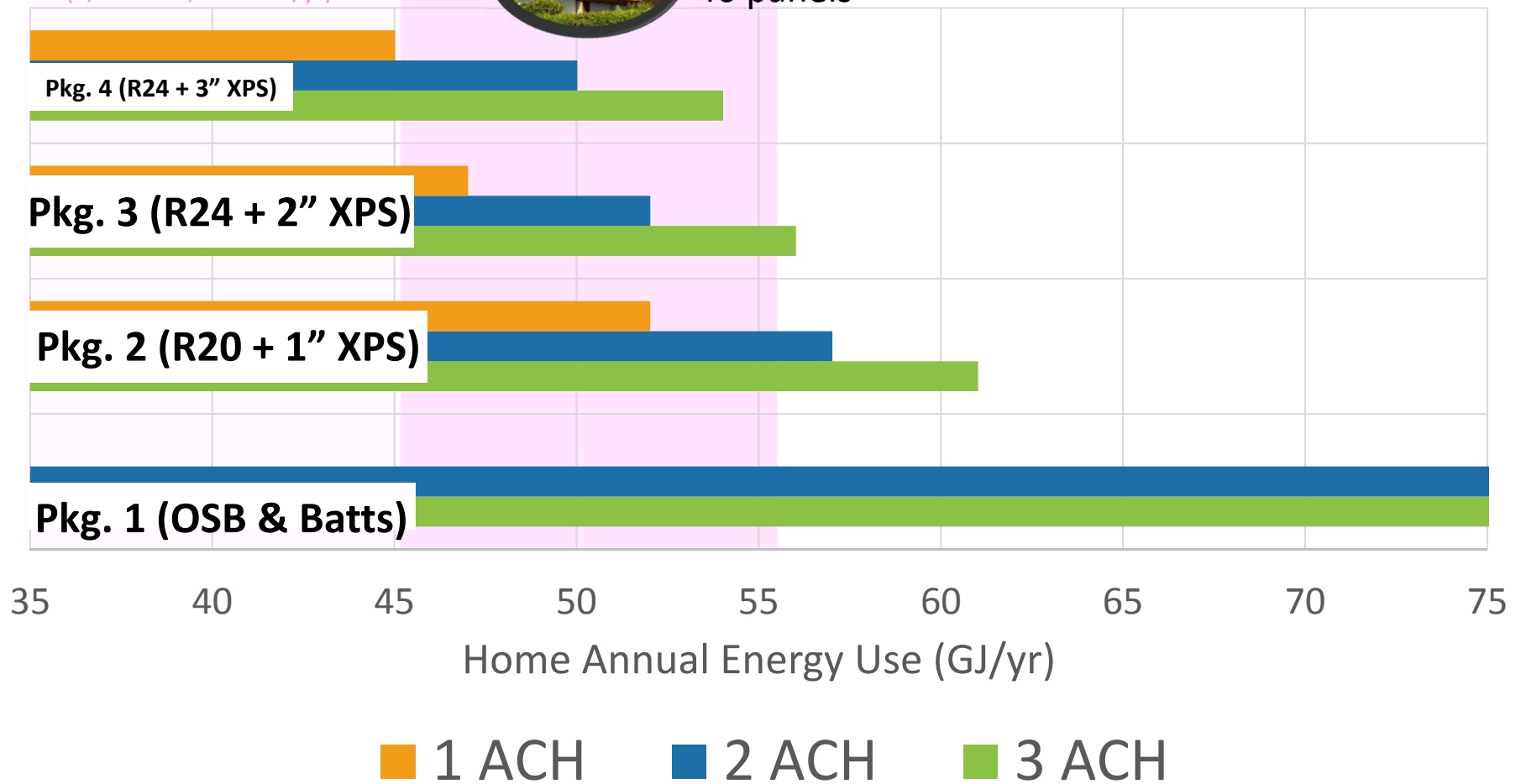
30 panels

NZE<sub>r</sub> Zone  
≤ 56 GJ/yr  
(15,500 kWh/yr)

NZE Zone  
35 – 45 GJ/yr  
(9,700 – 12,500 kWh/yr)



46 panels

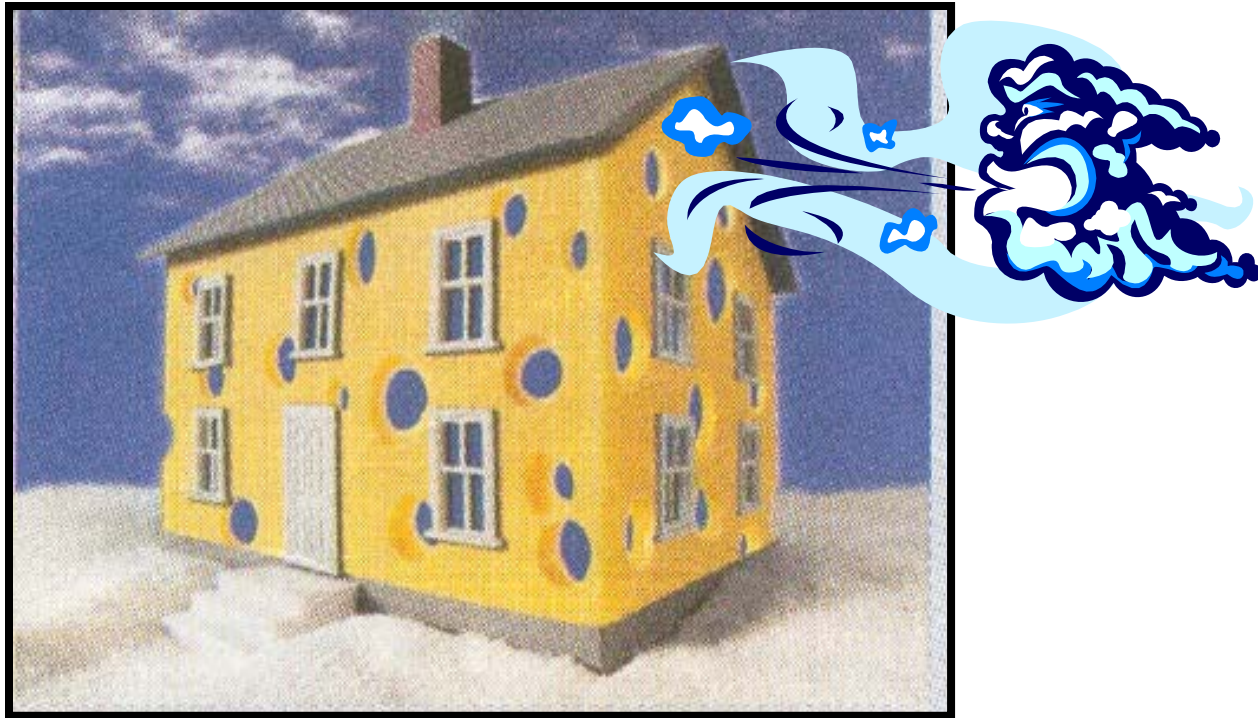


# CONSEQUENCES OF UNCONTROLLED AIR LEAKAGE





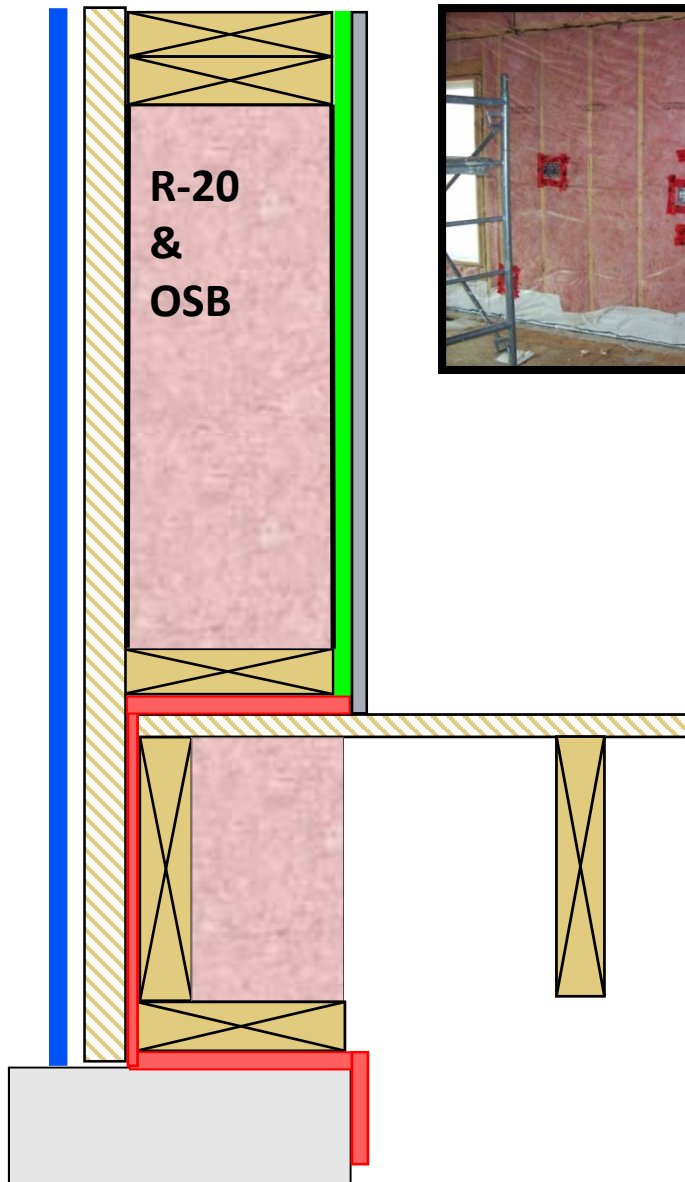
# Air Barrier Systems



Interior vs Exterior



## Interior Sealed Polyethylene Air Barrier System

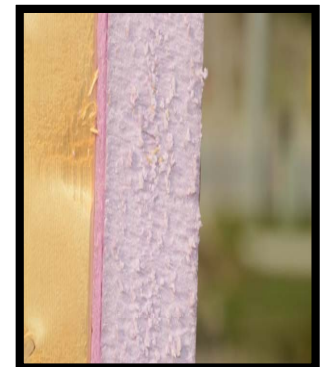


### Wall System:

- OSB sheathing
- Batt insulation
- Polyethylene air/vapor retarder
- Weather barrier

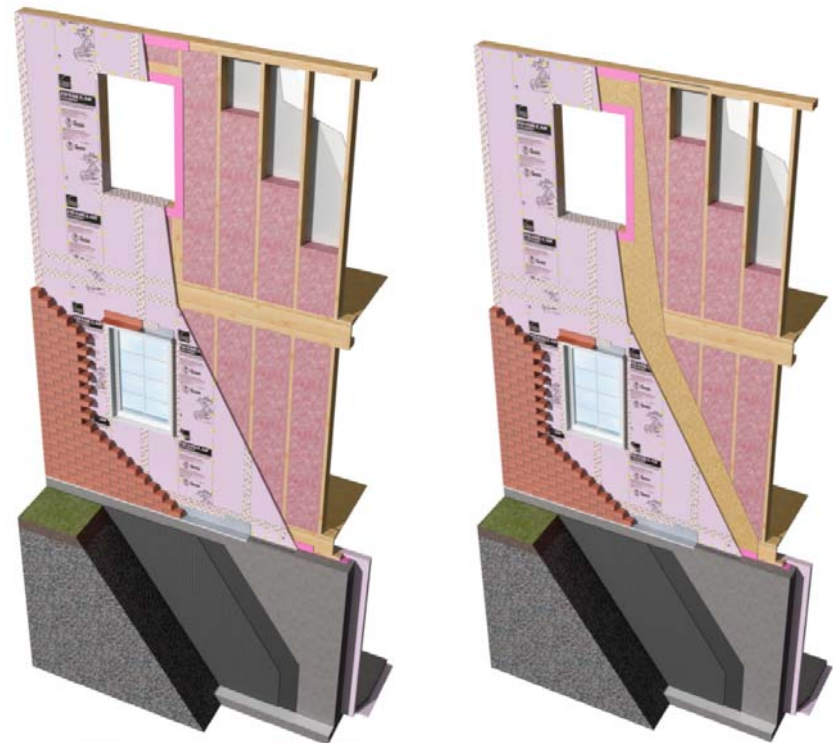


# CodeBord Exterior Air Barrier System (CABS)



## CABS THREE FUNCTIONS IN ONE APPLICATION

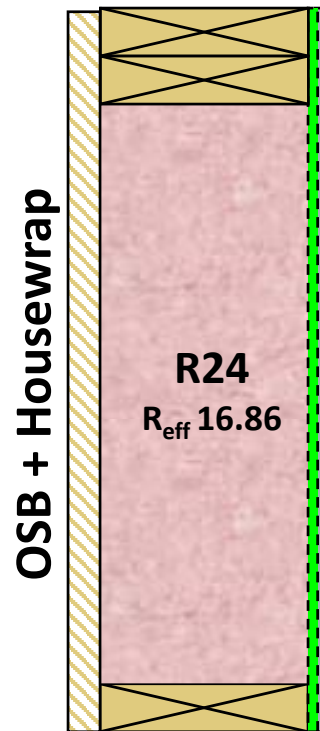
- 1- Thermal Barrier
- 2- Air Barrier
- 3- Moisture Barrier



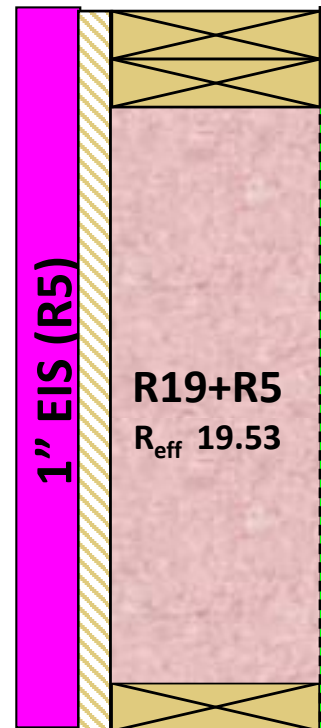
CCMC third party certification 14003-R

# Benefits of Continuous Insulation & Exterior Air Sealing

## CodeBord Exterior Air Barrier System Reduces Thermal Bridges (Energy Savings & Optimal Occupant Comfort)

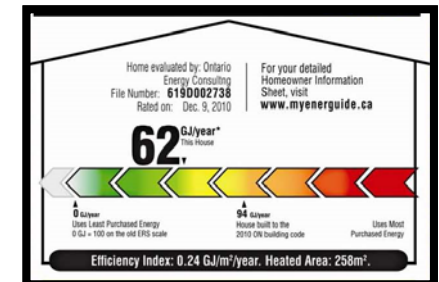


VS

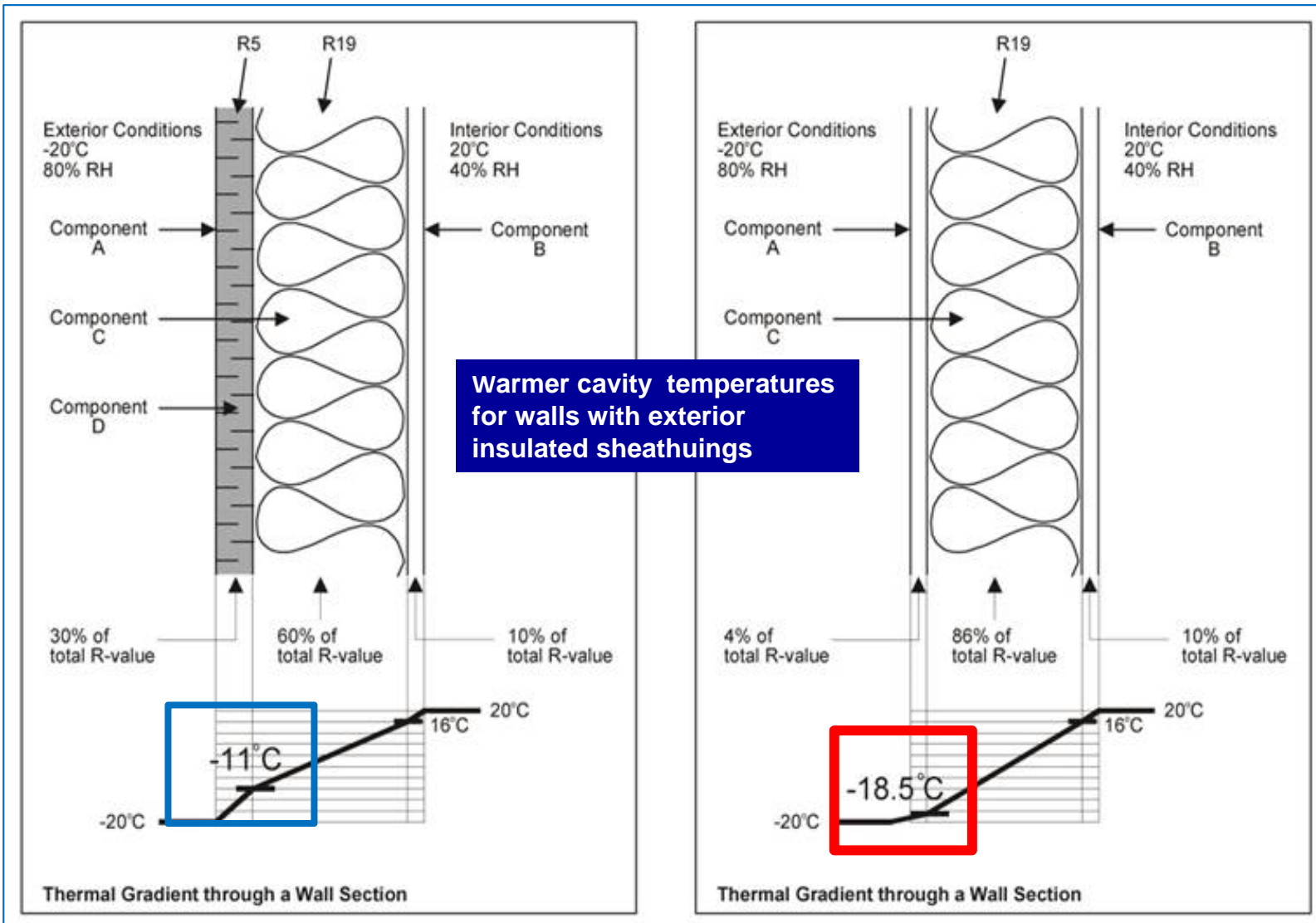


15% less heat loss  
through the studs

Optimal Stud  
spacing 24" cc



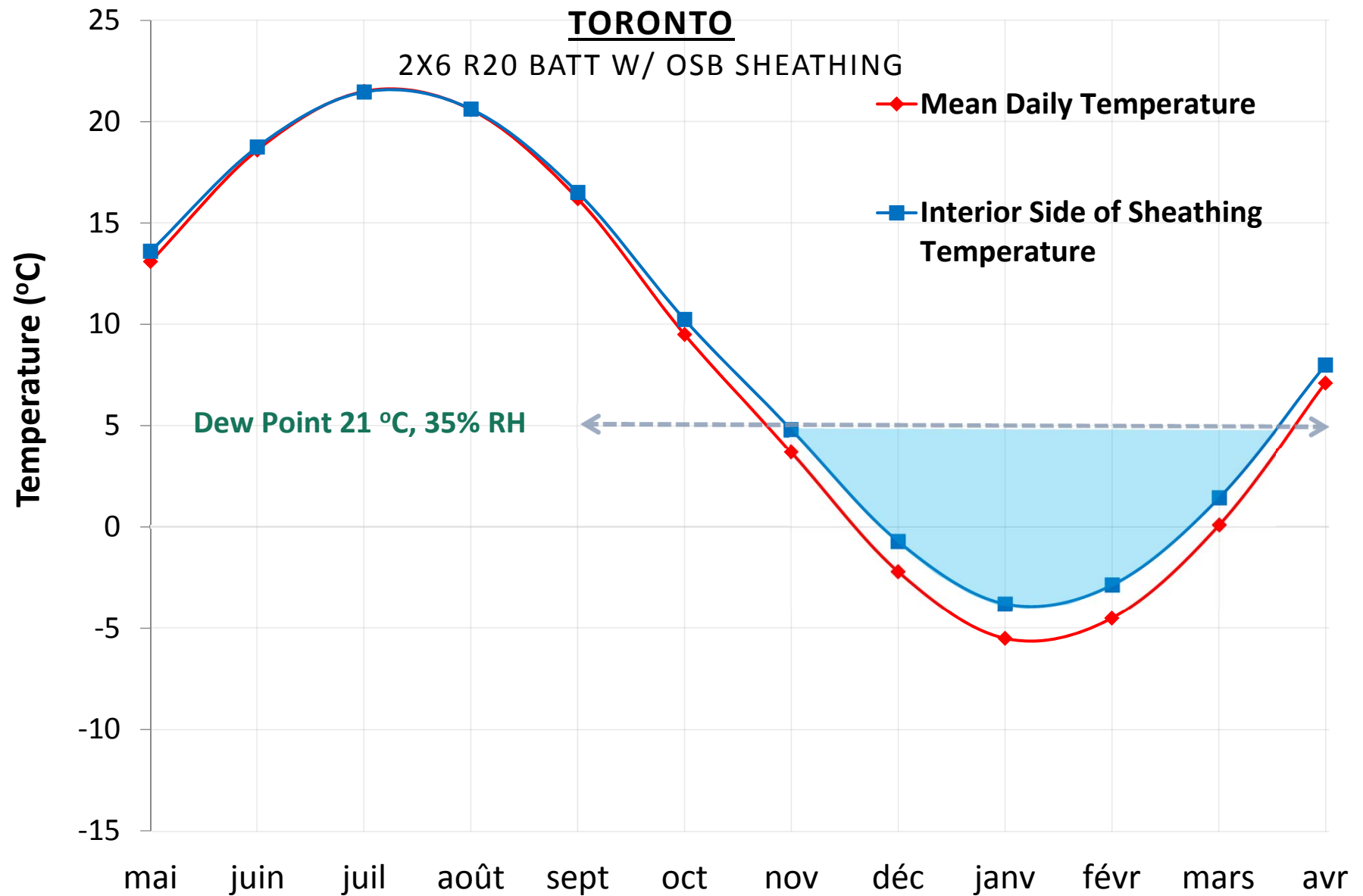
## CodeBord Insulating Sheathing Warms Up Cavity Reducing the Risk of Condensation



**WARM AIR CAN HOLD SIGNIFICANTLY MORE WATER VAPOUR THAN COLD AIR**

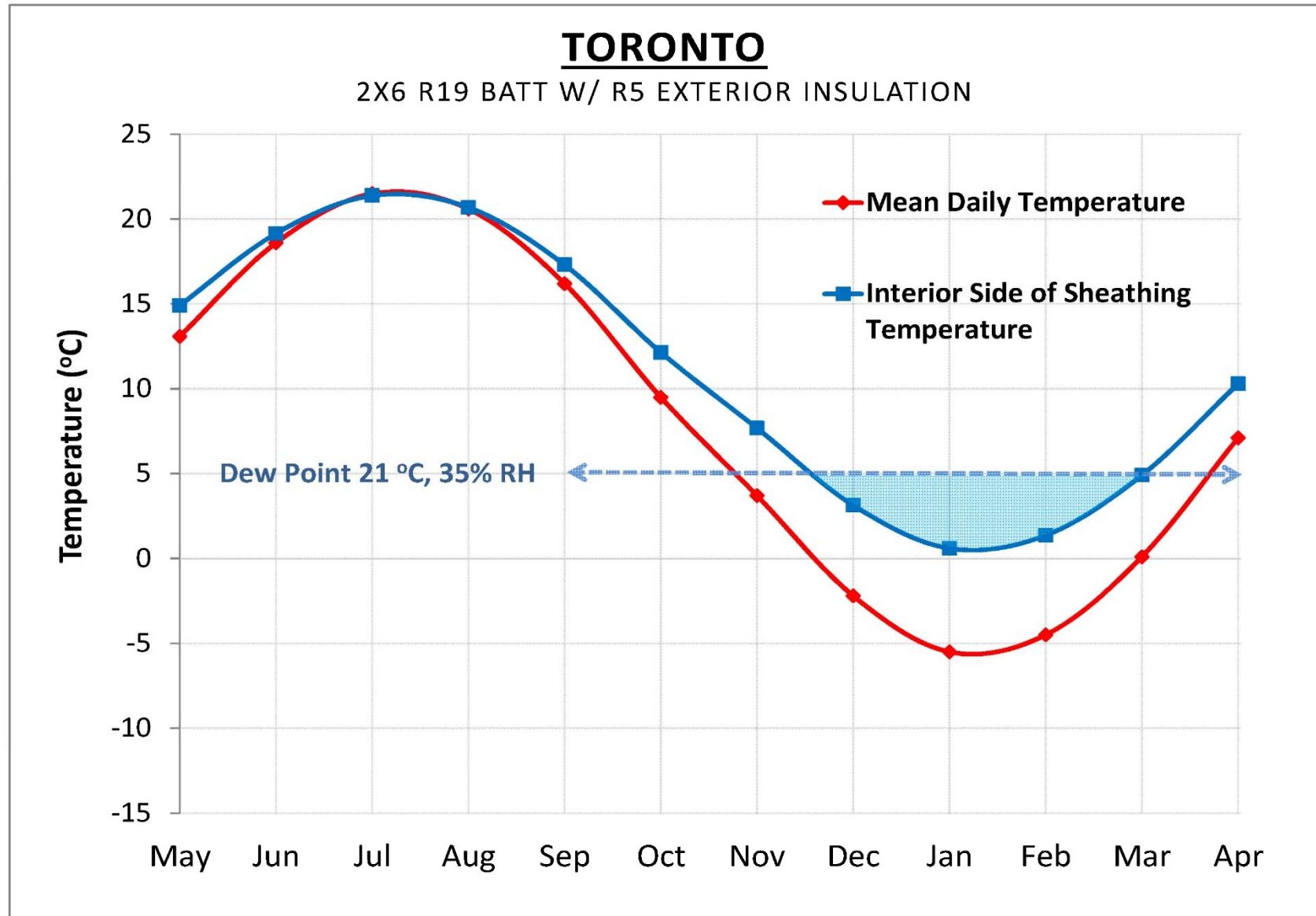


# CodeBord Insulating Sheathing Warms Up Cavity Reducing the Risk of Condensation

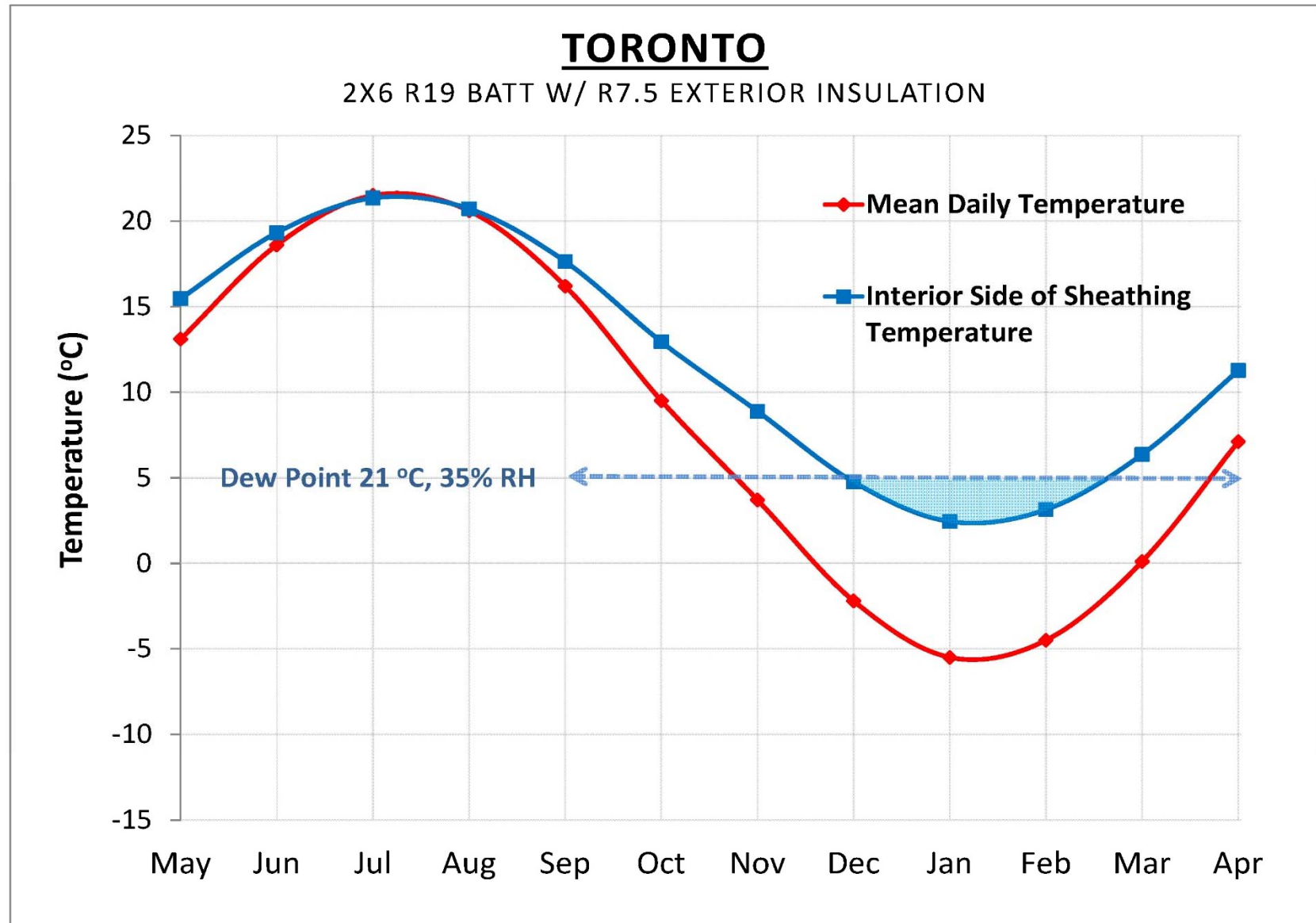




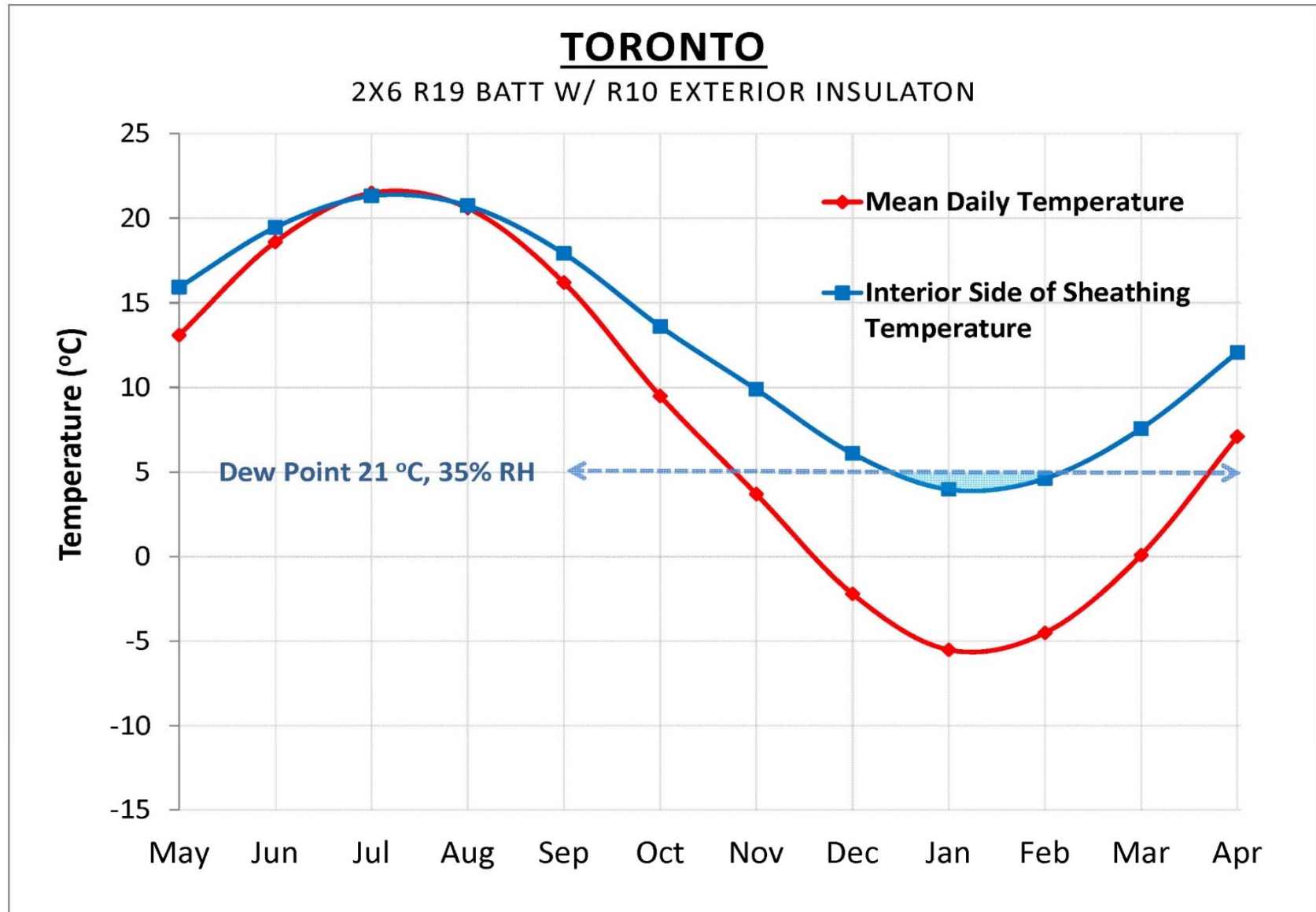
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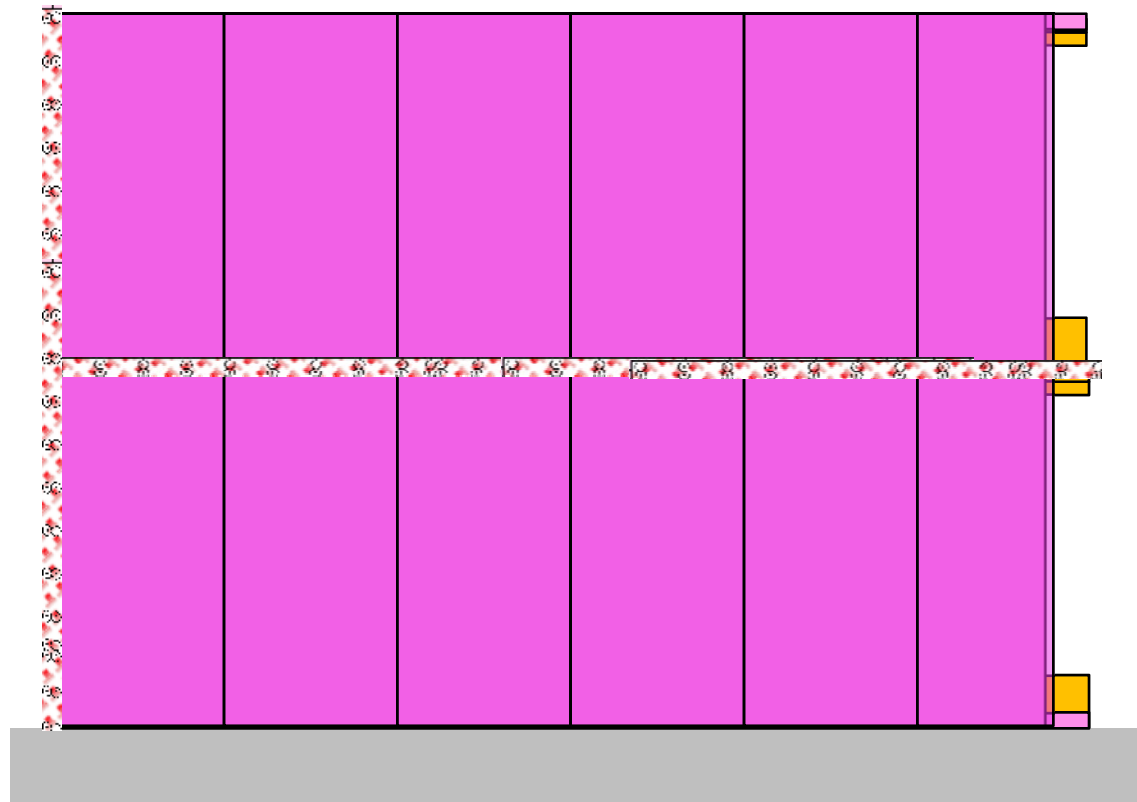


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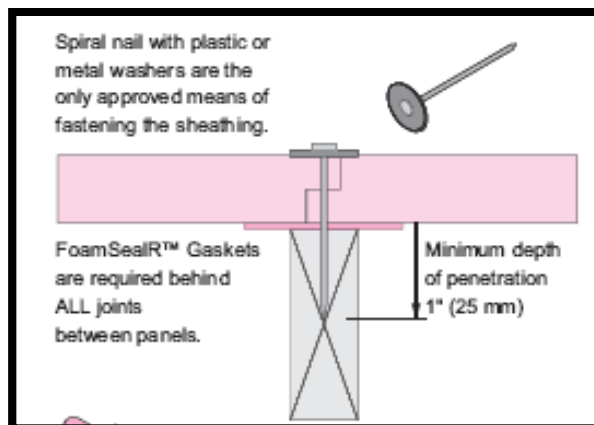


## CodeBord Exterior Air Barrier System

**XPS Foam + Compressible Gaskets + Tape**



## Fasteners

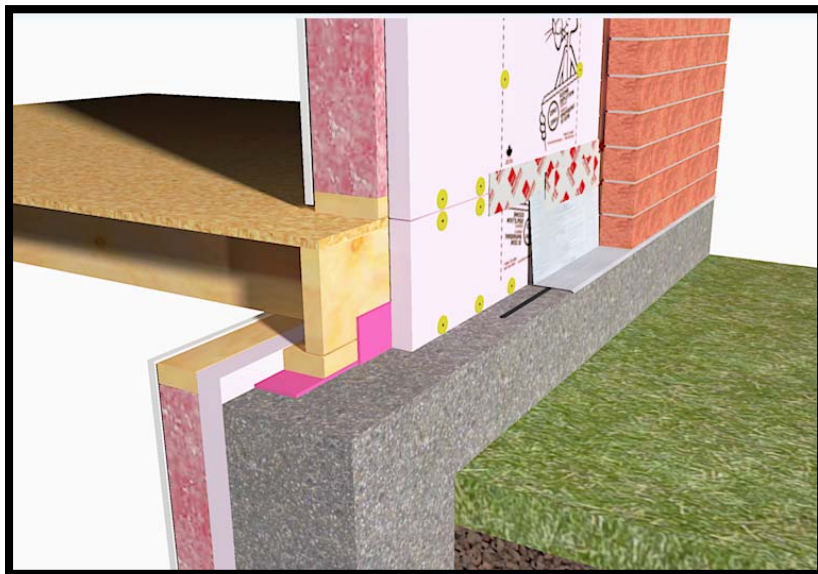
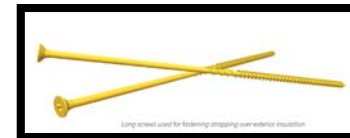
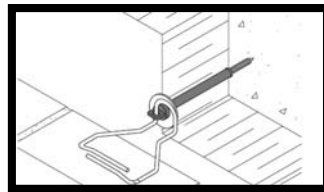
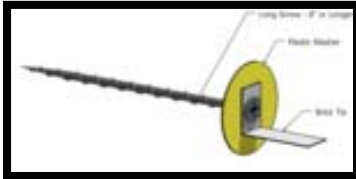
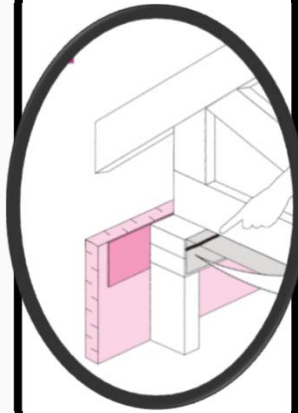


# CABS Installation Sequence

Videos on OC Website







Brick Veneer



Vinyl Siding

# Cladding Attachment



## Research Report

### Attachment of Exterior Wall Coverings Through Foam Plastic Insulating Sheathing (FPIS) to Wood or Steel Wall Framing

ABTG Research Report No. 1503-02

Conducted for  
Foam Sheathing Committee of the American Chemistry Council  
Washington, DC  
[fsc.americanchemistry.com](http://fsc.americanchemistry.com)

#### Report Written by:

Applied Building Technology Group, LLC  
[appliedbuildingtech.com](http://appliedbuildingtech.com)

#### Report Date:

**Final Report:** March 27, 2015  
**Updated:** April 16, 2015

CLADDING  
FASTENER  
THROUGH  
FOAM  
SHEATHING

WOOD  
FRAMING  
(MINIMUM  
1 1/4 INCH  
PENETRATIO

For SI: 1 inch = 25  
DR = Design req  
O.C. = On Cent  
a. Wood framing s  
b. Nail fasteners s  
c. Foam sheathing

d. Foam sheathing  
e. Furring shall be s  
wall studs and at  
be achieved by u

SPACING

25 PSF

DR

DR

DR

DR

DR

DR

DR

DR

DR

I

0.75

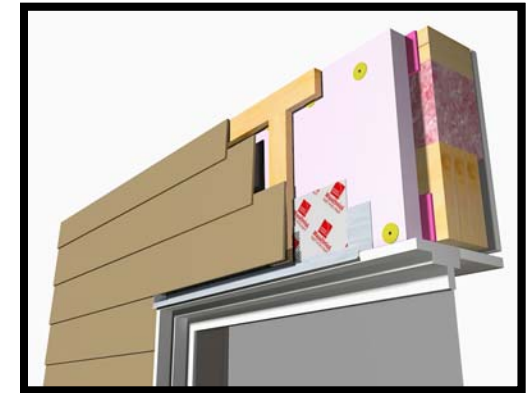
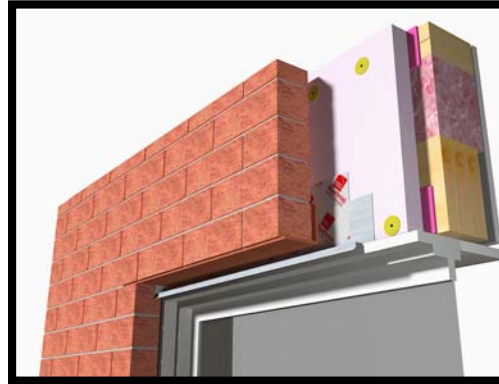
DR

# Moisture Management (Windows)



- JointSealR™ Foam Tape

- Application temperature -18°C
- Width 3.5" / Length 90'
- Meets air barrier requirements
- Prevents moisture intrusion

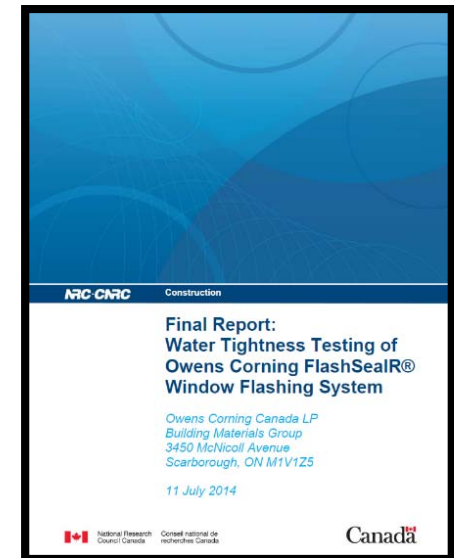


- FlashSealR™ Flashing Tape

- Application temperature = -18°C
- Length 75' / Widths
  - 4" (101.6 mm)
  - 6" (152.4 mm)
  - 9" (228.6 mm)

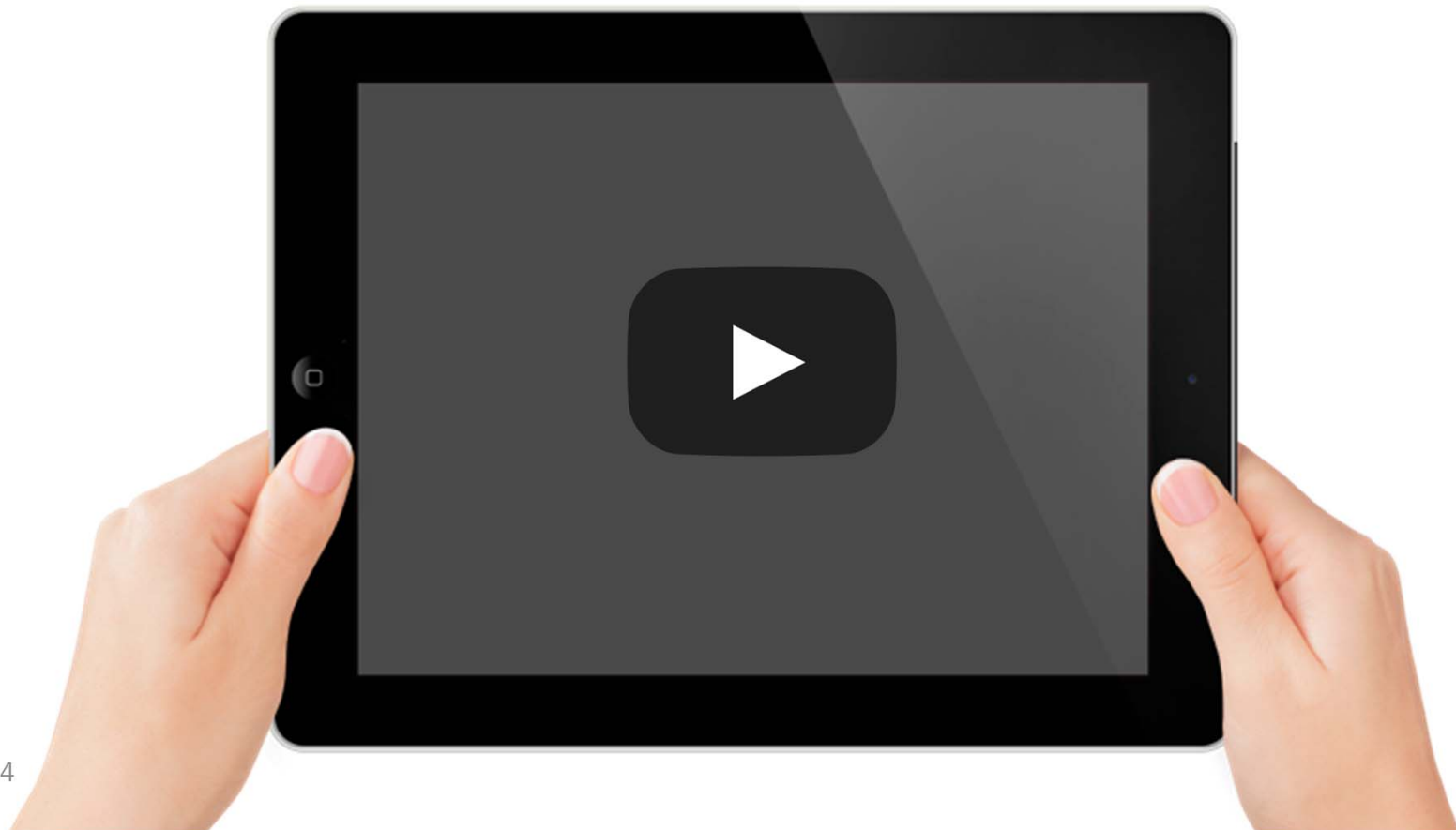
- **CCMC 14003-R**

Approval seam & flashing tape as a weather resistive barrier



# Flashing & Air Sealing Windows

Videos on OC Website





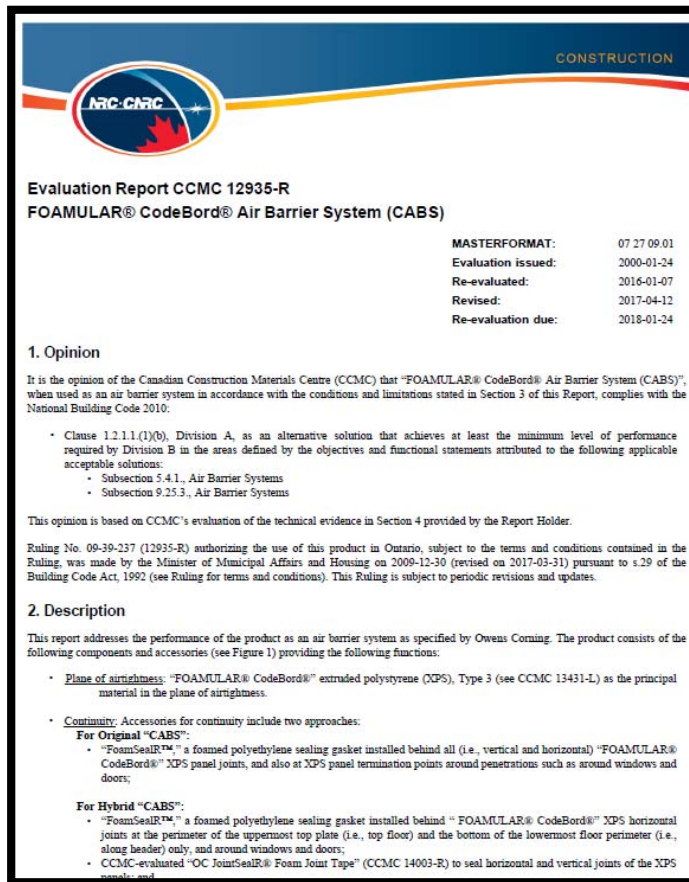
Floor Above Garage



## Air Barrier System Classification/Durability

## Air Barrier System Classification per CAN ULC S742 A1 (750 Pa, 20 Meters in building height)

### Durability & Compatibility of Air Barrier Components (CAN ULC S741)



Air Leakage Rate Classification as per CAN/ULC-S742:

A1:  $\leq 0.05 \text{ L/s}\cdot\text{m}^2 @ 75 \text{ Pa}$

A2:  $\leq 0.10 \text{ L/s}\cdot\text{m}^2 @ 75 \text{ Pa}$

A3:  $\leq 0.15 \text{ L/s}\cdot\text{m}^2 @ 75 \text{ Pa}$

A4:  $\leq 0.20 \text{ L/s}\cdot\text{m}^2 @ 75 \text{ Pa}$

A5:  $\leq 0.50 \text{ L/s}\cdot\text{m}^2 @ 75 \text{ Pa}$

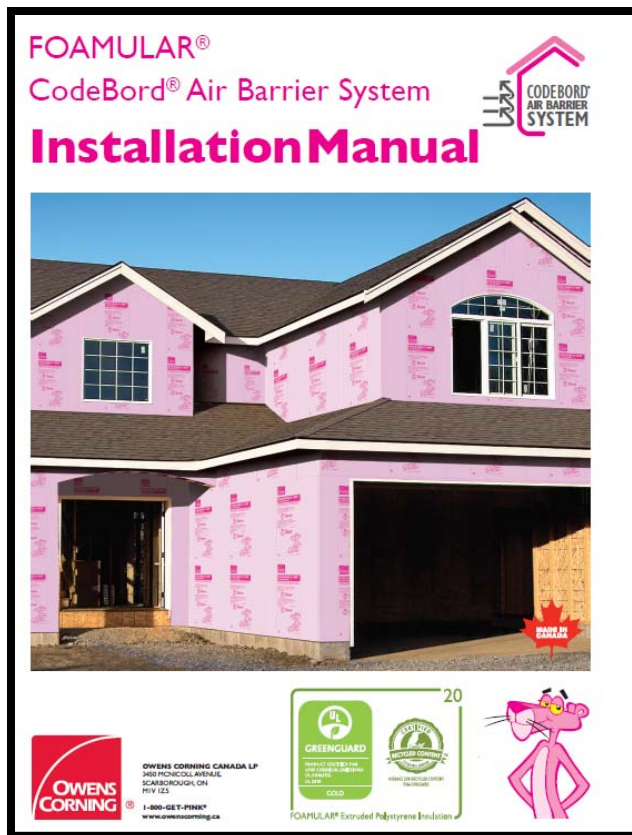


CCMC 12935R &  
Ontario Minister Ruling as an Air Barrier System



## Dedicated Builder Website with Installation Videos

[www.owenscorning.ca](http://www.owenscorning.ca)



## Cabs Installation Videos

<http://insulation.owenscorning.ca/builders/cabs/>



## Benefits of the CodeBord Exterior Air Barrier System

- Provides a Continuous Heat, Air and Moisture Barrier On The Exterior (not affected by wind/water)
- Easy to Achieve and Maintain Continuity of Air and Moisture Control Layers
- Exceptional Airtightness Performance (<1.5 ACH Typically) at the framing stage
- Significantly Reduces Risk of Condensation with increased insulation levels
- Cost savings to the builder: (eliminate weather barrier, header wrap, spray foam, airtight electrical boxes, tape and caulking to seal interior polyethylene acting as air and vapor retarder)
- Replace polyethylene vapor barrier with vapor barrier paint eliminating one step and improving drying potential
- Third Party Attestation as an Air/Moisture Barrier System (Durability & Compatibility of System Components):
  - CCMC 12935R, Air Barrier System Report
  - CCMC 14003R, Joint SealR Seam Tape and Flash SealR Flashing Tape
- Dedicated Website, Installation Manual and Installation Videos (Construction Instruction APP)
- On Site Support and Classroom Training for Builders, Trades and Building Officials



# REID'S HERITAGE HOMES

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EXTERIOR AIR SEALING

## ECO EII PROGRAM – 5 PRODUCTION HOMES AFFORDABLY

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- PARTICIPATION IN THE ECO EII NET ZERO PROJECT – moving forward – conversion of all new developed sites
- Improve the lives of homeowners by providing a healthier, more comfortable, and affordable home
- Build better homes today for tomorrow (the code is changing to this anyways)



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@zeroENERGY #OCNetZero

[www.zeroenergy.ca](http://www.zeroenergy.ca)





## DESIGN OPPORTUNITY started with....



**Climate Zone 6:** 4270 HDD (ESNH ON Zone 1)

**PV Potential:** 4.7 GJ/kW x 8.5 KW = 38.25 GJ

(house load)

South, 8:12 Slope, module eff. 15.5%

**Heating Design Temp:** -19°C  
**Cooling Design Temp:** 29°C



**March 2016 – Homes under Construction**



### TECHNICAL OPPORTUNITY

#### Energy Data:

• Space Heating	8.4 GJ	23%
• Electrical Base Loads	22.5 GJ	61%
• Water Heating	4.4 GJ	12%
• Ventilation	1.0 GJ	3%
• Space Cooling	0.5 GJ	1%

Annual Energy Use	36.8 GJ
Annual Energy Generation	<u>37.4 GJ</u>
Net Annual Energy Use	-0.6 GJ



The NZ Magic Number

# 37 GJ

1 ACH or less





## ELEMENT 5 - RENEWABLES



**Push ridgeline forward and drop pitch to contain all needed panels**  
**Reduce array to a maximum of 32 panels – 8.5 KW – size to the needs of the home**

## EXPERIENCE SAYS....



- . I had thought corners and “Butt” Joints had to be taped and gasketed and Ship lapped joints just properly nailed. Ideally, I would recommend Gasket at all vertical joints as it much less expensive than taping all vertical. Just seems to some differences on how each installation methods are completed.

The devil is in the details – once you figure it out – the next area to watch is flashing details – the walls will not dry out as quickly as other wall assemblies of leaky homes

*IF students can do this on a student build – a home building company/framers should be able too*

The cabs system made a tremendous difference is meeting the air change requirements early on with energy star, and then later with the net zero homes

Why keep poly on the inside?

*The first house took 2 weeks to frame, the second home took 7 days. What is your motivation – is it time, materials, performance???*

Its like putting a hat, coat and boots on your home!





# THANK YOU

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# QUESTIONS??



## Turn Building Science Into Building Genius™

Complete Enclosure Solutions to Help Build a Better Tomorrow

# Are you still air sealing your building envelope from the interior?



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