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**BUILDING
ENCLOSURE
CONFERENCE**
RESTON
VA
2022
MAY 10-11

MARRY ME?

WAIT! WAIT!

ARE WE COMPATIBLE

Jamie Murphy P.L.(Eng.), RET, CCCA, LEED AP BD+C

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Creative Thinking
Practical Results



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A bit about me...





Explore the compatibility of materials and what is performance versus chemical compatibility



Identify the compatibility considerations during the design stage

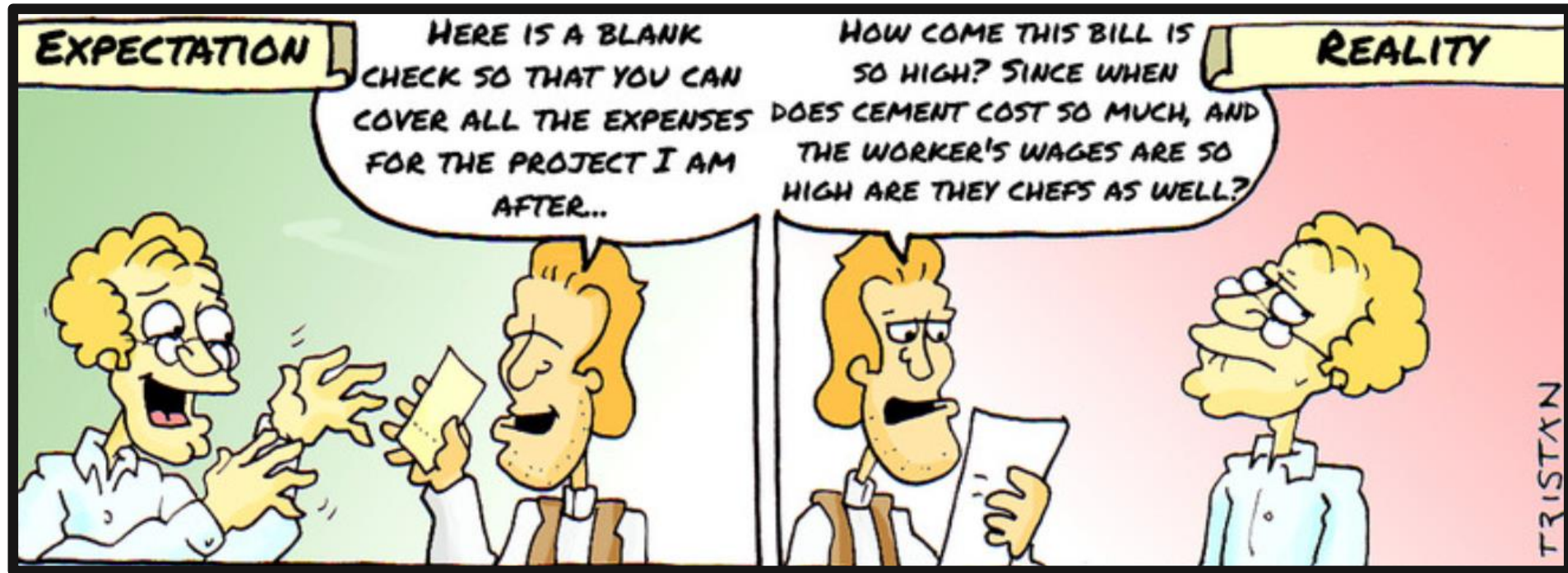


Explain the coordination necessary during construction

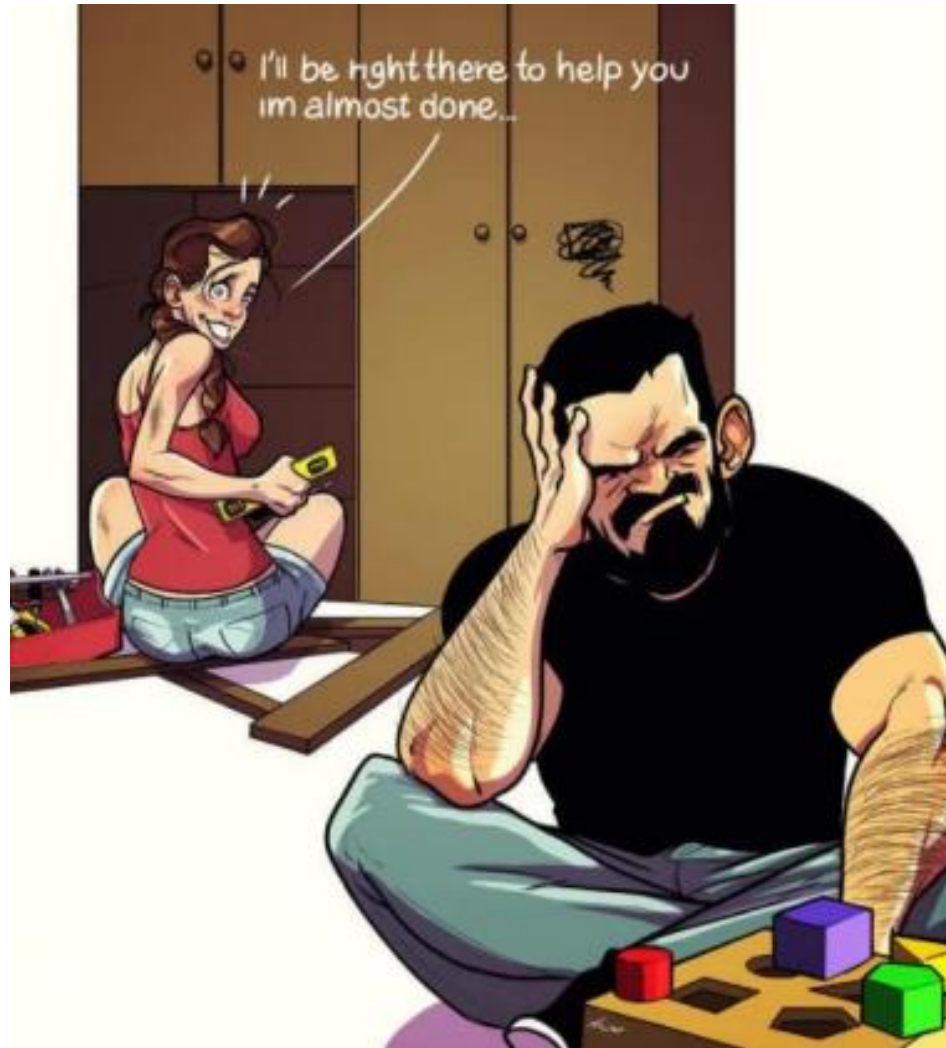


Investigate material compatibility at critical transitions through the use of examples

Expectation Versus Reality



Are We
Compatible?



What is Compatibility?



com·pat·i·bil·i·ty

/kəmˌpədəˈbɪlədē/

noun

a state in which two things are able to exist or occur together without problems or conflict.
"he argues for the compatibility of science and religion"

Similar:

like-mindedness

similarity

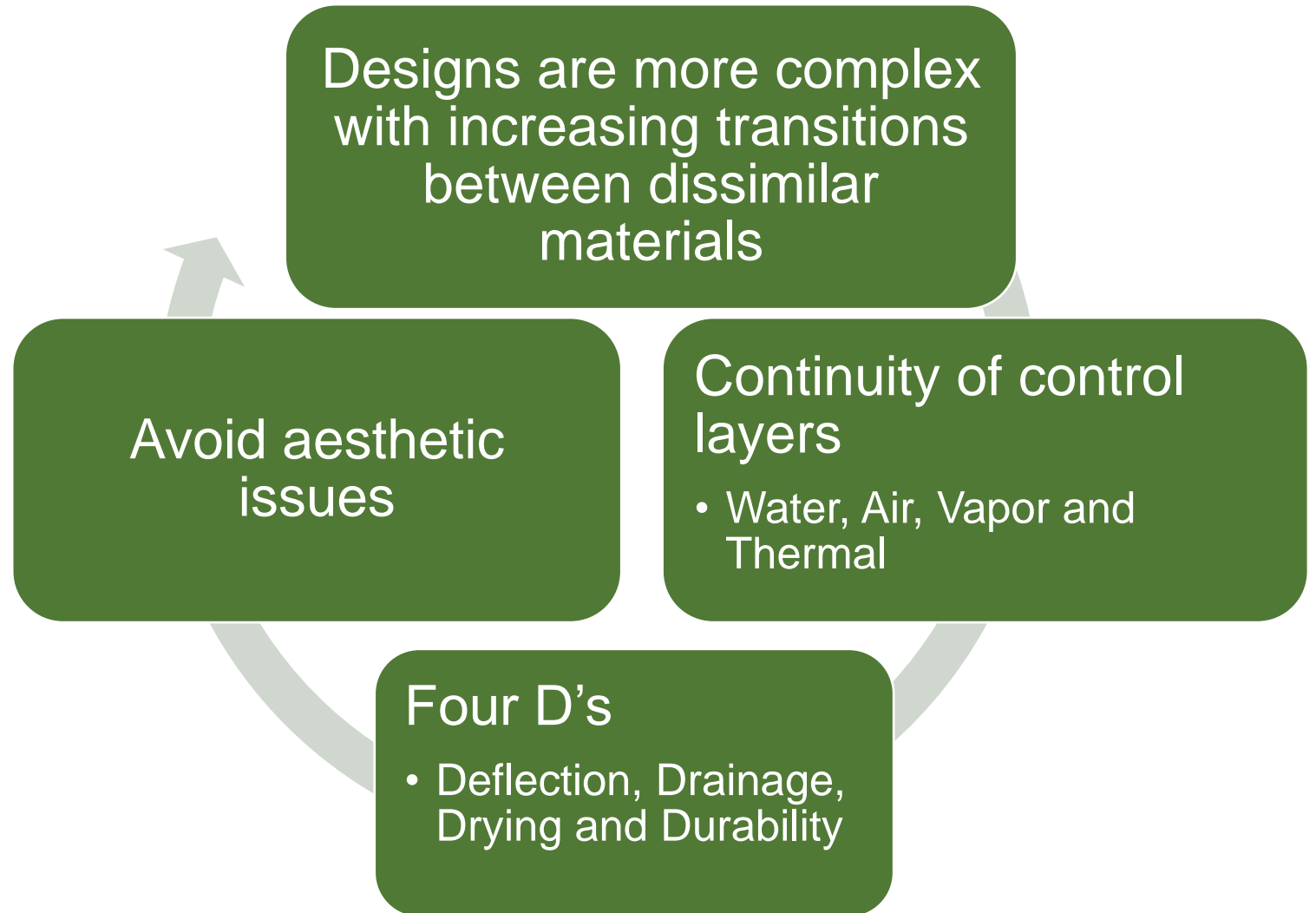
agreement

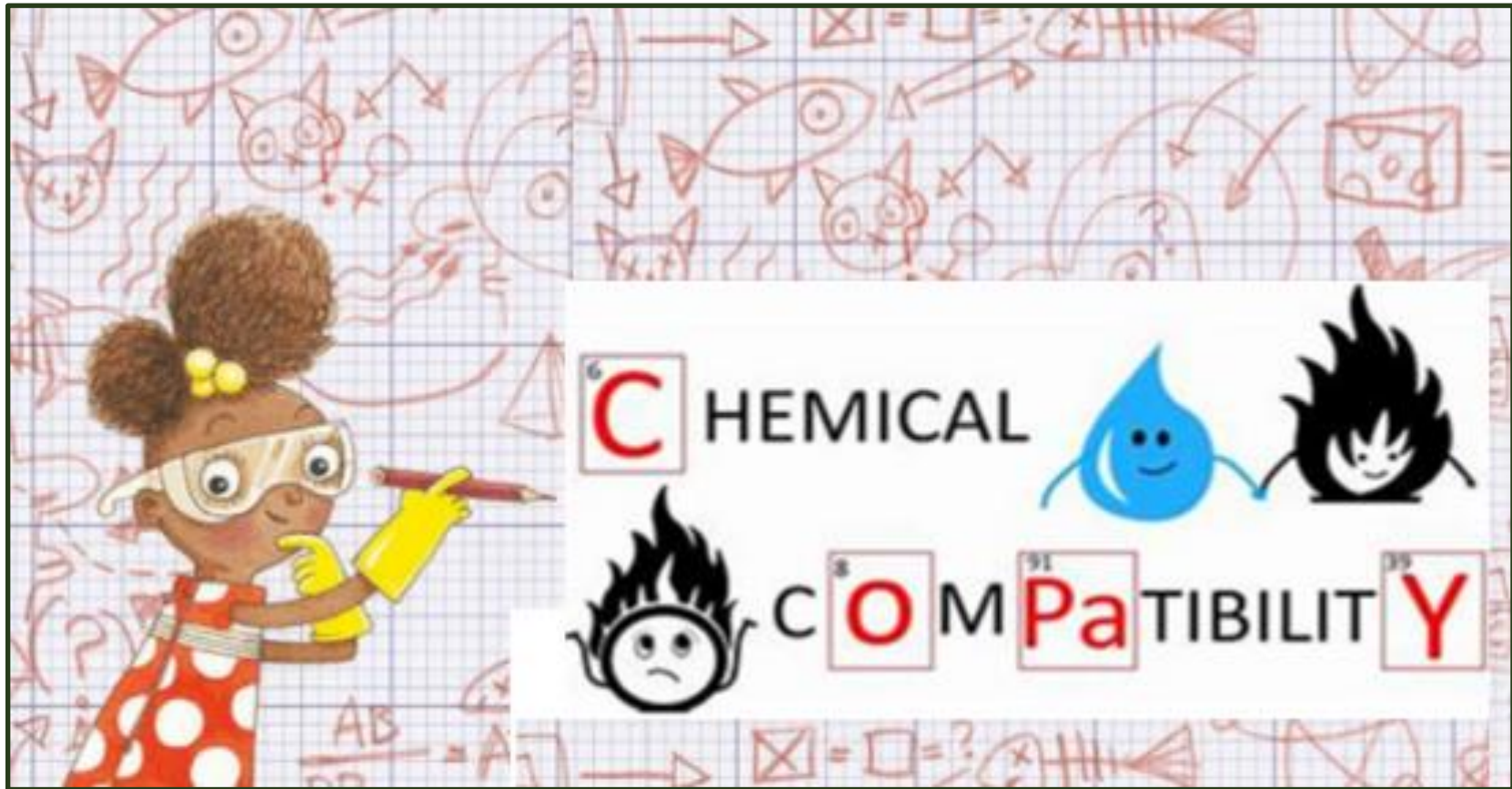
affinity

closeness



Why is Compatibility Important?





Chemical Compatibility

When chemicals in dissimilar materials do not react with each other and do not affect the long-term performance and durability of the materials or assemblies

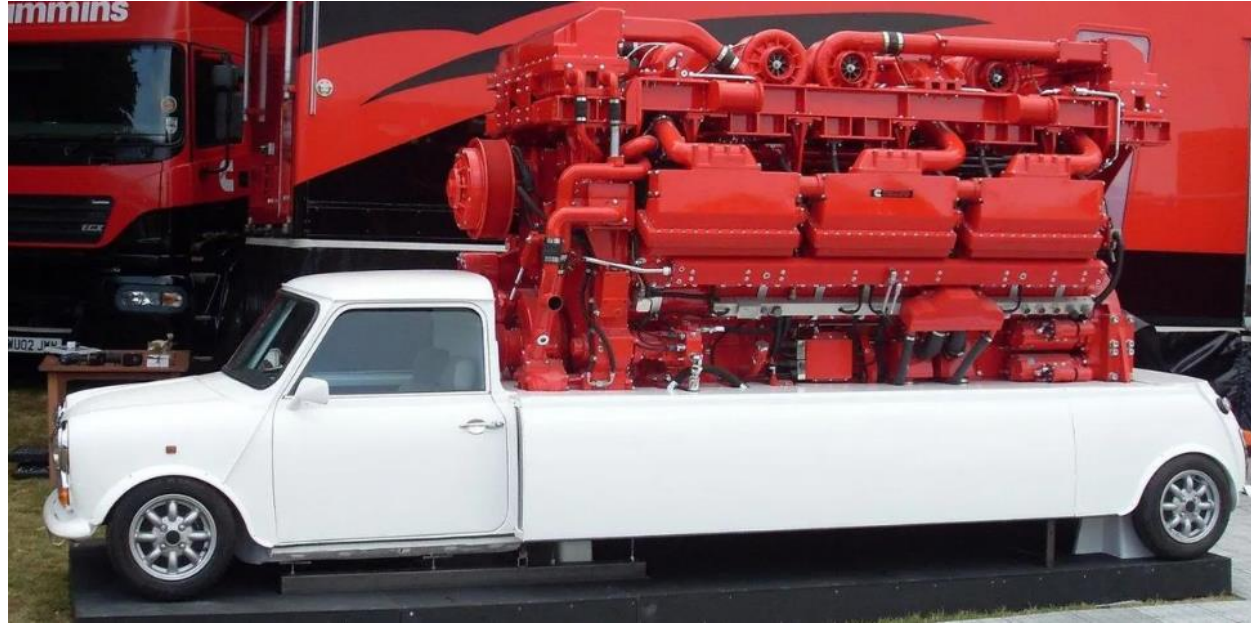


C.2.8 Chemical incompatibility

In some cases, materials in contact can cause or accelerate degradation as a result of chemical interaction. The following are some examples:

- a) galvanic corrosion between dissimilar metals;
- b) accelerated corrosion of steel and zinc in contact with certain woods and wood containing certain preservative chemicals (ASTM STP691, 1980);
- c) corrosion of lead and some aluminum alloys in contact with moist concrete or mortar; and
- d) crazing or fracture of plastic in contact with certain sealants (BRANZ 242, 1985).

Performance Compatibility

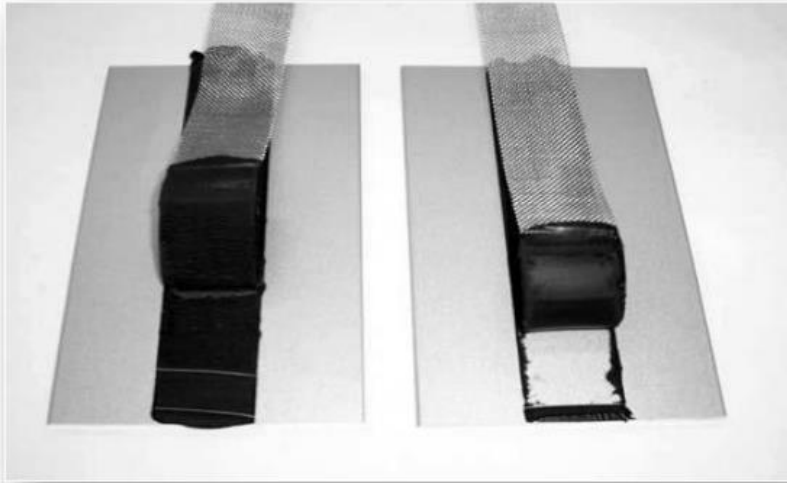


Performance Compatibility

Performance compatibility is when dissimilar materials adhere or marry together to perform their function without affecting the performance of the assembly or building envelope.



Performance Compatibility Testing



Performance Compatibility Testing

- ASTM D4541-17 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers – Test Method B.
- ABAA T0002 – 2019 Standard Test Method for Pull-Off Strength of Adhered Air and Water Resistive Barriers Using an Adhesion Tester.



Adhesion Testing



Adhesion Test Results

Test Results

The following results were obtained:

Sample	Failure Load (lb)	Failure Pressure (psi)	Failure Mode
1	N/A	-	Gypsum facer
2	216	20	Gypsum facer
3	115	10.5	██████████ to ██████████
4	122	11	Gypsum facer
5	193	18	██████████ to ██████████



Compatibility in the Code

What does the Canadian Building Code say about compatibility?

5.1.4.2. Resistance to Deterioration

(See Note A-5.1.4.2.)

- 1)** Except as provided in Sentence (2), materials used in *building* components and assemblies that separate dissimilar environments, or in assemblies exposed to the exterior, shall be
 - a) compatible with adjoining materials, and
 - b) resistant to any mechanisms of deterioration that may reasonably be expected, given
 - i) the nature and function of the materials, and
 - ii) the exposure and climatic conditions in which they will be installed.
- 2)** Material compatibility and deterioration resistance are not required where it can be shown that incompatibility or uncontrolled deterioration will not adversely affect any of
 - a) the health or safety of *building* users,
 - b) the intended use of the *building*, or
 - c) the operation of *building* services.

Compatibility Considerations for Designers



"I'm aiming for 'aggressively non-contextual.'"

Design Considerations for Designers



- Critical for designers to understand the various transitions where compatibility might be an issue
- What materials/products will be used to provide continuity of the control layers
- Correspond with manufacturers to establish if specified materials/products will provide a compatible transition when installed
- Include clauses in specifications that dissimilar materials must be compatible with each other
- Remember that 1 hour of work during design stage is worth 4 during construction



What do the Specs Say?

Compatibility:

- .1 Compatibility between all components of roofing system is essential. Ensure that all Products selected for use are compatible with each other.
- .2 Procure all roofing membranes from one manufacturer who certifies that all components are compatible with each other.
- .3 Components other than those supplied by the PVC membrane manufacturer may be used if reviewed and accepted by the membrane manufacturer, provided a letter from the membrane manufacturer confirming compatibility is submitted to the Consultant prior to commencing installation of those materials.
- .4 Certain PVC membranes are incompatible with asphalt, coal tar, heavy oils, roofing cements, creosote and some preservative materials. Such materials shall not remain in contact with PVC membranes. Consult the membrane manufacturer regarding compatibility, precautions and recommendations.

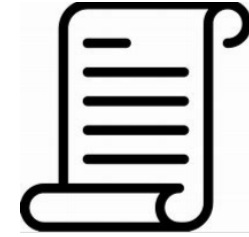
Manufacturer Compatibility Information



- Manufacturers generally have information regarding compatibility of their materials readily available
- Read the product data
- Contact your local manufacturer rep
- Get confirmation of compatibility
- Manufacturers may have materials in question already tested



Letters of Compatibility



Letters of compatibility can be provided by manufacturers

Critical to have assurance that materials are compatible

Even if chemically compatible, adhesion field tests should be performed

Letters of Compatibility



To whom it may concern

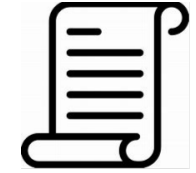
Re: [REDACTED] compatibility

Please be advised that [REDACTED] does not foresee any chemical incompatibility with [REDACTED] coming in contact with [REDACTED] membrane or PVC vinyl decking. We have not conducted long term adhesion test's however and recommend periodic adhesion test's during install.

[REDACTED] is compatible with [REDACTED]

If you have any questions, please contact me directly

Letters of Compatibility



Subject: [REDACTED] Compatibility with Various Membranes

Dear Mr. [REDACTED]

This letter is to confirm that our [REDACTED] Adhesive are compatible with [REDACTED] Rubberized asphalt waterproofing membrane.

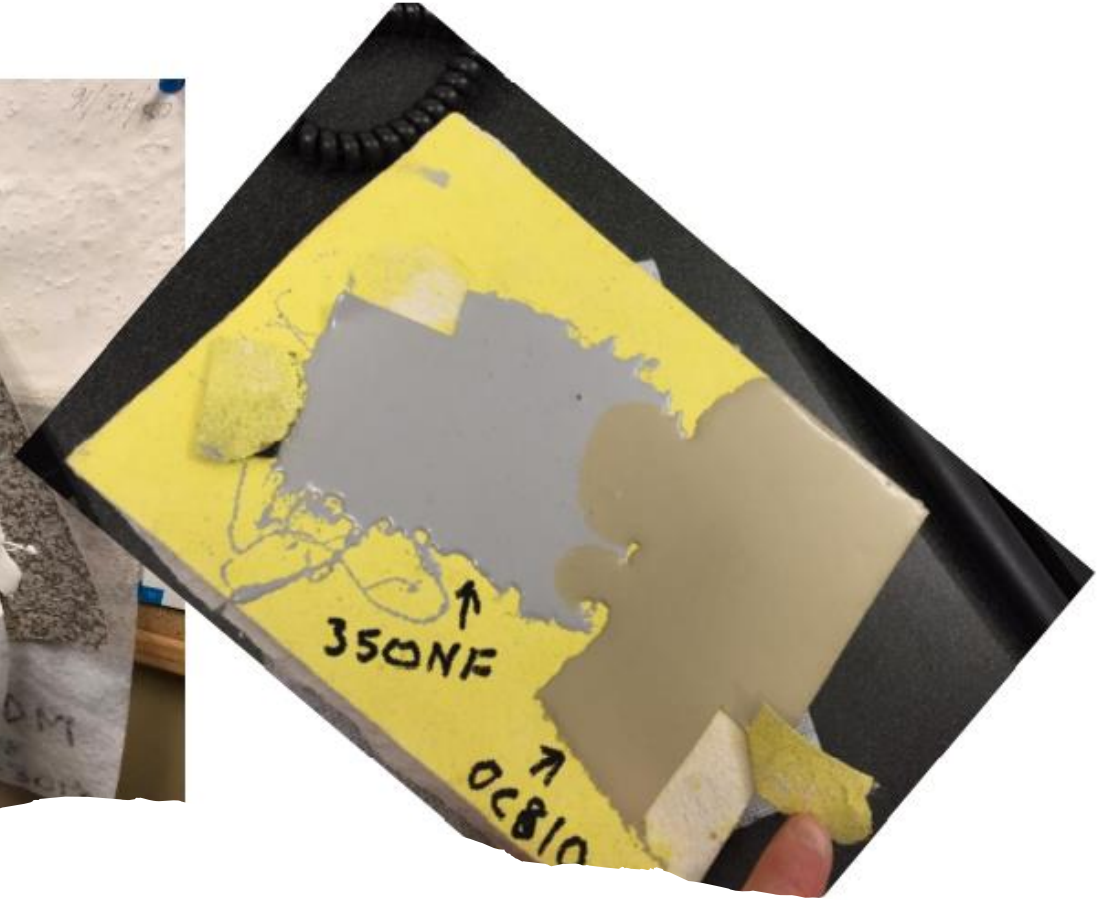
[REDACTED] may not be compatible with [REDACTED] as it is a polyurethane product. We suggest using our [REDACTED] Sealant as a separator a minimum of 3 mm thick between the [REDACTED] and the [REDACTED]

Please contact me should you have any questions.

Regards,



Cursory Material Testing



Cursory Material Testing



Compatible Backing

- Compatible backings are required where support for membrane/product is required
- Backing to be compatible with primers
- Metal, gypsum board, wood, backer rod, etc.
- What about deflection joints – compressible backing?

Compatible Backing

To whom it may concern;

RE: Membrane and Windows

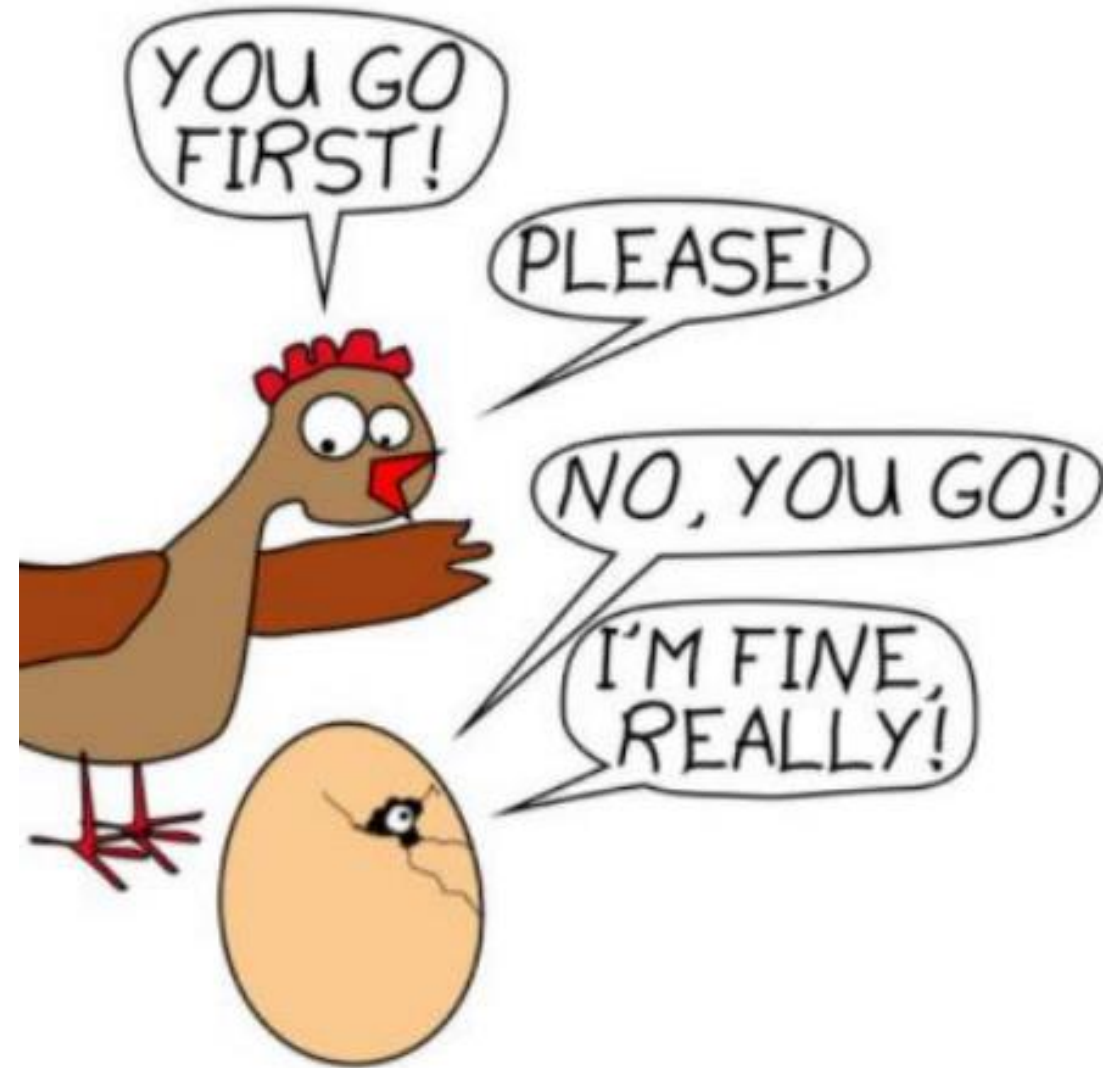
This letter is to inform all concerned parties that spray foam can be used to an extent to support or provide backing for Windows. This should not be used for gaps larger than 25mm however. In instances where the gap may be larger than 25mm foam backer rod and sealant should be used.



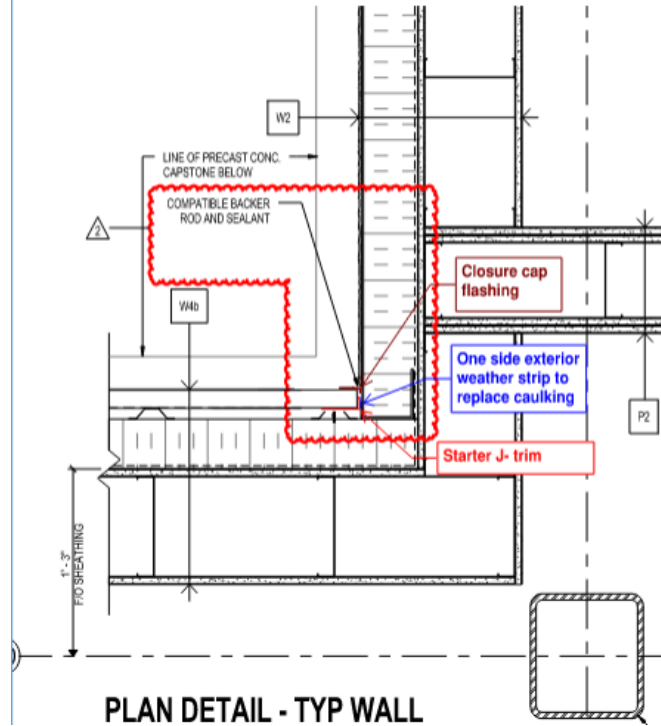
Coordination During Construction

Coordination of Different Trades

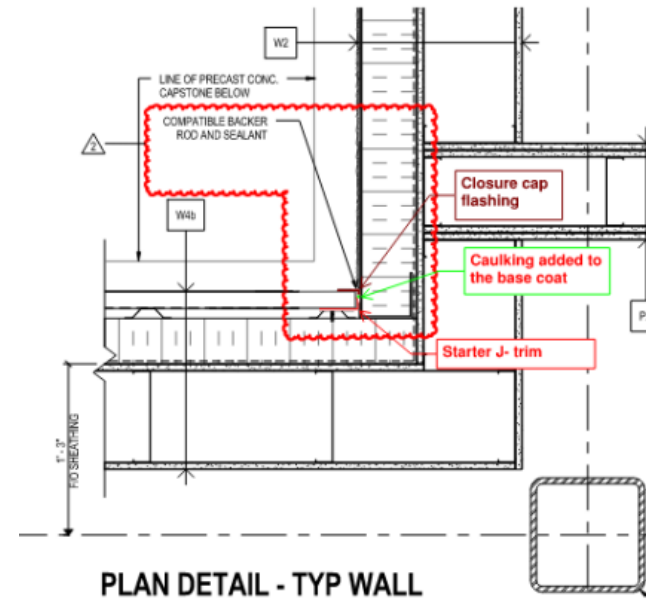
- Requires coordination at design stage and construction stage
- Preconstruction meetings
- Different trades want to use different materials
- Some trades use different membranes than other trades (EIFS trade versus Metal cladding trade)
- Option to specify one manufacturer in specifications



When EIFS goes first:



When Metal Panel goes first:



Transitions Where Compatibility is a Consideration



Transitions Where Compatibility is a Consideration

Foundation walls
(different
waterproofing
systems)

Waterproofing
Transitions to
Exterior Walls

Windows and
Doors in Exterior
Walls

Transitions
Between
Different
Claddings

Exterior Walls to
Balconies
(concrete and
wood frame)

Exterior Wall
Penetrations

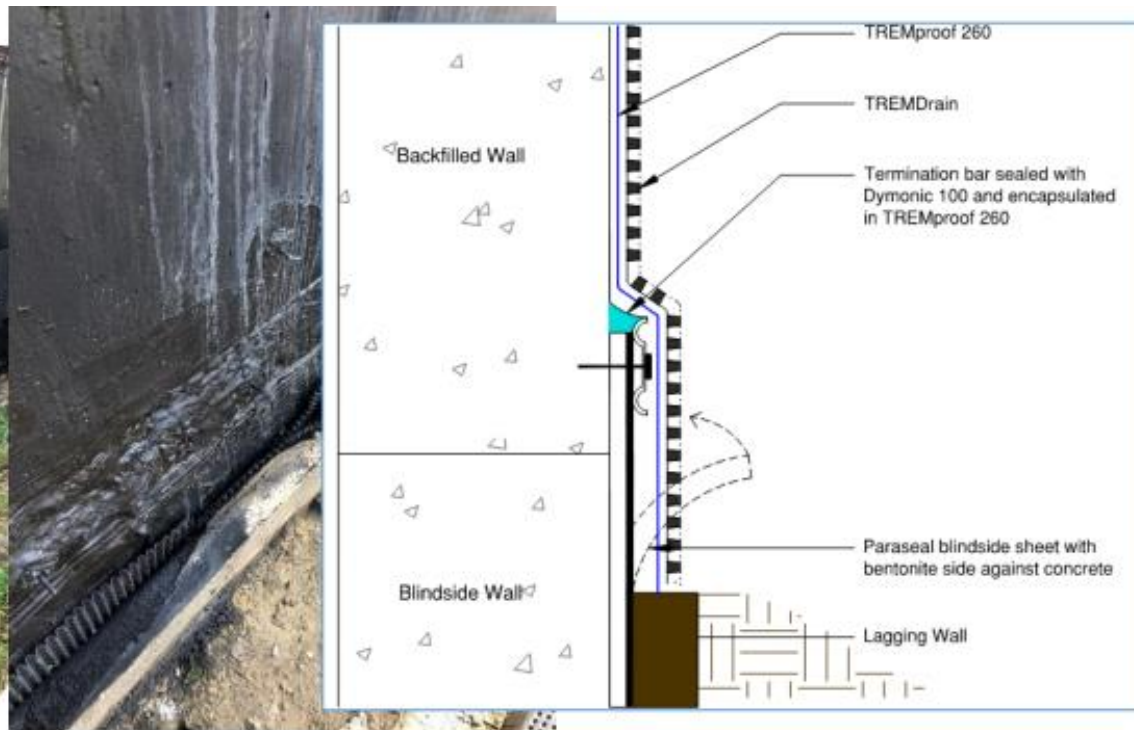
Roof Parapets to
Exterior Walls

Roof to Wall
Transitions



Foundation Walls

- Different waterproofing materials used for waterproofing walls
- Blindside waterproofing/positive side waterproofing



Blindside to Positive Transition

- What happens when blindside and positive side waterproofing membranes meet?



Foundation Wall Waterproofing Penetrations



Foundation Wall to Plaza Deck

Waterproofing Transitions to Exterior Walls





Window Detailing



Window Detailing

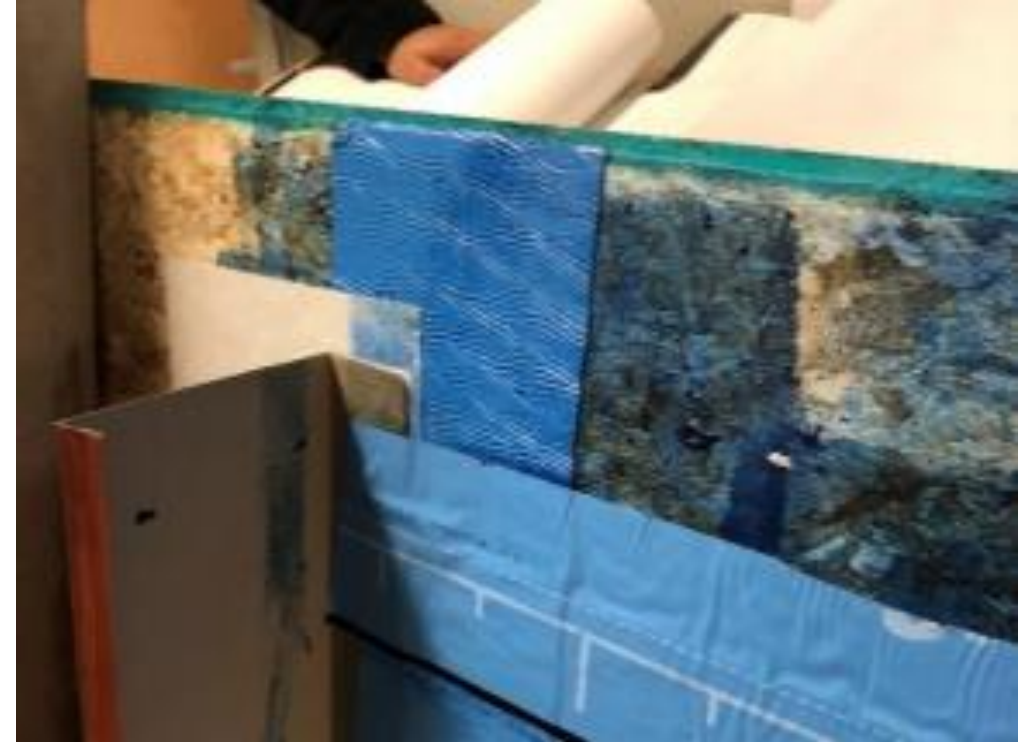


Window Detailing



Door Detailing

Transitions Between Different Claddings



Need to consider what materials are required for different claddings

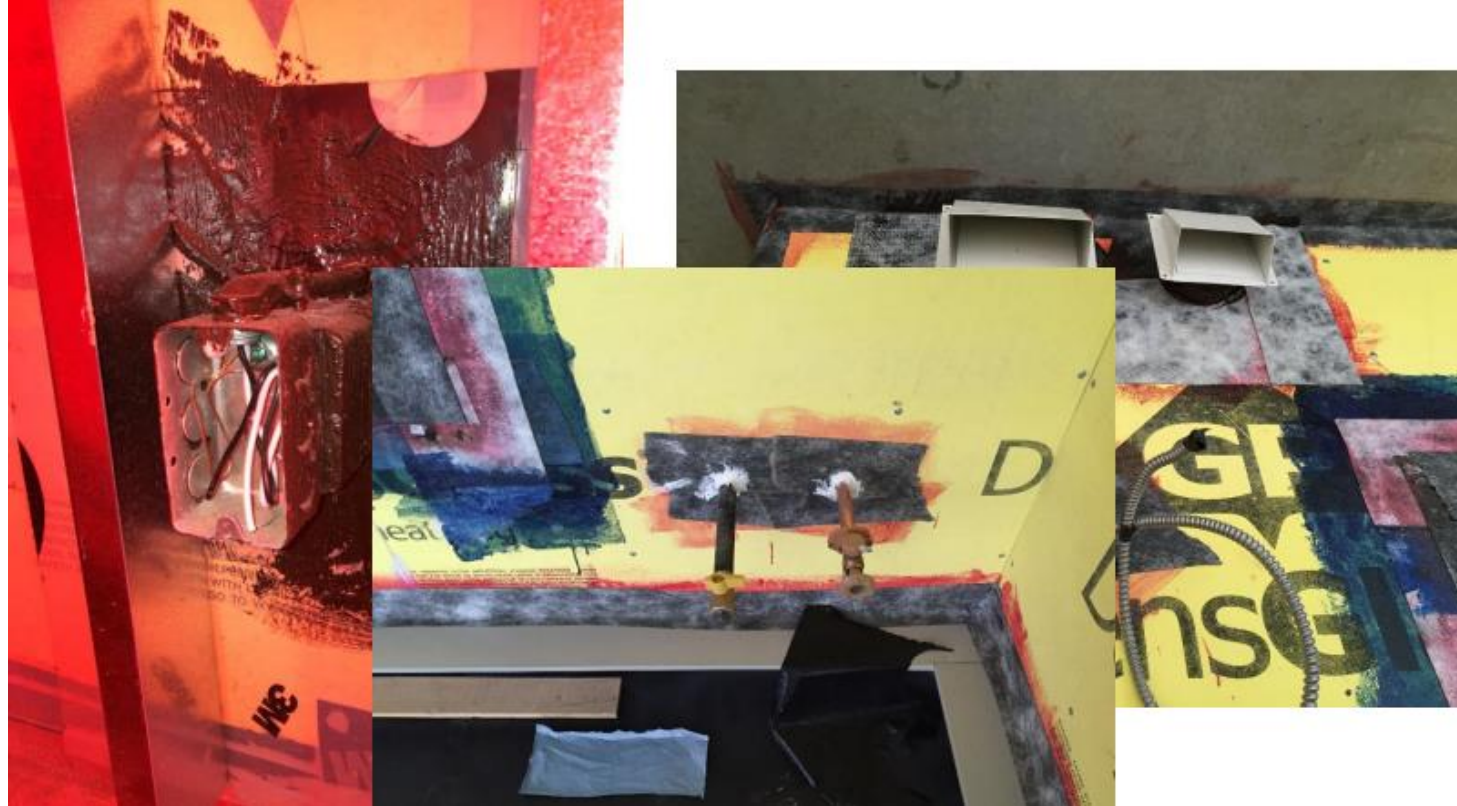
Balcony to Exterior Wall Transitions



Balcony to Exterior Wall Transitions



Exterior Wall Penetrations



Roof Parapet to Exterior Wall Transitions



Roof to Wall Transitions



Conclusion

- Compatibility of materials is critical for the continuity of the various control layers -durability and long-term performance
- Performance and chemical compatibility
- Reach out to manufacturers – use all the various resources
- Know the materials and products being used
- Compatibility considerations at various transitions/penetrations
- There is no room for complacency when dealing with the building envelope

Questions??





Creative Thinking
Practical Results

RJC Engineers

Suite 100

17415 - 102 Avenue

Edmonton, AB T5S 1J8

Canada

Company Main (780) 452-2325

Email jmurphy@rjc.ca

Direct (587) 745 0266

Mobile (780) 983 0288

www.rjc.ca



Jamie Murphy, P.L. (Eng), RET, CCCA, LEED® AP Principal



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