

The logo for RAINA (Rainscreen Association in North America) features the word "RAiNA" in a bold, blue, sans-serif font. A small blue water droplet icon is positioned above the letter 'i'.

RAiNA
RAINSCREEN ASSOCIATION
IN NORTH AMERICA

Elephant of Opportunities: Rainscreen Retrofit

Jeff Ker, Engineered Assemblies
Ross Boehmer, Architectural Panel Systems

*AIA Learning Credits: 1.0 LU/HSW
RAiNA AIA Provider #: 502111378
Course #: RAiNA-CONF24-5*

RAiNA

RAINSCREEN ASSOCIATION
IN NORTH AMERICA

DISCLAIMER & ANTI-TRUST

Disclaimer:

This is a Rainscreen Association in North America (RAiNA) presentation and has been provided to RAiNA members for delivery to the industry. While every effort has been made to ensure the accuracy of the presentation, RAiNA does not warrant the completeness or correctness of the content. This presentation is not to be altered in any manner. The presenter is solely responsible for any comments they make, and RAiNA assumes no liability for those comments.

Anti-Trust Policy

1. DON'T discuss the prices your company will charge customers.
2. DON'T discuss discounts, terms or conditions of sale, warranty terms, profits or profit margins, shares of the market, bids or the intent to bid, rejection or termination of customers, sales territories or markets.
3. DON'T discuss administrative or disciplinary action by the Association against a particular member or nonmember, or enforcement of any Association code of ethics against particular members or non-members, in the absence of specific legal guidance.
4. DON'T propose or discuss any proposal, in the absence of specific legal guidance that the Association sponsor or engage in any activity, which may have the effect of producing an adverse economic impact on some competing companies.

RAiNA

RAINSCREEN ASSOCIATION
IN NORTH AMERICA

AIA DISCLAIMER

Rainscreen Association in North America is a Registered Provider with *The American Institute of Architects Continuing Education Systems (AIA/CES)*. Credit(s) earned on completion of this program will be reported to **AIA/CES** for AIA Members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This program is registered with **AIA/CES** for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing and material or product.

Provider #: 502111378

Course ID: RAiNA-CONF24-5

Presenters Bio



Jeff Ker

Engineered Assemblies

Jeff Ker's thirty plus years of technical sales experience with the Ontario Architectural and Design community benefit each project he undertakes. His experience includes two years in the West-Coast market and twelve years in the Eastern-Canadian market; representing a variety of Rear Ventilated Rainscreen systems. With a solid background in technical sales, project management and liaison with the construction community; Jeff enjoys a tireless passion with matters of a technical nature in his personal and professional life. Jeff has spoken at numerous architectural and specification conferences across Canada, including SeaBEC, Central IOWA CSI and Greater Detroit BEC. He is also a regular technical article contributor to AWARD and Construction Canada magazines.



Ross Boehmer

Architectural Panel Systems

Involved in the exterior cladding industry since 1981 with roles including project engineer, project manager, sales & marketing and current role as President of Architectural Panel Systems. Architectural Panel Systems is one of the leading installers of wall cladding in the Midwest with an emphasis on rainscreen designs. APS has been involved with numerous retrofit projects with two winning national awards.

The Big Questions are...

Do rainscreens belong everywhere?

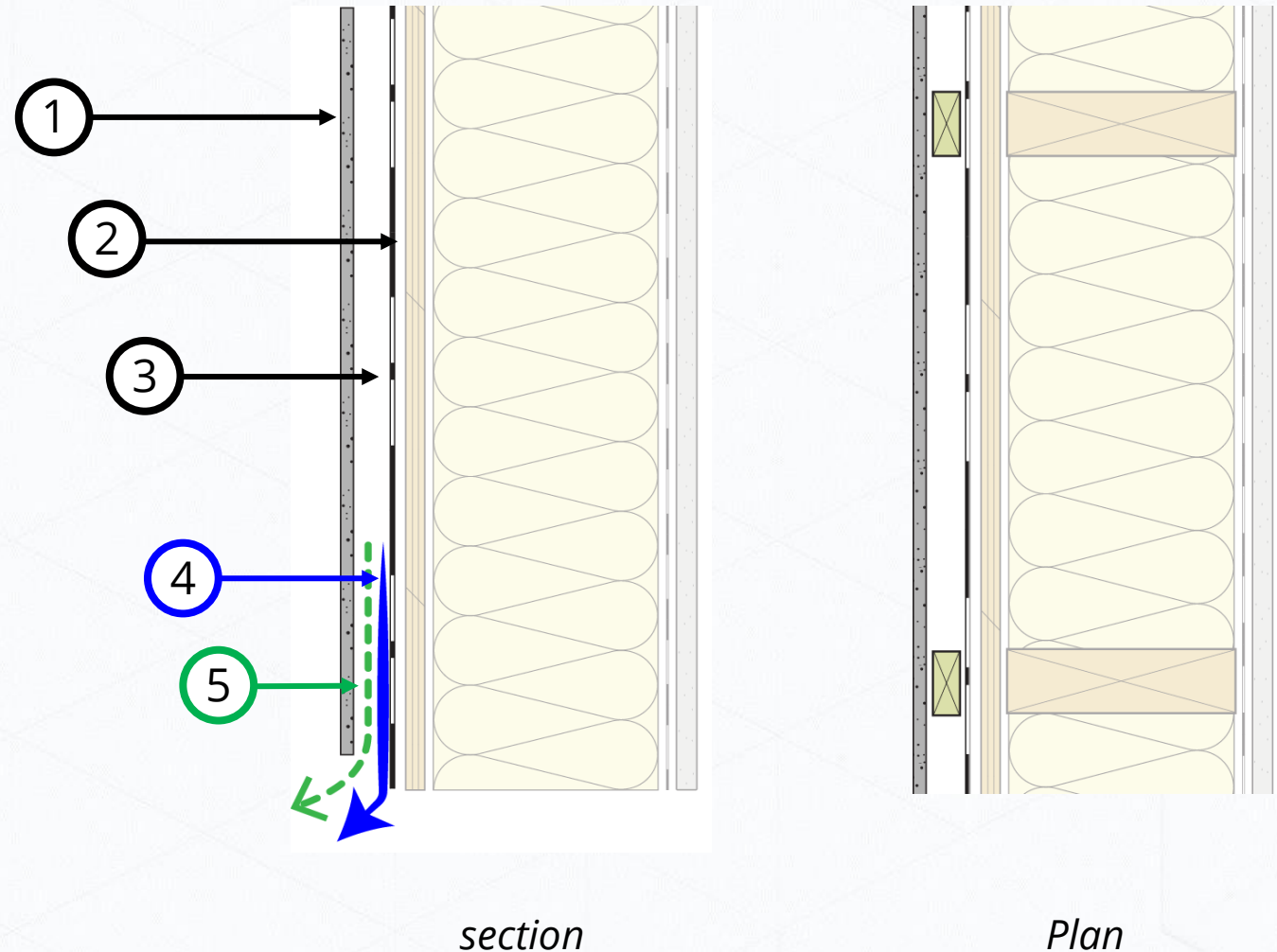
-YES

Can all residential, commercial and recreational spaces justify an efficient, passive, thermally controlled environment?

-YES

An assembly applied to an exterior wall which consists of, at minimum:

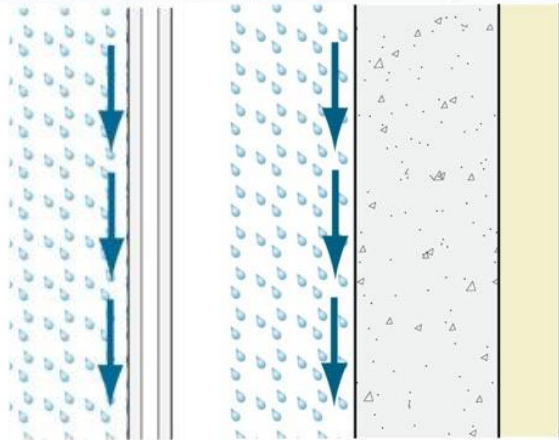
- 1) Outer layer
- 2) Inner layer
- 3) Cavity between the layers sufficient for the passive removal:
- 4) Liquid water
- 5) Water vapor



Three Approaches to Rain Control in Walls

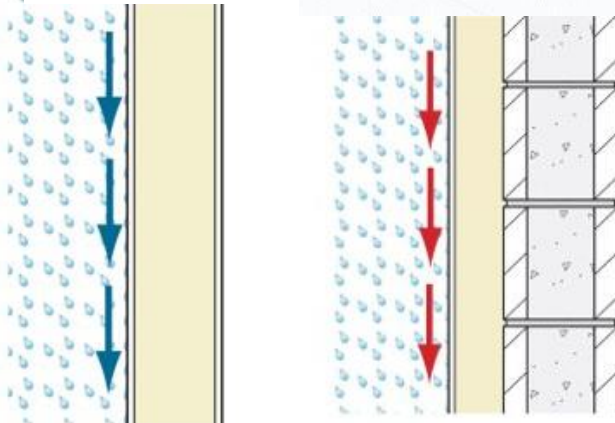
PERFECT BARRIER

Exclusion



Structural Glazing

Architectural Precast

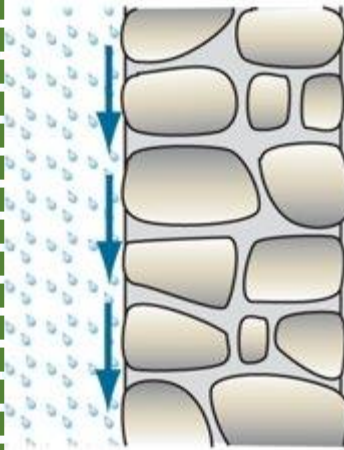


Steel-Clad Foam Panels

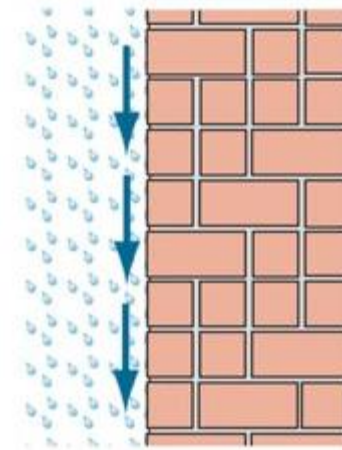
Face-Sealed EIFS

IMPERFECT BARRIER

Mass / Storage

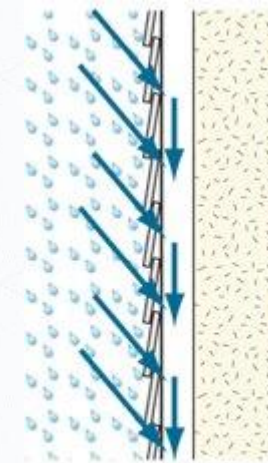


Rubble

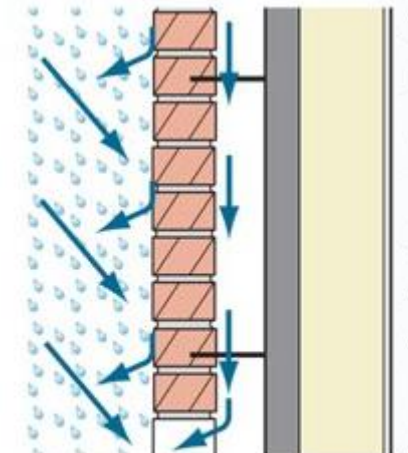


Solid Masonry

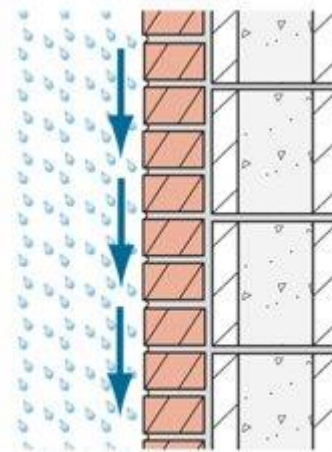
Drained



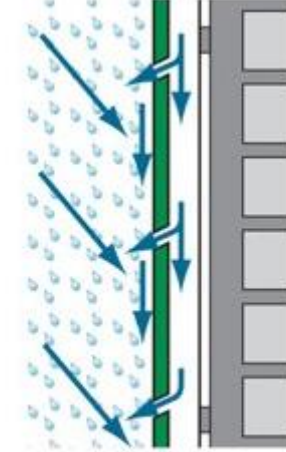
Lap Siding



Masonry Veneer

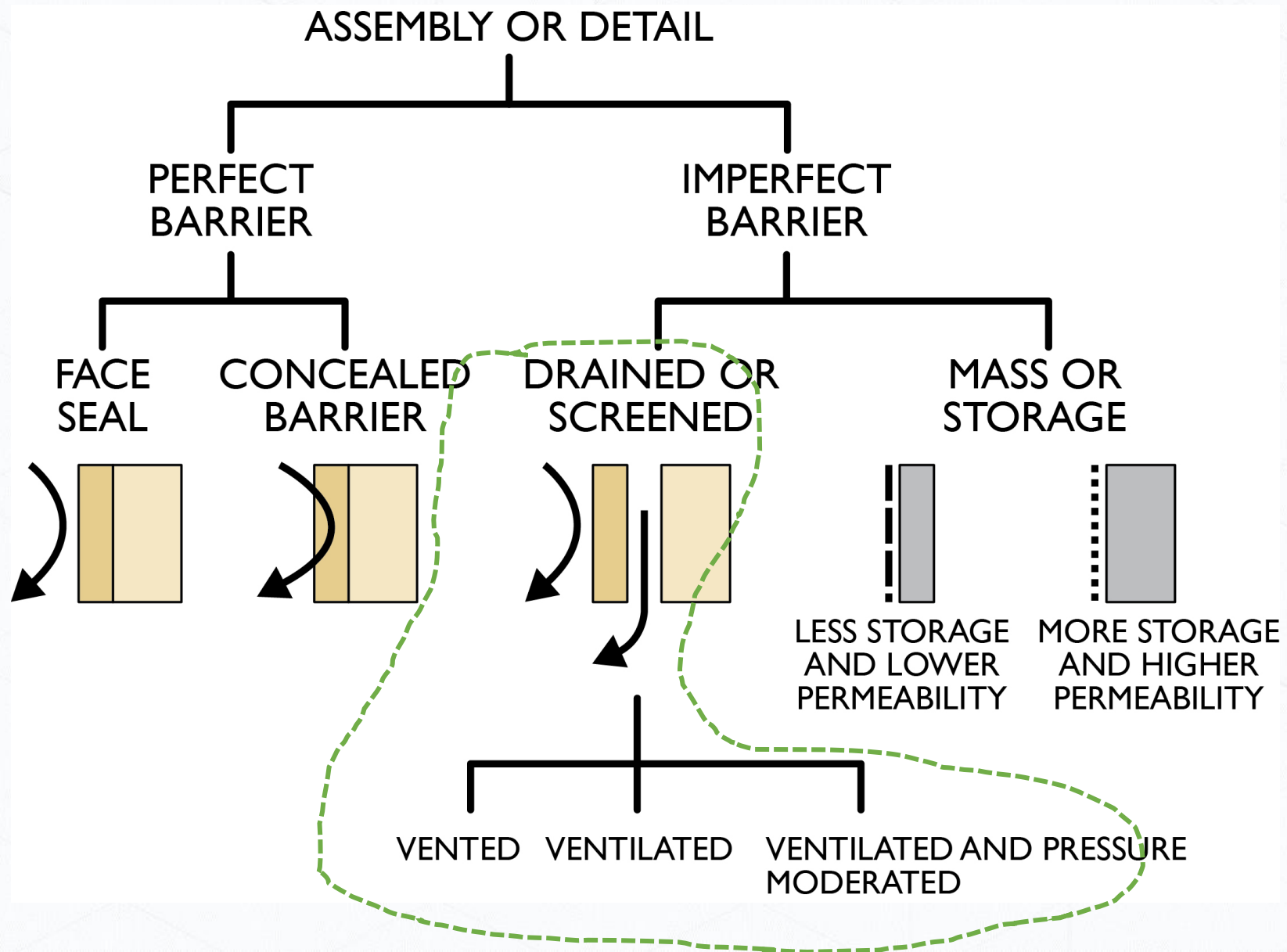


Composite/
Layered

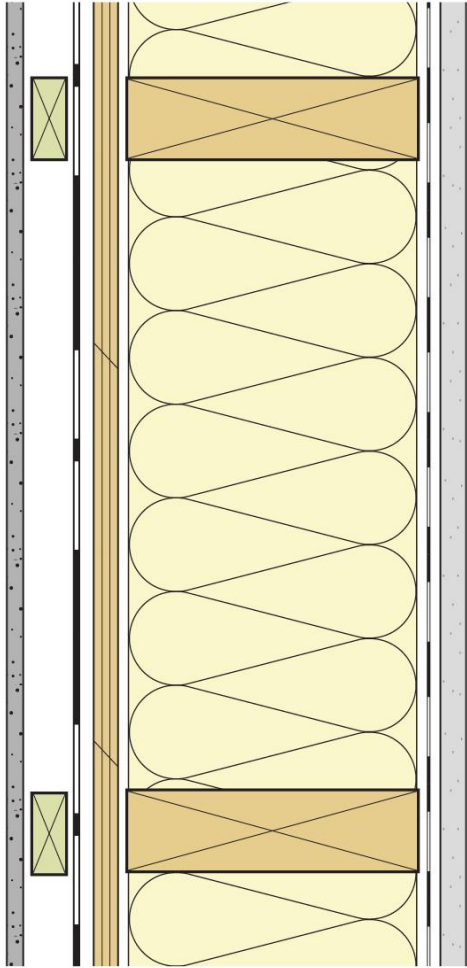


Panel Cladding
Systems

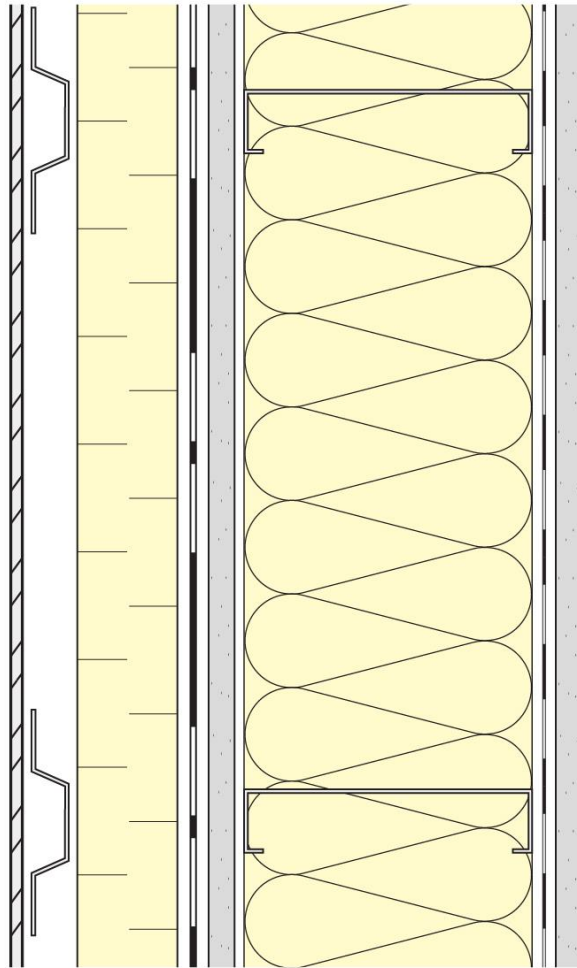
Water Control Strategy



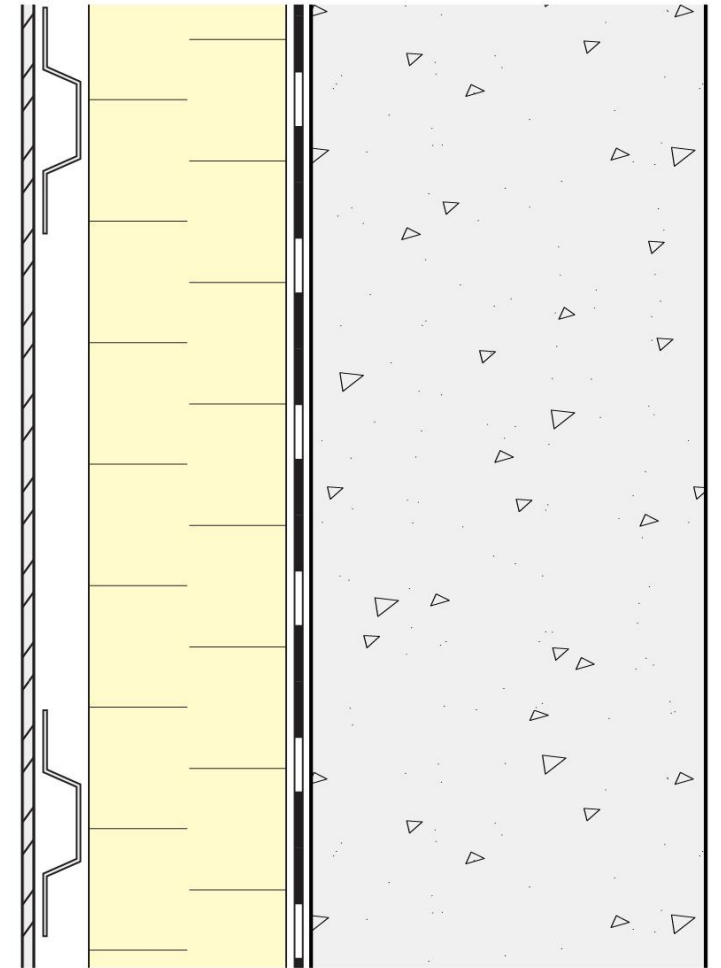
It's **Not** about Product, Material, Or Building Type



Plan View

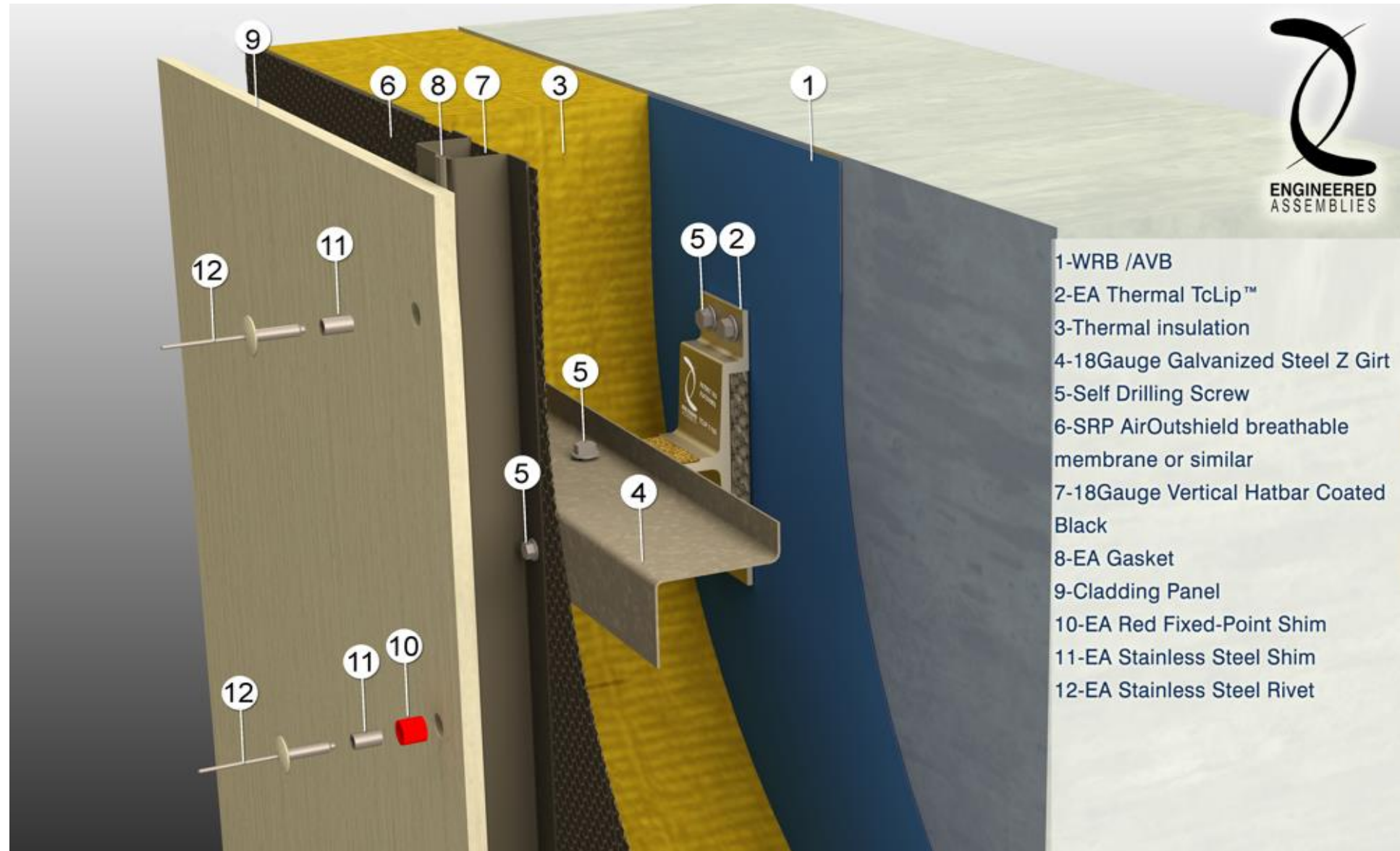


Plan View



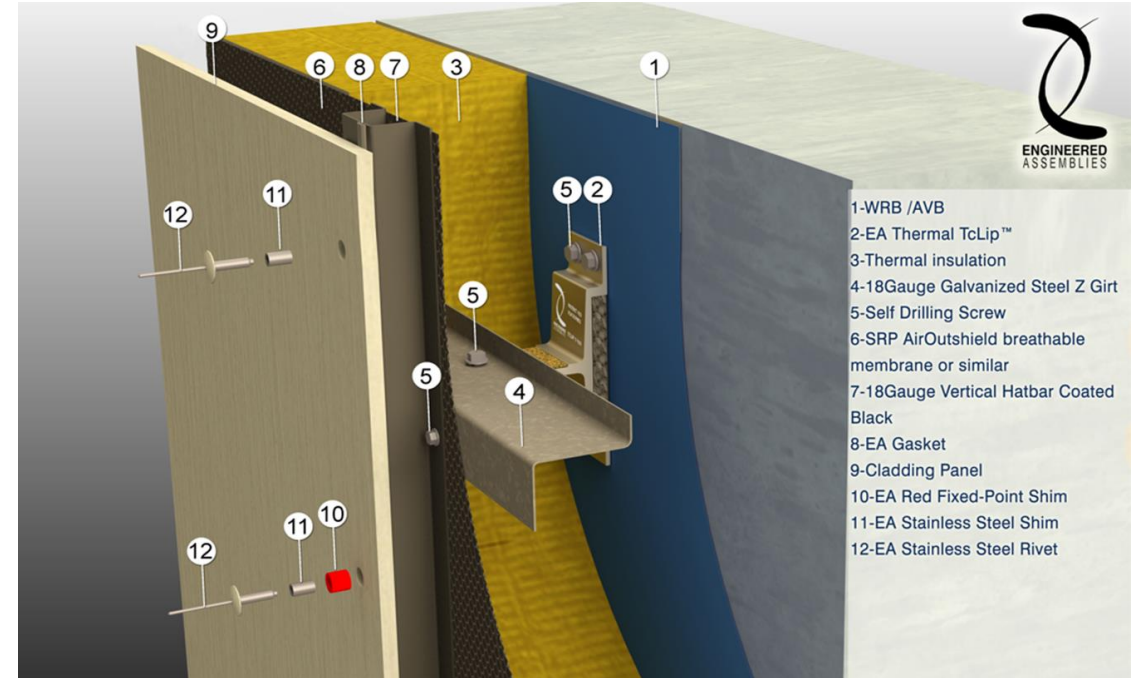
Plan View

High Performance Rainscreen System



Why rainscreen?

Why not?



Will we be converting non-rainscreen'd buildings to rainscreens ones for the sake of the rainscreen alone? – probably not

Why not?

- Expense
- Don't fix what ain't broken/ Perception
- But what if it is broken? Then what?

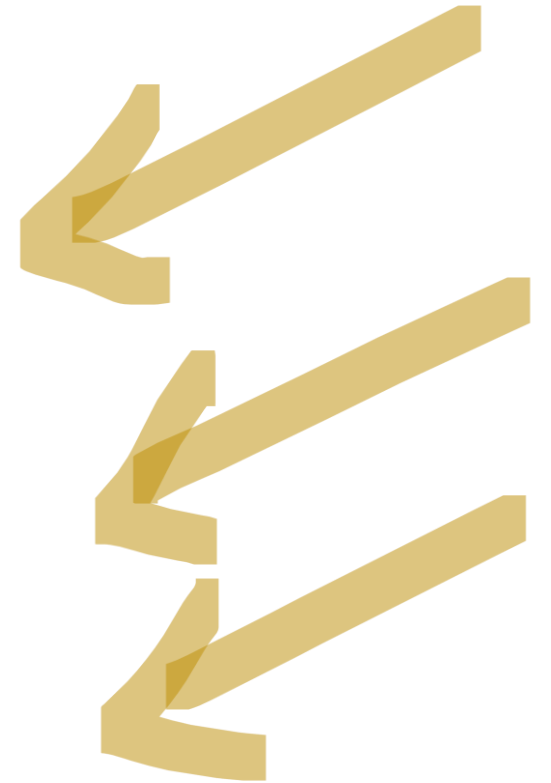
What's the most sustainable
building to **build**

?

The one you don't have to

Most common reason to reclad

1. Improved wall performance
2. Façade structural issues
3. Improved Appearance



Façade deficiencies and retrofits

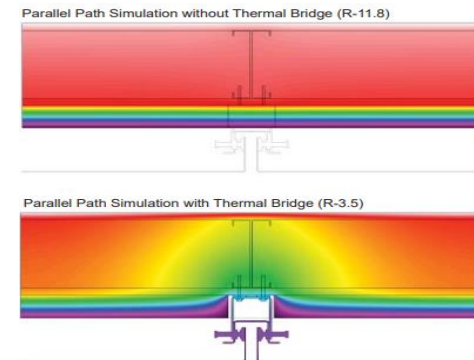
Typical sealant de-bonding at the horizontal EIFS panel joint.



Spalling bricks are a problem that face thousands of natural brickwork buildings



Create high performing facades that minimize energy usage & maximize thermal comfort



So then, how about Façade renewal?

Diminishing integrity of the original façade (falling tiles) and a need to upgrade thermal performance

MP Towers Circa 1965, Vancouver, Canada



Present day

Moisture issues

WEST COAST LEAKY CONDO CRISIS

Poor detailing around corners , windows and doors.

Eifs without a sufficient drainage gap/no ventilation

Discussion

Judge orders Vancouver strata to impose \$16 million levy to repair leaky condo problems

Keith Fraser

Published Oct 02, 2016 • 2 minute read

[Join the conversation](#)



More Moisture issues

Moisture management vacuum



~~XXXX~~ Holdings Ltd



Project: ~~XXXX~~ Vancouver, BC

Observation: High Moisture Readings noted at this location

Location: Drop 5 / Level: 8

Frequency: Isolated

Date: January 25th, 2019

EIFS Moisture Readings: 100 (of a 100 reference scale)

EIFS – first Generation

The EIFS at the Carl is comprised of an assembly of acrylic stucco finish applied to a thickness of expanded polystyrene insulation affixed to exterior gypsum sheathing. The insulation is affixed by means of **adhesive onto the paper-faced surface** of the exterior gypsum or a concrete guard structure. The EIFS cladding is designed as a “face-seal” system, **with no provision to drain penetrating water**

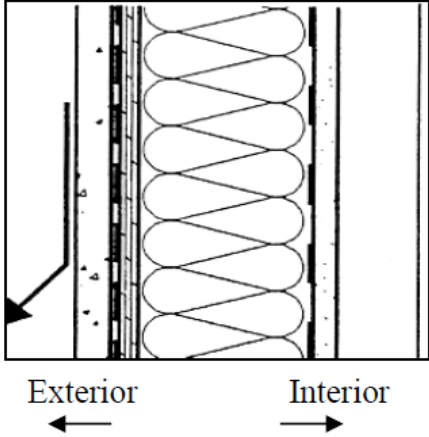
The Carl Building

Face-seal EIFS, as installed on the building, has proven to be ineffective at providing long term moisture protection of the underlying building envelope components without diligent monitoring and maintenance of the sealant joints, connections, and acrylic finish”.

A more suitable system for our coastal climate, that is subject to high annual rainfall and driving rain, **is a wall assembly incorporating a rainscreen system with more durable materials.**

Williams Engineering (July 2019)

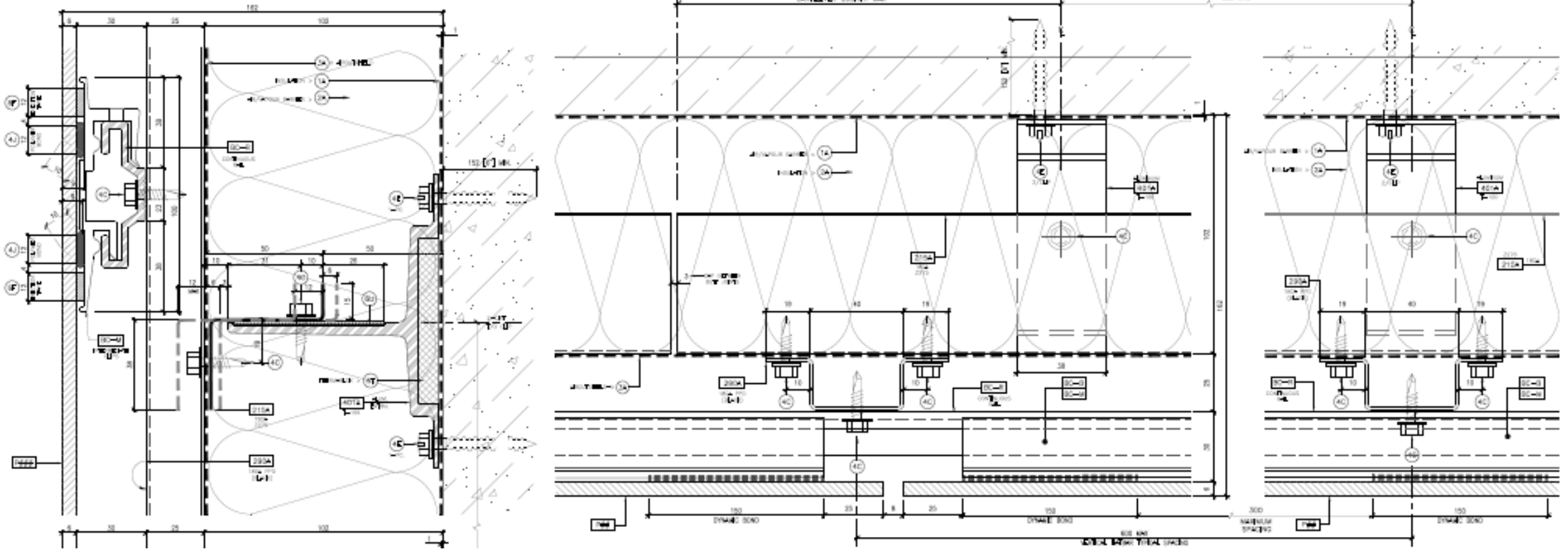
3.2 WALL CONSTRUCTION

19	<p>TYPICAL FACE-SEAL APPROACH</p> 	<ul style="list-style-type: none">• Interior• Gypsum wallboard• Polyethylene vapour barrier• Fiberglass batt. insulation between 3-5/8" steel studs• 6mm exterior gypsum sheathing• 2" EIFS Face-seal System (adhesive attachment)• Exterior <p>Only Drainage Plane is intended for the exterior surface</p>
----	---	--

Why façade renewal – Thermal upgrade



How rainscreen?



TB rainscreen façade system for porcelain with hidden fastener

Façade retrofit for thermal upgrade

Once existing cladding (if existing) is removed, membrane is applied,



and thermally broken clips are added

Façade retrofit for thermal upgrade

insulation



weather membrane
& vertical hat bars...



Next is horizontal girts

Façade retrofit for thermal upgrade

And finally, a panel
(porcelain in this case)



Rainscreen complete!

High Density FRC





Phenolic core HPL

Lightweight Natural stone
(slate)



Retrofit Challenges

Will the Old façade system and/or its respective substrate(masonry) manage the loads of the new system (cantilever/integrity)

- Dead loads (shear loads)
- Wind loads (pull out test?)

Esthetics

- Existing exterior mounted conduit/vents/Utility Boxes
- Misalignment of windows for new panel layout
- Availability of drawings of existing structure?



Retrofit Challenges



=



Can the building sustain a new rainscreen substructure cantilevered off the existing masonry?

Up Next ... Local Case Studies

Ross Boehmer – Architectural Panel Systems Inc
Addison, IL

Most common walls being reclad/retrofit

Masonry



Stone



EIFS



Other Materials



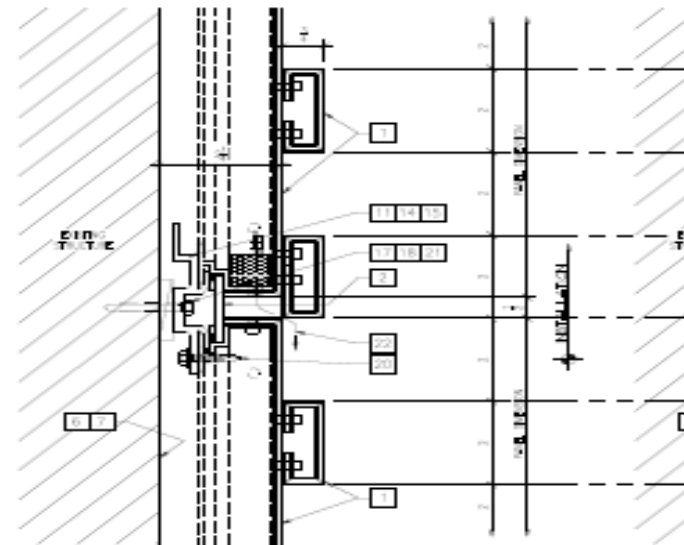
Why Façade renewal?

Improve the appearance to attract new tenants

And

improve market value

Add accent to the new design to make the building stand out from others in the area.





LINCOLN RETAIL (AFTER)



IBEW



LOCAL

134

IBEW AFTER

DisneyQuest



Room & Board



Why Façade renewal?

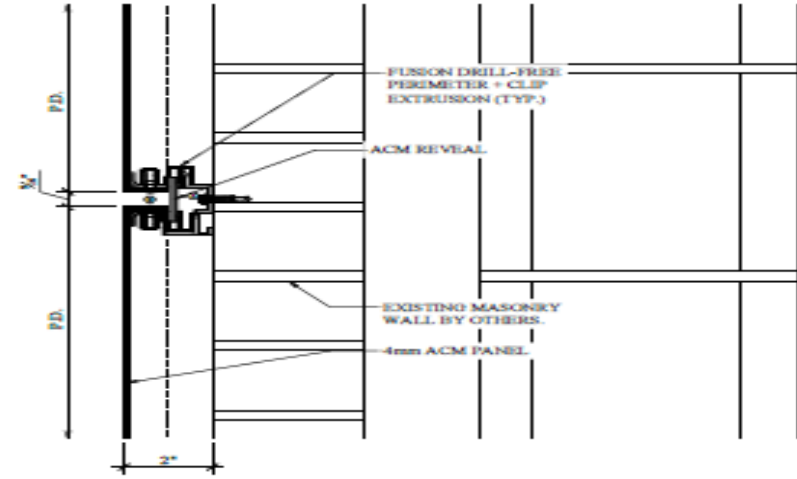
Government programs providing incentives for improving building appearance and energy efficiency



Elk Grove building owners can now apply for city cash to give their facades a facelift. The city's new facade improvement program provides up to \$50,000 in matching grant funding or half of any eligible reimbursable costs, whichever is less, along with professional architecture and engineering services to successful grantees. The program aims to encourage new investment in the city's older commercial buildings, said Darrell Doan, Elk Grove Economic Development Director, in a statement announcing the new plan



LANDMEIER BEFORE



LANDMEIER AFTER

ISSUES TO ADDRESS WITH A RETROFIT

- Structural integrity of existing wall
- Weight of new cladding
- Air/moisture integrity of existing wall
- Accuracy of dimensions of existing wall

(BEFORE)



(AFTER)



RAINSCREEN RETROFITTING CONCLUSIONS:

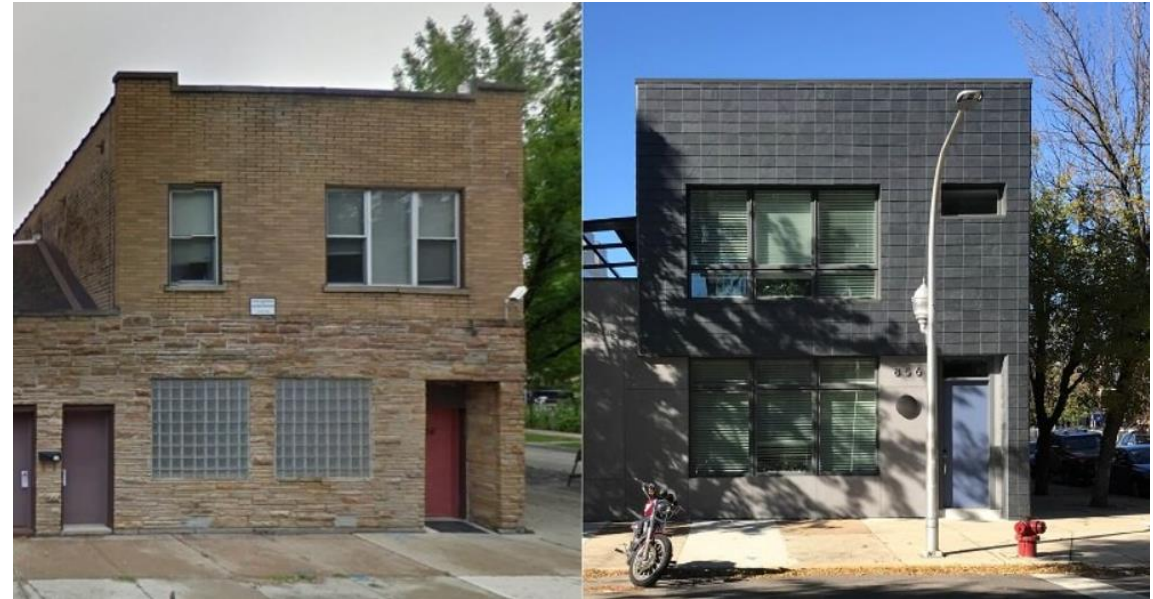
Rainscreen retrofits will likely only occur in conjunction with:

- Thermal upgrades to the façade envelope
- Enhancing the structural integrity of a compromised existing façade
- Rebranding/updating through façade renovation

The take-away?

- Education

We need to ensure that the façade retrofits that do occur, incorporate a high functioning rainscreen following RAINA standards.



Humboldt Park, Chicago

Thank you

J e f f K e r (Sr Tech. Advisor) – Engineered Assemblies Inc, Toronto/ Canada

R o s s B o e h m e r (President) – Architectural Panel Systems Inc, Addison, IL/ USA

QUESTION & ANSWER PERIOD

RAiNA
RAINSCREEN ASSOCIATION
IN NORTH AMERICA

rainscreenassociation.org