

Solutions to Overcome Façade Challenges in Mid-Rise Multi-residential Marketplace

Notice anything?



Make a difference

Please consider donating
\$20 to homeless causes

I thought bringing this big an audience together should
have some other effects.

If this was a Lunch and Learn my suppliers and I would
be spending about this much on lunch. I will be giving
too.



Notice anything?



Toronto



West Coast

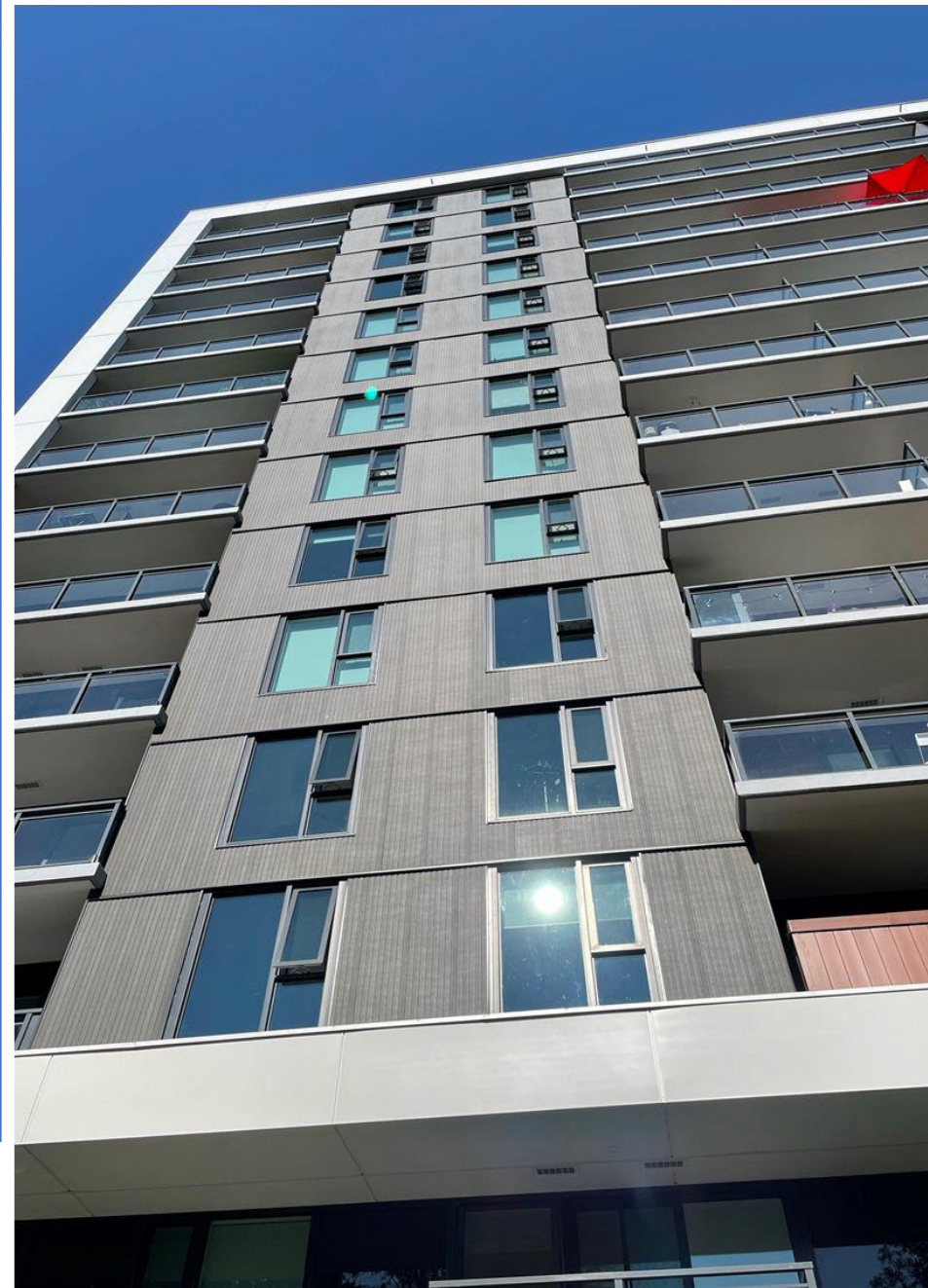


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Why Does Mid-Rise Matter?

It Just Does

- We are not going to **supply** affordable housing without the whole portfolio of high rise (>10 storeys), midrise (4-10 Storey) and some lowrise.
- Midrise only configuration that suits many uses; **purpose built rental, condominium, social and senior housing, student housing.**
- **Mirage** of single family houses **sprawl** and commuting not going to happen.





But It's Not Easy

Challenges abound

- Investors express **fear**, uncertainty and doubt.
- Zoning and **approval process** too slow.
- **First Cost**. Land costs up, \$/unit available flat or marginally up, construction cost going up. **Cost Volatility** an issue too.*
- **Maintenance** eats into profitability.*
- **Higher Performance requirements** are here now.*
- Is **Differentiation** becoming essential?*

***many of which are addressed by façade decisions**

Turning to Facades – Challenges

(what do you think – put your issues in the chat box)

- Status quo issues – will concrete, brick, glass, EFIS, metal panel suit the changes in codes and client expectations? **Maybe***
- Can we meet **higher thermal requirements** with status quo?
- Do we want the buildings to **look the same**?
- Do we want **maintenance** issues in the future? (See Quebec new law on facades.)
- Less glass, means **more wall**, means time to consider how.
- **I'd say we don't know what we don't know, yet. But others have solved this.**

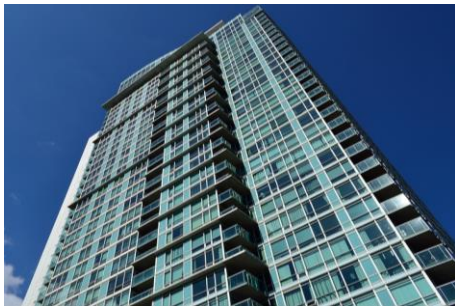
Macro Directions – moves as fast as you want them to.



- Labour availability and skill
- >6” insulation application

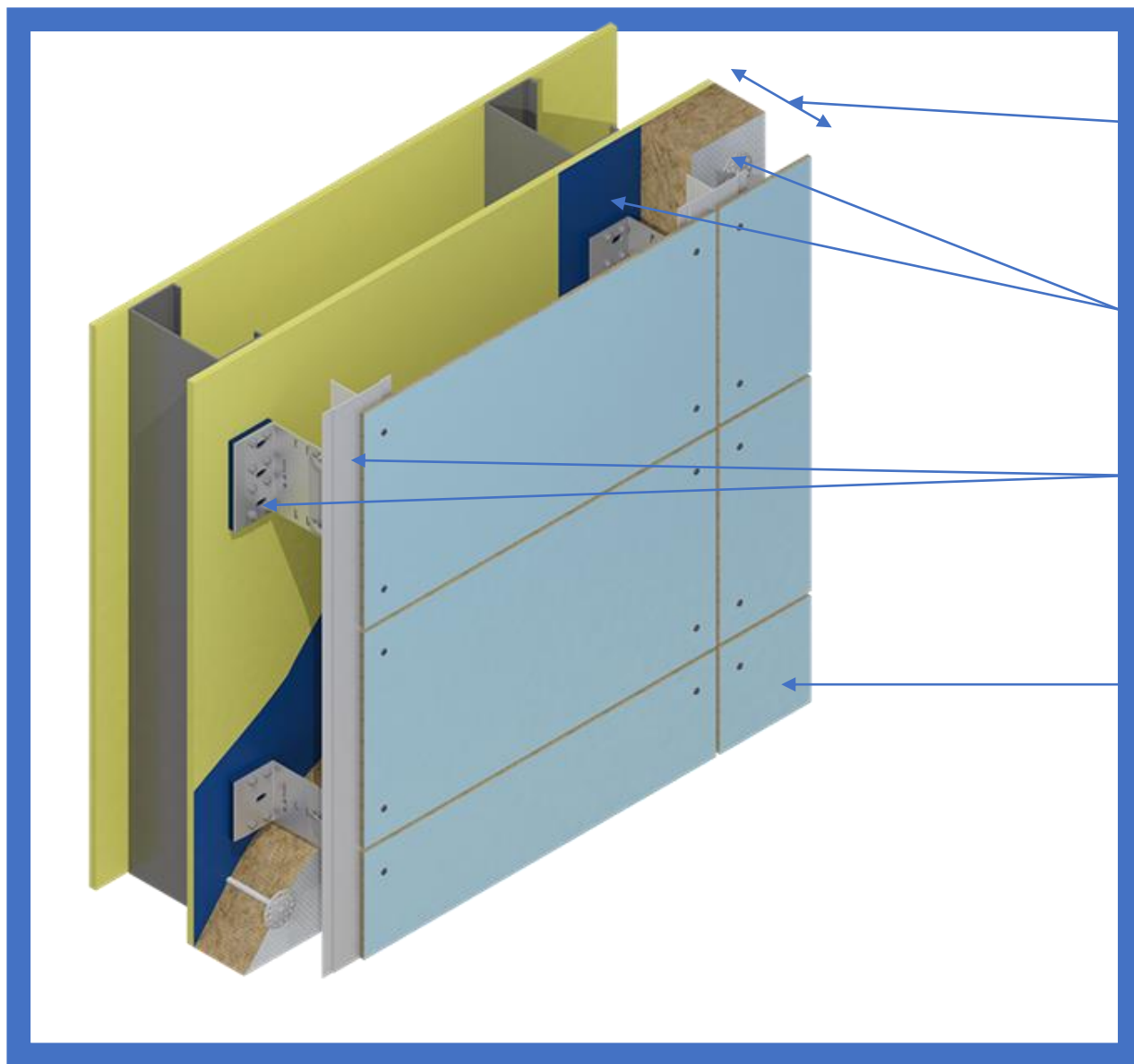


- GHG impact
- >6” insulation application



- Long term resilience – gaskets.
- Thermal performance now
- % fenestration going down.
- Curtain wall exceptions (office, high performance spandrels)

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Façade – everything outside of Sheathing

Insulation & AVB

Thermally Broken Substructure
'System'

Cladding; Skin, Light to Heavy, All types of finishes; Resilient; All budgets; Sustainable; Replaceable.

Universe of choice, same system

Systems

Not components

Facades are getting more complicated with higher objectives.

Specifying components was ok before.
'Specify and Hope'. No Longer

Must:

- Design and specify.
- Assign accountability.
- GIRTFT



Cost

*Fibre Cement
Meet Budget
Excellent Design Choices*

NBK ARCHITECTURAL TERRACOTTA
A Hunter Douglas Company

TRESPA®

SWISS PEARL®

Argeton

DEKTON FACADES
designed by COSENTINO

EQUITONE

CERACLAD
Rain Screen Exterior Siding System

JamesHardie

dryvit

vicwest
BUILDING PRODUCTS

Aluminum

Fibre Cement in Context

Cost

- + great for wild layouts.
- + open reveals.
- + good for high rise
- expensive for simple layouts
- a flat sheet, not a system.



- + affordable for houses
- + available everywhere
- + low rise installers everywhere
- suitable for midrise?
- a flat sheet, not a system.



Design Freedom

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- First Cost
- Maintenance Cost
- Differentiation
- Thermal Performance
- Sustainability
- Other

Let's check this out



Solution

FRC on a Proper Subsystem

Let's explore how this
checks the boxes



Fibre Cement System



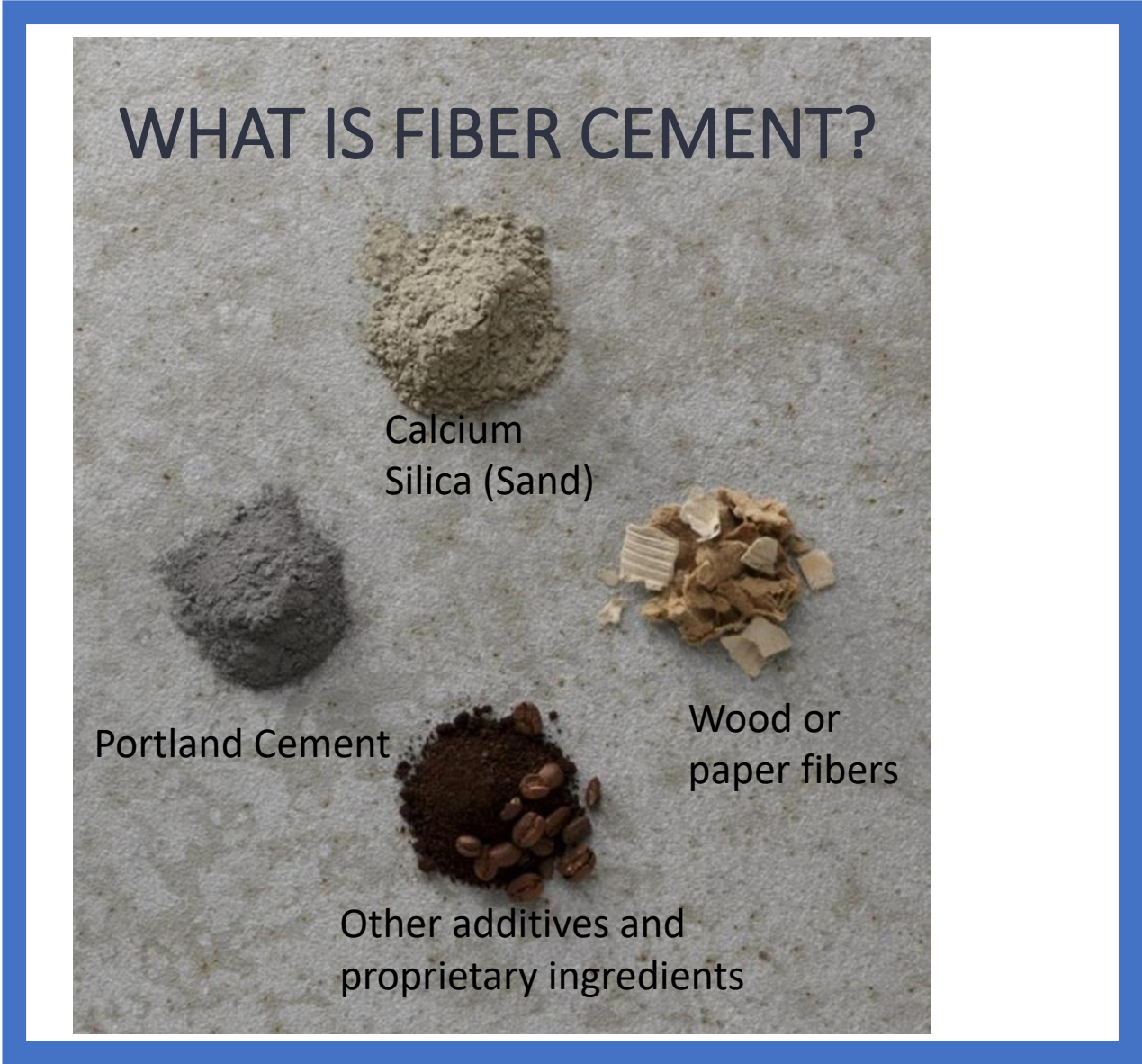
No limit on height. Non-combustible. CMCC rated.

Attachment ventilated rainscreen façade system with matching trim for corners.

Large panel size; all Panels are 10 feet x 18" with ship lap edges.
[we'll talk about flat panel fibre cement products]

- ✓ Total Cost; material, installation, life.
- ✓ Aesthetic choices = curb appeal
- ✓ Health and Well being: ventilated façade
- ✓ Sustainability; Mindful Material
- ✓ Performance: Proven in tough freeze thaw conditions
- ✓ Owned by Panasonic / Kubota of Japan

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WHAT IS FIBER CEMENT?

Calcium
Silica (Sand)

Portland Cement

Wood or
paper fibers

Other additives and
proprietary ingredients



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Simple Ingredients.

Panels Manufactured In **Precise** Manner

Limited Commodity **Inflation.**

Not impacted by Global Events.

Sustainable footprint





First cost matters

Wise choices matter too

- v Cheap products, small material premium
\$12-14 / sq ft for panels and accessories.
 - Install ease
 - speeds construction
 - Lower labour costs
- **Less** reliance on **skilled labour**
- **Risks** (do you budget risk?)
 - Reduce or eliminate overages
 - No surprises



Budget \$50 - 70/Sq ft

- CERACLAD (\$12/sq ft)
- U-Kon Subsystem (\$7/sq ft)
- AVB
- 100mm Insulation
- Design and Engineer's Stamp
- Equipment
- Labour

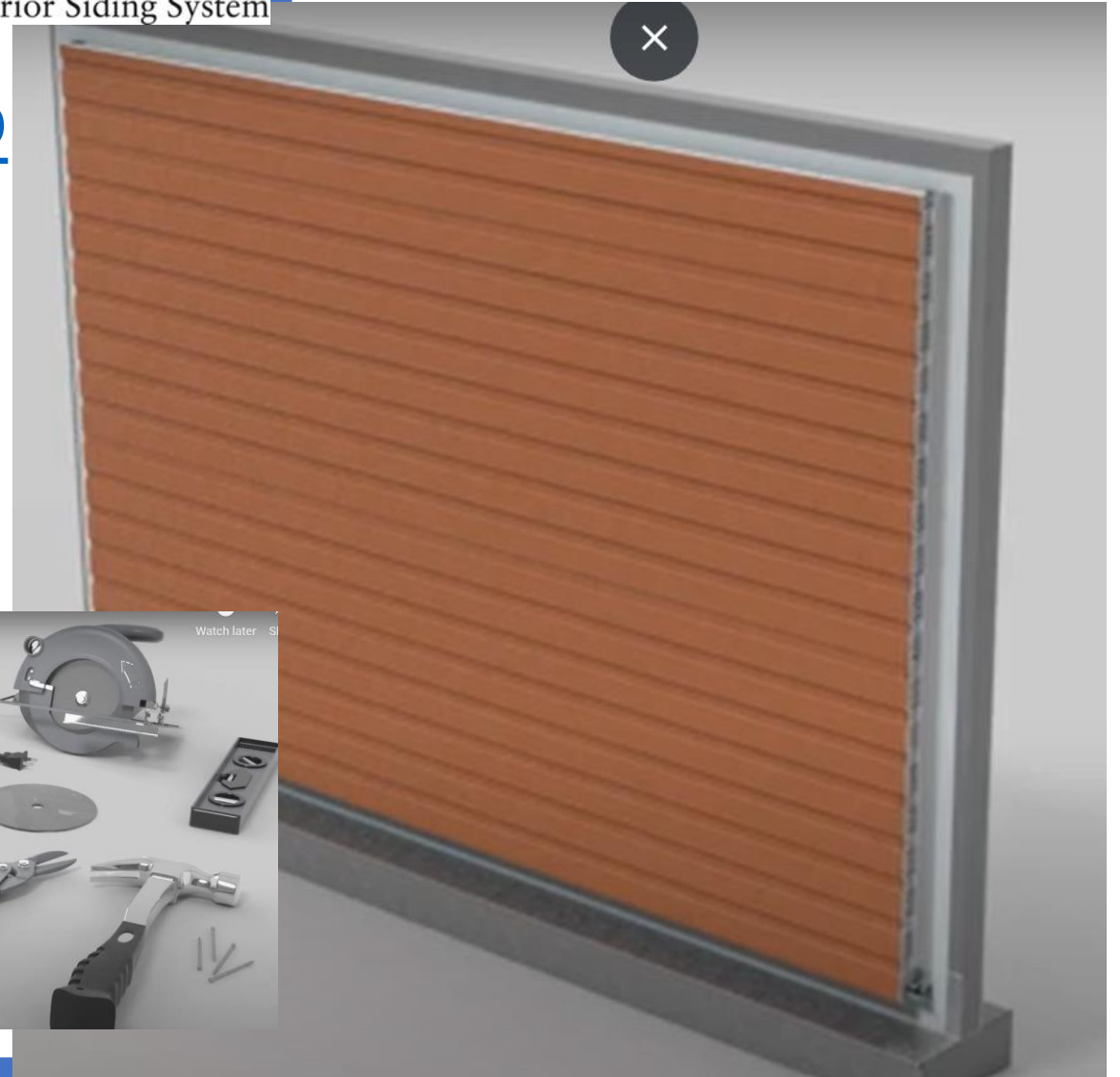
“Sheathing to cladding” On Budget

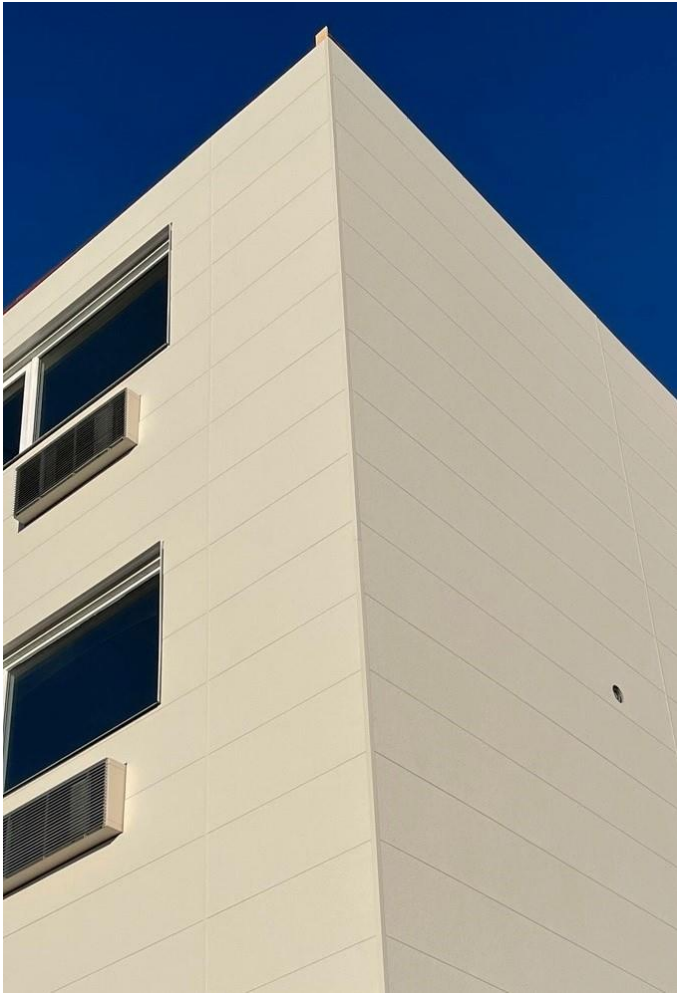


CERACLAD install video

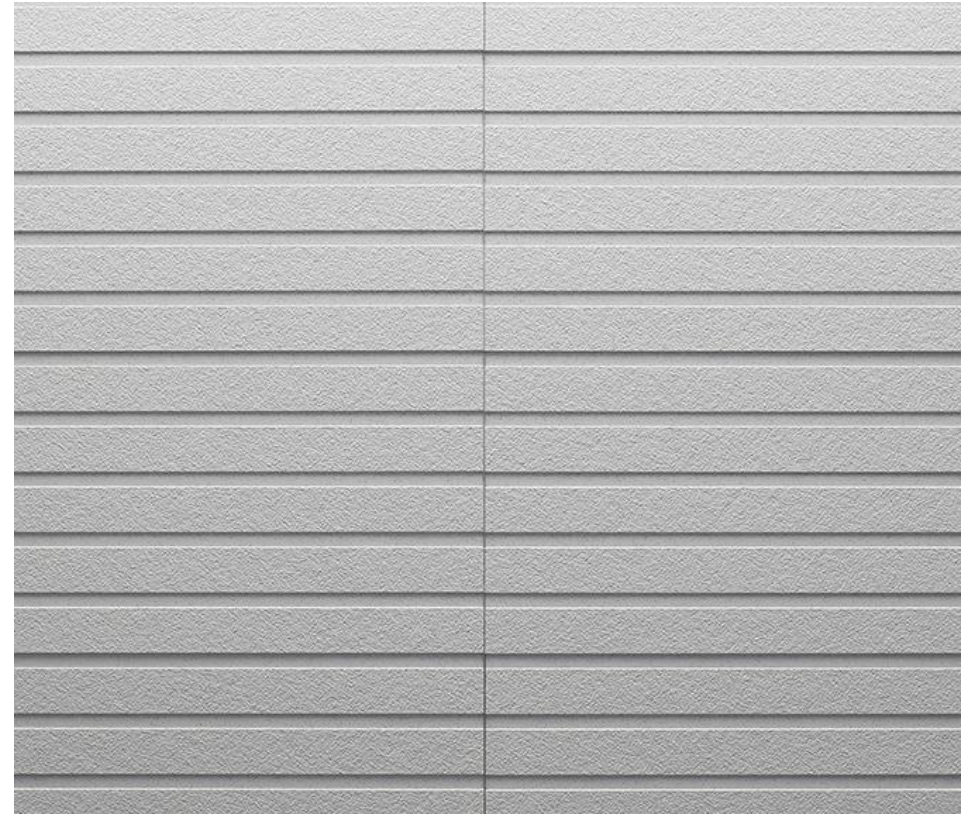
Why see this?

- Simple tools
- Easy to do right, difficult to do wrong.
- Reduces dependence on expensive skilled labour.





CERACLAD
Rain Screen Exterior Siding System



Corners and Joints

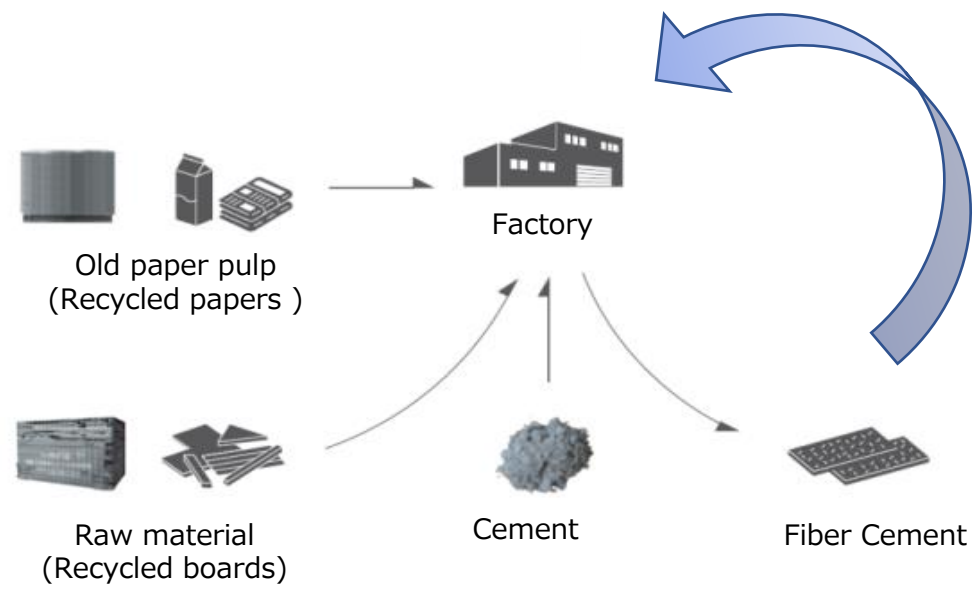
60,000 Square Feet
Façade 6 Mos install [500 sq ft per day]
System = Inherent Quality







Fiber cement manufacturing process



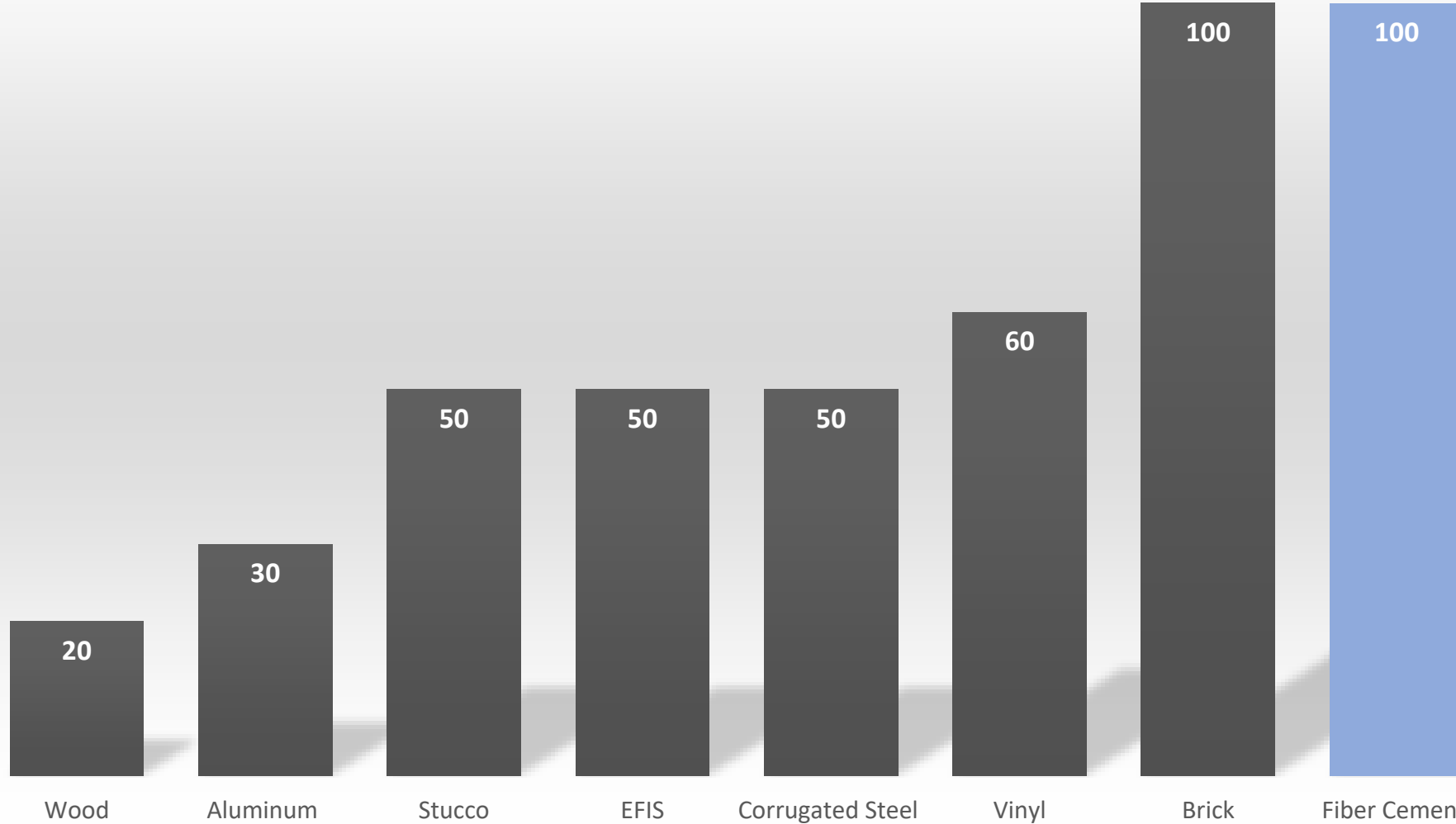
Fiber cement typically has anywhere from 30-60% recycled materials

A large percentage of the recycled content can be “post-consumer” recycled content, typically 8-22%

Some manufacturers also have takeback programs for construction scraps

Greenest material is one you never replace*

Years






CERACLAD

Triple-Coated Rainscreen Siding Systems

Finishes of Fibre Cement

Coatings is Part of a System

Coating	Consistent Factory Finish	Fade Resistance	Graffiti Resistance	Low Maintenance
	✓	✓	✓	✓
Graffiti Resistant Coating	✓		✓	✓
Base Paint + Protective Clear coat	✓	✓		✓
Acrylic Paint (Pre-finished)	✓			
Acrylic Paint (Field Painted)				



Maintenance – Boo!

What if zero?

- Finish durability
- Cleanliness
- Designed for Canadian Climate
- Graffiti and Impact Resistance
- Easily demountable

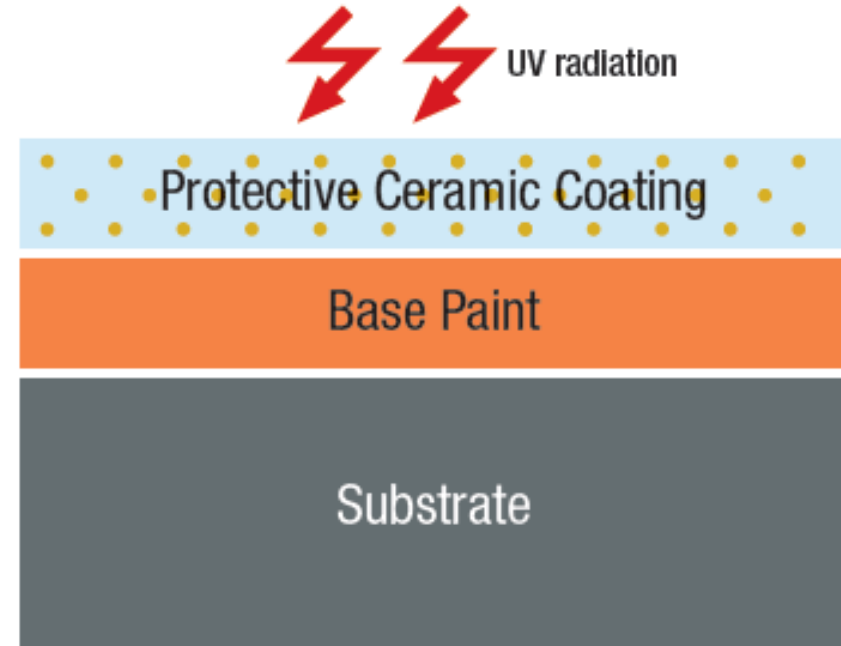


Repainting Fibre Cement – Whaaa?



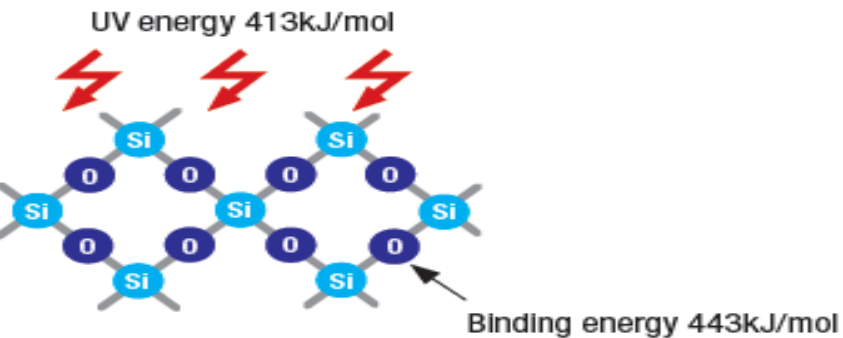
Ceramic Coated

- Standard color choices
- Prefinished in Japan
- UV blocking Ceramic coating protects finish and color



• UV absorber

The protective ceramic coating prevents the penetration of ultraviolet rays into the colored layer.



Zero Maintenance

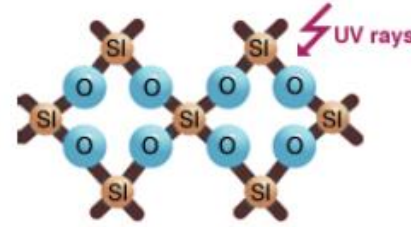
Coatings: Silicon Oxide UV resistant coating



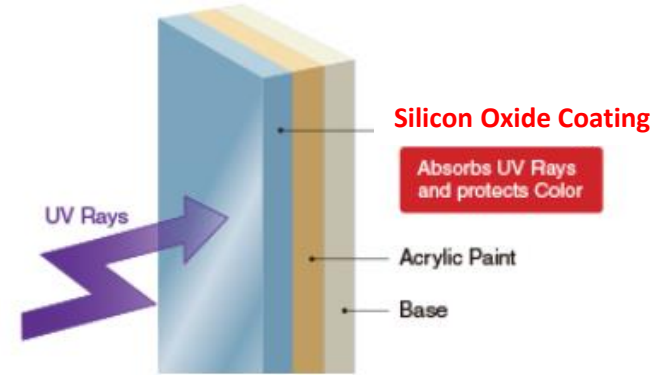
August, 2010



< Molecular bonds >



No breaks of the bonds +
No penetration of UV rays



May, 2017



Pros

- Factory Coated
- Easy to clean
- UV Resistant, prevents color fade
- Requires minimal maintenance and repainting
- Graffiti resistant

Cons

- Not available from all manufacturers
- Requires high adhesion primer for re-coating

Finishes

Coatings: Graffiti Resistant



Two Kinds of Graffiti Resistant Coatings:

Sacrificial Coating [The Other Guys]

- Clear Polymer coating that is applied to the substrate and protects the material underneath
- Graffiti is removed with the coating (usually by high pressure washing)
- Coating is reapplied after removal
- Cheap, effective.
- Not low maintenance due to reapplication process
- Repetitive power-washing can damage material underneath

Permanent Coating

- Some manufacturers offer this as a factory coating option
- Many different types, but all act in the same way to repel water and oil
- If applied right, can be cleaned over and over



Vancouver

Don't have to look far ...

Toronto







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So Far



First Cost



Maintenance Cost



Differentiation



Thermal Performance



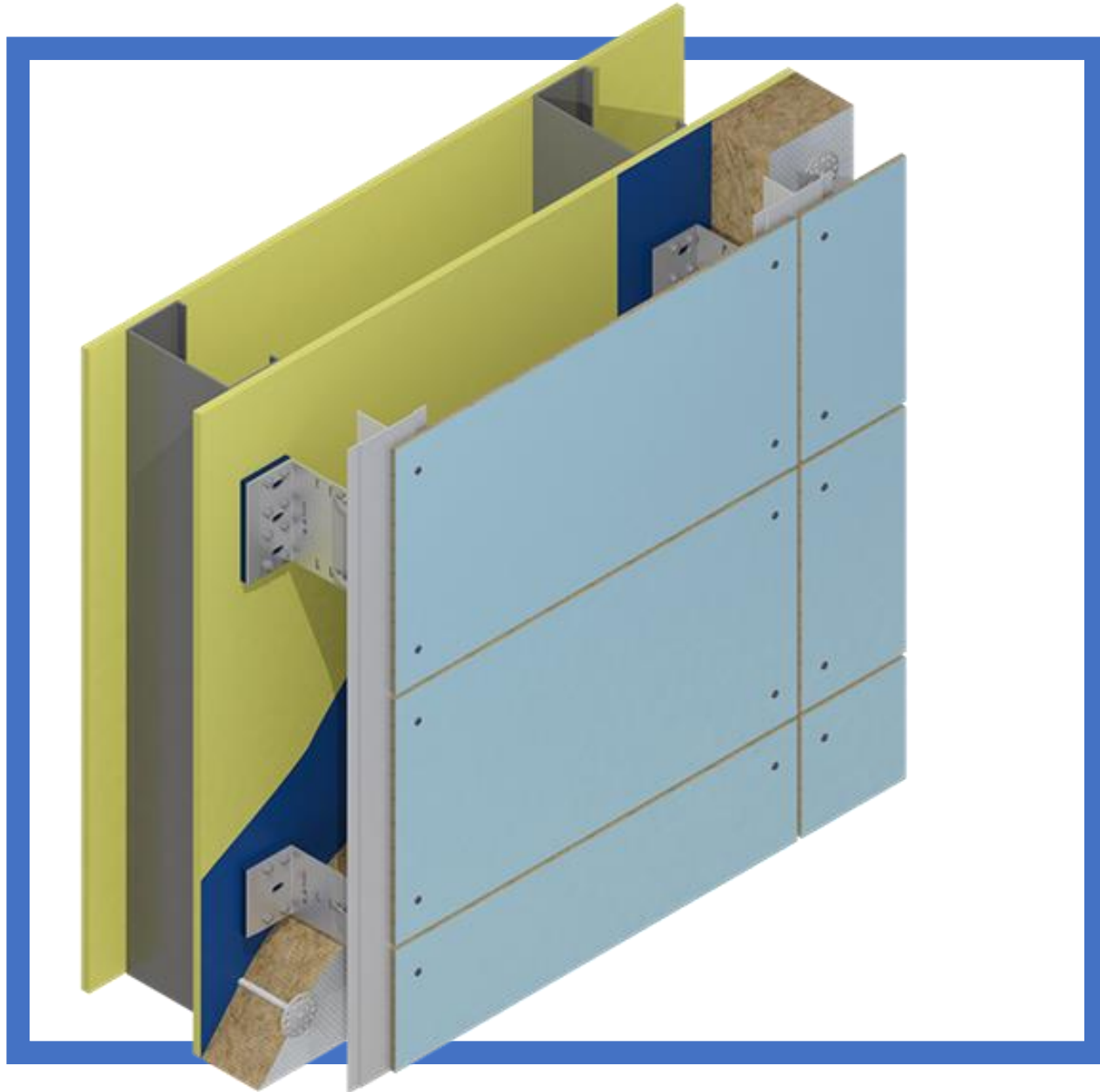
Sustainability



Other



CERACLAD
Rain Screen Exterior Siding System

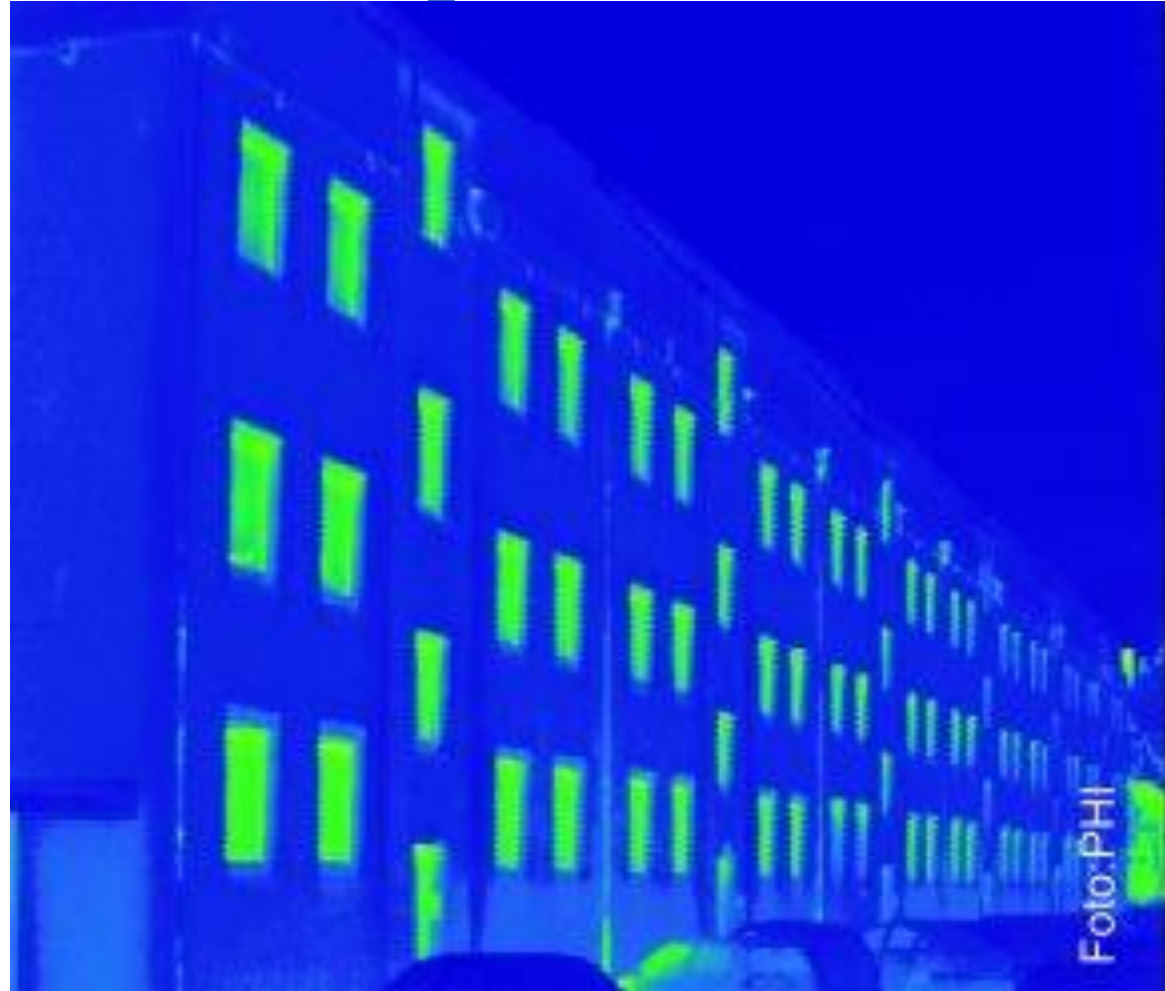


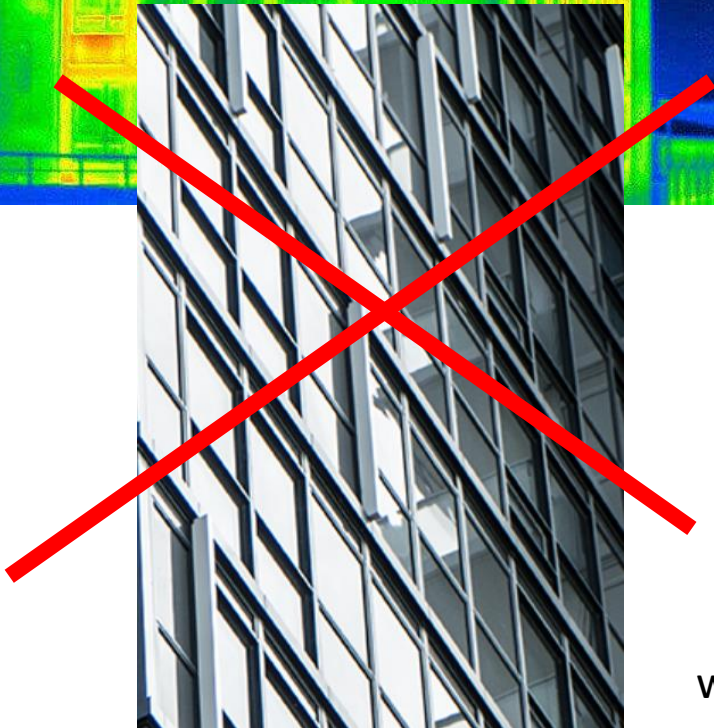
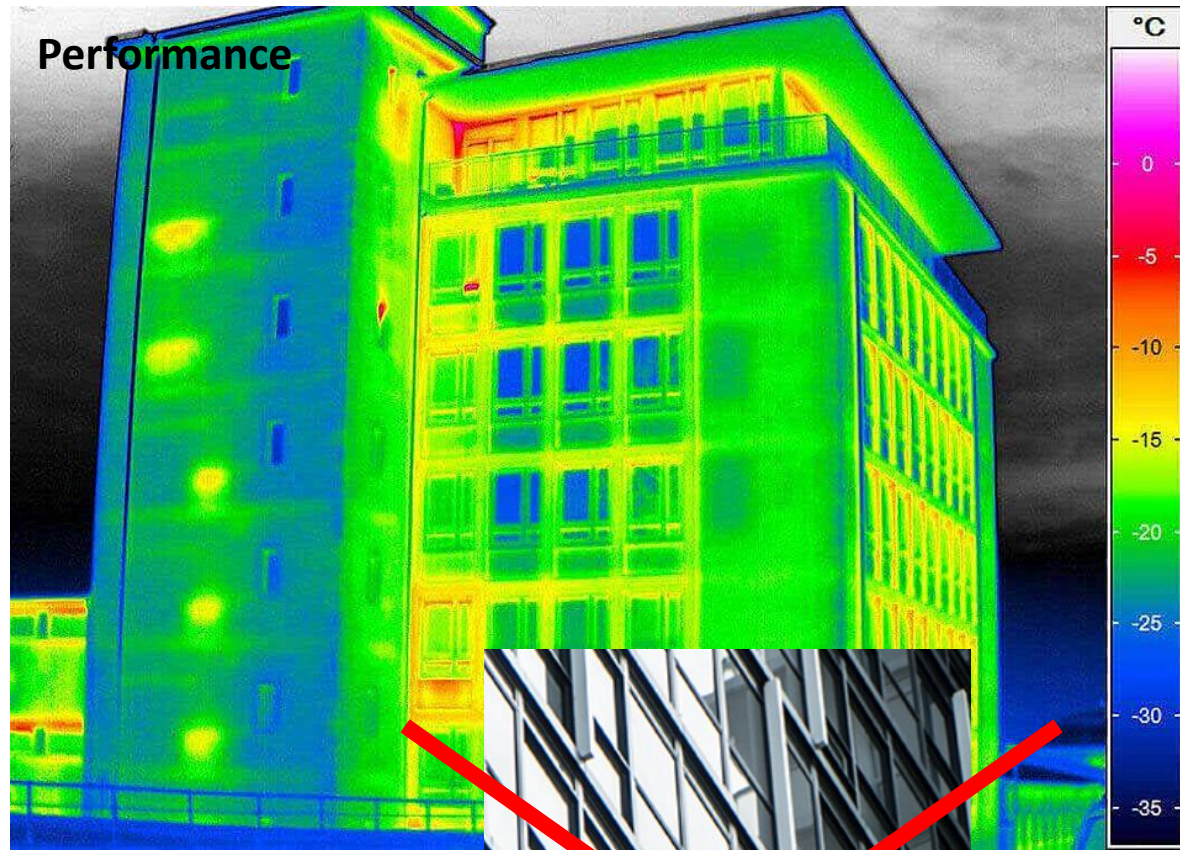
Did I say System?

- Thermally Broken Subsystem
- Sheathing to Cladding
- Design and supplied – Sole Accountability
- Comprehensive drawings and speculations
- Pre and Post award confidence

Performance Yea!

- Thermally Broken System
- Systems explained
- Design Precision
- Bespoke Systems





Performance Targets are Here, not Tomorrow

- Window % ↓
- R Value ↑
- Society's expectations of us ↑
- Longer term failures ↑

Buy a Clip

- 3-6 clip choices
- Most often one clip size laid out across façade
- Sometimes profiles / girts
- Sometimes structural engineering
- No single source accountability



Design a System

- Always single source accountability.
- Always designed 'Bespoke Systems'
- Always a system.*





Buy a clip

Who makes things happen

Clip, one size for whole building, from one guy

Girts made by another

Fasteners, standard but from another guy. Right amount?

Designed by design guide, not for your building.

Thermal and structural not interlocked.

Install, fabrication, quality control by another guy.

Might have worked for 3" of insulation, not now.

Look for System Choices – Demand Better

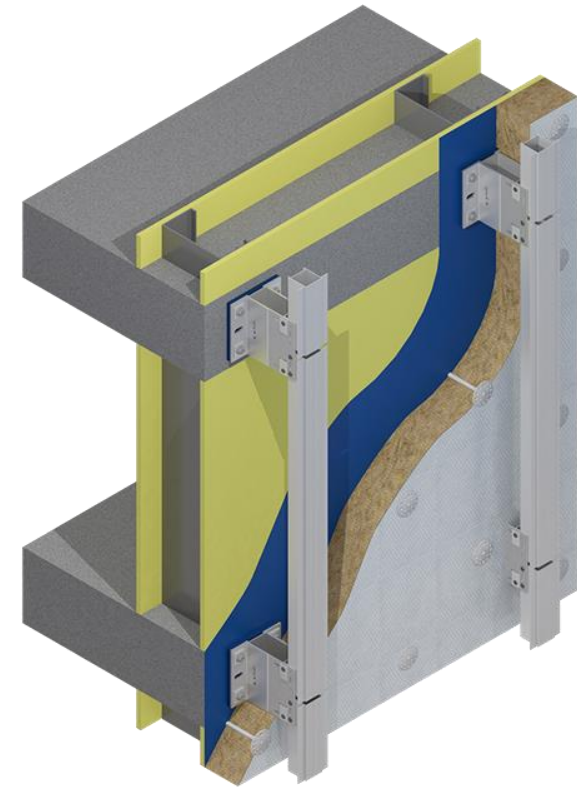
Simple



High Performance



Innovative (slab-to-slab)



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*And Everything Between

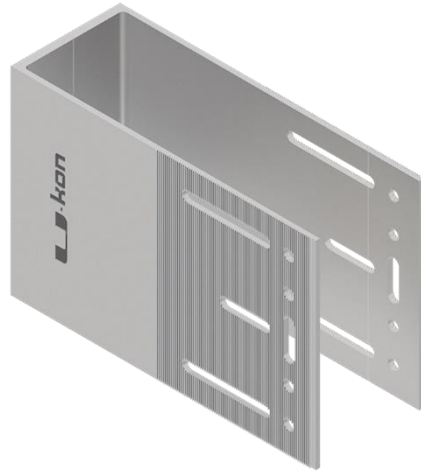


Wall Brackets that offer Options – High Performance

Different brackets, extenders, materials provides unique flexibility

Adjustable in three directions: higher quality, faster install

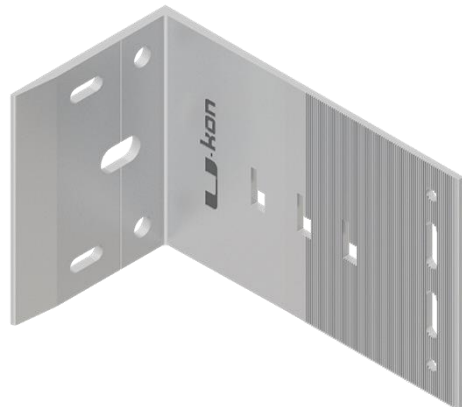
WALL BRACKETS “U” SHAPE



WALL BRACKETS “U” SHAPE WITH EXTENSION



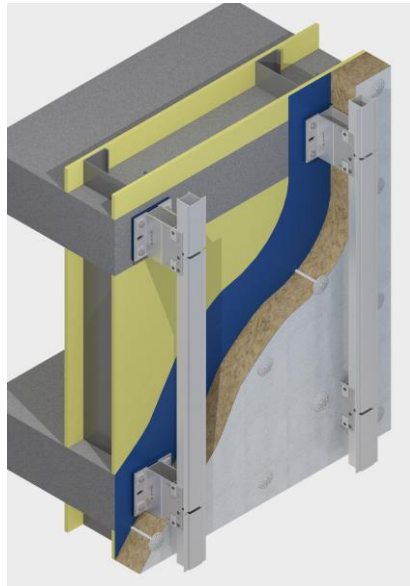
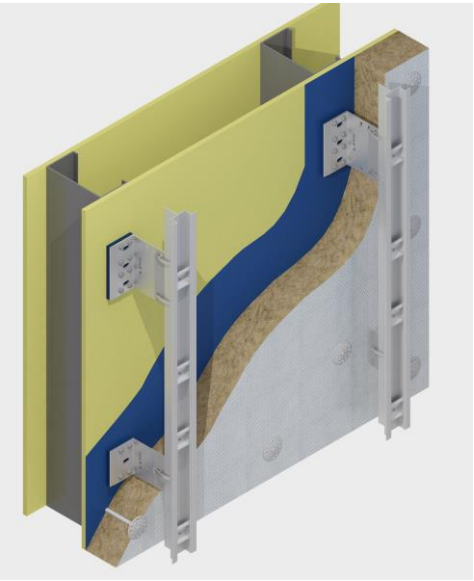
WALL BRACKETS “L” SHAPE



WALL BRACKETS “L” SHAPE WITH EXTENSION



Thermal Performance Explained



Aluminum
Bracket

Stainless
Steel Bracket

Vertical Spacing in	Exterior Insulation Thickness in	Exterior Insulation Nominal R-Value	Assembly Effective R-Value	Assembly Effective R-Value	Assembly Effective R-Value (Stainless steel Bracket HIGH)*
24	4	R-16.8	R-14.3	R-17.7 (20%)	
24	5	R-21.0	R-16.0	R-21.1 (25%)	
24	6	R-25.2	R-17.7	R-24.8 (29%)	
36	4	R-16.8	R-15.8	R-18.3 (14%)	
36	5	R-21.0	R-18.0	R-21.9 (18%)	
36	6	R-25.2	R-20.2	R-25.8 (22%)	
48	4	R-16.8	R-16.7	R-18.7 (11%)	
48	5	R-21.0	R-19.3	R-22.4 (14%)	
48	6	R-25.2	R-21.8	R-26.3 (18%)	
120	4	R-16.8			18.2*
120	5	R-21.0			21.9*
120	6	R-25.2			25.8*

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THERMAL ANALYSIS PERFORMED BY MORRISON & HERSHFIELD

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* - Bracket is mounted to the intermediate floor slab, thermal bridging of the concrete slab must be included in the analysis. As a result, a linear transmittance value, Ψ , is provided to account for the thermal bridging effect of the intermediate floor.

Build = Design Starts at Beginning



**Best accomplishments are at the beginning;
Greatest Failures Avoided are too.**

- Design review.
- Cladding layout review.
- Initial system recommendation.
- Initial **structural engineering** and resulting **thermal performance**.
- Comprehensive **value engineering**.
- **Cladding fabrication** recommendations.
- **Document creation; details, specifications.**
- **Budgeting.**



You Should Ask for This.

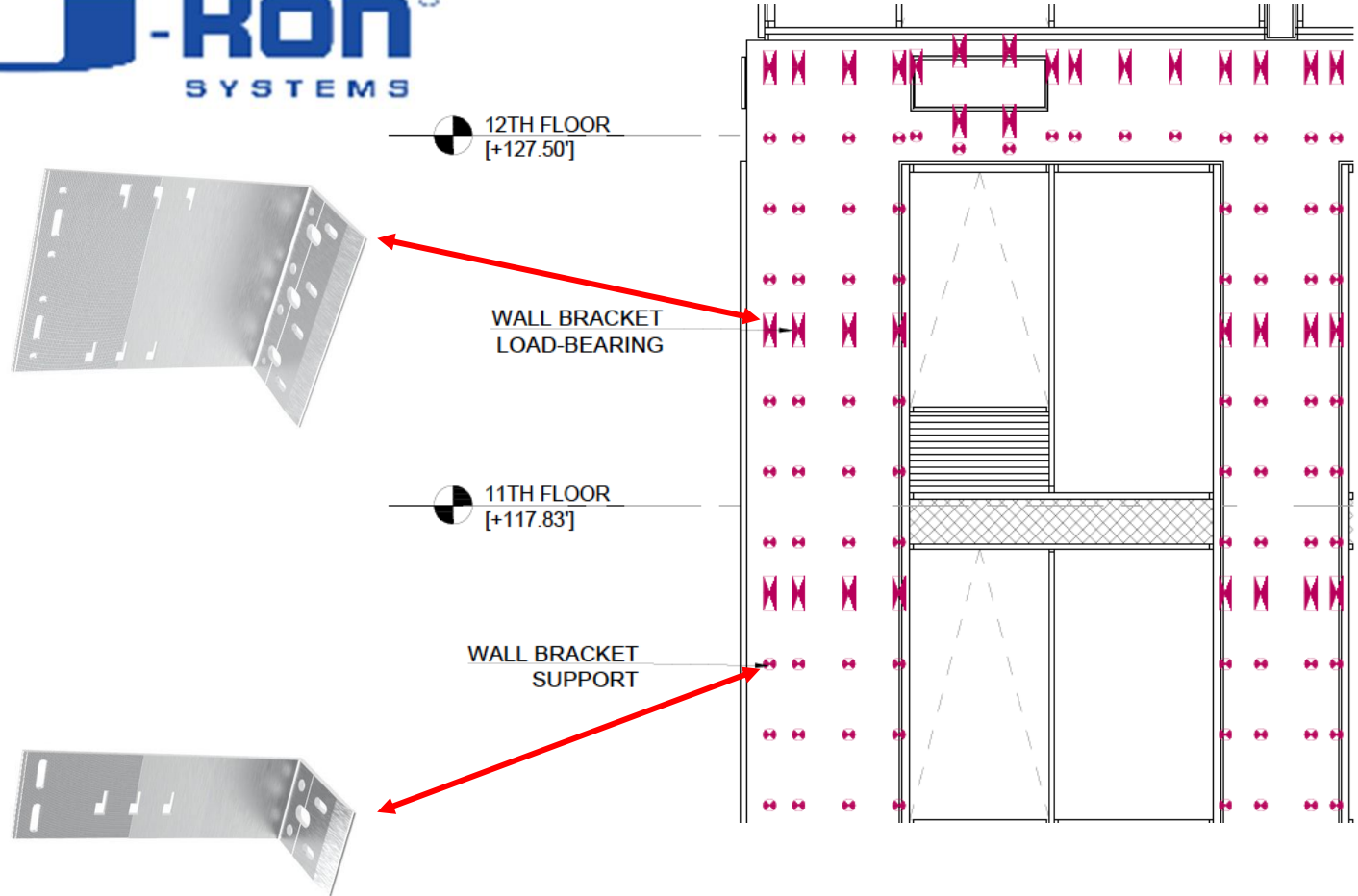
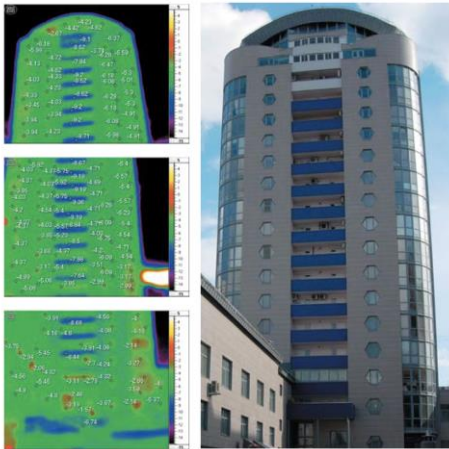
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Structural and Thermal Engineering Together

A façade is modelled for structural requirements and thereby thermal results.

Initial **budgeting** and value engineering opportunities identified.

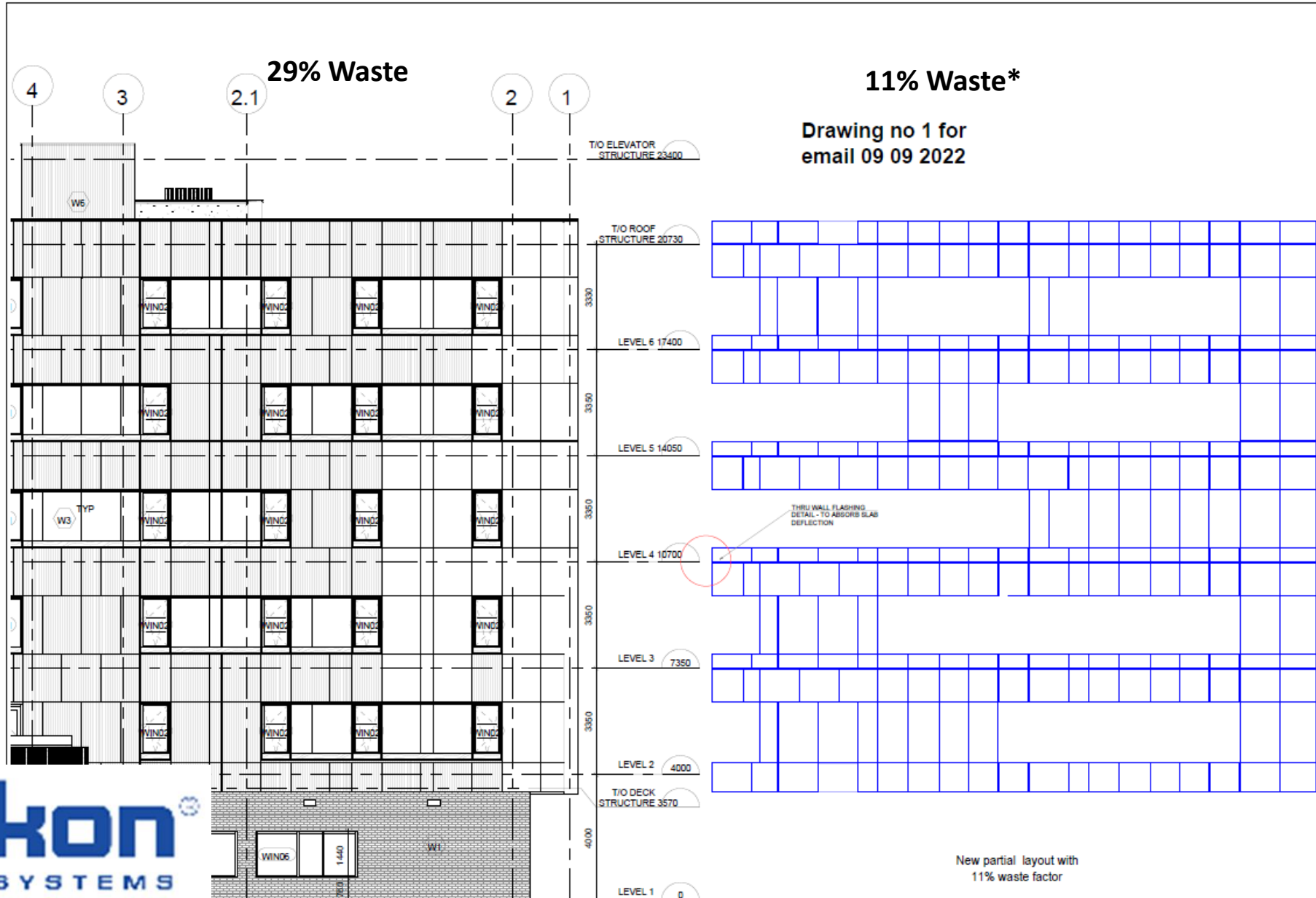
Problems revealed early.



Location of wall brackets; based on structural analysis



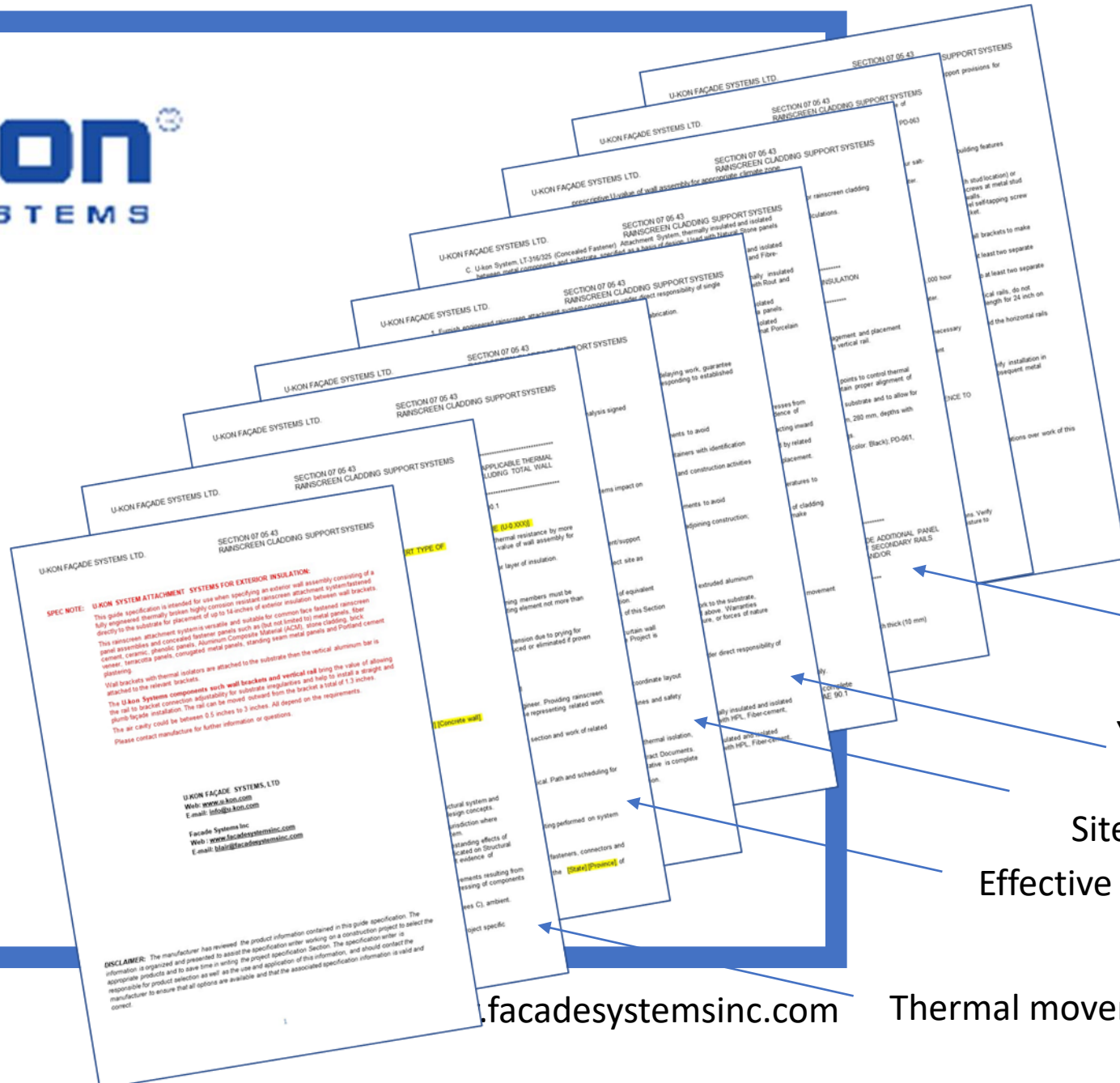
Panel Layout – largest opportunity to save money and be sustainable



*and accounted for building deflection.



That is a spec!



Sole accountability

Years in business

Site Launch meeting

Effective R value

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Thermal movements

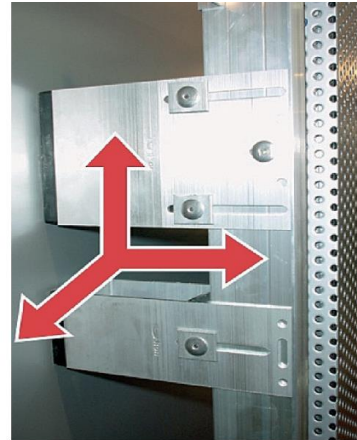
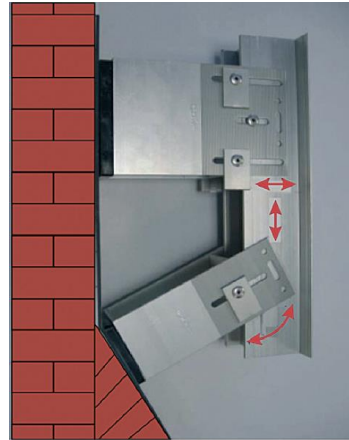


Wall Brackets Adjustable in Three Directions

Uneven wall not an issue, e.g. recladding.

Install: attach then adjust, reducing error and rework.

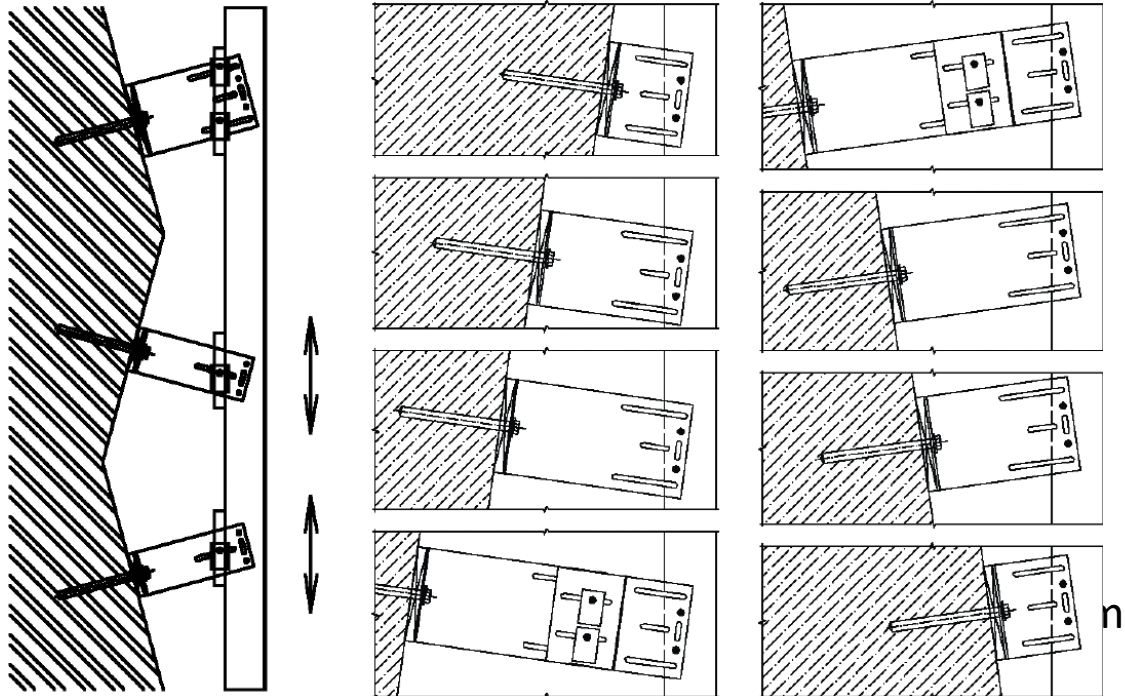
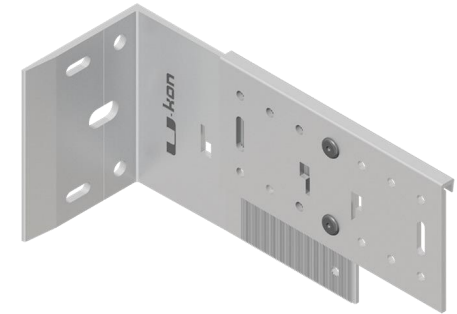
Reduce compromises on site,
“Build What Is Designed, Easily”



WITHOUT EXTENSION



WITH EXTENSION



Victoria BC Stone Install

- 3" out of true ground to roof
- Adjusted with U-Kon Subsystem.



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DRAWING LIST

SERIES NUMBER	SERIES DESCRIPTION	SEQ. #	DRAWING NUMBER	DRAWING TITLE
F0.	DRAWING LIST AND NOTES	1	F0.1	DRAWING LIST
		2	F0.2	GENERAL NOTES
		3	F0.3	TYPES OF CLADDING INSTALLATION
		4	F0.3	TYPES OF CLADDING INSTALLATION
F1.	TYPICAL WALL DETAILS	5	F1.1	TYPICAL SECTION INSULATED STUDS WALL
		6	F1.2	TYPICAL CEILING SECTION
F2.	CLIP LAYOUTS	7	F2.1	BRACKET LAYOUT WEST ELEVATION
		8	F2.2	BRACKET LAYOUT EAST ELEVATION
		9	F2.3	BRACKET LAYOUT NORTH ELEVATION
		10	F2.4	BRACKET LAYOUT SOUTH ELEVATION
		11	F2.5	BRACKET LAYOUT RCP GROUND FLOOR
		12	F2.6	BRACKET LAYOUT RCP ROOF
		13	F2.7	BRACKET LAYOUT PENTHOUSE WALLS
F3.	GIRT LAYOUTS	14	F3.1	GIRT LAYOUT WEST ELEVATION
		15	F3.2	GIRT LAYOUT EAST ELEVATION
		16	F3.3	GIRT LAYOUT NORTH ELEVATION
		17	F3.4	GIRT LAYOUT SOUTH ELEVATION
		18	F3.5	GIRT LAYOUT RCP GROUND FLOOR
		19	F3.6	GIRT LAYOUT RCP ROOF
		20	F3.7	GIRT LAYOUT PENTHOUSE WALLS
	DRWG LAYOUTS	21	F4.1	CLADDING LAYOUT WEST ELEVATION
		22	F4.2	CLADDING LAYOUT EAST ELEVATION
		23	F4.3	CLADDING LAYOUT NORTH ELEVATION
		24	F4.4	CLADDING LAYOUT SOUTH ELEVATION
		25	F4.5	CLADDING LAYOUT RCP GROUND FLOOR
		26	F4.6	CLADDING LAYOUT RCP ROOF
		27	F4.7	CLADDING LAYOUT PENTHOUSE WALLS
F6.	F6.1 TO F6.9 SECTIONS	28	F6.1	VERTICAL SECTIONS
		29	F6.2	VERTICAL SECTION
		30	F6.3	VERTICAL SECTIONS
		31	F6.4	VERTICAL SECTIONS
		32	F6.5	VERTICAL SECTION
		33	F6.6	HORIZONTAL AND VERTICAL SECTIONS
		34	F6.7	VERTICAL AND HORIZONTAL SECTIONS
		35	F6.8	HORIZONTAL AND VERTICAL SECTIONS
		36	F6.9	SECTIONS WITH DOUBLED GIRTS



CERAMIC CLADDING AND SUPPORT SYSTEM

This is our Drawing Table of Contents

REVISIONS

REV.	DESCRIPTION	DATE
0	ISSUED FOR REVIEW	04/15/22
1	ISSUED FOR ESTIMATION	10/11/22
2	ISSUED FOR CONSTRUCTION	09/11/22

SEAL:
ADEPT Engineering Ltd.
PEO Certificate of Authorization
#120692018



CONTRACTOR

PROJECT:
101 Sheppard
Avenue East
Toronto, Ontario, M2N 3A3

CLIENT:

ARCHITECT:
STUDIO URINA Inc.
180 Spadina St suite 216, Toronto, ON M5S 2W5
416-451-8888
info@studiourina.ca

STRUCTURAL:

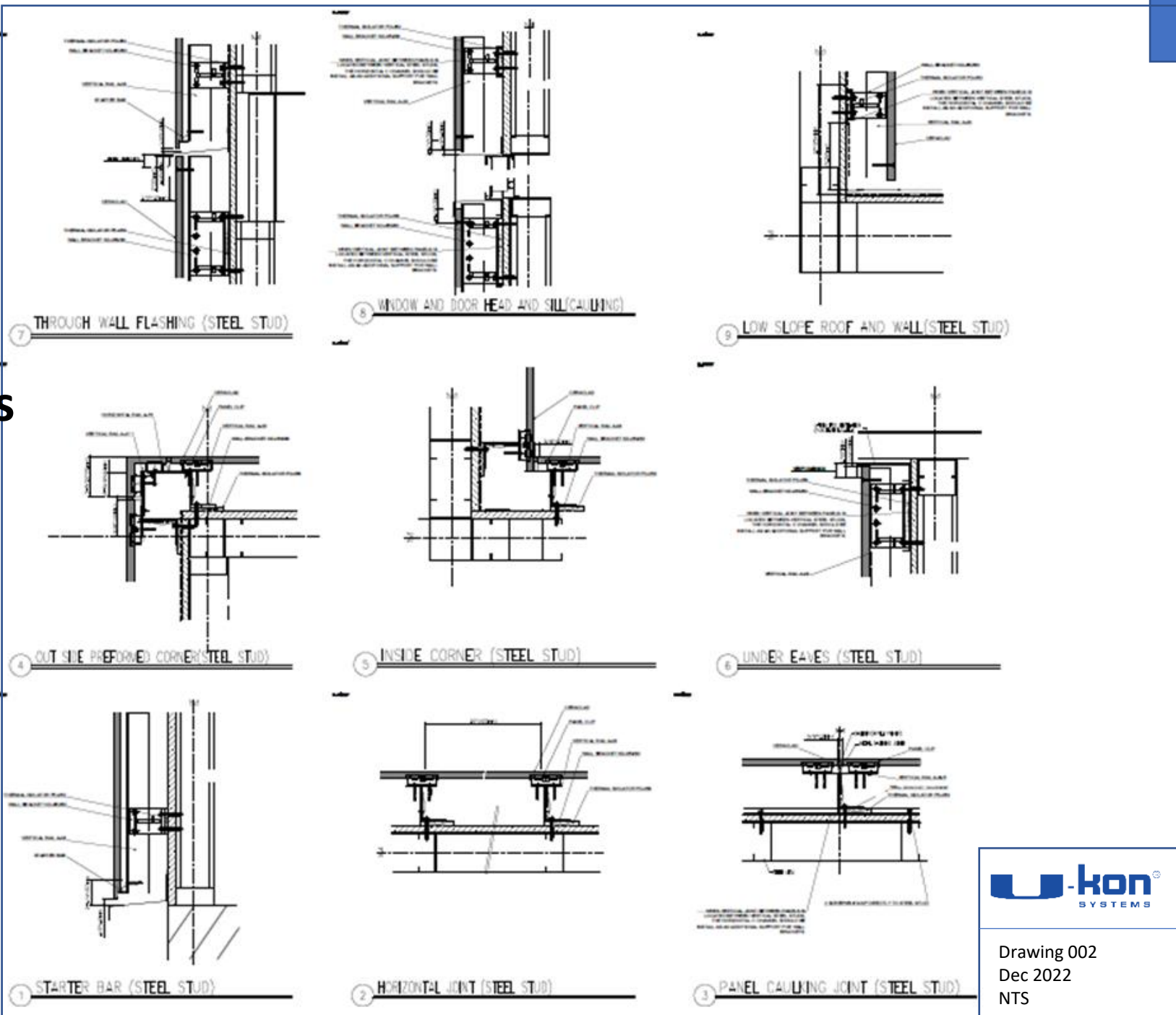
DRAWING TITLE:
DRAWING LIST

DRAWN BY: E.DAHER	TBI
PROJECT NO.: 1541	
SCALE:	REVISION NO.:
FILE REF. NO.:	SHEET NO. F0.1



Complete Designs

- Review
- Fabrication
- Installation



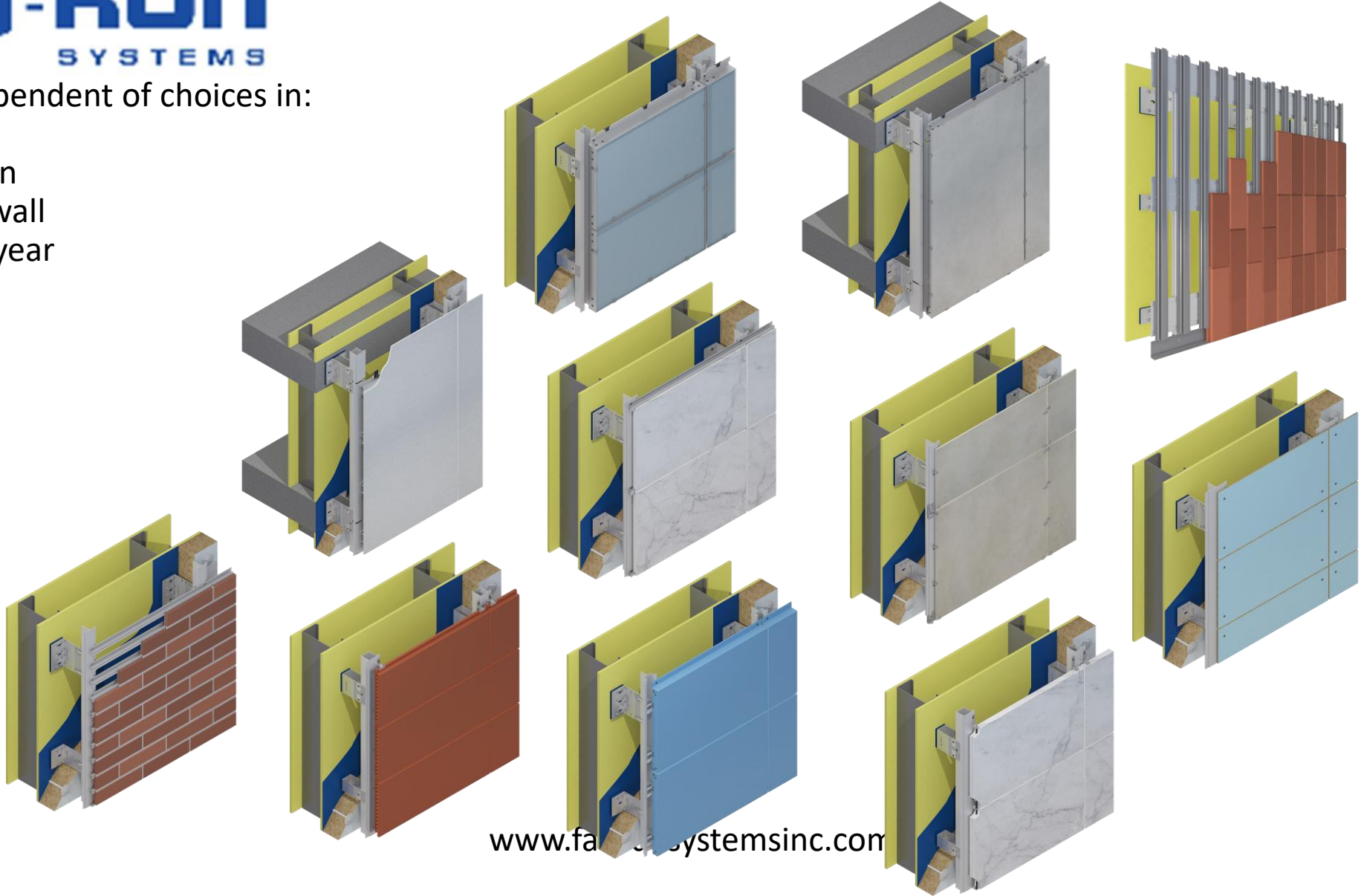
Drawing 002
 Dec 2022
 NTS

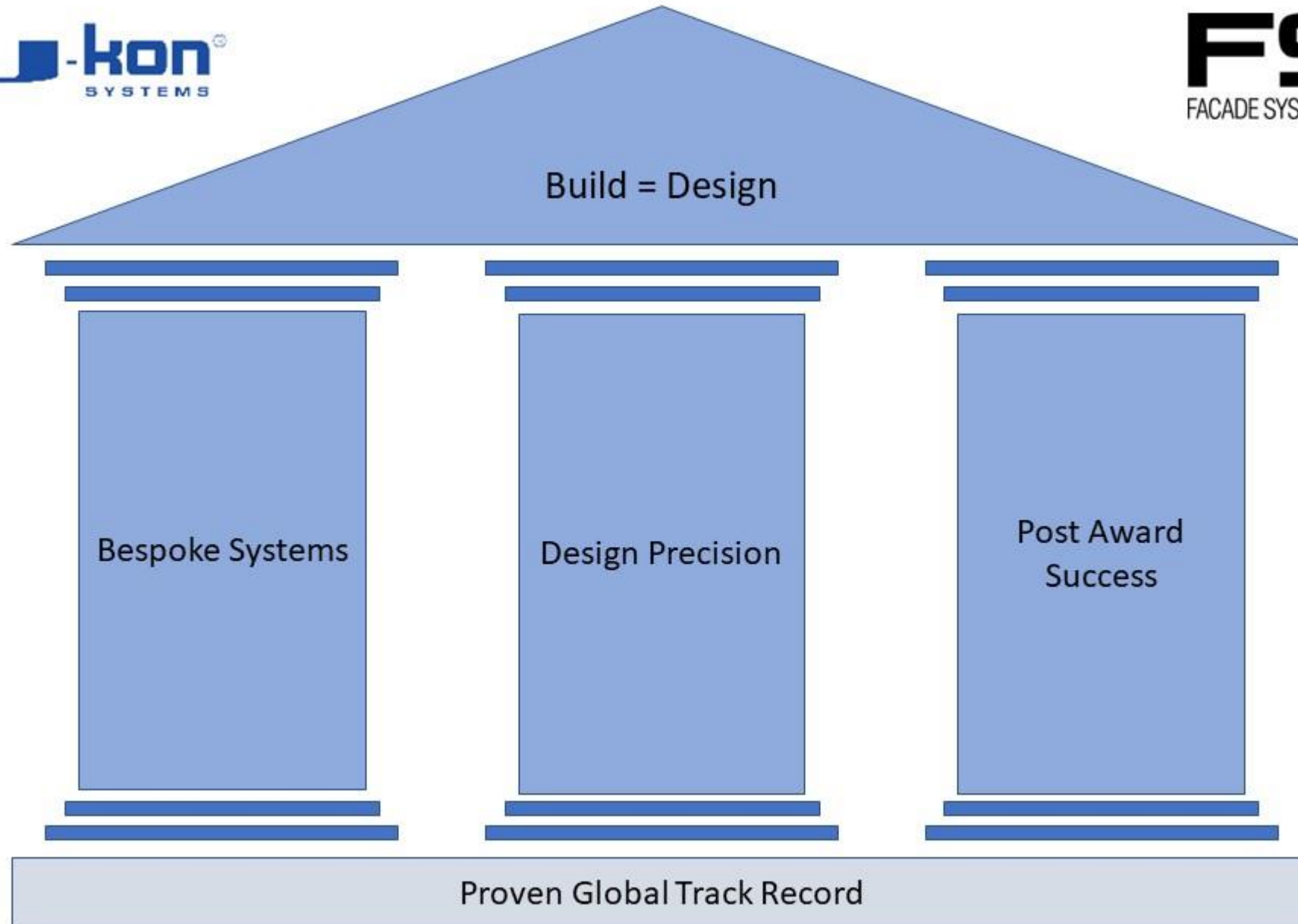


Subsystem Independence

Systems independent of choices in:

- Cladding
- Insulation
- Backup wall
- Time of year
- Location
-





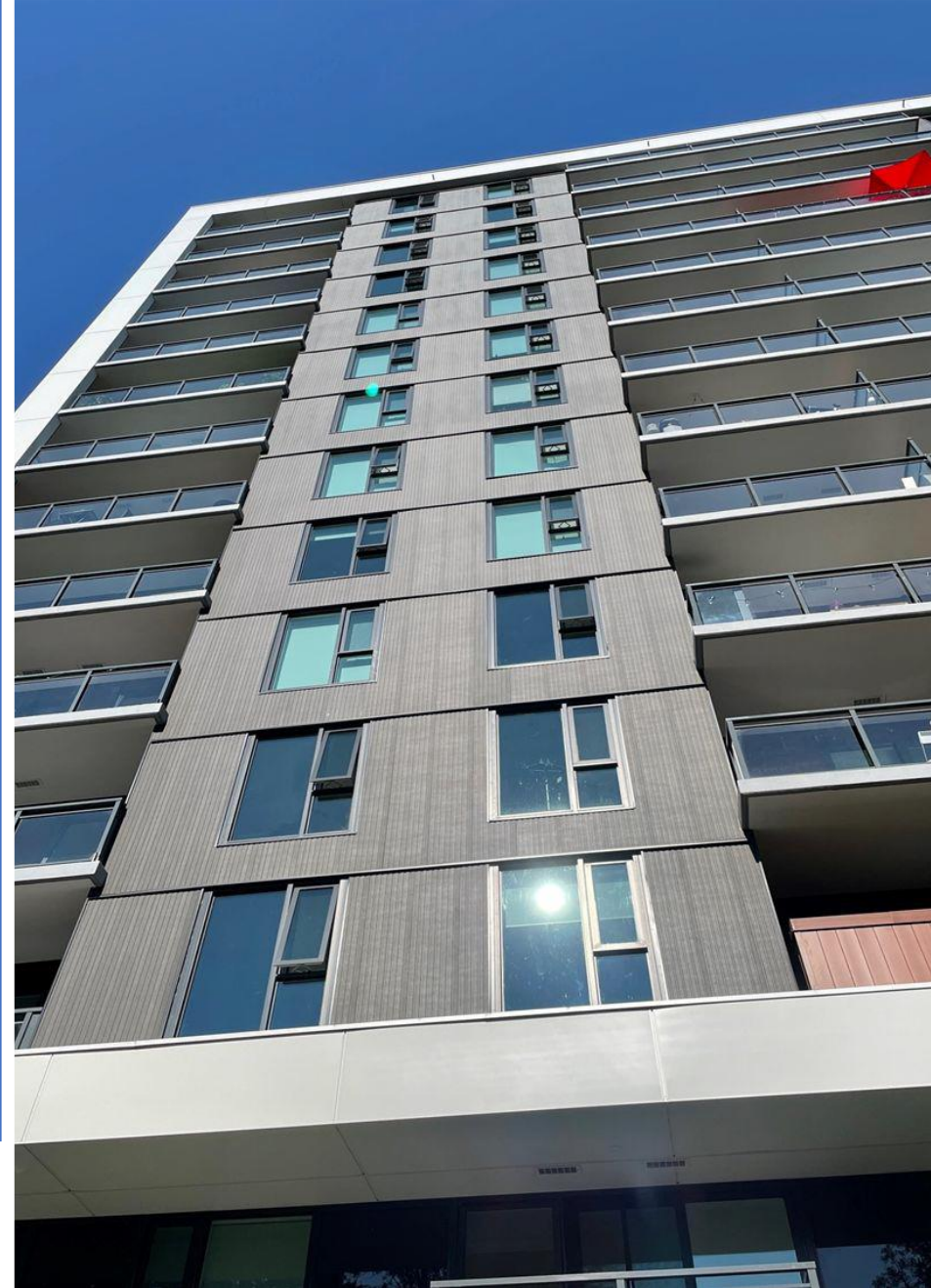


CERACLAD
Rain Screen Exterior Siding System



Why Does Mid-Rise Matter?

We Said We Need Midrise





But It's Not Easy

We Said It Is Not Easy

And

Some of the issues are
addresses by Facade

A couple of the thinkers in the business

My main area of interest is that I'm looking for options. The commercially available façade products are limited as it pertains to cost-conscious developer mindset and as we're doing more and more mass timber buildings the weight of more obvious products (brick, precast) won't work above a few storeys.

Paraphrase of an hour long meeting:

- *How are we going to supply housing with out.*
- *Mid – rise needs to become Core, not a Fringe or Niche*
- *Who cares about this? Not that visible? Let's get together*



First Cost



Maintenance Cost



Differentiation



Thermal Performance



Sustainability



Other



Accountability
Services to support you
Trusted Partner
Networked to bring it all together



CERACLAD
Rain Screen Exterior Siding System



What's Next

Invite us in. Show us your projects, no obligation.

Challenge us on your creativity.

Demand better.

Tell us what matters to you.

Strive to meet the built environment's needs [Society's Needs]

Agent for Facades and Building Systems that are innovative, aesthetic, sustainable, constructible, affordable and proven

- Professional Engineer.
- Leader in engineered based businesses for 25+ years in three industries.
- Building industry since 2005.
- Clients tell me they appreciate the technical service.
- A testimony: *“You have always been an experienced voice in the world of facade materials, so we look forward to continued discussions on how we can realize our design objectives, from both an aesthetic and technical point of view.”*



Make a difference

Please consider donating
\$20 to homeless causes

I thought bringing this big an audience together should
have some other effects.

If this was a Lunch and Learn my suppliers and I would
be spending about this much on lunch. I will be giving
too.

