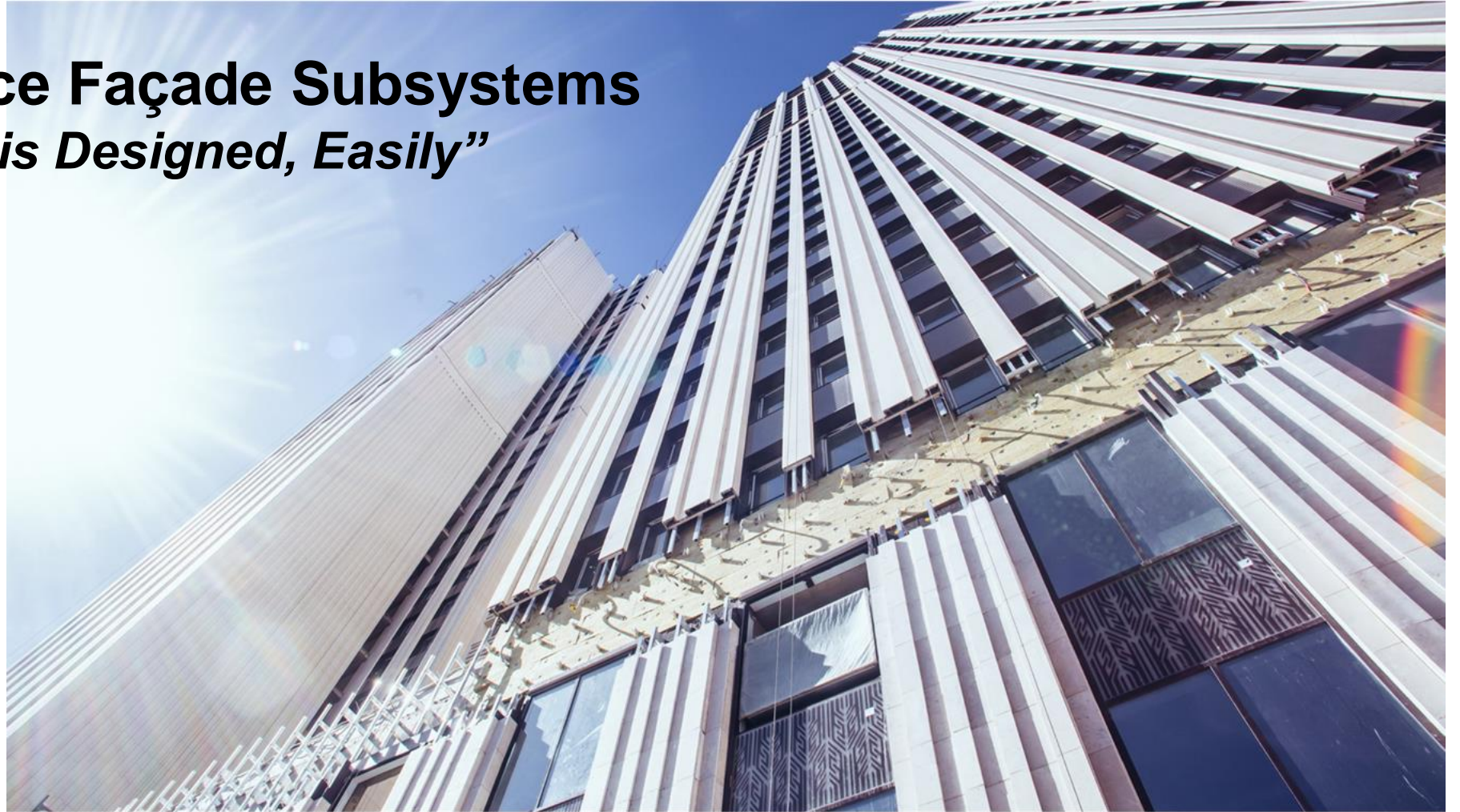


# High Performance Façade Subsystems

*“Build What is Designed, Easily”*



# System is the real word in façade subsystems

- Discuss macro-forces at work emphasizing ventilated rainscreen facades.
- Explain system choices. Why 'systems' thinking is so important. From Simple, to High Performance to Innovative.
- Explain Bespoke System Design, and the system for the exact location on the exact building.
- How early Design Precision and value engineering cuts costs and avoids failure.
- How sloppy specification can lead to failure and what to do about it.
- What to expect in review, shop, and installation drawings.
- Review case studies.

# Achieving High Performance Facades Should Not Be Left to Chance

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blair@facadesystemsinc.com



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

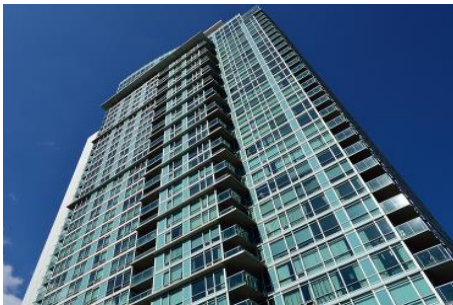
## Macro Directions – moves as fast as you want them to.



- Labour availability and skill
- >6" insulation application

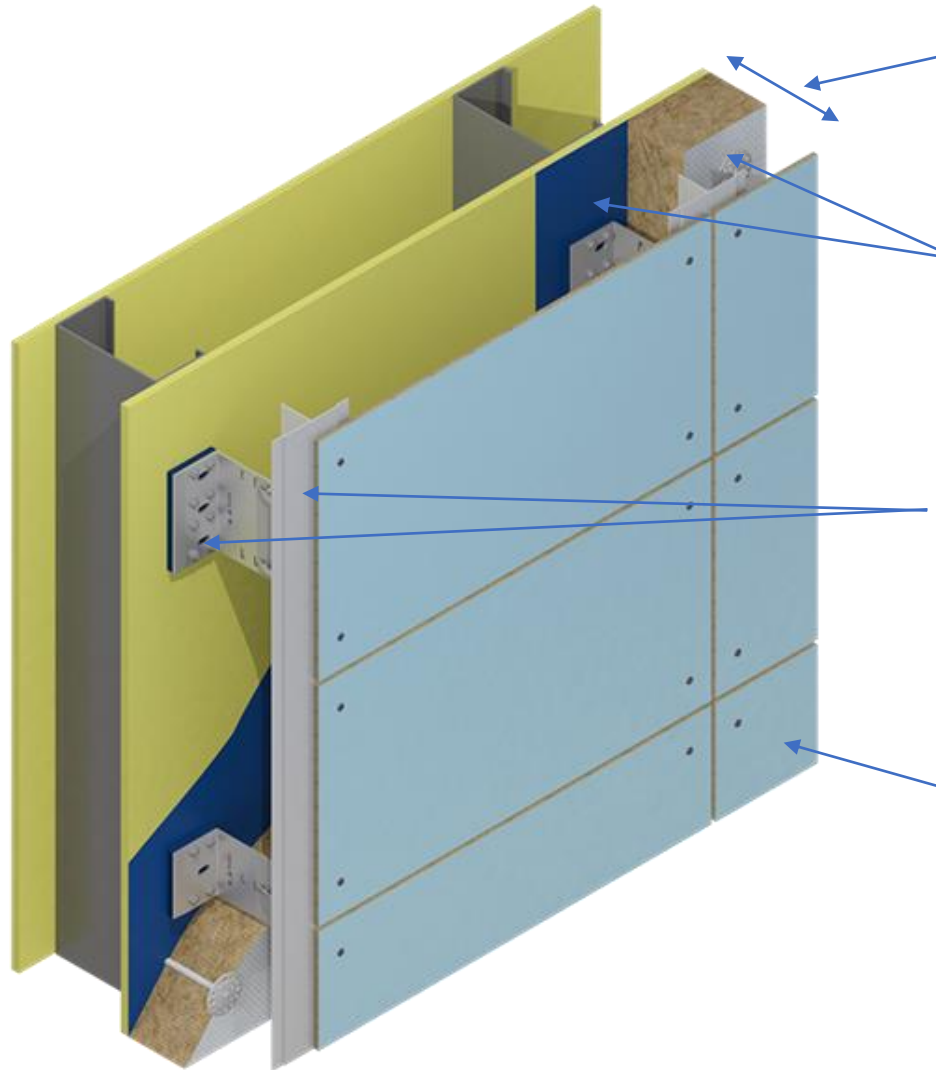


- GHG impact
- >6" insulation application



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





**Façade – everything  
outside of Sheathing**

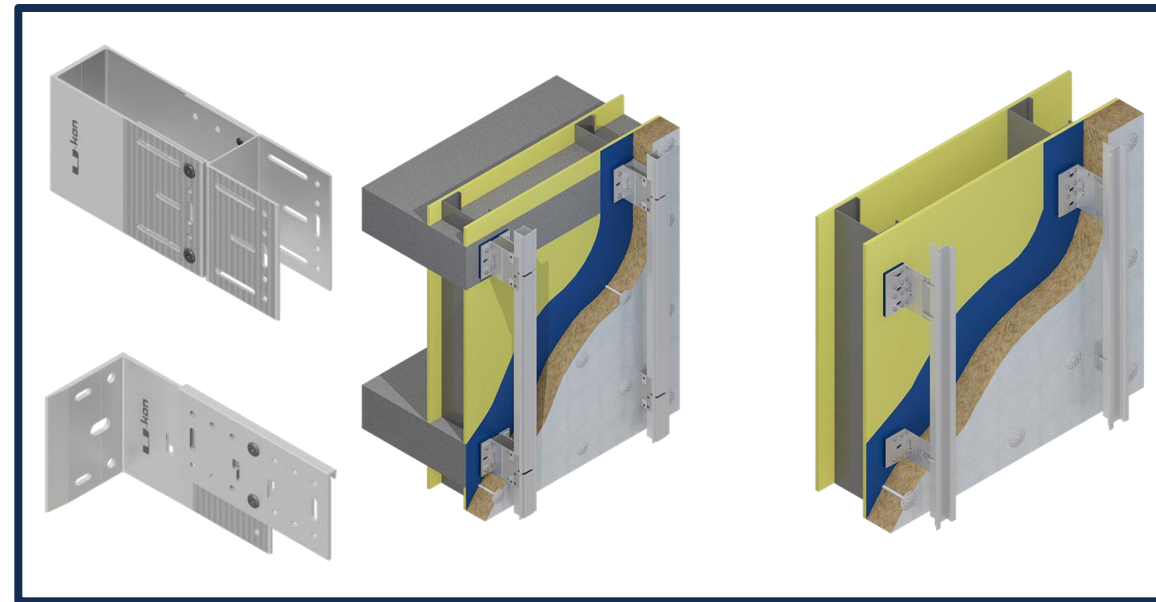
**Insulation & AVB**

**Thermally Broken  
Substructure 'System'**

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

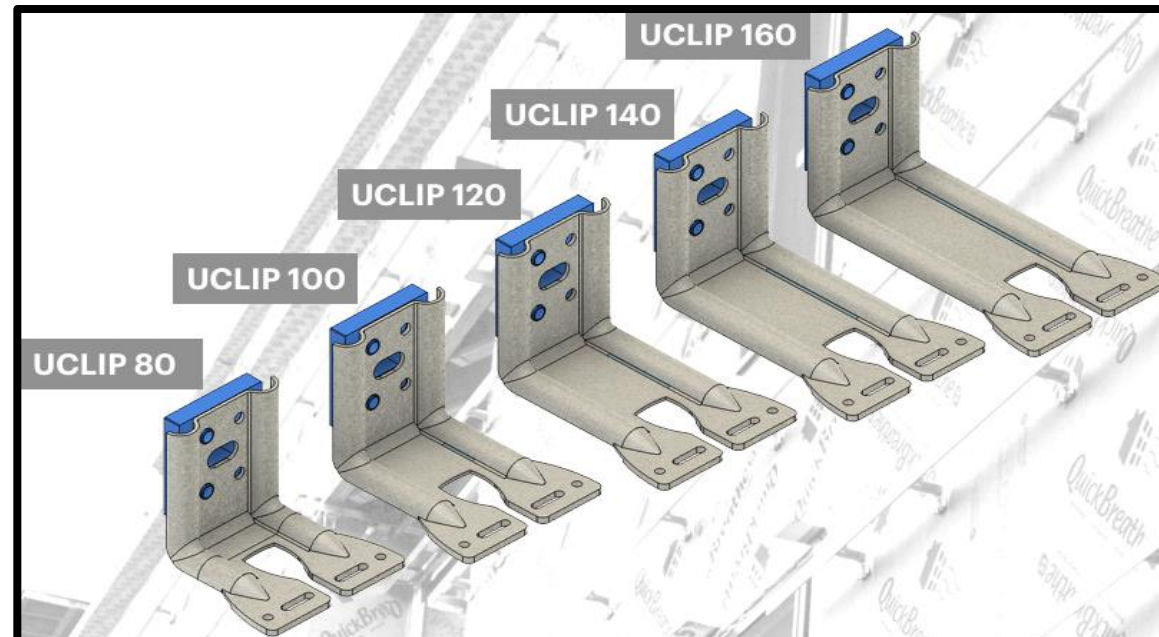
# Toughest Challenges – what you are telling us

- **Built ≠ Design**
- Trade-offs; performance vs cost
- Specification pitfalls
- Constructability
- Independence of cladding.
- Best **value engineering** opportunities.
- Initial and Lifecycle costs.
- **Sustainability**

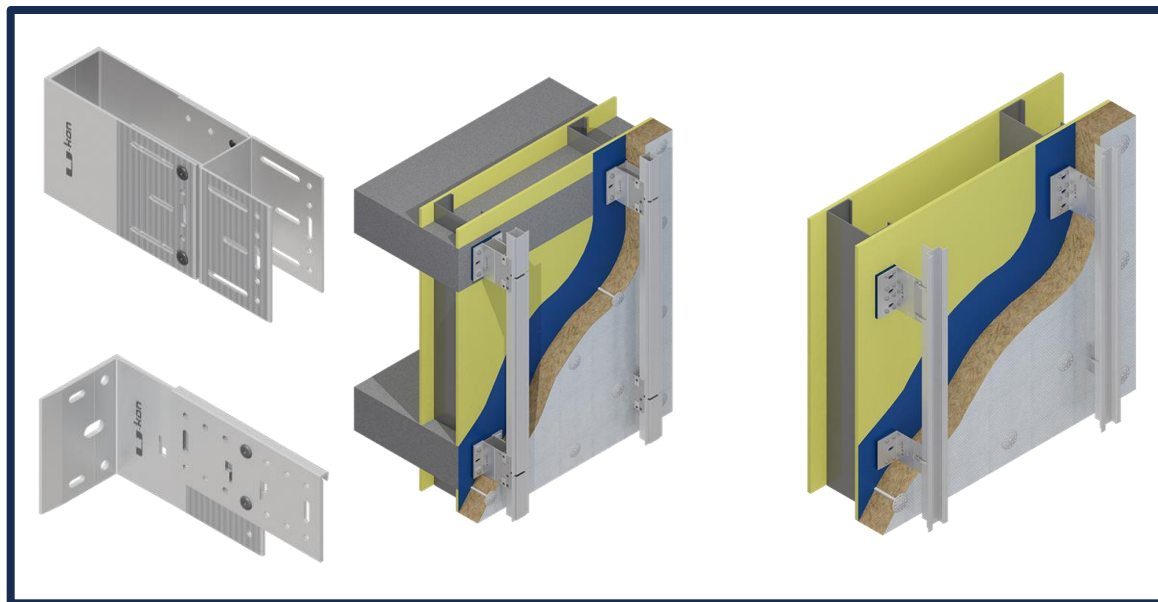




































Portfolio of pre-engineered components configured for your building

**System or  
Component**



Buy clips, do the rest yourself (status quo)



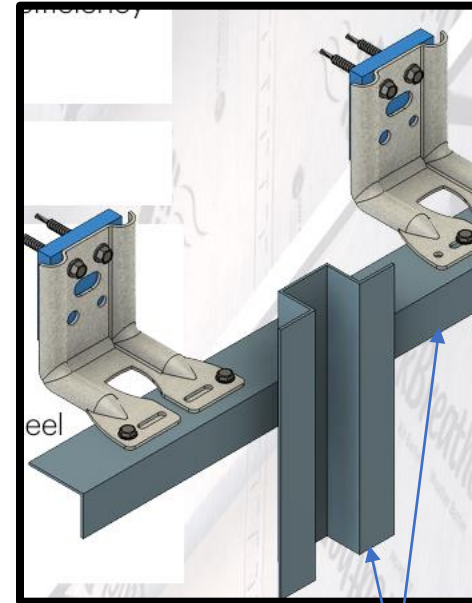
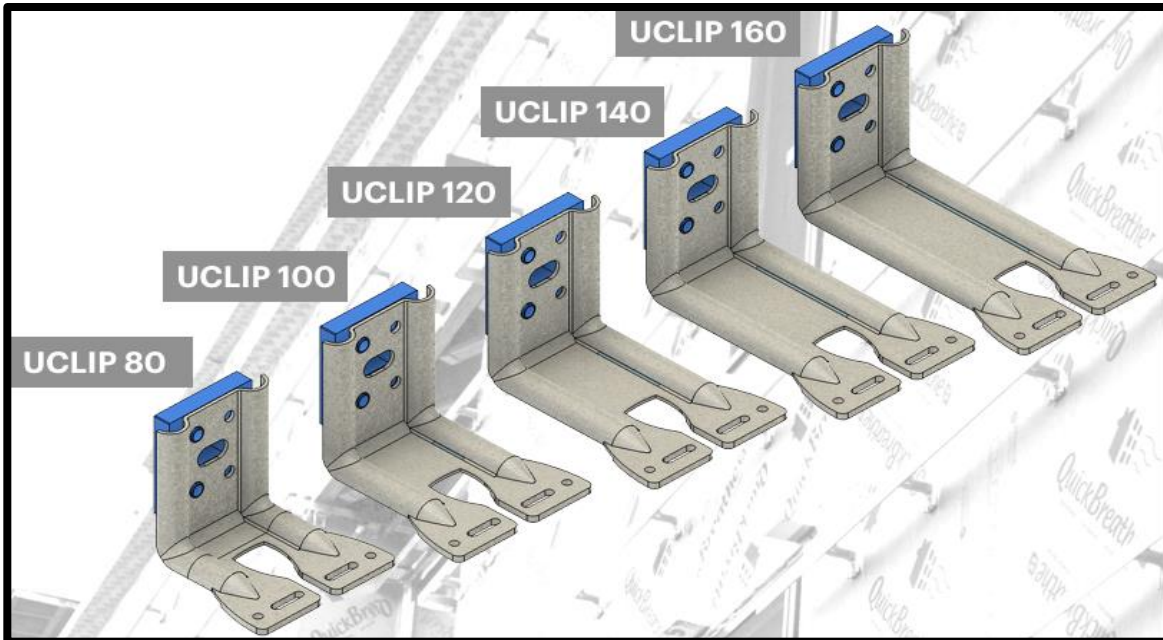
Name	↓
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 LT-228-Canadian standard_2.dwg	
 LT-228-Canadian standard_1.pdf	
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 LT-147p-23.dwg	
 LT-147p Ceraclad.dwg	
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 Copy of 316_compressed.pdf	
 Copy of 234_compressed.pdf	
 Copy of 228_compressed.pdf	
 572_compressed.pdf	
 450_compressed.pdf	
 414_compressed.pdf	

## Why

- Delegated risk and accountability
- Hire excellence
- Engineered system (>8" of insulation)
- Unique system e.g. slab-to-slab
- Heavy cladding, e.g. stone
- Many claddings on the project. One provider.



## DIY Solution (contractor design)



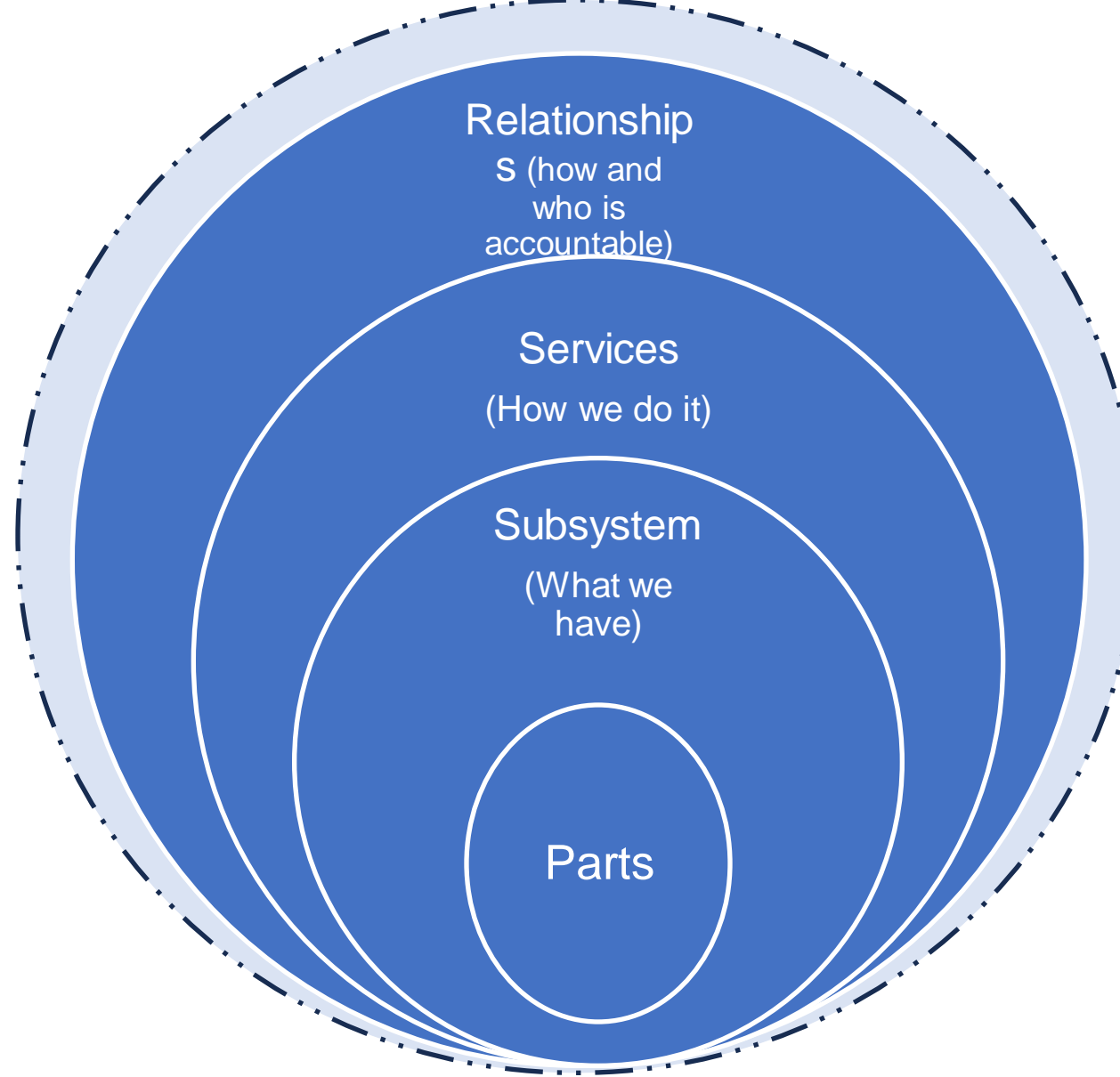
Typical galvanized girts

Buy clips, do the  
rest yourself  
(status quo)\*

- Less insulation.
- Simple cladding.
- Simple cladding layout.
- Few claddings on the project.
- Light cladding.
- Simple structural engineering

\*T-clip, ISO clip, ACS, TAC,  
Cascadia et al





The Division 07 System inside the entire building system, inside the entire property system, inside the entire community system, and so on, and so on...

Hmmm.



Systems thinking is a way of making sense of the **complexity** of the world by looking at it in terms of **wholes** and relationships **rather than by splitting it down into its parts**.<sup>[1][2]</sup> It has been used as a way of exploring and developing effective action in complex contexts,<sup>[3]</sup> **enabling systems change**.<sup>[4][5]</sup> Systems thinking draws on and contributes to systems theory and the system sciences.<sup>1</sup>

Tools for the Systems Thinkers: 6 Fundamental Concepts of Systems Thinking.<sup>3</sup>

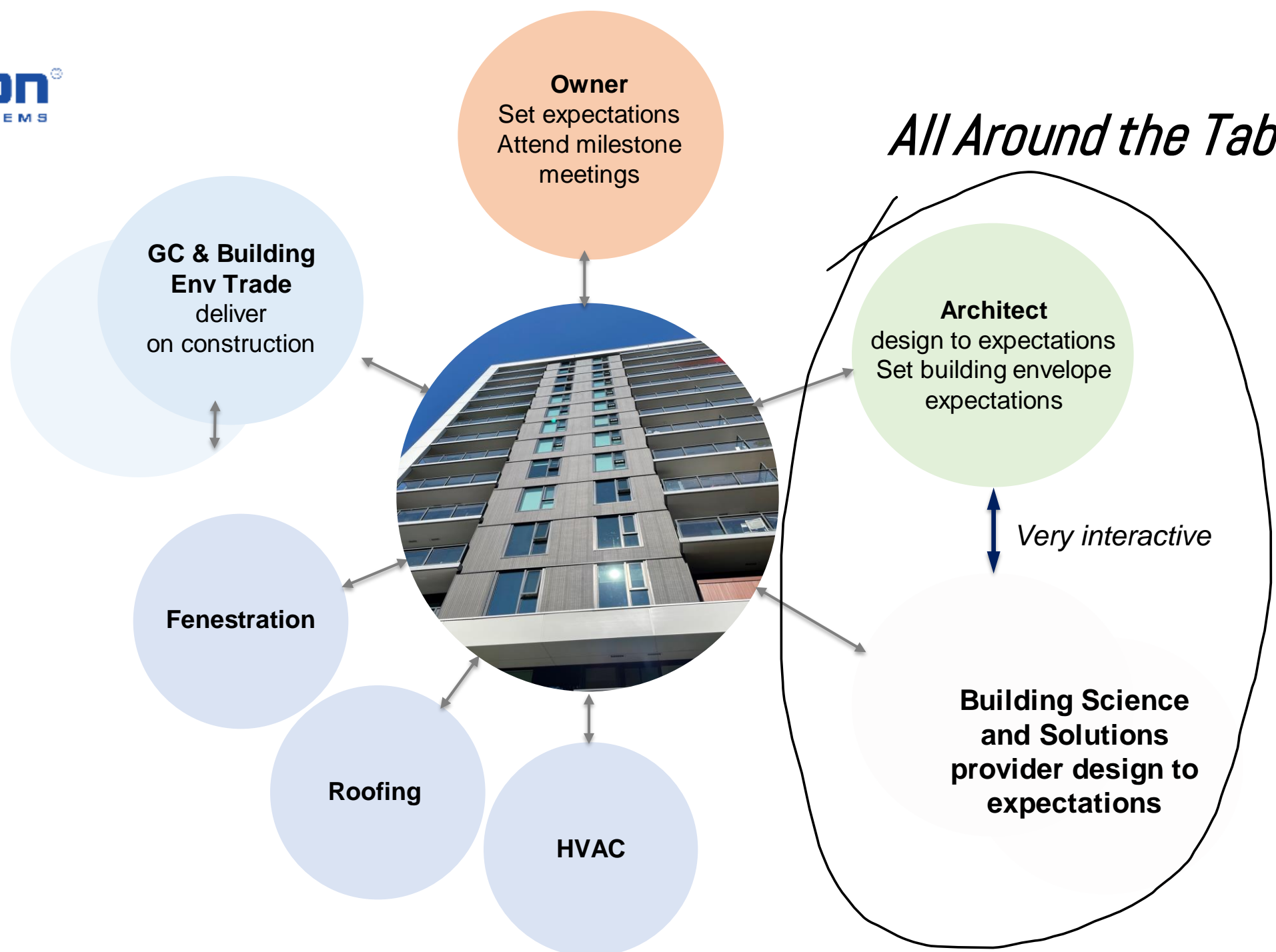
- Interconnectedness
- Synthesis
- Emergence
- Feedback Loops
- Causality
- Systems Mapping



Systems thinking is a **holistic** way to investigate factors and interactions that could contribute to a possible outcome. A **mindset** more than a prescribed practice, systems thinking provides an understanding of how individuals can work together in different types of **teams** and through that understanding, create the best possible processes to accomplish just about anything.<sup>2</sup>



## *All Around the Table!*



# System Choices\*

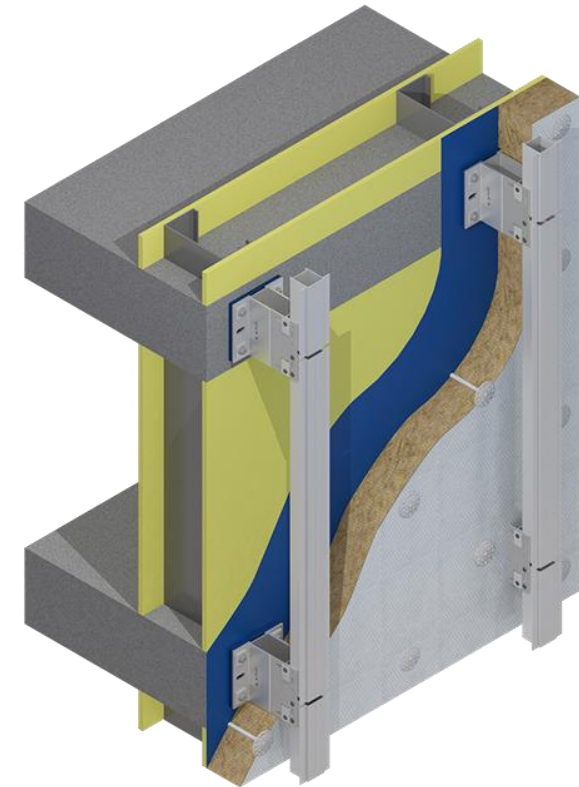
Simple



High Performance



Innovative  
(slab-to-slab)



\*And Everything Between

# Design Precision

# 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.



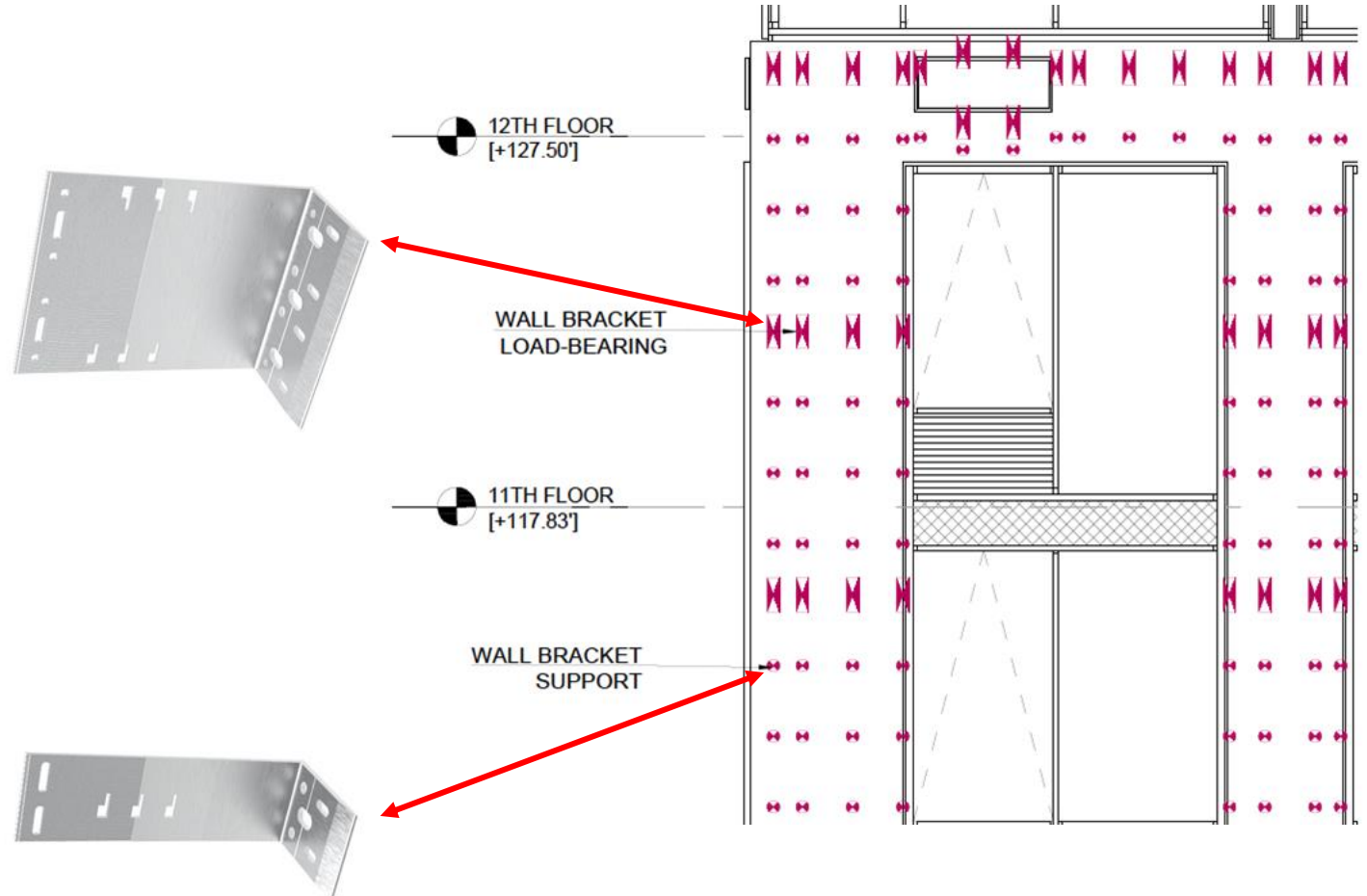
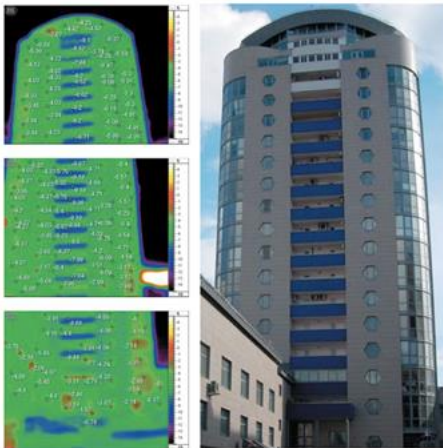
**You Should Ask for This.**



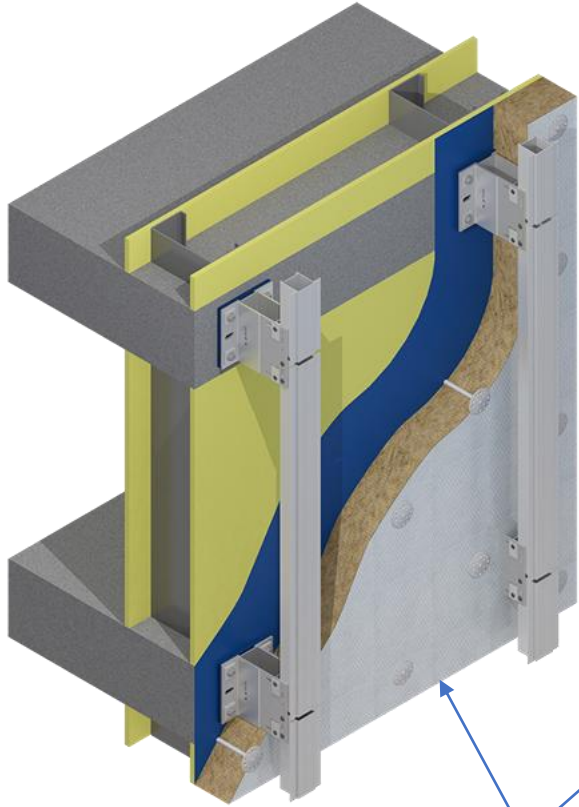
A façade is modelled for structural requirements and thereby thermal results.

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

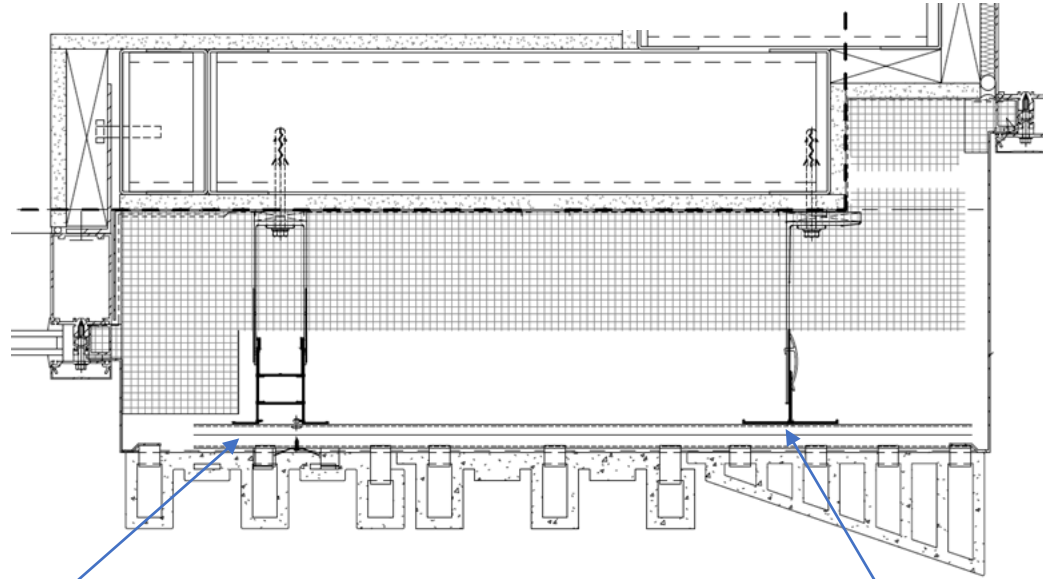
Problems revealed early.



Location of wall brackets; based on structural analysis

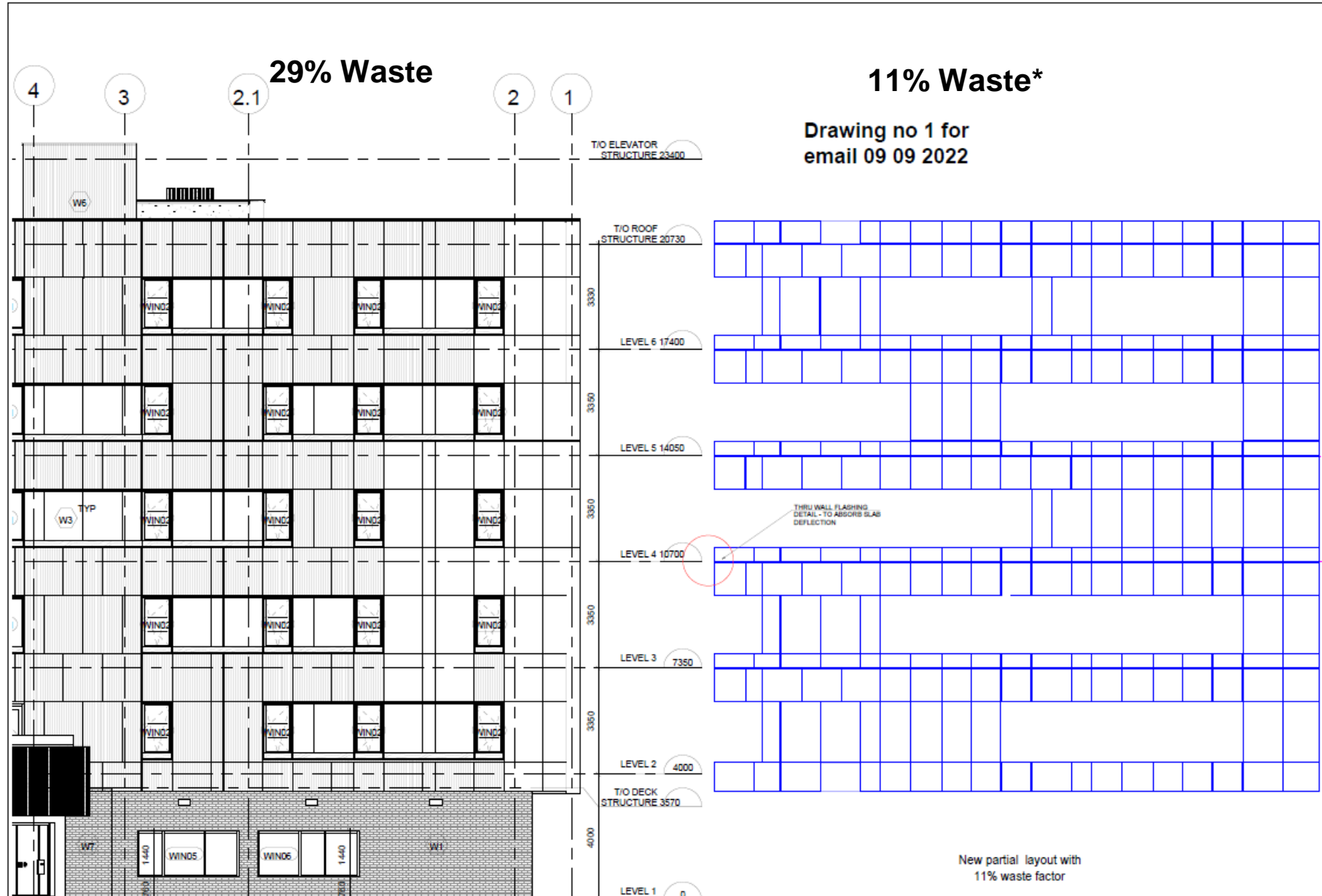


**Slab to Slab**  
Higher loads / Wall Bracket  
Faster Install



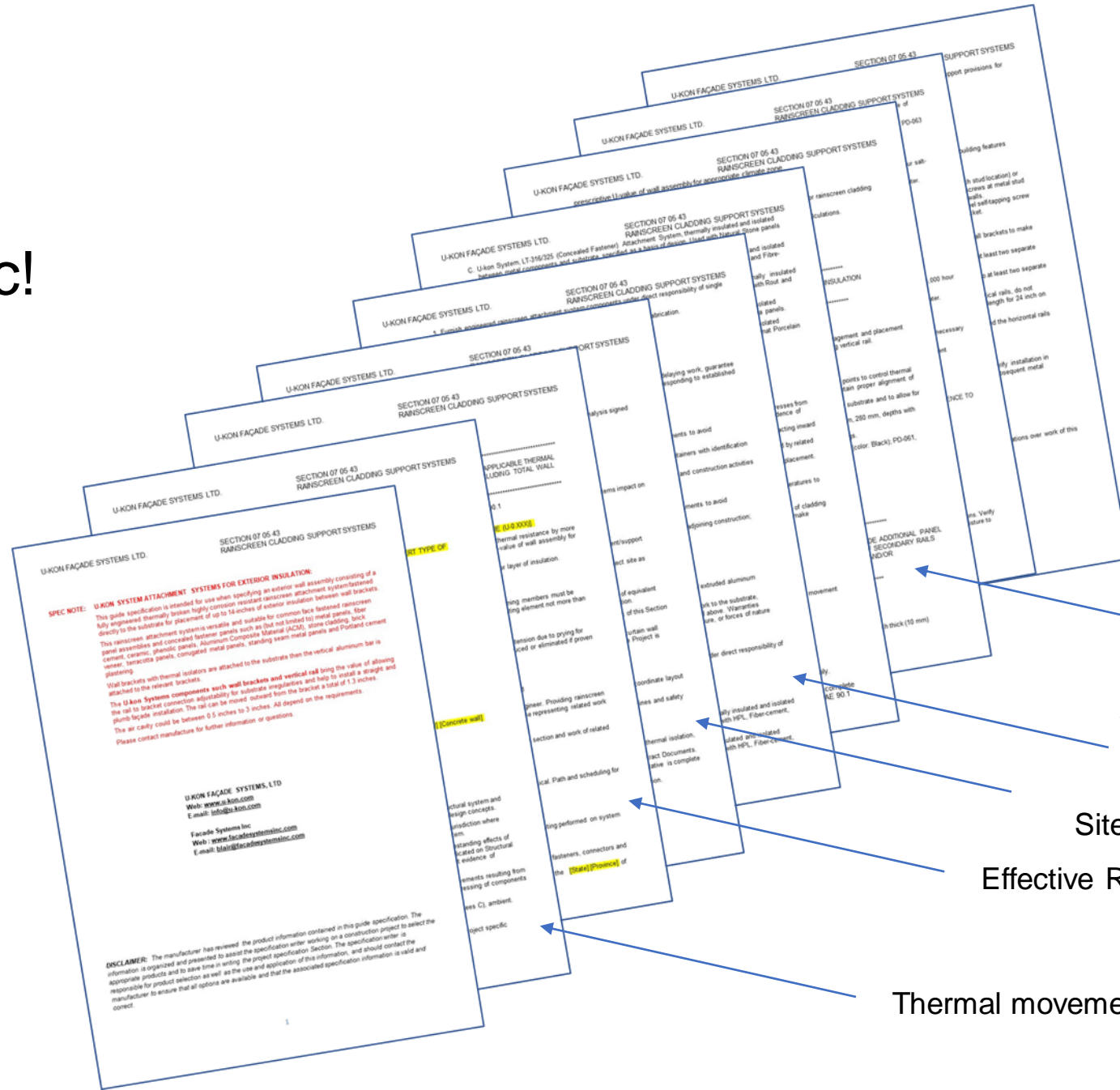
**Distributed System**  
Lighter gauge wall brackets  
Slower Install

# Panel Optimization



\*and accounted for building deflection.

That is a spec!



Sole accountability

Years in business

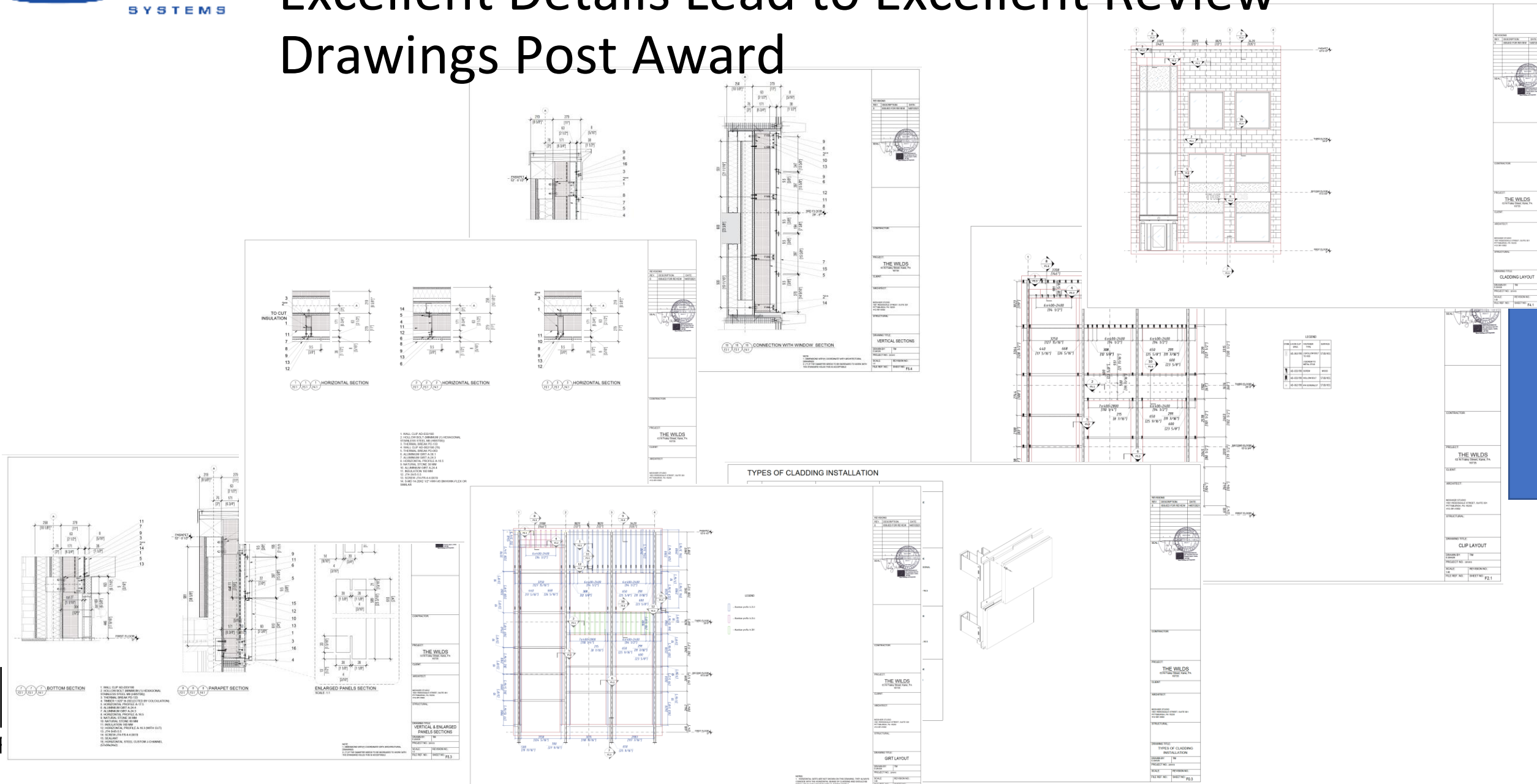
Site Launch meeting

Effective R value

Thermal movements



# Excellent Details Lead to Excellent Review Drawings Post Award



# Bespoke Systems

#1 Wall Brackets



#2 Profiles



#3 Cladding Attachments



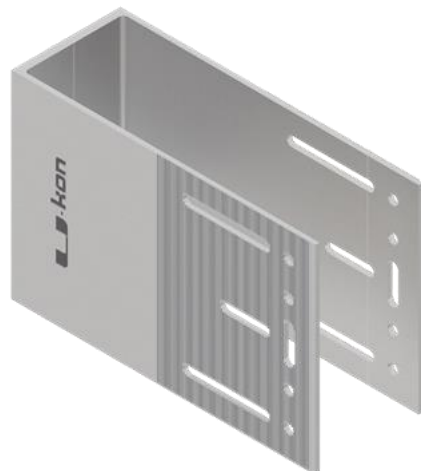
Note: Often different systems are used on the same building, depending on cladding and loads

# Wall Brackets that offer Options – High Performance

Different brackets, extenders, materials provides unique flexibility

**Adjustable in three directions: higher quality, faster install**

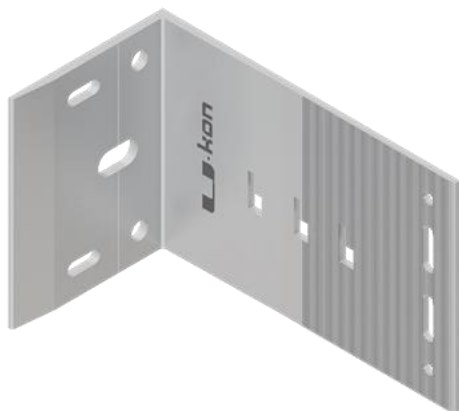
WALL BRACKETS “U” SHAPE



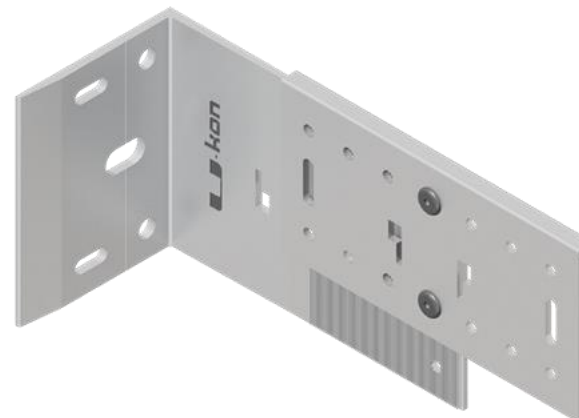
WALL BRACKETS “U” SHAPE WITH EXTENSION



WALL BRACKETS “L” SHAPE



WALL BRACKETS “L” SHAPE WITH EXTENSION





And everything in between



### LT – 147

- Lower loads
- Metal panel, FRC, FRP
- Typically steel stud, but can be concrete, wood etc
- Any fastener type

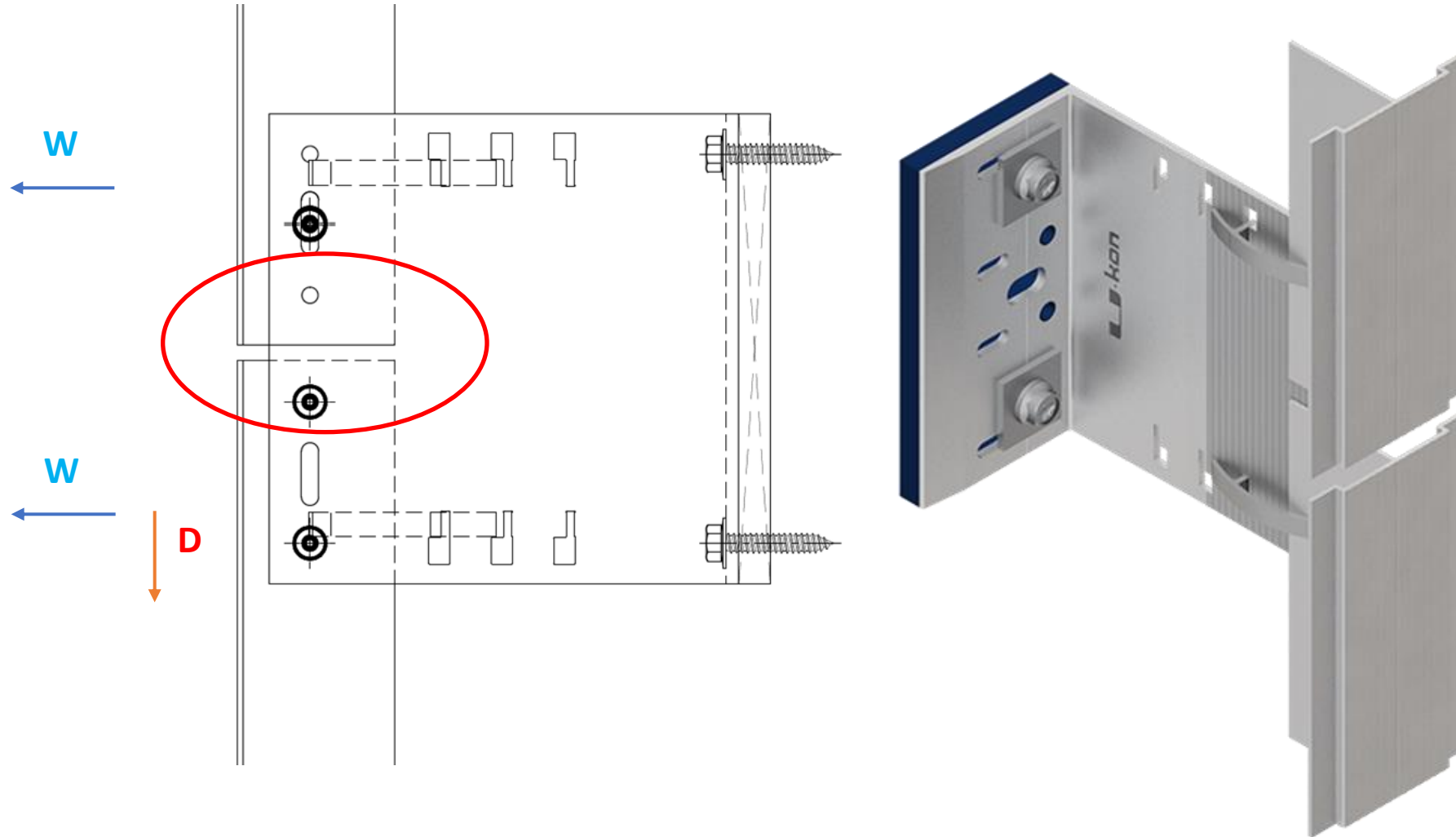
### LT – 325

- Heavier Loads
- Stone, thick engineered stone.
- Taller buildings
- Typically steel stud or concrete
- Any fastener type

Name	
LT147p-23.pdf	
LT-228-Canadian standard.pdf	
LT-228-Canadian standard_2.dwg	
LT-228-Canadian standard_1.pdf	
LT-228-Canadian standard_1.dwg	
LT-147p-23.dwg	
LT-147p Ceraclad.dwg	
LT-147 Cross Section_C Channel.pptx	
LT-147 Cross Section_C Channel.pdf	
Introduction to Systems_FSI_UKon 2023.pdf	
Copy of 325_compressed.pdf	
Copy of 316_compressed.pdf	
Copy of 234_compressed.pdf	
Copy of 228_compressed.pdf	
572_compressed.pdf	
450_compressed.pdf	
414_compressed.pdf	



# Innovations Reducing Wall Brackets

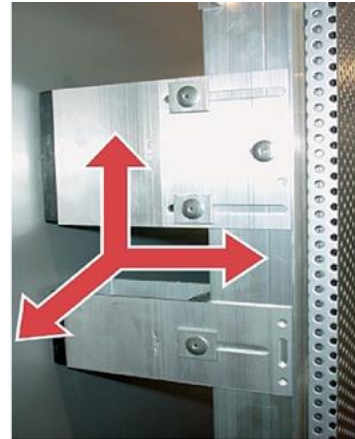
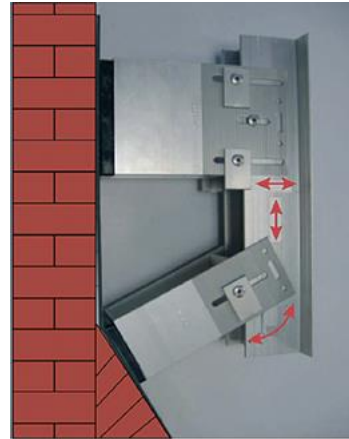


# Wall Brackets Adjustable in Three Directions

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

Install: attach then adjust, reducing error and rework.

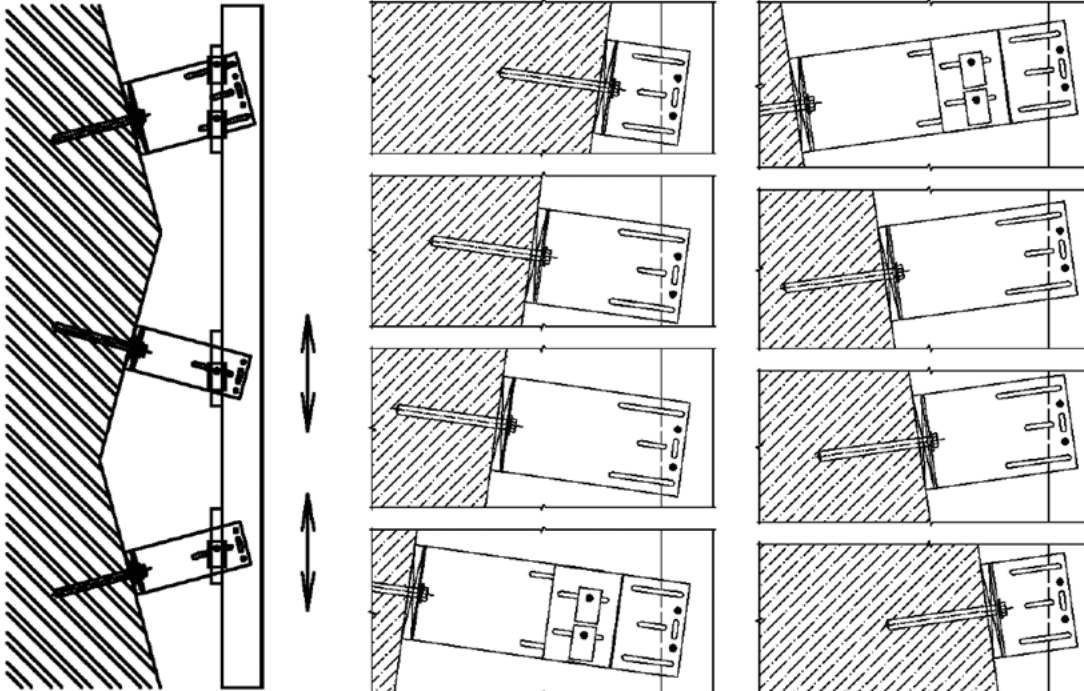
Reduce compromises on site,  
*“Build What Is Designed, Easily”*



WITHOUT EXTENSION



WITH EXTENSION



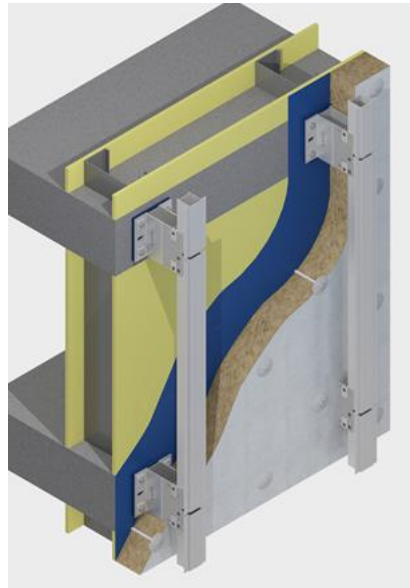
## Victoria BC Stone Install

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

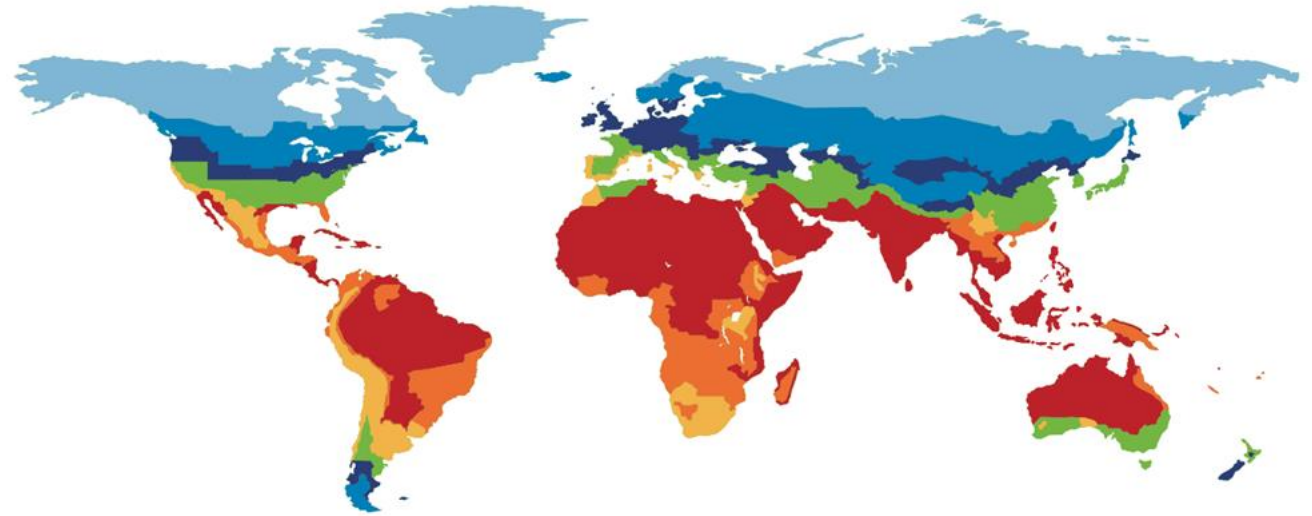




# Thermal Performance Explained



Vertical Spacing in	Exterior Insulation Thickness in	Exterior Insulation Nominal R-Value	Aluminum Bracket	Stainless Steel Bracket	Assembly Effective R-Value (Stainless steel Bracket HIGH)*
			Assembly Effective R-Value	Assembly Effective R-Value	
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*



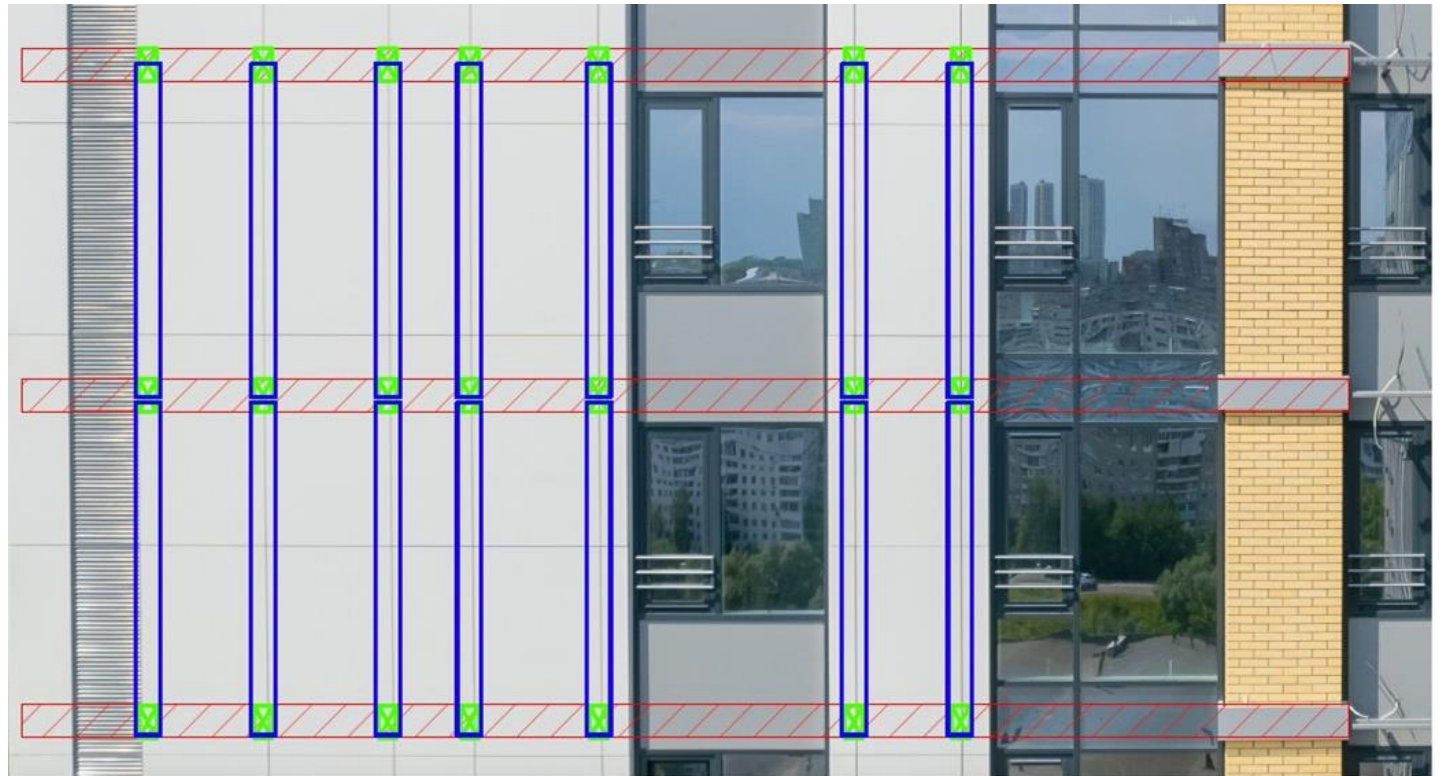
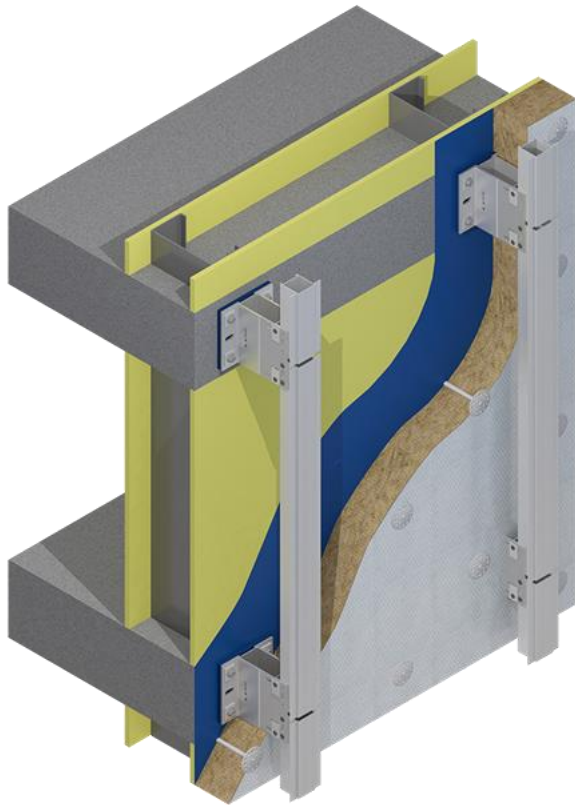






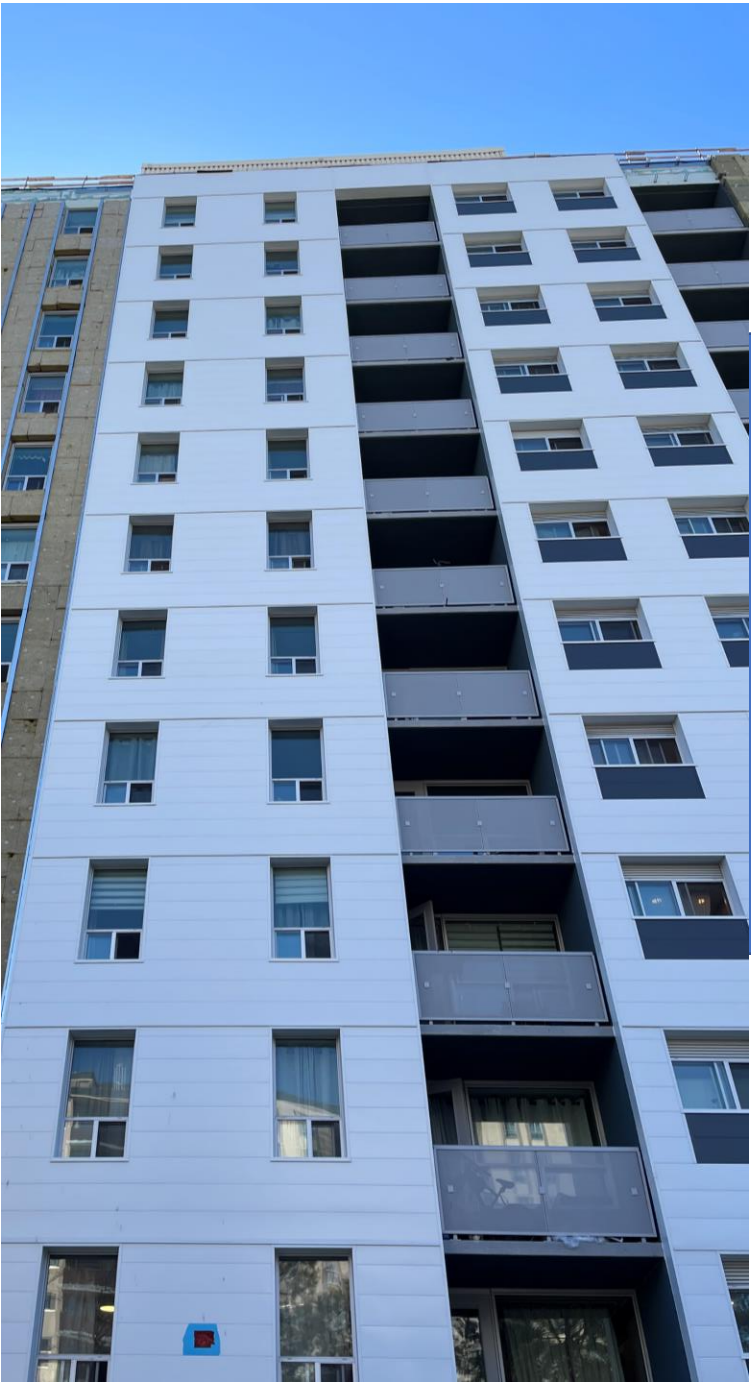
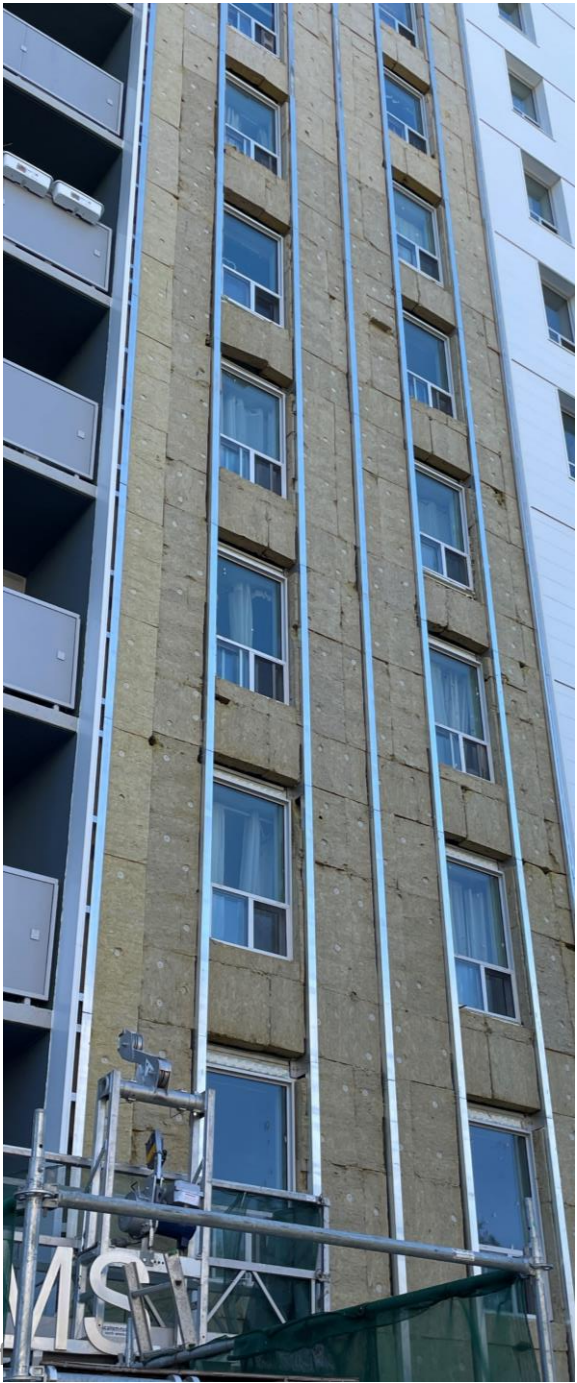
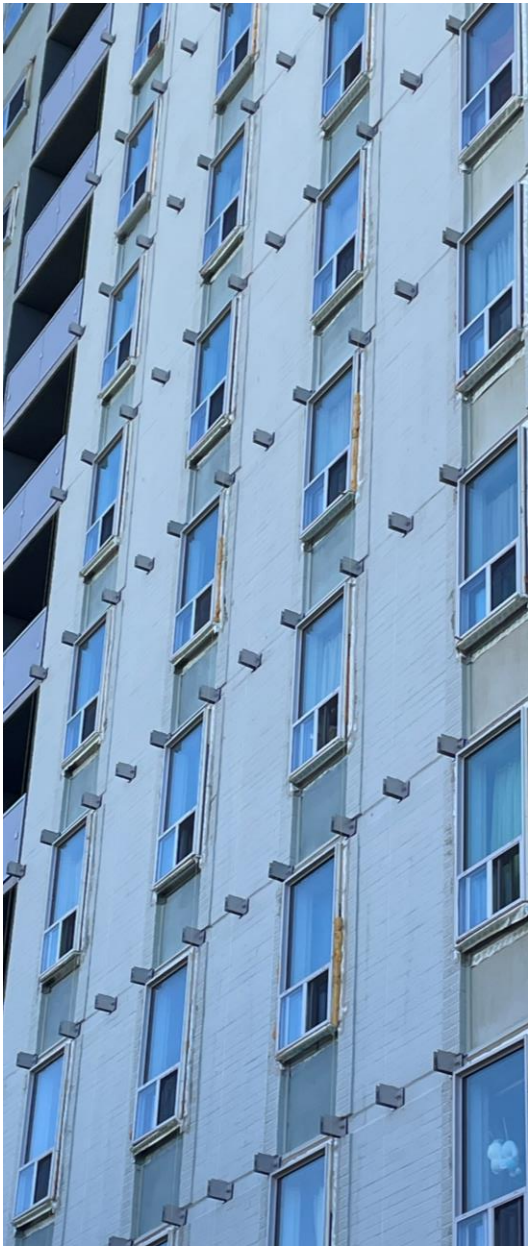
# Innovative System: Slab-To-Slab

Reduce wall brackets, easy alignment, unload studs.



Back wall can be anything: studs, concrete, block or existing wall





2 Brahms, North York  
Construction Trinity Group



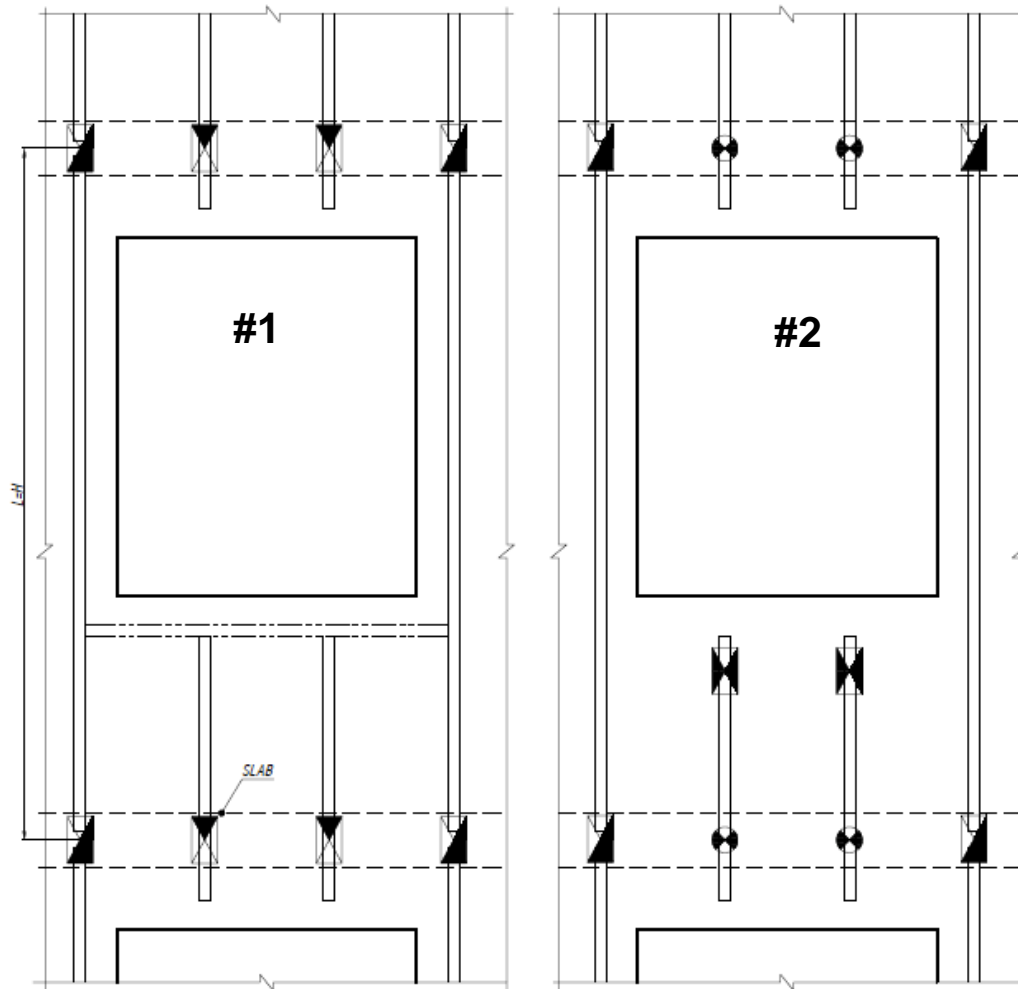
## IDEAL SOLUTION FOR RENOVATION

- WHEN WE DO NOT HAVE GOOD/STRONG BACKUP WALL
- WHEN WE NEED MINIMIZE THERMAL BRIDGING
- WHEN WE NEED TO PROVIDE FAST INSTALLATION



# Slab to Slab attachment methods

HOW CAN WE INSTALL SLAB TO SLAB SYSTEM  
WHEN WE HAVE WINDOWS IN A MIDDLE?







cool, temperate climate

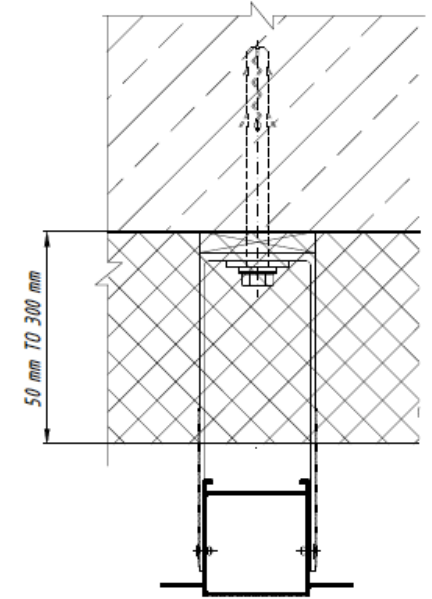
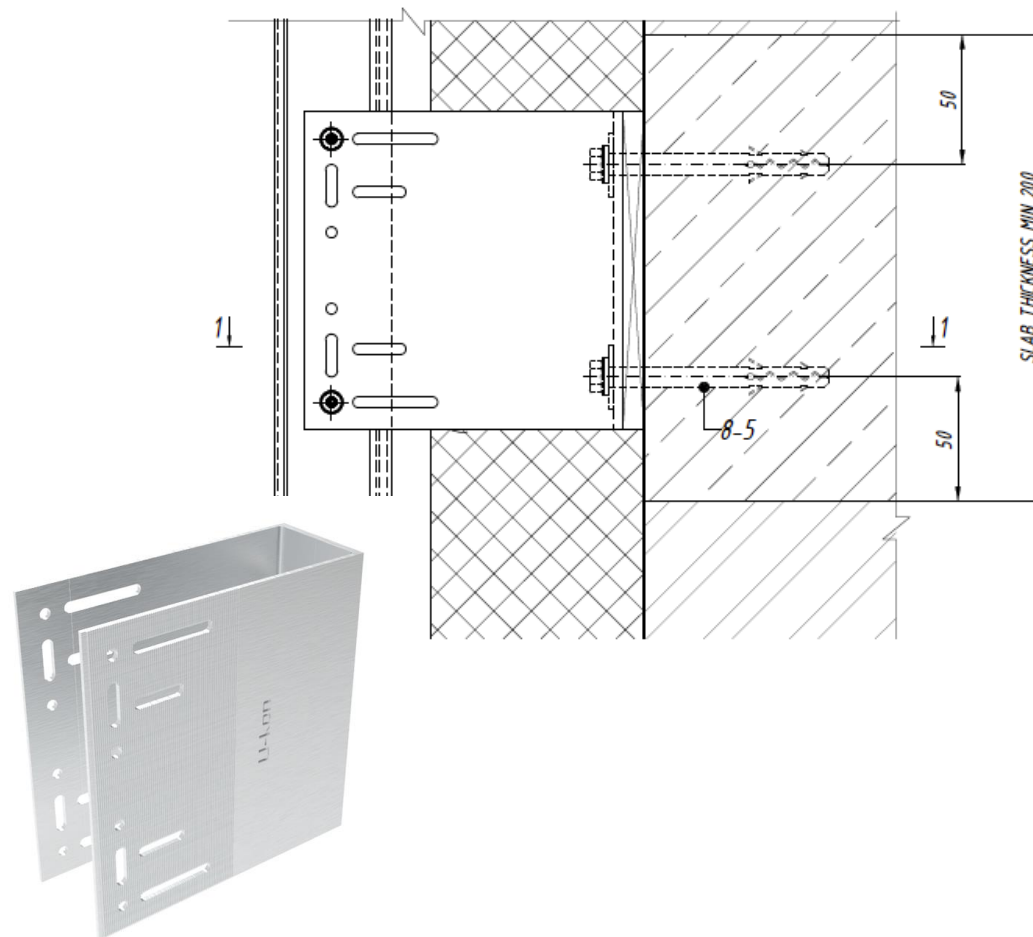


**CERTIFIED  
COMPONENT**

Passive House Institute

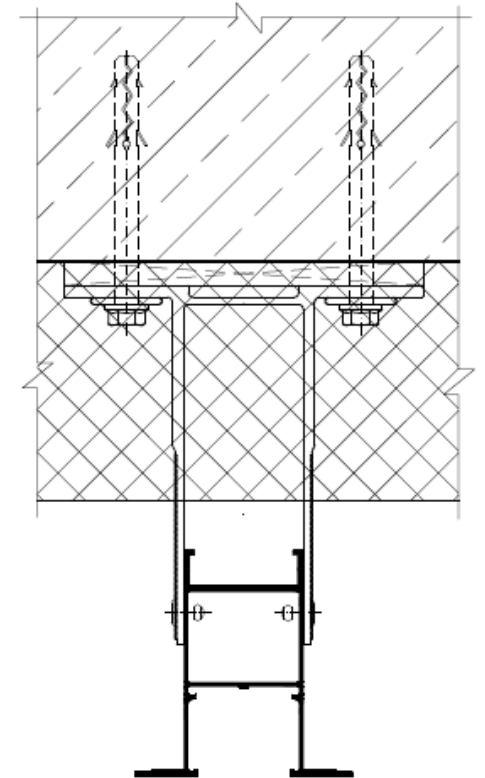
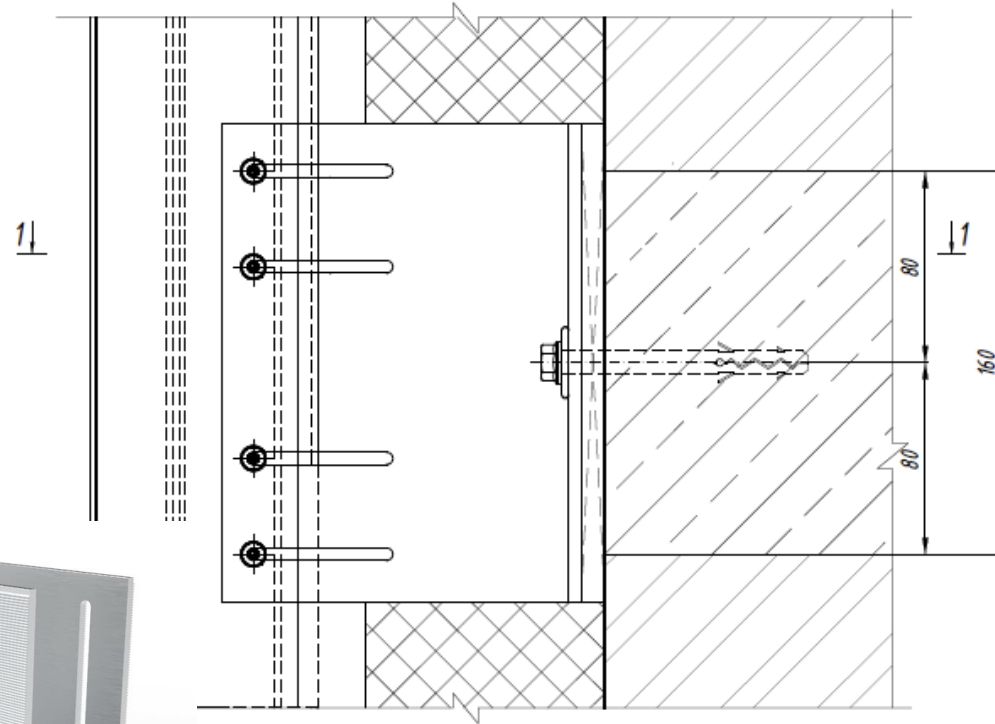
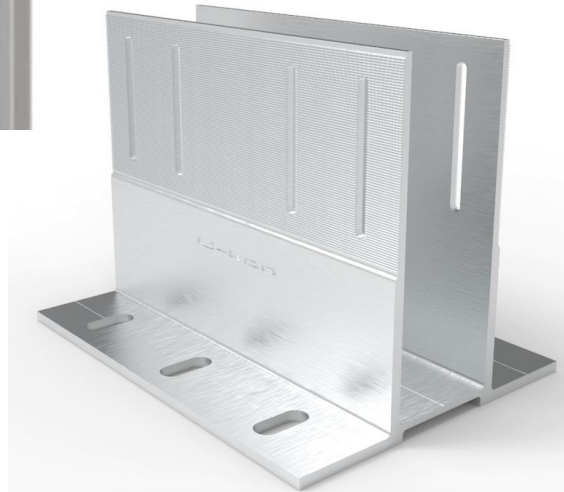
# Slab to Slab attachment methods

WEAK POINT – EXISTING SLAB CONNECTION  
SLAB THICKNESS MORE THEN 200 mm



# Slab to Slab attachment methods

WEAK POINT – EXISTING SLAB CONNECTION  
SLAB THICKNESS LESS THEN 200 mm

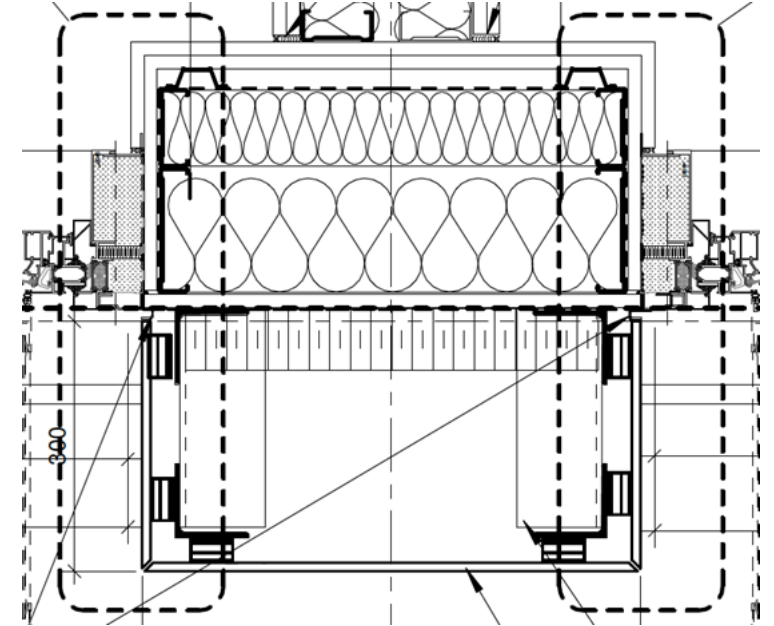
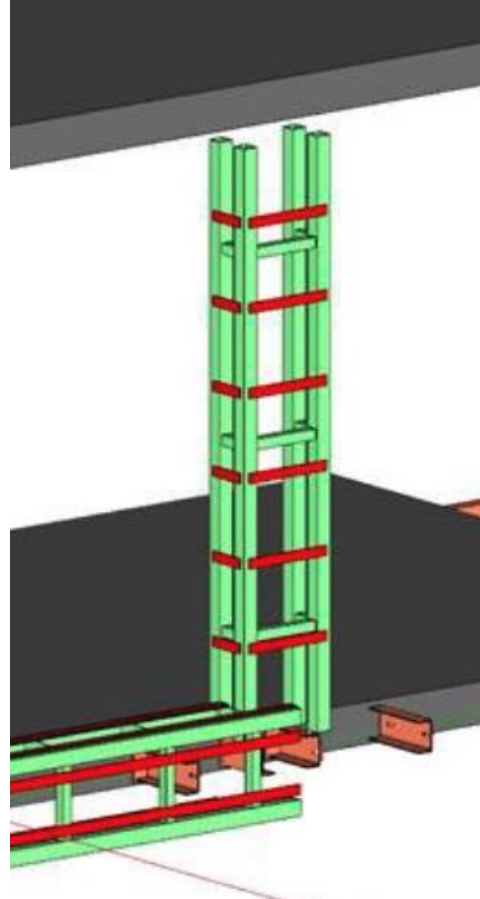




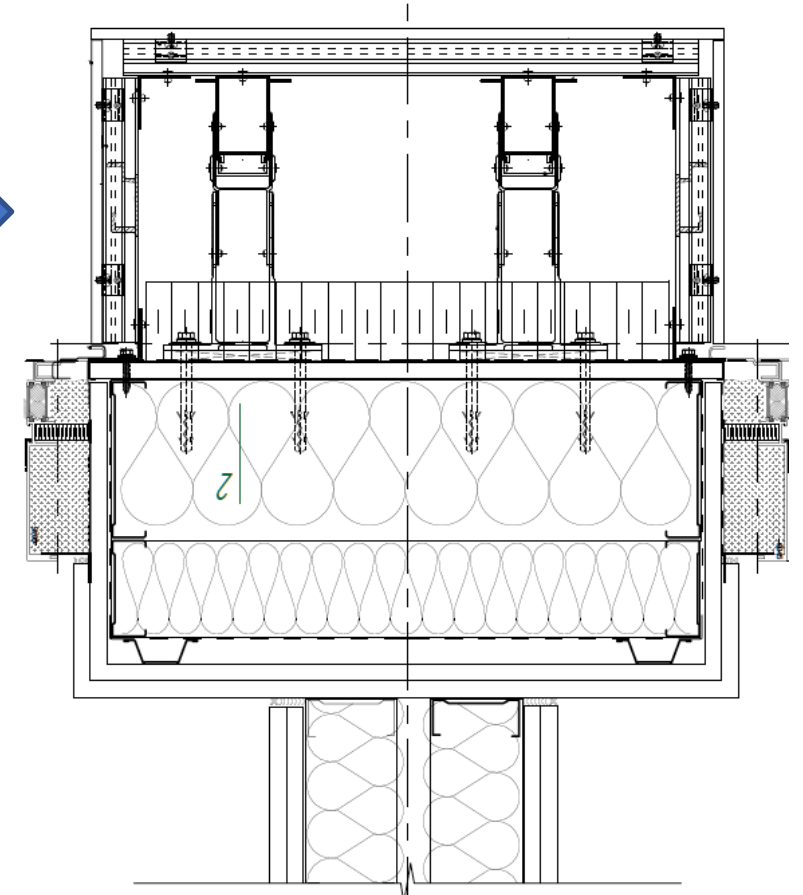
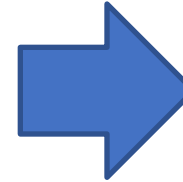
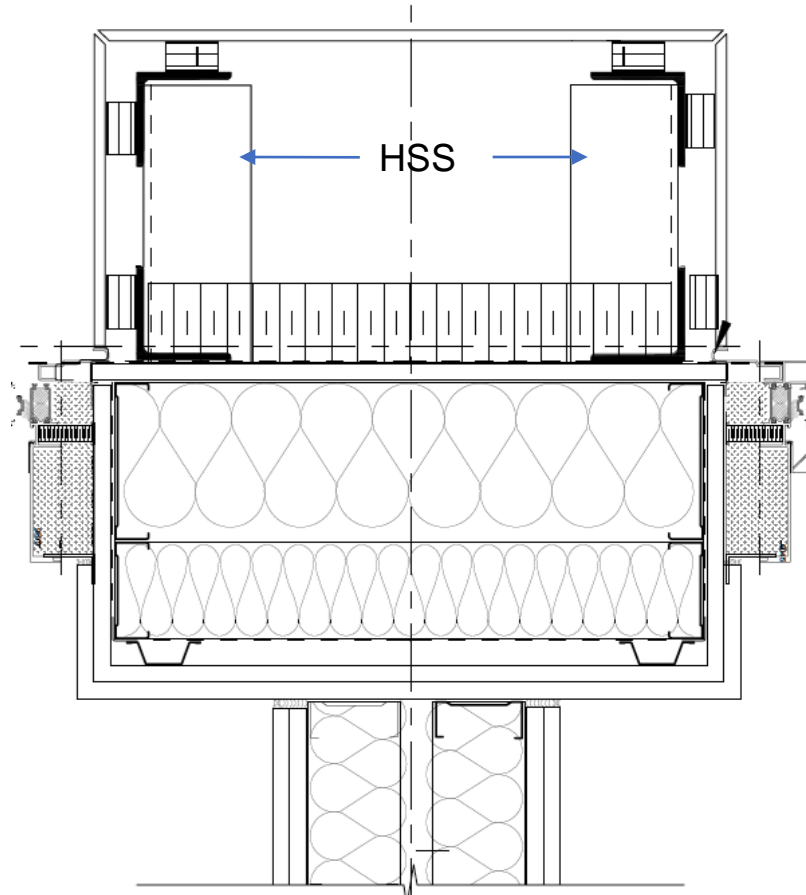
# One more story – remove HSS



Original design



Column



Proposed design  
– (plan view)



## Status Quo

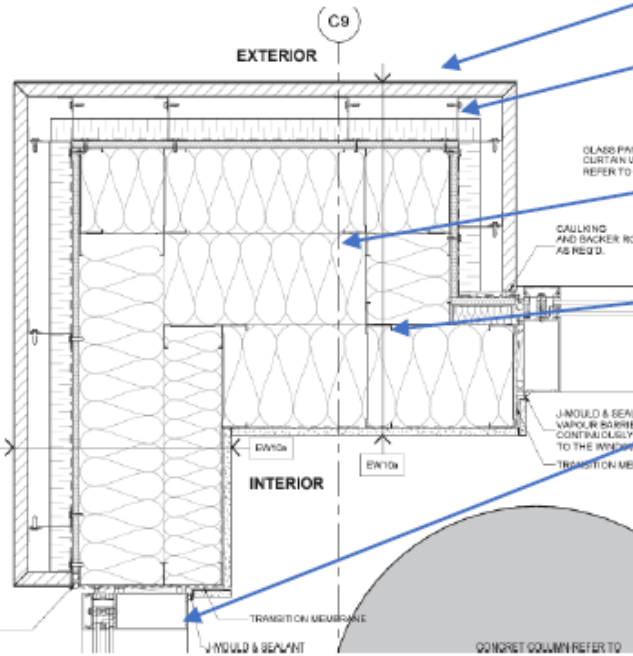
## Cladding

## Cladding attachment

## Stud framing

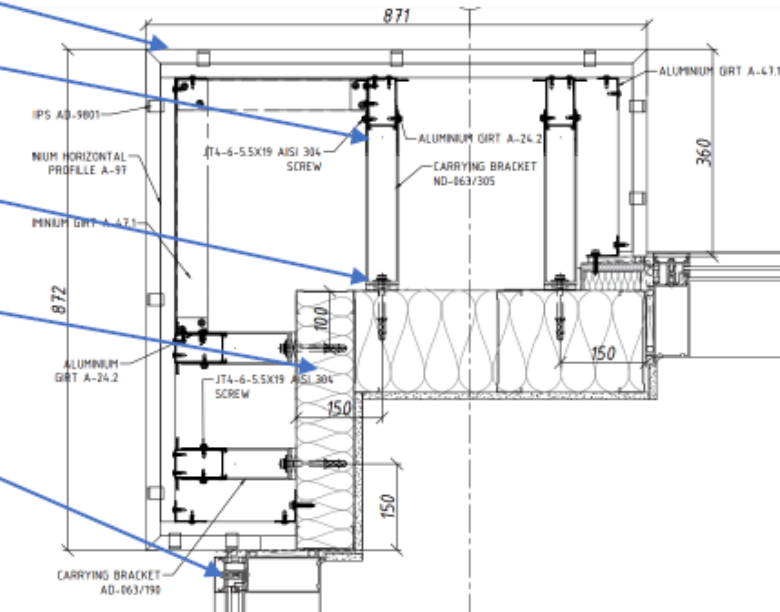
## Insulation

## Curtain Wall



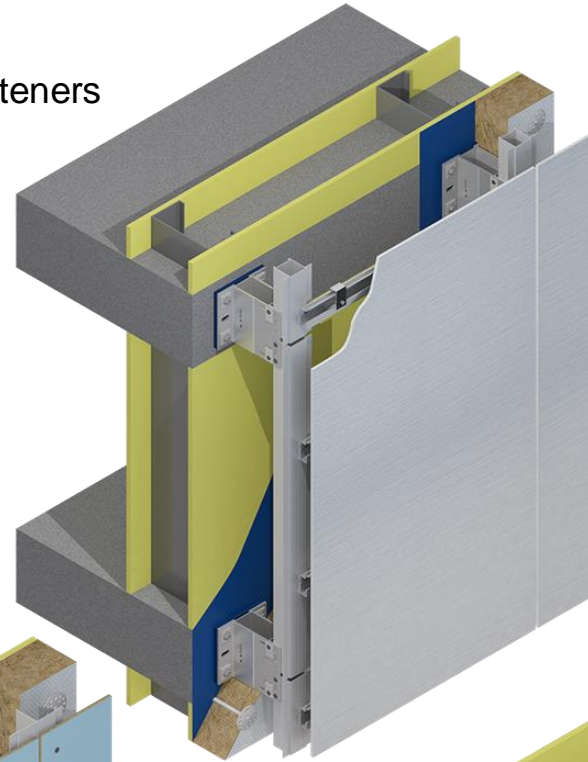
- Complex building envelope
- Two trades – framing and Div 07 cladding
- Stud puzzle
- Too much insulation?
- No alignment capability

## Improvement

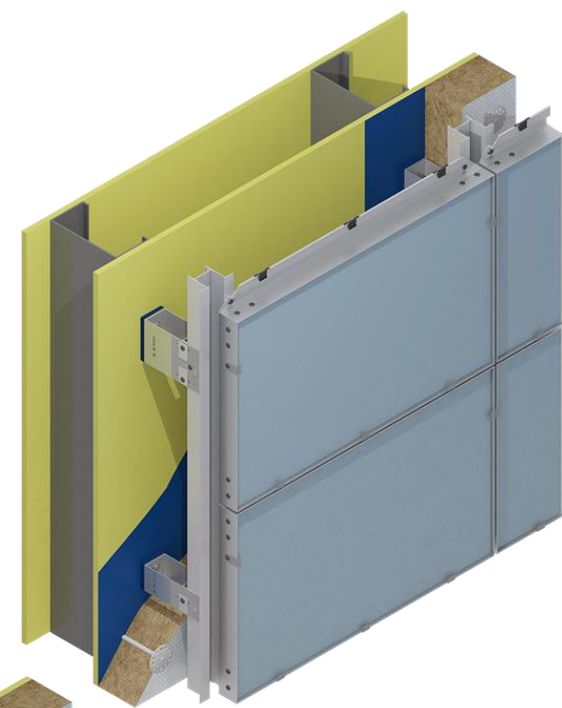


- Intuitive building envelope
- One trade, industry standard work.
- Simple stud framing.
- Right insulation, can accommodate more.
- Infinite adjustability.
- Suitable for all cladding.

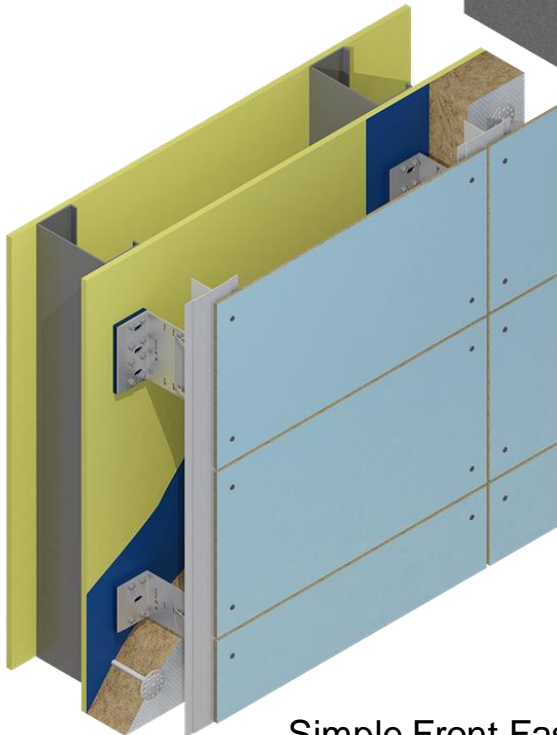
Concealed Fasteners



BIPV



## Building Block #3 Cladding Attachments



Simple Front Fastened



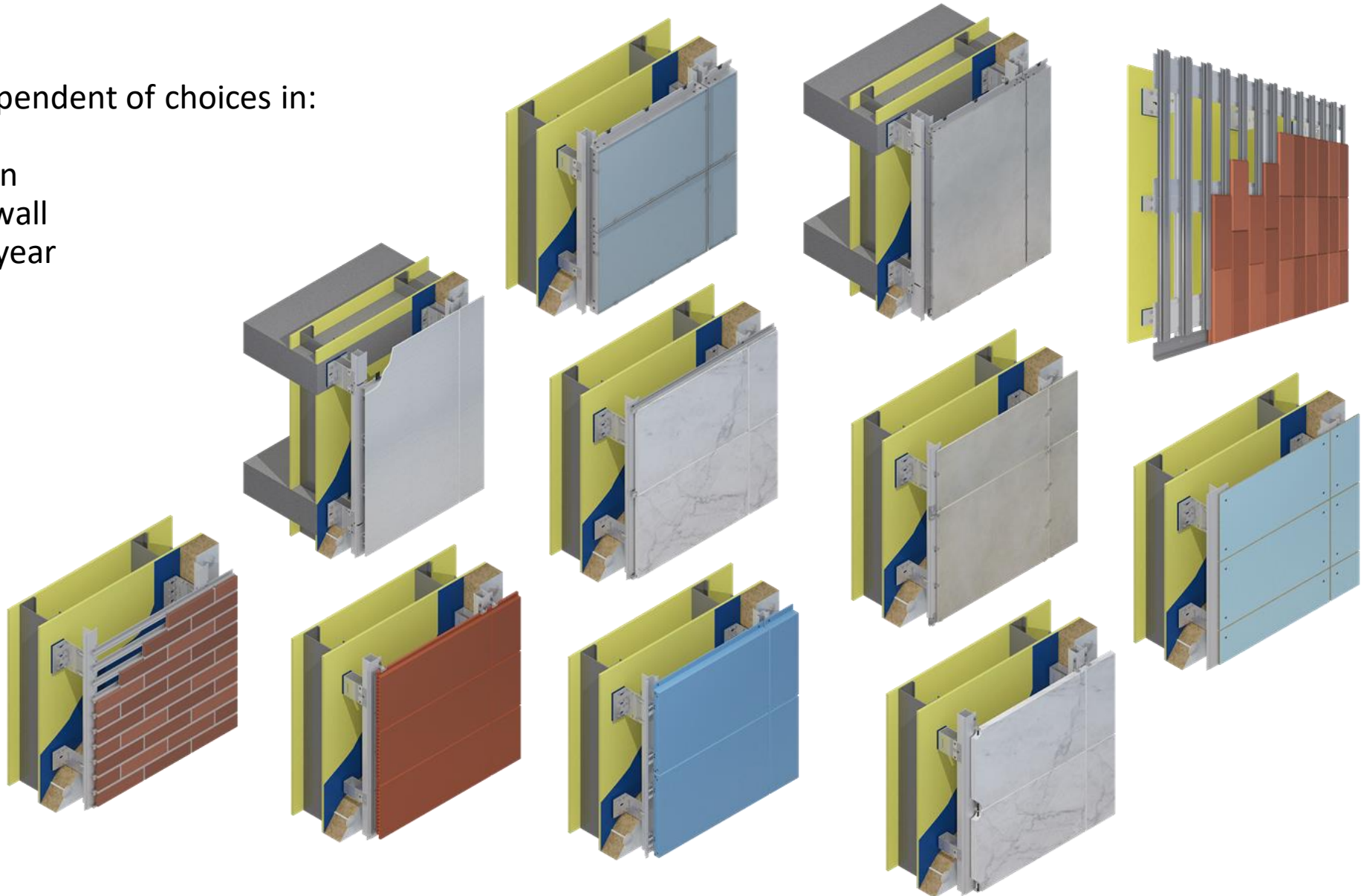
Specialized; Kerf for Stone



# Subsystem Independence

Systems independent of choices in:

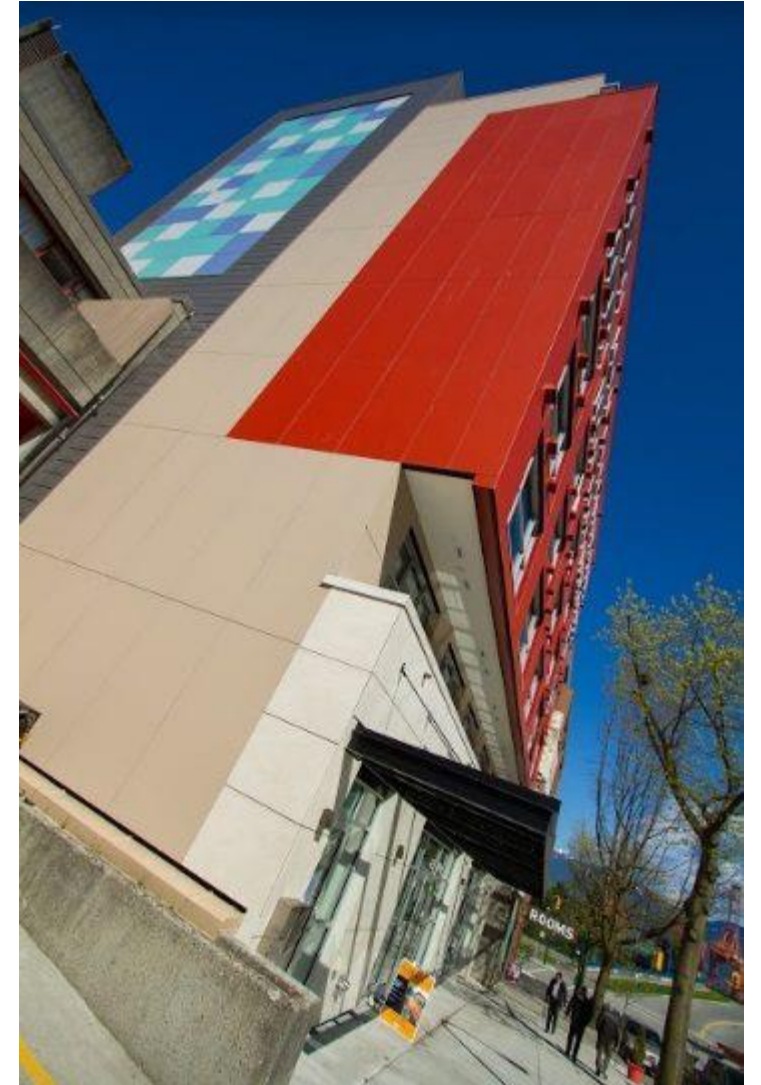
- Cladding
- Insulation
- Backup wall
- Time of year
- Location
- .....















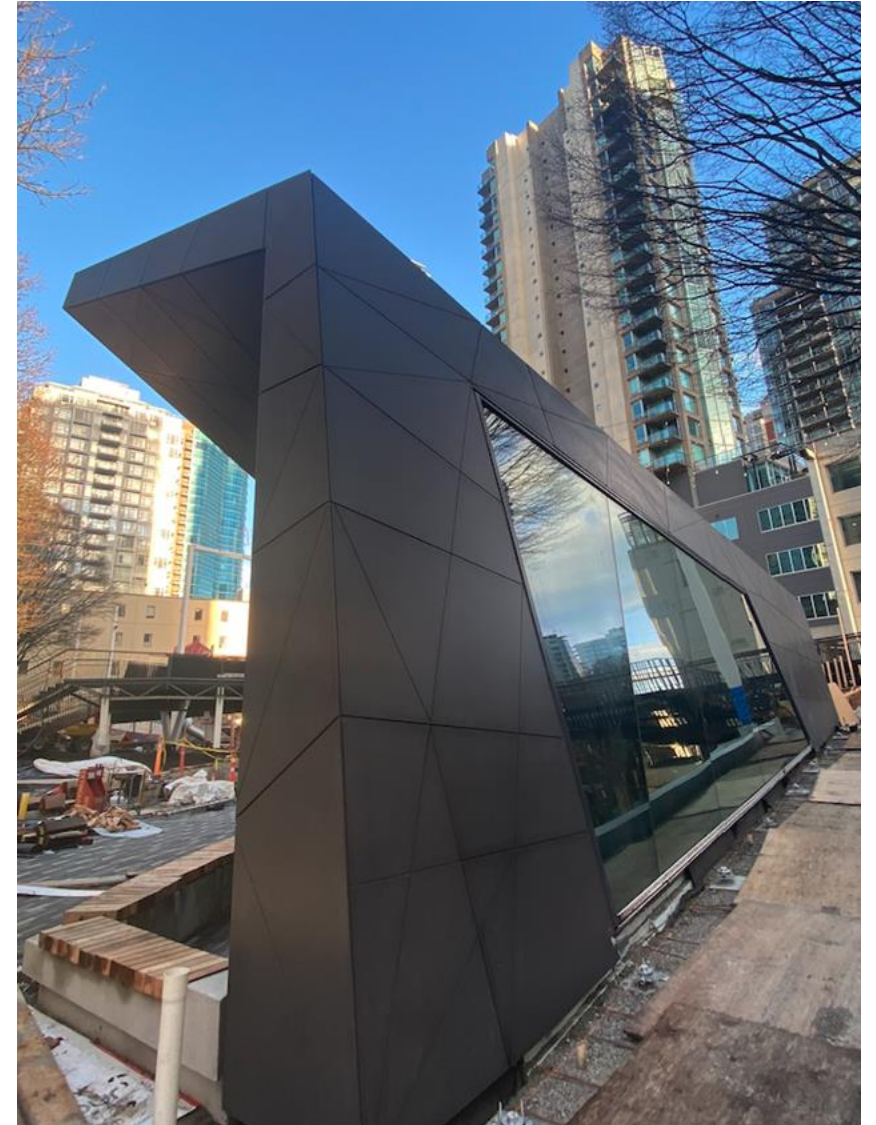








# Undercut Anchors System





# Innovative Configuration: Building Integrated PV (BIPV)



















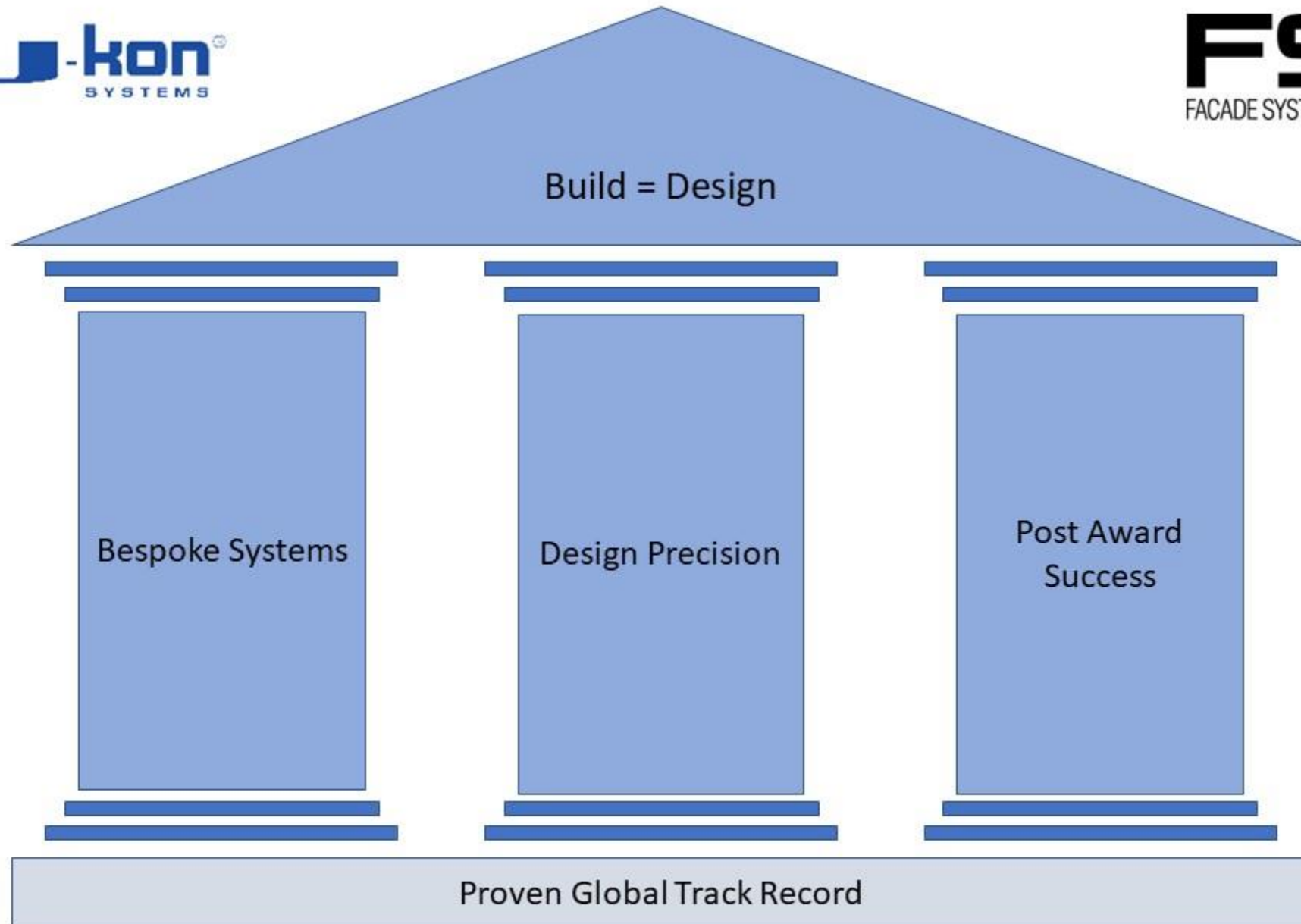


## Visible Fasteners



# Achieving High Performance Facades Should Not Be Left To Chance

We assist you to design great facades, suggest products and systems, and develop great relationships.



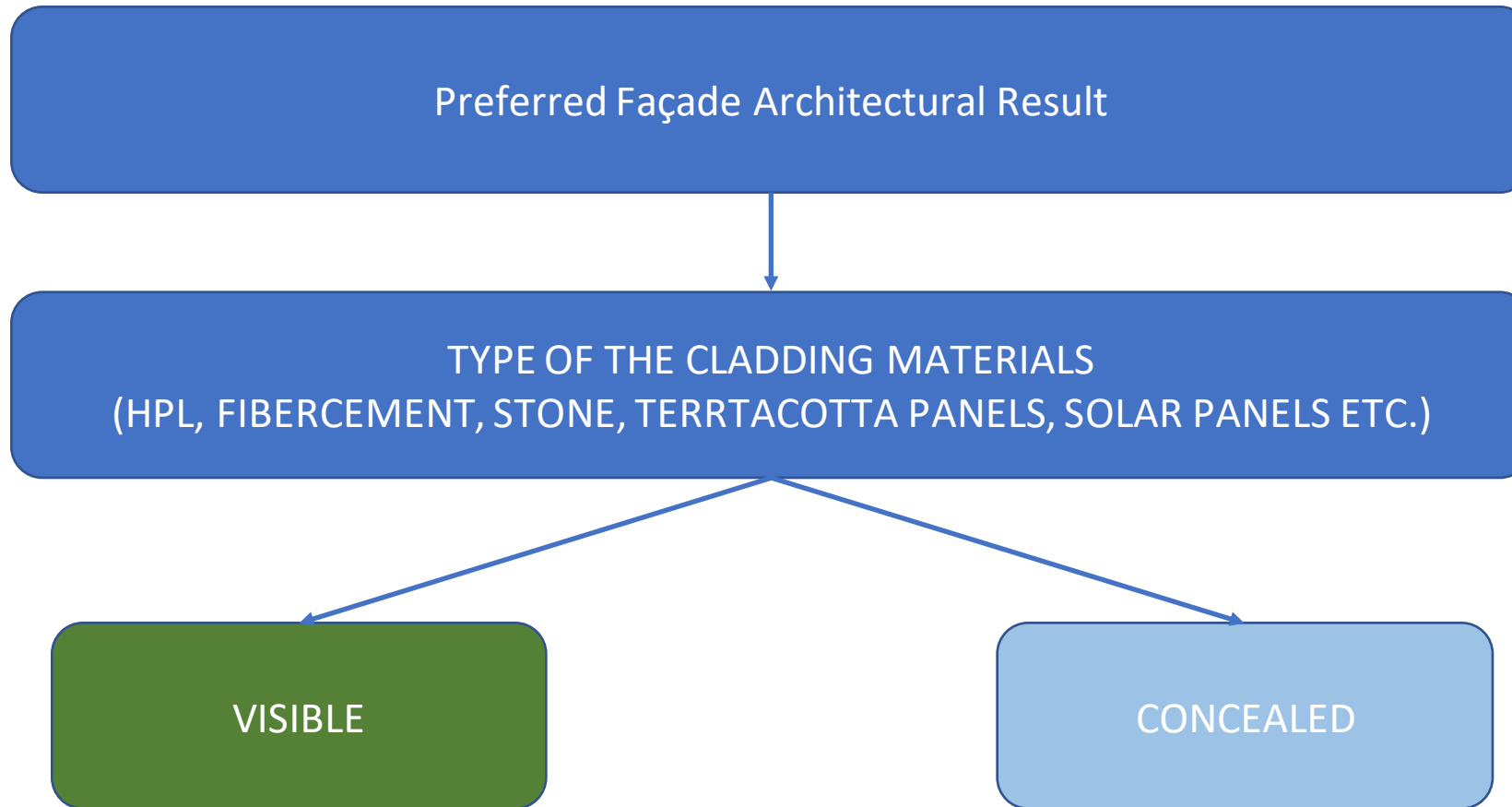


## What is next?

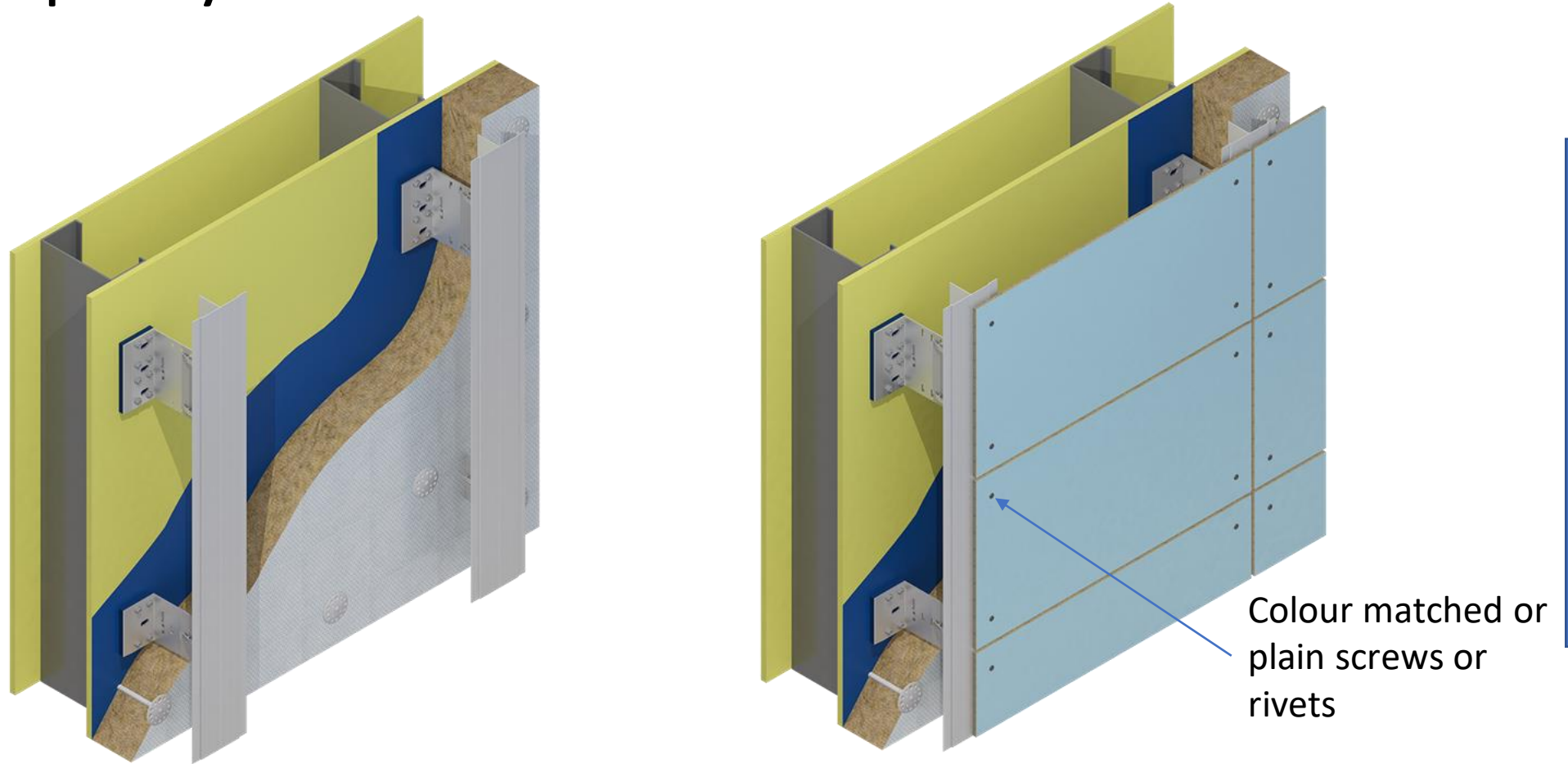
- Tells us your woes, challenges, and curiosities about high performance facades. You can help us help you or guide us on our next webinar.
- Under no obligation, let's review a project at any stage and discuss some ideas.
- or just give us a call. We love learning.

**We hope we have set expectations about how you should proceed on thermal and structural aspects of high-performance facades... and taught you a bit about us, wink wink.**

# Building Block #3 – Cladding Attachment



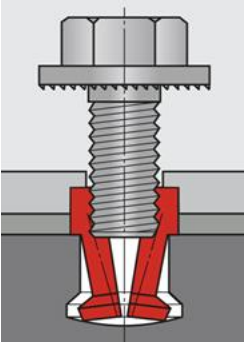
# Simple System: Visible Fasteners



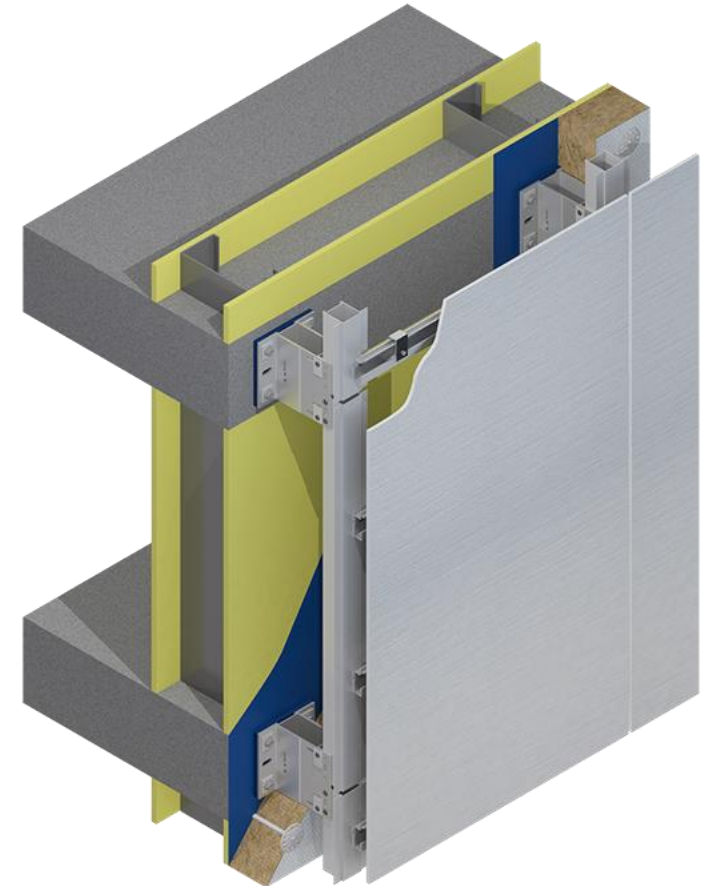
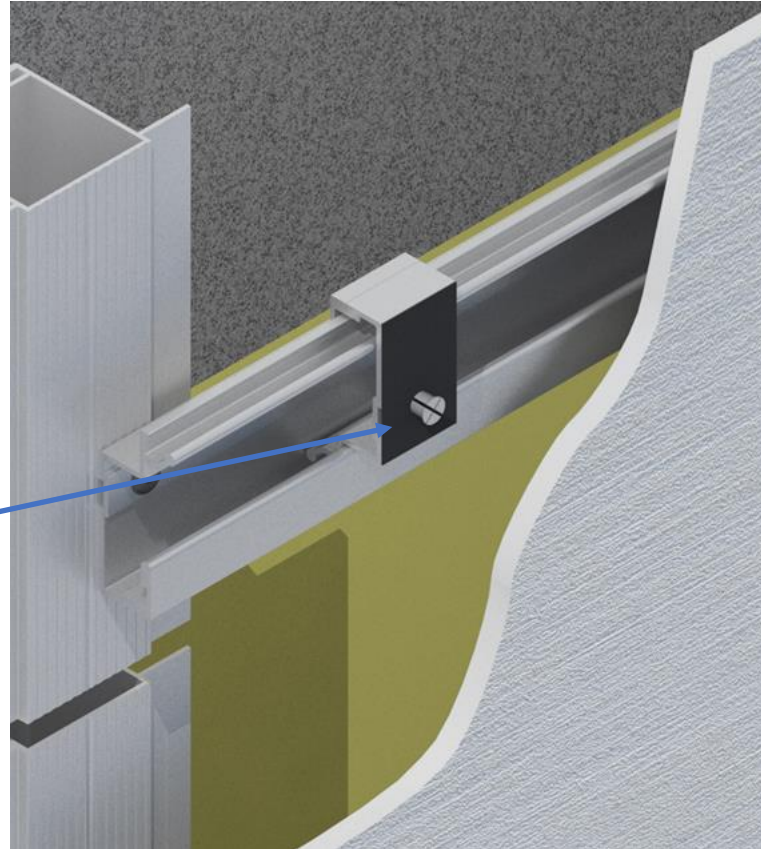
The system is a simple, economical and frequently used system for visible fixing of flat facade material like aluminum composite panels, sheets, HPL, fiber cement corrugated and standing seam metal panels.



**fischer**



Location of under  
cut anchor, typical  
2' spacing



The system is designed for invisible fixing of ceramic, porcelain, HPL and fiber cement panels using special undercut technology.

The system is designed for concealed way of fastening the natural stone.

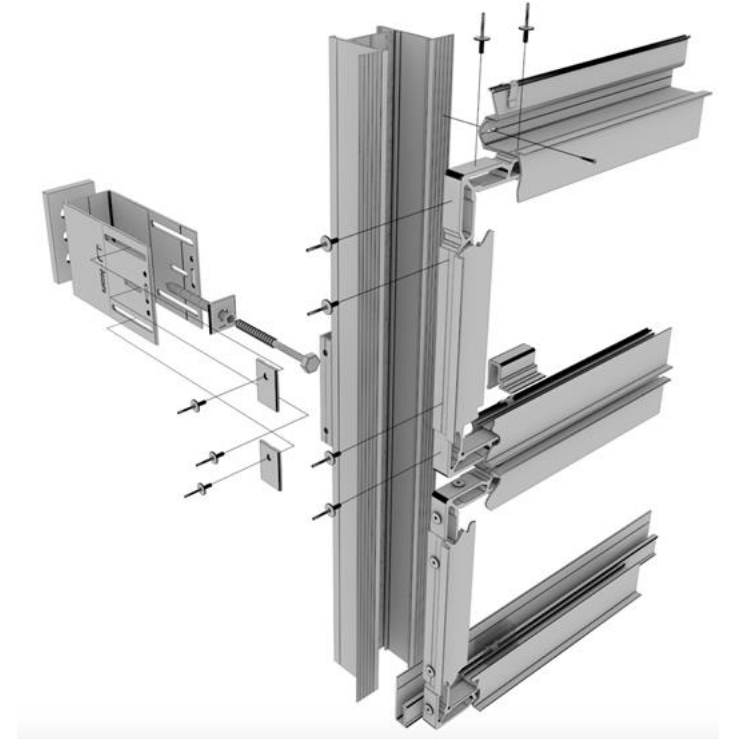
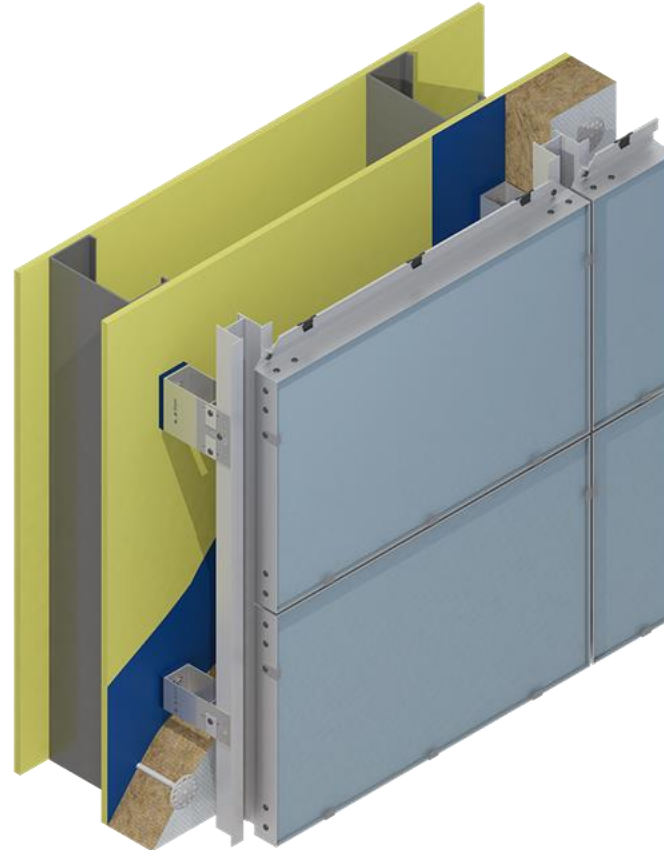
The cladding is fixed to the system of vertical and horizontal profiles.

Stone panels are installed on horizontal girts, for which in the lower and upper ends of the panel the cut is made, where installing special horizontal profiles is set.



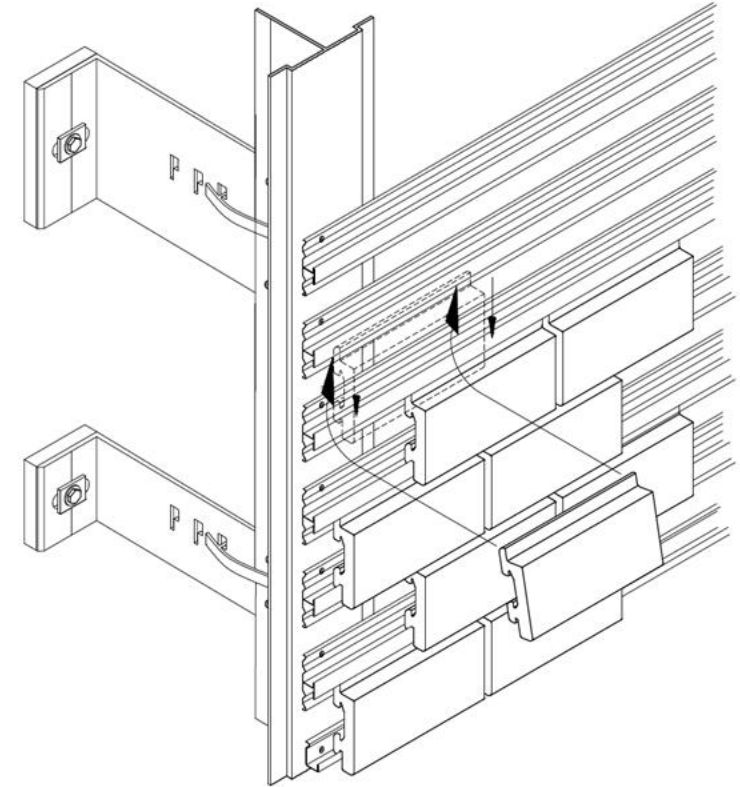
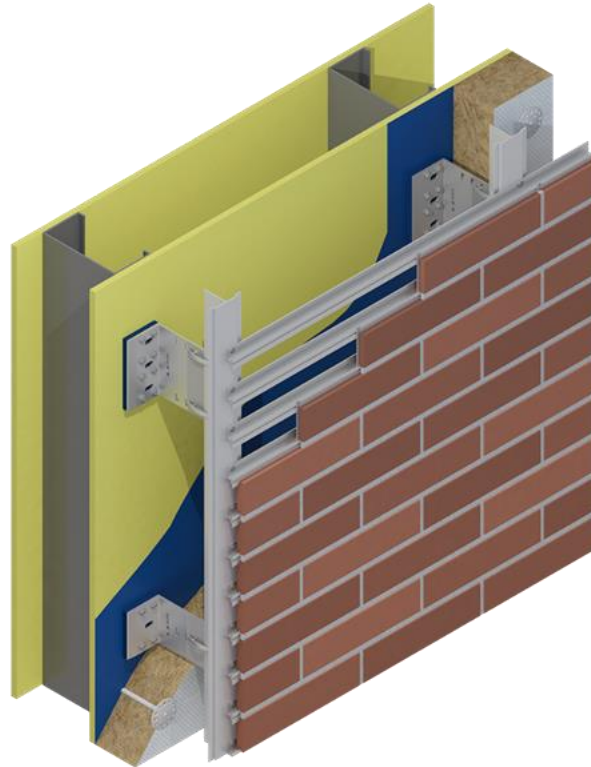
# Innovative Configuration: Glass/ Building Integrated PV (BIPV) Facades

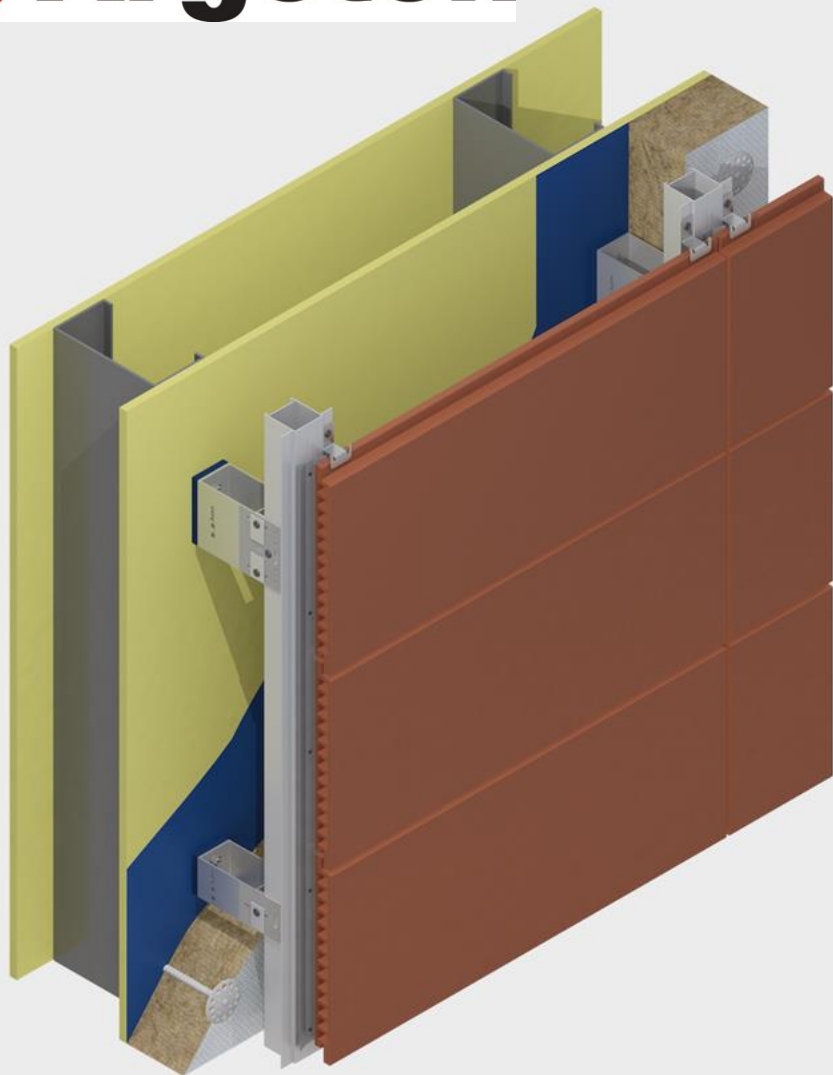
This system is designed for invisible fixing of glass, ceramic, and photovoltaic solar panels. The system can withhold a large format of panels that have a thickness between 3.5 mm to 8 mm. The cladding panel is glued into the frame of aluminum profiles. Special stainless steel safety clips are installed around the perimeter of the cladding panel.





This system is designed for invisible fixing of thin brick. The brick veneer can be installed with or without grouting. Brick veneer without grouting: Cladding panels are installed on horizontal rails, the shelves of which engage with grooves in the horizontal ends of the panels. Horizontal and vertical seams overlap shelves of plates.





Systems are designed for invisible fixing of terracotta panels with different thicknesses from 8,5 mm to 40 mm for vertical and horizontal layout.

We provide a system for following brand of terracotta panels:

- **AgGeTon**
- Agrob Buchtal
- Ceramics Terracotta
- CN-ceramic
- Faveton
- Frontek
- Moeding
- NBK
- Tempio
- Terreal

