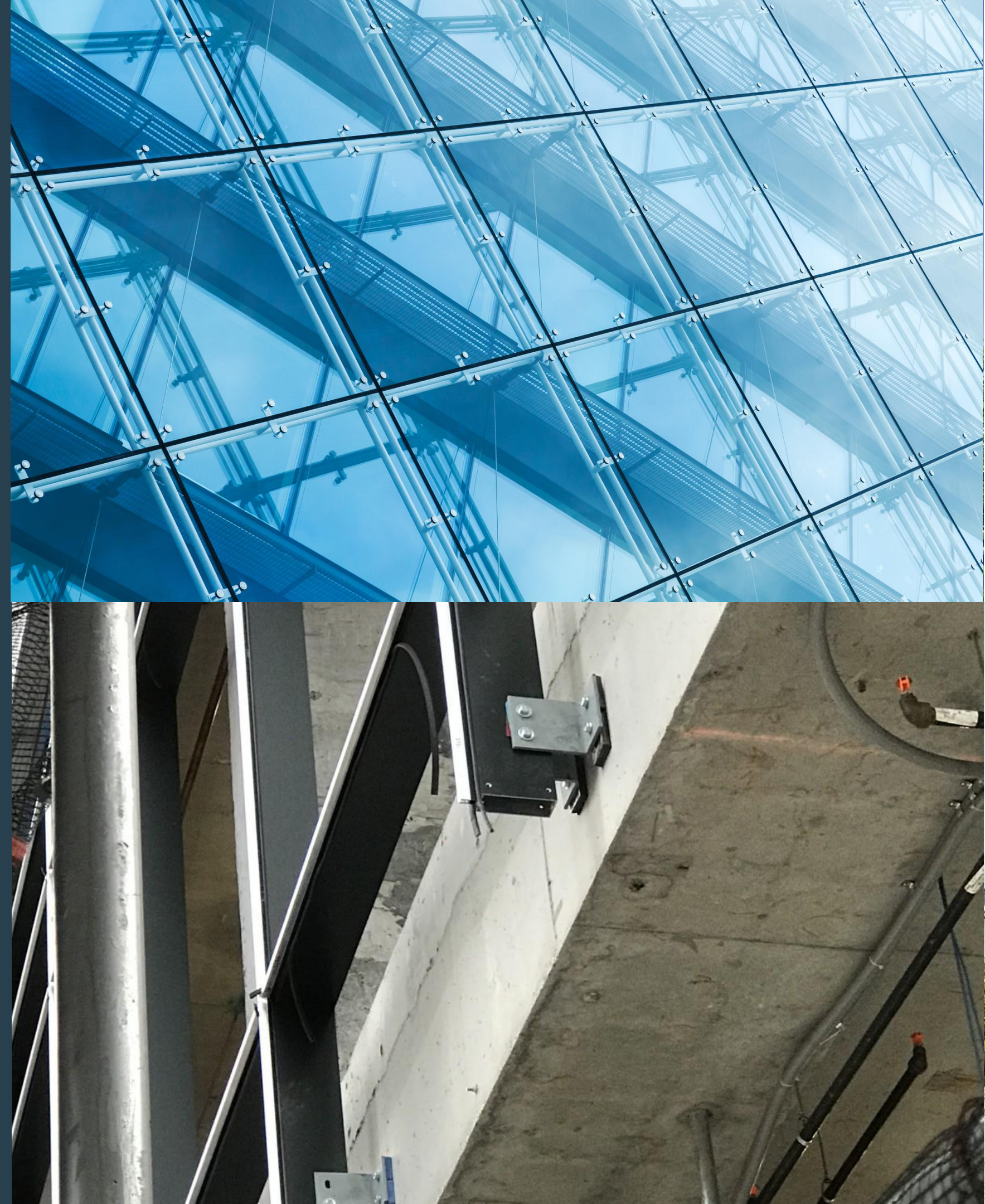


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Curtain Wall Façades



What is Curtain Walling?



- A Curtain wall is a grid structure – typically Aluminium
- Tied back to the primary or secondary structure
- Normally large areas of translucent panels
- Can have opaque panels – Often at floor levels
- Generally non load bearing structure

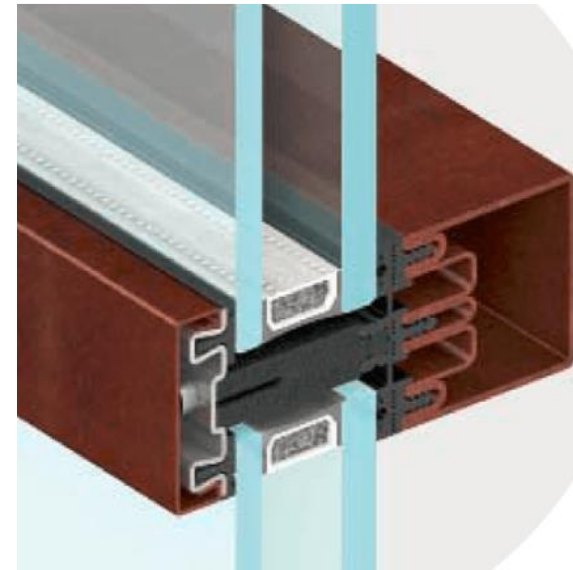
Types of Curtain Wall

Materials for Curtain Walling Framing?



Timber / Composite

- Low Strength
- Extruded Complex Shapes
- Light Weight



Steel

- High Strength
- Folded – Simple Shapes
- Heavy



Aluminium

- Mid Strength
- Extruded Complex Shapes
- Light Weight

Types of Curtain Wall Framing Systems

1. Ladder System

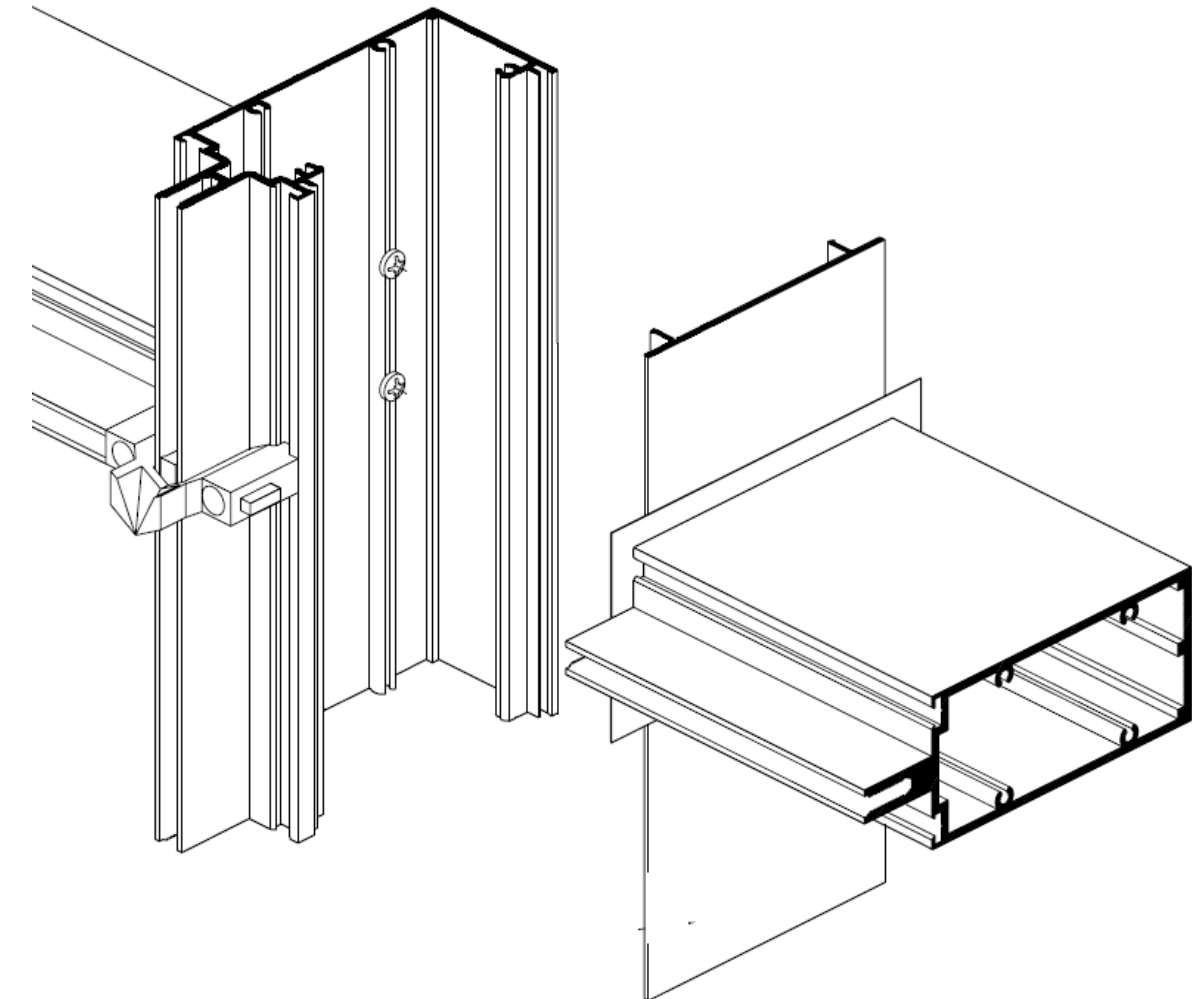
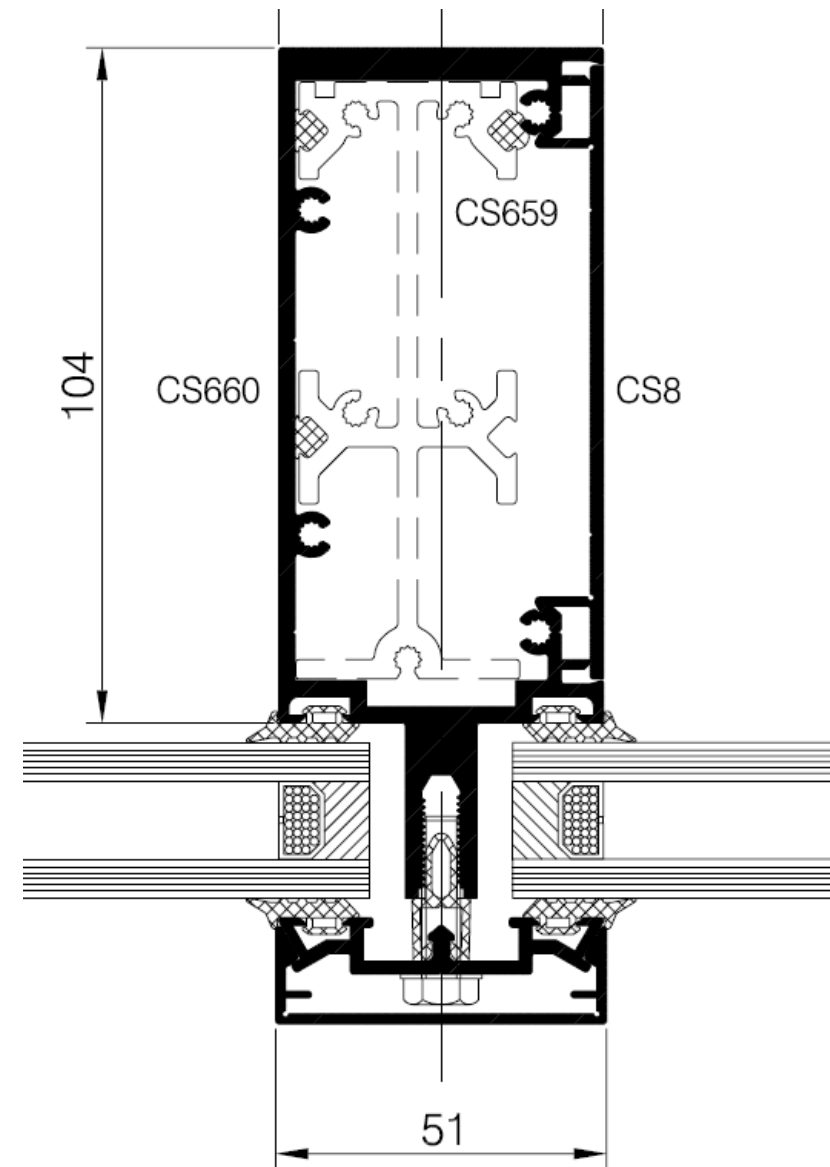
2. Stick System

3. Unitised System

4. Structural System

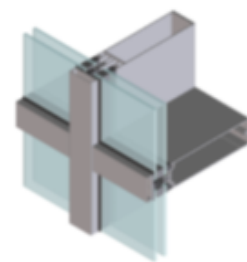
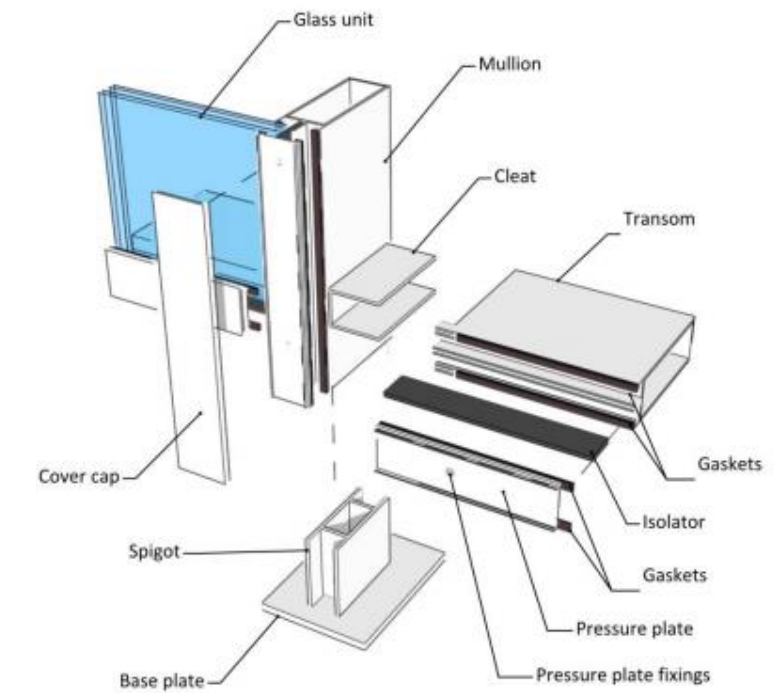
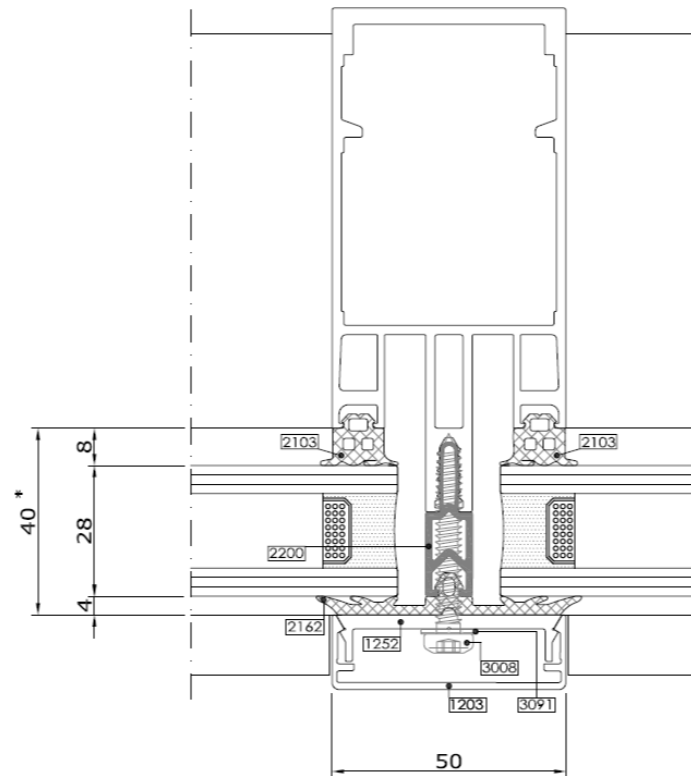
1. Ladder Frame Curtain Walling

- Box & Plate
- Zone Drained
- Screw Ported
- Gaskets
- Pressure Plate
- Capping

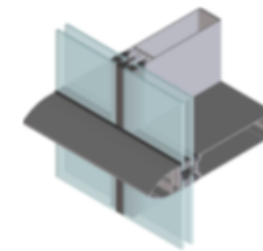


2. Stick Frame Curtain Walling

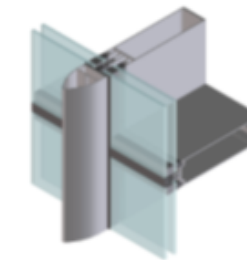
- Mullion / Transom
- Cleated
- Gaskets
- Glazing
- Pressure Plates
- Capping



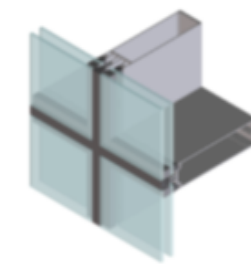
EFP 50 RCW Capped



EFP 50 TSH Capped Horizontal



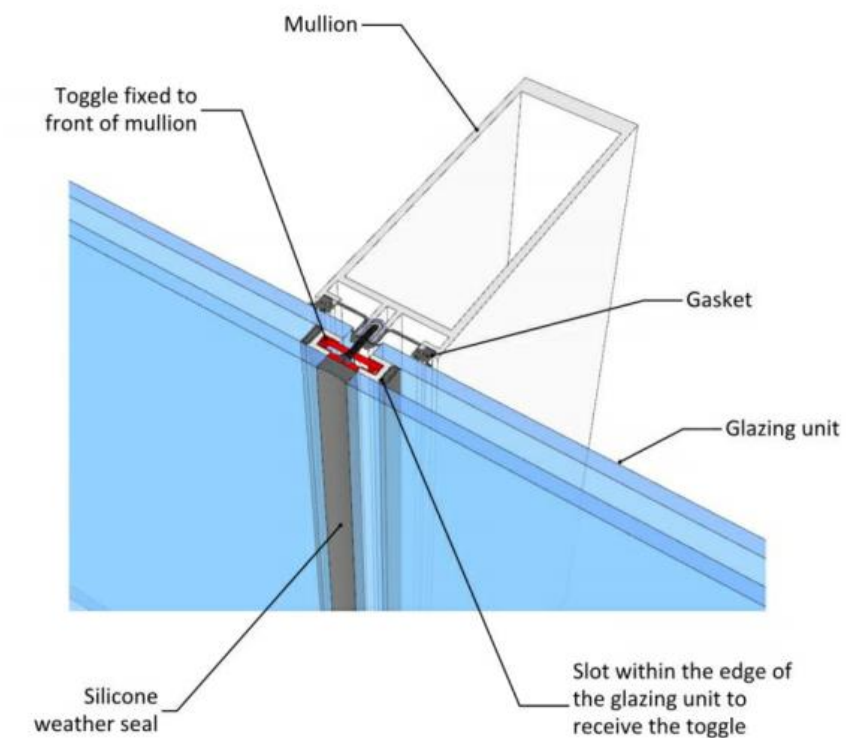
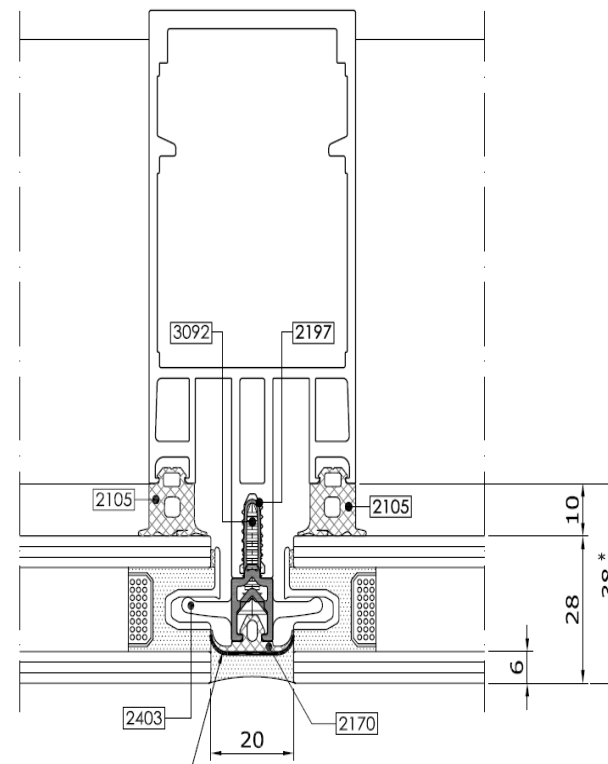
EFP 50 TSV Capped Vertical



EFP 50 FSS 4 Sided Structural Glazed

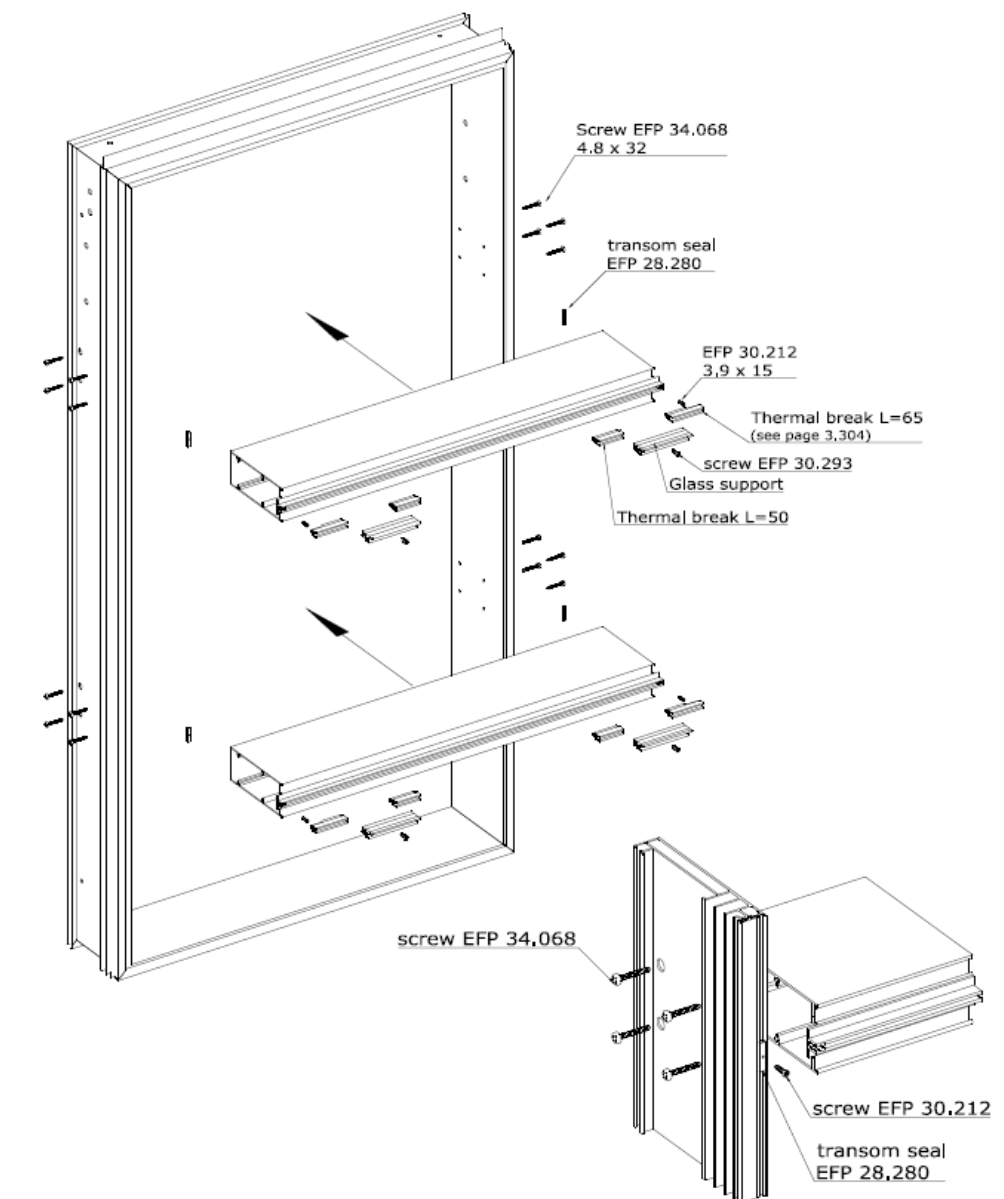
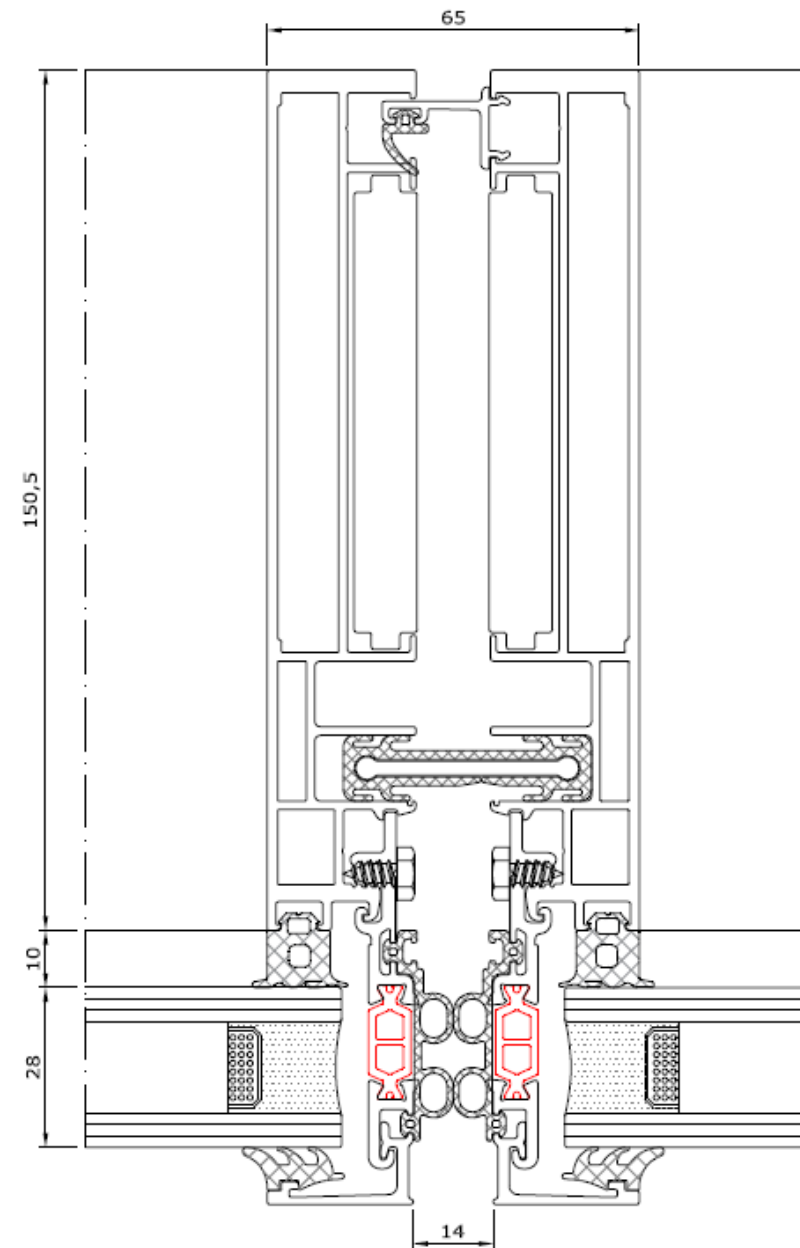
2. Stick Curtain Wall Façade – *Toggle Variant*

- Mullion
- Transom
- Cleated
- Gaskets
- Glazing
- Silicone

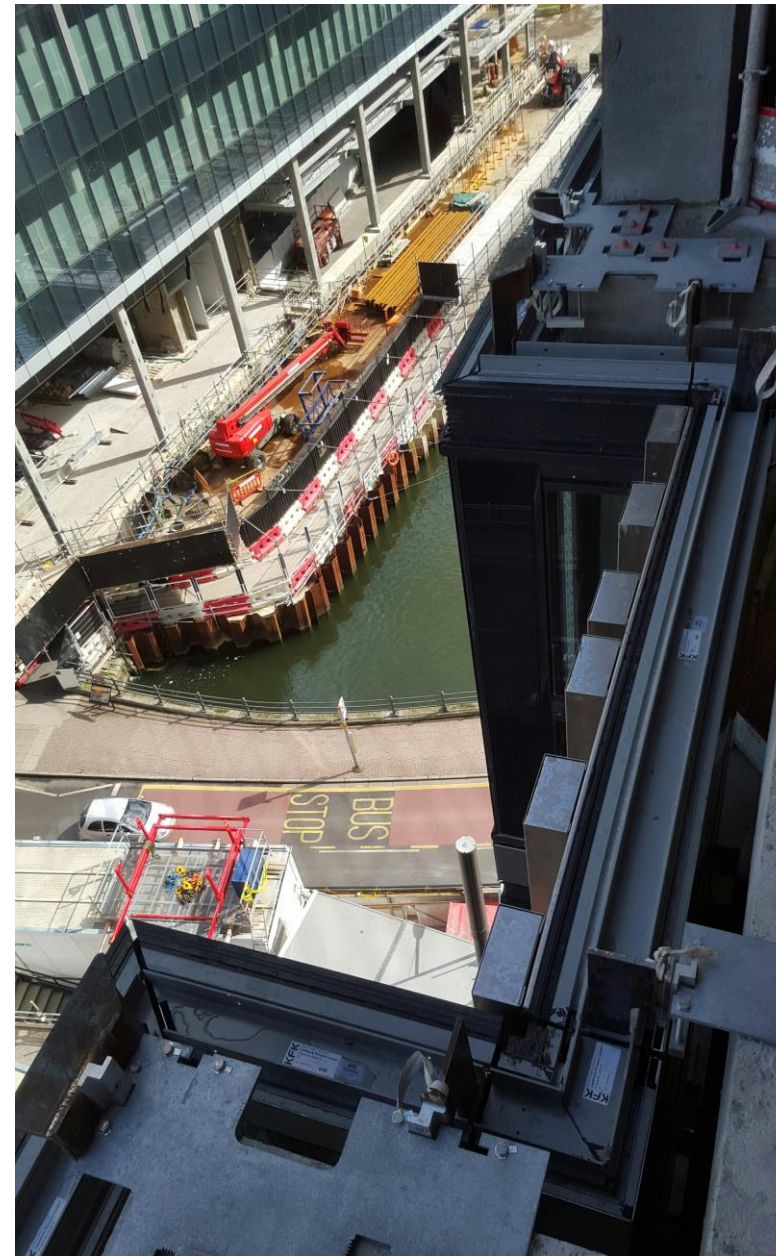


3. Unitised Curtain Wall Components

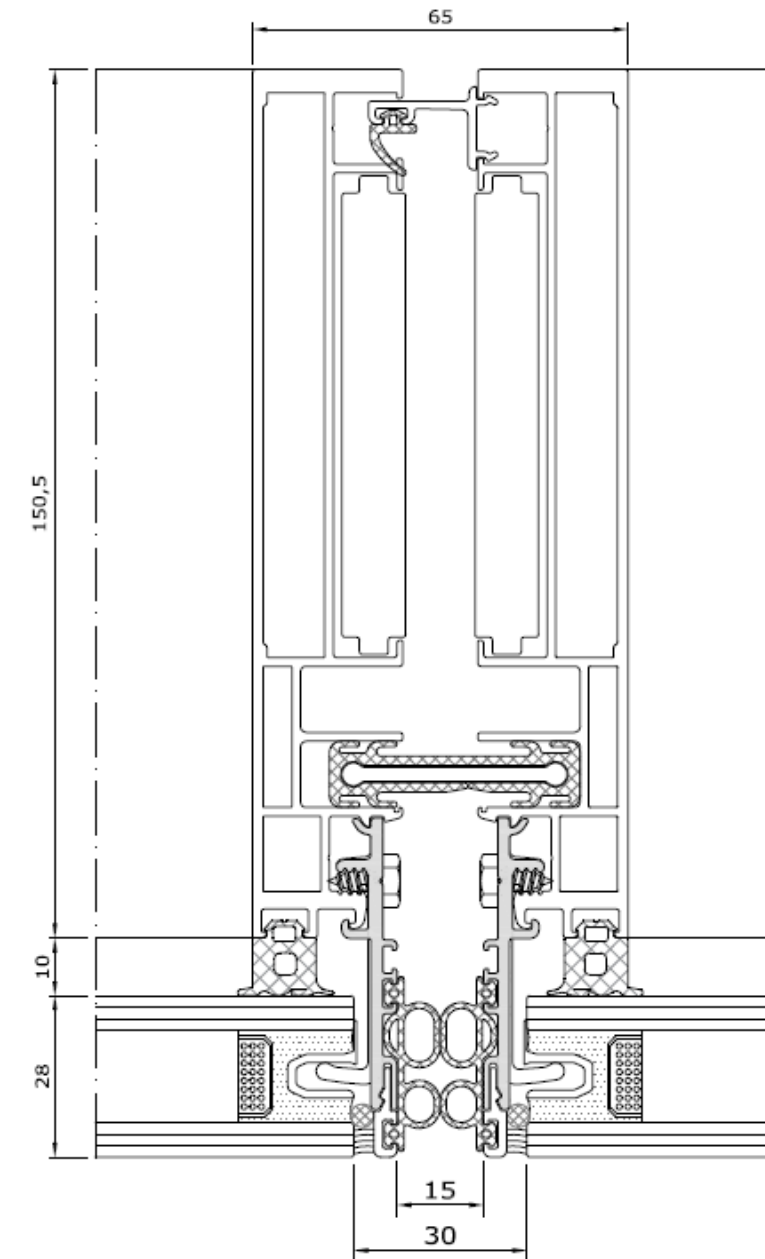
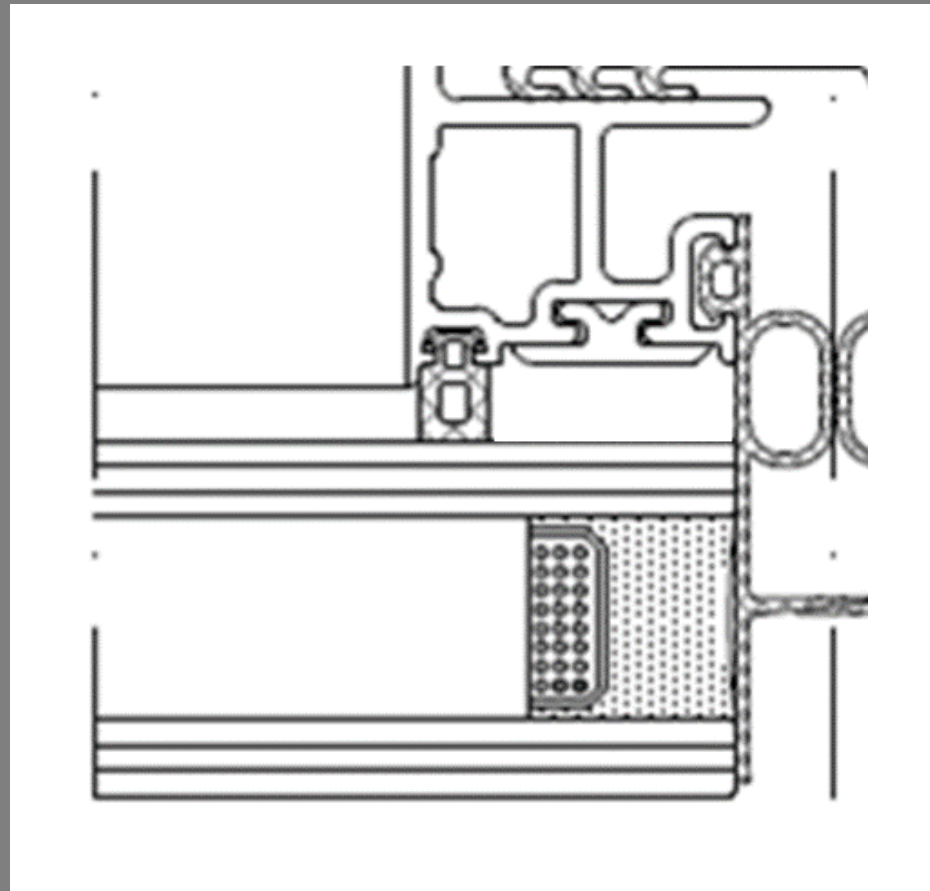
- Mullion
- Transom
- Gaskets
- Glazing
- Silicone
- Locating lugs



3. Unitised Curtain Wall Facade

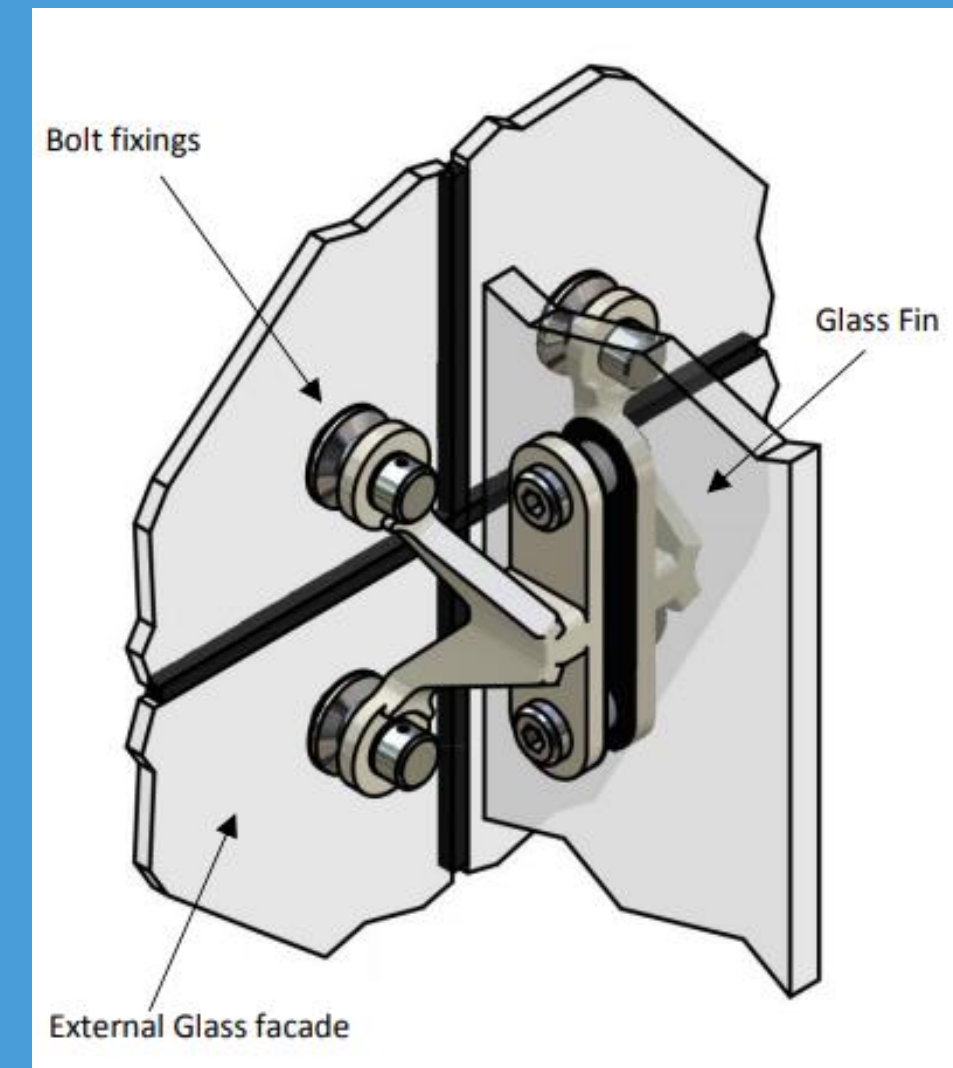


3. *Semi* Unitised Curtain Walling



4. Structural Bolted System

- Toughened glass panels bolted to support system.
- Various types of support structure possible;
- Brackets fixed to primary structure i.e. direct.
- Steel secondary structure.
- Curtain wall framing system.
- Cable nets.
- Glass fins.



Design Calculations

Design Calculations

We expect to see ratification of the systems in terms of:

Where Curtain wall systems are used (stick or unitised): a full set of structural calculations which include

- Framing members
- Brackets
- Fixings and connections



Façade Accommodation of Building Movement

Why Buildings Move

Temperature

Structural frames move due to temperature change – Expansion & contraction

Moisture

Concrete frames move due to initial moisture change – Slabs & columns

Floor loading - Column shortening

Wind loading - Location, building shape, wind velocity, direction so on...

Snow loading

Drift loads, melting snow

Settlement

- Varying soil conditions across site / Varying foundation loads
- Differences in rate of application of load / Variations in groundwater level

Creep

Permanent load moves over time

Types of Building Movement

Response to load:

Floor/edge beam deflection – Imposed loads

Floor loading – Heavy objects in particular areas

Cladding / Façade loading

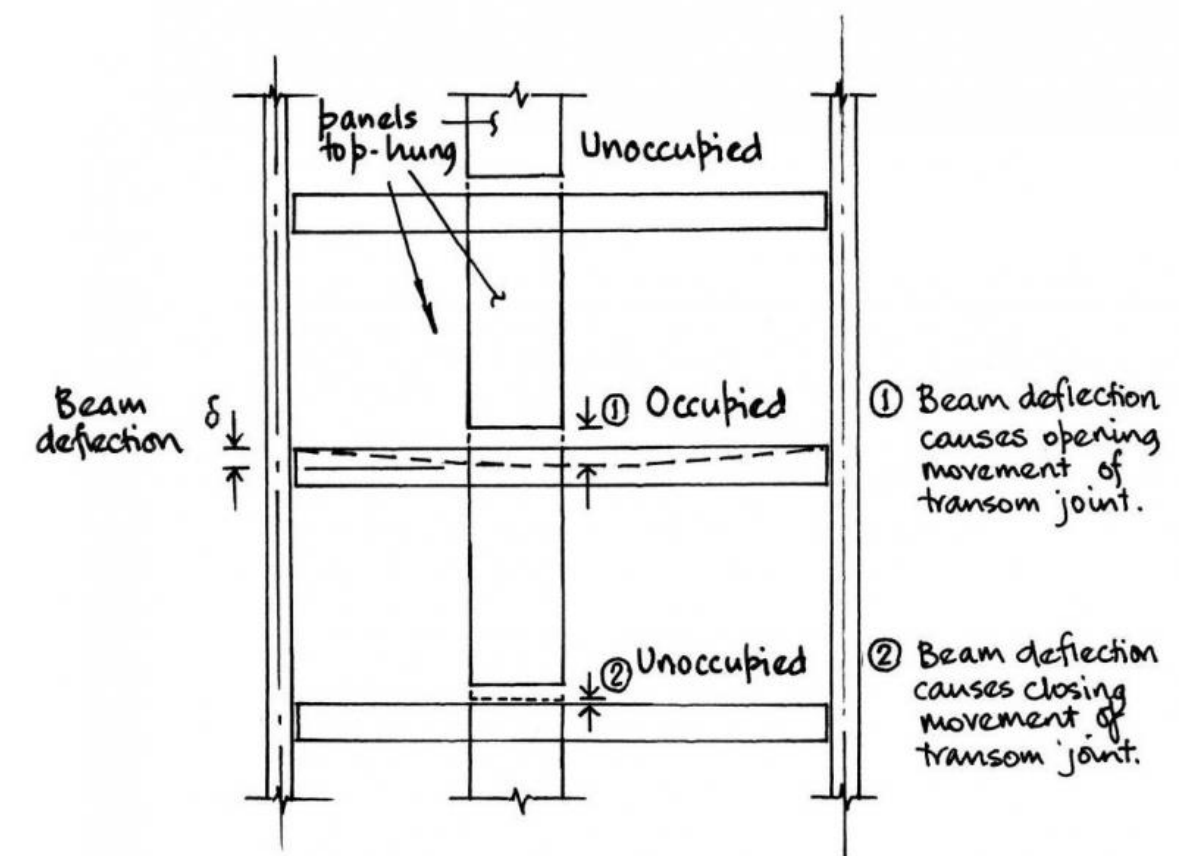
Effect of cantilevers –

Column shortening

Wind sway – Inter-story drift

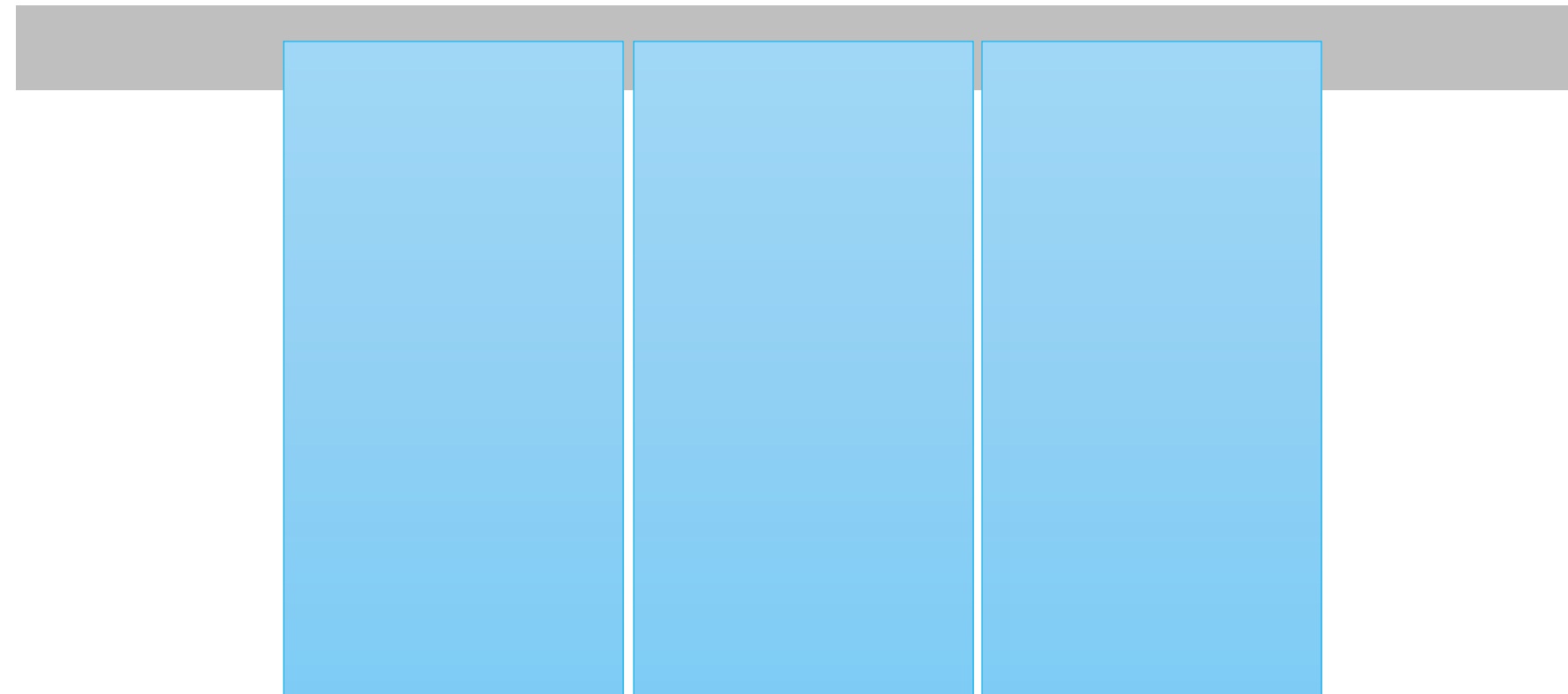
Earthquake – Not so much in the UK

Other imposed loads – Maintenance cranes or gantry system etc.



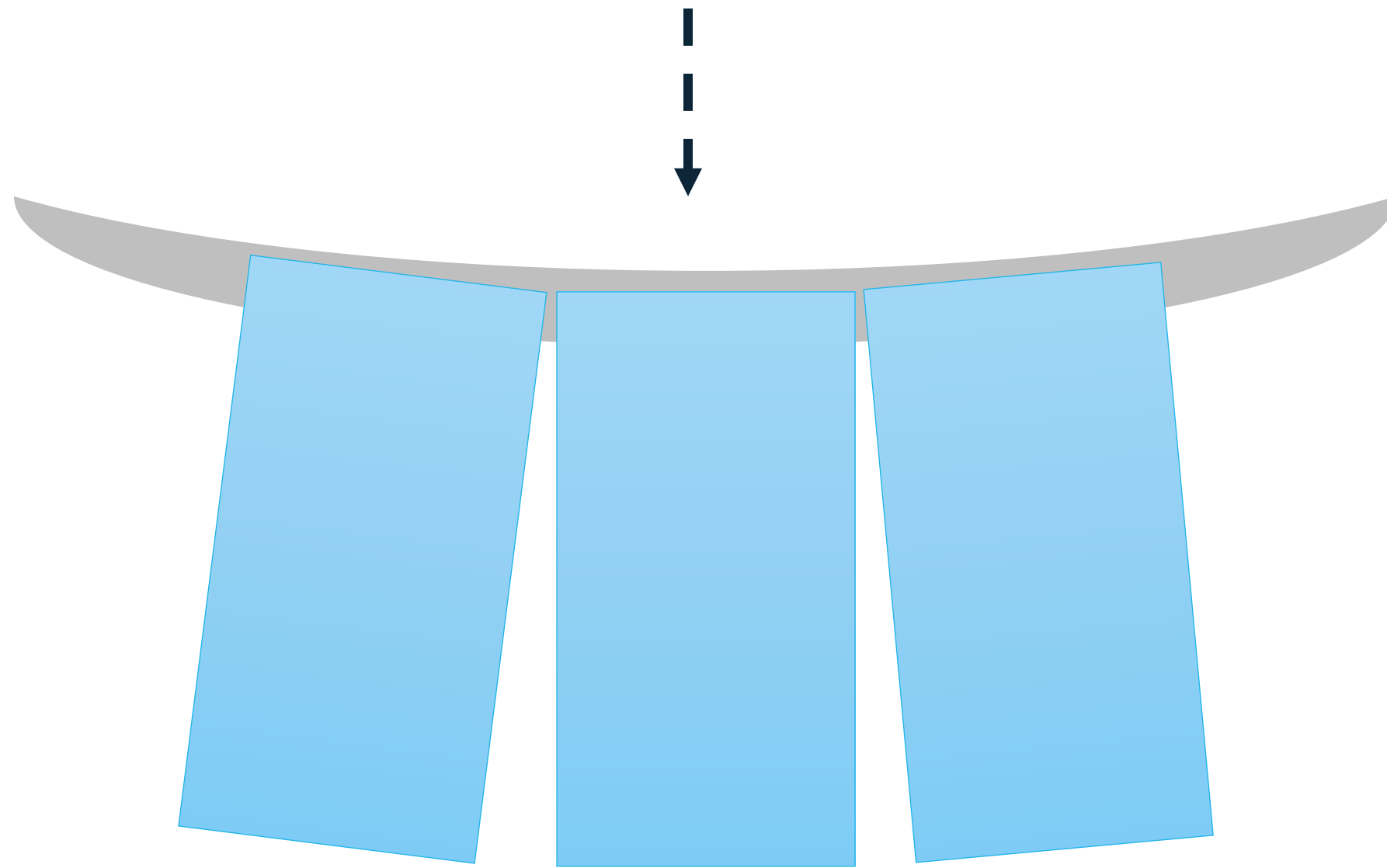
Façade Accommodation of Building Movement

Deflection



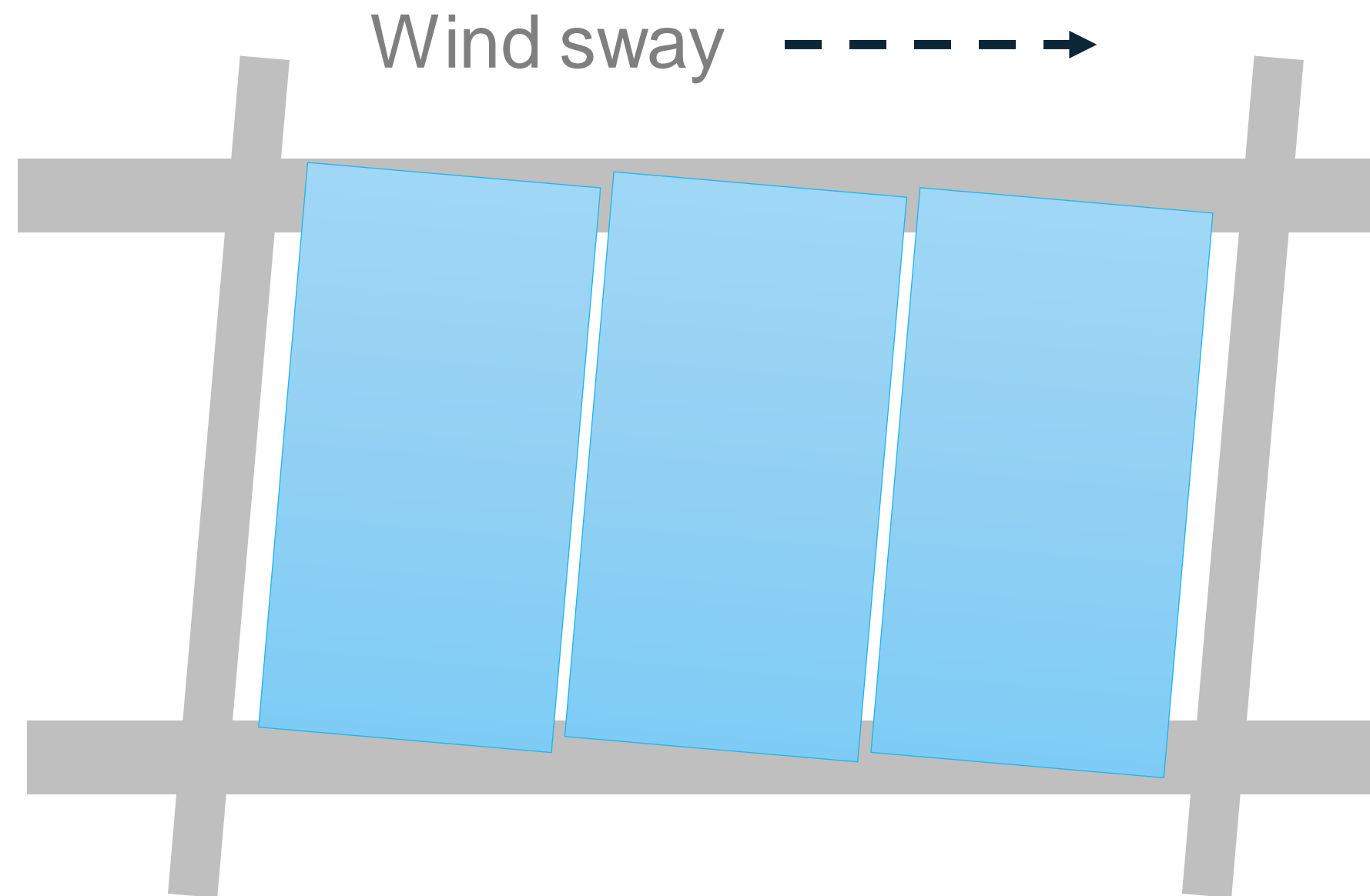
Façade Accommodation of Building Movement

Deflection



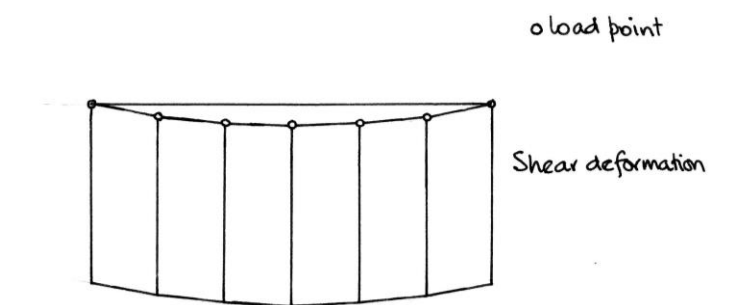
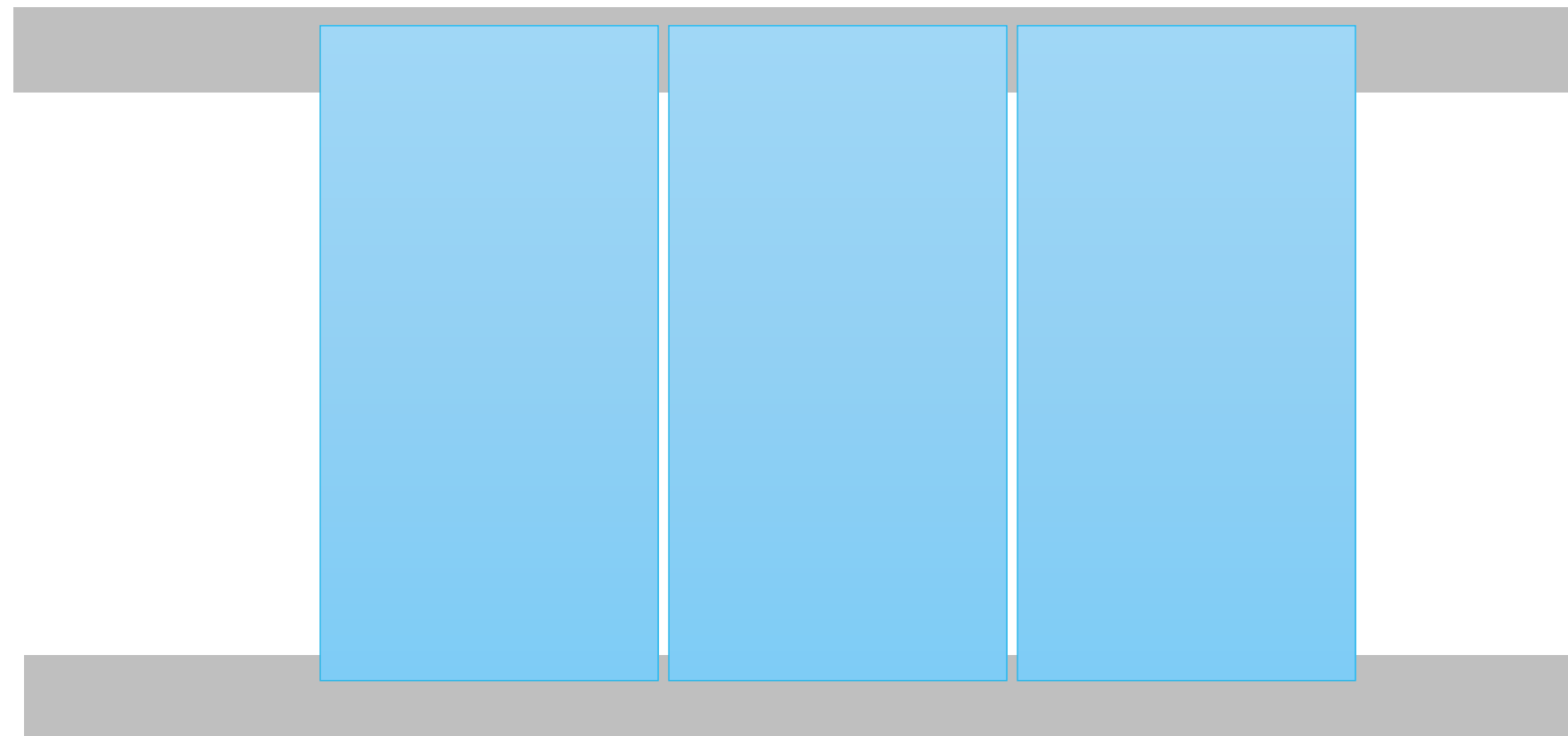
Façade Accommodation of Building Movement

Rotation
Racking



Façade Accommodation of Building Movement

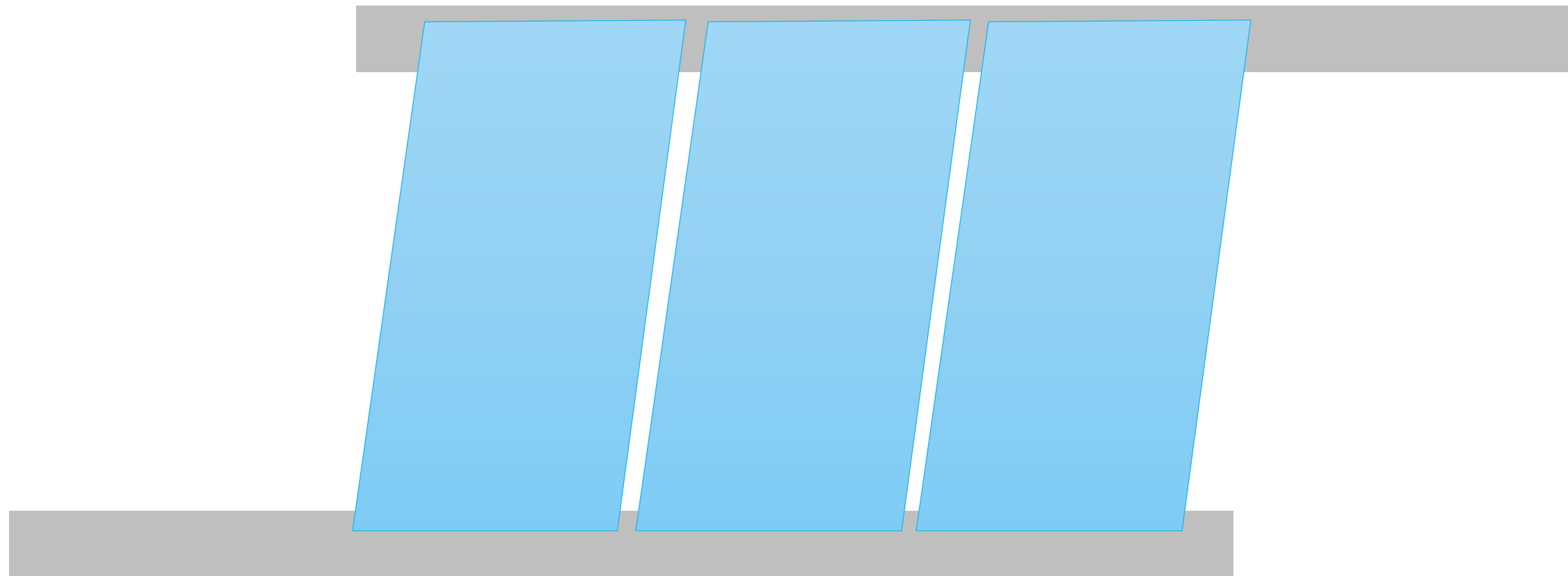
Shear Forces



Façade Accommodation of Building Movement

Shear

Inter-story drift - - - - ->



Movement and Accommodation

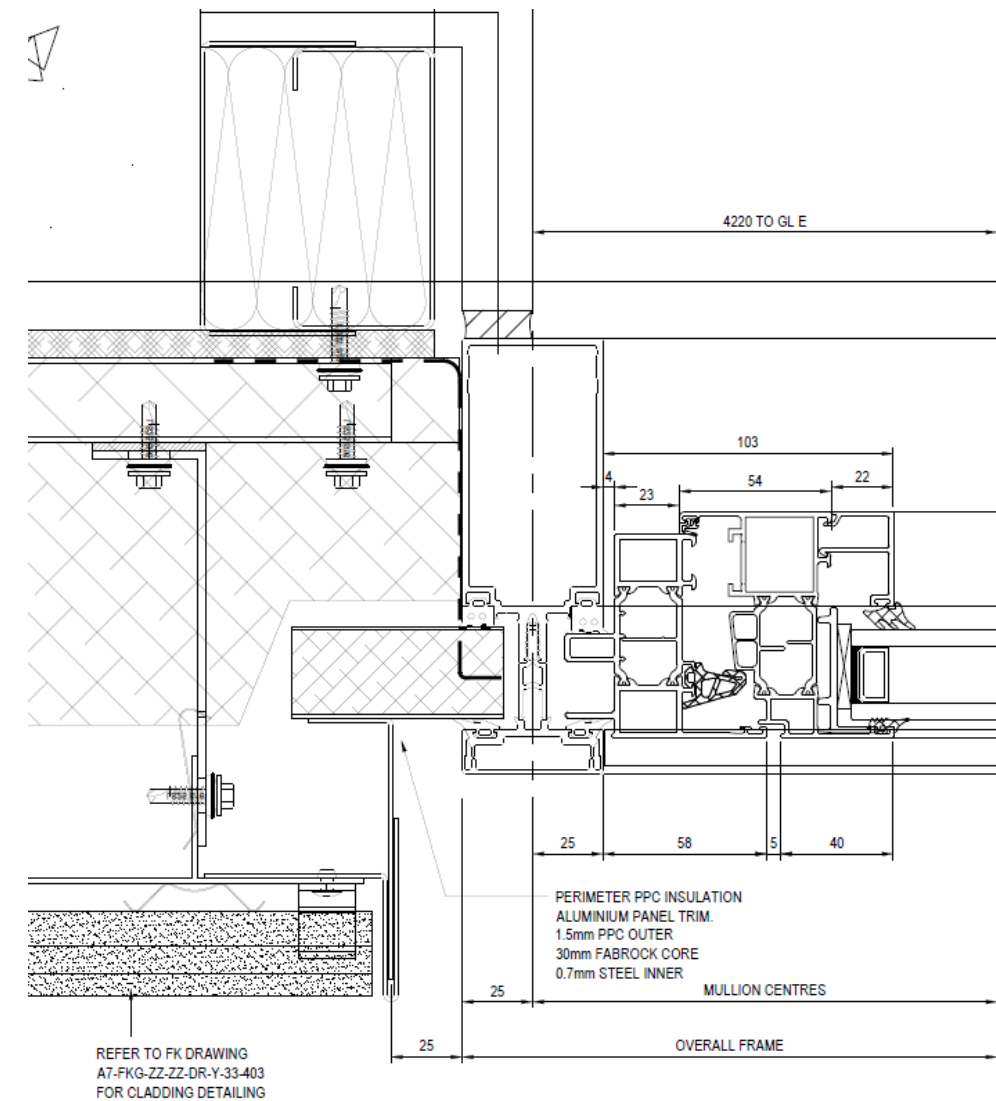
We will need to see evidence that the proposed facade systems can accommodate the building movement.

A copy of the structural engineers building movement and tolerance report must be issued to show that the façade can accommodate the movement imposed upon it.

Waterproofing

Waterproofing

EPDM seals from curtain wall should be coordinated with the final line of defense.



Waterproofing

Penetrations through the facade must be sealed correctly and water tested

- Solar shading supports
- Balcony supports
- Ducts
- Feature Fins
- Services



Testing

CWCT test sequence reports for all proposed curtain wall systems which cover:

- Air Permeability
- Water Penetration Static test
- Wind Resistance Serviceability
- Water Penetration Dynamic Fan
- Water Penetration Hose
- Wind Resistance Safety



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