



Studio Bell, Home of the National Music Centre A Building Envelope Case Study

Project Background

→ Terminology

- Studio Bell = The building
- The National Music Centre (NMC) = The building owner and occupant
- NMC used to be The Cantos Music Foundation (Cantos)

StudioBell

———— Home of the · Maison du ————



**National
Music
Centre**

**Centre
National
de Musique**

Project Background

- NMC conducted an international design competition, in July 2009 five architects were short-listed
- In September 2009 Allied Works Architecture were selected as the designers of Studio Bell



Project Background

→ Project Team

- Owner and building occupant – NMC
- Architect – Allied Works Architecture
- Local Architect - Kasian
- Project Manager - DukeEvans Inc.
- Structural Engineer - RJC
- Mechanical Engineer – SMP
- Electrical Engineer – Stantec
- Constructor – CANA
- Owner's Building Envelope Consultant – WSP
- Contractor's Building Envelope Consultant – Morrison Hershfield

Project Background

→ Project Timeline

- Design Competition – 2009
- Detailed Design – 2009 to 2014
- Construction – 2013 to 2016

→ Cost and Funding

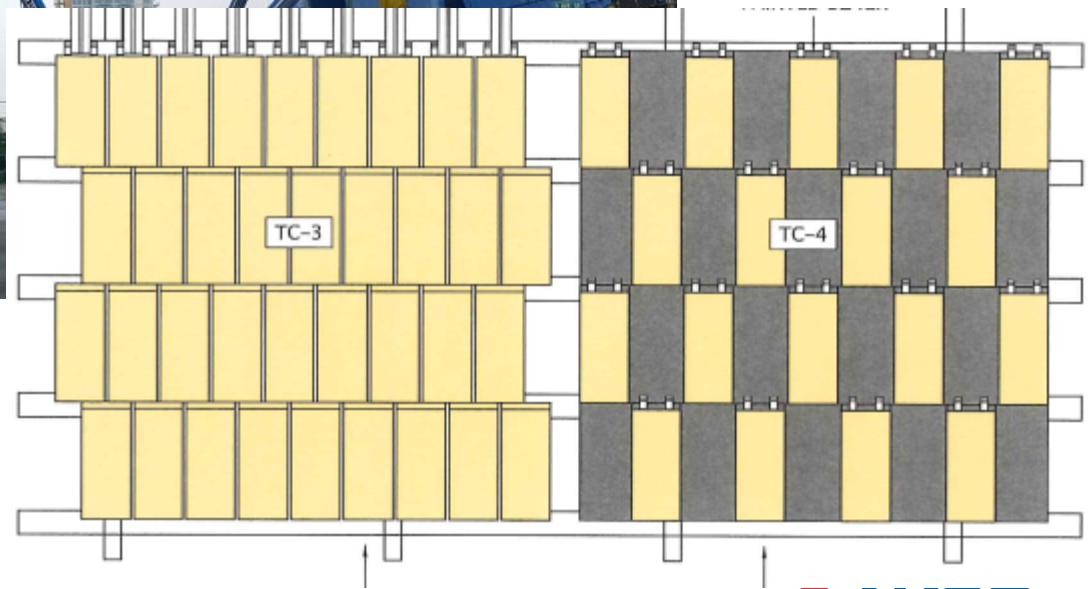
- Final Project Cost: \$191M
- Just over \$130M of funding secured to date from:
 - All levels of government
 - Private donations
 - Corporate donations and partnerships

Building Overview



Façade Systems Overview

→ Horizontally and vertically extruded terra cotta tiles



Façade Systems Overview

→ **Horizontally and vertically extruded terra cotta tiles**



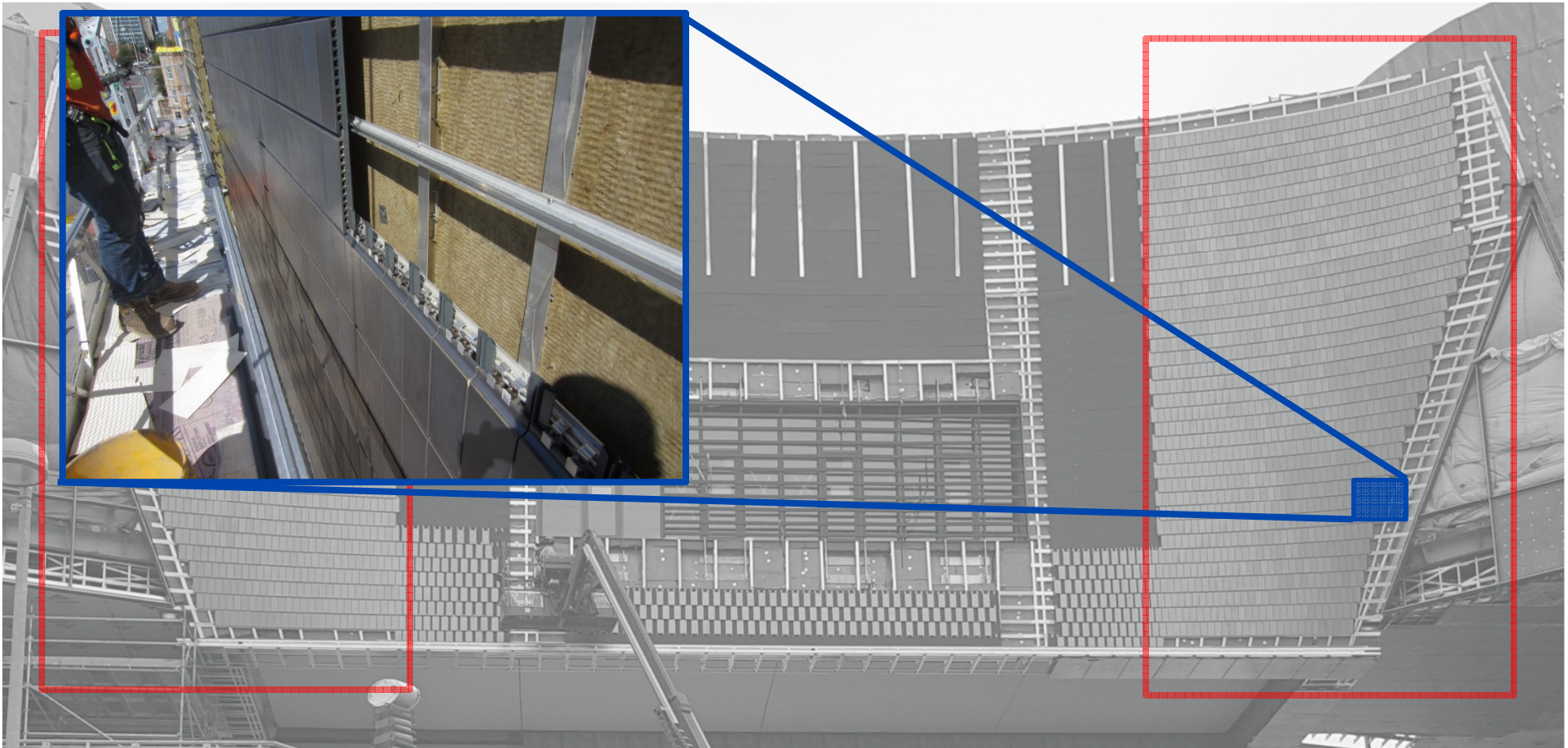
Façade Systems Overview

→ Solid Walls – Horizontally extruded terra cotta tiles



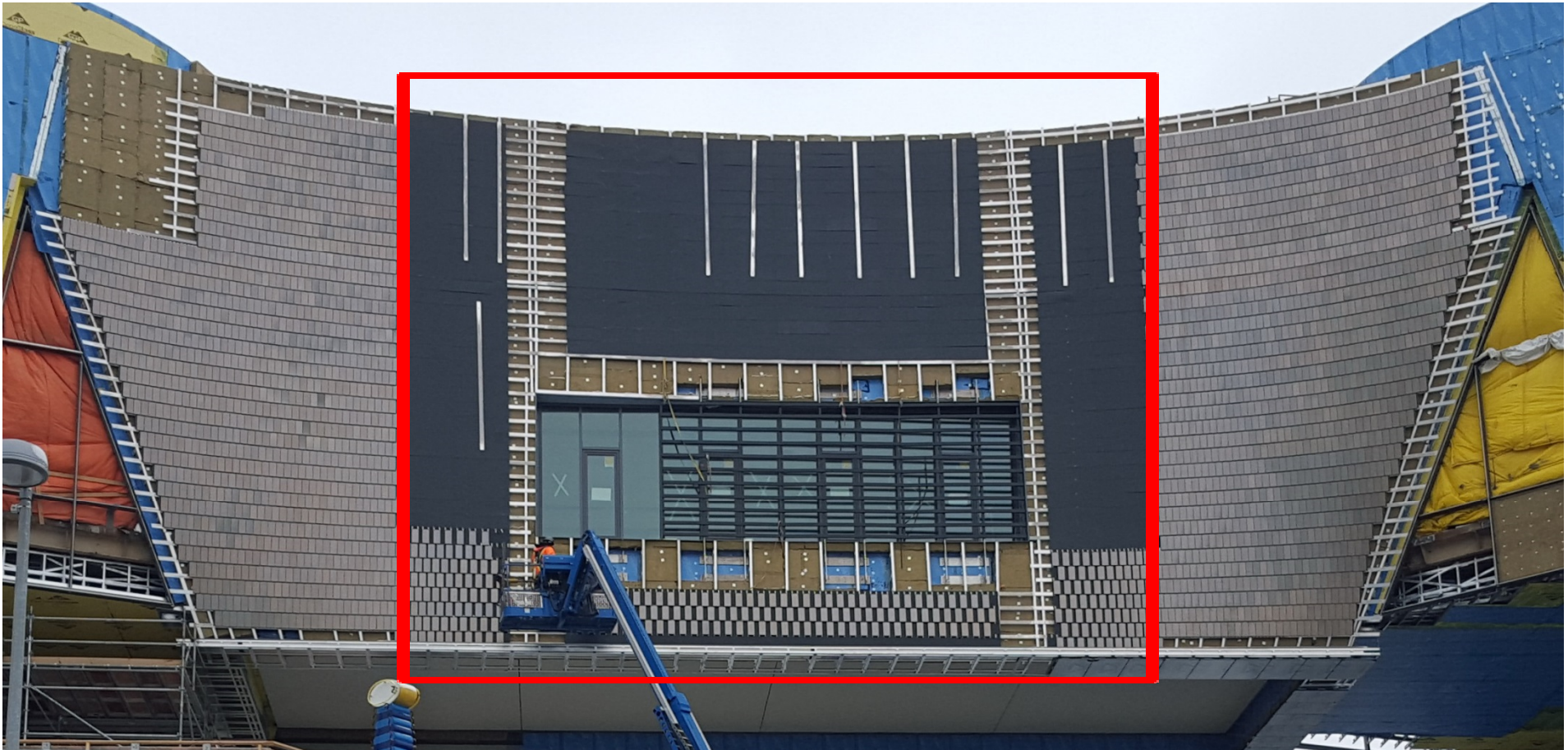
Façade Systems Overview

→ Solid Walls – Horizontally extruded terra cotta tiles



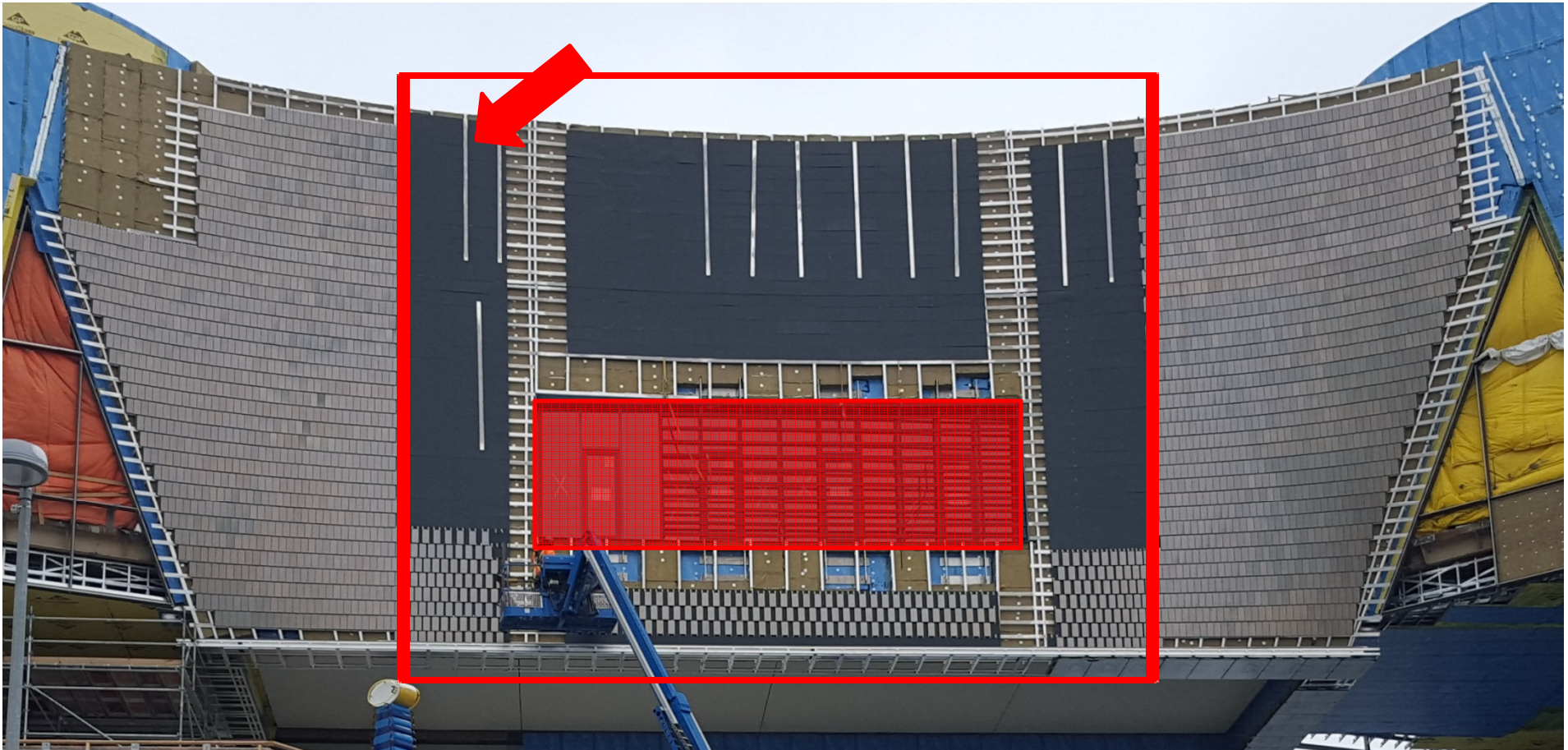
Façade Systems Overview

→ Screened Walls – Vertically extruded terra cotta tiles



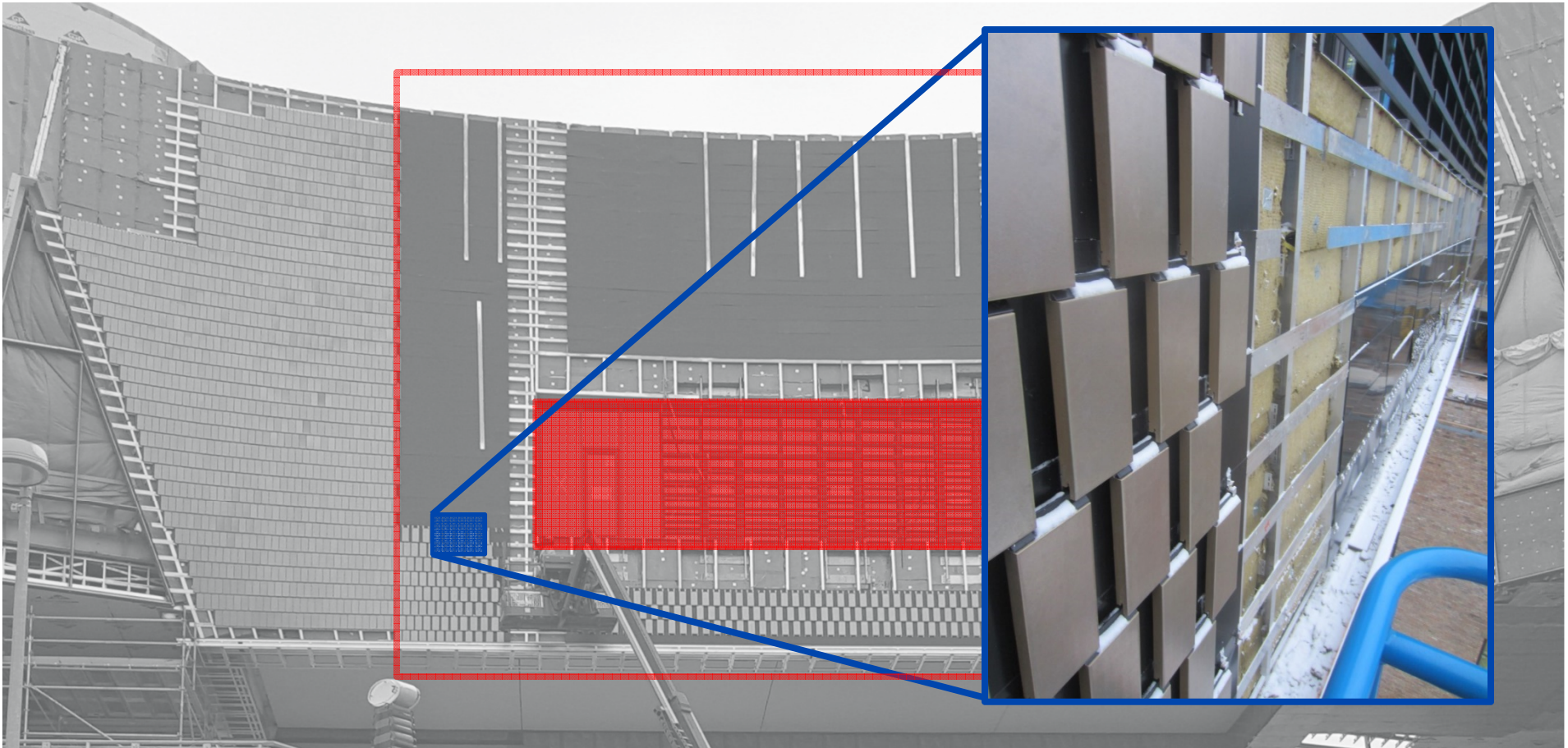
Façade Systems Overview

→ Screened Walls – Vertically extruded terra cotta tiles



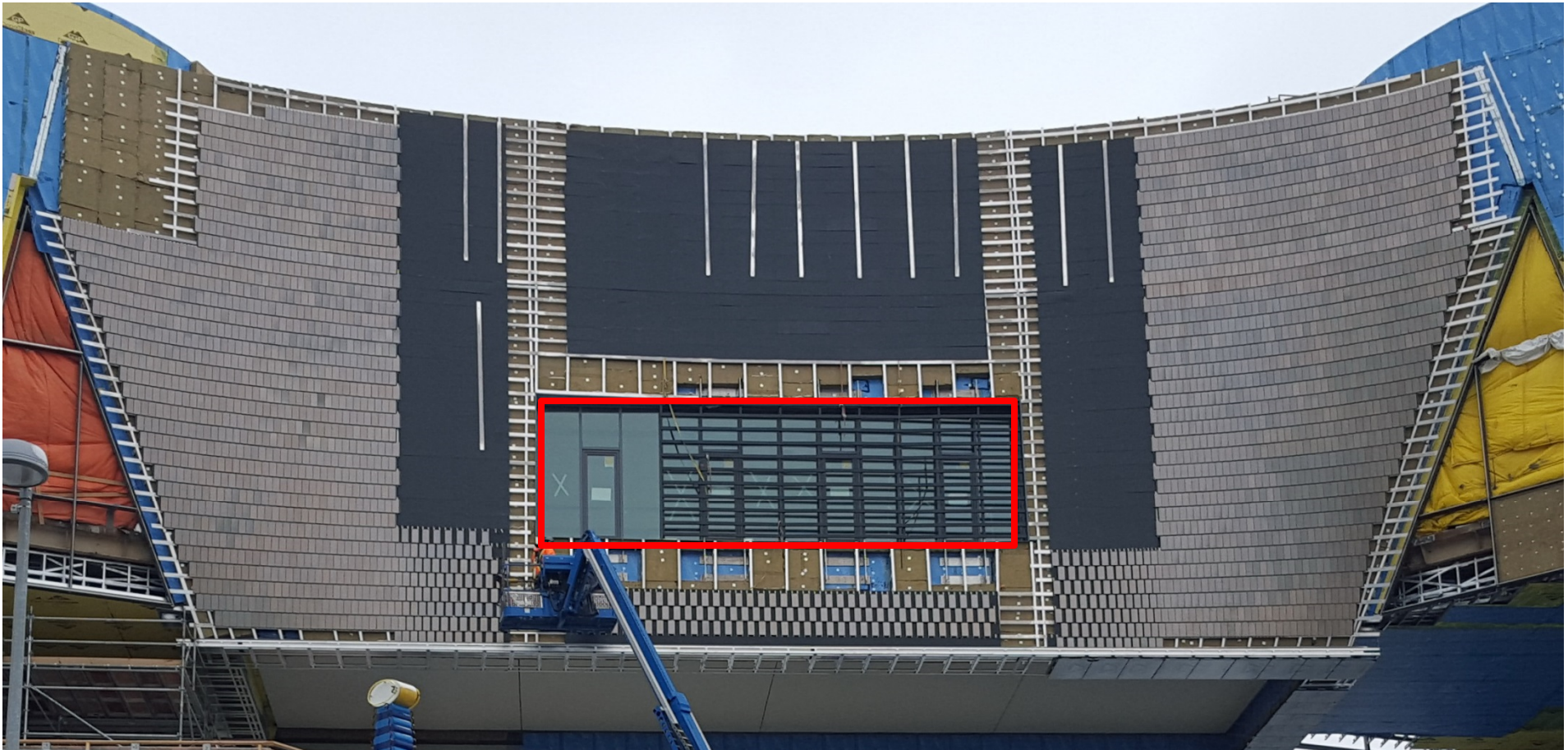
Façade Systems Overview

→ **Screened Walls – Vertically extruded terra cotta tiles**



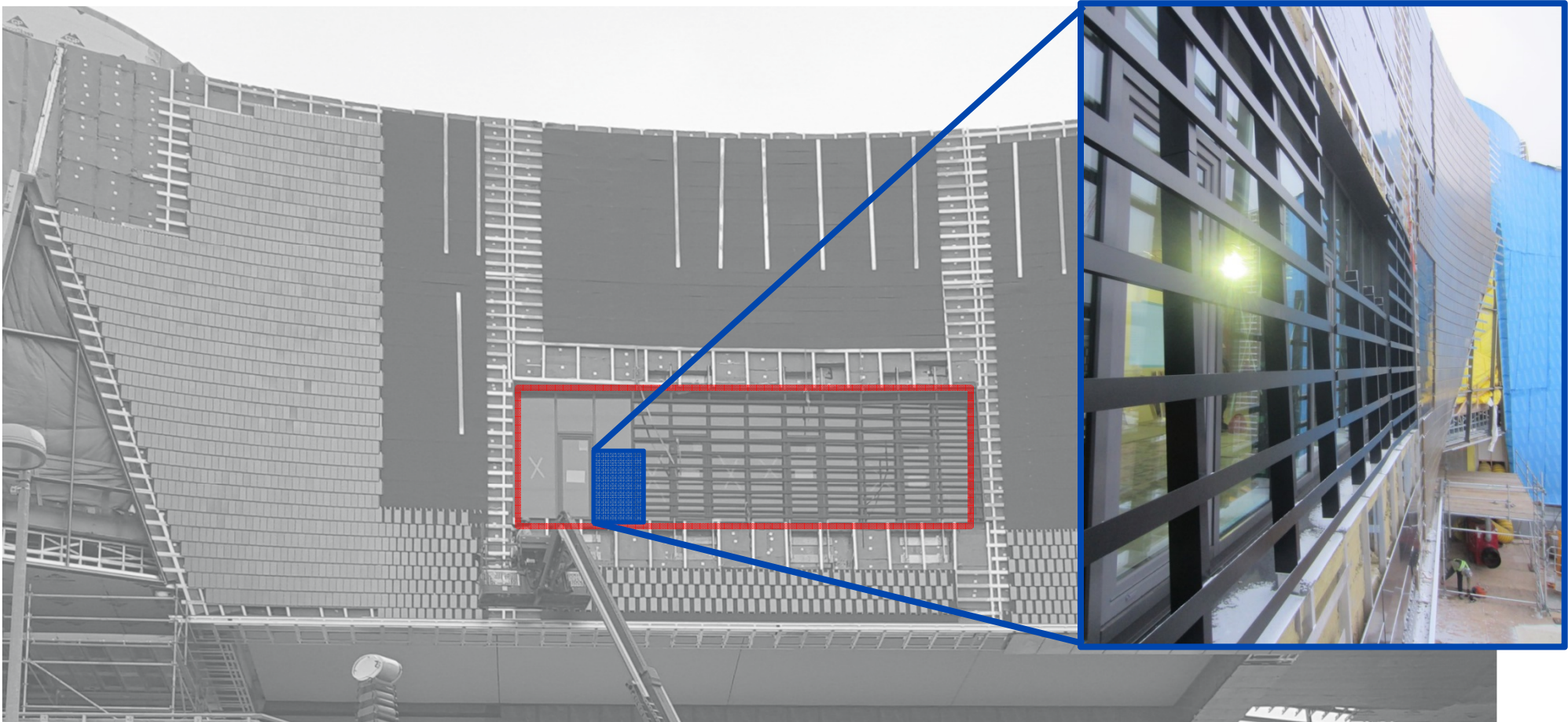
Façade Systems Overview

→ Screened Walls – Vertically extruded terra cotta tiles



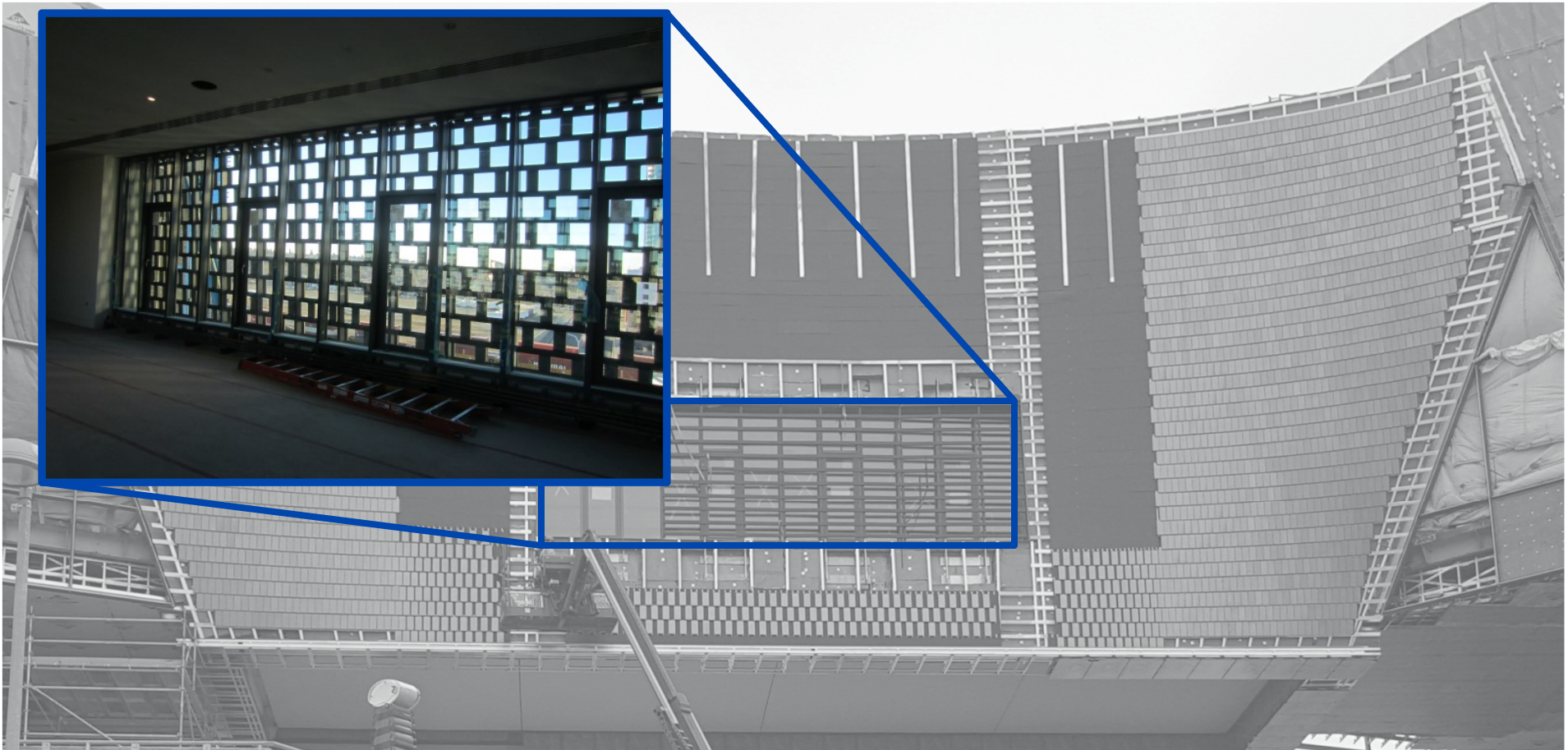
Façade Systems Overview

→ Screened Walls – Vertically extruded terra cotta tiles



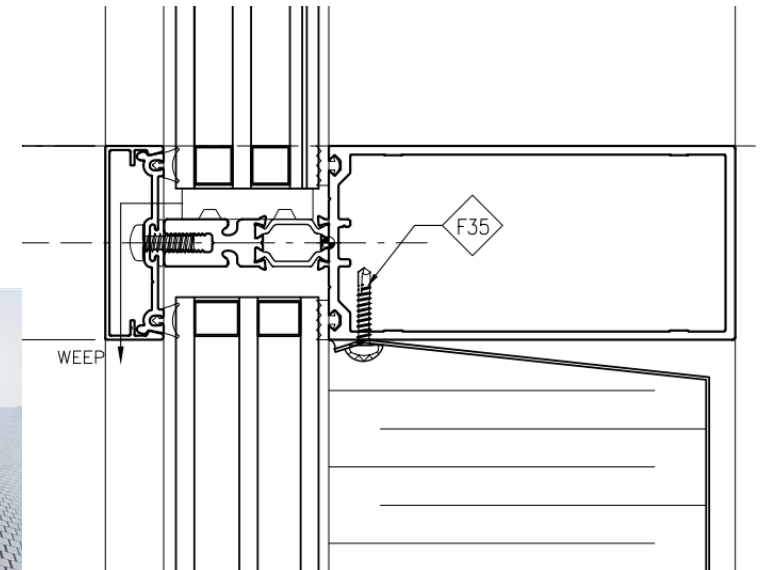
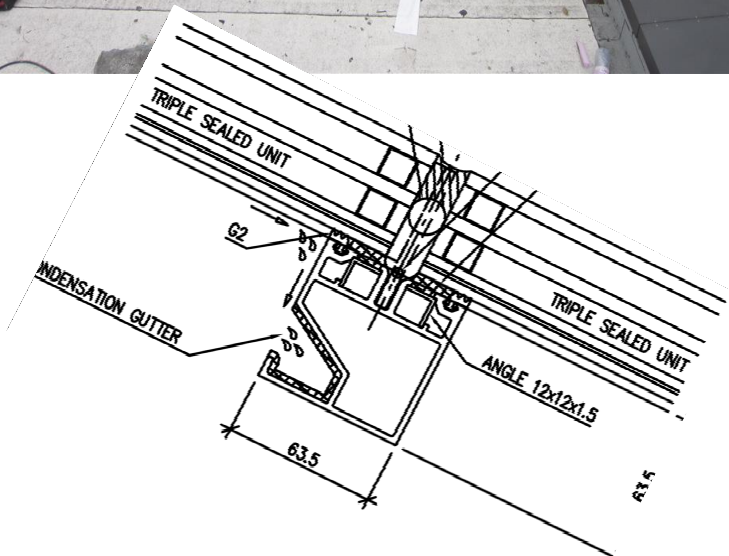
Façade Systems Overview

→ Screened Walls – Vertically extruded terra cotta tiles



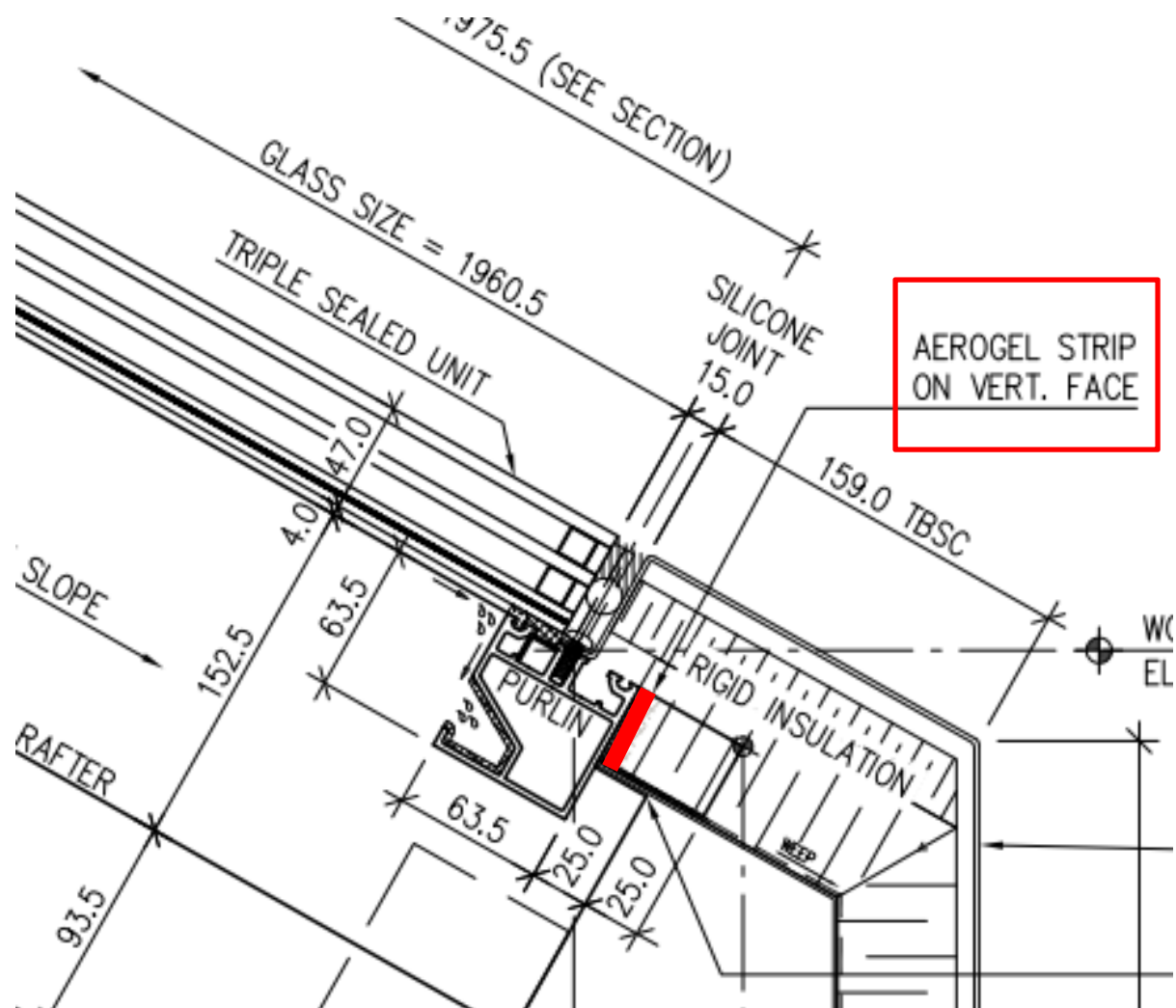
Façade Systems Overview

→ Glazing – Triple glazed curtain wall and skylights



Façade Systems Overview

→ Skylights



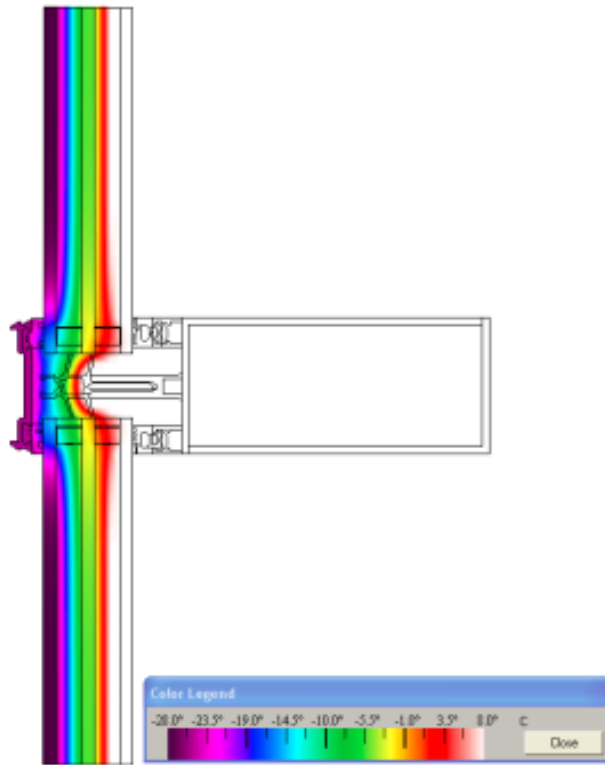
Design Parameters

→ Winter Exterior Design Temperature:

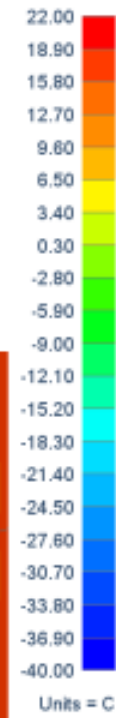
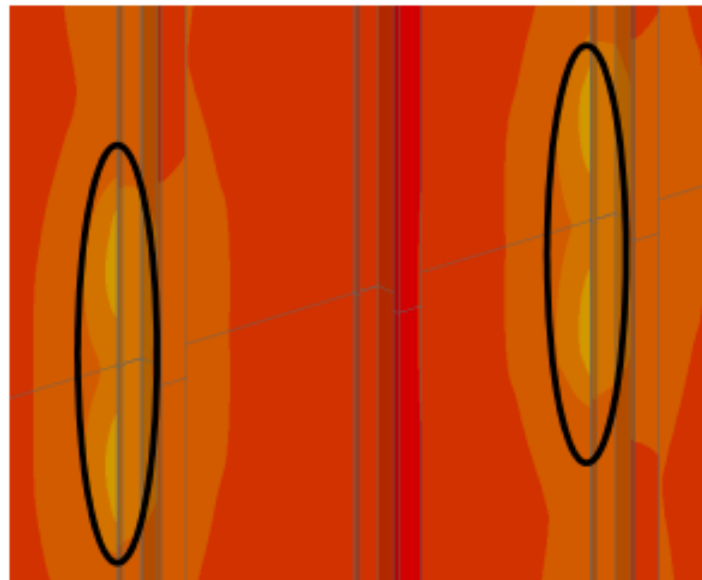
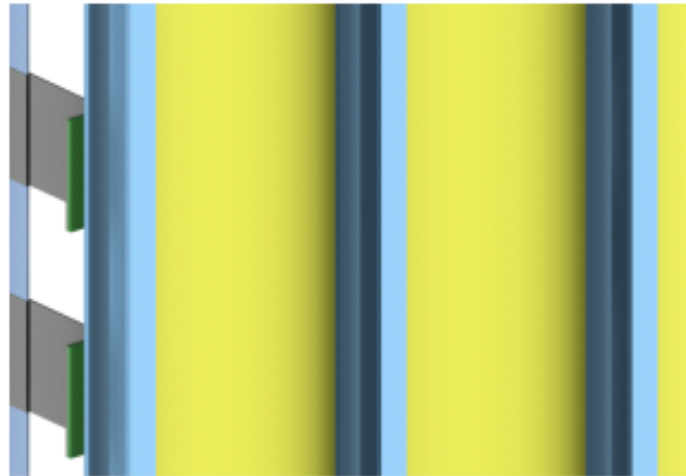
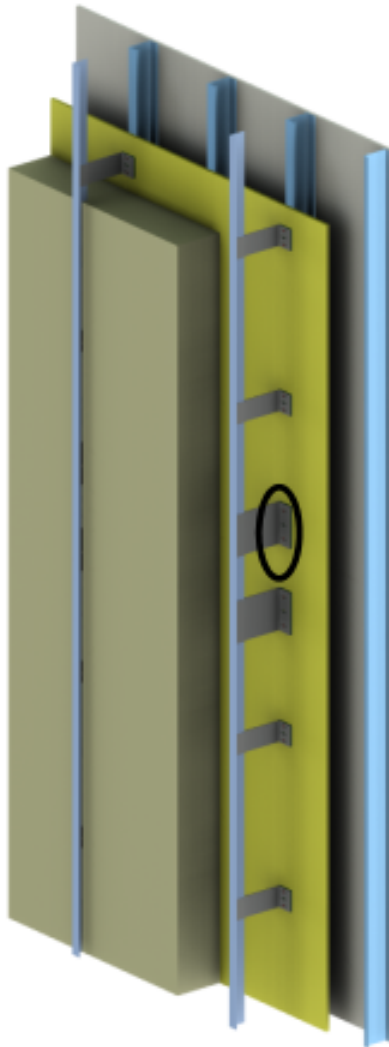
- -40°C (With special operating protocol)
- -30°C with no special procedures required

→ Winter Interior Design Parameters:

- 21°C +/-2°C
- 40%RH +/- 5%

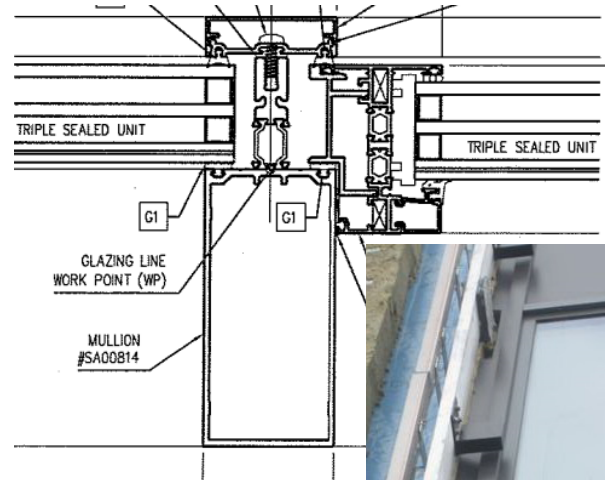
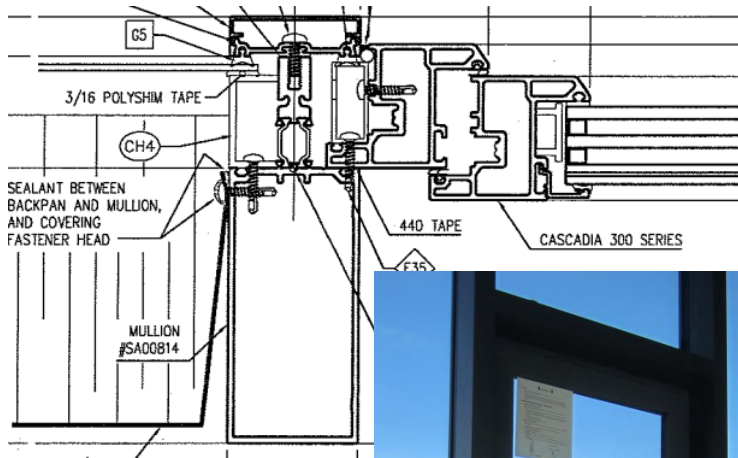


Design Parameters



Design Parameters

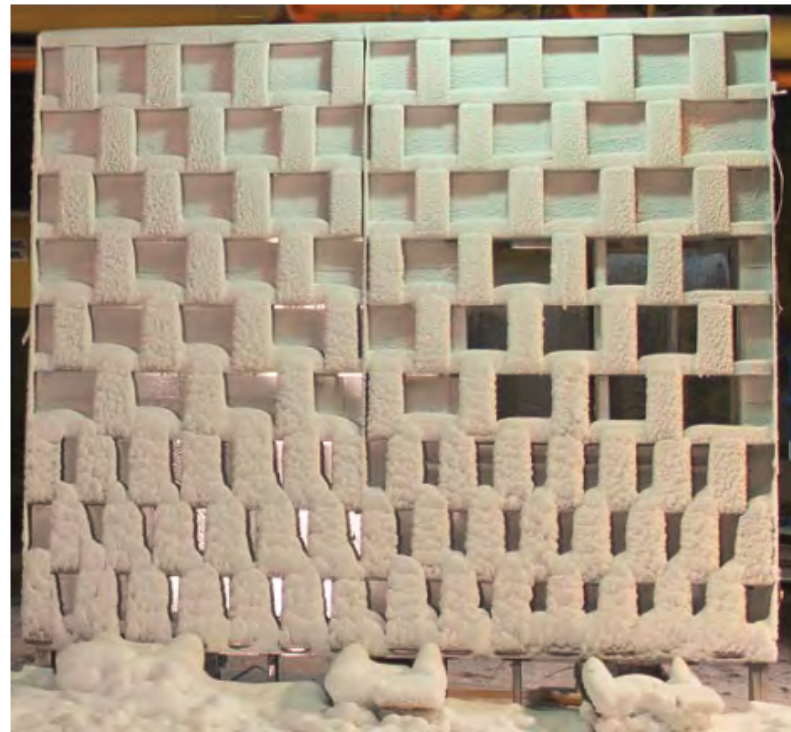
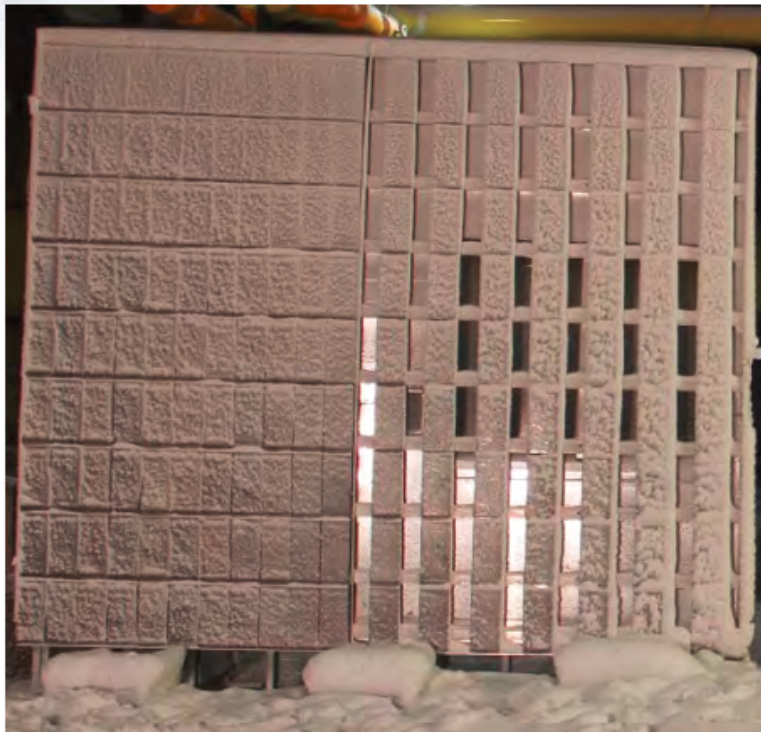
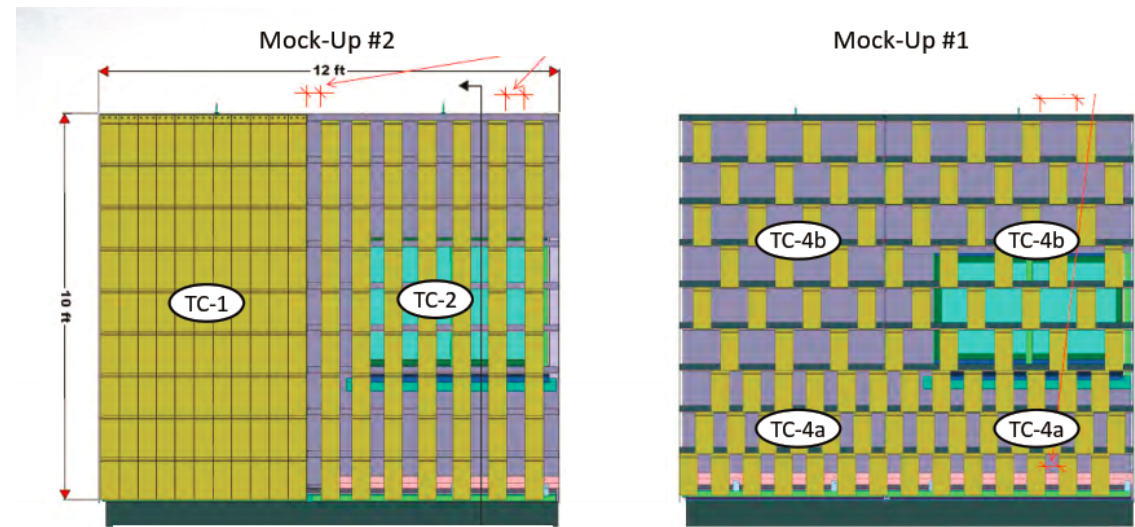
→ Access to curtain wall behind screens for cleaning + glass replacement



Design Parameters

→ Calgary weather

- Freeze thaw cycles
- Ice formation



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Construction Challenges



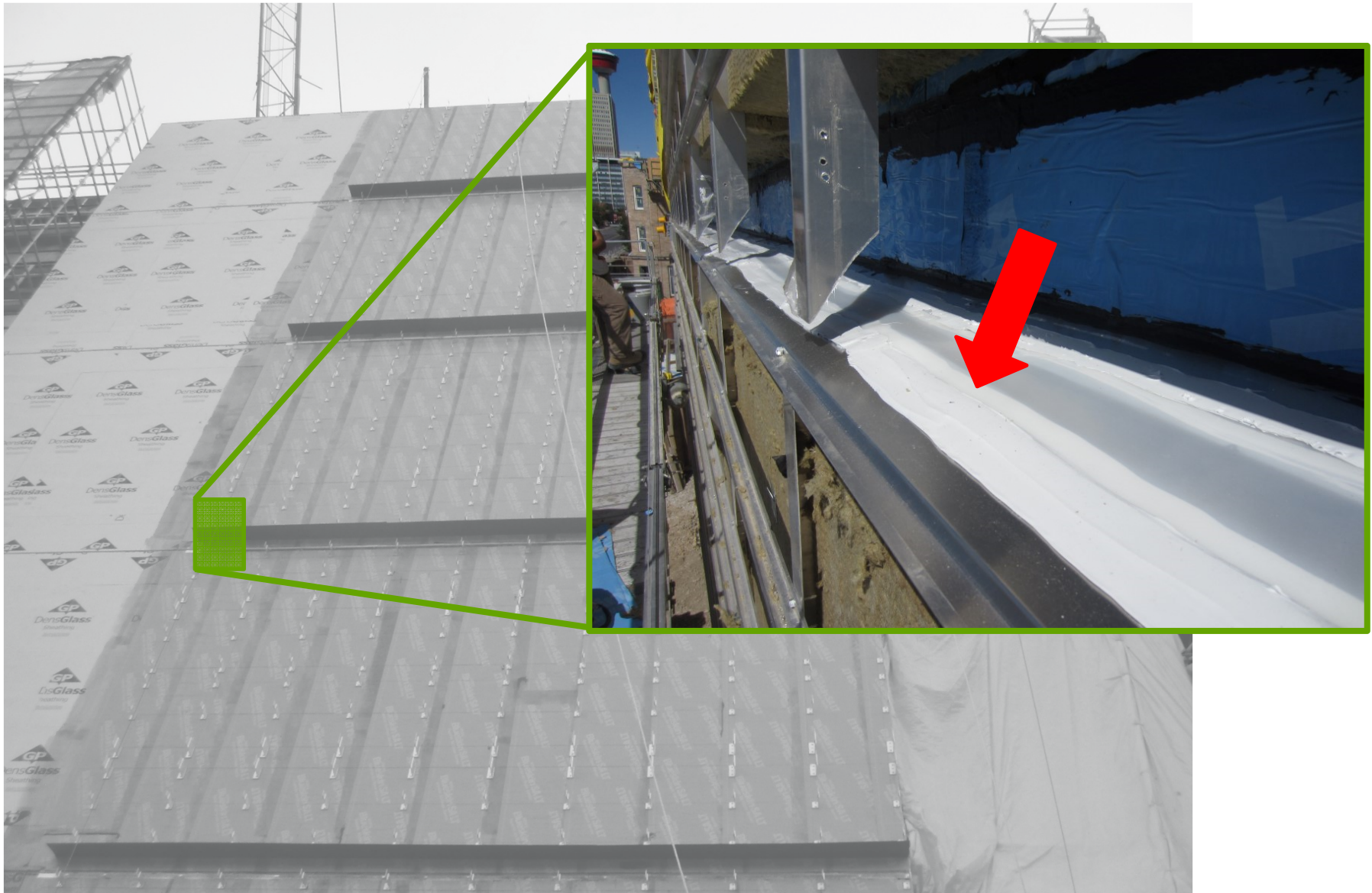
Material Compatibility and Manufacturers



Thermal Bridging



Thermal Bridging



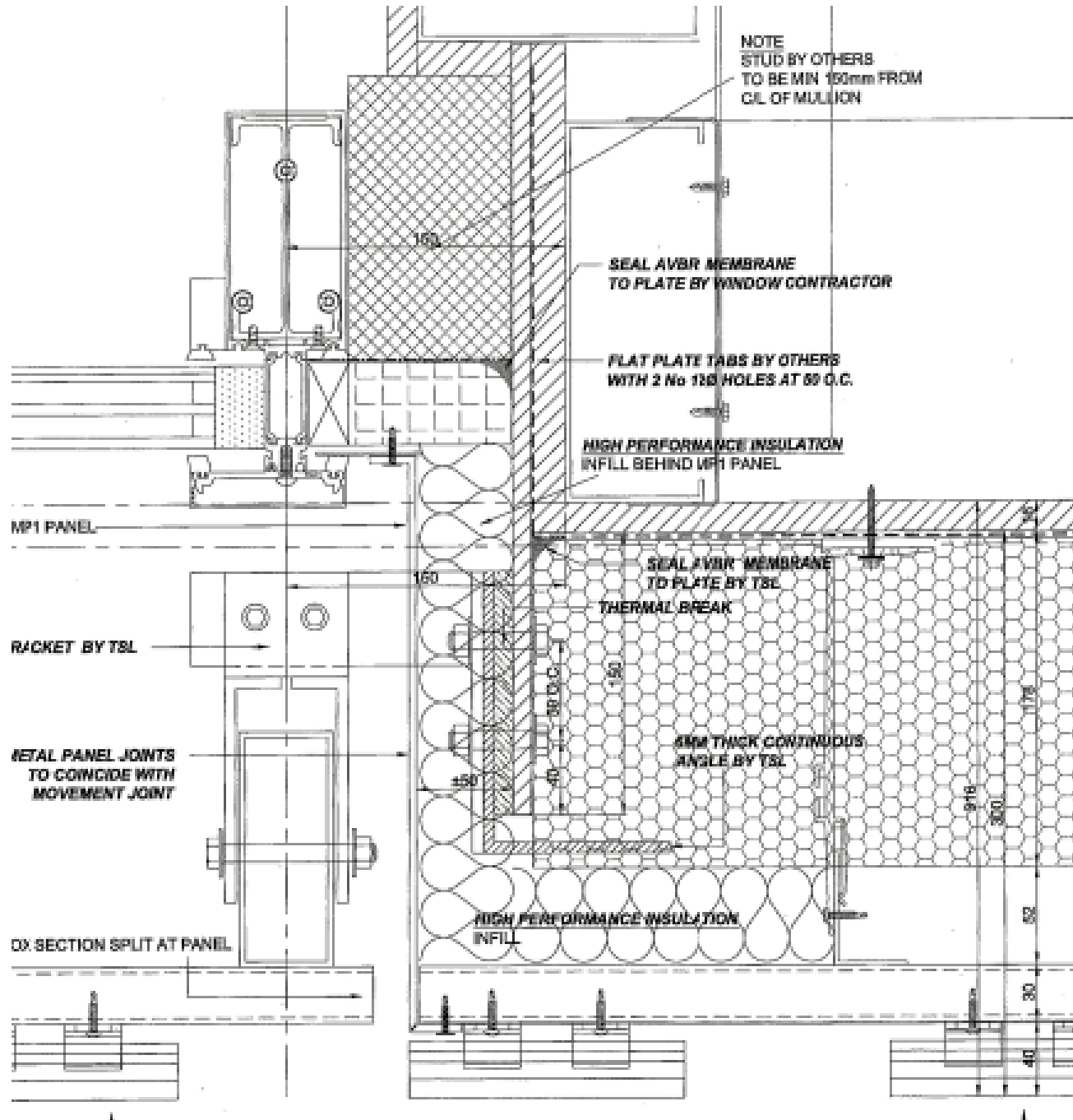
Thermal Bridging



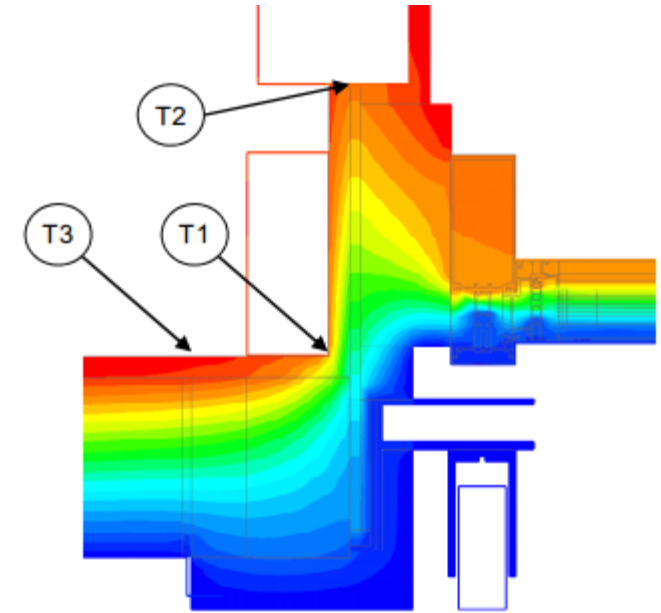
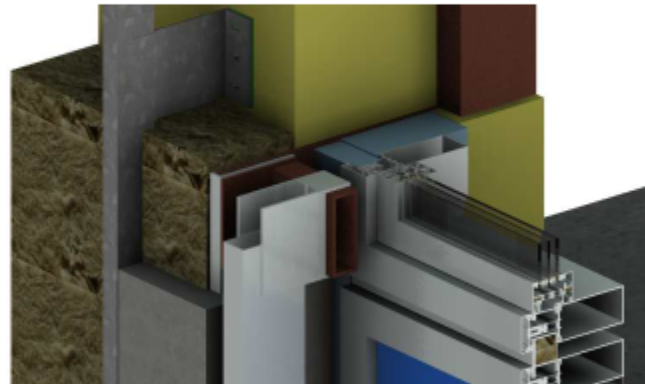
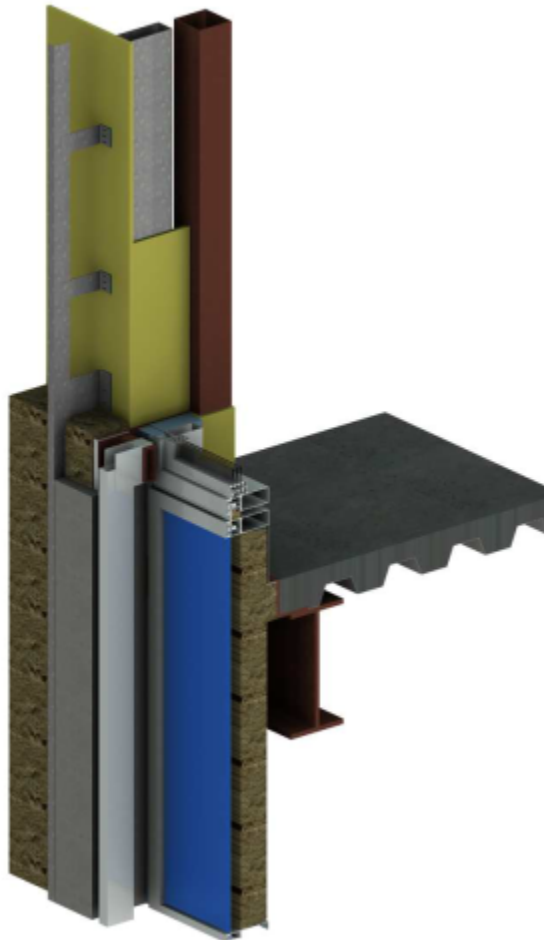
Thermal Bridging



Thermal Bridging



Thermal Bridging



Location	Interior Surface Temperature (°C)	
	Interior Surface Temperature (°C)	Allowable Relative Humidity at 21°C
T1 – Sheathing at Exterior Corner beside Bracket	7.9	43%
T2 – Sheathing at Bracket to HSS Post connection	14.3	66%
T3 – Sheathing Behind Cladding Clip System	8.0	43%

Thermal Bridging



Thermal Bridging





Skylights



Skylights



Skylights

