

# CURTAIN WALL AND OPAQUE FACADE SYSTEMS

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ARCH 2431  
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# Manufacturer 1

DRI-DESIGN Painted Aluminum Panels

# CASE STUDY - Ryerson University Canada



# Structure- Attachment

The panels are prefabricated and fasten to Z-GIRT, which is fasten to exterior sheathing.

The panels does not act as structure for the building nor help with the load.

The panels rely on the structure of the building in order for them to function as intended.

Panels are put up from left to right, then bottom to top.

<https://youtu.be/HQGPdfbsXE?t=22>  
<https://vimeo.com/330088538#t=20s>

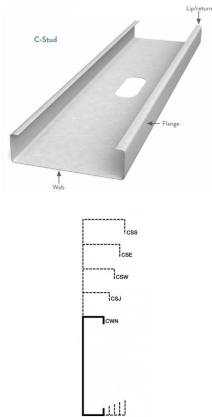


# Structure- Attachment

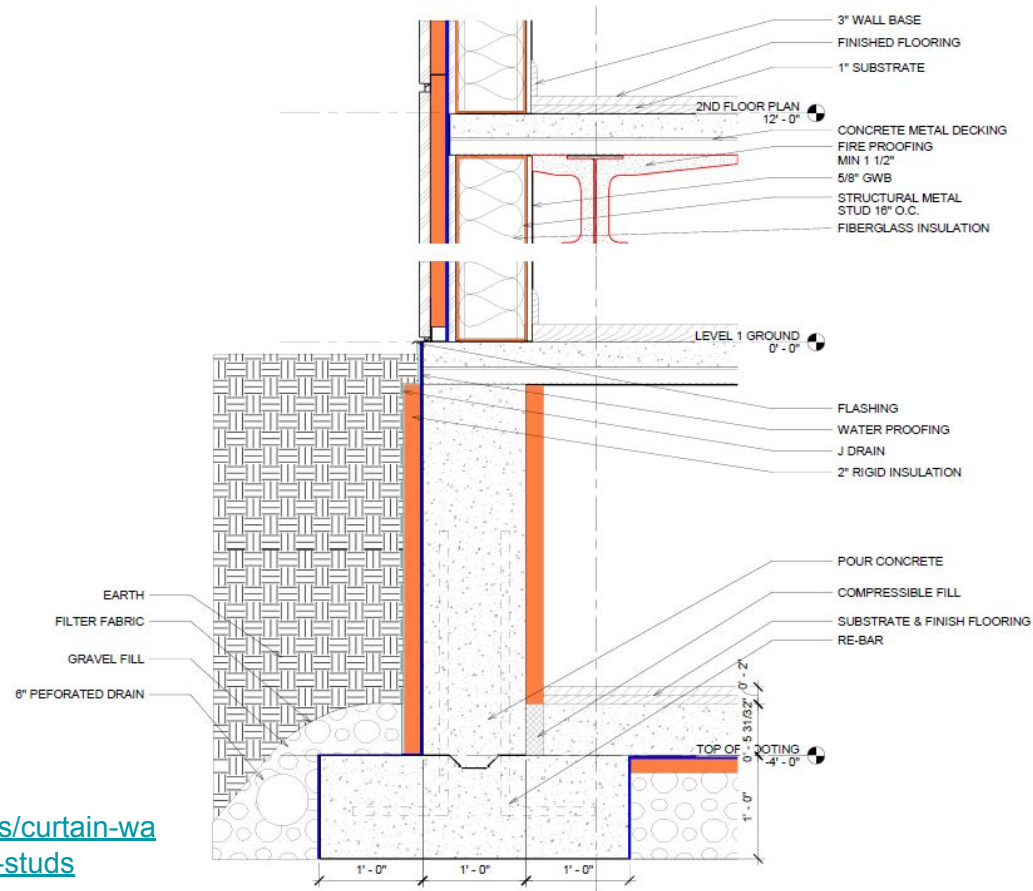
Our primary structure contain steel column, corrugated metal deck and structure metal studs.

CMU on the parapet.

Cast in place concrete on the foundation



<https://www.clarkdietrich.com/products/curtain-wall-and-load-bearing-framing/structural-studs>



# Thermal- Resistance, Insulate, Thermal Bridges



Just like the structure, the panels do not help with maintaining the heat.

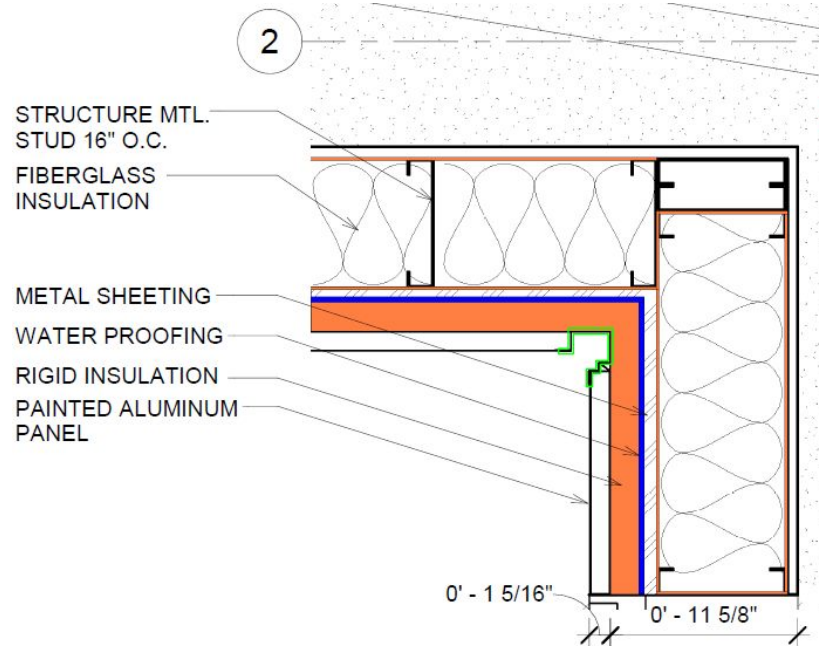
Some of the panels even come with holes as decoration if requested. Although the addition of the foam helps with sealing the air, it is more for stabilizing the panels.

Here is where we see large thermal bridges occurring. Building requires good insulation materials in order to prevent the leakage of energy.



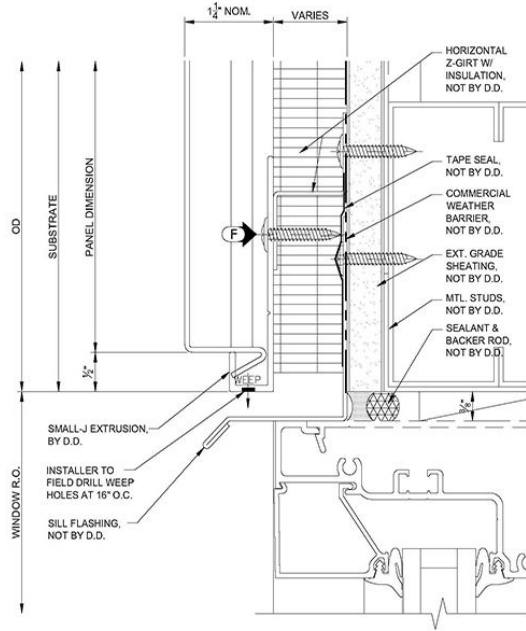
<https://www.owenscorning.com/insulation/products/ecotouch>

# Thermal- Resistance, Insulate, Thermal Bridges



<https://www.owenscorning.com/insulation/products/foamular-250>

# Waterproofing



Since the panels are put up like a puzzle pieces, water can easily get through the seams.

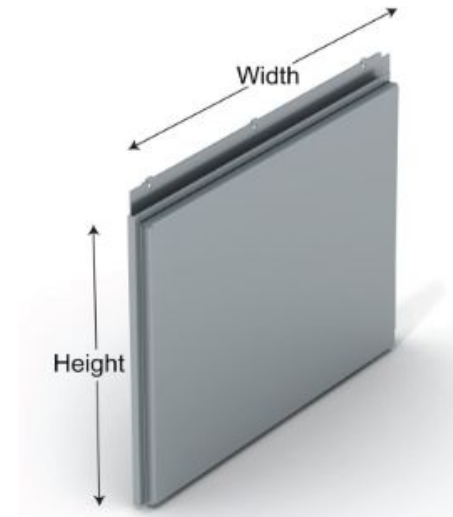
Adequate water proofing materials should apply all over.

Flashing is also a big part of the assembly; we need to guide the water away from the wall system.

The panels only act as final finishing

<https://youtu.be/HQGPrdfbsXE?t=22>

<https://vimeo.com/330088538#t=20s>



# Waterproofing



<https://gcpat.com/en/solutions/products/bituthene-post-applied-waterproofing#overview>

# Fireproofing

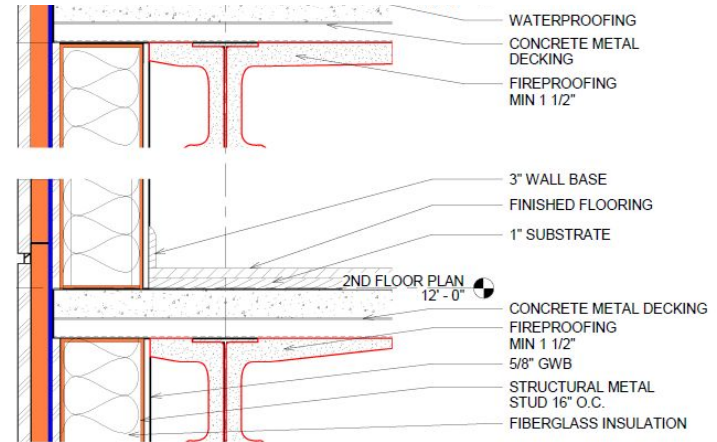
Cementitious fireproofing spray on

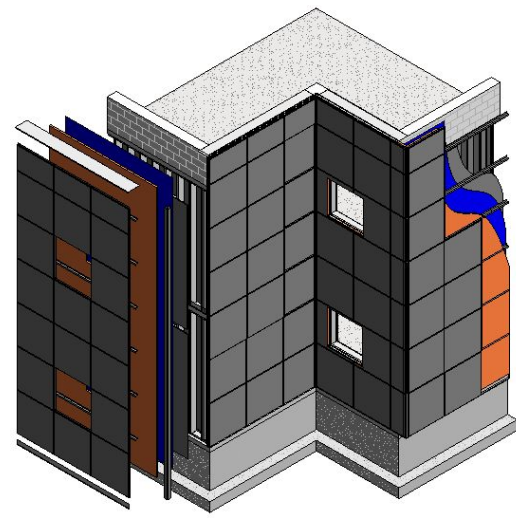
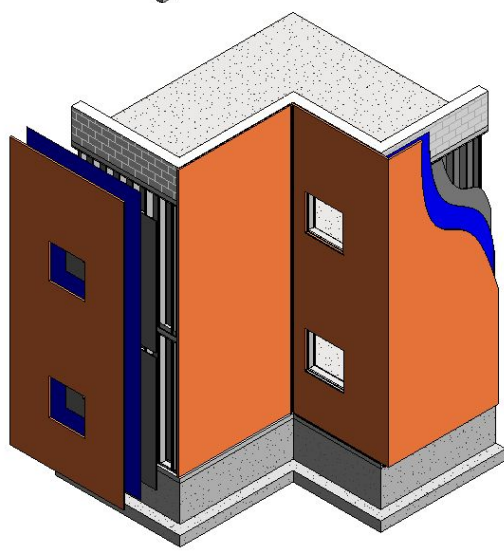
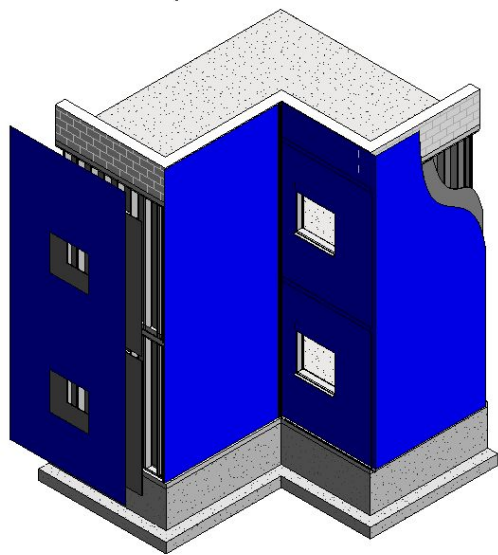
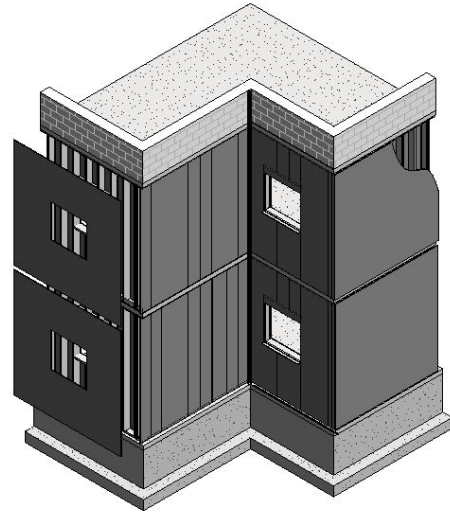
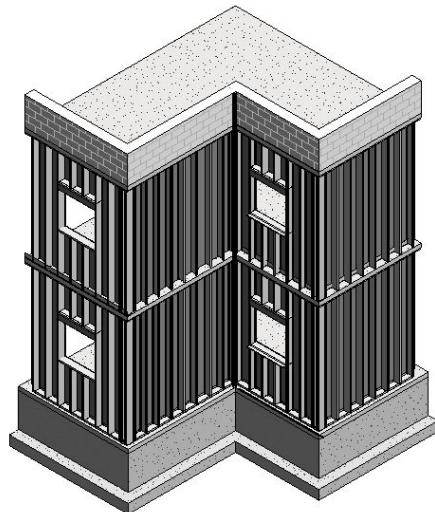
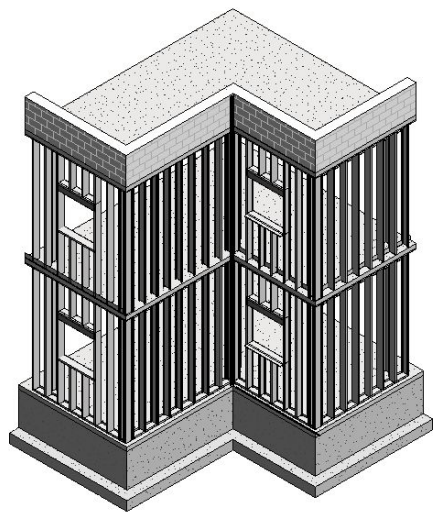
Portland cement-based material that is batched onsite and spray applied, it is mainly used to provide fire protection to structural steel members, but some time can also be used to protect structural concrete.

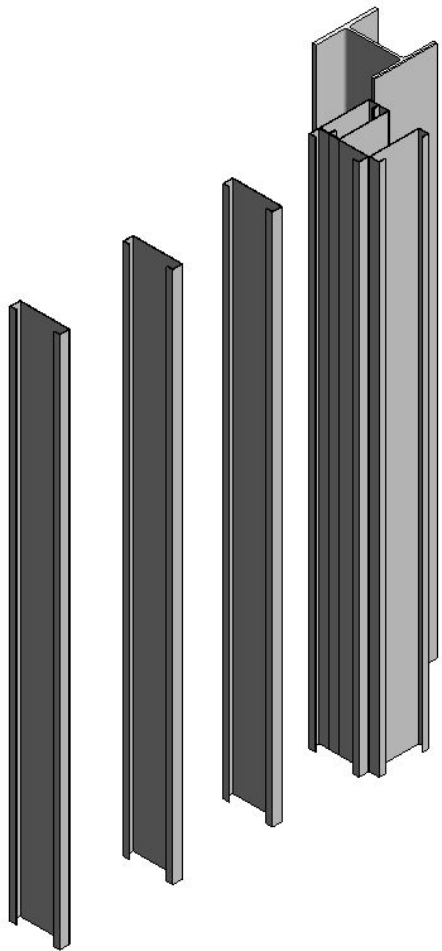


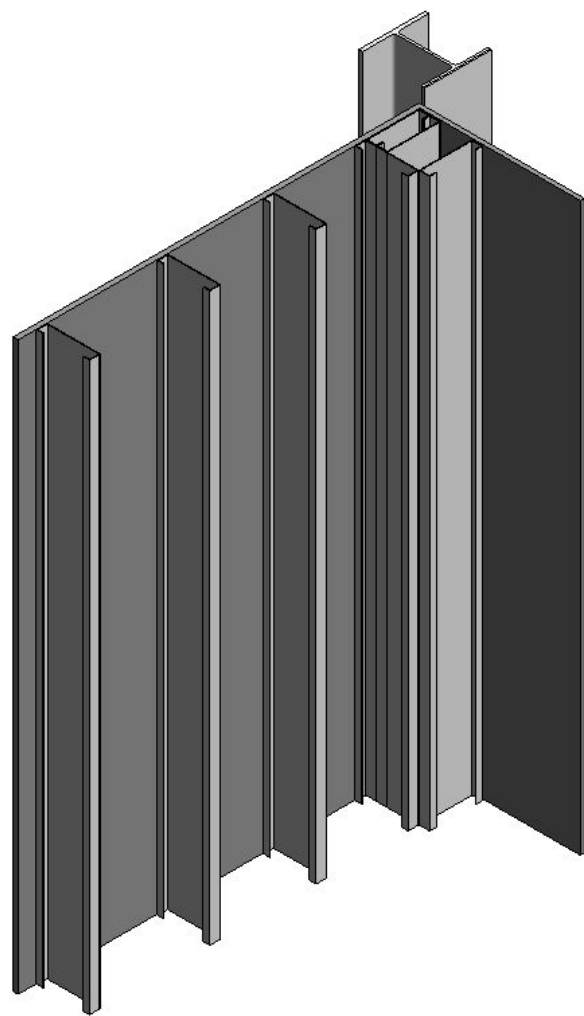
<http://www.narangprojects.com/fireproof>

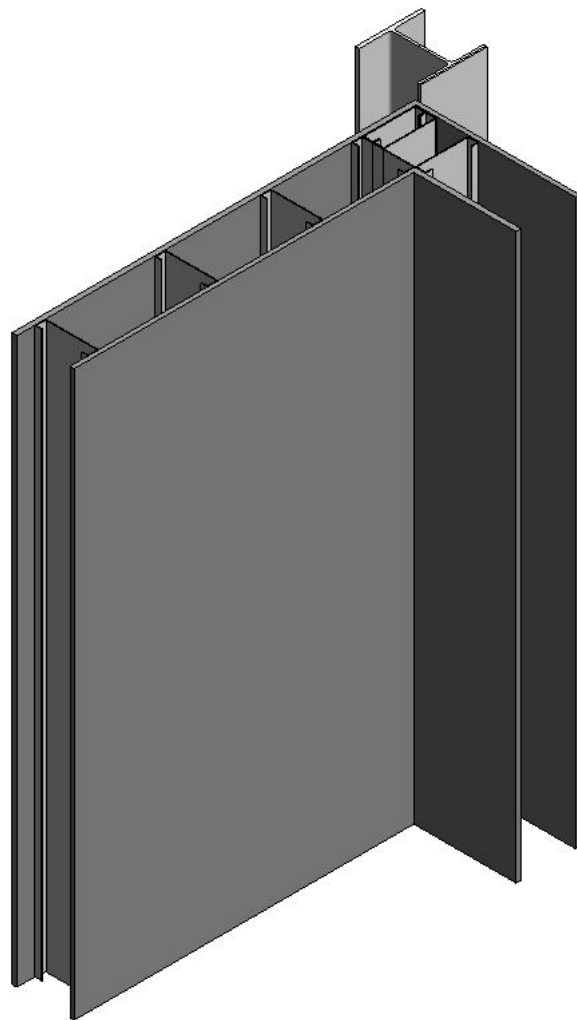
<https://westproconstruction.com/products/spray-applied-fireproofing/>

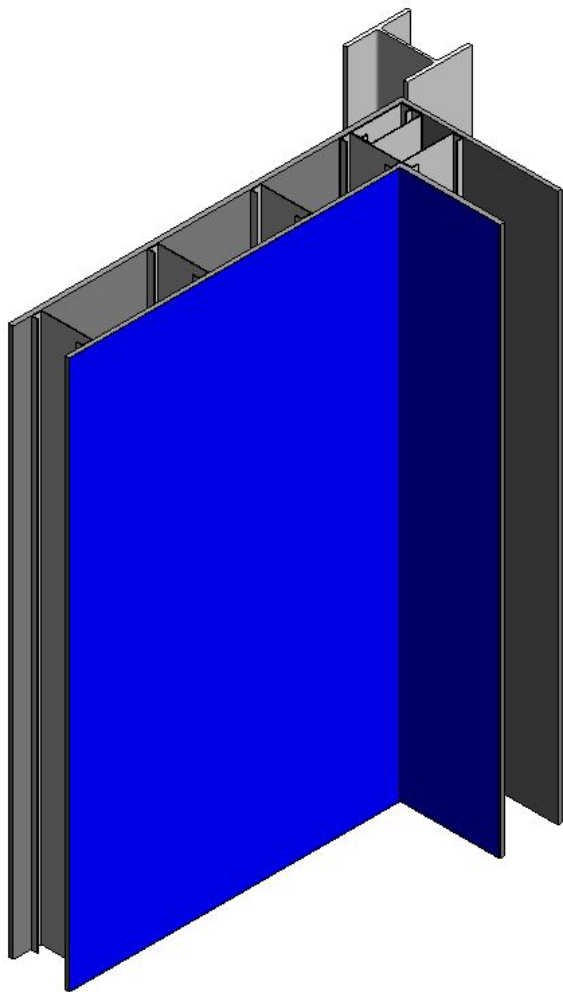


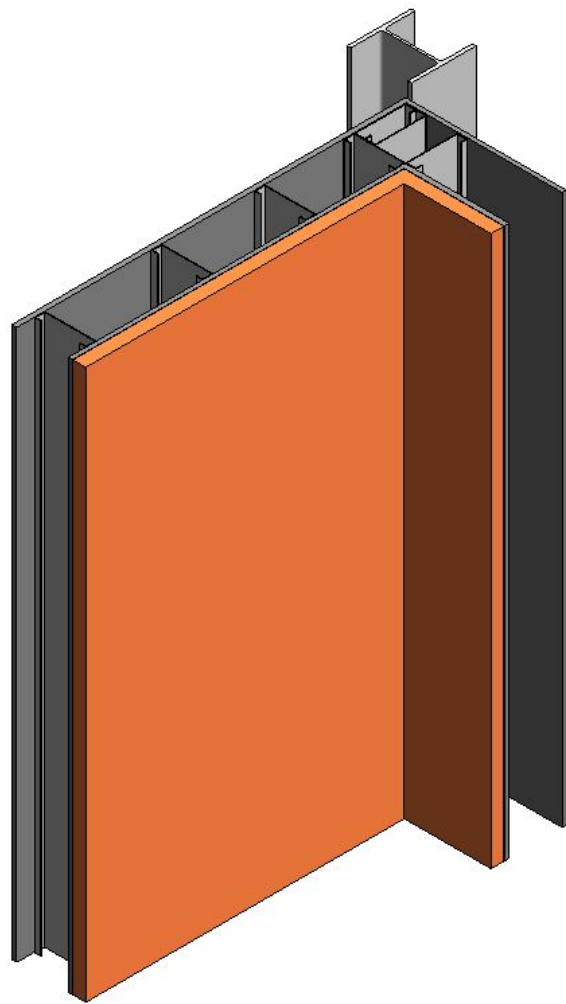


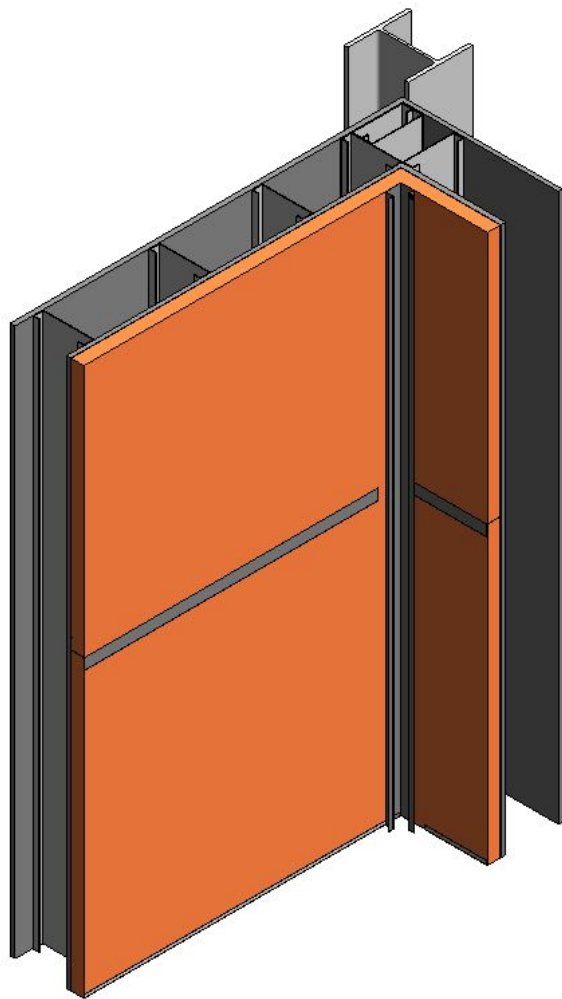


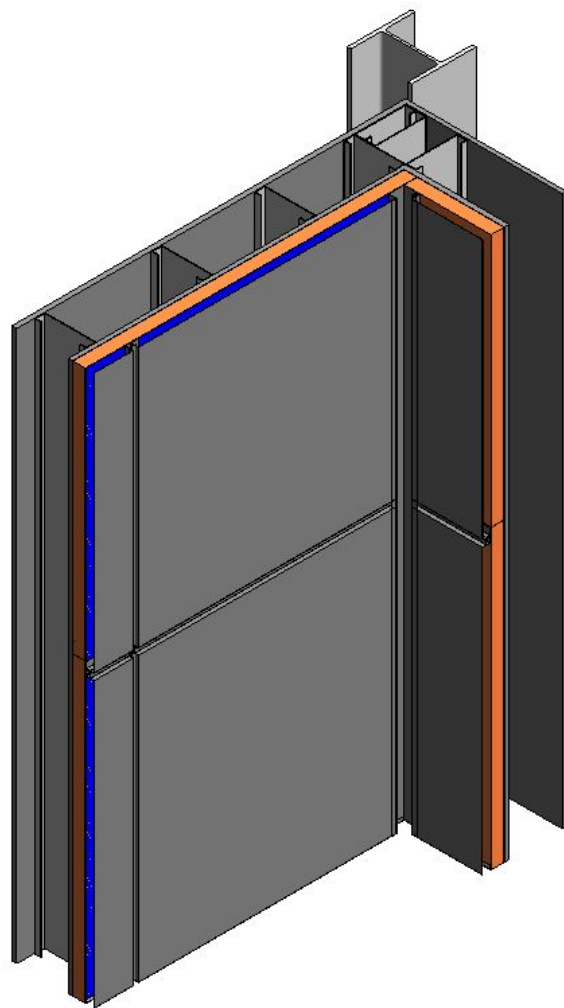












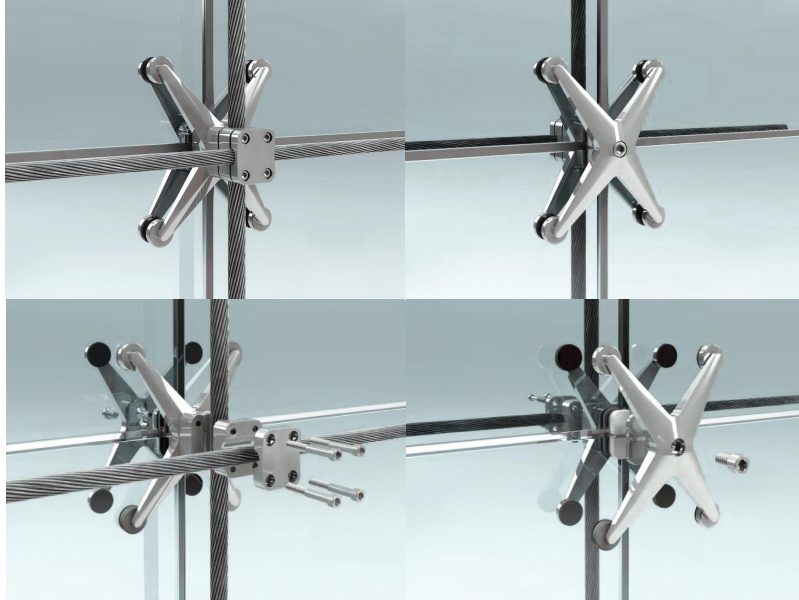
# Manufacturer 2

SENTECH Architectural System

# CASE STUDY - One World Trade Center



# Structure- Attachment



Stainless steel tension cables or rods that are pre-tensioned from the structure act as support for the laminated glasses.

VetraNet B-Series fittings (Spiders) are secure onto the tension cable trough series of screws and clamps as indicated on the images on the left.

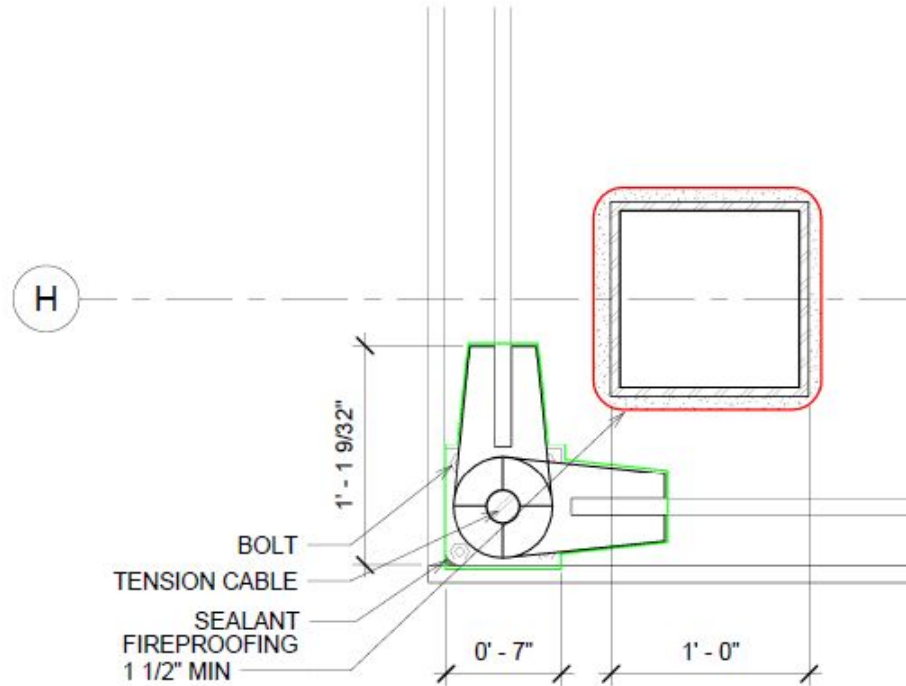
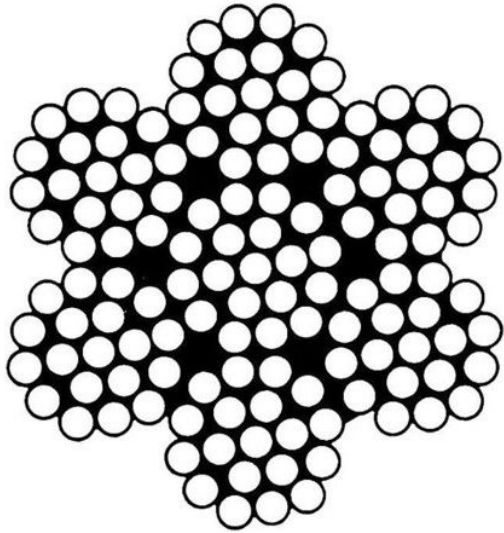
This system is used for walls up to 100' tall in two-way cable configurations, and walls up to 60' tall in one-way cable arrangements.

Vertical loads are resisted through these spiders, which pass the forces into the vertical cables to the base of the structure.

<https://www.sentechas.com/product/vetranet-b-series/>

<https://youtu.be/PDXGs5dGxXE?t=7>

# Structure- Attachment



# Thermal- Resistance, Insulate, Thermal Bridges

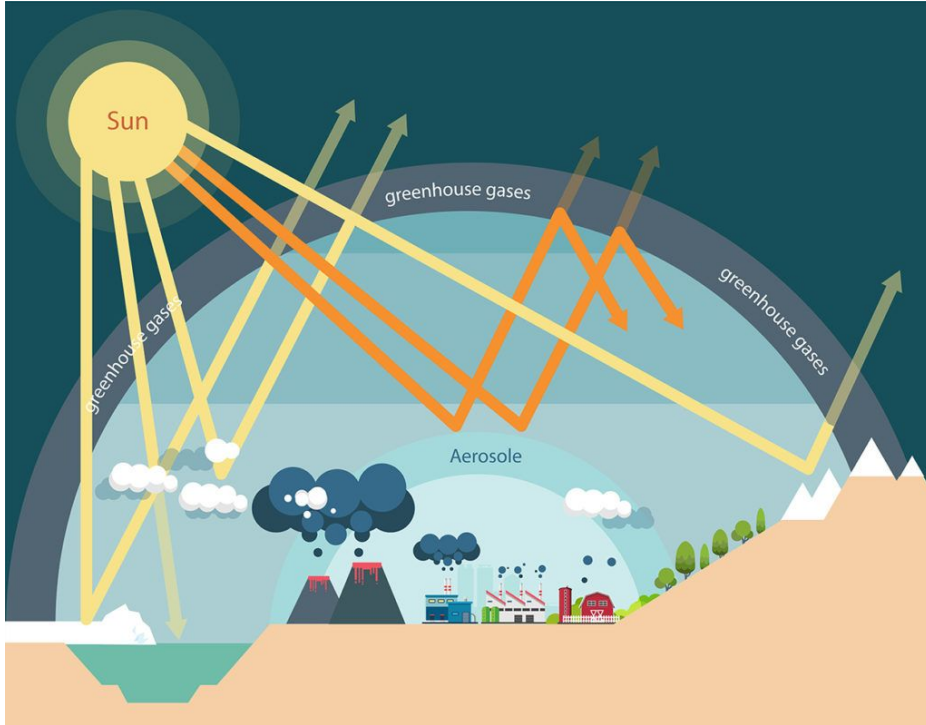


The curtain wall act as greenhouse and warm up the leaving space. The sunlight heat up objects and they give off heat in a form of long-wavelength.

The position of the curtain wall need to be well thought off and ventilation system need to be suitable in order to avoid overheating.

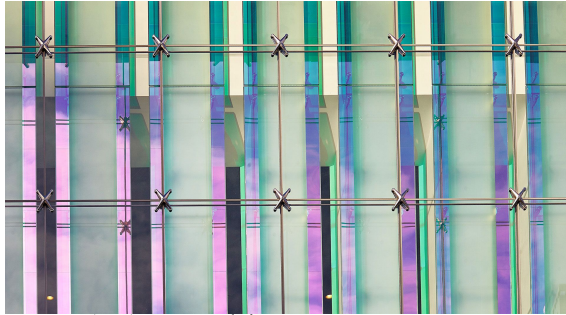
Glass can be tinted to desirable color to help with the heat gain.

# Thermal- Resistance, Insulate, Thermal Bridges



<https://www.coolaustralia.org/the-greenhouse-effect-secondary/>

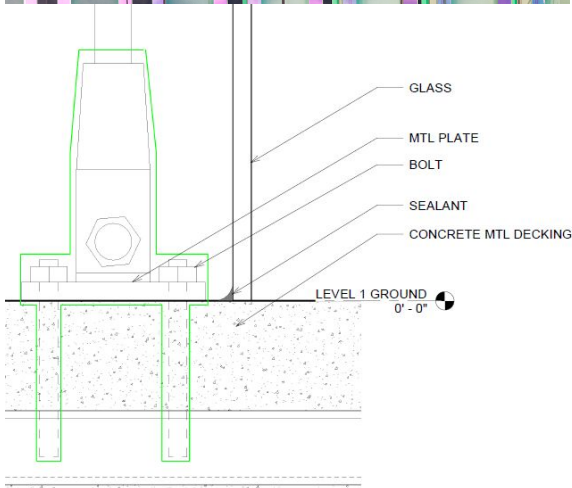
# Waterproof



Plugs and seals at gaps between screw and mullion intersections must be continuously and perfectly seal to create air and water tight.

Even with all the preparation, water can still be force through the seams due to pressure difference.

Equalizing the pressure is the key to reduce the water penetration or else the water needed to be manually wipe down or dripped down along the glass.



Water can be guide through the weep hole.

# Fireproofing

## Intumescent fireproofing

It is a spray applied coating that swells and expands from the exposure of the heat.

It provide clean, smooth surface.

Fire rating ranging from 1 - 4 hour.

One 5 gallons bucket cost about \$300 depending on the manufacturer. It cover about 1,155 cubic inches in volume.

<https://youtu.be/JQUPUoECjtc?t=4>



<https://westproconstruction.com/products/spray-applied-fireproofing/>

