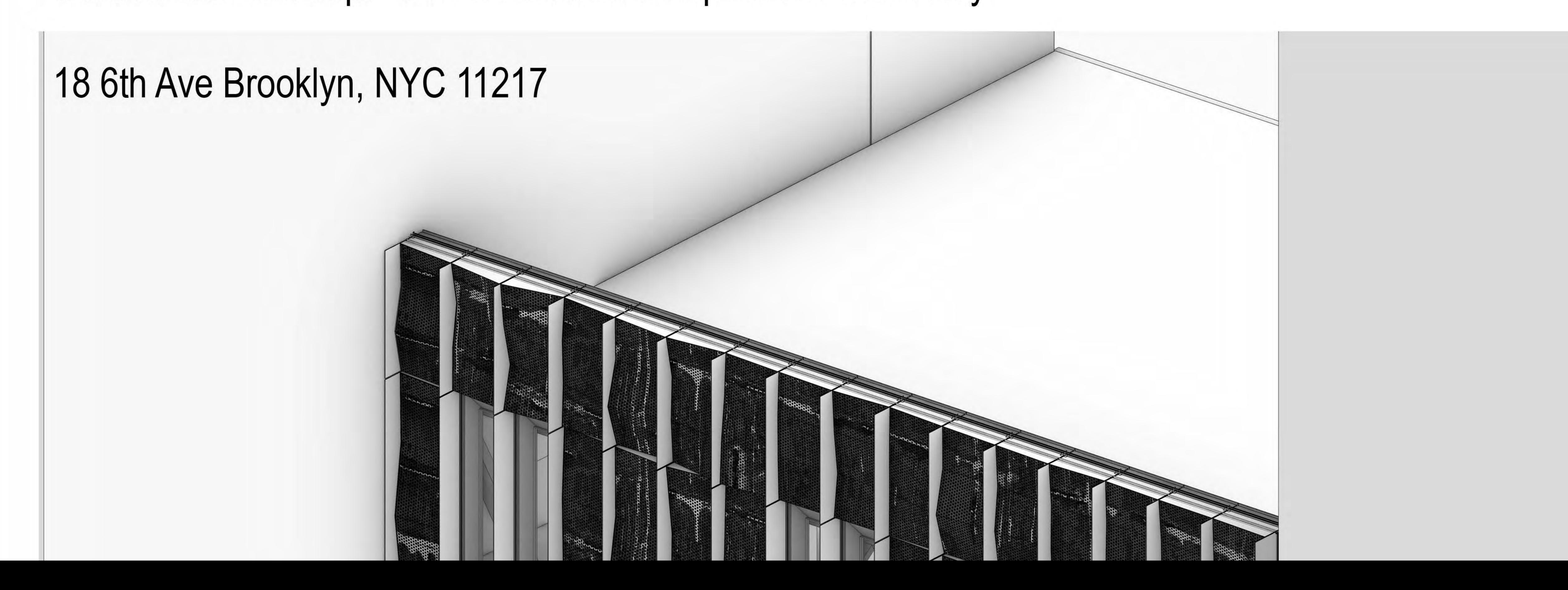
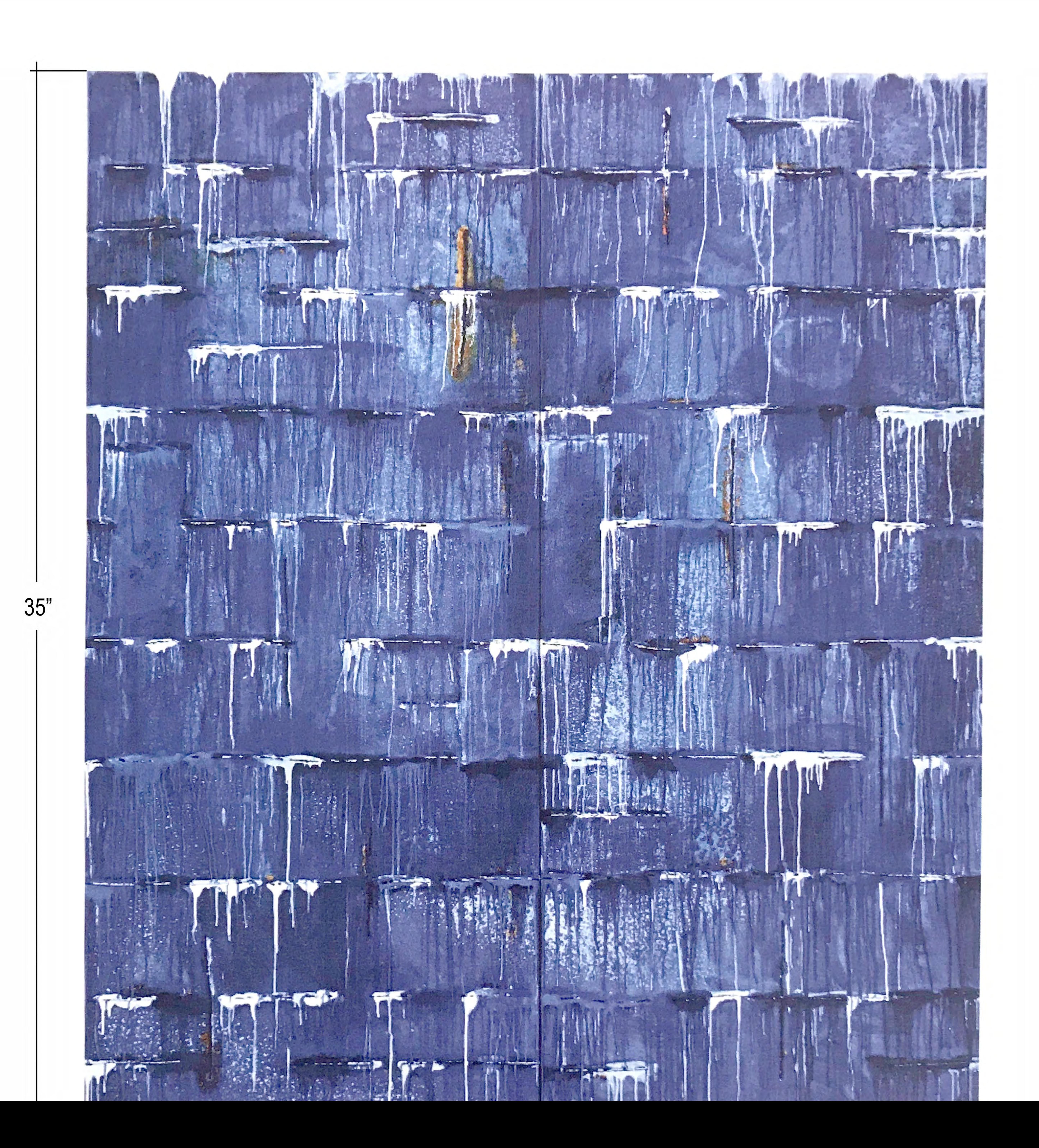
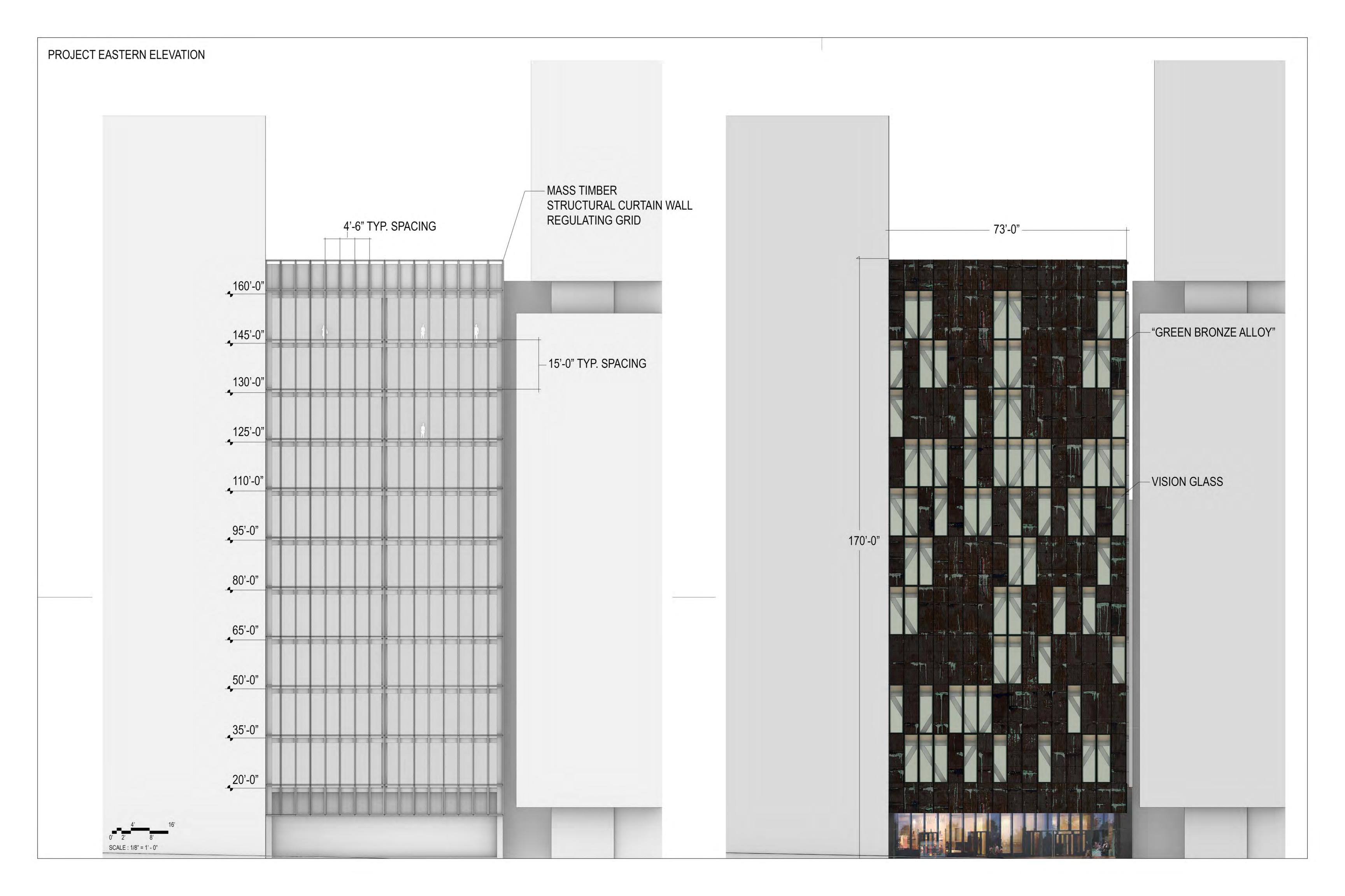
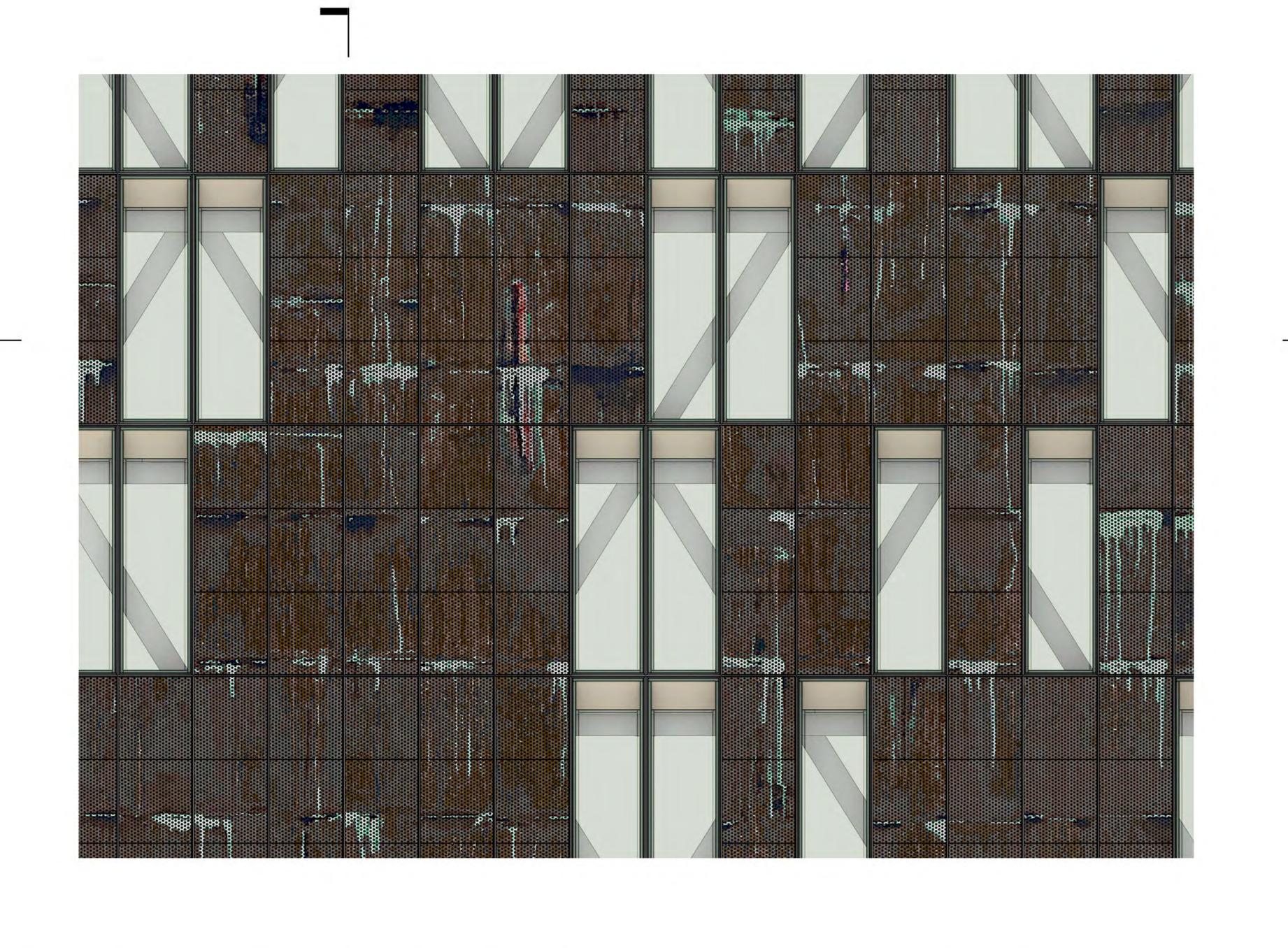
WILLIAM C. ANDERSON
ADV. CURTAIN WALL DESIGN
COLUMBIA GSAPP SPRING 2020
FINAL SUBMITTAL DRAWINGS
05-04-2020

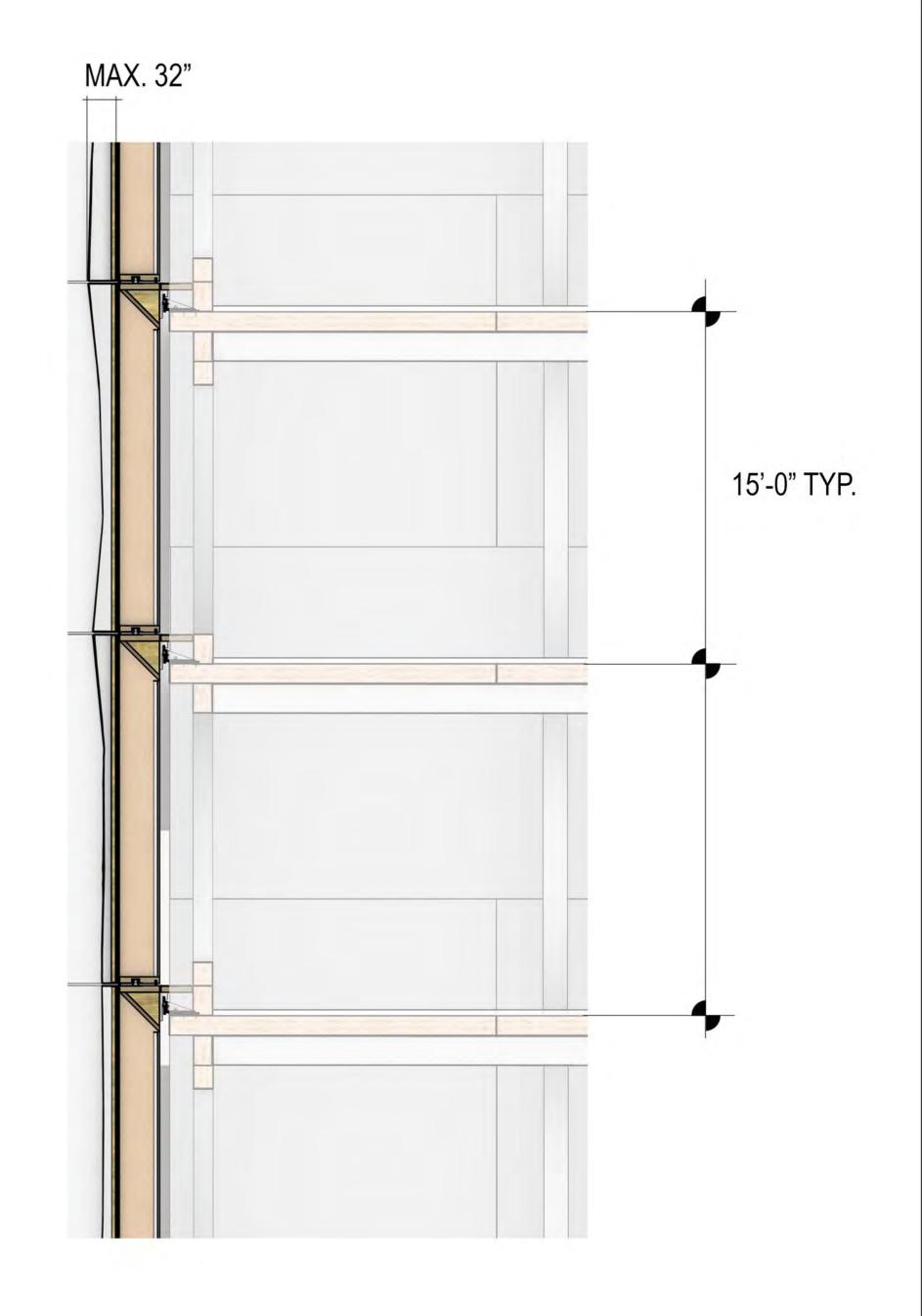
Buidling Use: Commercial Office / Public Institution Curtain Wall Concept - Pre-weathered Sculptural Bronze Alloy

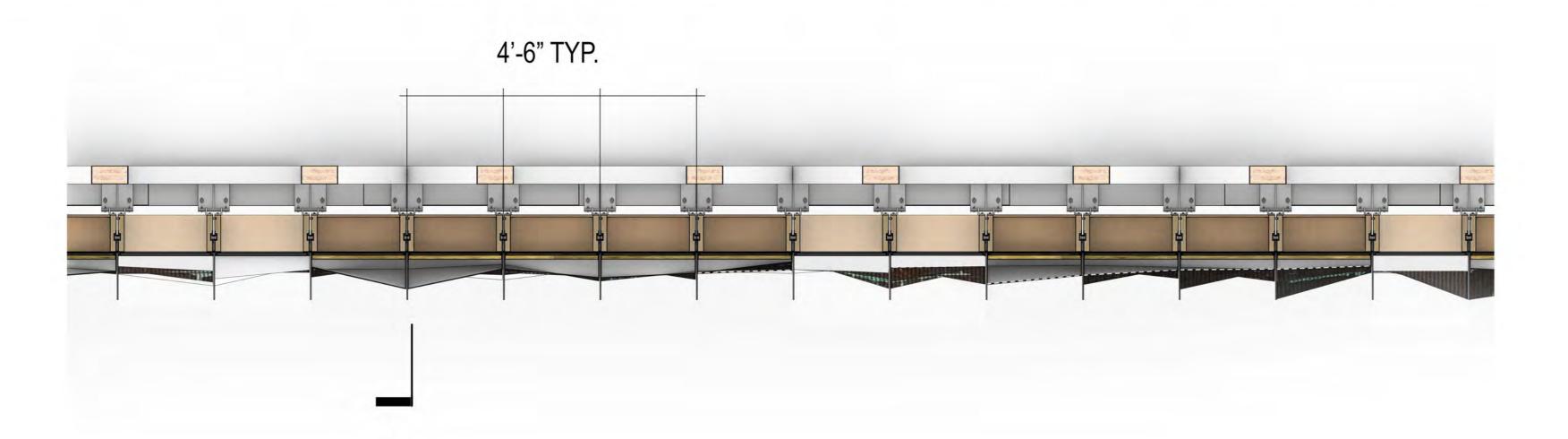




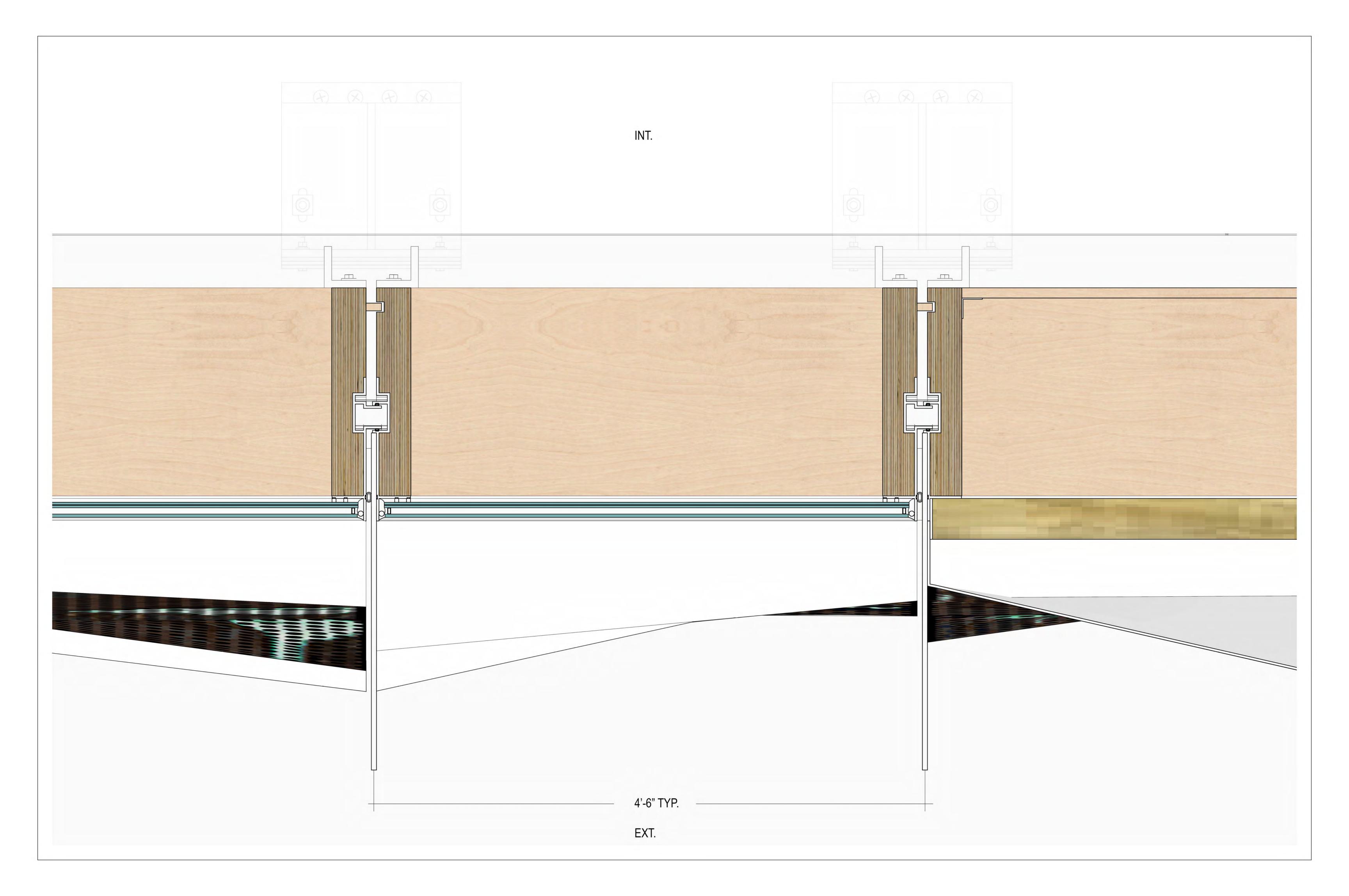


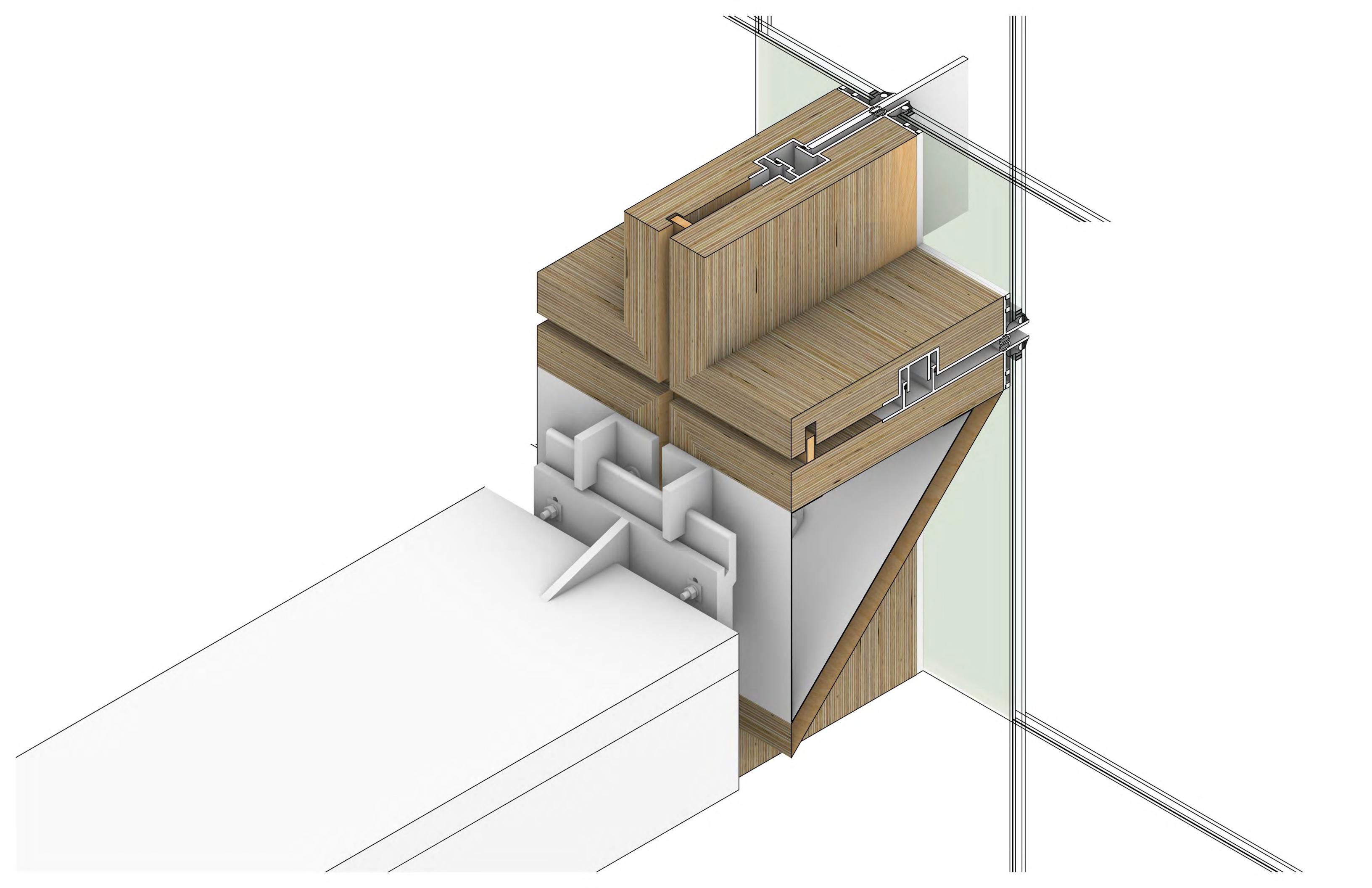


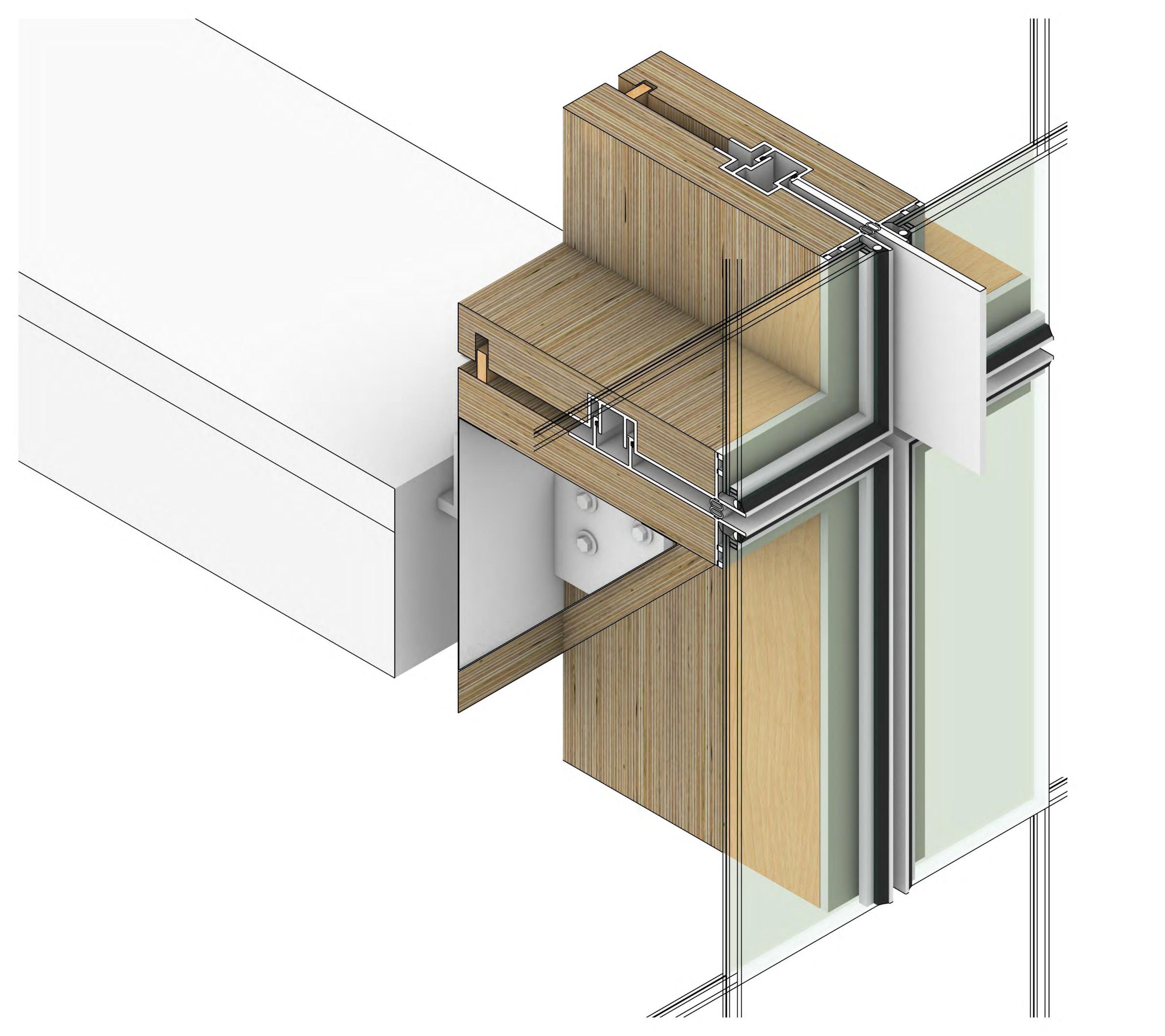












This design and specification statement is intended solely as a means of introducing the project client to the general aesthetic objectives, specific technical conditions, and rationale governing the conceptual design scope and services for the requested custom curtain wall system for the project. As requested by the client, the general aesthetic shall mimic, emulate, and or quote qualities of the work of art, "Venezia's Child". Inspirations taken from the artwork include: the subtle grid and the compositions respected proportions, tensions between sculpture and painting, and the natural weathered effect.

SCOPE:

The 10,500 square foot, *Freres Mass Timbe*r supported, curtain wall utilizes an undulating exterior grade self oxidizing bronze alloy cladding to capture, express, and take advantage of local environmental contaminants for the express use of creating the aesthetic qualities found in the aforementioned artwork. Wherein, this ¼" sculptural bronze armature is a self supporting (80 unique piece) module which is mounted to stainless steel plate attached to the timber mullions. The system is composed of a rationalized engineered *Freres Mass Plywood* framing fitted with extruded stainless steel components for system gaskets and glazing, and high performance glazing. The insulating glass (IGU) is composed of an inner light of laminated with a Low-e coating applied to the #2 surface of the heat strengthened outer light glass. This IGU is attached and secured by 4-side structural silicone glazing. The intention of these two systems, both vision glass & opaque wall, is expressed in high performance semi reflective vision glass helping to serve as a minimal threshold between the inside and outside of the facade as well as a means for daylight illumination. The Exterior Bronze Sculptural panels are configured to trap air contaminants and water to enhance natural weathering, as well as filtering sunlight in order to emphasize the sculpture quality of the facade. At vision areas behind the bronze panels, units are fitted with a 4 inch rockwool insulating layer and opaque 1 inch plywood concealing panel.

MATERIALS:

Freres Mass Plywood (MT): Structural Material

Stainless Steel: For all extrusions and structural armaments.

Structural Silicone Glazing: For the structural attachment of all vision glass in the system.

Non Corrosive Fasteners: Fasteners will be required to perform in minimizing thermal bridging.

1/4" Perforated copper alloy (bronze), formulated to enhance the natural weathering desired, and custom formed in 80 configurations.

Rockwool and Fire Safing: All to be compliant with Underwriting Laboratories (UL) code spec.

Sealants and Gaskets: Selection requires utmost quality and superior lifetime warranty.

IGU: high performance insulating glass with low-e coating and a perimeter ceramic frit mask to obscure stainless extrusions behind the glazing.

Curtain Wall Anchoring: 1/2" Structural and Corrosion protected steel brackets lag bolted to (MT)

Due to NYC not having adopted IBC 2021, the timber structure of this curtain wall has been designed with a 2x safety factor for wind loads and mullion sizing.

Data Point Assumptions: Mullion	Location	Data point	units	
Maximum fiber stress in bending for compact laterally supported beams (Fb -				
bending force) Safety Factor	Code	0.66	Fy Safe Factor	
Tributary Area of unitized curtainwall modual		4.5	ft^2	
Wind Load on Mullion lbs / linear foot		194.2	lbs/L ft	
Wind Load on Mullion lbs / linear inch		16.18	lbs/L in	
Wind Load 1 (stress design) - Geographic PSF	NYC	43.2	lbs/PSF	
Wind Load 1 (stress design) - Geographic lbs / inch		16.18	lbs/in	
Wind Load 2,(deflection design): from wind tunnel	Wind tunnel	30	Fw lbs/PSF	
Wind Load 2,(deflection design) lbs / inch		11.24	Fw lbs/in	
Mullion Vertical Span dimension ft.		10.42	ft	
Mullion Horizontal Spacing dimension ft		4.49	ft	
Mullion Vertical Span dimension inch		125	inches	
Mullion Horizontal Spacing dimension inch		53.931	inches	
Allowable deflection ratio (mullion length/ratio)	(min)		L/175	
Wood - 3 ply Engineered Beam @ 4.125", tensile strength	1	1950		
Material Modulus of elasticity		1300	-	
Wood - 3 ply Engineered Beam @ 4.125"		1,700,000	psi	
Wood:	condition	material	calculation	units
Maximum Moment (bending)			31,600	
Section Modulus, S (required)				in^3
depth (nominal)			16.625	
Moment of Inertia, I (required)			204.10	
Calculated Deflection and Moment of Inertia, I, Required:			201.10	
Deflection, Δ, at Wind Load 1 and I (selected)			0.68	inch
Wind Load 1 and deflection based on span/ ∆ entered above			113.09	inch^4
Deflection, Δ, at Wind Load 2 and I (selected)				inch
and the state of t				111001
Mullion Specifications		+ 3/8"		
Enter nominal width "b" (in)		3	2.625	inch
Enter thickness of mullion "t", Major axis (in)			() inch
Enter nominal depth "d" (in)		17	16.625	inch
Enter thickness of mullion "t", minor axis (in)			() inch
Enter nominal width "b" (in)			() inch
Enter nominal width "d" (in)			(inch inch
Moment of Inertia "I" (of mullion shape)			985.05	in*4
Section Modulus "S" (of mullion shape)			118.50	in^3
Calculated Deflection and Moment of Inertia, I, Required:			PASS	
Deflection,Δ,at Wind Load 1 and I (selected)	1 7		0.68	inch
Max allowable floor deflection (inches)				inches
Stack Joint Mullion Deflection Space			1.08	inches
Mullion (Beam) Analysis:	condition	material	calculation	units
Loading	uniform		Try and the	
Span	simple			
Calculated Stress in Bending:	77.7			
Max allowable mullion deflection (inches)			0.712	inches
Calculated allowable bending force, Fy		wood	1287	7 psi

Mullion Spacing: 54" Mullion Dimension: 2 5/8" Vertical Deflection: 1.08" Horizontal Deflection: 1.02"