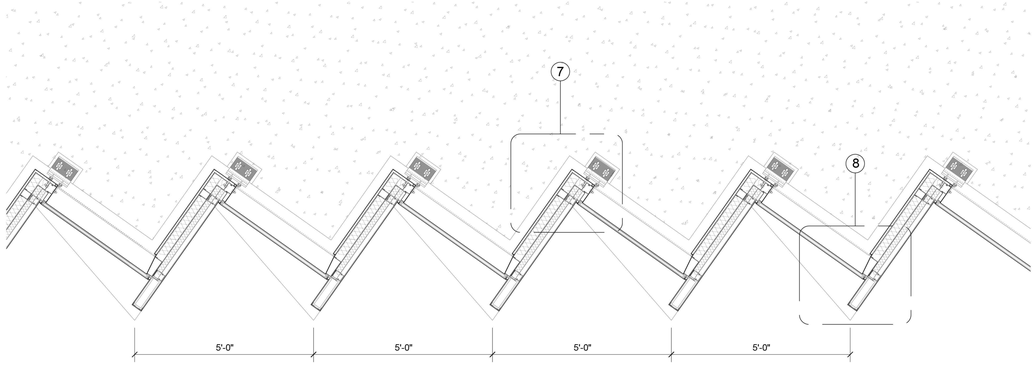
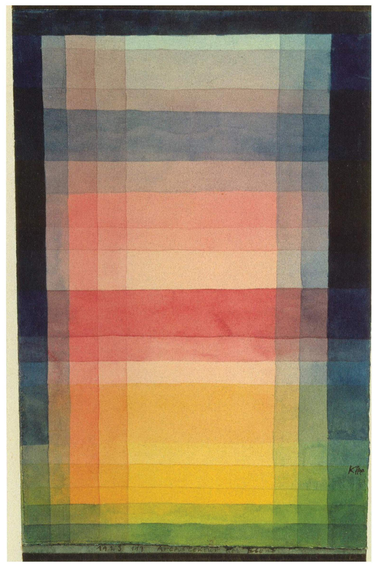
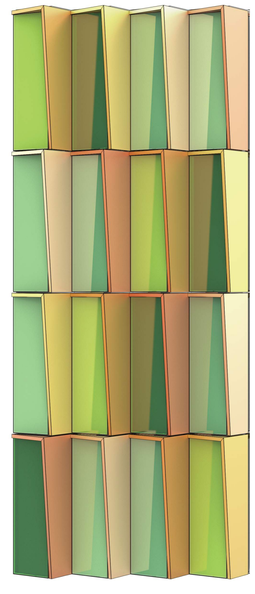


1 ROADMAP - PLAN
1/2" = 1' - 0"



5 INSPIRATION IMAGE
NTS

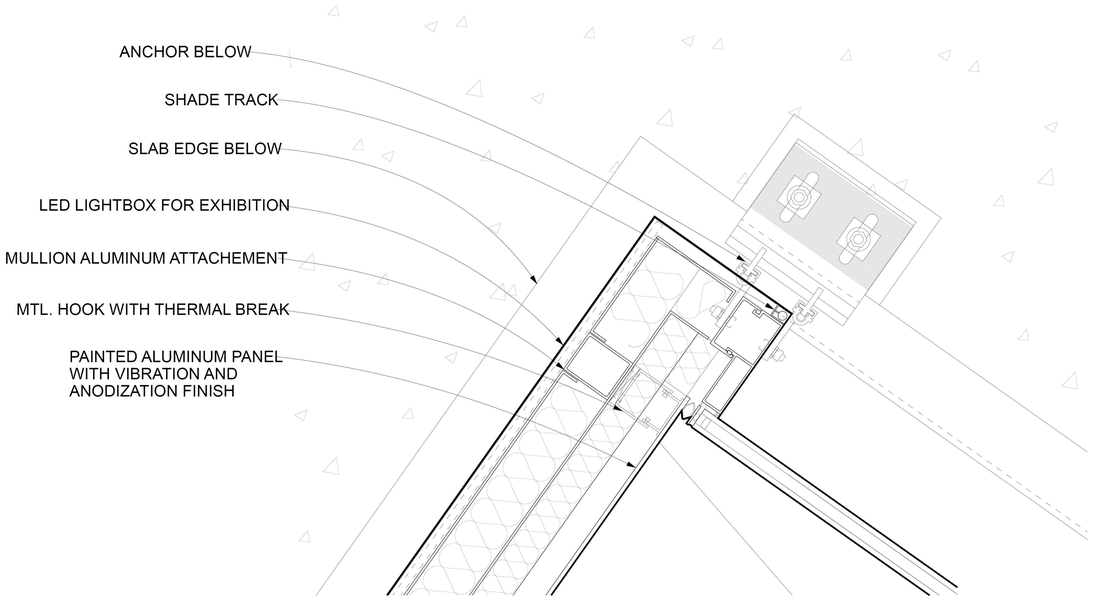


6 UNIT PROTOYPES
NTS

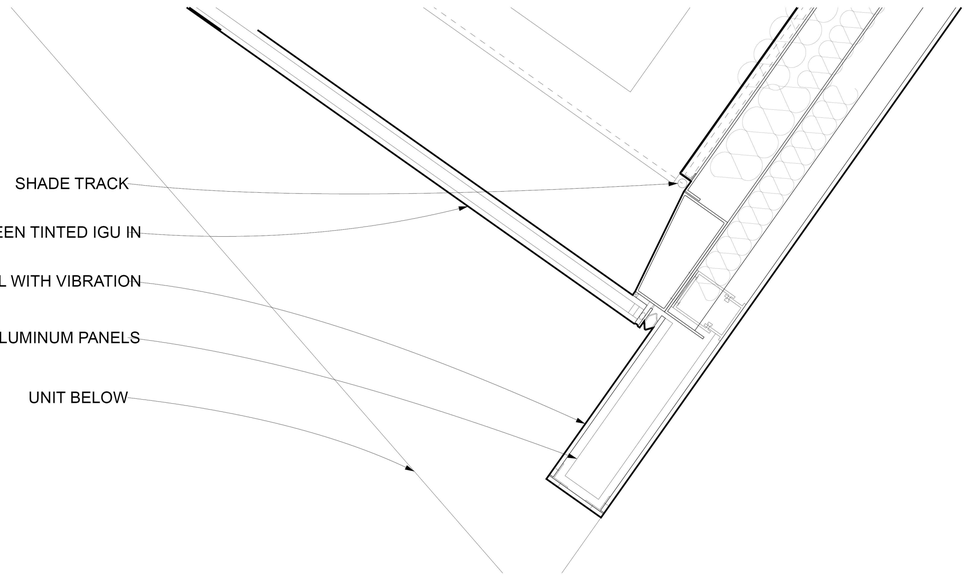
2 ROADMAP - ELEVATION
1/2" = 1' - 0"

3 ROADMAP - SECTION THRU GLAZING
1/2" = 1' - 0"

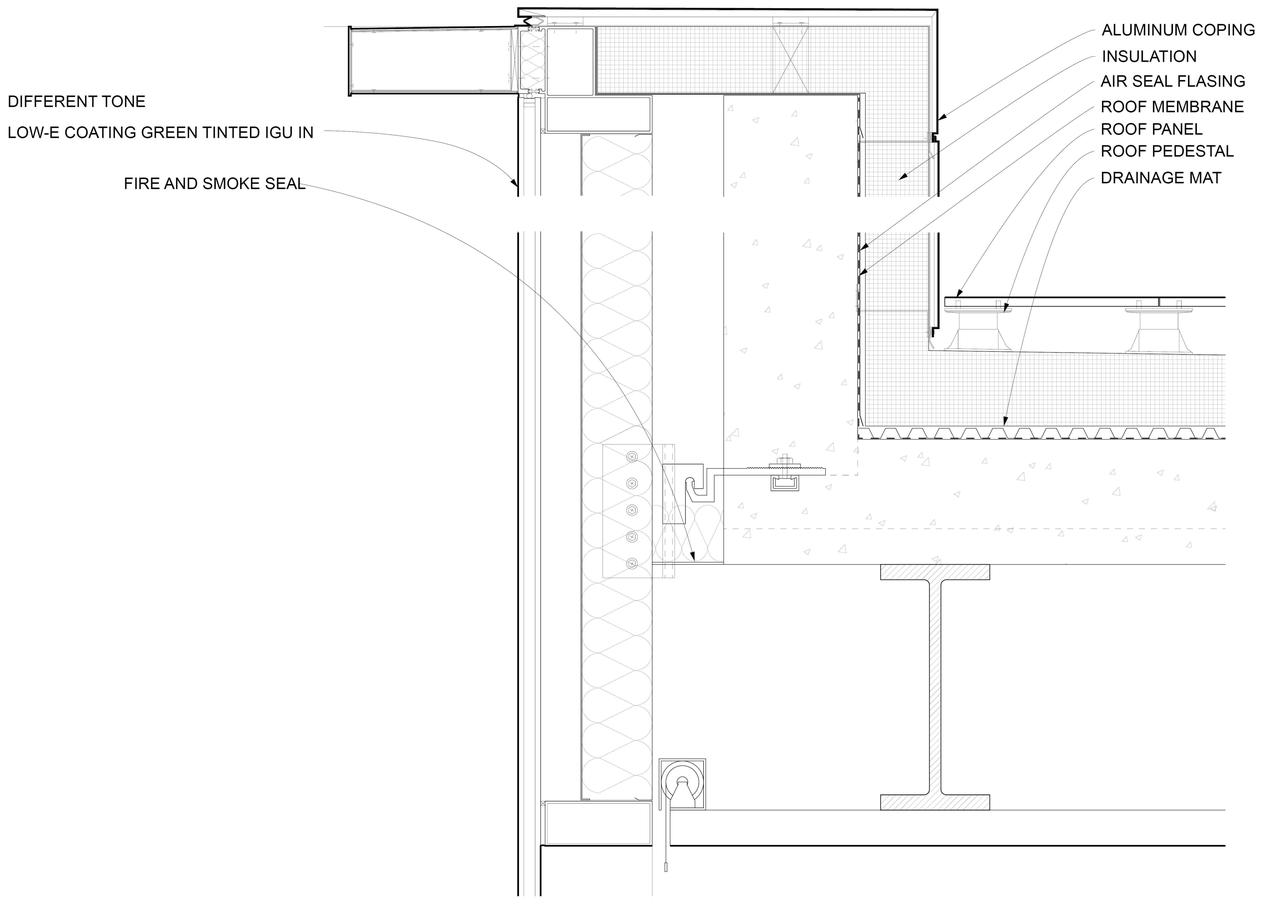
4 ROADMAP - SECTION THRU MTL. PANEL
1/2" = 1' - 0"



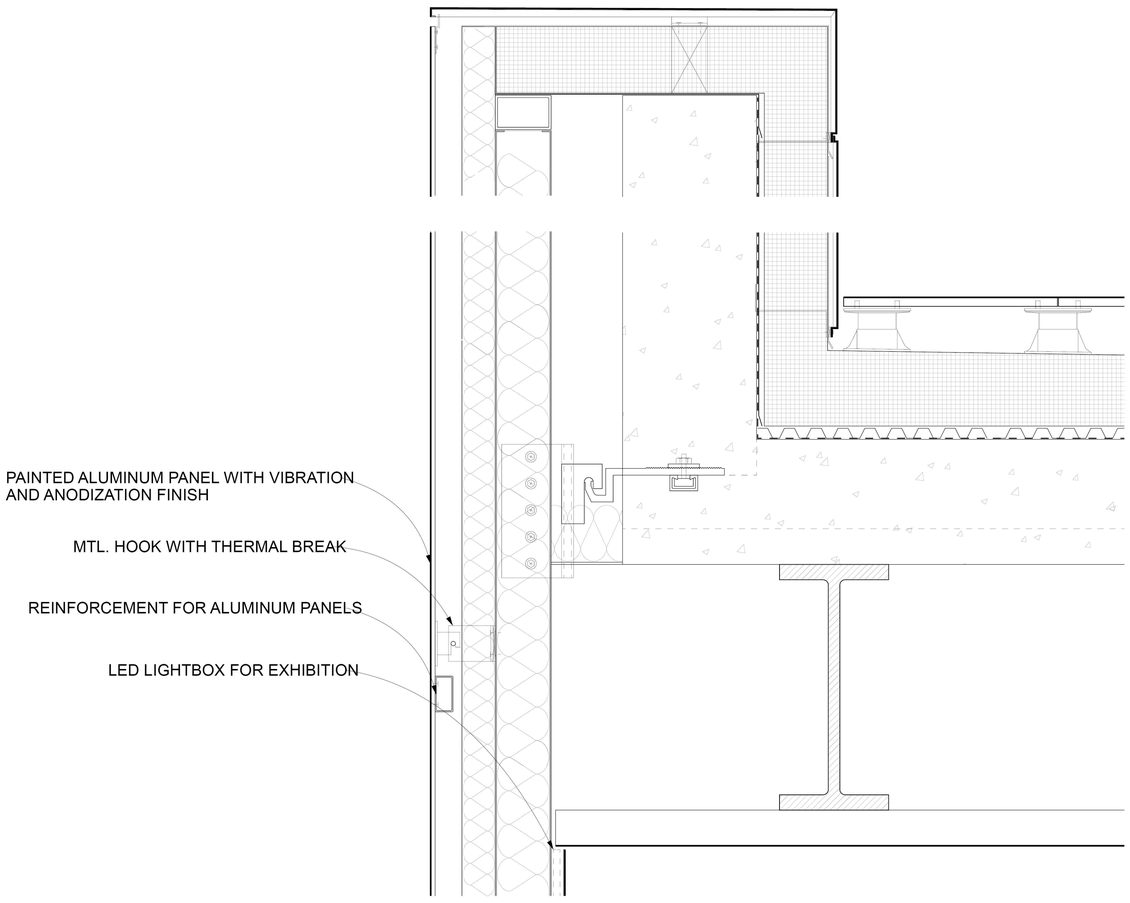
7 DETAILED PLAN AT SPLIT MULLION
3" = 1' - 0"



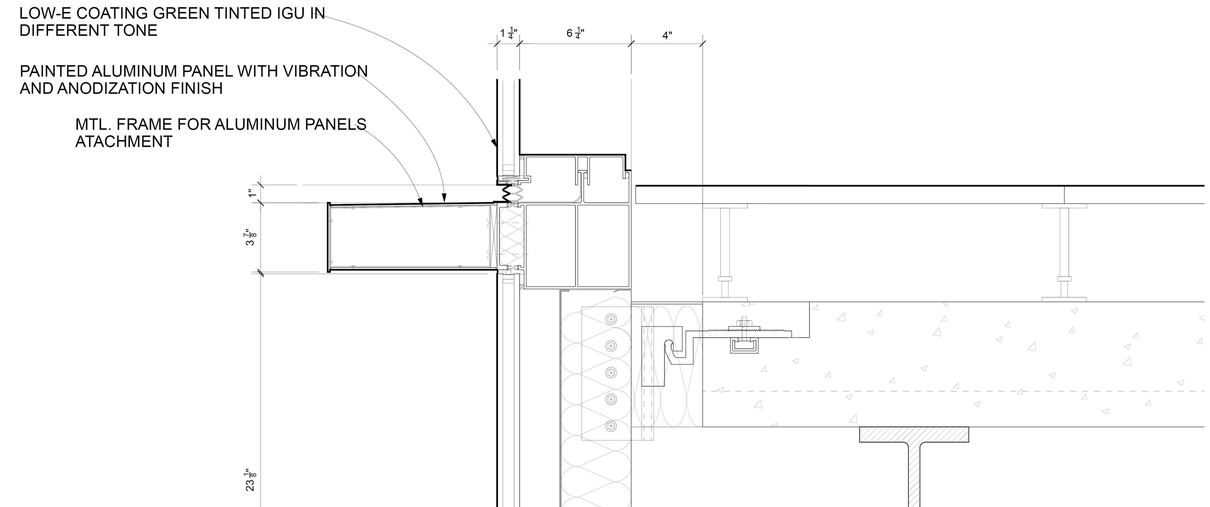
8 DETAILED PLAN AT EDGE
3" = 1' - 0"



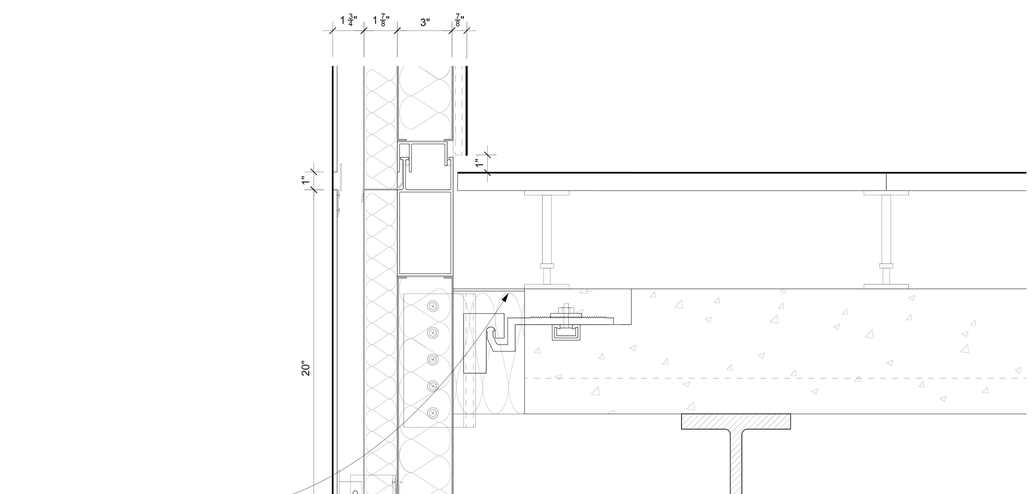
9 PARAPET SECTION DETAIL THRU GLAZING
3" = 1' - 0"



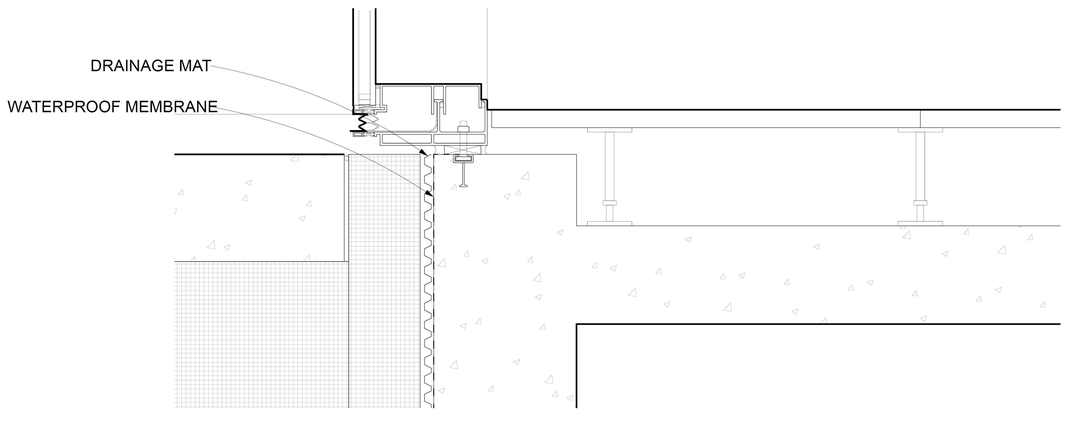
10 PARAPET SECTION DETAIL THRU MTL. PANEL
3" = 1' - 0"



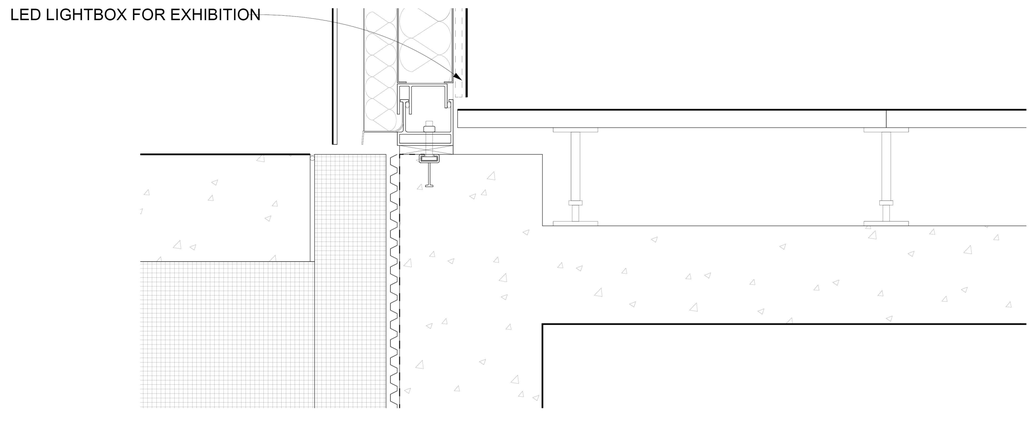
11 TYPICAL SECTION DETAIL THRU GLAZING
3" = 1' - 0"



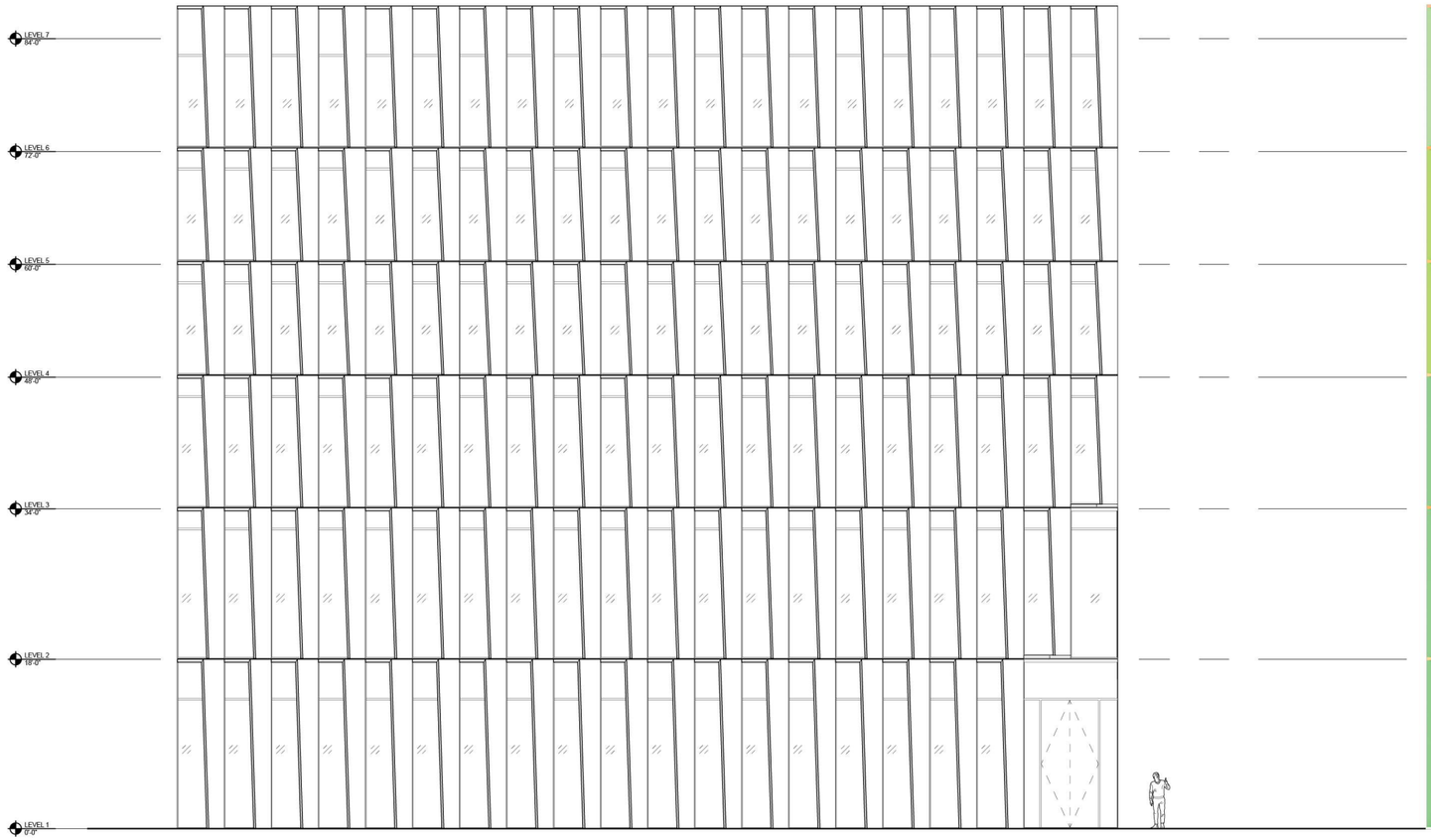
12 TYPICAL SECTION DETAIL THRU MTL. PANEL
3" = 1' - 0"



13 AT GRADE SECTION DETAIL THRU GLAZING
3" = 1' - 0"

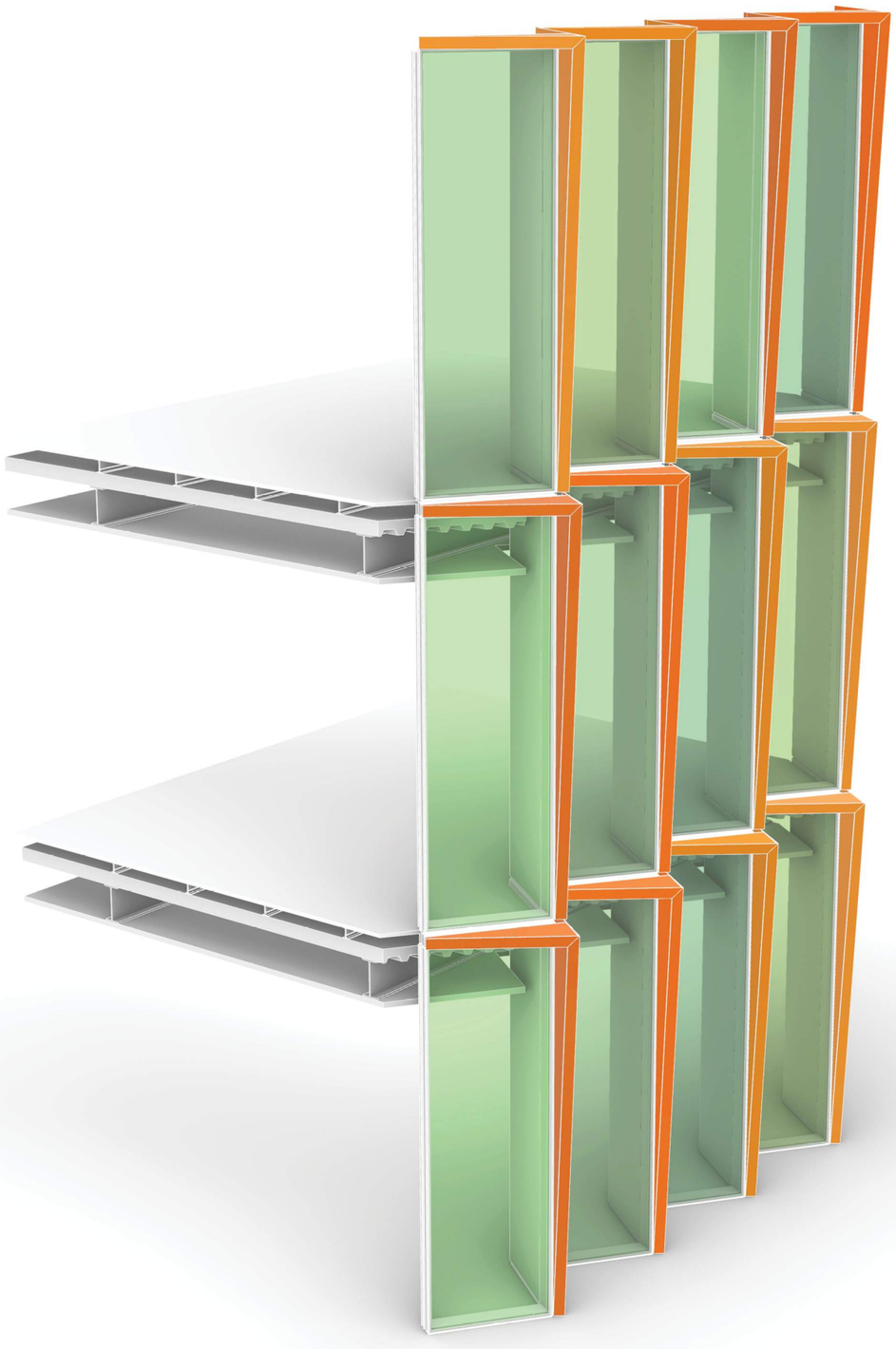


14 AT GRADE SECTION DETAIL THRU MTL. PANEL
3" = 1' - 0"

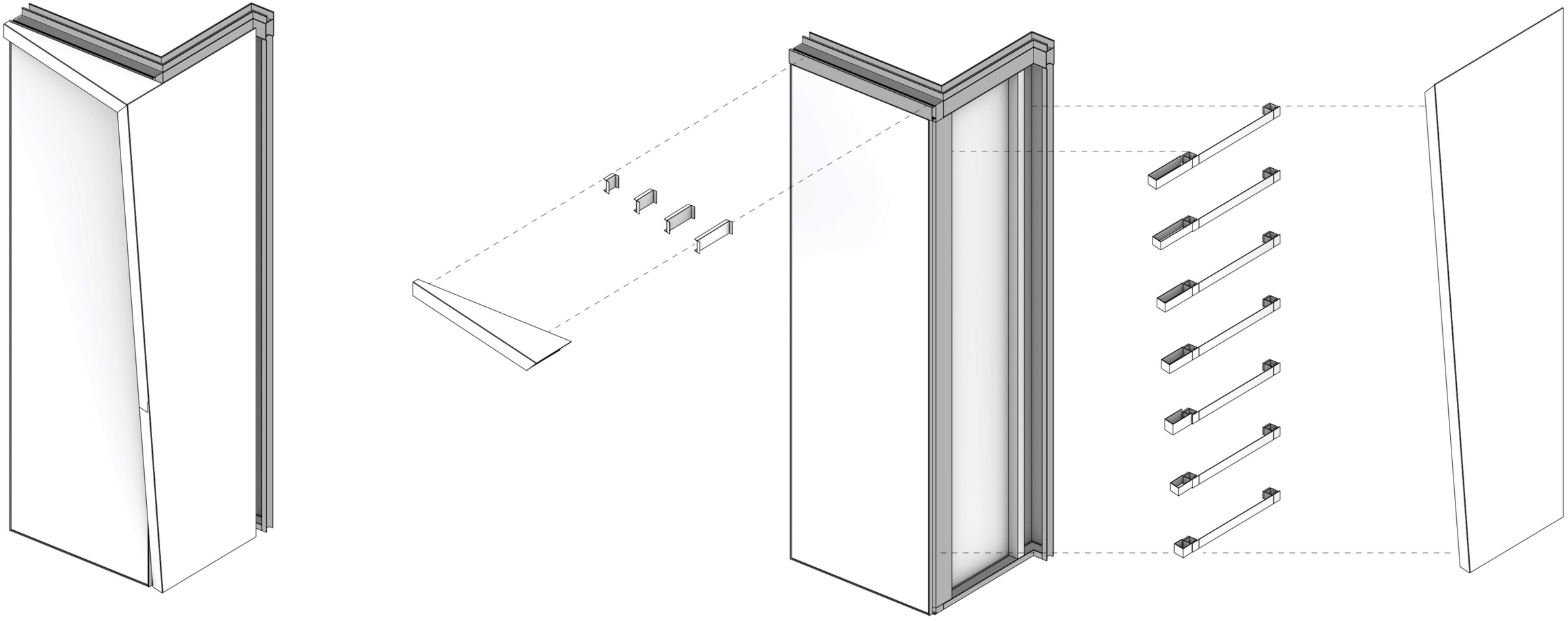


15 BUILDING ELEVATIOIN
1/16" = 1' - 0"

16 BUILDING ELEVATIOIN RENDERED
1/16" = 1' - 0"



17 UNIT COMPLEX
NTS



18 UNIT EXPLODED AXON
NTS

19 INTERIOR RENDER 1
NTS

20 INTERIOR RENDER 2
NTS

heintges

ASCE 7-05 Wind Load: Components & Cladding

13-Dec-21

Project:
Prepared by: *Yuchen Qiu*

BUILDING INFORMATION

Notes and Assumptions

Height, h	84 ft	Mean roof height	Roof Slope = 0 degrees
Exposure Category	B	See Section 6.5.6 description	
K_Z	1.01	Velocity Pressure Coefficient (Table 6-3)	
K_{ZT}	1.00	Topographic Factor (Section 6.5.7 Topographic Effects)	
K_d	0.85	Wind Directionality Factor (Table 6-4)	
Enclosure Classification	Enclosed	From Figure 6-5 (Choose "Partially Enclosed" for dominant opening.)	
V (WIND SPEED)	98.00 mph	From Figure 6-1 (Note: NYC specifies 98 mph.)	
I (IMPORTANCE FACTOR)	1.00	From Table 6-1 (See Table 1-1 for Building Occupancy Categories.)	

VELOCITY PRESSURE

$q_h = 0.00256K_zK_{zt}K_d(V^2)I$ psf

q_h = **21** psf

GUST EFFECT FACTOR Included in calculated GCp and GCpi below.

TRIBUTARY AREA 32 sq ft Components and Cladding: (span length) x (tributary width)
Fasteners: Area not greater than tributary area for each fastener.

NOTE: IF YOU ARE USING A LARGE TRIBUTARY AREA BECAUSE THE UNIT OR GLASS IS LARGE (≥ 100 SQ FT), CONSIDER A SMALLER TRIBUTARY AREA FOR ANCHOR DESIGN. ASK RAHED.

DESIGN WIND PRESSURE (Note: ASCE 7-05 limits net pressure or suction to minimum 10 psf. 2008 NYC code limits to 20 psf.)

Walls : Zone 5 (Corner)	*Suction*		*Pressure*	
GC_p (Ext. pressure coeff.)	-1.00		0.60	based on Fig. 6-17
GC_{pi} (Int. pressure coeff.)	0.18	from Fig.6-5	-0.18	based on Fig. 6-5
GCp - Gcpi =	-1.18		0.78	
p = ***qh (GC$_p$ - GCpi)***				
p =	**-25** psf		**p =** **16** psf	

Walls : Zone 4 (Field)	*Suction*		*Pressure*	
GC_p (Ext. pressure coeff.)	-0.70		0.60	based on Fig. 6-17
GC_{pi} (Int. pressure coeff.)	0.18	from Fig. 6-5	-0.18	based on Fig. 6-5
GCp - Gcpi =	-0.88		0.78	
p = ***qh (GC$_p$ - GCpi)***				
p =	**-19** psf		**p =** **16** psf	

Note: Zone 5 is 10% of least horizontal dimension or 0.4h, whichever is smaller, but not less than either 4% of least horizontal dimension or 3 ft. *

* As per AAMA TIR-A10-1997 this is defined as the shortest distance between two parallel lines which contains the entire building floor plan.

Mullion Analysis Calculation

Project:
Mullion Id: Curtain Wall\[
Prepared by:

Input correct length, width, load (w), and Modulus of Elasticity (E):

Span length (l) =	192	in	
Tributary width (w) =	24	in	
load / pressure (q) =	25.0	psf	
Modulus of Elasticity (E) =	10,000,000	psi	check for aluminum ST=29xE6 AL=10XE6

Calculation for required Moment of Inertia:

Max Defl. = span / 240	0.80	in	<<<< used in delfection calc
span / 175	1.10	in	
User Choice Max Deflect:	0.70	in	

Dmax = ℓ / 175
Dmax = ℓ / 240 + 1/4"
if ℓ = 192.00
Dmax = 1.05

Tributary Area = length x width =	4,608	sq in
Total Load (W) = q x Trib. Area =	800	lbs
Uniform Load (w) = q x w =	4	lb / in

$$I = \frac{5\ W\ L^3}{384\ E\ \text{deflection}}$$

Assuming: Uniform load across full span of

I required = 10.53 in^4

Mullion sizing:

exterior width = b =	2.50	in	
exterior depth = d =	6.50	in	
I ext = $bd^3/12$ =	57	in^4	
flange wall thickness (b)=	0.125	in	
flange wall thickness (d)=	0.125	in	s1
interior width = b -	2.25	in	
interior depth = d -	6.25	in	
I int =	45.78	in^4	
I tube = I ext - I int =	11.44	in^4	
	11.44	in^4	GOOD
check against req'd :	10.53	in^4	

Check for Fiber Stress in Bending:

Calculation for Fiber Stress in bending:

$$\text{Moment, } M = \frac{W \times \text{length}}{8}$$

M =	19	kip-inch
C = b/2 =	1.25	in
S = I/C =		in^3
Fb = M/S =		ksi

OUTLINE SPECIFICATION – SYSTEM DESCRIPTION

1. Concept Description – *A unitized curtain wall façade enclosing a 7 story/84' retail store in New York City (57th St and 5th Ave). The façade is made of angled units, which will use green tinted IGU panels in 4 different tones and aluminum panels with anodized and vibration finish painted in 4 different orange – brown – red color. The idea is to use different colors and angled façade to create a vibrant and 3-dimensional color palette painting of the elevation.*

2. General
    a. The Curtain Wall Sub-Contractor shall design, engineer, test, fabricate, deliver, install, and guarantee all construction necessary to provide for the for the complete airtight and watertight enclosure of the building.
    b. Design shall conform to all requirements of the Building Code of the *State of New York*
    c. Sub-contractor's design shall conform to all of the following:
        i. All applicable Codes and Standards
        ii. The specified performance requirements
        iii. The design intent shown on the architect's contract documents
        iv. Approval of the Architect

3. Work Included
    Curtain wall consists of unitized extruded aluminum frames with……(use language similar to the specs provided earlier; include a verbal description of type of system, e.g. unitized, as well as all materials, min. thicknesses of materials, finishes, etc.
    a. 1/8" and ¼" aluminum panel with vibration and anodization finish painted in 4 different orange – brown – red color
    b. 1/8" rectangular unitized extruded stack joints and split mullions
    c. 1/8" rectangular intermediate mullion
    d. Structural silicone IGU component
    e. Double pane IGU with low-e coating green tinted glass in 4 different tones
    f. LED strip lights for exhibition

4. Performance Requirements
    a. Wind load*: ± 19 psf* at field, *± 25 psf* at corners
    b. Inter-story drift due to wind: H/ 400
    c. Tolerance of Building Structure at perimeter: ± *1"* any direction
    d. Laboratory Mock-up Testing
        i. Static air and water
        ii. Dynamic water
        iii. Structural performance
        iv. Inter-story racking, in- and normal to plane, then repeat static air and water
    e. Thermal Performance
        i. Overall Building Envelope (Walls & Skylights: U-value not less than 0.20 Btu / hr sf °F
        ii. Vision Glass: U-value not less than: 0.20 Btu / hr sf °F
        iii. Spandrel Glass/Area: not less than: 0.05 Btu / hr sf °F

OUTLINE SPECIFICATION – SYSTEM DESCRIPTION

5. Contractor's Engineer
   All shop drawings and structural calculations shall be prepared and stamped by the curtain wall sub-contractor's Professional Engineer registered in the *State of New York*

6. Warranty
   Sub-contractor shall warrant the work for a period of 5 years against any defects and shall provide pass through warranties for glass, sealants, paints, etc.