FLL TERMINAL ONE MODERNIZATION – Ft. Lauderdale, FL

Architect: **Corgan Associates**

Photographer: Isaac Baird

OPTIMAL DESIGN FOR HIGH PERFORMANCE GLAZING SYSTEMS

PRESENTATION BY:
RAYMOND E. CRAWFORD, CRAWFORD-TRACEY CORPORATION

- SYSTEM DESIGN AND INTEGRATION
- CODE COMPLIANCE
- WEATHER TIGHTNESS/WATER RESISTANCE
- ENERGY PERFORMANCE
- IMPACT RESISTANCE (WHERE APPLICABLE)

MT. SINAI MEDICAL CENTER – Miami, FL

Architect: **Cannon Design**

Photographer: Christopher Barrett

723 Lincoln Rd. – Miami Beach, FL

Architect: **Shulman & Associates**

Photographer: Emilio Collavino

801 Lincoln Rd. – Miami Beach, FL

Architect: **Shulman & Associates**

Photographer: Emilio Collavino

COMMON ENVELOPE FAILURES

GLASS BREAKAGE

CONDENSATION

WEATHER SEAL DEGRADATION

LEAKS DUE TO POOR SYSTEM DESIGN

LEAKS DUE TO SURROUNDING CONDITIONS

POOR CRAFTSMANSHIP

BROWARD COLLEGE HEALTH SCIENCES SIMULATION CTR. – Davie, FL
Architect: **ACAI Associates, Inc.**

DESIGN PHILOSOPHIES

STICK BUILT/FIELD GLAZED

- OLDEST OF SYSTEM DESIGN
- SEEMINGLY LESS EXPENSIVE
- REQUIRES MULTIPLE PHASE INSTALLATION
- EXPOSED TO ELEMENTS
- MORE LABOR INTENSIVE


Genie S-80

UNITIZED/PRE-GLAZED

- PRE-GLAZED IN A CONTROLLED ENVIRONMENT
- SEEMINGLY MORE EXPENSIVE
- FASTER DRY IN
- QUICKER INSTALLATION
- LESS LABOR INTENSIVE

FBC ASCE 7-16 UPDATES/PRODUCT APPROVALS

CATEGORY I:

Buildings and other structures that represent a low hazard to human life in the event of failure.

- Agriculture facilities
- Certain temporary facilities
- Minor storage facilities

Seminole Coconut Creek Garage – Coconut Creek, FL
Architect: **Friedmutter Group**
Photographer: John Randall

CATEGORY II:

Buildings and other structures except those listed in Risk Categories I, III and IV.

NOVA CCR
Architect: **ACAI Associates, Inc.**

CATEGORY III:

Buildings and other structures that represent a substantial hazard to human life in the event of failure.

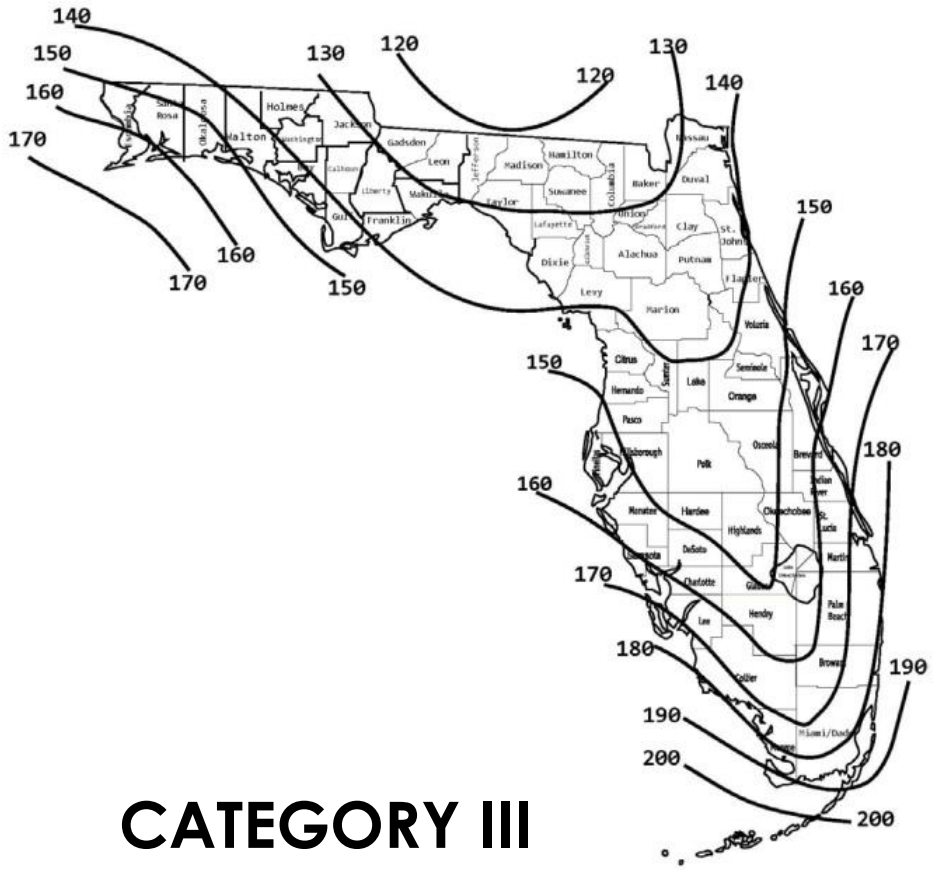
- University Facilities
- Power-generating stations
- Large elementary and secondary school facilities

MERCY HOSPITAL – Miami, FL
Architect: **Earl Swensson Associates**

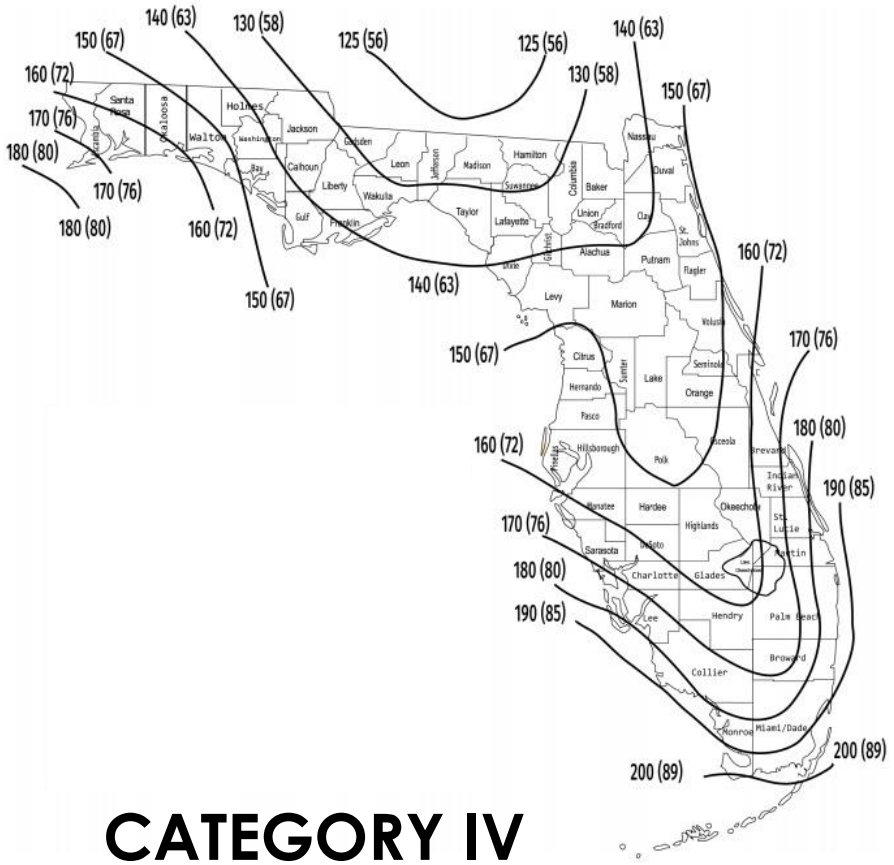
CATEGORY IV:

Buildings and other structures designated as essential facilities.

- Surgery or Emergency Treatment Facilities
- Fire, rescue, ambulance and police stations
- Designated emergency shelters



CATEGORY III



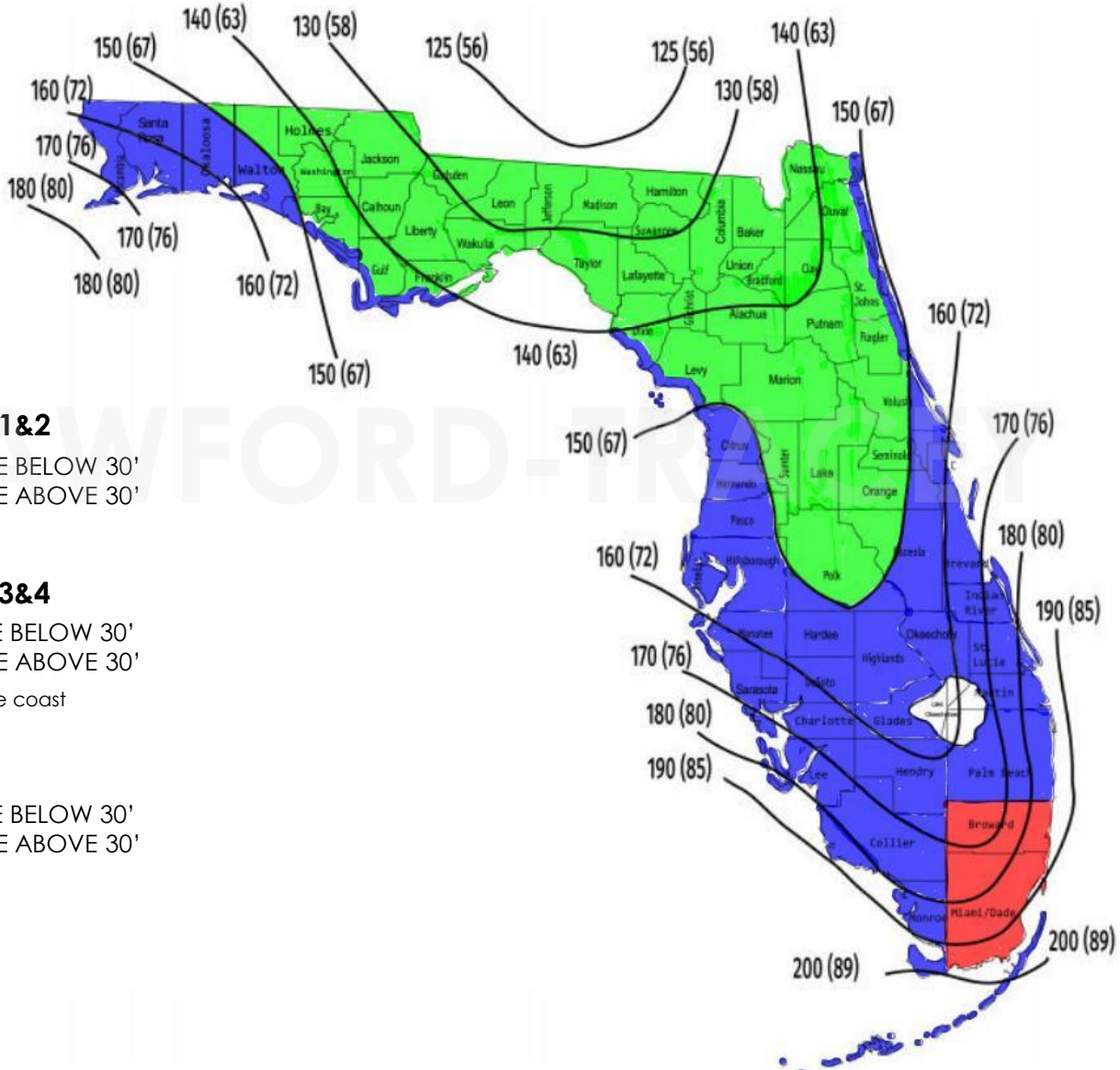
CATEGORY IV

SEPARATE MAPS:

The only significant change to the wind speed maps was the introduction of a new map for Category IV.

- Separated III and IV to better differentiate risk levels
- Category IV shows increased wind speeds that range from 2% to 6% throughout the state

FLORIDA BUILDING CODE 7TH EDITION (2020)



WIND ZONE 1&2

LEVEL D MISSILE BELOW 30'
LEVEL D MISSILE ABOVE 30'

WIND ZONE 3&4

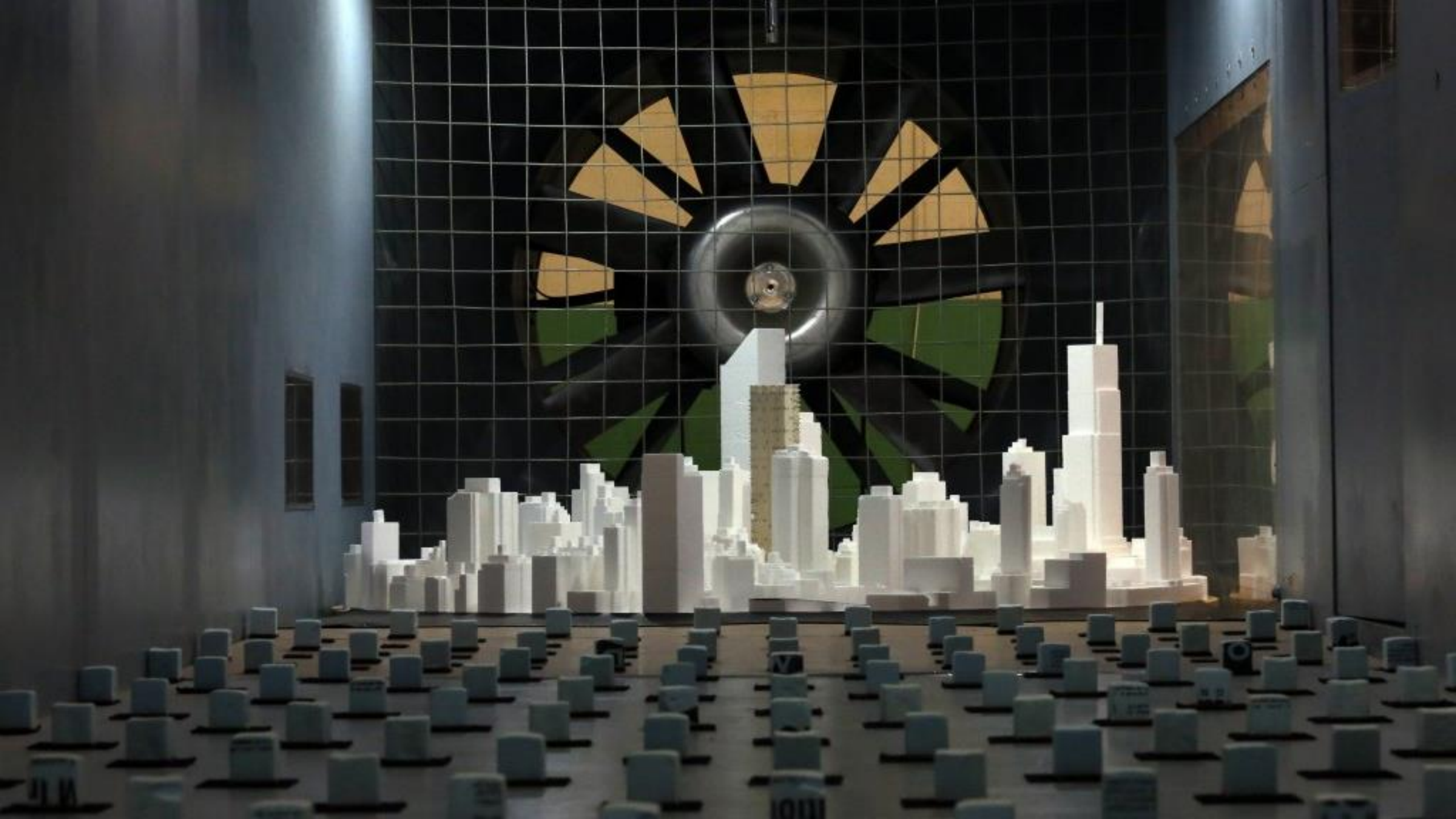
LEVEL E MISSILE BELOW 30'
LEVEL D MISSILE ABOVE 30'

Within 1 mile of the coast

HVHZ

LEVEL E MISSILE BELOW 30'
LEVEL D MISSILE ABOVE 30'

IMPACT RESISTANCE REQUIREMENTS FOR RISK CATEGORY IV



APPLICABLE MISSILES		
Missile Level	Missile	Impact Speed (f/s)
A	2g Steel Ball	130 f/s
B	2lb 2X4	50 f/s
C	4.5lb 2X4	40 f/s
D	9.5lb 2X4	50 f/s
E	9.5lb 2X4	80 f/s

WIND-BORNE DEBRIS PROTECTION

LMI –30ft. below grade **SMI** – 30ft. above grade

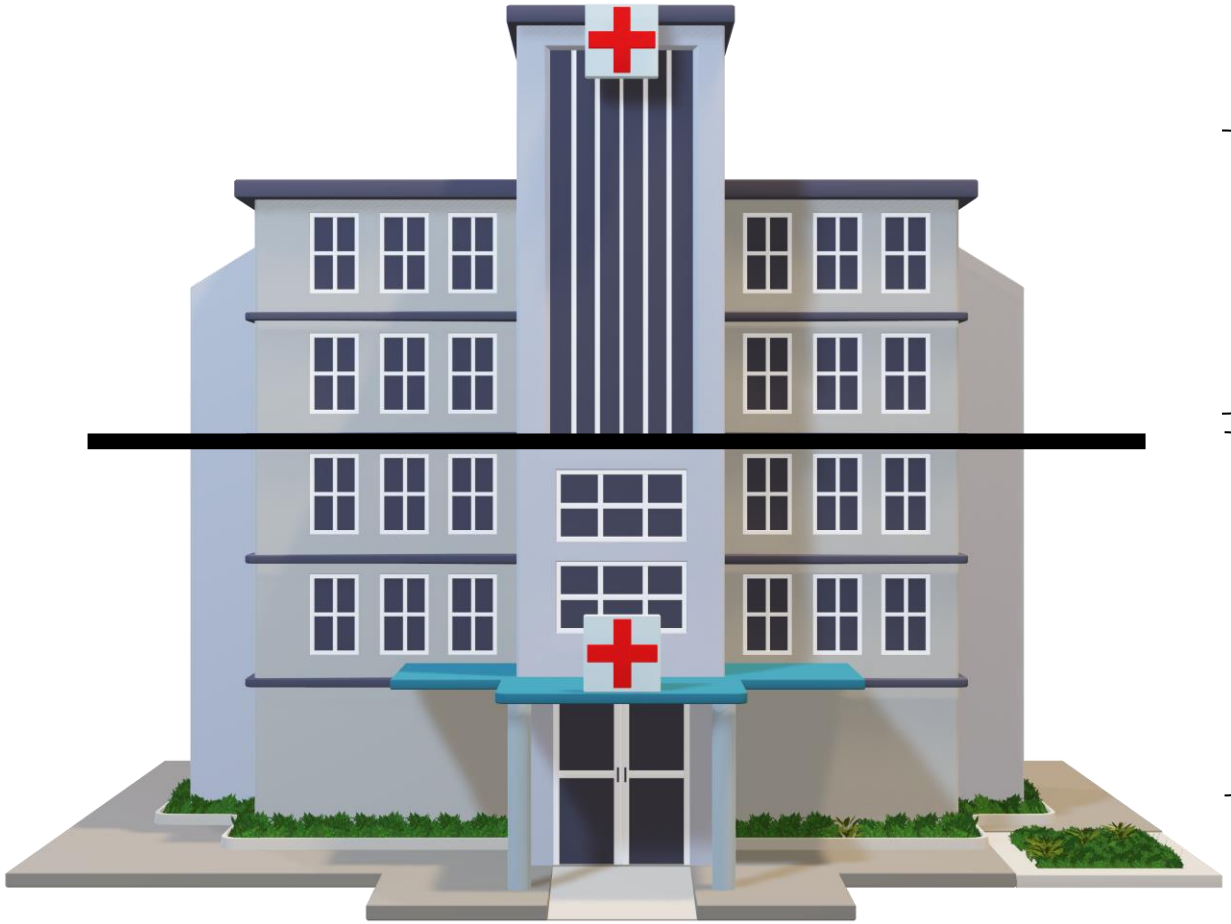
- **CAUTION** on AHCA designation for large and small missile

LARGE MISSILE IMPACT/SMALL MISSILE IMPACT SECTION 1626.2.4/SECTION 1626.3.1

Large Missile Impact: The large missile shall impact the surface of each test specimen at a speed of 50 feet per second (15.2 m/s); 80 feet per second (24.38 m/s) for Risk Category IV–Essential Facility buildings or structures.

Small Missile Impact: This test shall be conducted on three test specimens in accordance with test protocols TAS 201 and TAS 203. This test shall be applicable to the construction units, assemblies, and materials to be used above 30 feet (9.1 m) in height in any and all structures; Risk Category IV–Essential Facility buildings or structures shall follow the large missile impact testing in Section 1626.2.4 at 50 feet per second (15.2 m/s).

AHCA AND ESSENTIAL FACILITIES (CATEGORY IV)



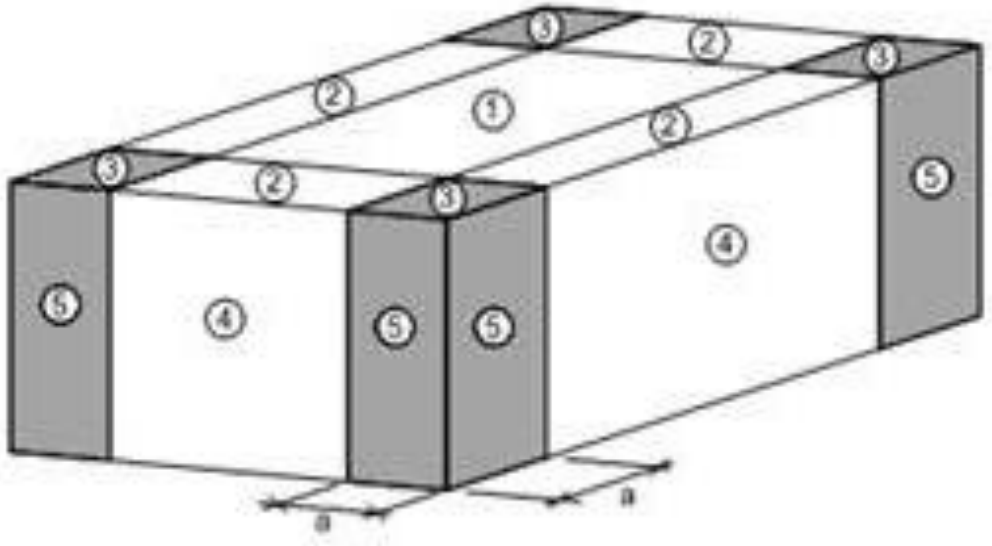
Above 30 Feet
LEVEL D

Below 30 Feet
LEVEL E

CAUTION ON GRADE DETERMINATION

Joe DiMaggio Children's Hospital, Hollywood, FL
Architect: **Stanley Beaman and Sears**

DESIGN PRESSURES



NOTES:

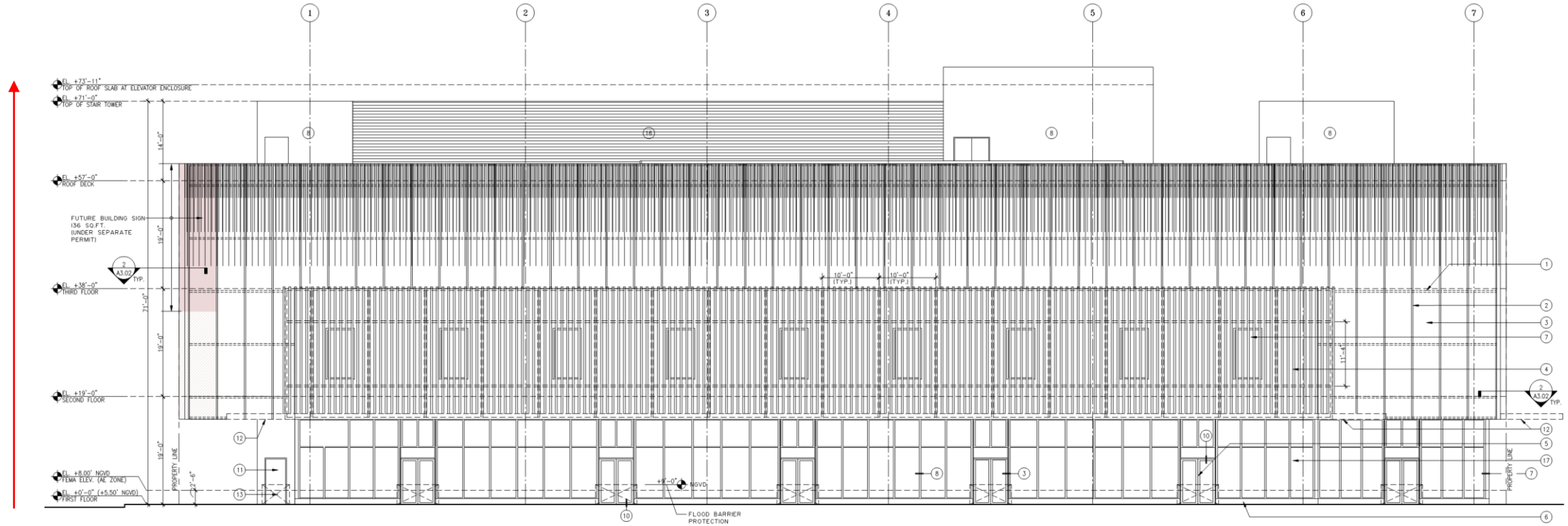
1. ULTIMATE DESIGN PRESSURE VARIES WITH DIRECTION OF APPLICATION, DUE TO DIFFERENT SHAPE FACTORS. NUMBERS SHOWN REPRESENT MAXIMUM GROSS VALUES. (PRESSURE IN PSF, TYP.)
2. WIND DESIGN CRITERIA (ASCE 7-10):
   a) WIND SPEED 180 MPH.
   b) RISK CATEGORY III.
   c) EXPOSURE "D"
   d) INTERNAL PRESSURE COEFFICIENT = ±0.18
   e) TOPOGRAPHIC FACTOR KZt = 1.0
   f) DIRECTIONALITY FACTOR: Kd = 0.85
3. FOR FLAT ROOFS. Ø = 0°
4. h = MEAN ROOF HEIGHT = 90'-0" FT
5. (4) REPRESENTS COMPONENTS AND CLADDING PRESSURE ZONES.
6. a = WIDTH OF PRESSURE COEFFICIENT ZONE = 15'-0" FT

NOTE:
C/C WIND PRESSURES NOTED ABOVE ARE CALCULATED FOR ELEMENTS WITH TRIBUTARY AREA OF 10sqft. PRESSURES MAY BE REDUCED FOR ELEMENTS HAVING LARGER TRIBUTARY AREAS PER CODE.

WALLS	
COMPONENTS AND CLADDING (GROSS LOADS)	
PRESSURE ZONE	ULTIMATE WIND PRESSURE (PSF)
4. (FIELD)	-111
5. (CORNER)	-203
4 & 5 (POSITIVE)	+111
PARAPET (FIELD)	+/-131
PARAPET (CORNER)	+/-196

WIND LOADS FOR COMPONENTS AND CLADDING

- Magnitude of the force is dependent on the wind area tributary to the component
- The smaller the tributary area of a component the more likely to see higher pressures



1 A4.01 SOUTH ELEVATION
SCALE: 1/8"=1'-0"

ULTIMATE OR ALLOWABLE?

WIND LOAD PRESSURE FOR WINDOWS, DOORS AND PANELS. (ASD) (POUNDS PER SQUARE FOOT)

AREA	ZONE ④		ZONE ⑤	
	POSITIVE	NEGATIVE	POSITIVE	NEGATIVE
10 ft^2	44 P.S.F	47 P.S.F	44 P.S.F	58 P.S.F
25 ft^2	41 P.S.F	44 P.S.F	41 P.S.F	53 P.S.F
50 ft^2	39 P.S.F	43 P.S.F	39 P.S.F	49 P.S.F
100 ft^2	37 P.S.F	41 P.S.F	37 P.S.F	45 P.S.F
250 ft^2	35 P.S.F	38 P.S.F	35 P.S.F	40 P.S.F
500 ft^2	33 P.S.F	36 P.S.F	33 P.S.F	36 P.S.F

NOTES:

1.- ZONE ⑤ IS DEFINED AS ANY DOOR OR WINDOW WITHIN 19'-0" FROM ANY CORNER OF THE BUILDING. ALL OTHER LOCATIONS ARE DEFINED AS ZONE ④

2.- VALUES INDICATED CAN BE INTERPOLATED.

ELEV. 22'-8"

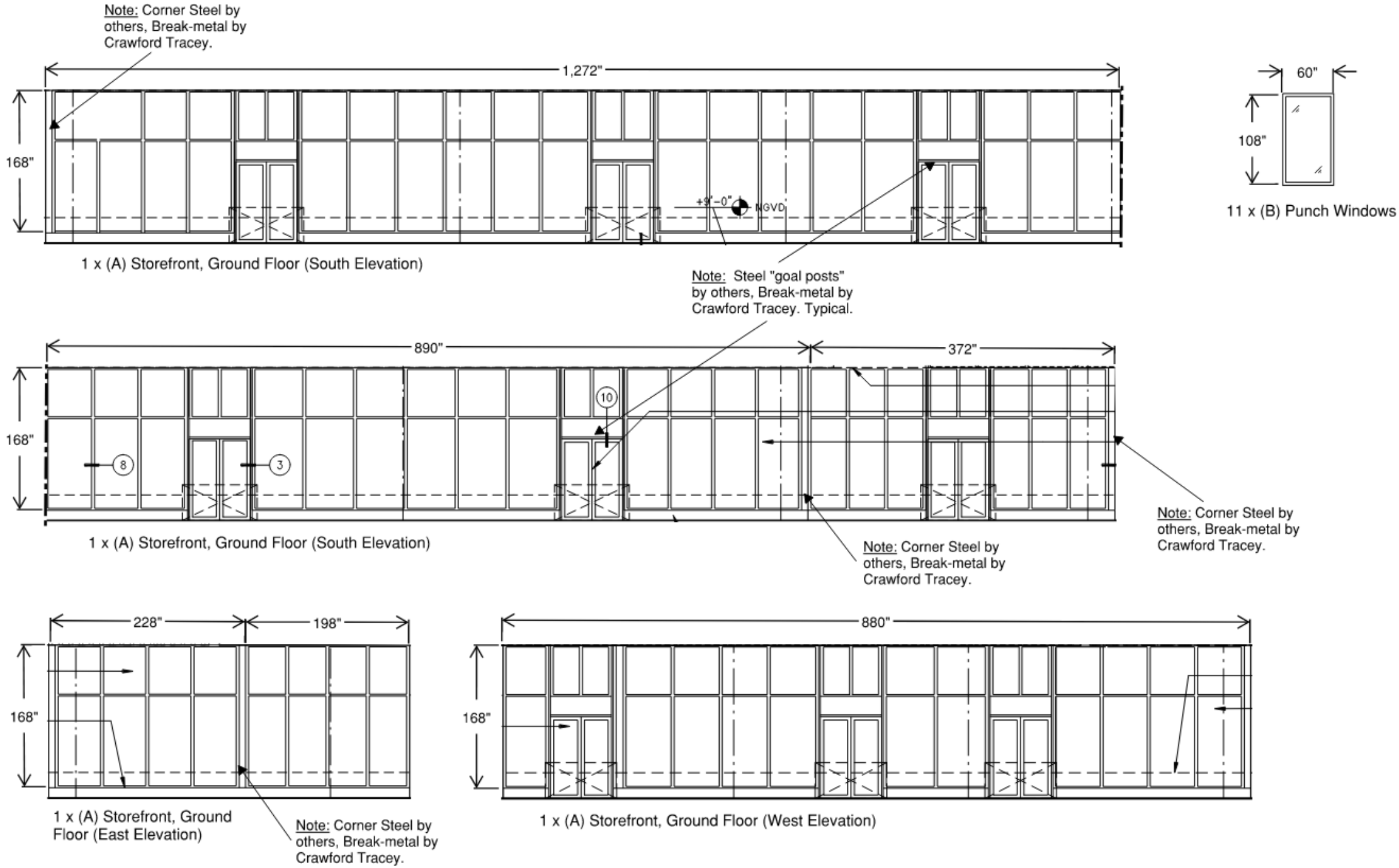
ZONE	WIND LOAD PRESSURES FOR ROOFING DESIGN (A.S.D.)
1	44 P.S.F.
2	73 P.S.F.
3	73 P.S.F.
3A	80 P.S.F.

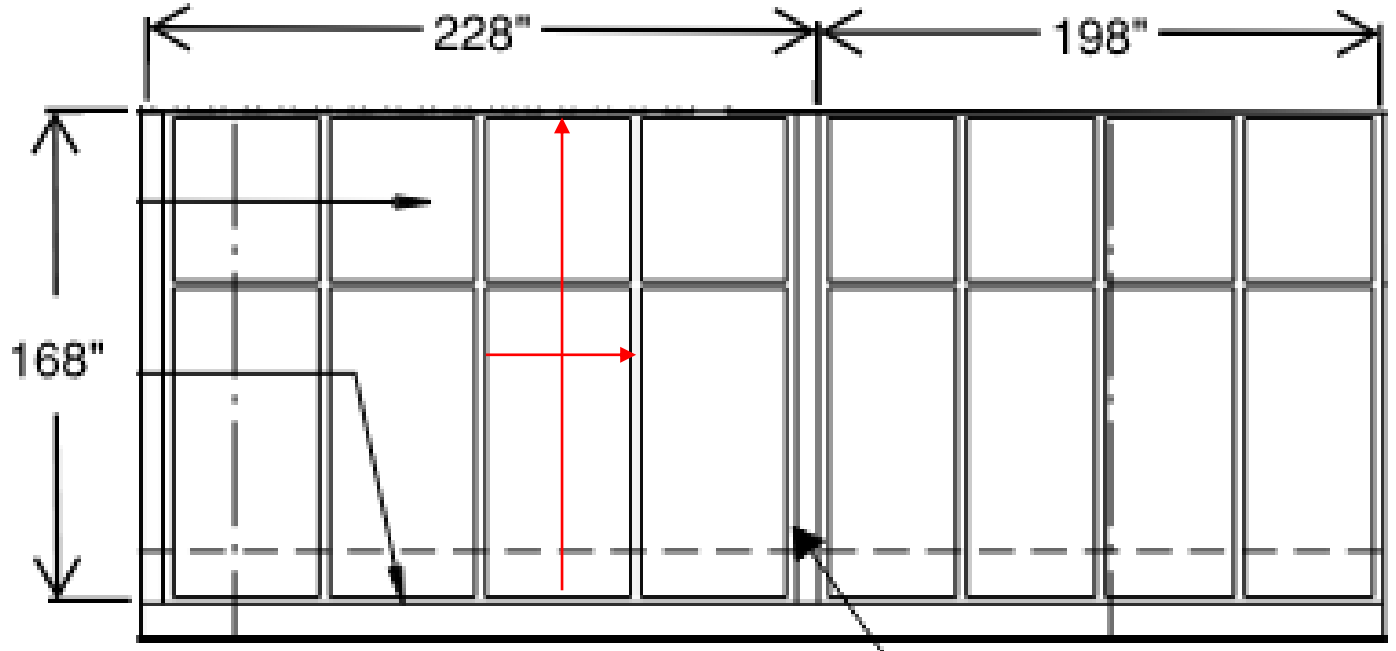
ELEV. 32'-3"

ZONE	WIND LOAD PRESSURES FOR ROOFING DESIGN (A.S.D.)
1	48 P.S.F.
2	80 P.S.F.
3	80 P.S.F.
3A	127 P.S.F.
3B	132 P.S.F.

ASD pressures are allowable stress design

* If ultimate is shown, with a product approved system, you can reduce allowed by 40%


Note: Corner Steel by others, Break-metal by Crawford Tracey.
1,272"
168"
+9'-0" NGVD
1 x (A) Storefront, Ground Floor (South Elevation)
60"
108"
11 x (B) Punch Windows
Note: Steel "goal posts" by others, Break-metal by Crawford Tracey. Typical.
890"
372"
168"
10
8
3
1 x (A) Storefront, Ground Floor (South Elevation)
Note: Corner Steel by others, Break-metal by Crawford Tracey.
Note: Corner Steel by others, Break-metal by Crawford Tracey.
228"
198"
168"
1 x (A) Storefront, Ground Floor (East Elevation)
Note: Corner Steel by others, Break-metal by Crawford Tracey.
880"
168"
1 x (A) Storefront, Ground Floor (West Elevation)



1 x (A) Storefront, Ground Floor (East Elevation)

Note: Corner Steel by others, Break-metal by Crawford Tracey.

SINGLE SPAN MULLION LOADING TABLES (P.S.F.)

HEIGHT 102 (in.)

WIDTH (in.)	NON-REINFORCED		ALUMINUM REINFORCEMENT		STEEL REINFORCEMENT	
	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F
36	120	145	160	160	160	160
42	120	145	160	160	160	160
48	120	141	160	160	160	160
54	120	126	160	160	160	160
60	120	120	160	160	160	160
62	120	120	160	160	160	160
66	120	120	160	160	160	160
69	120	120	160	160	160	160
72	120	120	160	160	160	160
78	120	120	160	160	160	160
84	120	120	160	160	160	160
90	120	120	160	160	160	160
96	120	120	160	160	160	160

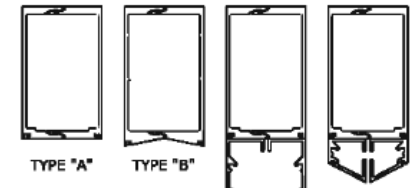
HEIGHT 108 (in.)

WIDTH (in.)	NON-REINFORCED		ALUMINUM REINFORCEMENT		STEEL REINFORCEMENT	
	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F
36	120	145	160	160	160	160
42	120	140	160	160	160	160
48	120	125	160	160	160	160
54	120	120	160	160	160	160
60	120	120	160	160	160	160
62	120	120	160	160	160	160
66	120	120	160	160	160	160
69	120	120	160	160	160	160
72	120	120	160	160	160	160
78	120	120	160	160	160	160
84	119	119	158	158	158	158
90	116	116	154	154	154	154

HEIGHT 114 (in.)

WIDTH (in.)	NON-REINFORCED		ALUMINUM REINFORCEMENT		STEEL REINFORCEMENT	
	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F
36	120	144	160	160	160	160
42	120	125	160	160	160	160
48	120	120	160	160	160	160
54	120	120	160	160	160	160
60	120	120	160	160	160	160
62	120	120	160	160	160	160
66	120	120	160	160	160	160
69	118	118	160	160	160	160
72	115	115	156	156	156	156
78	109	109	148	148	150	150
84	104	104	141	141	145	145

NON
REINFORCED MULLION



	Ix (in.^4)	Sx (in.^3)
MULLION	21.607	7.3494
CORNER MULL.	55.250	10.289
ALUM. REINF.	-	-
STEEL REINF.	-	-

HEIGHT 120 (in.)

WIDTH (in.)	NON-REINFORCED		ALUMINUM REINFORCEMENT		STEEL REINFORCEMENT	
	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F
36	120	130	160	160	160	160
42	120	120	160	160	160	160
48	120	120	160	160	160	160
54	120	120	160	160	160	160
60	118	118	160	160	160	160
62	115	115	155	155	159	159
66	109	109	148	148	152	152
69	106	106	143	143	148	148
72	102	102	138	138	145	145
78	97	97	131	131	139	139
84	92	92	125	125	134	134

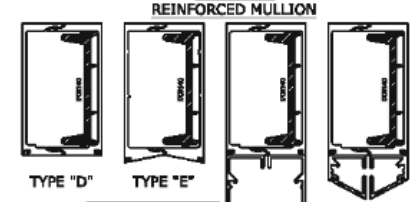
HEIGHT 126 (in.)

WIDTH (in.)	NON-REINFORCED		ALUMINUM REINFORCEMENT		STEEL REINFORCEMENT	
	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F
36	120	120	160	160	160	160
42	120	120	160	160	160	160
48	120	120	160	160	160	160
54	116	116	157	157	160	160
60	106	106	143	143	152	152
62	103	103	140	140	149	149
66	98	98	133	133	143	143
69	95	95	128	128	139	139
72	92	92	124	124	135	135
78	86	86	117	117	129	129

HEIGHT 132 (in.)

WIDTH (in.)	NON-REINFORCED		ALUMINUM REINFORCEMENT		STEEL REINFORCEMENT	
	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F
36	120	120	160	160	160	160
42	120	120	160	160	160	160
48	117	117	158	158	160	160
54	105	105	142	142	154	154
60	96	96	130	130	143	143
62	93	93	126	126	140	140
66	88	88	120	120	134	134
69	85	85	115	115	130	130
72	82	82	112	112	127	127

ALUMINUM
REINFORCED MULLION



	Ix (in.^4)	Sx (in.^3)
MULLION	21.607	7.3494
CORNER MULL.	55.250	10.289
ALUM. REINF.	6.7038	2.5949
STEEL REINF.	-	-

HEIGHT 138 (in.)

WIDTH (in.)	NON-REINFORCED		ALUMINUM REINFORCEMENT		STEEL REINFORCEMENT	
	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F
36	120	120	160	160	160	160
42	120	120	160	160	160	160
48	106	106	144	144	160	160
54	96	96	129	129	146	146
60	87	87	118	118	135	135
62	85	85	115	115	132	132
66	80	80	109	109	126	126
69	78	78	105	105	122	122
72	75	75	101	101	119	119

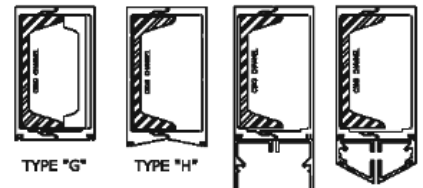
HEIGHT 144 (in.)

WIDTH (in.)	NON-REINFORCED		ALUMINUM REINFORCEMENT		STEEL REINFORCEMENT	
	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F
36	120	120	160	160	160	160
42	109	109	143	143	160	160
48	96	96	126	126	152	152
54	87	87	114	114	139	139
60	80	80	104	104	128	126
62	77	77	101	101	125	125
66	73	73	96	96	119	119
69	-	-	92	92	116	116

HEIGHT 150 (in.)

WIDTH (in.)	NON-REINFORCED		ALUMINUM REINFORCEMENT		STEEL REINFORCEMENT	
	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F
36	-	-	146	146	160	160
42	-	-	126	126	160	160
48	-	-	111	111	145	145
54	-	-	100	100	132	132
60	-	-	91	91	122	122
62	-	-	89	89	119	119
66	-	-	84	84	113	113

STEEL
REINFORCED MULLION



	Ix (in.^4)	Sx (in.^3)
MULLION	21.607	7.3494
CORNER MULL.	55.250	10.289
ALUM. REINF.	-	-
STEEL REINF.	10.900	4.2614

HEIGHT 156 (in.)

WIDTH (in.)	NON-REINFORCED		ALUMINUM REINFORCEMENT		STEEL REINFORCEMENT	
	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F
36	-	-	130	130	160	160
42	-	-	112	112	154	154
48	-	-	99	99	138	138
54	-	-	89	89	126	126
60	-	-	81	81	116	116
62	-	-	78	78	113	113

HEIGHT 162 (in.)

WIDTH (in.)	NON-REINFORCED		ALUMINUM REINFORCEMENT		STEEL REINFORCEMENT	
	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F
36	-	-	115	115	160	160
42	-	-	100	100	148	148
48	-	-	88	88	132	132
54	-	-	79	79	120	120
60	-	-	72	72	110	110
62	-	-	70	70	108	108

HEIGHT 168 (in.)

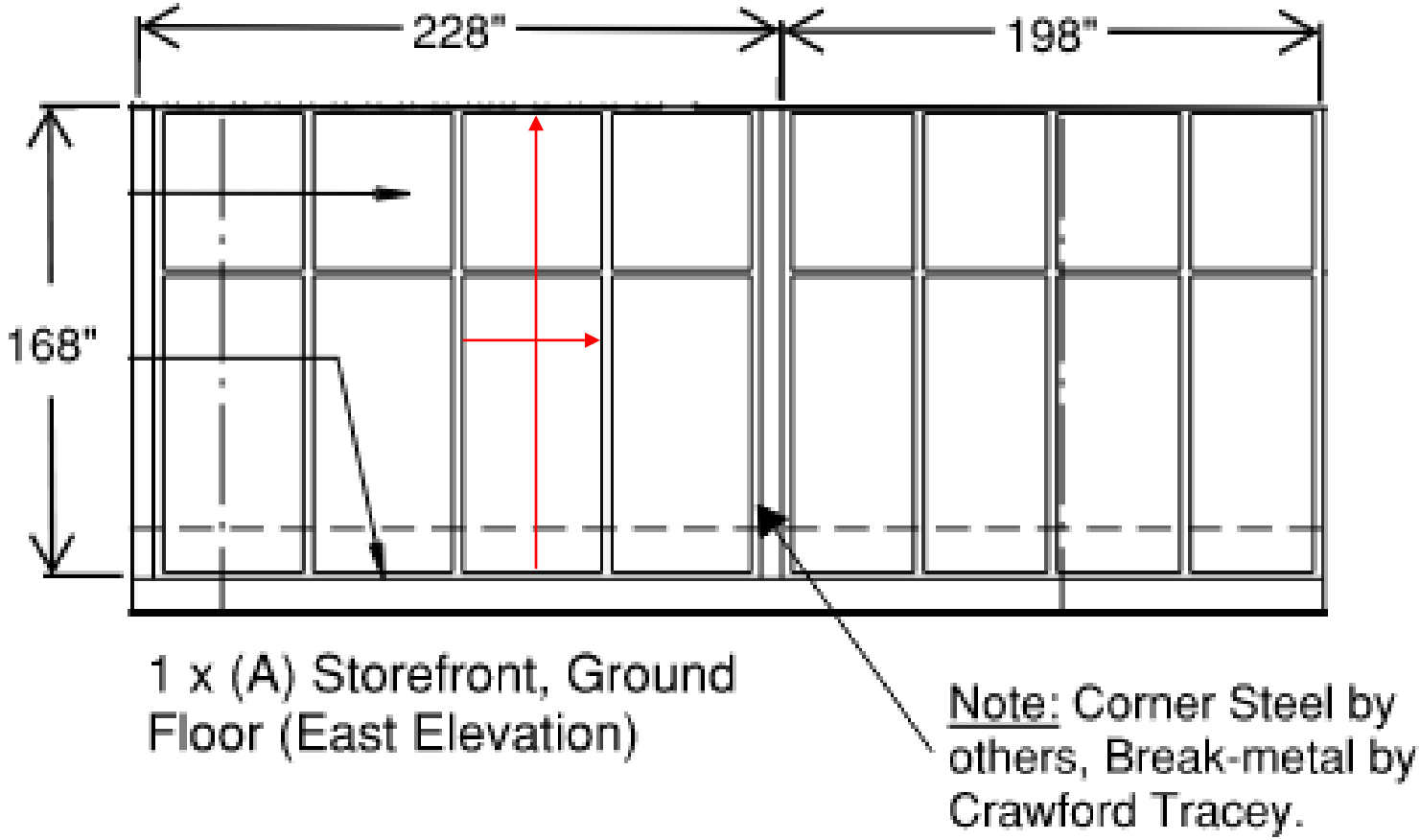
WIDTH (in.)	NON-REINFORCED		ALUMINUM REINFORCEMENT		STEEL REINFORCEMENT	
	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F	(+) P.S.F	(-) P.S.F
36	-	-	103	103	160	160
42	-	-	89	89	142	142
48	-	-	78	78	127	127
54	-	-	70	70	115	115
60	-	-	64	64	106	106

MULLION CAPACITIES ARE EQUAL WITH OR WITHOUT SUNSHADE.
MULLION CAPACITIES ARE EQUAL WITH OR WITHOUT HORIZONTALS.

LINEAR INTERPOLATION BETWEEN WIDTHS OR HEIGHTS ALLOWED.

MULLION TRIBUTARY WIDTH

$$W = \frac{W1}{2} + \frac{W2}{2}$$


228"
198"
168"
1 x (A) Storefront, Ground Floor (East Elevation)
Note: Corner Steel by others, Break-metal by Crawford Tracey.

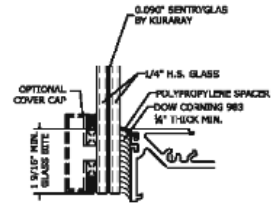
GLASS TYPE A & A1 - LOADING CHART (L.M.I.)

54 (in.)		
SIDE A OR B (D.L.O.)		
SIDE A OR B (D.L.O.) *(in.)*	*(+) P.S.F*	*(-) P.S.F*
30	120	145
36	120	145
42	120	145
48	120	145
54	120	136
58 1/2	120	136
60	120	136
66	120	136
72	120	136
78	120	136
84	120	136
90	120	136
96	120	136
102	120	136
108	120	136
114	120	126
120	120	126
126	120	126
132	120	126
138	120	126
144	120	126
150	120	126
156	120	126
162	120	126
168	120	126
174	120	126
180	120	126
186	120	126
189	120	126
192	120	126
198	120	126
204	120	126

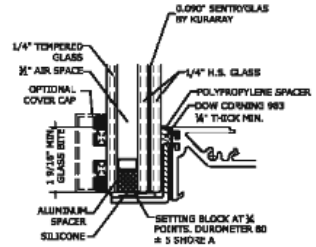
58 ½ (in.)		
SIDE A OR B (D.L.O.)		
SIDE A OR B (D.L.O.) *(in.)*	*(+) P.S.F*	*(-) P.S.F*
30	120	145
36	120	145
42	120	145
48	120	145
54	120	136
58 1/2	120	128
60	120	126
66	120	126
72	120	126
78	120	126
84	120	126
90	120	126
96	120	126
102	120	126
108	120	126
114	120	126
120	120	126
126	120	126
132	120	126
138	120	126
144	120	126
150	120	126
156	120	126
162	120	126
168	120	126
174	120	126
180	120	126
186	120	126
189	120	126

60 (in.)		
SIDE A OR B (D.L.O.)		
SIDE A OR B (D.L.O.) *(in.)*	*(+) P.S.F*	*(-) P.S.F*
30	120	145
36	120	145
42	120	145
48	120	145
54	120	136
58 1/2	120	126
60	120	123
66	120	123
72	120	123
78	120	123
84	120	123
90	120	123
96	117	123
102	117	122
108	117	122
114	117	122
120	117	122
126	117	122
132	117	122
138	117	122
144	117	122
150	117	122
156	117	122
162	117	122
168	117	122
174	117	122
180	117	122

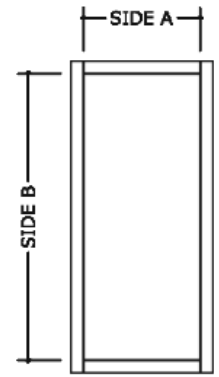
66 (in.)		
SIDE A OR B (D.L.O.)		
SIDE A OR B (D.L.O.) *(in.)*	*(+) P.S.F*	*(-) P.S.F*
30	120	145
36	120	145
42	120	145
48	120	145
54	120	136
58 1/2	120	126
60	120	123
66	120	123
72	120	120
78	120	120
84	120	120
90	119	119
96	110	111
102	106	111
108	106	111
114	106	111
120	106	111
126	106	111
132	106	111
138	106	111
144	106	111
150	106	111
156	106	111
162	106	111



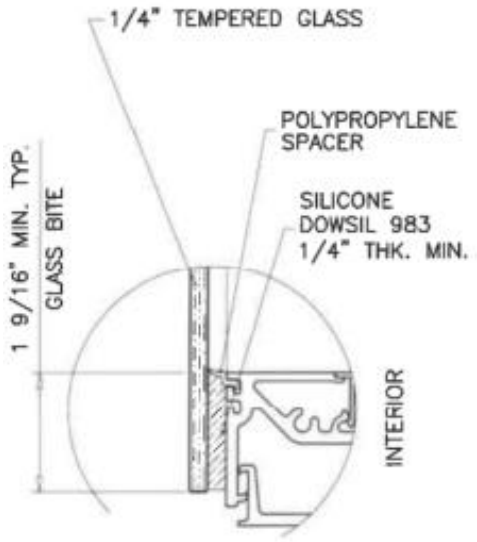
GLASS TYPE (A)
GLAZING DETAIL
N.T.S.
GLASS RATING:
LARGE MISSILE LEVEL D
9/16" GLASS



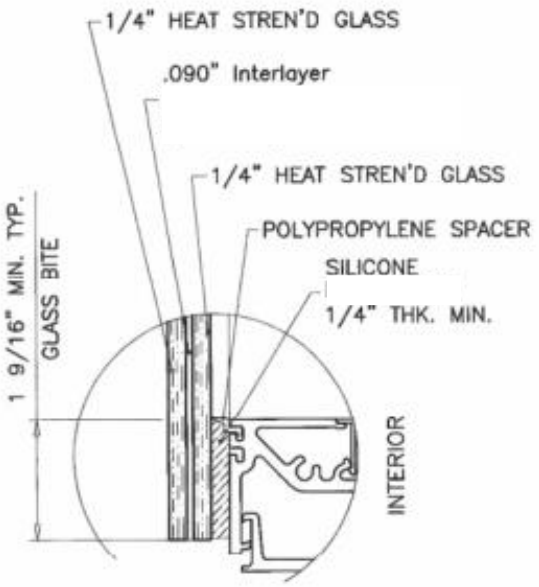
GLASS TYPE (A1)
GLAZING DETAIL
N.T.S.
GLASS RATING:
LARGE MISSILE LEVEL D
1 9/16" GLASS



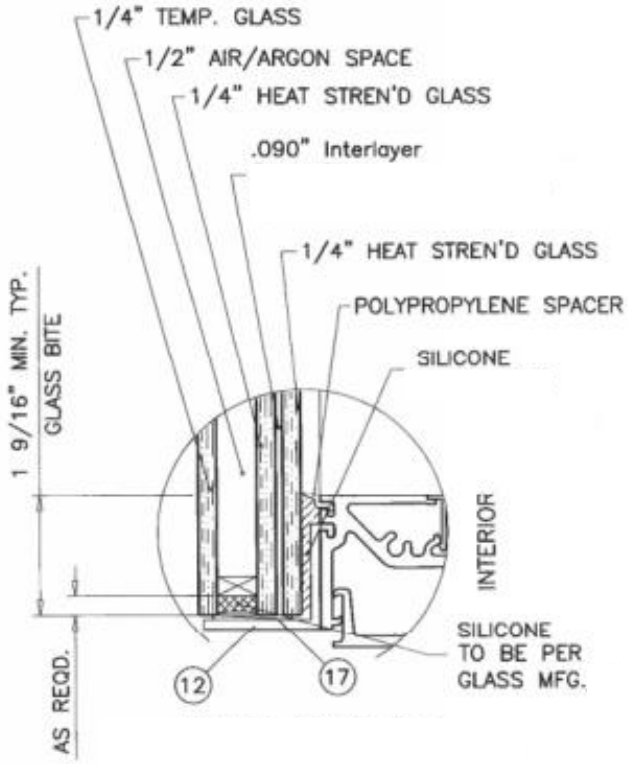
D.L.O. = DAYLIGHT OPENING



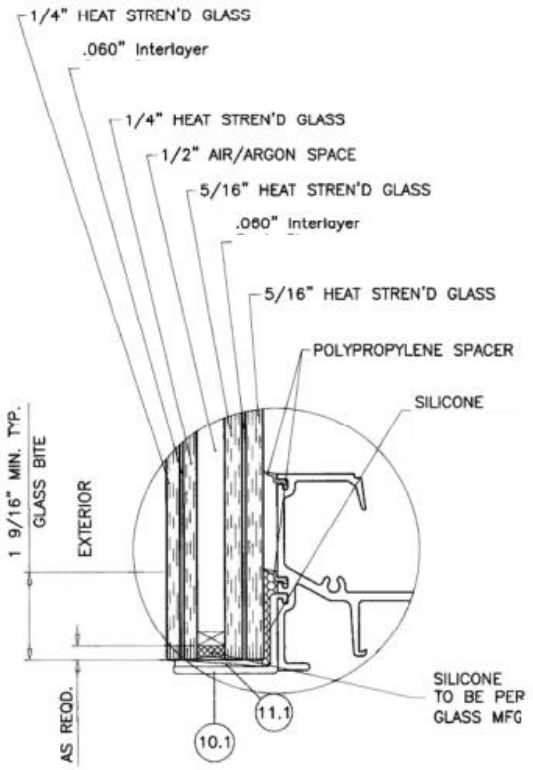
MONOLITHIC



LAMINATED



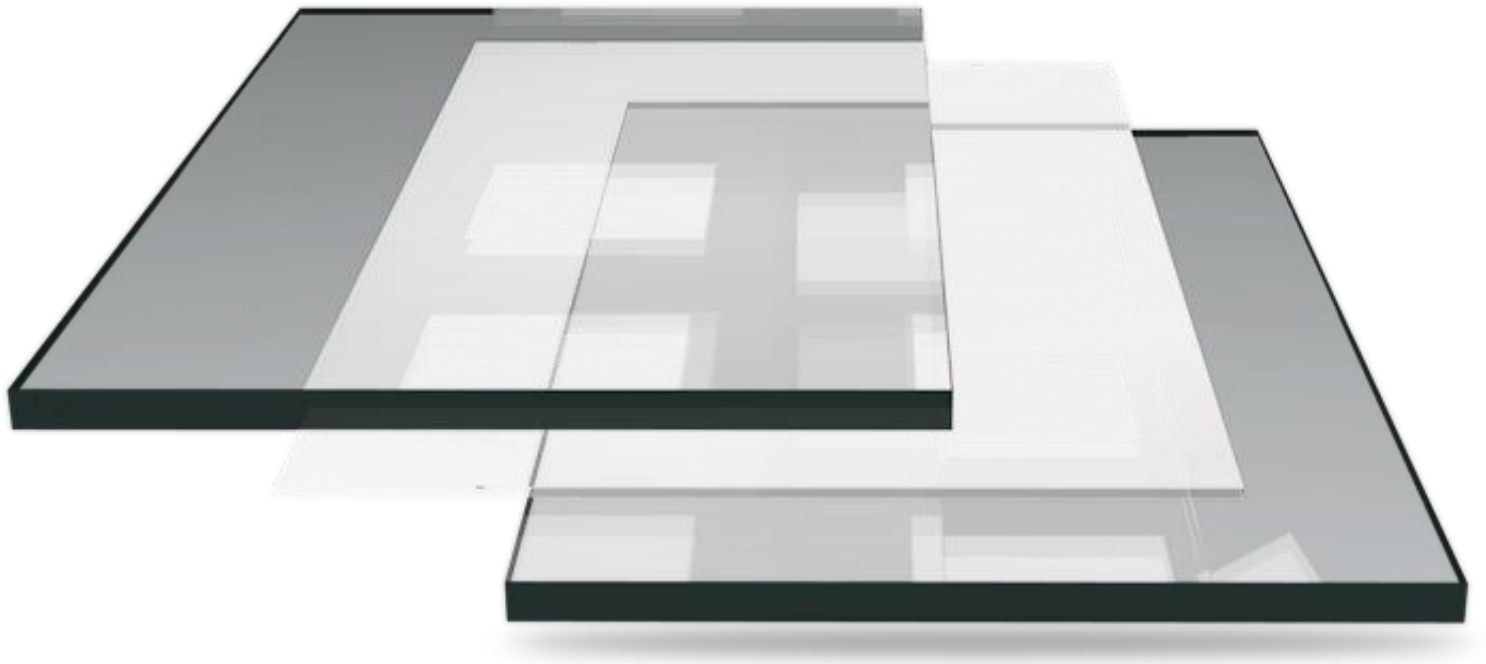
INSULATED LAMINATED



LAMINATED INSULATED LAMINATED

GLASS THICKNESS

- Monolithic
- Laminated
- Insulated Laminated
- Laminated Insulated Laminated



INTERLAYERS AND COATINGS

- Impact Resistance
- Acoustics
- Fade Protection
- Solar Heat Gain
- Aesthetics

FLORIDA HOSPITAL EXECUTIVE TOWER – Orlando, FL
Architect: **Little Diversified Architectural Consulting**

OVERSIZED LITES

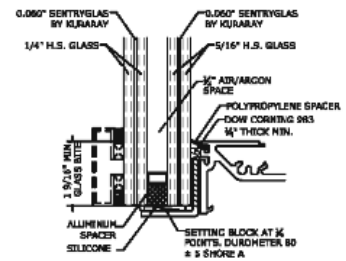
GLASS TYPE D - LOADING CHART (L.M.I.)

72 (In.)		
SIDE A OR B (D.L.O.)		
SIDE A OR B (D.L.O.) *(In.)*	*(+) P.S.F*	*(-) P.S.F*
30	100	100
36	100	100
42	100	100
48	100	100
54	100	100
58 1/2	100	100
60	100	100
66	100	100
72	100	100
78	100	100
84	100	100
90	100	100
96	100	100
102	100	100
108	100	100
114	100	100
120	100	100
126	100	100
132	100	100
138	100	100
144	100	100
150	100	100
156	100	100
162	100	100
168	100	100
174	100	100
180	100	100
186	100	100
189	100	100
192	100	100
198	100	100
204	100	100
210	100	100
216	100	100
222	100	100
228	100	100
233	100	100
240	100	100
246	100	100
252	100	100

78 (In.)		
SIDE A OR B (D.L.O.)		
SIDE A OR B (D.L.O.) *(In.)*	*(+) P.S.F*	*(-) P.S.F*
30	100	100
36	100	100
42	100	100
48	100	100
54	100	100
58 1/2	100	100
60	100	100
66	100	100
72	100	100
78	100	100
84	100	100
90	100	100
96	100	100
102	100	100
108	100	100
114	100	100
120	100	100
126	100	100
132	100	100
138	100	100
144	100	100
150	100	100
156	100	100
162	100	100
168	100	100
174	100	100
180	100	100
186	100	100
189	100	100
192	100	100
198	100	100
204	100	100
210	100	100
216	100	100
222	100	100
228	100	100
233	100	100
240	100	100
246	100	100
252	100	100

84 (In.)		
SIDE A OR B (D.L.O.)		
SIDE A OR B (D.L.O.) *(In.)*	*(+) P.S.F*	*(-) P.S.F*
30	100	100
36	100	100
42	100	100
48	100	100
54	100	100
58 1/2	100	100
60	100	100
66	100	100
72	100	100
78	100	100
84	100	100
90	100	100
96	100	100
102	100	100
108	100	100
114	100	100
120	100	100
126	100	100
132	100	100
138	100	100
144	100	100
150	100	100
156	100	100
162	100	100
168	100	100
174	100	100
180	100	100
186	100	100
189	100	100
192	100	100
198	100	100
204	100	100
210	100	100
216	100	100
222	100	100
228	100	100
233	100	100
240	100	100
246	100	100

90 (In.)		
SIDE A OR B (D.L.O.)		
SIDE A OR B (D.L.O.) *(In.)*	*(+) P.S.F*	*(-) P.S.F*
30	100	100
36	100	100
42	100	100
48	100	100
54	100	100
58 1/2	100	100
60	100	100
66	100	100
72	100	100
78	100	100
84	100	100
90	100	100
96	100	100
102	100	100
108	100	100
114	100	100
120	100	100
126	100	100
132	100	100
138	100	100
144	100	100
150	100	100
156	100	100
162	100	100
168	100	100
174	100	100
180	100	100
186	100	100
189	100	100
192	100	100
198	100	100
204	100	100
210	100	100
216	100	100
222	100	100
228	100	100



GLASS TYPE (D)

GLAZING DETAIL

N.T.S.

GLASS RATING:

LARGE MISSILE LEVEL D

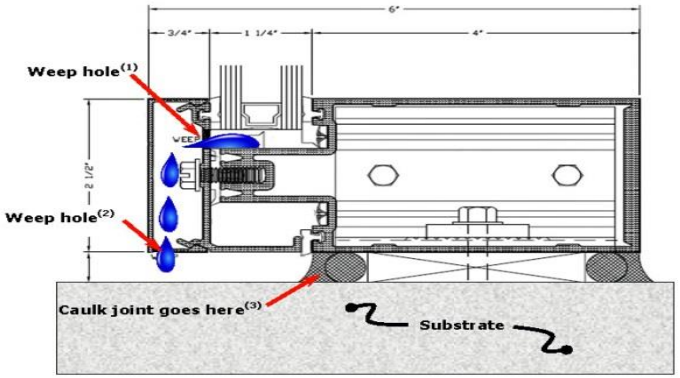
1 13/16" GLASS

D.L.O. = DAYLIGHT OPENING


OVERSIZED PANELS

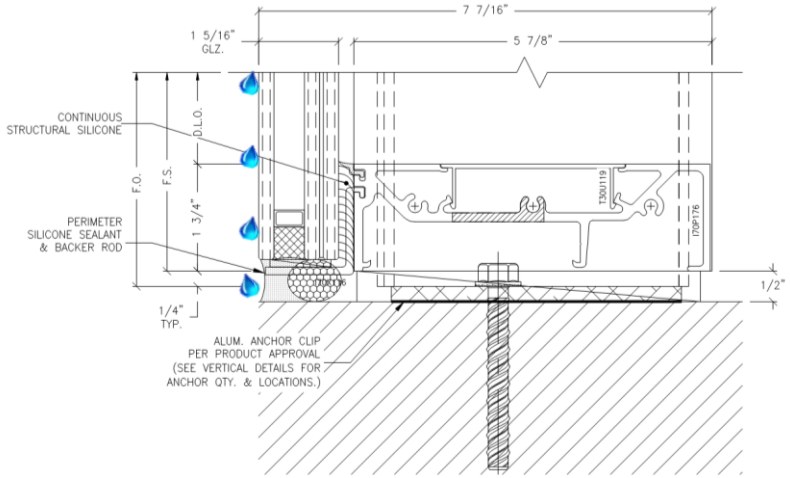
DESIGN FOR WATER RESISTANCE

PRESSURE EQUALIZED VS. FACE SEALED BARRIER WALL



PRESSURE EQUALIZED (RAINSCREEN)

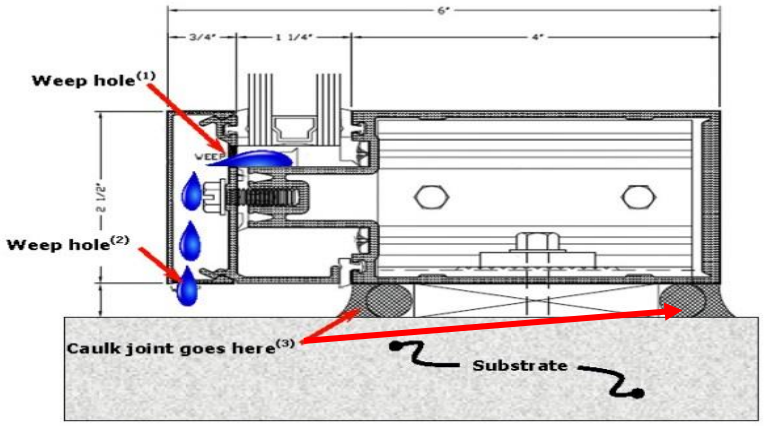
The interior interface of the glass and the frame establishes the difference between the wet side and dry side.

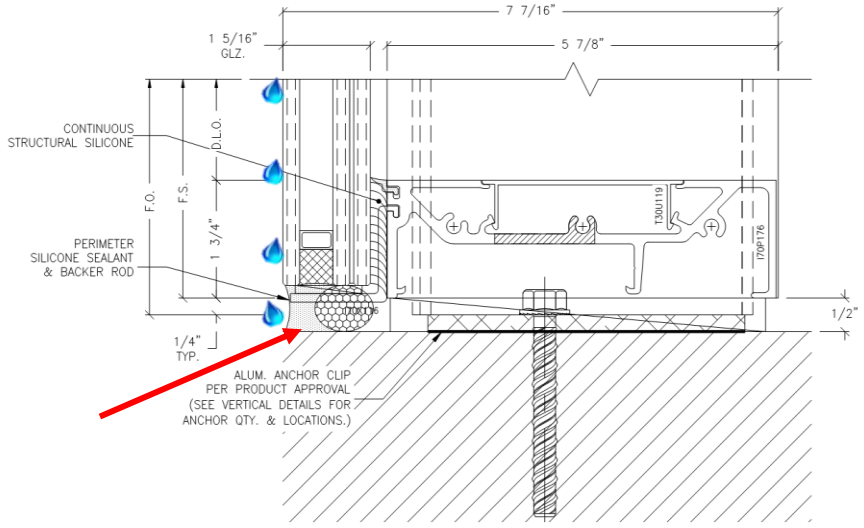


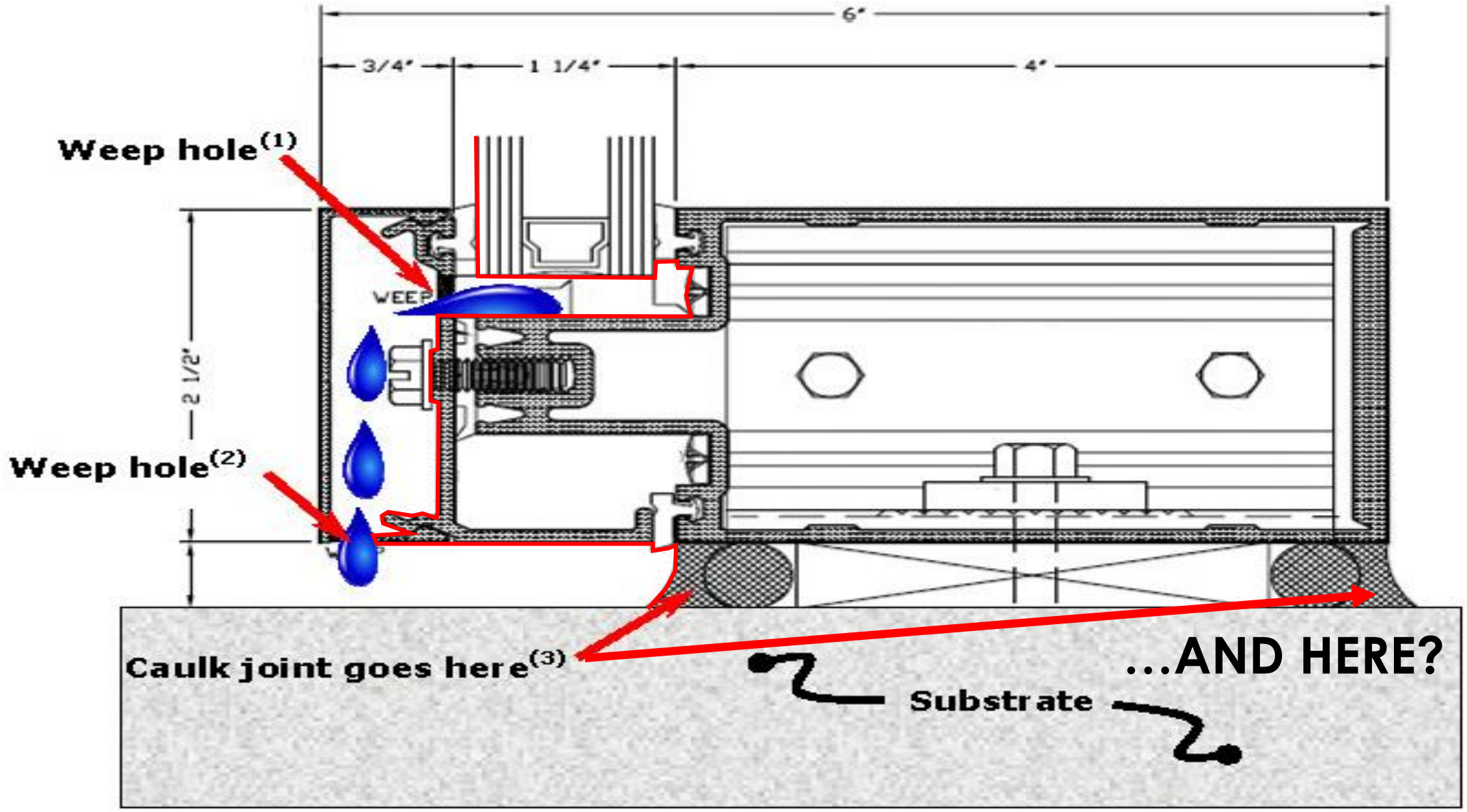
FACE SEALED BARRIER WALL

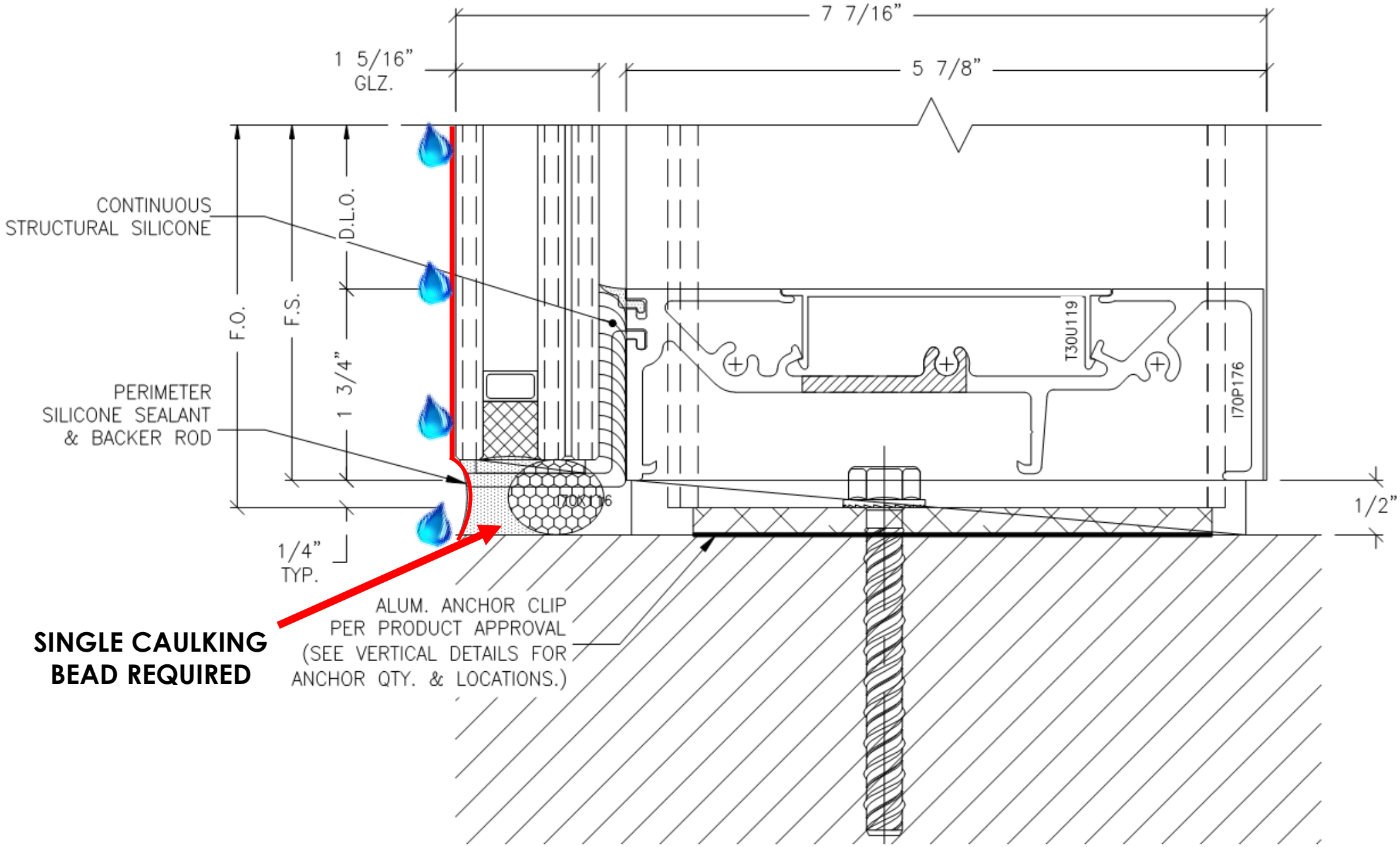
The exterior face of the glass defines the principal drainage plane

TWO BEADS OR NOT TWO BEADS, THAT IS THE QUESTION






6"
3/4"
1 1/4"
4"
Weep hole(1)
WEEP
2 1/2"
Weep hole(2)
Caulk joint goes here(3)
...AND HERE?
Substrate

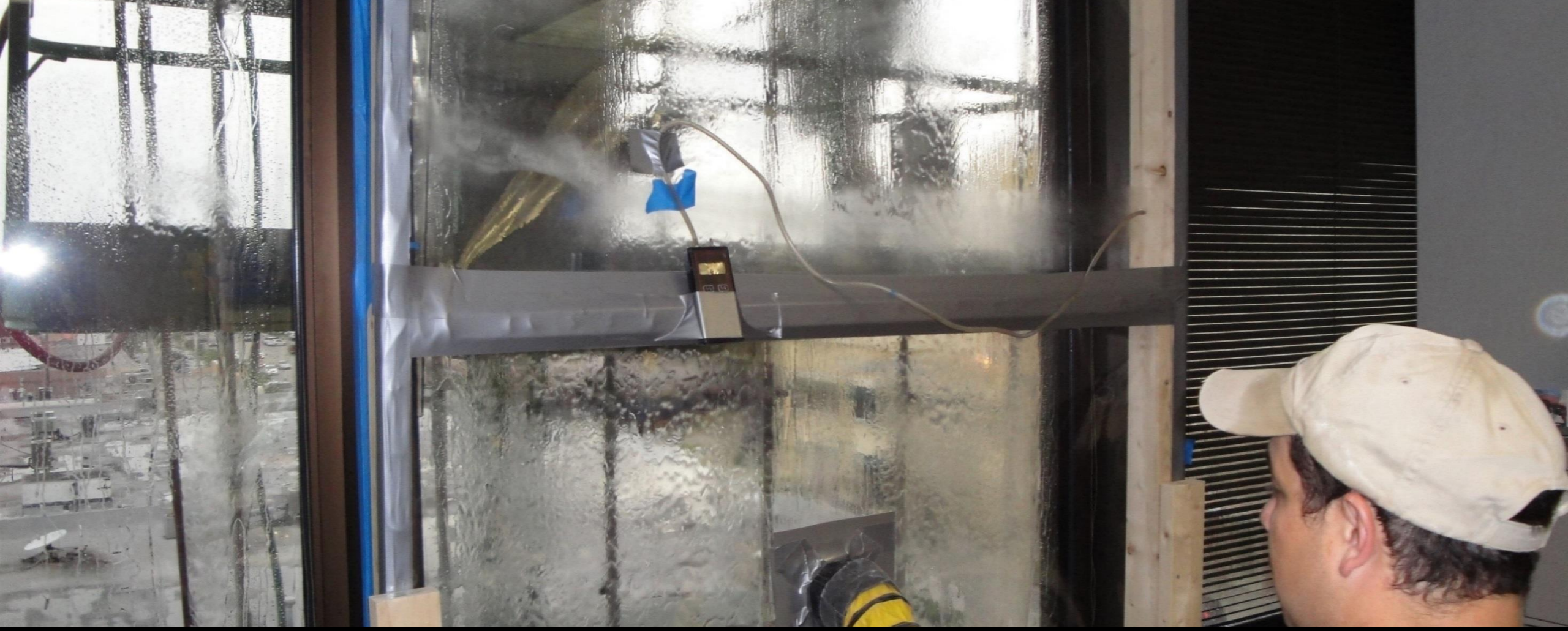

7 7/16"
1 5/16"
GLZ.
5 7/8"
CONTINUOUS
STRUCTURAL SILICONE
PERIMETER
SILICONE SEALANT
& BACKER ROD
F.O.
F.S.
D.L.O.
1 3/4"
1/4"
TYP.
T30U119
I70P176
1/2"
ALUM. ANCHOR CLIP
PER PRODUCT APPROVAL
(SEE VERTICAL DETAILS FOR
ANCHOR QTY. & LOCATIONS.)
SINGLE CAULKING
BEAD REQUIRED

REQUIRED FOR BACK UP

NOT NECESSARY

AAMA 501.2

The purpose of this test is to provide a quality assurance and diagnostic field water check method for installed storefronts, curtain walls and sloped glazing systems.



ASTM E 1105

Standard test method for field determination of water penetration of exterior windows, skylights, doors, and curtain walls, by cyclic static air pressure difference.


IN WC
-.299
I/O
E/M


Balenciaga– Miami Beach, FL
Architect: Atmosphere Design Group
ENERGY PERFORMANCE

INFORMATION COURTESY OF VIRACON

VISIBLE LIGHT TRANSMITTANCE (0-100%)

Percentage of visible light transmitted through glass; visible light is the only portion of the solar spectrum visible to the human eye

- Medical 35%-45%
- Office 25%-35%
- Residential 45%-55%
- Retail 60%-90%
- Marine Turtle max. 45%

INFORMATION COURTESY OF VIRACON

SOLAR HEAT GAIN COEFFICIENT (SHGC)

Portion of directly transmitted and absorbed solar energy entering the building's interior.
The higher the SHGC the higher the heat gain.

- The lower the better
- Florida Prescriptive Energy Code compliance SHGC 0.25 Fixed Glazing

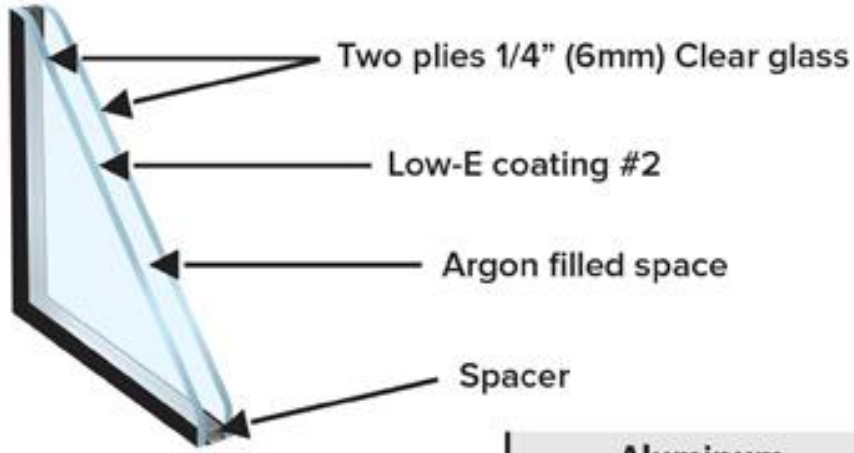
INFORMATION COURTESY OF VIRACON

U-VALUE

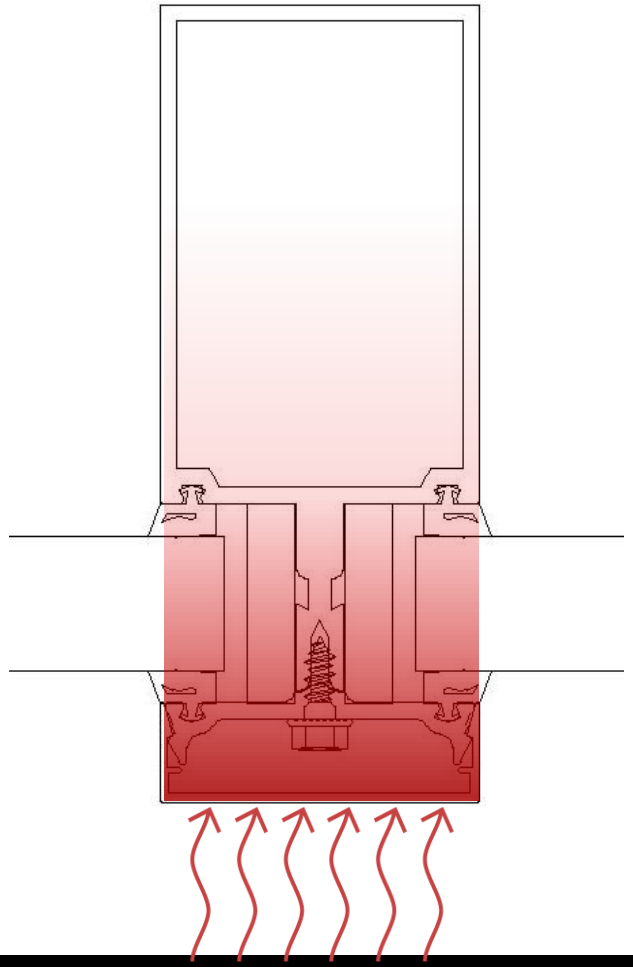
A measure of heat gain or loss through glass due to the difference in indoor and outdoor temperatures.

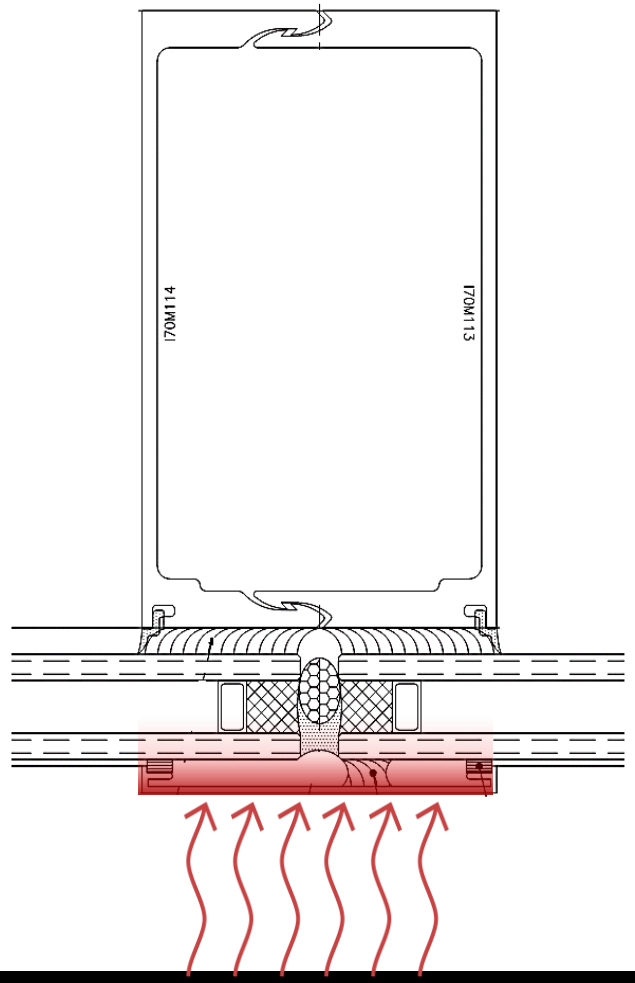
- The lower the better
- Florida Prescriptive Energy Code compliance requires 0.50 U-value for Fixed Glazing
- Requires an insulated glass unit to achieve 0.50 U-Value

IMAGE COURTESY OF VIRACON



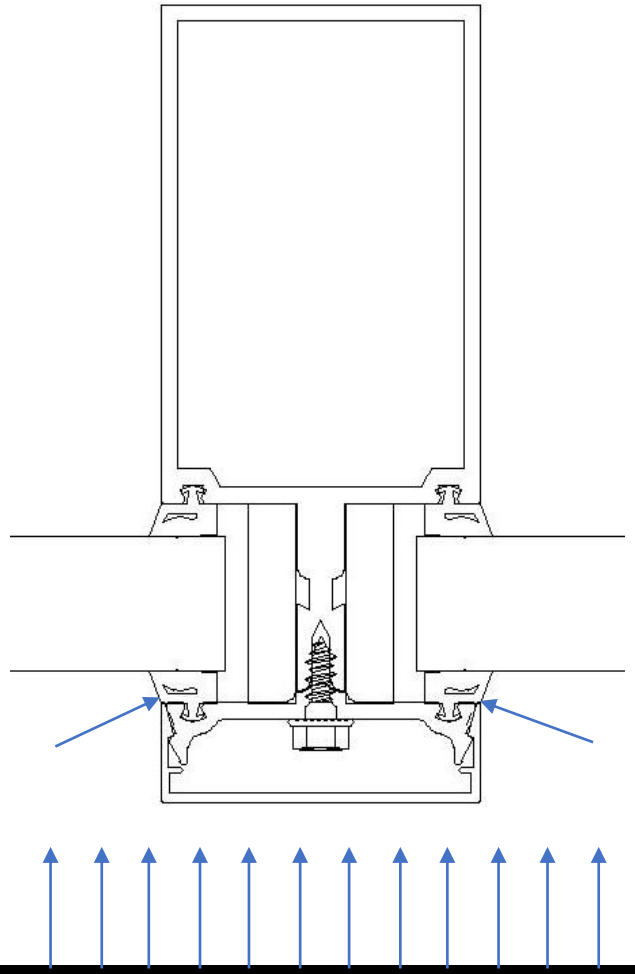
1" Low-E Insulating	Center of Glass U-Value[1]	**Aluminum Spacer** 1/2" (13.2mm)	**Stainless Steel Spacer** 1/2" (13.2mm)	**VTS™ Spacer** 1/2" (13.2mm)
		Rough Opening U-Value[2]		
Conventionally Glazed Framing System	.25	.391	.379	.371
		CR[3] 48	*CR[3] 52*	*CR[3] 55*
2-Sided Structurally Glazed Framing System	.25	.354	.334	.319
		CR[3] 53	*CR[3] 57*	*CR[3] 60*
4-Sided Structurally Glazed Framing System	.25	.336	.312	.293
		CR[3] 56	*CR[3] 60*	*CR[3] 66*

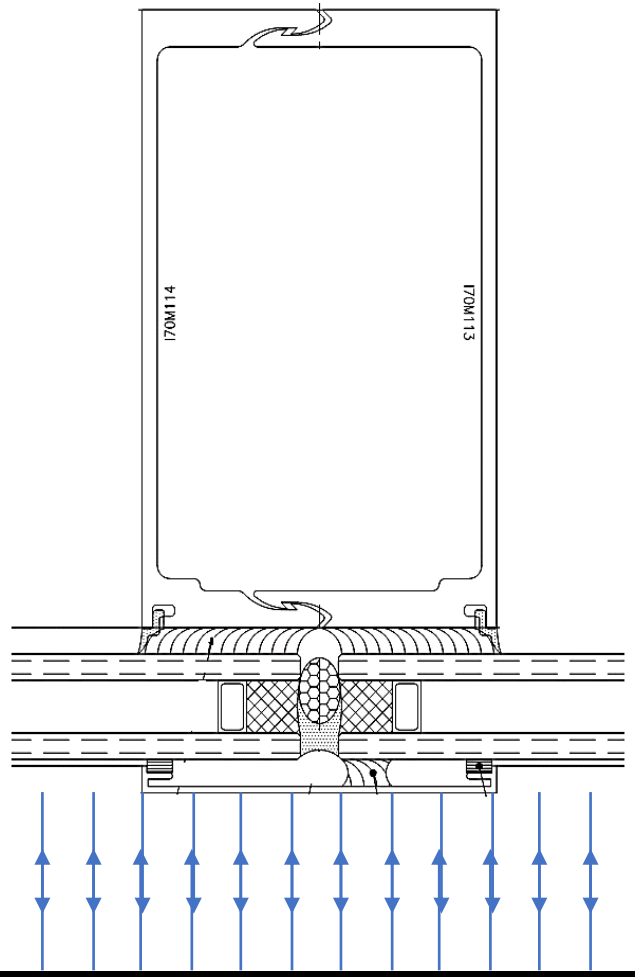




THERMAL CONDUCTIVITY

- The required cap on the pressure equalized system is attached to the backend framing allowing the heat to transfer inside.
- The cap on this structurally glazed, face-sealed barrier system is completely isolated from the vertical mullion shown, thus significantly reducing thermal conductivity.





AIR INFILTRATION

- Pressure-equalized systems are meant to block all forces to keep the building interior air and watertight. However, both air and water can enter through the gasket, gasket joinery and frame joinery.
- The structurally glazed, face-sealed barrier wall system creates an actual “barrier” against both water and air, resisting their entry.

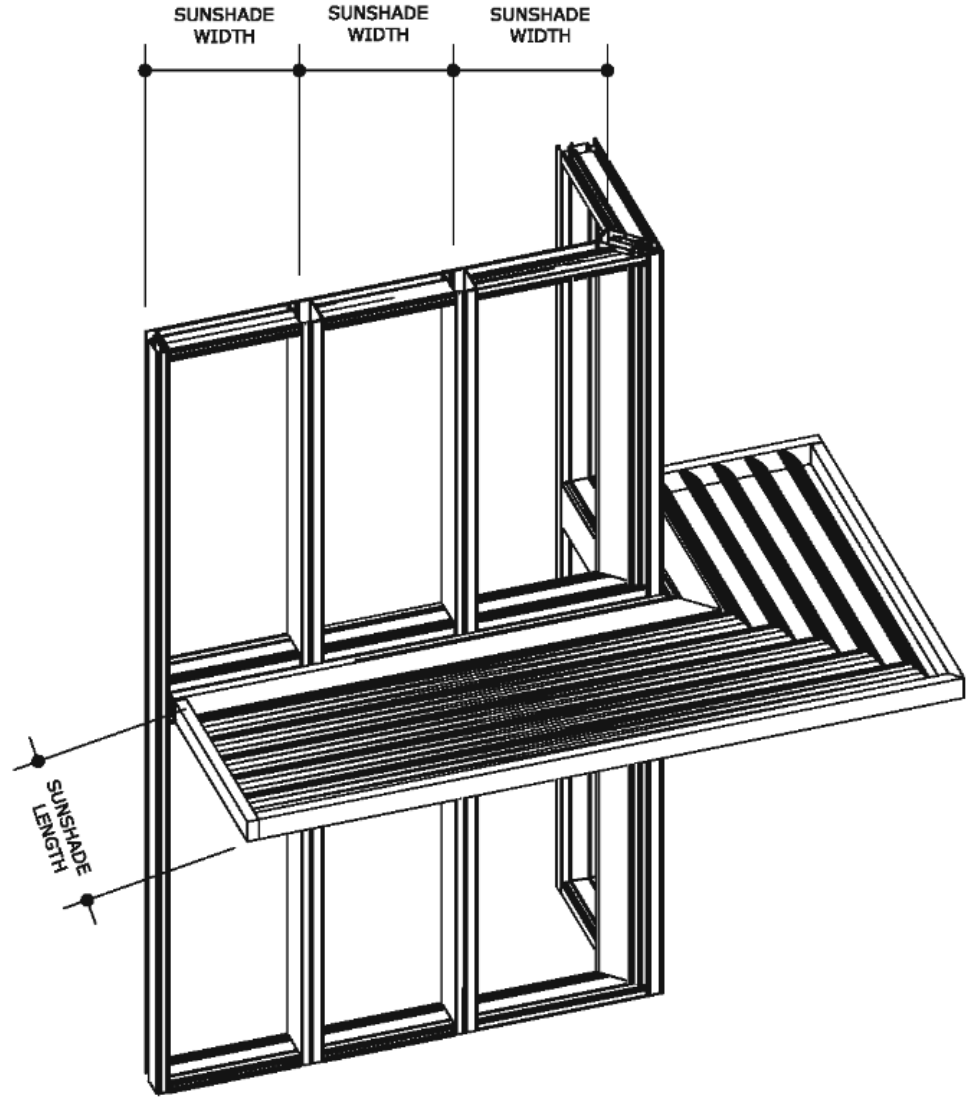
FLORIDA HOSPITAL APOPKA – Apopka, FL
Architect: **Earl Swensson Associates**

KEY FACTORS FOR EFFECTIVE SUNSHADES

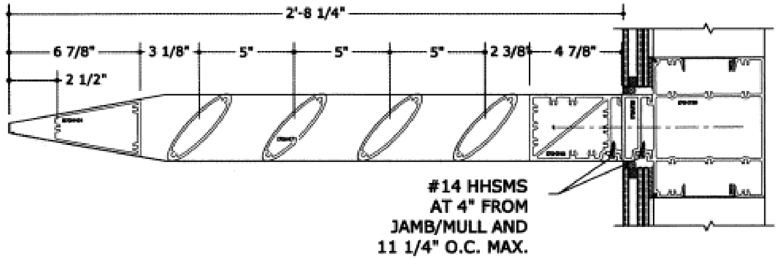
- BUILDING ORIENTATION
- SUN POSITION
- BLADE TYPES
- PROJECTION DEPTHS

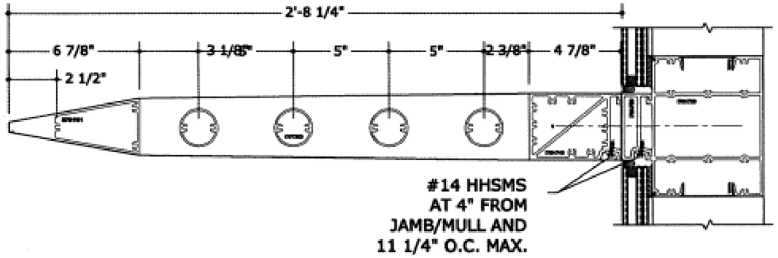
SUNSHADE LOADING TABLE (P.S.F.)

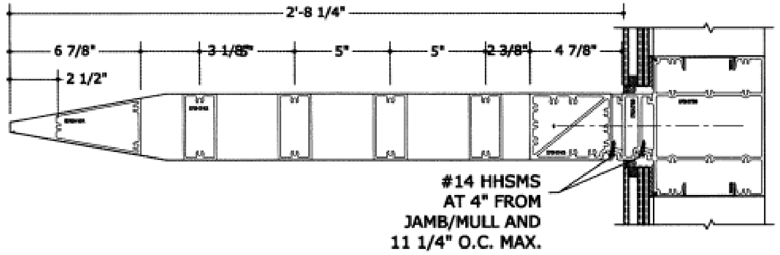
Sunshade Width (in.)	Sunshade Length (in.)	Max Pressure 0% Porosity P.S.F.	Max Pressure 25% Porosity P.S.F.	Max Pressure 50% Porosity P.S.F.
30	12	120	120	120
	18	120	120	120
	24	120	120	120
	30	120	120	120
	36	83	111	120
	42	61	82	120
	48	47	63	94
	54	37	49	74
	60	30	40	60
36	12	120	120	120
	18	120	120	120
	24	120	120	120
	30	120	120	120
	36	83	111	120
	42	61	82	120
	48	47	63	94
	54	37	49	74
	60	30	40	60
42	12	120	120	120
	18	120	120	120
	24	120	120	120
	30	120	120	120
	36	83	111	120
	42	61	82	120
	48	47	63	94
	54	37	49	74
	60	30	40	60
48	12	120	120	120
	18	120	120	120
	24	120	120	120
	30	120	120	120
	36	83	111	120
	42	61	82	120
	48	47	63	94
	54	37	49	74
	60	30	40	60
54	12	120	120	120
	18	120	120	120
	24	120	120	120
	30	120	120	120
	36	83	111	120
	42	61	82	120
	48	47	63	94
	54	37	49	74
	60	30	40	60
60	12	120	120	120
	18	120	120	120
	24	120	120	120
	30	120	120	120
	36	83	111	120
	42	61	82	120
	48	47	63	94
	54	37	49	74
	60	30	40	60

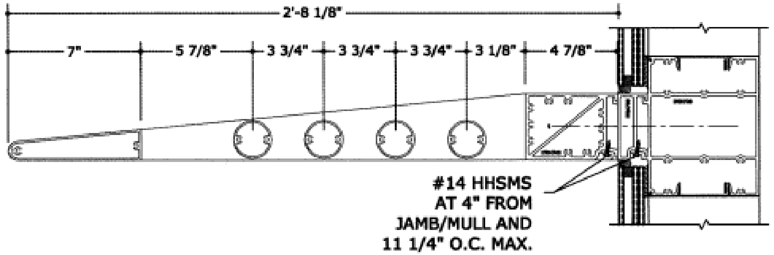


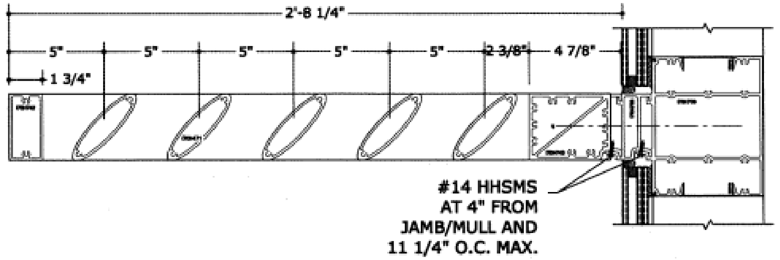
NOTE:
SUNSHADES AT CANTILEVERED CONDITIONS ARE ACCEPTABLE IN BOTH HEAD AND SILL LOCATIONS. IF THEY OCCUR SIMULTANEOUSLY, SITE-SPECIFIC ENGINEERING IS REQUIRED. FINAL DESIGN MUST BE APPROVED BY A LICENSED PROFESSIONAL ENGINEER AND THE PRODUCT MANUFACTURER.

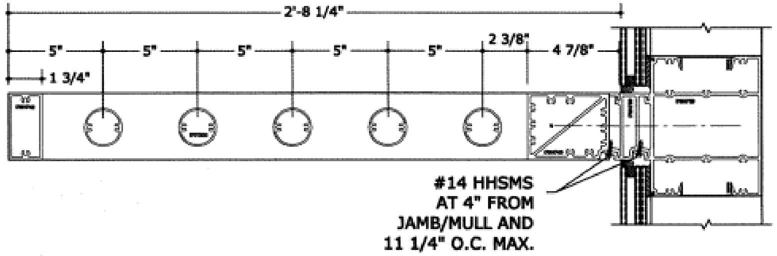

2'-8 1/4"
6 7/8"
3 1/8"
5"
5"
5"
2 3/8"
4 7/8"
2 1/2"
#14 HHSMS
AT 4" FROM
JAMB/MULL AND
11 1/4" O.C. MAX.

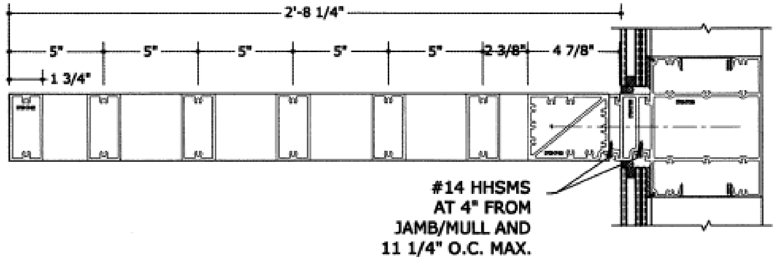

2'-8 1/4"
6 7/8"
3 1/8"
5"
5"
2 3/8"
4 7/8"
2 1/2"
#14 HHSMS
AT 4" FROM
JAMB/MULL AND
11 1/4" O.C. MAX.

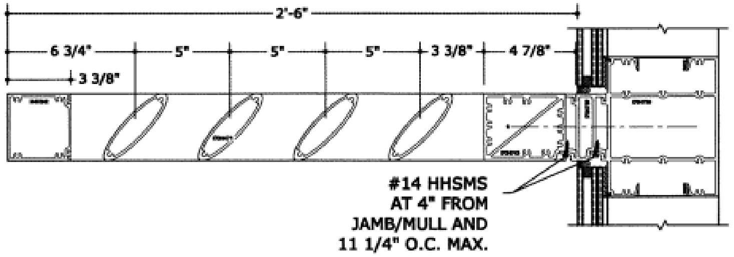

2'-8 1/4"
6 7/8"
3 1/8"
5"
5"
2 3/8"
4 7/8"
2 1/2"
#14 HHSMS
AT 4" FROM
JAMB/MULL AND
11 1/4" O.C. MAX.

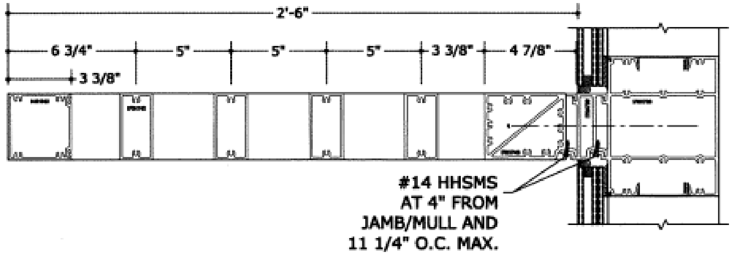

2'-8 1/8"
7"
5 7/8"
3 3/4"
3 3/4"
3 3/4"
3 1/8"
4 7/8"
#14 HHSMS
AT 4" FROM
JAMB/MULL AND
11 1/4" O.C. MAX.


2'-8 1/4"
5"
5"
5"
5"
5"
2 3/8"
4 7/8"
1 3/4"
#14 HHSMS
AT 4" FROM
JAMB/MULL AND
11 1/4" O.C. MAX.


2'-8 1/4"
5"
5"
5"
5"
5"
2 3/8"
4 7/8"
1 3/4"
#14 HHSMS
AT 4" FROM
JAMB/MULL AND
11 1/4" O.C. MAX.


2'-8 1/4"
5"
5"
5"
5"
5"
2 3/8"
4 7/8"
1 3/4"
#14 HHSMS
AT 4" FROM
JAMB/MULL AND
11 1/4" O.C. MAX.


2'-6"
6 3/4"
5"
5"
5"
3 3/8"
4 7/8"
3 3/8"
#14 HHSMS
AT 4" FROM
JAMB/MULL AND
11 1/4" O.C. MAX.


2'-6"
6 3/4"
5"
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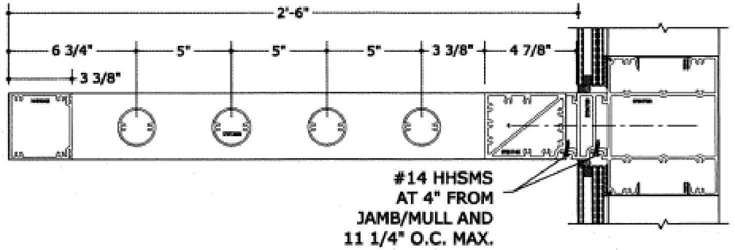
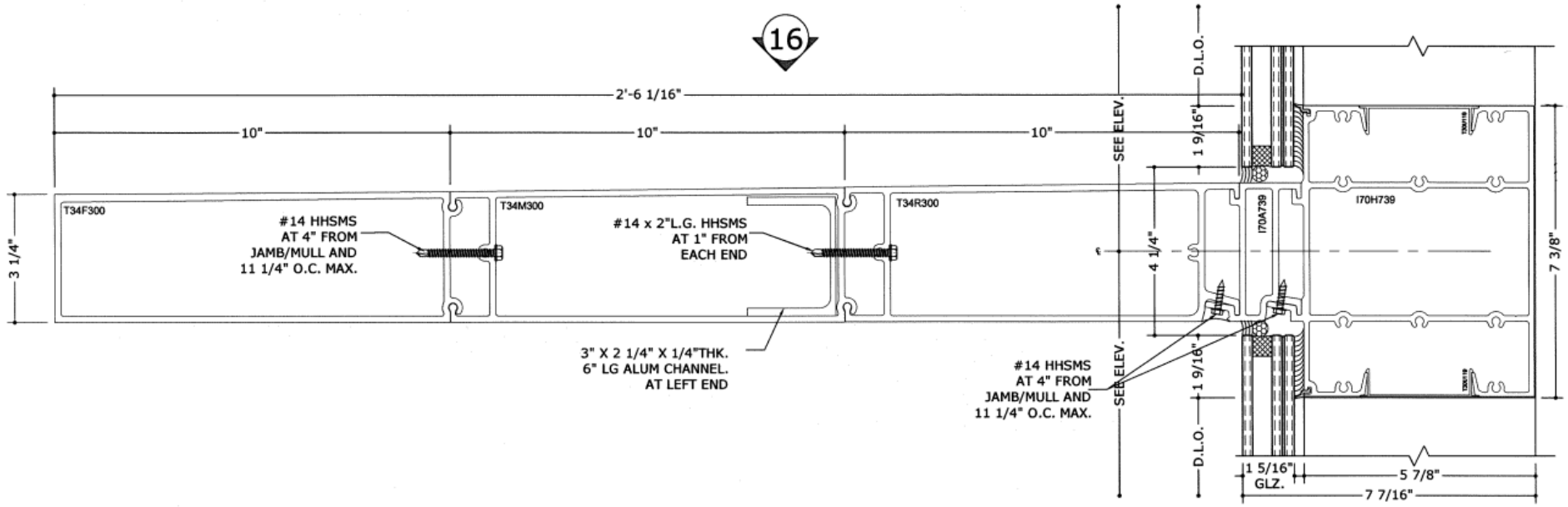
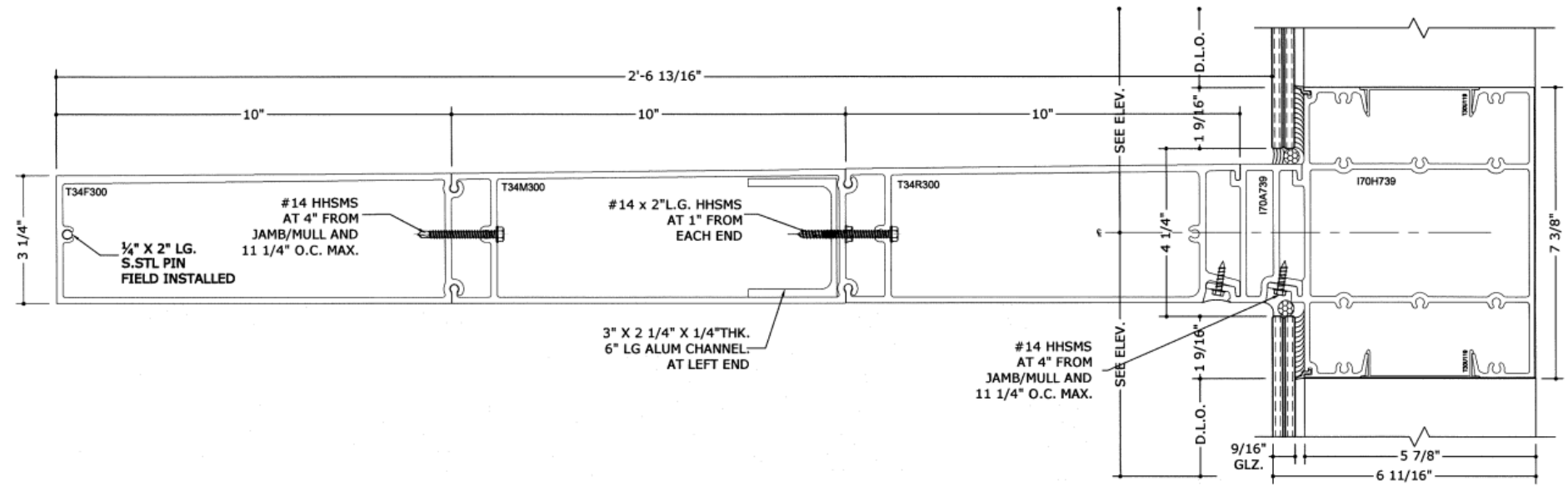
3 3/8"
4 7/8"
3 3/8"
#14 HHSMS
AT 4" FROM
JAMB/MULL AND
11 1/4" O.C. MAX.

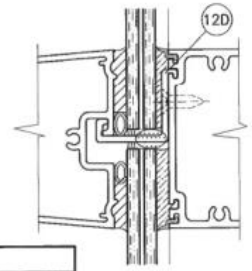

2'-6"
6 3/4"
5"
5"
5"
3 3/8"
4 7/8"
3 3/8"
#14 HHSMS
AT 4" FROM
JAMB/MULL AND
11 1/4" O.C. MAX.



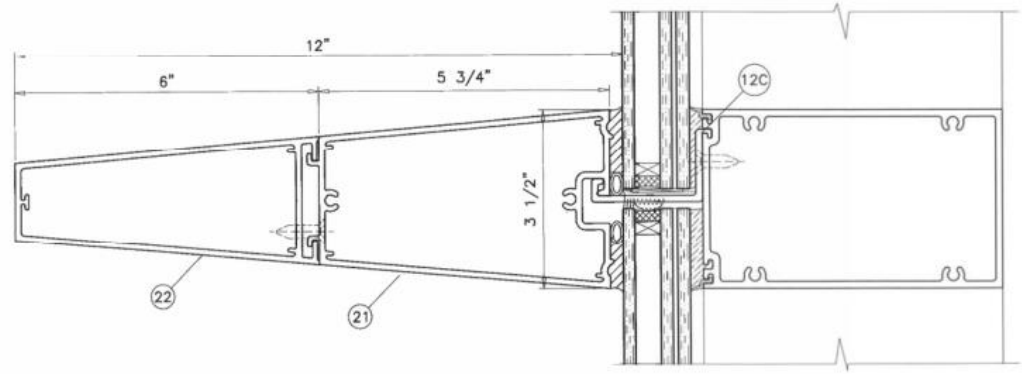
14 SUNSHADE 1



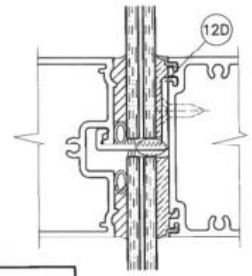
15 SUNSHADE 1



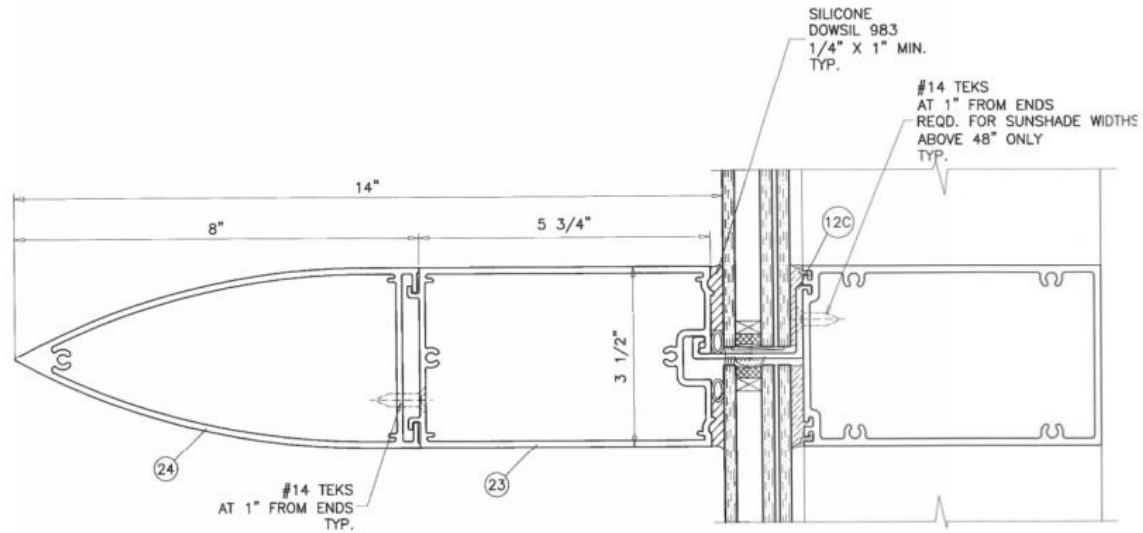
12" SUNSHADE RATING CHART							
MAXIMUM SUNSHADE WIDTH	MAXIMUM FRAME HEIGHT	UPLIFT = 120		UPLIFT = 150		UPLIFT = 204.7	
		EXT.(+)	INT.(−)	EXT.(+)	INT.(−)	EXT.(+)	INT.(−)
54"	96"	120.0	145.0	120.0	145.0	120.0	145.0
60"		120.0	145.0	120.0	145.0	78.1	145.0
61"		120.0	145.0	120.0	145.0	70.8	145.0
66"		120.0	145.0	118.0	145.0	39.0	145.0
68"		120.0	145.0	106.7	145.0	–	–
54"	108"	120.0	145.0	120.0	145.0	120.0	145.0
60"		120.0	145.0	120.0	145.0	75.7	145.0
66"		120.0	145.0	113.0	145.0	37.3	145.0
68"		120.0	145.0	101.8	145.0	–	–
54"	120"	120.0	145.0	120.0	145.0	120.0	145.0
60"		120.0	145.0	120.0	145.0	75.0	145.0
66"		120.0	145.0	110.1	145.0	36.4	145.0
68"		120.0	145.0	98.8	145.0	–	–



INTERMEDIATE HORIZONTAL
WITH 12" APPLIED FIN



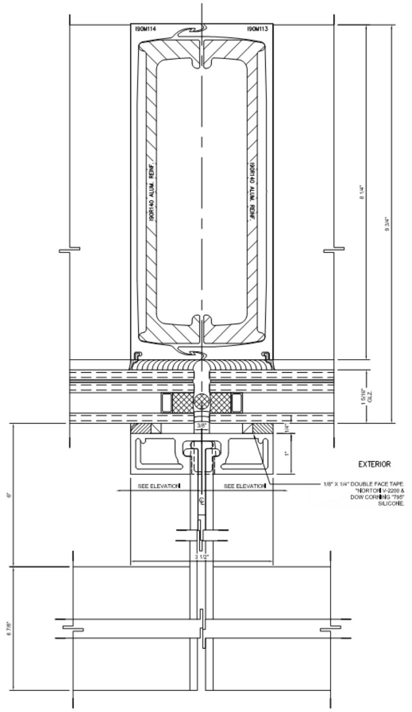
14" SUNSHADE RATING CHART							
MAXIMUM SUNSHADE WIDTH	MAXIMUM FRAME HEIGHT	UPLIFT = 88		UPLIFT = 110		UPLIFT = 150	
		EXT.(+)	INT.(−)	EXT.(+)	INT.(−)	EXT.(+)	INT.(−)
54"	96"	120.0	145.0	120.0	145.0	120.0	145.0
60"		120.0	145.0	120.0	145.0	78.1	145.0
61"		120.0	145.0	120.0	145.0	70.8	145.0
66"		120.0	145.0	118.0	145.0	39.0	145.0
68"		120.0	145.0	106.7	145.0	–	–
54"	108"	120.0	145.0	120.0	145.0	120.0	145.0
60"		120.0	145.0	120.0	145.0	75.7	145.0
66"		120.0	145.0	113.0	145.0	37.3	145.0
68"		120.0	145.0	101.8	145.0	–	–
54"	120"	120.0	145.0	120.0	145.0	120.0	145.0
60"		120.0	145.0	120.0	145.0	75.0	145.0
66"		120.0	145.0	110.1	145.0	36.4	145.0
68"		120.0	145.0	98.8	145.0	–	–



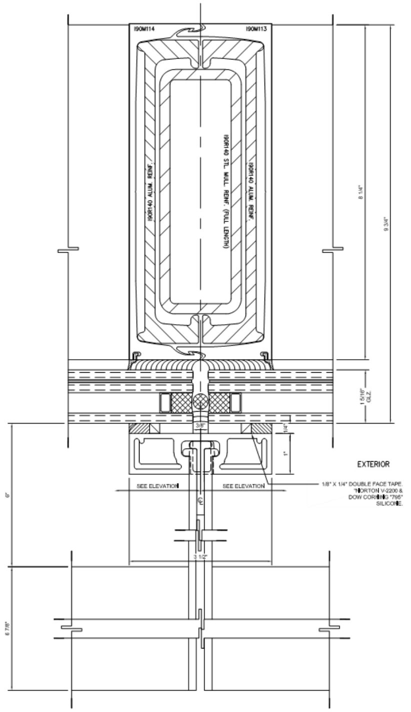
INTERMEDIATE HORIZONTAL
WITH 14" APPLIED FIN

U HEALTH: THE LENNAR FOUNDATION MEDICAL CTR. – Coral Gables, FL

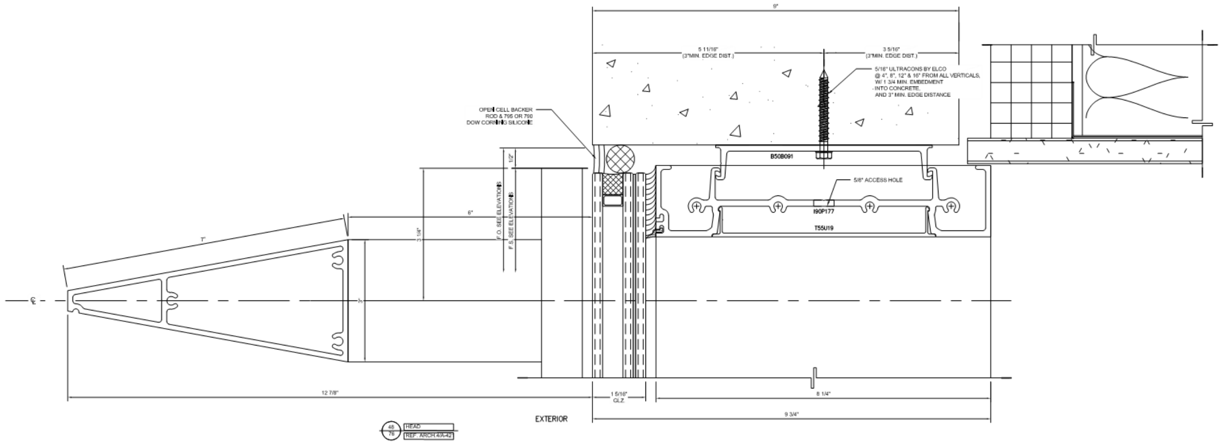
Architect: **Perkins + Will**



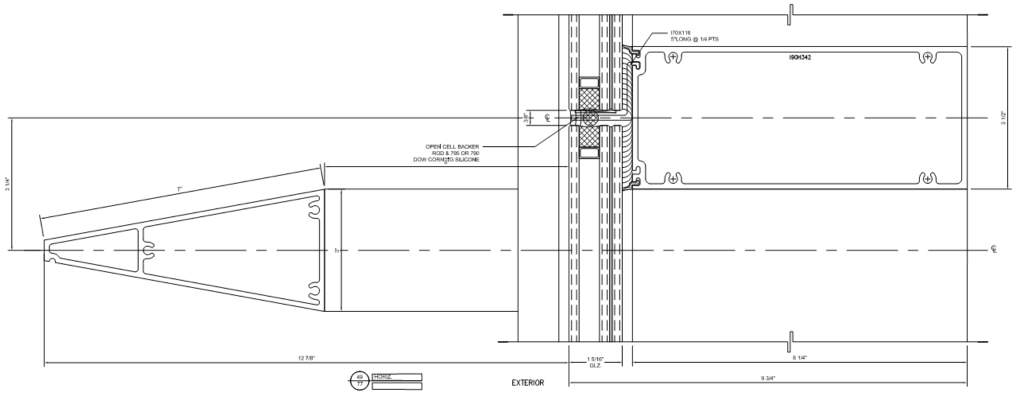
39 / 71 VERTICAL MULL



40 / 71 VERTICAL MULL



48 / 76 HEAD
REF. ARCH 4/A-42



49 / 77 HORIZ.

INFORMATION COURTESY OF VIEW GLASS

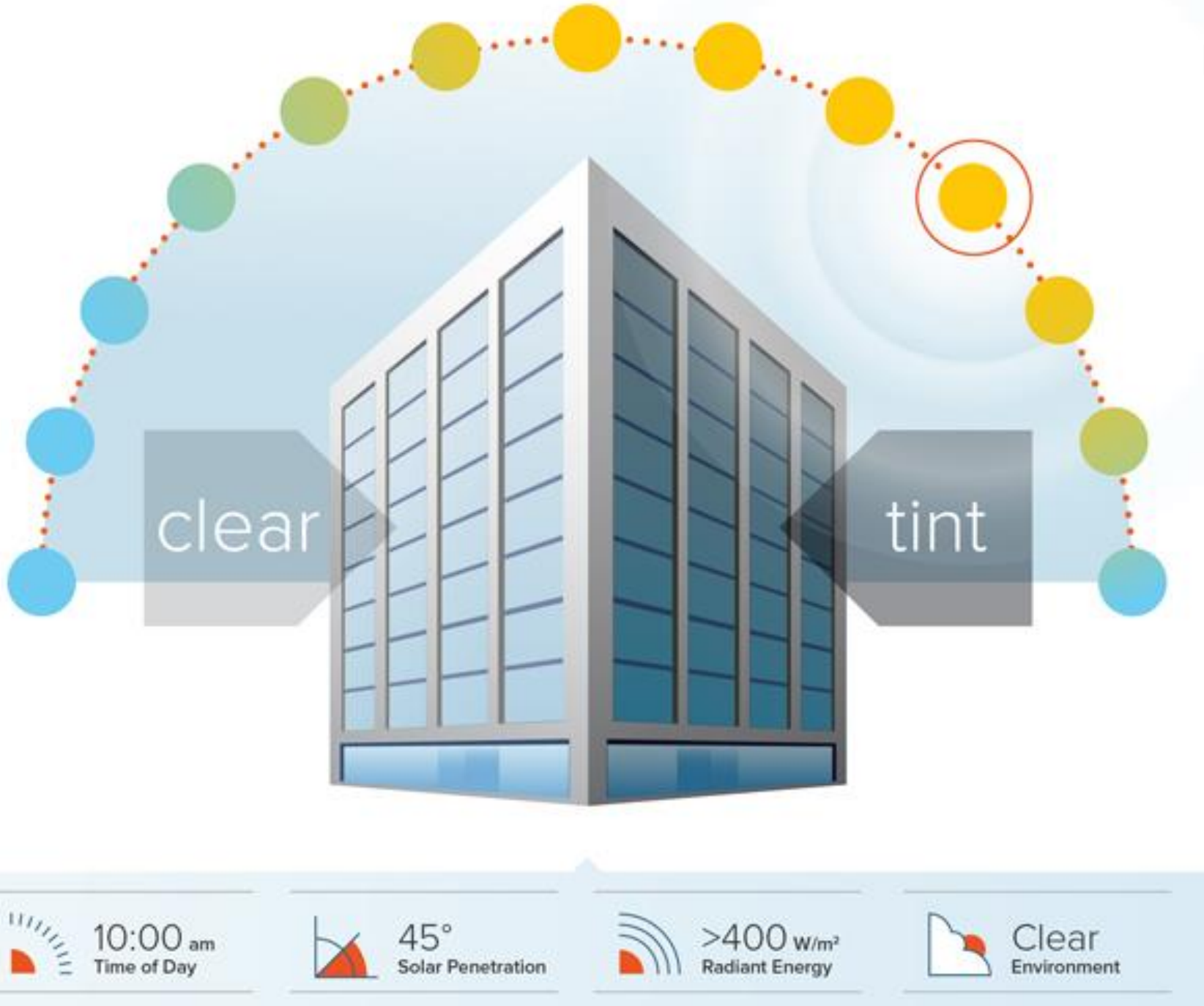


IMAGE COURTESY OF VIEW GLASS

INFORMATION COURTESY OF RESEARCH FRONTIER

SPD (SUSPENDED PARTICLE DEVICE)

- Instant switching speed
- Infinite intermediate state from dark to clear
- 99.5% UV light blockage

Balenciaga– Miami Beach, FL
Architect: Atmosphere Design Group

IMPACT RESISTANCE

- Hurricane Impact
- Human Impact
- Blast & Bullet Resistant
- Testing


1


Photron
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Time : 16:02

THANK YOU

For additional information on commercial glazing systems,
Please visit: www.crawfordtracey.com