Letter of Transmittal

September 25, 2017

Dr Aly Said

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209 Engineering Unit A

University Park, PA 16801

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Dear Dr Said,

I have attached the Note Book A file. It is a summary of the calculations of loading in the Generic Building Name, Nowhere USA. It includes Seismic, Wind and Gravity Loads. Hand Calculations and excel were used to calculate the loads.

Thank you for reviewing this report. Your feedback will be helpful as this project goes on.

Sincerely,

Harry Baker

Hab199@psu.edu

8145711049

Note Book A

Harry Baker | Structural Option| Advised By Dr. Aly Said

GENERIC BUILDING NAME

NOWHERE, USA

I EXECUTIVE SUMMARY

The purpose of this report is to discuss the structural systems of the Generic Building Name. The Generic Building Name is a Cancer research and treatment center. It is 10 floors and 10800 sf total. The main architectural feature is a two floor canopy on the norther side of the building. In this report the main gravity system, lateral system, loads and their paths and other structural systems will be detailed.

The Generic Building name is a concrete building. The floor slabs are reinforced two way concrete slabs. These Slabs are supported by reinforced concrete columns. The canopy is supported by four large concrete post tensioned beams. Theses beams are supported on either side by large circular columns. The lateral system is ordinary reinforce shear walls. An auger cast piles system is the foundation system. A possible topic for later assignments is a redesign in Steel.

II TABLE OF CONTENTS

1 Building Abstract

Building Name	Generic Building Name
Location And Site	Anywhere, USA
Owner Occupant Name	Generic University
Occupancy or function Type	Medical outpatient center
Size	184000 sf
Number of floors	10 total floors, 1 partially below grade
Dates of construction (start – finish)	September 9, 2015- late 2017
Cost	100 Million
Project Delivery Method	Design-bid-build
Architect	Wilmot/ Sanz, inc.
Consulting Arch & Land Scape Architect	Ayer/Saint/Gross
Mep Engineer	James Posey Associates
Structural Engineer	Cagley & Associates
Civil Engineer	RK&K Engineering
Telecomm Engineer	Smith Seckman Reid, inc.
Equipment Planner	Global Workplace Solutions
Construction Management	Whiting-Turner

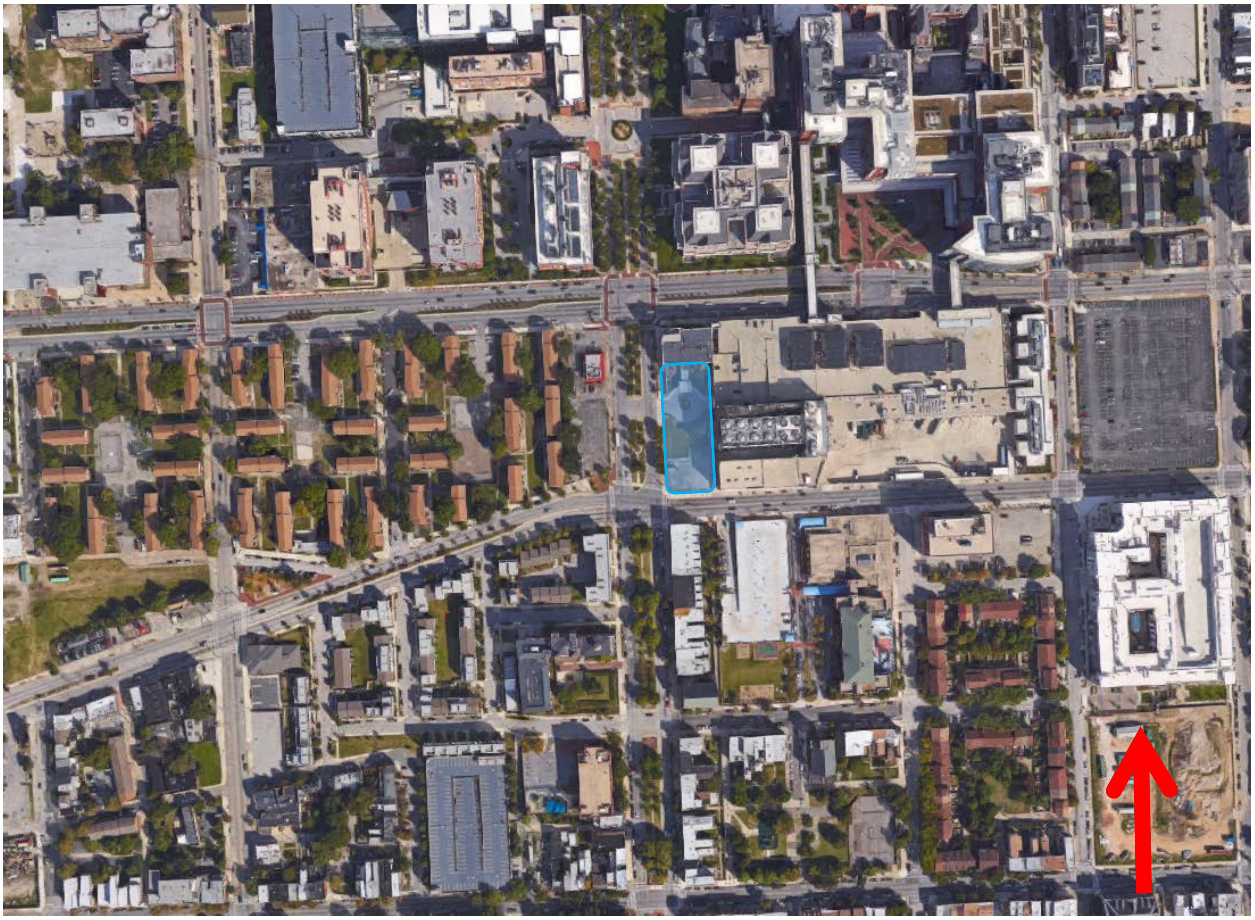
The Generic Building Name is being built in a larger Medical campus of a notable university. Its purpose is to provide clinical services to cancer patients with solid tumors and provide diagnostic and treatment planning to new patients. The tenth floor will house a special breast cancer center. It is entirely funded by philanthropic donations.

The Generic Building Name is a rectangular box in form. It's most prominent architectural moment is the large, 2 story underpass below the building on its plan north edge. This creates a covered space for drop of patients and an access road to the parking garage on the other side. The main entrance is a two story mezzanine. Above the two bottom floors, the floor plans maintain a consistent rectangular shape with little variation. The fourth floor features a connection bridge to the adjacent parking garage.

A protruding block of curtain wall mark the building main façade along the plan west side of the building. This façade faces the main access road. The protrusion is contrasted by step back in the façade in the northwest corner of the building. The windows on this façade also feature a double triple window shade. The building façades become tamer along the other sides of the building, featuring long windows.

Generic Building Name was built to the 2015 IBC (International Building Code). It is zoned in a Community business district.

2 Site and Location



Site

Figure 3-1: Down Town Nowhere, USA**

**By request of the owner the Location of the building will not appear in this report. A fictions Location is being used. The street names have been left out of the location plan for further confidentiality.

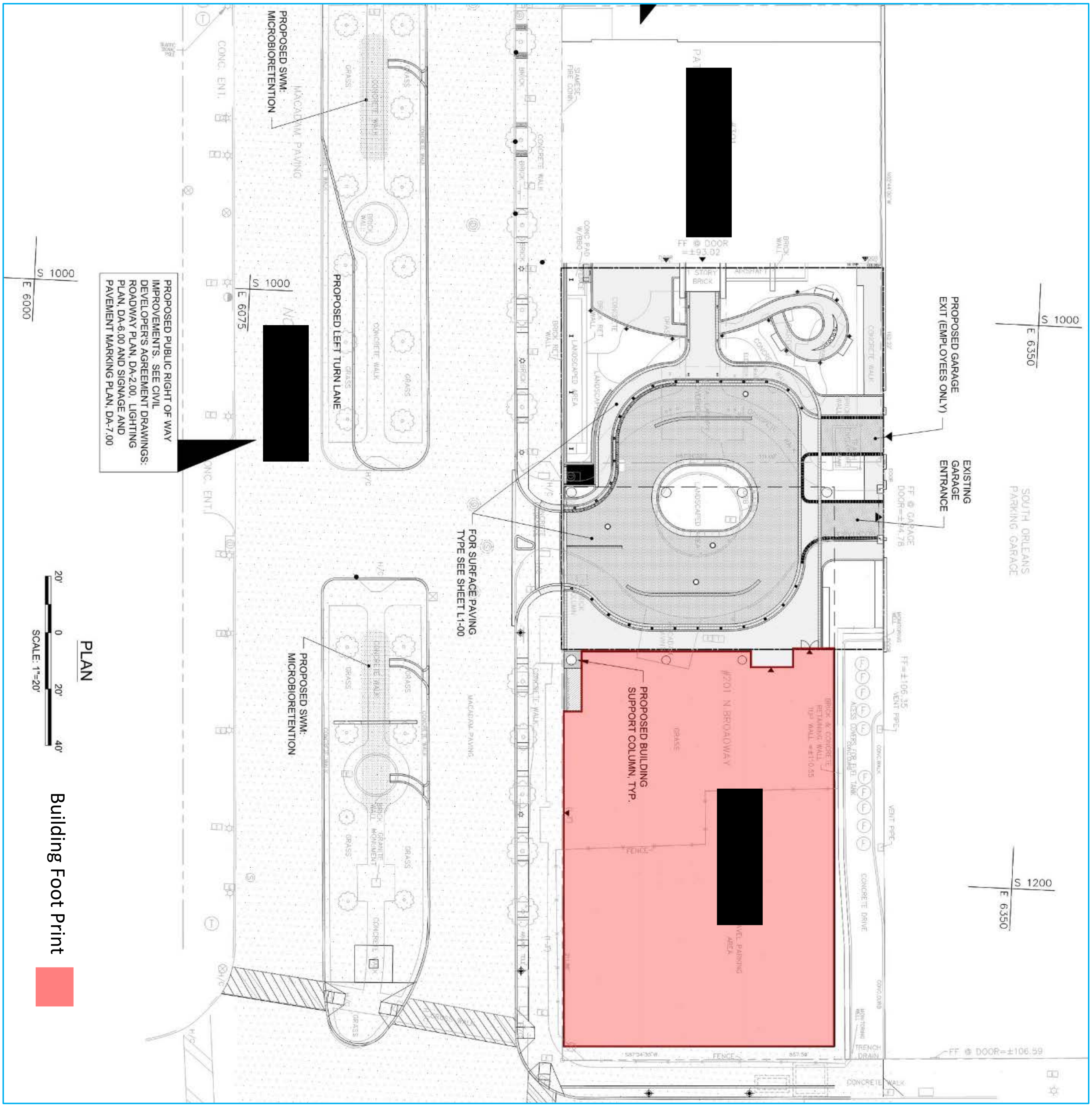


Figure 3.2: Site Plan **

** Building name and street names redacted for confidentiality.

3 Gravity

Roof

Typical Section

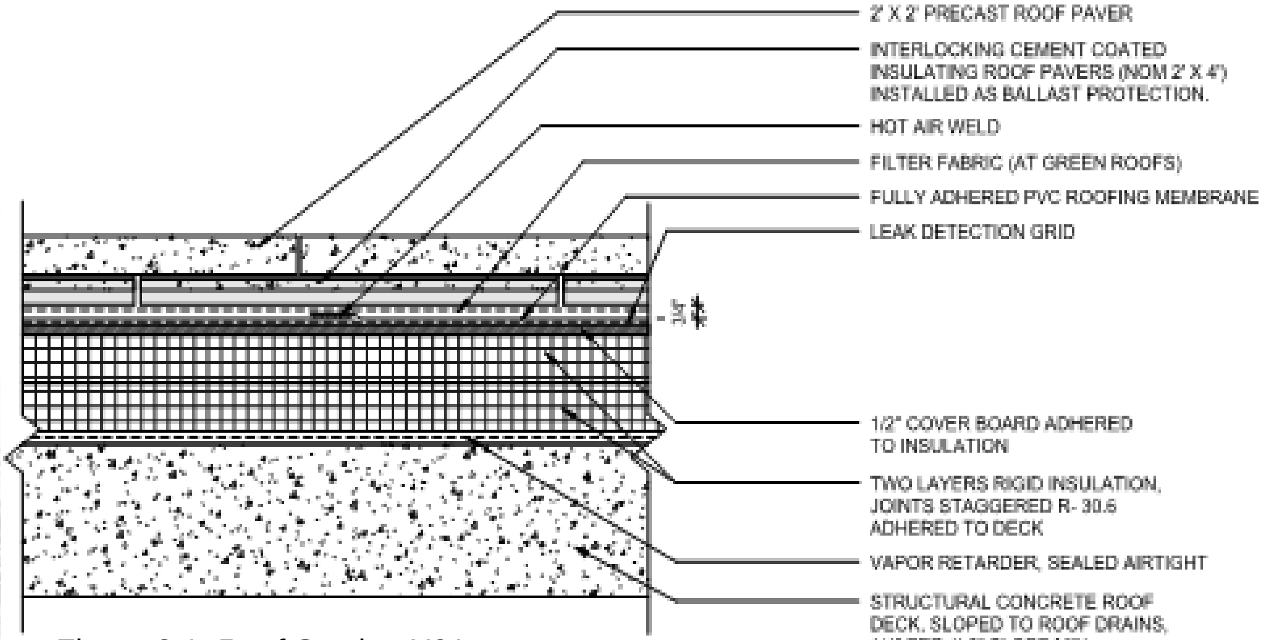


Figure 3.1: Roof Section X01

Pavers = 14 psf (ASCE)

Rigid insu. (6") .2 psf / in = .1 psf (ASCE)

Concrete NW (8") 8/12 (150 pcf) = 100 psf (ASCE)

Misc (Mep, ceiling) = 15 psf

DL = 130 psf

R_{LL} = 30 psf

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Parapet

For Typical Section see Figure 3.2

Metal copin 1.49 ($\frac{14''}{12}$) = 1.73 plf (Alcobond)

Rigid insu. (5" total) .2/in (5) = .1 psf (ASCE 7-10)

Metal panels = 1.49 psf (Alcobond)

1/2" sheathing = 2 psf (AISC)

4x4 Steel posts, 48" o.c 12.21/4 = 3 psf (AISC)

6" 16 gauge Metal framing = 1 psf (AISC)

2 x 5/8 Gypsum = 5 psf (ASCE)

2x 2x4's = 2 (1.22) plf (ASCE)

2x10 = 3.37 plf (ASCE)

$DL = 12.59(4.833) + 1.73 + 2(1.22) + 3.37$

$= 70$ plf

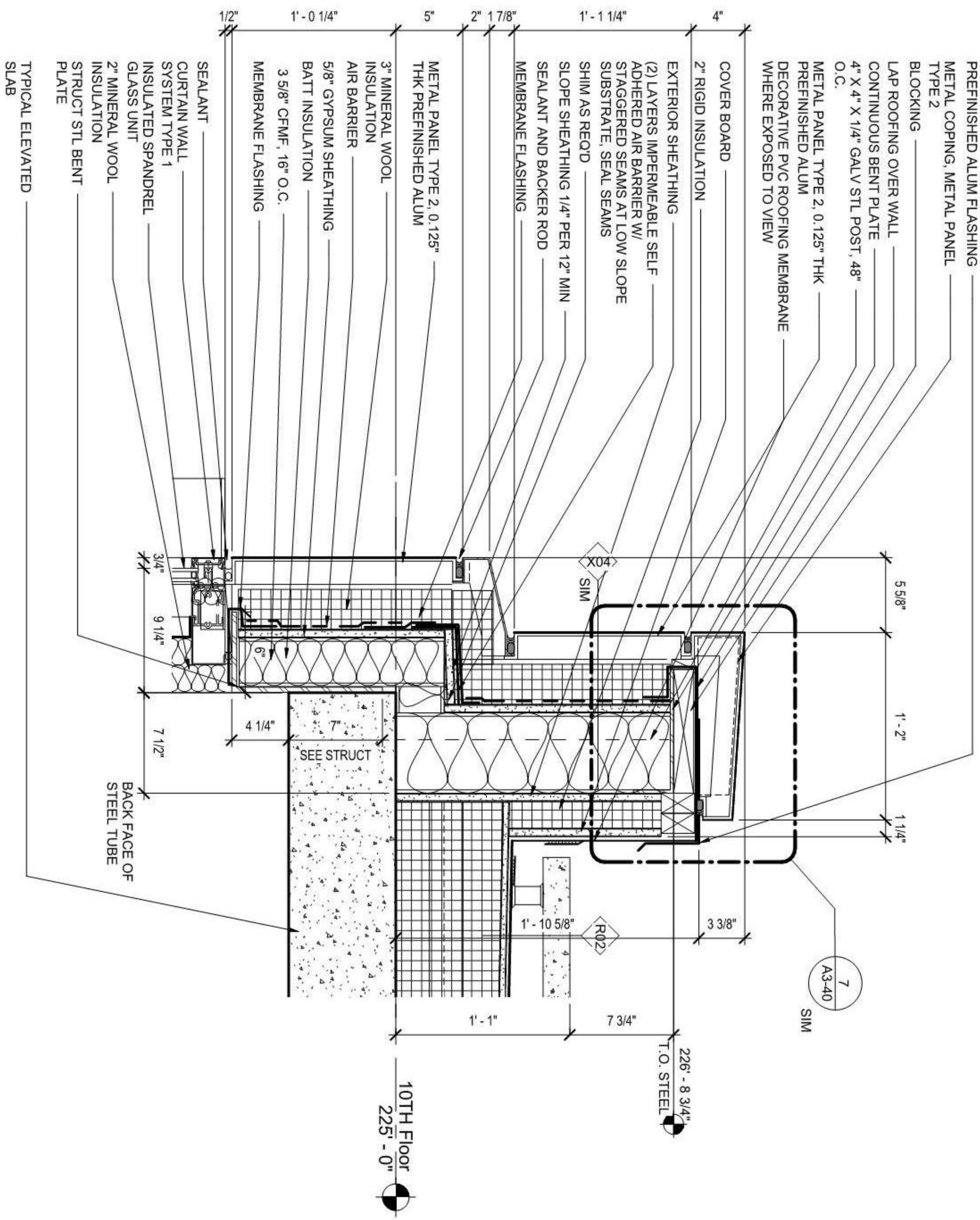

Figure 3.2: Typical Parapet Section

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Floor

Typical Section

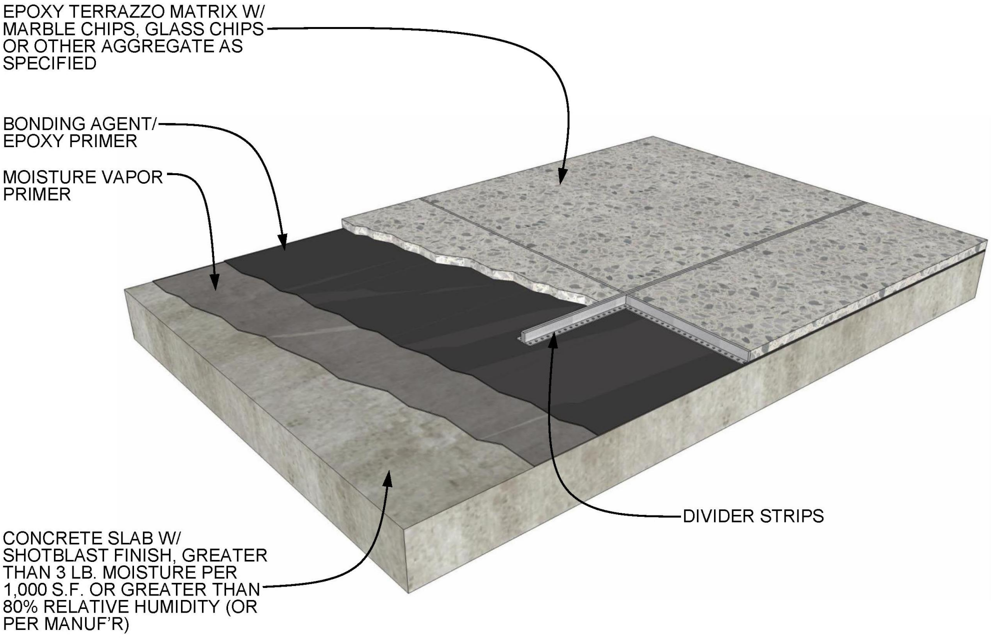

Figure 3.3: Typical Floor Section (International Masonry Institute)

Terrazo = 19 psf (AISC)

Concrete, 8", NW = 100 psf (ASCE)

Misc (MEP, Lights) = 15 psf

Ceiling, Accoustic tile = 1 psf (ASCE)

Drop Caps (10'x10'x6") = 7500 lb/(30x30) = 8.33 psf

DL = 144 psf

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Walls

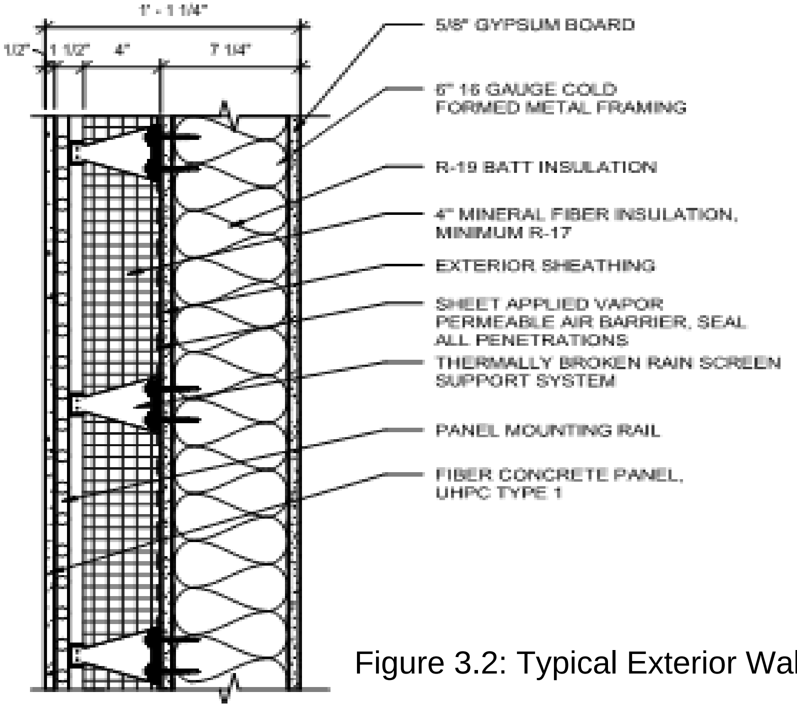

Figure 3.2: Typical Exterior Walls Section

Fiber Concret Pannel = 16 Psf (ASCE 7-10)

Rigid Insulation (3") $\left(\frac{0.2\,psf}{in}\right)$ = .6 psf (ASCE 7-10)

Vapor barrier = 0 psf

Exterior sheathing 1/2" = 2 psf (AISC S.M)

Batt insulation 6" $\frac{.04}{in}$ = .24 psf (ASCE 7-10)

6" Metal Studs @ 16" o.c = 1 psf (AISC S.M.)

2x 5/8 Gypsum = 5 psf (AISC S.M.)

Aluminum Sunshade = 12 plf (Arch. Louvers)

$DL = (24.84)(14) + 12 = 360\ plf$

Snow loads: (ASCE 7-10)

Location: Nowhere, USA

Ground snow loads: 25psf figure 7-1

Surface Roughness: B § 26.7.2

Exposure Catagory: C § 26.7.3

Exposure factor: $C_e = 1.0$ partially exposed
Table 7-2

Thermal factor: $C_t = 1.0$ heated roof.

Risk Catagory: II Table 1.5-1

Importance factor: $I = 1.0$ Table 1.5-2

Flat Roof loads:

$$P_f = .7\, C_e C_t I P_g = (.7)(1.0)(1.0)(1.0)(25)$$
$$= 18\text{psf}$$

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Snow drift ASCE 7-10

Parapet:

$l_u = 198\,ft \Rightarrow$ § 7.8

$h_d = 0.75\left(0.43\sqrt[3]{l_u}\sqrt[4]{p_g+10} - 1.5\right)$ figure 7-9

$= .75(0.43\sqrt[3]{198}\sqrt[4]{25+10} - 1.5)$

$= 3.45\,ft$

$\gamma = 0.13p_g + 14 = 0.13(25) + 14 = 17.25\,pcf$

§ 7.7.1

$P_d = \gamma h_d = (17.25)(3.45) = 60\,psf$

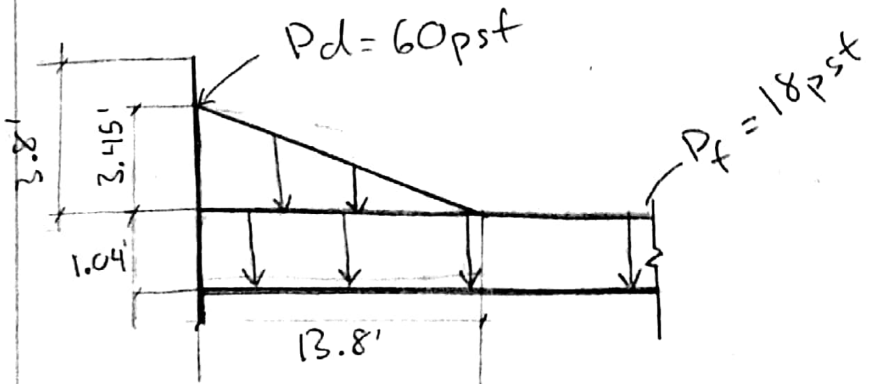
$h_b = \frac{P_f}{\gamma} = \frac{18}{17.25} = 1.04\,ft$

$h_c = (\text{height of parapet}) - h_b = 4.83 - 1.04$

$= 3.8\,ft$

$h_c > h_d$ therefore $W = 4h_d$

$W = 4(3.45) = 13.8\,ft$



Penthouse:

Leeward:

$l_u = 57\,ft$

$h_d = 0.43\,(57)^{1/3}\,(25+10)^{1/4} - 1.5$

$= 2.5\,ft$

Windward:

$l_u = 84\,ft$

$h_d = (0.43\,(84)^{1/3}\,(25+10)^{1/4} - 1.5)\,.75$

$= 2.3\,ft$

$h_d = 2.5$ controls

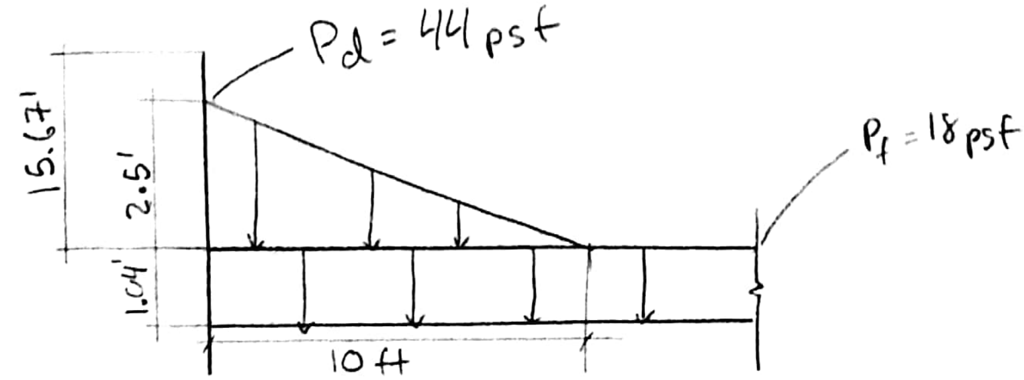
$P_d = (17.25)(2.5) = 44\,psf$

$h_b = 1.04\,ft$

$h_c = (\text{height of wall}) - h_b = 15.67\,ft$

$h_c > h_d$ therefore $w = 4h_d$

$w = 4(2.5) = 10\,ft$



Snow and Live load Code Comparisons

Roof

The roof live load reported in Cagley and Associates structural drawings is 30 psf minimum. A minimum 30 psf live load will also be used in this design. The minimum ordinary flat roof load listed in IBC 2015 is 20 psf.

The Flat roof snow load reported on Cagley and Associates Drawings is 18 psf. An 18 psf flat roof load will also be used in this design.

Floors

AREA	LIVE LOAD	PARTITIONS
ASSEMBLY AREAS - LOBBIES	100 PSF [U]	N / A
BALCONIES - EXTERIOR	100 PSF	N / A
CORRIDORS	100 PSF	N / A
CORRIDORS - ABOVE 1ST FLOOR	80 PSF	N / A
HOSPITALS - PATIENT ROOMS	40 PSF	15 PSF
MECHANICAL ROOMS	150 PSF [U]	N / A
OFFICES	80 PSF	15 PSF
STAIRS & EXITWAYS	100 PSF [U]	N / A

Above are the Live Loads used by Cagley and associates in design. Cagley's loads are the IBC 2015 minimum Codes with the exception of the Office live load which is minimum 50 psf.

Atypical Load Cases

Dead

AREA	SD LOAD
TYP. FLOORS	40 PSF
ROOF	30 PSF
MECHANICAL - 3RD	30 PSF
IMAGING - 4TH	30 PSF

A live smaller dead load of 30 psf is used for the 3rd floor mechanical floor. This is because there is no floor coverings on that floor. A smaller live load is used for the imaging rooms for the same reasons.

Live

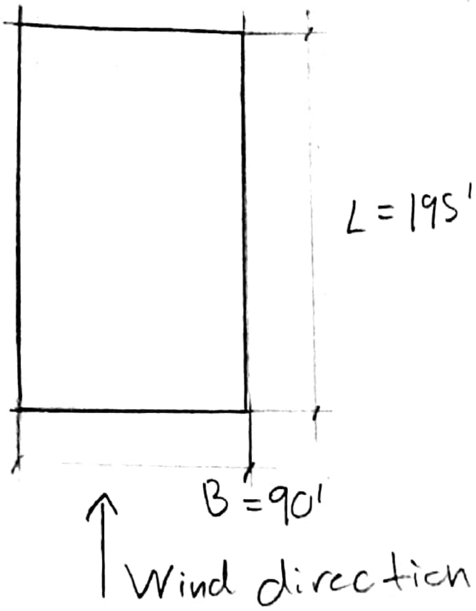
AREA	LIVE LOAD	PARTITIONS
ASSEMBLY AREAS - LOBBIES	100 PSF [U]	N / A
BALCONIES - EXTERIOR	100 PSF	N / A
CORRIDORS	100 PSF	N / A
CORRIDORS - ABOVE 1ST FLOOR	80 PSF	N / A
HOSPITALS - PATIENT ROOMS	40 PSF	15 PSF
MECHANICAL ROOMS	150 PSF [U]	N / A
OFFICES	80 PSF	15 PSF
STAIRS & EXITWAYS	100 PSF [U]	N / A

Due to Lower Foot traffic Patient Rooms have a smaller Live Load of 40 psf. To account for mechanical equipment a 100 psf unreducible live load is used.

4 Wind

Note Book A Baker

Wind Loads: NS (ASCE 7-10)



Exposure B § 26.7.3

$h = 144.5$

$\beta = 0.02$ pg. 621

$L/B = 2.167$

$C_{pw} = .8$ Figure 27.4-1

$C_{pL} = -.29$

$K_d = 0.85$ Table 26.6-1

$K_{zt} = 1$ § 26.8

K_z: Table 27.3-1

$GC_{pi} = \pm 0.18$ Table 26.11-1

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Natural frequency (ASCE 7-10)

§ 26.9.2.1 Limitations

1. 144.5 ft < 300 ft <u>OK</u>

2. $L_{eff} = \dfrac{(195)(\Sigma h_{3-10} = 819.5) + (138.75)(\Sigma h_{1-2} = 21.5)}{\Sigma h_{1-10} = 841}$

$= 193.5\ ft$

$4\ L_{eff} = 774\ ft > 144.5\ ft$ <u>OK</u>

Aproximate Natural Frequency § 29.9.3

$$C_w = \frac{100}{A_B} \Sigma \left(\frac{h}{h_i}\right)^2 \frac{A_i}{1+0.83\left(\frac{h_i}{D_i}\right)^2}$$

$$= \frac{100}{17,550}\left(\frac{19}{1+0.83\left(\frac{144.5}{19}\right)^2} + \frac{28.25}{1+0.83\left(\frac{144.5}{28.25}\right)^2}\right)$$

$= 0.045$

$$n_a = \frac{385(0.045)^{.5}}{144.5} = 0.565 < 1$$

therefore $G_f > 0.85$

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Gust Factor NS ASCE 7-10 § 26.9.5

$$g_R = \sqrt{2 \ln(3600\, n_1)} + \frac{0.577}{\sqrt{2 \ln(3600\, n_1)}}$$

$$= \sqrt{2 \ln(3600(.565))} + \frac{0.577}{\sqrt{2 \ln(3600(.565))}}$$

$$= 4.048$$

$$\bar{z} = .6h = .6(144.5) = 86.7$$

$\bar{b} = 0.45$ $\bar{\alpha} = .25$ Table 26.9-1

$$\bar{V}_{\bar{z}} = 0.45\left(\frac{86.7}{33}\right)^{.25}\left(\frac{88}{60}\right) 115$$

$$= 96.63$$

$\ell = 320$ $\bar{\epsilon} = 1/3$ Table 26.9-1

$$L_{\bar{z}} = \ell\left(\frac{\bar{z}}{33}\right)^{\bar{\epsilon}} = 320\left(\frac{86.7}{33}\right)^{1/3} = 441.6$$

$$N_1 = \frac{n_1 L_{\bar{z}}}{\bar{V}_{\bar{z}}} = \frac{(0.565)(441.6)}{96.63} = 2.58$$

$$R_n = \frac{7.47 N_1}{(1 + 10.3 N_1)^{5/3}} = 0.765$$

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R:

$$\eta = \frac{(4.6)(0.565)(144.5)}{96.63} = 3.88$$

$$R_h = \frac{1}{3.88} - \frac{1}{2(3.88)^2}\left(1 - e^{-2(3.88)}\right)$$

$$= 0.225$$

R_B:

$$\eta = \frac{4.6(90)(.565)}{96.63} = 4.28$$

$$R_B = \frac{1}{4.28} - \frac{1}{2(4.28)^2}\left(1 - e^{-2(4.28)}\right)$$

$$= 0.206$$

R_L:

$$\eta = \frac{15.4(195)(.565)}{96.63} = 17.55$$

$$R_L = \frac{1}{17.55} - \frac{1}{2(17.55)^2}\left(1 - e^{-2(17.55)}\right)$$

$$= 0.055$$

$\beta = 0.02$ pg 521

$$R = \sqrt{\frac{1}{\beta} R_h R_h R_B (0.53 + 0.47 R_L)}$$

$$= \sqrt{\frac{1}{0.02}(0.225)(0.765)(0.206)(0.53 + 0.47(0.055))}$$

$$= .99$$

$$G = \sqrt{\frac{1}{1 + 0.63\left(\frac{B+h}{L_z}\right)0.63}} = \sqrt{\frac{1}{1 + 0.63\left(\frac{90+144.5}{441.6}\right)}}$$

$$= 0.866$$

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$C = 0.30$ 26.9-1

$$I_{\bar{z}} = c\left(\frac{33}{\bar{z}}\right)^{1/6} = 0.3\left(\frac{33}{86.7}\right)^{1/6} = 0.255$$

$$G_f = 0.95\left(\frac{1+1.7(I_{\bar{z}})\sqrt{g_Q{}^2 Q^2 + g_R{}^2 R^2}}{1 + 1.7 g_v I_{\bar{z}}}\right)$$

$$= 0.95\left(\frac{1+1.7(0.225)\sqrt{3.4^2(0.886)^2 + 4.06^2(.99)^2}}{1+1.7(3.4)(0.255)}\right)$$

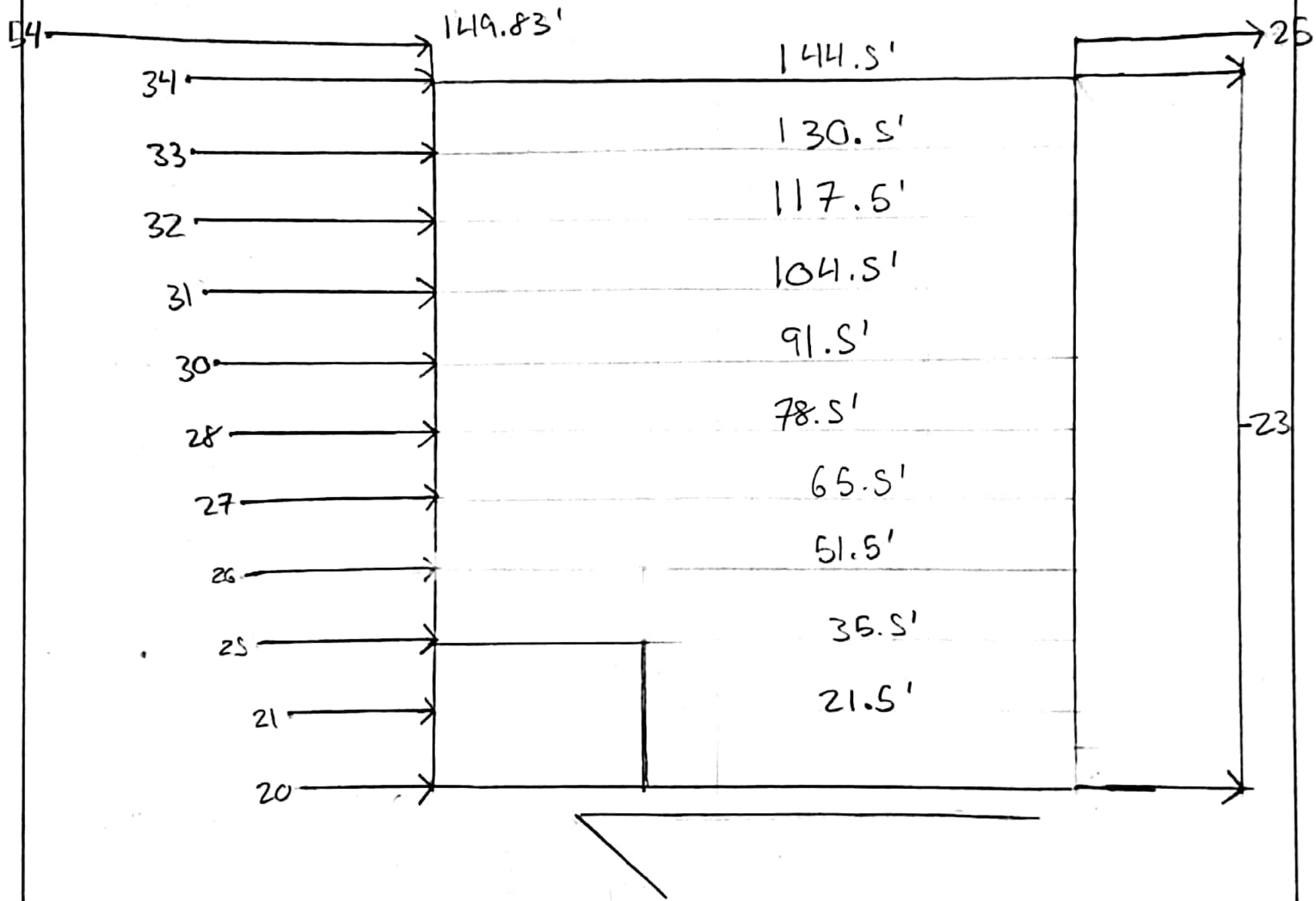
$$= 1.12$$

NS Story Foce														
Floor	z [ft]	kz	kzt	kd	qz	Gf	Cpw	Cpl	GCpw	GCpl	GCpi	Pw [psf]	Pl [psf]	Fx [kips]
1	0.00	0.57	1.0	0.85	16.40	0.86	0.8	-0.5	0.688	-0.43	0.18	16.83	-18.78	53.12
2	21.50	0.63	1.0	0.85	18.13	0.86	0.8	-0.5	0.688	-0.43	0.18	18.02	-18.78	145.52
3	35.50	0.73	1.0	0.85	21.01	0.86	0.8	-0.5	0.688	-0.43	0.18	20.00	-18.78	166.36
4	51.50	0.82	1.0	0.85	23.60	0.86	0.8	-0.5	0.688	-0.43	0.18	21.78	-18.78	181.92
5	65.50	0.87	1.0	0.85	25.04	0.86	0.8	-0.5	0.688	-0.43	0.18	22.77	-18.78	166.10
6	78.50	0.95	1.0	0.85	27.34	0.86	0.8	-0.5	0.688	-0.43	0.18	24.35	-18.78	164.02
7	91.50	0.96	1.0	0.85	27.63	0.86	0.8	-0.5	0.688	-0.43	0.18	24.55	-18.78	164.77
8	104.50	1.00	1.0	0.85	28.78	0.86	0.8	-0.5	0.688	-0.43	0.18	25.34	-18.78	167.78
9	117.50	1.03	1.0	0.85	29.64	0.86	0.8	-0.5	0.688	-0.43	0.18	25.94	-18.78	170.04
10	130.50	1.07	1.0	0.85	30.79	0.86	0.8	-0.5	0.688	-0.43	0.18	26.73	-18.78	177.49
Roof	144.50	1.10	1.0	0.85	31.66	0.86	0.8	-0.5	0.688	-0.43	0.18	27.32	-18.78	147.59
Parapet	149.33	1.11	1.0	0.85	31.94				1.5	1	0.18	53.46	25.25	26.58

Table 4.1: NS Wind Story Force Calculations

Wind Pressure Vs Story height

North South :



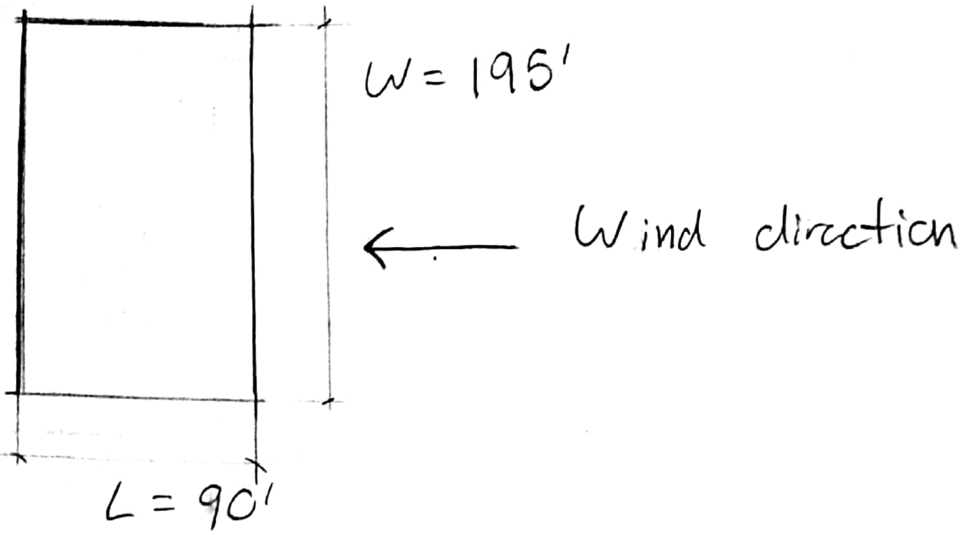
Base Sheer = 1020 kip

*pressures in psf

Figure 4.1: Wind pressure vs Story height NS

Note Book A | Baker

Wind Loads: EW



Exposure B § 26.7.3

h = 144.5

B = 0.02 pg 521

L/B =

C_{pw} = .8 Figure 27.4-1

C_{pL} = -0.5

k_d = 0.85 Table 26.6-1

k_{zt} = 1 § 26.8

k_z : Table 27.3-1

GC_{pi} = ± 0.18 Table 26.11-1

Gust Factor EW ASCE 7-10 § 26.9.5

See NS for calculations not shown here.

R_B : $\eta = \dfrac{4.6(195)}{96.63} = 9.28$

$$R_B = \frac{1}{9.28} - \frac{1}{2(9.28)^2}\left(1 - e^{-2(9.28)}\right)$$

$= 0.101$

R_L : $\eta = \dfrac{15.4(.565)(90)}{96.63} = 8.1$

$R_L = 0.11$

$$R = \sqrt{\frac{1}{0.02}(0.765)(0.225)(0.101)(0.53 + 0.47(0.11))}$$

$= 0.71$

$$G_f = 0.925\left(\frac{1 + 1.7(0.255)\sqrt{3.4^2(0.866)^2 + (4.05)^2(.71)^2}}{1 + 1.7(3.4)(.255)}\right)$$

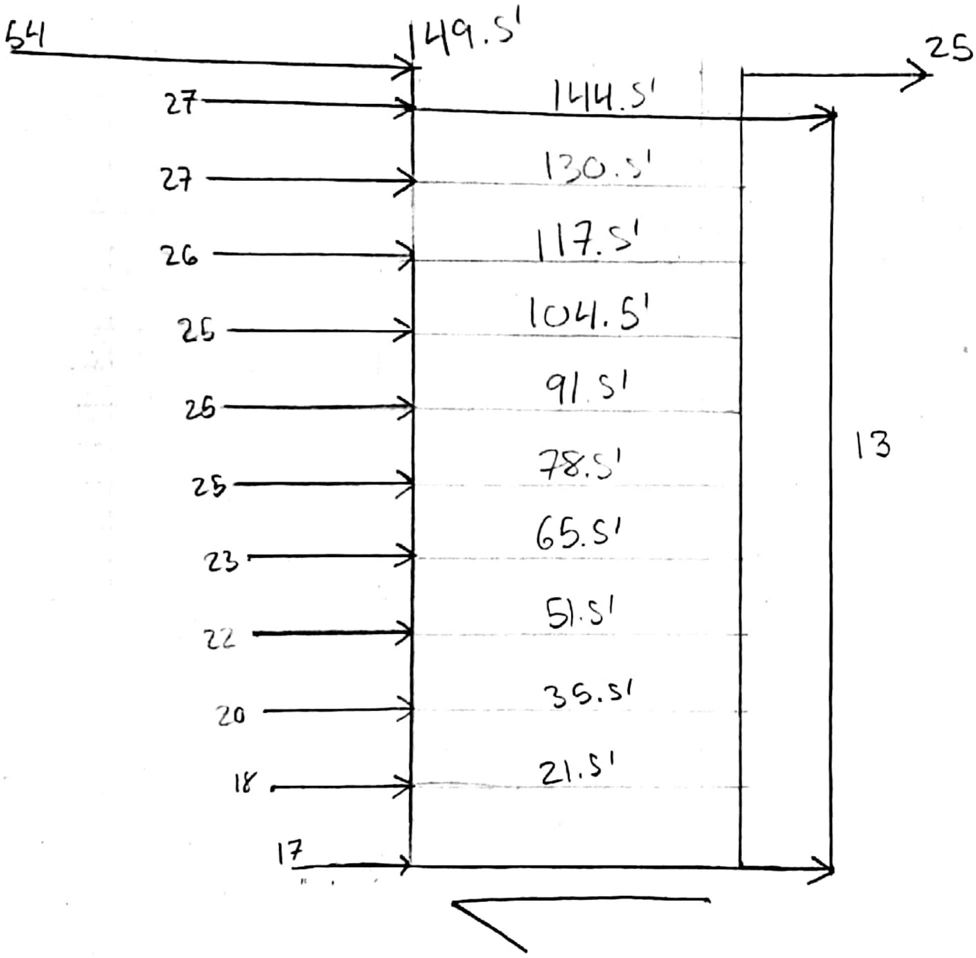
$G_f = 0.86$

EW Story Foce														
Floor	z [ft]	kz	kzt	kd	qz	Gf	Cpw	Cpl	GCpw	GCpl	GCpi	Pw [psf]	Pl [psf]	Fx [kips]
1	0.00	0.57	1.0	0.85	16.40	0.86	0.8	-0.29	0.688	-0.2494	0.18	16.83	-13.22	29.07
2	21.50	0.63	1.0	0.85	18.13	0.86	0.8	-0.29	0.688	-0.2494	0.18	18.02	-13.22	80.13
3	35.50	0.73	1.0	0.85	21.01	0.86	0.8	-0.29	0.688	-0.2494	0.18	20.00	-13.22	65.77
4	51.50	0.82	1.0	0.85	23.60	0.86	0.8	-0.29	0.688	-0.2494	0.18	21.78	-13.22	72.45
5	65.50	0.87	1.0	0.85	25.04	0.86	0.8	-0.29	0.688	-0.2494	0.18	22.77	-13.22	66.40
6	78.50	0.95	1.0	0.85	27.34	0.86	0.8	-0.29	0.688	-0.2494	0.18	24.35	-13.22	65.94
7	91.50	0.96	1.0	0.85	27.63	0.86	0.8	-0.29	0.688	-0.2494	0.18	24.55	-13.22	66.29
8	104.50	1.00	1.0	0.85	28.78	0.86	0.8	-0.29	0.688	-0.2494	0.18	25.34	-13.22	67.68
9	117.50	1.03	1.0	0.85	29.64	0.86	0.8	-0.29	0.688	-0.2494	0.18	25.94	-13.22	68.72
10	130.50	1.07	1.0	0.85	30.79	0.86	0.8	-0.29	0.688	-0.2494	0.18	26.73	-13.22	71.91
Roof	144.50	1.10	1.0	0.85	31.66	0.86	0.8	-0.29	0.688	-0.2494	0.18	27.32	-13.22	59.90
Parapet	149.33	1.11	1.0	0.85	31.94				1.5	1	0.18	53.46	25.25	12.27

Table 4.2: EW Wind Story Force Calculations

Note Book A | | Baker

Wind Pressure Vs Story height



Base shear = 1506 kip

* pressures in psf

Figure 4.2: Wind pressure vs Story height EW

4 Seismic

Note Book A | | Baker

<u>Seismic</u> (ASCE 7-10)

Site Class: D

Risk Category: II Table 1.5-1

USGS: U.S. Seismic design Maps

(https://earthquake.usgs.gov/designmaps/us/application)

$S_s = .130g$ $S_{MS} = 0.208g$ $S_{DS} = 0.138g$

$S_1 = 0.052g$ $S_{M1} = 0.124g$ $S_{D1} = 0.083g$

Seismic design Category: B table 11.6-2

Structural System: Ordinary reinforced concrete shear wall

$R = 4$ Table 12.2-1

$I_e = 1.0$ Table 1.5-2

$$C_s = \frac{S_{DS}}{\frac{R}{I_e}} = \frac{0.138}{\frac{4}{1.0}} = 0.0345$$

$$C_{s\,max} = \frac{S_{D1}}{T\left(\frac{R}{I_e}\right)} = \frac{0.083}{1.4\left(\frac{4}{1}\right)} = 0.0148$$

$$T_a = C_t h_n^x = 0.016(144.5)^{.9} = 1.4$$

$T_L = 10$ $T_a < T_L$

$C_{s\,min} = 0.044\,(0.138)\,(1.0) = 6 \times 10^{-3}$

$C_{s\,max} = 0.01 \Leftarrow$ controls

$C_s = 0.0148$

$V = C_s W = (0.0148)(27\,037) = 400$

$k = 1.45$

Note Book A Baker

Seismic Weight

Dead load: Floors:

$$(129 + 8.33)\,(2(138.75' \times 90) + 8(195 \times 90))$$

↑ Drop Caps

= 22711 kips

Roof: $(195 \times 90)(134.2) = 2355$ kips

Walls: $P = 2(2(138.75 + 90)) + 8(2(195 + 90)) = 5475$ ft

$5475(360) = 1971$ kips

1. No storage

2. 15 psf partition load

$$(2(138.75 \times 90) + 7(195 \times 90))\,15 = 2217 \text{ kips}$$

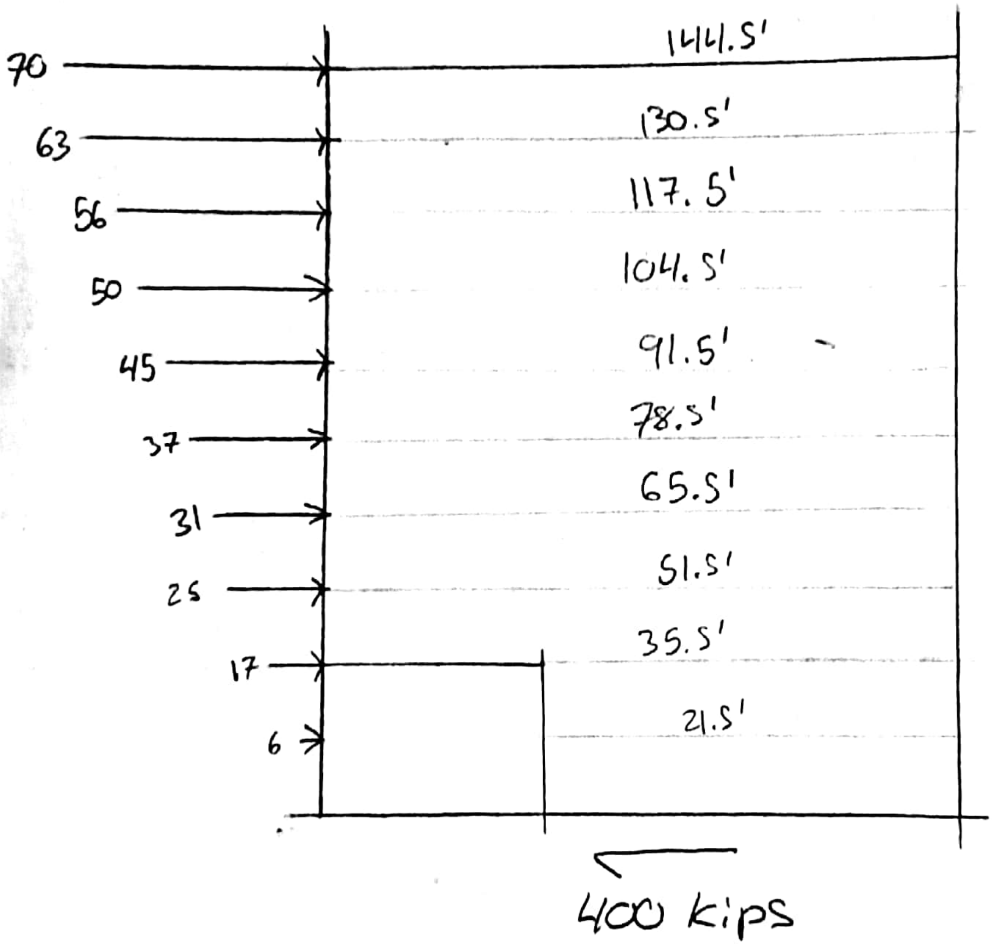
Total = 22711 + 1971 + 2355 = 27037 kips

Floor	z [ft]	L [ft]	W [ft]	Area [sf]	Perimiter [ft]	Wall DL [plf]	DL [psf]	Partition	wi [kips]	wi*h^k	Cvx	Fx [Kip]
1	0.00	138.75	90	12488	228.75	360	137.33	15	1985	0	0	0
2	21.50	138.75	90	12488	228.75	360	137.33	15	1985	27458	0.02	6.31
3	35.50	195	90	17550	285	360	137.33	0	2513	74264	0.04	17.05
4	51.50	195	90	17550	285	360	137.33	15	2776	107735	0.06	24.74
5	65.50	195	90	17550	285	360	137.33	15	2776	137022	0.08	31.47
6	78.50	195	90	17550	285	360	137.33	15	2776	164218	0.09	37.71
7	91.50	195	90	17550	285	360	137.33	15	2776	191413	0.11	43.96
8	104.50	195	90	17550	285	360	137.33	15	2776	218608	0.13	50.20
9	117.50	195	90	17550	285	360	137.33	15	2776	245803	0.14	56.45
10	130.50	195	90	17550	285	360	137.33	15	2776	272999	0.16	62.69
Roof	144.50	195	90	17550	285	70	134.2	15	2638	302286	0.17	69.42
Sum									28552	1741807		400

Table 5.1: Seismic force vs Story Height (same in both directions)

Seismic story force vs Height

North South elev:



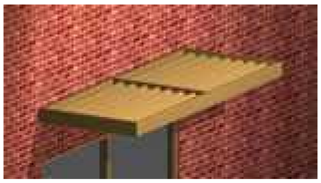
* story forces in kips

Figure 5.1: Seismic force vs Story Height (same in both directions)

References

Architectural Drawings provided by Wilmont Sanz, Structural Drawings provided by Cagley and Associates, AISC Steel Manual, ASCE 7-10, ASCE 7 ATC Wind speed by location, USGS Online Seismic Design Maps, Architecture Louvers Catalogue, Alucobond Catalogue

H6A Sunshade Louvers



H6A louvered sunshade is a versitile airfoil blade sun control device. Louver blades run horizontal with intermediate outriggers for attachment to building structural framing or exterior walls. Mounting brackets are provided. For application information, visit our How Sunshades Work section.

Features:

- Airfoil blade shape
- Made to order in sizes 12" wide x 12" high up to unlimited size
- Blades and frame made from heavy gauge 0.081" thickness aluminum
- Outriggers made from heavy gauge 0.125" thickness aluminum
- Mitered corners at outside trim for clean appearance
- Exposed Mullion joints at section breaks
- All mounting brackets and fasteners concealed from view

Specs:

- **30 psf** wind load rating
- Weight: **4.50 lbs** per sq ft of louver face area

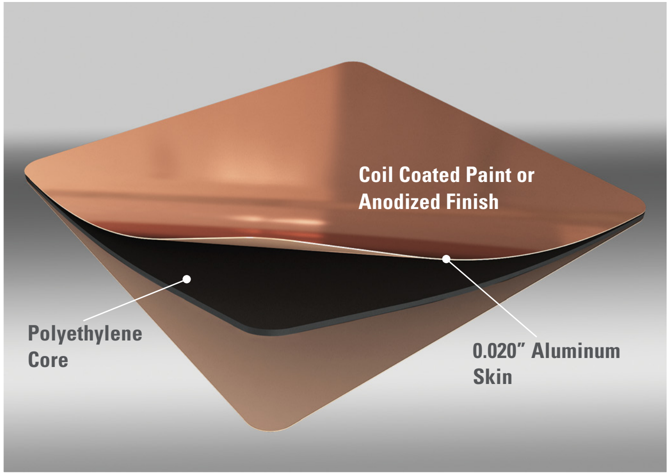
Options:

- A variety of metal finishes including paint and anodizing
- 15°, 25°, 35°, or 42° blade angle
- 4", 6", or 8" blade spacing
- Tube, Bullnose, or Round Taper trim
- Higher wind load ratings

The part number code is H6A**, where digit 4 is the blade angle, and digit 5 is the spacing (ie H6A16 has 15° blade angle and 6" blade spacing).

Part code digit 4 is: "1" for 15°, "2" for 25°, "3" for 35°, or "4" for 42°.

Part code digit 5 is: "4" for 4 inch, "6" for 6 inch, or "8" for 8 inch



ALUCOBOND PE

Alucobond® PE consists of two sheets of smooth 0.020” nominal aluminum thermobonded to a polyethylene core in a continuous process. Alucobond® PE offers the proven product properties of the Alucobond® family, such as flatness, formability, resistance to wear and simple processing. The superb properties of this material boost one’s inspiration and offer architects a wide range of lengths, widths and a rainbow of consistent color and finish options.

PRODUCT DESCRIPTION

Material Composition

- Aluminum interior and exterior facings in 0.020" nominal thickness to ensure flatness
- Polyethylene (PE) core available in 3mm, 4mm and 6mm nominal thickness

Sheet Widths

- Standard coil coated widths include 50" and 62”
- Standard anodized widths include 62”
- Custom width 40"

Sheet Lengths

- Standard lengths include 146” and 196”
- Custom lengths for coil coating up to a maximum of 360”
- Custom lengths for anodized up to a maximum of 216”

Minimum Bending Radius

- The minimum bending radius of Alucobond PE without routing the interior skin is 15 times the thickness of the material

FIRE TESTING

UL-94

- In a test of 6mm Alucobond PE material, all test criteria were passed, resulting in a 94 V-0 rating for Alucobond material

ASTM E-108, Modified

- This test impinges a gas flame on a vertically erected panel with a typical construction joint to simulate an exterior installation. In tests of both 4mm and 6 mm Alucobond material, the basic 15 minute test objective was exceeded. Neither of the material thickness contributed to vertical or horizontal flame spread and no significant outgassing was observed

TECHNICAL SUMMARY

Temperature Resistance

- Withstands environmental temperature changes from -55˚F to +175˚F
- Coefficient of linear expansion is governed by the aluminum sheet

Technical Properties

Nominal Thickness:	3mm	4mm	6mm
Nominal Weight:	0.92 lb/ft^2	1.12 lb/ft^2	1.49 lb/ft^2
Moment of Inertia:	.000108 in^4/in	.000212 in^4/in	.000525 in^4/in
Section Modulus:	.00196 in^3/in	.00275 in^3/in	.00432 in^3/in
Rigidity:	1091 $lb\text{-}in^2/in$	2143 $lb\text{-}in^2/in$	5299 $lb\text{-}in^2/in$

Sustainability Design

- LEED 3
- LEED v4
  - LCA Industry Standard
  - EPD Industry Standard

Accepted Code Evaluation Reports

- 1. ICC-ES
- 2. Florida Product Approval
- 3. Miami-Dade County NOA
- 4. City of Los Angeles

MANUFACTURING

Manufacturing Location

- Alucobond PE is currently manufactured in Benton, Kentucky USA

To download PDF or AutoCAD details and specifications, visit our website at www.alucobondusa.com.