STRUCTURAL CALCULATIONS FOR

Project Name: Associated Plastic Surgeons
Address: I-470 Business & Technology Center, NE McBain Drive, Lee's Summit, MO

Project # 24139

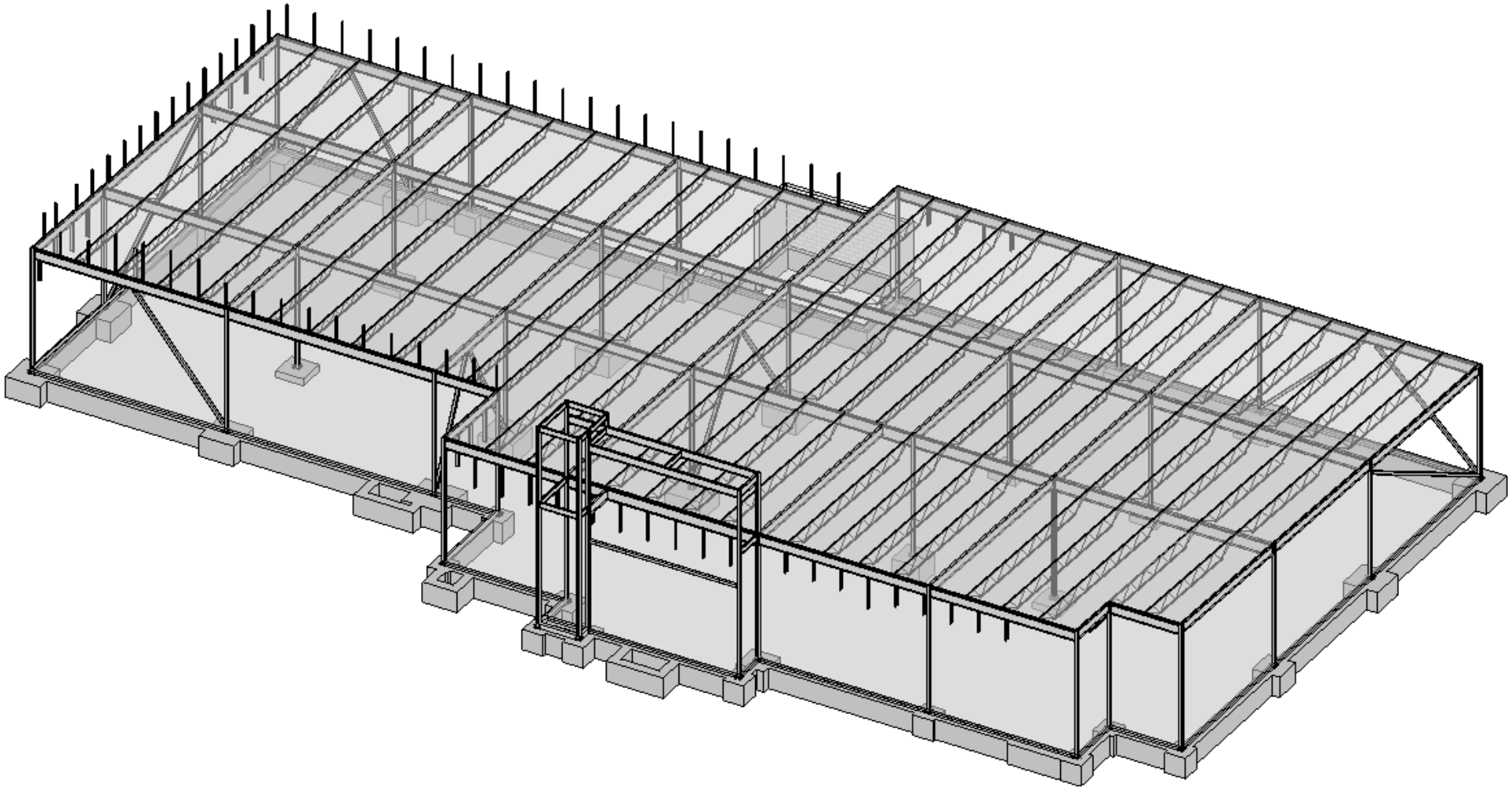
Date: 01/28/2025

01/30/25

STAND STRUCTURAL ENGINEERING INC

8234 Robinson Street
Overland Park, KS 66204
913-214-2169
stand-sei.com

Stability + Simplicity



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Design Criteria

STRUCTURAL DESIGN CRITERIA (2018 IBC AND ASCE 7-16):

1. BUILDING OCCUPANCY RISK CATEGORY II.

2. LIVE LOADS [UNIFORM (PSF) / POINT LOADS (KIPS)]:
-- ROOF ..... 20 PSF/300#
-- GROUND LEVEL SLAB ..... 100 PSF/2.0 K

3. ROOF SNOW LOAD :
-- GROUND SNOW LOAD (Pg) ..... 20 PSF
-- FLAT ROOF SNOW LOAD (Pf) ..... 22 PSF + DRIFT PER PLAN
-- MIN UNIFORM ROOF SNOW LOAD (Pm) ... 22 PSF (NO DRIFT OR RAIN)
-- RAIN ON SNOW SURCHARGE (Prs) ..... 5.0 PSF
-- SNOW EXPOSURE FACTOR (Ce) ..... 1.0, EXPOSURE C
-- SNOW LOAD IMPORTANCE FACTOR (Is) ..1.0
-- THERMAL FACTOR (Ct)..... 1.1 (just above freezing)
-- SLOPE FACTOR (CS)..... 1.0 (for ¼ per foot roofs)

4. WIND DESIGN DATA:
-- BASIC WIND SPEED (3 SEC GUST) ..... 117 MPH
-- ASD WIND SPEED, V(ASD) ..... 88 MPH
-- WIND EXPOSURE C
-- GROUND ELEVATION ABOVE SEA LEVEL 987 FT
-- DIRECTIONALITY FACTOR (Kd) 0.85
-- INTERNAL PRESSURE COEFF 0.18
-- COMPONENTS AND CLADDING WIND (ULTIMATE 1.0*W) PRESSURES (BASED ON TRIB 10 S.F., EXP. B MAY BE REDUCED FOR COMPONENTS WITH LARGER TRIB PER BLDG CODE):
-- WALLS AT CORNERS & EDGES ..... +26.4/-28.6 PSF
-- ALL OTHER MAIN WALL CONDITIONS ..... +26.4/–35.2 PSF
-- ROOF CORNERS ..... +26.4/-61 PSF
-- ROOF EDGES ..... +26.4/-61 PSF
-- ALL OTHER MAIN ROOF CONDITIONS ..... +16/-46 PSF

5. EARTHQUAKE DESIGN DATA:
-- SEISMIC IMPORTANCE FACTOR (Ie) 1.25
-- MAPPED SPECTRAL RESP ACCEL (Ss/S1) 0.1/0.068
-- SITE CLASS C
-- SPECTRAL RESPONSE COEFF (Sds/Sd1) 0.107/0.109
-- SEISMIC DESIGN CATEGORY ..... B
-- SEISMIC FORCE RESISTING SYSTEM ..... R=3, STEEL
-- DESIGN BASE SHEAR ..... 13 K (ELF AND ASD)
-- SEISMIC RESPONSE COEFF (Cs) 0.045
-- ANALYSIS PROCEDURE ..... ELF

6. RAIN LOAD DATA:

-- 15-MIN RAIN INTENSITY ..... 8.31 IN/HR

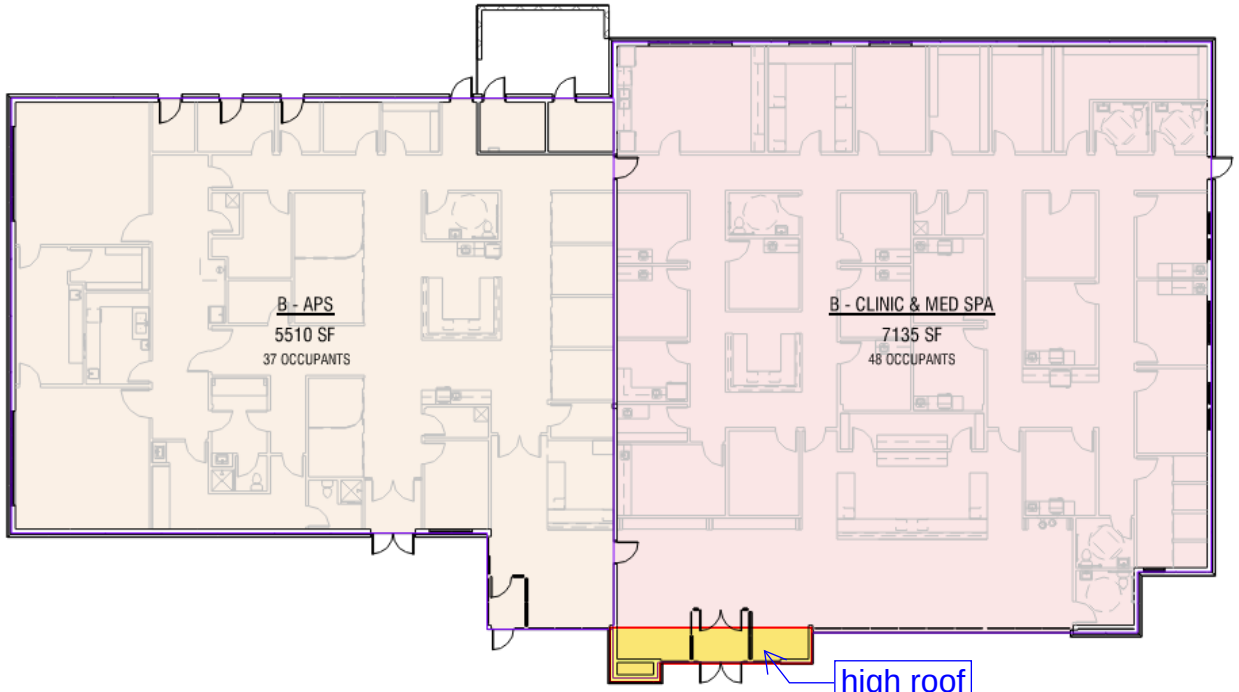
-- 60-MIN RAIN INTENSITY ..... 3.92 IN/HR

DESIGN ASSUMES APPROPRIATE ROOF SLOPE AND DRAINAGE (INCLUDING OVERFLOWS) ARE PROVIDED. ROOF IS DESIGNED FOR LIVE LOAD INDICATED ABOVE

Gravity Loads

B - APS

B - CLINIC & MED SPA



Typ Metal Roof:

Component	t, in	Wt.[psf]
Finish	1/4	1.00
Rigid Insulation	5	3.75
1.5B Metal Deck	1 1/2	3.00
Suspended Mechanical Duct Below	--	4.00
Total:	6 3/4	11.75
Use:		20 for Roof

Roof dead load

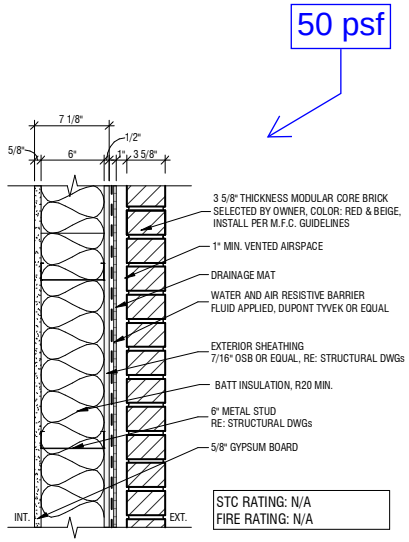
Roof:

Component	load [psf]
Roof Live Load (ASCE Table 4.3-1)	20
Total:	20
Use:	20 for Roof

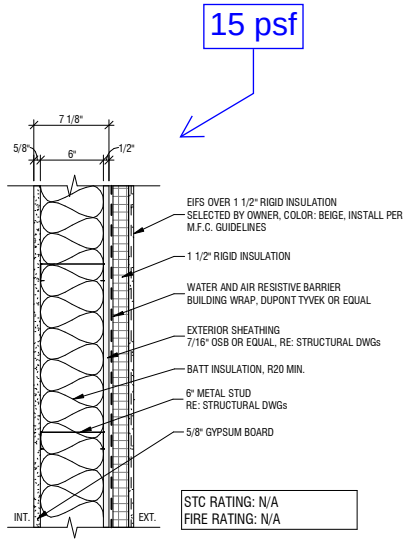
Roof live load

Walls Line Loads

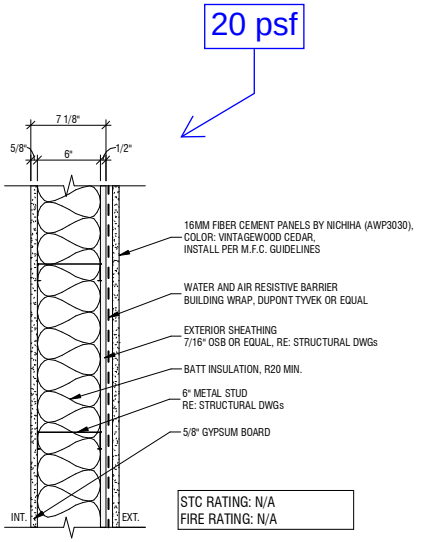
WALL TYPES:



1 WALL TYPE '1A' -EXTERIOR WALL-BRICK
1 1/2" = 1'-0"



2 WALL TYPE '1B' -EXTERIOR WALL-EIFS
1 1/2" = 1'-0"



3 WALL TYPE '1C' -EXTERIOR WALL-FIBER CEMENT PANEL
1 1/2" = 1'-0"

Exterior Wall - Brick:

Component	t, in	Wt.[psf]
Brick	4	39
Air Gap	1	0
Exterior Sheathing	5/8	2
Studs @ 16" OC + Insulation	5 1/2	6
Gyp Boards	5/8	2.5
Total:	11 3/4	49.5
Use:		50

Exterior Wall - EIFS:

Component	t, in	Wt.[psf]
EIFS Finish + Rigid Insulation	1 1/2	3
Air Gap	1/2	0
Exterior Sheathing	5/8	2
Studs @ 16" OC + Insulation	5 1/2	6
Gyp Boards	5/8	3
Total:	8 3/4	13.5
Use:		15

Exterior Wall - Fiber:

Component	t, in	Wt.[psf]
Fiber Cement Panels	5/8	8
Air Gap	1/2	0
Exterior Sheathing	5/8	2
Studs @ 16" OC + Insulation	5 1/2	6
Gyp Boards	5/8	2.5
Total:		18.5
Use:		20

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SNOW NS_LOW DRIFT

In accordance with ASCE7-16

Tedds calculation version 1.0.11

Building details

Roof type	Monopitch
Width of roof	b = **88.00** ft
Slope of roof 1	α = **1.50** deg

Ground snow load

Ground snow load (Figure 7.2-1)	p_g = **20.00** lb/ft^2
Density of snow	$\gamma = \min(0.13 \times p_g / 1ft + 14lb/ft^3, 30lb/ft^3)$ = **16.60** lb/ft^3
Terrain typeSect. 26.7	C
Exposure condition (Table 7.3-1)	Partially exposed
Exposure factor (Table 7.3-1)	C_e = **1.00**
Thermal condition (Table 7.3-2)	Structures kept just above freezing
Thermal factor (Table 7.3-2)	C_t = **1.10**
Importance category (Table 1.5-1)	III
Importance factor (Table 1.5-2)	I_s = **1.10**
Min snow load for low slope roofs (Sect 7.3.4)	$p_{f\_min} = I_s \times p_g$ = **22.00** lb/ft^2
Rain on snow surcharge (Sect 7.10)	p_{f_sur} = **5.00** lb/ft^2
Flat roof snow load (Sect 7.3)	$p_f = 0.7 \times C_e \times C_t \times I_s \times p_g + p_{f\_sur}$ = **21.94** lb/ft^2
Unbalanced flat roof snow load (Sect 7.3)	$p_{f\_unbal} = \max(p_{f\_min}, 0.7 \times C_e \times C_t \times I_s \times p_g)$ = **22.00** lb/ft^2

Cold roof slope factor (C_t > 1.0)

Roof surface type	Non slippery
Ventilation	Ventilated
Thermal resistance (R-value)	R = **30.00** °F h ft^2 / Btu
Roof slope factor Fig 7.4-1b (solid line)	C_s = **1.00**

Monoslope

Sloped roof snow load (Cl.7.4)	$p_s = \max(C_s \times p_f, p_{f\_min})$ = **22.00** lb/ft^2

Left parapet

Balanced snow load height	$h_b = p_f \times C_s / \gamma$ = **1.32** ft
Height of left parapet	h_{pptL} = **4.50** ft
Height from balance load to top of left parapet	$h_{c\_pptL} = h_{pptL} - h_b$ = **3.18** ft
Length of roof - left parapet	$l_{u\_pptL} = b_1$ = **88.00** ft
Drift height windward drift - left parpet	$h_{d\_l\_pptL} = \sqrt{(l_s)} \times 0.75 \times (0.43 \times (\max(20\ ft, l_{u\_pptL}) \times 1ft^2)^{1/3} \times (p_g / 1lb/ft^2 + 10)^{1/4} - 1.5ft)$ = **2.34** ft
Drift height - left parapet	$h_{d\_pptL} = \min(h_{d\_l\_pptL}, h_{pptL} - h_b)$ = **2.34** ft
Drift width	$W_{d\_pptL} = \min(4 \times h_{d\_l\_pptL}, 8 \times (h_{pptL} - h_b), b)$ = **9.36** ft
Drift surcharge load - left parapet	$p_{d\_pptL} = h_{d\_pptL} \times \gamma$ = **38.86** lb/ft^2

Right parapet

Height of right parapet	h_{pptR} = **3.50** ft
Height from balance load to top of right parapet	$h_{c\_pptR} = h_{pptR} - h_b$ = **2.18** ft
Length of roof - right parapet	$l_{u\_pptR} = b_1$ = **88.00** ft

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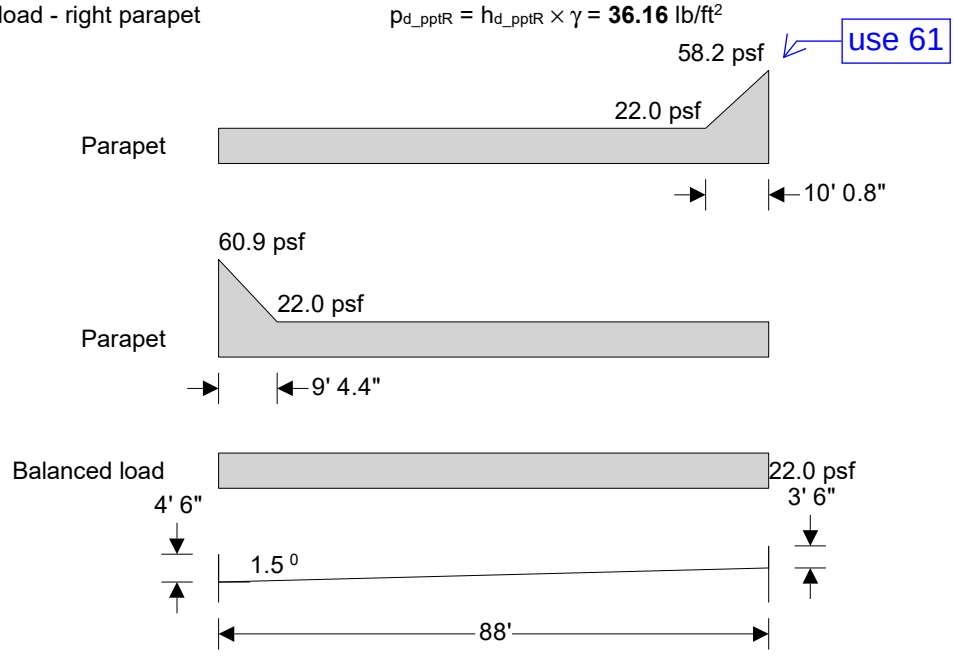
Drift height windward drift - right parpet $h_{d\_l\_pptR} = \sqrt{(l_s)} \times 0.75 \times (0.43 \times (\max(20\ ft, l_{u\_pptR}) \times 1ft^2)^{1/3} \times (p_g / 1lb/ft^2 + 10)^{1/4} - 1.5ft) =$ **2.34** ft

Drift height - right parapet $h_{d\_pptR} = \min(h_{d\_l\_pptR}, h_{pptR} - h_b) =$ **2.18** ft

Drift width $W_{d\_pptR} = \min(4 \times h_{d\_l\_pptR}^2 / h_{c\_pptR}, 8 \times (h_{pptR} - h_b), b) =$ **10.06** ft

Drift surcharge load - right parapet $p_{d\_pptR} = h_{d\_pptR} \times \gamma =$ **36.16** lb/ft²



Roof elevation

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SNOW NS_HIGH DRIFT

In accordance with ASCE7-16

Tedds calculation version 1.0.11

Building details

Roof type	Monopitch
Width of roof	b = **88.00** ft
Slope of roof 1	α = **1.50** deg

Ground snow load

Ground snow load (Figure 7.2-1)	p_g = **20.00** lb/ft^2
Density of snow	$\gamma = \min(0.13 \times p_g / 1ft + 14lb/ft^3, 30lb/ft^3)$ = **16.60** lb/ft^3
Terrain typeSect. 26.7	C
Exposure condition (Table 7.3-1)	Partially exposed
Exposure factor (Table 7.3-1)	C_e = **1.00**
Thermal condition (Table 7.3-2)	Structures kept just above freezing
Thermal factor (Table 7.3-2)	C_t = **1.10**
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Importance factor (Table 1.5-2)	I_s = **1.10**
Min snow load for low slope roofs (Sect 7.3.4)	$p_{f\_min} = I_s \times p_g$ = **22.00** lb/ft^2
Rain on snow surcharge (Sect 7.10)	p_{f_sur} = **5.00** lb/ft^2
Flat roof snow load (Sect 7.3)	$p_f = 0.7 \times C_e \times C_t \times I_s \times p_g + p_{f\_sur}$ = **21.94** lb/ft^2
Unbalanced flat roof snow load (Sect 7.3)	$p_{f\_unbal} = \max(p_{f\_min}, 0.7 \times C_e \times C_t \times I_s \times p_g)$ = **22.00** lb/ft^2

Cold roof slope factor (C_t > 1.0)

Roof surface type	Non slippery
Ventilation	Ventilated
Thermal resistance (R-value)	R = **30.00** °F h ft^2 / Btu
Roof slope factor Fig 7.4-1b (solid line)	C_s = **1.00**

Monoslope

Sloped roof snow load (Cl.7.4)	$p_s = \max(C_s \times p_f, p_{f\_min})$ = **22.00** lb/ft^2

Left parapet

Balanced snow load height	$h_b = p_f \times C_s / \gamma$ = **1.32** ft
Height of left parapet	h_{pptL} = **8.00** ft
Height from balance load to top of left parapet	$h_{c\_pptL} = h_{pptL} - h_b$ = **6.68** ft
Length of roof - left parapet	$l_{u\_pptL} = b_1$ = **88.00** ft
Drift height windward drift - left parpet	$h_{d\_l\_pptL} = \sqrt{(l_s)} \times 0.75 \times (0.43 \times (\max(20\ ft, l_{u\_pptL}) \times 1ft^2)^{1/3} \times (p_g / 1lb/ft^2 + 10)^{1/4} - 1.5ft)$ = **2.34** ft
Drift height - left parapet	$h_{d\_pptL} = \min(h_{d\_l\_pptL}, h_{pptL} - h_b)$ = **2.34** ft
Drift width	$W_{d\_pptL} = \min(4 \times h_{d\_l\_pptL}, 8 \times (h_{pptL} - h_b), b)$ = **9.36** ft
Drift surcharge load - left parapet	$p_{d\_pptL} = h_{d\_pptL} \times \gamma$ = **38.86** lb/ft^2

Right parapet

Height of right parapet	h_{pptR} = **10.00** ft
Height from balance load to top of right parapet	$h_{c\_pptR} = h_{pptR} - h_b$ = **8.68** ft
Length of roof - right parapet	$l_{u\_pptR} = b_1$ = **88.00** ft

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Drift height windward drift - right parpet

$h_{d\_l\_pptR} = \sqrt{(l_s)} \times 0.75 \times (0.43 \times (\max(20\ ft, l_{u\_pptR}) \times 1ft^2)^{1/3} \times (p_g / 1lb/ft^2 + 10)^{1/4} - 1.5ft) = \mathbf{2.34}$ ft

Drift height - right parapet

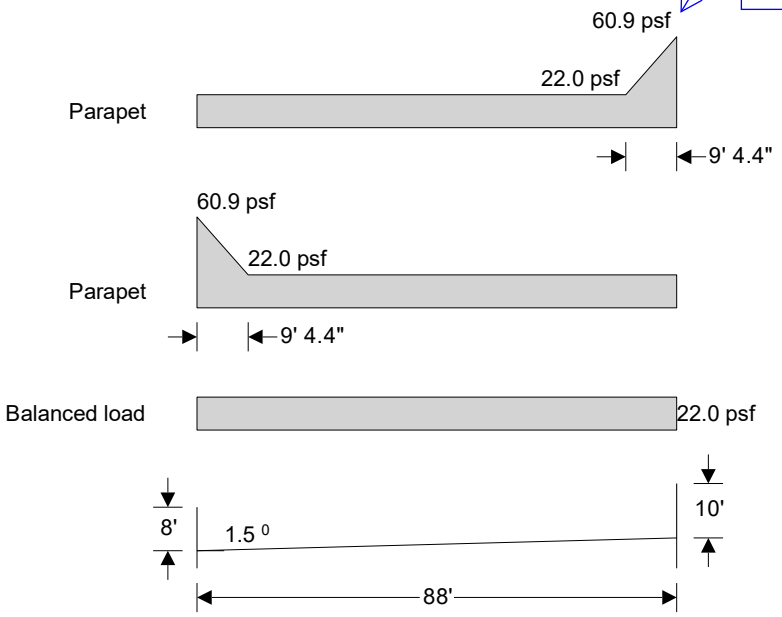
$h_{d\_pptR} = \min(h_{d\_l\_pptR}, h_{pptR} - h_b) = \mathbf{2.34}$ ft

Drift width

$W_{d\_pptR} = \min(4 \times h_{d\_l\_pptR}, 8 \times (h_{pptR} - h_b), b) = \mathbf{9.36}$ ft

Drift surcharge load - right parapet

$p_{d\_pptR} = h_{d\_pptR} \times \gamma = \mathbf{38.86}$ lb/ft^2 use 61psf



Roof elevation

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SNOW EW

In accordance with ASCE7-16

Tedds calculation version 1.0.11

Building details

Roof type	Flat
Width of roof	b = **170.00** ft

Ground snow load

Ground snow load (Figure 7.2-1)	p_g = **20.00** lb/ft^2
Density of snow	$\gamma = \min(0.13 \times p_g / 1ft + 14lb/ft^3, 30lb/ft^3)$ = **16.60** lb/ft^3
Terrain typeSect. 26.7	C
Exposure condition (Table 7.3-1)	Partially exposed
Exposure factor (Table 7.3-1)	C_e = **1.00**
Thermal condition (Table 7.3-2)	Structures kept just above freezing
Thermal factor (Table 7.3-2)	C_t = **1.10**
Importance category (Table 1.5-1)	III
Importance factor (Table 1.5-2)	I_s = **1.10**
Min snow load for low slope roofs (Sect 7.3.4)	$p_{f\_min} = I_s \times p_g$ = **22.00** lb/ft^2
Flat roof snow load (Sect 7.3)	$p_f = 0.7 \times C_e \times C_t \times I_s \times p_g$ = **16.94** lb/ft^2

Left parapet

Balanced snow load height	$h_b = p_f / \gamma$ = **1.02** ft
Height of left parapet	h_{pptL} = **5.00** ft
Height from balance load to top of left parapet	$h_{c\_pptL} = h_{pptL} - h_b$ = **3.98** ft
Length of roof - left parapet	$l_{u\_pptL} = b$ = **170.00** ft
Drift height windward drift - left parpet	$h_{d\_l\_pptL} = \sqrt{(I_s)} \times 0.75 \times (0.43 \times (\max(20\ ft, l_{u\_pptL}) \times 1ft^2)^{1/3} \times (p_g / 1lb/ft^2 + 10)^{1/4} - 1.5ft)$ = **3.21** ft
Drift height - left parapet	$h_{d\_pptL} = \min(h_{d\_l\_pptL}, h_{pptL} - h_b)$ = **3.21** ft
Drift width	$W_{d\_pptL} = \min(4 \times h_{d\_l\_pptL}, 8 \times (h_{pptL} - h_b), b)$ = **12.82** ft
Drift surcharge load - left parapet	$p_{d\_pptL} = h_{d\_pptL} \times \gamma$ = **53.21** lb/ft^2

Right parapet

Height of right parapet	h_{pptR} = **7.50** ft
Height from balance load to top of right parapet	$h_{c\_pptR} = h_{pptR} - h_b$ = **6.48** ft
Length of roof - right parapet	$l_{u\_pptR} = b$ = **170.00** ft
Drift height windward drift - right parpet	$h_{d\_l\_pptR} = \sqrt{(I_s)} \times 0.75 \times (0.43 \times (\max(20\ ft, l_{u\_pptR}) \times 1ft^2)^{1/3} \times (p_g / 1lb/ft^2 + 10)^{1/4} - 1.5ft)$ = **3.21** ft
Drift height - right parapet	$h_{d\_pptR} = \min(h_{d\_l\_pptR}, h_{pptR} - h_b)$ = **3.21** ft
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Drift surcharge load - right parapet	$p_{d\_pptR} = h_{d\_pptR} \times \gamma$ = **53.21** lb/ft^2

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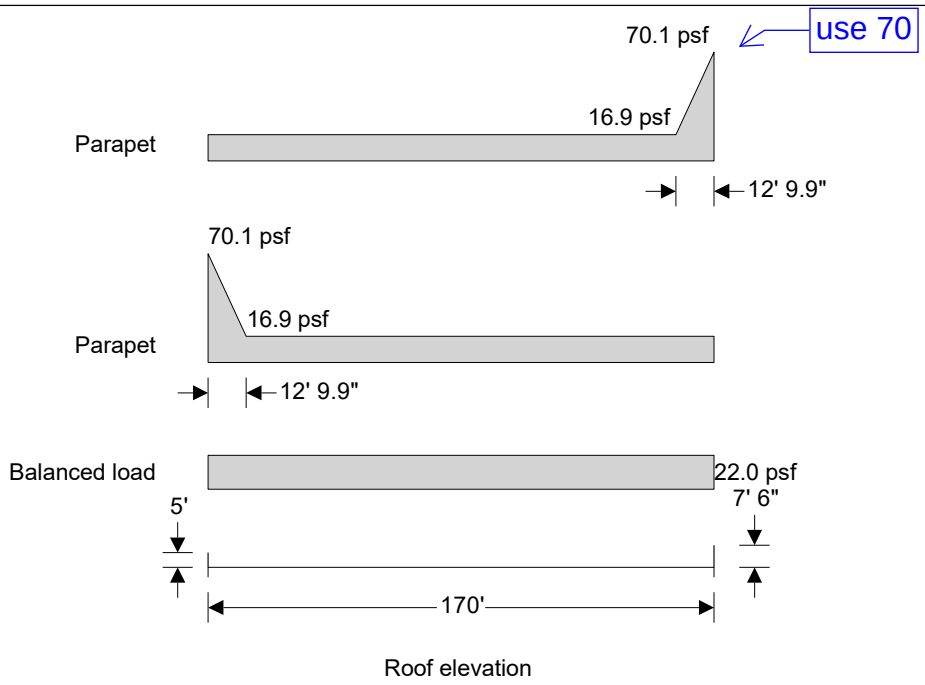
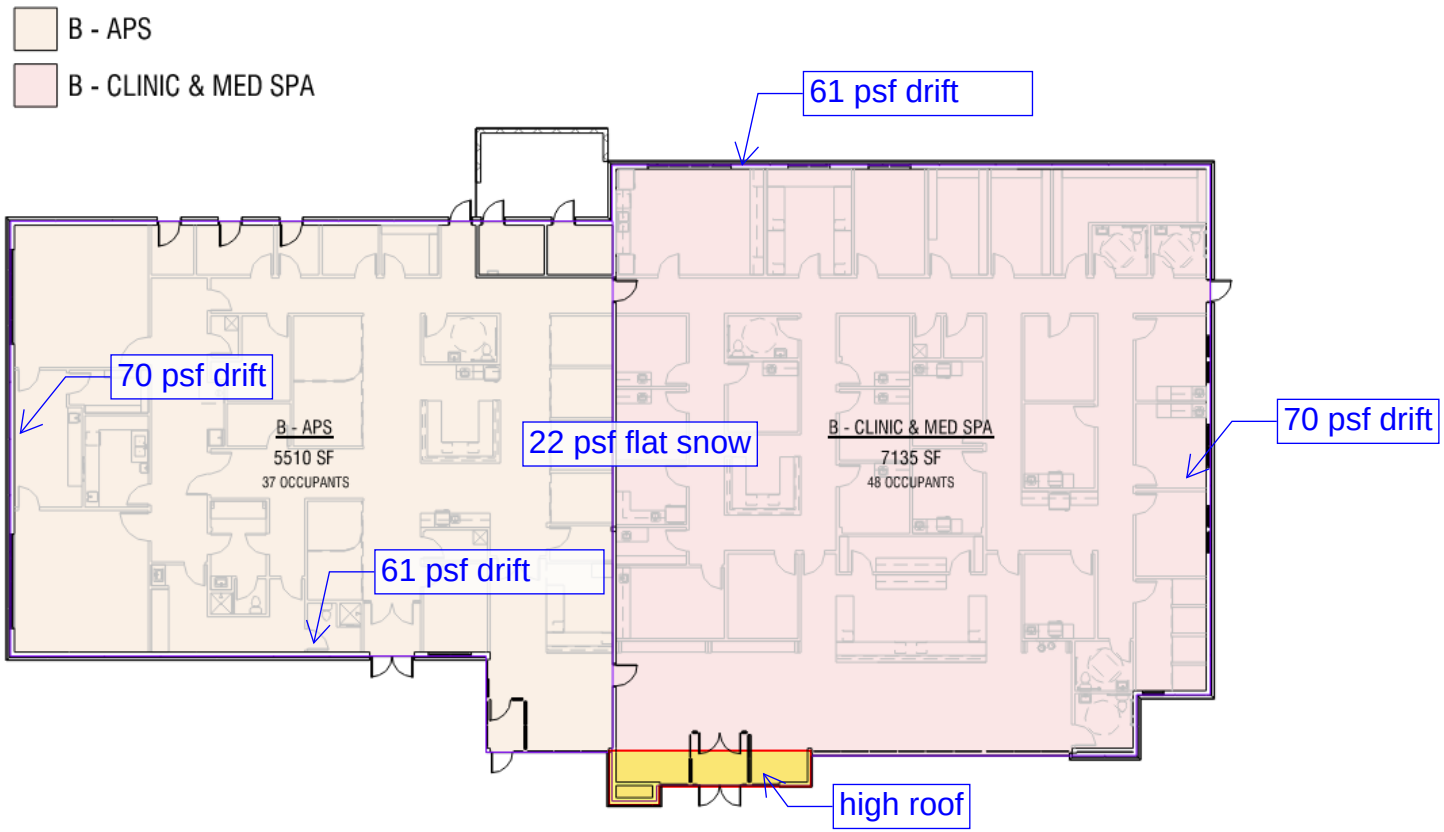


Roof elevation

Snow Load Plan



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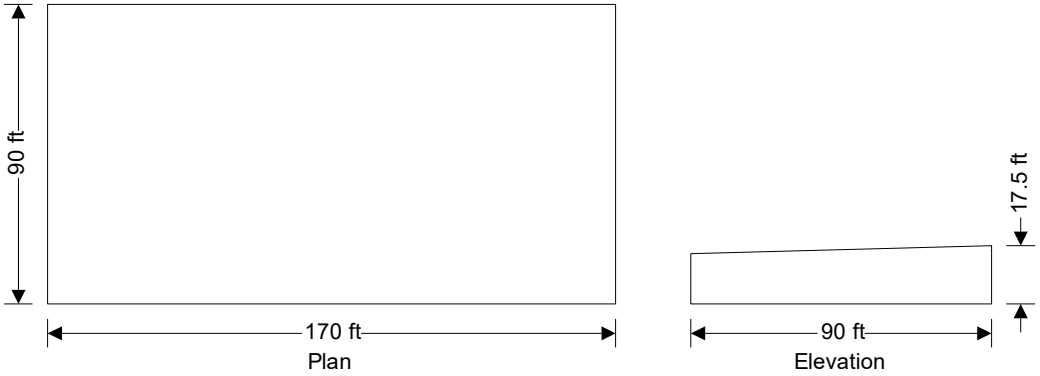
WIND LOAD _ MWFRS

In accordance with ASCE7-16

Using the directional design method

Tedds calculation version 2.1.14



Building data

Type of roof	Monoslope
Length of building	b = **170.00** ft
Width of building	d = **90.00** ft
Height to eaves	H = **15.13** ft
Pitch of roof	α_0 = **1.5** deg
Mean height	h = **15.13** ft

General wind load requirements

Basic wind speed	V = **117.0** mph
Risk category	III
Velocity pressure exponent coef (Table 26.6-1)	K_d = **0.85**
Ground elevation above sea level	z_{gl} = **1020** ft
Ground elevation factor	$K_e = \exp(-0.0000362 \times z_{gl}/1ft)$ = **0.96**
Exposure category (cl 26.7.3)	C
Enclosure classification (cl.26.12)	Enclosed buildings
Internal pressure coef +ve (Table 26.13-1)	GC_{pi_p} = **0.18**
Internal pressure coef –ve (Table 26.13-1)	GC_{pi_n} = **-0.18**
Gust effect factor	G_f = **0.85**
Minimum design wind loading (cl.27.1.5)	p_{min_r} = **8** lb/ft^2

Topography

Topography factor not significant	K_{zt} = 1.0
Velocity pressure equation	$q = 0.00256 \times K_z \times K_{zt} \times K_d \times V^2 \times 1psf/mph^2$

Velocity pressures table

z (ft)	K_z (Table 26.10-1)	q_z (psf)
15.00	0.85	24.40
15.13	0.85	24.44
17.49	0.87	25.12

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Peak velocity pressure for internal pressure

Peak velocity pressure – internal (as roof press.) q_i = **24.44** psf

Pressures and forces

Net pressure $p = q \times G_f \times C_{pe} - q_i \times GC_{pi}$

Net force $F_w = p \times A_{ref}$

Roof load case 1 - Wind 0, GC_{pi} 0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A (-ve)	15.13	-0.90	24.44	-23.09	1286.49	-29.71
B (-ve)	15.13	-0.90	24.44	-23.09	1286.49	-29.71
C (-ve)	15.13	-0.50	24.44	-14.79	2572.98	-38.04
D (-ve)	15.13	-0.30	24.44	-10.63	10159.28	-108.00

Total vertical net force $F_{w,v}$ = **-205.40** kips

Total horizontal net force $F_{w,h}$ = **-5.38** kips

Walls load case 1 - Wind 0, GC_{pi} 0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A_1	15.00	0.80	24.40	12.19	2550.00	31.09
A_2	15.13	0.80	24.44	12.22	22.10	0.27
B	15.13	-0.50	24.44	-14.79	2972.74	-43.95
C	15.13	-0.70	24.44	-18.94	1467.75	-27.80
D	15.13	-0.70	24.44	-18.94	1467.75	-27.80

27 psf

Overall loading

Projected vertical plan area of wall $A_{vert\_w\_0} = b \times H$ = **2572.10** ft^2

Projected vertical area of roof $A_{vert\_r\_0} = b \times d \times \tan(\alpha_0)$ = **400.64** ft^2

Minimum overall horizontal loading $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_0} + p_{min\_r} \times A_{vert\_r\_0}$ = **44.36** kips

Leeward net force $F_l = F_{w,wB}$ = **-44.0** kips

Windward net force $F_w = F_{w,wA\_1} + F_{w,wA\_2}$ = **31.4** kips

Overall horizontal loading $F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total\_min})$ = **69.9** kips

Roof load case 2 - Wind 0, GC_{pi} -0.18, $-0c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A (+ve)	15.13	-0.18	24.44	0.66	1286.49	0.85
B (+ve)	15.13	-0.18	24.44	0.66	1286.49	0.85
C (+ve)	15.13	-0.18	24.44	0.66	2572.98	1.70
D (+ve)	15.13	-0.18	24.44	0.66	10159.28	6.70

Total vertical net force $F_{w,v}$ = **10.10** kips

Total horizontal net force $F_{w,h}$ = **0.26** kips

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Walls load case 2 - Wind 0, GC_{pi} -0.18, $-0c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A_1	15.00	0.80	24.40	20.99	2550.00	53.53
A_2	15.13	0.80	24.44	-21.02	22.10	0.46
B	15.13	-0.50	24.44	-5.99	2972.74	-17.80
C	15.13	-0.70	24.44	-10.14	1467.75	-14.89
D	15.13	-0.70	24.44	-10.14	1467.75	-14.89

controls

27 psf

Overall loading

Projected vertical plan area of wall — $A_{vert\_w\_0} = b \times H =$ **2572.10** ft^2

Projected vertical area of roof — $A_{vert\_r\_0} = b \times d \times \tan(\alpha_0) =$ **400.64** ft^2

Minimum overall horizontal loading — $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_0} + p_{min\_r} \times A_{vert\_r\_0} =$ **44.36** kips

Leeward net force — $F_l = F_{w,wB} =$ **-17.8** kips

Windward net force — $F_w = F_{w,wA\_1} + F_{w,wA\_2} =$ **54.0** kips

Overall horizontal loading — $F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total\_min}) =$ **72.1** kips

Roof load case 3 - Wind 90, GC_{pi} 0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A (-ve)	15.13	-0.90	24.44	-23.09	681.08	-15.73
B (-ve)	15.13	-0.90	24.44	-23.09	681.08	-15.73
C (-ve)	15.13	-0.50	24.44	-14.79	1362.17	-20.14
D (-ve)	15.13	-0.30	24.44	-10.63	12580.91	-133.75

Total vertical net force — $F_{w,v} =$ **-185.28** kips

Total horizontal net force — $F_{w,h} =$ **0.00** kips

Walls load case 3 - Wind 90, GC_{pi} 0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A_1	15.00	0.80	24.40	12.19	1350.00	16.46
A_2	17.49	0.80	25.12	12.68	117.90	1.49
B	15.13	-0.32	24.44	-11.09	1467.75	-16.28
C	15.13	-0.70	24.44	-18.94	2572.10	-48.72
D	15.13	-0.70	24.44	-18.94	2972.74	-56.30

Overall loading

Projected vertical plan area of wall — $A_{vert\_w\_90} = d \times (H + d \times \tan(\alpha_0) / 2) =$ **1467.75** ft^2

Projected vertical area of roof — $A_{vert\_r\_90} =$ **0.00** ft^2

Minimum overall horizontal loading — $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_90} + p_{min\_r} \times A_{vert\_r\_90} =$ **23.48** kips

Leeward net force — $F_l = F_{w,wB} =$ **-16.3** kips

Windward net force — $F_w = F_{w,wA\_1} + F_{w,wA\_2} =$ **18.0** kips

Overall horizontal loading $F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total\_min}) =$ **34.2** kips

Roof load case 4 - Wind 90, GC_{pi} -0.18, $+c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A (+ve)	15.13	-0.18	24.44	0.66	681.08	0.45
B (+ve)	15.13	-0.18	24.44	0.66	681.08	0.45
C (+ve)	15.13	-0.18	24.44	0.66	1362.17	0.90
D (+ve)	15.13	-0.18	24.44	0.66	12580.91	8.30

Total vertical net force $F_{w,v} =$ **10.10** kips

Total horizontal net force $F_{w,h} =$ **0.00** kips

Walls load case 4 - Wind 90, GC_{pi} -0.18, $+c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A_1	15.00	0.80	24.40	20.99	1350.00	28.34
A_2	17.49	0.80	25.12	21.48	117.90	2.53
B	15.13	-0.32	24.44	-2.29	1467.75	-3.37
C	15.13	-0.70	24.44	-10.14	2572.10	-26.09
D	15.13	-0.70	24.44	-10.14	2972.74	-30.15

Overall loading

Projected vertical plan area of wall $A_{vert\_w\_90} = d \times (H + d \times \tan(\alpha_0) / 2) =$ **1467.75** ft^2

Projected vertical area of roof $A_{vert\_r\_90} =$ **0.00** ft^2

Minimum overall horizontal loading $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_90} + p_{min\_r} \times A_{vert\_r\_90} =$ **23.48** kips

Leeward net force $F_l = F_{w,wB} =$ **-3.4** kips

Windward net force $F_w = F_{w,wA\_1} + F_{w,wA\_2} =$ **30.9** kips

Overall horizontal loading $F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total\_min}) =$ **34.2** kips

Roof load case 5 - Wind 180, GC_{pi} 0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A (-ve)	15.13	-0.90	24.44	-23.09	1286.49	-29.71
B (-ve)	15.13	-0.90	24.44	-23.09	1286.49	-29.71
C (-ve)	15.13	-0.50	24.44	-14.79	2572.98	-38.04
D (-ve)	15.13	-0.30	24.44	-10.63	10159.28	-108.00

Total vertical net force $F_{w,v} =$ **-205.40** kips

Total horizontal net force $F_{w,h} =$ **-5.38** kips

Walls load case 5 - Wind 180, GC_{pi} 0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A_1	15.00	0.80	24.40	12.19	2550.00	31.09

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A_2	17.49	0.80	25.12	12.68	423.02	5.36
B	15.13	-0.50	24.44	-14.79	2572.10	-38.03
C	15.13	-0.70	24.44	-18.94	1467.75	-27.80
D	15.13	-0.70	24.44	-18.94	1467.75	-27.80

Overall loading

Projected vertical plan area of wall $A_{vert\_w\_180} = b \times (H + d \times \tan(\alpha_0)) =$ **2972.74** ft^2

Projected vertical area of roof $A_{vert\_r\_180} = b \times d \times \tan(\alpha_0) =$ **400.64** ft^2

Minimum overall horizontal loading $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_180} + p_{min\_r} \times A_{vert\_r\_180} =$ **50.77** kips

Leeward net force $F_l = F_{w,wB} =$ **-38.0** kips

Windward net force $F_w = F_{w,wA\_1} + F_{w,wA\_2} =$ **36.5** kips

Overall horizontal loading $F_{w,total} = \max(F_w - F_l - F_{w,h}, F_{w,total\_min}) =$ **79.9** kips

Roof load case 6 - Wind 180, GC_{pi} -0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A (+ve)	15.13	-0.18	24.44	0.66	1286.49	0.85
B (+ve)	15.13	-0.18	24.44	0.66	1286.49	0.85
C (+ve)	15.13	-0.18	24.44	0.66	2572.98	1.70
D (+ve)	15.13	-0.18	24.44	0.66	10159.28	6.70

Total vertical net force $F_{w,v} =$ **10.10** kips

Total horizontal net force $F_{w,h} =$ **0.26** kips

Walls load case 6 - Wind 180, GC_{pi} -0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A_1	15.00	0.80	24.40	20.99	2550.00	53.53
A_2	17.49	0.80	25.12	21.48	423.02	9.09
B	15.13	-0.50	24.44	-5.99	2572.10	-15.40
C	15.13	-0.70	24.44	-10.14	1467.75	-14.89
D	15.13	-0.70	24.44	-10.14	1467.75	-14.89

Overall loading

Projected vertical plan area of wall $A_{vert\_w\_180} = b \times (H + d \times \tan(\alpha_0)) =$ **2972.74** ft^2

Projected vertical area of roof $A_{vert\_r\_180} = b \times d \times \tan(\alpha_0) =$ **400.64** ft^2

Minimum overall horizontal loading $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_180} + p_{min\_r} \times A_{vert\_r\_180} =$ **50.77** kips

Leeward net force $F_l = F_{w,wB} =$ **-15.4** kips

Windward net force $F_w = F_{w,wA\_1} + F_{w,wA\_2} =$ **62.6** kips

Overall horizontal loading $F_{w,total} = \max(F_w - F_l - F_{w,h}, F_{w,total\_min}) =$ **77.8** kips

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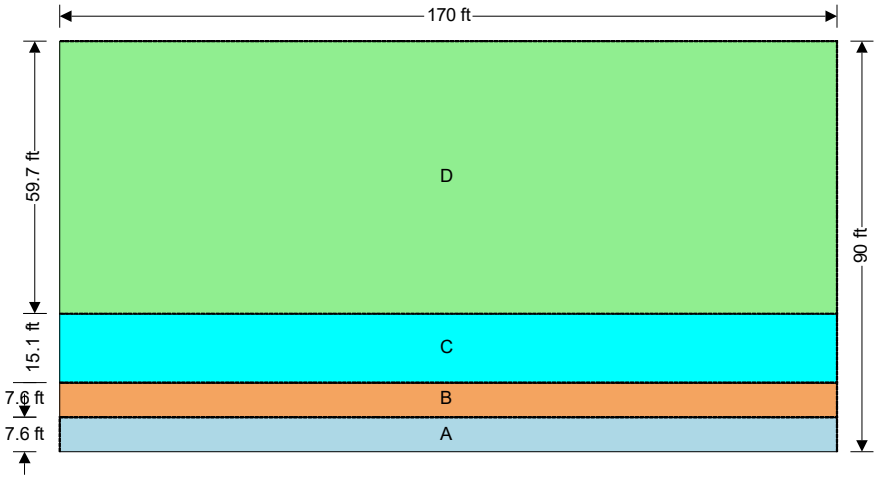
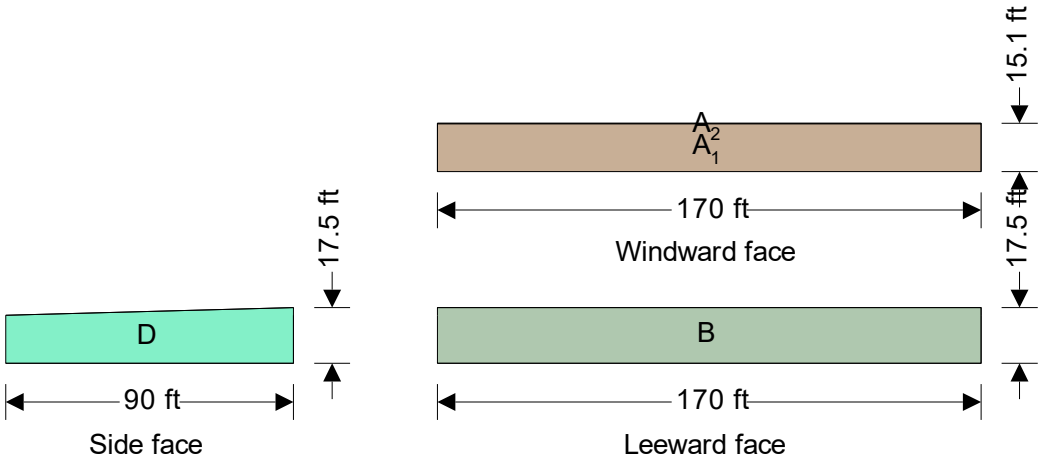


Plan view - Monoslope roof



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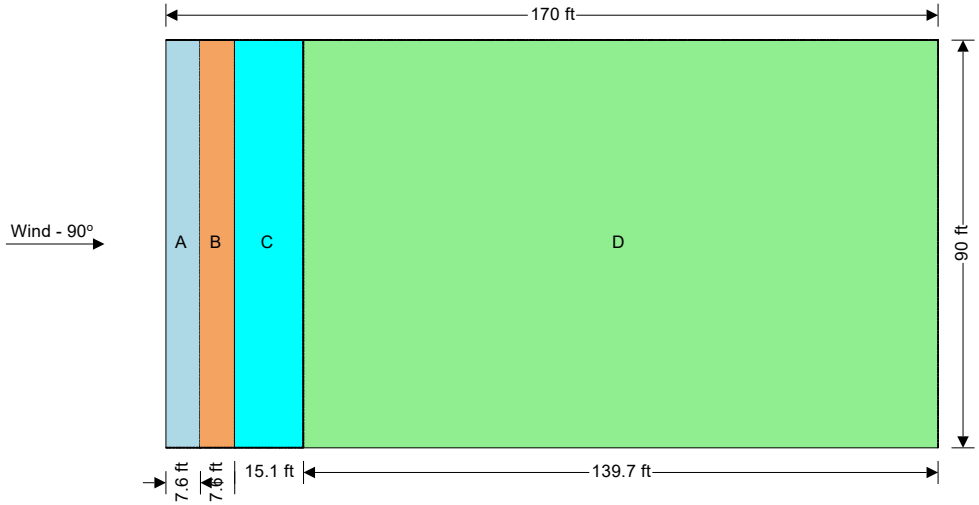
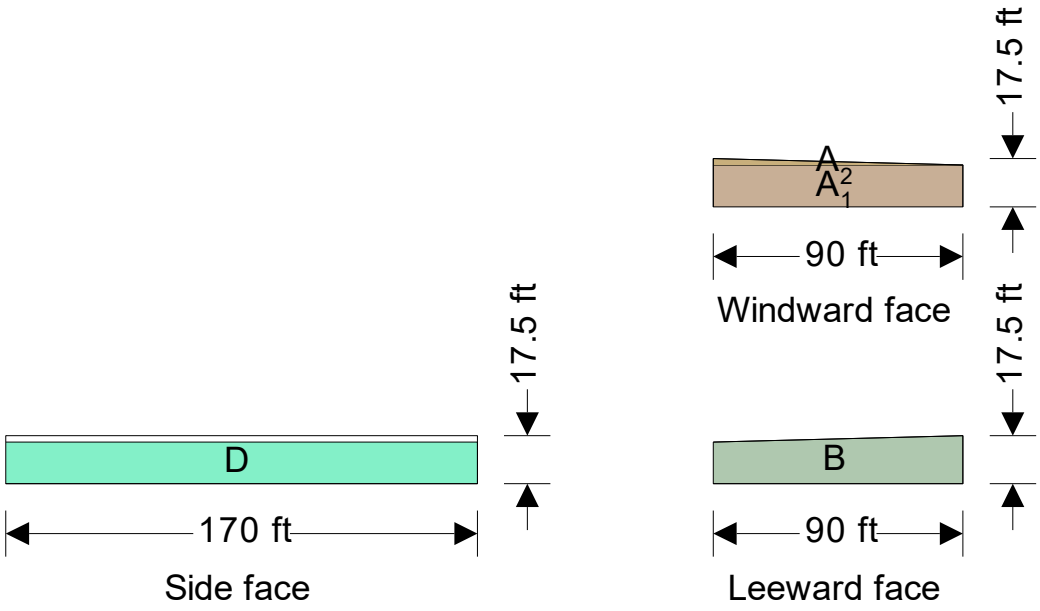


Plan view - Monoslope roof



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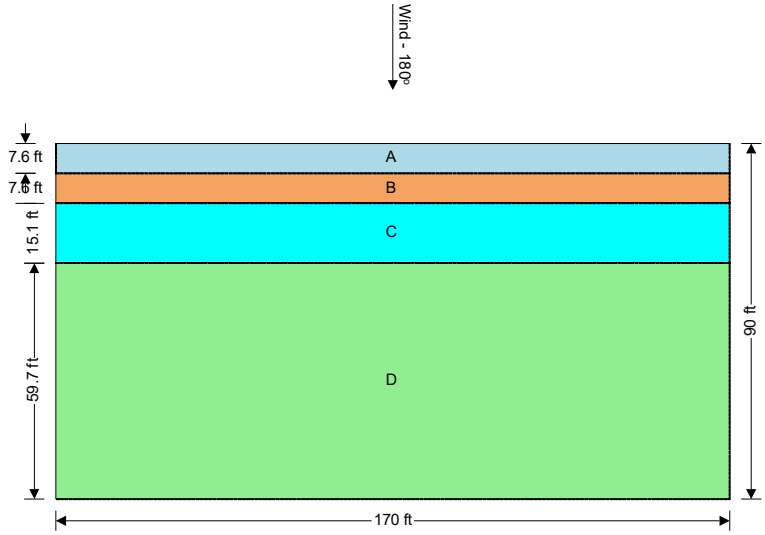
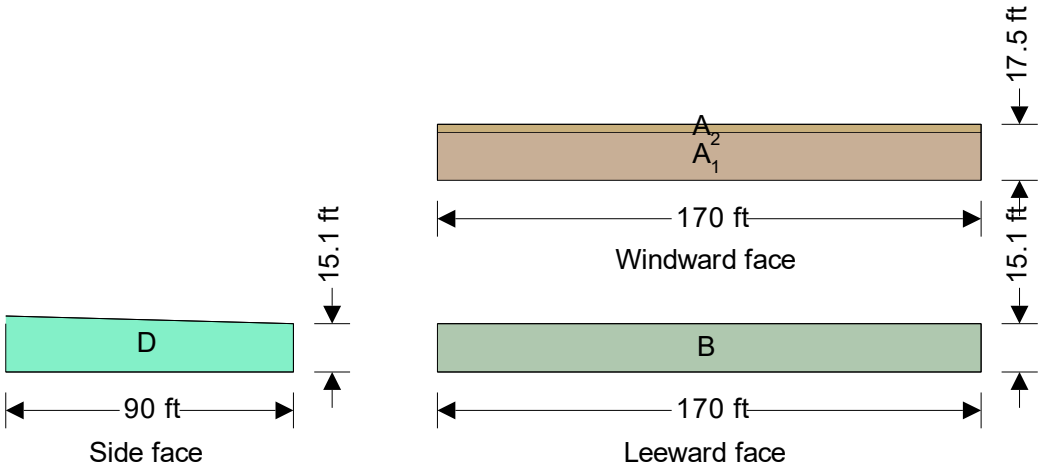


Plan view - Monoslope roof



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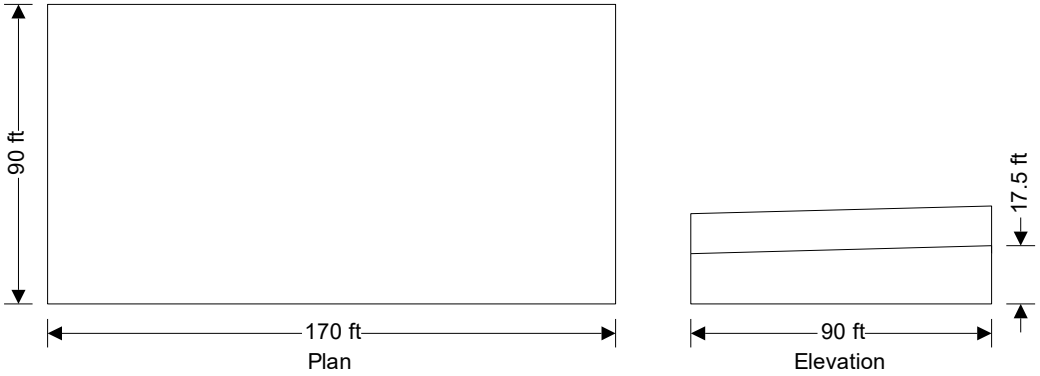
WIND LOAD _ C&C

In accordance with ASCE7-16

Using the components and cladding design method

Tedds calculation version 2.1.14



Building data

Type of roof	Monoslope
Length of building	b = **170.00** ft
Width of building	d = **90.00** ft
Height to eaves	H = **15.13** ft
Pitch of roof	α_0 = **1.5** deg
Height of parapet	h_p = **12.00** ft
Mean height	h = **15.13** ft
End zone width	a = max(min(0.1×min(b, d), 0.4×h), 0.04×min(b, d), 3ft) = **6.05** ft

General wind load requirements

Basic wind speed	V = **117.0** mph
Risk category	III
Velocity pressure exponent coef (Table 26.6-1)	K_d = **0.85**
Ground elevation above sea level	z_{gl} = **1020** ft
Ground elevation factor	$K_e = \exp(-0.0000362 \times z_{gl}/1ft)$ = **0.96**
Exposure category (cl 26.7.3)	C
Enclosure classification (cl.26.12)	Enclosed buildings
Internal pressure coef +ve (Table 26.13-1)	GC_{pi_p} = **0.18**
Internal pressure coef –ve (Table 26.13-1)	GC_{pi_n} = **-0.18**
Parapet internal pressure coef +ve (Table 26.11-1)	GC_{pi_pp} = **0.18**
Parapet internal pressure coef –ve (Table 26.11-1)	GC_{pi_np} = **-0.18**
Gust effect factor	G_f = **0.85**

Topography

Topography factor not significant	K_{zt} = 1.0

Velocity pressure

Velocity pressure coefficient (Table 26.10-1)	K_z = **0.85**
Velocity pressure	$q_h = 0.00256 \times K_z \times K_{zt} \times K_d \times K_e \times V^2 \times 1psf/mph^2$ = **24.4** psf

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Velocity pressure at parapet

Velocity pressure coefficient (Table 26.10-1) K_z = **0.96**

Velocity pressure $q_p = 0.00256 \times K_z \times K_{zt} \times K_d \times K_e \times V^2 \times 1psf/mph^2$ = **27.5** psf

Peak velocity pressure for internal pressure

Peak velocity pressure – internal (as roof press.) q_i = **24.44** psf

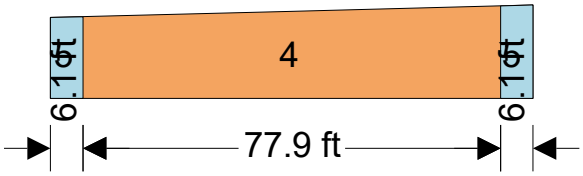
Equations used in tables

Net pressure $p = q_h \times [GC_p - GC_{pi}]$

Parapet net pressure $p = q_p \times [GC_p - GC_{pi\_p}]$

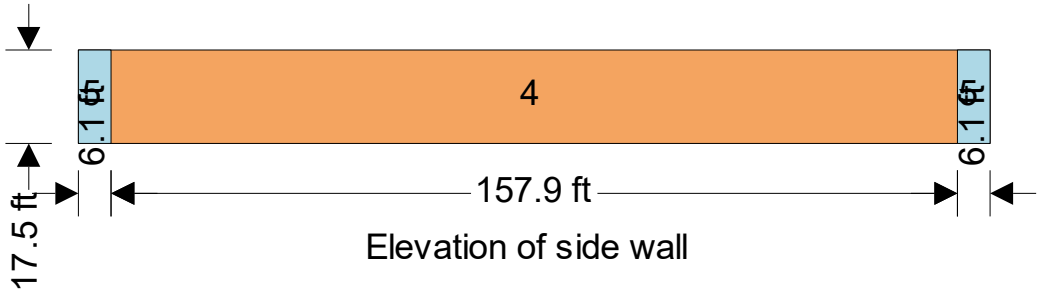
Components and cladding pressures - Wall (Table 30.3-1 and Figure 30.3-2A)

Component	Zone	Height (ft)	V press. (psf)	Length (ft)	Width (ft)	Effect Area (ft^2)	$+GC_p$	$-GC_p$	Pres (+ve) (psf)	Pres (-ve) (psf)
<=10 sf	4	15.1	24.4	-	-	10.0	0.90	-0.99	26.4	-28.6
<=10 sf	5	15.1	24.4	-	-	10.0	0.90	-1.26	26.4	-35.2



Elevation of gable wall

26.4+35.2 = 61.6 psf



Elevation of side wall

Components and cladding pressures - Roof (Figure 30.3-2A)

Component	Zone	Length (ft)	Width (ft)	Eff. area (ft^2)	$+GC_p$	$-GC_p$	Pres (+ve) (psf)	Pres (-ve) (psf)
<=10 sf	1	-	-	10.0	0.30	-1.70	11.7 #	-45.9
<=10 sf	1'	-	-	10.0	0.30	0.00	11.7 #	-4.4 #
<=10 sf	2	-	-	10.0	0.90	-2.30	26.4	-60.6
<=10 sf	3	-	-	10.0	0.90	-2.30	26.4	-60.6

The final net design wind pressure, including all permitted reductions, used in the design shall not be less than 16psf acting in either direction

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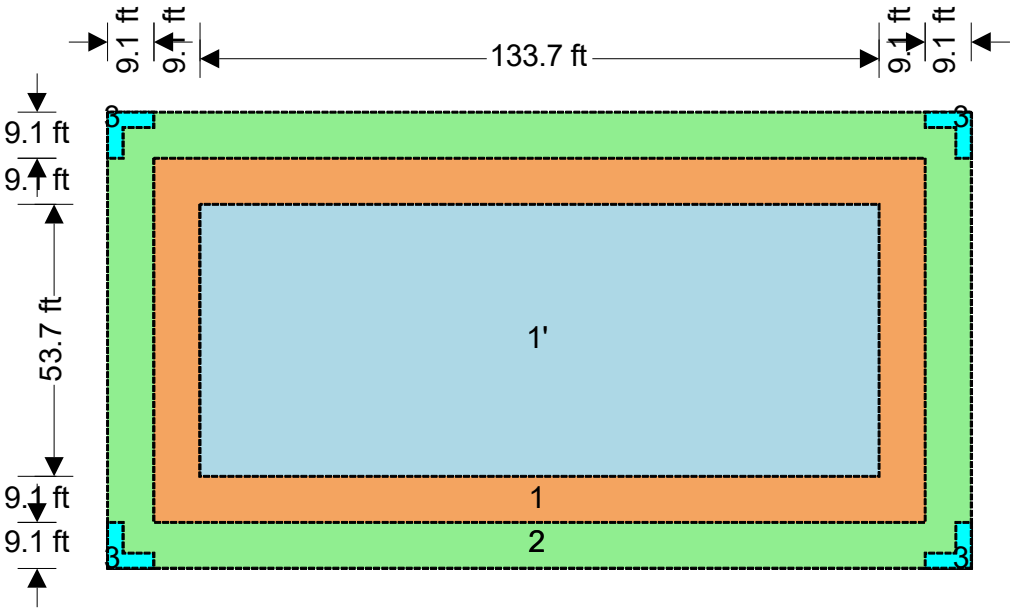
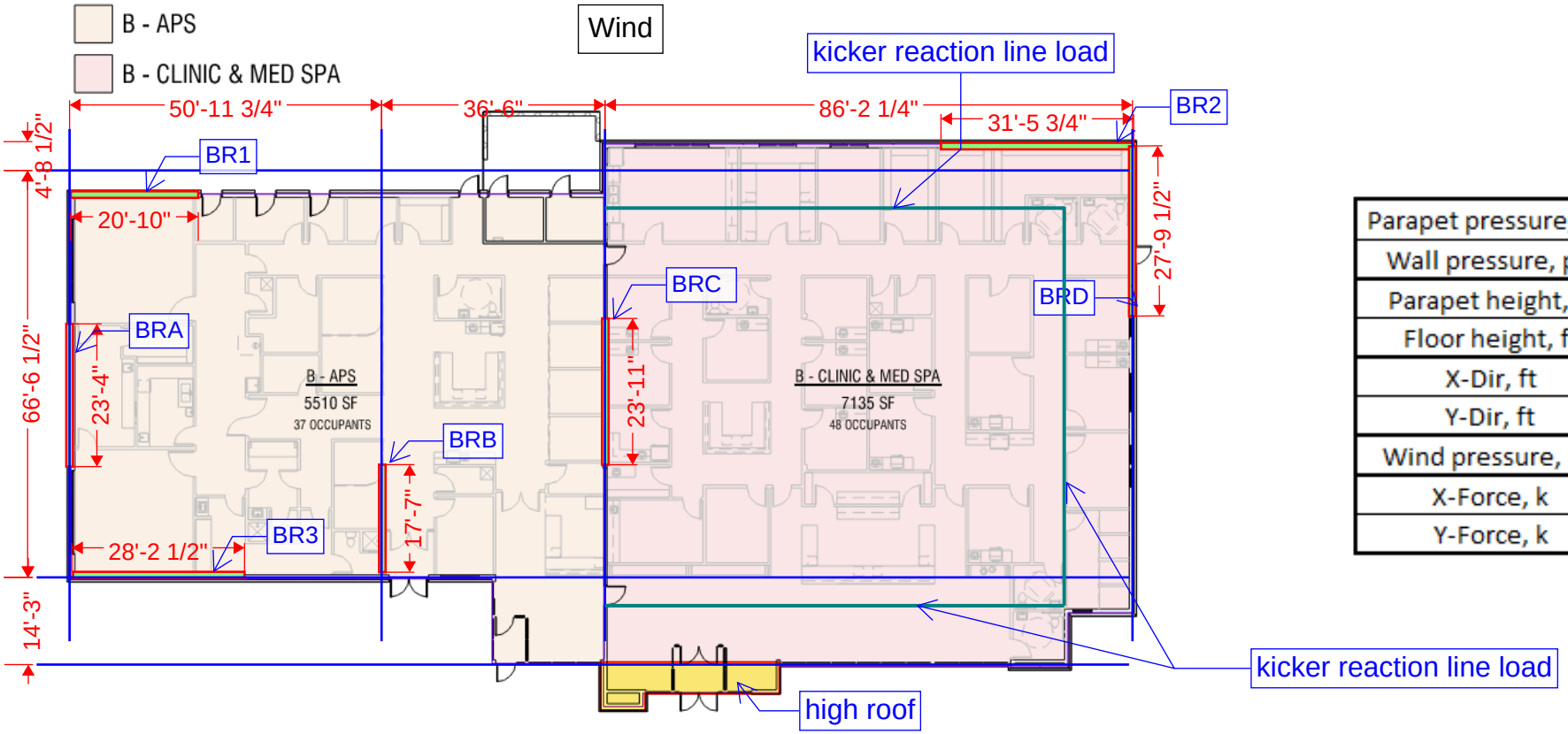


Plan on roof

Lateral Loads



Parapet pressure, psf	61.6
Wall pressure, psf	27
Parapet height, ft	10
Floor height, ft	12
X-Dir, ft	170
Y-Dir, ft	90
Wind pressure, plf	778
X-Force, k	70.0
Y-Force, k	132.3

Force Distribution				
X-direction				
Wall ID	L, ft	Trib., ft	Force, k	Force, plf
1	20.8	38.8	12.0091361	576.438535
2	31.5	38.8	18.1578139	576.438535
3	28.2	51.4	39.96975	1416.9483
4				
5				
6				
7				
8				
9				
10				
Total			70.1	

Y-direction				
Wall ID	L, ft	Trib., ft	Force, k	Force, plf
A	23.3	29.1	22.65925	971.249464
B	17.5	42.6	33.16225	1894.98571
C	24.0	55.9	43.4902	1812.09167
D	27.8	42.4	32.9872	1188.72793
E				
F				
G				
H				
I				
J				
Total			132.3	

Seismic

Seismic Generation Input

Seismic Code:	**ASCE 7-16**				
Ct_X:	**0.02**	T_X (sec):	**Not Entered**	R_X:	**3**
Ct_Z:	**0.02**	T_Z (sec):	**Not Entered**	R_Z:	**3**
Ct Exp. X:	**0.75**	Ct Exp. Z:	**0.75**		
Risk Cat	**III**	TL (sec):	**12**		
SD1 (g):	**0.11**	SDS (g):	**0.107**	S1 (g):	**0.07**
Base Elev (ft):	**0**	Parapet Ht :	**Included**		

Seismic Generation Detail Results

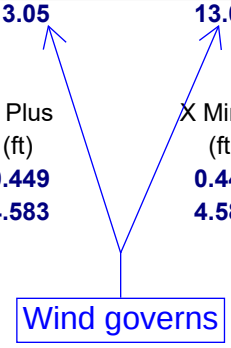
T_X Used (sec):	**0.237**	T_X Method A:	**0.237**	T_X Upper Limit:	**0.403**
T_Z Used (sec):	**0.237**	T_Z Method A:	**0.237**	T_Z Upper Limit:	**0.403**
Importance Fac.:	**1.25**	Design Cat.:	**B**		
V_X (k):	**13.05**	Gov. Eqn.	**ASCE Eqn 12.8-2**	Cs_X:	**0.045**
V_Z (k):	**13.05**	Gov. Eqn.	**ASCE Eqn 12.8-2**	Cs_Z:	**0.045**

Seismic Generation Force Results

Floor Level	Height (ft)	Weight (k)	Force X (k)	Force Z (k)	CG X (ft)	CG Z (ft)
High roof	**27**	**4.631**	**0.345**	**0.345**	**-20.098**	**-12.888**
Roof	**16**	**288.09**	**12.706**	**12.706**	**24.199**	**-20.623**
Base		**0**				
Totals		**292.721**	**13.05**	**13.05**		

Seismic Generation Diaphragm Results

Floor Level	Width (X) (ft)	Length (Z) (ft)	X Plus (ft)	X Minus (ft)	Z Plus (ft)	Z Minus (ft)
High roof	**8.979**	**29.76**	**0.449**	**0.449**	**1.488**	**1.488**
Roof	**91.667**	**171.687**	**4.583**	**4.583**	**8.584**	**8.584**



Sample Calculations

Trench Footing Design

ID:									
				Roof Slope:	6	:12	DL Fact:	1.12	
Description:	Load (psf)	Trib (ft)	Total (plf)						
Roof DL	20	18	402	Uniform Loads (plf)			Pt Load	Kips	Loc (ft)
Roof LL	20	18	360	DL:	612		DL:		
Ceiling DL	5	18	90	Roof LL:	360		Roof LL:		
Ceiling LL	0		0	Floor LL:	0		Floor LL		
Wall DL	12	10	120	DL + 3/4(LL+RLL):	882			qa, psf	1500
Floor DL	0	0	0	DL + (LL or RLL):	972	plf		16" wide ftg	2000
Floor LL	0	0	0	Conc wall wt:	900	plf		capacity (plf):	OK
				Total Brg Load:	1872	plf			

Spread Footing Design

Square Spread Footing Design

						LRFD Factor:	1.6		
f'c:	4	ksi	W Col BP	4	in	Allowable Bearing, qa:	1.5	ksf	
fy:	60	ksi	Rebar Clr:	3	in	Ultimate Bearing, qu:	2.4	ksf	
ϕ-v:	0.75								
ϕ-f:	0.9								
v-beam:	94.9	psi	<<Allowable Beam Shear Stress						
v-punch:	189.7	psi	<<Allowable Punching Shear Stress						

Bar Areas	
3	0.11
4	0.2
5	0.31
6	0.44
7	0.6
8	0.79
9	1

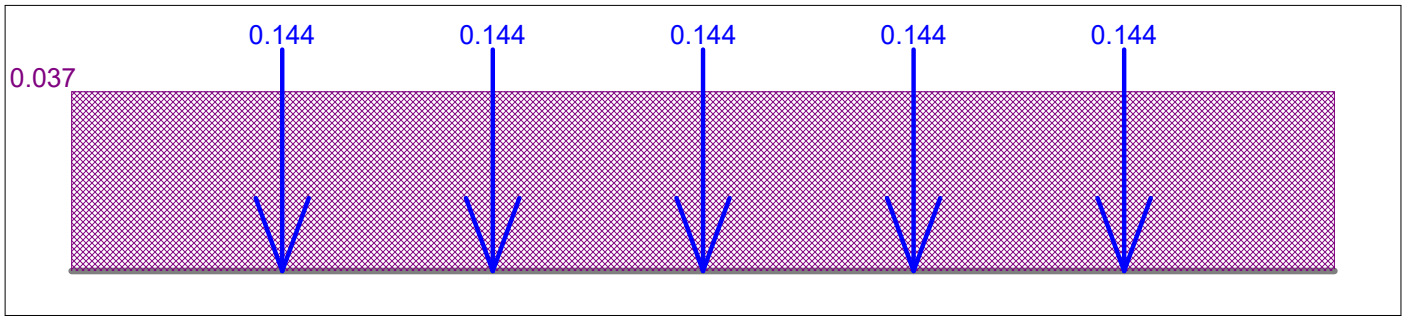
Width	Thickness	Depth	Reaction	BEAM SHEAR		PUNCHING SHEAR		LRFD Moment	Beam Min	Temp. & Shrinkage	Rebar Size		Footing Weight
b (ft):	h (in):	d (in):	P-allow:	σact	Unity	σact	Unity	Mu (kft)	As reqd	As reqd	5	6	kips
											0.31	0.44	
											num reqd		
3	36	32	13.50	0.0	0.00	0.0	0.00	6.40	0.06	1.17	4	3	4.05
4	36	32	24.00	0.0	0.00	3.6	0.02	16.13	0.15	1.56	6	4	7.20
5	32	28	37.50	0.0	0.00	12.0	0.06	32.67	0.35	1.73	6	4	10.00

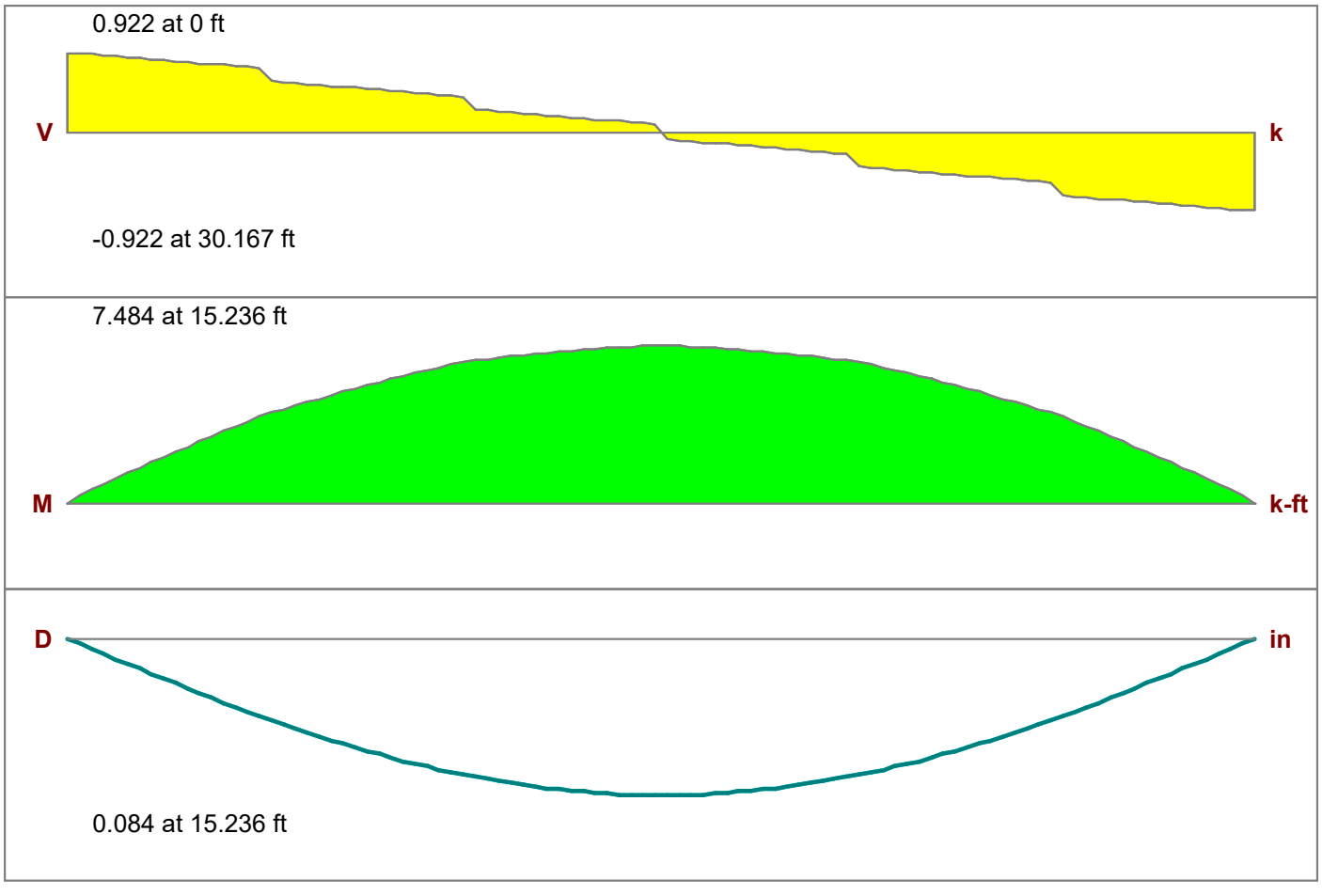
Beam Design - Gravity Loads

Beam:	**M19**	Shape Group:	**Wide Flange**	Code:	**AISC 15th (360-16): ASD**
Floor:	**Roof**	Span:	**Single**		
Size:	**W18x35**	Fixity:	**Pinned-Pinned**		
Material:	**A992 (Fy = 50ksi)**	Bending:	**Strong Axis**		
Function:	**Lateral**				

Geometry: Length = 30.1666ft
Points (Start to End): N37 to N33 (-53.0264,-3.795,0) to (-83.193,-3.795,0) Angle: 0 degrees

Diagrams for Load Category: DLPre
Load Diagram (Live Load Reduction not shown): Distributed Loads (k/ft), Point Loads (k)





Reaction for Category DLPre: (k)

I-End Reaction:	Axial:	**0k**	J-End Reaction:	Axial:	**0k**
	Shear:	**0.922k**		Shear:	**0.922k**
	Moment:	**0k-ft**		Moment:	**0k-ft**

*Live Load diagram displays controlling LL, LLS, RLL, SL, RL

Envelope and Category Shear Reactions: (k)

	DL	Non Reducible LL+LLS	(Unreduced) LL+LLS	Non Reducible Roof LL Total	(Unreduced) Roof LL Total
I-End:	**6.218**	**0**	**0**	**4.088(a)**	**0**
J-End:	**6.218**	**0**	**0**	**4.088**	**0**

Maximum Total I-End Reaction: 10.306k for LC 7 (DL+SL)
Maximum Total J-End Reaction: 10.306k for LC 7 (DL+SL)

All Category Member Loads

Distributed Loads (k/ft)

	Dist(ft)	DLPre	LLConst	DLConst	DL	LL
Start	**0**	**0.037**	**0.02**	**0**	**0.255**	**0**
End	**30.167**	**0.037**	**0.02**	**0**	**0.255**	**0**

	Dist(ft)	LLS	RLL	SL	SLN	RL
Start	**0**	**0**	**0.022**	**0.017**	**0**	**0**
End	**30.167**	**0**	**0.022**	**0.017**	**0**	**0**

Point Loads (k)

Dist(ft)	DLPre	LLConst	DLConst	DL	LL
5.028	**0.144**	**0.892**	**0**	**0.947**	**0**
10.056	**0.144**	**0.892**	**0**	**0.947**	**0**
15.083	**0.144**	**0.892**	**0**	**0.947**	**0**
20.111	**0.144**	**0.892**	**0**	**0.947**	**0**
25.139	**0.144**	**0.892**	**0**	**0.947**	**0**

Dist(ft)	LLS	RLL	SL	SLN	RL
5.028	**0**	**0.982**	**1.533**	**0**	**0**
10.056	**0**	**0.982**	**1.533**	**0**	**0**
15.083	**0**	**0.982**	**1.533**	**0**	**0**
20.111	**0**	**0.982**	**1.533**	**0**	**0**
25.139	**0**	**0.982**	**1.533**	**0**	**0**

Live Load Reduction **FLL Code: IBC** **RLL Code: IBC**

Span	Reducible Area ft^2	KLL	LL Factor	LLS Factor	RLL Factor
1	**0**	**2**	**1**	**1**	**1**

Design Rules: Spandrel Roof Beam

Max Depth (in)	Min Depth (in)	Max Width (in)	Min Width (in)	Max Bending	Max Shear
None	**12**	**None**	**None**	**0.95**	**0.95**

DL Defl (in)	DL Ratio	LL Defl (in)	LL Ratio	DL+LL Defl (in)	DL+LL Ratio
None	**240**	**0.5**	**360**	**None**	**240**

Cat1 Name	Cat1 Defl (in)	Cat1 Ratio	Cat2 Name	Cat2 Defl (in)	Cat2 Ratio
RLL	**0.5**	**360**	**SL**	**0.5**	**360**

Shear: 9.7% Capacity at 30.17ft for LC 7 (DL+SL)
V = 10.306k at 30.17ft fv = 1.941ksi Vn/om = 106.2k

Bending: 52.4% Capacity at 15.24ft for LC 7 (DL+SL)
M = 86.883k-ft Cb = 1.01084 LbTop = 2ft LbBot = 30.1666ft fb = 18.092ksi Mn/om = 165.918k-ft L-torque = 30.1666ft

Deflections: 80.9% Capacity at 15.24ft. (Camber = 0in)

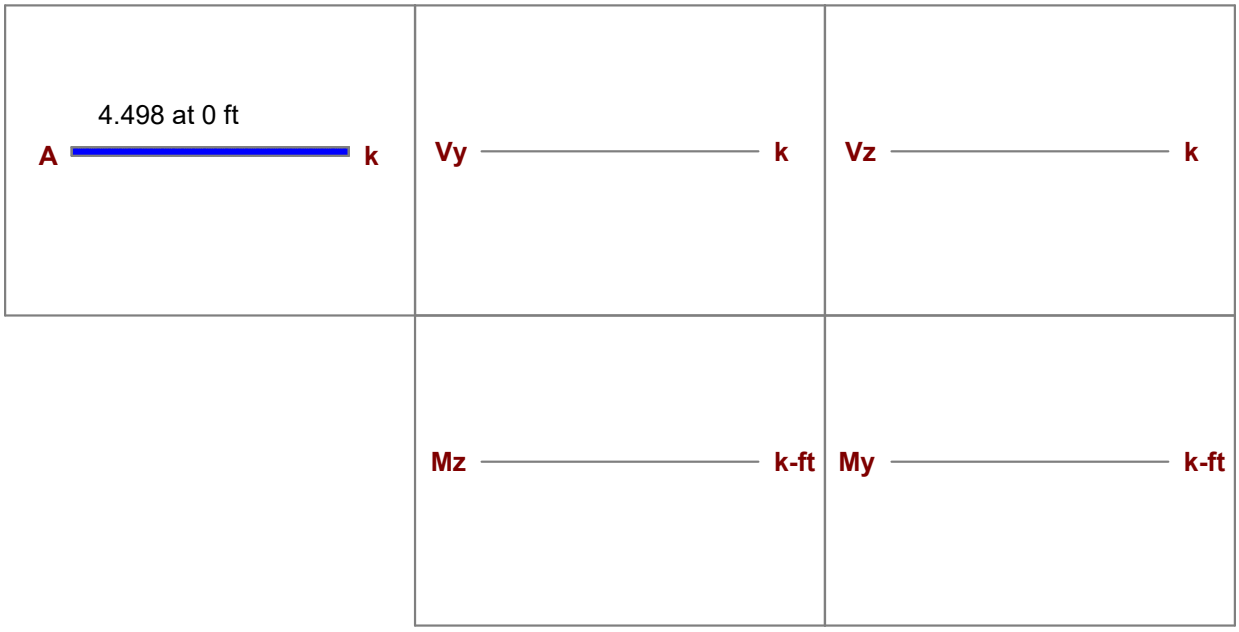
	PreDL	DL	LL*	DL+LL*	RLL	SL
Deflection (in):	**0.084**	**0.564**	**0.405**	**0.969**	**0.273**	**0.405**
Span Ratio	**4320**	**641**	**895**	**374**	**1324**	**895**

LL*: Live Load on beam can contain LL, LLS, RLL, SL, RL

Column Design - Gravity Loads

Col Stack:	**(C-5)**	Code:	**AISC 15th (360-16): ASD**
Lift:	**1**	Function:	**Lateral**
Span:	**Single Floor**	Material:	**A992 (Fy = 50ksi)**
Shape Group:	**SquareTube**	Fixity:	**Moment-Moment**
Size:	**HSS5X5X4**	Type:	**Standard**

Geometry: Length = 16ft
Point: N46 (-25.943,38.059) From: 0 ft To: 16 ft Angle: 0 degrees



All Category Column Loads

Point Loads (k)

Floor	DLPre	LLConst	DLConst	DL	LL
Roof	**4.498**	**14.971**	**0**	**23.959**	**0**
Floor	LLS	RLL	SL	SLN	RL
Roof	**0**	**16.469**	**14.853**	**0**	**0**

Moment Mz (k-ft)

Floor	DLPre	LLConst	DLConst	DL	LL
Roof	**0**	**0**	**0**	**0**	**0**
Floor	LLS	RLL	SL	SLN	RL
Roof	**0**	**0**	**0**	**0**	**0**

Moment My (k-ft)

Floor	DLPre	LLConst	DLConst	DL	LL
Roof	**0**	**0**	**0**	**0**	**0**
Floor	LLS	RLL	SL	SLN	RL
Roof	**0**	**0**	**0**	**0**	**0**

Live Load Reduction **FLL Code: IBC** **RLL Code: IBC**

Floor	Reducible Area ft^2	KLL	LL Factor	LLS Factor	RLL Factor
Roof	**0**	**4**	**1**	**1**	**1**

Design Rules: 6 in HSS Columns

Max Depth (in)	Min Depth (in)	Max Width (in)	Min Width (in)	Max Bending	Max Shear
6	**4**	**6**	**4**	**0.95**	**0.95**

Design Results

Shear (y) : 0% Capacity at 16 ft for LC 9 (DL + 3/4 (LL+SL))

Vy = 0k	fvy = 0ksi	Vny/om = 36.0048k
Vz = 0k	fvz = 0ksi	Vnz/om = 36.0048k

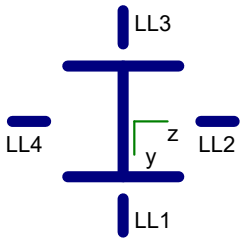
Bending: 64.8% Capacity at 16 ft for LC 6 (DL+RLL)

P = 40.428k	fa = 9.402ksi	Pnc/om = 62.3914k
Mz = 0k-ft	fbz = 0ksi	Mnz/om = 18.987k-ft
My = 0k-ft	fby = 0ksi	Mny/om = 18.987k-ft
	y-y	z-z
Lb	16 ft	16 ft
KL/r	99.535	99.535
Cb = 1	Lcomp Top = 16 ft	Lcomp Bot = 16 ft
L-torque = 16 ft		

Column Skip Loading

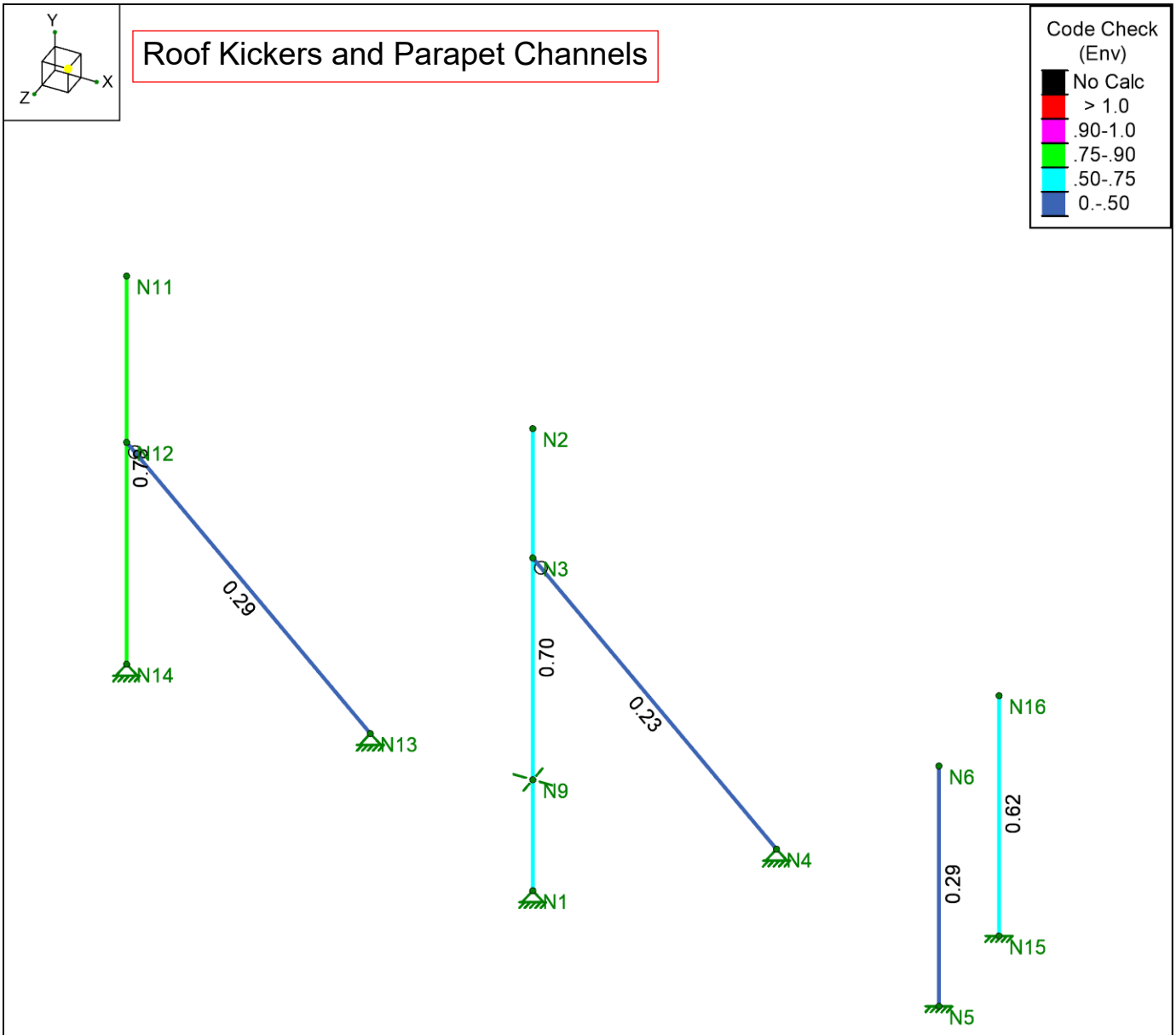
Bending Controlling Floor	Bending Controlling Pattern
Roof	**DL+LL1+LL2+LL3+LL4**

Shear Controlling Floor	Shear Controlling Pattern
Roof	**DL+LL1+LL2+LL3+LL4**



Note: LL includes all loads other than DL

Roof Kickers and Parapet Channels



Member Code Checks Displayed (Enveloped)

IRISA A NEMETSCHEK COMPANY	Stand Structural Enginee…		SK-1
	FHS		Jan 30, 2025 at 03:23 PM
			Kickers and External walls_…

Member Primary Data

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N2	600S162-54	Column	CS	A653 SS Gr33	Typical
2	M2	N3	N4	600S162-54	VBrace	CS	A653 SS Gr33	Typical
3	M3	N5	N6	C5X9	Column	Channel	A992	Typical
4	M5	N14	N11	600S162-54	Column	CS	A653 SS Gr33	Typical
5	M6	N12	N13	600S162-54	VBrace	CS	A653 SS Gr33	Typical
6	M7	N15	N16	C4X7.25	Column	Channel	A36 Gr.36	Typical

Member Advanced Data

	Label	I Release	Col-Wall Vert Release	Physical	Deflection Ratio Options	Seismic DR
1	M1			Yes	** NA **	None
2	M2	BenPIN		Yes	** NA **	None
3	M3			Yes	** NA **	None
4	M5			Yes	** NA **	None
5	M6	BenPIN		Yes	** NA **	None
6	M7			Yes	** NA **	None

Hot Rolled Steel Design Parameters

	Label	Shape	Length [ft]	Lcomp top [ft]	Channel Conn.	a [ft]	Function
1	M3	C5X9	6.5	Lbyy	N/A	N/A	Lateral
2	M7	C4X7.25	6.5	Lbyy	N/A	N/A	Lateral

Cold Formed Steel Design Parameters

	Label	Shape	Length [ft]	Lcomp top [ft]	Function
1	M1	600S162-54	12.5	Lbyy	Lateral
2	M2	600S162-54	8.485	Lbyy	Lateral
3	M5	600S162-54	10.5	Lbyy	Lateral
4	M6	600S162-54	8.485	Lbyy	Lateral

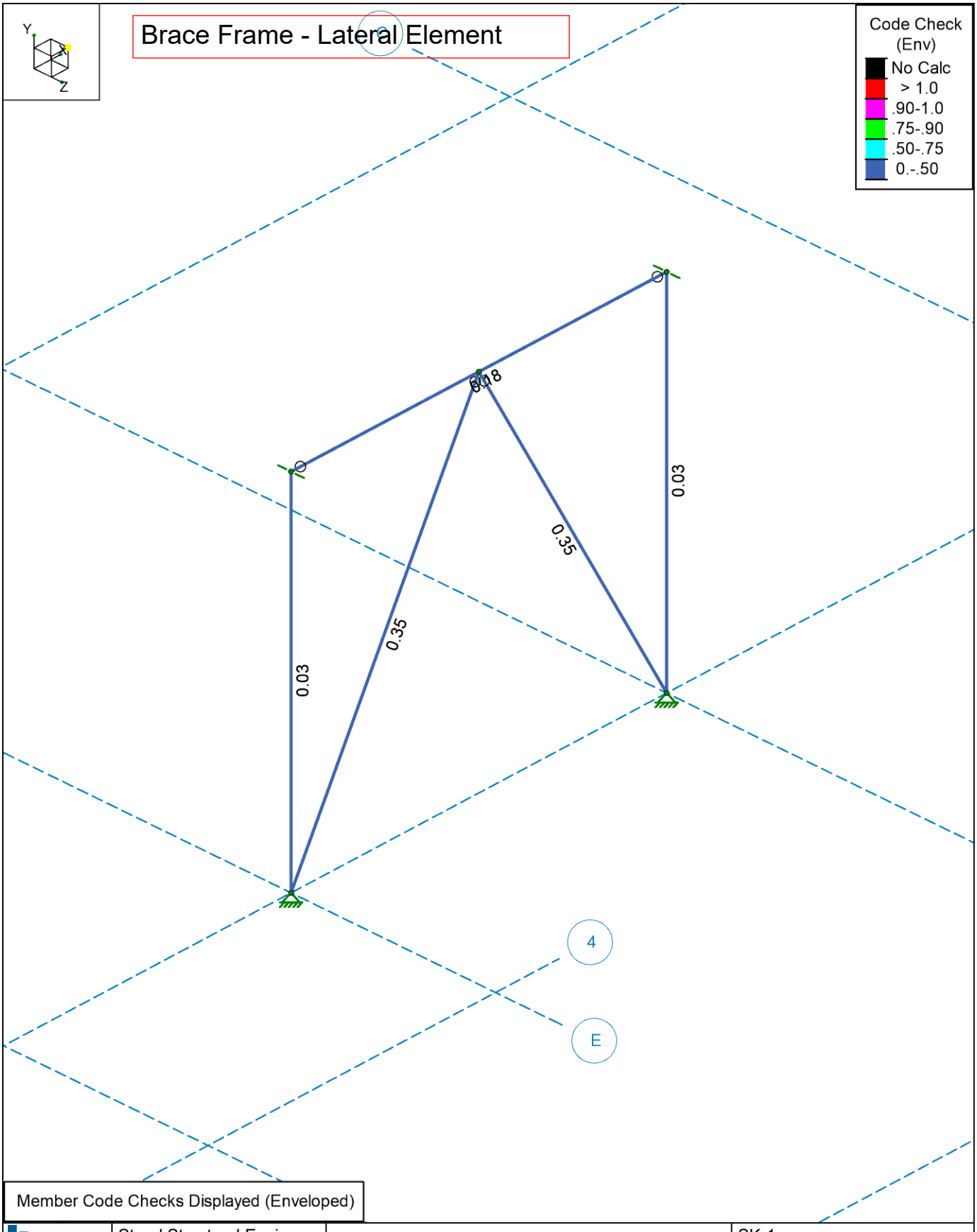
AISC 15TH (360-16): ASD Member Steel Code Checks

	LC	Member	Shape	UC Max	Loc[ft]	Shear UC	Loc[ft]	Dir	Pnc/om [k]	Pnt/om [k]	Mnyy/om [k-ft]	Mnzz/om [k-ft]	Cb	Eqn
1	1	M3	C5X9	0.29	0	0.033	0	y	15.416	79.042	1.764	10.953	2.325	H1-1b
2	1	M7	C4X7.25	0.623	0	0.059	0	y	10.5	45.916	0.969	5.102	2.325	H1-1b
3	2	M3	C5X9	0.29	0	0.033	0	y	15.416	79.042	1.764	10.953	2.325	H1-1b
4	2	M7	C4X7.25	0.623	0	0.059	0	y	10.5	45.916	0.969	5.102	2.325	H1-1b

AISI S100-20: ASD Member Cold Formed Steel Code Checks

	LC	Member	Shape	UC Max	Loc[ft]	Shear UC	Loc[ft]	Dir	Pn/Om[k]	Tn/Om[k]	Mnyy/Om[k-ft]	Mnzz/Om[k-ft]	Vny/Om[k]	Vnz/Om[k]	Cb	Eqn
1	1	M1	600S162-54	0.361	9.115	0.068	8.984	y	1.141	10.987	0.166	0.799	2.74	1.88	2.131	H1.2-1
2	1	M2	600S162-54	0.233	4.596	0.001	8.485	y	2.268	10.987	0.215	0.852	2.74	1.88	1.136	H1.2-1
3	1	M5	600S162-54	0.507	6.016	0.084	5.906	y	1.593	10.987	0.191	0.994	2.74	1.88	1.994	H1.2-1
4	1	M6	600S162-54	0.294	4.596	0.001	8.485	y	2.268	10.987	0.215	0.852	2.74	1.88	1.136	H1.2-1
5	2	M1	600S162-54	0.702	8.984	0.068	8.984	y	1.141	10.987	0.166	0.798	2.74	1.88	2.13	H1.2-1
6	2	M2	600S162-54	0.051	4.066	0.001	8.485	y	2.268	10.987	0.099	1.57	2.74	1.88	1.136	H1.1-1
7	2	M5	600S162-54	0.779	5.906	0.084	5.906	y	1.593	10.987	0.191	0.994	2.74	1.88	1.994	H1.2-1
8	2	M6	600S162-54	0.064	4.066	0.001	8.485	y	2.268	10.987	0.099	1.57	2.74	1.88	1.136	H1.1-1

Brace Frame - Lateral Element



Member Code Checks Displayed (Enveloped)

IRISA A NEMETSCHEK COMPANY	Stand Structural Enginee…		SK-1
	FHS		Jan 30, 2025 at 03:34 PM
			24139 APS Medical Office_…

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e^{5}°F^{-1}]	Density [k/ft^{3}]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B RECT	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A500 Gr.C RND	29000	11154	0.3	0.65	0.527	46	1.3	62	1.2
7	A500 Gr.C RECT	29000	11154	0.3	0.65	0.527	50	1.3	62	1.2
8	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
9	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3
10	A913 Gr.65	29000	11154	0.3	0.65	0.49	65	1.1	80	1.1
11	Steel Zero Density	29000	11154	0.3	0.65	0	50	1.1	65	1.1

Member Primary Data

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
1	F1_M125	N157A	F1_N36	W14X22	Beam	Wide Flange	A992	Infill Floor Beam
2	F1_(D-3)_L1	N155A	F1_N36	HSS5X5X4	Column	None	A992	6 in HSS Columns
3	F1_(E-3)_L1	N156A	N157A	HSS5X5X4	Column	Tube	A992	6 in HSS Columns
4	M107	N155A	N161	HSS5X5X6	VBrace	Tube	A500 Gr.B RECT	Vertical Braces
5	M108	N161	N156A	HSS5X5X6	VBrace	Tube	A500 Gr.B RECT	Vertical Braces

Member Distributed Loads (BLC 1 : Dead Load)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	F1_M125	Y	-0.21	-0.21	0	17.75

Member Distributed Loads (BLC 4 : Roof Live Load)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	F1_M125	Y	-0.209	-0.209	0	17.75

Member Distributed Loads (BLC 5 : Snow Load)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	F1_M125	Y	-0.407	0	0	9.553

Member Distributed Loads (BLC 8 : Wind Load X)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	F1_M125	X	1.9	1.9	0	%100

Envelope AISC 15TH (360-16): ASD Member Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	Pnc/om [k]	Pnt/om [k]	Mnyy/om [k-ft]	Mnzz/om [k-ft]	Cb	Eqn
1	F1_M125	W14X22	0.18	8.785	14	0.038	8.965	y	6	71.159	194.311	10.953	27.149	1.247	H1-1b
2	F1_(D-3)_L1	HSS5X5X4	0.028	0	6	0	16	y	10	62.391	128.743	18.987	18.987	1.656	H1-1b*
3	F1_(E-3)_L1	HSS5X5X4	0.035	0	7	0	16	y	12	62.391	128.743	18.987	18.987	1.656	H1-1b*
4	M107	HSS5X5X6	0.346	9.61	10	0.002	0	y	10	67.602	170.228	24.331	24.331	1.223	H1-1a
5	M108	HSS5X5X6	0.346	8.686	12	0.002	18.297	y	12	67.602	170.228	24.331	24.331	1.214	H1-1a