STRUCTURAL CALCULATIONS

Lateral Analysis & BEAM

CALCULATIONS

C-Store_ShellBldg

Building Code 19 CBC, ASCE 7-16 w/ Sup 1, WFCM-18 & SDPWS-21

Wind Design Criteria		Seismic Deisgn Criteria			
Risk Category	**II**	S Design Cat	**D**	Seis. Site Class	**D**
Basic Wind Speed	**110.00**	Ss Acc. %g	**1.13**	S. Res Coef. Cs	**0.13908**
Wind Exposure	**C**	S1 Acc. %g	**0.441**	Resp Mod Factor R	**6.5**
Wind Horiz. (psf)	**16.00**	Res Coef Sd1	**0.31135**	Base V	**12,509**
Wind Vert. (psf)	**-16.00**	Res Coef Sds	**0.904**	System	Light Frame SW
ASCE7-16 Ch. 28 Part 2		Calculation Method per 12.8			

Jerry Miles

September_2022

Lateral Loading: Area, Height & Weight Data	Page 1.1 of 1.3	**MaxQuake**	© 1995-2022 **Archforms Ltd.**	**Wind Lo**
Date: September_2022 Firm: Jerry Miles		All Rights Reserved	**License Expires** Lateral Load Analysis &	Date:
Job: C-Store_ShellBldg By: OGH		Q22.1	**1-Jan-23** Construction Design Software	Job:

FLOOR PLAN AREAS & SHEAR WALL GRID SPACING

•Establish Grid Spacing and Floor Plan Configuration at Each Level•

TYPICAL DEAD LOADS   Wind Area Calc ▶

•Establish Dead Loads (lbs/sf)•   See Page 1.2 &1.3

Horizontal

Grid line circles: **Left** (1) (2) (3) (4) (5) (6) (7) (8.) **Right**

	Roof	Floor	Perim	Overall	Roof:	R	Rb	Interior Wall		2nd Roof
Shear Wall Spacing 10 102	R Rb	1or2 b	Wall	Width	Roofing	10		Gyp.Bd.	6	
	Area+OH	Area / 100	LF	ft	FL Wdth Sheathing	1.5		Framing	4	
A **Back** Roof 2					Framing	2		Int. Finish		
2nd Fl/Rf 1 10 R	10.2			112	Vt Rf Area VT Rf Area Snow			Other		
B 1st Fl 1		10.2	122	112	**L-R**	13.5			10	
Roof 2			Roof at 2nd Fl	112	Zone E **Ceiling:**					
2nd Fl/Rf 1 40 R R	44.8				Insulation	1		**Exterior Wall**		
C 1st Fl 1 1		44.8	202		Typ OH 1070 Framing	0.5		Ext Finish	10	
Roof 2					Zone G Gyp. Bd.	2		Shear	1.5	**R2 Area**
2nd Fl/Rf 1					**L to R** Other			Framing	3	
D 1st Fl			Hz Rf Area	4430		3.5		Insulation	0.5	
Roof 2			Zone B		Oh Zn E **Floor:** 1or2 1b 2b			Gyp. Bd.	3	
2nd Fl/Rf 1					Floor	4		Int .Finish		**1st Roof**
E 1st Fl				8	Sub. Fl.	2		code additional		
Roof 2			Zone D		Oh Zn G Framing	3.5			18	
2nd Fl/Rf 1				44	Insul	0.5				
F 1st Fl			Hz Wl Area		Topping					
Roof 2			Zone A		Other					**R1 Area**
2nd Fl/Rf 1				10						
G 1st Fl				240	**FLOOR HEIGHTS & WIND AREA**					8
Roof 2			Zone C		•Establish Floor to Floor and Roof Heights (ft)•					248
2nd Fl/Rf 1					Roof Roof Floor					80
H 1st Fl			Vt Rf Area	360	Pitch Height Height					368
Front			**F-B**	Irregular Plan or Zone Adj	X/12			Roof		

Roof 2

Typical Overhang **F to B**			Zone E	**N** IF **L** Plan w/ both Legs >				2nd Fl/Roof		**W2 Area**
Rf Area **R** & **Rb**+OH /10			15%of Plan or Vert SW offset.Y?		1 4					**W1 Area**
Overall Depth ft a= 5 Zone B Zone D		450	Rf **2** Area + OH					1st Floor		
2nd Fl / Roof 1 50 Dpth of Roof 2nd Fl		Zone G	Rf **2b** Area + OH	2nd Fl Framing Ht.						**Base Wl Area**
Rf Area **R** & **Rb**+OH/10 4 51.0			Floor **2** Area	**1st Fl Top Plate Ht.**	12					
Floor **2** & **2b** Area /100		5,050	Floor **2b** Area	Total Ht.	12					**Vertical Lift**
Perimeter Wall LF		Oh Zn E	Wl **2** Perimeter LF	1st Fl Framing Ht.	**S**			Base/ Crawl Sp		**R2 Area**
Overall Depth ft 50 a= 5 Zone B 8 Zone D 248			Rf 1 **R** Area + OH	5,500	**Bsmt or Crawl Ht.**					
1st Floor Dpth of Roof 1st Fl Zone A Zone C			Rf 1 **Rb** Area + OH	Total Ht.				Slab/Foundation		**R1 Area**
Floor **1** & **1b** Area /100 4 51.0		Oh Zn G	Floor **1** Area	5,500	Wind Ht.@Ridge	**16.00**		**Ridge** F to B L to R		
Perimeter Wall LF 60 264			Floor **1b** Area	Wind Ht.@Gable	**14.00**		**Runs?**			
Overall Depth ft 50 a= 5 Zone A 240 Zone C 1104			Wl1 Perimeter LF	324	Mean Roof Ht.	**14.00**		**Hips?**		

ASCE7   a = less of 10%of least horiz dim or 40%of ht but not less than 4%of least horiz dim (min 3 ft) Sec 6.2 Low-rise Building: ht < 60 ft. Rf ht < least horiz dim.   Y at Rdg &Hips ?

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C-Store_ShellBldg
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By: OGH

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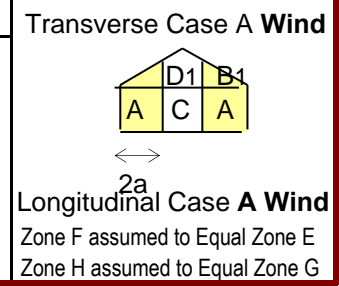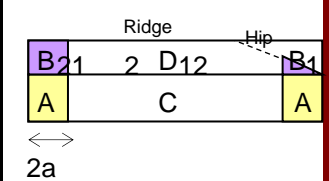All Rights Reserved
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	Line Name	Bay Lgth	1	10	2	102	3	4	5	6	7	.8.
	Sum lgth to line or mid line											
	Lgth of line to mid line											
	2a Lgth >											
	2a Lgth <											
	2a Lgth											
	Int Lgth											
	Rake Lgth											
	Rise at >											
	Rise at <											
	Hip/Gable B1 Area											
	Hip/Gable D1 Area											
	Slope Zone B2 Area											
	Slope Zone D2 Area											
	Sum lgth to line or mid line		5.0	10.0	61.0	112.0						
	Lgth of line to mid line		5.0	5.0	51.0	51.0						
	2a Lgth >	**10.0**	5.0	5.0								
	2a Lgth <	112.0				10.0						
	2a Lgth				10.0	10.0						
	Int Lgth	8.0				92.0						
	Rake Lgth	48.0			10.0	48.0						
	Rise at >	4.0	0.8			3.2						
	Rise at <					3.2	0.8					
8	Hip/Gable B1 Area	4	4	4	4	4						
248	Hip/Gable D1 Area	124			248	248						
80	Slope Zone B2 Area	4	40	40	40	40						
368	Slope Zone D2 Area				368	368						
	Wl Zone A Area											
	Wl Zone C Area											
240	Wl Zone A Area			120		120						
1104	Wl Zone C Area					1104						
	Wl Zone A Area											
	Wl Zone C Area											
	Zone E & F Area											
	Zone G & H Area											
	Oh Zone E Area											
	Oh Zone G Area											
450	Zone E Area			200		250						
5050	Zone G Area			200		4850						
	Oh Zone E Area											
	Oh Zone G Area											

Vert Roof Areas

Transverse Case A **Wind**

Longitudinal Case B **Wind**

Horiz Rf & Wl Areas

Transverse Case A **Wind**

Longitudinal Case **A Wind**
Zone F assumed to Equal Zone E
Zone H assumed to Equal Zone G
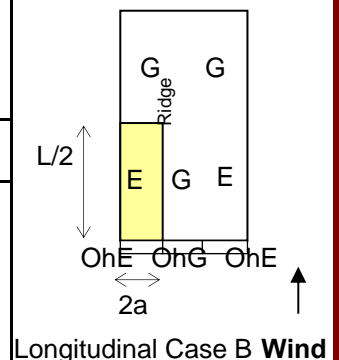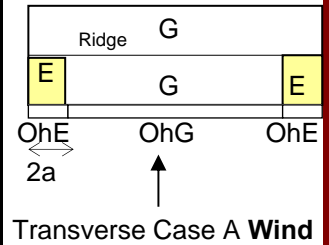
Wind Load Areas - Left to Right

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Job:	C-Store_ShellBldg	By:	OGH

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Horizontal		Line Name	Bay Lgth	A	10	B	40	C	D	E	F	G	H
		Sum lgth to line or mid line											
2nd Roof		Lgth of line to mid line											
		2a Lgth >											
		2a Lgth <											
		2a Lgth											
		Int Lgth											
		Rake Lgth											
		Rise at >											
		Rise at <											
R2 Area		Hip/Gable B1 Area											
		Hip/Gable D1 Area											
		Slope Zone B2 Area											
		Slope Zone D2 Area											
		Sum lgth to line or mid line		5.0	10.0	30.0	50.0						
1st Roof		Lgth of line to mid line		5.0	5.0	20.0	20.0						
		2a Lgth >	10.0	5.0	5.0								
		2a Lgth <	50.0				10.0						
		2a Lgth			10.0		10.0						
		Int Lgth					30.0						
		Rake Lgth	25.0		10.0		25.0						
		Rise at >	2.1	0.8			1.3						
R1 Area		Rise at <					1.3	0.8					
8	8	Hip/Gable B1 Area	4	4	4	4	4					
44	44	Hip/Gable D1 Area	22			44	44					
80	80	Slope Zone B2 Area	4	40	40	40	40					
120	120	Slope Zone D2 Area				120	120					
W2 Area		WI Zone A Area											
		WI Zone C Area											
W1 Area	240	WI Zone A Area			120		120					
	360	WI Zone C Area					360					
Base WI Area		WI Zone A Area											
		WI Zone C Area											
Vertical Lift		Zone E & F Area											
R2 Area		Zone G & H Area											
		Oh Zone E Area											
		Oh Zone G Area											
R1 Area	1070	Zone E Area			510		560					
	4430	Zone G Area			510		3920					
		Oh Zone E Area											
		Oh Zone G Area											

Vert Roof Areas

Transverse Case A **Wind**

Longitudinal Case B **Wind**

Horiz Rf & WI Areas

Transverse Case A **Wind**

Longitudinal Case B **Wind**
Zone F assumed to Equal Zone E
Zone H assumed to Equal Zone G
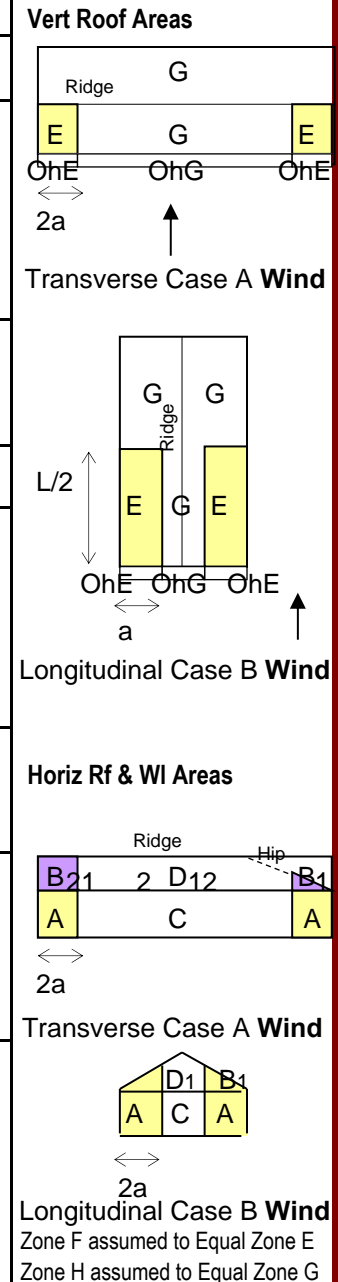
Lateral Load Analysis: Seismic & Wind Loads

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Lateral Load Analysis & Construction Design Software

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Job:	C-Store_ShellBldg	By:	OGH

SEISMIC LOADS — Sec.12.7.2 ASCE 7-16

BUILDING CODE   **19 CBC** [X]   **21 IBC** ASCE 7-16
w/ Sup-1, WFCM-18 & SDPWS-21

•Establish Dead Loads•

		2nd Floor		1st Floor		Base Level	
Item	DL(psf)	Area (sf)	DL(lbs)	Area(sf)	DL(lbs)	Area(sf)	DL(lbs)
Roof **R**	13.5			5,500	74,250		
Roof **Rb**							
Ceiling	3.5			5,500	19,250		
Ext Wall	18			1,944	34,992		
Int Wall	10						
F **1** or **2**	10						
Fl **1b** or **2b**							
		Sum 2nd		Sum 1st	128,492	Base	
				Sum 2nd,1st & Base	128,492		

•Distribute Weights to Various Levels•

	Roof 2 Line	2nd Fl Rf 1 Line	1st Fl Line	Base Fl Line	Wt Sum
Tributary Weight					
Wt Roof 2nd (R+Rb)					
Wt Ceil 2nd					
1/2Wt Ext Wl 2					
Wt Int Wl 2					
Wt Floor 2 (2+2b)					
Wt Roof 1st (R+Rb)		74,250			74,250
Wt Ceil 1		19,250			19,250
1/2 Wt Ext Wl 1		17,496	17,496	Load	34,992
Wt Int Wl 1				transfers	
Wt Floor 1 (1+1b)				directly	
1/2Wt Ext Wl Base				to Slab	
Wt Ceil Base					
Line Sum		110,996	17,496	W=	128,492

•Determine Base Shear•

Default Site Clas	**Y**	Sec 11-4.2 ASCE7	Calculation Method per 12.8 ASCE7 & Sec.1613.2.5.2 CBC
Site Class=	**D**	Tbl. 20.3-1 ASCE7	Mapped %g: Ss= **1.130** Fig.1613.2.1(1,3-8) 0.2 Sec.
Risk Cat =	**II**	Tbl.1604.5 CBC	Mapped %g: S1= **0.441** Fig.1613.2.1(2,3-8) 1.0 Sec.
Resp Mod R=	**6.5**	Tbl.12.2-1 A-15 ASCE	Mapped Period TL= **8** Fig.22-(14-17) ASCE7
Site Coef Fa=	1.20	Tbl. 1613.2.3(1) CBC	Seismic Design Cat.= D Sec.1613.3.5 CBC
Site Coef Fv=	1.06	Tbl. 1613.2.3(2) CBC	S.Coef Cs=Sds/(R/I) = 0.139 Eq.(12.8-2) ASCE7
Import Ie=	1.000	Tbl.11.5-1 ASCE7	Cs not >Sd1 /T(R/I) = 13.981 for T < = TL Eq.(12.8-3)
Sms=FaSs=	1.356	Eq.(16-36) CBC	Cs not>Sd1 TL/(R/I) T^2 = NA for T > TL Eq.(12.8-4)
Sm1=FvS1=	0.467		Cs not < 0.01 = 0.010 Eq.(12.8-5) ASCE7
Sds=2/3Sms=	0.904	Eq.(16-38) CBC	Cs not<0.5 S1/(R/I) = NA for S1 => 0.6g Eq.(12.8-6)
Sd1=2/3Sm1=	0.311	Eq.(16-39) CBC	V (SD)= CsW = 17,870 Eq.(12.8-1) ASCE7
P limit Cu=	1.400	Tbl.12.8-1 ASCE7	**V=(SD)*0.7=V(ASD) = 12,509** (ASD) Comb 5. ASCE7 12.4.1
Ta=Cth^n	0.145	Eq.(12.8-7) ASCE7	

•Vertical Distribution of Shear to Various Levels• — Sec. 12.8.3 ASCE7

Fx= V (Wtx)(Htx)^k/Sum(Wti)(Hti)^k   Ht from plate to foundation $\delta m= \rho Qe$ Eq.(12.4.3)

k= 1 Eq.(12.8-12) ASCE7

	Wt x	Ht x^k	(Wt)(Ht)^k	Fx	ρ F B	ρ L R
Roof 2						
2nd Fl/Rf 1	110,996	12	1,331,952	12,509	1.00	1.00
1st Floor	17,496					
Sum	128,492	12	1,331,952	12,509	Sec 12.3.4 ASCE7	

34,992

WIND LOADS

•Adjusted Wind Zone Pressures: 2.4.1.7 0.6D+0.6W Eq. 28.5-1 ASCE $Ps= \lambda Kztl\, Ps30 =$

Wind Loads per Simple Diaphragm Lowrise Envelope Fig. 28.5-1 ASCE 7 Roof 2 Ø Roof 1 Ø

Procedure for MWFRS per ASCE7-16 Tbl. 28.4 Longitudinal (Case B) Transvers (Case A)

		HZ Zone A	16.0	-16.0	16.0
Wind Speed	**110**	Fig.1609.3 CBC / Fig.26.5-ASC Zone B	16.0	-16.0	-16.0
Risk Cat.	**II**	Tbl.1604.5 CBC/Tbl.1.5-1 ASCE Zone C	16.0	-16.0	16.0
Exposure=	**C**	Sec 26.7.3 ASCE7/CBC 1609.4.3 Zone D	16.0	-16.0	-16.0
Ht. Coef λ	1.00	Fig.26.8-1 ASCE/CBC1609.1.1 VT Zone E	-16.0	-16.0	-16.0
Topo Kzt	1.00	Eq.(26.8-1) & Fig.26.8-1 ASCE7 Zone G	-16.0	-16.0	-16.0
		Zone E oh	-19.4	-19.4	-19.4
Topo Type:		Zone G oh	-16.0	-16.0	-16.0

Features: Escarpment   Hill / Ridge Ht   Distance   Bldg Ht

H=___ ft z=___ ft L=___ ft x=___ ft

•Total Wind Load In Each Direction At Each Level (lbs)•

Horizontal	Trib Area F to B			Trib Area L to R			Wind Load	
	B,A area	D,C area	Sum PsA	B,A area	D,C area	Sum PsA	F to B	L to R
Roof 2								
Roof 1	8	248	4,096	8	44	833		
2nd Floor							14,848	5,633
1st Floor	240	1,104	21,504	240	360	9,600		
Vert Uplift	E,F,Eoh	G,H,Goh	Sum PsA	E,F,Eoh	G,H,Goh	Sum PsA	F to B	L to R
Roof 2								
Roof 1	450	5,050	-88,000	1,070	4,430	-88,000	88,000	88,000

GOVERNING LATERAL LOADS

•Maximum Total Load In Each Direction At Each Level (lbs)•   Wind %of Seismic

	Front to Back	Left to Right	F to B	L to R
Roof 2				
2nd Fl / Roof 1	14,848 Wind	12,509 Seismic	119%	45%
1st Floor				

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	Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line .8.

Segment (Seg) names a-g appear to show possible quadrants (q). Remove Segs not used. Move and add 1,2...to denote multiple (m) seg's in a quadrant, ie., b2.

Seg Variables; Lg: Seg lgth. Ht: Seg hght (from pg 1). X: Wl Opening. B: Bearing Wall? - B=yes. E: Ext./Int. Wall? - E or I. S: Stacked Seg above, same row, q-m & ≤ Lg.

2nd level — 1,2,3.. Wall Lines Run From Front to Back

	Seg Wall Variables q-m Lg Ht X B E	Seg Wall Variables q-m Lg Ht X B E	Seg Wall Variables q-m Lg Ht X B E	Seg Wall Variables q-m Lg Ht X B E	Seg Wall Variables q-m Lg Ht X B E	Seg Wall Variables q-m Lg Ht X B E	Seg Wall Variables q-m Lg Ht X B E	Seg Wall Variables q-m Lg Ht X B E
	sum Syst	sum Syst	sum Syst	sum Syst	sum Syst	sum Syst	sum Syst	sum Syst

1st level

	Seg Wall Variables q-m Lg Ht X B E S	Seg Wall Variables q-m Lg Ht X B E S	Seg Wall Variables q-m Lg Ht X B E S	Seg Wall Variables q-m Lg Ht X B E S	Seg Wall Variables q-m Lg Ht X B E S	Seg Wall Variables q-m Lg Ht X B E S	Seg Wall Variables q-m Lg Ht X B E S	Seg Wall Variables q-m Lg Ht X B E S
	b1 16 11 B E b2 15 11 B E		a 50 12 N E					
	sum 31.00 Syst WS	sum Syst	sum 50.00 Syst WS	sum Syst	sum Syst	sum Syst	sum Syst	sum Syst
	31 ext	load trans to adj Ln	50 ext					

Base level

	Seg Wall Variables q-m Lg Ht X B E S	Seg Wall Variables q-m Lg Ht X B E S	Seg Wall Variables q-m Lg Ht X B E S	Seg Wall Variables q-m Lg Ht X B E S	Seg Wall Variables q-m Lg Ht X B E S	Seg Wall Variables q-m Lg Ht X B E S	Seg Wall Variables q-m Lg Ht X B E S	Seg Wall Variables q-m Lg Ht X B E S
	sum Syst	sum Syst	sum Syst	sum Syst	sum Syst	sum Syst	sum Syst	sum Syst
	load	load	load					

Shear Wall Segments Data: Lines A

Lines Run Left - Right

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Line A	Line B	Line C	Line D	Line E	Line F	Line G	Line H

Segment (Seg) names 1-7 appear to show possible quadrants (q). Remove Segs not used. Move and add a,b...to denote multiple (m) seg's in a quadrant, ie., 2b.

Seg Variables; Lg: Seg lgth. Ht: Seg hght (from pg 1). X: Wl Opening. B: Bearing Wall? - B=yes. E: Ext. /Int. Wall? - E or I. S: Stacked Seg above, same row, q-m & ≤ Lg.

2nd level — A,B,C.. Wall Lines Run From Side to Side

Each column header: Seg Wall Variables — q-m Lg Ht X B E

sum ... Syst (repeated across Lines A–H)

1st level

Each column header: Seg Wall Variables — q-m Lg Ht X B E S

Line A:

Seg	Lg	Ht	X	B	E
2a	28	12		N	E
2b	24	12		N	E

sum 52.00 Syst WS

52 ext

Line B:

sum Syst

load trans to adj Ln

Line C:

Seg	Lg	Ht	X	B	E
1	18	12		N	E
2	24	12		N	E

sum 42.00 Syst WS

42 ext

Lines D–H: sum ... Syst

Base level

Each column header: Seg Wall Variables — q-m Lg Ht X B E S

sum ... Syst (repeated across Lines A–H)

load (Lines A, B, C)

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DIAPHRAGM DIVISIONS AND LENGTH / WIDTH RATIOS

Shear Wall/Collector Line + + + + + Perimeter of Cantilevered Diaphragm Edge

Roof 2 Line 1 2 3 4 5 6 7 .8.

grid

A
B
C
D
E
F
G
H diaph

Rf1 / Fl 2 Line 1 2 3 4 5 6 7 .8.

grid 10 102

Adjust A 10 + + + + + 10.20
Interior B 40 # # # # 2.80 + + + + 2.55 #
Shear C # # # # + + + +
Walls D
and E
Block F
Ratios G
H diaph 1 112 102 1

1st Fl Line 1 2 3 4 5 6 7 .8.

grid 10 102

A 10
B 40
C
D
E
F
G
H diaph 112 102

If Gap? Check Load Dist btwn Jogs in Bldg - Cantilever wings out from Bldg Shear Lines.

UNBLOCKED DIAPHRAGM LIMITA ASCE7 Sec 12.3.1 & Sec1613.6.1 STORY DRIFT

I/w Ratios <Tbl.2305.2.3,Cantilever d< 25' & 2/3 w, Topping<1-1/2" and Wl Drift <Tbl.12.12-1 **Actual Limit**

Limitations: MaxTopping 1-1/2",Max Blocked Ratio 4.0, Unblocked 3.0, all Cantilevers Blocked Eq. 23-2 12.12-1

1 2 3 4 5 6 7 .8.

A
B
C
D
E
F
G
H

Blocked? 1 2 3 4 5 6 7 .8.

10 A Walls?
¹ B Unblock l >2/3 w' 0.65 2.88
40 ¹ C 0.65 2.88
D
E
F
G
H

Actual= 0.74 1.00
< <
Drift Limit= 2.88 2.88

Blocked? 1 2 3 4 5 6 7 .8.

50 A
40 B
C
D
E
F
G
H

Load Distribution to Segments: RM & OTM		MaxQuake © 1995-2022	Archforms Ltd.
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Job: C-Store_ShellBldg **By:** OGH		Q22.1	**Construction Design Software**

Lateral Force Distrib	Line 1 — Seis %= trib fl A/Sum flA	Line 2 — Wind %= trib wl A/Sum wlA	Line 3 — W/ft= if "w",- snow Sum lev. w*trib area	Line 4 — if "w" 0.6D if "s" pQe - 0.2 Sds D RM= W / ft* Lg^2 / 2k	Line 5 — OTM= if St'k Vnet*ht SumV*Ht*Lg/∑Lg	Line 6 — Vadj= SumV from adj Ln	Line 7 — V= Ln%*Vmax SorW	Line .8. — SumV= Vadj+Vabv+V
2nd Level	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM
	Vadj line 2 2nd Level V **Sum V**	Vadj line1 or 3 2nd Level V **Sum V**	Vadj line2 or 4 2nd Level V **Sum V**	Vadj line3 or 5 2nd Level V **Sum V**	Vadj line4 or 6 2nd Level V **Sum V**	Vadj line5 or 7 2nd Level V **Sum V**	Vadj line6 or 8 2nd Level V **Sum V**	Vadj line 7 2nd Level V **Sum V**
1st Level	%S 6 %W 3 Seg tA W/ft RM OTM	%S 58 %W 50 Seg tA W/ft RM OTM	%S 52 %W 47 Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM
Wind 14,848	b1 1-2 283 15.8 43.5 b2 1-2 283 12.8 39.1		a 2 ft 233 122 85.9					
p = Level V 35%Base Shear								
p = 1.00	31 b Vadj line 2 6.8 V above 1st Level V 0.7 **Sum V 7.5**	Vadj line1 or 3 V above 1st Level V 7.4 **Sum V**	50 b Vadj line2 or 4 0.7 V above 1st Level V 6.9 **Sum V 7.6**	Vadj line3 or 5 V above 1st Level V **Sum V**	Vadj line4 or 6 V above 1st Level V **Sum V**	Vadj line5 or 7 V above 1st Level V **Sum V**	Vadj line6 or 8 V above 1st Level V **Sum V**	Vadj line 7 V above 1st Level V **Sum V**
Regular								
Base Level	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM
	Vadj line 2 V above 7.5 Base Level V w **Sum V**	Vadj line1 or 3 V above Base Level V w **Sum V**	Vadj line2 or 4 V above 7.6 Base Level V w **Sum V**	Vadj line3 or 5 V above Base Level V **Sum V**	Vadj line4 or 6 V above Base Level V **Sum V**	Vadj line5 or 7 V above Base Level V **Sum V**	Vadj line6 or 8 V above Base Level V **Sum V**	Vadj line 7 V above Base Level V **Sum V**

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Date:	September_2022	Firm:	Jerry Miles
Job:	C-Store_ShellBldg	By:	OGH

Lateral Force Distrib	Line A Seis %= trib fl A/Sum flA	Line B Wind %= trib wl A/Sum wlA	Line C W/ft= if "w",-snow Sum lev. w*trib area	Line D if "w" 0.6D if "s" ρQe - 0.2 Sds D RM= W / ft* Lg^2 / 2k	Line E OTM= if St'k Vnet*ht SumV*Ht*Lg/∑Lg	Line F Vadj= SumV from adj Ln	Line G V= Ln%*Vmax SorW	Line H SumV= Vadj+Vabv+V
2nd Level	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM	%S %W Seg tA W/ft RM OTM
	Vadj line B 2nd Level V **Sum V**	Vadj lineA or C 2nd Level V **Sum V**	Vadj lineB or D 2nd Level V **Sum V**	Vadj lineC or E 2nd Level V **Sum V**	Vadj lineD or F 2nd Level V **Sum V**	Vadj lineE or G 2nd Level V **Sum V**	Vadj lineF or H 2nd Level V **Sum V**	Vadj line G 2nd Level V **Sum V**
1st Level Seismic 12,509 ρ = Level V ≥ 35%Base Shear ρ = 1.00 Regular	%S **14** %W **9** Seg tA W/ft RM OTM 2a 2 ft 233 38.3 48.5 2b 2 ft 233 28.1 41.6 **52** Vadj line B **5.8** b V above 1st Level V **1.7** **Sum V 7.5** w	%S **58** %W **50** Seg tA W/ft RM OTM Vadj lineA or C V above 1st Level V **7.2** **Sum V** w	%S **44** %W **41** Seg tA W/ft RM OTM 1 2 ft 233 15.8 35.8 2 2 ft 233 28.1 47.8 **42** Vadj lineB or D **1.4** b V above 1st Level V **5.5** **Sum V 7** w	%S %W Seg tA W/ft RM OTM Vadj lineC or E V above 1st Level V **Sum V**	%S %W Seg tA W/ft RM OTM Vadj lineD or F V above 1st Level V **Sum V**	%S %W Seg tA W/ft RM OTM Vadj lineE or G V above 1st Level V **Sum V**	%S %W Seg tA W/ft RM OTM Vadj lineF or H V above 1st Level V **Sum V**	%S %W Seg tA W/ft RM OTM Vadj line G V above 1st Level V **Sum V**
Base Level	%S %W Seg tA W/ft RM OTM Vadj line B V above **7.5** Base Level V w **Sum V**	%S %W Seg tA W/ft RM OTM Vadj lineA or C V above Base Level V w **Sum V**	%S %W Seg tA W/ft RM OTM Vadj lineB or D V above **7** Base Level V w **Sum V**	%S %W Seg tA W/ft RM OTM Vadj lineC or E V above Base Level V **Sum V**	%S %W Seg tA W/ft RM OTM Vadj lineD or F V above Base Level V **Sum V**	%S %W Seg tA W/ft RM OTM Vadj lineE or G V above Base Level V **Sum V**	%S %W Seg tA W/ft RM OTM Vadj lineF or H V above Base Level V **Sum V**	%S %W Seg tA W/ft RM OTM Vadj line G V above Base Level V **Sum V**

Seismic Load Distribution to Grid Lines

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Lateral Load Analysis & Construction Design Software

| Date: | September_2022 | Firm: | Jerry Miles |
| Job: | C-Store_ShellBldg | By: | OGH |

Sceismic Front - Back

	1	Line	2	Line	3	Line	4	Line	5	Line	6	Line	7	Line	.8.	
	Ln Spacing	10	Ln Spacing	102	Ln Spacing		Ln Spacing		Ln Spacing		Ln Spacing		Ln Spacing			
2nd Level wt/ft	%	Component Wt.	%	Component Wt.	%	Component Wt.	%	Component Wt.	%	Component Wt.	%	Component Wt.	%	Component Wt.	%	Total %
Roof 2 14																
1/2 Ext Wl 2 18																
Ceil 2 4																
1st Level wt/ft	←	→	←	→	←	→	←	→	←	→	←	→	←	→		
1/2 Ext Wl 2 18																
Int Wl 2 10																
Floor 2 10																
Roof 1 14		5,400		68,850												
1/2 Ext Wl 1 18		6,480		28,512												
Ceil 1 4		1,400		17,850												
Base Level wt/ft	6	← 13,280 →	58	← 115,212 →	52	← →		← →		← →		← →		← →		115.8
1/2 Ext Wl 1 18																
Int Wl 1 10																
Floor 1 10																
1/2 Ext Wl B 18																
Ceil B																
Load per Line	←	→	←	→	←	→	←	→	←	→	←	→	←	→		

Sceismic Left - Right

	A	Line	B	Line	C	Line	D	Line	E	Line	F	Line	G	Line	H	
	Ln Spacing	10	Ln Spacing	40	Ln Spacing		Ln Spacing		Ln Spacing		Ln Spacing		Ln Spacing			
1st Level wt/ft	%	Component Wt.	%	Component Wt.	%	Component Wt.	%	Component Wt.	%	Component Wt.	%	Component Wt.	%	Component Wt.	%	Total %
Roof 2 14																
1/2 Ext Wl 2 18																
Ceil 2 4																
1st Level wt/ft	←	→	←	→	←	→	←	→	←	→	←	→	←	→		
1/2 Ext Wl 2 18																
Int Wl 2 10																
Floor 2 10																
Roof 1 14		13,770		60,480												
1/2 Ext Wl 1 18		13,176		21,816												
Ceil 1 4		3,570		15,680												
Base Level wt/ft	14	← 30,516 →	58	← 97,976 →	44	← →		← →		← →		← →		← →		115.8
1/2 Ext Wl 1 18																
Int Wl 1 10																
Floor 1 10																
1/2 Ext Wl B 18																
Ceil B																
Load per Line	←	→	←	→	←	→	←	→	←	→	←	→	←	→		

BUILDING DEAD LOADS   2nd Level Roof =   1st Roof & 2nd Level Floor= 110,996   1st Level Floor = 17,496   Total Bldg Weight = 128,492

Wind Force Distribution to Grid Lines

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Q22.1

Lateral Load Analysis & Construction Design Software

Date: September_2022	**Firm:** Jerry Miles	
Job: C-Store_ShellBldg	**By:** OGH	

Wind Front - Back

	1 Line 10	2 Line 102	3 Line	4 Line	5 Line	6 Line	7 Line	.8.
	Ln Spacing 10	Ln Spacing 102	Ln Spacing	Ln Spacing	2.8.4.1 ASCE7 Horizontal Distribution of Seismic & Wind Forces for Flexible Diaphragms			

2nd Level Wind *P*s Force =

Row	%	Zone Area	*P*s	%	Zone Area	*P*s	%	Zone Area	*P*s	%	Zone Area	*P*s	%	Zone Area	*P*s	%	Zone Area	*P*s	%	Zone Area	*P*s	%	Total %
Roof zone B *P*s																							
Roof zone D *P*s																							
1/2 Wl 2 zn A *P*s																							
1/2 Wl 2 zn C *P*s																							
% Wind *P*s	← →			← →			← →			← →			← →			← →			← →				

1st Level Wind *P*s Force = 14,848

Row	%	Zone Area	*P*s	%	Zone Area	*P*s	%	...	Total %
1/2 Wl 2 zn A *P*s									
1/2 Wl 2 zn C *P*s									
Roof 1 zone B *P*s		4	16.0		4	16.0			133
Roof 1 zone D *P*s					248	16.0			3,963
1/2 Wl 1 zn A *P*s		60	16.0		60	16.0			1,920
1/2 Wl 1 zn C *P*s					552	16.0			8,832
% Wind *P*s	3	← 1,027 →		50	← 13,821 →		47	← → ...	100.00

Base Level Wind *P*s Force

Row	%	Zone Area	*P*s	...	Total %
1/2 Wl 1&B A *P*s					
1/2 Wl 1&B C *P*s					
% Wind *P*s	← →			...	

Wind Left - Right

	A Line 10	B Line 40	C Line	D Line	E Line	F Line	G Line	H
	Ln Spacing 10	Ln Spacing 40	Ln Spacing	Ln Spacing	Ln Spacing	Ln Spacing	Ln Spacing	

2nd Level Wind *P*s Force =

Row	%	Zone Area	*P*s	...	Total %
Roof zone B *P*s					
Roof zone D *P*s					
1/2 Wl 2 zn A *P*s					
1/2 Wl 2 zn C *P*s					
% Wind *P*s	← →			...	

1st Level Wind *P*s Force = 5,633

Row	%	Zone Area	*P*s	%	Zone Area	*P*s	%	...	Total %
1/2 Wl 2 zn A *P*s									
1/2 Wl 2 zn C *P*s									
Roof 1 zone B *P*s		4	16.0		4	16.0			133
Roof 1 zone D *P*s					44	16.0			700
1/2 Wl 1 zn A *P*s		60	16.0		60	16.0			1,920
1/2 Wl 1 zn C *P*s					180	16.0			2,880
% Wind *P*s	9	← 1,027 →		50	← 4,607 →		41	← → ...	100.00

Base Level Wind *P*s Force

Row	%	Zone Area	*P*s	...	Total %
1/2 Wl 1&B A *P*s					
1/2 Wl 1&B C *P*s					
% Wind *P*s	← →			...	

Wall Segment Construction: w/ Hold-Downs Lines Run Front - Back — Page 6.1 of 6.2	**MaxQuake** © 1995-2022 **Archforms Ltd.**
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Job: C-Store_ShellBldg By: OGH	Q22.1 Construction Design Software

Front to Back	Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line .8.

Uplift = Overturning Moment (OTM) - Resisting Moment (RM) / Segment Length (Seg Lg).
Maximum required Hold Down (HD Type) selected from Hold-down and Wall Strap Schedule on Page 11.

2nd Level

	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type

V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ

Roof Uplift from Side to Side Winds resisted by Left and Right Ext. Walls   Uplift (plf) Rf 2 @ Ext WI   Uplift Detail @ Rf 2 & Ext WI   NA

1st Level

	Seg	Uplift	Fl C	HD Type	Seg	Uplift	Fl C	HD Type	Seg	Uplift	Fl C	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type
									a			H1a															
	b1	1,696	Δ	H2																							
	b2	1,794	Δ	H2																							

V (plf) 242 WIΔ 6	V (plf) WIΔ	V (plf) 151 WIΔ 6	V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ

Roof Uplift from Side to Side Winds resisted by Left and Right Ext. Walls   Uplift (plf) Rf 1 @ Ext WI   385   Uplift Detail @ Rf 1 & Ext WI   Δ W

Straps/Hold-Downs must run continuous down through the Wall below to the Foundation. If no Wall below; tie to Beams, sized for Hold-Down Point Loads.

Base Level

	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type

V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ	V (plf) WIΔ

Shear per Linear Foot (V (plf)) = Sum of Shear at that Line & Level (Sum V) / Linear Feet of Shear Wall at that Line & Level (Sum Seg Lgth)
Maximum required Shear Wall Construction or Shear Frame for Wall Type Symbol is selected from Shear Wall Schedule on Page 11.

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Side to Side	Line A	Line B	Line C	Line D	Line E	Line F	Line G	Line H

Uplift = Overturning Moment (OTM) - Resisting Moment (RM) / Segment Length (Seg Lg).
Maximum required Hold Down (HD Type) selected from Hold-down and Wall Strap Schedule on Page 11.

2nd Level

	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type
V (plf)																								
WIΔ																								

Roof Uplift from Front to Back Winds resisted by Front and Back Ext. Walls — Uplift(plf) Rf 2 @ Ext WI — Uplift Detail @ Rf 2 & Ext WI — **NA**

1st Level

	Seg	Uplift	Fl C	HD Type	Seg	Uplift	HD Type	Seg	Uplift	Fl C	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type
								1	1,112	Δ	H1a																
	2a	366	Δ	H1a				2	819	Δ	H1a																
	2b	561	Δ	H1a																							
V (plf)		144							166																		
WIΔ		6							6																		

Roof Uplift from Front to Back Winds resisted by Front and Back Ext. Walls — Uplift(plf) Rf 1 @ Ext WI — 172 — Uplift Detail @ Rf 1 & Ext WI — Δ U

Straps/Hold-Downs must run continuous down through the Wall below to the Foundation. If no Wall below; tie to Beams, sized for Hold-Down Point Loads.

Base Level

	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type	Seg	Uplift	HD Type
V (plf)																								
WIΔ																								

Shear per Linear Foot (V (plf)) = Sum of Shear at that Line & Level (Sum V) / Linear Feet of Shear Wall at that Line & Level (Sum Seg Lgth)
Maximum required Shear Wall Construction or Shear Frame for Wall Type Symbol is selected from Shear Wall Schedule on Page 11.

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| Job: | C-Store_ShellBldg | By: | OGH |

Front to Back	Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line .8.

Seg C/T Load (back) - max. load on the Collector /Tie between this and Seg above. C/T Type - min. adequate Collector/Tie. Seg beg - feet Seg begins front of Quad Line.
front - C/T load at front of the front most Seg. Shear - the average Diaphragm Shear along the Line. IF "Gap" correct Line C/T discontinuity.

Diph V. per ASCE7 12.10.1.1

2nd Roof

Each line column header: C/T Seg | Load back | C/T Type | Seg beg

front ... Shear(plf) / Rf Diaph (for each line)

1 Rf 2 Fl

	C/T Seg	Load back	C/T Type	Seg beg
Line 1 b1				
Line 1 b2		2847 △	C2	16
Line 3 a				

Line 1 front: 611 △ C1

	Line 1	Line 3
Shear(plf)	68	55
Rf Diaph	△ R6	△ R6
Fl Diaph	△ F6	△ F6

1st Floor

front ... Shear(plf) / Fl Diaph (for each line)

If Rf or Fl Diaph return "block?", load values are higher than the diaphragm capacity. Change to blocked diaphragm or fastener Option (pg 10) or add Shear Wall (pg 3or4)

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Job:	C-Store_ShellBldg	By:	OGH

Seg C/T Load (left) - max. load on the Collector /Tie between this and Seg to left. C/T Type - min. adequate Collector/Tie. Seg beg - feet Seg begins right of Quad Line.
right - C/T load at right of the right most Seg. Shear - the average Diaphragm Shear along Line. If "Gap" correct Line C/T discontinuity.

Diph. V per ASCE7 12.10.1.1

2nd Roof

	Line A				Line B				Line C				Line D				Line E				Line F				Line G				Line H			
C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg
right				right				right				right				right				right				right				right			
Shear(plf) Rf Diaph				Shear(plf) Rf Diaph				Shear(plf) Rf Diaph				Shear(plf) Rf Diaph				Shear(plf) Rf Diaph				Shear(plf) Rf Diaph				Shear(plf) Rf Diaph				Shear(plf) Rf Diaph			

1 Rf 2 Fl

	Line A				Line B				Line C				Line D				Line E				Line F				Line G				Line H			
C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg
2a								1																							
2b	3299	△ C2	28					2	2582	△ C2																					
right	3394	△ C2		right				right	1755	△ C1		right				right				right				right				right			
Shear(plf)	27			Shear(plf)				Shear(plf)	22			Shear(plf)				Shear(plf)				Shear(plf)				Shear(plf)				Shear(plf)			
Rf Diaph	△ R6			Rf Diaph				Rf Diaph	△ R6			Rf Diaph				Rf Diaph				Rf Diaph				Rf Diaph				Rf Diaph			
Fl Diaph	△ F6			Fl Diaph				Fl Diaph	△ F6			Fl Diaph				Fl Diaph				Fl Diaph				Fl Diaph				Fl Diaph			

1st Floor

	Line A				Line B				Line C				Line D				Line E				Line F				Line G				Line H			
C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg	C/T Seg	Load left	C/T Type	Seg beg
right				right				right				right				right				right				right				right			
Shear(plf) Fl Diaph				Shear(plf) Fl Diaph				Shear(plf) Fl Diaph				Shear(plf) Fl Diaph				Shear(plf) Fl Diaph				Shear(plf) Fl Diaph				Shear(plf) Fl Diaph				Shear(plf) Fl Diaph			

If Rf or Fl Diaph return "block?", load values are higher than the diaphragm capacity. Change to blocked diaphragm or fastener Option (pg 10) or add Shear Wall (pg 3or4)

Shear Wall and Hold Down Schedules
Schd W

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Lateral Load Analysis & Construction Design Software

Date: September_2022 **Firm:** Jerry Miles
Job: C-Store_ShellBldg **By:** OGH

SHEAR WALL OPTIONS:
Place an "X" in the appropriate shaded block. Select only one option under each heading (except System when using frames)

Special Zone
- X No
- Los Angeles Area

Hardware Mfg.
- X Simpson
- USP
- Other (Apx.W)

Wall Framing Material
- X Doug Fir or So.Pine
- Hem Fir (s.grav.<.49)
- 3-1/2" Metal Studs
- Other (See Apx. W)

Shear Wall System
- X WS-All Plywd or PB
- WS-Gyp,Stuc or Ply
- Wall Frame Units on Shd X

Stud Spacing
- 16 in. o.c.

Ply/PB Wall Sheathing
- X 15/32" CC or CD Ply
- 15/32" Struc I Ply
- 3/8"or1/2" CD Ply o/GB
- 1/2"Ext M,S/M-2 Prtcl Bd

Fasteners
- X 8d
- 10d
- 14ga Staple
- 1"Screw in Steel
- Other Sheathing/Fastener Combo (See Apx. W)

To Customize, Overwrite Sched. on Apx. W below

WIND AND EARTHQUAKE DATA

19 CBC

		Risk Category	II
WIND	**SCEISMIC**		
Risk Category **II**	S Design Cat **D**	Seis. Site Class	**D**
Basic Wind Speed **110**	Ss Acc. %g **1.13**	S. Res Coef. Cs	**0.14**
Wind Exposure **C**	S1 Acc. %g **0.441**	Resp Mod Factor R	**6.5**
Wind Horiz. (psf) **16**	Res Coef Sd1 **0.31**	Base V	**12,509**
Wind Vert. (psf) **-16**	Res Coef Sds **0.90**	System	Light Frame SW

ASCE7-16 Ch. 28 Part 2   Calculation Method per 12.8 ASCE7 & Sec.1613.2.5.2 CBC

WALL HOLD-DOWN & STRAP SCHEDULE

Hold-Down Symbol	Max. Uplift lbs.	Min. Post Size	Wall Fl to Fl Strap	Foundation Anchor Straps	Bolt Type HD	Bolt Dia.
			Note 3,4	Note 2	Note 2,4	Note 2
NA up to	300	use the hold-down across or below req'd type				
△ H1a	1,200	2x	CS20-18"	LSTHD8		
△ H1b	1,500	2x	CS16-26"	STHD10	LTT20B	1/2"
△ H2	3,000	2-2x	MST 48"	STHD14	HDU2	5/8"
△ H4	4,565	2-2x	MST 60"		HDU4	5/8"
△ H5	5,645	2-2x	MST 72"		HDU5	5/8"
△ H8	6,970	4x4	CMST12+78"		HDU8	7/8"
△ H11	9,215	4x6	CMST12+178"		HDU11	1"
△ H14	14,375	4x8	2- CMST12+60"		HDU14	1"
△ H19	19,360	6x6			HD19	1-1/4"

? Add [ ] inches to Fl to Fl Tie Strap for gap across Joist

1 Straps and HD's as Mfg. by Simpson Strong-Tie Co. Cat C-2015
2 Nail Straps w/10d or SDS 1/4" Scw at HD (min.pen.1-3/4") Anchors into 8" Stem wall
   and Mfg. Data for Nailing, Bolt and Embedment Requirements
3 If No Cont. Rim Joist Add Lgth Of Gap.10d at CS, 16d: CMST & MST
4 Straps and Hold-Downs must run continuous to Walls below;
   if no Wall below, tie to Beams, sized for Hold-Down Point Loads

SHEAR WALL SCHEDULE

Wall Type Symbol	Wind Shear Capacity (plf)	Seismic Shear Capacity (plf)		Wall Construction Wall Sheathing Material	Footing Edge Nail 8d	Anchor Bolts 5/8"x12	Rased Floor to Framing Nail 16d	Lag 1/2"	Rf. Block Top Plate Clips A35
						GF:900	GF:120	GF:478	GF:590
APA Tbl.1				Note 1,2	Note 3	Note 6	Note 7	Note 6,8	Note 9,10

construct wall as spec'd per symbol or any below

	Wall Type Symbol	Wind Shear Cap (plf)	Seismic Shear Cap (plf)		Sheathing	Edge Nail	Anchor Bolts	Nail 16d	Lag 1/2"	Clips
	△ 6	364	260		1/2" Ply	6"	40"oc	6"oc	22"oc	24"oc
2,4,5	△ 4	532	380		1/2" Ply	4"	27"oc	4"oc	15"oc	16"oc
2,4,5	△ 3	686	490		1/2" Ply	3"	21"oc		11"oc	12"oc
2,4,5	△ 2	896	640		1/2" Ply	2"	16"oc		9"oc	10"oc
2,4,5	△ 44	1,064	760	ea side	1/2" Ply	4"	14"oc		7"oc	8"oc
2,4,5	△ 33	1,372	980	ea side	1/2" Ply	3"	10"oc		6"oc	6"oc
2,4,5	△ 22	1,792	1,280	ea side	1/2" Ply	2"	8"oc		4"oc	4"oc
	?									

1 Sheathing: 15/32" (4 ply min) CD, CC Plyor OSB with all edges blocked
2 Framing: 2x DF typ @ 16"oc.for 3/8" up to 24"oc.for 1/2", 3x req'd if 10d w/ +1-5/8" pen, 2" or 3"oc
3 Typical Fasteners: 8d Common or Galv. Box nails (no sinkers), nail field @12"
4 3x (or 2x w/ dbl AB) at plate and 3x panel edges at walls w/ Shear > 300 lbs.
5 Offset panel edges on opposite sides of wall and stagger plate splices
6 Anchor Bolts spaced per Schd w/ 3"x3"x0.229" Plate Washers req'd at Mud Sill
7 Stagger 16d nails in 2x, lags at 3x plates when no sheathing continuity to Rim Joist
8 Pre-drill 3/8" hole for Lag. Provide Washer. Adjust lgth for 2" penetration into Joist.
9 Clips: Plate to Blocks only req'd if no shear sheathing continuity from Wall to Blocks
10 Anchors and Clips as Mfg. by Simpson Strong-Tie Co. Cat C-2015

Manufactured Shear Frame Schedules

Schd X

Date: September_2022   **Firm:** Jerry Miles
Job: C-Store_ShellBldg   **By:** OGH

Upper Floor Panels   Anchor Bolt

Note	Width	Ht.		
2,3				
2,3				
2,3				
2,3				
2,3				

Panels on Raised Floor Framing   Anchor Bolt

Note	Width	Ht.		
2,3				
2,3				
2,3				
2,3				
2,3				

Panels on Concrete   Anchor Bolt   Conc.   HFX

Note	Width	Ht.		
4,5				
4,5				
4,5				
4,5				
4,5				
4,5				

Balloon Panels on Concrete   Anchor Bolt   Conc.

Note	Width	Ht		
4,5				
4,5				
4,5				

Installation Notes   Manually calculate Balloon Units and enter on Wl Cnst HD

1
2
3
4
5
6

Upper Floor Stacked Panels (in Wood cut to height   Anchor Bolt

Note	Width	Ht.			ht ?	
4,7						
4,7						
4,7						
4,7						
4,7						

Lower Floor Stacked Panels on Concr 2500 Conc.   Anchor Bolt

Note	Width	Ht.			ht ?	
3,4,7						
3,4,7						
3,4,7						
3,4,7						

Non-Stacked Bsmt / 1st Fl Panels on C 2500 Conc.   Anchor Bolt

Note	Width	Ht.		
4,5,6				
4,5,6				
4,5,6				
4,5,6				
4,5,6				

1st or 2nd Floor (Non-Stacked) on Raised Floor Fra   Anchor Bolt

Note	Width	Ht.		
4,5,6				
4,5,6				
4,5,6				
4,5,6				
4,5,6				

Installation Notes

1
2
3
4
5
6

Diaphragm, Collector, Uplift & Tie-Down Schedules

Schd Y

Date September_2022 Firm: Jerry Miles
Job: C-Store_ShellBldg By: OGH

DIAPHRAGM OPTIONS:

Rf/Fl Framing Mat.	Rf/Fl Diaphragm	Fasteners
X DF or So. Pine	Roof: 1/2" CDX or OSB	8d Com Only
Hem Fir	Floor: 3/4" CDX or OSB	**X** 8d@Rf, 10@Fl
Other	T&G Glue & Nail	10d Com Only
To Customize, Overwrite Schedule or See Apx. D		14 ga Staple
Change Hardware on Wall Schedule (Shd W) Tab		Other

ROOF UPLIFT CONNECTOR SCHEDULE

Wall Type	Uplift (plf)	Stud to Plate at 16" oc	Plate to Rafter at 24"oc	at 16"	Stud to Rafter at 16" oc
	50				
△ T	100	**Ply Nailing or**	**H!**	**H1**	
△ U	200	**A35**	**H1**	**H1**	**H2A**
△ V	285	**SSP**	**H2.5A**	**H2.5A**	**H10S**
△ W	435	**SSP**	**H8**	**H8**	**H10S**
△ X	630	**DSP**	**MTS12**	**MTS12**	**MTS12**
△ Y	1,015	**TSP**	**HTS20**	**HTS20**	**HTS20**
△ Z	1,850		**FTA7**	**FTA7**	**FTA7**
?					

1 Anchors and Clips as Mfg. by Simpson Strong-Tie Co. Cat C-2015

Rod Strength Options:

Standard Strength	**X**
High Strength	
Combo Std & High	

ALLTHREAD ROD CAPACITY

Standard Strength Rod				High Strength Rod			Anchor Bolt	Bearing Plate Type	Plate Size	lbs.
Size	Dia.	lbs.	Anchor Bolt	Size	Dia.	lbs.				
			2500 psi Conc.				2500 psi Conc.			
4	1/2"	4,271	**5/8" SSTB16**	4h	1/2"	7,753	SB1x30"	A	2" x 2" x 3/16"	2,500
5	5/8"	6,673	**7/8" SSTB28**	5h	5/8"	11,620	See Det	B	3" x 3-1/4" x 3/8"	6,090
6	3/4"	9,609	**SB 7/8"x24**	6h	3/4"	17,083	See Det	C	6" x 3-1/4" x 5/8"	12,180
7	7/8"	13,079	**SB 1"x30**	7h	7/8"	22,750	See Det	D	9" x 3-1/4" x 7/8"	18,280
8	1"	17,082	**" in 3000 psi**	8h	1"	29,732	See Det	E	Custom	24,000
9	1-1/8"	21,620	**See Det**	9h	1-1/8"	36,188	See Det	?		
1	1-1/4"	26,691	**See Det**	1h	1-1/4"	49,809	See Det		ASTM A36 Std Strength Steel	
?		ASTM A36 Standard Strength Steel		?		ASTM A193 B7 High Strength Steel			Plate Area x 625 psi = Capacity	

Provide End Wall Post at ea. TD: 2-2x min at 4-5, 4x min at 6-7 and 6x min at 8-1 Rod Size
Nut Capacity(1/3 Fu) for ea. Rod Diameter Exceeds Schedule Rod Capacity (2/3 fy)

COLLECTOR / TIE & DIAPHRAGM SCHEDULE

Collector Sizing determined per 12.12.1.1 ASCE7

C/T Type Symbol	Max. Force (lbs)	Collector/Tie Cont. Joist or Solid Blocking	Tie Strap or Cont. Joist	Tie Rod Washer Dia.	Dia.	HD
less of C&T parallel to grain:		425	20ksi	625		
		Note 1,2,6	Note 2,3,4	Note 4	Note 5	Note 7

Use Collector/Tie as spec'd per symbol or any below

NA	300					
△ **C1**	2,230	**2x4**	**MSTI26**			
△ **C2**	3,500	**2x6**	**MST48**	5/8"	1.78	**HTT4**
△ **C3**	4,620	**2x8**	**MST60**	5/8"	2.35	**HTT5**
△ **C4**	5,800	**2x10**	**MST72**	7/8"	2.96	**HDU8**
△ **C5**	7,100	**2x12**	**2-MST37**	7/8"	3.62	**HDU8**
△ **C6**	10,400	2- **2x10**	**2-MST60**	1"	5.30	**HDU11**
△ **C7**	10,650	2- **2x10**	**HST5**	1"	5.43	**HDU11**
?						

1 Provide Cont. Rim Joist/Rafter or Solid Blocking at all Shear Wall Grid Lines
2 A properly sized continuous Rafter or Joist can act as both Collector and Tie
3 Between Blocks or breaks in Rafters/Joists provide straps to maintain Tie continuity
4 Run All-thread Rod thru Rft/Jst, lgth=Load/Shear(plf), secure ends w/ Washer or HD
5 Provide Washer w/ Dia. (inches) at end of blocked Rft/Jst bays, Mal. iron or 1/4" St.
6 Connect Continuous Collector/Tie to shear wall as required by Shear Wall Schedule
7 HD at Rod to Shear Wall and/or Rft/Jst. Mfg. by Simpson Strong-Tie Cat C-2015
8 Overstrength Factor for Seismic Included in base shear per 12.4.3.1 &12.10.2.1 ASCE7

Roof Diaphragm	Shear Load	Diaphragm Material	Edge Nail	Floor Diaphragm	Shear Diaph. Load	Material
NDS 14.2/2.	(plf) Note 1,2,4		Note 3	Symbol	(plf) Note 1,2,4	
8d Nail		**b=blocked**		**10d Nail**		**b=blocked**
△ **R6**	170	**1/2" Ply** Unblocked	**6"**	△ **F6**	215	**3/4" Ply**
△ **R6b**	270	**1/2" Ply** Blocked	**6"**	△ **F6b**	320	**3/4" Ply**
△ **R4b**	360	**1/2" Ply** Blocked	**4"**	△ **F4b**	425	**3/4" Ply**
△ **R3b**	530	**1/2" Ply** Blocked	**2-1/2"**	△ **F3b**	640	**3/4" Ply**
△ **R2b**	600	**1/2" Ply** Blocked	**2"**	△ **F2b**	730	**3/4" Ply**
?				?		

1 Floor 3/4 CD-AC Ply/OSB, Roof 1/2 CD Ply/OSB (Block All Edges at b suffix Diaph)
2 Framing: 2x typ, 3x req'd if 10d pen more than1-5/8", or nails spaced less than 3"oc
3 Typ. Fasteners: 8d Com. @ Roof,10d Com. @ Floor (no sinkers) field 12"@Rf,10"@Fl
4 Continuous Rim Rafter/Joist Recommended at Perimeter of all Diaphragms
5 See Table 23-II-B-2 for High Wind Roof Zone Nailing Req'mts

Wind Pressure for Exterior Components & Cladding   Schd Z

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Lateral Load Analysis &
Overturning Calculation Template

Date: September_2022   **Firm** Jerry Miles
Job: C-Store_ShellBldg   **By:** OGH

Wind Pressure for GCp

Section 1609.6.3

	GCp	P (psf)
Horiz P		**16.0**
	-3.6	-58
Uplift	-3.4	-54
or	-3.2	-51
Out-	-3.0	-48
Force	-2.8	-45
	-2.6	-42
	-2.4	-38
	-2.2	-35
	-2.0	-32
	-1.8	-29
	-1.6	-26
	-1.4	-22
	-1.2	-19
	-1.0	-16
	-0.8	-13
	-0.6	-10
	-0.4	-6
	-0.2	-3
	0.0	0
Down	0.2	3
Load	0.4	6
or	0.6	10
In-	0.8	13
Force	1.0	16
	1.2	19
	1.4	22
	1.6	26

Note:
1. Values are for enclosed Buildings.
2. Graphs from ASCE7-10 Fig.30.4-1 thru 2C & 4 for GCp. See ASCE 7 Ch 30 for other Config.

Vertical Wind Loads for Gable or Hip Roofed Buildings
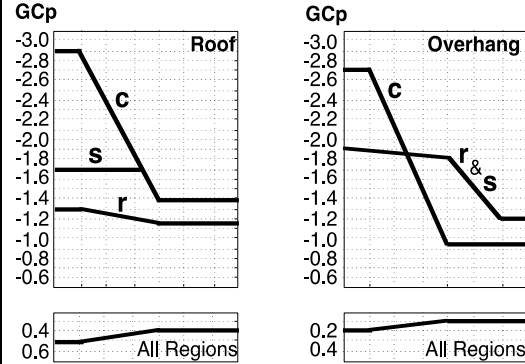
Figure1606.2D GCp for Roof Slope 0°≤ a ≤ 10°
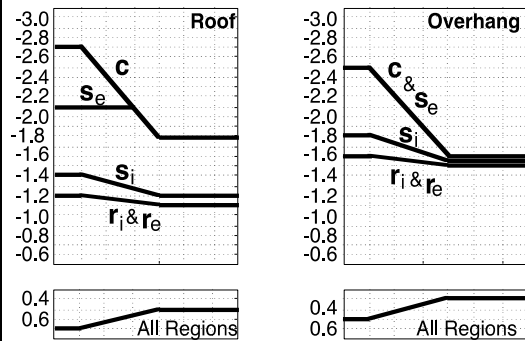
Figure1606.2E GCp for Roof Slope 10°≤ a ≤ 30°

Figure1606.2E GCp for Roof Slope 30°≤ a ≤ 45°

Effective Wind Area (sq.ft.)
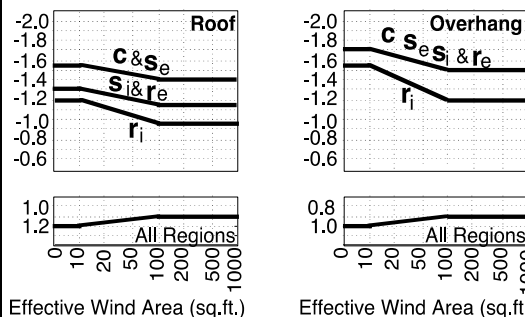
0°≤ a ≤ 10°   10°≤ a ≤ 45°
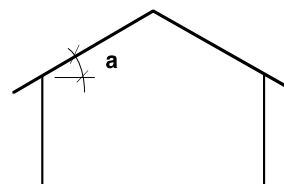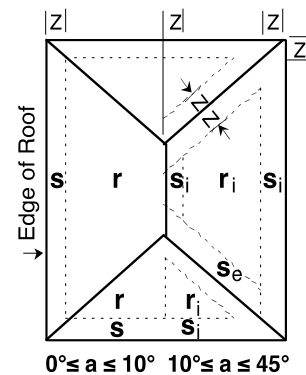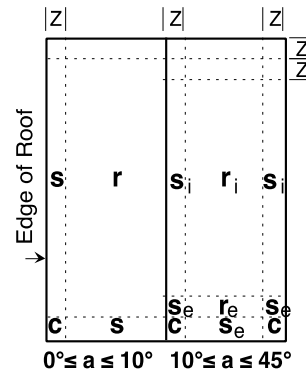
Overhang GCp include effect of both upper & lower surface

Horizontal Wind Loads for Buildings Walls
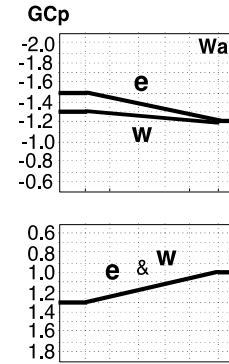
Figure 1606.2C Wall GCp
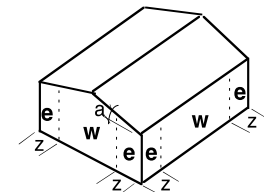
Plus: in, Minus: out, design for maximum ± pressure

For partially enclosed buildings +GCp add 0.1, -GCp minus 0.4.

Reduce GCp 10% when a ≤ 10°

Vertical Wind Loads for Monoslope Roofs

Figure 1606.2F 3°≤ a ≤ 10°

3°≤ a ≤ 30°

Effective Wind Area (sq.ft.)
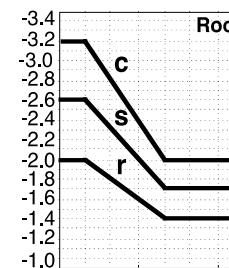
Figure 1606.2G Monoslope Roofs 10°≤ a ≤ 30°
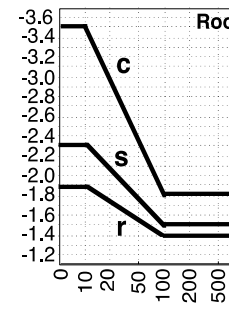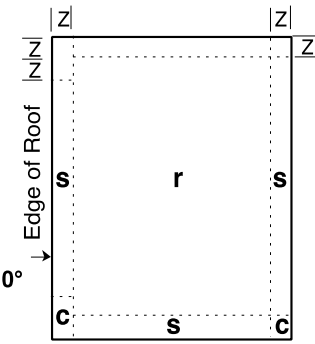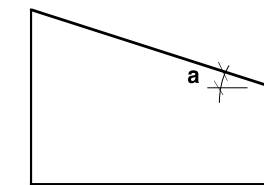
Reduce C 10% if 3°≤ a ≤ 5°
If a≤ 3° see Figure 1606.2D

Project: CStoreShellBeams

Location: Beam #1
Roof Beam
5.5 IN x 12.0 IN x 10.333 FT
24F-V4 - Visually Graded Western Species - Dry Use
Section Adequate By: 118.6%
Controlling Factor: Moment

			page
Design Development			of

StruCalc Version 10.0.1.5   9/20/2022 7:06:03 AM

DEFLECTIONS   Center
Live Load	0.11	IN L/1103
Dead Load	0.07	in
Total Load	0.19	IN L/662

Live Load Deflection Criteria: L/240   Total Load Deflection Criteria: L/180

REACTIONS   A   B
Live Load	3229	lb	3229	lb
Dead Load	2148	lb	2148	lb
Total Load	5377	lb	5377	lb
Bearing Length	1.50	in	1.50	in

BEAM DATA
Span Length	10.3	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft
Roof Pitch	1	:12
Roof Duration Factor	1.15	

MATERIAL PROPERTIES
24F-V4 - Visually Graded Western Species

		Base Values		Adjusted	
Bending Stress:	F_b =	2400 psi	*Controlled by:*		
	F_{b_cmpr} =	1850 psi	F_b' =	2760	psi
	Cd=1.15				
Shear Stress:	F_v =	265 psi	F_v' =	305	psi
	Cd=1.15				
Modulus of Elasticity:	E =	1800 ksi	E' =	1800	ksi
Comp. $\perp$ to Grain:	$F_c - \perp$ =	650 psi	$F_c - \perp'$ =	650	psi

Controlling Moment: 13889 ft-lb
  5.167 ft from left support
  Created by combining all dead and live loads.
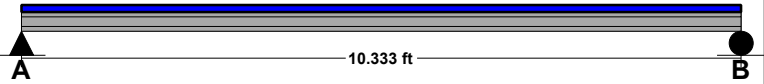**Controlling Shear:**   -5377 lb
  At support.
  Created by combining all dead and live loads.

Comparisons with required sections:	Req'd	Provided
Section Modulus:	60.39 in3	132 in3
Area (Shear):	26.46 in2	66 in2
Moment of Inertia (deflection):	215.25 in4	792 in4
Moment:	13889 ft-lb	30360 ft-lb
Shear:	-5377 lb	13409 lb

LOADING DIAGRAM

A ——————————— 10.333 ft ——————————— B

ROOF LOADING
Side One:
Roof Live Load:	LL =	0	psf
Roof Dead Load:	DL =	0	psf
Tributary Width:	TW =	0	ft

Side Two:
Roof Live Load:	LL =	25	psf
Roof Dead Load:	DL =	16	psf
Tributary Width:	TW =	25	ft

Wall Load:	WALL =	0	plf

SLOPE/PITCH ADJUSTED LENGTHS AND LOADS
Adjusted Beam Length:	Ladj =	10.33	ft
Beam Self Weight:	BSW =	14	plf
Beam Uniform Live Load:	wL =	625	plf
Beam Uniform Dead Load:	wD_adj =	416	plf
Total Uniform Load:	wT =	1041	plf

Project: CStoreShellBeams

Location: Beam #2
Roof Beam
5.5 IN x 12.0 IN x 12.0 FT
24F-V4 - Visually Graded Western Species - Dry Use
Section Adequate By: 55.9%
Controlling Factor: Moment

Design Development

DEFLECTIONS   Center
Live Load	0.21	IN L/677
Dead Load	0.14	in
Total Load	0.35	IN L/407

Live Load Deflection Criteria: L/240   Total Load Deflection Criteria: L/180

REACTIONS   A   B
Live Load	3900	lb	3900	lb
Dead Load	2590	lb	2590	lb
Total Load	6490	lb	6490	lb
Bearing Length	1.82	in	1.82	in

BEAM DATA
Span Length	12	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft
Roof Pitch	1	:12
Roof Duration Factor	1.15	

MATERIAL PROPERTIES
24F-V4 - Visually Graded Western Species

		Base Values		Adjusted	
Bending Stress:	F_b =	2400 psi	*Controlled by:*		
	F_{b_cmpr} = 1850 psi		F_b' =	2760	psi
	Cd=1.15				
Shear Stress:	F_v =	265 psi	F_v' =	305	psi
	Cd=1.15				
Modulus of Elasticity:	E =	1800 ksi	E' =	1800	ksi
Comp. $\perp$ to Grain:	$F_c - \perp$ =	650 psi	$F_c - \perp'$ =	650	psi

Controlling Moment: 19471 ft-lb
  6.0 ft from left support
  Created by combining all dead and live loads.
Controlling Shear: -6490 lb
  At support.
  Created by combining all dead and live loads.

Comparisons with required sections:
	Req'd	Provided
Section Modulus:	84.66 in3	132 in3
Area (Shear):	31.95 in2	66 in2
Moment of Inertia (deflection):	350.43 in4	792 in4
Moment:	19471 ft-lb	30360 ft-lb
Shear:	-6490 lb	13409 lb
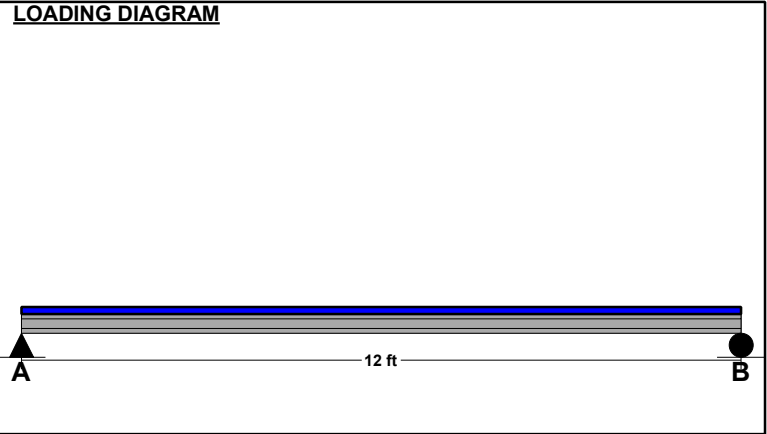
LOADING DIAGRAM

A   12 ft   B

ROOF LOADING
Side One:
Roof Live Load:	LL =	25	psf
Roof Dead Load:	DL =	16	psf
Tributary Width:	TW =	25	ft

Side Two:
Roof Live Load:	LL =	25	psf
Roof Dead Load:	DL =	16	psf
Tributary Width:	TW =	1	ft

Wall Load:	WALL =	0	plf

SLOPE/PITCH ADJUSTED LENGTHS AND LOADS
Adjusted Beam Length:	Ladj =	12	ft
Beam Self Weight:	BSW =	14	plf
Beam Uniform Live Load:	wL =	650	plf
Beam Uniform Dead Load:	wD_adj =	432	plf
Total Uniform Load:	wT =	1082	plf

Project: CStoreShellBeams

Location: Beam #3
Roof Beam
5.5 IN x 7.5 IN x 16.0 FT
24F-V4 - Visually Graded Western Species - Dry Use
Section Adequate By: 403.6%
Controlling Factor: Deflection

Design Development

StruCalc Version 10.0.1.5   9/20/2022 7:06:07 AM

DEFLECTIONS   Center
Live Load	0.11 IN	L/1813
Dead Load	0.11 in	
Total Load	0.21 IN	L/907

Live Load Deflection Criteria: L/240   Total Load Deflection Criteria: L/180

REACTIONS   A   B
Live Load	200 lb	200 lb
Dead Load	200 lb	200 lb
Total Load	400 lb	400 lb
Bearing Length	0.11 in	0.11 in

BEAM DATA
Span Length	16	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft
Roof Pitch	1	:12
Roof Duration Factor	1.15	

MATERIAL PROPERTIES

24F-V4 - Visually Graded Western Species

		Base Values		Adjusted	
Bending Stress:	F_b =	2400 psi	*Controlled by:*		
	F_{b_cmpr} =	1850 psi	F_b' =	2760	psi
	Cd=1.15				
Shear Stress:	F_v =	265 psi	F_v' =	305	psi
	Cd=1.15				
Modulus of Elasticity:	E =	1800 ksi	E' =	1800	ksi
Comp. $\perp$ to Grain:	F_c - $\perp$ =	650 psi	F_c - $\perp'$ =	650	psi

Controlling Moment: 1600 ft-lb
  8.0 ft from left support
  Created by combining all dead and live loads.
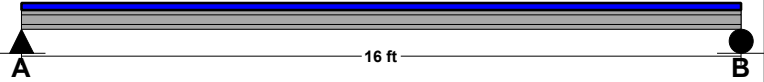**Controlling Shear:**   -400 lb
  At support.
  Created by combining all dead and live loads.

Comparisons with required sections:	Req'd	Provided
Section Modulus:	6.96 in3	51.56 in3
Area (Shear):	1.97 in2	41.25 in2
Moment of Inertia (deflection):	38.39 in4	193.36 in4
Moment:	1600 ft-lb	11859 ft-lb
Shear:	-400 lb	8381 lb

LOADING DIAGRAM

A   16 ft   B

ROOF LOADING
Side One:
Roof Live Load:	LL =	25	psf
Roof Dead Load:	DL =	16	psf
Tributary Width:	TW =	1	ft

Side Two:
Roof Live Load:	LL =	0	psf
Roof Dead Load:	DL =	0	psf
Tributary Width:	TW =	0	ft

Wall Load: WALL =   0   plf

SLOPE/PITCH ADJUSTED LENGTHS AND LOADS
Adjusted Beam Length:	Ladj =	16	ft
Beam Self Weight:	BSW =	9	plf
Beam Uniform Live Load:	wL =	25	plf
Beam Uniform Dead Load:	wD_adj =	25	plf
Total Uniform Load:	wT =	50	plf

Project: CStoreShellBeams

Location: Beam #4
Roof Beam
5.5 IN x 10.5 IN x 10.0 FT
24F-V4 - Visually Graded Western Species - Dry Use
Section Adequate By: 79.0%
Controlling Factor: Moment

DEFLECTIONS   Center
Live Load	0.15	IN L/815
Dead Load	0.10	in
Total Load	0.24	IN L/490

Live Load Deflection Criteria: L/240   Total Load Deflection Criteria: L/180

REACTIONS
	A	B
Live Load	3125 lb	3125 lb
Dead Load	2070 lb	2070 lb
Total Load	5195 lb	5195 lb
Bearing Length	1.45 in	1.45 in

BEAM DATA
Span Length	10	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft
Roof Pitch	1 :12	
Roof Duration Factor	1.15	

MATERIAL PROPERTIES

24F-V4 - Visually Graded Western Species

		Base Values		Adjusted	
Bending Stress:	F_b =	2400 psi	Controlled by:		
	F_{b_cmpr} =	1850 psi	F_b' =	2760 psi	
	Cd=1.15				
Shear Stress:	F_v =	265 psi	F_v' =	305 psi	
	Cd=1.15				
Modulus of Elasticity:	E =	1800 ksi	E' =	1800 ksi	
Comp. $\perp$ to Grain:	$F_c - \perp$ =	650 psi	$F_c - \perp'$ =	650 psi	

Controlling Moment: 12986 ft-lb
  5.0 ft from left support
  Created by combining all dead and live loads.
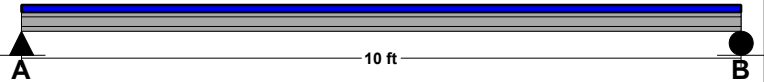**Controlling Shear:**   -5195 lb
  At support.
  Created by combining all dead and live loads.

Comparisons with required sections:	Req'd	Provided
Section Modulus:	56.46 in3	101.06 in3
Area (Shear):	25.57 in2	57.75 in2
Moment of Inertia (deflection):	194.76 in4	530.58 in4
Moment:	12986 ft-lb	23244 ft-lb
Shear:	-5195 lb	11733 lb

LOADING DIAGRAM

A ———————————— 10 ft ———————————— B

ROOF LOADING
Side One:
Roof Live Load:	LL =	25	psf
Roof Dead Load:	DL =	16	psf
Tributary Width:	TW =	25	ft

Side Two:
Roof Live Load:	LL =	0	psf
Roof Dead Load:	DL =	0	psf
Tributary Width:	TW =	0	ft

Wall Load:	WALL =	0	plf

SLOPE/PITCH ADJUSTED LENGTHS AND LOADS
Adjusted Beam Length:	Ladj =	10	ft
Beam Self Weight:	BSW =	13	plf
Beam Uniform Live Load:	wL =	625	plf
Beam Uniform Dead Load:	wD_adj =	414	plf
Total Uniform Load:	wT =	1039	plf

Project: CStoreShellBeams

Location: Beam #5
Roof Beam
5.5 IN x 9.0 IN x 9.0 FT
24F-V4 - Visually Graded Western Species - Dry Use
Section Adequate By: 3157.0%
Controlling Factor: Moment

Design Development

DEFLECTIONS   Center

Live Load	0.01	IN L/MAX
Dead Load	0.01	in
Total Load	0.01	IN L/8498

Live Load Deflection Criteria: L/240   Total Load Deflection Criteria: L/180

REACTIONS   A   B

Live Load	113	lb	113	lb
Dead Load	121	lb	121	lb
Total Load	234	lb	234	lb
Bearing Length	0.07	in	0.07	in

BEAM DATA

Span Length	9	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft
Roof Pitch	1	:12
Roof Duration Factor	1.15	

MATERIAL PROPERTIES

24F-V4 - Visually Graded Western Species

		Base Values		Adjusted		
Bending Stress:	F_b =	2400	psi	*Controlled by:*		
	F_{b_cmpr} =	1850	psi	F_b' =	2760	psi
	Cd=1.15					
Shear Stress:	F_v =	265	psi	F_v' =	305	psi
	Cd=1.15					
Modulus of Elasticity:	E =	1800	ksi	E' =	1800	ksi
Comp. $\perp$ to Grain:	$F_c - \perp$ =	650	psi	$F_c - \perp'$ =	650	psi

Controlling Moment: 524 ft-lb
 4.5 ft from left support
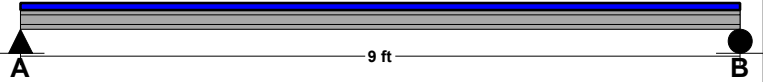 Created by combining all dead and live loads.
Controlling Shear: -233 lb
 At support.
 Created by combining all dead and live loads.

Comparisons with required sections:

	Req'd		Provided	
Section Modulus:	2.28	in3	74.25	in3
Area (Shear):	1.15	in2	49.5	in2
Moment of Inertia (deflection):	7.08	in4	334.13	in4
Moment:	524	ft-lb	17078	ft-lb
Shear:	-233	lb	10057	lb

LOADING DIAGRAM

A   9 ft   B

ROOF LOADING

Side One:
Roof Live Load:	LL =	25	psf
Roof Dead Load:	DL =	16	psf
Tributary Width:	TW =	1	ft

Side Two:
Roof Live Load:	LL =	0	psf
Roof Dead Load:	DL =	0	psf
Tributary Width:	TW =	0	ft

Wall Load: WALL =   0   plf

SLOPE/PITCH ADJUSTED LENGTHS AND LOADS

Adjusted Beam Length:	Ladj =	9	ft
Beam Self Weight:	BSW =	11	plf
Beam Uniform Live Load:	wL =	25	plf
Beam Uniform Dead Load:	wD_adj =	27	plf
Total Uniform Load:	wT =	52	plf

Project: CStoreShellBeams

Location: Header #1
Roof Beam
5.5 IN x 7.5 IN x 6.0 FT
#1 - Douglas-Fir-Larch - Dry Use
Section Adequate By: 27.3%
Controlling Factor: Moment

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DEFLECTIONS   Center
Live Load	0.06	IN L/1222
Dead Load	0.04	in
Total Load	0.10	IN L/738

Live Load Deflection Criteria: L/240   Total Load Deflection Criteria: L/180

REACTIONS   A   B
Live Load	1875	lb	1875	lb
Dead Load	1231	lb	1231	lb
Total Load	3106	lb	3106	lb
Bearing Length	0.90	in	0.90	in

BEAM DATA
Span Length	6	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	0	ft
Roof Pitch	1	:12
Roof Duration Factor	1.15	

MATERIAL PROPERTIES

#1 - Douglas-Fir-Larch

	Base Values		Adjusted	
Bending Stress:	Fb =	1200 psi	Fb' =	1380 psi
	$Cd=1.15$ $CF=1.00$			
Shear Stress:	Fv =	170 psi	Fv' =	196 psi
	$Cd=1.15$			
Modulus of Elasticity:	E =	1600 ksi	E' =	1600 ksi
Comp. $\perp$ to Grain:	Fc - $\perp$ =	625 psi	Fc - $\perp$' =	625 psi

Controlling Moment: 4659 ft-lb
  3.0 ft from left support
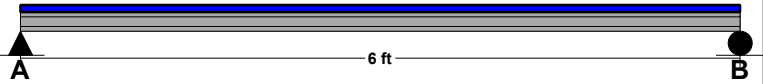 Created by combining all dead and live loads.
Controlling Shear: 3106 lb
  At support.
  Created by combining all dead and live loads.

Comparisons with required sections:	Req'd	Provided
Section Modulus:	40.51 in3	51.56 in3
Area (Shear):	23.83 in2	41.25 in2
Moment of Inertia (deflection):	47.16 in4	193.36 in4
Moment:	4659 ft-lb	5930 ft-lb
Shear:	3106 lb	5376 lb

LOADING DIAGRAM

A   6 ft   B

ROOF LOADING
Side One:
Roof Live Load:	LL =	0	psf
Roof Dead Load:	DL =	0	psf
Tributary Width:	TW =	0	ft

Side Two:
Roof Live Load:	LL =	25	psf
Roof Dead Load:	DL =	16	psf
Tributary Width:	TW =	25	ft

Wall Load: WALL =   0   plf

SLOPE/PITCH ADJUSTED LENGTHS AND LOADS
Adjusted Beam Length:	Ladj =	6	ft
Beam Self Weight:	BSW =	9	plf
Beam Uniform Live Load:	wL =	625	plf
Beam Uniform Dead Load:	wD_adj =	410	plf
Total Uniform Load:	wT =	1035	plf