

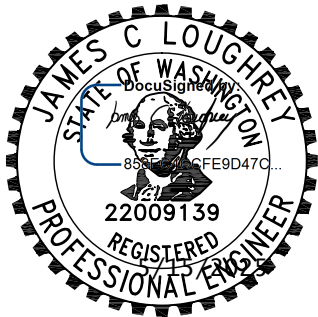
STRUCTURAL CALCULATIONS FOR:

Skokomish Recycle Transfer Station Project Building
80 N Tribal Center Rd
Skokomish, WA 98584
Job # MRET96772102

**(40' WIDE X 80' LONG BUILDING
WITH 14' EAVE HEIGHT
AND 3:12 ROOF PITCH)**

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CHG Building Systems

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Alliance Engineering of Oregon, Inc

JOB INFORMATION:

JOB NAME:	Skokomish Recycle Transfer Station Project	MAIN BUILDING FRAME WIDTH (ft.):	40.00
JOB ADDRESS:	80 N Tribal Center Rd	OVERALL ENCLOSED BUILDING WIDTH (ft.):	40.00
	Skokomish, WA 98584	BUILDING LENGTH (ft.):	80.00
JOB NUMBER:	MRET96772102	BUILDING FRAME EAVE HEIGHT (ft.):	14.00
		BUILDING FRAME ROOF SLOPE (?/12):	3.00
		Corner Wall Zones (ft):	8.00
		Sidewall Interior Zone (ft):	64.00

MATERIAL SPECIFICATIONS:

CONCRETE:	2500 psi (28-day Strength)
CONCRETE REINFORCING:	ASTM A615, Grade 60 (Fy = 60,000 psi)
STRUCTURAL BOLTS:	ASTM A307
METAL ROOF PANELS:	ASTM A653, Grade 50 (Fy = 50,000 psi min.)
METAL WALL PANELS:	ASTM A653, Grade 50 (Fy = 50,000 psi min.)
CEE AND ZEE COLD-FORMED STEEL:	ASTM A1011, Grade 55 (Fy = 55,000 psi min.)

PROJECT PARAMETERS:	SITE CLASS:	D
	RISK CATEGORY:	II

GOVERNING CODES:	-- 2021 International Building Code (Load Combinations per 2021 IBC Section 1605.3.1)
	-- AISI S100 (North American Specification for the Design of Cold-Formed Steel Structural Members)

VERTICAL LOADS:

DEAD LOADS:	METAL ROOF PANEL:	1.0	psf
	PURLINS:	1.0	psf
	MISC.:	3.0	psf
	STEEL FRAMES:	1.0	psf
	TOTAL ROOF DEAD LOAD:	6.0	psf
	WALL DEAD LOAD:	3.0	psf
ROOF LIVE LOADS:	ROOF LIVE LOAD REDUCTION FACTORS (R1 x R2):	0.61	
	DESIGN LIVE LOAD FOR CLEARSPAN FRAMES:	12.3	psf
	DESIGN LIVE LOAD FOR PURLINS AND OTHER ELEMENTS:	20.0	psf
ROOF SNOW LOADS:	GROUND SNOW LOAD:	25.0	psf
	SNOW LOAD IMPORTANCE FACTOR, Is:	1.00	
	Ce, Exposure Factor:	1.00	
	Ct, Thermal Factor:	1.20	
	Cs, Slope Factor:	1.00	
	MIN. ROOF SNOW LOAD:	25.0	psf
	DESIGN SLOPED ROOF SNOW LOAD:	25.0	psf

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LATERAL LOADS:
SEISMIC LOADS:

(Based on ASCE 7-16, Chapter 12, using Site Class "D" and Risk Category "II")				
'Short' Period			1-sec. Period	
PERP. TO SIDEWALL (TRANSVERSE)	PERP. TO ENDWALL (LONGITUDINAL)		PERP. TO SIDEWALL	PERP. TO ENDWALL
Ss: 1.559	1.559	S1: 0.587	0.587	0.587
Fa: 1.200	1.200	Fv: 1.713	1.713	1.713
S _{MS} = (F _a x S _s) = 1.871	1.871	S _{M1} = 1.006	1.006	1.006
S _{DS} = (2/3) x S _{MS} = 1.247	1.247	S _{D1} = 0.670	0.670	0.670
R = 3.0	3.0		3.0	3.0
REDUNDANCY FACTOR, rho = 1.00	1.30		1.00	1.30
SEISMIC IMPORTANCE FACTOR, Ie = 1.00	1.00		1.00	1.00
Cs = 0.415	0.415		0.223	0.223
Eh = Cs x W x rho = 0.415 W	0.5395 W		0.223 W	0.2899 W
Eh (ASD) = Eh * .7 = 0.29 W	0.377 W		0.156 W	0.202 W
W =TOTAL SEISMIC DESIGN DEAD LOAD (lbs.) = 25440	25440		25440	25440
LATERAL SYSTEM SEISMIC SHEAR EFFECT, Eh (lbs.) = 7378	9591		3969	5139
SEISMIC DESIGN CATEGORY (FOR BOTH PERIODS PER SEC. 1613.5.6.1):			D	
.8 x Ts = 0.43		(ASCE 11.4.6)		
Ta (sec.) = 0.30	0.18	(ASCE 12.8.2.1)		

WIND LOADS:

ULTIMATE WIND SPEED (mph) = 110	VELOCITY EXPOSURE COEFFICIENT, Kz = 0.870
EXPOSURE = C	WIND TOPOGRAPHICAL FACTOR, Kt = 1.000
BUILDING ENCLOSURE TYPE: ENCLOSED	WIND DIRECTIONALITY FACTOR, Kd = 0.850
	GROUND ELEVATION FACTOR, Ke = 0.999
MEAN ROOF HEIGHT (ft.): 16.50	

ULTIMATE WIND PRESSURE (psf): 22.89

MAIN FORCE RESISTING SYSTEM (MFRS) DESIGN WIND PRESSURES (Perp. to Sidewall):

	G * Cp ± Gcpi	ULTIMATE WIND PRESSURE (psf):	
Coefficient for Windward Wall Ballooning:	0.500	11.45	(pressure)
Coefficient for Leeward Wall Ballooning:	-0.605	-13.85	(suction)
Coefficient for Windward Roof Upward Ballooning:	-0.748	-17.13	(suction)
Coefficient for Leeward Roof Upward Ballooning:	-0.594	-13.59	(suction)
Coefficient for Windward Roof Downward Ballooning:	0.000	0.00	
Coefficient for Leeward Roof Downward Ballooning:	-0.594	-13.59	(suction)
Coefficient for Windward Wall Deflation:	0.860	19.69	(pressure)
Coefficient for Leeward Wall Deflation:	-0.245	-5.61	(suction)
Coefficient for Windward Roof Upward Deflation:	-0.388	-8.89	(suction)
Coefficient for Leeward Roof Upward Deflation:	-0.234	-5.35	(suction)
Coefficient for Windward Roof Downward Deflation:	0.070	1.61	(pressure)
Coefficient for Leeward Roof Downward Deflation:	-0.234	-5.35	(suction)

ALLOWABLE STRESS LATERAL SYSTEM WIND FORCE PERP. TO SIDEWALLS, W (lbs.) = 9290

MAIN FORCE RESISTING SYSTEM (MFRS) DESIGN WIND PRESSURES (Perp. to Endwall):

Int. Zone Wall Pressure Horiz. Coefficient:	1.105
Int. Zone Endwall Ultimate Wind Pressure (psf):	25.29

ALLOWABLE STRESS LATERAL SYSTEM WIND FORCE PERP. TO ENDWALLS, W (lbs.) = 4219

CLADDING AND COMPONENT ALLOWABLE STRESS DESIGN WIND PRESSURES:

Element	GCp ± Gcpi (FIELD)		Pressures (psf)	
	INWARD	OUTWARD	INWARD	OUTWARD
Roof Purlins:	0.561	-1.415	7.70	19.44
Sidewall Girts:	1.014	-1.114	13.93	15.30
Endwall Girts:	0.985	-1.085	13.53	14.91
Endwall Columns:	0.904	-1.004	12.42	13.79

CLEARSPAN FRAME ANALYSIS:

Analysis & Design Software: ACT Dimensions version 2.29.9.0 by ACT Building Systems

Applicable Frame Numbers: 2, 3, 5, 6

Overall Nominal Frame Width: 40' - 0"

Nominal Eave Height: 14' - 0"

Roof Pitch: 3:12

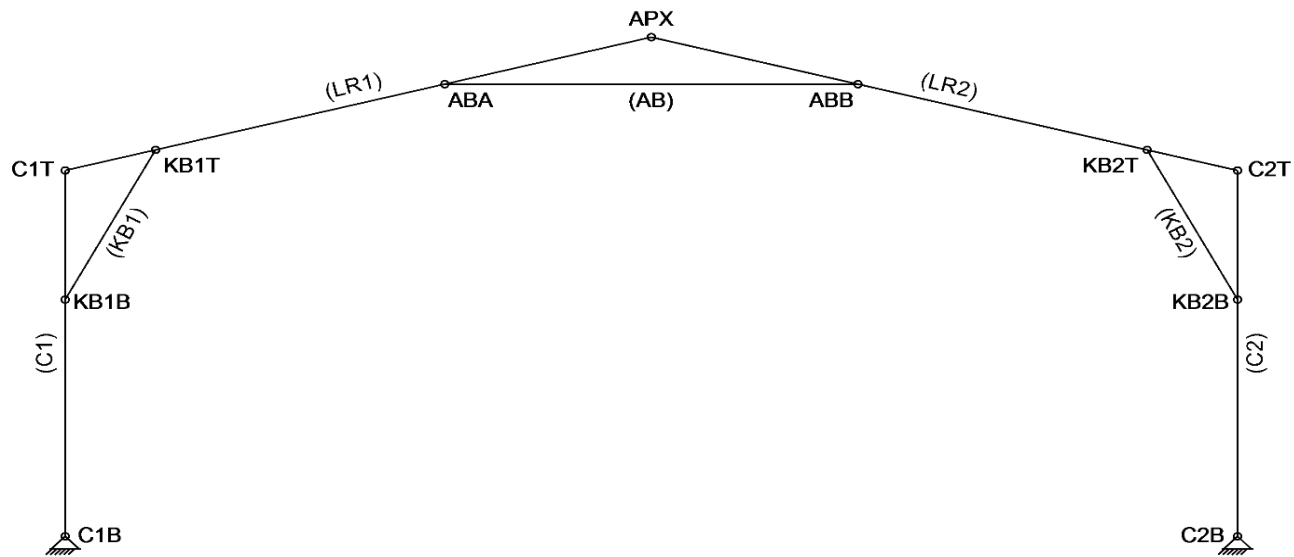
Tributary Width: 14' - 8"

Design Roof Snow Load: 25.00 psf

Roof Live Load: 20.00 psf

Wind Speed AndAlso Exposure: 110 mph, C

MEMBERS	MAX. CONNECTOR SPACING REQUIRED
Columns	2' - 1"
Rafters	3' - 2"



X - JOINT LABEL (SEE RISA ANALYSIS NEXT PAGE)
(X) - MEMBER LABEL (SEE RISA ANALYSIS NEXT PAGE)

FRAME NODE AND MEMBER DIAGRAM

Cold Formed Steel Properties

	Label	E[psi]	G[psi]	Nu	Therm/(1E5 F)	Density[lb/ft^3]	Yield[psi]	Fu[psi]
1	CF_STL	29500000	11300000	0.3	0.65	490	55000	70000

Joint Coordinates

	Label	X[ft]	Y[ft]
1	C1B	1.083	0.000
2	C1T	1.083	12.983
3	C2B	38.919	0.000
4	C2T	38.919	12.983
5	APX	20.001	17.712
6	KB1B	1.083	8.400
7	KB1T	4.000	13.712
8	KB2B	38.919	8.400
9	KB2T	36.002	13.712
10	ABA	13.335	16.046
11	ABB	26.667	16.046

Member Primary Data

	Label	I joint	J joint	Shape	Type	DesignList	Material	DesignRules
1	C1	C1B	C1T	2-14in x 4in 12G CEE-BB	Beam	CS	CF_STL	Typical
2	C2	C2B	C2T	2-14in x 4in 12G CEE-BB	Beam	CS	CF_STL	Typical
3	KB1	KB1B	KB1T	2-8in x 3.5in 16G CEE-BB	Beam	CS	CF_STL	Typical
4	KB2	KB2B	KB2T	2-8in x 3.5in 16G CEE-BB	Beam	CS	CF_STL	Typical
5	AB	ABA	ABB	2-8in x 3.5in 16G CEE-BB	Beam	CS	CF_STL	Typical
6	LR1	C1T	APX	2-14in x 4in 12G CEE-BB	Beam	CS	CF_STL	Typical
7	LR2	C2T	APX	2-14in x 4in 12G CEE-BB	Beam	CS	CF_STL	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[ft]	J Offset[ft]	Physical
1	C1		PIN	0.000	0.000	Yes
2	C2		PIN	0.000	0.000	Yes
3	KB1	PIN	PIN	0.000	0.000	
4	KB2	PIN	PIN	0.000	0.000	
5	AB	PIN	PIN	0.000	0.000	
6	LR1		PIN	0.566	0.000	Yes
7	LR2		PIN	0.566	0.000	Yes

Cold Formed Steel Design Parameters

	Label	Shape	Length[ft]	Lb y-y [ft]	Lcomp top[ft]	Lcomp bottom[ft]	L-Torque [ft]	K-in
1	C1	2-14in x 4in 12G CEE-BB	12.983	4.667	12.983	4.667	4.667	0.8
2	C2	2-14in x 4in 12G CEE-BB	12.983	4.667	4.667	12.983	4.667	0.8
3	KB1	2-8in x 3.5in 16G CEE-BB	6.060	6.060	6.060	6.060	6.060	
4	KB2	2-8in x 3.5in 16G CEE-BB	6.060	6.060	6.060	6.060	6.060	
5	AB	2-8in x 3.5in 16G CEE-BB	13.333	13.333	13.333	13.333	13.333	
6	LR1	2-14in x 4in 12G CEE-BB	19.500	2.434	14.667	2.434	2.434	0.8
7	LR2	2-14in x 4in 12G CEE-BB	19.500	2.434	2.434	14.667	2.434	0.8

Basic Load Cases

	BLC Description	Category	Joint	Point	Distributed
1	Roof Dead	DL	0	0	2
2	Roof Snow	SL	0	0	2
3	Roof Live	RLL	0	0	2
4	Wall Dead	DL	0	0	0
5	Floor Dead	DL	0	0	0
6	Floor Live	LL	0	0	0
7	Wind To Right - Upward Ballooning	OL1	0	0	6
8	Wind To Right - Upward Deflation	OL2	0	0	6
9	Wind To Right - Downward Ballooning	OL3	0	0	4
10	Wind To Right - Downward Deflation	OL4	0	0	6
11	Wind To Left - Upward Ballooning	OL5	0	0	6
12	Wind To Left - Upward Deflation	OL6	0	0	6
13	Wind To Left - Downward Ballooning	OL7	0	0	4
14	Wind To Left - Downward Deflation	OL8	0	0	6
15	Earthquake+	None	0	0	4
16	Earthquake-	None	0	0	4

Member Distributor Loads (BLC 1 : Roof Dead)

	Member Label	Direction	Start Mag[lb/ft]	End Mag[lb/ft]	Start Loc[ft/%]	End Loc[ft/%]
1	LR1	Y	-88.000	-88.000	-0.000	19.500
2	LR2	Y	-88.000	-88.000	-0.000	19.500

Member Distributor Loads (BLC 2 : Roof Snow)

	Member Label	Direction	Start Mag[lb/ft]	End Mag[lb/ft]	Start Loc[ft/%]	End Loc[ft/%]
1	LR1	Y	-355.719	-355.719	-0.000	19.500
2	LR2	Y	-355.719	-355.719	-0.000	19.500

Member Distributor Loads (BLC 3 : Roof Live)

	Member Label	Direction	Start Mag[lb/ft]	End Mag[lb/ft]	Start Loc[ft/%]	End Loc[ft/%]
1	LR1	Y	-174.539	-174.539	-0.000	19.500
2	LR2	Y	-174.539	-174.539	-0.000	19.500

Member Distributor Loads (BLC 7 : Wind To Right - Upward Ballooning)

	Member Label	Direction	Start Mag[lb/ft]	End Mag[lb/ft]	Start Loc[ft/%]	End Loc[ft/%]
1	C1	X	167.114	167.114	0.000	12.983
2	C2	X	202.208	202.208	0.000	12.983
3	LR1	X	-60.656	-60.656	-0.000	19.500
4	LR1	Y	242.625	242.625	-0.000	19.500
5	LR2	X	48.113	48.113	-0.000	19.500
6	LR2	Y	192.452	192.452	-0.000	19.500

Member Distributor Loads (BLC 8 : Wind To Right - Upward Deflation)

	Member Label	Direction	Start Mag[lb/ft]	End Mag[lb/ft]	Start Loc[ft/%]	End Loc[ft/%]
1	C1	X	287.436	287.436	0.000	12.983
2	C2	X	81.886	81.886	0.000	12.983
3	LR1	X	-31.474	-31.474	-0.000	19.500
4	LR1	Y	125.895	125.895	-0.000	19.500
5	LR2	X	18.931	18.931	-0.000	19.500
6	LR2	Y	75.722	75.722	-0.000	19.500

Member Distributor Loads (BLC 9 : Wind To Right - Downward Ballooning)

	Member Label	Direction	Start Mag[lb/ft]	End Mag[lb/ft]	Start Loc[ft/%]	End Loc[ft/%]
1	C1	X	167.114	167.114	0.000	12.983
2	C2	X	202.208	202.208	0.000	12.983
3	LR2	X	48.113	48.113	-0.000	19.500
4	LR2	Y	192.452	192.452	-0.000	19.500

Member Distributor Loads (BLC 10 : Wind To Right - Downward Deflation)

	Member Label	Direction	Start Mag[lb/ft]	End Mag[lb/ft]	Start Loc[ft/%]	End Loc[ft/%]
1	C1	X	287.436	287.436	0.000	12.983
2	C2	X	81.886	81.886	0.000	12.983
3	LR1	X	5.693	5.693	-0.000	19.500
4	LR1	Y	-22.771	-22.771	-0.000	19.500
5	LR2	X	18.931	18.931	-0.000	19.500
6	LR2	Y	75.722	75.722	-0.000	19.500

Member Distributor Loads (BLC 11 : Wind To Left - Upward Ballooning)

	Member Label	Direction	Start Mag[lb/ft]	End Mag[lb/ft]	Start Loc[ft/%]	End Loc[ft/%]
1	C1	X	-202.208	-202.208	0.000	12.983
2	C2	X	-167.114	-167.114	0.000	12.983
3	LR1	X	-48.113	-48.113	-0.000	19.500
4	LR1	Y	192.452	192.452	-0.000	19.500
5	LR2	X	60.656	60.656	-0.000	19.500
6	LR2	Y	242.625	242.625	-0.000	19.500

Member Distributor Loads (BLC 12 : Wind To Left - Upward Deflation)

	Member Label	Direction	Start Mag[lb/ft]	End Mag[lb/ft]	Start Loc[ft/%]	End Loc[ft/%]
1	C1	X	-81.886	-81.886	0.000	12.983
2	C2	X	-287.436	-287.436	0.000	12.983
3	LR1	X	-18.931	-18.931	-0.000	19.500
4	LR1	Y	75.722	75.722	-0.000	19.500
5	LR2	X	31.474	31.474	-0.000	19.500
6	LR2	Y	125.895	125.895	-0.000	19.500

Member Distributor Loads (BLC 13 : Wind To Left - Downward Ballooning)

	Member Label	Direction	Start Mag[lb/ft]	End Mag[lb/ft]	Start Loc[ft/%]	End Loc[ft/%]
1	C1	X	-202.208	-202.208	0.000	12.983
2	C2	X	-167.114	-167.114	0.000	12.983
3	LR1	X	-48.113	-48.113	-0.000	19.500
4	LR1	Y	192.452	192.452	-0.000	19.500

Member Distributor Loads (BLC 14 : Wind To Left - Downward Deflation)

	Member Label	Direction	Start Mag[lb/ft]	End Mag[lb/ft]	Start Loc[ft/%]	End Loc[ft/%]
1	C1	X	-81.886	-81.886	0.000	12.983
2	C2	X	-287.436	-287.436	0.000	12.983
3	LR1	X	-18.931	-18.931	-0.000	19.500
4	LR1	Y	75.722	75.722	-0.000	19.500
5	LR2	X	-5.693	-5.693	-0.000	19.500
6	LR2	Y	-22.771	-22.771	-0.000	19.500

Member Distributor Loads (BLC 15 : Earthquake+)

	Member Label	Direction	Start Mag[lb/ft]	End Mag[lb/ft]	Start Loc[ft/%]	End Loc[ft/%]
1	C1	X	18.291	18.291	0.000	12.983
2	C2	X	18.291	18.291	0.000	12.983
3	LR1	X	36.582	36.582	-0.000	19.500
4	LR2	X	36.582	36.582	-0.000	19.500

Member Distributor Loads (BLC 16 : Earthquake-)

	Member Label	Direction	Start Mag[lb/ft]	End Mag[lb/ft]	Start Loc[ft/%]	End Loc[ft/%]
1	C1	X	-18.291	-18.291	0.000	12.983
2	C2	X	-18.291	-18.291	0.000	12.983
3	LR1	X	-36.582	-36.582	-0.000	19.500
4	LR2	X	-36.582	-36.582	-0.000	19.500

Load Combinations

	Description	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	DL ONLY	DL	1						
2	FLL ONLY	LL	1						
3	IBC 16-9	DL	1	LL	1				
4	IBC 16-10 (a)	DL	1	RLL	1				
5	IBC 16-10 (b)	DL	1	SL	1				
6	IBC 16-11 (a)	DL	1	LL	0.75	RLL	0.75		
7	IBC 16-11 (b)	DL	1	LL	0.75	SL	0.75		
8	IBC 16-12 (a) 1	DL	1	OL1	0.6				
9	IBC 16-12 (a) 2	DL	1	OL2	0.6				
10	IBC 16-12 (a) 3	DL	1	OL3	0.6				
11	IBC 16-12 (a) 4	DL	1	OL4	0.6				
12	IBC 16-12 (a) 5	DL	1	OL5	0.6				
13	IBC 16-12 (a) 6	DL	1	OL6	0.6				
14	IBC 16-12 (a) 7	DL	1	OL7	0.6				
15	IBC 16-12 (a) 8	DL	1	OL8	0.6				
16	IBC 16-12 (b) 1	DL	1	15	0.7				
17	IBC 16-12 (b) 2	DL	1	16	0.7				
18	IBC 16-13 (a) 1	DL	1	LL	0.75	RLL	0.75	OL1	0.45
19	IBC 16-13 (a) 2	DL	1	LL	0.75	RLL	0.75	OL2	0.45
20	IBC 16-13 (a) 3	DL	1	LL	0.75	RLL	0.75	OL3	0.45
21	IBC 16-13 (a) 4	DL	1	LL	0.75	RLL	0.75	OL4	0.45
22	IBC 16-13 (a) 5	DL	1	LL	0.75	RLL	0.75	OL5	0.45
23	IBC 16-13 (a) 6	DL	1	LL	0.75	RLL	0.75	OL6	0.45
24	IBC 16-13 (a) 7	DL	1	LL	0.75	RLL	0.75	OL7	0.45
25	IBC 16-13 (a) 8	DL	1	LL	0.75	RLL	0.75	OL8	0.45
26	IBC 16-13 (b) 1	DL	1	LL	0.75	SL	0.75	OL1	0.45
27	IBC 16-13 (b) 2	DL	1	LL	0.75	SL	0.75	OL2	0.45
28	IBC 16-13 (b) 3	DL	1	LL	0.75	SL	0.75	OL3	0.45
29	IBC 16-13 (b) 4	DL	1	LL	0.75	SL	0.75	OL4	0.45
30	IBC 16-13 (b) 5	DL	1	LL	0.75	SL	0.75	OL5	0.45
31	IBC 16-13 (b) 6	DL	1	LL	0.75	SL	0.75	OL6	0.45
32	IBC 16-13 (b) 7	DL	1	LL	0.75	SL	0.75	OL7	0.45
33	IBC 16-13 (b) 8	DL	1	LL	0.75	SL	0.75	OL8	0.45
34	IBC 16-14 (a) 1	DL	1	LL	0.75	SL	0.75	15	0.525
35	IBC 16-14 (a) 2	DL	1	LL	0.75	SL	0.75	16	0.525
36	IBC 16-15 (a) 1	DL	0.6	OL1	0.6				
37	IBC 16-15 (a) 2	DL	0.6	OL2	0.6				

Load Combinations (continued)

	Description	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
38	IBC 16-15 (a) 3	DL	0.6	OL3	0.6				
39	IBC 16-15 (a) 4	DL	0.6	OL4	0.6				
40	IBC 16-15 (a) 5	DL	0.6	OL5	0.6				
41	IBC 16-15 (a) 6	DL	0.6	OL6	0.6				
42	IBC 16-15 (a) 7	DL	0.6	OL7	0.6				
43	IBC 16-15 (a) 8	DL	0.6	OL8	0.6				
44	IBC 16-16 (a) 1	DL	0.6	15	0.7				
45	IBC 16-16 (a) 2	DL	0.6	16	0.7				

Envelope Joint Reactions

	Joint		X[lb]	LC	Y[lb]	LC	Moment[ft-lb]	LC
1	C1B	max	3681	32	8401	5	0	38
2	C1B	min	-1853	37	-2045	36	-0	22
3	C2B	max	1853	41	8401	5	0	42
4	C2B	min	-3681	28	-2045	40	-0	34
5	Total	max	3423	14	16802	5	0	42
6	Total	min	-3423	38	-2943	40	-0	22

Envelope Member Section Forces

	Member	Sec		Axial[lb]	LC	Shear[lb]	LC	Moment[ft-lb]	LC
1	C1	1	max	8401	5	3681	32	0	38
2		1	min	-2045	36	-1853	37	-0	22
3	C1	2	max	4944	38	2851	36	0	32
4		2	min	-9910	32	-6257	32	-0	38
5	C2	1	max	8401	5	1853	41	0	42
6		1	min	-2045	40	-3681	28	-0	34
7	C2	2	max	4944	42	6257	28	0	8
8		2	min	-9910	28	-2851	40	-0	41
9	KB1	1	max	19568	5	0	42	0	1
10		1	min	-7065	36	-0	28	0	1
11	KB1	2	max	19568	5	0	42	0	28
12		2	min	-7065	36	-0	28	-0	42
13	KB2	1	max	19568	5	0	32	0	1
14		1	min	-7065	40	-0	38	0	1
15	KB2	2	max	19568	5	0	32	0	38
16		2	min	-7065	40	-0	38	-0	32
17	AB	1	max	1680	36	0	38	0	1
18		1	min	-13732	5	-0	14	0	1
19	AB	2	max	1680	36	0	38	0	14
20		2	min	-13732	5	-0	14	-0	38
21	LR1	1	max	3772	36	8097	32	0	14
22		1	min	-8473	32	-4189	38	-0	37
23	LR1	2	max	16547	5	4137	5	0	36
24		2	min	-2901	36	-1271	42	-0	5
25	LR2	1	max	3772	40	4189	42	0	41
26		1	min	-8473	28	-8097	28	-0	8
27	LR2	2	max	16547	5	1271	38	0	40
28		2	min	-2901	40	-4137	5	-0	5

AISI S100-16 : ASD Cold Formed Steel Code Checks

Member		Shape	H1.2-1 Check	Loc[ft]	LC	H2-1 Check	Loc[ft]	LC
1	C1	2-14in x 4in 12G CEE-BB	0.95	8.400	4	0.75	8.400	4
2	C2	2-14in x 4in 12G CEE-BB	0.95	8.400	4	0.75	8.400	4
3	KB1	2-8in x 3.5in 16G CEE-BB	0.90	6.060	4	0.00	6.060	1
4	KB2	2-8in x 3.5in 16G CEE-BB	0.90	6.060	4	0.00	6.060	1
5	AB	2-8in x 3.5in 16G CEE-BB	0.17	13.332	35	0.00	13.332	1
6	LR1	2-14in x 4in 12G CEE-BB	0.83	12.628	4	0.53	12.628	31
7	LR2	2-14in x 4in 12G CEE-BB	0.83	12.628	4	0.53	12.628	31

AISI S100-16 : ASD Cold Formed Steel Allowable Member Load

Member		Shape	Pn/Om[lb]	Tn/Om[lb]	Mn/Om[lb-ft]	Cb	Cm
1	C1	2-14in x 4in 12G CEE-BB	55688	73593	36393	1	1
2	C2	2-14in x 4in 12G CEE-BB	55688	73593	36393	1	1
3	KB1	2-8in x 3.5in 16G CEE-BB	21760	57463	8252	1	1
4	KB2	2-8in x 3.5in 16G CEE-BB	21760	57463	8252	1	1
5	AB	2-8in x 3.5in 16G CEE-BB	9660	57463	5556	1	1
6	LR1	2-14in x 4in 12G CEE-BB	52223	73593	36393	1	1
7	LR2	2-14in x 4in 12G CEE-BB	52223	73593	36393	1	1

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FRAME BRACE END SCREW CONNECTION DESIGN

Brace results apply at Frames 2, 3, 5, 6

Gable Frame Columns: Double 14in x 4in 12G CEE
Gable Frame Rafters: Double 14in x 4in 12G CEE
Gable Frame Typ. Knee Braces: Double 8in x 3.5in 16G CEE
Gable Frame Apex Braces: Double 8in x 3.5in 16G CEE
Knee Brace Vert. Intersection Dimension per Detail A/2 (ft.): 8' - 9 1/4"
Knee Brace Horiz. Intersection Dimension per Detail A/2 (ft.): 2' - 4 5/8"
Apex Brace Horiz. Intersection Dimension per Detail B/2 (ft.): 5' - 7 1/8"

Screw Size: #14
Ultimate Single Shear Screw Strength (lbs.): 2450
Ω = 2.5

	n Screws	R3d (group effect factor)	V single screw (lbs.)	P (design allowable, lbs.)
Knee Brace	19	0.64	525	9968
Apex Brace	13	0.66	543	7058

MAX. KNEE BRACE FORCE (lbs.): 9784 (INSTALL (19) #14 SCREWS AT EACH END OF EACH KNEE BRACE)
MAX. APEX BRACE FORCE (lbs.): 6866 (INSTALL (13) #14 SCREWS AT EACH END OF EACH APEX BRACE)

FRAME BRACE END ALTERNATE BOLT CONNECTION DESIGN

NOTATIONS

Fu = Tensile strength of connected part (psi)
Fy = Yield strength of connected part (psi)
db = Nominal bolt diameter (in.)
g1 = Nominal gauge of thinnest connected part (in.)
t1 = Thickness of thinnest connected part (in.)
Pn = Nominal bearing strength per bolt (lbs.)

ALLOWABLE SHEAR BASED ON CONNECTED MATERIALS:

Fu (psi) = 70000 db = 0.625
Fy (psi) = 55000 g1 = 16
d/t = 10.59 t1 = 0.059
C = 2.94
Pn = 7591

Allowable shear based on connected material bearing (lbs.): 3100

Bolt Grade: A307
Allowable shear based on A307 bolt in shear (lbs.): 4142

Allowable Shear on Each Bolt (lbs.): 3100

* MAX. KNEE BRACE FORCE (lbs.): 9784 (USE MIN. (4) 5/8" DIAM. A307 BOLTS AT EACH END OF EACH KNEE BRACE)
* MAX. APEX BRACE FORCE (lbs.): 6866 (USE MIN. (3) 5/8" DIAM. A307 BOLTS AT EACH END OF EACH APEX BRACE)

LATERAL FORCE RESISTANCE DIAPHRAGM ANALYSIS

Reports verifying diaphragm capacity available upon request.

'ENDWALL A' TOTAL SHEAR FORCE, ASD, LBS.: **1366** (SHEETING DIAPHRAGM ACTION USED TO RESIST LOAD)

PANEL #: 1
 PANEL WIDTH (ft.): 29.00
 PANEL WIDTH RELATIVE STIFFNESS: 841
 HEIGHT (ft.): 15.38
 MAX. PANEL SHEAR FORCE, ASD (lbs.): 1366
 PANEL SHEAR, ASD (plf): 47
 ALLOWABLE PANEL SHEAR, ASD (plf): 169
 OK
 MAX. BASE OF PANEL UPLIFT, UNFACTORED (lbs.): 1207
 D.L. TRIB. TO END OF PANEL, UNFACTORED (lbs.): 2307
 BASE OF NET PANEL UPLIFT, ULT (lbs.): 0
 PANEL EDGE CONCRETE ANCHOR: N/A, NO NET PANEL UPLIFT

'ENDWALL B' TOTAL SHEAR FORCE, ASD, LBS.: **976** (SHEETING DIAPHRAGM ACTION USED TO RESIST LOAD)

PANEL #: 1
 PANEL WIDTH (ft.): 29.00
 PANEL WIDTH RELATIVE STIFFNESS: 841
 HEIGHT (ft.): 15.38
 MAX. PANEL SHEAR FORCE, ASD (lbs.): 976
 PANEL SHEAR, ASD (plf): 34
 ALLOWABLE PANEL SHEAR, ASD (plf): 169
 OK
 MAX. BASE OF PANEL UPLIFT, UNFACTORED (lbs.): 862
 D.L. TRIB. TO END OF PANEL, UNFACTORED (lbs.): 2075
 BASE OF NET PANEL UPLIFT, ULT (lbs.): 0
 PANEL EDGE CONCRETE ANCHOR: N/A, NO NET PANEL UPLIFT

'PARTITION UNDER ROOF, FRAME 4' X-BRACING
TOTAL SHEAR FORCE, ASD, LBS.: **1756** (X-BRACING USED TO RESIST LOAD)

BAY #	1	4
X-BRACING WIDTH (ft.):	9.17	9.17
HEIGHT (ft.):	14.82	14.82
SHEAR FORCE, ASD (lbs.):	878	878
BASE UPLIFT TENSION, ASD (lbs.):	1419	1419
X-BRACING TENSION, ASD (lbs.):	1669	1669
STRAP SIZE:	(1) 1.5" x 16ga. strap	

'SIDEWALL A' TOTAL SHEAR FORCE, ASD, LBS.: 3571 (SHEETING DIAPHRAGM ACTION USED TO RESIST LOAD)

PANEL #:	1	2	3
PANEL WIDTH (ft.):	24.33	3.33	3.33
PANEL WIDTH RELATIVE STIFFNESS:	592.1	11.1	11.1
HEIGHT (ft.):	14.00	14.00	14.00
MAX. PANEL SHEAR FORCE, ASD (lbs.):	3442	65	65
PANEL SHEAR, ASD (plf):	141	19	19
ALLOWABLE PANEL SHEAR, ASD (plf):	174	174	174
	OK	OK	OK
MAX. BASE OF PANEL UPLIFT, UNFACTORED (lbs.):	1950	267	267
D.L. TRIB. TO END OF PANEL, UNFACTORED (lbs.):	1460	200	200
BASE OF NET PANEL UPLIFT, ULT (lbs.):	1515	207	207
PANEL EDGE CONCRETE ANCHOR:	5/8in x 5in DeWALT 'Screw-Bolt+' Anchor		
ANCHOR ALLOWABLE TENSION, ΦN_n (lbs.):	2309	2309	2309
	OK	OK	OK

'SIDEWALL B' TOTAL SHEAR FORCE, ASD, LBS.: 3571 (SHEETING DIAPHRAGM ACTION USED TO RESIST LOAD)

PANEL #:	1	2	3
PANEL WIDTH (ft.):	24.33	3.33	3.33
PANEL WIDTH RELATIVE STIFFNESS:	592.1	11.1	11.1
HEIGHT (ft.):	14.00	14.00	14.00
MAX. PANEL SHEAR FORCE, ASD (lbs.):	3442	65	65
PANEL SHEAR, ASD (plf):	141	19	19
ALLOWABLE PANEL SHEAR, ASD (plf):	174	174	174
	OK	OK	OK
MAX. BASE OF PANEL UPLIFT, UNFACTORED (lbs.):	1950	267	267
D.L. TRIB. TO END OF PANEL, UNFACTORED (lbs.):	1460	200	200
BASE OF NET PANEL UPLIFT, ULT (lbs.):	1515	207	207
PANEL EDGE CONCRETE ANCHOR:	5/8in x 5in DeWALT 'Screw-Bolt+' Anchor		
ANCHOR ALLOWABLE TENSION, ΦN_n (lbs.):	2309	2309	2309
	OK	OK	OK

'ROOF' X-BRACING TOTAL SHEAR FORCE, ASD, LBS.: 1468 (X-BRACING USED TO RESIST LOAD)

BAY #	1	4
X-BRACING WIDTH (ft.):	18.67	13.33
MAX STRAP LENGTH UP SHEETING (ft.):	18.11	18.11
SHEAR FORCE, ASD (lbs.):	857	612
X-BRACING TENSION, ASD (lbs.):	1182	1032
STRAP SIZE:	(1) 1.5" x 16ga. strap	

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ROOF PURLIN DESIGN

MEMBER SIZE USED -->		8in x 2.125/2.375in 16G ZEE		*			
		BAY #1	BAY #2	BAY #3	BAY #4	BAY #5	BAY #6
SPAN (ft.):		18.33	10.67	10.67	13.33	13.33	13.00
DOWNWARD LOAD TRIB. WIDTH (ft.):		2.43	2.43	2.43	2.43	2.43	2.43
DOWNWARD DISTRIBUTED LOAD (lbs./ft.):		71	71	71	71	71	71
UPWARD LOAD TRIB. WIDTH (ft.):		2.43	2.43	2.43	2.43	2.43	2.43
UPWARD DISTRIBUTED LOAD (lbs./ft.):		42	42	42	42	42	42
DESIGN DOWNWARD BENDING MOMENT, Mu (ft.-lbs.):		4970	1691	1691	2642	2642	2512
DESIGN DOWNWARD END SHEAR (lbs.):		649	380	380	475	475	463
DESIGN UPWARD BENDING MOMENT, Mu (ft.-lbs.):		3134	1008	1008	1575	1575	1671
DESIGN UPWARD END SHEAR (lbs.):		501	226	226	283	283	383
PURLIN BRACING LOCATIONS:		M/S	---	---	M/S	M/S	M/S
INSIDE FLANGE UNBRACED LENGTH (FT.):		9.00	10.67	10.67	6.67	6.67	6.33
(Mn values from NASPEC Section C3.1) -->							
+Mn allow (ft.-lbs.):		6713	6713	6713	6713	6713	6713
-Mn allow (ft.-lbs.):		4343	3043	3043	5960	5960	5960
		OK	OK	OK	OK	OK	OK
DOWNWARD DEFLECTION (in.):		0.80	0.09	0.09	0.22	0.22	0.20
		= (L/274)	(> L/1000)	(> L/1000)	= (L/709)	= (L/709)	= (L/765)
UPWARD DEFLECTION (in.):		0.48	0.05	0.05	0.13	0.13	0.12
		= (L/457)	(> L/1000)	(> L/1000)	(> L/1000)	(> L/1000)	(> L/1000)
		8in x 3.5in 14G Eave Strut Typ. OK					

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WALL GIRT DESIGN

MEMBER SIZE USED -->		SIDEWALL 'A' AND 'B' GIRT DESIGN					
		6in x 2.125/2.375in 14G ZEE					
		BAY #1	BAY #2	BAY #3	BAY #4	BAY #5	BAY #6
BAY WIDTH (ft.):		18.33	10.67	10.67	13.33	13.33	13.00
MAX. GIRT SPAN (ft.):		18.33	10.67	10.67	13.33	13.33	13.00
TRIB. WIDTH (ft.):		4.67	4.67	4.67	4.67	4.67	4.67
INWARD DISTRIBUTED LOAD (lbs./ft.):		65	65	65	65	65	65
OUTWARD DISTRIBUTED LOAD (lbs./ft.):		71	71	71	71	71	71
DESIGN INWARD BENDING MOMENT, Mu (ft.-lbs.):		4612	1544	1544	2412	2412	2345
DESIGN INWARD END SHEAR (lbs.):		624	347	347	433	433	449
DESIGN OUTWARD BENDING MOMENT, Mu (ft.-lbs.):		4975	1696	1696	2650	2650	2519
DESIGN OUTWARD END SHEAR (lbs.):		685	381	381	476	476	493
GIRT BRACING LOCATIONS:		1/3 PTS.	---	---	M/S	M/S	M/S
INSIDE FLANGE UNBRACED LENGTH (FT.):		6.11	10.67	10.67	6.67	6.67	6.50
(Mn values from NASPEC Section C3.1) -->							
+Mn allow (ft.-lbs.):		5760	5760	5760	5760	5760	5760
-Mn allow (ft.-lbs.):		5491	2663	2663	5477	5477	5491
		OK	OK	OK	OK	OK	OK
INWARD DEFLECTION (in.):		1.22	0.14	0.14	0.34	0.34	0.31
		= (L/179)	= (L/909)	= (L/909)	= (L/465)	= (L/465)	= (L/502)
OUTWARD DEFLECTION (in.):		1.34	0.15	0.15	0.37	0.37	0.34
		= (L/163)	= (L/828)	= (L/828)	= (L/423)	= (L/423)	= (L/457)

ENDWALL 'A' GIRT DESIGN					
MEMBER SIZE USED -->	6in x 2.125/2.375in 12G ZEE				
	BAY #1	BAY #2			
	BAY WIDTH (ft.):	18.33	18.33		
	MAX. GIRT SPAN (ft.):	18.33	18.33		
	TRIB. WIDTH (ft.):	6.33	6.33		
	INWARD DISTRIBUTED LOAD (lbs./ft.):	86	86		
	OUTWARD DISTRIBUTED LOAD (lbs./ft.):	94	94		
DESIGN INWARD BENDING MOMENT, Mu (ft.-lbs.):	6054	6054			
DESIGN INWARD END SHEAR (lbs.):	815	815			
DESIGN OUTWARD BENDING MOMENT, Mu (ft.-lbs.):	6669	6669			
DESIGN OUTWARD END SHEAR (lbs.):	898	898			
GIRT BRACING LOCATIONS:	1/3 PTS.	1/3 PTS.			
INSIDE FLANGE UNBRACED LENGTH (FT.): (Mn values from NASPEC Section C3.1) -->	6.11	6.11			
+Mn allow (ft.-lbs.):	9500	9500			
-Mn allow (ft.-lbs.):	8445	8445			
	OK	OK			
INWARD DEFLECTION (in.):	1.10 = (L/198)	1.10 = (L/198)			
OUTWARD DEFLECTION (in.):	1.21 = (L/180)	1.21 = (L/180)			

ENDWALL 'B' GIRT DESIGN					
6in x 2.125/2.375in 12G ZEE					
BAY #1	BAY #2				
18.33	18.33				
18.33	18.33				
6.33	6.33				
86	86				
94	94				
6054	6054				
815	815				
6669	6669				
898	898				
1/3 PTS.	1/3 PTS.				
6.11	6.11				
9500	9500				
8445	8445				
OK	OK				
1.10 = (L/198)	1.10 = (L/198)				
1.21 = (L/180)	1.21 = (L/180)				

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ENDWALL COLUMN DESIGN

LOCATION:	ENDWALL 'A' (LEFT ENDWALL)	
COLUMN #:	1-2	
END BAY (Y/N?):	Y	
DISTANCE FROM BLDG. CORNER:	20.00	
BAY WIDTH TO SIDE 1 (ft.):	20.00	
BAY WIDTH TO SIDE 2 (ft.):	20.00	
MAX. ENDWALL COLUMN HT. (ft.):	18.31	
MAX. TRIB. WIDTH (ft.):	18.92	
MAX. DISTRIBUTED LOAD (plf):	261	
MAX DESIGN MOMENT, with $\Omega_f = 1.67$ (ft.-lbs.):	18262	
V horiz. (lbs.):	2389	
# OF #14 TOP END CONN. SCREWS:	10	
COMPOSITE DESIGN (Y/N)?	N	
ENDWALL COLUMN MEMBER -->	Sgl. 12in x 4in 12G CEE	
DESIGN SECTION -->	12in x 4in 12G CEE	
FLYBRACING ELEV. (ft.):	12.67	
INSIDE FLANGE UNBRACED LENGTH (FT.):	12.67	
(Mn values from NASPEC Section C3.1) -->		
+Mn allow =	29243	
-Mn allow =	20127	
DEFLECTION :	OK	
DEFLECTION (L/?):	0.48	
	L/458	
	OK	

LOCATION:	ENDWALL 'B' (RIGHT ENDWALL)	
COLUMN #:	1-2	
END BAY (Y/N?):	Y	
DISTANCE FROM BLDG. CORNER:	20.00	
BAY WIDTH TO SIDE 1 (ft.):	20.00	
BAY WIDTH TO SIDE 2 (ft.):	20.00	
MAX. ENDWALL COLUMN HT. (ft.):	18.31	
MAX. TRIB. WIDTH (ft.):	18.92	
MAX. DISTRIBUTED LOAD (plf):	261	
MAX DESIGN MOMENT, with $\Omega_f = 1.67$ (ft.-lbs.):	18262	
V horiz. (lbs.):	2389	
# OF #14 TOP END CONN. SCREWS:	9	
COMPOSITE DESIGN (Y/N)?	N	
ENDWALL COLUMN MEMBER -->	Sgl. 12in x 4in 12G CEE	
DESIGN SECTION -->	12in x 4in 12G CEE	
FLYBRACING ELEV. (ft.):	12.67	
INSIDE FLANGE UNBRACED LENGTH (FT.):	12.67	
(Mn values from NASPEC Section C3.1) -->		
+Mn allow =	29243	
-Mn allow =	20127	
DEFLECTION :	OK	
DEFLECTION (L/?):	0.48	
	L/458	
	OK	

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OPENING FRAMING DESIGN

OPENING #	WALL LOCATION	BAY #	DESIGN WIND PRESSURE (psf):	BAY WIDTH (ft.)	MAX. DIST. FROM EDGE OF BAY TO OPENING C.L.	OPENING WIDTH (ft.)	OPENING HEIGHT (ft.)	DESIGN JAMB HEIGHT (ft.)	JAMB MOMENT (ft.-lbs.)	JAMB MEMBER	ALLOWABLE MOMENT FOR JAMB MEMBER (ft.-lbs.)		HEADER GIRT LENGTH (ft.)	HEADER GIRT MOMENT (ft.-lbs.)		HEADER GIRT MEMBER	HEADER GIRT MEMBER (SINGLE OR DOUBLE)	ALLOWABLE MOMENT FOR HEADER GIRT (ft.-lbs.)	BRACING (ft.)		OPENING #
1	Sidewall A	1	15.53	18.67	9.33	16.00	12.00	13.32	4973	6in x 4in 16G CEE	5198	OK	--								1
2	Sidewall B	1	15.53	18.67	9.33	16.00	12.00	13.32	4973	6in x 4in 16G CEE	5198	OK	--								2
3	Sidewall A	4	15.35	13.33	6.67	10.00	12.00	13.32	3309	6in x 3in 16G CHANNEL	3495	OK	---								3
4	Sidewall A	5	15.35	13.33	6.67	10.00	12.00	13.32	3309	6in x 3in 16G CHANNEL	3495	OK	---								4
5	Sidewall B	5	15.35	13.33	6.67	10.00	12.00	13.32	3309	6in x 3in 16G CHANNEL	3495	OK	---								5
6	Sidewall B	4	15.35	13.33	6.67	10.00	12.00	13.32	3309	6in x 3in 16G CHANNEL	3495	OK	---								6
7	Sidewall A	6	16.41	13.33	6.67	10.00	12.00	13.32	3537	6in x 3in 14G CHANNEL	4398	OK	---								7
8	Sidewall B	6	16.41	13.33	6.67	10.00	12.00	13.32	3537	6in x 3in 14G CHANNEL	4398	OK	---								8
9	Endwall A	2	14.98	18.17	16.00	3.00	7.00	12.67	4381	6in x 4in 14G CHANNEL	4587	OK	17.77	6055		6in x 2.125/2.375in 12G ZEE	SGL.	8565	6.11	OK	9
10	Endwall B	1	14.98	18.17	14.17	3.00	7.00	12.67	4381	6in x 4in 14G CHANNEL	4587	OK	17.77	6055		6in x 2.125/2.375in 12G ZEE	SGL.	8565	6.11	OK	10
11	Endwall B	2	14.98	18.17	16.00	3.00	7.00	12.67	4381	6in x 4in 14G CHANNEL	4587	OK	17.77	6055		6in x 2.125/2.375in 12G ZEE	SGL.	8565	6.11	OK	11
12	Endwall A	1	14.98	18.17	14.17	3.00	7.00	12.67	4381	6in x 4in 14G CHANNEL	4587	OK	17.77	6055		6in x 2.125/2.375in 12G ZEE	SGL.	8565	6.11	OK	12

FOUNDATION DESIGN

CONCRETE STRENGTH (f'c):	2500 psi
REINF. YIELD STRENGTH:	60000 psi
ALLOW. SOIL PRESSURE:	1500 psf

NOTE: FOOTING SHALL EXTEND BELOW LOCAL FROST DEPTH. CONSULT LOCAL BUILDING DEPARTMENT FOR REQUIREMENTS.

SIDEWALL CONTINUOUS FOOTING

CONCRETE SLAB THICKNESS	6 in. (MIN.)	
DEPTH OF FTG. BELOW GRADE	18 in. (MIN.)	
DESIGN SOIL PRESSURE	1418 psf	
FOOTING WIDTH	12 IN. (MIN.)	
FOOTING DEPTH	18 IN. (MIN.)	
DOWNWARD LOAD AT C.S. FRAME	8882 lbs.	
FOOTING AREA REQUIRED	6.3 ft.^2	
NET UPLIFT LOAD AT C.S. FRAME	1547 lbs. *	
NET UPLIFT FROM SIDEWALL X-BRACE	0 lbs.	
DESIGN d top	16.0 in.	
DESIGN d bottom	14.5 in.	
LENGTH FTG. REQ'D. (DL+SN)	6.3 ft.	OK
LENGTH FTG. REQ'D (UPLIFT)	3.6 ft.	OK

Mu DESIGN MOMENT (ft.-lbs.): a= AREA OF REINF. REQUIRED: AREA OF REINF. PROVIDED:			(ACTUAL MOMENT AT ANCHOR BOLT LOCATION = 693 FT.-LBS., f(t) top = 12 psi AND f(r) = 375 psi, THEREFORE DESIGN ANCHOR BOLTS IN UNCRACKED CONCRETE (SEE CALC PG. F3) (FROM A.C.I. FLEXURE TABLES) OK
	TOP	BOTTOM	
	971	11821	
	0.03	0.43	
	0.02	0.25	
	0.20	0.31	OK

USE -----> 12" WIDE BY 18" DEEP FOOTING W/ (1)-#4 TOP AND (1)-#5 BTM.
(NO SHEAR REINF. REQ'D)

FOUNDATION DESIGN

CONCRETE STRENGTH (f'c): 2500 psi
REINF. YIELD STRENGTH: 60000 psi
ALLOW. SOIL PRESSURE: 1500 psf

NOTE: FOOTING SHALL EXTEND BELOW LOCAL FROST DEPTH. CONSULT
LOCAL BUILDING DEPARTMENT FOR REQUIREMENTS.

ENDWALL CONTINUOUS FOOTING

CONCRETE SLAB THICKNESS 6 in. (MIN.)
DEPTH OF FTG. BELOW GRADE 18 in. (MIN.)
DESIGN SOIL PRESSURE 1418 psf
FOOTING WIDTH 12 IN. (MIN.)
FOOTING DEPTH 18 IN. (MIN.)
DOWNWARD LOAD AT ENDWALL COLUMN 3746 lbs.
FOOTING AREA REQUIRED 2.6 ft.^2
NET UPLIFT LOAD FROM ENDWALL COLUMN 2444 lbs.
NET UPLIFT FROM ENDWALL X-BRACE -151 lbs.
DESIGN d top 16.0 in.
DESIGN d bottom 14.5 in.
LENGTH FTG. REQ'D. (DL+SN) 2.6 ft. OK
LENGTH FTG. REQ'D (UPLIFT) 5.7 ft. OK

Mu DESIGN MOMENT (ft.-lbs.):

AREA OF STEEL REQ.
AREA OF STL. PROVIDED

a=	TOP	BOTTOM	(ACTUAL MOMENT AT ANCHOR BOLT LOCATION = 1731 FT.-LBS., f(t) top = 32 psi AND f(r) = 375 psi, THEREFORE DESIGN ANCHOR BOLTS IN UNCRACKED CONCRETE (SEE CALC PG. F4) (FROM A.C.I. FLEXURE TABLES) OK
	2425	2102	
	0.08	0.08	
	0.05	0.04	
	0.20	0.20	OK

USE -----> 12" WIDE BY 18" DEEP FOOTING W/ (1)-#4 TOP AND (1)-#4 BTM.

(NO SHEAR REINF. REQ'D)

Alliance Engineering of Oregon, Inc

CONCRETE ANCHOR DESIGN PER ACI 318-19, CHAPTER 17

ANCHOR LOCATION: SIDEWALL C.S. FRAME COLUMNS

DESIGN LOADS (from RISA analysis), ALLOWABLE STRESS LEVELS :	SIDE #1	SIDE #2	CONCRETE ANCHOR MANUFACTURER AND TYPE: DEWALT 'SCREW-BOLT+' ANCHOR (VALUES FROM ICC REPORT ESR-3889, EFF. THRU 11/2025)			
D.L. SHEAR FORCE (LBS.), POSITIVE SHEAR LOADS ARE TOWARD EDGE OF SLAB:	659	659	STEEL CONCRETE ANCHOR			
D.L. VERTICAL FORCE (LBS.):	-1666	-1666	TENSILE STRENGTH:	115000	PSI	
F.L.L. SHEAR FORCE (LBS.):	0	0	NORMAL WT. CONCRETE			
F.L.L. VERTICAL FORCE (LBS.):	0	0	STRENGTH (f'c):	2500	PSI	
RLL SHEAR FORCE (LBS.):	1308	1308	CONCRETE ANCHOR TENSION			
RLL VERTICAL FORCE (LBS.):	-3304	-3304	REINFORCING PROVIDED?	N		
SL SHEAR FORCE (LBS.):	2665	2665	CONCRETE ANCHOR SHEAR			
SL VERTICAL FORCE (LBS.):	-6735	-6735	REINFORCING PROVIDED?	N		
WIND L-R SHEAR FORCE (LBS.):	-2247	488				
WIND L-R VERTICAL FORCE (LBS.):	3045	1897				
WIND R-L SHEAR FORCE (LBS.):	488	-2247				
WIND R-L VERTICAL FORCE (LBS.):	1897	3045				
SEISMIC SHEAR FORCE (LBS.):	651	-651				
SEISMIC VERTICAL FORCE (LBS.):	-452	452				
ACI 318-19 Table 5.3.1:	(Eqn. 9-2)	(Eqn. 9-3)	(Eqn. 9-4)	(Eqn. 9-5)	(Eqn. 9-6)	(Eqn. 9-7)
GOVERNING LOAD COMB. EQUATION:	(9-2b.1)	(9-3f.1)	(9-4d.1)	(9-5a.1)	(9-6b.2)	(9-7a.1)
ULT. SHEAR FORCE (LBS.), Vu:	2124	5208	2428	2254	-1653	1523
ULT. TENSION FORCE (LBS.), Tu:	0	0	0	0	1546	0
CONCRETE ANCHOR TYPE (diam. x length):	.5X3.0					
CONCRETE ANCHOR DIAM. (IN.):	0.500	0.500	0.500	0.500	0.500	0.500
CONCRETE ANCHOR LENGTH (IN.):	3.00	3.00	3.00	3.00	3.00	3.00
NUMBER OF CONCRETE ANCHORS:	4	4	4	4	4	4
SPECIAL INSPECTION REQUIRED?	N	N	N	N	N	N
X' CONCRETE ANCHOR SPACING:	8.00	8.00	8.00	8.00	8.00	8.00
Y' CONCRETE ANCHOR SPACING:	2.96	2.96	2.96	2.96	2.96	2.96
EFFECTIVE EMBEDMENT:	2.17	2.17	2.17	2.17	2.17	2.17
LOAD EDGE DISTANCE, c1:	9.00	9.00	9.00	9.00	36.00	9.00
PERP. EDGE DISTANCE, c2:	48.0	48.0	48.0	48.0	48.0	48.0
DEPTH OF CONCRETE EDGE (IN.):	18.0	18.0	18.0	18.0	18.0	18.0
CRACKED CONCRETE CONDITION (Y/N)?	N	N	N	N	N	N
e eccentricity (IN.) =	0.00	0.00	0.00	0.00	0.00	0.00
psi [ec,N] ((Eqn. 17.4.2.5a)) =	1.00	1.00	1.00	1.00	1.00	1.00
psi [ed,N] ((Eqn. 17.4.2.7a, 17.4.2.7b)) =	1.00	1.00	1.00	1.00	1.00	1.00
psi [c,N] ((Sec. 17.4.2.6)) =	1.40	1.40	1.40	1.40	1.40	1.40
psi [cp,N] (Eqn.17.4.2.7b, 17.4.3.1) =	1.00	1.00	1.00	1.00	1.00	1.00
psi [c,P] (Sec. 17.4.3.6) =	1.40	1.40	1.40	1.40	1.40	1.40
V eccentricity (IN.) =	0.00	0.00	0.00	0.00	0.00	0.00
psi [ec,V] (Eqn. 17.5.2.5) =	1.00	1.00	1.00	1.00	1.00	1.00
psi [ed,V] (Eqn. 17.5.2.6a, 17.5.2.6b) =	1.00	1.00	1.00	1.00	0.97	1.00
psi [c,V] (Sec. 17.5.2.7) =	1.40	1.40	1.40	1.40	1.40	1.40
ANo (IN.^2) =	42.4	42.4	42.4	42.4	42.4	42.4
AN (IN.^2) =	61.6	61.6	61.6	61.6	61.6	61.6
Nb (LBS.) =	3836	3836	3836	3836	3836	3836
Ncbg (LBS.) =	7812	7812	7812	7812	7812	7812
Ns (LBS.) =	81900	81900	81900	81900	81900	81900
Npn (LBS.) =	0	0	0	0	0	0
SEISMIC TENSION DUCTILITY FACTOR:	1.00	1.00	1.00	0.40	1.00	0.40
ΦNn (LBS.) =	7812	7812	7812	3125	7812	3125
	0.00%	0.00%	0.00%	0.00%	19.78%	0.00%
Avc (IN.^2) =	472.5	472.5	472.5	472.5	1980.0	472.5
Avco (IN.^2) =	364.5	364.5	364.5	364.5	5832.0	364.5
Vb (LBS.) =	8962	8962	8962	8962	71698	8962
Vcbg (LBS.) =	16265	16265	16265	16265	32943	16265
Vs (LBS.) =	35440	35440	35440	35440	35440	35440
SEISMIC SHEAR DUCTILITY FACTOR:	1.00	1.00	1.00	0.40	1.00	0.40
ΦVn (LBS.) =	16265	16265	16265	6506	32943	6506
	13.06%	32.02%	14.93%	34.65%	5.02%	23.42%
MAX. UNITY VALUE (Sec. 17.6):	0.13	0.32	0.15	0.35	0.20	0.23
MAX. UNITY:	0.35					

USE -----> (4) - 1/2" DIAM. X 3" LONG DEWALT 'SCREW-BOLT+' ANCHOR CONCRETE ANCHORS IN 3.5 IN. DEEP HOLES

(SIDEWALL CONCRETE ANCHOR DESIGN GOVERNS AT THIS LOCATION)

Alliance Engineering of Oregon, Inc

CONCRETE ANCHOR DESIGN PER ACI 318-19, CHAPTER 17

ANCHOR LOCATION: ENDWALL COLUMNS

DESIGN LOADS AT ALLOWABLE STRESS LEVELS :

D.L. SHEAR FORCE (LBS.), POSITIVE SHEAR LOADS ARE TOWARD EDGE OF SLAB:	1
D.L. TENSION FORCE (LBS.):	-1079
F.L.L. SHEAR FORCE (LBS.):	0
F.L.L. TENSION FORCE (LBS.):	0
SL (RLL) SHEAR FORCE (LBS.):	0
SL (RLL) TENSION FORCE (LBS.):	-3595
WIND SHEAR FORCE (LBS.):	2389
WIND TENSION FORCE (LBS.):	3494
SEISMIC SHEAR FORCE (LBS.):	151
SEISMIC TENSION FORCE (LBS.):	0

CONCRETE ANCHOR
MANUFACTURER AND TYPE: DEWALT 'SCREW-BOLT+' ANCHOR
(VALUES FROM ICC REPORT ESR-3889, EFF. THRU 11/2025)

STEEL ANCHOR TENSILE STRENGTH:	115000	PSI
NORMAL WT. CONCRETE STRENGTH:	2500	PSI
ANCHOR TENSION REINFORCING PROVIDED?	N	
ANCHOR SHEAR REINFORCING PROVIDED?	N	

ACI 318-19 Table 5.3.1:	(EQ. 9-2)	(EQ. 9-3)	(EQ. 9-4)	(EQ. 9-5)	(EQ. 9-6)	(EQ. 9-7)
ULT. SHEAR FORCE (LBS.), Vu:	2	1912	2390	152	2390	152
ULT. TENSION FORCE (LBS.), Tu:	0	0	403	0	2524	0
ANCHOR TYPE (diam. x length):	.5X3.0					
ANCHOR DIAM. (IN.):	0.500	0.500	0.500	0.500	0.500	0.500
ANCHOR LENGTH (IN.):	3.00	3.00	3.00	3.00	3.00	3.00
NUMBER OF ANCHORS:	2	2	2	2	2	2
SPECIAL INSPECTION REQUIRED?	N	N	N	N	N	N
X' ANCHOR SPACING:	8.00	8.00	8.00	8.00	8.00	8.00
EFFECTIVE EMBEDMENT:	2.17	2.17	2.17	2.17	2.17	2.17
LOAD EDGE DISTANCE, c1:	8.00	8.00	8.00	8.00	8.00	8.00
PERP. EDGE DISTANCE, c2:	48.00	48.00	48.00	48.00	48.00	48.00
DEPTH OF CONCRETE EDGE (IN.):	18.0	18.0	18.00	18.00	18.00	18.00
CRACKED CONCRETE CONDITION (Y/N)?	N	N	N	N	N	N
e eccentricity (IN.) =	0.00	0.00	0.00	0.00	0.00	0.00
psi [ec,N] ((Eqn. 17.4.2.5a)) =	1.00	1.00	1.00	1.00	1.00	1.00
psi [ed,N] ((Eqn. 17.4.2.7a, 17.4.2.7b)) =	1.00	1.00	1.00	1.00	1.00	1.00
psi [c,N] ((Sec. 17.4.2.6)) =	1.40	1.40	1.40	1.40	1.40	1.40
psi [cp,N] (Eqn.17.4.2.7b, 17.4.3.1) =	1.00	1.00	1.00	1.00	1.00	1.00
psi [c,P] (Sec. 17.4.3.6) =	1.40	1.40	1.40	1.40	1.40	1.40
V eccentricity (IN.) =	0.00	0.00	0.00	0.00	0.00	0.00
psi [ec,V] (Eqn. 17.5.2.5) =	1.00	1.00	1.00	1.00	1.00	1.00
psi [ed,V] (Eqn. 17.5.2.6a, 17.5.2.6b) =	0.73	0.73	0.73	0.73	0.73	0.73
psi [c,V] (Sec. 17.5.2.7) =	1.40	1.40	1.40	1.40	1.40	1.40
ANo (IN.^2) =	42.4	42.4	42.4	42.4	42.4	42.4
AN (IN.^2) =	42.4	42.4	42.4	42.4	42.4	42.4
Nb (LBS.) =	3836	3836	3836	3836	3836	3836
Ncbg (LBS.) =	5370	5370	5370	5370	5370	5370
Ns (LBS.) =	40950	40950	40950	40950	40950	40950
Npn (LBS.) =	0	0	0	0	0	0
SEISMIC TENSION DUCTILITY FACTOR:	1.00	1.00	1.00	0.40	1.00	0.40
ΦNn (LBS.) =	5370	5370	5370	2148	5370	2148
	0.00%	0.00%	7.50%	0.00%	46.99%	0.00%
Avc (IN.^2) =	384.0	384.0	384.0	384.0	384.0	384.0
Avco (IN.^2) =	288.0	288.0	288.0	288.0	288.0	288.0
Vb (LBS.) =	7511	7511	7511	7511	7511	7511
Vcbg (LBS.) =	10281	10281	10281	10281	10281	10281
Vs (LBS.) =	17720	17720	17720	17720	17720	17720
SEISMIC SHEAR DUCTILITY FACTOR:	1.00	1.00	1.00	0.40	1.00	0.40
ΦVn (LBS.) =	10281	10281	10281	4113	10281	4113
	0.01%	18.60%	23.25%	3.71%	23.24%	3.70%
MAX. UNITY VALUE (Sec. 17.6):	0.00	0.19	0.23	0.04	0.70	0.04

MAX. UNITY:

USE ----> (2) - 1/2" DIAM. X 3" LONG DEWALT 'SCREW-BOLT+' ANCHOR ANCHORS IN 3.5 IN. DEEP HOLES

(ENDWALL ANCHOR DESIGN GOVERNS AT THIS LOCATION)

Alliance Engineering of Oregon, Inc

CONCRETE ANCHOR DESIGN PER ACI 318-19, CHAPTER 17

ANCHOR LOCATION: SIDEWALL OPENING JAMBS

DESIGN LOADS AT ALLOWABLE STRESS LEVELS :

D.L. SHEAR FORCE (LBS.), POSITIVE SHEAR	
LOADS ARE TOWARD EDGE OF SLAB:	0
D.L. TENSION FORCE (LBS.):	0
F.L.L. SHEAR FORCE (LBS.):	0
F.L.L. TENSION FORCE (LBS.):	0
SL (RLL) SHEAR FORCE (LBS.):	0
SL (RLL) TENSION FORCE (LBS.):	0
WIND SHEAR FORCE (LBS.):	896
WIND TENSION FORCE (LBS.):	0
SEISMIC SHEAR FORCE (LBS.):	51
SEISMIC TENSION FORCE (LBS.):	0

CONCRETE ANCHOR		
MANUFACTURER AND TYPE: DEWALT 'SCREW-BOLT+' ANCHOR		
(VALUES FROM ICC REPORT ESR-3889, EFF. THRU 11/2025)		
STEEL ANCHOR TENSILE		
STRENGTH:	95000	PSI
NORMAL WT. CONCRETE		
STRENGTH:	2500	PSI
ANCHOR TENSION REINFORCING		
PROVIDED?	N	
ANCHOR SHEAR REINFORCING		
PROVIDED?	N	

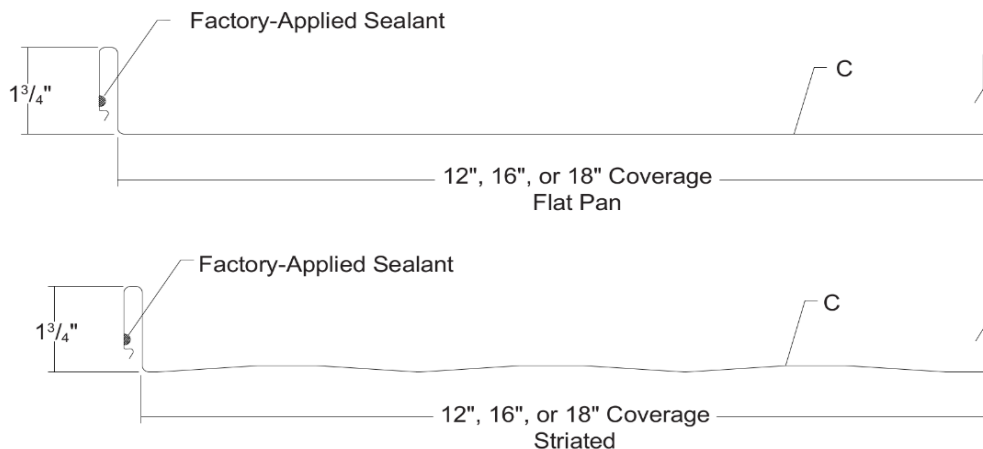
ACI 318-19 Table 5.3.1:	(EQ. 9-2)	(EQ. 9-3)	(EQ. 9-4)	(EQ. 9-5)	(EQ. 9-6)	(EQ. 9-7)
ULT. SHEAR FORCE (LBS.), Vu:	0	717	896	51	896	51
ULT. TENSION FORCE (LBS.), Tu:	0	0	0	0	0	0
ANCHOR TYPE (diam. x length):	.625X5.0					
ANCHOR DIAM. (IN.):	0.625	0.625	0.625	0.625	0.625	0.625
ANCHOR LENGTH (IN.):	5.00	5.00	5.00	5.00	5.00	5.00
NUMBER OF ANCHORS:	1	1	1	1	1	1
SPECIAL INSPECTION REQUIRED?	N	N	N	N	N	N
EFFECTIVE EMBEDMENT:	3.73	3.73	3.73	3.73	3.73	3.73
LOAD EDGE DISTANCE, c1:	3.00	3.00	3.00	3.00	3.00	3.00
PERP. EDGE DISTANCE, c2:	48.00	48.00	48.00	48.00	48.00	48.00
DEPTH OF CONCRETE EDGE:	18.0	18.0	18.00	18.00	18.00	18.00
CRACKED CONCRETE CONDITION (Y/N)?	N	N	N	N	N	N
e eccentricity (IN.) =	0.00	0.00	0.00	0.00	0.00	0.00
psi [ec,N] ((Eqn. 17.4.2.5a)) =	1.00	1.00	1.00	1.00	1.00	1.00
psi [ed,N] ((Eqn. 17.4.2.7a, 17.4.2.7b)) =	0.86	0.86	0.86	0.86	0.86	0.86
psi [c,N] ((Sec. 17.4.2.6)) =	1.40	1.40	1.40	1.40	1.40	1.40
psi [cp,N] (Eqn.17.4.2.7b, 17.4.3.1) =	0.55	0.55	0.55	0.55	0.55	0.55
psi [c,P] (Sec. 17.4.3.6) =	1.00	1.00	1.00	1.00	1.00	1.00
V eccentricity (IN.) =	0.00	0.00	0.00	0.00	0.00	0.00
psi [ec,V] (Eqn. 17.5.2.5) =	1.00	1.00	1.00	1.00	1.00	1.00
psi [ed,V] (Eqn. 17.5.2.6a, 17.5.2.6b) =	1.00	1.00	1.00	1.00	1.00	1.00
psi [c,V] (Sec. 17.5.2.7) =	1.40	1.40	1.40	1.40	1.40	1.40
ANo (IN.^2) =	125.2	125.2	125.2	125.2	125.2	125.2
AN (IN.^2) =	125.2	125.2	125.2	125.2	125.2	125.2
Nb (LBS.) =	8645	8645	8645	8645	8645	8645
Ncbg (LBS.) =	5771	5771	5771	5771	5771	5771
Ns (LBS.) =	26260	26260	26260	26260	26260	26260
Npn (LBS.) =	0	0	0	0	0	0
SEISMIC TENSION DUCTILITY FACTOR:	1.00	1.00	1.00	1.00	1.00	1.00
ΦNn (LBS.) =	5771	5771	5771	5771	5771	5771
	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Avc (IN.^2) =	40.5	40.5	40.5	40.5	40.5	40.5
Avco (IN.^2) =	40.5	40.5	40.5	40.5	40.5	40.5
Vb (LBS.) =	2055	2055	2055	2055	2055	2055
Vcbg (LBS.) =	2877	2877	2877	2877	2877	2877
Vs (LBS.) =	15585	15585	15585	15585	15585	15585
SEISMIC SHEAR DUCTILITY FACTOR:	1.00	1.00	1.00	1.00	1.00	1.00
ΦVn (LBS.) =	2877	2877	2877	2877	2877	2877
	0.00%	24.92%	31.14%	1.77%	31.14%	1.77%
MAX. UNITY VALUE (Sec. 17.6):	0.00	0.25	0.31	0.02	0.31	0.02

MAX. UNITY: 0.31
USE -----> (1) - 5/8" DIAM.X 5" LONG DEWALT 'SCREW-BOLT+' ANCHOR ANCHORS IN 5.5 IN. DEEP HOLES

(OPENING JAMB ANCHOR DESIGN GOVERNS AT THIS LOCATION)

VERTICAL SEAM

**Condensed
Technical
Reference**



SECTION PROPERTIES

ALLOWABLE UNIFORM LOADS, psf For various clip spacings

Ga	Width in	Yield ksi	Weight psf	Top In Compression		Bottom In Compression		Inward Load						Outward Load					
				Ixx	Sxx	Ixx	Sxx												
				in ⁴ /ft	in ³ /ft	in ⁴ /ft	in ³ /ft	2.5'	3'	3.5'	4'	4.5'	5'	2.5'	3'	3.5'	4'	4.5'	5'
26	12	50	1.06	0.0781	0.0530	0.0377	0.0408	148	104	77	59	-	-	55	49	42	36	-	-
26	16	50	0.97	0.0614	0.0402	0.0283	0.0306	114	79	58	45	-	-	55	49	42	36	-	-
26	18	50	0.94	0.0553	0.0358	0.0253	0.0273	-	-	-	-	-	-	-	-	-	-	-	-
24	12	50	1.38	0.1118	0.0774	0.0533	0.0557	204	143	105	81	64	52	44	43	42	41	40	39
24	16	50	1.26	0.0885	0.0589	0.0398	0.0419	153	107	79	61	48	39	42	38	34	30	27	24
24	18	50	1.22	0.0800	0.0526	0.0353	0.0372	136	95	70	54	43	35	33	30	27	24	20	19
22	12	50	1.81	0.1533	0.1071	0.0773	0.0771	284	198	146	112	89	72	69	67	65	62	60	58
22	16	50	1.66	0.1230	0.0822	0.0585	0.0579	213	149	110	84	66	54	54	51	48	45	36	35
22	18	50	1.60	0.1113	0.0736	0.0520	0.0515	190	132	97	75	59	48	31	30	29	29	28	27

- Theoretical section properties have been calculated per AISI 2012 'North American Specification for the Design of Cold-Formed Steel Structural Members'. Ixx and Sxx are effective section properties for deflection and bending.
 - Allowable loads are calculated in accordance with AISI 2012 specifications considering bending, shear, combined bending and shear, deflection and ASTM E 1592 uplift testing for 24 ga and 22 ga and UL 580 uplift testing for 26 ga. Allowable loads consider the 3 or more equal spans condition. Allowable loads do not address web crippling, fasteners or support material. Panel weight is not considered.
 - Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
 - Allowable loads do not include a 1/3 stress increase for wind.
- Indicates that no testing is available for the application.

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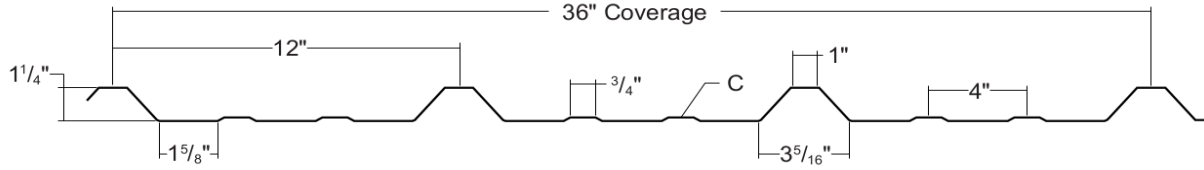
TESTING AND APPROVALS

- ▶ UL 2218 Impact Resistance - Class 4
- ▶ UL 790 Fire Resistance Rating - Class A, per building code
- ▶ UL 263 Fire Resistance Rating - per assembly
- ▶ ASTM E 283 Air Leakage - 0.035 cfm/ft² at 1.57 psf
- ▶ ASTM E 331 Water Penetration - none at 12 psf
- ▶ ASTM E 1680 Air Leakage - 0.0036 cfm/ft² at 6.24 psf
- ▶ ASTM E 1646 Water Penetration - none at 6.24 psf
- ▶ ASTM E 1592 Structural Performance
- ▶ UL 580 Uplift Resistance - Class 90 Constructions: #436, #446 and #448
- ▶ Texas Windstorm - Evaluation RC-412
- ▶ 2017 FBC Approvals - FL11560.10, FL11560.11, FL 11560.12, FL11560.13 and FL11560.14
- ▶ Miami-Dade County, Florida - NOA 13-0905.05, expires 3/8/2019
- ▶ ICC Evaluation Report - ESR-2385

ms metal sales
manufacturing corporation

PBR-PANEL

Condensed Technical Reference



SECTION PROPERTIES								ALLOWABLE UNIFORM LIVE LOADS, psf For various fastener spacings													
Ga	Width in	Yield ksi	Weight psf	Top in Compression		Bottom in Compression		Inward Load							Outward Load						
				Ixx in ⁴ /ft	Sxx in ³ /ft	Ixx in ⁴ /ft	Sxx in ³ /ft	2'	3'	4'	5'	6'	7'	2'	3'	4'	5'	6'	7'		
26	36	80	0.84	0.0367	0.0367	0.0317	0.0458	261	129	76	49	35	23	223	107	62	40	28	21		
24	36	50	1.09	0.0560	0.0579	0.0457	0.0613	330	153	88	57	39	29	314	145	83	53	37	27		
22	36	50	1.43	0.0800	0.0860	0.0633	0.0816	453	207	118	76	53	39	474	217	124	80	55	41		

- Theoretical section properties have been calculated per AISI 2016 'North American Specification for the Design of Cold-Formed Steel Structural Members'. Ixx and Sxx are effective section properties for deflection and bending.
- Allowable load is calculated in accordance with AISI 2016 specifications considering bending, shear, combined bending and shear & deflection. Allowable load does not address web crippling, fasteners, support material or load testing. Allowable load considers the three or more equal spans condition. Panel weight is not considered.
- Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
- Allowable loads do not include a 1/3 stress increase for wind.

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TESTING AND APPROVALS

- ▶ UL 2218 Impact Resistance - Class 4
- ▶ UL 790 Fire Resistance Rating - Class A, per building code
- ▶ UL 263 Fire Resistance Rating - per assembly
- ▶ ASTM E 1592 Structural Performance
- ▶ UL 580 Uplift Resistance - Class 90 Construction: #161
- ▶ Texas Windstorm - Evaluations RC-198, RC-265 and RC-279
- ▶ 2020 FBC Approvals - FL9482.4, FL10999.7 and FL14645.12
- ▶ Miami-Dade County, Florida NOA 20-0331.02 - Wall expires 4/22/2025
- ▶ Miami-Dade County, Florida NOA 20-0331.03 - Roof expires 6/2/2025
- ▶ ICC Evaluation Report - ESR-2385

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SCREW CONNECTION DESIGN

NOTATIONS

ds = Nominal screw diameter (in.)
Ω Omega = 3.0
Pns = Nominal shear strength per screw (lbs.)
Pnt = Nominal tension strength per screw (lbs.)
Pnot = Nominal pull-out strength per screw (lbs.)
Pnov = Nominal pull-over strength per screw (lbs.)
g1 = nominal gauge of member in contact with the screw head (in.)
t1 = Thickness of member in contact with the screw head (in.)
g2 = nominal gauge of member NOT in contact with the screw head (in.)
t2 = Thickness of member NOT in contact with the screw head (in.)
Fu1 = Tensile strength of member in contact with the screw head (lbs.)
Fu2 = Tensile strength of member NOT in contact with the screw head (lbs.)

ROOF PANEL (Vertical Seam 18" Striated 24G)		WALL PANEL (PBR-Panel 26G)	
g1 =	24	g1 =	26
g2 =	16	g2 =	12
t1 =	0.0239	t1 =	0.0179
t2 =	0.057	t2 =	0.1046
Fu1 =	67000	Fu1 =	80000
Fu2 =	67000	Fu2 =	67000
Screw # =	12	Screw # =	12
ds (in.) =	0.216	ds (in.) =	0.216

ALLOWABLE SHEAR BASED ON CONNECTED MATERIALS:

t2/t1 =	2.38	t2/t1 =	5.84
Pns (eq. E4.3.1-2) =	934		
Pns (eq. E4.3.1-4) =	934	Pns (eq. E4.3.1-4) =	835
Allowable Shear per Screw (Ω Omega = 3.0):	311	Allowable Shear per Screw =	278

ALLOWABLE SHEAR BASED ON SCREW:

Allowable Shear per Screw =	625	Allowable Shear per Screw =	625
Design Shear per Screw =	311	Design Shear per Screw =	278

ALLOWABLE TENSION BASED ON CONNECTED MATERIALS:

Pullout Strength, Pnot (eq. E4.4.1.1) =	701	1287
Pullover Strength, Pnov (eq. E4.4.2.1) =	600	537
Allowable Tension per Screw (lbs.) =	200	179
Nominal Screw Tension Strength (lbs) =	860	860