Butler Manufacturing™

1540 Genessee Street
Kansas City, MO 64102

STRUCTURAL DESIGN DATA

Project: LSMO Water Utilites
Builder: Mar Building Solutions
Order #: 24-007756-02
Jobsite: 123456 Hamblen

City, State: Lees Summit, Missouri 64002
County: Jackson
Country: United States

Designer: Ethan Henderson
Supervising Engineer: Alan Jungnitsch

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This document has been electronically signed and sealed by Alan Jungnitsch, PE using my Digital Signature with PE seal affixed. Printed copies of this document are not considered signed and sealed, and the signature must be verified on any electronic copy
2024.05.09 14:16:17-05'00'

05/09/2024

Building Loading - Expanded Report

Shape: Covered Parking Addition

Loads and Codes - Shape: Covered Parking Addition

City: Lees Summit **County:** Jackson **State:** Missouri **Country:** United States
Building Code: 2018 International Building Code
Building Risk/Occupancy Category: II (Standard Occupancy Structure)
Structural: 16AISC - ASD
Cold Form: 16AISI - ASD
Rainfall: I: 7.00 inches per hour
f'c: 3000.00 psi Concrete

Dead and Collateral Loads
Collateral Gravity:10.00 psf
Collateral Uplift: 0.00 psf
Frame Weight (assumed for seismic):2.50 psf

Side	Type	Mag	Units	Shape	Applied to	Description
A	D	2.714	psf	Entire	Frm	Covering Weight - 24 MR-24 1.20 + Secondary Weight 1.51 : Roof: A
A	D	1.200	psf	Entire	Pur	Covering Weight - 24 MR-24 1.20 : Roof: A

Roof Live Load
Roof Live Load: 20.00 psf Not Reducible

Wind Load
Wind Speed: Vult: 115.00 (Vasd: 89.08) mph
Wind Enclosure: Partially Open
Height Used: 18/0/0 (Type: Eave)
Base Elevation: 0/0/0
Site Elevation: 1024.0 ft
Primary Zone Strip Width: 2a: 12/0/0

Topographic Factor: Kzt: 1.0000
Directionality Factor: Kd: 0.8500
Ground Elevation Factor: Ke: 0.9636
Primaries
Primaries Wind Exposure: C - Kz: 0.882
Velocity Pressure: qz: 24.46 psf

Gust Factor: G: 1.0000
Least Horiz. Dimension: 60/0/0

NOT Windborne Debris Region
Parts / Portions Zone Strip Width:
Walls, a: 6/0/0
Roof(s), 0.6h: 10/9/10

The 'Envelope Procedure' is Used
Parts and Portions
Parts Wind Exposure Factor: 0.882
Velocity Pressure (C&C): qz:24.46 psf

Snow Load
Ground Snow Load: pg: 20.00 psf
Flat Roof Snow: pf: 16.80 psf
Design Snow (Sloped): ps: 16.80 psf
Specified Minimum Roof Snow: 20.00 psf (Code)
Snow Accumulation Factor: 1.000
Snow Importance: Is: 1.000
Ground / Roof Conversion: 0.70

Rain Surcharge: 0.00
Exposure Factor: 2 Partially Exposed Ce: 1.00
Thermal Factor: Unheated - Ct: 1.20
Obstructed or Not Slippery
Slope Reduction: Cs: 1.00
Slope Used: 2.386 deg. (0.5000:12)

Seismic Load
Lateral Force Resisting Systems using Equivalent Force Procedure
Mapped MCE Acceleration: Ss: 12.00 %g
Mapped MCE Acceleration: S1: 7.00 %g
Site Class: Stiff soil (D) - Default
Seismic Importance: Ie: 1.000
Design Acceleration Parameter: Sds: 0.1280
Design Acceleration Parameter: Sd1: 0.1120
Seismic Design Category:: B
% Snow Used in Seismic: 0.00
Seismic Snow Load: 0.00 psf
Diaphragm Condition: Flexible
Fundamental Period Height Used: 19/3/0

Transverse Direction Parameters
System NOT detailed for Seismic
Redundancy Factor: Rho: 1.00
Fundamental Period: Ta: 0.2983
R-Factor: 3.00
Overstrength Factor: Omega: 2.50
Deflection Amplification Factor: Cd: 3.00
Base Shear: V: 0.0427 x W

Longitudinal Direction Parameters
System NOT detailed for Seismic
Redundancy Factor: Rho: 1.00
Fundamental Period: Ta: 0.1838
R-Factor: 3.00
Overstrength Factor: Omega: 2.50
Deflection Amplification Factor: Cd: 3.00
Base Shear: V: 0.0427 x W

Side	Type	Mag	Units	Shape	Applied to	Description
A	E	0.649	psf	Entire	Frm	Seismic: Covering Weight - 24 MR-24 1.20 + Secondary Weight 1.51 + (Includes 10.000 Collateral 2.500 Frame Weight) : Roof: A
A	E	0.649	psf	Entire	Brc	Seismic: Covering Weight - 24 MR-24 1.20 + Secondary Weight 1.51 + (Includes 10.000

Collateral 2.500 Frame Weight) : Roof: A

Deflection Conditions
Frames are vertically supporting:Metal Roof Purlins and Panels
Frames are laterally supporting:Metal Wall Girts and Panels
Purlins are supporting:Metal Roof Panels
Girts are supporting:Metal Wall Panels

Design Load Combinations - Framing

No.	Origin	Factor	Application	Description
1	System	1.000	1.0 D + 1.0 CG + 1.0 L>	D + CG + L>
2	System	1.000	1.0 D + 1.0 CG + 1.0 <L	D + CG + <L
3	System	1.000	1.0 D + 1.0 CG + 1.0 SMS>	D + CG + SMS>
4	System	1.000	1.0 D + 1.0 CG + 1.0 <SMS	D + CG + <SMS
5	System	1.000	1.0 D + 1.0 CG + 0.6 W1>	D + CG + W1>
6	System	1.000	1.0 D + 1.0 CG + 0.6 <W1	D + CG + <W1
7	System	1.000	1.0 D + 1.0 CG + 0.6 W2>	D + CG + W2>
8	System	1.000	1.0 D + 1.0 CG + 0.6 <W2	D + CG + <W2
9	System	1.000	1.0 D + 1.0 CG + 0.6 WPL	D + CG + WPL
10	System	1.000	1.0 D + 1.0 CG + 0.6 WPR	D + CG + WPR
11	System	1.000	0.6 MW	MW - Wall: 1
12	System	1.000	0.6 MW	MW - Wall: 2
13	System	1.000	0.6 MW	MW - Wall: 3
14	System	1.000	0.6 MW	MW - Wall: 4
15	System	1.000	0.6 D + 0.6 CU + 0.6 W1>	D + CU + W1>
16	System	1.000	0.6 D + 0.6 CU + 0.6 <W1	D + CU + <W1
17	System	1.000	0.6 D + 0.6 CU + 0.6 W2>	D + CU + W2>
18	System	1.000	0.6 D + 0.6 CU + 0.6 <W2	D + CU + <W2
19	System	1.000	0.6 D + 0.6 CU + 0.6 WPL	D + CU + WPL
20	System	1.000	0.6 D + 0.6 CU + 0.6 WPR	D + CU + WPR
21	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1>	D + CG + L + W1>
22	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W1	D + CG + L + <W1
23	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W2>	D + CG + L + W2>
24	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2	D + CG + L + <W2
25	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL	D + CG + L + WPL
26	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR	D + CG + L + WPR
27	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1>	D + CG + S + W1>
28	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W1	D + CG + S + <W1
29	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W2>	D + CG + S + W2>
30	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2	D + CG + S + <W2
31	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL	D + CG + S + WPL
32	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR	D + CG + S + WPR
33	System	1.000	1.0 D + 1.0 CG + 0.7 E> + 0.7 EG+	D + CG + E> + EG+
34	System	1.000	1.0 D + 1.0 CG + 0.7 <E + 0.7 EG+	D + CG + <E + EG+
35	System	1.000	0.6 D + 0.6 CU + 0.7 E> + 0.7 EG-	D + CU + E> + EG-
36	System	1.000	0.6 D + 0.6 CU + 0.7 <E + 0.7 EG-	D + CU + <E + EG-
37	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPR + 0.6 WB1>	D + CG + WPR + WB1>
38	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPR + 0.6 WB1>	D + CU + WPR + WB1>
39	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR + 0.45 WB1>	D + CG + L + WPR + WB1>
40	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR + 0.45 WB1>	D + CG + S + WPR + WB1>
41	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPR + 0.6 <WB1	D + CG + WPR + <WB1
42	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPR + 0.6 <WB1	D + CU + WPR + <WB1
43	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR + 0.45 <WB1	D + CG + L + WPR + <WB1
44	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR + 0.45 <WB1	D + CG + S + WPR + <WB1
45	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPR + 0.6 WB2>	D + CG + WPR + WB2>
46	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPR + 0.6 WB2>	D + CU + WPR + WB2>
47	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR + 0.45 WB2>	D + CG + L + WPR + WB2>
48	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR + 0.45 WB2>	D + CG + S + WPR + WB2>
49	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPR + 0.6 <WB2	D + CG + WPR + <WB2
50	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPR + 0.6 <WB2	D + CU + WPR + <WB2
51	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR + 0.45 <WB2	D + CG + L + WPR + <WB2
52	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR + 0.45 <WB2	D + CG + S + WPR + <WB2
53	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPL + 0.6 WB3>	D + CG + WPL + WB3>
54	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPL + 0.6 WB3>	D + CU + WPL + WB3>
55	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL + 0.45 WB3>	D + CG + L + WPL + WB3>
56	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL + 0.45 WB3>	D + CG + S + WPL + WB3>
57	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPL + 0.6 <WB3	D + CG + WPL + <WB3

58	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPL + 0.6 <WB3	D + CU + WPL + <WB3
59	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL + 0.45 <WB3	D + CG + L + WPL + <WB3
60	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL + 0.45 <WB3	D + CG + S + WPL + <WB3
61	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPL + 0.6 WB4>	D + CG + WPL + WB4>
62	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPL + 0.6 WB4>	D + CU + WPL + WB4>
63	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL + 0.45 WB4>	D + CG + L + WPL + WB4>
64	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL + 0.45 WB4>	D + CG + S + WPL + WB4>
65	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPL + 0.6 <WB4	D + CG + WPL + <WB4
66	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPL + 0.6 <WB4	D + CU + WPL + <WB4
67	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL + 0.45 <WB4	D + CG + L + WPL + <WB4
68	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL + 0.45 <WB4	D + CG + S + WPL + <WB4
69	System Derived	1.000	0.6 MWB	MWB - Wall: 1
70	System Derived	1.000	0.6 MWB	MWB - Wall: 2
71	System Derived	1.000	0.6 MWB	MWB - Wall: 3
72	System Derived	1.000	0.6 MWB	MWB - Wall: 4
73	System Derived	1.000	1.0 D + 1.0 CG + 0.7 EB> + 0.7 EG+	D + CG + EB> + EG+
74	System Derived	1.000	0.6 D + 0.6 CU + 0.7 EB> + 0.7 EG-	D + CU + EB> + EG-
75	System Derived	1.000	1.0 D + 1.0 CG + 0.7 <EB + 0.7 EG+	D + CG + <EB + EG+
76	System Derived	1.000	0.6 D + 0.6 CU + 0.7 <EB + 0.7 EG-	D + CU + <EB + EG-

Design Load Combinations - Bracing

No.	Origin	Factor	Application	Description
1	System	1.000	1.0 D + 0.6 W1>	D + W1>
2	System	1.000	1.0 D + 0.6 <W1	D + <W1
3	System	1.000	1.0 D + 0.6 W2>	D + W2>
4	System	1.000	1.0 D + 0.6 <W2	D + <W2
5	System	1.000	1.0 D + 0.6 W3>	D + W3>
6	System	1.000	1.0 D + 0.6 <W3	D + <W3
7	System	1.000	1.0 D + 0.6 W4>	D + W4>
8	System	1.000	1.0 D + 0.6 <W4	D + <W4
9	System	1.000	0.6 MW	MW - Wall: 1
10	System	1.000	0.6 MW	MW - Wall: 2
11	System	1.000	0.6 MW	MW - Wall: 3
12	System	1.000	0.6 MW	MW - Wall: 4
13	System	1.000	1.0 D + 0.7 E>	D + E>
14	System	1.000	1.0 D + 0.7 <E	D + <E
15	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1>	D + CG + W1>
16	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W1	D + CG + <W1
17	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W2>	D + CG + W2>
18	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2	D + CG + <W2
19	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W3>	D + CG + W3>
20	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W3	D + CG + <W3
21	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W4>	D + CG + W4>
22	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W4	D + CG + <W4
23	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1>	D + CU + W1>
24	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W1	D + CU + <W1
25	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W2>	D + CU + W2>
26	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2	D + CU + <W2
27	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W3>	D + CU + W3>
28	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W3	D + CU + <W3
29	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W4>	D + CU + W4>
30	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W4	D + CU + <W4
31	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1>	D + CG + S + W1>
32	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W1	D + CG + S + <W1
33	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W2>	D + CG + S + W2>
34	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2	D + CG + S + <W2
35	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W3>	D + CG + S + W3>
36	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W3	D + CG + S + <W3
37	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W4>	D + CG + S + W4>
38	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W4	D + CG + S + <W4
39	System Derived	1.000	1.0 D + 1.0 CG + 0.7 E> + 0.7 EG+	D + CG + E> + EG+
40	System Derived	1.000	1.0 D + 1.0 CG + 0.7 <E + 0.7 EG+	D + CG + <E + EG+
41	System Derived	1.000	0.6 D + 0.6 CG + 0.7 E> + 0.7 EG-	D + CG + E> + EG-
42	System Derived	1.000	0.6 D + 0.6 CG + 0.7 <E + 0.7 EG-	D + CG + <E + EG-

Design Load Combinations - Purlin

No.	Origin	Factor	Application	Description

1	System	1.000	1.0 D + 1.0 CG + 1.0 L	D + CG + L
2	System	1.000	1.0 D + 1.0 CG + 1.0 SMS	D + CG + SMS
3	System	1.000	1.0 D + 1.0 CG + 1.0 PF1	D + CG + PF1(Span 1)
4	System	1.000	1.0 D + 1.0 CG + 1.0 PF1	D + CG + PF1(Span 2)
5	System Derived	1.000	1.0 D + 1.0 CG + 0.7 EB> + 0.7 EG+	D + CG + EB> + EG+
6	System Derived	1.000	0.6 D + 0.6 CU + 0.7 EB> + 0.7 EG-	D + CU + EB> + EG-
7	System Derived	1.000	1.0 D + 1.0 CG + 0.7 <EB + 0.7 EG+	D + CG + <EB + EG+
8	System Derived	1.000	0.6 D + 0.6 CU + 0.7 <EB + 0.7 EG-	D + CU + <EB + EG-
9	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 <WB1	D + CG + W1> + <WB1
10	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 <WB1	D + CG + <W2 + <WB1
11	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 <WB1	D + CU + W1> + <WB1
12	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 <WB1	D + CU + <W2 + <WB1
13	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 <WB1	D + CG + L + W1> + <WB1
14	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 <WB1	D + CG + L + <W2 + <WB1
15	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 <WB1	D + CG + S + W1> + <WB1
16	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 <WB1	D + CG + S + <W2 + <WB1
17	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 <WB2	D + CG + W1> + <WB2
18	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 <WB2	D + CG + <W2 + <WB2
19	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 <WB2	D + CU + W1> + <WB2
20	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 <WB2	D + CU + <W2 + <WB2
21	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 <WB2	D + CG + L + W1> + <WB2
22	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 <WB2	D + CG + L + <W2 + <WB2
23	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 <WB2	D + CG + S + W1> + <WB2
24	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 <WB2	D + CG + S + <W2 + <WB2
25	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 <WB3	D + CG + W1> + <WB3
26	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 <WB3	D + CG + <W2 + <WB3
27	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 <WB3	D + CU + W1> + <WB3
28	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 <WB3	D + CU + <W2 + <WB3
29	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 <WB3	D + CG + L + W1> + <WB3
30	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 <WB3	D + CG + L + <W2 + <WB3
31	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 <WB3	D + CG + S + W1> + <WB3
32	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 <WB3	D + CG + S + <W2 + <WB3
33	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 <WB4	D + CG + W1> + <WB4
34	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 <WB4	D + CG + <W2 + <WB4
35	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 <WB4	D + CU + W1> + <WB4
36	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 <WB4	D + CU + <W2 + <WB4
37	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 <WB4	D + CG + L + W1> + <WB4
38	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 <WB4	D + CG + L + <W2 + <WB4
39	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 <WB4	D + CG + S + W1> + <WB4
40	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 <WB4	D + CG + S + <W2 + <WB4
41	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 WB1>	D + CG + W1> + WB1>
42	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 WB1>	D + CG + <W2 + WB1>
43	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 WB1>	D + CU + W1> + WB1>
44	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 WB1>	D + CU + <W2 + WB1>
45	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 WB1>	D + CG + L + W1> + WB1>
46	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 WB1>	D + CG + L + <W2 + WB1>
47	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 WB1>	D + CG + S + W1> + WB1>
48	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 WB1>	D + CG + S + <W2 + WB1>
49	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 WB2>	D + CG + W1> + WB2>
50	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 WB2>	D + CG + <W2 + WB2>
51	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 WB2>	D + CU + W1> + WB2>
52	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 WB2>	D + CU + <W2 + WB2>
53	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 WB2>	D + CG + L + W1> + WB2>
54	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 WB2>	D + CG + L + <W2 + WB2>
55	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 WB2>	D + CG + S + W1> + WB2>
56	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 WB2>	D + CG + S + <W2 + WB2>
57	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 WB3>	D + CG + W1> + WB3>
58	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 WB3>	D + CG + <W2 + WB3>
59	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 WB3>	D + CU + W1> + WB3>
60	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 WB3>	D + CU + <W2 + WB3>
61	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 WB3>	D + CG + L + W1> + WB3>
62	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 WB3>	D + CG + L + <W2 + WB3>
63	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 WB3>	D + CG + S + W1> + WB3>
64	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 WB3>	D + CG + S + <W2 + WB3>
65	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 WB4>	D + CG + W1> + WB4>
66	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 WB4>	D + CG + <W2 + WB4>
67	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 WB4>	D + CU + W1> + WB4>

68	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 WB4>	D + CU + <W2 + WB4>
69	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 WB4>	D + CG + L + W1> + WB4>
70	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 WB4>	D + CG + L + <W2 + WB4>
71	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 WB4>	D + CG + S + W1> + WB4>
72	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 WB4>	D + CG + S + <W2 + WB4>

Design Load Combinations - Girt

No.	Origin	Factor	Application	Description
1	System	1.000	0.6 W1>	W1>
2	System	1.000	0.6 <W2	<W2

Design Load Combinations - Roof - Panel

No.	Origin	Factor	Application	Description
1	System	1.000	1.0 D + 1.0 L	D + L
2	System	1.000	1.0 D + 1.0 SMS	D + SMS
3	System	1.000	1.0 D + 1.0 S	D + S
4	System	1.000	1.0 D + 0.6 <W2	D + <W2
5	System	1.000	0.6 D + 0.6 W1>	D + W1>

Design Load Combinations - Wall - Panel

No.	Origin	Factor	Application	Description
1	System	1.000	0.6 W1>	W1>
2	System	1.000	0.6 <W2	<W2

Deflection Load Combinations - Framing

No.	Origin	Factor	Def H	Def V	Application	Description
1	System	1.000	0	180	1.0 L	L
2	System	1.000	0	180	1.0 SMS	SMS
3	System	1.000	60	180	0.42 W1>	W1>
4	System	1.000	60	180	0.42 <W1	<W1
5	System	1.000	60	180	0.42 W2>	W2>
6	System	1.000	60	180	0.42 <W2	<W2
7	System	1.000	60	180	0.42 WPL	WPL
8	System	1.000	60	180	0.42 WPR	WPR
9	System	1.000	10	0	1.0 E> + 1.0 EG-	E> + EG-
10	System	1.000	10	0	1.0 <E + 1.0 EG-	<E + EG-

Deflection Load Combinations - Purlin

No.	Origin	Factor	Deflection	Application	Description
1	User	1.000	200	1.0 U1	D + CG + 50%SL
2	System	1.000	150	1.0 L	L
3	System	1.000	180	1.0 SMS	SMS
4	System	1.000	180	0.42 W1>	W1>
5	System	1.000	180	0.42 <W2	<W2

Deflection Load Combinations - Girt

No.	Origin	Factor	Deflection	Application	Description
1	System	1.000	90	0.42 W1>	W1>
2	System	1.000	90	0.42 <W2	<W2

Deflection Load Combinations - Roof - Panel

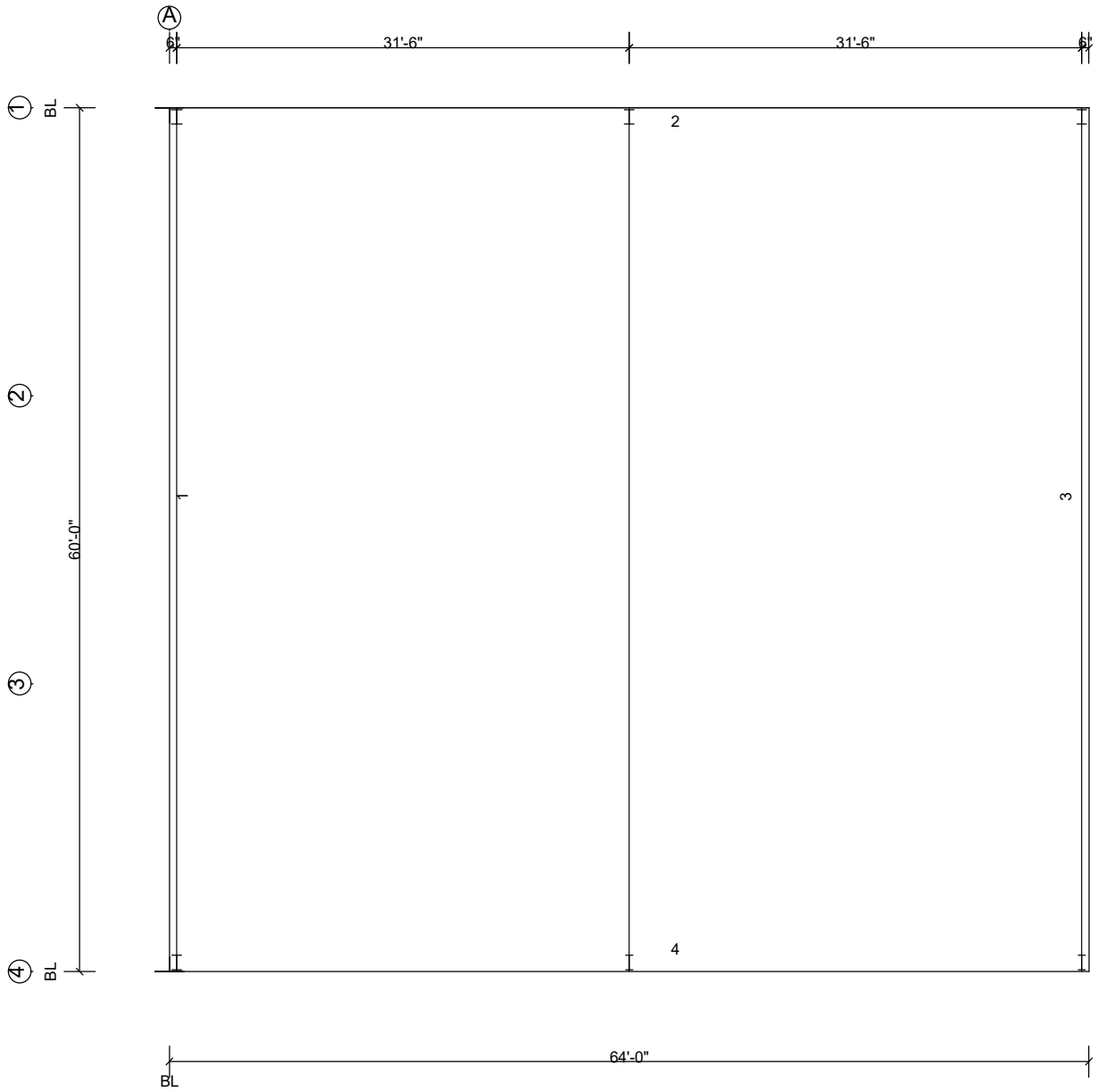
No.	Origin	Factor	Def H	Def V	Application	Description
1	System	1.000	60	60	1.0 S	S
2	System	1.000	60	60	1.0 SMS	SMS
3	System	1.000	60	60	0.42 <W2	<W2

Load Type Descriptions

D	Material Dead Weight	C	Collateral Load
CG	Collateral Load for Gravity Cases	CU	Collateral Load for Wind Cases
L	Roof Live Load	ASL^	Alternate Span Live Load, Shifted Right
^ASL	Alternate Span Live Load, Shifted Left	PL2	Partial Live, Full, 2 Spans
L>	Live - Notional Right	<L	Live - Notional Left
S	Snow Load	US1*	Unbalanced Snow Load 1, Shifted Right
*US1	Unbalanced Snow Load 1, Shifted Left	US2*	Unbalanced Snow Load 2, Shifted Right
*US2	Unbalanced Snow Load 2, Shifted Left	SD	Snow Drift Load
SS	Sliding Snow Load	RS	Rain Surcharge Load

PF1	Partial Load, Full, 1 Span
PF2	Partial Load, Full, 2 Spans
S>	Snow - Notional Right
SMS	Specified Min. Roof Snow
<SMS	Specified Min. Roof Snow - Notional Left
PS2	Partial Load, Half Span 2
W1>	Wind Load, Case 1, Right
W2>	Wind Load, Case 2, Right
W3>	Wind Load, Case 3, Right
W4>	Wind Load, Case 4, Right
W5>	Wind Load, Case 5, Right
W6>	Wind Load, Case 6, Right
WP	Wind Load, Parallel to Ridge
WPL	Wind Load, || Ridge, Left
WPA2	Wind Parallel - Ref A, Case 2
WPB2	Wind Parallel - Ref B, Case 2
WPC2	Wind Parallel - Ref C, Case 2
WPD2	Wind Parallel - Ref D, Case 2
<WB1	Wind Brace Reaction, Case 1, Left
<WB2	Wind Brace Reaction, Case 2, Left
<WB3	Wind Brace Reaction, Case 3, Left
<WB4	Wind Brace Reaction, Case 4, Left
<WB5	Wind Brace Reaction, Case 5, Left
<WB6	Wind Brace Reaction, Case 6, Left
MWB	Minimum Wind Bracing Reaction
E>	Seismic Load, Right
EG	Vertical Seismic Effect
EG-	Vertical Seismic Effect, Subtractive
<EB	Seismic Brace Reaction, Left
EHP>	Seismic High Performance Load, Right
EGHP	Vertical Seismic High Performance Effect
EGHP-	Vertical Seismic High Performance Effect, Subtractive
EHPB>	Seismic High Performance Brace Reaction, Right
FL	Floor Live Load
*FL	Alternate Span Floor Live Load, Shifted Left
AL	Auxiliary Live Load
*AL>	Auxiliary Live Load, Right, Left
<*AL	Auxiliary Live Load, Left, Left
*AL	Aux Live, Left
*AL>(1)	Auxiliary Live Load, Right, Left, Aisle 1
<*AL(1)	Auxiliary Live Load, Left, Left, Aisle 1
*AL(1)	Aux Live, Left, Aisle 1
*AL>(2)	Auxiliary Live Load, Right, Left, Aisle 2
<*AL(2)	Auxiliary Live Load, Left, Left, Aisle 2
*AL(2)	Aux Live, Left, Aisle 2
*AL>(3)	Auxiliary Live Load, Right, Left, Aisle 3
<*AL(3)	Auxiliary Live Load, Left, Left, Aisle 3
*AL(3)	Aux Live, Left, Aisle 3
*AL>(4)	Auxiliary Live Load, Right, Left, Aisle 4
<*AL(4)	Auxiliary Live Load, Left, Left, Aisle 4
*AL(4)	Aux Live, Left, Aisle 4
*AL>(5)	Auxiliary Live Load, Right, Left, Aisle 5
<*AL(5)	Auxiliary Live Load, Left, Left, Aisle 5
*AL(5)	Aux Live, Left, Aisle 5
ALB>	Aux Live Bracing Reaction, Right
WALB>	Wind, Aux Live Bracing Reaction, Right
ALB>(1)	Aux Live Bracing Reaction, Right, Aisle 1
WALB>(1)	Wind, Aux Live Bracing Reaction, Right, Aisle 1
ALB>(2)	Aux Live Bracing Reaction, Right, Aisle 2
WALB>(2)	Wind, Aux Live Bracing Reaction, Right, Aisle 2
ALB>(3)	Aux Live Bracing Reaction, Right, Aisle 3
WALB>(3)	Wind, Aux Live Bracing Reaction, Right, Aisle 3
ALB>(4)	Aux Live Bracing Reaction, Right, Aisle 4
WALB>(4)	Wind, Aux Live Bracing Reaction, Right, Aisle 4
ALB>(5)	Aux Live Bracing Reaction, Right, Aisle 5
WALB>(5)	Wind, Aux Live Bracing Reaction, Right, Aisle 5
WALB	Wind, Aux Live Bracing Reaction
PH1	Partial Load, Half, 1 Span
PH2	Partial Load, Half, 2 Spans
<S	Snow - Notional Left
SMS>	Specified Min. Roof Snow - Notional Right
PS1	Partial Load, Half Span 1
W	Wind Load
<W1	Wind Load, Case 1, Left
<W2	Wind Load, Case 2, Left
<W3	Wind Load, Case 3, Left
<W4	Wind Load, Case 4, Left
<W5	Wind Load, Case 5, Left
<W6	Wind Load, Case 6, Left
WPR	Wind Load, || Ridge, Right
WPA1	Wind Parallel - Ref A, Case 1
WPB1	Wind Parallel - Ref B, Case 1
WPC1	Wind Parallel - Ref C, Case 1
WPD1	Wind Parallel - Ref D, Case 1
WB1>	Wind Brace Reaction, Case 1, Right
WB2>	Wind Brace Reaction, Case 2, Right
WB3>	Wind Brace Reaction, Case 3, Right
WB4>	Wind Brace Reaction, Case 4, Right
WB5>	Wind Brace Reaction, Case 5, Right
WB6>	Wind Brace Reaction, Case 6, Right
MW	Minimum Wind Load
E	Seismic Load
<E	Seismic Load, Left
EG+	Vertical Seismic Effect, Additive
EB>	Seismic Brace Reaction, Right
EHP	Seismic High Performance Load
<EHP	Seismic High Performance Load, Left
EGHP+	Vertical Seismic High Performance Effect, Additive
EHPB	Seismic High Performance Brace Reaction
<EHPB	Seismic High Performance Brace Reaction, Left
FL*	Alternate Span Floor Live Load, Shifted Right
FD	Floor Dead Load
AL*>	Auxiliary Live Load, Right, Right
<AL*	Auxiliary Live Load, Left, Right
AL*	Aux Live, Right
AL*>(1)	Auxiliary Live Load, Right, Right, Aisle 1
<AL*(1)	Auxiliary Live Load, Left, Right, Aisle 1
AL*(1)	Aux Live, Right, Aisle 1
AL*>(2)	Auxiliary Live Load, Right, Right, Aisle 2
<AL*(2)	Auxiliary Live Load, Left, Right, Aisle 2
AL*(2)	Aux Live, Right, Aisle 2
AL*>(3)	Auxiliary Live Load, Right, Right, Aisle 3
<AL*(3)	Auxiliary Live Load, Left, Right, Aisle 3
AL*(3)	Aux Live, Right, Aisle 3
AL*>(4)	Auxiliary Live Load, Right, Right, Aisle 4
<AL*(4)	Auxiliary Live Load, Left, Right, Aisle 4
AL*(4)	Aux Live, Right, Aisle 4
AL*>(5)	Auxiliary Live Load, Right, Right, Aisle 5
<AL*(5)	Auxiliary Live Load, Left, Right, Aisle 5
AL*(5)	Aux Live, Right, Aisle 5
ALB	Aux Live Bracing Reaction
<ALB	Aux Live Bracing Reaction, Left
<WALB	Wind, Aux Live Bracing Reaction, Left
<ALB(1)	Aux Live Bracing Reaction, Left, Aisle 1
<WALB(1)	Wind, Aux Live Bracing Reaction, Left, Aisle 1
<ALB(2)	Aux Live Bracing Reaction, Left, Aisle 2
<WALB(2)	Wind, Aux Live Bracing Reaction, Left, Aisle 2
<ALB(3)	Aux Live Bracing Reaction, Left, Aisle 3
<WALB(3)	Wind, Aux Live Bracing Reaction, Left, Aisle 3
<ALB(4)	Aux Live Bracing Reaction, Left, Aisle 4
<WALB(4)	Wind, Aux Live Bracing Reaction, Left, Aisle 4
<ALB(5)	Aux Live Bracing Reaction, Left, Aisle 5
<WALB(5)	Wind, Aux Live Bracing Reaction, Left, Aisle 5
AD	Auxiliary Dead Load

U0	User Defined Load	U1	User Defined Load - 1
U2	User Defined Load - 2	U3	User Defined Load - 3
U4	User Defined Load - 4	U5	User Defined Load - 5
U6	User Defined Load - 6	U7	User Defined Load - 7
U8	User Defined Load - 8	U9	User Defined Load - 9
UB	User Brace Reaction	UB1	User Brace Reaction - 1
UB2	User Brace Reaction - 2	UB3	User Brace Reaction - 3
UB4	User Brace Reaction - 4	UB5	User Brace Reaction - 5
UB6	User Brace Reaction - 6	UB7	User Brace Reaction - 7
UB8	User Brace Reaction - 8	UB9	User Brace Reaction - 9
R	Rain Load	T	Temperature Load
V	Shear	WT	Tornado Load
WT1>	Tornado Load, Case 1, Right	<WT1	Tornado Load, Case 1, Left
WT2>	Tornado Load, Case 2, Right	<WT2	Tornado Load, Case 2, Left
WT3>	Tornado Load, Case 3, Right	<WT3	Tornado Load, Case 3, Left
WT4>	Tornado Load, Case 4, Right	<WT4	Tornado Load, Case 4, Left
WT5>	Tornado Load, Case 5, Right	<WT5	Tornado Load, Case 5, Left
WT6>	Tornado Load, Case 6, Right	<WT6	Tornado Load, Case 6, Left
WTP	Tornado Load, Parallel to Ridge	WTPR	Tornado Load, Parallel to Ridge, Right
WTPL	Tornado Load, Parallel to Ridge, Left	WTB1>	Tornado Brace Reaction, Case 1, Right
<WTB1	Tornado Brace Reaction, Case 1, Left	WTB2>	Tornado Brace Reaction, Case 2, Right
<WTB2	Tornado Brace Reaction, Case 2, Left	WTB3>	Tornado Brace Reaction, Case 3, Right
<WTB3	Tornado Brace Reaction, Case 3, Left	WTB4>	Tornado Brace Reaction, Case 4, Right
<WTB4	Tornado Brace Reaction, Case 4, Left	WTB5>	Tornado Brace Reaction, Case 5, Right
<WTB5	Tornado Brace Reaction, Case 5, Left	WTB6>	Tornado Brace Reaction, Case 6, Right
<WTB6	Tornado Brace Reaction, Case 6, Left		



<*> The building is designed with bracing diagonals in the designated bays. Column base reactions, base plates and anchor rods are affected by this bracing and diagonals may not be relocated without consulting the building supplier's engineer.

Shape: Covered Parking
Shape Covered Parking is set as an existing shape.

Bracing - Summary Report

Shape: Covered Parking Addition

Loads and Codes - Shape: Covered Parking Addition

City: Lees Summit **County:** Jackson **State:** Missouri **Country:** United States
Building Code: 2018 International Building Code
Building Risk/Occupancy Category: II (Standard Occupancy Structure)
Structural: 16AISC - ASD
Cold Form: 16AISI - ASD
Rainfall: I: 7.00 inches per hour
f'c: 3000.00 psi Concrete

Dead and Collateral Loads
Collateral Gravity: 10.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

Roof Live Load
Roof Live Load: 20.00 psf Not Reducible

Wind Load
Wind Speed: Vult: 115.00 (Vasd: 89.08) mph

The 'Envelope Procedure' is Used
Primaries Wind Exposure: C - Kz: 0.882
Parts Wind Exposure Factor: 0.882
Wind Enclosure: Partially Open
Topographic Factor: Kzt: 1.0000
Ground Elevation Factor: Ke: 0.9636

NOT Windborne Debris Region
Base Elevation: 0/0/0
Site Elevation: 1024.0 ft
Primary Zone Strip Width: 2a: 12/0/0
Parts / Portions Zone Strip Width:
Walls, a: 6/0/0
Roof(s), 0.6h: 10/9/10
Velocity Pressure: qz: 24.46, (C&C) 24.46 psf

Snow Load
Ground Snow Load: pg: 20.00 psf

Flat Roof Snow: pf: 16.80 psf
Design Snow (Sloped): ps: 16.80 psf
Rain Surcharge: 0.00 psf
Specified Minimum Roof Snow: 20.00 psf (Code)
Exposure Factor: 2 Partially Exposed - Ce: 1.00
Snow Importance: Is: 1.000
Thermal Factor: Unheated - Ct: 1.20
Ground / Roof Conversion: 0.70
Obstructed or Not Slippery

Seismic Load
Lateral Force Resisting Systems using Equivalent Force Procedure
Mapped MCE Acceleration: Ss: 12.00 %g
Mapped MCE Acceleration: S1: 7.00 %g
Site Class: Stiff soil (D) - Default
Seismic Importance: Ie: 1.000
Design Acceleration Parameter: Sds: 0.1280
Design Acceleration Parameter: Sd1: 0.1120
Seismic Design Category:: B
Seismic Snow Load: 0.00 psf
% Snow Used in Seismic: 0.00
Diaphragm Condition: Flexible
Fundamental Period Height Used: 19/3/0

Transverse Direction Parameters
System NOT detailed for Seismic
Redundancy Factor: Rho: 1.00
Fundamental Period: Ta: 0.2983
R-Factor: 3.00
Overstrength Factor: Omega: 2.50
Deflection Amplification Factor: Cd: 3.00
Base Shear: V: 0.0427 x W

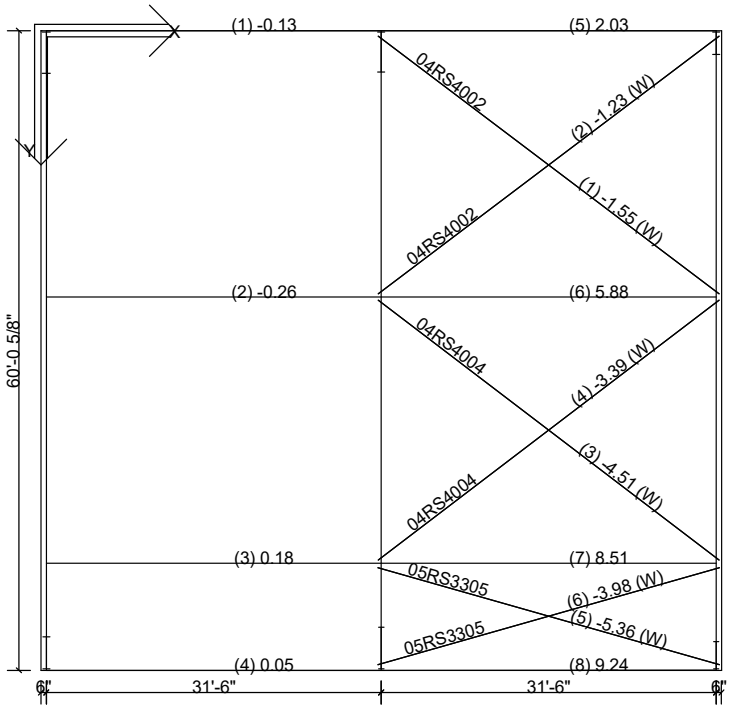
Longitudinal Direction Parameters
System NOT detailed for Seismic
Redundancy Factor: Rho: 1.00
Fundamental Period: Ta: 0.1838
R-Factor: 3.00
Overstrength Factor: Omega: 2.50
Deflection Amplification Factor: Cd: 3.00
Base Shear: V: 0.0427 x W

Deflection Conditions
Frames are vertically supporting: Metal Roof Purlins and Panels
Frames are laterally supporting: Metal Wall Girts and Panels
Purlins are supporting: Metal Roof Panels
Girts are supporting: Metal Wall Panels

Design Load Combinations - Bracing

No.	Origin	Factor	Application	Description
1	System	1.000	1.0 D + 0.6 W1>	D + W1>
2	System	1.000	1.0 D + 0.6 <W1	D + <W1
3	System	1.000	1.0 D + 0.6 W2>	D + W2>
4	System	1.000	1.0 D + 0.6 <W2	D + <W2
5	System	1.000	1.0 D + 0.6 W3>	D + W3>
6	System	1.000	1.0 D + 0.6 <W3	D + <W3
7	System	1.000	1.0 D + 0.6 W4>	D + W4>
8	System	1.000	1.0 D + 0.6 <W4	D + <W4
9	System	1.000	0.6 MW	MW - Wall: 1
10	System	1.000	0.6 MW	MW - Wall: 2
11	System	1.000	0.6 MW	MW - Wall: 3
12	System	1.000	0.6 MW	MW - Wall: 4
13	System	1.000	1.0 D + 0.7 E>	D + E>

14	System	1.000	1.0 D + 0.7 <E	D + <E
15	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1>	D + CG + W1>
16	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W1	D + CG + <W1
17	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W2>	D + CG + W2>
18	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2	D + CG + <W2
19	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W3>	D + CG + W3>
20	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W3	D + CG + <W3
21	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W4>	D + CG + W4>
22	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W4	D + CG + <W4
23	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1>	D + CU + W1>
24	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W1	D + CU + <W1
25	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W2>	D + CU + W2>
26	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2	D + CU + <W2
27	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W3>	D + CU + W3>
28	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W3	D + CU + <W3
29	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W4>	D + CU + W4>
30	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W4	D + CU + <W4
31	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1>	D + CG + S + W1>
32	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W1	D + CG + S + <W1
33	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W2>	D + CG + S + W2>
34	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2	D + CG + S + <W2
35	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W3>	D + CG + S + W3>
36	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W3	D + CG + S + <W3
37	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W4>	D + CG + S + W4>
38	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W4	D + CG + S + <W4
39	System Derived	1.000	1.0 D + 1.0 CG + 0.7 E> + 0.7 EG+	D + CG + E> + EG+
40	System Derived	1.000	1.0 D + 1.0 CG + 0.7 <E + 0.7 EG+	D + CG + <E + EG+
41	System Derived	1.000	0.6 D + 0.6 CG + 0.7 E> + 0.7 EG-	D + CG + E> + EG-
42	System Derived	1.000	0.6 D + 0.6 CG + 0.7 <E + 0.7 EG-	D + CG + <E + EG-

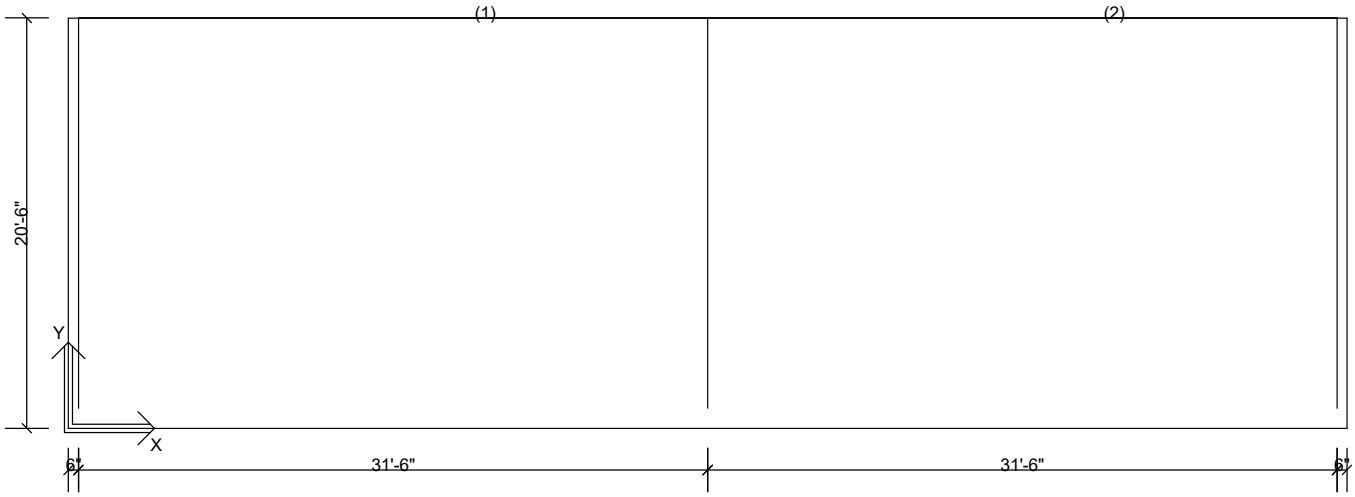


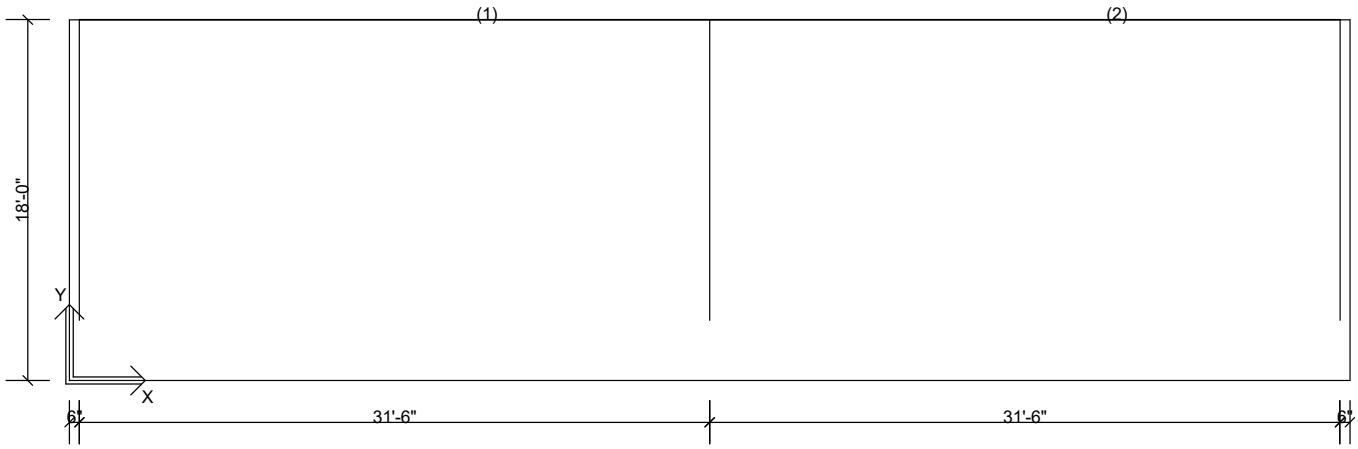
Diagonal Bracing Member Design Summary: Roof A

Mem. No.	Bracing Shape	Length (ft)	Angle	Design Axial (k)	Seismic Factor	Stress Factor	Stress Ratio	Governing Load Case	Design Status	Comment
1	R 0.5	40.13	39.5	-1.55	1.0000	1.0000	0.339	1.0D+0.6<W4	passed	
2	R 0.5	40.14	39.5	-1.23	1.0000	1.0000	0.268	1.0D+0.6W3>	passed	
3	R 0.5	40.27	39.5	-4.51	1.0000	1.0000	0.982	0.6MW Wall 3	passed	
4	R 0.5	40.27	39.5	-3.39	1.0000	1.0000	0.739	1.0D+0.6W3>	passed	
5	R 0.625	33.41	19.3	-5.36	1.0000	1.0000	0.721	0.6MW Wall 3	passed	
6	R 0.625	33.41	19.3	-3.98	1.0000	1.0000	0.536	1.0D+0.6W3>	passed	

Mem.	End	Diagonal Connection Design Information
1	Left	Slot: Web Thk = 0.188, Load Case 1.0D+0.6<W4, Factored F = 1.55, E factor = 1.000, stress increase = 1.000, slot offset, = 3.000, web-flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK, >> PASSED.
	Right	Slot: Web Thk = 0.134, Load Case 1.0D+0.6<W4, Factored F = 1.55, E factor = 1.000, stress increase = 1.000, slot offset, = 3.000, web-flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK, >> PASSED.
2	Left	Slot: Web Thk = 0.164, Load Case 1.0D+0.6W3>, Factored F = 1.23, E factor = 1.000, stress increase = 1.000, slot offset, = 3.000, web-flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK, >> PASSED.
	Right	Slot: Web Thk = 0.164, Load Case 1.0D+0.6W3>, Factored F = 1.23, E factor = 1.000, stress increase = 1.000, slot offset, = 3.000, web-flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK, >> PASSED.
3	Left	Slot: Web Thk = 0.164, Load Case 0.6MW Wall 3, Factored F = 4.51, E factor = 1.000, stress increase = 1.000, slot offset, = 3.000, web-flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK, >> PASSED.
	Right	Slot: Web Thk = 0.134, Load Case 0.6MW Wall 3, Factored F = 4.51, E factor = 1.000, stress increase = 1.000, slot offset, = 3.000, web-flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK, >> PASSED.
4	Left	Slot: Web Thk = 0.164, Load Case 1.0D+0.6W3>, Factored F = 3.39, E factor = 1.000, stress increase = 1.000, slot offset, = 3.000, web-flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK, >> PASSED.
	Right	Slot: Web Thk = 0.134, Load Case 1.0D+0.6W3>, Factored F = 3.39, E factor = 1.000, stress increase = 1.000, slot offset, = 3.000, web-flange

		weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK, >> PASSED.
5	Left	Slot: Web Thk = 0.164, Load Case 0.6MW Wall 3, Factored F = 5.36, E factor = 1.000, stress increase = 1.000, slot offset, = 3.000, web-flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK, >> PASSED.
	Right	Slot: Web Thk = 0.134, Load Case 0.6MW Wall 3, Factored F = 5.36, E factor = 1.000, stress increase = 1.000, slot offset, = 3.000, web-flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK, >> PASSED.
6	Left	Slot: Web Thk = 0.164, Load Case 1.0D+0.6W3>, Factored F = 3.98, E factor = 1.000, stress increase = 1.000, slot offset, = 3.000, web-flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK, >> PASSED.
	Right	Slot: Web Thk = 0.134, Load Case 1.0D+0.6W3>, Factored F = 3.98, E factor = 1.000, stress increase = 1.000, slot offset, = 3.000, web-flange weld OK, web direct shear OK, web punching shear OK, tensile fracture of web OK, >> PASSED.


(1)
(2)
20'-6"
Y
X
6"
31'-6"
31'-6"
6"


(1)
(2)
18'-0"
Y
X
6"
31'-6"
31'-6"
6"

Shape: Covered Parking
Shape Covered Parking is set as an existing shape.

Secondary - Summary Report

Loads and Codes - Shape: Covered Parking Addition

City: Lees Summit **County:** Jackson **State:** Missouri **Country:** United States
Building Code: 2018 International Building Code
Building Risk/Occupancy Category: II (Standard Occupancy Structure)
Structural: 16AISC - ASD
Cold Form: 16AISI - ASD
Rainfall: I: 7.00 inches per hour
f'c: 3000.00 psi Concrete

Dead and Collateral Loads
Collateral Gravity: 10.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

Roof Live Load
Roof Live Load: 20.00 psf Not Reducible

Wind Load
Wind Speed: Vult: 115.00 (Vasd: 89.08) mph

The 'Envelope Procedure' is Used
Primaries Wind Exposure: C - Kz: 0.882
Parts Wind Exposure Factor: 0.882
Wind Enclosure: Partially Open
Topographic Factor: Kzt: 1.0000
Ground Elevation Factor: Ke: 0.9636

NOT Windborne Debris Region
Base Elevation: 0/0/0
Site Elevation: 1024.0 ft
Primary Zone Strip Width: 2a: 12/0/0
Parts / Portions Zone Strip Width:
Walls, a: 6/0/0
Roof(s), 0.6h: 10/9/10
Velocity Pressure: qz: 24.46, (C&C) 24.46 psf

Snow Load
Ground Snow Load: pg: 20.00 psf

Flat Roof Snow: pf: 16.80 psf
Design Snow (Sloped): ps: 16.80 psf
Rain Surcharge: 0.00 psf
Specified Minimum Roof Snow: 20.00 psf (Code)
Exposure Factor: 2 Partially Exposed - Ce: 1.00
Snow Importance: Is: 1.000
Thermal Factor: Unheated - Ct: 1.20
Ground / Roof Conversion: 0.70
Obstructed or Not Slippery

Seismic Load
Lateral Force Resisting Systems using Equivalent Force Procedure
Mapped MCE Acceleration: Ss: 12.00 %g
Mapped MCE Acceleration: S1: 7.00 %g
Site Class: Stiff soil (D) - Default
Seismic Importance: Ie: 1.000
Design Acceleration Parameter: Sds: 0.1280
Design Acceleration Parameter: Sd1: 0.1120
Seismic Design Category:: B
Seismic Snow Load: 0.00 psf
% Snow Used in Seismic: 0.00
Diaphragm Condition: Flexible
Fundamental Period Height Used: 19/3/0

Transverse Direction Parameters
System NOT detailed for Seismic
Redundancy Factor: Rho: 1.00
Fundamental Period: Ta: 0.2983
R-Factor: 3.00
Overstrength Factor: Omega: 2.50
Deflection Amplification Factor: Cd: 3.00
Base Shear: V: 0.0427 x W

Longitudinal Direction Parameters
System NOT detailed for Seismic
Redundancy Factor: Rho: 1.00
Fundamental Period: Ta: 0.1838
R-Factor: 3.00
Overstrength Factor: Omega: 2.50
Deflection Amplification Factor: Cd: 3.00
Base Shear: V: 0.0427 x W

Design Load Combinations - Purlin

No.	Origin	Factor	Application	Description
1	System	1.000	1.0 D + 1.0 CG + 1.0 L	D + CG + L
2	System	1.000	1.0 D + 1.0 CG + 1.0 SMS	D + CG + SMS
3	System	1.000	1.0 D + 1.0 CG + 1.0 PF1	D + CG + PF1(Span 1)
4	System	1.000	1.0 D + 1.0 CG + 1.0 PF1	D + CG + PF1(Span 2)
5	System Derived	1.000	1.0 D + 1.0 CG + 0.7 EB> + 0.7 EG+	D + CG + EB> + EG+
6	System Derived	1.000	0.6 D + 0.6 CU + 0.7 EB> + 0.7 EG-	D + CU + EB> + EG-
7	System Derived	1.000	1.0 D + 1.0 CG + 0.7 <EB + 0.7 EG+	D + CG + <EB + EG+
8	System Derived	1.000	0.6 D + 0.6 CU + 0.7 <EB + 0.7 EG-	D + CU + <EB + EG-
9	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 <WB1	D + CG + W1> + <WB1
10	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 <WB1	D + CG + <W2 + <WB1
11	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 <WB1	D + CU + W1> + <WB1
12	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 <WB1	D + CU + <W2 + <WB1
13	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 <WB1	D + CG + L + W1> + <WB1
14	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 <WB1	D + CG + L + <W2 + <WB1
15	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 <WB1	D + CG + S + W1> + <WB1
16	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 <WB1	D + CG + S + <W2 + <WB1
17	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 <WB2	D + CG + W1> + <WB2
18	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 <WB2	D + CG + <W2 + <WB2
19	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 <WB2	D + CU + W1> + <WB2
20	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 <WB2	D + CU + <W2 + <WB2
21	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 <WB2	D + CG + L + W1> + <WB2

22	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 <WB2	D + CG + L + <W2 + <WB2
23	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 <WB2	D + CG + S + W1> + <WB2
24	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 <WB2	D + CG + S + <W2 + <WB2
25	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 <WB3	D + CG + W1> + <WB3
26	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 <WB3	D + CG + <W2 + <WB3
27	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 <WB3	D + CU + W1> + <WB3
28	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 <WB3	D + CU + <W2 + <WB3
29	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 <WB3	D + CG + L + W1> + <WB3
30	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 <WB3	D + CG + L + <W2 + <WB3
31	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 <WB3	D + CG + S + W1> + <WB3
32	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 <WB3	D + CG + S + <W2 + <WB3
33	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 <WB4	D + CG + W1> + <WB4
34	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 <WB4	D + CG + <W2 + <WB4
35	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 <WB4	D + CU + W1> + <WB4
36	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 <WB4	D + CU + <W2 + <WB4
37	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 <WB4	D + CG + L + W1> + <WB4
38	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 <WB4	D + CG + L + <W2 + <WB4
39	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 <WB4	D + CG + S + W1> + <WB4
40	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 <WB4	D + CG + S + <W2 + <WB4
41	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 WB1>	D + CG + W1> + WB1>
42	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 WB1>	D + CG + <W2 + WB1>
43	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 WB1>	D + CU + W1> + WB1>
44	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 WB1>	D + CU + <W2 + WB1>
45	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 WB1>	D + CG + L + W1> + WB1>
46	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 WB1>	D + CG + L + <W2 + WB1>
47	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 WB1>	D + CG + S + W1> + WB1>
48	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 WB1>	D + CG + S + <W2 + WB1>
49	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 WB2>	D + CG + W1> + WB2>
50	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 WB2>	D + CG + <W2 + WB2>
51	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 WB2>	D + CU + W1> + WB2>
52	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 WB2>	D + CU + <W2 + WB2>
53	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 WB2>	D + CG + L + W1> + WB2>
54	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 WB2>	D + CG + L + <W2 + WB2>
55	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 WB2>	D + CG + S + W1> + WB2>
56	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 WB2>	D + CG + S + <W2 + WB2>
57	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 WB3>	D + CG + W1> + WB3>
58	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 WB3>	D + CG + <W2 + WB3>
59	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 WB3>	D + CU + W1> + WB3>
60	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 WB3>	D + CU + <W2 + WB3>
61	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 WB3>	D + CG + L + W1> + WB3>
62	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 WB3>	D + CG + L + <W2 + WB3>
63	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 WB3>	D + CG + S + W1> + WB3>
64	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 WB3>	D + CG + S + <W2 + WB3>
65	System Derived	1.000	1.0 D + 1.0 CG + 0.6 W1> + 0.6 WB4>	D + CG + W1> + WB4>
66	System Derived	1.000	1.0 D + 1.0 CG + 0.6 <W2 + 0.6 WB4>	D + CG + <W2 + WB4>
67	System Derived	1.000	0.6 D + 0.6 CU + 0.6 W1> + 0.6 WB4>	D + CU + W1> + WB4>
68	System Derived	1.000	0.6 D + 0.6 CU + 0.6 <W2 + 0.6 WB4>	D + CU + <W2 + WB4>
69	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1> + 0.45 WB4>	D + CG + L + W1> + WB4>
70	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2 + 0.45 WB4>	D + CG + L + <W2 + WB4>
71	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1> + 0.45 WB4>	D + CG + S + W1> + WB4>
72	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2 + 0.45 WB4>	D + CG + S + <W2 + WB4>

Design Load Combinations - Girt

No.	Origin	Factor	Application	Description
1	System	1.000	0.6 W1>	W1>
2	System	1.000	0.6 <W2	<W2

Deflection Load Combinations - Purlin

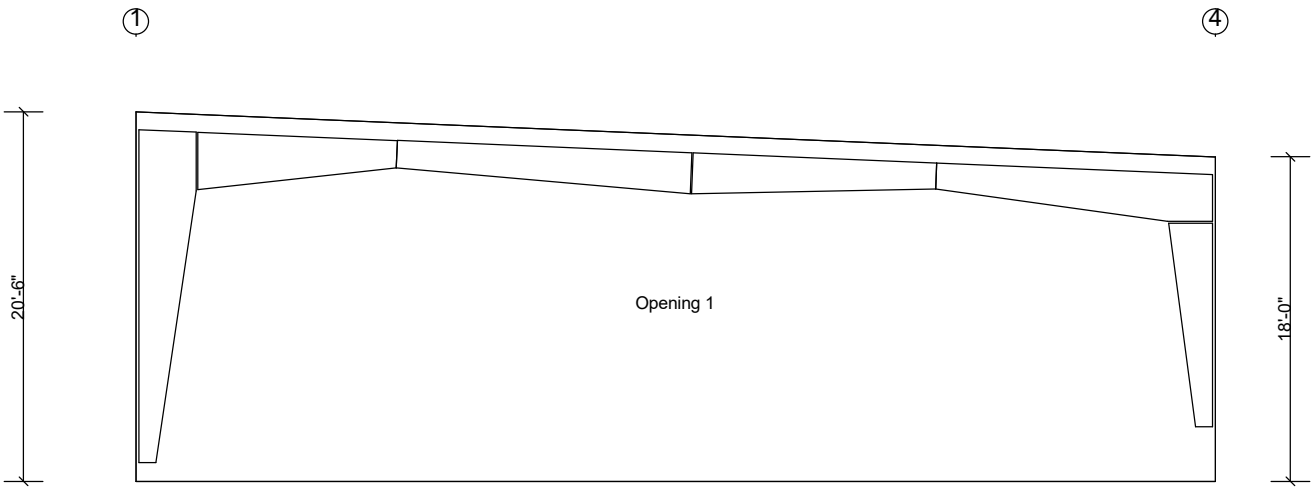
No.	Origin	Factor	Deflection	Application	Description
1	User	1.000	200	1.0 U1	D + CG + 50%SL
2	System	1.000	150	1.0 L	L
3	System	1.000	180	1.0 SMS	SMS
4	System	1.000	180	0.42 W1>	W1>
5	System	1.000	180	0.42 <W2	<W2

Deflection Load Combinations - Girt

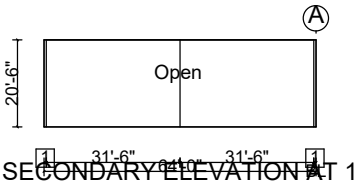
No.	Origin	Factor	Deflection	Application	Description

1	System	1.000	90	0.42 W1>	W1>
2	System	1.000	90	0.42 <W2	<W2

Wall: 1



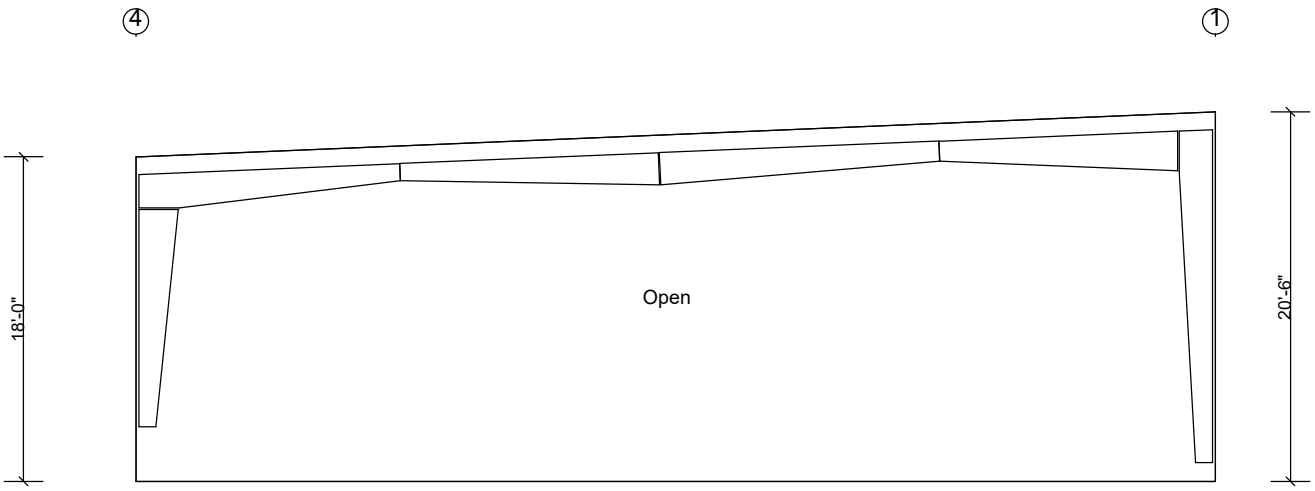
Wall: 2



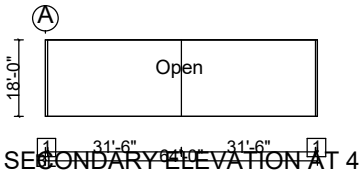
SECONDARY ELEVATION AT 1

Dimension Key
1 6"

Wall: 3



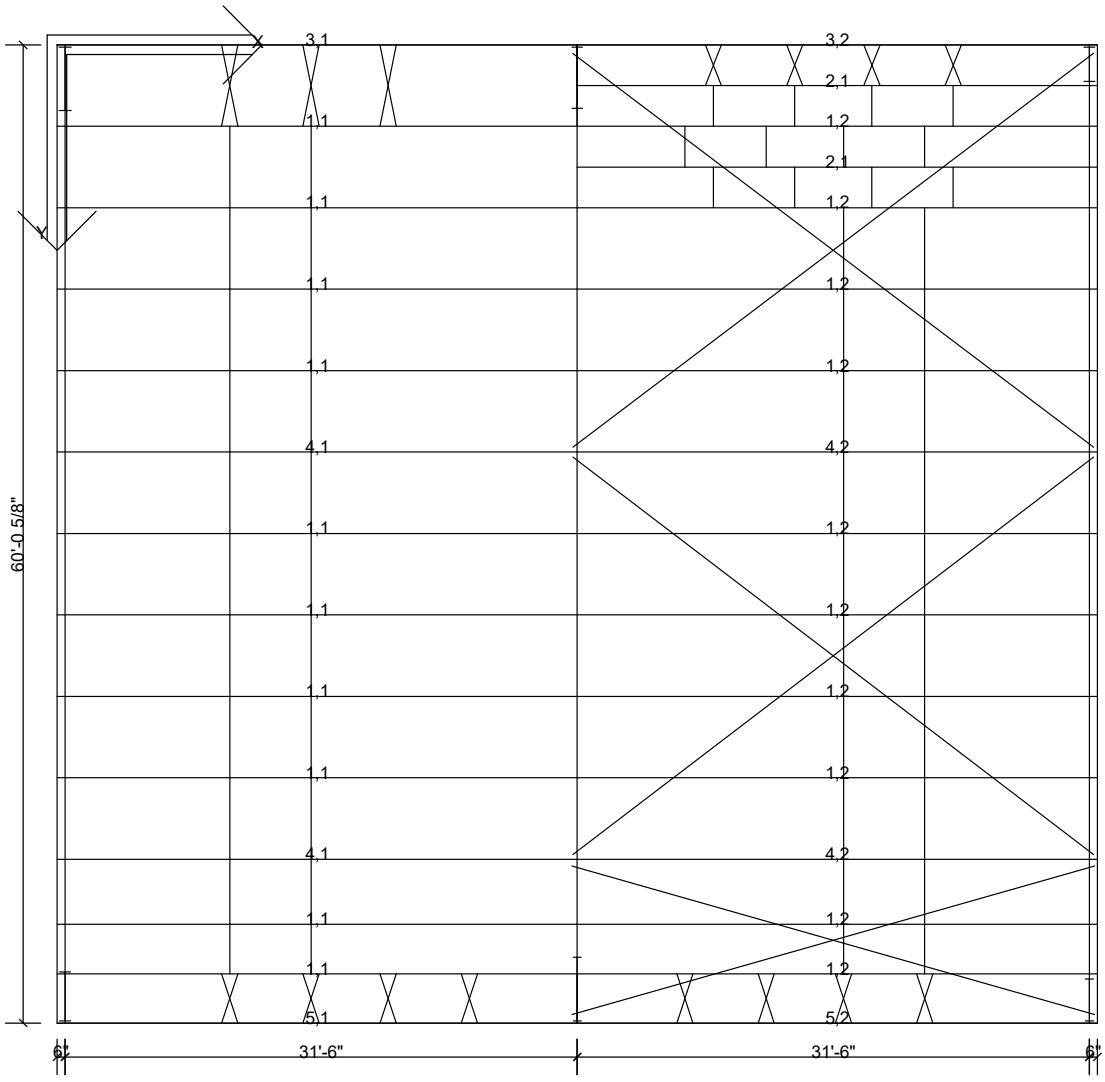
Wall: 4



SECONDARY ELEVATION AT 4

Dimension Key
1 6"

Roof: A



Maximum Secondary Designs for Shape Covered Parking Addition on Side A

Des Id	Len (ft)	Description - Fy(ksi)	Design Status	Detail Lap (in.)	Location	Stress Condition % Axial	% Bnd	% Shr	% Cmb	% Wcp	Ld Cs	Lap (in.)
1,1	32.00	11.50x0.113 Z Con-60.0	Yes	46.5	Interior	0.00	1.01	0.06	0.82	0.00	1	
					Right	0.00	0.79	0.29	0.85	0.00	1	46.5
1,2	32.00	11.50x0.113 Z Con-60.0	Yes	46.5	Left	0.00	0.79	0.29	0.85	0.00	1	46.5
					Interior	0.00	0.96	0.47	0.92	0.00	1	
2,1	32.00	11.50x0.113 Z Sim-60.0	Yes	0.0	Interior	0.00	0.96	0.00	0.96	0.00	1	
3,1	32.00	11.50x0.113 EZ Sim-60.0	Yes	0.0	Interior	0.00	0.73	0.02	0.48	0.00	1	

3,2	32.00	11.50x0.113 EZ Sim-60.0	Yes	0.0	Interior	0.07	0.83	0.03	0.98	0.00	38	
4,1	32.00	11.50x0.113 Z Con-60.0	Yes	46.5	Interior	0.00	0.97	0.47	0.93	0.00	2	
					Right	0.00	0.67	0.19	0.69	0.00	2	46.5
4,2	32.00	11.50x0.113 Z Con-60.0	Yes	46.5	Left	0.05	0.65	0.18	0.71	0.00	38	46.5
					Interior	0.08	0.65	0.22	0.75	0.00	38	
5,1	32.00	11.50x0.113 EZ Sim-60.0	Yes	0.0	Interior	0.00	0.66	0.00	0.66	0.00	1	
5,2	32.00	11.50x0.113 EZ Sim-60.0	Yes	0.0	Interior	0.30	0.64	0.00	1.03	0.00	38	

Maximum Secondary Deflections for Shape Covered Parking Addition on Side A

Design Id	Segment	Deflection(in.)	Ratio	Location(ft)	Load Case	Description
1	1	-1.08	(L/348)	14.50	3	1.0SMS
1	2	-0.76	(L/498)	50.88	3	1.0SMS
2	1	-1.34	(L/283)	15.50	3	1.0SMS
3	1	-0.88	(L/428)	16.50	3	1.0SMS
3	2	-0.74	(L/512)	47.50	3	1.0SMS
4	1	-0.75	(L/505)	13.00	3	1.0SMS
4	2	-0.59	(L/643)	50.88	3	1.0SMS
5	1	-0.89	(L/423)	16.50	3	1.0SMS
5	2	-0.89	(L/423)	47.50	3	1.0SMS

Purlin Anchorage Forces for Shape Covered Parking Addition, Roof A, Panel Type is MR24, Pitch = -0.500:12 AR Clip if req'd - PC6 Flipped Orientation=2

Bay	Thickness	Load(psf)	Ld Case	# Purlins	Length	Simple?	Diaphragm Width	Allowable Defl	Actual Defl
1	0.113	-31.17	1	12	32.00	N	60.05	2.133	0.462
2	0.113	-31.17	1	12	32.00	N	60.05	2.133	0.462

Reference Frm-Line	Located @	Force per Anch. Line(k)	Force per Anchor	Anch. Allow	Req'd AR Anchors	Actual AR, STD	Required Stiffness	Available Stiffness	Diaphragm Allow	Diaphragm Shr	Diaphragm Stress Ratio
1(0.00)	Frame	0.35D	0.03D (k)	0.50W	0	0, 12	1.211	18.854	0.069	0.005	0.078
	BR.1		0.85T (in-k)	4.35	1	1, 0			0.069	0.000	0.000
	BR.2		0.85T (in-k)	4.35	1	1, 0			0.069	0.000	0.000
	BR.3		0.85T (in-k)	4.35	1	1, 0			0.069	0.000	0.000
	BR.4		0.85T (in-k)	4.35	1	1, 0			0.069	0.000	0.000
2(32.00)	Frame	0.65D	0.05D (k)	0.57W	0	0, 14	2.248	30.267	0.069	0.005	0.067
	BR.1		0.85T (in-k)	4.35	1	1, 0			0.069	0.000	0.000
	BR.2		0.85T (in-k)	4.35	1	1, 0			0.069	0.000	0.000
	BR.3		0.85T (in-k)	4.35	1	1, 0			0.069	0.000	0.000
	BR.4		0.85T (in-k)	4.35	1	1, 0			0.069	0.000	0.000
3(64.00)	Frame	0.35D	0.03D (k)	0.50W	0	0, 14	1.211	18.854	0.069	0.005	0.078

Shape Covered Parking is set as an existing shape.

Framing - Summary Report

Loads and Codes - Shape: Covered Parking Addition

City: Lees Summit **County:** Jackson **State:** Missouri **Country:** United States
Building Code: 2018 International Building Code
Building Risk/Occupancy Category: II (Standard Occupancy Structure)
Structural: 16AISC - ASD
Cold Form: 16AISI - ASD
Rainfall: I: 7.00 inches per hour
f'c: 3000.00 psi Concrete

Dead and Collateral Loads
Collateral Gravity: 10.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

Roof Live Load
Roof Live Load: 20.00 psf Not Reducible

Wind Load
Wind Speed: Vult: 115.00 (Vasd: 89.08) mph

The 'Envelope Procedure' is Used
Primaries Wind Exposure: C - Kz: 0.882
Parts Wind Exposure Factor: 0.882
Wind Enclosure: Partially Open
Topographic Factor: Kzt: 1.0000
Ground Elevation Factor: Ke: 0.9636

NOT Windborne Debris Region
Base Elevation: 0/0/0
Site Elevation: 1024.0 ft
Primary Zone Strip Width: 2a: 12/0/0
Parts / Portions Zone Strip Width:
Walls, a: 6/0/0
Roof(s), 0.6h: 10/9/10
Velocity Pressure: qz: 24.46, (C&C) 24.46 psf

Snow Load
Ground Snow Load: pg: 20.00 psf

Flat Roof Snow: pf: 16.80 psf
Design Snow (Sloped): ps: 16.80 psf
Rain Surcharge: 0.00 psf
Specified Minimum Roof Snow: 20.00 psf (Code)
Exposure Factor: 2 Partially Exposed - Ce: 1.00
Snow Importance: Is: 1.000
Thermal Factor: Unheated - Ct: 1.20
Ground / Roof Conversion: 0.70
Obstructed or Not Slippery

Seismic Load
Lateral Force Resisting Systems using Equivalent Force Procedure
Mapped MCE Acceleration: Ss: 12.00 %g
Mapped MCE Acceleration: S1: 7.00 %g
Site Class: Stiff soil (D) - Default
Seismic Importance: Ie: 1.000
Design Acceleration Parameter: Sds: 0.1280
Design Acceleration Parameter: Sd1: 0.1120
Seismic Design Category:: B
Seismic Snow Load: 0.00 psf
% Snow Used in Seismic: 0.00
Diaphragm Condition: Flexible
Fundamental Period Height Used: 19/3/0

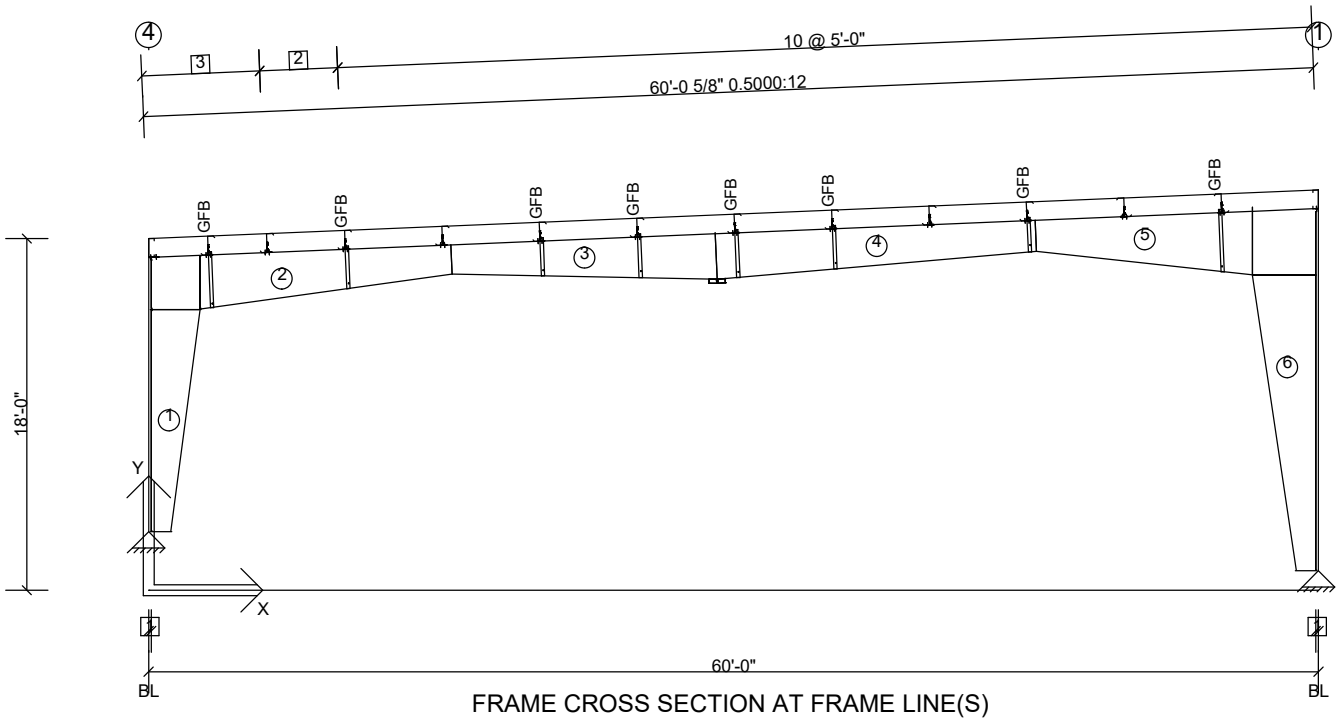
Transverse Direction Parameters
System NOT detailed for Seismic
Redundancy Factor: Rho: 1.00
Fundamental Period: Ta: 0.2983
R-Factor: 3.00
Overstrength Factor: Omega: 2.50
Deflection Amplification Factor: Cd: 3.00
Base Shear: V: 0.0427 x W

Longitudinal Direction Parameters
System NOT detailed for Seismic
Redundancy Factor: Rho: 1.00
Fundamental Period: Ta: 0.1838
R-Factor: 3.00
Overstrength Factor: Omega: 2.50
Deflection Amplification Factor: Cd: 3.00
Base Shear: V: 0.0427 x W

Deflection Conditions
Frames are vertically supporting: Metal Roof Purlins and Panels
Frames are laterally supporting: Metal Wall Girts and Panels
Purlins are supporting: Metal Roof Panels
Girts are supporting: Metal Wall Panels

Wall: 4, Frame at: 0/6/0

Frame Cross Section:



FRAME CROSS SECTION AT FRAME LINE(S)

Dimension Key
1 1 5/8"
2 4'-0"
3 2 @ 3'-0 5/16"

Frame Clearances
Horiz. Clearance between members 1(CX001) and 6(CX002): 53'-11 3/4"
Vert. Clearance at member 1(CX001): 14'-4 1/2"
Vert. Clearance at member 6(CX002): 16'-1 1/4"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

Frame Location Design Parameters:

Location	Avg. Bay Space	Description	Angle	Group	Trib. Override	Design Status
0/6/0	16/3/0	LRST	90.0000		33/0/0	Stress Check

Design Load Combinations - Framing

No.	Origin	Factor	Application	Description
1	System	1.000	1.0 D + 1.0 CG + 1.0 L>	D + CG + L>
2	System	1.000	1.0 D + 1.0 CG + 1.0 <L	D + CG + <L
3	System	1.000	1.0 D + 1.0 CG + 1.0 SMS>	D + CG + SMS>
4	System	1.000	1.0 D + 1.0 CG + 1.0 <SMS	D + CG + <SMS
5	System	1.000	1.0 D + 1.0 CG + 0.6 W1>	D + CG + W1>
6	System	1.000	1.0 D + 1.0 CG + 0.6 <W1	D + CG + <W1
7	System	1.000	1.0 D + 1.0 CG + 0.6 W2>	D + CG + W2>
8	System	1.000	1.0 D + 1.0 CG + 0.6 <W2	D + CG + <W2
9	System	1.000	1.0 D + 1.0 CG + 0.6 WPL	D + CG + WPL
10	System	1.000	1.0 D + 1.0 CG + 0.6 WPR	D + CG + WPR
11	System	1.000	0.6 MW	MW - Wall: 1
12	System	1.000	0.6 MW	MW - Wall: 2
13	System	1.000	0.6 MW	MW - Wall: 3
14	System	1.000	0.6 MW	MW - Wall: 4
15	System	1.000	0.6 D + 0.6 CU + 0.6 W1>	D + CU + W1>
16	System	1.000	0.6 D + 0.6 CU + 0.6 <W1	D + CU + <W1
17	System	1.000	0.6 D + 0.6 CU + 0.6 W2>	D + CU + W2>
18	System	1.000	0.6 D + 0.6 CU + 0.6 <W2	D + CU + <W2
19	System	1.000	0.6 D + 0.6 CU + 0.6 WPL	D + CU + WPL
20	System	1.000	0.6 D + 0.6 CU + 0.6 WPR	D + CU + WPR
21	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1>	D + CG + L + W1>
22	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W1	D + CG + L + <W1
23	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W2>	D + CG + L + W2>
24	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2	D + CG + L + <W2
25	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL	D + CG + L + WPL
26	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR	D + CG + L + WPR
27	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1>	D + CG + S + W1>
28	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W1	D + CG + S + <W1
29	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W2>	D + CG + S + W2>
30	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2	D + CG + S + <W2
31	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL	D + CG + S + WPL
32	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR	D + CG + S + WPR
33	System	1.000	1.0 D + 1.0 CG + 0.7 E> + 0.7 EG+	D + CG + E> + EG+
34	System	1.000	1.0 D + 1.0 CG + 0.7 <E + 0.7 EG+	D + CG + <E + EG+
35	System	1.000	0.6 D + 0.6 CU + 0.7 E> + 0.7 EG-	D + CU + E> + EG-
36	System	1.000	0.6 D + 0.6 CU + 0.7 <E + 0.7 EG-	D + CU + <E + EG-

Frame Member Sizes

Mem. No.	Flg Width (in.)	Flg Thk (in.)	Web Thk (in.)	Depth1 (in.)	Depth2 (in.)	Length (ft)	Weight (p)	Flg Fy (ksi)	Web Fy (ksi)	Splice Jt.1	Codes Jt.2	Shape
1	8.00	0.3750	0.1644	12.00	30.00	14.03	415.8	55.00	55.00	BP	KN	3P
2	6.00	0.3750	0.1644	33.00	18.00	15.37	492.7	55.00	55.00	KN	SS	3P
3	6.00	0.3125	0.1345	18.00	28.00	13.58	331.5	55.00	55.00	SS	SP	3P
4	6.00	0.3125	0.1345	28.00	19.00	16.42	400.5	55.00	55.00	SP	SS	3P
5	6.00	0.3750	0.1875	19.00	39.00	14.40	404.8	55.00	55.00	SS	KN	3P
6	9.00	0.3750	0.1875	12.00	39.00	18.54	811.4	55.00	55.00	BP	KN	3P

Total Frame Weight = 2856.6 (p) (Includes all plates)

Boundary Condition Summary

Member	X-Loc	Y-Loc	Supp. X	Supp. Y	Moment	Displacement X(in.)	Displacement Y(in.)	Displacement ZZ(rad.)
1	0/0/0	3/0/0	Yes	Yes	No	0/0/0	0/0/0	0.0000
6	60/0/0	1/0/0	Yes	Yes	No	0/0/0	0/0/0	0.0000

Values shown are resisting forces of the foundation.
Base Connection Design is Based on 3000.00 (psi) Concrete

Reactions - Unfactored Load Type at Frame Cross Section:

Type	Exterior Column	Exterior Column			
X-Loc	0/0/0	60/0/0			
Grid1 - Grid2	-4	-1			
Base Plate W x L (in.)	9 X 13	10 X 13			

Base Plate Thickness (in.)		0.375		0.375				
Anchor Rod Qty/Diam. (in.)		4 - 1.000		4 - 1.000				
Column Base Elev.		103'-0"		101'-0"				
Load Type	Desc.	Hx	Vy	Hx	Vy			
D	Frm	2.39	3.80	-2.39	4.24	-	-	-
CG	Frm	6.73	9.69	-6.73	10.11	-	-	-
L>	Frm	13.45	19.38	-13.45	20.22	-	-	-
<L	Frm	13.45	19.38	-13.45	20.22	-	-	-
SMS>	Frm	13.45	19.38	-13.45	20.22	-	-	-
<SMS	Frm	13.45	19.38	-13.45	20.22	-	-	-
W1>	Frm	-13.77	-20.33	14.79	-21.85	-	-	-
<W1	Frm	-8.70	-12.85	9.35	-13.82	-	-	-
W2>	Frm	-8.07	-11.92	8.67	-12.81	-	-	-
<W2	Frm	-3.01	-4.44	3.23	-4.77	-	-	-
WPL	Frm	-8.70	-12.85	9.35	-13.82	-	-	-
WPR	Frm	-13.77	-20.33	14.79	-21.85	-	-	-
MW - Wall: 1	Frm	-	-	-	-	-	-	-
MW - Wall: 2	Frm	3.31	1.60	6.99	-1.60	-	-	-
MW - Wall: 3	Frm	-	-	-	-	-	-	-
MW - Wall: 4	Frm	-6.11	-1.15	-2.12	1.15	-	-	-
CU	Frm	-	-	-	-	-	-	-
L	Frm	13.45	19.38	-13.45	20.22	-	-	-
S	Frm	11.30	16.28	-11.30	16.98	-	-	-
E>	Frm	-0.72	-0.35	-0.56	0.29	-	-	-
EG+	Frm	0.26	0.38	-0.26	0.39	-	-	-
<E	Frm	0.72	0.35	0.56	-0.29	-	-	-
EG-	Frm	-0.26	-0.38	0.26	-0.39	-	-	-
SMS	Frm	13.45	19.38	-13.45	20.22	-	-	-

Sum of Forces with Reactions Check - Framing

	Horizontal		Vertical	
Load Type	Load (k)	Reaction (k)	Load (k)	Reaction (k)
D	0.0	0.0	8.0	8.0
CG	0.0	0.0	19.8	19.8
L>	0.0	0.0	39.6	39.6
<L	0.0	0.0	39.6	39.6
SMS>	0.0	0.0	39.6	39.6
<SMS	0.0	0.0	39.6	39.6
W1>	1.8	1.0	42.1	42.2
<W1	1.1	0.6	26.6	26.7
W2>	1.0	0.6	24.7	24.7
<W2	0.4	0.2	9.2	9.2
WPL	1.1	0.6	26.6	26.7
WPR	1.8	1.0	42.1	42.2
MW - Wall: 1	0.0	0.0	0.0	0.0
MW - Wall: 2	10.3	10.3	0.0	0.0
MW - Wall: 3	0.0	0.0	0.0	0.0
MW - Wall: 4	8.2	8.2	0.0	0.0
CU	0.0	0.0	0.0	0.0
L	0.0	0.0	39.6	39.6
S	0.0	0.0	33.3	33.3
E>	1.3	1.3	0.0	0.1
EG+	0.0	0.0	0.8	0.8
<E	1.3	1.3	0.0	0.1
EG-	0.0	0.0	0.8	0.8
SMS	0.0	0.0	39.6	39.6

Maximum Combined Reactions Summary with Factored Loads - Framing

Note: All reactions are based on 1st order structural analysis.

X-Loc	Grid	Hrz left (-Hx) (k)	Load Case	Hrz Right (Hx) (k)	Load Case	Hrz In (-Hz) (k)	Load Case	Hrz Out (Hz) (k)	Load Case	Uplift (-Vy) (k)	Load Case	Vrt Down (Vy) (k)	Load Case	Mom cw (-Mzz) (in-k)	Load Case	Mom ccw (Mzz) (in-k)	Load Case
0/0/0	-4	6.83	15	22.57	1	-	-	-	-	9.92	15	32.87	1	-	-	-	-
60/0/0	-1	22.57	1	7.44	15	-	-	-	-	10.57	15	34.57	1	-	-	-	-

Base Plate Summary

Base Connection Design is Based on 3000.00 (psi) Concrete
Plate Fy = 55.00 ksi
Grade A36 Anchor Rods used to determine quantity and diameter
Gage and pitch standards are based on ACI-318 Appendix D criteria for "cast-in-place" anchor rods (Min space = 4*drod)

X-Loc	Grid	Mem. No.	Thickness (in.)	Width (in.)	Length (in.)	Stiff.	Num. Of Rods	Rod Diam. (in.)	Pitch (in.)	Gage (in.)	Hole Type	Welds to Flange	Welds to Web
0/0/0	-4	1	0.375	9	13	No	4	1.000	5.0	5.0	Std	OS-0.1875	OS-0.1875
60/0/0	-1	6	0.375	10	13	No	4	1.000	5.0	5.0	Std	OS-0.1875	OS-0.1875

Pinned Base Plate Connection Loading

	Maximum Shear Case			Maximum Tension Case			Maximum Comp Case			Maximum Bracing/WA Case			
X-Loc	Shear (k)	Axial (k)	Load Case	Shear (k)	Tension (k)	Load Case	Shear (k)	Comp (k)	Load Case	Shear (k)	Axial (k)	Frame Shear (k)	Load Case
0/0/0	22.93	32.87	2	6.80	-9.93	15	22.93	32.87	2	-	-	-	0
60/0/0	22.91	34.64	1	7.41	-10.56	15	22.91	34.64	1	-	-	-	0

Base Plate Connection Strength Ratios

X-Loc	Rod Shear	Load Case	Rod Tension	Load Case	Rod V + T	Load Case	Rod Bending	Load Case	Conc. Bearing	Load Case	Plate Tension	Load Case	Plate Comp	Load Case	Flange Weld	Load Case	Web Weld	Load Case
0/0/0	0.699	2	0.145	15	-	15	-	0	0.254	2	0.296	15	0.199	2	0.365	2	0.688	2
60/0/0	0.698	1	0.155	15	-	15	-	0	0.241	1	0.271	15	0.219	1	0.341	1	0.687	1

Web Stiffener Summary

Mem. No.	Stiff. No.	Desc.	Loc. (ft)	Web Depth (in.)	h/t	a/h	a (in.)	Thick. (in.)	Width (in.)	Side	Welding Description
2	***	MUST	Use Alternate	Alternate Web	Web Thick.=	Min.	0.2500 Weld	* Size =	* 0.1250	* To	* Flange,Flange Special,Bolting Plate
2	2	S9	2.50	32.191	195.81	N/A	N/A	0.6250	3.000	Both	SP-BS-0.5000,W-BS-0.1250,F-OS-0.1875
6	1	S3	15.12	38.250	N/A	N/A	N/A	0.3750	4.500	Both	SP-BS-0.3125,W-BS-0.1250,F-OS-0.1875

Bolted End-Plate Connections (Plate Fy = 55.00 ksi)

Mem.	Jt.	Type	End-Plate Dimensions			Bolt			Outside Flange			Inside Flange		
			Thick.	Width	Length	Diam.	Spec/Joint	Gages In/Out	Configuration		Pitches 1st/2nd	Configuration		Pitches 1st/2nd
No.	No.		(in.)	(in.)	(in.)	(in.)		(in.)	ID	Desc.	(in.)	ID	Desc.	(in.)
1	2	KN(Top)	0.625	8.00	31.00	0.750	A325N/ST	3.00	14	Flush	2.00/2.00	11	Flush	20.00/2.00
2	1	KN(Top)	0.625	6.00	31.00	0.750	A325N/ST	3.00	14	Flush	2.00/2.00	11	Flush	20.00/2.00
3	2	SP	0.375	6.00	30.98	0.750	A325N/ST	3.00	12	Flush	2.00	42	Ext/Gusset	3.25/2.00
		Gusset In 2.500 x 0.2500 x 4.50 SP-BS-0.1875,												
4	1	SP	0.375	6.00	30.98	0.750	A325N/ST	3.00	12	Flush	2.00	42	Ext/Gusset	3.25/2.00
		Gusset In 2.500 x 0.2500 x 4.38 SP-BS-0.1875,												
5	2	KN(Face)	0.500	6.00	42.14	0.750	A325N/ST	3.00	33	Extended	3.50/2.00	12	Flush	2.00/2.00
6	2	KN(Face)	0.500	9.00	42.17	0.750	A325N/ST	3.00	33	Extended	3.50/2.00	12	Flush	2.00/2.00

Moment Connections:

Outside Flange		Required Strength					Strength Ratios *							
Mem. No.	Jt. No.	Ld Cs	Axial (k)	Shear (k)	Moment (in-k)	Design Proc.	Bolt Tension	Bolt Shear	Plate Bending	Shear Yielding	Shear Rupture	Bearing Tearing	Flange Weld	Web Weld
1	2	2	-34.3	20.6	2836.0	AISC DG-16/Thin plate	0.771	0.168	0.870	0.000	0.000	0.060	0.856	0.631
2	1	2	-34.3	20.6	2836.0	AISC DG-16/Thin plate	0.771	0.168	0.870	0.000	0.000	0.060	0.913	0.631
3	2	15	7.3	0.2	528.1	AISC DG-16/Thin plate	0.425	0.002	0.920	0.000	0.000	0.001	0.799	0.516
4	1	15	7.3	0.2	528.1	AISC DG-16/Thin plate	0.425	0.002	0.920	0.000	0.000	0.001	0.799	0.516
5	2	1	-23.4	29.7	3494.1	AISC DG-16/Thin plate	0.721	0.242	0.948	0.579	0.856	0.121	0.914	0.719
6	2	1	-23.4	29.7	3494.1	AISC DG-16/Thin plate	0.721	0.242	0.948	0.579	0.856	0.121	0.762	0.719

Inside Flange		Required Strength					Strength Ratios *							
Mem. No.	Jt. No.	Ld Cs	Axial (k)	Shear (k)	Moment (in-k)	Design Proc.	Bolt Tension	Bolt Shear	Plate Bending	Shear Yielding	Shear Rupture	Bearing Tearing	Flange Weld	Web Weld
1	2	15	10.3	6.1	841.7	AISC DG-16/Thick plate	0.935	0.125	0.717	0.000	0.000	0.061	0.959	0.631
2	1	15	10.3	6.1	841.7	AISC DG-16/Thick plate	0.935	0.125	0.717	0.000	0.000	0.061	0.959	0.631
3	2	1	-22.8	1.6	1719.7	AISC DG-16/Thin plate	0.701	0.016	0.937	0.000	0.000	0.012	0.983	0.516
4	1	1	-22.8	1.6	1719.7	AISC DG-16/Thin plate	0.701	0.016	0.937	0.000	0.000	0.012	0.983	0.516
5	2	15	7.8	9.4	1134.2	AISC DG-16/Thin plate	0.532	0.128	0.733	0.000	0.000	0.065	0.959	0.719
6	2	15	7.8	9.4	1134.2	AISC DG-16/Thin plate	0.532	0.128	0.733	0.000	0.000	0.065	0.959	0.719

* Strength ratios shown for the connections are reported as a percentage of the system default or user Override Stress Limit (Stress Limit = 1.03)

Bolted End-Plate Connections Weld Data:

Mem.	Jt.		Outside Flange				Inside Flange				Web				WS P 01 Web Weld			
No.	No.	Type	Type	Size (in.)	Side	Notes	Type	Size (in.)	Side	Notes	Type	Size (in.)	Side	Notes	Type	Size (in.)	Side	Notes
1	2	KN(Top)	Fillet	0.2500	Both	-	Fillet	0.1875	Both	-	Fillet	0.1250	Both	-	-	-	-	-
2	1	KN(Top)	Fillet	0.3750	Both	-	CJP	99.0000	CJP	-	Fillet	0.1250	Both	-	-	-	-	-
3	2	SP	Fillet	0.1875	Both	-	Fillet	0.1875	Both	-	Fillet	0.1250	Both	-	-	-	-	-
4	1	SP	Fillet	0.1875	Both	-	Fillet	0.1875	Both	-	Fillet	0.1250	Both	-	-	-	-	-
5	2	KN(Face)	Fillet	0.3125	Both	-	Fillet	0.1875	Both	-	Fillet	0.1250	Both	-	-	-	-	-
6	2	KN(Face)	Fillet	0.2500	Both	-	CJP	99.0000	CJP	-	Fillet	0.1250	Both	-	-	-	-	-

Flange Brace Summary

Member	From Member Joint 1	From Side Point 1	Part	Axial Load per FB (k)	Load Case	Design Note
2	2/11/3	57/0/5	GFB4027	1.903	2	
2	9/11/8	50/0/0	GFB3000	0.885	0	
3	4/7/0	40/0/0	GFB2097	0.437	1	
3	9/7/0	35/0/0	GFB3000	0.527	1	
4	1/0/1	30/0/0	GFB3021	0.516	1	
4	6/0/1	25/0/0	GFB3000	0.441	2	
4	16/0/1	15/0/0	GFB2081	0.529	1	
5	9/7/0	5/0/0	GFB4050	1.894	1	

Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)

			Controlling Cases		Required Strength				Available Strength				Strength Ratios	
Mem. No.	Loc. ft	Depth in.	Axial + Flexure	Shear	Axial Pr k	Shear Vr k	Mom-x Mrx in-k	Mom-y Mry in-k	Axial Pc k	Shear Vc k	Mom-x Mcx in-k	Mom-y Mcy in-k	Axial + Flexure	Shear
1	11.42	30.00	2		-34.3		-2836.0	0.0	148.0		3203.2	339.5	1.02	
1	11.42	30.00		2		-20.6				32.0				0.64
2	1.11	33.00	2		-24.9		-2781.1	0.0	156.0		3046.7	229.9	0.99	
2	1.11	33.00		2		27.9				32.0				0.87
3	9.59	25.06	1		-22.8		1618.6	0.0	111.1		1739.6	175.9	1.03	
3	0.00	18.00		2		15.2				21.7				0.70
4	6.01	24.71	2		-22.3		1387.1	0.0	77.7		1750.1	175.8	0.99	
4	16.42	19.00		1		-19.6				21.6				0.91
5	9.61	36.39	1		-23.4		-2997.1	0.0	86.4		3599.5	233.1	1.01	
5	11.05	39.00		1		-29.7				41.4				0.72
6	15.19	39.00	1		-36.2		-3714.4	0.0	131.0		4545.7	376.3	1.00	
6	15.19	39.00		1		20.3				41.4				0.49

Parameters Used for Axial and Flexural Design

Mem. No.	Loc. ft	Lx in.	Ly/Lt in.	Lb in.	Ag in.2	Afn in.2	Ixx in.4	Iyy in.4	Sx in.3	Sy in.3	Zx in.3	Zy in.3	J in.4	Cw in.6	Cb	Rpg	Rpc	Aeff/ Ag
1	11.42	137.07	137.1	137.1	10.81	3.00	1659.38	32.01	110.63	8.00	124.04	12.20	0.33	7023.50	1.66	0.96	1.00	0.69
2	1.11	648.75	28.7	28.7	9.80	2.25	1657.02	13.51	100.43	4.50	116.15	6.97	0.26	3595.50	1.00	0.92	1.00	0.59
3	9.59	648.75	60.0	60.0	7.04	1.88	737.52	11.25	58.87	3.75	66.47	5.74	0.14	1722.83	1.01	0.95	1.00	0.66
4	6.01	648.75	120.0	60.0	6.99	1.88	714.63	11.25	57.84	3.75	65.25	5.73	0.14	1674.76	1.64	0.95	1.00	0.69
5	9.61	648.75	120.3	120.3	11.18	2.25	2167.06	13.52	119.09	4.51	140.59	7.06	0.29	4384.77	1.67	0.92	1.00	0.55
6	15.19	182.26	182.3	182.3	13.92	3.38	3392.05	45.58	173.95	10.13	198.94	15.52	0.40	17001.4 1	1.66	0.93	1.00	0.51

Deflection Load Combinations - Framing

No.	Origin	Factor	Def H	Def V	Application	Description
1	System	1.000	0	180	1.0 L	L
2	System	1.000	0	180	1.0 SMS	SMS
3	System	1.000	60	180	0.42 W1>	W1>
4	System	1.000	60	180	0.42 <W1	<W1
5	System	1.000	60	180	0.42 W2>	W2>
6	System	1.000	60	180	0.42 <W2	<W2
7	System	1.000	60	180	0.42 WPL	WPL
8	System	1.000	60	180	0.42 WPR	WPR
9	System	1.000	10	0	1.0 E> + 1.0 EG-	E> + EG-
10	System	1.000	10	0	1.0 <E + 1.0 EG-	<E + EG-

Controlling Frame Deflection Ratios for Cross Section:

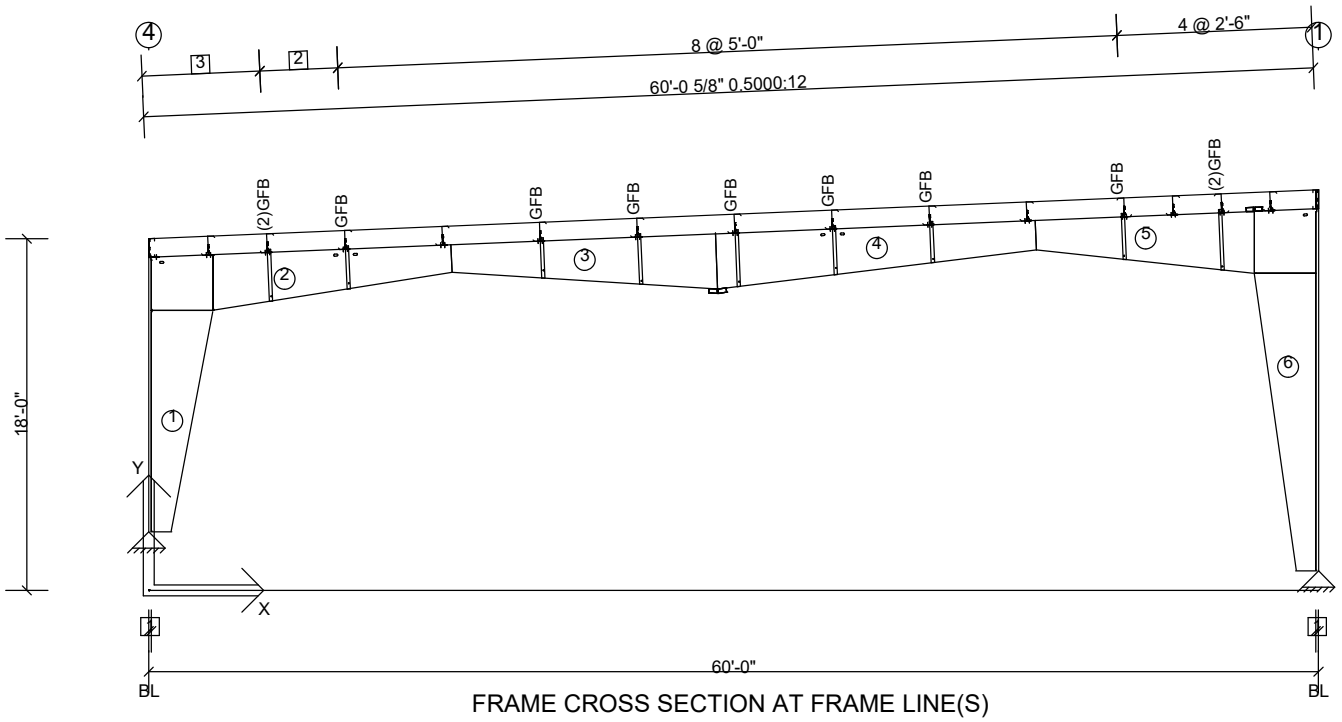
Description	Ratio	Deflection (in.)	Member	Joint	Load Case	Load Case Description
Max. Horizontal Deflection	(H/2148)	-0.071	1	2	8	WPR
Max. Vertical Deflection for Span 1	(L/484)	-1.403	4	1	2	SMS

* Negative horizontal deflection is left
* Negative vertical deflection is down
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms or partial base fixity. Therefore, these deflections may be considerably overstated.

Frame Lateral Stiffness (K): 13.666 (k/in)
Fundamental Period (calculated) (T): 0.475 (sec.)

Wall: 4, Frame at: 32/0/0

Frame Cross Section:



FRAME CROSS SECTION AT FRAME LINE(S)

Dimension Key
1 1 5/8"
2 4'-0"
3 2 @ 3'-0 5/16"

Frame Clearances
Horiz. Clearance between members 1(CX003) and 6(CX004): 53'-4 3/4"
Vert. Clearance at member 1(CX003): 14'-3 7/8"
Vert. Clearance at member 6(CX004): 16'-2 5/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

Frame Location Design Parameters:

Location	Avg. Bay Space	Description	Angle	Group	Trib. Override	Design Status
32/0/0	31/6/0	LRST	90.0000		-	Stress Check

Design Load Combinations - Framing

No.	Origin	Factor	Application	Description
1	System	1.000	1.0 D + 1.0 CG + 1.0 L>	D + CG + L>
2	System	1.000	1.0 D + 1.0 CG + 1.0 <L	D + CG + <L
3	System	1.000	1.0 D + 1.0 CG + 1.0 SMS>	D + CG + SMS>
4	System	1.000	1.0 D + 1.0 CG + 1.0 <SMS	D + CG + <SMS
5	System	1.000	1.0 D + 1.0 CG + 0.6 W1>	D + CG + W1>
6	System	1.000	1.0 D + 1.0 CG + 0.6 <W1	D + CG + <W1
7	System	1.000	1.0 D + 1.0 CG + 0.6 W2>	D + CG + W2>
8	System	1.000	1.0 D + 1.0 CG + 0.6 <W2	D + CG + <W2
9	System	1.000	1.0 D + 1.0 CG + 0.6 WPL	D + CG + WPL
10	System	1.000	1.0 D + 1.0 CG + 0.6 WPR	D + CG + WPR
11	System	1.000	0.6 MW	MW - Wall: 1
12	System	1.000	0.6 MW	MW - Wall: 2
13	System	1.000	0.6 MW	MW - Wall: 3
14	System	1.000	0.6 MW	MW - Wall: 4
15	System	1.000	0.6 D + 0.6 CU + 0.6 W1>	D + CU + W1>
16	System	1.000	0.6 D + 0.6 CU + 0.6 <W1	D + CU + <W1
17	System	1.000	0.6 D + 0.6 CU + 0.6 W2>	D + CU + W2>
18	System	1.000	0.6 D + 0.6 CU + 0.6 <W2	D + CU + <W2
19	System	1.000	0.6 D + 0.6 CU + 0.6 WPL	D + CU + WPL
20	System	1.000	0.6 D + 0.6 CU + 0.6 WPR	D + CU + WPR
21	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1>	D + CG + L + W1>
22	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W1	D + CG + L + <W1
23	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W2>	D + CG + L + W2>
24	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2	D + CG + L + <W2
25	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL	D + CG + L + WPL
26	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR	D + CG + L + WPR
27	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1>	D + CG + S + W1>
28	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W1	D + CG + S + <W1
29	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W2>	D + CG + S + W2>
30	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2	D + CG + S + <W2
31	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL	D + CG + S + WPL
32	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR	D + CG + S + WPR
33	System	1.000	1.0 D + 1.0 CG + 0.7 E> + 0.7 EG+	D + CG + E> + EG+
34	System	1.000	1.0 D + 1.0 CG + 0.7 <E + 0.7 EG+	D + CG + <E + EG+
35	System	1.000	0.6 D + 0.6 CU + 0.7 E> + 0.7 EG-	D + CU + E> + EG-
36	System	1.000	0.6 D + 0.6 CU + 0.7 <E + 0.7 EG-	D + CU + <E + EG-
37	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPR + 0.6 WB1>	D + CG + WPR + WB1>
38	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPR + 0.6 WB1>	D + CU + WPR + WB1>
39	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR + 0.45 WB1>	D + CG + L + WPR + WB1>
40	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR + 0.45 WB1>	D + CG + S + WPR + WB1>
41	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPR + 0.6 <WB1	D + CG + WPR + <WB1
42	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPR + 0.6 <WB1	D + CU + WPR + <WB1
43	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR + 0.45 <WB1	D + CG + L + WPR + <WB1
44	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR + 0.45 <WB1	D + CG + S + WPR + <WB1
45	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPR + 0.6 WB2>	D + CG + WPR + WB2>
46	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPR + 0.6 WB2>	D + CU + WPR + WB2>
47	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR + 0.45 WB2>	D + CG + L + WPR + WB2>
48	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR + 0.45 WB2>	D + CG + S + WPR + WB2>
49	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPR + 0.6 <WB2	D + CG + WPR + <WB2
50	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPR + 0.6 <WB2	D + CU + WPR + <WB2
51	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR + 0.45 <WB2	D + CG + L + WPR + <WB2
52	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR + 0.45 <WB2	D + CG + S + WPR + <WB2
53	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPL + 0.6 WB3>	D + CG + WPL + WB3>
54	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPL + 0.6 WB3>	D + CU + WPL + WB3>
55	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL + 0.45 WB3>	D + CG + L + WPL + WB3>
56	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL + 0.45 WB3>	D + CG + S + WPL + WB3>
57	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPL + 0.6 <WB3	D + CG + WPL + <WB3
58	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPL + 0.6 <WB3	D + CU + WPL + <WB3
59	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL + 0.45 <WB3	D + CG + L + WPL + <WB3
60	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL + 0.45 <WB3	D + CG + S + WPL + <WB3

61	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPL + 0.6 WB4>	D + CG + WPL + WB4>
62	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPL + 0.6 WB4>	D + CU + WPL + WB4>
63	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL + 0.45 WB4>	D + CG + L + WPL + WB4>
64	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL + 0.45 WB4>	D + CG + S + WPL + WB4>
65	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPL + 0.6 <WB4	D + CG + WPL + <WB4
66	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPL + 0.6 <WB4	D + CU + WPL + <WB4
67	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL + 0.45 <WB4	D + CG + L + WPL + <WB4
68	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL + 0.45 <WB4	D + CG + S + WPL + <WB4
69	System Derived	1.000	0.6 MWB	MWB - Wall: 1
70	System Derived	1.000	0.6 MWB	MWB - Wall: 2
71	System Derived	1.000	0.6 MWB	MWB - Wall: 3
72	System Derived	1.000	0.6 MWB	MWB - Wall: 4
73	System Derived	1.000	1.0 D + 1.0 CG + 0.7 EB> + 0.7 EG+	D + CG + EB> + EG+
74	System Derived	1.000	0.6 D + 0.6 CU + 0.7 EB> + 0.7 EG-	D + CU + EB> + EG-
75	System Derived	1.000	1.0 D + 1.0 CG + 0.7 <EB + 0.7 EG+	D + CG + <EB + EG+
76	System Derived	1.000	0.6 D + 0.6 CU + 0.7 <EB + 0.7 EG-	D + CU + <EB + EG-

Frame Member Sizes

Mem. No.	Flg Width (in.)	Flg Thk (in.)	Web Thk (in.)	Depth1 (in.)	Depth2 (in.)	Length (ft)	Weight (p)	Flg Fy (ksi)	Web Fy (ksi)	Splice Jt.1	Codes Jt.2	Shape
1	6.00	0.5000	0.1875	12.00	38.00	14.03	455.9	55.00	55.00	BP	KN	3P
2	6.00	0.3750	0.1875	34.00	17.00	15.37	532.6	55.00	55.00	KN	SS	3P
3	6.00	0.3750	0.1644	17.00	34.00	13.58	419.1	55.00	55.00	SS	SP	3P
4	6.00	0.3125	0.1644	34.00	18.00	16.42	465.6	55.00	55.00	SP	SS	3P
5	6.00	0.5000	0.1875	18.00	38.00	14.41	455.2	55.00	55.00	SS	KN	3P
6	8.00	0.5000	0.1875	12.00	38.00	18.54	870.0	55.00	55.00	BP	KN	3P

Total Frame Weight = 3198.4 (p) (Includes all plates)

Boundary Condition Summary

Member	X-Loc	Y-Loc	Supp. X	Supp. Y	Moment	Displacement X(in.)	Displacement Y(in.)	Displacement ZZ(rad.)
1	0/0/0	3/0/0	Yes	Yes	No	0/0/0	0/0/0	0.0000
6	60/0/0	1/0/0	Yes	Yes	No	0/0/0	0/0/0	0.0000

Values shown are resisting forces of the foundation.
Base Connection Design is Based on 3000.00 (psi) Concrete

Reactions - Unfactored Load Type at Frame Cross Section:

Type		Exterior Column		Exterior Column				
X-Loc		0/0/0		60/0/0				
Grid1 - Grid2		-4		-1				
Base Plate W x L (in.)		8 X 13		9 X 13				
Base Plate Thickness (in.)		0.375		0.375				
Anchor Rod Qty/Diam. (in.)		4 - 1.000		4 - 1.000				
Column Base Elev.		103'-0"		101'-0"				
Load Type	Desc.	Hx	Vy	Hx	Vy			
D	Frm	2.78	4.46	-2.78	4.97	-	-	-
CG	Frm	7.85	11.57	-7.85	12.06	-	-	-
L>	Frm	12.55	18.51	-12.55	19.29	-	-	-
<L	Frm	12.55	18.51	-12.55	19.29	-	-	-
SMS>	Frm	15.69	23.14	-15.69	24.11	-	-	-
<SMS	Frm	15.69	23.14	-15.69	24.11	-	-	-
W1>	Frm	-13.64	-20.19	13.86	-21.27	-	-	-
<W1	Frm	-8.54	-12.64	8.68	-13.32	-	-	-
W2>	Frm	-8.16	-12.07	8.29	-12.72	-	-	-
<W2	Frm	-3.06	-4.53	3.11	-4.77	-	-	-
WPL	Frm	-8.54	-12.64	8.68	-13.32	-	-	-
WPR	Frm	-13.64	-20.19	13.86	-21.27	-	-	-
MW - Wall: 1	Frm	-	-	-	-	-	-	-
MW - Wall: 2	Frm	3.22	1.52	6.61	-1.52	-	-	-
MW - Wall: 3	Frm	-	-	-	-	-	-	-
MW - Wall: 4	Frm	-6.08	-1.17	-2.11	1.17	-	-	-
CU	Frm	-	-	-	-	-	-	-
L	Frm	12.55	18.51	-12.55	19.29	-	-	-
S	Frm	13.18	19.43	-13.18	20.26	-	-	-
E>	Frm	-0.70	-0.33	-0.52	0.28	-	-	-
EG+	Frm	0.24	0.36	-0.24	0.38	-	-	-
<E	Frm	0.70	0.33	0.52	-0.28	-	-	-
EG-	Frm	-0.24	-0.36	0.24	-0.38	-	-	-
WB1>	Brc	-	-	-	-	-	-	-

<WB1	Brc	-	-	-	-	-	-	-
WB2>	Brc	-	-	-	-	-	-	-
<WB2	Brc	-	-	-	-	-	-	-
WB3>	Brc	-	-	-	-	-	-	-
<WB3	Brc	-	-	-	-	-	-	-
WB4>	Brc	-	-	-	-	-	-	-
<WB4	Brc	-	-	-	-	-	-	-
MWB - Wall: 1	Brc	-	-	-	-	-	-	-
MWB - Wall: 2	Brc	-	-	-	-	-	-	-
MWB - Wall: 3	Brc	-	-	-	-	-	-	-
MWB - Wall: 4	Brc	-	-	-	-	-	-	-
EB>	Brc	-	-	-	-	-	-	-
<EB	Brc	-	-	-	-	-	-	-
SMS	Frm	15.69	23.14	-15.69	24.11	-	-	-

Sum of Forces with Reactions Check - Framing

	Horizontal		Vertical	
Load Type	Load (k)	Reaction (k)	Load (k)	Reaction (k)
D	0.0	0.0	9.4	9.4
CG	0.0	0.0	23.6	23.6
L>	0.0	0.0	37.8	37.8
<L	0.0	0.0	37.8	37.8
SMS>	0.0	0.0	47.2	47.2
<SMS	0.0	0.0	47.2	47.2
W1>	1.7	0.2	41.4	41.5
<W1	1.1	0.1	25.9	26.0
W2>	1.0	0.1	24.7	24.8
<W2	0.4	0.0	9.3	9.3
WPL	1.1	0.1	25.9	26.0
WPR	1.7	0.2	41.4	41.5
MW - Wall: 1	0.0	0.0	0.0	0.0
MW - Wall: 2	9.8	9.8	0.0	0.0
MW - Wall: 3	0.0	0.0	0.0	0.0
MW - Wall: 4	8.2	8.2	0.0	0.0
CU	0.0	0.0	0.0	0.0
L	0.0	0.0	37.8	37.8
S	0.0	0.0	39.7	39.7
E>	1.2	1.2	0.0	0.1
EG+	0.0	0.0	0.7	0.7
<E	1.2	1.2	0.0	0.1
EG-	0.0	0.0	0.7	0.7
WB1>	0.0	0.0	0.0	0.0
<WB1	0.0	0.0	0.0	0.0
WB2>	0.0	0.0	0.0	0.0
<WB2	0.0	0.0	0.0	0.0
WB3>	0.0	0.0	0.0	0.0
<WB3	0.0	0.0	0.0	0.0
WB4>	0.0	0.0	0.0	0.0
<WB4	0.0	0.0	0.0	0.0
MWB - Wall: 1	0.0	0.0	0.0	0.0
MWB - Wall: 2	0.0	0.0	0.0	0.0
MWB - Wall: 3	0.0	0.0	0.0	0.0
MWB - Wall: 4	0.0	0.0	0.0	0.0
EB>	0.0	0.0	0.0	0.0
<EB	0.0	0.0	0.0	0.0
SMS	0.0	0.0	47.2	47.2

Maximum Combined Reactions Summary with Factored Loads - Framing

Note: All reactions are based on 1st order structural analysis.

X-Loc	Grid	Hrz left (-Hx) (k)	Load Case	Hrz Right (Hx) (k)	Load Case	Hrz In (-Hz) (k)	Load Case	Hrz Out (Hz) (k)	Load Case	Uplift (-Vy) (k)	Load Case	Vrt Down (Vy) (k)	Load Case	Mom cw (-Mzz) (in-k)	Load Case	Mom ccw (Mzz) (in-k)	Load Case
0/0/0	-4	6.52	15	26.32	3	-	-	-	-	9.44	15	39.17	3	-	-	-	-
60/0/0	-1	26.32	3	6.65	15	-	-	-	-	9.78	15	41.14	3	-	-	-	-

Base Plate Summary

Base Connection Design is Based on 3000.00 (psi) Concrete
Plate Fy = 55.00 ksi
Grade A36 Anchor Rods used to determine quantity and diameter
Gage and pitch standards are based on ACI-318 Appendix D criteria for "cast-in-place" anchor rods (Min space = 4*drod)

X-Loc	Grid	Mem. No.	Thickness (in.)	Width (in.)	Length (in.)	Stiff.	Num. Of Rods	Rod Diam. (in.)	Pitch (in.)	Gage (in.)	Hole Type	Welds to Flange	Welds to Web
0/0/0	-4	1	0.375	8	13	No	4	1.000	5.0	5.0	Std	OS-0.1875	OS-0.1875
60/0/0	-1	6	0.375	9	13	No	4	1.000	5.0	5.0	Std	OS-0.1875	OS-0.1875

Pinned Base Plate Connection Loading

	Maximum Shear Case			Maximum Tension Case			Maximum Comp Case			Maximum Bracing/WA Case			
X-Loc	Shear (k)	Axial (k)	Load Case	Shear (k)	Tension (k)	Load Case	Shear (k)	Comp (k)	Load Case	Shear (k)	Axial (k)	Frame Shear (k)	Load Case
0/0/0	26.71	39.12	4	6.50	-9.44	15	26.71	39.12	4	-	-	-	0
60/0/0	26.68	41.27	3	6.63	-9.77	15	26.68	41.27	3	-	-	-	0

Base Plate Connection Strength Ratios

X-Loc	Rod Shear	Load Case	Rod Tension	Load Case	Rod V + T	Load Case	Rod Bending	Load Case	Conc. Bearing	Load Case	Plate Tension	Load Case	Plate Comp	Load Case	Flange Weld	Load Case	Web Weld	Load Case
0/0/0	0.814	4	0.138	15	-	15	-	0	0.340	4	0.341	15	0.403	4	0.564	4	0.819	4
60/0/0	0.813	3	0.143	15	-	15	-	0	0.319	3	0.286	15	0.323	3	0.477	3	0.819	3

Web Stiffener Summary

Mem. No.	Stiff. No.	Desc.	Loc. (ft)	Web Depth (in.)	h/t	a/h	a (in.)	Thick. (in.)	Width (in.)	Side	Welding Description
2	1	S9	3.17	33.171	176.91	N/A	N/A	0.5000	3.000	Both	SP-BS-0.3750,W-OS-0.1250,F-OS-0.1875
6	1	S3	15.20	37.000	N/A	N/A	N/A	0.5000	4.000	Both	SP-BS-0.3750,W-BS-0.1250,F-OS-0.1875

Bolted End-Plate Connections (Plate Fy = 55.00 ksi)

Mem. No.	Jt. No.	Type	End-Plate Dimensions			Bolt			Outside Flange			Inside Flange		
			Thick. (in.)	Width (in.)	Length (in.)	Diam. (in.)	Spec/Joint	Gages In/Out (in.)	Configuration ID	Configuration Desc.	Pitches 1st/2nd (in.)	Configuration ID	Configuration Desc.	Pitches 1st/2nd (in.)
1	2	KN(Top)	0.625	6.00	39.00	0.750	A325N/ST	3.00	12	Flush	2.00	11	Flush	32.00
2	1	KN(Top)	0.625	6.00	39.00	0.750	A325N/ST	3.00	12	Flush	2.00	11	Flush	32.00
3	2	SP	0.375	6.00	37.09	0.750	A325N/ST	3.00	11	Flush	28.06	42	Ext/Gusset	3.50/2.00
		Gusset In 2.625 x 0.2500 x 4.88 SP-BS-0.1875,												
4	1	SP	0.375	6.00	37.09	0.750	A325N/ST	3.00	11	Flush	28.06	42	Ext/Gusset	3.50/2.00
		Gusset In 2.625 x 0.2500 x 4.88 SP-BS-0.1875,												
5	2	KN(Face)	0.500	6.00	41.01	0.750	A325N/ST	3.00	43	Ext/Gusset	3.50/2.00	11	Flush	30.13/2.00
		Gusset Out 2.500 x 0.2500 x 4.38 SP-BS-0.1875,												
6	2	KN(Face)	0.500	8.00	41.05	0.750	A325N/ST	3.00	43	Ext/Gusset	3.50/2.00	11	Flush	30.13/2.00
		Gusset Out 2.500 x 0.2500 x 4.38 SP-BS-0.1875,												

Moment Connections:

Outside Flange		Required Strength					Strength Ratios *							
Mem. No.	Jt. No.	Ld Cs	Axial (k)	Shear (k)	Moment (in-k)	Design Proc.	Bolt Tension	Bolt Shear	Plate Bending	Shear Yielding	Shear Rupture	Bearing Tearing	Flange Weld	Web Weld
1	2	4	-41.6	22.7	3104.9	AISC DG-16/Thin plate	0.949	0.308	0.865	0.000	0.000	0.125	0.959	0.719
2	1	4	-41.6	22.7	3104.9	AISC DG-16/Thin plate	0.949	0.308	0.865	0.000	0.000	0.125	0.898	0.719
3	2	15	6.5	0.1	544.2	AISC DG-16/Thin plate	0.690	0.003	0.933	0.000	0.000	0.002	0.799	0.631
4	1	15	6.5	0.1	544.2	AISC DG-16/Thin plate	0.690	0.003	0.933	0.000	0.000	0.002	0.799	0.631
5	2	3	-27.3	35.5	4108.6	AISC DG-16/Thin plate	0.879	0.289	0.907	0.000	0.000	0.147	0.928	0.719
6	2	3	-27.3	35.5	4108.6	AISC DG-16/Thin plate	0.879	0.289	0.907	0.000	0.000	0.147	0.835	0.719

Inside Flange		Required Strength					Strength Ratios *							
Mem. No.	Jt. No.	Ld Cs	Axial (k)	Shear (k)	Moment (in-k)	Design Proc.	Bolt Tension	Bolt Shear	Plate Bending	Shear Yielding	Shear Rupture	Bearing Tearing	Flange Weld	Web Weld
1	2	15	10.0	5.6	763.0	AISC DG-16/Thin plate	0.748	0.114	0.427	0.000	0.000	0.055	0.959	0.719
2	1	15	10.0	5.6	763.0	AISC DG-16/Thin plate	0.748	0.114	0.427	0.000	0.000	0.055	0.959	0.719
3	2	3	-26.5	2.3	2232.7	AISC DG-16/Thin plate	0.732	0.024	0.988	0.000	0.000	0.017	0.770	0.631
4	1	3	-26.5	2.3	2232.7	AISC DG-16/Thin plate	0.732	0.024	0.988	0.000	0.000	0.017	0.770	0.631
5	2	15	6.9	8.8	1016.0	AISC DG-16/Thin plate	0.949	0.179	0.803	0.000	0.000	0.109	0.959	0.719
6	2	15	6.9	8.8	1016.0	AISC DG-16/Thin plate	0.949	0.179	0.803	0.000	0.000	0.109	0.959	0.719

* Strength ratios shown for the connections are reported as a percentage of the system default or user Override Stress Limit (Stress Limit = 1.03)

Bolted End-Plate Connections Weld Data:

Mem.	Jt.		Outside Flange				Inside Flange				Web				WS P 01 Web Weld			
No.	No.	Type	Type	Size (in.)	Side	Notes	Type	Size (in.)	Side	Notes	Type	Size (in.)	Side	Notes	Type	Size (in.)	Side	Notes
1	2	KN(Top)	Fillet	0.2500	Both	-	Fillet	0.2500	Both	-	Fillet	0.1250	Both	-	-	-	-	-
2	1	KN(Top)	Fillet	0.3125	Both	-	CJP	99.0000	CJP	-	Fillet	0.1250	Both	-	-	-	-	-
3	2	SP	Fillet	0.1875	Both	-	Fillet	0.2500	Both	-	Fillet	0.1250	Both	-	-	-	-	-
4	1	SP	Fillet	0.1875	Both	-	Fillet	0.2500	Both	-	Fillet	0.1250	Both	-	-	-	-	-
5	2	KN(Face)	Fillet	0.3750	Both	-	Fillet	0.2500	Both	-	Fillet	0.1250	Both	-	-	-	-	-
6	2	KN(Face)	Fillet	0.3750	Both	-	CJP	99.0000	CJP	-	Fillet	0.1250	Both	-	-	-	-	-

Flange Brace Summary

Member	From Member Joint 1	From Side Point 1	Part	Axial Load per FB (k)	Load Case	Design Note
2	5/11/8	54/0/0	(2)GFB4007	0.731	4	
2	9/11/8	50/0/0	GFB3000	0.888	4	
3	4/7/0	40/0/0	GFB2097	0.415	3	
3	9/7/0	35/0/0	GFB4007	0.369	3	
4	1/0/1	30/0/0	GFB4027	0.332	3	
4	6/0/1	25/0/0	GFB3111	0.312	4	
4	11/0/1	20/0/0	GFB3000	0.256	4	
5	4/7/0	10/0/0	GFB3021	2.035	3	
5	9/7/0	5/0/0	(2)GFB4050	1.242	3	

Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)

			Controlling Cases		Required Strength				Available Strength				Strength Ratios	
Mem. No.	Loc. ft	Depth in.	Axial + Flexure	Shear	Axial Pr k	Shear Vr k	Mom-x Mrx in-k	Mom-y Mry in-k	Axial Pc k	Shear Vc k	Mom-x Mcx in-k	Mom-y Mcy in-k	Axial + Flexure	Shear
1	11.39	38.00	4		-41.6		-3104.9	0.0	95.5		4629.7	307.7	1.03	
1	11.39	38.00		4		-22.7				41.7				0.54
2	1.41	34.00	4		-29.3		-2918.1	0.0	167.2		3357.1	232.4	0.96	
2	1.41	34.00		4		32.2				41.5				0.77
3	4.59	22.74	3		-26.4		1533.4	0.0	99.7		2050.3	227.7	0.93	
3	0.00	17.00		4		18.7				32.7				0.57
4	1.00	33.02	3		-26.4		2200.8	0.0	131.8		2495.3	179.0	0.98	
4	16.43	18.00		3		-23.8				32.4				0.73
5	11.14	38.00	3		-27.3		-4108.6	0.0	216.9		4629.7	307.7	0.95	
5	11.14	38.00		3		-35.5				41.7				0.85
6	15.27	38.00	3		-43.0		-4376.7	0.0	132.7		5840.4	538.7	0.99	
6	15.27	38.00		3		23.8				41.7				0.57

Parameters Used for Axial and Flexural Design

Mem. No.	Loc. ft	Lx in.	Ly/Lt in.	Lb in.	Ag in.2	Afn in.2	Ixx in.4	Iyy in.4	Sx in.3	Sy in.3	Zx in.3	Zy in.3	J in.4	Cw in.6	Cb	Rpg	Rpc	Aeff/ Ag
1	11.39	136.73	136.7	136.7	12.94	3.00	2900.95	18.02	152.68	6.01	176.67	9.33	0.58	6335.27	1.66	0.92	1.00	0.66
2	1.41	642.14	32.3	32.3	10.73	2.25	1846.40	13.52	108.61	4.51	127.48	7.04	0.28	3821.07	1.00	0.94	1.00	0.57
3	4.59	642.14	120.2	60.1	8.11	2.25	708.28	13.51	62.30	4.50	70.19	6.90	0.24	1688.82	2.00	1.00	1.00	0.72
4	1.00	642.14	60.1	60.1	9.08	1.88	1468.93	11.26	88.97	3.75	104.47	5.84	0.17	3012.37	1.01	0.92	1.00	0.56
5	11.14	642.14	18.3	18.3	12.94	3.00	2900.95	18.02	152.68	6.01	176.67	9.33	0.58	6335.27	1.07	0.92	1.00	0.59
6	15.27	183.27	183.3	183.3	14.94	4.00	3604.12	42.69	189.69	10.67	214.17	16.33	0.75	15007.15	1.66	0.93	1.00	0.64

Deflection Load Combinations - Framing

No.	Origin	Factor	Def H	Def V	Application	Description
1	System	1.000	0	180	1.0 L	L
2	System	1.000	0	180	1.0 SMS	SMS
3	System	1.000	60	180	0.42 W1>	W1>
4	System	1.000	60	180	0.42 <W1	<W1
5	System	1.000	60	180	0.42 W2>	W2>
6	System	1.000	60	180	0.42 <W2	<W2
7	System	1.000	60	180	0.42 WPL	WPL
8	System	1.000	60	180	0.42 WPR	WPR
9	System	1.000	10	0	1.0 E> + 1.0 EG-	E> + EG-
10	System	1.000	10	0	1.0 <E + 1.0 EG-	<E + EG-

Controlling Frame Deflection Ratios for Cross Section:

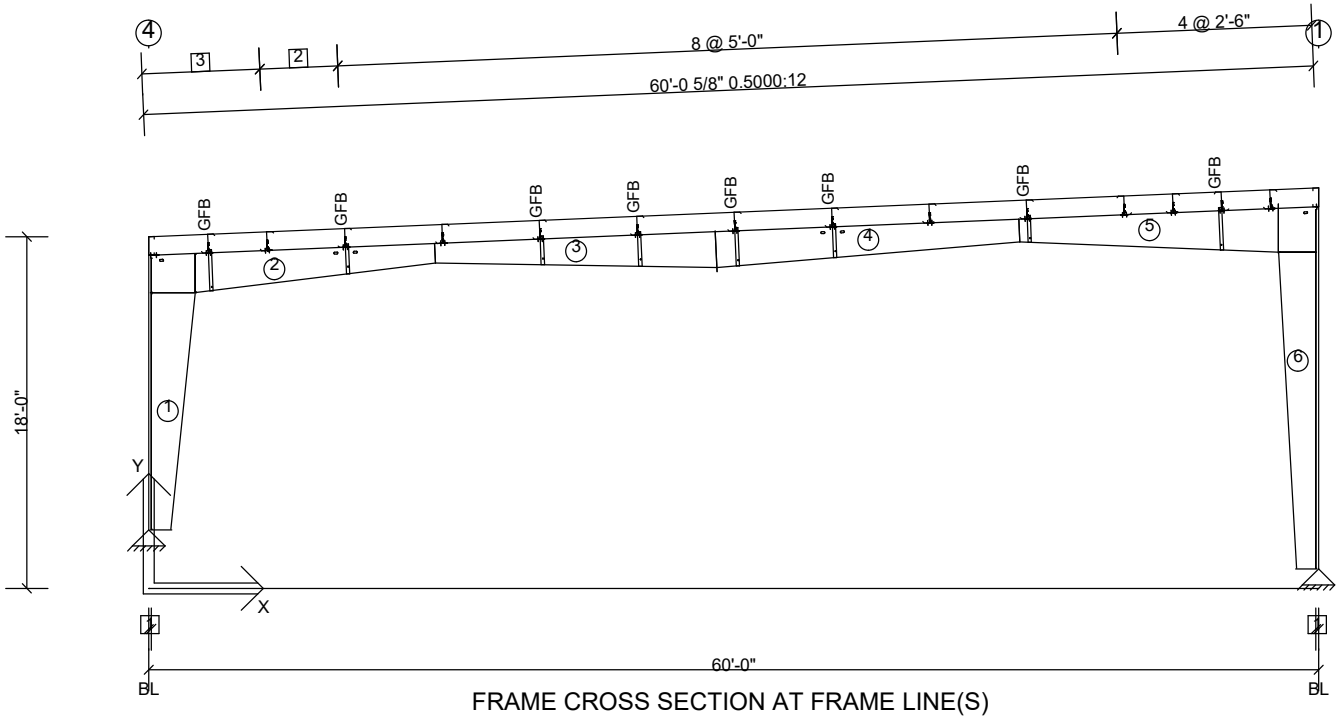
Description	Ratio	Deflection (in.)	Member	Joint	Load Case	Load Case Description
Max. Horizontal Deflection	(H/1926)	-0.079	1	2	8	WPR
Max. Vertical Deflection for Span 1	(L/529)	-1.278	4	1	2	SMS

* Negative horizontal deflection is left
* Negative vertical deflection is down
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms or partial base fixity. Therefore, these deflections may be considerably overstated.

Frame Lateral Stiffness (K): 16.329 (k/in)
Fundamental Period (calculated) (T): 0.424 (sec.)

Wall: 4, Frame at: 63/6/0

Frame Cross Section:



FRAME CROSS SECTION AT FRAME LINE(S)

Dimension Key
1 1 5/8"
2 4'-0"
3 2 @ 3'-0 5/16"

Frame Clearances
Horiz. Clearance between members 1(CX005) and 6(CX006): 55'-6 3/4"
Vert. Clearance at member 1(CX005): 15'-1 1/2"
Vert. Clearance at member 6(CX006): 17'-1 15/16"
Finished Floor Elevation = 100'-0" (Unless Noted Otherwise)

Frame Location Design Parameters:

Location	Avg. Bay Space	Description	Angle	Group	Trib. Override	Design Status
63/6/0	16/3/0	LRST	90.0000		-	Stress Check

Design Load Combinations - Framing

No.	Origin	Factor	Application	Description
1	System	1.000	1.0 D + 1.0 CG + 1.0 L>	D + CG + L>
2	System	1.000	1.0 D + 1.0 CG + 1.0 <L	D + CG + <L
3	System	1.000	1.0 D + 1.0 CG + 1.0 SMS>	D + CG + SMS>
4	System	1.000	1.0 D + 1.0 CG + 1.0 <SMS	D + CG + <SMS
5	System	1.000	1.0 D + 1.0 CG + 0.6 W1>	D + CG + W1>
6	System	1.000	1.0 D + 1.0 CG + 0.6 <W1	D + CG + <W1
7	System	1.000	1.0 D + 1.0 CG + 0.6 W2>	D + CG + W2>
8	System	1.000	1.0 D + 1.0 CG + 0.6 <W2	D + CG + <W2
9	System	1.000	1.0 D + 1.0 CG + 0.6 WPL	D + CG + WPL
10	System	1.000	1.0 D + 1.0 CG + 0.6 WPR	D + CG + WPR
11	System	1.000	0.6 MW	MW - Wall: 1
12	System	1.000	0.6 MW	MW - Wall: 2
13	System	1.000	0.6 MW	MW - Wall: 3
14	System	1.000	0.6 MW	MW - Wall: 4
15	System	1.000	0.6 D + 0.6 CU + 0.6 W1>	D + CU + W1>
16	System	1.000	0.6 D + 0.6 CU + 0.6 <W1	D + CU + <W1
17	System	1.000	0.6 D + 0.6 CU + 0.6 W2>	D + CU + W2>
18	System	1.000	0.6 D + 0.6 CU + 0.6 <W2	D + CU + <W2
19	System	1.000	0.6 D + 0.6 CU + 0.6 WPL	D + CU + WPL
20	System	1.000	0.6 D + 0.6 CU + 0.6 WPR	D + CU + WPR
21	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W1>	D + CG + L + W1>
22	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W1	D + CG + L + <W1
23	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 W2>	D + CG + L + W2>
24	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 <W2	D + CG + L + <W2
25	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL	D + CG + L + WPL
26	System	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR	D + CG + L + WPR
27	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W1>	D + CG + S + W1>
28	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W1	D + CG + S + <W1
29	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 W2>	D + CG + S + W2>
30	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 <W2	D + CG + S + <W2
31	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL	D + CG + S + WPL
32	System	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR	D + CG + S + WPR
33	System	1.000	1.0 D + 1.0 CG + 0.7 E> + 0.7 EG+	D + CG + E> + EG+
34	System	1.000	1.0 D + 1.0 CG + 0.7 <E + 0.7 EG+	D + CG + <E + EG+
35	System	1.000	0.6 D + 0.6 CU + 0.7 E> + 0.7 EG-	D + CU + E> + EG-
36	System	1.000	0.6 D + 0.6 CU + 0.7 <E + 0.7 EG-	D + CU + <E + EG-
37	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPR + 0.6 WB1>	D + CG + WPR + WB1>
38	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPR + 0.6 WB1>	D + CU + WPR + WB1>
39	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR + 0.45 WB1>	D + CG + L + WPR + WB1>
40	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR + 0.45 WB1>	D + CG + S + WPR + WB1>
41	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPR + 0.6 <WB1	D + CG + WPR + <WB1
42	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPR + 0.6 <WB1	D + CU + WPR + <WB1
43	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR + 0.45 <WB1	D + CG + L + WPR + <WB1
44	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR + 0.45 <WB1	D + CG + S + WPR + <WB1
45	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPR + 0.6 WB2>	D + CG + WPR + WB2>
46	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPR + 0.6 WB2>	D + CU + WPR + WB2>
47	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR + 0.45 WB2>	D + CG + L + WPR + WB2>
48	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR + 0.45 WB2>	D + CG + S + WPR + WB2>
49	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPR + 0.6 <WB2	D + CG + WPR + <WB2
50	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPR + 0.6 <WB2	D + CU + WPR + <WB2
51	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPR + 0.45 <WB2	D + CG + L + WPR + <WB2
52	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPR + 0.45 <WB2	D + CG + S + WPR + <WB2
53	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPL + 0.6 WB3>	D + CG + WPL + WB3>
54	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPL + 0.6 WB3>	D + CU + WPL + WB3>
55	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL + 0.45 WB3>	D + CG + L + WPL + WB3>
56	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL + 0.45 WB3>	D + CG + S + WPL + WB3>
57	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPL + 0.6 <WB3	D + CG + WPL + <WB3
58	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPL + 0.6 <WB3	D + CU + WPL + <WB3
59	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL + 0.45 <WB3	D + CG + L + WPL + <WB3
60	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL + 0.45 <WB3	D + CG + S + WPL + <WB3

61	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPL + 0.6 WB4>	D + CG + WPL + WB4>
62	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPL + 0.6 WB4>	D + CU + WPL + WB4>
63	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL + 0.45 WB4>	D + CG + L + WPL + WB4>
64	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL + 0.45 WB4>	D + CG + S + WPL + WB4>
65	System Derived	1.000	1.0 D + 1.0 CG + 0.6 WPL + 0.6 <WB4	D + CG + WPL + <WB4
66	System Derived	1.000	0.6 D + 0.6 CU + 0.6 WPL + 0.6 <WB4	D + CU + WPL + <WB4
67	System Derived	1.000	1.0 D + 1.0 CG + 0.75 L + 0.45 WPL + 0.45 <WB4	D + CG + L + WPL + <WB4
68	System Derived	1.000	1.0 D + 1.0 CG + 0.75 S + 0.45 WPL + 0.45 <WB4	D + CG + S + WPL + <WB4
69	System Derived	1.000	0.6 MWB	MWB - Wall: 1
70	System Derived	1.000	0.6 MWB	MWB - Wall: 2
71	System Derived	1.000	0.6 MWB	MWB - Wall: 3
72	System Derived	1.000	0.6 MWB	MWB - Wall: 4
73	System Derived	1.000	1.0 D + 1.0 CG + 0.7 EB> + 0.7 EG+	D + CG + EB> + EG+
74	System Derived	1.000	0.6 D + 0.6 CU + 0.7 EB> + 0.7 EG-	D + CU + EB> + EG-
75	System Derived	1.000	1.0 D + 1.0 CG + 0.7 <EB + 0.7 EG+	D + CG + <EB + EG+
76	System Derived	1.000	0.6 D + 0.6 CU + 0.7 <EB + 0.7 EG-	D + CU + <EB + EG-

Frame Member Sizes

Mem. No.	Flg Width (in.)	Flg Thk (in.)	Web Thk (in.)	Depth1 (in.)	Depth2 (in.)	Length (ft)	Weight (p)	Flg Fy (ksi)	Web Fy (ksi)	Splice Jt.1	Codes Jt.2	Shape
1	6.00	0.3125	0.1345	12.00	27.00	14.03	293.1	55.00	55.00	BP	KN	3P
2	5.00	0.3125	0.1345	24.00	12.00	14.54	298.0	55.00	55.00	KN	SS	3P
3	5.00	0.2500	0.1345	12.00	22.00	14.41	246.9	55.00	55.00	SS	SP	3P
4	5.00	0.2500	0.1345	22.00	14.00	15.58	272.7	55.00	55.00	SP	SS	3P
5	5.00	0.3750	0.1644	14.00	27.00	15.24	341.1	55.00	55.00	SS	KN	3P
6	8.00	0.3750	0.1644	12.00	23.00	18.54	599.3	55.00	55.00	BP	KN	3P

Total Frame Weight = 2051.1 (p) (Includes all plates)

Boundary Condition Summary

Member	X-Loc	Y-Loc	Supp. X	Supp. Y	Moment	Displacement X(in.)	Displacement Y(in.)	Displacement ZZ(rad.)
1	0/0/0	3/0/0	Yes	Yes	No	0/0/0	0/0/0	0.0000
6	60/0/0	1/0/0	Yes	Yes	No	0/0/0	0/0/0	0.0000

Values shown are resisting forces of the foundation.
Base Connection Design is Based on 3000.00 (psi) Concrete

Reactions - Unfactored Load Type at Frame Cross Section:

Type		Exterior Column		Exterior Column				
X-Loc		0/0/0		60/0/0				
Grid1 - Grid2		-4		-1				
Base Plate W x L (in.)		8 X 13		9 X 13				
Base Plate Thickness (in.)		0.375		0.375				
Anchor Rod Qty/Diam. (in.)		4 - 0.750		4 - 0.750				
Column Base Elev.		103'-0"		101'-0"				
Load Type	Desc.	Hx	Vy	Hx	Vy			
D	Frm	1.23	2.09	-1.23	2.48	-	-	-
CG	Frm	3.17	4.77	-3.17	4.98	-	-	-
L>	Frm	6.35	9.54	-6.35	9.97	-	-	-
<L	Frm	6.35	9.54	-6.35	9.97	-	-	-
SMS>	Frm	6.35	9.54	-6.35	9.97	-	-	-
<SMS	Frm	6.35	9.54	-6.35	9.97	-	-	-
W1>	Frm	-7.96	-12.54	9.06	-13.76	-	-	-
<W1	Frm	-4.68	-7.37	5.32	-8.09	-	-	-
W2>	Frm	-5.36	-8.44	6.10	-9.26	-	-	-
<W2	Frm	-2.08	-3.27	2.36	-3.59	-	-	-
WPL	Frm	-4.68	-7.37	5.32	-8.09	-	-	-
WPR	Frm	-7.96	-12.54	9.06	-13.76	-	-	-
MW - Wall: 1	Frm	-	-	-	-	-	-	-
MW - Wall: 2	Frm	1.58	0.79	3.49	-0.79	-	-	-
MW - Wall: 3	Frm	-	-	-	-	-	-	-
MW - Wall: 4	Frm	-3.10	-0.61	-1.12	0.61	-	-	-
CU	Frm	-	-	-	-	-	-	-
L	Frm	6.35	9.54	-6.35	9.97	-	-	-
S	Frm	5.33	8.01	-5.33	8.37	-	-	-
E>	Frm	-0.35	-0.18	-0.28	0.15	-	-	-
EG+	Frm	0.12	0.19	-0.12	0.19	-	-	-
<E	Frm	0.35	0.18	0.28	-0.15	-	-	-
EG-	Frm	-0.12	-0.19	0.12	-0.19	-	-	-
WB1>	Brc	-	-	-	-	-	-	-

<WB1	Brc	-	-	-	-	-	-	-
WB2>	Brc	-	-	-	-	-	-	-
<WB2	Brc	-	-	-	-	-	-	-
WB3>	Brc	-	-	-	-	-	-	-
<WB3	Brc	-	-	-	-	-	-	-
WB4>	Brc	-	-	-	-	-	-	-
<WB4	Brc	-	-	-	-	-	-	-
MWB - Wall: 1	Brc	-	-	-	-	-	-	-
MWB - Wall: 2	Brc	-	-	-	-	-	-	-
MWB - Wall: 3	Brc	-	-	-	-	-	-	-
MWB - Wall: 4	Brc	-	-	-	-	-	-	-
EB>	Brc	-	-	-	-	-	-	-
<EB	Brc	-	-	-	-	-	-	-
SMS	Frm	6.35	9.54	-6.35	9.97	-	-	-

Sum of Forces with Reactions Check - Framing

	Horizontal		Vertical	
Load Type	Load (k)	Reaction (k)	Load (k)	Reaction (k)
D	0.0	0.0	4.6	4.6
CG	0.0	0.0	9.8	9.8
L>	0.0	0.0	19.5	19.5
<L	0.0	0.0	19.5	19.5
SMS>	0.0	0.0	19.5	19.5
<SMS	0.0	0.0	19.5	19.5
W1>	1.1	1.1	26.3	26.3
<W1	0.6	0.6	15.4	15.5
W2>	0.7	0.7	17.7	17.7
<W2	0.3	0.3	6.9	6.9
WPL	0.6	0.6	15.4	15.5
WPR	1.1	1.1	26.3	26.3
MW - Wall: 1	0.0	0.0	0.0	0.0
MW - Wall: 2	5.1	5.1	0.0	0.0
MW - Wall: 3	0.0	0.0	0.0	0.0
MW - Wall: 4	4.2	4.2	0.0	0.0
CU	0.0	0.0	0.0	0.0
L	0.0	0.0	19.5	19.5
S	0.0	0.0	16.4	16.4
E>	0.6	0.6	0.0	0.0
EG+	0.0	0.0	0.4	0.4
<E	0.6	0.6	0.0	0.0
EG-	0.0	0.0	0.4	0.4
WB1>	0.0	0.0	0.0	0.0
<WB1	0.0	0.0	0.0	0.0
WB2>	0.0	0.0	0.0	0.0
<WB2	0.0	0.0	0.0	0.0
WB3>	0.0	0.0	0.0	0.0
<WB3	0.0	0.0	0.0	0.0
WB4>	0.0	0.0	0.0	0.0
<WB4	0.0	0.0	0.0	0.0
MWB - Wall: 1	0.0	0.0	0.0	0.0
MWB - Wall: 2	0.0	0.0	0.0	0.0
MWB - Wall: 3	0.0	0.0	0.0	0.0
MWB - Wall: 4	0.0	0.0	0.0	0.0
EB>	0.0	0.0	0.0	0.0
<EB	0.0	0.0	0.0	0.0
SMS	0.0	0.0	19.5	19.5

Maximum Combined Reactions Summary with Factored Loads - Framing

Note: All reactions are based on 1st order structural analysis.

X-Loc	Grid	Hrz left (-Hx) (k)	Load Case	Hrz Right (Hx) (k)	Load Case	Hrz In (-Hz) (k)	Load Case	Hrz Out (Hz) (k)	Load Case	Uplift (-Vy) (k)	Load Case	Vrt Down (Vy) (k)	Load Case	Mom cw (-Mzz) (in-k)	Load Case	Mom ccw (Mzz) (in-k)	Load Case
0/0/0	-4	4.04	15	10.75	1	-	-	-	-	6.27	15	16.39	1	-	-	-	-
60/0/0	-1	10.75	1	4.70	15	-	-	-	-	6.77	15	17.43	1	-	-	-	-

Base Plate Summary

Base Connection Design is Based on 3000.00 (psi) Concrete
Plate Fy = 55.00 ksi
Grade A36 Anchor Rods used to determine quantity and diameter
Gage and pitch standards are based on ACI-318 Appendix D criteria for "cast-in-place" anchor rods (Min space = 4*drod)

X-Loc	Grid	Mem. No.	Thickness (in.)	Width (in.)	Length (in.)	Stiff.	Num. Of Rods	Rod Diam. (in.)	Pitch (in.)	Gage (in.)	Hole Type	Welds to Flange	Welds to Web
0/0/0	-4	1	0.375	8	13	No	4	0.750	5.0	5.0	Std	OS-0.1875	OS-0.1875
60/0/0	-1	6	0.375	9	13	No	4	0.750	5.0	5.0	Std	OS-0.1875	OS-0.1875

Pinned Base Plate Connection Loading

	Maximum Shear Case			Maximum Tension Case			Maximum Comp Case			Maximum Bracing/WA Case			
X-Loc	Shear (k)	Axial (k)	Load Case	Shear (k)	Tension (k)	Load Case	Shear (k)	Comp (k)	Load Case	Shear (k)	Axial (k)	Frame Shear (k)	Load Case
0/0/0	10.99	16.34	2	4.19	-6.37	15	10.99	16.34	2	-	-	-	0
60/0/0	10.98	17.52	1	4.53	-6.66	15	10.98	17.52	1	-	-	-	0

Base Plate Connection Strength Ratios

X-Loc	Rod Shear	Load Case	Rod Tension	Load Case	Rod V + T	Load Case	Rod Bending	Load Case	Conc. Bearing	Load Case	Plate Tension	Load Case	Plate Comp	Load Case	Flange Weld	Load Case	Web Weld	Load Case
0/0/0	0.596	2	0.166	15	-	0	-	0	0.142	2	0.233	15	0.168	2	0.225	2	0.326	2
60/0/0	0.595	1	0.173	15	-	0	-	0	0.135	1	0.199	15	0.106	1	0.195	1	0.329	1

Web Stiffener Summary

Mem. No.	Stiff. No.	Desc.	Loc. (ft)	Web Depth (in.)	h/t	a/h	a (in.)	Thick. (in.)	Width (in.)	Side	Welding Description
2	1	S9	2.25	23.358	173.67	N/A	N/A	0.3125	3.000	Both	SP-BS-0.2500,W-OS-0.1250,F-OS-0.1875
6	***	MUST	Use	Alternate	Web	Thick.=	0.1875	*	*	*	*
				Alternate	Web	Min.	Weld	Size =	0.1250	To	Flange,Flange Special,Bolting Plate
6	2	S3	16.17	22.250	N/A	N/A	N/A	0.3125	3.500	Both	SP-BS-0.2500,W-OS-0.1250,F-OS-0.1875

Bolted End-Plate Connections (Plate Fy = 55.00 ksi)

Mem. No.	Jt. No.	Type	End-Plate Dimensions			Bolt			Outside Flange			Inside Flange		
			Thick. (in.)	Width (in.)	Length (in.)	Diam. (in.)	Spec/Joint	Gages In/Out (in.)	Configuration ID	Configuration Desc.	Pitches 1st/2nd (in.)	Configuration ID	Configuration Desc.	Pitches 1st/2nd (in.)
1	2	KN(Top)	0.500	6.00	28.00	0.750	A325N/ST	3.00	13	Flush	2.00/2.00	11	Flush	19.00/2.00
2	1	KN(Top)	0.500	6.00	28.00	0.750	A325N/ST	3.00	13	Flush	2.00/2.00	11	Flush	19.00/2.00
3	2	SP	0.375	6.00	24.98	0.750	A325N/ST	3.00	11	Flush	16.50	32	Extended	3.25/2.00
4	1	SP	0.375	6.00	24.98	0.750	A325N/ST	3.00	11	Flush	16.50	32	Extended	3.25/2.00
5	2	KN(Face)	0.500	6.00	30.13	0.750	A325N/ST	3.00	33	Extended	3.50/2.00	12	Flush	2.00/2.00
6	2	KN(Face)	0.500	8.00	30.16	0.750	A325N/ST	3.00	33	Extended	3.50/2.00	12	Flush	2.00/2.00

Moment Connections:

Outside Flange		Required Strength					Strength Ratios *							
Mem. No.	Jt. No.	Ld Cs	Axial (k)	Shear (k)	Moment (in-k)	Design Proc.	Bolt Tension	Bolt Shear	Plate Bending	Shear Yielding	Shear Rupture	Bearing Tearing	Flange Weld	Web Weld
1	2	2	-17.0	10.0	1459.2	AISC DG-16/Thin plate	0.620	0.102	0.981	0.000	0.000	0.048	0.895	0.516
2	1	2	-17.0	10.0	1459.2	AISC DG-16/Thin plate	0.620	0.102	0.981	0.000	0.000	0.048	0.805	0.516
3	2	15	4.5	0.1	351.8	AISC DG-16/Thin plate	0.612	0.002	0.986	0.000	0.000	0.002	0.959	0.516
4	1	15	4.5	0.1	351.8	AISC DG-16/Thin plate	0.612	0.002	0.986	0.000	0.000	0.002	0.959	0.516
5	2	1	-10.6	16.1	2016.2	AISC DG-16/Thin plate	0.633	0.131	0.956	0.506	0.748	0.066	0.959	0.631
6	2	1	-10.6	16.1	2016.2	AISC DG-16/Thin plate	0.633	0.131	0.956	0.506	0.748	0.066	0.767	0.631

Inside Flange		Required Strength					Strength Ratios *							
Mem. No.	Jt. No.	Ld Cs	Axial (k)	Shear (k)	Moment (in-k)	Design Proc.	Bolt Tension	Bolt Shear	Plate Bending	Shear Yielding	Shear Rupture	Bearing Tearing	Flange Weld	Web Weld
1	2	15	6.6	3.9	565.4	AISC DG-16/Thin plate	0.743	0.079	0.741	0.000	0.000	0.048	0.799	0.516
2	1	15	6.6	3.9	565.4	AISC DG-16/Thin plate	0.743	0.079	0.741	0.000	0.000	0.048	0.799	0.516
3	2	1	-10.9	0.8	907.4	AISC DG-16/Thin plate	0.470	0.009	0.989	0.356	0.526	0.006	0.843	0.516
4	1	1	-10.9	0.8	907.4	AISC DG-16/Thin plate	0.470	0.009	0.989	0.356	0.526	0.006	0.843	0.516
5	2	15	4.6	6.5	820.2	AISC DG-16/Thin plate	0.522	0.088	0.814	0.000	0.000	0.044	0.959	0.631
6	2	15	4.6	6.5	820.2	AISC DG-16/Thin plate	0.522	0.088	0.814	0.000	0.000	0.044	0.959	0.631

* Strength ratios shown for the connections are reported as a percentage of the system default or user Override Stress Limit (Stress Limit = 1.03)

Bolted End-Plate Connections Weld Data:

Mem.	Jt.		Outside Flange				Inside Flange				Web				WS_P_01 Web Weld			
No.	No.	Type	Type	Size (in.)	Side	Notes	Type	Size (in.)	Side	Notes	Type	Size (in.)	Side	Notes	Type	Size (in.)	Side	Notes
1	2	KN(Top)	Fillet	0.1875	Both	-	Fillet	0.1875	Both	-	Fillet	0.1250	Both	-	-	-	-	-
2	1	KN(Top)	Fillet	0.2500	Both	-	CJP	99.0000	CJP	-	Fillet	0.1250	Both	-	-	-	-	-
3	2	SP	Fillet	0.1250	Both	-	Fillet	0.1875	Both	-	Fillet	0.1250	Both	-	-	-	-	-
4	1	SP	Fillet	0.1250	Both	-	Fillet	0.1875	Both	-	Fillet	0.1250	Both	-	-	-	-	-
5	2	KN(Face)	Fillet	0.3125	Both	-	Fillet	0.1875	Both	-	Fillet	0.1250	Both	-	-	-	-	-
6	2	KN(Face)	Fillet	0.2500	Both	-	CJP	99.0000	CJP	-	Fillet	0.1250	Both	-	-	-	-	-

Flange Brace Summary

Member	From Member Joint 1	From Side Point 1	Part	Axial Load per FB (k)	Load Case	Design Note
2	2/11/3	57/0/5	GFB3000	1.441	2	
2	9/11/8	50/0/0	GFB2063	0.467	2	
3	5/5/1	40/0/0	GFB2063	0.343	1	
3	10/5/1	35/0/0	GFB2081	0.386	1	
4	1/0/2	30/0/0	GFB2097	0.367	1	
4	6/0/2	25/0/0	GFB2081	0.330	2	
5	0/5/3	15/0/0	GFB2063	0.227	0	
5	10/5/3	5/0/0	GFB3000	1.640	1	

Frame Design Member Summary - Controlling Load Case and Maximum Combined Stresses per Member (Locations are from Joint 1)

			Controlling Cases		Required Strength				Available Strength				Strength Ratios	
Mem. No.	Loc. ft	Depth in.	Axial + Flexure	Shear	Axial Pr k	Shear Vr k	Mom-x Mrx in-k	Mom-y Mry in-k	Axial Pc k	Shear Vc k	Mom-x Mcx in-k	Mom-y Mcy in-k	Axial + Flexure	Shear
1	12.15	27.00	2		-17.0		-1459.2	0.0	55.2		1878.1	176.1	1.00	
1	12.15	27.00		2		-10.0				21.4				0.47
2	1.04	24.00	2		-11.7		-1393.3	0.0	90.9		1522.7	132.4	0.98	
2	1.04	24.00		2		14.2				21.5				0.66
3	10.42	19.23	1		-10.9		861.3	0.0	63.4		918.1	94.9	1.02	
3	0.00	12.00		2		8.0				21.8				0.37
4	6.01	18.91	2		-10.7		740.0	0.0	41.2		944.5	94.9	0.96	
4	15.58	14.00		1		-9.3				21.7				0.43
5	13.25	27.00	1		-10.6		-2016.2	0.0	122.2		2129.0	160.5	0.99	
5	13.25	27.00		1		-16.1				32.1				0.50
6	16.21	23.00	1		-17.8		-2062.1	0.0	101.9		2407.4	338.3	0.94	
6	16.21	23.00		1		10.6				32.3				0.33

Parameters Used for Axial and Flexural Design

Mem. No.	Loc. ft	Lx in.	Ly/Lt in.	Lb in.	Ag in.2	Afn in.2	Ixx in.4	Iyy in.4	Sx in.3	Sy in.3	Zx in.3	Zy in.3	J in.4	Cw in.6	Cb	Rpg	Rpc	Aeff/ Ag
1	12.15	145.85	145.9	145.9	7.30	1.88	873.38	11.26	64.70	3.75	73.43	5.74	0.14	2004.08	1.66	0.93	1.00	0.69
2	1.04	667.57	23.5	23.5	6.27	1.56	581.53	6.52	48.46	2.61	55.38	4.01	0.12	913.91	1.00	0.95	1.00	0.65
3	10.42	667.57	60.0	60.0	5.02	1.25	298.82	5.21	31.08	2.08	35.52	3.21	0.07	469.42	1.01	1.00	1.00	0.70
4	6.01	667.57	120.0	60.0	4.98	1.25	287.72	5.21	30.42	2.08	34.73	3.21	0.07	453.92	1.59	1.00	1.00	0.76
5	13.25	667.57	33.8	33.8	8.07	1.88	912.43	7.82	67.59	3.13	78.24	4.86	0.22	1386.27	1.12	0.96	1.00	0.63
6	16.21	194.52	194.5	194.5	9.66	3.00	918.81	32.01	79.90	8.00	88.22	12.15	0.31	4096.18	1.65	1.00	1.00	0.68

Deflection Load Combinations - Framing

No.	Origin	Factor	Def H	Def V	Application	Description
1	System	1.000	0	180	1.0 L	L
2	System	1.000	0	180	1.0 SMS	SMS
3	System	1.000	60	180	0.42 W1>	W1>
4	System	1.000	60	180	0.42 <W1	<W1
5	System	1.000	60	180	0.42 W2>	W2>
6	System	1.000	60	180	0.42 <W2	<W2
7	System	1.000	60	180	0.42 WPL	WPL
8	System	1.000	60	180	0.42 WPR	WPR
9	System	1.000	10	0	1.0 E> + 1.0 EG-	E> + EG-
10	System	1.000	10	0	1.0 <E + 1.0 EG-	<E + EG-

Controlling Frame Deflection Ratios for Cross Section:

Description	Ratio	Deflection (in.)	Member	Joint	Load Case	Load Case Description
Max. Horizontal Deflection	(H/547)	-0.286	1	2	8	WPR

Max. Vertical Deflection for Span 1	(L/352)	-1.962	4	1	2	SMS

* Negative horizontal deflection is left
* Negative vertical deflection is down
Lateral deflections of primary frames are calculated on a bare frame basis and do not include resistance from systems such as roof and endwall diaphragms or partial base fixity. Therefore, these deflections may be considerably overstated.

Frame Lateral Stiffness (K): 4.589 (k/in)
Fundamental Period (calculated) (T): 0.575 (sec.)

Shape Covered Parking is set as an existing shape.

Covering - Summary Report

Shape: Covered Parking Addition

Loads and Codes - Shape: Covered Parking Addition

City: Lees Summit **County:** Jackson **State:** Missouri **Country:** United States
Building Code: 2018 International Building Code
Building Risk/Occupancy Category: II (Standard Occupancy Structure)
Structural: 16AISC - ASD
Cold Form: 16AISI - ASD
Rainfall: I: 7.00 inches per hour
f'c: 3000.00 psi Concrete

Dead and Collateral Loads
Collateral Gravity: 10.00 psf
Collateral Uplift: 0.00 psf
Roof Covering + Second. Dead Load: Varies
Frame Weight (assumed for seismic):2.50 psf

Roof Live Load
Roof Live Load: 20.00 psf Not Reducible

Wind Load
Wind Speed: Vult: 115.00 (Vasd: 89.08) mph

The 'Envelope Procedure' is Used
Primaries Wind Exposure: C - Kz: 0.882
Parts Wind Exposure Factor: 0.882
Wind Enclosure: Partially Open
Topographic Factor: Kzt: 1.0000
Ground Elevation Factor: Ke: 0.9636

NOT Windborne Debris Region
Base Elevation: 0/0/0
Site Elevation: 1024.0 ft
Primary Zone Strip Width: 2a: 12/0/0
Parts / Portions Zone Strip Width:
Walls, a: 6/0/0
Roof(s), 0.6h: 10/9/10
Velocity Pressure: qz: 24.46, (C&C) 24.46 psf

Snow Load
Ground Snow Load: pg: 20.00 psf

Flat Roof Snow: pf: 16.80 psf
Design Snow (Sloped): ps: 16.80 psf
Rain Surcharge: 0.00 psf
Specified Minimum Roof Snow: 20.00 psf (Code)
Exposure Factor: 2 Partially Exposed - Ce: 1.00
Snow Importance: Is: 1.000
Thermal Factor: Unheated - Ct: 1.20
Ground / Roof Conversion: 0.70
Obstructed or Not Slippery

Seismic Load
Lateral Force Resisting Systems using Equivalent Force Procedure
Mapped MCE Acceleration: Ss: 12.00 %g
Mapped MCE Acceleration: S1: 7.00 %g
Site Class: Stiff soil (D) - Default
Seismic Importance: Ie: 1.000
Design Acceleration Parameter: Sds: 0.1280
Design Acceleration Parameter: Sd1: 0.1120
Seismic Design Category:: B
Seismic Snow Load: 0.00 psf
% Snow Used in Seismic: 0.00
Diaphragm Condition: Flexible
Fundamental Period Height Used: 19/3/0

Transverse Direction Parameters
System NOT detailed for Seismic
Redundancy Factor: Rho: 1.00
Fundamental Period: Ta: 0.2983
R-Factor: 3.00
Overstrength Factor: Omega: 2.50
Deflection Amplification Factor: Cd: 3.00
Base Shear: V: 0.0427 x W

Longitudinal Direction Parameters
System NOT detailed for Seismic
Redundancy Factor: Rho: 1.00
Fundamental Period: Ta: 0.1838
R-Factor: 3.00
Overstrength Factor: Omega: 2.50
Deflection Amplification Factor: Cd: 3.00
Base Shear: V: 0.0427 x W

Covering Design Loads - Roof: A

Zone	Units	Type	Description	Actual	Loc1	Allow.	Ratio	Dir.	Coef.
Entire Surface	psf	L	Standard Spacing is Adequate	21.18	0/0/0	121.000	0.18	IN	0.999
Entire Surface	psf	S	Standard Spacing is Adequate	17.99	0/0/0	121.000	0.15	IN	0.999
Entire Surface	psf	SMS	Standard Spacing is Adequate	21.18	0/0/0	121.000	0.18	IN	0.999
Side Zone	psf	<W2	Standard Spacing is Adequate	8.24	0/0/0	121.000	0.07	IN	0.480
Side Zone	psf	W1>	Standard Spacing is Adequate	26.87	0/0/0	31.000	0.87	OUT	-1.880
Corner Zone	psf	<W2	Standard Spacing is Adequate	8.24	53/2/6	121.000	0.07	IN	0.480
Corner Zone	psf	W1>	Non-std Spacing: 4/9/0 Required	32.52	53/2/6	34.000	0.96	OUT	-2.265
Corner Zone	psf	<W2	Standard Spacing is Adequate	8.24	60/4/13	121.000	0.07	IN	0.480
Corner Zone	psf	W1>	Non-std Spacing: 4/9/0 Required	32.52	60/4/13	34.000	0.96	OUT	-2.265
Side Zone	psf	<W2	Standard Spacing is Adequate	8.24	53/2/6	121.000	0.07	IN	0.480
Side Zone	psf	W1>	Standard Spacing is Adequate	26.87	53/2/6	31.000	0.87	OUT	-1.880
Side Zone	psf	<W2	Standard Spacing is Adequate	8.24	53/2/6	121.000	0.07	IN	0.480
Side Zone	psf	W1>	Standard Spacing is Adequate	26.87	53/2/6	31.000	0.87	OUT	-1.880
Corner Zone	psf	<W2	Standard Spacing is Adequate	8.24	60/4/13	121.000	0.07	IN	0.480
Corner Zone	psf	W1>	Non-std Spacing: 4/9/0 Required	32.52	60/4/13	34.000	0.96	OUT	-2.265
Corner Zone	psf	<W2	Standard Spacing is Adequate	8.24	53/2/6	121.000	0.07	IN	0.480
Corner Zone	psf	W1>	Non-std Spacing: 4/9/0 Required	32.52	53/2/6	34.000	0.96	OUT	-2.265
Side Zone	psf	<W2	Standard Spacing is Adequate	8.24	0/0/0	121.000	0.07	IN	0.480
Side Zone	psf	W1>	Standard Spacing is Adequate	26.87	0/0/0	31.000	0.87	OUT	-1.880
Side Zone	psf	<W2	Standard Spacing is Adequate	8.24	53/2/6	121.000	0.07	IN	0.480

Side Zone	psf	W1>	Standard Spacing is Adequate	26.87	53/2/6	31.000	0.87	OUT	-1.880
Misc. Edge Zone	psf	<W2	Standard Spacing is Adequate	8.24	0/0/0	121.000	0.07	IN	0.480
Misc. Edge Zone	psf	W1>	Standard Spacing is Adequate	26.87	0/0/0	31.000	0.87	OUT	-1.880
Misc. Edge Zone	psf	<W2	Standard Spacing is Adequate	8.24	42/4/13	121.000	0.07	IN	0.480
Misc. Edge Zone	psf	W1>	Standard Spacing is Adequate	26.87	42/4/13	31.000	0.87	OUT	-1.880
Misc. Edge Zone	psf	<W2	Standard Spacing is Adequate	8.24	42/4/13	121.000	0.07	IN	0.480
Misc. Edge Zone	psf	W1>	Standard Spacing is Adequate	26.87	42/4/13	31.000	0.87	OUT	-1.880
Misc. Edge Zone	psf	<W2	Standard Spacing is Adequate	8.24	42/4/13	121.000	0.07	IN	0.480
Misc. Edge Zone	psf	W1>	Standard Spacing is Adequate	26.87	42/4/13	31.000	0.87	OUT	-1.880
Misc. Edge Zone	psf	<W2	Standard Spacing is Adequate	8.24	0/0/0	121.000	0.07	IN	0.480
Misc. Edge Zone	psf	W1>	Standard Spacing is Adequate	26.87	0/0/0	31.000	0.87	OUT	-1.880
Interior Area	psf	<W2	Standard Spacing is Adequate	8.24	0/0/0	121.000	0.07	IN	0.480
Interior Area	psf	W1>	Standard Spacing is Adequate	15.13	0/0/0	31.000	0.49	OUT	-1.080

Panel Data

Wall/Roof	Type	Thickness	Finish	Color	Direction	Gable Dir	Max. Length
Wall: 1	Open		Exposed to wind				
Wall: 2	Open						
Wall: 3	Open		Exposed to wind				
Wall: 4	Open						
Roof: A	MR-24	24	Special Request	LSMO PEWTER	System Generated	Not Applicable	50/0/0

Fastener Data

Wall/Roof	Type	Length	Spacing	Washers	Insul. Block	Mod. Ctrl.	Ice Damming
Wall: 1	None.						
Wall: 2	None.						
Wall: 3	None.						
Wall: 4	None.						
Roof: A	Stainless	Standard Option	Standard Option	Yes	None	No	Yes

Stud Wall

Wall	Use Bay Spaces	Max. Stud Panel Width	Stud Spacing	Deflection	Weight	Thickness	Wall Panel Offset	Description

Shape: Covered Parking

Shape Covered Parking is set as an existing shape.

Design Appendices

PIM #: **24-007756-02**

Project Description: **LSMO Water Utilities Covered Parking**

Designer: **Ethan Henderson**

Missouri has no state building code. Building code regulations are controlled at the local municipality level.

Local Code Links:

Joplin
Kansas City
Springfield
St. Louis

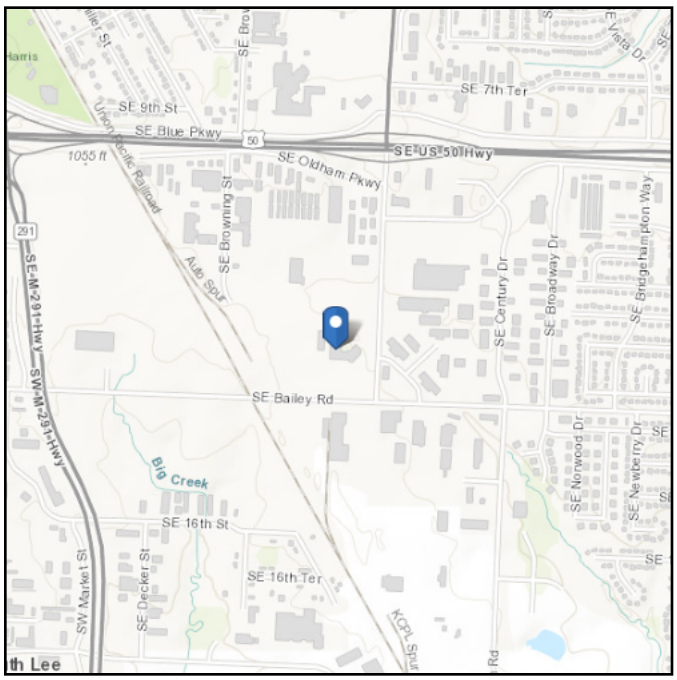
Document and Revision History

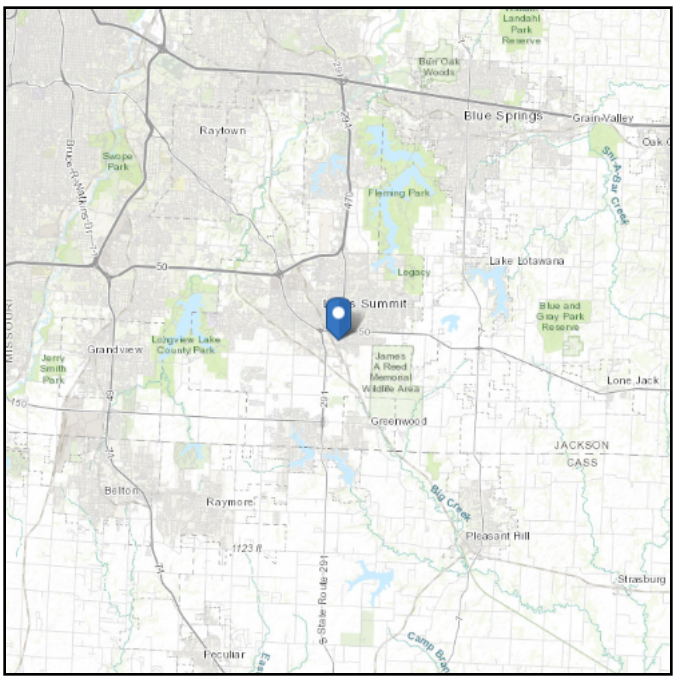
REV. #	DATE	NAME	DESCRIPTION
0	09/2009	Al Harrold	Original document
1	01/21/2011	Al Harrold	Add link to Springfield city document.
2	07/07/2011	Al Harrold	Add link to Joplin city document.
3	01/08/2013	Al Harrold	Add links to Kansas City and St. Louis city documents.

ASCE Hazards Report

Address:
1200 SE Hamblen Rd
Lees Summit, Missouri
64081

Standard:	ASCE/SEI 7-16	**Latitude:**	38.897202
Risk Category:	II	**Longitude:**	-94.364902
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	1024.0775408511888 ft (NAVD 88)





Wind

Results:

Wind Speed	109 Vmph
10-year MRI	76 Vmph
25-year MRI	83 Vmph
50-year MRI	88 Vmph
100-year MRI	94 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Wed Apr 24 2024

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

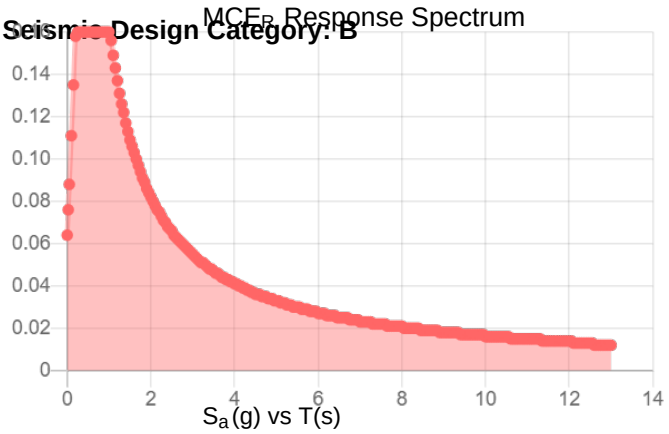
Seismic

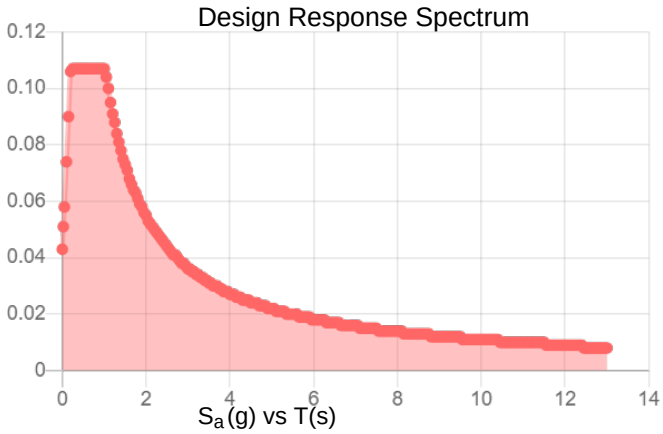
Site Soil Class: D - Default (see Section 11.4.3)

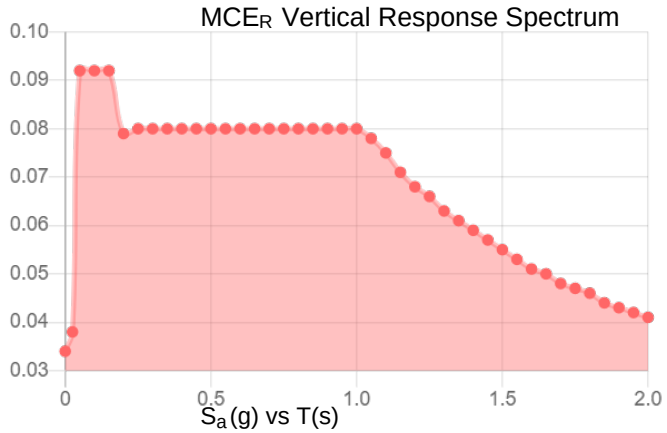
Results:

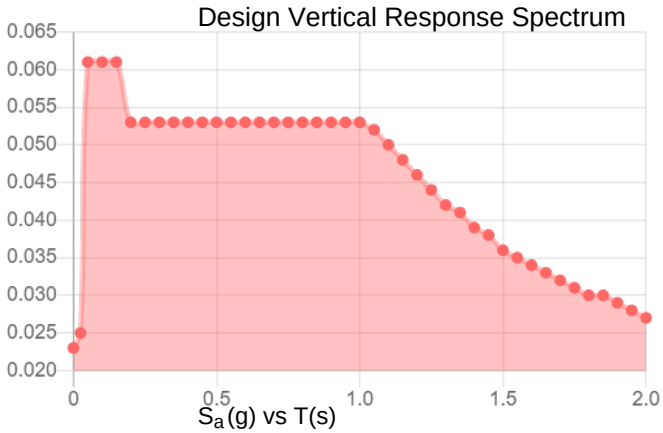
S_S :	0.1	S_{D1} :	0.109
S_1 :	0.068	T_L :	12
F_a :	1.6	PGA :	0.047
F_v :	2.4	PGA_M :	0.076
S_{MS} :	0.16	F_{PGA} :	1.6
S_{M1} :	0.164	I_e :	1
S_{DS} :	0.107	C_v :	0.7

Seismic Design Category: B









Data Accessed: **Wed Apr 24 2024**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Snow

Results:

Ground Snow Load, p_g:	20 lb/ft^2
Mapped Elevation:	1024.1 ft
Data Source:	ASCE/SEI 7-16, Table 7.2-8
Date Accessed:	Wed Apr 24 2024

Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.

Snow load values are mapped to a 0.5 mile resolution. This resolution can create a mismatch between the mapped elevation and the site-specific elevation in topographically complex areas. Engineers should consult the local authority having jurisdiction in locations where the reported ‘elevation’ and ‘mapped elevation’ differ significantly from each other.

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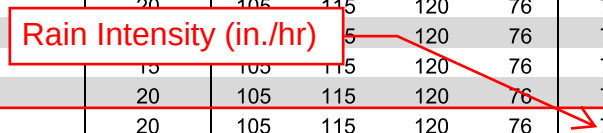
County Name	Snow	Wind				Rain		Seismic			
	S	W_1	W_2	W_3/W_4	W_s	I1	I2	County Seat	S_s	S_1	T_L
Yalobusha	10	105	115	120	76	7	10	Water Valley	0.385	0.167	12
Yazoo	5	105	115	120	76	8	11	Yazoo City	0.198	0.103	12
MISSOURI											
Adair	20	105	115	120	76	7	10	Kirksville	0.102	0.068	12
Andrew	20	105	115	120	76	7	10	Savannah	0.096	0.055	12
Atchison	20	105	115	120	76	7	10	Rock Port	0.104	0.051	12
Audrain	20	105	115	120	76	7	9	Mexico	0.172	0.096	12
Barry	15	105	115	120	76	8	11	Cassville	0.171	0.096	12
Barton	15	105	115	120	76	8	11	Lamar	0.130	0.080	12
Bates	20	105	115	120	76	7	10	Butler	0.120	0.072	12
Benton	20	105	115	120	76	7	10	Warsaw	0.151	0.087	12
Bollinger	15	105	115	120	76	7	9	Marble Hill	0.898	0.317	12
Boone	20	105	115	120	76	7	10	Columbia	0.167	0.093	12
Buchanan	20	105	115	120	76	7	10	Saint Joseph	0.100	0.057	12
Butler	15	105	115	120	76	7	9	Poplar Bluff	0.973	0.340	12
Caldwell	20	105	115	120	76	7	10	Kingston	0.099	0.062	12
Callaway	20	105	115	120	76	7	10	Fulton	0.192	0.103	12
Camden	20	105	115	120	76	7	10	Camdenton	0.199	0.104	12
Cape Girardeau	15	105	115	120	76	6	9	Jackson	1.018	0.356	12
Carroll	20	105	115	120	76	7	10	Carrollton	0.111	0.070	12
Carter	15	105	115	120	76	7	10	Van Buren	0.626	0.233	12
Cass	20	105	115	120	76	7	10	Harrisonville	0.116	0.069	12
Cedar	20	105	115	120	76	7	10	Stockton	0.146	0.086	12
Chariton	20	105	115	120	76	7	10	Keytesville	0.120	0.075	12
Christian	15	105	115	120	76	8	10	Ozark	0.209	0.109	12
Clark	20	105	115	120	76	6	9	Kahoka	0.130	0.072	12
Clay	20	105	115	120	76	7	10	Liberty	0.109	0.064	12
Clinton	20	105	115	120	76	7	10	Plattsburg	0.101	0.060	12
Cole	20	105	115	120	76	7	10	Jefferson City	0.200	0.105	12
Cooper	20	105	115	120	76	7	10	Boonville	0.150	0.086	12
Crawford	20	105	115	120	76	7	9	Steelville	0.350	0.153	12
Dade	20	105	115	120	76	8	11	Greenfield	0.151	0.088	12
Dallas	20	105	115	120	76	7	10	Buffalo	0.280	0.133	12
Daviess	20	105	115	120	76	7	10	Gallatin	0.190	0.102	12
Dekalb	20	105	115	120	76	7	10	Maysville	0.093	0.058	12
Dent	20	105	115	120	76	7	10	Salem	0.367	0.159	12
Douglas	15	105	115	120	76	7	10	Ava	0.263	0.128	12
Dunklin	10	105	115	120	76	7	9	Kennett	1.773	0.634	12
Franklin	20	105	115	120	76	7	9	Union	0.331	0.144	12
Gasconade	20	105	115	120	76	7	9	Hermann	0.241	0.119	12
Gentry	20	105	115	120	76	7	10	Albany	0.086	0.055	12
Greene	20	105	115	120	76	8	10	Springfield	0.194	0.104	12
Grundy	20	105	115	120	76	7	10	Trenton	0.090	0.060	12
Harrison	20	105	115	120	76	7	10	Bethany	0.085	0.056	12
Henry	20	105	115	120	76	7	10	Clinton	0.133	0.079	12
Hickory	20	105	115	120	76	7	10	Hermitage	0.165	0.092	12
Holt	20	105	115	120	76	7	10	Oregon	0.102	0.054	12
Howard	15	105	115	120	76	7	10	Fayette	0.142	0.084	12
Howell	15	105	115	120	76	7	10	West Plains	0.416	0.175	12
Iron	20	105	115	120	76	7	9	Ironton	0.596	0.222	12
Jackson	20	105	115	120	76	7	10	Kansas City	0.111	0.064	12
Jasper	15	105	115	120	76	8	11	Carthage	0.135	0.082	12



Roof Snow Loading

2018 International Building Code

ASCE 7-16 Chapter 7 DP Section 1.4.4

Job No:	24-007756-02	
Page:		
Date:	05/02/24	
Prepared By:	EH	
Reviewed By:		
Rev:	2.95	03/24

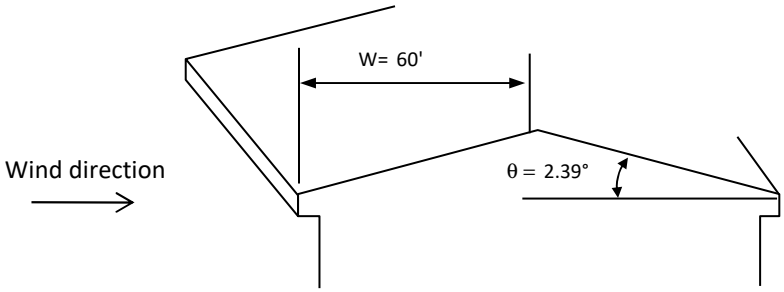
Notes:

Ground Snow p_g (psf) = **20.0**
Eave to ridge distance (windward side) **W** (ft) = **60.0**
Roof Pitch (leeward side) /12 = **0.5** ⇒ **θ =** 2.39°

Unbalanced snow is not required for monoslope roofs

(Risk Category) Occupancy =	(II) Standard	IBC Table 1604.5
Roof Exposure =	Partially Exposed	Table 7.3-1
Terrain Category (Exposure) =	Wind Exposure C	Table 7.3-1 & Sect. 26.7.3
Thermal Condition =	Unheated or open air structures	Table 7.3-2
Monoslope, Hip or Gabled Roof =	Monoslope	7.3.4 & 7.5.1
Type of Roof Surface =	All Other Surfaces	7.4 & Fig. 7.4-1

Exposure factor C_e =	1.0	7.3.1 & Table 7.3-1	
Thermal factor C_t =	1.2	7.3.2 & Table 7.3-2	
Importance factor I_s =	1.0	7.3.3 & Table 1.5-2	
Flat Roof Snow $p_f = 0.7\ C_e\ C_t\ I_s\ p_g$ (psf) =	**16.8**	Eq. 7.3-1	
Minimum Snow p_m (pst) =	**20.0**	7.3.4 = Is*pg	**Governs!**
Slope factor C_s =	1.000	Figure 7,4-1 and Commentary C7.4	
Sloped Roof Snow $p_s = C_s\ p_f$ (psf) =	**16.8**	Eq. 7.4-1	
Rain on Snow Surcharge =	0.0	7.10 N/A	
Snow density γ (pcf) =	16.60	Eq. 7.7-1	
Height of snow drift h_d (ft) =	0.00	Fig. 7.6-1 N/A	
ROOF SNOW LOAD p_r (psf) =	**16.80**		



Partial Loading on Continuous Members
on purlins & frames 7.5.1

Case 1
16.8 psf - Ext spans & 8.4 psf - Int spans

Case 2
8.4 psf - Ext spans & 16.8 psf - Int spans

Case 3
16.8 psf - Adj spans & 8.4 psf other spans

Balanced — 20.0 psf = Pm

Unbalanced - N/A

0 psf = Total (max.)

Wind Loading - Components & Cladding

2018 International Building Code - ASD Design Basis

ASCE7-16: Ch. 30 DP 1.4.5

Job No:	24-007756-02	
Page:		
Date:	05/02/24	
Prepared By:		EH
Reviewed By:		
Rev:	2.95	03/24

Notes:

ASD Load factor (0.6) is included in all loadings (pressure/suction)

(Risk Category) Occupancy: (II) Standard
Basic Wind Speed V_{ult} (mph) = 115 Fig. 26.5-1B
Exposure Category: C
Topographic Effects
Envelope: Partially Open

Exposure Factor	K_z = 0.88	K_1 = 0.00	Internal Pressure Coeff. GC_{pi} = 0.18	Table 26.13-1	
Topographic Factor	K_{zt} = 1.00	K_2 = 0.00	Gust Factor G = 0.85	Sect. 26.11.1	
Directionality Factor	K_d = 0.85	K_3 = 0.00	Site Elevation = 1024	Feet above S.L.	
Ground Elev. Factor	K_e = 0.964		☐ Parapet		
Velocity Pressure	q_h (psf) = 24.46	Eq. 26.10-1			
Height z (ft) =					
q_z (psf) =	24.46				

Width W (ft) =	60
Length L (ft) =	254
Eave Height H_e (ft) =	18
Roof Pitch /12 =	0.5 = 2.39°
High Eave (ft) =	20.5
Roof Shape	Monoslope
Mean Roof Height H_m (ft) =	18.0
C&C Edge Zone a (ft) =	6.0
Roof Edge Zone 0.6h (ft) =	10.8

PANEL LOADING

ROOF Wind Effective Area (ft^2) = 10 Figure 30.7-2

☑ Standing Seam Roof
AISI Red. 0.67

Zone	+GCp	-GCp	GCpi +/-	Pressure Coeff.	Pressure p (psf)	Suction Coeff.	Suction p (psf)
1'	0.30	-0.90	0.18	0.48	**7.0**	-1.08	**-15.9**
1	0.30	-1.70	0.18	0.48	**7.0**	-1.88	**-27.6**
2	0.30	-2.30	0.18	0.48	**7.0**	-2.48	**-27.6**
3	0.30	-3.20	0.18	0.48	**7.0**	-3.38	**-33.2**

OVERHANG

Zone	-GCp	Suction p (psf)
1'	-1.70	**-25.0**
1	-1.70	**-16.7**
2	-2.30	**-22.6**
3	-3.20	**-31.5**

WALLS Wind Effective Area (ft^2) = 10 Figure 30.3-1

Zone	+GCp	-GCp	GCpi +/-	Pressure Coeff.	Pressure p (psf)	Suction Coeff.	Suction p (psf)
4	0.90	-0.99	0.18	1.08	**15.9**	-1.17	**-17.2**
5	0.90	-1.26	0.18	1.08	**15.9**	-1.44	**-21.1**

SECONDARY LOADING

Tributary Width (ft) = 5
Member Length (ft) = 25
Trib. width used (ft^2) = 8.3

ROOF Wind Effective Area (ft^2) = 208.3 Figure 30.7-2

Zone	+GCp	-GCp	GCpi +/-	Pressure Coeff.	Pressure p (psf)	Suction Coeff.	Suction p (psf)
1'	0.20	-0.74	0.18	0.38	**5.6**	-0.92	**-13.5**
1	0.20	-1.16	0.18	0.38	**5.6**	-1.34	**-19.6**
2	0.20	-1.60	0.18	0.38	**5.6**	-1.78	**-26.1**
3	0.20	-1.80	0.18	0.38	**5.6**	-1.98	**-29.1**

OVERHANG

Zone	-GCp	Suction p (psf)
1'	-1.33	**-19.5**
1	-1.33	**-19.5**
2	-1.37	**-20.1**
3	-1.57	**-23.0**

Tributary Width (ft) = 5
Member Length (ft) = 25
Trib. width used (ft^2) = 8.3

WALLS Wind Effective Area (ft^2) = 208.3 Figure 30.3-1

Zone	+GC_p	-GC_p	GCpi +/-	Pressure Coeff.	Pressure (psf)	Suction Coeff.	Suction p (psf)
4	0.69	-0.78	0.18	0.87	**12.8**	-0.96	**-14.1**
5	0.69	-0.84	0.18	0.87	**12.8**	-1.02	**-15.0**

MINIMUM WIND LOAD - C&C

Min. wind of ± 9.6 psf is required for wind-only LC
Sect. 30.2.2

Wind Loading - MWFRS

2018 International Building Code - ASD Design Basis

ASCE7-16: Ch. 27 (All Heights) & 28 (Low Rise) DP 1.4.5

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Reviewed By:	
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Notes:

ASD Load factor (0.6) is included in all loadings (pressure/suction)

(Risk Category) Occupancy = (II) Standard

Basic Wind Speed V_{ult} (mph) = 115 Fig. 26.5-1B

Exposure Category = C

Envelope = Partially Open

Topographic Effects

Exposure Factor: Varies - See below; K_1 = 0

Topographic Factor: K_{zt} = 1.00; K_2 = 0

Directionality Factor: K_d = 0.85; K_3 = 0

Ground Elev. Factor: K_e = 0.964

Internal Pressure Coeff. GC_{pi} = 0.18 Table 26.13-1

Gust Factor G = 0.85 Sect. 26.11.1

Site Elevation = 1024 Feet above S.L.

Width W (ft) = 60

Length L (ft) = 254

Eave Height H_e (ft) = 18

Roof Pitch /12 = 0.5 = 2.39°

High Eave (ft) = 20.5

Roof Shape = Monoslope

Mean Roof Height H_m (ft) = 18.0

MAIN WIND FORCE RESISTING SYSTEM - ASCE 7-16 Figure 28.3.1 (Low Rise)

Effective Height z_1 = 18.00 Rigid Structure (assumed) Sect. 26.11.1

Exposure Factor K_z = 0.88 Table 26.10-1

Velocity Pressure q_h (psf) = 24.46 Eq. 26.10-1

Interior frame trib. width (ft) = 25 ft Partially Open - Monoslope Figure 28.3-1

Endbay length (ft) = 25 ft

Endwall Edge Zone a (ft) = 6.0

Sidewall Edge Zone 2a (ft) = 12.0

Winds Normal to Ridge

Zone	Zone Dim	w/ + GCi GC_{pf}	w/ - GCpi p (psf)	w/ + GCpi p (psf)	w/ - GCpi (kips/LF)	w/ + GCpi (kips/LF)
1	242.0' x Ht	0.400	**3.2**	**8.5**	0.08	0.21
2	242.0' x 30.0'	-0.690	**-12.8**	**-7.5**	-0.32	-0.19
3	242.0' x 30.0'	-0.370	**-8.1**	**-2.8**	-0.20	-0.07
4	242.0' x Ht	-0.290	**-6.9**	**-1.6**	-0.17	-0.04
1E	12.0' x Ht	0.610	**6.3**	**11.6**	0.07	0.13
2E	12.0' x 30.0'	-1.070	**-18.3**	**-13.1**	-0.21	-0.14
3E	12.0' x 30.0'	-0.530	**-10.4**	**-5.1**	-0.12	-0.06
4E	12.0' x Ht	-0.430	**-9.0**	**-3.7**	-0.10	-0.04

Winds Parallel to Ridge

Zone	Zone Dim	GC_{pf}	w/ - GCpi p (psf)	w/ + GCpi p (psf)
1	242.0' x Ht	-0.450	**-9.2**	**-4.0**
2	242.0' x 30.0'	-0.690	**-12.8**	**-7.5**
3	242.0' x 30.0'	-0.370	**-8.1**	**-2.8**
4	242.0' x Ht	-0.450	**-9.2**	**-4.0**
5	54.0' x Ht	0.400	**3.2**	**8.5**
6	54.0' x Ht	-0.290	**-6.9**	**-1.6**
1E	12.0' x Ht	-0.480	**-9.7**	**-4.4**
2E	12.0' x 30.0'	-1.070	**-18.3**	**-13.1**
3E	12.0' x 30.0'	-0.530	**-10.4**	**-5.1**
4E	12.0' x Ht	-0.480	**-9.7**	**-4.4**
5E	6.0' x Ht	0.610	**6.3**	**11.6**
6E	6.0' x Ht	-0.430	**-9.0**	**-3.7**

Positive = Inward pressure; Negative = Outward pressure

	Sum Vert Loads		Sum Horiz Loads	
Int frames	-15.6 k	-7.7 k	5 k	5.1 k
End frame	-10 k	-6 k	3.4 k	3.5 k

Sidewall MWFRS (=Base Shear) (kips)		
Combined	Eave 1	Eave 2
5E/6E Left	3.1 k	3 k
5E/6E Right	2.9 k	3.3 k

MAIN WIND FORCE RESISTING SYSTEM - ASCE 7-16 FIGURE 27.4-1 (All Heights)

Effective Height z_2 = 18.00

Exposure Factor K_z = 0.88 Table 26.10-1

$q_{h\ MWFRS}$ (psf) = 24.46 Eq. 26.10-1 Partially Open - Monoslope Figure 27.3-1 Rigid Structure (assumed) Sect. 26.11.1

WINDS NORMAL TO RIDGE L/B = 0.24 h/L = 0.3

Zone	Dim.	Cp Case A	Cp Case B	w/ - Cpi p (psf)	w/ + Cpi p (psf)
Windward Wall	Full Ht	0.80	0.80	**7.3**	**12.6**
Wwrd Roof Edge	< 9.0'	-0.90	-0.18	**-13.9**	**0.4**
Roof (h/2 - h)	9.0 - 18.0'	-0.90	-0.18	**-13.9**	**0.4**
Roof (h - 2h)	18.0 - 36.0'	-0.50	-0.18	**-8.9**	**0.4**
Roof (> 2h)	>36.0'	-0.30	-0.18	**-6.4**	**0.4**
Leeward Wall	Full Ht	-0.50	-0.50	**-8.9**	**-3.6**
Sidewalls	Full Ht	-0.70	-0.70	**-11.4**	**-6.1**

WINDS PARALLEL TO RIDGE L/B = 4.23 h/L = 0.07

Zone	Dim.	Cp Case A	Cp Case B	w/ - Cpi p (psf)	w/ + Cpi p (psf)
Windward Wall	Full Ht	0.80	0.80	**7.3**	**12.6**
Wwrd Roof Edge	< 9.0'	-0.90	-0.18	**-13.9**	**0.4**
Roof (h/2 - h)	9.0 - 18.0'	-0.90	-0.18	**-13.9**	**0.4**
Roof (h - 2h)	18.0 - 36.0'	-0.50	-0.18	**-8.9**	**0.4**
Roof (> 2h)	>36.0'	-0.30	-0.18	**-6.4**	**0.4**
Leeward Wall	Full Ht	-0.20	-0.20	**-5.1**	**0.1**
Sidewalls	Full Ht	-0.70	-0.70	**-11.4**	**-6.1**

Positive = Inward pressure; Negative = Outward pressure

Combined wind pressure on wall surfaces normal to ridge exceeds the minimum wind requirements listed below. Design checks per 27.1.5 can be ignored

Combined wind pressure on wall surfaces parallel to ridge exceeds the minimum wind requirements listed below. Design checks per 27.1.5 can be ignored

MAIN WIND FORCE RESISTING SYSTEM - (Minimum Wind Load)

$q_{h\ MWFRS}$ (psf) = **9.60** Sect. 27.1.5 Partially Open - Monoslope Figure C27.1-1

WINDS NORMAL TO RIDGE

	Min Wind
Int frames	4.9k
End frame	2.5k

WINDS PARALLEL TO RIDGE

Sidewall MWFRS (=Base Shear) (kips)	
Low Eave	2.7 k
High Eave	2.8 k

Wind Enclosure Classification

2018 International Building Code

ASCE7-16: Sections 26.2 and 26.12 (General Provisions) nDP 1.4.5

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BUILDING GEOMETRY

This tool is intended for simple and regularly shaped buildings only.

		(CC Wind Input)	(Override)
Width	W (ft) =	60	
Distance to Ridge	(ft) =	60	
Length	L (ft) =	254	
Left Eave	H_{eL} (ft) =	18	
Right Eave	H_{eR} (ft) =	20.5	
Ridge Height	H_r (ft) =	20.5	
Mean Roof Height	H_m (ft) =	19.25	

Shape = Monoslope

		(Override)	
Roof Pitch (Left) /12 =	0.5		θ_L = 2.39°
Roof Pitch (Right) /12 =	0.5		θ_R = 2.39°

BUILDING SURFACES AND OPENINGS

Building Surface	Gross Area A_g (sqft)	Openings A_o (sqft)	% Open A_o/A_g	Sum. Open A_{oi} (sqft)	Sum. Gross Area A_{gi} (sqft)	Density of Openings A_{oi}/A_{gi}	Building Enclosure Test: Enclosed	Partially Enclosed	Partially Open	Open
FEW	1155	1155	100%	9093	26187	0.35	FALSE	FALSE		TRUE
RSW	5207	4829	93%	5419	22135	0.24	FALSE	FALSE		TRUE
REW	1155	0	0%	10248	26187	0.39	FALSE	FALSE		FALSE
LSW	4572	4264	93%	5984	22770	0.26	FALSE	FALSE		TRUE
Total Wall	12089	10248	85%				**FALSE**	**FALSE**	**TRUE**	**FALSE**

Left Roof	15253	0	0%	10248
Right Roof	0	0	0%	0
Total Roof	15253	0	0%	
Total area	27342	10248		

Building Enclosure Classification: ***Partially Open***

Building Enclosure Test Criteria Ref. ASCE 7-16 Table 26.13-1

Enclosed: Must satisfy all of the following:
- Ao < smaller of (0.01 Ag or 4 sqft)
- Aoi / Agi <= 0.20

Partially Enclosed: Must satisfy all of the following:
- Ao > 1.1 Aoi
- Ao > smaller of (0.01 Ag or 4 sqft)
- Aoi / Agi <= 0.20

Partially Open: A building that does not qualify as enclosed, partially enclosed, or open.

Open: All walls are at least 80% open.
- Ao >= 0.8 Ag

Where:
Ao = the total area of openings in a wall that receives positive external pressure.
Ag = the gross area of that wall in which Ao is identified.
Aoi = the sum of the areas of openings in the building envelope (walls and roof) not including Ao.
Agi = the sum of the gross surface areas of the building envelope (walls and roof) not including Ag.

OPENINGS: Apertures or holes in the building envelope that allow air to flow through the building envelope and that are designed as "open" during design winds as defined by these provisions.

Earthquake Loads

2018 International Building Code - ASD Design Basis

(Ref. ASCE7-16 Chapters 11 and 12) nDP Section 1.4.6

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Reviewed By:	
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SITE DATA

ASCE 7 Hazard Tool US (Web App)

Fig 22-1	S_s	12.00%	g	
Fig 22-2	S_1	7.00%	g	
Table 20.3-1	Site Class	D (default) - Stiff Soil		
Fig. 22-14	T_L	12	sec	
Table 11.4-1	F_a	1.600	override	
Table 11.4-2	F_v	2.400	override	
Eq. 11.4-1	S_{MS}	0.1920		
Eq. 11.4-2	S_{M1}	0.1680		
Eq. 11.4-3	S_{DS}	0.1280		
Eq. 11.4-4	S_{D1}	0.1120		
11.4.6	T_s	0.8750	sec.	
Table 11.6-1	SDC	A		
Table 11.6-2	SDC	B		
11.6	SDC_{max}	B		
12.8.1.3	S_{DS_adj}	0.1280		
11.6	SDC_{adj}	B		

Risk Category: Standard

Importance Factor, I_e: 1.00

☑ Allow alt SDC evaluation using this Table only (ASCE 7 Section 11.6)

☑ Building has no PLAN or VERTICAL irregularities 12.3.2

FILL SFRS LISTS

Seismic Force Resisting System (SFRS) Table 12.2-1

Transverse: OMF: C.4.MF. Steel Ordinary Moment Frame - Primary Frames

Use applicable seismic detailing provisions in accordance with AISC 341 - Seismic Provisions.

Longitudina: OCBF: B.Steel ordinary concentric braced frames

Use applicable seismic detailing provisions in accordance with AISC 341 - Seismic Provisions.

BUILDING INFORMATION

Width	60	ft.
Length	254	ft.
Eave Height H_e	18	ft.
Roof Pitch /12	0.5	2.39°
Roof Shape	Monoslope	ft.
High Eave	20.5	ft.
Reference Ht.	19.3	ft.
Bays	2	
Aisles	1	
Levels	1	

Building Loads for SFRS Selection Only

Roof DL	5.0	psf
Wall DL > 35'	0.0	psf
Wall DL <= 35'	2.0	psf
Max Floor DL	0.0	psf

	DESCRIPTION		TRANVERSE SYSTEM		LONGITUDINAL SYSTEM	
12.3.1	Roof diaphragm condition (flexibility)		☑ Diaphragm is FLEXIBLE		☑ Diaphragm is FLEXIBLE	
	Number of vertical SFRS elements for the direction of loading		5		1	
12.3.4	Redundancy	ρ	1.000	override	1.000	override
Table 12.2-1	Response modification coefficient	R	3	3	3	3
Table 12.2-1	System overstrength factor	$\Omega_{o\ used}$	2.5	override	2	override
Table 12.2-1	Structural height limit	H_{max}	65	ft	60	ft
	Equivalent Lateral Force Procedure					
Table 12.8-2	Building period coefficient	C_T	0.028		0.02	
Table 12.8-2	Building period exponent	x	0.8		0.75	
Eq. 12.8-7	Approximate fundamental period	T_a	0.2983	override	0.1838	override
Eq. 12.8-8	Alternative approximate fundamental period	$T_{a\ min}$	0.1	sec.	0.1	sec.
Table 12.8-1	Coefficient for upper limit on calculated period	C_u	1.6760		1.6760	
12.8.2	Max. fundamental period for strength calculations ("limited")	$T_a C_u$	0.5000	sec.	0.3081	sec.
12.8.2	Fundamental period (alternate to full analysis: may use T=Ta)	T	0.2983	sec.	0.1838	sec.
	☐ Calculate fundamental period T (use instead of Ta)					
	Fundamental period for strength calculations	T	**0.2983**	override	**0.1838**	override
Eq. 12.8-2	Seismic response coefficient	C_S	0.0427		0.0427	
Eq. 12.8-3/4	Maximum seismic response coefficient	$C_{s\ max}$	0.1251		0.2031	
Eq. 12.8-5/6	Minimum seismic response coefficient	$C_{s\ min}$	0.0100		0.0100	
	Final C_s for strength calculations	C_s	**0.0427**	override	**0.0427**	override
Eq. 12.8-1	**Seismic base shear** for strength calculations	$V (=Q_E)$	**1.6**	kips	**1.6**	kips
					0.04266667	
	Vertical Force Distribution					
12.8.3	Vertical distribution coefficient	k	1.000		1.000	
12.8.3	Total seismic design force at roof level	$F_{Roof\ Level}$	**1.6**	kips	**1.6**	kips
	Required Strength (Design Forces)					
	FACTORED FORCES ... (Load Factor = 0.7 is included)					
Eq. 12.4-3	Horizontal seismic force	$E_h = \rho Q_E$	**1.1**	kips	**1.1**	kips
Eq. 12.4-7	Horizontal seismic force with overstrength	$E_{mh} = \Omega_o Q_E$	**2.8**	kips	**2.3**	kips
Eq. 12.4-4a	Vertical seismic force (up or down)	$E_v = +/-0.2 S_{DS} D$	**0.0**	kips	**0.0**	kips

Earthquake Loads

2018 International Building Code - ASD Design Basis

(Ref. ASCE7-16 Chapters 11 and 12) nDP Section 1.4.6

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DESCRIPTION			TRANSVERSE SYSTEM		LONGITUDINAL SYSTEM	
Roof Loading:				PSF		PSF
		Tributary Width		127 *ft*		30 *ft*
Uniform roof dead loads	12.7.2	DL_{roof}		5.0 *psf*		5.0 *psf*
Roof snow load to determine seismic lateral load determination	12.7.2	SL_{roof}		0.0 *psf*		0.0 *psf*
Wall weight to be included in the total seismic weight below	12.7.2	W_{wall}		0 *kips*		0 *kips*
Total seismic weight tributary to frame line analyzed	12.7.2	W_R		**38.1** *kips*		**38.1** *kips*
Alternative approximate period calculation						
For single story moment frames only		Smith & Uang [2013]				
Space between frame columns		S_{column}		60 *ft*		254 *ft*
Mean roof (bay) height		H_m		20.5 *ft*		20.5 *ft*
Aspect ratio		α		2.92682927		2.92682927
Approximate period for the selected system		T_a		**N/A** *sec*		**N/A** *sec*
Diaphragm Design Forces						
12.10.1 Total diaphragm design force at roof level		$Fp_{Roof\ Level}$		**1.6** *kips*		**1.6** *kips*

Earthquake Loads - Drift

2018 International Building Code - ASD Design Basis

(Ref. ASCE7-16 Chapters 11 and 12) nDP Section 1.4.6

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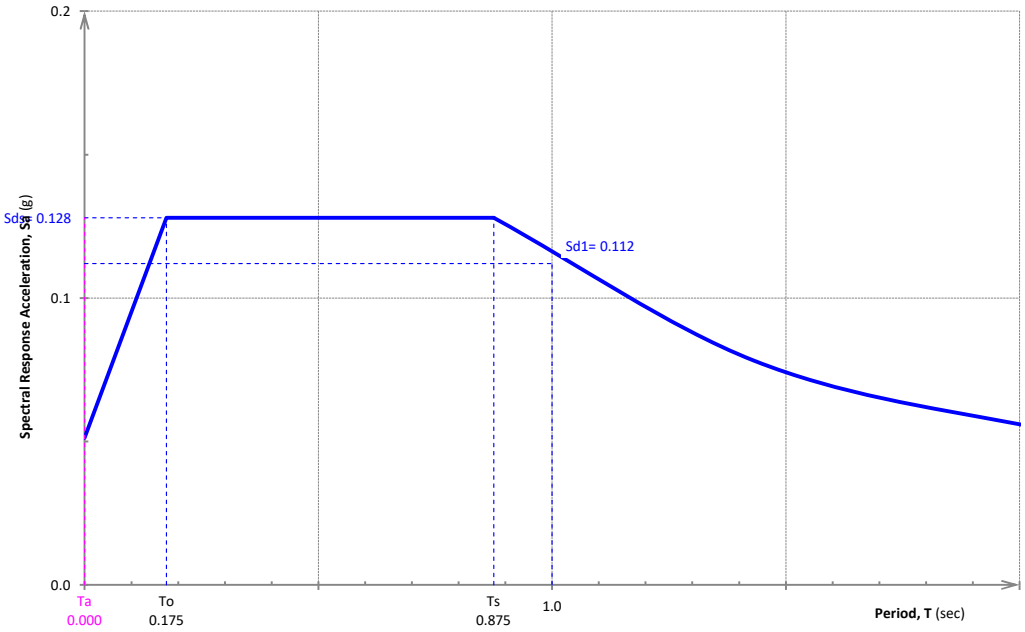
Notes:

Design Response Spectrum (ASCE 7 Section 11.4.6)

β effective viscous damping (%) = 5 FEMA 273 Ch 2

☑ DBE earthquake



DESCRIPTION		TRANSVERSE SYSTEM		LONGITUDINAL SYSTEM	
Drift Calculation					
Fundamental period based on approximate period (Ta) ... not limited by Cu	T_{drift}	0.2983 override		0.1838 override	
Maximum seismic response coefficient for drift	$C_{s\ max\ drift}$	0.1251		0.2031	
Final C_s for drift calculations	$C_{s\ drift}$	**0.0427**		**0.0427**	
Seismic base shear for drift calculations (total for system under consideration)	V_{drift} (=$Q_{E\ d}$)	**1.6**	*kips*	**1.6**	*kips*
Vertical Drift Force Distribution					
Vertical distribution coefficient	k	1.000		1.000	
Total seismic drift force at roof level	$F_{Roof\ Level}$	**1.6**	*kips*	**1.6**	*kips*
	ρ_d = 1.0				
Horizontal seismic load effect (must also include vertical seismic effect)	$E_{hd} = \rho_d Q_{E\ d}$	**1.6**	*kips*	**1.6**	*kips*
Eff load factor for seismic drift calcuations - applicable to drift load cases only	Reduction	(1.)		(1.)	
Story drift backcalculated from the period Tdrift and base shear Vdrift	δ_x	*0.037*	*in*	*0.014*	*in*
Deflection amplification factor	C_d	**3** override		**3.25** override	
Design story drift	Δ_x	**0.111**	*in*	**0.046**	*in*
		(H / 2208)		(H / 5369)	
Seismic story drift limit - Prescribed by Code		**H / 50** override		**H / 50** override	
Allowable story drift	Δ_a	**4.920**	*in*	**4.920**	*in*
P-Delta Effects					
Stability coefficient less than 10% (ignored)	θ	0.004		0.001	
Ratio of seismic design shear (max. demand) vs. shear capacity	β	1.000 override		1.000 override	
Upper limit on stability coefficient (assuming elastic analysis without P-D)	θ_{max}	0.167		0.154	
Incremental factor related to P-D effects	$a_d = 1/(1-\theta)$	1.000		1.000	
Final design story drift (increase for P-Delta effects not required)	$\Delta_x a_d$	0.111	*in*	0.046	*in*
		(H / 2208)		(H / 5369)	

Butler Manufacturing	24 Ga. MR-24® w/ Standard Clip ASD - Panel Available Strength (psf) *Equal Support Spaces*	Job No.	24-007756-02
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		Prepared By:	ETH
		Reviewed By:	xx
		Rev.: 22	10/22/2021

Reference: DP22.1

Panel		Span Lengths, ft.						Suction (-) Loads			Pressure (+) Loads	
Length (ft.)	# of Spans	# 1	# 2	# 3	# 4	# 5	# 6	ASD - Available Strength		Deflection	ASD	Deflection
								Panel	Connection	Δ = L / 60	Panel	Δ = L / 60
1.5 or 3	1 or 2	1.50	1.50	---	---	---	---	---	---	---	---	---
2 or 4	1 or 2	2.00	2.00	---	---	---	---	53	---	4378	267	6539
2.5 or 5	1 or 2	2.50	2.50	---	---	---	---	48	---	2242	174	3348
3 or 6	1 or 2	3.00	3.00	---	---	---	---	44	---	1297	122	1938
3.25 or 6.5	1 or 2	3.25	3.25	---	---	---	---	42	---	1020	105	1524
3.5 or 7	1 or 2	3.50	3.50	---	---	---	---	40	---	817	97	1220
3.75 or 7.5	1 or 2	3.75	3.75	---	---	---	---	38	---	664	97	992
4 or 8	1 or 2	4.00	4.00	---	---	---	---	36	---	547	97	817
4.25 or 8.5	1 or 2	4.25	4.25	---	---	---	---	34	---	456	97	681
4.5 or 9	1 or 2	4.50	4.50	---	---	---	---	32	---	384	97	574
4.75 or 9.5	1 or 2	4.75	4.75	---	---	---	---	30	---	327	97	488
5 or 10	1 or 2	5.00	5.00	---	---	---	---	28	---	280	97	419
4.50	3	1.50	1.50	1.50	---	---	---	---	---	---	---	---
6.00	3	2.00	2.00	2.00	---	---	---	61	---	8262	327	12340
7.50	3	2.50	2.50	2.50	---	---	---	54	---	4230	215	6318
9.00	3	3.00	3.00	3.00	---	---	---	50	---	2448	151	3656
9.75	3	3.25	3.25	3.25	---	---	---	48	---	1925	130	2876
10.50	3	3.50	3.50	3.50	---	---	---	45	---	1542	121	2302
11.25	3	3.75	3.75	3.75	---	---	---	43	---	1253	121	1872
12.00	3	4.00	4.00	4.00	---	---	---	41	---	1033	121	1542
12.75	3	4.25	4.25	4.25	---	---	---	38	---	861	121	1286
13.50	3	4.50	4.50	4.50	---	---	---	36	---	725	121	1083
14.25	3	4.75	4.75	4.75	---	---	---	34	---	617	121	921
15.00	3	5.00	5.00	5.00	---	---	---	31	---	529	121	790
6.00	≥ 4	1.50	1.50	1.50	1.50	etc.	---	---	---	---	---	---
8.00	≥ 4	2.00	2.00	2.00	2.00	etc.	---					
10.00	≥ 4	2.50	2.50	2.50	2.50	etc.	---					
12.00	≥ 4	3.00	3.00	3.00	3.00	etc.	---					
13.00	≥ 4	3.25	3.25	3.25	3.25	etc.	---					
14.00	≥ 4	3.50	3.50	3.50	3.50	etc.	---					
15.00	≥ 4	3.75	3.75	3.75	3.75	etc.	---	43	---	1330	121	1987
16.00	≥ 4	4.00	4.00	4.00	4.00	etc.	---	41	---	1096	121	1637
17.00	≥ 4	4.25	4.25	4.25	4.25	etc.	---	38	---	914	121	1365
18.00	≥ 4	4.50	4.50	4.50	4.50	etc.	---	36	---	770	121	1150
19.00	≥ 4	4.75	4.75	4.75	4.75	etc.	---	34	---	655	121	978
20.00	≥ 4	5.00	5.00	5.00	5.00	etc.	---	31	---	561	121	838

Zone 3

Zone 1&2

Suction Loads
Zone 1: 27.6 psf
Zone 2: 27.6 psf
Zone 3: 33.2 psf

Pressure Loads
Zone 1, 2, 3: 7.0 psf
D+S: 1.2+16.8 = 18.0 psf

Notes:

1. Panel available strength (resistance) load values are based on bending, shear, web crippling, combined bending and shear, and connection strengths (resistances), as applicable, in accordance with the 2016 AISI Specification using ASD Allowable Strength Design format.
   Panel suction loads derieved from full scale ASTM E1592 tests. Refer to DP 22.1.

Panel :	24 Ga.		Flexure: Compression on Outside of Panel			Shear:			
t_{base} =	0.0225	in.	$S_{x(+)}$ =	0.0895	in.^{3} / ft. width	Allowable Strength =	1.027	kips / ft. width panel	
F_y =	50	ksi	$I_{x(+)}$ =	0.1995	in.^{4} / ft. width	Web Crippling - End:			
F_u =	65	ksi	Flexure: Compression on Inside of Panel			Allowable Strength =	na	kips / ft. width panel	
E =	29500	ksi	$S_{x(-)}$ =	0.0679	in.^{3} / ft. width	Web Crippling - Int.:			
Weight =	1.17	psf	$I_{x(-)}$ =	0.0935	in.^{4} / ft. width	Allowable Strength =	na	kips / ft. width panel	

Fastener : 3/8 Scrubolt, 3/8 HWH Carbon — Fastener Spacing = 0.50 per foot width of panel
Pullover Allowable Strength = na lbs. per ft. width of panel
Pullout Allowable Strength = 214 lbs. per ft. width of panel from 0.06 in. secondary

2. Panel self-weight not included.
3. Ix (+) used for (+) positive load deflections. Ix (-) used for (-) suction load deflections.
4. Load reduction factor = 0.7 used for (-) suction deflection determinations.