



Structural Design Report

305' S3TL Series HD1 Self-Supporting Tower

Site: Otter Bay, FL

Site Number: FLC014

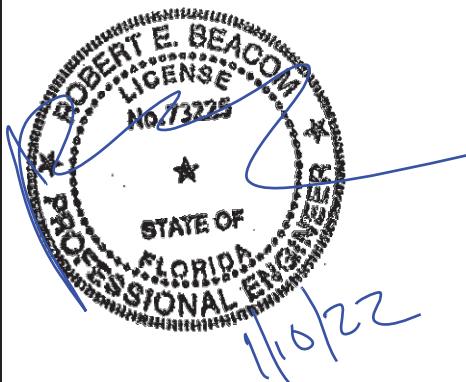
Prepared for: CITYSWITCH LLC
by: Sabre Industries™

Job Number: 22-4006-JDS

January 10, 2022



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Digitally Signed By Robert Beacom
DN: c=US, st=Texas, l=Alvarado, o=SABRE INDUSTRIES, INC., cn=Robert Beacom, email=rebeacom@sabreindustries.com Date: 2022.01.10 14:06:28

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Elev	Description	Tx-Line
300	(1) 40,000 sq. in. antenna loading (below top)	(12) 1 5/8"
288	(1) 33,000 sq.in. antenna loading (below top)	(12) 1 5/8"
278	(1) 33,000 sq.in. antenna loading (below top)	(12) 1 5/8"

Wind Speed (No Ice)	118 mph
Wind Speed (Ice)	30 mph
Design Ice Thickness	0.25 in
Risk Category	II
Exposure Category	B
Topographic Factor Procedure	Method 1 (Simplified)
Topographic Category	1
Ground Elevation	148 ft
Seismic Importance Factor, I _e	1.00
0.2-sec Spectral Response, S _s	0.088 g
1-sec Spectral Response, S ₁	0.051 g
Site Class	D (DEFAULT)
Seismic Design Category	B
Basic Seismic Force-Resisting System	Telecommunication Tower (Truss: Steel)

Total Foundation		Individual Footing	
Shear (kips)	80.7	Shear (kips)	49.51
Axial (kips)	98.11	Compression (kips)	544
Moment (ft-kips)	14608	Uplift (kips)	463

Total Foundation		Individual Footing	
Shear (kips)	2.67	Shear (kips)	3.68
Axial (kips)	109.17	Compression (kips)	58
Moment (ft-kips)	608	Uplift (kips)	0

- 1) All legs are A500 (50 ksi Min. Yield).
- 2) All braces are A572 Grade 50.
- 3) All brace bolts are A325-X.
- 4) The tower model is S3TL Series HD1.
- 5) Transmission lines are to be attached to standard 12 hole waveguide ladders with stackable hangers.
- 6) Azimuths are relative (not based on true north).
- 7) Foundation loads shown are maximums.
- 8) All unequal angles are oriented with the short leg vertical.
- 9) Weights shown are estimates. Final weights may vary.
- 10) This tower design and, if applicable, the foundation design(s) shown on the following page(s) also meet or exceed the requirements of the 2020 Florida Building Code.
- 11) Tower Rating: 99.23%

Page 1

Material List

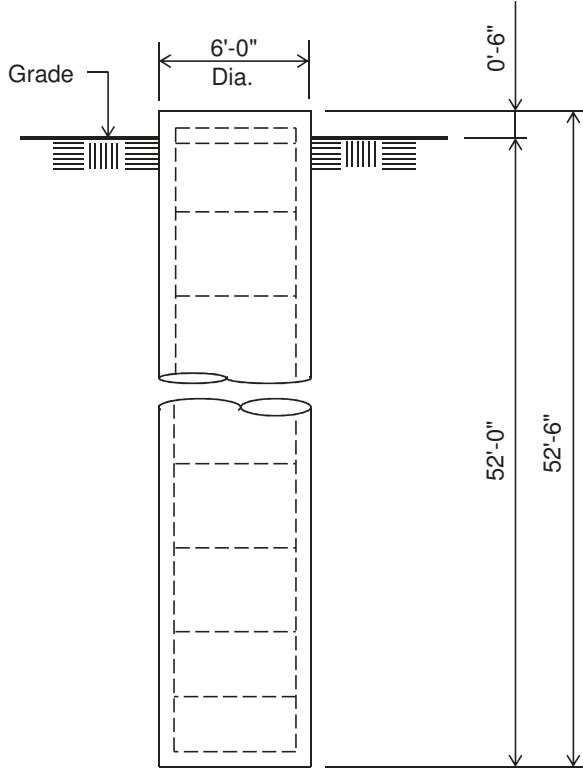
Display	Value
A	10.75 OD X .500
B	8.625 OD X .322
C	5.563 OD X .375
D	4.500 OD X .337
E	4.000 OD X .318
F	2.875 OD X .203
G	L 5 X 3 1/2 X 1/4
H	L 4 X 4 X 5/16
I	L 4 X 4 X 1/4
J	L 3 X 3 X 3/16

Display	Value
K	L 2 X 2 X 3/16
L	L 2 X 2 X 1/8
M	NONE
N	L 3 1/2 X 3 1/2 X 1/4
O	L 3 X 3 X 1/4
P	L 2 1/2 X 2 1/2 X 3/16
Q	1 @ 13.333'
R	1 @ 6.667'
S	306

 Sabre Industries 7101 Southbridge Drive P.O. Box 658 Sioux City, IA 51102-0658 Phone: (712) 258-6690 Fax: (712) 279-0814 Information contained herein is the sole property of Sabre Communications Corporation, constitutes a trade secret as defined by Iowa Code Ch. 550 and shall not be reproduced, copied or used in whole or part for any purpose whatsoever without the prior written consent of Sabre Communications Corporation.	Job: 22-4006-JDS
	Customer: CITYSWITCH LLC
	Site Name: Otter Bay, FL FLC014
	Description: 305' S3TL
	Date: 1/10/2022 By: REB

Customer: CITYSWITCH LLC
Site: Otter Bay, FL FLC014

305 ft. Model S3TL Series HD1 Self Supporting Tower



ELEVATION VIEW

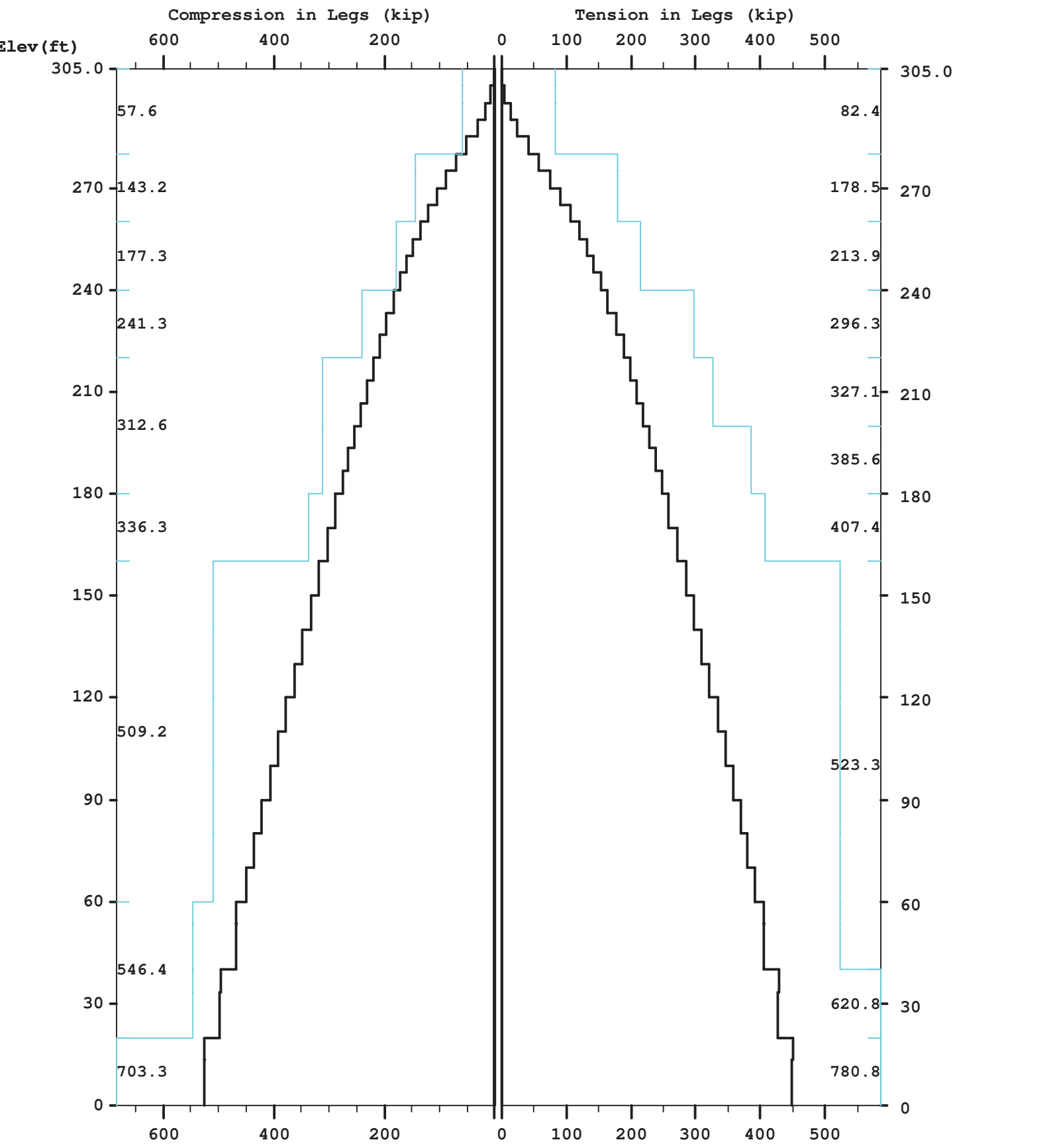
(55.0 cu. yds.)
(3 REQUIRED; NOT TO SCALE)

Notes:

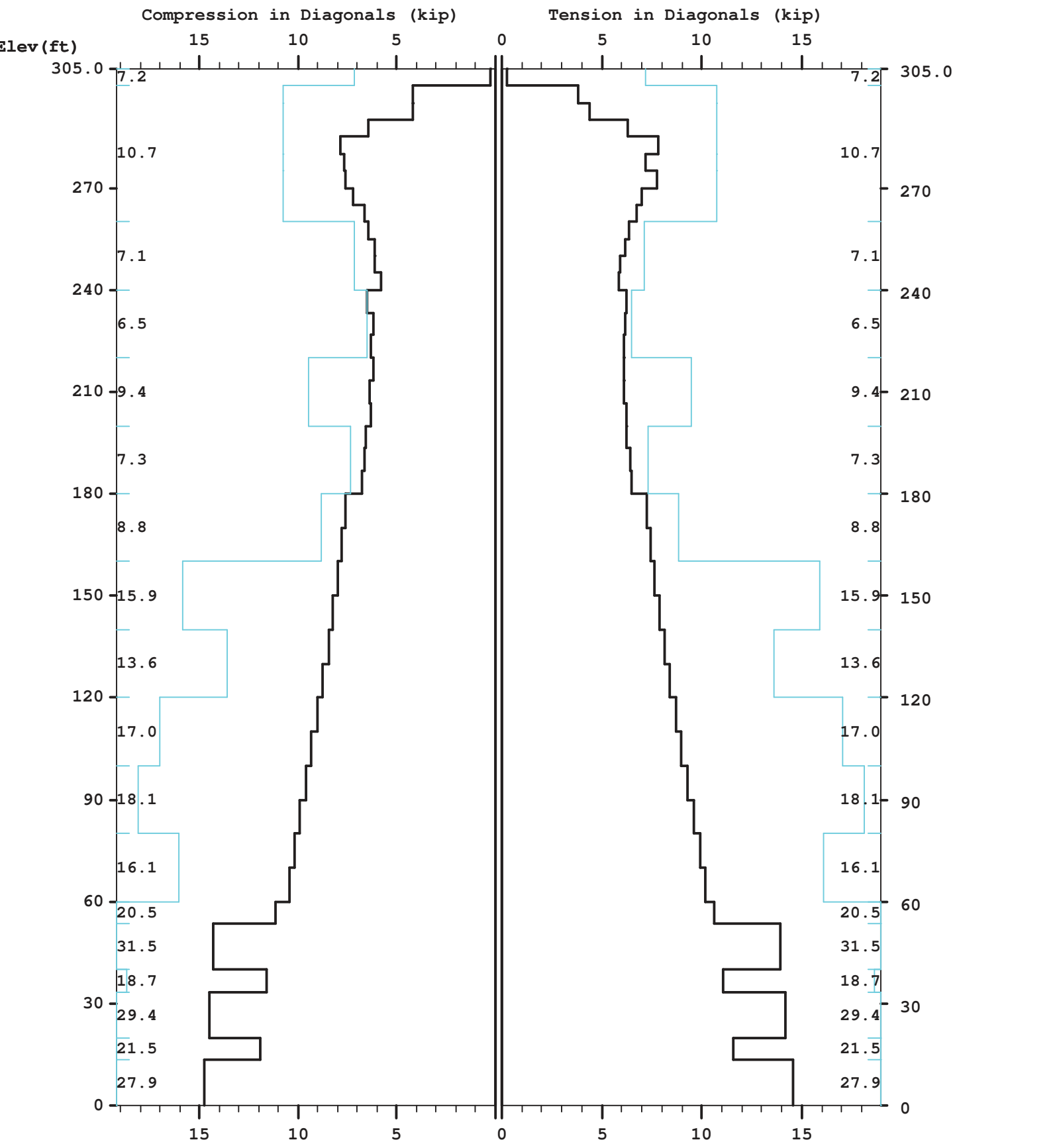
- 1) Concrete shall have a minimum 28-day compressive strength of 4,500 psi, in accordance with ACI 318-14.
- 2) Rebar to conform to ASTM specification A615 Grade 60.
- 3) All rebar to have a minimum of 3" concrete cover.
- 4) All exposed concrete corners to be chamfered 3/4".
- 5) The foundation design is based on the geotechnical report by G2 Project No. 212367, Date: 12/15/2021
- 6) See the geotechnical report for drilled pier installation requirements, if specified.
- 7) The bottom anchor bolt template shall be positioned as closely as possible to the bottom of the anchor bolts.

Rebar Schedule per Pier	
Pier	(18) #10 vertical rebar w/ #4 ties, two (2) within top 5" of pier then 12" C/C
Anchor Bolts per Leg	
	(6) 1.5" dia. x 78" F1554-105 on a 15.5" B.C. w/ 9.5" max. projection above concrete.

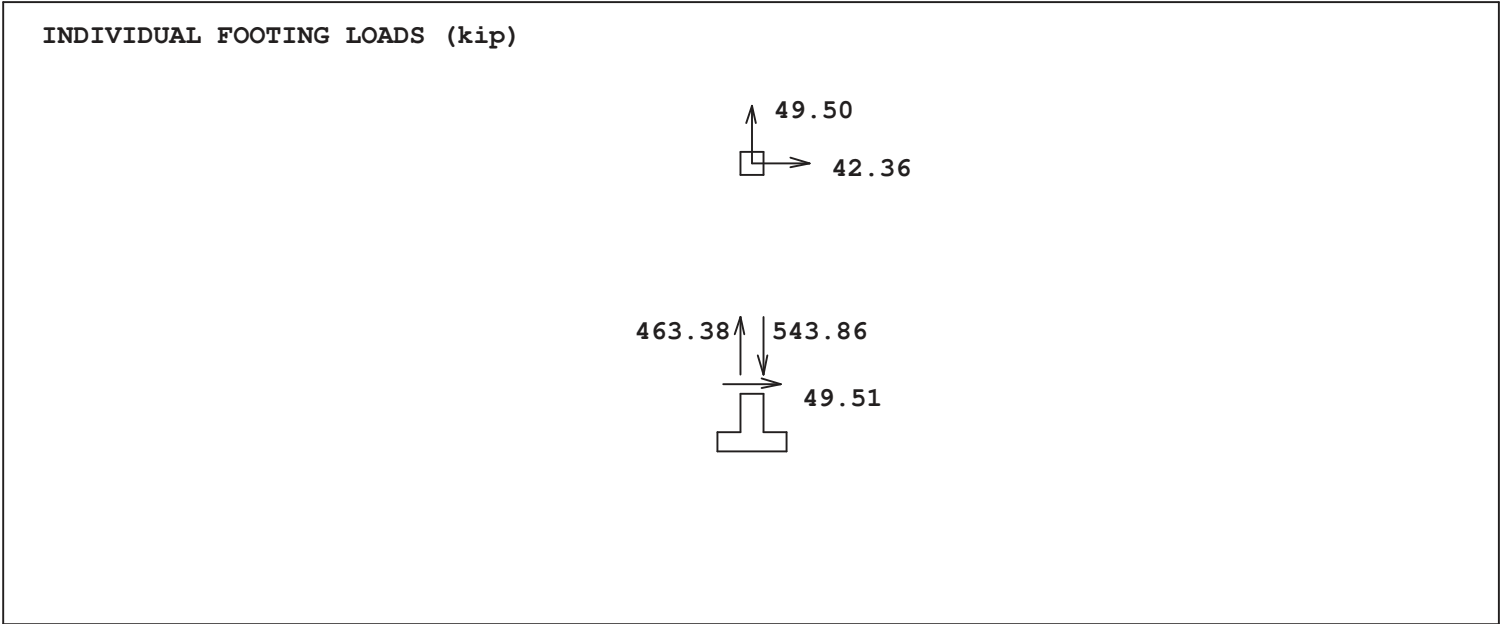
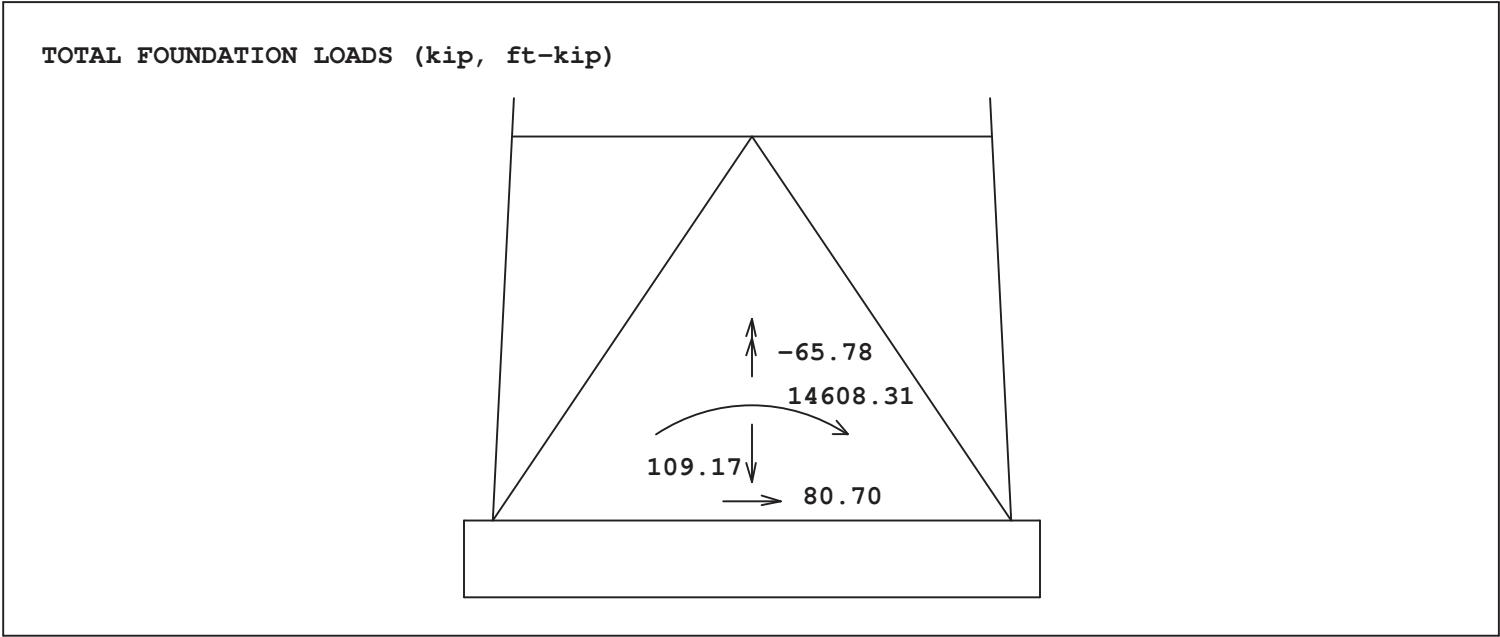
Maximum



Maximum



Maximum



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Latticed Tower Analysis (Unguyed)
 Processed under license at:

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Sabre Towers and Poles

on: 7 jan 2022 at: 15:00:16

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MAST GEOMETRY (ft)

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PANEL TYPE	NO.OF LEGS	ELEV.AT BOTTOM	ELEV.AT TOP	F.W..AT BOTTOM	F.W..AT TOP	TYPICAL PANEL HEIGHT
X	3	300.00	305.00	5.00	5.00	5.00
X	3	295.00	300.00	5.00	5.00	5.00
X	3	280.00	295.00	5.00	5.00	5.00
X	3	275.00	280.00	5.50	5.00	5.00
X	3	260.00	275.00	7.00	5.50	5.00
X	3	240.00	260.00	9.00	7.00	5.00
X	3	220.00	240.00	11.00	9.00	6.67
X	3	200.00	220.00	13.00	11.00	6.67
X	3	180.00	200.00	15.00	13.00	6.67
X	3	160.00	180.00	17.00	15.00	10.00
X	3	140.00	160.00	19.00	17.00	10.00
X	3	120.00	140.00	21.00	19.00	10.00
X	3	100.00	120.00	23.00	21.00	10.00
X	3	80.00	100.00	25.00	23.00	10.00
X	3	60.00	80.00	27.00	25.00	10.00
V	3	53.33	60.00	27.67	27.00	6.67
A	3	40.00	53.33	29.00	27.67	13.33
V	3	33.33	40.00	29.67	29.00	6.67
A	3	20.00	33.33	31.00	29.67	13.33
V	3	13.33	20.00	31.67	31.00	6.67
A	3	0.00	13.33	33.00	31.67	13.33

MEMBER PROPERTIES

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MEMBER TYPE	BOTTOM ELEV ft	TOP ELEV ft	X-SECTN AREA in.sq	RADIUS OF GYRAT in	ELASTIC MODULUS ksi	THERMAL EXPANSN /deg
LE	280.00	305.00	1.704	0.947	29000.	0.0000117
LE	260.00	280.00	3.678	0.947	29000.	0.0000117
LE	240.00	260.00	4.407	0.947	29000.	0.0000117
LE	220.00	240.00	6.111	0.947	29000.	0.0000117
LE	180.00	220.00	7.952	0.947	29000.	0.0000117
LE	160.00	180.00	8.399	0.947	29000.	0.0000117
LE	20.00	160.00	12.763	0.947	29000.	0.0000117
LE	0.00	20.00	16.101	0.947	29000.	0.0000117
DI	300.00	305.00	0.484	0.626	29000.	0.0000117
DI	260.00	300.00	0.715	0.626	29000.	0.0000117
DI	240.00	260.00	0.484	0.626	29000.	0.0000117
DI	220.00	240.00	0.715	0.626	29000.	0.0000117
DI	180.00	220.00	0.902	0.626	29000.	0.0000117
DI	160.00	180.00	1.090	0.626	29000.	0.0000117
DI	120.00	160.00	1.688	0.626	29000.	0.0000117
DI	53.33	120.00	1.938	0.626	29000.	0.0000117
DI	40.00	53.33	2.062	0.626	29000.	0.0000117
DI	33.33	40.00	1.938	0.626	29000.	0.0000117
DI	20.00	33.33	2.062	0.626	29000.	0.0000117
DI	13.33	20.00	2.402	0.626	29000.	0.0000117
DI	0.00	13.33	2.062	0.626	29000.	0.0000117
HO	300.00	305.00	0.484	0.626	29000.	0.0000117
HO	295.00	300.00	0.715	0.626	29000.	0.0000117
HO	275.00	280.00	0.715	0.626	29000.	0.0000117
HO	40.00	53.33	1.438	0.626	29000.	0.0000117
HO	20.00	33.33	1.688	0.626	29000.	0.0000117
HO	0.00	13.33	1.938	0.626	29000.	0.0000117
BR	40.00	53.33	1.438	0.000	29000.	0.0000117
BR	20.00	33.33	1.438	0.000	29000.	0.0000117
BR	0.00	13.33	1.688	0.000	29000.	0.0000117

FACTORED MEMBER RESISTANCES

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BOTTOM ELEV ft	TOP ELEV ft	LEGS		DIAGONALS		HORIZONTALS		INT BRACING	
		COMP kip	TENS kip	COMP kip	TENS kip	COMP kip	TENS kip	COMP kip	TENS kip
300.0	305.0	57.62	82.45	7.16	7.16	7.16	7.16	0.00	0.00
295.0	300.0	57.62	82.45	10.74	10.74	10.72	10.72	0.00	0.00
280.0	295.0	57.62	82.45	10.74	10.74	0.00	0.00	0.00	0.00
275.0	280.0	143.18	178.48	10.74	10.74	10.72	10.72	0.00	0.00
260.0	275.0	143.18	178.48	10.74	10.74	0.00	0.00	0.00	0.00
240.0	260.0	177.29	213.88	7.13	7.13	0.00	0.00	0.00	0.00
220.0	240.0	241.28	296.33	6.51	6.51	0.00	0.00	0.00	0.00
200.0	220.0	312.59	327.10	9.45	9.45	0.00	0.00	0.00	0.00
180.0	200.0	312.59	385.58	7.32	7.32	0.00	0.00	0.00	0.00
160.0	180.0	336.31	407.40	8.84	8.84	0.00	0.00	0.00	0.00
140.0	160.0	509.22	523.32	15.88	15.88	0.00	0.00	0.00	0.00
120.0	140.0	509.22	523.32	13.59	13.59	0.00	0.00	0.00	0.00
100.0	120.0	509.22	523.32	17.02	17.02	0.00	0.00	0.00	0.00
80.0	100.0	509.22	523.32	18.13	18.13	0.00	0.00	0.00	0.00
60.0	80.0	509.22	523.32	16.06	16.06	0.00	0.00	0.00	0.00
53.3	60.0	546.43	523.32	20.48	20.48	0.00	0.00	0.00	0.00
40.0	53.3	546.43	523.32	31.46	31.46	9.52	9.52	9.39	9.39
33.3	40.0	546.43	620.80	18.66	18.66	0.00	0.00	0.00	0.00
20.0	33.3	546.43	620.80	29.38	29.38	12.85	12.85	8.35	8.35
13.3	20.0	703.28	780.85	21.51	21.51	0.00	0.00	0.00	0.00
0.0	13.3	703.28	780.85	27.91	27.91	15.93	15.93	11.41	11.41

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* Only 4 condition(s) shown in full

* Some wind loads may have been derived from full-scale wind tunnel testing

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LOADING CONDITION A

118 mph wind with no ice. Wind Azimuth: 0° (1.2 D + 1.0 Wo)

MAST LOADING

LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD. AT AZI	LOAD AZI	FORCES		MOMENTS	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	300.0	0.00	0.0	0.0	7.70	7.20	0.00	0.00
C	288.0	0.00	0.0	0.0	6.28	6.00	0.00	0.00
C	278.0	0.00	0.0	0.0	6.22	6.00	0.00	0.00
D	305.0	0.00	180.0	0.0	0.07	0.05	0.00	0.00
D	300.0	0.00	180.0	0.0	0.07	0.05	0.00	0.00
D	300.0	0.00	42.0	0.0	0.13	0.08	0.04	0.09
D	290.0	0.00	42.0	0.0	0.12	0.07	0.04	0.09
D	290.0	0.00	42.0	0.0	0.13	0.08	0.06	0.09
D	280.0	0.00	42.0	0.0	0.13	0.08	0.07	0.10
D	280.0	0.00	58.3	0.0	0.16	0.13	0.07	0.11
D	275.0	0.00	58.3	0.0	0.16	0.13	0.07	0.11
D	275.0	0.00	71.1	0.0	0.16	0.13	0.07	0.12
D	260.0	0.00	75.7	0.0	0.17	0.13	0.06	0.11
D	260.0	0.00	63.1	0.0	0.17	0.13	0.09	0.13
D	240.0	0.00	67.9	0.0	0.18	0.14	0.08	0.12
D	240.0	0.00	58.6	0.0	0.17	0.16	0.10	0.14
D	220.0	0.00	61.6	0.0	0.18	0.16	0.09	0.13
D	220.0	0.00	55.1	0.0	0.18	0.20	0.12	0.15
D	200.0	0.00	57.3	0.0	0.19	0.20	0.11	0.14
D	200.0	0.00	52.5	0.0	0.19	0.20	0.13	0.16
D	180.0	0.00	54.2	0.0	0.19	0.21	0.12	0.15
D	180.0	0.00	50.6	0.0	0.19	0.21	0.15	0.16
D	160.0	0.00	51.6	0.0	0.19	0.21	0.14	0.16
D	160.0	0.00	49.0	0.0	0.20	0.30	0.17	0.17
D	140.0	0.00	49.7	0.0	0.20	0.30	0.16	0.16
D	140.0	0.00	47.6	0.0	0.20	0.30	0.18	0.17
D	120.0	0.00	48.2	0.0	0.20	0.31	0.18	0.17
D	120.0	0.00	46.5	0.0	0.21	0.33	0.20	0.17
D	100.0	0.00	47.0	0.0	0.21	0.33	0.19	0.17
D	100.0	0.00	45.5	0.0	0.20	0.33	0.22	0.17
D	80.0	0.00	46.0	0.0	0.20	0.34	0.21	0.17
D	80.0	0.00	44.7	0.0	0.20	0.34	0.23	0.17
D	60.0	0.00	45.1	0.0	0.20	0.35	0.23	0.17
D	60.0	0.00	44.0	0.0	0.17	0.32	0.25	0.16

D	53.3	0.00	44.0	0.0	0.17	0.32	0.25	0.16
D	53.3	0.00	44.3	0.0	0.19	0.39	0.24	0.16
D	40.0	0.00	44.3	0.0	0.19	0.39	0.24	0.16
D	40.0	0.00	43.4	0.0	0.16	0.33	0.27	0.15
D	33.3	0.00	43.4	0.0	0.16	0.33	0.27	0.15
D	33.3	0.00	43.6	0.0	0.19	0.42	0.26	0.15
D	20.0	0.00	43.6	0.0	0.19	0.42	0.26	0.15
D	20.0	0.00	42.8	0.0	0.16	0.40	0.29	0.16
D	13.3	0.00	42.8	0.0	0.16	0.40	0.29	0.16
D	13.3	0.00	43.1	0.0	0.20	0.48	0.28	0.15
D	0.0	0.00	43.1	0.0	0.20	0.48	0.28	0.15

LOADING CONDITION M

118 mph wind with no ice. Wind Azimuth: 0° (0.9 D + 1.0 Wo)

MAST LOADING

LOAD TYPE	ELEV ft	APPLY.. RADIUS ft	LOAD..AT AZI	LOAD AZI	FORCES.....		MOMENTS.....	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	300.0	0.00	0.0	0.0	7.70	5.40	0.00	0.00
C	288.0	0.00	0.0	0.0	6.28	4.50	0.00	0.00
C	278.0	0.00	0.0	0.0	6.22	4.50	0.00	0.00
D	305.0	0.00	180.0	0.0	0.07	0.03	0.00	0.00
D	300.0	0.00	180.0	0.0	0.07	0.03	0.00	0.00
D	300.0	0.00	42.0	0.0	0.13	0.06	0.03	0.09
D	290.0	0.00	42.0	0.0	0.12	0.05	0.03	0.09
D	290.0	0.00	42.0	0.0	0.13	0.06	0.04	0.09
D	280.0	0.00	42.0	0.0	0.13	0.06	0.05	0.10
D	280.0	0.00	58.3	0.0	0.16	0.10	0.05	0.11
D	275.0	0.00	58.3	0.0	0.16	0.10	0.05	0.11
D	275.0	0.00	71.1	0.0	0.16	0.10	0.05	0.12
D	260.0	0.00	75.7	0.0	0.17	0.10	0.05	0.11
D	260.0	0.00	63.1	0.0	0.17	0.10	0.07	0.13
D	240.0	0.00	67.9	0.0	0.18	0.10	0.06	0.12
D	240.0	0.00	58.6	0.0	0.17	0.12	0.08	0.14
D	220.0	0.00	61.6	0.0	0.18	0.12	0.07	0.13
D	220.0	0.00	55.1	0.0	0.18	0.15	0.09	0.15
D	200.0	0.00	57.3	0.0	0.19	0.15	0.08	0.14
D	200.0	0.00	52.5	0.0	0.19	0.15	0.10	0.16
D	180.0	0.00	54.2	0.0	0.19	0.16	0.09	0.15
D	180.0	0.00	50.6	0.0	0.19	0.16	0.11	0.16
D	160.0	0.00	51.6	0.0	0.19	0.16	0.11	0.16
D	160.0	0.00	49.0	0.0	0.20	0.22	0.12	0.17
D	140.0	0.00	49.7	0.0	0.20	0.22	0.12	0.16
D	140.0	0.00	47.6	0.0	0.20	0.23	0.14	0.17
D	120.0	0.00	48.2	0.0	0.20	0.23	0.13	0.17
D	120.0	0.00	46.5	0.0	0.21	0.24	0.15	0.17
D	100.0	0.00	47.0	0.0	0.21	0.25	0.14	0.17
D	100.0	0.00	45.5	0.0	0.20	0.25	0.16	0.17
D	80.0	0.00	46.0	0.0	0.20	0.25	0.16	0.17
D	80.0	0.00	44.7	0.0	0.20	0.26	0.18	0.17
D	60.0	0.00	45.1	0.0	0.20	0.26	0.17	0.17
D	60.0	0.00	44.0	0.0	0.17	0.24	0.19	0.16
D	53.3	0.00	44.0	0.0	0.17	0.24	0.19	0.16
D	53.3	0.00	44.3	0.0	0.19	0.29	0.18	0.16
D	40.0	0.00	44.3	0.0	0.19	0.29	0.18	0.16
D	40.0	0.00	43.4	0.0	0.16	0.25	0.20	0.15
D	33.3	0.00	43.4	0.0	0.16	0.25	0.20	0.15
D	33.3	0.00	43.6	0.0	0.19	0.31	0.20	0.15
D	20.0	0.00	43.6	0.0	0.19	0.31	0.20	0.15
D	20.0	0.00	42.8	0.0	0.16	0.30	0.22	0.16
D	13.3	0.00	42.8	0.0	0.16	0.30	0.22	0.16
D	13.3	0.00	43.1	0.0	0.20	0.36	0.21	0.15
D	0.0	0.00	43.1	0.0	0.20	0.36	0.21	0.15

LOADING CONDITION Y

Seismic - Azimuth: 0° (1.2 D + 1.0 Ev + 1.0 Eh)

MAST LOADING

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LOAD TYPE	ELEV ft	APPLY.. RADIUS ft	LOAD.. AZI	AT AZI	LOAD AZI	FORCES..... HORIZ kip	DOWN kip	MOMENTS..... VERTICAL ft-kip	TORSNAL ft-kip
C	302.5	0.00	0.0	0.0	0.0	0.02	0.37	0.00	0.00
C	300.0	0.00	0.0	0.0	0.0	0.43	7.31	0.00	0.00
C	294.0	0.00	0.0	0.0	0.0	0.01	0.24	0.00	0.00
C	290.0	0.00	0.0	0.0	0.0	0.07	1.29	0.00	0.00
C	288.0	0.00	0.0	0.0	0.0	0.34	6.09	0.00	0.00
C	284.0	0.00	0.0	0.0	0.0	0.02	0.28	0.00	0.00
C	279.0	0.00	0.0	0.0	0.0	0.00	0.07	0.00	0.00
C	278.0	0.00	0.0	0.0	0.0	0.32	6.09	0.00	0.00
C	270.0	0.00	0.0	0.0	0.0	0.10	1.90	0.00	0.00
C	269.0	0.00	0.0	0.0	0.0	0.02	0.36	0.00	0.00
C	269.0	0.00	0.0	0.0	0.0	0.03	0.64	0.00	0.00
C	250.0	0.00	0.0	0.0	0.0	0.02	0.40	0.00	0.00
C	250.0	0.00	0.0	0.0	0.0	0.03	0.71	0.00	0.00
C	250.0	0.00	0.0	0.0	0.0	0.09	1.95	0.00	0.00
C	230.0	0.00	0.0	0.0	0.0	0.03	0.71	0.00	0.00
C	230.0	0.00	0.0	0.0	0.0	0.02	0.40	0.00	0.00
C	230.0	0.00	0.0	0.0	0.0	0.10	2.54	0.00	0.00
C	210.0	0.00	0.0	0.0	0.0	0.12	3.29	0.00	0.00
C	210.0	0.00	0.0	0.0	0.0	0.01	0.40	0.00	0.00
C	210.0	0.00	0.0	0.0	0.0	0.03	0.71	0.00	0.00
C	190.0	0.00	0.0	0.0	0.0	0.11	3.63	0.00	0.00
C	190.0	0.00	0.0	0.0	0.0	0.01	0.40	0.00	0.00
C	190.0	0.00	0.0	0.0	0.0	0.02	0.71	0.00	0.00
C	170.0	0.00	0.0	0.0	0.0	0.01	0.40	0.00	0.00
C	170.0	0.00	0.0	0.0	0.0	0.10	3.67	0.00	0.00
C	170.0	0.00	0.0	0.0	0.0	0.02	0.71	0.00	0.00
C	150.0	0.00	0.0	0.0	0.0	0.01	0.40	0.00	0.00
C	150.0	0.00	0.0	0.0	0.0	0.02	0.71	0.00	0.00
C	150.0	0.00	0.0	0.0	0.0	0.12	5.51	0.00	0.00
C	130.0	0.00	0.0	0.0	0.0	0.11	5.67	0.00	0.00
C	130.0	0.00	0.0	0.0	0.0	0.01	0.40	0.00	0.00
C	130.0	0.00	0.0	0.0	0.0	0.01	0.71	0.00	0.00
C	110.0	0.00	0.0	0.0	0.0	0.01	0.71	0.00	0.00
C	110.0	0.00	0.0	0.0	0.0	0.01	0.40	0.00	0.00
C	110.0	0.00	0.0	0.0	0.0	0.09	6.11	0.00	0.00
C	90.0	0.00	0.0	0.0	0.0	0.07	6.40	0.00	0.00
C	90.0	0.00	0.0	0.0	0.0	0.01	0.71	0.00	0.00
C	90.0	0.00	0.0	0.0	0.0	0.00	0.40	0.00	0.00
C	70.0	0.00	0.0	0.0	0.0	0.00	0.40	0.00	0.00
C	70.0	0.00	0.0	0.0	0.0	0.01	0.71	0.00	0.00
C	70.0	0.00	0.0	0.0	0.0	0.05	6.59	0.00	0.00
C	50.0	0.00	0.0	0.0	0.0	0.00	0.71	0.00	0.00
C	50.0	0.00	0.0	0.0	0.0	0.04	7.28	0.00	0.00
C	50.0	0.00	0.0	0.0	0.0	0.00	0.40	0.00	0.00
C	30.0	0.00	0.0	0.0	0.0	0.00	0.71	0.00	0.00
C	30.0	0.00	0.0	0.0	0.0	0.00	0.40	0.00	0.00
C	30.0	0.00	0.0	0.0	0.0	0.02	7.98	0.00	0.00
C	10.0	0.00	0.0	0.0	0.0	0.00	0.40	0.00	0.00
C	10.0	0.00	0.0	0.0	0.0	0.01	9.50	0.00	0.00
C	10.0	0.00	0.0	0.0	0.0	0.00	0.71	0.00	0.00
D	305.0	0.00	180.0	180.0	0.0	0.00	0.00	0.00	0.00
D	0.0	0.00	180.0	180.0	0.0	0.00	0.00	0.00	0.00

LOADING CONDITION k

Seismic - Azimuth: 0• (0.9 D - 1.0 Ev + 1.0 Eh)

MAST LOADING

LOAD TYPE	ELEV ft	APPLY.. RADIUS ft	LOAD.. AZI	AT AZI	LOAD AZI	FORCES..... HORIZ kip	DOWN kip	MOMENTS..... VERTICAL ft-kip	TORSNAL ft-kip
C	302.5	0.00	0.0	0.0	0.0	0.02	0.27	0.00	0.00
C	300.0	0.00	0.0	0.0	0.0	0.43	5.29	0.00	0.00
C	294.0	0.00	0.0	0.0	0.0	0.01	0.17	0.00	0.00
C	290.0	0.00	0.0	0.0	0.0	0.07	0.93	0.00	0.00
C	288.0	0.00	0.0	0.0	0.0	0.34	4.41	0.00	0.00
C	284.0	0.00	0.0	0.0	0.0	0.02	0.20	0.00	0.00
C	279.0	0.00	0.0	0.0	0.0	0.00	0.05	0.00	0.00

C	278.0	0.00	0.0	0.0	0.32	4.41	0.00	0.00
C	270.0	0.00	0.0	0.0	0.10	1.38	0.00	0.00
C	269.0	0.00	0.0	0.0	0.02	0.26	0.00	0.00
C	269.0	0.00	0.0	0.0	0.03	0.46	0.00	0.00
C	250.0	0.00	0.0	0.0	0.02	0.29	0.00	0.00
C	250.0	0.00	0.0	0.0	0.03	0.51	0.00	0.00
C	250.0	0.00	0.0	0.0	0.09	1.41	0.00	0.00
C	230.0	0.00	0.0	0.0	0.03	0.51	0.00	0.00
C	230.0	0.00	0.0	0.0	0.02	0.29	0.00	0.00
C	230.0	0.00	0.0	0.0	0.10	1.83	0.00	0.00
C	210.0	0.00	0.0	0.0	0.12	2.38	0.00	0.00
C	210.0	0.00	0.0	0.0	0.01	0.29	0.00	0.00
C	210.0	0.00	0.0	0.0	0.03	0.51	0.00	0.00
C	190.0	0.00	0.0	0.0	0.11	2.62	0.00	0.00
C	190.0	0.00	0.0	0.0	0.01	0.29	0.00	0.00
C	190.0	0.00	0.0	0.0	0.02	0.51	0.00	0.00
C	170.0	0.00	0.0	0.0	0.01	0.29	0.00	0.00
C	170.0	0.00	0.0	0.0	0.10	2.65	0.00	0.00
C	170.0	0.00	0.0	0.0	0.02	0.51	0.00	0.00
C	150.0	0.00	0.0	0.0	0.01	0.29	0.00	0.00
C	150.0	0.00	0.0	0.0	0.02	0.51	0.00	0.00
C	150.0	0.00	0.0	0.0	0.12	3.98	0.00	0.00
C	130.0	0.00	0.0	0.0	0.11	4.10	0.00	0.00
C	130.0	0.00	0.0	0.0	0.01	0.29	0.00	0.00
C	130.0	0.00	0.0	0.0	0.01	0.51	0.00	0.00
C	110.0	0.00	0.0	0.0	0.01	0.51	0.00	0.00
C	110.0	0.00	0.0	0.0	0.01	0.29	0.00	0.00
C	110.0	0.00	0.0	0.0	0.09	4.42	0.00	0.00
C	90.0	0.00	0.0	0.0	0.07	4.63	0.00	0.00
C	90.0	0.00	0.0	0.0	0.01	0.51	0.00	0.00
C	90.0	0.00	0.0	0.0	0.00	0.29	0.00	0.00
C	70.0	0.00	0.0	0.0	0.00	0.29	0.00	0.00
C	70.0	0.00	0.0	0.0	0.01	0.51	0.00	0.00
C	70.0	0.00	0.0	0.0	0.05	4.76	0.00	0.00
C	50.0	0.00	0.0	0.0	0.00	0.51	0.00	0.00
C	50.0	0.00	0.0	0.0	0.04	5.27	0.00	0.00
C	50.0	0.00	0.0	0.0	0.00	0.29	0.00	0.00
C	30.0	0.00	0.0	0.0	0.00	0.51	0.00	0.00
C	30.0	0.00	0.0	0.0	0.00	0.29	0.00	0.00
C	30.0	0.00	0.0	0.0	0.02	5.77	0.00	0.00
C	10.0	0.00	0.0	0.0	0.00	0.29	0.00	0.00
C	10.0	0.00	0.0	0.0	0.01	6.87	0.00	0.00
C	10.0	0.00	0.0	0.0	0.00	0.51	0.00	0.00
D	305.0	0.00	180.0	180.0	0.00	0.00	0.00	0.00
D	0.0	0.00	180.0	180.0	0.00	0.00	0.00	0.00

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MAXIMUM TENSION IN MAST MEMBERS (kip)

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ELEV ft	LEGS	DIAG	HORIZ	BRACE
305.0	-----		0.13 A	0.00 A
	0.03 N	0.24 X		
300.0	-----		1.30 C	0.00 A
	3.08 M	3.82 T		
295.0	-----		0.28 A	0.00 A
	12.90 M	4.39 H		
290.0	-----		0.12 S	0.00 A
	24.53 M	6.28 N		
285.0	-----		0.32 A	0.00 A
	41.46 M	7.85 H		
280.0	-----		0.23 W	0.00 A
	57.93 M	7.18 M		
275.0	-----		0.25 A	0.00 A
	75.52 M	7.75 B		
270.0	-----		0.07 A	0.00 A
	91.34 M	7.02 N		
265.0	-----		0.22 A	0.00 A
	106.21 M	6.74 B		
260.0	-----		0.08 A	0.00 A
	119.15 M	6.33 T		
255.0	-----		0.15 A	0.00 A
	131.41 M	6.17 B		
250.0	-----		0.11 A	0.00 A
	142.46 M	5.92 T		
245.0	-----		0.13 A	0.00 A
	153.05 M	5.85 B		
240.0	-----		0.11 A	0.00 A

233.3	164.27 M	6.23 M	0.11 A	0.00 A
	176.61 M	6.14 G		
226.7	187.98 M	6.09 M	0.11 A	0.00 A
220.0	198.96 M	6.12 G	0.09 A	0.00 A
213.3	209.26 M	6.11 M	0.07 A	0.00 A
206.7	219.33 M	6.23 G	0.08 A	0.00 A
200.0	228.96 M	6.25 A	0.06 A	0.00 A
193.3	238.41 M	6.40 G	0.14 A	0.00 A
186.7	247.61 M	6.51 G	0.05 A	0.00 A
180.0	258.73 M	7.26 G	0.09 A	0.00 A
170.0	271.90 M	7.42 S	0.12 A	0.00 A
160.0	284.69 M	7.66 G	0.07 A	0.00 A
150.0	297.14 M	7.87 S	0.07 A	0.00 A
140.0	309.43 M	8.15 G	0.06 A	0.00 A
130.0	321.57 M	8.39 G	0.06 A	0.00 A
120.0	333.57 M	8.69 G	0.06 A	0.00 A
110.0	345.46 M	8.98 G	0.05 A	0.00 A
100.0	357.29 M	9.29 G	0.05 A	0.00 A
90.0	369.04 M	9.59 G	0.05 A	0.00 A
80.0	380.73 M	9.93 G	0.14 Y	0.00 A
70.0	392.32 M	10.20 G	0.07 S	0.00 A
60.0	405.93 M	10.63 S	0.23 A	0.00 A
53.3	405.02 M	13.94 G	0.71 M	0.00 I
40.0	428.42 M	11.06 S	0.22 A	0.00 A
33.3	427.45 M	14.18 G	0.67 M	0.00 A
20.0	450.31 M	11.57 G	0.09 A	0.00 A
13.3	449.18 M	14.55 G	0.69 M	0.00 F
0.0			0.00 A	0.00 A

MAXIMUM COMPRESSION IN MAST MEMBERS (kip)

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ELEV ft	LEGS	DIAG	HORIZ	BRACE
305.0	-0.10 A	-0.24 F	-0.12 S	0.00 A
300.0	-7.11 G	-4.17 H	-1.05 U	0.00 A
295.0	-18.07 G	-4.19 N	-0.18 S	0.00 A
290.0	-31.67 G	-6.45 B	-0.15 A	0.00 A
285.0	-50.72 G	-7.83 B	-0.22 S	0.00 A
280.0	-69.29 G	-7.66 G	-0.31 E	0.00 A
275.0	-89.67 G	-7.56 N	-0.19 S	0.00 A
270.0			-0.06 S	0.00 A

265.0	-105.62 G	-7.21 B	-0.17 S	0.00 A
	-121.45 G	-6.65 N		
260.0	-134.78 G	-6.45 B	-0.07 S	0.00 A
	-147.86 G	-6.12 N		
255.0	-159.41 G	-6.09 G	-0.12 S	0.00 A
	-170.77 G	-5.81 T		
250.0	-182.69 G	-6.46 G	-0.10 S	0.00 A
	-196.14 G	-6.18 G		
245.0	-208.43 G	-6.32 G	-0.10 S	0.00 A
	-220.56 G	-6.18 G		
240.0	-231.97 G	-6.37 G	-0.08 S	0.00 A
	-243.28 G	-6.33 G		
233.3	-254.08 G	-6.54 G	-0.07 S	0.00 A
	-264.80 G	-6.59 G		
226.7	-275.25 G	-6.72 G	-0.12 S	0.00 A
	-287.97 G	-7.59 G		
220.0	-303.08 G	-7.77 G	-0.05 S	0.00 A
	-318.10 G	-7.95 G		
213.3	-333.05 G	-8.22 G	-0.06 S	0.00 A
	-347.93 G	-8.45 G		
206.7	-362.67 G	-8.72 G	-0.06 S	0.00 A
	-377.40 G	-9.00 G		
200.0	-392.10 G	-9.30 G	-0.05 S	0.00 A
	-406.81 G	-9.60 G		
193.3	-421.49 G	-9.90 G	-0.04 S	0.00 A
	-436.19 G	-10.14 G		
186.7	-450.82 G	-10.42 G	-0.02 E	0.00 A
	-467.23 G	-11.14 G		
180.0	-468.45 G	-14.27 G	-0.08 A	0.00 A
	-496.12 G	-11.59 G		
170.0	-497.41 G	-14.52 G	-0.21 S	0.00 A
	-524.88 G	-11.92 G		
160.0	-526.40 G	-14.77 G	-0.86 G	0.00 C
150.0			-0.19 S	0.00 A
140.0			-0.83 G	0.00 S
130.0			-0.07 S	0.00 S
120.0			-0.86 G	0.00 L
110.0			0.00 A	0.00 A
100.0				
90.0				
80.0				
70.0				
60.0				
53.3				
40.0				
33.3				
20.0				
13.3				
0.0				

FORCE/RESISTANCE RATIO IN LEGS

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MAST ELEV ft	-- LEG COMPRESSION --			---- LEG TENSION ----		
	MAX COMP	COMP RESIST	FORCE/ RESIST RATIO	MAX TENS	TENS RESIST	FORCE/ RESIST RATIO
305.00	0.10	57.62	0.00	0.03	82.45	0.00
300.00	7.11	57.62	0.12	3.08	82.45	0.04
295.00						

	18.07	57.62	0.31	12.90	82.45	0.16
290.00	31.67	57.62	0.55	24.53	82.45	0.30
285.00	50.72	57.62	0.88	41.46	82.45	0.50
280.00	69.29	143.18	0.48	57.93	178.48	0.32
275.00	89.67	143.18	0.63	75.52	178.48	0.42
270.00	105.62	143.18	0.74	91.34	178.48	0.51
265.00	121.45	143.18	0.85	106.21	178.48	0.60
260.00	134.78	177.29	0.76	119.15	213.88	0.56
255.00	147.86	177.29	0.83	131.41	213.88	0.61
250.00	159.41	177.29	0.90	142.46	213.88	0.67
245.00	170.77	177.29	0.96	153.05	213.88	0.72
240.00	182.69	241.28	0.76	164.27	296.33	0.55
233.33	196.14	241.28	0.81	176.61	296.33	0.60
226.67	208.43	241.28	0.86	187.98	296.33	0.63
220.00	220.56	312.59	0.71	198.96	327.10	0.61
213.33	231.97	312.59	0.74	209.26	327.10	0.64
206.67	243.28	312.59	0.78	219.33	327.10	0.67
200.00	254.08	312.59	0.81	228.96	385.58	0.59
193.33	264.80	312.59	0.85	238.41	385.58	0.62
186.67	275.25	312.59	0.88	247.61	385.58	0.64
180.00	287.97	336.31	0.86	258.73	407.40	0.64
170.00	303.08	336.31	0.90	271.90	407.40	0.67
160.00	318.10	509.22	0.62	284.69	523.32	0.54
150.00	333.05	509.22	0.65	297.14	523.32	0.57
140.00	347.93	509.22	0.68	309.43	523.32	0.59
130.00	362.67	509.22	0.71	321.57	523.32	0.61
120.00	377.40	509.22	0.74	333.57	523.32	0.64
110.00	392.10	509.22	0.77	345.46	523.32	0.66
100.00	406.81	509.22	0.80	357.29	523.32	0.68
90.00	421.49	509.22	0.83	369.04	523.32	0.71
80.00	436.19	509.22	0.86	380.73	523.32	0.73
70.00	450.82	509.22	0.89	392.32	523.32	0.75
60.00	467.23	546.43	0.86	405.93	523.32	0.78
53.33	468.45	546.43	0.86	405.02	523.32	0.77
40.00	496.12	546.43	0.91	428.42	620.80	0.69
33.33	497.41	546.43	0.91	427.45	620.80	0.69
20.00	524.88	703.28	0.75	450.31	780.85	0.58
13.33	526.40	703.28	0.75	449.18	780.85	0.58
0.00						

FORCE/RESISTANCE RATIO IN DIAGONALS

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- DIAG COMPRESSION - --- DIAG TENSION ---

MAST ELEV ft	MAX COMP	COMP RESIST	FORCE/ RESIST RATIO	MAX TENS	TENS RESIST	FORCE/ RESIST RATIO
305.00	0.24	7.16	0.03	0.24	7.16	0.03
300.00	4.17	10.74	0.39	3.82	10.74	0.36
295.00	4.19	10.74	0.39	4.39	10.74	0.41
290.00	6.45	10.74	0.60	6.28	10.74	0.58
285.00	7.83	10.74	0.73	7.85	10.74	0.73
280.00	7.66	10.74	0.71	7.18	10.74	0.67
275.00	7.56	10.74	0.70	7.75	10.74	0.72
270.00	7.21	10.74	0.67	7.02	10.74	0.65
265.00	6.65	10.74	0.62	6.74	10.74	0.63
260.00	6.45	7.13	0.90	6.33	7.13	0.89
255.00	6.12	7.13	0.86	6.17	7.13	0.87
250.00	6.09	7.13	0.85	5.92	7.13	0.83
245.00	5.81	7.13	0.81	5.85	7.13	0.82
240.00	6.46	6.51	0.99	6.23	6.51	0.96
233.33	6.18	6.51	0.95	6.14	6.51	0.94
226.67	6.32	6.51	0.97	6.09	6.51	0.93
220.00	6.18	9.45	0.65	6.12	9.45	0.65
213.33	6.37	9.45	0.67	6.11	9.45	0.65
206.67	6.33	9.45	0.67	6.23	9.45	0.66
200.00	6.54	7.32	0.89	6.25	7.32	0.85
193.33	6.59	7.32	0.90	6.40	7.32	0.87
186.67	6.72	7.32	0.92	6.51	7.32	0.89
180.00	7.59	8.84	0.86	7.26	8.84	0.82
170.00	7.77	8.84	0.88	7.42	8.84	0.84
160.00	7.95	15.88	0.50	7.66	15.88	0.48
150.00	8.22	15.88	0.52	7.87	15.88	0.50
140.00	8.45	13.59	0.62	8.15	13.59	0.60
130.00	8.72	13.59	0.64	8.39	13.59	0.62
120.00	9.00	17.02	0.53	8.69	17.02	0.51
110.00	9.30	17.02	0.55	8.98	17.02	0.53
100.00	9.60	18.13	0.53	9.29	18.13	0.51
90.00	9.90	18.13	0.55	9.59	18.13	0.53
80.00	10.14	16.06	0.63	9.93	16.06	0.62
70.00	10.42	16.06	0.65	10.20	16.06	0.64
60.00	11.14	20.48	0.54	10.63	20.48	0.52
53.33	14.27	31.46	0.45	13.94	31.46	0.44
40.00	11.59	18.66	0.62	11.06	18.66	0.59
33.33	14.52	29.38	0.49	14.18	29.38	0.48
20.00						

	11.92	21.51	0.55	11.57	21.51	0.54
13.33	-----	-----	-----	-----	-----	-----
	14.77	27.91	0.53	14.55	27.91	0.52
0.00	-----	-----	-----	-----	-----	-----

MAXIMUM INDIVIDUAL FOUNDATION LOADS: (kip)

-----LOAD-----COMPONENTS-----				TOTAL
NORTH	EAST	DOWN	UPLIFT	SHEAR
49.50 G	42.36 K	543.86 G	-463.38 M	49.51 G

MAXIMUM TOTAL LOADS ON FOUNDATION : (kip & kip-ft)

-----HORIZONTAL-----			DOWN	-----OVERTURNING-----			TORSION
NORTH	EAST	TOTAL		NORTH	EAST	TOTAL	
		@ 0.0				@ 0.0	
80.7 G	71.0 V	80.7 G	109.2 h	14608.3 G	13069.8 J	14608.3 G	-65.8 F

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Latticed Tower Analysis (Unguyed) (c)2017 Guymast Inc. 416-736-7453
 Processed under license at:

Sabre Towers and Poles on: 7 jan 2022 at: 15:00:26

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 ***** Service Load Condition *****

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* Only 1 condition(s) shown in full
 * Some wind loads may have been derived from full-scale wind tunnel testing

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LOADING CONDITION A

60 mph wind with no ice. Wind Azimuth: 0° (1.0 D + 1.0 Wo)

MAST LOADING

LOAD TYPE	ELEV ft	APPLY.. RADIUS ft	LOAD..AT AZI	LOAD AZI	FORCES.....		MOMENTS.....	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	300.0	0.00	0.0	0.0	1.99	6.00	0.00	0.00
C	288.0	0.00	0.0	0.0	1.62	5.00	0.00	0.00
C	278.0	0.00	0.0	0.0	1.61	5.00	0.00	0.00
D	305.0	0.00	180.0	0.0	0.02	0.04	0.00	0.00
D	300.0	0.00	180.0	0.0	0.02	0.04	0.00	0.00
D	300.0	0.00	42.0	0.0	0.03	0.06	0.03	0.02
D	290.0	0.00	42.0	0.0	0.03	0.06	0.03	0.02
D	290.0	0.00	42.0	0.0	0.03	0.06	0.05	0.02
D	280.0	0.00	42.0	0.0	0.03	0.07	0.06	0.02
D	280.0	0.00	58.3	0.0	0.04	0.11	0.06	0.03
D	275.0	0.00	58.3	0.0	0.04	0.11	0.06	0.03
D	275.0	0.00	71.1	0.0	0.04	0.11	0.06	0.03
D	260.0	0.00	75.7	0.0	0.04	0.11	0.05	0.03
D	260.0	0.00	63.1	0.0	0.04	0.11	0.07	0.03
D	240.0	0.00	67.9	0.0	0.05	0.11	0.06	0.03
D	240.0	0.00	58.6	0.0	0.05	0.13	0.09	0.04
D	220.0	0.00	61.6	0.0	0.05	0.14	0.08	0.03
D	220.0	0.00	55.1	0.0	0.05	0.16	0.10	0.04

D	200.0	0.00	57.3	0.0	0.05	0.17	0.09	0.04
D	200.0	0.00	52.5	0.0	0.05	0.17	0.11	0.04
D	180.0	0.00	54.2	0.0	0.05	0.17	0.10	0.04
D	180.0	0.00	50.6	0.0	0.05	0.17	0.12	0.04
D	160.0	0.00	51.6	0.0	0.05	0.18	0.12	0.04
D	160.0	0.00	49.0	0.0	0.06	0.25	0.14	0.04
D	140.0	0.00	49.7	0.0	0.06	0.25	0.13	0.04
D	140.0	0.00	47.6	0.0	0.06	0.25	0.15	0.04
D	120.0	0.00	48.2	0.0	0.06	0.26	0.15	0.04
D	120.0	0.00	46.5	0.0	0.06	0.27	0.17	0.04
D	100.0	0.00	47.0	0.0	0.06	0.27	0.16	0.04
D	100.0	0.00	45.5	0.0	0.06	0.28	0.18	0.04
D	80.0	0.00	46.0	0.0	0.06	0.28	0.17	0.04
D	80.0	0.00	44.7	0.0	0.05	0.29	0.20	0.04
D	60.0	0.00	45.1	0.0	0.05	0.29	0.19	0.04
D	60.0	0.00	44.0	0.0	0.05	0.27	0.21	0.04
D	53.3	0.00	44.0	0.0	0.05	0.27	0.21	0.04
D	53.3	0.00	44.3	0.0	0.05	0.32	0.20	0.04
D	40.0	0.00	44.3	0.0	0.05	0.32	0.20	0.04
D	40.0	0.00	43.4	0.0	0.04	0.27	0.23	0.04
D	33.3	0.00	43.4	0.0	0.04	0.27	0.23	0.04
D	33.3	0.00	43.6	0.0	0.05	0.35	0.22	0.04
D	20.0	0.00	43.6	0.0	0.05	0.35	0.22	0.04
D	20.0	0.00	42.8	0.0	0.04	0.34	0.24	0.04
D	13.3	0.00	42.8	0.0	0.04	0.34	0.24	0.04
D	13.3	0.00	43.1	0.0	0.05	0.40	0.23	0.04
D	0.0	0.00	43.1	0.0	0.05	0.40	0.23	0.04

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MAXIMUM MAST DISPLACEMENTS:

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ELEV ft	-----DEFLECTIONS (ft)-----			--TILTS (DEG)---		TWIST DEG
	NORTH	EAST	DOWN	NORTH	EAST	
305.0	1.141 G	-1.043 D	0.017 G	0.529 G	-0.491 D	-0.057 F
300.0	1.094 G	-1.000 D	0.017 G	0.529 G	-0.491 D	-0.057 F
295.0	1.048 G	-0.957 D	0.017 G	0.527 G	-0.488 D	-0.057 F
290.0	1.002 G	-0.915 D	0.016 G	0.519 G	-0.481 D	-0.057 F
285.0	0.956 G	-0.872 D	0.016 G	0.504 G	-0.467 D	0.055 L
280.0	0.912 G	-0.832 D	0.015 G	0.480 G	-0.444 D	0.054 L
275.0	0.870 G	-0.793 D	0.015 G	0.467 G	-0.431 D	0.052 L
270.0	0.830 G	-0.755 D	0.014 G	0.450 G	-0.416 D	0.050 L
265.0	0.790 G	-0.719 D	0.014 G	0.432 G	-0.398 D	0.049 L
260.0	0.753 G	-0.684 D	0.014 G	0.413 G	-0.380 D	0.047 L
255.0	0.716 G	-0.651 D	0.013 G	0.396 G	-0.364 D	0.045 L
250.0	0.681 G	-0.619 D	0.013 G	0.379 G	-0.348 D	0.042 L
245.0	0.648 G	-0.588 D	0.012 G	0.361 G	-0.332 D	0.040 L
240.0	0.616 G	-0.559 D	0.012 G	0.344 G	-0.315 D	0.037 L
233.3	0.576 G	-0.522 D	0.012 L	0.326 G	-0.299 D	0.035 L
226.7	0.538 G	-0.488 D	0.011 L	0.309 G	-0.282 D	0.033 L
220.0	0.502 G	-0.455 D	0.011 L	0.291 G	-0.266 D	0.031 L
213.3	0.469 G	-0.424 D	0.011 L	0.278 G	-0.254 D	0.029 L
206.7	0.436 G	-0.394 D	0.010 L	0.265 G	-0.241 D	0.028 L
200.0	0.405 G	-0.366 D	0.010 L	0.251 G	-0.229 D	0.026 L
193.3	0.376 G	-0.340 D	0.010 L	0.238 G	-0.217 D	0.024 L
186.7	0.348 G	-0.315 D	0.009 L	0.225 G	-0.205 D	0.023 L
180.0	0.322 G	-0.291 D	0.009 L	0.212 G	-0.193 D	0.021 L
170.0	0.285 G	-0.257 D	0.008 L	0.194 G	-0.176 D	0.019 L
160.0	0.252 G	-0.227 D	0.008 L	0.176 G	-0.159 D	0.017 L
150.0	0.221 G	-0.199 D	0.008 L	0.164 G	-0.149 D	0.016 L
140.0	0.193 G	-0.174 D	0.007 L	0.152 G	-0.138 D	0.015 L
130.0	0.167 G	-0.150 D	0.007 L	0.141 G	-0.127 D	0.013 L
120.0	0.142 G	-0.128 D	0.006 L	0.129 G	-0.117 D	0.012 L
110.0	0.120 G	-0.107 D	0.006 L	0.118 G	-0.106 D	0.011 L
100.0	0.099 G	-0.089 D	0.006 L	0.106 G	-0.096 D	0.010 L
90.0	0.080 G	-0.072 D	0.005 L	0.095 G	-0.086 D	0.009 L
80.0	0.064 G	-0.057 D	0.005 L	0.084 G	-0.076 D	0.008 L
70.0	0.048 G	-0.043 D	0.004 L	0.072 G	-0.065 D	0.007 L
60.0	0.033 G	-0.030 D	0.003 L	0.061 G	-0.055 D	0.005 L
53.3	0.027 G	-0.024 D	0.003 L	0.054 G	-0.049 D	0.005 L
40.0	0.015 G	-0.013 D	0.002 L	0.039 G	-0.035 D	0.003 L
33.3	0.011 G	0.010 J	0.002 H	0.032 G	-0.029 D	0.003 L
20.0	0.004 G	0.004 J	0.001 H	0.017 G	-0.015 D	0.002 L
13.3	0.002 G	0.002 J	0.001 H	0.011 G	0.010 J	0.001 L
0.0	0.000 A	0.000 A	0.000 A	0.000 A	0.000 A	0.000 A

MAXIMUM TENSION IN MAST MEMBERS (kip)

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ELEV ft	LEGS	DIAG	HORIZ	BRACE
305.0	-----	-----	0.04 A	0.00 A
	0.00 A	0.06 L		
300.0	-----	-----	0.42 C	0.00 A
	0.00 A	0.87 H		
295.0	-----	-----	0.11 A	0.00 A
	1.57 A	1.21 H		
290.0	-----	-----	0.02 G	0.00 A
	3.96 A	1.58 H		
285.0	-----	-----	0.12 A	0.00 A
	7.70 A	2.05 H		
280.0	-----	-----	0.03 K	0.00 A
	11.31 A	1.73 A		
275.0	-----	-----	0.09 A	0.00 A
	14.96 A	2.07 B		
270.0	-----	-----	0.02 A	0.00 A
	19.11 A	1.76 B		
265.0	-----	-----	0.07 A	0.00 A
	22.71 A	1.78 B		
260.0	-----	-----	0.02 A	0.00 A
	26.03 A	1.61 B		
255.0	-----	-----	0.05 A	0.00 A
	29.02 A	1.63 B		
250.0	-----	-----	0.03 A	0.00 A
	31.81 A	1.52 H		
245.0	-----	-----	0.04 A	0.00 A
	34.39 A	1.54 B		
240.0	-----	-----	0.03 A	0.00 A
	37.18 A	1.61 A		
233.3	-----	-----	0.04 A	0.00 A
	40.15 A	1.62 G		
226.7	-----	-----	0.03 A	0.00 A
	42.93 A	1.58 A		
220.0	-----	-----	0.03 A	0.00 A
	45.54 A	1.61 G		
213.3	-----	-----	0.02 A	0.00 A
	48.01 A	1.59 A		
206.7	-----	-----	0.03 A	0.00 A
	50.37 A	1.64 G		
200.0	-----	-----	0.02 A	0.00 A
	52.65 A	1.64 A		
193.3	-----	-----	0.04 A	0.00 A
	54.86 A	1.69 G		
186.7	-----	-----	0.02 A	0.00 A
	57.01 A	1.71 G		
180.0	-----	-----	0.03 A	0.00 A
	59.61 A	1.92 G		
170.0	-----	-----	0.04 A	0.00 A
	62.70 A	1.96 G		
160.0	-----	-----	0.02 A	0.00 A
	65.60 A	2.04 G		
150.0	-----	-----	0.02 A	0.00 A
	68.34 A	2.10 G		
140.0	-----	-----	0.02 A	0.00 A
	71.02 A	2.18 G		
130.0	-----	-----	0.02 A	0.00 A
	73.69 A	2.25 G		
120.0	-----	-----	0.02 A	0.00 A
	76.29 A	2.34 G		
110.0	-----	-----	0.02 A	0.00 A
	78.86 A	2.42 G		
100.0	-----	-----	0.02 A	0.00 A
	81.39 A	2.51 G		
90.0	-----	-----	0.02 A	0.00 A
	83.92 A	2.59 G		
80.0	-----	-----	0.01 K	0.00 A
	86.40 A	2.69 G		
70.0	-----	-----	0.01 G	0.00 A
	88.87 A	2.77 G		
60.0	-----	-----	0.08 A	0.00 A
	92.05 A	2.87 G		
53.3	-----	-----	0.17 A	0.00 K
	91.03 A	3.79 G		
40.0	-----	-----	0.07 A	0.00 A
	96.73 A	3.00 G		
33.3	-----	-----	0.15 A	0.00 B
	95.65 A	3.86 G		
20.0	-----	-----	0.03 A	0.00 B
	101.10 A	3.14 G		

13.3	-----		0.16 A	0.00 L
	99.83 A	3.97 G		
0.0	-----		0.00 A	0.00 A

MAXIMUM COMPRESSION IN MAST MEMBERS (kip)

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ELEV ft	LEGS	DIAG	HORIZ	BRACE
305.0	-----		-0.03 G	0.00 A
	-0.05 A	-0.06 F		
300.0	-----		-0.19 E	0.00 A
	-3.15 G	-1.20 B		
295.0	-----		-0.01 G	0.00 A
	-6.33 G	-1.02 H		
290.0	-----		-0.05 A	0.00 A
	-10.47 G	-1.74 B		
285.0	-----		-0.02 G	0.00 A
	-16.06 G	-2.04 H		
280.0	-----		-0.11 E	0.00 A
	-21.51 G	-2.12 G		
275.0	-----		-0.02 G	0.00 A
	-27.65 G	-1.90 B		
270.0	-----		-0.01 G	0.00 A
	-31.76 G	-1.94 B		
265.0	-----		-0.03 G	0.00 A
	-36.12 G	-1.69 B		
260.0	-----		-0.01 G	0.00 A
	-39.64 G	-1.72 B		
255.0	-----		-0.02 G	0.00 A
	-43.24 G	-1.58 H		
250.0	-----		-0.02 G	0.00 A
	-46.33 G	-1.61 G		
245.0	-----		-0.02 G	0.00 A
	-49.46 G	-1.50 H		
240.0	-----		-0.02 G	0.00 A
	-52.70 G	-1.72 G		
233.3	-----		-0.02 G	0.00 A
	-56.47 G	-1.61 G		
226.7	-----		-0.02 G	0.00 A
	-59.87 G	-1.68 G		
220.0	-----		-0.02 G	0.00 A
	-63.32 G	-1.62 G		
213.3	-----		-0.01 G	0.00 A
	-66.56 G	-1.70 G		
206.7	-----		-0.01 G	0.00 A
	-69.82 G	-1.67 G		
200.0	-----		-0.01 G	0.00 A
	-72.92 G	-1.74 G		
193.3	-----		-0.02 G	0.00 A
	-76.03 G	-1.74 G		
186.7	-----		-0.01 G	0.00 A
	-79.06 G	-1.79 G		
180.0	-----		-0.01 G	0.00 A
	-82.76 G	-2.03 G		
170.0	-----		-0.02 G	0.00 A
	-87.19 G	-2.08 G		
160.0	-----		-0.01 G	0.00 A
	-91.70 G	-2.14 G		
150.0	-----		-0.01 G	0.00 A
	-96.28 G	-2.22 G		
140.0	-----		-0.01 G	0.00 A
	-100.87 G	-2.29 G		
130.0	-----		-0.01 G	0.00 A
	-105.43 G	-2.37 G		
120.0	-----		-0.01 G	0.00 A
	-110.02 G	-2.45 G		
110.0	-----		-0.01 G	0.00 A
	-114.64 G	-2.53 G		
100.0	-----		-0.01 G	0.00 A
	-119.26 G	-2.62 G		
90.0	-----		-0.01 G	0.00 A
	-123.90 G	-2.70 G		
80.0	-----		-0.01 E	0.00 A
	-128.55 G	-2.77 G		

70.0	-----			-0.03 A	0.00 A
	-133.20 G	-2.85 G			
60.0	-----			-0.04 G	0.00 A
	-138.20 G	-3.07 G			
53.3	-----			-0.26 G	0.00 D
	-139.22 G	-3.92 G			
40.0	-----			-0.04 G	0.00 A
	-147.50 G	-3.20 G			
33.3	-----			-0.25 G	0.00 G
	-148.57 G	-3.99 G			
20.0	-----			-0.01 G	0.00 G
	-156.89 G	-3.28 G			
13.3	-----			-0.26 G	0.00 K
	-158.15 G	-4.05 G			
0.0	-----			0.00 A	0.00 A

MAXIMUM INDIVIDUAL FOUNDATION LOADS: (kip)

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-----LOAD-----COMPONENTS-----				TOTAL
NORTH	EAST	DOWN	UPLIFT	SHEAR
14.34 G	12.29 K	163.54 G	-103.11 A	14.34 G

MAXIMUM TOTAL LOADS ON FOUNDATION : (kip & kip-ft)

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-----HORIZONTAL-----			DOWN	-----OVERTURNING-----			TORSION
NORTH	EAST	TOTAL		NORTH	EAST	TOTAL	
		@ 0.0				@ 0.0	
21.6	19.1	21.6	81.8	3894.9	3496.2	3894.9	17.0
G	J	G	H	G	J	G	L

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Seismic Load Effects
Equivalent Lateral Force Procedure
ANSI/TIA-222-H

Parameters	Description	h _n (ft.)	w _n (kips)	W ₂ (kips)	Vertical Distribution of Seismic Forces			
					$\frac{w_n h_n^k}{\sum w_n h_n^k}$	F_{sz} or E_h (kips)	E_v (kips)	$\frac{1.2 D + 1.0 E_v}{0.9 D - 1.0 E_v}$ (kips)
Risk Category II R S _S S ₁ Site Class D (default) T _L (sec) F _a F _v S _{MS} S _{M1} S _{DS} S _{D1} T _s I _e Ω C _s h (ft)	Structure - Section 1	302.50	0.3060	0.3060	779.3946	0.0221	0.0058	0.2696
	Antenna Load	300.00	6.0000	6.0000	15,109.1048	0.4294	0.1128	5.2872
	Ladder/Line	294.00	0.1978	0.1978	484.4703	0.0138	0.0037	0.1743
	Structure - Section 2	290.00	1.0580	0.5422	2,543.0689	0.0723	0.0199	0.9323
	Antenna Load	288.00	5.0000	0.0000	11,904.6297	0.3383	0.0940	4.4060
	Ladder/Line	284.00	0.2317	0.0000	541.1680	0.0154	0.0044	0.2041
	Ladder/Line	279.00	0.0579	0.0000	131.9754	0.0038	0.0011	0.0510
	Antenna Load	278.00	5.0000	0.0000	11,340.7952	0.3223	0.0940	4.4060
	Structure - Section 3	270.00	1.5610	0.0000	3,401.4599	0.0967	0.0293	1.3756
	Ladder/Line	269.00	0.2966	0.0000	643.0149	0.0183	0.0056	0.2613
Risk Category B S _S S ₁ Site Class D (default) T _L (sec) F _a F _v S _{MS} S _{M1} S _{DS} S _{D1} T _s I _e Ω C _s h (ft)	Ladder/Line	269.00	0.5213	0.0000	1,130.1539	0.0321	0.0098	0.4594
	Ladder/Line	250.00	0.5792	0.0000	1,135.5341	0.0323	0.0109	0.5104
	Ladder/Line	250.00	0.3296	0.0000	646.1879	0.0184	0.0062	0.2904
	Structure - Section 4	250.00	1.5980	0.0000	3,132.9135	0.0890	0.0300	1.4082
	Ladder/Line	230.00	0.5792	0.0000	1,012.7001	0.0288	0.0109	0.5104
	Ladder/Line	230.00	0.3296	0.0000	576.2879	0.0164	0.0062	0.2904
	Structure - Section 5	230.00	2.0820	0.0000	3,640.2654	0.1034	0.0391	1.8347
	Ladder/Line	210.00	0.3296	0.0000	508.6210	0.0145	0.0062	0.2904
	Ladder/Line	210.00	0.5792	0.0000	893.7903	0.0254	0.0109	0.5104
	Structure - Section 6	210.00	2.6990	0.0000	4,164.9518	0.1184	0.0507	2.3784
Risk Category B S _S S ₁ Site Class D (default) T _L (sec) F _a F _v S _{MS} S _{M1} S _{DS} S _{D1} T _s I _e Ω C _s h (ft)	Ladder/Line	190.00	0.3296	0.0000	443.3185	0.0126	0.0062	0.2904
	Ladder/Line	190.00	0.5792	0.0000	779.0355	0.0221	0.0109	0.5104
	Structure - Section 7	190.00	2.9750	0.0000	4,001.4341	0.1137	0.0559	2.6216
	Ladder/Line	170.00	0.3296	0.0000	380.5341	0.0108	0.0062	0.2904
	Ladder/Line	170.00	0.5792	0.0000	668.7055	0.0190	0.0109	0.5104
	Structure - Section 8	170.00	3.0090	0.0000	3,473.9899	0.0987	0.0566	2.6515
	Ladder/Line	150.00	0.3296	0.0000	320.4502	0.0091	0.0062	0.2904
	Ladder/Line	150.00	0.5792	0.0000	563.1212	0.0160	0.0109	0.5104
	Structure - Section 9	150.00	4.5180	0.0000	4,392.5784	0.1248	0.0849	3.9813
	Ladder/Line	130.00	0.3296	0.0000	263.2882	0.0075	0.0062	0.2904
Risk Category B S _S S ₁ Site Class D (default) T _L (sec) F _a F _v S _{MS} S _{M1} S _{DS} S _{D1} T _s I _e Ω C _s h (ft)	Ladder/Line	130.00	0.5792	0.0000	462.6715	0.0131	0.0109	0.5104
	Structure - Section 10	130.00	4.6540	0.0000	3,717.6680	0.1056	0.0875	4.1011
	Ladder/Line	110.00	0.5792	0.0000	367.8415	0.0105	0.0109	0.5104
	Ladder/Line	110.00	0.3296	0.0000	209.3242	0.0059	0.0062	0.2904
	Structure - Section 11	110.00	5.0130	0.0000	3,183.6833	0.0905	0.0942	4.4175

Seismic Load Effects
Equivalent Lateral Force Procedure
ANSI/TIA-222-H

Description	h _i (ft.)	w _i (kips)	W _s (kips)	Vertical Distribution of Seismic Forces				1.2 D + 1.0 E _v (kips)	0.9 D - 1.0 E _v (kips)
				W _h (kips)	w _h (kips)	F _{sz} or E _h (kips)	E _v (kips)		
Ladder/Line	90.00	0.5792	0.0000		279.2566	0.0079	0.0109	0.7059	0.5104
Ladder/Line	90.00	0.3296	0.0000		158.9140	0.0045	0.0062	0.4017	0.2904
Structure - Section 12	90.00	5.2530	0.0000		2,532.6919	0.0720	0.0988	6.4024	4.6289
Ladder/Line	70.00	0.3296	0.0000		112.5400	0.0032	0.0062	0.4017	0.2904
Ladder/Line	70.00	0.5792	0.0000		197.7644	0.0056	0.0109	0.7059	0.5104
Structure - Section 13	70.00	5.4060	0.0000		1,845.8468	0.0525	0.1016	6.5888	4.7638
Ladder/Line	50.00	0.5792	0.0000		124.5989	0.0035	0.0109	0.7059	0.5104
Ladder/Line	50.00	0.3296	0.0000		70.9044	0.0020	0.0062	0.4017	0.2904
Structure - Section 14	50.00	5.9770	0.0000		1,285.7871	0.0365	0.1124	7.2848	5.2669
Ladder/Line	30.00	0.5792	0.0000		61.7897	0.0018	0.0109	0.7059	0.5104
Ladder/Line	30.00	0.3296	0.0000		35.1621	0.0010	0.0062	0.4017	0.2904
Structure - Section 15	30.00	6.5450	0.0000		698.2278	0.0198	0.1230	7.9770	5.7675
Ladder/Line	10.00	0.3296	0.0000		7.7801	0.0002	0.0062	0.4017	0.2904
Ladder/Line	10.00	0.5792	0.0000		13.6719	0.0004	0.0109	0.7059	0.5104
Structure - Section 16	10.00	7.7960	0.0000		184.0229	0.0052	0.1466	9.5018	6.8698
Σ		89.57	7.0460		94,557.09	2.69	1.68	109.17	78.93

Leg Connection Details												
Bottom Elevation (ft)	Top Elevation (ft)	Pipe Dimensions	Top Splice				Bottom Splice/Base					
			Bolt Qty.	Bolt Dia. (in)	Bolt Circle (in)	Plate Thickness (in)	Plate Dia. (in)	Bolt Qty.	Bolt Dia. (in)	Bolt Circle (in)	Plate Thickness (in)	Plate Dia. (in)
300	305	2.875 OD X .203						6	0.75	6.50	0.75	8.50
280	300	2.875 OD X .203	6	0.75	6.50	1.00	8.50	6	1.00	9.00	1.25	11.50
260	280	4.000 OD X .318	6	1.00	9.00	1.25	11.50	6	1.00	9.00	1.25	11.50
240	260	4.500 OD X .337	6	1.00	9.00	1.25	11.50	6	1.00	9.00	1.25	11.50
220	240	5.563 OD X .375	6	1.00	9.00	1.25	11.50	6	1.00	9.00	1.25	11.50
200	220	5.563 OD X .500	6	1.00	9.00	1.25	11.50	6	1.00	9.00	1.25	11.50
180	200	5.563 OD X .500	6	1.00	9.00	1.25	11.50	6	1.25	12.50	1.75	15.75
160	180	8.625 OD X .322	6	1.25	12.50	1.50	15.75	6	1.25	12.50	1.50	15.75
140	160	8.625 OD X .500	6	1.25	12.50	1.50	15.75	6	1.25	12.50	1.50	15.75
120	140	8.625 OD X .500	6	1.25	12.50	1.50	15.75	6	1.25	12.50	1.50	15.75
100	120	8.625 OD X .500	6	1.25	12.50	1.50	15.75	6	1.25	12.50	1.50	15.75
80	100	8.625 OD X .500	6	1.25	12.50	1.50	15.75	6	1.25	12.50	1.50	15.75
60	80	8.625 OD X .500	6	1.25	12.50	1.50	15.75	6	1.25	12.50	1.50	15.75
40	60	8.625 OD X .500	6	1.25	12.50	1.50	15.75	6	1.25	12.50	1.50	15.75
20	40	8.625 OD X .500	6	1.25	12.50	1.50	15.75	8	1.50	17.25	2.00	21.00
0	20	10.75 OD X .500	8	1.50	17.25	2.00	21.00	6	1.50	15.50	1.75	19.25

Diagonal Bracing Connection Details								
Bottom Elevation (ft)	Top Elevation (ft)	Angle Shape	Bolt Qty.	Bolt Dia. (in)	Bolt End Distance (in)	Bolt Spacing (in)	Gage Distance From Heel (in)	Gusset Plate Thickness (in)
300	305	L 2 X 2 X 1/8	1	0.625	1.500		1.125	0.375
280	300	L 2 X 2 X 3/16	1	0.625	1.500		1.125	0.375
260	280	L 2 X 2 X 3/16	1	0.625	1.500		1.125	0.375
240	260	L 2 X 2 X 1/8	1	0.625	1.500		1.125	0.375
220	240	L 2 X 2 X 3/16	1	0.625	1.500		1.125	0.375
200	220	L 2 1/2 X 2 1/2 X 3/16	1	0.625	1.500		1.375	0.375
180	200	L 2 1/2 X 2 1/2 X 3/16	1	0.750	1.500		1.375	0.375
160	180	L 3 X 3 X 3/16	1	0.750	1.625		1.750	0.375
140	160	L 3 1/2 X 3 1/2 X 1/4	1	0.750	1.625		1.750	0.375
120	140	L 3 1/2 X 3 1/2 X 1/4	1	0.750	1.625		1.750	0.375
100	120	L 4 X 4 X 1/4	1	0.750	1.625		2.000	0.375
80	100	L 4 X 4 X 1/4	2	0.625	1.625	2.1250	2.000	0.500
60	80	L 4 X 4 X 1/4	2	0.625	1.625	2.1250	2.000	0.500
53.33	60	L 4 X 4 X 1/4	2	0.750	1.625	2.5000	2.000	0.500
40	53.33	L 5 X 3 1/2 X 1/4	2	0.750	1.625	2.5000	1.750	0.500
33.33	40	L 4 X 4 X 1/4	2	0.750	1.625	2.5000	2.000	0.500
20	33.33	L 5 X 3 1/2 X 1/4	2	0.750	1.625	2.5000	1.750	0.500
13.33	20	L 4 X 4 X 5/16	2	0.750	1.625	2.5000	2.000	0.500
0	13.33	L 5 X 3 1/2 X 1/4	2	0.750	1.625	2.5000	1.750	0.500

DRILLED STRAIGHT PIER DESIGN BY SABRE INDUSTRIES

305' S3TL Series HD1 CITYSWITCH LLC Otter Bay, FL (22-4006-JDS) 2022-01-10 DO

Factored Uplift (kips)	463
Factored Download (kips)	544
Factored Shear (kips)	50

Ultimate Bearing Pressure	13.5
Bearing ϕ_s	0.75
Bearing Design Strength (ksf)	10.125

Water Table Below Grade (ft)	2.5
Bolt Circle Diameter (in)	15.5

Effective Anchor Bolt Embedment	65.125
Pier Diameter (ft)	6
Ht. Above Ground (ft)	0.5
Pier Length Below Ground (ft)	52

Minimum Pier Diameter (ft) 2.63

Quantity of Bars	18
Bar Diameter (in)	1.27
Area of Bars (in ²)	22.80
Spacing of Bars (in)	11.07
Tie Bar Diameter (in)	0.5
Spacing of Ties (in)	12

Minimum Area of Steel (in²) 20.36

f'_c (ksi)	4.5
f_y (ksi)	60
Unit Wt. of Concrete (kcf)	0.15
Volume of Concrete (yd ³)	54.98

Length to ignore download (ft)

Ignore bottom length in download? ☒

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Depth at Bottom of Layer (ft)	Ult. Skin Friction (ksf)	(Ult. Skin Friction)*(Uplift Factor)	γ (kcf)
3	0.00	0.00	0.11
6.5	0.15	0.15	0.11
12	1.00	1.00	0.11
17	0.25	0.25	0.11
22	0.70	0.70	0.11
27	0.25	0.25	0.11
32	1.00	1.00	0.11
42	0.85	0.85	0.11
52	0.25	0.25	0.11
57	1.85	1.85	0.11
60	0.90	0.90	0.11

DRILLED STRAIGHT PIER DESIGN BY SABRE INDUSTRIES (CONTINUED)

Download:

Φ_s , Download Friction	0.75		
Q_f , Skin Friction (kips)	485.8	W_s (kips)	161.7
Q_b , End Bearing Strength (kips)	381.7	W_c (kips)	222.7
Download Design Strength (kips)	650.7	Factored Net Download (kips)	617.1

Uplift (skin friction):

Φ_s , Uplift (friction)	0.75		
Q_f , Skin Friction (kips)	528.3		
W_c (kips)	222.7		
W_w (kips)	87.3		
Uplift Design Strength (kips)	518.0	Factored Uplift (kips)	463.0

Uplift (cone):

Φ_s , Uplift (cone)	0.75		
$W_{s,cone}$ (kips)	7017.4		
$W_{w,cone}$ (kips)	3473.8		
W_c (kips)	222.7		
$W_{w,cyl}$ (kips)	87.3		
Uplift Design Strength (kips)	2779.5	Factored Uplift (kips)	463.0

Tension:

Design Tensile Strength (kips)	1231.3	T_u (kips)	463.0
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Shear:

ϕ	0.75		
V_c (kips)	429.9		
V_s (kips)	113.1	$V_{s,max}$ (kips)	2225.6
ϕV_n (kips)	407.2	V_u (kips)	50.0

Anchor Bolt Pull-Out:

$N_{ua} / \phi N_n$	0.70	$V_{ua} / \phi V_n$	0.15
Rebar Development Length (in)	45.24	Required Length of Development (in)	34.08

Condition	1 is OK, 0 Fails
Download	1
Uplift	1
Area of Steel	1
Shear	1
Anchor Bolt Pull-Out	1
Interaction Diagram	1