

Sabre Towers



OPTASITE TOWERS LLC

110' Ext. 150' Sabre Model Monopole

Waterbury, CT

Sabre Job Number 07-03039

STAMPED PERMIT DRAWINGS

***YOUR SABRE
REPRESENTATIVE IS***

***Connie Carey
1-800-369-6690 EXT. 188***



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Structural Design Report
110' Extendible to 150' Monopole
located at: Waterbury, CT

prepared for: OPTASITE TOWERS LLC
by: Sabre Communications Corporation™

Job Number: 07-03039

March 14, 2007

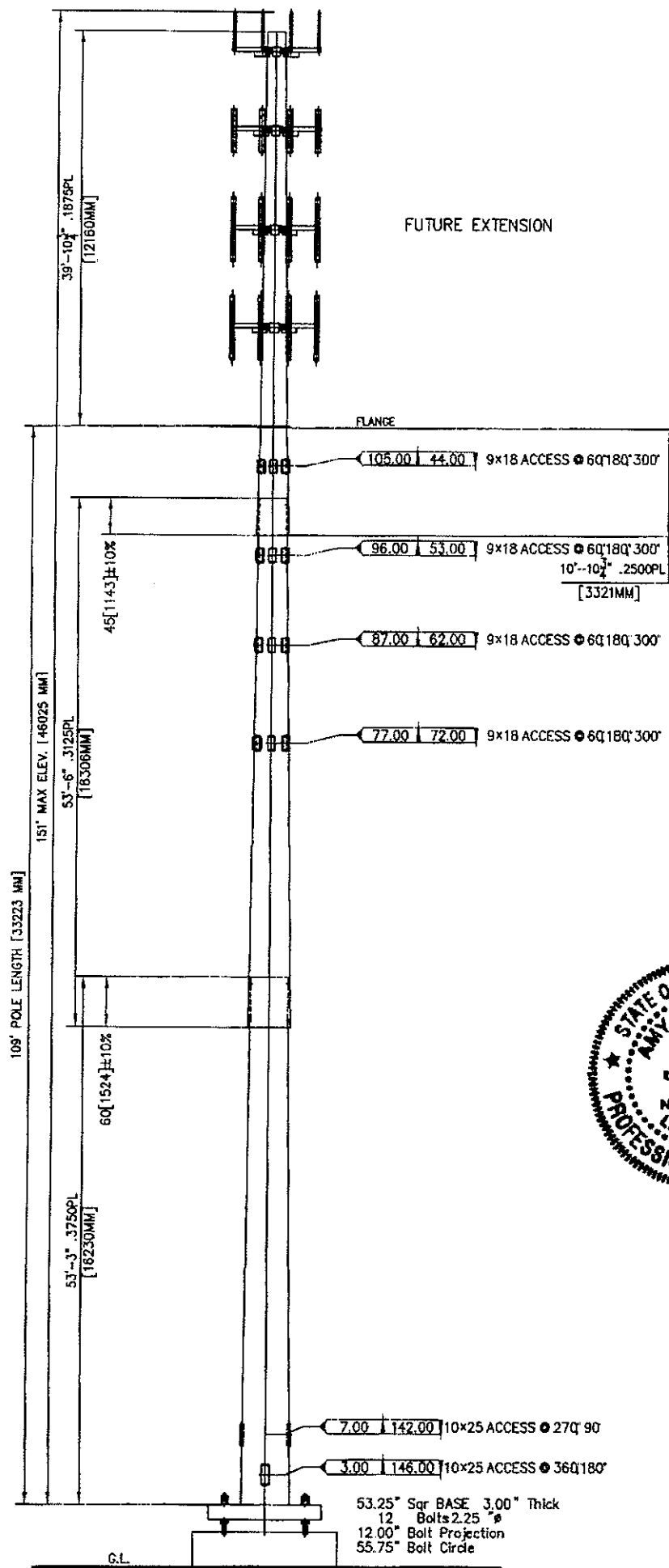
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Foundation Calculations.....	A1-A4



Tower by HAC

Foundation by FIK

Approved by AKA



POLE SPECIFICATIONS	
POLE HEIGHT	149.00 FEET
TAPER	2140 IN/FT
POLE SHAPE	18 SIDED POLYGON
ORIENTATION	FLAT-FLAT

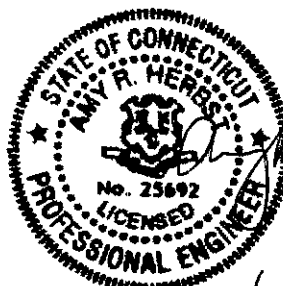
Lev	Qty	Elev ft.	Future	DESCRIPTION
1	1	107/147	F	12' Low Profile Platform (R)
12	109/149	F		DB844H105
2	1	99/139	F	12' Low Profile Platform (R)
12	99/139	F		APX18PV-16PVL
3	1	89/129	F	12' Low Profile Platform (R)
12	89/129	F		7752
4	1	79/119	F	12' Low Profile Platform (R)
12	79/119	F		7752

Load Case	DESCRIPTION	Wind (mph)	OLF Vert	Rad. Ice	Factors Gust	Wind Cf	Wind (psf)
1)	Max Wind	85.0	1.00		1.69	.65	31.3
2)	Max Wind Load x.75	73.6	1.00	50	1.69	.65	23.4
3)	Everyday Operating	50.0	1.00		1.69	.65	10.8

Load Case	DESCRIPTION	Res. Axial (kips)	Base Shear (kips)	React Mom (ft-k)	Disp DEFL. (ft)	Top SWAY (deg)
1)	Max Wind	34.4	23.8	2658	10.1	7.33
2)	Max Wind Load x.75	39.6	19.2	2194	8.4	6.13
3)	Everyday Operating	33.9	8.3	924	3.5	2.55

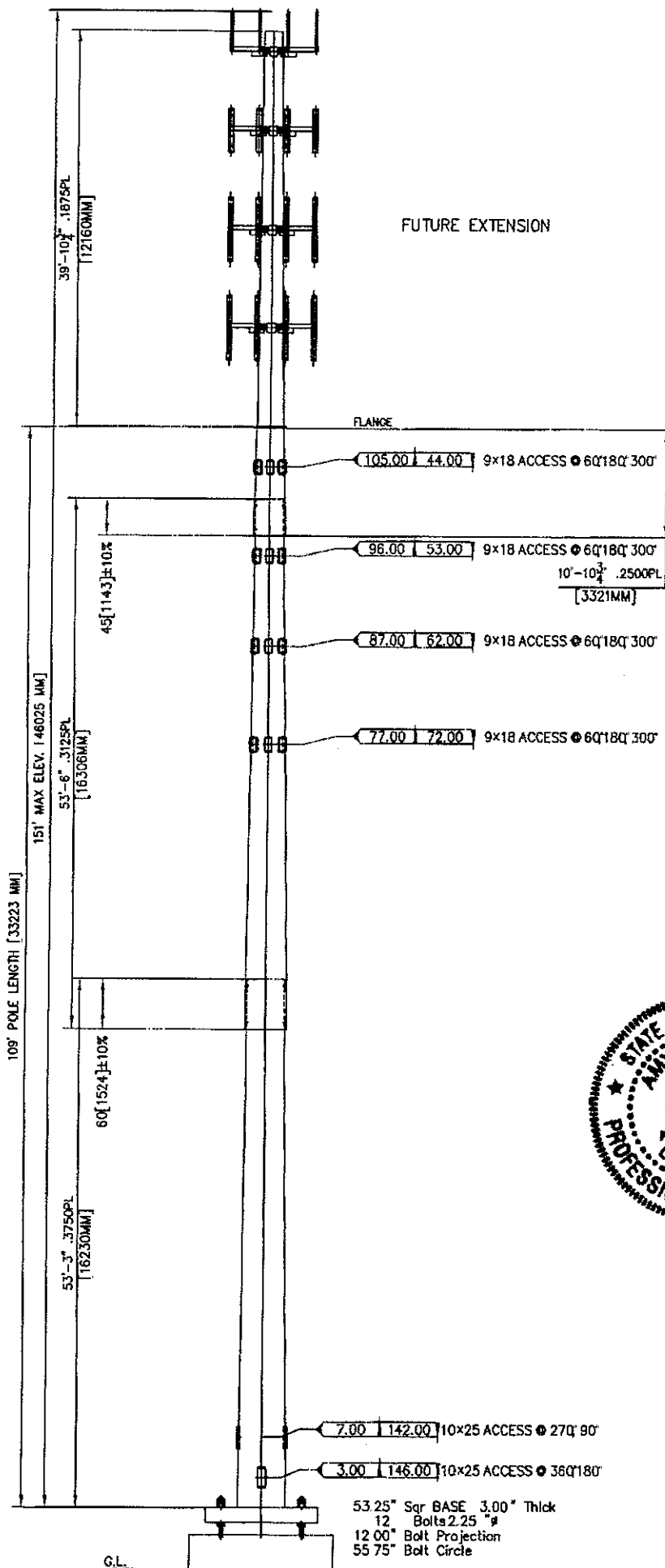
Sec	LENGTH (ft)	Flat-Flat TOP#	THICK (in)	WEIGHT (lbs)	STEEL SPEC	FINISH
1	40.00	18.50	27.06	.1875	0	A572-65 Future
2	11.00	27.18	29.54	.2500	1300	A572-65 Galv
3	53.50	28.24	39.69	.3125	6800	A572-65 Galv
4	53.25	37.99	49.39	.3750	11700	A572-65 Galv
		TOTAL 19800				
ABolt Cluster	Bolt#	Holes				
AB	84.00	2.25	2.625	1700	A615-75	Galv-18"

- 1) FULL HEIGHT STEP BOLTS
- 2) ANTENNA FEED LINES RUN INSIDE POLE
- 3) THIS MONOPOLE DESIGN AND, IF APPLICABLE THE FOUNDATION DESIGN SHOWN ON THE FOLLOWING PAGE(S) ALSO MEET OR EXCEED THE REQUIREMENTS OF THE 2003 INTERNATIONAL BUILDING CODE 3-SECOND WIND GUST OF 100 MPH.
- 4) THE MONOPOLE WAS DESIGNED IN ACCORDANCE WITH EIA/TIA-222-F.
- 5) ANTENNAS CANNOT BE INSTALLED AT THE HIGHER ELEVATIONS LISTED UNTIL AFTER THE MONOPOLE HAS BEEN EXTENDED.



3/19/07

OPTASITE TOWERS LLC			
Waterbury, CT			
110 0/150 0 MONOPOLE			
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DATE	19Mar07	SIZE	A
DRAWN BY	-	DRAWING NO.	07-03039-PE
CHECKED BY	HAC	REFERENCE DRAWING	SCALE N.T.S.
		PAGE	1



POLE SPECIFICATIONS			
POLE HEIGHT	149.00	FEET	
TAPER	2140	IN/FT	
POLE SHAPE	18	SIDED POLYGON	
ORIENTATION	FLAT-FLAT		

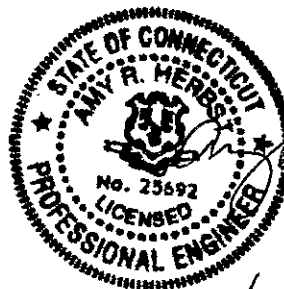
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1	1	107/147	F	12' Low Profile Platform (R)
12	109/149	F		DB844H105
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3	1	89/129	F	12' Low Profile Platform (R)
12	89/129	F		7752
4	1	79/119	F	12' Low Profile Platform (R)
12	79/119	F		7752

Load Case DESCRIPTION	Wind (mph)	OLF Vert	Rad. Ice	Factors Gust	Cf	Wind (psf)
1) 3s Gusted Wind	100.0	1.20		1.10	.65	42.8
2) 3s Gusted Wind 0.9	100.0	.90		1.10	.65	42.8
3) 3s Gusted Wind & Ice	50.0	1.20	.75	1.10	1.20	6.7
4) Service Loads	60.0	1.00		1.10	.65	8.6

Load Case DESCRIPTION	Res Axial (kips)	Base Shear (kips)	React Mom (ft-k)	Disp DEFL (ft)	Top SWAY (deg)
1) 3s Gusted Wind	41.9	28.8	3142	11.8	8.59
2) 3s Gusted Wind 0.9	31.6	28.8	3083	11.5	8.32
3) 3s Gusted Wind & Ice	63.6	7.4	791	3.0	2.15
4) Service Loads	34.2	5.8	628	2.4	1.71

Sec	LENGTH (ft)	Flat-Flat TOP#	Flat-Flat BOT#	THICK (in)	WEIGHT (lbs)	STEEL SPEC	FINISH
1	40.00	18.50	27.06	.1875	0	A572-65	Future
2	11.00	27.18	29.54	.2500	1300	A572-65	Galv
3	53.50	28.24	39.69	.3125	6800	A572-65	Galv
4	53.25	37.99	49.39	.3750	11700	A572-65	Galv
TOTAL					19800		
ABolt Cluster		Bolt#	Holes				
AB		84.00	2.25	2.625	1700	A615-75	Galv-18"

- 1) FULL HEIGHT STEP BOLTS
- 2) ANTENNA FEED LINES RUN INSIDE POLE
- 3) THIS MONOPOLE DESIGN AND, IF APPLICABLE, THE FOUNDATION DESIGN SHOWN ON THE FOLLOWING PAGE(S) ALSO MEET OR EXCEED THE REQUIREMENTS OF THE 2003 INTERNATIONAL BUILDING CODE 3-SECOND WIND GUST OF 100 MPH.
- 4) THE MONOPOLE WAS DESIGNED IN ACCORDANCE WITH ANSI/TIA-222-G, STRUCTURE CLASS II, EXPOSURE CATEGORY C, TOPOGRAPHIC CATEGORY 1.
- 5) ANTENNAS CANNOT BE INSTALLED AT THE HIGHER ELEVATIONS LISTED UNTIL AFTER THE MONOPOLE HAS BEEN EXTENDED



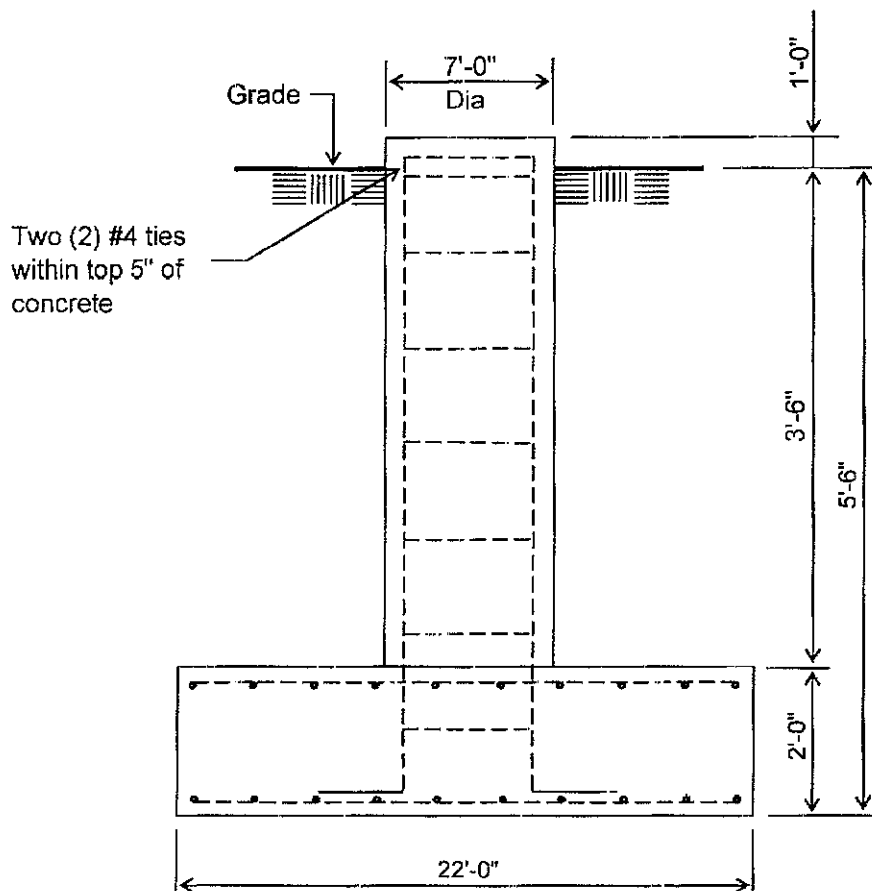
3/19/07

OPTASITE TOWERS LLC			
Waterbury, CT			
		110.0/150.0 MONOPOLE	
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07-03039	SIZE A	DRAWING NO. 07-03039-PE	REV
DATE 19Mar07	DRAWN BY	REFERENCE DRAWING	SCALE N.T.S.
CHECKED BY HAC			PAGE 2

Customer: OPTASITE TOWERS LLC

Site: Waterbury, CT

110' Extendible to 150' Monopole at
85 mph wind with 0.5 in ice per ANSI/TIA/EIA-222-F-1996 &
100 mph Wind with no ice & 50 mph wind with 0.75 in ice per ANSI/TIA-222-G-2005
Antenna Loading per Page 1



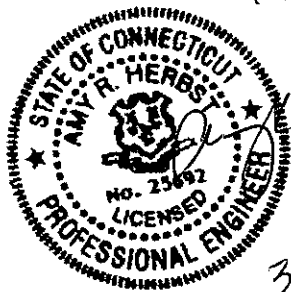
Notes:

- 1) Concrete shall have a minimum 28-day compressive strength of 4000 PSI, in accordance with ACI 318-05.
- 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 Gemini Geotechnical Associates, Inc., Project No. 07023CT, dated March 13, 2007
- 6) See the geotechnical report for compaction requirements, if specified.

ELEVATION VIEW

(42.27 Cu. Yds. each)

(1 REQUIRED)



Rebar Schedule per Pad and Pier	
Pier	(36) #8 vertical rebar w/hooks at bottom w/#4 ties, two within top 5" of top of pier then 12" C/C
Pad	(35) #8 horizontal rebar evenly spaced each way top and bottom (140 Total)

TOP	DIAMETER	18.50 in.	[18.79 in. Point-Point]
BOTTOM	DIAMETER	49.39 in.	[50.15 in. Point-Point]
POLE	HEIGHT	149.00 ft.	18 SIDED FLAT ORIENTATION
BASE	HEIGHT	1.00 ft.	ABOVE GROUND
E-MODULUS		29000 ksi	[12000 ksi SHEAR MODULUS]

APPURTENANCES

ATTACH POINTS:	NO.	X,ft	Qty	Description	Status
	1	147.00	1	12' Low Profile Platform (R)	Future Appurt
	2	139.00	1	12' Low Profile Platform (R)	Future Appurt
	3	129.00	1	12' Low Profile Platform (R)	Future Appurt
	4	119.00	1	12' Low Profile Platform (R)	Future Appurt

Pole Section	Bottom X,ft.	Thick in.	Connect Type	LAP in.	Taper in/ft	Length ft.	Weight lbs	Steel Spec	Pole Finish
1	40.00	.18750	FLANGE-X		.2140	40.00	1829	A572-65	Special
2	51.00	.25000	SLIP-JNT	45.	.2140	11.00	834	A572-65	GALVANIZE
3	100.75	.31250	SLIP-JNT	60.	.2140	53.50	6075	A572-65	GALVANIZE
4	149.00	.37500	C-WELD		.2140	53.25	9340	A572-65	GALVANIZE

SECTION PROPERTIES

X,ft	UP,ft	D,in	T,in	Area in ²	Iz in ⁴	IxIy in ⁴	SxSy in ³	w/t	d/t	F _y (ksi)	
149.00	.00	18.50	.1875	10.90	924	462	49.2	15.63	98.7	65.00	TOP
147.00	2.00	18.93	.1875	11.15	990	495	51.5	16.04	100.9	65.00	P01
142.00	7.00	20.00	.1875	11.79	1168	584	57.5	17.04	106.7	65.00	
139.00	10.00	20.64	.1875	12.17	1286	643	61.4	17.65	110.1	65.00	P02
134.00	15.00	21.71	.1875	12.81	1498	749	68.0	18.65	115.8	65.00	
129.00	20.00	22.78	.1875	13.44	1732	866	74.9	19.66	121.5	65.00	P03
124.00	25.00	23.85	.1875	14.08	1992	996	82.3	20.67	127.2	65.00	
119.00	30.00	24.92	.1875	14.72	2274	1137	89.9	21.67	132.9	65.00	P04
114.00	35.00	25.99	.1875	15.36	2582	1291	97.8	22.68	138.6	65.00	
109.00	40.00	27.06	.1875	15.99	2916	1458	106.1	23.68	144.3	65.00	Flng-B01
109.00	40.00	27.18	.2500	21.37	3916	1958	141.9	17.41	108.7	65.00	Flng-T02
104.00	45.00	28.25	.2500	22.22	4402	2201	153.4	18.17	113.0	65.00	
101.75	47.25	28.74	.2500	22.60	4634	2317	158.8	18.50	114.9	65.00	Slip-B02
98.00	51.00	29.04	.3125	28.49	5938	2969	201.4	14.62	92.9	65.00	Slip-T03
93.00	56.00	30.11	.3125	29.55	6628	3314	216.8	15.23	96.3	65.00	
88.00	61.00	31.18	.3125	30.61	7368	3684	232.7	15.83	99.8	65.00	
83.00	66.00	32.25	.3125	31.68	8162	4081	249.2	16.43	103.2	65.00	
78.00	71.00	33.32	.3125	32.74	9008	4504	266.2	17.04	106.6	65.00	
73.00	76.00	34.39	.3125	33.80	9914	4957	283.9	17.64	110.0	65.00	
68.00	81.00	35.46	.3125	34.86	10878	5439	302.1	18.24	113.5	65.00	
63.00	86.00	36.53	.3125	35.92	11902	5951	320.9	18.85	116.9	65.00	
58.00	91.00	37.60	.3125	36.98	12988	6494	340.2	19.45	120.3	65.00	
53.25	95.75	38.62	.3125	37.99	14078	7039	359.0	20.03	123.6	65.00	Slip-B03
48.25	100.75	39.06	.3750	46.04	17406	8703	438.8	16.60	104.2	65.00	Slip-T04
43.25	105.75	40.13	.3750	47.32	18892	9446	463.6	17.11	107.0	65.00	
38.25	110.75	41.20	.3750	48.59	20460	10230	489.1	17.61	109.9	65.00	
33.25	115.75	42.27	.3750	49.86	22108	11054	515.1	18.11	112.7	65.00	
28.25	120.75	43.34	.3750	51.14	23846	11923	541.8	18.62	115.6	65.00	
23.25	125.75	44.41	.3750	52.41	25672	12836	569.3	19.12	118.4	65.00	
18.25	130.75	45.48	.3750	53.68	27590	13795	597.4	19.62	121.3	65.00	
13.25	135.75	46.55	.3750	54.96	29600	14800	626.2	20.13	124.1	65.00	
8.25	140.75	47.62	.3750	56.23	31708	15854	655.7	20.63	127.0	65.00	
3.25	145.75	48.69	.3750	57.51	33910	16955	685.9	21.13	129.8	65.00	
.00	149.00	49.39	.3750	58.33	35396	17698	705.8	21.46	131.7	65.00	BASE

CASE - 1: Max Wind

TIA/EIA-222-F

VERTICAL OLF	1.00	WIND SPEED	85.0 mph 136.8 kph
ICE COVER	.00 in	GUST FACTOR	1.69
STRESS REDUCTION	.60	EXPOSURE COEFF.	.2857
STRESS AMPLIFY	1.33	Cf	.650
BASE ABOVE Grd	1.00 ft	REFERENCE HEIGHT	33.0 ft
		PRESSURE @Ref.Ht	31.3 psf 1496.Pa

APPURTENANCE LOADS

#	Qty	Description	Center Line Elev-Ft	WEIGHT each Lbs	AREA each Ft^2	Tx-CABLE Type	Qty	#/Ft	WIND Psf	FORCES Tra-Y Kips	AX-Z Kips	MOM. Lg-X Ft-K
1	1	12' Low Profile Platform (R)	147.0	1239	52.4				47.9	2.51	-1.2	-6
	12	DB844H105	149.0	10		1 5/8"	15	1.04	48.2		-2.4	
2	1	12' Low Profile Platform (R)	139.0	1239	61.4				47.2	2.90	-1.2	-7
	12	APX16PV-16PVL	139.0	45		1 5/8"	15	1.04	47.2		-2.7	
3	1	12' Low Profile Platform (R)	129.0	1239	89.1				46.2	4.11	-1.2	-10
	12	7752	129.0	44		1 5/8"	15	1.04	46.2		-2.5	
4	1	12' Low Profile Platform (R)	119.0	1239	89.1				45.1	4.02	-1.2	-10
	12	7752	119.0	44		1 5/8"	15	1.04	45.2		-2.4	

RESULTS

ELEV	POLE	WIND	--- FORCES, kips ---			--- MOMENTS, ft-kips ---			STRESS ALLOW		
X, ft	X, ft	psf	ShearX	ShearY	AxialZ	BendX	BendY	TorqZ	ksi	ksi	CSR
150.00	149.00	31.3	.0	.1	.0	.0	.0	.0	.01	51.87	.000
148.00	147.00	31.2	.0	3.2	-3.5	.7	.0	.0	.69	51.87	.013
143.00	142.00	30.9	.0	3.4	-3.6	-16.8	.0	.0	3.78	51.87	.073
140.00	139.00	30.7	.0	7.0	-7.4	-27.8	.0	.0	6.03	51.87	.116
135.00	134.00	30.4	.0	7.3	-7.6	-62.9	.0	.0	11.57	51.87	.223
130.00	129.00	30.1	.0	12.1	-11.1	-100.5	.0	.0	16.76	51.87	.323
125.00	124.00	29.7	.0	12.4	-11.4	-161.2	.0	.0	24.01	51.87	.463
120.00	119.00	29.4	.0	17.1	-14.8	-224.3	.0	.0	30.58	51.87	.589
115.00	114.00	29.0	.0	17.4	-15.2	-309.8	.0	.0	38.46	51.87	.742
110.00	109.00	28.7	.0	17.5	-15.4	-396.6	.0	.0	45.16	51.87	.871
110.00	109.00	28.7	.0	17.6	-15.6	-396.7	.0	.0	33.81	51.87	.652
105.00	104.00	28.3	.0	17.8	-16.0	-484.7	.0	.0	38.08	51.87	.734
102.75	101.75	28.1	.0	18.0	-16.5	-524.8	.0	.0	39.80	51.87	.767
99.00	98.00	27.8	.0	18.3	-17.3	-592.3	.0	.0	35.38	51.87	.682
94.00	93.00	27.4	.0	18.6	-18.0	-683.9	.0	.0	37.91	51.87	.731
89.00	88.00	27.0	.0	18.9	-18.6	-777.0	.0	.0	40.08	51.87	.773
84.00	83.00	26.5	.0	19.2	-19.3	-871.7	.0	.0	41.95	51.87	.809
79.00	78.00	26.1	.0	19.5	-19.9	-967.5	.0	.0	43.56	51.87	.840
74.00	73.00	25.6	.0	19.8	-20.6	-1065.0	.0	.0	44.95	51.87	.867
69.00	68.00	25.1	.0	20.1	-21.3	-1164.2	.0	.0	46.16	51.87	.890
64.00	63.00	24.6	.0	20.4	-22.0	-1265.0	.0	.0	47.21	51.87	.910
59.00	58.00	24.0	.0	20.7	-22.9	-1366.7	.0	.0	48.11	51.87	.927
54.25	53.25	23.4	.0	21.0	-24.2	-1465.8	.0	.0	48.89	51.87	.943
49.25	48.25	22.8	.0	21.3	-25.6	-1570.8	.0	.0	42.86	51.87	.826
44.25	43.25	22.1	.0	21.6	-26.7	-1677.5	.0	.0	43.33	51.87	.835
39.25	38.25	21.4	.0	21.9	-27.6	-1785.0	.0	.0	43.71	51.87	.843
34.25	33.25	20.5	.0	22.2	-28.5	-1895.0	.0	.0	44.06	51.87	.849
29.25	28.25	20.3	.0	22.5	-29.5	-2005.8	.0	.0	44.33	51.87	.855
24.25	23.25	20.3	.0	22.7	-30.5	-2118.3	.0	.0	44.56	51.87	.859
19.25	18.25	20.3	.0	23.0	-31.5	-2231.7	.0	.0	44.74	51.87	.862
14.25	13.25	20.3	.0	23.3	-32.5	-2346.7	.0	.0	44.88	51.87	.865
9.25	8.25	20.3	.0	23.6	-33.5	-2463.3	.0	.0	45.00	51.87	.867
4.25	3.25	20.3	.0	23.8	-34.4	-2580.8	.0	.0	45.07	51.87	.869
1.00	.00	20.3	.0	23.8	-34.4	-2658.3	.1	.0	45.10	51.87	.870 BASE

DISPLACEMENTS

ELEV	--- DEFLECTION feet ---				--- ROTATION, degrees ---			
X, ft	X	Y	Z	XY-Result	X	Y	Z	XY-Result
149.00	.00	10.06	-47	10.06< 6.75%>	-7.33	.00	.00	7.33

CASE - 2: Max Wind Load x.75

TIA/EIA-222-F

VERTICAL OLF	1.00	WIND SPEED	73.6 mph 118.4 kph
ICE COVER	.50 in	GUST FACTOR	1.69
STRESS REDUCTION	.60	EXPOSURE COEFF.	.2857
STRESS AMPLIFY	1.33	Cf	.650
BASE ABOVE Grd	1.00 ft	REFERENCE HEIGHT	33.0 ft
		PRESSURE @Ref.Ht	23.4 psf 1121 Pa

APPURTENANCE LOADS

#	Qty	Description	Center Line Elev-Ft	WEIGHT each Lbs	AREA each Ft^2	Tx-CABLE Type	Qty	#/Ft	WIND Psf	FORCES Tra-Y Kips	AX-Z Kips	MOM. Lg-X Ft-K
1	12	12' Low Profile Platform (R)	147.0	1363	57.9				35.9	2.08	-1.4	-.5
	12	DB844H105	149.0	36		1 5/8"	15	1.04	36.1		-2.7	
2	12	12' Low Profile Platform (R)	139.0	1363	67.1				35.4	2.37	-1.4	-.6
	12	APX16PV-16PVL	139.0	75		1 5/8"	15	1.04	35.4		-3.1	
3	12	12' Low Profile Platform (R)	129.0	1363	99.4				34.6	3.44	-1.4	-.9
	12	7752	129.0	89		1 5/8"	15	1.04	34.7		-3.1	
4	12	12' Low Profile Platform (R)	119.0	1363	99.4				33.8	3.36	-1.4	-.8
	12	7752	119.0	89		1 5/8"	15	1.04	33.9		-2.9	

RESULTS

ELEV.	POLE	WIND	--- FORCES, kips ---			--- MOMENTS, ft-kips ---			STRESS ALLOW		
X, ft	X, ft	psf	ShearX	ShearY	AxisZ	BendX	BendY	TorqZ	ksi	ksi	CSR
150.00	149.00	23.5	.0	.0	.0	.0	.0	.0	.01	51.87	.000
148.00	147.00	23.4	.0	2.7	-4.1	.0	.0	.0	.66	51.87	.013
143.00	142.00	23.2	.0	2.9	-4.3	.0	.0	.0	3.30	51.87	.064
140.00	139.00	23.0	.0	5.9	-8.7	.0	.0	.0	5.29	51.87	.102
135.00	134.00	22.8	.0	6.1	-9.0	.0	.0	.0	9.94	51.87	.192
130.00	129.00	22.5	.0	10.2	-13.4	.0	.0	.0	14.38	51.87	.277
125.00	124.00	22.3	.0	10.5	-13.7	.0	.0	.0	20.51	51.87	.395
120.00	119.00	22.0	.0	14.4	-18.0	.0	.0	.0	26.10	51.87	.503
115.00	114.00	21.8	.0	14.6	-18.4	.0	.0	.0	32.75	51.87	.631
110.00	109.00	21.5	.0	14.7	-18.7	.0	.0	.0	38.38	51.87	.740
110.00	109.00	21.5	.0	14.8	-18.9	.0	.0	.0	28.73	51.87	.554
105.00	104.00	21.2	.0	15.0	-19.3	.0	.0	.0	32.31	51.87	.623
102.75	101.75	21.1	.0	15.1	-19.9	.0	.0	.0	33.75	51.87	.651
99.00	98.00	20.9	.0	15.3	-20.7	.0	.0	.0	29.98	51.87	.578
94.00	93.00	20.5	.0	15.5	-21.5	.0	.0	.0	32.07	51.87	.618
89.00	88.00	20.2	.0	15.8	-22.2	.0	.0	.0	33.87	51.87	.653
84.00	83.00	19.9	.0	16.0	-22.9	.0	.0	.0	35.40	51.87	.683
79.00	78.00	19.5	.0	16.2	-23.6	.0	.0	.0	36.74	51.87	.708
74.00	73.00	19.2	.0	16.4	-24.4	.0	.0	.0	37.88	51.87	.730
69.00	68.00	18.8	.0	16.6	-25.2	.0	.0	.0	38.84	51.87	.749
64.00	63.00	18.4	.0	16.8	-26.0	.0	.0	.0	39.68	51.87	.765
59.00	58.00	18.0	.0	17.1	-26.9	.0	.0	.0	40.40	51.87	.779
54.25	53.25	17.6	.0	17.3	-28.3	.0	.0	.0	40.99	51.87	.790
49.25	48.25	17.1	.0	17.5	-29.8	.0	.0	.0	35.91	51.87	.692
44.25	43.25	16.6	.0	17.7	-31.0	.0	.0	.0	36.26	51.87	.699
39.25	38.25	16.0	.0	17.9	-32.0	.0	.0	.0	36.55	51.87	.705
34.25	33.25	15.4	.0	18.1	-33.0	.0	.0	.0	36.79	51.87	.709
29.25	28.25	15.2	.0	18.3	-34.1	.0	.0	.0	36.99	51.87	.713
24.25	23.25	15.2	.0	18.5	-35.2	.0	.0	.0	37.14	51.87	.716
19.25	18.25	15.2	.0	18.7	-36.3	.0	.0	.0	37.24	51.87	.718
14.25	13.25	15.2	.0	18.9	-37.4	.0	.0	.0	37.33	51.87	.720
9.25	8.25	15.2	.0	19.1	-38.6	.0	.0	.0	37.40	51.87	.721
4.25	3.25	15.2	.0	19.2	-39.6	.0	.0	.0	37.42	51.87	.721
1.00	.00	15.2	.0	19.2	-39.6	.0	.0	.0	37.42	51.87	.721 BASE

DISPLACEMENTS

ELEV	--- DEFLECTION feet ---				--- ROTATION, degrees ---			
X, ft	X	Y	Z	XY-Result	X	Y	Z	XY-Result
149.00	.00	8.39	-.33	8.39< 5.63%>	-6.13	.00	.00	6.13

CASE - 3: Everyday Operating

TIA/EIA-222-F

VERTICAL OLF	1.00	WIND SPEED	50.0 mph	80.5 kph
ICE COVER	.00 in	GUST FACTOR	1.69	
STRESS REDUCTION	.60	EXPOSURE COEFF.	.2857	
STRESS AMPLIFY	1.33	Cf	.650	
BASE ABOVE Grd	1.00 ft	REFERENCE HEIGHT	33.0 ft	
		PRESSURE @Ref.Ht	10.8 psf	518 Pa

APPURTENANCE LOADS

#	Qty	Description	Center Line Elev-Ft	WEIGHT each Lbs	AREA each Ft^2	Tx-CABLE Type Qty #/Ft	WIND Psf	FORCES Tra-Y Ax-Z Kips Kips	MOM. Lg-X Ft-K
1	1	12' Low Profile Platform (R)	147.0	1239	52.4		16.6	.87	-1.2
	12	DB844H105	149.0	10		1 5/8" 15 1.04	16.7		-2.4
2	1	12' Low Profile Platform (R)	139.0	1239	61.4		16.3	1.00	-1.2
	12	APX16PV-16PVL	139.0	45		1 5/8" 15 1.04	16.3		-2.7
3	1	12' Low Profile Platform (R)	129.0	1239	89.1		16.0	1.42	-1.2
	12	7752	129.0	44		1 5/8" 15 1.04	16.0		-2.5
4	1	12' Low Profile Platform (R)	119.0	1239	89.1		15.6	1.39	-1.2
	12	7752	119.0	44		1 5/8" 15 1.04	15.6		-2.4

RESULTS

ELEV.	POLE	WIND	--- FORCES, kips ---			--- MOMENTS, ft-kips ---			STRESS ALLOW		
X, ft	X, ft	psf	ShearX	ShearY	AxialZ	BendX	BendY	TorqZ	ksi	ksi	CSR
150.00	149.00	10.8	.0	.0	.0	.0	.0	.0	.00	51.87	.000
148.00	147.00	10.8	.0	1.1	-3.8	.3	.0	.0	.43	51.87	.008
143.00	142.00	10.7	.0	1.2	-3.9	.5	.0	.0	1.54	51.87	.030
140.00	139.00	10.6	.0	2.5	-8.0	.9	.0	.0	2.55	51.87	.049
135.00	134.00	10.5	.0	2.6	-8.2	21.9	.0	.0	4.47	51.87	.086
130.00	129.00	10.4	.0	4.2	-12.2	35.0	.0	.0	6.46	51.87	.124
125.00	124.00	10.3	.0	4.3	-12.4	56.2	.0	.0	8.97	51.87	.173
120.00	119.00	10.2	.0	6.0	-16.3	78.2	.0	.0	11.41	51.87	.220
115.00	114.00	10.0	.0	6.0	-16.5	108.0	.0	.0	14.14	51.87	.273
110.00	109.00	9.9	.0	6.1	-16.7	138.2	.0	.0	16.44	51.87	.317
110.00	109.00	9.9	.0	6.1	-16.9	138.2	.0	.0	12.31	51.87	.237
105.00	104.00	9.8	.0	6.2	-17.2	168.8	.0	.0	13.79	51.87	.266
102.75	101.75	9.7	.0	6.3	-17.6	182.8	.0	.0	14.39	51.87	.277
99.00	98.00	9.6	.0	6.4	-18.3	206.3	.0	.0	12.76	51.87	.246
94.00	93.00	9.5	.0	6.5	-19.0	238.2	.0	.0	13.63	51.87	.263
89.00	88.00	9.3	.0	6.6	-19.5	270.5	.0	.0	14.38	51.87	.277
84.00	83.00	9.2	.0	6.7	-20.1	303.4	.0	.0	15.02	51.87	.290
79.00	78.00	9.0	.0	6.8	-20.6	336.8	.0	.0	15.58	51.87	.300
74.00	73.00	8.9	.0	6.9	-21.2	370.7	.0	.0	16.06	51.87	.310
69.00	68.00	8.7	.0	7.0	-21.8	405.2	.0	.0	16.48	51.87	.318
64.00	63.00	8.5	.0	7.1	-22.4	440.1	.0	.0	16.84	51.87	.325
59.00	58.00	8.3	.0	7.2	-23.2	475.5	.0	.0	17.15	51.87	.331
54.25	53.25	8.1	.0	7.3	-24.4	509.7	.0	.0	17.42	51.87	.336
49.25	48.25	7.9	.0	7.4	-25.7	546.2	.0	.0	15.27	51.87	.294
44.25	43.25	7.6	.0	7.5	-26.7	583.2	.0	.0	15.43	51.87	.298
39.25	38.25	7.4	.0	7.6	-27.6	620.8	.0	.0	15.57	51.87	.300
34.25	33.25	7.1	.0	7.7	-28.4	658.8	.0	.0	15.69	51.87	.302
29.25	28.25	7.0	.0	7.8	-29.3	697.3	.0	.0	15.78	51.87	.304
24.25	23.25	7.0	.0	7.9	-30.2	736.3	.0	.0	15.86	51.87	.306
19.25	18.25	7.0	.0	8.0	-31.2	775.7	.0	.0	15.93	51.87	.307
14.25	13.25	7.0	.0	8.1	-32.1	815.6	.0	.0	15.98	51.87	.308
9.25	8.25	7.0	.0	8.2	-33.1	855.8	.0	.0	16.01	51.87	.309
4.25	3.25	7.0	.0	8.3	-33.9	896.7	.0	.0	16.04	51.87	.309
1.00	.00	7.0	.0	8.3	-33.9	924.2	.0	.0	16.06	51.87	.310 BASE

DISPLACEMENTS

ELEV	--- DEFLECTION feet ---			--- ROTATION, degrees ---			MicroW
X, ft	X	Y	Z	X	Y	Z	XY-Result Allow
149.00	.00	3.50	-.06	3.50 < 2.35% >	-2.55	.00	.00 2.55

FLANGE DESIGN at: 109.0 ft from BASE of POLE [40.0 ft from IOP]
 SHAPE: 18 SIDED POLYGON
 POLE ORIENTATION: FLAT-FLAT
 LOAD ORIENTATION: ANY LOAD DIRECTION

DESIGN CASE = 1 Max Wind

DIAMETER #1=	27.06 in.	AXIAL FORCE=	-15.4 kips
PLATE #1=	.1875 in.	SHEAR X =	.0 kips
DIAMETER #2=	27.18 in.	SHEAR Y =	17.5 kips
PLATE #2=	.2500 in.	X-AXIS MOM =	-396.6 ft-kips
		Y-AXIS MOM =	.0 ft-kips
		Z-AXIS MOM =	.0 ft-kips

FLANGE BOLTS:

EXTERNAL BC MODEL

AXIAL LOAD	=	43.66 kips	
SHEAR LOAD	=	1.25 kips	
BOLT AREA (Gross)	=	.79 in ²	
MOMENT of INERTIA	=	1267.48 in ⁴	
AXIAL Stress	=	55.62 ksi	
SHEAR Stress	=	1.59 ksi	
CSR	=	.952	
Ft Stress	=	44.00 ksi	
Fv Stress	=	30.00 ksi	
ALLOW TENSION Stress	=	58.52 ksi	[Ft x 1.33]
SHEAR Stress	=	39.90 ksi	[Fv x 1.33]

A-325 ::: BOLT DESIGN USED

14 Bolts	1.00 in.	BOLT DIAMETER	
	92.00 ksi	Fy YIELD STRENGTH	
	120.00 ksi	Fu ULTIMATE STRENGTH	
	30.375 in.	BOLT CIRCLE	SHIP
	6.76 in.	CHORD LENGTH	WEIGHT
	25.71°	ARC ANGLE	14 lbs

PLATE DESIGN

THICKNESS	Reqd	=	Upper-PL	Lower-PL	
BENDING	Stress	=	41.17	39.36 ksi	
TENSION	Stress	=	.56	.61 ksi	
COMBINED	Ratio	=	.87	.83	
ALLOWABLE	Stress (Fa)	=	47.88	47.88 ksi	[Fy x .60 x 1.33]

::: FLANGE PLATE DESIGN USED

1.250 in.	THICK
34.625 in.	OUTSIDE ROUND
60.00 ksi	YIELD STRENGTH
22.000 in.	CENTER HOLE
388 lbs.	SHIP WEIGHT (both)

LOAD CASE SUMMARY

RESULTANTS				BOLT STRESS		Flange-UP Stress		Flange-DW Stress	
Case	Axial kips	Shear kips	Moment ft-kips	Torq-Z ft-kips	Actual CSR	Allow ksi	Actual ksi	Allow ksi	Actual ksi
1	-15.39	17.48	396.6	.0	.952	58.52	41.73	47.88	39.96
2	-18.66	14.69	333.9	.0	.793	58.52	35.22	47.88	33.74
3	-16.66	6.08	138.2	.0	.314	58.52	14.90	47.88	14.32

SABRE COMMUNICATIONS CORP2101 Murray Street
Sioux City, IA 51101

JOB: 07-03039

OPTASITE TOWERS LLC**Waterbury, CT**

14-Mar-07 16:38

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SHAPE: 18 SIDED POLYGON with FLAT-FLAT ORIENTATION
BOLTS: QUADRANT SPACED BOLTS 6.00 in. ON CENTER
LOCATE:**POLE DATA**

DIAMETER =	49.39 in.	BASE	AXIAL FORCE=	-34.4 kips	Vert
PLATE =	.3750 in.	ACTIONS	SHEAR X =	16.8 kips	Long
TAPER =	.2140 in/ft		SHEAR Y =	16.8 kips	Tran
POLE Fy =	65.00 ksi		X-AXIS MOM =	1879.4 ft-kips	Tran
			Y-AXIS MOM =	1879.4 ft-kips	Long
			Z-AXIS MOM =	.0 ft-kips	Vert

DESIGN CASE = 1 Max Wind

Design: ANY Orientation Reactions at 45.00 deg to X-AXIS

BOLT LOADS

	AXIAL - COMPRESSION	=	193.60 kips	
	AXIAL - TENSION	=	187.86 kips	
	SHEAR	=	2.81 kips	
AXIAL	STRESS	=	59.57 ksi	
SHEAR	SIRESS	=	.91 ksi	
YIELD	STRENGTH Fy	=	75.00 ksi	
ULT.	STRENGTH Fu	=	100.00 ksi	CSR
ALLOW	STRESS Fa [.60 x 1.33]	=	59.85 ksi	.996 EIA-F
	TENSION AREA REQUIRED	=	3.23 in ²	
	TENSION AREA FURNISHED	=	3.25 in ²	
	ROOT AREA FURNISHED	=	3.07 in ²	

A615 ::: ANCHOR BOLT DESIGN USED

12 Bolts on a	55.750 in.	Bolt Circle	SHIP
2.250 in. Diameter	67.13 in.	Embedded	(lbs)
12.00 in. Exposed	84.00 in.	Total Length	1668

CONCRETE -- Fc= 4000 psi

ANCHOR BOLTS are STRAIGHT w\ UPLIFT NUT

BASE PLATE

[Bend Model:	Flat- 17]
YIELD STRENGTH	= 60.0 ksi
BEND LINE WIDTH	= 26.0 in.
PLATE MOMENT	= 1515.9 in-k
THICKNESS REQD	= 2.701 in.
BENDING SIRESS	= 38.8 ksi
ALLOWABLE STRESS	= 47.9 ksi
[Fy x .60 x 1.33]	

BASE PLATE USED

3.00 in.	THICK	SHIP
53.25 in.	SQUARE	(lbs)
35.75 in.	CENTER HOLE	1353
9.00 in.	CORNER CLIP	

LOAD CASE SUMMARY

FORCES- (kips)			MOMENTS- (ft-k)			ABolt-Str		Plate-Str		Design Code
LC	Axial	ShearX	ShearY	X-axis	Y-axis	TorQ	CSR	Allow	Actual	
1	34.4	16.8	16.8	1879	1879	0	.996	59.85	38.83	47.88 EIA-F
2	39.6	13.6	13.6	1551	1551	0	.827	59.85	32.24	47.88 EIA-F
3	33.9	5.8	5.8	653	653	0	.355	59.85	13.87	47.88 EIA-F

TOP	DIAMETER	18.50 in.	[18.79 in. Point-Point]
BOTTOM	DIAMETER	49.39 in.	[50.15 in. Point-Point]
POLE	HEIGHT	149.00 ft.	18 SIDED FLAT ORIENTATION
BASE	HEIGHT	1.00 ft.	ABOVE GROUND
E-MODULUS		29000 ksi	[12000 ksi SHEAR MODULUS]

APPURTENANCES

ATTACH POINTS:	NO.	X,ft	Qty	Description	Status
	1	147.00	1	12' Low Profile Platform (R)	Future Appurt
	2	139.00	1	12' Low Profile Platform (R)	Future Appurt
	3	129.00	1	12' Low Profile Platform (R)	Future Appurt
	4	119.00	1	12' Low Profile Platform (R)	Future Appurt

Some wind forces may have been derived from full-scale wind tunnel tests.

Pole Section	Bottom X,ft	Thick in.	Connect Type	LAP in.	Taper in/ft	Length ft.	Weight lbs	Steel Spec	Pole Finish
1	40.00	.18750	FLANGE-X		.2140	40.00	1829	A572-65	Special
2	51.00	.25000	SLIP-JNT	45.	.2140	11.00	834	A572-65	GALVANIZE
3	100.75	.31250	SLIP-JNT	60.	.2140	53.50	6075	A572-65	GALVANIZE
4	149.00	.37500	C-WELD		.2140	53.25	9340	A572-65	GALVANIZE

SECTION PROPERTIES

X,ft	UP,ft	D,in	T,in	Area in ²	Iz in ⁴	IxIy in ⁴	SxSy in ³	w/t	d/t	F _y (ksi)	
149.00	.00	18.50	.1875	10.90	924	462	49.2	15.63	98.7	65.00	TOP
147.00	2.00	18.93	.1875	11.15	990	495	51.5	16.04	100.9	65.00	P01
142.00	7.00	20.00	.1875	11.79	1168	584	57.5	17.04	106.7	65.00	
139.00	10.00	20.64	.1875	12.17	1286	643	61.4	17.65	110.1	65.00	P02
134.00	15.00	21.71	.1875	12.81	1498	749	68.0	18.65	115.8	65.00	
129.00	20.00	22.78	.1875	13.44	1732	866	74.9	19.66	121.5	65.00	P03
124.00	25.00	23.85	.1875	14.08	1992	996	82.3	20.67	127.2	65.00	
119.00	30.00	24.92	.1875	14.72	2274	1137	89.9	21.67	132.9	65.00	P04
114.00	35.00	25.99	.1875	15.36	2582	1291	97.8	22.68	138.6	65.00	
109.00	40.00	27.06	.1875	15.99	2916	1458	106.1	23.68	144.3	65.00	Flng-B01
109.00	40.00	27.18	.2500	21.37	3916	1958	141.9	17.41	108.7	65.00	Flng-T02
104.00	45.00	28.25	.2500	22.22	4402	2201	153.4	18.17	113.0	65.00	
101.75	47.25	28.74	.2500	22.60	4634	2317	158.8	18.50	114.9	65.00	Slip-B02
98.00	51.00	29.04	.3125	28.49	5938	2969	201.4	14.62	92.9	65.00	Slip-T03
93.00	56.00	30.11	.3125	29.55	6628	3314	216.8	15.23	96.3	65.00	
88.00	61.00	31.18	.3125	30.61	7368	3684	232.7	15.83	99.8	65.00	
83.00	66.00	32.25	.3125	31.68	8162	4081	249.2	16.43	103.2	65.00	
78.00	71.00	33.32	.3125	32.74	9008	4504	266.2	17.04	106.6	65.00	
73.00	76.00	34.39	.3125	33.80	9914	4957	283.9	17.64	110.0	65.00	
68.00	81.00	35.46	.3125	34.86	10878	5439	302.1	18.24	113.5	65.00	
63.00	86.00	36.53	.3125	35.92	11902	5951	320.9	18.85	116.9	65.00	
58.00	91.00	37.60	.3125	36.98	12988	6494	340.2	19.45	120.3	65.00	
53.25	95.75	38.62	.3125	37.99	14078	7039	359.0	20.03	123.6	65.00	Slip-B03
48.25	100.75	39.06	.3750	46.04	17406	8703	438.8	16.60	104.2	65.00	Slip-T04
43.25	105.75	40.13	.3750	47.32	18892	9446	463.6	17.11	107.0	65.00	
38.25	110.75	41.20	.3750	48.59	20460	10230	489.1	17.61	109.9	65.00	
33.25	115.75	42.27	.3750	49.86	22108	11054	515.1	18.11	112.7	65.00	
28.25	120.75	43.34	.3750	51.14	23846	11923	541.8	18.62	115.6	65.00	
23.25	125.75	44.41	.3750	52.41	25672	12836	569.3	19.12	118.4	65.00	
18.25	130.75	45.48	.3750	53.68	27590	13795	597.4	19.62	121.3	65.00	
13.25	135.75	46.55	.3750	54.96	29600	14800	626.2	20.13	124.1	65.00	
8.25	140.75	47.62	.3750	56.23	31708	15854	655.7	20.63	127.0	65.00	
3.25	145.75	48.69	.3750	57.51	33910	16955	685.9	21.13	129.8	65.00	
.00	149.00	49.39	.3750	58.33	35396	17698	705.8	21.46	131.7	65.00	BASE

SABRE COMMUNICATIONS CORP

2101 Murray Street
Sioux City, IA 51101

JOB: 07-03039

OPTASITE TOWERS LLC
Waterbury, CT

14-Mar-07 16:35

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CASE - 1: 3s Gusted Wind

ANSI-TIA-222-G

WIND OLF	1.60	GUSTED WIND (3sec)	100.0 mph	160.9 kph
VERTICAL OLF	1.20	EXP-CAT/STRUC CLASS	C-II	
DESIGN ICE	.00 in	EXP-POWER COEFF.	.2105	
GUST FACTOR (Gh)	1.10	REFERENCE HEIGHT	900.0 ft	
FORCE COEFF (Cf)	.65	PRESSURE @ 32.7 ft	42.8 psf	2048.2 Pa
IMPORTANCE FAC (I)	1.00	BASE ABOVE Grd	1.0	
DIRECTION FAC (Kd)	.95	CREST HEIGHT	.0 ft	
TOPOGRAPHIC CAT	1			

APPURTENANCES

Sabre Areas

#	Qty	Description	Center Line Elev-Ft	WEIGHT each Lbs	AREA each Ft^2	Tx-CABLE Type	Qty	#/Ft	WIND Psf	FORCES Tra-Y Kips	AX-Z Kips	MOM. Lg-X Ft-K
1	12	12' Low Profile Platform (R)	147.0	1239	48.5				58.9	2.85	-1.5	- .7
	12	DB844H105	149.0	10		1 5/8"	15	1.04	59.0		-2.9	
2	12	12' Low Profile Platform (R)	139.0	1239	54.6				58.2	3.18	-1.5	- .8
	12	APX16PV-16PVL	139.0	45		1 5/8"	15	1.04	58.1		-3.3	
3	12	12' Low Profile Platform (R)	129.0	1239	81.4				57.3	4.66	-1.5	-1.2
	12	7752	129.0	44		1 5/8"	15	1.04	57.2		-3.0	
4	12	12' Low Profile Platform (R)	119.0	1239	81.4				56.3	4.58	-1.5	-1.1
	12	7752	119.0	44		1 5/8"	15	1.04	56.3		-2.9	

RESULTS

X, ft	Kzt	WIND psf	ICE in	FORCES, kips			MOMENTS, ft-kips			Fly ksi	Inter 4.8.2
				ShearX	ShearY	AxialZ	BendX	BendY	TorqZ		
149.00	1.00	38.35	.00	0	.01	0	0	0	0	65.00	.000
147.00	1.00	38.24	.00	0	3.72	-4.1	- .8	0	0	65.00	.010
142.00	1.00	37.97	.00	0	4.05	-4.3	-19.7	0	0	65.00	.077
139.00	1.00	37.80	.00	0	8.18	-8.7	-32.7	0	0	65.00	.122
134.00	1.00	37.51	.00	0	8.53	-9.0	-73.6	0	0	65.00	.235
129.00	1.00	37.21	.00	0	14.15	-13.1	-117.4	0	0	65.00	.340
124.00	1.00	36.91	.00	0	14.49	-13.5	-188.2	0	0	65.00	.487
119.00	1.00	36.59	.00	0	19.95	-17.6	-261.8	0	0	65.00	.620
114.00	1.00	36.26	.00	0	20.26	-18.0	-361.5	0	0	65.00	.780
109.00	1.00	35.93	.00	0	20.41	-18.3	-462.8	0	0	65.00	.916
109.00	1.00	35.93	.00	0	20.58	-18.6	-462.9	0	0	65.00	.685
104.00	1.00	35.58	.00	0	20.84	-19.0	-565.8	0	0	65.00	.772
101.75	1.00	35.41	.00	0	21.09	-19.6	-612.6	0	0	65.00	.807
98.00	1.00	35.14	.00	0	21.45	-20.6	-691.7	0	0	65.00	.718
93.00	1.00	34.76	.00	0	21.83	-21.5	-798.9	0	0	65.00	.769
88.00	1.00	34.36	.00	0	22.21	-22.2	-908.3	0	0	65.00	.814
83.00	1.00	33.94	.00	0	22.59	-23.0	-1019.2	0	0	65.00	.852
78.00	1.00	33.51	.00	0	22.96	-23.8	-1131.7	0	0	65.00	.885
73.00	1.00	33.05	.00	0	23.34	-24.6	-1246.7	0	0	65.00	.914
68.00	1.00	32.57	.00	0	23.72	-25.5	-1363.3	0	0	65.00	.939
63.00	1.00	32.05	.00	0	24.10	-26.4	-1482.5	0	0	65.00	.961
58.00	1.00	31.51	.00	0	24.48	-27.4	-1602.5	0	0	65.00	.979
53.25	1.00	30.96	.00	0	24.89	-29.0	-1719.2	0	0	65.00	.996
48.25	1.00	30.33	.00	0	25.30	-30.7	-1843.3	0	0	65.00	.873
43.25	1.00	29.66	.00	0	25.69	-32.0	-1970.0	0	0	65.00	.884
38.25	1.00	28.92	.00	0	26.06	-33.1	-2098.3	0	0	65.00	.892
33.25	1.00	28.10	.00	0	26.43	-34.3	-2228.3	0	0	65.00	.900
28.25	1.00	27.18	.00	0	26.80	-35.5	-2360.8	0	0	65.00	.906
23.25	1.00	26.13	.00	0	27.17	-36.7	-2495.0	0	0	65.00	.911
18.25	1.00	24.89	.00	0	27.55	-37.9	-2630.8	0	0	65.00	.916
13.25	1.00	23.65	.00	0	27.93	-39.1	-2768.3	- .1	0	65.00	.919
8.25	1.00	23.65	.00	0	28.32	-40.4	-2908.3	- .1	0	65.00	.922
3.25	1.00	23.65	.00	0	28.64	-41.5	-3050.0	- .1	0	65.00	.925
.00	1.00	23.65	.00	0	28.80	-41.9	-3142.5	.1	0	65.00	.926

DISPLACEMENTS

ELEV X, ft	DEFLECTION feet			XY-Result	ROTATION, degrees			XY-Result
	X	Y	Z		X	Y	Z	
149.00	.00	11.80	-.65	11.80< 7.92%>	-8.59	.00	.00	8.59

SABRE COMMUNICATIONS CORP

2101 Murray Street
Sioux City, IA 51101

JOB: 07-03039

OPTASITE TOWERS LLC
Waterbury, CT

14-Mar-07 16:35

Ph 712.258.6690

Fx 712.258.8250

CASE - 2: 3s Gusted Wind 0.9 Dead

ANSI-TIA-222-G

WIND OLF	1.60	GUSTED WIND (3sec)	100.0 mph	160.9 kph
VERTICAL OLF	.90	EXP-CAT/STRUC CLASS	C-II	
DESIGN ICE	.00 in	EXP-POWER COEFF.	.2105	
GUST FACTOR (Gh)	1.10	REFERENCE HEIGHT	900.0 ft	
FORCE COEFF (Cf)	.65	PRESSURE @ 32.7 ft	42.8 psf	2048.2 Pa
IMPORTANCE FAC (I)	1.00	BASE ABOVE Grd	1.0	
DIRECTION FAC (Kd)	.95	CREST HEIGHT	.0 ft	
TOPOGRAPHIC CAT	1			

APPURTENANCES

Sabre Areas

#	Qty	Description	Center Line Elev-Ft	WEIGHT each Lbs	AREA each Ft^2	Tx-CABLE Type	Qty #/Ft	WIND Psf	FORCES Tra-Y Kips	MOM. Ax-Z Kips	Lg-X Ft-K
1	12	12' Low Profile Platform (R)	147.0	1239	48.5			58.9	2.85	-1.1	-7
	12	DB844H105	149.0	10		1 5/8"	15 1.04	59.0		-2.2	
2	12	12' Low Profile Platform (R)	139.0	1239	54.6			58.2	3.18	-1.1	-8
	12	APX16PV-16PVL	139.0	45		1 5/8"	15 1.04	58.1		-2.4	
3	12	12' Low Profile Platform (R)	129.0	1239	81.4			57.3	4.66	-1.1	-12
	12	7752	129.0	44		1 5/8"	15 1.04	57.2		-2.3	
4	12	12' Low Profile Platform (R)	119.0	1239	81.4			56.3	4.58	-1.1	-11
	12	7752	119.0	44		1 5/8"	15 1.04	56.3		-2.1	

RESULTS

X, ft	Kzt	WIND psf	ICE in	FORCES, kips	MOMENTS, ft-kips	F'y ksi	Inter
				ShearX ShearY AxiaZ	BendX BendY TorqZ		4.8.2
149.00	1.00	38.35	.00	.00 .00 .00	.0 .0 .0	65.00	.000
147.00	1.00	38.24	.00	3.53 -3.0 .0	-8 .0 .0	65.00	.008
142.00	1.00	37.97	.00	3.86 -3.1 .0	-18.8 .0 .0	65.00	.072
139.00	1.00	37.80	.00	7.79 -6.4 .0	-31.2 .0 .0	65.00	.114
134.00	1.00	37.51	.00	8.14 -6.6 .0	-70.2 .0 .0	65.00	.221
129.00	1.00	37.21	.00	13.59 -9.5 .0	-112.1 .0 .0	65.00	.320
124.00	1.00	36.91	.00	13.94 -9.8 .0	-180.0 .0 .0	65.00	.462
119.00	1.00	36.59	.00	19.25 -12.8 .0	-250.8 .0 .0	65.00	.589
114.00	1.00	36.26	.00	19.59 -13.1 .0	-347.1 .0 .0	65.00	.744
109.00	1.00	35.93	.00	19.75 -13.3 .0	-445.0 .0 .0	65.00	.876
109.00	1.00	35.93	.00	19.94 -13.5 .0	-445.1 .0 .0	65.00	.655
104.00	1.00	35.58	.00	20.21 -13.9 .0	-544.7 .0 .0	65.00	.740
101.75	1.00	35.41	.00	20.46 -14.4 .0	-590.2 .0 .0	65.00	.774
98.00	1.00	35.14	.00	20.83 -15.1 .0	-666.9 .0 .0	65.00	.689
93.00	1.00	34.76	.00	21.23 -15.8 .0	-771.1 .0 .0	65.00	.739
88.00	1.00	34.36	.00	21.63 -16.4 .0	-877.5 .0 .0	65.00	.783
83.00	1.00	33.94	.00	22.03 -17.0 .0	-985.0 .0 .0	65.00	.820
78.00	1.00	33.51	.00	22.44 -17.6 .0	-1095.8 .0 .0	65.00	.854
73.00	1.00	33.05	.00	22.85 -18.3 .0	-1207.5 .0 .0	65.00	.882
68.00	1.00	32.57	.00	23.26 -19.0 .0	-1321.7 .0 .0	65.00	.907
63.00	1.00	32.05	.00	23.67 -19.6 .0	-1438.3 .0 .0	65.00	.929
58.00	1.00	31.51	.00	24.08 -20.5 .0	-1556.7 .0 .0	65.00	.949
53.25	1.00	30.96	.00	24.51 -21.7 .0	-1670.8 .0 .0	65.00	.965
48.25	1.00	30.33	.00	24.94 -23.0 .0	-1793.3 .0 .0	65.00	.847
43.25	1.00	29.66	.00	25.36 -24.0 .0	-1918.3 .0 .0	65.00	.858
38.25	1.00	28.92	.00	25.77 -24.9 .0	-2045.0 .0 .0	65.00	.867
33.25	1.00	28.10	.00	26.18 -25.8 .0	-2174.2 .0 .0	65.00	.875
28.25	1.00	27.18	.00	26.58 -26.7 .0	-2305.0 .0 .0	65.00	.882
23.25	1.00	26.13	.00	26.99 -27.6 .0	-2437.5 .0 .0	65.00	.888
18.25	1.00	24.89	.00	27.41 -28.5 .0	-2572.5 .0 .0	65.00	.893
13.25	1.00	23.65	.00	27.84 -29.5 .0	-2710.0 .0 .0	65.00	.897
8.25	1.00	23.65	.00	28.27 -30.5 .0	-2849.2 .0 .0	65.00	.901
3.25	1.00	23.65	.00	28.63 -31.3 .0	-2990.0 .0 .0	65.00	.904
.00	1.00	23.65	.00	28.79 -31.6 .0	-3083.3 .0 .0	65.00	.906

DISPLACEMENTS

ELEV X, ft	DEFLECTION feet	ROTATION, degrees
	X Y Z XY-Result	X Y Z XY-Result
149.00	.00 11.48 -.61 11.48< 7.70%>	-8.32 .00 .00 8.32

SABRE COMMUNICATIONS CORP

2101 Murray Street
Sioux City, IA 51101

JOB: 07-03039

OPTASITE TOWERS LLC
Waterbury, CT

14-Mar-07 16:35

Ph 712.258.6690

Ex 712.258.8250

CASE - 3: 3s Gusted Wind&Ice

ANSI-TIA-222-G

WIND OLF	1.00	GUSTED WIND (3sec)	50.0 mph	80.5 kph
VERTICAL OLF	1.20	EXP-CAT/STRUC CLASS	C-II	
DESIGN ICE	.75 in	EXP-POWER COEFF.	.2105	
GUST FACTOR (Gh)	1.10	REFERENCE HEIGHT	900.0 ft	
FORCE COEFF (Cf)	1.20	PRESSURE @ 32.7 ft	6.7 psf	320.0 Pa
IMPORTANCE FAC (I)	1.00	BASE ABOVE Grd	1.0	
DIRECTION FAC (Kd)	.95	CREST HEIGHT	.0 ft	
TOPOGRAPHIC CAT	1			

APPURTENANCES

Sabre Areas

#	Qty	Description	Center Line Elev-Ft	WEIGHT each Lbs	AREA each Ft^2	Tx-CABLE Type	Qty	#/Ft	WIND Psf	FORCES Tra-Y Kips	MOM. Ax-Z Kips	Lg-X Ft-K
1	12'	Low Profile Platform (R)	147.0	1363	63.2				9.2	.58	-5.8	-1
	12	DB844H105	149.0	36		1 5/8"	15	1.04	9.2		-5.2	
2	12'	Low Profile Platform (R)	139.0	1363	69.7				9.1	.63	-5.8	-2
	12	APX16PV-16PVL	139.0	75		1 5/8"	15	1.04	9.1		-5.8	
3	12'	Low Profile Platform (R)	129.0	1363	102.8				8.9	.92	-5.7	-2
	12	7752	129.0	89		1 5/8"	15	1.04	8.9		-6.6	
4	12'	Low Profile Platform (R)	119.0	1363	102.6				8.8	.90	-5.7	-2
	12	7752	119.0	89		1 5/8"	15	1.04	8.8		-6.4	

RESULTS

X, ft	Kzt	WIND psf	ICE in	--- FORCES, kips ---	--- MOMENTS, ft-kips ---	F'y	Inter
				ShearX ShearY AxiaZ	BendX BendY TorqZ	ksi	4.8.2
149.00	1.00	11.06	1.75	0.01	0.0	0.0	65.00
147.00	1.00	11.03	1.74	.93	-7.2	0.0	65.00
142.00	1.00	10.95	1.74	1.04	-7.5	0.0	65.00
139.00	1.00	10.90	1.73	2.05	-15.3	0.0	65.00
134.00	1.00	10.82	1.73	2.18	-15.8	0.0	65.00
129.00	1.00	10.73	1.72	3.51	-24.6	0.0	65.00
124.00	1.00	10.65	1.71	3.62	-25.1	0.0	65.00
119.00	1.00	10.55	1.71	4.90	-33.7	0.0	65.00
114.00	1.00	10.46	1.70	4.99	-34.3	0.0	65.00
109.00	1.00	10.36	1.69	5.03	-34.6	0.0	65.00
109.00	1.00	10.36	1.69	5.09	-35.0	0.0	65.00
104.00	1.00	10.26	1.68	5.16	-35.6	0.0	65.00
101.75	1.00	10.22	1.68	5.23	-36.4	0.0	65.00
98.00	1.00	10.14	1.67	5.34	-37.5	0.0	65.00
93.00	1.00	10.03	1.67	5.45	-38.6	0.0	65.00
88.00	1.00	9.91	1.66	5.56	-39.5	0.0	65.00
83.00	1.00	9.79	1.65	5.66	-40.5	0.0	65.00
78.00	1.00	9.67	1.64	5.77	-41.6	0.0	65.00
73.00	1.00	9.53	1.63	5.88	-42.6	0.0	65.00
68.00	1.00	9.39	1.61	5.98	-43.7	0.0	65.00
63.00	1.00	9.25	1.60	6.09	-44.8	0.0	65.00
58.00	1.00	9.09	1.59	6.19	-46.1	0.0	65.00
53.25	1.00	8.93	1.58	6.30	-47.9	0.0	65.00
48.25	1.00	8.75	1.56	6.41	-49.9	0.0	65.00
43.25	1.00	8.56	1.54	6.52	-51.5	0.0	65.00
38.25	1.00	8.34	1.53	6.62	-52.9	0.0	65.00
33.25	1.00	8.11	1.51	6.72	-54.3	0.0	65.00
28.25	1.00	7.84	1.48	6.82	-55.8	0.0	65.00
23.25	1.00	7.54	1.45	6.92	-57.3	0.0	65.00
18.25	1.00	7.18	1.42	7.02	-58.8	0.0	65.00
13.25	1.00	6.82	1.38	7.13	-60.3	0.0	65.00
8.25	1.00	6.82	1.32	7.23	-61.9	0.0	65.00
3.25	1.00	6.82	1.22	7.32	-63.2	0.0	65.00
.00	1.00	6.82	1.06	7.36	-63.6	0.0	65.00

DISPLACEMENTS

ELEV	X	Y	Z	XY-Result	X	Y	Z	XY-Result
149.00	.00	2.96	-.05	2.96< 1.98%>	-2.15	.00	.00	2.15

SABRE COMMUNICATIONS CORP

2101 Murray Street
Sioux City, IA 51101

JOB: 07-03039

OPTASITE TOWERS LLC
Waterbury, CT

14-Mar-07 16:35

Ph 712.258.6690

Fx 712.258.8250

CASE - 4: Service Loads

ANSI-TIA-222-G

WIND OLF	1.00	GUSTED WIND (3sec)	60.0 mph	96.6 kph
VERTICAL OLF	1.00	EXP-CAT/STRUC CLASS	C-II	
DESIGN ICE	.00 in	EXP-POWER COEFF.	.2105	
GUST FACTOR (Gh)	1.10	REFERENCE HEIGHT	900.0 ft	
FORCE COEFF (Cf)	.65	PRESSURE @ 32.7 ft	8.6 psf	412.3 Pa
IMPORTANCE FAC (I)	1.00	BASE ABOVE Grd	1.0	
DIRECTION FAC (Kd)	.85	CREST HEIGHT	.0 ft	
TOPOGRAPHIC CAT	1			

APPURTENANCES

Sabre Areas

#	Qty	Description	Center Line Elev-Ft	WEIGHT each Lbs	AREA each Ft^2	Tx-CABLE Type	Qty	#/Ft	WIND Psf	FORCES Tra-Y Kips	AX-Z Kips	MOM. Lg-X Ft-K
1	1	12' Low Profile Platform (R)	147.0	1239	48.5				11.8	.57	-1.2	-.1
	12	DB844H105	149.0	10		1 5/8"	15	1.04	11.9		-2.4	
2	1	12' Low Profile Platform (R)	139.0	1239	54.6				11.7	.64	-1.2	-.2
	12	APX16PV-16PVL	139.0	45		1 5/8"	15	1.04	11.7		-2.7	
3	1	12' Low Profile Platform (R)	129.0	1239	81.4				11.5	.94	-1.2	-.2
	12	7752	129.0	44		1 5/8"	15	1.04	11.5		-2.5	
4	1	12' Low Profile Platform (R)	119.0	1239	81.4				11.3	.92	-1.2	-.2
	12	7752	119.0	44		1 5/8"	15	1.04	11.3		-2.4	

RESULTS

X, ft	Kzt	WIND psf	ICE in	--- FORCES, kips ---	--- MOMENTS, ft-kips ---	F'y ksi	Inter
				[ShearX ShearY AxiaZ]	BendX BendY TorqZ		
149.00	1.00	7.72	.00	.00 .00 .00	.0 .0 .0	65.00	.000
147.00	1.00	7.70	.00	.73 -3.8 .0	.2 .0 .0	65.00	.007
142.00	1.00	7.64	.00	.80 -4.0 .0	.3 .0 .0	65.00	.020
139.00	1.00	7.61	.00	1.61 -8.1 .0	.4 .0 .0	65.00	.033
134.00	1.00	7.55	.00	1.68 -8.3 .0	.5 .0 .0	65.00	.055
129.00	1.00	7.49	.00	2.80 -12.3 .0	.2 .0 .0	65.00	.079
124.00	1.00	7.43	.00	2.87 -12.5 .0	.2 .0 .0	65.00	.108
119.00	1.00	7.37	.00	3.96 -16.4 .0	.8 .0 .0	65.00	.137
114.00	1.00	7.30	.00	4.02 -16.6 .0	.5 .0 .0	65.00	.169
109.00	1.00	7.23	.00	4.05 -16.8 .0	.7 .0 .0	65.00	.195
109.00	1.00	7.23	.00	4.09 -17.0 .0	.7 .0 .0	65.00	.146
104.00	1.00	7.16	.00	4.14 -17.3 .0	.1 .0 .0	65.00	.163
101.75	1.00	7.13	.00	4.19 -17.7 .0	.4 .0 .0	65.00	.170
98.00	1.00	7.07	.00	4.27 -18.4 .0	.2 .0 .0	65.00	.151
93.00	1.00	7.00	.00	4.35 -19.1 .0	.5 .0 .0	65.00	.161
88.00	1.00	6.92	.00	4.42 -19.6 .0	.3 .0 .0	65.00	.170
83.00	1.00	6.83	.00	4.50 -20.1 .0	.3 .0 .0	65.00	.177
78.00	1.00	6.75	.00	4.58 -20.7 .0	.8 .0 .0	65.00	.184
73.00	1.00	6.65	.00	4.66 -21.3 .0	.8 .0 .0	65.00	.190
68.00	1.00	6.56	.00	4.74 -21.9 .0	.0 .0 .0	65.00	.195
63.00	1.00	6.45	.00	4.82 -22.5 .0	.8 .0 .0	65.00	.199
58.00	1.00	6.34	.00	4.90 -23.3 .0	.8 .0 .0	65.00	.203
53.25	1.00	6.23	.00	4.98 -24.4 .0	.1 .0 .0	65.00	.206
48.25	1.00	6.11	.00	5.07 -25.7 .0	.0 .0 .0	65.00	.181
43.25	1.00	5.97	.00	5.15 -26.8 .0	.3 .0 .0	65.00	.183
38.25	1.00	5.82	.00	5.23 -27.6 .0	.2 .0 .0	65.00	.185
33.25	1.00	5.66	.00	5.31 -28.4 .0	.3 .0 .0	65.00	.187
28.25	1.00	5.47	.00	5.39 -29.3 .0	.8 .0 .0	65.00	.188
23.25	1.00	5.26	.00	5.47 -30.2 .0	.8 .0 .0	65.00	.189
18.25	1.00	5.01	.00	5.55 -31.1 .0	.2 .0 .0	65.00	.190
13.25	1.00	4.76	.00	5.64 -32.1 .0	.9 .0 .0	65.00	.191
8.25	1.00	4.76	.00	5.72 -33.0 .0	.1 .0 .0	65.00	.192
3.25	1.00	4.76	.00	5.79 -33.8 .0	.7 .0 .0	65.00	.192
.00	1.00	4.76	.00	5.82 -34.2 .0	.5 .0 .0	65.00	.193

DISPLACEMENTS

ELEV X, ft	DEFLECTION feet	ROTATION, degrees	MicroW Allow
	X Y Z XY-Result	X Y Z XY-Result	
149.00	.00 2.35 -.03 2.35< 1.58%>	-1.71 .00 .00 1.71	

FLANGE DESIGN at: 109.0 ft from BASE of POLE [40.0 ft from TOP]
 SHAPE: 18 SIDED POLYGON
 POLE ORIENTATION: FLAT-FLAT
 LOAD ORIENTATION: ANY LOAD DIRECTION

DESIGN CASE = 1 3s Gusted Wind

DIAMETER #1=	27.06 in.	AXIAL FORCE=	-18.3 kips
PLATE #1=	.1875 in.	SHEAR X =	.0 kips
DIAMETER #2=	27.18 in.	SHEAR Y =	20.4 kips
PLATE #2=	.2500 in.	X-AXIS MOM =	-462.8 ft-kips
		Y-AXIS MOM =	.0 ft-kips
		Z-AXIS MOM =	.0 ft-kips

FLANGE BOLTS:

EXTERNAL BC MODEL

AXIAL Stress	=	65.38 ksi
SHEAR Stress	=	1.44 ksi
BOLT AREA (Tension)	=	.61 in ²
MOMENT of INERTIA	=	1258 in ⁴
CSR	=	.977

ALLOW TENSION Stress	=	69.00 ksi [.75 x Fy]
SHEAR Stress	=	48.30 ksi [.75 x Fy x 0.70]

A-325 ::: BOLT DESIGN USED

18 Bolts	1.00 in.	BOLT DIAMETER	
	92.00 ksi	Fy YIELD STRENGTH	
	120.00 ksi	Fu ULTIMATE STRENGTH	
	30.375 in.	BOLT CIRCLE	SHIP
	5.27 in.	CHORD LENGTH	WEIGHT
	20.00°	ARC ANGLE	18 lbs

PLATE DESIGN

			Upper-PL	Lower-PL	
THICKNESS	Reqd	=	1.19	1.16 in.	
BENDING	Stress	=	48.05	45.93 ksi	
TENSION	Stress	=	.67	.72 ksi	
COMBINED	Ratio	=	.90	.86	
ALLOWABLE	Stress (Fa)	=	54.00	54.00 ksi	[Fy x .90]

::: FLANGE PLATE DESIGN USED

1.250 in.	THICK
34.625 in.	OUTSIDE ROUND
60.00 ksi	YIELD STRENGTH
22.000 in.	CENTER HOLE
384 lbs.	SHIP WEIGHT (both)

LOAD CASE SUMMARY

RESULTANTS					BOLT STRESS		Flange-UP Stress		Flange-DW Stress	
Case	Axial kips	Shear kips	Moment ft-kips	Torq-Z ft-kips	Actual CSR	Allow ksi	Actual ksi	Allow ksi	Actual ksi	Allow ksi
1	-18.26	20.41	462.8	.0	.977	69.00	48.71	54.00	46.65	54.00
2	-13.31	19.75	445.0	.0	.946	69.00	46.86	54.00	44.88	54.00
3	-34.63	5.03	114.9	.0	.203	69.00	12.59	54.00	12.12	54.00
4	-16.76	4.05	91.7	.0	.176	69.00	10.18	54.00	9.81	54.00

SABRE COMMUNICATIONS CORP2101 Murray Street
Sioux City, IA 51101

JOB: 07-03039

OPTASITE TOWERS LLC**Waterbury, CT**

14-Mar-07 16:35

Ph 712.258.6690

Fx 712.258.8250

SHAPE: 18 SIDED POLYGON with FLAT-FLAT ORIENTATION
BOLTS: QUADRANT SPACED BOLTS 6.00 in. ON CENTER
LOCATE:**POLE DATA**

DIAMETER =	49.39 in.	BASE	AXIAL FORCE=	-41.9 kips	Vert
PLATE =	.3750 in.	ACTIONS	SHEAR X =	20.4 kips	Long
TAPER =	.2140 in/ft		SHEAR Y =	20.4 kips	Tran
POLE Fy =	65.00 ksi		X-AXIS MOM =	2221.7 ft-kips	Tran
			Y-AXIS MOM =	2221.7 ft-kips	Long
			Z-AXIS MOM =	.0 ft-kips	Vert

DESIGN CASE = 1 3s Gusted Wind

Design: ANY Orientation Reactions at 45.00 deg to X-AXIS

BOLT LOADS

	AXIAL - COMPRESSION	=	228.96 kips	
	AXIAL - TENSION	=	221.98 kips	
	SHEAR	=	3.39 kips	
AXIAL	STRESS	=	70.45 ksi	
SHEAR	STRESS	=	1.11 ksi	
YIELD	SIRENGTH Fy	=	75.00 ksi	
ULT.	SIRENGTH Fu	=	100.00 ksi	
ALLOW	SIRESS Fa [.80 x 1.00]	=	80.00 ksi	Interaction
	SHEAR Fv [.80 x .40]	=	32.00 ksi	.908 TIA-G
	TENSION AREA REQUIRED	=	2.86 in ²	
	TENSION AREA FURNISHED	=	3.25 in ²	
	ROOT AREA FURNISHED	=	3.07 in ²	

A615 ::: ANCHOR BOLT DESIGN USED

12 Bolts on a	55.750 in.	Bolt Circle	SHIP
2.250 in. Diameter	67.13 in.	Embedded	(lbs)
12.00 in. Exposed	84.00 in.	Total Length	1668

CONCRETE - Fc= 4000 psi

ANCHOR BOLIS are STRAIGHT w\ UPLIFT NUT

BASE PLATE

[Bend Model:	Flat- 17]
YIELD STRENGTH	= 60.0 ksi
BEND LINE WIDTH	= 26.0 in.
PLATE MOMENT	= 1792.8 in-k
THICKNESS REQD	= 2.766 in.
BENDING STRESS	= 45.9 ksi
ALLOWABLE STRESS	= 54.0 ksi
[Fy x .90 x 1.00]	

BASE PLATE USED

3.00 in.	THICK	SHIP
53.25 in.	SQUARE	(lbs)
35.75 in.	CENTER HOLE	1353
9.00 in.	CORNER CLIP	

LOAD CASE SUMMARY

FORCES- (kips)			MOMENTS- (ft-k)			ABolt-Str		Plate-Str		Design
LC	Axial	ShearX	ShearY	X-axis	Y-axis	TorQ	CSR	Allow	Actual	
1	41.9	20.4	20.4	2222	2222	0	.908	75.00	45.92	54.00 TIA-G
2	31.6	20.4	20.4	2180	2180	0	.889	75.00	44.89	54.00 TIA-G
3	63.6	5.2	5.2	559	559	0	.246	75.00	12.47	54.00 TIA-G
4	34.2	4.1	4.1	444	444	0	.190	75.00	9.62	54.00 IIA-G

MAT FOUNDATION DESIGN BY SABRE COMMUNICATIONS CORP.
150' Monopole OPTASITE TOWERS LLC Waterbury, CT (07-03039) 3-14-07 FIK

Overall Loads:

Moment (ft-kips)	2658.33		
Axial (kips)	34.42		
Shear (kips)	23.82		
Allowable Bearing Pressure (ksf)	8	Maximum Net Bearing Pressure (ksf)	2.34
Water Table Below Grade (ft)	999		
Width of Mat (ft)	22		
Thickness of Mat (ft)	2		
Depth to Bottom of Slab (ft)	5.5		
Quantity of Bars in Bolt Circle	12		
Bolt Circle Diameter (in)	55.75		
Top of Concrete to Top of Bottom Threads (in)	60		
Diameter of Pier (ft)	7	Minimum Pier Diameter (ft)	6.15
Ht. of Pier Above Ground (ft)	1	Equivalent Square b (ft)	6.20
Ht. of Pier Below Ground (ft)	3.5		
Quantity of Bars in Mat	35		
Bar Diameter in Mat (in)	1		
Area of Bars in Mat (in ²)	27.49		
Spacing of Bars in Mat (in)	7.56	Recommended Spacing (in)	6 to 12
Quantity of Bars Pier	36		
Bar Diameter in Pier (in)	1		
Tie Bar Diameter in Pier (in)	0.5		
Spacing of Ties (in)	12		
Area of Bars in Pier (in ²)	28.27	Minimum Pier A _s (in ²)	27.71
Spacing of Bars in Pier (in)	6.63	Recommended Spacing (in)	6 to 12
f _c (ksi)	4		
f _y (ksi)	60		
Unit Wt. of Soil (kcf)	0.13		
Unit Wt. of Concrete (kcf)	0.15		
Load Factor	1.3		
Volume of Concrete (yd ³)	42.27		
Two-Way Shear Action:			
Average d (in)	20		
φV _c (kips)	1239.8	V _u (kips)	49.6
φV _c = φ(2 + 4/β _c)f _c ^{1/2} b _o d	1859.8		
φV _c = φ(α _s d/b _o + 2)f _c ^{1/2} b _o d	1378.9		
φV _c = φ4f _c ^{1/2} b _o d	1239.8		
Shear perimeter, b _o (in)	326.73		
β _c	1		
One-Way Shear:			
φV _c (kips)	500.9	V _u (kips)	279.3
Stability:			
Allowable Resisting M (ft-k)	2994.2	Total Applied M (ft-k)	2813.2

MAT FOUNDATION DESIGN BY SABRE COMMUNICATIONS CORP. (CONTINUED)
 150' Monopole OPTASITE TOWERS LLC Waterbury, CT (07-03039) 3-14-07 FIK

Pier Design:

ϕV_n (kips)	537.2	V_u (kips)	31.0
$\phi V_c = \phi 2(1 + N_u / (2000 A_g)) f_c^{1/2} b_w d$	537.2		
V_s (kips)	0.0	*** $V_s \text{ max} = 4 f_c^{1/2} b_w d$ (kips)	1428.0
Maximum Spacing (in)	5.61	(Only if Shear Ties are Required)	

*** Ref. To Spacing Requirements ACI 11.5.4.3

Flexure in Slab:

ϕM_n (ft-kips)	2360.4	M_u (ft-kips)	2351.6
a (in)	1.84		
Steel Ratio	0.00521		
β_1	0.85		
Maximum Steel Ratio (75 p_b)	0.0214		
Minimum Steel Ratio	0.0018		
Rebar Development in Pad (in)	129.00	Required Development in Pad (in)	47.25

Condition	1 is OK, 0 Fails
Maximum Soil Bearing Pressure	1
Pier Area of Steel	1
Pier Shear	1
Interaction Diagram Visual Check	1
Two-Way Shear Action	1
One-Way Shear Action	1
Stability (Safety Factor = 1.5)	1
Flexure	1
Steel Ratio	1
Length of Development in Pad	1

MAT FOUNDATION DESIGN BY SABRE COMMUNICATIONS CORP.

150' Monopole OPTASITE TOWERS LLC Waterbury, CT (07-03039) 3-14-07 FIK

Overall Loads:

Factored Moment (ft-kips)	3142.5
Factored Axial (kips)	41.864
Factored Shear (kips)	28.799
Bearing Design Strength (ksf)	12
Water Table Below Grade (ft)	999
Width of Mat (ft)	22
Thickness of Mat (ft)	2
Depth to Bottom of Slab (ft)	5.5
Quantity of Bars in Bolt Circle	12
Bolt Circle Diameter (in)	55.75
Top of Concrete to Top of Bottom Threads (in)	60
Diameter of Pier (ft)	7
Ht. of Pier Above Ground (ft)	1
Ht. of Pier Below Ground (ft)	3.5
Quantity of Bars in Mat	35
Bar Diameter in Mat (in)	1
Area of Bars in Mat (in ²)	27.49
Spacing of Bars in Mat (in)	7.56
Quantity of Bars Pier	36
Bar Diameter in Pier (in)	1
Tie Bar Diameter in Pier (in)	0.5
Spacing of Ties (in)	12
Area of Bars in Pier (in ²)	28.27
Spacing of Bars in Pier (in)	6.63
f _c (ksi)	4
f _y (ksi)	60
Unit Wt. of Soil (kcf)	0.13
Unit Wt. of Concrete (kcf)	0.15

Max Net Bearing Press (ksf) 3.65

Ultimate Bearing Pressure (ksf) 16.00
Bearing Φ s 0.75

Minimum Pier Diameter (ft) 6.15
Equivalent Square b (ft) 6.20

Recommended Spacing (in) 6 to 12

Minimum Pier A_s (in²) 27.71
Recommended Spacing (in) 6 to 12

Volume of Concrete (yd³) 42.27

Two-Way Shear Action:

Average d (in)	20
ϕV_c (kips)	1239.8
$\phi V_c = \phi(2 + 4/\beta_c)f_c^{1/2}b_o d$	1859.8
$\phi V_c = \phi(\alpha_s d/b_o + 2)f_c^{1/2}b_o d$	1378.9
$\phi V_c = \phi 4f_c^{1/2}b_o d$	1239.8
Shear perimeter, b _o (in)	326.73
β_c	1

V_u (kips) 45.6

One-Way Shear:

ϕV_c (kips) 567.7

V_u (kips) 224.6

Stability:

Overturning Design Strength (ft-k) 4115.9

Total Applied M (ft-k) 3329.7

MAT FOUNDATION DESIGN BY SABRE COMMUNICATIONS CORP. (CONTINUED)
 150' Monopole OPTASITE TOWERS LLC Waterbury, CT (07-03039) 3-14-07 FIK

Pier Design:

ϕV_n (kips)	609.2	V_u (kips)	28.8
$\phi V_c = \phi 2(1 + N_u / (2000 A_g)) f'_c{}^{1/2} b_w d$	609.2		
V_s (kips)	0.0	*** $V_s \text{ max} = 4 f'_c{}^{1/2} b_w d$ (kips)	1428.0
Maximum Spacing (in)	5.61	(Only if Shear Ties are Required)	

*** Ref To Spacing Requirements ACI 11.5.4.3

Flexure in Slab:

ϕM_n (ft-kips)	2360.4	M_u (ft-kips)	2294.3
a (in)	1.84		
Steel Ratio	0.00521		
β_1	0.85		
Maximum Steel Ratio (.75 p_b)	0.0214		
Minimum Steel Ratio	0.0018		
Rebar Development in Pad (in)	129.00	Required Development in Pad (in)	46.04

Condition	1 is OK, 0 Fails
Maximum Soil Bearing Pressure	1
Pier Area of Steel	1
Pier Shear	1
Interaction Diagram Visual Check	1
Two-Way Shear Action	1
One-Way Shear Action	1
Overturning	1
Flexure	1
Steel Ratio	1
Length of Development in Pad	1