

# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

Internet: [ct.gov/csc](http://ct.gov/csc)

Daniel F. Caruso  
Chairman

August 21, 2008

Kenneth C. Baldwin, Esq.  
Robinson & Cole LLP  
280 Trumbull Street  
Hartford, CT 06103-3597

RE: **EM-VER-018-080717** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 37 Carmen Hill Road, Brookfield, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated July 17, 2008, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

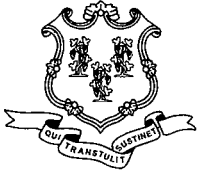
Thank you for your attention and cooperation.

Very truly yours,

S. Derek Phelps  
Executive Director

SDP/MP/cm

c: The Honorable Robert G. Silvaggi, First Selectman, Town of Brookfield  
Clare Ann Walsh, Land Use Enforcement Officer, Town of Brookfield  
Charter Communications



# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

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Internet: [ct.gov/csc](http://ct.gov/csc)

Daniel F. Caruso  
Chairman

July 18, 2008

The Honorable Robert G. Silvaggi  
First Selectman  
Town of Brookfield  
Brookfield Municipal Center  
Pocono Road  
P. O. Box 5106  
Brookfield, CT 06804-5106

RE: **EM-VER-018-080717** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 37 Carmen Hill Road, Brookfield, Connecticut.

Dear Mr. Silvaggi:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by August 1, 2008.

Thank you for your cooperation and consideration.

Very truly yours,

S. Derek Phelps  
Executive Director

SDP/jb

Enclosure: Notice of Intent

c: Clare Ann Walsh, Land Use Enforcement Officer, Town of Brookfield  
Heather Paton, Land Use Office, Town of Brookfield

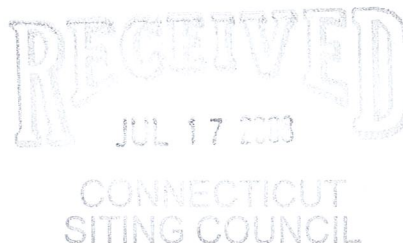
EM-VER-018-080717

280 Trumbull Street  
Hartford, CT 06103-3597  
Main (860) 275-8200  
Fax (860) 275-8299  
kbaldwin@rc.com  
Direct (860) 275-8345

ORIGINAL

July 17, 2008

*Via Hand Delivery*



S. Derek Phelps  
Executive Director  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

Re: **Notice of Exempt Modification – Antenna Swap  
37 Carmen Hill Road, Brookfield, Connecticut**

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains a wireless telecommunications facility at the above referenced location. The Council approved Cellco’s shared use of this facility on August 8, 1995. Cellco intends to modify its installation by replacing its existing cellular antennas with three (3) newer model (BXA-80080/4CF) cellular antennas at the 70-foot level on the 80-foot Charter Communications tower. Attached behind Tab 1 are the specifications for the proposed replacement antennas.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Robert Silvaggi, First Selectman of the Town of Brookfield. Charter Communications is the owner of the property on which the facility is located.

The planned modifications to the facility falls squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in any increase in the overall height of the existing structures. Cellco’s replacement antennas will be located at the same height and location as the existing antennas.

2. The proposed modifications will not involve any ground-mounted equipment and, therefore, will not require the extension of the site boundaries.



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S. Derek Phelps  
July 17, 2008  
Page 2


3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) power density levels at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative power density table for the facility is included behind Tab 2.

Also attached is a Structural Analysis Report confirming that the tower can support the proposed modifications. (See Tab 3).

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,



Kenneth C. Baldwin

Enclosures

Copy to:

Robert Silvaggi, Brookfield First Selectman  
Sandy M. Carter



Slant +/- 45° Dual Polarized, Panel 80° / 12 dBd

## BXA-80080/4CF

When ordering replace "\_\_\_" with connector type.

### Mechanical specifications

Length	1225 mm	48.2 in
Width	285 mm	11.2 in
Depth	150 mm	5.9 in
Depth with z-bracket	190 mm	7.5 in
4) Weight	6.5 kg	14.3 lbs
Wind Area		
Fore/Aft	0.35 m <sup>2</sup>	3.76 ft <sup>2</sup>
Side	0.18 m <sup>2</sup>	1.98 ft <sup>2</sup>
Rated Wind Velocity (Safety factor 2.0)		
	>380 km/hr	>236 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	500 N	112.3 lbs
Side	277 N	62.2 lbs

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiberglass radome.

### Mounting and Downtilting

Mounting brackets attach to a pipe diameter of Ø50-160 mm (2.0-6.3 in).

Mounting bracket kit #36210002

Downtilt bracket kit #36114003

### Electrical specifications

Frequency Range	806-900 MHz*
Impedance	50Ω
3) Connector(s)	NE or E-DIN 2 ports / center
1) VSWR	≤ 1.4:1
Polarization	Slant ± 45°
1) Isolation Between Ports	< -30 dB
1) Gain	12 dBd
2) Power Rating	500 W
1) Half Power Angle	
H-Plane	80°
E-Plane	15°
1) Electrical Downtilt	0°
1) Null Fill	5%
Lightning Protection	Direct Ground

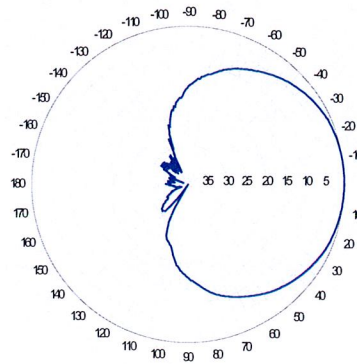
\*Also available for 870-960 MHz. Consult your sales director for more information.

Patented Dipole Design: U.S. Patent No. 6,608,600 B2

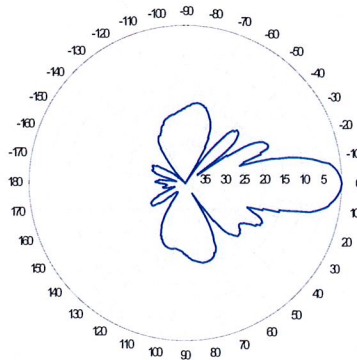
- 1) Typical values.
- 2) Power rating limited by connector only.
- 3) NE indicates an elongated N connector.  
E-DIN indicates an elongated DIN connector.
- 4) The antenna weight listed above does not include the bracket weight.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

### Radiation pattern<sup>1)</sup>



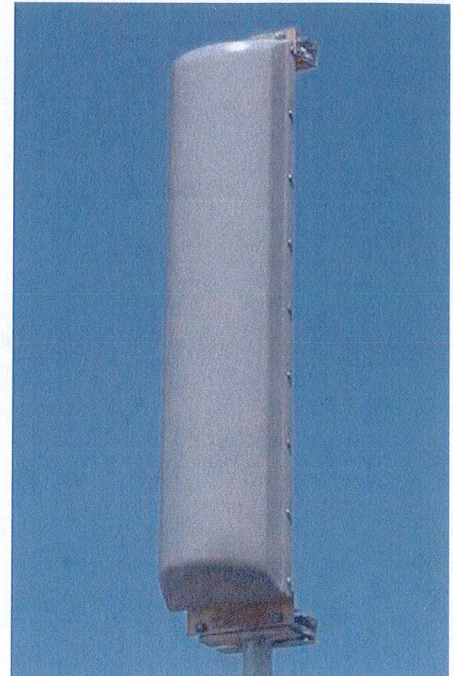
Horizontal



Vertical

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back ratio.



Amphenol Antel's  
Exclusive 3T (True  
Transmission Line  
Technology)  
Antenna Design:

- Watercut brass feedline assembly for consistent performance.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- Air as insulation for virtually no internal signal loss.

*This Amphenol Antel antenna is under a five-year limited warranty for repair or replacement.*

Antenna available with center-fed connectors only.

CF Denotes a Center-Fed Connector.

806-900 MHz



1079 N. 205<sup>th</sup> Street  
Elkhorn, NE 68022  
Ph: 402-289-1888  
Fax: 402-289-1861

**SEMAAN ENGINEERING SOLUTIONS**

**80 ft Rohn Self Supported Tower  
Structural Analysis**

**Prepared for:  
KGI  
6200 Bridge Point Parkway  
Building IV, Suite 520  
Austin, TX 78730**

**Site: 11464  
Verizon  
Brookfield, CT**

**June 24, 2008**

Ms. Michelle Giannascoli  
KGI  
6200 Bridge Point Parkway  
Building IV, Suite 520  
Austin, TX 78730

**Re: Site Number 11464 – Brookfield, CT.**

Dear Ms. Giannascoli:

We have completed the structural analysis for the existing Self Supported Tower, located at the above referenced site. The purpose of this analysis is to determine that the existing Self Supported Tower design is in conformance with the TIA/EIA-222 Rev F standard and local building codes for the proposed antennae loads installation. Refer to the Review and Recommendations section at the end of this report for the analysis results.

**Description of Structure:**

The structure is a 80 ft Rohn Self Supported Tower.

Refer to the HTS mapping dated February 21, 2008 for a detailed description of the structure.

**Method of analysis:**

The tower was analyzed using Semaan Engineering Solutions' software suite for communication structures. The structural analysis is performed using the SAPS finite element engine. The method is 3D, non-linear, which accounts for the second order geometric effects due to the displacements. The analysis was performed in conformance with TIA/EIA-222 Rev F and local building codes for a basic wind speed of 85 mph no ice and 74 mph with 1/2" radial ice (fastest mile). This is in conformance with the IBC 2006: Section 1609.1.1, Exception (4) and Section 3108.4. Wind is applied to the structure, accessories and antennas.



**Structure loading:**

The following loads were used in the tower analysis:

Elev (ft)	Qty	Antennas	Mounts	Coax	Carrier
78.5	1	Allgon 7250	Sidearm	(2) 7/8	
77.5	1	TMA	(4) Sidearms	-	
	1	Allgon 7486.00		(1) 7/8	
	3	DB932DG90VTE-M		(4) 7/8	

Proposed Loads:

Elev (ft)	Qty	Antennas	Mounts	Coax	Carrier
70.0	3	BXA-80080/4CF	(3) Sidearms	(6) 7/8	Verizon

**The proposed transmission lines may be placed anywhere on the tower.  
No line shielding was considered.**

**Results of Analysis:**

Refer to the attached Computer Summary sheets for detailed analysis results.

**Structure:**

The existing Self Supported Tower is structurally capable of supporting the existing and proposed antennas.

The maximum structure usage is: 74.0% Legs, 81.0% Diagonals, 13.0% Horizontals.

**Foundation:**

Leg Forces	Original Design Reactions	Current Analysis Reactions	% Of Design
Uplift (Kips)	N/A	37.44	N/A
Axial (Kips)	N/A	43.19	N/A
Shear (Kips)	N/A	4.60	N/A

The foundation was not investigated due to the lack of design drawings and documents and is not part of this analysis.

**Review and Recommendations:**

Based on the analysis results, the existing structure meets the requirements per the TIA/EIA-222 Rev F standards for a basic wind speed of 85 mph no ice and 74 mph with 1/2" radial ice.

**SEMAAN ENGINEERING SOLUTIONS**  
 1079 N.204<sup>th</sup> Avenue  
 Elkhorn, NE 68022

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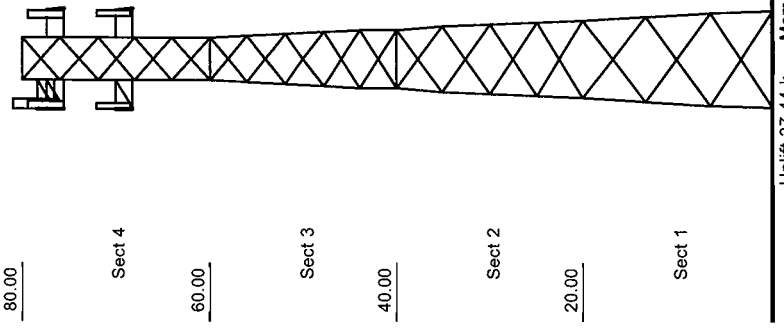
Loads: 85 mph no ice  
 74 mph w/ 1/2" radial ice  
 50 mph no ice

Job Information	
Tower : 11464	Location : Brookfield, CT
Code : TIA/EIA-222 Rev F	Shape : Triangle
Client : KGI	Base Width : 10.58 ft
	Top Width : 4.52 ft

Sections Properties			
Section	Leg Members	Diagonal Members	Horizontal Members
1	PX 50ksi 2-1/2" DIA PIPE	SAE 36ksi 1.75X1.75X0.01563	
2	PST 50ksi 2-1/2" DIA PIPE	SAE 36ksi 1.5X1.5X0.1563	SAE 36ksi 1.75X1.75X0.1875
3	PX 50ksi 2" DIA PIPE	SAE 36ksi 1.5X1.5X0.1563	SAE 36ksi 1.5X1.5X0.1875
4	PST 50ksi 2" DIA PIPE	SAE 36ksi 1.5X1.5X0.1563	SAE 36ksi 1.5X1.5X0.1563

Discrete Appurtenance			
Elev (ft)	Type	Qty	Description
78.50	Straight Arm	1	Sidearm
78.50	Panel	1	Alligon 7250
77.50	Panel	1	TMA
77.50	Panel	1	Allcon 7486.00
77.50	Straight Arm	4	Sidearms
77.50	Panel	3	DB932DG90VTE-M
70.00	Straight Arm	3	Sidearms
70.00	Panel	3	BXA-90080/4CF

Linear Appurtenance			
Elev (ft)	From	To	Description
0.000	78.500	2	7/8" Coax
0.000	77.500	5	7/8" Coax
0.000	70.000	6	7/8" Coax



Uplift 37.44 k  
 Moment 374.80 ft-k  
 Vert 43.19 k  
 Horiz 4.60 k  
 Total Down 6.85 k  
 Total Shear 7.88 k

**SEMAAN ENGINEERING SOLUTIONS**

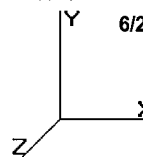
1079 N.204<sup>th</sup> Avenue  
 Elkhorn, NE 68022  
 Phone: 402-289-1888  
 Fax: 402-289-1861

Site Number: 11464  
 Location: Brookfield, CT

Code: TIA/EIA-222 Rev F

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Gh: 1.18

**Section Forces**

**LoadCase Normal No Ice      85.00 mph Wind Normal To Face with No Ice**

Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Wind Height (ft)	qz	Total	Total	Ice	Sol Ratio	Cf	Df	Dr	Rr	Eff	Linear	Linear	Total	Struct Force (lb)	Linear	Total	Eff Face	
			Flat Area (sqft)	Round Area (sqft)	Round Area (sqft)						Area (sqft)	Area (sqft)	Area (sqft)	Weight (lb)		Weight Ice (lb)	Force (lb)		Force (lb)
4	70.00	22.93	8.11	14.48	0.00	0.25	2.44	1.00	1.00	0.60	16.83	5.55	0.00	610.9	0.0	1,108.90	180.00	1,288.90	3
3	50.00	20.83	9.09	15.33	0.00	0.22	2.53	1.00	1.00	0.60	18.21	11.10	0.00	772.4	0.0	1,129.45	327.00	1,456.45	3
2	30.00	18.50	9.99	17.00	0.00	0.18	2.67	1.00	1.00	0.59	19.96	11.10	0.00	854.3	0.0	1,160.11	290.39	1,450.50	3
1	10.00	18.50	10.20	17.00	0.00	0.14	2.80	1.00	1.00	0.58	20.07	11.10	0.00	950.1	0.0	1,225.07	290.39	1,515.47	3
														3,187.7	0.0			5,711.31	

**LoadCase 60 deg No Ice      85.00 mph Wind at 60 deg From Face with No Ice**

Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Wind Height (ft)	qz	Total	Total	Ice	Sol Ratio	Cf	Df	Dr	Rr	Eff	Linear	Linear	Total	Struct Force (lb)	Linear	Total	Eff Face	
			Flat Area (sqft)	Round Area (sqft)	Round Area (sqft)						Area (sqft)	Area (sqft)	Area (sqft)	Weight (lb)		Weight Ice (lb)	Force (lb)		Force (lb)
4	70.00	22.93	8.11	14.48	0.00	0.25	2.44	0.80	1.00	0.60	15.21	5.55	0.00	610.9	0.0	1,001.99	180.00	1,181.99	3
3	50.00	20.83	9.09	15.33	0.00	0.22	2.53	0.80	1.00	0.60	16.40	11.10	0.00	772.4	0.0	1,016.69	327.00	1,343.69	3
2	30.00	18.50	9.99	17.00	0.00	0.18	2.67	0.80	1.00	0.59	17.96	11.10	0.00	854.3	0.0	1,043.98	290.39	1,334.37	3
1	10.00	18.50	10.20	17.00	0.00	0.14	2.80	0.80	1.00	0.58	18.03	11.10	0.00	950.1	0.0	1,100.51	290.39	1,390.90	3
														3,187.7	0.0			5,250.95	

**LoadCase 90 deg No Ice      85.00 mph Wind at 90 deg From Face with No Ice**

Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Wind Height (ft)	qz	Total	Total	Ice	Sol Ratio	Cf	Df	Dr	Rr	Eff	Linear	Linear	Total	Struct Force (lb)	Linear	Total	Eff Face	
			Flat Area (sqft)	Round Area (sqft)	Round Area (sqft)						Area (sqft)	Area (sqft)	Area (sqft)	Weight (lb)		Weight Ice (lb)	Force (lb)		Force (lb)
4	70.00	22.93	8.11	14.48	0.00	0.25	2.44	0.85	1.00	0.60	15.61	5.55	0.00	610.9	0.0	1,028.72	180.00	1,208.72	3
3	50.00	20.83	9.09	15.33	0.00	0.22	2.53	0.85	1.00	0.60	16.85	11.10	0.00	772.4	0.0	1,044.88	327.00	1,371.88	3
2	30.00	18.50	9.99	17.00	0.00	0.18	2.67	0.85	1.00	0.59	18.46	11.10	0.00	854.3	0.0	1,073.01	290.39	1,363.41	3
1	10.00	18.50	10.20	17.00	0.00	0.14	2.80	0.85	1.00	0.58	18.54	11.10	0.00	950.1	0.0	1,131.65	290.39	1,422.04	3
														3,187.7	0.0			5,366.04	

**SEMAAN ENGINEERING SOLUTIONS**

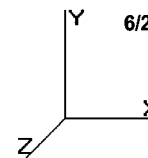
1079 N.204<sup>th</sup> Avenue  
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 Phone: 402-289-1888  
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Site Number: 11464  
 Location: Brookfield, CT

Code: TIA/EIA-222 Rev F

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Gh: 1.18

**Section Forces**

**LoadCase Normal Ice 73.61 mph Wind Normal To Face with Ice**

Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Wind Height		Total Flat Area	Total Round Area	Ice Round Area	Sol Ratio	Cf	Df	Dr	Rr	Eff Area	Linear Area	Linear Area	Total Weight	Weight Ice	Struct Force	Linear Force	Total Force	Eff Face
	(ft)	qz	(sqft)	(sqft)	(sqft)						(sqft)	(sqft)	(sqft)	(lb)	(lb)	(lb)	(lb)	(lb)	
4	70.00	17.20	8.11	29.14	14.66	0.41	2.04	1.00	1.00	0.66	27.24	5.55	5.00	1,162.7	551.8	1,127.04	256.60	1,383.64	3
3	50.00	15.62	9.09	31.40	16.07	0.37	2.13	1.00	1.00	0.64	29.15	11.10	10.00	1,430.7	658.3	1,144.49	466.16	1,610.66	3
2	30.00	13.87	9.99	33.57	16.57	0.29	2.32	1.00	1.00	0.61	30.56	11.10	10.00	1,559.6	705.3	1,161.34	413.98	1,575.32	3
1	10.00	13.87	10.20	32.84	15.84	0.23	2.51	1.00	1.00	0.60	29.77	11.10	10.00	1,656.2	706.1	1,223.69	413.98	1,637.67	3
														5,809.2	2,621.5			6,207.30	

**LoadCase 60 deg Ice 73.61 mph Wind at 60 deg From Face with Ice**

Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Wind Height		Total Flat Area	Total Round Area	Ice Round Area	Sol Ratio	Cf	Df	Dr	Rr	Eff Area	Linear Area	Linear Area	Total Weight	Weight Ice	Struct Force	Linear Force	Total Force	Eff Face
	(ft)	qz	(sqft)	(sqft)	(sqft)						(sqft)	(sqft)	(sqft)	(lb)	(lb)	(lb)	(lb)	(lb)	
4	70.00	17.20	8.11	29.14	14.66	0.41	2.04	0.80	1.00	0.66	25.62	5.55	5.00	1,162.7	551.8	1,059.92	256.60	1,316.53	3
3	50.00	15.62	9.09	31.40	16.07	0.37	2.13	0.80	1.00	0.64	27.33	11.10	10.00	1,430.7	658.3	1,073.09	466.16	1,539.25	3
2	30.00	13.87	9.99	33.57	16.57	0.29	2.32	0.80	1.00	0.61	28.56	11.10	10.00	1,559.6	705.3	1,085.43	413.98	1,499.41	3
1	10.00	13.87	10.20	32.84	15.84	0.23	2.51	0.80	1.00	0.60	27.73	11.10	10.00	1,656.2	706.1	1,139.81	413.98	1,553.79	3
														5,809.2	2,621.5			5,908.98	

**LoadCase 90 deg Ice 73.61 mph Wind at 90 deg From Face with Ice**

Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Wind Height		Total Flat Area	Total Round Area	Ice Round Area	Sol Ratio	Cf	Df	Dr	Rr	Eff Area	Linear Area	Linear Area	Total Weight	Weight Ice	Struct Force	Linear Force	Total Force	Eff Face
	(ft)	qz	(sqft)	(sqft)	(sqft)						(sqft)	(sqft)	(sqft)	(lb)	(lb)	(lb)	(lb)	(lb)	
4	70.00	17.20	8.11	29.14	14.66	0.41	2.04	0.85	1.00	0.66	26.03	5.55	5.00	1,162.7	551.8	1,076.70	256.60	1,333.31	3
3	50.00	15.62	9.09	31.40	16.07	0.37	2.13	0.85	1.00	0.64	27.78	11.10	10.00	1,430.7	658.3	1,090.94	466.16	1,557.10	3
2	30.00	13.87	9.99	33.57	16.57	0.29	2.32	0.85	1.00	0.61	29.06	11.10	10.00	1,559.6	705.3	1,104.41	413.98	1,518.39	3
1	10.00	13.87	10.20	32.84	15.84	0.23	2.51	0.85	1.00	0.60	28.24	11.10	10.00	1,656.2	706.1	1,160.78	413.98	1,574.76	3
														5,809.2	2,621.5			5,983.56	

**SEMAAN ENGINEERING SOLUTIONS**

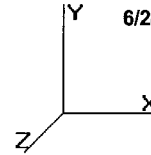
1079 N.204<sup>th</sup> Avenue  
 Elkhorn, NE 68022  
 Phone: 402-289-1888  
 Fax: 402-289-1861

Site Number: 11464  
 Location: Brookfield, CT

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**Section Forces**

**LoadCase Normal**

50.00 mph Wind Normal To Face with No Ice

Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Wind Height (ft)	qz	Total Flat Area	Total Round Area	Ice Round Area	Sol Ratio	Cf	Df	Dr	Rr	Eff Area	Linear Area	Ice Linear Area	Total Weight	Weight Ice	Struct Force	Linear Force	Total Force	Eff Face
			(sqft)	(sqft)	(sqft)						(sqft)	(sqft)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)
4	70.00	7.93	8.11	14.48	0.00	0.25	2.44	1.00	1.00	0.60	16.83	5.55	0.00	610.9	0.0	383.70	62.28	445.98	3
3	50.00	7.21	9.09	15.33	0.00	0.22	2.53	1.00	1.00	0.60	18.21	11.10	0.00	772.4	0.0	390.81	113.15	503.96	3
2	30.00	6.40	9.99	17.00	0.00	0.18	2.67	1.00	1.00	0.59	19.96	11.10	0.00	854.3	0.0	401.42	100.48	501.90	3
1	10.00	6.40	10.20	17.00	0.00	0.14	2.80	1.00	1.00	0.58	20.07	11.10	0.00	950.1	0.0	423.90	100.48	524.38	3
														3,187.7	0.0			1,976.23	

**LoadCase 60 deg**

50.00 mph Wind at 60 deg From Face with No Ice

Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Wind Height (ft)	qz	Total Flat Area	Total Round Area	Ice Round Area	Sol Ratio	Cf	Df	Dr	Rr	Eff Area	Linear Area	Ice Linear Area	Total Weight	Weight Ice	Struct Force	Linear Force	Total Force	Eff Face
			(sqft)	(sqft)	(sqft)						(sqft)	(sqft)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)
4	70.00	7.93	8.11	14.48	0.00	0.25	2.44	0.80	1.00	0.60	15.21	5.55	0.00	610.9	0.0	346.71	62.28	408.99	3
3	50.00	7.21	9.09	15.33	0.00	0.22	2.53	0.80	1.00	0.60	16.40	11.10	0.00	772.4	0.0	351.80	113.15	464.94	3
2	30.00	6.40	9.99	17.00	0.00	0.18	2.67	0.80	1.00	0.59	17.96	11.10	0.00	854.3	0.0	361.24	100.48	461.72	3
1	10.00	6.40	10.20	17.00	0.00	0.14	2.80	0.80	1.00	0.58	18.03	11.10	0.00	950.1	0.0	380.80	100.48	481.28	3
														3,187.7	0.0			1,816.94	

**LoadCase 90 deg**

50.00 mph Wind at 90 deg From Face with No Ice

Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Wind Height (ft)	qz	Total Flat Area	Total Round Area	Ice Round Area	Sol Ratio	Cf	Df	Dr	Rr	Eff Area	Linear Area	Ice Linear Area	Total Weight	Weight Ice	Struct Force	Linear Force	Total Force	Eff Face
			(sqft)	(sqft)	(sqft)						(sqft)	(sqft)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb)
4	70.00	7.93	8.11	14.48	0.00	0.25	2.44	0.85	1.00	0.60	15.61	5.55	0.00	610.9	0.0	355.96	62.28	418.24	3
3	50.00	7.21	9.09	15.33	0.00	0.22	2.53	0.85	1.00	0.60	16.85	11.10	0.00	772.4	0.0	361.55	113.15	474.70	3
2	30.00	6.40	9.99	17.00	0.00	0.18	2.67	0.85	1.00	0.59	18.46	11.10	0.00	854.3	0.0	371.28	100.48	471.77	3
1	10.00	6.40	10.20	17.00	0.00	0.14	2.80	0.85	1.00	0.58	18.54	11.10	0.00	950.1	0.0	391.57	100.48	492.06	3
														3,187.7	0.0			1,856.76	

**SEMAAN ENGINEERING SOLUTIONS**

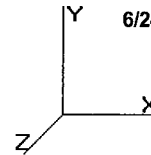
1079 N.204<sup>th</sup> Avenue  
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 Location: Brookfield, CT

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**Tower Loading****Discrete Appurtenance Properties**

Attach Elev (ft)	Description	Qty	Weight (lb)	No Ice CaAa (sf)	CaAa Factor	Weight (lb)	Ice CaAa (sf)	CaAa Factor	Distance From Face (ft)	X Angle (deg)	Vert Ecc (ft)
78.50	Sidearm	1	70.00	5.150	1.00	100.00	7.100	1.00	0.000	0.00	-2.500
78.50	Allgon 7250	1	16.00	4.300	1.00	36.00	5.000	1.00	0.000	0.00	0.000
77.50	TMA	1	17.00	1.200	1.00	24.90	1.430	1.00	0.000	0.00	0.000
77.50	Allgon 7486.00	1	36.30	5.347	1.00	64.17	5.950	1.00	0.000	0.00	0.000
77.50	Sidearms	4	53.32	3.500	1.00	84.00	5.790	1.00	0.000	0.00	0.000
77.50	DB932DG90VTE-M	3	11.00	3.500	0.72	30.22	4.050	0.72	0.000	0.00	0.000
70.00	Sidearms	3	53.32	3.500	1.00	84.00	5.790	1.00	0.000	0.00	0.000
70.00	BXA-80080/4CF	3	14.30	5.248	0.76	45.30	5.836	0.76	0.000	0.00	0.000
Totals		17	588.44			1039.63			Number of Appurtenances : 8		

**Linear Appurtenance Properties**

Elev From (ft)	Elev To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Wind	Spread On Faces	Bundling Arrangement
0.00	78.50	7/8" Coax	2	1.11	0.52	100.00	2,3	Separate
0.00	77.50	7/8" Coax	5	1.11	0.52	60.00	3	Separate
0.00	70.00	7/8" Coax	6	1.11	0.52	100.00	Lin App	Separate

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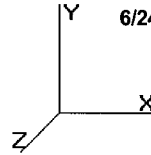
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**Force/Stress Summary**

**Section: 1 9NH-2 Bot Elev (ft): 0.00 Height (ft): 20.000**

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing %			Fa (ksi)	Member		Shear Cap (kip)	Bear Cap (kip)	Use %	Controls	
				X	Y	Z		Cap (kip)	Num Bolts					Num Holes
LEG PX - 2-1/2" DIA PIPE	-41.63	Normal Ice	6.68	100	100	100	0.0	55.99	0	0.00	0.00	74	User Input	
HORIZ	0.00		0.000	0	0	0	0.0	0.00	0	0.00	0.00	0		
DIAG SAE - 1.75X1.75X.015	-1.66	90 deg Ice	11.65	50	75	50	220.1	4.1	2.04	1	5.49	7.25	81	Member Z

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
HORIZ	0.00		0	0.00	0	0	0.00	0.00	0	
DIAG SAE - 1.75X1.75X.015	1.66	90 deg Ice	36	11.84	1	1	5.49	7.25	30	Bolt Shear

**Section: 2 8N-2 Bot Elev (ft): 20.00 Height (ft): 20.000**

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing %			Fa (ksi)	Member		Shear Cap (kip)	Bear Cap (kip)	Use %	Controls	
				X	Y	Z		Cap (kip)	Num Bolts					Num Holes
LEG PST - 2-1/2" DIA PIP	-32.06	Normal Ice	5.01	100	100	100	0.0	52.53	0	1	0.00	1,333.2	61	User Input
HORIZ SAE - 1.75X1.75X0.18	-0.33	Normal Ice	6.507	100	100	100	227.7	3.8	2.38	1	0.00	10.87	13	Member Z
DIAG SAE - 1.5X1.5X0.1563	-1.46	90 deg Ice	9.677	50	75	50	196.8	5.1	2.26	1	5.49	7.25	64	Member Z

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
HORIZ SAE - 1.75X1.75X0.18	0.29	60 deg No Ice	36	17.85	1	0	0.00	10.87	2	Bolt Bear
DIAG SAE - 1.5X1.5X0.1563	1.38	90 deg Ice	36	10.21	1	1	5.49	7.25	25	Bolt Shear

**Section: 3 7N3-TAPERED Bot Elev (ft): 40.00 Height (ft): 20.000**

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing %			Fa (ksi)	Member		Shear Cap (kip)	Bear Cap (kip)	Use %	Controls	
				X	Y	Z		Cap (kip)	Num Bolts					Num Holes
LEG PX - 2" DIA PIPE	-21.37	Normal Ice	4.01	100	100	100	0.0	46.01	0	0	0.00	0.00	46	User Input
HORIZ SAE - 1.5X1.5X0.1875	-0.01	Normal No Ice	4.522	100	100	100	185.2	5.8	3.08	0	0.00	0.00	0	Member Z
DIAG SAE - 1.5X1.5X0.1563	-1.23	Normal Ice	7.471	50	75	50	151.9	8.6	3.79	1	5.49	7.25	32	Member Z

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
HORIZ SAE - 1.5X1.5X0.1875	0.02	Normal No Ice	36	15.26	0	0	0.00	0.00	0	Member
DIAG SAE - 1.5X1.5X0.1563	1.14	Normal Ice	36	10.21	1	1	5.49	7.25	20	Bolt Shear

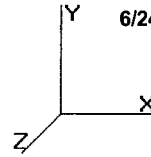
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 Phone: 402-289-1888  
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**Force/Stress Summary**

Section: 4		6NST-2		Bot Elev (ft): 60.00				Height (ft): 20.000							
Max Compression Member		Force (kip)	Load Case	Len (ft)	Bracing %			Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	PST - 2" DIA PIPE	-9.14	Normal Ice	4.00	100	100	100	0.0	0.0	33.73	0	0	0.00	0.00	27 User Input
HORIZ	SAE - 1.5X1.5X0.1563	-0.13	90 deg No Ice	4.522	100	100	100	184.0	5.9	2.59	0	0	0.00	0.00	5 Member Z
DIAG	SAE - 1.5X1.5X0.1563	-1.38	90 deg Ice	6.038	50	75	50	122.8	13.2	5.79	1	1	5.49	7.25	25 Bolt Shear
Max Tension Member		Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls				
LEG	PST - 2" DIA PIPE	7.80	60 deg Ice	50	33.73	0	0	0.00	0.00	23	User Input				
HORIZ	SAE - 1.5X1.5X0.1563	0.15	60 deg No Ice	36	12.67	0	0	0.00	0.00	1	Member				
DIAG	SAE - 1.5X1.5X0.1563	1.38	90 deg Ice	36	10.21	1	1	5.49	7.25	25	Bolt Shear				



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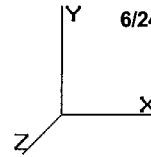
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**Support Forces Summary**

Load Case	Node	FX (kip)	FY (kip)	FZ (kip)	(-) = Uplift (+) = Down
90 deg	1b	-1.05	-9.78	-0.50	
	1a	-1.19	12.30	0.58	
	1	-0.18	1.26	-0.09	
60 deg	1b	-1.15	-11.30	-0.65	
	1a	-0.77	7.56	0.25	
	1	-0.14	7.52	-0.79	
Normal	1b	-0.50	-5.37	-0.46	
	1a	0.48	-5.32	-0.49	
	1	0.02	14.47	-1.58	
90 deg Ice	1b	-3.64	-32.42	-1.77	
	1a	-3.46	37.00	1.66	
	1	-0.56	2.28	0.11	
60 deg Ice	1b	-4.00	-37.44	-2.27	
	1a	-2.12	22.20	0.62	
	1	-0.45	22.09	-2.14	
Normal Ice	1b	-1.89	-18.22	-1.61	
	1a	1.83	-18.12	-1.71	
	1	0.05	43.19	-4.56	
90 deg No Ice	1b	-3.18	-30.73	-1.53	
	1a	-3.32	33.25	1.60	
	1	-0.51	1.26	-0.08	
60 deg No Ice	1b	-3.48	-35.15	-1.97	
	1a	-2.07	19.51	0.65	
	1	-0.40	19.42	-2.12	
Normal No Ice	1b	-1.61	-17.94	-1.41	
	1a	1.55	-17.89	-1.51	
	1	0.06	39.61	-4.43	

Max Uplift:	37.44 (kip)	Moment:	374.80 (ft-kip)	Normal Ice
Max Down:	43.19 (kip)	Total Down:	6.85 (kip)	
Max Shear:	4.60 (kip)	Total Shear:	7.88 (kip)	

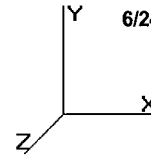
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**Deflections and Rotations**

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
50.00 mph Wind Normal To Face with No Ice	68.00	0.0868	0.0037	0.1417
	76.00	0.1066	0.0030	0.1612
	80.00	0.1164	0.0029	0.0756
50.00 mph Wind at 60 deg From Face with No Ice	68.00	0.0832	0.0026	0.1356
	76.00	0.1024	0.0012	0.1396
	80.00	0.1120	0.0007	0.1756
50.00 mph Wind at 90 deg From Face with No Ice	68.00	0.0839	0.0022	0.1379
	76.00	0.1034	0.0017	0.1428
	80.00	0.1132	0.0017	0.2017
73.61 mph Wind Normal To Face with Ice	68.00	0.2673	0.0128	0.4342
	76.00	0.3282	0.0110	0.4924
	80.00	0.3581	0.0105	0.2369
73.61 mph Wind at 60 deg From Face with Ice	68.00	0.2605	0.0008	0.4226
	76.00	0.3205	0.0000	0.4344
	80.00	0.3502	-0.0117	0.5405
73.61 mph Wind at 90 deg From Face with Ice	68.00	0.2625	0.0074	0.4273
	76.00	0.3227	0.0064	0.4417
	80.00	0.3521	0.0063	0.6177
85.00 mph Wind Normal To Face with No Ice	68.00	0.2519	0.0121	0.4113
	76.00	0.3096	0.0105	0.4675
	80.00	0.3379	0.0100	0.2207
85.00 mph Wind at 60 deg From Face with No Ice	68.00	0.2408	0.0012	0.3921
	76.00	0.2964	0.0000	0.4032
	80.00	0.3240	-0.0102	0.5063
85.00 mph Wind at 90 deg From Face with No Ice	68.00	0.2430	0.0070	0.3980
	76.00	0.2991	0.0061	0.4116
	80.00	0.3272	0.0059	0.5816
		0.0000	0.0000	0.0000