

# 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

July 11, 2007

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

RE: **EM-VER-137-070619** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 86 Voluntown Road, Stonington, Connecticut.

Dear Attorney Baldwin:

At a public meeting held on July 3, 2007, the Connecticut Siting Council (Council) acknowledged 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 June 19, 2007, 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.

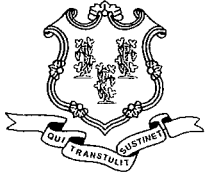
Thank you for your attention and cooperation.

Very truly yours,

Daniel F. Caruso  
Chairman

DFC/MP/laf

c: The Honorable William S. Brown, First Selectman, Town of Stonington  
Jason Vincent, Town Planner, Town of Stonington  
Thomas J. Regan, Esq., Brown Rudnick Berlack Israels LLP  
Christopher B. Fisher, Esq., Cuddy & Feder LLP  
Christine Farrell, T-Mobile Inc.



Daniel F. Caruso  
Chairman

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

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

June 22, 2007

The Honorable William S. Brown  
First Selectman  
Town of Stonington  
Town Hall  
152 Elm Street  
P. O. Box 352  
Stonington, CT 06378

RE: **EM-VER-137-070619** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 86 Voluntown Road, Stonington, Connecticut.

Dear Mr. Brown:

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.

The Council will consider this item at the next meeting scheduled for Tuesday, July 3, 2007 at 1:30 p.m. in Hearing Room One, Ten Franklin Square, New Britain, Connecticut.

If you have any questions or comments regarding this proposal, please call me or inform the Council by June 28, 2007.

Thank you for your cooperation and consideration.

Very truly yours,

S. Derek Phelps  
Executive Director

SDP/MP/laf

Enclosure: Notice of Intent

c: Jason Vincent, Town Planner, Town of Stonington

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

ORIGINAL

EM-VER-137-070619

June 19, 2007

*Via Hand Delivery*

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

RECEIVED  
JUN 19 2007  
CONNECTICUT  
SITING COUNCIL

Re: **Notice of Exempt Modification  
Voluntown Road, Stonington, Connecticut**

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") intends to install antennas on the existing 196-foot self-supporting monopole tower owned by Sprint Nextel off Voluntown Road in Stonington, Connecticut. 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, and pursuant to Siting Council directive a copy of this letter is being sent to Stonington First Selectman, William S. Brown and to Blackrock Properties II LLC, owner of the property on which the tower is located.

The Sprint Nextel facility consists of a 196-foot self-supporting monopole tower capable of supporting multiple carriers within a fenced compound off Voluntown Road in Stonington. This tower is currently shared by Sprint at the 193-foot level; Nextel at the 180-foot level; T-Mobile at the 165-foot level; and AT&T at the 150-foot level. Cellco intends to install twelve (12) panel-type antennas (six (6) cellular and six (6) PCS) at the 140-foot level on the tower and place a 12' x 30' equipment shelter on a raised steel platform over the existing Sprint Nextel shelter and AT&T equipment all located at the base of the tower within the existing fenced compound. Attached behind Tab 1 are Project Plans for the proposed Cellco facility.

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



Law Offices

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HART1-1402177-1

S. Derek Phelps

June 19, 2007

Page 2

1. The proposed modification will not increase the overall height of the existing tower. Cellco's antennas will be mounted with their centerline at the 140-foot level on the 196-foot tower.
2. The proposed installation of a 12' x 30' equipment shelter will not require an extension of the fenced compound or leased area.
3. The proposed installation will not increase the noise levels at the facility by six decibels or more.
4. The operation of the 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. The cumulative worst-case RF power density calculations for existing and Cellco antennas would be 16.33% of the FCC standard. A copy of cumulative power density calculations table is attached behind Tab 2.

Also attached, behind Tab 3, is a Structural Analysis Report confirming that the existing tower can support the existing and proposed antennas and associated equipment.

For the foregoing reasons, Cellco respectfully submits that the proposed antenna installation at the facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,



Kenneth C. Baldwin

Attachments

Copy to:

William S. Brown, Stonington First Selectman  
Blackrock Properties II LLC  
Sandy M. Carter



# Cellco Partnership



## d.b.a. **verizon**wireless

# WIRELESS COMMUNICATIONS FACILITY

## STONINGTON EAST 86 VOLUNTOWN ROAD STONINGTON, CT 06379

REVISIONS	
A	06/15/07 07 BINA LOCATION REVIEW

Cellco Partnership  
d.b.a. **verizon**wireless

Malcom, Inc. Engineering Consultants  
**WIRELESS**  
Malcom, Inc. Engineering Consultants  
14, 2031 Main Street  
East Hartford, Connecticut 06117  
Tel: (860) 426-8000  
Fax: (860) 426-8001  
www.malcom-inc.com



**STONINGTON EAST**  
86 VOLUNTOWN ROAD  
STONINGTON, CT 06379-1324

PROJECT NO: 06151  
DRAWN BY: DEB  
CHECKED BY: CFC  
SCALE: AS NOTED  
DATE: 06/14/07

TITLE SHEET

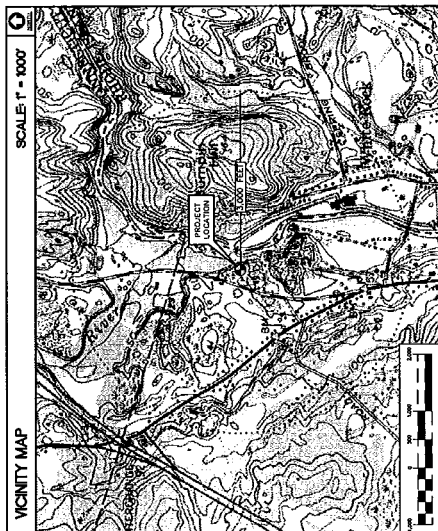
**T-1**  
PAGE 1 OF 2

SHEET INDEX	REV.
1-1	00
TITLE SHEET	
C-1	00
COMPOUND PLAN AND ELEVATION	

**GENERAL NOTES**  
1. ANTENNA LOCATIONS AND HEIGHTS PROVIDED BY VERIZON

**PROJECT SCOPE**  
1. THE PROPOSED SCOPE OF WORK GENERALLY INCLUDES THE INSTALLATION OF A 15'x30' PREPARED WIRELESS EQUIPMENT FOUNDATION WITHIN THE EXISTING WIRELESS COMMUNICATIONS COMPOUND.  
2. INCLUDE (12) PANEL ANTENNAS ARE PROPOSED TO BE MOUNTED ONTO THE EXISTING 198' WINDPOLE TOWER AT A 90 CENTER POINT.  
3. EXISTING AND PROPOSED ANTENNAS SHALL BE SITED UNDERGROUND TO THE WIRELESS EQUIPMENT SHEET FROM AN EXISTING UTILITY BACKBONE LOCATED WITHIN THE PERIOD COMPOUND.

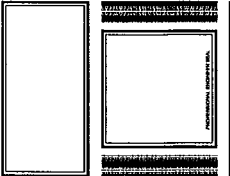
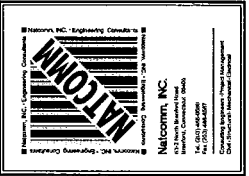
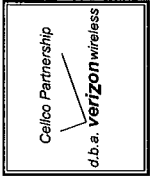
**SITE DIRECTIONS**  
FROM: 89 EAST RIVER DRIVE EAST HARTFORD, CONNECTICUT  
TO: 86 VOLUNTOWN ROAD STONINGTON, CONNECTICUT  
1. START OUT GOING EAST ON 6 PAVES DR. RAMP ON THE LEFT TOWARD BOSTON  
2. MERGE ONTO CT-29 S. VIA DOT 35 TOWARD NORWICH / NEW LONDON  
3. TAKE THE CT-85 EAST - EAST 1/4 TOWARD SALEM / ANDOVER  
4. TURN RIGHT AND EMPLOY MAIN RD / CT-22  
5. MERGE ONTO 1-85 N. VIA THE RAMP TOWARD NEW LONDON  
6. TURN LEFT ONTO LIBERTY ST. / CT-2  
7. TURN RIGHT TOWARD VOLUNTOWN RD / CT-45  
8. MERGE ONTO 1-85 N. VIA THE RAMP TOWARD NEW LONDON  
9. MERGE ONTO VOLUNTOWN RD / CT-45  
10. TURN RIGHT ONTO LIBERTY ST. / CT-2  
11. TURN LEFT TOWARD VOLUNTOWN RD / CT-45  
12. TURN LEFT ONTO VOLUNTOWN RD / CT-45  
13. END AT 86 VOLUNTOWN RD.  
40.1 MI.  
33.7 MI.  
23.2 MI.  
10.8 MI.  
10.3 MI.  
10.2 MI.  
10.4 MI.  
10.8 MI.  
10.8 MI.  
10.3 MI.  
10.4 MI.  
10.1 MI.



**PROJECT SUMMARY**  
SITE NAME: STONINGTON EAST  
SITE ADDRESS: 86 VOLUNTOWN ROAD STONINGTON, CT 06379  
SITE LOCATION: LATITUDE: 41-24-19.6" LONGITUDE: 72-04-17.8" UTM ZONE: 18 Q UTM GRID COORDINATES AND ELEVATION PROVIDED BY VERIZON  
PROPERTY OWNER: SBA NETWORK SERVICES, INC. 100 EAST HARTFORD RD BRIDGEWATER, N.J. 07007  
CELLCO PARTNERSHIP/TENANT: CELLCO PARTNERSHIP 89 EAST RIVER DRIVE EAST HARTFORD, CT 06117  
CONTACT PERSON: CELLCO PARTNERSHIP (860) 903-8219

PROJECT LOCATION

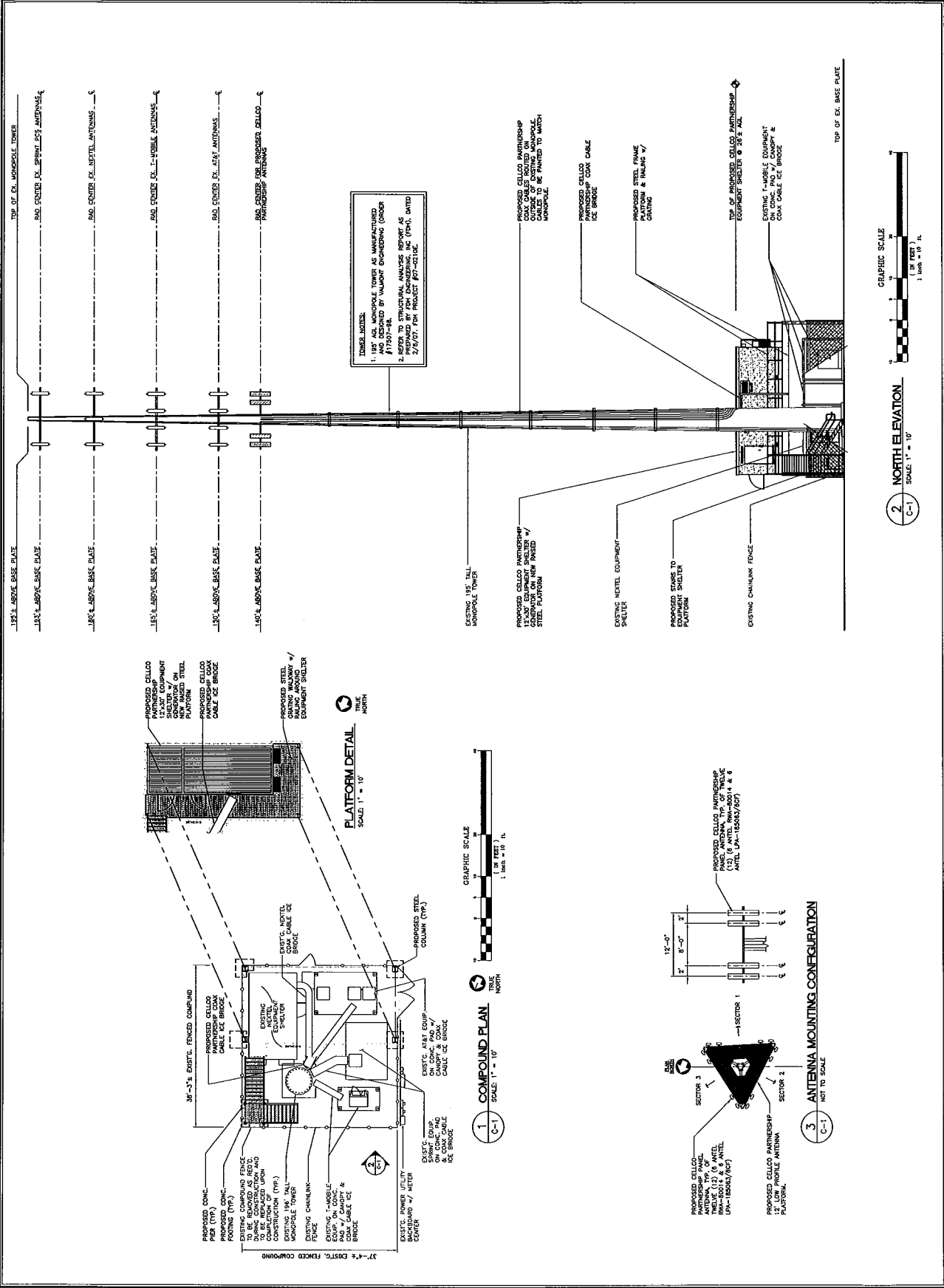
REVISIONS	
A	DATE



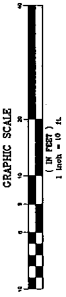
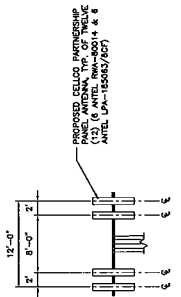
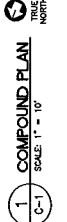
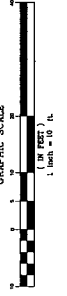
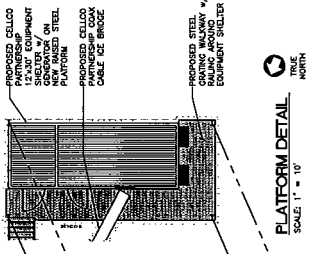
PROJECT NO: 06151  
 DRAWN BY: DBB  
 CHECKED BY: CFC  
 SCALE: AS NOTED  
 DATE: 08/14/07

COMPOUND PLAN AND ELEVATION

C-1  
 DWG. 2 OF 2



**TOWER NOTES:**  
 1. 156' TALL MONOPOLE TOWER AS MANUFACTURED BY VALMONT ENGINEERING (ORDER #12027-24L)  
 2. REFER TO STRUCTURAL ANALYSIS REPORT AS PREPARED BY PDI ENGINEERING, INC. (PDI), DATED 2/9/07, FOR PROJECT #07-010-IC.



Site Name: Stonington E Tower Height: Verizon @ 140Ft.	General		Power	Density		
Carrier	channels	ERP watt/ch	S (mW/cm^2)	f (MHz)	Smax	Percent MPE
AT&T*	4	275	0.01759	1900	1.0000	1.76
Sprint*	11	123.03	0.01281	1900	1.0000	1.28
Nextel*	9	100	0.00999	851	0.5673	1.76
T-Mobile*	8	123.03	0.01301	1900	1.0000	1.30
<b>Verizon</b>	<b>9</b>	<b>285</b>	<b>0.04709</b>	<b>880</b>	<b>0.5867</b>	<b>8.03</b>
<b>Verizon PCS</b>	<b>3</b>	<b>400</b>	<b>0.02203</b>	<b>1900</b>	<b>1.0000</b>	<b>2.20</b>
*Source: Siting Council Records					<b>Total %MPE</b>	<b>16.33</b>

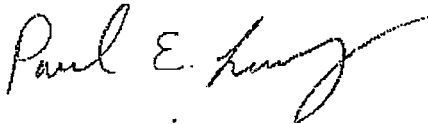
**Structural Analysis for  
SBA Network Services, Inc.**

**195' Monopole**

**Site Name: Stonington East  
Site ID: CT00595-S**

FDH Project Number 07-0210E

Prepared By:



Paul E. Lackey, EI  
Project Engineer

Reviewed By:

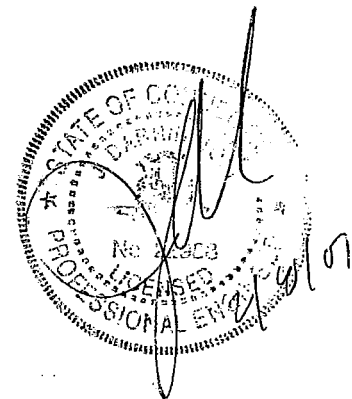


J. Darrin Holt, Ph.D., P.E.  
President  
CT PE License No. 22988

**FDH Engineering, Inc.**

PO Box 99556  
Raleigh, NC 27615  
(919)-755-1012  
info@fdh-inc.com

February 8, 2007



*Prepared pursuant to EIA/TIA-222-F June 1996 Structural Standards for Steel Antenna Towers and Antenna Supporting Structures*



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## EXECUTIVE SUMMARY

At the request of SBA Network Services, FDH Engineering performed a revised structural analysis of the monopole located in Stonington, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads, pursuant to the *TIA/EIA-222-F* standards. Information pertaining to the existing/proposed antenna loading, current tower geometry, and member sizes was obtained from Valmont Engineering (Order No. 17507-98) original design drawings dated September 20, 2005, and SBA Network Services.

The *basic design wind speed* per *TIA/EIA-222-F* standards is 85 MPH without ice and 74 MPH with ½" radial ice.

## Conclusions

With the existing and proposed antennas from Verizon placed at 140 ft., the tower meets the requirements of the *TIA/EIA-222-F* standards. Furthermore, provided the foundation was constructed per the original foundation drawings (see Valmont Drawing No. 17507-S-01), the foundation should be adequate to support both the proposed and existing loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH is accurate (i.e., the steel data, tower layout, current antenna loading, and proposed antenna loading) and that the tower will be properly erected and maintained per the original design drawings.

## Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed coax lines may be installed outside the pole's shaft in a single row.
2. The proposed loading should be installed on a low profile platform.

**APPURTENANCE LISTING**

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from this layout, FDH should be contacted to perform a revised analysis.*

**Table 1 – Appurtenance Loading**

**Existing Loading:**

No.	Centerline Elevation (ft)	Coax and Lines <sup>1</sup>	Carrier	Description
1-6	193	(6) 1-5/8"	Sprint	(6) Decibel DB980H90E-M
7-15	180	(9) 1-5/8"	Nextel	(9) Swedcom ALP9212
16-21	165	(12) 1-5/8"	T-Mobile	(6) EMS RV65-18-XXDPL2 + (6) TMA's
22-27	150	(12) 1-5/8"	AT&T	(6) Allgon 7184 + (6) TMA's
—	30	—	Sprint	(1) GPS

<sup>1</sup> Coax lines installed inside pole's shaft, unless otherwise stated.

**Proposed Loading:**

No.	Centerline Elevation (ft)	Coax and Lines	Carrier	Description
1-12	140	(12) 1-5/8"	Verizon	(6) Antel RWA-80014 (6) Antel LPA-185063/8CF

## RESULTS

Based on information obtained from the original design drawings, the yield strength of steel for individual members was as follows:

**Table 2 - Material Strength**

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Base Plate	60 ksi
Anchor Bolts	75 ksi

**Table 3** displays the ratio (as a percentage) of actual force in the member to their allowable capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its allowable capacity. *Note: Capacities up to 105% are considered acceptable.* **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information.

**Table 3 – Summary of Working Percentage of Structural Components  
(85 MPH without ice)**

Member Type	Elevation (ft.)	Existing and Proposed Loading Max. % Allowable Stress
Section 1	155 to 195	70%
Section 2	120 to 155	78%
Section 3	75 to 120	85%
Section 4	40 to 75	81%
Section 5	0 to 40	86%
Base Plate		OK
Anchor Bolts		OK

**Table 4 – Maximum Base Reactions**

Base Reactions	Linear (w/o ice)	Non-Linear (w/o ice)
Axial	52 k	52 k
Shear	41 k	41 k
Moment	4,658 k-ft	4,794 k-ft

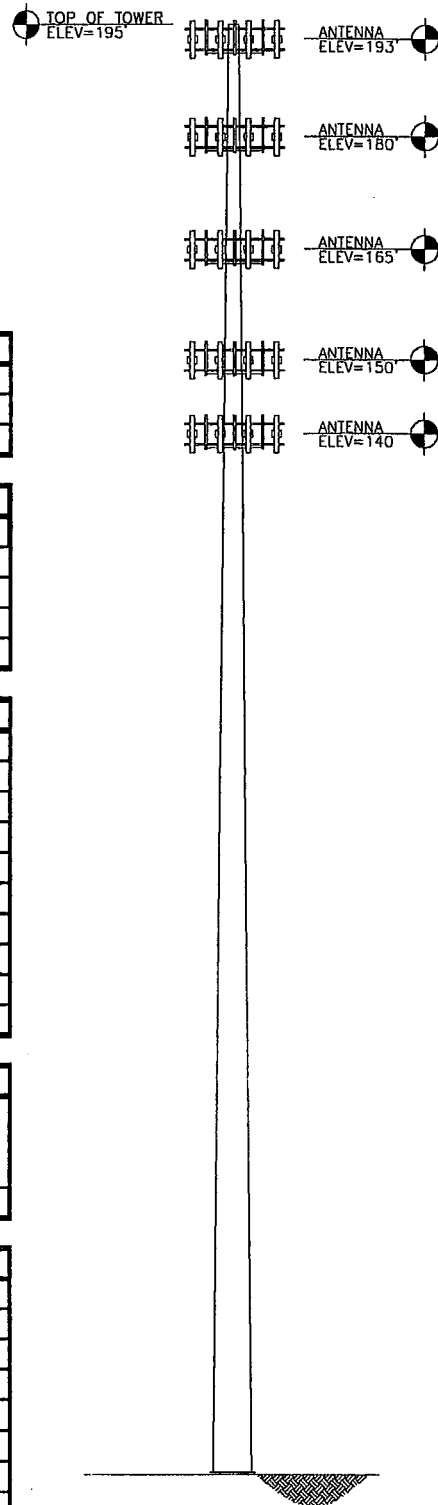
### GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering should be notified immediately to perform a revised analysis.

### LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

Page 1 of 1  
 By PEL Date 2/8/2007  
 Job No. 07-0210E  
 Revision No. \_\_\_\_\_ Date \_\_\_\_\_  
 Pole 195 FT  
 Location STONINGTON EAST, CT  
 Site CT00595-S  
 Owner SBA Properties, Inc.  
 Design 85 MPH No Ice  
74 MPH with 1/2" ice



Load Cases		
Case 1	85 MPH NO ICE	DESIGN WIND
Case 2	74 MPH w/ 1/2" radial ice	
Case 3	50 MPH	OPERATIONAL

Pole Specifications	
Pole Shape Type:	12- sided
Taper:	0.2536 in/ft
Shaft Steel:	Fy = 65 ksi
Base Plate Steel:	Fy = 60 ksi
Anchor Bolts:	(24) 2.25" Fy = 75 ksi

Appurtenance List		
No.	Elevation	Description
1-6	193	(6) Decibel DB980H-90E-M with (6) 1-5/8" coax
7-15	180	(9) ALP 9212 with (9) 1-5/8" coax
16-21	165	(6) RV65-18-XXDPL2, (6) TMA with (12) 1-5/8" coax
22-27	150	(6) 7184, (6) TMA with (12) 1-5/8" coax
28-39	140	(6) RVA-80014, (6) LPA-185063/BCF with (12) 1-5/8" coax
—	30	(1) GPS

Elevation	85 MPH WIND		50 MPH WIND	
	Lateral Deflection (in)	Rotation (Sway) (Degrees)	Lateral Deflection (in)	Rotation (Sway) (Degrees)
Top of Monopole (195 ft.)	147.2	7.0	50.9	2.4

Shaft Section Data					
Shaft Section	Sect. Length (ft)	Plate Thickness (in.)	Lap Splice (in.)	Diam. Across Flats (in)	
				Top	Bottom
1	41.25	0.1880	51.00	17.39	27.76
2	40.25	0.3130	62.00	25.31	35.43
3	49.50	0.3750	72.00	34.48	45.91
4	48.50	0.4360	90.00	44.53	55.97
5	43.00	0.4690	0.00	53.20	64.00

## **APPENDIX**

(c) 2000 FDH Engineering Inc. Raleigh, North Carolina

\*\*\*\*\*  
 Data File...:190\Pole\Ante.txt Job No.:07-0210E Engineer:PEL  
 Description :194.6-FT --Stonington East, CT  
 Design.....:85 MPH Without Radial Ice.  
 Owner.....:SBA Network Services  
 Analyzing Method: Finite Element Method

Analysis Results:

Pole Elemt No.	Segment Feature Location	Segment Elev. (ft)	Linear Deflec. (in)	Non-Lin Deflec. (in)	Lin. Rotat. (deg.)	Non-Lin. Rotat. (deg.)
48.	top	194.600	139.606	145.565	6.90	7.22
47.		193.000	137.292	143.146	6.90	7.22
46.		190.000	132.957	138.612	6.89	7.21
45.		185.000	125.759	131.084	6.84	7.16
44.		180.000	118.632	123.629	6.76	7.07
43.		175.000	111.611	116.286	6.64	6.94
42.		170.000	104.746	109.107	6.46	6.76
41.		165.000	98.078	102.134	6.26	6.55
40.		160.000	91.638	95.401	6.03	6.30
39.	top sec(2)	157.600	88.638	92.265	5.91	6.18
38.		155.000	85.457	88.940	5.77	6.03
37.	bot sec(1)	153.350	83.472	86.866	5.71	5.97
36.		150.000	79.508	82.725	5.58	5.83
35.		145.000	73.767	76.728	5.37	5.61
34.		140.000	68.250	70.967	5.16	5.38
33.		135.000	62.967	65.452	4.93	5.14
32.		130.000	57.928	60.193	4.69	4.89
31.		125.000	53.142	55.201	4.45	4.64
30.	top sec(3)	122.500	50.845	52.806	4.33	4.51
29.		120.000	48.612	50.478	4.20	4.38
28.	bot sec(2)	117.330	46.290	48.058	4.10	4.27
27.		115.000	44.314	45.999	4.00	4.17
26.		110.000	40.229	41.744	3.79	3.95
25.		105.000	36.363	37.719	3.59	3.73
24.		100.000	32.715	33.923	3.38	3.51
23.		95.000	29.284	30.354	3.17	3.30
22.		90.000	26.069	27.012	2.97	3.08
21.		85.000	23.069	23.895	2.76	2.87
20.		80.000	20.282	21.000	2.56	2.66
19.	top sec(4)	79.000	19.750	20.447	2.52	2.62
18.		75.000	17.704	18.323	2.36	2.45
17.	bot sec(3)	73.000	16.729	17.312	2.29	2.38
16.		70.000	15.322	15.852	2.19	2.27
15.		65.000	13.124	13.573	2.01	2.08
14.		60.000	11.109	11.485	1.84	1.90
13.		55.000	9.276	9.586	1.66	1.72
12.		50.000	7.619	7.871	1.50	1.55
11.		45.000	6.136	6.337	1.33	1.38
10.	top sec(5)	43.000	5.591	5.773	1.27	1.31
9.		40.000	4.824	4.980	1.17	1.21
8.	bot sec(4)	35.500	3.783	3.904	1.03	1.07
7.		35.000	3.675	3.792	1.02	1.05
6.		30.000	2.687	2.771	0.87	0.90
5.		25.000	1.857	1.914	0.72	0.74
4.		20.000	1.183	1.219	0.57	0.59
3.		15.000	0.662	0.682	0.42	0.44
2.		10.000	0.293	0.302	0.28	0.29
1.		5.000	0.073	0.075	0.14	0.14
0.	Base	0.000	0.000	0.000	0.00	0.00

Base Reactions	Linear	Non-Linear
Shear(kips)	-41.2795	-41.2795
Axial(kips)	52.0411	52.0411
Moment(Ft-kips)	-4658.2018	-4793.5534



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Data File...:190' Pole\Ante.txt Job No.:07-0210E Engineer:PEL  
 Description :194.6-FT --Stonington East, CT  
 Design.....:85 MPH Without Radial Ice  
 Owner.....:SBA Network Services  
 Analyzing Method: Finite Element Method

Shaft Segments ---- FORCES AND MOMENTS:

Load Case 1: Basic Wind Velocity = 85 MPH.

wind Force ( $F=qz*Gh*[Cf* Ae+sum(Ca*Aa)]$ )  $\leq 2*qz*Gh*Ag$ , where  $Ag$  is total area of pole.

Segment Elev. (ft)	[-----Cumulative Forces-----]		[-----Moments (Ft-Kips)-----]			
	Wind Forces (Kips)	Axial Forces (Kips)	From Ant/Arm	From Shaft Wind	From P-Delta Effects	Total Moment
194.60	0.1294	0.0573	0.14	0.00	0.01	0.15
193.00	2.8212	2.6832	0.19	0.21	0.29	0.69
190.00	3.2590	2.8785	7.61	1.35	0.86	9.81
185.00	3.7220	3.0867	19.97	5.43	1.92	27.33
180.00	7.4346	6.4678	32.34	11.83	4.01	48.18
175.00	7.9464	6.7019	60.83	20.67	6.20	87.70
170.00	8.4817	6.9489	89.32	32.07	8.47	129.86
165.00	11.1690	10.5588	117.81	46.15	11.58	175.54
160.00	11.4443	10.6882	156.94	63.02	14.72	234.68
157.60	11.7407	11.0671	175.72	71.77	16.22	263.71
155.00	11.9267	11.3102	196.07	82.03	17.90	296.01
153.35	12.3123	11.6198	208.99	88.85	18.99	316.83
150.00	14.7994	14.4141	235.21	103.98	21.74	360.93
145.00	15.4145	14.9163	283.81	129.53	25.96	439.30
140.00	18.9560	18.5605	332.40	158.17	30.90	521.47
135.00	19.6587	19.1065	395.29	190.22	35.86	621.37
130.00	20.3795	19.6745	458.18	225.78	40.82	724.78
125.00	20.7455	19.9667	521.07	264.95	45.76	831.78
122.50	21.1175	20.6288	552.51	285.44	48.19	886.14
120.00	21.5213	21.3432	583.95	306.87	50.67	941.50
117.33	21.8772	21.6844	617.54	330.84	53.39	1001.76
115.00	22.6548	22.4356	646.84	352.58	55.76	1055.18
110.00	23.4472	23.2126	709.73	403.12	60.92	1173.77
105.00	24.2533	24.0152	772.62	457.63	66.05	1296.29
100.00	25.0721	24.8437	835.50	516.16	71.14	1422.80
95.00	25.9025	25.6979	898.39	578.79	76.16	1553.34
90.00	26.7434	26.5779	961.28	645.57	81.09	1687.94
85.00	27.5934	27.4836	1024.17	716.56	85.91	1826.63
80.00	27.7632	27.6678	1087.05	791.80	90.60	1969.45
79.00	28.4429	29.2912	1099.63	807.01	91.50	1998.15
75.00	28.7802	30.1084	1149.94	870.60	95.26	2115.80
73.00	29.2891	30.7676	1175.10	903.07	97.11	2175.27
70.00	30.1452	31.8915	1212.83	953.30	99.86	2265.99
65.00	31.0056	33.0467	1275.72	1041.29	104.37	2421.38
60.00	31.8680	34.2333	1338.60	1133.59	108.69	2580.89
55.00	32.7304	35.4513	1401.49	1230.20	112.81	2744.50
50.00	33.5901	36.7006	1464.38	1331.12	116.70	2912.20
45.00	33.9293	37.2091	1527.26	1436.34	120.33	3083.94
43.00	34.4338	38.8271	1552.42	1479.11	121.69	3153.22
40.00	35.1822	41.2800	1590.15	1544.77	123.71	3258.63
35.50	35.2634	41.4203	1646.75	1646.63	126.66	3420.04
35.00	36.0824	42.8409	1653.04	1657.99	126.96	3437.99
30.00	36.9051	44.2937	1715.93	1775.67	129.89	3621.49
25.00	37.7452	45.7787	1778.81	1897.47	132.45	3808.73
20.00	38.6027	47.2960	1841.70	2023.46	134.61	3999.78
15.00	39.4776	48.8455	1904.59	2153.74	136.35	4194.68
10.00	40.3699	50.4272	1967.48	2288.40	137.63	4393.50
5.00	41.2795	52.0411	2030.36	2427.52	138.42	4596.30
0.00	41.2795	52.0411	2093.25	2571.19	138.69	4803.13

Antenna / Arm Loads:

Ant. Arm No.	Antenna Mount		Veloc. [qz] (psf)	Antenna Force (lbs)	Antenna Weight (lbs)	Antenna Moment (lbs-ft)
	Elev. (ft)	Applic. Elev. (ft)				
[1]	201.000	199.000	30.91	31.34	50.00	-62.68

[2]	193.000	193.000	30.64	1240.53	57.00	0.00
[3]	193.000	193.000	30.64	1201.18	1300.00	0.00
[4]	180.000	180.000	30.03	2047.40	240.00	0.00
[5]	180.000	180.000	30.03	1177.48	1300.00	0.00
[6]	165.000	165.000	29.29	980.25	70.00	0.00
[7]	165.000	165.000	29.29	1148.57	1300.00	0.00
[8]	150.000	150.000	28.51	775.18	114.00	0.00
[9]	150.000	150.000	28.51	1117.72	1300.00	0.00
[10]	140.000	140.000	27.95	1115.74	86.00	0.00
[11]	140.000	140.000	27.95	646.20	54.00	0.00
[12]	140.000	140.000	27.95	1095.90	1300.00	0.00

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Total Number of Antennas / Arms = 12  
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Data File...:190' Pole\Ante.txt Job No.:07-0210E Engineer:PEL  
Description :194.6-FT --Stonington East, CT  
Design.....:85 MPH Without Radial Ice  
Owner.....:SBA Network Services  
Analyzing Method: Finite Element Method

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Pole Shaft Segments--- ACTUAL AND ALLOWABLE STRESSES:

Load Case 1: Basic wind velocity = 85 MPH.

Segment Elev. (ft)	[-----ACTUAL STRESSES-----]					Allow. Stress [Fb] (ksi)	Percent Used [Ftot/Fb] %
	Bending [fb] (ksi)	Axial [fb] (ksi)	Torsion [ft] (ksi)	Shear [fv] (ksi)	Combined [Ftot] (ksi)		
194.60	0.040	0.006	0.000	0.026	0.046	48.00	0.10
193.00	0.180	0.252	0.733	0.548	1.281	48.00	2.67
190.00	2.361	0.259	0.674	0.606	2.784	48.00	5.80
185.00	5.756	0.260	0.590	0.647	6.074	48.00	12.65
180.00	8.959	0.513	1.325	1.214	9.653	48.00	20.11
175.00	14.499	0.501	1.178	1.222	15.092	48.00	31.44
170.00	19.215	0.492	1.054	1.233	19.763	47.72	41.41
165.00	23.382	0.709	1.254	1.540	24.156	46.48	51.97
160.00	28.289	0.683	1.135	1.500	29.016	45.23	64.15
157.60	30.353	0.691	1.083	1.504	31.082	44.63	69.64
155.00	21.568	0.430	0.686	0.940	22.019	48.00	45.87
153.35	22.343	0.435	0.664	0.955	22.797	48.00	47.49
150.00	23.886	0.523	0.748	1.111	24.431	48.00	50.90
145.00	26.523	0.517	0.682	1.105	27.056	48.00	56.37
140.00	28.838	0.615	0.832	1.299	29.477	48.00	61.41
135.00	31.592	0.608	0.765	1.291	32.218	48.00	67.12
130.00	33.994	0.601	0.706	1.285	34.609	48.00	72.10
125.00	36.101	0.587	0.653	1.257	36.699	48.00	76.46
122.50	37.038	0.595	0.629	1.256	37.644	48.00	78.42
120.00	31.748	0.510	0.508	1.062	32.266	48.00	67.22
117.33	32.506	0.508	0.488	1.059	33.022	48.00	68.79
115.00	33.130	0.517	0.473	1.078	33.654	48.00	70.11
110.00	34.399	0.517	0.441	1.078	34.921	48.00	72.75
105.00	35.541	0.517	0.413	1.078	36.063	48.00	75.13
100.00	36.573	0.518	0.387	1.078	37.095	48.00	77.28
95.00	37.510	0.520	0.363	1.079	38.034	48.00	79.24
90.00	38.365	0.522	0.342	1.081	38.890	48.00	81.02
85.00	39.147	0.524	0.323	1.082	39.673	48.00	82.65
80.00	39.864	0.512	0.305	1.058	40.379	48.00	84.12
79.00	39.993	0.539	0.301	1.078	40.535	48.00	84.45
75.00	36.281	0.476	0.258	0.938	36.758	48.00	76.58
73.00	36.442	0.481	0.252	0.943	36.925	48.00	76.93
70.00	36.678	0.490	0.244	0.954	37.169	48.00	77.44
65.00	37.056	0.493	0.230	0.954	37.551	48.00	78.23
60.00	37.401	0.497	0.218	0.954	37.899	48.00	78.96
55.00	37.715	0.502	0.207	0.953	38.218	48.00	79.62
50.00	38.003	0.506	0.196	0.953	38.510	48.00	80.23
45.00	38.265	0.500	0.187	0.939	38.766	48.00	80.76
43.00	38.357	0.517	0.183	0.943	38.875	48.01	80.97
40.00	36.979	0.512	0.171	0.898	37.492	48.00	78.11
35.50	37.215	0.503	0.164	0.881	37.718	48.00	78.58
35.00	37.238	0.519	0.163	0.900	37.757	48.00	78.66
30.00	37.479	0.525	0.156	0.899	38.004	48.00	79.17
25.00	37.699	0.530	0.149	0.899	38.230	48.00	79.65
20.00	37.903	0.536	0.143	0.899	38.439	47.66	80.66
15.00	38.090	0.542	0.137	0.900	38.633	47.16	81.92
10.00	38.264	0.548	0.131	0.901	38.813	46.66	83.18
5.00	38.427	0.554	0.126	0.903	38.981	46.16	84.45
0.00	38.578	0.543	0.121	0.885	39.122	45.66	85.68

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Data File...:190' Pole\Ante.txt Job No.:07-0210E Engineer:PEL  
 Description :194.6-FT --Stonington East, CT  
 Design.....:50 MPH Without Radial Ice.  
 Owner.....:SBA Network Services  
 Analyzing Method: Finite Element Method

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 Analysis Results:

Pole Elemt No.	Segment Feature Location	Segment Elev. (ft)	Linear Deflec. (in)	Non-Lin Deflec. (in)	Lin. Rotat. (deg.)	Non-Lin. Rotat. (deg.)
48.	top	194.600	48.306	50.369	2.39	2.50
47.		193.000	47.506	49.531	2.39	2.50
46.		190.000	46.006	47.962	2.39	2.49
45.		185.000	43.515	45.358	2.37	2.48
44.		180.000	41.049	42.778	2.34	2.45
43.		175.000	38.620	40.237	2.30	2.40
42.		170.000	36.244	37.753	2.24	2.34
41.		165.000	33.937	35.340	2.17	2.27
40.		160.000	31.709	33.011	2.09	2.18
39.	top sec(2)	157.600	30.671	31.926	2.04	2.14
38.		155.000	29.570	30.775	2.00	2.09
37.	bot sec(1)	153.350	28.883	30.057	1.98	2.07
36.		150.000	27.511	28.624	1.93	2.02
35.		145.000	25.525	26.549	1.86	1.94
34.		140.000	23.616	24.556	1.78	1.86
33.		135.000	21.788	22.648	1.71	1.78
32.		130.000	20.044	20.828	1.62	1.69
31.		125.000	18.388	19.101	1.54	1.60
30.	top sec(3)	122.500	17.593	18.272	1.50	1.56
29.		120.000	16.821	17.466	1.45	1.52
28.	bot sec(2)	117.330	16.017	16.629	1.42	1.48
27.		115.000	15.333	15.917	1.39	1.44
26.		110.000	13.920	14.444	1.31	1.37
25.		105.000	12.582	13.052	1.24	1.29
24.		100.000	11.320	11.738	1.17	1.22
23.		95.000	10.133	10.503	1.10	1.14
22.		90.000	9.021	9.347	1.03	1.07
21.		85.000	7.982	8.268	0.96	0.99
20.		80.000	7.018	7.266	0.89	0.92
19.	top sec(4)	79.000	6.834	7.075	0.87	0.91
18.		75.000	6.126	6.340	0.82	0.85
17.	bot sec(3)	73.000	5.789	5.990	0.79	0.82
16.		70.000	5.302	5.485	0.76	0.78
15.		65.000	4.541	4.697	0.70	0.72
14.		60.000	3.844	3.974	0.64	0.66
13.		55.000	3.210	3.317	0.58	0.60
12.		50.000	2.636	2.723	0.52	0.54
11.		45.000	2.123	2.193	0.46	0.48
10.	top sec(5)	43.000	1.935	1.998	0.44	0.45
9.		40.000	1.669	1.723	0.41	0.42
8.	bot sec(4)	35.500	1.309	1.351	0.36	0.37
7.		35.000	1.272	1.312	0.35	0.36
6.		30.000	0.930	0.959	0.30	0.31
5.		25.000	0.642	0.662	0.25	0.26
4.		20.000	0.409	0.422	0.20	0.20
3.		15.000	0.229	0.236	0.15	0.15
2.		10.000	0.102	0.105	0.10	0.10
1.		5.000	0.025	0.026	0.05	0.05
0.	Base	0.000	0.000	0.000	0.00	0.00

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Base Reactions	Linear	Non-Linear
Shear(Kips)	-14.2836	-14.2836
Axial(Kips)	52.0411	52.0411
Moment(Ft-Kips)	-1611.8345	-1658.6690

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Data File...:190'Pole\Ante.txt Job No.:07-0210E Engineer:PEL  
 Description :194.6-FT --Stonington East, CT  
 Design.....:50 MPH Without Radial Ice  
 Owner.....:SBA Network Services  
 Analyzing Method: Finite Element Method

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 Shaft Segments --- FORCES AND MOMENTS:

Load Case 1: Basic Wind Velocity = 50 MPH.

wind Force (F=qz\*Gh\*[Cf\*Ae+sum(Ca\*Aa)]) <= 2\*qz\*Gh\*Ag, where Ag is total area of pole.

Segment Elev. (ft)	[-----Cumulative Forces-----]		[-----Moments (Ft-Kips)-----]			
	Wind Forces (Kips)	Axial Forces (Kips)	From Ant/Arm	From Shaft Wind	From P-Delta Effects	Total Moment
194.60	0.0448	0.0573	0.05	0.00	0.00	0.05
193.00	0.9762	2.6832	0.07	0.07	0.10	0.24
190.00	1.1277	2.8785	2.63	0.47	0.30	3.40
185.00	1.2879	3.0867	6.91	1.88	0.67	9.46
180.00	2.5725	6.4678	11.19	4.09	1.39	16.67
175.00	2.7496	6.7019	21.05	7.15	2.15	30.35
170.00	2.9349	6.9489	30.91	11.10	2.93	44.94
165.00	3.8647	10.5588	40.76	15.97	4.01	60.74
160.00	3.9600	10.6882	54.30	21.80	5.09	81.20
157.60	4.0625	11.0671	60.80	24.84	5.61	91.25
155.00	4.1269	11.3102	67.85	28.38	6.19	102.42
153.35	4.2603	11.6198	72.31	30.74	6.57	109.63
150.00	5.1209	14.4141	81.39	35.98	7.52	124.89
145.00	5.3337	14.9163	98.20	44.82	8.98	152.01
140.00	6.5592	18.5605	115.02	54.73	10.69	180.44
135.00	6.8023	19.1065	136.78	65.82	12.41	215.01
130.00	7.0517	19.6745	158.54	78.12	14.13	250.79
125.00	7.1784	19.9667	180.30	91.68	15.84	287.81
122.50	7.3071	20.6288	191.18	98.77	16.68	306.62
120.00	7.4468	21.3432	202.06	106.18	17.53	325.78
117.33	7.5700	21.6844	213.68	114.48	18.48	346.63
115.00	7.8390	22.4356	223.82	122.00	19.30	365.11
110.00	8.1132	23.2126	245.58	139.49	21.08	406.15
105.00	8.3921	24.0152	267.34	158.35	22.86	448.54
100.00	8.6755	24.8437	289.10	178.60	24.61	492.32
95.00	8.9628	25.6979	310.86	200.27	26.35	537.49
90.00	9.2538	26.5779	332.62	223.38	28.06	584.06
85.00	9.5479	27.4836	354.38	247.94	29.73	632.05
80.00	9.6066	27.6678	376.14	273.98	31.35	681.47
79.00	9.8418	29.2912	380.50	279.24	31.66	691.40
75.00	9.9585	30.1084	397.90	301.25	32.96	732.11
73.00	10.1346	30.7676	406.61	312.48	33.60	752.69
70.00	10.4309	31.8915	419.66	329.86	34.55	784.08
65.00	10.7286	33.0467	441.42	360.31	36.11	837.85
60.00	11.0270	34.2333	463.18	392.25	37.61	893.04
55.00	11.3254	35.4513	484.94	425.67	39.04	949.65
50.00	11.6229	36.7006	506.71	460.59	40.38	1007.68
45.00	11.7403	37.2091	528.47	497.00	41.64	1067.11
43.00	11.9148	38.8271	537.17	511.80	42.11	1091.08
40.00	12.1738	41.2800	550.23	534.52	42.81	1127.55
35.50	12.2019	41.4203	569.81	569.77	43.83	1183.40
35.00	12.4853	42.8409	571.99	573.70	43.93	1189.62
30.00	12.7699	44.2937	593.75	614.42	44.95	1253.11
25.00	13.0606	45.7787	615.51	656.56	45.83	1317.90
20.00	13.3573	47.2960	637.27	700.16	46.58	1384.01
15.00	13.6601	48.8455	659.03	745.24	47.18	1451.45
10.00	13.9688	50.4272	680.79	791.83	47.62	1520.24
5.00	14.2836	52.0411	702.55	839.97	47.90	1590.42
0.00	14.2836	52.0411	724.31	889.68	47.99	1661.98

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 Antenna / Arm Loads:

Ant. Arm No.	Mount Elev. (ft)	Load Elev. (ft)	Veloc. [qz] (psf)	Antenna Force (lbs)	Antenna Weight (lbs)	Antenna Moment (lbs-ft)
[1]	201.000	199.000	10.69	10.84	50.00	-21.69

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[2]	193.000	193.000	10.60	429.25	57.00	0.00
[3]	193.000	193.000	10.60	415.63	1300.00	0.00
[4]	180.000	180.000	10.39	708.44	240.00	0.00
[5]	180.000	180.000	10.39	407.43	1300.00	0.00
[6]	165.000	165.000	10.14	339.19	70.00	0.00
[7]	165.000	165.000	10.14	397.43	1300.00	0.00
[8]	150.000	150.000	9.86	268.23	114.00	0.00
[9]	150.000	150.000	9.86	386.75	1300.00	0.00
[10]	140.000	140.000	9.67	386.07	86.00	0.00
[11]	140.000	140.000	9.67	223.60	54.00	0.00
[12]	140.000	140.000	9.67	379.20	1300.00	0.00

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Total Number of Antennas / Arms = 12

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Data File...:190' Pole\Ante.txt Job No.:07-0210E Engineer:PEL

Description:194.6-FT --Stonington East, CT

Design.....:50 MPH Without Radial Ice

Owner.....:SBA Network Services

Analyzing Method: Finite Element Method

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Pole Shaft Segments--- ACTUAL AND ALLOWABLE STRESSES:

Load Case 1: Basic wind velocity = 50 MPH.

Segment Elev. (ft)	[-----ACTUAL STRESSES-----]					Allow. Stress [Fb] (ksi)	Percent Used [Ftot/Fb] %
	Bending [fb] (ksi)	Axial [fb] (ksi)	Torsion [ft] (ksi)	Shear [fv] (ksi)	Combined [Ftot] (ksi)		
194.60	0.014	0.006	0.000	0.009	0.020	48.00	0.04
193.00	0.062	0.252	0.254	0.190	0.456	48.00	0.95
190.00	0.817	0.259	0.233	0.210	1.125	48.00	2.34
185.00	1.992	0.260	0.204	0.224	2.270	48.00	4.73
180.00	3.100	0.513	0.458	0.420	3.670	48.00	7.65
175.00	5.017	0.501	0.408	0.423	5.548	48.00	11.56
170.00	6.649	0.492	0.365	0.427	7.159	47.72	15.00
165.00	8.091	0.709	0.434	0.533	8.821	46.48	18.98
160.00	9.789	0.683	0.393	0.519	10.486	45.23	23.18
157.60	10.503	0.691	0.375	0.520	11.206	44.63	25.11
155.00	7.463	0.430	0.237	0.325	7.900	48.00	16.46
153.35	7.731	0.435	0.230	0.330	8.172	48.00	17.03
150.00	8.265	0.523	0.259	0.385	8.795	48.00	18.32
145.00	9.177	0.517	0.236	0.382	9.700	48.00	20.21
140.00	9.979	0.615	0.288	0.450	10.602	48.00	22.09
135.00	10.932	0.608	0.265	0.447	11.545	48.00	24.05
130.00	11.763	0.601	0.244	0.445	12.368	48.00	25.77
125.00	12.492	0.587	0.226	0.435	13.082	48.00	27.25
122.50	12.816	0.595	0.218	0.434	13.415	48.00	27.95
120.00	10.985	0.510	0.176	0.368	11.498	48.00	23.95
117.33	11.248	0.508	0.169	0.366	11.758	48.00	24.50
115.00	11.464	0.517	0.164	0.373	11.983	48.00	24.96
110.00	11.903	0.517	0.153	0.373	12.421	48.00	25.88
105.00	12.298	0.517	0.143	0.373	12.817	48.00	26.70
100.00	12.655	0.518	0.134	0.373	13.175	48.00	27.45
95.00	12.979	0.520	0.126	0.373	13.500	48.00	28.13
90.00	13.275	0.522	0.118	0.374	13.798	48.00	28.75
85.00	13.546	0.524	0.112	0.374	14.070	48.00	29.31
80.00	13.794	0.512	0.105	0.366	14.307	48.00	29.81
79.00	13.839	0.539	0.104	0.373	14.379	48.00	29.96
75.00	12.554	0.476	0.089	0.325	13.030	48.00	27.15
73.00	12.610	0.481	0.087	0.326	13.091	48.00	27.27
70.00	12.691	0.490	0.084	0.330	13.182	48.00	27.46
65.00	12.822	0.493	0.080	0.330	13.316	48.00	27.74
60.00	12.941	0.497	0.075	0.330	13.439	48.00	28.00
55.00	13.050	0.502	0.072	0.330	13.552	48.00	28.23
50.00	13.150	0.506	0.068	0.330	13.656	48.00	28.45
45.00	13.241	0.500	0.065	0.325	13.741	48.00	28.63
43.00	13.272	0.517	0.063	0.326	13.790	48.01	28.72
40.00	12.796	0.512	0.059	0.311	13.308	48.00	27.72
35.50	12.877	0.503	0.057	0.305	13.380	48.00	27.88
35.00	12.885	0.519	0.056	0.311	13.404	48.00	27.93
30.00	12.968	0.525	0.054	0.311	13.493	48.00	28.11
25.00	13.045	0.530	0.052	0.311	13.575	48.00	28.28
20.00	13.115	0.536	0.049	0.311	13.651	47.66	28.64
15.00	13.180	0.542	0.047	0.311	13.722	47.16	29.10
10.00	13.240	0.548	0.045	0.312	13.788	46.66	29.55
5.00	13.296	0.554	0.044	0.312	13.851	46.16	30.01
0.00	13.349	0.543	0.042	0.306	13.892	45.66	30.42