STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
Fax: (860) 827-2950

January 29, 2001

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

RE: **EM-VER-078-010111** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located on the University of Connecticut campus, Storrs, Connecticut. (Docket No. 179)

Dear Attorney Baldwin:

At a public meeting held on January 25, 2001, 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 January 11, 2001, and January 24, 2001. 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. 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,

Mortimer A. Gelston
Chairman

MAG/laf

c: Honorable Elizabeth Patterson, Mayor, Town of Mansfield
Mr. Martin H. Berliner, Town Manager, Town of Mansfield
Mr. Gregory Padick, Town Planner, Town of Mansfield
Ms. Sandy M. Carter, Verizon Wireless
Mr. Paul Shapiro, Assistant Attorney General
Mr. Robert Vietzke, Manager, Video Services
Mr. John Murphy, General Manager, WHUS Radio

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ROBINSON & COLE LLP
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LAW OFFICES
280 Trumbull Street
Hartford, CT 06103-3597
860-275-8200
Fax 860-275-8299

Kenneth C. Baldwin
860-275-8345
Internet: kbaldwin@rc.com

January 24, 2001

Via Facsimile

Paul Aresta
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **EM-VER-078-010111**
University of Connecticut Campus, Storrs, Connecticut

Dear Mr. Aresta:

In response to your request for some additional information regarding the above-referenced exempt modification I offer the following comment from Cellco Partnership d/b/a Verizon Wireless regarding why they are proposing a change of antennas on the existing Storrs facility.

> The proposed antenna system offered by Metawave will allow Verizon Wireless to better maximize our existing network resources. This improvement is achieved by minimizing the inefficiencies caused by imbalance traffic loading. The three directional antenna designs used by Verizon may result in one or two sectors of a base station carrying more or less traffic than other sectors. This imbalance can result in an inefficient use of base station hardware and spectrum resources. The deployment of the Metawave system will better equalize a cell's traffic load and thus improve our overall network efficiency.
>
> The Metawave installation uses a software adaptable directional antenna array. This means that the coverage area for an individual sector can be increased of decreased without making any physical change to the antennas. The antenna pattern modification is achieved by internal logic inherent to the antenna system design. This type of flexibility will allow Verizon to reduce the coverage area for heavily used sectors and increase the coverage area for lightly used sectors. This balance of traffic yields system efficiencies by ensuring that each sector is handling about a third of the site's total load.

ROBINSON & COLE LLP

In addition, because these antennas will be mounted on the tower at the same location as the existing antennas and will not take up any additional space on the tower we do not believe that the proposed antenna change out will have any affect on the Council's tower consolidation planning efforts.

If you have any additional questions please feel free to contact me. Thank you for your assistance and cooperation.

Sincerely,

Kenneth C. Baldwin

KCB/kmd
cc: David S. Malko, P.E.
Sandy M. Carter

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LAW OFFICES

280 Trumbull Street
Hartford, CT 06103-3597
860-275-8200
Fax 860-275-8299

Kenneth C. Baldwin
860-275-8345
Internet: kbaldwin@rc.com

January 11, 2001

Via Hand Delivery

Mr. Joel M. Rinebold
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: Notice of Exempt Modification
University of Connecticut (UCONN)
Storrs, Connecticut

Dear Mr. Rinebold:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") intends to modify its antenna configuration on the existing "facility" tower at UCONN in Storrs, 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, a copy of this letter is being sent to the Mansfield Town Manager, Martin H. Berliner.

Cellco's facility consists of its standard array of panel-type antennas attached at the 80-foot level on the existing 292-foot guyed lattice tower and a single-story equipment shelter near the base of the tower. Cellco now intends to remove the existing panel antennas and replace them with three (3) Metawave® panel antennas at the same 80-foot level on the tower. Specifications for the Metawave® antennas are attached hereto. There are no changes proposed to any ground mounted structures or equipment.

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

1. The proposed modification will not increase the overall height of the existing tower. Cellco's antennas will be mounted at the 80-foot level on the existing 292-foot tower.

2. The proposed antenna modification does not effect any ground level equipment or structure and therefore will not require an extension of facility boundaries.

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

4. The operation of the Metawave® antennas does not result in an increase in existing radio frequency (RF) power density levels at the facility. Updated RF power density calculations were therefore not performed for Cellco or other uses at this facility.

Also attached is a copy of a structural analysis verifying that the tower can accommodate the proposed antenna modification.

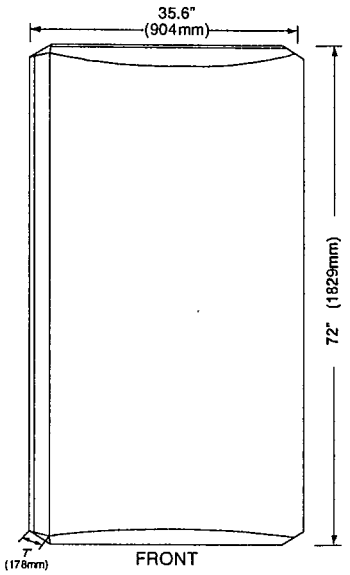
For the foregoing reasons, Cellco respectfully submits that the proposed antenna modification at the UCONN facility tower constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

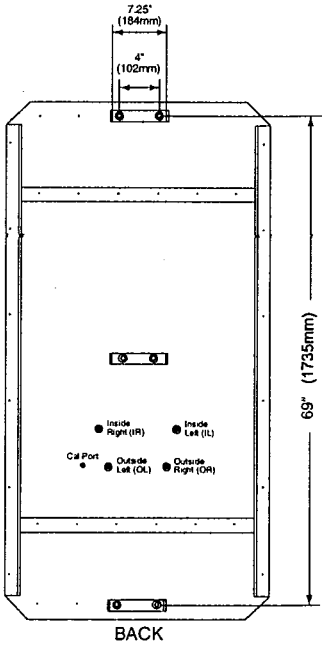
Sincerely,

Kenneth C. Baldwin

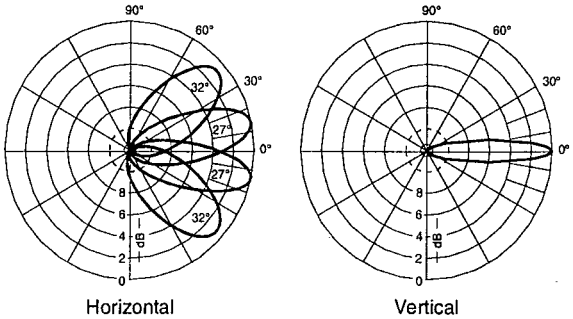
KCB/kmd
Attachments
cc: Martin H. Berliner, Mansfield Town Manager
Sandy M. Carter

Part Number	155-0007-02
Terminations	Antenna Ports: 7/16 DIN Calibration Port: Type N-Female
Frequency Range	824-896 MHz
Gain	Outer Beams: 15.9 dBd (18.0 dBi) Inner Beams: 16.9 dBd (19.0 dBi)
VSWR	Input Ports: 1.5 : 1 Calibration Port: 1.8 : 1
Beamwidth (± 3°) (3dB from max)	Horizontal: 2 outer beams 32° ± 3°, 2 inner beams 27° ± 3° Vertical: 11° ± 2°
Azimuth Pointing Angle (± 2°)	2 Outer Beams: ± 45° 2 Inner Beams: ± 15°
Side Lobe Level	Inside: ≥ 10.25 dBc, down from main beam Outside: ≥ 8.25 dBc, down from main beam
Front-to-Back Ratio	25 dB
Polarization	Vertical
Max. Input Power	250 Watts, per beam 500 Watts, composite
Weight	75 lb (34 kg)
Wind Area	17.8 ft² (1.65 m²)
Wind Load	712 lbf (3167N) 320 kp (at 100 mph)
Max. Wind Speed	125 mph (201 km/h)
Material	~~Reflector: Pass. Aluminum~~ Radiators: Silver-Plated Brass Radome: ABS, UV Resistant Mounting Hdw: Galvanized Steel
Color, Radome	Gray
Mounting	DB380 pipe mount kit (max. 3.5" OD), included
Downtilt Bracket	Optional
Weather Protection	Fully protected by backplate and radome
Lightning Protection	All metal parts grounded
Packing Size	74" x 41" x 10" (188 x 104 x 25.4 cm)
Shipping Weight	131 lbs (59.4 kg)





ANTENNA PATTERNS



In CDMA systems, SpotLight 2000 combines beams to create custom sector patterns. You can use SpotLight's Beam Controller software to define, model and display CDMA sectors.

METAWAVE®
10735 Willows Road NE, Redmond, WA 98052 USA
Tel: (425) 702-5600 Fax: (425) 702-5970
www.metawave.com

SPOTLIGHT™ 2000

CABLE RECOMMENDATIONS AND CONNECTOR REQUIRMENTS

Metawave advises the following connector requirements and cable recommendations:

CONNECTOR SPECIFICATIONS (required)

The Metawave SpotLight system employs duplexers on all antenna transmission lines. In a duplexed system, each transmission line carries both receive and transmit signals. A drawback to duplexed systems is their sensitivity to intermodulation (IMD) generated in the antenna or transmission line.

To reduce the possibility of IMD, Metawave has specified that RF connectors on the transmission line jumpers be silver plated or white bronze. Other materials may work satisfactorily in most systems, but certain combinations of metals may be susceptible to oxidation. This oxidation may contribute to the generation of IMD. In an effort to reduce IMD and optimize system performance, Metawave requires that only silver plated or white bronze connectors be used on all transmission line jumpers.

CABLE SPECIFICATIONS (recommended)

Metawave highly recommends the use of Amphenol cables, particularly on the cables from the Polyphasers to the IDLS. The Amphenol cable provides for consistent connections and ease of assembly. The Amphenol cables require no soldering or silicon to seal the joint. It also uses a captive pin technology and has the silicon embedded in the o-rings.

The Amphenol cable has a proprietary technology in that the inner insulation will pull away easily from the center conductor of the cable so the assembler does not have to scrape the insulation away, as is the case with other vendor cables. When employing the scraping method, there is a high risk of nicking the center conductor, which increases the risk of IMD problems.

Jumpers & Connectors: Antenna ports to RF Transmission Lines:

- AFC4-50J
  - ½" Hardline Annular
- A4PNM
  - N Connector Male Silver Plating
- A4WNM
  - N Connector Male White Bronze
- A4PDM
  - 7/16 DIN Connector Male Silver Plating
- A4WDM
  - 7/16 DIN Connector Male White Bronze

Cables & Connectors: Polyphasers to SpotLight IDLS:

- SFC4-50J
  - ½" Hardline SuperFlex
- S4PNM
  - N Connector Male Silver Plating
- S4WNM
  - N Connector Male White Bronze
- S4PDM

- 7/16 DIN Connector Male Silver Plating
- S4WDM
  - 7/16 DIN Connector Male White Bronze

CABLE PREP TOOLS

The cable prep tool fits into a regular drill chuck and allows for quick and consistent preparation of the cable end for the specific connector.

- TXL-ST-S4
  - Superflex drill style cable prep tool
- TXL-ST-A4
  - Annular drill style cable prep tool

The flare tool is used on the annular type cables and makes locking the connector body to the cable quicker and easier.

- TXL-FT-12
  - Annular cable flare tool

SUPPLIER OF PRODUCTS

Amphenol Corporation, Wireless Cable Products

www.amphenol.com

SPOTLIGHT™ 2000

ANTENNA BRACING RECOMMENDATION

Metawave, and our antenna manufacturer (Decibel), recommend the following antenna bracing for the high-gain antenna with the 80° analog transmit antenna (used for Analog Pass-Thru functionality):

BRACING RECOMMENDATION

Metawave recommends applying an azimuth arm brace to either side of the high-gain multibeam antenna. For the brace it is recommended that the following be used:

- ½" threaded rod for lengths up to 2 feet
- 1" rigid conduit (or equivalent) up to 6 feet
- 1-1/4" rigid conduit up to 10 feet

All of the hardware used on exterior antenna and tower structures should be galvanized, stainless steel, or aluminum. Metawave advises against using cable and turnbuckle bracing methods as those impose undue stress on the antenna structure. Due to a variety of install situations, no single connecting bracket and hardware package can be assembled. However, case appropriate materials can be found among offerings of manufacturers such as Andrew, B-Line, Decibel, Rohn, Unistrut, Valmont/Microflect, etc.

SPOTLIGHT™ 2000

RACK ENVELOPE & COMPONENT (approx.) WEIGHT REQUIRMENTS

RACK ENVELOPE REQUIREMENTS

ACK

SpotLight racks require the following minimum envelope dimensions:

19" RACK

Standard Rack

- 90"tall x 30"deep x 23.13"wide

Short (non-standard) Rack

- 82.88"tall x 30"deep x 23.13"wide

25" RACK

Standard Rack

- 90"tall x 30"deep x 29.13"wide

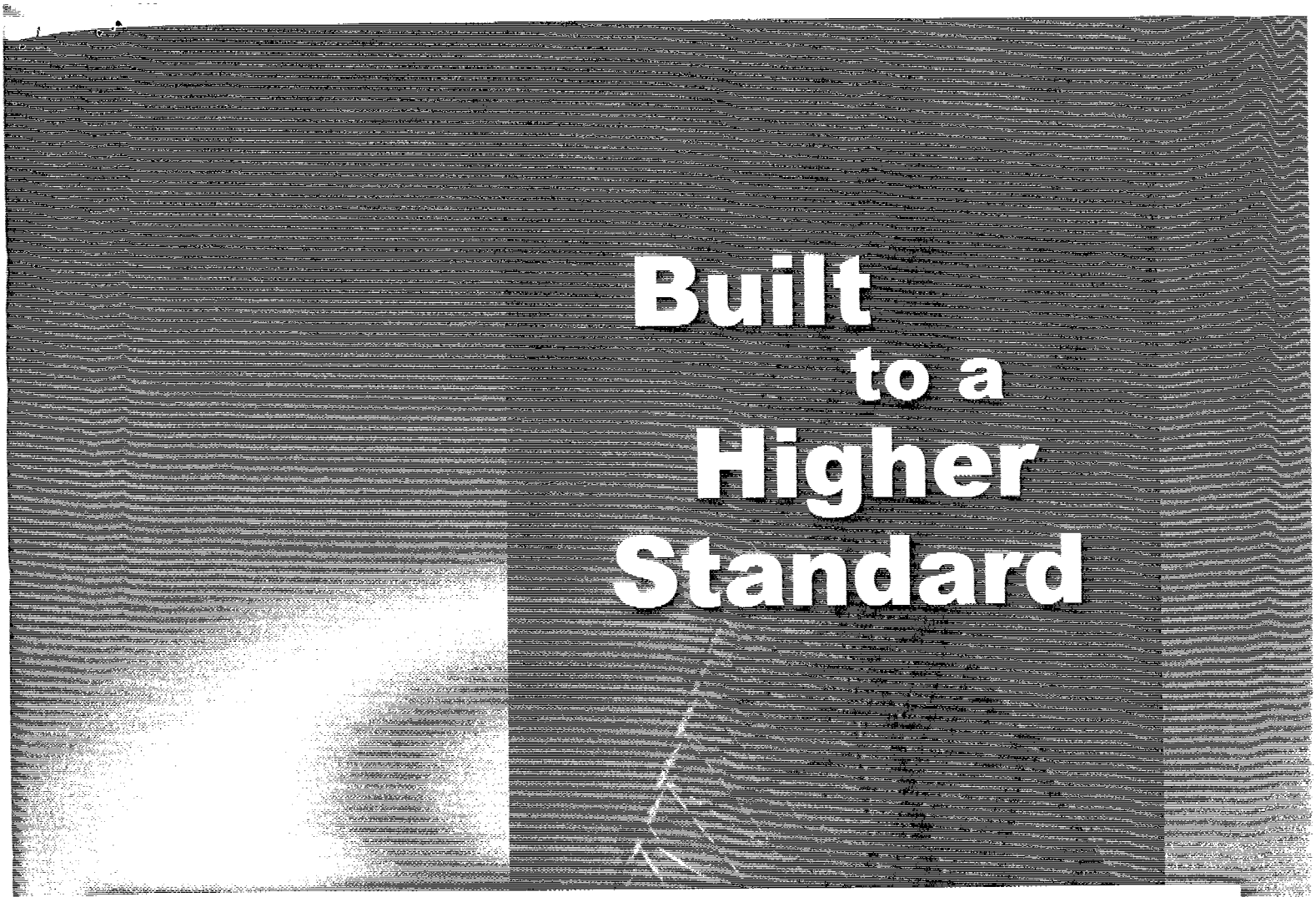
Short (non-standard) Rack

- 82.88"tall x 30"deep x 29.13"wide

COMPONENT (approx.) WEIGHT REQUIREMENTS

25" rack with cages:	300 lbs. ea.
19" rack with cages:	250 lbs. ea.
LPA's (30 & 50 W):	38 lbs. ea.
SMU's:	14 lbs. ea.
IDLS's:	34 lbs. ea.
RX FRU's:	5.20 lbs. ea.
TX FRU's:	5.20 lbs. ea.
Controller FRU's:	5.20 lbs. ea.
fan assy (on 19" rack):	25 lbs.
cables and misc:	50 lbs. per rack
standard gain antenna (or EDT):	47 lbs.
high gain antenna (or EDT):	75 lbs.
analog transmit (80 degree) antenna:	90 lbs.

(25"rack loaded - ~1,366; 19"rack loaded - ~500 lbs.)



VERIZON WIRELESS
STRUCTURAL ANALYSIS REPORT

STORRS, CT ***01-12035***

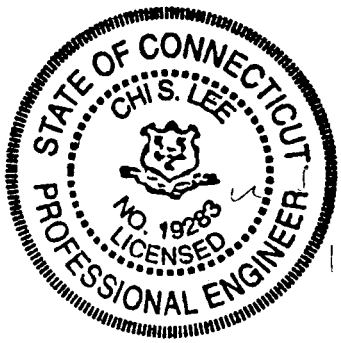
Built to a Higher Standard
2101 Murray Street
Phone 712-258-6690

Structural Analysis Report

Job # 01-12035

Existing 292' Sabre Communications Corporation
4400SRW Guyed Tower

Located at Storrs, Connecticut



12-18-00

Report Completed for

Verizon Wireless

Wallingford, Connecticut

Prepared by

Sabre Communications Corporation

December 15, 2000

Structural Analysis Report
Existing 292' Sabre Communications Corporation
4400SRW Guyed Tower

Table of Contents

Introduction

The purpose of this analysis is to determine if the existing tower is in conformance with the requirements of ANSI/TIA/EIA 222-F, while supporting specified equipment. The tower is a 292' (plus 35' top pole) 4400SRW guyed tower and was originally manufactured by Sabre Communications Corporation. The tower is located in Storrs, Connecticut. The analysis is being performed for Verizon Wireless, Wallingford, Connecticut.

Method of Analysis

The computer program that was used for this analysis is described on the attached page. The analysis was performed using a basic wind speed of 90 mph concurrent with 1/2" ice, in accordance with ANSI/TIA/EIA 222-F. Allowable stresses, safety factors and load factors were also determined in accordance with this standard.

Supported Equipment

The analysis was performed for the tower, supporting the following equipment:

1. One (1) 4-bay FM antenna on a 35' high, 10-3/4" diameter pole between 292' and 327'
2. Three (3) 10' whip antennas with mounts at 292'
3. One (1) 3' panel antenna with mount at 290'
4. One (1) 3' panel antenna with mount at 289'
5. One (1) 3' panel antenna with mount at 283'
6. Six (6) PD-220 antennas with mounts at 280'
7. One (1) 3' panel antenna with mount at 277'
8. Six (6) PD-220 antennas with mounts and AMPS at 260'
9. Twelve (12) ALP-E9011 panel antennas with mounts at 240'
10. Twelve (12) panel antennas at 230'
11. Six (6) PD-220 antennas with mounts at 210'
12. One (1) 4-dipole array at 200'
13. One (1) yagi antenna at 200'
14. Six (6) PD-220 antennas with mounts at 190'
15. One (1) yagi antenna at 190'
16. Six (6) PD-220 antennas with mounts at 180'

17. Six (6) PD-220 antennas with mounts at 160'
18. One (1) ASP-952 antenna with mount at 150'
19. Two (2) 8' dishes with radomes at 135'
20. One (1) 6' dish with radome at 125'
21. One (1) 6' dish with radome at 100'
22. One (1) yagi antenna at 100'
23. One (1) GPS antenna with mount at 80'
24. Three (3) Metawave panel antennas with mounts at 80', with twelve (12) 1-1/4" lines and three (3) 1/2" lines (proposed)

For the purpose of calculating wind loads on the feedlines, the tower was considered to be covered solid with lines, over the entire height.

Results

The results of the analysis show no overstresses in any tower component or the foundations.

The results also show the following minimum reserve capacities (additional amount of allowable load beyond the calculated loads):

Guy wires	= 25%
Legs	= 23%
Diagonals	= 29%
Foundations	= 27%

Conclusions

Based on the preceding results, the following conclusions have been made:

1. The tower with specified equipment is adequate to achieve a basic wind speed rating of 90 mph concurrent with 1/2" radial ice, in accordance with ANSI/TIA/EIA 222-F.
2. No modifications are required, in order to meet the structural criteria stated above.
3. The analysis is valid only for the equipment listed above. If the equipment is not as listed, an additional analysis should be performed.

4. The analysis assumes that the tower contains no structural defects, and that all components have been installed properly.

Description of Guyed Tower Computer Program

A guyed tower computer program employing the stiffness matrix (finite element) method is utilized by Sabre Communications to perform the structural analysis and design of guyed towers.

The general principle of analysis of a guyed tower is based on the papers published in the ASCE Journal of the Structural Division such as No.'s 3021, 3375 and 4671. The stiffness matrix method is based on the articles published in the ASCE's Fall Convention and Exhibit held in San Francisco California in October of 1977 and ASCE's 8th Conference of Electronic Computation in Houston, Texas in February of 1983.

The other reference books for stiffness matrix or finite element are Richard H. Gallagher, Finite Element Analysis Fundamentals, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1975; William Weaver, Jr. and Paul R. Johnston, Finite Elements for Structural Analysis, Prentice-Hall, Inc., 1984 and M. B. Kanchi, Matrix Methods of Structural Analysis, John Wiley & Sons, New York, New York, 1981.

The basic criteria of designing a guyed tower such as wind speed, effective areas of tower sections, allowable stresses, safety factors of guys and foundations are based on the ANSI/EIA/TIA Standards.

Basically, a guyed tower is treated as a continuous beam on elastic supports, namely guy wires. Wind, ice and weight are the major design loads considered in the static analysis. Effects to due eccentric moments, torques, axial deformations, slopes and deflections and the elevations of guy anchors are included in the tower program.

After all the necessary input data is entered, the program will compute the wind loads at different elevations, effective area of tower sections and the allowable capacity of each tower member. Then it will generate a stiffness matrix of each individual tower member and guy wire. Then the matrices are assembled to form a global matrix. A system of linear simultaneous equations is set based upon the equilibrium conditions of a global matrix, deformations and load vector. By solving the equations and then by back substitution of the deformations into individual elements (tower spans), the final axial forces, end shears and end moments are obtained. Each tower span is divided into ten small sections so that the shear, moment, leg and brace loads, and the combined stress ratios of each small section are calculated.

For clarity and simplicity, the tower program only prints out the maximum reactions and loads of tower members due to the different directions of wind acting at a tower, namely, into leg, parallel to face and into face. Usually the relative maximum guy tensions, brace loads and leg loads are caused when the direction of wind is at the tower leg or apex, parallel to tower face and into tower face, respectively.

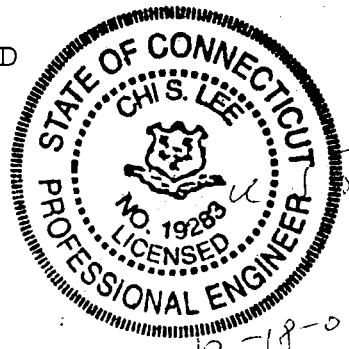
EXIST. 292' + 35' POLE MODEL 4400SRW, STORRS, CT (#01-12035) 12-14-00
90 MPH WIND + 0.5 in. ICE (NO REDUCTION) PER EIA-222-F-1996
TOWER SECTION WITH FEEDLINES IS CONSIDERED TO BE SOLID PROJECTED AREA
25% EXTRA CAPACITY OF THE TOWER AND FOUNDATIONS IS REQUIRED
INPUT DATA FILE SABRE\GUYTOWER\00J1049.DAT PER QB\LEEGTSP

***** GUYED TOWER *****

TOWER HEIGHT (ft.)	=	292
RADIAL ICE (in.)	=	.5
WIND SPEED (mph)	=	90
NO. OF SET OF ANCHORS	=	1
REQ'ED GUY SAFETY FACTOR	=	2
BASE CONDITION	=	PIVOT
ANCHOR AZIMUTHS (deg)	=	0 , 120 , 240

***** ANTENNA LOADING *****

ELEV. ft.	PROJ. AREA sq.ft.	WIND LOAD kips	DEAD LOAD kips	ANTENNA TORQUE k-ft	DESCRIPTION OF ANTENNA
57	16.0	0.42	0.70	0.0	CHANNEL TORQUE ARM
80	6.0	0.17	0.10	0.0	GPS ANT. + MOUNT
80	75.0	2.18	0.60	0.0	NEW (3) METAWAVE ANT'S + MT
100	8.0	0.25	0.20	0.0	YAGI ANTENNA
100	25.0	0.78	0.30	1.0	6' DISH W/RADOME
107	16.0	0.51	0.70	0.0	CHANNEL TORQUE ARM
125	25.0	0.83	0.30	1.0	6' DISH W/RADOME
135	76.0	2.57	0.80	1.4	(2) 8' DISHES W/RAD
150	8.0	0.28	0.22	0.0	ASP952 + MOUNT
160	35.0	1.24	0.85	0.0	(6) PD220 + MOUNTS
167	16.0	0.57	0.70	0.0	CHANNEL TORQUE ARM
180	35.0	1.28	0.85	0.0	(6) PD220 + MOUNTS
190	8.0	0.30	0.20	0.0	YAGI ANTENNA
190	35.0	1.30	0.85	0.0	(6) PD220 + MOUNTS
200	8.0	0.30	0.20	0.0	YAGI ANTENNA
200	12.0	0.45	0.22	0.0	DIPOLE ARRAY
210	35.0	1.34	0.85	0.0	(6) PD220 + MOUNTS
217	16.0	0.62	0.70	0.0	CHANNEL TORQUE ARM
230	75.0	2.95	2.30	0.0	(12) PANELS
240	71.0	2.83	2.20	0.0	(12) ALP-E9011 PANELS
257	16.0	0.65	0.70	0.0	CHANNEL TORQUE ARM
260	41.0	1.67	0.92	0.0	(6) PD220 + AMPS + MOUNTS
277	8.0	0.33	0.25	0.0	3' PANEL + MOUNT
280	35.0	1.46	0.85	0.0	(6) PD220 + MOUNTS
283	8.0	0.33	0.25	0.0	3' PANEL + MOUNT
284	16.0	0.67	0.70	0.0	CHANNEL TORQUE ARM
289	8.0	0.34	0.25	0.0	3' PANEL + MOUNT
290	8.0	0.34	0.25	0.0	3' PANEL + MOUNT
292	33.0	1.39	1.00	0.0	(3) 10' WHIPS + MOUNT
310	108.0	4.63	6.00	0.0	4-BAY FM + 10.75 POLE



12-18-00

***** LINEAR ATTACHMENT *****

ELEVATION ft.	EFFECTIVE AREA sq.ft/ft.	DEAD LOAD k/ft	DESCRIPTION OF ATTACHMENT
292	6.40	0.160	FEEDLINES

EXIST. 292' + 35' POLE MODEL 4400SRW, STORRS, CT (#01-12035) 12-14-00
90 MPH WIND + 0.5 in. ICE (NO REDUCTION) PER EIA-222-F-1996
TOWER SECTION WITH FEEDLINES IS CONSIDERED TO BE SOLID PROJECTED AREA
25% EXTRA CAPACITY OF THE TOWER AND FOUNDATIONS IS REQUIRED
INPUT DATA FILE SABRE\GUYTOWER\00J1049.DAT PER QB\LEEGTSP

**** TOWER SPAN DATA ****
(LINEAR ATTACHMENTS ARE NOT INCLUDED)

ELEVATION FROM ft	TO ft	PROJ. AREA ft^2/ft	Ag ft^2/ft	e	Cf	EFFECTIVE AREA ft^2/ft	WIND PRESSURE ksf	WIND LOAD k/ft	DEAD LOAD k/ft
0	57	0.69	4.00	0.281	2.35	1.61	0.023	0.036	0.133
57	107	0.70	4.00	0.284	2.34	1.63	0.029	0.048	0.138
107	167	0.66	3.98	0.272	2.37	1.56	0.034	0.053	0.118
167	217	0.68	3.98	0.279	2.35	1.59	0.037	0.060	0.128
217	257	0.65	3.96	0.270	2.38	1.54	0.040	0.061	0.114
257	284	0.58	3.92	0.248	2.44	1.43	0.041	0.059	0.084
284	292	0.58	3.92	0.248	2.44	1.43	0.042	0.060	0.084

GUY ELEV	GUY RADIUS	ANCHOR LEVEL	# OF GUYS	UNIF WIND	UNIF WT	ANT'S WT	ECC. ARM	WIND* LOAD	LEG AREA	FACE WIDTH	TORQ/ ELEV
ft	ft	ft	/ELEV	k/ft	k/ft	k	ft	psf	in2	ft	ft-k
57	235	-25.0	6	0.181	0.293	0.70	2.12	21	7.07	3.66	0.0
107	235	-25.0	6	0.235	0.298	1.90	2.12	24	7.07	3.66	1.7
167	235	-25.0	6	0.270	0.278	2.87	2.12	27	5.94	3.66	1.7
217	235	-25.0	6	0.299	0.288	3.87	2.12	29	5.94	3.66	0.0
257	235	-25.0	6	0.315	0.274	5.20	2.12	31	4.91	3.66	0.0
284	235	-25.0	6	0.323	0.244	3.04	2.12	31	3.14	3.66	0.0
CANTILEVER ARM :-				0.330	0.244	7.50			3.14	3.66	0.0

* MEANS WIND PRESSURE ON GUYS

EXIST. 292' + 35' POLE MODEL 4400SRW, STORRS, CT (#01-12035) 12-14-00
90 MPH WIND + 0.5 in. ICE (NO REDUCTION) PER EIA-222-F-1996
TOWER SECTION WITH FEEDLINES IS CONSIDERED TO BE SOLID PROJECTED AREA
25% EXTRA CAPACITY OF THE TOWER AND FOUNDATIONS IS REQUIRED
INPUT DATA FILE SABRE\GUYTOWER\00J1049.DAT PER QB\LEEGTSP

***** TOWER'S MEMBER DATA *****

Fy of LEGS = 50 ksi Fy of DIAGONALS = 36 ksi Fy of GIRTS = 36 ksi

SEC. FROM ft	LENGTH TO ft	MEMBER SIZE		DIAG CONFIG	K-VALUE	L in.	r in.	AREA in2	KL/r	Fa or Ft ksi	ALLOW LOAD kips
*** LEGS OF TOWER ***											
0	80	3.0	ROD	ZG	1.0	40.0	0.75	7.07	53	23.82	168.43
80	100	3.0	ROD	ZG	1.0	40.0	0.75	7.07	53	23.82	168.43
100	120	2.75	ROD	ZG	1.0	40.0	0.69	5.94	58	23.03	136.81
120	140	2.75	ROD	ZG	1.0	40.0	0.69	5.94	58	23.03	136.81
140	160	2.5	ROD	ZG	1.0	40.0	0.63	4.91	64	22.02	108.13
160	180	2.75	ROD	ZG	1.0	40.0	0.69	5.94	58	23.03	136.81
180	200	2.5	ROD	ZG	1.0	40.0	0.63	4.91	64	22.02	108.13
200	220	2.5	ROD	ZG	1.0	40.0	0.63	4.91	64	22.02	108.13
220	260	2.25	ROD	ZG	1.0	40.0	0.56	3.98	71	20.74	82.56
260	292	2.0	ROD	ZG	1.0	40.0	0.50	3.14	80	19.01	59.70
*** DIAGONALS OF TOWER ***											
0	80	1.25	ROD	ZG	1.0	56.3	0.31	1.23	180	4.62	5.68
80	100	1.375	ROD	ZG	1.0	56.3	0.34	1.48	164	5.54	8.20
100	120	1.5	ROD	ZG	1.0	56.3	0.38	1.77	150	6.63	11.73
120	140	1.25	ROD	ZG	1.0	56.3	0.31	1.23	180	4.62	5.68
140	160	1.375	ROD	ZG	1.0	56.3	0.34	1.48	164	5.54	8.20
160	180	1.5	ROD	ZG	1.0	56.3	0.38	1.77	150	6.63	11.73
180	200	1.25	ROD	ZG	1.0	56.3	0.31	1.23	180	4.62	5.68
200	220	1.5	ROD	ZG	1.0	56.3	0.38	1.77	150	6.63	11.73
220	260	1.375	ROD	ZG	1.0	56.3	0.34	1.48	164	5.54	8.20
260	292	1.375	ROD	ZG	1.0	56.3	0.34	1.48	164	5.54	8.20
*** GIRTS OF TOWER ***											
0	80	1.0	ROD	ZG	1.0	44.0	0.25	0.79	176	4.82	3.78
80	100	1.0	ROD	ZG	1.0	44.0	0.25	0.79	176	4.82	3.78
100	120	1.0	ROD	ZG	1.0	44.0	0.25	0.79	176	4.82	3.78
120	140	1.0	ROD	ZG	1.0	44.0	0.25	0.79	176	4.82	3.78
140	160	1.0	ROD	ZG	1.0	44.0	0.25	0.79	176	4.82	3.78
160	180	1.0	ROD	ZG	1.0	44.0	0.25	0.79	176	4.82	3.78
180	200	1.0	ROD	ZG	1.0	44.0	0.25	0.79	176	4.82	3.78
200	220	1.0	ROD	ZG	1.0	44.0	0.25	0.79	176	4.82	3.78
220	260	1.0	ROD	ZG	1.0	44.0	0.25	0.79	176	4.82	3.78
260	292	1.0	ROD	ZG	1.0	44.0	0.25	0.79	176	4.82	3.78

***** GUY WIRE DATA *****

GUY ELEV ft.	GUY SIZE	*DIAMETER in.	AREA sq.in.	B.S. kips	I.T. kips	*GUY WT. lb/ft	E ksi
57	1/2 EHS	1.500	0.15	26.90	2.69	1.128	21000
107	5/8 EHS	1.625	0.24	42.40	4.24	1.500	21000
167	3/4 EHS	1.750	0.34	58.30	5.83	1.918	21000
217	3/4 EHS	1.750	0.34	58.30	5.83	1.918	21000
257	3/4 EHS	1.750	0.34	58.30	5.83	1.918	21000
284	3/4 EHS	1.750	0.34	58.30	5.83	1.918	21000

* MEANS ICE IS INCLUDED, IF ANY

EXIST. 292' + 35' POLE MODEL 4400SRW, STORRS, CT (#01-12035) 12-14-00
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***** RESULTS OF ANALYSIS *****

GUY ELEV ft	GUY LENGTH ft	GUY SIZE in	BREAKING STRENGTH kips	I.T. kips	GUY TENSION kips	GUY SAFETY FACTOR	SAFETY FACTOR REQ'D
57	249	1/2 EHS	26.90	2.69	7.91	3.40	2.00
107	270	5/8 EHS	42.40	4.24	16.03	2.64	2.00
167	303	3/4 EHS	58.30	5.83	22.97	2.54	2.00
217	337	3/4 EHS	58.30	5.83	22.79	2.56	2.00
257	367	3/4 EHS	58.30	5.83	21.05	2.77	2.00
284	388	3/4 EHS	58.30	5.83	21.70	2.69	2.00

GUY ELEVATION ft.	MOMENT OF INERTIA in^2ft^2	DEFLECTION OF TOWER ft.	SWAY OF TOWER deg.	TWIST OF TOWER deg.
57.00	47.35	0.437	0.44	0.00
107.00	47.35	0.736	0.34	0.09
167.00	39.78	0.952	0.21	0.09
217.00	39.78	1.164	0.24	0.00
257.00	32.89	1.237	0.10	0.00
284.00	21.03	1.442	0.44	0.00

EXIST. 292' + 35' POLE MODEL 4400SRW, STORRS, CT (#01-12035) 12-14-00
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GUY ELEV ft	LOCATION OF END FORCES	END MOMENT ft-k	VERT LOAD kips	LEG LOAD kips	TORQUE SHEAR kips	WIND SHEAR kips	TOTAL SHEAR kips	DIAG LOAD kips	GIRT LOAD kips
284	ABOVE	-145.66	11.1	49.6	0.0	9.3	9.3	8.4	0.7
	BELOW	104.79	71.2	56.8	0.0	5.9	5.9	5.3	0.9
257	ABOVE	-140.51	82.5	71.8	0.0	7.5	7.5	6.8	1.1
	BELOW	104.43	139.5	79.5	0.0	8.8	8.8	8.0	1.2
217	ABOVE	-132.28	158.4	94.5	0.0	10.2	10.2	9.2	1.4
	BELOW	92.19	215.8	101.0	0.0	9.3	9.3	8.4	1.5
167	ABOVE	-166.28	237.2	131.5	0.5	11.2	11.7	10.6	2.0
	BELOW	134.37	289.2	138.8	0.0	12.5	12.5	11.3	2.1
107	ABOVE	-68.13	312.0	125.5	0.5	9.2	9.7	8.8	1.9
	BELOW	50.06	340.8	129.4	0.0	10.2	10.2	9.2	1.9
57	ABOVE	44.23	360.5	134.1	0.0	5.4	5.4	4.9	2.0
	BELOW	-50.87	370.6	139.6	0.0	4.7	4.7	4.2	2.1
0	ABOVE	-0.00	391.0	130.3	0.0	6.0	6.0	5.5	2.0

*** GUY ANCHOR REACTIONS (THE WORST CASE) ***

ANCHOR NO. 1 (GUY RADIUS = 235 ft.)

HORIZONTAL FORCE = 163.44 kips
UPLIFT FORCE = 149.56 kips
RESULTANT = 221.54 kips

*** BASE REACTIONS ***

AXIAL FORCE = 391.00 kips
HORIZONTAL FORCE = 6.05 kips
BENDING MOMENT = 0.00 ft-k

ESTIMATED TOWER STEEL WEIGHT = 26.65 kips

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***** SHEARS, MOMENTS AND AXIAL LOADS OF PANEL POINTS *****

SPAN NO. 7
SPAN LENGTH = 8.0 FT.

ELEV. ft.	SHEAR kips	MOMENT ft-k	VERTICAL LOAD kips	LEG LOAD kips	LEG CSR	DIAG LOAD kips	DIAG CSR	GIRT LOAD kips	GIRT CSR
292.0	0.00	0.00	0.00	0.0	0.00	0.0	0.00	0.0	0.00
291.2	6.28	-88.19	9.30	30.9	0.52	5.7	0.69	0.5	0.12
290.4	6.55	-93.33	9.50	32.6	0.55	5.9	0.72	0.5	0.13
289.6	7.15	-98.80	9.69	34.4	0.58	6.4	0.79	0.5	0.14
288.8	7.75	-104.69	9.89	36.3	0.61	7.0	0.85	0.5	0.14
288.0	8.01	-110.99	10.08	38.4	0.64	7.2	0.88	0.6	0.15
287.2	8.27	-117.50	10.28	40.5	0.68	7.5	0.91	0.6	0.16
286.4	8.54	-124.23	10.47	42.7	0.72	7.7	0.94	0.6	0.17
285.6	8.80	-131.16	10.67	44.9	0.75	7.9	0.97	0.7	0.18
284.8	9.06	-138.31	10.86	47.3	0.79	8.2	1.00	0.7	0.19
284.0	9.33	-145.66	11.06	49.6	0.83	8.4	1.03	0.7	0.20

NOTES:-
(1) CSR MEANS COMBINED STRESS RATIO
(2) DIAGONAL AND/OR GIRT LOADS ARE PER TOWER FACE
(3) DESIGN LOAD OF REDUNDANTS = 1.5% OF LEG LOAD

EXIST. 292' + 35' POLE MODEL 4400SRW, STORRS, CT (#01-12035) 12-14-00
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***** SHEARS, MOMENTS AND AXIAL LOADS OF PANEL POINTS *****

SPAN NO. 6
SPAN LENGTH = 27.0 FT.

ELEV. ft.	SHEAR kips	MOMENT ft-k	VERTICAL LOAD kips	LEG LOAD kips	LEG CSR	DIAG LOAD kips	DIAG CSR	GIRT LOAD kips	GIRT CSR
284.0	5.91	104.79	71.22	56.8	0.95	5.3	0.65	0.9	0.23
281.3	-4.03	-92.39	76.56	54.7	0.92	3.6	0.44	0.8	0.22
278.6	-1.46	-85.07	77.22	52.6	0.88	1.3	0.16	0.8	0.21
275.9	-0.25	-82.68	77.88	52.0	0.87	0.2	0.03	0.8	0.21
273.2	0.62	-83.17	78.54	52.4	0.88	0.6	0.07	0.8	0.21
270.5	1.49	-86.01	79.19	53.5	0.90	1.3	0.16	0.8	0.21
267.8	2.36	-91.21	79.85	55.4	0.93	2.1	0.26	0.8	0.22
265.1	3.23	-98.75	80.51	58.0	0.97	2.9	0.36	0.9	0.23
262.4	4.10	-108.65	81.17	61.3	1.03	3.7	0.45	0.9	0.24
259.7	6.64	-121.40	81.83	65.6	0.79	6.0	0.73	1.0	0.26
257.0	7.51	-140.51	82.49	71.8	0.87	6.8	0.83	1.1	0.28

NOTES:-
(1) CSR MEANS COMBINED STRESS RATIO
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***** SHEARS, MOMENTS AND AXIAL LOADS OF PANEL POINTS *****

SPAN NO. 5
SPAN LENGTH = 40.0 FT.

ELEV. ft.	SHEAR kips	MOMENT ft-k	VERTICAL LOAD kips	LEG LOAD kips	LEG CSR	DIAG LOAD kips	DIAG CSR	GIRT LOAD kips	GIRT CSR
257.0	8.84	104.43	139.54	79.5	0.96	8.0	0.97	1.2	0.31
253.0	-6.93	-74.19	148.58	72.9	0.88	6.3	0.76	1.1	0.29
249.0	-5.67	-48.98	149.68	65.3	0.79	5.1	0.62	1.0	0.26
245.0	-4.41	-28.82	150.77	59.4	0.72	4.0	0.48	0.9	0.24
241.0	-3.15	-13.70	151.87	54.9	0.67	2.8	0.35	0.8	0.22
237.0	0.94	-12.11	152.96	54.8	0.66	0.8	0.10	0.8	0.22
233.0	2.20	-18.39	154.06	57.2	0.69	2.0	0.24	0.9	0.23
229.0	6.41	-32.66	155.15	62.0	0.75	5.8	0.70	0.9	0.25
225.0	7.67	-60.82	156.25	71.3	0.86	6.9	0.84	1.1	0.28
221.0	8.93	-94.03	157.34	82.1	0.99	8.1	0.98	1.2	0.33
217.0	10.19	-132.28	158.44	94.5	0.87	9.2	0.78	1.4	0.37

NOTES:-
(1) CSR MEANS COMBINED STRESS RATIO
(2) DIAGONAL AND/OR GIRT LOADS ARE PER TOWER FACE
(3) DESIGN LOAD OF REDUNDANTS = 1.5% OF LEG LOAD

EXIST. 292' + 35' POLE MODEL 4400SRW, STORRS, CT (#01-12035) 12-14-00
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***** SHEARS, MOMENTS AND AXIAL LOADS OF PANEL POINTS *****

SPAN NO. 4
SPAN LENGTH = 50.0 FT.

ELEV. ft.	SHEAR kips	MOMENT ft-k	VERTICAL LOAD kips	LEG LOAD kips	LEG CSR	DIAG LOAD kips	DIAG CSR	GIRT LOAD kips	GIRT CSR
217.0	9.33	92.19	215.80	101.0	0.93	8.4	0.72	1.5	0.40
212.0	-7.21	-52.38	224.21	91.3	0.84	6.5	0.55	1.4	0.36
207.0	-4.38	-24.07	225.65	82.8	0.77	3.9	0.34	1.2	0.33
202.0	-2.89	-5.91	227.09	77.6	0.72	2.6	0.22	1.2	0.31
197.0	-0.64	2.52	228.53	77.0	0.71	0.6	0.10	1.2	0.31
192.0	0.86	1.98	229.97	77.3	0.71	0.8	0.14	1.2	0.31
187.0	3.95	-10.84	231.41	80.6	0.74	3.6	0.63	1.2	0.32
182.0	5.44	-34.33	232.85	88.4	0.82	4.9	0.86	1.3	0.35
177.0	8.22	-69.13	234.29	99.9	0.73	7.4	0.63	1.5	0.40
172.0	9.71	-113.97	235.73	114.5	0.84	8.8	0.75	1.7	0.45
167.0	11.74	-166.28	237.17	131.5	0.96	10.6	0.90	2.0	0.52

NOTES:-
(1) CSR MEANS COMBINED STRESS RATIO
(2) DIAGONAL AND/OR GIRT LOADS ARE PER TOWER FACE
(3) DESIGN LOAD OF REDUNDANTS = 1.5% OF LEG LOAD

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***** SHEARS, MOMENTS AND AXIAL LOADS OF PANEL POINTS *****

SPAN NO. 3
SPAN LENGTH = 60.0 FT.

ELEV. ft.	SHEAR kips	MOMENT ft-k	VERTICAL LOAD kips	LEG LOAD kips	LEG CSR	DIAG LOAD kips	DIAG CSR	GIRT LOAD kips	GIRT CSR
167.0	12.52	134.37	289.18	138.8	1.01	11.3	0.96	2.1	0.55
161.0	-10.33	-67.55	297.04	120.3	0.88	9.3	0.79	1.8	0.48
155.0	-7.47	-16.65	298.70	104.8	0.97	6.7	0.82	1.6	0.42
149.0	-5.57	23.00	300.37	107.4	0.99	5.0	0.61	1.6	0.43
143.0	-3.95	51.54	302.03	116.9	1.08	3.6	0.43	1.8	0.46
137.0	-2.33	70.36	303.70	123.4	0.90	2.1	0.37	1.9	0.49
131.0	1.86	69.19	305.36	123.6	0.90	1.7	0.30	1.9	0.49
125.0	4.31	53.16	307.03	119.1	0.87	3.9	0.68	1.8	0.47
119.0	5.93	22.45	308.69	110.0	0.80	5.3	0.46	1.6	0.44
113.0	7.55	-17.98	310.36	109.1	0.80	6.8	0.58	1.6	0.43
107.0	9.71	-68.13	312.02	125.5	0.92	8.8	0.75	1.9	0.50

NOTES:-
(1) CSR MEANS COMBINED STRESS RATIO
(2) DIAGONAL AND/OR GIRT LOADS ARE PER TOWER FACE
(3) DESIGN LOAD OF REDUNDANTS = 1.5% OF LEG LOAD

EXIST. 292' + 35' POLE MODEL 4400SRW, STORRS, CT (#01-12035) 12-14-00
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***** SHEARS, MOMENTS AND AXIAL LOADS OF PANEL POINTS *****

SPAN NO. 2
SPAN LENGTH = 50.0 FT.

ELEV. ft.	SHEAR kips	MOMENT ft-k	VERTICAL LOAD kips	LEG LOAD kips	LEG CSR	DIAG LOAD kips	DIAG CSR	GIRT LOAD kips	GIRT CSR
107.0	10.23	50.06	340.79	129.4	0.95	9.2	0.79	1.9	0.51
102.0	-8.55	-4.36	347.04	117.1	0.86	7.7	0.66	1.8	0.46
97.0	-6.35	32.40	348.53	126.4	0.75	5.7	0.70	1.9	0.50
92.0	-5.18	61.23	350.03	136.0	0.81	4.7	0.57	2.0	0.54
87.0	-4.00	84.18	351.52	143.7	0.85	3.6	0.44	2.2	0.57
82.0	-2.83	101.25	353.01	149.6	0.89	2.5	0.31	2.2	0.59
77.0	0.71	105.37	354.50	151.4	0.90	0.6	0.11	2.3	0.60
72.0	1.88	98.91	355.99	149.9	0.89	1.7	0.30	2.2	0.59
67.0	3.06	86.56	357.48	146.5	0.87	2.8	0.49	2.2	0.58
62.0	4.23	68.33	358.97	141.2	0.84	3.8	0.67	2.1	0.56
57.0	5.41	44.23	360.47	134.1	0.80	4.9	0.86	2.0	0.53

NOTES:-
(1) CSR MEANS COMBINED STRESS RATIO
(2) DIAGONAL AND/OR GIRT LOADS ARE PER TOWER FACE
(3) DESIGN LOAD OF REDUNDANTS = 1.5% OF LEG LOAD

EXIST. 292' + 35' POLE MODEL 4400SRW, STORRS, CT (#01-12035) 12-14-00
90 MPH WIND + 0.5 in. ICE (NO REDUCTION) PER EIA-222-F-1996
TOWER SECTION WITH FEEDLINES IS CONSIDERED TO BE SOLID PROJECTED AREA
25% EXTRA CAPACITY OF THE TOWER AND FOUNDATIONS IS REQUIRED
INPUT DATA FILE SABRE\GUYTOWER\00J1049.DAT PER QB\LEEGTSP

***** SHEARS, MOMENTS AND AXIAL LOADS OF PANEL POINTS *****

SPAN NO. 1
SPAN LENGTH = 57.0 FT.

ELEV. ft.	SHEAR kips	MOMENT ft-k	VERTICAL LOAD kips	LEG LOAD kips	LEG CSR	DIAG LOAD kips	DIAG CSR	GIRT LOAD kips	GIRT CSR
57.0	4.69	-50.87	370.62	139.6	0.83	4.2	0.74	2.1	0.55
51.3	-3.23	72.24	375.95	148.1	0.88	2.9	0.51	2.2	0.59
45.6	-2.20	87.72	377.63	153.6	0.91	2.0	0.35	2.3	0.61
39.9	-1.17	97.33	379.30	157.1	0.93	1.1	0.19	2.4	0.62
34.2	-0.14	101.06	380.97	158.9	0.94	0.1	0.02	2.4	0.63
28.5	0.89	98.91	382.64	158.8	0.94	0.8	0.14	2.4	0.63
22.8	1.92	90.89	384.31	156.8	0.93	1.7	0.31	2.4	0.62
17.1	2.96	76.98	385.99	153.0	0.91	2.7	0.47	2.3	0.61
11.4	3.99	57.20	387.66	147.3	0.87	3.6	0.63	2.2	0.58
5.7	5.02	31.54	389.33	139.7	0.83	4.5	0.80	2.1	0.55
0.0	6.05	-0.00	391.00	130.3	0.77	5.5	0.96	2.0	0.52

NOTES:-
(1) CSR MEANS COMBINED STRESS RATIO
(2) DIAGONAL AND/OR GIRT LOADS ARE PER TOWER FACE
(3) DESIGN LOAD OF REDUNDANTS = 1.5% OF LEG LOAD