



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@po.state.ct.us

Web Site: www.state.ct.us/csc/index.htm

October 15, 2003

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

RE: **EM-VER-111-031001** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 297 North Street, Plymouth, Connecticut.

Dear Attorney Baldwin:

At a public meeting held on October 14, 2003, 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 with the condition that the modifications recommended in the Structural Analysis Report prepared by Daniel Blakeman (dated September 9, 2003) be implemented as part of the antenna installation.

The proposed modifications are to be implemented as specified here and in your notice dated October 1, 2003. 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,

Pamela B. Katz, P.E.
Chairman

PBK/laf

- c: Honorable David C. Mischke, Mayor, Town of Plymouth
- William Kuehn, Town Planner, Town of Plymouth
- Sheila R. Becker, Regional Director of Compliance, SBA, Inc.
- Thomas J. Regan, Esq., Brown Rudnick Berlack Israels
- Thomas F. Flynn III, Nextel Communications
- Stephen J. Humes, Esq., LeBoeuf, Lamb, Greene & MacRae

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

EM-VER-111-031001

October 1, 2003

Via Hand Delivery

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

RECEIVED
OCT - 1 2003
CONNECTICUT
SITING COUNCIL

**Re: Notice of Exempt Modification
297 North Street
Plymouth, Connecticut**

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") intends to install antennas on an existing tower at 297 North Street in Plymouth, 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 Plymouth Mayor, David C. Mischke.

The facility consists of a 195-foot self-supporting monopole tower, capable of supporting multiple carriers within an approximately 60' x 65' site compound. The tower is owned and operated by SBA, Inc. ("SBA") and is currently shared by Sprint at the 195-foot level (TS-Sprint-111-000307); Nextel at the 185-foot level (TS-Nextel-111-000622); and T-Mobile at the 175-foot level. Cellco proposes to install twelve (12) panel-type antennas at the 165-foot level on the tower and a 12' x 30' single-story equipment shelter near the base of the tower. (See attached Project Plans).

The planned modifications to the Plymouth 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 with their centerline at the 165-foot level on the 195-foot tower.



Law Offices

BOSTON

HARTFORD

NEW LONDON

STAMFORD

GREENWICH

NEW YORK

www.rc.com

HART1-1121804-1

S. Derek Phelps
October 1, 2003
Page 2

2. The proposed installation of twelve (12) panel-type antennas and a 12' x 30' equipment shelter will not require an extension of the site boundaries.
3. The proposed modification 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. According to the RF Exposure Analysis prepared for the Nextel filing (TS-Nextel-111-000622), the cumulative worst-case RF power density for the Sprint, T-Mobile and Nextel antennas would be 6.3655% of the FCC Standard. The worst-case RF power density calculations for Cellco antennas would be 1.96% of the FCC standard (see attached power density calculations table). The total worst-case radio frequency emission levels for the site would therefore be 8.3255% of the FCC standard, as measured for mixed frequency sites.

Also attached is an antenna specification sheet and engineer's certification verifying that the tower can accommodate Sprint, Nextel, T-Mobile and Cellco antennas and related equipment.

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

Sincerely,



Kenneth C. Baldwin

Attachments

cc: David C. Mischke, Plymouth Mayor
Sandy M. Carter

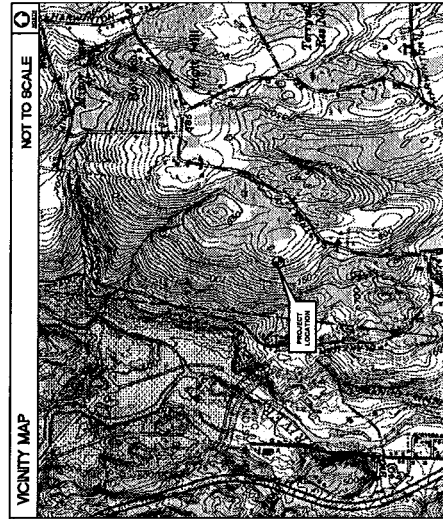


d.b.a. verizon wireless

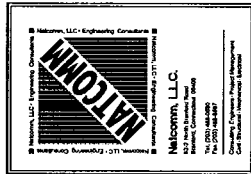
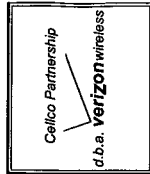
100

Nalcomm, LLC.

Card - Structural, Morphological, Adapted

A detailed topographic map showing the project location. The map features contour lines indicating elevation, with labels such as 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000, 2100, 2200, 2300, 2400, 2500, 2600, 2700, 2800, 2900, 3000, 3100, 3200, 3300, 3400, 3500, 3600, 3700, 3800, 3900, 4000, 4100, 4200, 4300, 4400, 4500, 4600, 4700, 4800, 4900, 5000, 5100, 5200, 5300, 5400, 5500, 5600, 5700, 5800, 5900, 6000, 6100, 6200, 6300, 6400, 6500, 6600, 6700, 6800, 6900, 7000, 7100, 7200, 7300, 7400, 7500, 7600, 7700, 7800, 7900, 8000, 8100, 8200, 8300, 8400, 8500, 8600, 8700, 8800, 8900, 9000, 9100, 9200, 9300, 9400, 9500, 9600, 9700, 9800, 9900, 10000. The map also shows a network of roads, including a major highway (Interstate 5) and several local roads. A specific location is marked with a dot and labeled "PROJECT LOCATION". The map is oriented with North at the top. A scale bar is located in the bottom left corner, indicating distances in feet (0, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000). The text "VICINITY MAP" is printed vertically on the left side, and "NOT TO SCALE" is printed vertically on the right side.

LEGEND		SHEET INDEX	
	BNDRY.	DIST. NO.	REV. NO.
	DESCRIPTION	DISCRIPTION	
	STATIONING	TITLE SHEET	00
	ELEVATION	COMPOUND PLAN AND ELEVATION	00
	COMPOUND PLAN AND ELEVATION		

[illegible]

297 NORTH STREET
PLYMOUTH, CT 06782

PROJECT NO:	03060
DRAWN BY:	KC
CHECKED BY:	AAJ
SCALE:	AS NOTED
DATE:	07/14/03

TITLE
SHEET

DWG. 1 OF 2

General Power Density_WorstCase

Site Name: Plymouth NW, CT
Tower Height: 165' centerline

Operator	Operating Frequency (MHz)	Number of Trans.	ERP Per Trans. (watts)	Total ERP (watts)	Distance to Target (feet)	Calculated Power Density (mW/cm ²)	Maximum Permissible Exposure (mW/cm ²)	Fraction of MPE (%)
Verizon	1900	3	494	1482	165	0.0196	1	1.96%
Total Percentage of Maximum Permissible Exposure								1.96%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
mW/cm² = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case scenario, maximum values used.



September 24, 2003

Mr. David Patrick
SBA Network Services
121 Boone Ridge Drive
Johnson City, TN 37615

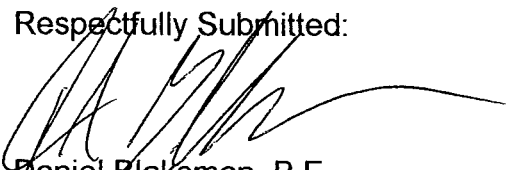
Subject: **Structural Analysis Report Addendum Letter**
 SBA Site Number CT01497
 SBA Site Name "Plymouth 2, CT"
 195' Nudd MJ-180 Monopole Tower
 VSI Job Number 2003-007-016

Dear Mr. Patrick:

Vertical Structures is pleased to provide you with this addendum letter to the September 9, 2003 report on the results of the structural analysis performed on the 195' tall monopole tower at SBA's Plymouth 2 site in Connecticut. The purpose of the analysis was to determine the suitability of the tower upon adding twelve (12) proposed Decibel DB950G65E-M panel antennas on a low profile platform at 165' for Verizon. We concluded that the tower is structurally inadequate to support the proposed and existing loading as considered in the study and recommended modifications to remedy the deficiencies. Upon completing the modifications the tower will be completely adequate for the proposed loading.

Please, feel free to call if there are any questions. We appreciate the opportunity to provide this report and would ask that you consider Vertical Structures again on any future projects requiring material, engineering, and construction services.

Respectfully Submitted:



Daniel Blakeman, P.E.
Project Engineer



September 9, 2003

Mr. David Patrick
SBA Network Services
121 Boone Ridge Drive
Johnson City, TN 37615

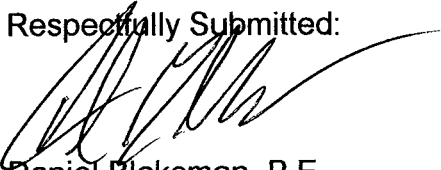
Subject: **Structural Analysis Report**
 SBA Site Number CT01497
 SBA Site Name "Plymouth 2, CT"
 195' Nudd MJ-180 Monopole Tower
 VSI Job Number 2003-007-016

Dear Mr. Patrick:

Vertical Structures is pleased to provide you with the results of the structural analysis performed on the 195' tall monopole tower at SBA's Plymouth 2 site in Connecticut. The purpose of the analysis was to determine the suitability of the tower upon adding twelve (12) proposed Decibel DB950G65E-M panel antennas on a low profile platform at 165' for Verizon. We have concluded that the tower is structurally inadequate to support the proposed and existing loading as considered in this study.

Please, feel free to call if there are any questions. We appreciate the opportunity to provide this report and would ask that you consider Vertical Structures again on any future projects requiring material, engineering, and construction services.

Respectfully Submitted:



Daniel Blakeman, P.E.
Project Engineer



TABLE OF CONTENTS

Introduction.....	3
Analysis Criteria.....	3
Table 1 – Proposed and Existing Loads.....	3
Table 2 – Original Design Loads.....	3
Analysis Procedures.....	4
Analysis Conclusions.....	4
Table 3 – Tower Component Stresses vs. Capacity.....	4
Table 4 – Required Modifications.....	5
Appendix A.....	Tower Rework Drawings
Appendix B.....	Computer Output

Introduction

The 195' Nudd MJ-180 monopole tower was designed and manufactured in 1999 for SBA, Inc. The tower consists of four (4) 18-sided tapered polygon tubes joined via slip joint connections and a round tube at the top connected via a bolted flange. The tower is founded on a 35' x 35' x 4'6" thick mat, buried 3' deep.

Analysis Criteria

The Harwinton monopole tower was analyzed in accordance with the current EIA-222-F publication, "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures." The proposed and existing antennas, lines and mounts considered in this analysis are listed in Table 1. The applied forces for this analysis were derived from an 80 MPH basic wind speed with no ice accumulation and a reduced 69 MPH basic wind speed with a 1/2" of radial ice accumulation. The EIA minimum basic wind speed for Litchfield County, Connecticut is 80 MPH. The original design loads are listed in Table 2. The tower was originally designed for an 80 MPH basic wind speed with no ice accumulation and a reduced 69 MPH basic wind speed with a 1/2" of radial ice accumulation. All coax are assumed to be run in the pole interior.

Table 1 – Proposed and Existing Loads

Elev.	Carrier	Status	Antennas	Feedlines	Mounts
196'	Sprint	Existing	(6) DB980H90T3-M Panels	(6) 1 5/8" Coax	(1) 14' L.P. Platform
185'	Nextel	Proposed	(9) DB844H90E-XY Panels	(9) 1 1/4" Coax	(1) 14' L.P. Platform
175'	Omnipoint	Proposed	(6) EMS RR90-17-02DP Panels	(12) 1 5/8" Coax	(1) 14' L.P. Platform
165'	Verizon	Proposed	(12) DB950G65E-M Panels	(12) 1 5/8" Coax	(1) 14' L.P. Platform

Table 2 – Original Design Loads

Elev.	Carrier	Status	Antennas	Feedlines	Mounts
195'	Co-Lo	Design	(12) DB896 Panels	(12) 1 5/8" Coax	(1) 14' L.P. Platform
185'	Co-Lo	Design	(12) DB896 Panels	(12) 1 5/8" Coax	(1) 14' L.P. Platform
175'	Co-Lo	Design	(12) DB896 Panels	(12) 1 5/8" Coax	(1) 14' L.P. Platform
165'	Co-Lo	Design	(12) DB896 Panels	(12) 1 5/8" Coax	(1) 14' L.P. Platform
155'	Co-Lo	Design	(12) DB896 Panels	(12) 1 5/8" Coax	(1) 14' L.P. Platform

Analysis Procedures

No site visit was performed by Vertical Structures. All structural information, material specifications and foundation details were taken directly from the original Nudd tower design drawings. Existing and proposed loads were provided by SBA.

ERI Tower (Version 2.0), a commercially available software program, was used to create a three-dimensional model of the tower and calculate member stresses for various dead, live, wind, and ice load cases.

Analysis Conclusions

The Plymouth monopole tower is found to be inadequate for the intended loading at the wind and ice conditions considered. Analysis results are listed in Table 3.

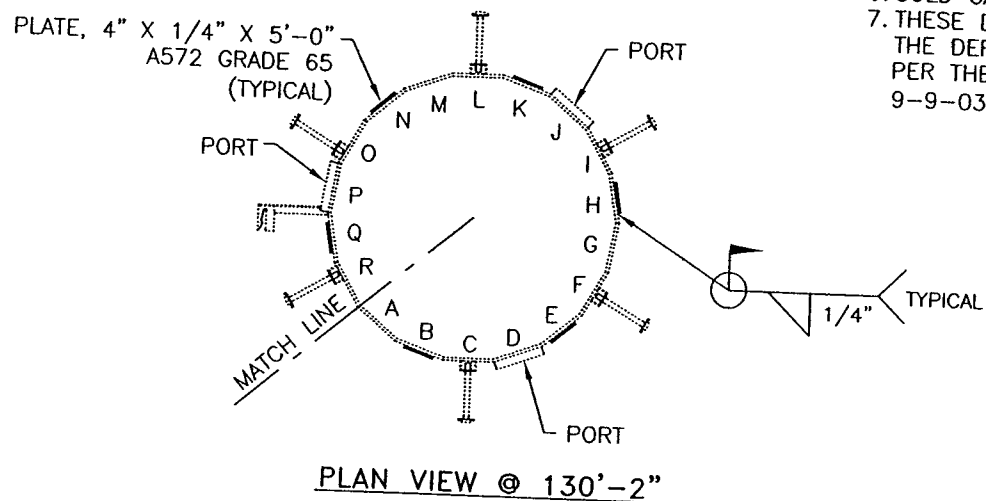
Table 3 – Tower Component Stresses vs. Capacity

Section Number	Elevation	Combined Stress Ratio	Allowable Stress Ratio	Percent Used
1	195' – 180'	.400	1.333	36.5
2	180' – 130'	1.080	1.333	97.0
3	130' – 125'		1.333	106.7
4	125' – 85'	1.113	1.333	96.6
5	85' – 81'		1.333	101.0
6	81' – 41'	1.010	1.333	86.2
7	41' – 0'	1.099	1.333	92.6
Splice Plate @ 180' – Bending				104.2
Splice Bolts @ 180' – Tension				70.1
Base Plate - Bending				182.6
Anchor Bolts – Tension				80.2
Foundation – Moment (comparing design load to actual load)				90.4

Modifications (A) and (B), listed in Table 4, are required to remedy the deficiencies in the Plymouth 2 tower identified in this analysis. Overstresses less than 5% are considered to be acceptable. Tower rework drawings depicting the required modifications have been provided in Appendix A.

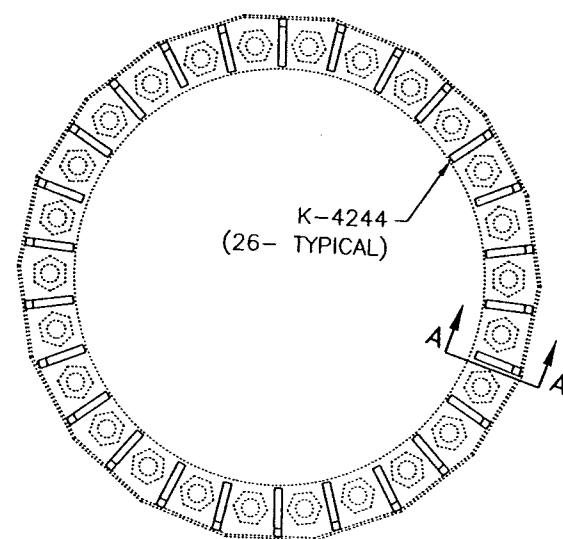
Table 4 – Required Modifications

- (A) Install one (1) intermediate flange stiffener in every space between the existing 2" diameter anchor bolts. The total number of new stiffeners required is twenty-six (26).
- (B) Weld six (6) vertical 1/4" x 4" plates ($F_y > 65$ ksi) equally distributed around the pole between the 130' and 125' elevations.

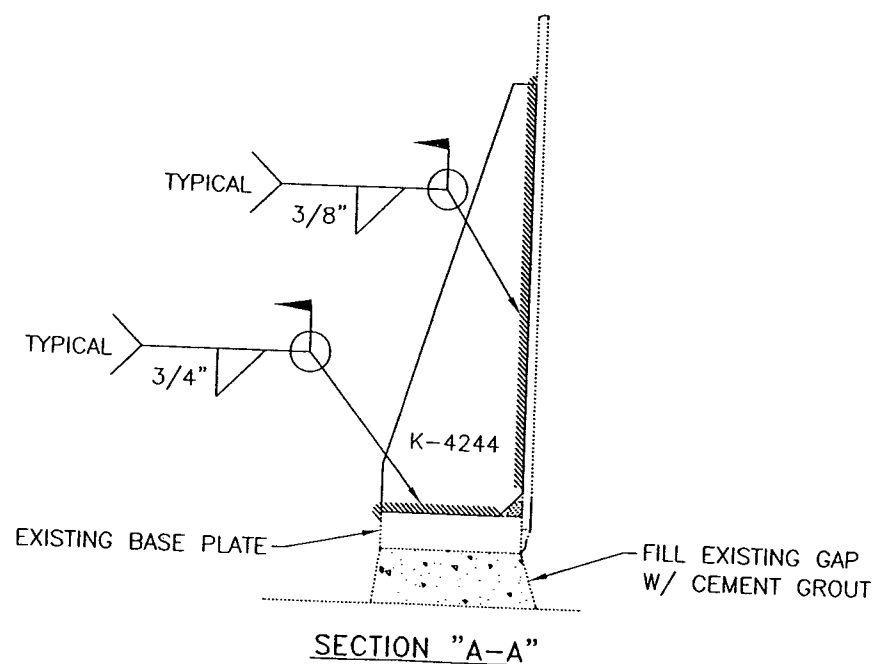


NOTES:

1. THE SECONDARY STEPBOLTS AROUND SPLICES MAY FOUL WITH NEW PLATES. REMOVE THESE STEPBOLTS AND REINSTALL AS CLOSE TO THEIR ORIGINAL LOCATION AS POSSIBLE.
2. ANY HARDWARE REMOVED DURING THE INSTALLATION OF THE MATERIAL TO THE TOWER MUST BE REPLACED WITH NEW HARDWARE.
3. ALL NEW STEEL INSTALLED IS TO BE HOT DIPPED GALVANIZED.
4. WELDER MUST BE AWS CERTIFIED.
5. SURFACES TO BE CLEARED OF GALVANIZATION BEFORE FIELD WELDING ANY MATERIAL.
6. COLD GALVANIZE ANY MATERIAL AFTER FIELD WELDING.
7. THESE DRAWINGS DEPICT THE REWORK REQUIRED TO REMEDY THE DEFICIENCIES FOUND IN THE PLYMOUTH 2, CT TOWER PER THE REPORT PUBLISHED BY VERTICAL STRUCTURES ON 9-9-03, JOB# 2003-007-016.



PLAN VIEW @ BASE PLATE
STEPBOLTS, SAFETY CLIMB, AND PORTS
NOT DRAWN FOR CLARIFICATION



A	ORIGINAL RELEASE	9-11-03	JAC
REV.	DESCRIPTION	DATE	BY



**VERTICAL
STRUCTURES, INC.**

P.O. Box 1496
Richmond, KY 40476

Phone: (859) 624-8360
Fax: (859) 624-8369
Email: engineering@verticalstructures.com

FOR

SBA

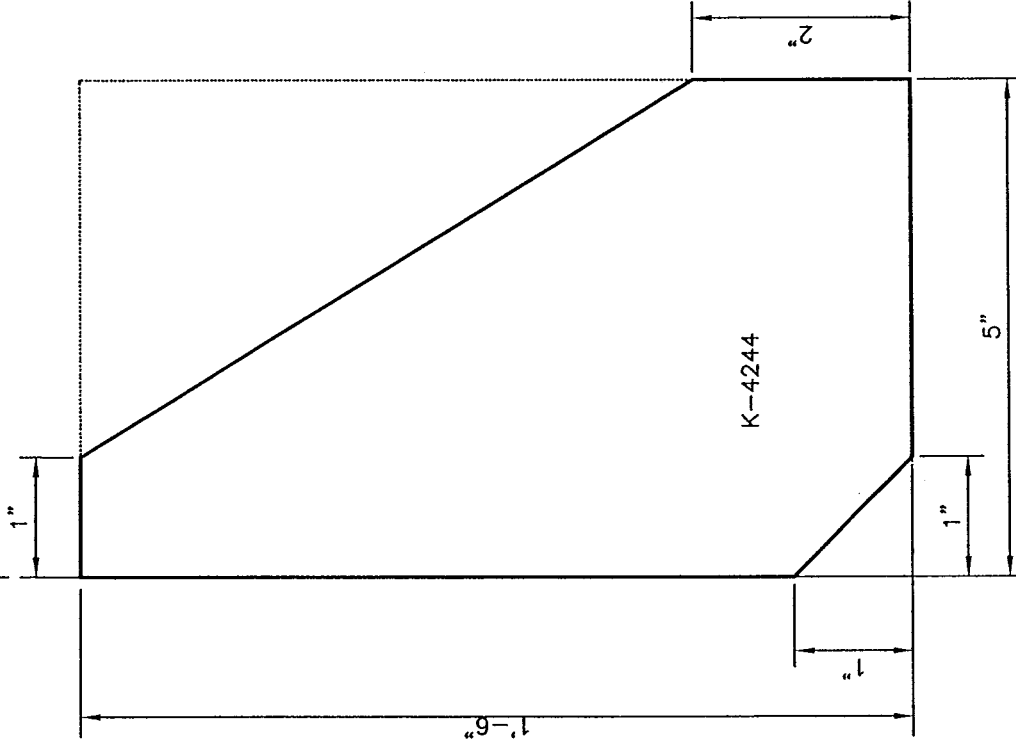
2003 MODIFICATIONS
TOWER REWORK FOR A
195' MONOPOLE
SITE: PLYMOUTH 2, CT

DRAFTSPERSON: J. COMBS	DATE 9-11-03
CHK'D BY:	DATE
ENGR: <i>JCB</i>	DATE 9-11-02

SHEET 1 OF 1

B TA2003007016-T1

SCALE:	NONE
--------	------



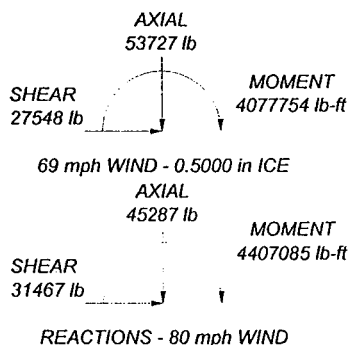
MARK NO. K-4244 50 KSI STEEL
 MATERIAL: PL 5" X 1" X 1'-6"

A		REVISED TITLE BLOCK	JAC 7-9-03	JUN 5-23-02
-		ORIGINALLY DRAWN	JAC 8-23-02	JUN 5-23-02
REV.		DESCRIPTION	DRAWN BY	APPROD BY
VERTICAL STRUCTURES, INC. P.O. Box 1496 Richmond, KY 40476 Phone: (859) 624-8360 Fax: (859) 624-8369 Email: engineering@verticalstructures.com DWN BY: JAC DATE: 5-23-02 WEIGHT: 25.50# APP'D BY: <i>[Signature]</i> DATE: 9-11-03 FABRICATING DETAIL: MARK NO. K-4244				

TYPE	ELEVATION	TYPE	ELEVATION
Nudd 14' Boom (3)	196	Nudd 14' Boom (3)	175
(2) DB980H90T3E-M w/Mount Pipe	196	(2) RR90-17-02DP w/Mount Pipe	175
(2) DB980H90T3E-M w/Mount Pipe	196	(2) RR90-17-02DP w/Mount Pipe	175
(2) DB980H90T3E-M w/Mount Pipe	196	(2) RR90-17-02DP w/Mount Pipe	175
Nudd 14' Boom (3)	185	Nudd 14' Boom (3)	165
(3) DB844H90E-XY w/Mount Pipe	185	(4) DB950G65E-M w/Mount Pipe	165
(3) DB844H90E-XY w/Mount Pipe	185	(4) DB950G65E-M w/Mount Pipe	165
(3) DB844H90E-XY w/Mount Pipe	185	(4) DB950G65E-M w/Mount Pipe	165

GRADE	YIELD	GRADE	YIELD
A36	36 ksi	A572-65	65 ksi

1. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 106.7%



Vertical Structures, Inc.
 309 Spangler Drive, Suite E
 Richmond, KY 40475
 Phone: (859) 624-8360
 FAX: (859) 624-8369

ERITower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Plymouth 2, CT (CT01497)	Page	1 of 8
	Project	VSI Job No. 2003-007-016	Date	16:34:48 09/09/03
	Client	SBA	Designed by	dblakeman

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Basic wind speed of 80 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 69 mph is used in combination with ice.

Temperature drop of 50 F.

Deflections calculated using a wind speed of 50 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads and feedline supports are not considered

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	√ Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	√ Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	√ Consider Feedline Torque
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	√ All Leg Panels Have Same Allowable
Escalate Ice	Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Poles
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Shear-Torsion Interaction
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Always Use Sub-Critical Flow
√ Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	√ Use Top Mounted Sockets

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	195'-180'	15'	0'	Round	24.0000	24.0000	0.2810		A36 (36 ksi)
L2	180'-130'	50'	5'	18	24.0000	35.2500	0.2500	1.0000	A572-65 (65 ksi)
L3	130'-125'	10'	0'	18	33.6250	35.9725	0.2500	1.0000	A572-65 (65 ksi)
L4	125'-85'	40'	6'	18	35.9725	45.3625	0.3125	1.2500	A572-65 (65 ksi)
L5	85'-81'	10'	0'	18	43.3290	45.7207	0.3125	1.2500	A572-65 (65 ksi)
L6	81'-41'	40'	7'	18	45.7207	55.2875	0.3750	1.5000	A572-65 (65 ksi)
L7	41'-0'	48'		18	52.8633	64.5000	0.3750	1.5000	A572-65 (65 ksi)

ERITower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Plymouth 2, CT (CT01497)	Page	2 of 8
	Project	VSI Job No. 2003-007-016	Date	16:34:48 09/09/03
	Client	SBA	Designed by	dblakeman

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	24.0000	20.9282	1473.6284	8.3965	12.0000	122.8024	2943.2423	10.4632	0.0000	0
	24.0000	20.9282	1473.6284	8.3965	12.0000	122.8024	2943.2423	10.4632	0.0000	0
L2	24.3702	18.8456	1342.9976	8.4313	12.1920	110.1540	2687.7623	9.4246	3.7840	15.136
	35.7938	27.7725	4298.2188	12.4250	17.9070	240.0301	8602.0932	13.8889	5.7640	23.056
L3	35.3356	26.4831	3726.9040	11.8481	17.0815	218.1836	7458.7119	13.2440	5.4780	21.912
	36.5274	28.3458	4569.9339	12.6815	18.2740	250.0781	9145.8810	14.1756	5.8912	23.565
L4	36.5274	35.3703	5682.4865	12.6593	18.2740	310.9597	11372.4501	17.6885	5.7812	18.5
	46.0623	44.6840	11457.2075	15.9927	23.0441	497.1851	22929.4908	22.3462	7.4338	23.788
L5	45.4546	42.6670	9974.6946	15.2709	22.0111	453.1659	19962.5142	21.3375	7.0759	22.643
	46.4260	45.0393	11732.6808	16.1199	23.2261	505.1504	23480.7997	22.5239	7.4968	23.99
L6	46.4260	53.9727	14021.1609	16.0977	23.2261	603.6808	28060.7711	26.9915	7.3868	19.698
	56.1404	65.3596	24899.4233	19.4939	28.0861	886.5406	49831.6100	32.6860	9.0706	24.188
L7	55.4020	62.4742	21745.2002	18.6334	26.8546	809.7395	43519.0132	31.2430	8.6439	23.051
	65.4950	76.3248	39651.3314	22.7644	32.7660	1210.1365	79354.8371	38.1696	10.6920	28.512

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft ²	in					in	in
L1 195'-180'				1	1	1		
L2 180'-130'				1	1	1		
L3 130'-125'				1	1	1		
L4 125'-85'				1	1	1		
L5 85'-81'				1	1	1		
L6 81'-41'				1	1	1		
L7 41'-0'				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face	Allow Shield	Component Type	Placement	Total Number	C _A A _A	Weight
				ft		ft ² /ft	plf
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	195' - 5'	6	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00 4" Ice 0.00	0.82 0.82 0.82 0.82 0.82
LDF6-50A (1-1/4 FOAM)	C	No	Inside Pole	185' - 5'	9	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00 4" Ice 0.00	0.66 0.66 0.66 0.66 0.66
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	175' - 5'	12	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00 4" Ice 0.00	0.82 0.82 0.82 0.82 0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	165' - 5'	12	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00 4" Ice 0.00	0.82 0.82 0.82 0.82 0.82

ERITower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Plymouth 2, CT (CT01497)	Page	3 of 8
	Project	VSI Job No. 2003-007-016	Date	16:34:48 09/09/03
	Client	SBA	Designed by	dblakeman

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight lb
L1	195'-180'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	103.50
L2	180'-130'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1330.20
L3	130'-125'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	152.70
L4	125'-85'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1221.60
L5	85'-81'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	122.16
L6	81'-41'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1221.60
L7	41'-0'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1099.44

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight lb
L1	195'-180'	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	103.50
L2	180'-130'	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1330.20
L3	130'-125'	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	152.70
L4	125'-85'	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1221.60
L5	85'-81'	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	122.16
L6	81'-41'	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1221.60
L7	41'-0'	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1099.44

ERITower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Plymouth 2, CT (CT01497)	Page	4 of 8
	Project	VSI Job No. 2003-007-016	Date	16:34:48 09/09/03
	Client	SBA	Designed by	dblakeman

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L1	195'-180'	0.0000	0.0000	0.0000	0.0000
L2	180'-130'	0.0000	0.0000	0.0000	0.0000
L3	130'-125'	0.0000	0.0000	0.0000	0.0000
L4	125'-85'	0.0000	0.0000	0.0000	0.0000
L5	85'-81'	0.0000	0.0000	0.0000	0.0000
L6	81'-41'	0.0000	0.0000	0.0000	0.0000
L7	41'-0'	0.0000	0.0000	0.0000	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment deg	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
Nudd 14' Boom (3)	C	None		0.0000	196'	No Ice	47.00	47.00	1600.00
						1/2" Ice	67.00	67.00	2050.00
						1" Ice	87.00	87.00	2500.00
						2" Ice	127.00	127.00	3400.00
						4" Ice	207.00	207.00	5200.00
(2) DB980H90T3E-M w/Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	196'	No Ice	4.27	3.86	34.05
						1/2" Ice	4.86	4.95	69.84
						1" Ice	5.37	5.75	116.19
						2" Ice	6.42	7.39	231.29
						4" Ice	8.86	10.87	585.45
(2) DB980H90T3E-M w/Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	196'	No Ice	4.27	3.86	34.05
						1/2" Ice	4.86	4.95	69.84
						1" Ice	5.37	5.75	116.19
						2" Ice	6.42	7.39	231.29
						4" Ice	8.86	10.87	585.45
(2) DB980H90T3E-M w/Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	196'	No Ice	4.27	3.86	34.05
						1/2" Ice	4.86	4.95	69.84
						1" Ice	5.37	5.75	116.19
						2" Ice	6.42	7.39	231.29
						4" Ice	8.86	10.87	585.45
Nudd 14' Boom (3)	C	None		0.0000	185'	No Ice	47.00	47.00	1600.00
						1/2" Ice	67.00	67.00	2050.00
						1" Ice	87.00	87.00	2500.00
						2" Ice	127.00	127.00	3400.00
						4" Ice	207.00	207.00	5200.00
(3) DB844H90E-XY w/Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	185'	No Ice	3.58	5.40	35.55
						1/2" Ice	4.20	6.49	76.59
						1" Ice	4.73	7.30	127.74
						2" Ice	5.86	8.96	251.11
						4" Ice	8.27	12.49	616.43
(3) DB844H90E-XY w/Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	185'	No Ice	3.58	5.40	35.55
						1/2" Ice	4.20	6.49	76.59
						1" Ice	4.73	7.30	127.74
						2" Ice	5.86	8.96	251.11
						4" Ice	8.27	12.49	616.43
(3) DB844H90E-XY w/Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	185'	No Ice	3.58	5.40	35.55
						1/2" Ice	4.20	6.49	76.59
						1" Ice	4.73	7.30	127.74

ERITower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Plymouth 2, CT (CT01497)	Page	5 of 8
	Project	VSI Job No. 2003-007-016	Date	16:34:48 09/09/03
	Client	SBA	Designed by	dblakeman

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment deg	Placement ft	CAA Front ft ²	CAA Side ft ²	Weight lb
Nudd 14' Boom (3)	C	None		0.0000	175'	2" Ice	5.86	251.11
						4" Ice	8.27	616.43
						No Ice	47.00	1600.00
						1/2" Ice	67.00	2050.00
						1" Ice	87.00	2500.00
						2" Ice	127.00	3400.00
						4" Ice	207.00	5200.00
(2) RR90-17-02DP w/Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	175'	No Ice	4.91	43.55
						1/2" Ice	5.57	81.64
						1" Ice	6.14	130.14
						2" Ice	7.32	249.13
						4" Ice	9.81	609.39
(2) RR90-17-02DP w/Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	175'	No Ice	4.91	43.55
						1/2" Ice	5.57	81.64
						1" Ice	6.14	130.14
						2" Ice	7.32	249.13
						4" Ice	9.81	609.39
(2) RR90-17-02DP w/Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	175'	No Ice	4.91	43.55
						1/2" Ice	5.57	81.64
						1" Ice	6.14	130.14
						2" Ice	7.32	249.13
						4" Ice	9.81	609.39
Nudd 14' Boom (3)	C	None		0.0000	165'	No Ice	47.00	1600.00
						1/2" Ice	67.00	2050.00
						1" Ice	87.00	2500.00
						2" Ice	127.00	3400.00
						4" Ice	207.00	5200.00
(4) DB950G65E-M w/Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	165'	No Ice	6.60	40.55
						1/2" Ice	7.27	95.17
						1" Ice	7.86	160.90
						2" Ice	9.08	316.45
						4" Ice	11.65	758.19
(4) DB950G65E-M w/Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	165'	No Ice	6.60	40.55
						1/2" Ice	7.27	95.17
						1" Ice	7.86	160.90
						2" Ice	9.08	316.45
						4" Ice	11.65	758.19
(4) DB950G65E-M w/Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	165'	No Ice	6.60	40.55
						1/2" Ice	7.27	95.17
						1" Ice	7.86	160.90
						2" Ice	9.08	316.45
						4" Ice	11.65	758.19

ERITower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Plymouth 2, CT (CT01497)	Page	6 of 8
	Project	VSI Job No. 2003-007-016	Date	16:34:48 09/09/03
	Client	SBA	Designed by	dblakeman

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Total Member Self-Weight	32363.68			0.00	0.00	
Wind 0 deg - No Ice	45287.03	0.00	-31467.24	-4231366.35	0.00	0.00
Wind 30 deg - No Ice	45287.03	15733.62	-27251.43	-3664470.75	-2115683.18	0.00
Wind 60 deg - No Ice	45287.03	27251.43	-15733.62	-2115683.18	-3664470.75	0.00
Wind 90 deg - No Ice	45287.03	31467.24	0.00	0.00	-4231366.35	0.00
Wind 120 deg - No Ice	45287.03	27251.43	15733.62	2115683.18	-3664470.75	0.00
Wind 150 deg - No Ice	45287.03	15733.62	27251.43	3664470.75	-2115683.18	0.00
Wind 180 deg - No Ice	45287.03	0.00	31467.24	4231366.35	0.00	0.00
Wind 210 deg - No Ice	45287.03	-15733.62	27251.43	3664470.75	2115683.18	0.00
Wind 240 deg - No Ice	45287.03	-27251.43	15733.62	2115683.18	3664470.75	0.00
Wind 270 deg - No Ice	45287.03	-31467.24	0.00	0.00	4231366.35	0.00
Wind 300 deg - No Ice	45287.03	-27251.43	-15733.62	-2115683.18	3664470.75	0.00
Wind 330 deg - No Ice	45287.03	-15733.62	-27251.43	-3664470.75	2115683.18	0.00
Member Ice	5172.05			0.00	0.00	
Wind 0 deg - Ice	53727.17	0.00	-27547.67	-3861668.01	0.00	0.00
Wind 30 deg - Ice	53727.17	13773.83	-23856.98	-3344302.60	-1930834.00	0.00
Wind 60 deg - Ice	53727.17	23856.98	-13773.83	-1930834.00	-3344302.60	0.00
Wind 90 deg - Ice	53727.17	27547.67	0.00	0.00	-3861668.01	0.00
Wind 120 deg - Ice	53727.17	23856.98	13773.83	1930834.00	-3344302.60	0.00
Wind 150 deg - Ice	53727.17	13773.83	23856.98	3344302.60	-1930834.00	0.00
Wind 180 deg - Ice	53727.17	0.00	27547.67	3861668.01	0.00	0.00
Wind 210 deg - Ice	53727.17	-13773.83	23856.98	3344302.60	1930834.00	0.00
Wind 240 deg - Ice	53727.17	-23856.98	13773.83	1930834.00	3344302.60	0.00
Wind 270 deg - Ice	53727.17	-27547.67	0.00	0.00	3861668.01	0.00
Wind 300 deg - Ice	53727.17	-23856.98	-13773.83	-1930834.00	3344302.60	0.00
Wind 330 deg - Ice	53727.17	-13773.83	-23856.98	-3344302.60	1930834.00	0.00
Wind 0 deg - Service	45287.03	0.00	-12291.89	-1652877.48	0.00	0.00
Wind 30 deg - Service	45287.03	6145.94	-10645.09	-1431433.89	-826438.74	0.00
Wind 60 deg - Service	45287.03	10645.09	-6145.94	-826438.74	-1431433.89	0.00
Wind 90 deg - Service	45287.03	12291.89	0.00	0.00	-1652877.48	0.00
Wind 120 deg - Service	45287.03	10645.09	6145.94	826438.74	-1431433.89	0.00
Wind 150 deg - Service	45287.03	6145.94	10645.09	1431433.89	-826438.74	0.00
Wind 180 deg - Service	45287.03	0.00	12291.89	1652877.48	0.00	0.00
Wind 210 deg - Service	45287.03	-6145.94	10645.09	1431433.89	826438.74	0.00
Wind 240 deg - Service	45287.03	-10645.09	6145.94	826438.74	1431433.89	0.00
Wind 270 deg - Service	45287.03	-12291.89	0.00	0.00	1652877.48	0.00
Wind 300 deg - Service	45287.03	-10645.09	-6145.94	-826438.74	1431433.89	0.00
Wind 330 deg - Service	45287.03	-6145.94	-10645.09	-1431433.89	826438.74	0.00

ERITower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Plymouth 2, CT (CT01497)	Page	7 of 8
	Project	VSI Job No. 2003-007-016	Date	16:34:48 09/09/03
	Client	SBA	Designed by	dblakeman

Compression Checks

Pole Design Data:

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio $\frac{P}{P_a}$
L1	195 - 180 (1)	TP24x24x0.281	15'	195'	278.7	1.923	20.9282	-5561.24	40239.40	0.138
L2	180 - 130 (2)	TP35.25x24x0.25	50'	195'	194.6	3.944	26.8798	-16061.30	106013.00	0.152
L3	130 - 125 (3)	TP35.9725x33.625x0.25 H1-3 (1.42 CR) - 3	10'	195'	184.5	4.386	28.3458	-18088.40	124322.00	0.145
L4	125 - 85 (4)	TP45.3625x35.9725x0.3125	40'	195'	151.0	6.546	43.2869	-19449.80	283356.00	0.069
L5	85 - 81 (5)	TP45.7207x43.329x0.3125 H1-3 (1.35 CR) - 5	10'	195'	145.2	7.087	45.0393	-22257.90	319180.00	0.070
L6	81 - 41 (6)	TP55.2875x45.7207x0.375	40'	195'	123.8	9.741	63.3669	-30343.80	617287.00	0.049
L7	41 - 0 (7)	TP64.5x52.8633x0.375	48'	195'	102.8	14.133	76.3248	-45268.10	1078690.00	0.042

Pole Bending Design Data:

Section No.	Elevation ft	Size	Actual M _x lb-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M _y lb-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	195 - 180 (1)	TP24x24x0.281	84740.8 3	-8.281	23.760	0.349	0.00	0.000	23.760	0.000
L2	180 - 130 (2)	TP35.25x24x0.25	834016. 67	-44.521	39.000	1.142	0.00	0.000	39.000	0.000
L3	130 - 125 (3)	TP35.9725x33.625x0.25	1038258 .33	-49.821	39.000	1.277	0.00	0.000	39.000	0.000
L4	125 - 85 (4)	TP45.3625x35.9725x0.3125	1847208 .33	-47.519	39.000	1.218	0.00	0.000	39.000	0.000
L5	85 - 81 (5)	TP45.7207x43.329x0.3125	2096541 .67	-49.804	39.000	1.277	0.00	0.000	39.000	0.000
L6	81 - 41 (6)	TP55.2875x45.7207x0.375	2977291 .67	-42.883	39.000	1.100	0.00	0.000	39.000	0.000
L7	41 - 0 (7)	TP64.5x52.8633x0.375	4407083 .33	-43.702	36.657	1.192	0.00	0.000	36.657	0.000

Pole Interaction Design Data:

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	195 - 180 (1)	TP24x24x0.281	0.138	0.349	0.000	0.487 ✓	1.333	H1-3 ✓
L2	180 - 130 (2)	TP35.25x24x0.25	0.152	1.142	0.000	1.293 ✓	1.333	H1-3 ✓
L3	130 - 125 (3)	TP35.9725x33.625x0.25	0.145	1.277	0.000	1.423 ✗	1.333	H1-3 ✗
L4	125 - 85 (4)	TP45.3625x35.9725x0.3125	0.069	1.218	0.000	1.287 ✓	1.333	H1-3 ✓
L5	85 - 81 (5)	TP45.7207x43.329x0.3125	0.070	1.277	0.000	1.347 ✗	1.333	H1-3 ✗
L6	81 - 41 (6)	TP55.2875x45.7207x0.375	0.049	1.100	0.000	1.149 ✓	1.333	H1-3 ✓
L7	41 - 0 (7)	TP64.5x52.8633x0.375	0.042	1.192	0.000	1.234 ✓	1.333	H1-3 ✓

ERITower Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Job	Plymouth 2, CT (CT01497)	Page	8 of 8
	Project	VSI Job No. 2003-007-016	Date	16:34:48 09/09/03
	Client	SBA	Designed by	dblakeman

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
L1	195 - 180	Pole	TP24x24x0.281	1	-5561.24	53639.12	36.5	Pass
L2	180 - 130	Pole	TP35.25x24x0.25	2	-16061.30	141315.32	97.0	Pass
L3	130 - 125	Pole	TP35.9725x33.625x0.25	3	-18088.40	165721.22	106.7	Fail X
L4	125 - 85	Pole	TP45.3625x35.9725x0.3125	4	-19449.80	377713.53	96.6	Pass
L5	85 - 81	Pole	TP45.7207x43.329x0.3125	5	-22257.90	425466.92	101.0	Fail X
L6	81 - 41	Pole	TP55.2875x45.7207x0.375	6	-30343.80	822843.54	86.2	Pass
L7	41 - 0	Pole	TP64.5x52.8633x0.375	7	-45268.10	1437893.71	92.6	Pass
Summary								
Pole (L3)							106.7	Fail X
RATING =							106.7	Fail X