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-066-031001** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 133 Clearview Avenue, Harwinton, 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 structural modifications recommended in the Structural Analysis Report prepared by Daniel Blakeman (dated September 8, 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

Pamela B. Katz, P.E.
Chairman

PBK/laf

c: Honorable Marie M. Knudsen, First Selectman, Town of Harwinton
William J. Tracy, Jr., Planning Chairman, Town of Harwinton
Sheila R. Becker, Regional Director of Compliance, SBA, Inc.
Stephen J. Humes, Esq., LeBoeuf Lamb Greene & MacRae

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 2, 2003

Honorable Marie M. Knudsen
First Selectman
Town of Harwinton
Town Hall
100 Bentley Drive
Harwinton, CT 06791

RE: **EM-VER-066-031001** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 133 Clearview Avenue, Harwinton, Connecticut.

Dear Ms. Knudsen:

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 tentatively scheduled for October 14, 2003, at 1:30 p.m., in Hearing Room Two, Ten Franklin Square, New Britain, Connecticut.

Please call me or inform the Council if you have any questions or comments regarding this proposal.

Thank you for your cooperation and consideration.

Very truly yours,

SDP/laf

S. Derek Phelps
Executive Director

SDP/laf

Enclosure: Notice of Intent

c: William J. Tracy, Jr., Planning Chairman, Town of Harwinton

EM-VER-066-031001

ROBINSON & COLE LLP

KENNETH C. BALDWIN

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

October 1, 2003

Via Hand Delivery

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

Re: **Notice of Exempt Modification**
133 Clearview Avenue
Harwinton, Connecticut

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") intends to install antennas on an existing tower at 133 Clearview Avenue in Harwinton, 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 Harwinton First Selectman, Marie Knudsen.

The facility consists of a 195-foot self-supporting monopole tower, capable of supporting multiple carriers within an approximately 70' x 70' site compound. The tower is owned and operated by SBA Towers, Inc. ("SBA") and is currently shared by T-Mobile at the 192-foot level. Cellco proposes to install twelve (12) panel-type antennas at the 183-foot level on the tower and a 12' x 30' single-story equipment shelter near the base of the tower. (See Attachment 1 - Project Plans).

The planned modifications to the Harwinton 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 approximately the 183-foot level on the 195-foot tower.

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. The cumulative worst-case RF emissions levels for T-Mobile's antennas and Cellco's proposed PCS antennas would be 1.84% of the FCC Standard, as measured for mixed frequency sites (See Attachment 2).

Also included as Attachment 3 attached is an engineer's certification verifying that the tower can accommodate T-Mobile and Cellco antennas and related equipment.

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

Sincerely,

Kenneth C. Baldwin

Attachments

cc: Marie Knudsen, First Selectman
Sandy M. Carter

Cellco Partnership

d.b.a. verizon wireless

WIRELESS COMMUNICATIONS FACILITY

HARWINTON NORTHWEST
133 CLEARVIEW AVENUE
HARWINTON, CONNECTICUT 06791

PROJECT SUMMARY

SITE NAME:	HARWINTON NORTHWEST
SITE ADDRESS:	133 CLEARVIEW AVENUE HARWINTON, CONNECTICUT 06791
PROPERTY OWNER:	SBA TOWERS, INC. ONE TOWN CENTER RD., 3RD FLOOR BOCA RATON, FL 33486
LEASOR:	SBA TOWERS, INC. ONE TOWN CENTER RD., 3RD FLOOR BOCA RATON, FL 33486
LESSEE:	CELLCO PARTNERSHIP 99-101 EAST RIVER DR. EAST HARTFORD, CT 06108
APPLICANT:	CELLCO PARTNERSHIP 99-101 EAST RIVER DR. EAST HARTFORD, CT 06108
CONTACT PERSON:	SANDY CARTER CELLCO PARTNERSHIP (860) 603-8219
CENTER OF TOWER:	LATITUDE 41° 46' 32.87" LONGITUDE 73° 05' 54.8" GROUND ELEV. 993 ± AMSL COORDINATES WERE TAKEN USING A HAND HELD GPS

GENERAL NOTES

1. PROPOSED AND EXISTING ANTENNA LOCATIONS AND HEIGHTS PROVIDED BY CELLCO PARTNERSHIP.

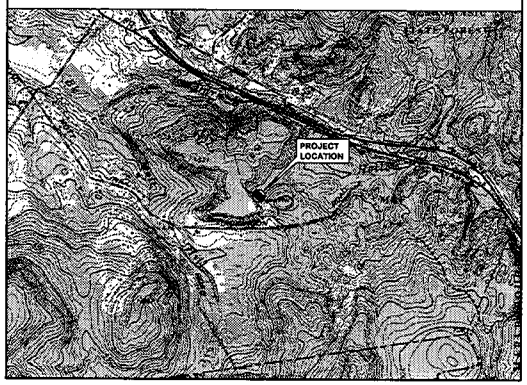
SITE DIRECTIONS

FROM: 99-101 EAST RIVER DR.,EAST HARTFORD, CT.
TO: 133 CLEARVIEW AVE., HARWINTON, CT

START OUT GOING WEST ON US-44 W/ CONNECTICUT BLVD. STAY STRAIGHT TO GO ONTO US-6 W/ I-84 W. MERGE ONTO FARMINGTON AVE/ CT-4 W VIA EXIT NUMBER 39 TOWARD FARMINGTON. TURN SLIGHT RIGHT ONTO CT-4/ MAIN ST. AND CONTINUE TO FOLLOW CT-4. TURN LEFT ONTO CT-4/ SPIELMAN HWY. AND CONTINUE TO FOLLOW CT-4. TURN RIGHT ONTO CLEARVIEW AVE.

VICINITY MAP

NOT TO SCALE



LEGEND

SYMBOL	DESCRIPTION
	SECTION OR DETAIL NUMBER SHEET WHERE DETAIL/SECTION OCCURS
	ELEVATION NUMBER
	SHEET WHERE ELEVATION OCCURS

SHEET INDEX

SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	00
C-1	COMPOUND PLAN AND ELEVATION	00

REVISIONS		
00	9/15/03	SITING COUNCIL REVIEW
01	9/30/03	REVISED SITING COUNCIL
02	9/30/03	FINAL SITING COUNCIL

Cellco Partnership
d.b.a. verizon wireless

Natcomm, LLC
63-2 North Branford Road
Branford, Connecticut 06405
Tel. (203) 488-0580
Fax (203) 488-8587
Consulting Engineers- Project Management
Civil-Structural-Mechanical-Electrical

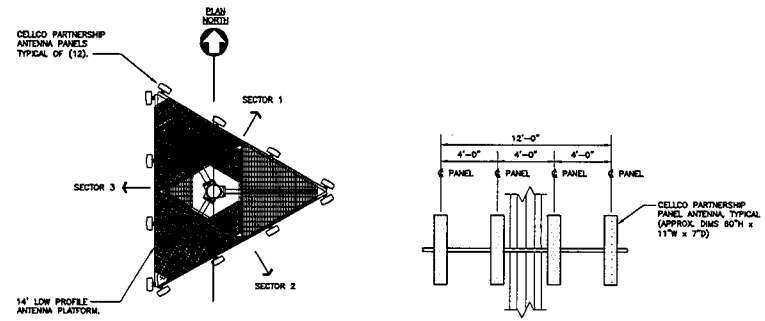
PROFESSIONAL ENGINEER SEAL

HARWINTON NORTHWEST
133 CLEARVIEW AVENUE
HARWINTON, CT 06791

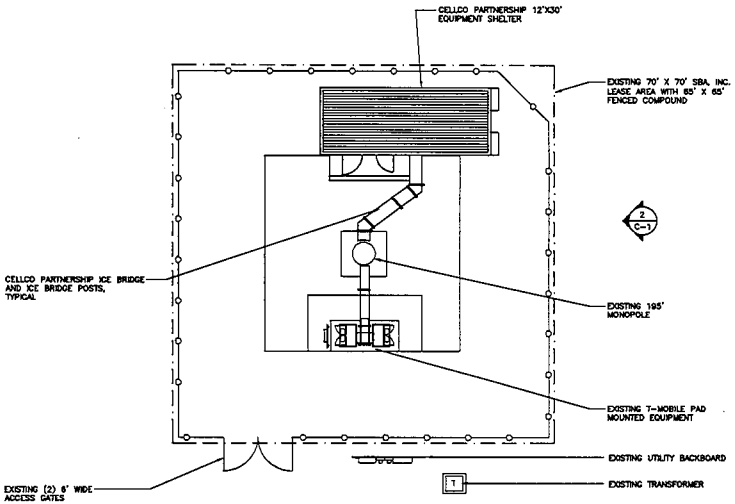
PROJECT NO:	03053
DRAWN BY:	KC
CHECKED BY:	AAJ
SCALE:	AS NOTED
DATE:	07/14/03

TITLE SHEET

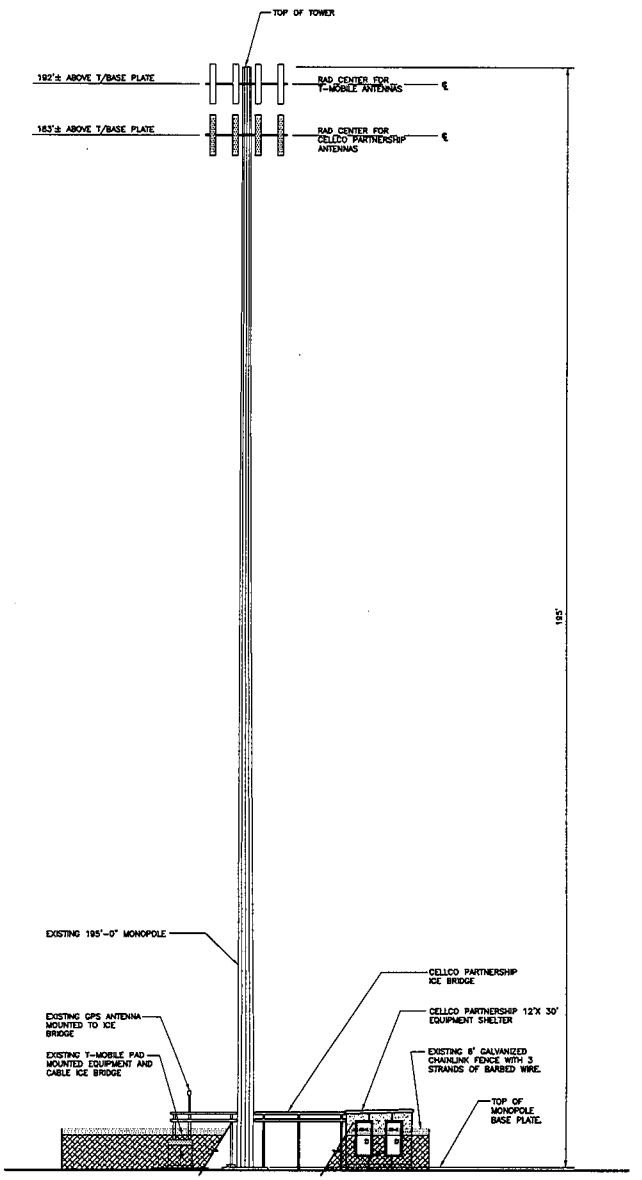
T-1
DWG. 1 OF 2



3 C-1 **ANTENNA MOUNTING CONFIGURATION**
NOT TO SCALE



1 C-1 **COMPOUND**
SCALE: 1"=10'-0"



2 C-1 **ELEVATION**
SCALE: 1"=10'-0"

REVISIONS		
00	8/15/03	SITING COUNCIL REVIEW
01	9/30/03	REVISED SITING COUNCIL
02	9/30/03	FINAL SITING COUNCIL

Cellco Partnership
d.b.a. verizonwireless

Natcomm, LLC.
63-2 North Branford Road
Branford, Connecticut 06405
Tel. (203) 488-0580
Fax (203) 488-8587
Consulting Engineers - Project Management
Civil · Structural · Mechanical · Electrical

HARWINTON NORTH-WEST

133 CLEARVIEW AVENUE
HARWINTON, CT 06791

PROJECT NO:	03053
DRAWN BY:	KC
CHECKED BY:	AAJ
SCALE:	AS NOTED
DATE:	07/14/03

COMPOUND PLAN AND ELEVATION

C-1
DWG. 2 OF 2

Site Name: Harwinton NW
Cumulative Power Density

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissable Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
T-Mobile	1935	6	205	1230	192	0.0120	1	1.20%
Verizon	1970	3	200	600	183	0.0064	1	0.64%
Total Percentage of Maximum Permissible Exposure								**1.84%**

*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/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case scenario, maximum values used.

VERTICAL STRUCTURES, INC.

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 CT01944
SBA Site Name "Harwinton, CT"
195' Nudd MJ-180 Monopole Tower
VSI Job Number 2003-007-014

Dear Mr. Patrick:

Vertical Structures is pleased to provide you with this addendum letter to the September 8, 2003 report on the results of the structural analysis performed on the 195' tall monopole tower at SBA's Harwinton 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 182' for Verizon and twelve (12) proposed DB844H90E-XY panel antennas on a low profile platform at 163' as well as two (2) GPS antennas at 80' for Nextel. 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

309 Spangler Drive • Suite E • Richmond, Kentucky 40475 • (859) 624-8360 • Fax (859) 624-8369

VERTICAL STRUCTURES, INC.

September 8, 2003

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

Subject: **Structural Analysis Report**
SBA Site Number CT01944
SBA Site Name "Harwinton, CT"
195' Nudd MJ-180 Monopole Tower
VSI Job Number 2003-007-014

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 Harwinton 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 182' for Verizon and twelve (12) proposed DB844H90E-XY panel antennas on a low profile platform at 163' as well as two (2) GPS antennas at 80' for Nextel. 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

STATE OF CONNECTICUT
JOHN IRVING MATHIS
NO 14220
LICENSED
PROFESSIONAL ENGINEER
9/4/03

309 Spangler Drive • Suite E • Richmond, Kentucky 40475 • (859) 624-8360 • Fax (859) 624-8369

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Table 1 – Proposed and Existing Loads.....3
Table 2 – Original Design Loads.....3

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Table 4 – Required Modifications.....4

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
192'	Omnipoint	Existing	(6) EMS RR90-17-02DP Panels	(12) 1 5/8" Coax	(1) 14' L.P. Platform
182'	**Verizon**	**Proposed**	**(12) DB950G65E-M Panels**	**(12) 1 5/8" Coax**	**(1) 14' L.P. Platform**
163'	**Nextel**	**Proposed**	**(12) DB844H90E-XY Panels**	**(12) 1 5/8" Coax**	**(1) 14' L.P. Platform**
80'		**Proposed**	**(2) GPS**		

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 Harwinton 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.

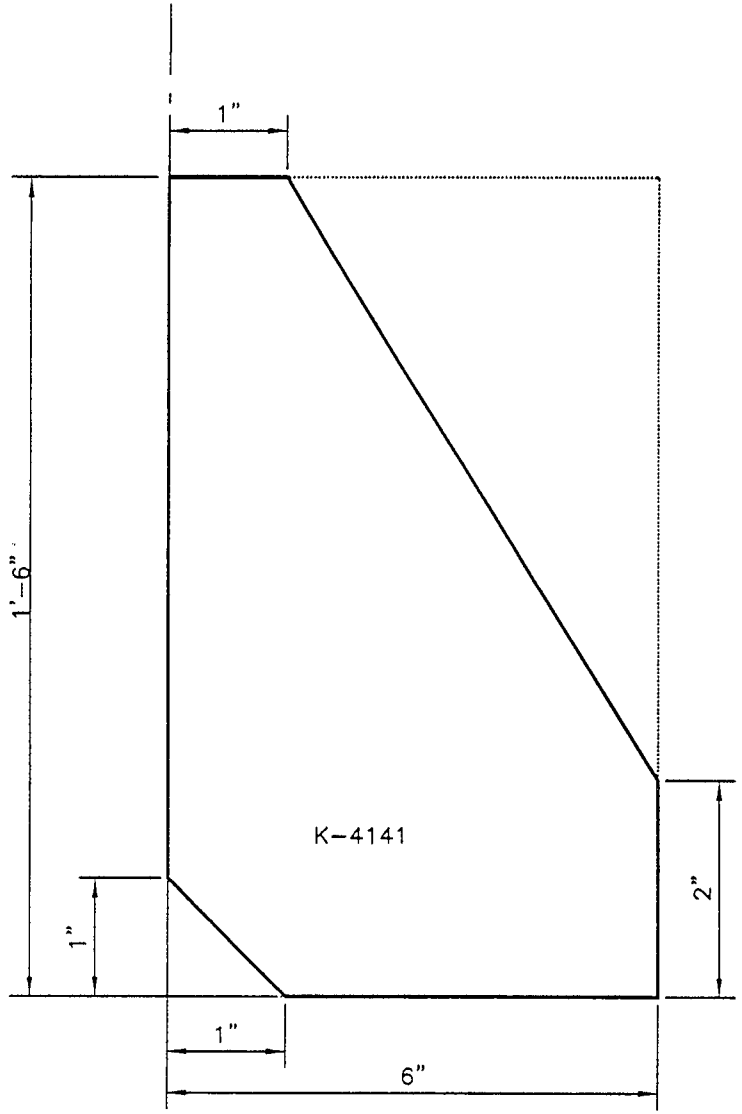
Table 3 – Tower Component Stresses vs. Capacity

Section Number	Elevation	Combined Stress Ratio	Allowable Stress Ratio	Percent Used
1	195' – 180'	.400	1.333	30.0
2	180' – 130'	1.080	1.333	81.0
3	130' – 85'	1.113	1.333	83.5
4	85' – 41'	1.010	1.333	75.7
5	41' – 0'	1.099	1.333	82.5
Splice Plate @ 180' – Bending				86.0
Splice Bolts @ 180' – Tension				48.7
Base Plate - Bending				149.8
Anchor Bolts – Tension				77.0
Foundation – Moment (comparing design load to actual load)				80.2

Modification (A), listed in Table 4, is required to remedy the deficiencies in the Harwinton tower identified in this analysis. 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-four (24).**



MARK NO. K-4141

MATERIAL: PL 6" X 1" X 1'-6"

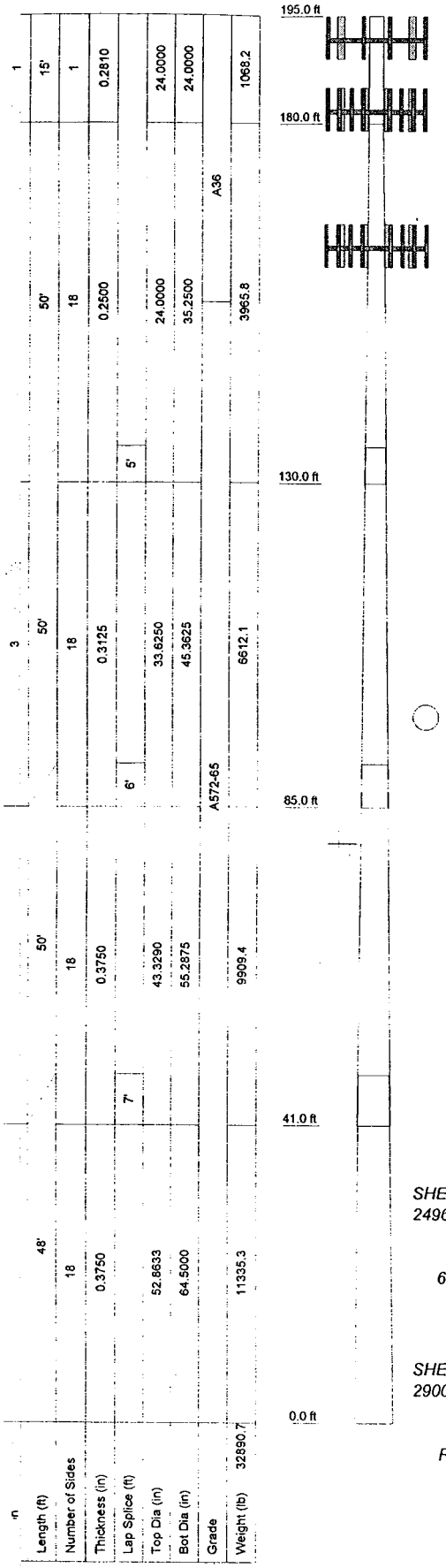
50 KSI STEEL

REV.	DESCRIPTION	DRAWN BY	APP'D BY
A	REVISED TITLE BLOCK	JAC 10-24-02	
-	ORIGINALLY DRAWN	JMH 5-10-02	JM 5-15-02

VERTICAL STRUCTURES, INC.
P.O. Box 1496
Richmond, KY 40476
Phone: (859) 624-8360
Fax: (859) 624-8369
Email: engineering@verticalstructures.com

DWN BY	DATE	APP'D BY	DATE
JMH	5-10-02	DJA	11-1-02

WEIGHT	FABRICATIN DETAIL
30.60#	MARK NO. K-4141



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Nudd 14' Boom (3)	192	(4) DB950G65E-M w/Mount Pipe	182
(2) RR90-17-02DP w/Mount Pipe	192	Nudd 14' Boom (3)	163
(2) RR90-17-02DP w/Mount Pipe	192	(4) DB844H90E-XY w/Mount Pipe	163
(2) RR90-17-02DP w/Mount Pipe	192	(4) DB844H90E-XY w/Mount Pipe	163
Nudd 14' Boom (3)	182	(4) DB844H90E-XY w/Mount Pipe	163
(4) DB950G65E-M w/Mount Pipe	182	(2) Generic GPS	80
(4) DB950G65E-M w/Mount Pipe	182		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

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: 83.5%

AXIAL
52069 lb

SHEAR
24968 lb

MOMENT
3546468 lb-ft

TORQUE 384 lb-ft
69 mph WIND - 0.5000 in ICE

AXIAL
44130 lb

MOMENT
3913866 lb-ft

SHEAR
29009 lb

TORQUE 411 lb-ft
REACTIONS - 80 mph WIND

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

Job: *Harwinton, CT (CT01944)*			
Project: *VSI Job No. 2003-007-014*			
Client: SBA	Drawn by: dblakeman	App'd:	
Code: TIA/EIA-222-F	Date: 09/08/03	Scale: NTS	
Path: E:\Harwinton.eri		Dwg No. E-1	

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 ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
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'-85'	50'	6'	18	33.6250	45.3625	0.3125	1.2500	A572-65 (65 ksi)
L4	85'-41'	50'	7'	18	43.3290	55.2875	0.3750	1.5000	A572-65 (65 ksi)
L5	41'-0'	48'		18	52.8633	64.5000	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/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	33.0418	4632.5069	11.8259	17.0815	271.2002	9271.1093	16.5241	5.3680	17.178
	46.0623	44.6840	11457.2075	15.9927	23.0441	497.1851	22929.4908	22.3462	7.4338	23.788
L4	45.4546	51.1260	11917.5362	15.2487	22.0111	541.4322	23850.7537	25.5679	6.9659	18.576
	56.1404	65.3596	24899.4233	19.4939	28.0861	886.5406	49831.6100	32.6860	9.0706	24.188
L5	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 ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 195'-180'				1	1	1		
L2 180'-130'				1	1	1		
L3 130'-85'				1	1	1		
L4 85'-41'				1	1	1		
L5 41'-0'				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	192' - 5'	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	182' - 5'	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	163' - 5'	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A 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	137.76
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	1308.72
L3	130'-85'	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C	0.000	0.000	0.000	0.000	1328.40
L4	85'-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	1298.88
L5	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	1062.72

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_A In Face ft^2	C_AA_A 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	137.76
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	1308.72
L3	130'-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	1328.40
L4	85'-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	1298.88
L5	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	1062.72

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice 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'-85'	0.0000	0.0000	0.0000	0.0000
L4	85'-41'	0.0000	0.0000	0.0000	0.0000
L5	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_A Front ft^2	C_AA_A Side ft^2	Weight lb
Nudd 14' Boom (3)	C	None		0.0000	192'	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

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft	deg	ft		ft^2	ft^2	lb
						2" Ice	127.00	127.00	3400.00
						4" Ice	207.00	207.00	5200.00
(2) RR90-17-02DP w/Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	192'	No Ice	4.91	3.64	43.55
						1/2" Ice	5.57	4.70	81.64
						1" Ice	6.14	5.48	130.14
						2" Ice	7.32	7.08	249.13
						4" Ice	9.81	10.47	609.39
(2) RR90-17-02DP w/Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	192'	No Ice	4.91	3.64	43.55
						1/2" Ice	5.57	4.70	81.64
						1" Ice	6.14	5.48	130.14
						2" Ice	7.32	7.08	249.13
						4" Ice	9.81	10.47	609.39
(2) RR90-17-02DP w/Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	192'	No Ice	4.91	3.64	43.55
						1/2" Ice	5.57	4.70	81.64
						1" Ice	6.14	5.48	130.14
						2" Ice	7.32	7.08	249.13
						4" Ice	9.81	10.47	609.39
Nudd 14' Boom (3)	C	None		0.0000	182'	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
(4) DB950G65E-M w/Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	182'	No Ice	6.60	5.90	40.55
						1/2" Ice	7.27	7.01	95.17
						1" Ice	7.86	7.84	160.90
						2" Ice	9.08	9.60	316.45
						4" Ice	11.65	13.41	758.19
(4) DB950G65E-M w/Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	182'	No Ice	6.60	5.90	40.55
						1/2" Ice	7.27	7.01	95.17
						1" Ice	7.86	7.84	160.90
						2" Ice	9.08	9.60	316.45
						4" Ice	11.65	13.41	758.19
(4) DB950G65E-M w/Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	182'	No Ice	6.60	5.90	40.55
						1/2" Ice	7.27	7.01	95.17
						1" Ice	7.86	7.84	160.90
						2" Ice	9.08	9.60	316.45
						4" Ice	11.65	13.41	758.19
Nudd 14' Boom (3)	C	None		0.0000	163'	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
(4) DB844H90E-XY w/Mount Pipe	A	From Leg	4.00 0' 0'	0.0000	163'	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
(4) DB844H90E-XY w/Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	163'	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
(4) DB844H90E-XY w/Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	163'	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
(2) Generic GPS	C	From Leg	1.00 0'	0.0000	80'	No Ice	2.00	2.00	20.00
						1/2" Ice	2.50	2.50	40.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft	deg	ft		ft^2	ft^2	lb
			0'			1" Ice	3.00	3.00	60.00
						2" Ice	4.00	4.00	100.00
						4" Ice	6.00	6.00	180.00

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	32890.70			58.30	100.98	
Wind 0 deg - No Ice	44041.68	0.00	-29009.13	-3774188.35	100.98	-360.09
Wind 30 deg - No Ice	44041.68	14504.57	-25122.65	-3268535.18	-1887022.35	-207.90
Wind 60 deg - No Ice	44041.68	25122.65	-14504.57	-1887065.03	-3268492.50	0.00
Wind 90 deg - No Ice	44041.68	29009.13	0.00	58.30	-3774145.67	207.90
Wind 120 deg - No Ice	44041.68	25122.65	14504.57	1887181.63	-3268492.50	360.09
Wind 150 deg - No Ice	44041.68	14504.57	25122.65	3268651.78	-1887022.35	415.80
Wind 180 deg - No Ice	44041.68	0.00	29009.13	3774304.95	100.98	360.09
Wind 210 deg - No Ice	44041.68	-14504.57	25122.65	3268651.78	1887224.30	207.90
Wind 240 deg - No Ice	44041.68	-25122.65	14504.57	1887181.63	3268694.46	0.00
Wind 270 deg - No Ice	44041.68	-29009.13	0.00	58.30	3774347.63	-207.90
Wind 300 deg - No Ice	44041.68	-25122.65	-14504.57	-1887065.03	3268694.46	-360.09
Wind 330 deg - No Ice	44041.68	-14504.57	-25122.65	-3268535.18	1887224.30	-415.80
Member Ice	5172.05			116.60	201.96	
Wind 0 deg - Ice	51980.20	0.00	-24968.23	-3379925.98	201.96	-337.59
Wind 30 deg - Ice	51980.20	12484.12	-21623.13	-2927086.14	-1689819.33	-194.91
Wind 60 deg - Ice	51980.20	21623.13	-12484.12	-1689904.69	-2927000.78	0.00
Wind 90 deg - Ice	51980.20	24968.23	0.00	116.60	-3379840.62	194.91
Wind 120 deg - Ice	51980.20	21623.13	12484.12	1690137.89	-2927000.78	337.59
Wind 150 deg - Ice	51980.20	12484.12	21623.13	2927319.34	-1689819.33	389.81
Wind 180 deg - Ice	51980.20	0.00	24968.23	3380159.18	201.96	337.59
Wind 210 deg - Ice	51980.20	-12484.12	21623.13	2927319.34	1690223.25	194.91
Wind 240 deg - Ice	51980.20	-21623.13	12484.12	1690137.89	2927404.70	0.00
Wind 270 deg - Ice	51980.20	-24968.23	0.00	116.60	3380244.54	-194.91
Wind 300 deg - Ice	51980.20	-21623.13	-12484.12	-1689904.69	2927404.70	-337.59
Wind 330 deg - Ice	51980.20	-12484.12	-21623.13	-2927086.14	1690223.25	-389.81
Wind 0 deg - Service	44041.68	0.00	-11331.69	-1474256.80	100.98	-140.66
Wind 30 deg - Service	44041.68	5665.85	-9813.53	-1276736.03	-737056.57	-81.21
Wind 60 deg - Service	44041.68	9813.53	-5665.85	-737099.25	-1276693.35	0.00
Wind 90 deg - Service	44041.68	11331.69	0.00	58.30	-1474214.12	81.21
Wind 120 deg - Service	44041.68	9813.53	5665.85	737215.85	-1276693.35	140.66
Wind 150 deg - Service	44041.68	5665.85	9813.53	1276852.63	-737056.57	162.42
Wind 180 deg - Service	44041.68	0.00	11331.69	1474373.40	100.98	140.66
Wind 210 deg - Service	44041.68	-5665.85	9813.53	1276852.63	737258.53	81.21
Wind 240 deg - Service	44041.68	-9813.53	5665.85	737215.85	1276895.31	0.00
Wind 270 deg - Service	44041.68	-11331.69	0.00	58.30	1474416.08	-81.21
Wind 300 deg - Service	44041.68	-9813.53	-5665.85	-737099.25	1276895.31	-140.66
Wind 330 deg - Service	44041.68	-5665.85	-9813.53	-1276736.03	737258.53	-162.42

Compression Checks

ERITower	Job	Page
	Harwinton, CT (CT01944)	6 of 7
Vertical Structures, Inc. 309 Spangler Drive, Suite E Richmond, KY 40475 Phone: (859) 624-8360 FAX: (859) 624-8369	Project VSI Job No. 2003-007-014	Date 12:12:16 09/08/03
	Client SBA	Designed by dblakeman

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	-6172.86	40239.40	0.153
L2	180 - 130 (2)	TP35.25x24x0.25	50'	195'	194.6	3.944	26.8798	-10416.40	106013.00	0.098
L3	130 - 85 (3)	TP45.3625x33.625x0.3125	50'	195'	151.0	6.546	43.2869	-18274.90	283356.00	0.064
L4	85 - 41 (4)	TP55.2875x43.329x0.375	50'	195'	123.8	9.741	63.3669	-29291.50	617287.00	0.047
L5	41 - 0 (5)	TP64.5x52.8633x0.375	48'	195'	102.8	14.133	76.3248	-44026.20	1078690.00	0.041

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	60033.17	-5.866	23.760	0.247	0.00	0.000	23.760	0.000
L2	180 - 130 (2)	TP35.25x24x0.25	717290.83	-38.291	39.000	0.982	0.00	0.000	39.000	0.000
L3	130 - 85 (3)	TP45.3625x33.625x0.3125	1589541.67	-40.891	39.000	1.048	0.00	0.000	39.000	0.000
L4	85 - 41 (4)	TP55.2875x43.329x0.375	2604950.00	-37.520	39.000	0.962	0.00	0.000	39.000	0.000
L5	41 - 0 (5)	TP64.5x52.8633x0.375	3913225.00	-38.804	36.657	1.059	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	0.153	0.247	0.000	0.400 ✓	1.333	H1-3 ✓
L2	180 - 130 (2)	TP35.25x24x0.25	0.098	0.982	0.000	1.080 ✓	1.333	H1-3 ✓
L3	130 - 85 (3)	TP45.3625x33.625x0.3125	0.064	1.048	0.000	1.113 ✓	1.333	H1-3 ✓
L4	85 - 41 (4)	TP55.2875x43.329x0.375	0.047	0.962	0.000	1.010 ✓	1.333	H1-3 ✓
L5	41 - 0 (5)	TP64.5x52.8633x0.375	0.041	1.059	0.000	1.099 ✓	1.333	H1-3 ✓

Section Capacity Table

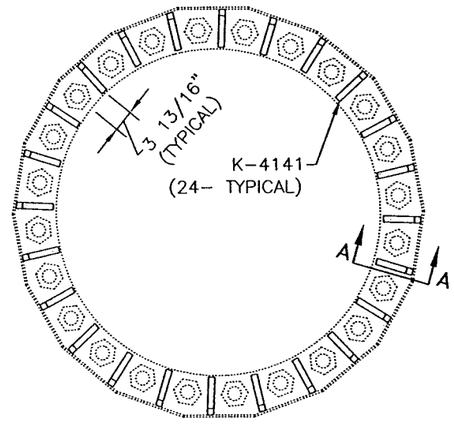
Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	195 - 180	Pole	TP24x24x0.281	1	-6172.86	53639.12	30.0	Pass
L2	180 - 130	Pole	TP35.25x24x0.25	2	-10416.40	141315.32	81.0	Pass
L3	130 - 85	Pole	TP45.3625x33.625x0.3125	3	-18274.90	377713.53	83.5	Pass
L4	85 - 41	Pole	TP55.2875x43.329x0.375	4	-29291.50	822843.54	75.7	Pass
L5	41 - 0	Pole	TP64.5x52.8633x0.375	5	-44026.20	1437893.71	82.5	Pass
							Summary	
						Pole (L3)	83.5	Pass
						RATING =	**83.5**	**Pass**

Program Version 2.0.0.58 - 8/17/2003 File:E:/Harwinton.eri

BILL OF MATERIALS		
MARK NO.	QTY.	DESCRIPTION
K-4141	24	BASE PLATE REIN., PL 6" X 1" X 1'-6"

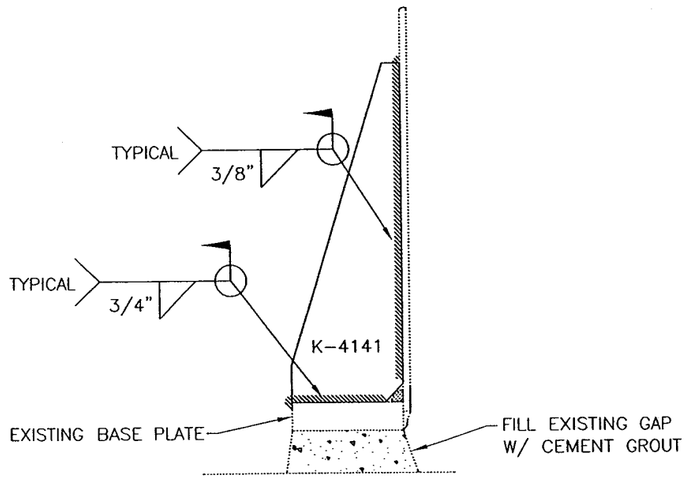
NOTES:

1. ANY HARDWARE REMOVED DURING THE INSTALLATION OF THE MATERIAL TO THE TOWER MUST BE REPLACED WITH NEW HARDWARE.
2. WELDER MUST BE AWS CERTIFIED.
3. SURFACES TO BE CLEARED OF GALVANIZATION BEFORE FIELD WELDING ANY MATERIAL.
4. COLD GALVANIZE ANY MATERAL AFTER FIELD WELDING.
5. THIS DRAWING DEPICTS THE REWORK REQUIRED TO REMEDY THE DEFICIENCIES FOUND IN THE HARWINTON, CT TOWER PER THE REPORT PUBLISHED BY VERTICAL STRUCTURES ON 9-8-03, JOB# 2003-007-014.



PLAN VIEW @ BASE PLATE

STEPBOLTS, SAFETY CLIMB, AND PORTS NOT DRAWN FOR CLARIFICATION



SECTION "A-A"

REV.	DESCRIPTION	DATE	BY
A	ORIGINAL RELEASE	9-8-03	JAC

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: HARWINTON, CT

DRAFTSPERSON: J. COMBS	DATE 9-8-03		
CHK'D BY:	DATE		
ENGR:	DATE 9-9-03	SHEET 1 OF 1	B TA2003007014-T1	SCALE: NONE