STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
Internet: ct.gov/csc

Daniel F. Caruso
Chairman

February 22, 2008

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

RE: **EM-VER-066-080118** – 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 February 14, 2008, 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 18, 2008, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

Thank you for your attention and cooperation.

Very truly yours,

Daniel F. Caruso
Chairman

DFC/MP/cm

c: The Honorable Frank J. Chiaramonte, First Selectman, Town of Harwinton
William J. Tracy, Jr., Planning Chairman, Town of Harwinton
SBA

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STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
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Daniel F. Caruso
Chairman

January 22, 2008

The Honorable Frank J. Chiaramonte
First Selectman
Town of Harwinton
Town Hall
100 Bentley Drive
Harwinton, CT 06791

RE: **EM-VER-066-080118** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 133 Clearview Avenue, Harwinton, Connecticut.

Dear Mr. Chiaramonte:

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

The Council will consider this item at the next meeting scheduled for February 14, 2008, at 1:30 p.m. in Hearing Room One, Ten Franklin Square, New Britain, Connecticut.

If you have any questions or comments regarding this proposal, please call me or inform the Council by February 13, 2008.

Thank you for your cooperation and consideration.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/jb

Enclosure: Notice of Intent

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

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

EM-VER-066-080118

ORIGINAL

January 18, 2008

Via Hand Delivery

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

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

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains a wireless telecommunications facility at the above referenced location. The Council approved Cellco's shared use of this facility on October 14, 2003. Cellco intends to modify its installation by replacing six (6) DB950F65T4E-M antennas with six (6) LPA-80063/4CF antennas at the same 181-foot level on the tower. Attached behind Tab 1 are the specifications for the existing and proposed replacement antennas.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Frank Chiaramonte, First Selectman of the Town of Harwinton. Pursuant to a Council directive, a copy of this letter is also being sent to Clearview Storage Park LLC, the owner of the property on which the facility is located.

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

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

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

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

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

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

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Frank Chiaramonte, Harwinton First Selectman
Clearview Storage Park LLC
Sandy M. Carter

ANDREW

Vertically Polarized Directed Dipole® Panel Antennas

1710 - 2170 MHz

65° HORIZONTAL BEAMWIDTH

HORIZONTAL BEAMWIDTH	65°	65°	65°	65°
FREQUENCY RANGE	1850-1990 MHz	1850-1990 MHz	1850-1990 MHz	1850-1990 MHz
	18.6 dBi / 0° Tilt	17.9 dBi / 2° Tilt	18 dBi / 2° Tilt	17.8 dBi / 4° Tilt
MODEL	DB950G65E-M	950F65T2E-M	950F65T2ZE-M	950F65T4E-M
TYPE	Directed Dipole®	Directed Dipole®	Directed Dipole®, No Screen	Directed Dipole®
ELECTRICAL SPECIFICATIONS				
Frequency Range (MHz)	1850-1990	1850-1990	1850-1990	1850-1990
Gain (dBd/dBi)	16.5 / 18.6	15.8 / 17.9	15.9 / 18	15.7 / 17.8
Horizontal Beamwidth (Deg.)	65	65	65	65
Elevation Beamwidth (Deg.)	6	6.5	6.5	6.5
USLS (dB)	N/A	>18	>20	>18
Null Fill (dB) – Below Peak	N/A	12	15	12
Beam Tilt (Deg.)	0	2	2	4
VSWR	<1.33:1	<1.33:1	<1.33:1	<1.33:1
Front-To-Back Ratio (dB)	40	40	40	40
Isolation (dB)	N/A	N/A	N/A	N/A
Max. Input Power (Watts)	250	250	250	250
Polarization	Vertical	Vertical	Vertical	Vertical
Connector Location	Bottom	Bottom	Bottom	Bottom
Connector Type	7-16 DIN - Female	7-16 DIN - Female	7-16 DIN - Female	7-16 DIN - Female
MECHANICAL SPECIFICATIONS				
Length (inch/mm)	60 / 1,524	60 / 1,524	60 / 1,524	60 / 1,524
Width (inch/mm)	10.5 / 267	10.5 / 267	6.5 / 165	10.5 / 267
Depth (inch/mm)	7 / 178	7 / 178	4 / 102	7 / 178
Net Weight (lbs/kg)	16 / 7.2	16 / 7.2	9.5 / 4.3	16 / 7.2
Max. Flat Plate Area (ft^2/m^2)	2.91 / 0.27	2.91 / 0.27	1.61 / 0.15	2.91 / 0.27
Max. Wind Load at 100 mph (lbf/N)	158 / 703	158 / 703	87 / 385	158 / 703
Max. Wind Speed (mph/kmh)	125 / 201	125 / 201	125 / 201	125 / 201
Radome Material	ABS, UV Resistant	ABS, UV Resistant	ABS, UV Resistant	ABS, UV Resistant
Reflector Material	Pass. Aluminum	Pass. Aluminum	Pass. Aluminum	Pass. Aluminum
Radiator Material	Low Loss Circuit Board	Low Loss Circuit Board	Low Loss Circuit Board	Low Loss Circuit Board
Hardware Material	Galvanized Steel	Galvanized Steel	Galvanized Steel	Galvanized Steel
Color	Light Gray	Light Gray	Light Gray	Light Gray
Std. Mounting Hardware	DB390	DB390	DB390	DB390
Optional Downtilt Kit	DB5098	DB5098	DB5098	DB5098
Optional Special Mounting	DB5094-AZ	DB5094-AZ	DB5094-AZ	DB5094-AZ

Specifications are subject to change. Please see our website for the latest information.
*TELETILT® compatible.

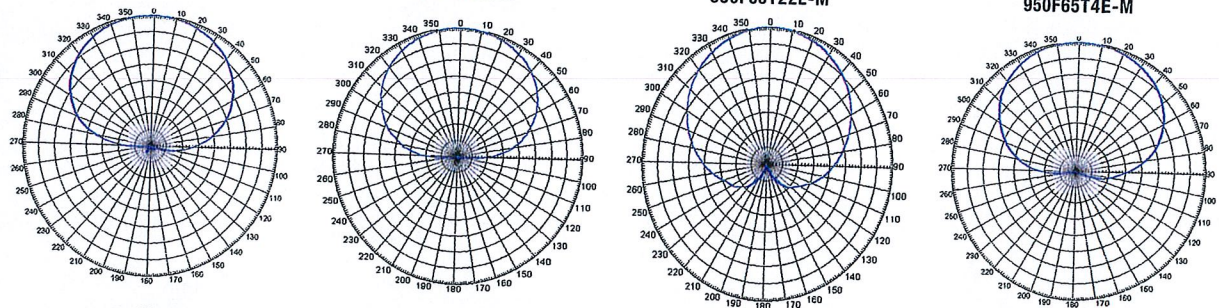
DB950G65E-M

950F65T2E-M

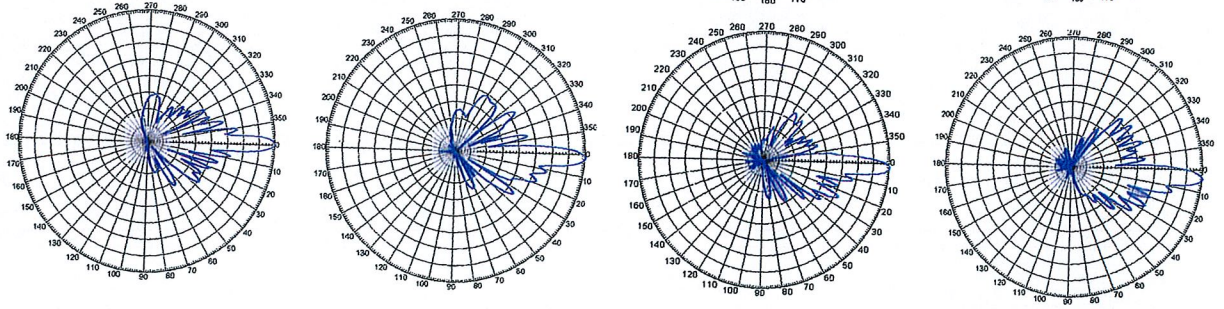
950F65T2ZE-M

950F65T4E-M

Azimuth Pattern



Elevation Pattern



Scale: 10° radials, 5 dB per division

ANDREW CORPORATION PHONE 1-800-676-5342 • (214) 631-0310 FAX 1-800-229-4706 • (214) 631-4706 WWW.ANDREW.COM

Vertically Polarized, Log Periodic 63° / 13 dBd

LPA-80063/4CF ___

When ordering replace "___" with connector type.

Mechanical specifications

Length	1205 mm	47.4 in
Width	386 mm	15.2 in
Depth	335 mm	13.2 in
Depth with z-bracket	375 mm	14.8 in
4) Weight	9.1 kg	20.0 lbs
Wind Area		
Fore/Aft	0.47 m^2	5.0 ft^2
Side	0.40 m^2	4.4 ft^2
Rated Wind Velocity (Safety factor 2.0)	>351 km/hr	>218 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	665 N	149.5 lbs
Side	577 N	129.6 lbs

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

Mounting and Downtilting

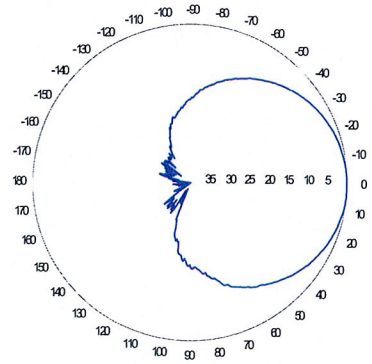
Mounting brackets attach to a pipe diameter of Ø50-102 mm (2.0-4.0 in). If the lock-down brace is used, the maximum diameter is Ø88.9 mm (3.5 in)

Mounting Bracket and Downtilt Bracket Kit #21699999

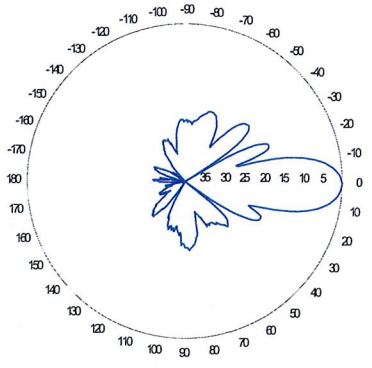
Electrical specifications

Frequency Range	806-960 MHz
Impedance	50Ω
3) Connector(s)	NE or E-DIN 1 port / center
1) VSWR	≤ 1.4:1
Polarization	Vertical
1) Gain	13 dBd
2) Power Rating	500 W
1) Half Power Angle	
H-Plane	63°
E-Plane	15°
1) Electrical Downtilt	0°
1) Null Fill	10%
Lightning Protection	Direct Ground

Radiation pattern[1)]



Horizontal

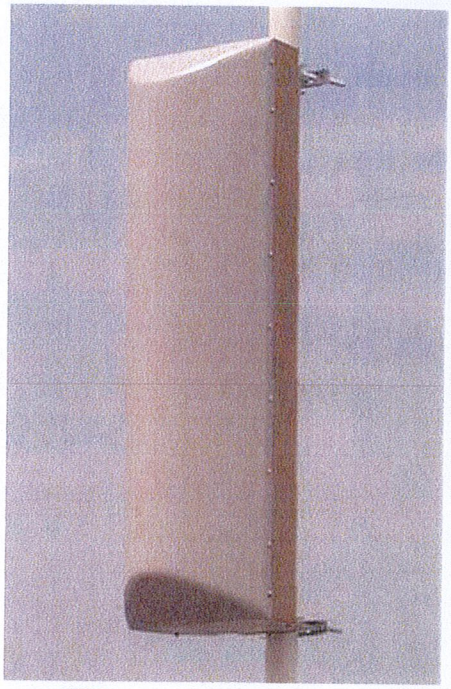


Vertical

Featuring upper side lobe suppression.

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

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



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

- True log-periodic design allows for superior front-to-side characteristics to minimize sector overlap.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad band-width and superior performance.
- Air as insulation for virtually no internal signal loss.

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

Antenna available with center-fed connector only.

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

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

CF Denotes a Center-Fed Connector.

806-960 MHz

Amphenol Antel, Inc. 1300 Capital Drive Rockford, Illinois 61109 USA Tel. (815) 399-0001
Toll-Free (888) 417-9562 Fax. (815) 399-0156 antel@antelinc.com www.antelinc.com

Amphenol Antel, Inc. The Antenna Technology Company

Revision Date: 7/5/07

			General	Power	Density		
Site Name: Harwinton NW							
Tower Height: Verizon @ 181Ft.							
		ERP					
Carrier	**channels**	**watt/ch**	**distance (feet)**	**S (mW/cm^2)**	**f (MHz)**	**Smax**	**Percent MPE**
*T-Mobile	6	205	192	0.0120	1930	1.0000	1.20%
*Nextel	9	100	175	0.0106	851	0.5673	1.86%
Verizon	**9**	**485**	**181**	**0.04794**	**1970**	**1.0000**	**4.79**
Verizon	**9**	**200**	**181**	**0.01977**	**875**	**0.5830**	**3.39**
*Source: Siting Council Records						**Total %MPE**	8.22

VERTICAL STRUCTURES, INC.

January 8, 2008

Mr. Mark Luther
SBA Network Services
723 Highland Ave.
Clarks Green, PA 18411
(570) 558-3450

Subject:

Structural Analysis Report
Verizon Wireless Change-Out
SBA Site Name: Harwinton, CT
SBA Site Number: CT-01944-S
195' Nudd MJ-180 Monopole Tower
Vertical Structures Job Number: 2008-007-001

Dear Mr. Luther,

Vertical Structures is pleased to provide you with the results of the structural analysis performed on the 195' tall monopole tower at the Harwinton site in Connecticut. The purpose of the analysis was to determine the suitability of the tower upon replacing six (6) existing Decibel DB950F65T4E-M panel antennas mounted on the existing platform at 181' with six (6) proposed Antel LPA-80063/4CF panel antennas for Verizon Wireless when combined with the existing and reserved equipment on the structure. This analysis has been performed in accordance with the TIA/EIA-222-F standard and local code requirements based upon an 80 MPH basic "fastest mile" wind speed, equivalent to a 100 MPH basic "3-second gust" wind speed per IBC Table 1609.3.1.

Based on our analysis we have determined the tower superstructure and foundation are sufficient for the proposed loading.

Vertical Structures appreciates the opportunity to provide this report and our continuing professional services. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted,

Andy Cronin
Project Engineer

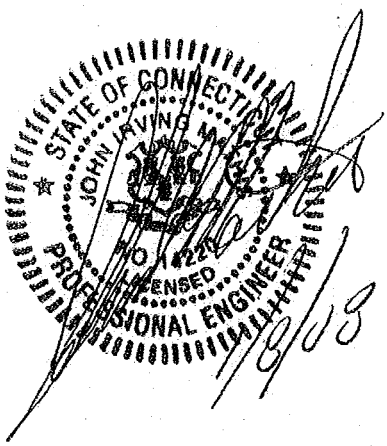


TABLE OF CONTENTS

INTRODUCTION

The subject tower is located in Harwinton, Connecticut. The 195' Nudd MJ-180 monopole tower was designed in 1999 and manufactured in 2000 for SBA, Inc. The tower consists of four (4) 18-sided tapered polygonal tubes joined via slip joint connections and one (1) pipe section joined via a bolted flange connection. The tower is founded on a 35' square by 4'-6" thick mat bearing 3' below grade. The tower was reworked in 2003 to accommodate additional loading.

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, existing, and reserved 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 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. The original design loads are listed in Table 2. All cables are assumed to be routed up the interior of the pole unless noted otherwise.

Table 1 – Proposed, Existing, and Reserved Loads

Mount Elevation	Carrier Name	Status	Antennas	Mounts	Feedlines
195'	Omnipoint/ T-Mobile	Existing	(3) EMS Wireless RR90-17-02DP Panels	14' L.P. Platform	(6) 1 5/8" Coax
		Reserved	(3) EMS Wireless RR90-17-02DP Panels		(6) 1 5/8" Coax
181'	**Verizon Wireless**	Existing	(6) Decibel DB950F65T4E-M Panels	14' L.P. Platform	(12) 1 5/8" Coax
		Remove	**(6) Decibel DB950F65T4E-M Panels**		
		Proposed	**(6) Antel LPA-80063/4CF Panels**		
173'	Nextel	Existing	(12) Decibel DB844H90E-XY Panels	14' L.P. Platform	(12) 1 5/8" Coax

Table 2 – Original Design Loads

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

ANALYSIS PROCEDURE

Table 3 – Resources Utilized

Resource	Remarks
Proposed and Existing Loads	SBA E-mail Dated "December 13, 2007"
Tower Drawing	Nudd Project No. 7218
Foundation Drawing	Nudd Project No. 7218
Geotechnical Report	Jaworski Geotech Project No. 99503G
Rework Drawings	Vertical Structures Job No. 2003-007-014

Analysis Methods

RISA Tower (Version 5.0), 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. All loads were computed in accordance with the ANSI/EIA/TIA-222-F or the local building code requirements. Selected output from the analysis is included in Appendix A.

Assumptions

1. Tower and structures were built in accordance with the manufacturer's specifications.
2. The tower and structures have been maintained in accordance with manufacturer's specifications.
3. The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Table 1 and any referenced drawings.
4. When applicable, transmission cables are considered to be structural components for calculating wind loads, as allowed by TIA/EIA-222-F.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and Vertical Structures should be allowed to review any new information to determine its effect on the structural integrity of the tower.

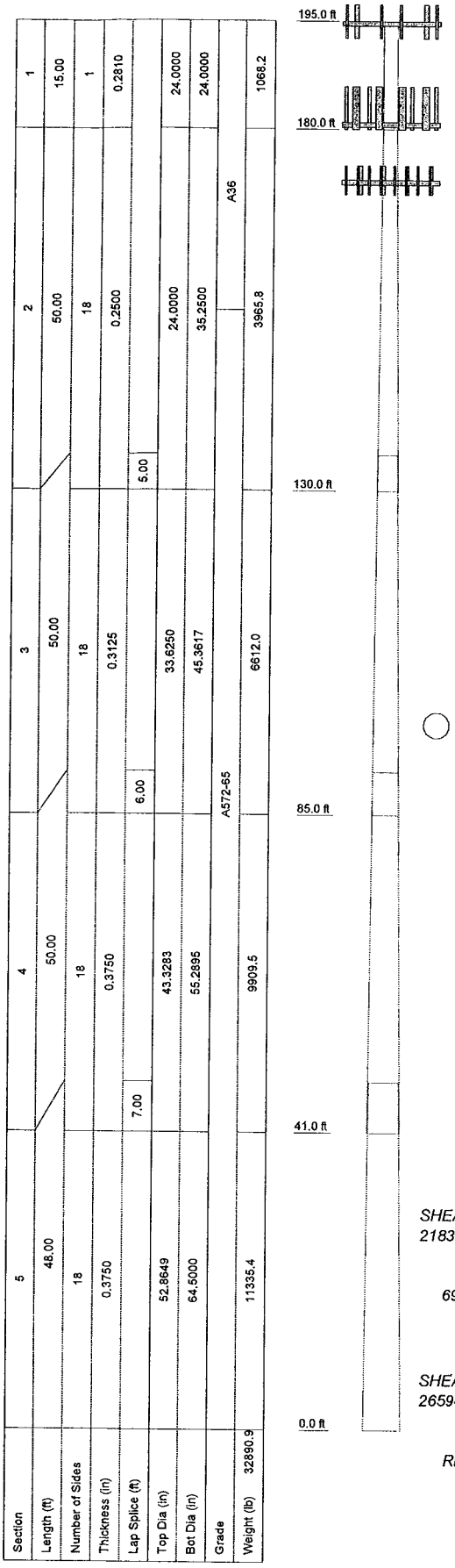
ANALYSIS RESULTS

The Harwinton tower superstructure is found to be adequate for the intended loading at the wind and ice conditions considered. Calculated foundation reactions are within the original design limits. Table 4 summarizes the condition of the tower. Capacities up to 105% are considered acceptable based on the analysis procedures used.

Table 4 – Tower Component Capacities

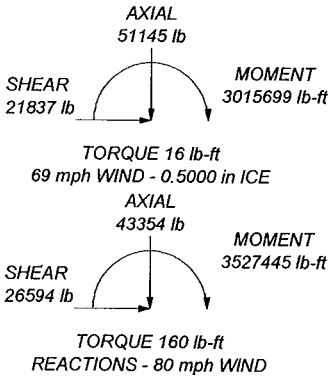
Section Number	Elevation	Percent Capacity Used		
		Pole	Flange Plate	Splice Bolts
1	195 - 180	19.5	88.2	51.0
2	180 - 130	68.7	-	-
3	130 - 85	71.5	-	-
4	85 – 41	65.6	-	-
5	41 - 0	72.7	-	-
Anchor Bolts – Tension		69.4		
Base Plate and Gussets		80.7		
Foundation – Moment		72.3		

APPENDIX A



Section	1	2	3	4	5
Length (ft)	15.00	50.00	50.00	50.00	48.00
Number of Sides	1	18	18	18	18
Thickness (in)	0.2810	0.2500	0.3125	0.3750	0.3750
Lap Splice (ft)		5.00	6.00	7.00	
Top Dia (in)	24.0000	24.0000	33.6250	43.3283	52.8649
Bot Dia (in)	24.0000	35.2500	45.3617	55.2895	64.5000
Grade	A36	A36	A572-65	A572-65	A572-65
Weight (lb)	1068.2	3965.8	6612.0	9909.5	11335.4

Total Weight: 32890.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Nudd 14' Low Profile Platform (VSI)	195	(2) LPA-80063/4CF w/ Mount Pipe (VSI) (Verizon Wireless)	181
(2) RR90-17-02DP w/Mount Pipe	195	(2) DB950F65T4E-M w/Mount Pipe (Verizon Wireless)	181
(2) RR90-17-02DP w/Mount Pipe	195	(2) LPA-80063/4CF w/ Mount Pipe (VSI) (Verizon Wireless)	181
(2) RR90-17-02DP w/Mount Pipe	195	14' Low Profile Platform (VSI)	173
14' Low Profile Platform (VSI) (Verizon Wireless)	181	(4) DB844H90E-XY w/Mount Pipe	173
(2) DB950F65T4E-M w/Mount Pipe (Verizon Wireless)	181	(4) DB844H90E-XY w/Mount Pipe	173
(2) LPA-80063/4CF w/ Mount Pipe (VSI) (Verizon Wireless)	181	(4) DB844H90E-XY w/Mount Pipe	173
(2) DB950F65T4E-M w/Mount Pipe (Verizon Wireless)	181		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi	A572-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 72.7%

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

Job: *Harwinton, CT (CT-01944-S)*		
Project: *Vertical Structures Job No. 2008-007-001*		
Client: SBA	Drawn by: Andy Cronin	App'd:
Code: TIA/EIA-222-F	Date: 01/08/08	Scale: NTS
Path: \\Nas1\acronin\2008-007-001-Harwinton CT\RISA\Harwinton_CT.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:

Tower is located in Litchfield County, Connecticut.
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, feedline supports, and appurtenance mounts 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	Ignore Redundant Members in FEA
√ 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	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Poles
√ Leg Bolts Are At Top Of Section	√ SR Members Have Cut Ends	Include Shear-Torsion Interaction
√ Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	√ Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		

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	195.00-180.00	15.00	0.00	Round	24.0000	24.0000	0.2810		A36 (36 ksi)
L2	180.00-130.00	50.00	5.00	18	24.0000	35.2500	0.2500	1.0000	A572-65 (65 ksi)
L3	130.00-85.00	50.00	6.00	18	33.6250	45.3617	0.3125	1.2500	A572-65 (65 ksi)
L4	85.00-41.00	50.00	7.00	18	43.3283	55.2895	0.3750	1.5000	A572-65 (65 ksi)
L5	41.00-0.00	48.00		18	52.8649	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
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	35.3355	33.0418	4632.5069	11.8259	17.0815	271.2002	9271.1093	16.5241	5.3680	17.178
	46.0615	44.6832	11456.5972	15.9925	23.0437	497.1674	22928.2692	22.3458	7.4337	23.788
L4	45.4542	51.1252	11916.9502	15.2484	22.0108	541.4144	23849.5810	25.5674	6.9658	18.575
	56.1424	65.3620	24902.1441	19.4946	28.0871	886.6054	49837.0550	32.6872	9.0710	24.189
L5	55.4034	62.4761	21747.2149	18.6339	26.8554	809.7897	43523.0453	31.2440	8.6442	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 195.00-180.00				1	1	1		
L2 180.00-130.00				1	1	1		
L3 130.00-85.00				1	1	1		
L4 85.00-41.00				1	1	1		
L5 41.00-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	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	195.00 - 5.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM) (Verizon Wireless)	C	No	Inside Pole	183.00 - 5.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	173.00 - 5.00	12	No Ice	0.00	0.82
						1/2" 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	195.00-180.00	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	177.12
L2	180.00-130.00	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	1407.12

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
L3	130.00-85.00	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	1328.40
L4	85.00-41.00	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	41.00-0.00	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 or Leg	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	195.00-180.00	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	177.12
L2	180.00-130.00	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	1407.12
L3	130.00-85.00	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	85.00-41.00	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	41.00-0.00	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	195.00-180.00	0.0000	0.0000	0.0000	0.0000
L2	180.00-130.00	0.0000	0.0000	0.0000	0.0000
L3	130.00-85.00	0.0000	0.0000	0.0000	0.0000
L4	85.00-41.00	0.0000	0.0000	0.0000	0.0000
L5	41.00-0.00	0.0000	0.0000	0.0000	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Nudd 14' Low Profile Platform (VSI)	C	None		0.0000	195.00	No Ice	32.00	32.00	1350.00
						1/2" Ice	42.00	42.00	1750.00
(2) RR90-17-02DP w/Mount Pipe	A	From Centroid-Leg	4.50 0.00 0.00	0.0000	195.00	No Ice	4.91	3.64	43.55
						1/2" Ice	5.57	4.70	81.64
(2) RR90-17-02DP w/Mount Pipe	B	From Centroid-Leg	4.50 0.00 0.00	0.0000	195.00	No Ice	4.91	3.64	43.55
						1/2" Ice	5.57	4.70	81.64
(2) RR90-17-02DP w/Mount Pipe	C	From Centroid-Leg	4.50 0.00 0.00	0.0000	195.00	No Ice	4.91	3.64	43.55
						1/2" Ice	5.57	4.70	81.64
***									
14' Low Profile Platform (VSI) (Verizon Wireless)	C	None		0.0000	181.00	No Ice	25.67	25.67	1350.00
						1/2" Ice	32.67	32.67	1750.00
(2) DB950F65T4E-M w/Mount Pipe (Verizon Wireless)	A	From Centroid-Face	4.50 0.00 2.00	0.0000	181.00	No Ice	6.60	5.90	40.55
						1/2" Ice	7.27	7.01	95.17
(2) LPA-80063/4CF w/ Mount Pipe (VSI) (Verizon Wireless)	A	From Centroid-Face	4.50 0.00 2.00	0.0000	181.00	No Ice	7.02	6.95	34.60
						1/2" Ice	7.43	7.59	96.28
(2) DB950F65T4E-M w/Mount Pipe (Verizon Wireless)	B	From Centroid-Face	4.50 0.00 2.00	0.0000	181.00	No Ice	6.60	5.90	40.55
						1/2" Ice	7.27	7.01	95.17
(2) LPA-80063/4CF w/ Mount Pipe (VSI) (Verizon Wireless)	B	From Centroid-Face	4.50 0.00 2.00	0.0000	181.00	No Ice	7.02	6.95	34.60
						1/2" Ice	7.43	7.59	96.28
(2) DB950F65T4E-M w/Mount Pipe (Verizon Wireless)	C	From Centroid-Face	4.50 0.00 2.00	-30.0000	181.00	No Ice	6.60	5.90	40.55
						1/2" Ice	7.27	7.01	95.17
(2) LPA-80063/4CF w/ Mount Pipe (VSI) (Verizon Wireless)	C	From Centroid-Face	4.50 0.00 2.00	-30.0000	181.00	No Ice	7.02	6.95	34.60
						1/2" Ice	7.43	7.59	96.28
***									
14' Low Profile Platform (VSI)	A	None		0.0000	173.00	No Ice	25.67	25.67	1350.00
						1/2" Ice	32.67	32.67	1750.00
(4) DB844H90E-XY w/Mount Pipe	A	From Centroid-Leg	4.00 0.75 0.00	10.0000	173.00	No Ice	3.58	5.40	35.55
						1/2" Ice	4.20	6.49	76.59
(4) DB844H90E-XY w/Mount Pipe	B	From Centroid-Leg	4.00 0.75 0.00	10.0000	173.00	No Ice	3.58	5.40	35.55
						1/2" Ice	4.20	6.49	76.59
(4) DB844H90E-XY w/Mount Pipe	C	From Centroid-Leg	4.00 0.75 0.00	10.0000	173.00	No Ice	3.58	5.40	35.55
						1/2" Ice	4.20	6.49	76.59

Load Combinations

Comb. No.	Description
1	Dead Only

Comb. No.	Description
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	195 - 180	Pole	Max Tension	36	0.00	-0.02	0.02
			Max. Compression	14	-6608.23	0.00	0.00
			Max. Mx	5	-3802.23	-61107.84	-90.84
			Max. My	2	-3807.85	85.86	60996.03
			Max. Vy	11	-8645.68	61107.81	104.53
			Max. Vx	8	8610.03	-109.52	-60995.97
			Max. Torque	13			160.91
L2	180 - 130	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-14865.63	0.00	0.00
			Max. Mx	5	-10076.17	-661588.95	-1517.99
			Max. My	2	-10081.36	1515.95	659845.53
			Max. Vy	11	-15590.23	661588.95	1523.66
			Max. Vx	8	15553.73	-1525.76	-659845.52
			Max. Torque	13			160.91
L3	130 - 85	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-23404.92	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	5	-17838.32	-1427455.17	-2919.84
			Max. My	2	-17841.66	2918.99	1424100.92
			Max. Vy	11	-19238.60	1427455.17	2922.27
			Max. Vx	8	19202.06	-2923.19	-1424100.91
			Max. Torque	13			160.34
L4	85 - 41	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-35250.54	0.00	0.00
			Max. Mx	5	-28720.27	-2335047.51	-4279.06
			Max. My	2	-28722.03	4278.64	2330126.60
			Max. Vy	11	-22909.03	2335047.51	4280.33
			Max. Vx	8	22872.88	-4280.84	-2330126.59
			Max. Torque	13			159.92
L5	41 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-51144.87	0.00	0.00
			Max. Mx	5	-43341.21	-3524119.31	-5761.27
			Max. My	2	-43341.25	5760.77	3517487.21
			Max. Vy	11	-26597.66	3524119.31	5762.74
			Max. Vx	8	26562.72	-5763.33	-3517487.21
			Max. Torque	13			159.71

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	15.00	0.00	0.0	21.600	20.9282	-3799.37	452050.00	0.008
L2	180 - 130 (2)	TP35.25x24x0.25	50.00	0.00	0.0	39.000	26.8798	-10073.50	1048310.00	0.010
L3	130 - 85 (3)	TP45.3617x33.625x0.3125	50.00	0.00	0.0	39.000	43.2862	-17836.60	1688160.00	0.011
L4	85 - 41 (4)	TP55.2895x43.3283x0.375	50.00	0.00	0.0	39.000	63.3688	-28719.40	2471380.00	0.012
L5	41 - 0 (5)	TP64.5x52.8649x0.375	48.00	0.00	0.0	36.657	76.3248	-43341.20	2797840.00	0.015

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	61164.00	-5.977	23.760	0.252	0.00	0.000	23.760	0.000
L2	180 - 130 (2)	TP35.25x24x0.25	662463.33	-35.364	39.000	0.907	0.00	0.000	39.000	0.000
L3	130 - 85 (3)	TP45.3617x33.625x0.3125	1429141.67	-36.765	39.000	0.943	0.00	0.000	39.000	0.000

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 $\frac{f_{by}}{F_{by}}$
L4	85 - 41 (4)	TP55.2895x43.3283x0.375	2337516.67	-33.666	39.000	0.863	0.00	0.000	39.000	0.000
L5	41 - 0 (5)	TP64.5x52.8649x0.375	3527441.67	-34.979	36.657	0.954	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	0.008	0.252	0.000	0.260 ✔	1.333	H1-3 ✔
L2	180 - 130 (2)	TP35.25x24x0.25	0.010	0.907	0.000	0.916 ✔	1.333	H1-3 ✔
L3	130 - 85 (3)	TP45.3617x33.625x0.3125	0.011	0.943	0.000	0.953 ✔	1.333	H1-3 ✔
L4	85 - 41 (4)	TP55.2895x43.3283x0.375	0.012	0.863	0.000	0.875 ✔	1.333	H1-3 ✔
L5	41 - 0 (5)	TP64.5x52.8649x0.375	0.015	0.954	0.000	0.970 ✔	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	-3799.37	602582.62	19.5	Pass
L2	180 - 130	Pole	TP35.25x24x0.25	2	-10073.50	1397397.17	68.7	Pass
L3	130 - 85	Pole	TP45.3617x33.625x0.3125	3	-17836.60	2250317.19	71.5	Pass
L4	85 - 41	Pole	TP55.2895x43.3283x0.375	4	-28719.40	3294349.40	65.6	Pass
L5	41 - 0	Pole	TP64.5x52.8649x0.375	5	-43341.20	3729520.57	72.7	Pass
						Summary		
						Pole (L5)	72.7	Pass
						RATING =	**72.7**	**Pass**