

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

July 30, 2008

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

RE: **EM-VER-066-080612** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 123 Campville Hill Road, Harwinton, Connecticut.

Dear Attorney Baldwin:

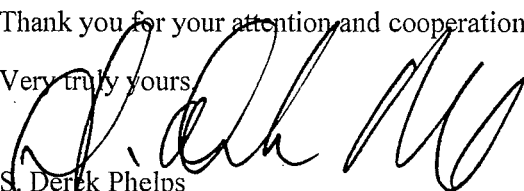
The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies, with the condition that all remaining antenna mounts at approximately the 147-foot level of the tower be removed within one year of the date of this letter unless they can be utilized by another carrier within that time period.

The proposed modifications are to be implemented as specified here and in your notice dated June 12, 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,


S. Derek Phelps
Executive Director

SDP/MP/cm

c: The Honorable Frank J. Chiamonte, First Selectman, Town of Harwinton
William J. Tracy, Jr., Planning Chairman, Town of Harwinton
Crown Castle International



Daniel F. Caruso
Chairman

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Phone: (860) 827-2935 Fax: (860) 827-2950

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June 13, 2008

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

RE: **EM-VER-066-080612** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 123 Campville Hill Road, Harwinton, Connecticut.

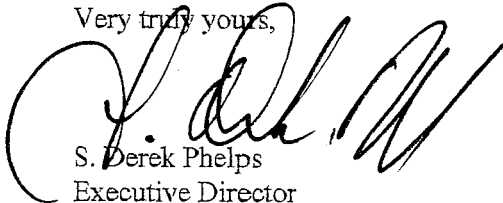
Dear Mr. Chiaramonte:

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.

If you have any questions or comments regarding this proposal, please call me or inform the Council by June 27, 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

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

EM-VER-066-080612

ORIGINAL

June 12, 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
123 Campville Hill Road, Harwinton, Connecticut**

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains a wireless telecommunications facility at the above-referenced address. The Council approved Cellco’s shared use of this facility on February 4, 2004. Cellco currently maintains twelve PCS antennas at the 147-foot level on the existing 177-foot tower. Alltel Communications (“Alltel”) maintains nine antennas at the 157-foot level on the tower.

On May 30, 2008, Cellco acquired Alltel’s CT-1 RSA cellular license for Litchfield County Connecticut. Cellco now intends to remove its twelve antennas and Alltel’s nine antennas and install four (4) LPA-80080/6CF cellular antennas; two (2) LPA-80063/6CF cellular antennas; four (4) DB950F85E-M PCS antennas; and two (2) DB950F65E-M PCS antennas all at the 156-foot level on the tower. The tower is owned by Crown Castle International. Attached behind Tab 1 are the specifications for the 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 J. Chiamonte, First Selectman of the Town of Harwinton. Pursuant to a Council directive, a copy of this letter is also being sent to Harwinton Rod & Gun Club, Inc., the owner of the property on which the tower 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).

HART1-1472594-1



Law Offices

BOSTON

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STAMFORD

WHITE PLAINS

NEW YORK CITY

SARASOTA

www.rc.com

S. Derek Phelps
June 12, 2008
Page 2

1. The proposed modifications will not result in the increase in the overall height of the existing structure. Cellco's replacement antennas will be located at the 156-foot level of the 177-foot tower.

2. The proposed antenna modifications will not require the extension of the site boundaries. Alltel's ground mounted equipment will be removed from the existing site compound.

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 Structural Analysis Report 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 J. Chiamonte, Harwinton First Selectman
Harwinton Rod & Gun Club, Inc.
Sandy M. Carter



LPA-80080/6CF

When ordering replace "___" with connector type.

Mechanical specifications

Length	1800 mm	70.9 in
Width	140 mm	5.5 in
Depth	335 mm	13.2 in
Depth with z-bracket	375 mm	14.8 in
4) Weight	9.5 kg	21.0 lbs
Wind Area		
Fore/Aft	0.25 m ²	2.7 ft ²
Side	0.60 m ²	6.5 ft ²
Rated Wind Velocity (Safety factor 2.0)		
	>295 km/hr	>183 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	415 N	93.3 lbs
Side	870 N	195.6 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 & 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	14 dBd
2) Power Rating	500 W
1) Half Power Angle	
H-Plane	80°
E-Plane	10°
1) Electrical Downtilt	0°
1) Null Fill	10%
Lightning Protection	Direct Ground

1) Typical values.

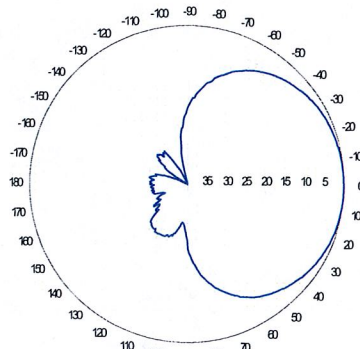
2) Power rating limited by connector only.

3) NE indicates an elongated N connector. E-DIN indicates an elongated DIN connector.

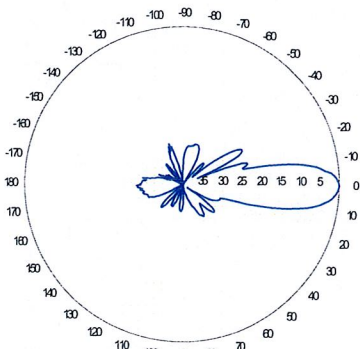
4) The antenna weight listed above does not include the bracket weight.

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

Radiation pattern¹⁾



Horizontal

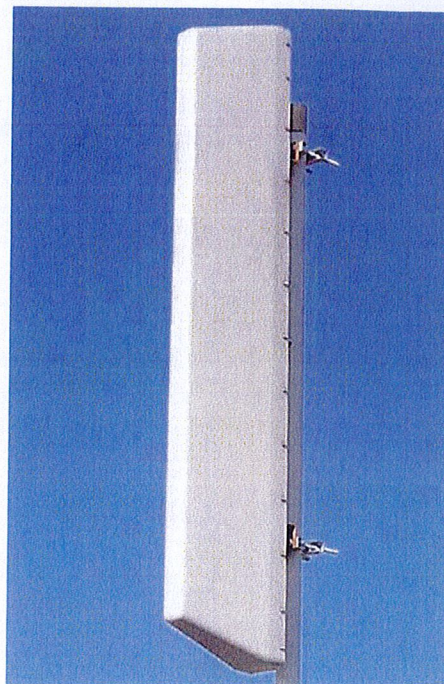


Vertical

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:

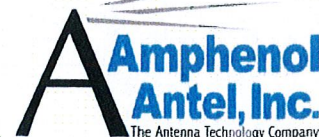
- True log-periodic design allows for superior front-to-side characteristics to minimize sector overlap.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- 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.

CF Denotes a Center-Fed Connector.

806-960 MHz



Revision Date: 7/5/07

Vertically Polarized, Log Periodic 63° / 14.5 dBd

LPA-80063/6CF

When ordering replace "___" with connector type.

Mechanical specifications

Length	1800 mm	70.9 in
Width	380 mm	15.0 in
Depth	332 mm	13.1 in
Depth with z-bracket	372 mm	14.6 in
4) Weight	12.3 kg	27.0 lbs
Wind Area		
Fore/Aft	0.68 m ²	7.4 ft ²
Side	0.60 m ²	6.5 ft ²
Rated Wind Velocity (Safety factor 2.0)	>235 km/hr >146 mph	
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	993 N	223.3 lbs
Side	872 N	196.1 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 & Downtilt Bracket Kit
#21699999

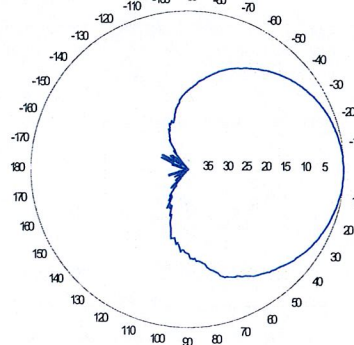
Electrical specifications

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	14.5 dBd
2) Power Rating	500 W
1) Half Power Angle	
H-Plane	63°
E-Plane	10°
1) Electrical Downtilt	0°
1) Null Fill	10%
Lightning Protection	Direct Ground

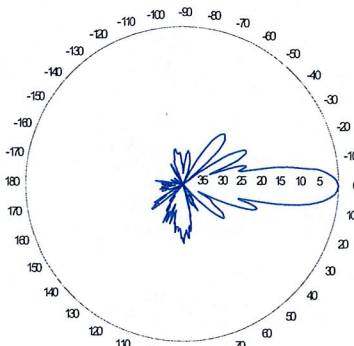
- 1) Typical values.
2) Power rating limited by connector only.
3) NE indicates an elongated N connector.
E-DIN indicates an elongated DIN connector.
4) The antenna weight listed above does not include the bracket weight.

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

Radiation pattern¹⁾



Horizontal

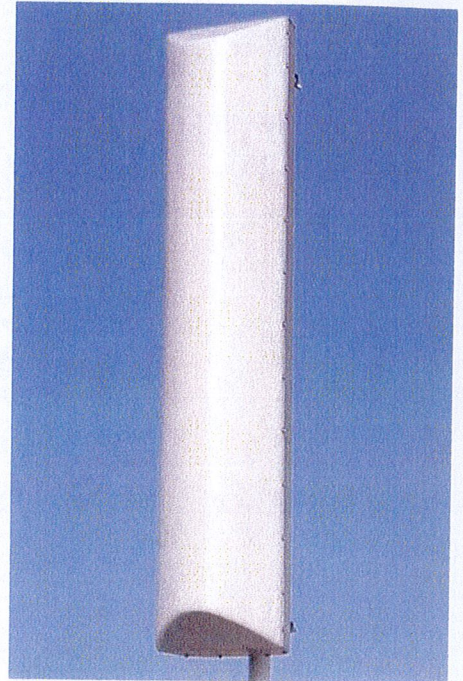


Vertical

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:

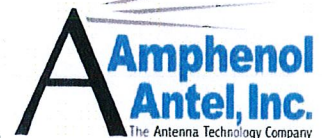
- True log-periodic design allows for superior front-to-side characteristics to minimize sector overlap.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- 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.

CF Denotes a Center-Fed Connector.

806-960 MHz



Revision Date: 7/5/07

HORIZONTAL BEAMWIDTH	85°	85°	85°	85°
FREQUENCY RANGE	1850-1990 MHz	1850-1990 MHz	1850-1990 MHz	1850-1990 MHz
	16.5 dBi / 4° Tilt	15.9 dBi / 6° Tilt	17 dBi / 0° Tilt	17.7 dBi / 0° Tilt
MODEL	948G85T4E-M	948F85T6E-M	DB950F85E-M	DB950G85E-M
TYPE	Directed Dipole®	Directed Dipole®	Directed Dipole®	Directed Dipole®

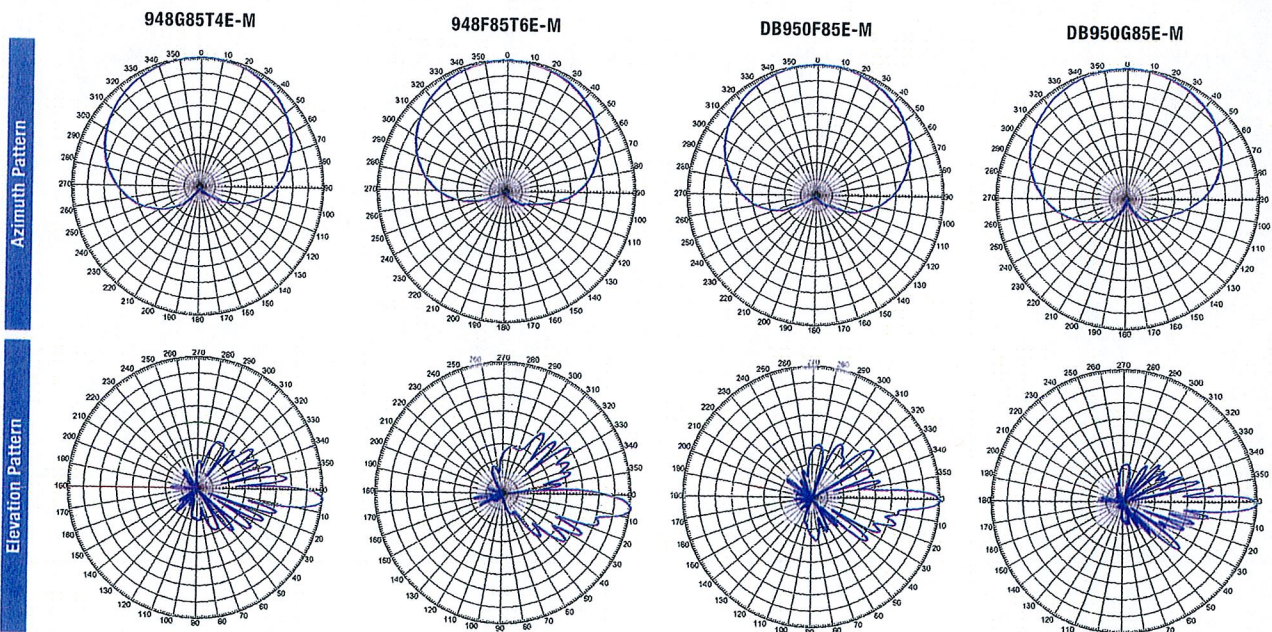
ELECTRICAL SPECIFICATIONS

Frequency Range (MHz)	1850-1990	1850-1990	1850-1990	1850-1990
Gain (dBd/dBi)	14.4 / 16.5	13.8 / 15.9	14.9 / 17	15.6 / 17.7
Horizontal Beamwidth (Deg.)	85	85	85	85
Elevation Beamwidth (Deg.)	7	8	6.5	6
USLS (dB)	N/A	>20	>18	N/A
Null Fill (dB) – Below Peak	N/A	15	12	N/A
Beam Tilt (Deg.)	4	6	0	0
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)	48 / 1,219	48 / 1,219	60 / 1,524	60 / 1,524
Width (inch/mm)	3.5 / 89	3.5 / 89	3.5 / 89	3.5 / 89
Depth (inch/mm)	7 / 178	7 / 178	7 / 178	7 / 178
Net Weight (lbs/kg)	8.5 / 3.9	8.5 / 3.9	11.5 / 5.2	11.5 / 5.2
Max. Flat Plate Area (ft²/m²)	1.18 / 0.11	1.18 / 0.11	1.51 / 0.14	1.51 / 0.14
Max. Wind Load at 100 mph (lbf/N)	65 / 285	65 / 285	84 / 373	84 / 373
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.
*TELEILT® compatible.



Scale: 10° radials, 5 dB per division

Vertically Polarized Directed Dipole® Panel Antennas



65° HORIZONTAL BEAMWIDTH

1710 - 2170 MHz

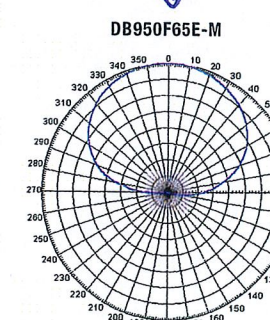
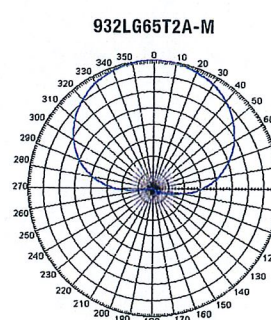
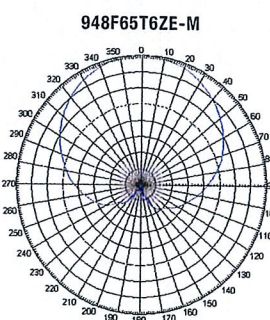
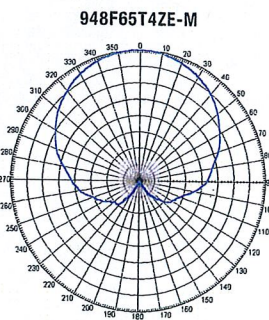
HORIZONTAL BEAMWIDTH	65°	65°	65°	65°
FREQUENCY RANGE	1850-1990 MHz	1850-1990 MHz	1850-1990 MHz	1850-1990 MHz
	17.1 dBi / 4° Tilt	17.1 dBi / 6° Tilt	18.5 dBi / 2° Tilt	18 dBi / 0° Tilt
MODEL	948F65T4ZE-M	948F65T6ZE-M	932LG65T2A-M	DB950F65E-M
TYPE	Directed Dipole®, No Screen	Directed Dipole®, No Screen	±45° Directed Dipole®	Directed Dipole®

ELECTRICAL SPECIFICATIONS				
Frequency Range (MHz)	1850-1990	1850-1990	1850-1990	1850-1990
Gain (dBd/dBi)	15 / 17.1	15 / 17.1	16.4 / 18.5	15.9 / 18
Horizontal Beamwidth (Deg.)	65	65	65	65
Elevation Beamwidth (Deg.)	8	6	6.5	6.5
USLS (dB)	>20	>20	>18	>18
Null Fill (dB) – Below Peak	15	15	20	12
Beam Tilt (Deg.)	4	6	2	0
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	>30	N/A
Max. Input Power (Watts)	250	250	250	250
Polarization	Vertical	Vertical	+45°/-45°	Vertical
Connector Location	Bottom	Bottom	Back	Bottom
Connector Type	7-16 DIN - Female	7-16 DIN - Female	7-16 DIN - Female	7-16 DIN - Female

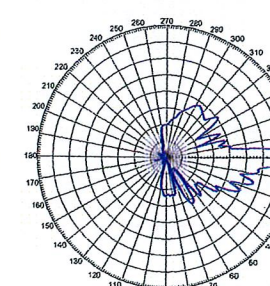
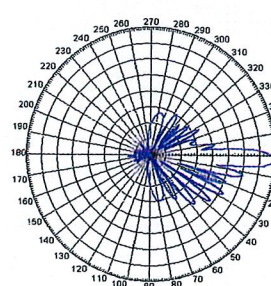
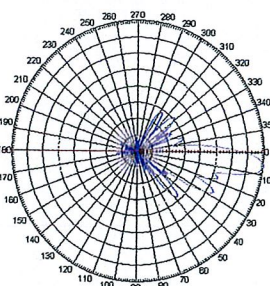
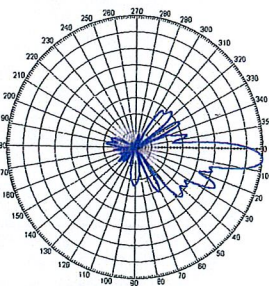
MECHANICAL SPECIFICATIONS				
Length (inch/mm)	48 / 1,219	48 / 1,219	51.5 / 1,308	60 / 1,524
Width (inch/mm)	6.5 / 165	6.5 / 165	8.5 / 216	10.5 / 267
Depth (inch/mm)	4 / 102	4 / 102	6.5 / 165	7 / 178
Net Weight (lbs/kg)	9.5 / 4.3	9.5 / 4.3	13 / 5.9	16 / 7.2
Max. Flat Plate Area (ft²/m²)	1.18 / 0.11	1.18 / 0.11	0.86 / 0.08	2.91 / 0.27
Max. Wind Load at 100 mph (lb/f/N)	67 / 299	67 / 299	50 / 221	158 / 703
Max. Wind Speed (mph/kmh)	125 / 201	125 / 201	125 / 201	125 / 201
Radome Material	ABS, UV Resistant	ABS, UV Resistant	Polycarbonate, 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	Aluminum	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.

Azimuth Pattern



Elevation Pattern



Scale: 10° radials, 5 dB per division

X P o l

VERTICAL
Directed Dipole®

VERTICAL
Panel

O m n i

General		Power	Density					
Site Name: Harwinton West								
Tower Height: Verizon @ 156Ft.								
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total
*Alltel	12	250	157	0.0438	880	0.5867	7.46%	
*Sprint	4	500	177	0.0230	1962.5	1.0000	2.30%	
*VoiceStream	4	250	167	0.0129	1930	1.0000	1.29%	
*Nextel	12	100	137	0.0230	851	0.5673	4.05%	
*Cingular	6	296	122	0.0429	880	0.5867	7.31%	
*Cingular	3	427	122	0.0309	1930	1.0000	3.09%	
Verizon	9	485	156	0.0645	1970	1.0000	6.45%	
Verizon	9	200	156	0.0266	875	0.5830	4.56%	36.52%
* Source: Siting Council								

Date: **January 2, 2008**

Mr. Marco Morales
Crown Castle International
1200 MacArthur Blvd, Suite 200
Mahwah, NJ 07430
(678)-366-1252

FDH Engineering, Inc.
2730 Rowland Rd., Suite 100
Raleigh, NC 27615
(919) 755-1012
info@FDH-Inc.com

Subject: Structural Analysis Report

Carrier Designation: Verizon Wireless Co-Locate
Carrier Site Number:
Carrier Site Name: Harwinton West

Crown Castle Designation: Crown Castle BU Number: 876376
Crown Castle Site Name: Scoville Hill
Crown Castle JDE Job Number: 98295

Engineering Firm Designation: FDH Engineering, Inc. Project Number: 07-1262E

Site Data: 123 Campville Hill Rd, Harwinton, CT, Litchfield Co.
Latitude 44°-44'-12.12", Longitude -73°-5'-50.86"
177 Foot – Monopole

Dear Mr. Morales,

FDH Engineering, Inc. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the aforementioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 184919, in accordance with application 55993, revision 0.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

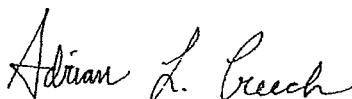
LC1: Existing + Reserved + Proposed Equipment Sufficient Capacity
Note: See Table I and Table II for the proposed and existing/reserved loading.

The analysis has been performed in accordance with the *TIA/EIA-222-F* standard based upon a basic wind speed of 80 mph without ice and 69 mph with 1/2" radial ice.

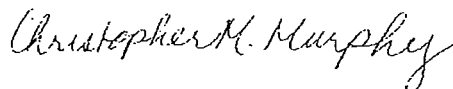
All equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at FDH Engineering, Inc. appreciate the opportunity of providing our continuing professional services to you and Crown Castle International. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted,



Adrian L. Creech, EI
Project Engineer



Christopher M. Murphy, PE
Vice President
CT PE License No. 25842

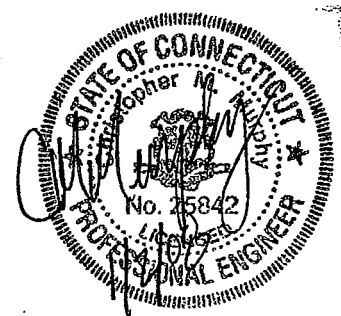


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1) INTRODUCTION

The subject tower is a 177 foot monopole manufactured in 2000 by Summit. Modifications were installed per Hutter Trankina Engineering, Inc. in 2004.

2) ANALYSIS CRITERIA

- TIA-222-F – Structural Standards for Steel Antenna Towers and Antenna Supporting Structures
- Basic Wind Speed: 80 MPH without ice and 69 MPH with 1/2" radial ice.

Table 1 – Proposed Antenna and Cable Information

Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount Information	Number of Feed Lines	Feed Line Size (in)
156	4 4 2 2	Antel Decibel Antel Decibel	LPA-80080/6CF DB950F85E-M LPA-80063/6CF DB950F65E-M	Low Profile Platform	12	1-5/8"

Table 2 – Existing and Reserved Antenna and Cable Information

Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
178	6	Decibel	DB980H90E-M	6	1-5/8"
178 ¹	9	MLA	72" x 12" Panel	9	1-5/8"
169	6	EMS Wireless	RR90-17-02DP	6	1-5/8"
159 ²	6	Allgon	7250.03	6	1-5/8"
159	3	Allgon	7262.01	3	1-5/8"
149 ³	12	Decibel	DB950G85E-M	12	1-5/8"
139	12	Decibel	DB844H90	12	1-5/8"
129	6	Kathrein	AP14/17-880/1940/065D/ADT/XXP	12	1-5/8"
79	1	Spectracom	8225	1	1/2"

1 Currently there is (6) DB980H90E-M antennas, and (6) coax installed at 178 ft. According to info provided by Crown Castle, the carrier may install up to (9) 72" x 12" MLA antennas and (9) coax. Analysis performed with largest loading in place.

2 According to info provided by Crown Castle, the carrier will remove (12) antennas and (12) coax at 149 ft.

3 According to info provided by Crown Castle, the carrier will remove (9) antennas and (9) coax at 159 ft.

Table 3 – Design Antenna and Cable Information

Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
177	12	Dapa	48000	---	---
167	12	Dapa	48000	---	---
157	12	Dapa	48000	---	---
75	1	---	GPS	---	---

3) ANALYSIS PROCEDURE

Table 4 – Documents Provided

Document	Remarks	Reference	Source
Tower Manufacturer Drawings	Summit Manufacturing	Doc # 1613568	Crown Castle
Modification Drawings	Hutter Trankina Engineering	Doc # 1637337	Crown Castle
Foundation Modification Drawings	Global Signal	Doc # 1623517	Crown Castle

3.1) Analysis Method

RISA Tower (version 5.0), a commercially available analysis software package, 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 TIA/EIA-222-F and the local building code requirements. Selected output from the analysis is included in Appendix A.

3.2) 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 the manufacturer's specifications.
3. The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the reference drawings.

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

4) ANALYSIS RESULTS

Table 5 – Tower Component Stresses vs. Capacity – LC1

Notes	Component	Elevation (ft)	% Capacity	Pass/Fail
RISA Tower Analysis Summary:(Monopole)				
			Summary	
Notes:	Component	Elevation	% Capacity	Pass/Fail
	L1	177 - 129.75	70.2	Pass
	L2	129.75 - 84	96.8	Pass
2	L3	84 - 39.25	50.6	Pass
2	L4	39.25 - 0	82.3	Pass
Individual Components:				
Notes:	Component	Elevation	% Capacity	Pass/Fail
	Anchor Rods		91.3%	Pass
	Base Plate		86.5%	Pass
2	Base Foundation Structural		93.2%	Pass
Structure Rating (max from all components) =				96.8%

*Notes:

- 1) The following components listed in the RISA Tower Analysis Summary were analyzed separately to determine the percent capacity consumed (see attached calculations):
- 2) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity listed.

4.1) Recommendations

1. The proposed coax should be installed per the base level drawing. See Appendix B.

**APPENDIX A
RISA TOWER OUTPUT**

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(3) 6' x 1' Panel	178	(2) DB950F65T2E-M	156
(3) 6' x 1' Panel	178	(2) LPA-80080/6CF	156
(3) 6' x 1' Panel	178	Low Profile Platform	147
Low Profile Platform	177	(4) DB844H90	139
(2) RR90-17-02DP	169	(4) DB844H90	139
(2) RR90-17-02DP	169	Low Profile Platform	137
(2) TMA	169	(2)	129
(2) TMA	169	AP14/17-880/1940/088D/ADT/XXP	
(2) TMA	169	(2)	129
Low Profile Platform	167	AP14/17-880/1940/088D/ADT/XXP	
Low Profile Platform	157	(2)	129
(2) LPA-80080/6CF	156	AP14/17-880/1940/088D/ADT/XXP	
(2) LPA-80063/6CF	156	Low Profile Platform	127
(2) DB950F85E-M	156	GPS	79
(2) DB950F85E-M	156		

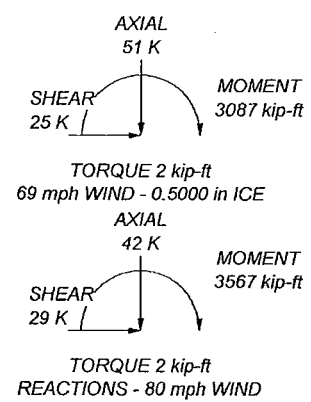
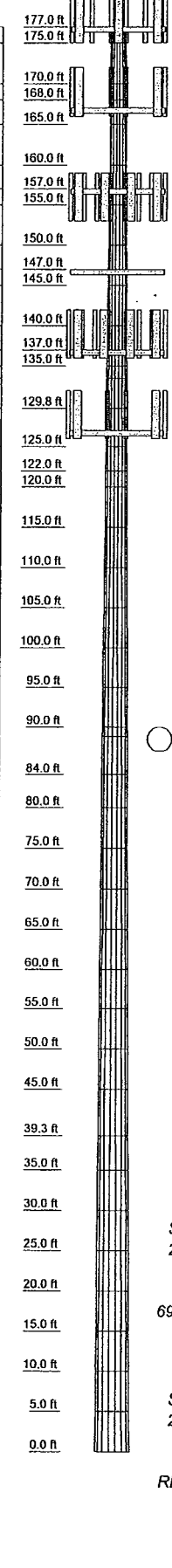
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

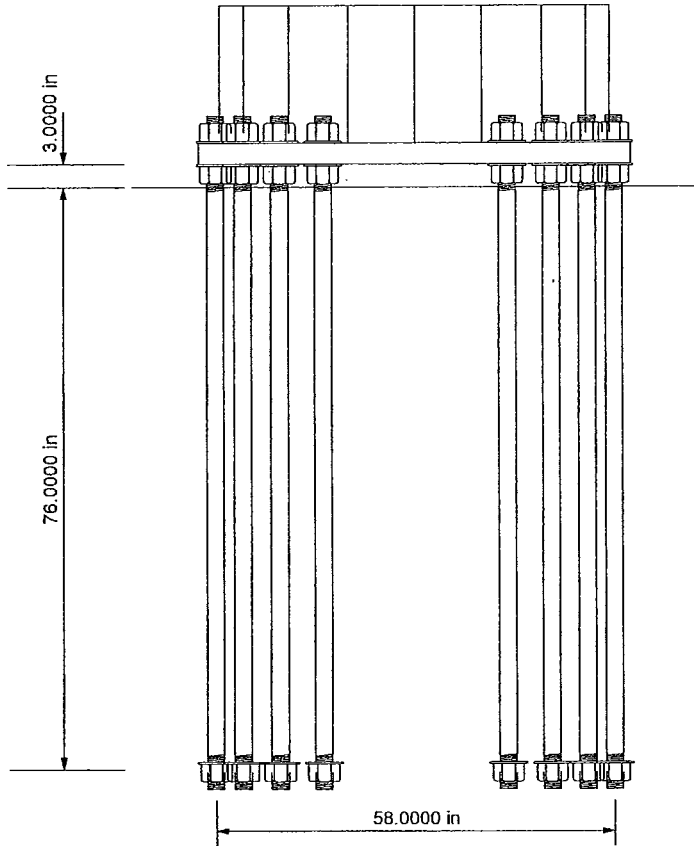
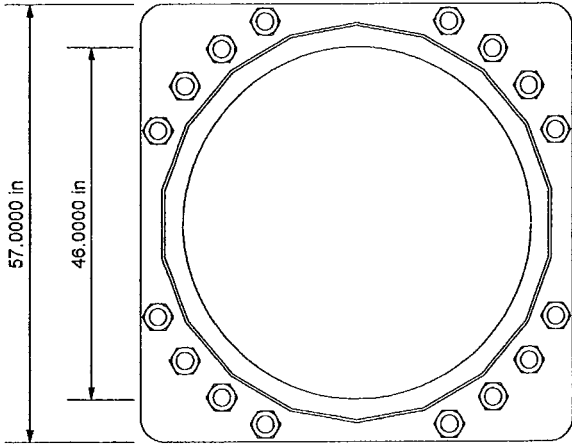
TOWER DESIGN NOTES

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.

Section	Length (ft)	Number of Sides	Thickness (in)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	18	0.37500	37.500	37.500	1.0	0.227
2	5.00	18	0.37500	37.500	37.500	1.0	0.227
3	5.00	18	0.37500	37.500	37.500	1.0	0.227
4	5.00	18	0.37500	37.500	37.500	1.0	0.227
5	5.00	18	0.37500	37.500	37.500	1.0	0.227
6	5.00	18	0.37500	37.500	37.500	1.0	0.227
7	5.00	18	0.37500	37.500	37.500	1.0	0.227
8	5.00	18	0.37500	37.500	37.500	1.0	0.227
9	5.00	18	0.37500	37.500	37.500	1.0	0.227
10	5.00	18	0.37500	37.500	37.500	1.0	0.227
11	5.00	18	0.37500	37.500	37.500	1.0	0.227
12	5.00	18	0.37500	37.500	37.500	1.0	0.227
13	5.00	18	0.37500	37.500	37.500	1.0	0.227
14	5.00	18	0.37500	37.500	37.500	1.0	0.227
15	5.00	18	0.37500	37.500	37.500	1.0	0.227
16	5.00	18	0.37500	37.500	37.500	1.0	0.227
17	5.00	18	0.37500	37.500	37.500	1.0	0.227
18	5.00	18	0.37500	37.500	37.500	1.0	0.227
19	5.00	18	0.37500	37.500	37.500	1.0	0.227
20	5.00	18	0.37500	37.500	37.500	1.0	0.227
21	5.00	18	0.37500	37.500	37.500	1.0	0.227
22	5.00	18	0.37500	37.500	37.500	1.0	0.227
23	5.00	18	0.37500	37.500	37.500	1.0	0.227
24	5.00	18	0.37500	37.500	37.500	1.0	0.227
25	5.00	18	0.37500	37.500	37.500	1.0	0.227
26	5.00	18	0.37500	37.500	37.500	1.0	0.227
27	5.00	18	0.37500	37.500	37.500	1.0	0.227
28	5.00	18	0.37500	37.500	37.500	1.0	0.227
29	5.00	18	0.37500	37.500	37.500	1.0	0.227
30	5.00	18	0.37500	37.500	37.500	1.0	0.227
31	5.00	18	0.37500	37.500	37.500	1.0	0.227
32	5.00	18	0.37500	37.500	37.500	1.0	0.227
33	5.00	18	0.37500	37.500	37.500	1.0	0.227
34	5.00	18	0.37500	37.500	37.500	1.0	0.227
35	5.00	18	0.37500	37.500	37.500	1.0	0.227
36	5.00	18	0.37500	37.500	37.500	1.0	0.227
37	5.00	18	0.37500	37.500	37.500	1.0	0.227
38	5.00	18	0.37500	37.500	37.500	1.0	0.227
39	5.00	18	0.37500	37.500	37.500	1.0	0.227
40	5.00	18	0.37500	37.500	37.500	1.0	0.227
41	5.00	18	0.37500	37.500	37.500	1.0	0.227
42	5.00	18	0.37500	37.500	37.500	1.0	0.227
43	5.00	18	0.37500	37.500	37.500	1.0	0.227




<p>FDH Engineering, Inc. 2730 Rowland Road, Suite 100 Raleigh, NC Phone: (919) 755-1012 FAX: (919) 755-1031</p>	<p>Job: 876376 Scoville Hill, CT</p>
	<p>Project: 07-1262E</p>
	<p>Client: Crown Castle Drawn by: ALC App'd:</p>
	<p>Code: TIA/EIA-222-F Date: 12/31/07 Scale: NTS</p>
<p>Tower Analysis</p>	<p>Path: D:\Projects\07-1262E\07-1262E-01.dwg</p>
	<p>Dwg No. E-1</p>



FOUNDATION NOTES

1. Plate thickness is 2.7500 in.
2. Plate grade is A572-55.
3. Anchor bolt grade is A615-75.
4. fc is 3 ksi.

 Tower Analysis	FDH Engineering, Inc. 2730 Rowland Road, Suite 100 Raleigh, NC Phone: (919) 755-1012 FAX: (919) 755-1031	Job: 876376 Scoville Hill, CT Project: 07-1262E	Client: Crown Castle Code: TIA/EIA-222-F Path:	Drawn by: ALC Date: 12/31/07	App'd: Scale: NTS Dwg No. F-1
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Base Plate Design Data

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual	Actual	Actual	Actual	Controlling Condition	Ratio
			Allowable	Allowable	Allowable	Allowable		
			Ratio Bolt Tension K	Ratio Bolt Compression K	Ratio Plate Stress ksi	Ratio Stiffener Stress ksi		
2.7500 <i>in</i>	16	2.2500 <i>in</i>	180.64	185.84	48.129	41.250	Bolt T	1.38 X
			131.21	217.81	41.250	1.17		
			1.38	0.85	1.17			

194.5k (INDUSTRY STANDARD)

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L _u	Kl/r	F _a	A	Actual P	Allow. P _a	Ratio P
			ft	ft		ksi	in ²	K	K	P _a
L1	177 - 175 (1)	TP22.349x22x0.2188	2.00	177.00	272.5	2.011	15.2476	-2.48	30.66	0.081*
L2	175 - 170 (2)	TP23.22x22.349x0.2188	5.00	177.00	260.1	2.207	15.9737	-2.51	35.25	0.071
L3	170 - 168 (3)	TP23.569x23.22x0.2188	2.00	177.00	256.2	2.274	16.2160	-3.00	36.88	0.081
L4	168 - 165 (4)	TP24.092x23.569x0.2188	3.00	177.00	250.6	2.377	16.5793	-4.91	39.42	0.124
L5	165 - 160 (5)	TP24.964x24.092x0.2188	5.00	177.00	241.8	2.554	17.1848	-5.29	43.90	0.121
L6	160 - 157 (6)	TP25.487x24.964x0.2188	3.00	177.00	236.8	2.663	17.5480	-5.55	46.74	0.119
L7	157 - 155 (7)	TP25.836x25.487x0.2188	2.00	177.00	233.6	2.738	17.7904	-7.77	48.70	0.160
L8	155 - 150 (8)	TP26.707x25.836x0.2188	5.00	177.00	225.9	2.927	18.3953	-8.29	53.84	0.154
L9	150 - 147 (9)	TP27.23x26.707x0.2188	3.00	177.00	221.5	3.044	18.7585	-5.31	57.09	0.093
L10	147 - 145 (10)	TP27.579x27.23x0.2188	2.00	177.00	218.7	3.123	19.0009	-6.71	59.34	0.113
L11	145 - 140 (11)	TP28.451x27.579x0.2188	5.00	177.00	211.9	3.325	19.6064	-7.24	65.19	0.111
L12	140 - 137 (12)	TP28.974x28.451x0.2188	3.00	177.00	208.1	3.449	19.9697	-7.45	68.88	0.108
L13	137 - 135 (13)	TP29.323x28.974x0.2188	2.00	177.00	205.6	3.534	20.2120	-8.90	71.42	0.125
L14	135 - 133.5 (14)	TP29.584x29.323x0.2188	1.50	177.00	203.7	3.597	20.3933	-9.08	73.36	0.124
L15	133.5 - 129.75 (15)	TP29.83x29.584x0.4688	3.75	177.00	203.8	3.596	43.6886	-9.83	157.11	0.063
L16	129.75 - 125 (16)	TP30.67x29.83x0.25	4.75	177.00	196.7	3.860	24.1383	-11.84	93.18	0.127
L17	125 - 122 (17)	TP31.186x30.67x0.25	3.00	177.00	193.4	3.992	24.5477	-12.31	98.00	0.126
L18	122 - 120 (18)	TP31.545x31.186x0.25	2.00	177.00	191.2	4.086	24.8326	-12.63	101.45	0.124
L19	120 - 115 (19)	TP32.42x31.545x0.25	5.00	177.00	186.0	4.317	25.5269	-13.44	110.20	0.122
L20	115 - 110 (20)	TP33.295x32.42x0.25	5.00	177.00	181.1	4.555	26.2212	-14.27	119.44	0.119
L21	110 - 105 (21)	TP34.17x33.295x0.25	5.00	177.00	176.4	4.800	26.9155	-15.13	129.19	0.117
L22	105 - 100 (22)	TP35.045x34.17x0.25	5.00	177.00	172.0	5.050	27.6098	-16.01	139.44	0.115
L23	100 - 95 (23)	TP35.92x35.045x0.25	5.00	177.00	167.7	5.308	28.3041	-16.91	150.23	0.113
L24	95 - 90 (24)	TP36.795x35.92x0.25	5.00	177.00	163.7	5.571	28.9985	-17.83	161.56	0.110
L25	90 - 88.8 (25)	TP37.005x36.795x0.25	1.20	177.00	162.8	5.635	29.1651	-18.05	164.36	0.110
L26	88.8 - 84.05 (26)	TP37.336x37.005x0.5625	4.75	177.00	162.7	5.641	65.6545	-19.47	370.37	0.053
L27	84.05 - 80 (27)	TP38.036x37.336x0.3125	4.05	177.00	158.6	5.936	37.4170	-20.32	222.12	0.091
L28	80 - 75 (28)	TP38.911x38.036x0.3125	5.00	177.00	155.0	6.215	38.2849	-21.42	237.94	0.090
L29	75 - 70 (29)	TP39.786x38.911x0.3125	5.00	177.00	151.6	6.500	39.1528	-22.52	254.49	0.089
L30	70 - 65 (30)	TP40.661x39.786x0.3125	5.00	177.00	148.3	6.791	40.0207	-23.65	271.79	0.087
L31	65 - 60 (31)	TP41.536x40.661x0.3125	5.00	177.00	145.1	7.089	40.8886	-24.79	289.86	0.086
L32	60 - 55 (32)	TP42.411x41.536x0.3125	5.00	177.00	142.1	7.393	41.7565	-25.95	308.71	0.084

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
L33	55 - 50 (33)	H1-3 (1.55 CR) - 32 TP43.286x42.411x0.3125	5.00	177.00	139.2	7.704	42.6243	-27.13	328.37	0.083
L34	50 - 45 (34)	H1-3 (1.58 CR) - 33 TP44.161x43.286x0.3125	5.00	177.00	136.4	8.021	43.4922	-28.33	348.83	0.081
L35	45 - 39.25 (35)	H1-3 (1.60 CR) - 34 TP44.542x44.161x0.6875	5.75	177.00	136.4	8.023	95.6960	-30.66	767.75	0.040
L36	39.25 - 35 (36)	TP45.286x44.542x0.375	4.25	177.00	133.2	8.414	53.4553	-31.81	449.77	0.071
L37	35 - 30 (37)	H1-3 (1.42 CR) - 36 TP46.161x45.286x0.375	5.00	177.00	130.7	8.745	54.4968	-33.19	476.58	0.070
L38	30 - 25 (38)	H1-3 (1.43 CR) - 37 TP47.036x46.161x0.375	5.00	177.00	128.2	9.083	55.5383	-34.59	504.43	0.069
L39	25 - 20 (39)	H1-3 (1.45 CR) - 38 TP47.91x47.036x0.375	5.00	177.00	125.9	9.426	56.5785	-36.02	533.31	0.068
L40	20 - 15 (40)	H1-3 (1.46 CR) - 39 TP48.785x47.91x0.375	5.00	177.00	123.6	9.776	57.6200	-37.46	563.30	0.066
L41	15 - 10 (41)	H1-3 (1.47 CR) - 40 TP49.66x48.785x0.375	5.00	177.00	121.4	10.133	58.6615	-38.92	594.40	0.065
L42	10 - 5 (42)	H1-3 (1.48 CR) - 41 TP50.535x49.66x0.375	5.00	177.00	119.3	10.496	59.7029	-40.40	626.63	0.064
L43	5 - 0 (43)	H1-3 (1.49 CR) - 42 TP51.41x50.535x0.375	5.00	177.00	117.2	10.865	60.7444	-41.57	660.00	0.063
		H1-3 (1.50 CR) - 43								

* DL controls

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio f _{bx} F _{bx}	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio f _{by} F _{by}
L1	177 - 175 (1)	TP22.349x22x0.2188	0.00	0.000	39.000	0.000	0.00	0.000	39.000	0.000
L2	175 - 170 (2)	TP23.22x22.349x0.2188	23.56	-3.123	39.000	0.080	0.00	0.000	39.000	0.000
L3	170 - 168 (3)	TP23.569x23.22x0.2188	31.01	-3.989	39.000	0.102	0.00	0.000	39.000	0.000
L4	168 - 165 (4)	TP24.092x23.569x0.2188	45.57	-5.606	39.000	0.144	0.00	0.000	39.000	0.000
L5	165 - 160 (5)	TP24.964x24.092x0.2188	72.70	-8.322	39.000	0.213	0.00	0.000	39.000	0.000
L6	160 - 157 (6)	TP25.487x24.964x0.2188	89.54	-9.828	39.000	0.252	0.00	0.000	39.000	0.000
L7	157 - 155 (7)	TP25.836x25.487x0.2188	105.81	-11.298	39.000	0.290	0.00	0.000	39.000	0.000
L8	155 - 150 (8)	TP26.707x25.836x0.2188	154.92	-15.467	39.000	0.397	0.00	0.000	39.000	0.000
L9	150 - 147 (9)	TP27.23x26.707x0.2188	210.70	-20.227	39.000	0.519	0.00	0.000	39.000	0.000
L10	147 - 145 (10)	TP27.579x27.23x0.2188	235.81	-22.062	39.000	0.566	0.00	0.000	39.000	0.000
L11	145 - 140 (11)	TP28.451x27.579x0.2188	299.87	-26.342	39.000	0.675	0.00	0.000	39.000	0.000
L12	140 - 137 (12)	TP28.974x28.451x0.2188	342.60	-29.007	39.000	0.744	0.00	0.000	39.000	0.000
L13	137 - 135 (13)	TP29.323x28.974x0.2188	374.24	-30.928	39.000	0.793	0.00	0.000	39.000	0.000
L14	135 - 133.5 (14)	TP29.584x29.323x0.2188	398.17	-32.320	39.000	0.829	0.00	0.000	39.000	0.000
L15	133.5 - 129.75 (15)	TP29.83x29.584x0.4688	458.80	-17.534	39.000	0.450	0.00	0.000	39.000	0.000
L16	129.75 - 125 (16)	TP30.67x29.83x0.25	542.98	-35.973	39.000	0.922	0.00	0.000	39.000	0.000
L17	125 - 122 (17)	TP31.186x30.67x0.25	598.99	-38.366	39.000	0.984	0.00	0.000	39.000	0.000
L18	122 - 120 (18)	TP31.545x31.186x0.25	636.78	-39.852	39.000	1.022	0.00	0.000	39.000	0.000
L19	120 - 115 (19)	TP32.42x31.545x0.25	732.80	-43.392	39.000	1.113	0.00	0.000	39.000	0.000
L20	115 - 110 (20)	TP33.295x32.42x0.25	831.02	-46.627	39.000	1.196	0.00	0.000	39.000	0.000
L21	110 - 105 (21)	TP34.17x33.295x0.25	931.58	-49.598	39.000	1.272	0.00	0.000	39.000	0.000
L22	105 - 100 (22)	TP35.045x34.17x0.25	1034.66	-52.340	39.000	1.342	0.00	0.000	39.000	0.000
L23	100 - 95 (23)	TP35.92x35.045x0.25	1140.18	-54.873	39.000	1.407	0.00	0.000	39.000	0.000
L24	95 - 90 (24)	TP36.795x35.92x0.25	1248.12	-57.217	39.000	1.467	0.00	0.000	39.000	0.000
L25	90 - 88.8 (25)	TP37.005x36.795x0.25	1274.38	-57.752	39.000	1.481	0.00	0.000	39.000	0.000
L26	88.8 - 84.05 (26)	TP37.336x37.005x0.5625	1379.88	-27.999	39.000	0.718	0.00	0.000	39.000	0.000
L27	84.05 - 80 (27)	TP38.036x37.336x0.3125	1471.73	-50.727	39.000	1.301	0.00	0.000	39.000	0.000
L28	80 - 75 (28)	TP38.911x38.036x0.3125	1587.40	-52.251	39.000	1.340	0.00	0.000	39.000	0.000
L29	75 - 70 (29)	TP39.786x38.911x0.3125	1705.40	-53.665	39.000	1.376	0.00	0.000	39.000	0.000
L30	70 - 65 (30)	TP40.661x39.786x0.3125	1825.65	-54.975	39.000	1.410	0.00	0.000	39.000	0.000
L31	65 - 60 (31)	TP41.536x40.661x0.3125	1948.07	-56.188	39.000	1.441	0.00	0.000	39.000	0.000
L32	60 - 55 (32)	TP42.411x41.536x0.3125	2072.58	-57.312	39.000	1.470	0.00	0.000	39.000	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bc} ksi	Allow. F_{bc} ksi	Ratio $\frac{f_{bc}}{F_{bc}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L33	55 - 50 (33)	TP43.286x42.411x0.3125	2199.13	-58.351	39.000	1.496	0.00	0.000	39.000	0.000
L34	50 - 45 (34)	TP44.161x43.286x0.3125	2327.60	-59.311	39.000	1.521	0.00	0.000	39.000	0.000
L35	45 - 39.25 (35)	TP44.542x44.161x0.6875	2478.00	-28.937	39.000	0.742	0.00	0.000	39.000	0.000
L36	39.25 - 35 (36)	TP45.286x44.542x0.375	2590.96	-52.509	39.000	1.346	0.00	0.000	39.000	0.000
L37	35 - 30 (37)	TP46.161x45.286x0.375	2725.44	-53.135	39.000	1.362	0.00	0.000	39.000	0.000
L38	30 - 25 (38)	TP47.036x46.161x0.375	2861.61	-53.709	39.000	1.377	0.00	0.000	39.000	0.000
L39	25 - 20 (39)	TP47.91x47.036x0.375	2999.42	-54.237	39.000	1.391	0.00	0.000	39.000	0.000
L40	20 - 15 (40)	TP48.785x47.91x0.375	3138.87	-54.717	39.000	1.403	0.00	0.000	39.000	0.000
L41	15 - 10 (41)	TP49.66x48.785x0.375	3279.93	-55.156	39.000	1.414	0.00	0.000	39.000	0.000
L42	10 - 5 (42)	TP50.535x49.66x0.375	3422.57	-55.557	39.000	1.425	0.00	0.000	39.000	0.000
L43	5 - 0 (43)	TP51.41x50.535x0.375	3566.80	-55.923	39.000	1.434	0.00	0.000	39.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
			P_a	$\frac{f_{bc}}{F_{bc}}$	$\frac{f_{by}}{F_{by}}$			
L1	177 - 175 (1)	TP22.349x22x0.2188	0.081	0.000	0.000	0.081 ✓	1.000	H1-3 ✓
L2	175 - 170 (2)	TP23.22x22.349x0.2188	0.071	0.080	0.000	0.151 ✓	1.333	H1-3 ✓
L3	170 - 168 (3)	TP23.569x23.22x0.2188	0.081	0.102	0.000	0.184 ✓	1.333	H1-3 ✓
L4	168 - 165 (4)	TP24.092x23.569x0.2188	0.124	0.144	0.000	0.268 ✓	1.333	H1-3 ✓
L5	165 - 160 (5)	TP24.964x24.092x0.2188	0.121	0.213	0.000	0.334 ✓	1.333	H1-3 ✓
L6	160 - 157 (6)	TP25.487x24.964x0.2188	0.119	0.252	0.000	0.371 ✓	1.333	H1-3 ✓
L7	157 - 155 (7)	TP25.836x25.487x0.2188	0.160	0.290	0.000	0.449 ✓	1.333	H1-3 ✓
L8	155 - 150 (8)	TP26.707x25.836x0.2188	0.154	0.397	0.000	0.551 ✓	1.333	H1-3 ✓
L9	150 - 147 (9)	TP27.23x26.707x0.2188	0.093	0.519	0.000	0.612 ✓	1.333	H1-3 ✓
L10	147 - 145 (10)	TP27.579x27.23x0.2188	0.113	0.566	0.000	0.679 ✓	1.333	H1-3 ✓
L11	145 - 140 (11)	TP28.451x27.579x0.2188	0.111	0.675	0.000	0.786 ✓	1.333	H1-3 ✓
L12	140 - 137 (12)	TP28.974x28.451x0.2188	0.108	0.744	0.000	0.852 ✓	1.333	H1-3 ✓
L13	137 - 135 (13)	TP29.323x28.974x0.2188	0.125	0.793	0.000	0.918 ✓	1.333	H1-3 ✓
L14	135 - 133.5 (14)	TP29.584x29.323x0.2188	0.124	0.829	0.000	0.953 ✓	1.333	H1-3 ✓
L15	133.5 - 129.75 (15)	TP29.83x29.584x0.4688	0.063	0.450	0.000	0.512 ✓	1.333	H1-3 ✓
L16	129.75 - 125 (16)	TP30.67x29.83x0.25	0.127	0.922	0.000	1.049 ✓	1.333	H1-3 ✓
L17	125 - 122 (17)	TP31.186x30.67x0.25	0.126	0.984	0.000	1.109 ✓	1.333	H1-3 ✓
L18	122 - 120 (18)	TP31.545x31.186x0.25	0.124	1.022	0.000	1.146 ✓	1.333	H1-3 ✓
L19	120 - 115 (19)	TP32.42x31.545x0.25	0.122	1.113	0.000	1.235 ✓	1.333	H1-3 ✓
L20	115 - 110 (20)	TP33.295x32.42x0.25	0.119	1.196	0.000	1.315 ✓	1.333	H1-3 ✓
L21	110 - 105 (21)	TP34.17x33.295x0.25	0.117	1.272	0.000	1.389 ✗	1.333	H1-3 ✗
L22	105 - 100 (22)	TP35.045x34.17x0.25	0.115	1.342	0.000	1.457 ✗	1.333	H1-3 ✗
L23	100 - 95 (23)	TP35.92x35.045x0.25	0.113	1.407	0.000	1.520 ✗	1.333	H1-3 ✗
L24	95 - 90 (24)	TP36.795x35.92x0.25	0.110	1.467	0.000	1.577 ✗	1.333	H1-3 ✗
L25	90 - 88.8 (25)	TP37.005x36.795x0.25	0.110	1.481	0.000	1.591 ✗	1.333	H1-3 ✗
L26	88.8 - 84.05 (26)	TP37.336x37.005x0.5625	0.053	0.718	0.000	0.770 ✓	1.333	H1-3 ✓
L27	84.05 - 80 (27)	TP38.036x37.336x0.3125	0.091	1.301	0.000	1.392 ✗	1.333	H1-3 ✗
L28	80 - 75 (28)	TP38.911x38.036x0.3125	0.090	1.340	0.000	1.430 ✗	1.333	H1-3 ✗
L29	75 - 70 (29)	TP39.786x38.911x0.3125	0.089	1.376	0.000	1.465 ✗	1.333	H1-3 ✗
L30	70 - 65 (30)	TP40.661x39.786x0.3125	0.087	1.410	0.000	1.497 ✗	1.333	H1-3 ✗
L31	65 - 60 (31)	TP41.536x40.661x0.3125	0.086	1.441	0.000	1.526 ✗	1.333	H1-3 ✗
L32	60 - 55 (32)	TP42.411x41.536x0.3125	0.084	1.470	0.000	1.554 ✗	1.333	H1-3 ✗
L33	55 - 50 (33)	TP43.286x42.411x0.3125	0.083	1.496	0.000	1.579 ✗	1.333	H1-3 ✗
L34	50 - 45 (34)	TP44.161x43.286x0.3125	0.081	1.521	0.000	1.602 ✗	1.333	H1-3 ✗

Section No.	Elevation <i>ft</i>	Size	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
			P	f_{bc}	f_{by}			
			P_a	F_{bc}	F_{by}			
L35	45 - 39.25 (35)	TP44.542x44.161x0.6875	0.040	0.742	0.000	0.782 ✓	1.333	H1-3 ✓
L36	39.25 - 35 (36)	TP45.286x44.542x0.375	0.071	1.346	0.000	1.417 ✗	1.333	H1-3 ✗
L37	35 - 30 (37)	TP46.161x45.286x0.375	0.070	1.362	0.000	1.432 ✗	1.333	H1-3 ✗
L38	30 - 25 (38)	TP47.036x46.161x0.375	0.069	1.377	0.000	1.446 ✗	1.333	H1-3 ✗
L39	25 - 20 (39)	TP47.91x47.036x0.375	0.068	1.391	0.000	1.458 ✗	1.333	H1-3 ✗
L40	20 - 15 (40)	TP48.785x47.91x0.375	0.066	1.403	0.000	1.469 ✗	1.333	H1-3 ✗
L41	15 - 10 (41)	TP49.66x48.785x0.375	0.065	1.414	0.000	1.480 ✗	1.333	H1-3 ✗
L42	10 - 5 (42)	TP50.535x49.66x0.375	0.064	1.425	0.000	1.489 ✗	1.333	H1-3 ✗
L43	5 - 0 (43)	TP51.41x50.535x0.375	0.063	1.434	0.000	1.497 ✗	1.333	H1-3 ✗

* DL controls

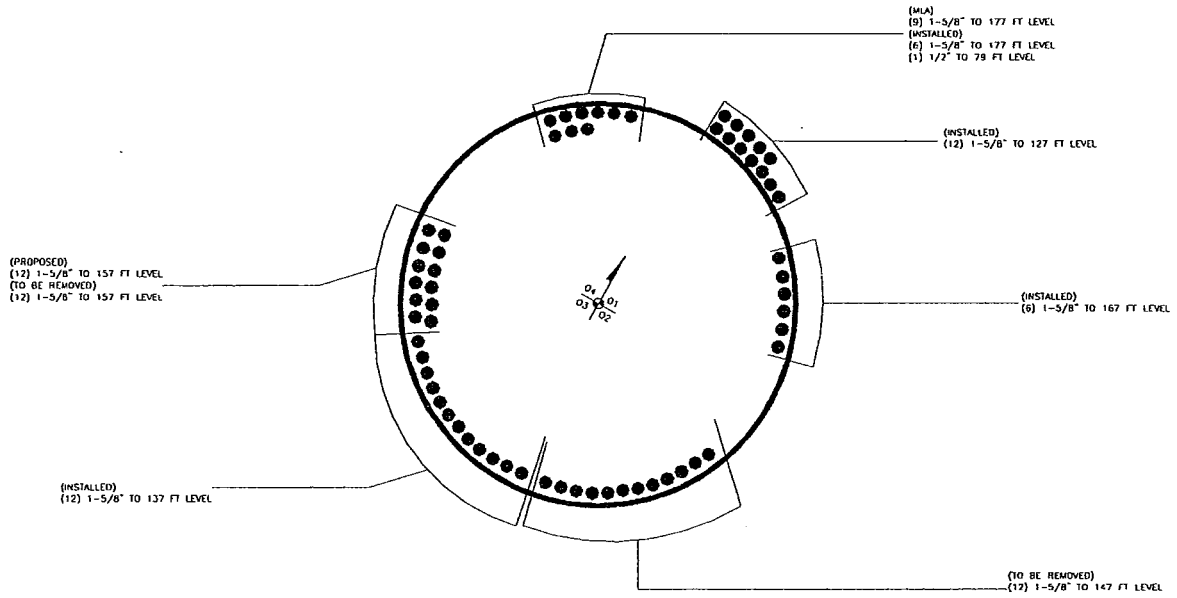
Section Capacity Table

Section No.	Elevation <i>ft</i>	Component Type	Size	Critical Element	P K	$SF \cdot P_{allow}$ K	% Capacity	Pass Fail
L1	177 - 175	Pole	TP22.349x22x0.2188	1	-2.48	30.66	8.1	Pass
L2	175 - 170	Pole	TP23.22x22.349x0.2188	2	-2.51	46.99	11.4	Pass
L3	170 - 168	Pole	TP23.569x23.22x0.2188	3	-3.00	49.16	13.8	Pass
L4	168 - 165	Pole	TP24.092x23.569x0.2188	4	-4.91	52.54	20.1	Pass
L5	165 - 160	Pole	TP24.964x24.092x0.2188	5	-5.29	58.51	25.1	Pass
L6	160 - 157	Pole	TP25.487x24.964x0.2188	6	-5.55	62.30	27.8	Pass
L7	157 - 155	Pole	TP25.836x25.487x0.2188	7	-7.77	64.92	33.7	Pass
L8	155 - 150	Pole	TP26.707x25.836x0.2188	8	-8.29	71.77	41.3	Pass
L9	150 - 147	Pole	TP27.23x26.707x0.2188	9	-5.31	76.11	45.9	Pass
L10	147 - 145	Pole	TP27.579x27.23x0.2188	10	-6.71	79.09	50.9	Pass
L11	145 - 140	Pole	TP28.451x27.579x0.2188	11	-7.24	86.90	59.0	Pass
L12	140 - 137	Pole	TP28.974x28.451x0.2188	12	-7.45	91.82	63.9	Pass
L13	137 - 135	Pole	TP29.323x28.974x0.2188	13	-8.90	95.20	68.8	Pass
L14	135 - 133.5	Pole	TP29.584x29.323x0.2188	14	-9.08	97.79	71.5	Pass
L15	133.5 - 129.75	Pole	TP29.83x29.584x0.4688	15	-9.83	209.43	38.4	Pass
L16	129.75 - 125	Pole	TP30.67x29.83x0.25	16	-11.84	124.21	78.7	Pass
L17	125 - 122	Pole	TP31.186x30.67x0.25	17	-12.31	130.64	83.2	Pass
L18	122 - 120	Pole	TP31.545x31.186x0.25	18	-12.63	135.24	86.0	Pass
L19	120 - 115	Pole	TP32.42x31.545x0.25	19	-13.44	146.90	92.6	Pass
L20	115 - 110	Pole	TP33.295x32.42x0.25	20	-14.27	159.22	98.7	Pass
L21	110 - 105	Pole	TP34.17x33.295x0.25	21	-15.13	172.20	104.2	Fail ✗
L22	105 - 100	Pole	TP35.045x34.17x0.25	22	-16.01	185.88	109.3	Fail ✗
L23	100 - 95	Pole	TP35.92x35.045x0.25	23	-16.91	200.26	114.0	Fail ✗
L24	95 - 90	Pole	TP36.795x35.92x0.25	24	-17.83	215.36	118.3	Fail ✗
L25	90 - 88.8	Pole	TP37.005x36.795x0.25	25	-18.05	219.09	119.3	Fail ✗
L26	88.8 - 84.05	Pole	TP37.336x37.005x0.5625	26	-19.47	493.70	57.8	Pass
L27	84.05 - 80	Pole	TP38.036x37.336x0.3125	27	-20.32	296.09	104.4	Fail ✗
L28	80 - 75	Pole	TP38.911x38.036x0.3125	28	-21.42	317.17	107.3	Fail ✗
L29	75 - 70	Pole	TP39.786x38.911x0.3125	29	-22.52	339.24	109.9	Fail ✗
L30	70 - 65	Pole	TP40.661x39.786x0.3125	30	-23.65	362.30	112.3	Fail ✗
L31	65 - 60	Pole	TP41.536x40.661x0.3125	31	-24.79	386.38	114.5	Fail ✗
L32	60 - 55	Pole	TP42.411x41.536x0.3125	32	-25.95	411.52	116.5	Fail ✗
L33	55 - 50	Pole	TP43.286x42.411x0.3125	33	-27.13	437.71	118.4	Fail ✗
L34	50 - 45	Pole	TP44.161x43.286x0.3125	34	-28.33	465.00	120.2	Fail ✗
L35	45 - 39.25	Pole	TP44.542x44.161x0.6875	35	-30.66	1023.41	58.7	Pass
L36	39.25 - 35	Pole	TP45.286x44.542x0.375	36	-31.81	599.55	106.3	Fail ✗
L37	35 - 30	Pole	TP46.161x45.286x0.375	37	-33.19	635.28	107.4	Fail ✗
L38	30 - 25	Pole	TP47.036x46.161x0.375	38	-34.59	672.40	108.5	Fail ✗
L39	25 - 20	Pole	TP47.91x47.036x0.375	39	-36.02	710.90	109.4	Fail ✗
L40	20 - 15	Pole	TP48.785x47.91x0.375	40	-37.46	750.88	110.2	Fail ✗
L41	15 - 10	Pole	TP49.66x48.785x0.375	41	-38.92	792.34	111.0	Fail ✗
L42	10 - 5	Pole	TP50.535x49.66x0.375	42	-40.40	835.30	111.7	Fail ✗

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
L43	5 - 0	Pole	TP51.41x50.535x0.375	43	-41.57	879.77	112.3	Fail X	
Summary									
Pole (L34)								120.2	Fail X
Base Plate								103.3	Fail X
RATING =								120.2	Fail X

↑
SEE APPENDIX C
FOR CAPACITIES W/
MODE

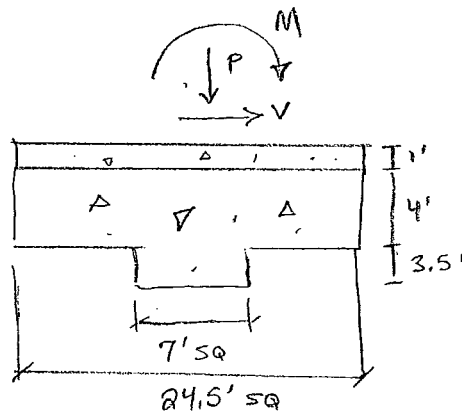
APENDIX B
BASE LEVEL DRAWING



Base Level Drawing

APPENDIX C
ADDITIONAL CALCULATIONS

FOUNDATION CHECK:



$$\begin{aligned}V &= 29 \text{ k} \\P &= 42 \text{ k} \\M &= 3567 \text{ k-ft}\end{aligned}$$

OVERTURNING

$$\text{VOLUME OF CONCRETE} = (1)24.5^2 + (4)24.5^2 + (3.5)7^2 = 3172.75 \text{ ft}^3$$

$$\text{WEIGHT OF CONCRETE} = 3172.75 (.15) = 475.9 \text{ k}$$

$$\Sigma M_R = \Sigma W \cdot d = (475.9) \left(\frac{24.5}{2}\right) = 5829.9 \text{ k-ft}$$

$$\text{F.S.} = \frac{\Sigma M_R}{M} = \frac{5829.9}{(3567 + 29(4))} = 1.58 > 1.5 \quad \checkmark$$

TOE PRESSURE

$$R_t = \Sigma W + P = 475.9 + 42 = 517.9 \text{ k}$$

$$e = \frac{M}{R_t} = \frac{(3567 + 29(4))}{517.9} = 7.11 \text{ ft}$$

$$d - e = \frac{24.5}{2} - 7.11 = 5.14 \text{ ft.}$$

$$5.14 = \frac{L}{3} \Rightarrow L = 15.42 \text{ ft.}$$

$$R_t = \frac{1}{2} f_t (L)(L_e)$$

$$517.9 = \frac{1}{2} f_t (15.42)(24.5) \Rightarrow f_t = 2.74 \text{ ksf} < 4 \text{ ksf} \quad \checkmark$$

(ACTUAL) (ALLOWABLE)

