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
www.ct.gov/csc

November 6, 2012

Jennifer Palumbo
Real Estate Consultant
48 Spruce Street
Oakland, NJ 07436

RE: **EM-SPRINT-124-121015B** – Sprint Spectrum notice of intent to modify an existing telecommunications facility located at 34 Rimmon Street, Seymour, Connecticut.

Dear Ms. Palumbo:

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 following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated September 19, 2012. 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. Thank you for your attention and cooperation.

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/CDM/jbw

c: The Honorable W. Kurt Miller, First Selectman, Town of Seymour
James Baldwin, Sr., Zoning Enforcement Officer, Town of Seymour
Crown Castle

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CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
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October 16, 2012

The Honorable W. Kurt Miller
First Selectman
Town of Seymour
Town Hall
One First Street
Seymour, CT 06483

RE: **EM-SPRINT-124-121015A** – Sprint Spectrum notice of intent to modify an existing telecommunications facility located at 2 Progress Avenue, Seymour, Connecticut.

EM-SPRINT-124-121015B – Sprint Spectrum notice of intent to modify an existing telecommunications facility located at 34 Rimmon Street, Seymour, Connecticut.

Dear First Selectman Miller:

The Connecticut Siting Council (Council) received a request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72. A copy of which has already been provided to you.

If you have any questions or comments regarding the proposal, please call me or inform the Council by October 30, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/jbw

c: James Baldwin, Sr., Zoning Enforcement Officer, Town of Seymour

EM-SPRINT-124-121015B

Together with Nextel

48 Spruce Street
Oakland, NJ 07436
Phone: (845) 499-4712
Jennifer Palumbo

September 19, 2012

Hand Delivered

Ms. Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 34 Rimmon Street, Seymour, CT 06483. Known to Sprint Spectrum L.P. as site CT03XC034.

Dear Ms. Roberts:

In order to accommodate technological changes, implement Code Division Multiple Access ("CDMA") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the state of Connecticut, Sprint Spectrum L.P. plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and its attachments is being sent to the chief elected official of the municipality in which affected cell site is located.

CDMA employs Spread-Spectrum technology and special coding scheme to allow multiple users to be multiplexed over the same physical channel. LTE is a new high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

As part of the project the new multi-mode 800/1900 antenna will replace existing antennas. These antennas will provide more flexibility for optimization by allowing fast and easy electrical tilt adjustment from remote location and will enable the transmission of multiple technologies from a single antenna. As Sprint Nextel's network evolves to meet the demands of its customers, it is essential for Sprint Nextel to install modern equipment and antennas in order to provide reliable wireless voice and data services. The

proposed equipment will include multi-mode radios that will allow Sprint Nextel to transmit at different frequencies using different technologies, including LTE technology. Likewise, the proposed antennas are quad-pole multi-band high gain antennas that will allow Sprint to operate using its multiple frequency bands and technologies, including LTE technology. The proposed equipment and antennas will improve the reliability, coverage and capacity of Sprint Nextel's voice and data networks across Sprint Nextel's various FCC licensed frequency bands and significantly increase the data speeds of Sprint Nextel's network by utilizing the latest LTE technology. Without the proposed modifications Sprint Nextel will be unable to provide reliable wireless voice and data service using the latest technologies.

Sprint Spectrum L.P. will have an interim (testing) period during the modification/installation prior to the final configuration. This antenna configuration is shown on the attached drawings of the planned modifications. Also included is the power density calculation reflecting the change in Sprint's operations at the site and documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

The changes to the facility do not constitute modification as defined Connecticut General Statues ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for the R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will not be affected.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound.
3. The proposed changes will not increase the noise level at the existing facility by 6 decibels or more.
4. Radio Frequency power density may increase due to the use of one or more CDMA transmissions. Moreover, LTE will utilize additional radio frequencies newly licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons Sprint Spectrum L.P. respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (845)-499-4712 or email JPalumbo@Transcendwireless.com with questions concerning this matter.
Thank you for your consideration.

Sincerely,

Jennifer Palumbo
Real Estate Consultant

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

Sprint Existing Facility

Site ID: CT03XC034

Rimmon Street
34 Rimmon Street
Seymour, CT 06483

August 18, 2012

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting

environmental | engineering | due diligence

August 18, 2012

Sprint
Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Re: Emissions Values for Site **CT03XC034 – Rimmon Street**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 34 Rimmon Street, Seymour, CT, for the purpose of determining whether the emissions from the proposed Sprint equipment upgrades on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of μW/cm2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the cellular band is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the PCS band is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 34 Rimmon Street, Seymour, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

1) 3 CDMA Carriers (1900 MHz) were considered for each sector of the proposed installation.
2) 1 CDMA Carrier (850 MHz) was considered for each sector of the proposed installation
3) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
4) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
5) The antenna used in this modeling is the RFS APXVSPP18-C-A20. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario.

6) The antenna mounting height centerline of the proposed antennas is **150 feet** above ground level (AGL)
7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits

EBI Consulting

environmental | engineering | due diligence

Summary

All calculations performed for this analysis yielded results that were well within the allowable limits for general public exposure to RF Emissions.

The anticipated Maximum Composite contributions from the Sprint facility are **14.398% (4.799% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **17.968%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

Structural Evaluation Report
Antenna Replacements

150' Monopole

Prepared for:
Crown Castle
BU No. 876318
Rimmon St.

Sprint PCS Co-Locate
CT03XC034

B&T Project Number
84704.001

June 06, 2012

B&T Engineering, Inc.
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630 Phone
(918) 295-0265 Fax

June 06, 2012

Ms. Marianne Dunst
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6580

B&T Engineering, Inc.
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
ctuttle@btengineering.com

Subject:	**Structural Analysis Report - Interim Load**	
Carrier Designation:	***Sprint* Co-Locate**	
	Carrier Site Number:	CT03XC034
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	876318
	Crown Castle Site Name:	Rimmon ST.
	Crown Castle JDE Job Number:	188920
	Crown Castle Work Order Number:	498910
	Crown Castle Application Number:	151462 Rev. 0
Engineering Firm Designation:	**B&T Engineering, Inc. Project Number:**	84704.001
Site Data:	**34 Rimmon Street, Seymour, New Haven County, CT** **Latitude *41° 24' 7.93"*, Longitude *-73° 4' 20.16"*** **150 Foot - Monopole Tower**	

Dear Ms. Dunst,

B&T Engineering, Inc. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned 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 467683, in accordance with application 151462, 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:

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing loading, respectively.

The analysis has been performed in accordance with the TIA-222-G standard and the 2005 Connecticut State Building Code based upon a wind speed of 105 mph 3-second gust, exposure category C with topographic category 1 and crest height of 0 feet.

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

Respectfully submitted by:

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
6/6/12

Raul Ortiz Jr., E.I.T.
Project Engineer

Chad E. Tuttle, P.E
President

tnxTower Report - version 6.0.4.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft. Monopole tower designed by Pittsburg Monopole in December of 1996. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 105 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category C with topographic category 1 and crest height of 0 feet.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
148.0	150.0	3	Alcatel Lucent	1900MHz RRH (65MHz)	3	1 1/4	1
		3	Alcatel Lucent	800 EXTERNAL NOTCH FILTER			
		3	Alcatel Lucent	800MHZ RRH			
		9	Rfs Celwave	ACU-A20-N			
		3	Rfs Celwave	APXVSPP18-C-A20			

Notes:
1) Handrails Added to Existing Platform

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
148.0	148.0	6	Ems Wireless	FV65-14-00NA2	6	1 5/8	1
		1	--	Platform Mount [LP 1001-1]			
137.0	138.0	3	Kathrein	742 213	6	1 5/8	1
118.0	120.0	1	Kathrein	OG-860/1920/GPS-A	1	1/2	1
	118.0	1	--	Side Arm Mount [SO 701-1]			
86.0	86.0	1	--	Pipe Mount [PM 601-1]	1	1/2	1
	85.5	1	Decibel	DB225-2-D			
75.0	75.0	1	Decibel	DB225-2-D	--	--	1
		1	--	Pipe Mount [PM 601-1]			

Notes:
1) Existing Equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150	150	12	--	4 SQ FT	--	--
		1	--	Platform		
130	130	12	--	4 SQ FT	--	--
		1	--	Platform		
110	110	12	--	4 SQ FT	--	--
		1	--	Platform		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Sprint Co-Locate Revision# 0	151462	CCI Sites
Tower Manufacturing Drawings	Pittsburg, Job no. 96088-152	1619418	CCI Sites
Foundation Drawings	Pittsburg, Job no. 96088-152	1620580	CCI Sites
Geotechnical Report	Soil Report, Site: CT03XC034D	1619384	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 05/30/2012	CCI Sites

3.1) Analysis Method

tnxTower (version 6.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. 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 specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Mount areas and weights are assumed based on photographs provided.

This analysis may be affected if any assumptions are not valid or have been made in error. B&T Engineering, Inc. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 120	Pole	P24x3/8	1	-8.599	876.725	59.0	Pass
L2	120 - 80	Pole	P36x1/2	2	-19.055	1756.540	58.2	Pass
L3	80 - 40	Pole	P48x1/2	3	-32.607	2335.680	64.4	Pass
L4	40 - 0	Pole	P54x5/8	4	-50.925	3301.250	63.6	Pass
							Summary	
						Pole (L3)	64.4	Pass
						Rating =	**64.4**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	60.8	Pass
1	Base Plate	Base	28.0	Pass
1	Flange Connection	120	69.2	Pass
1	Flange Connection	80	65.8	Pass
1	Flange Connection	40	73.1	Pass
1	Base Foundation	Base	91.9	Pass

Structure Rating (max from all components) =	91.9%

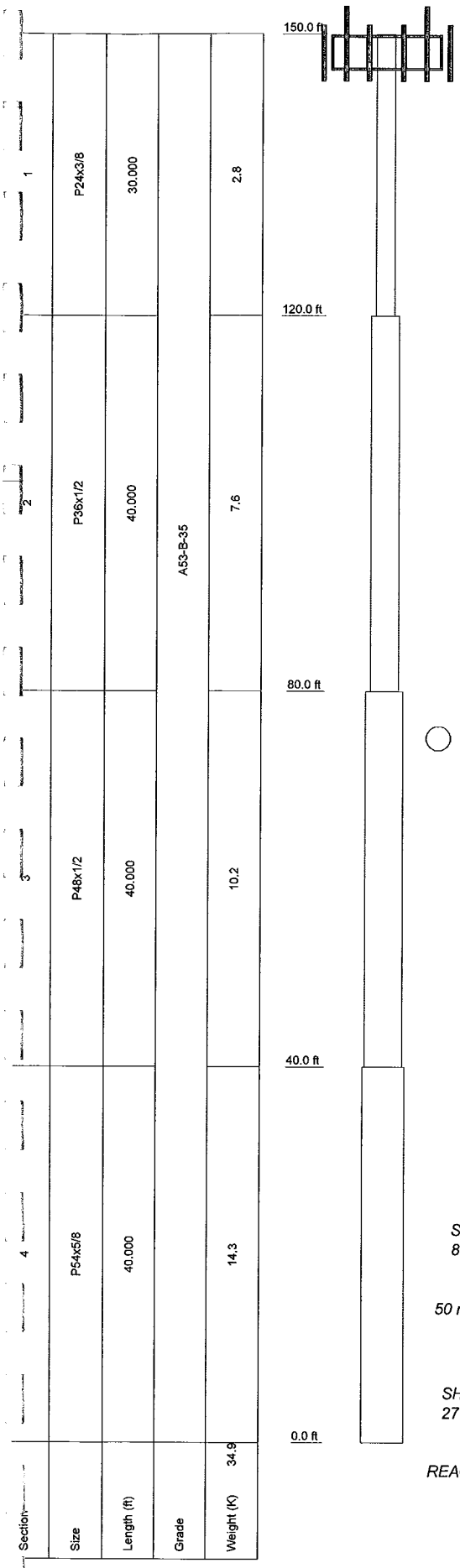
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Capacities up to 100% are considered acceptable based on analysis methods used.

4.1) Recommendations

N/A

APPENDIX A

TNXTOWER OUTPUT



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) FV65-14-00NA2 w/ Mount Pipe (E)	148	(3) ACU-A20-N (P)	148
(2) FV65-14-00NA2 w/ Mount Pipe (E)	148	APXVSPP18-C-A20 w/ Mount Pipe (P)	148
(2) FV65-14-00NA2 w/ Mount Pipe (E)	148	APXVSPP18-C-A20 w/ Mount Pipe (P)	148
1900MHz RRH (65MHz) (P)	148	APXVSPP18-C-A20 w/ Mount Pipe (P)	148
1900MHz RRH (65MHz) (P)	148	Platform Mount [LP 1001-1] (E)	148
1900MHz RRH (65MHz) (P)	148	742 213 w/ Mount Pipe (E)	137
800 EXTERNAL NOTCH FILTER (P)	148	742 213 w/ Mount Pipe (E)	137
800 EXTERNAL NOTCH FILTER (P)	148	742 213 w/ Mount Pipe (E)	137
800 EXTERNAL NOTCH FILTER (P)	148	OG-860/1920/GPS-A (E)	118
800MHZ RRH (P)	148	Side Arm Mount [SO 701-1] (E)	118
800MHZ RRH (P)	148	DB225-2-D (E)	86
800MHZ RRH (P)	148	Pipe Mount [PM 601-1] (E)	86
(3) ACU-A20-N (P)	148	DB225-2-D (E)	75
(3) ACU-A20-N (P)	148	Pipe Mount [PM 601-1] (E)	75

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 64.4%

ALL REACTIONS ARE FACTORED

AXIAL 73 K

SHEAR 8 K — *MOMENT 745 kip-ft*

TORQUE 0 kip-ft
50 mph WIND - 0.750 in ICE

AXIAL 51 K

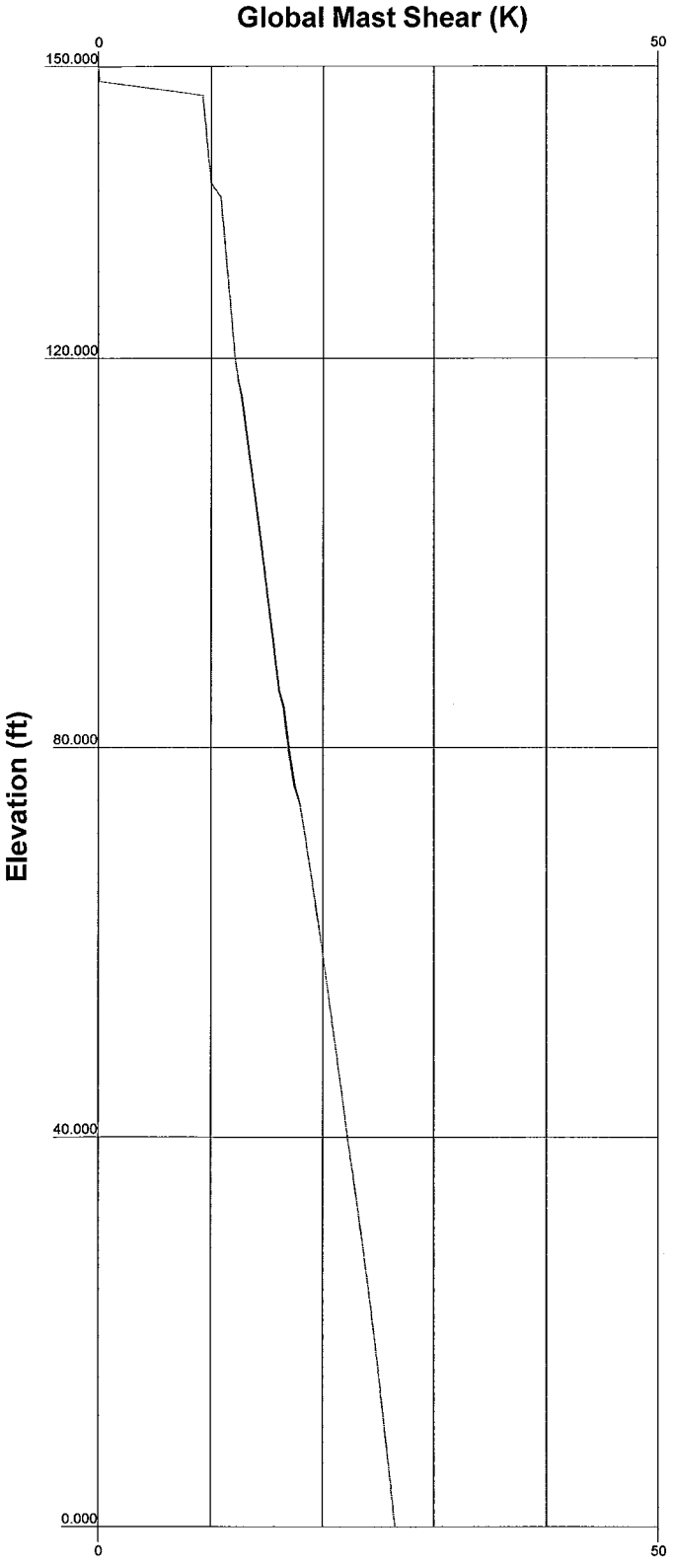
SHEAR 27 K — *MOMENT 2698 kip-ft*

TORQUE 1 kip-ft
REACTIONS - 105 mph WIND

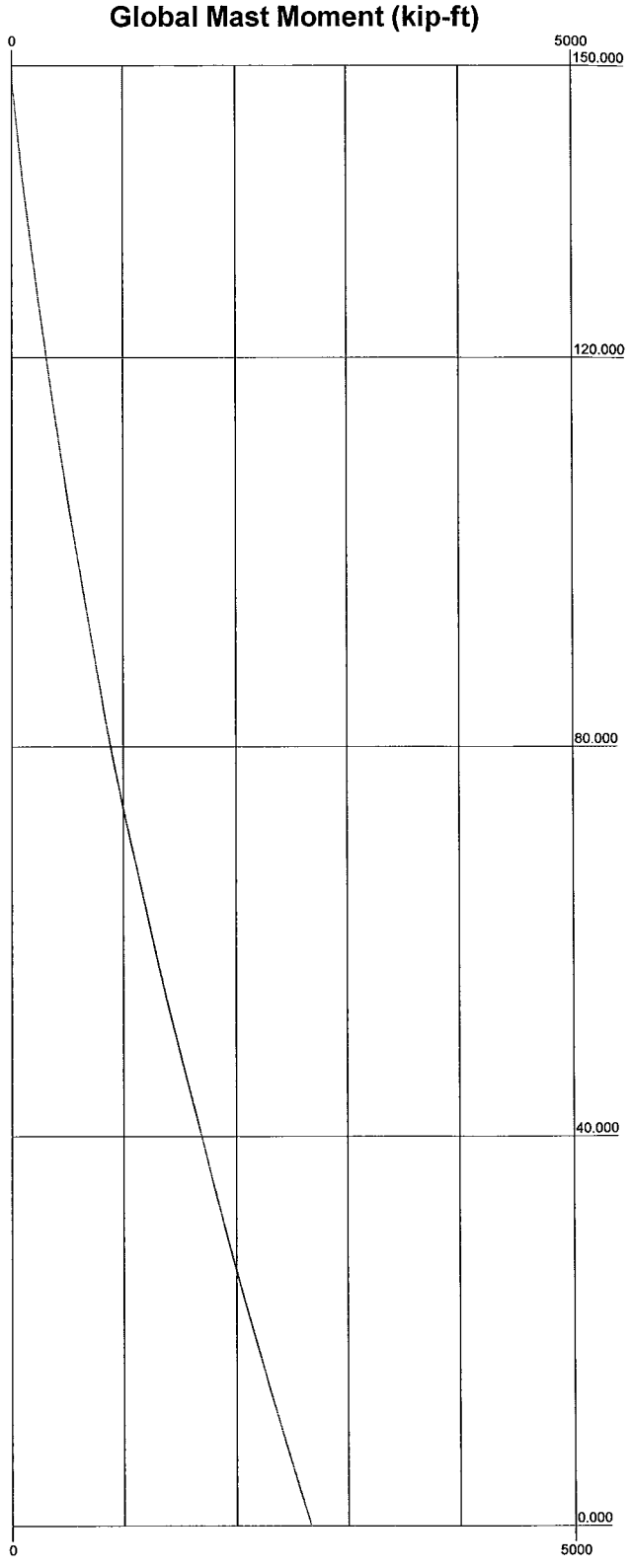
B&T Engineering, Inc.
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: *84704.001 - RIMMON ST, CT (BU# 876318)*		
Project: *150' Pittsburg Monopole / App ID: 151462; Rev: 0*		
Client: Crown Castle	Drawn by: Rortiz	App'd:
Code: TIA-222-G	Date: 06/06/12	Scale: N
Path: S:\B&T Engineering\Projects\Crown Castle\84704_876318_Rimmon St\Engineering\tnxTower\84704_001_Rimmon St_CT_Island.eri		Dwg No.

Vx Vz



Mx Mz



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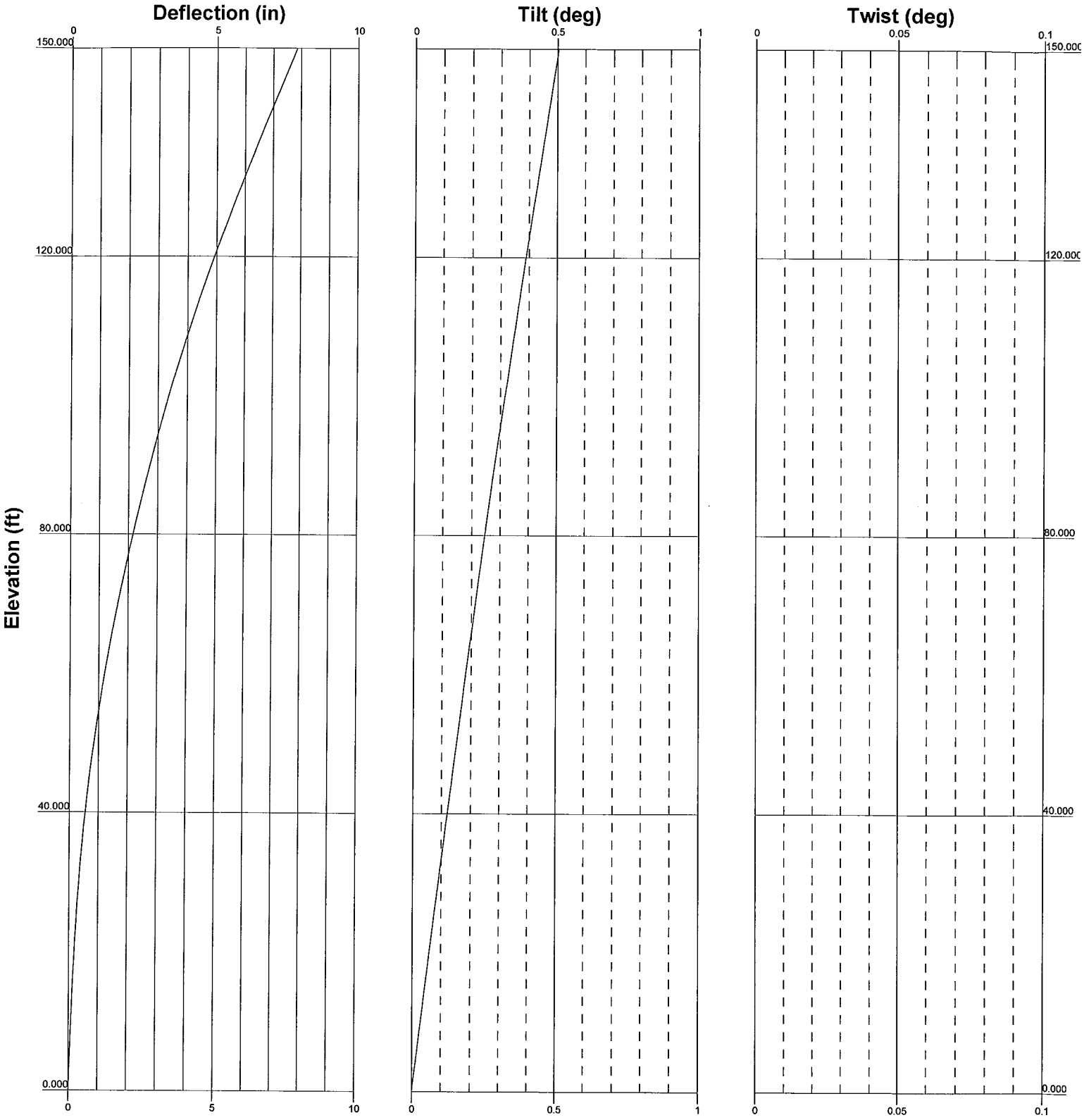
Job: 84704.001 - RIMMON ST, CT (BU# 876318)		
Project: 150' Pitttsburg Monopole / App ID: 151462; Rev: 0		
Client: Crown Castle	Drawn by: Rortiz	App'd:
Code: TIA-222-G	Date: 06/06/12	Scale: N
Path:		Dwg No.

TIA-222-G - Service - 60 mph

Maximum Values



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Job: *84704.001 - RIMMON ST, CT (BU# 876318)*		
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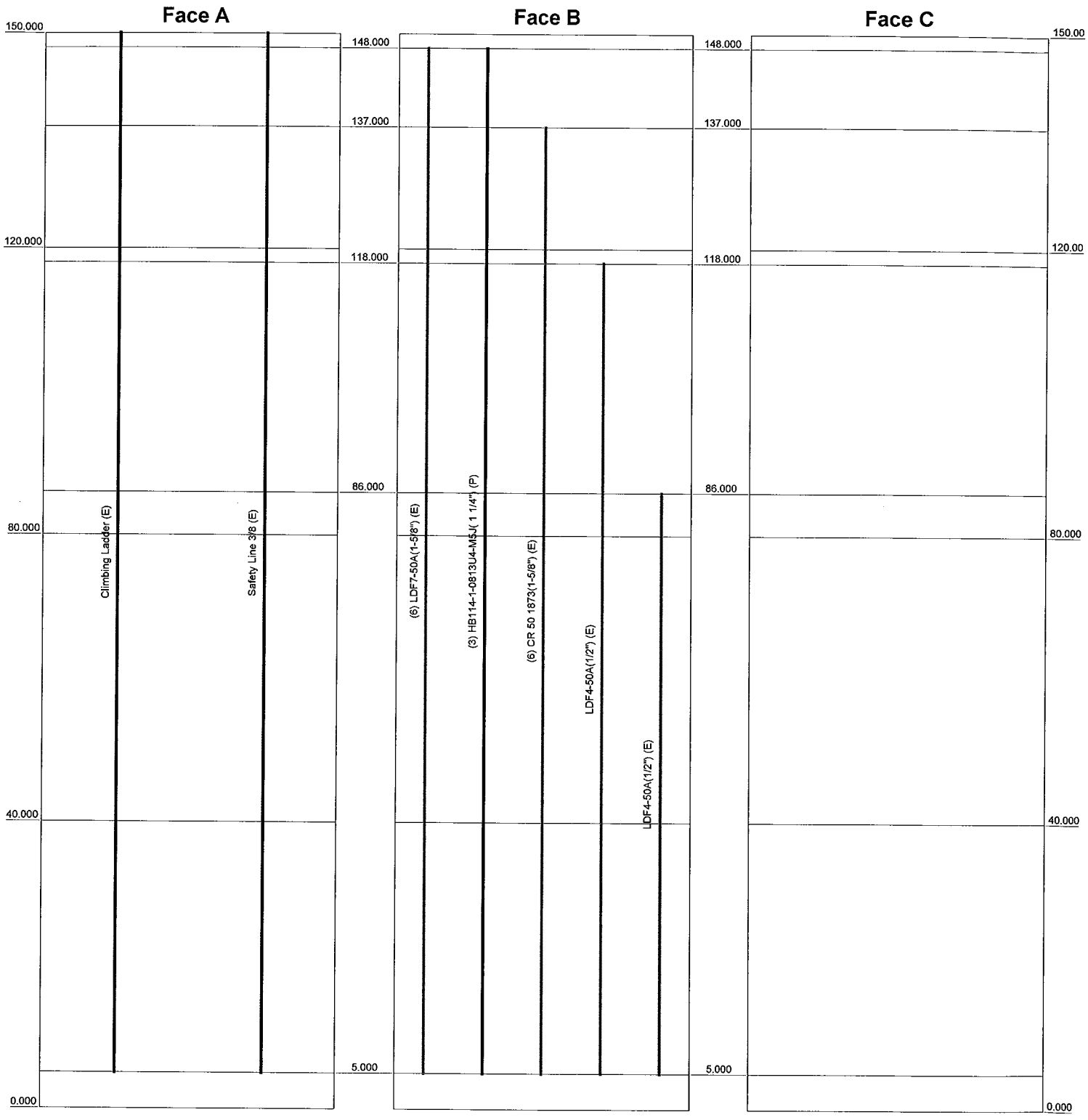
Client: Crown Castle	Drawn by: Rortiz	App'd:
Code: TIA-222-G	Date: 06/06/12	Scale: N
Path: S:\B&T Engineering\Projects\Crown Castle\84704_876318_Rimmon St\Engineering\tnxTower\[001]84704_001_Rimmon St_CT_Interim		Dwg No.

0' - 150'

Round | Flat | App In Face | App Out Face | Truss Leg



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Job: *84704.001 - RIMMON ST, CT (BU# 876318)*		
Project: *150' Pitttsburg Monopole / App ID: 151462; Rev: 0*		
Client: Crown Castle	Drawn by: Rortiz	App'd:
Code: TIA-222-G	Date: 06/06/12	Scale: N
Path: S:\B&T Engineering\Projects\Crown Castle\84704_876318_Rimmon St\Engineering\RnxTower\900184704_001_Rimmon St_CT_Inputs		Dwg No.

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 105 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.000 ft.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
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				

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	150.000-120.000	30.000	P24x3/8	A53-B-35 (35 ksi)	
L2	120.000-80.000	40.000	P36x1/2	A53-B-35 (35 ksi)	
L3	80.000-40.000	40.000	P48x1/2	A53-B-35 (35 ksi)	
L4	40.000-0.000	40.000	P54x5/8	A53-B-35 (35 ksi)	

Tower Elevation ft	Gusset Area (per face) ft²	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 150.000-120.000				1	1	1		
L2 120.000-80.000				1	1	1		
L3 80.000-40.000				1	1	1		
L4 40.000-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
HB114-1-0813U4-M5J(1 1/4") (P) ****	B	Surface Ar (CaAa)	148.000 - 5.000	3	3	-0.350 -0.250	1.540		0.001
Climbing Ladder (E)	A	Surface Af (CaAa)	150.000 - 5.000	1	1	0.000 0.000	3.000	12.000	0.008
Safety Line 3/8 (E) ****	A	Surface Ar (CaAa)	150.000 - 5.000	1	1	0.000 0.000	0.375		0.000

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight klf
LDF7-50A(1-5/8") (E) ****	B	No	Inside Pole	148.000 - 5.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
CR 50 1873(1-5/8") (E) ****	B	No	Inside Pole	137.000 - 5.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
LDF4-50A(1/2") (E) ****	B	No	Inside Pole	118.000 - 5.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
LDF4-50A(1/2") (E) ****	B	No	Inside Pole	86.000 - 5.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000

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 K
L1	150.000-120.000	A	0.000	0.000	16.125	0.000	0.259
		B	0.000	0.000	12.936	0.000	0.323
		C	0.000	0.000	0.000	0.000	0.000
L2	120.000-80.000	A	0.000	0.000	21.500	0.000	0.345
		B	0.000	0.000	18.480	0.000	0.547
		C	0.000	0.000	0.000	0.000	0.000
L3	80.000-40.000	A	0.000	0.000	21.500	0.000	0.345
		B	0.000	0.000	18.480	0.000	0.552
		C	0.000	0.000	0.000	0.000	0.000
L4	40.000-0.000	A	0.000	0.000	18.813	0.000	0.302
		B	0.000	0.000	16.170	0.000	0.483
		C	0.000	0.000	0.000	0.000	0.000

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 K
L1	150.000-120.000	A	1.727	0.000	0.000	36.848	0.000	0.765
		B		0.000	0.000	28.258	0.000	0.643
		C		0.000	0.000	0.000	0.000	0.000
L2	120.000-80.000	A	1.676	0.000	0.000	48.320	0.000	0.991
		B		0.000	0.000	39.862	0.000	0.987
		C		0.000	0.000	0.000	0.000	0.000
L3	80.000-40.000	A	1.593	0.000	0.000	46.994	0.000	0.945
		B		0.000	0.000	39.033	0.000	0.964
		C		0.000	0.000	0.000	0.000	0.000
L4	40.000-0.000	A	1.432	0.000	0.000	38.858	0.000	0.752
		B		0.000	0.000	32.741	0.000	0.799
		C		0.000	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.000-120.000	-0.337	-0.727	-0.448	-0.944
L2	120.000-80.000	-0.344	-0.821	-0.507	-1.174
L3	80.000-40.000	-0.359	-0.864	-0.560	-1.314
L4	40.000-0.000	-0.326	-0.788	-0.514	-1.228

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	HB114-1-0813U4-M5J(1 1/4")	120.00 - 148.00	1.0000	1.0000
L1	10	Climbing Ladder	120.00 - 150.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	11	Safety Line 3/8	120.00 - 150.00	1.0000	1.0000
L2	2	HB114-1-0813U4-M5J(1 1/4")	80.00 - 120.00	1.0000	1.0000
L2	10	Climbing Ladder	80.00 - 120.00	1.0000	1.0000
L2	11	Safety Line 3/8	80.00 - 120.00	1.0000	1.0000
L3	2	HB114-1-0813U4-M5J(1 1/4")	40.00 - 80.00	1.0000	1.0000
L3	10	Climbing Ladder	40.00 - 80.00	1.0000	1.0000
L3	11	Safety Line 3/8	40.00 - 80.00	1.0000	1.0000
L4	2	HB114-1-0813U4-M5J(1 1/4")	5.00 - 40.00	1.0000	1.0000
L4	10	Climbing Ladder	5.00 - 40.00	1.0000	1.0000
L4	11	Safety Line 3/8	5.00 - 40.00	1.0000	1.0000

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 K
(2) FV65-14-00NA2 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	8.637 9.290 9.910	6.946 8.127 9.021	0.056 0.121 0.199
(2) FV65-14-00NA2 w/ Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	8.637 9.290 9.910	6.946 8.127 9.021	0.056 0.121 0.199
(2) FV65-14-00NA2 w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	8.637 9.290 9.910	6.946 8.127 9.021	0.056 0.121 0.199
1900MHz RRH (65MHz) (P)	C	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	2.698 2.936 3.183	2.771 3.011 3.260	0.060 0.084 0.111
1900MHz RRH (65MHz) (P)	B	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	2.698 2.936 3.183	2.771 3.011 3.260	0.060 0.084 0.111
1900MHz RRH (65MHz) (P)	A	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	2.698 2.936 3.183	2.771 3.011 3.260	0.060 0.084 0.111
800 EXTERNAL NOTCH FILTER (P)	C	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	0.770 0.890 1.018	0.375 0.465 0.563	0.011 0.017 0.024
800 EXTERNAL NOTCH FILTER (P)	B	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	0.770 0.890 1.018	0.375 0.465 0.563	0.011 0.017 0.024
800 EXTERNAL NOTCH FILTER (P)	A	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	0.770 0.890 1.018	0.375 0.465 0.563	0.011 0.017 0.024
800MHZ RRH (P)	C	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	2.490 2.706 2.931	2.068 2.271 2.481	0.053 0.074 0.098
800MHZ RRH (P)	B	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	2.490 2.706 2.931	2.068 2.271 2.481	0.053 0.074 0.098
800MHZ RRH (P)	A	From Leg	4.000 0.000	0.000	148.000	No Ice 1/2" Ice	2.490 2.706	2.068 2.271	0.053 0.074

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Offsets: ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
				2.000				1" Ice	2.931	2.481	0.098
(3) ACU-A20-N (P)	C	From Leg		4.000		0.000	148.000	No Ice	0.078	0.136	0.001
				0.000				1/2" Ice	0.121	0.189	0.002
				2.000				1" Ice	0.173	0.251	0.004
(3) ACU-A20-N (P)	B	From Leg		4.000		0.000	148.000	No Ice	0.078	0.136	0.001
				0.000				1/2" Ice	0.121	0.189	0.002
				2.000				1" Ice	0.173	0.251	0.004
(3) ACU-A20-N (P)	A	From Leg		4.000		0.000	148.000	No Ice	0.078	0.136	0.001
				0.000				1/2" Ice	0.121	0.189	0.002
				2.000				1" Ice	0.173	0.251	0.004
APXVSPP18-C-A20 w/ Mount Pipe (P)	C	From Leg		4.000		0.000	148.000	No Ice	8.498	6.946	0.083
				0.000				1/2" Ice	9.149	8.127	0.148
				2.000				1" Ice	9.767	9.021	0.225
APXVSPP18-C-A20 w/ Mount Pipe (P)	B	From Leg		4.000		0.000	148.000	No Ice	8.498	6.946	0.083
				0.000				1/2" Ice	9.149	8.127	0.148
				2.000				1" Ice	9.767	9.021	0.225
APXVSPP18-C-A20 w/ Mount Pipe (P)	A	From Leg		4.000		0.000	148.000	No Ice	8.498	6.946	0.083
				0.000				1/2" Ice	9.149	8.127	0.148
				2.000				1" Ice	9.767	9.021	0.225
6' x 2" Mount Pipe (E)	C	From Leg		4.000		0.000	148.000	No Ice	1.425	1.425	0.022
				0.000				1/2" Ice	1.925	1.925	0.033
				0.000				1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe (E)	B	From Leg		4.000		0.000	148.000	No Ice	1.425	1.425	0.022
				0.000				1/2" Ice	1.925	1.925	0.033
				0.000				1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe (E)	A	From Leg		4.000		0.000	148.000	No Ice	1.425	1.425	0.022
				0.000				1/2" Ice	1.925	1.925	0.033
				0.000				1" Ice	2.294	2.294	0.048
Platform Mount [LP 1001-1] (E)	C	None				0.000	148.000	No Ice	47.700	47.700	3.017
								1/2" Ice	59.500	59.500	3.621
								1" Ice	71.300	71.300	4.225
****											
742 213 w/ Mount Pipe (E)	C	From Leg		4.000		0.000	137.000	No Ice	5.373	4.620	0.049
				0.000				1/2" Ice	5.950	6.000	0.091
				1.000				1" Ice	6.501	6.982	0.144
742 213 w/ Mount Pipe (E)	B	From Leg		4.000		0.000	137.000	No Ice	5.373	4.620	0.049
				0.000				1/2" Ice	5.950	6.000	0.091
				1.000				1" Ice	6.501	6.982	0.144
742 213 w/ Mount Pipe (E)	A	From Leg		4.000		0.000	137.000	No Ice	5.373	4.620	0.049
				0.000				1/2" Ice	5.950	6.000	0.091
				1.000				1" Ice	6.501	6.982	0.144
****											
OG-860/1920/GPS-A (E)	A	From Leg		4.000		0.000	118.000	No Ice	0.329	0.404	0.002
				0.000				1/2" Ice	0.434	0.514	0.005
				2.000				1" Ice	0.548	0.632	0.010
Side Arm Mount [SO 701-1] (E)	A	From Leg		0.000		0.000	118.000	No Ice	0.850	1.670	0.065
				0.000				1/2" Ice	1.140	2.340	0.079
				0.000				1" Ice	1.430	3.010	0.093
****											
DB225-2-D (E)	B	From Leg		4.000		0.000	86.000	No Ice	2.320	2.320	0.056
				0.000				1/2" Ice	4.176	4.176	0.073
				-0.500				1" Ice	6.032	6.032	0.090
Pipe Mount [PM 601-1] (E)	B	From Leg		0.000		0.000	86.000	No Ice	3.000	0.900	0.065
				0.000				1/2" Ice	3.740	1.120	0.079
				0.000				1" Ice	4.480	1.340	0.093
****											
DB225-2-D	A	From Leg		4.000		0.000	75.000	No Ice	2.320	2.320	0.056

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0.000			1/2" Ice	4.176	4.176	0.073
			0.000			1" Ice	6.032	6.032	0.090
Pipe Mount [PM 601-1]	A	From Leg	0.000	0.000	75.000	No Ice	3.000	0.900	0.065
(E)			0.000			1/2" Ice	3.740	1.120	0.079
			0.000			1" Ice	4.480	1.340	0.093
****									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service

Comb. No.	Description
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 120	Pole	Max Tension	30	0.000	0.001	-0.000
			Max. Compression	26	-17.428	0.619	0.938
			Max. Mx	20	-8.616	308.034	0.314
			Max. My	2	-8.617	0.256	308.068
			Max. Vy	20	-12.172	308.034	0.314
			Max. Vx	2	-12.172	0.256	308.068
			Max. Torque	18			-0.000
L2	120 - 80	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-32.172	0.991	2.611
			Max. Mx	20	-19.065	892.211	1.146
			Max. My	2	-19.068	0.660	890.163
			Max. Vy	20	-17.007	892.211	1.146
			Max. Vx	2	-16.890	0.660	890.163
			Max. Torque	14			0.717
L3	80 - 40	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-50.555	2.350	5.763
			Max. Mx	20	-32.613	1683.861	4.610
			Max. My	2	-32.613	3.413	1681.989
			Max. Vy	20	-22.252	1683.861	4.610
			Max. Vx	2	-22.254	3.413	1681.989
			Max. Torque	11			1.018
L4	40 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-73.259	3.569	7.708
			Max. Mx	20	-50.925	2665.385	7.491
			Max. My	2	-50.925	6.141	2663.728
			Max. Vy	20	-26.550	2665.385	7.491
			Max. Vx	2	-26.552	6.141	2663.728
			Max. Torque	11			1.017

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	73.259	0.000	0.000
	Max. H_x	20	50.934	26.532	0.053
	Max. H_z	2	50.934	0.053	26.534
	Max. M_x	2	2663.728	0.053	26.534
	Max. M_z	8	2662.293	-26.532	-0.053
	Max. Torsion	11	1.017	-23.004	-13.313
	Min. Vert	7	38.201	-22.951	13.221
	Min. H_x	8	50.934	-26.532	-0.053

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. H_z	14	50.934	-0.053	-26.534
	Min. M_x	14	-2657.936	-0.053	-26.534
	Min. M_z	20	-2665.385	26.532	0.053
	Min. Torsion	23	-1.017	23.004	13.313

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	42.445	0.000	0.000	-2.362	1.263	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	50.934	-0.053	-26.534	-2663.728	6.141	0.716
0.9 Dead+1.6 Wind 0 deg - No Ice	38.201	-0.053	-26.534	-2649.253	5.731	0.713
1.2 Dead+1.6 Wind 30 deg - No Ice	50.934	13.360	-23.194	-2338.294	-1345.647	0.241
0.9 Dead+1.6 Wind 30 deg - No Ice	38.201	13.360	-23.194	-2325.479	-1339.065	0.237
1.2 Dead+1.6 Wind 60 deg - No Ice	50.934	22.951	-13.221	-1329.336	-2303.111	-0.300
0.9 Dead+1.6 Wind 60 deg - No Ice	38.201	22.951	-13.221	-1321.745	-2291.594	-0.303
1.2 Dead+1.6 Wind 90 deg - No Ice	50.934	26.532	0.053	1.696	-2662.293	-0.760
0.9 Dead+1.6 Wind 90 deg - No Ice	38.201	26.532	0.053	2.415	-2648.924	-0.762
1.2 Dead+1.6 Wind 120 deg - No Ice	50.934	23.004	13.313	1331.497	-2307.703	-1.017
0.9 Dead+1.6 Wind 120 deg - No Ice	38.201	23.004	13.313	1325.348	-2296.168	-1.017
1.2 Dead+1.6 Wind 150 deg - No Ice	50.934	13.312	23.005	2303.748	-1334.352	-1.001
0.9 Dead+1.6 Wind 150 deg - No Ice	38.201	13.312	23.005	2292.577	-1327.848	-0.999
1.2 Dead+1.6 Wind 180 deg - No Ice	50.934	0.053	26.534	2657.936	-3.046	-0.716
0.9 Dead+1.6 Wind 180 deg - No Ice	38.201	0.053	26.534	2644.934	-3.421	-0.714
1.2 Dead+1.6 Wind 210 deg - No Ice	50.934	-13.360	23.194	2332.499	1348.742	-0.240
0.9 Dead+1.6 Wind 210 deg - No Ice	38.201	-13.360	23.194	2321.158	1341.375	-0.237
1.2 Dead+1.6 Wind 240 deg - No Ice	50.934	-22.951	13.221	1323.540	2306.205	0.301
0.9 Dead+1.6 Wind 240 deg - No Ice	38.201	-22.951	13.221	1317.423	2293.902	0.304
1.2 Dead+1.6 Wind 270 deg - No Ice	50.934	-26.532	-0.053	-7.491	2665.385	0.760
0.9 Dead+1.6 Wind 270 deg - No Ice	38.201	-26.532	-0.053	-6.736	2651.231	0.762
1.2 Dead+1.6 Wind 300 deg - No Ice	50.934	-23.004	-13.313	-1337.289	2310.795	1.016
0.9 Dead+1.6 Wind 300 deg - No Ice	38.201	-23.004	-13.313	-1329.668	2298.475	1.017
1.2 Dead+1.6 Wind 330 deg - No Ice	50.934	-13.312	-23.005	-2309.540	1337.445	1.000

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.6 Wind 330 deg - No Ice	38.201	-13.312	-23.005	-2296.896	1330.156	0.999
1.2 Dead+1.0 Ice+1.0 Temp	73.259	-0.000	-0.000	-7.708	3.569	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	73.259	-0.014	-7.344	-716.628	4.837	0.352
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	73.259	3.778	-6.553	-649.124	-366.602	0.148
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	73.259	6.357	-3.660	-361.218	-610.787	-0.096
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	73.259	7.349	0.014	-6.684	-706.529	-0.314
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	73.259	6.371	3.684	347.531	-611.982	-0.448
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	73.259	3.686	6.367	606.513	-352.479	-0.462
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	73.259	0.014	7.344	700.870	2.446	-0.352
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	73.259	-3.778	6.553	633.365	373.885	-0.148
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	73.259	-6.357	3.660	345.460	618.070	0.096
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	73.259	-7.349	-0.014	-9.074	713.812	0.314
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	73.259	-6.371	-3.684	-363.288	619.265	0.448
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	73.259	-3.686	-6.367	-622.271	359.762	0.462
Dead+Wind 0 deg - Service	42.445	-0.010	-4.845	-486.720	2.122	0.131
Dead+Wind 30 deg - Service	42.445	2.440	-4.235	-427.487	-243.926	0.044
Dead+Wind 60 deg - Service	42.445	4.191	-2.414	-243.839	-418.198	-0.055
Dead+Wind 90 deg - Service	42.445	4.845	0.010	-1.570	-483.576	-0.139
Dead+Wind 120 deg - Service	42.445	4.200	2.431	240.475	-419.035	-0.186
Dead+Wind 150 deg - Service	42.445	2.431	4.201	417.439	-241.870	-0.183
Dead+Wind 180 deg - Service	42.445	0.010	4.845	481.907	0.448	-0.131
Dead+Wind 210 deg - Service	42.445	-2.440	4.235	422.674	246.496	-0.044
Dead+Wind 240 deg - Service	42.445	-4.191	2.414	239.025	420.768	0.055
Dead+Wind 270 deg - Service	42.445	-4.845	-0.010	-3.243	486.145	0.139
Dead+Wind 300 deg - Service	42.445	-4.200	-2.431	-245.288	421.605	0.186
Dead+Wind 330 deg - Service	42.445	-2.431	-4.201	-422.253	244.440	0.183

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.000	-42.445	0.000	0.000	42.445	0.000	0.000%
2	-0.053	-50.934	-26.534	0.053	50.934	26.534	0.000%
3	-0.053	-38.201	-26.534	0.053	38.201	26.534	0.000%
4	13.360	-50.934	-23.194	-13.360	50.934	23.194	0.000%
5	13.360	-38.201	-23.194	-13.360	38.201	23.194	0.000%
6	22.951	-50.934	-13.221	-22.951	50.934	13.221	0.000%
7	22.951	-38.201	-13.221	-22.951	38.201	13.221	0.000%
8	26.532	-50.934	0.053	-26.532	50.934	-0.053	0.000%
9	26.532	-38.201	0.053	-26.532	38.201	-0.053	0.000%
10	23.004	-50.934	13.313	-23.004	50.934	-13.313	0.000%
11	23.004	-38.201	13.313	-23.004	38.201	-13.313	0.000%
12	13.312	-50.934	23.005	-13.312	50.934	-23.005	0.000%
13	13.312	-38.201	23.005	-13.312	38.201	-23.005	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
14	0.053	-50.934	26.534	-0.053	50.934	-26.534	0.000%
15	0.053	-38.201	26.534	-0.053	38.201	-26.534	0.000%
16	-13.360	-50.934	23.194	13.360	50.934	-23.194	0.000%
17	-13.360	-38.201	23.194	13.360	38.201	-23.194	0.000%
18	-22.951	-50.934	13.221	22.951	50.934	-13.221	0.000%
19	-22.951	-38.201	13.221	22.951	38.201	-13.221	0.000%
20	-26.532	-50.934	-0.053	26.532	50.934	0.053	0.000%
21	-26.532	-38.201	-0.053	26.532	38.201	0.053	0.000%
22	-23.004	-50.934	-13.313	23.004	50.934	13.313	0.000%
23	-23.004	-38.201	-13.313	23.004	38.201	13.313	0.000%
24	-13.312	-50.934	-23.005	13.312	50.934	23.005	0.000%
25	-13.312	-38.201	-23.005	13.312	38.201	23.005	0.000%
26	0.000	-73.259	0.000	0.000	73.259	0.000	0.000%
27	-0.014	-73.259	-7.344	0.014	73.259	7.344	0.000%
28	3.778	-73.259	-6.553	-3.778	73.259	6.553	0.000%
29	6.357	-73.259	-3.660	-6.357	73.259	3.660	0.000%
30	7.349	-73.259	0.014	-7.349	73.259	-0.014	0.000%
31	6.371	-73.259	3.684	-6.371	73.259	-3.684	0.000%
32	3.686	-73.259	6.367	-3.686	73.259	-6.367	0.000%
33	0.014	-73.259	7.344	-0.014	73.259	-7.344	0.000%
34	-3.778	-73.259	6.553	3.778	73.259	-6.553	0.000%
35	-6.357	-73.259	3.660	6.357	73.259	-3.660	0.000%
36	-7.349	-73.259	-0.014	7.349	73.259	0.014	0.000%
37	-6.371	-73.259	-3.684	6.371	73.259	3.684	0.000%
38	-3.686	-73.259	-6.367	3.686	73.259	6.367	0.000%
39	-0.010	-42.445	-4.845	0.010	42.445	4.845	0.000%
40	2.440	-42.445	-4.235	-2.440	42.445	4.235	0.000%
41	4.191	-42.445	-2.414	-4.191	42.445	2.414	0.000%
42	4.845	-42.445	0.010	-4.845	42.445	-0.010	0.000%
43	4.200	-42.445	2.431	-4.200	42.445	-2.431	0.000%
44	2.431	-42.445	4.201	-2.431	42.445	-4.201	0.000%
45	0.010	-42.445	4.845	-0.010	42.445	-4.845	0.000%
46	-2.440	-42.445	4.235	2.440	42.445	-4.235	0.000%
47	-4.191	-42.445	2.414	4.191	42.445	-2.414	0.000%
48	-4.845	-42.445	-0.010	4.845	42.445	0.010	0.000%
49	-4.200	-42.445	-2.431	4.200	42.445	2.431	0.000%
50	-2.431	-42.445	-4.201	2.431	42.445	4.201	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00004400
3	Yes	4	0.00000001	0.00002703
4	Yes	5	0.00000001	0.00002974
5	Yes	4	0.00000001	0.00078304
6	Yes	5	0.00000001	0.00002870
7	Yes	4	0.00000001	0.00075610
8	Yes	4	0.00000001	0.00004884
9	Yes	4	0.00000001	0.00002997
10	Yes	5	0.00000001	0.00002786
11	Yes	4	0.00000001	0.00073455
12	Yes	5	0.00000001	0.00002915
13	Yes	4	0.00000001	0.00076880
14	Yes	4	0.00000001	0.00004926
15	Yes	4	0.00000001	0.00003081
16	Yes	5	0.00000001	0.00002937

17	Yes	4	0.00000001	0.00077381
18	Yes	5	0.00000001	0.00002821
19	Yes	4	0.00000001	0.00074376
20	Yes	4	0.00000001	0.00005468
21	Yes	4	0.00000001	0.00003402
22	Yes	5	0.00000001	0.00002940
23	Yes	4	0.00000001	0.00077396
24	Yes	5	0.00000001	0.00002806
25	Yes	4	0.00000001	0.00073874
26	Yes	4	0.00000001	0.00000857
27	Yes	4	0.00000001	0.00066612
28	Yes	4	0.00000001	0.00073623
29	Yes	4	0.00000001	0.00069384
30	Yes	4	0.00000001	0.00065540
31	Yes	4	0.00000001	0.00068317
32	Yes	4	0.00000001	0.00068196
33	Yes	4	0.00000001	0.00064874
34	Yes	4	0.00000001	0.00072460
35	Yes	4	0.00000001	0.00068913
36	Yes	4	0.00000001	0.00066306
37	Yes	4	0.00000001	0.00070310
38	Yes	4	0.00000001	0.00070257
39	Yes	4	0.00000001	0.00000451
40	Yes	4	0.00000001	0.00001079
41	Yes	4	0.00000001	0.00001048
42	Yes	4	0.00000001	0.00000454
43	Yes	4	0.00000001	0.00000963
44	Yes	4	0.00000001	0.00001089
45	Yes	4	0.00000001	0.00000447
46	Yes	4	0.00000001	0.00001042
47	Yes	4	0.00000001	0.00000996
48	Yes	4	0.00000001	0.00000458
49	Yes	4	0.00000001	0.00001122
50	Yes	4	0.00000001	0.00000993

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	7.859	40	0.502	0.000
L2	120 - 80	4.925	40	0.389	0.000
L3	80 - 40	2.156	40	0.249	0.000
L4	40 - 0	0.548	40	0.122	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.000	(2) FV65-14-00NA2 w/ Mount Pipe	40	7.653	0.494	0.000	68765
137.000	742 213 w/ Mount Pipe	40	6.532	0.452	0.000	26448
118.000	OG-860/1920/GPS-A	40	4.753	0.382	0.000	11794
86.000	DB225-2-D	40	2.491	0.269	0.000	17579
75.000	DB225-2-D	40	1.893	0.232	0.000	18582

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	43.082	4	2.751	0.001
L2	120 - 80	27.000	4	2.133	0.001
L3	80 - 40	11.816	4	1.364	0.001
L4	40 - 0	3.005	4	0.667	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.000	(2) FV65-14-00NA2 w/ Mount Pipe	4	41.952	2.709	0.001	12590
137.000	742 213 w/ Mount Pipe	4	35.810	2.481	0.001	4841
118.000	OG-860/1920/GPS-A	4	26.054	2.093	0.001	2157
86.000	DB225-2-D	4	13.656	1.475	0.001	3209
75.000	DB225-2-D	4	10.379	1.274	0.001	3391

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 120 (1)	P24x3/8	30.000	0.000	0.0	27.833	-8.599	876.725	0.010
L2	120 - 80 (2)	P36x1/2	40.000	0.000	0.0	55.763	-19.055	1756.540	0.011
L3	80 - 40 (3)	P48x1/2	40.000	0.000	0.0	74.613	-32.607	2335.680	0.014
L4	40 - 0 (4)	P54x5/8	40.000	0.000	0.0	104.802	-50.925	3301.250	0.015

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 120 (1)	P24x3/8	312.208	538.742	0.580	0.000	538.742	0.000
L2	120 - 80 (2)	P36x1/2	905.983	1586.550	0.571	0.000	1586.550	0.000
L3	80 - 40 (3)	P48x1/2	1707.058	2713.100	0.629	0.000	2713.100	0.000
L4	40 - 0 (4)	P54x5/8	2697.850	4349.317	0.620	0.000	4349.317	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 120 (1)	P24x3/8	12.456	438.363	0.028	0.000	849.758	0.000
L2	120 - 80 (2)	P36x1/2	17.160	878.272	0.020	0.679	2562.642	0.000
L3	80 - 40 (3)	P48x1/2	22.492	1167.840	0.019	0.241	4575.067	0.000
L4	40 - 0 (4)	P54x5/8	26.785	1650.620	0.016	0.241	7257.858	0.000

Pole Interaction Design Data

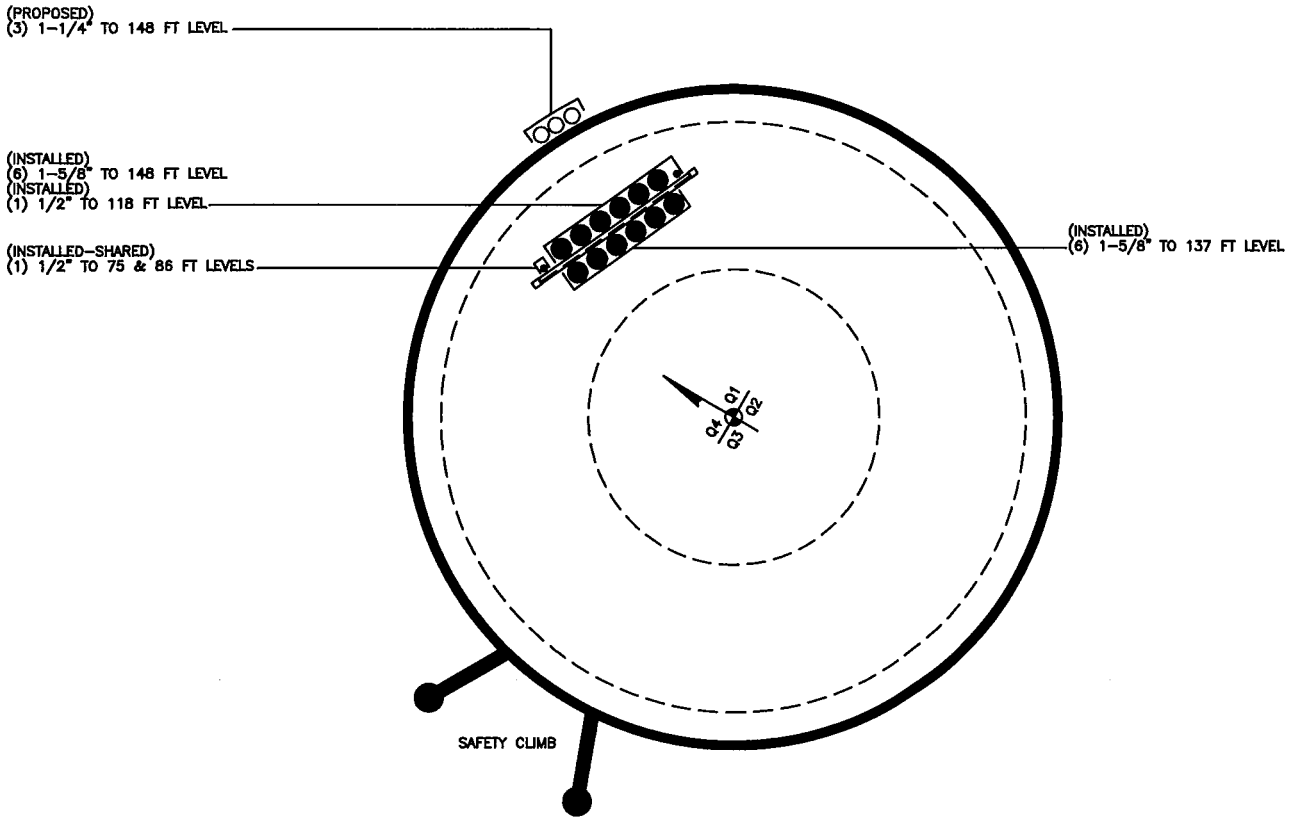
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 120 (1)	0.010	0.580	0.000	0.028	0.000	0.590 ✔	1.000	4.8.2 ✔
L2	120 - 80 (2)	0.011	0.571	0.000	0.020	0.000	0.582 ✔	1.000	4.8.2 ✔
L3	80 - 40 (3)	0.014	0.629	0.000	0.019	0.000	0.644 ✔	1.000	4.8.2 ✔
L4	40 - 0 (4)	0.015	0.620	0.000	0.016	0.000	0.636 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 120	Pole	P24x3/8	1	-8.599	876.725	59.0	Pass
L2	120 - 80	Pole	P36x1/2	2	-19.055	1756.540	58.2	Pass
L3	80 - 40	Pole	P48x1/2	3	-32.607	2335.680	64.4	Pass
L4	40 - 0	Pole	P54x5/8	4	-50.925	3301.250	63.6	Pass
						Summary	ELC:	Intrim
						Pole (L3)	64.4	Pass
						Rating =	64.4	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876318 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Reactions		
Mu	312.208	ft-kips
Axial, Pu:	8.599	kips
Shear, Vu:	12.456	kips
Elevation:	120	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
21.87

Pole Manufacturer:	Other

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	24		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle (in.):	29.5		

Plate Data		
Diam:	34.75	in
Thick, t:	1.875	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.14	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	24	in
Thick:	0.375	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn,**B1**:	30.06	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	30.05	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	20.81	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.319	in	
Min PL "treq" for actual **T w/ Pry**:	0.832	in	
Min PL "t1" for actual **T w/o Pry**:	1.097	in	
T allowable w/o Prying:	30.06	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	20.81	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	69.2%	Pass	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	12.0	ksi	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	37.2%	Pass	Comp. Y.L. Length:
No Prying			17.15
Tension Side Stress Ratio, (treq/t)^2:	19.7%	Pass	

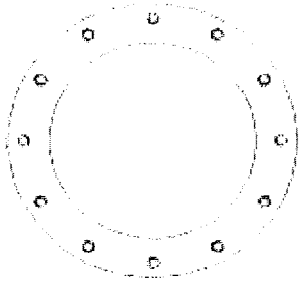
n/a

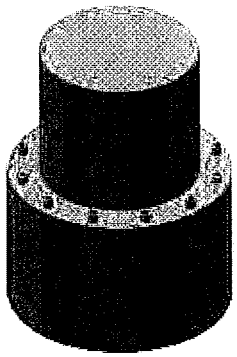
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Manufacturer:	Other

Reactions		
Moment:	312.208	ft-kips
Axial:	8.599	kips
Shear:	12.456	kips
Exterior Flange Run, T+q:	20.81	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
21.87

Elevation: 120 feet

Bolt Data			
Qty:	24		
Diam:	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle:	29.5	in	

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	20.8	Kips, Ext. Flange Tu+q
Adjusted φ*Tn (due to Vu=Vu/Qty),	30.1	Kips
Bolt Stress Ratio:	69.2%	Pass

Plate Data		
Plate Outer Diam:	35	in
Plate Inner Diam:	24.25	in (Hole @ Ctr)
Thick:	1.875	in
Grade:	36	ksi
Effective Width:	4.58	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	21.5	Kips, Ext. Cu=Interior Cu
Plate Stress:	14.7	ksi
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	45.4%	Pass

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

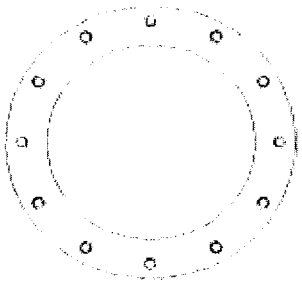
Stiffener Results

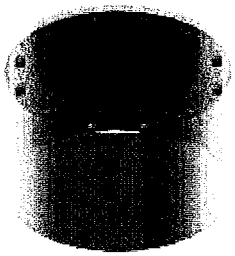
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	36	in
Thick:	0.5	in
Pole Inner Diam:	35	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Reactions		
Mu	905.983	ft-kips
Axial, Pu:	19.055	kips
Shear, Vu:	17.16	kips
Elevation:	80	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
21.87

Pole Manufacturer:	Other

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	52		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle (in.):	41.5		

Plate Data		
Diam:	46.75	in
Thick, t:	2.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	2.17	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	36	in
Thick:	0.5	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	30.06	kips	Rigid
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	30.06	kips	φ*Tn
Max Bolt directly applied Tu:	19.79	Kips	φTn[(1-(Vu/φVn)^2]^0.5
Min. PL "tc" for **B** cap. **w/o** Pry:	1.585	in	
Min PL "treq" for actual **T w/ Pry**:	1.008	in	
Min PL "t1" for actual **T w/o Pry**:	1.286	in	
T allowable w/o Prying:	30.06	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	19.79	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	65.8%	**Pass**	

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	9.8	ksi	Rigid
Allowable Plate Stress:	32.4	ksi	TIA G
Compression Plate Stress Ratio:	30.2%	**Pass**	φ*Fy
No Prying			Comp. Y.L. Length:
Tension Side Stress Ratio, (treq/t)^2:	16.3%	**Pass**	20.65

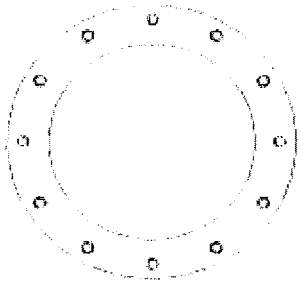
n/a

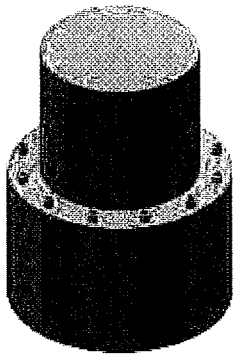
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Manufacturer:	Other

Reactions		
Moment:	905.983	ft-kips
Axial:	19.055	kips
Shear:	17.16	kips
Exterior Flange Run, T+q:	19.79	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
21.87

Elevation: 80 feet

Bolt Data			
Qty:	52		
Diam:	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle:	41.5	in	

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	19.8 Kips, Ext. Flange Tu+q
Adjusted φ*Tn (due to Vu=Vu/Qty),	30.1 Kips
Bolt Stress Ratio:	65.8% Pass

Plate Data		
Plate Outer Diam:	47	in
Plate Inner Diam:	36.25	in (Hole @ Ctr)
Thick:	2.5	in
Grade:	36	ksi
Effective Width:	2.84	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	20.5 Kips, Ext. Cu=Interior Cu
Plate Stress:	12.7 ksi
Allowable Plate Stress, φ*Fy:	32.4 ksi
Plate Stress Ratio:	39.3% Pass

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

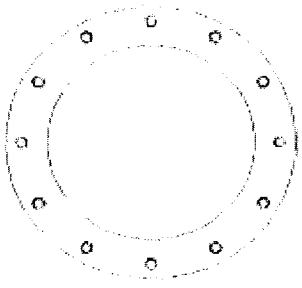
Stiffener Results

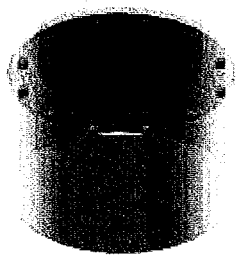
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check:	n/a

Pole Data		
Pole OuterDiam:	48	in
Thick:	0.5	in
Pole Inner Diam:	47	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Reactions		
Mu	1707.058	ft-kips
Axial, Pu:	32.607	kips
Shear, Vu:	22.492	kips
Elevation:	40	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Other

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	40		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle (in.):	50.375		

Plate Data		
Diam:	52.5	in
Thick, t:	2.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	48	in
Thick:	0.5	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.53	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	39.85	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	0.873	in	
Min PL "treq" for actual **T w/ Pry**:	0.569	in	
Min PL "t1" for actual **T w/o Pry**:	0.746	in	
T allowable w/o Prying:	54.54	kips	q'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	39.85	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	73.1%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	6.8	ksi	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	21.0%	**Pass**	Comp. Y.L. Length:
No Prying			15.29
Tension Side Stress Ratio, (treq/t)^2:	6.4%	**Pass**	

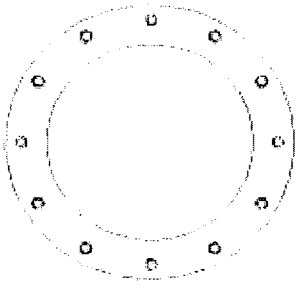
n/a

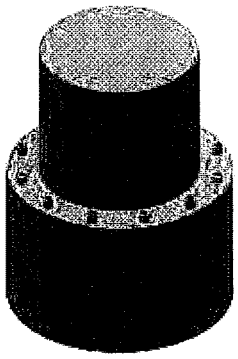
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Manufacturer:	Other

Reactions		
Moment:	1707.058	ft-kips
Axial:	32.607	kips
Shear:	22.492	kips
Exterior Flange Run, T+q:	39.85	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Elevation: 40 feet

Bolt Data			
Qty:	40		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle:	50.375	in	

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	39.9	Kips, Ext. Flange Tu+q
Adjusted φ*Tn (due to Vu=Vu/Qty),	54.5	Kips
Bolt Stress Ratio:	73.1%	**Pass**

Plate Data		
Plate Outer Diam:	52.75	in
Plate Inner Diam:	48.25	in (Hole @ Ctr)
Thick:	2.25	in
Grade:	36	ksi
Effective Width:	4.14	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	41.5	Kips, Ext. Cu=Interior Cu
Plate Stress:	9.4	ksi
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	29.0%	**Pass**

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

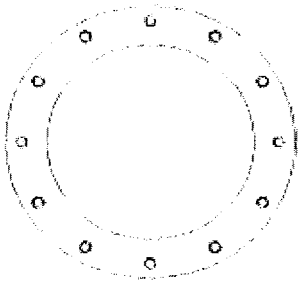
Stiffener Results

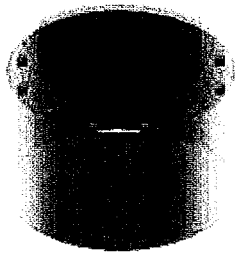
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	54	in
Thick:	0.625	in
Pole Inner Diam:	52.75	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Pole Manufacturer:	*Other*

Anchor Rod Data		
Qty:	32	
Diam:	2	in
Rod Material:	Other	
Strength (Fu):	58	ksi
Yield (Fy):	36	ksi
Bolt Circle:	60	in

Plate Data		
Diam:	66	in
Thick:	3.25	in
Grade:	36	ksi
Single-Rod B-eff:	5.30	in

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	54	in
Thick:	0.625	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions		
Mu:	2698	ft-kips
Axial, Pu:	51	kips
Shear, Vu:	27	kips
Eta Factor, η	0.55	TIA G (Fig. 4-4)

If No stiffeners, Criteria:	AISC LRFD	<-Only Applcable to Unstiffened Cases

Anchor Rod Results

Max Rod (Cu+ Vu/ń):	70.6 Kips	Rigid
Allowable Axial, Φ*Fu*Anet:	116.0 Kips	AISC LRFD
Anchor Rod Stress Ratio:	60.8% Pass	φ*Tn

Base Plate Results Flexural Check

Base Plate Stress:	9.1 ksi	Rigid
Allowable Plate Stress:	32.4 ksi	AISC LRFD
Base Plate Stress Ratio:	28.0% Pass	φ*Fy
		Y.L. Length: 26.15

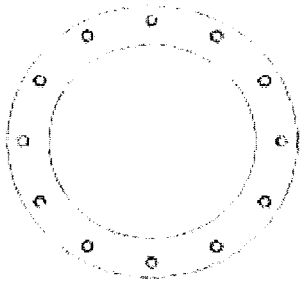
n/a

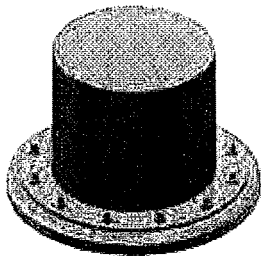
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

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B&T Engineering

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*****************************************************************************************
*                                                                                       *
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*                                                                                       *
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Project Title: 84704.001 - RIMMON ST, CT (BU# 876318)
Project Notes: 150' Pitttsburg Monopole- 7.5' Dia, 18' Depth (17.5' Bearing)

Calculation Method: Full 8CD

******* I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
7.50	0.50		

Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Clay	3.75	0.00	115.0			
2	Sand	2.25	3.75	115.0		3.000	30.00
3	Sand	11.00	6.00	125.0		3.852	36.00

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure	
2698.0	51.0	27.00	1.45	≥ 1.333 (F.S.), Soil Interaction = (1.333/1.45)× 100% = 91.9%

******* R E S U L T S

Calculated Pier Properties

Length (ft)	Weight (kips)	End Bearing Pressure (psf)
18.000	119.282	1154.4

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)
Clay	0.50	3.75	115.0			0.00	2.38
Sand	4.25	2.25	115.0		3.000	85.14	5.46
Sand	6.50	6.96	125.0		3.852	679.25	10.43
Sand	13.46	4.54	125.0		3.852	-724.80	15.85

Shear and Moments Along Pier

Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)
0.00	39.6	3936.4	27.3	2714.8
1.80	39.6	4007.7	27.3	2763.9
3.60	39.6	4079.0	27.3	2813.1
5.40	1.0	4129.0	0.7	2847.6
7.20	-90.1	4058.2	-62.1	2798.8
9.00	-228.9	3776.4	-157.9	2604.4
10.80	-402.8	3213.1	-277.8	2216.0
12.60	-611.9	2305.2	-422.0	1589.8
14.40	-593.6	1110.6	-409.4	765.9
16.20	-314.3	288.2	-216.8	198.7
18.00	0.0	0.0	0.0	0.0

M_{MAX} = 2847.985 Kip-ft (Moment for DSMC sheet)

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Loads Already Factored		
For M (WL)		<----Disregard
For P (DL)		<----Disregard

Maximum Shaft Superimposed Forces		
TIA Revision:	G	
Max. Factored Shaft Mu:	2847.985	ft-kips (* Note)
Max. Factored Shaft Pu:	51	kips
Max Axial Force Type:	Comp.	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Load Factor	Shaft Factored Loads		
1.00	Mu:	2847.985	ft-kips
1.00	Pu:	51	kips

Pier Properties		
Concrete:		
Pier Diameter =	7.5	ft
Concrete Area =	6361.7	in^2
Reinforcement:		
Clear Cover to **Tie**=	4.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	6.61	ft
Vert. Cage Diameter =	79.34	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	21	
As Total=	32.76	in^2
A s/ Aconc, Rho:	0.0051	0.51%

Material Properties		
Concrete Comp. strength, f'c =	4000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	
ACI 318 Code		
Select Analysis ACI Code=	2008	
Seismic Properties		
Seismic Design Category =	D	
Seismic Risk =	**High**	

Solve (Run) <-- Press Upon Completing All Input

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy:	0.0032	
200 / Fy:	0.0033	
IBC 1810.1.2:	0.0050	SDC D, E, or F
Governing:	0.0050	**0.50%**

ACI 10.8 and 10.9
Min As for Columns, Comp. Controlled, Shafts:

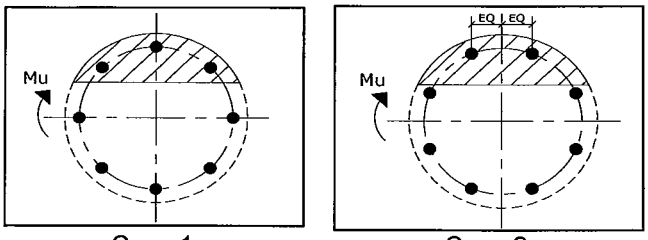
Min As:	0.0100	**1.00%**

Minimum Rho Check:

Actual Req'd Min. Rho:	0.50%	Flexural
Provided Rho:	0.51%	OK

Results:

Governing Orientation Case: **2**



Case 1 Case 2

Dist. From Edge to Neutral Axis: **12.07** in
Extreme Steel Strain, ϵt: **0.0180**
ϵt > 0.0050, Tension Controlled
Reduction Factor, φ: **0.900**

<-- Comment Box

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	12211.72	kips
at Mu=(ϕ=0.65)Mn=	7970.64	ft-kips
Max Tu, (φ=0.9) Tn =	1769.04	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	51.00	kips
Drilled Shaft Moment Capacity, φMn:	**5775.64**	ft-kips
Drilled Shaft Superimposed Mu:	**2847.99**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**49.31%**

June 06, 2012

Ms. Marianne Dunst
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6580

B&T Engineering, Inc.
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
ctuttle@btengineering.com

Subject: **Structural Analysis Report**

Carrier Designation:

***Sprint* Co-Locate**
Carrier Site Number: CT03XC034
Carrier Site Name: N/A

Crown Castle Designation:

Crown Castle BU Number: 876318
Crown Castle Site Name: Rimmon ST.
Crown Castle JDE Job Number: 188920
Crown Castle Work Order Number: 498910
Crown Castle Application Number: 151462 Rev. 0

Engineering Firm Designation:

B&T Engineering, Inc. Project Number: 84704.001

Site Data:

34 Rimmon Street, Seymour, New Haven County, CT
Latitude *41° 24' 7.93"*, Longitude *-73° 4' 20.16"*
150 Foot - Monopole Tower

Dear Ms. Dunst,

B&T Engineering, Inc. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned 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 467683, in accordance with application 151462, 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:

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing loading, respectively.

The analysis has been performed in accordance with the TIA-222-G standard and the 2005 Connecticut State Building Code based upon a wind speed of 105 mph 3-second gust, exposure category C with topographic category 1 and crest height of 0 feet.

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

Respectfully submitted by:

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
6/6/12

Raul Ortiz Jr., E.I.T.
Project Engineer

Chad E. Tuttle, P.E
President

tnxTower Report - version 6.0.4.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft. Monopole tower designed by Pittsburg Monopole in December of 1996. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 105 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category C with topographic category 1 and crest height of 0 feet.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
148.0	150.0	3	Alcatel Lucent	1900MHz RRH (65MHz)	3	1 1/4	1
		3	Alcatel Lucent	800 EXTERNAL NOTCH FILTER			
		3	Alcatel Lucent	800MHZ RRH			
		9	Rfs Celwave	ACU-A20-N			
		3	Rfs Celwave	APXVSPP18-C-A20			

Notes:
1) Handrails Added to Existing Platform

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
148.0	148.0	**6**	**Ems Wireless**	**FV65-14-00NA2**	**6**	**1 5/8**	**2**
		1	--	Platform Mount [LP 1001-1]	--	--	1
137.0	138.0	3	Kathrein	742 213	6	1 5/8	1
118.0	120.0	1	Kathrein	OG-860/1920/GPS-A	1	1/2	1
	118.0	1	--	Side Arm Mount [SO 701-1]			
86.0	86.0	1	--	Pipe Mount [PM 601-1]	1	1/2	1
	85.5	1	Decibel	DB225-2-D			
75.0	75.0	1	Decibel	DB225-2-D	--	--	1
		1	--	Pipe Mount [PM 601-1]			

Notes:
1) Existing Equipment
2) Equipment To Be Removed

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150	150	12	--	4 SQ FT	--	--
		1	--	Platform		
130	130	12	--	4 SQ FT	--	--
		1	--	Platform		
110	110	12	--	4 SQ FT	--	--
		1	--	Platform		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Sprint Co-Locate Revision# 0	151462	CCI Sites
Tower Manufacturing Drawings	Pittsburg, Job no. 96088-152	1619418	CCI Sites
Foundation Drawings	Pittsburg, Job no. 96088-152	1620580	CCI Sites
Geotechnical Report	Soil Report, Site: CT03XC034D	1619384	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 05/30/2012	CCI Sites

3.1) Analysis Method

tnxTower (version 6.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. 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 specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Mount areas and weights are assumed based on photographs provided.

This analysis may be affected if any assumptions are not valid or have been made in error. B&T Engineering, Inc. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 120	Pole	P24x3/8	1	-8.287	876.725	44.2	Pass
L2	120 - 80	Pole	P36x1/2	2	-18.460	1756.540	46.0	Pass
L3	80 - 40	Pole	P48x1/2	3	-31.718	2335.680	53.0	Pass
L4	40 - 0	Pole	P54x5/8	4	-49.759	3301.250	53.9	Pass
							Summary	
						Pole (L4)	53.9	Pass
						Rating =	**53.9**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	51.6	Pass
1	Base Plate	Base	23.8	Pass
1	Flange Connection	120	51.4	Pass
1	Flange Connection	80	51.6	Pass
1	Flange Connection	40	59.7	Pass
1	Base Foundation	Base	78.4	Pass

Structure Rating (max from all components) =	78.4%

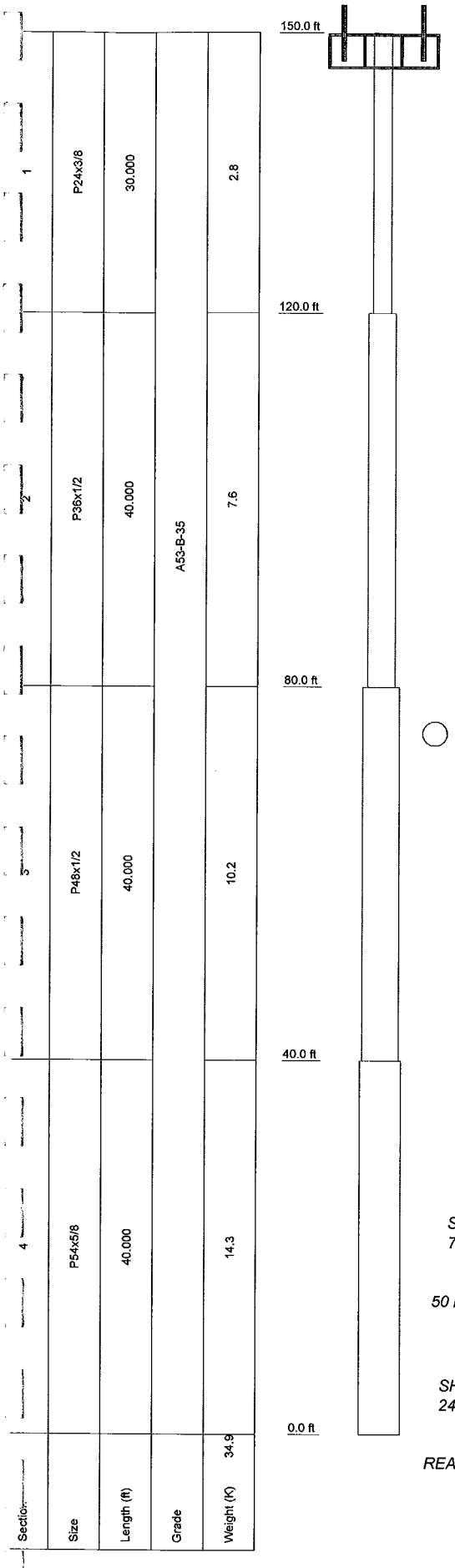
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Capacities up to 100% are considered acceptable based on analysis methods used.

4.1) Recommendations

N/A

APPENDIX A

TNXTOWER OUTPUT



ALL REACTIONS ARE FACTORED

AXIAL 71 K

SHEAR 7 K *MOMENT 666 kip-ft*

TORQUE 0 kip-ft
50 mph WIND - 0.750 in ICE

AXIAL 50 K

SHEAR 24 K *MOMENT 2279 kip-ft*

TORQUE 1 kip-ft
REACTIONS - 105 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
1900MHz RRH (65MHz) (P)	148	APXVSPP18-C-A20 w/ Mount Pipe (P)	148
1900MHz RRH (65MHz) (P)	148	6' x 2" Mount Pipe (E)	148
1900MHz RRH (65MHz) (P)	148	6' x 2" Mount Pipe (E)	148
800 EXTERNAL NOTCH FILTER (P)	148	6' x 2" Mount Pipe (E)	148
800 EXTERNAL NOTCH FILTER (P)	148	Platform Mount [LP 1001-1] (E)	148
800 EXTERNAL NOTCH FILTER (P)	148	742 213 w/ Mount Pipe (E)	137
800MHZ RRH (P)	148	742 213 w/ Mount Pipe (E)	137
800MHZ RRH (P)	148	742 213 w/ Mount Pipe (E)	137
800MHZ RRH (P)	148	OG-860/1920/GPS-A (E)	118
(3) ACU-A20-N (P)	148	Side Arm Mount [SO 701-1] (E)	118
(3) ACU-A20-N (P)	148	DB225-2-D (E)	86
(3) ACU-A20-N (P)	148	Pipe Mount [PM 601-1] (E)	86
APXVSPP18-C-A20 w/ Mount Pipe (P)	148	DB225-2-D (E)	75
APXVSPP18-C-A20 w/ Mount Pipe (P)	148	Pipe Mount [PM 601-1] (E)	75

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 53.9%

B&T Engineering, Inc.
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: *84704.001 - RIMMON ST, CT (BU# 876318)*		
Project: *150' Pitttsburg Monopole / App ID: 151462; Rev: 0*		
Client: Crown Castle	Drawn by: Rortiz	App'd:
Code: TIA-222-G	Date: 06/06/12	Scale: N
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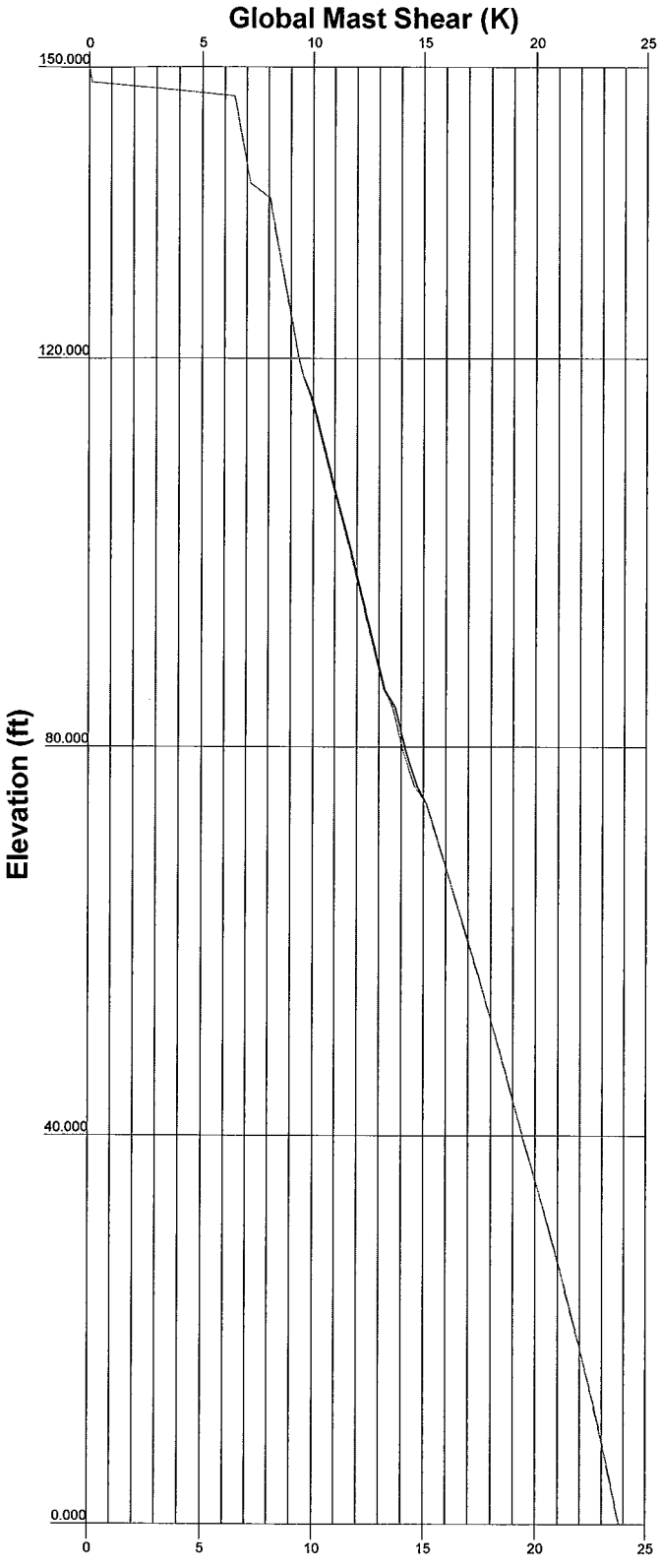
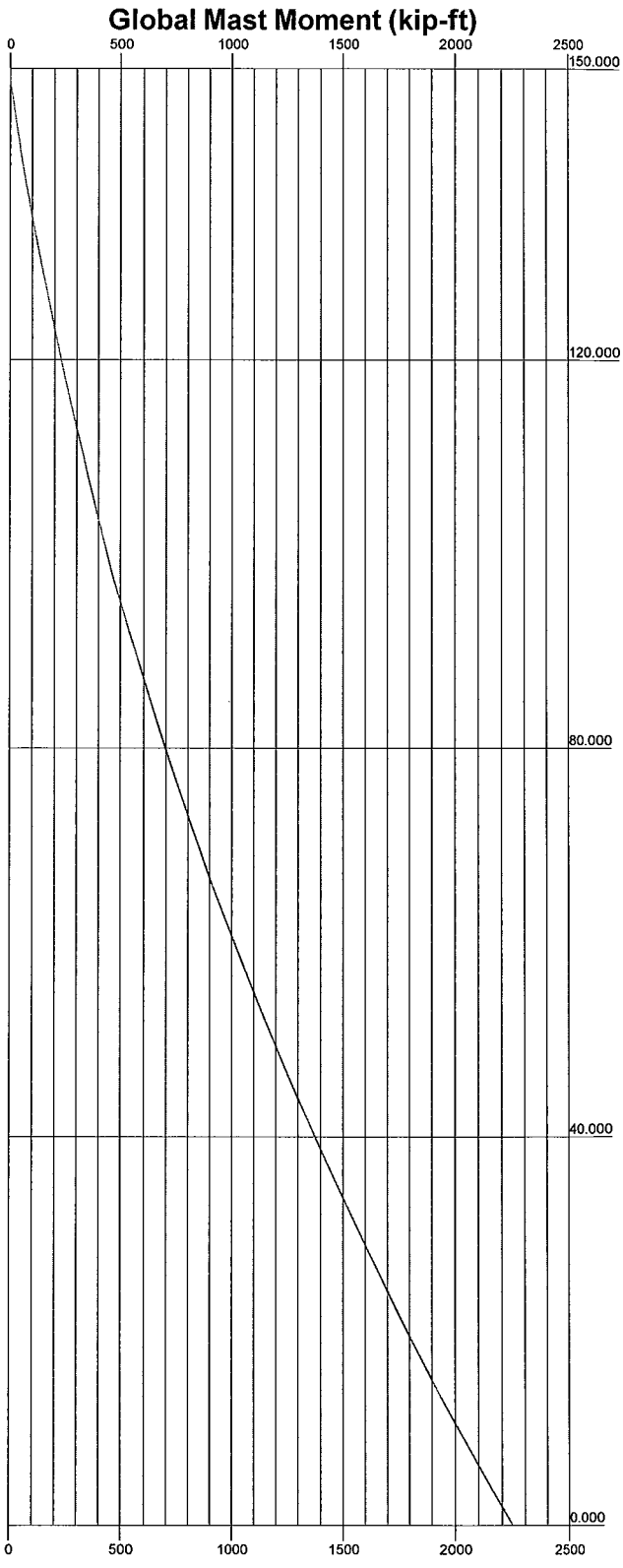
Vx Vz



Mx Mz



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Client: Crown Castle	Drawn by: Rortiz	App'd:
Code: TIA-222-G	Date: 06/06/12	Scale: N
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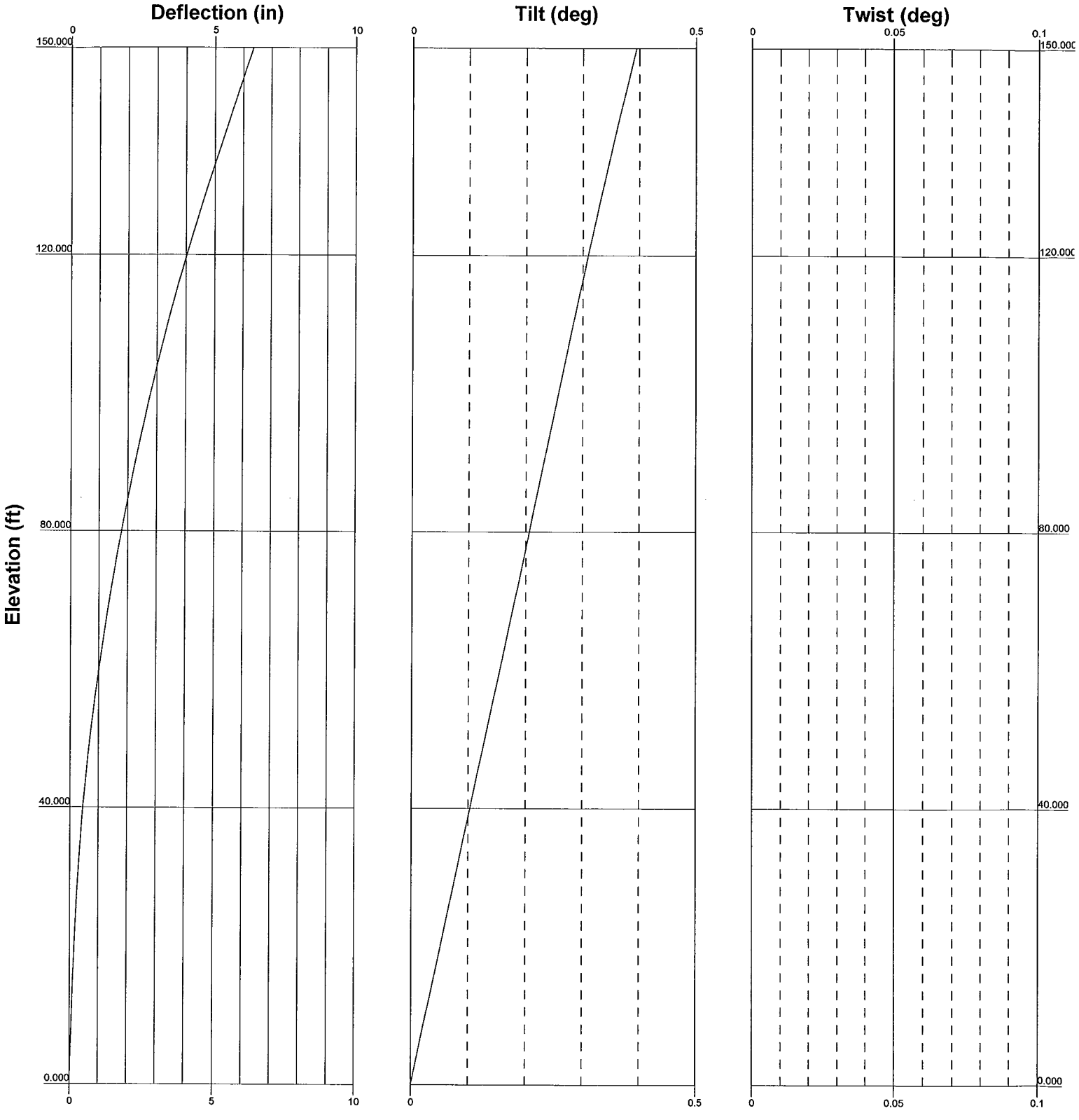
TIA-222-G - Service - 60 mph

Maximum Values



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Project: 150' Pitttsburg Monopole / App ID: 151462; Rev: 0		
Client: Crown Castle	Drawn by: Rortiz	App'd:
Code: TIA-222-G	Date: 06/06/12	Scale: N
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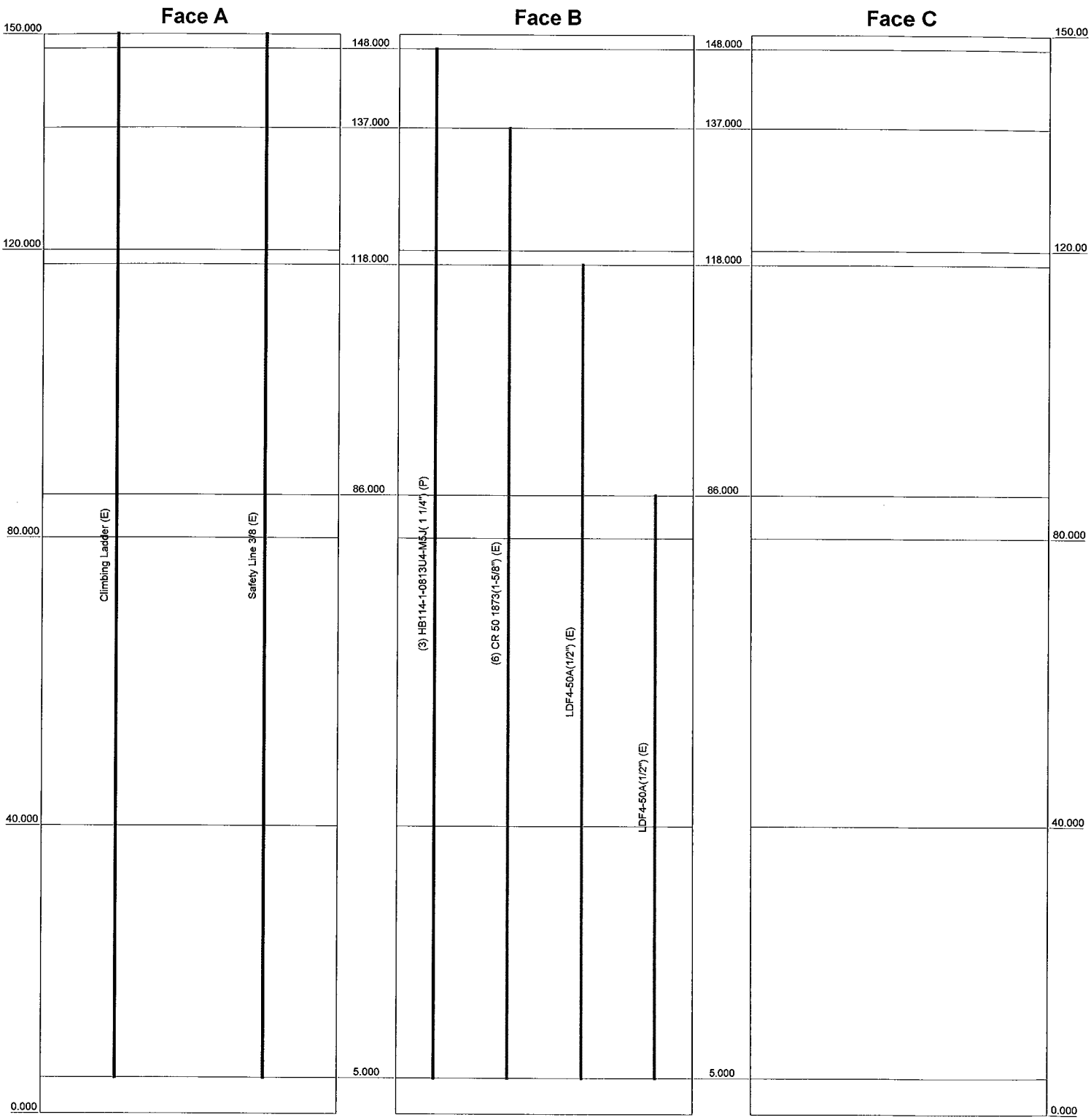
0' - 150'

Round ____ Flat ____ App In Face ____ App Out Face ____ Truss Leg



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Job: *84704.001 - RIMMON ST, CT (BU# 876318)*		
Project: *150' Pitttsburg Monopole / App ID: 151462; Rev: 0*		
Client: Crown Castle	Drawn by: Rortiz	App'd:
Code: TIA-222-G	Date: 06/06/12	Scale: N
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Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 105 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.000 ft.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
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				

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	150.000-120.000	30.000	P24x3/8	A53-B-35 (35 ksi)	
L2	120.000-80.000	40.000	P36x1/2	A53-B-35 (35 ksi)	
L3	80.000-40.000	40.000	P48x1/2	A53-B-35 (35 ksi)	
L4	40.000-0.000	40.000	P54x5/8	A53-B-35 (35 ksi)	

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 150.000-120.000				1	1	1		
L2 120.000-80.000				1	1	1		
L3 80.000-40.000				1	1	1		
L4 40.000-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
HB114-1-0813U4-M5J(1 1/4") (P) ****	B	Surface Ar (CaAa)	148.000 - 5.000	3	3	-0.350 -0.250	1.540		0.001
Climbing Ladder (E)	A	Surface Af (CaAa)	150.000 - 5.000	1	1	0.000 0.000	3.000	12.000	0.008
Safety Line 3/8 (E) ****	A	Surface Ar (CaAa)	150.000 - 5.000	1	1	0.000 0.000	0.375		0.000

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 klf
****								
CR 50 1873(1-5/8") (E)	B	No	Inside Pole	137.000 - 5.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
****								
LDF4-50A(1/2") (E)	B	No	Inside Pole	118.000 - 5.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
****								
LDF4-50A(1/2") (E)	B	No	Inside Pole	86.000 - 5.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
****								

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 K
L1	150.000-120.000	A	0.000	0.000	16.125	0.000	0.259
		B	0.000	0.000	12.936	0.000	0.185
		C	0.000	0.000	0.000	0.000	0.000
L2	120.000-80.000	A	0.000	0.000	21.500	0.000	0.345
		B	0.000	0.000	18.480	0.000	0.350
		C	0.000	0.000	0.000	0.000	0.000
L3	80.000-40.000	A	0.000	0.000	21.500	0.000	0.345
		B	0.000	0.000	18.480	0.000	0.355
		C	0.000	0.000	0.000	0.000	0.000
L4	40.000-0.000	A	0.000	0.000	18.813	0.000	0.302
		B	0.000	0.000	16.170	0.000	0.311
		C	0.000	0.000	0.000	0.000	0.000

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 K
L1	150.000-120.000	A	1.727	0.000	0.000	36.848	0.000	0.765
		B		0.000	0.000	28.258	0.000	0.505
		C		0.000	0.000	0.000	0.000	0.000
L2	120.000-80.000	A	1.676	0.000	0.000	48.320	0.000	0.991
		B		0.000	0.000	39.862	0.000	0.790
		C		0.000	0.000	0.000	0.000	0.000
L3	80.000-40.000	A	1.593	0.000	0.000	46.994	0.000	0.945
		B		0.000	0.000	39.033	0.000	0.768
		C		0.000	0.000	0.000	0.000	0.000
L4	40.000-0.000	A	1.432	0.000	0.000	38.858	0.000	0.752
		B		0.000	0.000	32.741	0.000	0.627
		C		0.000	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.000-120.000	-0.337	-0.727	-0.448	-0.944
L2	120.000-80.000	-0.344	-0.821	-0.507	-1.174
L3	80.000-40.000	-0.359	-0.864	-0.560	-1.314
L4	40.000-0.000	-0.326	-0.788	-0.514	-1.228

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	HB114-1-0813U4-M5J(1 1/4")	120.00 - 148.00	1.0000	1.0000
L1	10	Climbing Ladder	120.00 - 150.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	11	Safety Line 3/8	120.00 - 150.00	1.0000	1.0000
L2	2	HB114-1-0813U4-M5J(1 1/4")	80.00 - 120.00	1.0000	1.0000
L2	10	Climbing Ladder	80.00 - 120.00	1.0000	1.0000
L2	11	Safety Line 3/8	80.00 - 120.00	1.0000	1.0000
L3	2	HB114-1-0813U4-M5J(1 1/4")	40.00 - 80.00	1.0000	1.0000
L3	10	Climbing Ladder	40.00 - 80.00	1.0000	1.0000
L3	11	Safety Line 3/8	40.00 - 80.00	1.0000	1.0000
L4	2	HB114-1-0813U4-M5J(1 1/4")	5.00 - 40.00	1.0000	1.0000
L4	10	Climbing Ladder	5.00 - 40.00	1.0000	1.0000
L4	11	Safety Line 3/8	5.00 - 40.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
1900MHz RRH (65MHz) (P)	C	From Leg	4.000 0.000 2.000		0.000	148.000	No Ice 1/2" Ice 1" Ice	2.698 2.936 3.183	2.771 3.011 3.260	0.060 0.084 0.111
1900MHz RRH (65MHz) (P)	B	From Leg	4.000 0.000 2.000		0.000	148.000	No Ice 1/2" Ice 1" Ice	2.698 2.936 3.183	2.771 3.011 3.260	0.060 0.084 0.111
1900MHz RRH (65MHz) (P)	A	From Leg	4.000 0.000 2.000		0.000	148.000	No Ice 1/2" Ice 1" Ice	2.698 2.936 3.183	2.771 3.011 3.260	0.060 0.084 0.111
800 EXTERNAL NOTCH FILTER (P)	C	From Leg	4.000 0.000 2.000		0.000	148.000	No Ice 1/2" Ice 1" Ice	0.770 0.890 1.018	0.375 0.465 0.563	0.011 0.017 0.024
800 EXTERNAL NOTCH FILTER (P)	B	From Leg	4.000 0.000 2.000		0.000	148.000	No Ice 1/2" Ice 1" Ice	0.770 0.890 1.018	0.375 0.465 0.563	0.011 0.017 0.024
800 EXTERNAL NOTCH FILTER (P)	A	From Leg	4.000 0.000 2.000		0.000	148.000	No Ice 1/2" Ice 1" Ice	0.770 0.890 1.018	0.375 0.465 0.563	0.011 0.017 0.024
800MHZ RRH (P)	C	From Leg	4.000 0.000 2.000		0.000	148.000	No Ice 1/2" Ice 1" Ice	2.490 2.706 2.931	2.068 2.271 2.481	0.053 0.074 0.098
800MHZ RRH (P)	B	From Leg	4.000 0.000 2.000		0.000	148.000	No Ice 1/2" Ice 1" Ice	2.490 2.706 2.931	2.068 2.271 2.481	0.053 0.074 0.098
800MHZ RRH (P)	A	From Leg	4.000 0.000 2.000		0.000	148.000	No Ice 1/2" Ice 1" Ice	2.490 2.706 2.931	2.068 2.271 2.481	0.053 0.074 0.098
(3) ACU-A20-N (P)	C	From Leg	4.000 0.000 2.000		0.000	148.000	No Ice 1/2" Ice 1" Ice	0.078 0.121 0.173	0.136 0.189 0.251	0.001 0.002 0.004
(3) ACU-A20-N (P)	B	From Leg	4.000 0.000 2.000		0.000	148.000	No Ice 1/2" Ice 1" Ice	0.078 0.121 0.173	0.136 0.189 0.251	0.001 0.002 0.004
(3) ACU-A20-N (P)	A	From Leg	4.000 0.000		0.000	148.000	No Ice 1/2" Ice	0.078 0.121	0.136 0.189	0.001 0.002

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft / ft / ft	°	ft		ft^2	ft^2	K
			2.000			1" Ice	0.173	0.251	0.004
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000 / 0.000	0.000	148.000	No Ice	8.498	6.946	0.083
(P)			0.000			1/2" Ice	9.149	8.127	0.148
			2.000			1" Ice	9.767	9.021	0.225
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000 / 0.000	0.000	148.000	No Ice	8.498	6.946	0.083
(P)			0.000			1/2" Ice	9.149	8.127	0.148
			2.000			1" Ice	9.767	9.021	0.225
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000 / 0.000	0.000	148.000	No Ice	8.498	6.946	0.083
(P)			0.000			1/2" Ice	9.149	8.127	0.148
			2.000			1" Ice	9.767	9.021	0.225
6' x 2" Mount Pipe	C	From Leg	4.000 / 0.000	0.000	148.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	B	From Leg	4.000 / 0.000	0.000	148.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	A	From Leg	4.000 / 0.000	0.000	148.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
Platform Mount [LP 1001-1]	C	None		0.000	148.000	No Ice	47.700	47.700	3.017
(E)						1/2" Ice	59.500	59.500	3.621
						1" Ice	71.300	71.300	4.225
****									
742 213 w/ Mount Pipe	C	From Leg	4.000 / 0.000	0.000	137.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.091
			1.000			1" Ice	6.501	6.982	0.144
742 213 w/ Mount Pipe	B	From Leg	4.000 / 0.000	0.000	137.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.091
			1.000			1" Ice	6.501	6.982	0.144
742 213 w/ Mount Pipe	A	From Leg	4.000 / 0.000	0.000	137.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.091
			1.000			1" Ice	6.501	6.982	0.144
****									
OG-860/1920/GPS-A	A	From Leg	4.000 / 0.000	0.000	118.000	No Ice	0.329	0.404	0.002
(E)			0.000			1/2" Ice	0.434	0.514	0.005
			2.000			1" Ice	0.548	0.632	0.010
Side Arm Mount [SO 701-1]	A	From Leg	0.000 / 0.000	0.000	118.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
****									
DB225-2-D	B	From Leg	4.000 / 0.000	0.000	86.000	No Ice	2.320	2.320	0.056
(E)			0.000			1/2" Ice	4.176	4.176	0.073
			-0.500			1" Ice	6.032	6.032	0.090
Pipe Mount [PM 601-1]	B	From Leg	0.000 / 0.000	0.000	86.000	No Ice	3.000	0.900	0.065
(E)			0.000			1/2" Ice	3.740	1.120	0.079
			0.000			1" Ice	4.480	1.340	0.093
****									
DB225-2-D	A	From Leg	4.000 / 0.000	0.000	75.000	No Ice	2.320	2.320	0.056
(E)			0.000			1/2" Ice	4.176	4.176	0.073
			0.000			1" Ice	6.032	6.032	0.090
Pipe Mount [PM 601-1]	A	From Leg	0.000 / 0.000	0.000	75.000	No Ice	3.000	0.900	0.065
(E)			0.000			1/2" Ice	3.740	1.120	0.079
			0.000			1" Ice	4.480	1.340	0.093
****									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 120	Pole	Max Tension	33	0.000	0.000	0.000
			Max. Compression	26	-15.441	0.615	0.930
			Max. Mx	20	-8.300	228.842	0.312
			Max. My	2	-8.301	0.257	228.876
			Max. Vy	20	-9.339	228.842	0.312
			Max. Vx	2	-9.338	0.257	228.876
			Max. Torque	18			-0.000
L2	120 - 80	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-29.949	0.984	2.596
			Max. Mx	20	-18.468	699.002	1.141
			Max. My	2	-18.471	0.657	696.955
			Max. Vy	20	-14.154	699.002	1.141
			Max. Vx	2	-14.038	0.657	696.955
			Max. Torque	14			0.715
L3	80 - 40	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-48.096	2.343	5.748
			Max. Mx	20	-31.723	1376.752	4.606
			Max. My	2	-31.723	3.410	1374.881
			Max. Vy	20	-19.422	1376.752	4.606
			Max. Vx	2	-19.424	3.410	1374.881
			Max. Torque	11			1.018
L4	40 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-70.593	3.562	7.693
			Max. Mx	20	-49.759	2246.279	7.486
			Max. My	2	-49.759	6.137	2244.624
			Max. Vy	20	-23.792	2246.279	7.486
			Max. Vx	2	-23.794	6.137	2244.624
			Max. Torque	11			1.018

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	70.593	0.000	0.000
	Max. H_x	20	49.766	23.777	0.053
	Max. H_z	2	49.766	0.053	23.779
	Max. M_x	2	2244.624	0.053	23.779
	Max. M_z	8	2243.189	-23.777	-0.053
	Max. Torsion	11	1.018	-20.618	-11.935
	Min. Vert	7	37.325	-20.565	11.844
	Min. H_x	8	49.766	-23.777	-0.053
	Min. H_z	14	49.766	-0.053	-23.779
	Min. M_x	14	-2238.835	-0.053	-23.779
	Min. M_z	20	-2246.279	23.777	0.053
	Min. Torsion	23	-1.017	20.618	11.935

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	41.472	0.000	0.000	-2.362	1.263	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	49.766	-0.053	-23.779	-2244.624	6.137	0.714
0.9 Dead+1.6 Wind 0 deg - No Ice	37.325	-0.053	-23.779	-2233.137	5.728	0.712
1.2 Dead+1.6 Wind 30 deg - No Ice	49.766	11.982	-20.809	-1975.321	-1136.087	0.238
0.9 Dead+1.6 Wind 30 deg - No Ice	37.325	11.982	-20.809	-1965.101	-1131.002	0.235
1.2 Dead+1.6 Wind 60 deg - No Ice	49.766	20.565	-11.844	-1119.784	-1940.157	-0.302
0.9 Dead+1.6 Wind 60 deg - No Ice	37.325	20.565	-11.844	-1113.687	-1931.227	-0.305
1.2 Dead+1.6 Wind 90 deg - No Ice	49.766	23.777	0.053	1.696	-2243.189	-0.762
0.9 Dead+1.6 Wind 90 deg - No Ice	37.325	23.777	0.053	2.415	-2232.807	-0.763
1.2 Dead+1.6 Wind 120 deg - No Ice	49.766	20.618	11.935	1121.945	-1944.747	-1.017
0.9 Dead+1.6 Wind 120 deg - No Ice	37.325	20.618	11.935	1117.290	-1935.800	-1.018
1.2 Dead+1.6 Wind 150 deg - No Ice	49.766	11.934	20.619	1940.795	-1124.798	-1.000
0.9 Dead+1.6 Wind 150 deg - No Ice	37.325	11.934	20.619	1932.210	-1119.788	-0.999
1.2 Dead+1.6 Wind 180 deg - No Ice	49.766	0.053	23.779	2238.835	-3.045	-0.715
0.9 Dead+1.6 Wind 180 deg - No Ice	37.325	0.053	23.779	2228.818	-3.420	-0.712
1.2 Dead+1.6 Wind 210 deg - No Ice	49.766	-11.982	20.809	1969.530	1139.179	-0.238
0.9 Dead+1.6 Wind 210 deg - No Ice	37.325	-11.982	20.809	1960.782	1133.310	-0.235
1.2 Dead+1.6 Wind 240 deg - No Ice	49.766	-20.565	11.844	1113.993	1943.248	0.303
0.9 Dead+1.6 Wind 240 deg - No Ice	37.325	-20.565	11.844	1109.367	1933.534	0.305
1.2 Dead+1.6 Wind 270 deg - No Ice	49.766	-23.777	-0.053	-7.486	2246.279	0.762
0.9 Dead+1.6 Wind 270 deg - No Ice	37.325	-23.777	-0.053	-6.734	2235.113	0.764
1.2 Dead+1.6 Wind 300 deg - No Ice	49.766	-20.618	-11.935	-1127.734	1947.837	1.017
0.9 Dead+1.6 Wind 300 deg - No Ice	37.325	-20.618	-11.935	-1121.608	1938.106	1.017
1.2 Dead+1.6 Wind 330 deg - No Ice	49.766	-11.934	-20.619	-1946.584	1127.889	1.000
0.9 Dead+1.6 Wind 330 deg - No Ice	37.325	-11.934	-20.619	-1936.528	1122.095	0.998
1.2 Dead+1.0 Ice+1.0 Temp	70.593	-0.000	-0.000	-7.693	3.562	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	70.593	-0.014	-6.837	-636.798	4.823	0.351
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	70.593	3.525	-6.115	-579.898	-326.660	0.147
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	70.593	5.919	-3.407	-321.292	-541.682	-0.096
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	70.593	6.842	0.014	-6.660	-626.731	-0.314

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	70.593	5.932	3.430	307.652	-542.875	-0.448
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	70.593	3.433	5.928	537.425	-312.584	-0.461
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	70.593	0.014	6.837	621.091	2.437	-0.351
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	70.593	-3.525	6.115	564.191	333.920	-0.147
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	70.593	-5.919	3.407	305.585	548.942	0.097
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	70.593	-6.842	-0.014	-9.046	633.991	0.314
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	70.593	-5.932	-3.430	-323.359	550.135	0.448
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	70.593	-3.433	-5.928	-553.132	319.844	0.461
Dead+Wind 0 deg - Service	41.472	-0.010	-4.342	-410.493	2.120	0.130
Dead+Wind 30 deg - Service	41.472	2.188	-3.800	-361.468	-205.811	0.043
Dead+Wind 60 deg - Service	41.472	3.755	-2.163	-205.725	-352.185	-0.056
Dead+Wind 90 deg - Service	41.472	4.342	0.010	-1.569	-407.350	-0.139
Dead+Wind 120 deg - Service	41.472	3.765	2.179	202.363	-353.022	-0.186
Dead+Wind 150 deg - Service	41.472	2.179	3.765	351.428	-203.757	-0.183
Dead+Wind 180 deg - Service	41.472	0.010	4.342	405.683	0.448	-0.130
Dead+Wind 210 deg - Service	41.472	-2.188	3.800	356.658	208.379	-0.043
Dead+Wind 240 deg - Service	41.472	-3.755	2.163	200.915	354.753	0.056
Dead+Wind 270 deg - Service	41.472	-4.342	-0.010	-3.241	409.918	0.139
Dead+Wind 300 deg - Service	41.472	-3.765	-2.179	-207.173	355.590	0.186
Dead+Wind 330 deg - Service	41.472	-2.179	-3.765	-356.237	206.325	0.183

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-41.472	0.000	0.000	41.472	0.000	0.000%
2	-0.053	-49.766	-23.779	0.053	49.766	23.779	0.000%
3	-0.053	-37.325	-23.779	0.053	37.325	23.779	0.000%
4	11.982	-49.766	-20.809	-11.982	49.766	20.809	0.000%
5	11.982	-37.325	-20.809	-11.982	37.325	20.809	0.000%
6	20.565	-49.766	-11.844	-20.565	49.766	11.844	0.000%
7	20.565	-37.325	-11.844	-20.565	37.325	11.844	0.000%
8	23.777	-49.766	0.053	-23.777	49.766	-0.053	0.000%
9	23.777	-37.325	0.053	-23.777	37.325	-0.053	0.000%
10	20.618	-49.766	11.935	-20.618	49.766	-11.935	0.000%
11	20.618	-37.325	11.935	-20.618	37.325	-11.935	0.000%
12	11.934	-49.766	20.619	-11.934	49.766	-20.619	0.000%
13	11.934	-37.325	20.619	-11.934	37.325	-20.619	0.000%
14	0.053	-49.766	23.779	-0.053	49.766	-23.779	0.000%
15	0.053	-37.325	23.779	-0.053	37.325	-23.779	0.000%
16	-11.982	-49.766	20.809	11.982	49.766	-20.809	0.000%
17	-11.982	-37.325	20.809	11.982	37.325	-20.809	0.000%
18	-20.565	-49.766	11.844	20.565	49.766	-11.844	0.000%
19	-20.565	-37.325	11.844	20.565	37.325	-11.844	0.000%
20	-23.777	-49.766	-0.053	23.777	49.766	0.053	0.000%
21	-23.777	-37.325	-0.053	23.777	37.325	0.053	0.000%
22	-20.618	-49.766	-11.935	20.618	49.766	11.935	0.000%
23	-20.618	-37.325	-11.935	20.618	37.325	11.935	0.000%
24	-11.934	-49.766	-20.619	11.934	49.766	20.619	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
25	-11.934	-37.325	-20.619	11.934	37.325	20.619	0.000%
26	0.000	-70.593	0.000	0.000	70.593	0.000	0.000%
27	-0.014	-70.593	-6.837	0.014	70.593	6.837	0.000%
28	3.525	-70.593	-6.115	-3.525	70.593	6.115	0.000%
29	5.919	-70.593	-3.407	-5.919	70.593	3.407	0.000%
30	6.842	-70.593	0.014	-6.842	70.593	-0.014	0.000%
31	5.932	-70.593	3.430	-5.932	70.593	-3.430	0.000%
32	3.433	-70.593	5.928	-3.433	70.593	-5.928	0.000%
33	0.014	-70.593	6.837	-0.014	70.593	-6.837	0.000%
34	-3.525	-70.593	6.115	3.525	70.593	-6.115	0.000%
35	-5.919	-70.593	3.407	5.919	70.593	-3.407	0.000%
36	-6.842	-70.593	-0.014	6.842	70.593	0.014	0.000%
37	-5.932	-70.593	-3.430	5.932	70.593	3.430	0.000%
38	-3.433	-70.593	-5.928	3.433	70.593	5.928	0.000%
39	-0.010	-41.472	-4.342	0.010	41.472	4.342	0.000%
40	2.188	-41.472	-3.800	-2.188	41.472	3.800	0.000%
41	3.755	-41.472	-2.163	-3.755	41.472	2.163	0.000%
42	4.342	-41.472	0.010	-4.342	41.472	-0.010	0.000%
43	3.765	-41.472	2.179	-3.765	41.472	-2.179	0.000%
44	2.179	-41.472	3.765	-2.179	41.472	-3.765	0.000%
45	0.010	-41.472	4.342	-0.010	41.472	-4.342	0.000%
46	-2.188	-41.472	3.800	2.188	41.472	-3.800	0.000%
47	-3.755	-41.472	2.163	3.755	41.472	-2.163	0.000%
48	-4.342	-41.472	-0.010	4.342	41.472	0.010	0.000%
49	-3.765	-41.472	-2.179	3.765	41.472	2.179	0.000%
50	-2.179	-41.472	-3.765	2.179	41.472	3.765	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00003546
3	Yes	4	0.00000001	0.00002236
4	Yes	4	0.00000001	0.00063352
5	Yes	4	0.00000001	0.00042062
6	Yes	4	0.00000001	0.00060375
7	Yes	4	0.00000001	0.00040182
8	Yes	4	0.00000001	0.00003887
9	Yes	4	0.00000001	0.00002452
10	Yes	4	0.00000001	0.00057806
11	Yes	4	0.00000001	0.00038468
12	Yes	4	0.00000001	0.00061849
13	Yes	4	0.00000001	0.00041246
14	Yes	4	0.00000001	0.00003880
15	Yes	4	0.00000001	0.00002481
16	Yes	4	0.00000001	0.00062228
17	Yes	4	0.00000001	0.00041323
18	Yes	4	0.00000001	0.00058891
19	Yes	4	0.00000001	0.00039205
20	Yes	4	0.00000001	0.00004261
21	Yes	4	0.00000001	0.00002716
22	Yes	4	0.00000001	0.00062542
23	Yes	4	0.00000001	0.00041608
24	Yes	4	0.00000001	0.00058380
25	Yes	4	0.00000001	0.00038755
26	Yes	4	0.00000001	0.00000770
27	Yes	4	0.00000001	0.00049766

28	Yes	4	0.00000001	0.00054575
29	Yes	4	0.00000001	0.00051008
30	Yes	4	0.00000001	0.00048837
31	Yes	4	0.00000001	0.00050170
32	Yes	4	0.00000001	0.00050021
33	Yes	4	0.00000001	0.00048258
34	Yes	4	0.00000001	0.00053581
35	Yes	4	0.00000001	0.00050665
36	Yes	4	0.00000001	0.00049500
37	Yes	4	0.00000001	0.00051773
38	Yes	4	0.00000001	0.00051770
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000622
41	Yes	4	0.00000001	0.00000602
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000554
44	Yes	4	0.00000001	0.00000634
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000598
47	Yes	4	0.00000001	0.00000569
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000656
50	Yes	4	0.00000001	0.00000572

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	6.352	40	0.395	0.000
L2	120 - 80	4.029	40	0.312	0.000
L3	80 - 40	1.787	40	0.204	0.000
L4	40 - 0	0.460	40	0.102	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.000	1900MHz RRH (65MHz)	40	6.189	0.390	0.000	92635
137.000	742 213 w/ Mount Pipe	40	5.304	0.359	0.000	35629
118.000	OG-860/1920/GPS-A	40	3.891	0.307	0.000	15854
86.000	DB225-2-D	40	2.062	0.220	0.000	22524
75.000	DB225-2-D	40	1.572	0.191	0.000	23308

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 120	34.803	4	2.166	0.001
L2	120 - 80	22.073	4	1.711	0.001
L3	80 - 40	9.791	4	1.118	0.001
L4	40 - 0	2.518	4	0.556	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.000	1900MHz RRH (65MHz)	4	33.912	2.136	0.001	16935
137.000	742 213 w/ Mount Pipe	4	29.062	1.969	0.001	6513
118.000	OG-860/1920/GPS-A	4	21.318	1.681	0.001	2897
86.000	DB225-2-D	4	11.298	1.205	0.001	4113
75.000	DB225-2-D	4	8.611	1.046	0.001	4255

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 120 (1)	P24x3/8	30.000	0.000	0.0	27.833	-8.287	876.725	0.009
L2	120 - 80 (2)	P36x1/2	40.000	0.000	0.0	55.763	-18.460	1756.540	0.011
L3	80 - 40 (3)	P48x1/2	40.000	0.000	0.0	74.613	-31.718	2335.680	0.014
L4	40 - 0 (4)	P54x5/8	40.000	0.000	0.0	104.802	-49.759	3301.250	0.015

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 120 (1)	P24x3/8	233.013	538.742	0.433	0.000	538.742	0.000
L2	120 - 80 (2)	P36x1/2	712.764	1586.550	0.449	0.000	1586.550	0.000
L3	80 - 40 (3)	P48x1/2	1399.933	2713.100	0.516	0.000	2713.100	0.000
L4	40 - 0 (4)	P54x5/8	2278.725	4349.317	0.524	0.000	4349.317	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 120 (1)	P24x3/8	9.622	438.363	0.022	0.000	849.758	0.000
L2	120 - 80 (2)	P36x1/2	14.307	878.272	0.016	0.678	2562.642	0.000
L3	80 - 40 (3)	P48x1/2	19.662	1167.840	0.017	0.238	4575.067	0.000
L4	40 - 0 (4)	P54x5/8	24.027	1650.620	0.015	0.238	7257.858	0.000

Pole Interaction Design Data

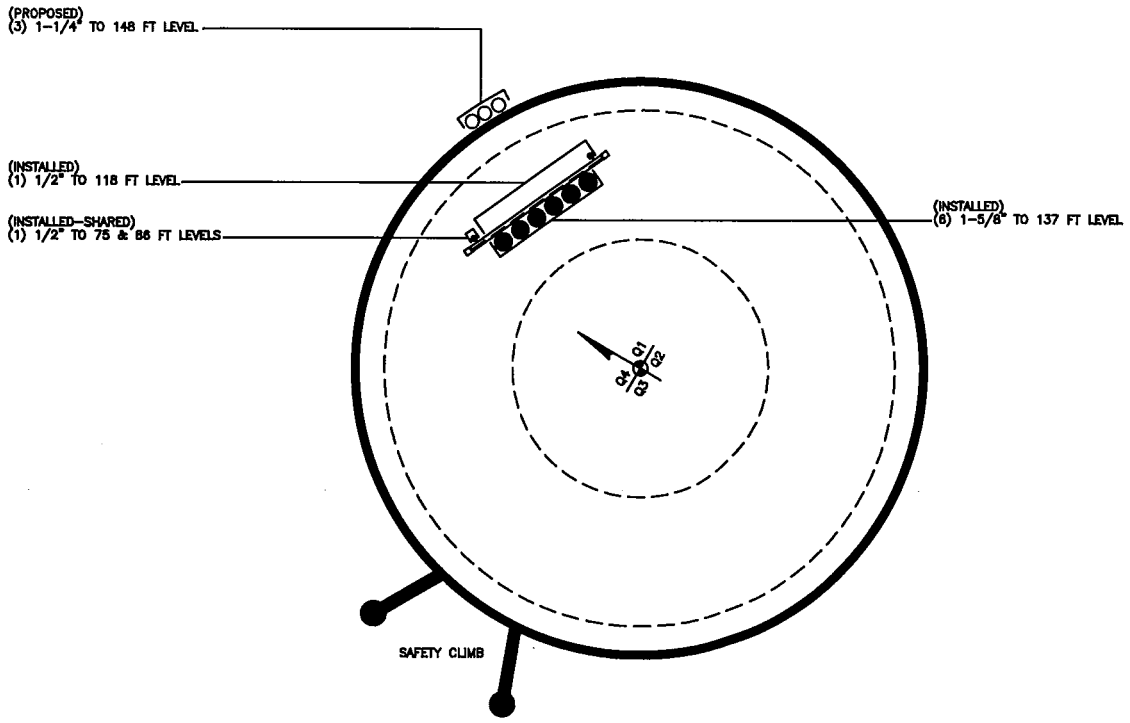
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 120 (1)	0.009	0.433	0.000	0.022	0.000	0.442 ✔	1.000	4.8.2 ✔
L2	120 - 80 (2)	0.011	0.449	0.000	0.016	0.000	0.460 ✔	1.000	4.8.2 ✔
L3	80 - 40 (3)	0.014	0.516	0.000	0.017	0.000	0.530 ✔	1.000	4.8.2 ✔
L4	40 - 0 (4)	0.015	0.524	0.000	0.015	0.000	0.539 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 120	Pole	P24x3/8	1	-8.287	876.725	44.2	Pass
L2	120 - 80	Pole	P36x1/2	2	-18.460	1756.540	46.0	Pass
L3	80 - 40	Pole	P48x1/2	3	-31.718	2335.680	53.0	Pass
L4	40 - 0	Pole	P54x5/8	4	-49.759	3301.250	53.9	Pass
						Summary	ELC:	Final
						Pole (L4)	53.9	Pass
						Rating =	53.9	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876318 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Reactions		
Mu	233.013	ft-kips
Axial, Pu:	8.287	kips
Shear, Vu:	9.622	kips
Elevation:	120	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
21.87

Pole Manufacturer:	Other

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	24		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle (in.):	29.5		

Plate Data		
Diam:	34.75	in
Thick, t:	1.875	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.14	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	24	in
Thick:	0.375	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	30.06	kips	Rigid
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	30.05	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	15.45	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.319	in	
Min PL "treq" for actual **T w/ Pry**:	0.717	in	
Min PL "t1" for actual **T w/o Pry**:	0.946	in	
T allowable w/o Prying:	30.06	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	15.45	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	51.4%	Pass	

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	9.0	ksi	Rigid
Allowable Plate Stress:	32.4	ksi	TIA G
Compression Plate Stress Ratio:	27.9%	Pass	φ*Fy
No Prying			Comp. Y.L. Length: 17.15
Tension Side Stress Ratio, (treq/t)^2:	14.6%	Pass	

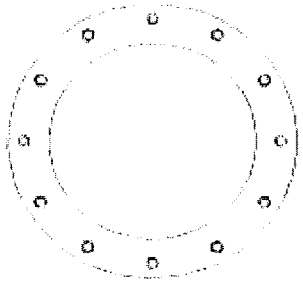
n/a

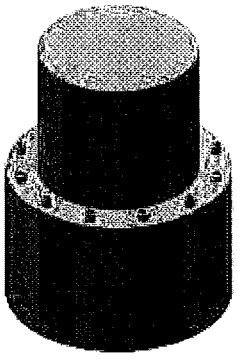
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Manufacturer:	Other

Reactions		
Moment:	233.013	ft-kips
Axial:	8.287	kips
Shear:	9.622	kips
Exterior Flange Run, T+q:	15.45	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
21.87

Elevation: 120 feet

Bolt Data			
Qty:	24		
Diam:	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle:	29.5	in	

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	15.5 Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty),	30.1 Kips
Bolt Stress Ratio:	51.4% Pass

Plate Data		
Plate Outer Diam:	35	in
Plate Inner Diam:	24.25	in (Hole @ Ctr)
Thick:	1.875	in
Grade:	36	ksi
Effective Width:	4.58	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	16.1 Kips, Ext. Cu=Interior Cu
Plate Stress:	11.0 ksi
Allowable Plate Stress, φ*Fy:	32.4 ksi
Plate Stress Ratio:	34.0% Pass

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

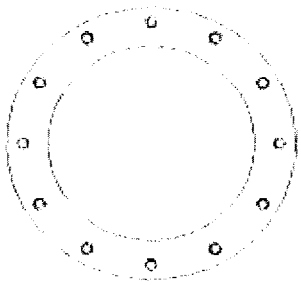
Stiffener Results

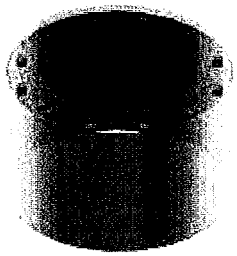
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check:	n/a

Pole Data		
Pole OuterDiam:	36	in
Thick:	0.5	in
Pole Inner Diam:	35	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Reactions		
Mu	712.764	ft-kips
Axial, Pu:	18.46	kips
Shear, Vu:	14.307	kips
Elevation:	80	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
21.87

Pole Manufacturer:	Other

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	52		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle (in.):	41.5		

Plate Data		
Diam:	46.75	in
Thick, t:	2.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	2.17	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	36	in
Thick:	0.5	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	30.06	kips	Rigid: φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	30.06	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	15.50	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.585	in	
Min PL "treq" for actual **T w/ Pry**:	0.893	in	
Min PL "t1" for actual **T w/o Pry**:	1.138	in	
T allowable w/o Prying:	30.06	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	15.50	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	51.6%	**Pass**	

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	7.7	ksi	Rigid: TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	23.8%	**Pass**	Comp. Y.L. Length: 20.65
No Prying			
Tension Side Stress Ratio, (treq/t)^2:	12.7%	**Pass**	

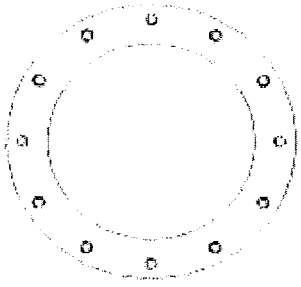
n/a

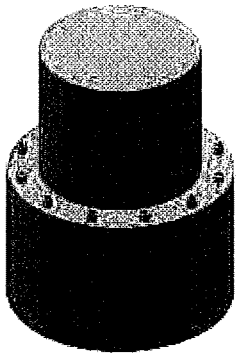
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Manufacturer:	Other

Reactions		
Moment:	712.764	ft-kips
Axial:	18.46	kips
Shear:	14.307	kips
Exterior Flange Run, T+q:	15.5	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
21.87

Elevation: 80 feet

Bolt Data			
Qty:	52		
Diam:	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle:	41.5	in	

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	15.5	Kips, Ext. Flange Tu+q
Adjusted φ*Tn (due to Vu=Vu/Qty),	30.1	Kips
Bolt Stress Ratio:	51.6%	**Pass**

Plate Data		
Plate Outer Diam:	47	in
Plate Inner Diam:	36.25	in (Hole @ Ctr)
Thick:	2.5	in
Grade:	36	ksi
Effective Width:	2.84	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	16.2	Kips, Ext. Cu=Interior Cu
Plate Stress:	10.0	ksi
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	31.0%	**Pass**

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

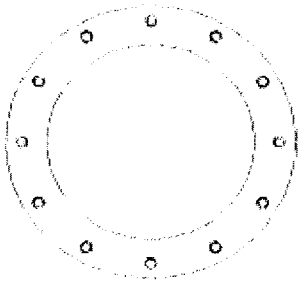
Stiffener Results

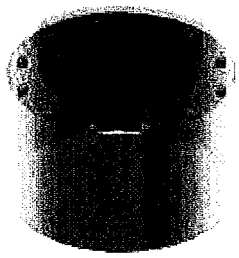
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	48	in
Thick:	0.5	in
Pole Inner Diam:	47	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Reactions		
Mu	1399.933	ft-kips
Axial, Pu:	31.718	kips
Shear, Vu:	19.662	kips
Elevation:	40	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Other

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	40		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle (in.):	50.375		

Plate Data		
Diam:	52.5	in
Thick, t:	2.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	48	in
Thick:	0.5	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	32.56	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	0.873	in	
Min PL "treq" for actual **T w/ Pry**:	0.514	in	
Min PL "t1" for actual **T w/o Pry**:	0.674	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	32.56	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	59.7%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	5.6	ksi	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	17.3%	**Pass**	Comp. Y.L. Length:
No Prying			15.29
Tension Side Stress Ratio, (treq/t)^2:	5.2%	**Pass**	

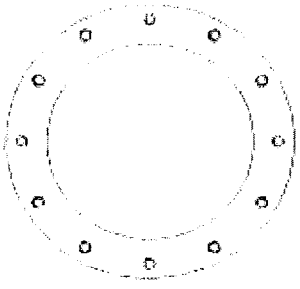
n/a

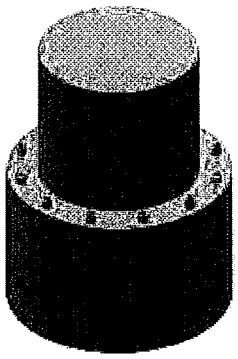
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Manufacturer:	Other

Reactions		
Moment:	1399.933	ft-kips
Axial:	31.718	kips
Shear:	19.662	kips
Exterior Flange Run, T+q:	32.56	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Elevation: 40 feet

Bolt Data			
Qty:	40		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle:	50.375	in	

Plate Data		
Plate Outer Diam:	52.75	in
Plate Inner Diam:	48.25	in (Hole @ Ctr)
Thick:	2.25	in
Grade:	36	ksi
Effective Width:	4.14	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Pole OuterDiam:	54	in
Thick:	0.625	in
Pole Inner Diam:	52.75	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	32.6 Kips, Ext. Flange Tu+q
Adjusted φ*Tn (due to Vu=Vu/Qty),	54.5 Kips
Bolt Stress Ratio:	59.7% Pass

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	34.1 Kips, Ext. Cu=Interior Cu
Plate Stress:	7.7 ksi
Allowable Plate Stress, φ*Fy:	32.4 ksi
Plate Stress Ratio:	23.9% Pass

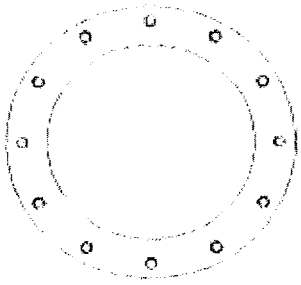
n/a

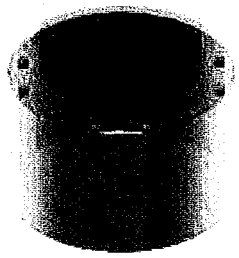
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Pole Manufacturer:	*Other*

Anchor Rod Data		
Qty:	32	
Diam:	2	in
Rod Material:	Other	
Strength (Fu):	58	ksi
Yield (Fy):	36	ksi
Bolt Circle:	60	in

Plate Data		
Diam:	66	in
Thick:	3.25	in
Grade:	36	ksi
Single-Rod B-eff:	5.30	in

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	54	in
Thick:	0.625	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions		
Mu:	2279	ft-kips
Axial, Pu:	50	kips
Shear, Vu:	24	kips
Eta Factor, η	0.55	TIA G (Fig. 4-4)

If No stiffeners, Criteria:	AISC LRFD	<-Only Applcable to Unstiffened Cases

Anchor Rod Results

Max Rod (Cu+ Vu/ή):	59.9 Kips	Rigid
Allowable Axial, Φ*Fu*Anet:	116.0 Kips	AISC LRFD
Anchor Rod Stress Ratio:	51.6% Pass	φ*Tn

Base Plate Results Flexural Check

Base Plate Stress:	7.7 ksi	Rigid
Allowable Plate Stress:	32.4 ksi	AISC LRFD
Base Plate Stress Ratio:	23.8% Pass	φ*Fy
		Y.L. Length: 26.15

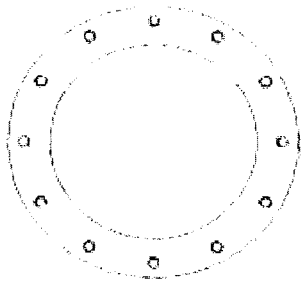
n/a

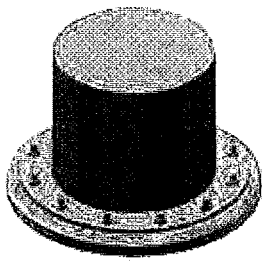
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

CAISSON Version 10.35 2:08:31 PM Wednesday, June 06, 2012
B&T Engineering

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*****************************************************************************************************
*                                                                                                   *
* CAISSON - Pier Foundations Analysis and Design -  Copyright Power Line Systems, Inc. 1993-2010 *
*                                                                                                   *
*****************************************************************************************************
```

Project Title: 84704.001 - RIMMON ST, CT (BU# 876318)
Project Notes: 150' Pitttsburg Monopole- 7.5' Dia, 18' Depth (17.5' Bearing)

Calculation Method: Full 8CD

******* I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
7.50	0.50		

Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Clay	3.75	0.00	115.0			
2	Sand	2.25	3.75	115.0		3.000	30.00
3	Sand	11.00	6.00	125.0		3.852	36.00

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure	
2279.0	50.0	24.00	1.70	**≥ 1.333 (F.S.), Soil Interaction = (1.333/1.70)× 100% = 78.4%**

******* R E S U L T S

Calculated Pier Properties

Length (ft)	Weight (kips)	End Bearing Pressure (psf)
18.000	119.282	1131.8

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)
Clay	0.50	3.75	115.0			0.00	2.38
Sand	4.25	2.25	115.0		3.000	85.14	5.46
Sand	6.50	6.97	125.0		3.852	680.20	10.44
Sand	13.47	4.53	125.0		3.852	-723.85	15.85

Shear and Moments Along Pier

Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)
0.00	41.5	3910.8	24.4	2300.5
1.80	41.5	3985.5	24.4	2344.4
3.60	41.5	4060.2	24.4	2388.3
5.40	2.9	4113.7	1.7	2419.8
7.20	-88.2	4046.3	-51.9	2380.2
9.00	-227.0	3767.9	-133.5	2216.4
10.80	-400.9	3208.1	-235.8	1887.1
12.60	-610.0	2303.5	-358.8	1355.0
14.40	-593.6	1110.6	-349.2	653.3
16.20	-314.3	288.2	-184.9	169.5
18.00	0.0	0.0	0.0	0.0

M_{MAX} = 2420.799 Kip-ft (Moment for DSMC sheet)

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *876318*
Site Name: *RIMMON ST, CT*
App #: *151462; Rev: 0*

Loads Already Factored		
For M (WL)		<----Disregard
For P (DL)		<----Disregard

Pier Properties

Concrete:

Pier Diameter =	7.5	ft
Concrete Area =	6361.7	in^2

Reinforcement:

Clear Cover to **Tie**=	4.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	6.61	ft
Vert. Cage Diameter =	79.34	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	21	
As Total=	32.76	in^2
A s/ Aconc, Rho:	0.0051	0.51%

Maximum Shaft Superimposed Forces

TIA Revision:	G	
Max. Factored Shaft Mu:	2420.799	ft-kips **(* Note)**
Max. Factored Shaft Pu:	50	kips
Max Axial Force Type:	Comp.	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Load Factor	Shaft Factored Loads		
1.00	Mu:	2420.799	ft-kips
1.00	Pu:	50	kips

Material Properties

Concrete Comp. strength, f'c =	4000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code= 2008

Seismic Properties

Seismic Design Category = D
Seismic Risk = **High**

Solve (Run) <-- Press Upon Completing All Input

ACI 10.5 , ACI 21.10.4, and IBC 1810.

Min As for Flexural, Tension Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy:	0.0032	
200 / Fy:	0.0033	
IBC 1810.1.2:	0.0050	SDC D, E, or F
Governing:	0.0050	**0.50%**

ACI 10.8 and 10.9

Min As for Columns, Comp. Controlled, Shafts:

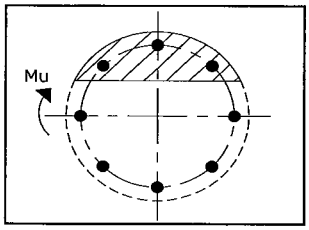
Min As: 0.0100 **1.00%**

Minimum Rho Check:

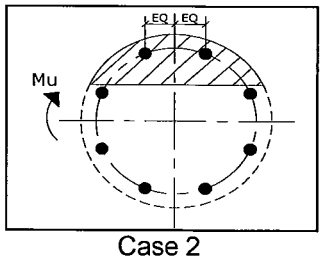
Actual Req'd Min. Rho:	0.50%	Flexural
Provided Rho:	0.51%	OK

Results:

Governing Orientation Case: **2**



Case 1



Case 2

Dist. From Edge to Neutral Axis: **12.06** in
Extreme Steel Strain, εt: **0.0181**
εt > 0.0050, Tension Controlled
Reduction Factor,φ: **0.900**

<-- Comment Box

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	12211.72	kips
at Mu=(ϕ=0.65)Mn=	7970.64	ft-kips
Max Tu, (φ=0.9) Tn =	1769.04	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	50.00	kips
Drilled Shaft Moment Capacity, φMn:	**5772.79**	ft-kips
Drilled Shaft Superimposed Mu:	**2420.80**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR: 41.93%

Know what's **below.**
Call before you dig.

APPROVALS					
			APPROVED	APPROVED AS NOTED	DISAPPROVED REVISE
SPRINT REPRESENTATIVES	DATE		☐	☐	☐
SPRINT RF ENGINEER	DATE		☐	☐	☐
SITE OWNER	DATE		☐	☐	☐
	DATE		☐	☐	☐

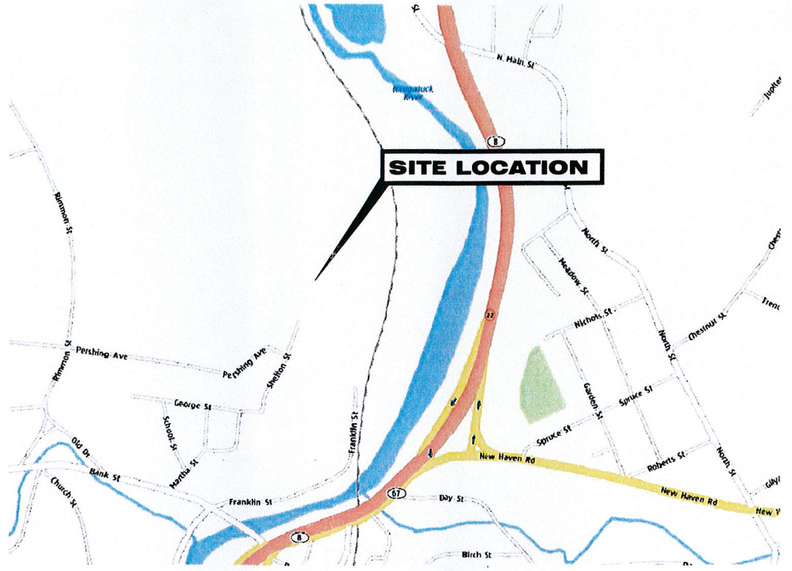
Sprint®

SITE ID: CT03XC034
SITE NAME: RIMMON ST.

THE STRUCTURAL ENGINEERING CONCERNING THE STRUCTURAL STABILITY OF THE TOWER/POLE, FOUNDATION, ANTENNAS, MOUNTS AND ALL ASSOCIATED ANCILLARY RADIO EQUIPMENT IS BEING COMPLETED BY OTHERS. KMB DESIGN GROUP, LLC HAS NOT BEEN REQUESTED TO PERFORM ANY STRUCTURAL ANALYSIS SERVICES TO VERIFY THAT THE TOWER/POLE AND/OR FOUNDATION IS CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT DEPICTED WITHIN THESE SIGNED AND SEALED DRAWINGS. FURTHERMORE KMB DESIGN GROUP, LLC HAS NOT BEEN REQUESTED TO PHYSICALLY CONFIRM THE EXISTING MOUNT CONFIGURATION AND PERFORM A STRUCTURAL ANALYSIS TO VERIFY THAT THE EXISTING, INTERIM AND PROPOSED ANTENNAS, MOUNTS AND ALL ASSOCIATED ANCILLARY RADIO EQUIPMENT CAN BE SAFELY SUPPORTED. SIGNED AND SEALED DRAWINGS REVISED TO STATE "ISSUED FOR CONSTRUCTION" SHALL BE PROVIDED TO THE PROFESSIONAL ENGINEERS RESPONSIBLE FOR THE STRUCTURAL ANALYSIS OF THE TOWER/POLE, ANTENNAS, MOUNTS AND ALL ASSOCIATED ANCILLARY RADIO EQUIPMENT. KMB DESIGN GROUP, LLC SHALL BE NOTIFIED SHOULD THE STRUCTURAL ANALYSIS RESULT IN SOME ELEMENTS NOT BEING STRUCTURALLY CAPABLE OF SUPPORTING THE PROPOSED DESIGN DEPICTED. THE CONTRACTOR SHALL NOT COMMENCE CONSTRUCTION WITHOUT OBTAINING (A) A SIGNED AND SEALED COPY OF THE PLANS "ISSUED FOR CONSTRUCTION"; (B) STRUCTURAL ANALYSIS REPORT STATING THAT THE TOWER/POLE/FOUNDATION IS CAPABLE OF SUPPORTING THE PROPOSED LOADING REFERENCING THE SIGNED AND SEALED PLANS BY KMB DESIGN GROUP, LLC; (C) SPRINT PLATFORM ANALYSIS STATING THAT THE SPRINT PLATFORM IS CAPABLE OF SUPPORTING THE PROPOSED DESIGN AS REFERENCED WITHIN THE SIGNED AND SEALED PLANS BY KMB DESIGN GROUP, LLC.

NETWORK VISION CONSTRUCTION DRAWINGS

AERIAL VIEW
SCALE: NTS



LOCATION MAP
SCALE: NTS

DRAWING INDEX

DWG #	DRAWING TITLES
A01	COVER SHEET
C01	GENERAL NOTES 1 OF 2
C01A	GENERAL NOTES 2 OF 2
C02	COMPOUND PLAN
C02A	ELEVATION
C03	EQUIPMENT PLANS
C03A	EQUIPMENT & ANTENNA SPECIFICATIONS
C04	EXISTING ANTENNA PLAN (ALL SECTORS)
C04A	INTERIM ANTENNA PLAN (ALL SECTORS)
C04B	FINAL ANTENNA PLAN (ALL SECTORS)
C05	SITE DETAILS
C06	RF SCHEDULE
C06A	RF DATA SHEET
C07	AAV DRAWINGS - COVER SHEET
C07A	AAV DRAWINGS - SITE PHOTOS
C07B	AAV DRAWINGS - KEY & EQUIPMENT PLAN
C07C	AAV DRAWINGS - DETAILS
E01	ELECTRICAL NOTES
E02	ELECTRICAL & GROUNDING DETAILS

CODES & STANDARDS

These documents are in compliance & all construction to be in accordance with the following codes & standards as applicable:

State Building Code: 2005 Connecticut Supplement

2003 International Building Code
2003 International Residential Code
2003 International Existing Building Code
2003 International Mechanic Code
2003 International Plumbing Code
2003 International Energy Conservation Code (re-adopted with changes)
ICC/ANSI A117.1-2003 Assessible and Usable Buildings and Facilities

2005 National Electrical Code (NFPA-70)

DRIVING DIRECTIONS

1. DEPART 1 INTERNATIONAL BLVD, MAHWAH, NJ 07495
2. TAKE 3RD EXIT FROM ROUNDABOUT INTERNATIONAL BLVD ONTO LEISURE LN.
3. TAKE RAMP ONTO STATE HIGHWAY 17 (RT-17 N).
4. CONTINUE ON I-287 N.
5. TAKE THE I-87 S/I-287/NEW YORK STATE THRUWAY SOUTH/TAPPAN ZEE BR/NEW YORK CITY EXIT ONTO NEW YORK STATE THRUWAY SOUTH (I-287 E, I-87 S) (PARTIAL TOLL ROAD).
6. KEEP LEFT ONTO CROSS WESTCHESTER EXPY (I-287 E) AT EXIT #8 TOWARD WHITE PLAINS/RYE.
7. TAKE EXIT #9S-N/HUTCHINSON PKWY/WHITESTONE BR/MERRITT PKWY ONTO WESTCHESTER AVE (CR-62 E).
8. TAKE EXIT #9N/HUTCHINSON PKWY NORTH/MERRITT PKWY ONTO HUTCHINSON RIVER PKY N.
9. CONTINUE ON MERRITT PKY (CT-15 N).
10. TAKE EXIT #52/CT-8 N/WATERBURY ONTO CT-8 N.
11. TAKE EXIT #22/BANK STREET.
12. TURN LEFT ONTO WAKELEY ST.
13. TURN LEFT ONTO WAKELEY ST (CT-67).
14. BEAR RIGHT ONTO OLD DR.
15. BEAR RIGHT ONTO RIMMON ST. YOUR DESTINATION ON RIMMON ST IS ON THE RIGHT.

SITE INFORMATION

BLOCK: TBD
LOT: TBD
MAP: TBD
ZONING CLASSIFICATION: TBD
ZONING JURISDICTION: TBD

PROJECT INFORMATION:

SITE ADDRESS:
34 RIMMON STREET
SEYMOUR, CT 06483
NEW HAVEN COUNTY

COORDINATES:
LATITUDE: N 41° 24' 8.08"
LONGITUDE: W 73° 4' 20.06"
DATUM : NAD 83

STRUCTURE HEIGHT:
±150'-0" (TOP OF EXISTING MONOPOLE)

PROJECT DIRECTORY:

PROPERTY OWNER:
GLOBAL SIGNAL ACQUISITIONS III LLC

APPLICANT:
SPRINT-NEXTEL
6200 SPRINT PARKWAY
OVERLAND PARK, KS 66251

ENGINEER:
KMB DESIGN GROUP, LLC
1800 ROUTE 34, SUITE 209
WALL, NJ 07719
KEITH DRENNAN - PROJECT MANAGER
(732) 280-5623

POWER COMPANY:
CONNECTICUT LIGHT & POWER
P.O. BOX 270
HARTFORD, CT 06141-0270
(800) 286-2000

CONSTRUCTION MANAGER:
TODD AMANN
(914) 715-9363

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1	08-20-12	REVISED PER CLIENT COMMENTS	CCR	KCD
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KMB DESIGN GROUP
kmbdg.com
1800 ROUTE 34, SUITE 209
WALL, NJ 07719
(732) 280-5623

Stephen A. Bray
PROFESSIONAL ENGINEER

STATE OF CONNECTICUT
STEPHEN A. BRAY
No. 26657
LICENSED
PROFESSIONAL ENGINEER

CT LICENSE: 26657 9/13/12

PROJECT NUMBER: **332.1460**

SITE INFORMATION:
34 RIMMON STREET
SEYMOUR, CT 06483
NEW HAVEN COUNTY

CT03XC034

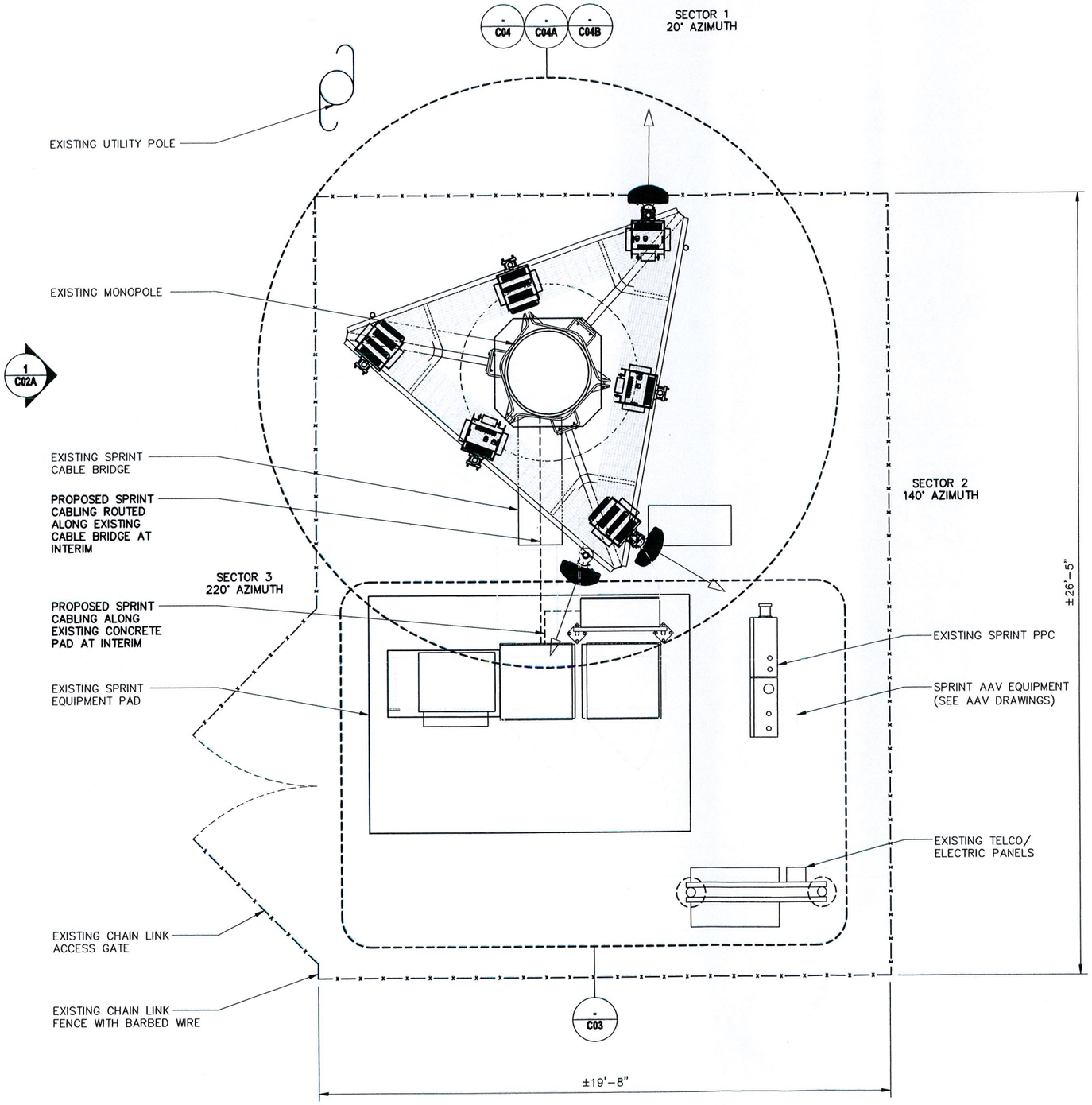
PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE: COVER SHEET

SHEET NUMBER: A01 REV.: 1

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1460_CT03XC034_34 Rimmon Street\332.1460_CAD\332.1460_Construction\332.1460.A01.dwg, 9/13/2012 11:52:25 AM, ezampitella



1 0 0.5 1 2 4
(IN FEET)

1 COMPOUND PLAN

11x17 SCALE: 1/4" = 1'-0" | 24x36 SCALE: 1/2" = 1'-0"

CABLING NOTES:
1. PROPOSED CABLING TO FOLLOW EXISTING ROUTE AND METHOD OF ATTACHMENT AT INTERIM.
2. EXISTING COAXIAL CABLES TO BE REMOVED AT FINAL.
3. CONTRACTOR TO REPAIR/REPLACE ANY MISSING/DAMAGED CABLE TRAY AND ADD HURRICANE STRAPS AS REQUIRED IF APPLICABLE.

GENERAL NOTES:
1. FINAL ANTENNA & EQUIPMENT CONFIGURATION SHOWN ON THIS PLAN. SEE EQUIPMENT & ANTENNA PLAN SHEETS FOR EXISTING AND INTERIM CONFIGURATION.
2. CONTRACTOR TO REPLACE ALL MISSING GROUND BARS AND GROUNDING CONNECTIONS AS REQUIRED WITH GALVANIZED GROUND BARS. CONTRACTOR SHALL PROVIDE BEFORE & AFTER PHOTOS.
3. CONTRACTOR TO RESTORE ANY RUST AREA TO ORIGINAL CONDITION AND PROTECTIVE COATING TO BE APPLIED.
4. STRUCTURAL ANALYSIS PROVIDED UNDER SEPARATE COVER.
5. PROPOSED SPRINT GPS UNIT TO REPLACE EXISTING GPS AT FINAL.

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kmbdg.com
1800 ROUTE 34, SUITE 205
WALL, NJ 07719
(732) 280-5623

Stephen A. Bray
PROFESSIONAL ENGINEER

STATE OF CONNECTICUT · STEPHEN A. BRAY · No. 26657 · LICENSED PROFESSIONAL ENGINEER

CT LICENSE: 26657 9/13/12

PROJECT NUMBER: **332.1460**

SITE INFORMATION:
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SEYMOUR, CT 06483
NEW HAVEN COUNTY

CT03XC034

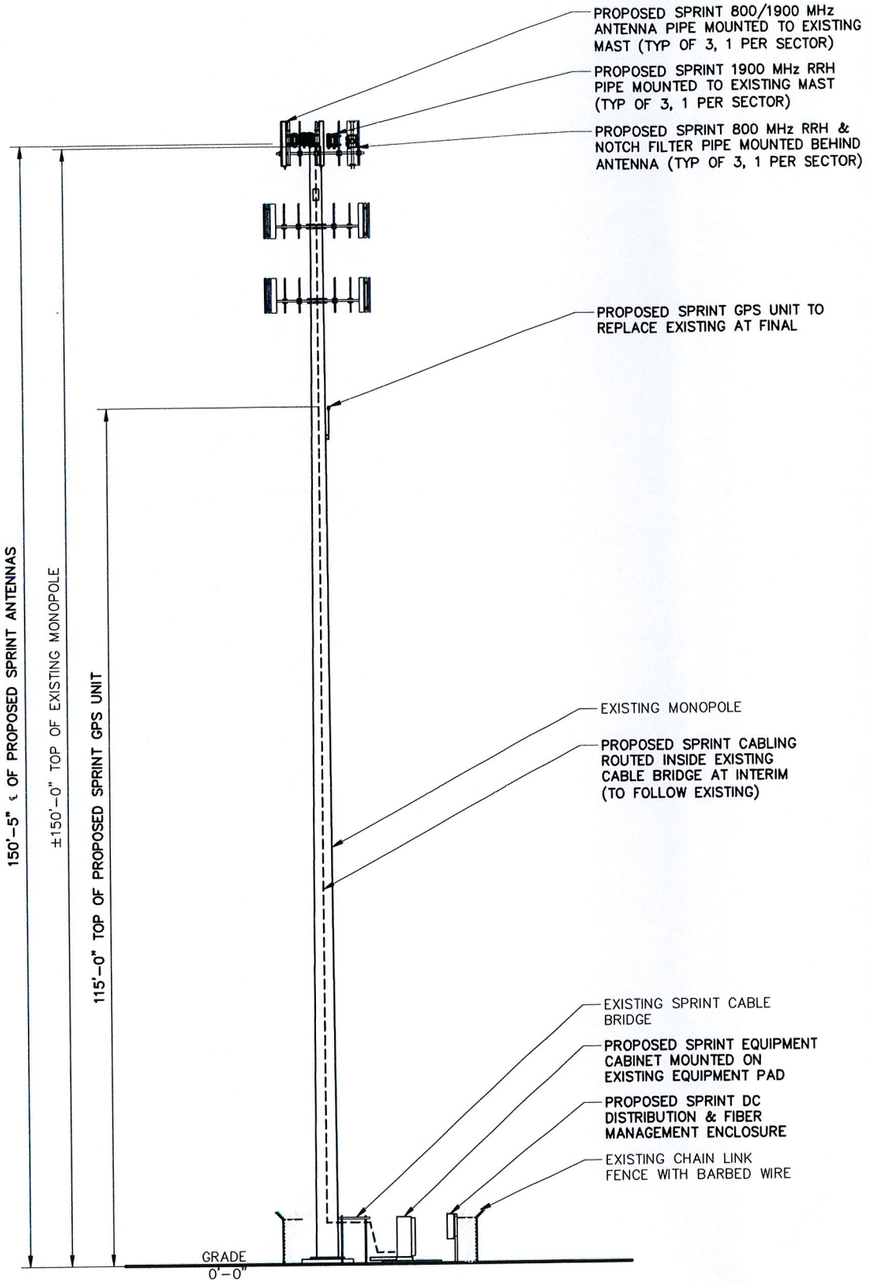
PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE: COMPOUND PLAN

SHEET NUMBER: C02 | REV.: 1

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1460_CT03XC034_34 Rimmon Street\332.1460_CAD\332.1460_Construction\332.1460.C02.dwg, 9/13/2012 11:52:30 AM, ezampitella



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NOTES:
1. FINAL ANTENNA & EQUIPMENT CONFIGURATION SHOWN ON THIS PLAN. SEE EQUIPMENT & ANTENNA PLAN SHEETS FOR EXISTING AND INTERIM CONFIGURATION.

1 0 0.5 1 2 4
(IN FEET)

1 NORTHWEST ELEVATION

11x17 SCALE: 1/4" = 1'-0" | 24x36 SCALE: 1/2" = 1'-0"

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KMB DESIGN GROUP
kmbdg.com
1800 ROUTE 34, SUITE 209
WALL, NJ 07719
(732) 280-5623

Stephen A. Bray
PROFESSIONAL ENGINEER
STATE OF CONNECTICUT · STEPHEN A. BRAY · No. 26657 · LICENSED PROFESSIONAL ENGINEER

CT LICENSE: 26657 9/13/12

PROJECT NUMBER: **332.1460**

SITE INFORMATION:
34 RIMMON STREET
SEYMOUR, CT 06483
NEW HAVEN COUNTY
CT03XC034

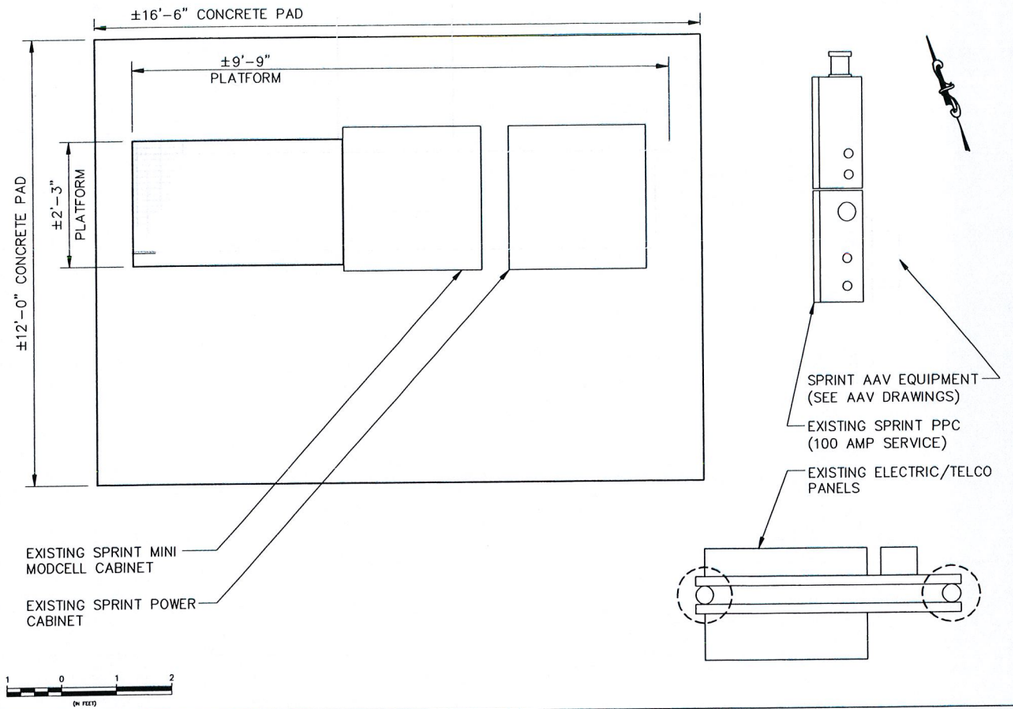
PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE: ELEVATION

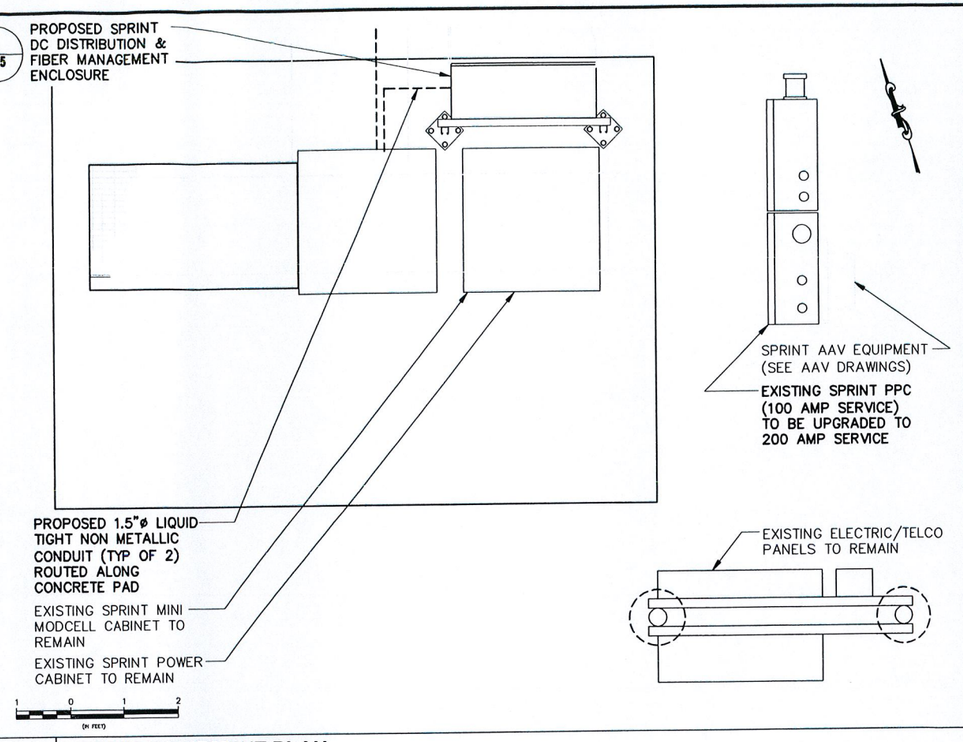
SHEET NUMBER: C02A | REV.: 1

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1460_CT03XC034_34 Rimmon Street\332.1460_CAD\332.1460_Construction\332.1460.C02A.dwg, 9/13/2012 11:52:35 AM, ezampitella



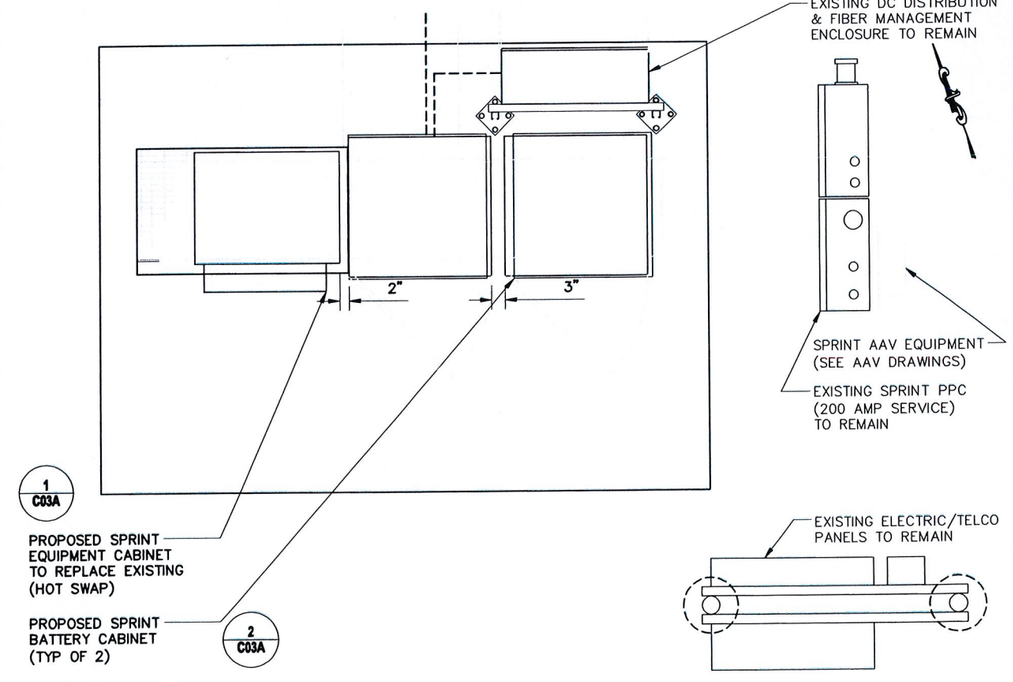
1 EXISTING EQUIPMENT PLAN

11x17 SCALE: 3/8" = 1'-0" | 24x36 SCALE: 3/4" = 1'-0"



2 INTERIM EQUIPMENT PLAN

11x17 SCALE: 3/8" = 1'-0" | 24x36 SCALE: 3/4" = 1'-0"



3 FINAL EQUIPMENT PLAN

11x17 SCALE: 3/8" = 1'-0" | 24x36 SCALE: 3/4" = 1'-0"

NOTE:
1. CONTRACTOR TO REPLACE ALL MISSING GROUND BARS AND GROUNDING CONNECTIONS AS REQUIRED.

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KMB DESIGN GROUP
kmbdg.com
1800 ROUTE 34, SUITE 209
WALL, NJ 07719
(732) 280-5623

Stephen A. Bray
PROFESSIONAL ENGINEER
STATE OF CONNECTICUT STEPHEN A. BRAY No. 26657 LICENSED PROFESSIONAL ENGINEER
CT LICENSE: 26657 9/13/12

PROJECT NUMBER: 332.1460

SITE INFORMATION:
34 RIMMON STREET
SEYMOUR, CT 06483
NEW HAVEN COUNTY

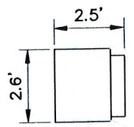
CT03XC034

PROJECT TYPE: NETWORK VISION

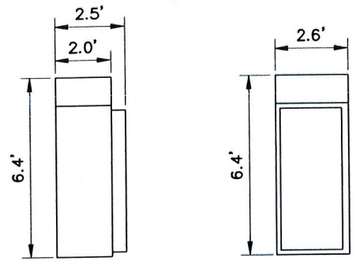
DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE: EQUIPMENT PLANS

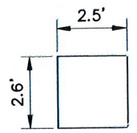
SHEET NUMBER: C03 | REV.: 1



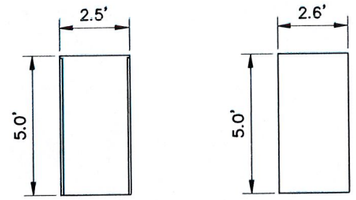
9927
EQUIPMENT CABINET
CABINET WEIGHT: 1020 lbs
FOOTPRINT: 5.3 SF



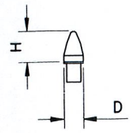
1	EQUIPMENT CABINET SPECIFICATIONS		
11x17 SCALE: 3/16" = 1'-0"	24x36 SCALE: 3/8" = 1'-0"		



AVAYA 60ECv2
BATTERY CABINET
CABINET WEIGHT: 1625 lbs
FOOTPRINT: 6.5 SF

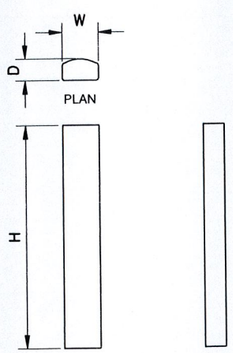


2	BATTERY CABINET SPECIFICATION		
11x17 SCALE: 3/16" = 1'-0"	24x36 SCALE: 3/8" = 1'-0"		



MANUF.: PCTEL
MODEL #: GPS-TMG-HR-26NCM
HEIGHT: 5.0"
DIAMETER: 3.2"
WEIGHT: 0.6 lbs

3	GPS UNIT SPECIFICATIONS		
11x17 SCALE: 1/4" = 1'-0"	24x36 SCALE: 1/2" = 1'-0"		



MANUF.: RFS
MODEL: APXVSPP18-C-A20
LENGTH 72.0"
WIDTH: 11.8"
DEPTH: 7.0"
WEIGHT: 64.5 lbs
AREA: 5.9 SF

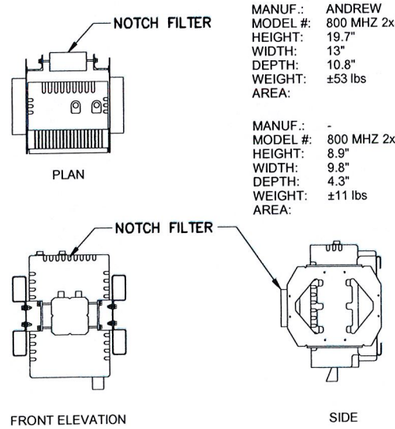
4			

5			

6			

7	ANTENNA SPECIFICATIONS - 800/1900 MHz		
SCALE: NTS			

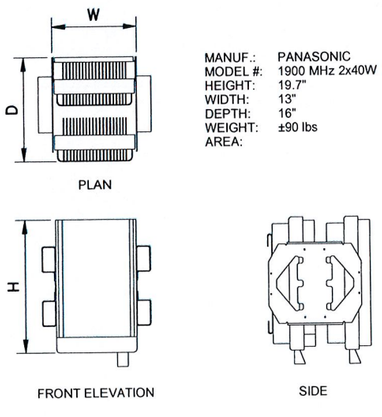
8			



MANUF.: ANDREW
MODEL #: 800 MHZ 2x50W
HEIGHT: 19.7"
WIDTH: 13"
DEPTH: 10.8"
WEIGHT: ±53 lbs
AREA:

MANUF.: -
MODEL #: 800 MHZ 2x50W
HEIGHT: 8.9"
WIDTH: 9.8"
DEPTH: 4.3"
WEIGHT: ±11 lbs
AREA:

9	RRH SPECIFICATIONS - 800 MHz		
11x17 SCALE: 1/2" = 1'-0"	24x36 SCALE: 1" = 1'-0"		



MANUF.: PANASONIC
MODEL #: 1900 MHz 2x40W
HEIGHT: 19.7"
WIDTH: 13"
DEPTH: 16"
WEIGHT: ±90 lbs
AREA:

10	RRH SPECIFICATIONS - 1900 MHz		
11x17 SCALE: 1/2" = 1'-0"	24x36 SCALE: 1" = 1'-0"		

11			

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SITE INFORMATION:
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NEW HAVEN COUNTY

CT03XC034

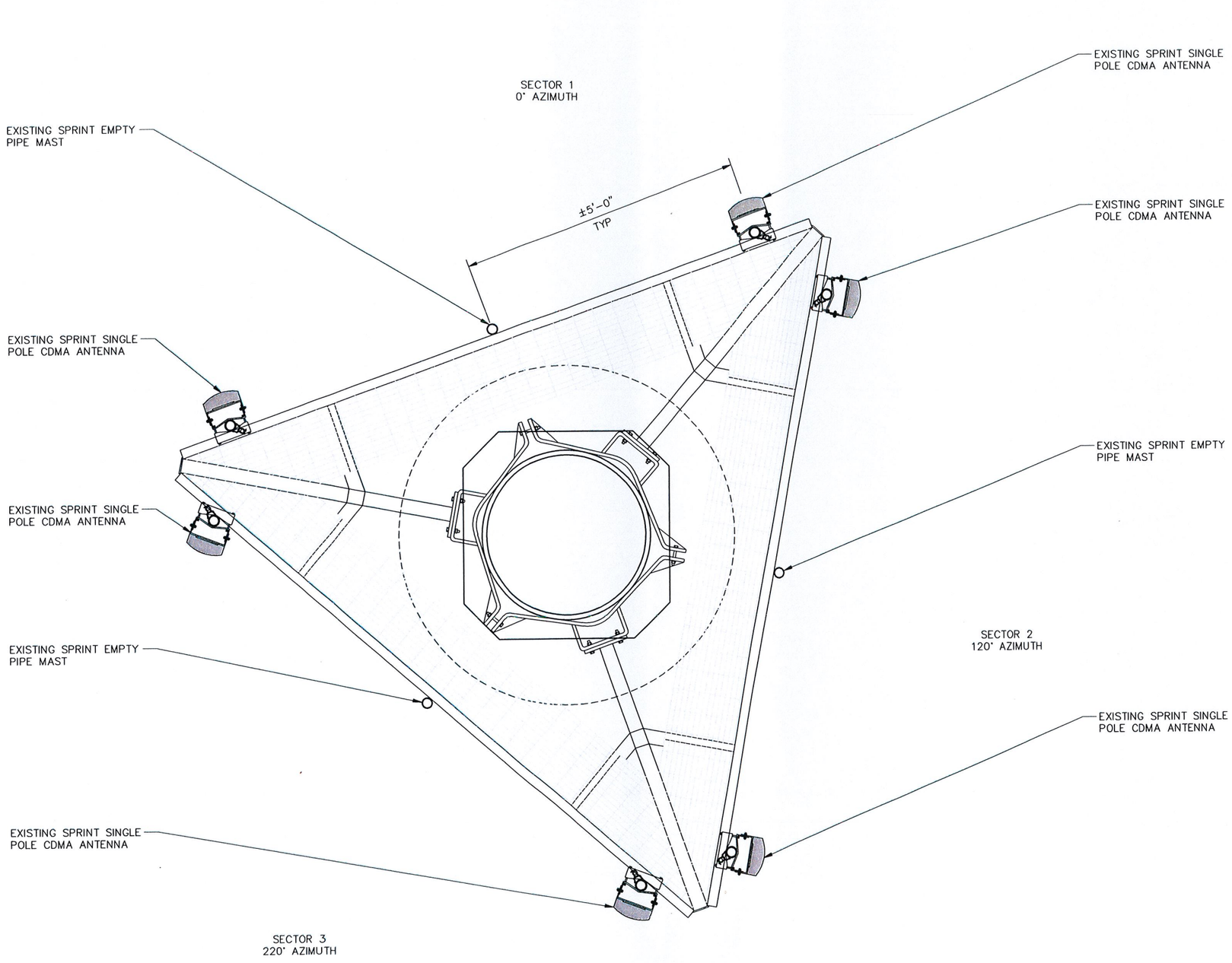
PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE:
EQUIPMENT & ANTENNA SPECIFICATIONS

SHEET NUMBER:	REV.:
C03A	1

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1460_CT03XC034_34 Rimmon Street\332.1460_CAD\332.1460_Construction\332.1460.C03A.dwg, 9/13/2012 11:52:42 AM, ezampitella



1 0 1 2
(IN FEET)

1 EXISTING ANTENNA PLAN @ ±150'-5" AGL (ALL SECTORS)

11x17 SCALE: 1/2" = 1'-0" | 24x36 SCALE: 1" = 1'-0"

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NEW HAVEN COUNTY

CT03XC034

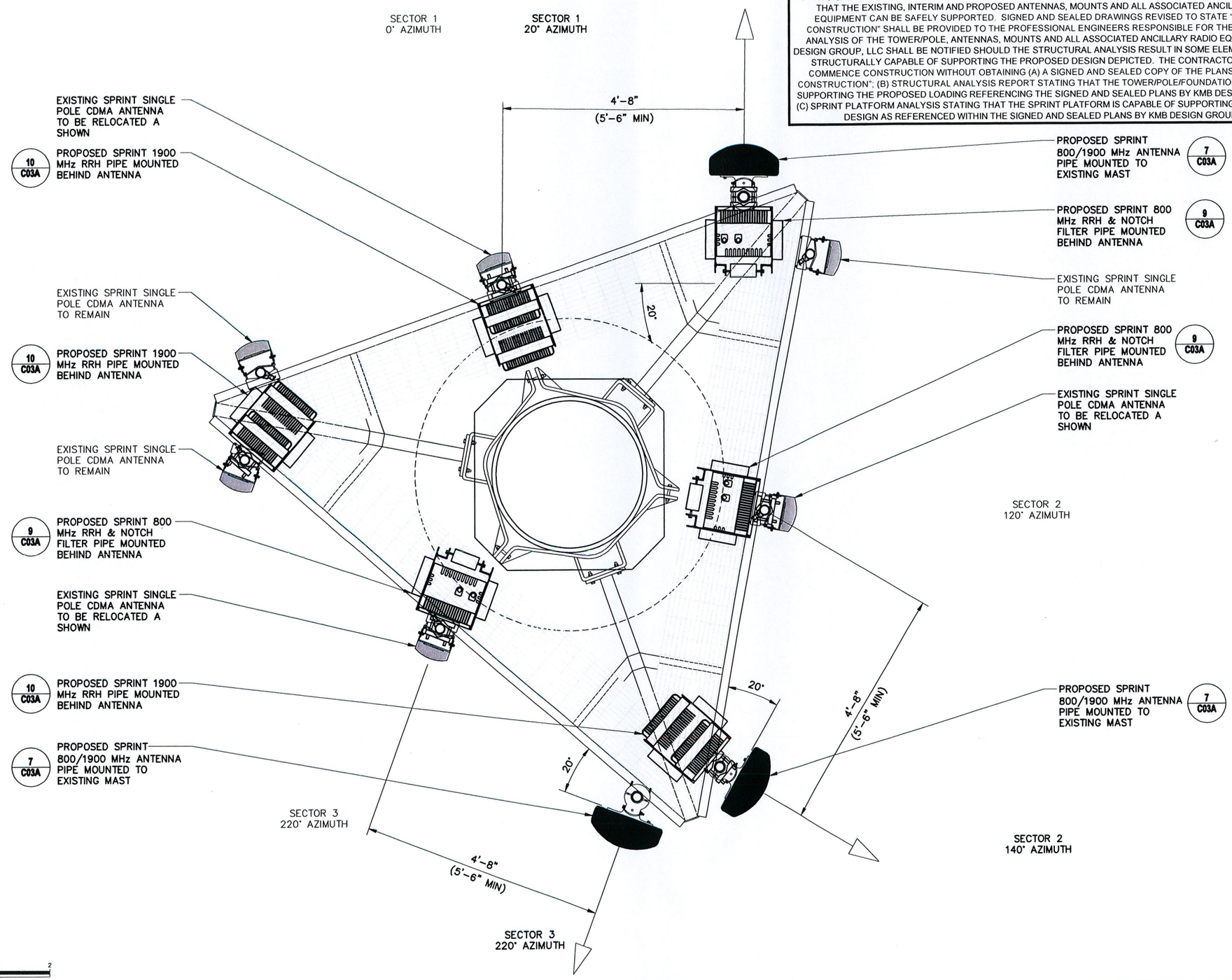
PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE: EXISTING ANTENNA PLAN (ALL SECTORS)

SHEET NUMBER: C04 | REV.: 1

THE STRUCTURAL ENGINEERING CONCERNING THE STRUCTURAL STABILITY OF THE TOWER/POLE, FOUNDATION, ANTENNAS, MOUNTS AND ALL ASSOCIATED ANCILLARY RADIO EQUIPMENT IS BEING COMPLETED BY OTHERS. KMB DESIGN GROUP, LLC HAS NOT BEEN REQUESTED TO PERFORM ANY STRUCTURAL ANALYSIS SERVICES TO VERIFY THAT THE TOWER/POLE AND/OR FOUNDATION IS CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT DEPICTED WITHIN THESE SIGNED AND SEALED DRAWINGS. FURTHERMORE KMB DESIGN GROUP, LLC HAS NOT BEEN REQUESTED TO PHYSICALLY CONFIRM THE EXISTING MOUNT CONFIGURATION AND PERFORM A STRUCTURAL ANALYSIS TO VERIFY THAT THE EXISTING, INTERIM AND PROPOSED ANTENNAS, MOUNTS AND ALL ASSOCIATED ANCILLARY RADIO EQUIPMENT CAN BE SAFELY SUPPORTED. SIGNED AND SEALED DRAWINGS REVISED TO STATE "ISSUED FOR CONSTRUCTION" SHALL BE PROVIDED TO THE PROFESSIONAL ENGINEERS RESPONSIBLE FOR THE STRUCTURAL ANALYSIS OF THE TOWER/POLE, ANTENNAS, MOUNTS AND ALL ASSOCIATED ANCILLARY RADIO EQUIPMENT. KMB DESIGN GROUP, LLC SHALL BE NOTIFIED SHOULD THE STRUCTURAL ANALYSIS RESULT IN SOME ELEMENTS NOT BEING STRUCTURALLY CAPABLE OF SUPPORTING THE PROPOSED DESIGN DEPICTED. THE CONTRACTOR SHALL NOT COMMENCE CONSTRUCTION WITHOUT OBTAINING (A) A SIGNED AND SEALED COPY OF THE PLANS "ISSUED FOR CONSTRUCTION"; (B) STRUCTURAL ANALYSIS REPORT STATING THAT THE TOWER/POLE/FOUNDATION IS CAPABLE OF SUPPORTING THE PROPOSED LOADING REFERENCING THE SIGNED AND SEALED PLANS BY KMB DESIGN GROUP, LLC; (C) SPRINT PLATFORM ANALYSIS STATING THAT THE SPRINT PLATFORM IS CAPABLE OF SUPPORTING THE PROPOSED DESIGN AS REFERENCED WITHIN THE SIGNED AND SEALED PLANS BY KMB DESIGN GROUP, LLC.



1 | INTERIM ANTENNA PLAN @ ±150'-5" AGL (ALL SECTORS)

11x17 SCALE: 1/2" = 1'-0" | 24x36 SCALE: 1" = 1'-0"

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REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
1	08-20-12	REVISED PER CLIENT COMMENTS	CCR	KCD
0	07-16-12	ISSUED FOR CONSTRUCTION	AJL	KCD

KMB DESIGN GROUP
kmbdg.com
1800 ROUTE 34 SUITE 209
WALL NJ 07719
(732) 280-5623

Stephen A. Bray
PROFESSIONAL ENGINEER
STATE OF CONNECTICUT
STEPHEN A. BRAY
No. 26657
LICENSED PROFESSIONAL ENGINEER

CT LICENSE: 26657 9/13/12

PROJECT NUMBER: 332.1460

SITE INFORMATION:
34 RIMMON STREET
SEYMOUR, CT 06483
NEW HAVEN COUNTY

CT03XC034

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE: INTERIM ANTENNA PLAN (ALL SECTORS)

SHEET NUMBER: C04A | REV.: 1

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1460_CT03XC034_34 Rimmon Street\332.1460_CAD\332.1460_Construction\332.1460.C04A.dwg, 9/13/2012 11:52:49 AM, ezamptella

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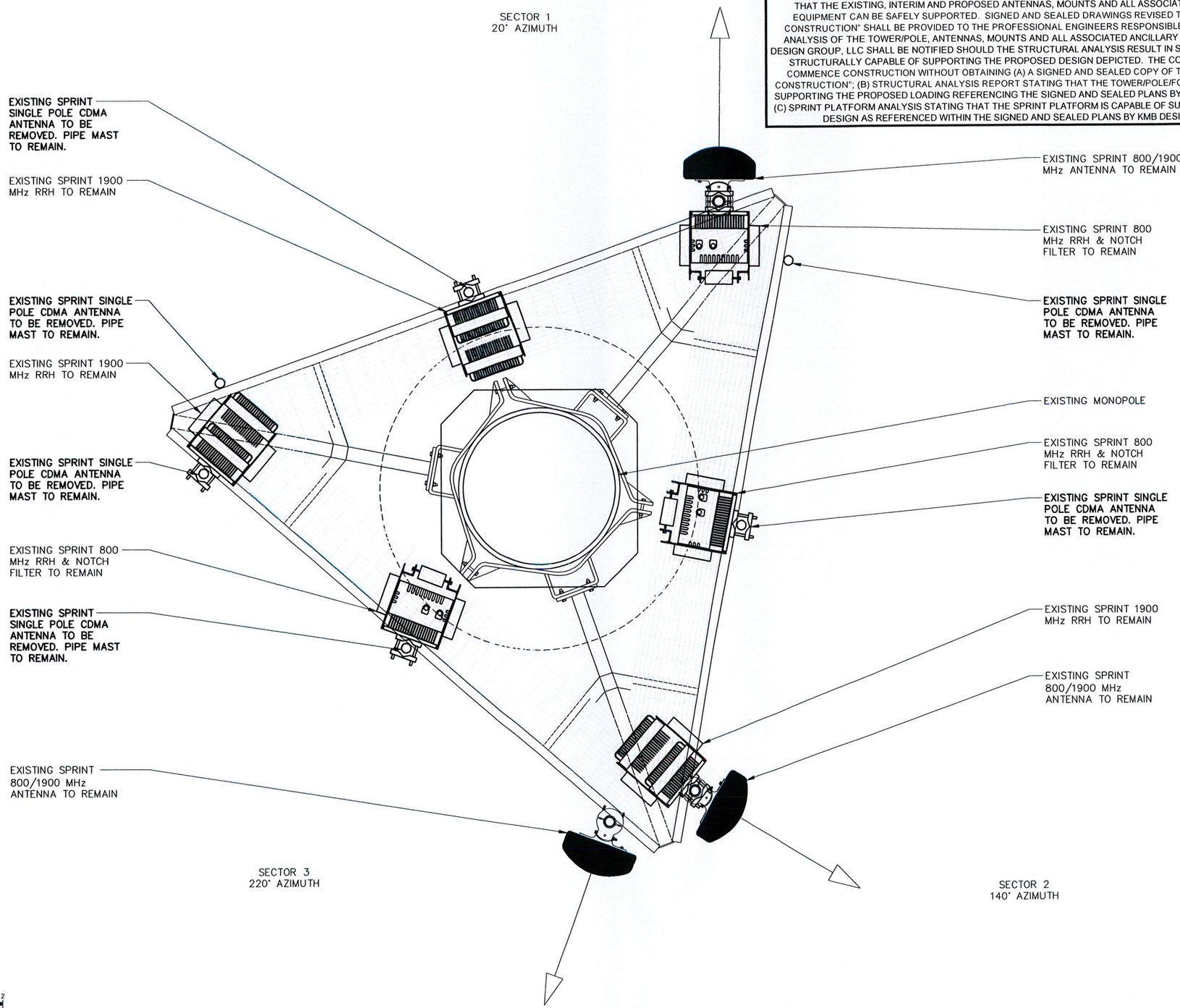

1 INTERIM ANTENNA PLAN @ ±150'-5" AGL (ALL SECTORS)

11x17 SCALE: 1/2" = 1'-0" | 24x36 SCALE: 1" = 1'-0"

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1	08-20-12	REVISED PER CLIENT COMMENTS	CCR	KCD
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KMB DESIGN GROUP
kmbdg.com
1800 ROUTE 34, SUITE 209
WALL, NJ 07719
(732) 280-5622

Stephen A. Bray
PROFESSIONAL ENGINEER
STATE OF CONNECTICUT STEPHEN A. BRAY No. 26657 LICENSED PROFESSIONAL ENGINEER
CT LICENSE: 26657 9/13/12

PROJECT NUMBER: 332.1460

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34 RIMMON STREET
SEYMOUR, CT 06483
NEW HAVEN COUNTY

CT03XC034

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE: FINAL ANTENNA PLAN (ALL SECTORS)

SHEET NUMBER: C04B | REV.: 1

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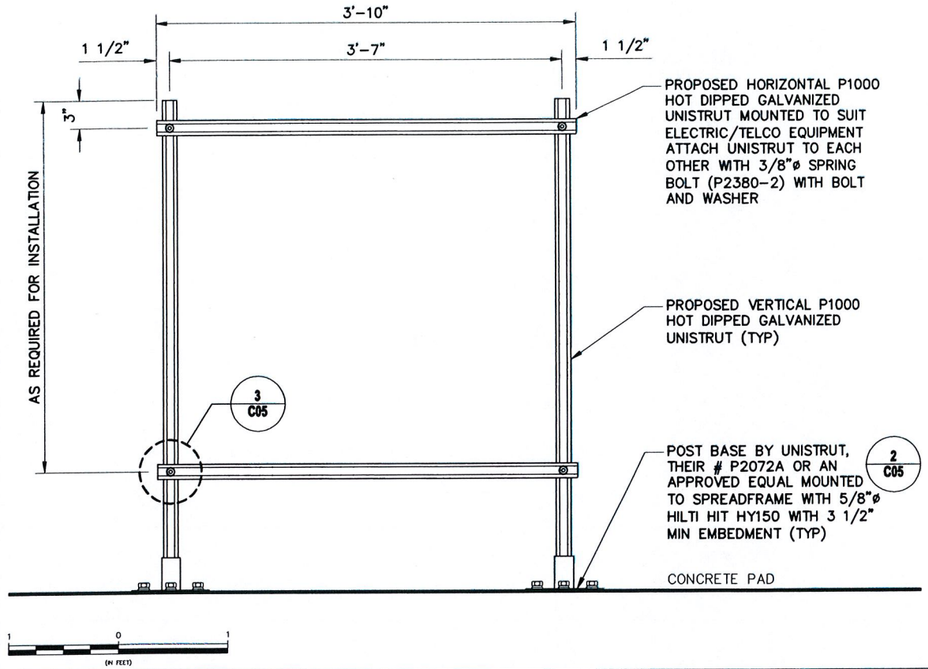
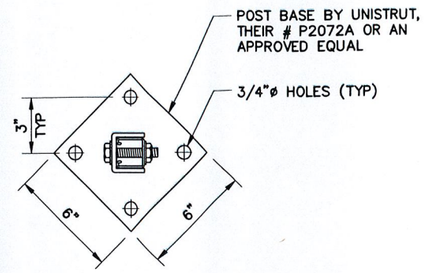


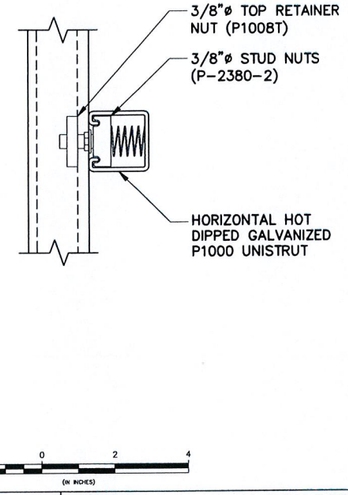
1 **UNISTRUT BACKBOARD ELEVATION**

11x17 SCALE: 3/4" = 1'-0" | 24x36 SCALE: 1 1/2" = 1'-0"



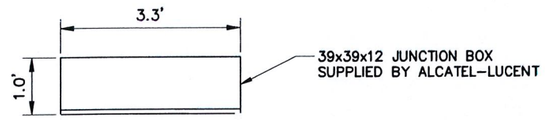
2 **POST BASE DETAIL**

11x17 SCALE: 1 1/2" = 1'-0" | 24x36 SCALE: 3" = 1'-0"

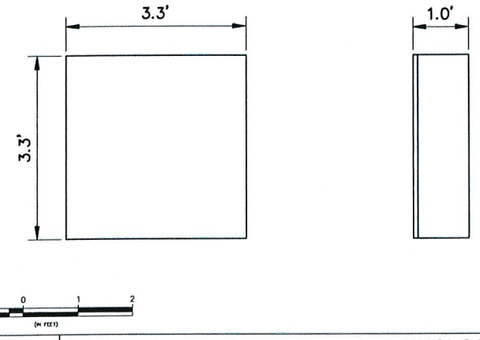


3 **UNISTRUT CONNECTION DETAIL**

11x17 SCALE: 3" = 1'-0" | 24x36 SCALE: 6" = 1'-0"



JUNCTION BOX TO BE CONFIGURED AS REQUIRED FOR SITE CONDITIONS PER MANUFACTURER'S SPECIFICATIONS



4 **DC DISTRIBUTION & FIBER MGMT ENCLOSURE DETAIL**

11x17 SCALE: 3/8" = 1'-0" | 24x36 SCALE: 3/4" = 1'-0"

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CT LICENSE: 26657 9/13/12

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NEW HAVEN COUNTY

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PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
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SHEET TITLE:
SITE
DETAILS

SHEET NUMBER:	REV.:
C05	1

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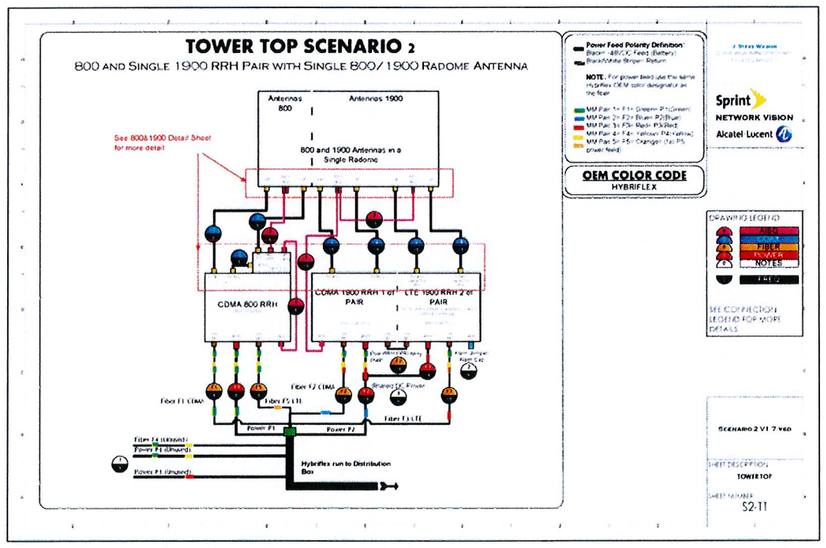
FINAL ANTENNA AND CABLE SCHEDULE

SECTOR	ANTENNA	AZIMUTH (DEGREES)	MECHANICAL DT (DEGREES)	ELECTRICAL DT (DEGREES)	RAD CENTER AGL (FT)	ANTENNA MAKE	ANTENNA MODEL	RRH QTY	TOP COAX JUMPER QTY	TOP COAX JUMPER LENGTH (FT)	COMBINER JUMPER QTY	COMBINER JUMPER LENGTH (FT)	NOTCH FILTER JUMPER QTY	NOTCH FILTER JUMPER LENGTH (FT)	HYBRIFLEX LENGTH (FT)
1	–														200
	–														
	800/1900	20	0	800: 0 / 1900: −8	150.4	RFS	APXVSPP18−C−A20	800: 1 / 1900: 1	6	10	–	–	1	3	
2	–														200
	–														
	800/1900	140	0	800: 0 / 1900: −8	150.4	RFS	APXVSPP18−C−A20	800: 1 / 1900: 1	6	10	–	–	1	3	
3	800/1900	220	0	800: 0 / 1900: −8	150.4	RFS	APXVSPP18−C−A20	800: 1 / 1900: 1	6	10	–	–	1	3	200
	–														
	–														

NOTES:
1. DUE TO FIELD MEASUREMENTS AND THE INSTALLATION OF NEW ANTENNAS THAT VARY IN SIZE FROM THE EXISTING ANTENNAS, THE ANTENNA RAD CENTER HAS CHANGED FROM WHAT IS ON RECORD. THE DATABASE MAY NEED TO BE UPDATED TO MATCH THESE PLANS.
2. SOME CABLING MAY CHANGE AT THE TIME OF CONSTRUCTION. CONTRACTOR TO CONFIRM ALL CABLE LENGTHS, TYPE, QUANTITIES, AND CONFIGURATION PRIOR TO CONSTRUCTION.
3. ALL UNUSED POWER AND FIBER MUST BE PROPERLY TERMINATED AND WEATHERPROOFED.

CONTRACTOR TO VERIFY & USE THE LATEST TOWER TOP SCENARIO AS PROVIDED BY ALCATEL−LUCENT CONSTRUCTION MANAGER



ALL SECTORS

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NEW HAVEN COUNTY

CT03XC034

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE: RF SCHEDULE

SHEET NUMBER: C06 REV.: 1

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GENERAL SPECIFICATIONS

1. Contractor shall verify that the total number of service entrance disconnects in the existing utility company pedestal must not exceed six. If the new service added exceeds this value, contractor must coordinate with the utility company and authority having jurisdiction. Run an additional exclusive and dedicated service lateral set for the new load added to the compound as per NEC Article # 230-2(B)
2. All work should be done in a neat workmanlike manner, left clean and free from defects, and completely operable. The contractor shall provide all equipment as scheduled on the drawings. All materials shall be new and all work and materials shall be guaranteed by the contractor for a period of one (1) year from the date of acceptance by the owner.
3. All work shall be carefully coordinated with the landlord and all trades involved, and the contractor shall provide proper connections, fittings, valves, piping, etc. for all equipment furnished by carrier or other trades involved in this contract.
4. Contractor shall inform the engineer immediately of any conflict discovered before performing any work related to such conflict.
5. Provide all required temporary utilities and pay all associated fees and operating costs.
6. Before submitting this bid, the contractor shall visit the job site to examine and fully acquaint himself with the existing job conditions, paying particular attention to the location of existing conditions to make a complete and operable system without additional cost to the carrier or the engineer.
7. Obtain all permits and approvals from authorities having jurisdiction and paying all fees required.
8. Label all equipment served from Sprint panelboard with phenolic labels sized in relation to usage.
9. Contractor to provide and install engraved label on the Sprint meter socket enclosure.
10. Redlined As-Builts are to be delivered to a Sprint representative.
11. The equipment/protections must be rated for standard of AIC rate higher than incoming equipment and/or utility company AIC rate.

GROUNDING NOTES

1. The subcontractor is responsible for properly sequencing grounding and underground conduit installation as to prevent any loss of continuity in the grounding system or damage to the conduit.
2. All exterior ground conductors shall be #2 AWG solid tinned copper unless otherwise indicated.
3. All ground connections above grade (interior & exterior) shall be formed using high press crimps.
4. All ground connections below grade shall be exothermic (Cadweld).
5. Connections to equipment and enclosures shall be made utilizing two-hole ground lugs with an antioxidant compound.
6. Maximum resistance of the completed ground system shall not exceed 5 Ohms. Testing shall be performed in accordance with technical specification for facility grounding, using fall potential method.
7. Where grounding connections are made to painted metal surfaces shall be scraped clean to bear metal to ensure proper contact. Surfaces shall be restored to match original finishes.
8. Use of 90° bends in the protection grounding conductors shall be avoided when 45° bends can be adequately supported.
9. Ground depth shall be 30" minimum below finished grade, or 6" below frost line, whichever is greater.

ELECTRICAL SYMBOLS		ABBREVIATIONS	
WIRING SYMBOLS		AWG	AMERICAN WIRE GAUGE
	DISCONNECT SWITCH	BCW	BARE COPPER WIRE
M	METER	DWG	DRAWING
	CIRCUIT BREAKER	EMT	ELECTRICAL METALLIC TUBING
	CADWELD TYPE CONNECTION	GEN	GENERATOR
	COMPRESSION TYPE CONNECTION	MGB	MASTER GROUND BAR
	GROUND ROD WITH ACCESS	PVC	RIGID (SCH 40) PVC CONDUIT
	CHEMICAL GROUND ROD	RGS	RIGID GALVANIZED STEEL
	GROUND ROD	RWY	RACEWAY
	CONDUIT TURNING DOWN	TYP	TYPICAL
	CONDUIT TURNING UP		
JB	JUNCTION BOX		
PB	PULL BOX		
	CONDUIT RUNNING ABOVE GRADE		
	CONDUIT RUNNING UNDER GROUND		

ELECTRICAL SPECIFICATIONS

1. General:
   - A. The electrical contractor shall furnish all labor,materials, tools, transportation equipment, services and facilities required for the complete, proper and substantial installation of all electrical work. All fixtures, devices, and equipment shown, noted or required on these drawings, and/or contained herein shall be connected from the source of electric power to the final connection, tested and made ready for satisfactory operation.
   - B. Service equipment shall be 120/240 VAC, 100 Amp, single phase, unless otherwise directed by the Sprint Construction Manager.
   - C. Unless otherwise indicated, the arrangement, position, connections, etc. shown on the drawings shall be taken on a diagram basis. The right is reserved by the engineer to make minor changes in locations and arrangements when required by job development without additional compensation to the contractor.
   - D. All work shall conform to the adopted edition of the National Electrical Code and local, state and applicable codes.
   - E. When a utility company meter is specified, the contractor shall obtain all associated cut-in cards, inspections, etc., necessary to have the meter set. It is the responsibility of the contractor to meet with utility company prior to construction to verify source of electric service, tap and meter location.
2. Identification:
   - A. Provide typewritten directories for panels, indicating use of each branch circuit and designating spare circuits. Handwritten directories are not acceptable.
   - B. All panel boards, switches and other equipment enclosures shall bear engraved nameplates as manufactured by Seton Nameplate Corp., or equal lettering to be 1/2" white letters on black background unless noted otherwise.
3. Raceways:
   - A. Minimum conduit size shall be 3/4" unless otherwise noted on the drawings.
   - B. Exposed raceways shall be run true, plumb, and parallel or perpendicular to building lines.
   - C. Conduit routings are schematic. Sub contractor shall install conduits so that access to equipment is not blocked.
4. Wiring Methods:
   - A. All feeders shall consist of pulled conductors in conduit. All branch circuits shall consist of pulled conductors in conduit. Except 15 and 20 Ampere 1 pole lighting receptacles, miscellaneous branch circuits concealed above suspended ceilings or within dry walls shall consist of type MC metal clad cable if allowed by code. Connections to communications cabinets and vibrating equipment shall consist of pulled conductors in LFMC, maximum 6' in length.
   - B. Conductors shall be continuous from origin to panel or equipment without splices. Where tap splices are necessary and approved, they shall be made with suitable connectors in junction boxes.
   - C. Equipment ground conductors shall be provided for all feeders and branch circuits.
   - D. The contractor shall conceal all conduit routing passing through finished areas. Conduit routing through unfinished shall be supported as specified in drawings. Unless clearly specified, no conduits shall be routed on exterior surface of buildings.
   - E. All conductor terminals shall be U.L. listed for minimum of 75° C.
   - F. Provide fire stopping around all conduits at wall and floor penetrations.
   - G. Seal all exterior wall penetrations as required.
   - H. Underground conduits shall be a minimum of 24" below finished grade. All underground work shall be documented by photograph before any backfill is begun. Photos will be required at time punchlist is performed. Feeders shall be individual conductors in schedule 40 PVC, direct burial conduit. When buried conduits are subject to vehicular traffic, conduits shall be encased in concrete. All sweeps below grade shall be schedule 80 PVC.
   - I. All feeders in "damp" or "wet" locations shall consist of individual conductor in rigid galvanized steel or rigid aluminum conduit. Liquid-tight flexible metallic conduit shall be utilized when connecting to equipment cabinets and vibrating equipment. The maximum length for flexible conduit shall be 6'-0".
5. Wiring Devices:
   - A. Switches, receptacles and other wiring devices shall be specification grade of type, size and rating indicated on the drawings.
6. Disconnect Switches:
   - A. Switches shall be quick-make, quick-break NEMA 1 for indoor use and NEMA 3R for outdoor use as manufactured by General Electric, Square D or equal. Electrical contractor to provide all safety disconnects.
7. Special Requirements:
   - A. The electrical contractor shall furnish and install all power and control wiring for equipment contained in contract documents.
   - B. All work requiring an outage or interruption of service (power, telephone) shall be scheduled only at such time permitted by owner.
8. Lighting fixtures and lamps:
   - A. Lighting fixtures shall be furnished complete with necessary hardware and lamps.
9. Transformers:
   - A. Transformers shall be dry type with average temperature rise not to exceed 150° C (115° C)(80° C)
   - B. Transformers shall be as manufactured by Square D, General Electric, or Siemens.

The contractor is required to contact the utility companies prior to starting construction. This is necessary to reconfirm that the utility points have remained consistent with the contractor documents:

* Telephone Demarcation Point
* Electrical Service Tap Point
* New Utility Meter Location

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CT LICENSE: 26657 9/13/12

PROJECT NUMBER: 332.1460

SITE INFORMATION:
34 RIMMON STREET
SEYMOUR, CT 06483
NEW HAVEN COUNTY

CT03XC034

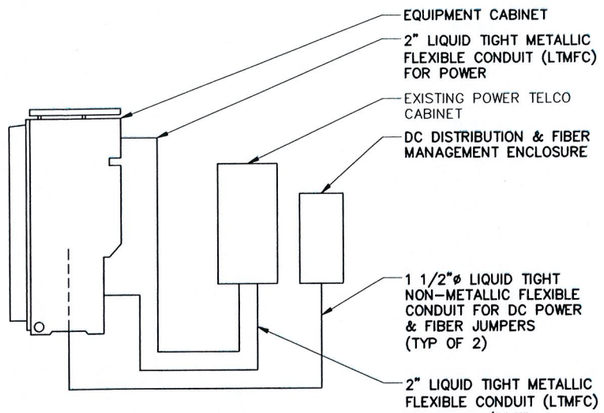
PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE: ELECTRICAL NOTES

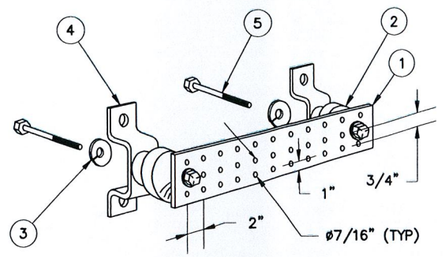
SHEET NUMBER: E01 REV.: 1

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1460_CT03XC034_34 Rimmon Street\332.1460_CAD\332.1460_Construction\332.1460.E01.dwg, 9/13/2012 11:53:03 AM, examplella



1 PLUMBING SCHEMATIC (IF REQUIRED)

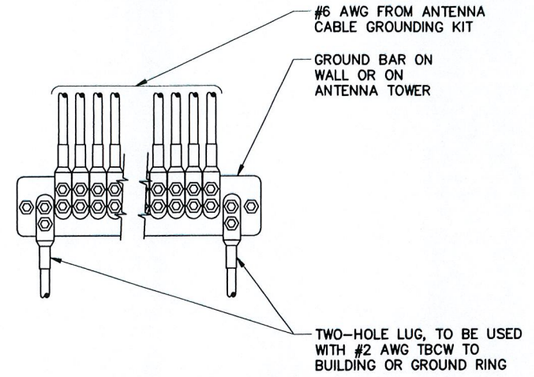
SCALE: NTS



1. GALVANIZED STEEL GROUND BAR, 1/4" x 4" x 20", HAGER PART NO TGBI-14420C OR A.L.T. PART NO. 382227. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11 X 1" H.H.C.S.BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1

2 GROUND BAR DETAIL

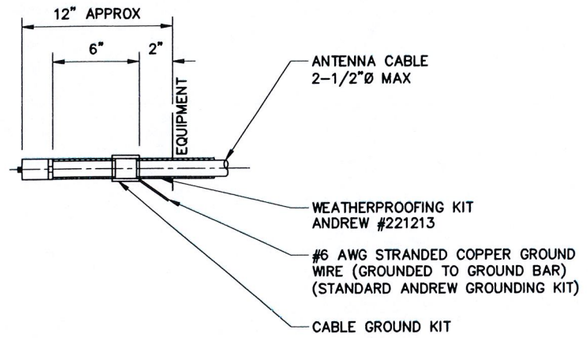
SCALE: NTS



NOTE:
CONTRACTOR TO UTILIZE KOPR-SHIELD (THOMAS & BETTS) ON ALL LUG CONNECTIONS

3 GROUND LUG TO GROUND BAR CONNECTION DETAIL

SCALE: NTS



NOTE:
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

4 CABLE GROUND KIT CONNECTION DETAIL

SCALE: NTS

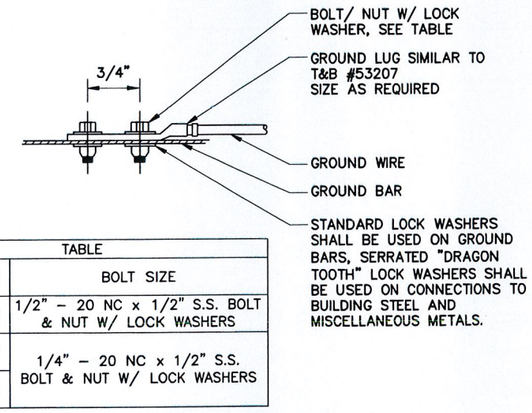
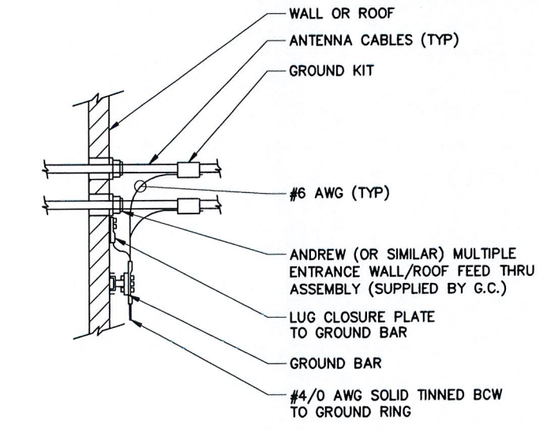


TABLE		
WIRE SIZE	LUG #	BOLT SIZE
#4/0	53212	1/2" - 20 NC x 1/2" S.S. BOLT & NUT W/ LOCK WASHERS
#2	53207	1/4" - 20 NC x 1/2" S.S. BOLT & NUT W/ LOCK WASHERS
#6	53205	

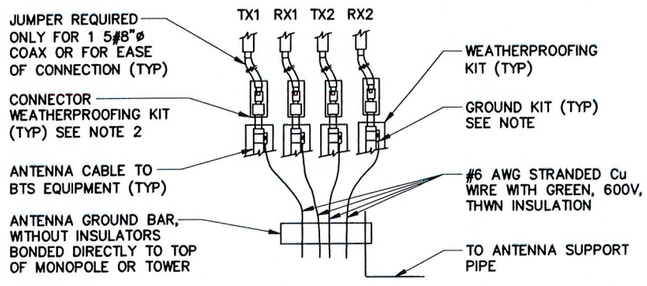
5 GROUND LUG CONNECTION DETAIL

SCALE: NTS



6 CABLE GROUNDING DETAIL

SCALE: NTS



NOTES:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.
3. ATTACH "DO NOT DISCONNECT" LABELS TO GROUND BARS. CAN USE BRASS TAG "DO NOT DISCONNECT" AT EACH COAX GROUND POINT OR BACK-A-LITE PLATE ON GROUND BAR.

7 GROUND BAR TO GROUND WIRE CONNECTION DETAIL

SCALE: NTS

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REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
1	08-20-12	REVISED PER CLIENT COMMENTS	CCR	KCD
0	07-16-12	ISSUED FOR CONSTRUCTION	AJL	KCD

KMB DESIGN GROUP
kmbdg.com
1800 ROUTE 34, SUITE 209
WALL, NJ 07719
(732) 280-5623

Stephen A. Bray
PROFESSIONAL ENGINEER
STATE OF CONNECTICUT
STEPHEN A. BRAY
No. 26657
LICENSED
PROFESSIONAL ENGINEER

CT LICENSE: 26657 9/13/12

PROJECT NUMBER:
332.1460

SITE INFORMATION:
34 RIMMON STREET
SEYMOUR, CT 06483
NEW HAVEN COUNTY

CT03XC034

PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		04-19-12

SHEET TITLE:
ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER: E02

REV.: 1

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1460_CT03XC034_34 Rimmon Street\332.1460_CAD\332.1460_Construction\332.1460.E02.dwg, 9/13/2012 11:53:06 AM, ezampitella