10 Industrial Ave, Suite 3
Mahwah, NJ 07430
Phone: (845)499-4712
Jennifer Notaro
Real Estate Consultant

August 6th, 2014

Hand Delivered

Ms. Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

CC to Property Owner
Town of Farmington
1 Monteith Drive, Farmington, CT 06032

RE: Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 319-321 New Britain Ave., Farmington, CT 06085. Known to Sprint Spectrum L.P. as site CT33XC534.

Dear Ms. Bachman:

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.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in Sprint's operations at the site. Also included is 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 JNotaro@Transcendwireless.com with questions concerning this matter.
Thank you for your consideration.

Sincerely,

Jennifer Notaro
Real Estate Consultant

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY FCC REGULATORY COMPLIANCE MAXIMUM PERMISSIBLE EXPOSURE (MPE) ASSESSMENT

Sprint Existing Facility

Site ID: CT33XC534

Unionville / Police Dept.

319 - 321 New Britain Avenue
Farmington, CT 06032

July 15, 2014

EBI Project Number: 62143789

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

EBI Consulting
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July 15, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT33XC534 - Unionville / Police Dept.

Site Total: 71.75% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 319 - 321 New Britain Avenue, Farmington, CT, for the purpose of determining whether the radio frequency (RF) exposure levels 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 (850 MHz Band) is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz and 2500 MHz bands 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 319 - 321 New Britain Avenue, Farmington, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. 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) 2 channels in the 1900 MHz Band were considered for each sector of the proposed installation.
2) 1 channel in the 800 MHz Band was considered for each sector of the proposed installation
3) 2 channels in the 2500 MHz Band were considered for each sector of the proposed installation.
4) 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.
5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

6) The antennas used in this modeling are the RFS APXVSPP18-C-A20, RFS APXV9ERR18-C-A20 and the RFS APXVTM14-C-I20. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 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. The RFS APXV9ERR18-C-A20 has a 14.9 dBd gain value at its main lobe at 1900 MHz and 11.9 dBd at its main lobe for 850 MHz . The RFS APXVTM14-C-I20 has a 15.9 dBd gain value at its main lobe at 2500 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
7) The antenna mounting height centerline for the proposed antennas is **170 feet** above ground level (AGL).
8) 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

Site ID	CT33XC534 - Unionville / Police Dept.
Site Addresss	319 - 321 New Britain Avenue, Farmington, CT, 06032
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	170	164	1/2 "	0.5	0	138.69	0.19%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	170	164	1/2 "	0.5	0	39.00	0.09%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	170	164	1/2 "	0.5	0	138.69	0.33%
														Sector total Power Density Value:		0.60%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	170	164	1/2 "	0.5	0	138.69	0.19%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	170	164	1/2 "	0.5	0	39.00	0.09%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	170	164	1/2 "	0.5	0	138.69	0.33%
														Sector total Power Density Value:		0.60%

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
3a	RFS	APXV9ERR18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	4.9	170	164	1/2 "	0.5	0	110.17	0.15%
3a	RFS	APXV9ERR18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	1.9	170	164	1/2 "	0.5	0	27.61	0.07%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	170	164	1/2 "	0.5	0	138.69	0.33%
														Sector total Power Density Value:		0.54%

Site Composite MPE %	
Carrier	MPE %
Sprint	1.75%
Town	2.19%
Emergency	8.03%
Public Works	35.67%
Clearwire	0.63%
MetroPCS	6.20%
AT&T	17.15%
T-Mobile	0.13%
Total Site MPE %	**71.75%**

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Summary

All calculations performed for this analysis yielded results that were well within the allowable limits for general public Maximum Permissible Exposure (MPE) to radio frequency energy.

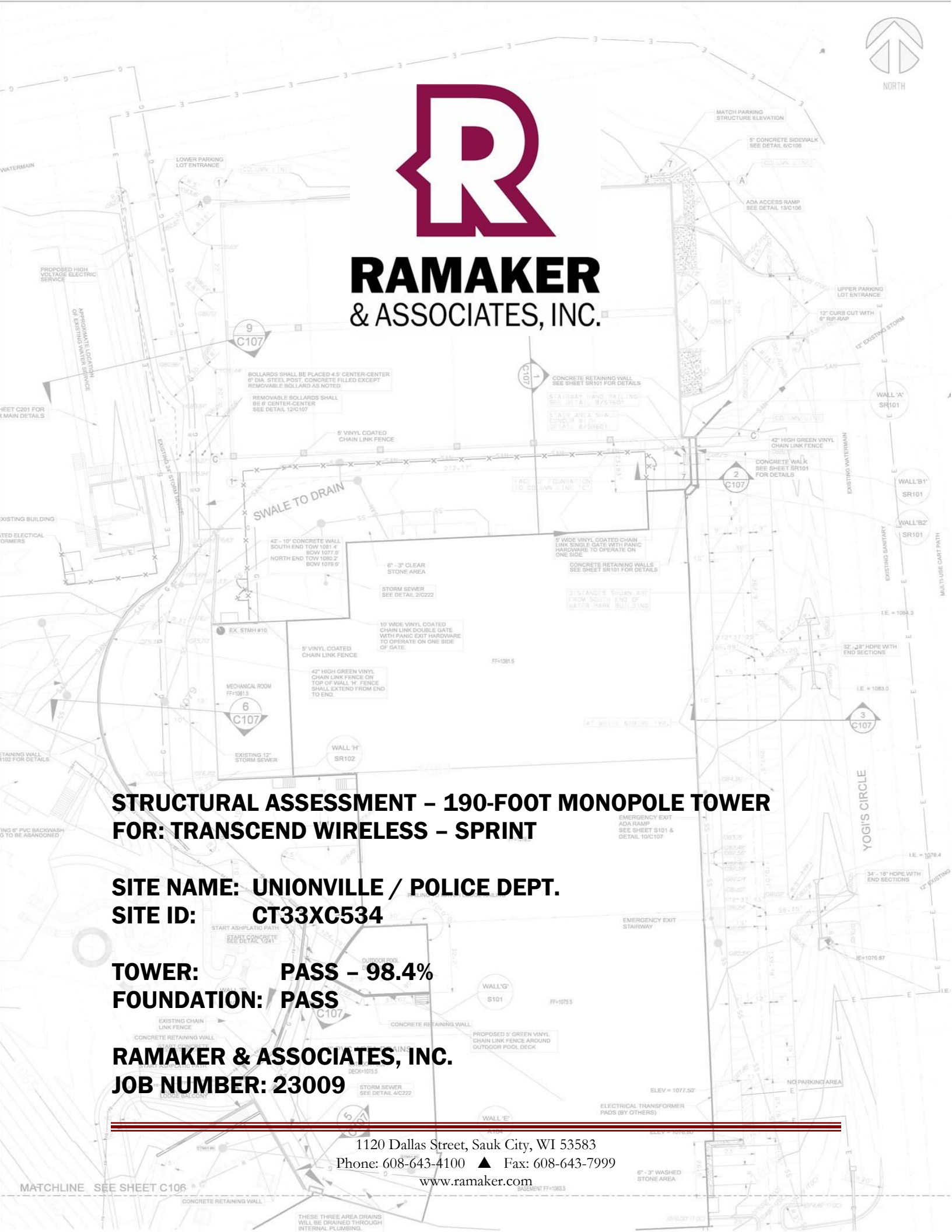
The anticipated Maximum Composite contributions from the Sprint facility are **1.75% (0.60% from sector 1, 0.60% from sector 2 and 0.54% from sector 3)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **71.75%** of the allowable FCC established general public limit sampled at 6 feet above ground level. This total composite site value is based upon MPE 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 ASSESSMENT – 190-FOOT MONOPOLE TOWER
FOR: TRANSCEND WIRELESS – SPRINT

SITE NAME: UNIONVILLE / POLICE DEPT.
SITE ID: CT33XC534

TOWER: PASS – 98.4%
FOUNDATION: PASS

RAMAKER & ASSOCIATES, INC.
JOB NUMBER: 23009

1120 Dallas Street, Sauk City, WI 53583
Phone: 608-643-4100 ▲ Fax: 608-643-7999
www.ramaker.com

STRUCTURAL ASSESSMENT

SITE: Unionville / Police Dept. (CT33XC534)
319-321 New Britain Avenue
Farmington, Hartford County, Connecticut 06032

PREPARED FOR: Transcend Wireless

CONTACT PERSON: Mike Kithcart
Transcend Wireless
48 Spruce Street, Oakland, NJ 07436

PREPARED BY: Ramaker & Associates, Inc.
1120 Dallas Street
Sauk City, Wisconsin 53583
Telephone: (608) 643-4100
Facsimile: (608) 643-7999

RAMAKER JOB NUMBER: 23009

DATE OF REPORT ISSUANCE: July 28, 2014

Josh Opseth

Joshua M. Opseth
Engineering Technician

07/28/14
Date

James R Skowronski

James R. Skowronski, P.E.
Supervising Engineer

07/28/14
Date

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LIST OF APPENDICES

SECTION 1

EXECUTIVE SUMMARY

This report summarizes the structural analysis conducted by Ramaker & Associates, Inc. (RAMAKER) for Transcend Wireless on behalf of Sprint, who intends to install additional equipment on an existing tower.

The Sprint proposed loading includes installing three (3) RFS APXV9TM14-ALU-I20 panel antennas and three (3) Alcatel-Lucent TD-RRH8x20-25 RRH's on the existing low-profile platform at a centerline elevation of 170-feet AGL. The proposed antennas shall be fed with one (1) 1-1/4-inch hybrid cable that was assumed to be routed up inside the tower.

Results of our tower analysis show that the tower will be stressed to a maximum of 98.4 percent of capacity under proposed loading conditions. Therefore, it is anticipated that the existing tower will provide adequate strength under proposed under proposed loading conditions.

Results of our foundation analysis show that proposed model shear and moment foundation reactions, which are expected to control the design of a monopole foundation are less than the original design reactions. The proposed model axial foundation reaction is greater than the original design reaction. However, since the axial load is not expected to control the foundation design for a monopole foundation, this load increase is considered acceptable using engineering judgment. Therefore, it is anticipated that the existing foundation will provide adequate strength under proposed under proposed loading conditions.

Results of our mount assessment show that by engineering calculation and inspection, the antenna and RRH mounting structure is capable of supporting the existing and proposed Sprint 2.5 equipment deployment without causing an overstress condition in the antenna and RRH mounting structure, **provided the proposed structural modifications are completed prior to installation of new equipment per construction drawings by Ramaker & Associates.**

In summary, the tower and foundations will pass the TIA/EIA-222-F code requirements under proposed loading conditions. The mounting structure will pass the TIA-222 code requirements under proposed loading conditions, **provided the proposed structural modifications are completed prior to installation of new equipment per construction drawings by Ramaker & Associates.**

SECTION 2
INTRODUCTION

2.1 PROJECT INFORMATION

This report summarizes the structural analysis conducted by Ramaker & Associates, Inc. (RAMAKER) for Transcend Wireless on behalf of Sprint, who intends to install additional equipment on an existing tower.

2.2 PURPOSE OF REPORT

The analysis activities of this report were conducted for the purposes of creating and analyzing a model of the subject structure under the required loading conditions. Base reactions from the resulting model were also determined for tower foundation and support development. Recommendations regarding the analysis results, loading configuration, and structural modifications are also provided.

2.3 SCOPE OF SERVICES

RAMAKER developed a finite element model (FEM) of the tower, using tnxTower, for member force, joint deflection, and structure reaction determinations. Subsequently, this report was drafted to provide our engineering recommendations. All information contained herein is valid only for the described structure configuration and loading conditions. RAMAKER reserves the right to modify our recommendations should alterations to the tower loading occur.

SECTION 3
MODEL DEVELOPMENT

3.1 INTRODUCTION

RAMAKER developed a FEM of the tower superstructure. Required static loads consisting of the antenna configuration, wind forces, ice loads, and linear appurtenances (including cable loads) were then applied to the FEM. As a result, all member forces, allowable capacities, and base reactions were computed. Additionally, potentially overstressed members were identified.

3.2 EXISTING STRUCTURE INFORMATION

Existing structure information was gathered from:

- Original tower drawings by Pirod, file number A-118703, dated April 19, 2002
- Previous structural analysis by RAMAKER, job number 23009, dated November 16, 2012
- Previous structural analysis by Bay State Design, site ID CT-HFD-0073A, dated March 29, 2010
- Previous structural analysis by Malouf Engineering, project ID CT00937M-07V0, dated September 28, 2007
- Statement of Special Inspections by URS, project number F300001972.52

3.3 TOWER LOADING

RAMAKER understands that the tower loading to be used for this analysis will consist of the existing and proposed antenna, mount, and cable configurations as shown in the following chart:

Elevation	Appurtenance	Mount	Coax	Owner	Status
190	4' Lightning Rod	Pipe Mount	---	Tower	Existing
190	(2) 10' Omni	(3) 5' Standoffs	(4) Interior 7/8	Farmington	Existing
	(2) Kathrein – Scala PR-850				
185	(2) 3' Yagi	(2) 5' Standoffs	(2) Interior 7/8		
180	5' Omni	(2) 5' Standoffs	(1) Interior 7/8		
175	(3) ALU 800MHz 2x50W RRH	Collar	(3) Interior 1-1/4	Sprint	Existing
	(3) ALU 1900MHz 4x40W RRH				
170	(2) RFS APXVSPP18-C	Low-Profile Platform			
	RFS APXV9ERR18-C				
	(3) RFS APXV9TM14-ALU-I20		**(1) Interior 1-1/4**		**Proposed**
	(3) ALU TD-RRH8x20-25				
	(3) Argus LLPX310R		Interior 2" Conduit	Clearwire	Existing
	(3) Samsung DAP				
	Fiber Junction Box				
	Andrew VHLP2.5		(2) Interior 1/2		
	Andrew VHLP4				

Elevation	Appurtenance	Mount	Coax	Owner	Status
160	(6) 5'x1' Panel Antennas	Low-Profile Platform	(6) Exterior 1-1/4 (6) Interior 1-1/4	T-Mobile	Existing
	(6) TMA's				
150	(3) Powerwave P65-17-XLH-RR	(3) T-Arms	Interior 3" Conduit	AT&T	Existing
	(3) Ericsson RRUS-11				
	Raycap DC6-48-60-18-8F				
	(3) Kathrein 800 10121		(6) Interior 1-5/8		
	(6) Powerwave LGP21401				
140	(3) Kathrein 742 213	Collar	(6) Exterior 1-5/8	Unknown	Existing
113	(3) 6' Omni	(3) 5' Standoffs	(3) Interior 1/2	Unknown	Existing
90	(3) 18' Omni	(3) 5' Standoffs	(3) Interior 1/2	Unknown	Existing

The proposed equipment shall be fed with one (1) proposed hybrid cable that was assumed to be routed up inside of the tower.

3.4 WIND AND ICE LOAD

Wind forces used in model development are in compliance with the TIA/EIA-222-F Standard. These guidelines call for an analysis to be performed, which assumes a basic wind speed of 80 miles-per-hour (mph) without ice in Hartford County. The tower is also designed for a 69 mph basic wind speed with 0.5-inch of radial ice.

SECTION 4
ANALYSIS RESULTS

4.1 ANALYSIS RESULTS

The tower superstructure was analyzed with the combined existing and proposed antenna loading with and without radial ice. The computed maximum tower member stress capacities are as follows:

Component Type	Percent Capacity
Section 1	35.3
Section 2	68.4
Section 3	74.3
Section 4	84.4
Section 5	90.3
Section 6	98.4
Base Plate	61.0
Anchor Bolts	88.2
RATING =	**98.4**

Results of our tower analysis show that the tower will be stressed to a maximum of 98.4 percent of capacity under proposed loading conditions. Therefore, it is anticipated that the existing tower will provide adequate strength under proposed under proposed loading conditions.

4.2 BASE REACTIONS

The computed maximum reactions under the corresponding maximum moment are as follows:

Load Type	Original Design	Proposed Model
Axial (k)	46.1	48.3
Shear (k)	36.7	35.6
Moment (k-ft)	4673.6	4510.1

Results of our foundation analysis show that proposed model shear and moment foundation reactions, which are expected to control the design of a monopole foundation are less than the original design reactions. The proposed model axial foundation reaction is greater than the original design reaction. However, since the axial load is not expected to control the foundation design for a monopole foundation, this load increase is considered acceptable using engineering judgment. Therefore, it is anticipated that the existing foundation will provide adequate strength under proposed under proposed loading conditions.

4.3 MOUNT ASSESSMENT

Results of our mount assessment show that by engineering calculation and inspection, the antenna and RRH mounting structure is capable of supporting the existing and proposed Sprint 2.5 equipment deployment without causing an overstress condition in the antenna and RRH mounting structure, **provided the proposed structural modifications are completed prior to installation of new equipment per construction drawings by Ramaker & Associates.**

This assessment is inclusive of the entire antenna mounting structure, including tower platforms, arms, and all other aspects of the mounting structure that will support the Sprint 2.5 equipment deployment. This assessment assumes that the mounting structure(s) has been installed correctly, is free from deterioration, and is maintained properly.

SECTION 5
LIMITATIONS

The recommendations contained within this report were developed using general project information provided by the owner, tower manufacturer, general field observations, reference information and laboratory testing data, as applicable. All recommendations pertain only to the proposed tower construction, location, and loading as described in this report. RAMAKER assumes no responsibility for failures caused by factors beyond our control. These include but are not limited to the following:

1. Missing, corroding, and/or deteriorating members
2. Improper manufacturing and/or construction
3. Improper maintenance

RAMAKER assumes no responsibility for modifications completed prior to or hereafter in which RAMAKER was not directly involved. These modifications include but are not limited to the following:

1. Replacing or strengthening bracing members
2. Reinforcing or extending vertical members
3. Installing or removing antenna mounting gates or side arms
4. Changing loading configurations

Furthermore, RAMAKER hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations and conclusions are based on the information contained and set forth herein. If you are aware of any information contrary to that contained herein, or if you are aware of any defects arising from the original design, material, fabrication and erection deficiencies, you should disregard this report and immediately contact RAMAKER. RAMAKER isn't liable for any representation, recommendation or conclusion not expressly stated herein.

The tower owner is responsible for verifying that the existing loading on the tower is consistent with the loading applied to the tower within this report.

SECTION 6

REFERENCES

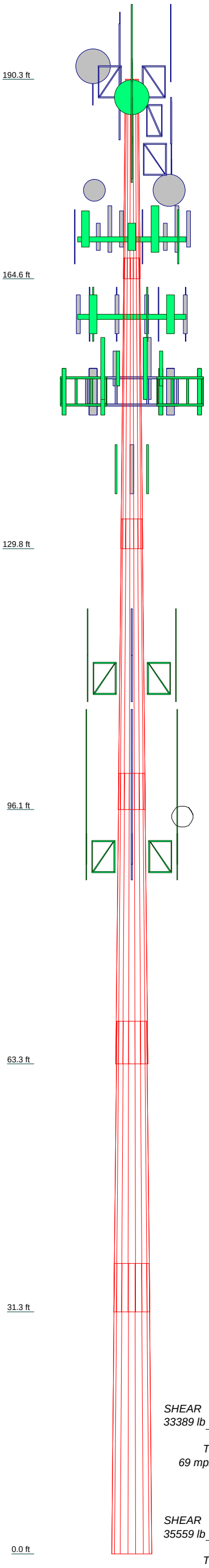
1. 2003 International Building Code.

2. Telecommunications Industries Association, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA Standard TIA/EIA-222-F 1996, Washington, D.C.

APPENDIX A

TOWER FIGURES

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	25.75	18	0.2500	2.67	19.5625	26.0000		1566.6
2	37.50	18	0.3125	3.83	24.8325	34.0625		3687.6
3	37.50	18	0.3750	4.67	32.4948	41.7500		5581.3
4	37.50	18	0.3750	5.50	39.8474	49.0625		6694.9
5	37.50	18	0.3750	6.25	46.9610	56.1250		7771.5
6	37.50	18	0.3750		53.8477	62.9375	A572-65	8811.8
								34113.6



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8x4'	190	7' x 2" Pipe Mount (T-Mobile)	160
15'x2-1/2" Pipe Mount	190	7' x 2" Pipe Mount (T-Mobile)	160
5' Standoff (Farmington)	190	7' x 2" Pipe Mount (T-Mobile)	160
5' Standoff (Farmington)	190	(2) 5' x 1' Panel Antenna w/Mount Pipe (T-Mobile)	160
5' Standoff (Farmington)	190	(2) 5' x 1' Panel Antenna w/Mount Pipe (T-Mobile)	160
10' Omni (Farmington)	190	(2) 5' x 1' Panel Antenna w/Mount Pipe (T-Mobile)	160
10' Omni (Farmington)	190	(2) TMA 7"x6"x3" (T-Mobile)	160
6' x 2" Pipe Mount (Farmington)	190	(2) TMA 7"x6"x3" (T-Mobile)	160
6' x 2" Pipe Mount (Farmington)	190	(2) TMA 7"x6"x3" (T-Mobile)	160
PR-850 (Farmington)	190	PiROD 13' Low Profile Platform (Monopole) (T -Mobile)	160
PR-850 (Farmington)	190		
6' x 2" Pipe Mount (Farmington)	185	7' x 2" Pipe Mount (T-Mobile)	160
6' x 2" Pipe Mount (Farmington)	185	7' x 2" Pipe Mount (T-Mobile)	160
3' Yagi (Farmington)	185	7' x 2" Pipe Mount (T-Mobile)	160
3' Yagi (Farmington)	185	P65-17-XLH-RR w/Mount Pipe (ATI)	150
5' Standoff (Farmington)	185	P65-17-XLH-RR w/Mount Pipe (ATI)	150
5' Standoff (Farmington)	185	DC6-48-60-18-8F (ATI)	150
6' x 2" Pipe Mount (Farmington)	180	RRUS-11 (ATI)	150
4' x 2" Pipe Mount (Farmington)	180	RRUS-11 (ATI)	150
5' Omni (Farmington)	180	RRUS-11 (ATI)	150
5' Standoff (Farmington)	180	800 10121 W/ Mount Pipe (ATI)	150
5' Standoff (Farmington)	180	800 10121 W/ Mount Pipe (ATI)	150
1900MHz 4x40W RRH (Sprint)	175	800 10121 W/ Mount Pipe (ATI)	150
1900MHz 4x40W RRH (Sprint)	175	(2) LGP214nn (ATI)	150
800MHz 2x50W RRH (Sprint)	175	(2) LGP214nn (ATI)	150
800MHz 2x50W RRH (Sprint)	175	(2) LGP214nn (ATI)	150
800MHz 2x50W RRH (Sprint)	175	2' Standoff T-Arm (5' face width) (ATI)	150
Valmont Light Duty Tri-Bracket (1) (Sprint)	175	2' Standoff T-Arm (5' face width) (ATI)	150
1900MHz 4x40W RRH (Sprint)	175	2' Standoff T-Arm (5' face width) (ATI)	150
7' x 2" Pipe Mount (Sprint)	170	P65-17-XLH-RR w/Mount Pipe (ATI)	150
7' x 2" Pipe Mount (Sprint)	170	Valmont Light Duty Tri-Bracket (1) (Unknown)	140
LLPX310R w/Mount Pipe (Clearwire)	170	742 213 W/ Mount Pipe (Unknown)	140
LLPX310R w/Mount Pipe (Clearwire)	170	742 213 W/ Mount Pipe (Unknown)	140
LLPX310R w/Mount Pipe (Clearwire)	170	742 213 W/ Mount Pipe (Unknown)	140
DAP Head 2.5GHz (Clearwire)	170	6' x 2" Pipe Mount (Unknown)	113
DAP Head 2.5GHz (Clearwire)	170	6' x 2" Pipe Mount (Unknown)	113
DAP Head 2.5GHz (Clearwire)	170	6' x 2" Pipe Mount (Unknown)	113
DAP Head 2.5GHz (Clearwire)	170	6' Omni (Unknown)	113
2'x2'x8" Box (Clearwire)	170	6' Omni (Unknown)	113
APXVSPP18-C w/Mount Pipe (Sprint)	170	6' Omni (Unknown)	113
APXVSPP18-C w/Mount Pipe (Sprint)	170	5' Standoff (Unknown)	113
APXV9ERR18-C w/Mount Pipe (Sprint)	170	5' Standoff (Unknown)	113
APXV9TM14-ALU-120 W/ Mount Pipe (Sprint)	170	5' Standoff (Unknown)	113
APXV9TM14-ALU-120 W/ Mount Pipe (Sprint)	170	6' x 2" Pipe Mount (Unknown)	113
APXV9TM14-ALU-120 W/ Mount Pipe (Sprint)	170	6' x 2" Pipe Mount (Unknown)	90
TD-RRH8x20-25 (Sprint)	170	6' x 2" Pipe Mount (Unknown)	90
TD-RRH8x20-25 (Sprint)	170	18' Omni (Unknown)	90
TD-RRH8x20-25 (Sprint)	170	18' Omni (Unknown)	90
PiROD 13' Low Profile Platform (Monopole) (Sprint / Clearwire)	170	18' Omni (Unknown)	90
		5' Standoff (Unknown)	90
7' x 2" Pipe Mount (Sprint)	170	5' Standoff (Unknown)	90
VHLP4 (Clearwire)	170	5' Standoff (Unknown)	90
VHLP2.5 (Clearwire)	170	6' x 2" Pipe Mount (Unknown)	90

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

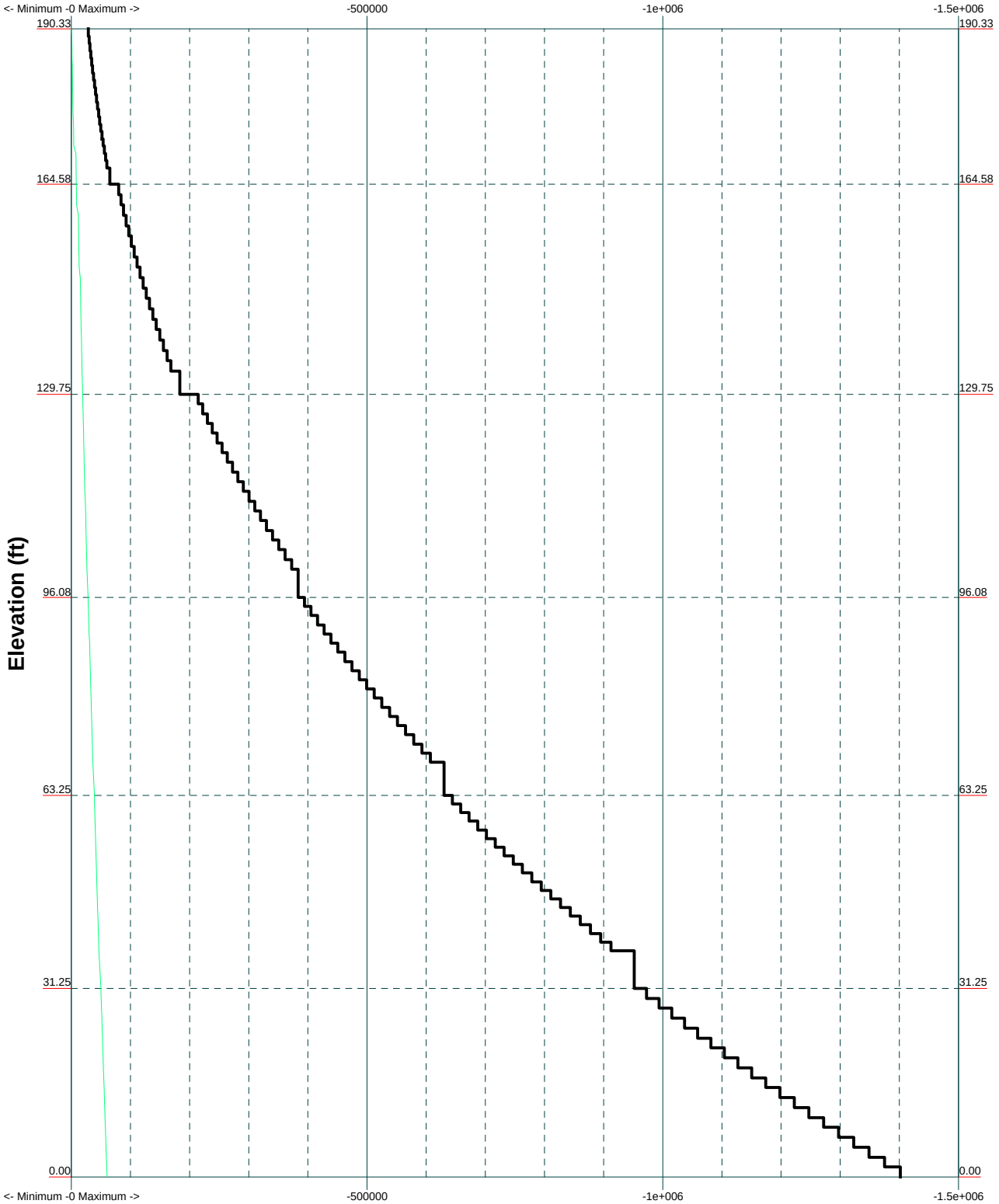
1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 60 mph wind.
5. TOWER RATING: 98.4%

Ramaker & Associates
1120 Dallas St.
Sauk City, WI 53583
Phone: (608) 643-4100
FAX: (608) 643-7999

Job: Unionville / Police Dept. (CT33XC534)			
Project: 23009			
Client: Transcend Wireless / Sprint	Drawn by: jopseth	App'd:	
Code: TIA/EIA-222-F	Date: 06/09/14	Scale: NTS	
Path: I:\23000\23009\Structural\2014 2.5 Project\Tower\tnx\23009.eri		Dwg No. E-1	

TIA/EIA-222-F - 80 mph/69 mph 0.5000 in Ice

Leg Capacity ——— **Leg Compression (lb)**



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Project: ***23009***			
Client: Transcend Wireless / Sprint	Drawn by: jopseth	App'd:	
Code: TIA/EIA-222-F	Date: 06/09/14	Scale: NTS	
Path: I:\23000\23009\Structural\2014 2.5 Project\Tower\tnx\23009.eri		Dwg No. E-3	

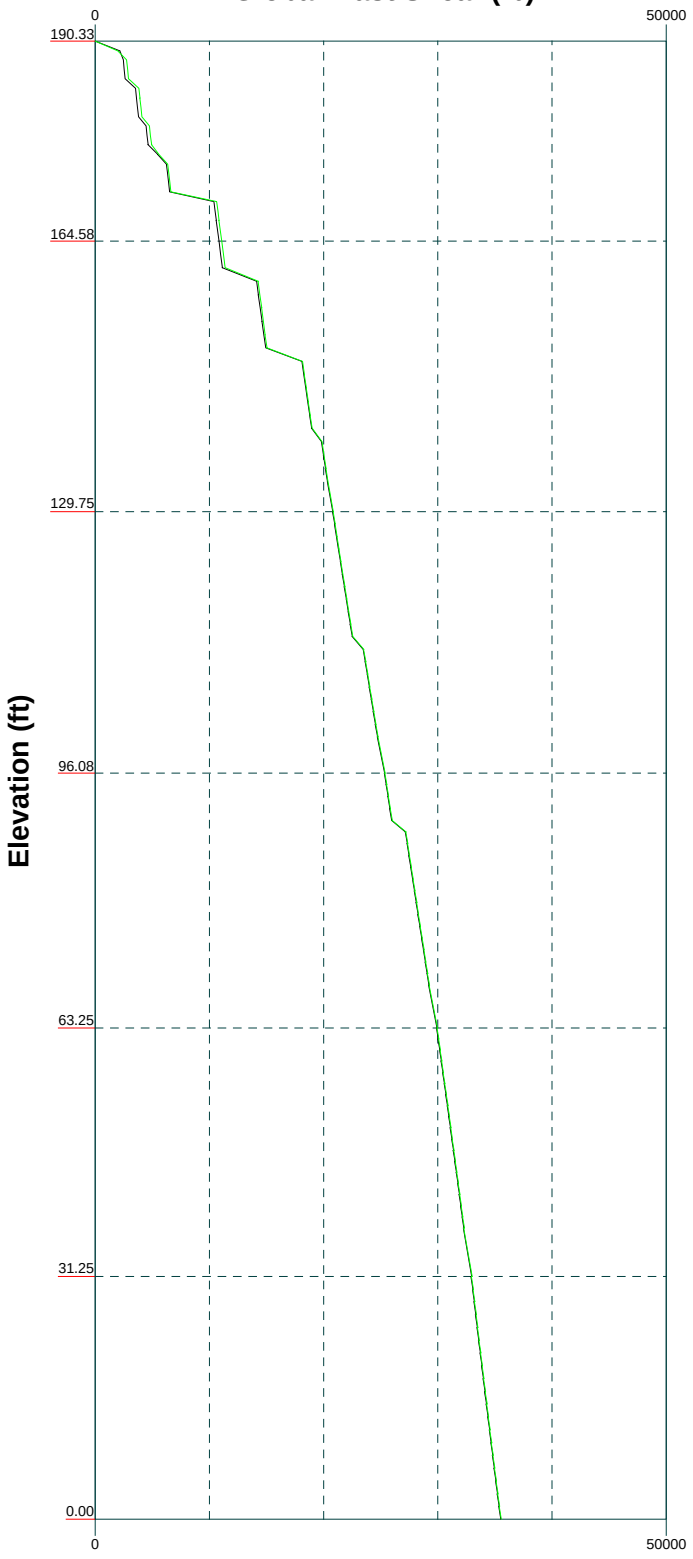
TIA/EIA-222-F - 80 mph/69 mph 0.5000 in Ice

Vx Vz

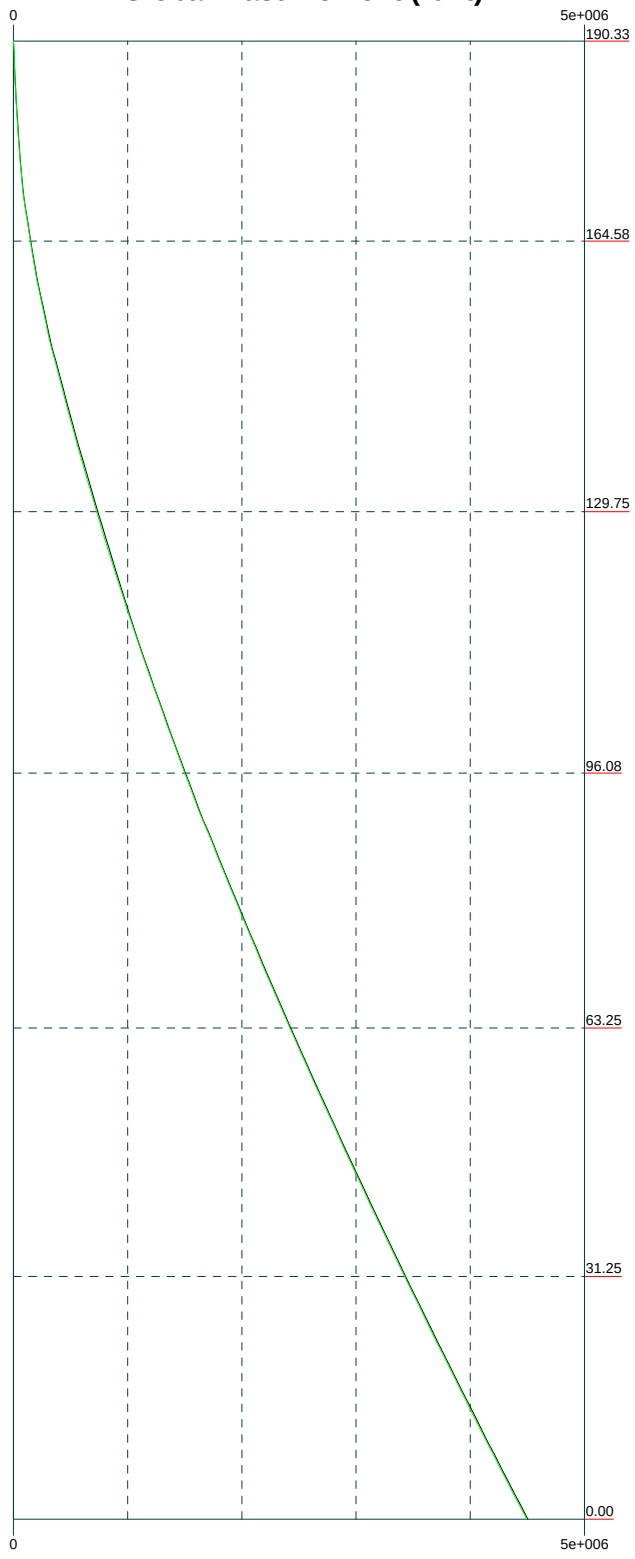
Maximum Values

Mx Mz

Global Mast Shear (lb)



Global Mast Moment (lb-ft)



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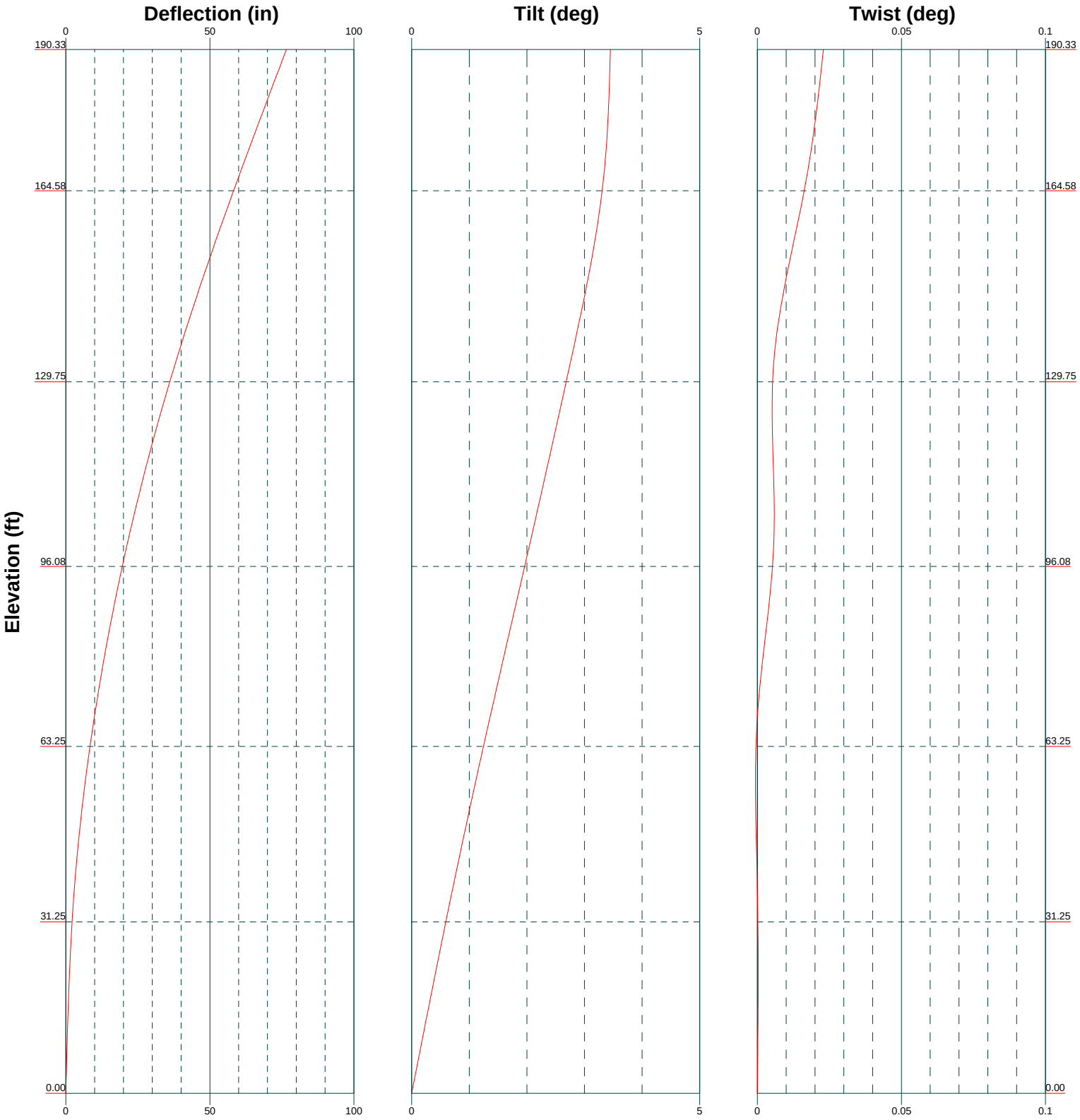
Job: ***Unionville / Police Dept. (CT33XC534)***			
Project: ***23009***			
Client: Transcend Wireless / Sprint		Drawn by: jopseth	App'd:
Code: TIA/EIA-222-F		Date: 06/09/14	Scale: NTS
Path: I:\23000\23009\Structural\2014 2.5 Project\Tower\tnx\23009.eri			Dwg No. E-4

TIA/EIA-222-F - Service - 60 mph

Maximum Values

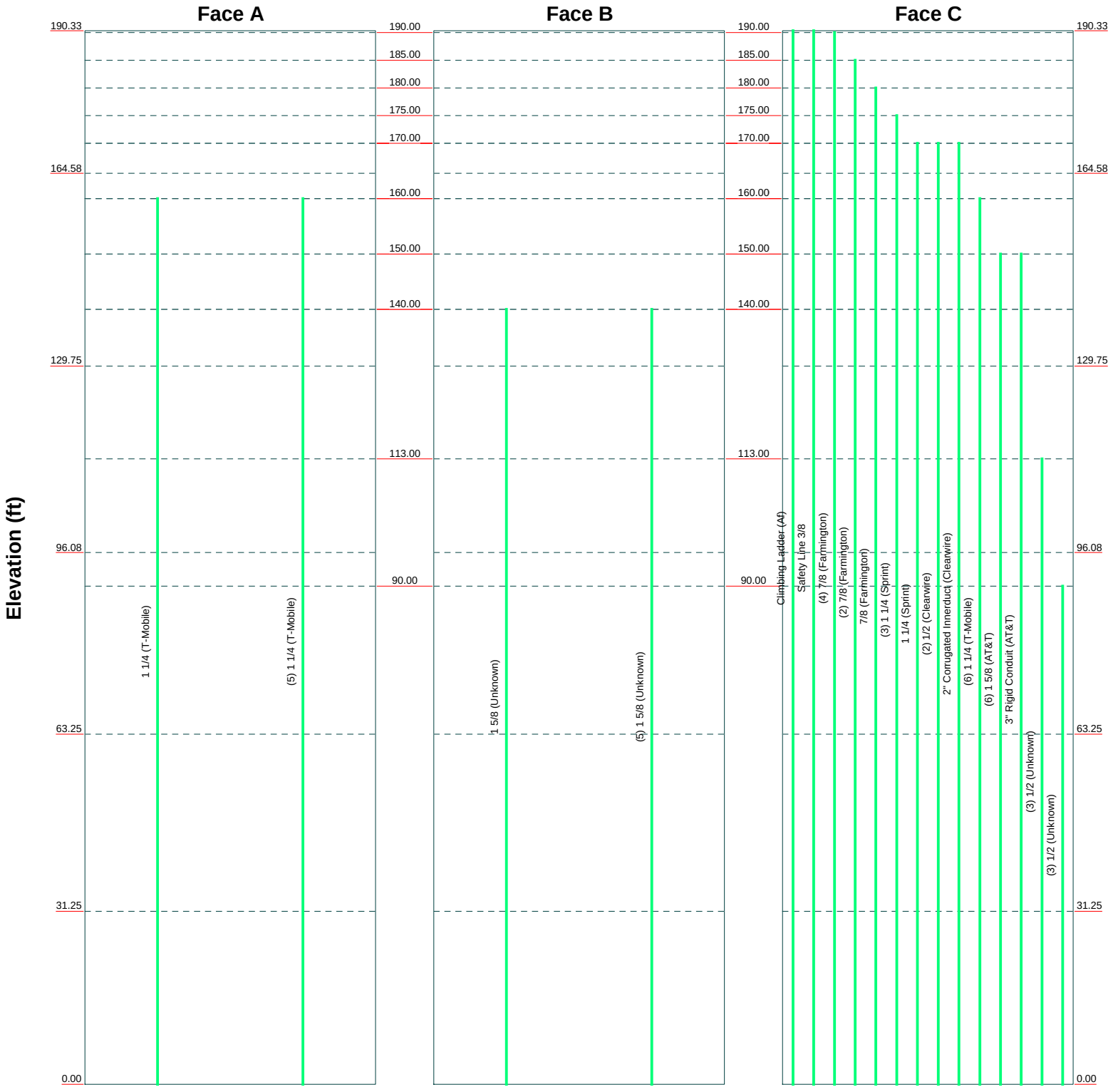


Ramaker & Associates
1120 Dallas St.
Sauk City, WI 53583
Phone: (608) 643-4100
FAX: (608) 643-7999

Job: ***Unionville / Police Dept. (CT33XC534)***			
Project: ***23009***			
Client: Transcend Wireless / Sprint	Drawn by: jopseth	App'd:	
Code: TIA/EIA-222-F	Date: 06/09/14	Scale: NTS	
Path: I:\23000\23009\Structural\2014 2.5 Project\Tower\tnx\23009.eri		Dwg No. E-5	

Feed Line Distribution Chart
0' - 190'3-31/32"

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

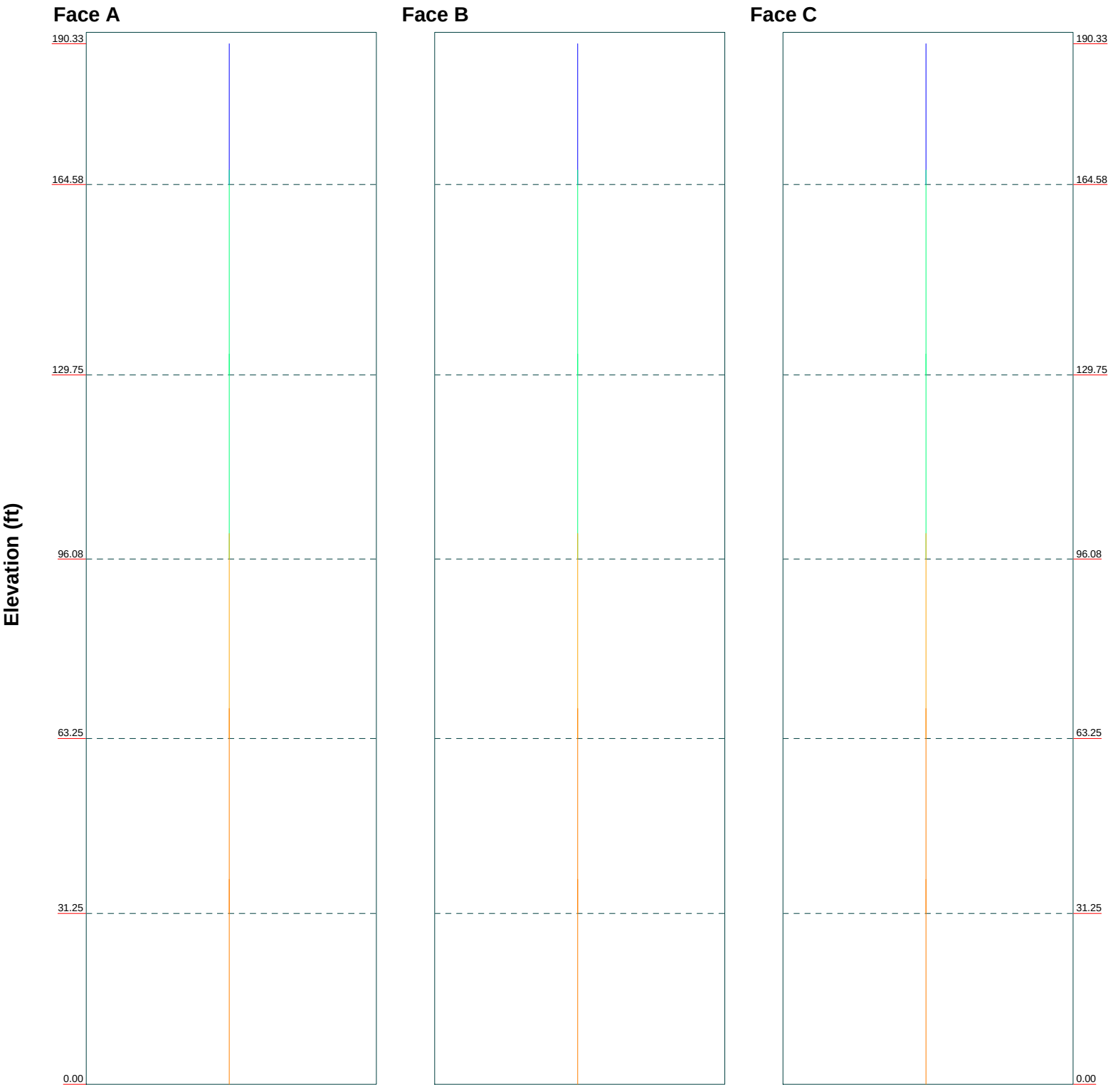


Ramaker & Associates
1120 Dallas St.
Sauk City, WI 53583
Phone: (608) 643-4100
FAX: (608) 643-7999

Job: ***Unionville / Police Dept. (CT33XC534)***			
Project: ***23009***			
Client: Transcend Wireless / Sprint	Drawn by: jopseth	App'd:	
Code: TIA/EIA-222-F	Date: 06/09/14	Scale: NTS	
Path: I:\23000\23009\Structural\2014 2.5 Project\Tower\tnx\23009.eri		Dwg No. E-7	

Stress Distribution Chart
0' - 190'3-31/32"

> 100% | 90%-100% | 75%-90% | 50%-75% | < 50% Overstress



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Sauk City, WI 53583
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FAX: (608) 643-7999

Job:	Unionville / Police Dept. (CT33XC534)		
Project:	23009		
Client:	Transcend Wireless / Sprint	Drawn by: jopseth	App'd:
Code:	TIA/EIA-222-F	Date: 06/09/14	Scale: NTS
Path:	I:\23000\23009\Structural\2014 2.5 Project\Tower\tnx\23009.eri		Dwg No. E-8

APPENDIX B

TOWER CALCULATIONS

Tower Input Data

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

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 69 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line 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		Use TIA-222-G Tension Splice Capacity Exemption		

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	190.33-164.58	25.75	2.67	18	19.5625	26.0000	0.2500	1.0000	A572-65 (65 ksi)
L2	164.58-129.75	37.50	3.83	18	24.8325	34.0625	0.3125	1.2500	A572-65 (65 ksi)
L3	129.75-96.08	37.50	4.67	18	32.4948	41.7500	0.3750	1.5000	A572-65 (65 ksi)
L4	96.08-63.25	37.50	5.50	18	39.8474	49.0625	0.3750	1.5000	A572-65 (65 ksi)
L5	63.25-31.25	37.50	6.25	18	46.9610	56.1250	0.3750	1.5000	A572-65 (65 ksi)
L6	31.25-0.00	37.50		18	53.8477	62.9375	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	19.8643	15.3245	722.1042	6.8559	9.9377	72.6627	1445.1586	7.6637	3.0030	12.012
	26.4011	20.4326	1711.6544	9.1412	13.2080	129.5922	3425.5610	10.2183	4.1360	16.544
L2	25.8829	24.3208	1847.3781	8.7046	12.6149	146.4440	3697.1870	12.1627	3.8205	12.226
	34.5880	33.4758	4817.4335	11.9812	17.3038	278.4040	9641.2058	16.7411	5.4450	17.424
L3	33.9559	38.2306	4983.0415	11.4025	16.5074	301.8678	9972.6398	19.1189	5.0591	13.491
	42.3941	49.2466	10650.9822	14.6881	21.2090	502.1916	21315.9793	24.6280	6.6880	17.835
L4	41.6274	46.9820	9248.1933	14.0127	20.2425	456.8704	18508.5557	23.4955	6.3531	16.942
	49.8194	57.9503	17355.1378	17.2841	24.9238	696.3293	34733.1119	28.9807	7.9750	21.267
L5	49.0502	55.4489	15203.3974	16.5380	23.8562	637.2943	30426.7999	27.7297	7.6051	20.28
	56.9908	66.3564	26056.1506	19.7913	28.5115	913.8821	52146.5865	33.1845	9.2180	24.581
L6	56.2167	63.6458	22991.6946	18.9828	27.3546	840.5053	46013.6422	31.8290	8.8172	23.513
	63.9084	74.4650	36822.8946	22.2097	31.9722	1151.7142	73694.2417	37.2396	10.4170	27.779

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 190.33-164.58				1	1	1		
L2 164.58-129.75				1	1	1		
L3 129.75-96.08				1	1	1		
L4 96.08-63.25				1	1	1		
L5 63.25-31.25				1	1	1		
L6 31.25-0.00				1	1	1		

Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	A687
Anchor bolt size	1.2500 in
Number of bolts	44
Embedment length	51.5000 in
f'_c	4 ksi
Grout space	2.0000 in
Base plate grade	A572-50
Base plate thickness	1.5000 in
Bolt circle diameter	68.0000 in
Outer diameter	72.0000 in
Inner diameter	62.0000 in
Base plate type	Stiffened Plate
Bolts per stiffener	1
Stiffener thickness	0.5000 in
Stiffener height	10.0000 in

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight plf
Climbing Ladder (Af)	C	No	CaAa (Out Of Face)	190.33 - 0.00	3.0000	0	1	No Ice	0.29	7.90
								1/2" Ice	0.55	10.60
Safety Line 3/8	C	No	CaAa (Out Of Face)	190.33 - 0.00	6.0000	0	1	No Ice	0.04	0.22
								1/2" Ice	0.14	0.75
7/8 (Farmington)	C	No	Inside Pole	190.00 - 0.00	0.0000	0	4	No Ice	0.00	0.54
								1/2" Ice	0.00	0.54
7/8 (Farmington)	C	No	Inside Pole	185.00 - 0.00	0.0000	0	2	No Ice	0.00	0.54
								1/2" Ice	0.00	0.54
7/8 (Farmington)	C	No	Inside Pole	180.00 - 0.00	0.0000	0	1	No Ice	0.00	0.54
								1/2" Ice	0.00	0.54
1 1/4 (Sprint)	C	No	Inside Pole	175.00 - 0.00	0.0000	0	3	No Ice	0.00	0.66
								1/2" Ice	0.00	0.66
1 1/4 (Sprint)	C	No	Inside Pole	170.00 - 0.00	0.0000	0	1	No Ice	0.00	0.66
								1/2" Ice	0.00	0.66
1/2 (Clearwire)	C	No	Inside Pole	170.00 - 0.00	0.0000	0	2	No Ice	0.00	0.25
								1/2" Ice	0.00	0.25
2" Corrugated Innerduct (Clearwire)	C	No	Inside Pole	170.00 - 0.00	0.0000	0	1	No Ice	0.00	0.22
								1/2" Ice	0.00	0.22
1 1/4 (T-Mobile)	A	No	CaAa (Out Of Face)	160.00 - 0.00	1.0000	0	1	No Ice	0.16	0.66
								1/2" Ice	0.25	1.91
1 1/4 (T-Mobile)	A	No	CaAa (Out Of Face)	160.00 - 0.00	1.0000	0	5	No Ice	0.00	0.66
								1/2" Ice	0.00	1.91
1 1/4 (T-Mobile)	C	No	Inside Pole	160.00 - 0.00	0.0000	0	6	No Ice	0.00	0.66
								1/2" Ice	0.00	0.66
1 5/8 (AT&T)	C	No	Inside Pole	150.00 - 0.00	0.0000	0	6	No Ice	0.00	1.04
								1/2" Ice	0.00	1.04
3" Rigid Conduit (AT&T)	C	No	Inside Pole	150.00 - 0.00	0.0000	0	1	No Ice	0.00	2.63
								1/2" Ice	0.00	2.63
1 5/8 (Unknown)	B	No	CaAa (Out Of Face)	140.00 - 0.00	1.0000	0	1	No Ice	0.20	1.04
								1/2" Ice	0.30	2.55
1 5/8 (Unknown)	B	No	CaAa (Out Of Face)	140.00 - 0.00	1.0000	0	5	No Ice	0.00	1.04
								1/2" Ice	0.00	2.55
1/2 (Unknown)	C	No	Inside Pole	113.00 - 0.00	0.0000	0	3	No Ice	0.00	0.25
								1/2" Ice	0.00	0.25
1/2 (Unknown)	C	No	Inside Pole	90.00 - 0.00	0.0000	0	3	No Ice	0.00	0.25
								1/2" Ice	0.00	0.25

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	190.33-164.58	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	8.433	322.48
L2	164.58-129.75	A	0.000	0.000	0.000	4.689	119.79
		B	0.000	0.000	0.000	2.030	63.96
		C	0.000	0.000	0.000	11.407	830.88
L3	129.75-96.08	A	0.000	0.000	0.000	5.219	133.33
		B	0.000	0.000	0.000	6.667	210.10
		C	0.000	0.000	0.000	11.027	958.45
L4	96.08-63.25	A	0.000	0.000	0.000	5.089	130.01
		B	0.000	0.000	0.000	6.500	204.86

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C	0.000	0.000	0.000	10.752	966.85
L5	63.25-31.25	A	0.000	0.000	0.000	4.960	126.72
		B	0.000	0.000	0.000	6.336	199.68
		C	0.000	0.000	0.000	10.480	946.85
L6	31.25-0.00	A	0.000	0.000	0.000	4.844	123.75
		B	0.000	0.000	0.000	6.188	195.00
		C	0.000	0.000	0.000	10.235	924.66

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	190.33-164.58	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	17.703	405.66
L2	164.58-129.75	A	0.500	0.000	0.000	0.000	7.714	346.67
		B		0.000	0.000	0.000	3.054	156.82
		C		0.000	0.000	0.000	23.945	943.38
L3	129.75-96.08	A	0.500	0.000	0.000	0.000	8.586	385.86
		B		0.000	0.000	0.000	10.034	515.15
		C		0.000	0.000	0.000	23.148	1067.20
L4	96.08-63.25	A	0.500	0.000	0.000	0.000	8.372	376.23
		B		0.000	0.000	0.000	9.783	502.30
		C		0.000	0.000	0.000	22.570	1072.89
L5	63.25-31.25	A	0.500	0.000	0.000	0.000	8.160	366.72
		B		0.000	0.000	0.000	9.536	489.60
		C		0.000	0.000	0.000	22.000	1050.21
L6	31.25-0.00	A	0.500	0.000	0.000	0.000	7.969	358.13
		B		0.000	0.000	0.000	9.312	478.13
		C		0.000	0.000	0.000	21.484	1025.59

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	190.33-164.58	-0.3628	0.2095	-0.6352	0.3667
L2	164.58-129.75	-0.2828	0.0728	-0.5348	0.1739
L3	129.75-96.08	-0.1382	0.1328	-0.3557	0.2507
L4	96.08-63.25	-0.1424	0.1368	-0.3740	0.2636
L5	63.25-31.25	-0.1455	0.1398	-0.3879	0.2734
L6	31.25-0.00	-0.1478	0.1420	-0.3989	0.2811

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Lightning Rod 5/8x4'	A	From Face	1.00 0.00 7.00	0.0000	190.00	No Ice 1/2" Ice	0.25 0.66	0.25 0.66	31.00 33.82
15'x2-1/2" Pipe Mount	A	From Face	1.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice	4.32 5.85	4.32 5.85	87.00 118.35
*****									
5' Standoff (Farmington)	A	From Face	2.50 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice	3.26 5.89	3.26 5.89	60.00 107.00
5' Standoff (Farmington)	B	From Face	2.50 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice	3.26 5.89	3.26 5.89	60.00 107.00
5' Standoff (Farmington)	C	From Face	2.50 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice	3.26 5.89	3.26 5.89	60.00 107.00
10' Omni (Farmington)	B	From Face	5.00 0.00 5.00	0.0000	190.00	No Ice 1/2" Ice	2.50 3.53	2.50 3.53	30.00 48.64
10' Omni (Farmington)	C	From Face	5.00 0.00 5.00	0.0000	190.00	No Ice 1/2" Ice	2.50 3.53	2.50 3.53	30.00 48.64
6' x 2" Pipe Mount (Farmington)	A	From Face	5.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	21.90 32.73
6' x 2" Pipe Mount (Farmington)	C	From Face	5.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	21.90 32.73
*****									
5' Standoff (Farmington)	C	From Face	2.50 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice	3.26 5.89	3.26 5.89	60.00 107.00
5' Standoff (Farmington)	B	From Face	2.50 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice	3.26 5.89	3.26 5.89	60.00 107.00
6' x 2" Pipe Mount (Farmington)	C	From Face	5.00 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	21.90 32.73
6' x 2" Pipe Mount (Farmington)	B	From Face	5.00 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	21.90 32.73
3' Yagi (Farmington)	C	From Face	5.00 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice	2.08 3.79	2.08 3.79	30.95 52.87
3' Yagi (Farmington)	B	From Face	5.00 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice	2.08 3.79	2.08 3.79	30.95 52.87
*****									
5' Standoff (Farmington)	C	From Face	2.50 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	3.26 5.89	3.26 5.89	60.00 107.00
5' Standoff (Farmington)	B	From Face	2.50 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	3.26 5.89	3.26 5.89	60.00 107.00

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 lb
6' x 2" Pipe Mount	C	From Face	5.00	0.0000	180.00	No Ice	1.43	1.43	21.90
(Farmington)			0.00			1/2" Ice	1.92	1.92	32.73
			0.00						
4' x 2" Pipe Mount	B	From Face	5.00	0.0000	180.00	No Ice	0.87	0.87	14.60
(Farmington)			0.00			1/2" Ice	1.11	1.11	21.91
			-2.00						
5' Omni	B	From Face	5.00	0.0000	180.00	No Ice	1.00	1.00	25.00
(Farmington)			0.00			1/2" Ice	1.39	1.39	32.86
			2.50						
*****									
Valmont Light Duty Tri-Bracket	A	None		0.0000	175.00	No Ice	1.76	1.76	54.00
(1)						1/2" Ice	2.08	2.08	70.00
(Sprint)									
1900MHz 4x40W RRH	A	From Face	1.00	0.0000	175.00	No Ice	2.71	2.61	60.00
(Sprint)			0.00			1/2" Ice	2.95	2.84	83.12
			-2.00						
1900MHz 4x40W RRH	B	From Face	1.00	0.0000	175.00	No Ice	2.71	2.61	60.00
(Sprint)			0.00			1/2" Ice	2.95	2.84	83.12
			-2.00						
1900MHz 4x40W RRH	C	From Face	1.00	0.0000	175.00	No Ice	2.71	2.61	60.00
(Sprint)			0.00			1/2" Ice	2.95	2.84	83.12
			-2.00						
800MHz 2x50W RRH	A	From Face	1.00	0.0000	175.00	No Ice	2.40	2.25	64.00
(Sprint)			0.00			1/2" Ice	2.61	2.46	86.12
			0.00						
800MHz 2x50W RRH	B	From Face	1.00	0.0000	175.00	No Ice	2.40	2.25	64.00
(Sprint)			0.00			1/2" Ice	2.61	2.46	86.12
			0.00						
800MHz 2x50W RRH	C	From Face	1.00	0.0000	175.00	No Ice	2.40	2.25	64.00
(Sprint)			0.00			1/2" Ice	2.61	2.46	86.12
			0.00						
*****									
PiROD 13' Low Profile Platform	A	None		0.0000	170.00	No Ice	15.70	15.70	1300.00
(Monopole)						1/2" Ice	20.10	20.10	1765.00
(Sprint / Clearwire)									
7' x 2" Pipe Mount	A	From Face	4.00	0.0000	170.00	No Ice	1.66	1.66	25.55
(Sprint)			-6.00			1/2" Ice	2.39	2.39	38.13
			0.00						
7' x 2" Pipe Mount	B	From Face	4.00	0.0000	170.00	No Ice	1.66	1.66	25.55
(Sprint)			-6.00			1/2" Ice	2.39	2.39	38.13
			0.00						
7' x 2" Pipe Mount	C	From Face	4.00	0.0000	170.00	No Ice	1.66	1.66	25.55
(Sprint)			-6.00			1/2" Ice	2.39	2.39	38.13
			0.00						
LLPX310R w/Mount Pipe	A	From Face	4.00	0.0000	170.00	No Ice	5.19	3.14	46.85
(Clearwire)			0.00			1/2" Ice	5.64	3.72	86.10
			0.00						
LLPX310R w/Mount Pipe	B	From Face	4.00	0.0000	170.00	No Ice	5.19	3.14	46.85
(Clearwire)			0.00			1/2" Ice	5.64	3.72	86.10
			0.00						
LLPX310R w/Mount Pipe	C	From Face	4.00	0.0000	170.00	No Ice	5.19	3.14	46.85
(Clearwire)			0.00			1/2" Ice	5.64	3.72	86.10
			0.00						
DAP Head 2.5GHz	A	From Face	4.00	0.0000	170.00	No Ice	1.80	0.78	40.00
(Clearwire)			0.00			1/2" Ice	1.99	0.92	51.58
			-2.00						
DAP Head 2.5GHz	B	From Face	4.00	0.0000	170.00	No Ice	1.80	0.78	40.00

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 lb
(Clearwire)			0.00 -2.00			1/2" Ice	1.99	0.92	51.58
DAP Head 2.5GHz	C	From Face	4.00	0.0000	170.00	No Ice	1.80	0.78	40.00
(Clearwire)			0.00 -2.00			1/2" Ice	1.99	0.92	51.58
2'x2'x8" Box	A	From Leg	2.00	0.0000	170.00	No Ice	5.60	1.87	50.00
(Clearwire)			0.00 0.00			1/2" Ice	5.92	2.08	82.96
APXVSPP18-C w/Mount Pipe	A	From Face	4.00	0.0000	170.00	No Ice	8.26	6.71	78.90
(Sprint)			3.00 1.00			1/2" Ice	8.81	7.66	144.31
APXVSPP18-C w/Mount Pipe	B	From Face	4.00	0.0000	170.00	No Ice	8.26	6.71	78.90
(Sprint)			3.00 1.00			1/2" Ice	8.81	7.66	144.31
APXV9ERR18-C w/Mount Pipe	C	From Face	4.00	0.0000	170.00	No Ice	8.26	6.71	71.90
(Sprint)			-3.00 1.00			1/2" Ice	8.81	7.66	137.31
APXV9TM14-ALU-120 W/	A	From Face	4.00	0.0000	170.00	No Ice	7.24	5.31	89.74
Mount Pipe			6.00			1/2" Ice	7.77	6.03	147.80
(Sprint)			1.00						
APXV9TM14-ALU-120 W/	B	From Face	4.00	0.0000	170.00	No Ice	7.24	5.31	89.74
Mount Pipe			6.00			1/2" Ice	7.77	6.03	147.80
(Sprint)			1.00						
APXV9TM14-ALU-120 W/	C	From Face	4.00	0.0000	170.00	No Ice	7.24	5.31	89.74
Mount Pipe			6.00			1/2" Ice	7.77	6.03	147.80
(Sprint)			1.00						
TD-RRH8x20-25	A	From Leg	2.00	0.0000	170.00	No Ice	4.70	1.69	70.00
(Sprint)			0.00 0.00			1/2" Ice	5.00	1.91	97.05
TD-RRH8x20-25	B	From Leg	2.00	0.0000	170.00	No Ice	4.70	1.69	70.00
(Sprint)			0.00 0.00			1/2" Ice	5.00	1.91	97.05
TD-RRH8x20-25	C	From Leg	2.00	0.0000	170.00	No Ice	4.70	1.69	70.00
(Sprint)			0.00 0.00			1/2" Ice	5.00	1.91	97.05
*****									
PiROD 13' Low Profile Platform	A	None		0.0000	160.00	No Ice	15.70	15.70	1300.00
(Monopole)						1/2" Ice	20.10	20.10	1765.00
(T -Mobile)									
7' x 2" Pipe Mount	A	From Face	4.00	0.0000	160.00	No Ice	1.66	1.66	25.55
(T-Mobile)			-2.00 0.00			1/2" Ice	2.39	2.39	38.13
7' x 2" Pipe Mount	B	From Face	4.00	0.0000	160.00	No Ice	1.66	1.66	25.55
(T-Mobile)			-2.00 0.00			1/2" Ice	2.39	2.39	38.13
7' x 2" Pipe Mount	C	From Face	4.00	0.0000	160.00	No Ice	1.66	1.66	25.55
(T-Mobile)			-2.00 0.00			1/2" Ice	2.39	2.39	38.13
7' x 2" Pipe Mount	A	From Face	4.00	0.0000	160.00	No Ice	1.66	1.66	25.55
(T-Mobile)			5.00 0.00			1/2" Ice	2.39	2.39	38.13
7' x 2" Pipe Mount	B	From Face	4.00	0.0000	160.00	No Ice	1.66	1.66	25.55
(T-Mobile)			5.00 0.00			1/2" Ice	2.39	2.39	38.13
7' x 2" Pipe Mount	C	From Face	4.00	0.0000	160.00	No Ice	1.66	1.66	25.55
(T-Mobile)			5.00 0.00			1/2" Ice	2.39	2.39	38.13

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 lb
(2) 5' x 1' Panel Antenna	A	From Face	4.00	0.0000	160.00	No Ice	7.00	4.94	53.25
w/Mount Pipe			0.00			1/2" Ice	7.47	5.62	106.42
(T-Mobile)			0.00						
(2) 5' x 1' Panel Antenna	B	From Face	4.00	0.0000	160.00	No Ice	7.00	4.94	53.25
w/Mount Pipe			0.00			1/2" Ice	7.47	5.62	106.42
(T-Mobile)			0.00						
(2) 5' x 1' Panel Antenna	C	From Face	4.00	0.0000	160.00	No Ice	7.00	4.94	53.25
w/Mount Pipe			0.00			1/2" Ice	7.47	5.62	106.42
(T-Mobile)			0.00						
(2) TMA 7"x6"x3"	A	From Face	4.00	0.0000	160.00	No Ice	0.41	0.20	10.00
(T-Mobile)			0.00			1/2" Ice	0.50	0.27	13.18
			2.00						
(2) TMA 7"x6"x3"	B	From Face	4.00	0.0000	160.00	No Ice	0.41	0.20	10.00
(T-Mobile)			0.00			1/2" Ice	0.50	0.27	13.18
			2.00						
(2) TMA 7"x6"x3"	C	From Face	4.00	0.0000	160.00	No Ice	0.41	0.20	10.00
(T-Mobile)			0.00			1/2" Ice	0.50	0.27	13.18
			2.00						
*****									
2' Standoff T-Arm (5' face width)	A	From Leg	1.00	0.0000	150.00	No Ice	3.50	3.50	91.00
(AT&T)			0.00			1/2" Ice	4.20	4.20	120.00
			0.00						
2' Standoff T-Arm (5' face width)	B	From Leg	1.00	0.0000	150.00	No Ice	3.50	3.50	91.00
(AT&T)			0.00			1/2" Ice	4.20	4.20	120.00
			0.00						
2' Standoff T-Arm (5' face width)	C	From Leg	1.00	0.0000	150.00	No Ice	3.50	3.50	91.00
(AT&T)			0.00			1/2" Ice	4.20	4.20	120.00
			0.00						
P65-17-XLH-RR w/Mount Pipe	A	From Leg	2.00	0.0000	150.00	No Ice	11.47	8.70	99.20
(AT&T)			2.00			1/2" Ice	12.08	10.11	182.36
			3.00						
P65-17-XLH-RR w/Mount Pipe	B	From Leg	2.00	0.0000	150.00	No Ice	11.47	8.70	99.20
(AT&T)			2.00			1/2" Ice	12.08	10.11	182.36
			3.00						
P65-17-XLH-RR w/Mount Pipe	C	From Leg	2.00	0.0000	150.00	No Ice	11.47	8.70	99.20
(AT&T)			2.00			1/2" Ice	12.08	10.11	182.36
			3.00						
DC6-48-60-18-8F	A	From Leg	1.00	0.0000	150.00	No Ice	1.47	1.47	33.00
(AT&T)			0.00			1/2" Ice	1.67	1.67	50.72
			0.00						
RRUS-11	A	From Leg	2.00	0.0000	150.00	No Ice	2.94	1.25	55.00
(AT&T)			2.00			1/2" Ice	3.17	1.41	74.32
			2.00						
RRUS-11	B	From Leg	2.00	0.0000	150.00	No Ice	2.94	1.25	55.00
(AT&T)			2.00			1/2" Ice	3.17	1.41	74.32
			2.00						
RRUS-11	C	From Leg	2.00	0.0000	150.00	No Ice	2.94	1.25	55.00
(AT&T)			2.00			1/2" Ice	3.17	1.41	74.32
			2.00						
800 10121 W/ Mount Pipe	A	From Leg	2.00	0.0000	150.00	No Ice	5.57	4.48	62.35
(AT&T)			-2.00			1/2" Ice	6.02	5.14	108.54
			3.00						
800 10121 W/ Mount Pipe	B	From Leg	2.00	0.0000	150.00	No Ice	5.57	4.48	62.35
(AT&T)			-2.00			1/2" Ice	6.02	5.14	108.54
			3.00						
800 10121 W/ Mount Pipe	C	From Leg	2.00	0.0000	150.00	No Ice	5.57	4.48	62.35
(AT&T)			-2.00			1/2" Ice	6.02	5.14	108.54

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 lb
			3.00						
(2) LGP214nn	A	From Leg	2.00	0.0000	150.00	No Ice	1.30	0.23	14.10
(AT&T)			-2.00			1/2" Ice	1.45	0.31	21.30
			3.00						
(2) LGP214nn	B	From Leg	2.00	0.0000	150.00	No Ice	1.30	0.23	14.10
(AT&T)			-2.00			1/2" Ice	1.45	0.31	21.30
			3.00						
(2) LGP214nn	C	From Leg	2.00	0.0000	150.00	No Ice	1.30	0.23	14.10
(AT&T)			-2.00			1/2" Ice	1.45	0.31	21.30
			3.00						
*****									
Valmont Light Duty Tri-Bracket	A	None		0.0000	140.00	No Ice	1.76	1.76	54.00
(1)						1/2" Ice	2.08	2.08	70.00
(Unknown)									
742 213 W/ Mount Pipe	A	From Leg	1.00	0.0000	140.00	No Ice	5.19	4.53	48.03
(Unknown)			0.00			1/2" Ice	5.68	5.73	90.76
			0.00						
742 213 W/ Mount Pipe	B	From Leg	1.00	0.0000	140.00	No Ice	5.19	4.53	48.03
(Unknown)			0.00			1/2" Ice	5.68	5.73	90.76
			0.00						
742 213 W/ Mount Pipe	C	From Leg	1.00	0.0000	140.00	No Ice	5.19	4.53	48.03
(Unknown)			0.00			1/2" Ice	5.68	5.73	90.76
			0.00						
*****									
5' Standoff	A	From Leg	2.50	0.0000	113.00	No Ice	3.26	3.26	60.00
(Unknown)			0.00			1/2" Ice	5.89	5.89	107.00
			0.00						
5' Standoff	B	From Leg	2.50	0.0000	113.00	No Ice	3.26	3.26	60.00
(Unknown)			0.00			1/2" Ice	5.89	5.89	107.00
			0.00						
5' Standoff	C	From Leg	2.50	0.0000	113.00	No Ice	3.26	3.26	60.00
(Unknown)			0.00			1/2" Ice	5.89	5.89	107.00
			0.00						
6' x 2" Pipe Mount	A	From Leg	5.00	0.0000	113.00	No Ice	1.43	1.43	21.90
(Unknown)			0.00			1/2" Ice	1.92	1.92	32.73
			0.00						
6' x 2" Pipe Mount	B	From Leg	5.00	0.0000	113.00	No Ice	1.43	1.43	21.90
(Unknown)			0.00			1/2" Ice	1.92	1.92	32.73
			0.00						
6' x 2" Pipe Mount	C	From Leg	5.00	0.0000	113.00	No Ice	1.43	1.43	21.90
(Unknown)			0.00			1/2" Ice	1.92	1.92	32.73
			0.00						
6' Omni	A	From Leg	5.00	0.0000	113.00	No Ice	1.69	1.69	37.30
(Unknown)			0.00			1/2" Ice	2.36	2.36	53.11
			6.00						
6' Omni	B	From Leg	5.00	0.0000	113.00	No Ice	1.69	1.69	37.30
(Unknown)			0.00			1/2" Ice	2.36	2.36	53.11
			6.00						
6' Omni	C	From Leg	5.00	0.0000	113.00	No Ice	1.69	1.69	37.30
(Unknown)			0.00			1/2" Ice	2.36	2.36	53.11
			6.00						
*****									
5' Standoff	A	From Leg	2.50	0.0000	90.00	No Ice	3.26	3.26	60.00
(Unknown)			0.00			1/2" Ice	5.89	5.89	107.00
			0.00						
5' Standoff	B	From Leg	2.50	0.0000	90.00	No Ice	3.26	3.26	60.00
(Unknown)			0.00			1/2" Ice	5.89	5.89	107.00

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 lb
			0.00						
5' Standoff	C	From Leg	2.50	0.0000	90.00	No Ice	3.26	3.26	60.00
(Unknown)			0.00			1/2" Ice	5.89	5.89	107.00
			0.00						
6' x 2" Pipe Mount	A	From Leg	5.00	0.0000	90.00	No Ice	1.43	1.43	21.90
(Unknown)			0.00			1/2" Ice	1.92	1.92	32.73
			0.00						
6' x 2" Pipe Mount	B	From Leg	5.00	0.0000	90.00	No Ice	1.43	1.43	21.90
(Unknown)			0.00			1/2" Ice	1.92	1.92	32.73
			0.00						
6' x 2" Pipe Mount	C	From Leg	5.00	0.0000	90.00	No Ice	1.43	1.43	21.90
(Unknown)			0.00			1/2" Ice	1.92	1.92	32.73
			0.00						
18' Omni	A	From Leg	5.00	0.0000	90.00	No Ice	4.50	4.50	50.00
(Unknown)			0.00			1/2" Ice	6.33	6.33	83.30
			9.00						
18' Omni	B	From Leg	5.00	0.0000	90.00	No Ice	4.50	4.50	50.00
(Unknown)			0.00			1/2" Ice	6.33	6.33	83.30
			9.00						
18' Omni	C	From Leg	5.00	0.0000	90.00	No Ice	4.50	4.50	50.00
(Unknown)			0.00			1/2" Ice	6.33	6.33	83.30
			9.00						

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
PR-850	A	Grid	From	5.00	0.0000		190.00	4.65	No Ice	16.98	38.00
(Farmington)			Face	0.00					1/2" Ice	17.60	128.35
				2.00							
PR-850	C	Grid	From	5.00	0.0000		190.00	4.65	No Ice	16.98	38.00
(Farmington)			Face	0.00					1/2" Ice	17.60	128.35
				-2.00							
*****											
VHLP4	B	Paraboloid	From	4.00	0.0000		170.00	4.23	No Ice	14.08	101.40
(Clearwire)		w/Shroud (HP)	Face	1.00					1/2" Ice	14.63	176.50
				6.00							
VHLP2.5	A	Paraboloid	From	4.00	0.0000		170.00	2.92	No Ice	6.68	48.00
(Clearwire)		w/Shroud (HP)	Face	-1.00					1/2" Ice	7.07	76.00
				6.00							

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 190.33-164.58	176.85	1.616	26	48.885	A	0.000	48.885	48.885	100.00	0.000	0.000
					B	0.000	48.885		100.00	0.000	0.000
					C	0.000	48.885		100.00	0.000	8.433
L2 164.58-129.75	146.48	1.531	25	86.425	A	0.000	86.425	86.425	100.00	0.000	4.689
					B	0.000	86.425		100.00	0.000	2.030
					C	0.000	86.425		100.00	0.000	11.407
L3 129.75-96.08	112.47	1.42	23	105.485	A	0.000	105.485	105.485	100.00	0.000	5.219
					B	0.000	105.485		100.00	0.000	6.667
					C	0.000	105.485		100.00	0.000	11.027
L4 96.08-63.25	79.42	1.285	21	123.191	A	0.000	123.191	123.191	100.00	0.000	5.089
					B	0.000	123.191		100.00	0.000	6.500
					C	0.000	123.191		100.00	0.000	10.752
L5 63.25-31.25	47.24	1.108	18	139.240	A	0.000	139.240	139.240	100.00	0.000	4.960
					B	0.000	139.240		100.00	0.000	6.336
					C	0.000	139.240		100.00	0.000	10.480
L6 31.25-0.00	15.29	1	16	154.037	A	0.000	154.037	154.037	100.00	0.000	4.844
					B	0.000	154.037		100.00	0.000	6.188
					C	0.000	154.037		100.00	0.000	10.235

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 190.33-164.58	176.85	1.616	20	0.5000	51.031	A	0.000	51.031	51.031	100.00	0.000	0.000
						B	0.000	51.031		100.00	0.000	0.000
						C	0.000	51.031		100.00	0.000	17.703
L2 164.58-129.75	146.48	1.531	19	0.5000	89.328	A	0.000	89.328	89.328	100.00	0.000	7.714
						B	0.000	89.328		100.00	0.000	3.054
						C	0.000	89.328		100.00	0.000	23.945
L3 129.75-96.08	112.47	1.42	17	0.5000	108.291	A	0.000	108.291	108.291	100.00	0.000	8.586
						B	0.000	108.291		100.00	0.000	10.034
						C	0.000	108.291		100.00	0.000	23.148
L4 96.08-63.25	79.42	1.285	16	0.5000	125.927	A	0.000	125.927	125.927	100.00	0.000	8.372
						B	0.000	125.927		100.00	0.000	9.783
						C	0.000	125.927		100.00	0.000	22.570
L5 63.25-31.25	47.24	1.108	14	0.5000	141.907	A	0.000	141.907	141.907	100.00	0.000	8.160
						B	0.000	141.907		100.00	0.000	9.536
						C	0.000	141.907		100.00	0.000	22.000
L6 31.25-0.00	15.29	1	12	0.5000	156.641	A	0.000	156.641	156.641	100.00	0.000	7.969
						B	0.000	156.641		100.00	0.000	9.312
						C	0.000	156.641		100.00	0.000	21.484

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 190.33-164.58	176.85	1.616	15	48.885	A	0.000	48.885	48.885	100.00	0.000	0.000
					B	0.000	48.885		100.00	0.000	0.000
					C	0.000	48.885		100.00	0.000	8.433
L2 164.58-129.75	146.48	1.531	14	86.425	A	0.000	86.425	86.425	100.00	0.000	4.689
					B	0.000	86.425		100.00	0.000	2.030
					C	0.000	86.425		100.00	0.000	11.407
L3 129.75-96.08	112.47	1.42	13	105.485	A	0.000	105.485	105.485	100.00	0.000	5.219
					B	0.000	105.485		100.00	0.000	6.667
					C	0.000	105.485		100.00	0.000	11.027
L4 96.08-63.25	79.42	1.285	12	123.191	A	0.000	123.191	123.191	100.00	0.000	5.089
					B	0.000	123.191		100.00	0.000	6.500
					C	0.000	123.191		100.00	0.000	10.752
L5 63.25-31.25	47.24	1.108	10	139.240	A	0.000	139.240	139.240	100.00	0.000	4.960
					B	0.000	139.240		100.00	0.000	6.336
					C	0.000	139.240		100.00	0.000	10.480
L6 31.25-0.00	15.29	1	9	154.037	A	0.000	154.037	154.037	100.00	0.000	4.844
					B	0.000	154.037		100.00	0.000	6.188
					C	0.000	154.037		100.00	0.000	10.235

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	322.48	1566.55	A	1	0.65	1	1	1	48.885	1798.60	69.85	C
190.33-164.58			B	1	0.65	1	1	1	48.885			
			C	1	0.65	1	1	1	48.885			
L2	1014.63	3687.56	A	1	0.65	1	1	1	86.425	3147.42	90.37	C
164.58-129.75			B	1	0.65	1	1	1	86.425			
			C	1	0.65	1	1	1	86.425			
L3 129.75-96.08	1301.88	5581.25	A	1	0.65	1	1	1	105.485	3591.97	106.68	C
			B	1	0.65	1	1	1	105.485			
			C	1	0.65	1	1	1	105.485			
L4 96.08-63.25	1301.71	6694.93	A	1	0.65	1	1	1	123.191	3637.39	110.79	C
			B	1	0.65	1	1	1	123.191			
			C	1	0.65	1	1	1	123.191			
L5 63.25-31.25	1273.25	7771.47	A	1	0.65	1	1	1	139.240	3426.16	107.07	C
			B	1	0.65	1	1	1	139.240			
			C	1	0.65	1	1	1	139.240			
L6 31.25-0.00	1243.41	8811.80	A	1	0.65	1	1	1	154.037	3361.15	107.56	C
			B	1	0.65	1	1	1	154.037			
			C	1	0.65	1	1	1	154.037			
Sum Weight:	6457.36	34113.55						OTM	1685229.42 lb-ft	18962.69		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	322.48	1566.55	A	1	0.65	1	1	1	48.885	1798.60	69.85	C
190.33-164.58			B	1	0.65	1	1	1	48.885			
			C	1	0.65	1	1	1	48.885			
L2	1014.63	3687.56	A	1	0.65	1	1	1	86.425	3147.42	90.37	C
164.58-129.75			B	1	0.65	1	1	1	86.425			
			C	1	0.65	1	1	1	86.425			
L3 129.75-96.08	1301.88	5581.25	A	1	0.65	1	1	1	105.485	3591.97	106.68	C
			B	1	0.65	1	1	1	105.485			
			C	1	0.65	1	1	1	105.485			
L4 96.08-63.25	1301.71	6694.93	A	1	0.65	1	1	1	123.191	3637.39	110.79	C
			B	1	0.65	1	1	1	123.191			
			C	1	0.65	1	1	1	123.191			
L5 63.25-31.25	1273.25	7771.47	A	1	0.65	1	1	1	139.240	3426.16	107.07	C
			B	1	0.65	1	1	1	139.240			
			C	1	0.65	1	1	1	139.240			
L6 31.25-0.00	1243.41	8811.80	A	1	0.65	1	1	1	154.037	3361.15	107.56	C
			B	1	0.65	1	1	1	154.037			
			C	1	0.65	1	1	1	154.037			
Sum Weight:	6457.36	34113.55						OTM	1685229.42 lb-ft	18962.69		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	322.48	1566.55	A	1	0.65	1	1	1	48.885	1798.60	69.85	C
190.33-164.58			B	1	0.65	1	1	1	48.885			
			C	1	0.65	1	1	1	48.885			
L2	1014.63	3687.56	A	1	0.65	1	1	1	86.425	3147.42	90.37	C
164.58-129.75			B	1	0.65	1	1	1	86.425			
			C	1	0.65	1	1	1	86.425			
L3 129.75-96.08	1301.88	5581.25	A	1	0.65	1	1	1	105.485	3591.97	106.68	C
			B	1	0.65	1	1	1	105.485			
			C	1	0.65	1	1	1	105.485			
L4 96.08-63.25	1301.71	6694.93	A	1	0.65	1	1	1	123.191	3637.39	110.79	C
			B	1	0.65	1	1	1	123.191			
			C	1	0.65	1	1	1	123.191			
L5 63.25-31.25	1273.25	7771.47	A	1	0.65	1	1	1	139.240	3426.16	107.07	C
			B	1	0.65	1	1	1	139.240			
			C	1	0.65	1	1	1	139.240			
L6 31.25-0.00	1243.41	8811.80	A	1	0.65	1	1	1	154.037	3361.15	107.56	C
			B	1	0.65	1	1	1	154.037			
			C	1	0.65	1	1	1	154.037			
Sum Weight:	6457.36	34113.55						OTM	1685229.42 lb-ft	18962.69		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	405.66	1936.54	A	1	0.65	1	1	1	51.031	1706.73	66.28	C
190.33-164.58			B	1	0.65	1	1	1	51.031			
			C	1	0.65	1	1	1	51.031			
L2	1446.87	4338.37	A	1	0.65	1	1	1	89.328	2947.51	84.63	C
164.58-129.75			B	1	0.65	1	1	1	89.328			
			C	1	0.65	1	1	1	89.328			
L3 129.75-96.08	1968.21	6372.87	A	1	0.65	1	1	1	108.291	3302.94	98.10	C
			B	1	0.65	1	1	1	108.291			
			C	1	0.65	1	1	1	108.291			
L4 96.08-63.25	1951.42	7617.41	A	1	0.65	1	1	1	125.927	3265.11	99.45	C
			B	1	0.65	1	1	1	125.927			
			C	1	0.65	1	1	1	125.927			
L5 63.25-31.25	1906.53	8812.56	A	1	0.65	1	1	1	141.907	3019.38	94.36	C
			B	1	0.65	1	1	1	141.907			
			C	1	0.65	1	1	1	141.907			
L6 31.25-0.00	1861.84	9962.24	A	1	0.65	1	1	1	156.641	2919.42	93.42	C
			B	1	0.65	1	1	1	156.641			
			C	1	0.65	1	1	1	156.641			
Sum Weight:	9540.53	39039.98						OTM	1551654.27 lb-ft	17161.08		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	405.66	1936.54	A	1	0.65	1	1	1	51.031	1706.73	66.28	C
190.33-164.58			B	1	0.65	1	1	1	51.031			
			C	1	0.65	1	1	1	51.031			
L2	1446.87	4338.37	A	1	0.65	1	1	1	89.328	2947.51	84.63	C
164.58-129.75			B	1	0.65	1	1	1	89.328			
			C	1	0.65	1	1	1	89.328			
L3 129.75-96.08	1968.21	6372.87	A	1	0.65	1	1	1	108.291	3302.94	98.10	C
			B	1	0.65	1	1	1	108.291			
			C	1	0.65	1	1	1	108.291			
L4 96.08-63.25	1951.42	7617.41	A	1	0.65	1	1	1	125.927	3265.11	99.45	C
			B	1	0.65	1	1	1	125.927			
			C	1	0.65	1	1	1	125.927			
L5 63.25-31.25	1906.53	8812.56	A	1	0.65	1	1	1	141.907	3019.38	94.36	C
			B	1	0.65	1	1	1	141.907			
			C	1	0.65	1	1	1	141.907			
L6 31.25-0.00	1861.84	9962.24	A	1	0.65	1	1	1	156.641	2919.42	93.42	C
			B	1	0.65	1	1	1	156.641			
			C	1	0.65	1	1	1	156.641			
Sum Weight:	9540.53	39039.98						OTM	1551654.27 lb-ft	17161.08		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	405.66	1936.54	A	1	0.65	1	1	1	51.031	1706.73	66.28	C
190.33-164.58			B	1	0.65	1	1	1	51.031			
			C	1	0.65	1	1	1	51.031			
L2	1446.87	4338.37	A	1	0.65	1	1	1	89.328	2947.51	84.63	C
164.58-129.75			B	1	0.65	1	1	1	89.328			
			C	1	0.65	1	1	1	89.328			
L3 129.75-96.08	1968.21	6372.87	A	1	0.65	1	1	1	108.291	3302.94	98.10	C
			B	1	0.65	1	1	1	108.291			
			C	1	0.65	1	1	1	108.291			
L4 96.08-63.25	1951.42	7617.41	A	1	0.65	1	1	1	125.927	3265.11	99.45	C
			B	1	0.65	1	1	1	125.927			
			C	1	0.65	1	1	1	125.927			
L5 63.25-31.25	1906.53	8812.56	A	1	0.65	1	1	1	141.907	3019.38	94.36	C
			B	1	0.65	1	1	1	141.907			
			C	1	0.65	1	1	1	141.907			
L6 31.25-0.00	1861.84	9962.24	A	1	0.65	1	1	1	156.641	2919.42	93.42	C
			B	1	0.65	1	1	1	156.641			
			C	1	0.65	1	1	1	156.641			
Sum Weight:	9540.53	39039.98						OTM	1551654.27 lb-ft	17161.08		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	322.48	1566.55	A	1	0.65	1	1	1	48.885	1011.71	39.29	C
190.33-164.58			B	1	0.65	1	1	1	48.885			
			C	1	0.65	1	1	1	48.885			
L2	1014.63	3687.56	A	1	0.65	1	1	1	86.425	1770.43	50.83	C
164.58-129.75			B	1	0.65	1	1	1	86.425			
			C	1	0.65	1	1	1	86.425			
L3 129.75-96.08	1301.88	5581.25	A	1	0.65	1	1	1	105.485	2020.48	60.01	C
			B	1	0.65	1	1	1	105.485			
			C	1	0.65	1	1	1	105.485			
L4 96.08-63.25	1301.71	6694.93	A	1	0.65	1	1	1	123.191	2046.03	62.32	C
			B	1	0.65	1	1	1	123.191			
			C	1	0.65	1	1	1	123.191			
L5 63.25-31.25	1273.25	7771.47	A	1	0.65	1	1	1	139.240	1927.22	60.23	C
			B	1	0.65	1	1	1	139.240			
			C	1	0.65	1	1	1	139.240			
L6 31.25-0.00	1243.41	8811.80	A	1	0.65	1	1	1	154.037	1890.65	60.50	C
			B	1	0.65	1	1	1	154.037			
			C	1	0.65	1	1	1	154.037			
Sum Weight:	6457.36	34113.55						OTM	947941.55 lb-ft	10666.52		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	322.48	1566.55	A	1	0.65	1	1	1	48.885	1011.71	39.29	C
190.33-164.58			B	1	0.65	1	1	1	48.885			
			C	1	0.65	1	1	1	48.885			
L2	1014.63	3687.56	A	1	0.65	1	1	1	86.425	1770.43	50.83	C
164.58-129.75			B	1	0.65	1	1	1	86.425			
			C	1	0.65	1	1	1	86.425			
L3 129.75-96.08	1301.88	5581.25	A	1	0.65	1	1	1	105.485	2020.48	60.01	C
			B	1	0.65	1	1	1	105.485			
			C	1	0.65	1	1	1	105.485			
L4 96.08-63.25	1301.71	6694.93	A	1	0.65	1	1	1	123.191	2046.03	62.32	C
			B	1	0.65	1	1	1	123.191			
			C	1	0.65	1	1	1	123.191			
L5 63.25-31.25	1273.25	7771.47	A	1	0.65	1	1	1	139.240	1927.22	60.23	C
			B	1	0.65	1	1	1	139.240			
			C	1	0.65	1	1	1	139.240			
L6 31.25-0.00	1243.41	8811.80	A	1	0.65	1	1	1	154.037	1890.65	60.50	C
			B	1	0.65	1	1	1	154.037			
			C	1	0.65	1	1	1	154.037			
Sum Weight:	6457.36	34113.55						OTM	947941.55 lb-ft	10666.52		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	322.48	1566.55	A	1	0.65	1	1	1	48.885	1011.71	39.29	C
190.33-164.58			B	1	0.65	1	1	1	48.885			
			C	1	0.65	1	1	1	48.885			
L2	1014.63	3687.56	A	1	0.65	1	1	1	86.425	1770.43	50.83	C
164.58-129.75			B	1	0.65	1	1	1	86.425			
			C	1	0.65	1	1	1	86.425			
L3 129.75-96.08	1301.88	5581.25	A	1	0.65	1	1	1	105.485	2020.48	60.01	C
			B	1	0.65	1	1	1	105.485			
			C	1	0.65	1	1	1	105.485			
L4 96.08-63.25	1301.71	6694.93	A	1	0.65	1	1	1	123.191	2046.03	62.32	C
			B	1	0.65	1	1	1	123.191			
			C	1	0.65	1	1	1	123.191			
L5 63.25-31.25	1273.25	7771.47	A	1	0.65	1	1	1	139.240	1927.22	60.23	C
			B	1	0.65	1	1	1	139.240			
			C	1	0.65	1	1	1	139.240			
L6 31.25-0.00	1243.41	8811.80	A	1	0.65	1	1	1	154.037	1890.65	60.50	C
			B	1	0.65	1	1	1	154.037			
			C	1	0.65	1	1	1	154.037			
Sum Weight:	6457.36	34113.55						OTM	947941.55 lb-ft	10666.52		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	34113.55					
Bracing Weight	0.00					
Total Member Self-Weight	34113.55			1032.80	-372.14	
Total Weight	48251.87			1032.80	-372.14	
Wind 0 deg - No Ice		60.17	-35446.40	-4324981.95	-9824.79	3626.75
Wind 30 deg - No Ice		17717.39	-30611.96	-3729236.97	-2161146.92	4224.92
Wind 60 deg - No Ice		30692.15	-17583.53	-2136336.10	-3745295.96	3430.46
Wind 90 deg - No Ice		35408.26	-21.86	-1958.67	-4319706.43	1270.73
Wind 120 deg - No Ice		30780.94	17647.21	2151656.18	-3762377.64	-260.51
Wind 150 deg - No Ice		17860.18	30748.35	3757876.38	-2188597.94	-2023.22
Wind 180 deg - No Ice		-161.45	35534.38	4342922.40	27266.81	-3363.90
Wind 210 deg - No Ice		-17941.05	30663.68	3739917.82	2200608.17	-4202.56
Wind 240 deg - No Ice		-30792.63	17723.43	2163078.20	3762511.59	-3313.30
Wind 270 deg - No Ice		-35490.52	146.54	26519.18	4333438.58	-1590.11
Wind 300 deg - No Ice		-30865.37	-17497.11	-2123248.46	3777161.11	-355.80
Wind 330 deg - No Ice		-17726.44	-30739.70	-3753946.40	2164908.14	2224.69
Member Ice	4926.42					
Total Weight Ice	60461.30			854.00	-2280.31	
Wind 0 deg - Ice		-0.59	-33352.10	-4151506.27	-559.38	2528.27
Wind 30 deg - Ice		16184.59	-28855.58	-3589467.19	-1985074.50	2448.60
Wind 60 deg - Ice		28927.57	-16585.82	-2056777.78	-3608512.80	3660.17
Wind 90 deg - Ice		33118.19	428.71	84171.39	-4112366.12	3531.89
Wind 120 deg - Ice		28931.64	16658.74	2076172.96	-3608789.49	1071.90
Wind 150 deg - Ice		17169.15	28635.86	3551192.41	-2173007.79	-1985.42
Wind 180 deg - Ice		628.91	33342.57	4151921.42	-125605.55	-3745.45
Wind 210 deg - Ice		-16588.64	28440.26	3512332.23	2054865.06	-4433.09
Wind 240 deg - Ice		-28562.60	16445.00	2032672.94	3532326.49	-3559.60
Wind 270 deg - Ice		-32899.83	97.76	17676.39	4064869.67	-1773.06
Wind 300 deg - Ice		-28574.62	-17108.25	-2159769.04	3535687.79	-136.34
Wind 330 deg - Ice		-16241.16	-29101.53	-3636831.24	1993495.18	2137.86
Total Weight	48251.87			1032.80	-372.14	
Wind 0 deg - Service		33.84	-19938.60	-2433357.80	-6514.21	2040.05
Wind 30 deg - Service		9966.03	-17219.23	-2098251.24	-1216632.91	2376.52
Wind 60 deg - Service		17264.33	-9890.73	-1202244.50	-2107716.75	1929.63
Wind 90 deg - Service		19917.15	-12.29	-1657.20	-2430822.63	714.78
Wind 120 deg - Service		17314.28	9926.55	1209751.15	-2117325.19	-146.54
Wind 150 deg - Service		10046.35	17295.94	2113250.02	-1232074.11	-1138.06
Wind 180 deg - Service		-90.81	19988.09	2442338.41	14349.81	-1892.19
Wind 210 deg - Service		-10091.84	17248.32	2103148.33	1236854.33	-2363.94
Wind 240 deg - Service		-17320.85	9969.43	1216176.04	2115425.00	-1863.73
Wind 270 deg - Service		-19963.42	82.43	14361.60	2436571.43	-894.44
Wind 300 deg - Service		-17361.77	-9842.13	-1194882.70	2123665.36	-200.14
Wind 330 deg - Service		-9971.12	-17291.08	-2112150.29	1216773.06	1251.39

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	190.33 - 164.58	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-8019.15	-1665.03	-556.24
			Max. Mx	18	-6977.46	-120118.48	-12102.08
			Max. My	21	-6938.19	-19756.67	-122549.26
			Max. Vy	18	10595.74	-120118.48	-12102.08
			Max. Vx	15	-10837.40	238.90	121137.96
			Max. Torque	22			4637.90
L2	164.58 - 129.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18090.76	-1465.93	-393.83
			Max. Mx	18	-16507.04	-652090.48	-27701.31
			Max. My	21	-16466.83	-42686.07	-662581.48
			Max. Vy	11	-20343.75	646404.02	-6281.43
			Max. Vx	8	20390.46	5672.35	-649713.20
			Max. Torque	22			4625.76
L3	129.75 - 96.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26515.45	-1595.03	-469.11
			Max. Mx	11	-18260.15	1383971.85	-11557.97
			Max. My	8	-18253.01	11262.12	-1388875.99
			Max. Vy	11	-24725.08	1383971.85	-11557.97
			Max. Vx	8	24772.04	11262.12	-1388875.99

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Torque	22			4466.68
L4	96.08 - 63.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36355.77	-1795.46	-578.39
			Max. Mx	11	-26642.48	2258659.13	-16728.70
			Max. My	8	-26637.49	16753.81	-2265158.29
			Max. Vy	11	-29233.10	2258659.13	-16728.70
			Max. Vx	8	29279.72	16753.81	-2265158.29
			Max. Torque	22			4405.84
L5	63.25 - 31.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-46657.48	-2022.40	-702.11
			Max. Mx	11	-35833.67	3221908.40	-21742.43
			Max. My	8	-35830.96	22106.43	-3229960.22
			Max. Vy	11	-32279.83	3221908.40	-21742.43
			Max. Vx	8	32325.54	22106.43	-3229960.22
			Max. Torque	22			4346.90
L6	31.25 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-60461.30	-2332.38	-871.11
			Max. Mx	11	-48234.09	4494164.99	-27639.81
			Max. My	8	-48234.03	28430.67	-4504046.32
			Max. Vy	11	-35514.69	4494164.99	-27639.81
			Max. Vx	8	35558.60	28430.67	-4504046.32
			Max. Torque	22			4291.63

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	15	60461.30	0.59	33352.10
	Max. H_x	11	48251.87	35490.52	-146.54
	Max. H_z	2	48251.87	-60.17	35446.40
	Max. M_x	2	4485401.83	-60.17	35446.40
	Max. M_z	5	4479937.26	-35408.26	21.86
	Max. Torsion	22	4239.97	16588.64	-28440.26
	Min. Vert	1	48251.87	-0.00	-0.00
	Min. H_x	5	48251.87	-35408.26	21.86
	Min. H_z	8	48251.87	161.45	-35534.38
	Min. M_x	8	-4504046.32	161.45	-35534.38
	Min. M_z	11	-4494164.99	35490.52	-146.54
	Min. Torsion	3	-4100.60	-17717.39	30611.96

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	48251.87	0.00	0.00	1034.31	-375.73	0.04
Dead+Wind 0 deg - No Ice	48251.87	60.17	-35446.40	-4485401.83	-10207.03	3501.16
Dead+Wind 30 deg - No Ice	48251.87	17717.39	-30611.96	-3867500.52	-2241282.75	4100.60
Dead+Wind 60 deg - No Ice	48251.87	30692.15	-17583.53	-2215437.52	-3884248.95	3353.28
Dead+Wind 90 deg - No Ice	48251.87	35408.26	-21.86	-2034.00	-4479937.26	1246.64
Dead+Wind 120 deg - No Ice	48251.87	30780.94	17647.21	2231398.85	-3902041.68	-235.89
Dead+Wind 150 deg - No Ice	48251.87	17860.18	30748.35	3897290.48	-2269925.19	-1949.69

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead+Wind 180 deg - No Ice	48251.87	-161.45	35534.38	4504046.32	28431.16	-3256.64
Dead+Wind 210 deg - No Ice	48251.87	-17941.05	30663.68	3878480.87	2282440.73	-4071.88
Dead+Wind 240 deg - No Ice	48251.87	-30792.63	17723.43	2243221.65	3902104.87	-3212.89
Dead+Wind 270 deg - No Ice	48251.87	-35490.52	146.54	27639.58	4494164.99	-1551.92
Dead+Wind 300 deg - No Ice	48251.87	-30865.37	-17497.11	-2201776.29	3917442.15	-378.58
Dead+Wind 330 deg - No Ice	48251.87	-17726.44	-30739.70	-3893226.52	2245244.59	2134.74
Dead+Ice+Temp	60461.30	0.00	0.00	871.11	-2332.38	0.12
Dead+Wind 0 deg+Ice+Temp	60461.30	-0.59	-33352.10	-4365577.54	-522.74	2329.19
Dead+Wind 30 deg+Ice+Temp	60461.30	16184.59	-28855.58	-3774679.30	-2086477.66	2273.22
Dead+Wind 60 deg+Ice+Temp	60461.30	28927.57	-16585.82	-2162580.42	-3794816.90	3656.29
Dead+Wind 90 deg+Ice+Temp	60461.30	33118.20	428.71	89545.45	-4324244.20	3555.68
Dead+Wind 120 deg+Ice+Temp	60461.30	28931.64	16658.74	2183299.75	-3795073.25	1113.92
Dead+Wind 150 deg+Ice+Temp	60461.30	17169.15	28635.86	3733817.62	-2286211.80	-1930.24
Dead+Wind 180 deg+Ice+Temp	60461.30	628.91	33342.57	4366036.74	-133697.65	-3687.48
Dead+Wind 210 deg+Ice+Temp	60461.30	-16588.64	28440.26	3692752.95	2160685.14	-4239.97
Dead+Wind 240 deg+Ice+Temp	60461.30	-28562.60	16445.00	2137099.09	3714003.07	-3409.54
Dead+Wind 270 deg+Ice+Temp	60461.30	-32899.83	97.76	18710.09	4273838.92	-1728.66
Dead+Wind 300 deg+Ice+Temp	60461.30	-28574.62	-17108.25	-2272232.79	3717334.48	-192.75
Dead+Wind 330 deg+Ice+Temp	60461.30	-16241.16	-29101.53	-3824858.73	2095421.87	1987.81
Dead+Wind 0 deg - Service	48251.87	33.84	-19938.60	-2525290.88	-5943.45	1991.39
Dead+Wind 30 deg - Service	48251.87	9966.03	-17219.23	-2177315.14	-1262262.82	2330.09
Dead+Wind 60 deg - Service	48251.87	17264.33	-9890.73	-1247034.00	-2187418.48	1901.29
Dead+Wind 90 deg - Service	48251.87	19917.15	-12.29	-671.63	-2522861.39	706.63
Dead+Wind 120 deg - Service	48251.87	17314.28	9926.55	1256993.17	-2197472.81	-133.84
Dead+Wind 150 deg - Service	48251.87	10046.35	17295.94	2195098.50	-1278428.58	-1106.30
Dead+Wind 180 deg - Service	48251.87	-90.81	19988.09	2536762.25	15820.02	-1848.93
Dead+Wind 210 deg - Service	48251.87	-10091.84	17248.32	2184487.76	1285079.83	-2315.72
Dead+Wind 240 deg - Service	48251.87	-17320.85	9969.43	1263659.94	2197132.95	-1827.91
Dead+Wind 270 deg - Service	48251.87	-19963.42	82.43	16043.02	2530522.55	-882.16
Dead+Wind 300 deg - Service	48251.87	-17361.77	-9842.13	-1239365.55	2205774.24	-212.93
Dead+Wind 330 deg - Service	48251.87	-9971.13	-17291.08	-2191852.82	1264132.43	1214.91

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0.00	-48251.87	0.00	-0.00	48251.87	-0.00	0.000%
2	60.17	-48251.87	-35446.40	-60.17	48251.87	35446.40	0.000%
3	17717.39	-48251.87	-30611.96	-17717.39	48251.87	30611.96	0.000%
4	30692.15	-48251.87	-17583.53	-30692.15	48251.87	17583.53	0.000%
5	35408.26	-48251.87	-21.86	-35408.26	48251.87	21.86	0.000%
6	30780.94	-48251.87	17647.21	-30780.94	48251.87	-17647.21	0.000%
7	17860.18	-48251.87	30748.35	-17860.18	48251.87	-30748.35	0.000%
8	-161.45	-48251.87	35534.38	161.45	48251.87	-35534.38	0.000%
9	-17941.05	-48251.87	30663.68	17941.05	48251.87	-30663.68	0.000%
10	-30792.63	-48251.87	17723.43	30792.63	48251.87	-17723.43	0.000%
11	-35490.52	-48251.87	146.54	35490.52	48251.87	-146.54	0.000%
12	-30865.37	-48251.87	-17497.11	30865.37	48251.87	17497.11	0.000%
13	-17726.44	-48251.87	-30739.70	17726.44	48251.87	30739.70	0.000%
14	0.00	-60461.30	0.00	-0.00	60461.30	-0.00	0.000%
15	-0.59	-60461.30	-33352.10	0.59	60461.30	33352.10	0.000%
16	16184.59	-60461.30	-28855.58	-16184.59	60461.30	28855.58	0.000%
17	28927.57	-60461.30	-16585.82	-28927.57	60461.30	16585.82	0.000%
18	33118.19	-60461.30	428.71	-33118.20	60461.30	-428.71	0.000%
19	28931.64	-60461.30	16658.74	-28931.64	60461.30	-16658.74	0.000%
20	17169.15	-60461.30	28635.86	-17169.15	60461.30	-28635.86	0.000%
21	628.91	-60461.30	33342.57	-628.91	60461.30	-33342.57	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
22	-16588.64	-60461.30	28440.26	16588.64	60461.30	-28440.26	0.000%
23	-28562.60	-60461.30	16445.00	28562.60	60461.30	-16445.00	0.000%
24	-32899.83	-60461.30	97.76	32899.83	60461.30	-97.76	0.000%
25	-28574.62	-60461.30	-17108.25	28574.62	60461.30	17108.25	0.000%
26	-16241.16	-60461.30	-29101.53	16241.16	60461.30	29101.53	0.000%
27	33.84	-48251.87	-19938.60	-33.84	48251.87	19938.60	0.000%
28	9966.03	-48251.87	-17219.23	-9966.03	48251.87	17219.23	0.000%
29	17264.33	-48251.87	-9890.73	-17264.33	48251.87	9890.73	0.000%
30	19917.15	-48251.87	-12.29	-19917.15	48251.87	12.29	0.000%
31	17314.28	-48251.87	9926.55	-17314.28	48251.87	-9926.55	0.000%
32	10046.35	-48251.87	17295.94	-10046.35	48251.87	-17295.94	0.000%
33	-90.81	-48251.87	19988.09	90.81	48251.87	-19988.09	0.000%
34	-10091.84	-48251.87	17248.32	10091.84	48251.87	-17248.32	0.000%
35	-17320.85	-48251.87	9969.43	17320.85	48251.87	-9969.43	0.000%
36	-19963.42	-48251.87	82.43	19963.42	48251.87	-82.43	0.000%
37	-17361.77	-48251.87	-9842.13	17361.77	48251.87	9842.13	0.000%
38	-9971.12	-48251.87	-17291.08	9971.13	48251.87	17291.08	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	6	0.00000001	0.00000723
3	Yes	6	0.00000001	0.00007187
4	Yes	6	0.00000001	0.00006318
5	Yes	5	0.00000001	0.00005536
6	Yes	6	0.00000001	0.00006713
7	Yes	6	0.00000001	0.00007049
8	Yes	6	0.00000001	0.00000508
9	Yes	6	0.00000001	0.00006416
10	Yes	6	0.00000001	0.00007145
11	Yes	5	0.00000001	0.00009845
12	Yes	6	0.00000001	0.00006662
13	Yes	6	0.00000001	0.00006534
14	Yes	4	0.00000001	0.00000737
15	Yes	6	0.00000001	0.00005021
16	Yes	7	0.00000001	0.00001447
17	Yes	7	0.00000001	0.00001390
18	Yes	6	0.00000001	0.00005944
19	Yes	7	0.00000001	0.00001482
20	Yes	7	0.00000001	0.00001533
21	Yes	6	0.00000001	0.00006617
22	Yes	7	0.00000001	0.00001343
23	Yes	7	0.00000001	0.00001470
24	Yes	6	0.00000001	0.00004907
25	Yes	7	0.00000001	0.00001483
26	Yes	7	0.00000001	0.00001382
27	Yes	5	0.00000001	0.00007589
28	Yes	6	0.00000001	0.00002301
29	Yes	6	0.00000001	0.00001922
30	Yes	5	0.00000001	0.00002768
31	Yes	6	0.00000001	0.00002093
32	Yes	6	0.00000001	0.00002247
33	Yes	5	0.00000001	0.00006115
34	Yes	6	0.00000001	0.00001978

35	Yes	6	0.00000001	0.00002284
36	Yes	5	0.00000001	0.00004095
37	Yes	6	0.00000001	0.00002063
38	Yes	6	0.00000001	0.00002014

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190.33 - 164.58	76.564	32	3.4480	0.0245
L2	167.25 - 129.75	60.092	32	3.3364	0.0180
L3	133.58 - 96.08	38.283	32	2.7595	0.0081
L4	100.75 - 63.25	21.568	32	2.0622	0.0043
L5	68.75 - 31.25	9.944	32	1.3648	0.0023
L6	37.5 - 0	2.985	32	0.7188	0.0010

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.00	PR-850	32	76.564	3.4480	0.0245	26172
190.00	Lightning Rod 5/8x4'	32	76.326	3.4472	0.0244	26172
188.00	PR-850	32	74.882	3.4424	0.0239	26172
185.00	5' Standoff	32	72.719	3.4347	0.0231	24551
180.00	5' Standoff	32	69.124	3.4186	0.0217	12667
176.00	VHLP4	32	66.264	3.4006	0.0207	9131
175.00	Valmont Light Duty Tri-Bracket (1)	32	65.553	3.3951	0.0204	8535
170.00	PiROD 13' Low Profile Platform (Monopole)	32	62.017	3.3610	0.0190	6440
160.00	PiROD 13' Low Profile Platform (Monopole)	32	55.096	3.2495	0.0160	4537
150.00	2' Standoff T-Arm (5' face width)	32	48.442	3.0871	0.0127	3557
140.00	Valmont Light Duty Tri-Bracket (1)	32	42.126	2.8926	0.0098	2925
113.00	5' Standoff	32	27.229	2.3255	0.0053	2635
90.00	5' Standoff	32	17.161	1.8276	0.0036	2709

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190.33 - 164.58	135.609	7	6.1853	0.0435
L2	167.25 - 129.75	106.478	7	5.9301	0.0318
L3	133.58 - 96.08	67.879	7	4.8943	0.0143
L4	100.75 - 63.25	38.261	7	3.6588	0.0076
L5	68.75 - 31.25	17.648	7	2.4222	0.0040
L6	37.5 - 0	5.298	7	1.2760	0.0018

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.00	PR-850	7	135.609	6.1853	0.0484	12490
190.00	Lightning Rod 5/8x4'	7	135.188	6.1831	0.0482	12490
188.00	PR-850	7	132.635	6.1697	0.0470	12490
185.00	5' Standoff	7	128.810	6.1485	0.0452	11717
180.00	5' Standoff	7	122.453	6.1073	0.0421	6044
176.00	VHLP4	7	117.396	6.0655	0.0397	4356
175.00	Valmont Light Duty Tri-Bracket (1)	7	116.137	6.0534	0.0391	4072
170.00	PiROD 13' Low Profile Platform (Monopole)	7	109.884	5.9805	0.0360	3074
160.00	PiROD 13' Low Profile Platform (Monopole)	7	97.641	5.7612	0.0297	2293
150.00	2' Standoff T-Arm (5' face width)	7	85.864	5.4742	0.0236	1896
140.00	Valmont Light Duty Tri-Bracket (1)	7	74.682	5.1300	0.0182	1615
113.00	5' Standoff	7	48.295	4.1255	0.0099	1494
90.00	5' Standoff	7	30.447	3.2429	0.0067	1536

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual Allowable Ratio Bolt Tension lb	Actual Allowable Ratio Bolt Compression lb	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Ratio
1.5000	44	1.2500	71259.09 60745.64 1.17	73451.54 100837.76 0.73	30.407 37.500 0.81	11.197 37.500 0.30	Bolt T	1.17 ✔

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	190.33 - 164.58 (1)	TP26x19.5625x0.25	25.75	190.33	256.5	2.270	19.9030	-6930.29	45174.20	0.153
L2	164.58 - 129.75 (2)	TP34.0625x24.8325x0.3125	37.50	190.33	196.1	3.883	32.5407	-16458.20	126357.00	0.130
L3	129.75 - 96.08 (3)	TP41.75x32.4948x0.375	37.50	190.33	160.0	5.837	47.8747	-25037.30	279430.00	0.090
L4	96.08 - 63.25 (4)	TP49.0625x39.8474x0.375	37.50	190.33	135.9	8.084	56.3416	-35197.30	455452.00	0.077
L5	63.25 - 31.25 (5)	TP56.125x46.961x0.375	37.50	190.33	118.7	10.607	64.5385	-35829.30	684560.00	0.052
L6	31.25 - 0 (6)	TP62.9375x53.8477x0.375	37.50	190.33	102.8	14.121	74.4650	-48234.00	1051510.00	0.046

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	190.33 - 164.58 (1)	TP26x19.5625x0.25	126549.17	-12.353	39.000	0.317	0.00	0.000	39.000	0.000
L2	164.58 - 129.75 (2)	TP34.0625x24.8325x0.3125	668088.33	-30.483	39.000	0.782	0.00	0.000	39.000	0.000
L3	129.75 - 96.08 (3)	TP41.75x32.4948x0.375	1388450.00	-35.115	39.000	0.900	0.00	0.000	39.000	0.000
L4	96.08 - 63.25 (4)	TP49.0625x39.8474x0.375	2241716.67	-40.879	39.000	1.048	0.00	0.000	39.000	0.000
L5	63.25 - 31.25 (5)	TP56.125x46.961x0.375	3235225.00	-44.916	39.000	1.152	0.00	0.000	39.000	0.000
L6	31.25 - 0 (6)	TP62.9375x53.8477x0.375	4510150.00	-46.992	37.124	1.266	0.00	0.000	37.124	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	190.33 - 164.58 (1)	TP26x19.5625x0.25	0.153	0.317	0.000	0.470 ✔	1.333	H1-3 ✔
L2	164.58 - 129.75 (2)	TP34.0625x24.8325x0.3125	0.130	0.782	0.000	0.912 ✔	1.333	H1-3 ✔
L3	129.75 - 96.08 (3)	TP41.75x32.4948x0.375	0.090	0.900	0.000	0.990 ✔	1.333	H1-3 ✔
L4	96.08 - 63.25 (4)	TP49.0625x39.8474x0.375	0.077	1.048	0.000	1.125 ✔	1.333	H1-3 ✔
L5	63.25 - 31.25 (5)	TP56.125x46.961x0.375	0.052	1.152	0.000	1.204 ✔	1.333	H1-3 ✔
L6	31.25 - 0 (6)	TP62.9375x53.8477x0.375	0.046	1.266	0.000	1.312 ✔	1.333	H1-3 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
L1	190.33 - 164.58	Pole	TP26x19.5625x0.25	1	-6930.29	60217.21	35.3	Pass
L2	164.58 - 129.75	Pole	TP34.0625x24.8325x0.3125	2	-16458.20	168433.87	68.4	Pass
L3	129.75 - 96.08	Pole	TP41.75x32.4948x0.375	3	-25037.30	372480.17	74.3	Pass
L4	96.08 - 63.25	Pole	TP49.0625x39.8474x0.375	4	-35197.30	607117.49	84.4	Pass
L5	63.25 - 31.25	Pole	TP56.125x46.961x0.375	5	-35829.30	912518.44	90.3	Pass
L6	31.25 - 0	Pole	TP62.9375x53.8477x0.375	6	-48234.00	1401662.77	98.4	Pass
							Summary	
						Pole (L6)	98.4	Pass
						Base Plate	88.0	Pass
						RATING =	**98.4**	**Pass**

APPENDIX C

MOUNT CALCULATIONS

RAMAKER & ASSOCIATES, INC.
1120 Dallas Street
Sauk City, WI 53583
Office: (608) 643-4100

Job:	23009
Project:	Unionville / Police Dept. (CT33XC534-B)
By:	JMO
Date:	7/28/2014

Wind Load on Antennas TIA-222

2.6.9.6 Velocity Pressure

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

Occupancy:	II		Classification of Structures (Table 2-1)
Exposure:	C		Exposure Category
V:	98	mph	Basic Wind Speed (Annex B)
z:	170	ft	Height above ground level to the center of the antenna
I:	1.00		Importance Factor (Table 2-3)
K_z:	1.42		Velocity Pressure Coefficient (2.6.5.2)
K_{zt}:	1		Topographic Factor (2.6.6.4)
K_d:	0.95		Wind Direction Probability Factor (Table 2-2)
q_z =	**33.1**	**psf**	

G_h:	1.00	Appurtenances and their Connections

Mount & Antenna Wind Loads

Appurtenance	Height	Width	h/D	Shape	C_a	A_f	**$F = q_z G_h C_a A_a$**	
Pipe2STD x 7 ft	84.0 in	2.4 in	35.3	Round	1.200	1.39 sf	**55.1 lb**	7.9 plf
Pipe3STD x 13 ft	156.0 in	3.5 in	44.6	Round	1.129	3.79 sf	**141.5 lb**	10.9 plf
L2X2X3/16 x 4 ft	48.0 in	2.0 in	24.0	Flat	1.967	0.67 sf	**43.3 lb**	10.8 plf
HSS4X4X1/4 x 6.5 ft	78.0 in	4.0 in	19.5	Flat	1.817	2.17 sf	**130.1 lb**	20.0 plf
APXVSPP18-C-A20	72.0 in	11.9 in	6.1	Flat	1.358	5.95 sf	**266.9 lb**	
APXV9ERR18-C-A20	72.0 in	11.9 in	6.1	Flat	1.358	5.95 sf	**267.0 lb**	
LLPX310R	42.4 in	11.8 in	3.6	Flat	1.248	3.48 sf	**143.5 lb**	
DAP	16.1 in	11.6 in	1.4	Flat	1.200	1.30 sf	**51.7 lb**	
VHLP2.5	35.0 in	0.0 in	1.0	Generic	1.262	6.68 sf	**278.6 lb**	
APXV9TM14-ALU-120	56.3 in	12.6 in	4.5	Flat	1.287	4.93 sf	**209.6 lb**	
TD-RRH8x20	26.1 in	18.6 in	1.4	Flat	1.200	3.37 sf	**133.7 lb**	

RAMAKER & ASSOCIATES, INC.
1120 Dallas Street
Sauk City, WI 53583
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By:	JMO
Date:	7/28/2014

Wind Load on Antennas TIA-222

2.6.9.6 Velocity Pressure

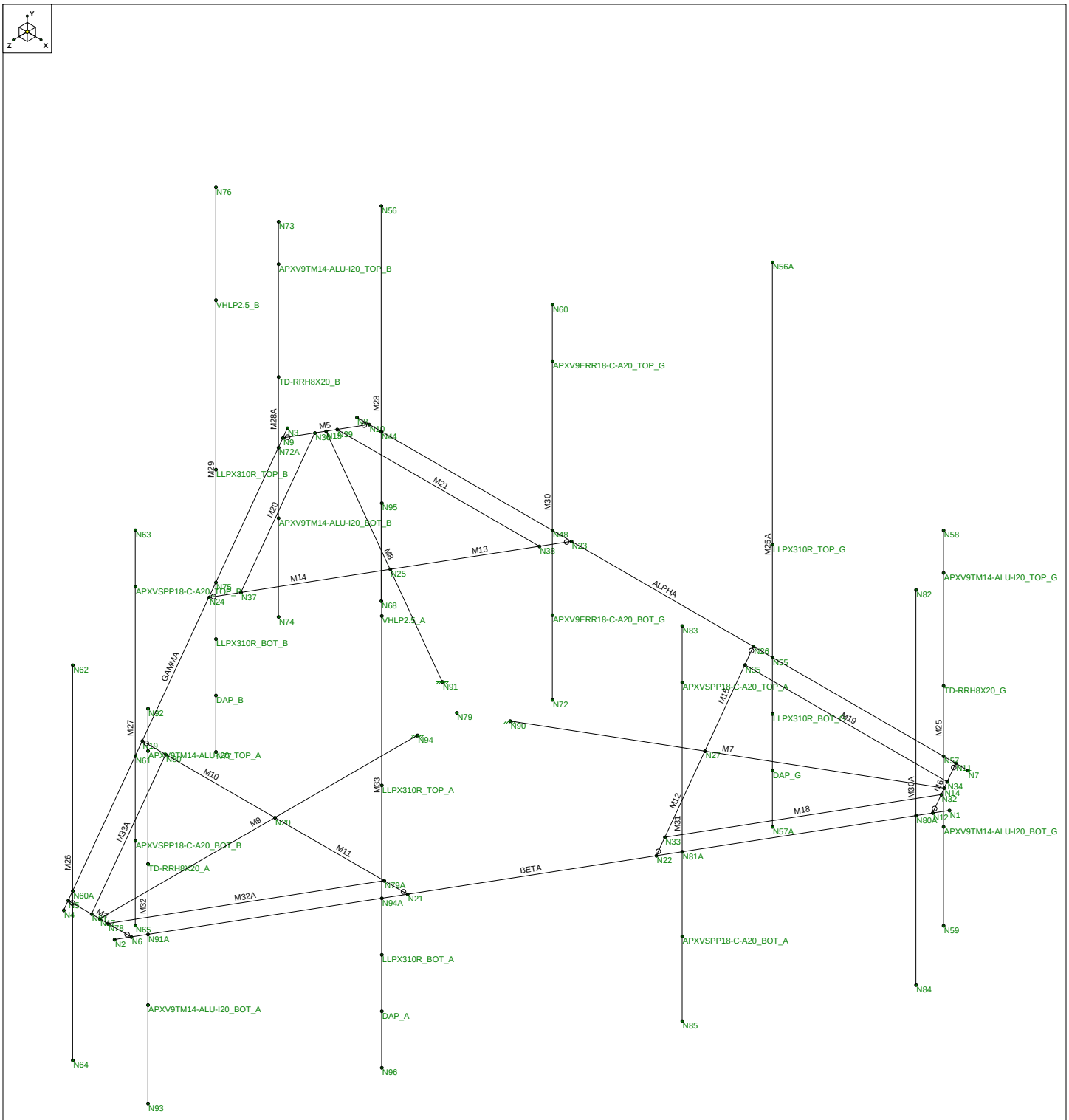
$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

Occupancy:	II		Classification of Structures (Table 2-1)
Exposure:	C		Exposure Category
V:	98	mph	Basic Wind Speed (Annex B)
z:	170	ft	Height above ground level to the center of the antenna
I:	1.00		Importance Factor (Table 2-3)
K_z:	1.42		Velocity Pressure Coefficient (2.6.5.2)
K_{zt}:	1		Topographic Factor (2.6.6.4)
K_d:	0.95		Wind Direction Probability Factor (Table 2-2)
q_z =	**33.1**	**psf**	

G_h:	1.00	Appurtenances and their Connections

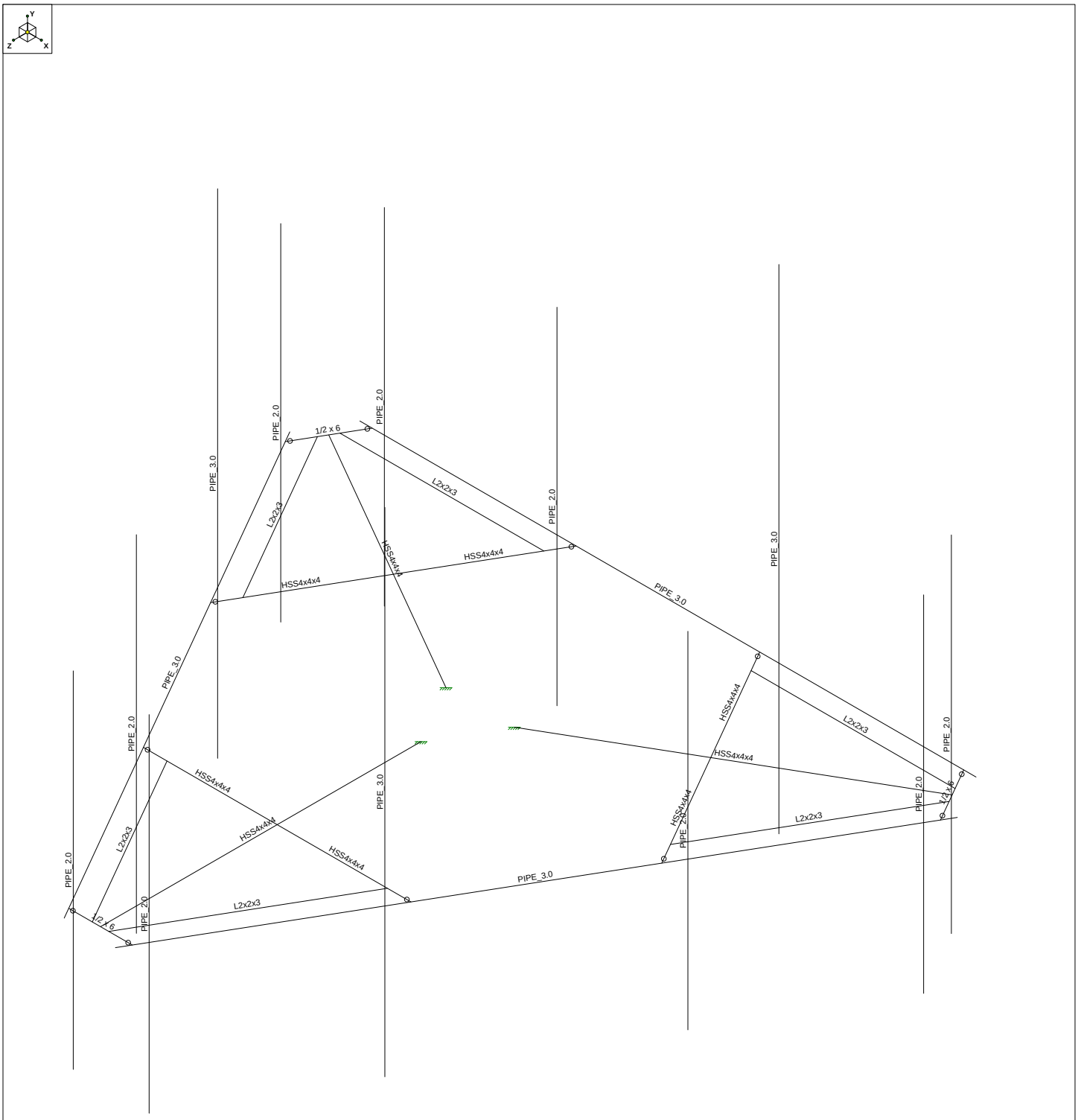
Mount & Antenna Wind Loads

Appurtenance	Height	Depth	h/D	Shape	C_a	A_f	**$F = q_z G_h C_a A_a$**	
Pipe2STD x 7 ft	84.0 in	2.4 in	35.3	Round	1.200	1.39 sf	**55.1 lb**	7.9 plf
Pipe3STD x 13 ft	156.0 in	3.5 in	44.6	Round	1.129	3.79 sf	**141.5 lb**	10.9 plf
L2X2X3/16 x 4 ft	48.0 in	2.0 in	24.0	Flat	1.967	0.67 sf	**43.3 lb**	10.8 plf
HSS4X4X1/4 x 6.5 ft	78.0 in	4.0 in	19.5	Flat	1.817	2.17 sf	**130.1 lb**	20.0 plf
APXVSPP18-C-A20	72.0 in	7.0 in	10.3	Flat	1.509	3.50 sf	**174.8 lb**	
APXV9ERR18-C-A20	72.0 in	7.9 in	9.1	Flat	1.470	3.95 sf	**192.0 lb**	
LLPX310R	42.4 in	4.5 in	9.4	Flat	1.479	1.33 sf	**65.2 lb**	
DAP	16.1 in	5.3 in	3.1	Flat	1.224	0.59 sf	**24.0 lb**	
VHLP2.5	35.0 in	0.0 in	1.0	Generic	0.625	6.68 sf	**138.0 lb**	
APXV9TM14-ALU-120	56.3 in	6.3 in	8.9	Flat	1.465	2.46 sf	**119.2 lb**	
TD-RRH8x20	26.1 in	6.7 in	3.9	Flat	1.262	1.21 sf	**50.7 lb**	



Envelope Only Solution

Ramaker & Associates	Unionville / Police Dept. (CT33XC534-B)	SK - 1
JMO		July 28, 2014 at 4:46 PM
23009		23009 New Mount.r3d



Envelope Only Solution

Ramaker & Associates	Unionville / Police Dept. (CT33XC534-B)	SK - 2
JMO		July 28, 2014 at 4:46 PM
23009		23009 New Mount.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E..Density[k/ft...		Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
3	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.4	58	1.3
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.4	58	1.3
6	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	60	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	standoff	HSS4x4x4	Beam	SquareTube	A36 Gr.36	Typical	3.37	7.8	7.8	12.8
2	angle	L2x2x3	Beam	Single Angle	A36 Gr.36	Typical	.722	.271	.271	.009
3	pipe 3.0	PIPE_3.0	Beam	Pipe	A53 Gr. B	Typical	2.07	2.85	2.85	5.69
4	pipe 2.0	PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical	1.02	.627	.627	1.25
5	corner plate	1/2 x 6	Beam	Pipe	A36 Gr.36	Typical	3	9	.063	.237

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	BETA	N1	N2			pipe 3.0	Beam	Pipe	A53 Gr. B	Typical
2	GAMMA	N3	N4			pipe 3.0	Beam	Pipe	A53 Gr. B	Typical
3	M3	N5	N6		90	corner plate	Beam	Pipe	A36 Gr.36	Typical
4	ALPHA	N7	N8			pipe 3.0	Beam	Pipe	A53 Gr. B	Typical
5	M5	N9	N10		90	corner plate	Beam	Pipe	A36 Gr.36	Typical
6	M6	N11	N12		90	corner plate	Beam	Pipe	A36 Gr.36	Typical
7	M7	N90	N14			standoff	Beam	SquareTube	A36 Gr.36	Typical
8	M8	N15	N91			standoff	Beam	SquareTube	A36 Gr.36	Typical
9	M9	N17	N94			standoff	Beam	SquareTube	A36 Gr.36	Typical
10	M10	N19	N20			standoff	Beam	SquareTube	A36 Gr.36	Typical
11	M11	N20	N21			standoff	Beam	SquareTube	A36 Gr.36	Typical
12	M12	N27	N22			standoff	Beam	SquareTube	A36 Gr.36	Typical
13	M13	N25	N23			standoff	Beam	SquareTube	A36 Gr.36	Typical
14	M14	N24	N25			standoff	Beam	SquareTube	A36 Gr.36	Typical
15	M15	N26	N27			standoff	Beam	SquareTube	A36 Gr.36	Typical
16	M18	N32	N33			angle	Beam	Single Angle	A36 Gr.36	Typical
17	M19	N34	N35		270	angle	Beam	Single Angle	A36 Gr.36	Typical
18	M20	N36	N37		270	angle	Beam	Single Angle	A36 Gr.36	Typical
19	M21	N38	N39		270	angle	Beam	Single Angle	A36 Gr.36	Typical
20	M28	N56	N68			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
21	M30	N60	N72			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
22	M32A	N78	N79A		270	angle	Beam	Single Angle	A36 Gr.36	Typical
23	M33A	N80	N81		270	angle	Beam	Single Angle	A36 Gr.36	Typical
24	M25	N58	N59			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
25	M25A	N56A	N57A			pipe 3.0	Beam	Pipe	A53 Gr. B	Typical
26	M26	N62	N64			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
27	M27	N63	N65			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
28	M28A	N73	N74			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
29	M29	N76	N77			pipe 3.0	Beam	Pipe	A53 Gr. B	Typical
30	M30A	N82	N84			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
31	M31	N83	N85			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
32	M32	N92	N93			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
33	M33	N95	N96			pipe 3.0	Beam	Pipe	A53 Gr. B	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	6.769338	0	-3.308599	0	
2	N2	0.519338	0	7.516718	0	
3	N3	-6.769338	0	-3.308599	0	
4	N4	-0.519338	0	7.516718	0	
5	N5	-0.644338	0	7.300212	0	
6	N6	0.644338	0	7.300212	0	
7	N7	6.25	0	-4.208119	0	
8	N8	-6.25	0	-4.208119	0	
9	N9	-6.644338	0	-3.092093	0	
10	N10	-6	0	-4.208119	0	
11	N11	6	0	-4.208119	0	
12	N12	6.644338	0	-3.092093	0	
13	N14	6.322169	0	-3.650106	0	
14	N15	-6.322169	0	-3.650106	0	
15	N17	-0.	0	7.300212	0	
16	N19	-2.713176	0	3.716878	0	
17	N20	-0.	0	3.716878	0	
18	N21	2.713176	0	3.716878	0	
19	N22	4.575499	0	0.49124	0	
20	N23	-1.862323	0	-4.208119	0	
21	N24	-4.575499	0	0.49124	0	
22	N25	-3.218911	0	-1.858439	0	
23	N26	1.862323	0	-4.208119	0	
24	N27	3.218911	0	-1.858439	0	
25	N32	6.405502	0	-3.505768	0	
26	N33	4.336664	0	0.077565	0	
27	N34	6.238835	0	-3.794443	0	
28	N35	2.101159	0	-3.794443	0	
29	N36	-6.405502	0	-3.505768	0	
30	N37	-4.336664	0	0.077565	0	
31	N38	-2.101159	0	-3.794443	0	
32	N39	-6.238835	0	-3.794443	0	
33	N44	-5.75	0	-4.208119	0	
34	N48	-2.25	0	-4.208119	0	
35	N56	-5.75	4	-4.208119	0	
36	N60	-2.25	4	-4.208119	0	
37	N68	-5.75	-3	-4.208119	0	
38	N72	-2.25	-3	-4.208119	0	
39	APXV9TM14-ALU-I20_TOP_G	5.75	3.25	-4.208119	0	
40	APXV9ERR18-C-A20_TOP_G	-2.25	3	-4.208119	0	
41	APXV9TM14-ALU-I20_BOT_G	5.75	-1.25	-4.208119	0	
42	APXV9ERR18-C-A20_BOT_G	-2.25	-1.5	-4.208119	0	
43	TD-RRH8X20_G	5.75	1.25	-4.208119	0	
44	N79	0	0	0.	0	
45	N78	0.166667	0	7.300212	0	
46	N79A	2.235505	0	3.716878	0	
47	N80	-2.235505	0	3.716878	0	
48	N81	-0.166667	0	7.300212	0	
49	N94	-0.	0	0.800212	0	
50	N90	0.693004	0	-0.400106	0	
51	N91	-0.693004	0	-0.400106	0	
52	N57	5.75	0	-4.208119	0	
53	N58	5.75	4	-4.208119	0	
54	N59	5.75	-3	-4.208119	0	
55	N55	2.25	0	-4.208119	0	
56	N56A	2.25	7	-4.208119	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
57	N57A	2.25	-3	-4.208119	0	
58	LLPX310R_TOP_G	2.25	2	-4.208119	0	
59	LLPX310R_BOT_G	2.25	-1	-4.208119	0	
60	N60A	-0.769338	0	7.083705	0	
61	N61	-2.519338	0	4.052616	0	
62	N62	-0.769338	4	7.083705	0	
63	N63	-2.519338	4	4.052616	0	
64	N64	-0.769338	-3	7.083705	0	
65	N65	-2.519338	-3	4.052616	0	
66	APXV9TM14-ALU-I20_TOP_B	-6.519338	3.25	-2.875587	0	
67	APXVSPP18-C-A20_TOP_B	-2.519338	3	4.052617	0	
68	APXV9TM14-ALU-I20_BOT_B	-6.519338	-1.25	-2.875587	0	
69	APXVSPP18-C-A20_BOT_B	-2.519338	-1.5	4.052617	0	
70	TD-RRH8X20_B	-6.519338	1.25	-2.875587	0	
71	N72A	-6.519338	0	-2.875587	0	
72	N73	-6.519338	4	-2.875587	0	
73	N74	-6.519338	-3	-2.875587	0	
74	N75	-4.769338	0	0.155502	0	
75	N76	-4.769338	7	0.155502	0	
76	N77	-4.769338	-3	0.155502	0	
77	LLPX310R_TOP_B	-4.769338	2	0.155502	0	
78	LLPX310R_BOT_B	-4.769338	-1	0.155502	0	
79	N80A	6.519338	0	-2.875587	0	
80	N81A	4.769338	0	0.155502	0	
81	N82	6.519338	4	-2.875587	0	
82	N83	4.769338	4	0.155502	0	
83	N84	6.519338	-3	-2.875587	0	
84	N85	4.769338	-3	0.155502	0	
85	APXV9TM14-ALU-I20_TOP_A	0.769338	3.25	7.083706	0	
86	APXVSPP18-C-A20_TOP_A	4.769338	3	0.155502	0	
87	APXV9TM14-ALU-I20_BOT_A	0.769338	-1.25	7.083706	0	
88	APXVSPP18-C-A20_BOT_A	4.769338	-1.5	0.155502	0	
89	TD-RRH8X20_A	0.769338	1.25	7.083706	0	
90	N91A	0.769338	0	7.083705	0	
91	N92	0.769338	4	7.083705	0	
92	N93	0.769338	-3	7.083705	0	
93	N94A	2.519338	0	4.052616	0	
94	N95	2.519338	7	4.052616	0	
95	N96	2.519338	-3	4.052616	0	
96	LLPX310R_TOP_A	2.519338	2	4.052617	0	
97	LLPX310R_BOT_A	2.519338	-1	4.052617	0	
98	DAP_G	2.25	-2	-4.208119	0	
99	DAP_B	-4.769338	-2	0.155502	0	
100	DAP_A	2.519338	-2	4.052617	0	
101	VHLP2.5_B	-4.769338	5	0.155502	0	
102	VHLP2.5_A	2.519338	5	4.052616	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	N94	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
2	N90	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
3	N91	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	

Joint Loads and Enforced Displacements (BLC 1 : DL)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*...
1	APXV9TM14-ALU-I20_TOP_G	L	Y	-27.5
2	APXV9TM14-ALU-I20_BOT_G	L	Y	-27.5
3	APXV9ERR18-C-A20_TOP_G	L	Y	-31
4	APXV9ERR18-C-A20_BOT_G	L	Y	-31
5	TD-RRH8X20_G	L	Y	-70
6	LLPX310R_TOP_G	L	Y	-14
7	LLPX310R_BOT_G	L	Y	-14
8	APXV9TM14-ALU-I20_TOP_B	L	Y	-27.5
9	APXVSPP18-C-A20_TOP_B	L	Y	-28.5
10	APXV9TM14-ALU-I20_BOT_B	L	Y	-27.5
11	APXVSPP18-C-A20_BOT_B	L	Y	-28.5
12	TD-RRH8X20_B	L	Y	-70
13	LLPX310R_TOP_B	L	Y	-14
14	LLPX310R_BOT_B	L	Y	-14
15	APXV9TM14-ALU-I20_TOP_A	L	Y	-27.5
16	APXVSPP18-C-A20_TOP_A	L	Y	-28.5
17	APXV9TM14-ALU-I20_BOT_A	L	Y	-27.5
18	APXVSPP18-C-A20_BOT_A	L	Y	-28.5
19	TD-RRH8X20_A	L	Y	-70
20	LLPX310R_TOP_A	L	Y	-14
21	LLPX310R_BOT_A	L	Y	-14
22	DAP_G	L	Y	-33
23	DAP_B	L	Y	-33
24	DAP_A	L	Y	-33
25	VHLP2.5_B	L	Y	-48
26	VHLP2.5_A	L	Y	-48

Joint Loads and Enforced Displacements (BLC 2 : WLz)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*...
1	APXV9TM14-ALU-I20_TOP_G	L	Z	-104.8
2	APXV9TM14-ALU-I20_BOT_G	L	Z	-104.8
3	APXV9ERR18-C-A20_TOP_G	L	Z	-133.5
4	APXV9ERR18-C-A20_BOT_G	L	Z	-133.5
5	TD-RRH8X20_G	L	Z	-133.7
6	LLPX310R_TOP_G	L	Z	-71.8
7	LLPX310R_BOT_G	L	Z	-71.8
8	APXV9TM14-ALU-I20_TOP_B	L	Z	-104.8
9	APXVSPP18-C-A20_TOP_B	L	Z	-133.4
10	APXV9TM14-ALU-I20_BOT_B	L	Z	-104.8
11	APXVSPP18-C-A20_BOT_B	L	Z	-133.4
12	TD-RRH8X20_B	L	Z	-133.7
13	LLPX310R_TOP_B	L	Z	-71.8
14	LLPX310R_BOT_B	L	Z	-71.8
15	APXV9TM14-ALU-I20_TOP_A	L	Z	-104.8
16	APXVSPP18-C-A20_TOP_A	L	Z	-133.4
17	APXV9TM14-ALU-I20_BOT_A	L	Z	-104.8
18	APXVSPP18-C-A20_BOT_A	L	Z	-133.4
19	TD-RRH8X20_A	L	Z	-133.7
20	LLPX310R_TOP_A	L	Z	-71.8
21	LLPX310R_BOT_A	L	Z	-71.8
22	DAP_G	L	Z	-51.7
23	DAP_B	L	Z	-51.7
24	DAP_A	L	Z	-51.7
25	VHLP2.5_B	L	Z	-278.6
26	VHLP2.5_A	L	Z	-278.6

Joint Loads and Enforced Displacements (BLC 3 : WLx)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*...
1	APXV9TM14-ALU-I20_TOP_G	L	X	-104.8
2	APXV9TM14-ALU-I20_BOT_G	L	X	-104.8
3	APXV9ERR18-C-A20_TOP_G	L	X	-133.5
4	APXV9ERR18-C-A20_BOT_G	L	X	-133.5
5	TD-RRH8X20_G	L	X	-133.7
6	LLPX310R_TOP_G	L	X	-71.8
7	LLPX310R_BOT_G	L	X	-71.8
8	APXV9TM14-ALU-I20_TOP_B	L	X	-104.8
9	APXVSPP18-C-A20_TOP_B	L	X	-133.4
10	APXV9TM14-ALU-I20_BOT_B	L	X	-104.8
11	APXVSPP18-C-A20_BOT_B	L	X	-133.4
12	TD-RRH8X20_B	L	X	-133.7
13	LLPX310R_TOP_B	L	X	-71.8
14	LLPX310R_BOT_B	L	X	-71.8
15	APXV9TM14-ALU-I20_TOP_A	L	X	-104.8
16	APXVSPP18-C-A20_TOP_A	L	X	-133.4
17	APXV9TM14-ALU-I20_BOT_A	L	X	-104.8
18	APXVSPP18-C-A20_BOT_A	L	X	-133.4
19	TD-RRH8X20_A	L	X	-133.7
20	LLPX310R_TOP_A	L	X	-71.8
21	LLPX310R_BOT_A	L	X	-71.8
22	DAP_G	L	X	-51.7
23	DAP_B	L	X	-51.7
24	DAP_A	L	X	-51.7
25	VHLP2.5_B	L	X	-278.6
26	VHLP2.5_A	L	X	-278.6

Member Distributed Loads (BLC 2 : WLz)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M28	Z	-7.9	-7.9	0	0
2	M26	Z	-7.9	-7.9	0	0
3	M30A	Z	-7.9	-7.9	0	0
4	BETA	PZ	-10.9	-10.9	0	0
5	GAMMA	PZ	-10.9	-10.9	0	0
6	ALPHA	PZ	-10.9	-10.9	0	0
7	M18	PZ	-10.8	-10.8	0	0
8	M19	PZ	-10.8	-10.8	0	0
9	M20	PZ	-10.8	-10.8	0	0
10	M21	PZ	-10.8	-10.8	0	0
11	M32A	PZ	-10.8	-10.8	0	0
12	M33A	PZ	-10.8	-10.8	0	0
13	M7	PZ	-20	-20	0	0
14	M8	PZ	-20	-20	0	0
15	M9	PZ	-20	-20	0	0
16	M10	PZ	-20	-20	0	0
17	M11	PZ	-20	-20	0	0
18	M12	PZ	-20	-20	0	0
19	M13	PZ	-20	-20	0	0
20	M14	PZ	-20	-20	0	0
21	M15	PZ	-20	-20	0	0

Member Distributed Loads (BLC 3 : WLx)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M28	X	-7.9	-7.9	0	0
2	M26	X	-7.9	-7.9	0	0

Member Distributed Loads (BLC 3 : WLx) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
3	M30A	X	-7.9	-7.9	0	0
4	BETA	PX	-10.9	-10.9	0	0
5	GAMMA	PX	-10.9	-10.9	0	0
6	ALPHA	PX	-10.9	-10.9	0	0
7	M18	PX	-10.8	-10.8	0	0
8	M19	PX	-10.8	-10.8	0	0
9	M20	PX	-10.8	-10.8	0	0
10	M21	PX	-10.8	-10.8	0	0
11	M32A	PX	-10.8	-10.8	0	0
12	M33A	PX	-10.8	-10.8	0	0
13	M7	PX	-20	-20	0	0
14	M8	PX	-20	-20	0	0
15	M9	PX	-20	-20	0	0
16	M10	PX	-20	-20	0	0
17	M11	PX	-20	-20	0	0
18	M12	PX	-20	-20	0	0
19	M13	PX	-20	-20	0	0
20	M14	PX	-20	-20	0	0
21	M15	PX	-20	-20	0	0

Member Distributed Loads (BLC 6 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M5	Y	0	-2.565	.232	.464
2	M5	Y	-2.565	-2.565	.464	.696
3	M5	Y	-2.565	0	.696	.928
4	M14	Y	.088	-.485	0	.543
5	M14	Y	-.485	-2.051	.543	1.085
6	M14	Y	-2.051	-3.93	1.085	1.628
7	M14	Y	-3.93	-5.695	1.628	2.171
8	M14	Y	-5.695	-7.482	2.171	2.713
9	M20	Y	-3.637	-2.867	0	.828
10	M20	Y	-2.867	-2.135	.828	1.655
11	M20	Y	-2.135	-1.434	1.655	2.483
12	M20	Y	-1.434	-.714	2.483	3.31
13	M20	Y	-.714	.004	3.31	4.138
14	M5	Y	0	-2.565	.361	.593
15	M5	Y	-2.565	-2.565	.593	.825
16	M5	Y	-2.565	0	.825	1.057
17	M13	Y	-7.538	-5.729	0	.543
18	M13	Y	-5.729	-3.907	.543	1.085
19	M13	Y	-3.907	-2.014	1.085	1.628
20	M13	Y	-2.014	-.483	1.628	2.171
21	M13	Y	-.483	.089	2.171	2.713
22	M21	Y	.002	-.721	0	.828
23	M21	Y	-.721	-1.439	.828	1.655
24	M21	Y	-1.439	-2.135	1.655	2.483
25	M21	Y	-2.135	-2.862	2.483	3.31
26	M21	Y	-2.862	-3.625	3.31	4.138
27	M6	Y	0	-2.565	.361	.593
28	M6	Y	-2.565	-2.565	.593	.825
29	M6	Y	-2.565	0	.825	1.057
30	M12	Y	-7.538	-5.729	0	.543
31	M12	Y	-5.729	-3.907	.543	1.085
32	M12	Y	-3.907	-2.014	1.085	1.628
33	M12	Y	-2.014	-.483	1.628	2.171
34	M12	Y	-.483	.089	2.171	2.713

Member Distributed Loads (BLC 6 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
35	M18	Y	-3.637	-2.867	0	.828
36	M18	Y	-2.867	-2.135	.828	1.655
37	M18	Y	-2.135	-1.434	1.655	2.483
38	M18	Y	-1.434	-.714	2.483	3.31
39	M18	Y	-.714	.004	3.31	4.138
40	M6	Y	0	-2.565	.232	.464
41	M6	Y	-2.565	-2.565	.464	.696
42	M6	Y	-2.565	0	.696	.928
43	M15	Y	.088	-.485	0	.543
44	M15	Y	-.485	-2.051	.543	1.085
45	M15	Y	-2.051	-3.93	1.085	1.628
46	M15	Y	-3.93	-5.695	1.628	2.171
47	M15	Y	-5.695	-7.482	2.171	2.713
48	M19	Y	-3.637	-2.867	0	.828
49	M19	Y	-2.867	-2.135	.828	1.655
50	M19	Y	-2.135	-1.434	1.655	2.483
51	M19	Y	-1.434	-.714	2.483	3.31
52	M19	Y	-.714	.004	3.31	4.138
53	M3	Y	0	-2.565	.361	.593
54	M3	Y	-2.565	-2.565	.593	.825
55	M3	Y	-2.565	0	.825	1.057
56	M11	Y	-7.538	-5.729	0	.543
57	M11	Y	-5.729	-3.907	.543	1.085
58	M11	Y	-3.907	-2.013	1.085	1.628
59	M11	Y	-2.013	-.481	1.628	2.171
60	M11	Y	-.481	.089	2.171	2.713
61	M32A	Y	-3.637	-2.867	0	.828
62	M32A	Y	-2.867	-2.135	.828	1.655
63	M32A	Y	-2.135	-1.435	1.655	2.483
64	M32A	Y	-1.435	-.715	2.483	3.31
65	M32A	Y	-.715	.003	3.31	4.138
66	M3	Y	0	-2.565	.232	.464
67	M3	Y	-2.565	-2.565	.464	.696
68	M3	Y	-2.565	0	.696	.928
69	M10	Y	.088	-.483	0	.543
70	M10	Y	-.483	-2.05	.543	1.085
71	M10	Y	-2.05	-3.93	1.085	1.628
72	M10	Y	-3.93	-5.694	1.628	2.171
73	M10	Y	-5.694	-7.482	2.171	2.713
74	M33A	Y	.002	-.722	0	.828
75	M33A	Y	-.722	-1.439	.828	1.655
76	M33A	Y	-1.439	-2.135	1.655	2.483
77	M33A	Y	-2.135	-2.862	2.483	3.31
78	M33A	Y	-2.862	-3.625	3.31	4.138

Member Distributed Loads (BLC 7 : BLC 4 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M5	Y	0	-16.032	.232	.464
2	M5	Y	-16.032	-16.032	.464	.696
3	M5	Y	-16.032	0	.696	.928
4	M14	Y	.548	-3.033	0	.543
5	M14	Y	-3.033	-12.817	.543	1.085
6	M14	Y	-12.817	-24.564	1.085	1.628
7	M14	Y	-24.564	-35.592	1.628	2.171
8	M14	Y	-35.592	-46.765	2.171	2.713
9	M20	Y	-22.729	-17.92	0	.828

Member Distributed Loads (BLC 7 : BLC 4 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
10	M20	Y	-17.92	-13.343	.828	1.655
11	M20	Y	-13.343	-8.965	1.655	2.483
12	M20	Y	-8.965	-4.461	2.483	3.31
13	M20	Y	-4.461	.022	3.31	4.138
14	M5	Y	0	-16.032	.361	.593
15	M5	Y	-16.032	-16.032	.593	.825
16	M5	Y	-16.032	0	.825	1.057
17	M13	Y	-47.116	-35.807	0	.543
18	M13	Y	-35.807	-24.421	.543	1.085
19	M13	Y	-24.421	-12.588	1.085	1.628
20	M13	Y	-12.588	-3.017	1.628	2.171
21	M13	Y	-3.017	.555	2.171	2.713
22	M21	Y	.016	-4.504	0	.828
23	M21	Y	-4.504	-8.991	.828	1.655
24	M21	Y	-8.991	-13.345	1.655	2.483
25	M21	Y	-13.345	-17.884	2.483	3.31
26	M21	Y	-17.884	-22.653	3.31	4.138
27	M6	Y	0	-16.032	.361	.593
28	M6	Y	-16.032	-16.032	.593	.825
29	M6	Y	-16.032	0	.825	1.057
30	M12	Y	-47.116	-35.807	0	.543
31	M12	Y	-35.807	-24.421	.543	1.085
32	M12	Y	-24.421	-12.588	1.085	1.628
33	M12	Y	-12.588	-3.017	1.628	2.171
34	M12	Y	-3.017	.555	2.171	2.713
35	M18	Y	-22.729	-17.92	0	.828
36	M18	Y	-17.92	-13.343	.828	1.655
37	M18	Y	-13.343	-8.965	1.655	2.483
38	M18	Y	-8.965	-4.461	2.483	3.31
39	M18	Y	-4.461	.022	3.31	4.138
40	M6	Y	-7.658e-16	-7.658e-16	0	.232
41	M6	Y	-7.658e-16	-16.032	.232	.464
42	M6	Y	-16.032	-16.032	.464	.696
43	M6	Y	-16.032	-7.658e-16	.696	.928
44	M6	Y	-7.658e-16	-7.658e-16	.928	1.16
45	M15	Y	.548	-3.033	0	.543
46	M15	Y	-3.033	-12.817	.543	1.085
47	M15	Y	-12.817	-24.564	1.085	1.628
48	M15	Y	-24.564	-35.592	1.628	2.171
49	M15	Y	-35.592	-46.765	2.171	2.713
50	M19	Y	-22.729	-17.92	0	.828
51	M19	Y	-17.92	-13.343	.828	1.655
52	M19	Y	-13.343	-8.965	1.655	2.483
53	M19	Y	-8.965	-4.461	2.483	3.31
54	M19	Y	-4.461	.022	3.31	4.138
55	M3	Y	0	-16.032	.361	.593
56	M3	Y	-16.032	-16.032	.593	.825
57	M3	Y	-16.032	0	.825	1.057
58	M11	Y	-47.115	-35.806	0	.543
59	M11	Y	-35.806	-24.42	.543	1.085
60	M11	Y	-24.42	-12.583	1.085	1.628
61	M11	Y	-12.583	-3.006	1.628	2.171
62	M11	Y	-3.006	.556	2.171	2.713
63	M32A	Y	-22.73	-17.922	0	.828
64	M32A	Y	-17.922	-13.344	.828	1.655
65	M32A	Y	-13.344	-8.966	1.655	2.483
66	M32A	Y	-8.966	-4.469	2.483	3.31

Member Distributed Loads (BLC 7 : BLC 4 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F]	End Magnitude[lb/ft,F]	Start Location[ft,%]	End Location[ft,%]
67	M32A	Y	-4.469	.021	3.31	4.138
68	M3	Y	7.658e-16	7.658e-16	0	.232
69	M3	Y	7.658e-16	-16.032	.232	.464
70	M3	Y	-16.032	-16.032	.464	.696
71	M3	Y	-16.032	7.658e-16	.696	.928
72	M3	Y	7.658e-16	7.658e-16	.928	1.16
73	M10	Y	.55	-3.022	0	.543
74	M10	Y	-3.022	-12.811	.543	1.085
75	M10	Y	-12.811	-24.562	1.085	1.628
76	M10	Y	-24.562	-35.59	1.628	2.171
77	M10	Y	-35.59	-46.764	2.171	2.713
78	M33A	Y	.014	-4.511	0	.828
79	M33A	Y	-4.511	-8.993	.828	1.655
80	M33A	Y	-8.993	-13.346	1.655	2.483
81	M33A	Y	-13.346	-17.886	2.483	3.31
82	M33A	Y	-17.886	-22.655	3.31	4.138

Member Area Loads (BLC 1 : DL)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N25	N15	N36	N37	Y	A-B	-4
2	N25	N15	N39	N38	Y	A-B	-4
3	N27	N14	N32	N33	Y	A-B	-4
4	N27	N14	N34	N35	Y	A-B	-4
5	N20	N17	N78	N79A	Y	A-B	-4
6	N20	N17	N81	N80	Y	A-B	-4

Member Area Loads (BLC 4 : LL1)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N25	N15	N36	N37	Y	A-B	-25
2	N25	N15	N39	N38	Y	A-B	-25
3	N27	N14	N32	N33	Y	A-B	-25
4	N27	N14	N34	N35	Y	A-B	-25
5	N20	N17	N78	N79A	Y	A-B	-25
6	N20	N17	N81	N80	Y	A-B	-25

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	DL	DL		-1		26			6	
2	WLz	WLZ				26		21		
3	WLx	WLX				26		21		
4	LL1	LL							6	
5	LL2	None					2			
6	BLC 1 Transient Area L...	None						78		
7	BLC 4 Transient Area L...	None						82		

Load Combinations

	Description	Sol..	PDelta	SR..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..
1	1.4DL	Yes	Y		DL	1.4														
2	1.2DL+1.6WLz	Yes	Y		DL	1.2	WLZ	1.6												
3	1.2DL-1.6WLz	Yes	Y		DL	1.2	WLZ	-1.6												
4	1.2DL+1.6WLx	Yes	Y		DL	1.2	W...	1.6												
5	1.2DL-1.6WLx	Yes	Y		DL	1.2	W...	-1.6												

Load Combinations (Continued)

	Description	Sol..	PDelta	SR..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..	BLC	Fact..
6	1.2DL+1.6(0.75WLz+0.75WLx)	Yes	Y		DL	1.2	WLZ	1.2	W...	1.2												
7	1.2DL+1.6(0.75WLz-0.75WLx)	Yes	Y		DL	1.2	WLZ	1.2	W...	-1.2												
8	1.2DL-1.6(0.75WLz-0.75WLx)	Yes	Y		DL	1.2	WLZ	-1.2	W...	1.2												
9	1.2DL-1.6(0.75WLz+0.75WLx)	Yes	Y		DL	1.2	WLZ	-1.2	W...	-1.2												
10	1.2DL+1.5LLend	Yes	Y		DL	1.2	LL	1.5														
11	1.2DL+1.5LLmid	Yes	Y		DL	1.2	5	1.5														
12	1.2DL+1.5LL+10%1.6WLz	Yes	Y		DL	1.2	LL	1.5	WLZ	.16												
13	1.2DL+1.5LL-10%1.6WLz	Yes	Y		DL	1.2	LL	1.5	WLZ	-.16												
14	1.2DL+1.5LL+10%1.6WLx	Yes	Y		DL	1.2	LL	1.5	W...	.16												
15	1.2DL+1.5LL-10%1.6WLx	Yes	Y		DL	1.2	LL	1.5	W...	-.16												
16	1.2DL+1.5LL+10%1.6(0.75WLz+...	Yes	Y		DL	1.2	LL	1.5	WLZ	.12	W...	.12										
17	1.2DL+1.5LL+10%1.6(0.75WLz-...	Yes	Y		DL	1.2	LL	1.5	WLZ	.12	W...	-.12										
18	1.2DL+1.5LL-10%1.6(0.75WLz-0...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.12	W...	.12										
19	1.2DL+1.5LL-10%1.6(0.75WLz+...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.12	W...	-.12										
20	1.2DL+1.5LL+10%1.6WLz	Yes	Y		DL	1.2	5	1.5	WLZ	.16												
21	1.2DL+1.5LL-10%1.6WLz	Yes	Y		DL	1.2	5	1.5	WLZ	-.16												
22	1.2DL+1.5LL+10%1.6WLx	Yes	Y		DL	1.2	5	1.5	W...	.16												
23	1.2DL+1.5LL-10%1.6WLx	Yes	Y		DL	1.2	5	1.5	W...	-.16												
24	1.2DL+1.5LL+10%1.6(0.75WLz+...	Yes	Y		DL	1.2	5	1.5	WLZ	.12	W...	.12										
25	1.2DL+1.5LL+10%1.6(0.75WLz-...	Yes	Y		DL	1.2	5	1.5	WLZ	.12	W...	-.12										
26	1.2DL+1.5LL-10%1.6(0.75WLz-0...	Yes	Y		DL	1.2	5	1.5	WLZ	-.12	W...	.12										
27	1.2DL+1.5LL-10%1.6(0.75WLz+...	Yes	Y		DL	1.2	5	1.5	WLZ	-.12	W...	-.12										
28	DL		Y		DL	1																
29	WLz		Y		WLZ	1																
30	WLx		Y		W...	1																

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N94	max	1535.788	4	1669.497	21	3261.903	2	1571.338	2	2698.271	4	1091.954	7
2		min	-1536.512	5	162.844	2	-3281.384	3	-7219.029	3	-2698.592	5	-918.986	8
3	N90	max	2378.089	8	1564.543	7	1976.371	7	2332.458	7	1305.674	3	5076.629	5
4		min	-2394.331	7	81.014	8	-1965.367	8	365.061	8	-1303.04	2	-510.707	4
5	N91	max	2597.371	4	1481.73	6	1883.177	6	3347.93	6	1636.341	2	554.574	9
6		min	-2581.709	5	244.122	9	-1871.721	9	-725.262	9	-1639.329	3	-5495.571	6
7	Totals:	max	6365.226	4	3534.166	13	6452.749	2						
8		min	-6365.226	5	2565.791	2	-6452.749	3						

Envelope AISC 13th(360-05): LRFD Steel Code Checks

	Member	Shape	Code Ch...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn ...	phi*Mn ...	Cb	Eqn
1	BETA	PIPE_3.0	.755	8.203	9	.566	8.203		9	28250.5...	65205	5748.75	5748.75	2....	H3-6
2	GAMMA	PIPE_3.0	.659	4.297	4	.569	4.297		8	28250.5...	65205	5748.75	5748.75	2....	H3-6
3	M3	1/2 x 6	.262	.644	3	.739	.819	y	9	53371.6...	97200	12150	1012.5	1....	H1-1b
4	ALPHA	PIPE_3.0	.217	8.073	4	.119	4.297		2	28250.5...	65205	5748.75	5748.75	2....	H1-1b
5	M5	1/2 x 6	.258	.644	6	.793	0	y	8	53371.6...	97200	12150	1012.5	1....	H1-1b
6	M6	1/2 x 6	.259	.644	7	.466	.819	y	9	53371.6...	97200	12150	1012.5	1....	H1-1b
7	M7	HSS4x4x4	.523	0	7	.115	0	y	5	95077.2...	109188	12663	12663	2....	H1-1b
8	M8	HSS4x4x4	.593	6.5	6	.103	6.5	z	8	95077.2...	109188	12663	12663	2....	H1-1b
9	M9	HSS4x4x4	.661	6.5	8	.137	6.5	z	5	95077.2...	109188	12663	12663	2....	H1-1b
10	M10	HSS4x4x4	.231	2.713	8	.267	.452	z	7	106586....	109188	12663	12663	1....	H1-1b
11	M11	HSS4x4x4	.340	0	9	.371	2.261	z	9	106586....	109188	12663	12663	1....	H3-6
12	M12	HSS4x4x4	.220	0	5	.256	2.261	z	6	106586....	109188	12663	12663	1....	H1-1b
13	M13	HSS4x4x4	.157	0	6	.119	2.261	z	3	106586....	109188	12663	12663	1....	H1-1b
14	M14	HSS4x4x4	.349	2.713	8	.355	.452	z	8	106586....	109188	12663	12663	1....	H3-6
15	M15	HSS4x4x4	.168	2.713	7	.122	.452	z	2	106586....	109188	12663	12663	1....	H1-1b

Envelope AISC 13th(360-05): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Ch...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn ...	phi*Mn ...	Cb	Eqn
16	M18	L2x2x3	.433	0	5	.024	0	y	9	9921.867	23392.8	557.717	1239.29	2....	H2-1
17	M19	L2x2x3	.356	4.138	7	.015	4.138	y	2	9921.867	23392.8	557.717	1226.562	2....	H2-1
18	M20	L2x2x3	.607	4.138	8	.033	0	z	8	9921.867	23392.8	557.717	1239.29	2....	H2-1
19	M21	L2x2x3	.303	4.138	2	.014	0	y	2	9921.867	23392.8	557.717	1220.032	2....	H2-1
20	M28	PIPE_2.0	.056	3.938	6	.005	3.938		6	17855.0...	32130	1871.625	1871.625	1....	H1-1b
21	M30	PIPE_2.0	.359	3.938	6	.024	1.021		6	17855.0...	32130	1871.625	1871.625	1....	H1-1b
22	M32A	L2x2x3	.649	4.138	9	.031	0	z	9	9921.867	23392.8	557.717	1239.29	2....	H2-1
23	M33A	L2x2x3	.491	4.138	8	.025	4.138	z	8	9921.867	23392.8	557.717	1235.868	2....	H2-1
24	M25	PIPE_2.0	.453	3.938	7	.042	2.771		7	17855.0...	32130	1871.625	1871.625	1....	H1-1b
25	M25A	PIPE_3.0	.050	7.083	7	.011	7.083		7	38176.7	65205	5748.75	5748.75	2....	H1-1b
26	M26	PIPE_2.0	.057	3.938	8	.006	3.938		8	17855.0...	32130	1871.625	1871.625	1....	H1-1b
27	M27	PIPE_2.0	.359	3.938	8	.024	1.021		8	17855.0...	32130	1871.625	1871.625	1....	H1-1b
28	M28A	PIPE_2.0	.456	3.938	8	.043	2.771		8	17855.0...	32130	1871.625	1871.625	1....	H1-1b
29	M29	PIPE_3.0	.457	6.979	8	.031	5		8	38176.7	65205	5748.75	5748.75	2....	H1-1b
30	M30A	PIPE_2.0	.056	3.938	9	.005	3.938		9	17855.0...	32130	1871.625	1871.625	1....	H1-1b
31	M31	PIPE_2.0	.359	3.938	9	.024	1.021		9	17855.0...	32130	1871.625	1871.625	1....	H1-1b
32	M32	PIPE_2.0	.457	3.938	9	.043	2.771		9	17855.0...	32130	1871.625	1871.625	1....	H1-1b
33	M33	PIPE_3.0	.457	6.979	9	.031	5		9	38176.7	65205	5748.75	5748.75	2....	H1-1b

Sprint®

PROJECT: 2.5 EQUIPMENT DEPLOYMENT

SITE NAME: UNIONVILLE/POLICE DEPT.

SITE CASCADE: CT33XC534-B

SITE ADDRESS: 319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032

SITE TYPE: 190'-0" MONOPOLE

SITE INFORMATION

PROPERTY OWNER:
TOWN OF FARMINGTON
1 MONTEITH DRIVE
FARMINGTON, CT 06032
PH.:860-675-2325

SITE ADDRESS:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

GEOGRAPHIC COORDINATES:
LATITUDE: 41° 44' 58.9986" N (41.749722)
LONGITUDE: 72° 52' 21" W (-72.8725)

ZONING JURISDICTION:
TOWN OF FARMINGTON

ZONING DISTRICT:
COMMERCIAL/RESIDENTIAL

POWER COMPANY:
CONN. LIGHT & POWER
PH.: (800) 286-2000

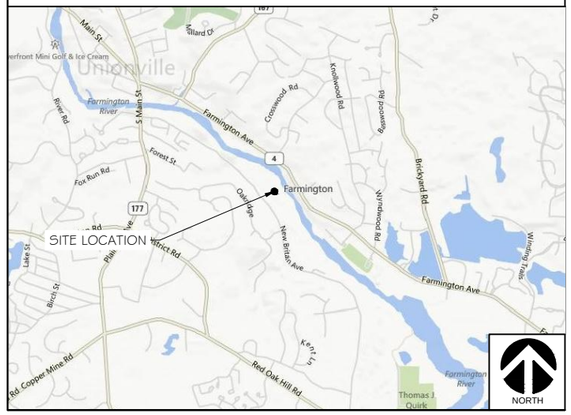
AAV PROVIDER:
AT&T
PH.: (210) 821-4105

SPRINT CONSTRUCTION MANAGER:
NAME: MIKE DELIA
PHONE: (781) 316-6348
E-MAIL: michael.delia@sprint.com

EQUIPMENT SUPPLIER:
ALCATEL-LUCENT
600-700 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974
PH.: (908) 508-8080

PLANS PREPARED BY:
RAMAKER & ASSOCIATES, INC.
CONTACT: KEITH BOHNSACK, PROJECT MANAGER
PH.: (608) 643-4100
EMAIL: kbohnsack@ramaker.com

AREA MAP



LOCATION MAP

PROJECT DESCRIPTION

- INSTALL NEW 2.5 EQUIPMENT IN EXISTING BTS CABINET
  *(1) RECTIFIER SHELF AND (3) RECTIFIERS
  *(1) BASE BAND UNIT
- INSTALL NEW BATTERY STRING IN EXISTING BATTERY CABINET
- INSTALL (3) PANEL ANTENNAS
- INSTALL (3) RRH'S ON TOWER
- INSTALL (1) HYBRID CABLE AND (2) SECTOR JUMPERS
- INSTALL (27) ANTENNA / RRH JUMPERS

APPLICABLE CODES

* ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

1. INTERNATIONAL BUILDING CODE
2. ANSI/TIA-222 STRUCTURAL STANDARD FOR ANTENNA STRUCTURES
3. NFPA 780 - LIGHTNING PROTECTION CODE
4. NATIONAL ELECTRIC CODE

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SHEET INDEX

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www.Ramaker.com

Transcend Wireless
48 SPRUCE STREET
OAKLAND, NJ 07346

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT ★ JAMES R. SKOWRONSKI ★ No. 26266 ★ LICENSED PROFESSIONAL ENGINEER

Signature: 7/29/2014 Date:

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL DATE ISSUED: 07/29/2014

PROJECT TITLE:
UNIONVILLE / POLICE DEPARTMENT
CT33XC534-B

PROJECT INFORMATION:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

SHEET TITLE:
TITLE SHEET

SCALE: NONE

PROJECT NUMBER: 23009
SHEET NUMBER: T-1

DRAWN BY: TJN CHECKED BY: KAB

SECTION 01 100 - SCOPE OF WORK

THE WORK:
THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE CONSTRUCTION DRAWINGS AND ASSOCIATED OUTLINE SPECIFICATIONS AND THE SITE SPECIFIC WORK ORDER, DESCRIBE THE WORK TO BE PERFORMED BY THIS CONSTRUCTION CONTRACTOR (SUPPLIER).

RELATED DOCUMENTS:
A. THE REQUIREMENTS OF EACH SECTION OF THIS SPECIFICATION APPLY TO ALL SECTIONS, INDIVIDUALLY AND COLLECTIVELY.
B. RELATED DOCUMENTS: THE CONTRACTOR SHALL COMPLY WITH THE MOST CURRENT VERSION OF THE FOLLOWING SUPPLEMENTAL REQUIREMENTS FOR INSTALLATION AND TESTING.
   1. EN-2012-001: (FIBER OPTIC, DC CABLE, AND DC CIRCUIT BREAKER TAGGING STANDARDS)
   2. TS-0200 - (TRANSMISSION ANTENNA LINE ACCEPTANCE STANDARDS)
   3. EL-0568: (FIBER TESTING POLICY)
   4. NP-312-201: (EXTERIOR GROUNDING SYSTEM TESTING)
   5. NP-760-500: ETHERNET, MICROWAVE, TESTING AND ACCEPTANCE

PRECEDENCE:
SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.

NATIONALLY RECOGNIZED CODES AND STANDARDS:
THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
C. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY -GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
D. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE - "NEC") AND NFPA 101 (LIFE SAFETY CODE).
E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
G. AMERICAN CONCRETE INSTITUTE (ACI)
H. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
I. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
J. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
K. PORTLAND CEMENT ASSOCIATION (PCA)
L. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
M. BRICK INDUSTRY ASSOCIATION (BIA)
N. AMERICAN WELDING SOCIETY (AWS)
O. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
P. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
Q. DOOR AND HARDWARE INSTITUTE (DHI)
R. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
S. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

DEFINITIONS:
A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B. COMPANY: "SPRINT"; SPRINT NEXTEL CORPORATION AND IT'S OPERATING ENTITIES.
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D. CONTRACTOR: CONSTRUCTION CONTRACTOR, SUPPLIER, CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.
F. CONSTRUCTION MANAGER - ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT.

SITE FAMILIARITY:
CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.

POINT OF CONTACT:
COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.

ON-SITE SUPERVISION:
THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

DRAWINGS REQUIRED AT JOBSITE:
THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.
B. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

USE OF JOB SITE:
THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

UTILITY SERVICES:
WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED:

PERMITS/FEES:
WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

CONTRACTOR:
CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.

USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:
CONTRACTOR WILL UTILIZE ITS BEST EFFORTS TO WORK WITH SPRINT ELECTRONIC PROJECT MANAGEMENT SYSTEMS. CONTRACTOR UNDERSTANDS THAT SUFFICIENT INTERNET ACCESS, EQUIVALENT TO "BROADBAND" OR BETTER, IS REQUIRED TO TIMELY AND EFFECTIVELY UTILIZE SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS AND AGREES TO MAINTAIN APPROPRIATE CONNECTIONS FOR CONTRACTOR'S STAFF AND OFFICES THAT ARE COMPATIBLE WITH SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS

TEMPORARY UTILITIES AND FACILITIES:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSOR'S OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

ACCESS TO WORK:
THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

DIMENSIONS:
VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

EXISTING CONDITIONS:
NOTIFY THE SPRINT CONSTRUCTION MANAGER OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

SECTION 01 200 - COMPANY FURNISHED MATERIAL AND EQUIPMENT

FURNISHED MATERIALS:
COMPANY FURNISHED MATERIALS AND EQUIPMENT TO BE INSTALLED BY THE CONTRACTOR (OFIC) IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.

RECEIPT OF MATERIAL AND EQUIPMENT:
A. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
   1. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
   2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
   3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
B. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
C. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
D. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

DELIVERABLES:
A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.
B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.

SECTION 01 300 - CELL SITE CONSTRUCTION

NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S ISSUANCE OF THE WORK ORDER.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

GENERAL REQUIREMENTS FOR CONSTRUCTION:
A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.
B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.
C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
   1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
   2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.
D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION

FUNCTIONAL REQUIREMENTS:
A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. CONTRACTOR SHALL TAKE ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.
B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.
C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES
D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
   2. PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
   3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND BACKHAUL (FIBER, COPPER, OR MICROWAVE).
   4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
   5. INSTALL ABOVE GROUND GROUNDING SYSTEMS, CONDUIT AND BOXES.
   6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
   7. INSTALL "H-FRAMES", CABINETS AND PADS AND PLATFORMS AS INDICATED.
   8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
   9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
   10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
   11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
   12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
   13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
   14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER
   15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
   16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
   17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
   18. CONDUCT ALL REQUIRED TESTS AND INSPECTIONS
   19. PERFORM, DOCUMENT, AND CLOSE OUT ALL JURISDICTIONAL PERMITTING REQUIREMENTS AND ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
   20. PERFORM ALL ADDITIONAL WORK AS IDENTIFIED IN SCOPE OF SERVICES ATTACHED TO THE SUPPLIER AGREEMENT FOR THIS PROJECT. THIS WORK MAY INCLUDE COMMISSIONING, INTEGRATION, SPECIAL WAREHOUSING, REVERSE LOGISTICS ACTIVITIES, ETC. PERFORM COMMISSIONING AND INTEGRATION ACTIVITIES PER APPLICABLE MOPS.

DELIVERABLES:
A. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED TEST REPORTS AND DOCUMENTATION INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
   1. PRODUCT SPECIFICATIONS FOR MATERIALS OR SPECIAL CONSTRUCTION IF REQUESTED BY SPRINT
   2. ACTUALIZE ALL CONSTRUCTION RELATED MILESTONES IN SITERRA AND COMPLETE ALL ON-LINE FORMS AND COMPLETE DOCUMENT UP-LOADS. UPLOAD ALL REQUIRED CLOSEOUT DOCUMENTS AND FINAL SITE PHOTOS
   3. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT LEFT ON SITE INSIDE BASE OF MAIN RF CABINET IN A PROTECTIVE POUCH.
   4. ALL REQUIRED TEST REPORTS.
   5. REQUIRED CLOSEOUT DOCUMENTATION INCLUDING BUT NOT LIMITED TO:
      a. ALL JURISDICTIONAL PERMITTING AND OCCUPANCY INFORMATION
      b. PDF SCAN OF REDLINES PRODUCED IN THE FIELD
      c. ELECTRONIC AS-BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS
      d. LIEN WAIVERS
      e. FINAL PAYMENT APPLICATION
      f. REQUIRED FINAL CONSTRUCTION PHOTOS
      g. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
      h. LISTS OF SUBCONTRACTORS
B. PROVIDE ADDITIONAL DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.
   1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
   2. PROJECT PROGRESS REPORTS.
   3. PRE-CONSTRUCTION MEETING NOTES.

SECTION 01 400 - TESTS, INSPECTIONS, SUBMITTALS, AND PROJECT CLOSEOUT

TESTS AND INSPECTIONS:
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. COAX SWEEPS AND FIBER TESTS PER TS-0200 (CURRENT VERSION) ANTENNA LINE ACCEPTANCE STANDARDS
   2. POST CONSTRUCTION HEIGHT VERIFICATION, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE-FOR-THE-PURPOSE ANTENNA ALIGNMENT TOOL.
   3. CONCRETE BREAK TESTS
   4. SITE RESISTANCE TO EARTH TEST
   5. STRUCTURAL BACKFILL COMPACTION TESTS
   6. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
   7. ADDITIONAL TESTING AS REQUIRED ELSEWHERE IN THIS SPECIFICATION.

SUBMITTALS:
A. THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS.
B. UPLOAD THE FOLLOWING TO SITERRA AS APPLICABLE INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. CONCRETE MIX-DESIGNS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.
   2. CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
   3. CHEMICAL GROUNDING SYSTEM .
   4. REINFORCEMENT CERTIFICATIONS
   5. STRUCTURAL BACKFILL TEST RESULTS
   6. SWEEP AND FIBER TESTS
   7. ANTENNA AZIMUTH AND DOWN-TILT VERIFICATION
   8. POST CONSTRUCTION HEIGHT VERIFICATION
   9. ADDITIONAL SUBMITTALS MAY BE REQUIRED FOR SPECIAL CONSTRUCTION OR MINOR MATERIALS
C. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

TESTING BY THIRD PARTY AGENCY:
A. EMPLOY AN AGENCY OF ENGINEERS AND SCIENTISTS WHO IS REGULARLY ENGAGED IN FIELD AND LABORATORY TESTING AND ANALYSIS. AGENCY SHALL HAVE BEEN IN BUSINESS A MINIMUM OF FIVE YEARS, AND BE LICENSED AS PROFESSIONAL ENGINEERS IN THE STATE WHERE THE PROJECT IS LOCATED. AGENCY IS SUBJECT TO APPROVAL BY COMPANY.
   1. AGENCY MUST HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
   2. AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
   3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
B. REQUIRED THIRD PARTY TESTS:
   1. SITE RESISTANCE TO EARTH TEST PER NP-312-201
   2. CONCRETE CYLINDER BREAK TESTS FOR TOWER PIER AND ANCHORS PER NATIONALLY RECOGNIZED STANDARDS
   3. STRUCTURAL SOILS COMPACTION TESTS PER NATIONALLY RECOGNIZED STANDARDS
   4. REBAR PLACEMENT VERIFICATION WITH REPORT
   5. TESTING TENSION STUDY FOR ROCK ANCHORS
   6. ALL THIRD PARTY TESTS AS REQUIRED BY LOCAL JURISDICTION
C. REQUIRED TESTS BY CONTRACTOR
   1. COAX SWEEP TESTS PER SPRINT STANDARD TS-0200
   2. FIBER TESTS PER SPRINT STANDARD EL-0568
   3. MICROWAVE LINK TESTS PER NP-760-500
   4. ANTENNA AZIMUTHS AND DOWN TILT USING ELECTRONIC ALIGNMENT TOOL PER ANTENNA INSTALLATION SPECIFICATION HEREIN.

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

RAMAKER & ASSOCIATES, INC.
1120 Dallas Street, Sauk City, WI 53583
Phone: 608-643-4100 Fax: 608-643-7999
www.Ramaker.com

Transcend Wireless
48 SPRUCE STREET
OAKLAND, NJ 07346

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT ★ JAMES R. SKOWRONSKI ★ No. 26266 LICENSED PROFESSIONAL ENGINEER

Signature: James R. Skowronski Date: 7/29/2014

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 07/29/2014

PROJECT TITLE:
UNIONVILLE / POLICE DEPARTMENT
CT33XC534-B

PROJECT INFORMATION:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 23009
SHEET NUMBER: SP-1

DRAWN BY: TJN CHECKED BY: KAB

5. POST CONSTRUCTION HEIGHT VERIFICATION AS REQUIRED HEREWITH IN THE TOWER INSTALLATION SPECIFICATIONS.
6. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED HEREWITH IN THE ASPHALT PAVING SPECIFICATIONS.
7. FIELD QUALITY CONTROL TESTING AS SPECIFIED HEREWITH IN THE CONCRETE PAVING SPECIFICATIONS.
8. TESTING REQUIRED HEREWITH UNDER SPECIFICATIONS FOR AGGREGATE BASE FOR ROADWAYS
9. ALL OTHER TESTS REQUIRED BY LOCAL JURISDICTION

D. INSPECTIONS BY COMPANY: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN INSPECTION ACTIVITIES, FINAL ACCEPTANCE / PUNCH WALK REVIEW, AND/OR AS A RESULT OF TESTING

E. SPRINT RESERVES THE RIGHT TO INSPECT THE CONSTRUCTION SITE AT ANY TIME VIA SITE WALKS AND/OR PHOTO REVIEWS. CONTRACTOR SHALL GIVE SPRINT 24 HOURS NOTICE PRIOR TO THE COMMENCEMENT OF THE FOLLOWING CONSTRUCTION ACTIVITIES AND PHOTOGRAPHS OF THE IN-PROGRESS WORK.
1. GROUNDING SYSTEM AND BURIED UTILITIES INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
3. COMPACTION OF BACKFILL MATERIALS, AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS, ASPHALT PAVING, AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
4. PRE AND POST CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES. PRIOR TO CONSTRUCTION ACTIVITIES AND AFTER CONSTRUCTION IS COMPLETE, PROVIDE PHOTOGRAPHIC DOCUMENTATION OF ROOF, FLASHINGS, AND PARAPETS, BOTH BEFORE AND AFTER CONSTRUCTION IS COMPLETE.
5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
6. TOWER TOP AND INACCESSIBLE EQUIPMENT (RRUS, ANTENNAS, AND CABLING): PROVIDE PHOTOS OF THE BACKS OF ALL ANTENNAS, RRUS, COMBINERS, FILTERS, FIBER AND DC CABLING, CABLE COLOR CODING, EQUIPMENT GROUNDING AND CONNECTOR WATER PROOFING INCLUDING NAME PLATE AND SERIAL NUMBER FOR ALL SERIALIZED EQUIPMENT.

PROJECT CLOSEOUT:

A. FINAL ACCEPTANCE PUNCH WALK AND INSPECTION: AS IDENTIFIED IN THE SCOPE OF SERVICES, SPRINT WILL CONDUCT A FINAL PUNCH WALK OR FINAL DESK TOP PHOTO REVIEW (SITE MODIFICATIONS). PUNCH WALKS MUST BE SCHEDULED IN ADVANCE AS REQUIRED. AT THE PUNCH WALK / REVIEW, SPRINT MAY IDENTIFY CRITICAL DEFICIENCIES WHICH MUST BE CORRECTED PRIOR TO PUTTING SITE ON AIR. MINOR DEFICIENCIES MUST BE CORRECTED WITHIN 30 DAYS EXCEPT AS OTHERWISE REQUIRED. VERIFICATIONS OF CORRECTIONS MAY BE MADE BY COMPANY DURING A REPEAT SITE WALK OR DESK TOP PHOTO REVIEW AT COMPANY'S SOLE DISCRETION.

B. CLOSEOUT DOCUMENTATION: ALL CLOSEOUT DOCUMENTATION AND PHOTOGRAPHS SHALL BE UPLOADED PRIOR TO FINAL ACCEPTANCE. SPRINT WILL REVIEW CLOSEOUT DOCUMENTATION FOR PRESENCE AND CONTENT. CLOSEOUT DOCUMENTATION SHALL INCLUDE BUT IS NOT LIMITED TO THE FOLLOWING AS APPLICABLE:
1. COAX SWEEP TESTS:
2. FIBER TESTS:
3. JURISDICTION FINAL INSPECTION DOCUMENTATION
4. REINFORCEMENT CERTIFICATION (MILL CERTIFICATION)
5. CONCRETE MIX DESIGN AND PRODUCT DATA (TOWER FOUNDATION)
6. LIEN WAIVERS AND RELEASES.
7. POST -CONSTRUCTION HEIGHT VERIFICATION
8. JURISDICTION CERTIFICATE OF OCCUPANCY
9. ELECTRONIC ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
10. STRUCTURAL BACKFILL TEST RESULTS (IF APPLICABLE)
11. CELL SITE UTILITY SETUP
12. AS-BUILT REDLINE CONSTRUCTION DRAWINGS (PDF SCAN OF FIELD MARKS)
13. AS-BUILT CONSTRUCTION DRAWINGS IN DWG AND PDF FORMATS
14. LIST OF SUB CONTRACTORS
15. APPROVED PERMITTING DOCUMENTS
16. FINAL SITE PHOTOS UP-LOADED TO SITERRA. INCLUDE THE FOLLOWING AS APPLICABLE:
    a. TOWER, ANTENNAS, RRUS, AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX/CABLE LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING - TOP AND BOTTOM; PHOTOS OF COAX GROUNDING--TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
    b. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
    c. SITE LAYOUT - PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
    d. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.

PROJECT PHOTOGRAPHS:

A. PROVIDE PROJECT CLOSEOUT GENERAL ARRANGEMENT PHOTOS OF ALL NEW WORK. THE FOLLOWING LIST REPRESENTS MINIMUM REQUIREMENTS AND MINIMUM QUANTITY. ADDITIONAL PHOTOS MAY BE REQUIRED TO ADEQUATELY DOCUMENT THE WORK.
1. ASR AND RF MPE SIGNAGE (IF NOT IN PLACE, SUPPLIER NOTIFIES EMS FIELD REPRESENTATIVE)
2. BACK OF ANTENNAS AND RRUS (1 EACH SECTOR)
3. BACK OF ANTENNAS AND RRUS (1 EACH SECTOR) CLOSE UP SHOWING WEATHERPROOFING AND GROUNDING (AS REQUIRED). CLOSE-UP OF BACK SIDE OF EACH PERMANENT RRU SHOWING SERIAL NUMBER/BAR CODE.
4. VIEW (1 EACH SECTOR) ALONG THE AZIMUTH AND TILT OF THE ANTENNAS
5. TOP OF TOWER FROM GROUND, 1 EACH SECTOR
6. MAINLINE HYBRID CABLE ROUTE DOWN TOWER SHOWING FASTENERS AND SUPPORT
7. MAINLINE/HYBRID CABLE ROUTE ALONG ICE BRIDGE OR IN CABLE TRAY SHOWING FASTENERS AND SUPPORT
8. GROUND MOUNTED RRU RACKS (FRONT AND BACK)
9. FRONT, SIDE AND BACK ELEVATIONS OF ALL GROUND CABINETS
10. VIEW OF COMPOUND FROM A DISTANCE
11. VIEW OF EACH GROUND CABINET (POWER, RF, FIBER SPOOL, PPC POWER, PPC TELCO WITH DOOR OPEN)
12. BACKHAUL FIBER MEET-ME-POINT AND CONDUIT ROUTE (MICROWAVE INSTALLATION IF NOT FIBER)
13. AAV NETWORK INTERFACE DEVICE OR MICROWAVE RADIO INSTALLATION

DEFICIENCY CORRECTIONS:

CONTRACTOR IS RESPONSIBLE FOR ALL CORRECTIONS TO DEFICIENCIES IDENTIFIED THROUGH TESTING, REVIEW OF SUBMITTALS, INSPECTIONS AND CLOSEOUT REVIEWS.

SECTION 01 500 - PROJECT REPORTING

WEEKLY REPORTS:

A. CONTRACTOR SHALL REPORT TO SPRINT AT MINIMUM ON A WEEKLY BASIS VIA SITERRA BY UPDATING ALL APPLICABLE POST END KEEPING MILESTONES WITH ACTUAL AND FORECASTED COMPLETION DATES.

B. ADDITIONAL REQUIREMENTS FOR REPORTING MAY BE IDENTIFIED ELSEWHERE OR REQUIRED BY THE SCOPE OF SERVICES OR SPRINTS LOCAL MARKET CONSTRUCTION MANAGER. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

PROJECT CONFERENCE CALLS:

SPRINT MAY HOLD PERIODIC PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.

FINAL PROJECT ACCEPTANCE: PRIOR TO SPRINTS FINAL PROJECT ACCEPTANCE. ALL REQUIRED MILESTONE ACTUALS MUST BE UPDATED IN SITERRA AND ALL REQUIRED REPORTING TASKS MUST BE COMPLETE.

SECTION 11 700 - ANTENNA ASSEMBLY, REMOTE RADIO UNITS AND CABLE INSTALLATION

SUMMARY:

THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRU'S, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE.

ANTENNAS AND RRU'S:

THE NUMBER AND TYPE OF ANTENNAS AND RRU'S TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

HYBRID CABLE:

HYBRID CABLE WILL BE DC/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE. CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTORS:

FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRU'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE. JUMPERS BETWEEN THE RRU'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE, MIN. LENGTH FOR JUMPER SHALL BE 10'-0".

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:

INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHEET, FURNISHED BY SPRINT.

ANTENNA INSTALLATION:

THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER. ANTENNA HEIGHT, AZIMUTH, AND FEED ORIENTATION INFORMATION SHALL BE A DESIGNATED ON THE CONSTRUCTION DRAWINGS.

A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.

B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

HYBRID CABLE INSTALLATION:

A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.

C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.

1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE INSTALLED INSIDE MONOPOLE WITH CABLE SUPPORT GRIPS AS REQUIRED BY THE MANUFACTURER.
2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
    a. FIBER: SUPPORT FIBER BUNDLES USING 1/2" VELCRO STRAPS OF THE REQUIRED LENGTH AT 18" O.C. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.
    b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.
3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
4. CABLE INSTALLATION:
    a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER.
    b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.
    c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM BEND RADIUS.
5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 (CURRENT VERSION).
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.

B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.
1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.
3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE STATIONS (MMBS) AND RELATED EQUIPMENT

SUMMARY:

A. THIS SECTION SPECIFIES MMBS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRED BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURER'S INSTALLATION AND START-UP REQUIREMENTS.

DC CIRCUIT BREAKER LABELING

A. NEW DC CIRCUIT IS REQUIRED IN MMBS CABINET SHALL BE CLEARLY IDENTIFIED AS TO RRU BEING SERVICED.

SECTION 26 100 - BASIC ELECTRICAL REQUIREMENTS

SUMMARY:

THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS

QUALITY ASSURANCE:

A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTINGS ARE AVAILABLE IN THE INDUSTRY.

B. MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE PROPOSED USE FOR THIS PROJECT.

C. MATERIALS AND EQUIPMENT: ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
1. ALLIED TUBE AND CONDUIT.
2. B-LINE SYSTEM.
3. UNISTRUT DIVERSIFIED PRODUCTS.
4. THOMAS & BETTS.

B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:
1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

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www.Ramaker.com

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OAKLAND, NJ 07346

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STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · No. 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: Date: 7/29/2014

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL DATE ISSUED: 07/29/2014

PROJECT TITLE:
UNIONVILLE / POLICE DEPARTMENT
CT33XC534-B

PROJECT INFORMATION:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 23009
SHEET NUMBER: SP-2

SUPPORTING DEVICES:

A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.

B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.

C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:

1. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.

2. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.

B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR UNDERGROUND RUNS. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED - SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.

B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.

C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.

D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.

E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRED BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.

F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.

B. CABLE TERMINATION FITTINGS FOR CONDUIT

1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL BY ROXTEC.

2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO - CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.

C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.

D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKET COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.

E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM:

A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM TO THE EXTENT INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS EXCEPT AS OTHERWISE NOTED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO-OX.

C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE. WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

CONDUIT AND CONDUCTOR INSTALLATION:

A. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.

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Certification & Seal:
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STATE OF CONNECTICUT ★ JAMES R. SKOWRONSKI ★ No. 26266 LICENSED PROFESSIONAL ENGINEER

Signature: 7/29/2014 Date:

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL DATE ISSUED: 07/29/2014

PROJECT TITLE:
UNIONVILLE / POLICE DEPARTMENT
CT33XC534-B

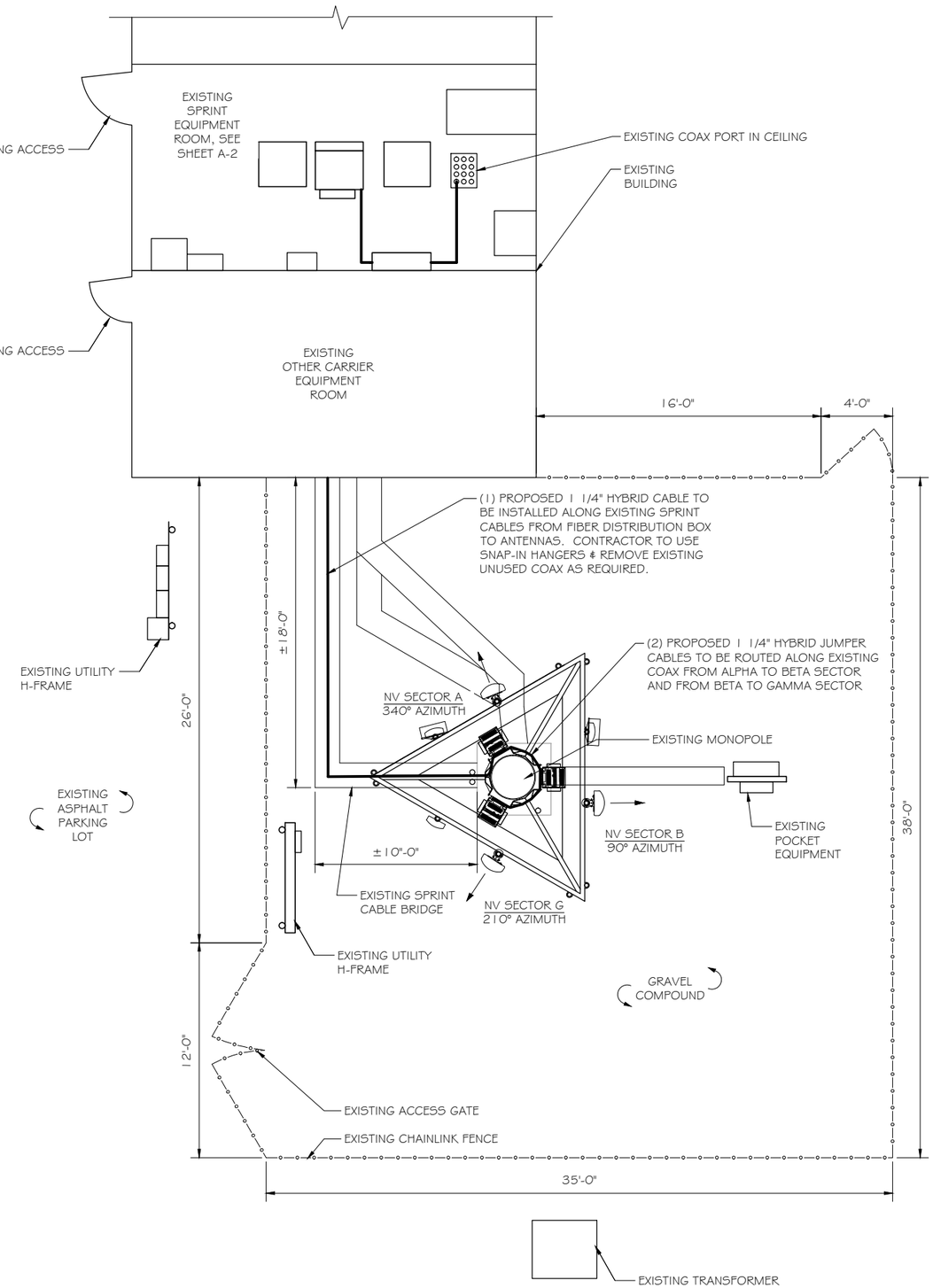
PROJECT INFORMATION:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 23009

SHEET NUMBER: SP-3



SITE PLAN
SCALE: 1" = 7.5'

NORTH

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ISSUE PHASE: FINAL
DATE ISSUED: 07/29/2014

PROJECT TITLE:
UNIONVILLE / POLICE DEPARTMENT
CT33XC534-B

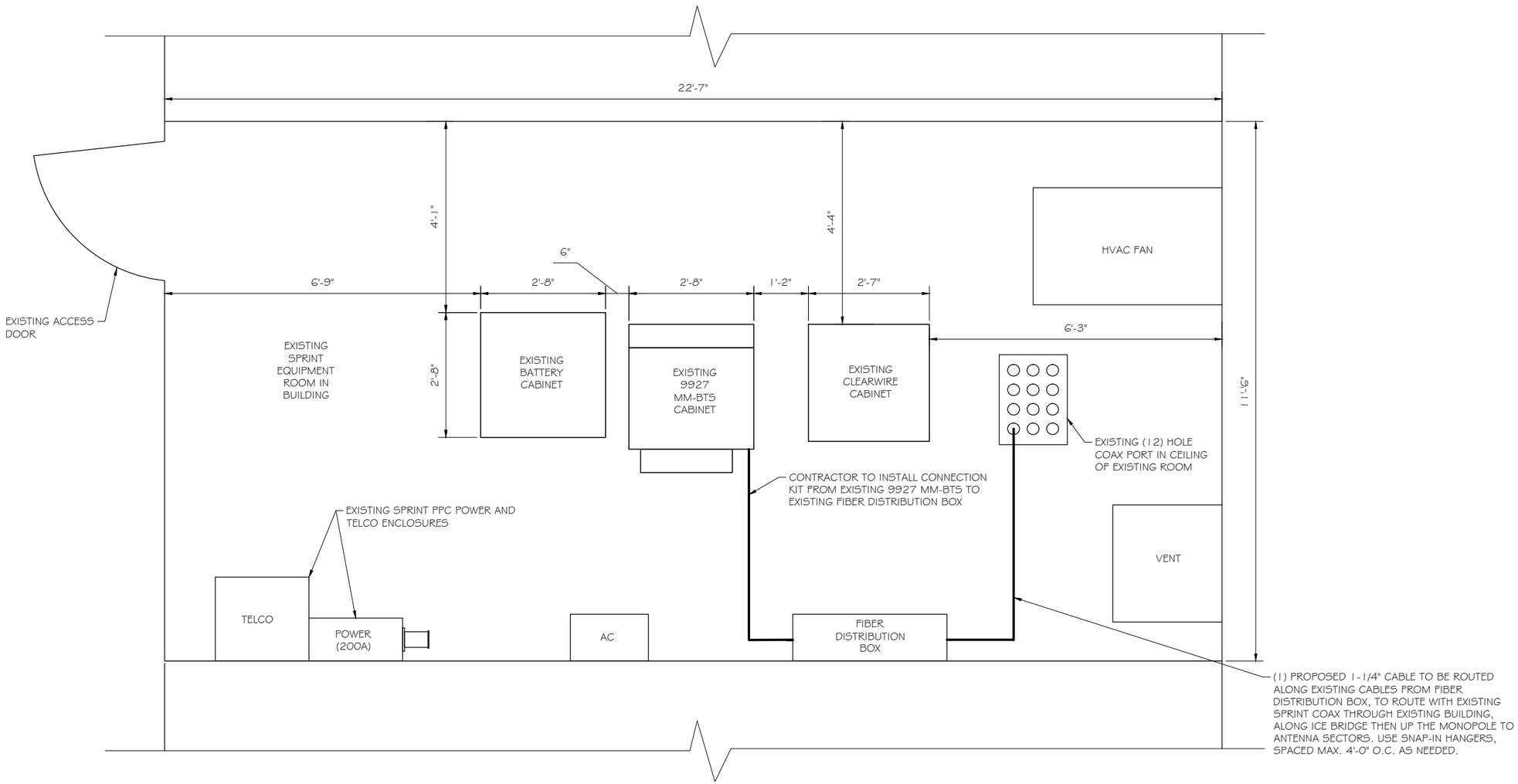
PROJECT INFORMATION:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

SHEET TITLE:
SITE PLAN

0 3.75' 7.5' 15'
11" x 17" - 1" = 7.5'
22" x 34" - 1" = 3.75'

PROJECT NUMBER: 23009
SHEET NUMBER: A-1

DRAWN BY: TJN CHECKED BY: KAB



EQUIPMENT PLAN
SCALE: 1" = 2.5'
1

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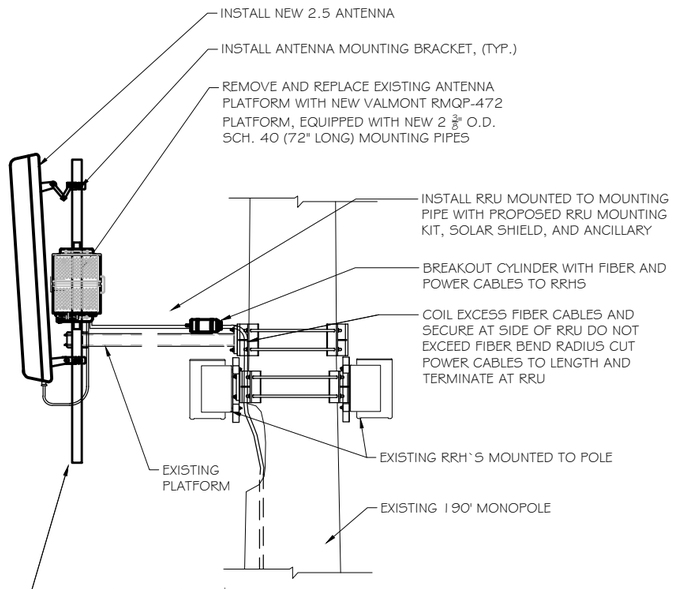
PROJECT INFORMATION:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

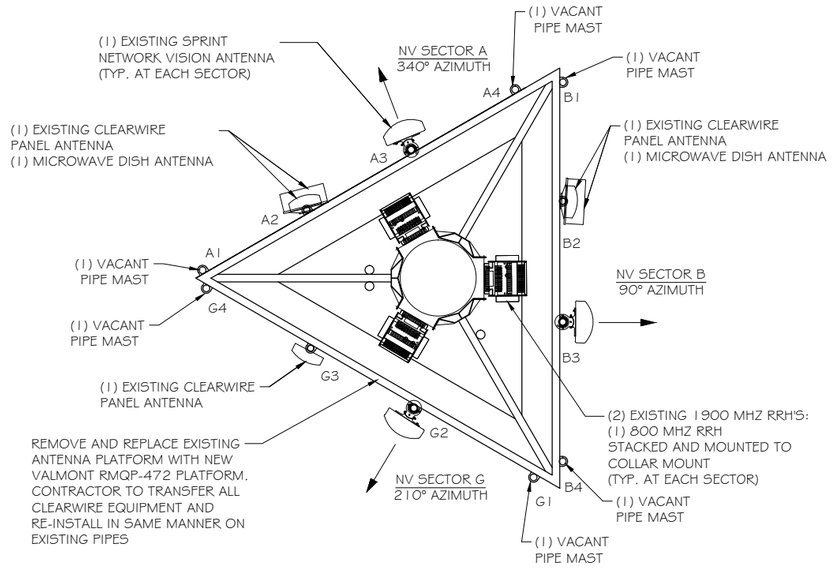
SHEET TITLE:
EQUIPMENT PLAN

0 1.25' 2.5' 5'
11" x 17" - 1" = 2.5'
22" x 34" - 1" = 1.25'

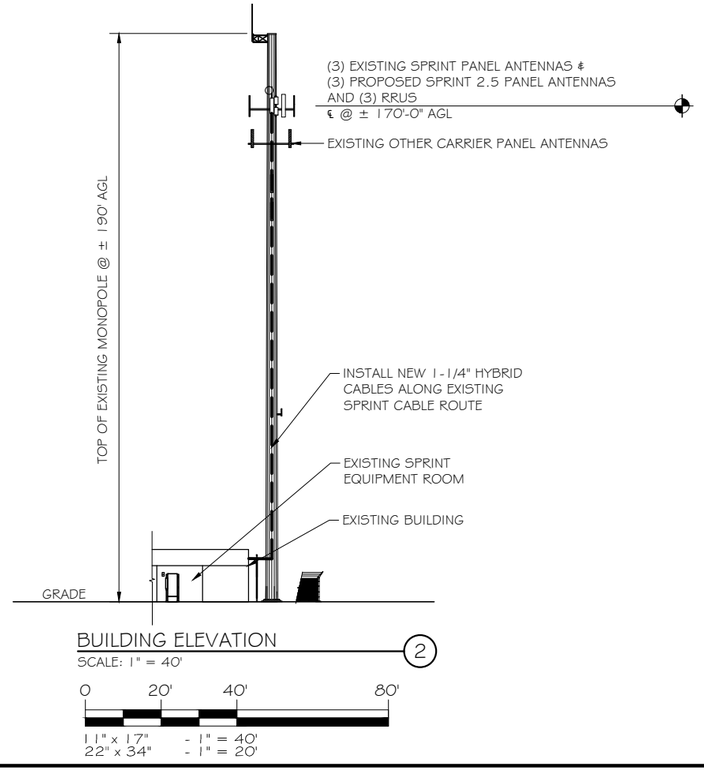
PROJECT NUMBER: 23009
SHEET NUMBER: A-2



ANTENNA & RRH MOUNTING DETAILS 1
SCALE: NTS



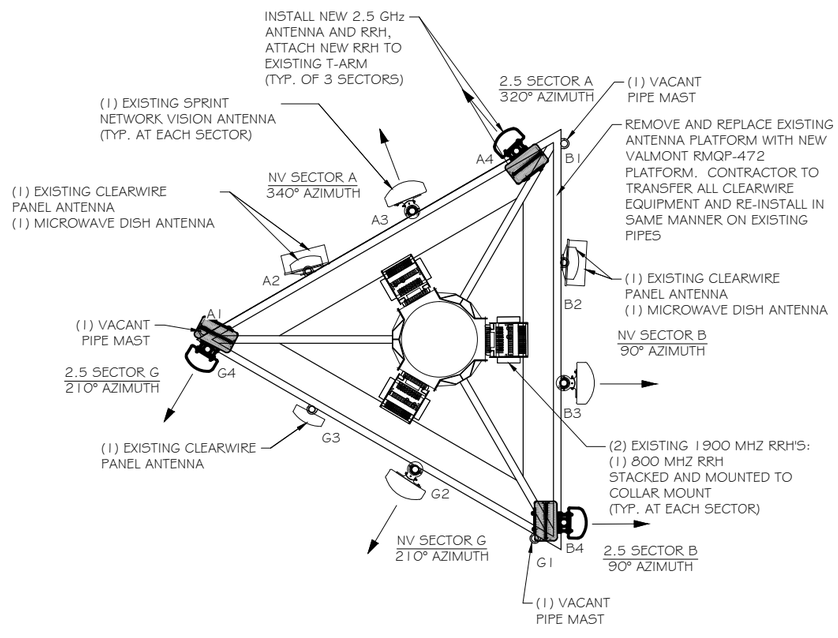
EXISTING ANTENNA ARRAY 3
SCALE: NTS



BUILDING ELEVATION 2
SCALE: 1" = 40'

0 20' 40' 80'

11" x 17" - 1" = 40'
22" x 34" - 1" = 20'



PROPOSED ANTENNA ARRAY 4
SCALE: NTS

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UNIONVILLE / POLICE DEPARTMENT
CT33XC534-B

PROJECT INFORMATION:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

SHEET TITLE:
BUILDING ELEVATIONS & ANTENNA DETAILS

SCALE:
AS NOTED

PROJECT NUMBER 23009
SHEET NUMBER A-3

Sprint

RFDS Sheet

General Site Information

Site ID	CT33XC534	Equipment Vendor	Alcatel-Lucent
Market	Northern Connecticut	Lattitude	41.749722
Region	Northeast	Longitude	-72.8725
MLA	N/A	LL SITE ID	N/A
Structure Type	Monopole		
BTS Type			
Solution ID		Siterra SR Equipment type	
		Equipment Vendor	Alcatel-Lucent

Incremental Power Draw needed by added Equipment: N/A

Base Equipment

BBU Kit	ALU BBU Kit	Top Hat	None
BBU Kit Qty	1	Top Hat Qty	N/A
		Top Hat Dimenstions	N/A
Growth Cabinet	None	Top Hat Weight (lbs)	N/A
Growth Cabinet Qty	N/A		
Growth Cabinet Dimensions	N/A		
Growth Cabinet Weight	N/A		

RF Path Information

RRH	TD-RRH8x20-25
RRH Qty	3
RRH Dimensions	26.1"x18.6"x6.7"
RRH Weight. lbs.	70
RRH Mount Weight. Lbs.	10
Power and Fiber Cable	ALU HYBRID CABLE
Cable Qty	1
Weight per foot. Lbs.	0.992
Diameter. Inches.	1.25
Length Ft.	225 (calculated as antenna height plus 20%)
Coax Jumper	TBD
Coax Jumper Qty	27
Coax Jumper Length. Feet.	8
Coax Jumper Weight	1.7
Coax Jumper Diameter. Inches	0.5
AISG Cable	COMMSCOPE ATCB-B01-006
AISG Cable Qty	3
AISG Diameter. Inches.	0.315
AISG Cable length.	8'
Weight of entire AISG cable. Lbs.	1.3

Antenna Sector Information

	Sector 1	Sector 2	Sector 3
Antenna make/model	RFS APXV9TM14-ALU-I20	RFS APXV9TM14-ALU-I20	RFS APXV9TM14-ALU-I20
Antenna qty	1	1	1
Antenna Dimensions. Inches	56.3"x12.6"x6.3"	56.3"x12.6"x6.3"	56.3"x12.6"x6.3"
Antenna Weight. Lbs	55.12	55.12	55.12
Antenna Mounting Kit Weight. Lbs.	11.5	11.5	11.5
CL Height	170	170	170
Antenna Azimuth	320	90	210
Antenna Mechanical Downtilt	0	0	0
Antenna etilt	-2	-2	-2

*RFDS SHEET WAS GENERATED BY RAMAKER & ASSOCIATES FROM PLAN OF RECORD (POR) PROVIDED BY SPRINT. CONTRACTOR SHALL VERIFY AND OBTAIN FINAL RFDS FROM SPRINT CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.

NOTES:

1. GENERAL CONTRACTOR TO FIELD VERIFY AZIMUTH AND C/L HEIGHT AND MECHANICAL DOWNTILT. IF DIFFERENT THAN CALLED OUT BELOW, HALT ANTENNA WORK FOR ONE HOUR, CALL SPRINT RF ENGINEER (OR MANAGER IF RF ENGINEER DOES NOT ANSWER, BUT STILL LEAVE A MESSAGE TO RF ENGINEER) USING CONTACT INFORMATION ABOVE FOR FURTHER INSTRUCTIONS. IF SPRINT DOES NOT RESPOND WITHIN ONE HOUR, PLACE 2.5GHZ ANTENNA AT SAME C/L HEIGHT AS 1.9GHZ ANTENNA AND EMAIL CORRECT C/L HEIGHT AND AZIMUTH TO SPRINT RF ENGINEER. UPDATE AS-BUILD DRAWING WITH CORRECT C/L HEIGHT. ALSO EMAIL CORRECT 1.9GHZ AND 800MHZ ANTENNA C/L HEIGHT, AZIMUTH AND MECHANICAL DOWNTILT TO RF ENGINEER.
2. AISG TESTS TO VERIFY OPERATION IS TO BE PERFORMED AFTER FINAL INSTALLATION OF ANTENNAS AND AISG CABLES HAVE BEEN CONNECTED. VERIFY OPERATION OF ALL EXISTING SPRINT AISG EQUIPMENT INCLUDING 800MHZ, 1.9GHZ AND 2.5GHZ. TEST TO INCLUDE COMPLETE DOWNTILT, AZIMUTH (IF APPLICABLE) AND BEAMWIDTH SWINGS (IF APPLICABLE). DOCUMENT AISG TEST RESULTS IN COAX SWEEP TEST SPREADSHEET.
3. GENERAL CONTRACTOR MUST ENSURE THAT NO OBJECT IS LOCATED WITHIN 45 DEGREES OF LEFT AND RIGHT OF FRONT OF ANTENNA OR 7 DEGREES UP AND DOWN FROM CENTER OF ANTENNA. IF THIS IS NOT POSSIBLE, CONTACT RF ENGINEER FOR FURTHER INSTRUCTION. IN ADDITION, 2.5GHZ ANTENNA IS NOT TO BE PLACED IN FRONT OF ANY OTHER ANTENNA USING THE SAME 45 DEGREE RULE. THIS INCLUDES SPRINT AND NON-SPRINT ANTENNAS.
4. 2.5GHZ ANTENNA MUST BE AT LEAST 6' FROM 1.9GHZ ANTENNA, 30" FROM 800MHZ ANTENNA AND 30" FROM DUAL BAND 1.9GHZ AND 800MHZ ANTENNA.
5. GENERAL CONTRACT IS REQUIRED TO USE A DIGITAL ALIGNMENT TOOL TO SET AZIMUTH, ROLL AND DOWNTILT. AZIMUTH ACCURACY IS TO BE WITHIN 1 DEGREE. DOWNTILT AND ROLL (LEFT TO RIGHT TILT) IS TO BE WITHIN 0.1 DEGREES. IF FOR SOME REASON THIS ACCURACY CANNOT BE ACHIEVED, UPDATE AS-BUILT DRAWINGS AND EMAIL SPRINT RF ENGINEER WITH AS-BUILT SETTINGS. USE 3Z RF ALIGNMENT TOOL OR EQUIVALENT TOOL.

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1120 Dallas Street, Sauk City, WI 53583
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STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · No. 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: Date: 7/29/2014

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL — DATE ISSUED: 07/29/2014

PROJECT TITLE:
UNIONVILLE / POLICE DEPARTMENT
CT33XC534-B

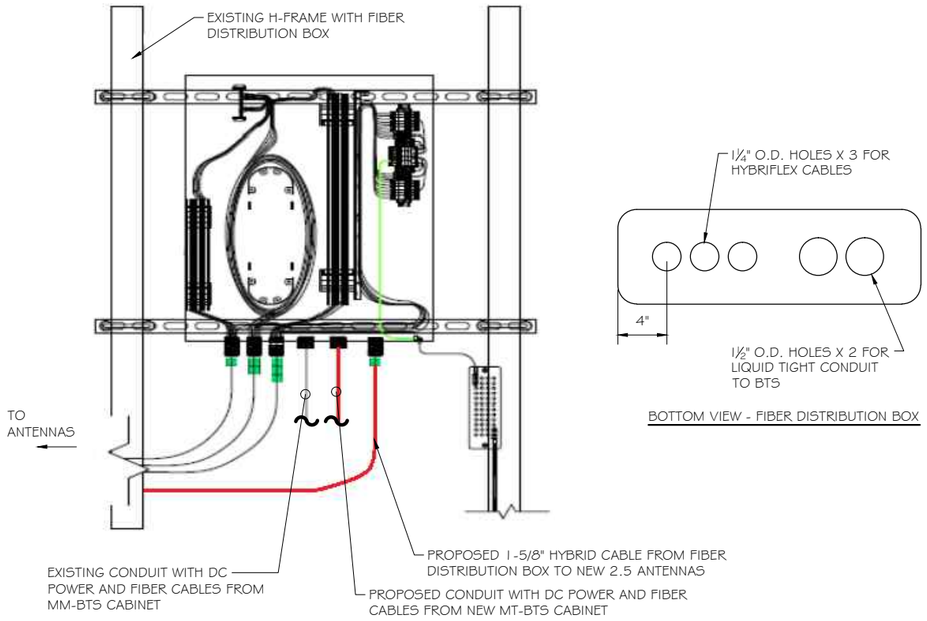
PROJECT INFORMATION:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

SHEET TITLE:
RF DATA SHEET

SCALE:
AS NOTED

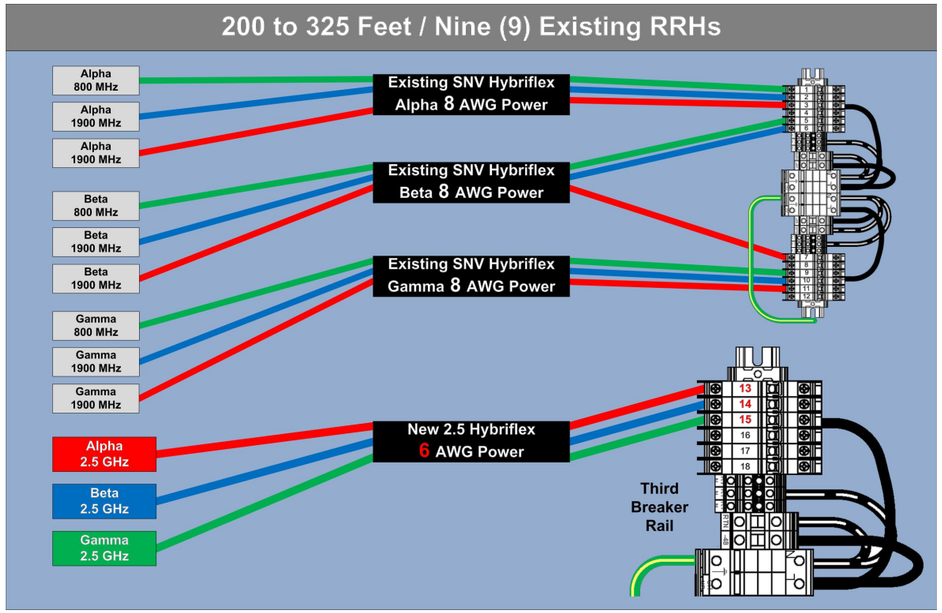
PROJECT NUMBER: 23009

SHEET NUMBER: A-4

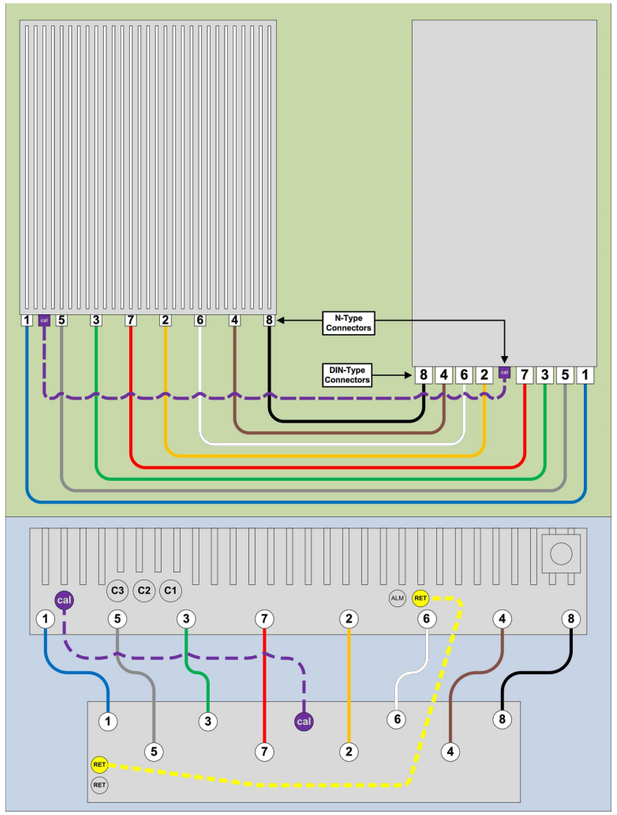


BOTTOM VIEW - FIBER DISTRIBUTION BOX

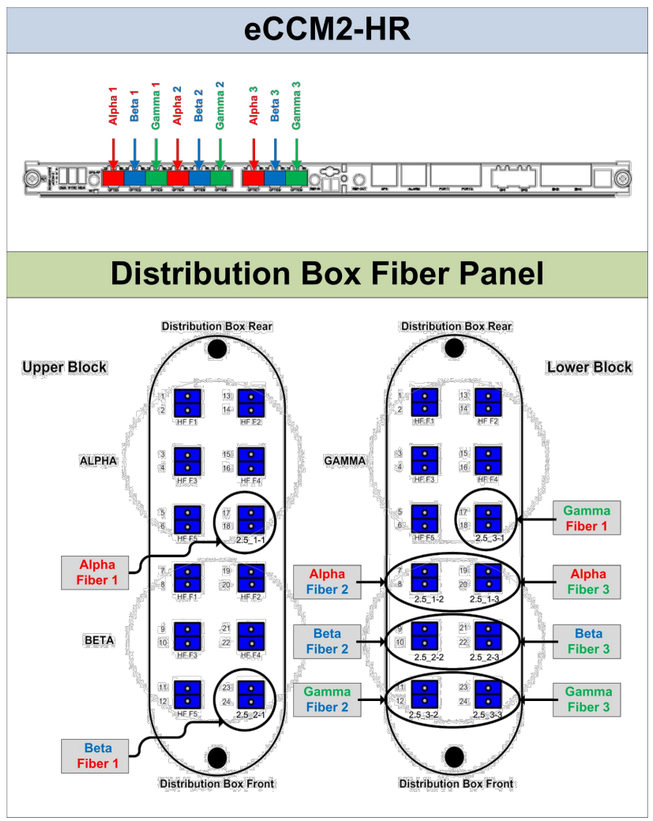
TYPICAL FIBER DISTRIBUTION BOX DETAIL 1
SCALE: NTS



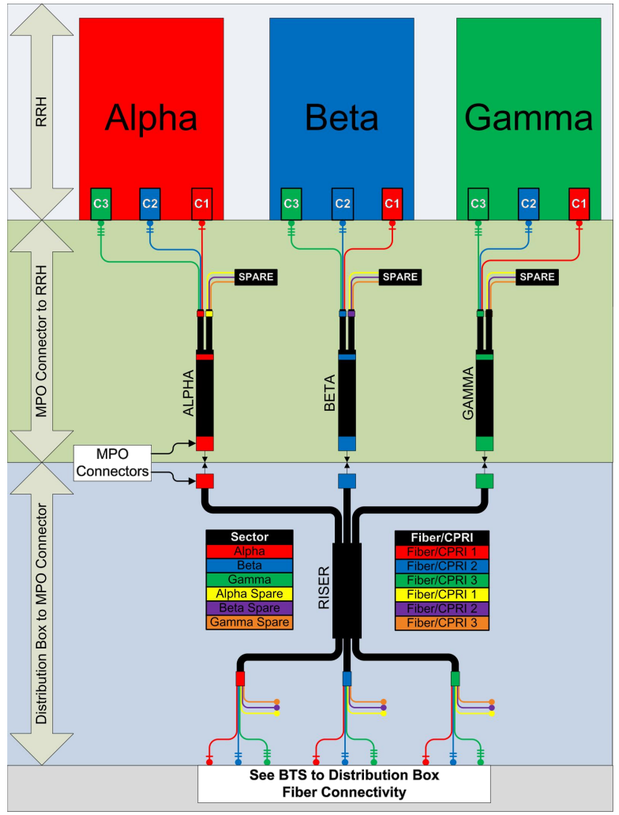
RRH TO DISTRIBUTION BOX POWER CONNECTIVITY DETAIL 2
SCALE: NTS



8T8R DETAIL 3
SCALE: NTS



BTS TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL 4
SCALE: NTS



RRH TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL 5
SCALE: NTS

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Phone: 608-643-4100 Fax: 608-643-7999
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UNIONVILLE / POLICE DEPARTMENT
CT33XC534-B

PROJECT INFORMATION:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

SHEET TITLE:
FIBER PLUMBING DIAGRAM

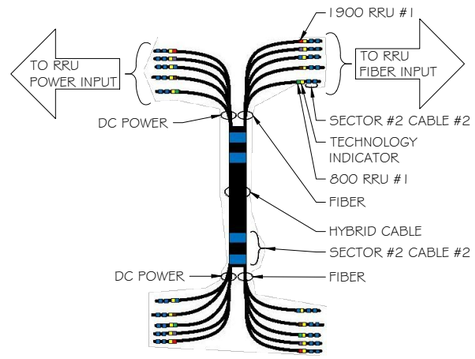
SCALE:
AS NOTED

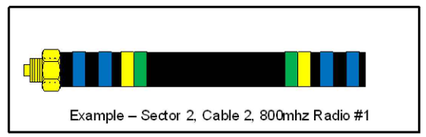
PROJECT NUMBER: 23009
SHEET NUMBER: A-5

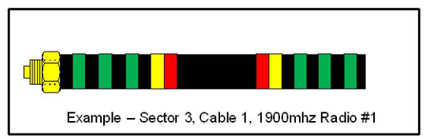
Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Blue	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Grey	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Blue	Blue	No Tape
2	3	Brown	Brown	No Tape
2	4	White	White	No Tape
2	5	Red	Red	No Tape
2	6	Grey	Grey	No Tape
2	7	Purple	Purple	No Tape
2	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
3	2	Blue	Blue	Blue
3	3	Brown	Brown	Brown
3	4	White	White	White
3	5	Red	Red	Red
3	6	Grey	Grey	Grey
3	7	Purple	Purple	Purple
3	8	Orange	Orange	Orange

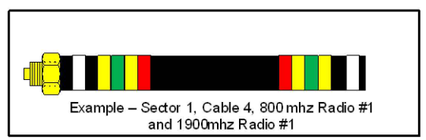
2.5 FREQUENCY	INDICATOR		ID
2500 -1	YEL	WHT	GRN
2500 -2	YEL	WHT	RED
2500 -3	YEL	WHT	BRN
2500 -4	YEL	WHT	BLU
2500 -5	YEL	WHT	SLT
2500 -6	YEL	WHT	ORG
2500 -7	YEL	WHT	WHT
2500 -8	YEL	WHT	PPL

NV FREQUENCY	INDICATOR	ID
800-1	YEL	GRN
1900-1	YEL	RED
1900-2	YEL	BRN
1900-3	YEL	BLU
1900-4	YEL	SLT
800-1	YEL	ORG
RESERVED	YEL	WHT
RESERVED	YEL	PPL




Example – Sector 2, Cable 2, 800mhz Radio #1


Example – Sector 3, Cable 1, 1900mhz Radio #1


Example – Sector 1, Cable 4, 800 mhz Radio #1 and 1900mhz Radio #1

COLOR CODING CHARTS (1)
SCALE: NTS

CABLE MARKING NOTES

1. ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.
2. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM THE END CONNECTOR, WEATHERPROOFING, OR BREAKOUT UNIT. THERE SHALL BE 1" SPACE BETWEEN EACH RING.
3. A 2" GAP SHALL SEPARATE THE CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.
4. THE 2" COLORED TAPE(S) SHALL BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS POSSIBLE.
5. SITES WITH MORE THAN FOUR (4) SECTORS WILL REQUIRE ADDITIONAL RINGS FOR EACH SECTOR, FOLLOWING THE PATTERN. HIGH CAPACITY SITES WILL USE THE SECOND CABLE IDENTIFIED BY BLUE BANDS OF TAPE
6. HYBRID FIBER CABLE SHALL BE SECTOR IDENTIFIED INSIDE THE CABINET ON FREQUENCY BUNDLES, ON THE SEALTITE, ON THE MAIN LINE UPON EXIT OF SEALTITE, AND BEFORE AND AFTER THE BREAKOUT UNIT (MEDUSA), AS WELL AS BEFORE AND AFTER ANY ENTRANCE OR EXIT.
7. HFC "MAIN TRUNK" WILL NOT BE MARKED WITH THE FREQUENCY CODES, AS IT CONTAINS ALL FREQUENCIES.
8. INDIVIDUAL POWER PAIRS AND FIBER BUNDLES SHALL BE LABELED WITH BOTH THE CABLE AND FREQUENCY.

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STATE OF CONNECTICUT ★ JAMES R. SKOWRONSKI ★ No. 26266 ★ LICENSED PROFESSIONAL ENGINEER

Signature: James R Skowronski Date: 7/29/2014

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
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PROJECT TITLE:
UNIONVILLE / POLICE DEPARTMENT
CT33XC534-B

PROJECT INFORMATION:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

SHEET TITLE:
CABLE COLOR CODING

SCALE:
AS NOTED

PROJECT NUMBER: 23009
SHEET NUMBER: A-6

HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE
MANUF:RFS

CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
*Fiber Only	Varies	Use NV Hybriflex	5/8"
Hybriflex	<200'	8 AWG	1-1/4"
Hybriflex	225-300'	6 AWG	1-1/4"
Hybriflex	325-375'	4 AWG	1-1/4"

RFS HYBRIFLEX RISER CABLE SCHEDULE

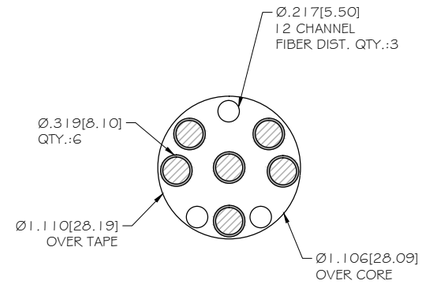
FIBER ONLY (EXISTING DC POWER)	Hybrid cable MN:HB058-M12-050F 12x multi-mode fiber pairs, Top:Outdoor protected connectors, Bottom:LC Connectors, 5/8 cable, 50 ft	50 ft
	MN:HB058-M12-075F	75 ft
	MN:HB058-M12-100F	100 ft
	*MN:HB058-M12-125F	125 ft
	MN:HB058-M12-150F	150 ft
	MN:HB058-M12-175F	175 ft
	MN:HB058-M12-200F	200 ft
8 AWG Power	Hybrid cable MN:HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC connectors. 1 1/4 cable, 50 ft	50 ft
	MN:HB114-08U3M12-075F	75 ft
	MN:HB114-08U3M12-100F	100 ft
	MN:HB114-08U3M12-125F	125 ft
	MN:HB114-08U3M12-150F	150 ft
	MN:HB114-08U3M12-175F	175 ft
	MN:HB114-08U3M12-200F	200 ft
6 AWG Power	Hybrid cable MN:HB114-13U3M12-225F 3x 6 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC connectors. 1 1/4 cable, 225 ft	225 ft
	MN:HB114-13U3M12-250F	250 ft
	MN:HB114-13U3M12-275F	275 ft
	MN:HB114-13U3M12-300F	300 ft
4 AWG Power	Hybrid cable MN:HB114-21U3M12-325F 3x 4 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC connectors. 1 1/4 cable, 325 ft	325 ft
	MN:HB114-21U3M12-350F	350 ft
	MN:HB114-21U3M12-375F	375 ft

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

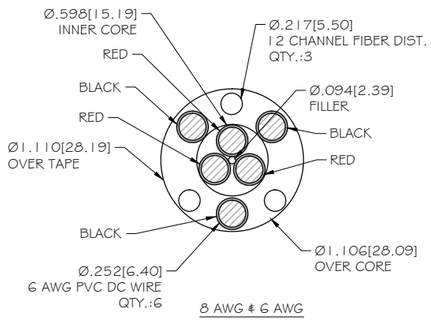
FIBER ONLY	Hybrid Jumper cable MN:HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN:HBF012-M3-10F1	10 ft
	*MN:HBF012-M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	
8 AWG POWER	Hybrid Jumper cable MN:HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 5/8 cable	5 ft
	MN:HBF058-08U1M3-10F1	10 ft
	MN:HBF058-08U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	
6 AWG POWER	Hybrid Jumper cable MN:HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 5/8 cable	5 ft
	MN:HBF058-13U1M3-10F1	10 ft
	MN:HBF058-13U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	
4 AWG POWER	Hybrid Jumper cable MN:HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 7/8 cable	5 ft
	MN:HBF078-21U1M3-10F1	10 ft
	MN:HBF078-21U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	

*NOTE: SPRINT CM TO CONFIRM HYBRID/FIBER RISER CABLE & HYBRID/FIBER JUMPER CABLE MODEL NUMBERS BEFORE PREPARING BOM.

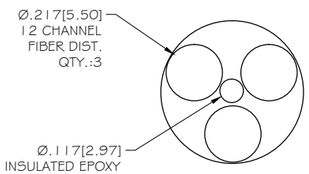
HYBRID CABLE CROSS SECTION & DATA (1)
SCALE: NTS



4 AWG

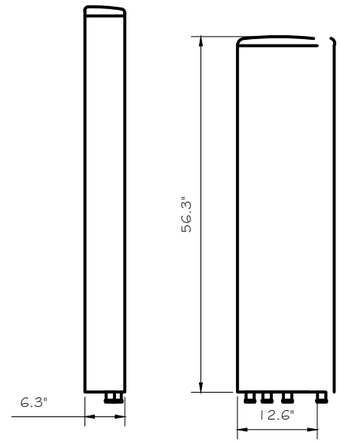


8 AWG & 6 AWG



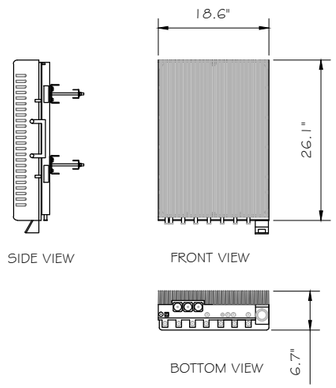
FIBER ONLY

RFS: APXV9TM14-ALU-120



DIMENSIONS, HxWxD:	56.3" x 12.6" x 6.3"
WEIGHT, WITHOUT PRE-MOUNTED BRACKETS:	55.12 lbs.
CONNECTOR:	(9) XX" MINI-DIN FEMALE/BOTTOM

2.5 ANTENNA DETAIL (2)
SCALE: NTS



ALCATEL-LUCENT: TD-RRH8x20-25

HxWxD = (26.1" x 18.6" x 6.7")

WEIGHT = 70 lbs.

2.5 RRH DETAIL (3)
SCALE: NTS

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Signature: 7/29/2014 Date:

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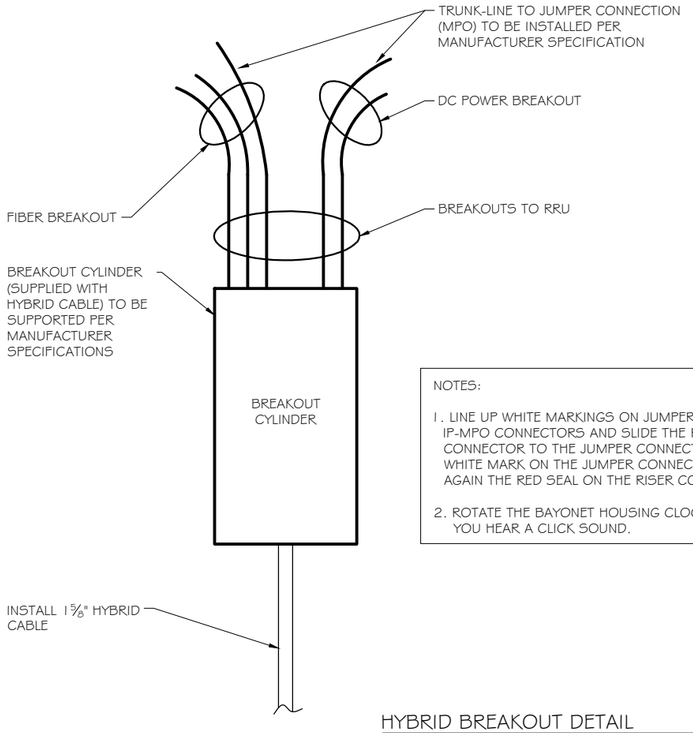
UNIONVILLE / POLICE DEPARTMENT
CT33XC534-B

PROJECT INFORMATION:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

SHEET TITLE:
ANTENNA & HYBRID CABLE DETAILS

SCALE:
AS NOTED

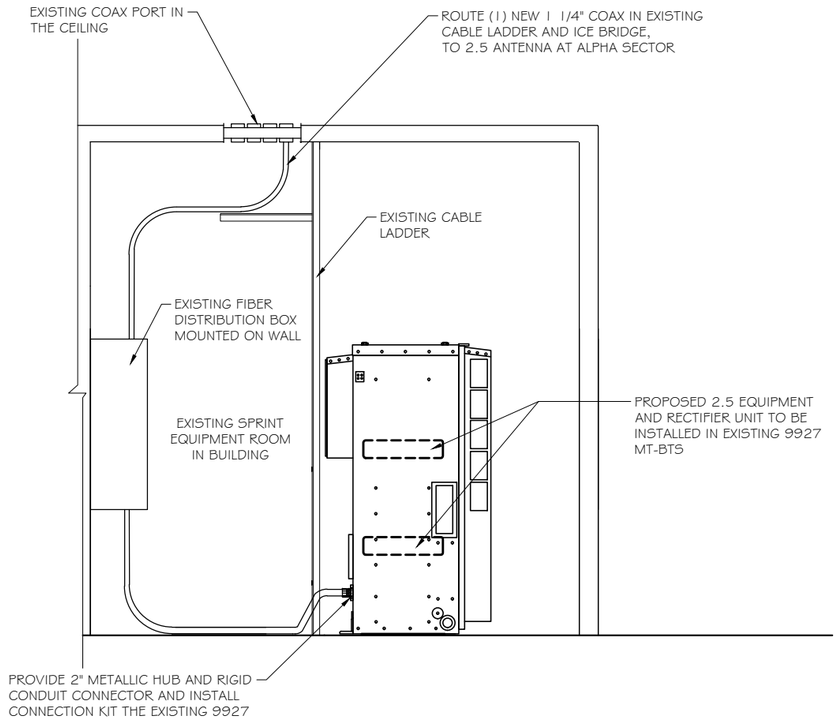
PROJECT NUMBER: 23009
SHEET NUMBER: A-7



NOTES:

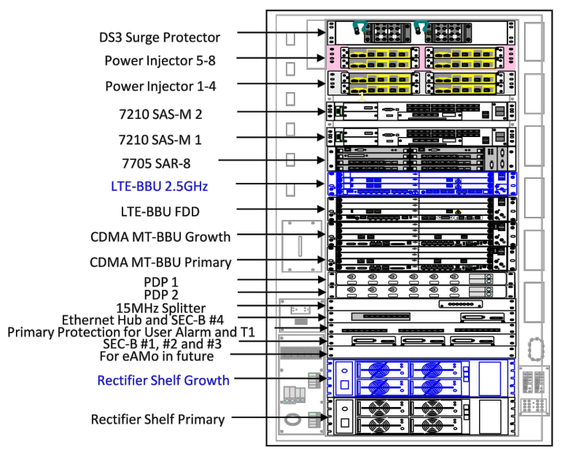
1. LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTORS AND SLIDE THE RISER CONNECTOR TO THE JUMPER CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAIN THE RED SEAL ON THE RISER CONNECTOR.
2. ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL YOU HEAR A CLICK SOUND.

HYBRID BREAKOUT DETAIL (1)
SCALE: NTS



CABLE ROUTE FROM CABINET (2)
SCALE: NTS

EXISTING BBU CABINET (3)
SCALE: NTS



EXISTING MMBS CABINET (4)
SCALE: NTS

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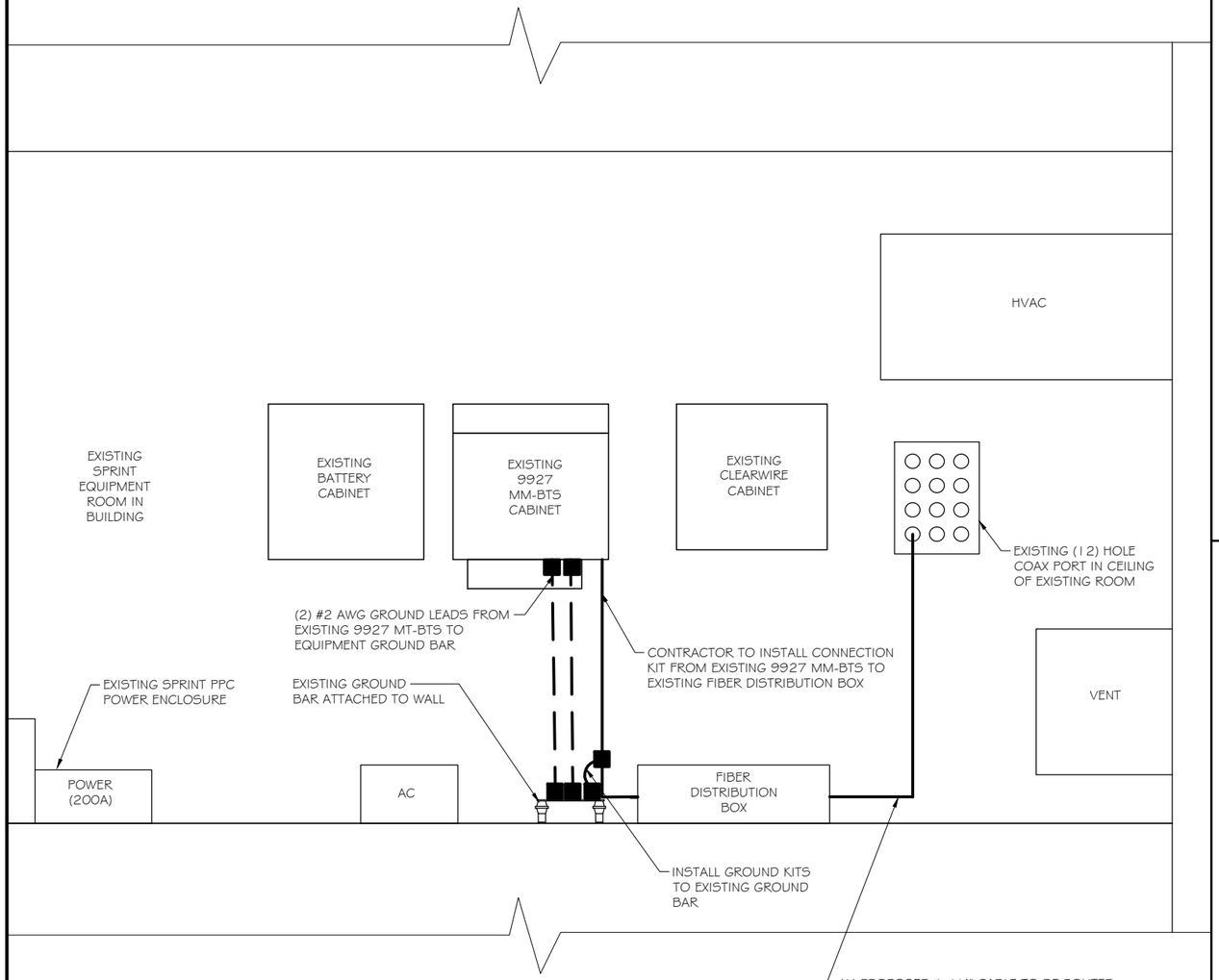
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

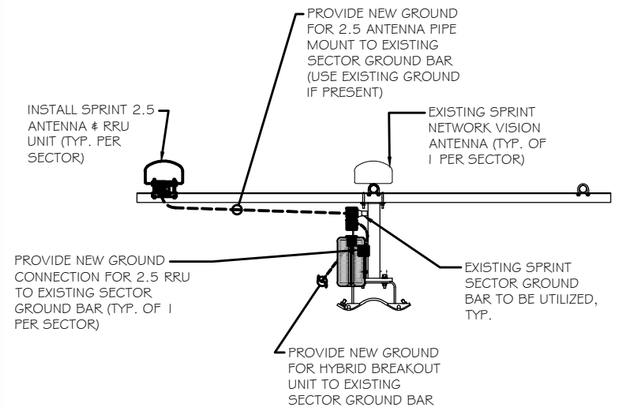
SHEET TITLE:
EQUIPMENT DETAILS

SCALE:
AS NOTED

PROJECT NUMBER: 23009
SHEET NUMBER: A-8



EQUIPMENT UTILITY & GROUNDING PLAN (1)
SCALE: NTS



ANTENNA GROUNDING DETAIL (2)
SCALE: NTS

GROUNDING NOTES:

1. CONTRACTOR TO ENSURE PROPER SEQUENCING OF GROUNDING AND UNDERGROUND CONDUIT INSTALLATION TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM AND/OR DAMAGE TO THE CONDUIT.
2. ALL EXTERIOR GROUND CONDUCTORS SHALL BE #2 AWG SOLID TINNED COPPER UNLESS NOTED OTHERWISE.
3. ALL GROUND CONNECTIONS BELOW GRADE SHALL BE EXOTHERMIC (CADWELD).
4. ALL GROUND CONNECTIONS ABOVE GRADE AND/OR INTERIOR SHALL BE COMPRESSION TYPE, TWO-HOLE LUGS OR DOUBLE-CRIMP "C" TAPS.
5. CONTACT AREAS WHERE CONNECTIONS ARE MADE SHALL BE PREPARED TO A BARE BRIGHT FINISH AND COATED WITH AN ANTI-OXIDATION MATERIAL BEFORE CONNECTIONS ARE MADE.
6. MAXIMUM RESISTANCE OF THE COMPLETED GROUND SYSTEM SHALL NOT EXCEED 5 OHMS.
7. WHERE GROUNDING CONNECTIONS ARE MADE TO PAINTED METAL SURFACES, PAINT SHALL BE REMOVED TO BEAR METAL TO ENSURE PROPER CONTACT AND RESTORED/PAINTED TO ORIGINAL FINISH.
8. GROUND DEPTH SHALL BE 30" MINIMUM BELOW FINISHED GRADE, OR 6" BELOW FROST LINE, WHICHEVER IS GREATER.

LEGEND:	
– – – – – – – – – – – –	EXISTING GROUND CABLE
▬▬▬▬▬▬▬▬▬▬▬▬	PROPOSED GROUND CABLE
▲	MECHANICAL CONNECTION
■	EXOTHERMIC CONNECTION
—E—E—E—E—	PROPOSED ELECTRIC

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Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT ★ JAMES R. SKOWRONSKI ★ No. 26266 LICENSED PROFESSIONAL ENGINEER

Signature: Date: 7/29/2014

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 07/29/2014

PROJECT TITLE:
UNIONVILLE / POLICE DEPARTMENT
CT33XC534-B

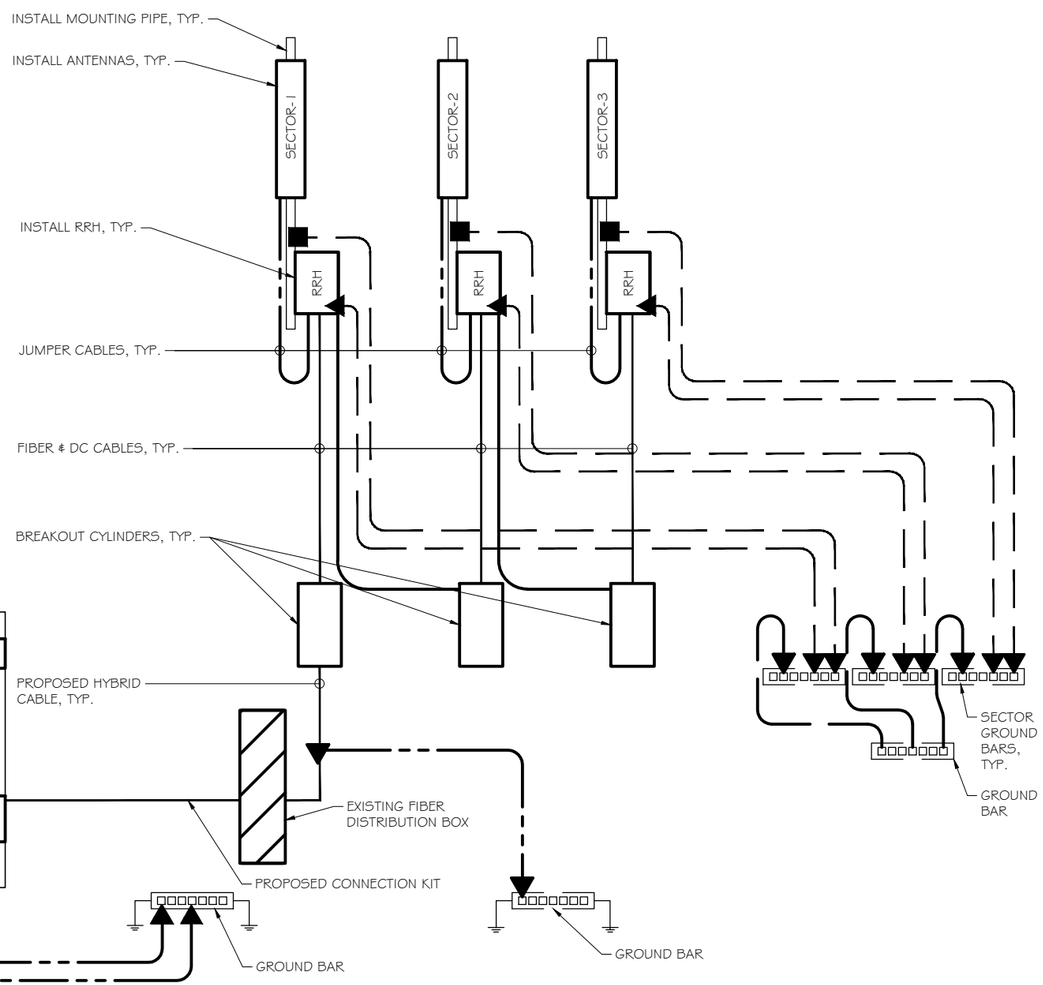
PROJECT INFORMATION:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

SHEET TITLE:
EQUIPMENT UTILITY & GROUNDING PLAN

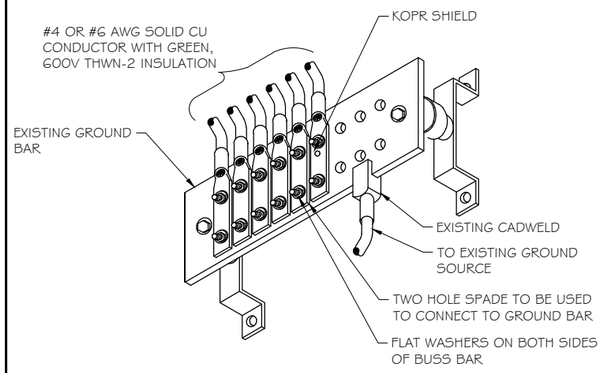
SCALE:
AS NOTED

PROJECT NUMBER: 23009
SHEET NUMBER: E-1

SYMBOL LEGEND
- MECHANICAL CONNECTION
- EXOTHERMIC CONNECTION



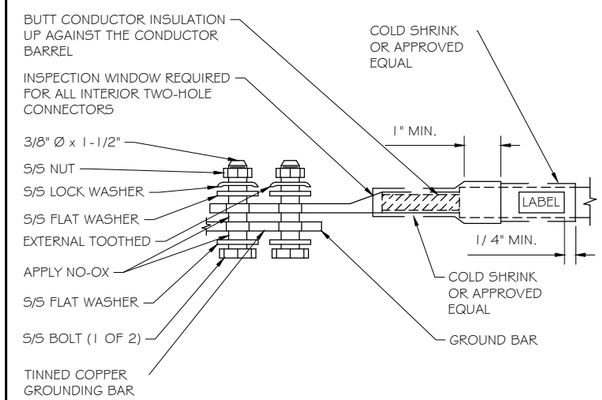
GROUNDING RISER DIAGRAM (1)
SCALE: NTS



NOTES:
1. APPLY NO-OX TO LUG AND GROUND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.

2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

GROUNDING CONDUCTOR INSTALLATION (2)
SCALE: NTS



TWO-HOLE LUG (3)
SCALE: NTS

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STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
No. 26266
LICENSED PROFESSIONAL ENGINEER

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ISSUE PHASE: FINAL
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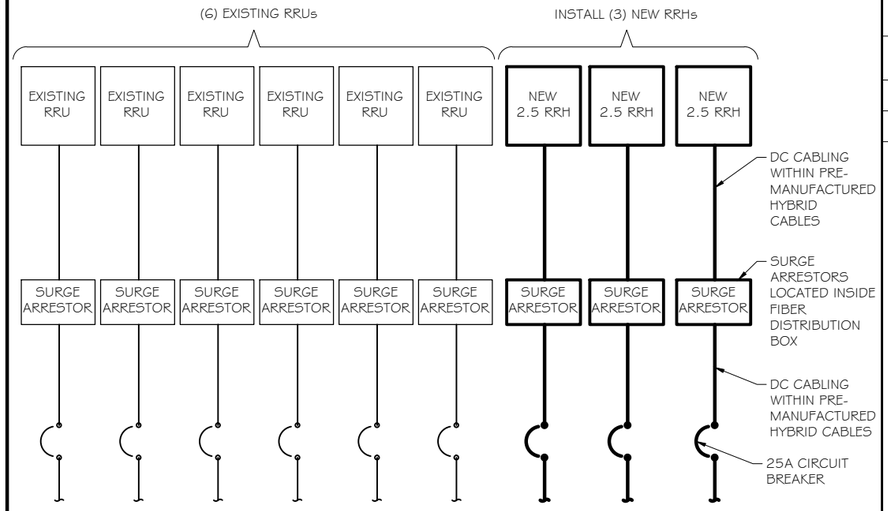
PROJECT TITLE:
UNIONVILLE / POLICE DEPARTMENT
CT33XC534-B

PROJECT INFORMATION:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

SHEET TITLE:
GROUNDING DETAILS

SCALE:
AS NOTED

PROJECT NUMBER: 23009
SHEET NUMBER: E-2



DC ONE-LINE DIAGRAM (1)
SCALE: NTS

A/C PANEL SCHEDULE

VOLTAGE:	240V/120		PANEL STATUS:	EXISTING		N TO GROUND BOND:	YES
MAIN BREAKER:	200 AMP		MODEL NUMBER:	TBD		INTERNAL TVSS:	YES
MOUNT:	EQUIPMENT ROOM		PHASE:	1		WIRE:	3
ENCLOSURE TYPE:	NEMA 3R		BUSS RATING:	200 AMP		GROUND BAR:	YES
			NEUTRAL BAR:	YES			

CKT	DESCRIPTION	BREAKER AMPS	BREAKER POLES	BREAKER STATUS	PHASE A VA	PHASE B VA	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	DESCRIPTION	CKT
1	SUB PANEL	100	2	ON			ON	2	60	AC SURGE PROTECTION	7
2											8
3	UNIT 1 MMBTS	80	2	ON			-	-	-	BLANK (UNUSED)	9
4							-	-	-	BLANK (UNUSED)	10
5	BLANK (UNUSED)	-	-	-			ON	1	15	TELCO GFI	11
6	BLANK (UNUSED)	-	-	-			ON	1	10	FAN	12

AC PANEL SCHEDULE (2)
SCALE: NTS

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MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 07/29/2014

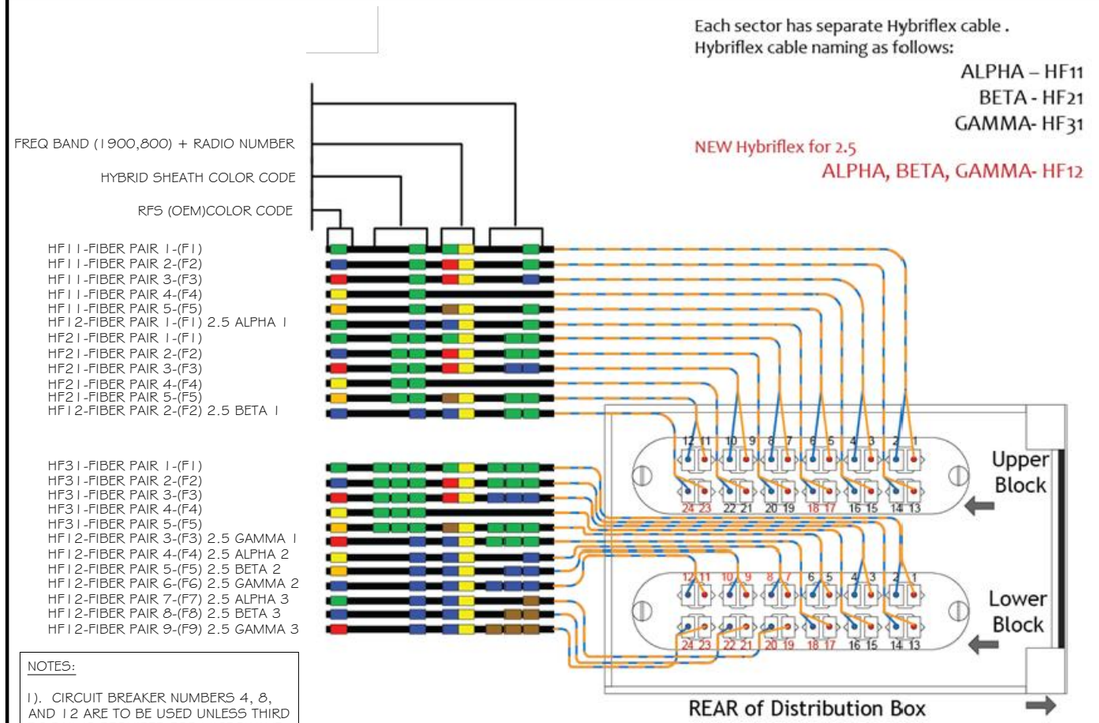
PROJECT TITLE:
UNIONVILLE / POLICE DEPARTMENT
CT33XC534-B

PROJECT INFORMATION:
319-321 NEW BRITAIN AVENUE
FARMINGTON, CT 06032
HARTFORD COUNTY

SHEET TITLE:
DC POWER DETAILS & PANEL SCHEDULES

SCALE:
AS NOTED

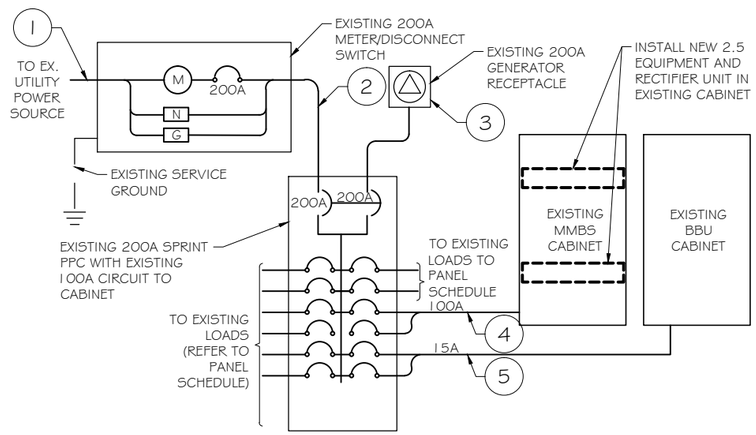
PROJECT NUMBER: 23009
SHEET NUMBER: E-3



NOTES:

1). CIRCUIT BREAKER NUMBERS 4, 8, AND 12 ARE TO BE USED UNLESS THIRD DC RAIL IS REQUIRED FOR MICROWAVE.
2). USE DC POWER LOOP.
3). ALL UNUSED DC FEEDERS TO BE TERMINATED WITH WIRE NUTS AND TAPED.
4). REMOVE ALL DEBRIS FROM INTERIOR OF FIBER DISTRIBUTION BOX WHEN COMPLETE.

TYPICAL FIBER DISTRIBUTION (3)
SCALE: NTS



CIRCUIT SCHEDULE			
NO.	FROM	TO	CONFIGURATION
1	UTILITY SOURCE	METER/ DISCONNECT	EXISTING
2	METER/ DISCONNECT	TRANSFER & LOAD CENTER	EXISTING
3	TRANSFER & LOAD CENTER	GENERATOR RECEPTACLE	EXISTING
4	TRANSFER & LOAD CENTER	EX. MMBS CABINET	(3) #2 AWG, (1) #8 GND IN 1½" CONDUIT
5	TRANSFER & LOAD CENTER	EX. BBU CABINET	(2) #12 AWG, (1) #12 GND IN ¾" CONDUIT

ELECTRICAL ONE-LINE DIAGRAM (4)
SCALE: NTS

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