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

March 18, 2014

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

RE: **EM-SPRINT-051-121116** – Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 100 Reef Road, Fairfield, Connecticut.

Dear Ms. Palumbo:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Prior to antenna installation, the tower modifications depicted in the Structural Modification Drawings prepared by KMB Design Group, LLC and dated February 26, 2014 shall be implemented;
- Within 45 days following completion of the antenna installation, Sprint shall provide documentation certified by a professional engineer that its installation complied with the requirements of the structural analysis;
- Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated September 19, 2012, and the structural analysis report, dated February 26, 2014. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site by any dimension, increase noise levels at the tower site boundary by six decibels or more, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the

Telecommunications Act of 1996 and by the state Department of Energy and Environmental Protection pursuant to Connecticut General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below state and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Melanie A. Bachman
Acting Executive Director

MAB/CDM/laf

c: The Honorable Michael C. Tetreau, First Selectman, Town of Fairfield
Joseph E. Devonshuk, Town Planner, Town of Fairfield
Chief Gary MacNamara, Fairfield Police Department

EM-SPRINT-051-121116

Together with Nextel

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

September 19, 2012

Hand Delivered

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

RE: Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at Southport Police Department, 100 Reef Road, Fairfield, CT 06824. Known to Sprint Spectrum L.P. as site CT03XC354.

Dear Ms. Roberts:

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

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

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

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

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

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

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

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

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

Sincerely,

Jennifer Palumbo
Real Estate Consultant

EBI Consulting
environmental | engineering | due diligence

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

Sprint Existing Facility

Site ID: CT03XC354

Southport Police Department
100 Reef Road
Fairfield, CT 06824

August 26, 2012

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

EBI Consulting

environmental | engineering | due diligence

August 26, 2012

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

Re: Emissions Values for Site **CT03XC354 – Southport Police Department**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 100 Reef Road, Fairfield, CT, for the purpose of determining whether the emissions from the proposed Sprint equipment upgrades on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 100 Reef Road, Fairfield, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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

6) The antenna mounting height centerline of the proposed antennas is **110.3 feet** above ground level (AGL)
7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

Site ID	CT03XC354 - Southport Police Dept.
Site Addresss	100 Reef Road, Fairfield, CT 06824
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 in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	15.9	110.3	104.3	1/2 "	0.5	0	2773.8948	91.67002	9.16700%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	110.3	104.3	1/2 "	0.5	0	389.96892	12.88746	2.27292%
															Sector total Power Density Value:		11.440%

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 in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	15.9	110.3	104.3	1/2 "	0.5	0	2773.8948	91.67002	9.16700%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	110.3	104.3	1/2 "	0.5	0	389.96892	12.88746	2.27292%
															Sector total Power Density Value:		11.440%

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 in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
3a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	15.9	110.3	104.3	1/2 "	0.5	0	2773.8948	91.67002	9.16700%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	110.3	104.3	1/2 "	0.5	0	389.96892	12.88746	2.27292%
															Sector total Power Density Value:		11.440%

Site Composite MPE %

Carrier	MPE %
Sprint	34.320%
T-Mobile	4.870%
Clearwire	0.910%
AT&T	18.220%
MetroPCS	16.480%
Nextel	0.010%
FCI900	0.010%
Fairfield	0.010%
Total Site MPE %	**74.830%**

Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **34.320% (11.440% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **74.830%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions

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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

Structural Analysis Report

For

100 Reef Road
Fairfield, CT

Site ID: CT03XC354

KMB ID: 332.1475

Prepared For:

Sprint-Nextel
1 International Blvd
Mahwah, NJ 07495

Date: 7/19/2012

Analyzed By:

Jiang J. Yu, P.E.

Reviewed By:

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

Stephen A. Bray, P.E.
CT PE License No. 26657

Contents

1.0 Introduction

Pursuant to your request, we have prepared this report describing the methodology and codes used to review the reactions imparted upon the existing antenna mounts.

The existing installation consists of three (3) antenna sectors and equipment cabinets on a steel platform on the roof. Sprint-Nextel proposes to replace one (1) antenna per sector and add the associated remote radio units and combiners.

The existing equipment platform supports two (2) battery cabinet weighing 1,625 lbs each and one Sprint equipment cabinet weighing 1,625 lbs for a total equipment weight of 4,875 lbs. The proposed equipment configuration consists of two (2) Avaya EC60v2 battery cabinets, each weighing 1,625 lbs, one (1) equipment cabinet weighing 1,390 lbs and one (1) DC Distribution and Fiber Management Enclosure weighing 200 lbs.

2.0 Design Codes

As part of the design process, structural engineers, licensed to practice in the State of Connecticut, have reviewed the existing platform and connections to which the proposed additional loads will be applied. The applicable design codes which govern the structural analysis of this project are as follows:

International Building Code – CT Edition 2009

"IBC 2009 - CT Edition"

American Institute of Steel Construction

"Steel Construction Manual – 9th Edition"

Masonry Standards Joint Committee Code

"2005 Masonry Standards Joint Committee Code"

3.0 Conclusion

Based on the attached calculations, the maximum reaction force at any support is calculated at 2,842 lbs.

The maximum stress on the main beam of the platform supporting the cabinets will be 10.175 ksi, which is less than the allowable stress of 23.76 ksi.

The maximum beam deflection at the platform is calculated to be 0.484 inches, which is less than L/240. (L=beam, L/240 = 1.25 inches)

Based on our structural calculations the maximum stress on any antenna supporting member will be 7.600 ksi, which is less than the allowable member stress of 23.1 ksi.

The proposed antenna systems are calculated to be within acceptable tolerances for pipe stress, deflection, and bending moment at critical bending section. Please refer to the calculations in Appendix A.

Appendix A
Structural Calculations

Sprint ID:	CT03XC354
KMB Project No:	332.1475
Date:	7/5/2012

Loading Summary

Platform

Dead Loads
Existing Equipment

Cabinet	Weight, lbs (Each)	Quantity
Spring Equipment Cabinet	1,625	1
Battery Cabinet	1,625	2

Proposed Equipment

Cabinet	Weight, lbs (Each)	Quantity
Battery Cabinet	1,625	2
9928 Equipment Cabinet	1,390	1
DC Distribution Box	200	1

Grating: 9 psf
Handrail and misc.: 6 psf

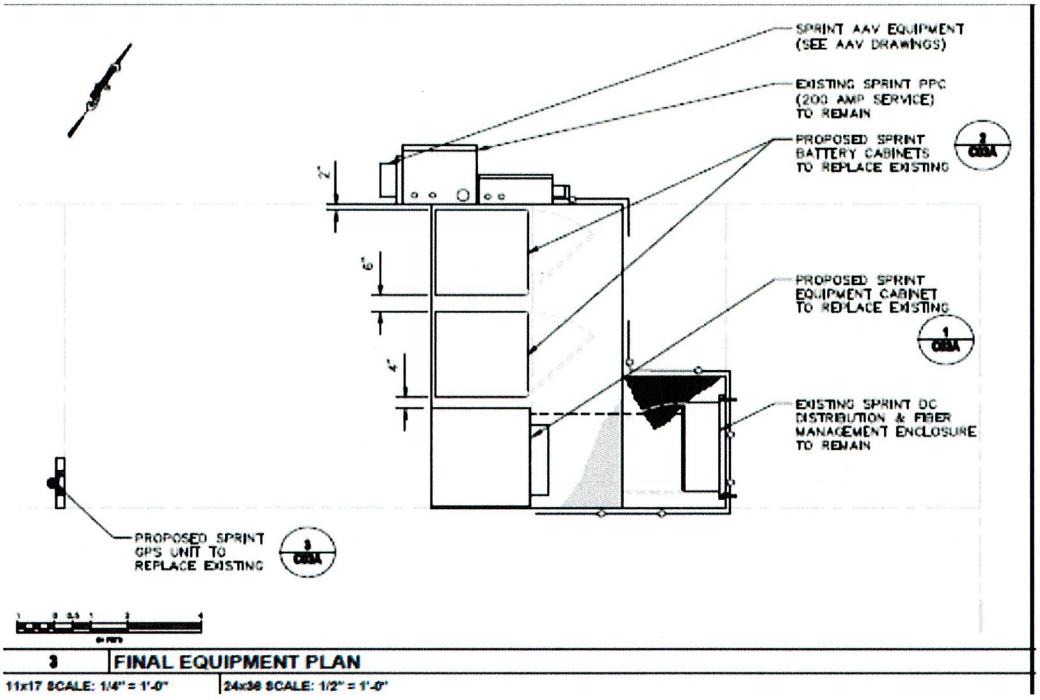
Self weight of Steel Platform: Included in the analysis

Live Load: 30 psf

The dead loads from the equipment and live load are converted to corresponding uniform loads and assigned to appropriate members.

The analysis identifies the maximum shear stress, bending stress and deflection and compares the actual values to the allowable.

Sprint ID:	CT03XC354
KMB Project No:	332.1475
Date:	7/5/2012



PLATFORM PLAN VIEW

CT03XC354

VisualAnalysis 6.00 Report

Project File: 332.1475.vap
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Member Min/Max Displacements

Extreme	Item	Member	Result Case Name	Offset in	Dy in	Dz in
Max	Dy	BmX001	16-9	0.000	-0.000	-0.000
Max	Dz	BmX001	16-9	0.000	-0.000	-0.000
Min	Dy	BmX001	16-9	150.00	-0.484	0.000
Min	Dz	BmX001	16-9	0.000	-0.000	-0.000

MAX. DISPLACEMENT

Member Min/Max Stresses

Extreme	Item	Member	Result Case Name	Offset in	fa Ksi	fby(+z) Ksi	fby(-z) Ksi	fbz(+y) Ksi	fbz(-y) Ksi
Max	fby(+z)	BmX001	16-9	0.000	0.000	0.000	-0.000	0.000	-0.000
Max	fby(-z)	BmX001	16-9	0.000	0.000	0.000	-0.000	0.000	-0.000
Max	fbz(+y)	BmX001	16-9	300.00	0.000	0.000	-0.000	0.000	-0.000
Max	fbz(-y)	BmX001	16-9	132.00	0.000	0.000	-0.000	-10.175	10.175
Max	fx	BmX001	16-9	0.000	0.000	0.000	-0.000	0.000	-0.000
Min	fby(+z)	BmX001	16-9	0.000	0.000	0.000	-0.000	0.000	-0.000
Min	fby(-z)	BmX001	16-9	0.000	0.000	0.000	-0.000	0.000	-0.000
Min	fbz(+y)	BmX001	16-9	132.00	0.000	0.000	-0.000	-10.175	10.175
Min	fbz(-y)	BmX001	16-9	300.00	0.000	0.000	-0.000	0.000	-0.000
Min	fx	BmX001	16-9	0.000	0.000	0.000	-0.000	0.000	-0.000

MAX. BEAM STRESS

Nodal Reactions

Node	Result Case Name	FX K	FY K	FZ K	MX K-in	MY K-in	MZ K-in
N001	16-9	**0.000**	**2.732**	**0.000**	**-NA-**	**-NA-**	**-NA-**
N002	16-9	0.000	**2.842**	0.000	0.000	-NA-	-NA-

MAX. REACTION

KMB DESIGN GROUP, LLC

Page No.: 0

Project ID: Alcatel-Lucent (CT03XC354) KMB ID 332.1475 Rev: 0
Site: 100 Reef Road By: PRW Chk: JY
Address Fairfield, CT 06824 Date: 7/3/2012 Date: 7/3/2012

Antenna Mount Structural Calculation (All Sectors)
WIND LOAD CALCULATION (Per IBC 2009)

Antenna Height z	110.33	feet
Basic wind speed (3 sec gust)	120	mph
Importance factor, *I*	1.00	
Exposure Category	C	
Located on hill or escarpment?	N	(Y/N)
Direction factor	0.85	

Exposure dependent factors from Tables C6-2 and C6-6

α =	9.5		α–bar =	0.1538
z_g =	900	feet	*b*-bar =	0.65
			c =	0.20
			l =	500
			ε =	0.200

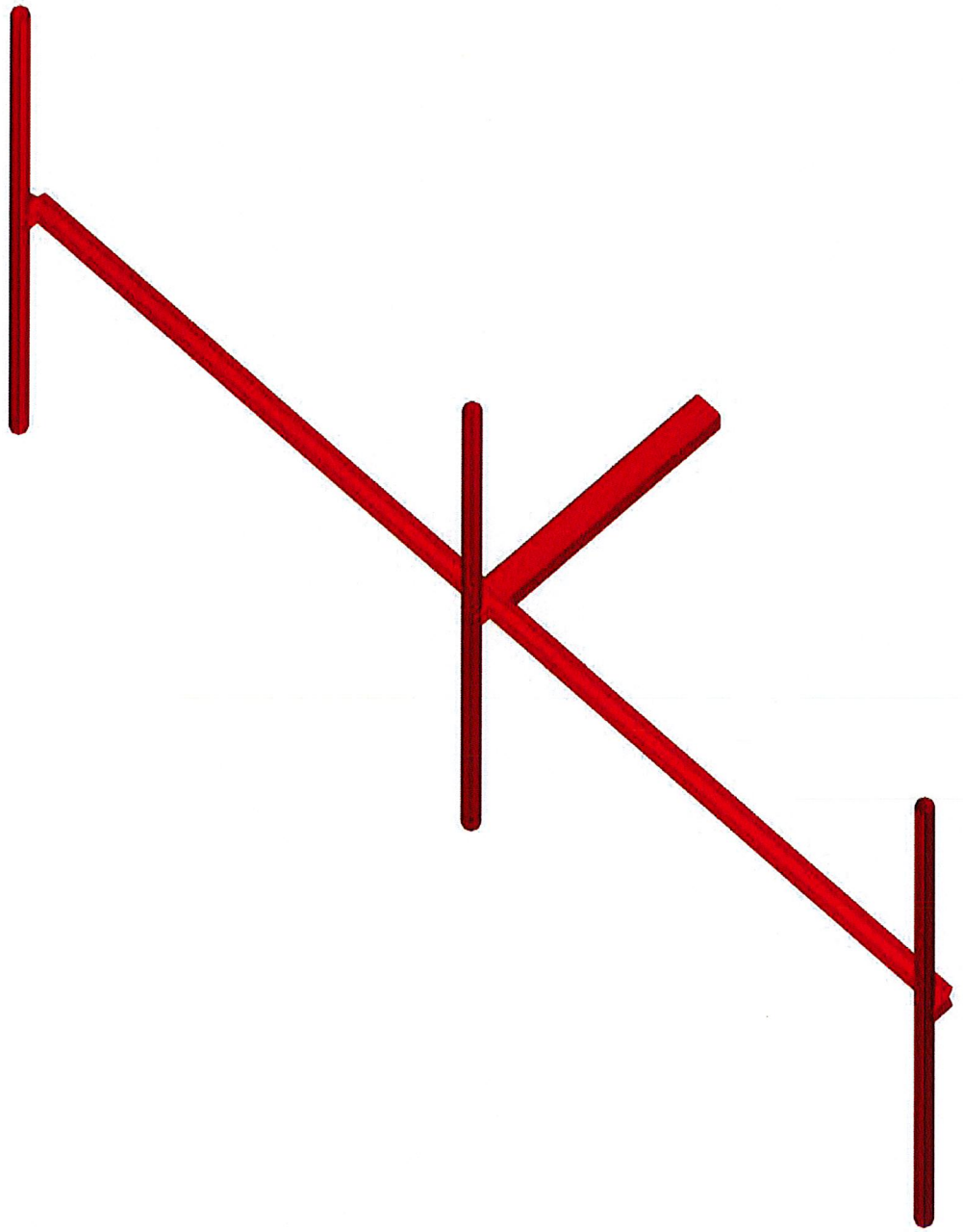
G = 1.000 gust effect factor

Height	*Kzt*	*Kz*	*qz*	*p*
110.33	1.00	1.29	47.63	40.49

Cf 1 =	Cf 2 =	Cf 3 =	Cf 4 =
1.4	1.25	0.7	1.0
p0	*p1*	*p2*	*p3*
56.68	50.61	28.34	40.49

Antenna forces calculations

		A	F	weight
800/1900 Mhz antenna		5.9	334.4202 LBS	65
3" Sch 40 Pipe	3.5		14.76078 *plf*	



CT03XC354

VisualAnalysis 6.00 Report

Project File: 332.1475 ANTENNA.vap
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Nodal Displacements

Node	Result Case Name	DX in	DY in	DZ in	RX deg	RY deg	RZ deg
N001	16-9	-0.000	-0.096	-0.260	0.051	-0.290	0.085
N002	16-9	-0.000	-0.019	-0.000	0.045	-0.000	-0.000
N003	16-9	0.000	-0.096	-0.260	0.051	0.290	-0.085
N004	16-9	-0.000	**-0.000**	**-0.000**	0.000	-0.000	-0.000
N005	16-9	-0.015	-0.099	-0.260	0.051	**-0.290**	0.085
N006	16-9	-0.000	-0.021	-0.000	0.046	-0.000	-0.000
N007	16-9	0.015	-0.099	-0.260	0.051	**0.290**	-0.085
N008	16-9	**-0.087**	**-0.099**	-0.262	-0.020	-0.290	**0.085**
N009	16-9	0.000	-0.021	-0.089	**-0.157**	-0.000	-0.000
N010	16-9	**0.087**	-0.099	-0.262	-0.020	0.290	**-0.085**
N011	16-9	0.056	-0.099	**-0.348**	0.123	-0.290	0.085
N012	16-9	-0.000	-0.021	-0.166	**0.248**	-0.000	-0.000
N013	16-9	-0.056	-0.099	-0.348	0.123	0.290	-0.085

MAX. DEFLECTION

Nodal Reactions

Node	Result Case Name	FX K	FY K	FZ K	MX K-in	MY K-in	MZ K-in
N004	16-9	**0.000**	**0.275**	**0.755**	**-9.734**	**0.000**	**0.000**

Member Min/Max Stresses

Extreme Item	Member	Result Case Name	Offset in	fa Ksi	fby(+z) Ksi	fby(-z) Ksi	fbz(+y) Ksi	fbz(-y) Ksi
Max fby(+z)	COL002-0	16-9	0.000	-0.079	7.600	-7.600	-0.000	0.000
Max fby(-z)	BmZ003	16-9	0.000	-0.057	-0.000	0.000	0.052	-0.052
Max fbz(+y)	BmZ004	16-9	36.000	-0.224	0.000	-0.000	2.496	-2.496
Max fbz(-y)	COL002-1	16-9	48.000	0.000	-0.000	0.000	-0.000	0.000
Max fx	COL001	16-9	48.000	0.014	2.684	-2.684	-0.000	0.000
Min fby(+z)	BmZ003	16-9	0.000	-0.057	-0.000	0.000	0.052	-0.052
Min fby(-z)	COL002-0	16-9	0.000	-0.079	7.600	-7.600	-0.000	0.000
Min fbz(+y)	COL002-1	16-9	48.000	0.000	-0.000	0.000	-0.000	0.000
Min fbz(-y)	BmZ004	16-9	36.000	-0.224	0.000	-0.000	2.496	-2.496
Min fx	BmZ004	16-9	0.000	-0.224	0.000	-0.000	0.115	-0.115

MAX. STRESS

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

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

Sprint®

SITE ID: CT03XC354
SITE NAME: SOUTHPORT POLICE DEPARTMENT

NETWORK VISION CONSTRUCTION DRAWINGS

AERIAL VIEW
SCALE: NTS

500 0 500 1000 (IN FEET)

LOCATION MAP
SCALE: NTS

500 0 500 1000 (IN FEET)

DRAWING INDEX

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A01	COVER SHEET
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E02	ELECTRICAL & GROUNDING DETAILS

CODES & STANDARDS

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

State Building Code: 2005 Connecticut Supplement *which includes the 2009 Amendment (effective August 1, 2009) to the 2005 State Building Code.*
2003 International Building Code
2003 International Residential Code
2003 International Existing Building Code
2003 International Mechanic Code
2003 International Plumbing Code
2006 International Energy Conservation Code *(new edition adopted with changes-effective August 1, 2009)*
2009 International Energy Conservation Code with Connecticut Amendments *(effective October 7, 2011)*
ICC/ANSI A117.1-2003 Accessible and Usable Buildings and Facilities
2005 National Electrical Code (NFPA-70)

DRIVING DIRECTIONS

1. DEPART 1 INTERNATIONAL BLVD, MAHWAH, NJ 07495
2. HEAD NORTH ON INTERNATIONAL BLVD TOWARD QUEENSLAND RD
3. TURN RIGHT ONTO PARK LN
4. CONTINUE STRAIGHT ONTO LEISURE LN
5. SLIGHT RIGHT ONTO NJ-17 N
6. TAKE THE EXIT TOWARD I-287 N/NJ-17 N
7. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR I-287 N/I-87/NJ-17 N/N Y. THRUWAY AND MERGE ONTO I-287 N/NJ-17 N
8. ENTERING NEW YORK
9. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR I-87 S/I-287/TAPPAN ZEE BR/NEW YORK CITY/NEW YORK THRUWAY AND MERGE ONTO I-287 E/I-87 S
10. CONTINUE TO FOLLOW I-287 E
11. TAKE THE EXIT ONTO I-95 N
12. ENTERING CONNECTICUT
13. TAKE EXIT 27A FOR CONNECTICUT 25/CONNECTICUT 8 TOWARD TRUMBULL/WATERBURY
14. MERGE ONTO CT-25 N/CT-8 N
15. TAKE EXIT 5 TOWARD US-1/BOSTON AVE/NORTH AVE
16. SHARP RIGHT ONTO CHOPSEY HILL RD
17. TURN RIGHT ONTO CHOPSEY HILL RD/POND ST
18. CONTINUE TO FOLLOW CHOPSEY HILL RD

SITE INFORMATION

PARCEL ID : 182 670

ZONING JURISDICTION TOWN OF FAIRFIELD

PROJECT INFORMATION:

SITE ADDRESS:
100 REEF ROAD
FAIRFIELD, CT 06824
FAIRFIELD COUNTY

COORDINATES:
LATITUDE: 41° 08' 22.46"N
LONGITUDE: 73° 15' 26.49" W
DATUM : NAD 83

STRUCTURE HEIGHT:
±145'-0" (TOP OF MONOPOLE)

PROJECT DIRECTORY:

PROPERTY OWNER:
FAIRFIELD TOWN
725 OLD POST RD
FAIRFEILD CT 06824 6684

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

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

POWER COMPANY:
THE UNITED ILLUMINATING COMPANY
157 CHURCH STREET
NEW HAVEN, CT 06510
1-800-7-CALL-UI

CONSTRUCTION MANAGER:
TODD AMAN
(914) 715-9363

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1800 ROUTE 34, SUITE 209
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(732) 280-5623

Stephen A. Bray
PROFESSIONAL ENGINEER
STATE OF CONNECTICUT · STEPHEN A. BRAY · No. 26557 · LICENSED PROFESSIONAL ENGINEER
CT LICENSE: 26657 11/7/12

PROJECT NUMBER: **332.1475**

SITE INFORMATION:
100 REEF ROAD
FAIRFIELD, CT 06824
FAIRFIELD COUNTY

CT03XC354

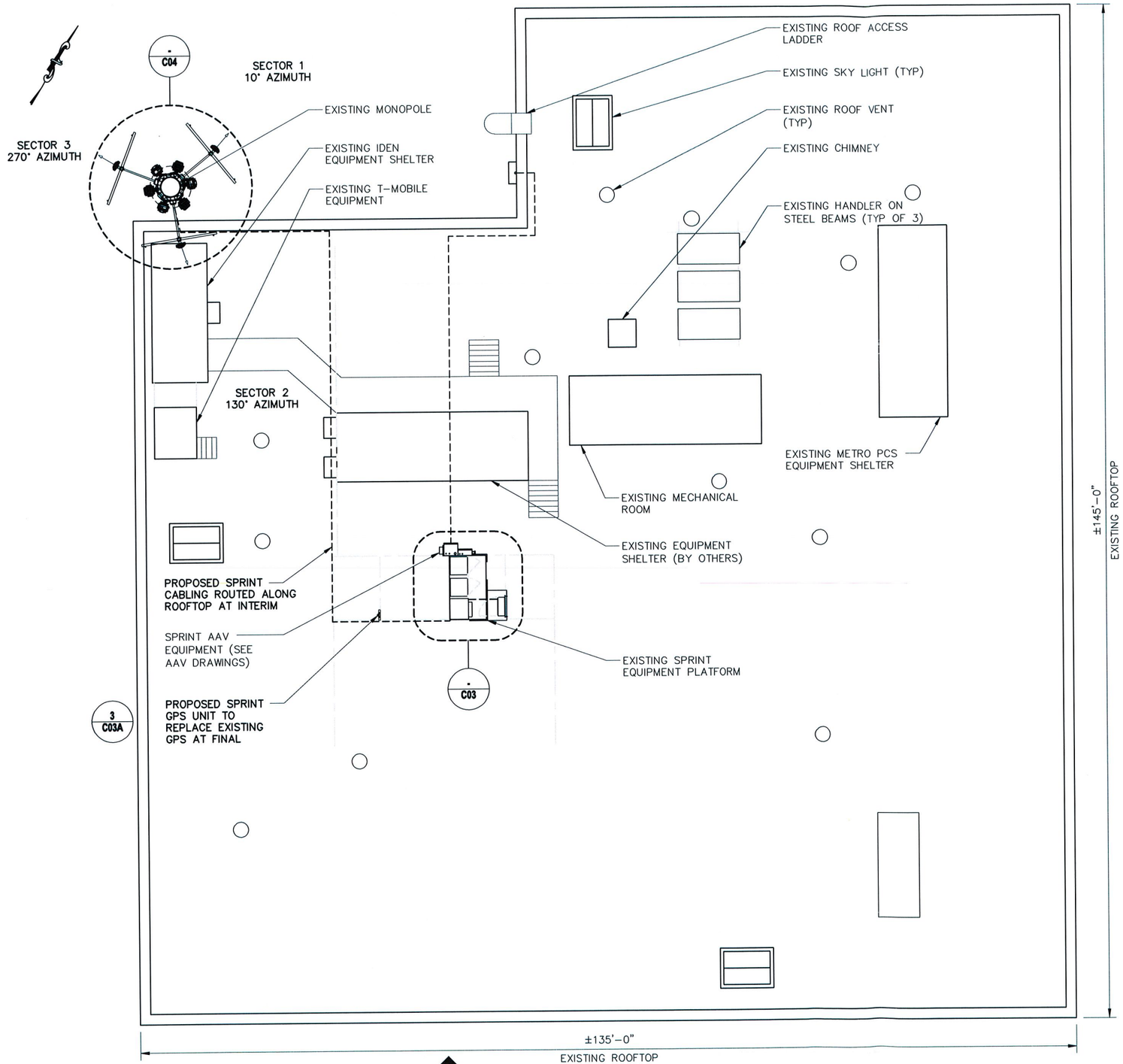
PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
RJS		05-28-12

SHEET TITLE: COVER SHEET

SHEET NUMBER: A01 REV.: 0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1475_CT03XC354_100 Reef Road\332.1475_CAD\332.1475_Construction\332.1475.A01.dwg, 11/7/2012 3:30:17 PM, KZimmerman



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

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

1 **COMPOUND PLAN**

11x17 SCALE: 1/16" = 1'-0" | 24x36 SCALE:1/8" = 1'-0"

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DRAWN BY:	CHECKED BY:	DATE:
RJS		05-28-12

SHEET TITLE: COMPOUND PLAN

SHEET NUMBER: C02 | REV.: 0

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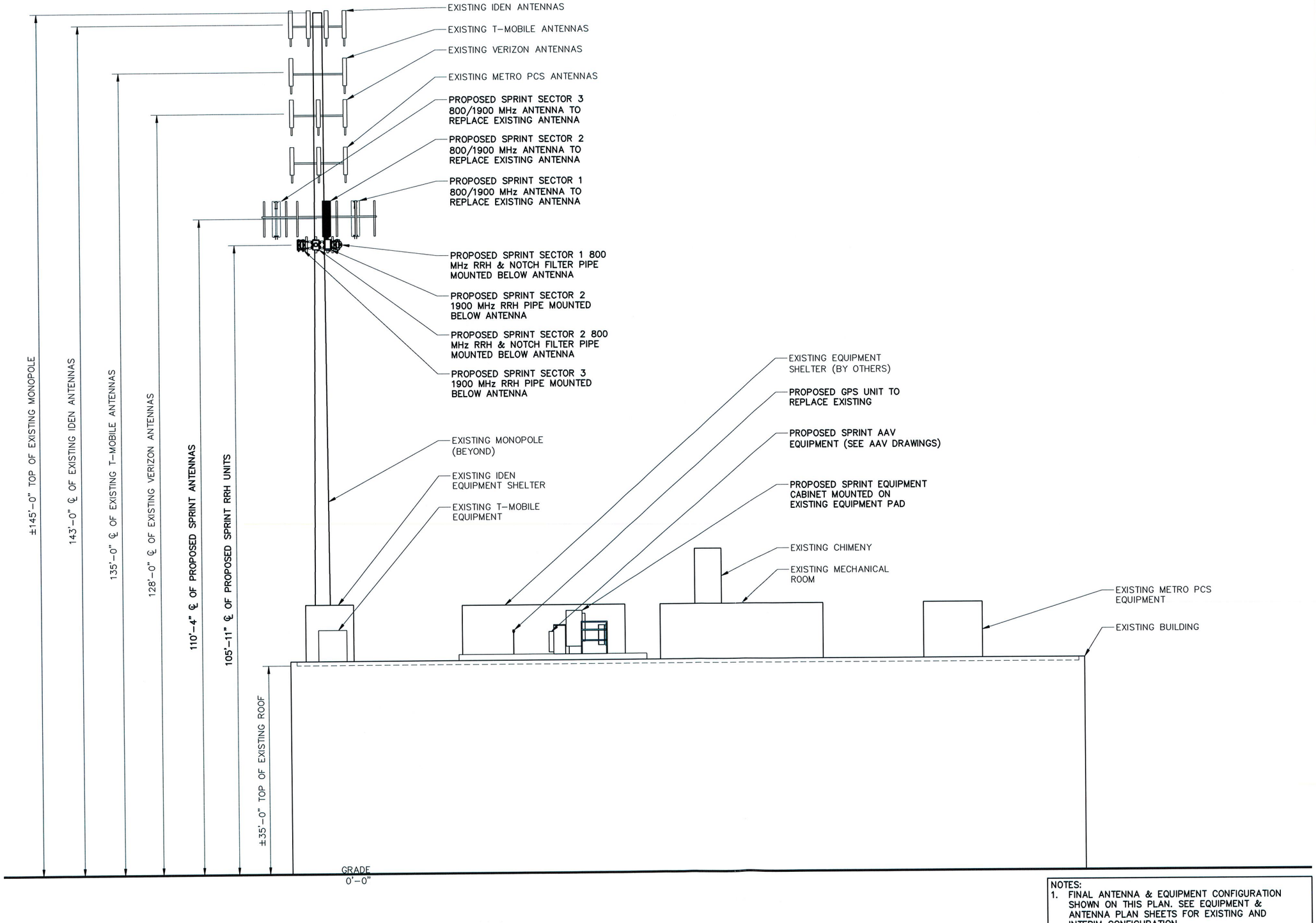

NOTES:
1. FINAL ANTENNA & EQUIPMENT CONFIGURATION SHOWN ON THIS PLAN. SEE EQUIPMENT & ANTENNA PLAN SHEETS FOR EXISTING AND INTERIM CONFIGURATION.

1 **SOUTHEAST ELEVATION**

11x17 SCALE: 1/16" = 1'-0" | 24x36 SCALE: 1/8" = 1'-0"

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PROJECT TYPE: NETWORK VISION

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RJS		05-28-12

SHEET TITLE: ELEVATION

SHEET NUMBER: C02A | REV.: 0

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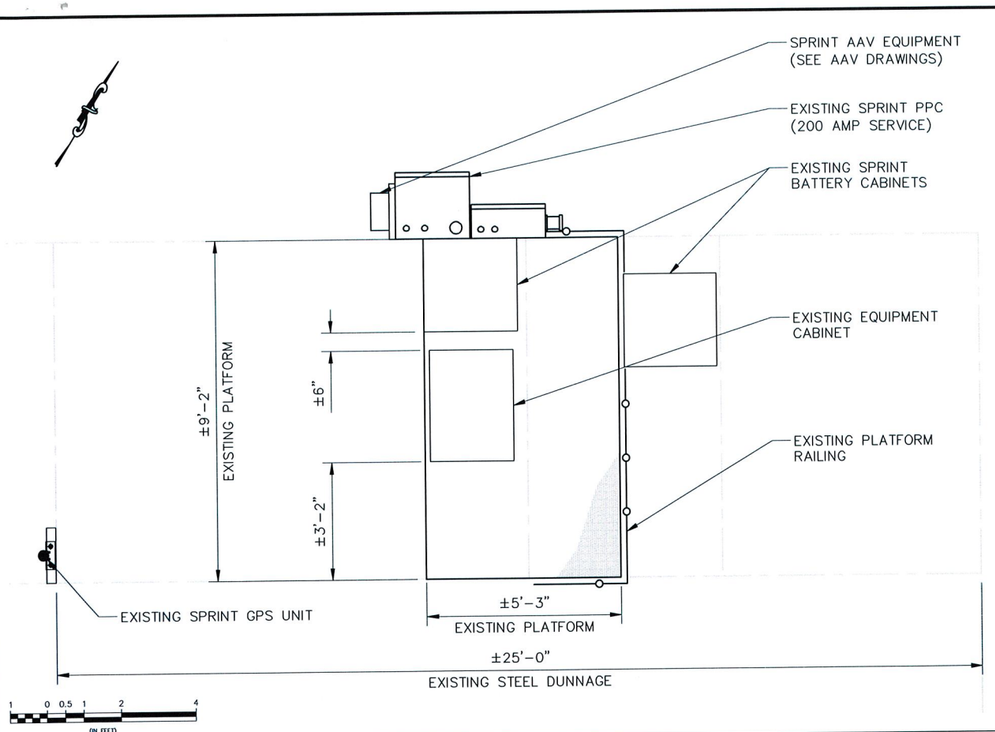
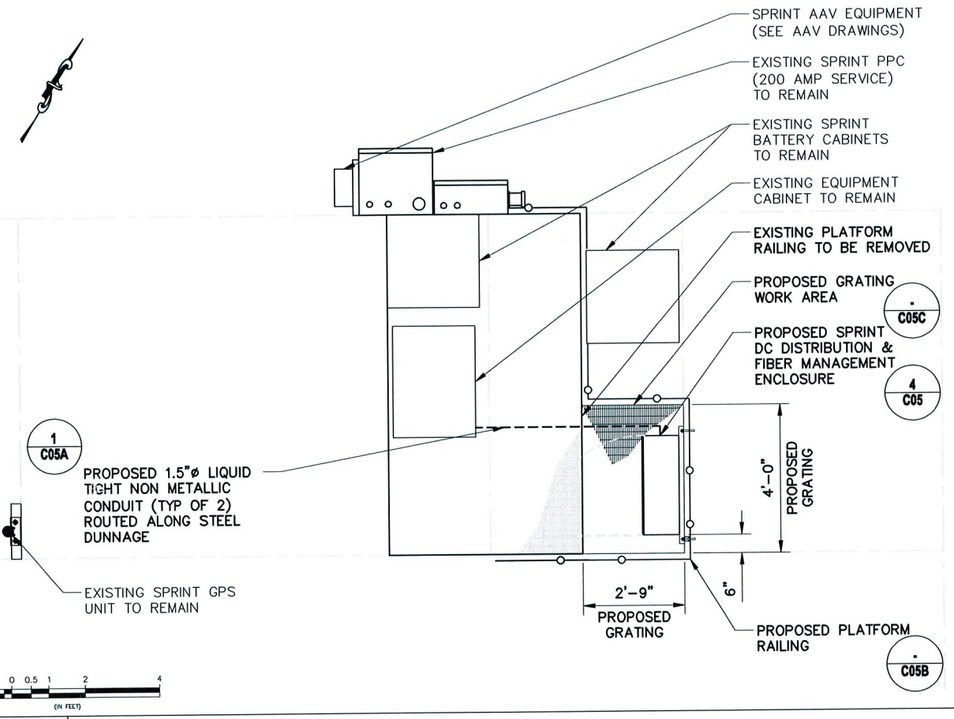


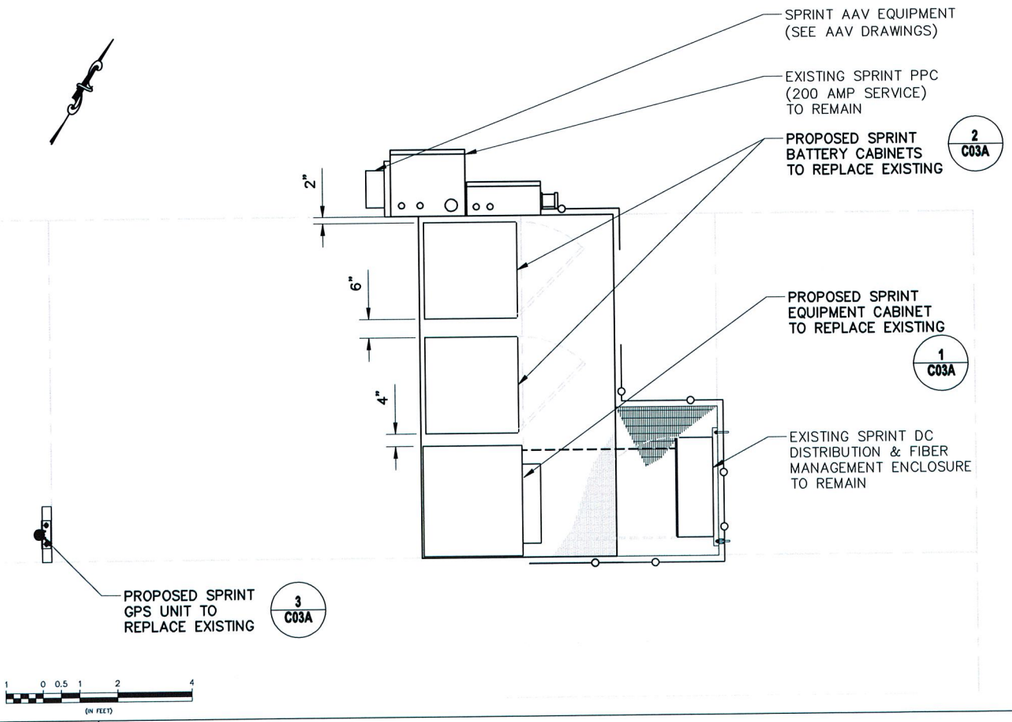
1 EXISTING EQUIPMENT PLAN

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



2 INTERIM EQUIPMENT PLAN

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



3 FINAL EQUIPMENT PLAN

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

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

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FAIRFIELD, CT 06824
FAIRFIELD COUNTY

CT03XC354

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
RJS		05-28-12

SHEET TITLE: EQUIPMENT PLANS

SHEET NUMBER: C03 | REV.: 0

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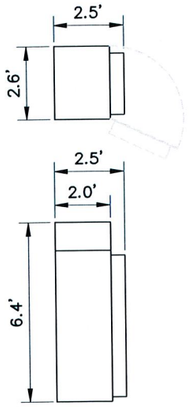
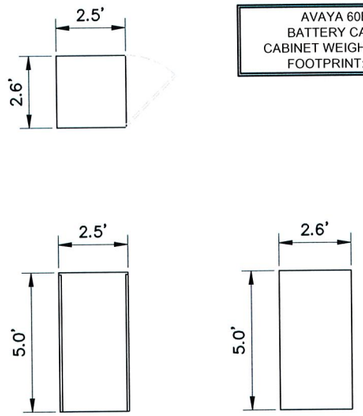


9927
EQUIPMENT CABINET
CABINET WEIGHT: 1020 lbs
FOOTPRINT: 5.3 SF

1 EQUIPMENT CABINET SPECIFICATIONS

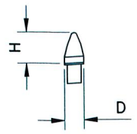
11x17 SCALE: 3/16" = 1'-0" | 24x36 SCALE: 3/8" = 1'-0"



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

2 BATTERY CABINET SPECIFICATION

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



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

3 GPS UNIT SPECIFICATIONS

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

DETAIL NOT USED

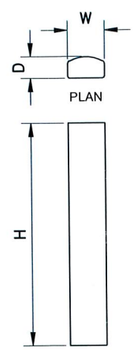
4

DETAIL NOT USED

5

DETAIL NOT USED

6



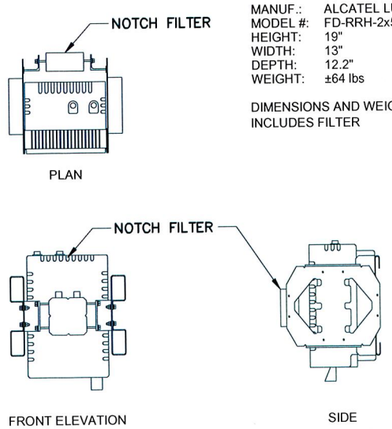
MANUF.: RFS
MODEL: APXVSPP18-C-A20
LENGTH 72.0"
WIDTH: 11.8"
DEPTH: 7.0"
WEIGHT: 64.5 lbs
AREA: 5.9 SF

7 ANTENNA SPECIFICATIONS - 800/1900 MHz

SCALE: NTS

DETAIL NOT USED

8

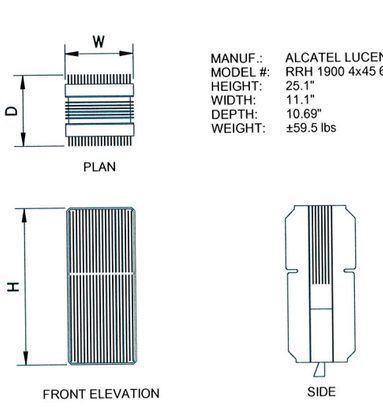


MANUF.: ALCATEL LUCENT
MODEL #: FD-RRH-2x50-800
HEIGHT: 19"
WIDTH: 13"
DEPTH: 12.2"
WEIGHT: ±64 lbs

DIMENSIONS AND WEIGHT INCLUDES FILTER

9 RRH SPECIFICATIONS - 800 MHz

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



MANUF.: ALCATEL LUCENT
MODEL #: RRH 1900 4x45 65MHz
HEIGHT: 25.1"
WIDTH: 11.1"
DEPTH: 10.69"
WEIGHT: ±59.5 lbs

10 RRH SPECIFICATIONS - 1900 MHz

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

DETAIL NOT USED

11

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PROJECT NUMBER: 332.1475

SITE INFORMATION:
100 REEF ROAD
FAIRFIELD, CT 06824
FAIRFIELD COUNTY

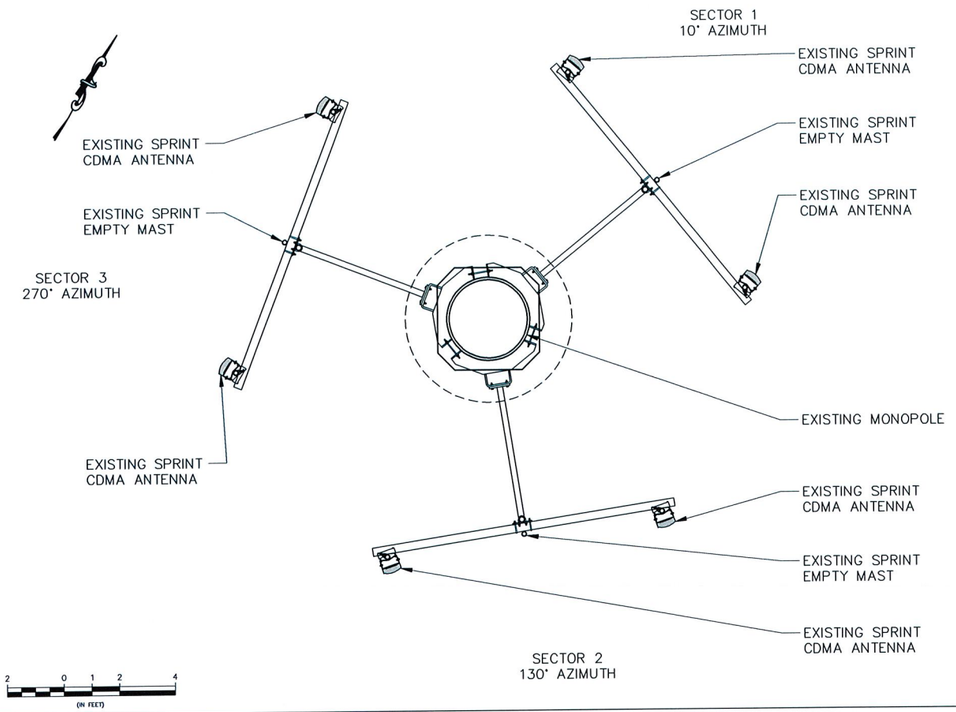
CT03XC354

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
RJS		05-28-12

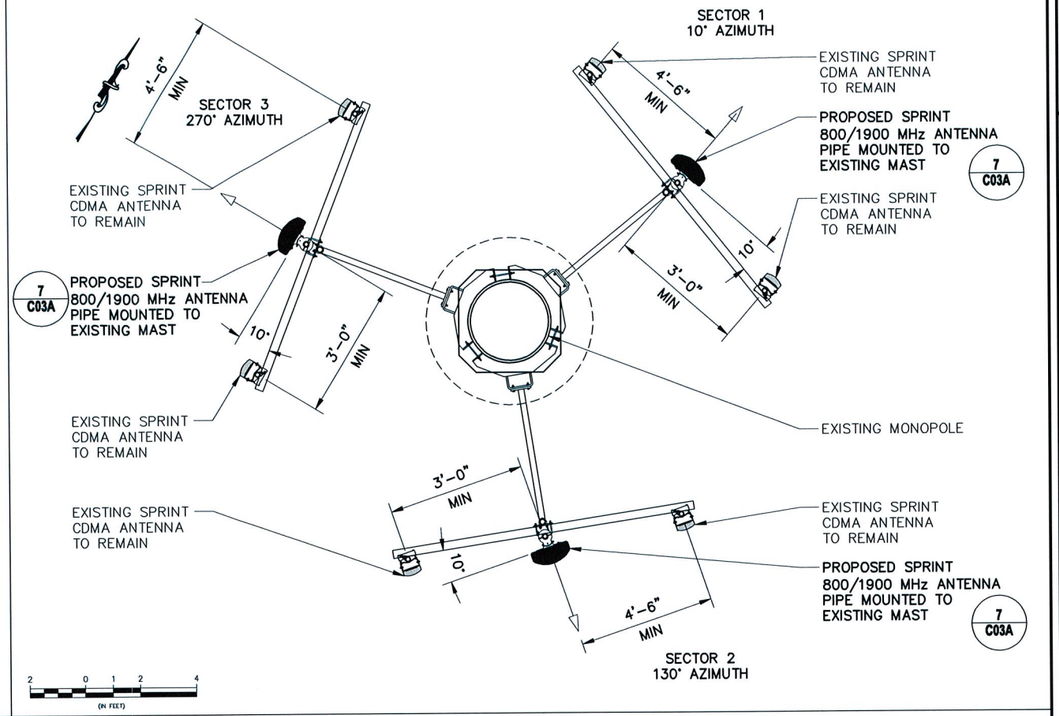
SHEET TITLE: EQUIPMENT & ANTENNA SPECIFICATIONS

SHEET NUMBER: C03A | REV.: 0



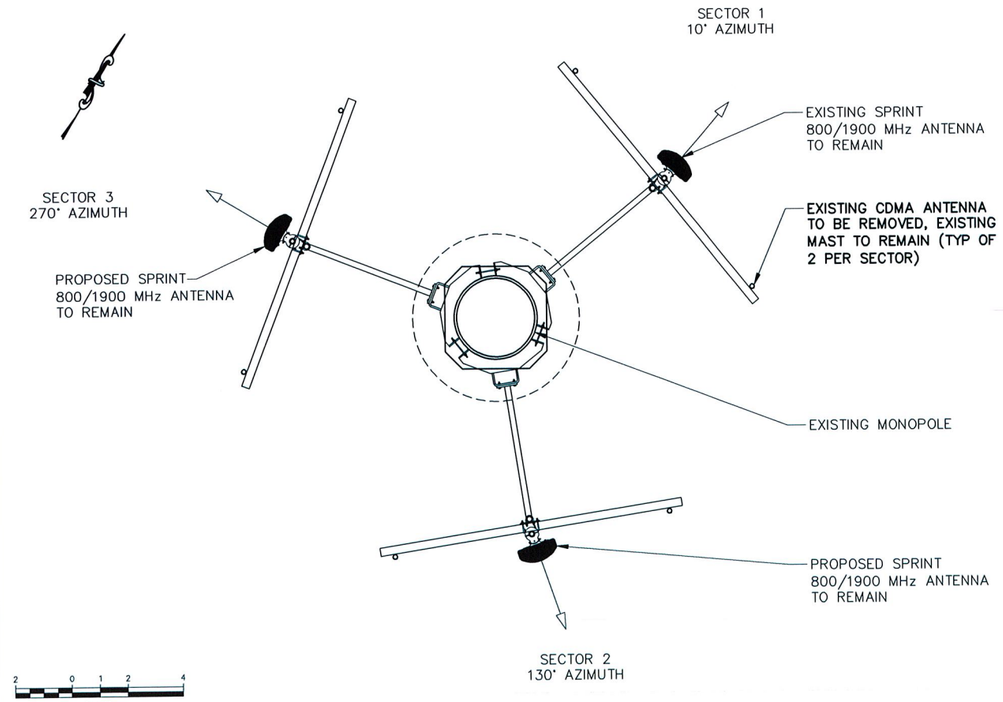
1 **EXISTING ANTENNA PLAN @ ±110'-4" AGL (ALL SECTORS)**

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



2 **INTERIM ANTENNA PLAN @ ±110'-4" AGL (ALL SECTORS)**

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



3 **FINAL ANTENNA PLAN @ ±110'-4" AGL (ALL SECTORS)**

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

NOTE:
1. CONTRACTOR TO REPLACE ALL MISSING GROUND BARS AND GROUNDING CONNECTIONS AS REQUIRED WITH GALVANIZED GROUND BARS. CONTRACTOR SHALL PROVIDE BEFORE & AFTER PHOTOS.

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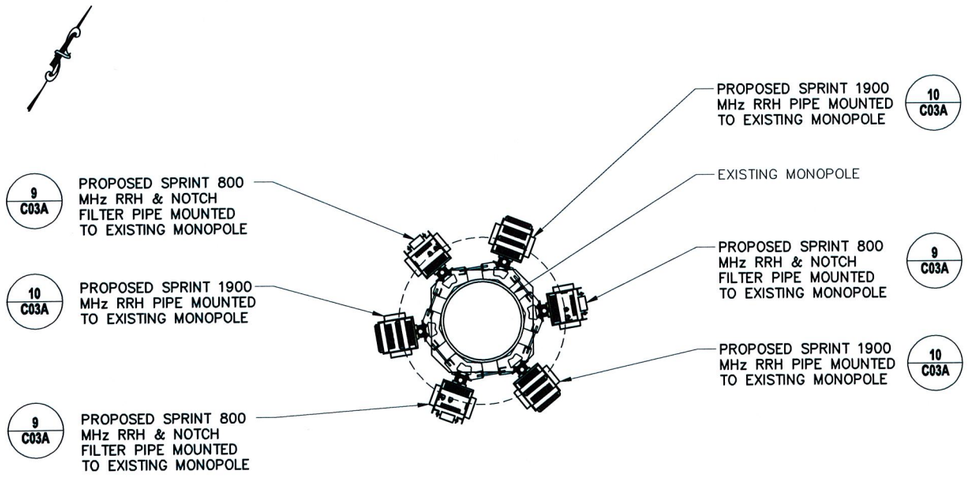
RJS		05-28-12

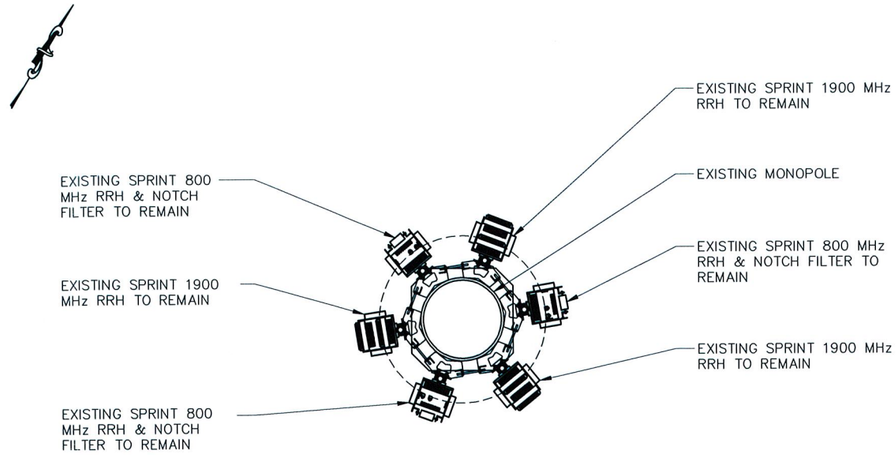
SHEET TITLE:
ANTENNA PLANS
(ALL SECTORS)

SHEET NUMBER:	REV.:
C04	0



1 **INTERIM RRH PLAN @ ±105'-11" AGL (ALL SECTORS)**

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



2 **FINAL RRH PLAN @ ±105'-11" AGL (ALL SECTORS)**

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

NOTE:
1. CONTRACTOR TO REPLACE ALL MISSING GROUND BARS AND GROUNDING CONNECTIONS AS REQUIRED WITH GALVANIZED GROUND BARS. CONTRACTOR SHALL PROVIDE BEFORE & AFTER PHOTOS.

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SHEET TITLE:
RRH PLANS
(ALL SECTORS)

SHEET NUMBER:	REV.:
C04A	0

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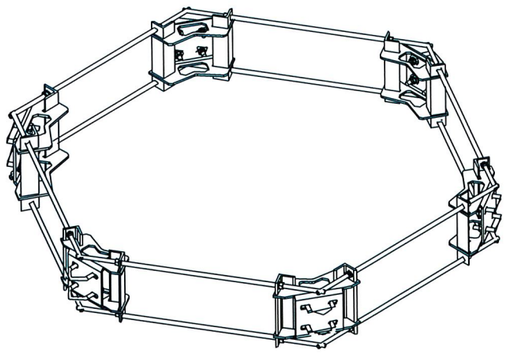

NOTE:
RRHs NOT SHOWN FOR CLARITY.

SIX SECTOR PIPE RING MOUNT KIT
BY COMMSCOPE, PART # RR-RM1560
OR AN APPROVED EQUAL
KIT INCLUDES:
MOUNT, THREADED ROD & (12)
2-3/8" U-BOLTS

1 **RRH MOUNT DETAIL**

SCALE: NTS

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SHEET TITLE:
RRH MOUNT DETAILS
(ALL SECTORS)

SHEET NUMBER:	REV.:
C04B	0

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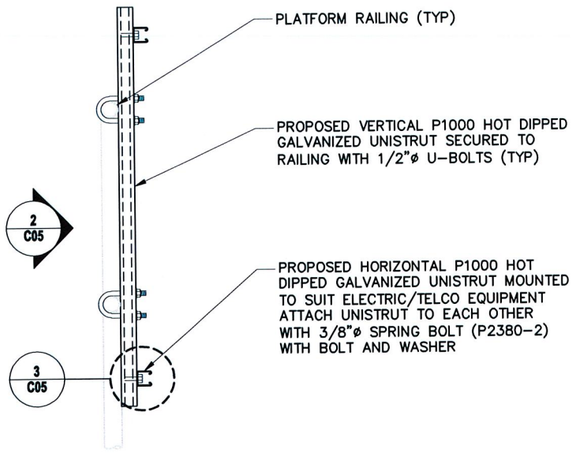
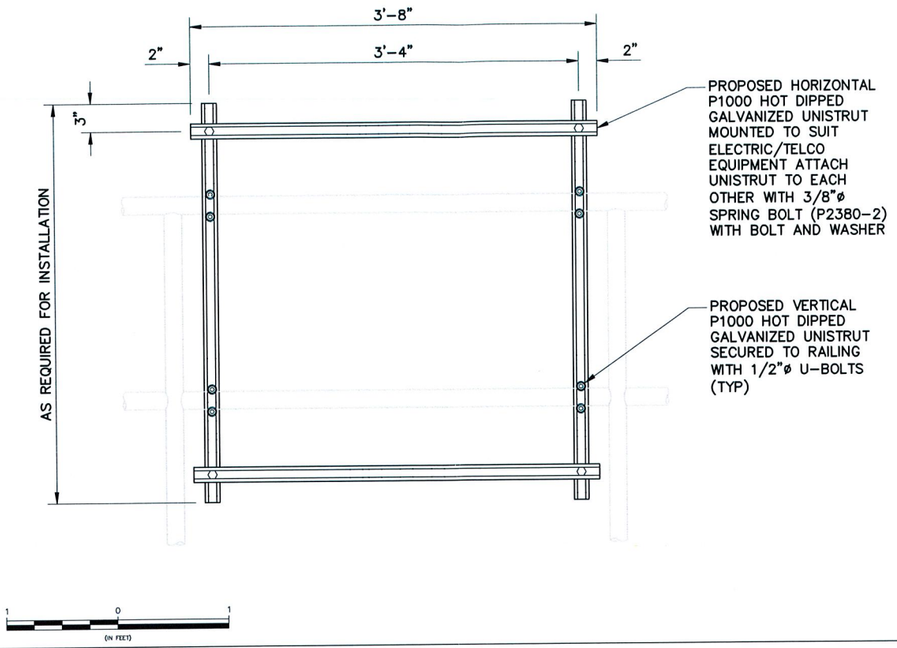
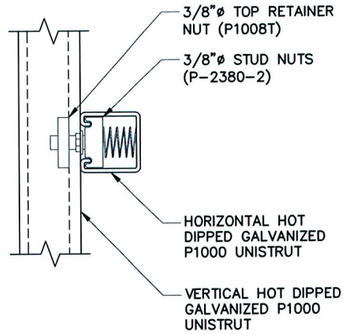


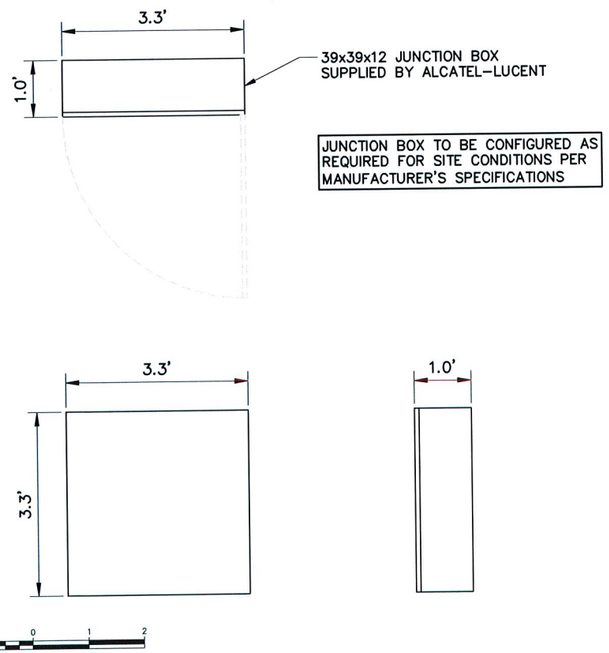
1	UNISTRUT BACKBOARD SECTION	
11x17 SCALE: 3/4" = 1'-0"	24x36 SCALE: 1 1/2" = 1'-0"	



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



3	UNISTRUT CONNECTION DETAIL	
11x17 SCALE: 3" = 1'-0"	24x36 SCALE: 6" = 1'-0"	



4	DC DISTRIBUTION & FIBER MGMT ENCLOSURE DETAIL	
11x17 SCALE: 3/8" = 1'-0"	24x36 SCALE: 3/4" = 1'-0"	

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CT LICENSE: 26657 11/7/12

PROJECT NUMBER:
332.1475

SITE INFORMATION:
100 REEF ROAD
FAIRFIELD, CT 06824
FAIRFIELD COUNTY

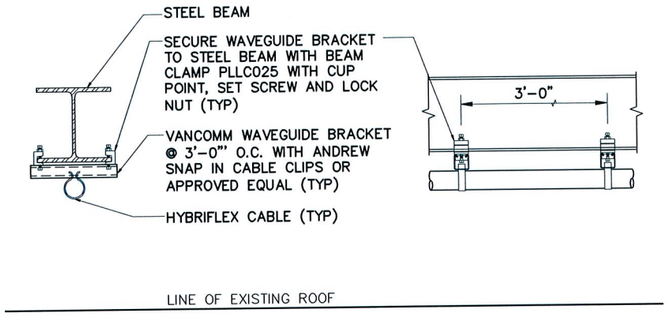
CT03XC354

PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
RJS		05-28-12

SHEET TITLE:
SITE
DETAILS

SHEET NUMBER:	REV.:
C05	0

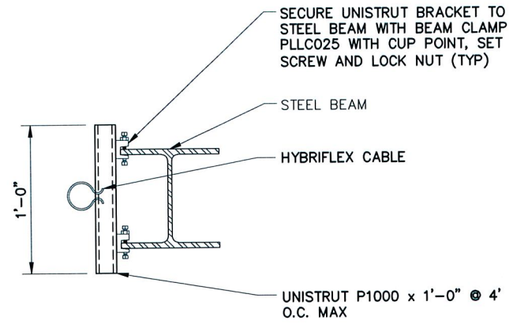


NOTE:
1. UTILIZE EXISTING UNISTRUT IF AVAILABLE.
2. PROVIDE NEW UNISTRUT IF ADEQUATE SPACE ON EXISTING UNISTRUT IS NOT AVAILABLE OR UNISTRUTS DO NOT EXIST.

1 0 1
(IN FEET)

1 CABLE ROUTING DETAIL ALONG STEEL

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



NOTE:
1. UTILIZE EXISTING UNISTRUT IF AVAILABLE.
2. PROVIDE NEW UNISTRUT IF ADEQUATE SPACE ON EXISTING UNISTRUT IS NOT AVAILABLE OR UNISTRUTS DO NOT EXIST.

.5 0 .5
(IN FEET)

2 ALTERNATE CABLE ROUTING DETAIL ALONG STEEL

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

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PROJECT NUMBER: 332.1475

SITE INFORMATION:
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FAIRFIELD, CT 06824
FAIRFIELD COUNTY

CT03XC354

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
RJS		05-28-12

SHEET TITLE: SITE DETAILS

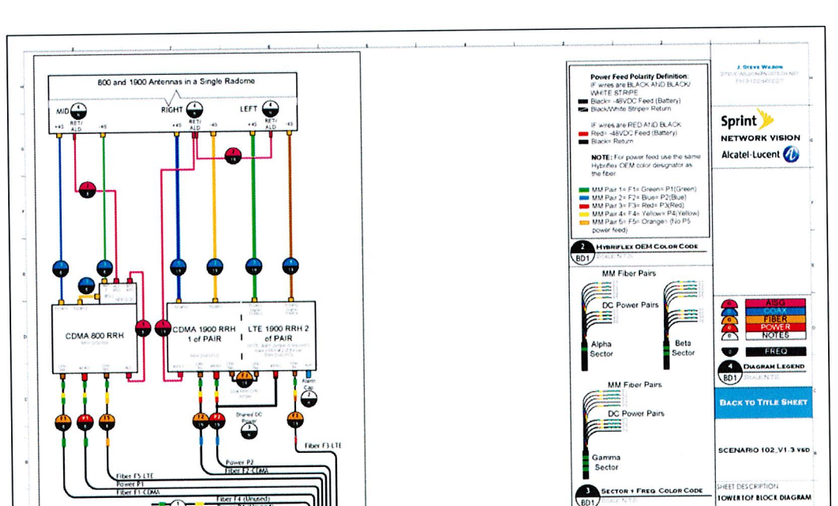
SHEET NUMBER: C05A | REV.: 0

FINAL ANTENNA AND CABLE SCHEDULE

SECTOR	ANTENNA	AZIMUTH (DEGREES)	MECHANICAL DT (DEGREES)	ELECTRICAL DT (DEGREES)	RAD CENTER AGL (FT)	ANTENNA MAKE	ANTENNA MODEL	RRH QTY	TOP COAX JUMPER QTY	TOP COAX JUMPER LENGTH (FT)	COMBINER JUMPER QTY	COMBINER JUMPER LENGTH (FT)	NOTCH FILTER JUMPER QTY	NOTCH FILTER JUMPER LENGTH (FT)	HYBRIFLEX LENGTH (FT)
1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	200
	800/1900	10	0	800: -3 / 1900: -1	110.3	RFS	APXVSPP18-C-A20	800: 1 / 1900: 1	6	10	–	–	1	3	
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	200
	800/1900	130	0	800: -2 / 1900: -1	110.3	RFS	APXVSPP18-C-A20	800: 1 / 1900: 1	6	10	–	–	1	3	
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	200
	800/1900	270	0	800: -7 / 1900: -1	110.3	RFS	APXVSPP18-C-A20	800: 1 / 1900: 1	6	10	–	–	1	3	
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	

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

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



ALL SECTORS

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FAIRFIELD COUNTY
CT03XC354

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
RJS		05-28-12

SHEET TITLE: RF SCHEDULE

SHEET NUMBER: C06 REV.: 0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1475_CT03XC354_100 Reef Road\332.1475_CAD\332.1475_Construction\332.1475_C06.dwg, 11/7/2012 3:31:12 PM, KZimmerman

GENERAL SPECIFICATIONS

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

GROUNDING NOTES

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

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

ELECTRICAL SPECIFICATIONS

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

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

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

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CT LICENSE: 26657 11/7/12

PROJECT NUMBER: **332.1475**

SITE INFORMATION:
100 REEF ROAD
FAIRFIELD, CT 06824
FAIRFIELD COUNTY

CT03XC354

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
RJS		05-28-12

SHEET TITLE: ELECTRICAL NOTES

SHEET NUMBER: E01 REV.: 0

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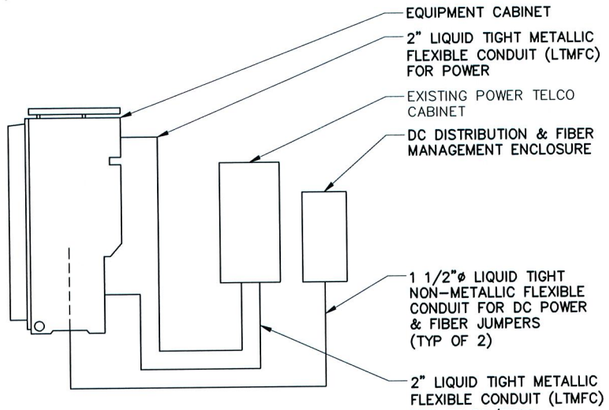
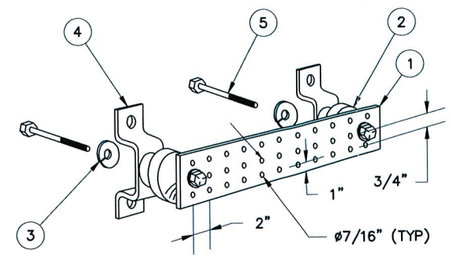


1 PLUMBING SCHEMATIC (IF REQUIRED)

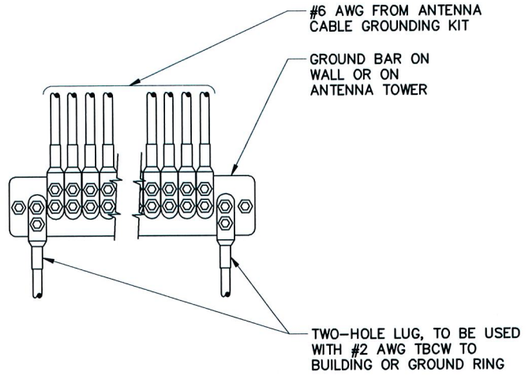
SCALE: NTS



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

2 GROUND BAR DETAIL

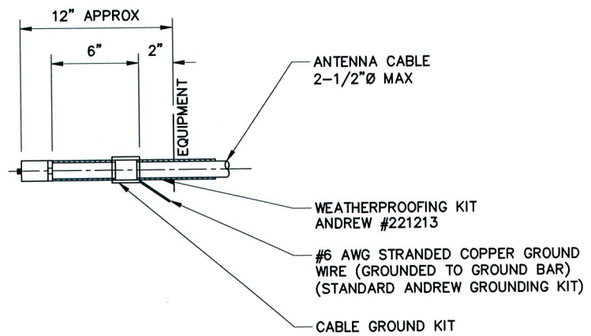
SCALE: NTS



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

3 GROUND LUG TO GROUND BAR CONNECTION DETAIL

SCALE: NTS



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

4 CABLE GROUND KIT CONNECTION DETAIL

SCALE: NTS

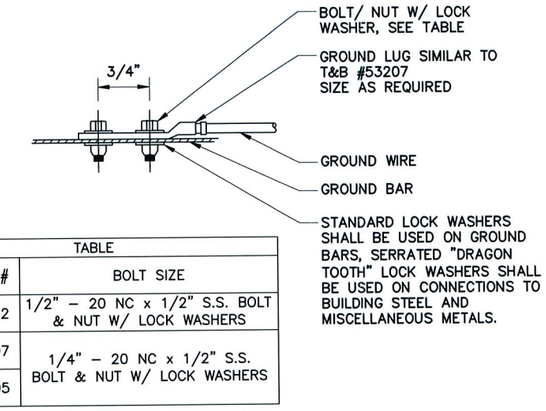
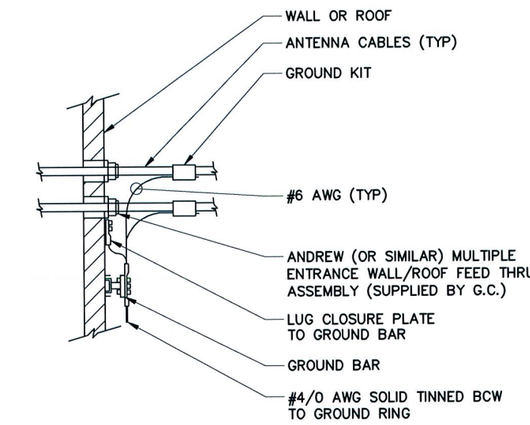


TABLE		
WIRE SIZE	LUG #	BOLT SIZE
#4/0	53212	1/2" – 20 NC x 1/2" S.S. BOLT & NUT W/ LOCK WASHERS
#2	53207	1/4" – 20 NC x 1/2" S.S. BOLT & NUT W/ LOCK WASHERS
#6	53205	

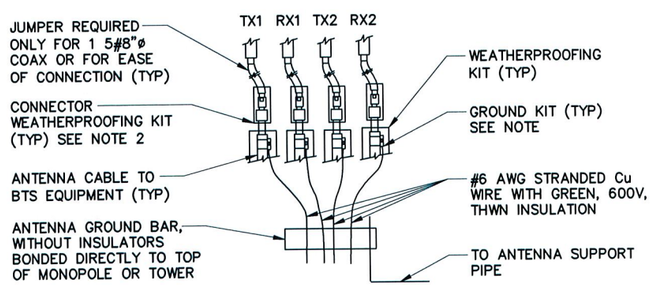
5 GROUND LUG CONNECTION DETAIL

SCALE: NTS



6 CABLE GROUNDING DETAIL

SCALE: NTS



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

7 GROUND BAR TO GROUND WIRE CONNECTION DETAIL

SCALE: NTS

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SITE INFORMATION:
100 REEF ROAD
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FAIRFIELD COUNTY

CT03XC354

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
RJS		05-28-12

SHEET TITLE: ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER: E02 REV.: 0

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KMB DESIGN GROUP

Structural Analysis Report
For Tower Modification

For

145ft Monopole
100 Reef Road
Fairfield, CT

Site ID: CT03XC354
Site Name: Southport Police Department

Network Vision MMBS Launch

KMB ID: 332.1475

Prepared For:

Sprint-Nextel
1 International Blvd
Mahwah, NJ 07495

Date: February 26, 2014

Analyzed By:

Jiang J. Yu, P.E.

Reviewed By:

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

Stephen A. Bray, P.E.
CT PE License No. 26657

Contents

1. Introduction

Pursuant to your request, KMB Design Group, LLC (KMB) has completed a structural analysis of the existing monopole structure to evaluate Sprint's existing and proposed antenna and equipment infrastructure with respect to the deployment Network Vision system and ancillary equipment at this installation at a centerline elevation of 105 ft above grade.

This structural analysis was completed according to the recommendations of the "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", ANSI TIA/EIA Standard and International Building Code (IBC) 2003 as adopted in 2005 CT Supplement with 2009 Amendments. Specifically this tower has been analyzed in accordance with the following:

- TIA/EIA-222-F
- 85 mph basic wind - Fairfield County
- 0.5" ice
- 50 mph under service loads
- Structure Class II

2. Information Utilized for the Report

The following documents were provided to us to aid in the preparation of this analysis:

1. Existing Structural Documentation entitled "Structural Analysis Site: Reef Road", prepared by FDH Engineering, Inc. dated March 23, 2009.

2. Existing Structural Documentation entitled "(Revised) Structural Analysis Report" prepared by Hudson Design group, LLC. dated December 20, 2011.

3. Existing and Proposed Tower Loading

The existing antenna information was obtained from the referenced analysis report prepared by Hudson Design Group, LLC, which is included in Appendix B. Proposed Sprint antenna information was obtained from the RF Data Sheet (RFDS) provided to us by Sprint. Our analysis considered the following loading:

Existing Loading (except Sprint loading):

Status	Elevation	Qty.	Antenna Model/Appurtenance	Coax/Conduit
Existing	143 ft	12	Panel Antenna on T-Arm Mount	(9) 7/8" (3) 1 1/4" (6) 1 5/8"
Existing	143 ft	3	RRU	

Existing	143 ft	2	8' 4-Bay Dipole	
Existing	143 ft	1	3ft Dish	
Existing	143 ft	1	2 ½" x 12' Omni	
Existing	135ft	6	Panel Antennas on T-Arm Mount	(6) 1 1/4"
Existing	135ft	3	TMA	(6) 1 5/8"
Existing	135ft	1	24" x 24" Dish	(1) 7/8"
Existing	125ft	6	Allgon 7770 Antennas on T-Arm Mount	
Existing	125ft	12	TMA	(9) 1 1/4"
Existing	125ft	1	1 1/4" x 3' Omni	(3) 1 5/8"
Existing	125ft	1	3" x 3' Omni	(1) 1/2"
Existing	125ft	3	P65-16-XLH-RR Antennas	(1) 7/8"
Existing	125ft	6	RRU	3" Conduit
Existing	125ft	1	Surge Arrestor DC6-48-60-18-8f	
Existing	113 ft	3	Panel Antennas on T-Arm Mount	(6) 1 5/8"

* Centerline

Existing Sprint Loading:

Status	Elevation	Qty.	Antenna Model/Appurtenance	Coax/Conduit
Existing	105ft*	6	Panel Antennas on Platform Mount	(6) 1-5/8"

* Centerline

Proposed Interim Sprint Loading:

Status	Elevation	Qty.	Antenna Model/Appurtenance	Coax/Conduit
Existing	105ft*	6	Panel Antennas on Platform Mount	(6) 1-5/8"
Proposed	***105ft****	***3*** ***3*** ***3***	***APXVSPP18-C-A20 on Platform Mount*** ***RRH 1900 on Collar Mount*** ***RRH 800 on Collar Mount***	***(3) Hybriflex***

* Centerline

Proposed Final Sprint Loading:

Status	Elevation	Qty.	Antenna Model/Appurtenance	Coax/Conduit
Proposed	***105 ft****	***3*** ***3*** ***3***	***APXVSPP18-C-A20 on Platform Mount*** ***RRH 1900 on Collar Mount*** ***RRH 800 on Collar Mount***	***(3) Hybriflex***

* Centerline

Ultimate user is responsible to verify that the tower loading, as represented above, is the actual as-built tower loading. In the event of discrepancies, ultimate user shall notify KMB and a revised structural review must be conducted prior to any tower, antenna and appurtenance placement or modifications on the existing structure.

4. Analysis Method

Tnx Tower 6.0, a commercially available engineering software programs, was used to create a theoretical mathematical model of the tower members and calculate primary member stresses under various loading conditions.

It should be noted that the referenced analysis prepared by Hudson Design Group indicated that the monopole structure required modifications. At the time of our site visit, these modifications were not installed. Hence we have not considered these modifications as a part of our design and have modeled this pole in accordance with the proposed modifications shown in the construction drawings prepared by our firm. Nevertheless, the existing antenna loading information is obtained from the analysis prepared by Hudson Design Group.

Selected output from the analysis is included in Appendix A.

5. Assumptions

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the existing tower structure. Specifically, we assumed that the tower and foundations were erected, inspected and have been maintained according to the manufacturer's plans and specifications.

6. Tower Analysis Results

Monopole and Baseplate

Based on the above monopole loading scenarios and our structural analysis, the interim loading configuration will provide the maximum stress on the tower.

Below is a summary of results for the shafts on the pole showing their capacities after the proposed modifications are installed:

Section No.	*Elevation ft*	*Component Type*	*Size*	*% Capacity*	*Pass Fail*
L1	145 - 90.8333	Pole	TP33.48x23.61x0.2813	70.9	Pass
L2	90.8333 - 59.083	Pole	TP38.6863x31.976x0.375	97.5	Pass
L3	59.083 - 42.8333	Pole	TP41.64x38.6863x0.4807	101.0	Pass
L4	42.8333 - 40.5	Pole	TP41.3166x39.5577x0.5416	99.4	Pass
L5	40.5 - 0	Pole	TP48.69x41.3166x0.6219	101.1	Pass
				Summary	
			Pole (L5)	101.1	Pass ✔

Post modifications, the base plate will be stressed to 62.5% of the allowable capacity and the anchor rods will be stressed to 90.1% of its allowable capacity.

Foundation

Please note that the existing tower foundation drawings, geotechnical investigation and design reports were not available to KMB Design Group for evaluation. As such, no opinion regarding its structural stability is offered.

7. Conclusion

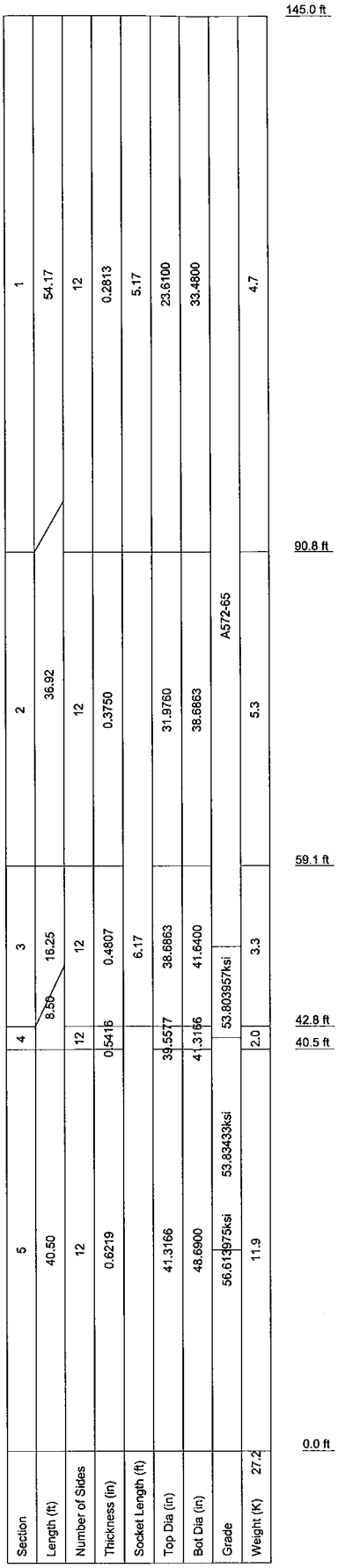
Based on the structural analysis with proposed loading, KMB Design Group, LLC concludes the existing monopole, base plate and anchor rods with the proposed modifications are structurally adequate to support the proposed loading.

Please refer to the Structural Modification Drawings prepared by our office dated February 21, 2014 for further details.

Should you have any questions or comments do not hesitate to contact us.

Appendix A

tnx Tower Output For
Interim Loading



Section	1	2	3	4	5
Length (ft)	54.17	36.92	16.25	8.50	40.50
Number of Sides	12	12	12	12	12
Thickness (in)	0.2813	0.3750	0.4807	0.5416	0.6219
Socket Length (ft)	5.17		6.17		
Top Dia (in)	23.6100	31.9760	38.6863	39.5577	41.3166
Bot Dia (in)	33.4800	38.6863	41.6400	41.3166	48.6900
Grade	A572-65		53.803957ksi		53.83433ksi / 56.613975ksi
Weight (K)	4.7	5.3	3.3	2.0	11.9

Total Weight (K): 27.2

DESIGNED APPURTENANCE LOADING

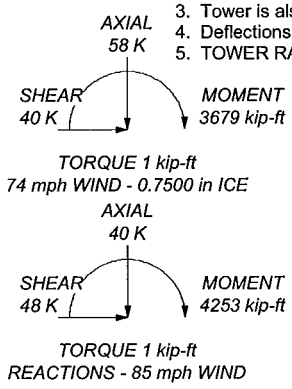
TYPE	ELEVATION	TYPE	ELEVATION
Standoff T-Arm	143	Omni 3"x6'	125
Standoff T-Arm	143	Powerwave P65-16-XLH-RR	125
Standoff T-Arm	143	Powerwave P65-16-XLH-RR	125
Panel Antenna	143	Powerwave P65-16-XLH-RR	125
Panel Antenna	143	(2) Ericsson RRU	125
Panel Antenna	143	(2) Ericsson RRU	125
Panel Antenna	143	(2) Ericsson RRU	125
Panel Antenna	143	Surge Arrestor (DC6-48-60-18-8F)	125
Panel Antenna	143	Valmont Light Duty Tri-Bracket	125
Panel Antenna	143	2"x5' Pipe	125
Panel Antenna	143	2"x5' Pipe	125
Panel Antenna	143	2"x5' Pipe	125
Panel Antenna	143	Standoff T-Arm	125
Panel Antenna	143	Standoff T-Arm	113
Panel Antenna	143	Standoff T-Arm	113
Ericcson RRU	143	Kathrein 800 10504	113
Ericcson RRU	143	Kathrein 800 10504	113
Ericcson RRU	143	Kathrein 800 10504	113
8' 4-Bay Dipole	143	2 1/2"x80"	113
8' 4-Bay Dipole	143	2 1/2"x80"	113
Omni 2 1/2" x 12"	143	2 1/2"x80"	113
Pull Box	143	Standoff T-Arm	113
P3F-52	143	Panel Antenna 60" x 6 1/2" x 3" w/ mount pipe	105
Standoff T-Arm	135		
Standoff T-Arm	135	Panel Antenna 60" x 6 1/2" x 3" w/ mount pipe	105
Panel Antenna	135		
Panel Antenna	135	Panel Antenna 60" x 6 1/2" x 3" w/ mount pipe	105
Panel Antenna	135		
Panel Antenna	135	Panel Antenna 60" x 6 1/2" x 3" w/ mount pipe	105
Panel Antenna	135		
Panel Antenna	135	Panel Antenna 60" x 6 1/2" x 3" w/ mount pipe	105
Panel Antenna	135		
(2) Powerwave TMA	135	Panel Antenna 60" x 6 1/2" x 3" w/ mount pipe	105
(2) Powerwave TMA	135		
(2) Powerwave TMA	135	APXVSPP18-C-A20	105
Dish 24" x 24"	135	APXVSPP18-C-A20	105
Standoff T-Arm	135	APXVSPP18-C-A20	105
Standoff T-Arm	125	RRH - 1900 4x45	105
Standoff T-Arm	125	RRH - 800 2x50	105
(2) Powerwave 7770	125	RRH - 1900 4x45	105
(2) Powerwave 7770	125	RRH - 800 2x50	105
(2) Powerwave 7770	125	RRH - 1900 4x45	105
LGP 21401	125	RRH - 800 2x50	105
LGP 21401	125	PiROD 13' Low Profile Platform	105
LGP 21401	125		
Omni 1 1/4" x 3'	125		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	53.83433ksi	54 ksi	69 ksi
53.803957ksi	54 ksi	69 ksi	56.613975ksi	57 ksi	72 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.75 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 101.1%



KMB Design Group
1800 Route 34, Suite 209
Wall, NJ
Phone: 732-280-5623
FAX: 732-280-3980

Job: ***332.1475 - CT03XC354 - Modification***		
Project: ***145Ft Monopole; 100 Reef Road, Fairfield, CT***		
Client: Sprint	Drawn by: Ekata Shah, P.E.	App'd:
Code: TIA/EIA-222-F	Date: 02/26/14	Scale: NTS
Path:		Dwg No. E-1

tnxTower	Job: 332.1475 - CT03XC354 - Modification	Page: 1 of 12
KMB Design Group 1800 Route 34, Suite 209 Wall, NJ Phone: 732-280-5623 FAX: 732-280-3980	Project: 145Ft Monopole; 100 Reef Road, Fairfield, CT	Date: 14:42:34 02/26/14
	Client: Sprint	Designed by: Ekata Shah, P.E.

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 Fairfield County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length in	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	145.00-90.83	54.17	62.00	12	23.6100	33.4800	0.2813	1.1250	A572-65 (65 ksi)
L2	90.83-59.08	36.92	0.00	12	31.9760	38.6863	0.3750	1.5000	A572-65 (65 ksi)
L3	59.08-42.83	16.25	74.00	12	38.6863	41.6400	0.4807	1.9228	53.803957ksi (54 ksi)
L4	42.83-40.50	8.50	0.00	12	39.5577	41.3166	0.5416	2.1666	53.83433ksi (54 ksi)
L5	40.50-0.00	40.50		12	41.3166	48.6900	0.6219	2.4877	56.613975ksi (57 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	24.4429	21.1271	1467.6036	8.3517	12.2300	120.0005	2973.7627	10.3981	5.5737	19.818
	34.6610	30.0656	4229.6024	11.8852	17.3426	243.8846	8570.3213	14.7974	8.2189	29.223
L2	34.0763	38.1583	4863.8207	11.3132	16.5636	293.6453	9855.4195	18.7803	7.5646	20.172
	40.0510	46.2609	8666.7277	13.7155	20.0395	432.4817	17561.1400	22.7682	9.3629	24.968
L3	40.0510	59.1358	11017.7131	13.6776	20.0395	549.7991	22324.8739	29.1048	9.0797	18.889
	43.1089	63.7075	13775.6757	14.7350	21.5695	638.6640	27913.2537	31.3549	9.8713	20.536
L4	42.2742	68.0472	13221.5763	13.9678	20.4909	645.2415	26790.4981	33.4908	9.1499	16.893
	42.7741	71.1148	15091.5280	14.5974	21.4020	705.1457	30579.5273	35.0006	9.6213	17.763
L5	42.7741	81.4961	17226.5359	14.5687	21.4020	804.9031	34905.6320	40.1099	9.4061	15.124
	50.4076	96.2623	28389.3466	17.2084	25.2214	1125.6046	57524.5129	47.3774	11.3821	18.301

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft^2	in					in	in
L1				1	1	1		
145.00-90.83								
L2 90.83-59.08				1	1	1		
L3 59.08-42.83				1	1	0.979485		
L4 42.83-40.50				1	1	0.981073		
L5 40.50-0.00				1	1	0.967785		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement	Total Number	Number Per Row	Start/End Position	Width or Diameter	Perimeter	Weight
			ft				in	in	plf
1 5/8	A	Surface Ar (CaAa)	105.00 - 12.00	6	6	0.000 0.000	1.9800		1.04
1 5/8	B	Surface Ar (CaAa)	113.00 - 12.00	6	6	0.000 0.000	1.9800		1.04
1 1/4	C	Surface Ar (CaAa)	125.00 - 12.00	9	9	0.000 0.000	1.5500		0.66
1 5/8	A	Surface Ar (CaAa)	125.00 - 12.00	3	3	0.000 0.000	1.9800		1.04
1 5/8	B	Surface Ar (CaAa)	135.00 - 12.00	6	6	0.000 0.000	1.9800		1.04
1 1/4	C	Surface Ar (CaAa)	135.00 - 12.00	6	6	0.000 0.000	1.5500		0.66
2 1/4	A	Surface Ar (CaAa)	143.00 - 12.00	3	3	0.000 0.000	2.3800		1.16
3	A	Surface Ar (CaAa)	125.00 - 12.00	3	3	0.000 0.000	3.0100		1.78

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		C_AA_A	Weight
				ft			ft^2/ft	plf
LDF5-50A (7/8 FOAM)	B	No	Inside Pole	125.00 - 7.00	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
LDF4P-50A (1/2 FOAM)	B	No	Inside Pole	125.00 - 7.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LDF5-50A (7/8 FOAM)	C	No	Inside Pole	135.00 - 7.00	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
LDF5-50A (7/8 FOAM)	C	No	Inside Pole	143.00 - 7.00	9	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
LDF6-50A (1-1/4 FOAM)	C	No	Inside Pole	143.00 - 7.00	3	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	143.00 - 7.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Hybriflex HB114-1-08U4-M5J	C	No	Inside Pole	105.00 - 0.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	1.08
						1" Ice	0.00	1.08
MP306	C	No	CaAa (Out Of Face)	40.50 - 0.00	1	No Ice	0.43	0.00
						1/2" Ice	0.43	0.00
						1" Ice	0.43	0.00
MP304	C	No	CaAa (Out Of Face)	60.50 - 40.50	1	No Ice	0.27	0.00
						1/2" Ice	0.27	0.00
						1" Ice	0.27	0.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Standoff T-Arm	A	From Face	2.50	0.0000	143.00	No Ice	4.20	4.20	0.17
			0.00			1/2" Ice	5.40	5.40	0.22
			0.00			1" Ice	6.60	6.60	0.27
Standoff T-Arm	B	From Face	2.50	0.0000	143.00	No Ice	4.20	4.20	0.17
			0.00			1/2" Ice	5.40	5.40	0.22
			0.00			1" Ice	6.60	6.60	0.27
Standoff T-Arm	C	From Face	2.50	0.0000	143.00	No Ice	4.20	4.20	0.17
			0.00			1/2" Ice	5.40	5.40	0.22
			0.00			1" Ice	6.60	6.60	0.27
Panel Antenna	A	From Face	5.00	0.0000	143.00	No Ice	2.87	3.73	0.01
			-2.00			1/2" Ice	3.18	4.10	0.04
			0.00			1" Ice	3.52	4.48	0.06
Panel Antenna	A	From Face	5.00	0.0000	143.00	No Ice	2.87	3.73	0.01
			2.00			1/2" Ice	3.18	4.10	0.04
			0.00			1" Ice	3.52	4.48	0.06
Panel Antenna	A	From Face	5.00	0.0000	143.00	No Ice	2.87	3.73	0.01
			6.00			1/2" Ice	3.18	4.10	0.04
			0.00			1" Ice	3.52	4.48	0.06
Panel Antenna	B	From Face	5.00	0.0000	143.00	No Ice	2.87	3.73	0.01
			-2.00			1/2" Ice	3.18	4.10	0.04
			0.00			1" Ice	3.52	4.48	0.06
Panel Antenna	B	From Face	5.00	0.0000	143.00	No Ice	2.87	3.73	0.01
			2.00			1/2" Ice	3.18	4.10	0.04
			0.00			1" Ice	3.52	4.48	0.06
Panel Antenna	B	From Face	5.00	0.0000	143.00	No Ice	2.87	3.73	0.01
			6.00			1/2" Ice	3.18	4.10	0.04
			0.00			1" Ice	3.52	4.48	0.06
Panel Antenna	C	From Face	5.00	0.0000	143.00	No Ice	2.87	3.73	0.01
			-2.00			1/2" Ice	3.18	4.10	0.04
			0.00			1" Ice	3.52	4.48	0.06
Panel Antenna	C	From Face	5.00	0.0000	143.00	No Ice	2.87	3.73	0.01
			2.00			1/2" Ice	3.18	4.10	0.04
			0.00			1" Ice	3.52	4.48	0.06
Panel Antenna	C	From Face	5.00	0.0000	143.00	No Ice	2.87	3.73	0.01
			6.00			1/2" Ice	3.18	4.10	0.04
			0.00			1" Ice	3.52	4.48	0.06
Panel Antenna	A	From Face	5.00	0.0000	143.00	No Ice	5.90	2.43	0.04
			-6.00			1/2" Ice	6.28	2.91	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	6.66	3.39	0.12
Panel Antenna	B	From Face	5.00	0.0000	143.00	No Ice	5.90	2.43	0.04
			-6.00			1/2" Ice	6.28	2.91	0.08
			0.00			1" Ice	6.66	3.39	0.12
Panel Antenna	C	From Face	5.00	0.0000	143.00	No Ice	5.90	2.43	0.04
			-6.00			1/2" Ice	6.28	2.91	0.08
			0.00			1" Ice	6.66	3.39	0.12
Ericcson RRU	A	From Face	5.00	0.0000	143.00	No Ice	2.07	1.08	0.04
			-6.00			1/2" Ice	2.26	1.23	0.06
			0.00			1" Ice	2.45	1.38	0.07
Ericcson RRU	B	From Face	5.00	0.0000	143.00	No Ice	2.07	1.08	0.04
			-6.00			1/2" Ice	2.26	1.23	0.06
			0.00			1" Ice	2.45	1.38	0.07
Ericcson RRU	C	From Face	5.00	0.0000	143.00	No Ice	2.07	1.08	0.04
			-6.00			1/2" Ice	2.26	1.23	0.06
			0.00			1" Ice	2.45	1.38	0.07
8' 4-Bay Dipole	A	From Face	5.00	0.0000	143.00	No Ice	1.60	1.60	0.03
			2.00			1/2" Ice	2.42	2.42	0.04
			4.00			1" Ice	3.24	3.24	0.05
8' 4-Bay Dipole	C	From Face	5.00	0.0000	143.00	No Ice	1.60	1.60	0.03
			6.00			1/2" Ice	2.42	2.42	0.04
			4.00			1" Ice	3.24	3.24	0.05
Omni 2 1/2" x 12"	C	From Face	0.50	0.0000	143.00	No Ice	3.00	3.00	0.03
			0.00			1/2" Ice	4.23	4.23	0.05
			6.00			1" Ice	5.46	5.46	0.07
Pull Box	C	From Face	2.00	0.0000	143.00	No Ice	1.40	0.70	0.03
			0.00			1/2" Ice	1.56	0.82	0.04
			0.00			1" Ice	1.72	0.94	0.05
Standoff T-Arm	A	From Face	2.50	60.0000	135.00	No Ice	4.20	4.20	0.17
			0.00			1/2" Ice	5.40	5.40	0.22
			0.00			1" Ice	6.60	6.60	0.27
Standoff T-Arm	B	From Face	2.50	60.0000	135.00	No Ice	4.20	4.20	0.17
			0.00			1/2" Ice	5.40	5.40	0.22
			0.00			1" Ice	6.60	6.60	0.27
Standoff T-Arm	C	From Face	2.50	60.0000	135.00	No Ice	4.20	4.20	0.17
			0.00			1/2" Ice	5.40	5.40	0.22
			0.00			1" Ice	6.60	6.60	0.27
Panel Antenna	A	From Face	5.00	60.0000	135.00	No Ice	7.47	3.95	0.06
			-6.00			1/2" Ice	8.15	5.04	0.10
			0.00			1" Ice	8.83	6.13	0.15
Panel Antenna	B	From Face	5.00	60.0000	135.00	No Ice	7.47	3.95	0.06
			-6.00			1/2" Ice	8.15	5.04	0.10
			0.00			1" Ice	8.83	6.13	0.15
Panel Antenna	C	From Face	5.00	60.0000	135.00	No Ice	7.47	3.95	0.06
			-6.00			1/2" Ice	8.15	5.04	0.10
			0.00			1" Ice	8.83	6.13	0.15
Panel Antenna	A	From Face	5.00	60.0000	135.00	No Ice	7.47	3.95	0.06
			6.00			1/2" Ice	8.15	5.04	0.10
			0.00			1" Ice	8.83	6.13	0.15
Panel Antenna	B	From Face	5.00	60.0000	135.00	No Ice	7.47	3.95	0.06
			6.00			1/2" Ice	8.15	5.04	0.10
			0.00			1" Ice	8.83	6.13	0.15
Panel Antenna	C	From Face	5.00	60.0000	135.00	No Ice	7.47	3.95	0.06
			6.00			1/2" Ice	8.15	5.04	0.10
			0.00			1" Ice	8.83	6.13	0.15
(2) Powerwave TMA	A	From Face	5.00	60.0000	135.00	No Ice	1.29	0.36	0.01
			0.00			1/2" Ice	1.45	0.48	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1" Ice	1.61	0.60	0.03
(2) Powerwave TMA	B	From Face	5.00		60.0000	135.00	No Ice	1.29	0.36	0.01
			0.00				1/2" Ice	1.45	0.48	0.02
			0.00				1" Ice	1.61	0.60	0.03
(2) Powerwave TMA	C	From Face	5.00		60.0000	135.00	No Ice	1.29	0.36	0.01
			0.00				1/2" Ice	1.45	0.48	0.02
			0.00				1" Ice	1.61	0.60	0.03
Dish 24" x 24"	C	From Face	5.00		60.0000	135.00	No Ice	5.60	0.33	0.03
			0.00				1/2" Ice	5.92	0.47	0.05
			0.00				1" Ice	6.24	0.61	0.07
Standoff T-Arm	A	From Face	2.50		0.0000	125.00	No Ice	3.50	3.50	0.02
			0.00				1/2" Ice	4.50	4.50	0.20
			0.00				1" Ice	5.50	5.50	0.38
Standoff T-Arm	B	From Face	2.50		0.0000	125.00	No Ice	3.50	3.50	0.02
			0.00				1/2" Ice	4.50	4.50	0.20
			0.00				1" Ice	5.50	5.50	0.38
Standoff T-Arm	C	From Face	2.50		0.0000	125.00	No Ice	3.50	3.50	0.02
			0.00				1/2" Ice	4.50	4.50	0.20
			0.00				1" Ice	5.50	5.50	0.38
(2) Powerwave 7770	A	From Face	5.00		0.0000	125.00	No Ice	6.10	4.23	0.06
			0.00				1/2" Ice	6.60	4.98	0.10
			0.00				1" Ice	7.10	5.73	0.14
(2) Powerwave 7770	B	From Face	5.00		0.0000	125.00	No Ice	6.10	4.23	0.06
			0.00				1/2" Ice	6.60	4.98	0.10
			0.00				1" Ice	7.10	5.73	0.14
(2) Powerwave 7770	C	From Face	5.00		0.0000	125.00	No Ice	6.10	4.23	0.06
			0.00				1/2" Ice	6.60	4.98	0.10
			0.00				1" Ice	7.10	5.73	0.14
LGP 21401	A	From Face	5.00		0.0000	125.00	No Ice	1.29	0.53	0.03
			0.00				1/2" Ice	1.45	0.65	0.04
			0.00				1" Ice	1.61	0.77	0.05
LGP 21401	C	From Face	5.00		0.0000	125.00	No Ice	1.29	0.53	0.03
			0.00				1/2" Ice	1.45	0.65	0.04
			0.00				1" Ice	1.61	0.77	0.05
LGP 21401	C	From Face	5.00		0.0000	125.00	No Ice	1.29	0.53	0.03
			0.00				1/2" Ice	1.45	0.65	0.04
			0.00				1" Ice	1.61	0.77	0.05
Omni 1 1/4" x 3'	A	From Face	5.00		0.0000	125.00	No Ice	0.38	0.38	0.01
			0.00				1/2" Ice	0.58	0.58	0.01
			3.50				1" Ice	0.78	0.78	0.02
Omni 3"x6'	B	From Face	5.00		0.0000	125.00	No Ice	1.77	1.77	0.02
			0.00				1/2" Ice	2.13	2.13	0.03
			5.00				1" Ice	2.49	2.49	0.05
Powerwave P65-16-XLH-RR	A	From Face	5.00		0.0000	125.00	No Ice	8.40	6.13	0.09
			0.00				1/2" Ice	8.95	7.07	0.15
			0.00				1" Ice	9.50	8.01	0.21
Powerwave P65-16-XLH-RR	B	From Face	5.00		0.0000	125.00	No Ice	8.40	6.13	0.09
			0.00				1/2" Ice	8.95	7.07	0.15
			0.00				1" Ice	9.50	8.01	0.21
Powerwave P65-16-XLH-RR	C	From Face	5.00		0.0000	125.00	No Ice	8.40	6.13	0.09
			0.00				1/2" Ice	8.95	7.07	0.15
			0.00				1" Ice	9.50	8.01	0.21
(2) Ericsson RRU	A	From Face	1.00		0.0000	125.00	No Ice	2.94	2.27	0.06
			0.00				1/2" Ice	3.35	2.73	0.09
			2.00				1" Ice	3.76	3.19	0.11
(2) Ericsson RRU	B	From Face	1.00		0.0000	125.00	No Ice	2.94	2.27	0.06
			0.00				1/2" Ice	3.35	2.73	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.00			1" Ice	3.76	3.19	0.11
(2) Ericsson RRU	C	From Face	1.00	0.0000	125.00	No Ice	2.94	2.27	0.06
			0.00			1/2" Ice	3.35	2.73	0.09
			2.00			1" Ice	3.76	3.19	0.11
Surge Arrestor	A	From Face	1.00	0.0000	125.00	No Ice	1.27	1.27	0.02
(DC6-48-60-18-8F)			0.00			1/2" Ice	1.46	1.46	0.04
			-1.50			1" Ice	1.65	1.65	0.05
Valmont Light Duty	A	None		0.0000	125.00	No Ice	1.76	1.76	0.05
Tri-Bracket						1/2" Ice	2.08	2.08	0.07
						1" Ice	2.40	2.40	0.09
2"x5' Pipe	A	From Face	0.50	0.0000	125.00	No Ice	1.19	1.19	0.02
			0.00			1/2" Ice	1.50	1.50	0.03
			0.00			1" Ice	1.81	1.81	0.04
2"x5' Pipe	B	From Face	0.50	0.0000	125.00	No Ice	1.19	1.19	0.02
			0.00			1/2" Ice	1.50	1.50	0.03
			0.00			1" Ice	1.81	1.81	0.04
2"x5' Pipe	C	From Face	0.50	0.0000	125.00	No Ice	1.19	1.19	0.02
			0.00			1/2" Ice	1.50	1.50	0.03
			0.00			1" Ice	1.81	1.81	0.04
Standoff T-Arm	A	From Face	3.00	0.0000	113.00	No Ice	2.80	2.80	0.14
			0.00			1/2" Ice	3.60	3.60	0.17
			0.00			1" Ice	4.40	4.40	0.20
Standoff T-Arm	B	From Face	3.00	0.0000	113.00	No Ice	2.80	2.80	0.14
			0.00			1/2" Ice	3.60	3.60	0.17
			0.00			1" Ice	4.40	4.40	0.20
Standoff T-Arm	C	From Face	3.00	0.0000	113.00	No Ice	2.80	2.80	0.14
			0.00			1/2" Ice	3.60	3.60	0.17
			0.00			1" Ice	4.40	4.40	0.20
Kathrein 800 10504	A	From Face	6.00	0.0000	113.00	No Ice	3.97	3.78	0.06
			-4.00			1/2" Ice	4.48	4.61	0.10
			0.00			1" Ice	4.99	5.44	0.13
Kathrein 800 10504	B	From Face	6.00	0.0000	113.00	No Ice	3.97	3.78	0.06
			-4.00			1/2" Ice	4.48	4.61	0.10
			0.00			1" Ice	4.99	5.44	0.13
Kathrein 800 10504	C	From Face	6.00	0.0000	113.00	No Ice	3.97	3.78	0.06
			-4.00			1/2" Ice	4.48	4.61	0.10
			0.00			1" Ice	4.99	5.44	0.13
2 1/2"x80"	A	From Face	6.00	0.0000	113.00	No Ice	1.92	1.92	0.04
			4.00			1/2" Ice	2.42	2.42	0.05
			0.00			1" Ice	2.92	2.92	0.07
2 1/2"x80"	B	From Face	6.00	0.0000	113.00	No Ice	1.92	1.92	0.04
			4.00			1/2" Ice	2.42	2.42	0.05
			0.00			1" Ice	2.92	2.92	0.07
2 1/2"x80"	C	From Face	6.00	0.0000	113.00	No Ice	1.92	1.92	0.04
			4.00			1/2" Ice	2.42	2.42	0.05
			0.00			1" Ice	2.92	2.92	0.07
PiROD 13' Low Profile	A	None		0.0000	105.00	No Ice	15.70	15.70	1.30
Platform						1/2" Ice	20.10	20.10	1.76
						1" Ice	24.50	24.50	2.23
Panel Antenna 60" x 6 1/2" x	A	From Face	3.75	0.0000	105.00	No Ice	4.28	4.02	0.06
3" w/ mount pipe			6.00			1/2" Ice	4.72	4.74	0.10
			0.00			1" Ice	5.16	5.46	0.14
Panel Antenna 60" x 6 1/2" x	A	From Face	3.75	0.0000	105.00	No Ice	4.28	4.02	0.06
3" w/ mount pipe			-6.00			1/2" Ice	4.72	4.74	0.10
			0.00			1" Ice	5.16	5.46	0.14
Panel Antenna 60" x 6 1/2" x	B	From Face	3.75	0.0000	105.00	No Ice	4.28	4.02	0.06
3" w/ mount pipe			6.00			1/2" Ice	4.72	4.74	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	5.16	5.46	0.14
Panel Antenna 60" x 6 1/2" x 3" w/ mount pipe	B	From Face	3.75	0.0000	105.00	No Ice	4.28	4.02	0.06
			-6.00			1/2" Ice	4.72	4.74	0.10
			0.00			1" Ice	5.16	5.46	0.14
Panel Antenna 60" x 6 1/2" x 3" w/ mount pipe	C	From Face	3.75	0.0000	105.00	No Ice	4.28	4.02	0.06
			6.00			1/2" Ice	4.72	4.74	0.10
			0.00			1" Ice	5.16	5.46	0.14
Panel Antenna 60" x 6 1/2" x 3" w/ mount pipe	C	From Face	3.75	0.0000	105.00	No Ice	4.28	4.02	0.06
			-6.00			1/2" Ice	4.72	4.74	0.10
			0.00			1" Ice	5.16	5.46	0.14
APXVSPP18-C-A20	A	From Face	3.75	0.0000	105.00	No Ice	8.26	5.28	0.06
			0.00			1/2" Ice	8.81	5.74	0.11
			0.00			1" Ice	9.36	6.20	0.16
APXVSPP18-C-A20	B	From Face	3.75	0.0000	105.00	No Ice	8.26	5.28	0.06
			0.00			1/2" Ice	8.81	5.74	0.11
			0.00			1" Ice	9.36	6.20	0.16
APXVSPP18-C-A20	C	From Face	3.75	0.0000	105.00	No Ice	8.26	5.28	0.06
			0.00			1/2" Ice	8.81	5.74	0.11
			0.00			1" Ice	9.36	6.20	0.16
RRH - 1900 4x45	A	From Face	1.00	0.0000	105.00	No Ice	2.81	2.61	0.06
			0.00			1/2" Ice	3.05	2.84	0.08
			0.00			1" Ice	3.30	3.09	0.11
RRH - 800 2x50	A	From Face	1.00	0.0000	105.00	No Ice	2.40	2.25	0.06
			0.00			1/2" Ice	2.61	2.46	0.09
			0.00			1" Ice	2.83	2.68	0.11
RRH - 1900 4x45	B	From Face	1.00	0.0000	105.00	No Ice	2.81	2.61	0.06
			0.00			1/2" Ice	3.05	2.84	0.08
			0.00			1" Ice	3.30	3.09	0.11
RRH - 800 2x50	B	From Face	1.00	0.0000	105.00	No Ice	2.40	2.25	0.06
			0.00			1/2" Ice	2.61	2.46	0.09
			0.00			1" Ice	2.83	2.68	0.11
RRH - 1900 4x45	C	From Face	1.00	0.0000	105.00	No Ice	2.81	2.61	0.06
			0.00			1/2" Ice	3.05	2.84	0.08
			0.00			1" Ice	3.30	3.09	0.11
RRH - 800 2x50	C	From Face	1.00	0.0000	105.00	No Ice	2.40	2.25	0.06
			0.00			1/2" Ice	2.61	2.46	0.09
			0.00			1" Ice	2.83	2.68	0.11

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 K
P3F-52	B	Paraboloid w/Radome	From Face	5.00	-90.0000		143.00	3.00	No Ice	7.10	0.09
				-7.00					1/2" Ice	7.46	0.13
				0.00					1" Ice	7.82	0.17

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 90 deg - No Ice
4	Dead+Wind 180 deg - No Ice
5	Dead+Ice+Temp
6	Dead+Wind 0 deg+Ice+Temp
7	Dead+Wind 90 deg+Ice+Temp
8	Dead+Wind 180 deg+Ice+Temp
9	Dead+Wind 0 deg - Service
10	Dead+Wind 90 deg - Service
11	Dead+Wind 180 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	145 - 90.8333	Pole	Max Tension	11	0.00	0.00	0.00
			Max. Compression	5	-21.07	0.89	0.80
			Max. Mx	3	-10.27	-697.80	2.44
			Max. My	4	-10.26	3.85	-699.61
			Max. Vy	3	25.71	-697.80	2.44
			Max. Vx	4	25.75	3.85	-699.61
			Max. Torque	3			1.61
L2	90.8333 - 59.083	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-32.47	1.66	1.45
			Max. Mx	3	-18.44	-1807.90	4.81
			Max. My	4	-18.43	7.29	-1811.11
			Max. Vy	3	34.40	-1807.90	4.81
			Max. Vx	4	34.44	7.29	-1811.11
			Max. Torque	3			0.74
L3	59.083 - 42.8333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-36.13	1.92	1.67
			Max. Mx	3	-21.24	-2166.45	5.48
			Max. My	4	-21.24	8.24	-2170.04
			Max. Vy	3	36.78	-2166.45	5.48
			Max. Vx	4	36.82	8.24	-2170.04
			Max. Torque	3			0.79
L4	42.8333 - 40.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-40.78	2.14	1.86
			Max. Mx	3	-25.06	-2488.10	6.03
			Max. My	4	-25.06	9.04	-2492.01
			Max. Vy	3	38.90	-2488.10	6.03
			Max. Vx	4	38.94	9.04	-2492.01
			Max. Torque	3			0.82
L5	40.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-57.98	2.92	2.53
			Max. Mx	3	-39.69	-4247.91	8.55
			Max. My	4	-39.69	12.73	-4253.33
			Max. Vy	3	48.20	-4247.91	8.55
			Max. Vx	4	48.24	12.73	-4253.33
			Max. Torque	6			1.12

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	5	57.98	-0.00	-0.00
	Max. H_x	4	39.73	0.08	-48.20
	Max. H_z	2	39.73	-0.08	48.11
	Max. M_x	2	4242.11	-0.08	48.11
	Max. M_z	3	4247.91	-48.17	0.05
	Max. Torsion	6	1.12	-0.07	39.84
	Min. Vert	4	39.73	0.08	-48.20
	Min. H_x	3	39.73	-48.17	0.05
	Min. H_z	4	39.73	0.08	-48.20
	Min. M_x	4	-4253.33	0.08	-48.20
	Min. M_z	4	-12.73	0.08	-48.20
	Min. Torsion	8	-0.86	0.06	-39.91

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	39.73	-0.00	-0.00	-1.23	1.13	0.00
Dead+Wind 0 deg - No Ice	39.73	0.08	-48.11	-4242.11	-10.55	-0.83
Dead+Wind 90 deg - No Ice	39.73	48.17	-0.05	-8.55	-4247.91	-0.92
Dead+Wind 180 deg - No Ice	39.73	-0.08	48.20	4253.33	12.73	0.51
Dead+Ice+Temp	57.98	0.00	0.00	-2.53	2.92	-0.00
Dead+Wind 0 deg+Ice+Temp	57.98	0.07	-39.84	-3672.93	-6.31	-1.12
Dead+Wind 90 deg+Ice+Temp	57.98	39.88	-0.04	-8.35	-3673.67	-0.71
Dead+Wind 180 deg+Ice+Temp	57.98	-0.06	39.91	3678.99	12.27	0.86
Dead+Wind 0 deg - Service	39.73	0.03	-16.64	-1469.28	-2.90	-0.29
Dead+Wind 90 deg - Service	39.73	16.66	-0.02	-3.79	-1469.72	-0.32
Dead+Wind 180 deg - Service	39.73	-0.03	16.67	1471.53	5.16	0.17

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 90.8333	32.517	11	1.8729	0.0000
L2	96 - 59.083	14.531	11	1.4761	0.0000
L3	59.083 - 42.8333	5.284	11	0.8478	0.0000
L4	49 - 40.5	3.669	11	0.6809	0.0001
L5	40.5 - 0	2.524	11	0.5917	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
143.00	P3F-52	11	31.732	1.8619	0.0025	37478
135.00	Standoff T-Arm	11	28.600	1.8170	0.0021	18739
125.00	Standoff T-Arm	11	24.748	1.7546	0.0017	9369
113.00	Standoff T-Arm	11	20.300	1.6618	0.0012	5855
105.00	PiROD 13' Low Profile Platform	11	17.492	1.5839	0.0010	4683

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 90.8333	93.809	4	5.4094	0.0017
L2	96 - 59.083	41.944	4	4.2612	0.0009
L3	59.083 - 42.8333	15.261	4	2.4484	0.0006
L4	49 - 40.5	10.597	4	1.9665	0.0005
L5	40.5 - 0	7.290	4	1.7091	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
143.00	P3F-52	4	91.545	5.3776	0.0071	13173
135.00	Standoff T-Arm	4	82.516	5.2473	0.0061	6585
125.00	Standoff T-Arm	4	71.408	5.0664	0.0049	3291
113.00	Standoff T-Arm	4	58.582	4.7979	0.0035	2054
105.00	PiROD 13' Low Profile Platform	4	50.484	4.5726	0.0028	1641

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 K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	145 - 90.8333 (1)	TP33.48x23.61x0.2813	54.17	0.00	0.0	39.000	29.2130	-10.26	1139.31	0.009
L2	90.8333 - 59.083 (2)	TP38.6863x31.976x0.375	36.92	0.00	0.0	39.000	46.2609	-18.43	1804.18	0.010
L3	59.083 - 42.8333 (3)	TP41.64x38.6863x0.4807	16.25	0.00	0.0	32.282	61.9726	-21.23	2000.62	0.011
L4	42.8333 - 40.5	H1-3+VT (1.35 CR) - 3 TP41.3166x39.5577x0.5416	8.50	0.00	0.0	32.301	71.1148	-25.06	2297.05	0.011

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L5	40.5 - 0 (5) (4)	TP48.69x41.3166x0.6219 H1-3+VT (1.35 CR) - 5	40.50	0.00	0.0	33.968	96.2623	-39.69	3269.87	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	145 - 90.8333 (1)	TP33.48x23.61x0.2813	699.62	36.471	39.000	0.935	0.00	0.000	39.000	0.000
L2	90.8333 - 59.083 (2)	TP38.6863x31.976x0.375	1811.13	50.253	39.000	1.289	0.00	0.000	39.000	0.000
L3	59.083 - 42.8333 (3)	TP41.64x38.6863x0.4807	2170.05	43.102	32.282	1.335	0.00	0.000	32.282	0.000
L4	42.8333 - 40.5 (4)	TP41.3166x39.5577x0.5416	2492.03	42.409	32.301	1.313	0.00	0.000	32.301	0.000
L5	40.5 - 0 (5)	TP48.69x41.3166x0.6219	4253.35	45.345	33.968	1.335	0.00	0.000	33.968	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	145 - 90.8333 (1)	TP33.48x23.61x0.2813	25.75	0.881	26.000	0.069	0.46	0.011	26.000	0.000
L2	90.8333 - 59.083 (2)	TP38.6863x31.976x0.375	34.44	0.745	26.000	0.058	0.19	0.002	26.000	0.000
L3	59.083 - 42.8333 (3)	TP41.64x38.6863x0.4807	36.82	0.594	21.522	0.056	0.08	0.001	21.522	0.000
L4	42.8333 - 40.5 (4)	TP41.3166x39.5577x0.5416	38.94	0.548	21.534	0.052	0.02	0.000	21.534	0.000
L5	40.5 - 0 (5)	TP48.69x41.3166x0.6219	48.24	0.501	22.646	0.045	0.51	0.003	22.646	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	145 - 90.8333 (1)	0.009	0.935	0.000	0.069	0.000	0.945 ✔	1.333	H1-3+VT ✔
L2	90.8333 - 59.083 (2)	0.010	1.289	0.000	0.058	0.000	1.300 ✔	1.333	H1-3+VT ✔
L3	59.083 - 42.8333 (3)	0.011	1.335	0.000	0.056	0.000	1.347 ✔	1.333	H1-3+VT ✔

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L4	42.8333 - 40.5 (4)	0.011	1.313	0.000	0.052	0.000	1.324 ✔	1.333	H1-3+VT ✔
L5	40.5 - 0 (5)	0.012	1.335	0.000	0.045	0.000	1.348 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	145 - 90.8333	Pole	TP33.48x23.61x0.2813	1	-10.26	1518.70	70.9	Pass
L2	90.8333 - 59.083	Pole	TP38.6863x31.976x0.375	2	-18.43	2404.97	97.5	Pass
L3	59.083 - 42.8333	Pole	TP41.64x38.6863x0.4807	3	-21.23	2666.83	101.0	Pass
L4	42.8333 - 40.5	Pole	TP41.3166x39.5577x0.5416	4	-25.06	3061.97	99.4	Pass
L5	40.5 - 0	Pole	TP48.69x41.3166x0.6219	5	-39.69	4358.74	101.1	Pass
						Summary		
						Pole (L5)	101.1	Pass ✔
						RATING =	**101.1**	**Pass** ✔

Program Version 6.1.2.0 - 6/24/2013 File:K:/332_Sprint/_332.1000_Alcatel-Lucent/332.1475_CT03XC354_100 Reef Road/332.1475_Documents/332.1475_Structural/332.1475_Tower Analysis/332.1475_145FT Monopole_Modification.eri

Preliminary Engineering MOD Form

AeroSolutions LLC
Optimizing Your Tower Infrastructure

5500 Flatiron Pkwy, Suite 100
Boulder, CO 80301
www.aerosolutionsllc.com

BU #	Site Name	
CT03XC354	Southport Police Department	
Failing SA Engineer	Failing SA Date	
KMB	02/27/13	
Aero MOD Engineer	MOD Date	Quote Date
BU	02/18/14	01/13/14

Shaft Upgrades	MP circular ○	MP polygon ◉	Self-Supporting ○	Guyed ○

(0-56.5' @ 123.2% Fail) 0.5-40.5' (3) MP306 w/ TS (In Ref: 96.8% ok)
40.5-60.5' (3) MP304 (In Ref: 96.7% ok, Out Ref: 97.1% ok)

*Assumes there are no interferences that cannot be seen in the photos provided by KMB

Base Plate

(78.3% ok) w/ AR (62.5% ok)

Anchor Rods

(113.9% Fail) (3) 2.5" x 8' embedment A193-B7 rods w/ ARB-8 as TS (90.1% ok)
*This assumes that the foundation is large enough to fit these anchor rod on this BC and that the rebar size will be sufficient for the development of the new AR in 8'

Flanges

NA

Foundation

Unknown - Assumed Passing

Pole Extensions

None

Notes & Value Engineering

Structure: MOD Cap. 100%, Allowable Cap. 100%; **Foundation:** MOD Cap. 100%, Allowable Cap. 100% **(CT SITE)**

***Foundation drawings, geotech, and appurtenance mapping were not provided to AeroSolutions. It is assumed that all the information in the provided SA is 100% correct and accurate with the final configuration.**

Website Difficulty: of 10, Liability: of 10, Time: of 10

Appendix A

Aero Solutions Calculations

Reinforced Pole Stress and Effective Thickness Check

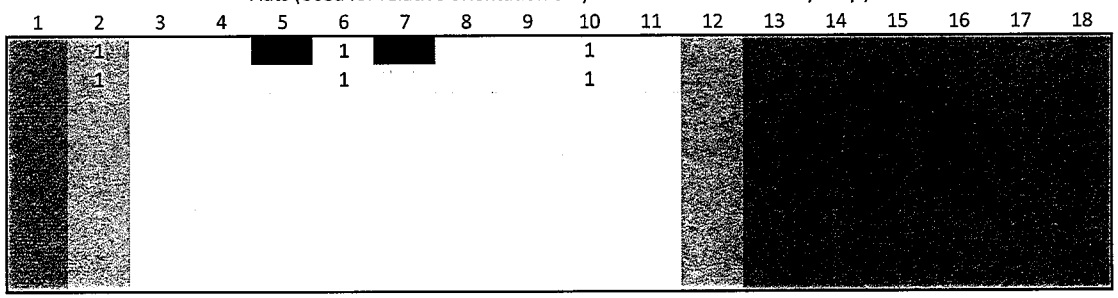
AeroSolutions LLC
Optimizing Your Tower Infrastructure
5500 Flatiron Parkway, Suite 100
Boulder, CO 80301
720-304-6882

Section		Loads				Pole														Unreinforced Pole - Rev. F						Reinforced Pole						Rev. F	Reinforcement 1									Composite						
Section	Elevation (ft)	Moment (ft-kip)	Compression (kip)	Shear (kip)	Torsion (kip-ft)	Number of Sides	OD (in)	Thickness (in)	Yield Strength (ksi)	Flat Width (in)	Area (in²)	Moment of Inertia (in⁴)	Percent of Composite Moment of Inertia	Angle Offset to Pole Flat	Distance to Extreme Fiber (in)	Section Modulus (in³)	Torsion Constant (in⁴)	Polygonal Compact Criterion	Allowable Bending Stress (ksi)	Allowable Bending Moment (ft-kip)	Allowable Axial Stress (ksi)	Allowable Shear Stress (ksi)	Bending Stress (ksi)	Axial Stress (ksi)	Shear Stress (ksi)	Torsion Shear Stress (ksi)	Stress Ratio	Moment in Pole when Reinforced	Bending Stress (ksi)	Axial Stress (ksi)	Shear Stress (ksi)	Torsion Shear Stress (ksi)	Reinforced Pole Stress Ratio	Qty	Model	Position (F-Flat, Corner)	Gap Between Pole and Back of Rein. (in)	Torsion only or Tension & Comp.	Total Moment of Inertia (in⁴)	Axial Force (kip)	Stress Ratio	Centroid Offset (in)	Area (in²)	Moment of Inertia (in⁴)	Controlling Stress Ratio	Thickness (in)	Weight (lb/ft)	Derated Yield Strength (ksi)	% Error in Derated Yield Stress
1	145	0.0	0.0	0.0	0.0	12	23.6100	0.2813	65	5.57	21.0	1466	100%	TRUE	12.17	130	3876	160	52.0	521.6	52.0	34.7	0.0	0.00	0.00	0.00	0.000	0.0	0.0	0.00	0.00	0.00	0.000										0.000	21.0	1466	0.000				
2	96	699.7	10.3	25.9	0.4	12	32.5385	0.2813	65	7.57	29.1	3877	100%	TRUE	16.79	231	7600	228	52.0	1000.3	52.0	34.7	36.4	0.35	0.00	0.01	0.706	690.7	36.4	0.35	0.00	0.00	0.706										0.000	29.1	3877	0.706				
3	90.8333	836.0	11.7	27.0	0.4	12	33.4800	0.6563	65	7.21	69.0	9507	100%	TRUE	17.21	552	18705	89	52.0	2392.4	52.0	34.7	18.2	0.17	0.00	0.00	0.353	836.0	18.2	0.17	0.00	0.00	0.353										0.000	69.0	9507	0.353				
4	59.053	1811.3	18.4	34.4	0.2	12	36.6863	0.3750	65	9.36	46.1	8659	100%	TRUE	19.96	434	16979	201	52.0	1879.5	52.0	34.7	50.1	0.40	0.00	0.00	0.971	1811.3	50.1	0.40	0.00	0.00	0.971										0.000	46.1	8659	0.971				
5	49	2170.4	21.2	36.8	0.1	12	40.5391	0.3750	65	9.85	48.3	9963	79%	0	20.26	492	19533	212	52.0	2130.5	52.0	34.7	53.0	0.44	0.00	0.00	1.027	1705.3	41.6	0.44	0.00	0.00	0.809	3	MP304	F	0	T&C	2717	177.1	0.967	0.000	60.7	17681	0.967				
6	42.9333	2402.1	24.4	38.4	0.0	12	41.6400	0.8125	65	8.98	106.2	22681	89%	0	20.82	1088	44566	89	52.0	4733.2	52.0	34.7	26.5	0.23	0.00	0.00	0.537	2132.4	23.5	0.23	0.00	0.00	0.537	3	MP304	F	0	T&C	3964	300.0	0.546	0.000	118.6	25035	0.546				
7	40.5	2492.4	25.3	38.9	0.0	12	41.3196	0.4375	65	9.90	57.4	12270	81%	0	20.66	594	24068	182	52.0	2573.2	52.0	34.7	50.4	0.44	0.00	0.00	0.977	2026.4	40.9	0.44	0.00	0.00	0.796	3	MP304	F	0	T&C	2821	174.2	0.953	0.000	69.8	15092	0.953				
8	0	4254.0	39.7	48.2	0.5	12	48.6900	0.4375	65	11.87	67.8	20187	71%	0	24.35	829	39572	219	52.0	3592.1	52.0	34.7	61.6	0.59	0.00	0.00	1.159 1.159	3024.9	43.8	0.59	0.00	0.00	0.853 0.971	3	MP306	F	0	T&C	8202	385.3	0.968 0.968	0.000	93.2	28389	0.968 0.971				

Rein1

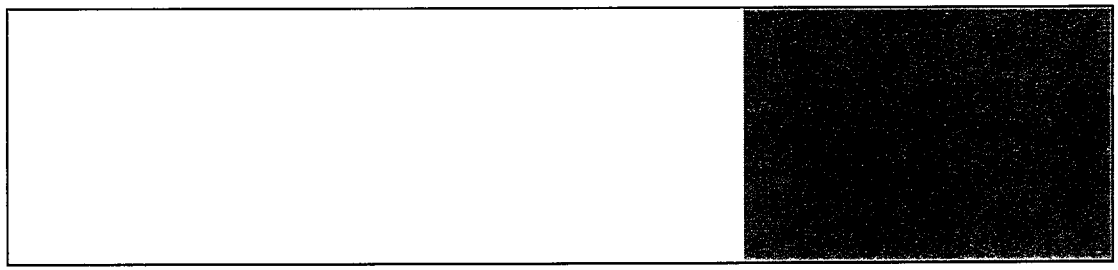
Bottom	Top	Qty	Model	Position	T or T&C
0	40.5	3	MP306	F	T&C
40.5	59.083	3	MP304	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

Flats (Used for relative orientation only. Actual flat numbers may vary.)



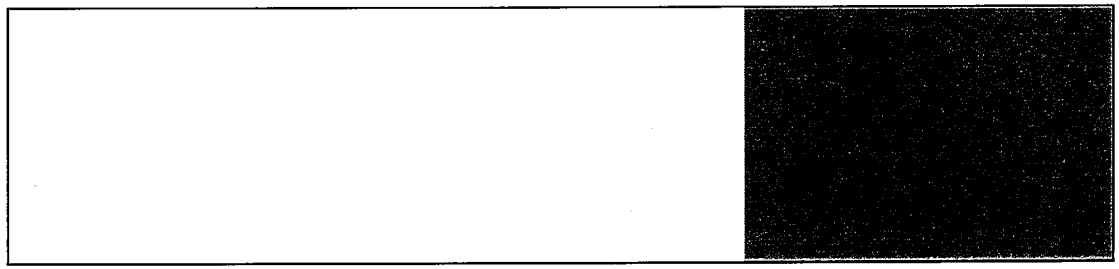
Rein2

Bottom	Top	Qty	Model	Position	T or T&C
0				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C



Rein3

Bottom	Top	Qty	Model	Position	T or T&C
0				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C



Reinforcement Capacity

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Optimizing Your Tower Infrastructure

5500 Flatirons Parkway, Suite 100
Boulder, CO 80301
720-304-6882

Dimensions and Properties														Compression				Axial					
																		ASD-9			LRFD		
Model	Weight (lb/ft)	Area (in^2)	Moment of Inertia (in^4)	Moment of Inertia (in^4)	Centroid from Mating Edge (in)	Centroid from Bolt Hole Center (in)	Web Thickness (in)	Width (in)	Flange Width (in)	Flange Thickness (in)	Hole Diameter (in)	Yield Stress (ksi)	Ultimate Stress (ksi)	Slender Ratio Coefficient	Unbraced Length (in)	Slender Ratio Coefficient	Unbraced Length (in)	Allowable Axial (kip)	Allowable Axial w/ Increase (kip)	Governing Axial	Design Axial Strength (kip)	Governing Axial
MP303	9.9	2.92	0.66	6.57	0.59	0	0.30	4.06	1.57	0.64	1.21875	65	80	0.80	18	1.00	18	96.4	128.6	Rupture	144.7	Rupture
MP306	28.8	8.47	4.95	52.50	0.93	0	0.64	6.89	2.61	1.01	1.21875	65	80	0.80	24	1.00	24	298.7	398.3	Rupture	448.1	Rupture

Anchor Rod Information for TIA/EIA-222-F and TIA-222-G-2

Site Information	
ID:	CT03XC354
Name:	Southport Police Department
App. #:	123456

AeroSolutions LLC
Optimizing Your Tower Infrastructure

Base Reactions		
Moment:	4254	ft-kip
Axial:	40	kip
Shear:	48	kip
Base Plate Type:	Circular	

Design Information	
TIA Code:	F
ASIF:	1.333
Failure:	100%
eta Factor:	0.50

Original Anchor Rod Data		
Quantity:	16	
Diameter:	2.25	in
Material:	A615 GR 75	
Bolt Circle:	56.9	in
Bolt Spacing:		in
Bolt Group Area:	63.62	in^2
Bolt Group MOIx:	25755	in^4

Reactions Seen by Original AR Group		
Moment:	3379.0	kip-ft
Axial:	39.7	kip
Shear:	48.2	kip

Original AR Capacity Check		
Tension Load:	175.6	kip
Allowable load:	194.8	kip
AR Capacity:	90.2%	Pass

First Added Anchor Rod Data		
Quantity:	3	
Diameter:	2.50	in
Material:	A193 B7	
Bolt Circle:	60.2	in
Bolt Group Area:	14.73	in^2
Bolt Group MOIx:	6669	in^4

Reactions Seen by First Added AR Group		
Moment:	874.9	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

First Added AR Capacity Check		
Tension Load:	232.6	kip
Allowable load:	269.9	kip
AR Capacity:	86.2%	Pass

Second Added Anchor Rod Data		
Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

Reactions Seen by Second Added AR Group		
Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check		
Tension Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

Third Added Anchor Rod Data		
Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

Reactions Seen by Second Added AR Group		
Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check		
Tension Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

Rev.4.1

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

TIA Rev F

Site Data

BU#: *CT03XC354*
Site Name: *Southport Police Departme*
App #: *123456*

Pole Manufacturer:	*Other*

Reactions		
Moment:	3379.0365	ft-kips
Axial:	39.6979	kips
Shear:	48.240872	kips

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	56.91	in

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

Anchor Rod Results

Maximum Rod Tension:	175.6 Kips	Rigid
Allowable Tension:	195.0 Kips	Service, ASD
Anchor Rod Stress Ratio:	90.1% Pass	Fty*ASIF

Plate Data		
Diam:	62.91	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	9.78	in

Base Plate Results Flexural Check

Base Plate Stress:	37.5 ksi	Rigid
Allowable Plate Stress:	60.0 ksi	Service ASD
Base Plate Stress Ratio:	62.5% Pass	0.75*Fy*ASIF
		Y.L. Length: 29.46

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

n/a

Stiffener Results

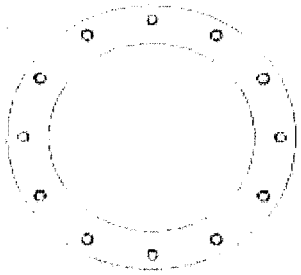
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

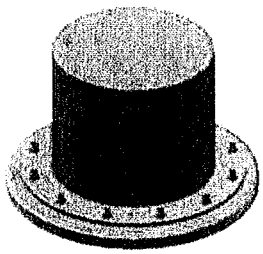
Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Diam:	48.69	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	





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

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

Appendix B

Referenced Monopole Design

Structural Analysis for
KMB Design Group, LLC

145' Monopole

Site Name: Reef Road
Site ID: CT11401
Site Address: 100 Reef Rd., Fairfield, CT 06824

FDH Project Number 09-02131E S1

Prepared By:

James Mathewson III, EI
Project Engineer

Reviewed By:

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

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

March 23, 2009

Prepared pursuant to TIA/EIA-222-F June 1996 Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

TABLE OF CONTENTS

2730 Rowland Rd., Raleigh, NC 27615 Ph: (919)-755-1012 Fax: (919)-755-1031 info@fdh-inc.com

EXECUTIVE SUMMARY

At the request of KMB Design Group, LLC, FDH Engineering, Inc. performed an analysis of the monopole located in Fairfield, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads, pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F.* Information pertaining to the existing/proposed antenna loading, current tower geometry, and member sizes was obtained from Valmont Industries, Inc. (Order No. 11635-94) Record Drawings dated May 19, 1994, All-Points Technology Corporation (Project No. CT255621) Structural Analysis Report dated April 30, 2008 and KMB Design Group, LLC

The *basic design wind speed* per *TIA/EIA-222-F* standards is 85 mph without ice and 74 mph with 1/2" radial ice.

Conclusions

With the existing and proposed antennas from Omnipoint in place at 133 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards. Furthermore, provided the foundation was designed and constructed to support the original design reactions (See Valmont Order No. 11635-94), the foundation should have the necessary capacity support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed coax should be installed inside the monopole's shaft, but may be installed outside the monopole's shaft in a single row if necessary.

2730 Rowland Rd., Raleigh, NC 27615 Ph: (919)-755-1012 Fax: (919)-755-1031 info@fdh-inc.com

APPURTENANCE LISTING

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1.** *If the actual layout determined in the field deviates from this layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

Table 1 – Appurtenance Loading

Existing Loading:

No.	Centerline Elevation (ft)	Coax and Lines[1]	Carrier	Mount Type	Description
1-15	143[2]	(10) 7/8" (6) 1-5/8" (2) 1-1/4"	---	(3) 12' T-Arms	(9) Decibel DB844H90E-XY (3) KMW AM-X-WM-17-65 (2) 8' 4-bay Dipoles (1) 18' x 2.5" Omni
16-20	133[3]	(6) 1-1/4" (1) 7/8"	Omnipoint	(3) 12' T-Arms	(3) EMS RR90-18-00DP (2) 2' x 2' Panels
21-28	125[2]	(6) 1-1/4" (3) 1-5/8" (2) 1/2"	---	(3) 10' T-Arms	(6) Allgon 7770.00 (1) 8' x 1.5" Omni (1) 3' x 2" Omni (6) LGP2140x TMAs
29-34	116	(6) 1-5/8" (6) 1-5/8"[4]	Metro PCS	(3) 10' T-Arms	(6) Kathrein 800-10504
35-40	108	(6) 1-5/8"	---	(1) Low Profile Platform	(6) Decibel DB980H90E-M

1 The existing coax is located inside the pole's shaft, unless otherwise noted.
2 Omni and dipole elevations are measured from the bottom of the antenna.
3 The loading for Omnipoint at 133 ft will be altered. See the proposed loading below.
4 Coax is installed outside the monopole's shaft in a single row.

Proposed Loading:

No.	Centerline Elevation (ft)	Coax and Lines	Carrier	Mount Type	Description
1-8	133[1]	(6) 1-1/4" (6) 1-5/8"[2] (1) 7/8"	Omnipoint	(3) 12' T-Arms	(3) EMS RR90-18-00DP (3) RFS APX16DWV-16DWV-S-E-ACU (2) 2' x 2' Panels

1 This represents the final configuration for Omnipoint at 133 ft. According to information provided by KMB, Omnipoint will install (3) RFS APX16DWV-16DWV-S-E-ACU antennas and (6) 1-5/8" coax in addition to the existing loading at 133 ft.
2 Coax is installed outside the monopole's shaft in a single row.

2730 Rowland Rd., Raleigh, NC 27615 Ph: (919)-755-1012 Fax: (919)-755-1031 info@fdh-inc.com

RESULTS

Based on information obtained from the original design drawings, the yield strength of steel for individual members was as follows:

Table 2 - Material Strength

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Base Plate	60 ksi
Anchor Bolts	75 ksi

Table 3 displays the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information.

Table 3 – Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity	Pass Fail
L1	145 - 90.83	Pole	TP33.48x23.61x0.281	55.3	Pass
L2	90.83 - 42.83	Pole	TP41.64x31.976x0.375	75.9	Pass
L3	42.83 - 0	Pole	TP48.69x39.7686x0.4375	84.1	Pass
			Anchor Bolts	OK	Pass
			Base Plate	OK	Pass

Table 4 – Maximum Base Reactions

Load Type	Current Analysis *(TIA/EIA-222-F)*	Original Design *(TIA/EIA-222-F)*
Axial	37 k	37 k
Shear*	30 k	28 k
Moment	2,881 k-ft	3,277 k-ft

* Based on projects of similar type the foundation has been determined to have adequate capacity to resist the additional shear load.

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GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of KMB Design Group, LLC to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

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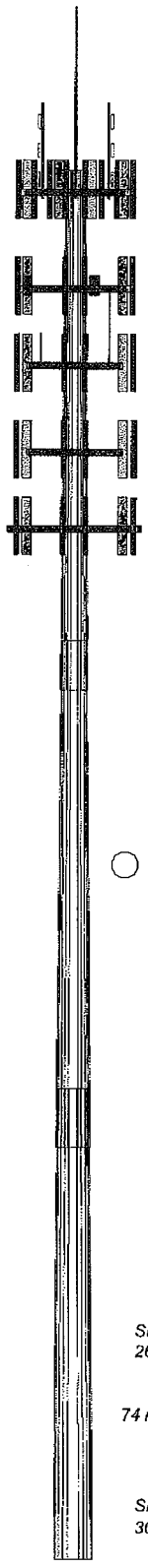
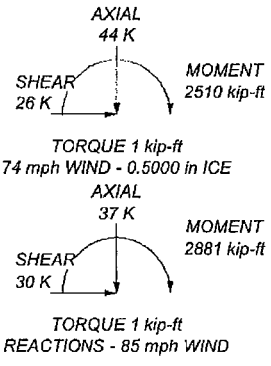
Section	1	2	3
Length (ft)	54.17	53.17	49.00
Number of Sides	12	12	12
Thickness (in)	0.2810	0.3750	0.4375
Lap Splice (ft)	5.17	6.17	
Top Dia (in)	23.6100	31.9760	39.7686
Bot Dia (in)	33.4800	41.6400	48.6900
Grade	A572-65		
Weight (K)	4.7	8.0	10.3





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
18' x 2.5" omni	152	2' x 2' panel w/ mount pipe	133
8' 4-bay dipole	147	2' x 2' panel w/ mount pipe	133
8' 4-bay dipole	147	8' x 1.5" omni	129
(3) DB844H90E-XY w/ mount pipe	143	3' x 2" omni	126.5
(3) DB844H90E-XY w/ mount pipe	143	10' T-Arm	125
(3) DB844H90E-XY w/ mount pipe	143	(2) 7770.00 w/ mount pipe	125
AM-X-WM-17-65 w/ mount pipe	143	(2) 7770.00 w/ mount pipe	125
AM-X-WM-17-65 w/ mount pipe	143	(2) 7770.00 w/ mount pipe	125
AM-X-WM-17-65 w/ mount pipe	143	(2) LGP2140X TMA	125
12' T-Arms	143	(2) LGP2140X TMA	125
12' T-Arms	143	(2) LGP2140X TMA	125
12' T-Arms	143	10' T-Arm	125
12' T-Arms	133	10' T-Arm	125
12' T-Arms	133	10' T-Arm	116
12' T-Arms	133	10' T-Arm	116
RR90-18-00DP w/ mount pipe	133	10' T-Arm	116
APX16DWV-16DWV-S-E-ACU w/ mount pipe	133	(2) 800-10504 w/ mount pipe	116
		(2) 800-10504 w/ mount pipe	116
RR90-18-00DP w/ mount pipe	133	(2) 800-10504 w/ mount pipe	116
APX16DWV-16DWV-S-E-ACU w/ mount pipe	133	13' Low Profile Platform	108
		(2) DB980H90E-M w/ mount pipe	108
RR90-18-00DP w/ mount pipe	133	(2) DB980H90E-M w/ mount pipe	108
APX16DWV-16DWV-S-E-ACU w/ mount pipe	133	(2) DB980H90E-M w/ mount pipe	108

MATERIAL STRENGTH

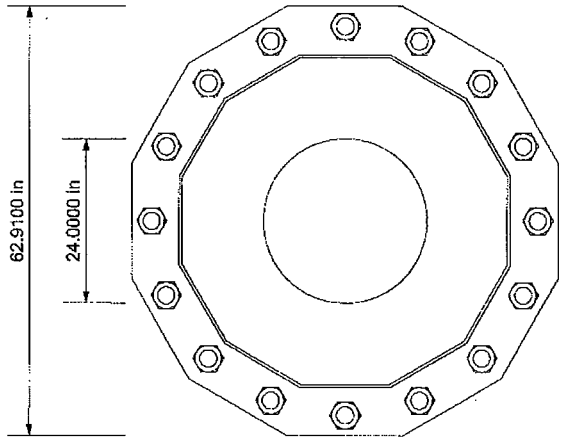
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

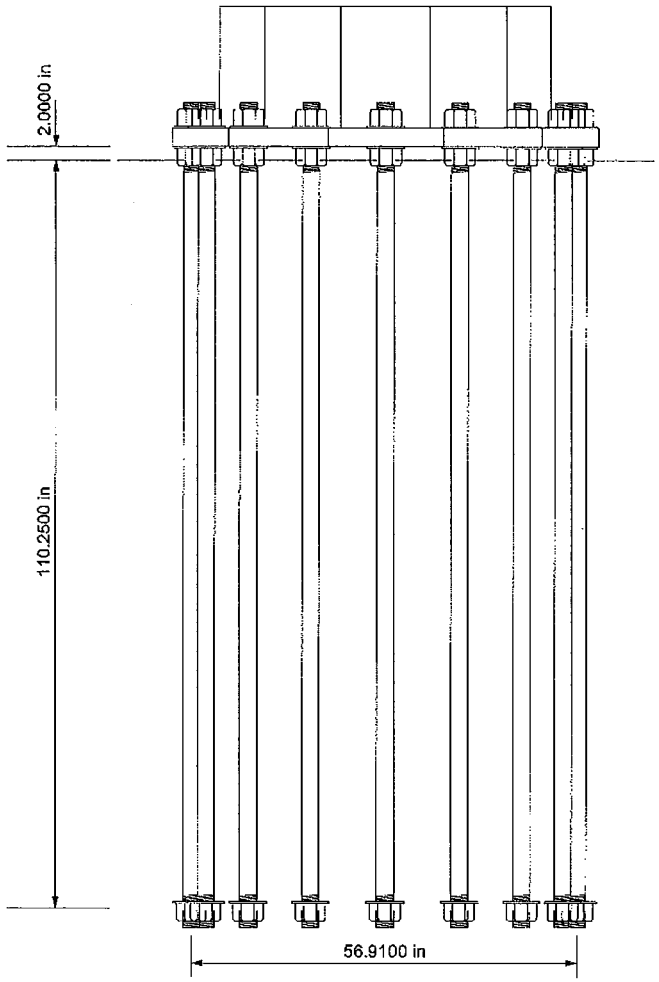
TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.

FDH Engineering, Inc.
2730 Rowland Road
Raleigh, North Carolina
Phone: (919) 755-1012
FAX: (919) 755-1031
Tower Analysis

Job:	Reef Road, CT11401
Project:	09-02131E S1
Client:	KMB Design Group, LLC
Drawn by:	James Mathewson III, E
App'd:	
Code:	TIA/EIA-222-F
Date:	03/23/09
Scale:	NTS
Path:	
Dwg No.	E-1





FOUNDATION NOTES

1. Plate thickness is 2.7500 in.
2. Plate grade is A633-60.
3. Anchor bolt grade is A615-75.
4. f'c is 4 ksi.

FDH Engineering, Inc.
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Raleigh, North Carolina
Phone: (919) 755-1012
FAX: (919) 755-1031
Tower Analysis

Job: *Reef Road, CT11401*			
Project: *09-02131E S1*			
Client: KMB Design Group, LLC	Drawn by: James Mathewson III, EI	App'd:	
Code: TIA/EIA-222-F	Date: 03/23/09	Scale: NTS	
Path:		Dwg No. F-1	

(Revised)
STRUCTURAL ANALYSIS REPORT

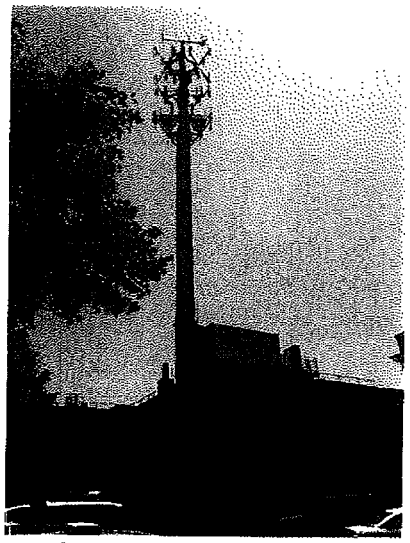
For

CT5022

AWE - FAIRFIELD

100 Reef Road
Fairfield, CT 06824

Antennas Mounted to the Monopole



Prepared for:

at&t

550 Cochituate Road
Framingham, MA 01701

Dated:
December 20, 2011

STATE OF CONNECTICUT
GI KAI WANG
No. 28220
LICENSED
PROFESSIONAL ENGINEER

Prepared by:
HUDSON DESIGN GROUP, LLC.
1600 Osgood Street Building 20 North, Suite 2-101
North Andover, MA 01845
Phone: (978) 557-5553
www.hudsondesigngroupllc.com

Hudson Design Group LLC

SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by AT&T to conduct a structural evaluation of the 145' monopole supporting the proposed AT&T antennas located at elevation 125' above the ground level.

This report represents this office's findings, conclusions and recommendations pertaining to the support of AT&T's existing and proposed antennas listed below.

Record drawings of the monopole prepared by Valmont Industries Inc. (order #11635-94, dated May 19, 1994) were available and obtained for our use. This office conducted an on-site visual survey and tower mapping on June 2, 2011 to record dimensional properties of the existing monopole and its appurtenances. Attendees included Bradley Loeb (HDG – Associate) and Nick Marshall (HDG - Associate).

CONCLUSION SUMMARY:

HDG performed structural analysis of the existing monopole with modifications (adding 6-C8x18.7 to the existing monopole from El.0' to El.60').

Based on our evaluation, we have determined that the existing monopole, anchor bolts and base plate **are in conformance** with the ANSI/TIA-222-F Standard for the loading considered under the criteria listed in this report. The monopole structure is rated at **98.2%** - Pole Section L4 from EL.0' to EL.42.83' Controlling).

All Tower Modification Design Details will be designed and furnished in the latest set of HDG construction drawings (Rev 3)-Tower Modification Details Included.

Hudson Design Group LLC

APPURTENANCES CONFIGURATION:

Tenant	Appurtenances	Elev.	Mount
	(12) Panel Antennas	143'	12' T-Arm
	(3) RRU	143'	12' T-Arm
	(2) 8' 4-Bay Dipole	143'	12' T-Arm
	Omni 2 1/2"x12' and Pull Box	143'	12' T-Arm
	3' diameter Dish	143'	12' T-Arm
	(6) Panel Antennas	135'	12' T-Arm
	(6) TMAs	135'	12' T-Arm
	24"x24" Dish	135'	12' T-Arm
AT&T	***(6)7770.00 Antennas***	***125'***	***10' T-Arm***
AT&T	***(12)LGP 21401 TMAs***	***125'***	***10' T-Arm***
AT&T	***Omni 1 1/4"x3'***	***125'***	***10' T-Arm***
AT&T	***Omni 3"x3'***	***125'***	***10' T-Arm***
AT&T	***(3)P65-16-XLH-RR Antennas***	***125'***	***10' T-Arm***
AT&T	***(6)RRUS***	***125'***	***Ring Mount***
AT&T	***Surge Arrestor DC6-48-60-18-8f***	***125'***	***Ring Mount***
	(3) Panel Antennas	113'	8' T-Arm
	(6) Panel Antennas	105'	Low Profile Platform

****Existing/Proposed AT&T Appurtenances shown in Bold.***

ANALYSIS RESULTS SUMMARY:

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Pole Section-L1	73.8 %	90.83 – 145	PASS	
Pole Section-L2	96.6 %	60 – 90.83	PASS	
Pole Section-L3	88.7 %	42.83 – 60	PASS	
Pole Section-L4	98.2 %	0 – 42.83	PASS	
Base Plate	95.6 %	0	PASS	

Hudson Design Group LLC

DESIGN CRITERIA:

1. EIA/TIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

   County: Fairfield
   Wind Load: 85 mph (fastest mile)
   Ice Thickness: 1/2 inch

2. Approximate height above grade to proposed antennas: 125'-0"

***Calculations and referenced documents are attached.**

ASSUMPTIONS:

1. The monopole dimensions, member sizes are as indicated in the drawings by Valmont Industries Inc. (order #11635-94, dated May 19, 1994). The monopole and foundation are properly constructed and maintained.

2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.

3. The appurtenances configuration is as stated in this report. All antennas, mounts coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer requirements.

4. The support mounts and platforms are not analyzed and are considered adequate to support the loading. The analysis is limited to the primary support structure itself.

5. All prior structural modification, if any, are assumed to be as per the data supplied (if available), and installed properly.

Hudson Design Group LLC

SUPPORT RECOMMENDATIONS:

HDG recommends that the proposed antennas be mounted on the existing T-frame supported by the existing monopole; the proposed RRHs be mounted on the proposed pipes.

Reference HDG's Latest Construction Drawings (Rev 3) including the Tower Modifications for all component and connection requirements (attached).

Hudson Design Group LLC

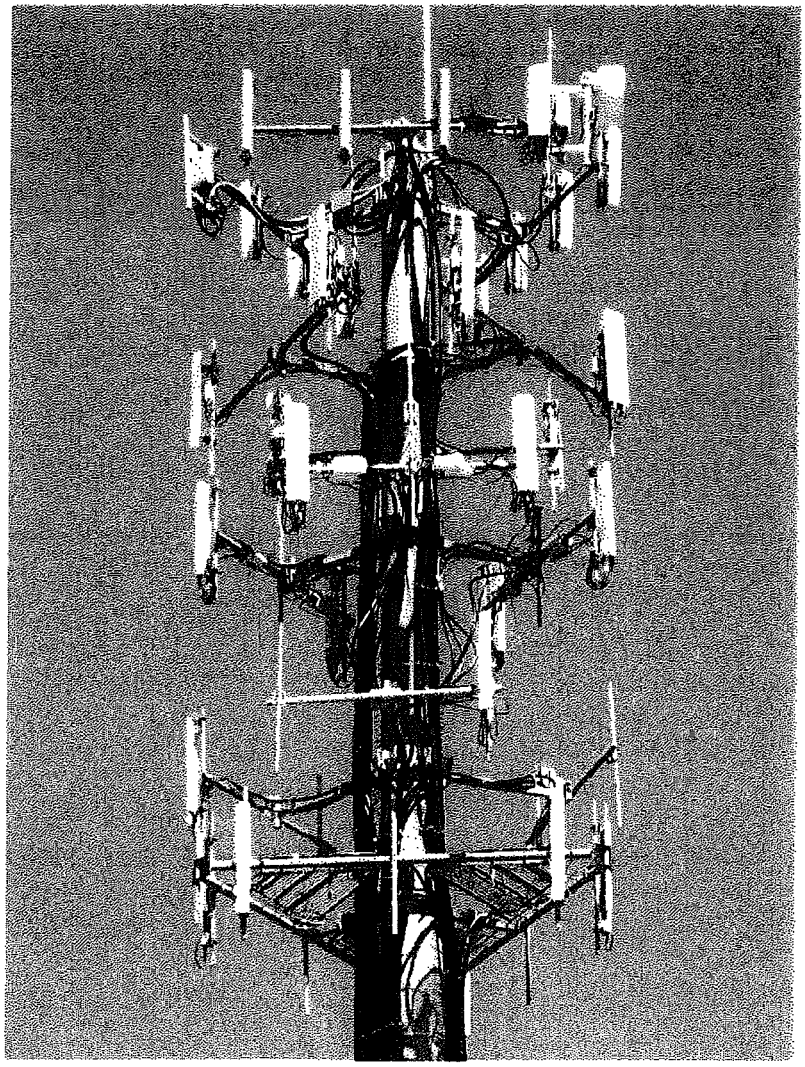


Photo 1: Photo illustrating the Monopole with Appurtenances shown.

Hudson Design Group LLC

CONSTRUCTION DRAWINGS

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
SITE ADDRESS:	100 REEF ROAD FAIRFIELD, CT 06824
LATITUDE:	41.13971911° N 41° 08' 22.99" N
LONGITUDE:	-73.25777725° W -73° 15' 28.00" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
NOC#	866-915-5600

at&t

SITE NUMBER: CT5022
SITE NAME: AWE - FAIRFIELD

DRAWING INDEX

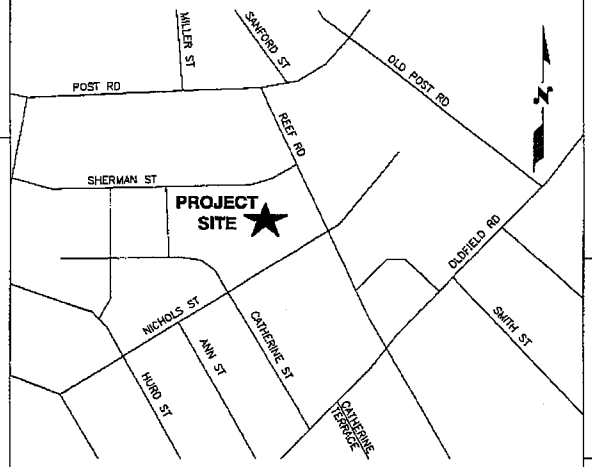
THE MODIFICATIONS DEPICTED ON THESE DRAWINGS ARE BASED ON THE RECOMMENDATIONS OUTLINED IN THE STRUCTURAL ANALYSIS COMPLETED BY HUDSON DESIGN GROUP, LLC. DATED DECEMBER 20, 2011.

THIS PLAN IS BASED ON A SPECIFIC ANTENNA AND COAX CONFIGURATION FROM "MAPPING REPORT FOR CT5022 – AT&T MOBILITY" AWE--FAIRFIELD 100 REEF ROAD, FAIRFIELD, CT 06824, DATED JUNE 2, 2011. PREPARED BY HUDSON DESIGN GROUP, LLC.

ALL DIMENSIONS, MEASUREMENTS, QUANTITIES, PART NUMBERS, AND COAX/ANTENNA PLACEMENTS TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO MATERIAL ORDERS AND CONSTRUCTION.

VICINITY MAP

DIRECTIONS TO SITE:
START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. 0.4 MI TURN LEFT ONTO CAPITOL BLVD. 0.3 MI TURN LEFT ONTO WEST ST. 0.3 MI MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. 29.1 MI MERGE ONTO I-95 S/GOVERNOR JOHN DAVIS LODGE TURNPIKE VIA THE EXIT ON THE LEFT TOWARD N.Y. CITY. 22.5 MI TAKE THE CT-135/N. BENSON ROAD EXIT, EXIT 22. 0.2 MI TURN LEFT ONTO N BENSON RD/CT-135. 0.2 MI TURN RIGHT ONTO POST RD/US-1. 0.6 MI TURN LEFT ONTO REEF RD. 0.1 MI 100 REEF RD IS ON THE RIGHT.



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

72 HOURS
BEFORE YOU DIG
CALL TOLL FREE 800-922-4455

UNDERGROUND SERVICE ALERT

Hudson Design Group LLC
1400 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-3286

SAI communications
22 KEEWAYDIN DRIVE
SALEM, NH 03079

SITE NUMBER: CT5022
SITE NAME: AWE - FAIRFIELD

100 REEF ROAD
FAIRFIELD, CT 06824
FAIRFIELD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	12/20/11	CONSTRUCTION REVISED	HC	DC	DPH
2	04/18/11	CONSTRUCTION REVISED	ASF	DC	DPH
1	03/18/11	ISSUED FOR CONSTRUCTION	HC	DC	DPH
0	02/17/11	ISSUED FOR REVIEW	DB	DC	DPH

SCALE: AS SHOWN DESIGNED BY: DC DRAWN BY: DB

AT&T

TITLE SHEET
(LTE)

JOB NUMBER	DRAWING NUMBER	REV
5022.01	T-1	3

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR – SAI
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. APPLICABLE BUILDING CODES:
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
   BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT & 2009 CT AMENDMENTS
   ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
   LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE (ACI) 318: BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF	REFERENCE	TYP	TYPICAL
EGR	EQUIPMENT GROUND RING	REQ	REQUIRED		

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SITE NUMBER: CT5022
SITE NAME: AWE - FAIRFIELD

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FAIRFIELD COUNTY

at&t
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NO.	DATE	REVISIONS	BY	CHK	APP'D
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0	02/17/11	ISSUED FOR REVIEW	DB	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

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GENERAL NOTES (LTE)

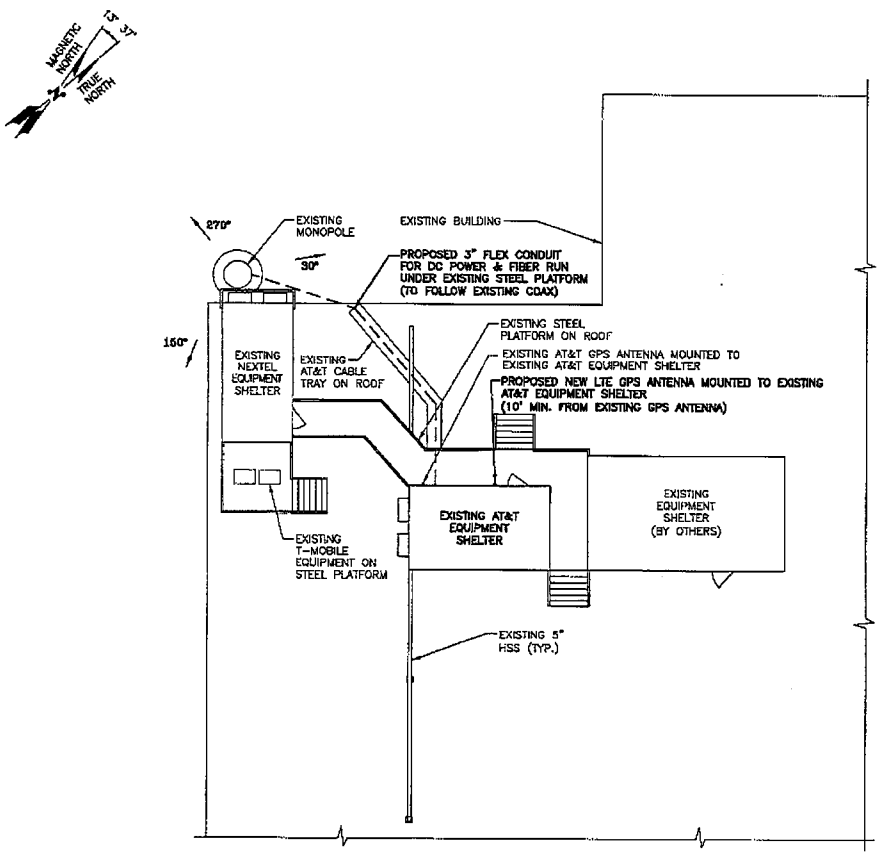
JOB NUMBER	DRAWING NUMBER	REV
5022.01	GN-1	3

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.
REFER TO STRUCTURAL ANALYSIS & MODIFICATIONS BY: HUDSON DESIGN GROUP, LLC – DATED: DECEMBER 12, 2011.

NOTE:

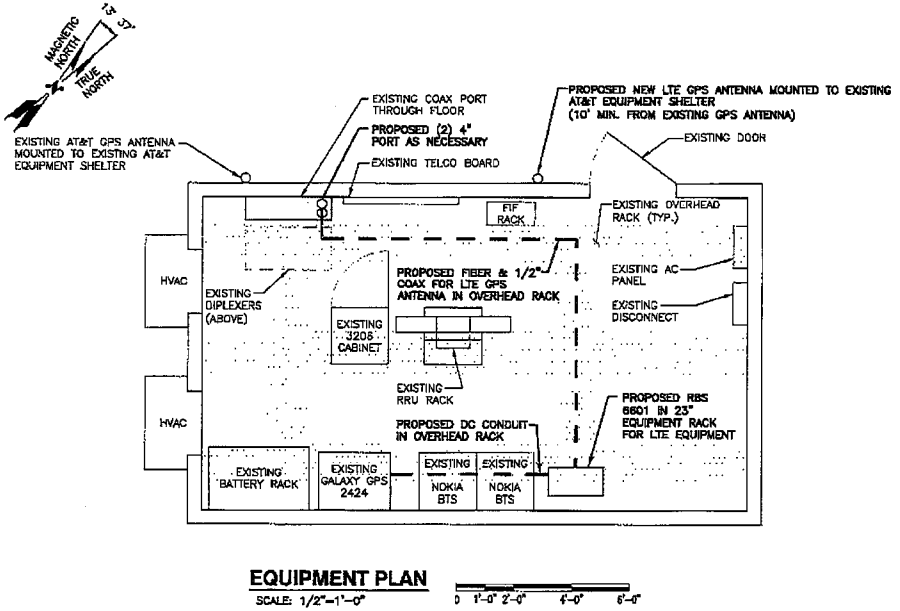
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



COMPOUND PLAN

SCALE: 1/4"=1'-0"

0 2'-0" 4'-0" 8'-0" 12'-0"



EQUIPMENT PLAN

SCALE: 1/2"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

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SCALE: AS SHOWN DESIGNED BY: DC DRAWN BY: DB

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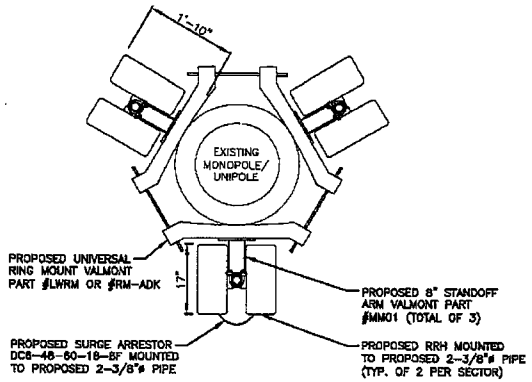
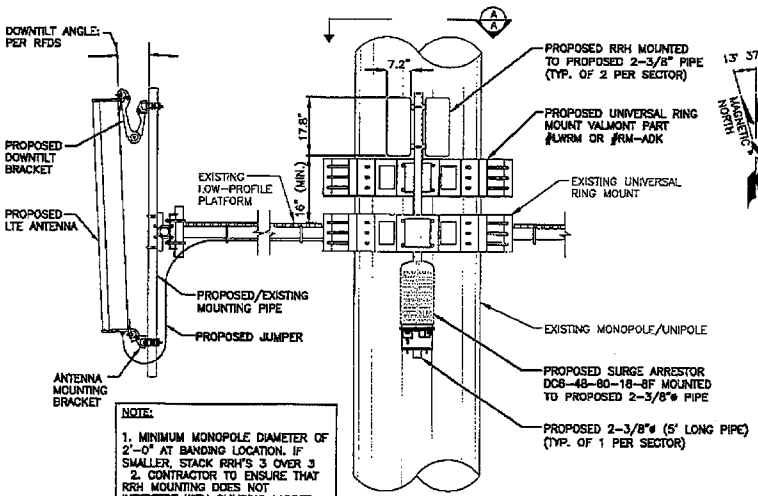
COMPOUND & EQUIPMENT PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
5022.01	A-1	3



SECTION A-A

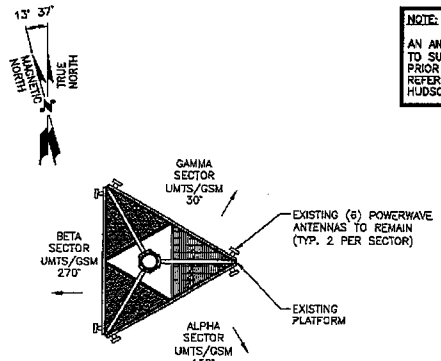


NOTE:
1. MINIMUM MONOPOLE DIAMETER OF 2'-0" AT BANDING LOCATION. IF SMALLER, STACK RRH'S 3 OVER 3
2. CONTRACTOR TO ENSURE THAT RRH MOUNTING DOES NOT INTERFERE WITH CLIMBING LADDER

PART #	VMI PART #	SIZE RANGE
LWRM	801068	12"-45"
RM-ADK	157268	36"-60" ADAPTER KIT

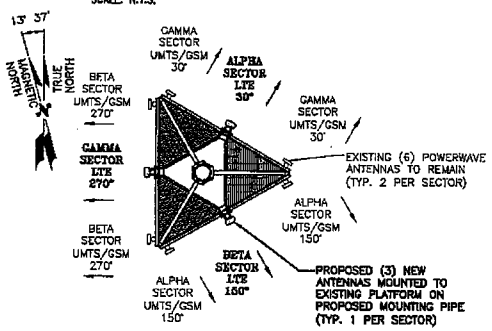
PROPOSED RRH & SURGE ARRESTOR MOUNTING DETAIL

SCALE: N.T.S.



EXISTING GSM/UMTS ANTENNA PLAN

SCALE: N.T.S.

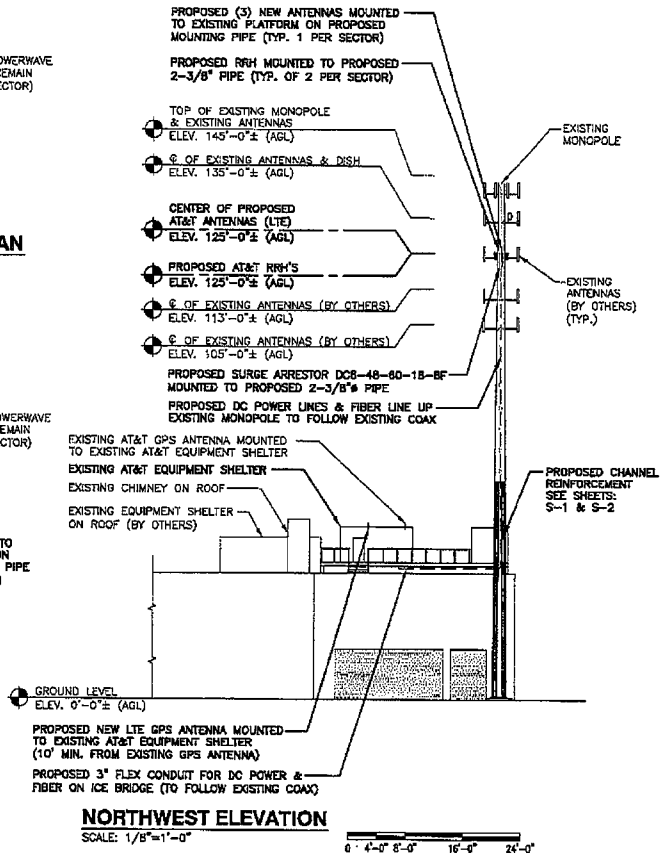


PROPOSED LTE ANTENNA PLAN

SCALE: N.T.S.

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.
REFER TO STRUCTURAL ANALYSIS & MODIFICATIONS BY: HUDSON DESIGN GROUP, LLC – DATED: DECEMBER 12, 2011.

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



NORTHWEST ELEVATION

SCALE: 1/8"=1'-0"

0' 4'-0" 8'-0" 16'-0" 24'-0"

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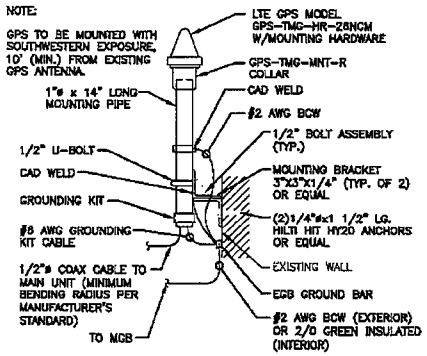
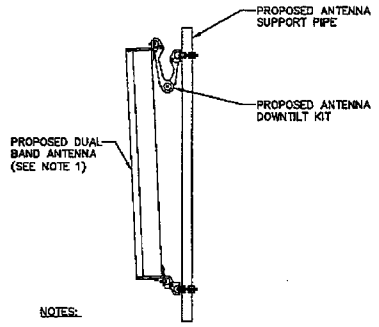
ANTENNA LAYOUT AND ELEVATION (LTE)

JOB NUMBER	DRAWING NUMBER	REV
5022.01	A-2	3



GPS MOUNTED TO WALL

SCALE: N.T.S.



NOTES:

1. REFER TO RFDS & SECTOR SCHEMATICS FOR ANTENNA MODEL, TYPE & QUANTITY REQUIRED PER SECTOR

PROPOSED ANTENNA DETAIL

SCALE: N.T.S.

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SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

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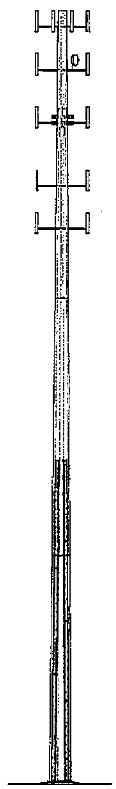
DETAILS (LTE)

JOB NUMBER	DRAWING NUMBER	REV
5022.01	A-3	3

SECTION	3	2	1
LENGTH (FT.)	42.83	48.00	64.17
# OF SIDES	12	12	12
THICKNESS (IN.)	0.438	0.375	0.281
TOP DIA.	41.64	33.48	23.81
BOTTOM DIA.	48.69	41.84	33.48
GRADE		A607-65	
TOWER FINISH		GALVANIZED	



TOP OF EXISTING MONOPOLE & EXISTING ANTENNAS
145'-0"± AGL

℄ OF EXISTING ANTENNAS & DISH
135'-0"± AGL

CENTER OF PROPOSED AT&T ANTENNAS (LTE)
PROPOSED RRH'S & SURGE ARRESTOR
125'-0"± AGL

EXISTING ANTENNAS (BY OTHERS)
113'-0"± AGL

EXISTING ANTENNAS (BY OTHERS)
105'-0"± AGL

TOP OF REINFORCEMENT
60'-0"± AGL

BOTTOM OF REINFORCEMENT
0'-0"± AGL

ELEVATION (1/S-1)

SCALE: 3/32" = 1'-0"

0' 5'-4" 10'-8" 21'-4" 32'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES AND ORDINANCES. IT IS THE CONTRACTORS RESPONSIBILITY TO OBTAIN ALL PERMITS NECESSARY TO COMPLETE THE PROJECT AND ABIDE BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS, ELEVATIONS, AND EXISTING CONDITIONS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO HUDSON DESIGN GROUP FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREA.
3. INCORRECTLY FABRICATED, DAMAGED, OTHERWISE MISFITTING, OR NON-CONFORMING MATERIALS AND CONDITIONS SHALL BE REPORTED TO HUDSON DESIGN GROUP PRIOR TO ANY REMEDIAL OR CORRECTIVE ACTION. ALL ACTIONS SHALL REQUIRE HUDSON DESIGN GROUP, LLC APPROVAL.
4. IT IS THE CONTRACTORS SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO INSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION AND/OR FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AFTER COMPLETION OF THE PROJECT.
5. CONTRACTOR SHALL PROMPTLY REMOVE ANY AND ALL DEBRIS FROM SITE AND RESTORE AS BEST AS POSSIBLE TO PRE-CONSTRUCTION CONDITION.

STEEL:

1. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST AISC CODE AND ASTM SPECIFICATIONS.
2. ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING SPECIFIED WELDS WITH WELDING ELECTRODES E-70XX OR SPECIFIED HIGH STRENGTH BOLTS TO BE ASTM A325N, THREAD INCLUDED WITH SHEAR PLANE (UNLESS OTHERWISE NOTED)
3. ALL BOLTED CONNECTIONS TO BE INSTALLED TO A SNUG-TIGHTENED CONDITION IN ACCORDANCE WITH AISC 13 PART 16.2, "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", SECTION 8.1, UNLESS OTHERWISE NOTED.
4. ALL STEEL (EXCEPT A490 BOLTS), AFTER FABRICATION, SHALL BE HOT DIPPED GALVANIZED PER ASTM A-123. ALL DAMAGED SURFACES, WELDED AREAS AND AUTHORIZED NON-GALVANIZED MEMBERS OR PARTS (EXISTING OR NEW) SHALL BE PAINTED WITH 2 COATS OF ZRC COLD GALVANIZING COMPOUND.
5. ALL SHOP AND FIELD WELDING SHALL BE DONE BY WELDERS QUALIFIED AS DESCRIBED IN THE "AMERICAN WELDING SOCIETY'S STANDARD QUALIFICATION PROCEDURE" TO PERFORM THE TYPE OF WORK REQUIRED.
6. STRUCTURAL STEEL MAY NOT BE TORCH CUT FOR FABRICATION. ALL STEEL FABRICATION MUST FOLLOW AISC STANDARDS.

MISC. NOTES:

1. ALL MODIFICATIONS ARE ASSUMED TO BE MADE ON AN EMPTY TOWER. CONTRACTOR IS RESPONSIBLE TO MAKE PROVISIONS TO SUPPORT OR WORK AROUND EXISTING ANTENNAS AND TRANSMISSION LINES. MODIFICATIONS MUST BE CONTINUOUS THROUGH ALL AREAS SHOWN.
2. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.

FABRICATION NOTES:

1. ALL DIMENSIONS ARE PRELIMINARY UNTIL FIELD VERIFIED BY CONTRACTOR. ANY CHANGES MUST BE APPROVED BY ENGINEER OF RECORD IN WRITING PRIOR TO FABRICATION AND INSTALLATION.
2. NEW STEEL MEMBERS MUST HAVE SINGLE DRILLED HOLES. SLOTTED AND DOUBLE DRILLED HOLES ARE NOT ACCEPTABLE MEANS OF FABRICATION.

CONTRACTOR QUALIFICATION NOTES:

1. ALL REPAIRS SHALL BE PERFORMED BY A TOWER CONTRACTOR WITH A MINIMUM OF 5 YEARS EXPERIENCE IN TOWER ERECTION AND RETROFIT AND WITH WORKING KNOWLEDGE OF THE ANSI/TIA-222-G "STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS"
2. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION MEANS AND METHODS. SHOULD THE CONTRACTOR REQUIRE DIRECT CONSULTATION, HUDSON DESIGN GROUP, LLC IS WILLING TO OFFER SERVICES BASED UPON AN AGREED FEE FOR THE WORK REQUIRED.
3. ALL SUBMITTAL INFORMATION MUST BE SENT TO HUDSON DESIGN GROUP, LLC 1600 OSGOOD ST. BUILDING 20N, SUITE 2-101 NORTH ANDOVER, MA 01845 TEL: (978)557-5553, FAX: (978)336-5586. ANY VARIATION OF THESE SPECIFICATIONS OR DRAWINGS WITHOUT CONSENT FROM HUDSON DESIGN GROUP WILL VOID ANY RESPONSIBILITY OR LIABILITY FOR DAMAGE (MATERIAL OR PHYSICAL) TOWARDS HUDSON DESIGN GROUP, LLC

JOB SITE SAFETY AND NOTES:

NEITHER THE PROFESSIONAL ACTIVITIES OF HUDSON DESIGN GROUP, LLC NOR THE PRESENCE OF HUDSON DESIGN GROUP, LLC OR EMPLOYEES AND SUB-CONSULTANTS AT THE CONSTRUCTION SITE, SHALL RELIEVE THE GENERAL CONTRACTOR AND/OR SUBCONTRACTORS AND ANY OTHER ENTITY OF THEIR OBLIGATIONS, DUTIES AND RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES, OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND ANY HEALTH OR SAFETY PRECAUTIONS REQUIRED BY ANY REGULATORY AGENCIES. THE GENERAL CONTRACTOR AND/OR SUBCONTRACTOR IS SOLELY RESPONSIBLE FOR JOB SAFETY, AND WARRANTS THAT THIS INTENT IS EVIDENT BY ACCEPTING THIS WORK.

SUBSTITUTES AND/OR EQUALS:

IF CONTRACTOR WISHES TO FURNISH OR USE A SUBSTITUTE ITEM OF MATERIAL OR EQUIPMENT, CONTRACTOR SHALL MAKE WRITTEN APPLICATION TO ENGINEER FOR ACCEPTANCE THEREOF, CERTIFYING THAT THE PROPOSED SUBSTITUTE WILL ADEQUATELY PERFORM THE FUNCTIONS AND ACHIEVE THE RESULTS CALLED FOR BY THE GENERAL DESIGN, BE SIMILAR IN SUBSTANCE TO THAT SPECIFIED, AND SUITED TO THE SAME USE AS THAT SPECIFIED. ALL VARIATIONS OF THE PROPOSED SUBSTITUTE FROM THAT SPECIFIED WILL BE IDENTIFIED IN THE APPLICATION AND AVAILABLE MAINTENANCE, REPAIR, AND REPLACEMENT SERVICE WILL BE INDICATED. THE APPLICATION WILL ALSO CONTAIN AN ITEMIZED ESTIMATE OF ALL COSTS OR CREDITS THAT WILL RESULT DIRECTLY OR INDIRECTLY FROM ACCEPTANCE OF SUCH SUBSTITUTE INCLUDING COSTS OF REDESIGN AND CLAIMS OF OTHER CONTRACTORS AFFECTED BY THE RESULTING CHANGE, ALL OF WHICH WILL BE CONSIDERED BY ENGINEER IN EVALUATION OF THE PROPOSED SUBSTITUTE. ENGINEER MAY REQUIRE CONTRACTOR TO FURNISH ADDITIONAL DATA ABOUT THE PROPOSED SUBSTITUTE.

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SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

AT&T

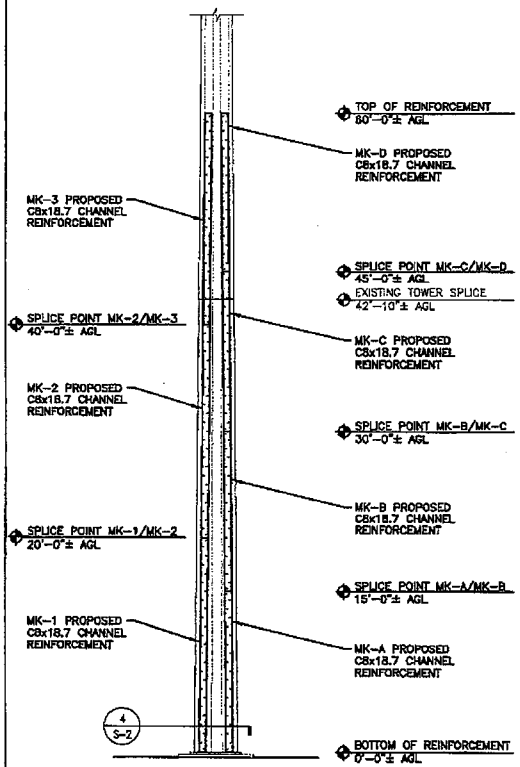
TOWER MODIFICATION DRAWINGS
MODIFICATION SCHEDULE

JOB NUMBER	DRAWING NUMBER	REV
5022.01	S-1	3

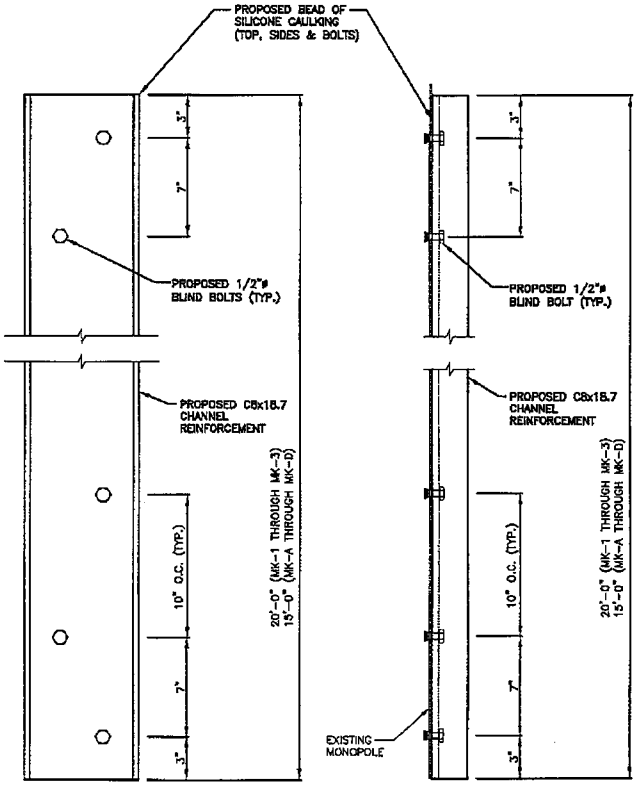
REINFORCEMENT CHANNEL INSTALLATION CHART

PART#	QTY	DESCRIPTION	ELEVATION
MK-1	3	20' CHANNEL REINFORCEMENT	0'-0" TO 20'-0"
MK-2	3	20' CHANNEL REINFORCEMENT	20'-0" TO 40'-0"
MK-3	3	20' CHANNEL REINFORCEMENT	40'-0" TO 60'-0"
MK-A	3	15' CHANNEL REINFORCEMENT	0'-0" TO 15'-0"
MK-B	3	15' CHANNEL REINFORCEMENT	15'-0" TO 30'-0"
MK-C	3	15' CHANNEL REINFORCEMENT	30'-0" TO 45'-0"
MK-D	3	15' CHANNEL REINFORCEMENT	45'-0" TO 60'-0"
	453	1/2"ø SHEREX BLIND BOLTS	

NOTE:
CHANNELS SHALL ALTERNATE BETWEEN MK-1 THROUGH MK-3 AND MK-A THROUGH MK-D TO AVOID HAVING SPLICE POINTS LEVEL AROUND THE CIRCUMFERENCE OF THE MONOPOLE.



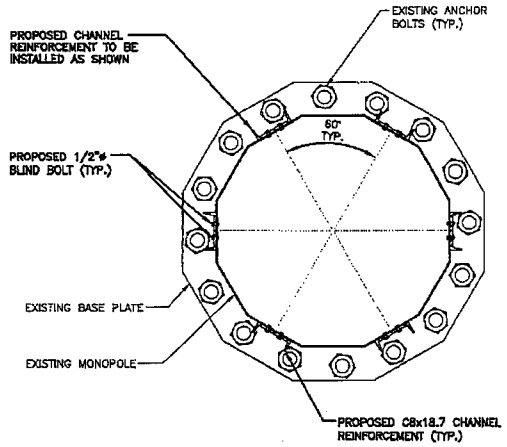
1 S-2 **ELEVATION**
SCALE: 3/16"= 1'-0"
0' 2'-8" 5'-4" 10'-8" 16'-0"



2 S-2 **CHANNEL DETAIL**
SCALE: 3"= 1'-0"
0' 0'-1" 0'-4" 0'-8" 1'-0"

3 S-2 **CHANNEL SECTION**
SCALE: 3"= 1'-0"
0' 0'-1" 0'-4" 0'-8" 1'-0"

NOTE:
CONTRACTOR TO COORDINATE CHANNEL REINFORCEMENTS W/ EXISTING CLIMBING PEGS, COAX LINES AND MISCELLANEOUS OBSTRUCTIONS ON THE SHAFT OF THE TOWER. RELOCATION OF THESE OBSTRUCTIONS MAY BE REQUIRED PRIOR TO INSTALLATION OF TOWER MODIFICATIONS.



4 S-2 **SECTION**
SCALE: 1"= 1'-0"
0' 0'-6" 1'-0" 2'-0" 3'-0"

Hudson Design Groupsc
1400 OLDWOOD STREET BUILDING 20 NORTH, SUITE 3-101 X-ANDOVER, MA 01845
TEL: (978) 557-5553 FAX: (978) 336-5586

SAI communications
22 KEEWAYDIN DRIVE
SALEM, NH 03079

SITE NUMBER: CT5022
SITE NAME: AWE - FAIRFIELD
100 REEF ROAD
FAIRFIELD, CT 06824
FAIRFIELD COUNTY

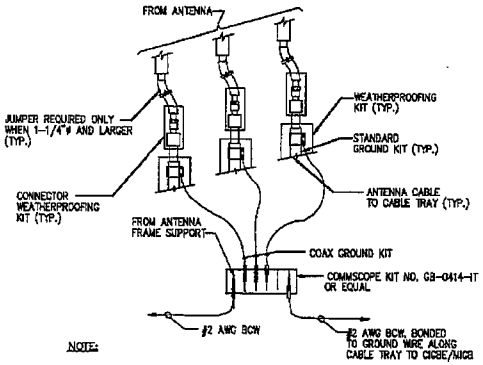
at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	12/20/11	CONSTRUCTION REVISED	HC	DC	DPH
2	04/19/11	CONSTRUCTION REVISED	AST	DC	DPH
1	03/18/11	ISSUED FOR CONSTRUCTION	HC	DC	DPH
0	02/17/11	ISSUED FOR REVIEW	DB	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

AT&T
TOWER MODIFICATION DRAWINGS
C8x18.7 CHANNEL REINFORCEMENT DETAILS

JOB NUMBER	DRAWING NUMBER	REV
5022.01	S-2	3

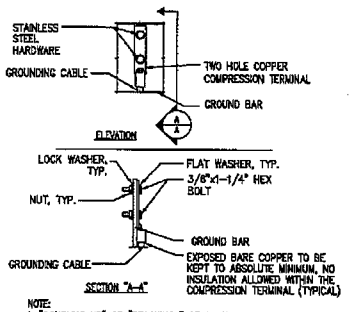


NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

1 GROUND WIRE TO GROUND BAR CONNECTION DETAIL

N.T.S.

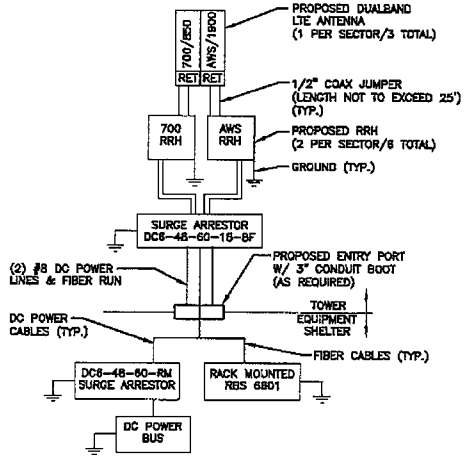


NOTE:

1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

2 TYPICAL GROUND BAR CONNECTION DETAIL

N.T.S.



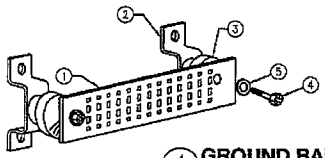
NOTES:

1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.

3 PLUMBING DIAGRAM

N.T.S.

WIRELESS SOLUTIONS INC.			
NO.	REQ.	PART NO.	DESCRIPTION
1	1	HLGB-0420-IS	SOLID GND. BAR (20"x4"x1/4")
2	2	———	WALL MTG. BRKT.
3	2	———	INSULATORS
4	4	———	5/8"-11x1" H.H.C.S.
5	4	———	5/8 LOCKWASHER



4 GROUND BAR - DETAIL

N.T.S.

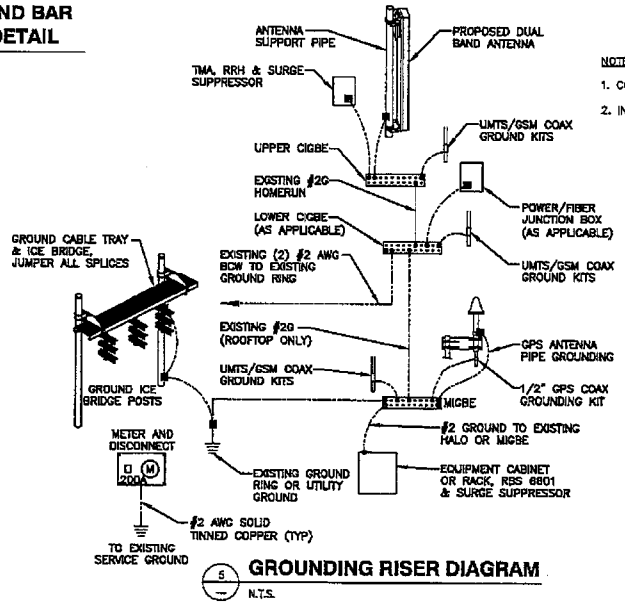
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLY RETURN BAR (#2)
RECTIFIER FRAMES.

SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)



5 GROUNDING RISER DIAGRAM

N.T.S.

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3-104
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5566

SAI communications
22 KEEWAYDIN DRIVE
SALEM, NH 03079

SITE NUMBER: CT5022
SITE NAME: AWE - FAIRFIELD

100 REEF ROAD
FAIRFIELD, CT 06824
FAIRFIELD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
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0	02/17/11	ISSUED FOR REVIEW	DB	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

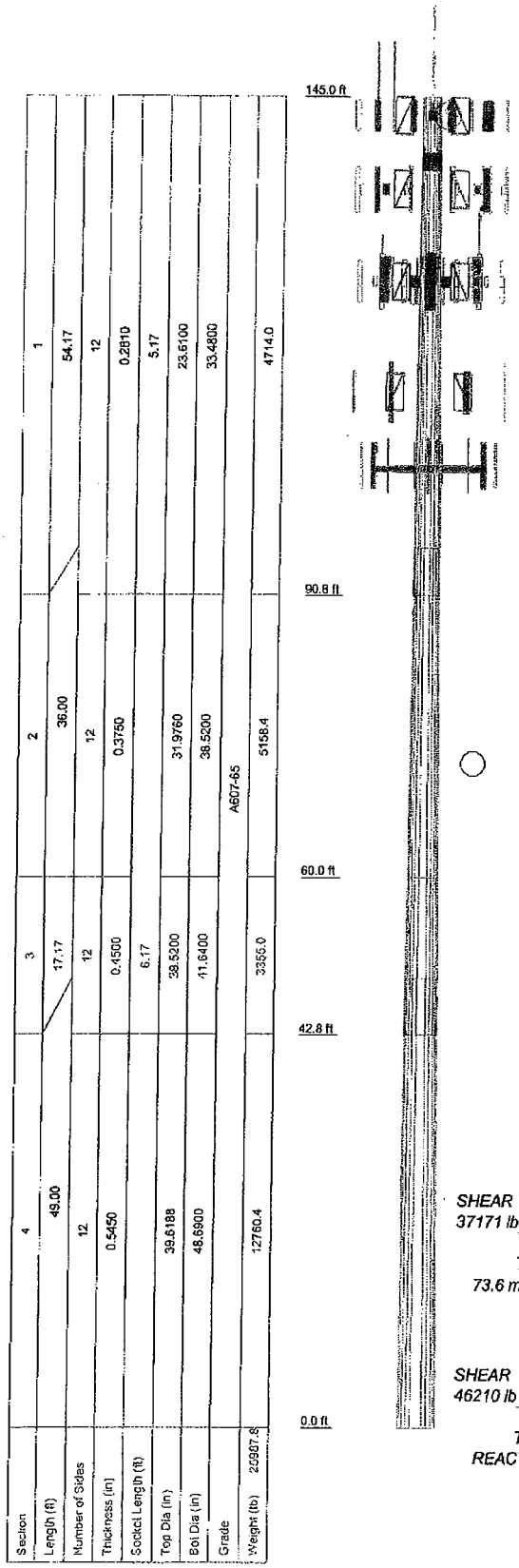
AT&T

PLUMBING DIAGRAM & DETAILS (LTE)

JOB NUMBER	DRAWING NUMBER	REV
5022.01	C-1	3

Hudson Design Group LLC

CALCULATIONS



Section	1	2	3	4
Length (ft)	54.17	36.00	17.17	48.00
Number of Sides	12	12	12	12
Thickness (in)	0.2810	0.3750	0.4500	0.5450
Socket Length (ft)	5.17		6.17	
Top Dia (in)	23.6100	31.9760	38.5200	39.6188
Bot Dia (in)	33.4800	38.5200	41.6400	48.6900
Grade	A607-65			
Weight (lb)	4714.0	5158.4	3356.0	12760.4
25987.8				

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Standoff T-Arm (12' face width)	143	Standoff T-Arm (10' face width)	125
Standoff T-Arm (12' face width)	143	Standoff T-Arm (10' face width)	125
Standoff T-Arm (12' face width)	143	(2) Powerwave 7770.00 w/mount pipe	125
Panel Antenna 40"x15"x4" w/mount pipe	143	(2) Powerwave 7770.00 w/mount pipe	125
Panel Antenna 40"x15"x4" w/mount pipe	143	(2) Powerwave 7770.00 w/mount pipe	125
Panel Antenna 40"x15"x4" w/mount pipe	143	(4) Powerwave LGP 21401	125
Panel Antenna 42"x6"x6" w/mount pipe	143	(4) Powerwave LGP 21401	125
Panel Antenna 42"x6"x6" w/mount pipe	143	(4) Powerwave LGP 21401	125
Panel Antenna 42"x6"x6" w/mount pipe	143	Omni 1 1/4"x3'	125
Panel Antenna 42"x6"x6" w/mount pipe	143	Omni 3"x6'	125
Panel Antenna 42"x6"x6" w/mount pipe	143	Powerwave P65-16-XLH-RR w/mount pipe	125
Panel Antenna 42"x6"x6" w/mount pipe	143	Powerwave P65-18-XLH-RR w/mount pipe	125
Panel Antenna 42"x6"x6" w/mount pipe	143	Powerwave P65-16-XLH-RR w/mount pipe	125
Panel Antenna 42"x6"x6" w/mount pipe	143	(2) Ericsson RRU w/mount pipe	125
Panel Antenna 42"x6"x6" w/mount pipe	143	(2) Ericsson RRU w/mount pipe	125
Panel Antenna 42"x6"x6" w/mount pipe	143	(2) Ericsson RRU w/mount pipe	125
Panel Antenna 42"x6"x6" w/mount pipe	143	Surge Arrestor (DC6-48-60-18-8F)	125
Ericsson RRU	143	Valmont Light Duty Tri-Bracket (1)	125
Ericsson RRU	143	2"x5' pipe	125
Ericsson RRU	143	2"x5' pipe	125
8' 4-Bay Dipole	143	2"x5' pipe	125
8' 4-Bay Dipole	143	Standoff T-Arm (10' face width)	125
Omni 2 1/2"x12'	143	Standoff T-Arm (8' face width)	113
pull box	143	Standoff T-Arm (8' face width)	113
P3F-52	143	kathrein 800 10504 w/80" mount pipe	113
Standoff T-Arm (12' face width)	135	kathrein 800 10504 w/80" mount pipe	113
Standoff T-Arm (12' face width)	135	kathrein 800 10504 w/80" mount pipe	113
Panel Antenna 60"x12"x3" w/mount pipe	135	2 1/2"x80" pipe	113
Panel Antenna 60"x12"x3" w/mount pipe	135	2 1/2"x80" pipe	113
Panel Antenna 60"x12"x3" w/mount pipe	135	2 1/2"x80" pipe	113
Panel Antenna 60"x6"x3" w/mount pipe	135	Standoff T-Arm (8' face width)	113
Panel Antenna 60"x6"x3" w/mount pipe	135	Panel Antenna 60"x6 1/2"x3" w/mount pipe	105
Panel Antenna 60"x6"x3" w/mount pipe	135	Panel Antenna 60"x6 1/2"x3" w/mount pipe	105
(2) Powerwave tma	135	Panel Antenna 60"x6 1/2"x3" w/mount pipe	105
(2) Powerwave tma	135	Panel Antenna 60"x6 1/2"x3" w/mount pipe	105
(2) Powerwave tma	135	Panel Antenna 60"x6 1/2"x3" w/mount pipe	105
Dish 24"x24"	135	Panel Antenna 60"x6 1/2"x3" w/mount pipe	105
Standoff T-Arm (12' face width)	135	2 1/2"x6' pipe	105
		2 1/2"x6' pipe	105
		2 1/2"x6' pipe	105
		PiROD 13' Low Profile Platform (Monopole)	105

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

Hudson Design Group
1600 Osgood Street, Building 20 North, Suite 2-101
North Andover, MA 01845
Phone: (978)557-5553
FAX: (978)336-5586

Job: *CT5022 - MOD*		
Project: *145 ft monopole*		
Client: at&t	Drawn by: kw	App'd:
Code: TIA/EIA-222-F	Date: 12/20/11	Scale: NTS
Path: R:\STRUCTURAL DEPT\Ambis Software\RISATower\RISA Projects\CT 5022 - MOD\CT5022 - MOD.ei		Dwg No. E-1

Tower Input Data

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

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 85.0 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56.0 pcf.
A wind speed of 73.6 mph is used in combination with ice.
Temperature drop of 60.0 °F.
Deflections calculated using a wind speed of 50.0 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

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	145.00-90.83	54.17	5.17	12	23.6100	33.4800	0.2810	1.1240	A607-65 (65 ksi)
L2	90.83-60.00	36.00	0.00	12	31.9760	38.5200	0.3750	1.5000	A607-65 (65 ksi)
L3	60.00-42.83	17.17	6.17	12	38.5200	41.6400	0.4500	1.8000	A607-65 (65 ksi)
L4	42.83-0.00	49.00		12	39.6188	48.6900	0.5450	2.1800	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	24.4429	21.1085	1466.3462	8.3518	12.2300	119.8977	2971.2149	10.3890	5.5744	19.838
	34.6610	30.0391	4225.9383	11.8852	17.3426	243.6733	8562.8966	14.7843	8.2196	29.251
L2	34.0769	38.1582	4863.8005	11.3132	16.5636	293.6444	9855.3784	18.7803	7.5646	20.172
	39.8788	46.0601	8554.3290	13.6559	19.9534	428.7162	17333.3897	22.6694	9.3184	24.849
L3	39.8788	55.1634	10204.7640	13.6291	19.9534	511.4309	20677.6185	27.1498	9.1174	20.261
	43.1089	59.6843	12924.9750	14.7460	21.5695	599.2240	26189.5035	29.3748	9.9535	22.119
L4	42.1990	68.5707	13362.7685	13.9884	20.5226	651.1259	27076.5918	33.7484	9.1572	16.802
	50.4076	84.4897	24997.2306	17.2359	25.2214	991.1112	50651.1664	41.5832	11.5883	21.263

Monopole Base Plate Data

Base Plate Data

Base plate is square	
Base plate is grouted	√
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	16
Embedment length	108.0000 in
f'_c	4.0 ksi
Grout space	4.0000 in
Base plate grade	A572-60
Base plate thickness	2.7500 in
Bolt circle diameter	56.9100 in
Outer diameter	62.9100 in
Inner diameter	24.0000 in
Base plate type	Plain Plate

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement	Total Number	Number Per Row	Start/End Position	Width or Diameter	Perimeter	Weight
			ft				in	in	plf
1 5/8	A	Surface Ar (CaAa)	105.00 - 12.00	6	6	0.000 0.300	1.9800		1.04
1 5/8	B	Surface Ar (CaAa)	113.00 - 12.00	6	6	0.000 0.300	1.9800		1.04
1 1/4	C	Surface Ar (CaAa)	125.00 - 12.00	9	9	0.000 0.300	1.5500		0.66
1 5/8	A	Surface Ar (CaAa)	125.00 - 12.00	3	3	0.000 0.300	1.9800		1.04
1 5/8	B	Surface Ar (CaAa)	135.00 - 12.00	6	6	0.000 0.300	1.9800		1.04
1 1/4	C	Surface Ar (CaAa)	135.00 - 12.00	6	6	0.000 0.300	1.5500		0.66
2 1/4	A	Surface Ar (CaAa)	143.00 - 12.00	3	3	0.000 0.300	2.3800		1.16
3" conduit	B	Surface Ar (CaAa)	125.00 - 12.00	3	3	0.000 0.000	3.5000		3.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		C_AA_A	Weight
				ft			ft²/ft	plf
7/8	B	No	Inside Pole	125.00 - 7.00	1	No Ice	0.00	0.54
						1/2" Ice	0.00	0.54
1/2	B	No	Inside Pole	125.00 - 7.00	1	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
7/8	C	No	Inside Pole	135.00 - 7.00	1	No Ice	0.00	0.54
						1/2" Ice	0.00	0.54
7/8	C	No	Inside Pole	143.00 - 7.00	9	No Ice	0.00	0.54
						1/2" Ice	0.00	0.54
1 1/4	C	No	Inside Pole	143.00 - 7.00	3	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
1 5/8	C	No	Inside Pole	143.00 - 7.00	6	No Ice	0.00	1.04

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
						1/2" Ice	0.00	1.04

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight lb
Standoff T-Arm (12' face width)	A	From Face	2.50 0.00 0.00	0.0000	143.00	No Ice 1/2" Ice	4.20 5.40	4.20 5.40	170.00 220.00
Standoff T-Arm (12' face width)	B	From Face	2.50 0.00 0.00	0.0000	143.00	No Ice 1/2" Ice	4.20 5.40	4.20 5.40	170.00 220.00
Standoff T-Arm (12' face width)	C	From Face	2.50 0.00 0.00	0.0000	143.00	No Ice 1/2" Ice	4.20 5.40	4.20 5.40	170.00 220.00
Panel Antenna 40"x15"x4" w/mount pipe	A	From Face	5.00 -6.00 0.00	0.0000	143.00	No Ice 1/2" Ice	5.90 6.28	2.43 2.91	43.38 80.21
Panel Antenna 40"x15"x4" w/mount pipe	B	From Face	5.00 -6.00 0.00	0.0000	143.00	No Ice 1/2" Ice	5.90 6.28	2.43 2.91	43.38 80.21
Panel Antenna 40"x15"x4" w/mount pipe	C	From Face	5.00 -6.00 0.00	0.0000	143.00	No Ice 1/2" Ice	5.90 6.28	2.43 2.91	43.38 80.21
Panel Antenna 42"x6"x6" w/mount pipe	A	From Face	5.00 -2.00 0.00	0.0000	143.00	No Ice 1/2" Ice	2.48 2.81	3.22 3.76	43.38 70.98
Panel Antenna 42"x6"x6" w/mount pipe	A	From Face	5.00 2.00 0.00	0.0000	143.00	No Ice 1/2" Ice	2.48 2.81	3.22 3.76	43.38 70.98
Panel Antenna 42"x6"x6" w/mount pipe	A	From Face	5.00 6.00 0.00	0.0000	143.00	No Ice 1/2" Ice	2.48 2.81	3.22 3.76	43.38 70.98
Panel Antenna 42"x6"x6" w/mount pipe	B	From Face	5.00 -2.00 0.00	0.0000	143.00	No Ice 1/2" Ice	2.48 2.81	3.22 3.76	43.38 70.98
Panel Antenna 42"x6"x6" w/mount pipe	B	From Face	5.00 2.00 0.00	0.0000	143.00	No Ice 1/2" Ice	2.48 2.81	3.22 3.76	43.38 70.98
Panel Antenna 42"x6"x6" w/mount pipe	B	From Face	5.00 6.00 0.00	0.0000	143.00	No Ice 1/2" Ice	2.48 2.81	3.22 3.76	43.38 70.98
Panel Antenna 42"x6"x6" w/mount pipe	C	From Face	5.00 -2.00 0.00	0.0000	143.00	No Ice 1/2" Ice	2.48 2.81	3.22 3.76	43.38 70.98
Panel Antenna 42"x6"x6" w/mount pipe	C	From Face	5.00 2.00 0.00	0.0000	143.00	No Ice 1/2" Ice	2.48 2.81	3.22 3.76	43.38 70.98
Panel Antenna 42"x6"x6" w/mount pipe	C	From Face	5.00 6.00 0.00	0.0000	143.00	No Ice 1/2" Ice	2.48 2.81	3.22 3.76	43.38 70.98
Ericsson RRU	A	From Face	5.00 -6.00	0.0000	143.00	No Ice 1/2" Ice	2.07 2.26	1.08 1.23	44.00 58.64

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
			0.00						
Ericsson RRU	B	From Face	5.00	0.0000	143.00	No Ice	2.07	1.08	44.00
			-6.00			1/2" Ice	2.26	1.23	58.64
			0.00						
Ericsson RRU	C	From Face	5.00	0.0000	143.00	No Ice	2.07	1.08	44.00
			-6.00			1/2" Ice	2.26	1.23	58.64
			0.00						
8' 4-Bay Dipole	A	From Face	5.00	0.0000	143.00	No Ice	1.60	1.60	25.00
			2.00			1/2" Ice	2.42	2.42	37.45
			4.00						
8' 4-Bay Dipole	C	From Face	5.00	0.0000	143.00	No Ice	1.60	1.60	25.00
			6.00			1/2" Ice	2.42	2.42	37.45
			4.00						
Omni 2 1/2"x12'	C	From Face	0.50	0.0000	143.00	No Ice	3.00	3.00	30.00
			0.00			1/2" Ice	4.23	4.23	52.30
			6.00						
pull box	C	From Face	2.00	0.0000	143.00	No Ice	1.40	0.70	30.00
			0.00			1/2" Ice	1.56	0.82	40.34
			0.00						
**********									
Standoff T-Arm (12' face width)	A	From Face	2.50	60.0000	135.00	No Ice	4.20	4.20	170.00
			0.00			1/2" Ice	5.40	5.40	220.00
			0.00						
Standoff T-Arm (12' face width)	B	From Face	2.50	60.0000	135.00	No Ice	4.20	4.20	170.00
			0.00			1/2" Ice	5.40	5.40	220.00
			0.00						
Standoff T-Arm (12' face width)	C	From Face	2.50	60.0000	135.00	No Ice	4.20	4.20	170.00
			0.00			1/2" Ice	5.40	5.40	220.00
			0.00						
Panel Antenna 60"x12"x3" w/mount pipe	A	From Face	5.00	60.0000	135.00	No Ice	7.47	3.95	55.55
			-6.00			1/2" Ice	8.15	5.04	104.01
			0.00						
Panel Antenna 60"x12"x3" w/mount pipe	B	From Face	5.00	60.0000	135.00	No Ice	7.47	3.95	55.55
			-6.00			1/2" Ice	8.15	5.04	104.01
			0.00						
Panel Antenna 60"x12"x3" w/mount pipe	C	From Face	5.00	60.0000	135.00	No Ice	7.47	3.95	55.55
			-6.00			1/2" Ice	8.15	5.04	104.01
			0.00						
Panel Antenna 60"x6"x3" w/mount pipe	A	From Face	5.00	60.0000	135.00	No Ice	4.22	3.95	55.55
			6.00			1/2" Ice	4.81	5.04	91.57
			0.00						
Panel Antenna 60"x6"x3" w/mount pipe	B	From Face	5.00	60.0000	135.00	No Ice	4.22	3.95	55.55
			6.00			1/2" Ice	4.81	5.04	91.57
			0.00						
Panel Antenna 60"x6"x3" w/mount pipe	C	From Face	5.00	60.0000	135.00	No Ice	4.22	3.95	55.55
			6.00			1/2" Ice	4.81	5.04	91.57
			0.00						
(2) Powerwave tma	A	From Face	5.00	60.0000	135.00	No Ice	1.29	0.36	14.10
			0.00			1/2" Ice	1.45	0.48	21.26
			0.00						
(2) Powerwave tma	B	From Face	5.00	60.0000	135.00	No Ice	1.29	0.36	14.10
			0.00			1/2" Ice	1.45	0.48	21.26
			0.00						
(2) Powerwave tma	C	From Face	5.00	60.0000	135.00	No Ice	1.29	0.36	14.10
			0.00			1/2" Ice	1.45	0.48	21.26
			0.00						
Dish 24"'x24"	C	From Face	5.00	60.0000	135.00	No Ice	5.60	0.33	30.00

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
			0.00 3.00			1/2" Ice	5.92	0.47	51.84
**********									
Standoff T-Arm (10' face width)	A	From Face	2.50 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	3.50 4.50	3.50 4.50	160.00 200.00
Standoff T-Arm (10' face width)	B	From Face	2.50 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	3.50 4.50	3.50 4.50	160.00 200.00
Standoff T-Arm (10' face width)	C	From Face	2.50 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	3.50 4.50	3.50 4.50	160.00 200.00
(2) Powerwave 7770.00 w/mount pipe	A	From Face	5.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	6.10 6.60	4.23 4.98	55.08 100.07
(2) Powerwave 7770.00 w/mount pipe	B	From Face	5.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	6.10 6.60	4.23 4.98	55.08 100.07
(2) Powerwave 7770.00 w/mount pipe	C	From Face	5.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	6.10 6.60	4.23 4.98	55.08 100.07
(4) Powerwave LGP 21401	A	From Face	5.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	1.29 1.45	0.53 0.65	31.00 39.08
(4) Powerwave LGP 21401	B	From Face	5.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	1.29 1.45	0.53 0.65	31.00 39.08
(4) Powerwave LGP 21401	C	From Face	5.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	1.29 1.45	0.53 0.65	31.00 39.08
Omni 1 1/4"x3'	A	From Face	5.00 0.00 3.50	0.0000	125.00	No Ice 1/2" Ice	0.38 0.58	0.38 0.58	10.00 13.34
Omni 3"x6'	B	From Face	5.00 0.00 5.00	0.0000	125.00	No Ice 1/2" Ice	1.77 2.13	1.77 2.13	20.00 33.24
Powerwave P65-16-XLH-RR w/mount pipe	A	From Face	5.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	8.40 8.95	6.13 7.07	85.90 146.64
Powerwave P65-16-XLH-RR w/mount pipe	B	From Face	5.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	8.40 8.95	6.13 7.07	85.90 146.64
Powerwave P65-16-XLH-RR w/mount pipe	C	From Face	5.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	8.40 8.95	6.13 7.07	85.90 146.64
(2) Ericsson RRU w/mount pipe	A	From Face	1.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice	2.94 3.35	2.27 2.73	62.25 88.15
(2) Ericsson RRU w/mount pipe	B	From Face	1.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice	2.94 3.35	2.27 2.73	62.25 88.15
(2) Ericsson RRU w/mount pipe	C	From Face	1.00 0.00 2.00	0.0000	125.00	No Ice 1/2" Ice	2.94 3.35	2.27 2.73	62.25 88.15
Surge Arrestor (DC6-48-60-18-8F)	A	From Face	1.00 0.00 -1.50	0.0000	125.00	No Ice 1/2" Ice	1.27 1.46	1.27 1.46	20.00 35.12

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
Valmont Light Duty Tri-Bracket (1)	A	None		0.0000	125.00	No Ice	1.76	1.76	54.00
						1/2" Ice	2.08	2.08	70.00
2"x5' pipe	A	From Face	0.50 0.00 0.00	0.0000	125.00	No Ice	1.19	1.19	19.00
						1/2" Ice	1.50	1.50	28.09
2"x5' pipe	B	From Face	0.50 0.00 0.00	0.0000	125.00	No Ice	1.19	1.19	19.00
						1/2" Ice	1.50	1.50	28.09
2"x5' pipe	C	From Face	0.50 0.00 0.00	0.0000	125.00	No Ice	1.19	1.19	19.00
						1/2" Ice	1.50	1.50	28.09
**********									
Standoff T-Arm (8' face width)	A	From Face	3.00 0.00 0.00	0.0000	113.00	No Ice	2.80	2.80	140.00
						1/2" Ice	3.60	3.60	170.00
Standoff T-Arm (8' face width)	B	From Face	3.00 0.00 0.00	0.0000	113.00	No Ice	2.80	2.80	140.00
						1/2" Ice	3.60	3.60	170.00
Standoff T-Arm (8' face width)	C	From Face	3.00 0.00 0.00	0.0000	113.00	No Ice	2.80	2.80	140.00
						1/2" Ice	3.60	3.60	170.00
kathrein 800 10504 w/80" mount pipe	A	From Face	6.00 -4.00 0.00	0.0000	113.00	No Ice	3.97	3.78	58.60
						1/2" Ice	4.48	4.61	95.27
kathrein 800 10504 w/80" mount pipe	B	From Face	6.00 -4.00 0.00	0.0000	113.00	No Ice	3.97	3.78	58.60
						1/2" Ice	4.48	4.61	95.27
kathrein 800 10504 w/80" mount pipe	C	From Face	6.00 -4.00 0.00	0.0000	113.00	No Ice	3.97	3.78	58.60
						1/2" Ice	4.48	4.61	95.27
2 1/2"x80" pipe	A	From Face	6.00 4.00 0.00	0.0000	113.00	No Ice	1.92	1.92	39.00
						1/2" Ice	2.42	2.42	53.15
2 1/2"x80" pipe	B	From Face	6.00 4.00 0.00	0.0000	113.00	No Ice	1.92	1.92	39.00
						1/2" Ice	2.42	2.42	53.15
2 1/2"x80" pipe	C	From Face	6.00 4.00 0.00	0.0000	113.00	No Ice	1.92	1.92	39.00
						1/2" Ice	2.42	2.42	53.15
**********									
PiROD 13' Low Profile Platform (Monopole)	A	None		0.0000	105.00	No Ice	15.70	15.70	1300.00
						1/2" Ice	20.10	20.10	1765.00
Panel Antenna 60"x6 1/2"x3" w/mount pipe	A	From Face	3.75 6.00 0.00	0.0000	105.00	No Ice	4.28	4.02	64.74
						1/2" Ice	4.72	4.74	102.93
Panel Antenna 60"x6 1/2"x3" w/mount pipe	A	From Face	3.75 -6.00 0.00	0.0000	105.00	No Ice	4.28	4.02	64.74
						1/2" Ice	4.72	4.74	102.93
Panel Antenna 60"x6 1/2"x3" w/mount pipe	B	From Face	3.75 6.00 0.00	0.0000	105.00	No Ice	4.28	4.02	64.74
						1/2" Ice	4.72	4.74	102.93
Panel Antenna 60"x6 1/2"x3" w/mount pipe	B	From Face	3.75 -6.00 0.00	0.0000	105.00	No Ice	4.28	4.02	64.74
						1/2" Ice	4.72	4.74	102.93
Panel Antenna 60"x6 1/2"x3" w/mount pipe	C	From Face	3.75 6.00 0.00	0.0000	105.00	No Ice	4.28	4.02	64.74
						1/2" Ice	4.72	4.74	102.93

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
Panel Antenna 60"x6 1/2"x3" w/mount pipe	C	From Face	3.75 -6.00 0.00	0.0000	105.00	No Ice 1/2" Ice	4.28 4.72	4.02 4.74	64.74 102.93
2 1/2"x6' pipe	A	From Face	3.75 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice	1.73 2.09	1.73 2.09	35.00 47.77
2 1/2"x6' pipe	B	From Face	3.75 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice	1.73 2.09	1.73 2.09	35.00 47.77
2 1/2"x6' pipe	C	From Face	3.75 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice	1.73 2.09	1.73 2.09	35.00 47.77

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
P3F-52	B	Paraboloid w/o Radome	From Face	5.00 -7.00 0.00	-90.0000		143.00	3.00	No Ice 1/2" Ice	7.10 7.46	90.00 128.31

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	25987.84					
Bracing Weight	0.00					
Total Member Self-Weight	25987.84			-1845.32	-1525.19	
Total Weight	39692.26			-1845.32	-1525.19	
Wind 0 deg - No Ice		91.06	-46036.14	-3993369.25	-14009.27	1621.80
Wind 30 deg - No Ice		23066.94	-39880.02	-3459989.89	-2003500.46	971.16
Wind 60 deg - No Ice		39846.42	-23026.54	-1998353.56	-3454328.18	190.29
Wind 90 deg - No Ice		46183.85	333.44	46373.85	-4013551.76	-3165.91
Wind 120 deg - No Ice		39893.71	23238.68	2025929.00	-3461627.86	-3007.88
Wind 150 deg - No Ice		23086.11	40015.12	3476156.59	-2007171.95	-3754.63
Wind 180 deg - No Ice		164.03	46193.25	4012146.52	-25518.02	-4352.26
Wind 210 deg - No Ice		-22803.15	40191.92	3500901.02	1962729.07	-4123.11
Wind 240 deg - No Ice		-39850.37	23019.69	1993683.53	3451843.25	-142.85
Wind 270 deg - No Ice		-46045.63	50.95	4903.74	3990735.63	1494.65
Wind 300 deg - No Ice		-39885.18	-22939.21	-1986795.75	3457358.15	2575.57
Wind 330 deg - No Ice		-23002.41	-39870.16	-3459117.09	1992153.02	2750.46
Member Ice	3333.25					
Total Weight Ice	51582.55			-2993.30	-2598.55	
Wind 0 deg - Ice		70.26	-37035.77	-3281241.35	-12229.67	956.58

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
Wind 30 deg - Ice		18554.17	-32082.27	-2843026.25	-1646311.86	489.44
Wind 60 deg - Ice		32054.19	-18523.26	-1642526.41	-2838200.50	-6.40
Wind 90 deg - Ice		37150.32	264.26	35211.45	-3296747.30	-2489.78
Wind 120 deg - Ice		32092.96	18693.03	1661536.36	-2844159.54	-2205.20
Wind 150 deg - Ice		18571.87	32190.24	2852894.47	-1649563.09	-2677.85
Wind 180 deg - Ice		130.76	37159.58	3292960.09	-21712.27	-3108.25
Wind 210 deg - Ice		-18346.30	32328.06	2872187.09	1611389.53	-2973.27
Wind 240 deg - Ice		-32057.31	18517.87	1635768.03	2833448.98	43.79
Wind 270 deg - Ice		-37041.40	38.65	2118.46	3275974.21	1172.78
Wind 300 deg - Ice		-32086.24	-18457.04	-1633776.53	2838001.57	1864.53
Wind 330 deg - Ice		-18505.92	-32076.00	-2842545.14	1634934.42	1886.54
Total Weight	39692.26			-1845.32	-1525.19	
Wind 0 deg - Service		31.51	-15929.46	-1381730.67	-4233.59	561.18
Wind 30 deg - Service		7981.64	-13799.31	-1197170.34	-692638.84	336.04
Wind 60 deg - Service		13787.69	-7967.66	-691413.83	-1194655.36	65.85
Wind 90 deg - Service		15980.57	115.38	16104.31	-1388158.33	-1095.47
Wind 120 deg - Service		13804.05	8041.07	701071.49	-1197181.20	-1040.79
Wind 150 deg - Service		7988.27	13846.06	1202880.34	-693909.26	-1299.18
Wind 180 deg - Service		56.76	15983.83	1388343.99	-8215.85	-1505.97
Wind 210 deg - Service		-7890.36	13907.24	1211442.43	679758.92	-1426.68
Wind 240 deg - Service		-13789.06	7965.29	689913.89	1195023.34	-49.43
Wind 270 deg - Service		-15932.74	17.63	1754.79	1381491.29	517.18
Wind 300 deg - Service		-13801.10	-7937.44	-687414.58	1196931.61	891.20
Wind 330 deg - Service		-7959.31	-13795.90	-1196868.33	689940.21	951.72

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
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

Comb. No.	Description
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	145 - 90.83	Pole	Max Tension	30	0.03	0.03	-1.19
			Max. Compression	14	-18370.86	-552.44	1168.66
			Max. Mx	5	-11109.53	-691265.82	-15959.18
			Max. My	8	-11109.50	-8647.79	-691254.20
			Max. Vy	5	24606.76	-691265.82	-15959.18
			Max. Vx	8	24616.47	-8647.79	-691254.20
			Max. Torque	9			3762.91
L2	90.83 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28559.35	-1325.77	1845.21
			Max. Mx	5	-19134.88	-1730984.98	-28028.34
			Max. My	8	-19135.02	-15399.69	-1730488.79
			Max. Vy	5	33086.13	-1730984.98	-28028.34
			Max. Vx	8	33095.86	-15399.69	-1730488.79
			Max. Torque	9			3880.00
L3	60 - 42.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32142.60	-1605.49	2099.40
			Max. Mx	5	-22124.99	-2108533.66	-31672.89
			Max. My	8	-22125.14	-17457.24	-2107839.33
			Max. Vy	5	35568.47	-2108533.66	-31672.89
			Max. Vx	8	35577.61	-17457.24	-2107839.33
			Max. Torque	8			3945.58
L4	42.83 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-51582.55	-2605.80	3004.91
			Max. Mx	5	-39649.42	-4113918.44	-47838.51
			Max. My	8	-39649.49	-26295.25	-4112618.66
			Max. Vy	5	46218.89	-4113918.44	-47838.51
			Max. Vx	8	46229.45	-26295.25	-4112618.66
			Max. Torque	8			4298.72

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	14	51582.55	0.19	-0.32
	Max. H_x	11	39692.17	46043.97	-50.95
	Max. H_z	2	39692.17	-91.05	46034.48
	Max. M_x	2	4093202.71	-91.05	46034.48
	Max. M_z	5	4113918.43	-46182.18	-333.41
	Max. Torsion	8	4298.79	-164.03	-46192.76
	Min. Vert	5	39692.17	-46182.18	-333.41
	Min. H_x	5	39692.17	-46182.18	-333.41
	Min. H_z	8	39692.23	-164.03	-46192.76
	Min. M_x	8	-4112618.66	-164.03	-46192.76
	Min. M_z	11	-4090487.36	46043.97	-50.95
	Min. Torsion	13	-2720.78	23002.39	39870.12

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	39692.26	-0.01	0.03	-1846.01	-1525.47	0.02
Dead+Wind 0 deg - No Ice	39692.17	91.05	-46034.48	-4093202.71	-14424.31	1620.93
Dead+Wind 30 deg - No Ice	39692.25	23066.92	-39879.98	-3546644.85	-2053689.29	978.92
Dead+Wind 60 deg - No Ice	39692.25	39846.38	-23026.52	-2048418.56	-3540808.81	195.67
Dead+Wind 90 deg - No Ice	39692.17	46182.18	333.41	47839.34	-4113918.43	-3127.33
Dead+Wind 120 deg - No Ice	39692.25	39893.68	23238.66	2076832.88	-3548271.00	-2977.56
Dead+Wind 150 deg - No Ice	39692.25	23086.09	40015.09	3563269.06	-2057448.00	-3712.00
Dead+Wind 180 deg - No Ice	39692.23	164.03	46192.76	4112618.66	-26294.11	-4298.79
Dead+Wind 210 deg - No Ice	39692.25	-22803.14	40191.88	3588756.64	2011652.81	-4077.27
Dead+Wind 240 deg - No Ice	39692.25	-39850.34	23019.67	2043596.87	3538271.80	-149.30
Dead+Wind 270 deg - No Ice	39692.17	-46043.97	50.95	5048.01	4090487.36	1460.17
Dead+Wind 300 deg - No Ice	39692.25	-39885.15	-22939.19	-2036507.59	3543966.22	2531.71
Dead+Wind 330 deg - No Ice	39692.25	-23002.39	-39870.12	-3545762.68	2042040.33	2720.78
Dead+Ice+Temp	51582.55	-0.19	0.32	-3004.91	-2605.80	0.04
Dead+Wind 0 deg+Ice+Temp	51582.55	70.26	-37035.73	-3400846.11	-12756.26	959.68
Dead+Wind 30 deg+Ice+Temp	51582.55	18554.15	-32082.24	-2946658.49	-1706332.51	501.09
Dead+Wind 60 deg+Ice+Temp	51582.55	32054.16	-18523.24	-1702414.27	-2941595.80	4.85
Dead+Wind 90 deg+Ice+Temp	51582.55	37150.28	264.26	36830.48	-3416980.91	-2460.43
Dead+Wind 120 deg+Ice+Temp	51582.55	32092.92	18693.01	1722281.80	-2947794.23	-2183.13
Dead+Wind 150 deg+Ice+Temp	51582.55	18571.85	32190.20	2956952.82	-1709724.90	-2651.80
Dead+Wind 180 deg+Ice+Temp	51582.55	130.76	37159.54	3413049.68	-22676.22	-3079.46
Dead+Wind 210 deg+Ice+Temp	51582.55	-18346.29	32328.02	2977095.41	1669859.58	-2952.54
Dead+Wind 240 deg+Ice+Temp	51582.55	-32057.27	18517.85	1695341.82	2936670.18	31.93
Dead+Wind 270 deg+Ice+Temp	51582.55	-37041.36	38.65	2201.20	3395345.72	1144.17
Dead+Wind 300 deg+Ice+Temp	51582.55	-32086.20	-18457.02	-1693282.20	2941437.21	1832.93
Dead+Wind 330 deg+Ice+Temp	51582.55	-18505.90	-32075.97	-2946172.82	1694502.13	1867.87
Dead+Wind 0 deg - Service	39692.22	31.50	-15927.52	-1419127.49	-6026.85	562.14
Dead+Wind 30 deg - Service	39692.25	7981.55	-13799.16	-1229923.48	-712492.51	338.87
Dead+Wind 60 deg - Service	39692.25	13787.53	-7967.57	-710884.94	-1227667.94	68.81

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 90 deg - Service	39692.22	15978.62	115.35	15325.91	-1426104.64	-1091.25
Dead+Wind 120 deg - Service	39692.25	13803.89	8040.97	718241.81	-1230278.08	-1037.50
Dead+Wind 150 deg - Service	39692.25	7988.18	13845.90	1233198.92	-713809.46	-1295.85
Dead+Wind 180 deg - Service	39692.25	56.75	15983.21	1423482.99	-10147.11	-1503.07
Dead+Wind 210 deg - Service	39692.25	-7890.07	13906.70	1241994.68	695847.50	-1425.80
Dead+Wind 240 deg - Service	39692.25	-13788.90	7965.20	706709.24	1224731.65	-52.46
Dead+Wind 270 deg - Service	39692.22	-15930.81	17.63	496.07	1415905.18	511.72
Dead+Wind 300 deg - Service	39692.25	-13800.94	-7937.35	-706759.43	1226706.74	885.77
Dead+Wind 330 deg - Service	39692.25	-7959.22	-13795.74	-1229615.43	706395.81	948.97

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-39692.26	0.00	0.01	39692.26	-0.03	0.000%
2	91.06	-39692.26	-46036.14	-91.05	39692.17	46034.48	0.003%
3	23066.94	-39692.26	-39880.02	-23066.92	39692.25	39879.98	0.000%
4	39846.42	-39692.26	-23026.54	-39846.38	39692.25	23026.52	0.000%
5	46183.85	-39692.26	333.44	-46182.18	39692.17	-333.41	0.003%
6	39893.71	-39692.26	23238.68	-39893.68	39692.25	-23238.66	0.000%
7	23086.11	-39692.26	40015.12	-23086.09	39692.25	-40015.09	0.000%
8	164.03	-39692.26	46193.25	-164.03	39692.23	-46192.76	0.001%
9	-22803.15	-39692.26	40191.92	22803.14	39692.25	-40191.88	0.000%
10	-39850.37	-39692.26	23019.69	39850.34	39692.25	-23019.67	0.000%
11	-46045.63	-39692.26	50.95	46043.97	39692.17	-50.95	0.003%
12	-39885.18	-39692.26	-22939.21	39885.15	39692.25	22939.19	0.000%
13	-23002.41	-39692.26	-39870.16	23002.39	39692.25	39870.12	0.000%
14	0.00	-51582.55	0.00	0.19	51582.55	-0.32	0.001%
15	70.26	-51582.55	-37035.77	-70.26	51582.55	37035.73	0.000%
16	18554.17	-51582.55	-32082.27	-18554.15	51582.55	32082.24	0.000%
17	32054.19	-51582.55	-18523.26	-32054.16	51582.55	18523.24	0.000%
18	37150.32	-51582.55	264.26	-37150.28	51582.55	-264.26	0.000%
19	32092.96	-51582.55	18693.03	-32092.92	51582.55	-18693.01	0.000%
20	18571.87	-51582.55	32190.24	-18571.85	51582.55	-32190.20	0.000%
21	130.76	-51582.55	37159.58	-130.76	51582.55	-37159.54	0.000%
22	-18346.30	-51582.55	32328.06	18346.29	51582.55	-32328.02	0.000%
23	-32057.31	-51582.55	18517.87	32057.27	51582.55	-18517.85	0.000%
24	-37041.40	-51582.55	38.65	37041.36	51582.55	-38.65	0.000%
25	-32086.24	-51582.55	-18457.04	32086.20	51582.55	18457.02	0.000%
26	-18505.92	-51582.55	-32076.00	18505.90	51582.55	32075.97	0.000%
27	31.51	-39692.26	-15929.46	-31.50	39692.22	15927.52	0.005%
28	7981.64	-39692.26	-13799.31	-7981.55	39692.25	13799.16	0.000%
29	13787.69	-39692.26	-7967.66	-13787.53	39692.25	7967.57	0.000%
30	15980.57	-39692.26	115.38	-15978.62	39692.22	-115.35	0.005%
31	13804.05	-39692.26	8041.07	-13803.89	39692.25	-8040.97	0.000%
32	7988.27	-39692.26	13846.06	-7988.18	39692.25	-13845.90	0.000%
33	56.76	-39692.26	15983.83	-56.75	39692.25	-15983.21	0.001%
34	-7890.36	-39692.26	13907.24	7890.07	39692.25	-13906.70	0.001%
35	-13789.06	-39692.26	7965.29	13788.90	39692.25	-7965.20	0.000%
36	-15932.74	-39692.26	17.63	15930.81	39692.22	-17.63	0.005%
37	-13801.10	-39692.26	-7937.44	13800.94	39692.25	7937.35	0.000%
38	-7959.31	-39692.26	-13795.90	7959.22	39692.25	13795.74	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 90.83	34.0125	30	1.9262	0.0060
L2	96 - 60	15.4887	30	1.5281	0.0024
L3	60 - 42.83	5.9747	30	0.9317	0.0011
L4	49 - 0	4.0439	30	0.7431	0.0008

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
143.00	P3F-52	30	33.2046	1.9150	0.0119	37050
135.00	Standoff T-Arm (12' face width)	30	29.9833	1.8695	0.0104	18525
125.00	Standoff T-Arm (10' face width)	30	26.0190	1.8064	0.0085	9262
113.00	Standoff T-Arm (8' face width)	30	21.4388	1.7132	0.0065	5788
105.00	PiROD 13' Low Profile Platform (Monopole)	30	18.5446	1.6354	0.0053	4629

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 90.83	97.9250	5	5.5522	0.0175
L2	96 - 60	44.6271	5	4.4044	0.0067
L3	60 - 42.83	17.2248	5	2.6864	0.0030
L4	49 - 0	11.6598	5	2.1428	0.0022

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
143.00	P3F-52	5	95.6008	5.5201	0.0326	13075
135.00	Standoff T-Arm (12' face width)	5	86.3340	5.3885	0.0284	6536
125.00	Standoff T-Arm (10' face width)	5	74.9292	5.2064	0.0234	3266
113.00	Standoff T-Arm (8' face width)	5	61.7512	4.9377	0.0180	2039
105.00	PiROD 13' Low Profile Platform (Monopole)	5	53.4225	4.7135	0.0148	1629

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	145 - 90.83	Pole	TP33.48x23.61x0.281	1	-11107.90	255908.00	73.8	Pass
L2	90.83 - 60	Pole	TP38.52x31.976x0.375	2	-19133.90	564740.09	96.6	Pass
L3	60 - 42.83	Pole	TP41.64x38.52x0.45	3	-22124.30	785483.55	88.7	Pass
L4	42.83 - 0	Pole	TP48.69x39.6188x0.545	4	-39649.50	1650267.26	98.2	Pass
							Summary	
						Pole (L4)	98.2	Pass
						Base Plate	95.6	Pass
						RATING =	98.2	Pass