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

November 6, 2012

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

RE: **EM-SPRINT-066-121015B** – Sprint Spectrum notice of intent to modify an existing telecommunications facility located at 64 Hungerford Lane, Harwinton, Connecticut.

Dear Ms. Palumbo:

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

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

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated October 10, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/CDM/jbw

c: The Honorable Michael R. Criss, First Selectman, Town of Harwinton
Michael J. Orefice, Planning Chairman, Town of Harwinton
Crown Castle

CSC
CONNECTICUT SITING COUNCIL

EM-SPRINT-066-121015B

The Honorable Michael A. Perrie

Sprint

Together with Nextel

48 Spruce Street
Oakland, NJ 07436
Phone: (201)-951-3869
Tom Kincaid
Real Estate Consultant

October 10, 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 64 Hungerford Lane, Harwinton, CT 06791. Known to Sprint Spectrum L.P. as site CT33XC021.

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: CT33XC021

Harwinton / Buckley Broadcasting
64 Hungerford Lane
Harwinton, CT 06791

August 30, 2012

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

EBI Consulting

environmental | engineering | due diligence

August 30, 2012

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

Re: Emissions Values for Site **CT33XC021 – Harwinton / Buckley Broadcasting**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 64 Hungerford Lane, Harwinton, 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 64 Hungerford Lane, Harwinton, 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) 2 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 **180.5 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	CT33XC021 - Harwinton / Buckley Broadcasting
Site Addresss	64 Hungerford Lane, Harwinton, CT 06791
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	2	40	15.9	180.5	174.5	1/2 "	0.5	0	1386.9474	16.37477	1.63748%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	180.5	174.5	1/2 "	0.5	0	389.96892	4.604104	0.81201%
														Sector total Power Density Value:		2.449%	

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	2	40	15.9	180.5	174.5	1/2 "	0.5	0	1386.9474	16.37477	1.63748%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	180.5	174.5	1/2 "	0.5	0	389.96892	4.604104	0.81201%
														Sector total Power Density Value:		2.449%	

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	2	40	15.9	180.5	174.5	1/2 "	0.5	0	1386.9474	16.37477	1.63748%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	180.5	174.5	1/2 "	0.5	0	389.96892	4.604104	0.81201%
														Sector total Power Density Value:		2.449%	

Site Composite MPE %	
Carrier	MPE %
Sprint	7.348%
VZW	13.330%
AT&T	6.210%
Total Site MPE %	**26.888%**

EBI Consulting
environmental | engineering | due diligence

Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **7.348% (2.449% 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 **26.888%** 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

Date: **May 21, 2012**

Mitzi Parker
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Crown Castle
2000 Corporate Dr.
Canonsburg, PA 15317
724-416-2000

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate – Interim Load**	
	Carrier Site Number:	CT33XC021
	Carrier Site Name:	NA
Crown Castle Designation:	**Crown Castle BU Number:**	876369
	Crown Castle Site Name:	HARWINTON / BUCKLEY BROADCASTI
	Crown Castle JDE Job Number:	187611
	Crown Castle Work Order Number:	495699
	Crown Castle Application Number:	143819 Rev. 2
Engineering Firm Designation:	**Crown Castle Project Number:**	495699
Site Data:	**64 Hungerford Lane, Harwinton, Litchfield County, CT**	
	Latitude *41° 45' 26.15"*, Longitude *-73° 3' 9.2"*	
	178 Foot - Monopole Tower	

Dear Mitzi Parker,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 495699, in accordance with application 143819, revision 2.

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

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and local code requirements based upon a wind speed of 80 mph fastest mile.

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

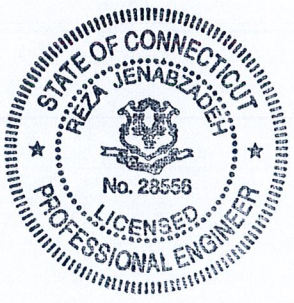
We at *Crown Castle* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Maham Barimani /IS

Respectfully submitted by:

R Jenabzadeh

Reza Jenabzadeh, P.E.
Engineer II



5/21/12

tnxTower Report - version 6.0.4.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 178 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in November of 2007. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 28.1 mph with 1 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
178.0	180.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER	3	1-1/4	-
		9	rfs celwave	ACU-A20-N			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	alcatel lucent	1900MHz RRH (25MHz)			
		3	alcatel lucent	800MHZ RRH			
176.0	176.0	6	tower mounts	4' x 2" Pipe Mount			
		1	tower mounts	Side Arm Mount [SO 102-3]			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
178.0	179.0	6	decibel	DB980H90E-M w/ Mount Pipe	6	1-5/8	1
	178.0	1	tower mounts	Platform Mount [LP 712-1]			
166.0	168.0	3	antel	BXA-171085-12BF-2 w/ Mount Pipe	-	-	2
		3	antel	BXA-70063-6CF-2 w/ Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
		6	antel	LPA-80080/6CF w/ Mount Pipe	12	1-5/8	1
	166.0	1	tower mounts	Platform Mount [LP 303-1]			
156.0	158.0	6	powerwave technologies	7770.00 w/ Mount Pipe	12	1-5/8	1
		12	powerwave technologies	LGP2140X			
	156.0	1	tower mounts	Platform Mount [LP 303-1]			
75.0	76.0	1	lucent	KS24019-L112A	1	1/2	1
	75.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
178	178	12	DAPA	48000	-	-
168	168	12	DAPA	48000	-	-
158	158	12	DAPA	48000	-	-
148	148	12	DAPA	48000	-	-
138	138	12	DAPA	48000	-	-
128	128	12	DAPA	48000	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E., P.C.	1532983	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	EEI	2150286	CCISITES
4-TOWER MANUFACTURER DRAWINGS	EEI	2150280	CCISITES

3.1) Analysis Method

tnxTower (version 6.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

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

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	178 - 129.87	Pole	TP29.64x19.5x0.25	1	-8.80	1175.45	70.5	Pass
L2	129.87 - 84.8307	Pole	TP38.5x28.2446x0.375	2	-16.44	2290.41	69.5	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L3	84.8307 - 41.2839	Pole	TP46.8x36.6403x0.4375	3	-27.06	3250.65	68.1	Pass
L4	41.2839 - 0	Pole	TP54.5x44.5913x0.5	4	-42.92	4455.18	63.6	Pass
							Summary	
						Pole (L1)	70.5	Pass
						Rating =	70.5	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	59.3	Pass
1	Base Plate	0	70.6	Pass
1	Base Foundation	0	69.8	Pass

Structure Rating (max from all components) =	70.6%

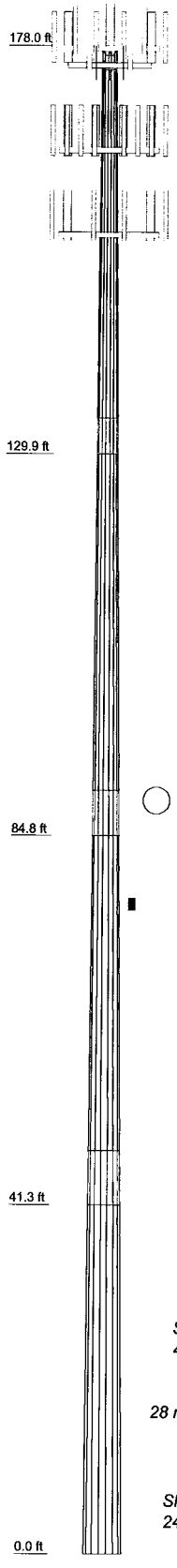
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

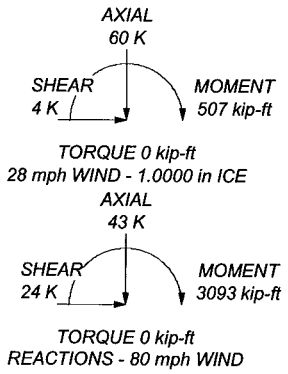
The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	48'1-9/16"	18	0.2500	4'3"	19.5000	29.6400	A572-65	3.2
2	49'3-15/32"	18	0.3750	5'3-31/32"	28.2446	38.5000		6.6
3	48'10-9/16"	18	0.4375	6'5-1/32"	36.6403	46.8000		9.5
4	47'8-13/32"	18	0.5000		44.5913	54.5000		12.6
								31.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) DB980H90E-M w/ Mount Pipe	178	(2) LPA-80080/6CF w/ Mount Pipe	166
800 EXTERNAL NOTCH FILTER	178	(2) LPA-80080/6CF w/ Mount Pipe	166
(3) ACU-A20-N	178	BXA-171085-12BF-2 w/ Mount Pipe	166
APXVSPP18-C-A20 w/ Mount Pipe	178	BXA-171085-12BF-2 w/ Mount Pipe	166
(2) DB980H90E-M w/ Mount Pipe	178	BXA-171085-12BF-2 w/ Mount Pipe	166
800 EXTERNAL NOTCH FILTER	178	BXA-70063-6CF-2 w/ Mount Pipe	166
800 EXTERNAL NOTCH FILTER	178	BXA-70063-6CF-2 w/ Mount Pipe	166
(3) ACU-A20-N	178	BXA-70063-6CF-2 w/ Mount Pipe	166
(3) ACU-A20-N	178	(2) FD9R6004/2C-3L	166
APXVSPP18-C-A20 w/ Mount Pipe	178	(2) FD9R6004/2C-3L	166
APXVSPP18-C-A20 w/ Mount Pipe	178	(2) FD9R6004/2C-3L	166
(2) DB980H90E-M w/ Mount Pipe	178	Platform Mount [LP 303-1]	166
Platform Mount [LP 712-1]	178	(2) 7770.00 w/ Mount Pipe	156
1900MHz RRH (25MHz)	176	(4) LGP2140X	156
800MHZ RRH	176	(2) 7770.00 w/ Mount Pipe	156
1900MHz RRH (25MHz)	176	(4) LGP2140X	156
1900MHz RRH (25MHz)	176	(2) 7770.00 w/ Mount Pipe	156
800MHZ RRH	176	(4) LGP2140X	156
800MHZ RRH	176	Platform Mount [LP 303-1]	156
Side Arm Mount [SO 102-3]	176	(2) 6' x 2" Mount Pipe	156
(2) 4' x 2" Pipe Mount	176	(2) 6' x 2" Mount Pipe	156
(2) 4' x 2" Pipe Mount	176	(2) 6' x 2" Mount Pipe	156
(2) 4' x 2" Pipe Mount	176	KS24019-L112A	75
(2) LPA-80080/6CF w/ Mount Pipe	166	Side Arm Mount [SO 701-1]	75

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 70.5%

CROWN CASTLE
We Are Solutions

Crown Castle
2000 Corporate Dr.
Canonsburg, PA 15317
Phone: 724-416-2000
FAX:

Job: **BU 876369**			
Project:			
Client: Crown Castle	Drawn by: MBarimani	App'd:	
Code: TIA/EIA-222-F	Date: 05/21/12	Scale: NTS	
Path: R:\SA Models - Letters\Work Area\mbarimani\876369\Interim\876369.eri		Dwg No. E-1	

Tower Input Data

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

3) Tower is located in Litchfield County, Connecticut.
4) Basic wind speed of 80 mph.
5) Nominal ice thickness of 1.0000 in.
6) Ice thickness is considered to increase with height.
7) Ice density of 56 pcf.
8) A wind speed of 28 mph is used in combination with ice.
9) Temperature drop of 50 °F.
10) Deflections calculated using a wind speed of 50 mph.
11) A non-linear (P-delta) analysis was used.
12) Pressures are calculated at each section.
13) Stress ratio used in pole design is 1.333.
14) Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	All Leg Panels Have Same Allowable
√ Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	√ Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	178'-129'10-7/16"	48'1-9/16"	4'3"	18	19.5000	29.6400	0.2500	1.0000	A572-65 (65 ksi)
L2	129'10-7/16"-84'9-31/32"	49'3-15/32"	5'3-31/32"	18	28.2446	38.5000	0.3750	1.5000	A572-65 (65 ksi)
L3	84'9-31/32"-41'3-3/8"	48'10-9/16"	6'5-1/32"	18	36.6403	46.8000	0.4375	1.7500	A572-65 (65 ksi)
L4	41'3-3/8"-0'	47'8-13/32"		18	44.5913	54.5000	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	19.8008	15.2749	715.1161	6.8338	9.9060	72.1902	1431.1733	7.6389	2.9920	11.968

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
	30.0972	23.3210	2544.9728	10.4335	15.0571	169.0212	5093.2943	11.6627	4.7766	19.107
L2	29.5783	33.1718	3255.1319	9.8937	14.3483	226.8659	6514.5470	16.5891	4.3111	11.496
	39.0939	45.3783	8333.0732	13.5344	19.5580	426.0698	16677.111 3	22.6935	6.1160	16.309
L3	38.3312	50.2721	8324.3325	12.8520	18.6133	447.2255	16659.618 3	25.1408	5.6787	12.98
	47.5220	64.3801	17483.282 3	16.4587	23.7744	735.3827	34989.569 5	32.1962	7.4668	17.067
L4	46.6327	69.9729	17185.936 7	15.6524	22.6524	758.6812	34394.487 0	34.9931	6.9681	13.936
	55.3408	85.6980	31571.532 0	19.1700	27.6860	1140.3428	63184.606 6	42.8571	8.7120	17.424

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 178'-129'10-7/16"				1	1	1		
L2 129'10-7/16"-84'9-31/32"				1	1	1		
L3 84'9-31/32"-41'3-3/8"				1	1	1		
L4 41'3-3/8"-0'				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	C	No	Inside Pole	178' - 0'	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A(1-5/8")	A	No	Inside Pole	166' - 0'	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A(1-5/8")	B	No	Inside Pole	156' - 0'	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF4-50A(1/2")	C	No	Inside Pole	75' - 0'	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
HB114-1-0813U4-M5J(1 1/4")	C	No	Inside Pole	178' - 0'	3	No Ice	0.00	1.20
						1/2" Ice	0.00	1.20
						1" Ice	0.00	1.20
						2" Ice	0.00	1.20
						4" Ice	0.00	1.20

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	178'-129'10-7/16"	A	0.000	0.000	0.000	0.000	0.36
		B	0.000	0.000	0.000	0.000	0.26
		C	0.000	0.000	0.000	0.000	0.41
L2	129'10-7/16"-84'9-31/32"	A	0.000	0.000	0.000	0.000	0.44
		B	0.000	0.000	0.000	0.000	0.44
		C	0.000	0.000	0.000	0.000	0.38
L3	84'9-31/32"-41'3-3/8"	A	0.000	0.000	0.000	0.000	0.43
		B	0.000	0.000	0.000	0.000	0.43
		C	0.000	0.000	0.000	0.000	0.38
L4	41'3-3/8"-0'	A	0.000	0.000	0.000	0.000	0.41
		B	0.000	0.000	0.000	0.000	0.41
		C	0.000	0.000	0.000	0.000	0.36

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	178'-129'10-7/16"	A	1.202	0.000	0.000	0.000	0.000	0.36
		B		0.000	0.000	0.000	0.000	0.26
		C		0.000	0.000	0.000	0.000	0.41
L2	129'10-7/16"-84'9-31/32"	A	1.151	0.000	0.000	0.000	0.000	0.44
		B		0.000	0.000	0.000	0.000	0.44
		C		0.000	0.000	0.000	0.000	0.38
L3	84'9-31/32"-41'3-3/8"	A	1.080	0.000	0.000	0.000	0.000	0.43
		B		0.000	0.000	0.000	0.000	0.43
		C		0.000	0.000	0.000	0.000	0.38
L4	41'3-3/8"-0'	A	1.000	0.000	0.000	0.000	0.000	0.41
		B		0.000	0.000	0.000	0.000	0.41
		C		0.000	0.000	0.000	0.000	0.36

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	178'-129'10-7/16"	0.0000	0.0000	0.0000	0.0000
L2	129'10-7/16"-84'9-31/32"	0.0000	0.0000	0.0000	0.0000
L3	84'9-31/32"-41'3-3/8"	0.0000	0.0000	0.0000	0.0000
L4	41'3-3/8"-0'	0.0000	0.0000	0.0000	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) DB980H90E-M w/ Mount Pipe	A	From Leg	4.00 0' 1'	0.0000	178'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.06 0.11 0.22 0.55

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00 0' 2'	0.0000	178'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
(3) ACU-A20-N	A	From Leg	4.00 0' 2'	0.0000	178'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0' 2'	0.0000	178'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.22 0.41 0.91
(2) DB980H90E-M w/ Mount Pipe	B	From Leg	4.00 0' 1'	0.0000	178'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.06 0.11 0.22 0.55
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00 0' 2'	0.0000	178'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00 0' 2'	0.0000	178'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
(3) ACU-A20-N	B	From Leg	4.00 0' 2'	0.0000	178'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
(3) ACU-A20-N	C	From Leg	4.00 0' 2'	0.0000	178'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0' 2'	0.0000	178'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.22 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0' 2'	0.0000	178'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.22 0.41 0.91
(2) DB980H90E-M w/ Mount Pipe	C	From Leg	4.00 0' 1'	0.0000	178'	No Ice 1/2" Ice 1" Ice 2" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.06 0.11 0.22 0.55

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
Platform Mount [LP 712-1]	C	None		0.0000	178'	No Ice	24.53	24.53	1.34
						1/2" Ice	29.94	29.94	1.65
						1" Ice	35.35	35.35	1.96
						2" Ice	46.17	46.17	2.58
						4" Ice	67.81	67.81	3.82
**									
1900MHz RRH (25MHz)	A	From Leg	2.00 0' 0'	0.0000	176'	No Ice	2.91	3.80	0.09
						1/2" Ice	3.14	4.06	0.12
						1" Ice	3.39	4.34	0.15
						2" Ice	3.91	4.91	0.24
						4" Ice	5.05	6.15	0.45
800MHZ RRH	A	From Leg	2.00 0' 0'	0.0000	176'	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
1900MHz RRH (25MHz)	B	From Leg	2.00 0' 0'	0.0000	176'	No Ice	2.91	3.80	0.09
						1/2" Ice	3.14	4.06	0.12
						1" Ice	3.39	4.34	0.15
						2" Ice	3.91	4.91	0.24
						4" Ice	5.05	6.15	0.45
1900MHz RRH (25MHz)	C	From Leg	2.00 0' 0'	0.0000	176'	No Ice	2.91	3.80	0.09
						1/2" Ice	3.14	4.06	0.12
						1" Ice	3.39	4.34	0.15
						2" Ice	3.91	4.91	0.24
						4" Ice	5.05	6.15	0.45
800MHZ RRH	B	From Leg	2.00 0' 0'	0.0000	176'	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
800MHZ RRH	C	From Leg	2.00 0' 0'	0.0000	176'	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
Side Arm Mount [SO 102-3]	C	None		0.0000	176'	No Ice	3.00	3.00	0.08
						1/2" Ice	3.48	3.48	0.11
						1" Ice	3.96	3.96	0.14
						2" Ice	4.92	4.92	0.20
						4" Ice	6.84	6.84	0.32
(2) 4' x 2" Pipe Mount	A	From Leg	1.00 0' 0'	0.0000	176'	No Ice	0.79	0.79	0.03
						1/2" Ice	1.03	1.03	0.04
						1" Ice	1.28	1.28	0.04
						2" Ice	1.81	1.81	0.07
						4" Ice	3.11	3.11	0.17
(2) 4' x 2" Pipe Mount	B	From Leg	1.00 0' 0'	0.0000	176'	No Ice	0.79	0.79	0.03
						1/2" Ice	1.03	1.03	0.04
						1" Ice	1.28	1.28	0.04
						2" Ice	1.81	1.81	0.07
						4" Ice	3.11	3.11	0.17
(2) 4' x 2" Pipe Mount	C	From Leg	1.00 0' 0'	0.0000	176'	No Ice	0.79	0.79	0.03
						1/2" Ice	1.03	1.03	0.04
						Ice	1.28	1.28	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	1.81	1.81	0.07
						2" Ice	3.11	3.11	0.17
						4" Ice			
**									
(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.00 0' 2'	0.0000	166'	No Ice	4.56	10.73	0.05
						1/2" Ice	5.11	11.99	0.11
						1" Ice	5.61	12.97	0.19
						2" Ice	6.65	14.98	0.36
						4" Ice	8.83	19.22	0.86
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.00 0' 2'	0.0000	166'	No Ice	4.56	10.73	0.05
						1/2" Ice	5.11	11.99	0.11
						1" Ice	5.61	12.97	0.19
						2" Ice	6.65	14.98	0.36
						4" Ice	8.83	19.22	0.86
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.00 0' 2'	0.0000	166'	No Ice	4.56	10.73	0.05
						1/2" Ice	5.11	11.99	0.11
						1" Ice	5.61	12.97	0.19
						2" Ice	6.65	14.98	0.36
						4" Ice	8.83	19.22	0.86
BXA-171085-12BF-2 w/ Mount Pipe	A	From Leg	4.00 0' 2'	0.0000	166'	No Ice	4.97	5.23	0.04
						1/2" Ice	5.52	6.39	0.08
						1" Ice	6.04	7.26	0.14
						2" Ice	7.09	9.05	0.27
						4" Ice	9.36	12.82	0.67
BXA-171085-12BF-2 w/ Mount Pipe	B	From Leg	4.00 0' 2'	0.0000	166'	No Ice	4.97	5.23	0.04
						1/2" Ice	5.52	6.39	0.08
						1" Ice	6.04	7.26	0.14
						2" Ice	7.09	9.05	0.27
						4" Ice	9.36	12.82	0.67
BXA-171085-12BF-2 w/ Mount Pipe	C	From Leg	4.00 0' 2'	0.0000	166'	No Ice	4.97	5.23	0.04
						1/2" Ice	5.52	6.39	0.08
						1" Ice	6.04	7.26	0.14
						2" Ice	7.09	9.05	0.27
						4" Ice	9.36	12.82	0.67
BXA-70063-6CF-2 w/ Mount Pipe	A	From Leg	4.00 0' 2'	0.0000	166'	No Ice	7.97	5.80	0.04
						1/2" Ice	8.61	6.95	0.10
						1" Ice	9.22	7.82	0.17
						2" Ice	10.46	9.60	0.34
						4" Ice	13.07	13.37	0.80
BXA-70063-6CF-2 w/ Mount Pipe	B	From Leg	4.00 0' 2'	0.0000	166'	No Ice	7.97	5.80	0.04
						1/2" Ice	8.61	6.95	0.10
						1" Ice	9.22	7.82	0.17
						2" Ice	10.46	9.60	0.34
						4" Ice	13.07	13.37	0.80
BXA-70063-6CF-2 w/ Mount Pipe	C	From Leg	4.00 0' 2'	0.0000	166'	No Ice	7.97	5.80	0.04
						1/2" Ice	8.61	6.95	0.10
						1" Ice	9.22	7.82	0.17
						2" Ice	10.46	9.60	0.34
						4" Ice	13.07	13.37	0.80
(2) FD9R6004/2C-3L	A	From Leg	4.00 0' 2'	0.0000	166'	No Ice	0.37	0.08	0.00
						1/2" Ice	0.45	0.14	0.01
						1" Ice	0.54	0.20	0.01
						2" Ice	0.75	0.34	0.02
						4" Ice	1.28	0.74	0.06
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.0000	166'	No Ice	0.37	0.08	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0'			1/2"	0.45	0.14	0.01
			2'			Ice	0.54	0.20	0.01
						1" Ice	0.75	0.34	0.02
						2" Ice	1.28	0.74	0.06
						4" Ice			
(2) FD9R6004/2C-3L	C	From Leg	4.00	0.0000	166'	No Ice	0.37	0.08	0.00
			0'			1/2"	0.45	0.14	0.01
			2'			Ice	0.54	0.20	0.01
						1" Ice	0.75	0.34	0.02
						2" Ice	1.28	0.74	0.06
						4" Ice			
Platform Mount [LP 303-1]	C	None		0.0000	166'	No Ice	14.66	14.66	1.25
						1/2"	18.87	18.87	1.48
						Ice	23.08	23.08	1.71
						1" Ice	31.50	31.50	2.18
						2" Ice	48.34	48.34	3.10
						4" Ice			
**									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0.0000	156'	No Ice	6.12	4.25	0.06
			0'			1/2"	6.63	5.01	0.10
			2'			Ice	7.13	5.71	0.16
						1" Ice	8.16	7.16	0.29
						2" Ice	10.36	10.41	0.66
						4" Ice			
(4) LGP2140X	A	From Leg	4.00	0.0000	156'	No Ice	1.26	0.38	0.02
			0'			1/2"	1.42	0.49	0.03
			2'			Ice	1.58	0.62	0.04
						1" Ice	1.94	0.89	0.06
						2" Ice	2.75	1.54	0.14
						4" Ice			
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	156'	No Ice	6.12	4.25	0.06
			0'			1/2"	6.63	5.01	0.10
			2'			Ice	7.13	5.71	0.16
						1" Ice	8.16	7.16	0.29
						2" Ice	10.36	10.41	0.66
						4" Ice			
(4) LGP2140X	B	From Leg	4.00	0.0000	156'	No Ice	1.26	0.38	0.02
			0'			1/2"	1.42	0.49	0.03
			2'			Ice	1.58	0.62	0.04
						1" Ice	1.94	0.89	0.06
						2" Ice	2.75	1.54	0.14
						4" Ice			
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	156'	No Ice	6.12	4.25	0.06
			0'			1/2"	6.63	5.01	0.10
			2'			Ice	7.13	5.71	0.16
						1" Ice	8.16	7.16	0.29
						2" Ice	10.36	10.41	0.66
						4" Ice			
(4) LGP2140X	C	From Leg	4.00	0.0000	156'	No Ice	1.26	0.38	0.02
			0'			1/2"	1.42	0.49	0.03
			2'			Ice	1.58	0.62	0.04
						1" Ice	1.94	0.89	0.06
						2" Ice	2.75	1.54	0.14
						4" Ice			
Platform Mount [LP 303-1]	C	None		0.0000	156'	No Ice	14.66	14.66	1.25
						1/2"	18.87	18.87	1.48
						Ice	23.08	23.08	1.71
						1" Ice	31.50	31.50	2.18
						2" Ice	48.34	48.34	3.10
						4" Ice			
(2) 6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	156'	No Ice	1.43	1.43	0.02
			0'			1/2"	1.92	1.92	0.03
			0'			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23

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
(2) 6' x 2" Mount Pipe	B	From Leg	4.00 0' 0'	0.0000	156'	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
(2) 6' x 2" Mount Pipe	C	From Leg	4.00 0' 0'	0.0000	156'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
* KS24019-L112A	B	From Leg	2.00 0' 1'	0.0000	75'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.10 0.18 0.26 0.42 0.74	0.10 0.18 0.26 0.42 0.74	0.01 0.01 0.01 0.01 0.02
Side Arm Mount [SO 701-1]	B	From Leg	1.00 0' 0'	0.0000	75'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18

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
28	Dead+Wind 30 deg - Service

Comb. No.	Description
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 K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	178 - 129.87	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.62	0.00	0.00
			Max. Mx	5	-8.80	-479.72	0.00
			Max. My	8	-8.80	-0.00	-479.72
			Max. Vy	5	14.74	-479.72	0.00
			Max. Vx	8	14.74	-0.00	-479.72
			Max. Torque	2			0.00
L2	129.87 - 84.8307	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.29	0.00	0.00
			Max. Mx	5	-16.44	-1196.04	0.00
			Max. My	8	-16.44	-0.00	-1196.05
			Max. Vy	5	17.87	-1196.04	0.00
			Max. Vx	8	17.87	-0.00	-1196.05
			Max. Torque	2			0.00
L3	84.8307 - 41.2839	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.27	-0.25	-0.14
			Max. Mx	5	-27.06	-2021.54	0.25
			Max. My	8	-27.06	0.18	-2021.87
			Max. Vy	5	20.91	-2021.54	0.25
			Max. Vx	8	20.93	0.18	-2021.87
			Max. Torque	3			-0.17
L4	41.2839 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-60.03	-0.25	-0.14
			Max. Mx	5	-42.92	-3091.28	0.85
			Max. My	8	-42.92	0.78	-3092.31
			Max. Vy	5	23.88	-3091.28	0.85
			Max. Vx	8	23.90	0.78	-3092.31
			Max. Torque	3			-0.17

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	60.03	0.00	0.00
	Max. H_x	11	42.94	23.86	-0.01
	Max. H_z	2	42.94	-0.01	23.87
	Max. M_x	2	3092.11	-0.01	23.87
	Max. M_z	5	3091.28	-23.86	0.01
	Max. Torsion	9	0.17	11.94	-20.68
	Min. Vert	1	42.94	0.00	0.00
	Min. H_x	5	42.94	-23.86	0.01
	Min. H_z	8	42.94	0.01	-23.87
	Min. M_x	8	-3092.31	0.01	-23.87
	Min. M_z	11	-3090.94	23.86	-0.01

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Torsion	3	-0.17	-11.94	20.68

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	42.94	0.00	0.00	0.10	-0.17	0.00
Dead+Wind 0 deg - No Ice	42.94	0.01	-23.87	-3092.11	-1.12	0.14
Dead+Wind 30 deg - No Ice	42.94	11.94	-20.68	-2678.31	-1546.55	0.17
Dead+Wind 60 deg - No Ice	42.94	20.67	-11.95	-1546.83	-2677.63	0.14
Dead+Wind 90 deg - No Ice	42.94	23.86	-0.01	-0.85	-3091.28	0.08
Dead+Wind 120 deg - No Ice	42.94	20.66	11.93	1545.38	-2676.68	0.00
Dead+Wind 150 deg - No Ice	42.94	11.92	20.67	2677.55	-1544.90	-0.08
Dead+Wind 180 deg - No Ice	42.94	-0.01	23.87	3092.31	0.78	-0.14
Dead+Wind 210 deg - No Ice	42.94	-11.94	20.68	2678.50	1546.21	-0.17
Dead+Wind 240 deg - No Ice	42.94	-20.67	11.95	1547.03	2677.28	-0.14
Dead+Wind 270 deg - No Ice	42.94	-23.86	0.01	1.05	3090.94	-0.08
Dead+Wind 300 deg - No Ice	42.94	-20.66	-11.93	-1545.18	2676.33	0.00
Dead+Wind 330 deg - No Ice	42.94	-11.92	-20.67	-2677.36	1544.56	0.08
Dead+Ice+Temp	60.03	0.00	0.00	0.14	-0.25	0.00
Dead+Wind 0 deg+Ice+Temp	60.03	0.00	-3.61	-506.23	-0.51	0.03
Dead+Wind 30 deg+Ice+Temp	60.03	1.81	-3.13	-438.51	-253.53	0.04
Dead+Wind 60 deg+Ice+Temp	60.03	3.13	-1.81	-253.25	-438.69	0.03
Dead+Wind 90 deg+Ice+Temp	60.03	3.61	-0.00	-0.09	-506.37	0.02
Dead+Wind 120 deg+Ice+Temp	60.03	3.12	1.80	253.14	-438.44	0.00
Dead+Wind 150 deg+Ice+Temp	60.03	1.80	3.13	438.57	-253.11	-0.02
Dead+Wind 180 deg+Ice+Temp	60.03	-0.00	3.61	506.54	-0.02	-0.03
Dead+Wind 210 deg+Ice+Temp	60.03	-1.81	3.13	438.81	253.00	-0.04
Dead+Wind 240 deg+Ice+Temp	60.03	-3.13	1.81	253.55	438.16	-0.03
Dead+Wind 270 deg+Ice+Temp	60.03	-3.61	0.00	0.39	505.84	-0.02
Dead+Wind 300 deg+Ice+Temp	60.03	-3.12	-1.80	-252.83	437.92	0.00
Dead+Wind 330 deg+Ice+Temp	60.03	-1.80	-3.13	-438.27	252.58	0.02
Dead+Wind 0 deg - Service	42.94	0.00	-9.33	-1209.38	-0.54	0.06
Dead+Wind 30 deg - Service	42.94	4.66	-8.08	-1047.53	-605.02	0.07
Dead+Wind 60 deg - Service	42.94	8.07	-4.67	-604.97	-1047.43	0.06
Dead+Wind 90 deg - Service	42.94	9.32	-0.00	-0.27	-1209.22	0.03
Dead+Wind 120 deg - Service	42.94	8.07	4.66	604.52	-1047.06	0.00
Dead+Wind 150 deg - Service	42.94	4.66	8.07	1047.36	-604.38	-0.03
Dead+Wind 180 deg - Service	42.94	-0.00	9.33	1209.58	0.20	-0.06
Dead+Wind 210 deg - Service	42.94	-4.66	8.08	1047.73	604.68	-0.07
Dead+Wind 240 deg - Service	42.94	-8.07	4.67	605.16	1047.09	-0.06
Dead+Wind 270 deg - Service	42.94	-9.32	0.00	0.47	1208.88	-0.03
Dead+Wind 300 deg - Service	42.94	-8.07	-4.66	-604.32	1046.72	0.00
Dead+Wind 330 deg - Service	42.94	-4.66	-8.07	-1047.16	604.03	0.03

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-42.94	0.00	0.00	42.94	0.00	0.000%
2	0.01	-42.94	-23.87	-0.01	42.94	23.87	0.000%
3	11.94	-42.94	-20.68	-11.94	42.94	20.68	0.000%
4	20.67	-42.94	-11.95	-20.67	42.94	11.95	0.000%
5	23.86	-42.94	-0.01	-23.86	42.94	0.01	0.000%
6	20.66	-42.94	11.93	-20.66	42.94	-11.93	0.000%
7	11.92	-42.94	20.67	-11.92	42.94	-20.67	0.000%
8	-0.01	-42.94	23.87	0.01	42.94	-23.87	0.000%
9	-11.94	-42.94	20.68	11.94	42.94	-20.68	0.000%
10	-20.67	-42.94	11.95	20.67	42.94	-11.95	0.000%
11	-23.86	-42.94	0.01	23.86	42.94	-0.01	0.000%
12	-20.66	-42.94	-11.93	20.66	42.94	11.93	0.000%
13	-11.92	-42.94	-20.67	11.92	42.94	20.67	0.000%
14	0.00	-60.03	0.00	0.00	60.03	0.00	0.000%
15	0.00	-60.03	-3.61	-0.00	60.03	3.61	0.000%
16	1.81	-60.03	-3.13	-1.81	60.03	3.13	0.000%
17	3.13	-60.03	-1.81	-3.13	60.03	1.81	0.000%
18	3.61	-60.03	-0.00	-3.61	60.03	0.00	0.000%
19	3.12	-60.03	1.80	-3.12	60.03	-1.80	0.000%
20	1.80	-60.03	3.13	-1.80	60.03	-3.13	0.000%
21	-0.00	-60.03	3.61	0.00	60.03	-3.61	0.000%
22	-1.81	-60.03	3.13	1.81	60.03	-3.13	0.000%
23	-3.13	-60.03	1.81	3.13	60.03	-1.81	0.000%
24	-3.61	-60.03	0.00	3.61	60.03	-0.00	0.000%
25	-3.12	-60.03	-1.80	3.12	60.03	1.80	0.000%
26	-1.80	-60.03	-3.13	1.80	60.03	3.13	0.000%
27	0.00	-42.94	-9.33	-0.00	42.94	9.33	0.000%
28	4.66	-42.94	-8.08	-4.66	42.94	8.08	0.000%
29	8.07	-42.94	-4.67	-8.07	42.94	4.67	0.000%
30	9.32	-42.94	-0.00	-9.32	42.94	0.00	0.000%
31	8.07	-42.94	4.66	-8.07	42.94	-4.66	0.000%
32	4.66	-42.94	8.07	-4.66	42.94	-8.07	0.000%
33	-0.00	-42.94	9.33	0.00	42.94	-9.33	0.000%
34	-4.66	-42.94	8.08	4.66	42.94	-8.08	0.000%
35	-8.07	-42.94	4.67	8.07	42.94	-4.67	0.000%
36	-9.32	-42.94	0.00	9.32	42.94	-0.00	0.000%
37	-8.07	-42.94	-4.66	8.07	42.94	4.66	0.000%
38	-4.66	-42.94	-8.07	4.66	42.94	8.07	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00000582
3	Yes	6	0.00000001	0.00003119
4	Yes	6	0.00000001	0.00003111
5	Yes	5	0.00000001	0.00000550
6	Yes	6	0.00000001	0.00003114
7	Yes	6	0.00000001	0.00003115
8	Yes	5	0.00000001	0.00000565
9	Yes	6	0.00000001	0.00003110
10	Yes	6	0.00000001	0.00003118
11	Yes	5	0.00000001	0.00000561
12	Yes	6	0.00000001	0.00003113
13	Yes	6	0.00000001	0.00003110
14	Yes	4	0.00000001	0.00000001
15	Yes	6	0.00000001	0.00001470
16	Yes	6	0.00000001	0.00001600

17	Yes	6	0.00000001	0.00001600
18	Yes	6	0.00000001	0.00001471
19	Yes	6	0.00000001	0.00001600
20	Yes	6	0.00000001	0.00001600
21	Yes	6	0.00000001	0.00001471
22	Yes	6	0.00000001	0.00001599
23	Yes	6	0.00000001	0.00001599
24	Yes	6	0.00000001	0.00001469
25	Yes	6	0.00000001	0.00001598
26	Yes	6	0.00000001	0.00001598
27	Yes	4	0.00000001	0.00008945
28	Yes	5	0.00000001	0.00006855
29	Yes	5	0.00000001	0.00006821
30	Yes	4	0.00000001	0.00008918
31	Yes	5	0.00000001	0.00006834
32	Yes	5	0.00000001	0.00006843
33	Yes	4	0.00000001	0.00008939
34	Yes	5	0.00000001	0.00006817
35	Yes	5	0.00000001	0.00006851
36	Yes	4	0.00000001	0.00008919
37	Yes	5	0.00000001	0.00006828
38	Yes	5	0.00000001	0.00006819

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	178 - 129.87	44.886	33	2.4529	0.0001
L2	134.12 - 84.8307	24.192	33	1.8722	0.0001
L3	90.1641 - 41.2839	10.222	33	1.1305	0.0001
L4	47.7005 - 0	2.738	34	0.5309	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178'	(2) DB980H90E-M w/ Mount Pipe	33	44.886	2.4529	0.0001	23422
176'	1900MHz RRH (25MHz)	33	43.877	2.4287	0.0001	23422
166'	(2) LPA-80080/6CF w/ Mount Pipe	33	38.861	2.3066	0.0001	9759
156'	(2) 7770.00 w/ Mount Pipe	33	33.968	2.1803	0.0001	5322
75'	KS24019-L112A	34	6.908	0.8963	0.0001	3909

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	178 - 129.87	114.516	8	6.2606	0.0003
L2	134.12 - 84.8307	61.772	8	4.7807	0.0003
L3	90.1641 - 41.2839	26.116	8	2.8882	0.0002
L4	47.7005 - 0	6.999	9	1.3568	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178'	(2) DB980H90E-M w/ Mount Pipe	8	114.516	6.2606	0.0003	9353
176'	1900MHz RRH (25MHz)	8	111.945	6.1988	0.0003	9353
166'	(2) LPA-80080/6CF w/ Mount Pipe	8	99.162	5.8878	0.0003	3896
156'	(2) 7770.00 w/ Mount Pipe	8	86.693	5.5659	0.0002	2122
75'	KS24019-L112A	8	17.652	2.2904	0.0002	1535

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	178 - 129.87 (1)	TP29.64x19.5x0.25	48'1-9/16"	0'	0.0	39.000	22.6105	-8.80	881.81	0.010
L2	129.87 - 84.8307 (2)	TP38.5x28.2446x0.375	49'3-15/32"	0'	0.0	39.000	44.0575	-16.44	1718.24	0.010
L3	84.8307 - 41.2839 (3)	TP46.8x36.6403x0.4375	48'10-9/16"	0'	0.0	39.000	62.5281	-27.06	2438.60	0.011
L4	41.2839 - 0 (4)	TP54.5x44.5913x0.5	47'8-13/32"	0'	0.0	39.000	85.6980	-42.92	3342.22	0.013

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	178 - 129.87 (1)	TP29.64x19.5x0.25	479.72	36.242	39.000	0.929	0.00	0.000	39.000	0.000
L2	129.87 - 84.8307 (2)	TP38.5x28.2446x0.375	1196.05	35.746	39.000	0.917	0.00	0.000	39.000	0.000
L3	84.8307 - 41.2839 (3)	TP46.8x36.6403x0.4375	2021.97	34.988	39.000	0.897	0.00	0.000	39.000	0.000
L4	41.2839 - 0 (4)	TP54.5x44.5913x0.5	3092.76	32.545	39.000	0.835	0.00	0.000	39.000	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	178 - 129.87 (1)	TP29.64x19.5x0.25	14.74	0.652	26.000	0.050	0.00	0.000	26.000	0.000
L2	129.87 - 84.8307 (2)	TP38.5x28.2446x0.375	17.87	0.406	26.000	0.031	0.00	0.000	26.000	0.000
L3	84.8307 - 41.2839 (3)	TP46.8x36.6403x0.4375	20.94	0.335	26.000	0.026	0.17	0.001	26.000	0.000
L4	41.2839 - 0 (4)	TP54.5x44.5913x0.5	23.90	0.279	26.000	0.021	0.17	0.001	26.000	0.000

Pole Interaction Design Data

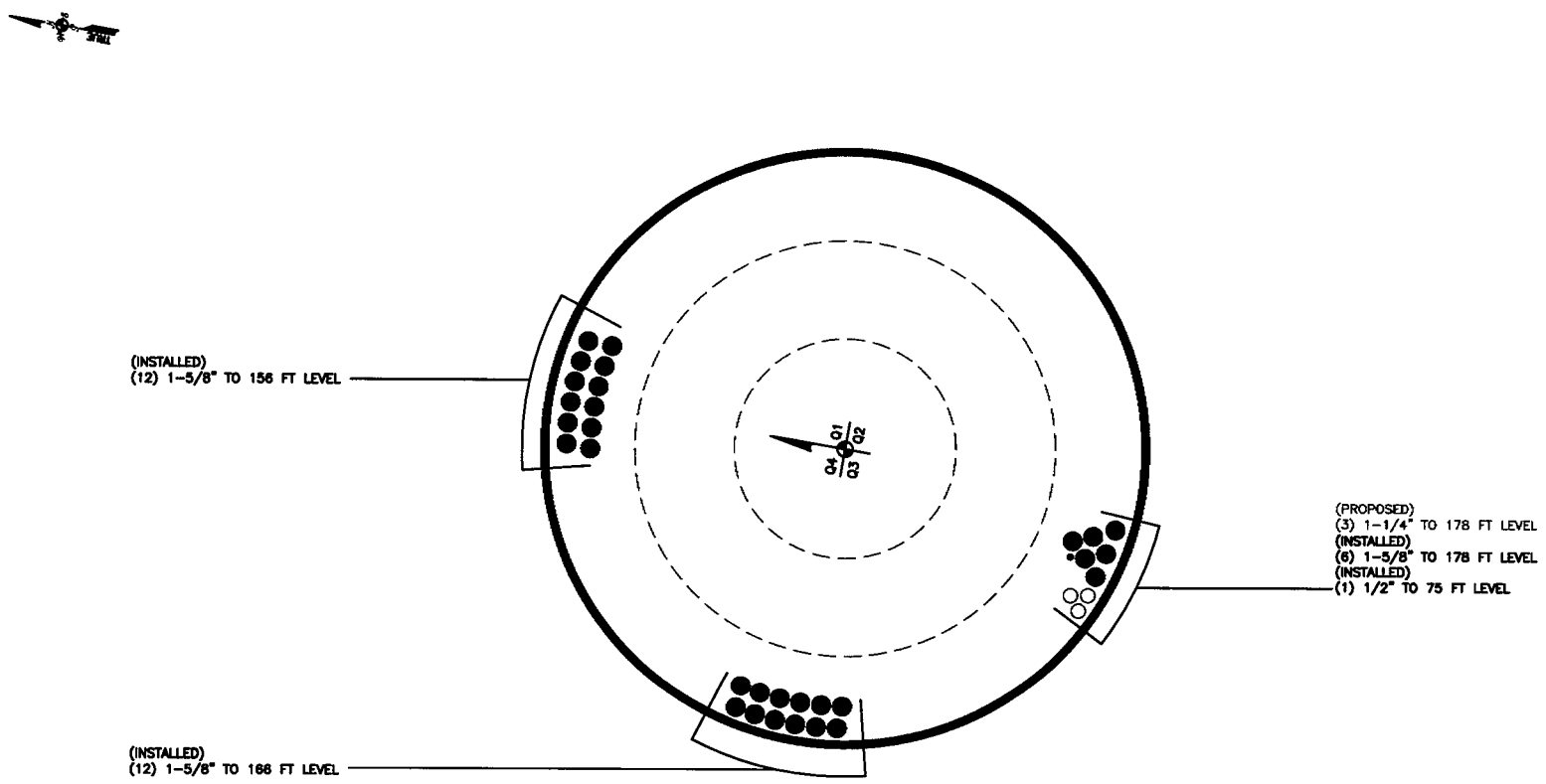
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	178 - 129.87 (1)	0.010	0.929	0.000	0.050	0.000	0.940 ✓	1.333	H1-3+VT ✓
L2	129.87 - 84.8307 (2)	0.010	0.917	0.000	0.031	0.000	0.926 ✓	1.333	H1-3+VT ✓
L3	84.8307 - 41.2839 (3)	0.011	0.897	0.000	0.026	0.000	0.908 ✓	1.333	H1-3+VT ✓
L4	41.2839 - 0 (4)	0.013	0.835	0.000	0.021	0.000	0.847 ✓	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	178 - 129.87	Pole	TP29.64x19.5x0.25	1	-8.80	1175.45	70.5	Pass
L2	129.87 - 84.8307	Pole	TP38.5x28.2446x0.375	2	-16.44	2290.41	69.5	Pass
L3	84.8307 - 41.2839	Pole	TP46.8x36.6403x0.4375	3	-27.06	3250.65	68.1	Pass
L4	41.2839 - 0	Pole	TP54.5x44.5913x0.5	4	-42.92	4455.18	63.6	Pass
							Summary	
						Pole (L1)	70.5	Pass
						RATING =	**70.5**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876389 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Maximum Allowable Moment of a Circular Pier

Axial Load (Negative for Compression) = -43.00 kips

Pier Properties

Concrete:

Pier Diameter = 7.0 ft

Concrete Area = 5541.8 in^2

Reinforcement:

Clear Cover = 3.00 in

Cage Diameter = 6.42 ft

Bar Size = 8

Bar Diameter = 1.00 in

Bar Area = 0.79 in^2

Number of Bars = 46

Material Properties

Concrete compressive strength = 4000 psi

Reinforcement yield strength = 60000 psi

Modulus of elasticity = 29000 ksi

Reinforcement yield strain = 0.00207

Limiting compressive strain = 0.003

Seismic Properties

Seismic Zone = 1

Minimum Area of Steel

Required area of steel = 27.71 in^2

Provided area of steel = 36.34 in^2 **OK**

Axial Loading

Load factor = 1.3

Reduction factor = 0.9

Factored axial load = -62.1111 kips

Neutral Axis

Distance from extreme edge to neutral axis =	12.30	in
Equivalent compression zone factor =	0.85	
Distance from extreme edge to equivalent compression zone factor =	10.45	in
Distance from centroid to neutral axis =	29.70	in

Compression Zone

Area of steel in compression zone =	6.32	in^2
Angle from centroid of pier to intersection of equivalent compression zone and edge of pier =	41.32	deg
Area of concrete in compression =	397.32	in^2
Force in concrete = 0.85 * f`c * Acc =	1350.90	kips
Total reinforcement forces =	-1288.79	kips
Factored axial load =	-62.11	kips
Force in concrete =	-1350.90	kips
Sum of the forces in concrete =	0.00	kips OK

Maximum Moment

First moment of the concrete area in compression about the centoid =	14214.26	in^3
Distance between centroid of concrete in compression and centroid of pier =	35.78	in
Moment of concrete in compression =	48328.50	in-kips
Total reinforcement moment =	31105.81	in-kips
Nominal moment strength of column =	79434.31	in-kips
Factored moment strength of column =	54992.98	in-kips

Maximum Allowable Moment = 4582.75 ft-kips

Individual Bars

Bar #	Angle from first bar (deg)	Distance to centroid (in)	Distance to neutral axis (in)	Distance to equivalent comp. zone (in)	Strain	Area of steel in compression (in^2)	Stress (ksi)	Axial force (kips)
1	0.00	0.00	-29.70	-31.55	-0.0072439	0.00	-60.00	-47.40
2	7.83	5.24	-24.46	-26.30	-0.0059653	0.00	-60.00	-47.40
3	15.65	10.39	-19.31	-21.16	-0.0047104	0.00	-60.00	-47.40
4	23.48	15.34	-14.36	-16.21	-0.0035028	0.00	-60.00	-47.40
5	31.30	20.00	-9.70	-11.54	-0.0023649	0.00	-60.00	-47.40
6	39.13	24.30	-5.40	-7.25	-0.0013178	0.00	-38.22	-30.19
7	46.96	28.14	-1.56	-3.41	-0.0003812	0.00	-11.05	-8.73
8	54.78	31.45	1.75	-0.09	0.0004276	0.00	12.40	9.80
9	62.61	34.18	4.48	2.64	0.0010936	0.79	31.71	22.37
10	70.43	36.28	6.58	4.73	0.0016042	0.79	46.52	34.07
11	78.26	37.69	7.99	6.15	0.0019499	0.79	56.55	41.99
12	86.09	38.41	8.71	6.87	0.0021245	0.79	60.00	44.71
13	93.91	38.41	8.71	6.87	0.0021245	0.79	60.00	44.71
14	101.74	37.69	7.99	6.15	0.0019499	0.79	56.55	41.99
15	109.57	36.28	6.58	4.73	0.0016042	0.79	46.52	34.07
16	117.39	34.18	4.48	2.64	0.0010936	0.79	31.71	22.37
17	125.22	31.45	1.75	-0.09	0.0004276	0.00	12.40	9.80
18	133.04	28.14	-1.56	-3.41	-0.0003812	0.00	-11.05	-8.73
19	140.87	24.30	-5.40	-7.25	-0.0013178	0.00	-38.22	-30.19
20	148.70	20.00	-9.70	-11.54	-0.0023649	0.00	-60.00	-47.40
21	156.52	15.34	-14.36	-16.21	-0.0035028	0.00	-60.00	-47.40
22	164.35	10.39	-19.31	-21.16	-0.0047104	0.00	-60.00	-47.40
23	172.17	5.24	-24.46	-26.30	-0.0059653	0.00	-60.00	-47.40
24	180.00	0.00	-29.70	-31.55	-0.0072439	0.00	-60.00	-47.40
25	187.83	-5.24	-34.94	-36.79	-0.0085225	0.00	-60.00	-47.40
26	195.65	-10.39	-40.09	-41.93	-0.0097774	0.00	-60.00	-47.40
27	203.48	-15.34	-45.04	-46.88	-0.010985	0.00	-60.00	-47.40
28	211.30	-20.00	-49.70	-51.55	-0.0121229	0.00	-60.00	-47.40
29	219.13	-24.30	-54.00	-55.84	-0.01317	0.00	-60.00	-47.40
30	226.96	-28.14	-57.84	-59.68	-0.0141066	0.00	-60.00	-47.40
31	234.78	-31.45	-61.15	-63.00	-0.0149155	0.00	-60.00	-47.40
32	242.61	-34.18	-63.88	-65.73	-0.0155814	0.00	-60.00	-47.40
33	250.43	-36.28	-65.98	-67.82	-0.016092	0.00	-60.00	-47.40
34	258.26	-37.69	-67.39	-69.24	-0.0164377	0.00	-60.00	-47.40
35	266.09	-38.41	-68.11	-69.96	-0.0166123	0.00	-60.00	-47.40
36	273.91	-38.41	-68.11	-69.96	-0.0166123	0.00	-60.00	-47.40
37	281.74	-37.69	-67.39	-69.24	-0.0164377	0.00	-60.00	-47.40
38	289.57	-36.28	-65.98	-67.82	-0.016092	0.00	-60.00	-47.40
39	297.39	-34.18	-63.88	-65.73	-0.0155814	0.00	-60.00	-47.40
40	305.22	-31.45	-61.15	-63.00	-0.0149155	0.00	-60.00	-47.40
41	313.04	-28.14	-57.84	-59.68	-0.0141066	0.00	-60.00	-47.40
42	320.87	-24.30	-54.00	-55.84	-0.01317	0.00	-60.00	-47.40
43	328.70	-20.00	-49.70	-51.55	-0.0121229	0.00	-60.00	-47.40
44	336.52	-15.34	-45.04	-46.88	-0.010985	0.00	-60.00	-47.40
45	344.35	-10.39	-40.09	-41.93	-0.0097774	0.00	-60.00	-47.40
46	352.17	-5.24	-34.94	-36.79	-0.0085225	0.00	-60.00	-47.40

Monopole Pier and Pad Foundation

BU # : 876369
Site Name: HARWINTON / BUCK
App. Number: 143819 Rev.2

TIA-222 Revision: F

Design Reactions		
Shear, **S**:	24	kips
Moment, **M**:	3093	ft-kips
Tower Height, **H**:	178	ft
Tower Weight, **Wt**:	43	kips
Base Diameter, **BD**:	4.5417	ft

Foundation Dimensions		
Depth, **D**:	6.5	ft
Pad Width, **W**:	28	ft
Neglected Depth, **N**:	4	ft
Thickness, **T**:	3.00	ft
Pier Diameter, **Pd**:	7.00	ft
Ext. Above Grade, **E**:	1.00	ft
BP Dist. Above Pier:	3	in.
Clear Cover, **Cc**:	3.0	in

Soil Properties		
Soil Unit Weight, **γ**:	0.088	kcf
Ult. Bearing Capacity, Bc:	8.0	ksf
Angle of Friction, **Φ**:	38	deg
Cohesion, **Co**:	0.000	ksf
Passive Pressure, **Pp**:	0.000	kcf
Base Friction, **μ**:	0.30	

Material Properties		
Rebar Yield Strength, **Fy**:	60000	psi
Concrete Strength, **F'c**:	4000	psi
Concrete Unit Weight, **δc**:	0.088	kcf
Seismic Zone, **z**:	1	

Rebar Properties		
Pier Rebar Size, **Sp**:	8	
Pier Rebar Quanity, **mp**:	46	36
Pad Rebar Size, **Spad**:	8	
Pad Rebar Quanity, **mpad**:	68	25
Pier Tie Size, **St**:	4	3
Tie Quanity, **mt**:	5	6

Design Checks	Capacity/ Availability	Demand/ Limits	Check
Req'd Pier Diam.(ft)	7	6.0417	**OK**
Overturning (ft-kips)	4439.15	3093.00	**69.7%**
Shear Capacity (kips)	81.76	24.00	**29.4%**
Bearing (ksf)	6.00	1.93	**32.1%**
Pad Shear - 1-way (kips)	1381.28	514.12	**37.2%**
Pad Shear - 2-way (kips)	3009.19	1012.52	**33.6%**
Pier Rebar Area (in^2)	36.34	27.71	**OK**
Pad Rebar Area (in^2)	53.72	19.35	**OK**
Pier Moment Capacity (k-ft)	4582.75	3201.00	**69.8%**
Pier Bar Spacing (in)	4.33	18 > s > 2	**OK**
Pad Bar Spacing (in)	3.91	12 > s > 4.5	**OK**

☐ Modifications

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

TIA Rev F

Site Data

BU#: *876369*
Site Name: *HARWINTON / BUCKLEY*
App #: *143819 Rev.2*

Pole Manufacturer:	*Other*

Reactions		
Moment:	3093	ft-kips
Axial:	43	kips
Shear:	24	kips

Anchor Rod Data		
Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	63	in

Plate Data		
Diam:	69	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	8.65	in

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

Pole Data		
Diam:	54.5	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

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

Anchor Rod Results

		Rigid
Maximum Rod Tension:	115.7 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	59.3%	

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	42.3 ksi	Service ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	70.6%	Y.L. Length: 31.60

n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

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

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

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®

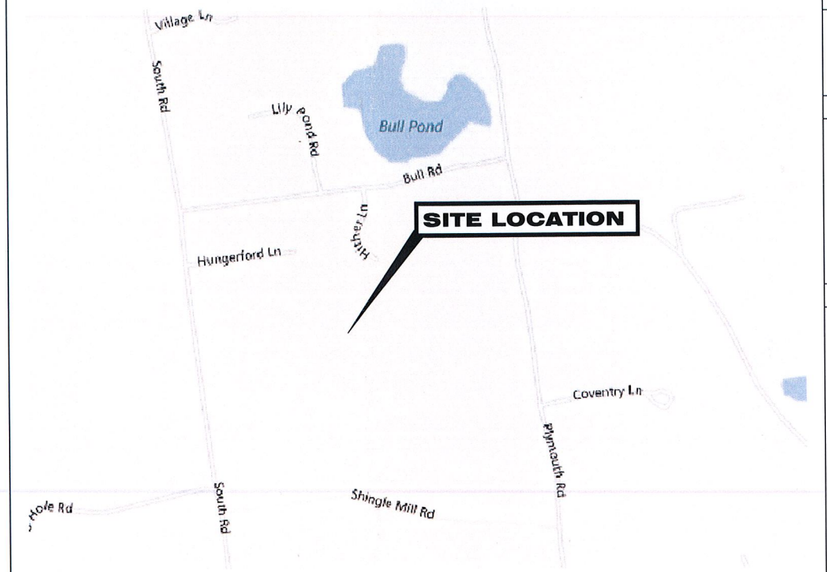
SITE ID: CT33XC021

SITE NAME: HARWINTON / BUCKLEY BROADCASTING CORP

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

NETWORK VISION CONSTRUCTION DRAWINGS

AERIAL VIEW
SCALE: NTS



LOCATION MAP
SCALE: NTS

DRAWING INDEX

DWG #	DRAWING TITLES
A01	COVER SHEET
C01	GENERAL NOTES 1 OF 2
C01A	GENERAL NOTES 2 OF 2
C02	COMPOUND PLAN
C02A	ELEVATION
C03	EQUIPMENT PLANS
C03A	EQUIPMENT & ANTENNA SPECIFICATIONS
C04	EXISTING ANTENNA PLAN (ALL SECTORS)
C04A	INTERIM ANTENNA PLAN (ALL SECTORS)
C04B	FINAL ANTENNA PLAN (ALL SECTORS)
C04C	RRH PLANS & DETAILS (ALL SECTORS)
C05	SITE DETAILS
C06	RF SCHEDULE
C06A	RF DATA SHEET
C07	AAV DRAWINGS - COVER SHEET
C07A	AAV DRAWINGS - SITE PHOTOS
C07B	AAV DRAWINGS - KEY & EQUIPMENT PLAN
C07C	AAV DRAWINGS - DETAILS
E01	ELECTRICAL NOTES
E02	ELECTRIC & GROUNDING DETAILS

CODES & STANDARDS

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

State Building Code: 2005 Connecticut Supplement

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

2005 National Electrical Code (NFPA-70)

DRIVING DIRECTIONS

1. DEPART 1 INTERNATIONAL BLVD, MAHWAH, NJ 07495
2. TAKE 3RD EXIT FROM ROUNDABOUT INTERNATIONAL BLVD ONTO LEISURE LN.
3. TAKE RAMP ONTO STATE HIGHWAY 17 (RT-17 N).
4. CONTINUE ON I-287 N.
5. TAKE THE I-87 S/I-287/NEW YORK STATE THRUWAY SOUTH/TAPPAN ZEE BR/NEW YORK CITY EXIT ONTO NEW YORK STATE THRUWAY SOUTH (I-287 E, I-87 S) (PARTIAL TOLL ROAD).
6. KEEP RIGHT ONTO NEW YORK STATE THRUWAY SOUTH (I-87 S) TOWARD RT-119/SAW MILL PKWY NORTH/SAW MILL PKWY SOUTH/NEW YORK CITY/ELMSFORD.
7. TAKE EXIT #8A/RT-119/SAW MILL PKWY NORTH/ELMSFORD ONTO SAW MILL PKY NORTH, SAW MILL RIVER PKY N TOWARD SAW MILL RIVER PKWY NORTH/KATONAH.
8. TAKE LEFT RAMP ONTO I-684 N TOWARD BREWSTER.
9. TAKE EXIT #9E/I-84 E/DANBURY ONTO I-84 E.
10. TAKE EXIT #20/CT-8 N/TORRINGTON TO THE LEFT ONTO CT-8 N.
11. TAKE EXIT #42/CT-118/LITCHFIELD/HARWINTON.
12. TURN RIGHT ONTO LITCHFIELD RD (CT-118) TOWARD CT-118 E/HARWINTON.
13. TURN RIGHT ONTO SOUTH RD.
14. TURN LEFT ONTO HUNGERFORD LN.

SITE INFORMATION

PARCEL: 21A & 22B
LOT: TBD
MAP: 45
ZONING CLASSIFICATION: DB-1
ZONING JURISDICTION: TBD

PROJECT INFORMATION:

SITE ADDRESS:
64 HUNGERFORD LANE
HARWINTON, CT 06791
LITCHFIELD COUNTY

COORDINATES:
LATITUDE: 41.757263
LONGITUDE: -73.052559
DATUM : NAD 83

STRUCTURE HEIGHT:
±180'-0" (TOP OF EXISTING MONOPOLE)

PROJECT DIRECTORY:

PROPERTY OWNER:
BUCKLEY BROADCASTING CORP OF CT

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

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

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

CONSTRUCTION MANAGER:
TODD AMANN
(914) 715-9363

Sprint®

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	06-18-12	ISSUED FOR CONSTRUCTION	JLS	KCD

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

Stephen A. Bray
PROFESSIONAL ENGINEER

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

CT LICENSE: 26657 6/18/12

PROJECT NUMBER:
332.1490

SITE INFORMATION:
64 HUNGERFORD LANE
HARWINTON, CT 06791
LITCHFIELD COUNTY

CT33XC021

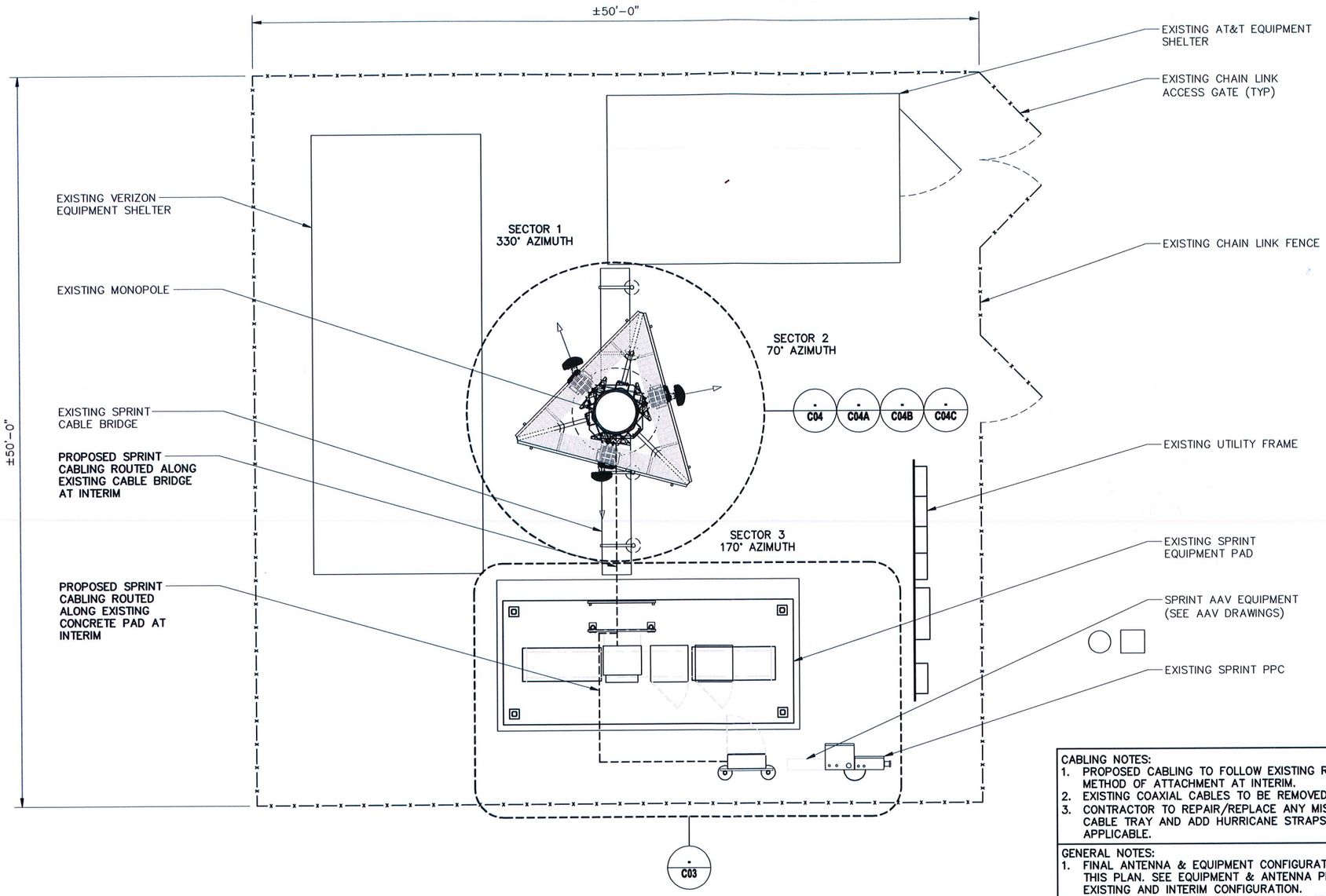
PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		03-16-12

SHEET TITLE:
COVER SHEET

SHEET NUMBER:	REV.:
A01	0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1490_CT33XC021_64 Hungerford Lane\332.1490_CAD\332.1490_Construction\332.1490_A01.dwg, 6/18/2012 10:51:42 AM, jspinlewski



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

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

2 0 1 2 4 8
(IN FEET)

1 COMPOUND PLAN

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

Sprint®

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	06-18-12	ISSUED FOR CONSTRUCTION	JLS	KCD

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

Stephen A. Bray
PROFESSIONAL ENGINEER
STATE OF CONNECTICUT · STEPHEN A. BRAY · LICENSED PROFESSIONAL ENGINEER

CT LICENSE: 26657 6/18/12

PROJECT NUMBER: 332.1490

SITE INFORMATION:
64 HUNGERFORD LANE
HARWINTON, CT 06791
LITCHFIELD COUNTY

CT33XC021

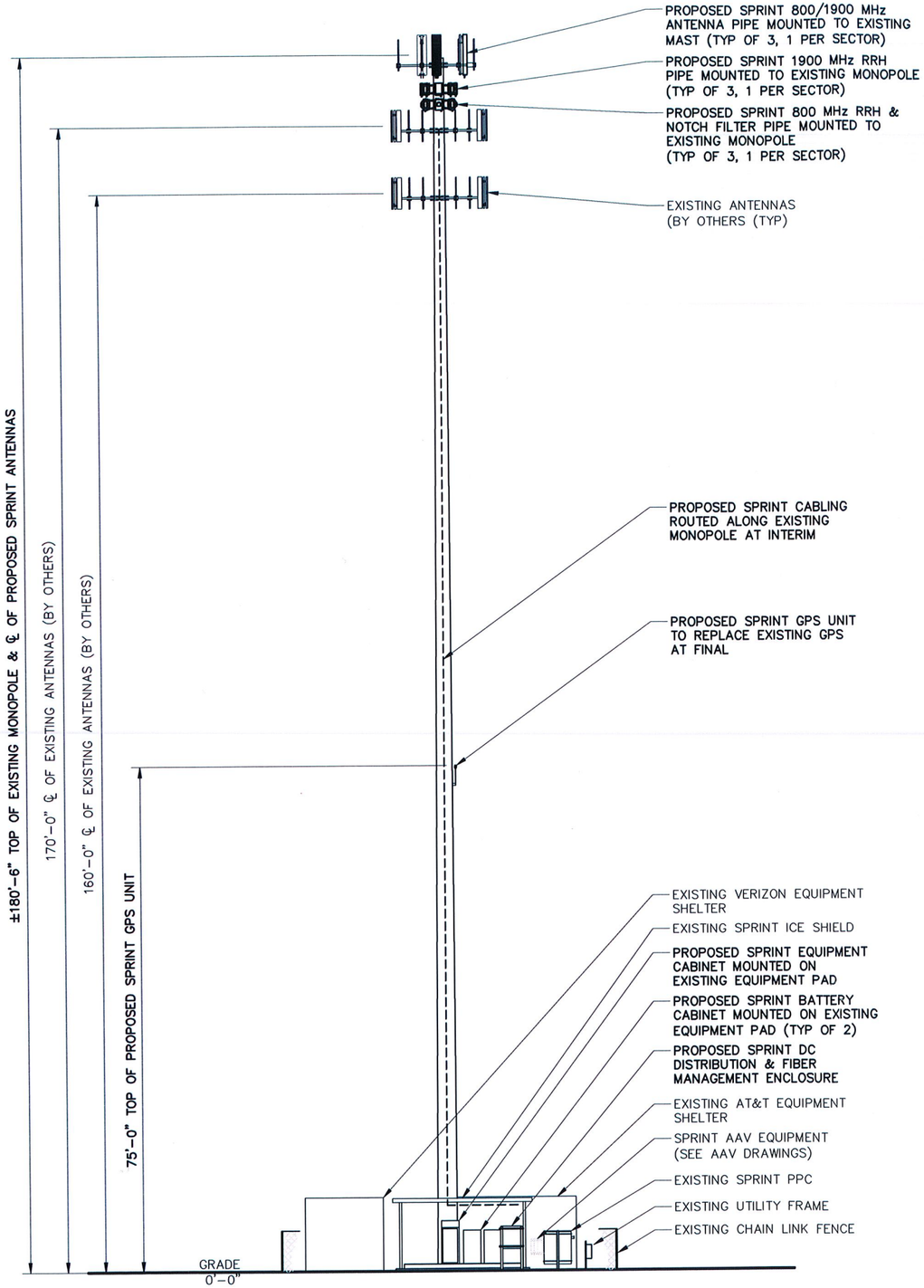
PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		03-16-12

SHEET TITLE: COMPOUND PLAN

SHEET NUMBER: C02 | REV.: 0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1490_CT33XC021_64 Hungerford Lane\332.1490_CAD\332.1490_Construction\332.1490_C02.dwg, 6/18/2012 10:51:50 AM, jsprinlewski



1 **SOUTHEAST ELEVATION**

11x17 SCALE: 1" = 20' | 24x36 SCALE: 1" = 10'

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

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

Sprint®

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	06-18-12	ISSUED FOR CONSTRUCTION	JLS	KCD

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

Stephen A. Bray
PROFESSIONAL ENGINEER
STATE OF CONNECTICUT STEPHEN A. BRAY 26657 LICENSED PROFESSIONAL ENGINEER

CT LICENSE: 26657 6/18/12

PROJECT NUMBER: **332.1490**

SITE INFORMATION:
64 HUNGERFORD LANE
HARWINTON, CT 06791
LITCHFIELD COUNTY

CT33XC021

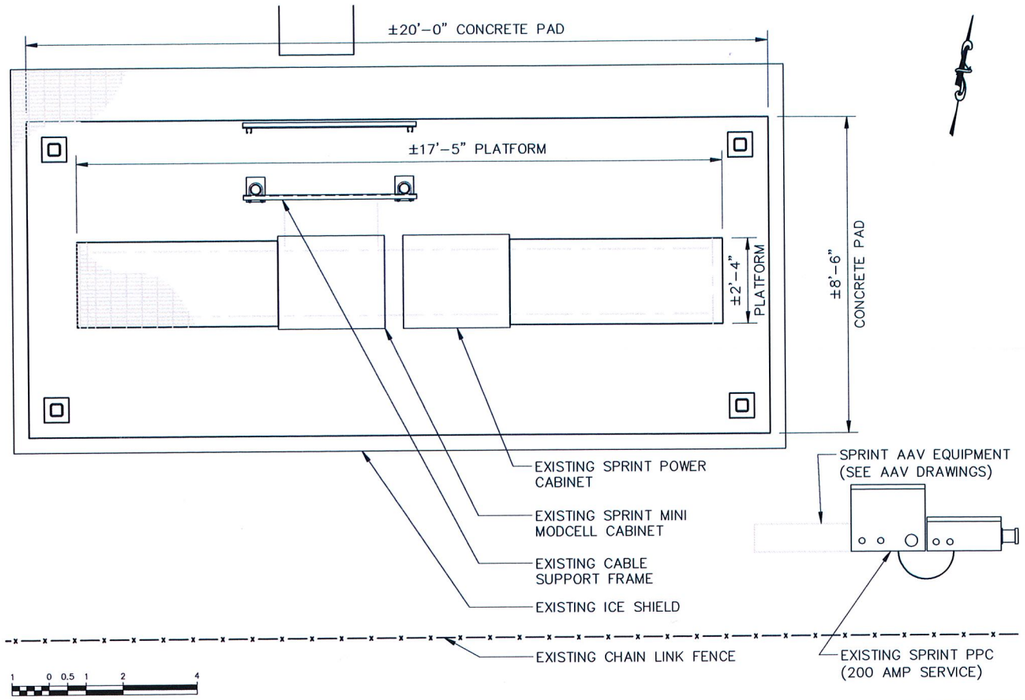
PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		03-16-12

SHEET TITLE: ELEVATION

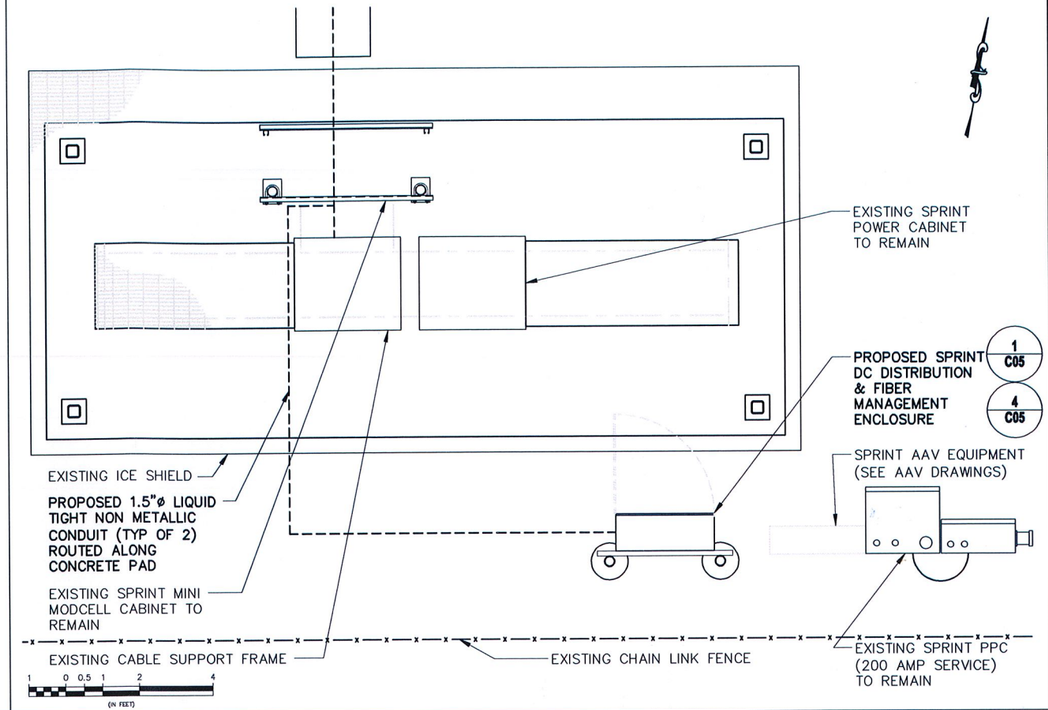
SHEET NUMBER: **C02A** REV.: **0**

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1490_CT33XC021_64 Hungerford Lane\332.1490_CAD\332.1490_Construction\332.1490_CD0A.dwg, 6/18/2012 10:51:53 AM, jspinlewski



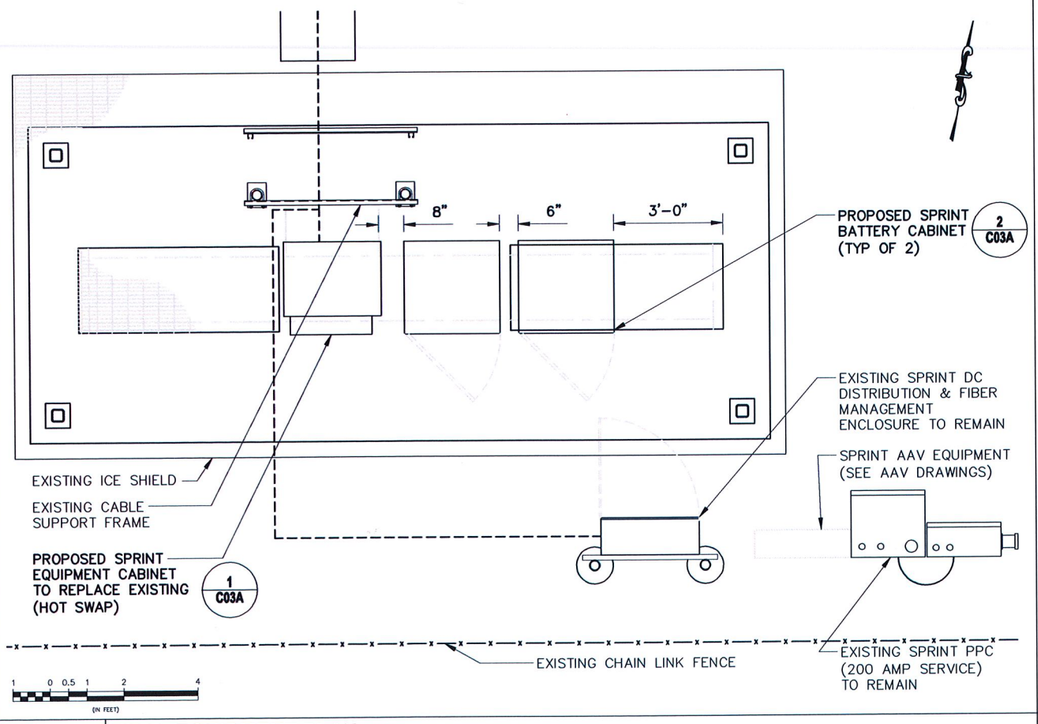
1 EXISTING EQUIPMENT PLAN

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.

Sprint

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	06-18-12	ISSUED FOR CONSTRUCTION	JLS	KCD

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

Stephen A. Bray
PROFESSIONAL ENGINEER

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

CT LICENSE: 26657 6/18/12

PROJECT NUMBER: 332.1490

SITE INFORMATION:
64 HUNGERFORD LANE
HARWINTON, CT 06791
LITCHFIELD COUNTY

CT33XC021

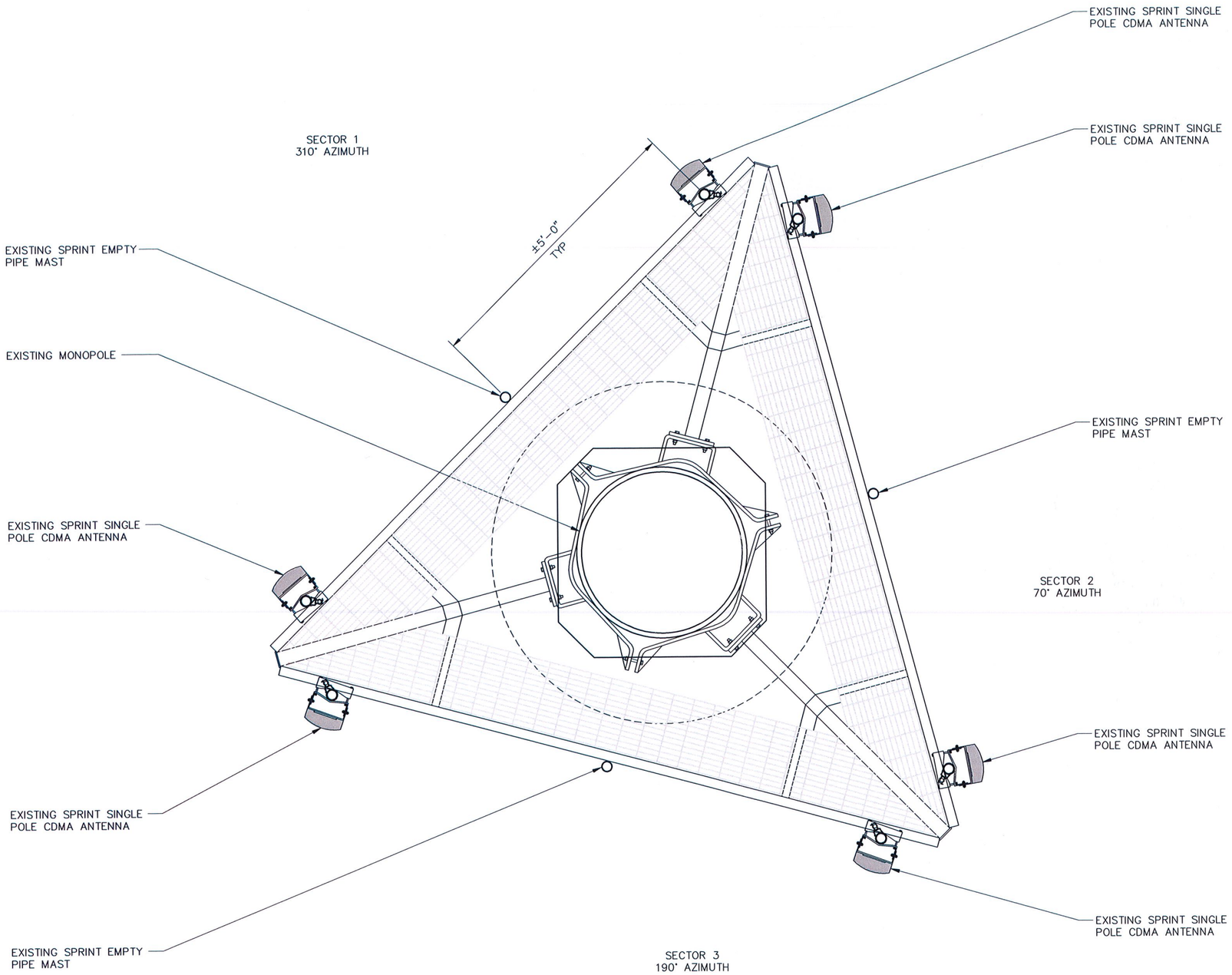
PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		03-16-12

SHEET TITLE: EQUIPMENT PLANS

SHEET NUMBER: C03 | REV.: 0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1490_CT33XC021_64 Hungerford Lane\332.1490_CAD\332.1490_Construction\332.1490.C03.dwg, 6/18/2012 10:51:57 AM, jsypniewski



1 0 1 2
(IN FEET)

1 EXISTING ANTENNA PLAN @ ±180'-6" AGL (ALL SECTORS)

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

Sprint®

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	06-18-12	ISSUED FOR CONSTRUCTION	JLS	KCD

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

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

CT LICENSE: 26657 6/18/12

PROJECT NUMBER:
332.1490

SITE INFORMATION:
64 HUNGERFORD LANE
HARWINTON, CT 06791
LITCHFIELD COUNTY

CT33XC021

PROJECT TYPE:
NETWORK VISION

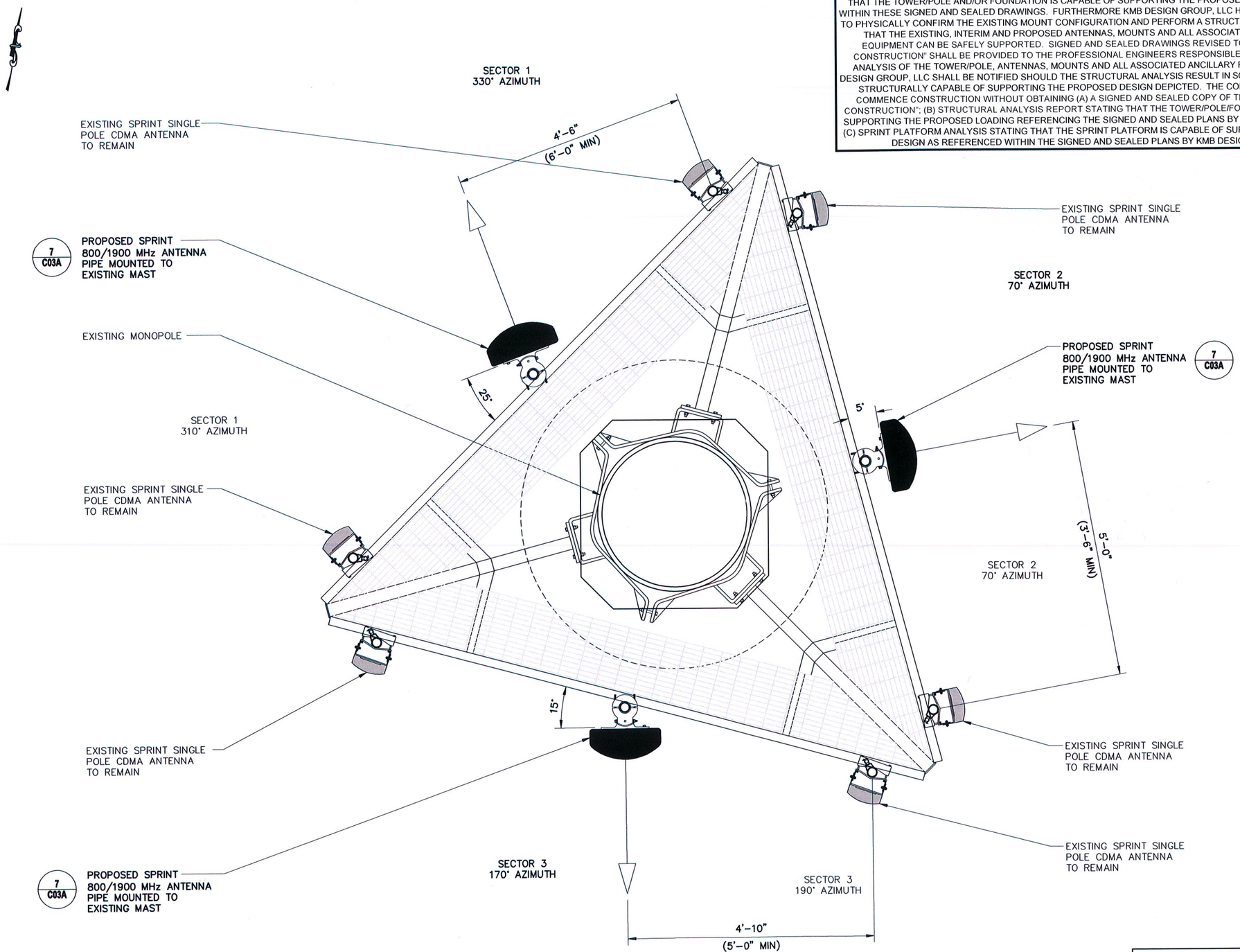
DRAWN BY:	CHECKED BY:	DATE:
JLS		03-16-12

SHEET TITLE:
EXISTING ANTENNA PLAN
(ALL SECTORS)

SHEET NUMBER:	REV.:
C04	0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1490_CT33XC021_64 Hungerford Lane\332.1490_CAD\332.1490_Construction\332.1490.C04.dwg, 6/18/2012 10:52:02 AM, jsypniewski

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



NOTE:
SEE DETAIL 1/C04C FOR RRH MOUNT DETAILS.

1 0 1 2
(IN FEET)

1 INTERIM ANTENNA PLAN @ ±180'-6" AGL (ALL SECTORS)

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

Sprint®

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	06-18-12	ISSUED FOR CONSTRUCTION	JLS	KCD

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

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

CT LICENSE: 26657 6/18/12

PROJECT NUMBER:
332.1490

SITE INFORMATION:
64 HUNGERFORD LANE
HARWINTON, CT 06791
LITCHFIELD COUNTY

CT33XC021

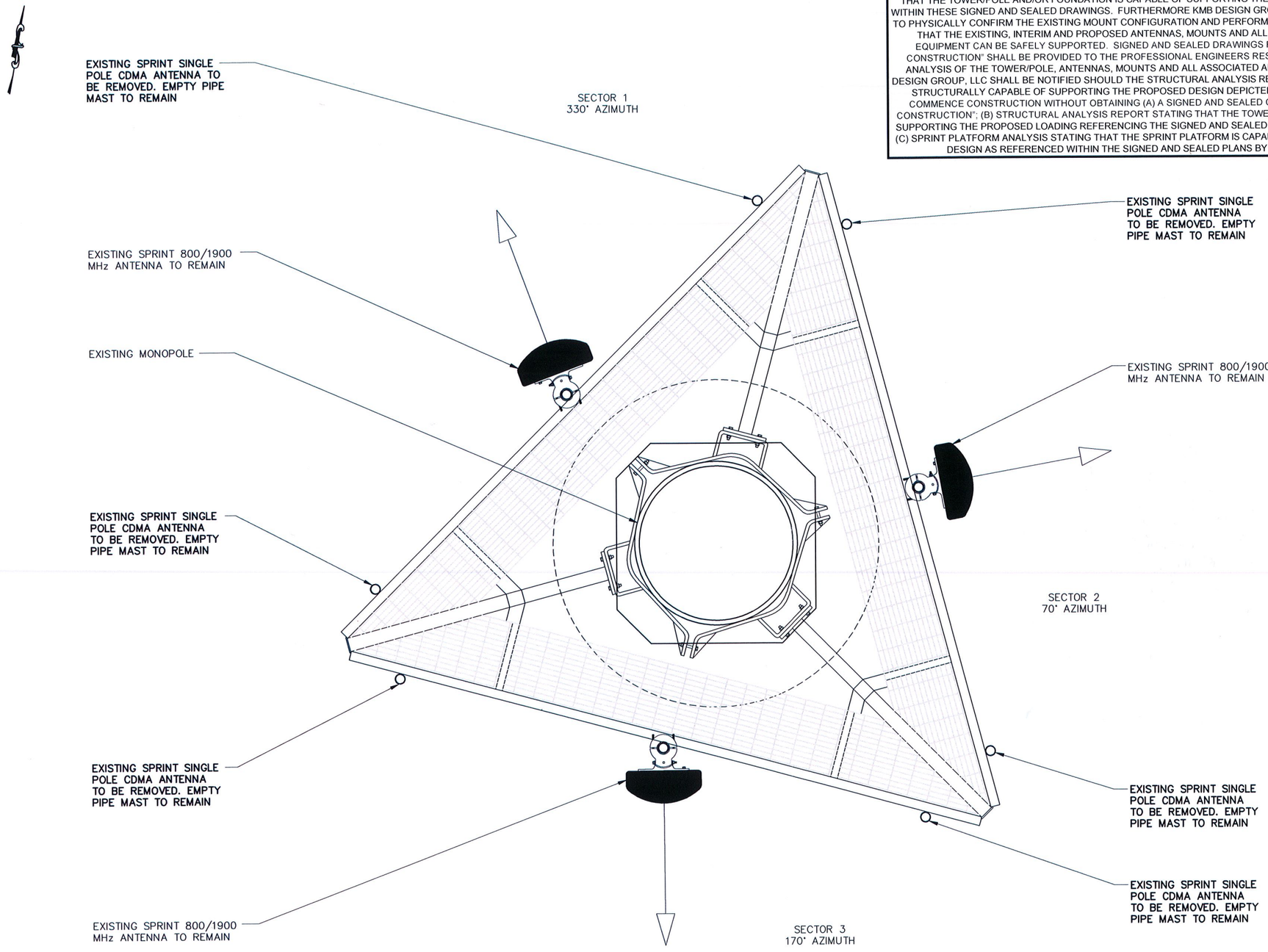
PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		03-16-12

SHEET TITLE:
INTERIM ANTENNA PLAN
(ALL SECTORS)

SHEET NUMBER:	REV.:
C04A	0

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



NOTE:
SEE DETAIL 2/C04C FOR RRH MOUNT DETAILS.

1 0 1 2
(IN FEET)

1 FINAL ANTENNA PLAN @ ±180'-6" AGL (ALL SECTORS)

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

Sprint®

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	06-18-12	ISSUED FOR CONSTRUCTION	JLS	KCD

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

Stephen A. Bray
PROFESSIONAL ENGINEER

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

CT LICENSE: 26657 6/18/12

PROJECT NUMBER:
332.1490

SITE INFORMATION:
64 HUNGERFORD LANE
HARWINTON, CT 06791
LITCHFIELD COUNTY

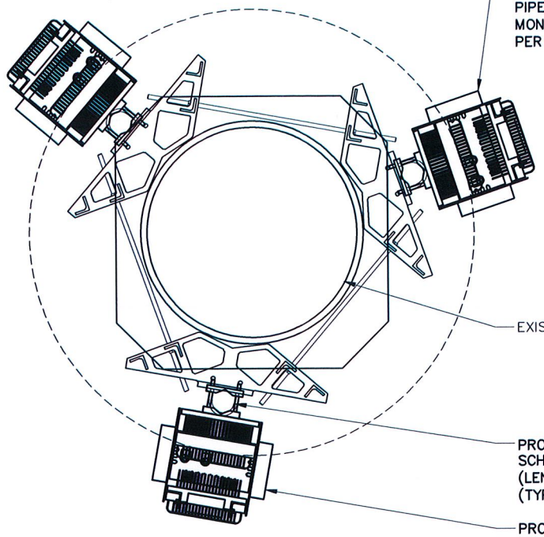
CT33XC021

PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		03-16-12

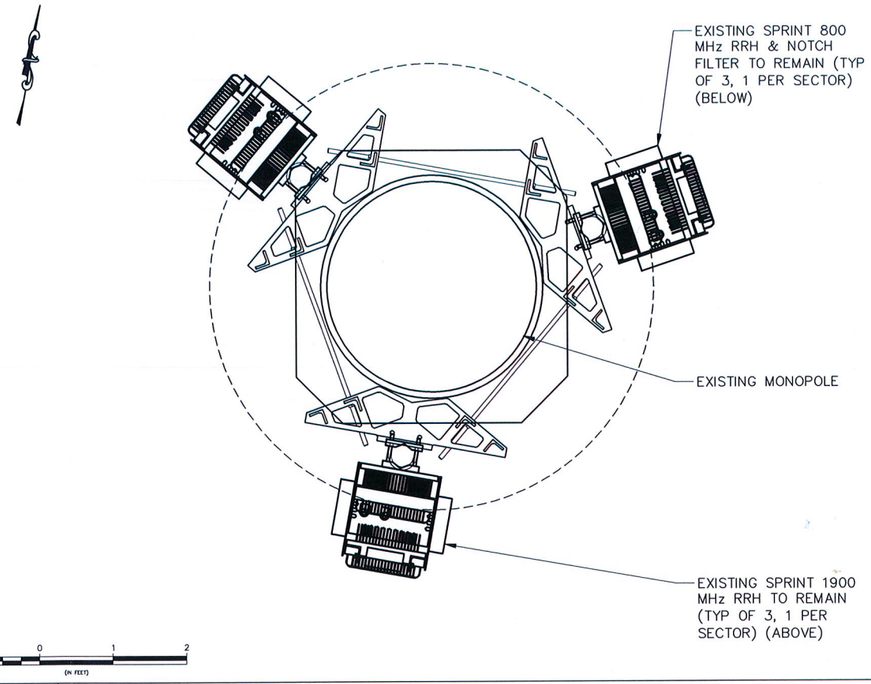
SHEET TITLE:
FINAL ANTENNA PLAN
(ALL SECTORS)

SHEET NUMBER: C04B | REV.: 0



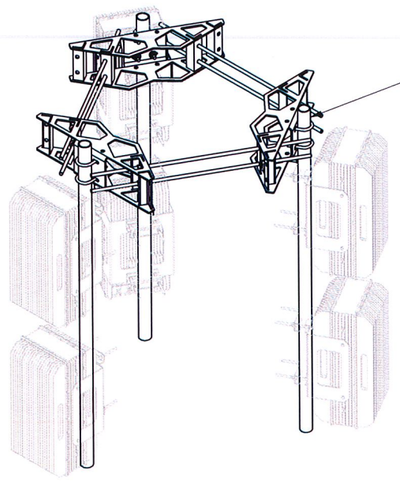
1 **INTERIM RRH PLAN @ ±175'-0" AGL (ALL SECTORS)**

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



2 **FINAL RRH PLAN @ ±175'-0" AGL (ALL SECTORS)**

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



NOTE:
PROPOSED RRHs MAY NOT MATCH RRH SHOWN. REFER TO SPECIFICATION SHEET FOR CORRECT RRH MODEL NUMBER.

THREE SECTOR DUAL RADIO RING MOUNT BY COMMSCOPE, PART # MC-551050-3 OR AN APPROVED EQUAL
KIT INCLUDES:
RING MOUNT, THREADED ROD, HARDWARE AND (6) 2-3/8" U-BOLTS

3 **RRH MOUNT DETAIL**

SCALE: NTS

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

Sprint®

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
0	06-18-12	ISSUED FOR CONSTRUCTION	JLS	KCD

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

Stephen A. Bray
PROFESSIONAL ENGINEER

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

CT LICENSE: 26657 6/18/12

PROJECT NUMBER:
332.1490

SITE INFORMATION:
64 HUNGERFORD LANE
HARWINTON, CT 06791
LITCHFIELD COUNTY

CT33XC021

PROJECT TYPE:
NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		03-16-12

SHEET TITLE:
RRH PLANS & DETAILS
(ALL SECTORS)

SHEET NUMBER: C04C | REV.: 0

K:\332_Sprint_332.1000_Alcatel-Lucent\332.1490_CT33XC021_64 Hungerford Lane\332.1490_CAD\332.1490_Construction\332.1490_C04C.dwg, 6/18/2012 10:52:11 AM, jsprinkewski