



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

September 6, 2013

Melanie Howlett
HPC Wireless Services
22 Shelter Rock Lane, Building C
Danbury, CT 06811

RE: **EM-SPRINT-004-130822** – Sprint Spectrum, L.P. notice of intent to modify an existing telecommunications facility located at 181 Montevideo Road, Avon, Connecticut.

Dear Ms. Howlett:

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 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 August 16, 2013. 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,



Melanie A. Bachman
Acting Executive Director

MAB/CDM/cm

c: The Honorable Mark W. Zacchio, Chairman, Town of Avon
Steven V. Kushner, Town Planner, Town of Avon
Monte, Inc.



EM-SPRINT-004-130822

HPC Wireless Services
22 Shelter Rock Lane.
CT, 06810
77.1112

August 20, 2013

RECEIVED
AUG 22 2013

CONNECTICUT
SITING COUNCIL

VIA OVERNIGHT COURIER

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

Re: Sprint Spectrum, L.P. – exempt modification
181 Montevideo Road, Avon, Connecticut

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Sprint Spectrum, L.P. (“Sprint”). Sprint is undertaking modifications to certain existing sites in its Connecticut system in order to implement updated technology. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction that 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 attachments is being sent to the Chairman of the Town Council for the Town of Avon.

Sprint plans to modify the existing wireless communications facility owned by Monte, LLC and located at 81 Montevideo Road, Avon (coordinates 41°-48’-11.25” N, 72°-48’-05.05” W). Attached are plan and elevation drawings depicting the planned changes, and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration. Also included is a power density report reflecting the modification to Sprint’s operations at the site.

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

1. Sprint will remove the existing three (3) CMDA antennas and add three (3) dual-band panel LTE antennas on new pipe masts mounted to the existing sector frames, at a centerline height of approximately 147’. Sprint will also install six (6) RRHs (remote radio heads) on existing pipe mounts behind the LTE antennas, also at a centerline height of approximately 147’. During an interim period of up to one year, the three (3) existing

CDMA antennas will remain. Sprint will also install three (3) hybridflex cables along the existing coaxial cable run, and will remove the coaxial cable at the end of the interim period. The proposed modifications will not extend the height of the approximately 150' structure.

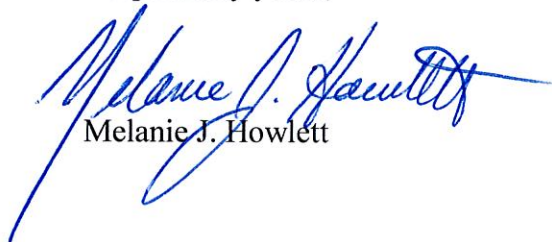
2. Sprint will make related equipment changes within the existing Equipment Shelter, and will mount a fiber distribution box to the Shelter façade. The existing GPS antenna will be replaced by another GPS antenna and a GPS Surge Suppressor. These changes will have no effect on the site boundaries.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility 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. As indicated on the attached report prepared by EBI Consulting, Sprint's operations at the site will result in a power density of approximately 15.017%; the combined site operations will result in a total power density of approximately 20.057%.

Please contact me by phone at (203) 610-1071 or by e-mail at mjhowlett@optonline.net with questions concerning this matter. Thank you for your consideration.

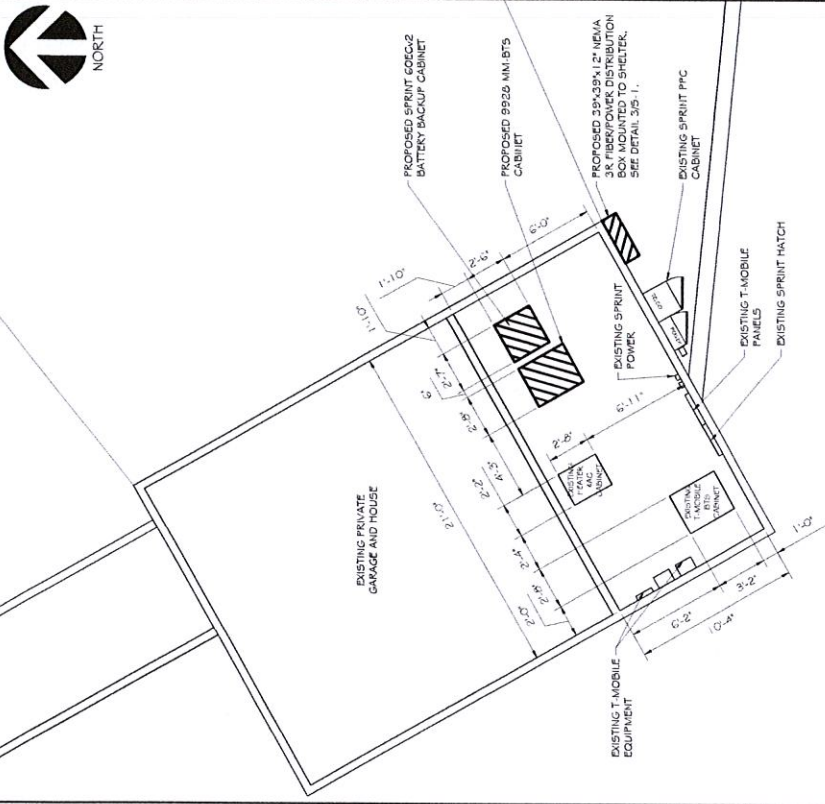
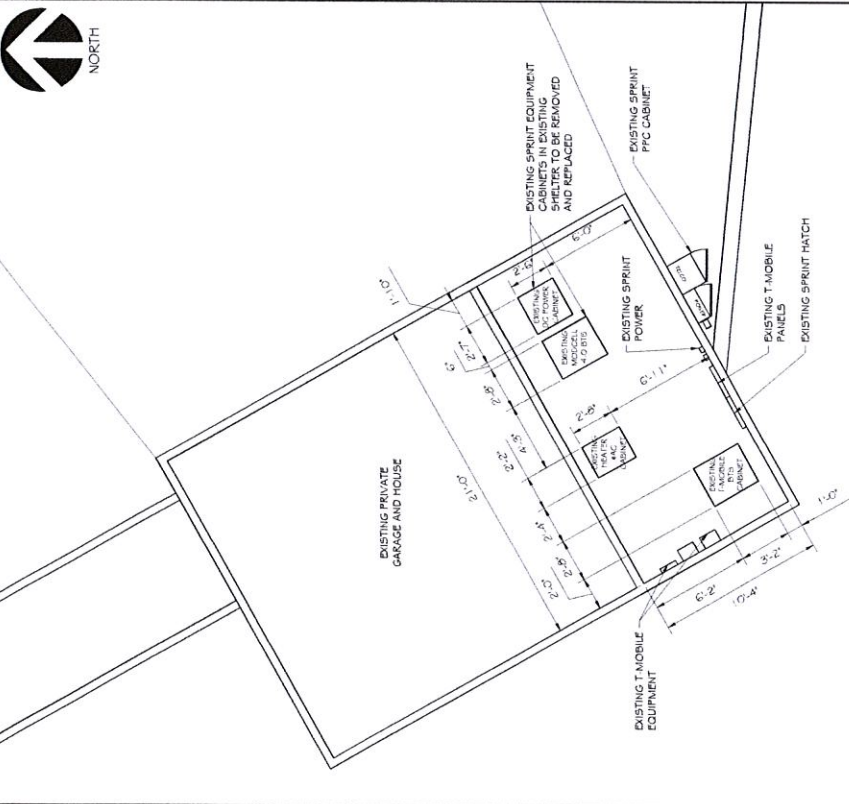
Respectfully yours,



Melanie J. Howlett

Attachments

cc: Honorable Mark W. Zacchio, Chairman of the Town Council, Town of Avon
Monte, LLC (underlying property owner)



6391 Sprint Parkway
 Overland Park, KS 66251

1120 Dallas Street, Sauk City, WI 53583
 Phone: 608-843-4100 Fax: 608-843-7999
 www.Ramaker.com

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 MMBTS LAUNCH
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Companion File

B	08/15	FINAL PRELIM CDS
A	10/30	FINAL PRELIM CDS
MARK	DATE	DESCRIPTION
SCALE	FINAL PRELIMS	DATE ISSUED 08/15/2013
PROJECT TITLE	PROJECT TITLE	

**AVON MOUNTAIN
 SITE #: CT03XC053**

PROJECT INFORMATION
 611 MONTEVIDEO ROAD
 AVON, CT 06001
 HARTFORD COUNTY

EQUIPMENT PLAN

0 3.75' 7.5' 15'

1" = 7.5'
 1" = 17'
 22' x 34' : 1" = 7.5'

DATE PLOTTED: 8/15/2013
 NUMBER: 22984
 SHEET: A-1

NOTES:

I. SCOPE
 THIS SECTION COVERS THE SPECIFICATIONS FOR ANTENNA AND COAXIAL CABLE INSTALLATION OF ANTENNAS, COAXIAL CONNECTIONS, AND ICE BRISKS.

B. REFERENCE SPRINT STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES FOR GENERAL REQUIREMENTS.

II. ANTENNAS:
 A. ANTENNAS SHALL BE PLUMB AND INSTALLED SO THAT THE CENTER OF GRAVITY OF THE ANTENNA SHALL BE VERTICAL TO THE DIRECTIONAL AXIS OF THE ANTENNA. THE ANTENNA SHALL BE PROVIDED ON THE RF SPECIFICATION SHEET. NOTE: THE ANTENNA MAY BE ORIENTED USING THE REFLECTOR AS THE REFERENCE, ADJUSTING ITS AZIMUTH 180 DEGREES FROM MAXIMUM ANTENNA RADIATION.

B. MICROWAVE ANTENNAS (DISHES) SHALL BE ASSEMBLED PER MANUFACTURER'S DRAWINGS. STIFF ARMS AND RADOMES SHALL BE INSTALLED WITH POLARIZATION PROVIDED BY RF SPECIFICATION SHEET. THE ANTENNA SHALL BE INSTALLED WITH THE STIFF ARM POINTED TOWARD CALCULATED AZIMUTH, OR DIRECTION OF FIELD STATE DENOTING OPPOSITE END. 2 STIFF ARMS SHALL BE PROVIDED FOR MICROWAVE DISHES 6'-0" IN DIAMETER OR GREATER.

C. A TRANSIT SHALL BE USED TO PROPERLY ALIGN CELLULAR AND MICROWAVE ANTENNAS.

III. COAXIAL CABLE
 A. SHAP IN HANGERS SHALL BE SUPPORTED WITH SWAP IN HANGERS. SHAP IN HANGERS SHOULD BE USED EVERY 3 FEET THE ENTIRE HEIGHT OF THE TOWER. ANGLE ADAPTERS OR ROUND MEMBER ADAPTERS WITH BUTTERFLY CLAMPS SHALL BE USED ELSEWHERE, I.E. SIDDARMS, PLATFORMS, AND MICROWAVE MOUNTS.

B. COAXIAL CABLE SHALL ALSO BE SUPPORTED WITH HOISTING GRIPS, INSTALLED AT MAXIMUM INTERVALS OF 200 FEET. HOISTING GRIPS SHALL BE ATTACHED WITH SHACKLES, BOLTED IN THE 1/4" HOLE OF WAVEGUIDE LADDER.

C. ALL JUMPERS USED BETWEEN COAXIAL CABLE AND ANTENNA SHALL BE SUPPORTED WITHIN 1.9 INCHES OF ANTENNA, USING BUTTERFLY CLAMPS WITH ANGLE ADAPTERS OR ROUND MEMBER ADAPTERS WITH BUTTERFLY CLAMPS. JUMPERS TYPICALLY USE 6" JUMPERS; MICROWAVE DISHES USE 3" JUMPERS.

D. COAXIAL CABLE SHALL BE NEATLY BENT WHEN REQUIRED, USING A MINIMUM BENDING RADIUS OF 10 TIMES THE DIAMETER OF THE CABLE. COAXIAL CABLE SHOULD BE AT A LOWER HEIGHT THAN THE ENTRY FORT.

E. COAXIAL CABLE SHALL BE SUPPORTED WITH SWAP IN HANGERS AND SHAP IN HANGERS. SWAP IN HANGERS AND SHAP IN HANGERS SHOULD BE NEATLY CUT AT INSIDE BUILDING AND TERMINATED AT THE QUARTER WAVE SHORTS.

F. CONNECTORS WILL NORMALLY BE PROVIDED FIRST OFF REEL AND SHOULD BE NEATLY INSTALLED PER MANUFACTURERS SPECIFICATIONS.

G. COAXIAL CABLES SHOULD BE LABELED WITH TAGS INSIDE THE BUILDING.

H. USE 2" WIDE COLORED TAPE TO INDICATE SECTORS. CONTRACTOR TO USE SECTOR COLOR CODING AS INDICATED IN THESE DRAWINGS OR AS PROVIDED BY SPRINT.

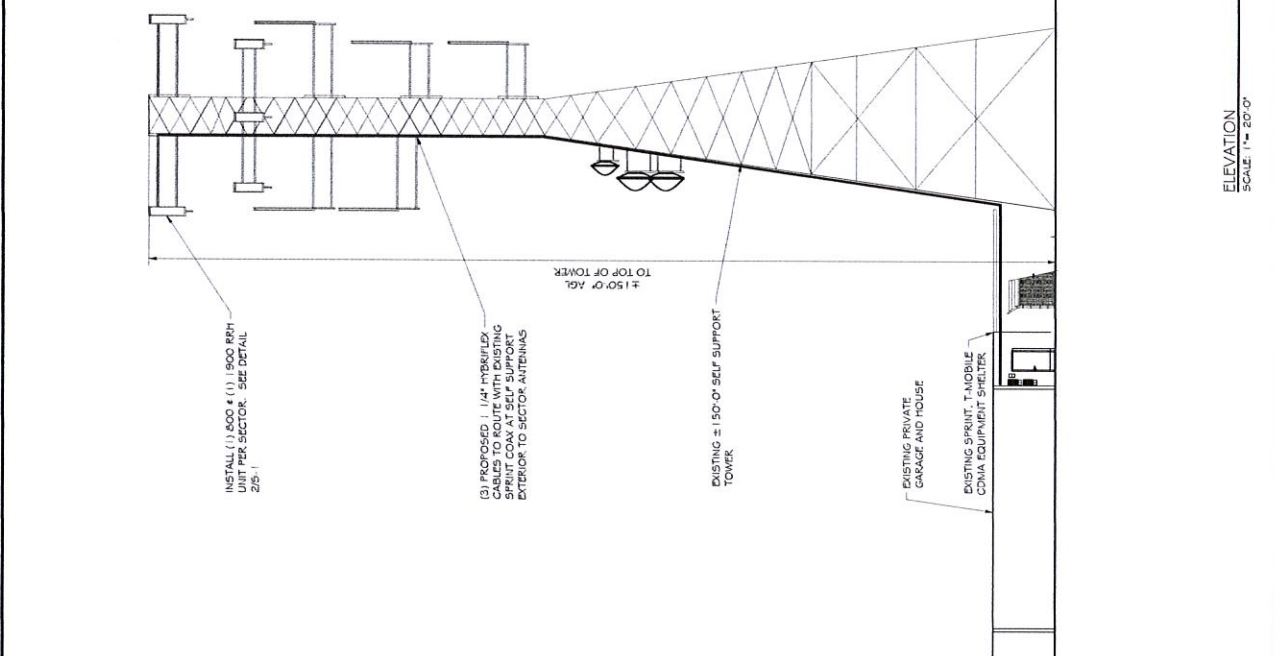
I. ALL EXCEPTIONS NEED TO BE VERIFIED WITH THE PROJECT MANAGER.

IV. CONNECTORS:
 A. ALL CONNECTORS AND GROUNDING KITS SHALL BE WEATHERPROOFED USING COLD SHRINK OR ANOTHER APPROVED WEATHER STRIPPING. NOTE: NO PORTION OF CONNECTOR SHALL BE EXPOSED TO THE ELEMENTS.


B. COAXIAL CABLE SHALL BE GROUNDED USING GROUNDING KITS AT THE TOP (BELOW THE BEND), BOTTOM ABOVE THE BEND ON TOWER GROUND BAR, AND ON BUILDING GROUND BAR BEFORE ENTRY INTO WAVEGUIDE FORTS. 4" CABLE BOOTS SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS.

C. GROUNDING KITS SHALL BE NEATLY INSTALLED SO THAT THE JUMPER RUNS IN THE SAME DIRECTION AS THE COAXIAL AND GROUND BAR. JUMPER WIRE SHOULD RUN IN A DIRECT PATH TO THE GROUND SHAP TOWER LADDER, BUT HAVE ADEQUATE SLACK TO ALLOW FOR TOWER MOVEMENT. GROUNDING WIRE SHOULD BE APPLIED BETWEEN LUG AND BAR/TOWER.


D. TOWER GROUND BAR SHALL BE INSTALLED ON THE ANGLE BEHIND THE FIRST DIAGONAL WAVEGUIDE LADDER RUNG. ABOVE 6" GROUND BAR SHOULD BE ISOLATED FROM ANGLE USING NONION BUSINESS PROVIDED.




- (3) EXISTING SPRINT CDMA ANTENNAS TO BE REMOVED (3) PROPOSED SPRINT PAIR ANTENNAS TO BE ADDED
CL @ ± 147' AGL
- (4) EXISTING T. MOBILE ANTENNAS
CL @ ± 133' AGL
- (2) EXISTING WHP ANTENNAS
@ ± 120' AGL
- (2) EXISTING WHP ANTENNAS
@ ± 105' AGL
- (1) EXISTING WHP ANTENNAS
@ ± 90' AGL
- (1) EXISTING CARRIER DISH ANTENNA
@ ± 75' AGL
- (1) EXISTING CARRIER DISH ANTENNA
@ ± 70' AGL
- (1) EXISTING CARRIER DISH ANTENNA
@ ± 60' AGL



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Overland Park, KS 66251





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NORTHERN CT MARKET

Consultant's Seal

NO.	DATE	DESCRIPTION
1	08/15/13	FINAL PRELIM CD'S
2	08/15/13	FINAL PRELIM CD'S
3	08/15/13	FINAL PRELIM CD'S
4	08/15/13	FINAL PRELIM CD'S

PROJECT TITLE: AVON MOUNTAIN
 SITE #: CTO3XC053

PROJECT INFORMATION:
 611 MONTEVIDEO ROAD
 AVON, CT 06001
 HARTFORD COUNTY

SHEET TITLE: SITE ELEVATION & NOTES

SCALE: 1" = 20'-0"

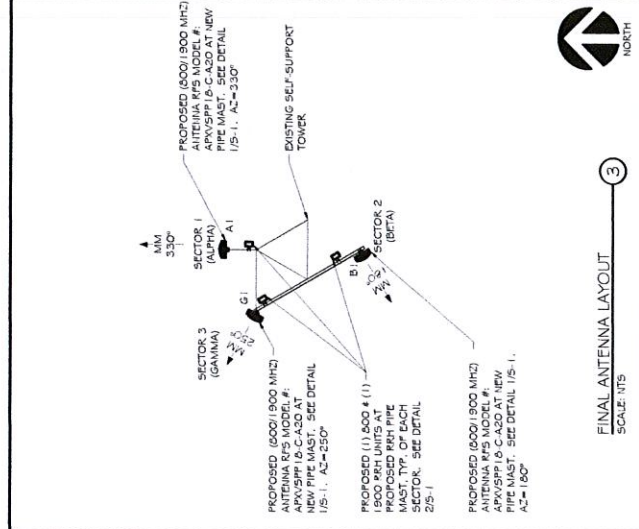
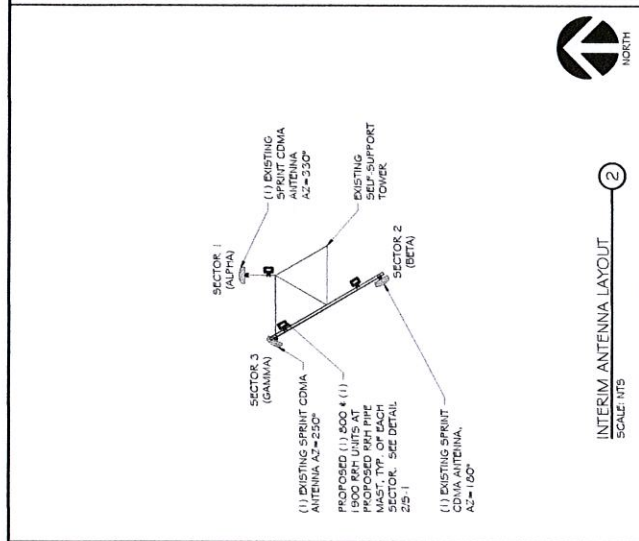
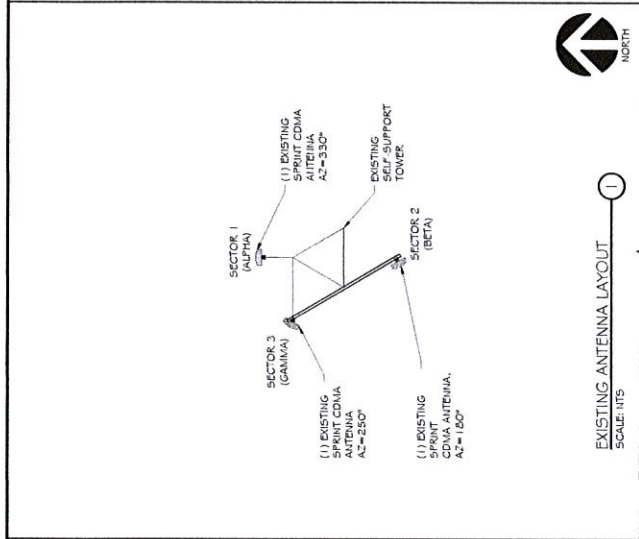
ELEVATION

0 10' 20' 40'

1 1/4" = 17' - 1/2" = 20'

2 1/2" = 34' - 1" = 40'

DATE: 08/15/2013
 DRAWN BY: JAS
 CHECKED BY: JAS
 229954
 A-2



ANTENNA AND COAXIAL CABLE SCHEDULE

SECTOR	POS.	AZIMUTH	ANTENNA CENTERLINE	ANTENNA STATUS	TECH.	ANTENNA MAKE/ MODEL	MECH. DOWNTILT (°)	ELEC. DOWNTILT (°)	RRHs	CABLE SIZE	CABLE LENGTH
ALPHA	A-1	240°	147'-0"	EX. TO BE REMOVED	CDMA					EX. TO BE REMOVED	200'-0"
	A-1	330°	147'-0"	PROPOSED	MULTIMODAL	RFS/APX/SFP 1/5-C-A30	1900(3), 2000(1)	1900(3), 2000(1)	(1) 1900, (1) 800	(1) 1/2" HYBRIFLEX HYBRID CABLE RFS #B 1/4-1-00U4-M5J	200'-0"
BETA	B-1	330°	147'-0"	EX. TO BE REMOVED	CDMA					EX. TO BE REMOVED	200'-0"
	B-1	150°	147'-0"	PROPOSED	MULTIMODAL	RFS/APX/SFP 1/5-C-A30	1900(3), 2000(1)	1900(3), 2000(1)	(1) 1900, (1) 800	(1) 1/2" HYBRIFLEX HYBRID CABLE RFS #B 1/4-1-00U4-M5J	200'-0"
GAMMA	G-1	120°	147'-0"	EX. TO BE REMOVED	CDMA					EX. TO BE REMOVED	200'-0"
	G-1	250°	147'-0"	PROPOSED	MULTIMODAL	RFS/APX/SFP 1/5-C-A30	1900(3), 2000(1)	1900(3), 2000(1)	(1) 1900, (1) 800	(1) 1/2" HYBRIFLEX HYBRID CABLE RFS #B 1/4-1-00U4-M5J	200'-0"

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Overland Park, KS 66251

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REV	DATE	DESCRIPTION
B	08/15	FINAL PRELIM CDS
A	10/30	FINAL PRELIM CDS

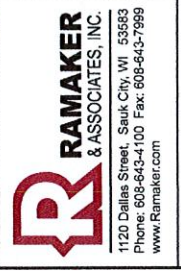
PROJECT TITLE: AVON MOUNTAIN
SITE #: CT03XC053

PROJECT LOCATION:
5 MONTEVIDEO ROAD
AVON, CT 06001
HARTFORD COUNTY

SHEET TITLE:
ANTENNA DETAILS
& COAX SCHEDULE

SCALE: NONE

PROJECT NUMBER	22984
SHEET NUMBER	A-3



**NETWORK VISION
MMBTS LAUNCH
NORTHERN CT MARKET**

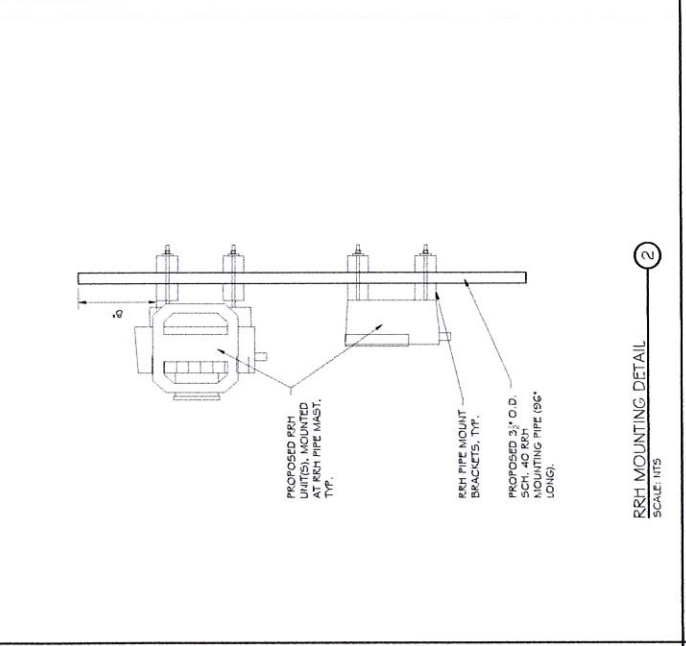
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A	10/30	FINAL PRELIM CD'S

PROJECT TITLE: AVON MOUNTAIN
SITE #: CT03XC053

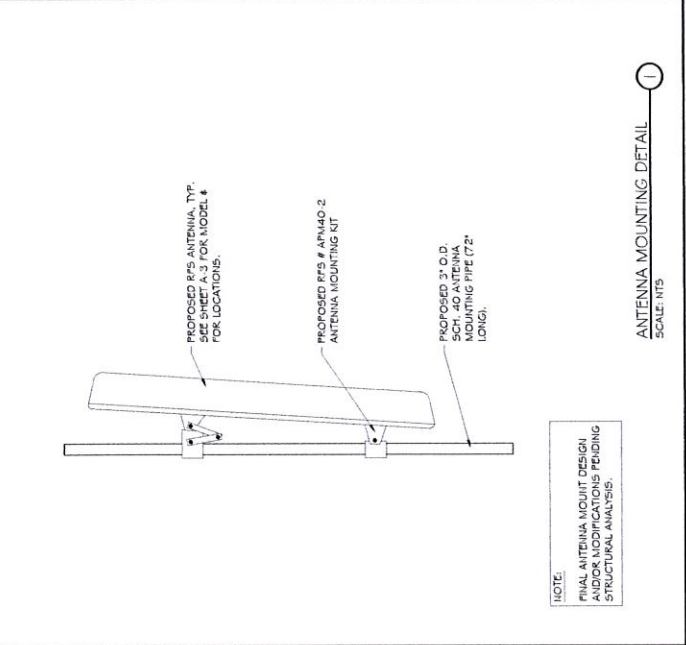
PROJECT INFORMATION:
811 MONTEVIDEO ROAD
AVON, CT 06001
HARTFORD COUNTY

SCALE: NONE

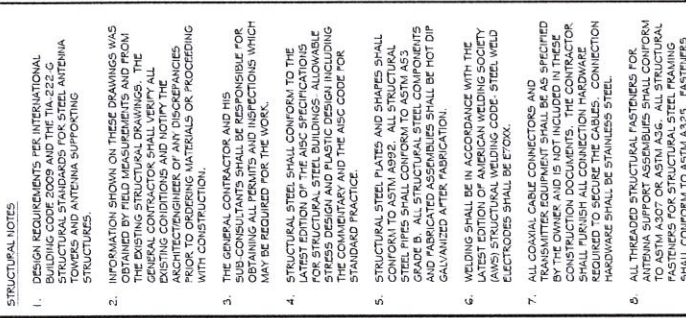
PROJECT NUMBER	22984
REVISION NUMBER	5-1



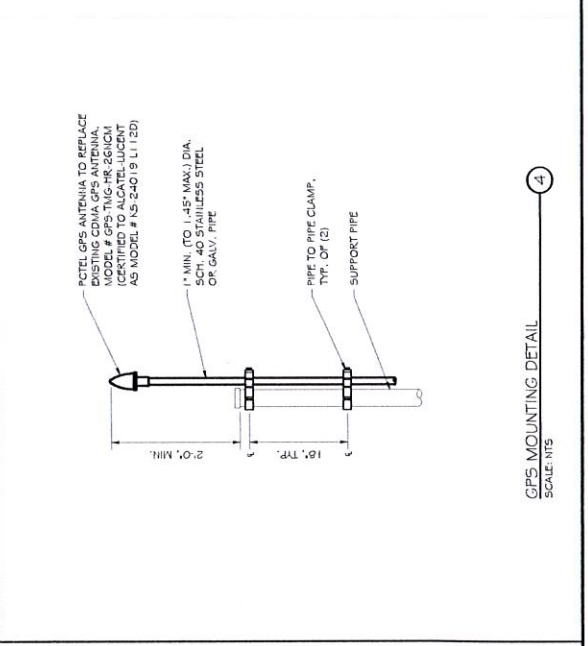
1 ANTENNA MOUNTING DETAIL
SCALE: NTS



2 RRH MOUNTING DETAIL
SCALE: NTS



3 FIBER BOX MOUNTING FRAME
SCALE: NTS



4 GPS MOUNTING DETAIL
SCALE: NTS

STRUCTURAL NOTES:
1. DESIGN REQUIREMENTS PER INTERNATIONAL BUILDING CODE 2009 AND THE IBC 2022.C STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED BY FIELD MEASUREMENTS AND FROM THE EXISTING STRUCTURAL DRAWINGS. THE GENERAL CONTRACTOR SHALL VERIFY ALL ARCHITECTURAL AND STRUCTURAL CONDITIONS PRIOR TO ORDERING MATERIALS OR PROCEEDING WITH CONSTRUCTION.
3. THE GENERAL CONTRACTOR AND HIS SUB CONSULTANTS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK.
4. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS - ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN INCLUDING THE AISC CODE FOR STANDARD PRACTICE.
5. STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO ASTM A992. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND WELDED TO A MINIMUM OF GRADE B. ALL STRUCTURAL STEEL COMPONENTS AND FABRICATED ASSEMBLIES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
6. WELDING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF AMERICAN WELDING SOCIETY (AWS) STRUCTURAL WELDING CODE. STEEL WELD ELECTRODES SHALL BE E70XX.
7. ALL CONICAL CABLE CONNECTIONS AND TRANSMITTER EQUIPMENT SHALL BE AS SPECIFIED BY THE OWNER AND IS NOT INCLUDED IN THESE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL FURNISH ALL CONNECTION HARDWARE. CONNECTION HARDWARE SHALL BE STAINLESS STEEL.
8. ALL THREADED STRUCTURAL FASTENERS FOR ANTENNA SUPPORT AND TRANSMITTER SHALL BE STRUCTURAL GRADE B. ALL STRUCTURAL STEEL FRAMING SHALL CONFORM TO ASTM A325. PASTERIES SHALL BE 1/2" MIN. DIAMETER BEARING TYPE CONNECTIONS WITH THREADS INCLUDED IN THE DESIGN. ALL BOLTS SHALL BE GALVANIZED UNLESS OTHERWISE NOTED. CONCRETE EXPANSION ANCHORS SHALL BE HILTI HWK BOLTS UNLESS OTHERWISE NOTED.
9. LUMBER (IF APPLICABLE) SHALL CONFORM WITH THE REQUIREMENTS OF AMERICAN INSTITUTE OF WOOD CONSTRUCTION AND THE NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
10. IF APPLICABLE, ROOF PROTECTION PADS UNDER SUPPORTS SHALL BE 0.30" THICK RUBBER FIRESTONE PROTECTION PADS. THE ROOF PROTECTION PADS SHALL BE A MINIMUM OF TWO INCHES BEYOND THE PERIMETER OF THE PAVERS AND THE WOOD SLEEPERS AND SHALL BE PLACED WITH A MINIMUM 1/2" SPACE BETWEEN ADJACENT PADS TO FACILITATE DRAINAGE. REMOVE ALL LOOSE STONES PRIOR TO PLACING THE SEPARATOR SHEET.
11. NORTH ARROW SHOWN ON PLANS REFERS TO THE NORTH ARROW SHOWN ON THE TITLE SHEET. NORTH AND INFORM CONSTRUCTION MANAGER OF ANY DISCREPANCY BEFORE STARTING CONSTRUCTION.



**RAMAKER
& ASSOCIATES, INC.**

AVON MOUNTAIN (CT03XC053)

**PREPARED FOR:
ALCATEL-LUCENT ON BEHALF OF SPRINT**

**PREPARED BY:
RAMAKER & ASSOCIATES, INC.
JOB NUMBER: 22984**

**STRUCTURAL ASSESSMENT
150-FOOT SELF-SUPPORT TOWER**

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

MATCHLINE SEE SHEET C106

AVON MOUNTAIN (CT03XC053)

SITE: Avon Mountain (CT03XC053)
81 Montevideo Road
Avon, Hartford County, Connecticut 06001

CONTACT PERSON: John Szilezy
Alcatel-Lucent
Site Acquisition Manager
600 Mountain Avenue, Murray Hill, NJ 07974
Email: john.szilezy@alcatel-lucent.com

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

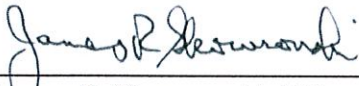
RAMAKER JOB NUMBER: 22984

DATE OF REPORT ISSUANCE: March 8, 2013



Joshua J. Fenske
Structural Designer

03/08/13
Date



James R. Skowronski, P.E.
Supervising Engineer

03/08/13
Date



TABLE OF CONTENTS

EXECUTIVE SUMMARY 3

INTRODUCTION..... 4

 2.1 PROJECT INFORMATION 4

 2.2 PURPOSE OF REPORT 4

 2.3 SCOPE OF SERVICES 4

MODEL DEVELOPMENT 5

 3.1 INTRODUCTION 5

 3.2 EXISTING STRUCTURE INFORMATION 5

 3.3 EXISTING TOWER LOADS 5

 3.4 PROPOSED TOWER LOADS 6

ANALYSIS RESULTS 7

 4.1 ANALYSIS RESULTS 7

 4.2 BASE REACTIONS 7

 4.3 MOUNTING STRUCTURE ASSESSMENT 7

LIMITATIONS 8

REFERENCES..... 9

LIST OF APPENDICES

- A. TOWER FIGURES
- B. TOWER CALCULATIONS

SECTION 1
EXECUTIVE SUMMARY

This report summarizes the structural analysis conducted by Ramaker & Associates, Inc. (Ramaker & Associates) for Alcatel-Lucent on behalf of Sprint, who intends to install additional equipment on an existing 150-foot self-support tower.

Alcatel-Lucent is proposing to install three (3) RFS APXVSP18-C-A20 panel antennas, three (3) Alcatel-Lucent 1900 MHz RRHs and three (3) Alcatel-Lucent 800 MHz RRHs at a centerline elevation of 147-feet AGL. The proposed antennas shall be mounted to the existing section frame and existing pipe mount and fed with three (3) 1-1/4-inch fiber/power hybrid cables. The proposed hybrid cables were assumed to be routed up the tower next to the existing Sprint coax. The three (3) existing Sprint panel antennas and their corresponding coax at 147 feet AGL shall be hot-swapped for the interim and final antenna layout.

Results of our analysis show that the tower will be stressed to a maximum of 86.5 percent of capacity under proposed loading conditions. Information regarding the existing soils or the existing tower foundation was not available for analysis, however it is anticipated that the foundation is structurally adequate for the proposed loading conditions based on the percent capacity of the tower.

Results of our mount assessment show that by engineering calculation and inspection, the antenna and RRH mounting structure is capable of supporting the existing and proposed Sprint Network Vision equipment deployment without causing an overstress condition in the antenna and RRH mounting structure.

In summary, the tower and mounting structure will pass the EIA/TIA-222-F code requirements under proposed loading conditions. The tower was also analyzed by Ramaker according to the TIA-222-G code and it did not pass.

SECTION 2

INTRODUCTION

2.1 PROJECT INFORMATION

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

2.2 PURPOSE OF REPORT

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

2.3 SCOPE OF SERVICES

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

SECTION 3

MODEL DEVELOPMENT

3.1 INTRODUCTION

Ramaker & Associates developed a FEM of the tower superstructure using the tower drawings and site photos. Required static loads consisting of the antenna configuration, wind forces, ice loads, and linear appurtenances (including cable loads) were then applied to the FEM. As a result, all member forces, allowable capacities, and base reactions were computed.

3.2 EXISTING STRUCTURE INFORMATION

Tower information was gathered from the Tower Mapping Report by Hightower Solutions, site number CT03XC053, dated 2/28/2013.

3.3 EXISTING TOWER LOADS

Ramaker & Associates understands that the existing antenna, cable, and appurtenance configurations are as shown in the following chart:

Elevation	Appurtenance	Mount	Coax
149	Lightning Rod	Tower Leg	---
	8' Whip Antenna		(1) 7/8
147	**(3) Andrew HBX-6516ESA-T2M**	Sector Frame (Beta & Gamma)	**(6) 1-5/8**
		Pipe Mount (Alpha)	
136	(3) RFS APXV18-206516S-C	Sector Frame	(6) 1-5/8
121	14' Whip Antenna	Standoff	(1) 7/8
117	21' Whip Antenna	Standoff	(1) 1-1/4
108	10' Dipole Antenna	Standoff	(1) 7/8
105	8' Whip Antenna	Standoff	(1) 1-1/4
102	6'-4" Antenna	Tower Leg	(1) 1/2
98	12' Whip Antenna	Standoff	(1) 7/8
84	3'-6" Microwave Dish	Standoff	(1) 1/4
78	4'-0" Microwave Dish	Standoff	(1) 1/4
74	GPS Antenna	Tower Leg	(1) 1/2
72	4'-0" Microwave Dish	Standoff	(1) 1/4
67	GPS Antenna	Tower Leg	(1) 1/4
12	GPS Antenna	Tower Leg	(2) 1/2

The three (3) Andrew HBX-6516ESA-T2M panel antennas and their corresponding coax at 147 feet AGL shall be hot-swapped for the interim and final antenna layouts.

AVON MOUNTAIN (CT03XC053)

3.4 PROPOSED TOWER LOADS

Ramaker & Associates understands that the total antenna loading for the tower will consist of the aforementioned existing antennas and the following proposed antennas:

Elevation	Appurtenance	Mount	Coax
147	(3) RFS APXVSP18-C-A20	Existing Sector Frame (Beta & Gamma)	(3) 1-1/4 Hybrid Cables
	(3) ALU 1900MHz 4x40W RRH		
	(3) ALU 800MHz 2x50W RRH	Existing Pipe Mount (Alpha)	

Proposed hybrid cables were assumed to be routed up the tower adjacent to the existing Sprint coax.

3.5 WIND AND ICE LOAD

Wind forces used in model development are in compliance with the TIA/EIA-222-F Standard. These guidelines call for an analysis to be performed, which assumes a basic wind speed (fastest-mile) of 80 miles-per-hour (mph) without ice in Hartford County. The tower is also designed for a 70 mph basic wind speed with 1.25-inch of radial ice.

SECTION 4
ANALYSIS RESULTS

4.1 ANALYSIS RESULTS

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

Component Type	Percent Capacity
Legs	85.8
Diagonals	86.5
Horizontals	63.6
Bolts	61.5
RATING =	86.5

4.2 BASE REACTIONS

The computed maximum factored reactions correlated to maximum moment are as follows:

Load Type	Original Design	Proposed Model
Total Axial (k)	---	22.0
Total Shear (k)	---	20.7
Total Moment (k-ft)	---	1597.1
Leg Uplift (k)	---	178.4
Leg Compression (k)	---	228.4
Leg Shear (k)	---	22.1

Information regarding the existing soils or the existing tower foundation was not available for analysis, however it is anticipated that the foundation is structurally adequate for the proposed loading conditions based on the percent capacity of the tower.

4.3 MOUNTING STRUCTURE ASSESSMENT

The antenna and RRH mounting structure is capable of supporting the existing and proposed Sprint Network Vision equipment deployment without causing an overstress condition in the antenna and RRH mounting structure.

This assessment is inclusive of the entire antenna and RRH mounting structure, including tower platforms, arms, and all other aspects of the mounting structure that will support the Sprint Network Vision equipment deployment.

SECTION 5

LIMITATIONS

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

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

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

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

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

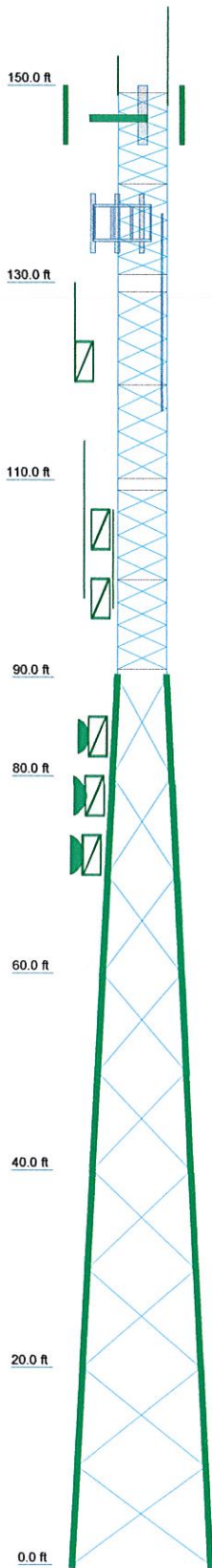
The tower owner is responsible for verifying that the existing loading on the tower is consistent with the loading applied to the tower within this report.

SECTION 6
REFERENCES

1. 2003 International Building Code.
2. Telecommunications Industry Association, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA Standard ANSI/TIA/EIA-222-F 1996, Washington, D.C.

APPENDIX A
TOWER FIGURES

Section	T1	T2	T3	T4	T5	T6	T7	T8
Legs	SR 1 3/4	SR 2	SR 2 1/4	Pirod 216415	Pirod 216413	Pirod 195557		
Leg Grade				A572-50	A572-50			
Diagonals	SR 7/8	A572-50	SR 1		L3x3x5/16			
Diagonal Grade					A36			
Top Girts	SR 1		SR 1 1/4		N.A.			
Mid Girts	SR 1		SR 1 1/4		N.A.			
Bottom Girts	SR 1		SR 1 1/4		N.A.			
Face Width (ft)	5		6	6	8	10	12	14
# Panels @ (ft)	11 @ 1.84167	8 @ 2.35938	9 @ 2.27504		9 @ 10			
Weight (lb)	1306.5	1034.7	1704.4	1374.7	2585.8	3160.5	3278.3	17744.6



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
8' Whip	149	20' Omni	117
Lightning Rod 5/8x4'	149	6' Standoff	117
4' Standoff (Sprint)	147	10' Dipole	108
12' T-Arm (Sprint)	147	6' Standoff	108
APXVSP18-C w/Mount Pipe (Sprint)	147	4' Standoff	105
APXVSP18-C w/Mount Pipe (Sprint)	147	8' Whip	105
APXVSP18-C w/Mount Pipe (Sprint)	147	8' Omni	102
1900MHz 4x40W RRH	147	12' Omni	98
1900MHz 4x40W RRH	147	6' Standoff	98
1900MHz 4x40W RRH	147	3' Standoff	84
800MHz 2x50W RRH	147	3'-6" Dish (84)	84
800MHz 2x50W RRH	147	3' Standoff	78
800MHz 2x50W RRH	147	4' Dish	78
Andrew 12'-6" Universal Sector Frame (T-Mobile)	136	GPS	74
(3) APXV18-206516S-C	136	3' Standoff	72
15' Omni	121	4' Dish	72
6' Standoff	121	GPS	67
		GPS	12

MATERIAL STRENGTH

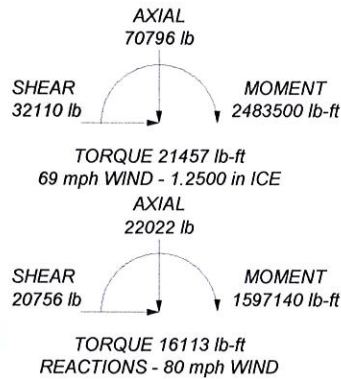
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 1.25 in ice.
4. Deflections are based upon a 60 mph wind.
5. TOWER RATING: 86.5%

MAX. CORNER REACTIONS AT BASE:

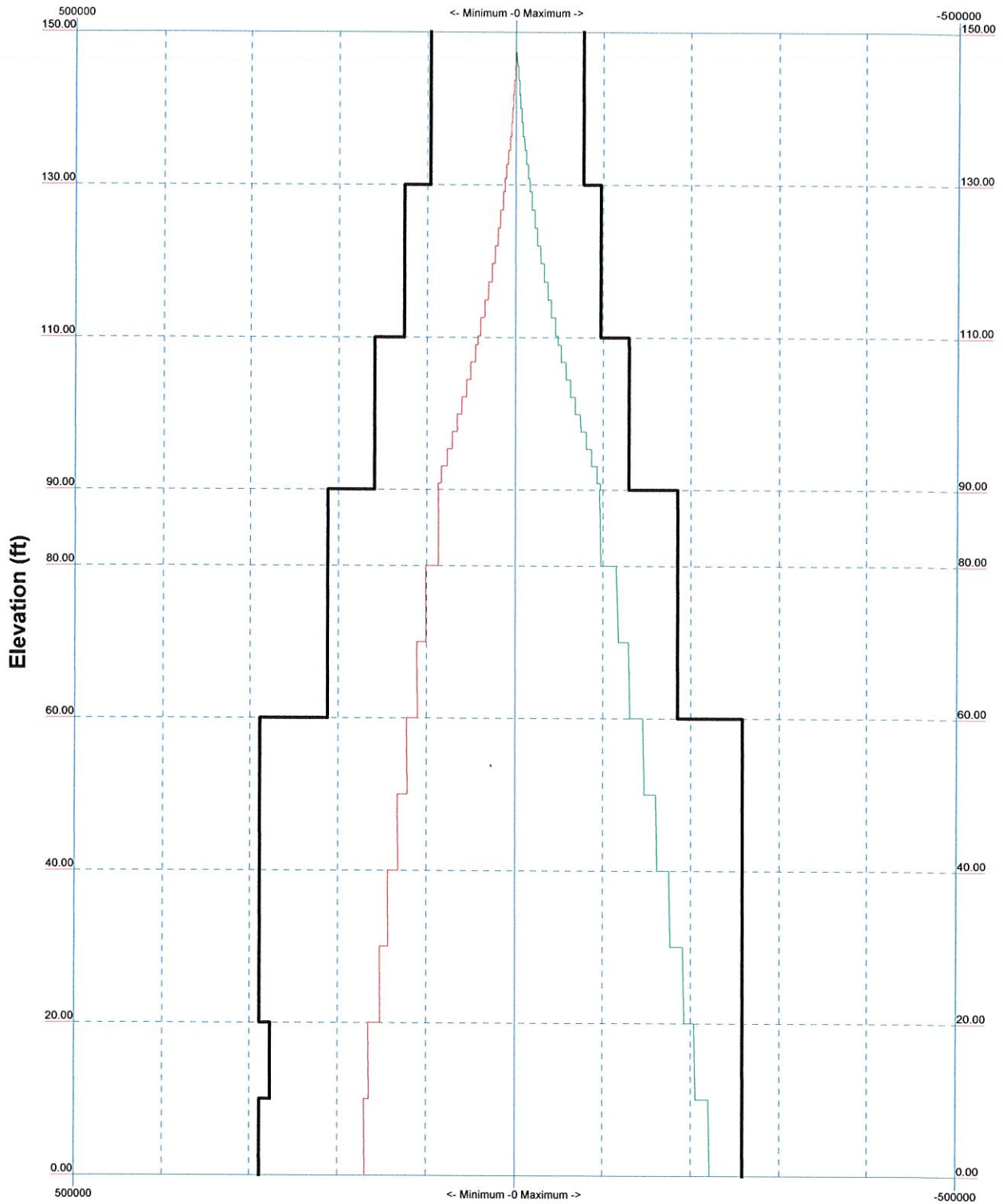
DOWN: 228424 lb
 UPLIFT: -178358 lb
 SHEAR: 22106 lb



	Ramaker & Associates			Job: Avon Mountain (CT03XC053)		
	1120 Dallas Street			Project: 22984		
	Sauk City, WI 53583			Client: Sprint		
	Phone: (608) 643-4100			Drawn by: JHZ		
	FAX: (608) 643-7999			App'd:		
			Code: TIA/EIA-222-F			
			Date: 03/08/13			
			Scale: NTS			
			Path: I:\22900\22984\Structural\Risa\22984.eti			
			Dwg No: E-1			

TIA/EIA-222-F - 80 mph/69 mph 1.2500 in Ice

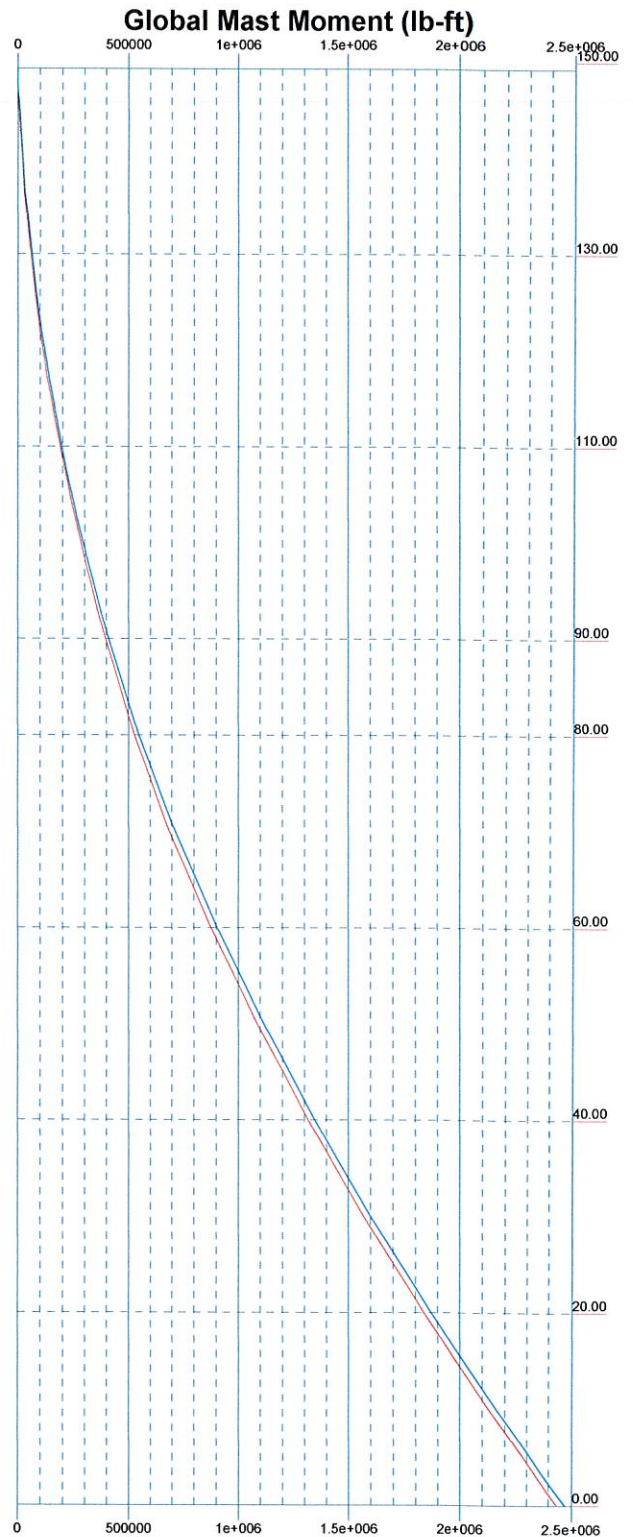
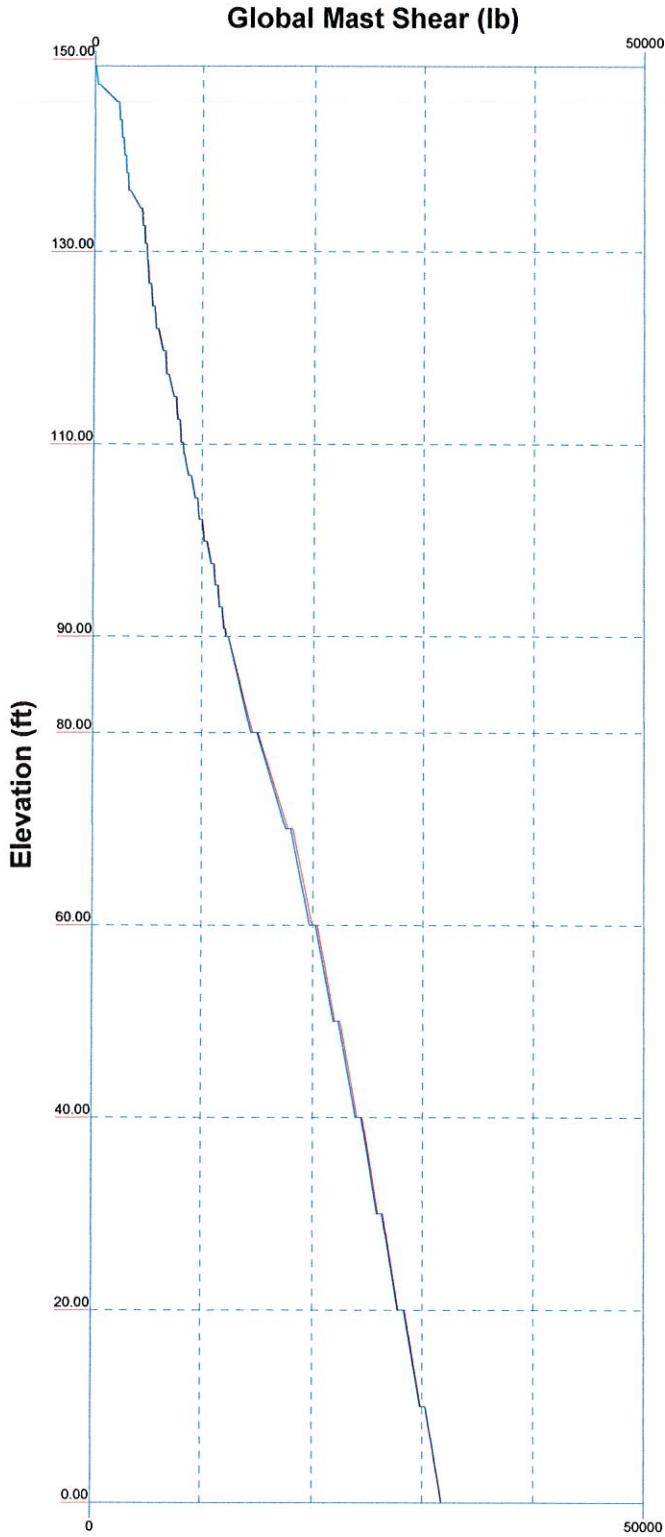
Leg Capacity ——— Leg Compression (lb)



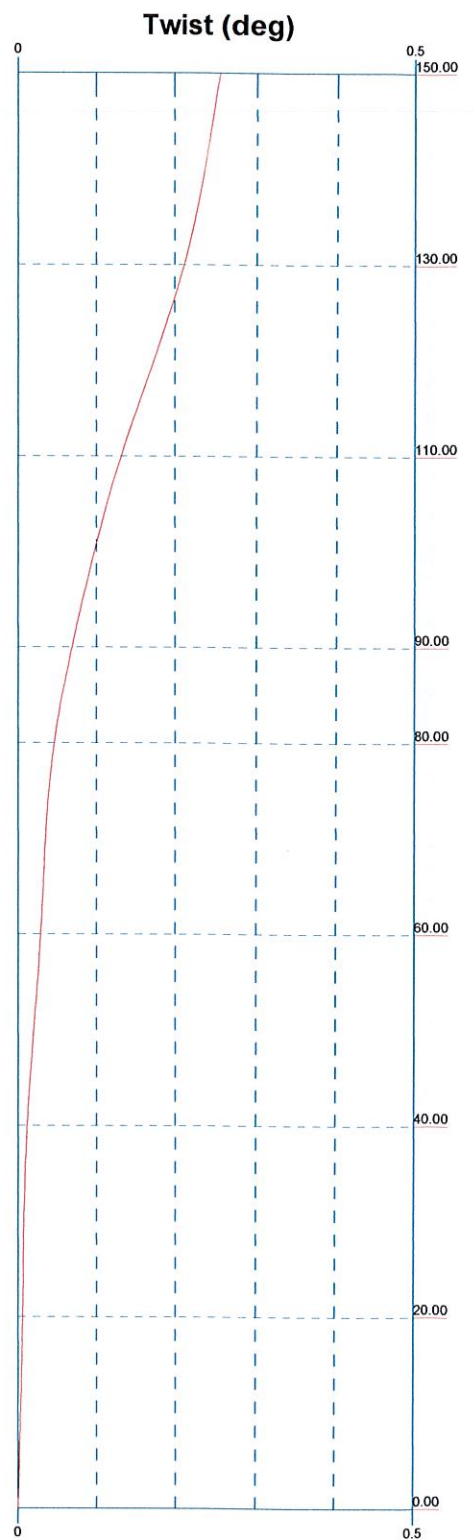
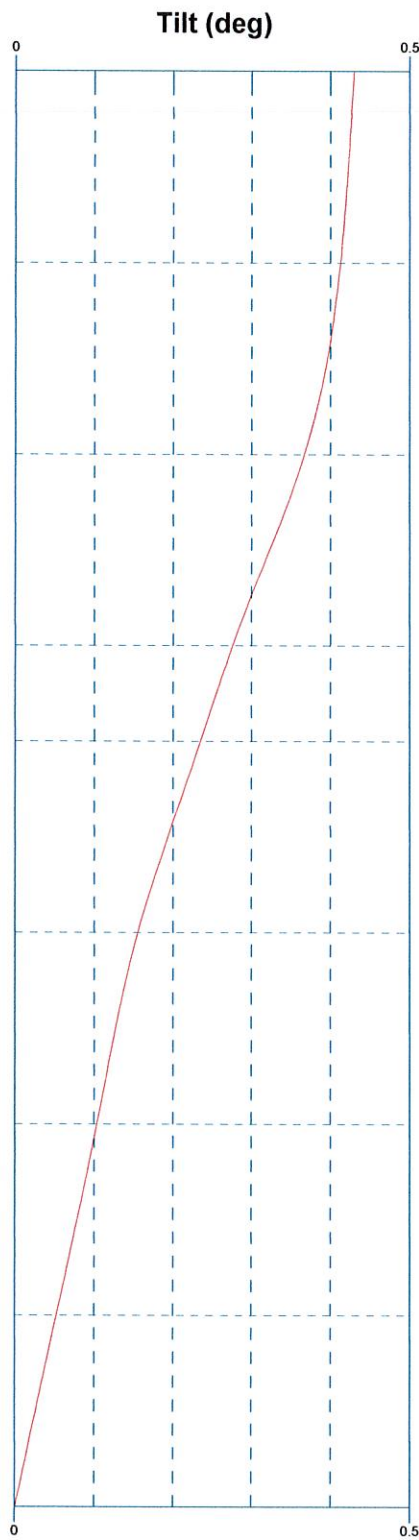
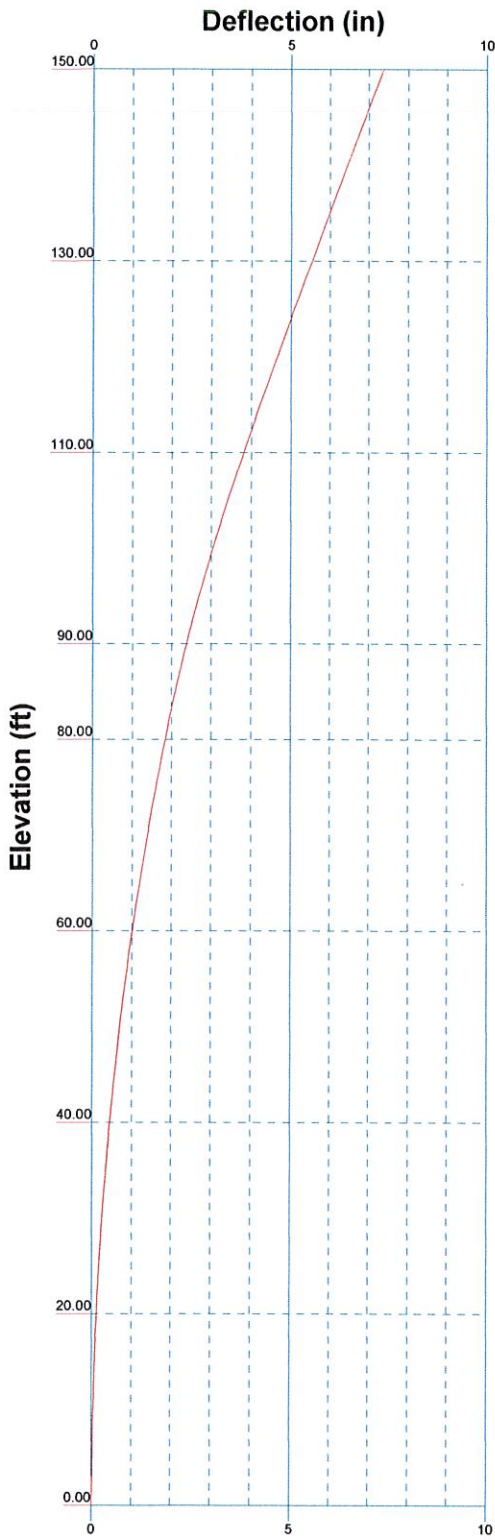
	Ramaker & Associates		Job: Avon Mountain (CT03XC053)		
	1120 Dallas Street		Project: 22984		
	Sauk City, WI 53583		Client: Sprint	Drawn by: JHZ	App'd:
	Phone: (608) 643-4100		Code: TIA/EIA-222-F	Date: 03/08/13	Scale: NTS
	FAX: (608) 643-7999		Path: I:\22900\22984\Structural\Risa\22984.eri		Dwg No: E-3


Vx Vz

Mx Mz



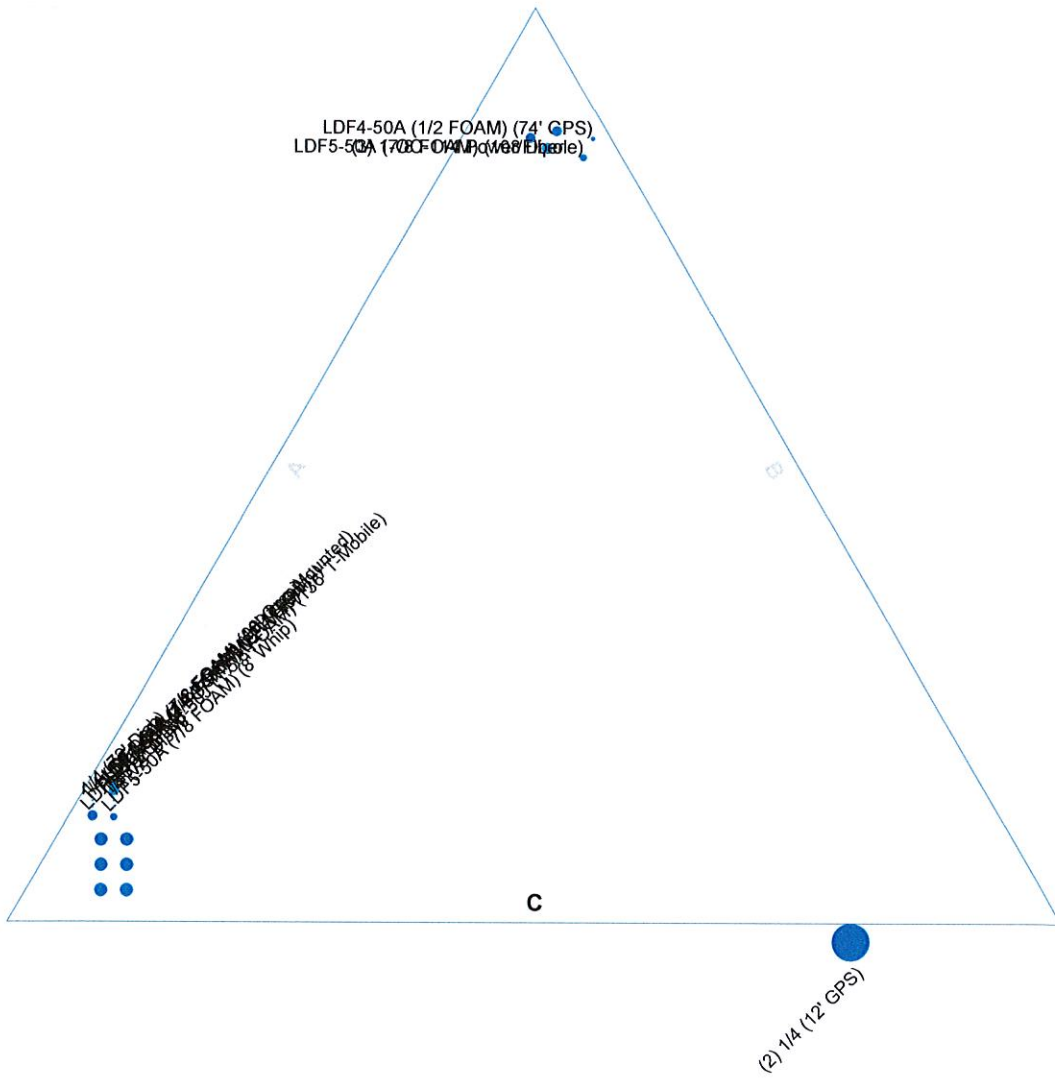
 <p>Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999</p>	Job: Avon Mountain (CT03XC053)		
	Project: 22984		
	Client: Sprint	Drawn by: JHZ	App'd:
	Code: TIA/EIA-222-F	Date: 03/08/13	Scale: NTS
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	Ramaker & Associates		Job: Avon Mountain (CT03XC053)		
	1120 Dallas Street		Project: 22984		
	Sauk City, WI 53583		Client: Sprint	Drawn by: JHZ	App'd:
	Phone: (608) 643-4100		Code: TIA/EIA-222-F	Date: 03/08/13	Scale: NTS
	FAX: (608) 643-7999		Path: I:\22900\22984\Structural\Resa\22984.eri		Dwg No. E-5

Feedline Plan

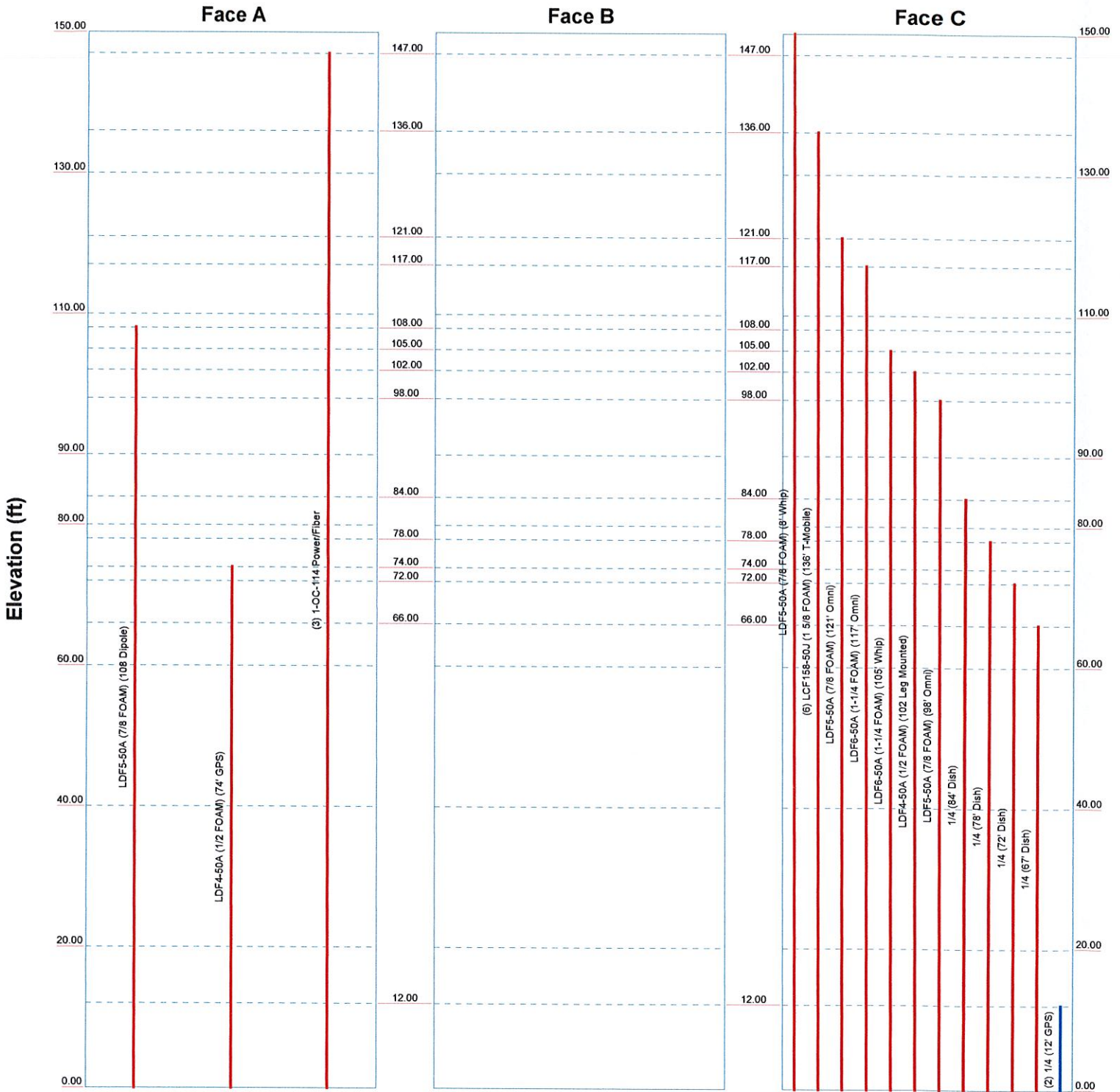
— Round
 — Flat
 — App In Face
 — App Out Face
 — Truss-Leg



	Ramaker & Associates		Job: Avon Mountain (CT03XC053)		
	1120 Dallas Street		Project: 22984		
	Sauk City, WI 53583		Client: Sprint	Drawn by: JHZ	App'd:
	Phone: (608) 643-4100		Code: TIA/EIA-222-F	Date: 03/08/13	Scale: NTS
	FAX: (608) 643-7999		Path: I:\22900\22984\Structural\Risa\22984.eri	Dwg No. E-7	

Feedline Distribution Chart 0' - 150'

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

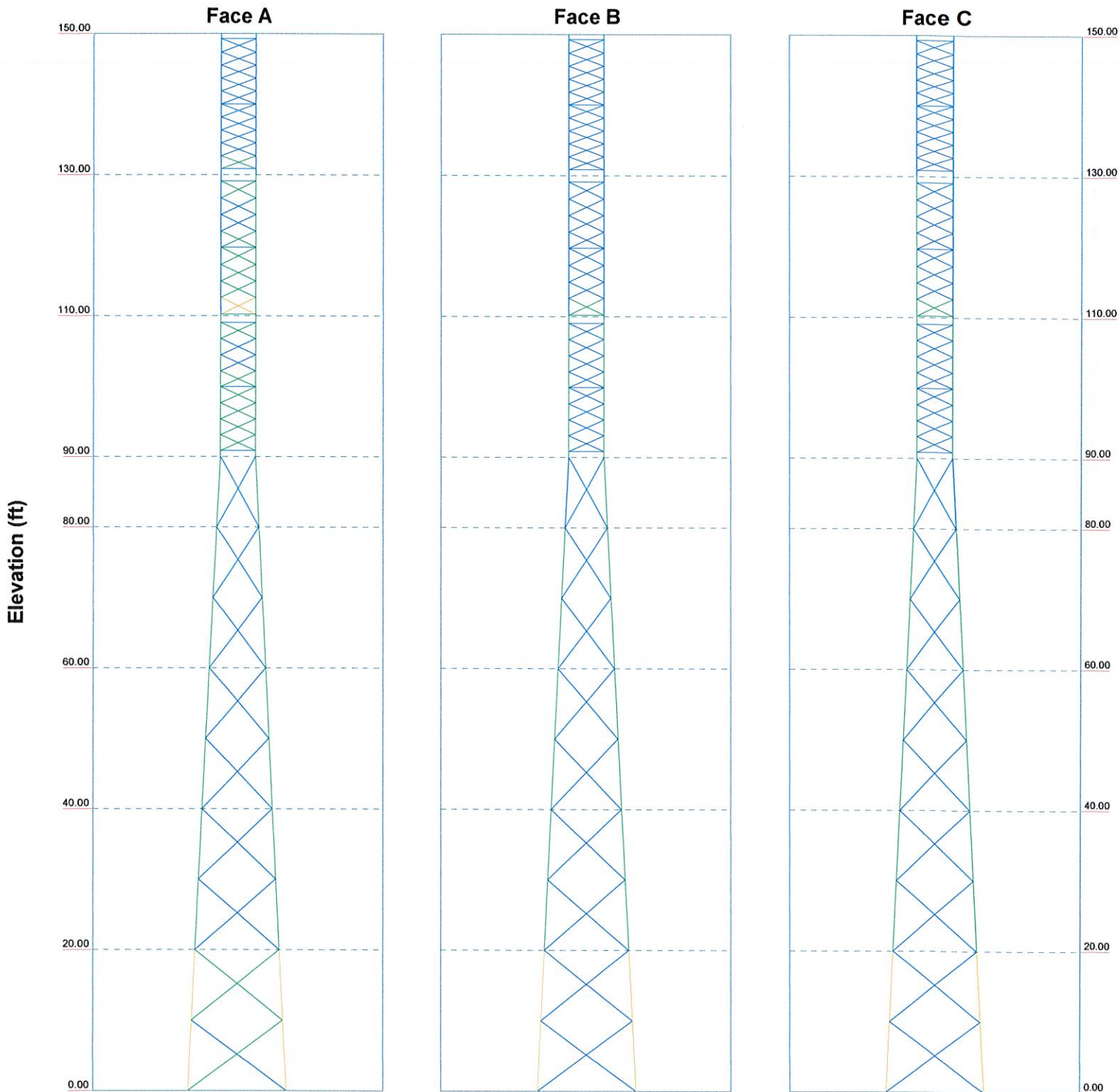



 Ramaker & Associates	Job: Avon Mountain (CT03XC053)		
	1120 Dallas Street		
	Sauk City, WI 53583		
	Phone: (608) 643-4100		
	FAX: (608) 643-7999		
Project: 22984	Client: Sprint	Drawn by: JHZ	App'd:
Code: TIA/EIA-222-F	Date: 03/08/13	Scale: NTS	Path: I:\22900\22984\Structural\Risal\22984.eri
Dwg No: E-7			

Stress Distribution Chart

0' - 150'

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



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	Sauk City, WI 53583		Client: Sprint	Drawn by: JHZ	App'd:
	Phone: (608) 643-4100		Code: TIA/EIA-222-F	Date: 03/08/13	Scale: NTS
	FAX: (608) 643-7999		Path: I:\22900\22984\Structural\Risa\22984.eti		Dwg No. E-8



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

Sprint Existing Facility

Site ID: CT03XC053

Avon Mountain
81 Montevideo Road
Avon, CT 6001

October 17, 2012



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October 17, 2012

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

Re: Emissions Values for Site: **CT03XC053 – Avon Mountain**

EBC Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 81 Montevideo Road, Avon, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ 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 ($\mu\text{W}/\text{cm}^2$). The general population exposure limit for the cellular band is approximately $567 \mu\text{W}/\text{cm}^2$, and the general population exposure limit for the PCS band is $1000 \mu\text{W}/\text{cm}^2$. 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 81 Montevideo Road, Avon, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

- 1) 3 CDMA Carriers (1900 MHz) were considered for each sector of the proposed installation.
- 2) 1 CDMA Carrier (850 MHz) was considered for each sector of the proposed installation
- 3) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 4) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
- 5) The antenna used in this modeling is the APXVSP18-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.



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- 6) The antenna mounting height centerline of the proposed antennas is **147 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	CT03XC053 - Avon Mountain
Site Address	81 Montevideo Road, Avon, CT, 6001
Site Type	Self Support Tower

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	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	15.9	147	141	1/2 "	0.5	0	2080.4211	37.62002	3.76200%
1a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	147	141	1/2 "	0.5	0	389.96892	7.051764	1.24370%
Sector total Power Density Value: 5.006%																	

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	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	15.9	147	141	1/2 "	0.5	0	2080.4211	37.62002	3.76200%
2a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	147	141	1/2 "	0.5	0	389.96892	7.051764	1.24370%
Sector total Power Density Value: 5.006%																	

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	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	15.9	147	141	1/2 "	0.5	0	2080.4211	37.62002	3.76200%
3a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	147	141	1/2 "	0.5	0	389.96892	7.051764	1.24370%
Sector total Power Density Value: 5.006%																	

Site Composite MPE %	
Carrier	MPE %
Sprint	15.017%
T-Mobile	5.040%
Total Site MPE %	20.057%



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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 **15.018% (5.006% 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 **101.937%** 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

APPENDIX B
TOWER CALCULATIONS

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job Avon Mountain (CT03XC053)	Page 1 of 29
	Project 22984	Date 16:37:35 03/08/13
	Client Sprint	Designed by JHZ

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 150.00 ft above the ground line.

The base of the tower is set at an elevation of 0.00 ft above the ground line.

The face width of the tower is 5.00 ft at the top and 14.00 ft at the base.

This tower is designed using the TIA/EIA-222-F standard.

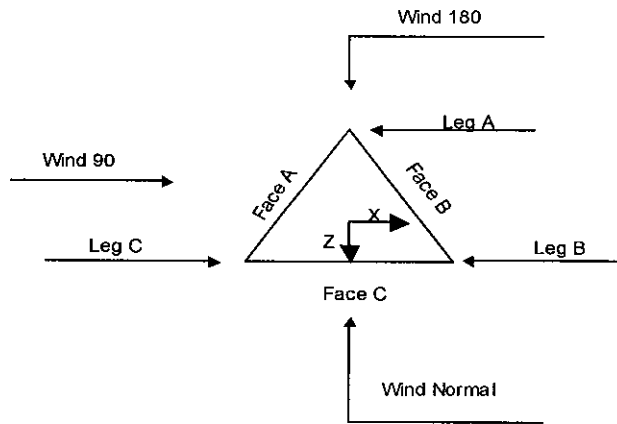
The following design criteria apply:

- Tower is located in Hartford County, Connecticut.
- Basic wind speed of 80 mph.
- Nominal ice thickness of 1.2500 in.
- Ice density of 56 pcf.
- A wind speed of 69 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.333.
- Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job Avon Mountain (CT03XC053)	Page 2 of 29
	Project 22984	Date 16:37:35 03/08/13
	Client Sprint	Designed by JHZ



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	150.00-130.00			5.00	1	20.00
T2	130.00-110.00			5.00	1	20.00
T3	110.00-90.00			5.00	1	20.00
T4	90.00-80.00			5.00	1	10.00
T5	80.00-60.00			6.00	1	20.00
T6	60.00-40.00			8.00	1	20.00
T7	40.00-20.00			10.00	1	20.00
T8	20.00-0.00			12.00	1	20.00

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	150.00-130.00	1.84	X Brace	No	Yes+Steps	9.5000	9.5000
T2	130.00-110.00	2.36	X Brace	No	Yes+Steps	11.2500	2.2500
T3	110.00-90.00	2.28	X Brace	No	Yes+Steps	12.0000	9.5000
T4	90.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T5	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T6	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T7	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job Avon Mountain (CT03XC053)	Page 3 of 29
	Project 22984	Date 16:37:35 03/08/13
	Client Sprint	Designed by JHZ

Tower Section	Tower Elevation <i>ft</i>	Diagonal Spacing <i>ft</i>	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset <i>in</i>	Bottom Girt Offset <i>in</i>
T8	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry (cont'd)

Tower Elevation <i>ft</i>	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 150.00-130.00	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 130.00-110.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 110.00-90.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T4 90.00-80.00	Truss Leg	Pirod 216415	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T5 80.00-60.00	Truss Leg	Pirod 216413	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T6 60.00-40.00	Truss Leg	Pirod 195557	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T7 40.00-20.00	Truss Leg	Pirod 195557	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T8 20.00-0.00	Truss Leg	Pirod 195557	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation <i>ft</i>	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 150.00-130.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T2 130.00-110.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 110.00-90.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)

Tower Section Geometry (cont'd)

Tower Elevation <i>ft</i>	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 150.00-130.00	1	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T2 130.00-110.00	1	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T3 110.00-90.00	1	Solid Round	1 1/4	A572-50	Solid Round		A572-50

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job Avon Mountain (CT03XC053)	Page 6 of 29
	Project 22984	Date 16:37:35 03/08/13
	Client Sprint	Designed by JHZ

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T3 110.00-90.00	Flange	0.7500	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T4 90.00-80.00	Flange	0.7500	0	1.2500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T5 80.00-60.00	Flange	0.7500	0	1.2500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T6 60.00-40.00	Flange	0.7500	0	1.2500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T7 40.00-20.00	Flange	0.7500	0	1.2500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T8 20.00-0.00	Flange	1.0000	6	1.2500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF5-50A (7/8 FOAM) (8' Whip)	C	No	Ar (CaAa)	150.00 - 0.00	-16.0000	0.4	1	1	1.0900	1.0900		0.33

LCF158-50J (1 5/8 FOAM) (136' T-Mobile)	C	No	Ar (CaAa)	136.00 - 0.00	-12.0000	0.4	6	2	2.0100	2.0100		0.92

LDF5-50A (7/8 FOAM) (121' Omni)	C	No	Ar (CaAa)	121.00 - 0.00	-20.0000	0.4	1	1	1.0900	1.0900		0.33
LDF6-50A (1-1/4 FOAM) (117' Omni)	C	No	Ar (CaAa)	117.00 - 0.00	-20.0000	0.4	1	1	1.5500	1.5500		0.66
LDF5-50A (7/8 FOAM) (108 Dipole)	A	No	Ar (CaAa)	108.00 - 0.00	-18.0000	0.4	1	1	1.0900	1.0900		0.33
LDF6-50A (1-1/4 FOAM) (105' Whip)	C	No	Ar (CaAa)	105.00 - 0.00	-16.0000	0.42	1	1	1.5500	1.5500		0.66
LDF4-50A (1/2 FOAM) (102 Leg Mounted)	C	No	Ar (CaAa)	102.00 - 0.00	-21.0000	0.4	1	1	0.6300	0.6300		0.15
LDF5-50A (7/8 FOAM) (98' Omni)	C	No	Ar (CaAa)	98.00 - 0.00	-21.0000	0.4	1	1	1.0900	1.0900		0.33

1/4 (84' Dish)	C	No	Ar (CaAa)	84.00 - 0.00	-18.0000	0.42	1	1	0.2900	0.2900		0.07

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job Avon Mountain (CT03XC053)	Page 7 of 29
	Project 22984	Date 16:37:35 03/08/13
	Client Sprint	Designed by JHZ

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1/4 (78' Dish)	C	No	Ar (CaAa)	78.00 - 0.00	-18.0000	0.4	1	1	0.2900	0.2900		0.07
LDF4-50A (1/2 FOAM) (74' GPS)	A	No	Ar (CaAa)	74.00 - 0.00	-18.0000	0.42	1	1	0.6300	0.6300		0.15
1/4 (72' Dish)	C	No	Ar (CaAa)	72.00 - 0.00	-19.0000	0.42	1	1	0.2900	0.2900		0.07
1/4 (67' Dish)	C	No	Ar (CaAa)	66.00 - 0.00	-19.0000	0.4	1	1	0.2900	0.2900		0.07
***** ***** ***												
1-OC-114 Power/Fiber	A	No	Ar (CaAa)	147.00 - 0.00	-12.0000	0.4	3	2	1.5400	1.5400		1.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	C _s A _s ft ² /ft	Weight plf
1/4 (12' GPS)	C	No	CaAa (In Face)	12.00 - 0.00	0.0000	-0.3	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.03 0.13 0.23 0.43
									0.07 0.55 1.65 5.67

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _s A _s In Face ft ²	C _s A _s Out Face ft ²	Weight lb
T1	150.00-130.00	A	0.000	0.000	7.854	0.000	51.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	8.779	0.000	39.72
T2	130.00-110.00	A	0.000	0.000	9.240	0.000	60.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	26.462	0.000	125.25
T3	110.00-90.00	A	0.000	0.000	11.202	0.000	65.94
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	33.411	0.000	151.14
T4	90.00-80.00	A	0.000	0.000	5.710	0.000	33.30
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	18.115	0.000	80.08
T5	80.00-60.00	A	0.000	0.000	12.302	0.000	68.70
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	37.622	0.000	163.52
T6	60.00-40.00	A	0.000	0.000	12.680	0.000	69.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	38.318	0.000	165.20
T7	40.00-20.00	A	0.000	0.000	12.680	0.000	69.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	38.318	0.000	165.20
T8	20.00-0.00	A	0.000	0.000	12.680	0.000	69.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	39.014	0.000	166.88

inxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job Avon Mountain (CT03XC053)	Page 8 of 29
	Project 22984	Date 16:37:35 03/08/13
	Client Sprint	Designed by JHZ

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	$C_d A_d$ In Face ft ²	$C_d A_d$ Out Face ft ²	Weight lb
T1	150.00-130.00	A	1.250	0.000	0.000	19.209	0.000	257.54
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	18.875	0.000	306.37
T2	130.00-110.00	A	1.250	0.000	0.000	22.599	0.000	302.99
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	52.947	0.000	916.56
T3	110.00-90.00	A	1.250	0.000	0.000	29.061	0.000	373.26
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	74.146	0.000	1157.38
T4	90.00-80.00	A	1.250	0.000	0.000	14.890	0.000	190.53
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	42.608	0.000	636.22
T5	80.00-60.00	A	1.250	0.000	0.000	34.161	0.000	423.36
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	98.607	0.000	1388.70
T6	60.00-40.00	A	1.250	0.000	0.000	36.039	0.000	441.48
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	105.303	0.000	1446.82
T7	40.00-20.00	A	1.250	0.000	0.000	36.039	0.000	441.48
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	105.303	0.000	1446.82
T8	20.00-0.00	A	1.250	0.000	0.000	36.039	0.000	441.48
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	111.999	0.000	1510.44

Feed Line Center of Pressure

Section	Elevation ft	CP_x in	CP_z in	CP_x Ice in	CP_z Ice in
T1	150.00-130.00	-1.4313	-1.1827	-1.0345	-0.7244
T2	130.00-110.00	-3.0947	-0.2309	-2.2142	-0.2620
T3	110.00-90.00	-3.1635	-0.4319	-2.5338	-0.5402
T4	90.00-80.00	-2.9234	-0.2683	-2.5332	-0.3696
T5	80.00-60.00	-3.7738	-0.0484	-3.5542	-0.1691
T6	60.00-40.00	-4.8500	0.2808	-4.7358	0.2015
T7	40.00-20.00	-5.9414	0.6252	-5.8230	0.5933
T8	20.00-0.00	-6.8420	1.0468	-6.3132	1.2980

Discrete Tower Loads

inxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job	Avon Mountain (CT03XC053)	Page	9 of 29
	Project	22984	Date	16:37:35 03/08/13
	Client	Sprint	Designed by	JHZ

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment	Placement ft	CA _A Front	CA _A Side	Weight lb	
8' Whip	B	From Leg	0.00 0.00 4.00	0.0000	149.00	No Ice 1.36 1/2" Ice 2.26 1" Ice 3.20 2" Ice 4.57	1.36 2.26 3.20 4.57	43.65 56.01 74.83 131.26	
Lightning Rod 5/8x4'	C	From Leg	0.00 0.00 2.00	0.0000	149.00	No Ice 0.25 1/2" Ice 0.66 1" Ice 0.97 2" Ice 1.49	0.25 0.66 0.97 1.49	31.00 33.82 39.29 58.83	

4' Standoff (Sprint)	A	From Leg	2.00 0.00 0.00	0.0000	147.00	No Ice 2.72 1/2" Ice 4.91 1" Ice 7.10 2" Ice 11.48	2.72 4.91 7.10 11.48	50.00 89.00 128.00 206.00	
12' T-Arm (Sprint)	C	From Leg	0.00 0.00 0.00	0.0000	147.00	No Ice 8.00 1/2" Ice 10.67 1" Ice 13.34 2" Ice 18.68	8.00 10.67 13.34 18.68	250.00 400.00 550.00 850.00	

*									
Andrew 12'-6" Universal Sector Frame (T-Mobile)	A	From Face	1.00 0.00 0.00	0.0000	136.00	No Ice 10.80 1/2" Ice 15.10 1" Ice 19.40 2" Ice 28.00	10.80 15.10 19.40 28.00	525.00 675.00 825.00 1125.00	
(3) APXV18-206516S-C	A	From Face	1.50 0.00 0.00	0.0000	136.00	No Ice 5.93 1/2" Ice 6.39 1" Ice 6.85 2" Ice 7.81	4.61 4.99 5.43 6.36	18.70 58.72 103.97 210.96	

15' Omni	C	From Leg	4.00 0.00 4.00	0.0000	121.00	No Ice 3.75 1/2" Ice 5.28 1" Ice 6.83 2" Ice 9.97	3.75 5.28 6.83 9.97	40.00 67.80 105.17 209.24	
6' Standoff	C	From Leg	2.00 0.00 0.00	0.0000	121.00	No Ice 4.97 1/2" Ice 6.12 1" Ice 7.27 2" Ice 9.57	4.97 6.12 7.27 9.57	70.00 130.00 190.00 310.00	
20' Omni	A	From Leg	4.00 0.00 10.00	0.0000	117.00	No Ice 5.00 1/2" Ice 7.03 1" Ice 9.07 2" Ice 13.22	5.00 7.03 9.07 13.22	55.00 91.96 141.55 279.21	
6' Standoff	A	From Leg	2.00 0.00 0.00	0.0000	117.00	No Ice 4.97 1/2" Ice 6.12 1" Ice 7.27 2" Ice 9.57	4.97 6.12 7.27 9.57	70.00 130.00 190.00 310.00	
10' Dipole	A	From Leg	4.00 0.00 4.00	0.0000	108.00	No Ice 3.00 1/2" Ice 4.00 1" Ice 5.00 2" Ice 6.25	3.00 4.00 5.00 6.25	30.00 55.00 85.00 100.00	
6' Standoff	A	From Leg	2.00 0.00 0.00	0.0000	108.00	No Ice 4.97 1/2" Ice 6.12 1" Ice 7.27 2" Ice 9.57	4.97 6.12 7.27 9.57	70.00 130.00 190.00 310.00	
8' Whip	C	From Leg	4.00 0.00 4.00	0.0000	105.00	No Ice 1.36 1/2" Ice 2.26 1" Ice 3.20 2" Ice 4.57	1.36 2.26 3.20 4.57	43.65 56.01 74.83 131.26	

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job	Avon Mountain (CT03XC053)	Page	10 of 29
	Project	22984	Date	16:37:35 03/08/13
	Client	Sprint	Designed by	JHZ

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment	Placement ft	C _A A ₁ Front ft ²	C _A A ₁ Side ft ²	Weight lb	
4' Standoff	C	From Leg	2.00	0.0000	105.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00			1" Ice	7.10	7.10	128.00
						2" Ice	11.48	11.48	206.00
8' Omni	C	From Leg	0.50	0.0000	102.00	No Ice	2.20	2.20	30.00
			0.00			1/2" Ice	3.03	3.03	46.24
			0.00			1" Ice	3.57	3.57	67.80
						2" Ice	4.56	4.56	127.49
12' Omni	C	From Leg	4.00	0.0000	98.00	No Ice	3.00	3.00	35.00
			0.00			1/2" Ice	4.23	4.23	57.30
			5.00			1" Ice	5.47	5.47	87.34
						2" Ice	7.69	7.69	171.25
6' Standoff	C	From Leg	2.00	0.0000	98.00	No Ice	4.97	4.97	70.00
			0.00			1/2" Ice	6.12	6.12	130.00
			0.00			1" Ice	7.27	7.27	190.00
						2" Ice	9.57	9.57	310.00

3' Standoff	C	From Leg	2.00	0.0000	84.00	No Ice	2.00	2.00	38.00
			0.00			1/2" Ice	3.70	3.70	67.00
			0.00			1" Ice	5.40	5.40	96.00
						2" Ice	8.80	8.80	154.00
3' Standoff	C	From Leg	2.00	0.0000	78.00	No Ice	2.00	2.00	38.00
			0.00			1/2" Ice	3.70	3.70	67.00
			0.00			1" Ice	5.40	5.40	96.00
						2" Ice	8.80	8.80	154.00

GPS	A	From Leg	0.50	0.0000	74.00	No Ice	1.00	1.00	10.00
			0.00			1/2" Ice	1.50	1.50	15.00
			0.00			1" Ice	2.00	2.00	20.00
						2" Ice	3.00	3.00	30.00

3' Standoff	C	From Leg	2.00	0.0000	72.00	No Ice	2.00	2.00	38.00
			0.00			1/2" Ice	3.70	3.70	67.00
			0.00			1" Ice	5.40	5.40	96.00
						2" Ice	8.80	8.80	154.00

GPS	C	From Leg	0.50	0.0000	67.00	No Ice	1.00	1.00	10.00
			0.00			1/2" Ice	1.50	1.50	15.00
			0.00			1" Ice	2.00	2.00	20.00
						2" Ice	3.00	3.00	30.00

*									
GPS	B	From Leg	0.50	0.0000	12.00	No Ice	1.00	1.00	10.00
			0.00			1/2" Ice	1.50	1.50	15.00
			0.00			1" Ice	2.00	2.00	20.00
						2" Ice	3.00	3.00	30.00

*									
APXVSP18-C w/Mount Pipe (Sprint)	A	From Leg	4.00	0.0000	147.00	No Ice	8.50	6.95	82.55
			0.00			1/2" Ice	9.15	8.13	147.74
			0.00			1" Ice	9.77	9.02	224.90
						2" Ice	11.03	10.84	405.88
APXVSP18-C w/Mount Pipe	B	From Leg	4.00	0.0000	147.00	No Ice	8.50	6.95	82.55
			4.00			1/2" Ice	9.15	8.13	147.74

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job	Avon Mountain (CT03XC053)	Page	11 of 29
	Project	22984	Date	16:37:35 03/08/13
	Client	Sprint	Designed by	JHZ

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A ₁ Front	C _A A ₁ Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	lb
(Sprint)			0.00						
APXVSP18-C w/Mount Pipe (Sprint)	C	From Leg	4.00		0.0000	147.00	1" Ice 9.77 2" Ice 11.03 No Ice 8.50	9.02 10.84 6.95	224.90 405.88 82.55
1900MHz 4x40W RRH	A	From Leg	4.00 0.00 0.00		0.0000	147.00	1/2" Ice 9.15 1" Ice 9.77 2" Ice 11.03 No Ice 2.71	8.13 9.02 10.84 2.61	147.74 224.90 405.88 60.00
1900MHz 4x40W RRH	B	From Leg	3.00 0.00 0.00		0.0000	147.00	1/2" Ice 2.95 1" Ice 3.20 2" Ice 3.72 No Ice 2.71	2.84 3.09 3.61 2.61	83.12 109.48 172.67 60.00
1900MHz 4x40W RRH	C	From Leg	4.00 0.00 0.00		0.0000	147.00	1/2" Ice 2.95 1" Ice 3.20 2" Ice 3.72 No Ice 2.71	2.84 3.09 3.61 2.61	83.12 109.48 172.67 60.00
800MHz 2x50W RRH	A	From Leg	3.00 0.00 0.00		0.0000	147.00	1/2" Ice 2.95 1" Ice 3.20 2" Ice 3.72 No Ice 2.40	2.84 3.09 3.61 2.25	86.12 109.48 172.67 64.00
800MHz 2x50W RRH	B	From Leg	4.00 0.00 0.00		0.0000	147.00	1/2" Ice 2.61 1" Ice 2.83 2" Ice 3.30 No Ice 2.40	2.46 2.68 3.13 2.25	86.12 111.30 171.62 64.00
800MHz 2x50W RRH	C	From Leg	3.00 4.00 0.00		0.0000	147.00	1/2" Ice 2.61 1" Ice 2.83 2" Ice 3.30 No Ice 2.40	2.46 2.68 3.13 2.25	86.12 111.30 171.62 64.00
							1/2" Ice 2.61 1" Ice 2.83 2" Ice 3.30	2.46 2.68 3.13	86.12 111.30 171.62

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				Horz	Lateral						
			ft	ft	°	°	ft	ft	ft ²	lb	
3'-6" Dish (84)	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00		0.0000		84.00	3.50	No Ice 12.57 1/2" Ice 13.10 1" Ice 13.62	150.00 217.25 284.49
4' Dish	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00		0.0000		78.00	4.00	2" Ice 14.68 No Ice 12.57 1/2" Ice 13.10	418.99 150.00 217.25
4' Dish	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00		0.0000		72.00	4.00	1" Ice 13.62 2" Ice 14.68 No Ice 12.57 1/2" Ice 13.10	284.49 418.99 150.00 217.25
										1" Ice 13.62 2" Ice 14.68	284.49 418.99

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job	Avon Mountain (CT03XC053)	Page	12 of 29
	Project	22984	Date	16:37:35 03/08/13
	Client	Sprint	Designed by	JHZ

Truss-Leg Properties

Section Designation	Area	Area Ice	Self Weight	Ice Weight	Equiv. Diameter	Equiv. Diameter Ice	Leg Area
	in ²	in ²	lb	lb	in	in	in ²
Pirod 216415	1080.4244	2978.7225	625.26	936.87	7.5029	20.6856	5.3014
Pirod 216413	2292.1448	5870.4117	549.31	1861.38	7.9588	20.3834	5.3014
Pirod 195557	2421.2300	5942.4117	678.42	1891.12	8.4070	20.6334	7.2158
Pirod 195557	2421.2300	5942.4117	678.42	1891.12	8.4070	20.6334	7.2158
Pirod 195557	2421.2300	5942.4117	678.42	1891.12	8.4070	20.6334	7.2158

Discrete Appurtenance Pressures - No Ice $G_H = 1.133$

Description	Aiming Azimuth °	Weight lb	Offset _x ft	Offset _z ft	z ft	K _z	q _z psf	C _{sAc} Front ft ²	C _{sAc} Side ft ²
8' Whip	120.0000	43.65	2.50	1.44	153.00	1.550	25	1.36	1.36
Lightning Rod 5/8x4'	240.0000	31.00	-2.50	1.44	151.00	1.544	25	0.25	0.25
4' Standoff	0.0000	50.00	0.00	-4.89	147.00	1.532	25	2.72	2.72
12' T-Arm	240.0000	250.00	-2.50	1.44	147.00	1.532	25	8.00	8.00
Andrew 12'-6" Universal Sector Frame	300.0000	525.00	-2.12	-1.22	136.00	1.499	25	10.80	10.80
APXV18-206516S-C	300.0000	56.10	-2.55	-1.47	136.00	1.499	25	17.79	13.82
15' Omni	240.0000	40.00	-5.96	3.44	125.00	1.463	24	3.75	3.75
6' Standoff	240.0000	70.00	-4.23	2.44	121.00	1.450	24	4.97	4.97
20' Omni	0.0000	55.00	0.00	-6.89	127.00	1.470	24	5.00	5.00
6' Standoff	0.0000	70.00	0.00	-4.89	117.00	1.436	24	4.97	4.97
10' Dipole	0.0000	30.00	0.00	-6.89	112.00	1.418	23	3.00	3.00
6' Standoff	0.0000	70.00	0.00	-4.89	108.00	1.403	23	4.97	4.97
8' Whip	240.0000	43.65	-5.96	3.44	109.00	1.407	23	1.36	1.36
4' Standoff	240.0000	50.00	-4.23	2.44	105.00	1.392	23	2.72	2.72
8' Omni	240.0000	30.00	-2.93	1.69	102.00	1.380	23	2.20	2.20
12' Omni	240.0000	35.00	-5.96	3.44	103.00	1.384	23	3.00	3.00
6' Standoff	240.0000	70.00	-4.23	2.44	98.00	1.365	22	4.97	4.97
3' Standoff	240.0000	38.00	-4.53	2.62	84.00	1.306	21	2.00	2.00
3' Standoff	240.0000	38.00	-4.83	2.79	78.00	1.279	21	2.00	2.00
GPS	0.0000	10.00	0.00	-4.31	74.00	1.260	21	1.00	1.00
3' Standoff	240.0000	38.00	-5.13	2.96	72.00	1.250	20	2.00	2.00
GPS	240.0000	10.00	-4.08	2.36	67.00	1.224	20	1.00	1.00
GPS	120.0000	10.00	6.83	3.95	12.00	1.000	16	1.00	1.00
APXVSPP18-C w/Mount Pipe	0.0000	82.55	0.00	-6.89	147.00	1.532	25	8.50	6.95
APXVSPP18-C w/Mount Pipe	120.0000	82.55	3.96	6.91	147.00	1.532	25	8.50	6.95
APXVSPP18-C w/Mount Pipe	240.0000	82.55	-7.96	-0.02	147.00	1.532	25	8.50	6.95
1900MHz 4x40W RRH	0.0000	60.00	0.00	-5.89	147.00	1.532	25	2.71	2.61
1900MHz 4x40W RRH	120.0000	60.00	3.10	6.41	147.00	1.532	25	2.71	2.61
1900MHz 4x40W RRH	240.0000	60.00	-7.10	-0.52	147.00	1.532	25	2.71	2.61
800MHz 2x50W RRH	0.0000	64.00	0.00	-5.89	147.00	1.532	25	2.40	2.25
800MHz 2x50W RRH	120.0000	64.00	3.10	6.41	147.00	1.532	25	2.40	2.25
800MHz 2x50W RRH	240.0000	64.00	-7.10	-0.52	147.00	1.532	25	2.40	2.25
Sum Weight:		2283.05							

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job	Avon Mountain (CT03XC053)	Page	13 of 29
	Project	22984	Date	16:37:35 03/08/13
	Client	Sprint	Designed by	JHZ

Discrete Appurtenance Pressures - With Ice $G_H = 1.133$

Description	Aiming Azimuth °	Weight lb	Offset _x ft	Offset _y ft	z ft	K _z	q _z psf	C _d A _c Front ft ²	C _d A _c Side ft ²	t _z in
8' Whip	120.0000	88.94	2.50	1.44	153.00	1.550	19	3.54	3.54	1.2500
Lightning Rod 5/8x4'	240.0000	44.18	-2.50	1.44	151.00	1.544	19	1.10	1.10	1.2500
4' Standoff	0.0000	147.50	0.00	-4.89	147.00	1.532	19	8.20	8.20	1.2500
12' T-Arm	240.0000	625.00	-2.50	1.44	147.00	1.532	19	14.68	14.68	1.2500
Andrew 12'-6" Universal Sector Frame	300.0000	900.00	-2.12	-1.22	136.00	1.499	18	21.55	21.55	1.2500
APXV18-206516S-C	300.0000	392.15	-2.55	-1.47	136.00	1.499	18	21.28	16.98	1.2500
15' Omni	240.0000	131.19	-5.96	3.44	125.00	1.463	18	7.61	7.61	1.2500
6' Standoff	240.0000	220.00	-4.23	2.44	121.00	1.450	18	7.84	7.84	1.2500
20' Omni	0.0000	175.97	0.00	-6.89	127.00	1.470	18	10.11	10.11	1.2500
6' Standoff	0.0000	220.00	0.00	-4.89	117.00	1.436	18	7.84	7.84	1.2500
10' Dipole	0.0000	88.75	0.00	-6.89	112.00	1.418	17	5.31	5.31	1.2500
6' Standoff	0.0000	220.00	0.00	-4.89	108.00	1.403	17	7.84	7.84	1.2500
8' Whip	240.0000	88.94	-5.96	3.44	109.00	1.407	17	3.54	3.54	1.2500
4' Standoff	240.0000	147.50	-4.23	2.44	105.00	1.392	17	8.20	8.20	1.2500
8' Omni	240.0000	82.72	-2.93	1.69	102.00	1.380	17	3.82	3.82	1.2500
12' Omni	240.0000	108.32	-5.96	3.44	103.00	1.384	17	6.03	6.03	1.2500
6' Standoff	240.0000	220.00	-4.23	2.44	98.00	1.365	17	7.84	7.84	1.2500
3' Standoff	240.0000	110.50	-4.53	2.62	84.00	1.306	16	6.25	6.25	1.2500
3' Standoff	240.0000	110.50	-4.83	2.79	78.00	1.279	16	6.25	6.25	1.2500
GPS	0.0000	22.50	0.00	-4.31	74.00	1.260	15	2.25	2.25	1.2500
3' Standoff	240.0000	110.50	-5.13	2.96	72.00	1.250	15	6.25	6.25	1.2500
GPS	240.0000	22.50	-4.08	2.36	67.00	1.224	15	2.25	2.25	1.2500
GPS	120.0000	22.50	6.83	3.95	12.00	1.000	12	2.25	2.25	1.2500
APXVSP18-C w/Mount Pipe	0.0000	270.14	0.00	-6.89	147.00	1.532	19	10.08	9.48	1.2500
APXVSP18-C w/Mount Pipe	120.0000	270.14	3.96	6.91	147.00	1.532	19	10.08	9.48	1.2500
APXVSP18-C w/Mount Pipe	240.0000	270.14	-7.96	-0.02	147.00	1.532	19	10.08	9.48	1.2500
1900MHz 4x40W RRH	0.0000	125.28	0.00	-5.89	147.00	1.532	19	3.33	3.22	1.2500
1900MHz 4x40W RRH	120.0000	125.28	3.10	6.41	147.00	1.532	19	3.33	3.22	1.2500
1900MHz 4x40W RRH	240.0000	125.28	-7.10	-0.52	147.00	1.532	19	3.33	3.22	1.2500
800MHz 2x50W RRH	0.0000	126.38	0.00	-5.89	147.00	1.532	19	2.95	2.79	1.2500
800MHz 2x50W RRH	120.0000	126.38	3.10	6.41	147.00	1.532	19	2.95	2.79	1.2500
800MHz 2x50W RRH	240.0000	126.38	-7.10	-0.52	147.00	1.532	19	2.95	2.79	1.2500
Sum Weight:		5865.54								

Discrete Appurtenance Pressures - Service $G_H = 1.133$

Description	Aiming Azimuth °	Weight lb	Offset _x ft	Offset _y ft	z ft	K _z	q _z psf	C _d A _c Front ft ²	C _d A _c Side ft ²
8' Whip	120.0000	43.65	2.50	1.44	153.00	1.550	14	1.36	1.36
Lightning Rod 5/8x4'	240.0000	31.00	-2.50	1.44	151.00	1.544	14	0.25	0.25
4' Standoff	0.0000	50.00	0.00	-4.89	147.00	1.532	14	2.72	2.72
12' T-Arm	240.0000	250.00	-2.50	1.44	147.00	1.532	14	8.00	8.00
Andrew 12'-6" Universal Sector Frame	300.0000	525.00	-2.12	-1.22	136.00	1.499	14	10.80	10.80
APXV18-206516S-C	300.0000	56.10	-2.55	-1.47	136.00	1.499	14	17.79	13.82
15' Omni	240.0000	40.00	-5.96	3.44	125.00	1.463	13	3.75	3.75
6' Standoff	240.0000	70.00	-4.23	2.44	121.00	1.450	13	4.97	4.97
20' Omni	0.0000	55.00	0.00	-6.89	127.00	1.470	14	5.00	5.00

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job	Avon Mountain (CT03XC053)	Page	14 of 29
	Project	22984	Date	16:37:35 03/08/13
	Client	Sprint	Designed by	JHZ

Description	Aiming Azimuth °	Weight lb	Offset _x ft	Offset _y ft	z ft	K _z	q _z psf	C _A A _c Front ft ²	C _A A _c Side ft ²
6' Standoff	0.0000	70.00	0.00	-4.89	117.00	1.436	13	4.97	4.97
10' Dipole	0.0000	30.00	0.00	-6.89	112.00	1.418	13	3.00	3.00
6' Standoff	0.0000	70.00	0.00	-4.89	108.00	1.403	13	4.97	4.97
8' Whip	240.0000	43.65	-5.96	3.44	109.00	1.407	13	1.36	1.36
4' Standoff	240.0000	50.00	-4.23	2.44	105.00	1.392	13	2.72	2.72
8' Omni	240.0000	30.00	-2.93	1.69	102.00	1.380	13	2.20	2.20
12' Omni	240.0000	35.00	-5.96	3.44	103.00	1.384	13	3.00	3.00
6' Standoff	240.0000	70.00	-4.23	2.44	98.00	1.365	13	4.97	4.97
3' Standoff	240.0000	38.00	-4.53	2.62	84.00	1.306	12	2.00	2.00
3' Standoff	240.0000	38.00	-4.83	2.79	78.00	1.279	12	2.00	2.00
GPS	0.0000	10.00	0.00	-4.31	74.00	1.260	12	1.00	1.00
3' Standoff	240.0000	38.00	-5.13	2.96	72.00	1.250	12	2.00	2.00
GPS	240.0000	10.00	-4.08	2.36	67.00	1.224	11	1.00	1.00
GPS	120.0000	10.00	6.83	3.95	12.00	1.000	9	1.00	1.00
APXVSPP18-C w/Mount Pipe	0.0000	82.55	0.00	-6.89	147.00	1.532	14	8.50	6.95
APXVSPP18-C w/Mount Pipe	120.0000	82.55	3.96	6.91	147.00	1.532	14	8.50	6.95
APXVSPP18-C w/Mount Pipe	240.0000	82.55	-7.96	-0.02	147.00	1.532	14	8.50	6.95
1900MHz 4x40W RRH	0.0000	60.00	0.00	-5.89	147.00	1.532	14	2.71	2.61
1900MHz 4x40W RRH	120.0000	60.00	3.10	6.41	147.00	1.532	14	2.71	2.61
1900MHz 4x40W RRH	240.0000	60.00	-7.10	-0.52	147.00	1.532	14	2.71	2.61
800MHz 2x50W RRH	0.0000	64.00	0.00	-5.89	147.00	1.532	14	2.40	2.25
800MHz 2x50W RRH	120.0000	64.00	3.10	6.41	147.00	1.532	14	2.40	2.25
800MHz 2x50W RRH	240.0000	64.00	-7.10	-0.52	147.00	1.532	14	2.40	2.25
Sum Weight:		2283.05							

Dish Pressures - No Ice

Elevation ft	Dish Description	Aiming Azimuth °	Weight lb	Offset _x ft	Offset _y ft	K _z	A _d ft ²	q _z psf
84.00	3'-6" Dish	240.0000	150.00	-5.40	3.12	1.306	12.57	21
78.00	4' Dish	240.0000	150.00	-5.70	3.29	1.279	12.57	21
72.00	4' Dish	240.0000	150.00	-6.00	3.46	1.250	12.57	20
	Sum Weight:		450.00					

Dish Pressures - With Ice

Elevation ft	Dish Description	Aiming Azimuth °	Weight lb	Offset _x ft	Offset _y ft	K _z	A _d ft ²	q _z psf	t _z in
84.00	3'-6" Dish	240.0000	318.12	-5.40	3.12	1.306	13.89	16	1.2500
78.00	4' Dish	240.0000	318.12	-5.70	3.29	1.279	13.89	16	1.2500
72.00	4' Dish	240.0000	318.12	-6.00	3.46	1.250	13.89	15	1.2500
	Sum Weight:		954.35						

Dish Pressures - Service

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job	Avon Mountain (CT03XC053)	Page	15 of 29
	Project	22984	Date	16:37:35 03/08/13
	Client	Sprint	Designed by	JHZ

Elevation ft	Dish Description	Aiming Azimuth °	Weight lb	Offset _x ft	Offset _y ft	K _z	A ₁ ft ²	q _z psf
84.00	3'-6" Dish	240.0000	150.00	-5.40	3.12	1.306	12.57	12
78.00	4' Dish	240.0000	150.00	-5.70	3.29	1.279	12.57	12
72.00	4' Dish	240.0000	150.00	-6.00	3.46	1.250	12.57	12
	Sum Weight:		450.00					

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 _y lb-ft	Sum of Torques lb-ft
Leg Weight	10650.41					
Bracing Weight	6885.15					
Total Member Self-Weight	17535.55			772.87	10587.03	
Gusset Weight	209.05					
Total Weight	22022.38			772.87	10587.03	
Wind 0 deg - No Ice		1121.36	-20641.50	-1579242.32	-74207.47	-14252.09
Wind 30 deg - No Ice		10825.18	-17310.01	-1336527.06	-826413.36	-11591.38
Wind 60 deg - No Ice		17750.89	-10193.24	-788081.91	-1368761.71	-7696.78
Wind 90 deg - No Ice		20486.36	-672.04	-48934.68	-1577317.75	-1790.75
Wind 120 deg - No Ice		18532.42	9349.62	717346.27	-1413155.69	6437.73
Wind 150 deg - No Ice		9833.88	16958.07	1313360.82	-753802.95	12929.85
Wind 180 deg - No Ice		-101.87	19640.23	1525008.00	15771.17	16029.85
Wind 210 deg - No Ice		-10030.93	17287.40	1336306.84	785565.69	14590.29
Wind 240 deg - No Ice		-17916.05	10288.60	785870.29	1383427.84	7814.35
Wind 270 deg - No Ice		-20069.65	-4.50	-2349.01	1565951.59	-1208.16
Wind 300 deg - No Ice		-17155.55	-9731.90	-756855.11	1346217.63	-8333.06
Wind 330 deg - No Ice		-9852.04	-16947.58	-1310996.16	776395.44	-12929.85
Member Ice	34409.84					
Gusset Ice	140.69					
Total Weight Ice	70796.45			3335.80	45653.49	
Wind 0 deg - Ice		929.75	-32029.68	-2411574.82	-24697.01	-19474.68
Wind 30 deg - Ice		16492.32	-27372.75	-2066924.28	-1203386.98	-16356.92
Wind 60 deg - Ice		27771.52	-15989.00	-1206751.39	-2060855.74	-10358.68
Wind 90 deg - Ice		32019.01	-557.50	-37946.57	-2380924.30	-1612.49
Wind 120 deg - Ice		28281.16	15209.65	1149865.79	-2091472.45	9052.12
Wind 150 deg - Ice		15669.77	27080.44	2053021.34	-1143056.08	17336.86
Wind 180 deg - Ice		-85.14	31358.46	2379032.68	50050.00	21023.39
Wind 210 deg - Ice		-15834.31	27354.02	2072132.85	1243311.45	18841.40
Wind 240 deg - Ice		-27771.27	15988.85	1206811.27	2140710.89	10422.56
Wind 270 deg - Ice		-31673.78	-2.98	851.12	2445273.00	-871.98
Wind 300 deg - Ice		-27277.57	-15605.50	-1180705.15	2115842.34	-10664.71
Wind 330 deg - Ice		-15684.81	-27071.75	-2045671.29	1235538.18	-17336.86
Total Weight	22022.38			772.87	10587.03	
Wind 0 deg - Service		630.77	-11610.84	-887785.80	-40336.21	-8016.80
Wind 30 deg - Service		6089.16	-9736.88	-751258.46	-463452.02	-6520.15
Wind 60 deg - Service		9984.88	-5733.70	-442758.07	-768522.97	-4329.44
Wind 90 deg - Service		11523.58	-378.02	-26987.75	-885835.75	-1007.30
Wind 120 deg - Service		10424.49	5259.16	404045.28	-793494.59	3621.22
Wind 150 deg - Service		5531.56	9538.92	739303.47	-422608.67	7273.04
Wind 180 deg - Service		-57.30	11047.63	858355.01	10276.77	9016.79
Wind 210 deg - Service		-5642.40	9724.16	752210.60	443286.19	8207.04
Wind 240 deg - Service		-10077.78	5787.33	442590.04	779583.65	4395.57
Wind 270 deg - Service		-11289.18	-2.53	-783.31	882253.26	-679.59
Wind 300 deg - Service		-9650.00	-5474.19	-425192.99	758652.91	-4687.35
Wind 330 deg - Service		-5541.77	-9533.02	-736897.33	438127.93	-7273.04

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job Avon Mountain (CT03XC053)	Page 16 of 29
	Project 22984	Date 16:37:35 03/08/13
	Client Sprint	Designed by JHZ

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
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
T1	150 - 130	Leg	Max Tension	25	12206.75	-1124.21	-568.20
			Max. Compression	23	-16334.24	66.39	-60.40
			Max. Mx	17	-9098.83	1273.28	-601.91
			Max. My	21	-9935.78	157.08	1468.42
			Max. Vy	17	1720.23	-85.18	43.27
		Diagonal	Max. Vx	21	1985.63	-7.04	-99.77
			Max Tension	22	3311.16	0.00	0.00
			Max. Compression	22	-3292.61	0.00	0.00

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job	Avon Mountain (CT03XC053)	Page	17 of 29
	Project	22984	Date	16:37:35 03/08/13
	Client	Sprint	Designed by	JHZ

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft	
T2	130 - 110	Top Girt	Max. Mx	23	894.05	-6.14	-0.10	
			Max. My	16	-3241.42	-4.25	-2.28	
			Max. Vy	23	-8.92	-6.14	-0.10	
			Max. Vx	16	0.88	-4.25	-2.28	
			Max Tension	12	99.08	0.00	0.00	
			Max. Compression	19	-133.81	0.00	0.00	
		Bottom Girt	Max. Mx	19	-133.81	19.09	0.00	
			Max. My	22	-24.48	0.00	0.00	
			Max. Vy	19	15.27	0.00	0.00	
			Max. Vx	22	-0.00	0.00	0.00	
			Max Tension	25	1434.84	0.00	0.00	
			Max. Compression	19	-1406.12	0.00	0.00	
		Mid Girt	Max. Mx	19	-1406.12	19.09	0.00	
			Max. My	22	152.68	0.00	0.00	
			Max. Vy	19	15.27	0.00	0.00	
			Max. Vx	22	0.00	0.00	0.00	
			Max Tension	19	81.93	0.00	0.00	
			Max. Compression	17	-51.41	0.00	0.00	
		Leg	Max. Mx	19	81.93	19.09	0.00	
			Max. My	22	19.82	0.00	0.00	
			Max. Vy	19	15.27	0.00	0.00	
			Max. Vx	22	0.00	0.00	0.00	
			Max Tension	25	42418.89	-757.86	-396.35	
			Max. Compression	23	-48926.07	-648.78	604.07	
			Max. Mx	17	-10258.99	-1702.41	811.54	
			Max. My	21	-9977.59	-202.16	-1966.60	
			Max. Vy	17	2841.33	835.88	-410.69	
			Max. Vx	15	-3266.19	-42.25	-961.42	
			Max Tension	22	4867.41	0.00	0.00	
			Max. Compression	22	-4816.46	0.00	0.00	
			Max. Mx	24	2554.82	-6.56	-0.33	
			Max. My	16	-4768.05	-3.66	-3.27	
			Max. Vy	24	-9.01	-6.56	-0.33	
			Max. Vx	16	1.20	-3.66	-3.27	
			Top Girt	Max Tension	19	1429.80	0.00	0.00
				Max. Compression	25	-1396.76	0.00	0.00
Max. Mx	19	1429.80		19.09	0.00			
Max. My	22	-122.05		0.00	0.00			
Max. Vy	19	15.27		0.00	0.00			
Max. Vx	22	0.00		0.00	0.00			
Bottom Girt	Max Tension	25	1821.43	0.00	0.00			
	Max. Compression	23	-1848.41	0.00	0.00			
	Max. Mx	19	-1844.69	19.09	0.00			
	Max. My	22	278.67	0.00	0.00			
	Max. Vy	19	15.27	0.00	0.00			
	Max. Vx	22	-0.00	0.00	0.00			
Mid Girt	Max Tension	25	178.55	0.00	0.00			
	Max. Compression	23	-141.02	0.00	0.00			
	Max. Mx	19	-116.76	19.09	0.00			
	Max. My	22	33.40	0.00	0.00			
	Max. Vy	19	15.27	0.00	0.00			
	Max. Vx	22	0.00	0.00	0.00			
Leg	Max Tension	25	87325.08	2630.70	1322.30			
	Max. Compression	23	-97218.29	2456.70	-2009.55			
	Max. Mx	19	-91682.47	-2821.43	-1429.15			
	Max. My	15	-95237.64	-684.79	3134.87			
	Max. Vy	19	4492.96	-2821.43	-1429.15			
	Max. Vx	15	-4968.88	-684.79	3134.87			
	Max Tension	22	6188.92	0.00	0.00			
	Max. Compression	16	-6254.70	0.00	0.00			
	Max. Mx	23	5047.83	-9.39	-0.11			
	Diagonal	Max. Mx	23	5047.83	-9.39	-0.11		
		Max. My	23	5047.83	-9.39	-0.11		
		Max. Vy	23	5047.83	-9.39	-0.11		
Max. Vx		23	5047.83	-9.39	-0.11			
Max Tension		23	5047.83	-9.39	-0.11			
Max. Compression		23	5047.83	-9.39	-0.11			

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job	Avon Mountain (CT03XC053)	Page	20 of 29
	Project	22984	Date	16:37:35 03/08/13
	Client	Sprint	Designed by	JHZ

Load Combination	Vertical lb	Shear _x lb	Shear _y lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _y lb-ft	Torque lb-ft
Dead+Wind 60 deg - No Ice	22022.37	17750.12	-10192.80	-791159.57	-1373997.48	-7740.67
Dead+Wind 90 deg - No Ice	22022.37	20485.56	-671.95	-49079.22	-1583384.60	-1795.38
Dead+Wind 120 deg - No Ice	22022.37	18531.18	9348.96	720168.23	-1418456.72	6476.74
Dead+Wind 150 deg - No Ice	22022.37	9833.55	16957.35	1318522.27	-756692.94	13004.72
Dead+Wind 180 deg - No Ice	22022.37	-101.86	19639.36	1530968.50	15900.80	16113.16
Dead+Wind 210 deg - No Ice	22022.37	-10030.59	17286.66	1341484.43	788692.19	14661.18
Dead+Wind 240 deg - No Ice	22022.36	-17914.81	10287.89	788837.09	1388737.50	7858.14
Dead+Wind 270 deg - No Ice	22022.37	-20068.83	-4.42	-2362.70	1572071.34	-1204.35
Dead+Wind 300 deg - No Ice	22022.37	-17154.78	-9731.46	-759810.27	1351510.43	-8373.17
Dead+Wind 330 deg - No Ice	22022.37	-9851.57	-16946.93	-1316122.50	779496.52	-13003.85
Dead+Ice+Temp	70796.45	0.35	0.02	3313.92	46282.34	0.73
Dead+Wind 0 deg+Ice+Temp	70796.43	929.77	-32028.10	-2437095.44	-24479.13	-19912.96
Dead+Wind 30 deg+Ice+Temp	70796.43	16491.42	-27371.36	-2088926.78	-1215706.62	-16721.93
Dead+Wind 60 deg+Ice+Temp	70796.43	27770.03	-15988.11	-1219624.25	-2082336.14	-10589.89
Dead+Wind 90 deg+Ice+Temp	70796.43	32017.38	-557.38	-38335.02	-2405801.29	-1645.61
Dead+Wind 120 deg+Ice+Temp	70796.43	28279.83	15208.89	1162133.21	-2113165.92	9255.47
Dead+Wind 150 deg+Ice+Temp	70796.43	15669.07	27078.95	2074831.37	-1154877.22	17724.11
Dead+Wind 180 deg+Ice+Temp	70796.43	-85.10	31356.70	2404264.71	50868.04	21457.28
Dead+Wind 210 deg+Ice+Temp	70796.43	-15833.53	27352.52	2094021.32	1256723.42	19203.39
Dead+Wind 240 deg+Ice+Temp	70796.43	-27769.86	15988.06	1219475.99	2163481.67	10650.59
Dead+Wind 270 deg+Ice+Temp	70796.43	-31672.06	-2.87	805.02	2471311.70	-842.65
Dead+Wind 300 deg+Ice+Temp	70796.43	-27275.98	-15604.61	-1193269.58	2138465.56	-10869.65
Dead+Wind 330 deg+Ice+Temp	70796.43	-15683.84	-27070.35	-2067415.46	1248908.33	-17722.00
Dead+Wind 0 deg - Service	22022.37	630.76	-11610.01	-891386.26	-37154.55	-8065.19
Dead+Wind 30 deg - Service	22022.37	6088.92	-9736.50	-754405.78	-461936.49	-6563.75
Dead+Wind 60 deg - Service	22022.37	9984.47	-5733.46	-444689.54	-768222.09	-4354.01
Dead+Wind 90 deg - Service	22022.37	11523.13	-377.99	-27268.48	-885999.51	-1006.89
Dead+Wind 120 deg - Service	22022.37	10423.77	5258.77	405431.80	-793226.80	3644.09
Dead+Wind 150 deg - Service	22022.37	5531.36	9538.52	742010.77	-420987.32	7312.29
Dead+Wind 180 deg - Service	22022.37	-57.29	11047.16	861518.68	13596.80	9063.61
Dead+Wind 210 deg - Service	22022.37	-5642.18	9723.76	754937.83	448298.59	8249.87
Dead+Wind 240 deg - Service	22022.37	-10077.04	5786.92	444068.77	785833.23	4419.95
Dead+Wind 270 deg - Service	22022.37	-11288.71	-2.50	-992.72	888965.75	-680.31
Dead+Wind 300 deg - Service	22022.37	-9649.57	-5473.95	-427066.55	764896.78	-4709.92
Dead+Wind 330 deg - Service	22022.37	-5541.52	-9532.64	-739994.54	443129.60	-7312.03

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-22022.38	0.00	-0.17	22022.38	-0.01	0.001%
2	1121.36	-22022.38	-20641.50	-1121.32	22022.36	20640.08	0.005%
3	10825.18	-22022.38	-17310.01	-10824.70	22022.37	17309.36	0.003%
4	17750.89	-22022.38	-10193.24	-17750.12	22022.37	10192.80	0.003%
5	20486.36	-22022.38	-672.04	-20485.56	22022.37	671.95	0.003%
6	18532.42	-22022.38	9349.62	-18531.18	22022.37	-9348.96	0.005%
7	9833.88	-22022.38	16958.07	-9833.55	22022.37	-16957.35	0.003%
8	-101.87	-22022.38	19640.23	101.86	22022.37	-19639.36	0.003%
9	-10030.93	-22022.38	17287.40	10030.59	22022.37	-17286.66	0.003%
10	-17916.05	-22022.38	10288.60	17914.81	22022.36	-10287.89	0.005%
11	-20069.65	-22022.38	-4.50	20068.83	22022.37	4.42	0.003%
12	-17155.55	-22022.38	-9731.90	17154.78	22022.37	9731.46	0.003%
13	-9852.04	-22022.38	-16947.58	9851.57	22022.37	16946.93	0.003%
14	0.00	-70796.45	0.00	-0.35	70796.45	-0.02	0.001%
15	929.75	-70796.45	-32029.68	-929.77	70796.43	32028.10	0.002%
16	16492.32	-70796.45	-27372.75	-16491.42	70796.43	27371.36	0.002%
17	27771.52	-70796.45	-15989.00	-27770.03	70796.43	15988.11	0.002%

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job	Avon Mountain (CT03XC053)	Page	21 of 29
	Project	22984	Date	16:37:35 03/08/13
	Client	Sprint	Designed by	JHZ

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
18	32019.01	-70796.45	-557.50	-32017.38	70796.43	557.38	0.002%
19	28281.16	-70796.45	15209.65	-28279.83	70796.43	-15208.89	0.002%
20	15669.77	-70796.45	27080.44	-15669.07	70796.43	-27078.95	0.002%
21	-85.14	-70796.45	31358.46	85.10	70796.43	-31356.70	0.002%
22	-15834.31	-70796.45	27354.02	15833.53	70796.43	-27352.52	0.002%
23	-27771.27	-70796.45	15988.85	27769.86	70796.43	-15988.06	0.002%
24	-31673.78	-70796.45	-2.98	31672.06	70796.43	2.87	0.002%
25	-27277.57	-70796.45	-15605.50	27275.98	70796.43	15604.61	0.002%
26	-15684.81	-70796.45	-27071.75	15683.84	70796.43	27070.35	0.002%
27	630.77	-22022.38	-11610.84	-630.76	22022.37	11610.01	0.003%
28	6089.16	-22022.38	-9736.88	-6088.92	22022.37	9736.50	0.002%
29	9984.87	-22022.38	-5733.70	-9984.47	22022.37	5733.46	0.002%
30	11523.58	-22022.38	-378.02	-11523.13	22022.37	377.99	0.002%
31	10424.49	-22022.38	5259.16	-10423.77	22022.37	-5258.77	0.003%
32	5531.56	-22022.38	9538.92	-5531.36	22022.37	-9538.52	0.002%
33	-57.30	-22022.38	11047.63	57.29	22022.37	-11047.16	0.002%
34	-5642.40	-22022.38	9724.16	5642.18	22022.37	-9723.76	0.002%
35	-10077.78	-22022.38	5787.33	10077.04	22022.37	-5786.92	0.003%
36	-11289.18	-22022.38	-2.53	11288.71	22022.37	2.50	0.002%
37	-9650.00	-22022.38	-5474.19	9649.57	22022.37	5473.95	0.002%
38	-5541.77	-22022.38	-9533.02	5541.52	22022.37	9532.64	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	9	0.00000001	0.00014168
2	Yes	13	0.00000001	0.00013922
3	Yes	14	0.00000001	0.00008510
4	Yes	14	0.00000001	0.00009244
5	Yes	14	0.00000001	0.00008461
6	Yes	13	0.00000001	0.00013807
7	Yes	14	0.00000001	0.00008500
8	Yes	14	0.00000001	0.00009302
9	Yes	14	0.00000001	0.00008483
10	Yes	13	0.00000001	0.00013848
11	Yes	14	0.00000001	0.00008448
12	Yes	14	0.00000001	0.00009245
13	Yes	14	0.00000001	0.00008515
14	Yes	12	0.00000001	0.00014668
15	Yes	15	0.00005775	0.00011184
16	Yes	15	0.00006177	0.00011942
17	Yes	15	0.00006554	0.00012658
18	Yes	15	0.00006151	0.00011911
19	Yes	15	0.00005720	0.00011108
20	Yes	15	0.00006199	0.00012005
21	Yes	15	0.00006593	0.00012737
22	Yes	15	0.00006173	0.00011942
23	Yes	15	0.00005744	0.00011137
24	Yes	15	0.00006162	0.00011913
25	Yes	15	0.00006562	0.00012660
26	Yes	15	0.00006213	0.00012003
27	Yes	13	0.00000001	0.00014500
28	Yes	14	0.00000001	0.00008409
29	Yes	14	0.00000001	0.00008827
30	Yes	14	0.00000001	0.00008372

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Phone: (608) 643-4100
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Job	Avon Mountain (CT03XC053)	Page	22 of 29
Project	22984	Date	16:37:35 03/08/13
Client	Sprint	Designed by	JHZ

31	Yes	13	0.00000001	0.00014400
32	Yes	14	0.00000001	0.00008437
33	Yes	14	0.00000001	0.00008895
34	Yes	14	0.00000001	0.00008408
35	Yes	13	0.00000001	0.00014446
36	Yes	14	0.00000001	0.00008377
37	Yes	14	0.00000001	0.00008838
38	Yes	14	0.00000001	0.00008440

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 130	7.370	36	0.4276	0.2593
T2	130 - 110	5.536	35	0.4143	0.2093
T3	110 - 90	3.810	35	0.3650	0.1333
T4	90 - 80	2.375	35	0.2748	0.0660
T5	80 - 60	1.832	35	0.2339	0.0486
T6	60 - 40	1.007	35	0.1562	0.0264
T7	40 - 20	0.453	35	0.1021	0.0140
T8	20 - 0	0.119	35	0.0501	0.0060

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	8' Whip	36	7.278	0.4273	0.2571	260632
147.00	4' Standoff	36	7.093	0.4266	0.2527	260632
136.00	Andrew 12'-6" Universal Sector Frame	36	6.081	0.4206	0.2265	93083
121.00	15' Omni	35	4.738	0.3982	0.1776	28215
117.00	20' Omni	35	4.393	0.3880	0.1619	22477
108.00	10' Dipole	35	3.649	0.3571	0.1251	15124
105.00	8' Whip	35	3.414	0.3444	0.1134	13414
102.00	8' Omni	35	3.187	0.3308	0.1022	12036
98.00	12' Omni	35	2.898	0.3120	0.0885	10586
84.00	3'-6" Dish	35	2.036	0.2499	0.0545	11118
78.00	4' Dish	35	1.736	0.2258	0.0458	14112
74.00	GPS	35	1.552	0.2094	0.0407	14901
72.00	4' Dish	35	1.465	0.2013	0.0383	15248
67.00	GPS	35	1.262	0.1815	0.0328	16128
12.00	GPS	35	0.054	0.0298	0.0034	29173

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 130	19.912	24	1.1402	0.5616

tnxTower

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Job	Avon Mountain (CT03XC053)	Page	23 of 29
Project	22984	Date	16:37:35 03/08/13
Client	Sprint	Designed by	JHZ

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T2	130 - 110	15.030	24	1.1078	0.4612
T3	110 - 90	10.379	24	0.9837	0.3008
T4	90 - 80	6.482	23	0.7481	0.1502
T5	80 - 60	5.009	23	0.6376	0.1104
T6	60 - 40	2.761	23	0.4267	0.0609
T7	40 - 20	1.245	23	0.2799	0.0328
T8	20 - 0	0.328	23	0.1377	0.0141

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	8' Whip	24	19.667	1.1394	0.5573	112774
147.00	4' Standoff	24	19.176	1.1377	0.5487	112774
136.00	Andrew 12'-6" Universal Sector Frame	24	16.484	1.1233	0.4965	40276
121.00	15' Omni	24	12.883	1.0680	0.3954	11567
117.00	20' Omni	24	11.954	1.0424	0.3622	9144
108.00	10' Dipole	24	9.945	0.9634	0.2828	6024
105.00	8' Whip	24	9.308	0.9303	0.2562	5270
102.00	8' Omni	24	8.691	0.8950	0.2318	4675
98.00	12' Omni	24	7.905	0.8459	0.2011	4062
84.00	3'-6" Dish	23	5.563	0.6810	0.1240	4168
78.00	4' Dish	23	4.746	0.6156	0.1042	5250
74.00	GPS	23	4.247	0.5712	0.0927	5531
72.00	4' Dish	23	4.011	0.5491	0.0874	5654
67.00	GPS	23	3.455	0.4952	0.0752	5974
12.00	GPS	23	0.148	0.0818	0.0081	10632

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load Allowable	Allowable Ratio	Criteria
T4	90	Diagonal	A325N	1.2500	1	6836.20	13593.80	0.503 ✓	1.333	Member Block Shear
T5	80	Diagonal	A325N	1.2500	1	7206.19	13593.80	0.530 ✓	1.333	Member Block Shear
T6	60	Diagonal	A325N	1.2500	1	6437.42	13593.80	0.474 ✓	1.333	Member Block Shear
T7	40	Diagonal	A325N	1.2500	1	7187.36	13593.80	0.529 ✓	1.333	Member Block Shear
T8	20	Leg	A325N	1.0000	6	28348.30	34557.30	0.820 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.2500	1	9605.08	13593.80	0.707 ✓	1.333	Member Block Shear

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job Avon Mountain (CT03XC053)	Page 24 of 29
	Project 22984	Date 16:37:35 03/08/13
	Client Sprint	Designed by JHZ

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
T1	150 - 130	1 3/4	20.00	1.84	50.5 K=1.00	24.270	2.4053	-16334.20	58376.90	0.280
T2	130 - 110	2	20.00	2.36	56.6 K=1.00	23.285	3.1416	-48926.10	73152.70	0.669 ✓
T3	110 - 90	2 1/4	20.00	2.28	48.6 K=1.00	24.574	3.9761	-97218.30	97708.80	0.995 ✓
T4	90 - 80	Pirod 216415	10.02	10.02	37.5 K=1.00	26.178	5.3014	-97758.80	138780.00	0.704 ✓
T5	80 - 60	Pirod 216413	20.03	10.02	37.5 K=1.00	26.178	5.3014	-131166.00	138780.00	0.945 ✓
T6	60 - 40	Pirod 195557	20.03	10.02	32.1 K=1.00	26.884	7.2158	-162273.00	193990.00	0.837 ✓
T7	40 - 20	Pirod 195557	20.03	10.02	32.1 K=1.00	26.884	7.2158	-192632.00	193990.00	0.993 ✓
T8	20 - 0	Pirod 195557	20.03	10.02	32.1 K=1.00	26.884	7.2158	-221801.00	193990.00	1.143 ✓

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L _d ft	Kl/r	F _a ksi	A in ²	Actual V lb	Allow. V _a lb	Stress Ratio
T4	90 - 80	0.5	1.46	119.3	10.377	0.1963	1068.71	2292.15	0.466 ✓
T5	80 - 60	0.5	1.46	119.3	10.377	0.1963	949.11	2292.15	0.414 ✓
T6	60 - 40	0.5	1.45	118.3	10.520	0.1963	389.30	2323.87	0.168 ✓
T7	40 - 20	0.5	1.45	118.3	10.520	0.1963	687.80	2323.87	0.296 ✓
T8	20 - 0	0.5	1.45	118.3	10.520	0.1963	1164.92	2323.87	0.501 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
T1	150 - 130	7/8	5.33	2.59	141.9 K=1.00	7.418	0.6013	-3292.61	4460.36	0.738 ✓
T2	130 - 110	7/8	5.53	2.67	146.6	6.949	0.6013	-4816.46	4178.78	1.153 ✓

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job Avon Mountain (CT03XC053)	Page 25 of 29
	Project 22984	Date 16:37:35 03/08/13
	Client Sprint	Designed by JHZ

Section No.	Elevation ft	Size	L ft	L _u ft	KL/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
T3	110 - 90	1	5.49	2.64	K=1.00 126.9	9.273	0.7854	-6254.70	7282.70	0.859
T4	90 - 80	L3x3x5/16	11.42	5.19	K=1.00 105.8	12.236	1.7800	-8227.76	21780.90	0.378
T5	80 - 60	L3x3x5/16	12.50	5.84	K=1.00 118.9	10.441	1.7800	-7241.65	18585.00	0.390
T6	60 - 40	L3x3x5/16	13.80	6.54	K=1.00 133.1	8.423	1.7800	-6693.94	14993.50	0.446
T7	40 - 20	L3x3x5/16	14.50	6.93	K=1.00 141.3	7.482	1.7800	-7020.98	13318.10	0.527
T8	20 - 0	L3x3x5/16	16.01	7.70	K=1.00 156.9	6.063	1.7800	-7889.74	10791.80	0.731

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	KL/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
T1	150 - 130	1	5.00	4.85	K=1.00 233.0	2.751	0.7854	-133.81	2160.38	0.062
T2	130 - 110	KL/R > 200 (C) - 6 1	5.00	4.83	K=1.00 232.0	2.774	0.7854	-1396.76	2179.04	0.641
T3	110 - 90	KL/R > 200 (C) - 78 1 1/4	5.00	4.81	K=1.00 184.8	4.373	1.2272	-1787.74	5366.08	0.333

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	KL/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
T1	150 - 130	1	5.00	4.85	K=1.00 233.0	2.751	0.7854	-1406.12	2160.38	0.651
T2	130 - 110	KL/R > 200 (C) - 9 1	5.00	4.83	K=1.00 232.0	2.774	0.7854	-1848.41	2179.04	0.848
T3	110 - 90	KL/R > 200 (C) - 80 1 1/4	5.00	4.81	K=1.00 184.8	4.373	1.2272	-1836.84	5366.08	0.342

Mid Girt Design Data (Compression)

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job Avon Mountain (CT03XC053)	Page 26 of 29
	Project 22984	Date 16:37:35 03/08/13
	Client Sprint	Designed by JHZ

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
T1	150 - 130	1	5.00	4.85	233.0 K=1.00	2.751	0.7854	-51.41	2160.38	0.024 ✓
T2	130 - 110	KL/R > 200 (C) - 11 1	5.00	4.83	232.0 K=1.00	2.774	0.7854	-141.02	2179.04	0.065 ✓
T3	110 - 90	KL/R > 200 (C) - 83 1 1/4	5.00	4.81	184.8 K=1.00	4.373	1.2272	-380.80	5366.08	0.071 ✓

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
T1	150 - 130	1 3/4	20.00	1.84	50.5	30.000	2.4053	12206.70	72158.50	0.169 ✓
T2	130 - 110	2	20.00	2.36	56.6	30.000	3.1416	42418.90	94247.80	0.450 ✓
T3	110 - 90	2 1/4	20.00	2.28	48.6	30.000	3.9761	87325.10	119282.00	0.732 ✓
T4	90 - 80	Pirod 216415	10.02	10.02	37.5	30.000	5.3014	87384.70	159043.00	0.549 ✓
T5	80 - 60	Pirod 216413	20.03	10.02	37.5	30.000	5.3014	111071.00	159043.00	0.698 ✓
T6	60 - 40	Pirod 195557	20.03	10.02	32.1	30.000	7.2158	132679.00	216475.00	0.613 ✓
T7	40 - 20	Pirod 195557	20.03	10.02	32.1	30.000	7.2158	152616.00	216475.00	0.705 ✓
T8	20 - 0	Pirod 195557	20.03	10.02	32.1	30.000	7.2158	170090.00	216475.00	0.786 ✓

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L _d ft	Kl/r	F _a ksi	A in ²	Actual V lb	Allow. V _a lb	Stress Ratio
T4	90 - 80	0.5	1.46	119.3	10.377	0.1963	1068.71	2292.15	0.466 ✓
T5	80 - 60	0.5	1.46	119.3	10.377	0.1963	949.11	2292.15	0.414 ✓
T6	60 - 40	0.5	1.45	118.3	10.520	0.1963	389.30	2323.87	0.168 ✓
T7	40 - 20	0.5	1.45	118.3	10.520	0.1963	687.80	2323.87	0.296 ✓

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job	Avon Mountain (CT03XC053)	Page	27 of 29
	Project	22984	Date	16:37:35 03/08/13
	Client	Sprint	Designed by	JHZ

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in ²	Actual V lb	Allow. V_a lb	Stress Ratio
T8	20 - 0	0.5	1.45	118.3	10.520	0.1963	1164.92	2323.87	0.501

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in ²	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	150 - 130	7/8	5.33	2.59	141.9	30.000	0.6013	3311.16	18039.60	0.184
T2	130 - 110	7/8	5.53	2.67	146.6	30.000	0.6013	4867.41	18039.60	0.270
T3	110 - 90	1	5.49	2.64	126.9	30.000	0.7854	6188.92	23561.90	0.263
T4	90 - 80	L3x3x5/16	11.42	5.19	67.6	29.000	1.0127	6836.20	29369.30	0.233
T5	80 - 60	L3x3x5/16	11.93	5.59	72.8	29.000	1.0127	7206.19	29369.30	0.245
T6	60 - 40	L3x3x5/16	13.13	6.22	81.0	29.000	1.0127	6437.42	29369.30	0.219
T7	40 - 20	L3x3x5/16	15.24	7.29	94.9	29.000	1.0127	7187.36	29369.30	0.245
T8	20 - 0	L3x3x5/16	16.80	8.09	105.3	29.000	1.0127	9605.08	29369.30	0.327

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in ²	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	150 - 130	1	5.00	4.85	233.0	30.000	0.7854	99.08	23561.90	0.004
T2	130 - 110	1	5.00	4.83	232.0	30.000	0.7854	1429.80	23561.90	0.061
T3	110 - 90	1 1/4	5.00	4.81	184.8	30.000	1.2272	1879.93	36815.50	0.051

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in ²	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	150 - 130	1	5.00	4.85	233.0	30.000	0.7854	1434.84	23561.90	0.061
T2	130 - 110	1	5.00	4.83	232.0	30.000	0.7854	1821.43	23561.90	0.077

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job Avon Mountain (CT03XC053)	Page 28 of 29
	Project 22984	Date 16:37:35 03/08/13
	Client Sprint	Designed by JHZ

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
T3	110 - 90	1 1/4	5.00	4.81	184.8	30.000	1.2272	1966.26	36815.50	0.053

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	F _a ksi	A in ²	Actual P lb	Allow. P _a lb	Ratio P/P _a
T1	150 - 130	1	5.00	4.85	233.0	30.000	0.7854	81.93	23561.90	0.003
T2	130 - 110	1	5.00	4.83	232.0	30.000	0.7854	178.55	23561.90	0.008
T3	110 - 90	1 1/4	5.00	4.81	184.8	30.000	1.2272	440.16	36815.50	0.012

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail	
T1	150 - 130	Leg	1 3/4	1	-16334.20	77816.40	21.0	Pass	
		Diagonal	7/8	18	-3292.61	5945.66	55.4	Pass	
		Top Girt	1	6	-133.81	2879.79	4.6	Pass	
		Bottom Girt	1	9	-1406.12	2879.79	48.8	Pass	
T2	130 - 110	Mid Girt	1	11	-51.41	2879.79	1.8	Pass	
		Leg	2	73	-48926.10	97512.55	50.2	Pass	
		Diagonal	7/8	90	-4816.46	5570.31	86.5	Pass	
		Top Girt	1	78	-1396.76	2904.66	48.1	Pass	
T3	110 - 90	Bottom Girt	1	80	-1848.41	2904.66	63.6	Pass	
		Mid Girt	1	83	-141.02	2904.66	4.9	Pass	
		Leg	2 1/4	133	-97218.30	130245.82	74.6	Pass	
		Diagonal	1	149	-6254.70	9707.84	64.4	Pass	
T4	90 - 80	Top Girt	1 1/4	137	-1787.74	7152.98	25.0	Pass	
		Bottom Girt	1 1/4	140	-1836.84	7152.98	25.7	Pass	
		Mid Girt	1 1/4	143	-380.80	7152.98	5.3	Pass	
		Leg	Pirod 216415	193	-97758.80	184993.73	52.8	Pass	
T5	80 - 60	Diagonal	L3x3x5/16	200	-8227.76	29033.94	28.3	Pass	
		Leg	Pirod 216413	202	-131166.00	184993.73	70.9	Pass	
T6	60 - 40	Diagonal	L3x3x5/16	209	-7241.65	24773.80	29.2	Pass	
		Leg	Pirod 195557	217	-162273.00	258588.66	62.8	Pass	
T7	40 - 20	Diagonal	L3x3x5/16	224	-6693.94	19986.33	33.5	Pass	
		Leg	Pirod 195557	232	-192632.00	258588.66	74.5	Pass	
T8	20 - 0	Diagonal	L3x3x5/16	245	-7020.98	17753.03	39.5	Pass	
		Leg	Pirod 195557	247	-221801.00	258588.66	85.8	Pass	
		Diagonal	L3x3x5/16	260	-7889.74	14385.47	54.8	Pass	
Summary									
							Leg (T8)	85.8	Pass
							Diagonal (T2)	86.5	Pass
							Top Girt (T2)	48.1	Pass

tnxTower Ramaker & Associates 1120 Dallas Street Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job Avon Mountain (CT03XC053)	Page 29 of 29
	Project 22984	Date 16:37:35 03/08/13
	Client Sprint	Designed by JHZ

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
						Bottom Girt (T2)	63.6	Pass
						Mid Girt (T3)	5.3	Pass
						Bolt Checks	61.5	Pass
						RATING =	86.5	Pass

EM-SPRINT-004-130822

181 Montevideo Road

Avon



RECEIVED
JUL 10 2014

1 Robbins Road
Westford, MA 01886

July 9, 2014

State of Connecticut
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

CONNECTICUT
SITING COUNCIL

RE: Notification of Construction Completion on telecommunication facilities

To whom it may concern:

Alcatel Lucent hereby acknowledges that the list of attached sites have completed construction per the approval granted on the specified date. Please advise if further information is needed..

Very truly yours,

Martha Powers

Martha Powers
Lead Development Manager
Alcatel-Lucent
Sprint Vision Project
1 Robbins Road
Westford, MA 01886

Cc: FST, Siterra

EM/TS#	Address	Town	Sprint ID	Decision Date
EM-SPRINT-062-130912	1065 Wintergreen Avenue	Hamden	CT03XC003	10/15/2013
EM-SPRINT-NEXTEL-060-130118	10 Tanner Marsh Road	Guilford	CT03XC022	2/14/2013
EM-SPRINT-004-130822	181 Montevideo Road	Avon	CT03XC053	9/6/2013
EM-SPRINT-NEXTEL-155-130214	1358 New Britain Ave.	West Hartford	CT03XC057	3/1/2013
EM-SPRINT-NEXTEL-164-130201	440 Hayden Station Road	Windsor	CT03XC065	3/8/2013
EM-SPRINT-NEXTEL-132-130201	59 McGuire Road	South Windsor	CT03XC066	3/1/2013
EM-SPRINT-NEXTEL-054-130201	299 Paxton Way	Glastonbury	CT03XC081	3/1/2013
EM-SPRINT-NEXTEL-094-130214	36 Prospect Street	Newington	CT03XC084	3/1/2013
EM-SPRINT-110-130725	10 Sparks Street	Plainville	CT03XC086	8/8/2013
EM-SPRINT-007-130314	260 Beckley Road	Kensington	CT03XC088	4/5/2013
EM-SPRINT-NEXTEL-155-130201	570 New Park Avenue	West Hartford	CT03XC091	3/1/2013
EM-SPRINT-NEXTEL-106-130201	430 Middlesex Turnpike	Old Saybrook	CT03XC102	3/1/2013
EM-SPRINT-NEXTEL-105-130201	30 Short Hills Road	Old Lyme	CT03XC104	3/1/2013
EM-SPRINT-NEXTEL-152-130201	41 Manitock Hill Road	Waterford	CT03XC105	3/1/2013
EM-SPRINT-NEXTEL-045-130201	93 Roxbury Road	East Lyme	CT03XC110	3/1/2013
EM-SPRINT-152-130114	45R Fargo Road	Waterford	CT03XC112	2/14/2013
EM-SPRINT-NEXTEL-027-130201	48 Cow Hill Road	Clinton	CT03XC156	3/1/2013
EM-SPRINT-NEXTEL-082-130201	238 Meridan Road	Middlefield	CT03XC160	3/8/2013
EM-SPRINT-047-130109	160 Plantation Road	East Windsor	CT03XC202	2/7/2013
EM-SPRINT-NEXTEL-077-130214	53 Slater Street	Manchester	CT03XC211	3/1/2013
EM-SPRINT-142-130109	497 Old Post Road	Tolland	CT03XC212	2/7/2013
EM-SPRINT-NEXTEL-042-130222	94 East High Street	East Hampton	CT03XC335	3/8/2013
EM-SPRINT-057-121226	Butternut Hollow Road	Greenwich	CT03XC343	1/11/2013
EM-SPRINT-158-130213	515 Boston Post Road	Westport	CT03XC355	3/1/2013
EM-SPRINT-046-130402	206 Everett Road	Easton	CT03XC362	4/19/2013
EM-SPRINT-085-130322	474 MAIN STREET	MONROE	CT03XC365	4/5/2013
EM-SPRINT-086-131011	57 Cook Drive	Montville	CT03XC365	10/25/2013
EM-SPRINT-118-130322	76 EAST RIDGE	RIDGEFIELD	CT03XC370	4/5/2013
EM-SPRINT-097-131230	20 Barnabas Road	Newtown	CT03XC383	1/21/2014
EM-SPRINT-051-130207	3965 Congress Street	Fairfield	CT03XC385	3/1/2013
EM-SPRINT-NEXTEL-094-130214	123 Costello Road	Newington	CT23XC555	3/1/2013
EM-SPRINT-119-131008	699 Old Main Street	Rocky Hill	CT23XC556	10/25/2013
EM-SPRINT-077-131008	60 Adams Street	Manchester	CT23XC557	10/25/2013
EM-SPRINT-NEXTEL-080-130123	462 West Main Street	Meriden	CT25XC840	2/14/2013
EM-SPRINT-096-130920	18 Hilltop View Lane	New Milford	CT33XC095	10/4/2013
EM-SPRINT-157-130213	237 Godfrey Road	Weston	CT33XC522	3/1/2013
EM-SPRINT-018-131008	20 Vale Road	Brookfield	CT33XC525	10/25/2013
EM-SPRINT-077-130528	595 Keeney Street	Manchester	CT33XC538	6/14/2013
EM-SPRINT-NEXTEL-129-130214	400 Main Street	Somers	CT33XC554	3/1/2013
EM-SPRINT-047-130322	15 CHAMBERLAIN	BROADBROOK	CT33XC565	4/5/2013
EM-SPRINT-004-130502	277 Huckleberry Road	Avon	CT33XC589	5/17/2013

EM-SPRINT-143-130604	218 Wheeler Road	Torrington	CT33XC592	6/28/2013
EM-SPRINT-140-130724	583 Chapel Street	Thomaston	CT33XC603	8/8/2013
EM-SPRINT-103-130920	Charles Marshall Drive	Norwalk	CT33XC802	10/4/2013
EM-SPRINT-NEXTEL-064-130214	439-455 Homestead Ave.	Hartford	CT43XC805	3/1/2013
EM-SPRINT-064-130311	99 Meadow Street	Hartford	CT43XC806	4/5/2013
EM-SPRINT-083-131127	290 Preston Ave.	Middletown	CT43XC816	12/16/2013
EM-SPRINT-128-130920	530 Bushy Hill Road	Simsbury	CT43XC825	10/4/2013
EM-SPRINT-164-130405A	340 Bloomfield Avenue	Windsor	CT43XC826	4/19/2013
EM-SPRINT-077-130109	239 Middle Turnpike	Manchester	CT43XC827	2/13/2013
EM-SPRINT-165-130118	2-4 Volunteer Drive	Windsor Locks	CT43XC828	2/14/2013
EM-SPRINT-NEXTEL-139-130214	44 Fyler Place	Suffield	CT43XC829	3/8/2013
EM-SPRINT-111-130712	171 Town Hill Road	Plymouth	CT54XC712	7/26/2013
EM-SPRINT-009-130322	38 Spring Hill Road	Bethel	CT54XC749	4/5/2013
EM-SPRINT-154-131011	315 Spencer Plains Road	Westbrook	CT54XC758	10/25/2013
EM-SPRINT-023-130405	14 Canton Springs Road	Canton	CT54XC760	4/19/2013
EM-SPRINT-104-130606	153 Old Salem Road	Norwich	CT54XC775	6/28/2013
EM-SPRINT-164-130405B	99 Day Hill Road	Windsor	CT54XC787	4/19/2013
EM-SPRINT-132-130920	300 Governor's Highway	South Windsor	CT60XC014	10/4/2013
EM-SPRINT-094-130108	605 Willard Avenue	Newington	CT60XC018	1/25/2013
EM-SPRINT-146-130506	197 South Street	Vernon	CT60XC935	5/24/2013
EM-SPRINT-146-130311	777 Talcottville Road	Vernon	CT70XC147	4/5/2013
EM-SPRINT-126-130531	62 Birdseye Road	Shelton	CT73XC004	6/21/2013

EM-SPRINT-143-130604	218 Wheeler Road	Torrington	CT33XC592	6/28/2013
EM-SPRINT-140-130724	583 Chapel Street	Thomaston	CT33XC603	8/8/2013
EM-SPRINT-103-130920	Charles Marshall Drive	Norwalk	CT33XC802	10/4/2013
EM-SPRINT-NEXTEL-064-130214	439-455 Homestead Ave.	Hartford	CT43XC805	3/1/2013
EM-SPRINT-064-130311	99 Meadow Street	Hartford	CT43XC806	4/5/2013
EM-SPRINT-083-131127	290 Preston Ave.	Middletown	CT43XC816	12/16/2013
EM-SPRINT-128-130920	530 Bushy Hill Road	Simsbury	CT43XC825	10/4/2013
EM-SPRINT-164-130405A	340 Bloomfield Avenue	Windsor	CT43XC826	4/19/2013
EM-SPRINT-077-130109	239 Middle Turnpike	Manchester	CT43XC827	2/13/2013
EM-SPRINT-165-130118	2-4 Volunteer Drive	Windsor Locks	CT43XC828	2/14/2013
EM-SPRINT-NEXTEL-139-130214	44 Fyler Place	Suffield	CT43XC829	3/8/2013
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STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

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August 23, 2013

The Honorable Mark W. Zacchio
Chairman
Town of Avon
60 West Main Street
Avon, CT 06001-3743

RE: **EM-SPRINT-004-130822** – Sprint Spectrum, L.P. notice of intent to modify an existing telecommunications facility located at 181 Montevideo Road, Avon, Connecticut.

Dear Chairman Zacchio:

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

If you have any questions or comments regarding the proposal, please call me or inform the Council by September 6, 2013.

Thank you for your cooperation and consideration.

Very truly yours,

Melanie Bachman
Acting Executive Director

MB/cm

c: Steven V. Kushner, Town Planner, Town of Avon