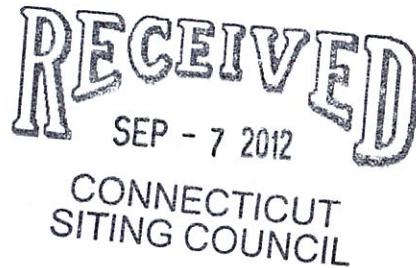




EM-SPRINT-010-120907

September 6, 2012

David Martin and  
Members of the Siting Council  
Connecticut Siting Council  
Ten Franklin Square  
New Britain, CT 06051



RE: Notice of Exempt Modification  
310 Watertown Road  
Bethlehem, CT 06763  
N 41 ° 40' 02.15"  
W 73 ° 10' 13.71"

Dear Mr. Martin and Members of the Siting Council:

On behalf of Sprint Spectrum, SBA Communications is submitting an exempt modification application to the Connecticut Siting council for modification of existing equipment at a tower facility located at 310 Watertown Road Bethlehem, CT.

The 310 Watertown Road facility consists of a 195' Monopole Tower owned and operated by SBA Communications. In order to accommodate technological changes and enhance system performance in the State of Connecticut, Sprint Spectrum plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of the municipality in which the affected cell site is located.

As part of Sprint's Network Vision modification project, Sprint desires to upgrade their equipment to meet the new standards of 4G technology. The new antennas and associated equipment will allow customers to download files and browse the internet at a high rate of speed while also allowing their phones to be compatible with the latest 4G technology.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in Sprint's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna and equipment configuration along with the required fee of \$625.

The changes to the facility do not constitute modifications 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 or altered. 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. The overall height of the structure will be unaffected.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than the new equipment cabinets.
3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.
4. The changes in radio frequency power density will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, SBA Communications on behalf of Sprint Spectrum, respectfully submits that he proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (508) 614-0389 with any questions you may have concerning this matter.

Thank you,

Rick Woods  
SBA Communications Corporation  
One Research Dr. Suite 200C  
Westborough, MA 01581  
508-366-5505 x 319 + T  
508-366-5507 + F  
508-614-0389 + C  
[rwoods@sbsite.com](mailto:rwoods@sbsite.com)





## Sprint Spectrum Equipment Modification

310 Watertown Road Bethlehem, CT  
Site number CT33XC109

**Tower Owner:** SBA Communications Corporation

**Equipment Configuration:** Monopole Tower

**Current and/or approved:** Six (6) CDMA Antennas @ 195'  
Six (6) lines of 1-5/8" coax  
Two (2) equipment cabinets

**Planned Modifications:** Remove Six (6) CDMA antennas & Six (6) lines of 1-5/8"  
Install Three (3) Network Vision antennas & Six (6) RRHs @ 195'  
Install Three (3) Hybriflex fiber cables  
Install Three (3) Filters  
Install Four (4) RETs  
Install One (1) Fiber Distribution Box  
Replacing Two (2) equipment cabinets with Three (3) new equipment cabinets

### Structural Information:

The attached structural analysis demonstrates that the tower and foundation will have adequate structural capacity to accommodate the proposed modifications.

### Power Density:

The anticipated Maximum Composite contributions from the Sprint facility are 6.264% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 22.754% of the allowable FCC established general public limit sampled at the ground level.

Site Composite MPE %	
Carrier	MPE %
Sprint	6.264%
Nextel	1.670%
AT&T	5.690%
Verizon Wireless	9.130%
<b>Total Site MPE %</b>	<b>22.754%</b>



September 6, 2012

Honorable Jeffrey Hamel  
First Selectman  
Town of Bethlehem  
42A North Street  
Goshen, CT 06756

RE: Telecommunications Facility-310 Watertown Road Bethlehem, CT 06763

Dear Mr. Hamel,

In order to accommodate technological changes and enhance system performance in the State of Connecticut, Sprint Spectrum will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies (R.C.S.A.) Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review Sprint's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes Sprint's proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at (508) 614-0389.

Thank you,



Rick Woods

SBA Communications Company  
One Research Dr. Suite 200C  
Westborough, MA 01581  
508-366-5505 x 319 + T  
508-366-5507 + F  
508-614-0389 + C  
[rwoods@sbsite.com](mailto:rwoods@sbsite.com)



**STRUCTURAL NOTE:**

STRUCTURAL DESIGNS AND DETAILS FOR ANTENNA MOUNTS AND RRH MOUNTS COMPLETED BY HUDSON DESIGN GROUP LLC ON BEHALF OF ALCATEL-LUCENT ARE INCLUSIVE OF THE ENTIRE ANTENNA FRAME/PLATFORM/ANTENNA/RRH MOUNTS SECURED TO THE TOWER STRUCTURE.

**STRUCTURAL NOTE:**

G.C. TO REFER TO SPECIAL INSTALLATION REQUIREMENTS AND/OR MODIFICATIONS RECOMMENDED IN STRUCTURAL ANALYSIS REPORT PREPARED BY FDH ENGINEERING, INC. DATED: MAY 11, 2012

**SBA SITE #: CT01501-S**  
**SBA SITE NAME: MORRIS**

# Sprint<sup>®</sup>

## VISION

SITE NUMBER:

**CT33XC109**

SITE NAME:

**STERING/SBA TOWERS, INC**

SITE ADDRESS:

**310 WATERTOWN ROAD  
BETHLEHEM, CT 06763****NOTE:**

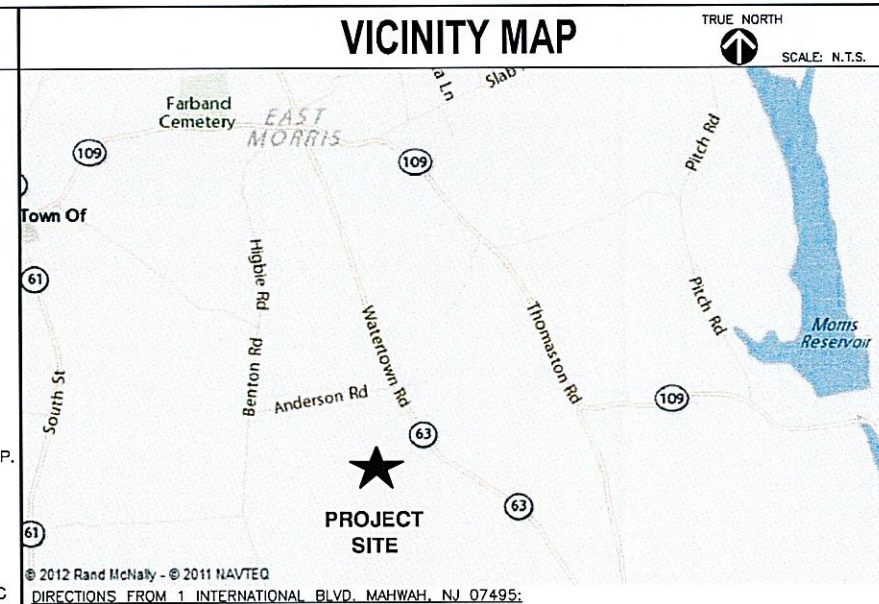
OWNER AND TENANT MAY, FROM TIME TO TIME AT TENANT'S OPTION, REPLACE THIS EXHIBIT WITH AN EXHIBIT SETTING FORTH THE LEGAL DESCRIPTION OF THE SITE, OR WITH ENGINEERED OR AS-BUILT DRAWING DEPICTING THE SITE OR ILLUSTRATING STRUCTURAL MODIFICATIONS OR CONSTRUCTION PLANS OF THE SITE. ANY VISUAL OR TEXTUAL REPRESENTATION OF THE EQUIPMENT LOCATED WITHIN THE SITE CONTAINED IN THESE OTHER DOCUMENTS IS ILLUSTRATIVE ONLY, AND DOES NOT LIMIT THE RIGHTS OF SPRINT AS PROVIDED FOR IN THE AGREEMENT. THE LOCATIONS OF ANY ACCESS AND UTILITY EASEMENTS ARE ILLUSTRATIVE ONLY. ACTUAL LOCATIONS MAY BE DETERMINED BY TENANT AND/OR THE SERVICING UTILITY COMPANY IN COMPLIANCE WITH LOCAL LAWS AND REGULATIONS.

**SITE INFORMATION**

SITE NUMBER:	CT33XC109	LOCAL POWER COMPANY:	NORTHEAST UTILITY
SITE NAME:	STERING/SBA TOWERS, INC	LOCAL TELCO COMPANY:	VERIZON
SITE ADDRESS:	310 WATERTOWN ROAD BETHLEHEM, CT 06763	APPLICANT:	SPRINT 1 INTERNATIONAL BLVD, SUITE 800 MAHWAH, NJ 07495
COUNTY:	LITCHFIELD	APPLICANT REPRESENTATIVE:	ALCATEL-LUCENT TODD AMANN 600 MOUNTAIN AVE. MURRAY HILL, NJ 07974 (914)715-9363
ZONING:	COMMERCIAL V	SITE ACQUISITION CONSULTANT:	SBA COMMUNICATIONS CORP. ONE RESEARCH DRIVE SUITE 200C WESTBOROUGH, MA 01581
PARCEL ID:	MAP: 12-7; LOT:006	A&E CONSULTANT:	HUDSON DESIGN GROUP LLC 1600 OSGOOD STREET BLDG 20 NORTH, SUITE 2-101 NORTH ANDOVER, MA 01845 TEL: (978) 557-5553 FAX: (978) 336-5586
COORDINATES(*):	N 41° 40' 02.15" W 73° 10' 13.71"		
GROUND ELEV. (*):	955± (AMSL)		
STRUCTURE TYPE:	MONOPOLE		
STRUCTURE HEIGHT:	195± (AGL)		
ANTENNA RAD CENTER:	195± (AGL)		
PROPERTY OWNER:	GARY J. & AMY SWINGLE 2579 LITCHFIELD ROAD WATERTOWN, CT 06795		
STRUCTURE OWNER:	SBA PROPERTIES, INC. 5900 BROKEN SOUND PKWY BOCA RATON, FL 33487		
(*) SOURCE OF COORDINATES/ELEVATION - PROVIDED BY SBA AND CONFIRMED USING GOOGLE EARTH.			

**GENERAL NOTES**

- THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION:  
-HANDICAPPED ACCESS NOT REQUIRED  
- POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED  
- NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED
- CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
- DEVELOPMENT AND USE OF THE SITE WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES. BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT & 2009 CT AMENDMENT ELECTRICAL CODE: 2005 NATIONAL ELECTRICAL CODE STRUCTURAL CODE: TIA/EIA-222-F STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS

**VICINITY MAP**

© 2012 Rand McNally - © 2011 NAVTEQ

DIRECTIONS FROM 1 INTERNATIONAL BLVD, MAHWAH, NJ 07495:

PROCEED NORTH ON INTERNATIONAL BLVD. EXIT ROUNDABOUT AT LEISURE LANE. ENTER RAMP FOLLOWING THE SIGN RT-17 N. FREEWAY ENDS, BEAR LEFT TAKING THE RAMP TO ALBANY(RT-17 N)/I-87 N/NEW YORK STATE THRUWAY NORTH. KEEP RIGHT TO HARRIMAN/RT-17/US-6. EXIT RIGHT FOLLOWING THE SIGN MIDDLETOWN(I-84)/NEWBURGH/RT-300/RT-17K (EXIT 17). KEEP LEFT TO (I-84)/(RT-300)/(17K) (EXIT 17). KEEP RIGHT TO DANBURY/I-84 E. KEEP RIGHT TO WATERBURY/HARTFORD/I-84 E. EXIT RIGHT FOLLOWING THE SIGN WATERTOWN/NAUGATUCK/CT-63 (EXIT 17). EXIT RAMP (LEFT) AT STRAITS TPKE/CT-63. BEAR LEFT ON MAIN ST/CT-63. ARRIVE AT YOUR DESTINATION ON THE LEFT.

**SCOPE OF WORK**

- REPLACE EXISTING MOD CELL WITH (1) MM-BTS CABINET & INSTALL FIBER DISTRIBUTION BOX WITHIN EXISTING LEASE AREA. REPLACE EXISTING BATTERY CABINET WITH (2) BBU CABINETS.
- REMOVE (6) EXISTING CDMA ANTENNAS AND REPLACE WITH (3) NETWORK VISION ANTENNAS & (6) RRH'S.
- REMOVE EXISTING CDMA COAX CABLES & INSTALL (3) HYBRIFLEX CABLES FROM EQUIPMENT CABINET TO ANTENNA
- REMOVE EXISTING GPS ANTENNA AND REPLACE WITH NEW GPS ANTENNA  
CALL BEFORE YOU DIG  
1-800-922-4455 OR DIAL 811

**SHEET INDEX**

SHEET NO.	DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES
A-1	COMPOUND PLAN AND ELEVATION
A-2	ANTENNA SCENARIO & EQUIPMENT LAYOUT
A-3	DETAILS
A-4	RF DATA SHEET
A-5	CABINET & ANTENNA WIRING DIAGRAM
S-1	STRUCTURAL DETAILS
E-1	TYPICAL POWER & GROUNDING ONE LINE DIAGRAM

**APPROVALS**

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR MODIFICATIONS.

CONSTRUCTION:	_____	DATE:	_____
LEASING/ SITE ACQUISITION:	_____	DATE:	_____
RF ENGINEER:	_____	DATE:	_____
LANDLORD/ PROPERTY OWNER:	_____	DATE:	_____

**APPROVED**

By Bryan Bakis, P.E. for SBA Communications Corp. at 3:03 pm, Jul 18, 2012

CHECKED BY: KB

APPROVED BY: DPH

**SUBMITTALS**

REV.	DATE	DESCRIPTION	BY
2	05/18/12	FOR CONSTRUCTION	SF
1	03/29/12	ISSUED FOR REVIEW	DD

SITE NUMBER:  
CT33XC109

SITE NAME:

**STERING/SBA  
TOWERS, INC**SITE ADDRESS:  
310 WATERTOWN ROAD  
BETHLEHEM, CT 06763

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



G.C. TO REFER TO SPECIAL  
INSTALLATION REQUIREMENTS AND/OR  
MODIFICATIONS RECOMMENDED IN  
STRUCTURAL ANALYSIS REPORT  
PREPARED BY FDH ENGINEERING, INC.  
DATED: MAY 11, 2012



**GRAPHIC SCALE**

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

A horizontal graphic scale bar with tick marks at 0, 2'-0", 4'-0", 8'-0", and 12'-0". The bar is divided into four equal segments, each representing 2 feet.


- 1) VERIFY EXACT ANTENNA MODEL & AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION.
- 2) REMOVE EXISTING GPS ANTENNA AND REPLACE WITH NEW GPS ANTENNA.

**PER THE MLA BETWEEN SPRINT AND SBA, ALL EXISTING NEXTEL EQUIPMENT MUST BE REMOVED WITHIN 6 MONTHS UNLESS OTHERWISE NOTED.**



**GRAPHIC SCALE**

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

A horizontal graphic scale bar with alternating black and white segments. The segments are labeled with their lengths: 0, 5'-4", 10'-8", 21'-4", and 32'-0". The bar is divided into four equal segments, each representing 5'-4".

SHEET NUMBER

A-1



FDH Engineering, Inc., 6521 Meridien Drive Raleigh, NC 27616, Ph. 919.755.1012

**Structural Analysis for  
SBA Network Services, Inc.**

**195' Monopole Tower**

**SBA Site Name: Morris  
SBA Site ID: CT01501-S  
Sprint Site ID: CT33XC109  
Sprint Site Name: Stering/SBA Towers, Inc.**

FDH Project Number 12-04774E S1

**Analysis Results**

Tower Components	94.1%	Sufficient
Foundation	91.5%	Sufficient

Prepared By:

Stephanie Neal, EI  
Project Engineer

Reviewed By:

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

**FDH Engineering, Inc.**  
6521 Meridien Drive  
Raleigh, NC 27616  
(919) 755-1012  
info@fdh-inc.com



May 11, 2012

*Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures & 2005 Connecticut Building Code*

TABLE OF CONTENTS

EXECUTIVE SUMMARY ..... 3

    Conclusions..... 3

    Recommendations ..... 3

APPURTENANCE LISTING ..... 4

RESULTS ..... 5

GENERAL COMMENTS ..... 6

LIMITATIONS ..... 6

APPENDIX ..... 7



## EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Bethlehem, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F*, and the *2005 Connecticut Building Code (CTBC)*. Information pertaining to the existing/proposed antenna loading, current tower geometry, geotechnical data, foundation dimensions, and member sizes was obtained from:

- ☐ Fred A. Nudd Corporation (Drawing No. 00-7627-1) original design drawings dated May 8, 2000
- ☐ o2wireless Solutions (Job No. 2230-043) Monopole Tower Structural Analysis Report dated September 4, 2002
- ☐ Vertical Structures, Inc. (Job No. 2008-007-002) Structural Analysis Report dated January 8, 2008
- ☐ Vertical Structures, Inc. (Job No. 2008-007-002) Structural Opinion Letter dated September 18, 2008
- ☐ SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and the *2005 CTBC* is 80 mph without ice and 28 mph with 1" radial ice. Ice is considered to increase in thickness with height.

## Conclusions

With the existing and proposed antennas from Sprint in place at 195 ft, the tower meets the requirements of the *TIA/EIA-222-F standards* and the *2005 Connecticut Building Code* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Fred A. Nudd Drawing No. 00-7627-1), the foundation should have the necessary capacity to support both the proposed and existing loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

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

## Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards and the *2005 CTBC* are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed coax should be installed inside the pole's shaft.
2. RRU/RRH Stipulation: The equipment may be installed in any arrangement as determined by the client.

## APPURTENANCE LISTING

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

**Table 1 - Appurtenance Loading**

### Existing Loading:

Antenna Elevation (ft)	Description	Coax and Lines <sup>1</sup>	Carrier	Mount Elevation (ft)	Mount Type
195	(6) Decibel DB979H90E-M	(6) 1-5/8"	Sprint	195	(1) 14' Low Profile Platform
185	(12) Decibel DB844H80-XY	(12) 1-5/8"	Nextel	185	(1) 12' Low Profile Platform
175	(6) Antel LPA-80080/6CF (3) Antel BXA-70063/6CF (3) Antel BXA-171085-12CF-2 (6) RFS FD9R6004/2C-3L Diplexers	(12) 1-5/8"	Verizon	175	(1) 14' Low Profile Platform
165	(12) Powerwave 7770.00 (24) Powerwave LGP2140X TMAs	(24) 1-5/8"	Cingular	165	(1) 14' Low Profile Platform
155	(3) RFS APXV18-209014-C (3) Remec S20057A1 TMAs	(6) 1-5/8"	T-Mobile	155	(1) 14' Low Profile Platform

<sup>1</sup> Coax installed inside the monopole shaft unless otherwise noted.

### Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
195	(3) RFS APXVSP18-C-A20 (3) ALU 1900 MHz RRH (3) ALU 800 MHz RRH (3) ALU 800 MHz Filter (4) RFS ACU-A20-N RETs	(3) 1-1/4" Fiber Cables	Sprint	195	(1) 14' Low Profile Platform

## RESULTS

The following yield strength of steel for individual members was used for analysis:

**Table 2 - Material Strength**

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Flange Plate	45 ksi
Flange Bolts	F <sub>u</sub> = 120 ksi
Base Plate	45 ksi
Anchor Bolts	F <sub>u</sub> = 125 ksi

**Table 3** displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. *Note: Capacities up to 105% are considered acceptable.* **Table 4** displays the maximum foundation reactions.

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

See the **Appendix** for detailed modeling information

**Table 3 - Summary of Working Percentage of Structural Components**

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
L1	195 - 180	Pole	TP24x24x0.281	13.3	Pass
	180	Flange Bolts	(18) 1/2" Ø w/ BC = 27"	59.2	Pass
	180	Flange Plate	30" Ø PL x 1/2" thk	84.9	Pass
L2	180 - 130	Pole	TP35.9444x24x0.25	83.0	Pass
L3	130 - 85	Pole	TP46.1944x34.25x0.3125	89.4	Pass
L4	85 - 81	Pole	TP46.525x44.1361x0.3125	94.1	Pass
L5	81 - 41	Pole	TP55.4556x46.525x0.375	83.6	Pass
L6	41 - 0	Pole	TP64.5x53.1427x0.375	92.0	Pass
		Anchor Bolts	(24) 2" Ø w/ BC = 58"	87.8	Pass
		Base Plate	64.5" Ø PL x 1.5" thk	78.0	Pass

\*Capacities include 1/3 allowable wind increase.

**Table 4 - Maximum Base Reactions**

Base Reactions	Current Analysis (TIA/EIA-222-F)	Original Design (TIA/EIA-222-F)
Axial	53 k	---
Shear	32 k	36 k
Moment	4,464 k-ft	4,878 k-ft



## GENERAL COMMENTS

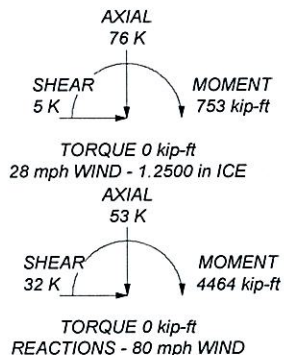
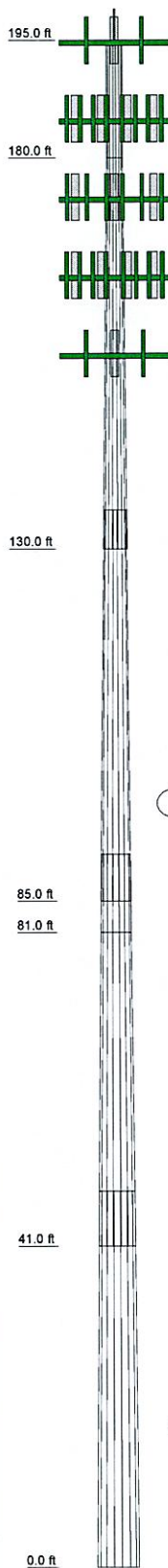
This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading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

## LIMITATIONS

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

## **APPENDIX**

Section	1	2	3	4	5	6
Length (ft)	15.00	50.00	50.00	10.00	40.00	48.00
Number of Sides	18	18	18	18	18	18
Thickness (in)	0.2810	0.2500	0.3125	0.3125	0.3750	0.3750
Socket Length (ft)		5.00	6.00		7.00	
Top Dia (in)	24.0000	24.0000	34.2500	44.1361	46.5250	53.1427
Bot Dia (in)	24.0000	35.9444	46.1944	46.5250	55.4556	64.5000
Grade			A572-85			
Weight (K)	1.1	4.0	6.7	1.5	8.2	11.4



## DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(1) 14' Low Profile Platform MNT	195	BXA-70063/6CF W/Mount Pipe	175
APXVSP18-C-A20 w/Mount Pipe	195	BXA-171085-12CF-EDIN-X w/Mount Pipe	175
APXVSP18-C-A20 w/Mount Pipe	195	BXA-171085-12CF-EDIN-X w/Mount Pipe	175
1900 MHz RRH	195	BXA-171085-12CF-EDIN-X w/Mount Pipe	175
1900 MHz RRH	195	(2) FD9R6004/2C-3L Diplexer	175
1900 MHz RRH	195	(2) FD9R6004/2C-3L Diplexer	175
800 MHz RRH	195	(2) FD9R6004/2C-3L Diplexer	175
800 MHz RRH	195	(1) 14' Low Profile Platform Mount	175
800 MHz Filter	195	(4) 7770.00 w/Mount Pipe	165
800 MHz Filter	195	(4) 7770.00 w/Mount Pipe	165
800 MHz Filter	195	(4) 7770.00 w/Mount Pipe	165
(2) ACU-A20-N RET	195	(8) LGP21401 TMA	165
ACU-A20-N RET	195	(8) LGP21401 TMA	165
ACU-A20-N RET	195	(8) LGP21401 TMA	165
Lightning Rod	195	(1) 14' Low Profile Platform MNT	165
(4) DB844H80-XY w/Mount Pipe	185	APXV18-209014 w/Mount Pipe	155
(4) DB844H80-XY w/Mount Pipe	185	APXV18-209014 w/Mount Pipe	155
(4) DB844H80-XY w/Mount Pipe	185	APXV18-209014 w/Mount Pipe	155
(1) 12' Low Profile Platform MNT	185	S20057A1	155
(2) LPA-80080/6CF w/ Mount Pipe	175	S20057A1	155
(2) LPA-80080/6CF w/ Mount Pipe	175	S20057A1	155
(2) LPA-80080/6CF w/ Mount Pipe	175	(1) 14' Low Profile Platform MNT	155
BXA-70063/6CF W/Mount Pipe	175		
BXA-70063/6CF W/Mount Pipe	175		

## MATERIAL STRENGTH

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

## TOWER DESIGN NOTES

- Tower is located in Litchfield County, Connecticut.
- Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
- Tower is also designed for a 28 mph basic wind with 1.25 in ice.
- Deflections are based upon a 50 mph wind.
- TOWER RATING: 94.1%



**FDH Engineering, Inc.**  
6521 Meridien Drive  
Raleigh, NC 27616  
Phone: (919) 755-1012  
FAX: (919) 755-1031

Job: **Morris, CT01501-S**

Project: **12-04774E S1**

Client: **SBA Network Services, Inc.**

Code: **TIA/EIA-222-F**

Path:

Drawn by: **SMN**

Date: **05/11/12**

Scale: **NTS**

App'd:

Dwg No. **E-1**

Tower Analysis





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

Sprint Existing Facility

Site ID: CT33XC109

Sterling SBA Towers  
310 Watertown Road  
Bethlehem, CT 06377

**August 23, 2012**

August 23, 2012

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

Re: Emissions Values for Site **CT33XC109 – Sterling SBA Towers**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 310 Watertown Road, Bethlehem, 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 310 Watertown Road, Bethlehem, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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





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- 6) The antenna mounting height centerline of the proposed antennas is **195 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



## 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 **6.264% (2.088% 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 **22.754%** 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

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