



June 10, 2014

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

RE: Notice of Exempt Modification  
350 Burr Mountain Road  
Torrington, CT 06790  
Sprint Site #: NV2.5\_CT33XC079  
N 41° 52' 23.72"  
W -73° 05' 18.26"

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 350 Burr Mountain Road, Torrington CT.

The 350 Burr Mountain Road facility consists of a 196' MONOPOLE Tower owned and operated by SBA 2012 TC Assets, LLC. 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 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 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 the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (508) 251-0720 x 3804 with any questions you may have concerning this matter.

Thank you,

A handwritten signature in black ink, appearing to read "Kri Pelletier".

Kri Pelletier  
SBA Communications Corporation  
33 Boston Post Road West Suite 320  
Marlborough, MA 01752  
508-251-0720 x 3804 + T  
508-251-1755 + F  
203-446-7700 + C  
[kpelletier@sbsite.com](mailto:kpelletier@sbsite.com)



**Sprint Spectrum  
Equipment Modification**

350 Burr Mountain Road, Torrington CT  
Site number CT33XC079

**Tower Owner:** SBA 2012 TC Assets, LLC

**Equipment Configuration:** MONOPOLE Tower

**Current and/or approved:**

- (6) Andrew 980F90T2E-M
- (3) RFS APXVSP18-C-A20
- (3) ALU 1900 MHz RRUs
- (3) ALU 800 MHz RRUs
- (3) ALU 800 MHz Filters
- (4) RFS ACU-A20-N RETs
- (6) 1-5/8" Feeds
- (3) 1-1/4" Feeds

**Planned Modifications:**

- (6) Andrew 980F90T2E-M
- (3) RFS APXVTM14-C-I20
- (3) RFS APXVSP18-C-A20
- (3) ALU 1900 MHz RRUs
- (3) ALU 800 MHz RRUs
- (3) ALU 800 MHz Filters
- (4) RFS ACU-A20-N RETs
- (3) TD-RRH8x20-25 RRHs
- (6) 1-5/8" Feeds
- (4) 1-1/4" Feeds

**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 7.102% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 48.252% of the allowable FCC established general public limit sampled at the ground level.

Site Composite MPE %	
Carrier	MPE %
Sprint	7.102%
MetroPCS	3.400%
T-Mobile	14.000%
Verizon Wireless	10.330%
AT&T	10.500%
Nextel	2.920%
<b>Total Site MPE %</b>	<b>48.252%</b>



June 10, 2014

Mayor Elinor Carbone  
City of Torrington  
City Hall  
140 Main Street  
Torrington, CT 06790

RE: Telecommunications Facility @ 350 Burr Mountain Road, Torrington CT

Dear Mayor Carbone,

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) 251-0720 x 3804.

Thank you,

A handwritten signature in black ink, appearing to read "Kri Pelletier", is written over a horizontal line.

Kri Pelletier  
SBA Communications Company  
33 Boston Post Road West, Suite 320  
Marlborough, MA 01752  
508-251-0720 x 3804 + T  
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203-446-7700 + C  
[kpelletier@sbsite.com](mailto:kpelletier@sbsite.com)



June 10, 2014

O&G Industries Inc  
112 Wall Street  
Torrington CT 06790-5464

RE: Telecommunications Facility @ 350 Burr Mountain Road, Torrington CT

Dear Whom It May Concern,

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) 251-0720 x 3804.

Thank you,

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

Sprint Existing Facility

Site ID: CT33XC079

Torrington O&G Ind

350 Burr Mountain  
Torrington, CT 06795

**May 21, 2014**

**EBI Project Number: 62143085**

May 21, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:  
**CT33XC079 - Torrington O&G Ind**

**Site Total: 48.252% - MPE % in full compliance**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 350 Burr Mountain, Torrington, CT, for the purpose of determining whether the radio frequency (RF) exposure levels from the proposed Sprint equipment upgrades on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 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 (850 MHz Band) is approximately  $567 \mu\text{W}/\text{cm}^2$ , and the general population exposure limit for the 1900 MHz and 2500 MHz bands 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 350 Burr Mountain, Torrington, 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 channels in the 1900 MHz Band were considered for each sector of the proposed installation.
- 2) 1 channel in the 800 MHz Band was considered for each sector of the proposed installation
- 3) 2 channels in the 2500 MHz Band were considered for each sector of the proposed installation.
- 4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications was used in this direction.

- 6) The antennas used in this modeling are the RFS APXVSPP18-C-A20 and the RFS APXVTMM-C-120. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The RFS APXVTMM-C-120 has a 15.9 dBd gain value at its main lobe at 2500 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.
- 7) The antenna mounting height centerline for the proposed antennas is **191.5 feet** above ground level (AGL).
- 8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

Site ID	CT33XC079 - Torrington O&G Ind,
Site Address	350 Burr Mountain, Torrington, CT 06795
Site Type	Monopole

**Sector 1**

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	15.9	191.5	185.5	1/2 "	0.5	3	695.12033	0.72624%
1a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	191.5	185.5	1/2 "	0.5	3	195.44744	0.36013%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	15.9	191.5	185.5	1/2 "	0.5	3	695.12033	1.28084%
Sector total Power Density Value:																2.367%

**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 (dB)	ERP	Power Density Percentage
2a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	15.9	191.5	185.5	1/2 "	0.5	3	695.12033	0.72624%
2a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	191.5	185.5	1/2 "	0.5	3	195.44744	0.36013%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	15.9	191.5	185.5	1/2 "	0.5	3	695.12033	1.28084%
Sector total Power Density Value:																2.367%

**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 (dB)	ERP	Power Density Percentage
3a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	15.9	191.5	185.5	1/2 "	0.5	3	695.12033	0.72624%
3a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	191.5	185.5	1/2 "	0.5	3	195.44744	0.36013%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	15.9	191.5	185.5	1/2 "	0.5	3	695.12033	1.28084%
Sector total Power Density Value:																2.367%

Site Composite MPE %	
Carrier	MPE %
Sprint	7.102%
MetroPCS	3.400%
T-Mobile	14.000%
Verizon Wireless	10.330%
AT&T	10.500%
Nextel	2.920%
<b>Total Site MPE %</b>	<b>48.252%</b>

## Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **7.102% (2.367% 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 **48.252%** of the allowable FCC established general public limit sampled at 6 feet above ground level. This total composite site value is based upon MPE values listed in the Connecticut Siting Council database for existing carrier emissions.

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



**Scott Heffernan**  
RF Engineering Director

**EBI Consulting**  
21 B Street  
Burlington, MA 01803



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

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

**196' Monopole Tower**

**SBA Site Name: Torrington/Oandg Ind Inc  
SBA Site ID: CT46138-A-03  
Sprint Site ID: CT33XC079**

FDH Project Number: 1462GR1400

**Analysis Results**

Tower Components	95.7 %	Sufficient
Foundation	98.7 %	Sufficient

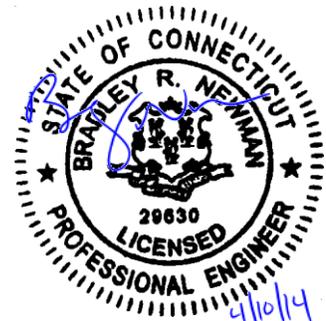
Prepared By:

Adam Stage, EI  
Project Engineer

Reviewed By:

Bradley R. Newman, PE  
Senior Project Engineer  
CT PE License No. 29630

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



April 10, 2014

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

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## EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Torrington, 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 *2005 Connecticut Building Code (CBC)*. Information pertaining to the existing/proposed antenna loading, current tower geometry, geotechnical data, foundation dimensions, and member sizes was obtained from:

- Valmont Structures (Order No. 17566-64) Communication Pole Permit Drawings dated August 3, 2004
- Valmont Structures (Order No. 17566-64) Communication Pole Design Calculations dated July 14, 2004
- Dr. Clarence Welti, P.E., P.C. (Project Name: Sprint Site CT33XC079) Geotechnical Study dated June 18, 2004
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and *2005 CBC* 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 191.5 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and *2005 CBC* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Valmont Structures Order No. 17566-64), the foundation should have the necessary capacity to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

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

## Recommendations

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

1. The proposed feed lines must be installed inside the pole's shaft.
2. RRU/RRH Stipulation: The proposed equipment may be installed in any configuration 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
198	(1) RFI OA 40-41	(1) 7/8"	Torrington P.D.	196	(1) Pipe Mount
191.5	(6) Andrew 980F90T2E-M (3) RFS APXVSP18-C-A20 (3) ALU 1900 MHz RRU's (3) ALU 800 MHz RRU's (3) ALU 800 MHz Filters (4) RFS ACU-A20-N RETs	(6) 1-5/8" (3) 1-1/4"	Sprint	191.5	(1) Low Profile Platform
185	(3) Antel BXA-70063-6CF-2 (6) Antel LPA-80063/4CF (3) Antel BXA-171063-8BF-2 (6) RFS FD9R6004/2C-3L Diplexers	(12) 1-5/8"	Verizon	185	(3) T-Arms
175 <sup>2</sup>	(6) Powerwave 7770 (3) KMW AM-X-CD-16-65-00T-RET (12) Powerwave LGP21401 TMAs (6) Ericsson RRUS-11 RRU's	(12) 1-5/8" (1) 1/2" Fiber (2) 3/4" DC	AT&T	175	(3) T-Arms
161.5 <sup>3</sup>	(12) Andrew DB846G90A-XY	(12) 1-5/8"	Nextel	161.5	(3) T-Arms
155	(3) Ericsson Air B2A B4P (3) Ericsson Air B4A B2P (3) Ericsson KRY 112 114-1 Double TMAs	(12) 1-5/8" (1) 1-5/8" Fiber	T-Mobile	155	(3) T-Arms (Assumed)
145	(3) RFS APXV18-206517S-C	(6) 1-5/8"	Metro (Pocket)	145	(3) T-Arms (Assumed)
100	(1) Maxrad MPRD2449 Dish	(2) CAT5E	Torrington P.D.	100	(1) Standoff Mount

1. Feed lines installed inside pole's shaft unless otherwise noted.

2. AT&T's (1) 1/2" Fiber and (2) 3/4" DC cables are installed inside (1) 3" Flex Conduit on the outside of the pole's shaft.

3. Nextel equipment must be removed prior to the installation of the proposed loading for this analysis to be considered valid; this equipment was not considered in this analysis.

### Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
191.5	(6) Andrew 980F90T2E-M (3) RFS APXVTM14-C-I20 (3) RFS APXVSP18-C-A20 (3) ALU 1900 MHz RRU's (3) ALU 800 MHz RRU's (3) ALU 800 MHz Filters (4) RFS ACU-A20-N RETs (3) TD-RRH8x20-25 RRHs	(6) 1-5/8" (4) 1-1/4"	Sprint	191.5	(1) 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
Base Plate	45 ksi
Anchor Bolts	75 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. **Table 4** displays the maximum foundation reactions. **Table 5** displays the maximum antenna rotations at service wind speeds.

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	196 - 165.25	Pole	TP27.98x21.53x0.1875	55.2	Pass
L2	165.25 - 123.583	Pole	TP36.35x26.6961x0.281	95.1	Pass
L3	123.583 - 84	Pole	TP44.11x34.6512x0.375	95.7	Pass
L4	84 - 45.4167	Pole	TP51.46x42.0112x0.5	83.3	Pass
L5	45.4167 - 0	Pole	TP60x48.9202x0.625	73.9	Pass
-	0	Anchor Bolts	(28) 2.25" Ø w/ BC = 67.68"	69.6	Pass
-	0	Base Plate	73.67" Ø PL x 3" Thick	72.0	Pass

**Table 4 - Maximum Base Reactions**

Base Reactions	Current Analysis (TIA/EIA-222-F)	Original Design (TIA/EIA-222-F)
Axial*	60 k	56 k
Shear*	41 k	41 k
Moment	5,439 k-ft	5,512 k-ft

\* Per our experience with foundations of similar type, the axial and shear loading should not control the foundation analysis.

**Table 5 - Maximum Antenna Rotations at Service Wind Speeds**

Centerline Elevation (ft)	Antenna	Tilt (deg)*	Twist (deg)*
100	(1) Maxrad MPRD2449 Dish	1.3455	0.0001

\*Allowable tilt and twist values to be reviewed by the carrier.

## **GENERAL COMMENTS**

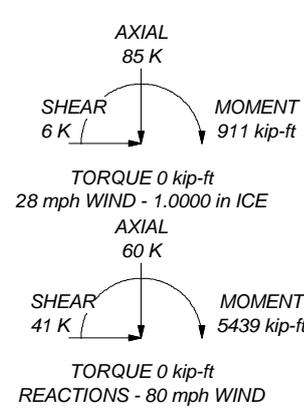
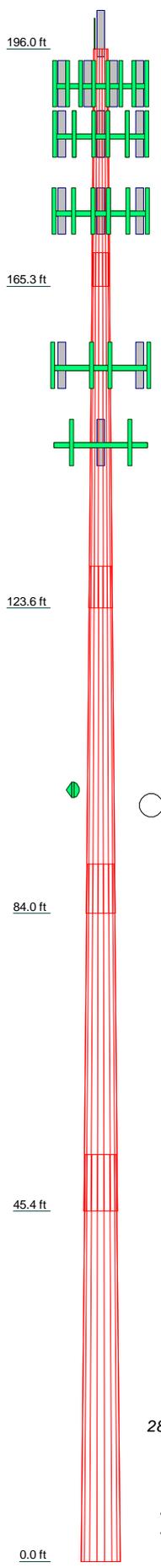
This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading 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
Length (ft)	30.75	46.00	45.00	45.00	52.75
Number of Sides	16	16	16	16	16
Thickness (in)	0.1875	0.2810	0.3750	0.5000	0.6250
Socket Length (ft)	4.33	5.42	6.42	7.33	8.33
Top Dia (in)	21.5300	26.6961	34.6512	42.0112	48.9202
Bot Dia (in)	27.9800	36.3500	44.1100	51.4600	60.0000
Grade			A572-65		
Weight (K)	1.5	4.4	7.1	11.3	19.3



### DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	196	(2) FD9R6004/2C-3L Diplexer	185
OA 40-41 w/ Mount Pipe	196	(2) FD9R6004/2C-3L Diplexer	185
(2) 980F90T2E-M w/ Mount Pipe	191.5	(3) T-Arms MNT	185
(2) 980F90T2E-M w/ Mount Pipe	191.5	BXA-70063-6CF-2 w/ Mount Pipe	185
Low Profile Platform MNT	191.5	(2) 7770.00 w/Mount Pipe	175
APXVSP18-C-A20 w/Mount Pipe	191.5	(2) 7770.00 w/Mount Pipe	175
APXVSP18-C-A20 w/Mount Pipe	191.5	AM-X-CD-16-65-00T-RET w/ Mount Pipe	175
APXVSP18-C-A20 w/Mount Pipe	191.5	AM-X-CD-16-65-00T-RET w/ Mount Pipe	175
1900MHz RRH	191.5	AM-X-CD-16-65-00T-RET w/ Mount Pipe	175
1900MHz RRH	191.5	AM-X-CD-16-65-00T-RET w/ Mount Pipe	175
1900MHz RRH	191.5	AM-X-CD-16-65-00T-RET w/ Mount Pipe	175
800 MHz RRH	191.5	(4) LGP21401 TMA	175
800 MHz RRH	191.5	(4) LGP21401 TMA	175
800 MHz RRH	191.5	(4) LGP21401 TMA	175
800 MHz Filter	191.5	(2) RRU-11	175
800 MHz Filter	191.5	(2) RRU-11	175
800 MHz Filter	191.5	(2) RRU-11	175
(2) ACU-A20-N RET	191.5	(3) T-Arms MNT	175
ACU-A20-N RET	191.5	(2) 7770.00 w/Mount Pipe	175
ACU-A20-N RET	191.5	AIR B2A/B4P w/Mount Pipe	155
APXVTM14-C-I20 w/ Mount Pipe	191.5	AIR B2A/B4P w/Mount Pipe	155
APXVTM14-C-I20 w/ Mount Pipe	191.5	AIR B4A/B2P w/Mount Pipe	155
APXVTM14-C-I20 w/ Mount Pipe	191.5	AIR B4A/B2P w/Mount Pipe	155
TD-RRH8x20-25	191.5	AIR B4A/B2P w/Mount Pipe	155
TD-RRH8x20-25	191.5	KRY 112 144-1 Double TMA	155
TD-RRH8x20-25	191.5	KRY 112 144-1 Double TMA	155
(2) 980F90T2E-M w/ Mount Pipe	191.5	KRY 112 144-1 Double TMA	155
BXA-70063-6CF-2 w/ Mount Pipe	185	(3) T-Arms (Assumed) MNT	155
BXA-70063-6CF-2 w/ Mount Pipe	185	AIR B2A/B4P w/Mount Pipe	155
(2) LPA-80063/4CF w/ Mount Pipe	185	APXV18-206517S-C w/Mount Pipe	145
(2) LPA-80063/4CF w/ Mount Pipe	185	APXV18-206517S-C w/Mount Pipe	145
(2) LPA-80063/4CF w/ Mount Pipe	185	(3) T-Arms (Assumed) MNT	145
BXA-171063-8BF-2 w/ Mount Pipe	185	APXV18-206517S-C w/Mount Pipe	145
BXA-171063-8BF-2 w/ Mount Pipe	185	(1) Standoff Mount	100
BXA-171063-8BF-2 w/ Mount Pipe	185	MPRD2449	100
(2) FD9R6004/2C-3L Diplexer	185		

### MATERIAL STRENGTH

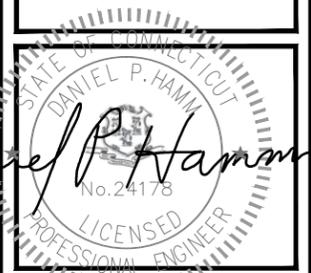
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

### TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 95.7%

**FDH Engineering, Inc.**  
 6521 Meriden Drive, Suite 107  
 Raleigh, NC 27616  
 Phone: 9197551012  
 FAX: 9197551031

Job: **Torrington/Oandg Ind Inc, CT46138-A-03**  
 Project: **1462GR1400**  
 Client: **SBA Network Services, Inc.** Drawn by: **Adam Stage** App'd:  
 Code: **TIA/EIA-222-F** Date: **04/10/14** Scale: **NTS**  
 Path: **C:\Users\Adam.Stage\Desktop\CT46138-A Torrington\_Oandg Ind CT1462GR1400\Analysis\Torrington\_Oandg Ind CT46138-A.dwg** Dwg No. **E-1**



CHECKED BY: KB

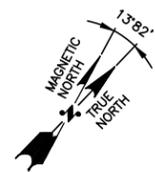
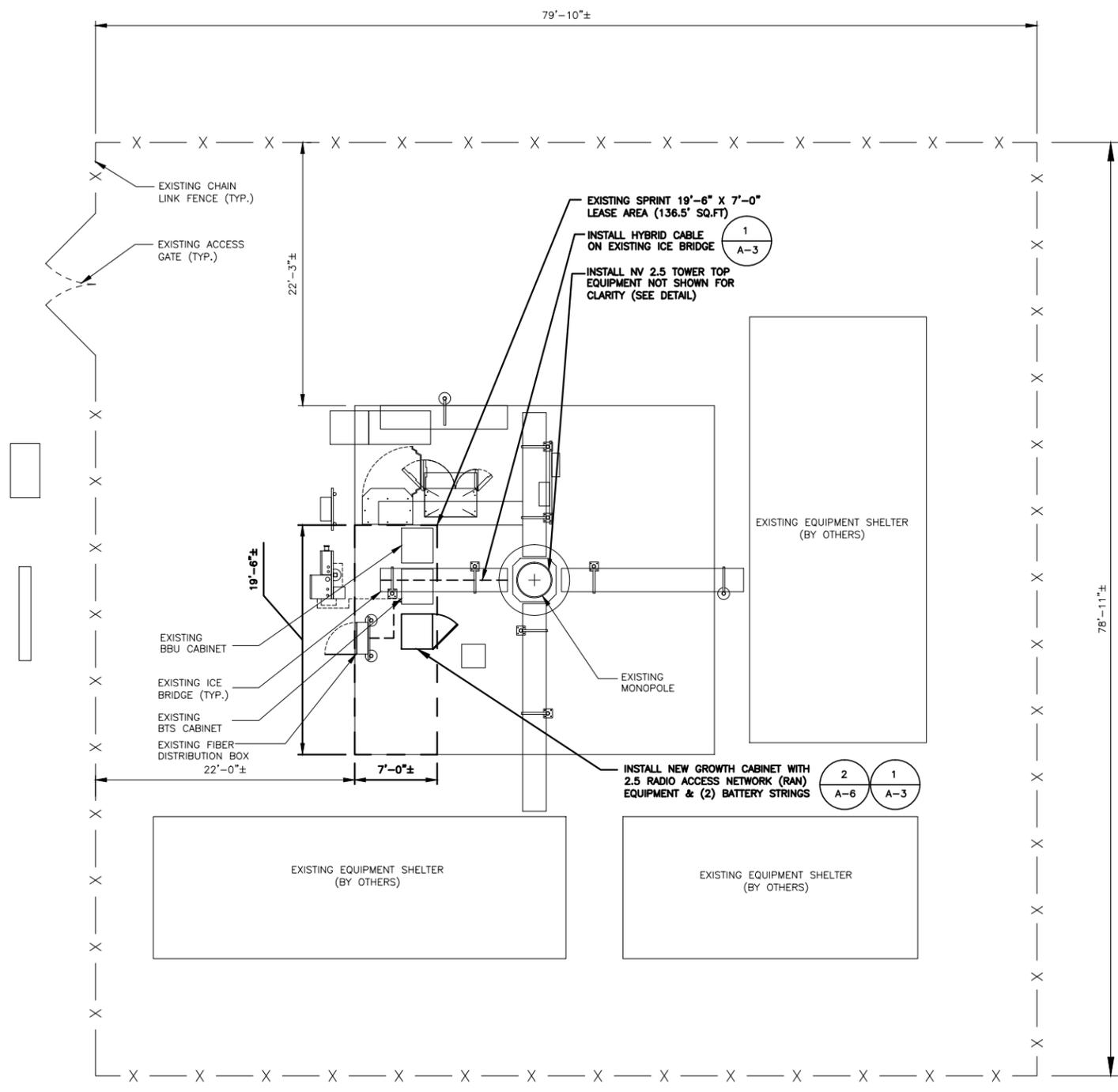
APPROVED BY: DPH

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	06/09/14	ISSUED FOR CONSTRUCTION	SF
0	05/16/14	ISSUED FOR CONSTRUCTION	SF

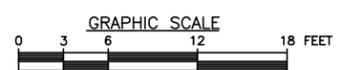
SITE NUMBER:  
CT33XC079-F  
SITE NAME:  
TORRINGTON /  
O & G IND, INC  
SITE ADDRESS:  
350 BURR MOUNTAIN ROAD  
TORRINGTON, CT 06790

SHEET TITLE  
COMPOUND PLAN

SHEET NUMBER  
A-1



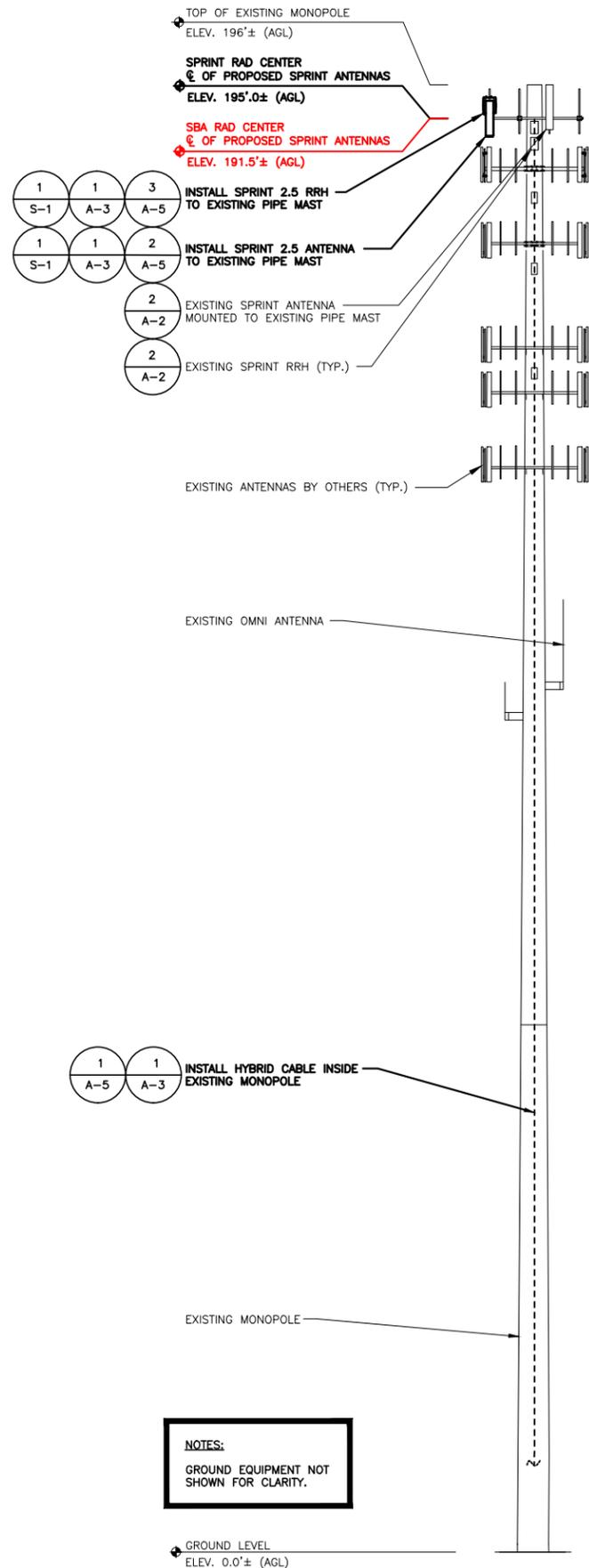
**COMPOUND PLAN**  
SCALE: 1" = 6'



SOURCE: HDG 04-01-14

**RAN EQUIPMENT PHOTO DETAIL**  
SCALE: N.T.S.

*Daniel P. Hamm*



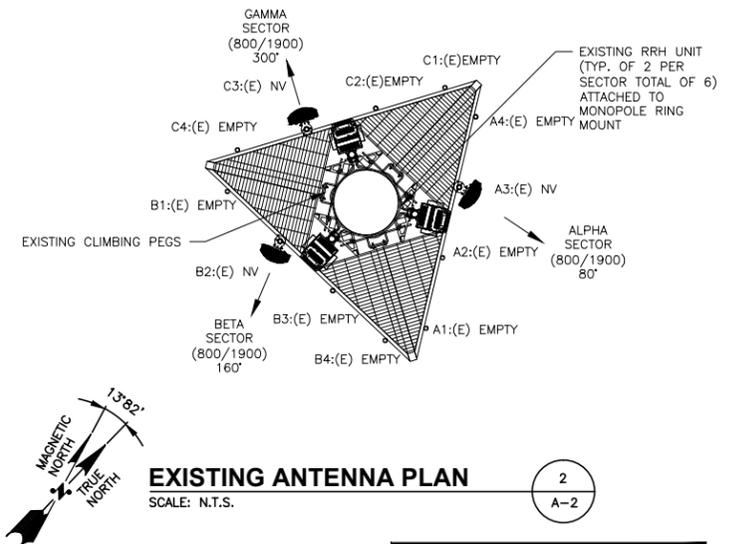
**SPECIAL CONSTRUCTION NOTE:**  
 SPRINT TOWER TOP WORK IS CONTINGENT ON THE FOLLOWING:  
 \* COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS (PROVIDED BY TOWER OWNER).  
 \* COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT (PROVIDED BY A&E VENDOR).  
 \* GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS AS INDICATED IN BEFORE-MENTIONED ANALYSIS AND ASSESSMENT.  
 \* SBA COMMUNICATIONS CORPORATION SHALL PROVIDE WRITTEN ACCEPTANCE/APPROVAL FOR THE COMPLETION OF ALL TOWER/FOUNDATION STRUCTURAL MODIFICATIONS INCLUDING (AS NECESSARY) CONTROLLED CONSTRUCTION INSPECTIONS, SHOP-DRAWING APPROVALS, MATERIALS TEST RESULTS, AND FINAL ENGINEER'S AFFIDAVIT.

**NOTE:**  
 SPRINT RAD CENTER SHOWN IN RED TEXT BASED ON SBA-PROVIDED COLLOCATION APPLICATION, EQUIPMENT DATABASE, AND STRUCTURAL ANALYSIS. THE SBA-PROVIDED ANTENNA RAD CENTER SHALL SUPERSEDE ANY CONFLICTING INFORMATION DERIVED FROM THE SPRINT NV 2.5 RFDS.

**NOTE:**  
 EXISTING AZIMUTHS FROM SPRINT FINAL CD DATED 07-10-13

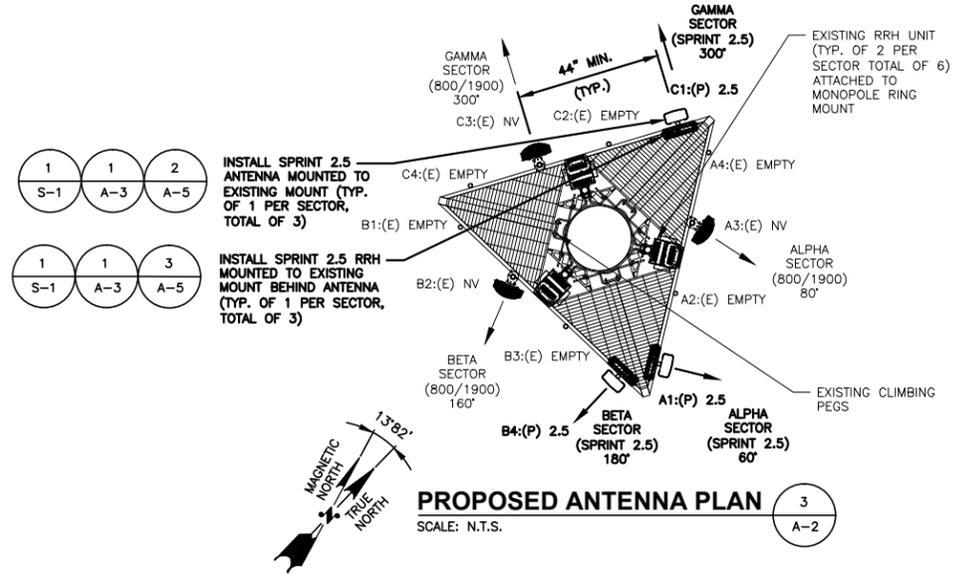


**EXISTING PARTIAL ELEVATION PHOTO DETAIL**  
 SCALE: N.T.S.



**SPECIAL WORK NOTE:**  
 JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA CAN NOT EXCEED 15'. NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY DISCREPANCY.

**NOTES:**  
 VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION



**Sprint**

1 INTERNATIONAL BLVD, SUITE 800  
 MAHWAH, NJ 07495  
 TEL: (800) 357-7641

**SBA**

SBA COMMUNICATIONS CORP.  
 33 BOSTON POST ROAD WEST, SUITE 320  
 MARLBOROUGH, MA 01752 TEL: (508) 251-0720

**Hudson Design Group**

1600 OSGOOD STREET  
 BUILDING 20 NORTH, SUITE 3090  
 N. ANDOVER, MA 01845 TEL: (978) 557-5553 FAX: (978) 336-5586

STATE OF CONNECTICUT  
 DANIEL P. HAMM  
 No. 24178  
 LICENSED PROFESSIONAL ENGINEER

CHECKED BY: KB  
 APPROVED BY: DPH

**SUBMITTALS**

REV.	DATE	DESCRIPTION	BY
1	06/09/14	ISSUED FOR CONSTRUCTION	SF
0	05/16/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:  
 CT33XC079-F  
 SITE NAME:  
 TORRINGTON / O & G IND, INC  
 SITE ADDRESS:  
 350 BURR MOUNTAIN ROAD  
 TORRINGTON, CT 06790

SHEET TITLE  
 ELEVATION AND ANTENNA PLANS

SHEET NUMBER  
 A-2

