



May 30, 2014

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

RE: Notice of Exempt Modification
11 Francis J. Clarke Circle
Bethel, CT 06801
Sprint Site #: NV2.5_CT33XC521-A
N 41° 21' 36.27"
W -73° 25' 30.06"

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 11 Francis J. Clarke Circle, Bethel, CT.

The 11 Francis J. Clarke Circle facility consists of a 155' MONOPOLE Tower owned and operated by SBA Towers, 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,



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



**Sprint Spectrum
Equipment Modification**

11 Francis J. Clarke Circle, Bethel, CT
Site number CT33XC521-A

Tower Owner: SBA Towers, LLC

Equipment Configuration: MONOPOLE Tower

Current and/or approved:

- (3) RFS APXVSP18-C-A20
- (3) Alcatel Lucent 1900 MHz RRH
- (3) Alcatel Lucent 800 MHz RRH
- (3) Alcatel Lucent 800 MHz Filter
- (4) RFS ACU-A20-N RET
- (3) 1-1/4" Feed Lines

Planned Modifications:

- (3) RFS APXVSP18-C-A20
- (3) Alcatel Lucent 1900 MHz RRH
- (3) Alcatel Lucent 800 MHz RRH
- (3) Alcatel Lucent 800 MHz Filter
- (4) RFS ACU-A20-N RET
- (3) RFS APXVTM14-C-I20
- (3) Alcatel Lucent TD-RRH8x20-25 RRHs
- (3) 1-1/4" Feed Lines
- (1) 1-1/4" Feed Lines

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 0.56% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 52.63% of the allowable FCC established general public limit sampled at the ground level.

Site Composite MPE %	
Carrier	MPE %
Sprint	0.56%
AT&T	15.14%
MetroPCS	3.50%
Verizon Wireless	23.05%
Nextel	7.14%
Clearwire	0.75%
Sprint Microwave	0.03%
Sprint / Nextel WiMAX	2.46%
Total Site MPE %	52.63%



May 30, 2014

Mr. Matt Knickerbocker
First Selectman
Town of Bethel
1 School Street
Bethel, CT 06801

RE: Telecommunications Facility @ 11 Francis J. Clarke Circle, Bethel, CT

Dear Mr. Knickerbocker,

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,

Kri Pelletier
SBA Communications Company
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



May 30, 2014

Costa Stergue
562 Redding Road
Redding, CT 06896-1903

RE: Telecommunications Facility @ 11 Francis J. Clarke Circle, Bethel, CT

Dear Property Owner:

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 positioned below the "Thank you," text.

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

Sprint Existing Facility

Site ID: CT33XC521

Bethel / SBA Towers

11 Francis J. Clarke Circle
Bethel, CT 06801

May 28, 2014

EBI Project Number: 62143099

May 28, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT33XC521 - Bethel / SBA Towers

Site Total: 52.63% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 11 Francis J. Clarke Circle, Bethel, 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 11 Francis J. Clarke Circle, Bethel, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

- 1) 4 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 minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

- 6) The antennas used in this modeling are the RFS APXVSPP18-C-A20 and the RFS APXVTM14-C-I20. 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 APXVTM14-C-I20 has a 15.9 dBd gain value at its main lobe at 2500 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antenna mounting height centerline for the proposed antennas is **157.4 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	CT33XC521 - Bethel / SBA Towers
Site Address	11 Francis J. Clarke Circle, Bethel, CT, 06801
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 (10 db reduction)	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	4	80	1.59	157.4	151.4	1/2 "	0.5	3	51.53	0.08%
1a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	1.34	157.4	151.4	1/2 "	0.5	3	12.16	0.03%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	1.59	157.4	151.4	1/2 "	0.5	3	25.77	0.07%
Sector total Power Density Value:																0.19%

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 (10 db reduction)	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	4	80	1.59	157.4	151.4	1/2 "	0.5	3	51.53	0.08%
2a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	1.34	157.4	151.4	1/2 "	0.5	3	12.16	0.03%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	1.59	157.4	151.4	1/2 "	0.5	3	25.77	0.07%
Sector total Power Density Value:																0.19%

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 (10 db reduction)	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	4	80	1.59	157.4	151.4	1/2 "	0.5	3	51.53	0.08%
3a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	1.34	157.4	151.4	1/2 "	0.5	3	12.16	0.03%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	1.59	157.4	151.4	1/2 "	0.5	3	25.77	0.07%
Sector total Power Density Value:																0.19%

Site Composite MPE %	
Carrier	MPE %
Sprint	0.56%
AT&T	15.14%
MetroPCS	3.50%
Verizon Wireless	23.05%
Nextel	7.14%
Clearwire	0.75%
Sprint Microwave	0.03%
Sprint / Nextel WiMAX	2.46%
Total Site MPE %	52.63%

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 **0.56% (0.19% from sector 1, 0.19% from sector 2 and 0.19% from sector 3)** 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 **52.63%** 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 Meriden Drive Raleigh, NC 27616, Ph. 919.755.1012

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

155' Monopole Tower

**SBA Site Name: North Bethel
SBA Site ID: CT00248-S-02
Sprint Site Name: Bethel SBA Towers, Inc.
Sprint Site ID: CT33XC521**

FDH Project Number 1462H51400

Analysis Results

Tower Components	92.4 %	Sufficient
Foundation	86.0 %	Sufficient

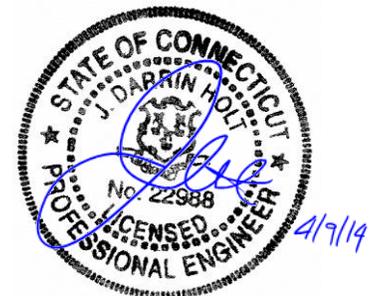
Prepared By:

Diana Tang, EIT
Project Engineer

Reviewed By:

J. Darrin Holt, PhD, PE
Principal
CT PE License No. 22988

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



April 9, 2014

Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and 2005 Connecticut 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 Bethel, 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*. Information pertaining to the existing/proposed antenna loading, current tower geometry, foundation dimensions, geotechnical data, and member sizes was obtained from:

- Summit Manufacturing LLC. (Job No. 4071) original design drawings dated October 22, 1998
- Paul J. Ford and Company (Job No. 29200-1210) Pad and Pier Foundation design drawings dated August 17, 2000
- Jaworski Geotech, Inc. (Project No. C98342E) Geotechnical Evaluation dated December 5, 2002
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and *2005 Connecticut Building Code* is 85 mph without ice and 38 mph with 3/4" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the existing and proposed antennas from Sprint in place at 157.4 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and *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 Paul J. Ford and Company Job No. 29200-1210), 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 Connecticut Building Code* are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed feed lines should be installed inside the pole 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	Feed Lines ¹	Carrier	Mount Elevation (ft)	Mount Type
157	(3) RFS APXVSP18-C-A20 (3) Alcatel Lucent 1900 MHz RRH (3) Alcatel Lucent 800 MHz RRH (3) Alcatel Lucent 800 MHz Filter (4) RFS ACU-A20-N RET	(3) 1-1/4"	Sprint	155	(1) Low Profile Platform
147	(9) Decibel DB844H90-XY	(9) 1-1/4"	Nextel	147	(1) Low Profile Platform
137	(2) Antel LPA-80080/6CF (2) Antel LPA-80063/6CF (2) Antel BXA-70063/4CF (2) Antel LPA-80080/4CF (3) Antel BXA-171063-8BF-2 (1) Swedcom SLCP 2x6014F (6) RFS FD9R6004/2CL-3CL Diplexer (1) GPS	(12) 1-5/8" (1) 1/2"	Verizon	137	(1) Low Profile Platform
127	(3) Powerwave 7770.00 (3) Powerwave P65-16-XL-2 (6) Powerwave LGP21401 TMA (6) Ericsson RRUS-11 RRUs (1) Raycap DC6-48-60-18-8F Surge Arrestor	(9) 1-1/4" (1) Fiber (2) DC Power Cables	AT&T	127	(1) Low Profile Platform
117	(3) Kathrein 800 10504 (3) Kathrein 742 351 (6) RETs	(12) 1-5/8" (1) 1/2"	Metro PCS	117 ²	(3) T-Arm Mounts

1. Feed lines installed inside the monopole shaft unless noted otherwise.

2. Metro PCS's (12) 1-5/8" coax are installed double stacked (6-on-6) outside the monopole shaft.

Proposed Loading:

Antenna Elevation (ft)	Description	Feed Lines	Carrier	Mount Elevation (ft)	Mount Type
157.4	(3) RFS APXVSP18-C-A20 (3) Alcatel Lucent 1900 MHz RRH (3) Alcatel Lucent 800 MHz RRH (3) Alcatel Lucent 800 MHz Filter (4) RFS ACU-A20-N RET (3) RFS APXVTM14-C-I20 (3) Alcatel Lucent TD-RRH8x20-25 RRHs	(3) 1-1/4" (1) 1-1/4"	Sprint	155	(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	50 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. *Note: Capacities up to 100% 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	155 - 120	Pole	TP26x16.5x0.1875	83.2	Pass
L2	120 - 89.5	Pole	TP33.91x24.7429x0.3125	84.1	Pass
L3	89.5 - 44	Pole	TP45.64x32.1306x0.375	82.7	Pass
L4	44 - 0	Pole	TP56.83x43.3286x0.375	85.9	Pass
		Anchor Bolts	(20) 2.25" Ø w/ BC = 64"	64.2	Pass
		Base Plate	64" Square PL x 2.75" Thick	92.4	Pass

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis (TIA/EIA-222-F)	Original Design (TIA/EIA-222-F)
Axial	37 k	54 k
Shear	30 k	33 k
Moment	3,385 k-ft	3,938 k-ft

GENERAL COMMENTS

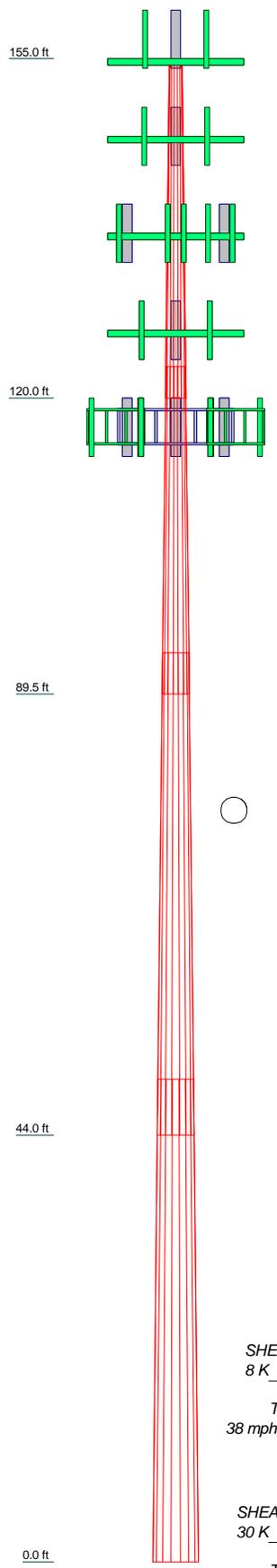
This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading 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
Length (ft)	35.00	33.75	49.75	49.75
Number of Sides	18	18	18	18
Thickness (in)	0.1875	0.3125	0.3750	0.3750
Socket Length (ft)	3.25	4.25	5.75	43.3286
Top Dia (in)	16.5000	24.7429	32.1306	56.8300
Bot Dia (in)	26.0000	33.9100	45.6400	10.0
Grade	A607-65			
Weight (K)	1.5	3.3	7.8	22.6



DESIGNED APPURTENANCE LOADING

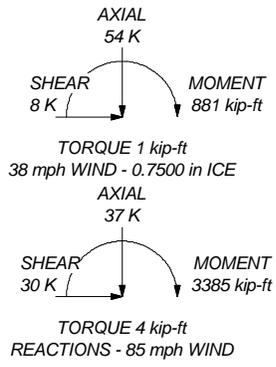
TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 403-1]	155	(2) FD9R6004/2CL-3CL Diplexer	137
APXVSP18-C-A20 w/Mount Pipe	155	(2) LPA-80063/6CF w/ Mount Pipe	137
APXVSP18-C-A20 w/Mount Pipe	155	GPS	137
APXVSP18-C-A20 w/Mount Pipe	155	(2) BXA-70063/4CF w/ Mount Pipe	137
1900 MHz RRH	155	(2) LPA-80080/4CF W/Mount Pipe	137
1900 MHz RRH	155	Platform Mount [LP 403-1]	137
1900 MHz RRH	155	(2) LPA-80080/6CF w/ Mount Pipe	137
800 MHz RRH	155	P65-16-XL-2 w/Mount Pipe	127
800 MHz RRH	155	(2) LGP21401 TMA	127
800 MHz RRH	155	(2) LGP21401 TMA	127
800 MHz Filter	155	(2) LGP21401 TMA	127
800 MHz Filter	155	(2) RRUS-11	127
800 MHz Filter	155	(2) RRUS-11	127
ACU-A20-N RET	155	(2) RRUS-11	127
ACU-A20-N RET	155	DC6-48-60-18-8F Surge Arrestor	127
(2) ACU-A20-N RET	155	Platform Mount [LP 403-1]	127
APXVTM14-C-I20 w/ Mount Pipe	155	7770.00 w/Mount Pipe	127
APXVTM14-C-I20 w/ Mount Pipe	155	7770.00 w/Mount Pipe	127
APXVTM14-C-I20 w/ Mount Pipe	155	7770.00 w/Mount Pipe	127
TD-RRH8x20-25	155	P65-16-XL-2 w/Mount Pipe	127
TD-RRH8x20-25	155	P65-16-XL-2 w/Mount Pipe	127
TD-RRH8x20-25	155	742 351 w/ Mount Pipe	117
Platform Mount [LP 403-1]	147	(2) RET	117
(3) DB844H90-XY w/ Mount Pipe	147	(2) RET	117
(3) DB844H90-XY w/ Mount Pipe	147	(2) RET	117
(3) DB844H90-XY w/ Mount Pipe	147	(3) T-Arms MNT	117
(2) BXA-171063-8BF-2	137	800 10504 w/ Mount Pipe	117
BXA-171063-8BF-2	137	800 10504 w/ Mount Pipe	117
SLCP 2x6014F w/ Mount Pipe	137	800 10504 w/ Mount Pipe	117
(2) FD9R6004/2CL-3CL Diplexer	137	742 351 w/ Mount Pipe	117
(2) FD9R6004/2CL-3CL Diplexer	137	742 351 w/ Mount Pipe	117

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. TOWER RATING: 85.9%



 FDH Engineering, Inc. 6521 Meriden Drive Raleigh, North Carolina 27616 Phone: (919) 755-1012 FAX: (919) 755-1031	Job: North Bethel, CT00248-S-02		
	Project: 1462H51400		
	Client: SBA	Drawn by: DTang	App'd:
	Code: TIA/EIA-222-F	Date: 04/09/14	Scale: NTS
Tower Analysis	Path:		Dwg No. E-1

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F / G

- Assumptions:**
- 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
 - 2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
 - 3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

Site ID: CT00248-S-02

Site Name: North Bethel

Job No. 1462H51400

Anchor Rod Data

Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	64	in
Anchor Spacing:	4	in

Plate Data

W=Side:	64	in
Thick:	2.75	in
Grade:	50	ksi
Clip Distance:	11	in

Stiffener Data (Welding at both sides)

Configuration:	Unstiffened	
Weld Type:		**
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data

Diam:	56.83	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor

ASD ASIF:	1.333	
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** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Base Reactions

TIA Revision:	F	
Unfactored Moment, M:	3385	ft-kips
Unfactored Axial, P:	37	kips
Unfactored Shear, V:	30	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	125.1 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	64.2% Pass

Base Plate Results

Base Plate Stress:	46.2 ksi	Flexural Check
Allowable PL Bending Stress:	50.0 ksi	
Base Plate Stress Ratio:	92.4% Pass	

PL Ref. Data

Yield Line (in):	33.68
Max PL Length:	33.68

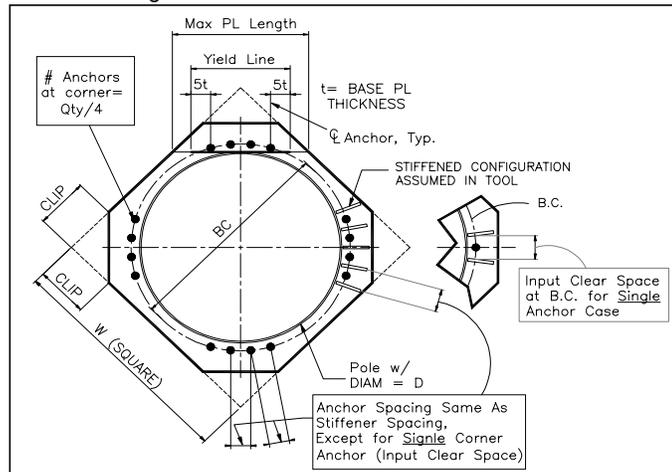
N/A - Unstiffened

Stiffener Results

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

Pole Results

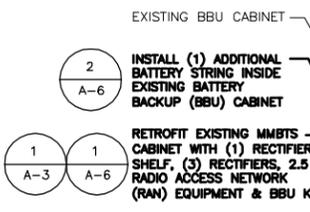
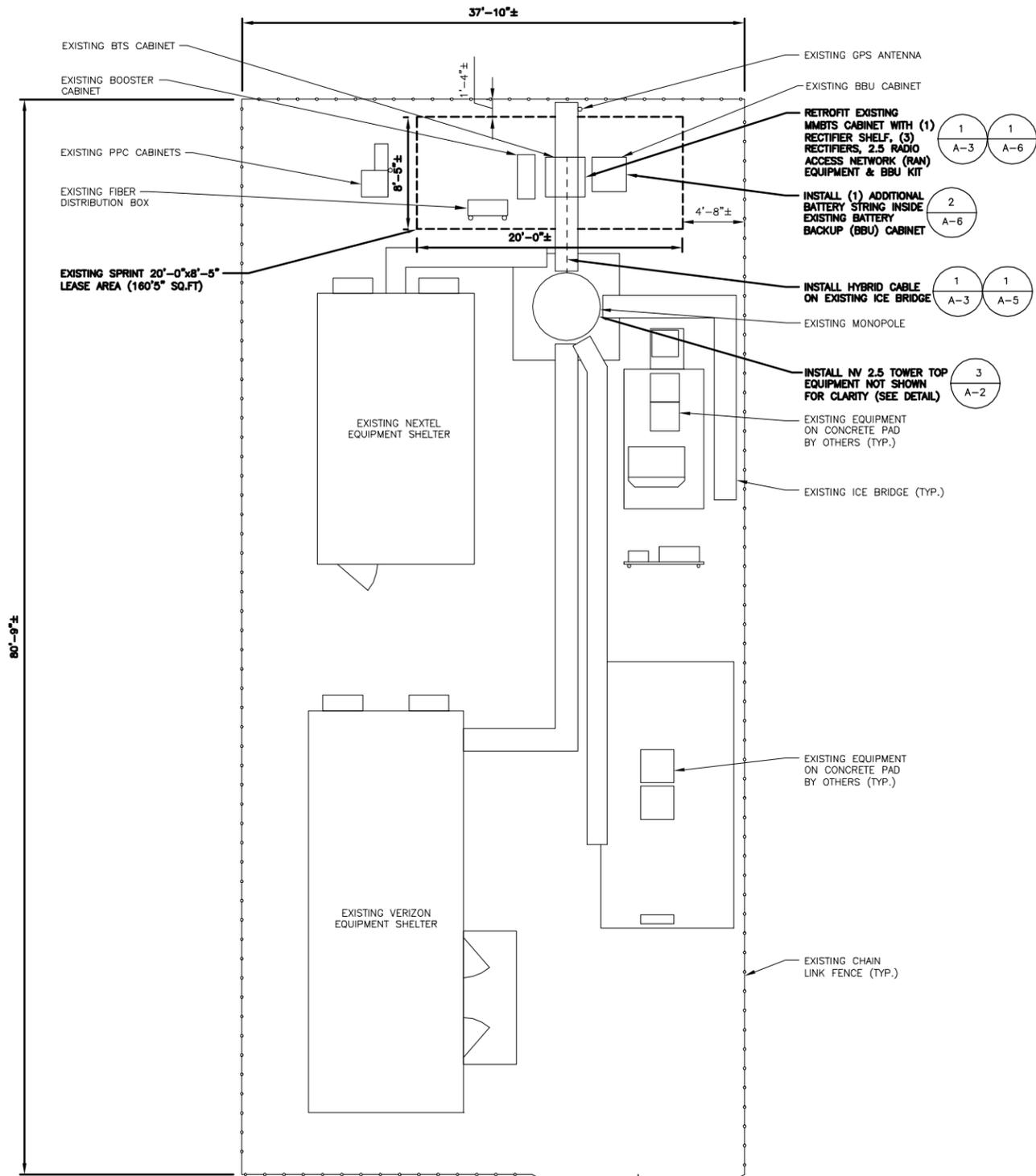
Pole Punching Shear Check:	N/A
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FOUNDATION REACTION COMPARISON

REACTIONS PER ANCHOR	DESIGN REACTIONS	CURRENT REACTION	% CAPACITY
AXIAL (kips)	54.0	37.0	68.5%
SHEAR (kips)	33.0	30.0	90.9%
MOMENT (kip-ft)	3938.0	3385.0	86.0%

Design loads from: Paul J. Ford & Company Job No. 29200-1210



SOURCE: HDG 05-07-14

RAN EQUIPMENT PHOTO DETAIL (2/A-1)
SCALE: N.T.S.



COMPOUND PLAN
SCALE: 3/16"=1'-0"

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

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

CHECKED BY: KB

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	05/22/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT33XC521-A
SITE NAME:
BETHEL SBA
TOWERS, INC.
SITE ADDRESS:
11 FRANCIS J. CLARKE CIRCLE
BETHEL, CT 06801

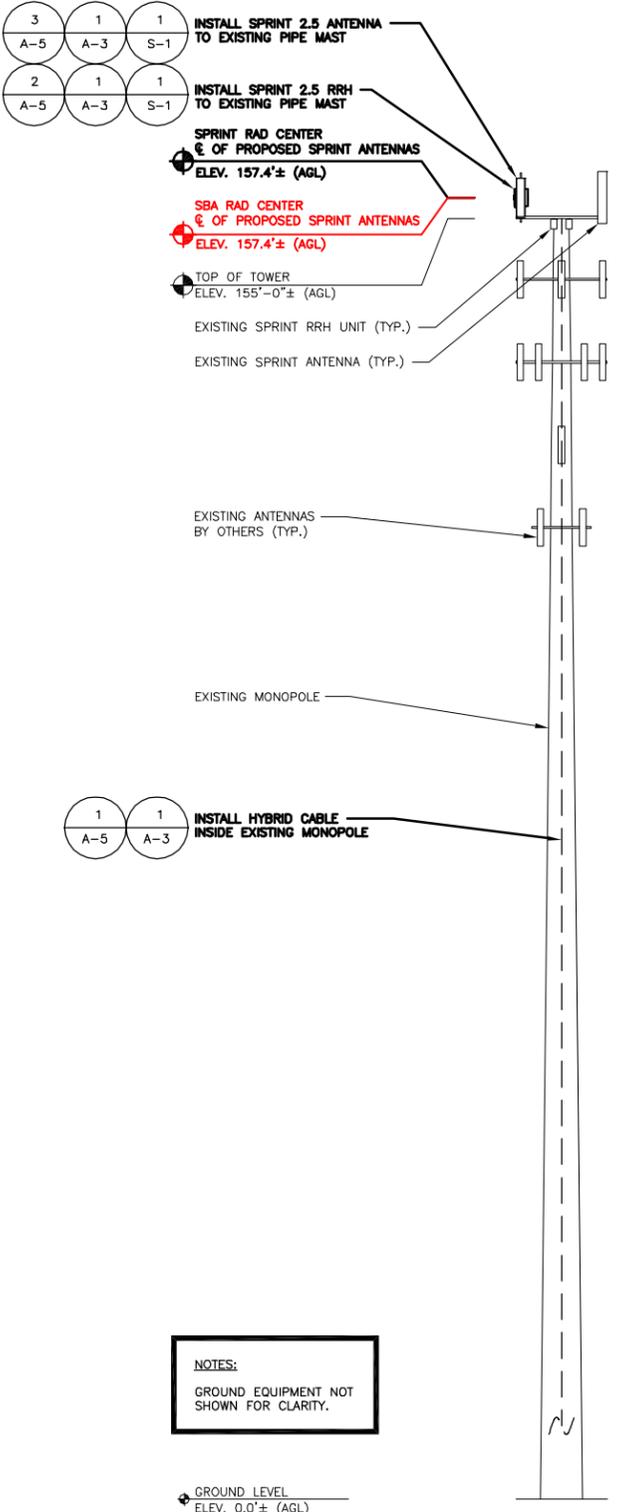
SHEET TITLE
COMPOUND PLAN

SHEET NUMBER
A-1

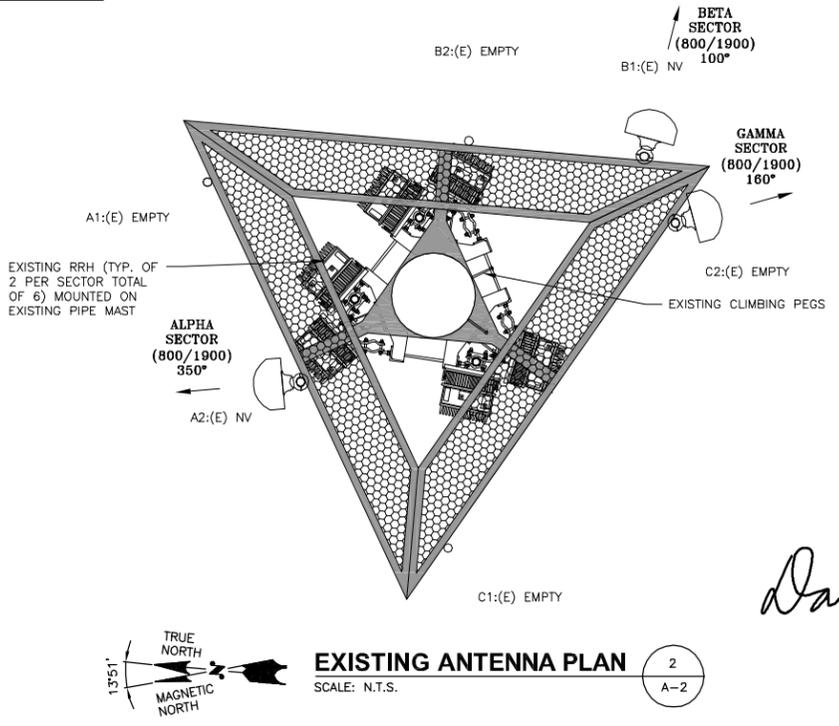
SPECIAL CONSTRUCTION NOTE:
 SPRINT TOWER TOP WORK IS CONTINGENT ON THE FOLLOWING:
 • COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS (PROVIDED BY TOWER OWNER).
 • COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT (PROVIDED BY A&E VENDOR).
 • GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED 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:
 EXISTING AZIMUTHS FROM FINAL CD DATED 09/11/13

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.



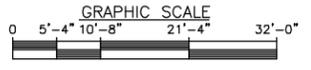
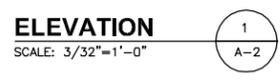
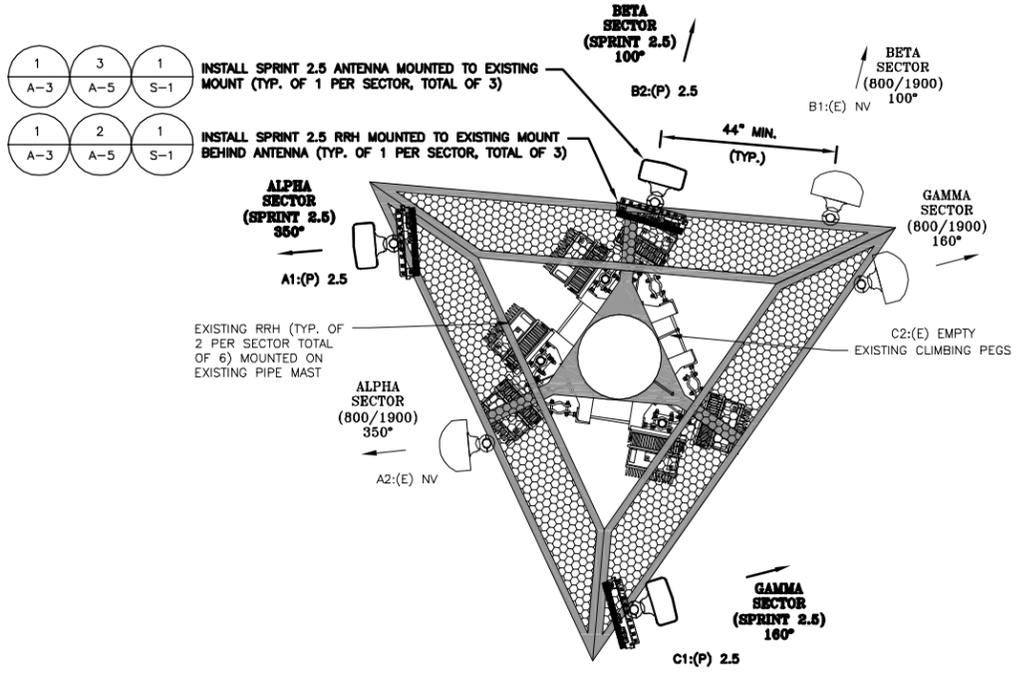
EXISTING PARTIAL PHOTO ELEVATION DETAIL
 SCALE: N.T.S.



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

NOTE:
 VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION

ANTENNA STATUS LEGEND:
 EMPTY - EMPTY PIPE
 (E) - EXISTING
 (P) - INSTALL
 NV - SPRINT ANTENNA MODEL APXVSP18-C-A20
 2.5 - SPRINT ANTENNA



Sprint

1 INTERNATIONAL BLVD, SUITE 800
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SITE ADDRESS:
 11 FRANCIS J. CLARKE CIRCLE
 BETHEL, CT 06801

SHEET TITLE
 ELEVATION AND ANTENNA PLANS

SHEET NUMBER
 A-2