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

December 14, 2012

Rick Woods
SBA Communications Corporation
33 Boston Post Road West Suite 320
Marlborough, MA 01752

RE: **EM-SPRINT-137-121126A** –Sprint Spectrum notice of intent to modify an existing telecommunications facility located at 86 Voluntown Road, Stonington, Connecticut.

Dear Mr. Woods:

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

- The coax lines and accessory equipment shall be installed in accordance with the recommendations made in the Structural Analysis Report prepared by FDH Engineering dated September 28, 2012 and stamped by Christopher Murphy; and
- Not more than 45 days following completion of the antenna installation, Sprint shall provide documentation certifying that its installation complied with the engineer's recommendation.
- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not more than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated November 20, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

CSC
CONNECTICUT SITING COUNCIL

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

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/CDM/cm

c: The Honorable Ed Haberek Jr., First Selectman, Town of Stonington
Keith Brynes, Town Planner, Town of Stonington

EM-SPRINT-137-121126A

SBA

November 20, 2012

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

ORIGINAL

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NOV 26 2012
CONNECTICUT
SITING COUNCIL

RE: Notice of Exempt Modification
86 Voluntown Road
Stonington, CT 06379
N 41 ° 24' 19.94"
W 71 ° 50' 42.89"

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 86 Voluntown Road Stonington, CT.

The 86 Voluntown Road facility consists of a 193' 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 cal me at (508) 614-0389 with any questions you may have concerning this matter.

Thank you,

Rick Woods
SBA Communications Corporation
33 Boston Post Road West Suite 320
Marlborough, MA 01752
508-251-1691 x 319 + T
508-251-1755 + F
508-614-0389 + C
rwoods@sbasite.com

[redacted]

SBA

Sprint Spectrum

Equipment Modification

86 Voluntown Road Stonington, CT
Site number CT03XC108

Tower Owner: SBA Communications Corporation

Equipment Configuration: MONOPOLE Tower

Current and/or approved:
Six (6) CDMA Antennas @ 193'
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 @ 193'
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 8.538% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 32.498% of the allowable FCC established general public limit sampled at the ground level.

Site Composite MPE %	
Carrier	MPE %
Sprint	8.538%
Nextel	1.760%
T-Mobile	2.980%
Metro PCS	4.640%
AT&T	3.520%
Verizon Wireless	11.060%
Total Site MPE %	32.498%

[redacted]

November 20, 2012

Honorable Edward Haberek, Jr.
First Selectman
Town of Stonington
152 Elm Street
Stonington, CT 06378

RE: Telecommunications Facility-86 Voluntown Road Stonington, CT 06379

Dear Mr. Haberek,

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
33 Boston Post Road West Suite 320
Marlborough, MA 01752
508-251-1691 x 319 + T
508-251-1755 + F
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rwoods@sbasite.com

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

Sprint Existing Facility

Site ID: CT03XC108

Stonington East
86 Voluntown Road
Stonington, CT 06379

October 18, 2012

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

EBI Consulting
environmental | engineering | due diligence

October 18, 2012

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

Re: Emissions Values for Site: **CT03XC108 – Stonington East**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 86 Voluntown Road, Stonington, CT, for the purpose of determining whether the emissions from the proposed Sprint equipment upgrades on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of μW/cm2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the cellular band is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the PCS band is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 86 Voluntown Road, Stonington, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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

6) The antenna mounting height centerline of the proposed antennas is **193 feet** above ground level (AGL)
7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

Site ID	CT03XC108 - Stonington East
Site Addresss	86 Voluntown Road, Stonington, CT, 06379
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	15.9	193	187	1/2 "	0.5	0	2080.4211	21.38819	2.13882%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	193	187	1/2 "	0.5	0	389.96892	4.009154	0.70708%
														Sector total Power Density Value:			2.846%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	15.9	193	187	1/2 "	0.5	0	2080.4211	21.38819	2.13882%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	193	187	1/2 "	0.5	0	389.96892	4.009154	0.70708%
														Sector total Power Density Value:			2.846%

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
3a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	15.9	193	187	1/2 "	0.5	0	2080.4211	21.38819	2.13882%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	193	187	1/2 "	0.5	0	389.96892	4.009154	0.70708%
														Sector total Power Density Value:			2.846%

Site Composite MPE %	
Carrier	MPE %
Sprint	8.538%
Nextel	1.760%
T-Mobile	2.980%
Metro PCS	4.640%
AT&T	3.520%
Verizon Wireless	11.060%
Total Site MPE %	32.498%

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Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **8.538% (2.846% 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 **32.498%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions

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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

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: Stonington East
SBA Site ID: CT00595-S
Sprint Site ID: CT03XC108
Sprint Site Name: Stonington East

FDH Project Number 12-09275E S2

Analysis Results

Tower Components	98.2%	Sufficient
Foundation	97.3%	Sufficient

Prepared By:

Nick Schauer, 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

September 28, 2012

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

TABLE OF CONTENTS

EXECUTIVE SUMMARY

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

- ❑ Valmont Industries, Inc. (Order No. 17507-98) Communication Pole Record Drawings dated June 23, 1998
- ❑ SAGE Environmental, Inc. (Project No. G004) geotechnical report dated June 10, 1998
- ❑ SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and *2005 CT 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 195 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and *2005 CT Building Code* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Valmont Industries, Inc. Order No. 17507-98), 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 *2005 CT Building Code* are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed coax must 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[1]	Carrier	Mount Elevation (ft)	Mount Type
193	(6) Decibel DB980H90E-M w/Mount Pipe	(6) 1-5/8"	Sprint	193	(1) Low Profile Platform
180	(9) Swedcom ALP 9212-N w/ Mount Pipe	(9) 1-5/8"	Nextel	180	(1) T-Arms w/Working Platform
167	(3) EMS RR90-17-02DP w/Mount Pipe (3) RFS APX16DWV-16DWV-A20 w/Mount Pipe (3) RFS Twin PCS TMA (3) RFS Twin AWS TMA	(12) 1-5/8"	T-Mobile	165	(1) Low Profile Platform
150	(6) Powerwave 7700.00 w/Mount Pipe (2) Powerwave P65-17-XLH-RR w/Mount Pipe (1) KMW AM-X-CD-14-65-00T w/ Mount Pipe (6) Powerwave LGP21401 TMAs (6) Powerwave LGP13519 TMA Diplexers (6) Ericsson RRUS-11 RRUs (1) Raycap DC6-48-60-18-8F Surge Arrestor	(12) 1-5/8" (2) DC Cables (1) Fiber Cable	New Cingular	150	(1) Low Profile Platform
140	(6) Antel RWA-80014 w/Mount Pipe (3) Antel BXA-70063/6CF w/ Mount Pipe (3) Rymsa MGD5-800T2 w/Mount Pipe (6) RFS FD9R6004/2C-3L Diplexers	(12) 1-5/8"	Verizon[2]	140	(1) Low Profile Platform
130	(6) Kathrein 742 351 w/Mount Pipe	(12) 1-5/8"	Metro PCS[3]	130	(1) Low Profile Platform
30	(1) GPS	---	Sprint	30	(1) Standoff

1. Coax installed inside the pole's shaft unless otherwise noted.
2. Verizon's coax are installed outside the pole's shaft in a single row.
3. Metro PCS's coax are installed outside the pole's shaft in a single row.

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
195	(3) RFS APXVSPP18-C-A20w/Mount Pipe (3) ALU 1900MHZ RRHs (3) ALU 800MHZ RRHs (3) ALU 800MHZ RRH Filters (4) RFS ACU-A20-N RETs	(3) 1.5" (7) LCF12-50J Jumpers	Sprint	193	(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	60 ksi
Anchor Bolts	75 ksi (assumed)

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	196 - 154.75	Pole	TP27.76x17.39x0.1875	72.5	Pass
L2	154.75 - 118.75	Pole	TP36.42x26.3166x0.3125	82.0	Pass
L3	118.75 - 74.5	Pole	TP46.91x34.4772x0.375	95.6	Pass
L4	74.5 - 35.5	Pole	TP55.97x44.5274x0.4375	93.3	Pass
L5	35.5 - 0	Pole	TP64x53.2089x0.4688	98.2	Pass
	0	Anchor Bolts	(24) 2.25"Ø on a 72.76" BC	81.6	Pass
	0	Base Plate	PL 2.5" x 78.75"Ø	83.7	Pass

**Capacities utilize 1/3 allowable stress increase for wind per TIA/EIA-222-F.*

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis* *(TIA/EIA-222-F)*	Original Design *(TIA/EIA-222-F)*
Axial	58 k	60 k
Shear	48 k	45 k
Moment	5,873 k-ft	5,768 k-ft

** Foundation determined to be adequate per independent analysis.*

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.

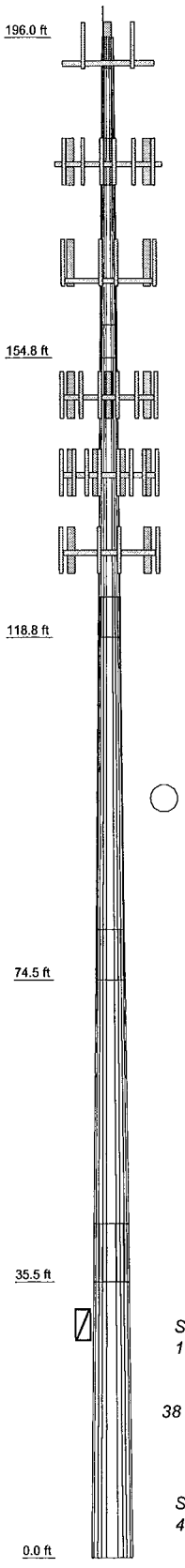
LIMITATIONS

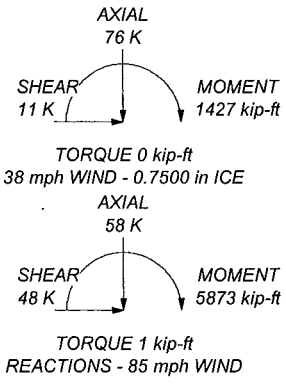
All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided 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)	41.25	40.25	49.50	45.50	43.00
Number of Sides	12	12	12	12	12
Thickness (in)	0.1875	0.3125	0.3750	0.4375	0.4688
Socket Length (ft)	4.25	5.25	6.50	7.50	
Top Dia (in)	17.3900	26.3166	34.4772	44.5274	53.2089
Bot Dia (in)	27.7600	36.4200	46.9100	55.9700	64.0000
Grade			A572-65		
Weight (K)	1.9	4.3	8.2	10.9	12.8

38.1





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	196	(2) 7700.00 w/Mount Pipe	150
APXVSPP18-C-A20 w/Mount Pipe	193	(2) 7700.00 w/Mount Pipe	150
APXVSPP18-C-A20 w/Mount Pipe	193	P65-17-XLH-RR w/Mount Pipe	150
APXVSPP18-C-A20 w/Mount Pipe	193	P65-17-XLH-RR w/Mount Pipe	150
1900 MHz RRH	193	AM-X-CD-14-65-00T w/ Mount Pipe	150
1900 MHz RRH	193	(2) Powerwave LGP21401 TMAs	150
1900 MHz RRH	193	(2) Powerwave LGP21401 TMAs	150
800 MHz RRH	193	(2) Powerwave LGP21401 TMAs	150
800 MHz RRH	193	(2) Powerwave LGP13519 TMA Diplexers	150
800 MHz RRH	193		
800 MHz Filter	193	(2) Powerwave LGP13519 TMA Diplexers	150
800 MHz Filter	193		
800 MHz Filter	193	(2) Powerwave LGP13519 TMA Diplexers	150
ACU-A20-N RET	193		
ACU-A20-N RET	193	(2) RRUS-11	150
(2) ACU-A20-N RET	193	(2) RRUS-11	150
(1) Low Profile Platform MNT	193	(2) RRUS-11	150
(3) ALP 9212-N w/ Mount Pipe	180	DC6-48-60-18-8F Surge Arrestor	150
(3) ALP 9212-N w/ Mount Pipe	180	(1) Low Profile Platform MNT	150
(3) ALP 9212-N w/ Mount Pipe	180	(2) RWA-80014 w/Mount Pipe	140
(1) T-Arms w/Working Platform MNT	180	(2) RWA-80014 w/Mount Pipe	140
RR90-17-02DP w/Mount Pipe	165	(2) RWA-80014 w/Mount Pipe	140
RR90-17-02DP w/Mount Pipe	165	BXA-70063/6CF w/ Mount Pipe	140
RR90-17-02DP w/Mount Pipe	165	BXA-70063/6CF w/ Mount Pipe	140
RFS APX16DWV-16DWV-A20 w/Mount Pipe	165	BXA-70063/6CF w/ Mount Pipe	140
		MGD5-800TX w/Mount Pipe	140
RFS APX16DWV-16DWV-A20 w/Mount Pipe	165	MGD5-800TX w/Mount Pipe	140
		MGD5-800TX w/Mount Pipe	140
RFS APX16DWV-16DWV-A20 w/Mount Pipe	165	(2) RFS FD9R6004/2C-3L Diplexers	140
		(2) RFS FD9R6004/2C-3L Diplexers	140
RFS Twin PCS TMA	165	(2) RFS FD9R6004/2C-3L Diplexers	140
RFS Twin PCS TMA	165	(1) Low Profile Platform MNT	140
RFS Twin PCS TMA	165	(2) 742 351 w/Mount Pipe	130
RFS Twin AWS TMA	165	(2) 742 351 w/Mount Pipe	130
RFS Twin AWS TMA	165	(2) 742 351 w/Mount Pipe	130
RFS Twin AWS TMA	165	(1) Low Profile Platform MNT	130
(1) Low Profile Platform MNT	165	GPS	30
(2) 7700.00 w/Mount Pipe	150	(1) Standoff MNT	30

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New London 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 50 mph wind.
5. TOWER RATING: 98.2%

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

Job: Stonington East, CT00595-S			
Project: 12-09275E S2			
Client: SBA	Drawn by: Nick Schauer	App'd:	
Code: TIA/EIA-222-F	Date: 09/28/12	Scale: NTS	
Path:		Dwg No. E-1	

STRUCTURAL DESIGNS AND DETAILS FOR ANTENNA MOUNTS AND RRH MOUNTS COMPLETED BY COM-EX CONSULTANTS ON BEHALF OF ALCATEL-LUCENT ARE INCLUSIVE OF THE ENTIRE ANTENNA STRUCTURE, INCLUDING TOWERS (ANALYZED BY OTHERS), TOWER PLATFORMS, ARMS AND ALL OTHER ASPECTS OF THE STRUCTURE THAT WILL SUPPORT THE SPRINT NETWORK VISIONS EQUIPMENT DEPLOYMENT FOR THE INTERIM AND FINAL EQUIPMENT SCENARIOS.

Sprint® VISION

SITE NUMBER:

CT03XC108

SITE NAME:

STONINGTON EAST

SITE ADDRESS:

86 VOLUNTOWN ROAD
STONINGTON, CT 06379

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 MAY BE DETERMINED BY TENANT AND/OR THE SERVICING UTILITY COMPANY IN COMPLIANCE WITH LOCAL LAWS AND REGULATIONS.

SBA SITE #: CT00595-S-02
SBA SITE NAME: STONINGTON EAST

CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811

Sprint VISION
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
PHONE: (201) 684-4000 FAX (201) 684-4223

Alcatel·Lucent
1 ROBBINS ROAD
WESTFORD, MA 01886
OFFICE: (978) 692-1153

SBA
SBA COMMUNICATION CORP.
5900 BROKEN SOUND PARKWAY
BOCA RATON, FL 33487
TEL: (561) 226-9523
FAX: (561) 226-3572

COM-EX Consultants
4 SECOND AVENUE
SUITE 204
DENVILLE, NJ 07834
PHONE: 862.209.4300
FAX: 862.209.4301

SITE INFORMATION

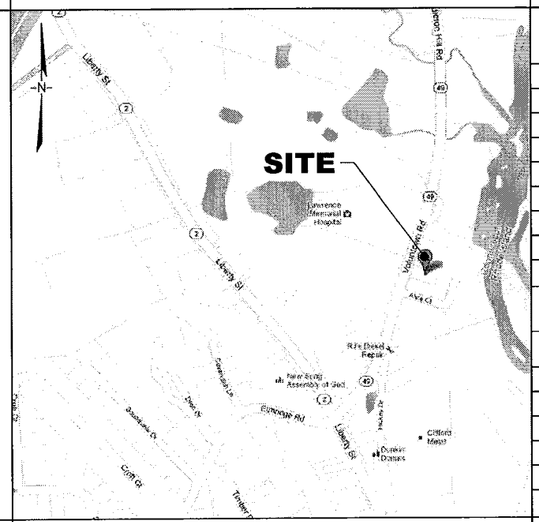
SITE ID NUMBER:	CT03XC108
SITE NAME:	STONINGTON EAST
SITE ADDRESS:	86 VOLUNTOWN ROAD STONINGTON, CT 06379
PARCEL ID:	00671600
COUNTY:	NEW LONDON
COORDINATES: (*)	N 41° 24' 19.94" W 71° 50' 42.89"
GROUND ELEVATION: (*)	53' AMSL
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	±193' AGL
ANTENNA HEIGHT (**) (RAD CENTER):	SECTOR 1: ±193.0' SECTOR 2: ±193.0' SECTOR 3: ±193.0'

(*) - COORDINATES DETERMINED FROM SPRINT SITERRA DATABASE AND CONFIRMED BY ALCATEL-LUCENT USING GOOGLE EARTH

(**) - NOTE: NETWORK VISION ANTENNA RADIATION CENTERLINE AGL (FEET) BASED ON SBA EQUIPMENT DATABASE AND SBA TOWER STRUCTURAL ANALYSIS AND WILL SUPERSEDE ANY CONFLICTING INFORMATION DERIVED FROM THE ALU/SPRINT DATABASE

PROPERTY OWNER:	BLACKROCK PROP 2 LLC PO BOX 1113 MIAMISBURG, OH 45343
STRUCTURE OWNER:	SBA TOWERS, LLC 5900 BROKEN SOUND PARKWAY BOCA RATON, FL 33487
LOCAL POWER COMPANY:	CONNECTICUT LIGHT & POWER CO.
LOCAL TELEPHONE COMPANY:	COX
APPLICANT:	SPRINT 1 INTERNATIONAL BLVD - SUITE 800 MAHWAH, NJ 07495 PHONE: (201) 684-4000
APPLICANT REPRESENTATIVE:	ALCATEL-LUCENT 1 ROBBINS ROAD WESTFORD, MA 01886 PHONE: (978) 952-1600
SITE ACQUISITION REPRESENTATIVE:	SBA COMMUNICATIONS CORPORATION 33 BOSTON POST ROAD WEST, SUITE 320 MARLBOROUGH, MA 01752 (508) 251-1807
ARCHITECT/ENGINEER:	COM-EX CONSULTANTS 4 SECOND AVENUE DENVILLE, NJ 07834 PHONE (862) 209-4300

VICINITY MAP (NOT TO SCALE)



CONSTRUCTION DRAWING SHEET INDEX

SHEET NUMBER:	SHEET DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES
A-1	COMPOUND PLAN, EQUIPMENT PLANS & ELEVATION
A-2	ANTENNA SCENARIOS
A-3	CONSTRUCTION DETAILS
A-4	RF DATA SHEET & ANTENNA SECTOR INSTALLATION DETAIL
A-5	CABINET AND ANTENNA WIRING DIAGRAM
E-1	ELECTRIC , TELCO , GROUNDING PLANS AND DETAILS
E-2	TYPICAL POWER AND GROUNDING ONE-LINE DIAGRAM

AAV DRAWING SHEET INDEX

SHEET NUMBER:	SHEET DESCRIPTION
T-1	TITLE SHEET
C-1	SITE SURVEY PHOTOS 1
C-2	SITE SURVEY PHOTOS 2
C-3	SITE PLAN
C-4	SPECIFICATIONS & DETAILS

INFORMATION ON THIS SET OF DRAWINGS IS NOT FOR OFFICIAL USE UNLESS ACCOMPANIED BY THE STAMPED SEAL & SIGNATURE OF A PROFESSIONAL ENGINEER

STATE OF CONNECTICUT · NICHOLAS D. BARILE · No. 28643 · LICENSED PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER, CT LIC No. 28643

SCHEDULE OF REVISIONS

REV. NO.	DATE	DESCRIPTION OF CHANGES
9		
8		
7		
6		
5		
4		
3		
2	10/26/12	REVISED PER CLIENT COMMENTS
1	09/24/12	CONSTRUCTION REVIEW

DRAWN BY:	DPB
CHECKED BY:	NB
SCALE:	AS NOTED
JOB NO:	12018-SBA

CT03XC108
STONINGTON EAST
86 VOLUNTOWN ROAD
STONINGTON, CT 06379
NEW LONDON COUNTY

DRAWING TITLE:

TITLE SHEET

DRAWING SHEET: 1 OF 9

T-1

GENERAL NOTES

1. THIS IS AN UNMANNED TELECOMMUNICATIONS FACILITY AND NOT FOR HUMAN HABITATION:
   - HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED
   - FACILITY HAS NO PLUMBING OR REFRIGERANTS
   - THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATOR REQUIREMENTS
2. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
3. DEVELOPMENT AND USE OF THE SITE WILL CONFORM TO ALL APPLICABLE CODES AND ORDINACES.
   BUILDING CODE: 2003 IBC; 2003 IRC (STATE BUILDING CODE, 2005 CT SUPPLEMENT)
   ELECTRICAL CODE: 2005 NEC (NFPA-70)

SCOPE OF WORK

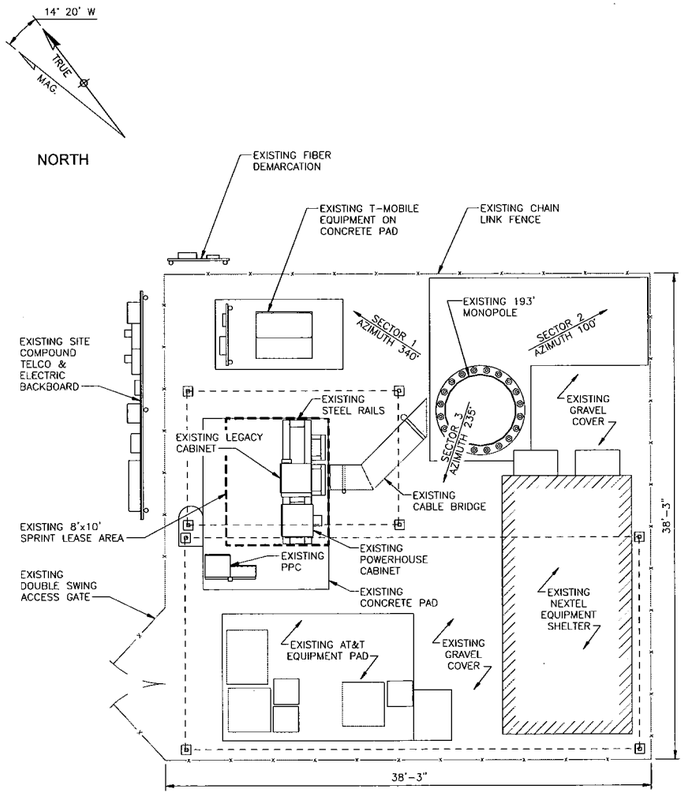
SPRINT PROPOSES TO MODIFY THIS EXISTING WIRELESS COMMUNICATIONS FACILITY AS FOLLOWS:

1. ONE (1) EXISTING CDMA OUTDOOR EQUIPMENT CABINET TO BE REPLACED WITH ONE (1) MULTIMODAL EQUIPMENT CABINET WITHIN THE EXISTING SPRINT LEASE AREA.
2. ONE (1) EXISTING POWERHOUSE CABINET TO BE REPLACED WITH TWO (2) BATTERY CABINETS.
3. ONE (1) PROPOSED FIBER DISTRIBUTION BOX (J-BOX) INSTALLED ON PROPOSED H-FRAME WITHIN EXISTING SPRINT LEASE AREA.
4. SIX (6) EXISTING ANTENNAS TO BE REPLACED WITH THREE (3) PROPOSED ANTENNAS AND SIX (6) RRH'S INSTALLED ON EXISTING SPRINT ANTENNA FRAME ON EXISTING ANTENNA SUPPORT STRUCTURE.
5. SIX (6) EXISTING COAXIAL CABLES TO BE REPLACED WITH THREE (3) PROPOSED HYBRIFLEX CABLES
6. ONE (1) GPS ANTENNA TO REPLACE EXISTING GPS ANTENNA
7. EXISTING LOCAL EXCHANGE CARRIER LANDLINE BACKHAUL FACILITIES TO BE REPLACED WITH PROPOSED ALTERNATIVE ACCESS VENDOR (AAV) FIBER OPTIC FACILITIES INCLUDING PROPOSED OVERHEAD/UNDERGROUND CONDUITS AND NETWORK INTERFACE DEVICE.

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.

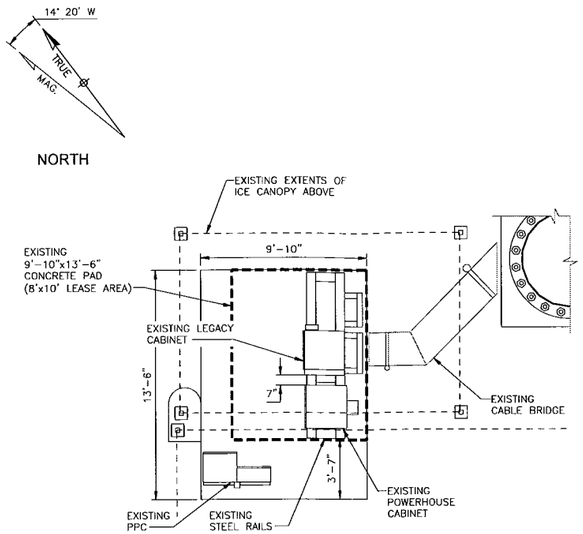
CONSTRUCTION:	DATE
LEASING/ SITE ACQUISITION	DATE
R.F. ENGINEER	DATE
LANDLORD/ PROPERTY OWNER	DATE



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

GRAPHIC SCALE

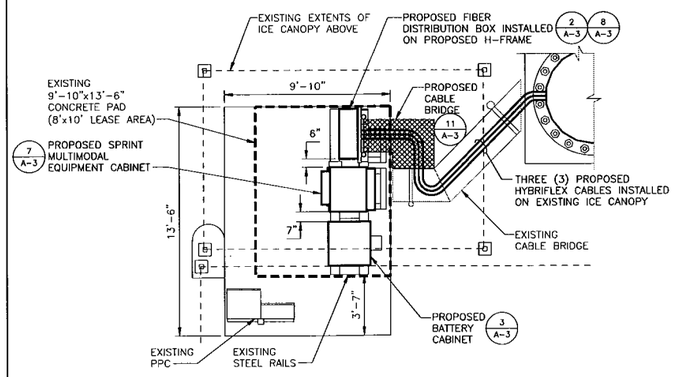
(IN FEET)
3/16 Inch = 1 Foot
(24"x36" SHEET SIZE)



2 / A-1 EXISTING EQUIPMENT PLAN
SCALE: 1/4"=1'

GRAPHIC SCALE

(IN FEET)
1/4 Inch = 1 Foot
(24"x36" SHEET SIZE)

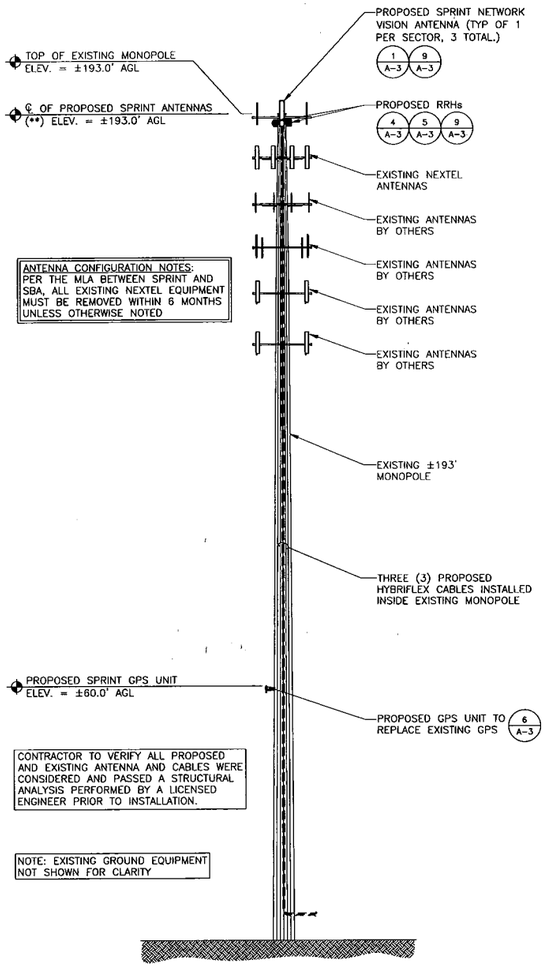


3 / A-1 FINAL EQUIPMENT PLAN
SCALE: 1/4"=1'

GRAPHIC SCALE

(IN FEET)
1/4 Inch = 1 Foot
(24"x36" SHEET SIZE)

(**) - NOTE: NETWORK VISION ANTENNA RADIATION CENTERLINE AGL (FEET) BASED ON SBA EQUIPMENT DATABASE AND SBA TOWER STRUCTURAL ANALYSIS AND WILL SUPERSEDE ANY CONFLICTING INFORMATION DERIVED FROM THE ALU/SPRINT DATABASE



4 / A-1 FINAL MONOPOLE ELEVATION
SCALE: 1/16"=1'

GRAPHIC SCALE

(IN FEET)
1/16 Inch = 1 Foot
(24"x36" SHEET SIZE)

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1 INTERNATIONAL BLVD, SUITE 800
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STATE OF CONNECTICUT · NICHOLAS D. BARILE · No. 29643 · LICENSED PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER, CT LIC No 29643

SCHEDULE OF REVISIONS

REV. NO.	DATE	DESCRIPTION OF CHANGES
9		
8		
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2	10/26/12	REVISED PER CLIENT COMMENTS
1	09/24/12	CONSTRUCTION REVIEW

DRAWN BY:	DPB
CHECKED BY:	NB
SCALE:	AS NOTED
JOB NO:	12018-SBA

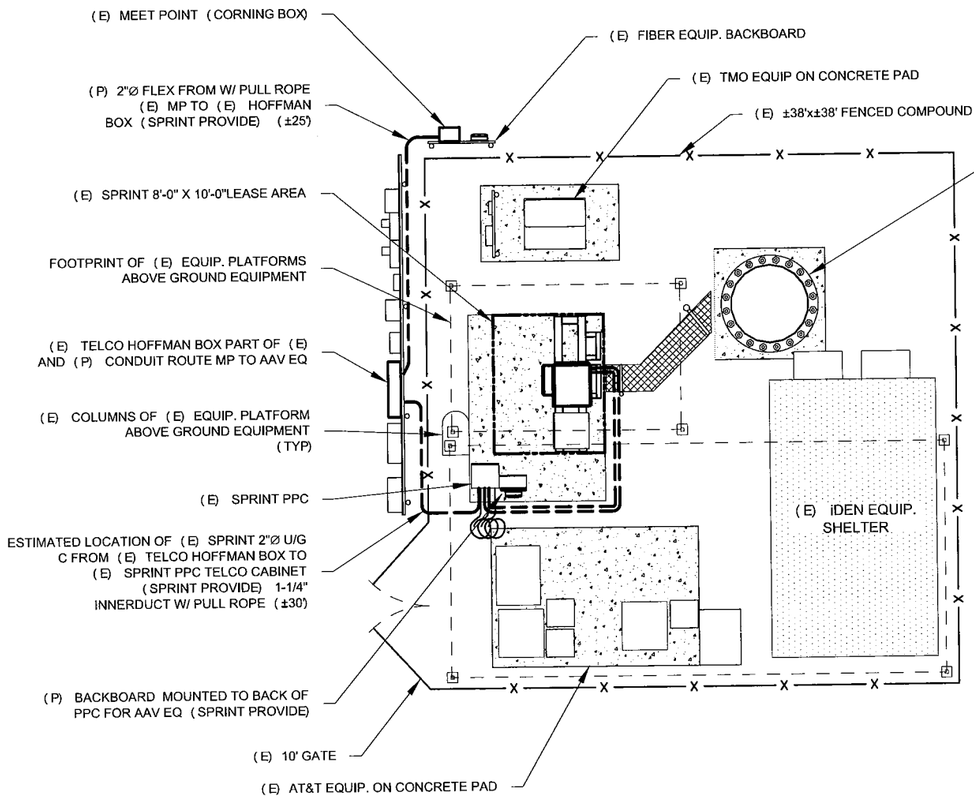
CT03XC108
STONINGTON EAST
86 VOLUNTOWN ROAD
STONINGTON, CT 06379
NEW LONDON COUNTY

DRAWING TITLE:

COMPOUND PLAN, EQUIPMENT PLANS & ELEVATION

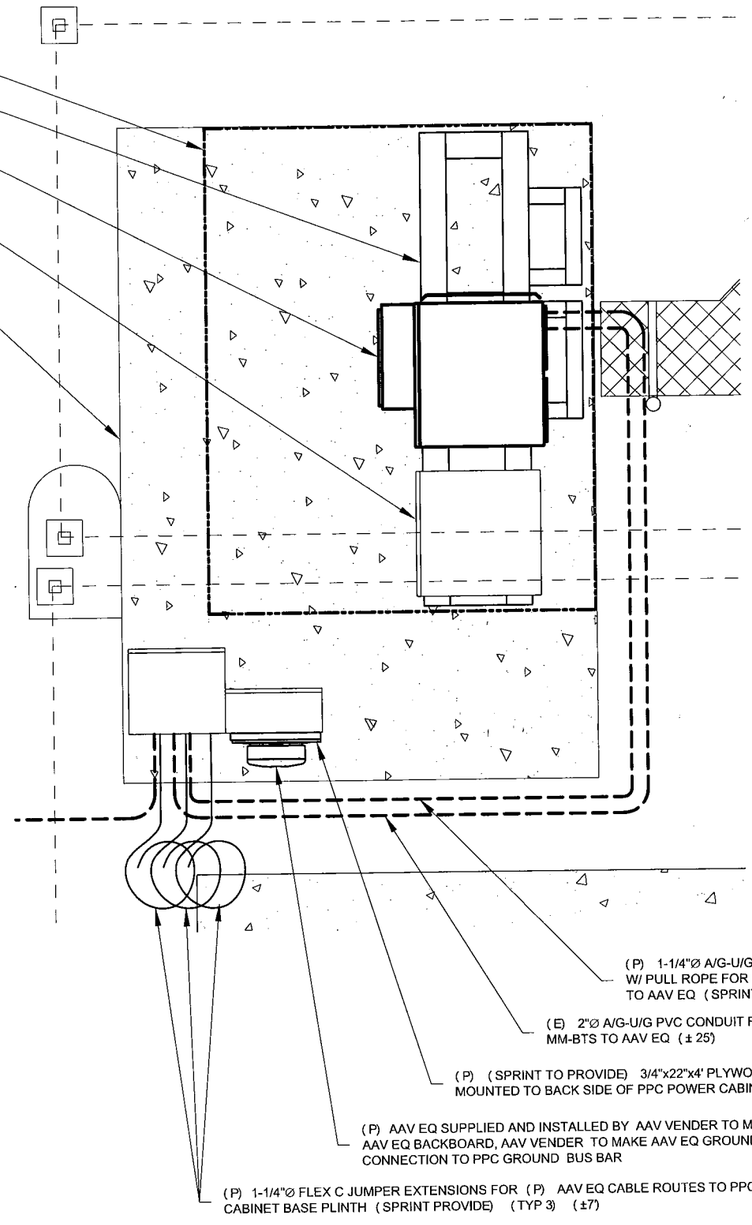
DRAWING SHEET: **3 OF 9**

A-1



1/C-3 FIBER SERVICE PLAN
SCALE: 3/32"=1'-0"

4 0 4 8 12 FT
SCALE 3/32"=1'-0"



2/C-3 FIBER SERVICE PLAN—EQUIPMENT SPACE
SCALE: N.T.S.

COM-EX Consultants
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DENVILLE, NJ 07834
PHONE: 862.209.4300
FAX: 862.209.4301
NEW JERSEY STATE BOARD OF PROFESSIONAL ENGINEERS CERTIFICATE OF AUTHORIZATION # 24GA28179100

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SBA
SBA COMMUNICATIONS CORP.
ONE RESEARCH DRIVE, SUITE 200C
WESTBOROUGH, MA 01581
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FAX:(508) 366-5507

Alcatel·Lucent
1 ROBBINS ROAD
WESTFORD, MA 01886
TEL: (978) 952-1600

SCHEDULE OF REVISIONS

REV NO.	DATE	DESCRIPTION OF CHANGES
5		
4		
3		
2		
1	10/25/12	REVISION
0	09/11/12	INITIAL SUBMISSION

DRAWN BY:	ELP
CHECKED BY:	JCP
SCALE:	AS NOTED
JOB NO:	12018-SBA

CT03XC108

86 VOLUNTOWN ROAD
STONINGTON, CT 06379

DRAWING TITLE:

SITE PLAN

DRAWING SHEET: 1 OF 4

C-3