May 29, 2014

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

RE: Notice of Exempt Modification
10 Redwood Lane
Avon, CT 06001
Sprint Site #: NV2.5_CT33XC533
N 41° 46' 20.09"
W -72° 52' 48.37"

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 10 Redwood Lane, Avon CT.

The 10 Redwood Lane facility consists of a 105' 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 he proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (508) 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@sbasite.com

**Sprint Spectrum**
**Equipment Modification**

10 Redwood Lane, New Britain, CT
Site number CT33XC533

**Tower Owner:** SBA Towers, LLC

**Equipment Configuration:** MONOPOLE Tower

**Current and/or approved:**

Sprint/Clearwire:

- (3) Andrew VHLP2.5 Dishes
- (3) Samsung RRU Radios
- (3) Horizon DUO Radios
- (3) RFS APXVSPP18-C-A20
- (3) Alcatel Lucent 1900 MHz RRUs
- (3) Alcatel Lucent 800 MHz RRUs
- (3) Alcatel Lucent 800 MHz Filters
- (4) RFS ACU-A20-N RETs
- (6) 5/16" feed lines
- (3) 1/2" feed lines
- (3) 1-1/4" Hybrid lines

**Planned Modifications:**

- (3) RFS APXVSPP18-C-A20
- (3) RFS APXVTM14-C-I20
- (3) Alcatel Lucent 1900 MHz RRHs
- (3) Alcatel Lucent 800 MHz RRHs
- (3) Alcatel Lucent 800 MHz Filters
- (3) Alcatel Lucent TD-RRH8x20-25 RRHs
- (4) RFS ACU-A20-N RETs
- (4) 1-1/4" Hybrid 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 1.735% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 73.125% of the allowable FCC established general public limit sampled at the ground level.

| Site Composite MPE % | |
|---|---|
| Carrier | MPE % |
| Sprint | 1.735% |
| AT&T | 37.560% |
| MetroPCS | 20.500% |
| T-Mobile | 0.310% |
| Clearwire | 2.240% |
| Farm. Woods | 10.780% |
| Total Site MPE % | 73.125% |

May 29, 2014

Town Manager
Mr. Brandon Robertson
Town of Avon
Town Hall
60 West Main Street
Avon, CT 06001

RE: Telecommunications Facility @ 10 Redwood Lane, Avon CT.

Dear Mr. Robertson,

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@sbasite.com

May 29, 2014

Farmington Woods Master Association
200 Byron Drive
Avon, CT 06001

RE: Telecommunications Facility @ 10 Redwood Lane, Avon, CT

Dear Sir or Madam:

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.

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EBI Consulting
environmental | engineering | due diligence

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

Sprint Existing Facility

Site ID: CT33XC533

Avon SBA

10 Redwood Lane
Avon CT 06001

**May 27, 2014**

**EBI Project Number: 62143109**

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

EBI Consulting
environmental | engineering | due diligence

May 27, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
**CT33XC533 - Avon SBA**

**Site Total: 73.125% - MPE% in full compliance**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 10 Redwood Lane, Avon 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 97-01and 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 (850 MHz Band) is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz and 2500 MHz bands 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 10 Redwood Lane, Avon 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) 3 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 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. 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 **87 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 | CT33XC533 - Avon SBA |
|---|---|
| Site Addresss | 10 Redwood Lane, Avon CT 06001 |
| 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 from maximum gain value) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss (dB) | ERP | Power Density Percentage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1a | RFS | APXVSPP18-C-A20 | RRH | 1900 MHz | CDMA / LTE | 20 | 3 | 60 | 1.59 | 87 | 81 | 1/2 " | 0.5 | 3 | 38.650156 | 0.21178% |
| 1a | RFS | APXVSPP18-C-A20 | RRH | 850 MHz | CDMA / LTE | 20 | 1 | 20 | 1.34 | 87 | 81 | 1/2 " | 0.5 | 3 | 12.1627 | 0.11754% |
| 1B | RFS | APXVTMM14-C-120 | RRH | 2500 MHz | CDMA / LTE | 20 | 2 | 40 | 1.59 | 87 | 81 | 1/2 " | 0.5 | 3 | 25.766771 | 0.24901% |
| | | | | | | | | | | | | | | Sector total Power Density Value: | | 0.578% |

**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 from maximum gain value) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss (dB) | ERP | Power Density Percentage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2a | RFS | APXVSPP18-C-A20 | RRH | 1900 MHz | CDMA / LTE | 20 | 3 | 60 | 1.59 | 87 | 81 | 1/2 " | 0.5 | 3 | 38.650156 | 0.21178% |
| 2a | RFS | APXVSPP18-C-A20 | RRH | 850 MHz | CDMA / LTE | 20 | 1 | 20 | 1.34 | 87 | 81 | 1/2 " | 0.5 | 3 | 12.1627 | 0.11754% |
| 2B | RFS | APXVTMM14-C-120 | RRH | 2500 MHz | CDMA / LTE | 20 | 2 | 40 | 1.59 | 87 | 81 | 1/2 " | 0.5 | 3 | 25.766771 | 0.24901% |
| | | | | | | | | | | | | | | Sector total Power Density Value: | | 0.578% |

**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 from maximum gain value) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss (dB) | ERP | Power Density Percentage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3a | RFS | APXVSPP18-C-A20 | RRH | 1900 MHz | CDMA / LTE | 20 | 3 | 60 | 1.59 | 87 | 81 | 1/2 " | 0.5 | 3 | 38.650156 | 0.21178% |
| 3a | RFS | APXVSPP18-C-A20 | RRH | 850 MHz | CDMA / LTE | 20 | 1 | 20 | 1.34 | 87 | 81 | 1/2 " | 0.5 | 3 | 12.1627 | 0.11754% |
| 3B | RFS | APXVTMM14-C-120 | RRH | 2500 MHz | CDMA / LTE | 20 | 2 | 40 | 1.59 | 87 | 81 | 1/2 " | 0.5 | 3 | 25.766771 | 0.24901% |
| | | | | | | | | | | | | | | Sector total Power Density Value: | | 0.578% |

**Site Composite MPE %**

| Carrier | MPE % |
|---|---|
| Sprint | 1.735% |
| AT&T | 37.560% |
| MetroPCS | 20.500% |
| T-Mobile | 0.310% |
| Clearwire | 2.240% |
| Farm. Woods | 10.780% |
| **Total Site MPE %** | **73.125%** |

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## 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 **1.735% (0.578% 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 **73.125%** 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

# Structural Analysis for SBA Network Services, Inc.

**105' Monopole Tower**

**SBA Site Name: Avon**
**SBA Site ID: CT01498-S-02**
**Sprint Site ID: CT33XC533**

FDH Project Number 1462HA1400

**Analysis Results**

| | | |
|---|---|---|
| Tower Components | 97.7% | Sufficient |
| Foundation | 58.5% | Sufficient |

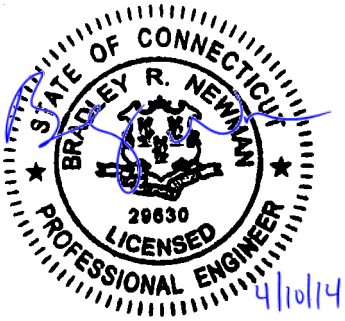
Prepared By:

Hailey Hipp, EIT
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 *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 Avon, 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 State Building Code*. Information pertaining to the existing/proposed antenna loading, current tower geometry, geotechnical data, foundation dimensions, and member sizes was obtained from:

- Pirod, Inc. (Eng. File No. A-117586) original design drawings dated September 26, 2000
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and *2005 Connecticut Building Code* is 80 mph without ice and 38 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 87 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and *2005 Connecticut State Building Code* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Pirod Eng. File No. A-117586), 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 Connecticut State 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's shaft.
2. RRH/RRU 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 | Feed Lines[1] | Carrier | Mount Elevation (ft) | Mount Type |
|---|---|---|---|---|---|
| 116 | (1) 20' Omni | (1) 7/8" | Farmintgon Woods | 106 | (1) Low Profile Platform |
| 106 | (3) Ericsson AIR 21 B2A/B4P<br>(3) Ericsson AIR 21 B4A/B2P<br>(3) Ericsson KRY 112 144 TMAs | (12) 1-5/8"<br>(1) 1-5/8" Fiber | T-Mobile | | |
| 98 | (6) Ericsson RRUS-11 RRUs<br>(1) Raycap DC2-48-60-18-8F Surge Arrestor | (12) 1-5/8"<br>(1) 3"<br>(1) 10 mm Fiber<br>(2) DC Power | AT&T | 98 | (3) Standoffs |
| 97 | (9) KMW AM-X-CD-16-65-00T-RET<br>(3) Kathrein 800-10121<br>(6) Powerwave LGP 21401 TMAs<br>(6) Kathrein 860-10035 RETs<br>(6) Kathrein 782-10250 Diplexers | | | 97 | (1) Low Profile Platform |
| 91 | (3) Andrew VHLP2.5 Dishes<br>(3) Samsung RRU Radios<br>(3) Horizon DUO Radios | (6) 5/16"<br>(3) 1/2" | Clearwire | 87 | (1) Low Profile Platform |
| 87 | (3) RFS APXVSPP18-C-A20<br>(3) Alcatel Lucent 1900 MHz RRUs<br>(3) Alcatel Lucent 800 MHz RRUs<br>(3) Alcatel Lucent 800 MHz Filters<br>(4) RFS ACU-A20-N RETs | (3) 1-1/4"<br>Hybrid | Sprint | | |
| 77[2] | (6) Kathrein 742-213 | (6) 1-5/8" | Pocket | 77 | (1) Low Profile Platform (assumed) |
| 75 | (1) GPS Unit | (1) 1/2" | Sprint | 75 | (1) Standoff |

1. Feed lines installed inside the pole's shaft unless otherwise noted.
2. Pocket currently has (6) 1-5/8" feed lines installed outside the pole's shaft in a single row. See **Figure 1** for assumed feed line layout.

### Proposed Loading:

| Antenna Elevation (ft) | Description | Feed Lines | Carrier | Mount Elevation (ft) | Mount Type |
|---|---|---|---|---|---|
| 87 | (3) RFS APXVSPP18-C-A20<br>(3) RFS APXVTM14-C-I20<br>(3) Alcatel Lucent 1900 MHz RRHs<br>(3) Alcatel Lucent 800 MHz RRHs<br>(3) Alcatel Lucent 800 MHz Filters<br>(3) Alcatel Lucent TD-RRH8x20-25 RRHs<br>(4) RFS ACU-A20-N RETs | (4) 1-1/4"<br>Hybrid | Sprint | 87 | (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 | 42 ksi |
| Flange Plate | 36 ksi |
| Flange Bolts | 92 ksi |
| Base Plate | 36 ksi |
| Anchor Bolts | 105 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 (dishes only).

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 | 105 - 80 | Pole | P36x3/8 | 19.5 | Pass |
| | 80 | Flange Bolts | (28) 1"Ø w/ BC=39" | 16.4 | Pass |
| | 80 | Flange Plates | PL 41.25"Ø x 1.25" Thick | 21.6 | Pass |
| L2 | 80 - 60 | Pole | P42x3/8 | 37.1 | Pass |
| | 60 | Flange Bolts | (32) 1"Ø w/ BC=45" | 32.0 | Pass |
| | 60 | Flange Plates | PL 47.25"Ø x 1.25" Thick | 40.8 | Pass |
| L3 | 60 - 40 | Pole | P48x3/8 | 49.1 | Pass |
| | 40 | Flange Bolts | (36) 1"Ø w/ BC=54" | 70.2 | Pass |
| | 40 | Flange Plates | PL 54"Ø x 1.25" Thick | 90.5 | Pass |
| L4 | 40 - 20 | Pole | P54x3/8 | 57.4 | Pass |
| | 20 | Flange Bolts | (48) 1"Ø w/ BC=57" | 41.4 | Pass |
| | 20 | Flange Plates | PL 59.25"Ø x 1.25" Thick | 62.4 | Pass |
| L5 | 20 - 0 | Pole | P60x3/8 | 63.5 | Pass |
| | | Anchor Bolts | (48) 1"Ø w/ BC=63" | 44.5 | Pass |
| | | Base Plate | PL 66.125"Ø x 1" Thick | 97.7 | Pass |

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

**Table 4 - Maximum Base Reactions**

| Base Reactions | Current Analysis *(TIA/EIA-222-F)* | Original Design *(TIA/EIA-222-F)* |
|---|---|---|
| Axial* | 32 k | 41 k |
| Shear* | 20 k | 31 k |
| Moment | 1,495 k-ft | 2,555 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 (Dishes Only)**

| Centerline Elevation (ft) | Antenna | Tilt (deg)* | Twist (deg)* |
|---|---|---|---|
| 91 | (3) Andrew VHLP2.5 Dishes | 0.3544 | 0.0010 |

*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

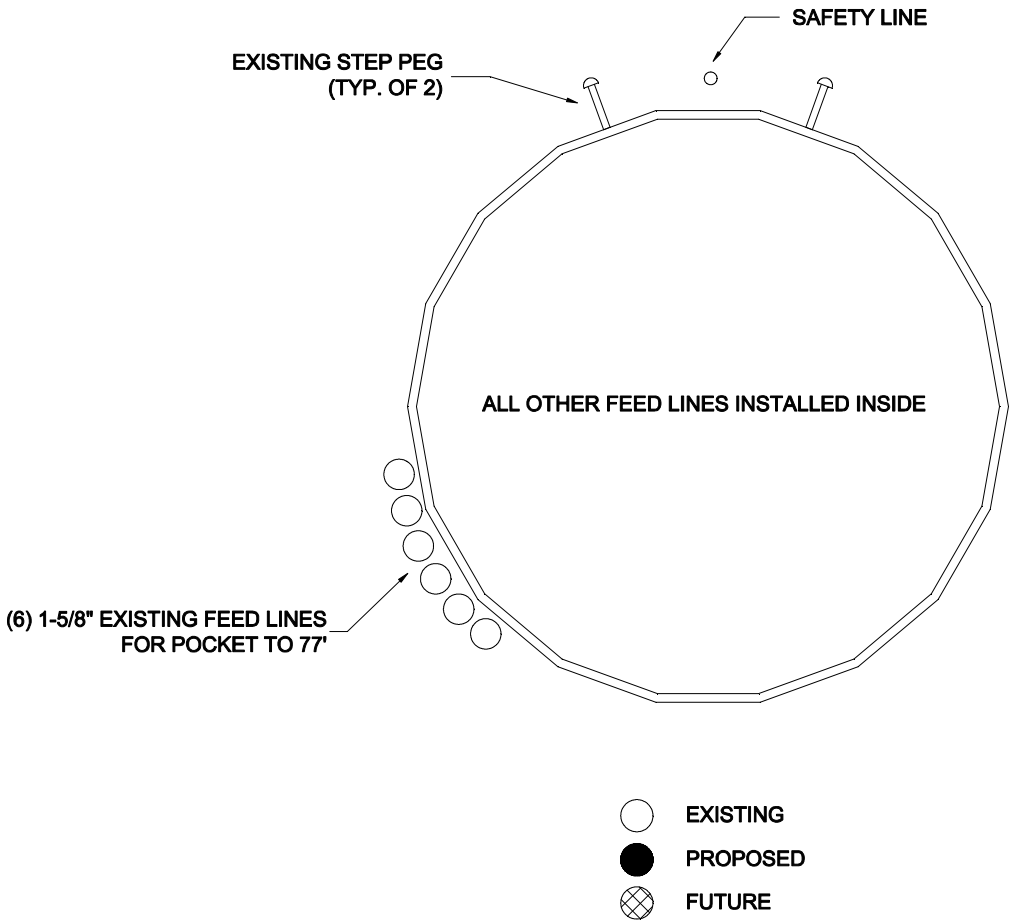
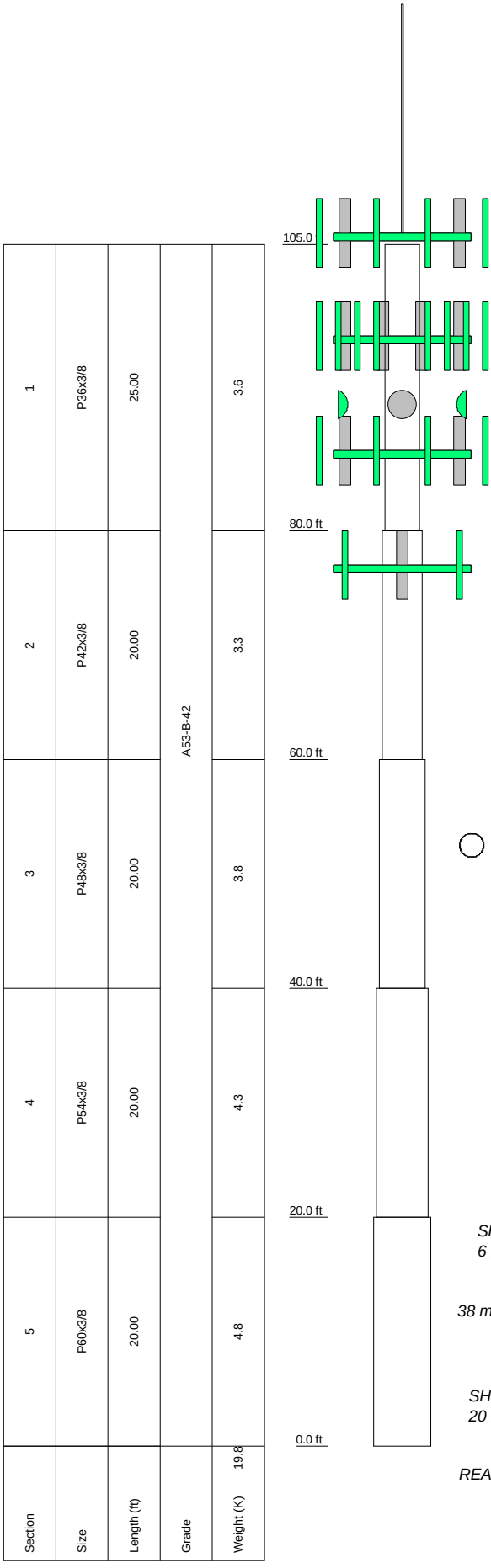
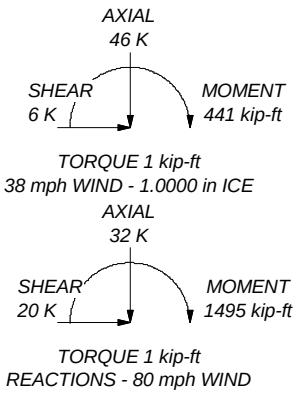



**Figure 1 - Assumed Feed Line Layout**




## DESIGNED APPURTENANCE LOADING

| TYPE | ELEVATION | TYPE | ELEVATION |
|---|---|---|---|
| 20' Omni | 106 | Samsung RRU | 87 |
| AIR 21 B2A/B4P w/Mount Pipe | 106 | Samsung RRU | 87 |
| AIR 21 B2A/B4P w/Mount Pipe | 106 | Samsung RRU | 87 |
| AIR 21 B2A/B4P w/Mount Pipe | 106 | APXVSPP18-C-A20 w/Mount Pipe | 87 |
| AIR 21 B4A/B2P w/Mount Pipe | 106 | APXVSPP18-C-A20 w/Mount Pipe | 87 |
| AIR 21 B4A/B2P w/Mount Pipe | 106 | APXVSPP18-C-A20 w/Mount Pipe | 87 |
| AIR 21 B4A/B2P w/Mount Pipe | 106 | APXVTM14-C-I20 w/ Mount Pipe | 87 |
| Ericsson KRY 112 144 | 106 | APXVTM14-C-I20 w/ Mount Pipe | 87 |
| Ericsson KRY 112 144 | 106 | APXVTM14-C-I20 w/ Mount Pipe | 87 |
| Ericsson KRY 112 144 | 106 | 1900 MHz RRH | 87 |
| Low Profile Platform | 106 | 1900 MHz RRH | 87 |
| (2) RRUS-11 | 98 | 1900 MHz RRH | 87 |
| (2) RRUS-11 | 98 | 800 MHz RRH | 87 |
| (2) RRUS-11 | 98 | 800 MHz RRH | 87 |
| DC6-48-60-18-8F Surge Arrestor | 98 | 800 MHz RRH | 87 |
| (3) Standoffs | 98 | 800 MHz Filter | 87 |
| (3) AM-X-CD-16-65-00T w/ Mount Pipe | 97 | 800 MHz Filter | 87 |
| (3) AM-X-CD-16-65-00T w/ Mount Pipe | 97 | 800 MHz Filter | 87 |
| (3) AM-X-CD-16-65-00T w/ Mount Pipe | 97 | TD-RRH8x20-25 | 87 |
| 800 10121 w/ Mount Pipe | 97 | TD-RRH8x20-25 | 87 |
| 800 10121 w/ Mount Pipe | 97 | TD-RRH8x20-25 | 87 |
| 800 10121 w/ Mount Pipe | 97 | (2) ACU-A20-N RET | 87 |
| (2) LGP21401 TMA | 97 | ACU-A20-N RET | 87 |
| (2) LGP21401 TMA | 97 | ACU-A20-N RET | 87 |
| (2) LGP21401 TMA | 97 | Low Profile Platform | 87 |
| (2) 860 10035 | 97 | VHLP2.5 | 87 |
| (2) 860 10035 | 97 | VHLP2.5 | 87 |
| (2) 860 10035 | 97 | VHLP2.5 | 87 |
| (2) 782 10250 | 97 | Low Profile Platform | 77 |
| (2) 782 10250 | 97 | (2) 742 213 w/ Mount Pipe | 77 |
| (2) 782 10250 | 97 | (2) 742 213 w/ Mount Pipe | 77 |
| Low Profile Platform | 97 | (2) 742 213 w/ Mount Pipe | 77 |
| Horizon Duo | 87 | Side Mount Standoff (1) | 75 |
| Horizon Duo | 87 | GPS | 75 |
| Horizon Duo | 87 | | |

## MATERIAL STRENGTH

| GRADE | Fy | Fu | GRADE | Fy | Fu |
|---|---|---|---|---|---|
| A53-B-42 | 42 ksi | 63 ksi | | | |

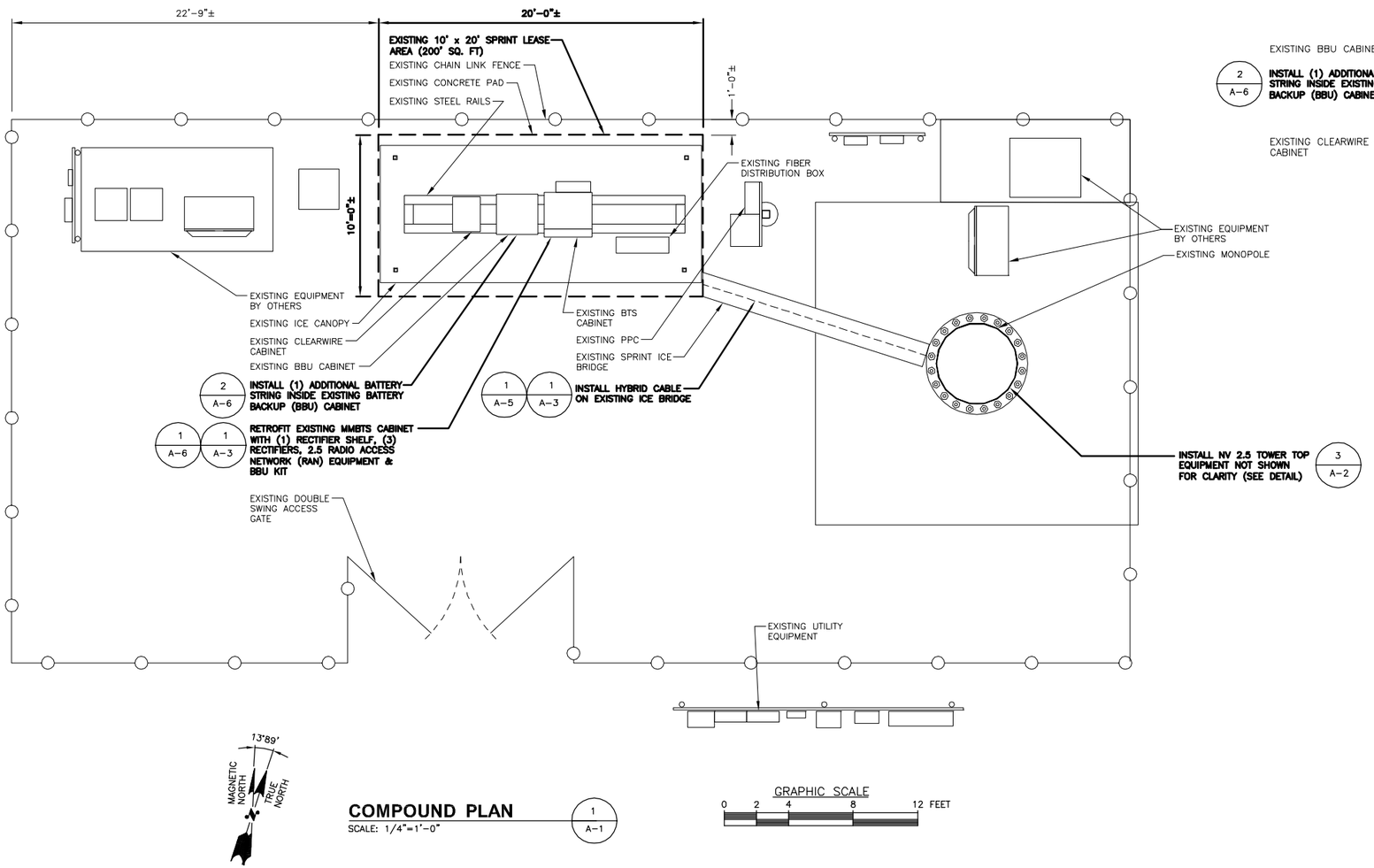
## TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 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: 63.5%


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

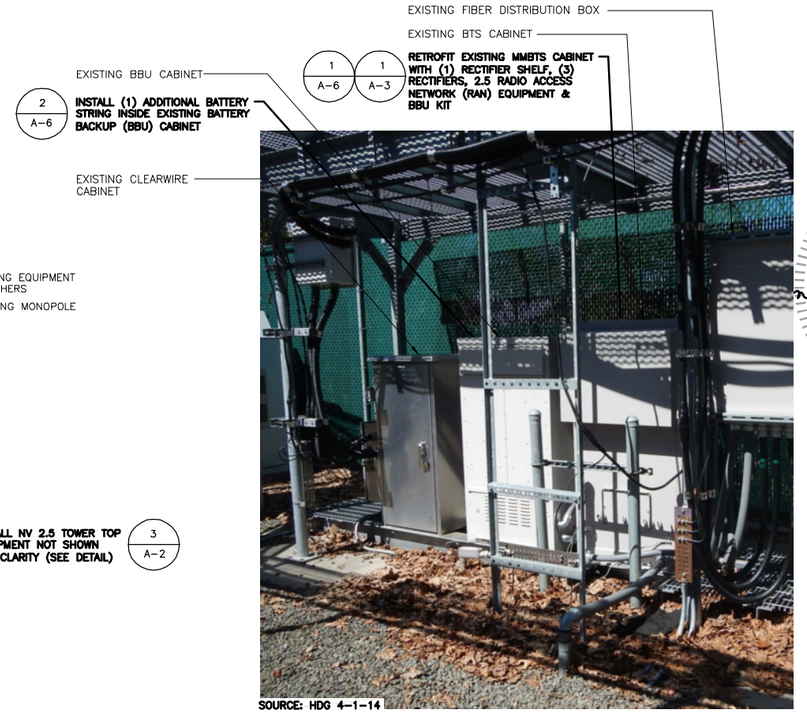

Tower Analysis

| | | | |
|---|---|---|---|
| Job: Avon, CT01498-S-02 | | | |
| Project: 1462HA1400 | | | |
| Client: SBA Network Services, Inc | Drawn by: Hailey Hipp | App'd: | |
| Code: TIA/EIA-222-F | Date: 04/10/14 | Scale: NTS | |
| Path: | | Dwg No. E-1 | |




## COMPOUND PLAN

SCALE: 1/4"=1'-0" (1 / A-1)




SOURCE: HDG 4-1-14

## RAN EQUIPMENT PHOTO DETAIL

SCALE: N.T.S. (2 / A-1)


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


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

CHECKED BY: KB

APPROVED BY: DPH

SUBMITTALS

| REV. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| 1 | 05/08/14 | ISSUED FOR CONSTRUCTION | SF |
| 0 | 05/06/14 | ISSUED FOR CONSTRUCTION | SF |

SITE NUMBER:
CT33XC533-A

SITE NAME:
AVON/SBA

SITE ADDRESS:
10 REDWOOD LANE
AVON,CT 06001

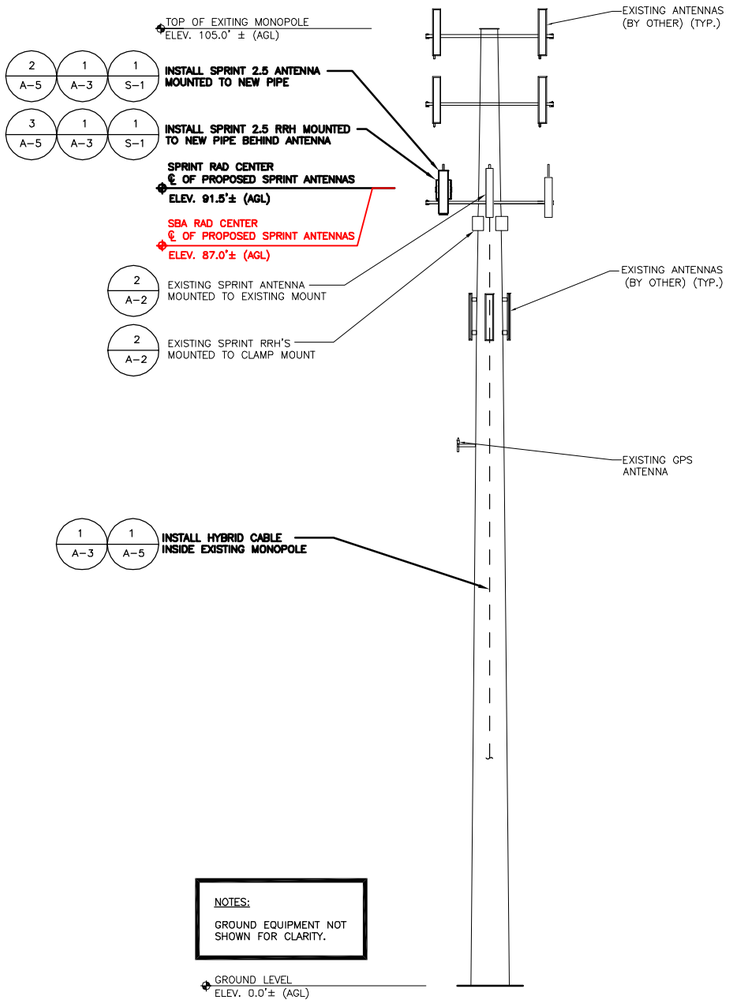
SHEET TITLE
COMPOUND PLAN

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 SPRINT SITE AUDIT DATED 08/17/13

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.



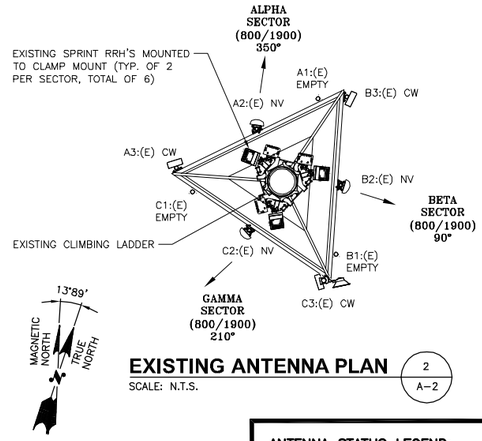

NOTES:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

## ELEVATION
SCALE: 1/8"=1'-0" (1 A-2)

GRAPHIC SCALE
0 4 8 16 24 FEET

SOURCE: HDG 4-1-14

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




## EXISTING ANTENNA PLAN
SCALE: N.T.S. (2 A-2)

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

NOTES:
1) VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION.

**ANTENNA STATUS LEGEND:**

EMPTY – EMPTY PIPE

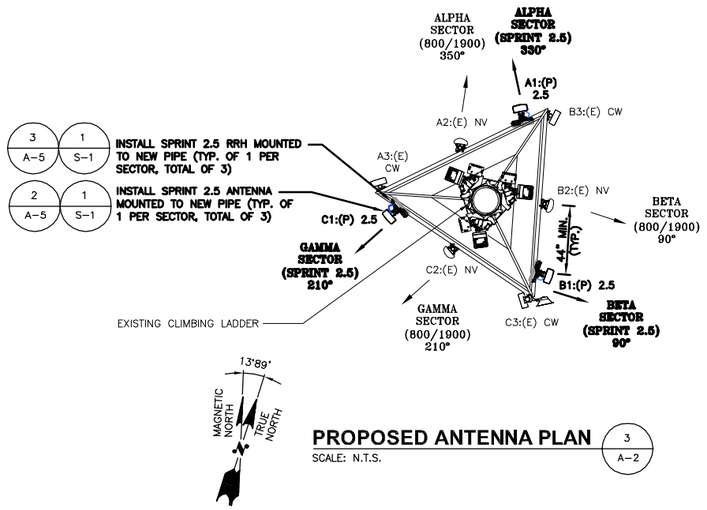
(E) – EXISTING

(P) – INSTALL

NV – SPRINT ANTENNA MODEL (APXVSPP18-C-A20)

2.5 – SPRINT ANTENNA

CW – CLEARWIRE ANTENNA




## PROPOSED ANTENNA PLAN
SCALE: N.T.S. (3 A-2)


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

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

CHECKED BY: KB

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SUBMITTALS

| REV. | DATE | DESCRIPTION | BY |
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| | | | |
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| | | | |
| 1 | 05/08/14 | ISSUED FOR CONSTRUCTION | SF |
| 0 | 05/06/14 | ISSUED FOR CONSTRUCTION | SF |

SITE NUMBER:
CT33XC533-A

SITE NAME:
AVON/SBA

SITE ADDRESS:
10 REDWOOD LANE
AVON,CT 06001

SHEET TITLE
ELEVATION AND ANTENNA PLANS

SHEET NUMBER
A-2