



Filed by:

Kri Pelletier, Property Specialist - SBA Communications  
134 Flanders Rd., Suite 125, Westborough, MA 01581  
508.251.0720 x 3804 - kpelletier@sbsite.com

February 8, 2018

Melanie A. Bachman  
Acting Executive Director  
Connecticut Siting Council  
Ten Franklin Square  
New Britain, CT 06051

**Notice of Exempt Modification**  
**277 Huckleberry Hill Road, Avon, CT**  
**41 47 17 N**  
**-72 55 5.4 W**  
**Sprint #: CT33XC589\_2.5**

Dear Ms. Bachman:

Sprint currently maintains antennas at the 99-foot level of the existing 100-Laminated Wood Pole Tower at 277 Huckleberry Hill Road in Avon, CT. The tower is owned by SBA 2012 TC Assets, LLC. The property is owned by the Town of Avon. Sprint now intends to replace (3) existing cell antennas with (3) newer technology cell antennas at the 99-foot level of the tower. The proposed full scope of work is as follows:

Remove:

- (3) EMS 36-2.5 EXT
- (6) 1-5/8" lines

Remove and Replace:

- Remove (3) EMS RR65-18-ODPL2-R Panel Antennas / Replace with (3) Andrew DHHTT65B-3XR – Panel Antennas
- At ground level: No change to compound size or area / equipment swap on existing pad*
- Remove (1) MMBTS Cabinet / Replace with (1) MMBTS 9927 cabinet (on existing pad)
  - Remove (1) BBU Cabinet / Replace with (1) BBU 6DECV2 Cabinet (on existing pad)

Install:

- (4) RFS ACU-A20-N RETs
- (3) ALU 1900 MHz RRHs
- (3) ALU 800 MHz RRHs
- (3) ALU TD-RRH8x20-25 RRHS
- (3) ALU 800 MHz Filters
- (4) 1-1/4" lines

Existing Equipment to Remain (Including entitlements): n/a



This facility was originally approved by the Council on 1/24/05 under Docket 297. The laminated wood monopole was to be no taller than 100' above ground level with flush mount antennas. A D&M plan was to be supplied and reasonable space on the tower was to be given to municipal antennas at no cost to the town. This modification complies with all conditions.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16.50j-72(b)(2). In accordance with R.C.S.A. § 16.50j-73, a copy of this letter is being sent to the Town of Avon's Town Manager, Brandon Robertson, as elected official and representative for the property owner the Town of Avon, and Director of Planning and Community Development, Hiram Peck. (Separate notice is not being sent to tower owner, as it belongs to SBA.)

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. §16.50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modification will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, Sprint respectfully submits that the proposed modifications to the above-referenced telecommunication facility constitute an exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kri Pelletier  
Property Specialist  
SBA COMMUNICATIONS CORPORATION  
134 Flanders Rd., Suite 125  
Westborough, MA 01581  
508.251.0720 x3804 + T  
508.366.2610 + F  
203.446.7700 + C  
kpelletier@sbsite.com

Attachments

cc: Brandon Robertson, Town Manager / with attachments  
*Avon Town Hall, 60 West Main Street, Avon, CT 06001*  
Hiram Peck, Director of Planning and Community Development / with attachments  
*Avon Town Hall, 60 West Main Street, Avon, CT 06001*



## POWER DENSITY

### SPRINT Site Inventory and Power Data by Antenna

| Sector:            | A   | Sector:            | B   | Sector:            | C   |
|--------------------|---|--------------------|---|--------------------|---|
| Antenna #:         | <b>1</b>  | Antenna #:         | <b>1</b>  | Antenna #:         | <b>1</b>  |
| Make / Model:      | Commscope<br>DHHTT65B-3XR                       | Make / Model:      | Commscope<br>DHHTT65B-3XR                       | Make / Model:      | Commscope<br>DHHTT65B-3XR                       |
| Gain:              | 13.35 / 15.25 / 15.05<br>dBd                    | Gain:              | 13.35 / 15.25 / 15.05<br>dBd                    | Gain:              | 13.35 / 15.25 / 15.05<br>dBd                    |
| Height (AGL):      | <b>99 feet</b>                                  | Height (AGL):      | <b>99 feet</b>                                  | Height (AGL):      | <b>99 feet</b>                                  |
| Frequency Bands    | 850 MHz /<br>1900 MHz (PCS) /<br>2500 MHz (BRS) | Frequency Bands    | 850 MHz /<br>1900 MHz (PCS) /<br>2500 MHz (BRS) | Frequency Bands    | 850 MHz /<br>1900 MHz (PCS) /<br>2500 MHz (BRS) |
| Channel Count      | 18  | Channel Count      | 18  | Channel Count      | 18  |
| Total TX Power(W): | 380 Watts                                       | Total TX Power(W): | 380 Watts                                       | Total TX Power(W): | 380 Watts                                       |
| ERP (W):           | 11,775.31                                       | ERP (W):           | 11,775.31                                       | ERP (W):           | 11,775.31                                       |
| Antenna A1 MPE%    | <b>5.31 %</b>                                   | Antenna B1 MPE%    | <b>5.31 %</b>                                   | Antenna C1 MPE%    | <b>5.31 %</b>                                   |

| Site Composite MPE%      |                |
|--------------------------|----------------|
| Carrier                  | MPE%           |
| SPRINT – Max per sector  | <b>5.31 %</b>  |
| T-Mobile                 | 0.07 %         |
| AT&T                     | 7.96 %         |
| <b>Site Total MPE %:</b> | <b>13.34 %</b> |

|                        |                |
|------------------------|----------------|
| SPRINT Sector A Total: | 5.31 %         |
| SPRINT Sector B Total: | 5.31 %         |
| SPRINT Sector C Total: | 5.31 %         |
| <b>Site Total:</b>     | <b>13.34 %</b> |

| SPRINT_ Frequency Band / Technology (All Sectors) | # Channels | Watts ERP (Per Channel) | Height (feet) | Total Power Density ( $\mu\text{W}/\text{cm}^2$ ) | Frequency (MHz) | Allowable MPE ( $\mu\text{W}/\text{cm}^2$ ) | Calculated % MPE |
|---|------------|-------------------------|---------------|---|-----------------|---|------------------|
| Sprint 850 MHz CDMA                               | 1          | 432.54                  | 99            | 1.80  | 850 MHz         | 567   | 0.32%            |
| Sprint 850 MHz LTE                                | 2          | 432.54                  | 99            | 3.60  | 850 MHz         | 567   | 0.64%            |
| Sprint 1900 MHz (PCS) CDMA                        | 5          | 535.94                  | 99            | 11.14   | 1900 MHz (PCS)  | 1000  | 1.11%            |
| Sprint 1900 MHz (PCS) LTE                         | 2          | 1,339.86                | 99            | 11.14   | 1900 MHz (PCS)  | 1000  | 1.11%            |
| Sprint 2500 MHz (BRS) LTE                         | 8          | 639.78                  | 99            | 21.27   | 2500 MHz (BRS)  | 1000  | 2.13%            |
| <b>Total:</b>                                     |            |                         |               |   |                 | <b>567</b>                                  | <b>5.31%</b>     |



ORIGIN ID:BBFA (508) 251-0720  
KRI PELLETIER  
SBA COMMUNICATIONS CORPORATION  
134 FLANDERS RD  
SUITE 125  
WESTBOROUGH, MA 01581  
UNITED STATES US

SHIP DATE: 08FEB18  
ACT'WG'T: 1.00 LB  
CAD: 105843304/NET/3980

BILL SENDER

TO **BRANDON ROBERTSON, TOWN MANAGER**  
**AVON TOWN HALL**  
**60 WEST MAIN STREET**

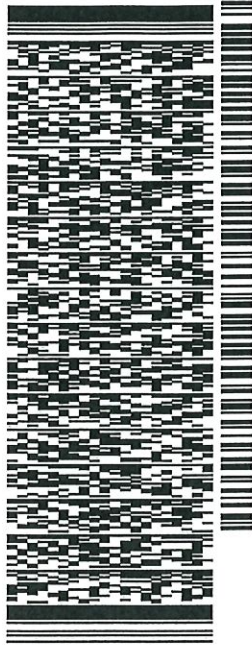
**AVON CT 06001**

(508) 251-0720 X.3804

REF: 10-56-92009-6089

PO:

DEPT:



J181118012691LV

552J11/22D/DCA5

**FRI - 09 FEB 10:30A**

**PRIORITY OVERNIGHT**

TRK# 7714 3483 2373  
0201

**EB MPEA**

06001  
CT-US BDL



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ORIGIN ID:BBFA (508) 251-0720  
KRI PELLETIER  
SEA COMMUNICATIONS CORPORATION  
134 FLANDERS RD  
SUITE 125  
WESTBOROUGH, MA 01581  
UNITED STATES US

SHIP DATE: 08-FEB-18  
ACTWGT: 1.00 LB  
CAD: 105843304/NET/3980

BILL SENDER

TO **HIRAM PECK, DIRECTOR OF PLANNING**  
**AVON TOWN HALL**  
**60 WEST MAIN STREET**

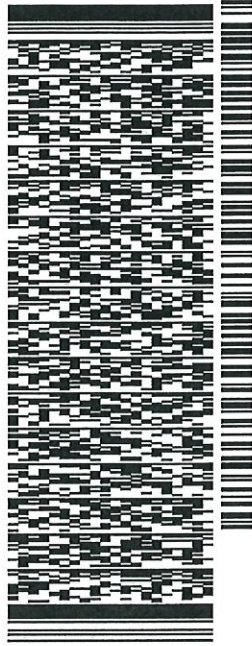
**AVON CT 06001**

(508) 251-0720 X 3804

REF: 10-55-92009-6089

INV:

DEPT:

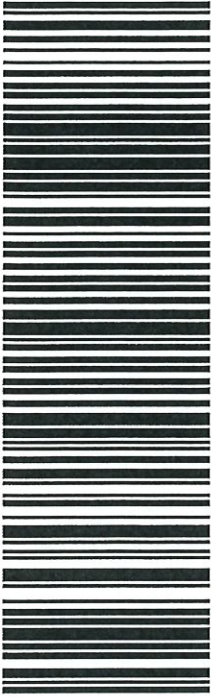


552J11/122D/DCA5

TRK# 7714 3484 9368  
0201

**FRI - 09 FEB 10:30A**  
**PRIORITY OVERNIGHT**

**EB MPEA**  
06001  
CT-US BDL



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**Property at 00277 HUCKLEBERRY HILL RD Prop ID 2810277**

| -----Administrative Information----- |                              |            |                      |             |                        |  |
|--------------------------------------|------------------------------|------------|----------------------|-------------|------------------------|--|
| BAAAX                                | Owner name: AVON TOWN OF     |            |                      |             |                        |  |
|                                      | Second name:                 |            |                      |             |                        |  |
|                                      | Address: 60 WEST MAIN STREET |            |                      |             |                        |  |
|                                      | City/state: AVON CT          |            |                      |             | Zip: 06001             |  |
| -----Location Information-----       |                              |            |                      |             |                        |  |
| Map: 016                             |                              | Clerk map: |                      |             |                        |  |
| Lot: 2810277                         |                              | Neigh.:    | Zone: R40            | Vol: 80     | Page: 20               |  |
| -----Assessments-----                |                              |            | -----Exemptions----- |             | -----Last sale-----    |  |
| Assmt category                       | Qty                          | Amount     | Exempt Cat           | Amount      | Sale date: 19-Dec-1972 |  |
| Resident Excess                      | 73.40                        | 385,350    |                      |             | Sale price:            |  |
| Resident Outbldg                     | 3.00                         | 28,460     |                      |             | Sale valid:            |  |
|                                      |                              |            |                      |             | +-----Values-----      |  |
|                                      |                              |            |                      |             | Mkt value :            |  |
|                                      |                              |            |                      |             | Cost value: 591,160    |  |
| -----Summary-----                    |                              |            | -----Utilities-----  |             | -----Sales ratios----- |  |
| Total assessments                    |                              | 413,810    | Water                | Cost/sale : |                        |  |
| Total exemptions                     |                              |            | Sewer                | Mkt/sale :  |                        |  |
| Net assessment                       |                              | 413,810    | Gas                  | Assmt/sale: |                        |  |

Card 01 [Street Card](#) [Sales History](#) [Home Page](#)





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

SPRINT Existing Facility

Site ID: CT33XC589

Burlington-Avon Landfill  
277 Huckleberry Road  
Avon, CT 06013

**January 29, 2018**

**EBI Project Number: 6218000483**

| Site Compliance Summary   |                  |
|---|------------------|
| Compliance Status:  | <b>COMPLIANT</b> |
| Site total MPE% of<br>FCC general<br>population<br>allowable limit: | <b>13.34 %</b>   |



January 29, 2018

SPRINT

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

## Emissions Analysis for Site: **CT33XC589 – Burlington-Avon Landfill**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **277 Huckleberry Road, Avon, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located 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 population 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 population 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.

General population 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 limits for the 850 MHz Band is approximately  $567 \mu\text{W}/\text{cm}^2$ . The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) 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 SPRINT Wireless antenna facility located at **277 Huckleberry Road, Avon, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, 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 equipment was calculated using the following assumptions:

- 1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.
- 2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.
- 3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.
- 4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.



- 6) 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.
- 7) For the following calculations, the sample point was the top of a 6-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.
- 8) The antennas used in this modeling are the **Commscope DHHTT65B-3XR** frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. 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.
- 9) The antenna mounting height centerlines of the proposed antennas are **99 feet** above ground level (AGL) for **Sector A**, **99 feet** above ground level (AGL) for **Sector B** and **99 feet** above ground level (AGL) for Sector C.
- 10) 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 calculations were done with respect to uncontrolled / general population threshold limits.





## SPRINT Site Inventory and Power Data by Antenna

| Sector:            | A   | Sector:            | B   | Sector:            | C   |
|--------------------|---|--------------------|---|--------------------|---|
| Antenna #:         | <b>1</b>  | Antenna #:         | <b>1</b>  | Antenna #:         | <b>1</b>  |
| Make / Model:      | Commscope<br>DHHTT65B-3XR                       | Make / Model:      | Commscope<br>DHHTT65B-3XR                       | Make / Model:      | Commscope<br>DHHTT65B-3XR                       |
| Gain:              | 13.35 / 15.25 / 15.05<br>dBd                    | Gain:              | 13.35 / 15.25 / 15.05<br>dBd                    | Gain:              | 13.35 / 15.25 / 15.05<br>dBd                    |
| Height (AGL):      | <b>99 feet</b>                                  | Height (AGL):      | <b>99 feet</b>                                  | Height (AGL):      | <b>99 feet</b>                                  |
| Frequency Bands    | 850 MHz /<br>1900 MHz (PCS) /<br>2500 MHz (BRS) | Frequency Bands    | 850 MHz /<br>1900 MHz (PCS) /<br>2500 MHz (BRS) | Frequency Bands    | 850 MHz /<br>1900 MHz (PCS) /<br>2500 MHz (BRS) |
| Channel Count      | 18  | Channel Count      | 18  | Channel Count      | 18  |
| Total TX Power(W): | 380 Watts                                       | Total TX Power(W): | 380 Watts                                       | Total TX Power(W): | 380 Watts                                       |
| ERP (W):           | 11,775.31                                       | ERP (W):           | 11,775.31                                       | ERP (W):           | 11,775.31                                       |
| Antenna A1 MPE%    | <b>5.31 %</b>                                   | Antenna B1 MPE%    | <b>5.31 %</b>                                   | Antenna C1 MPE%    | <b>5.31 %</b>                                   |

| Site Composite MPE%      |                |
|--------------------------|----------------|
| Carrier                  | MPE%           |
| SPRINT – Max per sector  | <b>5.31 %</b>  |
| T-Mobile                 | 0.07 %         |
| AT&T                     | 7.96 %         |
| <b>Site Total MPE %:</b> | <b>13.34 %</b> |

|                        |                |
|------------------------|----------------|
| SPRINT Sector A Total: | 5.31 %         |
| SPRINT Sector B Total: | 5.31 %         |
| SPRINT Sector C Total: | 5.31 %         |
| <b>Site Total:</b>     | <b>13.34 %</b> |

| SPRINT _ Frequency Band / Technology (All Sectors) | # Channels | Watts ERP (Per Channel) | Height (feet) | Total Power Density ( $\mu\text{W}/\text{cm}^2$ ) | Frequency (MHz) | Allowable MPE ( $\mu\text{W}/\text{cm}^2$ ) | Calculated % MPE |
|--|------------|-------------------------|---------------|---|-----------------|---|------------------|
| Sprint 850 MHz CDMA                                | 1          | 432.54                  | 99            | 1.80  | 850 MHz         | 567   | 0.32%            |
| Sprint 850 MHz LTE                                 | 2          | 432.54                  | 99            | 3.60  | 850 MHz         | 567   | 0.64%            |
| Sprint 1900 MHz (PCS) CDMA                         | 5          | 535.94                  | 99            | 11.14   | 1900 MHz (PCS)  | 1000  | 1.11%            |
| Sprint 1900 MHz (PCS) LTE                          | 2          | 1,339.86                | 99            | 11.14   | 1900 MHz (PCS)  | 1000  | 1.11%            |
| Sprint 2500 MHz (BRS) LTE                          | 8          | 639.78                  | 99            | 21.27   | 2500 MHz (BRS)  | 1000  | 2.13%            |
|  |            |                         |               |   |                 | <b>Total:</b>                               | <b>5.31%</b>     |

## Summary

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

The anticipated maximum composite contributions from the SPRINT facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

| SPRINT Sector                      | Power Density Value (%) |
|------------------------------------|-------------------------|
| Sector A:                          | 5.31 %                  |
| Sector B:                          | 5.31 %                  |
| Sector C:                          | 5.31 %                  |
| SPRINT Maximum Total (per sector): | 5.31 %                  |
|                                    |                         |
| Site Total:                        | 13.34 %                 |
|                                    |                         |
| Site Compliance Status:            | <b>COMPLIANT</b>        |

The anticipated composite MPE value for this site assuming all carriers present is **13.34 %** of the allowable FCC established general population 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.



**Tower Engineering Solutions**

Phone (972) 483-0607, Fax (972) 975-9615  
8445 Freeport Parkway, Suite 375, Irving, Texas 75063

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## Post-Mod Structural Analysis Report

**Existing 100 ft Guyed Laminated Wood Pole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT46143-A**

**Customer Site Name: Burlington - Avon Landfill**

**Carrier Name: Sprint Nextel**

**Carrier Site ID / Name: CT33XC589 / Burlington-Avon Landfill**

**Site Location: 277 Huckleberry Hill Road**

**Avon, Connecticut**

**Hartford County**

**Latitude: 41.788055**

**Longitude: -72.918166**

### Analysis Result:

**Max Structural Usage: 93.9% [Pass]**

**Max Foundation Usage: 90% [Pass]**

**Report Prepared By : Jie Chen**



## Introduction

The purpose of this report is to summarize the analysis results on the 100 ft Guyed Laminated Wood Pole to support the proposed antennas and transmission lines in addition to those currently installed. Any existing modification listed under Sources of Information was assumed completed and was included in this analysis.

The proposed modification by **TES** listed under Sources of Information was considered completed and was included in this analysis.

## Sources of Information

|                              |   |
|------------------------------|---|
| <b>Tower Drawings</b>        | Laminated Wood Systems, Inc. (DWG No. SPSM-0079) original design drawings dated April 7, 2005   |
| <b>Foundation Drawing</b>    | Laminated Wood Systems, Inc. (DWG No. SPSM-0079) original design drawings dated April 7, 2005   |
| <b>Geotechnical Report</b>   | Dr. Clarence Welti, P.E., P.C. Geotechnical Engineering (Project Name Avon Landfill Sprint Site) geotechnical report dated March 25, 2005 |
| <b>Existing Modification</b> | FDH, Project # 1309511400, Dated 6/28/2013<br>FDH, Project # 146EW81400, Dated 10/23/2014   |
| <b>Proposed Modification</b> | TES Job # 36667   |

## Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-G. In accordance with this standard, the structure was analyzed using **tnxTower**. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

|   |   |
|---|---|
| <b>Wind Speed Used in the Analysis:</b> | Ultimate Design Wind Speed $V_{ult} = 125.0$ mph (3-Sec. Gust)/<br>Nominal Design Wind Speed $V_{asd} = 97.0$ mph (3-Sec. Gust) |
| <b>Basic Wind Speed with Ice:</b>       | 50 mph (3-Sec. Gust) with 1" radial ice concurrent  |
| <b>Operational Wind Speed:</b>          | 60 mph + 0" Radial ice  |
| <b>Standard/Codes:</b>                  | ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code  |
| <b>Exposure Category:</b>               | C   |
| <b>Structure Class:</b>                 | II  |
| <b>Topographic Category:</b>            | 1   |
| <b>Crest Height:</b>                    | 0 ft  |
| <b>Seismic Parameters:</b>              | $S_s = 0.181$ , $S_1 = 0.064$   |



**Existing Antennas, Mounts and Transmission Lines**

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

| Items | Elevation (ft) | Qty. | Antenna Descriptions              | Mount Type & Qty. | Transmission Lines                           | Owner         |
|-------|----------------|------|-----------------------------------|-------------------|--|---------------|
| -     | 99.0           | 3    | EMS RR65-18-00DPL2-R - Panel      | (3) Flush Mounts  | (6) 1-5/8"                                   | Sprint Nextel |
| -     |                | 3    | EMS 36-2.5 EXT                    |                   |  |               |
| 7     | 90.0           | 1    | KMW AM-X-CD-16-65-00T-RET - Panel | (3) Flush Mounts  | (1) 7/16" Fiber<br>(2) 3/4" DC<br>(6) 1 5/8" | AT&T          |
| 8     |                | 1    | Andrew SBNH-1D6565C - Panel       |                   |  |               |
| 9     |                | 1    | Powerwave P65-17-XLH-RR - Panel   |                   |  |               |
| 10    |                | 3    | Andrew APTDC-BDFDM-DBW            |                   |  |               |
| 11    |                | 3    | Powerwave LGP21401 - TMA          |                   |  |               |
| 12    |                | 6    | Ericsson RRUS 11-700 – RRU        |                   |  |               |
| 13    |                | 3    | CCI DTMA BP7819VG12A- TMA         |                   |  |               |
| 14    | 80.0           | 3    | RFS APXV16DWV-16DWVS-C - Panel    | (3) Flush Mounts  | (12) 7/8"                                    | T-Mobile      |
| 15    |                | 6    | RFS ATMAA1412D-1A20 - TMA         |                   |  |               |

**Proposed Carrier’s Final Configuration of Antennas, Mounts and Transmission Lines**

Information pertaining to the proposed carrier’s final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

| Items | Elevation (ft) | Qty. | Antenna Descriptions        | Mount Type & Qty. | Transmission Lines | Owner         |
|-------|----------------|------|-----------------------------|-------------------|--------------------|---------------|
| 1     | 99.0           | 3    | Andrew DHHTT65B-3XR - Panel | (3) Flush Mounts  | (4) 1-1/4"         | Sprint Nextel |
| 2     |                | 4    | RFS ACU-A20-N RET           |                   |                    |               |
| 3     |                | 3    | ALU 1900MHz RRH             |                   |                    |               |
| 4     |                | 3    | ALU 800 MHz RRH             |                   |                    |               |
| 5     |                | 3    | ALU TD-RRH8x20-25           |                   |                    |               |
| 6     |                | 3    | ALU 800 MHz Filter          |                   |                    |               |

See the attached coax layout for the line placement considered in the analysis.

## **Analysis Results**

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

|             | Pole shafts  | Guy Wires    |
|-------------|--------------|--------------|
| Max. Usage: | <b>70.0%</b> | <b>93.9%</b> |
| Pass/Fail   | <b>Pass</b>  | <b>Pass</b>  |

## **Foundations**

|                    | Base Reactions  |              |              | Anchors       |              |
|--------------------|-----------------|--------------|--------------|---------------|--------------|
|                    | Moment (Kip-Ft) | Shear (Kips) | Axial (Kips) | Uplift (Kips) | Shear (Kips) |
| Analysis Reactions | 149             | 5.2          | 99.9         | 42.7          | 17.8         |

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

## **Operational Condition (Rigidity):**

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.3007 degrees under the operational wind speed as specified in the Analysis Criteria.

## **Conclusions**

Based on the analysis results, the structure and its foundation will be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the design ANSI/TIA/EIA 222-G standards under a basic wind speed of 97 mph no ice and 50 mph with 1" radial ice after the following proposed modification is successfully completed.

- Proposed modification design drawing by **TES** Job # 36667

## **Pre-Mod Installation Determination**

We have also checked this tower to determine if the proposed Sprint Nextel equipment loading can be installed prior to the completion of the required modifications. We ran a reduced wind loading case as required by TIA-322 considering a construction period of no more than 6 months.

The tower and foundations passed, so the Carrier can proceed and install their proposed loading prior to the mods completion. Please be aware that this approval is being provided and is based on the method outlined in TIA-322. This approval is not a blanket approval and there is still a risk that the tower will experience a wind event that cannot be predicted by TIA-322 or our Engineers. In the event of an unforeseen wind event, Tower Engineering Solutions will not be liable nor responsible for damage to the tower or the Carriers equipment. Additionally, the tower cannot go beyond the 6 month construction period without the modifications being completed. If the modifications cannot be completed within 6 months from the completed installation of the Carrier's proposed equipment, TES must be notified immediately for further review.

## Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC**. Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.
2. The analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.
3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.
4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.
5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.
6. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed or/and ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.
7. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.
8. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.
9. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.





|   |                |               |                    |                   |
|---|----------------|---------------|--------------------|-------------------|
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|   | <b>Project</b> |               | <b>Date</b>        | 15:25:14 10/02/17 |
|   | <b>Client</b>  | Sprint Nextel | <b>Designed by</b> | JC                |

## Guy-Tensioning Information

| Temperature At Time Of Tensioning |         |         |                       |                 |                       |                 |                       |                 |                       |                 |                       |                 |                       |                 |                       |                 |      |
|-----------------------------------|---------|---------|-----------------------|-----------------|-----------------------|-----------------|-----------------------|-----------------|-----------------------|-----------------|-----------------------|-----------------|-----------------------|-----------------|-----------------------|-----------------|------|
| Guy Elevation<br>ft               | H<br>ft | V<br>ft | 0 F                   |                 | 20 F                  |                 | 40 F                  |                 | 60 F                  |                 | 80 F                  |                 | 100 F                 |                 | 120 F                 |                 |      |
|                                   |         |         | Initial Tension<br>lb | Intercept<br>ft | Initial Tension<br>lb | Intercept<br>ft | Initial Tension<br>lb | Intercept<br>ft | Initial Tension<br>lb | Intercept<br>ft | Initial Tension<br>lb | Intercept<br>ft | Initial Tension<br>lb | Intercept<br>ft | Initial Tension<br>lb | Intercept<br>ft |      |
| 76.15                             | A       | 38.91   | 76.15                 | 2404            | 0.78                  | 2320            | 0.81                  | 2236            | 0.84                  | 2152            | 0.87                  | 2068            | 0.90                  | 1985            | 0.94                  | 1901            | 0.98 |
|                                   | B       | 38.91   | 76.15                 | 2404            | 0.78                  | 2320            | 0.81                  | 2236            | 0.84                  | 2152            | 0.87                  | 2068            | 0.90                  | 1985            | 0.94                  | 1901            | 0.98 |
|                                   | C       | 23.91   | 66.15                 | 2293            | 0.55                  | 2246            | 0.56                  | 2199            | 0.58                  | 2152            | 0.59                  | 2105            | 0.60                  | 2058            | 0.62                  | 2011            | 0.63 |
|                                   | D       | 38.91   | 76.15                 | 2404            | 0.78                  | 2320            | 0.81                  | 2236            | 0.84                  | 2152            | 0.87                  | 2068            | 0.90                  | 1985            | 0.94                  | 1901            | 0.98 |
| 54.95                             | A       | 38.91   | 54.95                 | 1978            | 0.45                  | 1873            | 0.48                  | 1768            | 0.51                  | 1664            | 0.54                  | 1560            | 0.58                  | 1456            | 0.62                  | 1352            | 0.66 |
|                                   | B       | 38.91   | 54.95                 | 1978            | 0.45                  | 1873            | 0.48                  | 1768            | 0.51                  | 1664            | 0.54                  | 1560            | 0.58                  | 1456            | 0.62                  | 1352            | 0.66 |
|                                   | C       | 23.91   | 44.95                 | 1872            | 0.27                  | 1803            | 0.29                  | 1733            | 0.30                  | 1664            | 0.31                  | 1595            | 0.32                  | 1525            | 0.34                  | 1456            | 0.35 |
|                                   | D       | 38.91   | 54.95                 | 1978            | 0.45                  | 1873            | 0.48                  | 1768            | 0.51                  | 1664            | 0.54                  | 1560            | 0.58                  | 1456            | 0.62                  | 1352            | 0.66 |
| 76.15                             | A       | 38.91   | 76.15                 | 3127            | 0.78                  | 3018            | 0.81                  | 2909            | 0.84                  | 2800            | 0.87                  | 2691            | 0.90                  | 2583            | 0.94                  | 2475            | 0.98 |
|                                   | B       | 38.91   | 76.15                 | 3127            | 0.78                  | 3018            | 0.81                  | 2909            | 0.84                  | 2800            | 0.87                  | 2691            | 0.90                  | 2583            | 0.94                  | 2475            | 0.98 |
|                                   | C       | 23.91   | 66.15                 | 2983            | 0.55                  | 2922            | 0.56                  | 2861            | 0.58                  | 2800            | 0.59                  | 2739            | 0.60                  | 2678            | 0.61                  | 2617            | 0.63 |
|                                   | D       | 38.91   | 76.15                 | 3127            | 0.78                  | 3018            | 0.81                  | 2909            | 0.84                  | 2800            | 0.87                  | 2691            | 0.90                  | 2583            | 0.94                  | 2475            | 0.98 |

## Tower Pressures - No Ice

$G_H = 1.100$

| Section Elevation<br>ft | z<br>ft | $K_z$ | $q_z$<br>psf | $A_G$<br>ft <sup>2</sup> | F<br>a<br>c<br>e | $A_F$<br>ft <sup>2</sup> | $A_R$<br>ft <sup>2</sup> | $A_{leg}$<br>ft <sup>2</sup> | Leg<br>% | $C_{AA}$<br>In<br>Face<br>ft <sup>2</sup> | $C_{AA}$<br>Out<br>Face<br>ft <sup>2</sup> |
|-------------------------|---------|-------|--------------|--------------------------|------------------|--------------------------|--------------------------|------------------------------|----------|---|--|
| L1 100.00-47.00         | 74.01   | 1.188 | 27           | 115.938                  | A                | 0.000                    | 193.268                  | 193.268                      | 100.00   | 39.204                                    | 0.000                                      |
|                         |         |       |              |                          | B                | 0.000                    | 193.268                  | 100.00                       | 0.000    | 0.000                                     |  |
|                         |         |       |              |                          | C                | 0.000                    | 193.268                  | 100.00                       | 51.084   | 0.000                                     |  |
|                         |         |       |              |                          | D                | 0.000                    | 193.268                  | 100.00                       | 0.000    | 0.000                                     |  |
| L2 47.00-0.00           | 24.55   | 0.942 | 21           | 102.813                  | A                | 0.000                    | 171.388                  | 171.388                      | 100.00   | 55.836                                    | 0.000                                      |
|                         |         |       |              |                          | B                | 0.000                    | 171.388                  | 100.00                       | 0.000    | 0.000                                     |  |
|                         |         |       |              |                          | C                | 0.000                    | 171.388                  | 100.00                       | 55.836   | 0.000                                     |  |
|                         |         |       |              |                          | D                | 0.000                    | 171.388                  | 100.00                       | 0.000    | 0.000                                     |  |

## Tower Pressure - With Ice

$G_H = 1.100$

| Section Elevation<br>ft | z<br>ft | $K_z$ | $q_z$<br>psf | $t_z$<br>in | $A_G$<br>ft <sup>2</sup> | F<br>a<br>c<br>e | $A_F$<br>ft <sup>2</sup> | $A_R$<br>ft <sup>2</sup> | $A_{leg}$<br>ft <sup>2</sup> | Leg<br>% | $C_{AA}$<br>In<br>Face<br>ft <sup>2</sup> | $C_{AA}$<br>Out<br>Face<br>ft <sup>2</sup> |
|-------------------------|---------|-------|--------------|-------------|--------------------------|------------------|--------------------------|--------------------------|------------------------------|----------|---|--|
| L1 100.00-47.00         | 74.01   | 1.188 | 7            | 2.1682      | 135.090                  | A                | 0.000                    | 225.195                  | 225.195                      | 100.00   | 66.893                                    | 0.000                                      |
|                         |         |       |              |             |                          | B                | 0.000                    | 225.195                  | 100.00                       | 0.000    | 0.000                                     |  |
|                         |         |       |              |             |                          | C                | 0.000                    | 225.195                  | 100.00                       | 147.441  | 0.000                                     |  |
|                         |         |       |              |             |                          | D                | 0.000                    | 225.195                  | 100.00                       | 28.187   | 0.000                                     |  |
| L2 47.00-0.00           | 24.55   | 0.942 | 6            | 1.9417      | 118.022                  | A                | 0.000                    | 196.743                  | 196.743                      | 100.00   | 92.610                                    | 0.000                                      |
|                         |         |       |              |             |                          | B                | 0.000                    | 196.743                  | 100.00                       | 0.000    | 0.000                                     |  |
|                         |         |       |              |             |                          | C                | 0.000                    | 196.743                  | 100.00                       | 147.365  | 0.000                                     |  |
|                         |         |       |              |             |                          | D                | 0.000                    | 196.743                  | 100.00                       | 22.815   | 0.000                                     |  |

|   |                                |                                  |
|---|--------------------------------|----------------------------------|
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|   | <b>Project</b>                 | <b>Date</b><br>15:25:14 10/02/17 |
|   | <b>Client</b><br>Sprint Nextel | <b>Designed by</b><br>JC         |

**Tower Pressure - Service**

$G_H = 1.100$

| Section Elevation<br>ft | z<br>ft | $K_Z$ | $q_z$<br>psf | $A_G$<br>ft <sup>2</sup> | F a c e | $A_F$<br>ft <sup>2</sup> | $A_R$<br>ft <sup>2</sup> | $A_{leg}$<br>ft <sup>2</sup> | Leg %  | $C_A A_A$<br>In Face<br>ft <sup>2</sup> | $C_A A_A$<br>Out Face<br>ft <sup>2</sup> |
|-------------------------|---------|-------|--------------|--------------------------|---------|--------------------------|--------------------------|------------------------------|--------|---|--|
| L1<br>100.00-47.00      | 74.01   | 1.188 | 9            | 115.938                  | A       | 0.000                    | 193.268                  | 193.268                      | 100.00 | 39.204                                  | 0.000                                    |
|                         |         |       |              |                          | B       | 0.000                    | 193.268                  |                              | 100.00 | 0.000                                   | 0.000                                    |
|                         |         |       |              |                          | C       | 0.000                    | 193.268                  |                              | 100.00 | 51.084                                  | 0.000                                    |
|                         |         |       |              |                          | D       | 0.000                    | 193.268                  |                              | 100.00 | 0.000                                   | 0.000                                    |
| L2<br>47.00-0.00        | 24.55   | 0.942 | 7            | 102.813                  | A       | 0.000                    | 171.388                  | 171.388                      | 100.00 | 55.836                                  | 0.000                                    |
|                         |         |       |              |                          | B       | 0.000                    | 171.388                  |                              | 100.00 | 0.000                                   | 0.000                                    |
|                         |         |       |              |                          | C       | 0.000                    | 171.388                  |                              | 100.00 | 55.836                                  | 0.000                                    |
|                         |         |       |              |                          | D       | 0.000                    | 171.388                  |                              | 100.00 | 0.000                                   | 0.000                                    |

**Tower Forces - No Ice - Wind Normal To Face**

| Section Elevation<br>ft | Add Weight<br>lb | Self Weight<br>lb | F a c e | e | $C_F$ | $q_z$<br>psf | $D_F$ | $D_R$ | $A_E$<br>ft <sup>2</sup> | F<br>lb  | w<br>plf | Ctrl. Face |
|-------------------------|------------------|-------------------|---------|---|-------|--------------|-------|-------|--------------------------|----------|----------|------------|
| L1<br>100.00-47.00      | 875.11           | 7967.50           | A       | 1 | 0.6   | 27           | 1     | 1     | 193.268                  | 7952.09  | 150.04   | D          |
|                         |                  |                   | B       | 1 | 1.2   |              |       |       | 193.268                  |          |          |            |
|                         |                  |                   | C       | 1 | 0.6   |              |       |       | 193.268                  |          |          |            |
|                         |                  |                   | D       | 1 | 1.2   |              |       |       | 193.268                  |          |          |            |
| L2<br>47.00-0.00        | 1064.55          | 7065.52           | A       | 1 | 0.6   | 21           | 1     | 1     | 171.388                  | 5923.25  | 126.03   | D          |
|                         |                  |                   | B       | 1 | 1.2   |              |       |       | 171.388                  |          |          |            |
|                         |                  |                   | C       | 1 | 0.6   |              |       |       | 171.388                  |          |          |            |
|                         |                  |                   | D       | 1 | 1.2   |              |       |       | 171.388                  |          |          |            |
| Sum Weight:             | 1939.66          | 15033.01          |         |   |       |              |       |       |                          | 13875.34 |          |            |

**Tower Forces - No Ice - Wind 45 To Face**

| Section Elevation<br>ft | Add Weight<br>lb | Self Weight<br>lb | F a c e | e | $C_F$ | $q_z$<br>psf | $D_F$ | $D_R$ | $A_E$<br>ft <sup>2</sup> | F<br>lb | w<br>plf | Ctrl. Face |
|-------------------------|------------------|-------------------|---------|---|-------|--------------|-------|-------|--------------------------|---------|----------|------------|
| L1<br>100.00-47.00      | 875.11           | 7967.50           | A       | 1 | 0.6   | 27           | 1     | 1     | 193.268                  | 3452.81 | 65.15    | D          |
|                         |                  |                   | B       | 1 | 0.6   |              |       |       | 193.268                  |         |          |            |
|                         |                  |                   | C       | 1 | 0.6   |              |       |       | 193.268                  |         |          |            |
|                         |                  |                   | D       | 1 | 0.6   |              |       |       | 193.268                  |         |          |            |
| L2<br>47.00-0.00        | 1064.55          | 7065.52           | A       | 1 | 0.6   | 21           | 1     | 1     | 171.388                  | 2415.21 | 51.39    | D          |
|                         |                  |                   | B       | 1 | 0.6   |              |       |       | 171.388                  |         |          |            |
|                         |                  |                   | C       | 1 | 0.6   |              |       |       | 171.388                  |         |          |            |
|                         |                  |                   | D       | 1 | 0.6   |              |       |       | 171.388                  |         |          |            |
| Sum Weight:             | 1939.66          | 15033.01          |         |   |       |              |       |       |                          | 5868.02 |          |            |

|   |                                |                                  |
|---|--------------------------------|----------------------------------|
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|   | <b>Project</b>                 | <b>Date</b><br>15:25:14 10/02/17 |
|   | <b>Client</b><br>Sprint Nextel | <b>Designed by</b><br>JC         |

**Tower Forces - With Ice - Wind Normal To Face**

| Section Elevation<br>ft | Add Weight<br>lb | Self Weight<br>lb | F a c e | e | C <sub>F</sub> | q <sub>z</sub><br>psf | D <sub>F</sub> | D <sub>R</sub> | A <sub>E</sub><br>ft <sup>2</sup> | F<br>lb | w<br>plf | Ctrl. Face |
|-------------------------|------------------|-------------------|---------|---|----------------|-----------------------|----------------|----------------|-----------------------------------|---------|----------|------------|
| L1<br>100.00-47.00      | 5034.48          | 11957.33          | A       | 1 | 1.2            | 7                     | 1              | 1              | 225.195                           | 2877.02 | 54.28    | D          |
|                         |                  |                   | B       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
|                         |                  |                   | C       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
|                         |                  |                   | D       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
| L2 47.00-0.00           | 5383.90          | 10208.71          | A       | 1 | 1.2            | 6                     | 1              | 1              | 196.743                           | 2119.63 | 45.10    | D          |
|                         |                  |                   | B       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
|                         |                  |                   | C       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
|                         |                  |                   | D       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
| Sum Weight:             | 10418.38         | 22166.04          |         |   |                |                       |                |                |                                   | 4996.66 |          |            |

**Tower Forces - With Ice - Wind 45 To Face**

| Section Elevation<br>ft | Add Weight<br>lb | Self Weight<br>lb | F a c e | e | C <sub>F</sub> | q <sub>z</sub><br>psf | D <sub>F</sub> | D <sub>R</sub> | A <sub>E</sub><br>ft <sup>2</sup> | F<br>lb | w<br>plf | Ctrl. Face |
|-------------------------|------------------|-------------------|---------|---|----------------|-----------------------|----------------|----------------|-----------------------------------|---------|----------|------------|
| L1<br>100.00-47.00      | 5034.48          | 11957.33          | A       | 1 | 1.2            | 7                     | 1              | 1              | 225.195                           | 2137.96 | 40.34    | D          |
|                         |                  |                   | B       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
|                         |                  |                   | C       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
|                         |                  |                   | D       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
| L2 47.00-0.00           | 5383.90          | 10208.71          | A       | 1 | 1.2            | 6                     | 1              | 1              | 196.743                           | 1473.33 | 31.35    | D          |
|                         |                  |                   | B       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
|                         |                  |                   | C       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
|                         |                  |                   | D       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
| Sum Weight:             | 10418.38         | 22166.04          |         |   |                |                       |                |                |                                   | 3611.29 |          |            |

**Tower Forces - Service - Wind Normal To Face**

| Section Elevation<br>ft | Add Weight<br>lb | Self Weight<br>lb | F a c e | e | C <sub>F</sub> | q <sub>z</sub><br>psf | D <sub>F</sub> | D <sub>R</sub> | A <sub>E</sub><br>ft <sup>2</sup> | F<br>lb | w<br>plf | Ctrl. Face |
|-------------------------|------------------|-------------------|---------|---|----------------|-----------------------|----------------|----------------|-----------------------------------|---------|----------|------------|
| L1<br>100.00-47.00      | 875.11           | 7967.50           | A       | 1 | 0.6            | 9                     | 1              | 1              | 193.268                           | 2722.30 | 51.36    | D          |
|                         |                  |                   | B       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
|                         |                  |                   | C       | 1 | 0.6            |                       |                |                |                                   |         |          |            |
|                         |                  |                   | D       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
| L2 47.00-0.00           | 1064.55          | 7065.52           | A       | 1 | 0.6            | 7                     | 1              | 1              | 171.388                           | 2027.75 | 43.14    | D          |
|                         |                  |                   | B       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
|                         |                  |                   | C       | 1 | 0.6            |                       |                |                |                                   |         |          |            |
|                         |                  |                   | D       | 1 | 1.2            |                       |                |                |                                   |         |          |            |
| Sum Weight:             | 1939.66          | 15033.01          |         |   |                |                       |                |                |                                   | 4750.05 |          |            |



|   |                                |                                  |
|---|--------------------------------|----------------------------------|
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|   | <b>Project</b>                 | <b>Date</b><br>15:25:14 10/02/17 |
|   | <b>Client</b><br>Sprint Nextel | <b>Designed by</b><br>JC         |

### Tower Forces - Service - Wind 45 To Face

| Section Elevation  | Add Weight | Self Weight | F a c e | e | C <sub>F</sub> | q <sub>z</sub> psf | D <sub>F</sub> | D <sub>R</sub> | A <sub>E</sub> ft <sup>2</sup> | F lb    | w plf | Ctrl. Face |
|--------------------|------------|-------------|---------|---|----------------|--------------------|----------------|----------------|--------------------------------|---------|-------|------------|
| L1<br>100.00-47.00 | 875.11     | 7967.50     | A       | 1 | 0.6            | 9                  | 1              | 1              | 193.268                        | 1182.03 | 22.30 | D          |
|                    |            |             | B       | 1 | 0.6            |                    | 1              | 1              | 193.268                        |         |       |            |
|                    |            |             | C       | 1 | 0.6            |                    | 1              | 1              | 193.268                        |         |       |            |
|                    |            |             | D       | 1 | 0.6            |                    | 1              | 1              | 193.268                        |         |       |            |
| L2 47.00-0.00      | 1064.55    | 7065.52     | A       | 1 | 0.6            | 7                  | 1              | 1              | 171.388                        | 826.82  | 17.59 | D          |
|                    |            |             | B       | 1 | 0.6            |                    | 1              | 1              | 171.388                        |         |       |            |
|                    |            |             | C       | 1 | 0.6            |                    | 1              | 1              | 171.388                        |         |       |            |
|                    |            |             | D       | 1 | 0.6            |                    | 1              | 1              | 171.388                        |         |       |            |
| Sum Weight:        | 1939.66    | 15033.01    |         |   |                |                    |                |                |                                | 2008.84 |       |            |

### Force Totals (Does not include forces on guys)

| Load Case                | Vertical Forces lb | Sum of Forces X lb | Sum of Forces Z lb | Sum of Torques kip-ft |
|--------------------------|--------------------|--------------------|--------------------|-----------------------|
| Leg Weight               | 15033.01           |                    |                    |                       |
| Bracing Weight           | 0.00               |                    |                    |                       |
| Total Member Self-Weight | 15033.01           |                    |                    |                       |
| Guy Weight               | 488.90             |                    |                    |                       |
| Total Weight             | 19261.83           |                    |                    |                       |
| Wind 0 deg - No Ice      |                    | 0.00               | -18049.01          | -0.01                 |
| Wind 45 deg - No Ice     |                    | 7675.45            | -7100.55           | -1.66                 |
| Wind 90 deg - No Ice     |                    | 10854.73           | 0.00               | -2.34                 |
| Wind 135 deg - No Ice    |                    | 7675.45            | 7100.55            | -1.65                 |
| Wind 180 deg - No Ice    |                    | 0.00               | 18049.01           | 0.01                  |
| Wind 225 deg - No Ice    |                    | -7675.45           | 7100.55            | 1.66                  |
| Wind 270 deg - No Ice    |                    | -10854.73          | 0.00               | 2.34                  |
| Wind 315 deg - No Ice    |                    | -7675.45           | -7100.55           | 1.65                  |
| Member Ice               | 7133.03            |                    |                    |                       |
| Guy Ice                  | 5630.45            |                    |                    |                       |
| Total Weight Ice         | 43013.37           |                    |                    |                       |
| Wind 0 deg - Ice         |                    | 0.00               | -6417.38           | -0.00                 |
| Wind 45 deg - Ice        |                    | 3718.73            | -3558.17           | -0.59                 |
| Wind 90 deg - Ice        |                    | 5259.07            | 0.00               | -0.83                 |
| Wind 135 deg - Ice       |                    | 3718.73            | 3558.17            | -0.58                 |
| Wind 180 deg - Ice       |                    | 0.00               | 6417.38            | 0.00                  |
| Wind 225 deg - Ice       |                    | -3718.73           | 3558.17            | 0.59                  |
| Wind 270 deg - Ice       |                    | -5259.07           | 0.00               | 0.83                  |
| Wind 315 deg - Ice       |                    | -3718.73           | -3558.17           | 0.58                  |
| Total Weight             | 19261.83           |                    |                    |                       |
| Wind 0 deg - Service     |                    | 0.00               | -6178.85           | -0.00                 |
| Wind 45 deg - Service    |                    | 2627.60            | -2430.78           | -0.57                 |
| Wind 90 deg - Service    |                    | 3715.98            | 0.00               | -0.80                 |
| Wind 135 deg - Service   |                    | 2627.60            | 2430.78            | -0.56                 |
| Wind 180 deg - Service   |                    | 0.00               | 6178.85            | 0.00                  |
| Wind 225 deg - Service   |                    | -2627.60           | 2430.78            | 0.57                  |
| Wind 270 deg - Service   |                    | -3715.98           | 0.00               | 0.80                  |
| Wind 315 deg - Service   |                    | -2627.60           | -2430.78           | 0.56                  |

|   |                                |                                  |
|---|--------------------------------|----------------------------------|
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|   | <b>Project</b>                 | <b>Date</b><br>15:25:14 10/02/17 |
|   | <b>Client</b><br>Sprint Nextel | <b>Designed by</b><br>JC         |

## Load Combinations

| Comb. No. | Description  |
|-----------|--|
| 1         | Dead Only  |
| 2         | 1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy           |
| 3         | 1.2 Dead+1.6 Wind 45 deg - No Ice+1.0 Guy          |
| 4         | 1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy          |
| 5         | 1.2 Dead+1.6 Wind 135 deg - No Ice+1.0 Guy         |
| 6         | 1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy         |
| 7         | 1.2 Dead+1.6 Wind 225 deg - No Ice+1.0 Guy         |
| 8         | 1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy         |
| 9         | 1.2 Dead+1.6 Wind 315 deg - No Ice+1.0 Guy         |
| 10        | 1.2 Dead+1.0 Ice+1.0 Temp+Guy                      |
| 11        | 1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy   |
| 12        | 1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp+1.0 Guy  |
| 13        | 1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy  |
| 14        | 1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 15        | 1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 16        | 1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 17        | 1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 18        | 1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp+1.0 Guy |
| 19        | Dead+Wind 0 deg - Service+Guy                      |
| 20        | Dead+Wind 45 deg - Service+Guy                     |
| 21        | Dead+Wind 90 deg - Service+Guy                     |
| 22        | Dead+Wind 135 deg - Service+Guy                    |
| 23        | Dead+Wind 180 deg - Service+Guy                    |
| 24        | Dead+Wind 225 deg - Service+Guy                    |
| 25        | Dead+Wind 270 deg - Service+Guy                    |
| 26        | Dead+Wind 315 deg - Service+Guy                    |

## Maximum Member Forces

| Section No. | Elevation ft | Component Type | Condition        | Gov. Load Comb. | Axial lb  | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |  |  |
|-------------|--------------|----------------|------------------|-----------------|-----------|--------------------------|--------------------------|--|--|
| L1          | 100 - 47     | Pole           | Max Tension      | 10              | 0.10      | -0.00                    | -0.00                    |  |  |
|             |              |                | Max. Compression | 2               | -90170.75 | 11.12                    | 87.05                    |  |  |
|             |              |                | Max. Mx          | 8               | -6680.82  | 157.34                   | 1.72                     |  |  |
|             |              |                | Max. My          | 2               | -6580.52  | 0.29                     | 180.77                   |  |  |
|             |              |                | Max. Vy          | 8               | -10706.15 | 157.34                   | 1.72                     |  |  |
|             |              |                | Max. Vx          | 2               | -12773.51 | 0.29                     | 180.77                   |  |  |
|             |              |                | Max. Torque      | 4               |           |                          | 3.75                     |  |  |
|             |              |                | Guy A            | Bottom Tension  | 5         | 12283.37                 |                          |  |  |
|             |              |                |                  | Top Tension     | 5         | 12321.77                 |                          |  |  |
|             |              |                |                  | Top Cable Vert  | 5         | 10976.58                 |                          |  |  |
|             |              |                |                  | Top Cable Norm  | 5         | 5598.27                  |                          |  |  |
|             |              |                |                  | Top Cable Tan   | 5         | 3.78                     |                          |  |  |
|             |              |                |                  | Bot Cable Vert  | 5         | -10868.28                |                          |  |  |
|             |              |                |                  | Bot Cable Norm  | 5         | 5723.77                  |                          |  |  |
|             |              | Bot Cable Tan  |                  | 5               | 3.78      |                          |                          |  |  |
|             |              | Guy A          | Bottom Tension   | 6               | 8039.58   |                          |                          |  |  |
|             |              |                | Top Tension      | 6               | 8060.89   |                          |                          |  |  |
|             |              |                | Top Cable Vert   | 6               | 6584.33   |                          |                          |  |  |
|             |              |                | Top Cable Norm   | 6               | 4650.22   |                          |                          |  |  |
|             |              |                | Top Cable Tan    | 6               | 1.24      |                          |                          |  |  |
|             |              |                | Bot Cable Vert   | 6               | -6522.70  |                          |                          |  |  |

|  |                |               |                    |                   |
|--|----------------|---------------|--------------------|-------------------|
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|  | <b>Project</b> |               | <b>Date</b>        | 15:25:14 10/02/17 |
|  | <b>Client</b>  | Sprint Nextel | <b>Designed by</b> | JC                |

| Section No. | Elevation ft | Component Type | Condition      | Gov. Load Comb. | Axial lb  | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|--------------|----------------|----------------|-----------------|-----------|--------------------------|--------------------------|
|             |              |                | Bot Cable Norm | 6               | 4699.36   |                          |                          |
|             |              |                | Bot Cable Tan  | 6               | 72.53     |                          |                          |
|             |              | Guy A          | Bottom Tension | 5               | 15943.34  |                          |                          |
|             |              |                | Top Tension    | 5               | 15993.32  |                          |                          |
|             |              |                | Top Cable Vert | 5               | 14241.75  |                          |                          |
|             |              |                | Top Cable Norm | 5               | 7277.27   |                          |                          |
|             |              |                | Top Cable Tan  | 5               | 4.91      |                          |                          |
|             |              |                | Bot Cable Vert | 5               | -14112.28 |                          |                          |
|             |              |                | Bot Cable Norm | 5               | 7418.45   |                          |                          |
|             |              |                | Bot Cable Tan  | 5               | 4.91      |                          |                          |
|             |              | Guy B          | Bottom Tension | 7               | 12336.18  |                          |                          |
|             |              |                | Top Tension    | 7               | 12374.57  |                          |                          |
|             |              |                | Top Cable Vert | 7               | 11023.24  |                          |                          |
|             |              |                | Top Cable Norm | 7               | 5623.00   |                          |                          |
|             |              |                | Top Cable Tan  | 7               | 8.89      |                          |                          |
|             |              |                | Bot Cable Vert | 7               | -10914.94 |                          |                          |
|             |              |                | Bot Cable Norm | 7               | 5748.50   |                          |                          |
|             |              |                | Bot Cable Tan  | 7               | 8.89      |                          |                          |
|             |              | Guy B          | Bottom Tension | 6               | 8136.88   |                          |                          |
|             |              |                | Top Tension    | 6               | 8158.19   |                          |                          |
|             |              |                | Top Cable Vert | 6               | 6663.27   |                          |                          |
|             |              |                | Top Cable Norm | 6               | 4707.12   |                          |                          |
|             |              |                | Top Cable Tan  | 6               | 1.41      |                          |                          |
|             |              |                | Bot Cable Vert | 6               | -6601.63  |                          |                          |
|             |              |                | Bot Cable Norm | 6               | 4756.25   |                          |                          |
|             |              |                | Bot Cable Tan  | 6               | 72.36     |                          |                          |
|             |              | Guy B          | Bottom Tension | 7               | 16011.94  |                          |                          |
|             |              |                | Top Tension    | 7               | 16061.91  |                          |                          |
|             |              |                | Top Cable Vert | 7               | 14302.37  |                          |                          |
|             |              |                | Top Cable Norm | 7               | 7309.38   |                          |                          |
|             |              |                | Top Cable Tan  | 7               | 11.53     |                          |                          |
|             |              |                | Bot Cable Vert | 7               | -14172.89 |                          |                          |
|             |              |                | Bot Cable Norm | 7               | 7450.57   |                          |                          |
|             |              |                | Bot Cable Tan  | 7               | 11.53     |                          |                          |
|             |              | Guy C          | Bottom Tension | 9               | 15129.62  |                          |                          |
|             |              |                | Top Tension    | 9               | 15162.27  |                          |                          |
|             |              |                | Top Cable Vert | 9               | 14230.07  |                          |                          |
|             |              |                | Top Cable Norm | 9               | 5234.45   |                          |                          |
|             |              |                | Top Cable Tan  | 9               | 5.19      |                          |                          |
|             |              |                | Bot Cable Vert | 9               | -14148.63 |                          |                          |
|             |              |                | Bot Cable Norm | 9               | 5359.24   |                          |                          |
|             |              |                | Bot Cable Tan  | 9               | 5.19      |                          |                          |
|             |              | Guy C          | Bottom Tension | 2               | 11634.14  |                          |                          |
|             |              |                | Top Tension    | 2               | 11651.26  |                          |                          |
|             |              |                | Top Cable Vert | 2               | 10261.75  |                          |                          |
|             |              |                | Top Cable Norm | 2               | 5517.87   |                          |                          |
|             |              |                | Top Cable Tan  | 2               | 38.13     |                          |                          |
|             |              |                | Bot Cable Vert | 2               | -10216.69 |                          |                          |
|             |              |                | Bot Cable Norm | 2               | 5564.42   |                          |                          |
|             |              |                | Bot Cable Tan  | 2               | 97.85     |                          |                          |
|             |              | Guy C          | Bottom Tension | 9               | 19640.33  |                          |                          |
|             |              |                | Top Tension    | 9               | 19682.95  |                          |                          |
|             |              |                | Top Cable Vert | 9               | 18468.84  |                          |                          |
|             |              |                | Top Cable Norm | 9               | 6805.91   |                          |                          |
|             |              |                | Top Cable Tan  | 9               | 6.74      |                          |                          |
|             |              |                | Bot Cable Vert | 9               | -18370.94 |                          |                          |
|             |              |                | Bot Cable Norm | 9               | 6946.30   |                          |                          |
|             |              |                | Bot Cable Tan  | 9               | 6.74      |                          |                          |
|             |              | Guy D          | Bottom Tension | 3               | 12374.27  |                          |                          |
|             |              |                | Top Tension    | 3               | 12412.67  |                          |                          |
|             |              |                | Top Cable Vert | 3               | 11056.95  |                          |                          |

|   |                |               |                    |                   |
|---|----------------|---------------|--------------------|-------------------|
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|   | <b>Project</b> |               | <b>Date</b>        | 15:25:14 10/02/17 |
|   | <b>Client</b>  | Sprint Nextel | <b>Designed by</b> | JC                |

| Section No. | Elevation ft | Component Type | Condition        | Gov. Load Comb. | Axial lb  | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|--------------|----------------|------------------|-----------------|-----------|--------------------------|--------------------------|
|             |              |                | Top Cable Norm   | 3               | 5640.76   |                          |                          |
|             |              |                | Top Cable Tan    | 3               | 0.54      |                          |                          |
|             |              |                | Bot Cable Vert   | 3               | -10948.65 |                          |                          |
|             |              |                | Bot Cable Norm   | 3               | 5766.26   |                          |                          |
|             |              |                | Bot Cable Tan    | 3               | 0.54      |                          |                          |
|             |              | Guy D          | Bottom Tension   | 2               | 8103.02   |                          |                          |
|             |              |                | Top Tension      | 2               | 8124.20   |                          |                          |
|             |              |                | Top Cable Vert   | 2               | 6635.55   |                          |                          |
|             |              |                | Top Cable Norm   | 2               | 4687.42   |                          |                          |
|             |              |                | Top Cable Tan    | 2               | 13.95     |                          |                          |
|             |              |                | Bot Cable Vert   | 2               | -6573.91  |                          |                          |
|             |              |                | Bot Cable Norm   | 2               | 4736.55   |                          |                          |
|             |              |                | Bot Cable Tan    | 2               | 87.72     |                          |                          |
|             |              | Guy D          | Bottom Tension   | 3               | 16061.42  |                          |                          |
|             |              |                | Top Tension      | 3               | 16111.39  |                          |                          |
|             |              |                | Top Cable Vert   | 3               | 14346.15  |                          |                          |
|             |              |                | Top Cable Norm   | 3               | 7332.46   |                          |                          |
|             |              |                | Top Cable Tan    | 3               | 0.70      |                          |                          |
|             |              |                | Bot Cable Vert   | 3               | -14216.68 |                          |                          |
|             |              |                | Bot Cable Norm   | 3               | 7473.64   |                          |                          |
|             |              |                | Bot Cable Tan    | 3               | 0.70      |                          |                          |
| L2          | 47 - 0       | Pole           | Max Tension      | 1               | 0.00      | 0.00                     | 0.00                     |
|             |              |                | Max. Compression | 2               | -99868.03 | 17.70                    | 147.80                   |
|             |              |                | Max. Mx          | 8               | -72235.72 | 97.87                    | 9.13                     |
|             |              |                | Max. My          | 2               | -99868.03 | 17.70                    | 147.80                   |
|             |              |                | Max. Vy          | 4               | -2837.76  | -88.50                   | 0.85                     |
|             |              |                | Max. Vx          | 6               | 5268.07   | 0.91                     | -131.87                  |
|             |              |                | Max. Torque      | 4               |           |                          | 3.75                     |

### Maximum Reactions

| Location                                       | Condition                                     | Gov. Load Comb.     | Vertical lb | Horizontal, X lb | Horizontal, Z lb |        |
|--|---|---------------------|-------------|------------------|------------------|--------|
| Mast   | Max. Vert                                     | 2                   | 99871.16    | 8.68             | 5055.43          |        |
|  | Max. H <sub>x</sub>                           | 17                  | 77142.90    | 743.02           | 30.08            |        |
|  | Max. H <sub>z</sub>                           | 2                   | 99871.16    | 8.68             | 5055.43          |        |
|  | Max. M <sub>x</sub>                           | 2                   | 147.80      | 8.68             | 5055.43          |        |
|  | Max. M <sub>z</sub>                           | 4                   | 36.67       | -509.03          | -8.23            |        |
|  | Max. Torsion                                  | 4                   | 3.75        | -509.03          | -8.23            |        |
|  | Min. Vert                                     | 1                   | 42651.08    | 28.25            | 8.85             |        |
|  | Min. H <sub>x</sub>                           | 13                  | 74082.19    | -589.22          | 14.88            |        |
|  | Min. H <sub>z</sub>                           | 6                   | 88803.36    | 11.56            | -5219.59         |        |
|  | Min. M <sub>x</sub>                           | 6                   | -131.87     | 11.56            | -5219.59         |        |
|  | Min. M <sub>z</sub>                           | 8                   | -50.13      | 484.23           | -1.81            |        |
|  | Min. Torsion                                  | 8                   | -3.73       | 484.23           | -1.81            |        |
|  | Guy D @ 40 ft<br>Elev 0 ft<br>Azimuth 225 deg | Max. Vert           | 7           | -1145.78         | -318.08          | 319.25 |
|  |   | Max. H <sub>x</sub> | 7           | -1145.78         | -318.08          | 319.25 |
|  | Max. H <sub>z</sub>                           | 2                   | -31690.50   | -12327.84        | 13007.22         |        |
|  | Min. Vert                                     | 2                   | -31690.50   | -12327.84        | 13007.22         |        |
|  | Min. H <sub>x</sub>                           | 2                   | -31690.50   | -12327.84        | 13007.22         |        |
|  | Min. H <sub>z</sub>                           | 7                   | -1145.78    | -318.08          | 319.25           |        |
| Guy C @ 25 ft<br>Elev 10 ft<br>Azimuth 135 deg | Max. Vert                                     | 14                  | -762.07     | 219.39           | 219.57           |        |



|   |                |               |                    |                   |
|---|----------------|---------------|--------------------|-------------------|
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|   | <b>Project</b> |               | <b>Date</b>        | 15:25:14 10/02/17 |
|   | <b>Client</b>  | Sprint Nextel | <b>Designed by</b> | JC                |

| Location                                      | Condition           | Gov. Load Comb. | Vertical lb | Horizontal, X lb | Horizontal, Z lb |
|---|---------------------|-----------------|-------------|------------------|------------------|
| Guy B @ 40 ft<br>Elev 0 ft<br>Azimuth 45 deg  | Max. H <sub>x</sub> | 9               | -41773.68   | 12275.91         | 12257.09         |
|   | Max. H <sub>z</sub> | 2               | -42699.62   | 12252.20         | 12952.56         |
|   | Min. Vert           | 2               | -42699.62   | 12252.20         | 12952.56         |
|   | Min. H <sub>x</sub> | 5               | -1227.04    | 219.05           | 219.63           |
|   | Min. H <sub>z</sub> | 6               | -1340.28    | 390.10           | 179.34           |
|   | Max. Vert           | 3               | -1144.14    | 318.15           | -318.04          |
| Guy A @ 40 ft<br>Elev 0 ft<br>Azimuth -45 deg | Max. H <sub>x</sub> | 6               | -31681.29   | 12392.00         | -12941.34        |
|   | Max. H <sub>z</sub> | 2               | -1366.29    | 564.37           | -316.98          |
|   | Min. Vert           | 6               | -31681.29   | 12392.00         | -12941.34        |
|   | Min. H <sub>x</sub> | 3               | -1144.14    | 318.15           | -318.04          |
|   | Min. H <sub>z</sub> | 6               | -31681.29   | 12392.00         | -12941.34        |
|   | Max. Vert           | 18              | -683.35     | -384.15          | -384.24          |
|   | Max. H <sub>x</sub> | 9               | -946.92     | -238.86          | -239.23          |
|   | Max. H <sub>z</sub> | 2               | -1140.89    | -470.26          | -230.96          |
|   | Min. Vert           | 6               | -31350.27   | -12257.00        | -12807.48        |
|   | Min. H <sub>x</sub> | 6               | -31350.27   | -12257.00        | -12807.48        |
|   | Min. H <sub>z</sub> | 6               | -31350.27   | -12257.00        | -12807.48        |

### Tower Mast Reaction Summary

| Load Combination                                   | Vertical lb | Shear <sub>x</sub> lb | Shear <sub>z</sub> lb | Overturning Moment, M <sub>x</sub> kip-ft | Overturning Moment, M <sub>z</sub> kip-ft | Torque kip-ft |
|--|-------------|-----------------------|-----------------------|---|---|---------------|
| Dead Only  | 42651.08    | -28.25                | -8.85                 | -1.48                                     | 1.90                                      | 0.00          |
| 1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy           | 99871.16    | -8.68                 | -5055.43              | -147.80                                   | 17.70                                     | -0.05         |
| 1.2 Dead+1.6 Wind 45 deg - No Ice+1.0 Guy          | 68875.15    | 379.98                | -688.85               | -34.09                                    | -25.48                                    | -2.67         |
| 1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy          | 73801.91    | 509.03                | 8.23                  | -0.67                                     | -36.67                                    | -3.75         |
| 1.2 Dead+1.6 Wind 135 deg - No Ice+1.0 Guy         | 68808.68    | 411.01                | 696.84                | 31.66                                     | -28.08                                    | -2.63         |
| 1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy         | 88803.36    | -11.56                | 5219.59               | 131.87                                    | 0.91                                      | 0.04          |
| 1.2 Dead+1.6 Wind 225 deg - No Ice+1.0 Guy         | 69379.92    | -446.74               | 669.05                | 28.57                                     | 31.98                                     | 2.69          |
| 1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy         | 81961.38    | -484.23               | 1.81                  | -12.72                                    | 50.13                                     | 3.73          |
| 1.2 Dead+1.6 Wind 315 deg - No Ice+1.0 Guy         | 79288.90    | -392.14               | -632.98               | -47.91                                    | 45.28                                     | 2.61          |
| 1.2 Dead+1.0 Ice+1.0 Temp+Guy                      | 70661.23    | -81.22                | -24.28                | -5.77                                     | 6.96                                      | -0.00         |
| 1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy   | 78153.80    | -86.78                | -1267.98              | -39.05                                    | 10.55                                     | -0.05         |
| 1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp+1.0 Guy  | 73423.65    | 391.92                | -557.05               | -18.32                                    | -3.56                                     | -0.66         |
| 1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy  | 74082.19    | 589.22                | -14.88                | -3.82                                     | -13.42                                    | -0.87         |
| 1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp+1.0 Guy | 72632.97    | 394.49                | 497.61                | 8.72                                      | -7.31                                     | -0.58         |
| 1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy | 74505.04    | -70.26                | 1235.95               | 26.10                                     | 4.80                                      | 0.04          |
| 1.2 Dead+1.0 Wind 225                              | 73534.54    | -568.96               | 496.26                | 4.81                                      | 19.37                                     | 0.66          |

|  |                |               |                    |                   |
|--|----------------|---------------|--------------------|-------------------|
| <p style="text-align: center;"><b>tnxTower</b></p> <p style="text-align: center;"><b>Tower Engineering Solutions</b><br/>8445 Freeport Parkway, Suite 375<br/>Irving, TX 75063<br/>Phone: (972) 483-0607<br/>FAX: (972) 975-9615</p> | <b>Job</b>     | CT46143-A     | <b>Page</b>        | 9 of 13           |
|  | <b>Project</b> |               | <b>Date</b>        | 15:25:14 10/02/17 |
|  | <b>Client</b>  | Sprint Nextel | <b>Designed by</b> | JC                |

| <i>Load Combination</i>  | <i>Vertical<br/>lb</i> | <i>Shear<sub>x</sub><br/>lb</i> | <i>Shear<sub>z</sub><br/>lb</i> | <i>Overturning<br/>Moment, M<sub>x</sub><br/>kip-ft</i> | <i>Overturning<br/>Moment, M<sub>z</sub><br/>kip-ft</i> | <i>Torque<br/>kip-ft</i> |
|--|------------------------|---------------------------------|---------------------------------|---|---|--------------------------|
| deg+1.0 Ice+1.0 Temp+1.0 Guy<br>1.2 Dead+1.0 Wind 270            | 77142.90               | -743.02                         | -30.08                          | -9.15   | 28.74   | 0.87                     |
| deg+1.0 Ice+1.0 Temp+1.0 Guy<br>1.2 Dead+1.0 Wind 315            | 76885.66               | -559.77                         | -548.20                         | -21.99  | 22.94   | 0.58                     |
| deg+1.0 Ice+1.0 Temp+1.0 Guy<br>Dead+Wind 0 deg -<br>Service+Guy | 43508.37               | -24.76                          | -1174.12                        | -23.65  | 2.99  | -0.01                    |
| Dead+Wind 45 deg -<br>Service+Guy                                | 42817.56               | 91.53                           | -181.67                         | -5.21   | -0.97   | -0.57                    |
| Dead+Wind 90 deg -<br>Service+Guy                                | 42828.15               | 139.46                          | -10.56                          | -0.98   | -2.79   | -0.80                    |
| Dead+Wind 135 deg -<br>Service+Guy                               | 42806.11               | 89.93                           | 160.53                          | 2.93  | -1.76   | -0.56                    |
| Dead+Wind 180 deg -<br>Service+Guy                               | 42903.85               | -27.19                          | 1162.42                         | 20.35   | 1.18  | 0.01                     |
| Dead+Wind 225 deg -<br>Service+Guy                               | 42840.26               | -149.22                         | 162.78                          | 2.07  | 4.97  | 0.58                     |
| Dead+Wind 270 deg -<br>Service+Guy                               | 43063.68               | -193.74                         | -5.04                           | -2.11   | 6.75  | 0.80                     |
| Dead+Wind 315 deg -<br>Service+Guy                               | 42971.78               | -144.23                         | -175.76                         | -5.90   | 5.59  | 0.56                     |

## Solution Summary

| <i>Load Comb.</i> | <i>Sum of Applied Forces</i> |                  |                  | <i>Sum of Reactions</i> |                  |                  | <i>% Error</i> |
|-------------------|------------------------------|------------------|------------------|-------------------------|------------------|------------------|----------------|
|                   | <i>PX<br/>lb</i>             | <i>PY<br/>lb</i> | <i>PZ<br/>lb</i> | <i>PX<br/>lb</i>        | <i>PY<br/>lb</i> | <i>PZ<br/>lb</i> |                |
| 1                 | 0.00                         | -19261.82        | 0.00             | -0.27                   | 19261.86         | -0.35            | 0.002%         |
| 2                 | -27.24                       | -22973.87        | -30467.56        | 27.15                   | 22973.86         | 30467.28         | 0.001%         |
| 3                 | 13382.35                     | -23016.40        | -12462.50        | -13382.09               | 23016.40         | 12462.24         | 0.001%         |
| 4                 | 18956.71                     | -23058.93        | 27.24            | -18956.44               | 23058.93         | -27.26           | 0.001%         |
| 5                 | 13440.06                     | -23068.04        | 12520.20         | -13439.85               | 23068.04         | -12520.00        | 0.001%         |
| 6                 | 27.24                        | -23058.93        | 30467.56         | -27.28                  | 23058.92         | -30467.04        | 0.001%         |
| 7                 | -13382.35                    | -23016.40        | 12462.50         | 13382.09                | 23016.40         | -12462.24        | 0.001%         |
| 8                 | -18956.71                    | -22973.87        | -27.24           | 18956.56                | 22973.87         | 27.18            | 0.001%         |
| 9                 | -13440.06                    | -22964.76        | -12520.20        | 13439.84                | 22964.75         | 12519.99         | 0.001%         |
| 10                | 0.00                         | -46767.77        | 0.00             | -1.41                   | 46767.74         | -1.49            | 0.004%         |
| 11                | -40.37                       | -46706.26        | -8778.08         | 40.17                   | 46706.25         | 8777.71          | 0.001%         |
| 12                | 5355.68                      | -46767.77        | -5195.12         | -5355.60                | 46767.77         | 5194.96          | 0.000%         |
| 13                | 7619.78                      | -46829.29        | 40.37            | -7618.95                | 46829.26         | -40.41           | 0.002%         |
| 14                | 5441.17                      | -46842.01        | 5280.61          | -5440.47                | 46841.98         | -5279.96         | 0.002%         |
| 15                | 40.37                        | -46829.28        | 8778.08          | -40.36                  | 46829.26         | -8777.11         | 0.002%         |
| 16                | -5355.68                     | -46767.77        | 5195.12          | 5355.52                 | 46767.77         | -5195.06         | 0.000%         |
| 17                | -7619.78                     | -46706.26        | -40.37           | 7619.44                 | 46706.25         | 40.18            | 0.001%         |
| 18                | -5441.17                     | -46693.53        | -5280.61         | 5441.08                 | 46693.53         | 5280.53          | 0.000%         |
| 19                | -5.83                        | -19252.72        | -6518.87         | 5.54                    | 19252.71         | 6518.48          | 0.002%         |
| 20                | 2863.30                      | -19261.82        | -2666.49         | -2863.21                | 19261.82         | 2666.34          | 0.001%         |
| 21                | 4056.00                      | -19270.92        | 5.83             | -4055.66                | 19270.91         | -5.84            | 0.002%         |
| 22                | 2875.65                      | -19272.87        | 2678.83          | -2875.45                | 19272.86         | -2678.66         | 0.001%         |
| 23                | 5.83                         | -19270.92        | 6518.87          | -5.90                   | 19270.91         | -6518.35         | 0.003%         |
| 24                | -2863.30                     | -19261.82        | 2666.49          | 2863.11                 | 19261.82         | -2666.45         | 0.001%         |
| 25                | -4056.00                     | -19252.72        | -5.83            | 4055.12                 | 19252.71         | 5.32             | 0.005%         |
| 26                | -2875.65                     | -19250.77        | -2678.83         | 2875.09                 | 19250.76         | 2678.30          | 0.004%         |

|  |                                |                                  |
|--|--------------------------------|----------------------------------|
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|  | <b>Project</b>                 | <b>Date</b><br>15:25:14 10/02/17 |
|  | <b>Client</b><br>Sprint Nextel | <b>Designed by</b><br>JC         |

### Non-Linear Convergence Results

| Load Combination | Converged? | Number of Cycles | Displacement Tolerance | Force Tolerance |
|------------------|------------|------------------|------------------------|-----------------|
| 1                | Yes        | 6                | 0.00000001             | 0.00001163      |
| 2                | Yes        | 10               | 0.00000001             | 0.00008079      |
| 3                | Yes        | 9                | 0.00000001             | 0.00010440      |
| 4                | Yes        | 9                | 0.00000001             | 0.00009800      |
| 5                | Yes        | 9                | 0.00000001             | 0.00007821      |
| 6                | Yes        | 9                | 0.00000001             | 0.00013772      |
| 7                | Yes        | 9                | 0.00000001             | 0.00010294      |
| 8                | Yes        | 10               | 0.00000001             | 0.00005916      |
| 9                | Yes        | 10               | 0.00000001             | 0.00008578      |
| 10               | Yes        | 7                | 0.00000001             | 0.00014813      |
| 11               | Yes        | 9                | 0.00000001             | 0.00009533      |
| 12               | Yes        | 9                | 0.00000001             | 0.00003220      |
| 13               | Yes        | 8                | 0.00000001             | 0.00009297      |
| 14               | Yes        | 8                | 0.00000001             | 0.00010216      |
| 15               | Yes        | 8                | 0.00000001             | 0.00011920      |
| 16               | Yes        | 9                | 0.00000001             | 0.00003191      |
| 17               | Yes        | 9                | 0.00000001             | 0.00008359      |
| 18               | Yes        | 10               | 0.00000001             | 0.00003436      |
| 19               | Yes        | 7                | 0.00000001             | 0.00006286      |
| 20               | Yes        | 6                | 0.00000001             | 0.00001175      |
| 21               | Yes        | 6                | 0.00000001             | 0.00001991      |
| 22               | Yes        | 6                | 0.00000001             | 0.00001470      |
| 23               | Yes        | 6                | 0.00000001             | 0.00002826      |
| 24               | Yes        | 6                | 0.00000001             | 0.00001230      |
| 25               | Yes        | 6                | 0.00000001             | 0.00005601      |
| 26               | Yes        | 6                | 0.00000001             | 0.00004215      |

### Maximum Tower Deflections - Service Wind

| Section No. | Elevation<br>ft | Horz. Deflection<br>in | Gov. Load Comb. | Tilt<br>° | Twist<br>° |
|-------------|-----------------|------------------------|-----------------|-----------|------------|
| L1          | 100 - 47        | 3.002                  | 19              | 0.3050    | 0.0070     |
| L2          | 47 - 0          | 0.598                  | 19              | 0.1018    | 0.0035     |

### Critical Deflections and Radius of Curvature - Service Wind

| Elevation<br>ft | Appurtenance          | Gov. Load Comb. | Deflection<br>in | Tilt<br>° | Twist<br>° | Radius of Curvature<br>ft |
|-----------------|-----------------------|-----------------|------------------|-----------|------------|---------------------------|
| 99.00           | DHHTT65B-3XR          | 19              | 2.948            | 0.3007    | 0.0069     | 127691                    |
| 90.00           | AM-X-CD-16-65-00T-RET | 19              | 2.465            | 0.2624    | 0.0063     | 63846                     |
| 80.00           | APXV16DWV-16DWVS-C    | 19              | 1.947            | 0.2207    | 0.0057     | 31923                     |
| 76.15           | Guy                   | 19              | 1.756            | 0.2051    | 0.0055     | 26770                     |
| 76.15           | Guy                   | 19              | 1.756            | 0.2051    | 0.0055     | 26770                     |
| 54.95           | Guy                   | 19              | 0.850            | 0.1267    | 0.0041     | 14172                     |

|   |                |               |                    |                   |
|---|----------------|---------------|--------------------|-------------------|
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|   | <b>Project</b> |               | <b>Date</b>        | 15:25:14 10/02/17 |
|   | <b>Client</b>  | Sprint Nextel | <b>Designed by</b> | JC                |

**Maximum Tower Deflections - Design Wind**

| Section No. | Elevation<br>ft | Horz. Deflection<br>in | Gov. Load Comb. | Tilt<br>° | Twist<br>° |
|-------------|-----------------|------------------------|-----------------|-----------|------------|
| L1          | 100 - 47        | 20.931                 | 2               | 1.8874    | 0.0341     |
| L2          | 47 - 0          | 4.673                  | 2               | 0.8452    | 0.0166     |

**Critical Deflections and Radius of Curvature - Design Wind**

| Elevation<br>ft | Appurtenance          | Gov. Load Comb. | Deflection<br>in | Tilt<br>° | Twist<br>° | Radius of Curvature<br>ft |
|-----------------|-----------------------|-----------------|------------------|-----------|------------|---------------------------|
| 99.00           | DHHTT65B-3XR          | 2               | 20.569           | 1.8673    | 0.0338     | 20477                     |
| 90.00           | AM-X-CD-16-65-00T-RET | 2               | 17.333           | 1.6865    | 0.0309     | 10238                     |
| 80.00           | APXV16DWV-16DWVS-C    | 2               | 13.853           | 1.4865    | 0.0276     | 5118                      |
| 76.15           | Guy                   | 2               | 12.570           | 1.4099    | 0.0263     | 4292                      |
| 76.15           | Guy                   | 2               | 12.570           | 1.4099    | 0.0263     | 4292                      |
| 54.95           | Guy                   | 2               | 6.424            | 0.9959    | 0.0193     | 2271                      |

**Guy Design Data**

| Section No. | Elevation<br>ft | Size     | Initial Tension<br>lb | Breaking Load<br>lb | Actual $T_n$<br>lb | Allowable $\phi T_n$<br>lb | Required S.F. | Actual S.F. |
|-------------|-----------------|----------|-----------------------|---------------------|--------------------|----------------------------|---------------|-------------|
| L1          | 76.15 (A) (6)   | 1/2 EHS  | 2152.00               | 26900.04            | 12321.80           | 16140.00                   | 1.000         | 1.310 ✓     |
|             | 76.15 (B) (5)   | 1/2 EHS  | 2152.00               | 26900.04            | 12374.60           | 16140.00                   | 1.000         | 1.304 ✓     |
|             | 76.15 (C) (4)   | 1/2 EHS  | 2152.00               | 26900.04            | 15162.30           | 16140.00                   | 1.000         | 1.064 ✓     |
|             | 76.15 (D) (3)   | 1/2 EHS  | 2152.00               | 26900.04            | 12412.70           | 16140.00                   | 1.000         | 1.300 ✓     |
|             | 54.95 (A) (10)  | 7/16 EHS | 1664.00               | 20800.02            | 8060.89            | 12480.00                   | 1.000         | 1.548 ✓     |
|             | 54.95 (B) (9)   | 7/16 EHS | 1664.00               | 20800.02            | 8158.19            | 12480.00                   | 1.000         | 1.530 ✓     |
|             | 54.95 (C) (8)   | 7/16 EHS | 1664.00               | 20800.02            | 11651.30           | 12480.00                   | 1.000         | 1.071 ✓     |
|             | 54.95 (D) (7)   | 7/16 EHS | 1664.00               | 20800.02            | 8124.20            | 12480.00                   | 1.000         | 1.536 ✓     |
|             | 76.15 (A) (14)  | 9/16 EHS | 2800.00               | 35000.04            | 15993.30           | 21000.00                   | 1.000         | 1.313 ✓     |
|             | 76.15 (B) (13)  | 9/16 EHS | 2800.00               | 35000.04            | 16061.90           | 21000.00                   | 1.000         | 1.307 ✓     |
|             | 76.15 (C) (12)  | 9/16 EHS | 2800.00               | 35000.04            | 19682.90           | 21000.00                   | 1.000         | 1.067 ✓     |
|             | 76.15 (D) (11)  | 9/16 EHS | 2800.00               | 35000.04            | 16111.40           | 21000.00                   | 1.000         | 1.303 ✓     |

**Compression Checks**

**Pole Design Data**

|   |                |               |                    |                   |
|---|----------------|---------------|--------------------|-------------------|
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|   | <b>Project</b> |               | <b>Date</b>        | 15:25:14 10/02/17 |
|   | <b>Client</b>  | Sprint Nextel | <b>Designed by</b> | JC                |

| Section No. | Elevation<br>ft | Size                 | L<br>ft | L <sub>u</sub><br>ft | Kl/r | A<br>in <sup>2</sup> | P <sub>u</sub><br>lb | φP <sub>n</sub><br>lb | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-----------------|----------------------|---------|----------------------|------|----------------------|----------------------|-----------------------|---------------------------------|
| L1          | 100 - 47 (1)    | TP26.25x26.25x13.125 | 53.00   | 0.00                 | 0.0  | 541.188<br>0         | -6580.52             | 584484.00             | 0.011                           |
| L2          | 47 - 0 (2)      | TP26.25x26.25x13.125 | 47.00   | 0.00                 | 0.0  | 541.188<br>0         | -99868.00            | 584484.00             | 0.171                           |

### Pole Bending Design Data

| Section No. | Elevation<br>ft | Size                 | M <sub>ux</sub><br>kip-ft | φM <sub>ux</sub><br>kip-ft | Ratio<br>$\frac{M_{ux}}{\phi M_{ux}}$ | M <sub>uy</sub><br>kip-ft | φM <sub>uy</sub><br>kip-ft | Ratio<br>$\frac{M_{uy}}{\phi M_{uy}}$ |
|-------------|-----------------|----------------------|---------------------------|----------------------------|---------------------------------------|---------------------------|----------------------------|---------------------------------------|
| L1          | 100 - 47 (1)    | TP26.25x26.25x13.125 | 180.77                    | 271.32                     | 0.666                                 | 0.00                      | 271.32                     | 0.000                                 |
| L2          | 47 - 0 (2)      | TP26.25x26.25x13.125 | 148.86                    | 271.32                     | 0.549                                 | 0.00                      | 271.32                     | 0.000                                 |

### Pole Shear Design Data

| Section No. | Elevation<br>ft | Size                 | Actual<br>V <sub>u</sub><br>lb | φV <sub>n</sub><br>lb | Ratio<br>$\frac{V_u}{\phi V_n}$ | Actual<br>T <sub>u</sub><br>kip-ft | φT <sub>n</sub><br>kip-ft | Ratio<br>$\frac{T_u}{\phi T_n}$ |
|-------------|-----------------|----------------------|--------------------------------|-----------------------|---------------------------------|------------------------------------|---------------------------|---------------------------------|
| L1          | 100 - 47 (1)    | TP26.25x26.25x13.125 | 12773.50                       | 292242.00             | 0.044                           | 0.01                               | 319.64                    | 0.000                           |
| L2          | 47 - 0 (2)      | TP26.25x26.25x13.125 | 5116.82                        | 292242.00             | 0.018                           | 0.05                               | 319.64                    | 0.000                           |

### Pole Interaction Design Data

| Section No. | Elevation<br>ft | Ratio<br>$\frac{P_u}{\phi P_n}$ | Ratio<br>$\frac{M_{ux}}{\phi M_{ux}}$ | Ratio<br>$\frac{M_{uy}}{\phi M_{uy}}$ | Ratio<br>$\frac{V_u}{\phi V_n}$ | Ratio<br>$\frac{T_u}{\phi T_n}$ | Comb.<br>Stress<br>Ratio | Allow.<br>Stress<br>Ratio | Criteria |
|-------------|-----------------|---------------------------------|---------------------------------------|---------------------------------------|---------------------------------|---------------------------------|--------------------------|---------------------------|----------|
| L1          | 100 - 47 (1)    | 0.011                           | 0.666                                 | 0.000                                 | 0.044                           | 0.000                           | 0.679                    | 1.000                     | 4.8.2 ✓  |
| L2          | 47 - 0 (2)      | 0.171                           | 0.549                                 | 0.000                                 | 0.018                           | 0.000                           | 0.720                    | 1.000                     | 4.8.2 ✓  |

### Section Capacity Table

| Section No. | Elevation<br>ft | Component<br>Type | Size                 | Critical<br>Element | P<br>lb  | φP <sub>allow</sub><br>lb | %<br>Capacity | Pass<br>Fail |
|-------------|-----------------|-------------------|----------------------|---------------------|----------|---------------------------|---------------|--------------|
| L1          | 100 - 47        | Pole              | TP26.25x26.25x13.125 | 1                   | -6580.52 | 584484.00                 | 67.9          | Pass         |
|             |                 | Guy A@76.15       | 1/2                  | 6                   | 12321.80 | 16140.00                  | 76.3          | Pass         |
|             |                 | Guy A@54.95       | 7/16                 | 10                  | 8060.89  | 12480.00                  | 64.6          | Pass         |

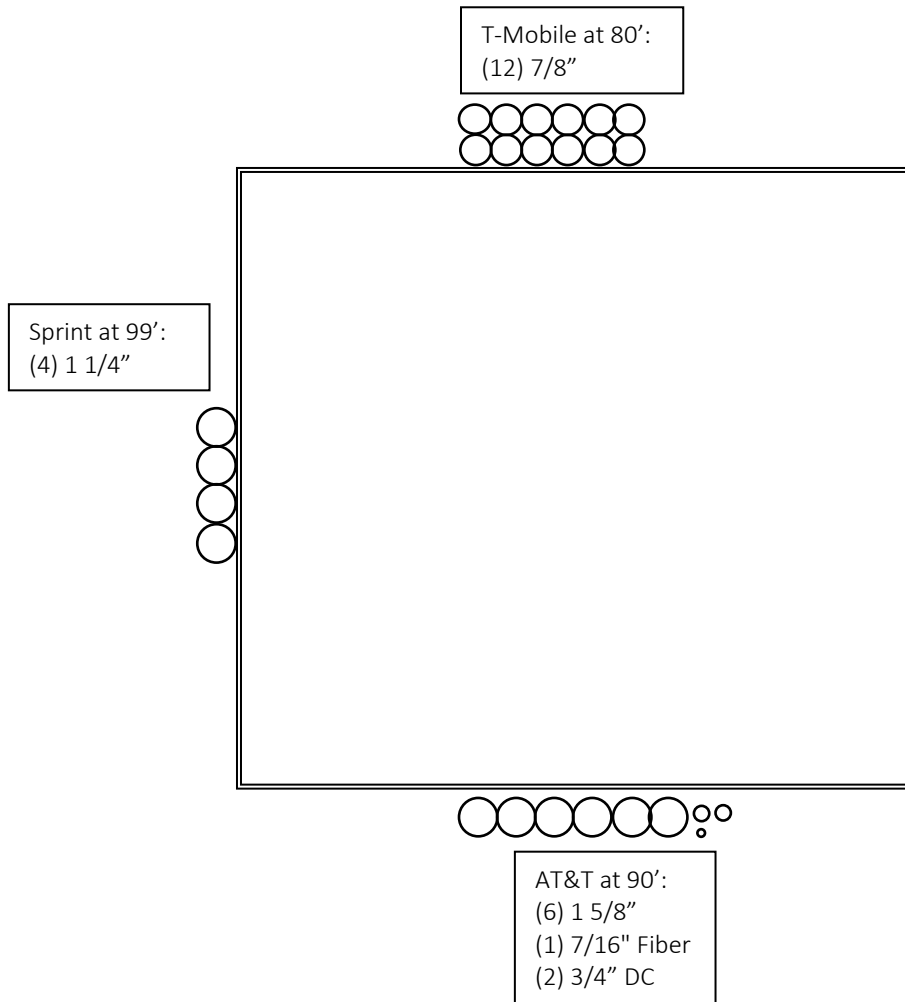
|  |                |               |                    |                   |
|--|----------------|---------------|--------------------|-------------------|
| <p><b>tnxTower</b></p> <p><b>Tower Engineering Solutions</b><br/> 8445 Freeport Parkway, Suite 375<br/> Irving, TX 75063<br/> Phone: (972) 483-0607<br/> FAX: (972) 975-9615</p> | <b>Job</b>     | CT46143-A     | <b>Page</b>        | 13 of 13          |
|  | <b>Project</b> |               | <b>Date</b>        | 15:25:14 10/02/17 |
|  | <b>Client</b>  | Sprint Nextel | <b>Designed by</b> | JC                |

| Section No. | Elevation ft | Component Type | Size                 | Critical Element | P lb      | $\phi P_{allow}$ lb | % Capacity      | Pass Fail   |             |
|-------------|--------------|----------------|----------------------|------------------|-----------|---------------------|-----------------|-------------|-------------|
|             |              | Guy A@76.15    | 9/16                 | 14               | 15993.30  | 21000.00            | 76.2            | Pass        |             |
|             |              | Guy B@76.15    | 1/2                  | 5                | 12374.60  | 16140.00            | 76.7            | Pass        |             |
|             |              | Guy B@54.95    | 7/16                 | 9                | 8158.19   | 12480.00            | 65.4            | Pass        |             |
|             |              | Guy B@76.15    | 9/16                 | 13               | 16061.90  | 21000.00            | 76.5            | Pass        |             |
|             |              | Guy C@76.15    | 1/2                  | 4                | 15162.30  | 16140.00            | 93.9            | Pass        |             |
|             |              | Guy C@54.95    | 7/16                 | 8                | 11651.30  | 12480.00            | 93.4            | Pass        |             |
|             |              | Guy C@76.15    | 9/16                 | 12               | 19682.90  | 21000.00            | 93.7            | Pass        |             |
|             |              | Guy D@76.15    | 1/2                  | 3                | 12412.70  | 16140.00            | 76.9            | Pass        |             |
|             |              | Guy D@54.95    | 7/16                 | 7                | 8124.20   | 12480.00            | 65.1            | Pass        |             |
|             |              | Guy D@76.15    | 9/16                 | 11               | 16111.40  | 21000.00            | 76.7            | Pass        |             |
| L2          | 47 - 0       | Pole           | TP26.25x26.25x13.125 | 2                | -99868.00 | 584484.00           | 72.0            | Pass        |             |
|             |              |                |                      |                  |           |                     | <b>Summary</b>  |             |             |
|             |              |                |                      |                  |           |                     | Pole (L2)       | 72.0        | Pass        |
|             |              |                |                      |                  |           |                     | Guy A (L1)      | 76.3        | Pass        |
|             |              |                |                      |                  |           |                     | Guy B (L1)      | 76.7        | Pass        |
|             |              |                |                      |                  |           |                     | Guy C (L1)      | 93.9        | Pass        |
|             |              |                |                      |                  |           |                     | Guy D (L1)      | 76.9        | Pass        |
|             |              |                |                      |                  |           |                     | <b>RATING =</b> | <b>93.9</b> | <b>Pass</b> |



# Coax Layout

CT46143-A





**Check Soil Capacities:**

|   |        |            |                                   |     | Usage           |
|---|--------|------------|-----------------------------------|-----|-----------------|
| Allowable Foundation Overturning Resistance (kips-ft.):     | 2235.3 | >          | Design Factored Moment (kips-ft): | 211 | 0.09 <b>OK!</b> |
| Factor of Safety of Passive Soil Resistance against Moment: | 10.58  | <b>OK!</b> |                                   |     |                 |



**Check Soil Capacities:**

|  |       |   |                                     |      |      |     |
|--|-------|---|-------------------------------------|------|------|-----|
| Calculated Foundation Allowable Axial Capacity (Kips): | 58.8  | > | Design Factored Axial Load (Kips):  | 23.9 | 0.41 | OK! |
| Calculated Foundation Uplift Capacity (Kips):          | 58.95 | > | Design Factored Uplift Load (Kips): | 43   | 0.72 | OK! |
| Allowable Overturning Moment Resistance (Kips-ft.):    | 318.1 | > | Design Factored Moment (kips-ft):   | 285  | 0.90 | OK! |

**Check the capacities of Reinforcing Concrete:**

|  |      |                                      |      |
|--|------|--------------------------------------|------|
| Strength reduction factor (Flexure and axial tension): | 0.90 | Strength reduction factor (Shear):   | 0.75 |
| Strength reduction factor (Axial compression):         | 0.65 | Wind Load Factor on Concrete Design: | 1.00 |

Reinforcing Concrete Pier:

|   |       |                                    |                                       |       |      |     |
|---|-------|------------------------------------|---------------------------------------|-------|------|-----|
| Vertical Steel Rebar Area (sq. in./each):         | 1.00  | Tie / Stirrup Area (sq. in./each): | 0.20                                  |       |      |     |
| Calculated Moment Capacity (Mn,Kips-Ft):          | 483   | >                                  | Design Factored Moment (Mu, K-Ft):    | 232.3 | 0.48 | OK! |
| Calculated Shear Capacity (Kips):                 | 131.1 | >                                  | Design Factored Shear (Kips):         | 17.8  | 0.14 | OK! |
| Calculated Tension Capacity (Tn, Kips):           | 324.0 | >                                  | Design Factored Tension (Tu Kips):    | 42.7  | 0.13 | OK! |
| Calculated Compression Capacity (Pn, Kips):       | 2392  | >                                  | Design Factored Axial Load (Pu Kips): | 0.0   | 0.00 | OK! |
| Moment & Axial Strength Combination(Tu/Tn+Mu/Mn): | 0.48  | OK!                                | Max. Allowable Tie/Stirrup Spacing:   | 12.00 | in.  |     |
| Pier Reinforcement Ratio:                         | 0.003 |                                    | Reinforcement Ratio is too small      |       |      |     |



**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.

**SPECIAL CONSTRUCTION NOTE:**  
 THE SPRINT NETWORK VISION 2.5 GHZ TOWER TOP WORK IS CONTINGENT UPON COMPLETION OF ALL REQUIRED STRUCTURAL MODIFICATIONS, ENGINEERING CONSTRUCTION CONTROL INSPECTIONS, FINAL ENGINEERING AFFIDAVIT, AND ACCEPTANCE/APPROVAL BY SBA COMMUNICATIONS CORP.

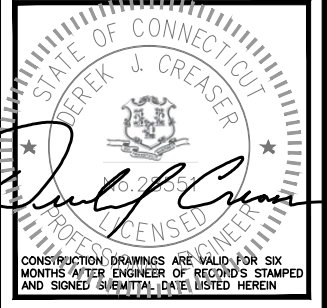
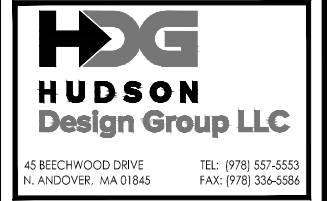


**SPECIAL CONSTRUCTION SCHEDULE NOTE (SBA DESIGN-BUILD TOWER MODS REQUIRED):**  
 SPECIAL CONSTRUCTION SCHEDULE NOTE (SBA DESIGN-BUILD TOWER MODS REQUIRED):  
 UNLESS A PRE-MOD CONDITIONAL OR TEMPORARY INSTALLATION IS SPECIFICALLY RECOMMENDED BY SBA TOWER STRUCTURAL ENGINEER AND INCLUDED IN SBA NOTICE-TO-PROCEED, SPRINT TOWER TOP EQUIPMENT INSTALLATION IS CONTINGENT UPON COMPLETION OF SBA DESIGN-BUILD FOR ALL REQUIRED TOWER/FOUNDATION STRUCTURAL MODIFICATIONS, ENGINEERING CONSTRUCTION CONTROL INSPECTIONS, AND FINAL ENGINEERING AFFIDAVIT (ALL PREVIOUS ITEMS TO BE DESIGN-BUILD PERFORMED BY SBA UNDER A SEPARATE BUILDING PERMIT).

**NOTE:**  
 THESE PLANS ARE BASED ON INFORMATION OBTAINED IN 2014. THEY HAVE NOT BEEN FIELD VERIFIED. THE SPRINT CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL ITEMS AND NOTIFYING THE ENGINEER OF RECORD OF ANY DISCREPANCIES.

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

**PROJECT:** DO MACRO EQUIPMENT DEPLOYMENT  
**SITE NAME:** BURLINGTON-AVON LANDFILL  
**SITE CASCADE:** CT33XC589-C  
**MARKET:** NORTHERN CONNECTICUT  
**SBA SITE ID:** CT46143-A / BURLINGTON-AVON LANDFILL  
**SITE ADDRESS:** 277 HUCKLEBERRY ROAD  
 AVON, CT 06013  
**SITE TYPE:** 100' WOOD POLE



**SITE INFORMATION**

**PROPERTY OWNER:**  
 TOWN OF AVON  
 60 WEST MAIN STREET  
 AVON, CT 06001

**TOWER OWNER:**  
 SBA 2012 TC ASSETS, LLC.  
 8051 CONGRESS AVENUE  
 BOCA RATON, FL 33487  
 (561)995-7670

**SBA REGIONAL SITE MANAGER:**  
 STEPHEN ROTH  
 PHONE: 860-539-4920  
 SROth@sbsite.com

**LATITUDE (NAD83):**  
**GOOGLE EARTH 2-C CONFIRMATION**  
 41°47'17.58"N  
 41.788217°

**LONGITUDE (NAD83):**  
**GOOGLE EARTH 2-C CONFIRMATION**  
 -72°55'05.67"W  
 -72.918242°

**COUNTY:**  
 HARTFORD

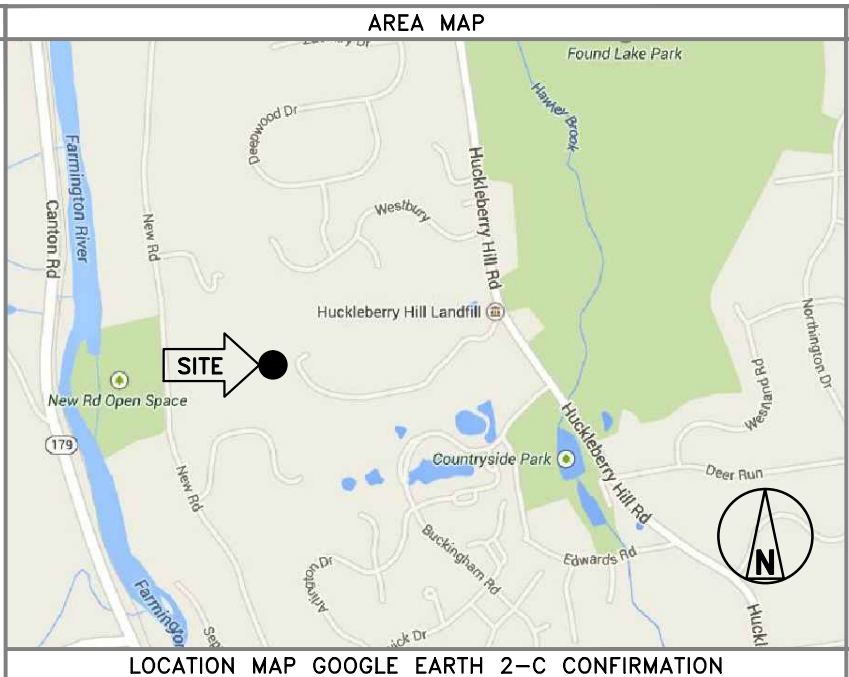
**ZONING DISTRICT:**  
 R-40

**POWER COMPANY:**  
 CL&P

**AAV PROVIDER:**  
 SAGE TELECOM

**SPRINT CONSTRUCTION MANAGER:**  
 MICHAEL DELIA  
 PHONE: 781-316-6348  
 Michael.Delia@sprint.com

**EQUIPMENT SUPPLIER:**  
 ALCATEL-LUCENT  
 600 MOUNTAIN AVENUE  
 MURRAY HILL, NJ 07974



**PROJECT DESCRIPTION**

SPRINT EQUIPMENT MODIFICATIONS REQUIRED TO SUPPORT MODERNIZATION OF AN EXISTING WIRELESS COMMUNICATIONS FACILITY AND UTILIZATION OF FCC BROADBAND SPECTRUM LICENSE FOR 2.5GHz FREQUENCY, INCLUDING INSTALLATION OF:

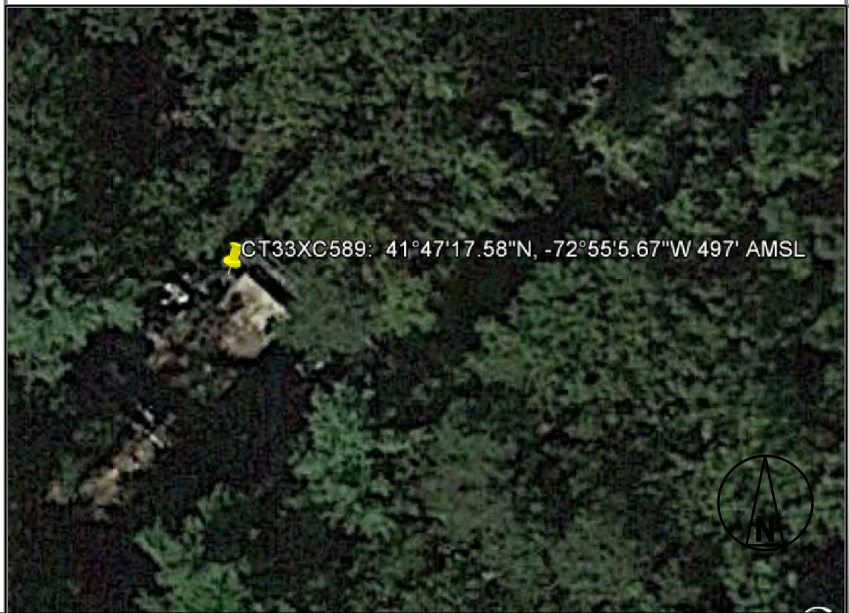
GROUND-LEVEL RAN EQUIPMENT, CONSISTING OF:  
 \* NEW GROWTH CABINET WITH 2.5 RADIO ACCESS NETWORK (RAN) EQUIPMENT & (2) BATTERY STRINGS

TOWER-TOP EQUIPMENT, INCLUDING INSTALLATION OF:  
 \* REMOVE EXISTING CDMA ANTENNAS AND ASSOCIATED COAX CABLES  
 \* (3) PANEL ANTENNAS  
 \* (3) 2.5 REMOTE RADIO HEADS (RRH)  
 \* (1) HYBRID CABLE (AND ASSOCIATED FIBER, DC POWER, COAXIAL CABLE JUMPERS AND ANTENNA REMOTE ELECTRICAL-TILT (RET) CABLE  
 \* (3) INSTALL EXISTING NV800 RRH TO SPRINT LEASE AREA ON TOWER  
 \* (3) RELOCATE EXISTING NV1900 RRH TO SPRINT LEASE AREA ON TOWER  
 \* (3) NV HYBRIFLEX CABLES (AND ASSOCIATED FIBER, DC POWER, COAXIAL CABLE JUMPERS AND ANTENNA REMOTE ELECTRICAL-TILT (RET) CABLE

**SPECIAL ZONING NOTE:**  
 BASED ON INFORMATION PROVIDED BY SPRINT REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AND ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW, ADMINISTRATIVE REVIEW).

**DRAWING INDEX**

| SHEET NO: | SHEET TITLE                 | REV | CHK | BY |
|-----------|-----------------------------|-----|-----|----|
| T-1       | TITLE SHEET                 | 2   | BB  | AN |
| SP-1      | OUTLINE SPECIFICATIONS      | 2   | BB  | AN |
| SP-2      | OUTLINE SPECIFICATIONS      | 2   | BB  | AN |
| SP-3      | OUTLINE SPECIFICATIONS      | 2   | BB  | AN |
| A-1       | COMPOUND PLAN               | 2   | BB  | AN |
| A-2       | ELEVATION AND ANTENNA PLANS | 2   | BB  | AN |
| A-3       | RF DATA SHEET               | 2   | BB  | AN |
| A-4       | RAN WIRING DIAGRAM          | 2   | BB  | AN |
| A-5       | EQUIPMENT DETAILS           | 2   | BB  | AN |
| A-6       | EQUIPMENT DETAILS           | 2   | BB  | AN |
| S-1       | STRUCTURAL DETAILS          | 2   | BB  | AN |
| E-1       | ONE LINE DIAGRAM            | 2   | BB  | AN |
| E-2       | GROUNDING DETAILS AND NOTES | 2   | BB  | AN |



**GENERAL NOTES**

- THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION:  
 - ADA COMPLIANCE NOT REQUIRED.  
 - POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.  
 - NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
- CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
- NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.  
 BUILDING CODE: IBC 2012 WITH 2016 CT STATE BUILDING CODE AMENDMENTS  
 ELECTRICAL CODE: 2014 NATIONAL ELECTRICAL CODE  
 STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

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 www.cbyd.com

**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.

SPRINT: \_\_\_\_\_ DATE: \_\_\_\_\_

CONSTRUCTION MANAGER: \_\_\_\_\_ DATE: \_\_\_\_\_

LEASING/SITE ACQUISITION: \_\_\_\_\_ DATE: \_\_\_\_\_

RF ENGINEER: \_\_\_\_\_ DATE: \_\_\_\_\_

LANDLORD/TOWER OWNER: \_\_\_\_\_ DATE: \_\_\_\_\_

**CHECKED BY:** BB

**APPROVED BY:** DJC

**SUBMITTALS**

| REV. | DATE     | DESCRIPTION              | BY |
|------|----------|--------------------------|----|
| 2    | 01/15/18 | REVISED FOR CONSTRUCTION | AN |
| 1    | 09/11/17 | REVISED-CODE UPDATE      | AN |
| 0    | 09/22/14 | ISSUED FOR REVIEW        | JA |

**SITE NUMBER:**  
 CT33XC589-C

**SITE NAME:**  
 BURLINGTON-AVON  
 LANDFILL

**SITE ADDRESS:**  
 277 HUCKLEBERRY ROAD  
 AVON, CT 06013

**SHEET TITLE**

TITLE SHEET

**SHEET NUMBER**

T-1



THESE OUTLINE SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT STANDARD CONSTRUCTION SPECIFICATIONS, INCLUDING CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

**SECTION 01 100 – SCOPE OF WORK**

**PART 1 – GENERAL**

1.1 **THE WORK:** THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT CONSTRUCTION STANDARDS FOR WIRELESS SITES, CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 **RELATED DOCUMENTS:**

- A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.
- B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HERewith.

1.3 **PRECEDENCE:** SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.

1.4 **NATIONALLY RECOGNIZED CODES AND STANDARDS:**

- A. THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
  1. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
  2. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY -GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
  3. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC") AND NFPA 101 (LIFE SAFETY CODE).
  4. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
  5. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
  6. AMERICAN CONCRETE INSTITUTE (ACI)
  7. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
  8. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
  9. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
  10. PORTLAND CEMENT ASSOCIATION (PCA)
  11. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
  12. BRICK INDUSTRY ASSOCIATION (BIA)
  13. AMERICAN WELDING SOCIETY (AWS)
  14. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
  15. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
  16. DOOR AND HARDWARE INSTITUTE (DHI)
  17. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
  18. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

1.5 **DEFINITIONS:**

- A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
- B. COMPANY: SPRINT CORPORATION
- C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
- D. CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
- E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.
- F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.
- G. CONSTRUCTION MANAGER – ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT...

1.6 **SITE FAMILIARITY:** CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.

1.7 **POINT OF CONTACT:** COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.

1.8 **ON-SITE SUPERVISION:** THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.9 **DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE:** THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

- A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.
- B. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK.
- C. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

1.10 **USE OF JOB SITE:** THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.11 **UTILITIES SERVICES:** WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED:

1.12 **PERMITS / FEES:** WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

1.13 CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.

1.14 METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION: CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS.

- A. TOP HAT
- B. HOW TO INSTALL A NEW CABINET
- C. BASE BAND UNIT IN EXISTING UNIT
- D. INSTALLATION OF BATTERIES
- E. INSTALLATION OF HYBRID CABLE
- F. INSTALLATION OF RRH'S
- G. CABLING
- H. SPRINT TS-0200 (CURRENT VERSION) – ANTENNA LINE ACCEPTANCE STANDARDS
- I. SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1.
- J. COMMISSIONING MOPS
- K. SPRINT CELL SITE ENGINEERING NOTICE – EN-2013-002
- L. SPRINT ENGINEERING LETTER – EL-0504
- M. SPRINT ENGINEERING LETTER – EL-0568
- N. SPRINT TECHNICAL SPECIFICATION – TS-0193

1.15 **USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:**

- A. CONTRACTOR WILL UTILIZE ITS BEST EFFORTS TO WORK WITH SPRINT ELECTRONIC PROJECT MANAGEMENT SYSTEMS. CONTRACTOR UNDERSTANDS THAT SUFFICIENT INTERNET ACCESS, EQUIVALENT TO "BROADBAND" OR BETTER, IS REQUIRED TO TIMELY AND EFFECTIVELY UTILIZE SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS AND AGREES TO MAINTAIN APPROPRIATE CONNECTIONS FOR CONTRACTOR'S STAFF AND OFFICES THAT ARE COMPATIBLE WITH SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

3.1 **TEMPORARY UTILITIES AND FACILITIES:** THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

3.2 **ACCESS TO WORK:** THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

3.3 **TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HERewith, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.**

3.4 **DIMENSIONS:** VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

3.5 **EXISTING CONDITIONS:** NOTIFY THE SPRINT CONSTRUCTION MANAGER OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

**SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT**

**PART 1 – GENERAL**

1.1 **THE WORK:** THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 **RELATED DOCUMENTS:**

- A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.
- B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HERewith.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

3.1 **RECEIPT OF MATERIAL AND EQUIPMENT:**

- A. COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.
- B. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
  1. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
  2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
  3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
  4. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
  5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
  6. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

3.2 **DELIVERABLES:**

- A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.
- B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.
- C. UPLOAD DOCUMENTATION INTO SPRINT SITE MANAGEMENT SYSTEM (SMS) AND/OR PROVIDE HARD COPY DOCUMENTATION AS REQUESTED.

**SECTION 01 300 – CELL SITE CONSTRUCTION**

**PART 1 – GENERAL**

1.1 **THE WORK:** THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 **RELATED DOCUMENTS:**

- A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.
- B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HERewith.

1.3 **NOTICE TO PROCEED:**

- A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF THE WORK ORDER.
- B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

3.1 **FUNCTIONAL REQUIREMENTS:**

- A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. THE ACTIVITIES DESCRIBED ARE NOT EXHAUSTIVE, AND CONTRACTOR SHALL TAKE ANY AND ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.
- B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.
- C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES
- D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
  1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
  2. PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
  3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND TELCO BACKHAUL.
  4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEMS.
  5. INSTALL ABOVE GROUND GROUNDING SYSTEMS.
  6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
  7. INSTALL "H-FRAMES", CABINETS AND SHELTERS AS INDICATED.
  8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
  9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
  10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
  11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
  12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
  13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREAFTER.
  14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREAFTER.
  15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
  16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
  17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
  18. PERFORM, DOCUMENT, AND CLOSE OUT ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
  19. PERFORM ANTENNAL AND COAX SWEEP TESTING AND MAKE ANY AND ALL NECESSARY CORRECTIONS.
  20. REMAIN ON SITE MOBILIZED THROUGHOUT HAND-OFF AND INTEGRATION TO ASSIST AS NEEDED UNTIL SITE IS DEEMED SUBSTANTIALLY COMPLETE AND PLACED "ON AIR."

3.2 **GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:**

- A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.
- B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.
- C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
  1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
  2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.
- D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION
- E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 **DELIVERABLES:**

- A. CONTRACTOR SHALL REVIEW, APPROVE, AND SUBMIT TO SPRINT SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND SIMILAR SUBMITTALS AS REQUIRED HEREAFTER
- B. PROVIDE DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.
  1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
  2. PROJECT PROGRESS REPORTS.
  3. CIVIL CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
  4. ELECTRICAL SERVICE COMPLETION DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
  5. LINES AND ANTENNA INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
  6. POWER INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
  7. TELCO READY DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
  8. PPC (OR SHELTER) INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
  9. TOWER CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
  10. TOWER CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
  11. BTS AND RADIO EQUIPMENT DELIVERED AT SITE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
  12. NETWORK OPERATIONS HANDOFF CHECKLIST (HOC WALK) COMPLETE (UPLOAD FORM IN SMS)
  13. CIVIL CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
  14. SITE CONSTRUCTION PROGRESS PHOTOS UNLOADED INTO SMS. **CONTINUE SHEET SP-2**



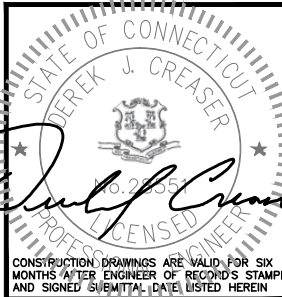
1 INTERNATIONAL BLVD, SUITE 800  
MAHWAH, NJ 07495  
TEL: (800) 357-7641



SBA COMMUNICATIONS CORP.  
134 FLANDERS ROAD, SUITE 125  
WESTBOROUGH, MA 01581 TEL: (508) 251-0720



45 BEECHWOOD DRIVE TEL: (978) 557-5553  
N. ANDOVER, MA 01845 FAX: (978) 336-5566



CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: BB

APPROVED BY: DJC

| SUBMITTALS |          |                          |    |
|------------|----------|--------------------------|----|
| REV.       | DATE     | DESCRIPTION              | BY |
| 2          | 01/15/18 | REVISED FOR CONSTRUCTION | AN |
| 1          | 09/11/17 | REVISED-CODE UPDATE      | AN |
| 0          | 09/22/14 | ISSUED FOR REVIEW        | JA |

SITE NUMBER:  
CT33XC589-C  
SITE NAME:  
BURLINGTON-AVON  
LANDFILL  
SITE ADDRESS:  
277 HUCKLEBERRY ROAD  
AVON, CT 06013

SHEET TITLE  
OUTLINE  
SPECIFICATIONS

SHEET NUMBER  
SP-1



**SECTION 01 400 – SUBMITTALS, TESTS, AND INSPECTIONS**

**PART 1 – GENERAL**

1.1 **THE WORK:** THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 **RELATED DOCUMENTS:**

- A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.
- B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 **SUBMITTALS:**

- A. THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS.
- B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.
  - 1. CONCRETE MIX-DESIGNS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.
  - 2. CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
  - 3. SPECIAL FINISHES FOR INTERIOR SPACES, IF ANY.
  - 4. ALL EQUIPMENT AND MATERIALS SO IDENTIFIED ON THE CONSTRUCTION DRAWINGS.
  - 5. CHEMICAL GROUNDING DESIGN.
- C. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

1.4 **TESTS AND INSPECTIONS:**

- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
- B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
  - 1. COAX SWEEPS AND FIBER TESTS PER SPRINT TS-0200 (CURRENT VERSION) ANTENNA LINE ACCEPTANCE STANDARDS.
  - 2. AGL, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE-FOR-THE-PURPOSE ANTENNA ALIGNMENT TOOL.
  - 3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
- C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:
  - 1. AZIMUTH, DOWNTILT, AGL – UPLOAD REPORT FROM ANTENNA ALIGNMENT TOOL TO SITERRA TASK 465. INSTALLED AZIMUTH, DOWNTILT, AND AGL MUST CONFORM TO THE RF DATA SHEETS. SWEEP AND FIBER TESTS
  - 2. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
  - 3. ALL AVAILABLE JURISDICTIONAL INFORMATION
  - 4. PDF SCAN OF REDLINES PRODUCED IN FIELD
  - 5. ELECTRONIC AS-BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS. ANY FIELD CHANGE MUST BE REFLECTED BY MODIFYING THE PLANS, ELEVATIONS, AND DETAILS IN THE DRAWING SETS. GENERAL NOTES INDICATING MODIFICATIONS WILL NOT BE ACCEPTED. CHANGES SHALL BE HIGHLIGHTED AS "CLOUDS" IDENTIFIED AS THE "AS-BUILT" CONDITION.
  - 6. LIEN WAIVERS
  - 7. FINAL PAYMENT APPLICATION
  - 8. REQUIRED FINAL CONSTRUCTION PHOTOS
  - 9. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
  - 10. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD).

1.5 **COMMISSIONING:** PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS

1.6 **INTEGRATION:** PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPS

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

3.1 **REQUIREMENTS FOR TESTING:**

- A. THIRD PARTY TESTING AGENCY: WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
  - 1. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
  - 2. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
  - 3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.

3.2 **REQUIRED TESTS:**

- A. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
  - 1. CONCRETE CYLINDER BREAK TESTS FOR THE TOWER AND ANCHOR FOUNDATIONS AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
  - 2. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED IN SECTION: HOT MIX ASPHALT PAVING.
  - 3. FIELD QUALITY CONTROL TESTING AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
  - 4. TESTING REQUIRED UNDER SECTION: AGGREGATE BASE FOR ACCESS ROADS, PADS AND ANCHOR LOCATIONS
  - 5. STRUCTURAL BACKFILL COMPACTION TESTS FOR THE TOWER FOUNDATION.
  - 6. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
  - 7. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
  - 8. GROUNDING AT ANTENNA MASTS FOR GPS AND ANTENNAS
  - 9. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

3.3 **REQUIRED INSPECTIONS:**

- A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.
- B. CONDUCT INSPECTIONS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
  - 1. GROUNDING SYSTEM INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
  - 2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
  - 3. COMPACTION OF BACKFILL MATERIALS; AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS; ASPHALT PAVING; AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
  - 4. PRE- AND POST-CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES.
  - 5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
  - 6. ANTENNA AZIMUTH , DOWN TILT AND PER SUNLIGHT TOOL SUNSIGHT INSTRUMENTS – ANTENNALIGN ALIGNMENT TOOL (AAT)
  - 7. VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE DEVELOPMENT REP, OR RF REP.
  - 8. FINAL INSPECTION CHECKLIST AND HANDOFF WALK (HOC). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SMS.
  - 9. COAX SWEEP AND FIBER TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.
  - 10. SCAN-ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
  - 11. ALL AVAILABLE JURISDICTIONAL INFORMATION
  - 12. PDF SCAN OF REDLINES PRODUCED IN FIELD
- E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
- F. CONSTRUCTION INSPECTIONS AND CORRECTIVE MEASURES SHALL BE DOCUMENTED BY THE CONTRACTOR WITH WRITTEN REPORTS AND PHOTOGRAPHS. PHOTOGRAPHS MUST BE DIGITAL AND OF SUFFICIENT QUALITY TO CLEARLY SHOW THE SITE CONSTRUCTION. PHOTOGRAPHS MUST CLEARLY IDENTIFY THE PHOTOGRAPHED ITEM AND BE LABELED WITH THE SITE CASCADE NUMBER, SITE NAME, DESCRIPTION, AND DATE.

3.4 **DELIVERABLES:** TEST AND INSPECTION REPORTS AND CLOSEOUT DOCUMENTATION SHALL BE UPLOADED TO THE SMS AND/OR FORWARDED TO SPRINT FOR INCLUSION INTO THE PERMANENT SITE FILES.

- A. THE FOLLOWING TEST AND INSPECTION REPORTS SHALL BE PROVIDED AS APPLICABLE.
  - 1. CONCRETE MIX AND CYLINDER BREAK REPORTS.
  - 2. STRUCTURAL BACKFILL COMPACTION REPORTS.
  - 3. SITE RESISTANCE TO EARTH TEST.
  - 4. ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
  - 5. TOWER ERECTION INSPECTIONS AND MEASUREMENTS DOCUMENTING TOWER INSTALLED PER SUPPLIER'S REQUIREMENTS AND THE APPLICABLE SECTIONS HEREIN.
  - 6. COAX CABLE SWEEP TESTS PER COMPANY'S "ANTENNA LINE ACCEPTANCE STANDARDS".
- B. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES THE FOLLOWING:
  - 1. TEST WELLS AND TRENCHES: PHOTOGRAPHS OF ALL TEST WELLS; PHOTOGRAPHS SHOWING ALL OPEN EXCAVATIONS AND TRENCHING PRIOR TO BACKFILLING SHOWING A TAPE MEASURE VISIBLE IN THE EXCAVATIONS INDICATING DEPTH.
  - 2. CONDUITS, CONDUCTORS AND GROUNDING: PHOTOGRAPHS SHOWING TYPICAL INSTALLATION OF CONDUCTORS AND CONNECTORS; PHOTOGRAPHS SHOWING TYPICAL BEND RADIUS OF INSTALLED GROUND WIRES AND GROUND ROD SPACING;
  - 3. CONCRETE FORMS AND REINFORCING: CONCRETE FORMING AT TOWER AND EQUIPMENT/SHELTER PAD/FOUNDATIONS – PHOTOGRAPHS SHOWING ALL REINFORCING STEEL, UTILITY AND CONDUIT STUB OUTS; PHOTOGRAPHS SHOWING CONCRETE POUR OF SHELTER SLAB/FOUNDATION, TOWER FOUNDATION AND GUY ANCHORS WITH VIBRATOR IN USE; PHOTOGRAPHS SHOWING EACH ANCHOR ON GUYED TOWERS, BEFORE CONCRETE POUR.
  - 4. TOWER, ANTENNAS AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING – TOP AND BOTTOM; PHOTOS OF COAX GROUNDING--TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
  - 5. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
  - 6. SITE LAYOUT – PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
  - 7. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.
  - 8. REQUIRED MATERIALS CERTIFICATIONS: CONCRETE MIX DESIGNS; MILL CERTIFICATION FOR ALL REINFORCING AND STRUCTURAL STEEL; AND ASPHALT PAVING MIX DESIGN.
  - 9. ANY AND ALL SUBMITTALS BY THE JURISDICTION OR COMPANY.

**SECTION 01 500 – PROJECT REPORTING**

**PART 1 – GENERAL**

1.1 **THE WORK:** THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 **RELATED DOCUMENTS:**

- A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.
- B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

3.1 **WEEKLY REPORTS:**

- A. CONTRACTOR SHALL PROVIDE SPRINT WITH WEEKLY REPORTS SHOWING PROJECT STATUS. THIS STATUS REPORT FORMAT WILL BE PROVIDED TO THE CONTRACTOR BY SPRINT. THE REPORT WILL CONTAIN SITE ID NUMBER, THE MILESTONES FOR EACH SITE, INCLUDING THE BASELINE DATE, ESTIMATED COMPLETION DATE AND ACTUAL COMPLETION DATE.

B. REPORT INFORMATION WILL BE TRANSMITTED TO SPRINT VIA ELECTRONIC MEANS AS REQUIRED. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

3.2 **PROJECT CONFERENCE CALLS:**

- A. SPRINT MAY HOLD WEEKLY PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.

3.3 **PROJECT TRACKING IN SMS:**

- A. CONTRACTOR SHALL PROVIDE SCHEDULE UPDATES AND PROJECTIONS IN THE SMS SYSTEM ON A WEEKLY BASIS.

3.4 **ADDITIONAL REPORTING:**

- A. ADDITIONAL OR ALTERNATE REPORTING REQUIREMENTS MAY BE ADDED TO THE REPORT AS DETERMINED TO BE REASONABLY NECESSARY BY COMPANY.

3.5 **PROJECT PHOTOGRAPHS:**

- A. FILE DIGITAL PHOTOGRAPHS OF COMPLETED SITE IN JPEG FORMAT IN THE SMS PHOTO LIBRARY FOR THE RESPECTIVE SITE. PHOTOGRAPHS SHALL BE CLEARLY LABELED WITH SITE NUMBER, NAME AND DESCRIPTION, AND SHALL INCLUDE AT A MINIMUM THE FOLLOWING AS APPLICABLE:
  - 1. SHELTER AND TOWER OVERVIEW.
  - 2. TOWER FOUNDATION(S) – FORMS AND STEEL BEFORE POUR (EACH ANCHOR ON GUYED TOWERS).
  - 3. TOWER FOUNDATION(S) POUR WITH VIBRATOR IN USE (EACH ANCHOR ON GUYED TOWERS).
  - 4. TOWER STEEL AS BEING INSTALLED INTO HOLE (SHOW ANCHOR STEEL ON GUYED TOWERS).
  - 5. PHOTOS OF TOWER SECTION STACKING.
  - 6. CONCRETE TESTING / SAMPLES.
  - 7. PLACING OF ANCHOR BOLTS IN TOWER FOUNDATION.
  - 8. BUILDING/WATER TANK FROM ROAD FOR TENANT IMPROVEMENTS OR COMMENTS.
  - 9. SHELTER FOUNDATION--FORMS AND STEEL BEFORE POURING.
  - 10. SHELTER FOUNDATION POUR WITH VIBRATOR IN USE.
  - 11. COAX CABLE ENTRY INTO SHELTER.
  - 12. PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
  - 13. ROOFTOP PRE AND POST CONSTRUCTION PHOTOS TO INCLUDE PENETRATIONS AND INTERIOR CEILING.
  - 14. PHOTOS OF TOWER TOP COAX LINE COLOR CODING AND COLOR CODING AT GROUND LEVEL.
  - 15. PHOTOS OF ALL APPROPRIATE COMPANY OR REGULATORY SIGNAGE.
  - 16. PHOTOS OF EQUIPMENT BOLT DOWN INSIDE SHELTER.
  - 17. POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE AND POWER AND TELCO SUPPLY LOCATIONS INCLUDING METER/DISCONNECT.
  - 18. ELECTRICAL TRENCH(S) WITH ELECTRICAL / CONDUIT BEFORE BACKFILL.
  - 19. ELECTRICAL TRENCH(S) WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.
  - 20. TELCO TRENCH WITH TELEPHONE / CONDUIT BEFORE BACKFILL.
  - 21. TELCO TRENCH WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.
  - 22. SHELTER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
  - 23. TOWER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
  - 24. FENCE GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
  - 25. ALL BTS GROUND CONNECTIONS.
  - 26. ALL GROUND TEST WELLS.
  - 27. ANTENNA GROUND BAR AND EQUIPMENT GROUND BAR.
  - 28. ADDITIONAL GROUNDING POINTS ON TOWERS ABOVE 200'.
  - 29. HVAC UNITS INCLUDING CONDENSERS ON SPLIT SYSTEMS.
  - 30. GPS ANTENNAS.
  - 31. CABLE TRAY AND/OR WAVEGUIDE BRIDGE.
  - 32. DOGHOUSE/CABLE EXIT FROM ROOF.
  - 33. EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA.
  - 34. MASTER BUS BAR.
  - 35. TELCO BOARD AND NIU.
  - 36. ELECTRICAL DISTRIBUTION WALL.
  - 37. CABLE ENTRY WITH SURGE SUPPRESSION.
  - 38. ENTRANCE TO EQUIPMENT ROOM.
  - 39. COAX WEATHERPROOFING--TOP AND BOTTOM OF TOWER.
  - 40. COAX GROUNDING --TOP AND BOTTOM OF TOWER.
  - 41. ANTENNA AND MAST GROUNDING.
  - 42. LANDSCAPING -- WHERE APPLICABLE.

3.6 **FINAL PROJECT ACCEPTANCE:** COMPLETE ALL REQUIRED REPORTING TASKS PER CONTRACT, CONTRACT DOCUMENTS OR THE SPRINT INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES AND UPLOAD INTO SITERRA.

**SECTION 07 500 – ROOF CUTTING, PATCHING AND REPAIR**

**SUMMARY:**

THIS SECTION SPECIFIES CUTTING AND PATCHING EXISTING ROOFING SYSTEMS WHERE CONDUIT OR CABLES EXIT THE BUILDING ONTO THE ROOF OR BUILDING-MOUNTED ANTENNAS, AND AS REQUIRED FOR WATERTIGHT PERFORMANCE. ROOFTOP ENTRY OPENINGS IN MEMBRANE ROOFTOPS SHALL BE CONSTRUCTED TO COMPLY WITH LANDLORD, ANY EXISTING WARRANTY, AND LOCAL JURISDICTIONAL STANDARDS.

1.4 **SUBMITTALS:**

- A. **PRE-CONSTRUCTION ROOF PHOTOS:** COMPLETE A ROOF INSPECTION PRIOR TO THE INSTALLATION OF SPRINT EQUIPMENT ON ANY ROOFTOP BUILD. AT A MINIMUM INSPECT AND PHOTOGRAPH (MINIMUM 3 EA.) ALL AREAS IMPACTED BY THE ADDITION OF THE SPRINT EQUIPMENT.
- B. PROVIDE SIMILAR PHOTOGRAPHS SHOWING ROOF CONDITIONS AFTER CONSTRUCTION (MINIMUM 3 EA.)
- C. ROOF INSPECTION PHOTOGRAPHS SHOULD BE UPLOADED WITH CLOSEOUT PHOTOGRAPHS.

**SECTION 09 900 – PAINTING**

**QUALITY ASSURANCE:**

- A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- B. COMPLY WITH ALL ENVIRONMENTAL REGULATIONS FOR VOLATILE ORGANIC COMPOUNDS.

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

SBA COMMUNICATIONS CORP.  
134 FLANDERS ROAD, SUITE 125  
WESTBOROUGH, MA 01581  
TEL: (508) 251-0720

45 BEECHWOOD DRIVE  
N. ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5566

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: BB

APPROVED BY: DJC

| SUBMITTALS |          |                          |    |
|------------|----------|--------------------------|----|
| REV.       | DATE     | DESCRIPTION              | BY |
| 2          | 01/15/18 | REVISED FOR CONSTRUCTION | AN |
| 1          | 09/11/17 | REVISED--CODE UPDATE     | AN |
| 0          | 09/22/14 | ISSUED FOR REVIEW        | JA |

SHEET TITLE

OUTLINE SPECIFICATIONS

SHEET NUMBER

SP-2

SITE NUMBER:  
CT33XC589-C

SITE NAME:  
BURLINGTON-AVON  
LANDFILL

SITE ADDRESS:  
277 HUCKLEBERRY ROAD  
AVON, CT 06013



CONTINUED FROM SP-2:

**MATERIALS:**

- A. MANUFACTURERS: BENJAMIN MOORE, ICI DEVOE COATINGS, PPG, SHERWIN WILLIAMS OR APPROVED EQUAL. PROVIDE PREMIUM GRADE, PROFESSIONAL-QUALITY PRODUCTS FOR COATING SYSTEMS.

**PAINT SCHEDULE:**

- A. EXTERIOR ANTENNAE AND ANTENNA MOUNTING HARDWARE: ONE COAT OF PRIMER AND TWO FINISH COATS. PAINT FOR ANTENNAE SHALL BE NON-METALLIC BASED AND CONTAIN NO METALLIC PARTICLES. PROVIDE COLORS AND PATTERNS AS REQUIRED TO MASK APPEARANCE OF ANTENNAE ON ADJACENT BUILDING SURFACES AND AS ACCEPTABLE TO THE OWNER. REFER TO ANTENNA MANUFACTURER'S INSTRUCTIONS WHENEVER POSSIBLE.
- B. ROOF TOP CONSTRUCTION: TOUCH UP - PREPARE SURFACES TO BE REPAIRED. FOLLOW INDUSTRY STANDARDS AND REQUIREMENTS OF OWNER TO MATCH EXISTING COATING AND FINISH.

**PAINTING APPLICATION:**

- 1. INSPECT SURFACES, REPORT UNSATISFACTORY CONDITIONS IN WRITING; BEGINNING WORK MEANS ACCEPTANCE OF SUBSTRATE.
- 2. COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR PREPARATION, PRIMING AND COATING WORK. COORDINATE WITH WORK OF OTHER SECTIONS.
- 3. MATCH APPROVED MOCK-UPS FOR COLOR, TEXTURE, AND PATTERN. RE-COAT OR REMOVE AND REPLACE WORK WHICH DOES NOT MATCH OR SHOWS LOSS OF ADHESION.
- 4. CLEAN UP, TOUCH UP AND PROTECT WORK.

**TOUCHUP PAINTING:**

- 1. GALVANIZING DAMAGE AND ALL BOLTS AND NUTS SHALL BE TOUCHED UP AFTER TOWER ERECTION WITH "GALVANOX," "DRY GALV," OR "ZINC-IT."
- 2. FIELD TOUCHUP PAINT SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
- 3. ALL METAL COMPONENTS SHALL BE HANDLED WITH CARE TO PREVENT DAMAGE TO THE COMPONENTS, THEIR PRESERVATIVE TREATMENT, OR THEIR PROTECTIVE COATINGS.

**SECTION 11 700 - ANTENNA ASSEMBLY, REMOTE RADIO HEADS AND CABLE INSTALLATION**

**SUMMARY:**

THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRH'S, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE.

**ANTENNAS AND RRH'S:**

THE NUMBER AND TYPE OF ANTENNAS AND RRH'S TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

**HYBRID CABLE:**

HYBRID CABLE WILL BE DC/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE. CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

**JUMPERS AND CONNECTORS:**

FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRH'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE. JUMPERS BETWEEN THE RRH'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE. DO NOT USE SUPERFLEX OUTDOORS. JUMPERS SHALL BE FACTORY FABRICATED IN APPROPRIATE LENGTHS WITH A MAXIMUM OF 4 FEET EXCESS PER JUMPER AND HAVE CONNECTORS AT EACH END, MANUFACTURED BY SUPPLIER. IF JUMPERS ARE FIELD FABRICATED, FOLLOW MANUFACTURER'S REQUIREMENTS FOR INSTALLATION OF CONNECTORS

**REMOTE ELECTRICAL TILT (RET) CABLES:**

**MISCELLANEOUS:**

INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHEET, FURNISHED BY SPRINT.

**ANTENNA INSTALLATION:**

THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER. ANTENNA HEIGHT, AZIMUTH, AND FEED ORIENTATION INFORMATION SHALL BE A DESIGNATED ON THE CONSTRUCTION DRAWINGS.

- A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.
- B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

**HYBRID CABLES INSTALLATION:**

- A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.
- C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.
  - 1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS.
  - 2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBTS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
    - a. FIBER: SUPPORT FIBER BUNDLES USING 1/2" VELCRO STRAPS OF THE REQUIRED LENGTH @ 18" OC. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.
    - b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.
  - 3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
  - 4. CABLE INSTALLATION:
    - a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER.
    - b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.
    - c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM BEND RADIUS.

- 5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
- 6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 REV 4.
- 7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1

**WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:**

- A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.
- B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.
  - 1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
  - 2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.
  - 3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
  - 4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

**SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE STATIONS (MMBTS) AND RELATED EQUIPMENT**

**SUMMARY:**

- A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).
- B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.
- C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

**DC CIRCUIT BREAKER LABELING**

- A. LABEL CIRCUIT BREAKERS ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1.

**SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE TRANSCIEVER STATIONS (MMBTS) AND RELATED EQUIPMENT**

**SUMMARY:**

- A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).
- B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.
- C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

**SUPPORTING DEVICES:**

- A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
  - 1. ALLIED TUBE AND CONDUIT
  - 2. B-LINE SYSTEM
  - 3. UNISTRUT DIVERSIFIED PRODUCTS
  - 4. THOMAS & BETTS
- B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:
  - 1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
  - 2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
  - 3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
  - 4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
  - 5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
  - 6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
  - 7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
  - 8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
  - 9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

**SUPPORTING DEVICES:**

- A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.
- B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.
- C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:
- D. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.
- E. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

**ELECTRICAL IDENTIFICATION:**

- A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.
- B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

**SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT**

**CONDUIT:**

- A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR ENCASED RUNS IN CONCRETE. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED - SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.
- B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.
- C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.
- D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.
- E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6- FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRE BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.
- F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

**HUBS AND BOXES:**

- A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.
- B. CABLE TERMINATION FITTINGS FOR CONDUIT
  - 1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL.
  - 2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO - CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROTEXC.
- C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.
- D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKETED COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.
- E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

**SUPPLEMENTAL GROUNDING SYSTEM**

- A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM AS INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS AS INDICATED.
- B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO OX.
- C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

**EXISTING STRUCTURE:**

- A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE. WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

**CONDUIT AND CONDUCTOR INSTALLATION:**

- A. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
- B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.



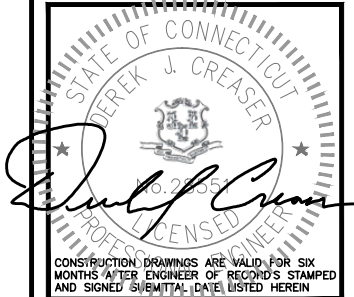
1 INTERNATIONAL BLVD, SUITE 800  
MAHWAH, NJ 07495  
TEL: (800) 357-7641



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134 FLANDERS ROAD, SUITE 125  
WESTBOROUGH, MA 01581 TEL: (508) 251-0720



45 BEECHWOOD DRIVE TEL: (978) 557-5553  
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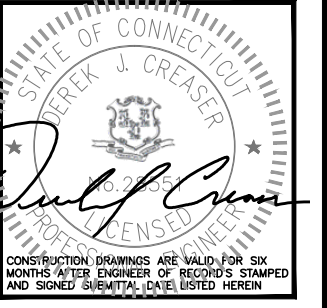
APPROVED BY: DJC

| SUBMITTALS |          |                          |    |
|------------|----------|--------------------------|----|
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| 1          | 09/11/17 | REVISED-CODE UPDATE      | AN |
| 0          | 09/22/14 | ISSUED FOR REVIEW        | JA |

SITE NUMBER:  
CT33XC589-C  
SITE NAME:  
BURLINGTON-AVON  
LANDFILL  
SITE ADDRESS:  
277 HUCKLEBERRY ROAD  
AVON, CT 06013

SHEET TITLE  
OUTLINE  
SPECIFICATIONS

SHEET NUMBER  
SP-3



CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

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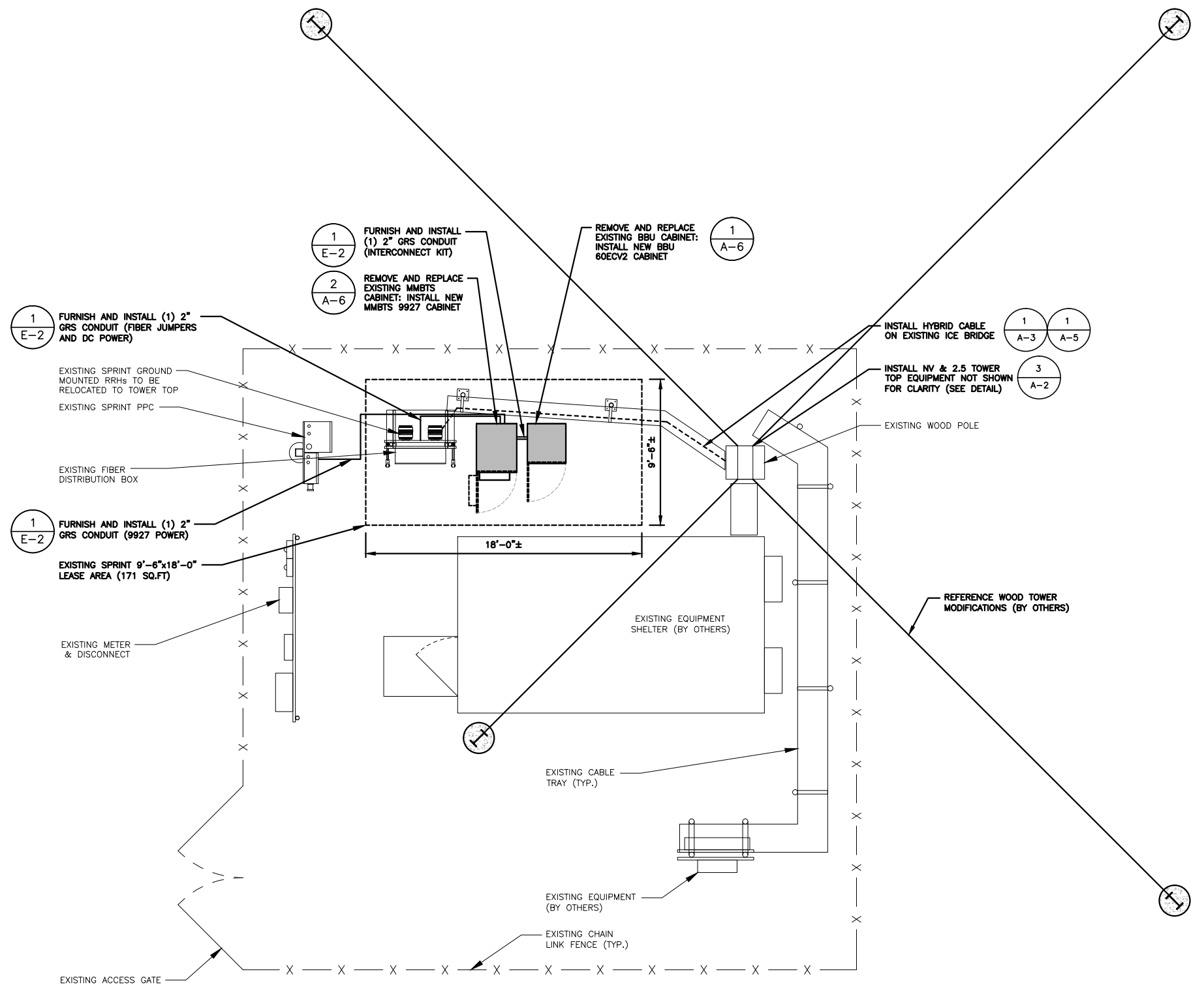
APPROVED BY: DJC

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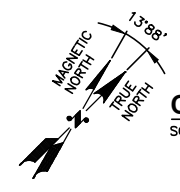
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SHEET TITLE  
COMPOUND PLAN

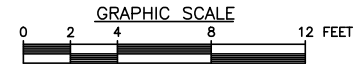
SHEET NUMBER  
A-1



**RAN EQUIPMENT PHOTO DETAIL** 2 A-1  
SCALE: N.T.S.



**COMPOUND PLAN** 1 A-1  
SCALE: 1/4"=1'-0"





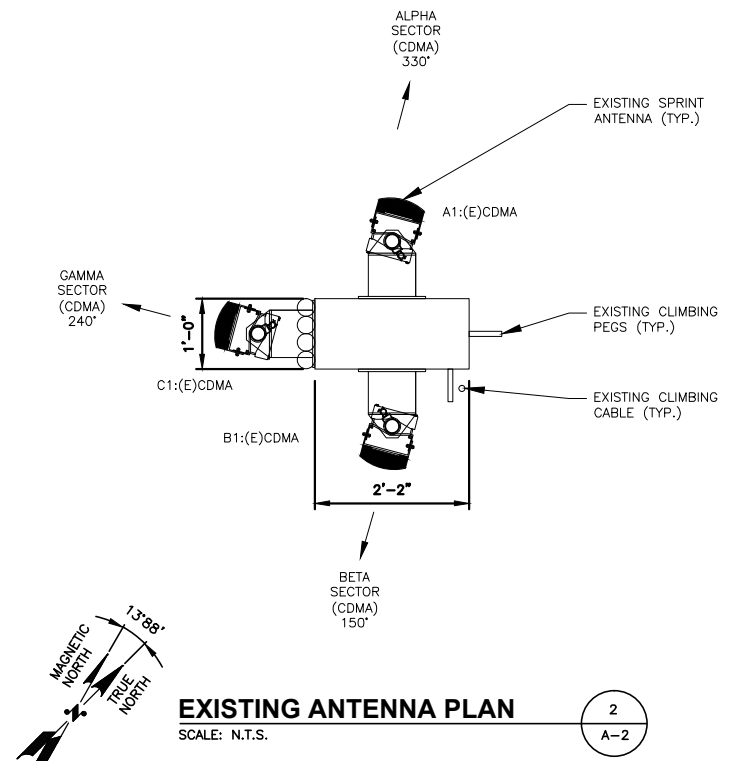
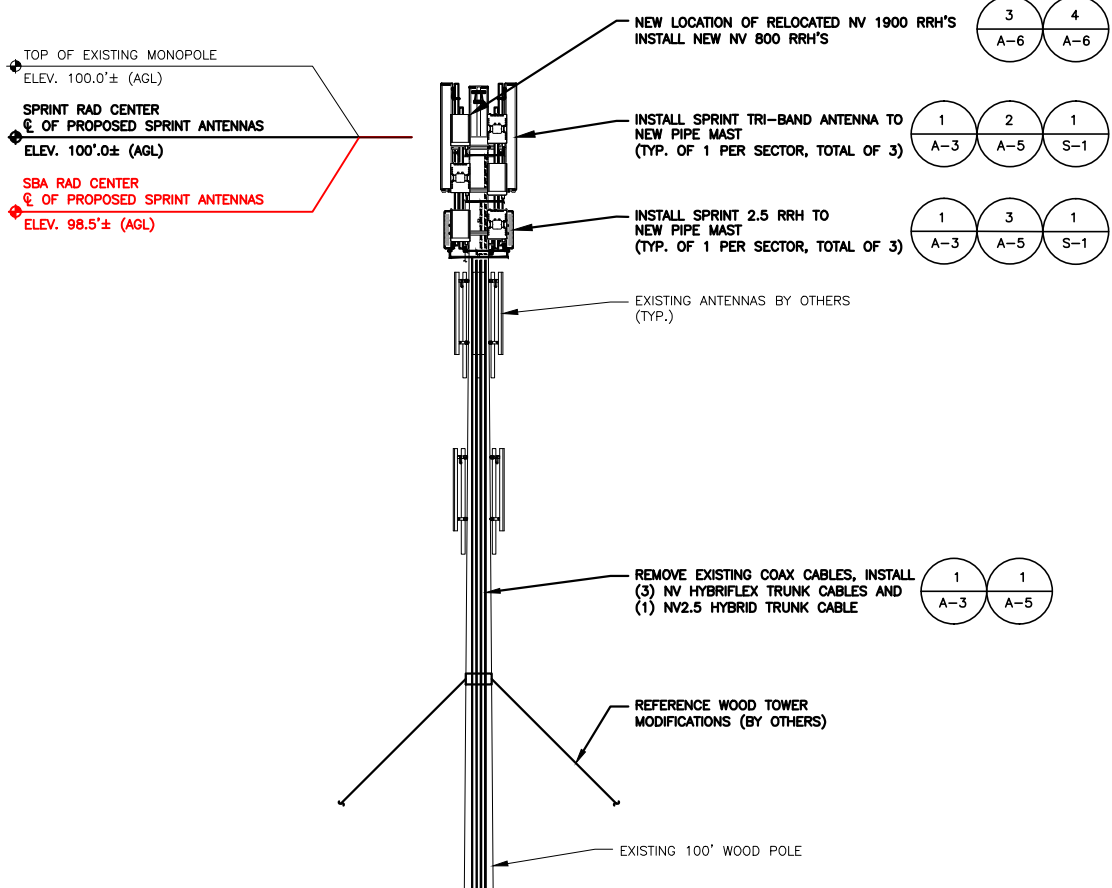
**SPECIAL CONSTRUCTION NOTE:**  
 SPRINT TOWER TOP WORK IS CONTINGENT ON THE FOLLOWING:  
 \* COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS (PROVIDED BY TOWER OWNER).  
 \* COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT (PROVIDED BY A&E VENDOR).  
 \* GC SHALL FURNISH, INSTALL AND COMPLETE 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 02-17-14

**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.

**SPECIAL CONSTRUCTION NOTE:**  
 THE SPRINT NETWORK VISION 2.5 GHZ TOWER TOP WORK IS CONTINGENT UPON COMPLETION OF ALL REQUIRED STRUCTURAL MODIFICATIONS, ENGINEERING CONSTRUCTION CONTROL INSPECTIONS, FINAL ENGINEERING AFFIDAVIT, AND ACCEPTANCE/APPROVAL BY SBA COMMUNICATIONS CORP.

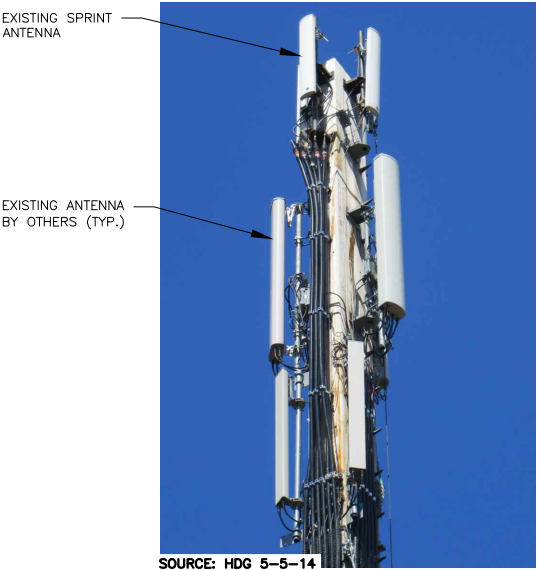
**SPECIAL CONSTRUCTION SCHEDULE NOTE (SBA DESIGN-BUILD TOWER MODS REQUIRED):**  
 SPECIAL CONSTRUCTION SCHEDULE NOTE (SBA DESIGN-BUILD TOWER MODS REQUIRED):  
 UNLESS A PRE-MOD CONDITIONAL OR TEMPORARY INSTALLATION IS SPECIFICALLY RECOMMENDED BY SBA TOWER STRUCTURAL ENGINEER AND INCLUDED IN SBA NOTICE-TO-PROCEED, SPRINT TOWER TOP EQUIPMENT INSTALLATION IS CONTINGENT UPON COMPLETION OF SBA DESIGN-BUILD FOR ALL REQUIRED TOWER/FOUNDATION STRUCTURAL MODIFICATIONS, ENGINEERING CONSTRUCTION CONTROL INSPECTIONS, AND FINAL ENGINEERING AFFIDAVIT (ALL PREVIOUS ITEMS TO BE DESIGN-BUILD PERFORMED BY SBA UNDER A SEPARATE BUILDING PERMIT).



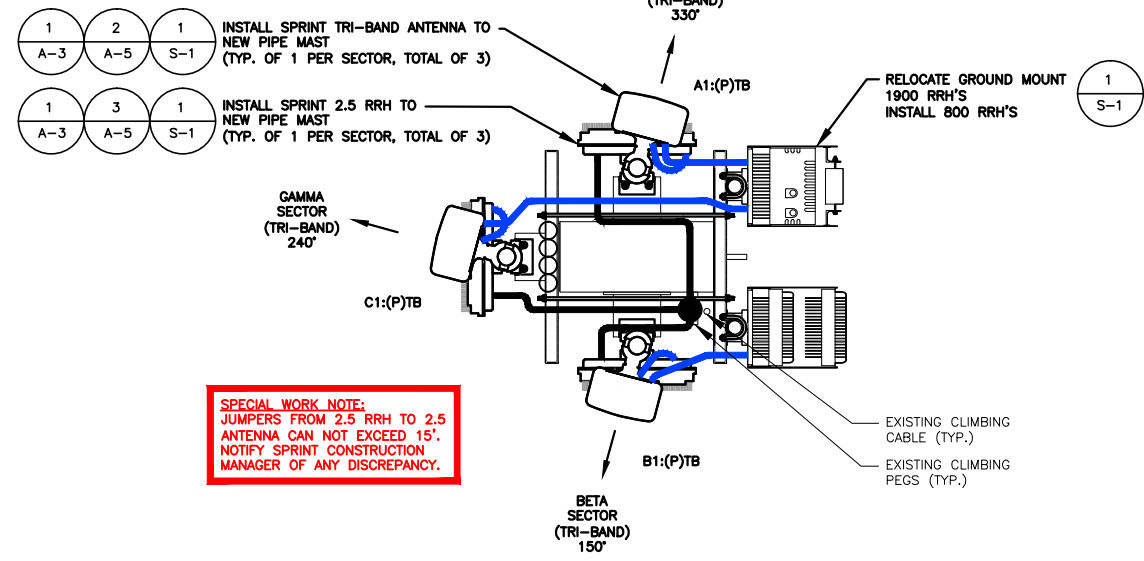
**ANTENNA STATUS LEGEND:**

|       |                         |
|-------|-------------------------|
| EMPTY | EMPTY PIPE              |
| (E)   | EXISTING                |
| (P)   | INSTALL                 |
| CDMA  | CDMA ANTENNA            |
| TB    | SPRINT TRI-BAND ANTENNA |

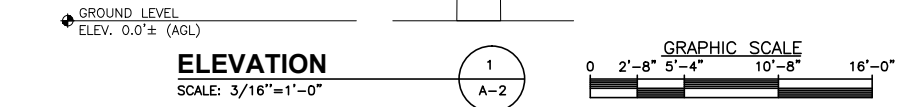
**NOTES:**  
 1) VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION



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



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



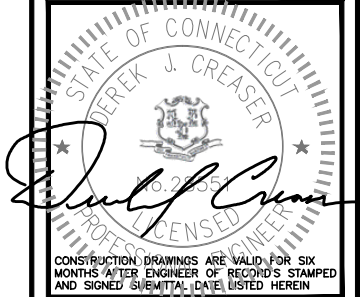
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**SUBMITTALS**

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 SITE NAME:  
 BURLINGTON-AVON  
 LANDFILL  
 SITE ADDRESS:  
 277 HUCKLEBERRY ROAD  
 AVON, CT 06013

SHEET TITLE  
 ELEVATION AND  
 ANTENNA PLANS

SHEET NUMBER  
 A-2



### RFDS Sheet

(by SBA Network Services 4/8/14. NOTE: General Contractor/Tower Crew shall verify that the latest RFDS is used for equipment installation.)

#### General Site Information

|                |                      |                           |               |   |
|----------------|----------------------|---------------------------|---------------|---|
| Site ID        | CT33XC589            | Equipment Vendor          | ALU           | <b>(40A PER SPRINT UPDATE) FOR INCREMENTAL POWER DRAW</b> |
| Market         | Northern Connecticut | Latitude                  | 41.788000     |   |
| Region         | East                 | Longitude                 | -72.918100    |   |
| MLA            | SBA                  | LL SITE ID                | CT46143-A     |   |
| Structure Type | STEALTH              |                           |               |   |
| BTS Type       | Outdoor Macro        |                           |               |   |
| Solution ID    | Not Available        | Siterra SR Equipment Type | Outdoor Macro | Incremental Power Draw Needed by Added Equipment          |
|                |                      | Equipment Vendor          | ALU           | 100   |

#### Base Equipment

|                                    |                         |                             |      |
|------------------------------------|-------------------------|-----------------------------|------|
| BBU Kit                            | ALU BBU Kit             | Top Hat                     | None |
| BBU Kit Qty                        | 0                       | Top Hat Qty                 | N/A  |
| Growth Cabinet                     | (MMBTS 9927)            | Top Hat Dimensions (Inches) | N/A  |
| Growth Cabinet Qty                 | 1                       | Top Hat Weight (Lbs.)       | N/A  |
| Growth Cabinet Dimensions (Inches) | (31.5W x 38.1D x 63.5H) |                             |      |
| Growth Cabinet Weight (Lbs.)       | (634 LBS)               |                             |      |

#### RF Path Information

|                                    |                        |   |
|------------------------------------|------------------------|---|
| RRH                                | TD-RRHx20-25           |   |
| RRH Qty                            | 3                      |   |
| RRH Dimensions (Inches)            | 26.1" x 18.6" x 6.7"   |   |
| RRH Weight (Lbs.)                  | 70.0                   |   |
| RRH Mount Weight (Lbs.)            | 10                     |   |
| Power and Fiber Cable              | ALU Fiber only         |   |
| Cable Qty                          | 1                      |   |
| Weight per Foot (Lbs.)             | 0.242                  |   |
| Diameter (Inches)                  | 0.730                  |   |
| Hybrid Cable Length (Feet) (**)    | 120                    | (Estimated by Sprint as Antenna CL plus 20%; DO NOT BOM using this length.) |
| Coax Jumper                        | Coax Jumper, Mfg TBD.  |   |
| Coax Jumper Qty                    | 27                     |   |
| Coax Jumper Length (Feet) (**)     | 8                      |   |
| Coax Jumper Weight (Lbs.)          | 1.7                    |   |
| Coax Jumper Diameter (Inches)      | 0.5                    |   |
| AISG Cable                         | Commscope ATCB-B01-006 |   |
| AISG Cable Qty                     | 3                      |   |
| AISG Diameter (Inches)             | 0.315                  |   |
| AISG Cable Length (Feet) (**)      | 8                      |   |
| Weight of Entire AISG Cable (Lbs.) | 1.3                    |   |

#### Antenna Sector Information

|                                       | Sector 1              | Sector 2              | Sector 3              |
|---------------------------------------|-----------------------|-----------------------|-----------------------|
| Antenna Make/Model                    | RFS APXV9TM14-ALU-I20 | RFS APXV9TM14-ALU-I20 | RFS APXV9TM14-ALU-I20 |
| Antenna Qty                           | 1                     | 1                     | 1                     |
| Antenna Dimensions (Inches)           | 56.3 x 12.6 x 6.3     | 56.3 x 12.6 x 6.3     | 56.3 x 12.6 x 6.3     |
| Antenna Weight (Lbs.)                 | 55.1                  | 55.1                  | 55.1                  |
| Antenna Mounting Kit Weight (Lbs.)    | 11.5                  | 11.5                  | 11.5                  |
| CL Height (Feet) (* SBA 98.5')        | 100.0                 | 100.0                 | 100.0                 |
| Antenna Azimuth (Degrees)             | 330                   | 150                   | 240                   |
| Antenna Mechanical Downtilt (Degrees) | 0                     | 0                     | 0                     |
| Antenna Etilt (Degrees)               | -2                    | -2                    | -2                    |
| RF Filter Make/Model                  | N/A                   | N/A                   | N/A                   |

#### Comments

RFDS generated 4/8/14 by SBA Network Services from Sprint Plan of Record dated 4/2/14.  
 Comments in Red Text provided by A&E Vendor.  
 IMPORTANT CONSTRUCTION NOTE: General Contractor/Tower Crew shall verify that the latest RFDS is used for equipment installation.  
 \* Note: Antenna Rad Center 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 Database.  
 \*\* Note: Sprint CM shall confirm Hybrid Cable Length, Coax Jumper Length and AISG Cable Length before preparing BOM. A&E Recommended Hybrid Cable Length based on NV 2.5 Equipment Audit plus 20 Feet for (2) 10-foot coils at each end of the fiber trunk.

1  
A-5 \*\*A&E: (1) 2.5 HYBRID TRUNK, 150'  
 \*\*A&E: (1) 2.5 HYBRID JUMPER, EACH SECTOR A; 10', B; 10', C; 10'

1  
A-5 \*\*A&E: (3) NV HYBRID TRUNK, ALL SECTORS A; B; C: 150'  
 \*\*A&E: (1) NV HYBRID JUMPER, EACH SECTOR A; 5', B; 5', C; 5'

A \*\*A&E: (4) 2.5 COAX JUMPERS, EACH SECTOR A; 8', B; 8', C; 8'

A \*\*A&E: (6) NV COAX JUMPERS, EACH SECTOR A; 15', B; 15', C; 15'

A \*\*A&E: (1) AISG CABLE, EACH SECTOR A; 8', B; 8', C; 8'

2  
A-5 \*\*COMMSCOPE DHHTT65B-3XR

2  
A-5 \*\*ANTENNA DIMENSIONS (72.0 x 12.0 x 7.1)

2  
A-5 \*\*ANTENNA WEIGHT (45 LBS)

A SPECIAL WORK NOTE:  
 JUMPERS (COAX/AISG) FROM 2.5 RRH TO 2.5 ANTENNA CANNOT EXCEED 15'.  
 NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY DISCREPANCY

### RF DATA SHEET

SCALE: N.T.S.

1  
A-3

#### SPRINT CONSTRUCTION STANDARDS:

GENERAL CONTRACTOR SHALL ADHERE TO THE FOLLOWING SPRINT CONSTRUCTION STANDARDS.

- CONSTRUCTION STANDARDS: INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES - (CURRENT VERSION), INCLUDING EXHIBITS A-M.
- CONSTRUCTION SPECIFICATIONS: CONSTRUCTION STANDARDS EXHIBIT A - STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES (CURRENT VERSION).
- GROUNDING STANDARDS: EXTERIOR GROUNDING SYSTEM DESIGN. GROUNDING STANDARDS (SUPPLEMENT): ANTI-THEFT UPDATE TO SPRINT GROUNDING 082412 AND SPRINT ENGINEERING LETTER EL-0504 DATED 04.20.12.
- WEATHER PROOFING STANDARDS: EXCERPT FROM CONSTRUCTION STANDARDS EXHIBIT A, SECTION 3.6 WEATHERPROOFING CONNECTORS AND GROUND KITS.
- COLOR CODING: SPRINT NEXTEL ANT AND LINE COLOR CODING PER SPRINT TS-0200 CURRENT VERSION.
- GENERAL CONTRACTOR TO FIELD VERIFY AZIMUTH AND CL HEIGHT AND MECHANICAL DOWNTILT. IF DIFFERENT THAN CALLED OUT IN RFDS, HALT ANTENNA WORK FOR ONE HOUR, CALL SPRINT RF ENGINEER (OR MANAGER IF RF ENGINEER DOES NOT ANSWER, BUT STILL LEAVE A MESSAGE TO RF ENGINEER) USING SPRINT-PROVIDED CONTACT INFORMATION FOR FURTHER INSTRUCTIONS. IF SPRINT DOES NOT RESPOND WITHIN ONE HOUR, PLACE 2.5G ANTENNA AT SAME CL HEIGHT AS 1.9G ANTENNA AND EMAIL CORRECT CL HEIGHT AND AZIMUTH TO SPRINT RF ENGINEER. UPDATE AS-BUILT DRAWING WITH CORRECT CL HEIGHT. ALSO EMAIL CORRECT 1900 MHZ AND 800 MHZ ANTENNA CL HEIGHT, AZIMUTH AND MECHANICAL DOWNTILT TO RF ENGINEER.
- AISG TESTS TO VERIFY OPERATION IS TO BE PERFORMED AFTER FINAL INSTALLATION OF ANTENNAS AND AISG CABLES HAVE BEEN CONNECTED. VERIFY OPERATION OF ALL EXISTING SPRINT AISG EQUIPMENT INCLUDING 800MHZ, 1.9GHZ AND 2.5G. TEST INCLUDE COMPLETE DOWNTILT, AZIMUTH (IF APPLICABLE) AND BEAMWIDTH SWINGS (IF APPLICABLE). DOCUMENT AISG TEST RESULTS IN COAX SWEEP TEST SPREADSHEET.
- GENERAL CONTRACTOR MUST INSURE THAT NO OBJECT IS LOCATED IN FRONT OF ANTENNA. THIS MEANS NO OBJECT IS TO BE LOCATED 45 DEGREES LEFT AND RIGHT OF FRONT OF ANTENNA OR 7 DEGREES UP AND DOWN FROM CENTER OF ANTENNA. IF THIS IS NOT POSSIBLE, CONTACT RF ENGINEER FOR FURTHER INSTRUCTION. IN ADDITION, 2.5G ANTENNA IS NOT TO BE PLACED IN FRONT OF ANY OTHER ANTENNA USING THE SAME 45 DEGREE RULE. THIS INCLUDES SPRINT AND NON-SPRINT ANTENNAS.
- GENERAL CONTRACTOR IS REQUIRED TO USE A DIGITAL ALIGNMENT TOOL TO SET AZIMUTH, ROLL AND DOWNTILT. AZIMUTH ACCURACY IS TO BE WITHIN 1 DEGREE. DOWNTILT AND ROLL (LEFT TO RIGHT TILT) IS TO BE WITHIN 0.1 DEGREE. IF FOR SOME REASON THIS ACCURACY CANNOT BE ACHIEVED, UPDATE AS-BUILT DRAWINGS AND EMAIL SPRINT RF ENGINEER WITH AS-BUILT SETTINGS. USE 3Z RF ALIGNMENT TOOL OR EQUIVALENT TOOL. [HTTP://WWW.3ZTELECOM.COM/ANTENNA-ALIGNMENT-TOOL/](http://www.3ztelecom.com/antenna-alignment-tool/).



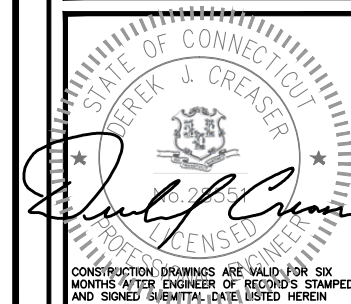
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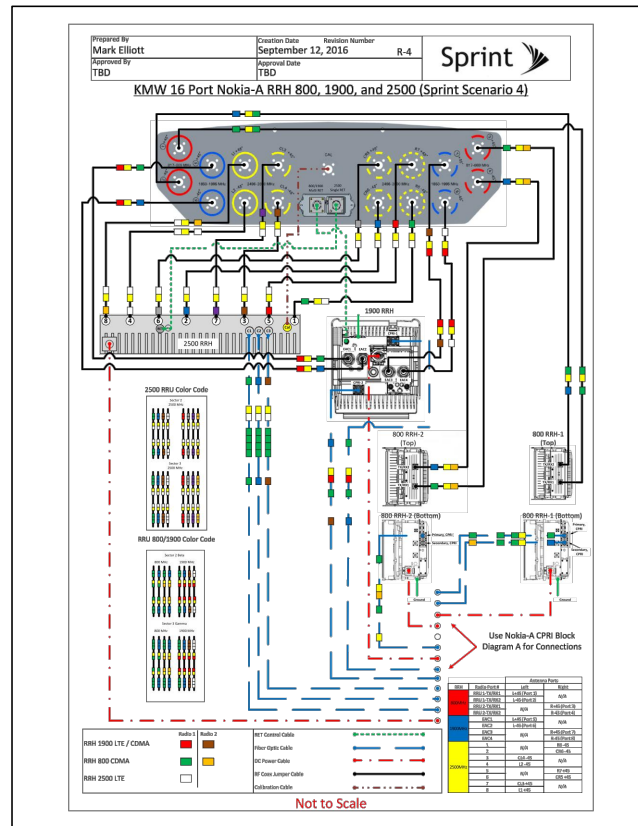
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RF DATA SHEET

SHEET NUMBER

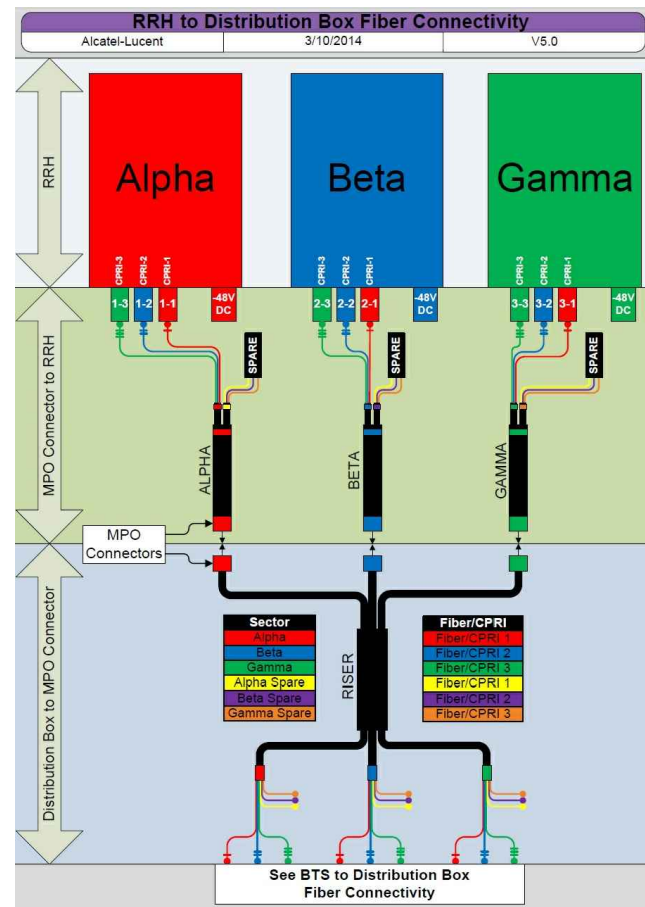
A-3





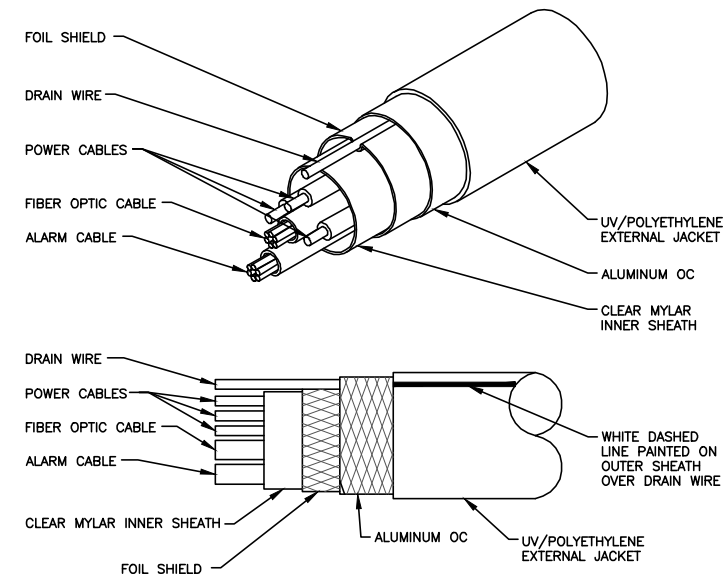
**TRI-BAND ANTENNA RAN WIRING DIAGRAM**

SCALE: N.T.S.



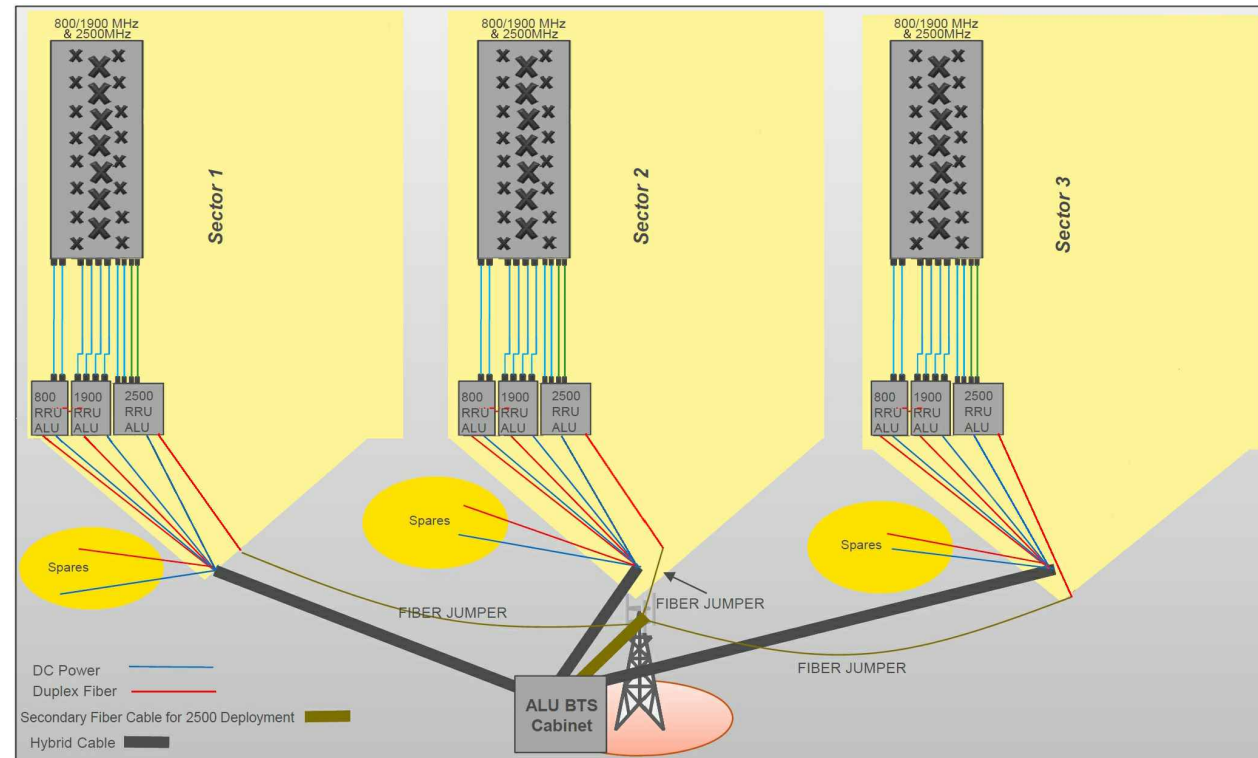
**CABLE COLOR CODING DIAGRAM**

SCALE: N.T.S.



**HYBRIFLEX CABLE DETAIL**

SCALE: N.T.S.

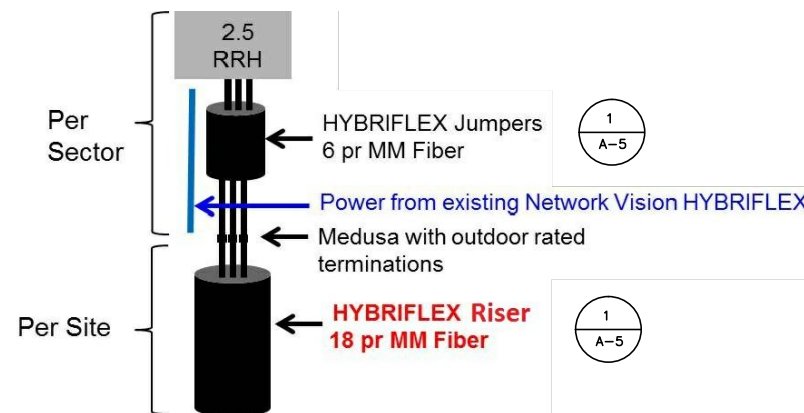


**RAN WIRING DIAGRAM: ALU EQUIPMENT**

SCALE: N.T.S.

**NOTE:**

GENERAL CONTRACTOR/TOWER CREW SHALL VERIFY THAT THE LATEST RF DATA SHEET IS USED FOR EQUIPMENT INSTALLATION.



**RFS 2.5 ALU SCENARIO 1**

SCALE: N.T.S.

**DC POWER INSTALLATION NOTE (FIBER-ONLY SCENARIO):**

USE SPACE DC CABLES COILED UP AT TOWER TOP NV ARRAY TO POWER UP 2.5 RRH. INSIDE EXISTING FIBER DISTRIBUTION BOX, TIE SPARE DC CONDUCTORS INTO EXISTING DC BREAKER PANEL PER APPROVED DC WIRING CONNECTIVITY OPTION (BASED ON NV HYBRIFLEX CABLE LENGTH). CONSULT WITH SPRINT CM TO DETERMINE APPROPRIATE DC CONNECTIVITY OPTION, PLUMBING DIAGRAM AND DC BREAKER SIZE.



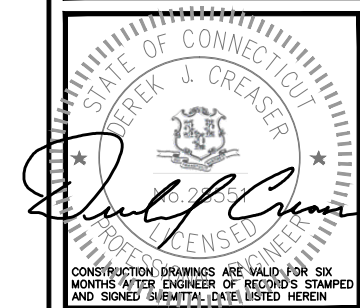
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 DIAGRAM

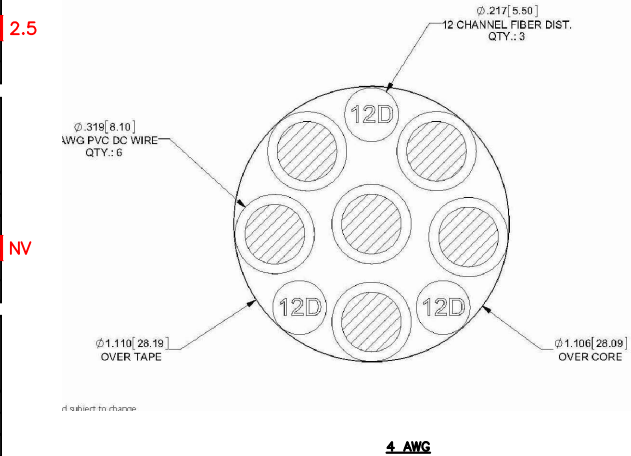
SHEET NUMBER  
 A-4

| HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE |     |            |          |                  |                |
|--|-----|------------|----------|------------------|----------------|
| MANUF:                                   | RFS | CABLE      | LENGTH   | DC CONDUCTOR     | CABLE DIAMETER |
| (*)                                      |     | FIBER ONLY | VARIES   | USE NV HYBRIFLEX | 5/8"           |
| (*)                                      |     | HYBRIFLEX  | <200'    | 8 AWG            | 1-1/4"         |
|  |     | HYBRIFLEX  | 225-300' | 6 AWG            | 1-1/4"         |
|  |     | HYBRIFLEX  | 325-375' | 4 AWG            | 1-1/4"         |

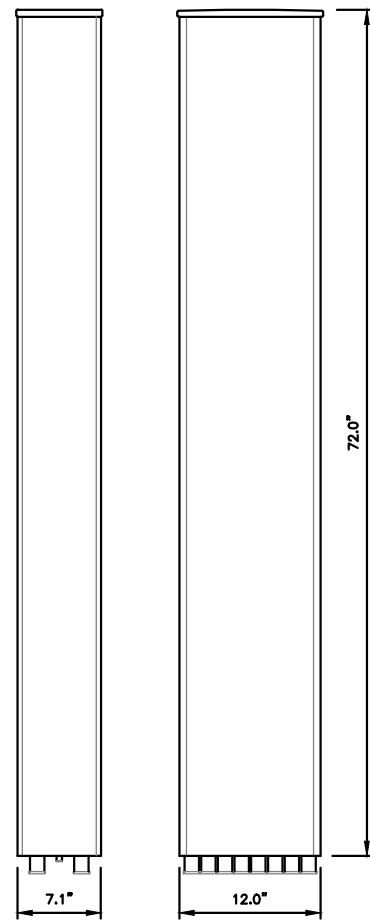
2.5 NV

RFS HYBRIFLEX RISER CABLE SCHEDULE

| Power                          | Hybrid cable   | Length |
|--------------------------------|--|--------|
| Fiber Only (Existing DC Power) | MN: HB058-M12-050F<br>12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC Connectors, 5/8 cable, 50 ft             | 50 ft  |
|                                | MN: HB058-M12-075F   | 75 ft  |
|                                | MN: HB058-M12-100F   | 100 ft |
|                                | MN: HB058-M12-125F   | 125 ft |
|                                | MN: HB058-M12-150F   | 150 ft |
|                                | MN: HB058-M12-175F   | 175 ft |
| 8 AWG Power                    | MN: HB114-08U3M12-050F<br>3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50 ft | 50 ft  |
|                                | MN: HB114-08U3M12-075F   | 75 ft  |
|                                | MN: HB114-08U3M12-100F   | 100 ft |
|                                | MN: HB114-08U3M12-125F   | 125 ft |
|                                | MN: HB114-08U3M12-150F   | 150 ft |
|                                | MN: HB114-08U3M12-175F   | 175 ft |
| 6 AWG Power                    | MN: HB114-13U3M12-225F<br>3x 6 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225 ft | 225 ft |
|                                | MN: HB114-13U3M12-250F   | 250 ft |
|                                | MN: HB114-13U3M12-275F   | 275 ft |
|                                | MN: HB114-13U3M12-300F   | 300 ft |
| 4 AWG Power                    | MN: HB114-21U3M12-325F<br>3x 4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 325 ft | 325 ft |
|                                | MN: HB114-21U3M12-350F   | 350 ft |
|                                | MN: HB114-21U3M12-375F   | 375 ft |

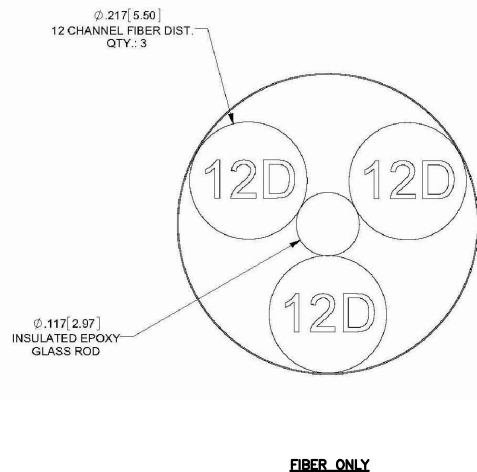
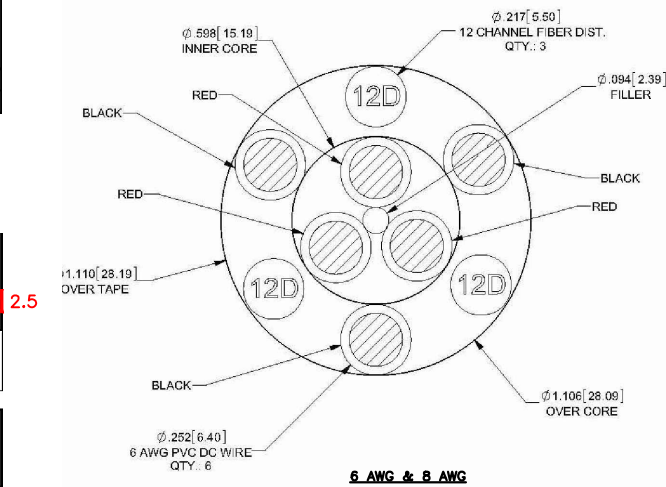


|         |              |
|---------|--------------|
| MANUF:  | COMMSCOPE    |
| MODEL:  | DHHTT65B-3XR |
| LENGTH: | 72.0         |
| WIDTH:  | 12.0         |
| DEPTH:  | 7.1          |
| WEIGHT: | 45.0 LBS     |
| AREA:   | 6.0 SF       |



RFS HYBRIFLEX JUMPER CABLE SCHEDULE

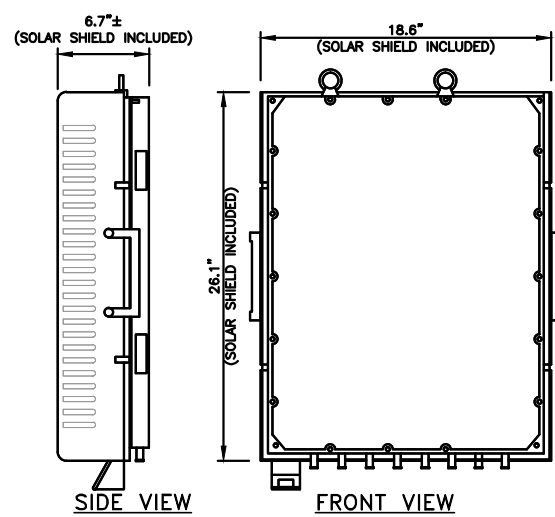
| Power       | Hybrid Jumper cable   | Length |
|-------------|---|--------|
| Fiber Only  | MN: HBF012-M3-5F1<br>5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable                          | 5 ft   |
|             | MN: HBF012-M3-10F1  | 10 ft  |
|             | MN: HBF012-M3-15F1  | 15 ft  |
| 8 AWG Power | MN: HBF058-08U1M3-5F1<br>5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable | 5 ft   |
|             | MN: HBF058-08U1M3-10F1  | 10 ft  |
|             | MN: HBF058-08U1M3-15F1  | 15 ft  |
| 6 AWG Power | MN: HBF058-13U1M3-5F1<br>5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable | 5 ft   |
|             | MN: HBF058-13U1M3-10F1  | 10 ft  |
|             | MN: HBF058-13U1M3-15F1  | 15 ft  |
| 4 AWG Power | MN: HBF078-21U1M3-5F1<br>5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 7/8 cable | 5 ft   |
|             | MN: HBF078-21U1M3-10F1  | 10 ft  |
|             | MN: HBF078-21U1M3-15F1  | 15 ft  |



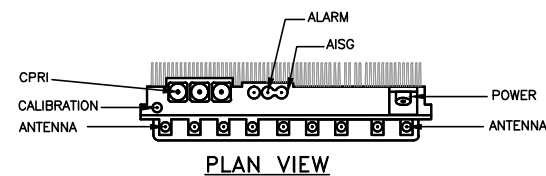
TRI-BAND ANTENNA SPECIFICATIONS

SCALE: N.T.S.

2 A-5



|         |                |
|---------|----------------|
| MANUF:  | ALCATEL-LUCENT |
| MODEL:  | TD-RRHx20-25   |
| LENGTH: | 26.1           |
| WIDTH:  | 18.6           |
| DEPTH:  | 6.7            |
| WEIGHT: | 70 LBS         |
| AREA:   | 3.5 SF         |



2.5 RRH'S

SCALE: N.T.S.

3 A-5

2.5 HYBRID CABLE X-SECTION AND DATA

SCALE: N.T.S.

1 A-5



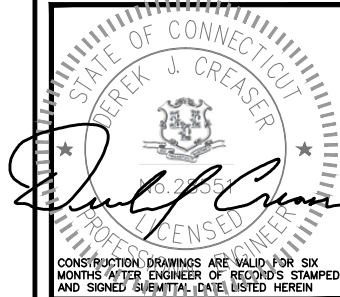
1 INTERNATIONAL BLVD, SUITE 800  
MAHWAH, NJ 07495  
TEL: (800) 357-7641



SBA COMMUNICATIONS CORP.  
134 FLANDERS ROAD, SUITE 125  
WESTBOROUGH, MA 01581 TEL: (508) 251-0720



45 BEECHWOOD DRIVE TEL: (978) 557-5553  
N. ANDOVER, MA 01845 FAX: (978) 336-5586



CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

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SUBMITTALS

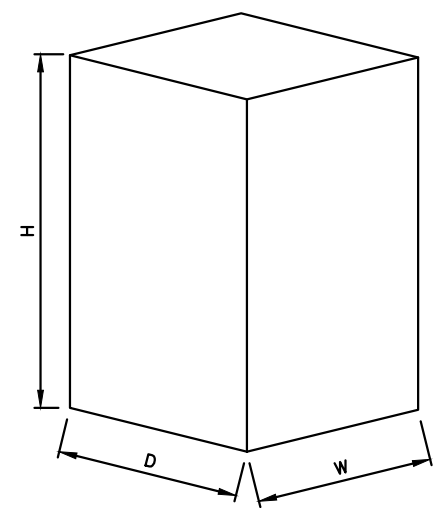
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|------|----------|--------------------------|----|
| 2    | 01/15/18 | REVISED FOR CONSTRUCTION | AN |
| 1    | 09/11/17 | REVISED-CODE UPDATE      | AN |
| 0    | 09/22/14 | ISSUED FOR REVIEW        | JA |

SITE NUMBER:  
CT33XC589-C  
SITE NAME:  
BURLINGTON-AVON  
LANDFILL  
SITE ADDRESS:  
277 HUCKLEBERRY ROAD  
AVON, CT 06013

SHEET TITLE  
EQUIPMENT DETAILS

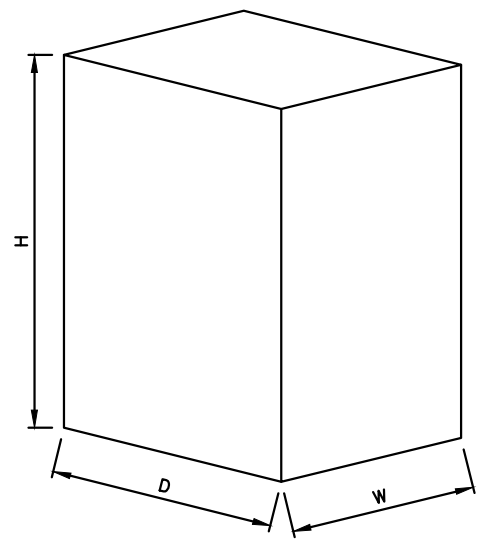
SHEET NUMBER  
A-5

| BBU DIMENSIONS  |                |
|---|----------------|
| MODEL #   | 60ECV2         |
| MANUF.  | ALCATEL-LUCENT |
| WIDTH   | 30"            |
| DEPTH   | 31"            |
| HEIGHT  | 60"            |
| WEIGHT  | 1284 LBS MAX.  |
| NOTE:<br>EQUIPMENT SHALL BE ANCHORED<br>PER MANUFACTURERS<br>SPECIFICATIONS |                |

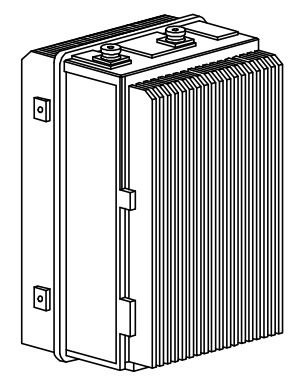


**BBU CABINET DETAIL** 1  
SCALE: N.T.S. A-6

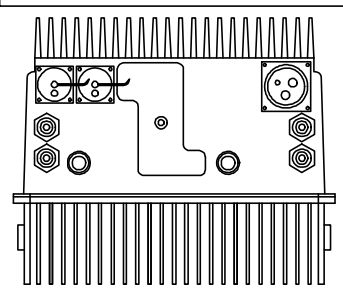
| MMBTS DIMENSIONS  |                |
|---|----------------|
| MODEL #   | 9927           |
| MANUF.  | ALCATEL-LUCENT |
| WIDTH   | 31.5"          |
| DEPTH   | 38.1"          |
| HEIGHT  | 63.5"          |
| WEIGHT  | 634 LBS        |
| NOTE:<br>EQUIPMENT SHALL BE ANCHORED<br>PER MANUFACTURERS<br>SPECIFICATIONS |                |



**MMBTS CABINET DETAIL** 2  
SCALE: N.T.S. A-6

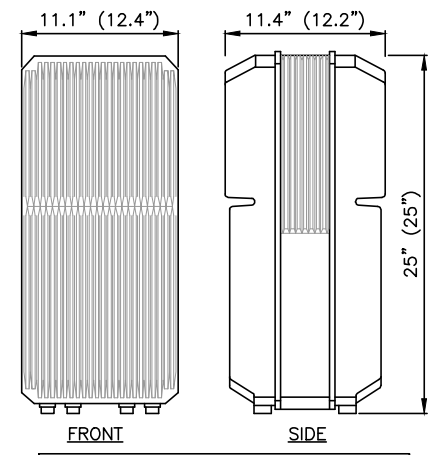


DIMENSIONS:  
800MHz RRH: 15.8"Hx13"Wx10"D  
800MHz NOTCH FILTER: 9"Hx9"Wx4"D



800MHz RRH WEIGHT: 53 LBS  
800MHz NOTCH FILTER WEIGHT: 11 LBS

**800MHz RRH** 3  
SCALE: N.T.S. A-6



DIMENSIONS WITHIN PARENTHESES ARE FOR THE OPTIONAL SOLAR SHIELD

1900MHz RRH WEIGHT: 60 LBS

**1900MHz RRH** 4  
SCALE: N.T.S. A-6

CHECKED BY: BB

APPROVED BY: DJC

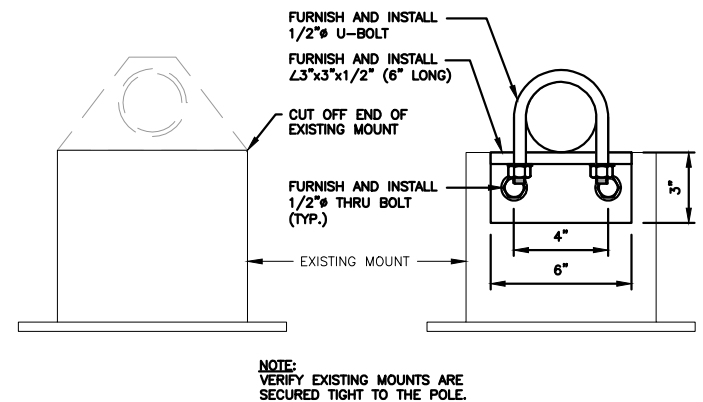
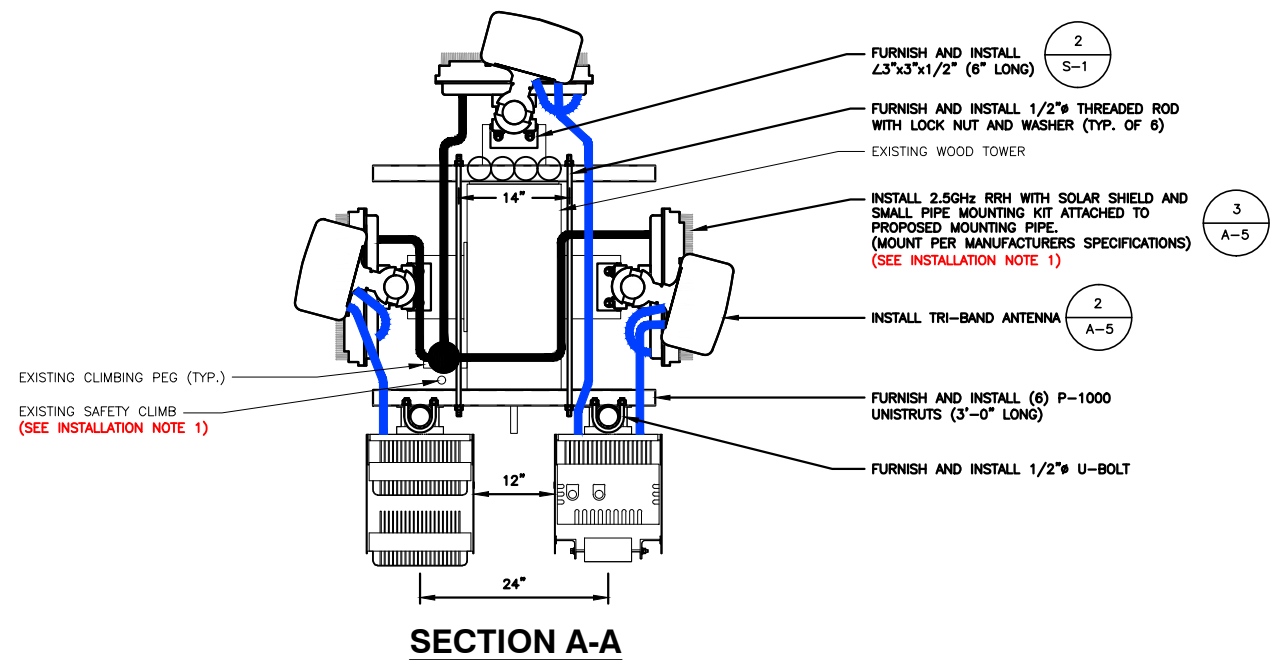
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SITE NUMBER:  
CT33XC589-C  
SITE NAME:  
BURLINGTON-AVON  
LANDFILL  
SITE ADDRESS:  
277 HUCKLEBERRY ROAD  
AVON, CT 06013

SHEET TITLE  
EQUIPMENT  
DETAILS

SHEET NUMBER  
A-6



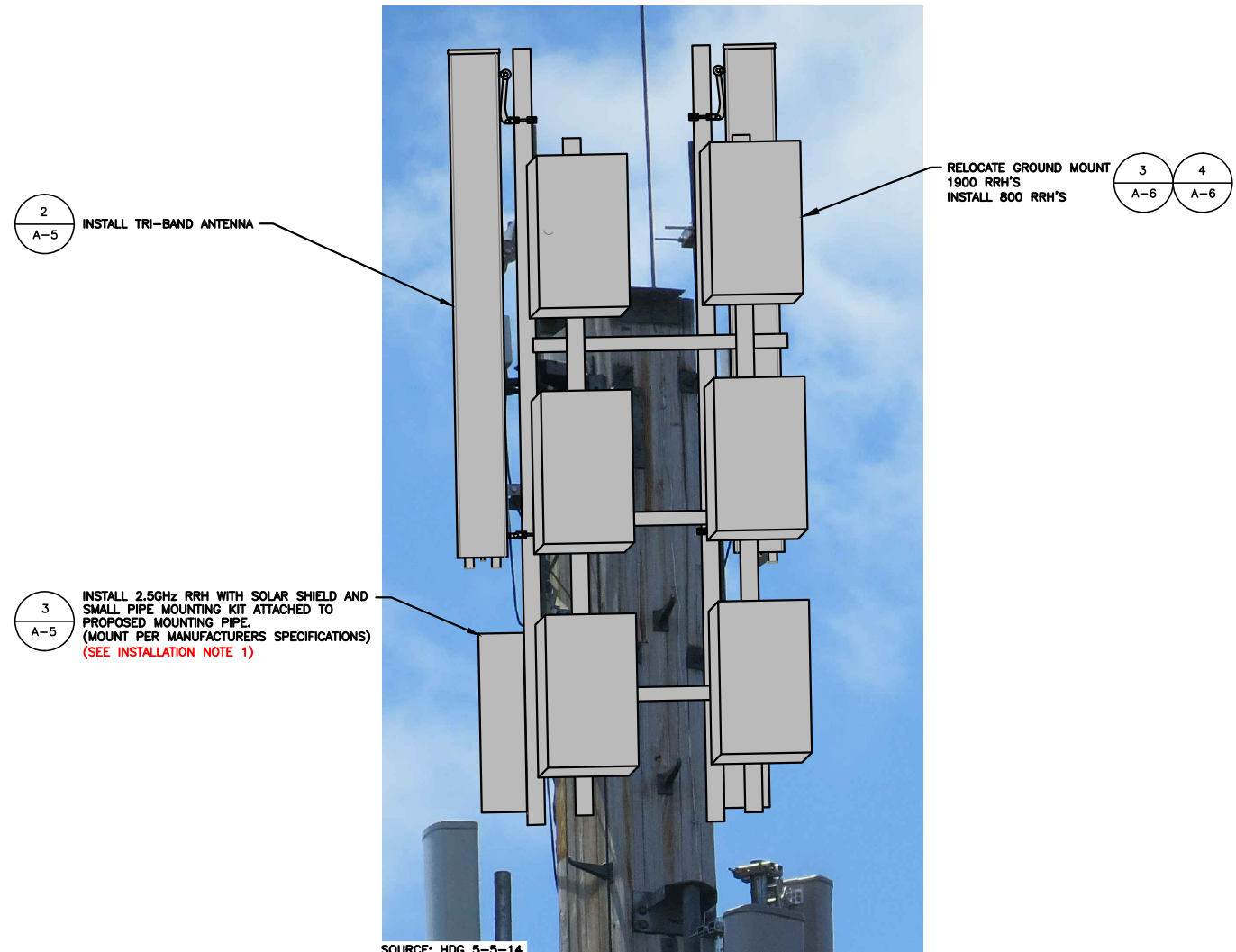
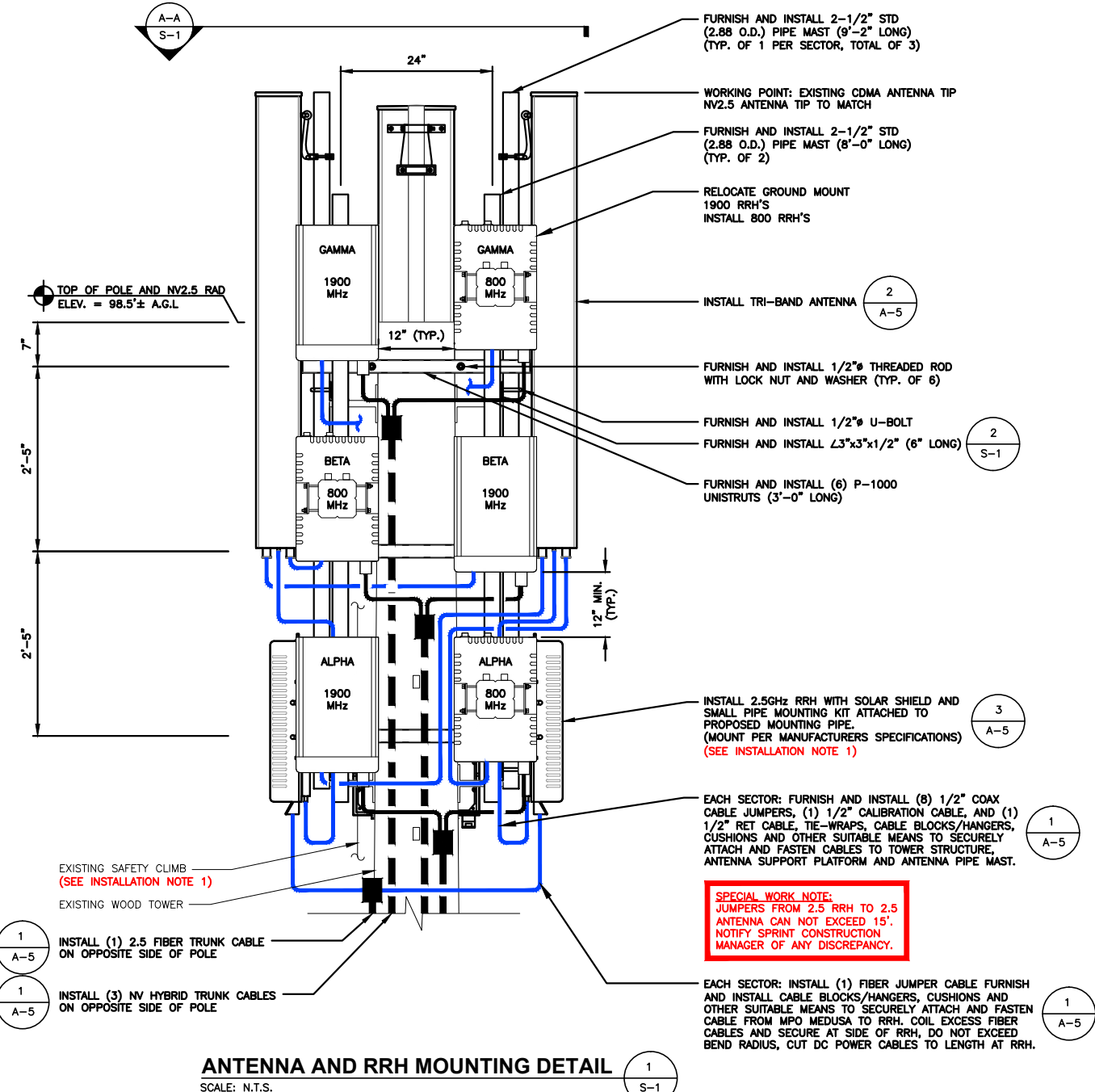


- INSTALLATION NOTES:**
- CONTRACTOR TO ENSURE THAT RRH MOUNTING DOES NOT INTERFERE WITH CLIMBING LADDER/PEGS, CABLE CLIMB, OR COAX PORTS. MONOPOLE: COLLAR-MOUNT RRH CLUSTER SHALL PROVIDE AN OPENING BETWEEN ADJACENT RRH AT LEAST 30" WIDE CENTERED ON THE EXISTING SAFETY-CLIMB AND 30" DEEP FROM THE FACE OF THE POLE. SELF-SUPPORT: RRH LEG-MOUNT OR FACE-MOUNT SHALL PROVIDE AN UNOBSTRUCTED VERTICAL CLIMBING PASSAGE AT LEAST 30" WIDE AND 30" DEEP CENTERED ON THE LEG WITH THE CLIMBING LADDER/PEGS.
  - CONTRACTOR TO VERIFY SIZE OF EXISTING POLE BEFORE ORDERING PARTS.
  - VERIFY EXACT RRH AND ANTENNA MODEL & AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION.
  - ROTATE EXISTING ANTENNA FRAME AS NEEDED TO ACCOMMODATE INSTALL ANTENNAS.
  - RRH PLACEMENT FOR REFERENCE ONLY. CONTRACTOR SHALL PLACE RRH IN CORRECT ORDER MATCHING INSTALL ANTENNA PLACEMENT AND ENSURE THAT THERE IS ENOUGH CLEARANCE FOR RRHS TO BE PLACED ON THE INSIDE ON THE ANTENNA FRAME.
  - INSTALL EQUIPMENT TO BE MOUNTED PER MANUFACTURERS SPECIFICATIONS.

- 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.

**SPECIAL CONSTRUCTION NOTE:**

THE SPRINT NETWORK VISION 2.5 GHZ TOWER TOP WORK IS CONTINGENT UPON COMPLETION OF ALL REQUIRED STRUCTURAL MODIFICATIONS, ENGINEERING CONSTRUCTION CONTROL INSPECTIONS, FINAL ENGINEERING AFFIDAVIT, AND ACCEPTANCE/APPROVAL BY SBA COMMUNICATIONS CORP.



STATE OF CONNECTICUT  
TEREK J. CREASER  
No. 2505  
REGISTERED PROFESSIONAL ENGINEER  
CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: BB

APPROVED BY: DJC

**SUBMITTALS**

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CT33XC589-C

SITE NAME:  
BURLINGTON-AVON  
LANDFILL

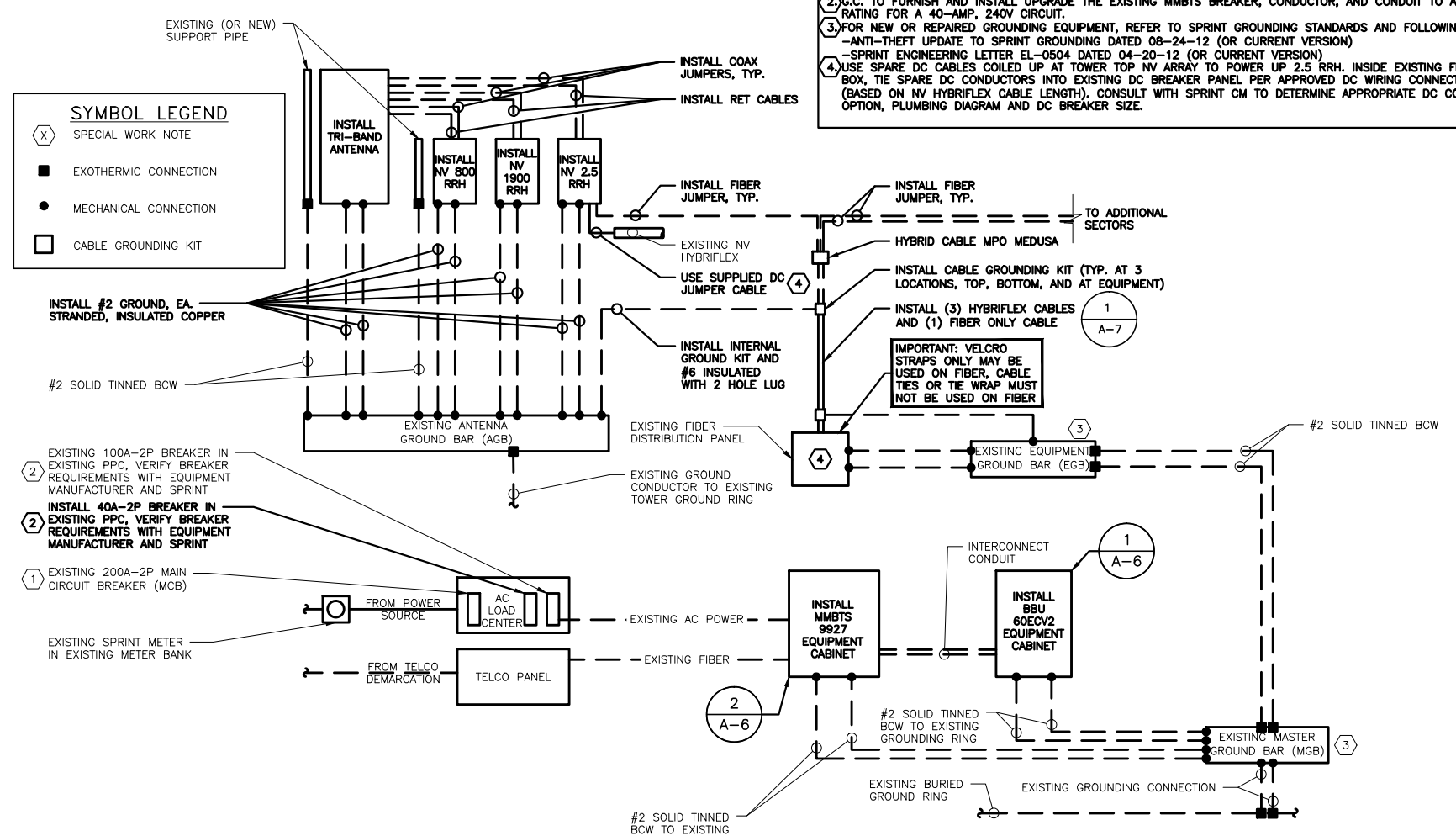
SITE ADDRESS:  
277 HUCKLEBERRY ROAD  
AVON, CT 06013

SHEET TITLE  
STRUCTURAL  
DETAILS

SHEET NUMBER  
S-1

**SYMBOL LEGEND**

|     |                       |
|-----|-----------------------|
| (X) | SPECIAL WORK NOTE     |
| ■   | EXOTHERMIC CONNECTION |
| ●   | MECHANICAL CONNECTION |
| □   | CABLE GROUNDING KIT   |



**TYPICAL POWER AND GROUNDING ONE LINE DIAGRAM**  
SCALE: N.T.S.

**SPECIAL WORK NOTE:**

- G.C. TO FURNISH AND INSTALL ALL COMPONENTS TO UPGRADE EXISTING ELECTRICAL SERVICE, CONDUIT, CONDUCTOR, PPC AND MCB IN ACCORDANCE WITH SPRINT CONSTRUCTION STANDARDS NV 2.5 ADDENDUM "ENGINEERING NOTICE 2013-002 (POWER UPGRADES) REV.0" (OR CURRENT VERSION)
- G.C. TO FURNISH AND INSTALL UPGRADE THE EXISTING MMBTS BREAKER, CONDUCTOR, AND CONDUIT TO A MINIMUM NEC RATING FOR A 40-AMP, 240V CIRCUIT.
- FOR NEW OR REPAIRED GROUNDING EQUIPMENT, REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS):  
-ANTI-THEFT UPDATE TO SPRINT GROUNDING DATED 08-24-12 (OR CURRENT VERSION)  
-SPRINT ENGINEERING LETTER EL-0504 DATED 04-20-12 (OR CURRENT VERSION)
- USE SPARE DC CABLES COILED UP AT TOWER TOP NV ARRAY TO POWER UP 2.5 RRH. INSIDE EXISTING FIBER DISTRIBUTION BOX, TIE SPARE DC CONDUCTORS INTO EXISTING DC BREAKER PANEL PER APPROVED DC WIRING CONNECTIVITY OPTION (BASED ON NV HYBRIFLEX CABLE LENGTH). CONSULT WITH SPRINT CM TO DETERMINE APPROPRIATE DC CONNECTIVITY OPTION, PLUMBING DIAGRAM AND DC BREAKER SIZE.

- ELECTRICAL NOTES**
- ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
  - THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CONDUIT ROUTING WITH LOCAL UTILITY COMPANIES AND SPRINT CONSTRUCTION MANAGER.
  - ALL CONDUITS ROUTED BELOW GRADE SHALL TRANSITION TO RIGID GALVANIZED ELBOWS WITH RIGID GALVANIZED STEEL CONDUIT ABOVE GRADE.
  - ALL METAL CONDUITS SHALL BE PROVIDED WITH GROUNDING BUSHINGS.
  - GENERAL CONTRACTOR SHALL PROVIDE ALL DIRECT BURIED CONDUITS WITH PLASTIC WARNING TAPE IDENTIFYING CONTENTS. TAPE COLORS SHALL BE ORANGE FOR TELEPHONE AND RED FOR ELECTRIC.
  - ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
  - THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIALS DESCRIBED BY DRAWINGS AND SPECIFICATIONS INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
  - GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
  - ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
  - BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
  - ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
  - RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE PPC AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
  - RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
  - FIBER OPTIC CIRCUITS SHALL BE IN ACCORDANCE WITH NEC ARTICLE 770—OPTICAL FIBER CABLES AND RACEWAYS.
  - COMMUNICATIONS CIRCUITS SHALL BE IN ACCORDANCE WITH NEC ARTICLE 800—COMMUNICATIONS SYSTEMS.

**Sprint**

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

**SBA**

SBA COMMUNICATIONS CORP.  
134 FLANDERS ROAD, SUITE 125  
WESTBOROUGH, MA 01581  
TEL: (508) 251-0720

**Hudson Design Group LLC**

1400 SPOON DRIVE  
SUITE 210 NORTH SUITE 3090  
ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 557-5553  
TEL: (978) 557-5553  
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STATE OF CONNECTICUT  
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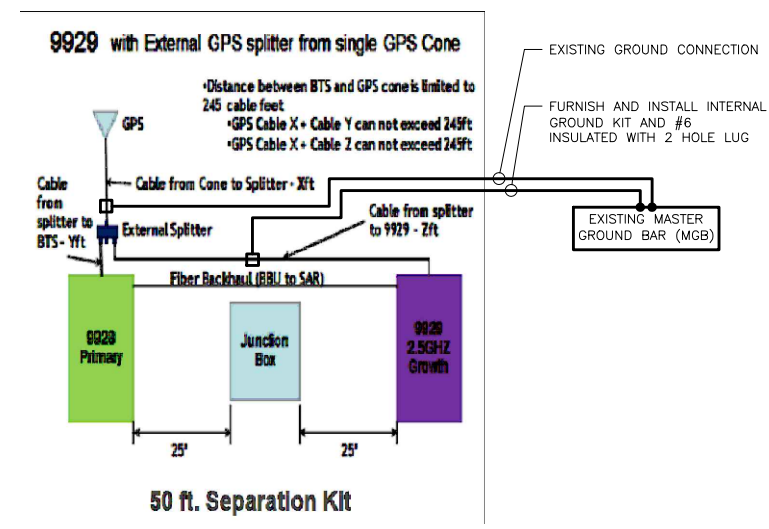
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CT33XC589-C  
SITE NAME:  
BURLINGTON-AVON  
LANDFILL  
SITE ADDRESS:  
277 HUCKLEBERRY ROAD  
AVON, CT 06013

SHEET TITLE  
ONE LINE DIAGRAM

SHEET NUMBER  
E-1

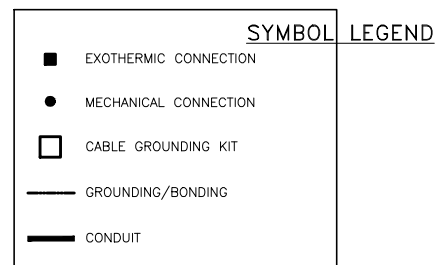
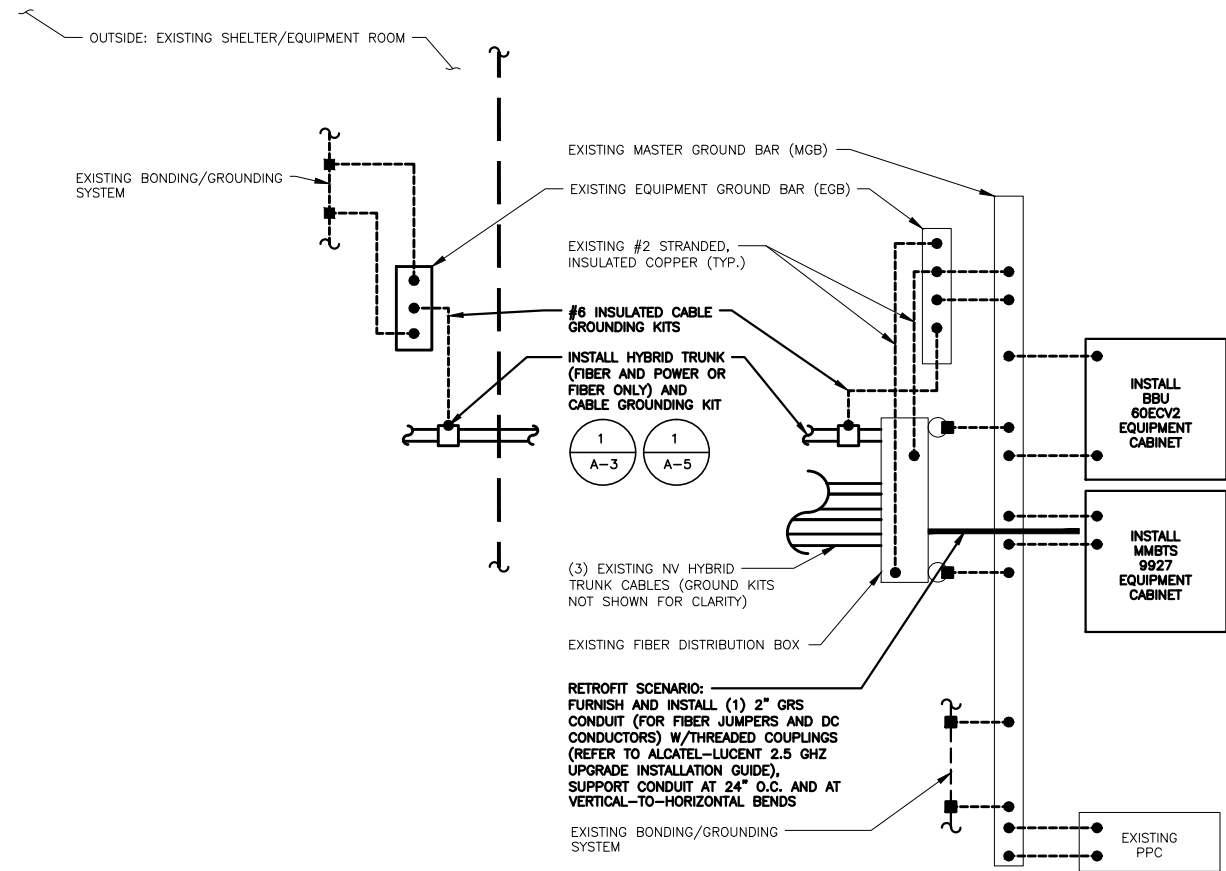


**EXISTING PPC BREAKER PANEL**  
SCALE: N.T.S.



**GPS SPLITTER DETAIL**  
SCALE: N.T.S.



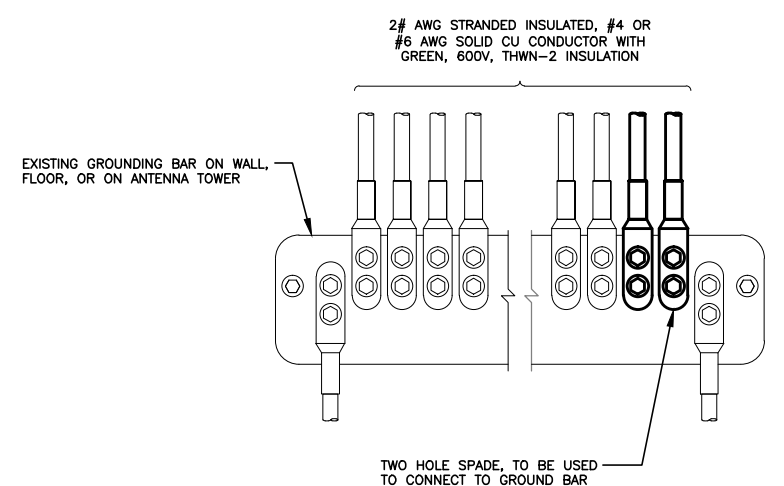


UNLESS NOTED OTHERWISE, ALL BONDING CONDUCTORS ARE #2 SOLID TINNED BCW.

NOTE: EXISTING NV EQUIPMENT CONDUITS NOT SHOWN FOR CLARITY, REFER TO RECORD AS-BUILT NV PHOTOS AND NV AS-BUILT DRAWINGS.

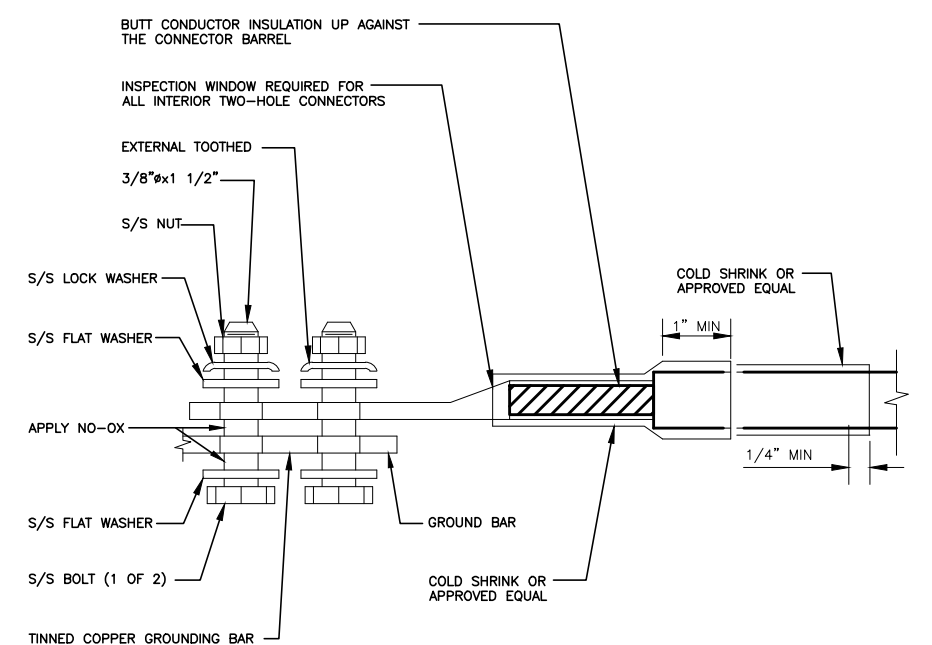
- PROTECTIVE GROUNDING SYSTEMS GENERAL NOTES:**
- GROUNDING SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250—GROUNDING AND BONDING.
  - GROUNDING SHALL BE IN ACCORDANCE WITH SPRINT SSEO DOCUMENTS 3.018.02.004 "BONDING, GROUNDING AND TRANSIENT PROTECTION FOR CELL SITES" AND 3.018.10.002 "SITE RESISTANCE TO EARTH TESTING".
  - PROVIDE GROUND CONNECTIONS FOR ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS AND OTHER CONDUCTIVE ITEMS ASSOCIATED WITH THE INSTALLATION OF CARRIER'S EQUIPMENT.
  - GROUND CONNECTIONS: CLEAN SURFACES THOROUGHLY BEFORE APPLYING GROUND LUGS OR CLAMPS. IF SURFACE IS COATED, REMOVE THE COATING, APPLY A NON-CORROSIVE APPROVED COMPOUND TO CLEAN SURFACE AND INSTALL LUGS OR CLAMPS. WHERE GALVANIZING IS REMOVED FROM METAL, IT SHALL BE PAINTED OR TOUCHED UP WITH "GALVAMOX" OR EQUAL.
  - ALL GROUND WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
  - ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTORS AND PVC CONDUITS SHALL BE PVC TYPE (NON CONDUCTIVE). DO NOT USE METAL BRACKETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING AROUND ANY GROUNDING CONDUCTOR.
  - ALL GROUND WIRES SHALL BE #2 SOLID TINNED BCW UNLESS NOTED OTHERWISE.
  - PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE.
  - GROUND ANTENNA BASES, FRAMES, CABLE RACKS, AND OTHER METALLIC COMPONENTS WITH #2 INSULATED TINNED STRANDED COPPER GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.
  - EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MGB) WITH #2 SOLID TINNED BCW EQUIPMENT CABINETS WALL HAVE (2) CONNECTIONS.
  - GROUND HYBRIFLEX SHIELD AT TOP, BOTTOM AND AT TRANSITION TO HYBRIFLEX JUMPER CABLES AT EQUIPMENT CABINET ENTRANCE USING MANUFACTURER'S GUIDELINES. WHEN HYBRIFLEX CABLE EXCEEDS 200', GROUND AT INTERVALS NOT EXCEEDING 100'.
  - THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.
  - EXOTHERMIC WELDING IS RECOMMENDED FOR GROUNDING CONNECTION WHERE PRACTICAL OTHERWISE. THE CONNECTION SHALL BE MADE USING COMPRESSION TYPE-2 HOLES, LONG BARREL LUGS OR DOUBLE CRIMP "C" CLAMP. THE COPPER CABLES SHALL BE COATED WITH AN ANTI-OXIDANT (THOMAS BETTS KOPR-SHILD) BEFORE MAKING THE CRIMP CONNECTIONS THE CONTRACTOR SHALL FOLLOW MANUFACTURER'S RECOMMENDED TORQUES ON THE BOLT ASSEMBLY TO SECURE CONNECTIONS.
  - AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANEL, AND FRAMES OF EQUIPMENT AND WHERE EXPOSED FOR GROUNDING, CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE LUGS WITH STAINLESS STEEL SELF-TAPPING SCREWS.
  - THE MASTER GROUND BAR (MGB) SHALL BE MADE OF BARE 1/4"x2" COPPER (FOR OUTDOOR APPLICATIONS IT SHALL BE TINNED COPPER) AND LARGE ENOUGH TO ACCOMMODATE THE REQUIRED NUMBER OF GROUND CONNECTIONS. THE HARDWARE SECURING THE MGB SHALL ELECTRICAL INSULATE THE MGB FROM ANY STRUCTURE TO WHICH IT IS FASTENED.
  - ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
  - ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI-CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH SPRINT CONSTRUCTION MANAGER.
  - FOR NEW OR REPAIRED GROUNDING EQUIPMENT. REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS):
    - ANTI-THEFT UPDATE TO SPRINT GROUNDING DATED: 08-24-12 (OR CURRENT VERSION)
    - SPRINT ENGINEERING LETTER EL-0504 DATED: 04-20-12 (OR CURRENT VERSION)

**2.5 RAN EQUIPMENT GROUNDING SCHEMATIC** 1 E-2  
SCALE: N.T.S.

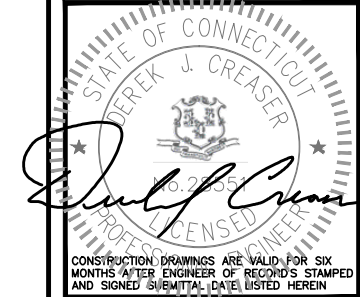
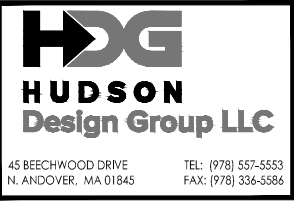


- NOTES**
- APPLY NO-OX TO LUG AND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.
  - IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

**INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR** 2 E-2  
SCALE: N.T.S.



**TWO HOLE LUG** 3 E-2  
SCALE: N.T.S.



CHECKED BY: BB

APPROVED BY: DJC

**SUBMITTALS**

| REV. | DATE     | DESCRIPTION              | BY |
|------|----------|--------------------------|----|
| 2    | 01/15/18 | REVISED FOR CONSTRUCTION | AN |
| 1    | 09/11/17 | REVISED-CODE UPDATE      | AN |
| 0    | 09/22/14 | ISSUED FOR REVIEW        | JA |

SITE NUMBER:  
CT33XC589-C

SITE NAME:  
BURLINGTON-AVON  
LANDFILL

SITE ADDRESS:  
277 HUCKLEBERRY ROAD  
AVON, CT 06013

SHEET TITLE  
**GROUNDING DETAILS AND NOTES**

SHEET NUMBER  
E-2



# MODIFICATION AND DESIGN DRAWINGS FOR AN EXISTING 100' GUYED LAMINATED WOOD POLE

PROPOSED CARRIER: SPRINT NEXTEL

SITE: CT46143-A-SBA / BURLINGTON - AVON LANDFILL

COORDINATES (LATITUDE: 41.788055°, LONGITUDE: -72.918166°)

## CONSTRUCTION CLASS

TES HAS DETERMINED THIS AS A  
CLASS III CONSTRUCTION PROJECT  
PER ANSI/ASSE A10.48

COMPLETE FABRICATION DRAWINGS FOR ALL MATERIALS REQUIRED FOR  
THIS PROJECT ARE AVAILABLE FROM TOWER ENGINEERING SOLUTIONS  
(TES). PLEASE CONTACT TES FOR MORE INFORMATION.

| SHEET | SHEET TITLE                 | REV |
|-------|-----------------------------|-----|
| T-1   | TITLE SHEET                 | 0   |
| BOM   | BILL OF MATERIALS           | 0   |
| GN-1  | GENERAL NOTES               | 0   |
| A-1   | TOWER PROFILE               | 0   |
| A-2   | NEW GUY LUG ASSEMBLY        | 0   |
| HC-1  | STANDARD GUY HARDWARE CHART | 0   |
| TC-1  | GUY TENSION CHART           | 0   |
|       |                             |     |
|       |                             |     |
|       |                             |     |

**NOTE:**

- THE MODIFICATION DRAWINGS ARE BASED ON THE  
TES PROJECT NO. 36505, DATED 07/31/17.



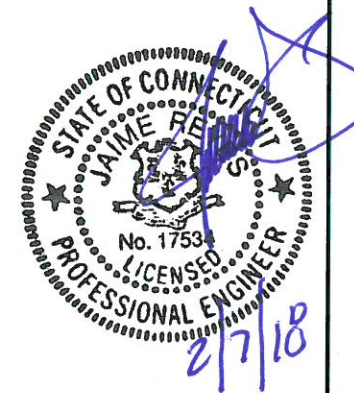
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TES JOB NO:  
36667

CUSTOMER SITE NO:  
CT46143-A-SBA  
CUSTOMER SITE NAME:  
BURLINGTON - AVON LANDFILL  
277 HUCKLEBERRY HILL ROAD  
AVON, CT 06013



DRAWN BY: DCR | CHECKED BY: JC/HA

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|------|-------------|-----|----------|
| 1    | FIRST ISSUE | DCR | 10/10/17 |
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**GENERAL NOTES**

1. ALL WORK SHALL COMPLY WITH THE ANSI/TIA-222-G, ANSI/ASSE A10.48, 2016 CONNECTICUT STATE BUILDING CODE AND ANY OTHER GOVERNING BUILDING CODES AND OSHA SAFETY REGULATIONS.
2. ALL WORK INDICATED ON THE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN TELECOMMUNICATIONS TOWER, POLE AND FOUNDATION CONSTRUCTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND FABRICATION OF ALL MISCELLANEOUS PARTS (SUCH AS SHIMS), TEMPORARY SUPPORTS, AND GUYINGS, ETC., PER TIA-1019-A, TO COMPLETE THE ASSEMBLY AS SHOWN IN THE DRAWINGS.
4. CONTRACTOR SHALL PROCEED WITH THE INSTALLATION WORK CAREFULLY SO THE WORK WILL NOT DAMAGE ANY EXISTING CABLE, EQUIPMENT OR THE STRUCTURE.
5. THE USE OF GAS TORCH OR WELDER, ARE NOT ALLOWED ON ANY TOWER STRUCTURE WITHOUT THE CONSENT OF THE TOWER OWNER.
6. GENERALLY THE CONTRACTOR IS RESPONSIBLE TO CONDUCT AN ONSITE VISIT SURVEY OF THE JOB SITE AFTER AWARD, AND REPORT ANY ISSUES WITH THE SITE TO TES BEFORE PROCEEDING CONSTRUCTION.

**FABRICATION**

1. ALL STEEL SHALL MEET OR EXCEED THE MINIMUM STRENGTH AS SPECIFIED IN THE DRAWINGS. IF YIELD STRENGTH WAS NOT NOTED IN THE DRAWINGS, CONTRACTORS SHALL CONTACT TES FOR DIRECTION.
2. ALL FIELD CUT EDGES SHALL BE GROUND SMOOTH. ALL FIELD CUT AND DRILLED SURFACES SHALL BE REPAIRED WITH A MINIMUM OF TWO COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.

**WELDING**

1. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS AND IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER METAL, PER AWS D1.1, UNO. (E70XX UNLESS NOTED OTHERWISE).
2. PRIOR TO FIELD WELDING GALVANIZED MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING APPROX. 0.5" BEYOND THE PROPOSED FIELD WELD SURFACES.
3. ALL WELDS SHALL BE INSPECTED VISUALLY. A MINIMUM OF 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. 100% OF WELDS SHALL BE INSPECTED IF DEFECTS ARE FOUND.
4. WELD INSPECTIONS SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.
5. AFTER INSPECTION, ALL FIELD WELDED SURFACES SHALL BE REPAIRED WITH A MINIMUM OF TWO COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.

**BOLTED ASSEMBLIES AND TIGHTENING OF CONNECTIONS**

1. ALL HIGH STRENGTH BOLTS SHALL CONFORM TO THE PROVISIONS OF THE SPECIFICATIONS FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS AS APPROVED BY THE RCSC.
2. FLANGE BOLTS SHALL BE TIGHTENED BY THE AISC "TURN-OF-THE-NUT" METHOD. THE FOLLOWING TABLE SHOULD BE USED FOR THE "TURN-OF-THE-NUT" TIGHTENING.
3. SPLICE BOLTS AND ALL OTHER BOLTS IN BEARING TYPE CONNECTIONS SHALL BE TIGHTENED TO A SNUG-TIGHT CONDITION.
4. THE SNUG-TIGHT CONDITION IS DEFINED AS THE TIGHTNESS ATTAINED BY EITHER A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER WITH AN ORDINARY SPUD WRENCH TO BRING THE CONNECTED PLIES INTO FIRM CONTACT.
5. HB HOLLO-BOLT SHALL BE INSTALLED PER ICC ESR-3330 INSTRUCTIONS.

**VERIFICATION AND INSPECTION**

1. IF APPLICABLE, VERIFICATION INSPECTION TO BE PERFORMED SHALL BE IN ACCORDANCE TO IBC-2012 SECTION 1705 - TABLE 1705.2.2 FOR STEEL CONSTRUCTION AND TABLE 1705.3 FOR CONCRETE CONSTRUCTION.

**POST INSTALLED EPOXY INJECTED ANCHOR BOLTS:**

1. CONCRETE MUST BE A MINIMUM OF 28 DAYS OLD.
2. FOLLOW MANUFACTURER'S REQUIREMENTS FOR CURE TIME VS. AMBIENT TEMPERATURE.
3. DRILL HOLE TO REQUIRED DIAMETER AND DEPTH. ALL WATER, DIRT, OIL, DEBRIS, GREASE OR DUST MUST BE REMOVED FROM EACH CORE HOLE. FOLLOW MANUFACTURER'S RECOMMENDATION FOR CORRECT TYPE OF CORE BIT. AVOID DAMAGING EXISTING REINFORCING STEEL OR OTHER EMBEDDED ITEMS. NOTIFY TES ENGINEERING IF VOIDS IN THE CONCRETE, REINFORCING STEEL OR OTHER EMBEDDED ITEMS ARE ENCOUNTERED. STOP CORING IMMEDIATELY IF THIS OCCURS.
4. A HOLE ROUGHENING DEVICE FROM EITHER HILTI OR ALLFASTENERS SHALL BE USED WITH ALL HOLES. FOLLOW ALL MANUFACTURER'S RECOMMENDED CORING AND INSTALLATION INSTRUCTIONS.
5. AFTER CORING AND ROUGHENING, FLUSH EACH HOLE WITH RUNNING WATER TO REMOVE ANY SLURRY OR DEBRIS. REMOVE ALL WATER FROM THE HOLE BY MECHANICAL PUMPING.
6. BRUSH EACH HOLE WITH AN APPROPRIATE SIZED NYLON BRUSH AND FLUSH WITH RUNNING WATER A SECOND TIME. REMOVE ALL WATER FROM THE HOLE.
7. AFTER THE SECOND WATER FLUSH BRUSH THE HOLE AGAIN WITH THE APPROPRIATE SIZED NYLON BRUSH.
8. BLOW EACH HOLE WITH COMPRESSED AIR TWO TIMES MINIMUM.
9. CONFIRM THAT EACH HOLE IS PROPERLY ROUGHED AND DRY.
10. NO EPOXY INJECTION SHALL TAKE PLACE IN RAINY CONDITIONS.
11. EPOXY SHOULD BE VISIBLE AT THE TOP OF THE CORE HOLE AFTER INSTALLATION.
12. CONTRACTOR TO SUPPLY ONE PHOTO OF EACH ROUGHED AND CLEANED HOLE IN CLOSEOUT PHOTO PACKAGE.

TABLE 8.2 NUT ROTATION FROM SNUG-TIGHT CONDITION FOR TURN-OF-NUT PRETENSIONING<sup>a,b</sup>

| BOLT LENGTH <sup>f</sup>                                     | DISPOSITION OF OUTER FACE OF BOLTED PARTS |  |  |
|--|---|--|--|
|  | BOTH FACES NORMAL TO BOLT AXIS            | ONE FACE NORMAL TO BOLT AXIS, OTHER SLOPED NOT MORE THAN 1:20 <sup>d</sup> | BOTH FACES SLOPED NOT MORE THAN 1:20 FROM NORMAL TO BOLT AXIS <sup>d</sup> |
| NOT MORE THAN 4d <sub>b</sub>                                | 1/3 TURN                                  | 1/2 TURN   | 2/3 TURN   |
| MORE THAN 4d <sub>b</sub> BUT NOT MORE THAN 8d <sub>b</sub>  | 1/2 TURN                                  | 2/3 TURN   | 5/6 TURN   |
| MORE THAN 8d <sub>b</sub> BUT NOT MORE THAN 12d <sub>b</sub> | 2/3 TURN                                  | 5/6 TURN   | 1 TURN   |

<sup>a</sup> NUT ROTATION IS RELATIVE TO BOLT REGARDLESS OF THE ELEMENT (NUT OR BOLT) BEING TURNED. FOR REQUIRED NUT ROTATIONS OF 1/2 TURN AND LESS, THE TOLERANCE IS PLUS OR MINUS 30 DEGREES; FOR REQUIRED NUT ROTATIONS OF 2/3 TURN AND MORE, THE TOLERANCE IS PLUS OR MINUS 45 DEGREES.

<sup>b</sup> APPLICABLE ONLY TO JOINTS IN WHICH ALL MATERIAL WITHIN THE GRIP IS STEEL.

<sup>c</sup> WHEN THE BOLT LENGTH EXCEEDS 12d<sub>b</sub>, THE REQUIRED NUT ROTATION SHALL BE DETERMINED BY ACTUAL TESTING IN A SUITABLE TENSION CALIBRATOR THAT SIMULATES THE CONDITIONS OF SOLIDLY FITTING STEEL.

<sup>d</sup> BEVELED WASHER NOT USED.

SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS, JUNE 30, 2004 RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS

**INSTALLATION TORQUE REQUIRED FOR HOLLO BOLTS AND AJAX BOLTS:**

1. HB12 HOLLO BOLT: 59 FT-LBS
2. HB16 HOLLO BOLT: 140 FT-LBS
3. HB20 HOLLO BOLT: 221 FT-LBS
4. M20 AJAX BOLT: 280 FT-LBS.

**FIELD HOT WORK PLAN NOTES:**

FOLLOWING GUIDELINES SHALL BE COMPLIED WITH:

1. CONTRACTOR'S RESPONSIBILITY TO COMPLETE A HOT WORK PLAN IF AWARDED PER CUSTOMER SPECIFICATIONS GUIDELINES FOR WELDING, CUTTING & SPARK PRODUCING WORK.
2. HAVE A FIRE PLAN APPROVED BY THE CUSTOMER AND THEIR SAFETY MANAGEMENT DEPT.
3. CONTRACTOR MUST OBTAIN THE CONTACT INFO OF THE LOCAL FIRE DEPARTMENT AND THE 911 ADDRESS OF THE TOWER SITE BEFORE CONSTRUCTION.
4. CONTRACTOR SHALL MAKE SURE THAT CELL PHONE COVERAGE IS AVAILABLE IN THE TOWER SITE. IF CELL COVERAGE IS NOT AVAILABLE, AN IMMEDIATE AVAILABLE MEANS OF DIRECT COMMUNICATION WITH THE FIRE DEPARTMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION START.
5. ALL CONSTRUCTION SHALL BE PERFORMED UNDER WIND SPEED LESS THAN 10 MPH ON THE GROUND LEVEL. IF WIND SPEED INCREASE, CONTRACTOR MUST DETERMINE IF CONSTRUCTION SHALL BE DISCONTINUED.
6. FIRE SUPPRESSION EQUIPMENT MUST BE MADE AVAILABLE ON SITE AND READY TO USE.
7. CONTRACTOR SHALL ASSIGN A FIRE WATCHER TO PERFORM FIRE-FIGHTING DUTIES.
8. ALL WELDERS SHALL BE AWS OR STATE CERTIFIED. THEY MUST ALSO BE EXPERIENCED IN WELDING ON GALVANIZED MATERIALS.
9. IF IT IS POSSIBLE, ALL EXISTING COAX NEAR WELDING AREA SHALL BE TEMPORARILY MOVED AWAY FROM THE WELDING AREA BEFORE WELDING THE PLATES.
10. PLEASE REPORT ANY FIELD ISSUE TO TES @ 972-483-0607.

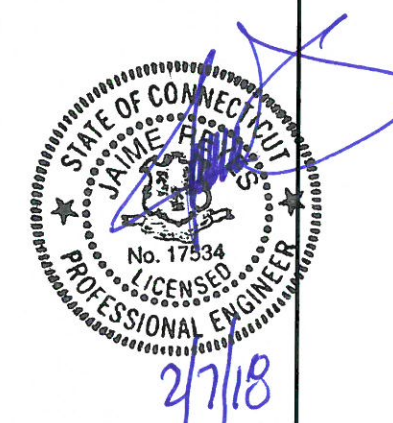


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**NOTES:**

- TEMPORARILY RELOCATE ANY EXISTING COAX ATTACHED TO THE WOOD POLE AND ANY OTHER MEMBERS WHERE OBSTRUCTION WITH THE PROPOSED MODIFICATION MAY OCCUR.

NEW AND EXISTING CABLE TAGS TO BE MARKED AT 8% BREAKING STRENGTH



PHOTO 2  
CABLE TAGS

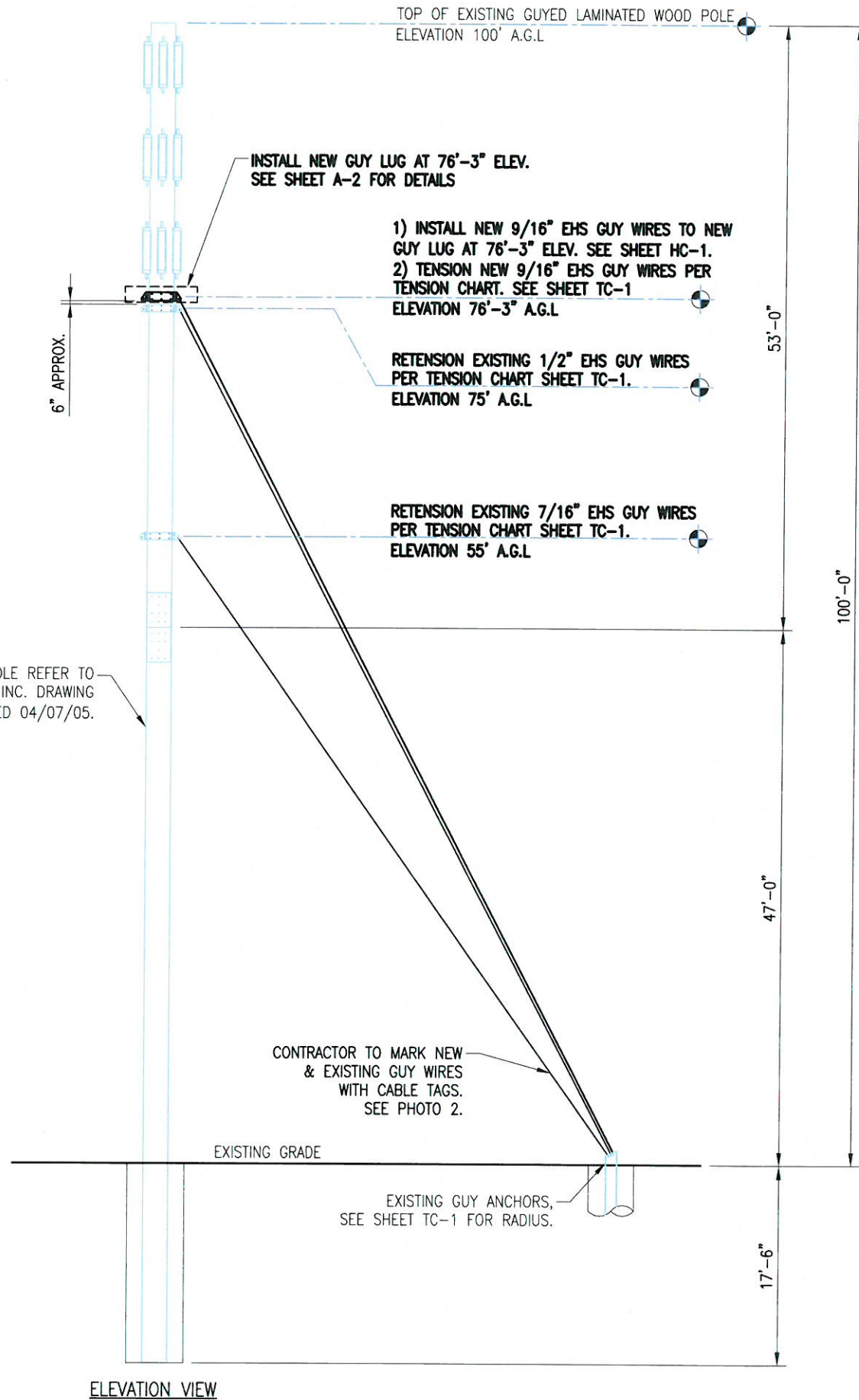


PHOTO 1  
GUY ANCHOR FND

**FOUNDATION COATING NOTES:**

- THE COATING MATERIALS SHALL BE LANCO WHITE ACRYLIC ELASTOMERIC COATING AND SEALER, OR HYDRO ARMOR COATING.
- THE COATING CAN BE PLACED AT LEAST (2) DAYS AFTER THE PLACEMENT OF THE CONCRETE FOR FOUNDATION REINFORCEMENT, AND MINIMUM (4) DAYS FOR NEW FOUNDATION CONSTRUCTION.
- THE CONCRETE SURFACE SHALL BE CLEAN AND DRY PRIOR TO THE APPLICATION OF THE COATING.
- THE COATING SHALL BE APPLIED TO ALL THE SURFACES OF THE CONCRETE ABOVE THE GROUND AND 6" BELOW THE GRADE SURFACE IF APPLICABLE.
- MINIMUM 30 MILS COATING IS REQUIRED.

EXISTING WOOD POLE REFER TO LAMINATED WOOD SYSTEMS, INC. DRAWING #SPSM-0079, DATED 04/07/05.



ELEVATION VIEW



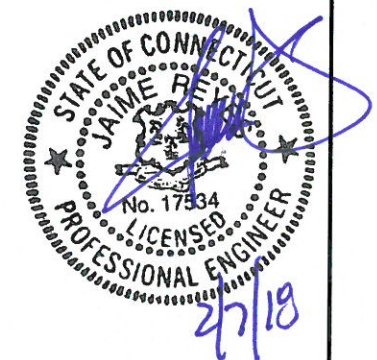
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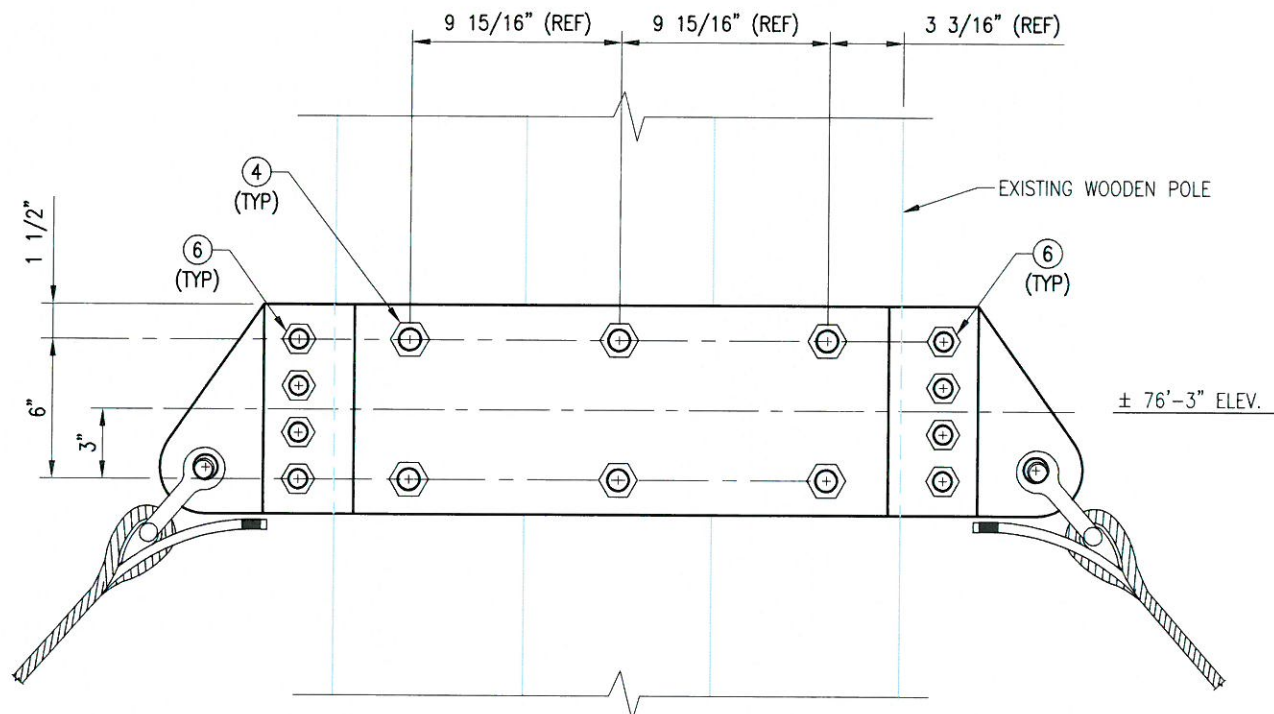


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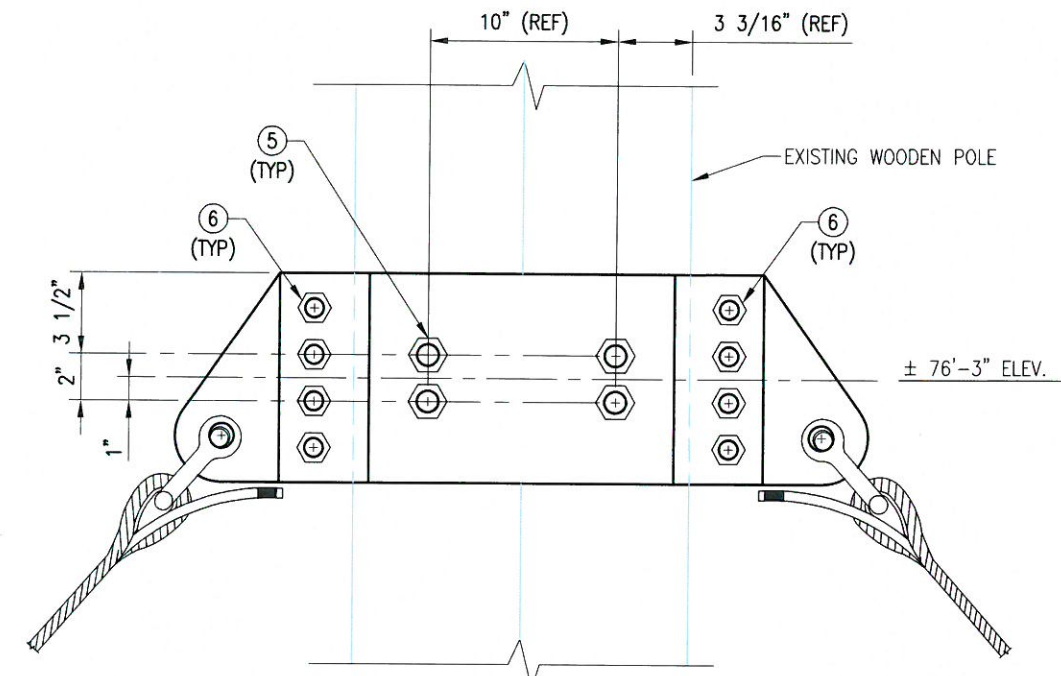
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**NEW GUY LUG ASSEMBLY**

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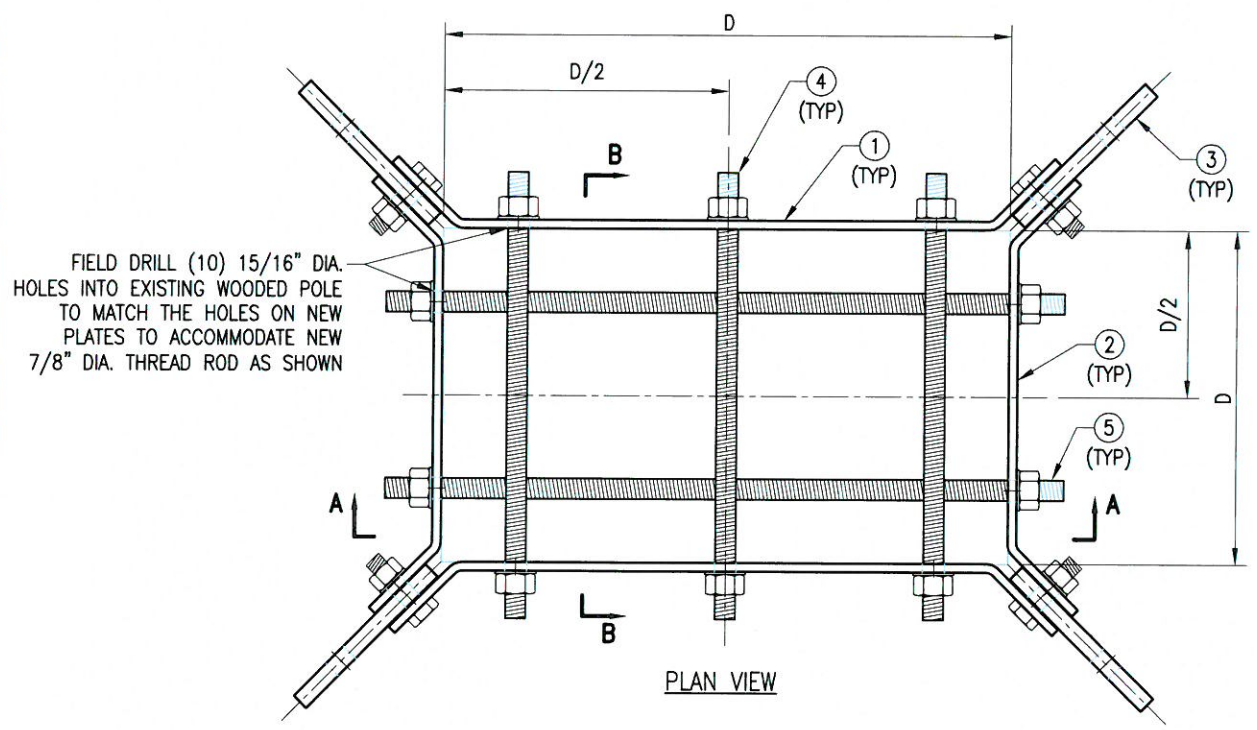
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SECTION "A-A"



SECTION "B-B"



PLAN VIEW

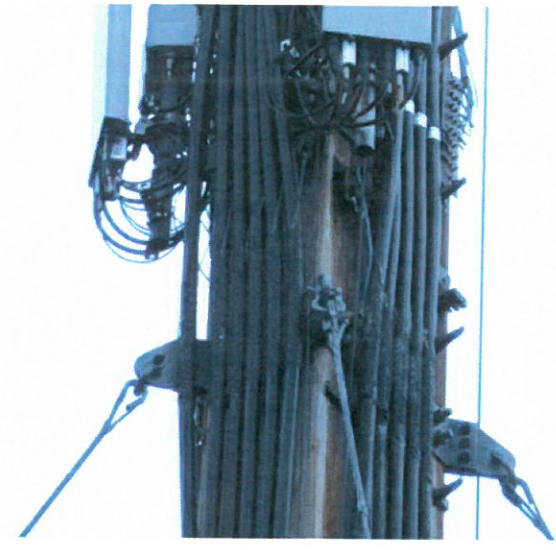


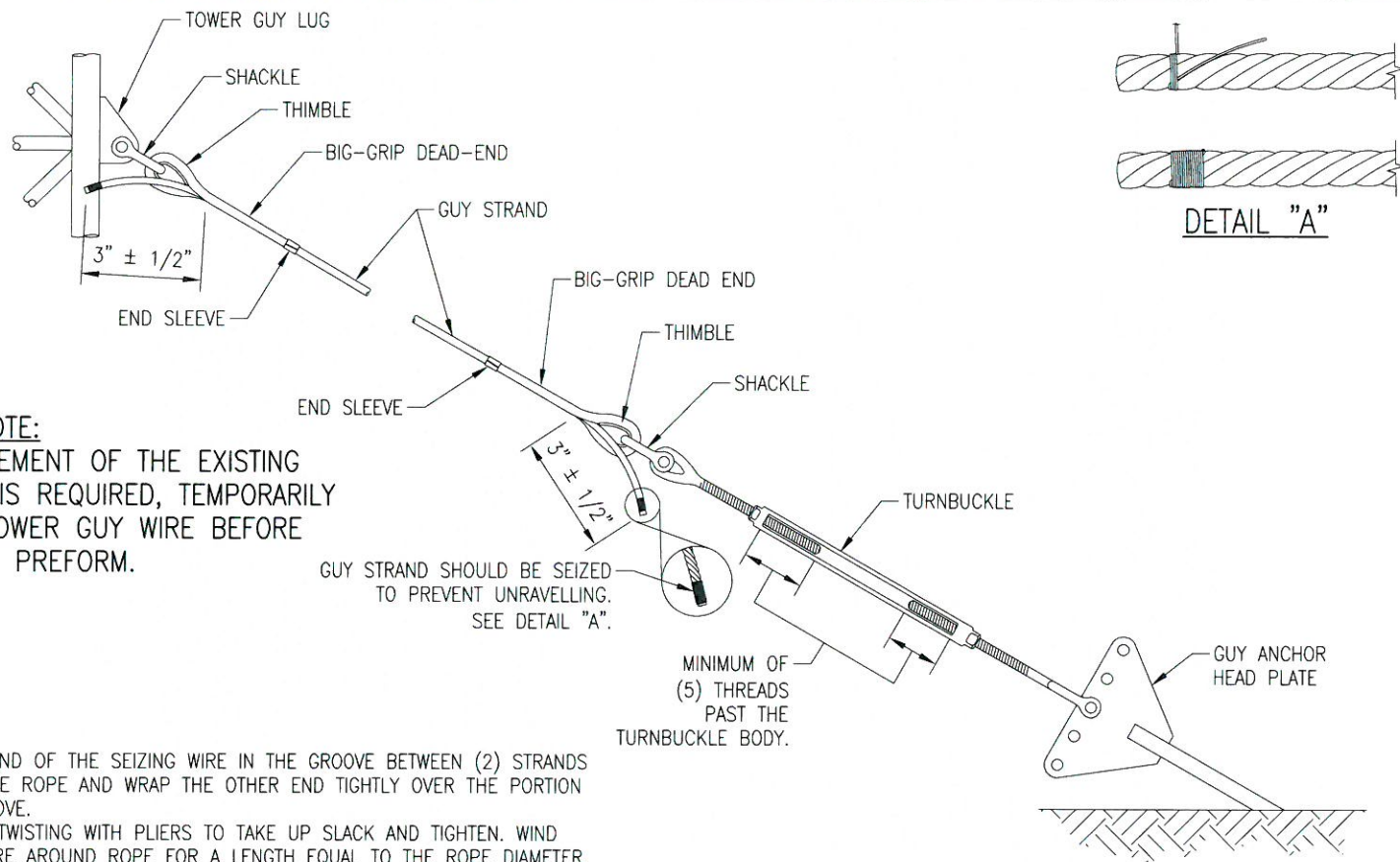
PHOTO 1

NOTES:

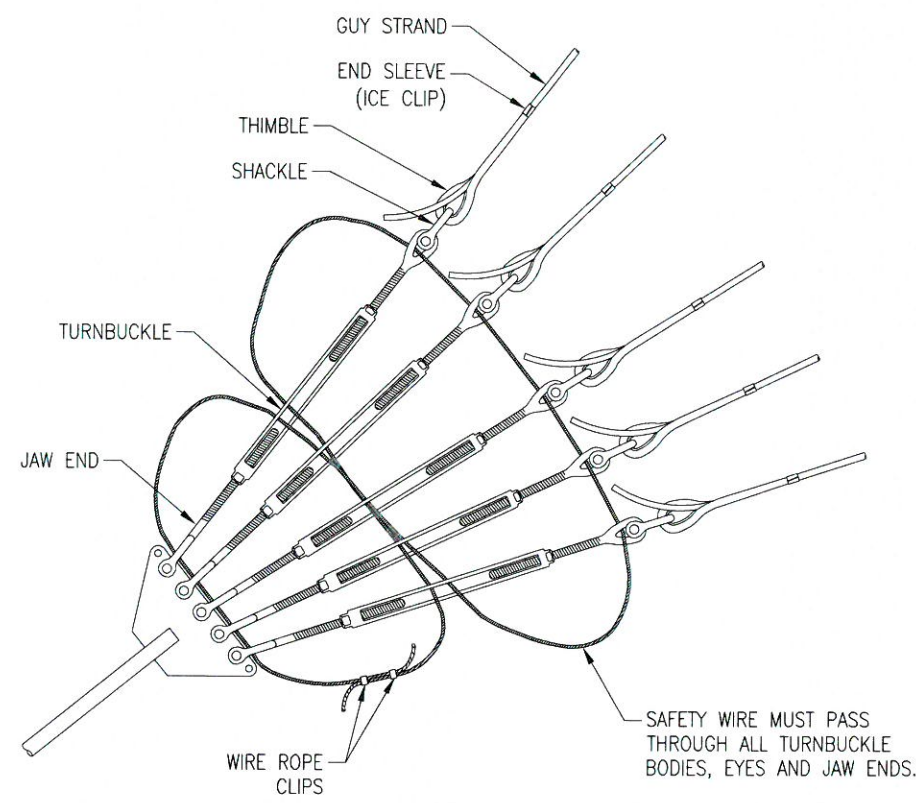
- TEMPORARILY RELOCATE ANY EXISTING COAX ATTACHED TO THE MONOPOLE AND ANY OTHER MEMBERS WHERE OBSTRUCTION WITH THE PROPOSED MODIFICATION MAY OCCUR.

| ITEM NO. | QTY. | PART NO. | DESCRIPTION   |
|----------|------|----------|---|
| 6        | 16   | ---      | BOLT 3/4" X 2 3/4" A325                                       |
| 5        | 4    | ---      | 7/8" DIA. X 2'-8" LONG ALL-THREAD ROD A36 W/ (2) HHN-LKW EA.  |
| 4        | 6    | ---      | 7/8" DIA. X 1'-10" LONG ALL-THREAD ROD A36 W/ (2) HHN-LKW EA. |
| 3        | 4    | PL-1     | PL 3/4" X 7 1/2" X 9" A572-50                                 |
| 2        | 2    | CP-2     | PL 3/8" X 9" X 1'-10 3/4" A572-50                             |
| 1        | 2    | CP-1     | PL 3/8" X 9" X 2'-8 5/8" A572-50                              |





**NOTE:**  
 USE (2) 3/8" WIRE ROPE CLIP PER ANCHOR WITH 3/8" EHS GUY STRAND X 20'-0" FOR TURNBUCKLE SAFETY WIRE INSTALLATION.



TYPICAL TURNBUCKLE SAFETY WIRE INSTALLATION

**SAFETY NOTE:**  
 IF REPLACEMENT OF THE EXISTING PERFORM IS REQUIRED, TEMPORARILY SECURE TOWER GUY WIRE BEFORE REPLACING PREFORM.

GUY STRAND SHOULD BE SEIZED TO PREVENT UNRAVELLING. SEE DETAIL "A".

1. LAY ONE END OF THE SEIZING WIRE IN THE GROOVE BETWEEN (2) STRANDS IN THE WIRE ROPE AND WRAP THE OTHER END TIGHTLY OVER THE PORTION IN THE GROOVE.
2. CONTINUE TWISTING WITH PLIERS TO TAKE UP SLACK AND TIGHTEN. WIND SEIZING WIRE AROUND ROPE FOR A LENGTH EQUAL TO THE ROPE DIAMETER.
3. TWIST WIRE TIGHTLY AGAINST SERVING, WINDING TWISTED WIRE INTO KNOT BEFORE CUTTING OFF ENDS OF THE WIRE. POUND KNOT SNUGGLY AGAINST THE ROPE.

MINIMUM OF (5) THREADS PAST THE TURNBUCKLE BODY.

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 CUSTOMER SITE NAME:  
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SHEET TITLE:  
**STANDARD GUY HARDWARE CHART**

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| SHEET NUMBER:<br>HC-1 | REV #:<br>0 |
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**GUY STRAND HARDWARE CHART**

| GUY STRAND INFORMATION |                |                        |                           |                     |                                   |                              |                   |                       |                        | JAW & EYE TURNBUCKLE<br>(CROSBY OR EQUIVALENT, 1 REQ'D PER GUY) |                       |                        |          | DEAD END GRIP |                | DEAD END SLEEVE |                   | THIMBLE |                   | SCREW PIN ANCHOR SHACKLE<br>(CROSBY BOLT TYPE OR EQUIVALENT) |                   |      |                       |                        |          |           |
|------------------------|----------------|------------------------|---------------------------|---------------------|-----------------------------------|------------------------------|-------------------|-----------------------|------------------------|---|-----------------------|------------------------|----------|---------------|----------------|-----------------|-------------------|---------|-------------------|--|-------------------|------|-----------------------|------------------------|----------|-----------|
| GUY STRAND SIZE        | GUY ELEV. (FT) | GUY ANCHOR RADIUS (FT) | GUY ANCH-OR DROP (+/- FT) | NUMBER OF GUY WIRES | REUSE EXISTING GUY WIRES (YES/NO) | NEW GUY WIRE CUT LENGTH (FT) | TOTAL LENGTH (FT) | ULTIMA-TE LOAD (KIPS) | ALLOWA-BLE LOAD (KIPS) | SIZE  | ULTIM-ATE LOAD (KIPS) | ALLOWA-BLE LOAD (KIPS) | PIN DIA. | QTY REQ'D     | REQ'D PER GUY: |                 | (2 REQ'D PER GUY) |         | (2 REQ'D PER GUY) |  | (2 REQ'D PER GUY) |      |                       |                        |          |           |
|                        |                |                        |                           |                     |                                   |                              |                   |                       |                        |   |                       |                        |          |               | SIZE           | COLOR           | QTY REQ'D         | SIZE    | QTY REQ'D         | SIZE   | QTY REQ'D         | SIZE | ULTIM-ATE LOAD (KIPS) | ALLOWA-BLE LOAD (KIPS) | PIN DIA. | QTY REQ'D |
| 9/16" EHS              | 76             | 40                     | 0                         | 4                   | NO                                | 106                          | 424               | 35.0                  | 21.0                   | 7/8 X 18  | 36.0                  | 21.6                   | 3/4"     | 4             | 9/16"          | YELLOW          | 8                 | 9/16"   | 8                 | 9/16"  | 8                 | 3/4" | 57                    | 34.2                   | 7/8"     | 8         |

**NOTE:**  
 1. THE GUY STRAND CUT LENGTHS INCLUDE A 5% INCREASE, OR 20', WHICHEVER IS GREATER.



**GUY STRAND TENSION CHART**

GUY ANCHOR A

| GUY STRAND INFORMATION |                |                        |                           |                      |                         |                                | GUY STRAND TENSION CALCULATED UNDER DIFFERENT TEMPERATURES |      |       |       |       |       |       |       |       |       |       |       |         |       |       |       |       |       |       |       |        |     |     |     |     |     |     |  |
|------------------------|----------------|------------------------|---------------------------|----------------------|-------------------------|--------------------------------|--|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|-------|-------|-------|-------|-------|-------|-------|--------|-----|-----|-----|-----|-----|-----|--|
| GUY WIRE SIZE          | GUY ELEV. (FT) | GUY ANCHOR RADIUS (FT) | GUY ANCH-OR DROP (+/- FT) | GUY WIRE LENGTH (FT) | Guy Initial Tension (%) | Tension Due To Temp (Lbs/Deg ) | 0° F   | 5° F | 10° F | 15° F | 20° F | 25° F | 30° F | 35° F | 40° F | 45° F | 50° F | 55° F | 60° F   | 65° F | 70° F | 75° F | 80° F | 85° F | 90° F | 95° F | 100° F |     |     |     |     |     |     |  |
|                        |                |                        |                           |                      |                         |                                | LBS  | LBS  | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS     | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS    | LBS | LBS | LBS | LBS | LBS | LBS |  |
| 7/16" EHS              | 55             | 40                     | 0                         | 68                   | 8                       | 6.79                           | 2071   | 2038 | 2004  | 1970  | 1936  | 1902  | 1868  | 1834  | 1800  | 1766  | 1732  | 1698  | 1,664.0 | 1630  | 1596  | 1562  | 1528  | 1494  | 1460  | 1426  | 1392   |     |     |     |     |     |     |  |
| 1/2" EHS               | 75             | 40                     | 0                         | 85                   | 8                       | 5.59                           | 2487   | 2459 | 2431  | 2403  | 2375  | 2347  | 2320  | 2292  | 2264  | 2236  | 2208  | 2180  | 2,152.0 | 2124  | 2096  | 2068  | 2040  | 2012  | 1984  | 1957  | 1929   |     |     |     |     |     |     |  |
| 9/16" EHS              | 76             | 40                     | 0                         | 86                   | 8                       | 6.97                           | 3218   | 3183 | 3148  | 3113  | 3079  | 3044  | 3009  | 2974  | 2939  | 2904  | 2870  | 2835  | 2,800.0 | 2765  | 2730  | 2696  | 2661  | 2626  | 2591  | 2556  | 2521   |     |     |     |     |     |     |  |

**GUY STRAND TENSION CHART**

GUY ANCHOR B

| GUY STRAND INFORMATION |                |                        |                           |                      |                         |                                | GUY STRAND TENSION CALCULATED UNDER DIFFERENT TEMPERATURES |      |       |       |       |       |       |       |       |       |       |       |         |       |       |       |       |       |       |       |        |     |     |     |     |     |     |  |
|------------------------|----------------|------------------------|---------------------------|----------------------|-------------------------|--------------------------------|--|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|-------|-------|-------|-------|-------|-------|-------|--------|-----|-----|-----|-----|-----|-----|--|
| GUY WIRE SIZE          | GUY ELEV. (FT) | GUY ANCHOR RADIUS (FT) | GUY ANCH-OR DROP (+/- FT) | GUY WIRE LENGTH (FT) | Guy Initial Tension (%) | Tension Due To Temp (Lbs/Deg ) | 0° F   | 5° F | 10° F | 15° F | 20° F | 25° F | 30° F | 35° F | 40° F | 45° F | 50° F | 55° F | 60° F   | 65° F | 70° F | 75° F | 80° F | 85° F | 90° F | 95° F | 100° F |     |     |     |     |     |     |  |
|                        |                |                        |                           |                      |                         |                                | LBS  | LBS  | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS     | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS    | LBS | LBS | LBS | LBS | LBS | LBS |  |
| 7/16" EHS              | 55             | 40                     | 0                         | 68                   | 8                       | 6.79                           | 2071   | 2038 | 2004  | 1970  | 1936  | 1902  | 1868  | 1834  | 1800  | 1766  | 1732  | 1698  | 1,664.0 | 1630  | 1596  | 1562  | 1528  | 1494  | 1460  | 1426  | 1392   |     |     |     |     |     |     |  |
| 1/2" EHS               | 75             | 40                     | 0                         | 85                   | 8                       | 5.59                           | 2487   | 2459 | 2431  | 2403  | 2375  | 2347  | 2320  | 2292  | 2264  | 2236  | 2208  | 2180  | 2,152.0 | 2124  | 2096  | 2068  | 2040  | 2012  | 1984  | 1957  | 1929   |     |     |     |     |     |     |  |
| 9/16" EHS              | 76             | 40                     | 0                         | 86                   | 8                       | 6.97                           | 3218   | 3183 | 3148  | 3113  | 3079  | 3044  | 3009  | 2974  | 2939  | 2904  | 2870  | 2835  | 2,800.0 | 2765  | 2730  | 2696  | 2661  | 2626  | 2591  | 2556  | 2521   |     |     |     |     |     |     |  |

**GUY STRAND TENSION CHART**

GUY ANCHOR C

| GUY STRAND INFORMATION |                |                        |                           |                      |                         |                                | GUY STRAND TENSION CALCULATED UNDER DIFFERENT TEMPERATURES |      |       |       |       |       |       |       |       |       |       |       |         |       |       |       |       |       |       |       |        |     |     |     |     |     |     |  |
|------------------------|----------------|------------------------|---------------------------|----------------------|-------------------------|--------------------------------|--|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|-------|-------|-------|-------|-------|-------|-------|--------|-----|-----|-----|-----|-----|-----|--|
| GUY WIRE SIZE          | GUY ELEV. (FT) | GUY ANCHOR RADIUS (FT) | GUY ANCH-OR DROP (+/- FT) | GUY WIRE LENGTH (FT) | Guy Initial Tension (%) | Tension Due To Temp (Lbs/Deg ) | 0° F   | 5° F | 10° F | 15° F | 20° F | 25° F | 30° F | 35° F | 40° F | 45° F | 50° F | 55° F | 60° F   | 65° F | 70° F | 75° F | 80° F | 85° F | 90° F | 95° F | 100° F |     |     |     |     |     |     |  |
|                        |                |                        |                           |                      |                         |                                | LBS  | LBS  | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS     | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS    | LBS | LBS | LBS | LBS | LBS | LBS |  |
| 7/16" EHS              | 55             | 25                     | 10                        | 51                   | 8                       | 3.36                           | 1866   | 1849 | 1832  | 1815  | 1798  | 1782  | 1765  | 1748  | 1731  | 1714  | 1698  | 1681  | 1,664.0 | 1647  | 1630  | 1614  | 1597  | 1580  | 1563  | 1546  | 1530   |     |     |     |     |     |     |  |
| 1/2" EHS               | 75             | 25                     | 10                        | 70                   | 8                       | 2.52                           | 2303   | 2291 | 2278  | 2265  | 2253  | 2240  | 2228  | 2215  | 2202  | 2190  | 2177  | 2165  | 2,152.0 | 2139  | 2127  | 2114  | 2102  | 2089  | 2076  | 2064  | 2051   |     |     |     |     |     |     |  |
| 9/16" EHS              | 76             | 25                     | 10                        | 71                   | 8                       | 3.14                           | 2988   | 2972 | 2957  | 2941  | 2925  | 2910  | 2894  | 2878  | 2863  | 2847  | 2831  | 2816  | 2,800.0 | 2784  | 2769  | 2753  | 2737  | 2722  | 2706  | 2690  | 2675   |     |     |     |     |     |     |  |

**GUY STRAND TENSION CHART**

GUY ANCHOR D

| GUY STRAND INFORMATION |                |                        |                           |                      |                         |                                | GUY STRAND TENSION CALCULATED UNDER DIFFERENT TEMPERATURES |      |       |       |       |       |       |       |       |       |       |       |         |       |       |       |       |       |       |       |        |     |     |     |     |     |     |  |
|------------------------|----------------|------------------------|---------------------------|----------------------|-------------------------|--------------------------------|--|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|-------|-------|-------|-------|-------|-------|-------|--------|-----|-----|-----|-----|-----|-----|--|
| GUY WIRE SIZE          | GUY ELEV. (FT) | GUY ANCHOR RADIUS (FT) | GUY ANCH-OR DROP (+/- FT) | GUY WIRE LENGTH (FT) | Guy Initial Tension (%) | Tension Due To Temp (Lbs/Deg ) | 0° F   | 5° F | 10° F | 15° F | 20° F | 25° F | 30° F | 35° F | 40° F | 45° F | 50° F | 55° F | 60° F   | 65° F | 70° F | 75° F | 80° F | 85° F | 90° F | 95° F | 100° F |     |     |     |     |     |     |  |
|                        |                |                        |                           |                      |                         |                                | LBS  | LBS  | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS     | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS   | LBS    | LBS | LBS | LBS | LBS | LBS | LBS |  |
| 7/16" EHS              | 55             | 40                     | 0                         | 68                   | 8                       | 6.79                           | 2071   | 2038 | 2004  | 1970  | 1936  | 1902  | 1868  | 1834  | 1800  | 1766  | 1732  | 1698  | 1,664.0 | 1630  | 1596  | 1562  | 1528  | 1494  | 1460  | 1426  | 1392   |     |     |     |     |     |     |  |
| 1/2" EHS               | 75             | 40                     | 0                         | 85                   | 8                       | 5.59                           | 2487   | 2459 | 2431  | 2403  | 2375  | 2347  | 2320  | 2292  | 2264  | 2236  | 2208  | 2180  | 2,152.0 | 2124  | 2096  | 2068  | 2040  | 2012  | 1984  | 1957  | 1929   |     |     |     |     |     |     |  |
| 9/16" EHS              | 76             | 40                     | 0                         | 86                   | 8                       | 6.97                           | 3218   | 3183 | 3148  | 3113  | 3079  | 3044  | 3009  | 2974  | 2939  | 2904  | 2870  | 2835  | 2,800.0 | 2765  | 2730  | 2696  | 2661  | 2626  | 2591  | 2556  | 2521   |     |     |     |     |     |     |  |



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SHEET TITLE:

GUY TENSION CHART

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