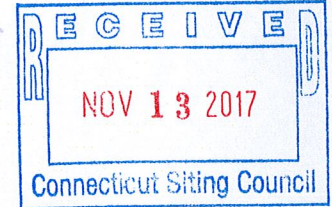




1280 Route 46 West, Suite 9, Parsippany NJ, 07054

Ms. Melanie Bachman  
Executive Director  
CT Siting Council  
10 Franklin Square  
New Britain, CT 06051

EM-SPRINT-088-171113



Re: Notice of Exempt Modification Application  
0 Clark Hill Road, Naugatuck, CT 06770

November 7, 2017

Dear Ms. Bachman:

Sprint Spectrum Realty Company, L.P. ("Sprint"), is submitting to the Connecticut Siting Council for a Notice of Exempt Modification for Proposed Modifications to an Existing Telecommunications Facility located at the above-referenced site. Sprint currently maintains 3 existing panel antenna and 6 remote radio units at the 208' level of the Tower. Sprint proposes to add 3 panel antennas (1 per sector) and 3 remote radio units (1 per sector) at 208' tower level as well as 1 hybrid cable and 33 Antenna-RRH jumper cables and new 2.5 equipment in existing radio cabinet.

There does not appear to be an initial CT Siting Council Tower Share approval (there is a tower share listed for Nextel - TS-NEXTEL-088-991013) and a BP was issued by the Town of Naugatuck on 12/20/1996. The documents enclosed reflect the reality of the current installations on the Tower.

If you have any questions, please feel free to contact me.

Thank you,

By: Paul F. Sagristano

Paul F. Sagristano  
Cherundolo Consulting  
917.841.0247  
[psagristano@lrvassoc.com](mailto:psagristano@lrvassoc.com)

ORIGINAL





1280 Route 46 West, Suite 9, Parsippany NJ, 07054

Ms. Melanie Bachman  
Executive Director  
CT Siting Council  
10 Franklin Square  
New Britain, CT 06051

Re: Notice of Exempt Modification Application  
0 Clark Hill Road, Naugatuck, CT 06770

Latitude : N41.3942  
Longitude: W73.1078

Dear Ms. Bachman:

Sprint currently maintains 3 existing panel antenna and 6 remote radio units at the 208' centerline level of the guyed tower. Sprint proposes to add 3 panel antenna and 3 remote radio units at 208' centerline on the tower. Sprint further proposes to add 1 hybrid cable, 33 Antenna to RRH jumper cables, a new 2.5 radio equipment in the existing ground based radio cabinet. Sprint is performing a new high-performance upgrade for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

The original CT Siting Council approval does not appear to be available for Sprint, but a Nextel TS is listed on the CSC site - TS-NEXTEL-088-991013 . The original building permit was issued by Naugatuck on December 20, 1996.

Please accept this letter as notification to the Council, pursuant to R.C.S.A. Section 16-50j-73, for construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter is being sent to and to Dean Maluski, the lead engineer for Tribune Broadcasting Hartford, LLC the tower owner as well as to N. Warren Hess III the Mayor of Naugatuck and to Lori Rotella the Town planner of the Borough of Naugatuck.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in Sprint's operations at the site. Also included is documentation of the structural sufficiency of the tower with proposed modifications to accommodate the revised antenna configuration.

#### **Existing Facility**

The Naugatuck facility is located at 0 Clark Hill Road, Naugatuck and is owned by Tribune Broadcasting Hartford, LLC, the Site coordinates are: N41.3942, W73.1078.

The existing facility consists of a 267 Guyed Tower. Sprint currently operates wireless communications equipment on a platform on a concrete slab at the facility and has 3 antennas and 6 RRU's mounted on at a centerline of 208' feet.



## Statutory Considerations

The planned modifications to the facility fall within the activities explicitly provided for in R.C.S.A. 16-50j-72(b)(2)

1. The height of the overall structure will be unaffected.
2. The proposed changes will not require an extension of the property boundaries.
3. The proposed additions will not increase the noise level at the existing facility by six decibels or more, or to levels that exceed state and/or local criteria
4. The changes will not increase the calculated “worst case” power density for the combined operations at the site to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications 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 changes at the referenced site constitute exempt modifications under R.C.S.A Section §16-50j-72(b)(2).

Respectfully submitted,

*Paul F. Sagristano*

Paul F. Sagristano  
Charles Cherundolo Consulting  
917-841-0247  
[psagristano@lrivassoc.com](mailto:psagristano@lrivassoc.com)

PFS/mtf

N. Warren Hess III Mayor of the Borough of Naugatuck – Via Fed Ex  
Lori Rotella – Town Planner for Naugatuck – Via Fed Ex  
Dean Maluski – Lead Engineer for Tribune Broadcasting Hartford, LLC - Via Fed Ex

Full Town View

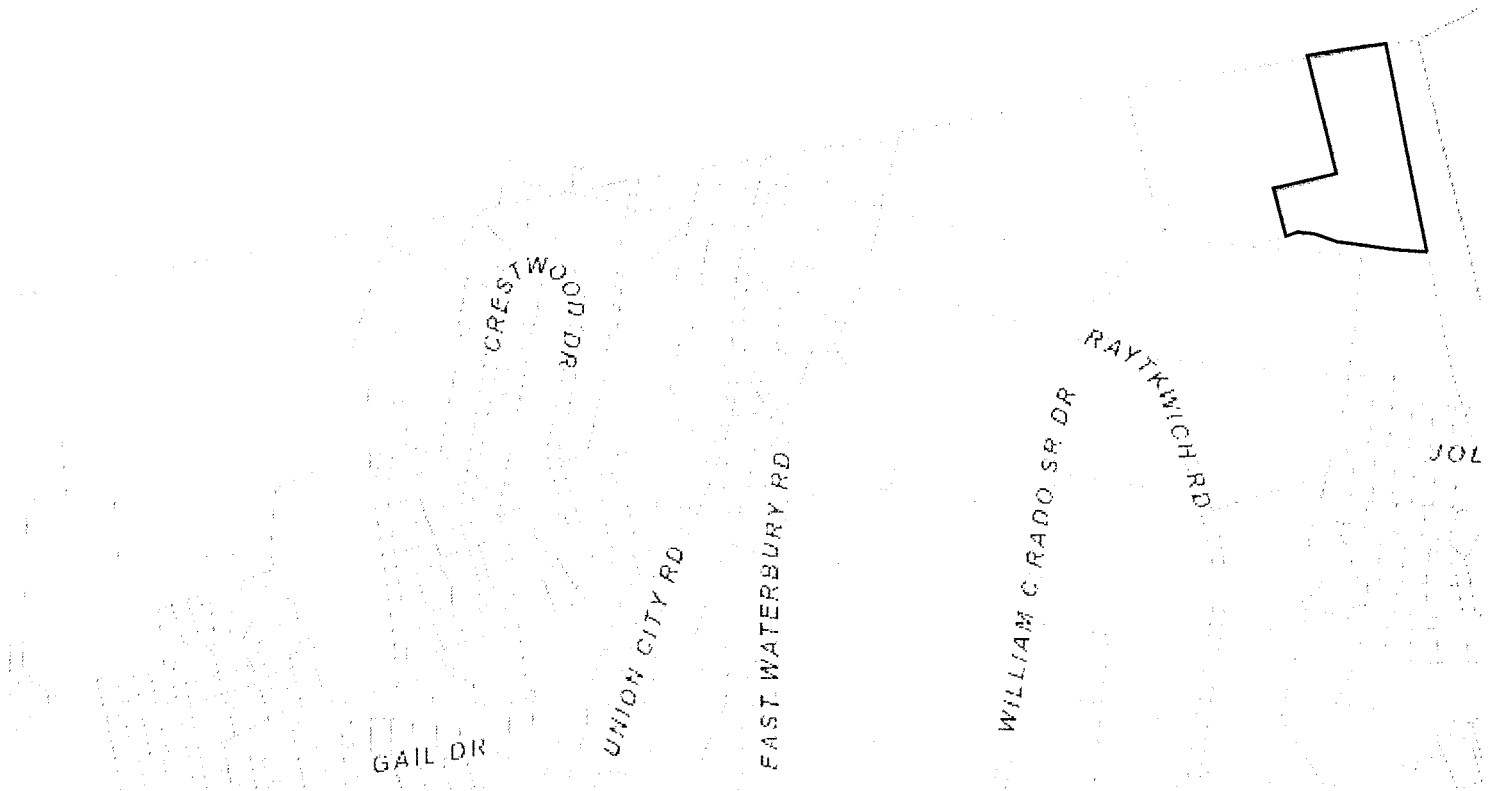
Reset Map

**Search**

Print Map

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Map Layers



Full Extent

Zoom In

Zoom Out

Prev Extent

Next Extent

Pan

**Parcel Information**

Simple M

Town of Naugatuck - NEGEO MapXpress v1.2





# Borough of Naugatuck, CT

Property Listing Report

Map Block Lot

K-20E138-A

Account

011-3060

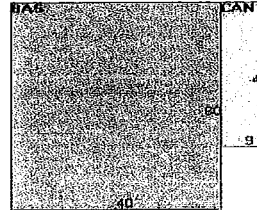
## Property Information

|                   |  |
|-------------------|--|
| Property Location | 0 CLARK HILL RD  |
| Owner             | CHANNEL 20 INC C/O WTIC TV                             |
| Co-Owner          |  |
| Mailing Address   | C/O EQUITY PROPERTY TAX GROUP<br>CHICAGO IL 60606-6115 |
| Land Use          | 4330 RAD/TV TR   |
| Land Class        | I  |
| Zoning Code       |  |
| Census Tract      |  |
| Sub Lot           |  |
| Neighborhood      | D  |
| Acreage           | 7.9  |
| Utilities         |  |
| Lot Setting/Desc  |  |
| Survey Map        |  |
| Additional Info   |  |

## Photo



## Sketch



## Primary Construction Details

|                    |               |
|--------------------|---------------|
| Year Built         | 1980          |
| Stories            | 1             |
| Building Style     | Transmit Bldg |
| Building Use       | Ind/Comm      |
| Building Condition | C             |
| Floors             | Concrete      |
| Total Rooms        |               |

|                |           |
|----------------|-----------|
| Bedrooms       |           |
| Full Bathrooms | 1         |
| Half Bathrooms |           |
| Bath Style     |           |
| Kitchen Style  |           |
| Roof Style     | Gable     |
| Roof Cover     | Metal/Tin |

|                   |                 |
|-------------------|-----------------|
| Exterior Walls    | Pre-finish Metl |
| Interior Walls    | Drywall         |
| Heating Type      | Forced Hot Air  |
| Heating Fuel      | Electric        |
| AC Type           | Central         |
| Gross Bldg Area   | 2778            |
| Total Living Area | 2400            |



# Borough of Naugatuck, CT

Property Listing Report

Map Block Lot

K-20E138-A

Account

011-3060

## Valuation Summary (Assessed value = 70% of Appraised Value)

| Item         | Appraised | Assessed |
|--------------|-----------|----------|
| Buildings    | 279060    | 195340   |
| Extras       | 0         | 0        |
| Outbuildings | 375690    | 262990   |
| Land         | 219000    | 153300   |
| Total        | 0         |          |

## Sub Areas

| Subarea Type | Gross Area (sq ft) | Living Area (sq ft) |
|--------------|--------------------|---------------------|
| First Floor  | 2400               | 2400                |
| Canopy       | 378                | 0                   |
|              |                    |                     |
|              |                    |                     |
|              |                    |                     |
|              |                    |                     |
|              |                    |                     |
|              |                    |                     |
|              |                    |                     |
| Total Area   | 2778               | 2400                |

## Outbuilding and Extra Items

| Type       | Description |
|------------|-------------|
| CELL BLDG  | 170 S.F.    |
| CELL BLDG  | 360 S.F.    |
| Fence 6 ft | 500 L.F.    |
| CELL BLDG  | 140 S.F.    |
| CELL BLDG  | 264 S.F.    |
| TV TOWER   | 980 HEIGHT  |
| TV TOWER   | 280 HEIGHT  |
|            |             |
|            |             |
|            |             |

## Sales History

| Owner of Record            | Book/ Page | Sale Date | Sale Price |
|----------------------------|------------|-----------|------------|
| CHANNEL 20 INC C/O WTIC TV | 328/ 466   | 3/3/1989  | 1800000    |



#16805 ANTENNA CHANNEL 2

# BUILDING PERMIT

## BOROUGH OF NAUGATUCK

This Permit Must Be Attached to or in Front of Building.  
To Be Removed Only By Building Inspector  
Upon Completion.

DATE 12-20-16

BUILDING OFFICIAL Sebastian Salafia

UPON COMPLETION AND BEFORE USING NOTIFY BUILDING INSPECTOR'S OFFICE.

FN57 (5/90) S.O.S.



# EBI Consulting

environmental | engineering | due diligence

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

SPRINT Existing Facility

Site ID: CT03XC025

Smaller WTX Tower  
0 Clark Hill Road  
Naugatuck, CT 06712

**November 6, 2017**

**EBI Project Number: 6217004291**

| Site Compliance Summary   |                  |
|---|------------------|
| Compliance Status:  | <b>COMPLIANT</b> |
| Site total MPE% of<br>FCC general<br>population<br>allowable limit: | <b>3.58 %</b>    |





November 6, 2017

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

Emissions Analysis for Site: **CT03XC025 – Smaller WTX Tower**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **0 Clark Hill Road, Naugatuck, 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.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure 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 **0 Clark Hill Road, Naugatuck, 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.





# EBI Consulting

environmental | engineering | due diligence

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- 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 **RFS APXVSP18-C-A20 and the Commscope DT465B-2XR** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) 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 **208 feet** above ground level (AGL) for **Sector A**, **208 feet** above ground level (AGL) for **Sector B** and **208 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

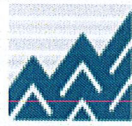
| Sector:            | A                           | Sector:            | B                           | Sector:            | C                           |
|--------------------|-----------------------------|--------------------|-----------------------------|--------------------|-----------------------------|
| Antenna #:         | <b>1</b>                    | Antenna #:         | <b>1</b>                    | Antenna #:         | <b>1</b>                    |
| Make / Model:      | RFS<br>APXVSPP18-C-A20      | Make / Model:      | RFS<br>APXVSPP18-C-A20      | Make / Model:      | RFS<br>APXVSPP18-C-A20      |
| Gain:              | 13.4 / 15.9 dBd             | Gain:              | 13.4 / 15.9 dBd             | Gain:              | 13.4 / 15.9 dBd             |
| Height (AGL):      | <b>208 feet</b>             | Height (AGL):      | <b>208 feet</b>             | Height (AGL):      | <b>208 feet</b>             |
| Frequency Bands    | 850 MHz /<br>1900 MHz (PCS) | Frequency Bands    | 850 MHz /<br>1900 MHz (PCS) | Frequency Bands    | 850 MHz /<br>1900 MHz (PCS) |
| Channel Count      | 10                          | Channel Count      | 10                          | Channel Count      | 10                          |
| Total TX Power(W): | 220 Watts                   | Total TX Power(W): | 220 Watts                   | Total TX Power(W): | 220 Watts                   |
| ERP (W):           | 7,537.38                    | ERP (W):           | 7,537.38                    | ERP (W):           | 7,537.38                    |
| Antenna A1 MPE%    | <b>0.75 %</b>               | Antenna B1 MPE%    | <b>0.75 %</b>               | Antenna C1 MPE%    | <b>0.75 %</b>               |
| Antenna #:         | <b>2</b>                    | Antenna #:         | <b>2</b>                    | Antenna #:         | <b>2</b>                    |
| Make / Model:      | Commscope<br>DT465B-2XR     | Make / Model:      | Commscope<br>DT465B-2XR     | Make / Model:      | Commscope<br>DT465B-2XR     |
| Gain:              | 15.05 dBd                   | Gain:              | 15.05 dBd                   | Gain:              | 15.05 dBd                   |
| Height (AGL):      | <b>208 feet</b>             | Height (AGL):      | <b>208 feet</b>             | Height (AGL):      | <b>208 feet</b>             |
| Frequency Bands    | 2500 MHz (BRS)              | Frequency Bands    | 2500 MHz (BRS)              | Frequency Bands    | 2500 MHz (BRS)              |
| Channel Count      | 8                           | Channel Count      | 8                           | Channel Count      | 8                           |
| Total TX Power(W): | 160 Watts                   | Total TX Power(W): | 160 Watts                   | Total TX Power(W): | 160 Watts                   |
| ERP (W):           | 5,118.23                    | ERP (W):           | 5,118.23                    | ERP (W):           | 5,118.23                    |
| Antenna A2 MPE%    | <b>0.45 %</b>               | Antenna B2 MPE%    | <b>0.45 %</b>               | Antenna C2 MPE%    | <b>0.45 %</b>               |

| Site Composite MPE%      |               |
|--------------------------|---------------|
| Carrier                  | MPE%          |
| SPRINT - Max per sector  | <b>1.20 %</b> |
| Prospect Police          | 0.03 %        |
| AT&T                     | 1.39 %        |
| T-Mobile                 | 0.96 %        |
| <b>Site Total MPE %:</b> | <b>3.58 %</b> |

|                        |               |
|------------------------|---------------|
| SPRINT Sector A Total: | 1.20 %        |
| SPRINT Sector B Total: | 1.20 %        |
| SPRINT Sector C Total: | 1.20 %        |
| <b>Site Total</b>      | <b>3.58 %</b> |

| SPRINT Max Values per Frequency Band / Technology Per Sector | # 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          | 437.55                  | 208           | 0.39  | 850 MHz         | 567   | 0.07%            |
| Sprint 850 MHz LTE   | 2          | 437.55                  | 208           | 0.77  | 850 MHz         | 567   | 0.14%            |
| Sprint 1900 MHz (PCS) CDMA                                   | 5          | 622.47                  | 208           | 2.74  | 1900 MHz (PCS)  | 1000  | 0.27%            |
| Sprint 1900 MHz (PCS) LTE                                    | 2          | 1,556.18                | 208           | 2.74  | 1900 MHz (PCS)  | 1000  | 0.27%            |
| Sprint 2500 MHz (BRS) LTE                                    | 8          | 639.78                  | 208           | 4.51  | 2500 MHz (BRS)  | 1000  | 0.45%            |
|  |            |                         |               |   |                 | <b>Total:</b>                               | <b>1.20%</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:                          | 1.20 %                  |
| Sector B:                          | 1.20 %                  |
| Sector C:                          | 1.20 %                  |
| SPRINT Maximum Total (per sector): | 1.20 %                  |
|                                    |                         |
| Site Total:                        | 3.58 %                  |
|                                    |                         |
| Site Compliance Status:            | <b>COMPLIANT</b>        |

The anticipated composite MPE value for this site assuming all carriers present is **3.58 %** 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.



**CT03XC025**  
**“DO MACRO UPGRADE”**

0 Clark Hill Road  
Naugatuck, CT 06770  
New Haven County

**Structural Analysis of Guyed Tower**

November 2, 2017

| <b>Item</b> | <b>Pass/Fail</b> | <b>Capacity</b> |
|-------------|------------------|-----------------|
| Tower       | <b>PASS</b>      | 93.1%           |
| Foundation  | <b>PASS</b>      | 94.9%           |

Nicholas D. Barile, PE  
Connecticut Professional Engineer  
License No. 28643  
Com-Ex Project No. **17041-CHE**





## Executive Summary

At the request of Sprint, COM-EX has performed a structural analysis of the antenna mounting system for the proposed antenna equipment loading under the **2016 Connecticut Building Code and ANSI/TIA-222-G standards**. Information pertaining to the antenna mounts was obtained from:

- Construction Drawings completed by Com-Ex Consultants, dated 11/01/17

## Conclusions

Per our analysis, the self-supported tower can support proposed loading under 2016 Connecticut Building Code and ANSI/TIA-222-G standards.

## General Comments

If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, COM-EX should be notified immediately to perform a revised analysis. This report is not a condition assessment and assumes good workmanship will be used and systems will be properly maintained.

## Limitations

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of COM-EX.

## Attachment A

### Proposed Equipment

#### Alpha Sector Antenna Configuration

*Rad Center: 208'-0"*

(1) (N) DT465B-2XR Commscope Antenna

(1) (N) 2500 MHz RRH, 8x20-25

#### Beta Sector Antenna Configuration

*Rad Center: 208'-0"*

(1) (N) DT465B-2XR Commscope Antenna

(1) (N) 2500 MHz RRH, 8x20-25

#### Gamma Sector Antenna Configuration

*Rad Center: 208'-0"*

(1) (N) DT465B-2XR Commscope Antenna

(1) (N) 2500 MHz RRH, 8x20-25

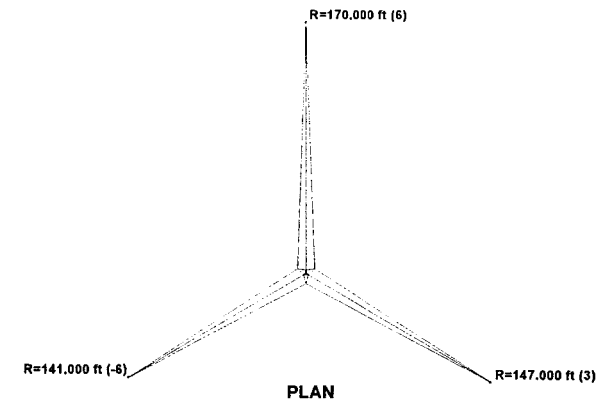
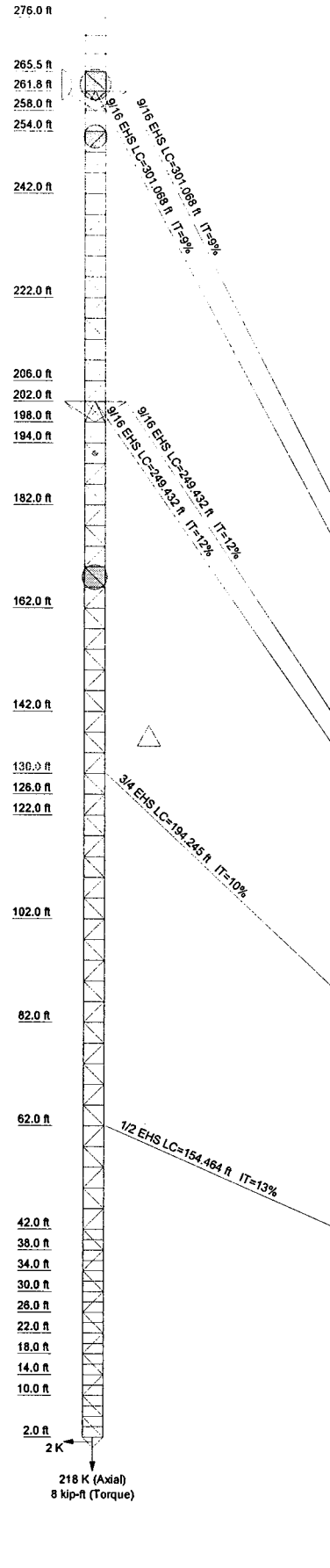
### Foundation Comparison Analysis

| Leg Forces        | Fullerton Design Reactions | Current Analysis | % Capacity |
|-------------------|----------------------------|------------------|------------|
| Tension (kips)    | 99.0                       | 94               | 94.9%      |
| Uplift (kips)     | 101.2                      | 72               | 71.1%      |
| Horizontal (kips) | 68.7                       | 61               | 88.8%      |

Wind per IBC 1609.3.1  $V_{asd} = V_{ult}(0.6)^{1/2} = 121\text{mph} \times (.6)^{1/2} = 93.7\text{mph}$



|                   |                  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-------------------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Section           | T78              | T77 | T76 | T15 | T14 | T13 | T12 | T11 | T10 | T9  | T8  | T7  | T6  | T5  | T4  | T3  | T2  | T1  |
| Legs              | SR 2             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Leg Grade         | A572-50          |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Diagonals         | L2x2x1/4         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Diagonal Grade    | N.A.             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Top Girts         | L2 1/2x2 1/2x1/4 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Horizontals       | L2x2x3/16        |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Sec. Horizontals  | L2 1/2x2 1/2x1/4 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Top Guy Pull-Offs | N.A.             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Face Width (ft)   | N.A.             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| # Panels @ (ft)   | 64 @ 4           |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Weight (K)        | 16.3             | 0.5 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.4 |

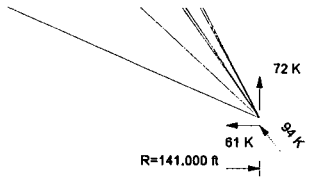


**DESIGNED APPURTENANCE LOADING**

| TYPE                           | ELEVATION | TYPE                       | ELEVATION |
|--------------------------------|-----------|----------------------------|-----------|
| Lightning Rod 5/8"x4"          | 276       | RFS APXVTM14-C-I20         | 208       |
| Flash Beacon                   | 276       | RFS APXVTM14-C-I20         | 208       |
| 6' Ice Shield                  | 274       | 3" Dish Pipe Mount         | 192       |
| 6' Ice Shield                  | 270       | 1ft HP Dish                | 192       |
| 3" Dish Pipe Mount             | 264       | 6' Ice Shield              | 172       |
| 3" Dish Pipe Mount             | 264       | GHF4-23A                   | 168       |
| HP6-105C                       | 263       | 3" Dish Pipe Mount         | 164       |
| HP6-105C                       | 263       | 2" STD X 20' Pipe Mount    | 162       |
| 3" Dish Pipe Mount             | 254       | 20' Dipole                 | 162       |
| KATHREIN PR-480                | 253       | 7770.00                    | 152       |
| RFS APXV18-206517L-C           | 236       | RRUS-11                    | 152       |
| RFS APXV18-206517L-C           | 236       | RRUS-11                    | 152       |
| RFS APXV18-206517L-C           | 236       | RRUS-11                    | 152       |
| (2) RRUS-11                    | 236       | (2) Powerwave LGP21401 TMA | 152       |
| (2) RRUS-11                    | 236       | (2) Powerwave LGP21401 TMA | 152       |
| (2) RRUS-11                    | 236       | (2) Powerwave LGP21401 TMA | 152       |
| PIROD 10FT LIGHTWEIGHT T-MOUNT | 236       | RRUS-12                    | 152       |
| PIROD 10FT LIGHTWEIGHT T-MOUNT | 236       | RRUS-12                    | 152       |
| PIROD 10FT LIGHTWEIGHT T-MOUNT | 236       | RRUS-12                    | 152       |
| ALU TD-RRH8X20-2500            | 208       | DC6-48-60-18-8F            | 152       |
| ALU TD-RRH8X20-2500            | 208       | QUINTEL QS66512-2 W/ MOUNT | 152       |
| ALU TD-RRH8X20-2500            | 208       | QUINTEL QS66512-2 W/ MOUNT | 152       |
| 800 MHz w/ Notch Filter        | 208       | CCI TPA-65R-LCUUUU-H8      | 152       |
| 800 MHz w/ Notch Filter        | 208       | RRUS-32                    | 152       |
| 800 MHz w/ Notch Filter        | 208       | RRUS-32                    | 152       |
| 1900 RRH Combiner              | 208       | DC6-48-60-18-8F            | 152       |
| 1900 RRH Combiner              | 208       | (6) CCI TPX-070821         | 152       |
| 1900 RRH Combiner              | 208       | CCI HPA-65R-BUU-H8         | 152       |
| 1900 MHz RRH                   | 208       | CCI HPA-65R-BUU-H8         | 152       |
| 1900 MHz RRH                   | 208       | CCI HPA-65R-BUU-H8         | 152       |
| 1900 MHz RRH                   | 208       | RRUS-32                    | 152       |
| DT485B-2XR Commscope           | 208       | RRUS-32                    | 152       |
| DT485B-2XR Commscope           | 208       | RRUS-32                    | 152       |
| DT485B-2XR Commscope           | 208       | 7770.00                    | 152       |
| Sector Frame (1)               | 208       | Pirod 12' T-Frame          | 152       |
| Sector Frame (1)               | 208       | Pirod 12' T-Frame          | 152       |
| Sector Frame (1)               | 208       | 7770.00                    | 152       |
| Sector Frame (1)               | 208       | Pirod 12' T-Frame          | 152       |
| RFS APXVTM14-C-I20             | 208       | ALARM                      | 58 - 20   |
|                                |           | Weather Station            | 58        |

**SYMBOL LIST**

| MARK | SIZE             | MARK | SIZE     |
|------|------------------|------|----------|
| A    | L2 1/2x2 1/2x1/4 | D    | N.A.     |
| B    | L2 1/2x2 1/2x3/8 | E    | 2 @ 3.75 |
| C    | L2x2x3/16        |      |          |



ALL REACTIONS ARE FACTORED

|                        |  |                             |                           |
|------------------------|--|-----------------------------|---------------------------|
| <b>SZS Engineering</b> |  | Job: <b>17041-CHE</b>       |                           |
| 4551 E Carriage Way    |  | Project: <b>Guyed Tower</b> |                           |
| Gilbert, AZ            |  | Client:                     | Drawn by: Samuel Gonzalez |
| Phone: 480-528-0914    |  | Code: TIA-222-G             | Date: 10/26/17            |
| FAX:                   |  | Scale: NTS                  | Dwg No. E-1               |

|  |                               |                                       |
|--|-------------------------------|---------------------------------------|
| <b>tnxTower</b><br><br><b>SZS Engineering</b><br>4551 E Carriage Way<br>Gilbert, AZ<br>Phone: 480-528-0914<br>FAX: | <b>Job</b><br>17041-CHE       | <b>Page</b><br>1 of 95                |
|  | <b>Project</b><br>Guyed Tower | <b>Date</b><br>00:36:24 10/26/17      |
|  | <b>Client</b>                 | <b>Designed by</b><br>Samuel Gonzalez |

## Tower Input Data

The main tower is a 3x guyed tower with an overall height of 276.000 ft above the ground line.

The base of the tower is set at an elevation of 0.000 ft above the ground line.

The face width of the tower is 4.000 ft at the top and 4.000 ft at the base.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Tower is located in Hartford County, Connecticut.

Basic wind speed of 94 mph.

Structure Class II.

Exposure Category B.

Topographic Category 5.

Crest Height 360.000 ft.

SEAW RSM-03 procedures for wind speed-up calculations are used.

Topographic Feature: Continuous Ridge.

Slope Distance L: 800.000 ft.

Distance from Crest x: 2000.000 ft.

Nominal ice thickness of 0.750 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Deflections calculated using a wind speed of 60 mph.

I-Beam base is 2.000 ft above the pivot.

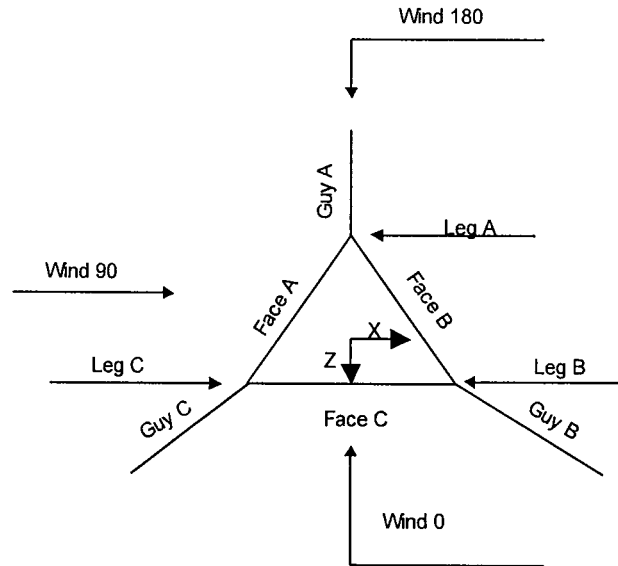
Pressures are calculated at each section.

Safety factor used in guy design is 1.

Stress ratio used in tower member design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

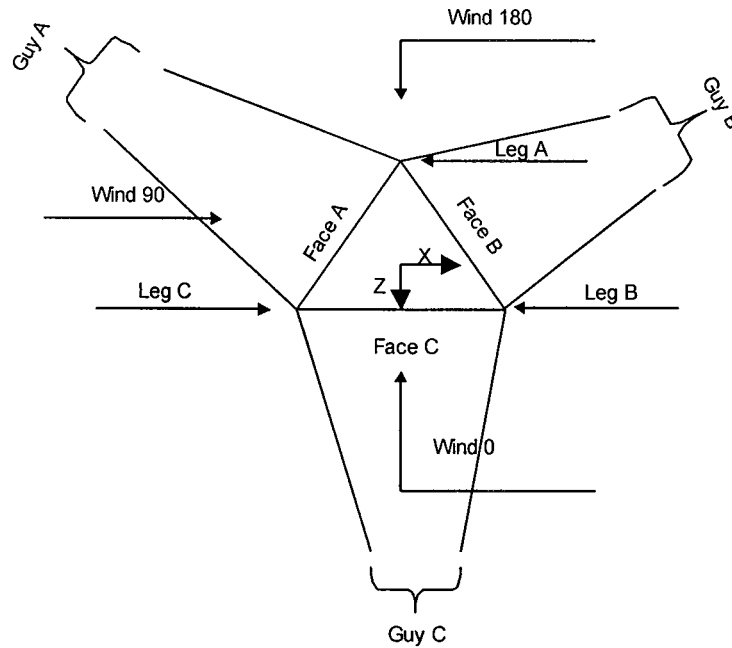
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|--|-------------------------------|---------------------------------------|
| <b>tnxTower</b><br><br><b>SZS Engineering</b><br>4551 E Carriage Way<br>Gilbert, AZ<br>Phone: 480-528-0914<br>FAX: | <b>Job</b><br>17041-CHE       | <b>Page</b><br>2 of 95                |
|  | <b>Project</b><br>Guyed Tower | <b>Date</b><br>00:36:24 10/26/17      |
|  | <b>Client</b>                 | <b>Designed by</b><br>Samuel Gonzalez |



**Corner & Starmount Guyed Tower**



|  |                               |                                       |
|--|-------------------------------|---------------------------------------|
| <b>tnxTower</b><br><br><b>SZS Engineering</b><br>4551 E Carriage Way<br>Gilbert, AZ<br>Phone: 480-528-0914<br>FAX: | <b>Job</b><br>17041-CHE       | <b>Page</b><br>3 of 95                |
|  | <b>Project</b><br>Guyed Tower | <b>Date</b><br>00:36:24 10/26/17      |
|  | <b>Client</b>                 | <b>Designed by</b><br>Samuel Gonzalez |



**Face Guyed**

### Tower Section Geometry

| Tower Section | Tower Elevation | Assembly Database | Description | Section Width | Number of Sections | Section Length |
|---------------|-----------------|-------------------|-------------|---------------|--------------------|----------------|
|               | ft              |                   |             | ft            |                    | ft             |
| T1            | 276.000-265.500 |                   |             | 4.000         | 1                  | 10.500         |
| T2            | 265.500-261.750 |                   |             | 4.000         | 1                  | 3.750          |
| T3            | 261.750-258.000 |                   |             | 4.000         | 1                  | 3.750          |
| T4            | 258.000-254.000 |                   |             | 4.000         | 1                  | 4.000          |
| T5            | 254.000-242.000 |                   |             | 4.000         | 1                  | 12.000         |
| T6            | 242.000-222.000 |                   |             | 4.000         | 1                  | 20.000         |
| T7            | 222.000-206.000 |                   |             | 4.000         | 1                  | 16.000         |
| T8            | 206.000-202.000 |                   |             | 4.000         | 1                  | 4.000          |
| T9            | 202.000-198.000 |                   |             | 4.000         | 1                  | 4.000          |
| T10           | 198.000-194.000 |                   |             | 4.000         | 1                  | 4.000          |
| T11           | 194.000-182.000 |                   |             | 4.000         | 1                  | 12.000         |
| T12           | 182.000-162.000 |                   |             | 4.000         | 1                  | 20.000         |
| T13           | 162.000-142.000 |                   |             | 4.000         | 1                  | 20.000         |
| T14           | 142.000-126.000 |                   |             | 4.000         | 1                  | 16.000         |
| T15           | 126.000-122.000 |                   |             | 4.000         | 1                  | 4.000          |
| T16           | 122.000-102.000 |                   |             | 4.000         | 1                  | 20.000         |

|  |                |             |                    |                   |
|--|----------------|-------------|--------------------|-------------------|
| <b>tnxTower</b><br><br><b>SZS Engineering</b><br>4551 E Carriage Way<br>Gilbert, AZ<br>Phone: 480-528-0914<br>FAX: | <b>Job</b>     | 17041-CHE   | <b>Page</b>        | 4 of 95           |
|  | <b>Project</b> | Guyed Tower | <b>Date</b>        | 00:36:24 10/26/17 |
|  | <b>Client</b>  |             | <b>Designed by</b> | Samuel Gonzalez   |

| Tower Section | Tower Elevation | Assembly Database | Description | Section Width | Number of Sections | Section Length |
|---------------|-----------------|-------------------|-------------|---------------|--------------------|----------------|
|               | ft              |                   |             | ft            |                    | ft             |
| T17           | 102.000-82.000  |                   |             | 4.000         | 1                  | 20.000         |
| T18           | 82.000-62.000   |                   |             | 4.000         | 1                  | 20.000         |
| T19           | 62.000-42.000   |                   |             | 4.000         | 1                  | 20.000         |
| T20           | 42.000-38.000   |                   |             | 4.000         | 1                  | 4.000          |
| T21           | 38.000-34.000   |                   |             | 4.000         | 1                  | 4.000          |
| T22           | 34.000-30.000   |                   |             | 4.000         | 1                  | 4.000          |
| T23           | 30.000-26.000   |                   |             | 4.000         | 1                  | 4.000          |
| T24           | 26.000-22.000   |                   |             | 4.000         | 1                  | 4.000          |
| T25           | 22.000-18.000   |                   |             | 4.000         | 1                  | 4.000          |
| T26           | 18.000-14.000   |                   |             | 4.000         | 1                  | 4.000          |
| T27           | 14.000-10.000   |                   |             | 4.000         | 1                  | 4.000          |
| T28           | 10.000-2.000    |                   |             | 4.000         | 1                  | 8.000          |

### Tower Section Geometry (cont'd)

| Tower Section | Tower Elevation | Diagonal Spacing | Bracing Type  | Has K Brace End Panels | Has Horizontals | Top Girt Offset | Bottom Girt Offset |
|---------------|-----------------|------------------|---------------|------------------------|-----------------|-----------------|--------------------|
|               | ft              | ft               |               |                        |                 | in              | in                 |
| T1            | 276.000-265.500 | 3.500            | K Brace Left  | No                     | Yes             | 0.000           | 0.000              |
| T2            | 265.500-261.750 | 3.750            | Diag Down     | No                     | Yes             | 0.000           | 0.000              |
| T3            | 261.750-258.000 | 3.750            | X Brace       | No                     | Yes             | 0.000           | 0.000              |
| T4            | 258.000-254.000 | 4.000            | Diag Down     | No                     | Yes             | 0.000           | 0.000              |
| T5            | 254.000-242.000 | 4.000            | K Brace Left  | No                     | Yes             | 0.000           | 0.000              |
| T6            | 242.000-222.000 | 4.000            | K Brace Right | No                     | Yes             | 0.000           | 0.000              |
| T7            | 222.000-206.000 | 4.000            | K Brace Right | No                     | Yes             | 0.000           | 0.000              |
| T8            | 206.000-202.000 | 4.000            | Diag Up       | No                     | Yes             | 0.000           | 0.000              |
| T9            | 202.000-198.000 | 4.000            | X Brace       | No                     | Yes             | 0.000           | 0.000              |
| T10           | 198.000-194.000 | 4.000            | Diag Up       | No                     | Yes             | 0.000           | 0.000              |
| T11           | 194.000-182.000 | 4.000            | K Brace Right | No                     | Yes             | 0.000           | 0.000              |
| T12           | 182.000-162.000 | 4.000            | K Brace Left  | No                     | Yes             | 0.000           | 0.000              |
| T13           | 162.000-142.000 | 4.000            | K Brace Right | No                     | Yes             | 0.000           | 0.000              |
| T14           | 142.000-126.000 | 4.000            | K Brace Right | No                     | Yes             | 0.000           | 0.000              |
| T15           | 126.000-122.000 | 4.000            | K Brace Left  | No                     | Yes             | 0.000           | 0.000              |
| T16           | 122.000-102.000 | 4.000            | K Brace Right | No                     | Yes             | 0.000           | 0.000              |
| T17           | 102.000-82.000  | 4.000            | K Brace Left  | No                     | Yes             | 0.000           | 0.000              |
| T18           | 82.000-62.000   | 4.000            | K Brace Right | No                     | Yes             | 0.000           | 0.000              |
| T19           | 62.000-42.000   | 4.000            | K Brace Left  | No                     | Yes             | 0.000           | 0.000              |
| T20           | 42.000-38.000   | 4.000            | Diag Down     | No                     | Yes             | 0.000           | 0.000              |
| T21           | 38.000-34.000   | 4.000            | Diag Up       | No                     | Yes             | 0.000           | 0.000              |
| T22           | 34.000-30.000   | 4.000            | Diag Down     | No                     | Yes             | 0.000           | 0.000              |
| T23           | 30.000-26.000   | 4.000            | Diag Up       | No                     | Yes             | 0.000           | 0.000              |
| T24           | 26.000-22.000   | 4.000            | Diag Down     | No                     | Yes             | 0.000           | 0.000              |
| T25           | 22.000-18.000   | 4.000            | Diag Up       | No                     | Yes             | 0.000           | 0.000              |
| T26           | 18.000-14.000   | 4.000            | Diag Down     | No                     | Yes             | 0.000           | 0.000              |
| T27           | 14.000-10.000   | 4.000            | Diag Up       | No                     | Yes             | 0.000           | 0.000              |
| T28           | 10.000-2.000    | 4.000            | Diag Down     | No                     | Yes             | 0.000           | 0.000              |

### Tower Section Geometry (cont'd)

|  |                               |                                       |
|--|-------------------------------|---------------------------------------|
| <b>tnxTower</b><br><br><b>SZS Engineering</b><br>4551 E Carriage Way<br>Gilbert, AZ<br>Phone: 480-528-0914<br>FAX: | <b>Job</b><br>17041-CHE       | <b>Page</b><br>5 of 95                |
|  | <b>Project</b><br>Guyed Tower | <b>Date</b><br>00:36:24 10/26/17      |
|  | <b>Client</b>                 | <b>Designed by</b><br>Samuel Gonzalez |

| Tower Elevation ft     | Leg Type    | Leg Size        | Leg Grade           | Diagonal Type | Diagonal Size     | Diagonal Grade  |
|------------------------|-------------|-----------------|---------------------|---------------|-------------------|-----------------|
| T1<br>276.000-265.500  | Solid Round | 1 3/4           | A572-50<br>(50 ksi) | Single Angle  | L1 3/4x1 3/4x3/16 | A36<br>(36 ksi) |
| T2<br>265.500-261.750  | Solid Round | 1 3/4           | A572-50<br>(50 ksi) | Single Angle  | L1 3/4x1 3/4x3/16 | A36<br>(36 ksi) |
| T3<br>261.750-258.000  | Solid Round | 1 3/4           | A572-50<br>(50 ksi) | Single Angle  | L1 3/4x1 3/4x3/16 | A36<br>(36 ksi) |
| T4<br>258.000-254.000  | Solid Round | 1 3/4           | A572-50<br>(50 ksi) | Single Angle  | L1 3/4x1 3/4x3/16 | A36<br>(36 ksi) |
| T5<br>254.000-242.000  | Solid Round | 1 3/4           | A572-50<br>(50 ksi) | Single Angle  | L1 3/4x1 3/4x3/16 | A36<br>(36 ksi) |
| T6<br>242.000-222.000  | Solid Round | 1 3/4           | A572-50<br>(50 ksi) | Single Angle  | L1 3/4x1 3/4x3/16 | A36<br>(36 ksi) |
| T7<br>222.000-206.000  | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2 1/2x2 1/2x1/4  | A36<br>(36 ksi) |
| T8<br>206.000-202.000  | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2 1/2x2 1/2x3/8  | A36<br>(36 ksi) |
| T9<br>202.000-198.000  | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2 1/2x2 1/2x3/8  | A36<br>(36 ksi) |
| T10<br>198.000-194.000 | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2 1/2x2 1/2x3/8  | A36<br>(36 ksi) |
| T11<br>194.000-182.000 | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2 1/2x2 1/2x1/4  | A36<br>(36 ksi) |
| T12<br>182.000-162.000 | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x1/4          | A36<br>(36 ksi) |
| T13<br>162.000-142.000 | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x1/4          | A36<br>(36 ksi) |
| T14<br>142.000-126.000 | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2 1/2x2 1/2x1/4  | A36<br>(36 ksi) |
| T15<br>126.000-122.000 | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x1/4          | A36<br>(36 ksi) |
| T16<br>122.000-102.000 | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x1/4          | A36<br>(36 ksi) |
| T17<br>102.000-82.000  | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x3/16         | A36<br>(36 ksi) |
| T18<br>82.000-62.000   | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x3/16         | A36<br>(36 ksi) |
| T19<br>62.000-42.000   | Pipe        | 2-Sr + 3X3X3/16 | A572-50<br>(50 ksi) | Single Angle  | L2x2x3/16         | A36<br>(36 ksi) |
| T20<br>42.000-38.000   | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x3/16         | A36<br>(36 ksi) |
| T21<br>38.000-34.000   | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x3/16         | A36<br>(36 ksi) |
| T22<br>34.000-30.000   | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x3/16         | A36<br>(36 ksi) |
| T23<br>30.000-26.000   | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x3/16         | A36<br>(36 ksi) |
| T24<br>26.000-22.000   | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x3/16         | A36<br>(36 ksi) |
| T25<br>22.000-18.000   | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x1/4          | A36<br>(36 ksi) |
| T26<br>18.000-14.000   | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x1/4          | A36<br>(36 ksi) |
| T27<br>14.000-10.000   | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x1/4          | A36<br>(36 ksi) |
| T28<br>10.000-2.000    | Solid Round | 2               | A572-50<br>(50 ksi) | Single Angle  | L2x2x1/4          | A36<br>(36 ksi) |



|  |                               |                                       |
|--|-------------------------------|---------------------------------------|
| <b>tnxTower</b><br><br><b>SZS Engineering</b><br>4551 E Carriage Way<br>Gilbert, AZ<br>Phone: 480-528-0914<br>FAX: | <b>Job</b><br>17041-CHE       | <b>Page</b><br>6 of 95                |
|  | <b>Project</b><br>Guyed Tower | <b>Date</b><br>00:36:24 10/26/17      |
|  | <b>Client</b>                 | <b>Designed by</b><br>Samuel Gonzalez |

### Tower Section Geometry (cont'd)

| Tower Elevation<br>ft | Top Girt Type | Top Girt Size    | Top Girt Grade  | Bottom Girt Type | Bottom Girt Size | Bottom Girt Grade |
|-----------------------|---------------|------------------|-----------------|------------------|------------------|-------------------|
| T1<br>276.000-265.500 | Single Angle  | L2x2x3/16        | A36<br>(36 ksi) | Flat Bar         |                  | A36<br>(36 ksi)   |
| T19<br>62.000-42.000  | Single Angle  | L2 1/2x2 1/2x1/4 | A36<br>(36 ksi) | Flat Bar         |                  | A36<br>(36 ksi)   |

### Tower Section Geometry (cont'd)

| Tower Elevation<br>ft  | No. of Mid Girts | Mid Girt Type | Mid Girt Size | Mid Girt Grade  | Horizontal Type | Horizontal Size  | Horizontal Grade |
|------------------------|------------------|---------------|---------------|-----------------|-----------------|------------------|------------------|
| T1<br>276.000-265.500  | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T2<br>265.500-261.750  | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T3<br>261.750-258.000  | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T4<br>258.000-254.000  | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T5<br>254.000-242.000  | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T6<br>242.000-222.000  | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T7<br>222.000-206.000  | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T8<br>206.000-202.000  | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T10<br>198.000-194.000 | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T11<br>194.000-182.000 | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T12<br>182.000-162.000 | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T13<br>162.000-142.000 | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T14<br>142.000-126.000 | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2 1/2x2 1/2x1/4 | A36<br>(36 ksi)  |
| T15<br>126.000-122.000 | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2 1/2x2 1/2x1/4 | A36<br>(36 ksi)  |
| T16<br>122.000-102.000 | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T17<br>102.000-82.000  | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T18<br>82.000-62.000   | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T19<br>62.000-42.000   | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T20<br>42.000-38.000   | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T21<br>38.000-34.000   | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |
| T22<br>34.000-30.000   | None             | Flat Bar      |               | A36<br>(36 ksi) | Single Angle    | L2x2x3/16        | A36<br>(36 ksi)  |

# Sprint<sup>®</sup>



## "DO MACRO UPGRADE"

**CT03XC025**  
**0 CLARK HILL ROAD**  
**NAUGATUCK, CT 06770**  
**NEW HAVEN COUNTY**

**COM-EX**  
 Consultants  
 115 Route 46  
 Suite E39  
 Mountain Lakes, NJ 07048  
 PHONE: 862.209.4300  
 FAX: 862.209.4301

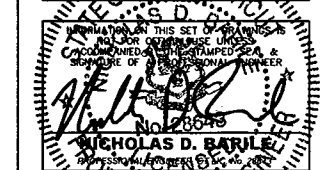
**Sprint**  
 6100 SPRINT PARKWAY  
 OVERLAND PARK, KS 66251

**Cherundolo**  
 Consulting

| SCHEDULE OF REVISIONS |          |                             |
|-----------------------|----------|-----------------------------|
| REV. NO.              | DATE     | DESCRIPTION OF CHANGES      |
| 7                     |          |                             |
| 6                     |          |                             |
| 5                     |          |                             |
| 4                     | 11/02/17 | REVISED PER CLIENT COMMENTS |
| 3                     | 10/10/17 | REVISED PER CLIENT COMMENTS |
| 2                     | 09/26/17 | ISSUED FOR CONSTRUCTION     |
| 1                     | 08/15/17 | PER NEW RFDS                |
| 0                     | 05/16/17 | INITIAL SUBMISSION          |

**DRAWN BY:** AM  
**CHECKED BY:** DTS  
**SCALE:** AS NOTED  
**JOB NO:** 17041-CHE

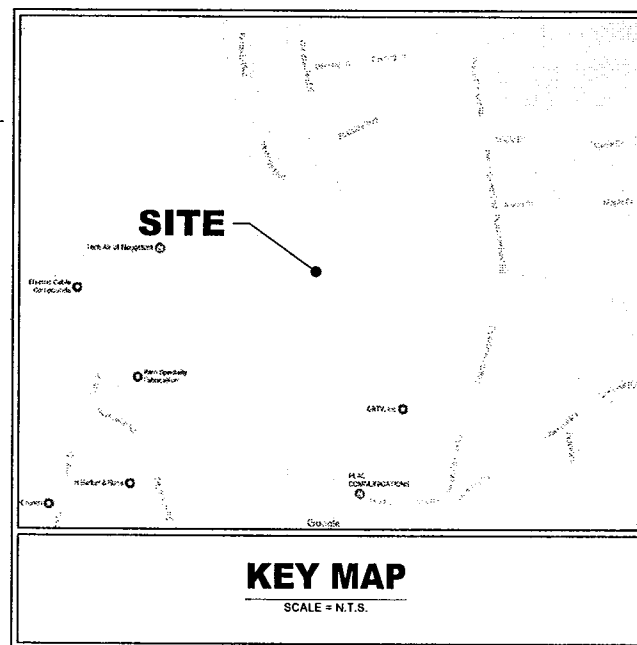
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**0 CLARK HILL ROAD**  
**NAUGATUCK, CT 06770**  
**NEW HAVEN COUNTY**

**DRAWING TITLE:**  
**TITLE SHEET**

**DRAWING SHEET: 1 OF 10**  
**T-1**



| SITE LOCATION INFORMATION |  |
|---------------------------|--|
| SITE ID NUMBER:           | CT03XC025  |
| SITE NAME:                | SMALLER WTX TOWER  |
| SITE ADDRESS:             | 37 PEACH ORCHARD RD.<br>PROSPECT, CT 06712               |
| PARCEL ID:                | C0048100   |
| CENSUS TRACT:             | 130200   |
| CENSUS BLOCK:             | 3010   |
| PROPERTY OWNER:           | COUNTERPOINT COMMUNICATIONS                              |
| APPLICANT:                | SPRINT<br>6100 SPRINT PARKWAY<br>OVERLAND PARK, KS 66251 |
| COUNTY:                   | HARTFORD COUNTY  |

| SITE CHARACTERISTICS            |   |
|---------------------------------|---|
| LATITUDE:                       | 41.394239   |
| LONGITUDE:                      | -73.107837  |
| STRUCTURE TYPE:                 | GUYED TOWER   |
| LOCATION OF PROPOSED EQUIPMENT: | EXISTING ANTENNA FRAME  |
| STRUCTURE HEIGHT:               | ±278'-0" AGL  |
| ANTENNA (RAD CENTER):           | ±208'-0" AGL (ALPHA)<br>±208'-0" AGL (BETA)<br>±208'-0" AGL (GAMMA) |

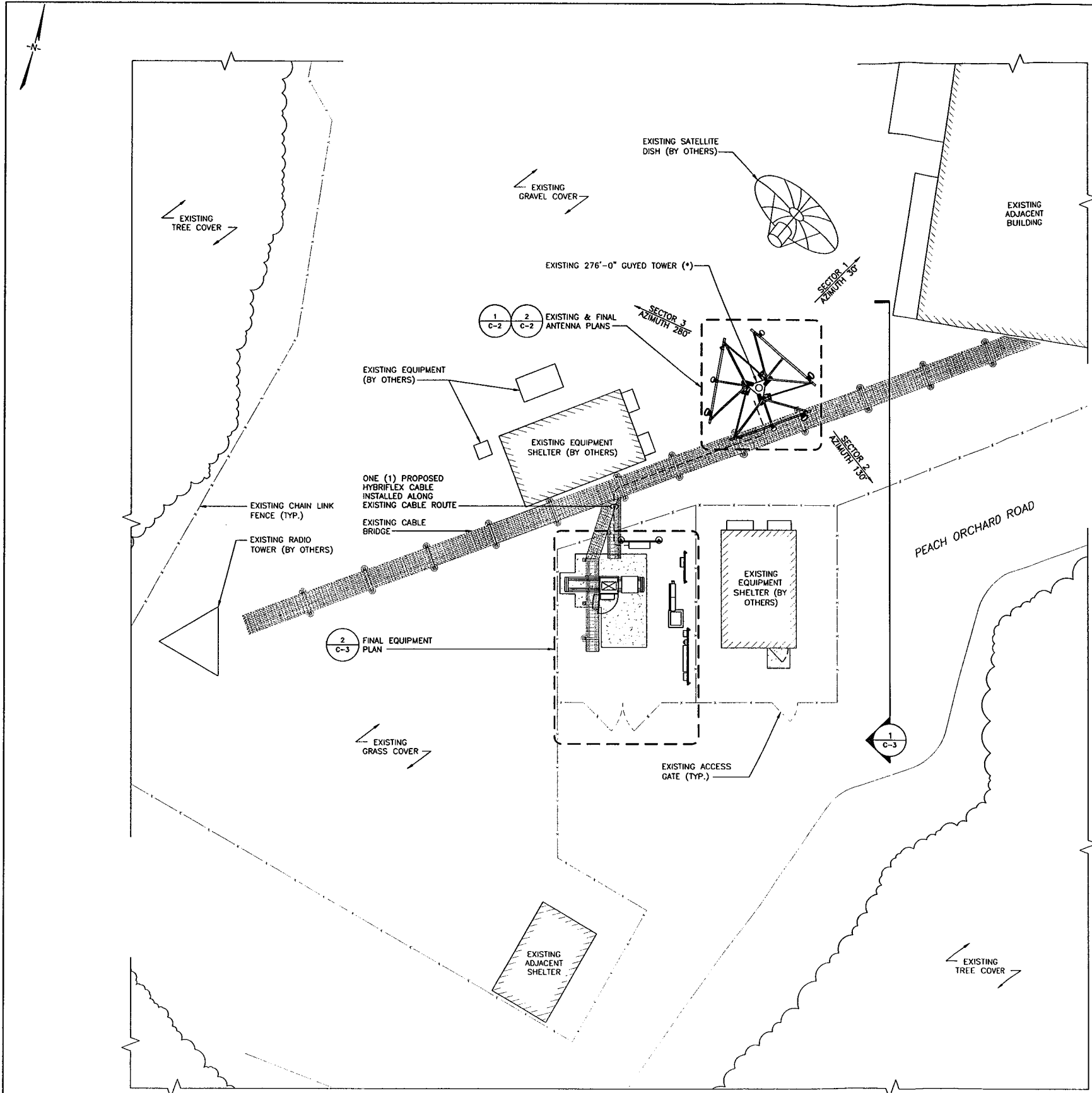
| SHEET INDEX |   |
|-------------|---|
| SHEET NO.   | SHEET DESCRIPTION                               |
| T-1         | TITLE SHEET                                     |
| C-1         | SITE PLAN & GENERAL NOTES                       |
| C-2         | EXISTING & FINAL ANTENNA PLANS                  |
| C-3         | TOWER ELEVATION, B.O.M., & FINAL EQUIPMENT PLAN |
| C-4         | CONSTRUCTION DETAILS                            |
| C-5         | FIBER PLUMBING DIAGRAM                          |
| C-6         | CABLE COLOR CODING                              |
| C-7         | EQUIPMENT DETAILS                               |
| E-1         | GROUNDING DETAILS                               |
| E-2         | DC POWER DETAILS & PANEL SCHEDULES              |

**SCOPE OF WORK**  
 THE APPLICANT PROPOSES TO INSTALL THREE (3) NEW ANTENNAS AND THREE (3) NEW RADIO HEADS ON EXISTING/PROPOSED MOUNTS (TYPICAL FOR ONE (1) PER SECTOR)

| SIGNATURE BLOCK:       |      |
|------------------------|------|
| SPRINT REPRESENTATIVE: | DATE |
| SPRINT RF ENGINEER:    | DATE |
| PROPERTY OWNER:        | DATE |







1 SITE PLAN  
 C-1 SCALE: 1/8"=1'  
 (24"x36" SHEET SIZE)

(\*) GUY WIRES NOT SHOWN FOR CLARITY

**GENERAL NOTES:**

1. SUBJECT PROPERTY IS KNOWN AS TAX PARCEL ID C0048100, CENSUS TRACT 130200, CENSUS BLOCK 3010 AS SHOWN THE OFFICIAL TAX MAP OF THE TOWN OF PROSPECT, CT.
2. THE APPLICANT PROPOSES TO INSTALL THREE (3) NEW ANTENNAS AND THREE (3) NEW RADIO HEADS ON EXISTING/PROPOSED MOUNTS (TYPICAL FOR ONE (1) PER SECTOR).
3. CONTRACTOR SHALL NOT COMMENCE ANY WORK UNTIL HE OBTAINS, AT HIS OWN EXPENSE, ALL INSURANCE REQUIRED BY SPRINT, THE PROPERTY OWNER AND/OR PROPERTY MANAGEMENT COMPANY.
4. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED AND EACH OF THE DRAWINGS HAVE BEEN REVISED TO INDICATED "ISSUED FOR CONSTRUCTION".
5. SITE INFORMATION SHOWN TAKEN FROM PLANS PREPARED BY FULLERTON ENGINEERING DESIGN FOR SPRINT'S INSTALLATION ON THIS FACILITY. DRAWINGS ENTITLED "SPRINT, SITE NAME: SMALLER WTXX TOWER, SPRINT NUMBER: CT03XC025" DATED 01/12/15 REVISED 09/08/15. ADDITIONAL SITE INFORMATION WAS SUPPLEMENTED WITH A LIMITED SITE VISIT BY COM-EX CONSULTANTS 05/10/17.
6. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITIES OR OTHER PUBLIC AUTHORITIES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
8. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK. MINOR OMISSIONS OR ERRORS IN THE BID DOCUMENTS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THIS PROJECT IN ACCORDANCE WITH THE OVERALL INTENT OF THESE DRAWINGS.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED AS A RESULT OF CONSTRUCTION OF THIS FACILITY.
10. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
11. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING A BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
12. CONTRACTOR SHALL VERIFY ANTENNA ELEVATION AND AZIMUTH WITH RF ENGINEERING PRIOR TO INSTALLATION.
13. ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
14. THE CONSTRUCTION CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ALL CONSTRUCTION MEANS AND METHODS. THE CONSTRUCTION CONTRACTOR IS ALSO RESPONSIBLE FOR ALL JOB SITE SAFETY.
15. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.
16. THE CONTRACTOR IS TO REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. THE CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND RELATED PARTIES. THE SUBCONTRACTOR SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT EFFECTS THEIR WORK.
17. THE CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON THE SITE AT ALL TIMES AND INSURE THE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. CONTRACTOR FURNISH 3 SETS OF REDLINE "AS-BUILT" DRAWINGS TO SPRINT UPON COMPLETION OF THE WORK.
18. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL INCLUDED AS PART OF THE WORK.
19. ALL MATERIAL PROVIDED BY IS TO BE REVIEWED BY THE CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTOR PRIOR TO INSTALLATION. ANY DEFICIENCIES TO PROVIDE MATERIALS SHALL BE BROUGHT TO THE CONSTRUCTION MANAGERS ATTENTION IMMEDIATELY.
20. THE MATERIALS INSTALLED SHALL MEET REQUIREMENTS OF CONTRACTORS DOCUMENTS. NO SUBSTITUTIONS ARE ALLOWED.
21. THE CONTRACTOR SHALL COORDINATE ALL CIVIL, STRUCTURAL AND ELECTRICAL DRAWINGS FOR THE LOCATIONS OF ALL OPENINGS, RECESSES, BUILT-IN WORK, ETC..
22. THE CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTACT DOCUMENTS.
23. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND TO BE IN THE FIELD.
24. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST-ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAND PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
25. THE CONTRACTOR SHALL COORDINATE HIS WORK AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROPERTY OWNER AND/OR PROPERTY MANAGEMENT COMPANY.
26. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
27. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH THE MANUFACTURE'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OR WHERE LOCAL CODES OR REGULATIONS MAY TAKE PRECEDENCE.
28. THE CONTRACTOR SHALL REPAIR ALL EXISTING SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
29. THE CONTRACTOR SHALL KEEP CONTRACT AREA CLEAN, HAZARD FREE AND DISPOSE OF ALL DEBRIS AND RUBBISH. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
30. BEFORE FINAL ACCEPTANCE OF THE WORK, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT, TEMPORARY WORKS, UNUSED AND USELESS MATERIALS, RUBBISH AND TEMPORARY STRUCTURES.
31. DESIGN REQUIREMENTS PER INTERNATIONAL BUILDING CODE 2015 AND THE EIA/TIA-222-G STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

**COM-EX**  
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 115 Route 46  
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 Mountain Lakes, NJ 07046  
 PHONE: 862.208.4300  
 FAX: 862.208.4301

**Sprint**  
 6100 SPRINT PARKWAY  
 OVERLAND PARK, KS 66251

**Cherundolo**  
 Consulting

**SCHEDULE OF REVISIONS**

| REV. NO. | DATE     | DESCRIPTION OF CHANGES      |
|----------|----------|-----------------------------|
| 7        |          |                             |
| 6        |          |                             |
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| 2        | 09/26/17 | ISSUED FOR CONSTRUCTION     |
| 1        | 08/16/17 | PER NEW RFDS                |
| 0        | 05/16/17 | INITIAL SUBMISSION          |

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STATE OF CONNECTICUT  
 REGISTERED PROFESSIONAL ENGINEER  
 NICHOLAS J. BARILE  
 LICENSE NO. 10123  
 0 CLARK HILL ROAD  
 NAUGTUCK, CT 06770  
 NEW HAVEN COUNTY

DRAWING TITLE:  
**SITE PLAN & GENERAL NOTES**

DRAWING SHEET: 2 OF 10

**C-1**



LOADING SHOWN ON THIS SET OF DRAWINGS IS BASED ON THE STRUCTURAL ANALYSIS PERFORMED BY COM-EX CONSULTANTS, DATED 11/02/17. CONTRACTOR TO NOTIFY COM-EX AND SPRINT IN THE EVENT SITE CONDITIONS DIFFER FROM WHAT IS REPRESENTED IN THE STRUCTURAL ANALYSIS. NO SUBSTITUTIONS ARE PERMITTED WITHOUT ADDITIONAL ANALYSIS.

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**Cherundolo Consulting**

**SCHEDULE OF REVISIONS**

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**SCALE:** AS NOTED  
**JOB NO.:** 17041-CHE

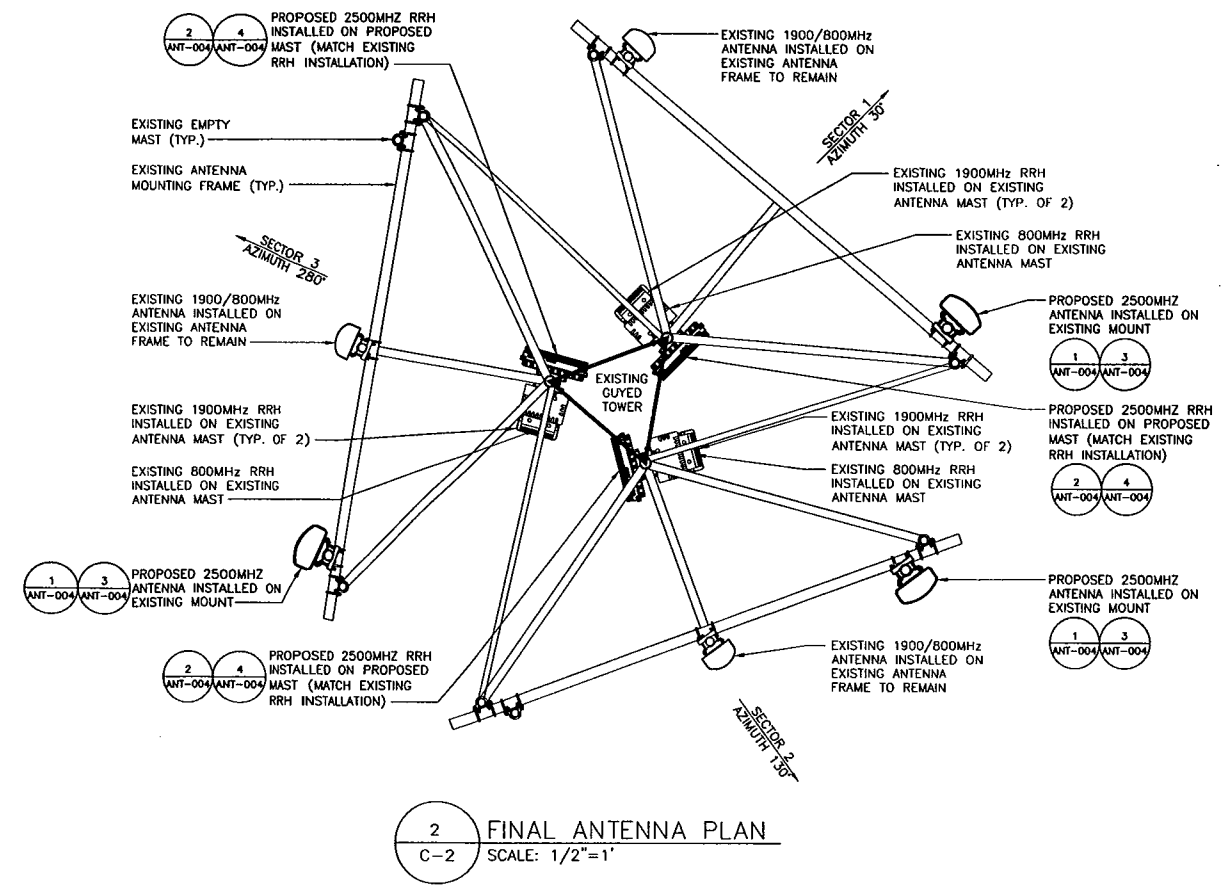
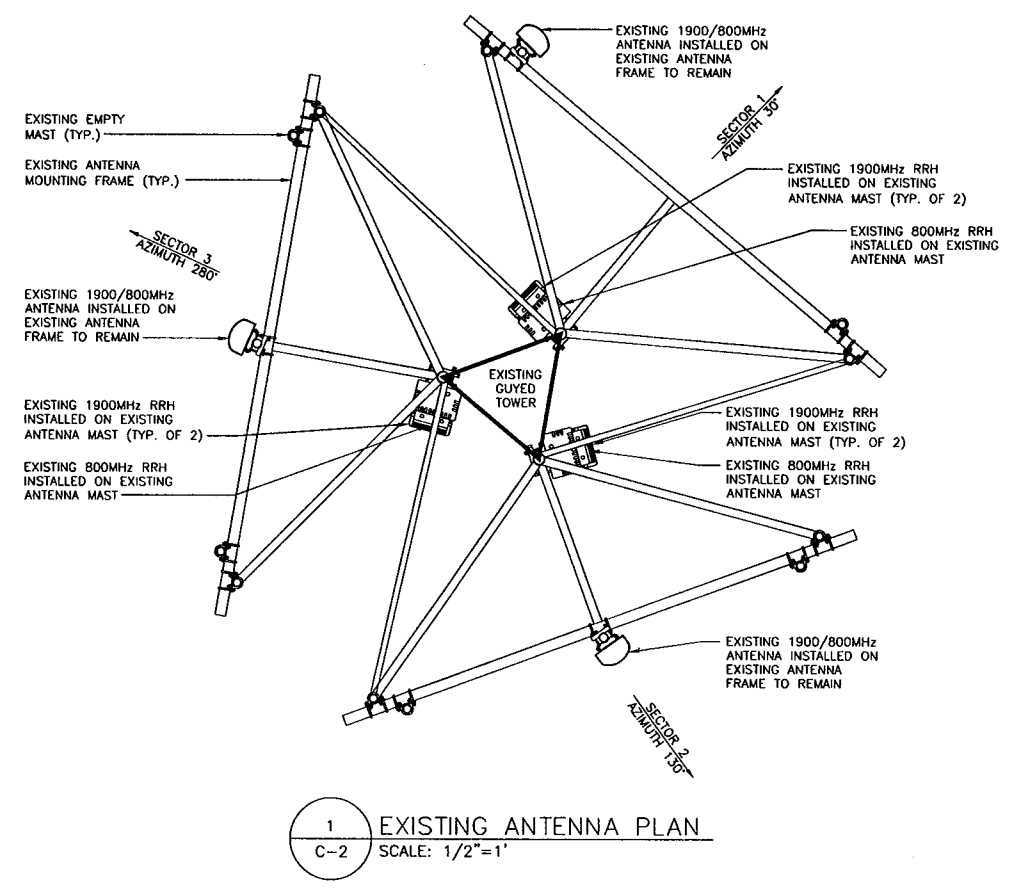
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**NICHOLAS D. BARILE**  
PROFESSIONAL ENGINEER  
STATE OF CONNECTICUT  
LICENSE NO. 25643  
0 CLARK HILL ROAD  
NAUGUTUCK, CT 06770  
NEW HAVEN COUNTY

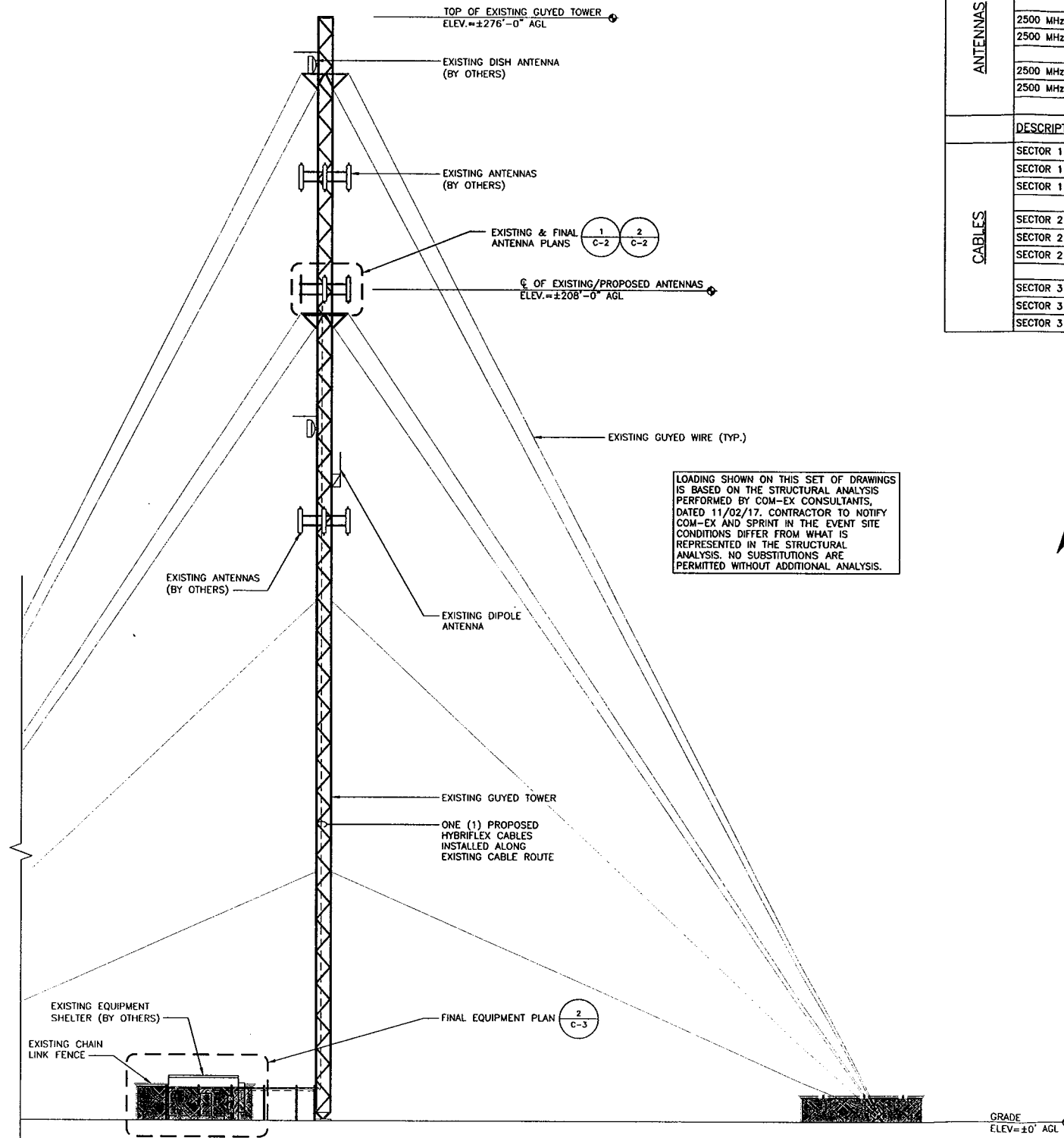
**DRAWING TITLE:**  
**EXISTING & FINAL ANTENNA PLANS**

**DRAWING SHEET:** 3 OF 10

**C-2**



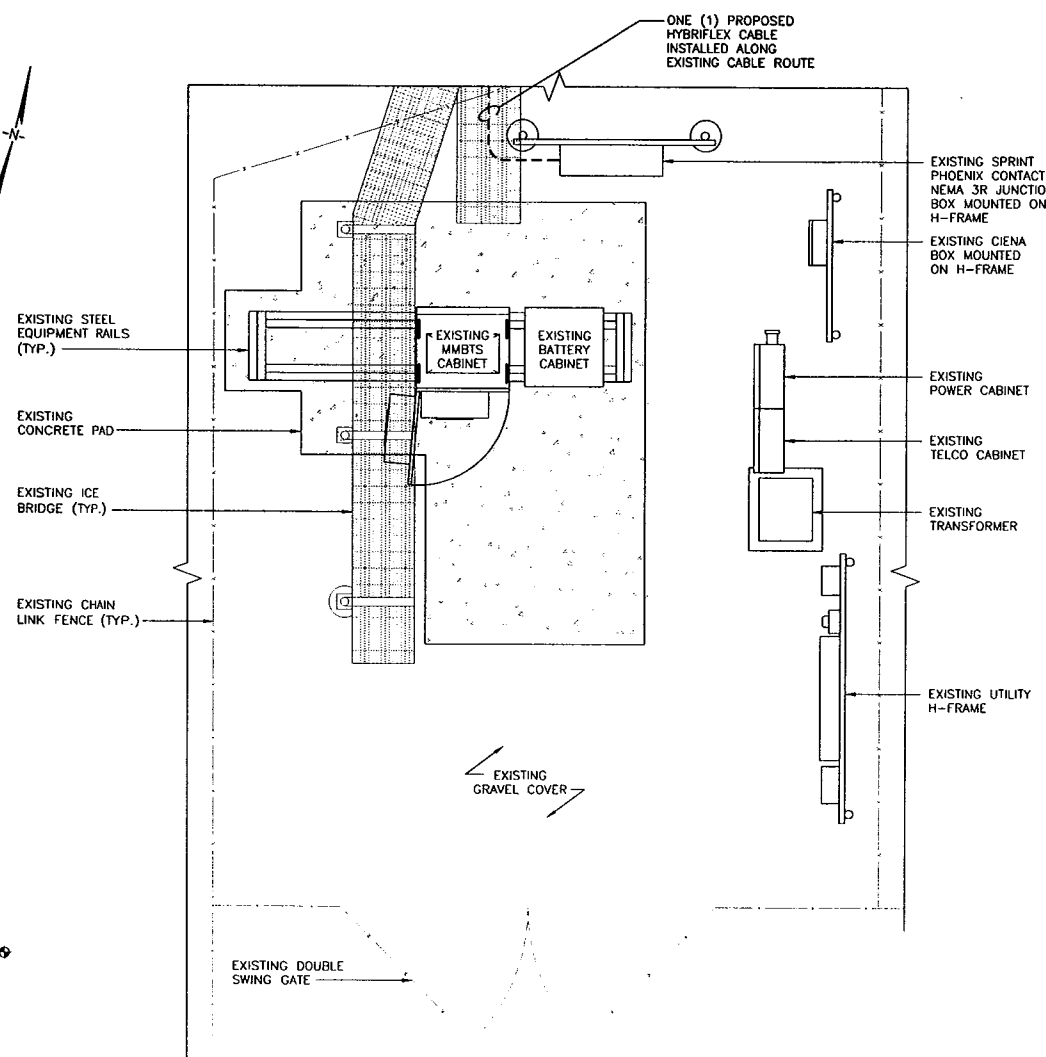




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### BILL OF MATERIALS

|          | DESCRIPTION                         | QUANTITY EACH | DIMENSIONS (HxWxD) | WEIGHT (LBS) EACH              | MANUFACTURER: PART/ MODEL#     |
|----------|-------------------------------------|---------------|--------------------|--------------------------------|--------------------------------|
| ANTENNAS | 2500 MHz PANEL ANTENNA - SECTOR 1   | 1             | 72"x14"x8"         | 58 LBS W/OUT MOUNTING HARDWARE | COMMSCOPE: DT465B-2XR          |
|          | 2500 MHz RRH, 8x20-25               | 1             | 26.1"x18.6"x6.7"   | 70 LBS W/OUT MOUNTING HARDWARE | ALCATEL LUCENT                 |
|          | 2500 MHz PANEL ANTENNA - SECTOR 2   | 1             | 72"x14"x8"         | 58 LBS W/OUT MOUNTING HARDWARE | COMMSCOPE: DT465B-2XR          |
|          | 2500 MHz RRH, 8x20-25               | 1             | 26.1"x18.6"x6.7"   | 70 LBS W/OUT MOUNTING HARDWARE | ALCATEL LUCENT                 |
|          | 2500 MHz PANEL ANTENNA - SECTOR 3   | 1             | 72"x14"x8"         | 58 LBS W/OUT MOUNTING HARDWARE | COMMSCOPE: DT465B-2XR          |
|          | 2500 MHz RRH, 8x20-25               | 1             | 26.1"x18.6"x6.7"   | 70 LBS W/OUT MOUNTING HARDWARE | ALCATEL LUCENT                 |
| CABLES   | SECTOR 1 HYBRIFLEX RUN (BTS TO RRH) | 1             | ±300'              | 1.3 LBS                        | RFS: 1-1/4" / HB114-1-08U4-M5J |
|          | SECTOR 1 COAX CABLE JUMPERS         | 11            | 10'                | N/A                            | LDF4-50 (OR EQUIVALENT)        |
|          | SECTOR 1 R.E.T. CABLES              | 4             | (3) 10' / (1) 2'   | N/A                            | TBD                            |
|          | SECTOR 2 HYBRIFLEX RUN (BTS TO RRH) | N/A           | N/A                | N/A                            | N/A                            |
|          | SECTOR 2 COAX CABLE JUMPERS         | 11            | 10'                | N/A                            | LDF4-50 (OR EQUIVALENT)        |
|          | SECTOR 2 R.E.T. CABLES              | 4             | (3) 10' / (1) 2'   | N/A                            | TBD                            |
|          | SECTOR 3 HYBRIFLEX RUN (BTS TO RRH) | N/A           | N/A                | N/A                            | N/A                            |
|          | SECTOR 3 COAX CABLE JUMPERS         | 11            | 10'                | N/A                            | LDF4-50 (OR EQUIVALENT)        |
|          | SECTOR 3 R.E.T. CABLES              | 4             | (3) 10' / (1) 2'   | N/A                            | TBD                            |



1 TOWER ELEVATION  
C-3 SCALE: 1/16"=1'  
(24"x36" SHEET SIZE)

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

**COM-EX**  
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8100 SPRINT PARKWAY  
OVERLAND PARK, KS 66251

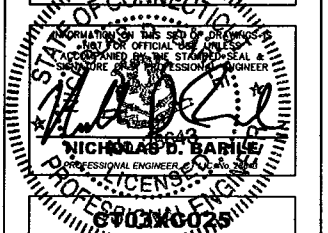
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#### SCHEDULE OF REVISIONS

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| 1        | 08/16/17 | PER NEW RFDS                |
| 0        | 05/16/17 | INITIAL SUBMISSION          |

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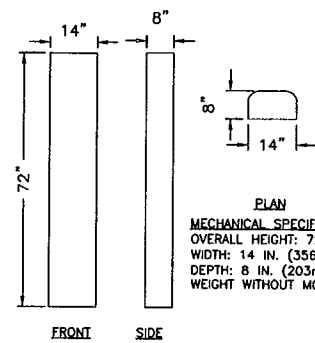


0 CLARK HILL ROAD  
NAUGUTUCK, CT 06770  
NEW HAVEN COUNTY

**DRAWING TITLE:**  
TOWER ELEVATION, B.O.M. & FINAL EQUIPMENT PLAN

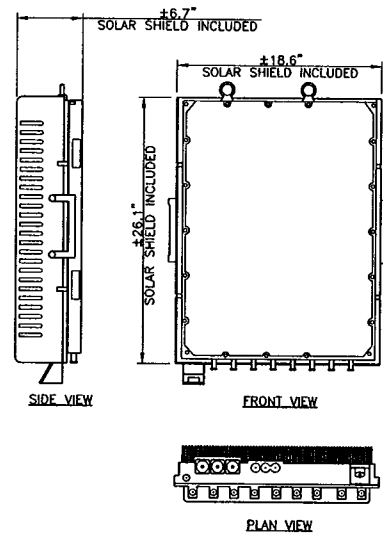
**DRAWING SHEET:** 4 OF 10

**C-3**

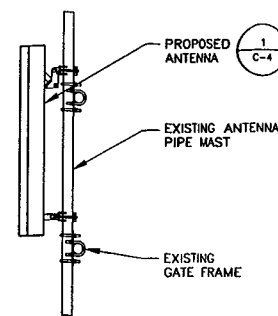


PLAN  
 MECHANICAL SPECIFICATIONS  
 OVERALL HEIGHT: 72.0 IN. (1829mm)  
 WIDTH: 14 IN. (356mm)  
 DEPTH: 8 IN. (203mm)  
 WEIGHT WITHOUT MOUNTING HARDWARE: 58.0 LBS

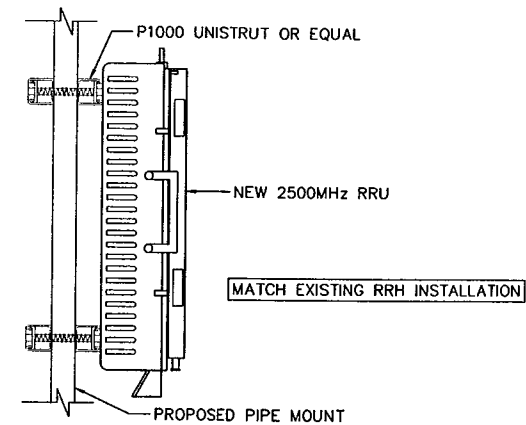
1  
 C-4  
 2500MHz ANTENNA  
 COMMSCOPE: DT465B-2XR  
 SCALE: N.T.S.



2  
 C-4  
 2500MHz RRH DETAIL  
 SCALE: N.T.S.



3  
 C-4  
 SECTOR 1, 2, & 3 ANTENNA  
 INSTALLATION DETAIL  
 SCALE: N.T.S.



4  
 C-4  
 RRH MOUNTING DETAIL  
 SCALE: N.T.S.

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 Consulting

SCHEDULE OF REVISIONS

| REV. NO. | DATE     | DESCRIPTION OF CHANGES      |
|----------|----------|-----------------------------|
| 7        |          |                             |
| 6        |          |                             |
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| 4        | 11/02/17 | REVISED PER CLIENT COMMENTS |
| 3        | 10/10/17 | REVISED PER CLIENT COMMENTS |
| 2        | 09/28/17 | ISSUED FOR CONSTRUCTION     |
| 1        | 08/16/17 | PER NEW RFDS                |
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Professional Engineer  
 NICHOLAS D. BARRILE  
 No. 28643  
 State of Connecticut

0 CLARK HILL ROAD  
 NAUGUTUCK, CT 06770  
 NEW HAVEN COUNTY

DRAWING TITLE:  
**CONSTRUCTION  
 DETAILS**

DRAWING SHEET: 5 OF 10

**C-4**

**SCHEDULE OF REVISIONS**

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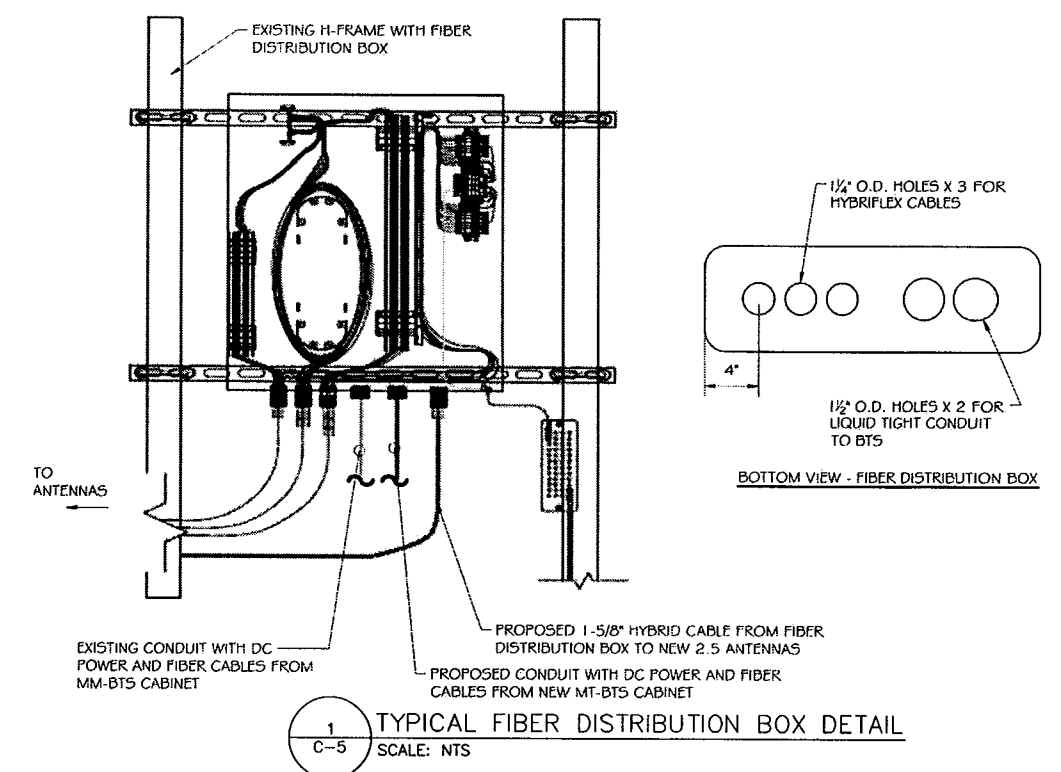
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**NICHOLAS D. GARILE**  
Professional Engineer  
No. 20003  
01/20/18

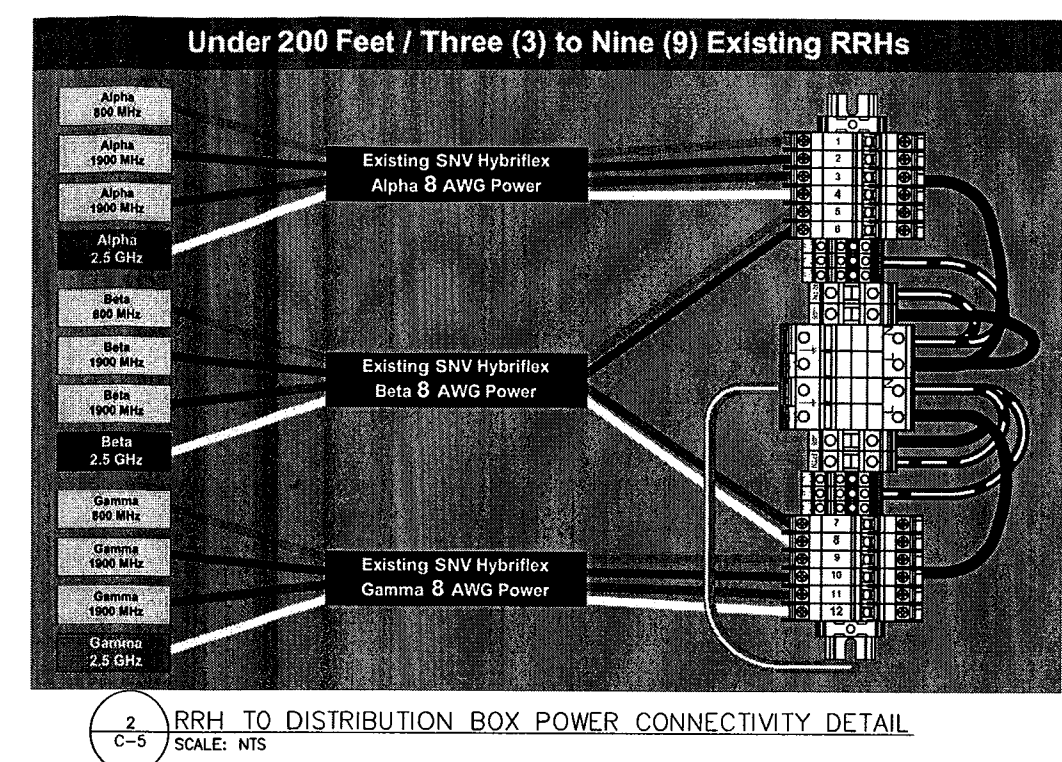
**CT09X0025**  
0 CLARK HILL ROAD  
NAUGTUCK, CT 06770  
NEW HAVEN COUNTY

DRAWING TITLE:  
**FIBER PLUMBING DIAGRAM**

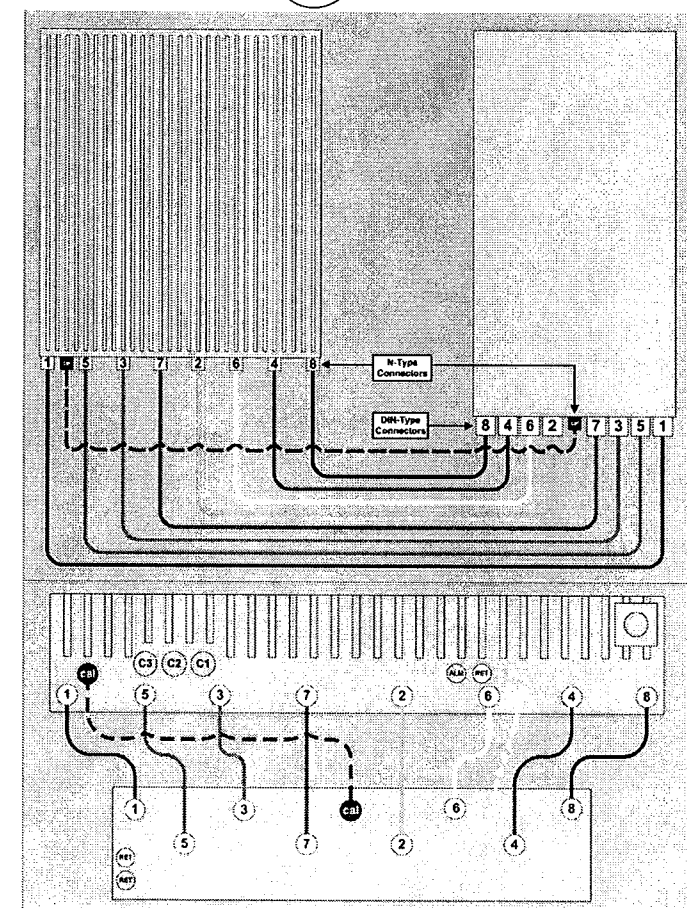
DRAWING SHEET: 6 OF 10



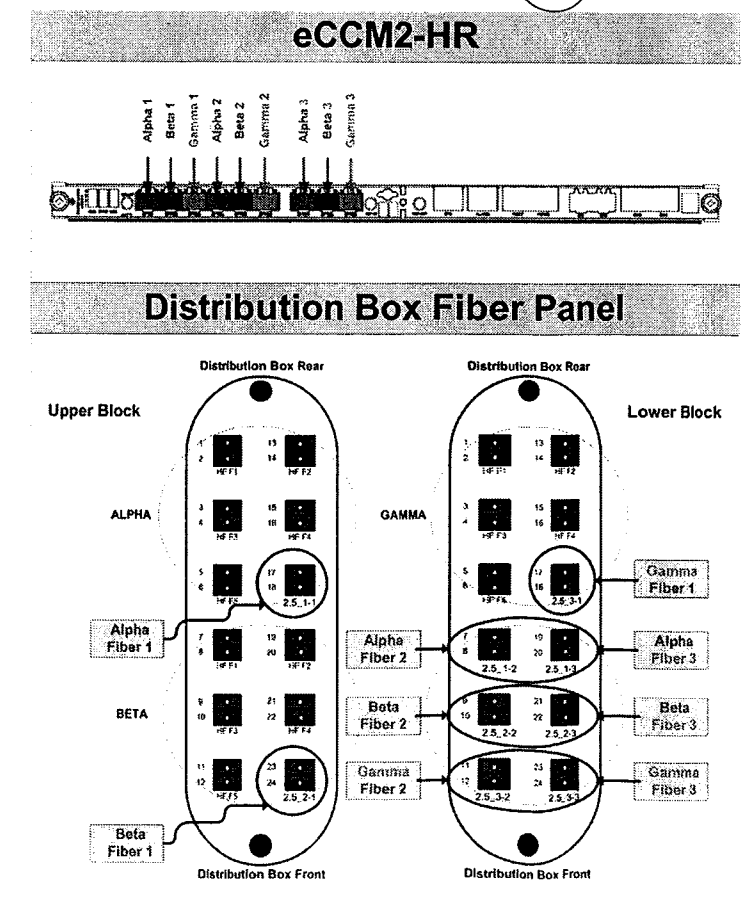
**1**  
C-5  
**TYPICAL FIBER DISTRIBUTION BOX DETAIL**  
SCALE: NTS



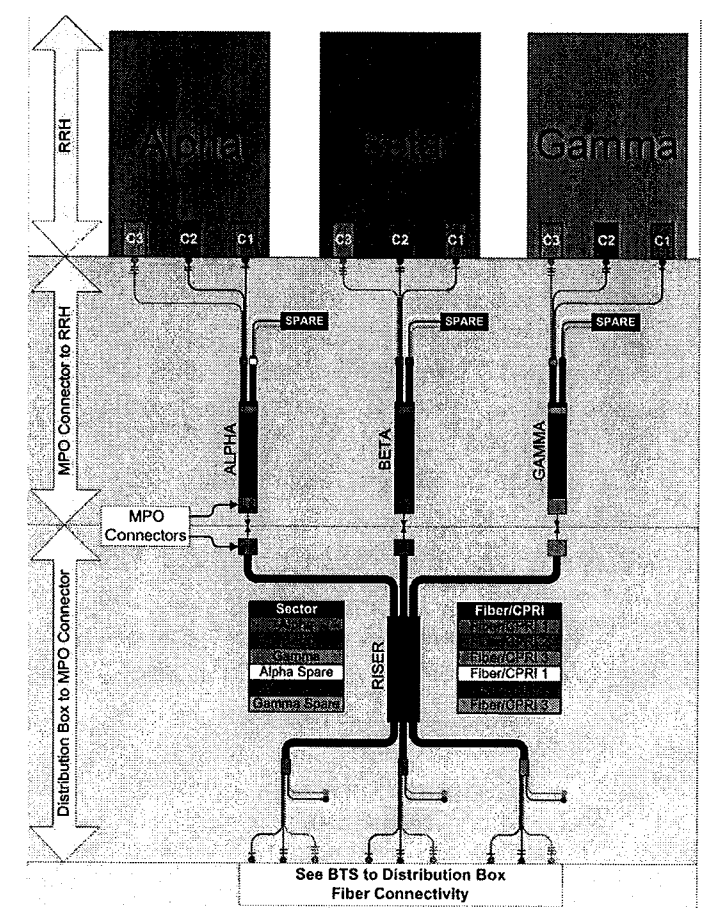
**2**  
C-5  
**RRH TO DISTRIBUTION BOX POWER CONNECTIVITY DETAIL**  
SCALE: NTS



**3**  
C-5  
**8T8R DETAIL**  
SCALE: NTS



**4**  
C-5  
**BTS TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL**  
SCALE: NTS

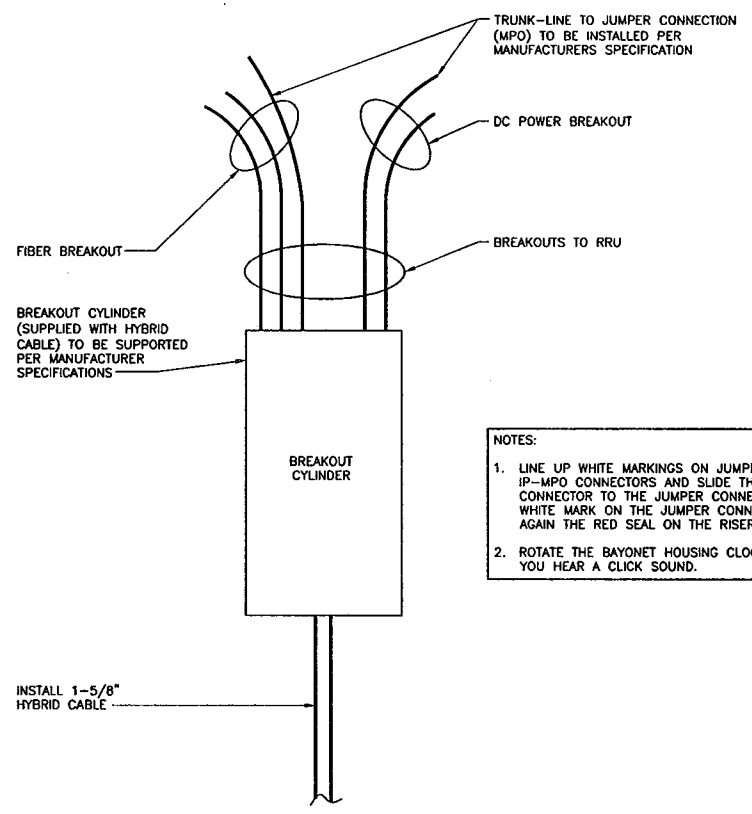


**5**  
C-5  
**RRH TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL**  
SCALE: NTS





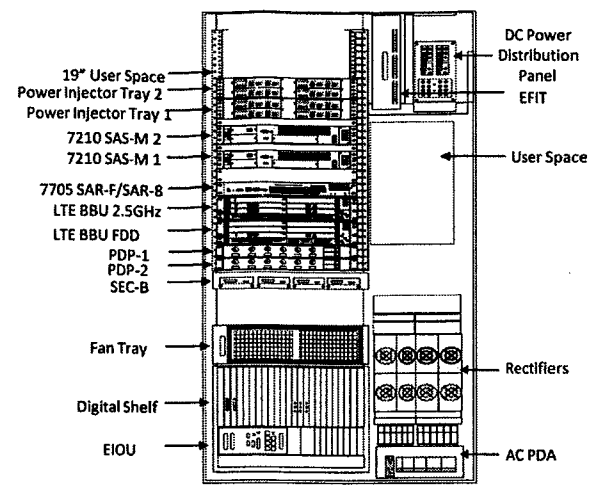




**NOTES:**

1. LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTORS AND SLIDE THE RISER CONNECTOR TO THE JUMPER CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAINST THE RED SEAL ON THE RISER CONNECTOR.
2. ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL YOU HEAR A CLICK SOUND.

**1** HYBRID BREAKOUT DETAIL  
C-7 SCALE: NTS



**2** EXISTING MMBS CABINET  
C-7 SCALE: NTS

**SCHEDULE OF REVISIONS**

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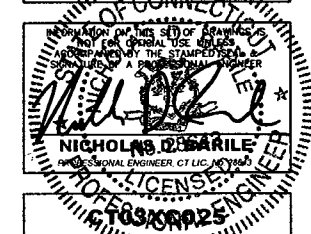
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**SCALE:** AS NOTED

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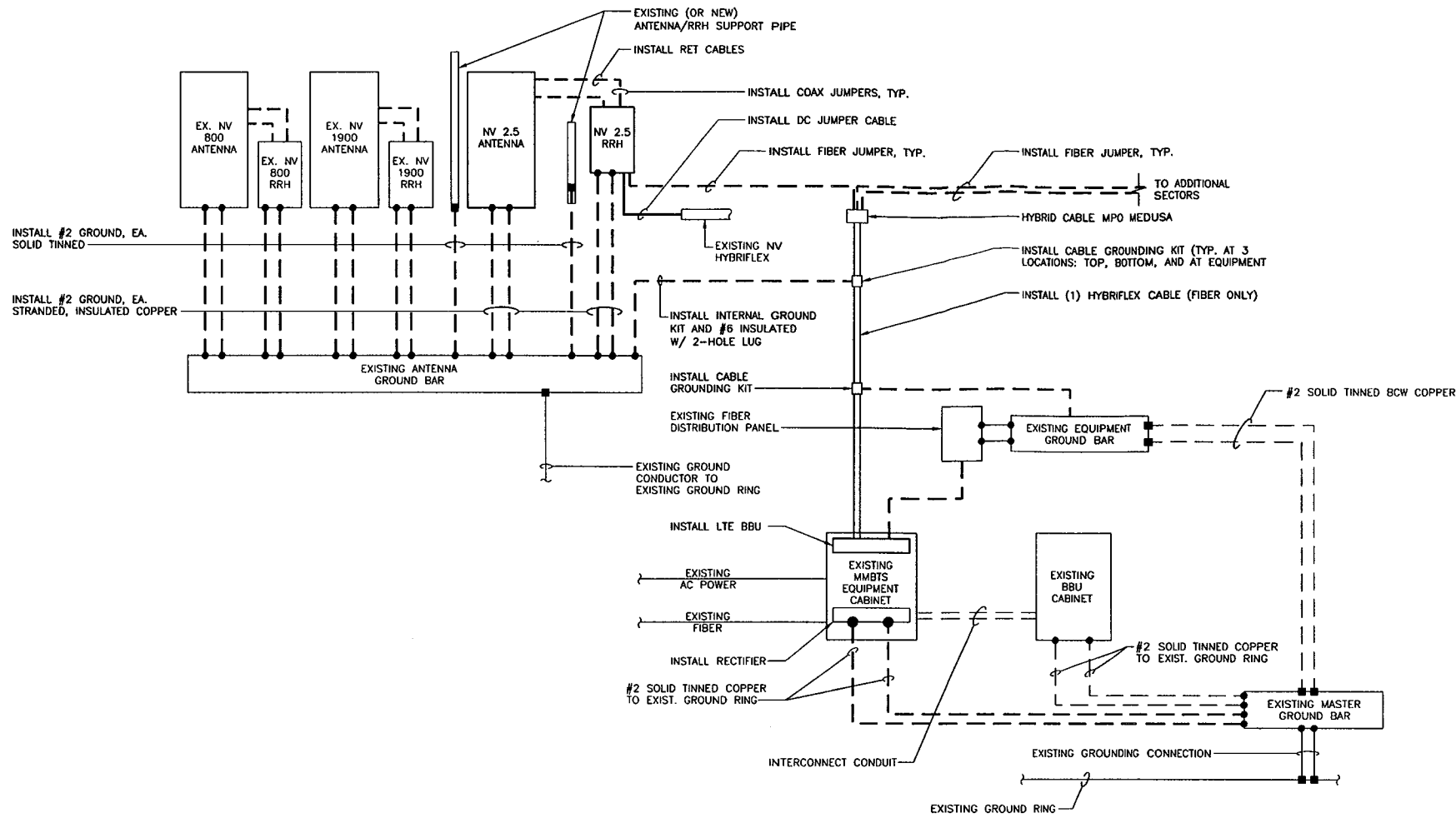
**DRAWING TITLE:**

**EQUIPMENT DETAILS**

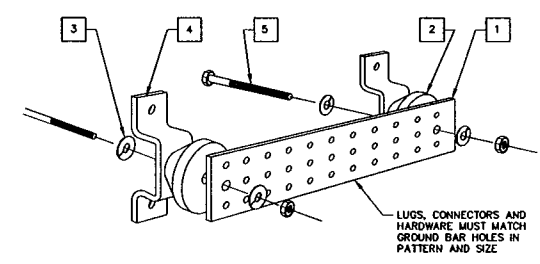
**DRAWING SHEET: 8 OF 10**

**C-7**





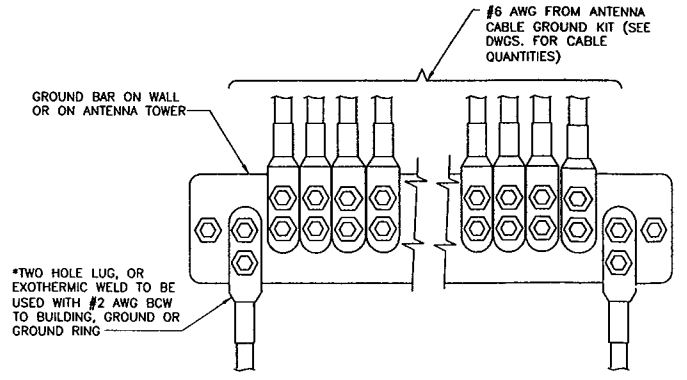
1 TYPICAL POWER & GROUNDING ONE-LINE DIAGRAM  
E-1 SCALE: N.T.S.



- LEGEND
1. COPPER GROUND BAR, 7/16" x 4" x 20", NEWTON INSTRUMENT CO. CAT. NO. 8-5142; HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
  2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
  3. 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-B.
  4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT. NO. A-8056.
  5. 5/8-11 x 1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT. NO. 3012-1.

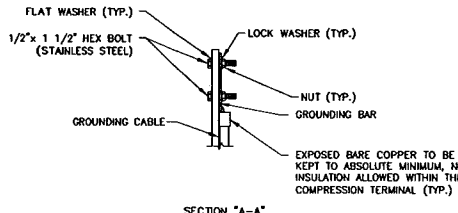
| GROUND BAR SCHEDULE |      |              |             |          |
|---------------------|------|--------------|-------------|----------|
| TYPE                | QTY. | MANUFACTURER | CAT. NO.    | REMARKS  |
| MGB                 | 2    | HARGER       | GB14420TMGB | OR EQUAL |
| CGB                 | 3    | HARGER       | GB14412TMGB | OR EQUAL |

2 TYPICAL GROUND BAR DETAIL  
E-1 SCALE: N.T.S.



- \* - GROUND BARS AT THE BOTTOM OF TOWERS/MONOPOLES SHALL ONLY USE EXOTHERMIC WELDS.
- ATTACH "DO NOT DISCONNECT" LABELS TO GROUND BARS. CAN USE BRASS TAG "DO NOT DISCONNECT" AT EACH HYBRIFLEX GROUND POINT OR BACK-A-LITE PLATE LABEL ON GROUND BAR.
- CONNECT SEQUENCE - BOLT/WASHER/NO-OX/GROUND BAR/NO-OX/WASHER/LOCK-WASHER/NUT. THIS IS REPEATED FOR EACH LUG CONNECTION POINT.

3 TYPICAL GROUND BAR CONNECTION PLAN  
E-1 SCALE: N.T.S.



- NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTIONS IS NOT PERMITTED.
  2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

4 TYPICAL GROUND BAR CONNECTION DETAIL  
E-1 SCALE: N.T.S.

- ELECTRICAL AND GROUNDING NOTES
1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
  2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
  3. 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.
  4. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
  5. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION.
  6. 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.
  7. WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT. ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
  8. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
  9. GROUNDING SHALL COMPLY WITH NEC ART. 250.
  10. GROUND HYBRIFLEX CABLE SHIELDS AT 3 LOCATIONS USING MANUFACTURER'S HYBRIFLEX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
  11. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
  12. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
  13. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
  14. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
  15. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
  16. BOND ANTENNA MOUNTING BRACKETS, HYBRIFLEX CABLE GROUND KITS, AND RRHs TO EGB PLACED NEAR THE ANTENNA LOCATION.
  17. BOND ANTENNA EGB'S AND MGB TO GROUND RING.
  18. CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULT FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMS MINIMUM RESISTANCE REQUIRED.
  19. CONTRACTOR SHALL CONDUCT ANTENNA, HYBRIFLEX CABLES, AND RRH RETURN-LOSS AND DISTANCE-TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.
  20. CONTRACTOR (CERTIFIED ELECTRICIAN) SHALL CHECK CAPACITY OF EXISTING SERVICE & PANEL ON SITE TO DETERMINE IF CAPACITY EXISTS TO ACCOMMODATE THE ADDED LOAD OF THIS PROJECT. ADVISE ENGINEER OF ANY DISCREPANCY.

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**Cherundolo**  
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SCHEDULE OF REVISIONS

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Professional Engineer  
SICOLAS A. BARILE  
Professional Engineer  
No. 06643

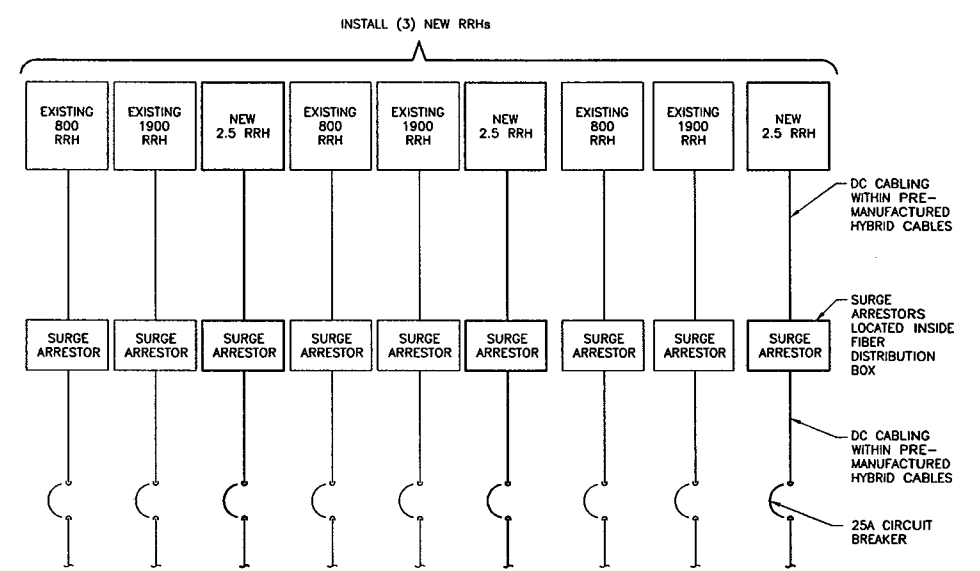
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NEW HAVEN COUNTY

DRAWING TITLE:  
**GROUNDING DETAILS**

DRAWING SHEET: 9 OF 10

**E-1**





1 DC ONE-LINE DIAGRAM  
E-2 SCALE: NTS

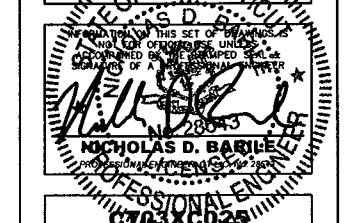
| A/C PANEL SCHEDULE |          |                   |          |
|--------------------|----------|-------------------|----------|
| VOLTAGE:           | 240V/120 | PANEL STATUS:     | EXISTING |
| MAIN BREAKER:      | 200 AMP  | MODEL NUMBER:     | TBD      |
| MOUNT:             | AT GRADE | PHASE:            | 1        |
| ENCLOSURE:         | NEMA 3R  | BUSS RATING:      | 200 AMP  |
|                    |          | NEUTRAL BAR:      | YES      |
|                    |          | N TO GROUND BOND: | YES      |
|                    |          | INTERNAL TVSS:    | YES      |
|                    |          | WIRE:             | 3        |
|                    |          | GROUND BAR:       | YES      |

2 AC PANEL SCHEDULE  
E-2 SCALE: NTS

| SCHEDULE OF REVISIONS |                                      |                        |
|-----------------------|--------------------------------------|------------------------|
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| 1                     | 08/16/17 PER NEW RFDS                |                        |
| 0                     | 05/16/17 INITIAL SUBMISSION          |                        |
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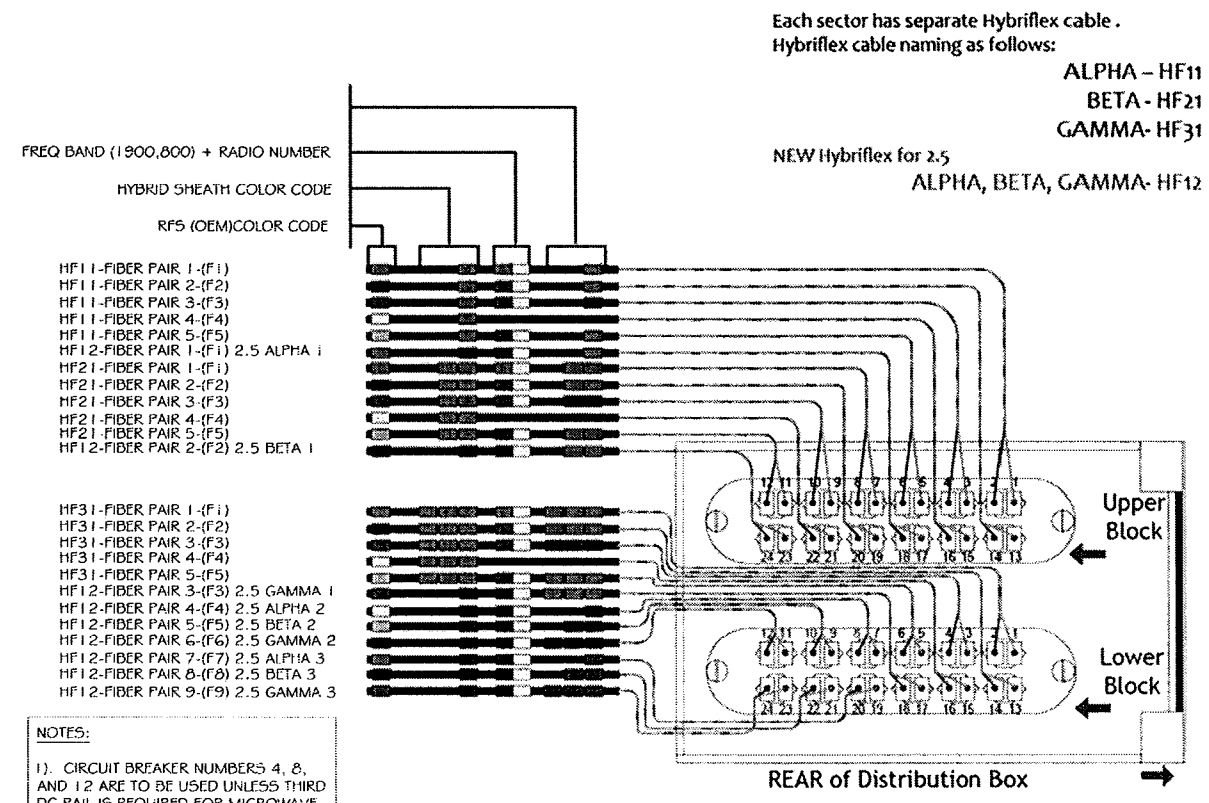


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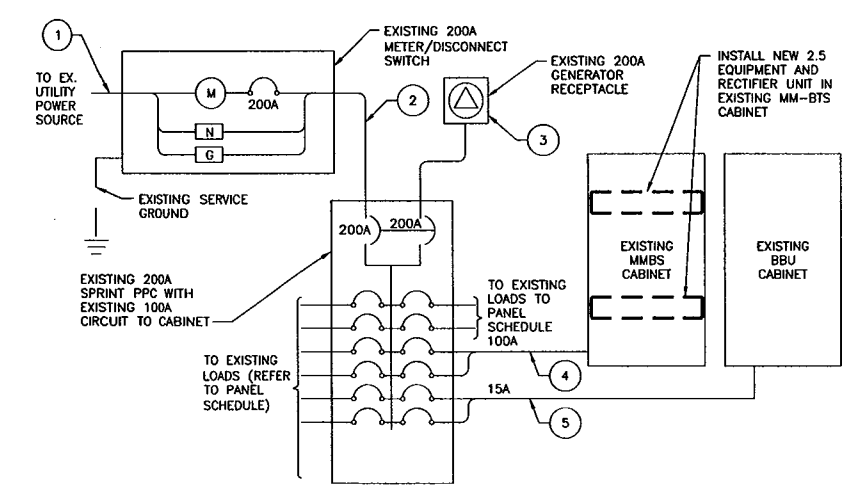
DRAWING TITLE:  
**DC POWER DETAILS & PANEL SCHEDULES**

DRAWING SHEET: 10 OF 10

**E-2**



3 TYPICAL FIBER DISTRIBUTION  
E-2 SCALE: NTS



| CIRCUIT SCHEDULE |                        |                        |  |
|------------------|------------------------|------------------------|--|
| NO.              | FROM                   | TO                     | CONFIGURATION                            |
| 1                | UTILITY SOURCE         | METER/DISCONNECT       | EXISTING                                 |
| 2                | METER/DISCONNECT       | TRANSFER & LOAD CENTER | EXISTING                                 |
| 3                | TRANSFER & LOAD CENTER | GENERATOR RECEPTACLE   | EXISTING                                 |
| 4                | TRANSFER & LOAD CENTER | EX. MMBS CABINET       | (3) #2 AWG, (1) #8 GND IN 1-1/2" CONDUIT |
| 5                | TRANSFER & LOAD CENTER | EX. BBU CABINET        | (2) #12 AWG, (1) #12 GND IN 3/4" CONDUIT |

4 ELECTRICAL ONE-LINE DIAGRAM  
E-2 SCALE: NTS

Each sector has separate Hybriflex cable.  
Hybriflex cable naming as follows:  
ALPHA - HF11  
BETA - HF21  
GAMMA - HF31  
NEW Hybriflex for 2.5  
ALPHA, BETA, GAMMA - HF12

- NOTES:
- 1). CIRCUIT BREAKER NUMBERS 4, 8, AND 12 ARE TO BE USED UNLESS THIRD DC RAIL IS REQUIRED FOR MICROWAVE.
  - 2). USE DC POWER LOOP.
  - 3). ALL UNUSED DC FEEDERS TO BE TERMINATED WITH WIRE NUTS AND TAPED.
  - 4). REMOVE ALL DEBRIS FROM INTERIOR OF FIBER DISTRIBUTION BOX WHEN COMPLETE.