4 Davis Road West, Suite 5 – Old Lyme, CT 06371

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

Re: Notice of Exempt Modification Application
530 Bushy Hill Road – Simsbury, CT 06070

October 11, 2018

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 panel antennas at the 115'centerline level of the Stealth Flagpole and 3 ground mounted RRH. Sprint proposes to replace 3 existing panel antennas with 3 new panel antennas (1 per sector) and add 6 new remote radio units (2 per sector) at ground level as well as 6 new coax cables and 12 diplexers, 6 ground based and 6 tower based. Sprint further proposes to remove and replace the existing radio and battery cabinetry with new cabinets.

The Sprint installation was initially zoning approved by the CT Siting Council on 7/23/2004. The original Building permit for this construction was issued by the Town of Simsbury on 9/13/2004. The attached construction and structural documents enclosed reflect the current reality of all the 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@lrivassoc.com

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
530 Bushy Hill Road, Simsbury, CT 06070

October 11, 2018

Dear Ms. Bachman:

Sprint Spectrum Realty Company, L.P. ("Sprint"), received CT Siting Council approval for an exempt modification on February 13, 2018; EM-SPRINT- 128-108124. Sprint subsequently found the need to change the proposed tower modification from that specified in the approved EM. Sprint, therefore, will not proceed with the EM approval received on that date and will instead resubmit for a new exempt modification with the revised equipment. Please advise if anything else is required to rescind the original approval, and clear the way for the subsequent resubmittal. Thank you.

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@lrivassoc.com

Cherundolo Consulting

4 Davis Road West, Suite 5 – Old Lyme, CT 06371

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

Re: Notice of Exempt Modification Application
530 Bushy Hill Road, Simsbury, CT 06070

Lat: N 41.81813
Long: W72.86304

October 11, 2018

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 panel antennas at the 115'centerline level of the Stealth Flagpole and 3 ground mounted RRH. Sprint proposes to replace 3 existing panel antennas with 3 new panel antennas (1 per sector) and add 6 new remote radio units (2 per sector) at ground level as well as 6 new coax cables and 12 diplexers, 6 ground based and 6 tower based. Sprint further proposes to remove and replace the existing radio and battery cabinetry with new cabinets. 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 Sprint installation was initially approved by the CT Siting Council on July 23, 2004 and the Permit for the Town of Simsbury was issued on September 13, 2004.

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 Mr. Eric Wellman the First Selectman for the Town of Simsbury, as well as Mr. James D. Rabbitt Town Planner for Simsbury for the Town and EDENS, the tower owner.
.
Attached is a summary of the planned modifications, including power density calculations reflecting the change in Sprint's operations at the facility. Also included is documentation of the structural sufficiency of the tower with proposed modifications to accommodate the revised antenna configuration.

Existing Facility

The the Simsbury facility is at 530 Bushy Hill Road and is owned by for EDENS, the Site coordinates are: N41.81813, W72.86304. The existing facility consists of a 120' Stealth Flagpole Tower. Sprint currently operates wireless communications equipment on a platform on a concrete slab at the facility and has 3 stealth mounted antennas at a centerline of 115' feet on the tower.

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

PFS/mtf

Additional Recipients:
Mr. Eric Wellman - First Selectman for the Town of Simsbury via Fed Ex
Mr. James D. Rabbitt, Town Planner for the Town of Simsbury via Fed Ex
EDENS, the tower owner via Fed Ex

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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

FedEx Shipment Receipt

Address Information

Ship to:	**Ship from:**
Mr Eric Wellman, 1st Selectman	Paul Sagristano
Town of Simsbury	CCC
993 Hopmeadow St.	4 Davis Road West Suite 5
SIMSBURY, CT	OLD LYME, CT
06070	06371
US	US
(860) 658-3231	9178410247

Shipment Information:
Tracking no.: 773453449700
Ship date: 10/11/2018
Estimated shipping charges: 18.87 USD

Package Information
Pricing option: FedEx Standard Rate
Service type: FedEx Express Saver
Package type: FedEx Envelope
Number of packages: 1
Total weight: 0.30 LBS
Declared Value: 0.00 USD
Special Services: Direct signature required
Pickup/Drop-off: Drop off package at FedEx location

Billing Information:
Bill transportation to: My Account - 429-429
Your reference: CT43XC825 - CSC resubmssion
P.O. no.:
Invoice no.:
Department no.:

Thank you for shipping online with FedEx ShipManager at fedex.com.

Please Note

After printing this label:
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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

FedEx Shipment Receipt

Address Information

Ship to:	**Ship from:**
Alden Bush	Paul Sagristano
EDENS	CCC
21 Customs House St.	4 Davis Road West
Suite 450	Suite 5
BOSTON, MA	OLD LYME, CT
02110	06371
US	US
617-369-6611	9178410247

Shipment Information:
Tracking no.: 773453425909
Ship date: 10/11/2018
Estimated shipping charges: 18.87 USD

Package Information
Pricing option: FedEx Standard Rate
Service type: FedEx Express Saver
Package type: FedEx Envelope
Number of packages: 1
Total weight: 0.50 LBS
Declared Value: 0.00 USD
Special Services: Direct signature required
Pickup/Drop-off: Drop off package at FedEx location

Billing Information:
Bill transportation to: My Account - 429-429
Your reference: CT43XC825 CSC to LL
P.O. no.:
Invoice no.:
Department no.:

Thank you for shipping online with FedEx ShipManager at fedex.com.

Please Note

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
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FedEx Shipment Receipt

Address Information

Ship to:	**Ship from:**
Mr. James D. Rabbit, Planner	Paul Sagristano
Town of Simsbury	CCC
993 Hopmeadow St.	4 Davis Road West
	Suite 5
SIMSBURY, CT	OLD LYME, CT
06070	06371
US	US
(860) 658-3231	9178410247

Shipment Information:
Tracking no.: 773453482651
Ship date: 10/11/2018
Estimated shipping charges: 18.87 USD

Package Information
Pricing option: FedEx Standard Rate
Service type: FedEx Express Saver
Package type: FedEx Envelope
Number of packages: 1
Total weight: 0.30 LBS
Declared Value: 0.00 USD
Special Services: Direct signature required
Pickup/Drop-off: Drop off package at FedEx location

Billing Information:
Bill transportation to: My Account - 429-429
Your reference: CT43XC825 CSC resubmission
P.O. no.:
Invoice no.:
Department no.:

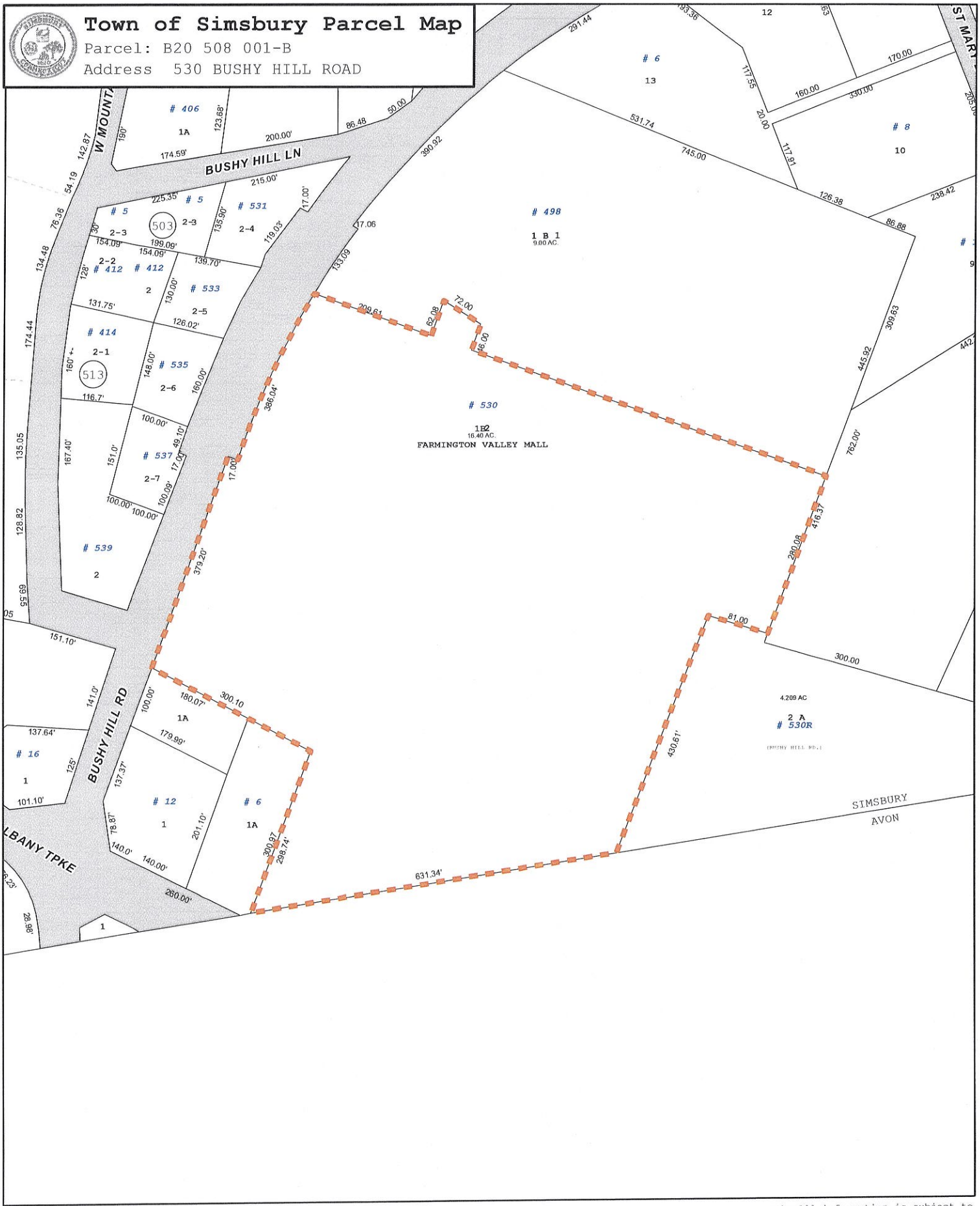
Thank you for shipping online with FedEx ShipManager at fedex.com.

Please Note

Town of Simsbury Parcel Map

Parcel: B20 508 001-B

Address 530 BUSHY HILL ROAD



1 inch = 200 feet

0 100 200 300 400 Feet

Disclaimer: This map is for informational purposes only All information is subject to verification by any user. The Town of Simsbury and its mapping contractors assume no legal responsibility for the information contained herein.

Map Produced: November 2017

Town of Simsbury
Property Listing Report

Parcel ID B20 508 001-B

Account 31116200

Property Information

Owner	E AND A/ I AND G SIMSBURY COMMONS LP
Address	530 BUSHY HILL ROAD
Mailing Address	PO BOX 528 COLUMBIA , SC 29202
Land Use	- Community Shopping Center
Land Class	Commercial

Census Tract	4661020
Neighborhood	0238
Zoning	B-3
Acreage	16.4
Utilities	
Lot Setting/ Desc	/

Photo

B20-508-001-B 05/17/2012

PARCEL VALUATIONS (Assessed value = 70% of Appraised Value)

	Appraised	Assessed
Buildings		
Outbuildings		
Improvements		
Extras		
Land		
Total	33500000	23450000
Previous		

Construction Details

Year Built	
Stories	1
Building Style	
Building Use	
Building Condition	Very Good/Good
Total Rooms	0
Bedrooms	0
Full Bathrooms	0
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	
Roof Cover	Compo_Built-Up

EXTERIOR WALLS:	
Primary	Concrete Block
Secondary	
INTERIOR WALLS:	
Primary	Dry Wall
Secondary	
FLOORS:	
Primary	Carpet
Secondary	
HEATING/AC:	
Heating Type	FHA
Heating Fuel	Heat Pump
AC Type	Central

BUILDING AREA:	
Effective Building Area	
Gross Building Area	
Total Living Area	173538

SALES HISTORY:	
Sale Date	11/10/2004
Sale Price	0
Book/ Page	0676/0582

Report Created On 1/19/2018

FAX NO. :
FROM : FLOR10-860-485-0361

... 1 1 0 3 1 3 TOWN OF SIMSBURY 930 BUSHY HILL ROAD
CONNECTICUT
** BUILDING PERMIT **

TOTAL ESTIMATED COST: $ 138700.00
... 10/13/2004 APPDATE: 09/13/2004 FEE: $ 1666.00

...ission is hereby granted to:

OWNER
SIMSBURY COMMONS
190 MAIN ST, STE 900
COLUMBIA
SC 29201

APPLICANT
SPRINT PCS, INC.
1 INTERNATIONAL BLVD
MAHWAH
NJ 07495
#684-4000

... area: ... SPRINT PCS TELECOMMUNICATIONS 120' STEALTH FLAG POLE ON PAD
... 930 BUSHY HILL ROADas per plans on file.
...SPRINT PCS TELECOMMUNICATIONS 120' STEALTH FLAG POLE ON PAD
...t #: Zone: No. of stories:

Richard Paquette
Building Official, Town of Simsbury

...e recipient of this permit accepts this permit on the condition that he as owner or representing the owner, agrees to ...comply with all building and zoning ordinances of the Town of Simsbury and the State of Connecticut Statutes regarding the ...se, occupancy, and type of building to be constructed.

OWNER'S COPY

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.ct.gov/csc

JUL - 1 2004
431825

June 30, 2004

Thomas J. Regan, Esquire
Brown Rudnick Berlack Isreals LLP
CityPlace I, 38th Floor
185 Asylum Street
Hartford, CT 06103-3402

RE: **DOCKET NO. 279** - Sprint Spectrum, L.P. d/b/a Sprint PCS application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 530 Bushy Hill Road, Simsbury, Connecticut.

Dear Attorney Regan:

By its Decision and Order dated June 23, 2004, the Connecticut Siting Council (Council) granted a Certificate of Environmental Compatibility and Public Need (Certificate) for the construction, maintenance and operation of a wireless telecommunications facility at 530 Bushy Hill Road, Simsbury, Connecticut.

Enclosed are the Council's Certificate, Findings of Fact, Opinion, and Decision and Order.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/laf

Enclosures (4)

CONNECTICUT SITING COUNCIL

DOCKET NO. 279 – Sprint Spectrum, L.P. d/b/a Sprint PCS application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 530 Bushy Hill Road, Simsbury, Connecticut.	}	Connecticut
	}	Siting
	}	Council

June 23, 2004

Opinion

On December 4, 2003, Sprint Spectrum L.P. (Sprint) applied to the Connecticut Siting Council (Council) for a Certificate of Environmental Compatibility and Public Need (Certificate) for the construction, operation and maintenance of a wireless telecommunications facility proposed to be located at 530 Bushy Hill Road (the Simsbury Common Mall) in Simsbury, Connecticut. Sprint had been searching for a tower site in this vicinity to provide Sprint service to existing coverage gaps in the area surrounding the intersection of Route 167 and Route 44 on the Simsbury-Canton border.

Sprint's facility would consist of a 120-foot flagpole tower designed to accommodate a total of three wireless carriers. AT&T Wireless PCS, an intervenor in this proceeding, seeks to place its antennas within the flagpole at a centerline of 108 feet above ground level (agl). Sprint's antennas would be located within the flagpole at the top of the tower. Sprint has offered the Town of Simsbury space on the tower for Town antennas.

The flagpole would be placed behind commercial buildings at the edge of a parking lot. No clearing of vegetation or access road construction would be required. The tower compound would be enclosed by a fence.

The flagpole would be fully visible along commercially-developed Route 44. Four homes along Joyce Lane would have some visibility of the flagpole above the trees. A visual analysis of the proposed tower indicates it would be visible to only approximately one percent of a two-mile radius study area.

The tower would have no effect on any rare, threatened or species of special concern in the area. The facility would have no effect on historic, architectural or archaeological resources listed on as eligible for the National Register of Historic Places. The closest wetland is approximately 50 feet east of the parking lot on which the facility would be built; however, this wetland is protected by an existing stockade fence.

The radio frequency power density levels at the base of the proposed tower would be well below federal and State standards for the frequencies used by wireless companies. If federal or state standards change, the Council will require that the tower be brought into compliance with such standards. The Council will require that the power densities be remodeled in the event other carriers add antennas to the tower.

Based on the record of this proceeding, the Council concludes that the proposed facility would be well sited to provide coverage to a heavily traveled area where several carriers currently have limited or unreliable service.

Therefore, the Council finds that the effects associated with the construction, operation, and maintenance of the proposed telecommunications facility, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with policies of the State concerning such effects, and are not sufficient reason to deny this application. Therefore, the Council will issue a Certificate for the construction, operation, and maintenance of a 120-foot flagpole tower and associated ground equipment at 530 Bushy Hill Road (the Simsbury Commons Mall), Simsbury, Connecticut.

DOCKET NO. 279 – Sprint Spectrum, L.P. d/b/a Sprint PCS application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 530 Bushy Hill Road, Simsbury, Connecticut.	}	Connecticut
	}	Siting
	}	Council

June 23, 2004

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Sprint Spectrum, L.P. for the construction, maintenance and operation of a wireless telecommunications facility at 530 Bushy Hill Road, Simsbury, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be designed as a flagpole and shall be constructed no taller than 120 feet above ground level to provide the proposed telecommunications services to both public and private entities.

2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Simsbury and all parties and intervenors, as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:

   a) a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment building, access, utility line, and landscaping; and
   b) construction plans for site preparation, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of electromagnetic radio frequency power density is submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

6. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

7. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

8. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.

9. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved. Any request for extensions of the period shall be filed with the Council not later than sixty days prior to expiration date of the Certificate and shall be served on all parties and intervenors, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the Hartford Courant, Valley News, and The Farmington Valley Post.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

Applicant	**Its Representative**
Sprint Spectrum L.P. d/b/a Sprint PCS	Thomas J. Regan Brown, Rudnick, Berlack, Israels, LLP City Place I 185 Asylum Avenue Hartford, CT 06103-3402 (860) 509-6500
Intervenor	**Its Representative**
AT&T Wireless PCS, LLC d/b/a AT&T Wireless	Christopher B. Fisher, Esq. Cuddy & Feder, LLP 90 Maple Avenue White Plains, NY 10601

CERTIFICATION

The undersigned members of the Connecticut Siting Council (Council) hereby certify that they have heard this case, or read the record thereof, in **DOCKET NO. 279** - Sprint Spectrum, L.P. d/b/a Sprint PCS application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 530 Bushy Hill Road, Simsbury, Connecticut, and voted as follows to approve the proposed site:

Council Members	Vote Cast
Pamela B. Katz, P.E., Chairman	Yes
Commissioner Donald W. Downes Designee: Gerald J. Heffernan	Yes
Commissioner Arthur J. Rocque, Jr. Designee: Brian J. Emerick	Abstained
Philip T. Ashton	Yes
Daniel P. Lynch, Jr.	Yes
James J. Murphy, Jr.	Abstained
Brian F. O'Neill	Yes
Colin C. Tait	Yes
Edward S. Wilensky	Yes

Dated at New Britain, Connecticut June 23, 2004.

STATE OF CONNECTICUT)

ss. New Britain, Connecticut :

COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the Findings of Fact, Opinion, and Decision and Order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:

S. Derek Phelps
Executive Director
Connecticut Siting Council

I certify that a copy of the Findings of Fact, Opinion, and Decision and Order in Docket No. 279 has been forwarded by Certified First Class Return Receipt Requested mail on June 30, 2004, to all parties and intervenors of record as listed on the attached service list, dated December 22, 2003.

ATTEST:

Lisa A. Fontaine
Administrative Assistant
Connecticut Siting Council

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: CT43XC825

Simsbury_Bushy Hill Rd
530 Bushy Hill Road
Simsbury, CT 06070

October 4, 2018

EBI Project Number: 6218006465

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	10.04 %

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

EBI Consulting
environmental | engineering | due diligence

October 4, 2018

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

Emissions Analysis for Site: **CT43XC825 – Simsbury_Bushy Hill Rd**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **530 Bushy Hill Road, Simsbury, 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ 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 ($\mu W/cm^2$). The general population exposure limits for the 850 MHz Band is approximately 567 $\mu W/cm^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **530 Bushy Hill Road, Simsbury, 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 for directional panel antennas, 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 50 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 for directional panel antennas, 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** 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 for directional panel antennas, 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 **115 feet** above ground level (AGL) for **Sector A**, **115 feet** above ground level (AGL) for **Sector B** and **115 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 #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Commscope DHHTT65B-3XR	Make / Model:	Commscope DHHTT65B-3XR	Make / Model:	Commscope DHHTT65B-3XR
Gain:	13.35 / 15.25/15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd
Height (AGL):	**115 feet**	Height (AGL):	**115 feet**	Height (AGL):	**115 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)
Channel Count	18	Channel Count	18	Channel Count	18
Total TX Power(W):	440 Watts	Total TX Power(W):	440 Watts	Total TX Power(W):	440 Watts
ERP (W):	13,072.94	ERP (W):	13,072.94	ERP (W):	13,072.94
Antenna A1 MPE%	**4.56 %**	Antenna B1 MPE%	**4.56 %**	Antenna C1 MPE%	**4.56 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**4.56 %**
AT&T	5.48 %
Site Total MPE %:	**10.04 %**

SPRINT Sector A Total:	4.56 %
SPRINT Sector B Total:	4.56 %
SPRINT Sector C Total:	4.56 %
Site Total:	10.04 %

SPRINT _ Frequency Band / Technology Power Values (Per Sector)	**# Channels**	**Watts ERP (Per Channel)**	**Height (feet)**	**Total Power Density ($\mu W/cm^2$)**	**Frequency (MHz)**	**Allowable MPE ($\mu W/cm^2$)**	**Calculated % MPE**
Sprint 850 MHz CDMA	1	432.54	115	1.31	850 MHz	567	0.24%
Sprint 850 MHz LTE	2	1,081.36	115	6.54	850 MHz	567	1.15%
Sprint 1900 MHz (PCS) CDMA	5	535.94	115	8.11	1900 MHz (PCS)	1000	0.81%
Sprint 1900 MHz (PCS) LTE	2	1,339.86	115	8.11	1900 MHz (PCS)	1000	0.81%
Sprint 2500 MHz (BRS) LTE	8	639.78	115	15.49	2500 MHz (BRS)	1000	1.55%
						Total:	**4.56%**

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:	4.56 %
Sector B:	4.56 %
Sector C:	4.56 %
SPRINT Maximum Total (per sector):	4.56 %
Site Total:	10.04 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **10.04 %** 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.

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED

September 13, 2018

Tom Jupin
Charles Cherundolo Consulting, Inc.
1280 Rt. 46 West
Parsippany, NJ 07054

Ramaker & Associates, Inc.
855 Community Drive
Sauk City, WI 53583

SUBJECT: **STRUCTURAL ASSESSMENT**
120-FOOT MONOPOLE TOWER

CARRIER: **SPRINT**

SITE: **CT43XC825**
530 BUSHY HILL ROAD
SIMSBURY, HARTFORD COUNTY, CONNECTICUT 06070
RAMAKER & ASSOCIATES PROJECT NUMBER: 23019

RESULTS:	**TOWER:**	**76.5%**	**PASS**
	FOUNDATION:	**63.4%**	**PASS**

Dear Tom Jupin:

Ramaker & Associates, Inc. (RAMAKER) respectfully submits this structural assessment for the above-mentioned site. The purpose of this report is to determine the structural integrity of the existing structure with the existing and proposed loading. Engineering recommendations regarding the analysis results are provided in the following pages.

RAMAKER developed a finite element model of the tower using tnxTower analysis software. All information contained herein is valid only for the described structure configuration and loading conditions. RAMAKER reserves the right to modify our recommendations should alterations to the tower loading occur.

If you have any questions or comments, please do not hesitate to contact our office.

Sincerely,

RAMAKER & ASSOCIATES, INC.

Thomas E. Moore
Project Engineer

James R. Skowronski, P.E.
Supervising Engineer

STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED
PROFESSIONAL ENGINEER

ANALYSIS CRITERIA

State Building Code	2016 CT State Building Code
Adopted Building Code	2012 IBC
Referenced Standard	TIA-222-G
Risk Category	II
Ultimate Design Wind Speed, V_{ult}	120 mph (3 sec. gust)
Nominal Design Wind Speed, V_{asd}	93 mph (3 sec. gust)
Design Wind Speed w/ Ice	40 mph (3 sec. gust)
Ice Thickness	1 inch
Exposure Category	C
Topographic Feature	None

SUPPORTING DOCUMENTATION

- Tower and foundation drawings by EEI, job number 12826, dated 8/12/04
- Tower modification drawings by EEI, job number 12826, dated 6/7/18
- Construction drawings by RAMAKER, project number 23019
- Site visit(s) conducted by RAMAKER
- Other pertinent data procured or assumed by RAMAKER during site due diligence activities

TOWER LOADING

RAMAKER understands that the loading to be used for this analysis will consist of the antenna equipment, mount, and cable configurations as shown in the following chart:

Elevation	Appurtenance	Mount	Coax	Owner	Status
119	(1) 14" Decorative Ball	Top of Tower	--	--	Existing
	(1) 8'x12' Flag		--	--	Existing
115	**(3) Panel Antenna**	Stealth Mount	(6) 1-1/4 **(6) 1-1/4**	Sprint	**Remove**
	(3) Commscope DHHTT65B-3XR				**Proposed**
	(3) CCI DPO-7126Y-0-T1				
	(3) RFS KIT-FD9R6004/1C-DL				
111.5	**(1) 20" Stealth Shroud**		--		**Remove**
	(1) 30" Stealth Shroud				**Proposed**
104	(3) Andrew SBNHH-1D65A	Stealth Mount	(3) 1-1/4	AT&T	Existing
	(3) CCI DTMABP7819VG12A				
101.5	(1) 30" Stealth Shroud		--		Existing
96	(3) Andrew SBNHH-1D65A	Stealth Mount	(3) 1-1/4		Existing
	(6) Kaelus TMA2117F00V1-1				
	(6) Kaelus TBC0020F1V1				
91.25	(1) 30" Stealth Shroud		--		Existing

TOWER RESULTS

The maximum tower member stress capacities under the loading conditions previously described are as follows:

Component Type	Percent Capacity	Pass/Fail
Section 1	52.0	Pass
Section 2	55.7	Pass
Section 3	55.7	Pass
Section 4	33.3	Pass
Section 5	62.1	Pass
Anchor Rod	55.1	Pass
Base Plate	76.5	Pass
RATING	**76.5**	**PASS**

Note: A rating of 105% or less is within engineering tolerances and considered acceptable.

Results of the analysis show that the existing tower will be stressed to a maximum of 76.5 percent of capacity. Therefore, the existing tower will pass the TIA-222-G analysis requirements under proposed loading conditions.

FOUNDATION RESULTS

The maximum foundation stress capacities are as follows:

Component Type	Percent Capacity	Pass/Fail
Soil Interaction	63.4	Pass
Structural	22.4	Pass
RATING	**63.4**	**PASS**

Note: A rating of 105% or less is within engineering tolerances and considered acceptable.

The foundations were analyzed utilizing the foundation drawings referenced above. Results of the analysis show that the existing foundation will be stressed to a maximum of 63.4 percent of capacity. Therefore, the existing foundation will pass the TIA-222-G analysis requirements under proposed loading conditions.

LIMITATIONS

The recommendations contained within this report were developed using the supporting documentation as previously described. All recommendations pertain only to the proposed antenna installation activities as described in this report. RAMAKER assumes no responsibility for failures caused by factors beyond our control. These include but are not limited to the following:

- Missing, corroding, and/or deteriorating members
- Improper manufacturing and/or construction
- Improper maintenance

RAMAKER assumes no responsibility for modifications completed prior to or hereafter in which RAMAKER was not directly involved. These modifications include but are not limited to the following:

- Replacing or strengthening bracing members
- Reinforcing or extending vertical members
- Installing or removing antenna mounting gates or side arms
- Changing loading configurations

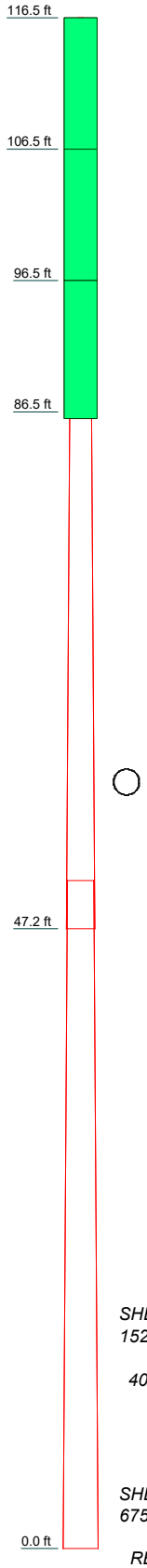
The tower owner is responsible for verifying that the existing loading on the structure is consistent with the loading applied to the structure within this report. If there is any information contrary to that contained herein, or if there are any defects arising from the original design, material, fabrication and erection deficiencies, this report should be disregarded and RAMAKER should be contacted immediately. RAMAKER is not liable for any representation, recommendation, or conclusion not expressly stated herein.

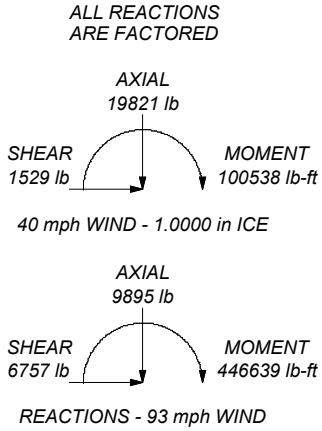
This analysis pertains only to the tower structure, and no analyses or conclusions were made regarding the antenna and equipment mounting structure(s). Analysis and certification of the antenna and equipment mounting structure(s) is performed and submitted separately.

ATTACHMENTS

- Analysis Figures
- Analysis Calculations

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	10.00	1	0.3370		4.5000	4.5000	A53-B-35	150.0
2	0.50	1	2.0000		4.0000	4.5000		24.1
3	9.50	1	2.0000		4.0000	4.0000		406.2
4	0.50	1	2.5000		4.0000	5.0000		26.7
5	9.50	1	2.5000		5.0000	5.0000		634.7
6	0.50	1	2.5000		5.0000	19.5000	A572-50	130.3
7	38.83	18	0.1875	3.66	19.5000	25.0700		1737.6
8	50.83	18	0.1875		24.1700	31.2500	A572-65	2833.0
								5942.6





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
14" Decorative Flagpole Ball	119	10' x 30" Shroud (ATT)	101.5
8'x12' Flag	119	DTMABP7819VG12A	98
DHHTT65B-3XR w/Mount Pipe	115	DTMABP7819VG12A	98
DHHTT65B-3XR w/Mount Pipe	115	DTMABP7819VG12A	98
DPO-7126Y-0-T1	115	SBNHH-1D65A w/Mount Pipe	96
DPO-7126Y-0-T1	115	SBNHH-1D65A w/Mount Pipe	96
DPO-7126Y-0-T1	115	(2) TBC0020F1Vxx-1 Triplexer	96
KIT-FD9R6004/1C-DL	115	(2) TBC0020F1Vxx-1 Triplexer	96
KIT-FD9R6004/1C-DL	115	(2) TBC0020F1Vxx-1 Triplexer	96
KIT-FD9R6004/1C-DL	115	(2) TMA2117F00V1-1	96
DHHTT65B-3XR w/Mount Pipe	115	(2) TMA2117F00V1-1	96
10' x 30" Shroud (Sprint)	111.5	(2) TMA2117F00V1-1	96
SBNHH-1D65A w/Mount Pipe	104	SBNHH-1D65A w/Mount Pipe	96
SBNHH-1D65A w/Mount Pipe	104	10.5' x 30" Shroud (ATT)	91.25
SBNHH-1D65A w/Mount Pipe	104		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A572-65	65 ksi	80 ksi
A572-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 62.1%

Ramaker & Associates, Inc
855 Community Drive
Sauk City, WI 53583
Phone: (608) 643-4100
FAX:

Job: CT43XC825			
Project: 23019			
Client: Sprint/CCCI	Drawn by: TEM	App'd:	
Code: TIA-222-G	Date: 09/13/18	Scale: NTS	
Path: I:\23000\23019\Structural\Risa\23019 rev6.eri		Dwg No. E-1	

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 93 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	116.50-106.50	10.00	0.00	Round	4.5000	4.5000	0.3370		A53-B-35 (35 ksi)
L2	106.50-106.00	0.50	0.00	Round	4.0000	4.5000	2.0000		A572-50 (50 ksi)
L3	106.00-96.50	9.50	0.00	Round	4.0000	4.0000	2.0000		A572-50 (50 ksi)
L4	96.50-96.00	0.50	0.00	Round	4.0000	5.0000	2.5000		A572-50 (50 ksi)
L5	96.00-86.50	9.50	0.00	Round	5.0000	5.0000	2.5000		A572-50 (50 ksi)
L6	86.50-86.00	0.50	0.00	Round	5.0000	19.5000	2.5000		A572-50 (50 ksi)
L7	86.00-47.17	38.83	3.66	18	19.5000	25.0700	0.1875	0.5625	A572-65 (65 ksi)
L8	47.17-0.00	50.83		18	24.1700	31.2500	0.1875	0.5625	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	4.5000	4.4074	9.6105	1.4767	2.2500	4.2713	19.2210	2.2024	0.0000	0
	4.5000	4.4074	9.6105	1.4767	2.2500	4.2713	19.2210	2.2024	0.0000	0
L2	4.0000	12.5664	12.5664	1.0000	2.0000	6.2832	25.1327	6.2794	0.0000	0
	4.5000	15.7080	20.1258	1.1319	2.2500	8.9448	40.2517	7.8493	0.0000	0
L3	4.0000	12.5664	12.5664	1.0000	2.0000	6.2832	25.1327	6.2794	0.0000	0
	4.0000	12.5664	12.5664	1.0000	2.0000	6.2832	25.1327	6.2794	0.0000	0
L4	4.0000	11.7810	12.5173	1.0308	2.0000	6.2586	25.0346	5.8870	0.0000	0
	5.0000	19.6350	30.6796	1.2500	2.5000	12.2718	61.3592	9.8116	0.0000	0
L5	5.0000	19.6350	30.6796	1.2500	2.5000	12.2718	61.3592	9.8116	0.0000	0
	5.0000	19.6350	30.6796	1.2500	2.5000	12.2718	61.3592	9.8116	0.0000	0
L6	5.0000	19.6350	30.6796	1.2500	2.5000	12.2718	61.3592	9.8116	0.0000	0
	19.5000	133.5177	4927.6372	6.0751	9.7500	505.3987	9855.2743	66.7190	0.0000	0
L7	19.7777	11.4934	541.5782	6.8559	9.9060	54.6717	1083.8689	5.7478	3.1680	16.896
	25.4336	14.8082	1158.3177	8.8333	12.7356	90.9515	2318.1595	7.4055	4.1483	22.124
L8	25.0374	14.2726	1037.1185	8.5138	12.2784	84.4672	2075.6016	7.1376	3.9899	21.28
	31.7089	18.4861	2253.4860	11.0272	15.8750	141.9519	4509.9372	9.2448	5.2360	27.925

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 116.50-106.50				1	0	1			
L2 106.50-106.00				1	0	1			
L3 106.00-96.50				1	0	1			
L4 96.50-96.00				1	0	1			
L5 96.00-86.50				1	0	1			
L6 86.50-86.00				1	0	1			
L7 86.00-47.17				1	1	1			
L8 47.17-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
*********											

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
*********									
1 1/4 (Sprint)	C	No	Yes	Inside Pole	115.00 - 0.00	6	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
1 1/4 (Sprint)	C	No	Yes	Inside Pole	115.00 - 0.00	6	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
*********									
1 1/4 (ATT)	C	No	Yes	Inside Pole	104.00 - 0.00	3	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
							1" Ice	0.00	0.66
*********									
1 1/4	C	No	Yes	Inside Pole	96.00 - 0.00	3	No Ice	0.00	0.66
(ATT)							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
*********									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	116.50-106.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	67.32
L2	106.50-106.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.96
L3	106.00-96.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	90.09
L4	96.50-96.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	4.95
L5	96.00-86.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	112.86
L6	86.50-86.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	5.94
L7	86.00-47.17	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	461.30
L8	47.17-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	560.38

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	116.50-106.50	A	2.259	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	67.32
L2	106.50-106.00	A	2.248	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.96
L3	106.00-96.50	A	2.237	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	90.09
L4	96.50-96.00	A	2.226	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	4.95
L5	96.00-86.50	A	2.214	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	112.86
L6	86.50-86.00	A	2.202	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	5.94
L7	86.00-47.17	A	2.144	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	461.30
L8	47.17-0.00	A	1.935	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	560.38

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

User Defined Loads

Description	Elevation ft	Offset From Centroid ft	Azimuth Angle °		Weight lb	F_x lb	F_z lb	Wind Force lb	C_AA_C ft^2
8'x12' Flag	119.00	0.00	0.0000	No Ice	20.00	0.00	0.00	177.60	**5.85**
				Ice	30.00	0.00	0.00	32.80	**5.84**
				Service	20.00	0.00	0.00	73.90	**6.53**

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
**********									
14" Decorative Flagpole Ball	C	None		0.0000	119.00	No Ice	0.67	0.67	45.00
						1/2" Ice	1.07	1.07	59.48
						1" Ice	1.23	1.23	76.15
**********									
**********									
DHHTT65B-3XR w/Mount Pipe	A	From Face	0.50	0.0000	115.00	No Ice	0.00	0.00	70.95
			0.00			1/2" Ice	0.00	0.00	70.95
			0.00			1" Ice	0.00	0.00	70.95

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
DHHTT65B-3XR w/Mount Pipe	B	From Face	0.50 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	70.95 70.95 70.95
DHHTT65B-3XR w/Mount Pipe	C	From Face	0.50 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	70.95 70.95 70.95
DPO-7126Y-0-T1	A	From Face	0.50 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	7.30 7.30 7.30
DPO-7126Y-0-T1	B	From Face	0.50 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	7.30 7.30 7.30
DPO-7126Y-0-T1	C	From Face	0.50 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	7.30 7.30 7.30
KIT-FD9R6004/1C-DL	A	From Face	0.50 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	6.40 6.40 6.40
KIT-FD9R6004/1C-DL	B	From Face	0.50 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	6.40 6.40 6.40
KIT-FD9R6004/1C-DL	C	From Face	0.50 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	6.40 6.40 6.40
10' x 30" Shroud (Sprint)	C	None		0.0000	111.50	No Ice 1/2" Ice 1" Ice	13.33 19.05 19.77	13.33 19.05 19.77	25.00 235.77 455.86
********** **********									
SBNHH-1D65A w/Mount Pipe	A	From Face	0.50 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	51.75 51.75 51.75
SBNHH-1D65A w/Mount Pipe	B	From Face	0.50 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	51.75 51.75 51.75
SBNHH-1D65A w/Mount Pipe	C	From Face	0.50 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	51.75 51.75 51.75
DTMABP7819VG12A	A	From Face	0.50 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	19.18 19.18 19.18
DTMABP7819VG12A	B	From Face	0.50 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	19.18 19.18 19.18
DTMABP7819VG12A	C	From Face	0.50 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	19.18 19.18 19.18
10' x 30" Shroud (ATT)	C	None		0.0000	101.50	No Ice 1/2" Ice 1" Ice	13.33 19.05 19.77	13.33 19.05 19.77	25.00 235.77 455.86
********** **********									
SBNHH-1D65A w/Mount Pipe	A	From Face	0.50 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	51.75 51.75 51.75
SBNHH-1D65A w/Mount Pipe	B	From Face	0.50 0.00	0.0000	96.00	No Ice 1/2" Ice	0.00 0.00	0.00 0.00	51.75 51.75

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	0.00	0.00	51.75
SBNHH-1D65A w/Mount Pipe	C	From Face	0.50	0.0000	96.00	No Ice	0.00	0.00	51.75
			0.00			1/2" Ice	0.00	0.00	51.75
			0.00			1" Ice	0.00	0.00	51.75
(2) TBC0020F1Vxx-1 Triplexer	A	From Face	0.50	0.0000	96.00	No Ice	0.00	0.00	13.00
			0.00			1/2" Ice	0.00	0.00	13.00
			-6.00			1" Ice	0.00	0.00	13.00
(2) TBC0020F1Vxx-1 Triplexer	B	From Face	0.50	0.0000	96.00	No Ice	0.00	0.00	13.00
			0.00			1/2" Ice	0.00	0.00	13.00
			-6.00			1" Ice	0.00	0.00	13.00
(2) TBC0020F1Vxx-1 Triplexer	C	From Face	0.50	0.0000	96.00	No Ice	0.00	0.00	13.00
			0.00			1/2" Ice	0.00	0.00	13.00
			-6.00			1" Ice	0.00	0.00	13.00
(2) TMA2117F00V1-1	A	From Face	0.50	0.0000	96.00	No Ice	0.00	0.00	26.00
			0.00			1/2" Ice	0.00	0.00	26.00
			-8.00			1" Ice	0.00	0.00	26.00
(2) TMA2117F00V1-1	B	From Face	0.50	0.0000	96.00	No Ice	0.00	0.00	26.00
			0.00			1/2" Ice	0.00	0.00	26.00
			-8.00			1" Ice	0.00	0.00	26.00
(2) TMA2117F00V1-1	C	From Face	0.50	0.0000	96.00	No Ice	0.00	0.00	26.00
			0.00			1/2" Ice	0.00	0.00	26.00
			-8.00			1" Ice	0.00	0.00	26.00
10.5' x 30" Shroud (ATT)	C	None		0.0000	91.25	No Ice	14.12	14.12	25.00
						1/2" Ice	20.11	20.11	245.09
						1" Ice	20.86	20.86	474.80
**********									
**********									

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	5942.65					
Bracing Weight	0.00					
Total Member Self-Weight	5942.65			0.00	0.00	
Total Weight	8245.44			0.00	0.00	
Wind 0 deg - No Ice		0.00	-4223.39	-265822.62	0.00	0.00
Wind 30 deg - No Ice		2111.70	-3657.56	-230209.14	-132911.31	0.00
Wind 60 deg - No Ice		3657.56	-2111.70	-132911.31	-230209.14	0.00
Wind 90 deg - No Ice		4223.39	0.00	0.00	-265822.62	0.00
Wind 120 deg - No Ice		3657.56	2111.70	132911.31	-230209.14	0.00
Wind 150 deg - No Ice		2111.70	3657.56	230209.14	-132911.31	0.00
Wind 180 deg - No Ice		0.00	4223.39	265822.62	0.00	0.00
Wind 210 deg - No Ice		-2111.70	3657.56	230209.14	132911.31	0.00
Wind 240 deg - No Ice		-3657.56	2111.70	132911.31	230209.14	0.00
Wind 270 deg - No Ice		-4223.39	0.00	0.00	265822.62	0.00
Wind 300 deg - No Ice		-3657.56	-2111.70	-132911.31	230209.14	0.00
Wind 330 deg - No Ice		-2111.70	-3657.56	-230209.14	132911.31	0.00
Member Ice	6449.93					

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Total Weight Ice	17910.60			0.00	0.00	
Wind 0 deg - Ice		0.00	-1529.12	-89990.96	0.00	0.00
Wind 30 deg - Ice		764.56	-1324.26	-77934.46	-44995.48	0.00
Wind 60 deg - Ice		1324.26	-764.56	-44995.48	-77934.46	0.00
Wind 90 deg - Ice		1529.12	0.00	0.00	-89990.96	0.00
Wind 120 deg - Ice		1324.26	764.56	44995.48	-77934.46	0.00
Wind 150 deg - Ice		764.56	1324.26	77934.46	-44995.48	0.00
Wind 180 deg - Ice		0.00	1529.12	89990.96	0.00	0.00
Wind 210 deg - Ice		-764.56	1324.26	77934.46	44995.48	0.00
Wind 240 deg - Ice		-1324.26	764.56	44995.48	77934.46	0.00
Wind 270 deg - Ice		-1529.12	0.00	0.00	89990.96	0.00
Wind 300 deg - Ice		-1324.26	-764.56	-44995.48	77934.46	0.00
Wind 330 deg - Ice		-764.56	-1324.26	-77934.46	44995.48	0.00
Total Weight	8245.44			0.00	0.00	
Wind 0 deg - Service		0.00	-1580.63	-99920.66	0.00	0.00
Wind 30 deg - Service		790.32	-1368.87	-86533.83	-49960.33	0.00
Wind 60 deg - Service		1368.87	-790.32	-49960.33	-86533.83	0.00
Wind 90 deg - Service		1580.63	0.00	0.00	-99920.66	0.00
Wind 120 deg - Service		1368.87	790.32	49960.33	-86533.83	0.00
Wind 150 deg - Service		790.32	1368.87	86533.83	-49960.33	0.00
Wind 180 deg - Service		0.00	1580.63	99920.66	0.00	0.00
Wind 210 deg - Service		-790.32	1368.87	86533.83	49960.33	0.00
Wind 240 deg - Service		-1368.87	790.32	49960.33	86533.83	0.00
Wind 270 deg - Service		-1580.63	0.00	0.00	99920.66	0.00
Wind 300 deg - Service		-1368.87	-790.32	-49960.33	86533.83	0.00
Wind 330 deg - Service		-790.32	-1368.87	-86533.83	49960.33	0.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice

Comb. No.	Description
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	116.5 - 106.5	Pole	Max Tension	42	0.02	0.00	0.00
			Max. Compression	26	-1993.63	0.00	-0.00
			Max. Mx	8	-497.26	-7926.55	-0.00
			Max. My	2	-497.26	0.00	7926.55
			Max. Vy	8	1058.21	-7926.55	-0.00
			Max. Vx	2	-1058.21	0.00	7926.55
			Max. Torque	7			0.00
L2	106.5 - 106	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-2036.17	0.00	-0.00
			Max. Mx	8	-532.97	-8456.44	-0.00
			Max. My	2	-532.97	0.00	8456.44
			Max. Vy	8	1062.74	-8456.44	-0.00
			Max. Vx	2	-1062.74	0.00	8456.44
			Max. Torque	7			0.00
L3	106 - 96.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-4104.23	0.00	-0.00
			Max. Mx	8	-1384.33	-22160.78	-0.00
			Max. My	2	-1384.33	0.00	22160.78
			Max. Vy	8	1766.48	-20303.65	-0.00
			Max. Vx	2	-1766.48	0.00	20303.65
			Max. Torque	7			0.00
L4	96.5 - 96	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-4151.39	0.00	-0.00
			Max. Mx	8	-1431.59	-23039.75	-0.00
			Max. My	14	-1431.59	0.00	-23039.75
			Max. Vy	8	1760.31	-23039.75	-0.00
			Max. Vx	14	1760.31	0.00	-23039.75
			Max. Torque	7			0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L5	96 - 86.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-6787.44	0.00	-0.00
			Max. Mx	8	-2859.08	-43296.25	-0.00
			Max. My	2	-2859.08	0.00	43296.25
			Max. Vy	8	2468.04	-32967.96	-0.00
			Max. Vx	14	2468.04	0.00	-32967.96
			Max. Torque	7			0.00
L6	86.5 - 86	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-6970.35	0.00	-0.00
			Max. Mx	8	-3031.03	-44510.26	-0.00
			Max. My	14	-3031.03	0.00	-44510.26
			Max. Vy	8	2434.67	-44510.26	-0.00
			Max. Vx	14	2434.67	0.00	-44510.26
			Max. Torque	7			0.00
L7	86 - 47.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-11611.37	0.00	-0.00
			Max. Mx	8	-5362.19	-162600.99	-0.00
			Max. My	2	-5362.19	0.00	162600.99
			Max. Vy	8	4308.19	-162600.99	-0.00
			Max. Vx	2	-4308.19	0.00	162600.99
			Max. Torque	7			0.00
L8	47.17 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19821.05	0.00	0.00
			Max. Mx	8	-9886.23	-446638.35	0.00
			Max. My	2	-9886.23	0.00	446638.35
			Max. Vy	8	6769.56	-446638.35	0.00
			Max. Vx	14	6769.56	0.00	-446638.35
			Max. Torque	7			0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	27	19821.05	0.00	1529.12
	Max. H_x	21	7420.89	6757.43	0.00
	Max. H_z	2	9894.52	0.00	6757.43
	Max. M_x	2	446638.35	0.00	6757.43
	Max. M_z	8	446638.35	-6757.43	0.00
	Max. Torsion	7	0.00	-5852.10	3378.71
	Min. Vert	13	7420.89	-3378.71	-5852.10
	Min. H_x	8	9894.52	-6757.43	0.00
	Min. H_z	14	9894.52	0.00	-6757.43
	Min. M_x	14	-446638.35	0.00	-6757.43
	Min. M_z	20	-446638.35	6757.43	0.00
	Min. Torsion	23	-0.00	5852.10	3378.71

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	8245.44	0.00	0.00	0.00	0.00	0.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.6 Wind 0 deg - No Ice	9894.52	0.00	-6757.43	-446638.35	0.00	0.00
0.9 Dead+1.6 Wind 0 deg - No Ice	7420.89	0.00	-6757.43	-440879.87	0.00	0.00
1.2 Dead+1.6 Wind 30 deg - No Ice	9894.52	3378.71	-5852.10	-386800.62	-223319.44	0.00
0.9 Dead+1.6 Wind 30 deg - No Ice	7420.89	3378.71	-5852.10	-381813.26	-220439.99	0.00
1.2 Dead+1.6 Wind 60 deg - No Ice	9894.52	5852.10	-3378.71	-223319.44	-386800.62	-0.00
0.9 Dead+1.6 Wind 60 deg - No Ice	7420.89	5852.10	-3378.71	-220439.99	-381813.26	-0.00
1.2 Dead+1.6 Wind 90 deg - No Ice	9894.52	6757.43	0.00	0.00	-446638.35	0.00
0.9 Dead+1.6 Wind 90 deg - No Ice	7420.89	6757.43	0.00	0.00	-440879.87	0.00
1.2 Dead+1.6 Wind 120 deg - No Ice	9894.52	5852.10	3378.71	223319.44	-386800.62	0.00
0.9 Dead+1.6 Wind 120 deg - No Ice	7420.89	5852.10	3378.71	220439.99	-381813.26	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice	9894.52	3378.71	5852.10	386800.62	-223319.44	-0.00
0.9 Dead+1.6 Wind 150 deg - No Ice	7420.89	3378.71	5852.10	381813.26	-220439.99	-0.00
1.2 Dead+1.6 Wind 180 deg - No Ice	9894.52	0.00	6757.43	446638.35	0.00	0.00
0.9 Dead+1.6 Wind 180 deg - No Ice	7420.89	0.00	6757.43	440879.87	0.00	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice	9894.52	-3378.71	5852.10	386800.62	223319.44	0.00
0.9 Dead+1.6 Wind 210 deg - No Ice	7420.89	-3378.71	5852.10	381813.26	220439.99	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice	9894.52	-5852.10	3378.71	223319.44	386800.62	-0.00
0.9 Dead+1.6 Wind 240 deg - No Ice	7420.89	-5852.10	3378.71	220439.99	381813.26	-0.00
1.2 Dead+1.6 Wind 270 deg - No Ice	9894.52	-6757.43	0.00	0.00	446638.35	0.00
0.9 Dead+1.6 Wind 270 deg - No Ice	7420.89	-6757.43	0.00	0.00	440879.87	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice	9894.52	-5852.10	-3378.71	-223319.44	386800.62	0.00
0.9 Dead+1.6 Wind 300 deg - No Ice	7420.89	-5852.10	-3378.71	-220439.99	381813.26	0.00
1.2 Dead+1.6 Wind 330 deg - No Ice	9894.52	-3378.71	-5852.10	-386800.62	223319.44	-0.00
0.9 Dead+1.6 Wind 330 deg - No Ice	7420.89	-3378.71	-5852.10	-381813.26	220439.99	-0.00
1.2 Dead+1.0 Ice+1.0 Temp	19821.05	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	19821.05	0.00	-1529.12	-100538.25	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	19821.05	764.56	-1324.26	-87068.68	-50269.13	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	19821.05	1324.26	-764.56	-50269.13	-87068.68	-0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	19821.05	1529.12	0.00	0.00	-100538.25	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	19821.05	1324.26	764.56	50269.13	-87068.68	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	19821.05	764.56	1324.26	87068.68	-50269.13	-0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	19821.05	0.00	1529.12	100538.25	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	19821.05	-764.56	1324.26	87068.68	50269.13	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	19821.05	-1324.26	764.56	50269.13	87068.68	-0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	19821.05	-1529.12	0.00	0.00	100538.25	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	19821.05	-1324.26	-764.56	-50269.13	87068.68	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	19821.05	-764.56	-1324.26	-87068.68	50269.13	-0.00
Dead+Wind 0 deg - Service	8245.44	0.00	-1580.63	-104185.07	0.00	0.00
Dead+Wind 30 deg - Service	8245.44	790.32	-1368.87	-90227.82	-52093.06	0.00
Dead+Wind 60 deg - Service	8245.44	1368.87	-790.32	-52093.06	-90227.82	-0.00
Dead+Wind 90 deg - Service	8245.44	1580.63	0.00	0.00	-104185.07	0.00
Dead+Wind 120 deg - Service	8245.44	1368.87	790.32	52093.06	-90227.82	0.00
Dead+Wind 150 deg - Service	8245.44	790.32	1368.87	90227.82	-52093.06	-0.00
Dead+Wind 180 deg - Service	8245.44	0.00	1580.63	104185.07	0.00	0.00
Dead+Wind 210 deg - Service	8245.44	-790.32	1368.87	90227.82	52093.06	0.00
Dead+Wind 240 deg - Service	8245.44	-1368.87	790.32	52093.06	90227.82	-0.00
Dead+Wind 270 deg - Service	8245.44	-1580.63	0.00	0.00	104185.07	0.00
Dead+Wind 300 deg - Service	8245.44	-1368.87	-790.32	-52093.06	90227.82	0.00
Dead+Wind 330 deg - Service	8245.44	-790.32	-1368.87	-90227.82	52093.06	-0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-8245.44	0.00	0.00	8245.44	0.00	0.000%
2	0.00	-9894.52	-6757.43	0.00	9894.52	6757.43	0.000%
3	0.00	-7420.89	-6757.43	0.00	7420.89	6757.43	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
4	3378.71	-9894.52	-5852.10	-3378.71	9894.52	5852.10	0.000%
5	3378.71	-7420.89	-5852.10	-3378.71	7420.89	5852.10	0.000%
6	5852.10	-9894.52	-3378.71	-5852.10	9894.52	3378.71	0.000%
7	5852.10	-7420.89	-3378.71	-5852.10	7420.89	3378.71	0.000%
8	6757.43	-9894.52	0.00	-6757.43	9894.52	0.00	0.000%
9	6757.43	-7420.89	0.00	-6757.43	7420.89	0.00	0.000%
10	5852.10	-9894.52	3378.71	-5852.10	9894.52	-3378.71	0.000%
11	5852.10	-7420.89	3378.71	-5852.10	7420.89	-3378.71	0.000%
12	3378.71	-9894.52	5852.10	-3378.71	9894.52	-5852.10	0.000%
13	3378.71	-7420.89	5852.10	-3378.71	7420.89	-5852.10	0.000%
14	0.00	-9894.52	6757.43	0.00	9894.52	-6757.43	0.000%
15	0.00	-7420.89	6757.43	0.00	7420.89	-6757.43	0.000%
16	-3378.71	-9894.52	5852.10	3378.71	9894.52	-5852.10	0.000%
17	-3378.71	-7420.89	5852.10	3378.71	7420.89	-5852.10	0.000%
18	-5852.10	-9894.52	3378.71	5852.10	9894.52	-3378.71	0.000%
19	-5852.10	-7420.89	3378.71	5852.10	7420.89	-3378.71	0.000%
20	-6757.43	-9894.52	0.00	6757.43	9894.52	0.00	0.000%
21	-6757.43	-7420.89	0.00	6757.43	7420.89	0.00	0.000%
22	-5852.10	-9894.52	-3378.71	5852.10	9894.52	3378.71	0.000%
23	-5852.10	-7420.89	-3378.71	5852.10	7420.89	3378.71	0.000%
24	-3378.71	-9894.52	-5852.10	3378.71	9894.52	5852.10	0.000%
25	-3378.71	-7420.89	-5852.10	3378.71	7420.89	5852.10	0.000%
26	0.00	-19821.05	0.00	0.00	19821.05	0.00	0.000%
27	0.00	-19821.05	-1529.12	0.00	19821.05	1529.12	0.000%
28	764.56	-19821.05	-1324.26	-764.56	19821.05	1324.26	0.000%
29	1324.26	-19821.05	-764.56	-1324.26	19821.05	764.56	0.000%
30	1529.12	-19821.05	0.00	-1529.12	19821.05	0.00	0.000%
31	1324.26	-19821.05	764.56	-1324.26	19821.05	-764.56	0.000%
32	764.56	-19821.05	1324.26	-764.56	19821.05	-1324.26	0.000%
33	0.00	-19821.05	1529.12	0.00	19821.05	-1529.12	0.000%
34	-764.56	-19821.05	1324.26	764.56	19821.05	-1324.26	0.000%
35	-1324.26	-19821.05	764.56	1324.26	19821.05	-764.56	0.000%
36	-1529.12	-19821.05	0.00	1529.12	19821.05	0.00	0.000%
37	-1324.26	-19821.05	-764.56	1324.26	19821.05	764.56	0.000%
38	-764.56	-19821.05	-1324.26	764.56	19821.05	1324.26	0.000%
39	0.00	-8245.44	-1580.63	0.00	8245.44	1580.63	0.000%
40	790.32	-8245.44	-1368.87	-790.32	8245.44	1368.87	0.000%
41	1368.87	-8245.44	-790.32	-1368.87	8245.44	790.32	0.000%
42	1580.63	-8245.44	0.00	-1580.63	8245.44	0.00	0.000%
43	1368.87	-8245.44	790.32	-1368.87	8245.44	-790.32	0.000%
44	790.32	-8245.44	1368.87	-790.32	8245.44	-1368.87	0.000%
45	0.00	-8245.44	1580.63	0.00	8245.44	-1580.63	0.000%
46	-790.32	-8245.44	1368.87	790.32	8245.44	-1368.87	0.000%
47	-1368.87	-8245.44	790.32	1368.87	8245.44	-790.32	0.000%
48	-1580.63	-8245.44	0.00	1580.63	8245.44	0.00	0.000%
49	-1368.87	-8245.44	-790.32	1368.87	8245.44	790.32	0.000%
50	-790.32	-8245.44	-1368.87	790.32	8245.44	1368.87	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00009031
3	Yes	5	0.00000001	0.00000001
4	Yes	7	0.00000001	0.00016830

5	Yes	6	0.00000001	0.00077218
6	Yes	7	0.00000001	0.00016830
7	Yes	6	0.00000001	0.00077218
8	Yes	5	0.00000001	0.00009031
9	Yes	5	0.00000001	0.00000001
10	Yes	7	0.00000001	0.00016830
11	Yes	6	0.00000001	0.00077218
12	Yes	7	0.00000001	0.00016830
13	Yes	6	0.00000001	0.00077218
14	Yes	5	0.00000001	0.00009031
15	Yes	5	0.00000001	0.00000001
16	Yes	7	0.00000001	0.00016830
17	Yes	6	0.00000001	0.00077218
18	Yes	7	0.00000001	0.00016830
19	Yes	6	0.00000001	0.00077218
20	Yes	5	0.00000001	0.00009031
21	Yes	5	0.00000001	0.00000001
22	Yes	7	0.00000001	0.00016830
23	Yes	6	0.00000001	0.00077218
24	Yes	7	0.00000001	0.00016830
25	Yes	6	0.00000001	0.00077218
26	Yes	4	0.00000001	0.00000001
27	Yes	7	0.00000001	0.00039079
28	Yes	7	0.00000001	0.00048643
29	Yes	7	0.00000001	0.00048643
30	Yes	7	0.00000001	0.00039079
31	Yes	7	0.00000001	0.00048643
32	Yes	7	0.00000001	0.00048643
33	Yes	7	0.00000001	0.00039079
34	Yes	7	0.00000001	0.00048643
35	Yes	7	0.00000001	0.00048643
36	Yes	7	0.00000001	0.00039079
37	Yes	7	0.00000001	0.00048643
38	Yes	7	0.00000001	0.00048643
39	Yes	4	0.00000001	0.00093932
40	Yes	5	0.00000001	0.00050401
41	Yes	5	0.00000001	0.00050401
42	Yes	4	0.00000001	0.00093932
43	Yes	5	0.00000001	0.00050401
44	Yes	5	0.00000001	0.00050401
45	Yes	4	0.00000001	0.00093932
46	Yes	5	0.00000001	0.00050401
47	Yes	5	0.00000001	0.00050401
48	Yes	4	0.00000001	0.00093932
49	Yes	5	0.00000001	0.00050401
50	Yes	5	0.00000001	0.00050401

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
L1	116.5 - 106.5	21.155	39	2.6022	0.0000
L2	106.5 - 106	15.886	39	2.3450	0.0000
L3	106 - 96.5	15.641	39	2.3308	0.0000
L4	96.5 - 96	11.637	39	1.5787	0.0000
L5	96 - 86.5	11.473	39	1.5537	0.0000
L6	86.5 - 86	8.987	39	0.8760	0.0000
L7	86 - 47.17	8.895	39	0.8757	0.0000
L8	50.83 - 0	3.385	39	0.5946	0.0000

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
119.00	14" Decorative Flagpole Ball	39	21.155	2.6022	0.0000	2300
115.00	DHHTT65B-3XR w/Mount Pipe	39	20.339	2.5639	0.0000	2300
111.50	10' x 30" Shroud	39	18.455	2.4743	0.0000	2300
104.00	SBNHH-1D65A w/Mount Pipe	39	14.687	2.2216	0.0000	969
101.50	10' x 30" Shroud	39	13.563	2.0020	0.0000	758
98.00	DTMABP7819VG12A	39	12.161	1.6777	0.0000	660
96.00	SBNHH-1D65A w/Mount Pipe	39	11.473	1.5537	0.0000	743
91.25	10.5' x 30" Shroud	39	10.066	1.1600	0.0000	828

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	116.5 - 106.5	89.731	8	10.9256	0.0000
L2	106.5 - 106	67.687	2	9.8904	0.0000
L3	106 - 96.5	66.660	2	9.8325	0.0000
L4	96.5 - 96	49.773	2	6.7108	0.0000
L5	96 - 86.5	49.078	2	6.6060	0.0000
L6	86.5 - 86	38.496	2	3.7495	0.0000
L7	86 - 47.17	38.103	2	3.7482	0.0000
L8	50.83 - 0	14.511	2	2.5490	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
119.00	14" Decorative Flagpole Ball	8	89.731	10.9256	0.0000	604
115.00	DHHTT65B-3XR w/Mount Pipe	8	86.322	10.7727	0.0000	604
111.50	10' x 30" Shroud	8	78.448	10.4142	0.0000	604
104.00	SBNHH-1D65A w/Mount Pipe	2	62.649	9.3812	0.0000	247
101.50	10' x 30" Shroud	2	57.916	8.4713	0.0000	190
98.00	DTMABP7819VG12A	2	51.997	7.1234	0.0000	163
96.00	SBNHH-1D65A w/Mount Pipe	2	49.078	6.6060	0.0000	182
91.25	10.5' x 30" Shroud	2	43.100	4.9483	0.0000	200

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
L1	116.5 - 106.5 (1)	TP4.5x4.5x0.337	10.00	0.00	0.0	4.4074	-497.25	138834.00	0.004
L2	106.5 - 106 (2)	TP4.5x4x2	0.50	0.00	0.0	12.5664	-516.41	565487.00	0.001
L3	106 - 96.5 (3)	TP4x4x2	9.50	0.00	0.0	12.5664	-1384.33	565487.00	0.002
L4	96.5 - 96 (4)	TP5x4x2.5	0.50	0.00	0.0	11.7810	-1412.71	530144.00	0.003
L5	96 - 86.5 (5)	TP5x5x2.5	9.50	0.00	0.0	19.6350	-2859.08	883573.00	0.003
L6	86.5 - 86 (6)	TP19.5x5x2.5	0.50	0.00	0.0	19.6350	-2949.47	883573.00	0.003
L7	86 - 47.17 (7)	TP25.07x19.5x0.1875	38.83	0.00	0.0	14.4958	-5362.19	990963.00	0.005
L8	47.17 - 0 (8)	TP31.25x24.17x0.1875	50.83	0.00	0.0	18.4861	-9886.23	1140590.00	0.009

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		lb-ft	lb-ft		lb-ft	lb-ft	
L1	116.5 - 106.5 (1)	TP4.5x4.5x0.337	7926.58	15364.58	0.516	0.00	15364.58	0.000
L2	106.5 - 106 (2)	TP4.5x4x2	7926.55	40000.00	0.198	0.00	40000.00	0.000
L3	106 - 96.5 (3)	TP4x4x2	22160.83	40000.00	0.554	0.00	40000.00	0.000
L4	96.5 - 96 (4)	TP5x4x2.5	22160.75	40625.00	0.545	0.00	40625.00	0.000
L5	96 - 86.5 (5)	TP5x5x2.5	43296.42	78125.00	0.554	0.00	78125.00	0.000
L6	86.5 - 86 (6)	TP19.5x5x2.5	43296.25	78125.00	0.554	0.00	78125.00	0.000
L7	86 - 47.17 (7)	TP25.07x19.5x0.1875	162601.67	496423.33	0.328	0.00	496423.33	0.000
L8	47.17 - 0 (8)	TP31.25x24.17x0.1875	446639.17	729870.83	0.612	0.00	729870.83	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V_u	ϕV_n	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u	ϕT_n	Ratio $\frac{T_u}{\phi T_n}$
	ft		lb	lb		lb-ft	lb-ft	
L1	116.5 - 106.5 (1)	TP4.5x4.5x0.337	1058.22	69417.10	0.015	0.00	22424.50	0.000
L2	106.5 - 106 (2)	TP4.5x4x2	1062.74	353429.00	0.003	0.00	47123.92	0.000
L3	106 - 96.5 (3)	TP4x4x2	1763.41	282743.00	0.006	0.00	47123.92	0.000
L4	96.5 - 96 (4)	TP5x4x2.5	1760.31	441786.00	0.004	0.00	46939.83	0.000
L5	96 - 86.5 (5)	TP5x5x2.5	2434.34	441786.00	0.006	0.00	92039.17	0.000
L6	86.5 - 86 (6)	TP19.5x5x2.5	2434.67	3004150.00	0.001	0.00	92039.17	0.000
L7	86 - 47.17 (7)	TP25.07x19.5x0.1875	4308.19	495481.00	0.009	0.00	994983.33	0.000
L8	47.17 - 0 (8)	TP31.25x24.17x0.1875	6769.56	570296.00	0.012	0.00	1462591.67	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	116.5 - 106.5 (1)	0.004	0.516	0.000	0.015	0.000	0.520 ✓	1.000	4.8.2 ✓
L2	106.5 - 106 (2)	0.001	0.198	0.000	0.003	0.000	0.199 ✓	1.000	4.8.2 ✓
L3	106 - 96.5 (3)	0.002	0.554	0.000	0.006	0.000	0.557 ✓	1.000	4.8.2 ✓
L4	96.5 - 96 (4)	0.003	0.545	0.000	0.004	0.000	0.548 ✓	1.000	4.8.2 ✓
L5	96 - 86.5 (5)	0.003	0.554	0.000	0.006	0.000	0.557 ✓	1.000	4.8.2 ✓
L6	86.5 - 86 (6)	0.003	0.554	0.000	0.001	0.000	0.558 ✓	1.000	4.8.2 ✓
L7	86 - 47.17 (7)	0.005	0.328	0.000	0.009	0.000	0.333 ✓	1.000	4.8.2 ✓
L8	47.17 - 0 (8)	0.009	0.612	0.000	0.012	0.000	0.621 ✓	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	116.5 - 106.5	Pole	TP4.5x4.5x0.337	1	-497.25	138834.00	52.0	Pass
L2	106.5 - 106	Pole	TP4.5x4x2	2	-516.41	565487.00	19.9	Pass
L3	106 - 96.5	Pole	TP4x4x2	3	-1384.33	565487.00	55.7	Pass
L4	96.5 - 96	Pole	TP5x4x2.5	4	-1412.71	530144.00	54.8	Pass
L5	96 - 86.5	Pole	TP5x5x2.5	5	-2859.08	883573.00	55.7	Pass
L6	86.5 - 86	Pole	TP19.5x5x2.5	6	-2949.47	883573.00	55.8	Pass
L7	86 - 47.17	Pole	TP25.07x19.5x0.1875	7	-5362.19	990963.00	33.3	Pass
L8	47.17 - 0	Pole	TP31.25x24.17x0.1875	8	-9886.23	1140590.00	62.1	Pass
							Summary	
						Pole (L8)	62.1	Pass
						RATING =	**62.1**	**Pass**

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

Project #: *23019*
Site Name: *CT43XC825*

Pole Manufacturer:	*Other*

Anchor Rod Data		
Qty:	4	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	39	in

Plate Data		
Diam:	45	in
Thick:	1.5	in
Grade:	60	ksi
Single-Rod B-eff:	17.75	in

Stiffener Data (Welding at both sides)		
Config:		*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	31.25	in
Thick:	0.1875	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions		
Mu:	446.639	ft-kips
Axial, Pu:	9.895	kips
Shear, Vu:	6.757	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria: AISC LRFD <-Only Applcable to Unstiffened Cases

Anchor Rod Results

Max Rod (Cu+ Vu/ή):	143.3	Kips
Allowable Axial, Φ*Fu*Anet:	260.0	Kips
Anchor Rod Stress Ratio:	55.1%	**Pass**

Non-Rigid
AISC LRFD
φ*Tn

Base Plate Results Flexural Check

Base Plate Stress:	41.3	ksi
Allowable Plate Stress:	54.0	ksi
Base Plate Stress Ratio:	76.5%	**Pass**

Non-Rigid
AISC LRFD
φ*Fy
Y.L. Length: 23.33

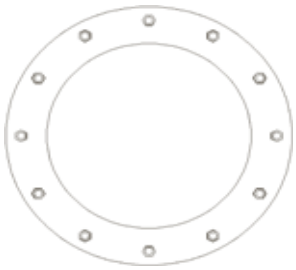
n/a

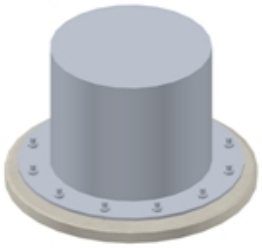
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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

Pier and Pad Foundation

Project #:	23019
Site Name:	CT43XC825

TIA-222 Revision:	G
Tower Type:	Monopole

Block Foundation?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	9.895	kips
Base Shear, Vu_comp:	6.757	kips
Moment, M_u:	446.639	ft-kips
Tower Height, **H**:	116.5	ft
BP Dist. Above Fdn, bp_{dist}:	3	in

Pier Properties		
Pier Shape:	Square	
Pier Diameter, **dpier**:	5	ft
Ext. Above Grade, **E**:	1	ft
Pier Rebar Size, **Sc**:	8	
Pier Rebar Quantity, **mc**:	24	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	5	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	6.5	ft
Pad Width, **W**:	12.5	ft
Pad Thickness, **T**:	3	ft
Pad Rebar Size, **Sp**:	8	
Pad Rebar Quantity, **mp**:	13	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	4000	psi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	100	pcf
Ultimate Gross Bearing, Qult:	8.000	ksf
Cohesion, **Cu**:		ksf
Friction Angle, φ:	30	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:	0.3	
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	None	ft

<--Toggle between Gross and Net

Foundation Analysis Checks	Capacity	Demand	Rating	Check
Lateral (Sliding) (kips)	71.47	6.76	**9.5%**	**Pass**
Bearing Pressure (ksf)	6.00	2.24	**37.4%**	**Pass**
*Overturning (kip*ft)*	787.07	499.01	**63.4%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	2126.76	477.05	**22.4%**	**Pass**
Pier Compression (kip)	15912.00	30.15	**0.2%**	**Pass**
*Pad Flexure (kip*ft)*	1427.85	147.05	**10.3%**	**Pass**
Pad Shear - 1-way (kips)	448.25	27.56	**6.1%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.000	**0.0%**	**Pass**

Soil Rating:	**63.4%**
Structural Rating:	**22.4%**

PROJECT INFORMATION:

TOWER INFORMATION

LAT: 41.81813056°

LONG: -72.86304167°

SITE TYPE: 120' FLAGPOLE

COUNTY: HARTFORD

APPLICANT

SPRINT
1 INTERNATIONAL BLVD., SUITE 800
MAHWAH, NJ 07495
CONTACT: TBD
PHONE: TBD
EMAIL: TBD

LANDLORD

SIMSBURY COMMONS NORTH E&A LLC
1901 MAIN ST, SUITE 900
COLUMBIA, SC 29201

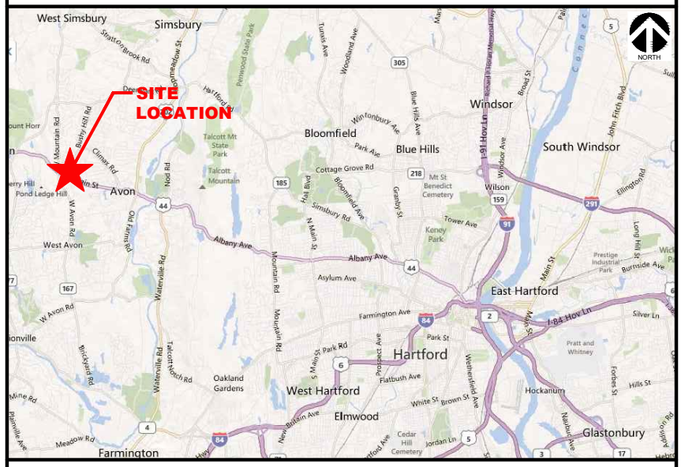
A&E FIRM

RAMAKER & ASSOCIATES, INC.
CONTACT: KEITH BOHNSACK
PROJECT MANAGER
PHONE: (608) 643-4100
EMAIL: kbohnsack@ramaker.com

SCOPE OF WORK:

- REPLACE (3) EXISTING ANTENNAS WITH (3) NEW TRI-BAND ANTENNAS ON EXISTING MOUNTS
- ADD (3) NEW 800 RRHS
- ADD (3) NEW 2500 RRHS
- ADD (12) DIPLEXERS
- ADD (6) COAX CABLE ,PLUS (6) EXISTING COAX, (12) COAX TOTAL, (4) PER SECTOR

VICINITY MAP:



AERIAL MAP:

SHEET INDEX:

SHEET #	SHEET DESCRIPTION	REVISION
T-1	COVER SHEET & SITE PLAN	3
A-1	ANTENNA LAYOUTS & EQUIPMENT LAYOUT	3
A-2	TOWER ELEVATION	3
A-3	ANTENNA DETAILS	3
A-4	ANTENNA SCHEDULE & DETAILS	3
A-5	PLUMBING DIAGRAM	3
E-1	DC POWER & FIBER DISTRIBUTION DETAIL	3

CODE COMPLIANCE:

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

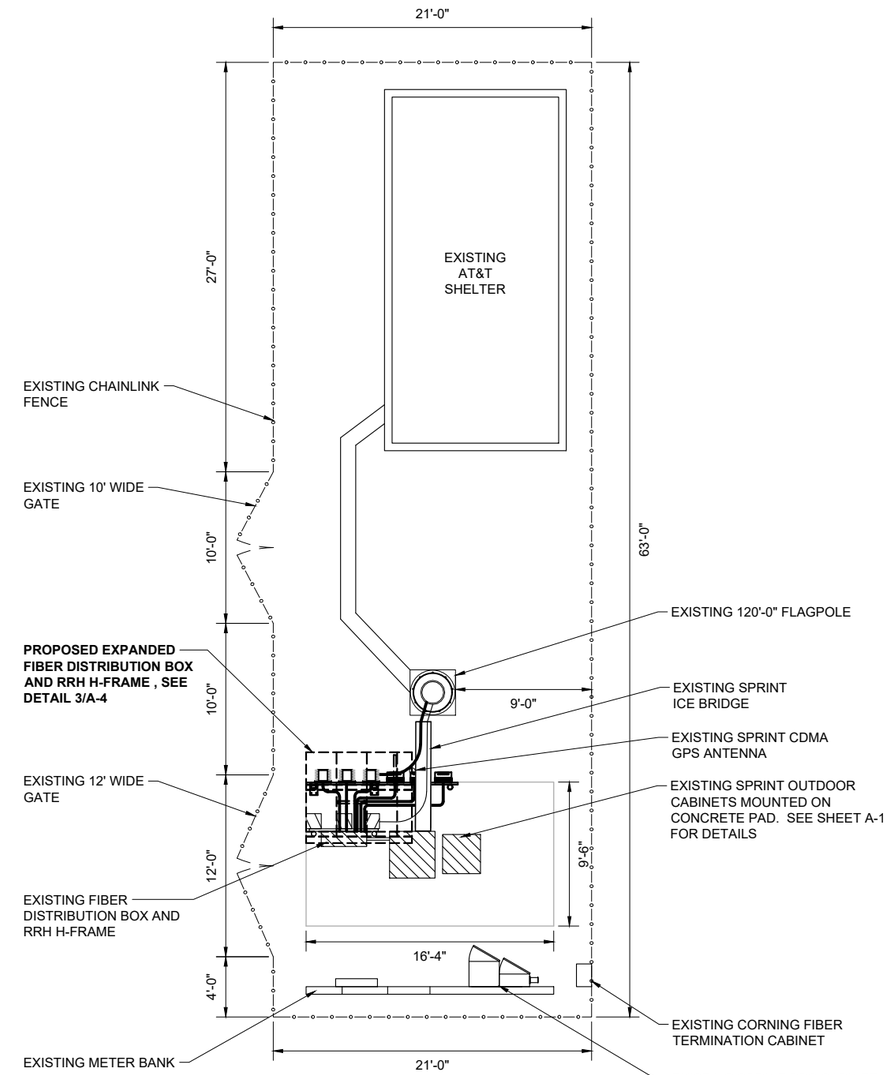
1. INTERNATIONAL BUILDING CODE
2. ANSI/TIA-222 STRUCTURAL STANDARD FOR ANTENNA STRUCTURES
3. NFPA 780 - LIGHTNING PROTECTION CODE
4. NATIONAL ELECTRIC CODE

811 Know what's below. Call before you dig. www.call811.com

DO MACRO UPGRADE

SITE CASCADE:

CT43XC825



OVERALL SITE PLAN (1)
SCALE: 1' = 10'

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495

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100% EMPLOYEE-OWNED
123 Broadway, Woodcliff Lake, NJ 07677
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
1280 RT. 46 WEST
PARSIPPANY, NJ 07054
Phone: 973-794-3633 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: 9/19/2018 Date:

MARK	DATE	DESCRIPTION
3	09/19/18	FINAL CDs ISSUED
2	09/12/18	REVISED RF CONFIGURATION
1	07/12/18	INCREASED STEALTH CANISTER FROM 26" TO 30" Ø

ISSUE PHASE: FINAL — DATE ISSUED: 12/29/2017

PROJECT TITLE:
CT43XC825

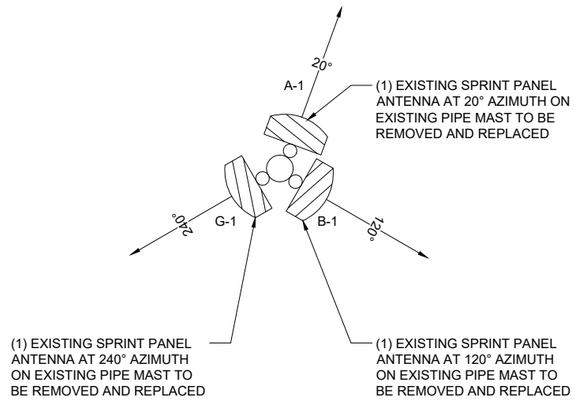
PROJECT INFORMATION:
530 BUSHY HILL ROAD
SIMSBURY, CT 06070
HARTFORD COUNTY

SHEET TITLE:
COVER SHEET & SITE PLAN

0 5' 10' 20'
11" x 17" - 1" = 10'
22" x 34" - 1" = 5'

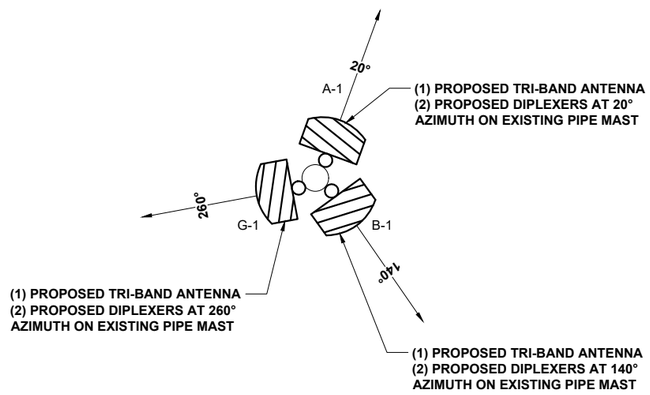
PROJECT NUMBER: 23019
SHEET NUMBER: T-1

NORTH



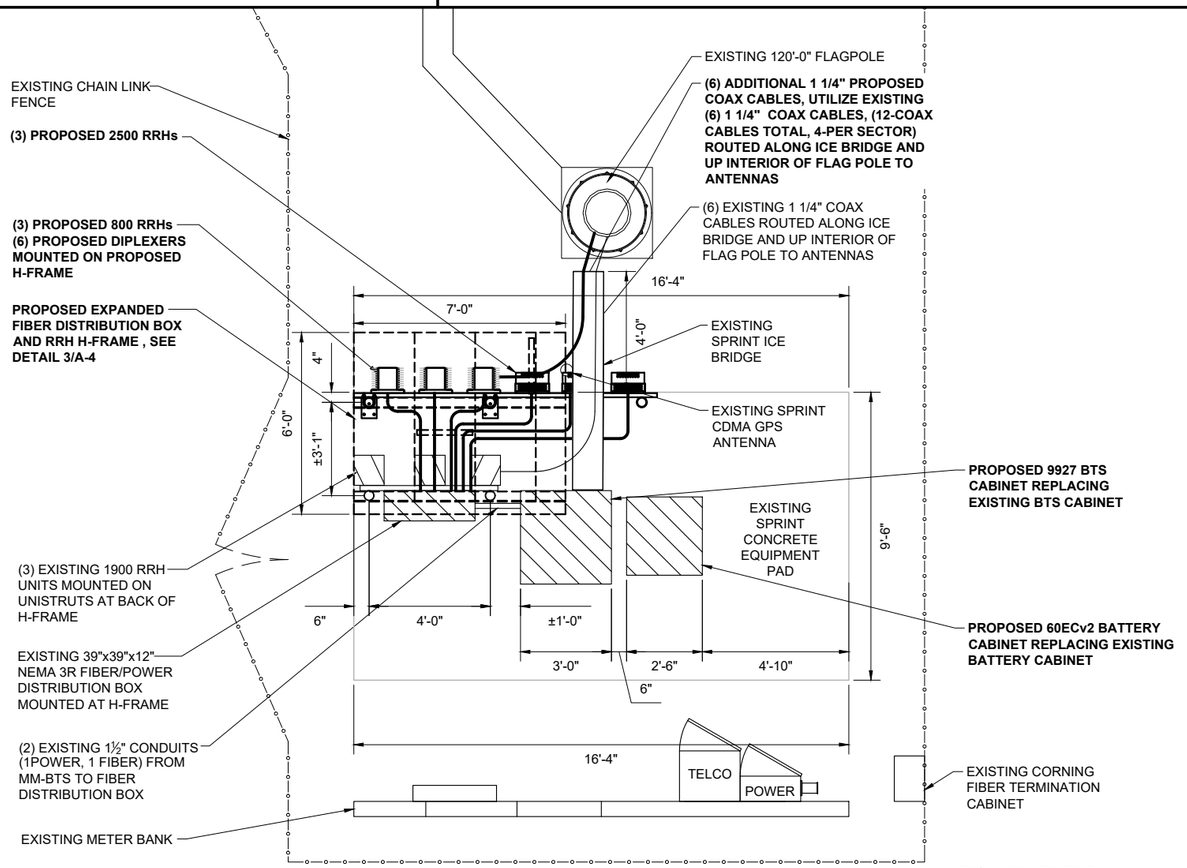
EXISTING ANTENNA PLAN (1)
SCALE: NTS

NORTH



PROPOSED ANTENNA PLAN (2)
SCALE: NTS

NORTH



EQUIPMENT PLAN (3)
SCALE: 1" = 5'

Sprint

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ISSUE PHASE: FINAL
DATE ISSUED: 12/29/2017

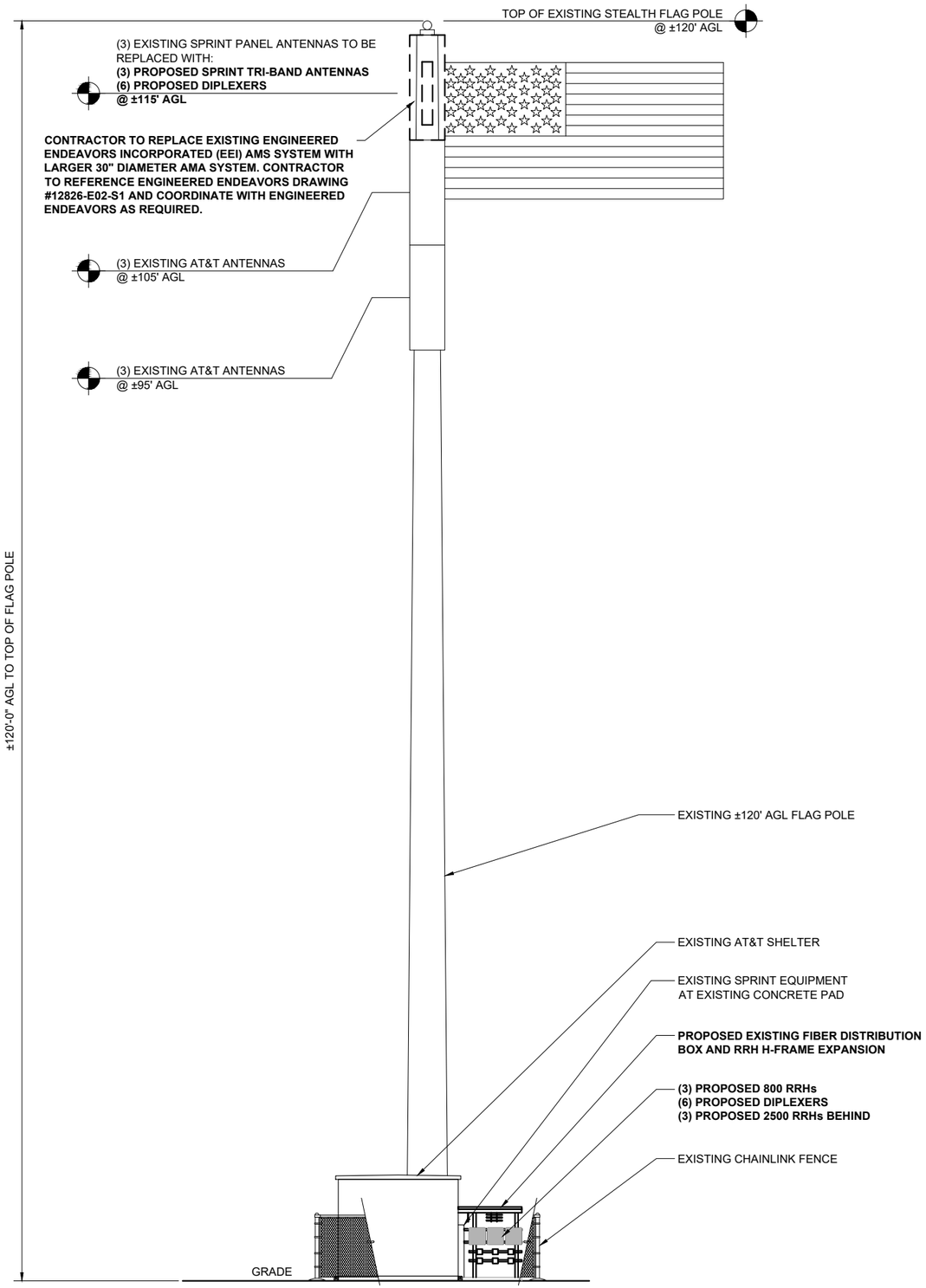
PROJECT TITLE:
CT43XC825

PROJECT INFORMATION:
530 BUSHY HILL ROAD
SIMSBURY, CT 06070
HARTFORD COUNTY

SHEET TITLE:
ANTENNA LAYOUTS & EQUIPMENT LAYOUT

0 2.5' 5' 10'
11" x 17" - 1" = 5'
22" x 34" - 1" = 2.5'

PROJECT NUMBER: 23019
SHEET NUMBER: A-1



NORTH TOWER ELEVATION 1
SCALE: 1" = 12.5'

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DATE ISSUED: 12/29/2017

PROJECT TITLE:
CT43XC825

PROJECT INFORMATION:
530 BUSHY HILL ROAD
SIMSBURY, CT 06070
HARTFORD COUNTY

SHEET TITLE:
TOWER ELEVATION

0 6.25' 12.5' 25'
11" x 17" - 1" = 12.5'
22" x 34" - 1" = 6.25'

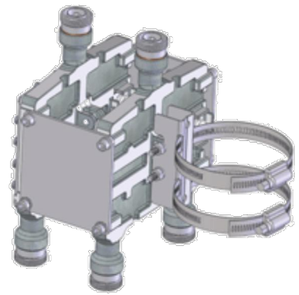
PROJECT NUMBER: 23019
SHEET NUMBER: A-2

MECHANICAL	
DIMENSION (HxWxD)	72.1" x 11.9" x 7.1"
WEIGHT	45.4 lbs

ANTENNA MODEL: COMMSCOPE #DHHTT65B-3XR - ANTENNA SPECS

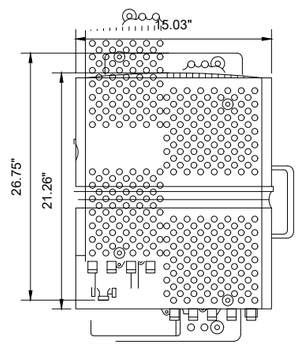
MECHANICAL	
DIMENSION (HxWxD)	7.42" x 2.95" x 1.95"
WEIGHT	7.3 lbs

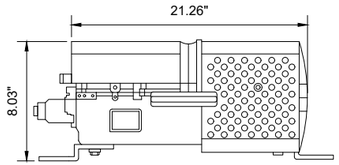
CCI OUTDOOR DIPLEXER #DPO-7126Y-0x1



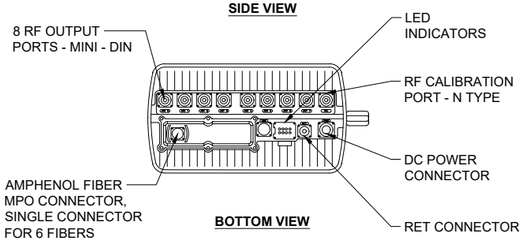
MECHANICAL	
DIMENSION (HxWxD)	5.8" x 6.5" x 4.6"
WEIGHT	6.4 lbs

RFS DIPLEXER/CROSS BAND COUPLER #KIT-FD9R6004/1C-DL





SIDE VIEW



FRONT VIEW BOTTOM VIEW

MECHANICAL	
DIMENSION (HxWxD)	21.26"x15.03"x8.03"
WEIGHT	59.5 lbs

RRH MODEL: SAMSUNG #RRH-B8 - 2500 MHz RADIO SPECS

800MHz 2X50W Remote Radio Head (RRH)

Simultaneous CDMA & LTE Multi technology RRH 862-869 MHz
- Any combination of CDMA and LTE carriers supported by 100W RF Power

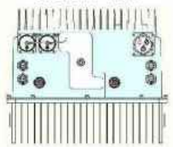
2 CPRI-like Optical Connections for daisy chaining
Software Switchable External Filter for use before Public Safety is cleared

Dimensions:	w/o Filter	w/ Filter
Height:	480 mm (19")	480 mm (19")
Width:	330 mm (13")	330 mm (13")
Depth:	218 mm (8.6")	310 (12.2")
Weight:	24 kg (53 lbs)	29 kg (64 lbs)
	49 liters, <29kg	

Power Supply: -48 VDC
Power Consumption: <400W Typical
Operating Temp range -40°C to +55°C
Option to mount on Ground at tower base

Front/Top View

Bottom View



Alcatel-Lucent's 800 RRH satisfies Sprint's requirements.

MECHANICAL	
DIMENSION (HxWxD)	19" x 13" x 12.2"
WEIGHT	64 lbs

RRH MODEL: ALU #800 MHz 2x50W - RADIO SPECS

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STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
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LICENSED PROFESSIONAL ENGINEER

Signature: 9/19/2018 Date:

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ISSUE PHASE: FINAL
DATE ISSUED: 12/29/2017

PROJECT TITLE:
CT43XC825

PROJECT INFORMATION:
530 BUSHY HILL ROAD
SIMSBURY, CT 06070
HARTFORD COUNTY

SHEET TITLE:
ANTENNA DETAILS

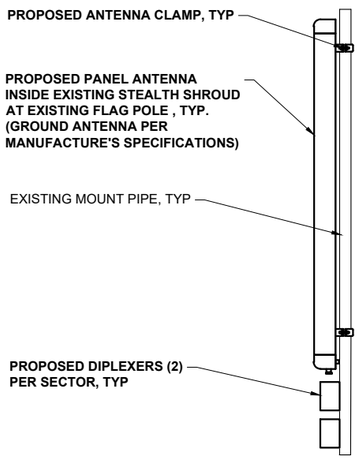
SCALE: NONE

PROJECT NUMBER: 23019
SHEET NUMBER: A-3

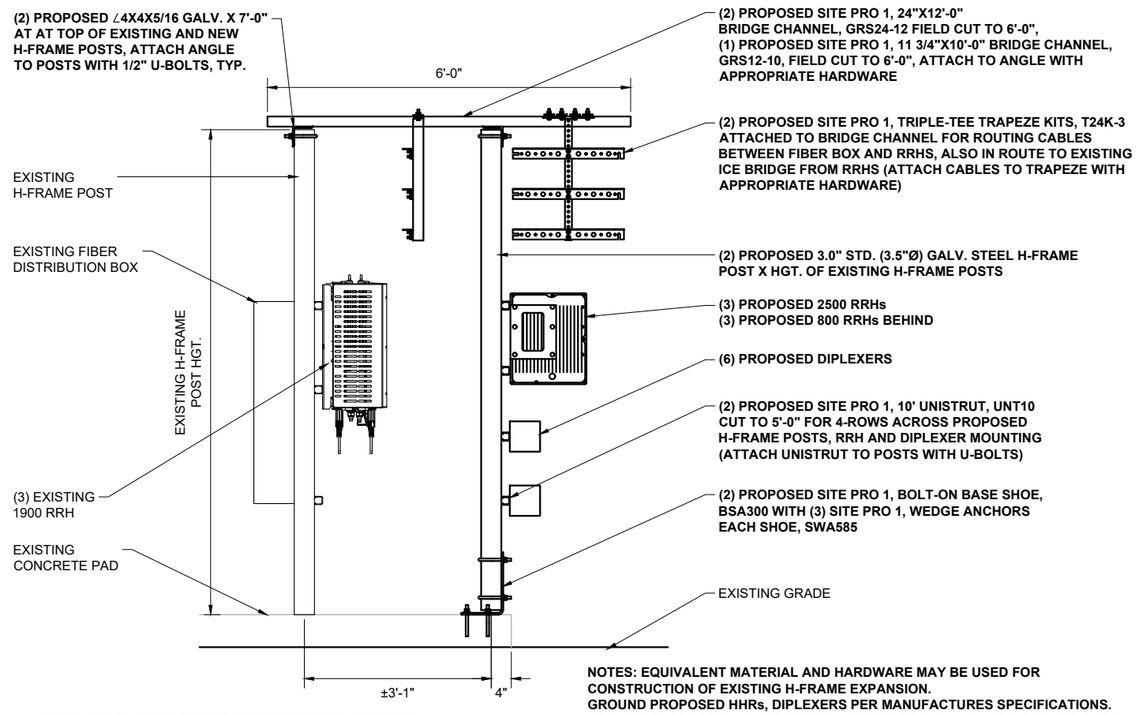
800/1900 EQUIPMENT SCHEDULE

SECTOR	POSITION	ANTENNA MAKE/MODEL	AZIMUTH	CENTERLINE	RRH	CABLE TYPE	CABLE LENGTH	JUMPER TYPE
ALPHA	1	(1) PROPOSED TRI-BAND ANTENNA (COMMSCOPE DHHTT65B-3XR)	20°	±115'-0"	(1) EXISTING 1900 RRH (GROUND LOCATED)	(2) EXISTING 1 1/4"	EXISTING	EXISTING
					(1) PROPOSED 2500 RRH ALU TD-RRH8x20-25 (GROUND LOCATED) (1) PROPOSED 800 RRH ALU RRH-2x50-800 (GROUND LOCATED) (2) DIPLEXERS CCI DPO-7126Y-0-T1 (1-GROUND LOCATED) (1-TOWER LOCATED) (2) DIPLEXERS RFS KIT-FD9R6004/1C-DL (1-GROUND LOCATED) (1-TOWER LOCATED)	(2) PROPOSED 1-1/4"	160'-0"	8' HYBRID
BETA	1	(1) PROPOSED TRI-BAND ANTENNA (COMMSCOPE DHHTT65B-3XR)	140°	±115'-0"	(1) EXISTING 1900 RRH (GROUND LOCATED)	(2) EXISTING 1 1/4"	EXISTING	EXISTING
					(1) PROPOSED 2500 RRH ALU TD-RRH8x20-25 (GROUND LOCATED) (1) PROPOSED 800 RRH ALU RRH-2x50-800 (GROUND LOCATED) (2) DIPLEXERS CCI DPO-7126Y-0-T1 (1-GROUND LOCATED) (1-TOWER LOCATED) (2) DIPLEXERS RFS KIT-FD9R6004/1C-DL (1-GROUND LOCATED) (1-TOWER LOCATED)	(2) PROPOSED 1-1/4"	160'-0"	8' HYBRID
GAMMA	1	(1) PROPOSED TRI-BAND ANTENNA (COMMSCOPE DHHTT65B-3XR)	260°	±115'-0"	(1) EXISTING 1900 RRH (GROUND LOCATED)	(2) EXISTING 1 1/4"	EXISTING	EXISTING
					(1) PROPOSED 2500 RRH ALU TD-RRH8x20-25 (GROUND LOCATED) (1) PROPOSED 800 RRH ALU RRH-2x50-800 (GROUND LOCATED) (2) DIPLEXERS CCI DPO-7126Y-0-T1 (1-GROUND LOCATED) (1-TOWER LOCATED) (2) DIPLEXERS RFS KIT-FD9R6004/1C-DL (1-GROUND LOCATED) (1-TOWER LOCATED)	(2) PROPOSED 1-1/4"	160'-0"	8' HYBRID

EQUIPMENT & CABLE SCHEDULE (1)
SCALE: NTS



ANTENNA MOUNTING DETAIL (2)
SCALE: NTS



RRH AND DIPLEXER MOUNTING DETAIL (3)
SCALE: NTS

NOTES: EQUIVALENT MATERIAL AND HARDWARE MAY BE USED FOR CONSTRUCTION OF EXISTING H-FRAME EXPANSION.
GROUND PROPOSED HHRs, DIPLEXERS PER MANUFACTURES SPECIFICATIONS.
GROUND PROPOSED H-FAME POSTS AND BRIDGE CHANNEL ADD GROUND BARS AS NEEDED AND CONNECT TO EXISTING GROUNDING SYSTEM.

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Charles Cherundolo Consulting, Inc.
1280 RT. 46 WEST
PARSIPPANY, NJ 07054
Phone: 973-794-3633 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: James R. Skowronski Date: 9/19/2018

MARK	DATE	DESCRIPTION
3	09/19/18	FINAL CDs ISSUED
2	09/12/18	REVISED RF CONFIGURATION
1	07/12/18	INCREASED STEALTH CANISTER FROM 26" TO 30" Ø

ISSUE PHASE: FINAL
DATE ISSUED: 12/29/2017

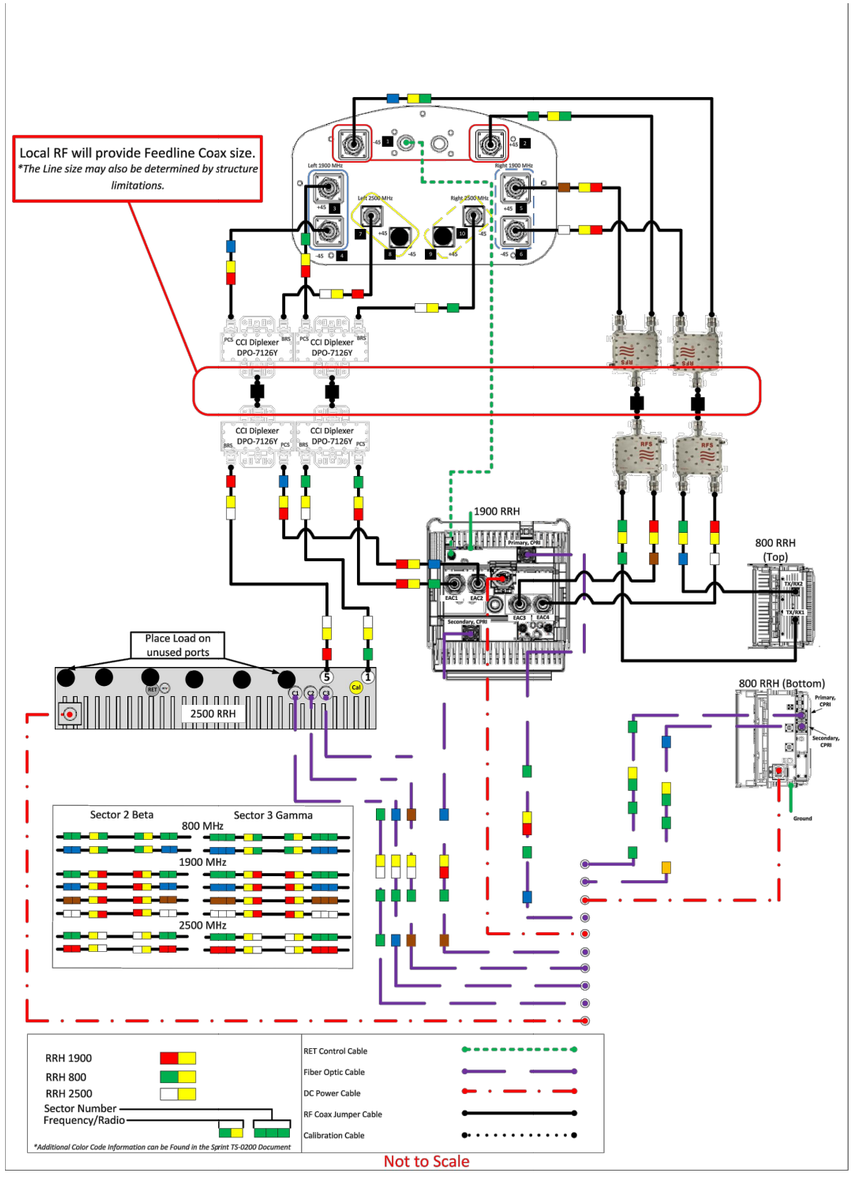
PROJECT TITLE:
CT43XC825

PROJECT INFORMATION:
530 BUSHY HILL ROAD
SIMSBURY, CT 06070
HARTFORD COUNTY

SHEET TITLE:
ANTENNA SCHEDULE & DETAIL

SCALE: NONE

PROJECT NUMBER: 23019
SHEET NUMBER: A-4



ANTENNA COLOR CODING CHART (1)
SCALE: NTS

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PROJECT TITLE:
CT43XC825

PROJECT INFORMATION:
530 BUSHY HILL ROAD
SIMSBURY, CT 06070
HARTFORD COUNTY

SHEET TITLE:
PLUMBING DIAGRAM

SCALE: NONE

PROJECT NUMBER: 23019
SHEET NUMBER: A-5

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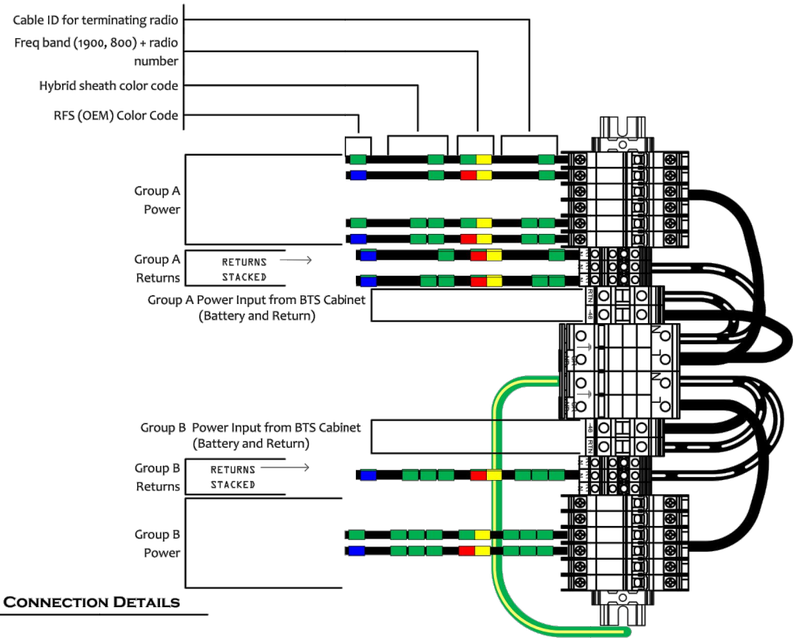
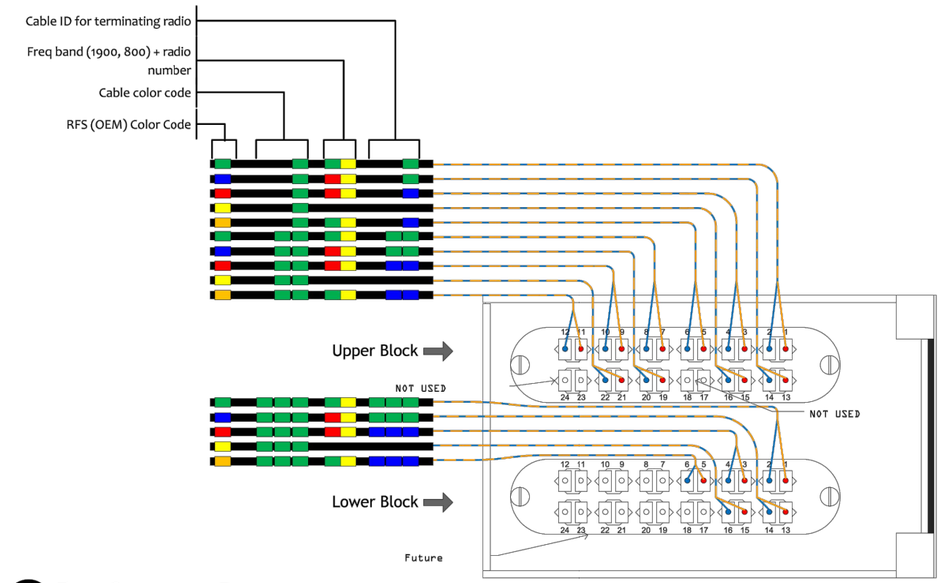
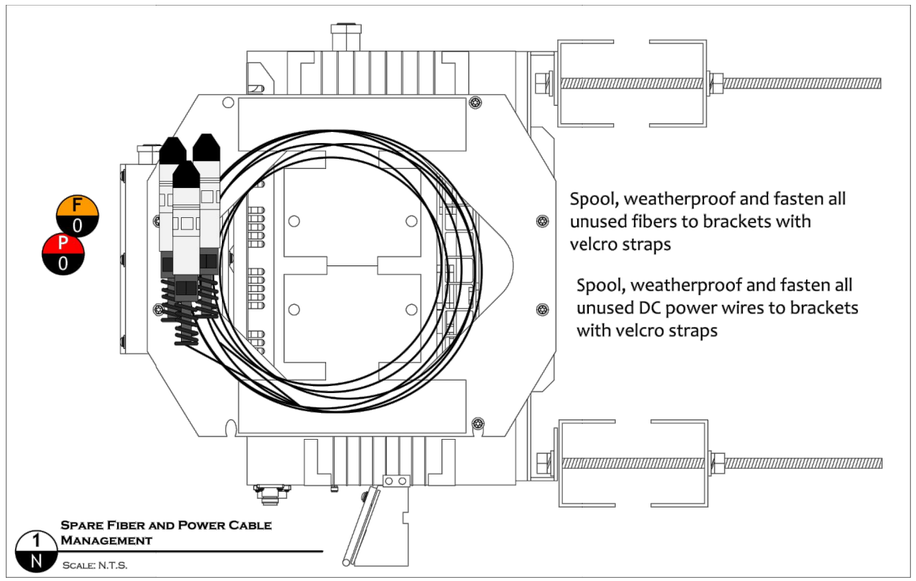


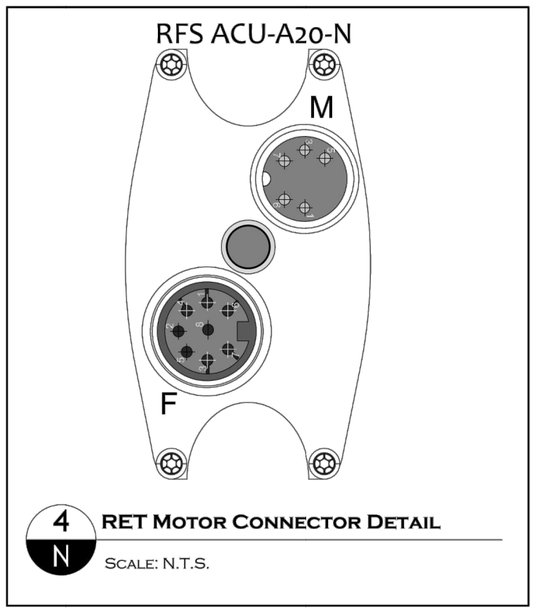
1 EC2 **DC Power Connection Details**
Scale: 8" = 1'-0"



2 EC2 **Fiber Connection Details**
Scale: 8" = 1'-0"



1 N **Spare Fiber and Power Cable Management**
Scale: N.T.S.



4 N **RET Motor Connector Detail**
Scale: N.T.S.

1 N	Spare Fiber Pairs & DC Power terminated, weatherproofed, spooled and tie wrapped to side of 800Mhz RRH. (cable management) Notes
4 N	RFS ACU-A20-N RET Motor connection details Notes

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PROJECT TITLE:
CT43XC825

PROJECT INFORMATION:
530 BUSHY HILL ROAD
SIMSBURY, CT 06070
HARTFORD COUNTY

SHEET TITLE:
DC POWER & FIBER DISTRIBUTION DETAIL

SCALE: NONE

PROJECT NUMBER: 23019
SHEET NUMBER: E-1