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

July 18, 2018

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

Notice of Exempt Modification
220 Winthrop Rd., Deep River, CT 06417
41 21 57.14 N
-72 28 29.46 W
Sprint #: CT33XC544 _DOMU

Dear Ms. Bachman:

Sprint currently maintains antennas at the 166-foot of the existing 180-foot Monopole Tower at 220 Winthrop Rd., Deep River, CT. The tower is SBA 2012 TC Assets, LLC. The property is owned by the Town of Deep River. Sprint now intends to replace (6) existing cell antennas with (6) newer technology cell antennas at the 166-foot level of the tower. Sprint's proposed full scope of work is as follows:

Remove: N/A
Remove and Replace:

- Remove:
  - (6) KMW ETCR-654L12H6 – Panel Antennas
- Replace with :
  - (3) RFS APXVTM14-C-I20 – Panel Antennas; and
  - (3) Commscope NNVV-65B-R4 – Panel Antennas

Install:

- (3) ALU 1900 Mhz RRUs (shown as previously run as well as proposed on Structural Analysis, but being added per drawings)
- (6) ALU 800 Mhz RRUs (shown as previously run as well as proposed on Structural Analysis, but being added per drawings)
- (3) ALU TD-RRH8x20-25 RRUs (shown as previously run as well as proposed on Structural Analysis, but being added per drawings)
- (1) Sitepro PRK-1245L
- (1) Handrail Kit
- (1) Sitepro PRK-SFS-H-L

Existing Equipment to Remain (Including entitlements):

- (1) Platform with hand rail (shown as previously run as well as proposed on Structural Analysis, but being added per drawings)
- (4) 1-1/4" hybrid

This facility was approved prior to the Council's jurisdiction. Building Permit 98-5-143 was issued on 8/24/98 for the tower's construction. Deep River Town property is exempt from zoning, so was not acted upon by the P&Z Commission at that time. The Town is unaware of any tower conditions. As such, it is SBA's opinion that this modification is in full compliance.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16.50j-72(b)(2). In accordance with R.C.S.A. § 16.50j-73, a copy of this letter is being sent to the Town of Deep River's First Selectmen and representative for the Town as Property Owner, Angus L. McDonald, Jr., as well as to Cathie Jefferson, Zoning Enforcement Officer for the Town. Separate notice is not being sent to tower owner, as it belongs to SBA.)

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

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

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

Sincerely,

Kri Pelletier
Property Specialist
SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581

508.251.0720 x3804 + T
508.366.2610 + F
203.446.7700 + C
kpelletier@sbasite.com

Attachments

cc: Angus L. McDonald, Jr., First Selectman / with attachments
Town of Deep River, 174 Main Street, Deep River, CT 06417
Cathie Jefferson, Zoning Enforcement Officer / with attachments
Town of Deep River, 174 Main Street, Deep River, CT 06417

POWER DENSITY

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6
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):	**166 feet**	Height (AGL):	**166 feet**	Height (AGL):	**166 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):	380 Watts	Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts
ERP (W):	11,775.31	ERP (W):	11,775.31	ERP (W):	11,775.31
Antenna A1 MPE%	**1.79 %**	Antenna B1 MPE%	**1.79 %**	Antenna C1 MPE%	**1.79 %**

Site Composite MPE%	
Carrier	MPE%
SPRINT – Max per sector	**1.79 %**
AT&T	1.55 %
Verizon Wireless	1.63 %

SPRINT Sector A Total:	1.79 %
SPRINT Sector B Total:	1.79 %
SPRINT Sector C Total:	1.79 %
Site Total:	5.14 %

SPRINT _ Frequency Band / Technology (All Sectors)	# 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	166	0.61	850 MHz	567	0.10%
Sprint 850 MHz LTE	2	432.54	166	1.21	850 MHz	567	0.21%
Sprint 1900 MHz (PCS) CDMA	5	535.94	166	3.76	1900 MHz (PCS)	1000	0.38%
Sprint 1900 MHz (PCS) LTE	2	1,339.86	166	3.76	1900 MHz (PCS)	1000	0.38%
Sprint 2500 MHz (BRS) LTE	8	639.78	166	7.19	2500 MHz (BRS)	1000	0.72%
						Total:	**1.79%**

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220 WINTHROP RD

Location	220 WINTHROP RD	**Mblu**	33/ / 1A/ /
Acct#	00047000	**Owner**	TOWN OF DEEP RIVER
Assessment	$239,260	**Appraisal**	$341,800
PID	546	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$185,000	$156,800	$341,800
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$129,500	$109,760	$239,260

Owner of Record

Owner	TOWN OF DEEP RIVER	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	174 MAIN ST DEEP RIVER, CT 06417	**Book & Page**	0093/0797
		Sale Date	12/27/1977

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
TOWN OF DEEP RIVER	$0		0093/0797	12/27/1977

Building Information

Building 1 : Section 1

Year Built: 1979
Living Area: 247

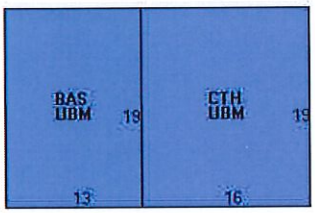
Building Photo

Building Attributes	
Field	**Description**
STYLE	Commercial
MODEL	Commercial
Stories:	1
Occupancy	1
Exterior Wall 1	Aluminum Sidng
Exterior Wall 2	

Roof Structure	Gambrel
Roof Cover	Asph/F Gls/Cmp
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Floor 1	Inlaid Sht Gds
Interior Floor 2	
Heating Fuel	Electric
Heating Type	Electr Basebrd
AC Type	None
Bldg Use	MUNICIPAL MDL-94
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	903I
Heat/AC	NONE
Frame Type	WOOD FRAME
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	LIGHT
Wall Height	9
% Comn Wall	0

(http://images.vgsi.com/photos/DeepRiverCTPhotos//\00\00\72/11.jpg)

Building Layout



(http://images.vgsi.com/photos/DeepRiverCTPhotos//Sketches/5

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	247	247
CTH	Cath Ceiling	304	0
UBM	Basement, Unfinished	551	0
		1,102	247

Extra Features

Extra Features
No Data for Extra Features

Land

Land Use

Use Code 9030
Description MUNICIPAL MDL-94
Neighborhood 0002

Land Line Valuation

Size (Acres) 9.94
Depth
Assessed Value $109,760
Appraised Value $156,800

Outbuildings

Outbuildings			Legend
Code	**Description**	**Size**	**Bldg #**
PAV1	PAVING-ASPHALT	30000 S.F.	1
PAV2	PAVING-CONC	1400 S.F.	1
SHD1	SHED FRAME	45 S.F.	1
SHD1	SHED FRAME	100 S.F.	1
FN3	FENCE-6' CHAIN	200 L.F.	1
	COMPACTOR	1	1

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: CT33XC544

Deep River Winthrop Rd
220 Winthrop Road
Deep River, CT 06417

November 30, 2017

EBI Project Number: 6217005376

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	5.14 %

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

November 30, 2017

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

Emissions Analysis for Site: **CT33XC544 – Deep River Winthrop Rd**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **220 Winthrop Road, Deep River, 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 public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure 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 **220 Winthrop Road, Deep River, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **KMW ETCR-654L12H6** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed antennas are **166 feet** above ground level (AGL) for **Sector A**, **166 feet** above ground level (AGL) for **Sector B** and **166 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 public threshold limits.

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6
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):	**166 feet**	Height (AGL):	**166 feet**	Height (AGL):	**166 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):	380 Watts	Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts
ERP (W):	11,775.31	ERP (W):	11,775.31	ERP (W):	11,775.31
Antenna A1 MPE%	**1.79 %**	Antenna B1 MPE%	**1.79 %**	Antenna C1 MPE%	**1.79 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**1.79 %**
AT&T	1.55 %
Verizon Wireless	1.63 %
Voicestream / T-Mobile	0.17 %
Site Total MPE %:	**5.14 %**

SPRINT Sector A Total:	1.79 %
SPRINT Sector B Total:	1.79 %
SPRINT Sector C Total:	1.79 %
Site Total:	5.14 %

SPRINT _ Frequency Band / Technology (All Sectors)	# 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	166	0.61	850 MHz	567	0.10%
Sprint 850 MHz LTE	2	432.54	166	1.21	850 MHz	567	0.21%
Sprint 1900 MHz (PCS) CDMA	5	535.94	166	3.76	1900 MHz (PCS)	1000	0.38%
Sprint 1900 MHz (PCS) LTE	2	1,339.86	166	3.76	1900 MHz (PCS)	1000	0.38%
Sprint 2500 MHz (BRS) LTE	8	639.78	166	7.19	2500 MHz (BRS)	1000	0.72%
						Total:	**1.79%**

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public 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 public exposure to RF Emissions are shown here:

SPRINT Sector	Power Density Value (%)
Sector A:	1.79 %
Sector B:	1.79 %
Sector C:	1.79 %
SPRINT Maximum Total (per sector):	1.79 %
Site Total:	5.14 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.14 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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

Structural Analysis Report

Existing 180 ft Valmont Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT46130-A

Customer Site Name: Deep River-winthrop Rd

Carrier Name: Sprint Nextel

Carrier Site ID / Name: CT33XC544 / Deep River-winthrop Rd

Site Location: 220 Winthrop Rd

Deep River, Connecticut

Middlesex County

Latitude: 41.365872

Longitude: -72.474849

6/1/18

Analysis Result:

Max Structural Usage: 99.1% [Pass]

Max Foundation Usage: 89.0% [Pass]

Additional Usage Caused by Mount Modification: + 2.0%

Report Prepared By: Saurav Devkota

Introduction

The purpose of this report is to summarize the analysis results on the 180 ft Valmont Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Original structural design report & permit drawings prepared by Valmont. Dated 10-27-2000. Order No 17593-98. CT750 Deep River Site. Project No F082. Previous structural report prepared by FDH Engineering, Inc. Dated 11-04-2013. Project No 13SFRX1400. Previous Structural Analysis by TES Project#: 41965 Dated: 10/30/2017
Foundation Drawing	Original foundation drawings prepared by Valmont Industries, Inc. Dated 08-11-1998. Project No 2633. Order No 17593-98. Drawing No 2633-F.
Geotechnical Report	Geotechnical report prepared by TECTONIC Engineering Consultants, P.C. Dated 07-13-1998. Work Order No 1170.C750.
Modification Drawings	N/A

Analysis Criteria

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

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 130.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 101.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.17g, S_1 = 0.06g

This structural analysis is based upon the tower being classified as a Structure Class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft.)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	178.0	6	Amphenol BXA-70063-6CF_2 - Panel	Platform w/ Hand Rails	(2) 1 5/8"	Verizon
2		6	Amphenol BXA-171063-12CF_2 - Panel			
3		3	RRH_2x40 AWS			
4		3	RRH_2x40 07-U			
5		1	RFS DB-B1-6C-8AB-OZ			
-	166.0	3	KMW ETCR-654L12H6 - Panel	Platform w/ Hand Rail	(4) 1-1/4" Hybrid	Sprint Nextel
-		3	ALU 1900 Mhz			
-		6	ALU 800 Mhz			
-		3	ALU TD-RRH8x20-25			
11	158.0	6	EMS RR90-17-02DP - Panel	(3) T-Arms	(6) 1 5/8"	T-Mobile
12		6	Stella Dooradus TMA's			
13	150.0	2	Cci HPA-65R-BUU-H6- Panel	Modified Low Profile Platform [Low Profile Platform w/ Handrail kit HRK-12]	(12) 1 1/4"; [(1) 10 mm & (2) 19.7 mm inside (1) 3" Innerduct]	AT&T
14		1	Commscope SBNHH-1D65A- Panel			
15		3	Ericsson RRUS-32- RRU			
16		2	KMW AM-X-CD-16-65-00T-RET w/ Mount- Panel			
17		3	Powerwave 7770 - Panel			
18		1	KMW AM-X-CD-14-65-00T- Panel			
19		6	Powerwave LGP21401 TMA			
20		3	Ericsson RRUS-11- RRU			
21		1	Raycap DC6-48-60-18-8F Surge			

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

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
6	166.0	3	RFS APXVTM14-C-I20 - Panel	Modified Platform w/Handrails [Platform w/Handrails + Sitepro PRK-1245L + handrail kit + Sitepro PRK-SFS-H-L]	(4) 1-1/4" Fiber	Sprint Nextel
7		3	Commscope NNVV-65B-R4 - Panel			
8		3	ALU 1900 Mhz			
9		6	ALU 800 Mhz			
10		3	ALU TD-RRH8x20-25			

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

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**99.1%**	**86.0%**	**62.8%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	5076.0	41.7
Analysis Reactions	6306.1	52.4
Factored Reactions*	6852.6	56.3
% of Design Reactions	92.0%	93.1%

* Per section 15.5.1 of the TIA-222-G standard, factored reactions were obtained by multiplying a 1.35 factor to the original design reactions.

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

Operational Condition (Rigidity)

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.9193 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the ANSI/TIA/EIA 222-G Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.

3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.

4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.

5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.

6. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

7. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

8. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

9. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Usage Diagram - Max Ratio 99.12% at 0.0ft

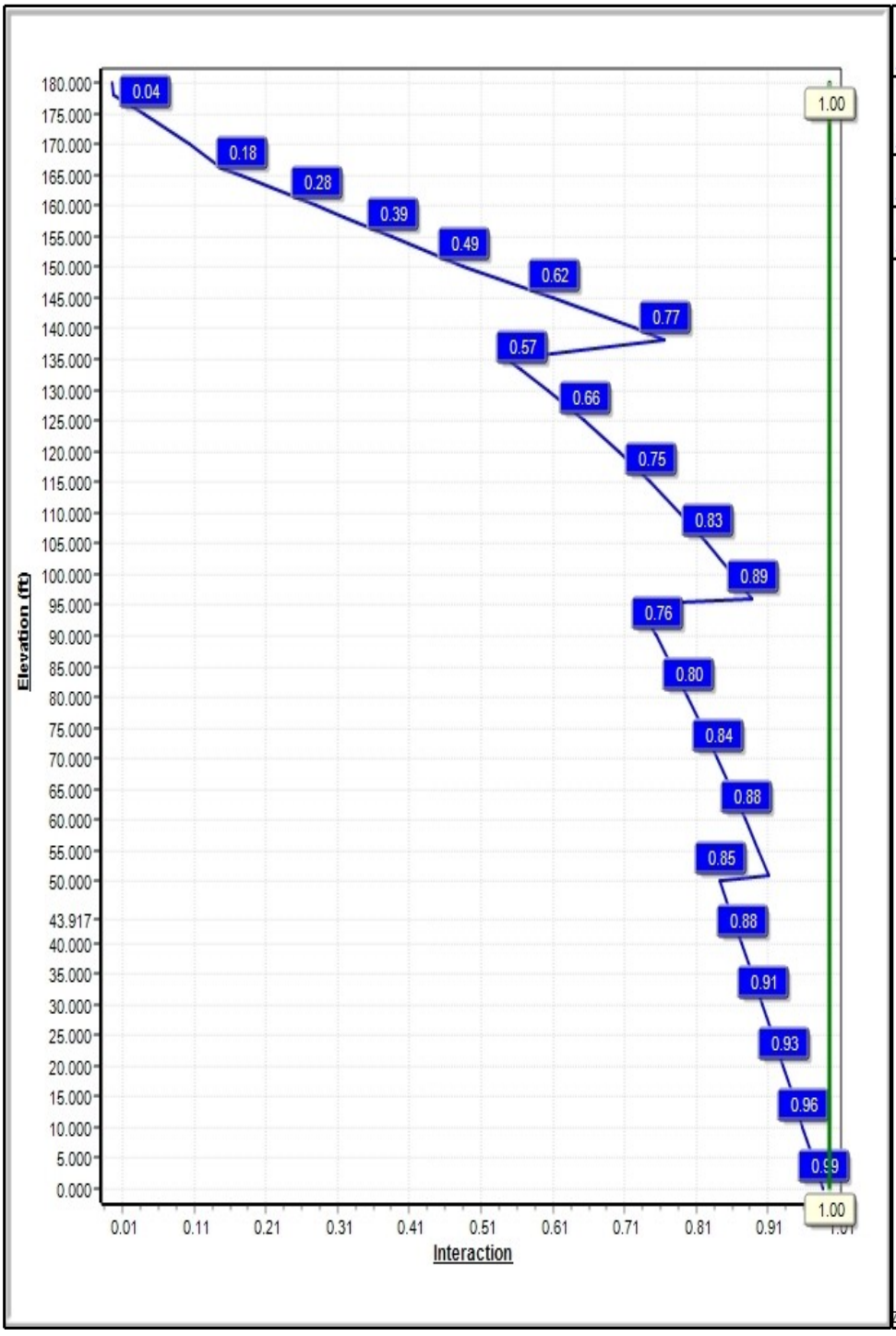
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Gh:**	1.1		
Base Elev:	0.000 (ft)			Page: 1	

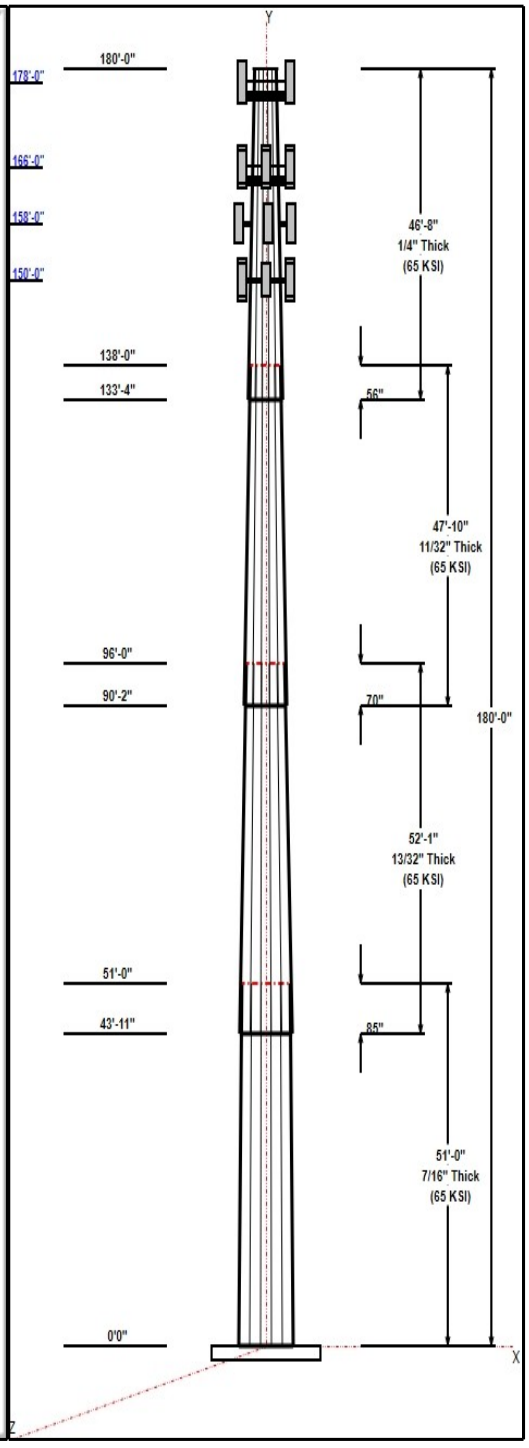
Tower Engineering Solutions

Dead Load Factor: 1.20
Wind Load Factor: 1.60

Load Case : 1.2D + 1.6W 101 mph Wind

Iterations: 26





Structure: CT46130-A-SBA

Type: Tapered
Site Name: Deep River-winthrop Rd
Height: 180.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 12 Sided
Taper: 0.24800

6/1/2018

Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	51.00	49.35	62.00	0.438		0.24800	65
2	52.08	39.00	51.92	0.406	Slip	0.24800	65
3	47.83	29.28	41.14	0.344	Slip	0.24800	65
4	46.67	19.36	30.93	0.250	Slip	0.24800	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
178.00	178.00	6	Amphenol	Verizon
178.00	178.00	6	Amphenol	Verizon
178.00	178.00	3	RRH_2x40 AWS	Verizon
178.00	178.00	3	RRH_2x40 07-U	Verizon
178.00	178.00	1	RFS DB-B1-6C-8AB-OZ	Verizon
178.00	178.00	1	Platform w/ Hand Rails	Verizon
166.00	166.00	1	Platform w/ Hand Rails	Sprint Nextel
166.00	166.00	3	RFS APXVTM14-C-I20	Sprint Nextel
166.00	166.00	3	Commscope	Sprint Nextel
166.00	166.00	3	ALU 1900 Mhz	Sprint Nextel
166.00	166.00	6	ALU 800 Mhz	Sprint Nextel
166.00	166.00	3	ALU TD-RRH8x20-25	Sprint Nextel
166.00	166.00	1	Sitepro	Sprint Nextel
166.00	166.00	1	Sitepro	Sprint Nextel
158.00	158.00	6	EMS RR90-17-02DP	T-Mobile
158.00	158.00	6	Stella Dooradus TMA's	T-Mobile
158.00	158.00	3	T-Arms	T-Mobile
150.00	150.00	2	Cci HPA-65R-BUU-H6	AT&T
150.00	150.00	1	SBNHH-1D65A	AT&T
150.00	150.00	3	RRUS-32	AT&T
150.00	150.00	2	KMW AM-X-CD-16-65-00T	AT&T
150.00	150.00	3	Powerwave 7770	AT&T
150.00	150.00	1	KMW AM-X-CD-14-65-00T	AT&T
150.00	150.00	6	Powerwave LGP21401	AT&T
150.00	150.00	3	Ericsson RRUS-11	AT&T
150.00	150.00	1	Raycap DC6-48-60-18-8F	AT&T
150.00	150.00	1	Platform w/ Hand Rail	AT&T

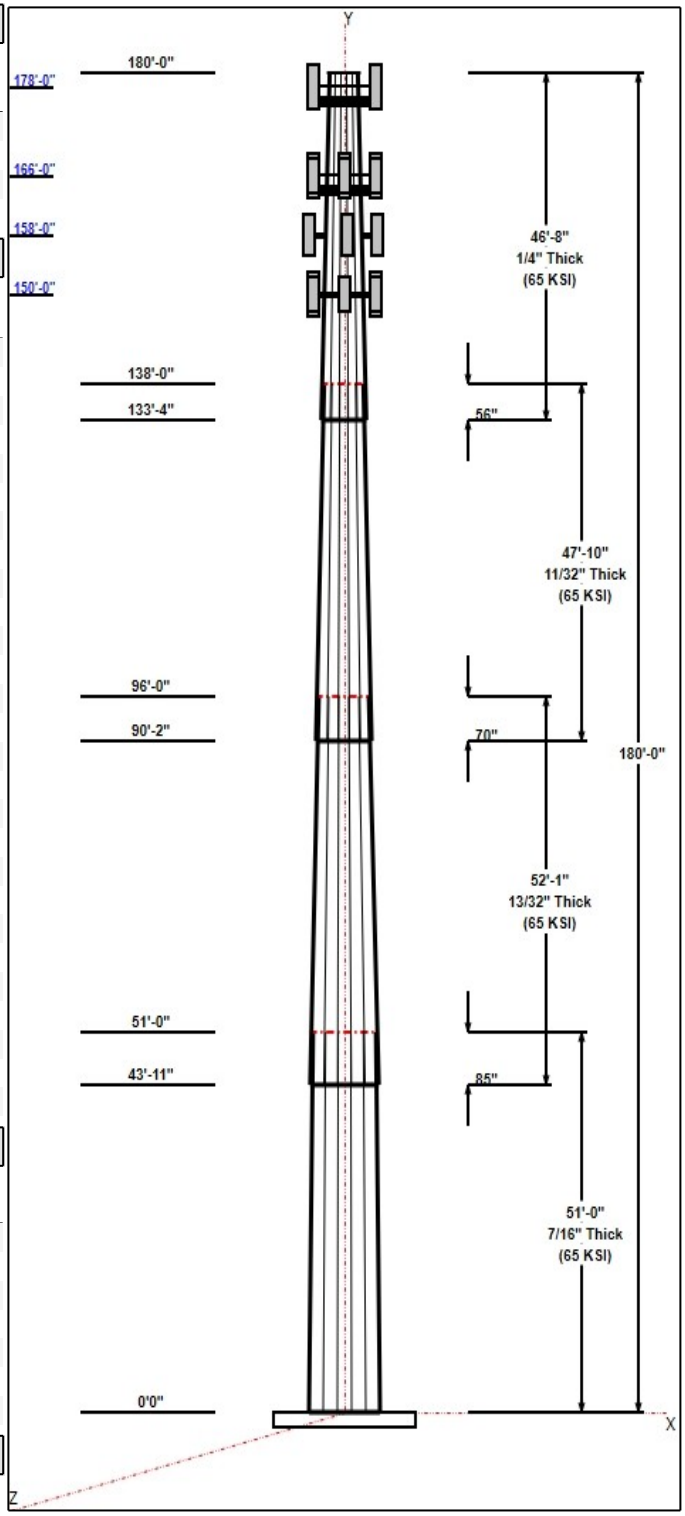
Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
3.00	178.00	Inside	1 5/8" Coax	Verizon
3.00	166.00	Inside	1-1/4" Fiber	Sprint Nextel
3.00	158.00	Inside	1 5/8" Coax	T-Mobile
3.00	150.00	Inside	1 1/4" Coax	AT&T
3.00	150.00	Inside	10 mm Fiber	AT&T
3.00	150.00	Inside	19.7 mm DC	AT&T
3.00	150.00	Inside	3" Innerduct	AT&T

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
20	2.25" 18J	75.0	Radial

Base Plate



Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.7500	76.7	60.0	Polygon

Reactions

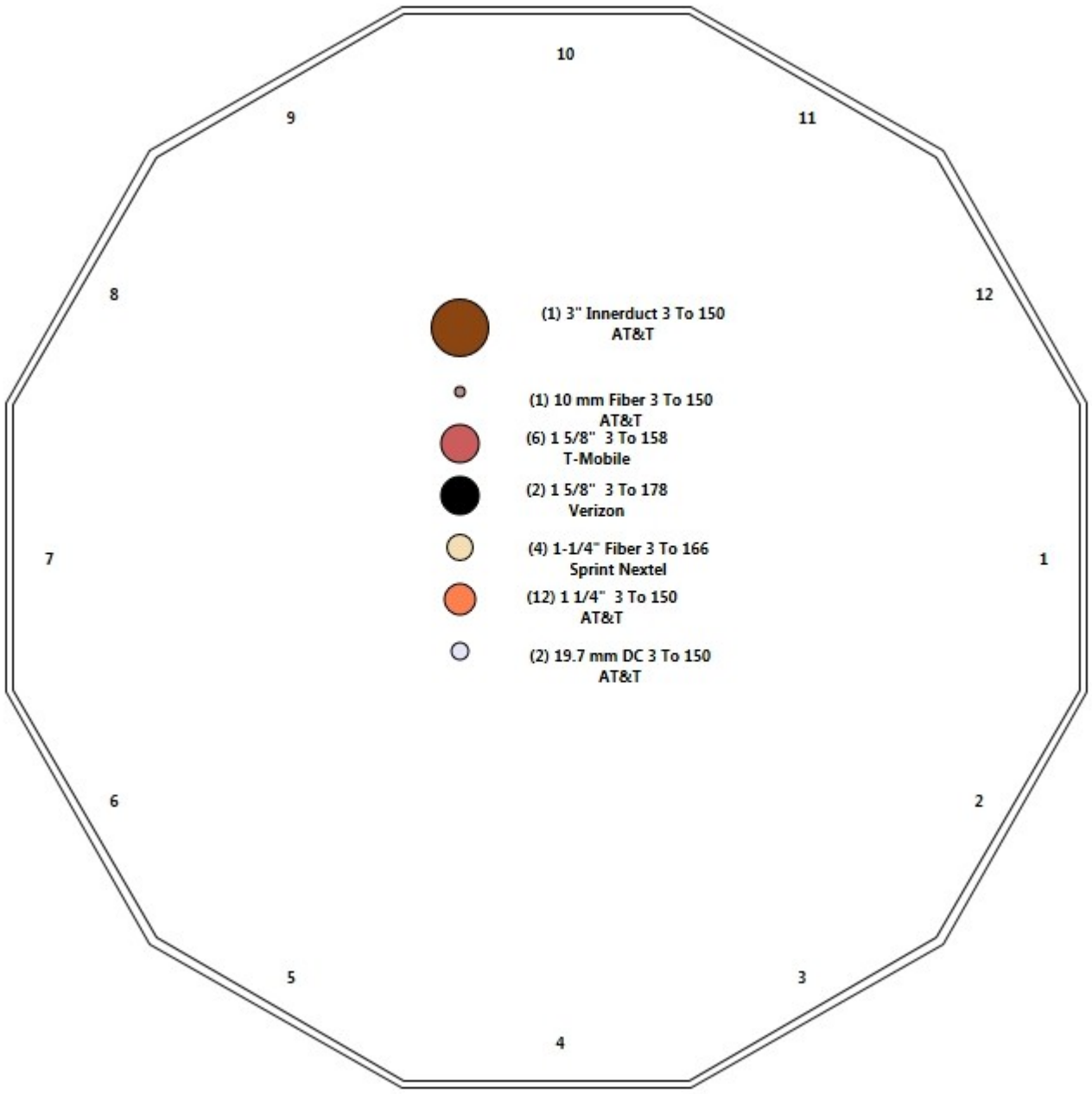
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 101 mph Wind	6306.1	52.4	55.7
0.9D + 1.6W 101 mph Wind	6235.4	52.4	41.7
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1409.7	11.0	84.1
1.2D + 1.0E	210.8	1.6	55.8
0.9D + 1.0E	208.1	1.6	41.8
1.0D + 1.0W 60 mph Wind	1384.2	11.6	46.5

Structure: CT46130-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Deep River-winthrop Rd
Height: 180.00 (ft)

6/1/2018

Tower Engineering Solutions



Shaft Properties

Structure:	CT46130-A-SBA		**Code:**	EIA/TIA-222-G	6/1/2018
Site Name:	Deep River-winthrop Rd		**Exposure:**	C	
Height:	180.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	12	51.000	0.4375	65		0.00	13,505
2	12	52.083	0.4063	65	Slip	85.00	10,446
3	12	47.833	0.3438	65	Slip	70.00	6,281
4	12	46.667	0.2500	65	Slip	56.00	3,183
					Total Shaft Weight:		**33,414**

	Bottom						Top						
Sec. No.	**Dia (in)**	**Elev (ft)**	**Area (sqin)**	**Ix (in^4)**	**W/t Ratio**	**D/t Ratio**	**Dia (in)**	**Elev (ft)**	**Area (sqin)**	**Ix (in^4)**	**W/t Ratio**	**D/t Ratio**	**Taper**
1	62.00	0.00	86.73	41953.54	35.83	141.71	49.35	51.00	68.91	21044.2	28.08	112.8	0.248000
2	51.92	43.92	67.39	22826.23	32.10	127.81	39.00	96.00	50.49	9601.48	23.58	96.01	0.248000
3	41.14	90.17	45.15	9591.86	29.92	119.68	29.28	138.00	32.02	3421.62	20.68	85.17	0.248000
4	30.93	133.3	24.70	2968.17	31.01	123.73	19.36	180.00	15.38	717.07	18.61	77.44	0.248000

Load Summary

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

Tower Engineering Solutions

Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	178.00	Amphenol BXA-70063-6CF_2	6	17.00	7.57	0.78	167.86	10.382	0.78	0.00	0.00
2	178.00	Amphenol BXA-171063-12CF_2	6	15.00	4.80	0.88	112.48	7.210	0.88	0.00	0.00
3	178.00	RRH_2x40 AWS	3	44.00	2.16	0.67	105.77	3.226	0.67	0.00	0.00
4	178.00	RRH_2x40 07-U	3	52.40	2.83	0.67	114.10	4.345	0.67	0.00	0.00
5	178.00	RFS DB-B1-6C-8AB-OZ	1	21.40	4.80	0.67	142.06	5.754	0.67	0.00	0.00
6	178.00	Platform w/ Hand Rails	1	2000.00	40.00	1.00	4130.41	61.304	1.00	0.00	0.00
7	166.00	Platform w/ Hand Rails	1	2000.00	40.00	1.00	4115.59	61.156	1.00	0.00	0.00
8	166.00	RFS APXVTM14-C-I20	3	56.20	6.34	0.77	218.58	7.465	0.77	0.00	0.00
9	166.00	Commscope NNVV-65B-R4	3	77.40	12.27	0.74	365.87	13.741	0.74	0.00	0.00
10	166.00	ALU 1900 Mhz	3	44.00	3.80	0.88	154.28	5.204	0.88	0.00	0.00
11	166.00	ALU 800 Mhz	6	53.00	2.49	0.92	127.71	3.645	0.92	0.00	0.00
12	166.00	ALU TD-RRH8x20-25	3	70.00	4.05	0.69	181.82	4.872	0.69	0.00	0.00
13	166.00	Sitepro	1	230.00	6.70	1.00	554.39	13.787	1.00	0.00	0.00
14	166.00	Sitepro	1	406.61	7.00	1.00	894.07	13.911	1.00	0.00	0.00
15	158.00	EMS RR90-17-02DP	6	13.50	7.34	0.71	173.25	8.565	0.71	0.00	0.00
16	158.00	Stella Dooradus TMA's	6	12.80	0.71	0.60	30.43	1.458	0.60	0.00	0.00
17	158.00	T-Arms	3	350.00	8.00	0.75	595.60	15.017	0.75	0.00	0.00
18	150.00	Cci HPA-65R-BUU-H6	2	51.00	9.66	0.85	299.10	11.026	0.85	0.00	0.00
19	150.00	SBNHH-1D65A	1	33.50	5.88	0.83	191.86	6.960	0.83	0.00	0.00
20	150.00	RRUS-32	3	77.00	3.87	0.67	190.59	4.106	0.67	0.00	0.00
21	150.00	KMW AM-X-CD-16-65-00T	2	48.50	8.02	0.79	210.78	10.814	0.79	0.00	0.00
22	150.00	Powerwave 7770	3	35.00	5.51	0.77	170.17	6.565	0.77	0.00	0.00
23	150.00	KMW AM-X-CD-14-65-00T	1	36.40	7.05	0.78	147.93	9.693	0.78	0.00	0.00
24	150.00	Powerwave LGP21401 TMA's	6	14.10	1.22	0.67	39.10	2.010	0.67	0.00	0.00
25	150.00	Ericsson RRUS-11	3	50.70	2.52	0.67	131.23	3.171	0.67	0.00	0.00
26	150.00	Raycap DC6-48-60-18-8F	1	31.80	1.81	0.67	93.62	2.672	0.67	0.00	0.00
27	150.00	Platform w/ Hand Rail	1	1600.00	35.00	1.00	3699.84	65.541	1.00	0.00	0.00
		Totals:	**79**	**9,881.21**			**25,578.54**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
3.00	178.00	(2) 1 5/8" Coax	0.00	Inside
3.00	166.00	(4) 1-1/4" Fiber	0.00	Inside
3.00	158.00	(6) 1 5/8" Coax	0.00	Inside
3.00	150.00	(12) 1 1/4" Coax	0.00	Inside
3.00	150.00	(1) 10 mm Fiber	0.00	Inside
3.00	150.00	(2) 19.7 mm DC	0.00	Inside
3.00	150.00	(1) 3" Innerduct	0.00	Inside

Shaft Section Properties

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 7	

Tower Engineering Solutions

Increment Length: **5 (ft)**

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.4375	62.000	86.726	41953.5	35.83	141.71	65.6	1307.	0.0
5.00		0.4375	60.760	84.979	39469.2	35.07	138.88	66.5	1254.	1460.7
10.00		0.4375	59.520	83.232	37084.8	34.31	136.05	67.3	1203.	1431.0
15.00		0.4375	58.280	81.486	34798.5	33.55	133.21	68.1	1153.	1401.2
20.00		0.4375	57.040	79.739	32608.2	32.79	130.38	69.0	1104.	1371.5
25.00		0.4375	55.800	77.992	30511.7	32.03	127.54	69.8	1056.	1341.8
30.00		0.4375	54.560	76.245	28507.1	31.27	124.71	70.6	1009.	1312.1
35.00		0.4375	53.320	74.498	26592.3	30.51	121.87	71.4	963.5	1282.4
40.00		0.4375	52.080	72.751	24765.2	29.75	119.04	72.3	918.6	1252.6
43.92	Bot - Section 2	0.4375	51.109	71.383	23393.9	29.16	116.82	72.9	884.3	960.5
45.00		0.4375	50.840	71.005	23023.8	28.99	116.21	73.1	874.9	510.2
50.00		0.4375	49.600	69.258	21365.9	28.23	113.37	73.9	832.2	2320.0
51.00	Top - Section 1	0.4063	50.165	65.090	20569.8	30.94	123.48	0.0	0.0	457.1
55.00		0.4063	49.173	63.792	19363.9	30.29	121.04	71.7	760.8	877.1
60.00		0.4063	47.933	62.170	17924.0	29.47	117.99	72.6	722.4	1071.6
65.00		0.4063	46.693	60.548	16557.4	28.65	114.94	73.5	685.0	1044.0
70.00		0.4063	45.453	58.926	15262.0	27.84	111.88	74.4	648.7	1016.4
75.00		0.4063	44.213	57.304	14036.0	27.02	108.83	75.2	613.3	988.8
80.00		0.4063	42.973	55.682	12877.5	26.20	105.78	76.1	578.9	961.2
85.00		0.4063	41.733	54.060	11784.6	25.38	102.73	77.0	545.5	933.6
90.00		0.4063	40.493	52.438	10755.3	24.56	99.67	77.9	513.1	906.0
90.17	Bot - Section 3	0.4063	40.451	52.384	10722.0	24.54	99.57	78.0	512.1	29.7
95.00		0.4063	39.253	50.816	9787.7	23.75	96.62	78.8	481.7	1580.4
96.00	Top - Section 2	0.3438	39.692	43.554	8607.2	28.80	115.47	0.0	0.0	321.0
100.00		0.3438	38.700	42.456	7972.5	28.02	112.58	74.2	398.0	585.3
105.00		0.3438	37.460	41.083	7224.0	27.06	108.97	75.2	372.5	710.7
110.00		0.3438	36.220	39.711	6523.9	26.09	105.37	76.3	348.0	687.3
115.00		0.3438	34.980	38.338	5870.5	25.12	101.76	77.3	324.2	664.0
120.00		0.3438	33.740	36.965	5262.3	24.16	98.15	78.4	301.3	640.6
125.00		0.3438	32.500	35.593	4697.7	23.19	94.55	79.4	279.2	617.3
130.00		0.3438	31.260	34.220	4174.9	22.22	90.94	80.5	258.0	593.9
133.33	Bot - Section 4	0.3438	30.433	33.305	3848.9	21.58	88.53	81.2	244.3	383.0
135.00		0.3438	30.020	32.848	3692.4	21.26	87.33	81.5	237.6	326.7
138.00	Top - Section 3	0.2500	29.776	23.768	2644.8	29.77	119.10	0.0	0.0	576.8
140.00		0.2500	29.280	23.369	2513.8	29.24	117.12	72.8	165.9	160.4
145.00		0.2500	28.040	22.371	2205.2	27.91	112.16	74.3	151.9	389.1
150.00		0.2500	26.800	21.373	1923.0	26.58	107.20	75.7	138.6	372.1
155.00		0.2500	25.560	20.375	1665.9	25.25	102.24	77.2	125.9	355.1
158.00		0.2500	24.816	19.776	1523.3	24.45	99.26	78.0	118.6	204.9
160.00		0.2500	24.320	19.376	1432.9	23.92	97.28	78.6	113.8	133.2
165.00		0.2500	23.080	18.378	1222.6	22.59	92.32	80.1	102.3	321.2
166.00		0.2500	22.832	18.179	1183.2	22.33	91.33	80.4	100.1	62.2
170.00		0.2500	21.840	17.380	1034.0	21.26	87.36	81.5	91.5	242.0
175.00		0.2500	20.600	16.382	865.9	19.94	82.40	81.9	81.2	287.2
178.00		0.2500	19.856	15.783	774.4	19.14	79.42	81.9	75.3	164.2
180.00		0.2500	19.360	15.384	717.1	18.61	77.44	81.9	71.6	106.1
										33413.9

Wind Loading - Shaft

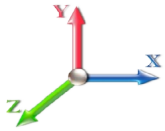
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 26

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	21.088	23.20	498.08	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	21.088	23.20	488.12	1.000	0.000	5.00	26.477	26.48	982.7	0.0	1752.8
10.00		1.00	0.85	21.088	23.20	478.16	1.000	0.000	5.00	25.942	25.94	962.8	0.0	1717.2
15.00		1.00	0.85	21.088	23.20	468.19	1.000	0.000	5.00	25.407	25.41	943.0	0.0	1681.5
20.00		1.00	0.90	22.375	24.61	472.01	1.000	0.000	5.00	24.873	24.87	979.5	0.0	1645.8
25.00		1.00	0.95	23.451	25.80	472.72	1.000	0.000	5.00	24.338	24.34	1004.5	0.0	1610.2
30.00		1.00	0.98	24.369	26.81	471.18	1.000	0.000	5.00	23.803	23.80	1020.9	0.0	1574.5
35.00		1.00	1.01	25.172	27.69	468.00	1.000	0.000	5.00	23.268	23.27	1030.8	0.0	1538.8
40.00		1.00	1.04	25.890	28.48	463.59	1.000	0.000	5.00	22.733	22.73	1035.9	0.0	1503.2
43.92	Bot - Section 2	1.00	1.06	26.404	29.04	459.44	1.000	0.000	3.92	17.434	17.43	810.2	0.0	1152.6
45.00		1.00	1.07	26.540	29.19	458.19	1.000	0.000	1.08	4.840	4.84	226.1	0.0	612.3
50.00		1.00	1.09	27.135	29.85	452.00	1.000	0.000	5.00	22.014	22.01	1051.3	0.0	2783.9
51.00	Top - Section 1	1.00	1.10	27.249	29.97	450.68	1.000	0.000	1.00	4.339	4.34	208.1	0.0	548.5
55.00		1.00	1.12	27.685	30.45	452.63	1.000	0.000	4.00	17.140	17.14	835.2	0.0	1052.5
60.00		1.00	1.14	28.197	31.02	445.27	1.000	0.000	5.00	20.944	20.94	1039.4	0.0	1285.9
65.00		1.00	1.16	28.676	31.54	437.42	1.000	0.000	5.00	20.409	20.41	1030.0	0.0	1252.8
70.00		1.00	1.17	29.127	32.04	429.14	1.000	0.000	5.00	19.874	19.87	1018.8	0.0	1219.6
75.00		1.00	1.19	29.553	32.51	420.48	1.000	0.000	5.00	19.339	19.34	1005.9	0.0	1186.5
80.00		1.00	1.21	29.958	32.95	411.47	1.000	0.000	5.00	18.804	18.80	991.5	0.0	1153.4
85.00		1.00	1.22	30.342	33.38	402.15	1.000	0.000	5.00	18.269	18.27	975.6	0.0	1120.3
90.00		1.00	1.24	30.710	33.78	392.56	1.000	0.000	5.00	17.734	17.73	958.5	0.0	1087.2
90.17	Bot - Section 3	1.00	1.24	30.722	33.79	392.24	1.000	0.000	0.17	0.582	0.58	31.5	0.0	35.7
95.00		1.00	1.25	31.061	34.17	382.71	1.000	0.000	4.83	16.904	16.90	924.1	0.0	1896.5
96.00	Top - Section 2	1.00	1.25	31.130	34.24	380.71	1.000	0.000	1.00	3.435	3.44	188.2	0.0	385.2
100.00		1.00	1.27	31.399	34.54	379.37	1.000	0.000	4.00	13.526	13.53	747.5	0.0	702.4
105.00		1.00	1.28	31.723	34.89	369.10	1.000	0.000	5.00	16.426	16.43	917.1	0.0	852.8
110.00		1.00	1.29	32.035	35.24	358.64	1.000	0.000	5.00	15.891	15.89	896.0	0.0	824.8
115.00		1.00	1.30	32.336	35.57	347.98	1.000	0.000	5.00	15.357	15.36	874.0	0.0	796.7
120.00		1.00	1.32	32.627	35.89	337.15	1.000	0.000	5.00	14.822	14.82	851.1	0.0	768.7
125.00		1.00	1.33	32.909	36.20	326.16	1.000	0.000	5.00	14.287	14.29	827.5	0.0	740.7
130.00		1.00	1.34	33.182	36.50	315.01	1.000	0.000	5.00	13.752	13.75	803.1	0.0	712.7
133.33	Bot - Section 4	1.00	1.34	33.359	36.69	307.50	1.000	0.000	3.33	8.871	8.87	520.8	0.0	459.6
135.00		1.00	1.35	33.446	36.79	303.72	1.000	0.000	1.67	4.418	4.42	260.1	0.0	392.1
138.00	Top - Section 3	1.00	1.35	33.601	36.96	296.88	1.000	0.000	3.00	7.803	7.80	461.5	0.0	692.2
140.00		1.00	1.36	33.703	37.07	297.37	1.000	0.000	2.00	5.095	5.09	302.2	0.0	192.5
145.00		1.00	1.37	33.953	37.35	285.83	1.000	0.000	5.00	12.363	12.36	738.8	0.0	466.9
150.00	Appurtenance(s)	1.00	1.38	34.196	37.62	274.17	1.000	0.000	5.00	11.828	11.83	711.9	0.0	446.6
155.00		1.00	1.39	34.433	37.88	262.39	1.000	0.000	5.00	11.293	11.29	684.4	0.0	426.2
158.00	Appurtenance(s)	1.00	1.39	34.573	38.03	255.26	1.000	0.000	3.00	6.519	6.52	396.7	0.0	245.9
160.00		1.00	1.40	34.664	38.13	250.49	1.000	0.000	2.00	4.239	4.24	258.6	0.0	159.9
165.00		1.00	1.41	34.890	38.38	238.49	1.000	0.000	5.00	10.223	10.22	627.8	0.0	385.4
166.00	Appurtenance(s)	1.00	1.41	34.934	38.43	236.08	1.000	0.000	1.00	1.980	1.98	121.8	0.0	74.6
170.00		1.00	1.42	35.110	38.62	226.39	1.000	0.000	4.00	7.708	7.71	476.3	0.0	290.4
175.00		1.00	1.42	35.324	38.86	214.19	1.000	0.000	5.00	9.154	9.15	569.1	0.0	344.7
178.00	Appurtenance(s)	1.00	1.43	35.451	39.00	206.82	1.000	0.000	3.00	5.235	5.24	326.7	0.0	197.0
180.00		1.00	1.43	35.535	39.09	201.89	1.000	0.000	2.00	3.383	3.38	211.6	0.0	127.3

Wind Loading - Shaft

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Totals:	**180.00**	**31,838.8**	**40,096.7**

Discrete Appurtenance Forces

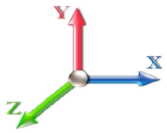
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 26

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	178.00	RFS DB-B1-6C-8AB-OZ	1	35.451	38.996	0.50	0.75	2.41	25.68	0.000	0.000	150.49	0.00	0.00
2	178.00	RRH_2x40 07-U	3	35.451	38.996	0.50	0.75	4.27	188.64	0.000	0.000	266.19	0.00	0.00
3	178.00	RRH_2x40 AWS	3	35.451	38.996	0.50	0.75	3.26	158.40	0.000	0.000	203.17	0.00	0.00
4	178.00	Amphenol	6	35.451	38.996	0.66	0.75	19.01	108.00	0.000	0.000	1185.98	0.00	0.00
5	178.00	Amphenol	6	35.451	38.996	0.58	0.75	26.57	122.40	0.000	0.000	1657.85	0.00	0.00
6	178.00	Platform w/ Hand Rails	1	35.451	38.996	1.00	1.00	40.00	2400.00	0.000	0.000	2495.75	0.00	0.00
7	166.00	ALU 1900 Mhz	3	34.934	38.427	0.66	0.75	7.52	158.40	0.000	0.000	462.60	0.00	0.00
8	166.00	RFS APXVTM14-C-I20	3	34.934	38.427	0.58	0.75	10.98	202.32	0.000	0.000	675.34	0.00	0.00
9	166.00	Commscope	3	34.934	38.427	0.55	0.75	20.43	278.64	0.000	0.000	1256.09	0.00	0.00
10	166.00	Sitepro	1	34.934	38.427	1.00	1.00	7.00	487.93	0.000	0.000	430.39	0.00	0.00
11	166.00	ALU 800 Mhz	6	34.934	38.427	0.69	0.75	10.31	381.60	0.000	0.000	633.81	0.00	0.00
12	166.00	ALU TD-RRH8x20-25	3	34.934	38.427	0.52	0.75	6.29	252.00	0.000	0.000	386.59	0.00	0.00
13	166.00	Sitepro	1	34.934	38.427	1.00	1.00	6.70	276.00	0.000	0.000	411.94	0.00	0.00
14	166.00	Platform w/ Hand Rails	1	34.934	38.427	1.00	1.00	40.00	2400.00	0.000	0.000	2459.35	0.00	0.00
15	158.00	Stella Dooradus TMA's	6	34.573	38.030	0.48	0.80	2.04	92.16	0.000	0.000	124.42	0.00	0.00
16	158.00	EMS RR90-17-02DP	6	34.573	38.030	0.57	0.80	25.01	97.20	0.000	0.000	1522.09	0.00	0.00
17	158.00	T-Arms	3	34.573	38.030	0.56	0.75	13.50	1260.00	0.000	0.000	821.44	0.00	0.00
18	150.00	Powerwave 7770	3	34.196	37.616	0.58	0.75	9.55	126.00	0.000	0.000	574.54	0.00	0.00
19	150.00	Cci HPA-65R-BUU-H6	2	34.196	37.616	0.64	0.75	12.32	122.40	0.000	0.000	741.28	0.00	0.00
20	150.00	SBNHH-1D65A	1	34.196	37.616	0.62	0.75	3.66	40.20	0.000	0.000	220.30	0.00	0.00
21	150.00	RRUS-32	3	34.196	37.616	0.50	0.75	5.83	277.20	0.000	0.000	351.13	0.00	0.00
22	150.00	KMW AM-X-CD-16-65-00T	2	34.196	37.616	0.59	0.75	9.50	116.40	0.000	0.000	571.99	0.00	0.00
23	150.00	Powerwave LGP21401	6	34.196	37.616	0.50	0.75	3.68	101.52	0.000	0.000	221.38	0.00	0.00
24	150.00	KMW AM-X-CD-14-65-00T	1	34.196	37.616	0.58	0.75	4.12	43.68	0.000	0.000	248.22	0.00	0.00
25	150.00	Ericsson RRUS-11	3	34.196	37.616	0.54	0.80	4.05	182.52	0.000	0.000	243.88	0.00	0.00
26	150.00	Raycap DC6-48-60-18-8F	1	34.196	37.616	0.54	0.80	0.97	38.16	0.000	0.000	58.39	0.00	0.00
27	150.00	Platform w/ Hand Rail	1	34.196	37.616	1.00	1.00	35.00	1920.00	0.000	0.000	2106.50	0.00	0.00
							Totals:		**11,857.45**			**20,481.10**		

Total Applied Force Summary

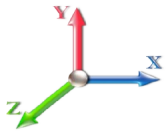
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 26

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		982.67	1801.99	0.00	0.00
10.00		962.82	1840.08	0.00	0.00
15.00		942.97	1804.41	0.00	0.00
20.00		979.47	1768.75	0.00	0.00
25.00		1004.50	1733.08	0.00	0.00
30.00		1020.87	1697.42	0.00	0.00
35.00		1030.84	1661.75	0.00	0.00
40.00		1035.86	1626.09	0.00	0.00
43.92		810.18	1248.86	0.00	0.00
45.00		226.08	638.89	0.00	0.00
50.00		1051.33	2906.86	0.00	0.00
51.00		208.07	573.12	0.00	0.00
55.00		835.17	1150.87	0.00	0.00
60.00		1039.38	1408.78	0.00	0.00
65.00		1030.04	1375.67	0.00	0.00
70.00		1018.82	1342.55	0.00	0.00
75.00		1005.90	1309.43	0.00	0.00
80.00		991.46	1276.32	0.00	0.00
85.00		975.63	1243.20	0.00	0.00
90.00		958.53	1210.08	0.00	0.00
90.17		31.47	39.77	0.00	0.00
95.00		924.12	2015.29	0.00	0.00
96.00		188.20	409.82	0.00	0.00
100.00		747.48	800.74	0.00	0.00
105.00		917.12	975.71	0.00	0.00
110.00		895.98	947.68	0.00	0.00
115.00		873.97	919.66	0.00	0.00
120.00		851.12	891.64	0.00	0.00
125.00		827.48	863.62	0.00	0.00
130.00		803.11	835.59	0.00	0.00
133.33		520.82	541.49	0.00	0.00
135.00		260.08	433.04	0.00	0.00
138.00		461.45	765.92	0.00	0.00
140.00		302.22	241.64	0.00	0.00
145.00		738.78	589.85	0.00	0.00
150.00	(23) attachments	6049.48	3537.55	0.00	0.00
155.00		684.39	498.99	0.00	0.00
158.00	(15) attachments	2864.63	1738.97	0.00	0.00
160.00		258.62	174.02	0.00	0.00
165.00		627.77	420.79	0.00	0.00
166.00	(21) attachments	6837.87	4518.60	0.00	0.00
170.00		476.30	300.38	0.00	0.00
175.00		569.09	357.13	0.00	0.00
178.00	(20) attachments	6286.09	3207.62	0.00	0.00
180.00		211.59	127.26	0.00	0.00

Total Applied Force Summary

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Totals:	**52,319.85**	**55,770.97**	**0.00**	**0.00**

Calculated Forces

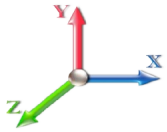
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 26

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-55.67	-52.42	0.00	-6306.1	0.00	6306.12	5123.29	2561.65	13030.5	6435.29	0.00	0.000	0.000	0.991
5.00	-53.68	-51.64	0.00	-6044.0	0.00	6044.00	5083.45	2541.72	12666.9	6255.72	0.11	-0.209	0.000	0.977
10.00	-51.66	-50.86	0.00	-5785.8	0.00	5785.83	5041.00	2520.50	12301.0	6075.05	0.45	-0.423	0.000	0.963
15.00	-49.67	-50.09	0.00	-5531.5	0.00	5531.54	4995.94	2497.97	11933.4	5893.46	1.01	-0.640	0.000	0.949
20.00	-47.72	-49.27	0.00	-5281.1	0.00	5281.11	4948.29	2474.14	11564.2	5711.17	1.80	-0.861	0.000	0.935
25.00	-45.82	-48.42	0.00	-5034.7	0.00	5034.75	4898.02	2449.01	11194.1	5528.36	2.82	-1.086	0.000	0.920
30.00	-43.95	-47.54	0.00	-4792.6	0.00	4792.66	4845.16	2422.58	10823.3	5345.24	4.08	-1.315	0.000	0.906
35.00	-42.12	-46.64	0.00	-4554.9	0.00	4554.96	4789.68	2394.84	10452.3	5162.01	5.58	-1.548	0.000	0.892
40.00	-40.36	-45.71	0.00	-4321.7	0.00	4321.75	4731.61	2365.80	10081.4	4978.87	7.33	-1.785	0.000	0.877
43.92	-39.04	-44.94	0.00	-4142.7	0.00	4142.72	4684.30	2342.15	9791.39	4835.60	8.87	-1.976	0.000	0.865
45.00	-38.29	-44.80	0.00	-4094.0	0.00	4094.04	4670.93	2335.46	9711.23	4796.01	9.33	-2.030	0.000	0.862
50.00	-35.31	-43.73	0.00	-3870.0	0.00	3870.06	4607.64	2303.82	9341.95	4613.64	11.59	-2.276	0.000	0.847
51.00	-34.65	-43.57	0.00	-3826.3	0.00	3826.34	4157.28	2078.64	8537.21	4216.21	12.07	-2.327	0.000	0.916
55.00	-33.36	-42.83	0.00	-3652.0	0.00	3652.05	4115.37	2057.69	8281.29	4089.82	14.11	-2.530	0.000	0.902
60.00	-31.81	-41.87	0.00	-3437.9	0.00	3437.92	4060.64	2030.32	7961.67	3931.97	16.89	-2.790	0.000	0.883
65.00	-30.30	-40.91	0.00	-3228.5	0.00	3228.59	4003.30	2001.65	7642.72	3774.45	19.96	-3.054	0.000	0.863
70.00	-28.83	-39.95	0.00	-3024.0	0.00	3024.04	3943.36	1971.68	7324.85	3617.47	23.30	-3.323	0.000	0.844
75.00	-27.40	-39.00	0.00	-2824.2	0.00	2824.27	3880.82	1940.41	7008.46	3461.22	26.92	-3.596	0.000	0.823
80.00	-26.00	-38.06	0.00	-2629.2	0.00	2629.26	3815.67	1907.83	6693.96	3305.90	30.84	-3.872	0.000	0.803
85.00	-24.65	-37.12	0.00	-2438.9	0.00	2438.97	3747.91	1873.96	6381.75	3151.70	35.04	-4.152	0.000	0.781
90.00	-23.42	-36.13	0.00	-2253.3	0.00	2253.38	3677.55	1838.78	6072.22	2998.84	39.53	-4.435	0.000	0.758
90.17	-23.30	-36.16	0.00	-2247.3	0.00	2247.36	3675.16	1837.58	6061.96	2993.77	39.69	-4.445	0.000	0.757
95.00	-21.26	-35.14	0.00	-2072.6	0.00	2072.61	3604.59	1802.30	5765.80	2847.51	44.33	-4.722	0.000	0.734
96.00	-20.78	-34.97	0.00	-2037.4	0.00	2037.47	2873.56	1436.78	4663.81	2303.28	45.32	-4.782	0.000	0.892
100.00	-19.87	-34.25	0.00	-1897.6	0.00	1897.60	2833.34	1416.67	4481.60	2213.29	49.43	-5.015	0.000	0.865
105.00	-18.80	-33.36	0.00	-1726.3	0.00	1726.34	2780.72	1390.36	4254.92	2101.34	54.85	-5.338	0.000	0.829
110.00	-17.76	-32.48	0.00	-1559.5	0.00	1559.55	2725.50	1362.75	4029.81	1990.17	60.60	-5.662	0.000	0.791
115.00	-16.75	-31.61	0.00	-1397.1	0.00	1397.18	2667.67	1333.84	3806.69	1879.98	66.70	-5.984	0.000	0.750
120.00	-15.79	-30.75	0.00	-1239.1	0.00	1239.14	2607.24	1303.62	3585.95	1770.96	73.12	-6.304	0.000	0.706
125.00	-14.86	-29.91	0.00	-1085.3	0.00	1085.38	2544.20	1272.10	3368.00	1663.33	79.88	-6.618	0.000	0.659
130.00	-14.00	-29.08	0.00	-935.80	0.00	935.80	2478.56	1239.28	3153.24	1557.27	86.96	-6.924	0.000	0.607
133.33	-13.45	-28.53	0.00	-838.87	0.00	838.87	2433.35	1216.68	3012.04	1487.53	91.86	-7.125	0.000	0.570
135.00	-12.99	-28.25	0.00	-791.32	0.00	791.32	2410.32	1205.16	2942.08	1452.98	94.36	-7.226	0.000	0.551
138.00	-12.22	-27.73	0.00	-706.56	0.00	706.56	1545.45	772.73	1882.66	929.77	98.94	-7.399	0.000	0.769
140.00	-11.91	-27.44	0.00	-651.11	0.00	651.11	1531.69	765.84	1834.28	905.88	102.06	-7.512	0.000	0.728
145.00	-11.28	-26.69	0.00	-513.89	0.00	513.89	1495.44	747.72	1713.73	846.35	110.09	-7.841	0.000	0.616
150.00	-8.52	-20.25	0.00	-380.42	0.00	380.42	1456.60	728.30	1594.07	787.25	118.43	-8.130	0.000	0.490
155.00	-8.06	-19.53	0.00	-279.17	0.00	279.17	1415.15	707.58	1475.70	728.79	127.06	-8.374	0.000	0.390
158.00	-6.74	-16.45	0.00	-220.59	0.00	220.59	1389.03	694.52	1405.47	694.11	132.34	-8.502	0.000	0.323
160.00	-6.57	-16.18	0.00	-187.69	0.00	187.69	1371.10	685.55	1359.03	671.17	135.91	-8.578	0.000	0.285
165.00	-6.23	-15.51	0.00	-106.78	0.00	106.78	1324.44	662.22	1244.46	614.59	144.94	-8.724	0.000	0.179
166.00	-2.79	-8.06	0.00	-91.27	0.00	91.27	1314.79	657.40	1221.83	603.42	146.77	-8.747	0.000	0.154
170.00	-2.56	-7.55	0.00	-59.01	0.00	59.01	1275.17	637.59	1132.39	559.24	154.10	-8.820	0.000	0.108
175.00	-2.29	-6.93	0.00	-21.26	0.00	21.26	1207.50	603.75	1010.00	498.80	163.33	-8.875	0.000	0.045
178.00	-0.09	-0.23	0.00	-0.46	0.00	0.46	1163.35	581.68	937.07	462.78	168.89	-8.886	0.000	0.001
180.00	0.00	-0.21	0.00	0.00	0.00	0.00	1133.92	566.96	889.96	439.52	172.60	-8.886	0.000	0.000

Wind Loading - Shaft

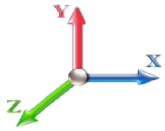
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 26

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	21.088	23.20	498.08	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	21.088	23.20	488.12	1.000	0.000	5.00	26.477	26.48	982.7	0.0	1314.6
10.00		1.00	0.85	21.088	23.20	478.16	1.000	0.000	5.00	25.942	25.94	962.8	0.0	1287.9
15.00		1.00	0.85	21.088	23.20	468.19	1.000	0.000	5.00	25.407	25.41	943.0	0.0	1261.1
20.00		1.00	0.90	22.375	24.61	472.01	1.000	0.000	5.00	24.873	24.87	979.5	0.0	1234.4
25.00		1.00	0.95	23.451	25.80	472.72	1.000	0.000	5.00	24.338	24.34	1004.5	0.0	1207.6
30.00		1.00	0.98	24.369	26.81	471.18	1.000	0.000	5.00	23.803	23.80	1020.9	0.0	1180.9
35.00		1.00	1.01	25.172	27.69	468.00	1.000	0.000	5.00	23.268	23.27	1030.8	0.0	1154.1
40.00		1.00	1.04	25.890	28.48	463.59	1.000	0.000	5.00	22.733	22.73	1035.9	0.0	1127.4
43.92	Bot - Section 2	1.00	1.06	26.404	29.04	459.44	1.000	0.000	3.92	17.434	17.43	810.2	0.0	864.4
45.00		1.00	1.07	26.540	29.19	458.19	1.000	0.000	1.08	4.840	4.84	226.1	0.0	459.2
50.00		1.00	1.09	27.135	29.85	452.00	1.000	0.000	5.00	22.014	22.01	1051.3	0.0	2088.0
51.00	Top - Section 1	1.00	1.10	27.249	29.97	450.68	1.000	0.000	1.00	4.339	4.34	208.1	0.0	411.4
55.00		1.00	1.12	27.685	30.45	452.63	1.000	0.000	4.00	17.140	17.14	835.2	0.0	789.4
60.00		1.00	1.14	28.197	31.02	445.27	1.000	0.000	5.00	20.944	20.94	1039.4	0.0	964.4
65.00		1.00	1.16	28.676	31.54	437.42	1.000	0.000	5.00	20.409	20.41	1030.0	0.0	939.6
70.00		1.00	1.17	29.127	32.04	429.14	1.000	0.000	5.00	19.874	19.87	1018.8	0.0	914.7
75.00		1.00	1.19	29.553	32.51	420.48	1.000	0.000	5.00	19.339	19.34	1005.9	0.0	889.9
80.00		1.00	1.21	29.958	32.95	411.47	1.000	0.000	5.00	18.804	18.80	991.5	0.0	865.0
85.00		1.00	1.22	30.342	33.38	402.15	1.000	0.000	5.00	18.269	18.27	975.6	0.0	840.2
90.00		1.00	1.24	30.710	33.78	392.56	1.000	0.000	5.00	17.734	17.73	958.5	0.0	815.4
90.17	Bot - Section 3	1.00	1.24	30.722	33.79	392.24	1.000	0.000	0.17	0.582	0.58	31.5	0.0	26.8
95.00		1.00	1.25	31.061	34.17	382.71	1.000	0.000	4.83	16.904	16.90	924.1	0.0	1422.4
96.00	Top - Section 2	1.00	1.25	31.130	34.24	380.71	1.000	0.000	1.00	3.435	3.44	188.2	0.0	288.9
100.00		1.00	1.27	31.399	34.54	379.37	1.000	0.000	4.00	13.526	13.53	747.5	0.0	526.8
105.00		1.00	1.28	31.723	34.89	369.10	1.000	0.000	5.00	16.426	16.43	917.1	0.0	639.6
110.00		1.00	1.29	32.035	35.24	358.64	1.000	0.000	5.00	15.891	15.89	896.0	0.0	618.6
115.00		1.00	1.30	32.336	35.57	347.98	1.000	0.000	5.00	15.357	15.36	874.0	0.0	597.6
120.00		1.00	1.32	32.627	35.89	337.15	1.000	0.000	5.00	14.822	14.82	851.1	0.0	576.5
125.00		1.00	1.33	32.909	36.20	326.16	1.000	0.000	5.00	14.287	14.29	827.5	0.0	555.5
130.00		1.00	1.34	33.182	36.50	315.01	1.000	0.000	5.00	13.752	13.75	803.1	0.0	534.5
133.33	Bot - Section 4	1.00	1.34	33.359	36.69	307.50	1.000	0.000	3.33	8.871	8.87	520.8	0.0	344.7
135.00		1.00	1.35	33.446	36.79	303.72	1.000	0.000	1.67	4.418	4.42	260.1	0.0	294.1
138.00	Top - Section 3	1.00	1.35	33.601	36.96	296.88	1.000	0.000	3.00	7.803	7.80	461.5	0.0	519.1
140.00		1.00	1.36	33.703	37.07	297.37	1.000	0.000	2.00	5.095	5.09	302.2	0.0	144.4
145.00		1.00	1.37	33.953	37.35	285.83	1.000	0.000	5.00	12.363	12.36	738.8	0.0	350.2
150.00	Appurtenance(s)	1.00	1.38	34.196	37.62	274.17	1.000	0.000	5.00	11.828	11.83	711.9	0.0	334.9
155.00		1.00	1.39	34.433	37.88	262.39	1.000	0.000	5.00	11.293	11.29	684.4	0.0	319.6
158.00	Appurtenance(s)	1.00	1.39	34.573	38.03	255.26	1.000	0.000	3.00	6.519	6.52	396.7	0.0	184.4
160.00		1.00	1.40	34.664	38.13	250.49	1.000	0.000	2.00	4.239	4.24	258.6	0.0	119.9
165.00		1.00	1.41	34.890	38.38	238.49	1.000	0.000	5.00	10.223	10.22	627.8	0.0	289.1
166.00	Appurtenance(s)	1.00	1.41	34.934	38.43	236.08	1.000	0.000	1.00	1.980	1.98	121.8	0.0	56.0
170.00		1.00	1.42	35.110	38.62	226.39	1.000	0.000	4.00	7.708	7.71	476.3	0.0	217.8
175.00		1.00	1.42	35.324	38.86	214.19	1.000	0.000	5.00	9.154	9.15	569.1	0.0	258.5
178.00	Appurtenance(s)	1.00	1.43	35.451	39.00	206.82	1.000	0.000	3.00	5.235	5.24	326.7	0.0	147.8
180.00		1.00	1.43	35.535	39.09	201.89	1.000	0.000	2.00	3.383	3.38	211.6	0.0	95.4

Wind Loading - Shaft

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

Totals:	**180.00**	**31,838.8**	**30,072.5**

Discrete Appurtenance Forces

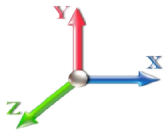
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 26

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	178.00	RFS DB-B1-6C-8AB-OZ	1	35.451	38.996	0.50	0.75	2.41	19.26	0.000	0.000	150.49	0.00	0.00
2	178.00	RRH_2x40 07-U	3	35.451	38.996	0.50	0.75	4.27	141.48	0.000	0.000	266.19	0.00	0.00
3	178.00	RRH_2x40 AWS	3	35.451	38.996	0.50	0.75	3.26	118.80	0.000	0.000	203.17	0.00	0.00
4	178.00	Amphenol	6	35.451	38.996	0.66	0.75	19.01	81.00	0.000	0.000	1185.98	0.00	0.00
5	178.00	Amphenol	6	35.451	38.996	0.58	0.75	26.57	91.80	0.000	0.000	1657.85	0.00	0.00
6	178.00	Platform w/ Hand Rails	1	35.451	38.996	1.00	1.00	40.00	1800.00	0.000	0.000	2495.75	0.00	0.00
7	166.00	ALU 1900 Mhz	3	34.934	38.427	0.66	0.75	7.52	118.80	0.000	0.000	462.60	0.00	0.00
8	166.00	RFS APXVTM14-C-I20	3	34.934	38.427	0.58	0.75	10.98	151.74	0.000	0.000	675.34	0.00	0.00
9	166.00	Commscope	3	34.934	38.427	0.55	0.75	20.43	208.98	0.000	0.000	1256.09	0.00	0.00
10	166.00	Sitepro	1	34.934	38.427	1.00	1.00	7.00	365.95	0.000	0.000	430.39	0.00	0.00
11	166.00	ALU 800 Mhz	6	34.934	38.427	0.69	0.75	10.31	286.20	0.000	0.000	633.81	0.00	0.00
12	166.00	ALU TD-RRH8x20-25	3	34.934	38.427	0.52	0.75	6.29	189.00	0.000	0.000	386.59	0.00	0.00
13	166.00	Sitepro	1	34.934	38.427	1.00	1.00	6.70	207.00	0.000	0.000	411.94	0.00	0.00
14	166.00	Platform w/ Hand Rails	1	34.934	38.427	1.00	1.00	40.00	1800.00	0.000	0.000	2459.35	0.00	0.00
15	158.00	Stella Dooradus TMA's	6	34.573	38.030	0.48	0.80	2.04	69.12	0.000	0.000	124.42	0.00	0.00
16	158.00	EMS RR90-17-02DP	6	34.573	38.030	0.57	0.80	25.01	72.90	0.000	0.000	1522.09	0.00	0.00
17	158.00	T-Arms	3	34.573	38.030	0.56	0.75	13.50	945.00	0.000	0.000	821.44	0.00	0.00
18	150.00	Powerwave 7770	3	34.196	37.616	0.58	0.75	9.55	94.50	0.000	0.000	574.54	0.00	0.00
19	150.00	Cci HPA-65R-BUU-H6	2	34.196	37.616	0.64	0.75	12.32	91.80	0.000	0.000	741.28	0.00	0.00
20	150.00	SBNHH-1D65A	1	34.196	37.616	0.62	0.75	3.66	30.15	0.000	0.000	220.30	0.00	0.00
21	150.00	RRUS-32	3	34.196	37.616	0.50	0.75	5.83	207.90	0.000	0.000	351.13	0.00	0.00
22	150.00	KMW AM-X-CD-16-65-00T	2	34.196	37.616	0.59	0.75	9.50	87.30	0.000	0.000	571.99	0.00	0.00
23	150.00	Powerwave LGP21401	6	34.196	37.616	0.50	0.75	3.68	76.14	0.000	0.000	221.38	0.00	0.00
24	150.00	KMW AM-X-CD-14-65-00T	1	34.196	37.616	0.58	0.75	4.12	32.76	0.000	0.000	248.22	0.00	0.00
25	150.00	Ericsson RRUS-11	3	34.196	37.616	0.54	0.80	4.05	136.89	0.000	0.000	243.88	0.00	0.00
26	150.00	Raycap DC6-48-60-18-8F	1	34.196	37.616	0.54	0.80	0.97	28.62	0.000	0.000	58.39	0.00	0.00
27	150.00	Platform w/ Hand Rail	1	34.196	37.616	1.00	1.00	35.00	1440.00	0.000	0.000	2106.50	0.00	0.00
							Totals:		**8,893.09**			**20,481.10**		

Total Applied Force Summary

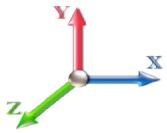
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 26

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		982.67	1351.49	0.00	0.00
10.00		962.82	1380.06	0.00	0.00
15.00		942.97	1353.31	0.00	0.00
20.00		979.47	1326.56	0.00	0.00
25.00		1004.50	1299.81	0.00	0.00
30.00		1020.87	1273.06	0.00	0.00
35.00		1030.84	1246.32	0.00	0.00
40.00		1035.86	1219.57	0.00	0.00
43.92		810.18	936.64	0.00	0.00
45.00		226.08	479.16	0.00	0.00
50.00		1051.33	2180.15	0.00	0.00
51.00		208.07	429.84	0.00	0.00
55.00		835.17	863.15	0.00	0.00
60.00		1039.38	1056.59	0.00	0.00
65.00		1030.04	1031.75	0.00	0.00
70.00		1018.82	1006.91	0.00	0.00
75.00		1005.90	982.07	0.00	0.00
80.00		991.46	957.24	0.00	0.00
85.00		975.63	932.40	0.00	0.00
90.00		958.53	907.56	0.00	0.00
90.17		31.47	29.82	0.00	0.00
95.00		924.12	1511.46	0.00	0.00
96.00		188.20	307.37	0.00	0.00
100.00		747.48	600.56	0.00	0.00
105.00		917.12	731.78	0.00	0.00
110.00		895.98	710.76	0.00	0.00
115.00		873.97	689.75	0.00	0.00
120.00		851.12	668.73	0.00	0.00
125.00		827.48	647.71	0.00	0.00
130.00		803.11	626.70	0.00	0.00
133.33		520.82	406.12	0.00	0.00
135.00		260.08	324.78	0.00	0.00
138.00		461.45	574.44	0.00	0.00
140.00		302.22	181.23	0.00	0.00
145.00		738.78	442.38	0.00	0.00
150.00	(23) attachments	6049.48	2653.16	0.00	0.00
155.00		684.39	374.24	0.00	0.00
158.00	(15) attachments	2864.63	1304.23	0.00	0.00
160.00		258.62	130.52	0.00	0.00
165.00		627.77	315.59	0.00	0.00
166.00	(21) attachments	6837.87	3388.95	0.00	0.00
170.00		476.30	225.28	0.00	0.00
175.00		569.09	267.85	0.00	0.00
178.00	(20) attachments	6286.09	2405.71	0.00	0.00
180.00		211.59	95.45	0.00	0.00

Total Applied Force Summary

Structure:	CT46130-A-SBA		**Code:**	EIA/TIA-222-G	6/1/2018
Site Name:	Deep River-winthrop Rd		**Exposure:**	C	
Height:	180.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 18

Tower Engineering Solutions

Totals:	**52,319.85**	**41,828.23**	**0.00**	**0.00**

Calculated Forces

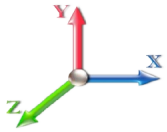
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 26

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-41.73	-52.40	0.00	-6235.4	0.00	6235.40	5123.29	2561.65	13030.5	6435.29	0.00	0.000	0.000	0.978
5.00	-40.19	-51.56	0.00	-5973.4	0.00	5973.42	5083.45	2541.72	12666.9	6255.72	0.11	-0.207	0.000	0.963
10.00	-38.63	-50.73	0.00	-5715.6	0.00	5715.63	5041.00	2520.50	12301.0	6075.05	0.44	-0.418	0.000	0.949
15.00	-37.10	-49.92	0.00	-5461.9	0.00	5461.98	4995.94	2497.97	11933.4	5893.46	0.99	-0.632	0.000	0.935
20.00	-35.60	-49.06	0.00	-5212.4	0.00	5212.40	4948.29	2474.14	11564.2	5711.17	1.77	-0.850	0.000	0.920
25.00	-34.13	-48.17	0.00	-4967.1	0.00	4967.11	4898.02	2449.01	11194.1	5528.36	2.78	-1.072	0.000	0.906
30.00	-32.69	-47.25	0.00	-4726.2	0.00	4726.29	4845.16	2422.58	10823.3	5345.24	4.03	-1.298	0.000	0.891
35.00	-31.28	-46.31	0.00	-4490.0	0.00	4490.05	4789.68	2394.84	10452.3	5162.01	5.51	-1.528	0.000	0.877
40.00	-29.92	-45.35	0.00	-4258.4	0.00	4258.48	4731.61	2365.80	10081.4	4978.87	7.24	-1.762	0.000	0.862
43.92	-28.92	-44.57	0.00	-4080.8	0.00	4080.85	4684.30	2342.15	9791.39	4835.60	8.76	-1.950	0.000	0.850
45.00	-28.33	-44.41	0.00	-4032.5	0.00	4032.56	4670.93	2335.46	9711.23	4796.01	9.21	-2.003	0.000	0.847
50.00	-26.08	-43.34	0.00	-3810.5	0.00	3810.54	4607.64	2303.82	9341.95	4613.64	11.44	-2.245	0.000	0.832
51.00	-25.57	-43.17	0.00	-3767.2	0.00	3767.20	4157.28	2078.64	8537.21	4216.21	11.92	-2.296	0.000	0.900
55.00	-24.57	-42.40	0.00	-3594.5	0.00	3594.51	4115.37	2057.69	8281.29	4089.82	13.92	-2.495	0.000	0.885
60.00	-23.38	-41.42	0.00	-3382.5	0.00	3382.52	4060.64	2030.32	7961.67	3931.97	16.67	-2.751	0.000	0.866
65.00	-22.21	-40.44	0.00	-3175.4	0.00	3175.43	4003.30	2001.65	7642.72	3774.45	19.70	-3.011	0.000	0.847
70.00	-21.08	-39.47	0.00	-2973.2	0.00	2973.24	3943.36	1971.68	7324.85	3617.47	22.99	-3.276	0.000	0.828
75.00	-19.98	-38.50	0.00	-2775.9	0.00	2775.91	3880.82	1940.41	7008.46	3461.22	26.56	-3.544	0.000	0.808
80.00	-18.91	-37.54	0.00	-2583.4	0.00	2583.43	3815.67	1907.83	6693.96	3305.90	30.42	-3.815	0.000	0.787
85.00	-17.87	-36.59	0.00	-2395.7	0.00	2395.74	3747.91	1873.96	6381.75	3151.70	34.56	-4.090	0.000	0.765
90.00	-16.95	-35.61	0.00	-2212.8	0.00	2212.81	3677.55	1838.78	6072.22	2998.84	38.99	-4.368	0.000	0.743
90.17	-16.83	-35.61	0.00	-2206.8	0.00	2206.88	3675.16	1837.58	6061.96	2993.77	39.14	-4.378	0.000	0.742
95.00	-15.30	-34.62	0.00	-2034.7	0.00	2034.75	3604.59	1802.30	5765.80	2847.51	43.71	-4.650	0.000	0.719
96.00	-14.92	-34.44	0.00	-2000.1	0.00	2000.13	2873.56	1436.78	4663.81	2303.28	44.69	-4.709	0.000	0.874
100.00	-14.22	-33.72	0.00	-1862.3	0.00	1862.36	2833.34	1416.67	4481.60	2213.29	48.73	-4.938	0.000	0.847
105.00	-13.39	-32.81	0.00	-1693.7	0.00	1693.78	2780.72	1390.36	4254.92	2101.34	54.06	-5.255	0.000	0.811
110.00	-12.60	-31.92	0.00	-1529.7	0.00	1529.73	2725.50	1362.75	4029.81	1990.17	59.73	-5.572	0.000	0.774
115.00	-11.83	-31.05	0.00	-1370.1	0.00	1370.11	2667.67	1333.84	3806.69	1879.98	65.73	-5.888	0.000	0.734
120.00	-11.09	-30.19	0.00	-1214.8	0.00	1214.86	2607.24	1303.62	3585.95	1770.96	72.05	-6.202	0.000	0.691
125.00	-10.38	-29.36	0.00	-1063.8	0.00	1063.89	2544.20	1272.10	3368.00	1663.33	78.70	-6.510	0.000	0.644
130.00	-9.73	-28.53	0.00	-917.12	0.00	917.12	2478.56	1239.28	3153.24	1557.27	85.67	-6.809	0.000	0.593
133.33	-9.31	-27.99	0.00	-822.03	0.00	822.03	2433.35	1216.68	3012.04	1487.53	90.48	-7.007	0.000	0.557
135.00	-8.96	-27.71	0.00	-775.39	0.00	775.39	2410.32	1205.16	2942.08	1452.98	92.94	-7.105	0.000	0.538
138.00	-8.38	-27.20	0.00	-692.27	0.00	692.27	1545.45	772.73	1882.66	929.77	97.45	-7.275	0.000	0.751
140.00	-8.13	-26.91	0.00	-637.87	0.00	637.87	1531.69	765.84	1834.28	905.88	100.51	-7.386	0.000	0.711
145.00	-7.66	-26.16	0.00	-503.33	0.00	503.33	1495.44	747.72	1713.73	846.35	108.40	-7.709	0.000	0.601
150.00	-5.76	-19.83	0.00	-372.54	0.00	372.54	1456.60	728.30	1594.07	787.25	116.61	-7.991	0.000	0.478
155.00	-5.43	-19.12	0.00	-273.40	0.00	273.40	1415.15	707.58	1475.70	728.79	125.08	-8.230	0.000	0.380
158.00	-4.53	-16.10	0.00	-216.05	0.00	216.05	1389.03	694.52	1405.47	694.11	130.28	-8.355	0.000	0.315
160.00	-4.40	-15.83	0.00	-183.85	0.00	183.85	1371.10	685.55	1359.03	671.17	133.79	-8.430	0.000	0.278
165.00	-4.16	-15.17	0.00	-104.67	0.00	104.67	1324.44	662.22	1244.46	614.59	142.67	-8.573	0.000	0.174
166.00	-1.83	-7.91	0.00	-89.50	0.00	89.50	1314.79	657.40	1221.83	603.42	144.46	-8.596	0.000	0.150
170.00	-1.67	-7.40	0.00	-57.87	0.00	57.87	1275.17	637.59	1132.39	559.24	151.66	-8.667	0.000	0.105
175.00	-1.49	-6.80	0.00	-20.85	0.00	20.85	1207.50	603.75	1010.00	498.80	160.74	-8.721	0.000	0.043
178.00	-0.06	-0.22	0.00	-0.45	0.00	0.45	1163.35	581.68	937.07	462.78	166.20	-8.731	0.000	0.001
180.00	0.00	-0.21	0.00	0.00	0.00	0.00	1133.92	566.96	889.96	439.52	169.85	-8.732	0.000	0.000

Wind Loading - Shaft

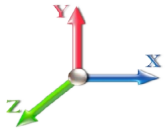
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 25

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	5.168	5.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.242	5.00	27.512	33.01	187.7	498.8	2251.7
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.331	5.00	27.052	32.46	184.5	524.7	2241.8
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.386	5.00	26.563	31.88	181.2	535.7	2217.2
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.427	5.00	26.061	31.27	188.6	540.3	2186.1
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.459	5.00	25.553	30.66	193.9	541.0	2151.2
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.486	5.00	25.041	30.05	197.4	539.3	2113.8
35.00		1.00	1.01	6.169	6.79	0.00	1.200	1.509	5.00	24.525	29.43	199.7	535.7	2074.6
40.00		1.00	1.04	6.345	6.98	0.00	1.200	1.529	5.00	24.007	28.81	201.1	530.8	2034.0
43.92	Bot - Section 2	1.00	1.06	6.471	7.12	0.00	1.200	1.543	3.92	18.441	22.13	157.5	412.2	1564.8
45.00		1.00	1.07	6.504	7.15	0.00	1.200	1.547	1.08	5.119	6.14	44.0	115.5	727.7
50.00		1.00	1.09	6.650	7.32	0.00	1.200	1.564	5.00	23.317	27.98	204.7	526.3	3310.2
51.00	Top - Section 1	1.00	1.10	6.678	7.35	0.00	1.200	1.567	1.00	4.600	5.52	40.5	105.0	653.5
55.00		1.00	1.12	6.785	7.46	0.00	1.200	1.579	4.00	18.193	21.83	162.9	415.0	1467.5
60.00		1.00	1.14	6.910	7.60	0.00	1.200	1.592	5.00	22.271	26.73	203.1	510.6	1796.5
65.00		1.00	1.16	7.028	7.73	0.00	1.200	1.605	5.00	21.747	26.10	201.7	502.0	1754.7
70.00		1.00	1.17	7.138	7.85	0.00	1.200	1.617	5.00	21.222	25.47	200.0	492.8	1712.5
75.00		1.00	1.19	7.243	7.97	0.00	1.200	1.628	5.00	20.696	24.84	197.9	483.3	1669.8
80.00		1.00	1.21	7.342	8.08	0.00	1.200	1.639	5.00	20.170	24.20	195.5	473.3	1626.7
85.00		1.00	1.22	7.436	8.18	0.00	1.200	1.649	5.00	19.643	23.57	192.8	463.1	1583.3
90.00		1.00	1.24	7.526	8.28	0.00	1.200	1.658	5.00	19.116	22.94	189.9	452.5	1539.6
90.17	Bot - Section 3	1.00	1.24	7.529	8.28	0.00	1.200	1.659	0.17	0.628	0.75	6.2	15.1	50.7
95.00		1.00	1.25	7.612	8.37	0.00	1.200	1.667	4.83	18.247	21.90	183.4	434.1	2330.6
96.00	Top - Section 2	1.00	1.25	7.629	8.39	0.00	1.200	1.669	1.00	3.713	4.46	37.4	89.4	474.6
100.00		1.00	1.27	7.695	8.46	0.00	1.200	1.676	4.00	14.643	17.57	148.7	350.4	1052.8
105.00		1.00	1.28	7.774	8.55	0.00	1.200	1.684	5.00	17.830	21.40	183.0	426.7	1279.5
110.00		1.00	1.29	7.851	8.64	0.00	1.200	1.692	5.00	17.301	20.76	179.3	415.1	1239.9
115.00		1.00	1.30	7.925	8.72	0.00	1.200	1.699	5.00	16.773	20.13	175.5	403.4	1200.2
120.00		1.00	1.32	7.996	8.80	0.00	1.200	1.707	5.00	16.244	19.49	171.5	391.5	1160.2
125.00		1.00	1.33	8.065	8.87	0.00	1.200	1.714	5.00	15.715	18.86	167.3	379.4	1120.1
130.00		1.00	1.34	8.132	8.95	0.00	1.200	1.720	5.00	15.186	18.22	163.0	367.1	1079.8
133.33	Bot - Section 4	1.00	1.34	8.175	8.99	0.00	1.200	1.725	3.33	9.829	11.79	106.1	239.2	698.8
135.00		1.00	1.35	8.197	9.02	0.00	1.200	1.727	1.67	4.898	5.88	53.0	120.1	512.2
138.00	Top - Section 3	1.00	1.35	8.235	9.06	0.00	1.200	1.731	3.00	8.668	10.40	94.2	211.7	903.9
140.00		1.00	1.36	8.260	9.09	0.00	1.200	1.733	2.00	5.673	6.81	61.8	139.1	331.6
145.00		1.00	1.37	8.321	9.15	0.00	1.200	1.739	5.00	13.812	16.57	151.7	335.1	802.0
150.00	Appurtenance(s)	1.00	1.38	8.381	9.22	0.00	1.200	1.745	5.00	13.282	15.94	146.9	322.2	768.8
155.00		1.00	1.39	8.439	9.28	0.00	1.200	1.751	5.00	12.752	15.30	142.0	309.3	735.5
158.00	Appurtenance(s)	1.00	1.39	8.473	9.32	0.00	1.200	1.754	3.00	7.396	8.88	82.7	180.9	426.8
160.00		1.00	1.40	8.495	9.34	0.00	1.200	1.757	2.00	4.825	5.79	54.1	118.5	278.4
165.00		1.00	1.41	8.551	9.41	0.00	1.200	1.762	5.00	11.692	14.03	132.0	283.0	668.4
166.00	Appurtenance(s)	1.00	1.41	8.561	9.42	0.00	1.200	1.763	1.00	2.274	2.73	25.7	56.1	130.7
170.00		1.00	1.42	8.604	9.46	0.00	1.200	1.767	4.00	8.886	10.66	100.9	215.8	506.2
175.00		1.00	1.42	8.657	9.52	0.00	1.200	1.772	5.00	10.631	12.76	121.5	256.3	601.0
178.00	Appurtenance(s)	1.00	1.43	8.688	9.56	0.00	1.200	1.775	3.00	6.123	7.35	70.2	148.9	345.9
180.00		1.00	1.43	8.709	9.58	0.00	1.200	1.777	2.00	3.976	4.77	45.7	97.1	224.4

Wind Loading - Shaft

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 21	

Totals:	**180.00**	**6,328.5**	**55,600.1**

Discrete Appurtenance Forces

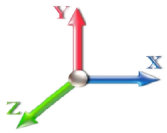
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	178.00	RFS DB-B1-6C-8AB-OZ	1	8.688	9.557	0.50	0.75	2.89	116.64	0.000	0.000	27.63	0.00	0.00
2	178.00	RRH_2x40 07-U	3	8.688	9.557	0.50	0.75	6.55	321.83	0.000	0.000	62.60	0.00	0.00
3	178.00	RRH_2x40 AWS	3	8.688	9.557	0.50	0.75	4.86	291.52	0.000	0.000	46.48	0.00	0.00
4	178.00	Amphenol	6	8.688	9.557	0.66	0.75	28.55	528.46	0.000	0.000	272.86	0.00	0.00
5	178.00	Amphenol	6	8.688	9.557	0.58	0.75	36.44	772.53	0.000	0.000	348.25	0.00	0.00
6	178.00	Platform w/ Hand Rails	1	8.688	9.557	1.00	1.00	61.30	3930.41	0.000	0.000	585.88	0.00	0.00
7	166.00	ALU 1900 Mhz	3	8.561	9.418	0.66	0.75	10.30	395.63	0.000	0.000	97.04	0.00	0.00
8	166.00	RFS APXVTM14-C-I20	3	8.561	9.418	0.58	0.75	12.93	689.46	0.000	0.000	121.81	0.00	0.00
9	166.00	Commscope	3	8.561	9.418	0.55	0.75	22.88	946.64	0.000	0.000	215.46	0.00	0.00
10	166.00	Sitepro	1	8.561	9.418	1.00	1.00	13.91	1382.00	0.000	0.000	131.01	0.00	0.00
11	166.00	ALU 800 Mhz	6	8.561	9.418	0.69	0.75	15.09	703.28	0.000	0.000	142.13	0.00	0.00
12	166.00	ALU TD-RRH8x20-25	3	8.561	9.418	0.52	0.75	7.56	587.47	0.000	0.000	71.23	0.00	0.00
13	166.00	Sitepro	1	8.561	9.418	1.00	1.00	13.79	499.39	0.000	0.000	129.84	0.00	0.00
14	166.00	Platform w/ Hand Rails	1	8.561	9.418	1.00	1.00	61.16	3915.59	0.000	0.000	575.94	0.00	0.00
15	158.00	Stella Dooradus TMA's	6	8.473	9.320	0.48	0.80	4.20	167.95	0.000	0.000	39.13	0.00	0.00
16	158.00	EMS RR90-17-02DP	6	8.473	9.320	0.57	0.80	29.19	1055.68	0.000	0.000	272.06	0.00	0.00
17	158.00	T-Arms	3	8.473	9.320	0.56	0.75	25.34	1786.81	0.000	0.000	236.19	0.00	0.00
18	150.00	Powerwave 7770	3	8.381	9.219	0.58	0.75	11.37	531.52	0.000	0.000	104.86	0.00	0.00
19	150.00	Cci HPA-65R-BUU-H6	2	8.381	9.219	0.64	0.75	14.06	618.61	0.000	0.000	129.60	0.00	0.00
20	150.00	SBNHH-1D65A	1	8.381	9.219	0.62	0.75	4.33	198.56	0.000	0.000	39.94	0.00	0.00
21	150.00	RRUS-32	3	8.381	9.219	0.50	0.75	6.19	617.97	0.000	0.000	57.06	0.00	0.00
22	150.00	KMW AM-X-CD-16-65-00T	2	8.381	9.219	0.59	0.75	12.81	347.95	0.000	0.000	118.13	0.00	0.00
23	150.00	Powerwave LGP21401	6	8.381	9.219	0.50	0.75	6.06	208.93	0.000	0.000	55.88	0.00	0.00
24	150.00	KMW AM-X-CD-14-65-00T	1	8.381	9.219	0.58	0.75	5.67	123.31	0.000	0.000	52.27	0.00	0.00
25	150.00	Ericsson RRUS-11	3	8.381	9.219	0.54	0.80	5.10	424.12	0.000	0.000	47.01	0.00	0.00
26	150.00	Raycap DC6-48-60-18-8F	1	8.381	9.219	0.54	0.80	1.43	82.28	0.000	0.000	13.20	0.00	0.00
27	150.00	Platform w/ Hand Rail	1	8.381	9.219	1.00	1.00	65.54	3419.84	0.000	0.000	604.21	0.00	0.00
							Totals:		**24,664.40**			**4,597.71**		

Total Applied Force Summary

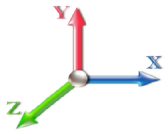
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 23	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		187.68	2300.82	0.00	0.00
10.00		184.54	2364.76	0.00	0.00
15.00		181.20	2340.14	0.00	0.00
20.00		188.64	2309.00	0.00	0.00
25.00		193.86	2274.10	0.00	0.00
30.00		197.40	2236.69	0.00	0.00
35.00		199.71	2197.50	0.00	0.00
40.00		201.07	2156.94	0.00	0.00
43.92		157.52	1661.09	0.00	0.00
45.00		43.95	754.37	0.00	0.00
50.00		204.68	3433.13	0.00	0.00
51.00		40.55	678.08	0.00	0.00
55.00		162.94	1565.88	0.00	0.00
60.00		203.15	1919.42	0.00	0.00
65.00		201.74	1877.63	0.00	0.00
70.00		199.96	1835.37	0.00	0.00
75.00		197.86	1792.69	0.00	0.00
80.00		195.47	1749.64	0.00	0.00
85.00		192.81	1706.25	0.00	0.00
90.00		189.91	1662.56	0.00	0.00
90.17		6.24	54.84	0.00	0.00
95.00		183.35	2449.37	0.00	0.00
96.00		37.39	499.19	0.00	0.00
100.00		148.74	1151.13	0.00	0.00
105.00		182.97	1402.38	0.00	0.00
110.00		179.30	1362.83	0.00	0.00
115.00		175.45	1323.08	0.00	0.00
120.00		171.45	1283.14	0.00	0.00
125.00		167.30	1243.02	0.00	0.00
130.00		163.00	1202.73	0.00	0.00
133.33		106.07	780.74	0.00	0.00
135.00		52.99	553.15	0.00	0.00
138.00		94.22	977.60	0.00	0.00
140.00		61.85	380.75	0.00	0.00
145.00		151.71	924.91	0.00	0.00
150.00	(23) attachments	1369.10	7464.80	0.00	0.00
155.00		142.05	808.28	0.00	0.00
158.00	(15) attachments	630.10	3480.93	0.00	0.00
160.00		54.10	292.51	0.00	0.00
165.00		131.96	703.82	0.00	0.00
166.00	(21) attachments	1510.16	9257.25	0.00	0.00
170.00		100.93	516.16	0.00	0.00
175.00		121.48	613.45	0.00	0.00
178.00	(20) attachments	1413.93	6314.83	0.00	0.00
180.00		45.70	224.39	0.00	0.00

Total Applied Force Summary

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Totals:	**10,926.21**	**84,081.32**	**0.00**	**0.00**

Calculated Forces

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

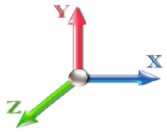
Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00

Iterations 25



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-84.08	-10.96	0.00	-1409.7	0.00	1409.73	5123.29	2561.65	13030.5	6435.29	0.00	0.000	0.000	0.235
5.00	-81.77	-10.84	0.00	-1354.9	0.00	1354.92	5083.45	2541.72	12666.9	6255.72	0.03	-0.047	0.000	0.233
10.00	-79.39	-10.72	0.00	-1300.7	0.00	1300.73	5041.00	2520.50	12301.0	6075.05	0.10	-0.095	0.000	0.230
15.00	-77.04	-10.60	0.00	-1247.1	0.00	1247.13	4995.94	2497.97	11933.4	5893.46	0.23	-0.144	0.000	0.227
20.00	-74.73	-10.47	0.00	-1194.1	0.00	1194.14	4948.29	2474.14	11564.2	5711.17	0.40	-0.193	0.000	0.224
25.00	-72.44	-10.33	0.00	-1141.7	0.00	1141.79	4898.02	2449.01	11194.1	5528.36	0.63	-0.244	0.000	0.221
30.00	-70.20	-10.19	0.00	-1090.1	0.00	1090.13	4845.16	2422.58	10823.3	5345.24	0.92	-0.296	0.000	0.218
35.00	-67.99	-10.04	0.00	-1039.1	0.00	1039.18	4789.68	2394.84	10452.3	5162.01	1.26	-0.350	0.000	0.216
40.00	-65.83	-9.88	0.00	-988.98	0.00	988.98	4731.61	2365.80	10081.4	4978.87	1.65	-0.404	0.000	0.213
43.92	-64.17	-9.74	0.00	-950.28	0.00	950.28	4684.30	2342.15	9791.39	4835.60	2.00	-0.447	0.000	0.210
45.00	-63.41	-9.73	0.00	-939.72	0.00	939.72	4670.93	2335.46	9711.23	4796.01	2.10	-0.460	0.000	0.210
50.00	-59.97	-9.53	0.00	-891.07	0.00	891.07	4607.64	2303.82	9341.95	4613.64	2.62	-0.516	0.000	0.206
51.00	-59.29	-9.52	0.00	-881.54	0.00	881.54	4157.28	2078.64	8537.21	4216.21	2.73	-0.528	0.000	0.223
55.00	-57.71	-9.39	0.00	-843.47	0.00	843.47	4115.37	2057.69	8281.29	4089.82	3.19	-0.575	0.000	0.220
60.00	-55.79	-9.23	0.00	-796.51	0.00	796.51	4060.64	2030.32	7961.67	3931.97	3.82	-0.635	0.000	0.216
65.00	-53.90	-9.06	0.00	-750.37	0.00	750.37	4003.30	2001.65	7642.72	3774.45	4.52	-0.697	0.000	0.212
70.00	-52.06	-8.90	0.00	-705.05	0.00	705.05	3943.36	1971.68	7324.85	3617.47	5.28	-0.759	0.000	0.208
75.00	-50.26	-8.73	0.00	-660.57	0.00	660.57	3880.82	1940.41	7008.46	3461.22	6.11	-0.823	0.000	0.204
80.00	-48.50	-8.56	0.00	-616.92	0.00	616.92	3815.67	1907.83	6693.96	3305.90	7.01	-0.887	0.000	0.199
85.00	-46.79	-8.40	0.00	-574.09	0.00	574.09	3747.91	1873.96	6381.75	3151.70	7.97	-0.953	0.000	0.195
90.00	-45.13	-8.21	0.00	-532.10	0.00	532.10	3677.55	1838.78	6072.22	2998.84	9.01	-1.020	0.000	0.190
90.17	-45.07	-8.23	0.00	-530.73	0.00	530.73	3675.16	1837.58	6061.96	2993.77	9.04	-1.022	0.000	0.190
95.00	-42.62	-8.03	0.00	-490.97	0.00	490.97	3604.59	1802.30	5765.80	2847.51	10.11	-1.088	0.000	0.184
96.00	-42.11	-8.01	0.00	-482.95	0.00	482.95	2873.56	1436.78	4663.81	2303.28	10.34	-1.102	0.000	0.224
100.00	-40.95	-7.88	0.00	-450.92	0.00	450.92	2833.34	1416.67	4481.60	2213.29	11.29	-1.157	0.000	0.218
105.00	-39.55	-7.72	0.00	-411.51	0.00	411.51	2780.72	1390.36	4254.92	2101.34	12.54	-1.234	0.000	0.210
110.00	-38.18	-7.57	0.00	-372.89	0.00	372.89	2725.50	1362.75	4029.81	1990.17	13.88	-1.312	0.000	0.201
115.00	-36.85	-7.41	0.00	-335.06	0.00	335.06	2667.67	1333.84	3806.69	1879.98	15.29	-1.389	0.000	0.192
120.00	-35.56	-7.25	0.00	-298.02	0.00	298.02	2607.24	1303.62	3585.95	1770.96	16.79	-1.465	0.000	0.182
125.00	-34.31	-7.10	0.00	-261.76	0.00	261.76	2544.20	1272.10	3368.00	1663.33	18.36	-1.541	0.000	0.171
130.00	-33.11	-6.94	0.00	-226.28	0.00	226.28	2478.56	1239.28	3153.24	1557.27	20.02	-1.615	0.000	0.159
133.33	-32.33	-6.83	0.00	-203.15	0.00	203.15	2433.35	1216.68	3012.04	1487.53	21.16	-1.664	0.000	0.150
135.00	-31.77	-6.78	0.00	-191.77	0.00	191.77	2410.32	1205.16	2942.08	1452.98	21.75	-1.688	0.000	0.145
138.00	-30.79	-6.67	0.00	-171.44	0.00	171.44	1545.45	772.73	1882.66	929.77	22.82	-1.730	0.000	0.204
140.00	-30.41	-6.63	0.00	-158.09	0.00	158.09	1531.69	765.84	1834.28	905.88	23.55	-1.757	0.000	0.194
145.00	-29.48	-6.49	0.00	-124.95	0.00	124.95	1495.44	747.72	1713.73	846.35	25.44	-1.838	0.000	0.167
150.00	-22.06	-4.90	0.00	-92.51	0.00	92.51	1456.60	728.30	1594.07	787.25	27.40	-1.908	0.000	0.133
155.00	-21.25	-4.75	0.00	-68.02	0.00	68.02	1415.15	707.58	1475.70	728.79	29.43	-1.967	0.000	0.108
158.00	-17.79	-4.00	0.00	-53.78	0.00	53.78	1389.03	694.52	1405.47	694.11	30.68	-1.998	0.000	0.090
160.00	-17.50	-3.95	0.00	-45.77	0.00	45.77	1371.10	685.55	1359.03	671.17	31.52	-2.017	0.000	0.081
165.00	-16.80	-3.80	0.00	-26.03	0.00	26.03	1324.44	662.22	1244.46	614.59	33.65	-2.052	0.000	0.055
166.00	-7.60	-1.96	0.00	-22.23	0.00	22.23	1314.79	657.40	1221.83	603.42	34.08	-2.058	0.000	0.043
170.00	-7.09	-1.84	0.00	-14.40	0.00	14.40	1275.17	637.59	1132.39	559.24	35.82	-2.076	0.000	0.031
175.00	-6.48	-1.70	0.00	-5.20	0.00	5.20	1207.50	603.75	1010.00	498.80	38.00	-2.089	0.000	0.016
178.00	-0.22	-0.05	0.00	-0.11	0.00	0.11	1163.35	581.68	937.07	462.78	39.31	-2.092	0.000	0.000
180.00	0.00	-0.05	0.00	0.00	0.00	0.00	1133.92	566.96	889.96	439.52	40.19	-2.092	0.000	0.000

Seismic Segment Forces (Factored)

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	23
Gust Response Factor	1.10				**Sds**	0.14		**Ss**	0.17
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.07		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.32		**SA**	0.02	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1460.6	0.00	0.03	0.02	18.53	
10.00		1430.9	0.01	0.05	0.03	26.80	
15.00		1401.2	0.01	0.06	0.03	30.76	
20.00		1371.5	0.02	0.07	0.04	32.56	
25.00		1341.8	0.04	0.07	0.04	33.24	
30.00		1312.0	0.05	0.07	0.04	33.40	
35.00		1282.3	0.07	0.07	0.04	33.34	
40.00		1252.6	0.09	0.07	0.04	33.23	
43.92	Bot - Section 2	960.48	0.11	0.07	0.04	25.88	
45.00		510.21	0.12	0.07	0.03	13.81	
50.00		2319.9	0.15	0.07	0.03	63.95	
51.00	Top - Section 1	457.11	0.15	0.07	0.03	12.64	
55.00		877.12	0.18	0.07	0.03	24.48	
60.00		1071.5	0.21	0.06	0.02	29.89	
65.00		1043.9	0.25	0.06	0.02	28.45	
70.00		1016.3	0.29	0.05	0.01	26.04	
75.00		988.76	0.33	0.04	0.01	22.35	
80.00		961.17	0.37	0.03	0.01	17.16	
85.00		933.57	0.42	0.01	0.01	10.45	
90.00		905.97	0.47	-0.01	0.01	2.62	
90.17	Bot - Section 3	29.72	0.47	-0.01	0.01	0.08	
95.00		1580.3	0.53	-0.03	0.01	-9.83	
96.00	Top - Section 2	321.03	0.54	-0.03	0.01	-2.58	
100.00		585.34	0.58	-0.05	0.01	-8.75	
105.00		710.66	0.64	-0.07	0.02	-15.75	
110.00		687.31	0.71	-0.09	0.03	-18.62	
115.00		663.95	0.77	-0.11	0.05	-19.53	
120.00		640.60	0.84	-0.12	0.07	-18.62	
125.00		617.25	0.91	-0.12	0.09	-16.13	
130.00		593.90	0.99	-0.11	0.12	-12.29	
133.33	Bot - Section 4	382.96	1.04	-0.10	0.15	-6.01	
135.00		326.73	1.06	-0.09	0.17	-4.18	
138.00	Top - Section 3	576.81	1.11	-0.06	0.19	-3.98	
140.00		160.40	1.14	-0.04	0.21	-0.40	
145.00		389.11	1.23	0.03	0.27	3.99	
150.00	Appurtenance(s)	2845.5	1.31	0.14	0.35	72.41	
155.00		355.14	1.40	0.29	0.43	15.31	
158.00	Appurtenance(s)	1412.7	1.46	0.40	0.49	77.58	
160.00		133.23	1.49	0.48	0.53	8.43	
165.00		321.18	1.59	0.74	0.65	27.64	
166.00	Appurtenance(s)	3759.6	1.61	0.80	0.68	341.82	
170.00		242.00	1.69	1.07	0.79	26.97	
175.00		287.21	1.79	1.48	0.95	40.07	
178.00	Appurtenance(s)	2666.7	1.85	1.77	1.06	420.43	
180.00		106.05	1.89	1.98	1.14	18.06	

Seismic Segment Forces (Factored)

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Totals:	**43,295.2**	**1,435.7**	**Total Wind:** **52,319.8**

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	23
Gust Response Factor	1.10			**Sds**	0.14			**Ss**	0.17
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.07			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.32	**SA**	0.02	**Seismic Importance Factor**			1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-55.77	-1.58	0.00	-210.76	0.00	210.76	5123.29	2561.65	13030.5	6435.29		0.00	0.00	0.044
5.00	-53.97	-1.56	0.00	-202.89	0.00	202.89	5083.45	2541.72	12666.9	6255.72		0.00	-0.01	0.043
10.00	-52.13	-1.54	0.00	-195.07	0.00	195.07	5041.00	2520.50	12301.0	6075.05		0.01	-0.01	0.042
15.00	-50.32	-1.52	0.00	-187.36	0.00	187.36	4995.94	2497.97	11933.4	5893.46		0.03	-0.02	0.042
20.00	-48.55	-1.49	0.00	-179.77	0.00	179.77	4948.29	2474.14	11564.2	5711.17		0.06	-0.03	0.041
25.00	-46.82	-1.46	0.00	-172.31	0.00	172.31	4898.02	2449.01	11194.1	5528.36		0.09	-0.04	0.041
30.00	-45.12	-1.43	0.00	-165.00	0.00	165.00	4845.16	2422.58	10823.3	5345.24		0.14	-0.04	0.040
35.00	-43.46	-1.41	0.00	-157.83	0.00	157.83	4789.68	2394.84	10452.3	5162.01		0.19	-0.05	0.040
40.00	-41.84	-1.38	0.00	-150.80	0.00	150.80	4731.61	2365.80	10081.4	4978.87		0.25	-0.06	0.039
43.92	-40.59	-1.35	0.00	-145.40	0.00	145.40	4684.30	2342.15	9791.39	4835.60		0.30	-0.07	0.039
45.00	-39.95	-1.34	0.00	-143.94	0.00	143.94	4670.93	2335.46	9711.23	4796.01		0.32	-0.07	0.039
50.00	-37.04	-1.28	0.00	-137.23	0.00	137.23	4607.64	2303.82	9341.95	4613.64		0.39	-0.08	0.038
51.00	-36.47	-1.27	0.00	-135.95	0.00	135.95	4157.28	2078.64	8537.21	4216.21		0.41	-0.08	0.041
55.00	-35.32	-1.25	0.00	-130.89	0.00	130.89	4115.37	2057.69	8281.29	4089.82		0.48	-0.09	0.041
60.00	-33.91	-1.22	0.00	-124.66	0.00	124.66	4060.64	2030.32	7961.67	3931.97		0.58	-0.10	0.040
65.00	-32.53	-1.19	0.00	-118.56	0.00	118.56	4003.30	2001.65	7642.72	3774.45		0.68	-0.11	0.040
70.00	-31.19	-1.17	0.00	-112.59	0.00	112.59	3943.36	1971.68	7324.85	3617.47		0.80	-0.12	0.039
75.00	-29.88	-1.15	0.00	-106.74	0.00	106.74	3880.82	1940.41	7008.46	3461.22		0.93	-0.13	0.039
80.00	-28.60	-1.14	0.00	-100.99	0.00	100.99	3815.67	1907.83	6693.96	3305.90		1.06	-0.14	0.038
85.00	-27.36	-1.13	0.00	-95.30	0.00	95.30	3747.91	1873.96	6381.75	3151.70		1.21	-0.15	0.038
90.00	-26.15	-1.12	0.00	-89.67	0.00	89.67	3677.55	1838.78	6072.22	2998.84		1.37	-0.16	0.037
90.17	-26.11	-1.13	0.00	-89.48	0.00	89.48	3675.16	1837.58	6061.96	2993.77		1.38	-0.16	0.037
95.00	-24.09	-1.12	0.00	-84.03	0.00	84.03	3604.59	1802.30	5765.80	2847.51		1.55	-0.17	0.036
96.00	-23.68	-1.13	0.00	-82.91	0.00	82.91	2873.56	1436.78	4663.81	2303.28		1.58	-0.17	0.044
100.00	-22.88	-1.13	0.00	-78.40	0.00	78.40	2833.34	1416.67	4481.60	2213.29		1.73	-0.18	0.044
105.00	-21.91	-1.13	0.00	-72.77	0.00	72.77	2780.72	1390.36	4254.92	2101.34		1.93	-0.20	0.043
110.00	-20.96	-1.13	0.00	-67.12	0.00	67.12	2725.50	1362.75	4029.81	1990.17		2.14	-0.21	0.041
115.00	-20.04	-1.13	0.00	-61.46	0.00	61.46	2667.67	1333.84	3806.69	1879.98		2.37	-0.22	0.040
120.00	-19.15	-1.13	0.00	-55.80	0.00	55.80	2607.24	1303.62	3585.95	1770.96		2.61	-0.24	0.039
125.00	-18.28	-1.14	0.00	-50.13	0.00	50.13	2544.20	1272.10	3368.00	1663.33		2.87	-0.25	0.037
130.00	-17.45	-1.13	0.00	-44.45	0.00	44.45	2478.56	1239.28	3153.24	1557.27		3.14	-0.27	0.036
133.33	-16.91	-1.13	0.00	-40.67	0.00	40.67	2433.35	1216.68	3012.04	1487.53		3.33	-0.28	0.034
135.00	-16.47	-1.13	0.00	-38.78	0.00	38.78	2410.32	1205.16	2942.08	1452.98		3.43	-0.28	0.034
138.00	-15.71	-1.13	0.00	-35.37	0.00	35.37	1545.45	772.73	1882.66	929.77		3.61	-0.29	0.048
140.00	-15.47	-1.13	0.00	-33.11	0.00	33.11	1531.69	765.84	1834.28	905.88		3.73	-0.30	0.047
145.00	-14.88	-1.13	0.00	-27.44	0.00	27.44	1495.44	747.72	1713.73	846.35		4.05	-0.31	0.042
150.00	-11.34	-1.04	0.00	-21.78	0.00	21.78	1456.60	728.30	1594.07	787.25		4.38	-0.33	0.035
155.00	-10.84	-1.03	0.00	-16.57	0.00	16.57	1415.15	707.58	1475.70	728.79		4.74	-0.34	0.030
158.00	-9.10	-0.94	0.00	-13.49	0.00	13.49	1389.03	694.52	1405.47	694.11		4.95	-0.35	0.026
160.00	-8.93	-0.93	0.00	-11.61	0.00	11.61	1371.10	685.55	1359.03	671.17		5.10	-0.35	0.024
165.00	-8.51	-0.90	0.00	-6.96	0.00	6.96	1324.44	662.22	1244.46	614.59		5.48	-0.36	0.018
166.00	-3.99	-0.53	0.00	-6.05	0.00	6.05	1314.79	657.40	1221.83	603.42		5.55	-0.37	0.013
170.00	-3.69	-0.50	0.00	-3.93	0.00	3.93	1275.17	637.59	1132.39	559.24		5.86	-0.37	0.010
175.00	-3.33	-0.46	0.00	-1.42	0.00	1.42	1207.50	603.75	1010.00	498.80		6.25	-0.37	0.006
178.00	-0.13	-0.02	0.00	-0.04	0.00	0.04	1163.35	581.68	937.07	462.78		6.49	-0.37	0.000
180.00	0.00	-0.02	0.00	0.00	0.00	0.00	1133.92	566.96	889.96	439.52		6.65	-0.37	0.000

Calculated Forces

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 29	

Seismic Segment Forces (Factored)

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 30	

Tower Engineering Solutions

Load Case:	0.9D + 1.0E							**Iterations**	23
Gust Response Factor	1.10				**Sds**	0.14		**Ss**	0.17
Dead Load Factor	0.90	**Seismic Load Factor**	1.00		**Sd1**	0.07		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.32		**SA**	0.02	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1460.6	0.00	0.03	0.02	18.53	
10.00		1430.9	0.01	0.05	0.03	26.80	
15.00		1401.2	0.01	0.06	0.03	30.76	
20.00		1371.5	0.02	0.07	0.04	32.56	
25.00		1341.8	0.04	0.07	0.04	33.24	
30.00		1312.0	0.05	0.07	0.04	33.40	
35.00		1282.3	0.07	0.07	0.04	33.34	
40.00		1252.6	0.09	0.07	0.04	33.23	
43.92	Bot - Section 2	960.48	0.11	0.07	0.04	25.88	
45.00		510.21	0.12	0.07	0.03	13.81	
50.00		2319.9	0.15	0.07	0.03	63.95	
51.00	Top - Section 1	457.11	0.15	0.07	0.03	12.64	
55.00		877.12	0.18	0.07	0.03	24.48	
60.00		1071.5	0.21	0.06	0.02	29.89	
65.00		1043.9	0.25	0.06	0.02	28.45	
70.00		1016.3	0.29	0.05	0.01	26.04	
75.00		988.76	0.33	0.04	0.01	22.35	
80.00		961.17	0.37	0.03	0.01	17.16	
85.00		933.57	0.42	0.01	0.01	10.45	
90.00		905.97	0.47	-0.01	0.01	2.62	
90.17	Bot - Section 3	29.72	0.47	-0.01	0.01	0.08	
95.00		1580.3	0.53	-0.03	0.01	-9.83	
96.00	Top - Section 2	321.03	0.54	-0.03	0.01	-2.58	
100.00		585.34	0.58	-0.05	0.01	-8.75	
105.00		710.66	0.64	-0.07	0.02	-15.75	
110.00		687.31	0.71	-0.09	0.03	-18.62	
115.00		663.95	0.77	-0.11	0.05	-19.53	
120.00		640.60	0.84	-0.12	0.07	-18.62	
125.00		617.25	0.91	-0.12	0.09	-16.13	
130.00		593.90	0.99	-0.11	0.12	-12.29	
133.33	Bot - Section 4	382.96	1.04	-0.10	0.15	-6.01	
135.00		326.73	1.06	-0.09	0.17	-4.18	
138.00	Top - Section 3	576.81	1.11	-0.06	0.19	-3.98	
140.00		160.40	1.14	-0.04	0.21	-0.40	
145.00		389.11	1.23	0.03	0.27	3.99	
150.00	Appurtenance(s)	2845.5	1.31	0.14	0.35	72.41	
155.00		355.14	1.40	0.29	0.43	15.31	
158.00	Appurtenance(s)	1412.7	1.46	0.40	0.49	77.58	
160.00		133.23	1.49	0.48	0.53	8.43	
165.00		321.18	1.59	0.74	0.65	27.64	
166.00	Appurtenance(s)	3759.6	1.61	0.80	0.68	341.82	
170.00		242.00	1.69	1.07	0.79	26.97	
175.00		287.21	1.79	1.48	0.95	40.07	
178.00	Appurtenance(s)	2666.7	1.85	1.77	1.06	420.43	
180.00		106.05	1.89	1.98	1.14	18.06	

Seismic Segment Forces (Factored)

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 31	

Totals:	**43,295.2**	**1,435.7**	**Total Wind:** **52,319.8**

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 32	

Tower Engineering Solutions

Load Case:	0.9D + 1.0E							**Iterations**	23
Gust Response Factor	1.10			**Sds**	0.14			**Ss**	0.17
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.07			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.32	**SA**	0.02	**Seismic Importance Factor**			1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-41.83	-1.57	0.00	-208.13	0.00	208.13	5123.29	2561.65	13030.5	6435.29		0.00	0.00	0.041
5.00	-40.48	-1.56	0.00	-200.26	0.00	200.26	5083.45	2541.72	12666.9	6255.72		0.00	-0.01	0.040
10.00	-39.10	-1.54	0.00	-192.46	0.00	192.46	5041.00	2520.50	12301.0	6075.05		0.01	-0.01	0.039
15.00	-37.74	-1.51	0.00	-184.77	0.00	184.77	4995.94	2497.97	11933.4	5893.46		0.03	-0.02	0.039
20.00	-36.42	-1.48	0.00	-177.21	0.00	177.21	4948.29	2474.14	11564.2	5711.17		0.06	-0.03	0.038
25.00	-35.12	-1.45	0.00	-169.79	0.00	169.79	4898.02	2449.01	11194.1	5528.36		0.09	-0.04	0.038
30.00	-33.84	-1.42	0.00	-162.52	0.00	162.52	4845.16	2422.58	10823.3	5345.24		0.14	-0.04	0.037
35.00	-32.60	-1.39	0.00	-155.39	0.00	155.39	4789.68	2394.84	10452.3	5162.01		0.19	-0.05	0.037
40.00	-31.38	-1.36	0.00	-148.42	0.00	148.42	4731.61	2365.80	10081.4	4978.87		0.24	-0.06	0.036
43.92	-30.44	-1.34	0.00	-143.07	0.00	143.07	4684.30	2342.15	9791.39	4835.60		0.30	-0.07	0.036
45.00	-29.96	-1.33	0.00	-141.62	0.00	141.62	4670.93	2335.46	9711.23	4796.01		0.31	-0.07	0.036
50.00	-27.78	-1.26	0.00	-134.98	0.00	134.98	4607.64	2303.82	9341.95	4613.64		0.39	-0.08	0.035
51.00	-27.35	-1.25	0.00	-133.72	0.00	133.72	4157.28	2078.64	8537.21	4216.21		0.40	-0.08	0.038
55.00	-26.49	-1.23	0.00	-128.71	0.00	128.71	4115.37	2057.69	8281.29	4089.82		0.47	-0.09	0.038
60.00	-25.43	-1.20	0.00	-122.55	0.00	122.55	4060.64	2030.32	7961.67	3931.97		0.57	-0.10	0.037
65.00	-24.40	-1.18	0.00	-116.53	0.00	116.53	4003.30	2001.65	7642.72	3774.45		0.67	-0.10	0.037
70.00	-23.39	-1.15	0.00	-110.65	0.00	110.65	3943.36	1971.68	7324.85	3617.47		0.79	-0.11	0.037
75.00	-22.41	-1.13	0.00	-104.88	0.00	104.88	3880.82	1940.41	7008.46	3461.22		0.91	-0.12	0.036
80.00	-21.45	-1.12	0.00	-99.22	0.00	99.22	3815.67	1907.83	6693.96	3305.90		1.05	-0.13	0.036
85.00	-20.52	-1.11	0.00	-93.63	0.00	93.63	3747.91	1873.96	6381.75	3151.70		1.20	-0.15	0.035
90.00	-19.61	-1.11	0.00	-88.08	0.00	88.08	3677.55	1838.78	6072.22	2998.84		1.35	-0.16	0.035
90.17	-19.58	-1.11	0.00	-87.90	0.00	87.90	3675.16	1837.58	6061.96	2993.77		1.36	-0.16	0.035
95.00	-18.07	-1.11	0.00	-82.55	0.00	82.55	3604.59	1802.30	5765.80	2847.51		1.52	-0.17	0.034
96.00	-17.76	-1.11	0.00	-81.44	0.00	81.44	2873.56	1436.78	4663.81	2303.28		1.56	-0.17	0.042
100.00	-17.16	-1.11	0.00	-77.02	0.00	77.02	2833.34	1416.67	4481.60	2213.29		1.71	-0.18	0.041
105.00	-16.43	-1.11	0.00	-71.48	0.00	71.48	2780.72	1390.36	4254.92	2101.34		1.90	-0.19	0.040
110.00	-15.72	-1.11	0.00	-65.93	0.00	65.93	2725.50	1362.75	4029.81	1990.17		2.11	-0.21	0.039
115.00	-15.03	-1.11	0.00	-60.38	0.00	60.38	2667.67	1333.84	3806.69	1879.98		2.33	-0.22	0.038
120.00	-14.36	-1.11	0.00	-54.82	0.00	54.82	2607.24	1303.62	3585.95	1770.96		2.57	-0.23	0.036
125.00	-13.71	-1.11	0.00	-49.25	0.00	49.25	2544.20	1272.10	3368.00	1663.33		2.82	-0.25	0.035
130.00	-13.08	-1.11	0.00	-43.69	0.00	43.69	2478.56	1239.28	3153.24	1557.27		3.09	-0.26	0.033
133.33	-12.68	-1.11	0.00	-39.98	0.00	39.98	2433.35	1216.68	3012.04	1487.53		3.28	-0.27	0.032
135.00	-12.35	-1.11	0.00	-38.12	0.00	38.12	2410.32	1205.16	2942.08	1452.98		3.37	-0.28	0.031
138.00	-11.78	-1.11	0.00	-34.78	0.00	34.78	1545.45	772.73	1882.66	929.77		3.55	-0.28	0.045
140.00	-11.60	-1.11	0.00	-32.56	0.00	32.56	1531.69	765.84	1834.28	905.88		3.67	-0.29	0.044
145.00	-11.16	-1.11	0.00	-27.00	0.00	27.00	1495.44	747.72	1713.73	846.35		3.98	-0.31	0.039
150.00	-8.50	-1.03	0.00	-21.45	0.00	21.45	1456.60	728.30	1594.07	787.25		4.31	-0.32	0.033
155.00	-8.13	-1.01	0.00	-16.32	0.00	16.32	1415.15	707.58	1475.70	728.79		4.66	-0.34	0.028
158.00	-6.82	-0.92	0.00	-13.30	0.00	13.30	1389.03	694.52	1405.47	694.11		4.87	-0.34	0.024
160.00	-6.69	-0.92	0.00	-11.45	0.00	11.45	1371.10	685.55	1359.03	671.17		5.02	-0.35	0.022
165.00	-6.38	-0.89	0.00	-6.87	0.00	6.87	1324.44	662.22	1244.46	614.59		5.39	-0.36	0.016
166.00	-2.99	-0.52	0.00	-5.98	0.00	5.98	1314.79	657.40	1221.83	603.42		5.47	-0.36	0.012
170.00	-2.77	-0.50	0.00	-3.88	0.00	3.88	1275.17	637.59	1132.39	559.24		5.77	-0.36	0.009
175.00	-2.50	-0.45	0.00	-1.40	0.00	1.40	1207.50	603.75	1010.00	498.80		6.15	-0.37	0.005
178.00	-0.10	-0.02	0.00	-0.04	0.00	0.04	1163.35	581.68	937.07	462.78		6.38	-0.37	0.000
180.00	0.00	-0.02	0.00	0.00	0.00	0.00	1133.92	566.96	889.96	439.52		6.54	-0.37	0.000

Calculated Forces

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 33	

Wind Loading - Shaft

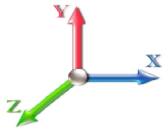
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 34	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	7.442	8.19	295.89	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	289.97	1.000	0.000	5.00	26.477	26.48	216.7	0.0	1460.7
10.00		1.00	0.85	7.442	8.19	284.05	1.000	0.000	5.00	25.942	25.94	212.4	0.0	1431.0
15.00		1.00	0.85	7.442	8.19	278.13	1.000	0.000	5.00	25.407	25.41	208.0	0.0	1401.2
20.00		1.00	0.90	7.896	8.69	280.40	1.000	0.000	5.00	24.873	24.87	216.0	0.0	1371.5
25.00		1.00	0.95	8.276	9.10	280.83	1.000	0.000	5.00	24.338	24.34	221.6	0.0	1341.8
30.00		1.00	0.98	8.600	9.46	279.91	1.000	0.000	5.00	23.803	23.80	225.2	0.0	1312.1
35.00		1.00	1.01	8.883	9.77	278.02	1.000	0.000	5.00	23.268	23.27	227.4	0.0	1282.4
40.00		1.00	1.04	9.137	10.05	275.40	1.000	0.000	5.00	22.733	22.73	228.5	0.0	1252.6
43.92	Bot - Section 2	1.00	1.06	9.318	10.25	272.93	1.000	0.000	3.92	17.434	17.43	178.7	0.0	960.5
45.00		1.00	1.07	9.366	10.30	272.19	1.000	0.000	1.08	4.840	4.84	49.9	0.0	510.2
50.00		1.00	1.09	9.576	10.53	268.52	1.000	0.000	5.00	22.014	22.01	231.9	0.0	2320.0
51.00	Top - Section 1	1.00	1.10	9.616	10.58	267.73	1.000	0.000	1.00	4.339	4.34	45.9	0.0	457.1
55.00		1.00	1.12	9.770	10.75	268.89	1.000	0.000	4.00	17.140	17.14	184.2	0.0	877.1
60.00		1.00	1.14	9.951	10.95	264.52	1.000	0.000	5.00	20.944	20.94	229.3	0.0	1071.6
65.00		1.00	1.16	10.120	11.13	259.86	1.000	0.000	5.00	20.409	20.41	227.2	0.0	1044.0
70.00		1.00	1.17	10.279	11.31	254.94	1.000	0.000	5.00	19.874	19.87	224.7	0.0	1016.4
75.00		1.00	1.19	10.430	11.47	249.79	1.000	0.000	5.00	19.339	19.34	221.9	0.0	988.8
80.00		1.00	1.21	10.572	11.63	244.44	1.000	0.000	5.00	18.804	18.80	218.7	0.0	961.2
85.00		1.00	1.22	10.708	11.78	238.90	1.000	0.000	5.00	18.269	18.27	215.2	0.0	933.6
90.00		1.00	1.24	10.838	11.92	233.20	1.000	0.000	5.00	17.734	17.73	211.4	0.0	906.0
90.17	Bot - Section 3	1.00	1.24	10.842	11.93	233.01	1.000	0.000	0.17	0.582	0.58	6.9	0.0	29.7
95.00		1.00	1.25	10.962	12.06	227.35	1.000	0.000	4.83	16.904	16.90	203.8	0.0	1580.4
96.00	Top - Section 2	1.00	1.25	10.986	12.08	226.17	1.000	0.000	1.00	3.435	3.44	41.5	0.0	321.0
100.00		1.00	1.27	11.081	12.19	225.37	1.000	0.000	4.00	13.526	13.53	164.9	0.0	585.3
105.00		1.00	1.28	11.195	12.31	219.27	1.000	0.000	5.00	16.426	16.43	202.3	0.0	710.7
110.00		1.00	1.29	11.305	12.44	213.05	1.000	0.000	5.00	15.891	15.89	197.6	0.0	687.3
115.00		1.00	1.30	11.412	12.55	206.72	1.000	0.000	5.00	15.357	15.36	192.8	0.0	664.0
120.00		1.00	1.32	11.514	12.67	200.29	1.000	0.000	5.00	14.822	14.82	187.7	0.0	640.6
125.00		1.00	1.33	11.614	12.78	193.76	1.000	0.000	5.00	14.287	14.29	182.5	0.0	617.3
130.00		1.00	1.34	11.710	12.88	187.14	1.000	0.000	5.00	13.752	13.75	177.1	0.0	593.9
133.33	Bot - Section 4	1.00	1.34	11.773	12.95	182.67	1.000	0.000	3.33	8.871	8.87	114.9	0.0	383.0
135.00		1.00	1.35	11.803	12.98	180.43	1.000	0.000	1.67	4.418	4.42	57.4	0.0	326.7
138.00	Top - Section 3	1.00	1.35	11.858	13.04	176.37	1.000	0.000	3.00	7.803	7.80	101.8	0.0	576.8
140.00		1.00	1.36	11.894	13.08	176.66	1.000	0.000	2.00	5.095	5.09	66.7	0.0	160.4
145.00		1.00	1.37	11.982	13.18	169.80	1.000	0.000	5.00	12.363	12.36	163.0	0.0	389.1
150.00	Appurtenance(s)	1.00	1.38	12.068	13.27	162.87	1.000	0.000	5.00	11.828	11.83	157.0	0.0	372.1
155.00		1.00	1.39	12.152	13.37	155.87	1.000	0.000	5.00	11.293	11.29	151.0	0.0	355.1
158.00	Appurtenance(s)	1.00	1.39	12.201	13.42	151.64	1.000	0.000	3.00	6.519	6.52	87.5	0.0	204.9
160.00		1.00	1.40	12.233	13.46	148.81	1.000	0.000	2.00	4.239	4.24	57.0	0.0	133.2
165.00		1.00	1.41	12.313	13.54	141.68	1.000	0.000	5.00	10.223	10.22	138.5	0.0	321.2
166.00	Appurtenance(s)	1.00	1.41	12.328	13.56	140.25	1.000	0.000	1.00	1.980	1.98	26.9	0.0	62.2
170.00		1.00	1.42	12.390	13.63	134.49	1.000	0.000	4.00	7.708	7.71	105.1	0.0	242.0
175.00		1.00	1.42	12.466	13.71	127.24	1.000	0.000	5.00	9.154	9.15	125.5	0.0	287.2
178.00	Appurtenance(s)	1.00	1.43	12.511	13.76	122.87	1.000	0.000	3.00	5.235	5.24	72.0	0.0	164.2
180.00		1.00	1.43	12.540	13.79	119.94	1.000	0.000	2.00	3.383	3.38	46.7	0.0	106.1

Wind Loading - Shaft

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 35	

Totals:	**180.00**	**7,022.6**	**33,413.9**

Discrete Appurtenance Forces

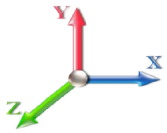
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 36	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	178.00	RFS DB-B1-6C-8AB-OZ	1	12.511	13.762	0.50	0.75	2.41	21.40	0.000	0.000	33.19	0.00	0.00
2	178.00	RRH_2x40 07-U	3	12.511	13.762	0.50	0.75	4.27	157.20	0.000	0.000	58.71	0.00	0.00
3	178.00	RRH_2x40 AWS	3	12.511	13.762	0.50	0.75	3.26	132.00	0.000	0.000	44.81	0.00	0.00
4	178.00	Amphenol	6	12.511	13.762	0.66	0.75	19.01	90.00	0.000	0.000	261.59	0.00	0.00
5	178.00	Amphenol	6	12.511	13.762	0.58	0.75	26.57	102.00	0.000	0.000	365.67	0.00	0.00
6	178.00	Platform w/ Hand Rails	1	12.511	13.762	1.00	1.00	40.00	2000.00	0.000	0.000	550.48	0.00	0.00
7	166.00	ALU 1900 Mhz	3	12.328	13.561	0.66	0.75	7.52	132.00	0.000	0.000	102.03	0.00	0.00
8	166.00	RFS APXVTM14-C-I20	3	12.328	13.561	0.58	0.75	10.98	168.60	0.000	0.000	148.96	0.00	0.00
9	166.00	Commscope	3	12.328	13.561	0.55	0.75	20.43	232.20	0.000	0.000	277.05	0.00	0.00
10	166.00	Sitepro	1	12.328	13.561	1.00	1.00	7.00	406.61	0.000	0.000	94.93	0.00	0.00
11	166.00	ALU 800 Mhz	6	12.328	13.561	0.69	0.75	10.31	318.00	0.000	0.000	139.80	0.00	0.00
12	166.00	ALU TD-RRH8x20-25	3	12.328	13.561	0.52	0.75	6.29	210.00	0.000	0.000	85.27	0.00	0.00
13	166.00	Sitepro	1	12.328	13.561	1.00	1.00	6.70	230.00	0.000	0.000	90.86	0.00	0.00
14	166.00	Platform w/ Hand Rails	1	12.328	13.561	1.00	1.00	40.00	2000.00	0.000	0.000	542.45	0.00	0.00
15	158.00	Stella Dooradus TMA's	6	12.201	13.421	0.48	0.80	2.04	76.80	0.000	0.000	27.44	0.00	0.00
16	158.00	EMS RR90-17-02DP	6	12.201	13.421	0.57	0.80	25.01	81.00	0.000	0.000	335.72	0.00	0.00
17	158.00	T-Arms	3	12.201	13.421	0.56	0.75	13.50	1050.00	0.000	0.000	181.18	0.00	0.00
18	150.00	Powerwave 7770	3	12.068	13.275	0.58	0.75	9.55	105.00	0.000	0.000	126.72	0.00	0.00
19	150.00	Cci HPA-65R-BUU-H6	2	12.068	13.275	0.64	0.75	12.32	102.00	0.000	0.000	163.50	0.00	0.00
20	150.00	SBNHH-1D65A	1	12.068	13.275	0.62	0.75	3.66	33.50	0.000	0.000	48.59	0.00	0.00
21	150.00	RRUS-32	3	12.068	13.275	0.50	0.75	5.83	231.00	0.000	0.000	77.45	0.00	0.00
22	150.00	KMW AM-X-CD-16-65-00T	2	12.068	13.275	0.59	0.75	9.50	97.00	0.000	0.000	126.16	0.00	0.00
23	150.00	Powerwave LGP21401	6	12.068	13.275	0.50	0.75	3.68	84.60	0.000	0.000	48.83	0.00	0.00
24	150.00	KMW AM-X-CD-14-65-00T	1	12.068	13.275	0.58	0.75	4.12	36.40	0.000	0.000	54.75	0.00	0.00
25	150.00	Ericsson RRUS-11	3	12.068	13.275	0.54	0.80	4.05	152.10	0.000	0.000	53.79	0.00	0.00
26	150.00	Raycap DC6-48-60-18-8F	1	12.068	13.275	0.54	0.80	0.97	31.80	0.000	0.000	12.88	0.00	0.00
27	150.00	Platform w/ Hand Rail	1	12.068	13.275	1.00	1.00	35.00	1600.00	0.000	0.000	464.62	0.00	0.00
							Totals:		**9,881.21**			**4,517.45**		

Total Applied Force Summary

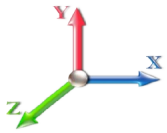
Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 37	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		216.75	1501.66	0.00	0.00
10.00		212.37	1533.40	0.00	0.00
15.00		207.99	1503.68	0.00	0.00
20.00		216.04	1473.96	0.00	0.00
25.00		221.56	1444.24	0.00	0.00
30.00		225.17	1414.52	0.00	0.00
35.00		227.37	1384.79	0.00	0.00
40.00		228.48	1355.07	0.00	0.00
43.92		178.70	1040.72	0.00	0.00
45.00		49.87	532.41	0.00	0.00
50.00		231.89	2422.39	0.00	0.00
51.00		45.89	477.60	0.00	0.00
55.00		184.21	959.06	0.00	0.00
60.00		229.25	1173.99	0.00	0.00
65.00		227.19	1146.39	0.00	0.00
70.00		224.72	1118.79	0.00	0.00
75.00		221.87	1091.19	0.00	0.00
80.00		218.68	1063.60	0.00	0.00
85.00		215.19	1036.00	0.00	0.00
90.00		211.42	1008.40	0.00	0.00
90.17		6.94	33.14	0.00	0.00
95.00		203.83	1679.41	0.00	0.00
96.00		41.51	341.52	0.00	0.00
100.00		164.87	667.28	0.00	0.00
105.00		202.29	813.09	0.00	0.00
110.00		197.62	789.74	0.00	0.00
115.00		192.77	766.38	0.00	0.00
120.00		187.73	743.03	0.00	0.00
125.00		182.52	719.68	0.00	0.00
130.00		177.14	696.33	0.00	0.00
133.33		114.88	451.25	0.00	0.00
135.00		57.36	360.87	0.00	0.00
138.00		101.78	638.27	0.00	0.00
140.00		66.66	201.37	0.00	0.00
145.00		162.95	491.54	0.00	0.00
150.00	(23) attachments	1334.31	2947.96	0.00	0.00
155.00		150.95	415.82	0.00	0.00
158.00	(15) attachments	631.84	1449.14	0.00	0.00
160.00		57.04	145.02	0.00	0.00
165.00		138.47	350.66	0.00	0.00
166.00	(21) attachments	1508.21	3765.50	0.00	0.00
170.00		105.06	250.32	0.00	0.00
175.00		125.52	297.61	0.00	0.00
178.00	(20) attachments	1386.50	2673.01	0.00	0.00
180.00		46.67	106.05	0.00	0.00

Total Applied Force Summary

Structure:	CT46130-A-SBA		**Code:**	EIA/TIA-222-G	6/1/2018
Site Name:	Deep River-winthrop Rd		**Exposure:**	C	
Height:	180.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 38

Tower Engineering Solutions

Totals:	**11,540.01**	**46,475.81**	**0.00**	**0.00**

Calculated Forces

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 39	

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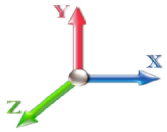
Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 24

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-46.47	-11.56	0.00	-1384.2	0.00	1384.22	5123.29	2561.65	13030.5	6435.29	0.00	0.000	0.000	0.224
5.00	-44.96	-11.38	0.00	-1326.4	0.00	1326.43	5083.45	2541.72	12666.9	6255.72	0.02	-0.046	0.000	0.221
10.00	-43.42	-11.20	0.00	-1269.5	0.00	1269.55	5041.00	2520.50	12301.0	6075.05	0.10	-0.093	0.000	0.218
15.00	-41.91	-11.02	0.00	-1213.5	0.00	1213.56	4995.94	2497.97	11933.4	5893.46	0.22	-0.140	0.000	0.214
20.00	-40.42	-10.84	0.00	-1158.4	0.00	1158.45	4948.29	2474.14	11564.2	5711.17	0.39	-0.189	0.000	0.211
25.00	-38.97	-10.64	0.00	-1104.2	0.00	1104.26	4898.02	2449.01	11194.1	5528.36	0.62	-0.238	0.000	0.208
30.00	-37.55	-10.45	0.00	-1051.0	0.00	1051.05	4845.16	2422.58	10823.3	5345.24	0.89	-0.288	0.000	0.204
35.00	-36.15	-10.24	0.00	-998.82	0.00	998.82	4789.68	2394.84	10452.3	5162.01	1.22	-0.340	0.000	0.201
40.00	-34.79	-10.03	0.00	-947.61	0.00	947.61	4731.61	2365.80	10081.4	4978.87	1.61	-0.392	0.000	0.198
43.92	-33.75	-9.86	0.00	-908.31	0.00	908.31	4684.30	2342.15	9791.39	4835.60	1.95	-0.433	0.000	0.195
45.00	-33.21	-9.83	0.00	-897.62	0.00	897.62	4670.93	2335.46	9711.23	4796.01	2.05	-0.445	0.000	0.194
50.00	-30.79	-9.59	0.00	-848.48	0.00	848.48	4607.64	2303.82	9341.95	4613.64	2.54	-0.499	0.000	0.191
51.00	-30.30	-9.56	0.00	-838.89	0.00	838.89	4157.28	2078.64	8537.21	4216.21	2.65	-0.510	0.000	0.206
55.00	-29.34	-9.39	0.00	-800.65	0.00	800.65	4115.37	2057.69	8281.29	4089.82	3.10	-0.555	0.000	0.203
60.00	-28.16	-9.18	0.00	-753.69	0.00	753.69	4060.64	2030.32	7961.67	3931.97	3.71	-0.612	0.000	0.199
65.00	-27.00	-8.97	0.00	-707.80	0.00	707.80	4003.30	2001.65	7642.72	3774.45	4.38	-0.670	0.000	0.194
70.00	-25.88	-8.76	0.00	-662.97	0.00	662.97	3943.36	1971.68	7324.85	3617.47	5.11	-0.729	0.000	0.190
75.00	-24.78	-8.54	0.00	-619.19	0.00	619.19	3880.82	1940.41	7008.46	3461.22	5.91	-0.789	0.000	0.185
80.00	-23.71	-8.34	0.00	-576.47	0.00	576.47	3815.67	1907.83	6693.96	3305.90	6.77	-0.849	0.000	0.181
85.00	-22.67	-8.13	0.00	-534.79	0.00	534.79	3747.91	1873.96	6381.75	3151.70	7.69	-0.910	0.000	0.176
90.00	-21.66	-7.91	0.00	-494.14	0.00	494.14	3677.55	1838.78	6072.22	2998.84	8.68	-0.973	0.000	0.171
90.17	-21.63	-7.92	0.00	-492.82	0.00	492.82	3675.16	1837.58	6061.96	2993.77	8.71	-0.975	0.000	0.171
95.00	-19.94	-7.70	0.00	-454.55	0.00	454.55	3604.59	1802.30	5765.80	2847.51	9.73	-1.036	0.000	0.165
96.00	-19.60	-7.66	0.00	-446.85	0.00	446.85	2873.56	1436.78	4663.81	2303.28	9.95	-1.049	0.000	0.201
100.00	-18.93	-7.50	0.00	-416.21	0.00	416.21	2833.34	1416.67	4481.60	2213.29	10.85	-1.100	0.000	0.195
105.00	-18.11	-7.31	0.00	-378.69	0.00	378.69	2780.72	1390.36	4254.92	2101.34	12.04	-1.171	0.000	0.187
110.00	-17.32	-7.12	0.00	-342.15	0.00	342.15	2725.50	1362.75	4029.81	1990.17	13.30	-1.242	0.000	0.178
115.00	-16.54	-6.93	0.00	-306.58	0.00	306.58	2667.67	1333.84	3806.69	1879.98	14.64	-1.312	0.000	0.169
120.00	-15.80	-6.74	0.00	-271.95	0.00	271.95	2607.24	1303.62	3585.95	1770.96	16.05	-1.382	0.000	0.160
125.00	-15.08	-6.56	0.00	-238.25	0.00	238.25	2544.20	1272.10	3368.00	1663.33	17.54	-1.451	0.000	0.149
130.00	-14.38	-6.38	0.00	-205.46	0.00	205.46	2478.56	1239.28	3153.24	1557.27	19.09	-1.519	0.000	0.138
133.33	-13.93	-6.26	0.00	-184.21	0.00	184.21	2433.35	1216.68	3012.04	1487.53	20.17	-1.563	0.000	0.130
135.00	-13.56	-6.20	0.00	-173.78	0.00	173.78	2410.32	1205.16	2942.08	1452.98	20.72	-1.585	0.000	0.125
138.00	-12.93	-6.08	0.00	-155.18	0.00	155.18	1545.45	772.73	1882.66	929.77	21.73	-1.623	0.000	0.175
140.00	-12.72	-6.02	0.00	-143.02	0.00	143.02	1531.69	765.84	1834.28	905.88	22.41	-1.648	0.000	0.166
145.00	-12.23	-5.86	0.00	-112.90	0.00	112.90	1495.44	747.72	1713.73	846.35	24.18	-1.720	0.000	0.142
150.00	-9.32	-4.45	0.00	-83.59	0.00	83.59	1456.60	728.30	1594.07	787.25	26.02	-1.784	0.000	0.113
155.00	-8.90	-4.29	0.00	-61.36	0.00	61.36	1415.15	707.58	1475.70	728.79	27.91	-1.837	0.000	0.091
158.00	-7.47	-3.61	0.00	-48.50	0.00	48.50	1389.03	694.52	1405.47	694.11	29.08	-1.865	0.000	0.075
160.00	-7.33	-3.55	0.00	-41.27	0.00	41.27	1371.10	685.55	1359.03	671.17	29.86	-1.882	0.000	0.067
165.00	-6.98	-3.41	0.00	-23.49	0.00	23.49	1324.44	662.22	1244.46	614.59	31.85	-1.914	0.000	0.044
166.00	-3.27	-1.77	0.00	-20.09	0.00	20.09	1314.79	657.40	1221.83	603.42	32.25	-1.919	0.000	0.036
170.00	-3.02	-1.66	0.00	-12.99	0.00	12.99	1275.17	637.59	1132.39	559.24	33.87	-1.935	0.000	0.026
175.00	-2.73	-1.53	0.00	-4.68	0.00	4.68	1207.50	603.75	1010.00	498.80	35.90	-1.947	0.000	0.012
178.00	-0.10	-0.05	0.00	-0.10	0.00	0.10	1163.35	581.68	937.07	462.78	37.13	-1.950	0.000	0.000
180.00	0.00	-0.05	0.00	0.00	0.00	0.00	1133.92	566.96	889.96	439.52	37.94	-1.950	0.000	0.000

Final Analysis Summary

Structure:	CT46130-A-SBA	**Code:**	EIA/TIA-222-G	6/1/2018	
Site Name:	Deep River-winthrop Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 40	

Tower Engineering Solutions

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 101 mph Wind	52.4	0.00	55.67	0.00	0.00	6306.12
0.9D + 1.6W 101 mph Wind	52.4	0.00	41.73	0.00	0.00	6235.40
1.2D + 1.0Di + 1.0Wi 50 mph Wind	11.0	0.00	84.08	0.00	0.00	1409.73
1.2D + 1.0E	1.6	0.00	55.77	0.00	0.00	210.76
0.9D + 1.0E	1.6	0.00	41.83	0.00	0.00	208.13
1.0D + 1.0W 60 mph Wind	11.6	0.00	46.47	0.00	0.00	1384.22

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 101 mph Wind	-55.67	-52.42	0.00	-6306.1	0.00	-6306.1	5123.29	2561.6	13030.5	6435.29	0.00	0.991
0.9D + 1.6W 101 mph Wind	-41.73	-52.40	0.00	-6235.4	0.00	-6235.4	5123.29	2561.6	13030.5	6435.29	0.00	0.978
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-84.08	-10.96	0.00	-1409.7	0.00	-1409.7	5123.29	2561.6	13030.5	6435.29	0.00	0.235
1.2D + 1.0E	-15.71	-1.13	0.00	-35.37	0.00	-35.37	1545.45	772.73	1882.66	929.77	138.00	0.048
0.9D + 1.0E	-11.78	-1.11	0.00	-34.78	0.00	-34.78	1545.45	772.73	1882.66	929.77	138.00	0.045
1.0D + 1.0W 60 mph Wind	-46.47	-11.56	0.00	-1384.2	0.00	-1384.2	5123.29	2561.6	13030.5	6435.29	0.00	0.224

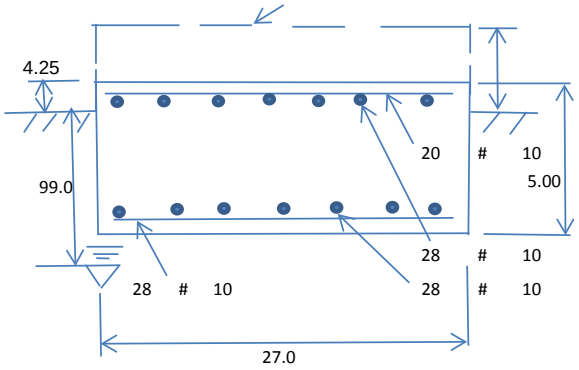
Monopole Mat Foundation Design

				Date
				6/1/2018
Customer Name:	SBA Communcations Corp	**EIA/TIA Standard:**	EIA-222-G
Site Name:	Deep River-winthrop Rd	**Structure Height (Ft.):**	180
Site Number:	CT46130-A-SBA	**Engineer Name:**	Rama K.
Engr. Number:	53615	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

Analysis or Design? Analysis

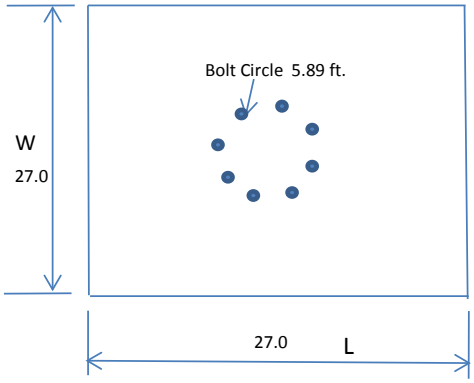


Base Reactions (Factored):

Axial Load (Kips):	55.7	Shear Force (Kips):	52.4
Uplift Force (Kips):	0.0	Moment (Kips-ft):	6306.1
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Anchor Bolt Circle (ft.):	5.89	Depth of Base BG (ft.):	0.75
Thickness of Pad (ft):	5.00		
Length of Pad (ft.):	27	Width of Pad (ft.):	27
Final Length of pad (ft)	27.0	Final width of pad (ft):	27.0



Material Properties and Reabr Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Pad Rebar Yield (Ksi):	60	Tie Spacing (in):	12.0	
Pad Steel Rebar Size (#):	10			
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	20	Qty. of Rebar in Pad (W):	20	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	28	Qty. of Rebar in Pad (W):	28	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	120000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

Foundation Analysis and Design: Uplift Strength Reduction Factor: 0.75 — Compression Strength Reduction Factor: 0.75

Total Dry Soil Volume (cu. Ft.):	0.00	Total Dry Soil Weight (Kips):	0.00
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	0.00	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	3645.00	Total Dry Concrete Weight (Kips):	546.75
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	546.75	Total Vertical Load on Base (Kips):	602.45

Check Soil Capacities:

				Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	4703	<	Allowable Factored Soil Bearing (psf): 90000	0.05	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	7395.0	>	Design Factored Momont (kips-ft): 6571	0.89	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.13	OK!			

Check the capacities of Reinforceing Concrete:

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

Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	1732.8	>	One-Way Factored Shear (L-D. Kips):	386.8	0.22	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1732.8	>	One-Way Factored Shear (W-D., Kips)	386.8	0.22	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	2040.5	>	One-Way Factored Shear (C-C, Kips):	890.8	0.44	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0014	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0014		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	6364.6	>	Moment at Bottom (L-Direct. K-Ft):	1084.5	0.17	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	6364.6	>	Moment at Bottom (W-Direct. K-Ft):	1084.5	0.17	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	8978.4	>	Moment at Bottom (C-C Dir. K-Ft):	1533.7	0.17	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0019	OK!	Upper Steel Reinf. Ratio (W-Direct.):	0.0019		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	8866.2	>	Moment at the top (L-Dir Kips-Ft):	56.2	0.01	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	8866.2	>	Moment at the top (W-Dir Kips-Ft):	56.2	0.01	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	12494.6	>	Moment at the top (C-C Direc. K-Ft):	892.6	0.07	OK!

Antenna Mount Structural Analysis

Source: SBA Date: 7.19.2017

SBA Site:	**CT46130-A Deep River-winthrop Rd**
Sprint Site Number:	**CT33XC544**
Project:	**Sprint DO Macro Upgrade**
Prepared For:	**Sprint**
Mount Description:	**(1) Platform**
Site Location:	**220 Winthrop Rd, Deep River, CT** **Middlesex County** **41.36587222°, -72.47485°**
Design Codes:	**ANSI/TIA-222-G** **IBC 2015 w/ 2016 CT State Amend.**
Analysis Load Case:	**Sprint Final Configuration**
Analysis Result:	**Adequate @ 73% - Once Augmented** **See Conclusion**

STATE OF CONNECTICUT
GREGORY DURGIN
No 32155
LICENSED
PROFESSIONAL ENGINEER

Revision 1
May 9, 2018

CT33XC544-PASSING-MOUNT-STRUCTURAL-ANALYSIS-05-09-18-REV1

1.0 Introduction

An antenna mount structural analysis has been performed on Sprint's existing mount assembly located at the CT46130-A Deep River-winthrop Rd communications site in Middlesex County, CT considering the final equipment loading configuration listed in Section 3.0.

2.0 Analysis Criteria

An elastic three-dimensional model of the mount structure has been analyzed pursuant to the following criteria:

- IBC 2015 – International Building Code.
- ANSI/TIA-222-G – Structural Standard for Antenna Supporting Structures and Antennas.
- AISC – Steel Construction Manual.
- ANSI/AWS D1.1 – Structural Welding Code.

Wind w/o ice = 130 mph (3-sec gust Ultimate Wind Speed) Wind w/o ice = 114 mph (3-sec gust Equivalent per TIA-222-G Tower Code)	
Wind with ice = 50 mph (3-sec gust, 3/4" Ice)	Topographic Category 1
Exposure Category C	Structure Class II

The following documents were provided:

- Prelim Construction Drawings
  ProTerra, 11/1/17.
- Mount and Tower Record Documents
  SBA
- Mount Assessment
  ProTerra, 11/1/17.
- Tower Structural Analysis
  TES, 10/30/17.
- RF Design
  Sprint DOMU Project, RFDS ID: 45840.

The results of the analysis are illustrated in Section 4.0. If any of the existing or proposed conditions reported in this analysis are not properly represented, please contact our office immediately to request an amended report.

3.0 Appurtenance Information

Table 3.1 – Sprint Final Configuration[1]

COR	(Quantity) Appurtenance Make/Model	Mount Description
166.0'±	(3) RFS APXVTM14-ALU-I20	*(1) Platform*
	(3) COMMSCOPE NNVV-65B-R4	
	(6) ALU 800MHz RRH	
	(3) ALU 1900MHz RRH	
	(3) ALU 2500MHz RRH	

1. *Refer to antenna installation Construction Drawings (by others, when applicable) for additional information regarding final antenna and equipment orientations.*
2. *Panel antennas to be installed in Positions 1 and 3 (end and middle of mount face). RRH units to be installed on new mount pipes in Positions 2 and 4 on dual RRH swivel brackets (maximum of two RRH per panel mount pipe) as shown in Construction Drawings.*

4.0 Analysis Results

Table 4.1 – Existing Mount Capacity

Load Case	Governing Mount Component[1]	% Capacity[2]	Result
Final Sprint Configuration	Bottom Rail	>200%	**Inadequate[3]**

1. *Refer to the Calculations & Software Output portion of this report for mount component and structural information.*
2. *Listed results are expressed as a percentage of available mount member capacity based upon the assumed material strengths listed in Table 4.3. 105% is an acceptable allowable stress percentage for mount components.*
3. *Structural augments to the existing mount structure are required to obtain a mount structure capable of supporting the currently proposed final loading configuration in Table 3.1.*

Table 4.2 – Augmented Mount Capacity

Load Case	Governing Mount Component[1]	% Capacity[2]	Result
Final Sprint Configuration	New PRK Connection Capacity	73%	**Adequate Once Augmented[3]**

1. *Refer to the Calculations & Software Output portion of this report for mount component and structural information.*
2. *Listed results are expressed as a percentage of available mount member capacity based upon the assumed material strengths listed in Table 4.3. 105% is an acceptable allowable stress percentage for mount components.*
3. *Refer to GeoStructural Mount Augmentation Drawings and Section 5.0 for information regarding required mount augments.*

Table 4.3 – Structural Component Material Strengths

Structural Component	Nominal Strength/Material[1]
Pipe	F_y = 35 ksi (A53, Gr. B)
Tube	F_y = 46 ksi (A500, Gr. B)
Structural Shapes (L, C, W, etc.), Plate / Bar	F_y = 36 ksi (A36)
Uni-Strut	F_y = 33 ksi (A570, Gr. 33)
Connection Bolts	A325
Stainless Steel Bolts	18-8 Stainless, Grade 316/304 F_y = 74 ksi (Yield) & F_u = 29 ksi (Tension)
U-Bolts / Threaded Rod	SAE J429 Grade 2 (Substitution: ASTM A449) F_y = 57 ksi (Yield) & F_u = 74 ksi (Tension)
Welds	E70XX Electrodes

1. *Strengths listed were assumed for this analysis and are based upon ASTM, AISC, RCSC, AWS and ACI preferred specification values. Values and materials are consistent with industry standards. Material strengths were taken from original design documents when available.*

5.0 Conclusion & Recommendations

Based on Sprint's final equipment loading configuration, the existing mount assembly does not have sufficient capacity to support the loading considered in this analysis pursuant to the listed standards. Structural augments (reinforcements) will be required and are briefly summarized below:

- Install Platform Reinforcement Kit; located 5.0' below the existing collar mount and attaching to the existing tube steel platform members 5.0' from collar interface.
  - Sitepro1 PRK-1245L, (1) total.
- Install Handrail Kit; located 4.0' above the existing mount face rail centerline. Remove existing single angle top handrail and properly dispose of.
  - Pipe2.0STD x 12.5' Horizontal Rail, (3) total. Attach SFS-H-L kit angles to new horizontal rail.
  - Pipe2.0STD x ~4' long corner braces, (3) total. Attach to new horizontal rail w/ Sitepro1 PUCK brackets, (6) total.
  - Sitepro1 SCX1-K, (15) total. 1/2"Ø or 5/8"Ø U-Bolts, (12) total. Attach all mount pipes to new rail w/ SCX1-K plates and to existing bottom rail w/ (2) U-Bolts. (6) new Pipe2.0STD mount pipes will be required to span between existing rail and new rail.
- Install V-Brace Kit; located 4.0' above the existing mount face rail centerline.
  - Sitepro1 PRK-SFS-H-L, (1) total. Attach kit ring mount in kit to monopole shaft.
    - If the PRK-SFS-H-L kit is not available, provide (6) total L2-1/2x2-1/2x3/16 x ~8' long replacement angles, field-cut and drill to suit.
- Panel antennas to be installed in Positions 1 and 3 (end and middle of mount face). RRH units to be installed on new mount pipes in Positions 2 and 4 on dual RRH swivel brackets (maximum of two RRH per panel mount pipe) as shown in Construction Drawings.

Once the recommended augments are successfully implemented, the augmented mount assembly has sufficient capacity to support the loading considered in this analysis pursuant to the listed standards.

Augmentation Requirements:

- **In order to obtain a mount structure capable of supporting the currently proposed final loading configuration, upgrade augments must be installed in accordance with GeoStructural's *Mount Augmentation Drawings*.**
- **Antennas and equipment shall be installed centered vertically on the mount front face rails. If this assumption is incorrect, the results of this analysis will be affected.**

This analysis only encompasses the antenna mount assembly. The tower, overall mount support structure, foundation, etc. are beyond the scope of this analysis. If any of the existing or proposed conditions (appurtenance loading, member sizes, etc.) reported in this analysis are not properly represented, please contact our office immediately to request an amended report.

Prepared by:

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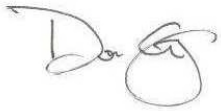
Reviewed and Approved by:



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6.0 Standard Conditions

- All data required to complete our structural analysis was furnished by our client and provided record data. GeoStructural has not conducted a site visit or independent study to verify existing conditions and the results of this analysis are based solely on the information provided. It has been assumed that the tower, antenna support structure and foundation have been constructed according to the provided existing drawings, previous structural analysis reports, mapping documents, etc.

- The default Structure Classification is Class II in accordance with ANSI/TIA-222-G §A.2.2 & §A.15.3 and has been assumed for this analysis. The owner shall verify this classification conforms with original or desired reliability criteria.

- This analysis assumes that the structure has been properly installed and maintained in accordance with ANSI/TIA-222-G §15.5 and that no physical deterioration has occurred in any of the components of the structure. Damaged, missing, or rusted members were not considered.

- This analysis verifies the adequacy of the main components of the structure. Not all connections, welds, bolts, plates, etc. were individually detailed and analyzed. Where not specifically analyzed, the existing connection plates, welds, bolts, etc. were assumed adequate to develop the full capacity of the main structural members.

- No consideration has been made for unusual or extreme wind events, rime/in-cloud ice loadings, harmonic or nodal vibration, vortex shedding or other similar conditions.

- It is the owner's responsibility to determine the appropriate design wind speed and amount of ice accumulation beyond code minimum values that should be considered in the analysis.

- This analysis report does not constitute a maintenance and condition assessment. No certifications regarding maintenance and condition are expressed or implied. If desired, GeoStructural can provide these services under a subsequent contract.

- This analysis only encompasses the antenna mount assembly. The tower, overall mount support structure, foundation, etc. are beyond the scope of this analysis. If desired, GeoStructural can provide these services under a subsequent contract.

7.0 Calculations & Software Output

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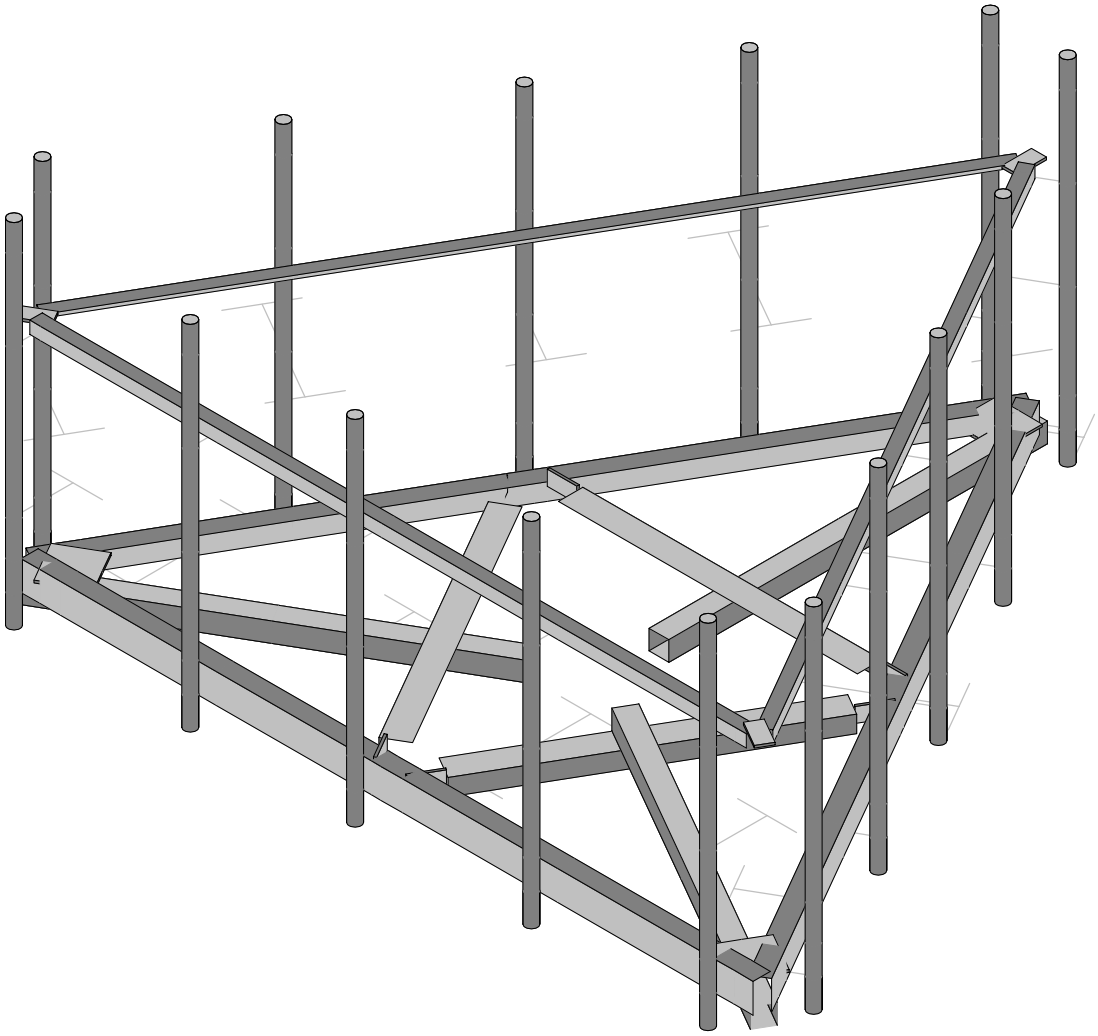

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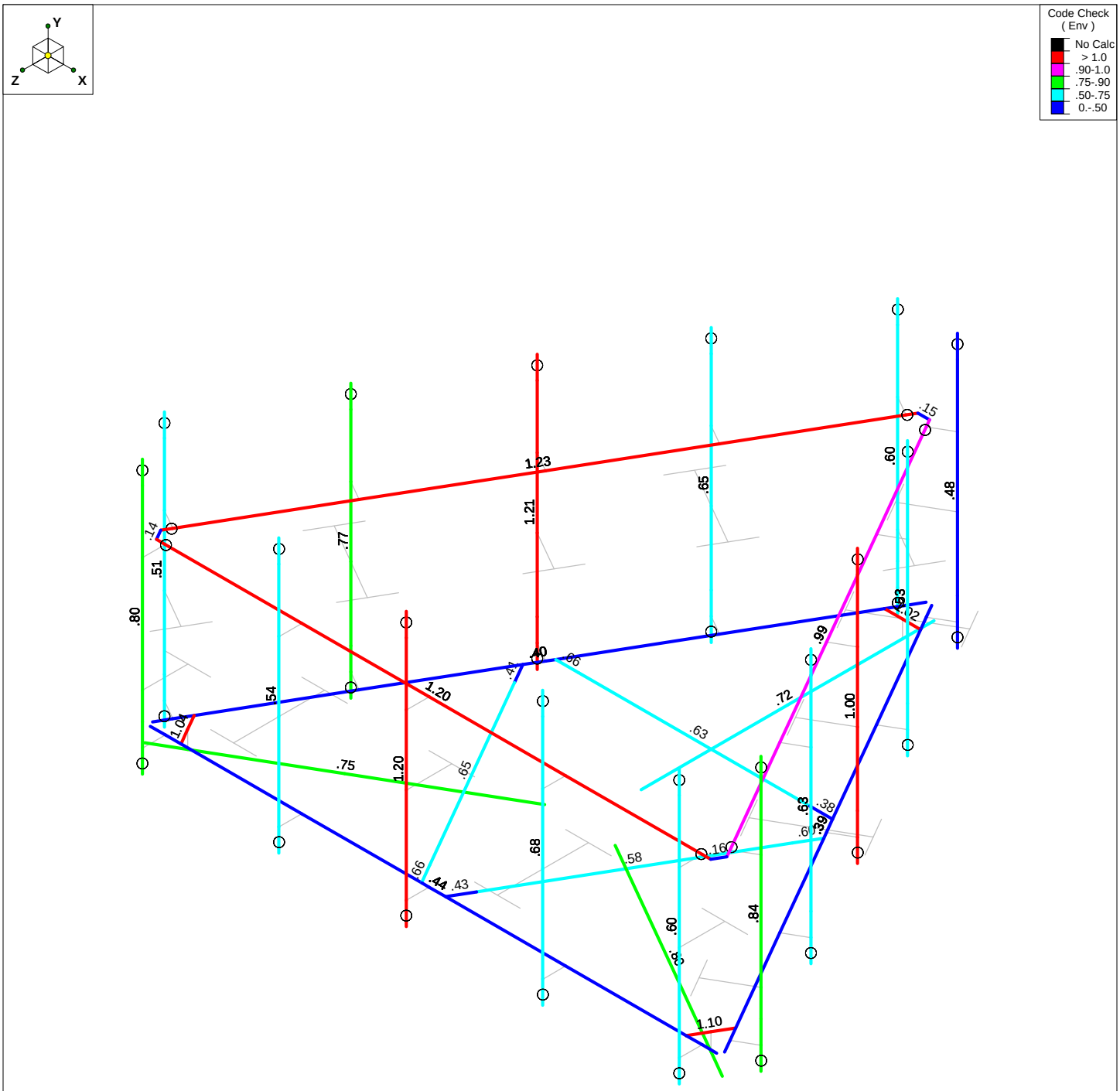

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Envelope Only Solution

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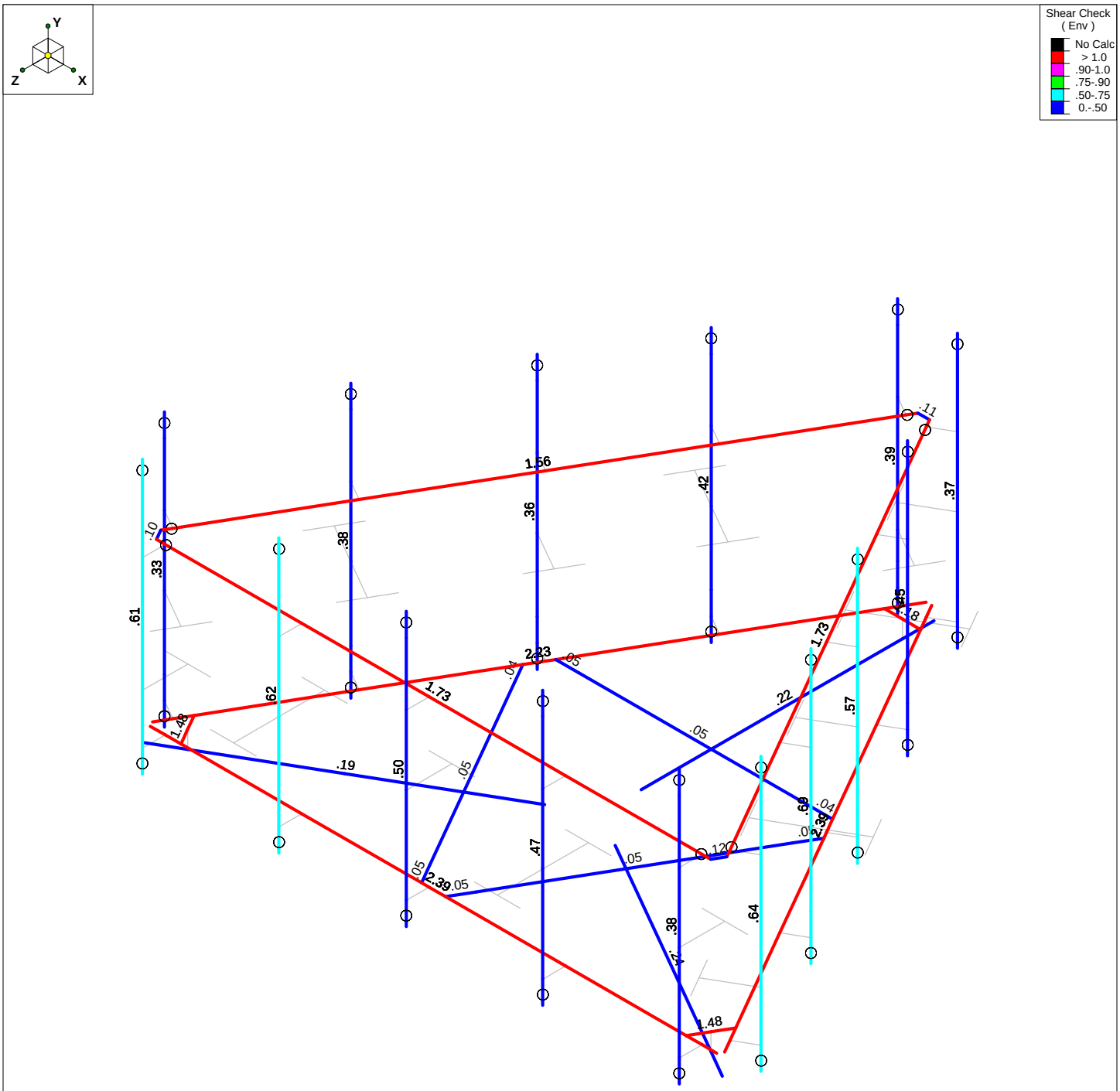

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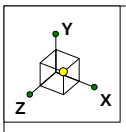

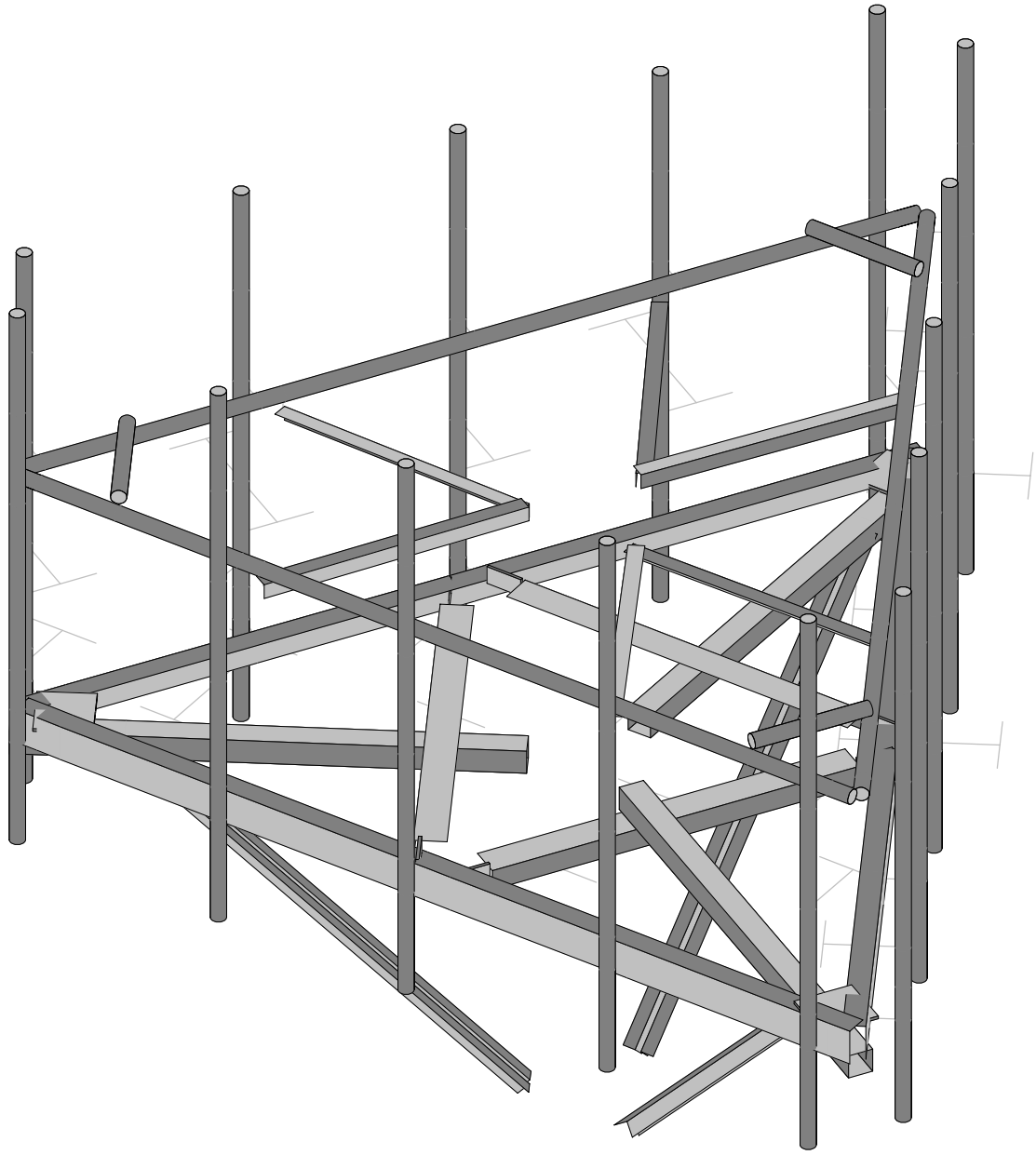

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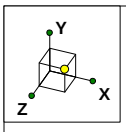

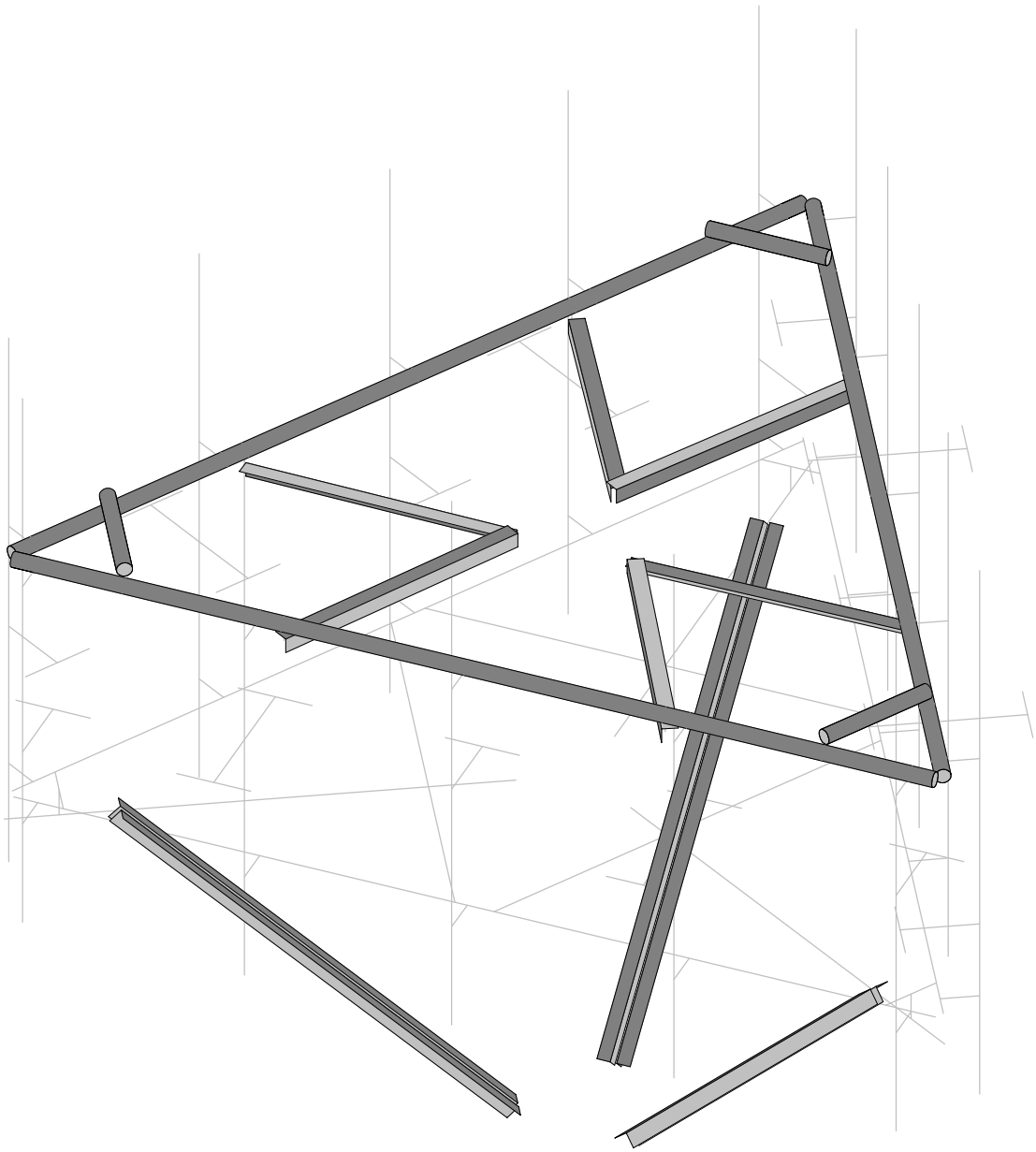

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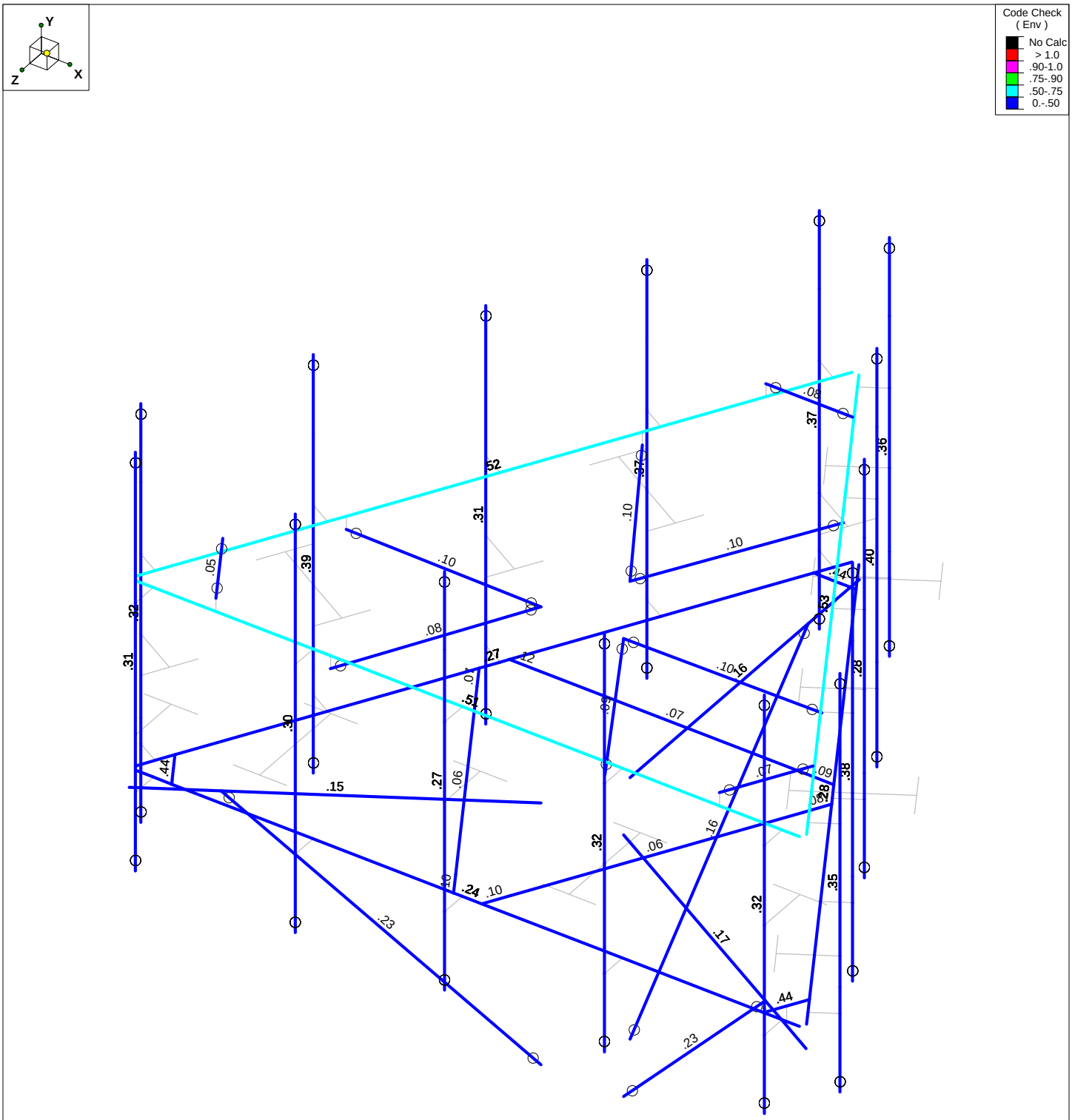

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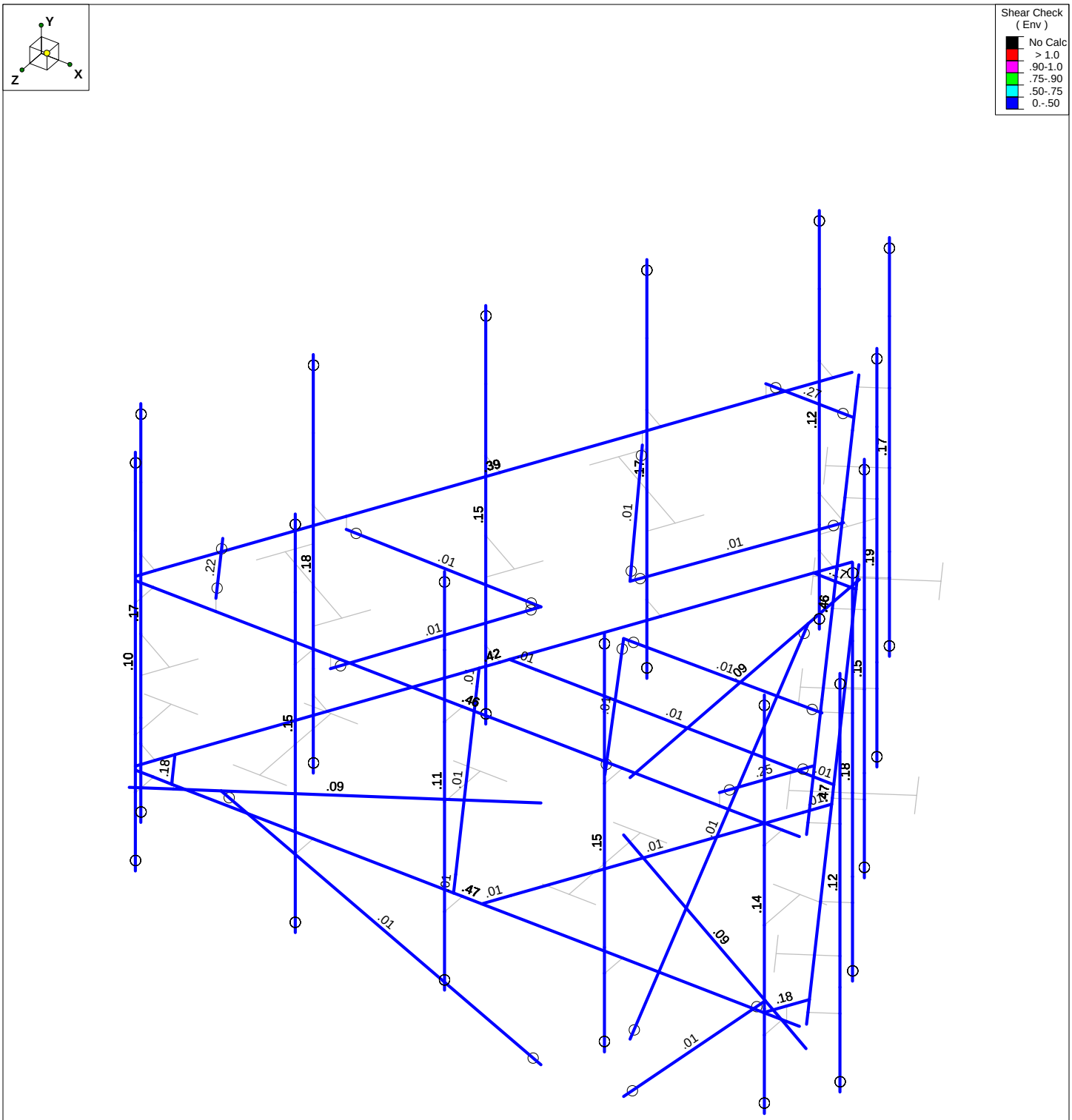

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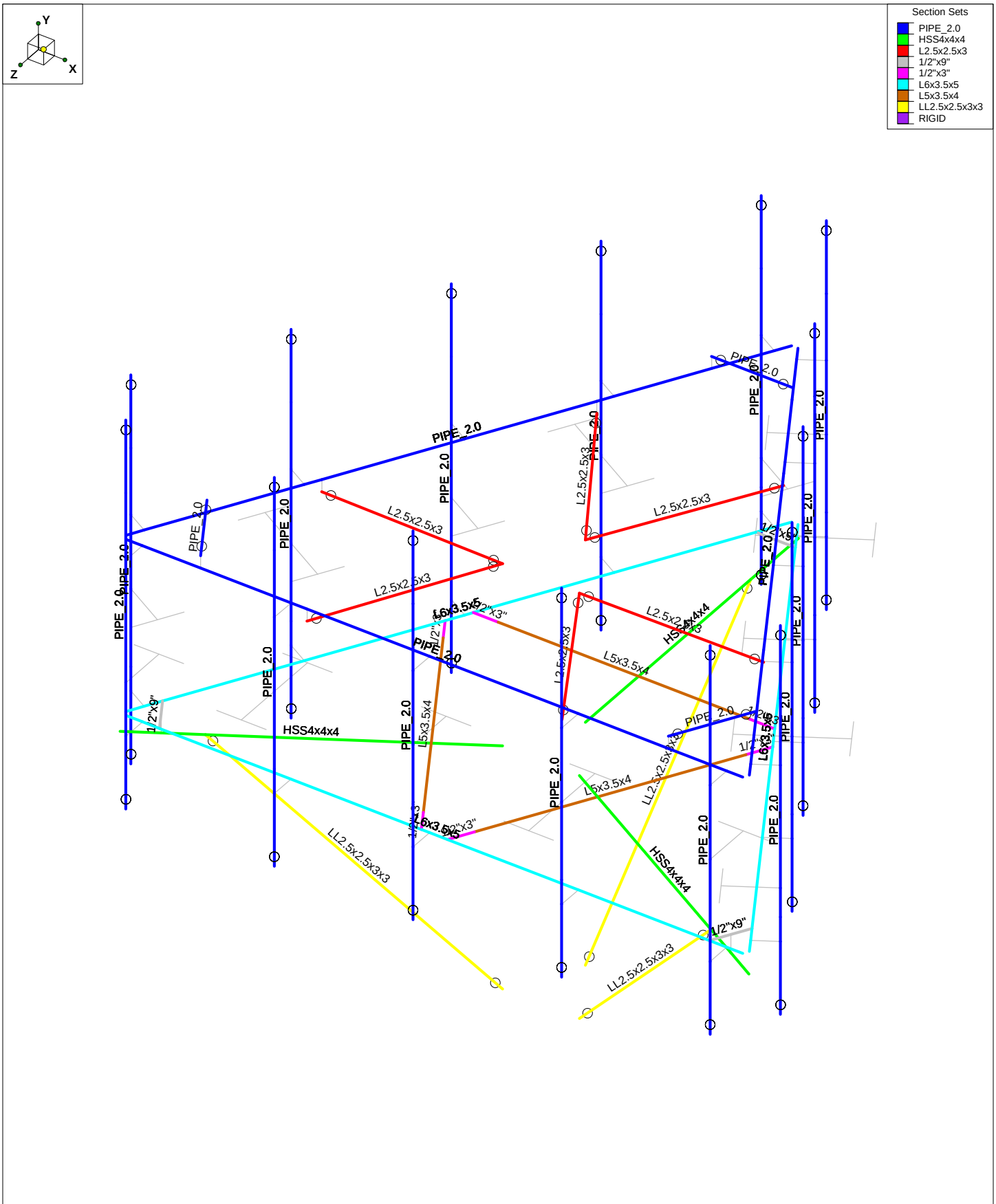

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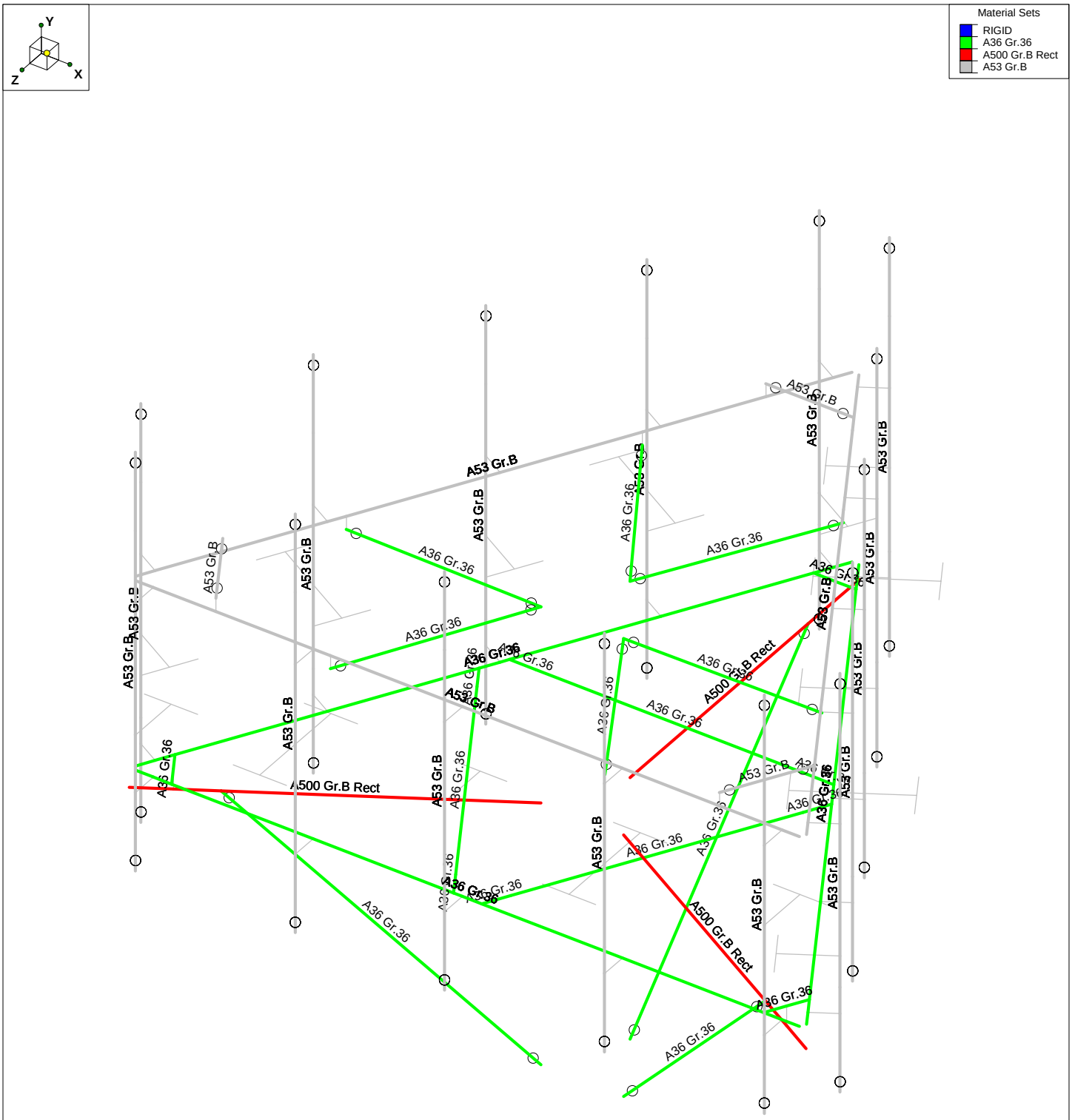

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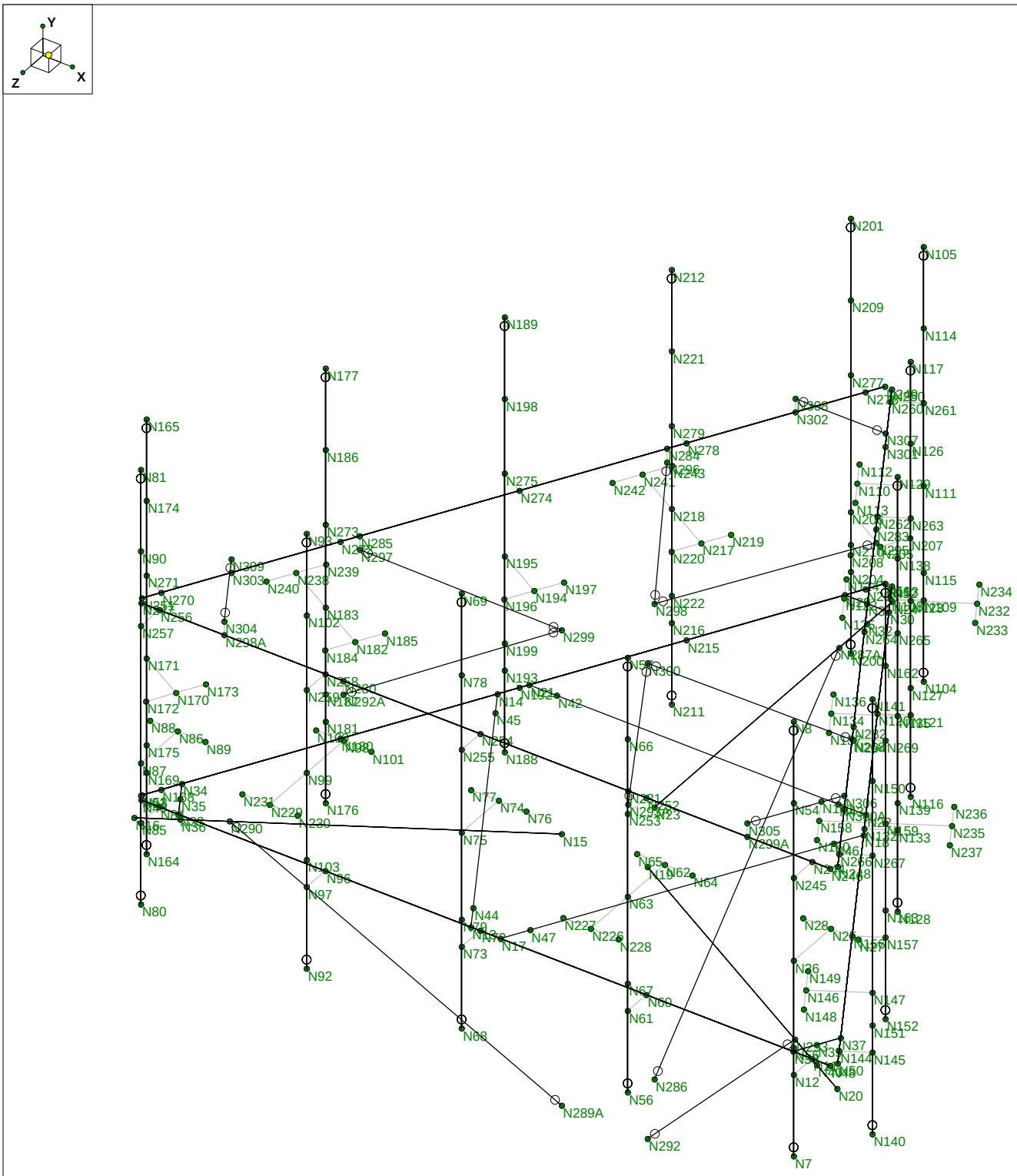

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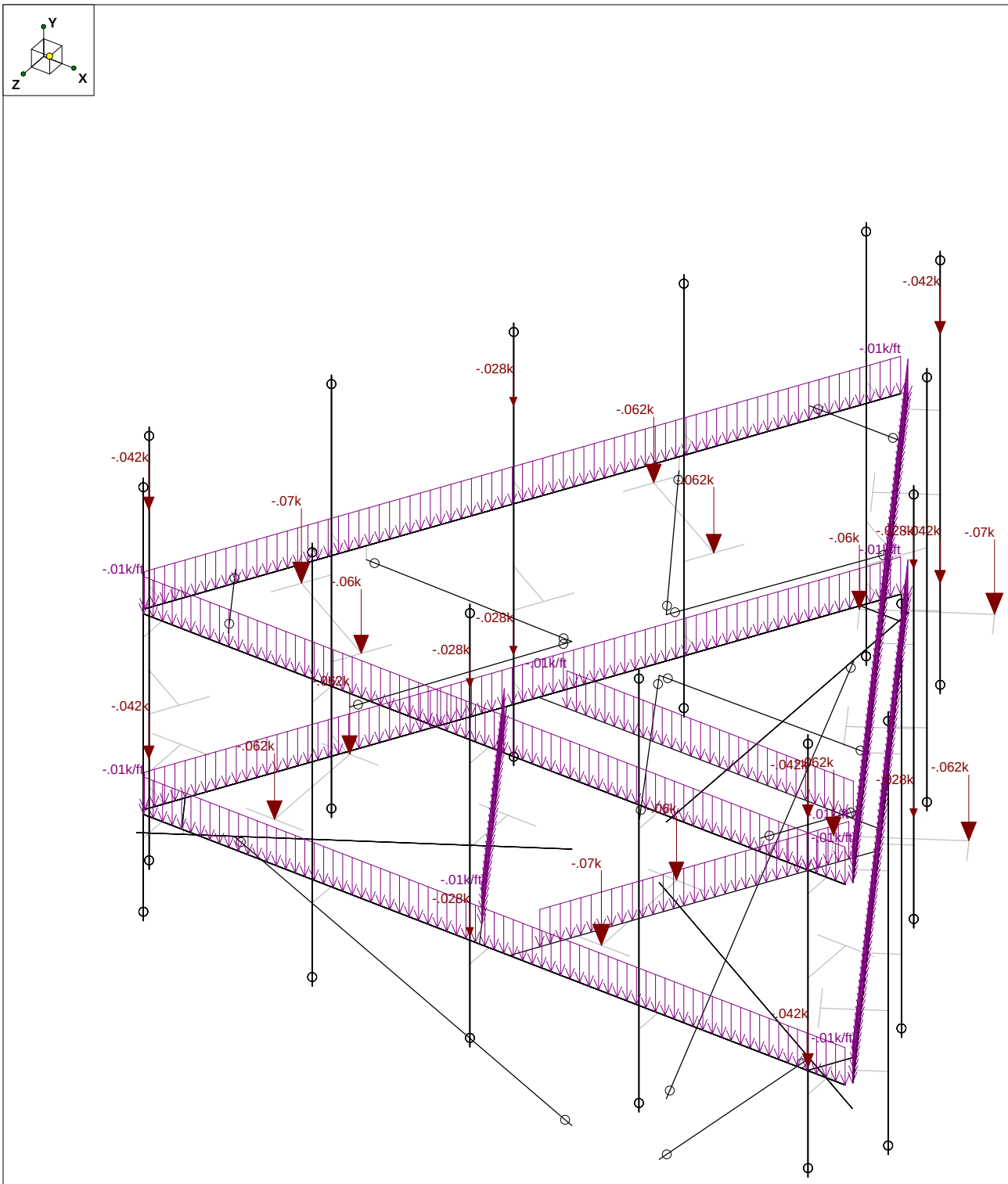

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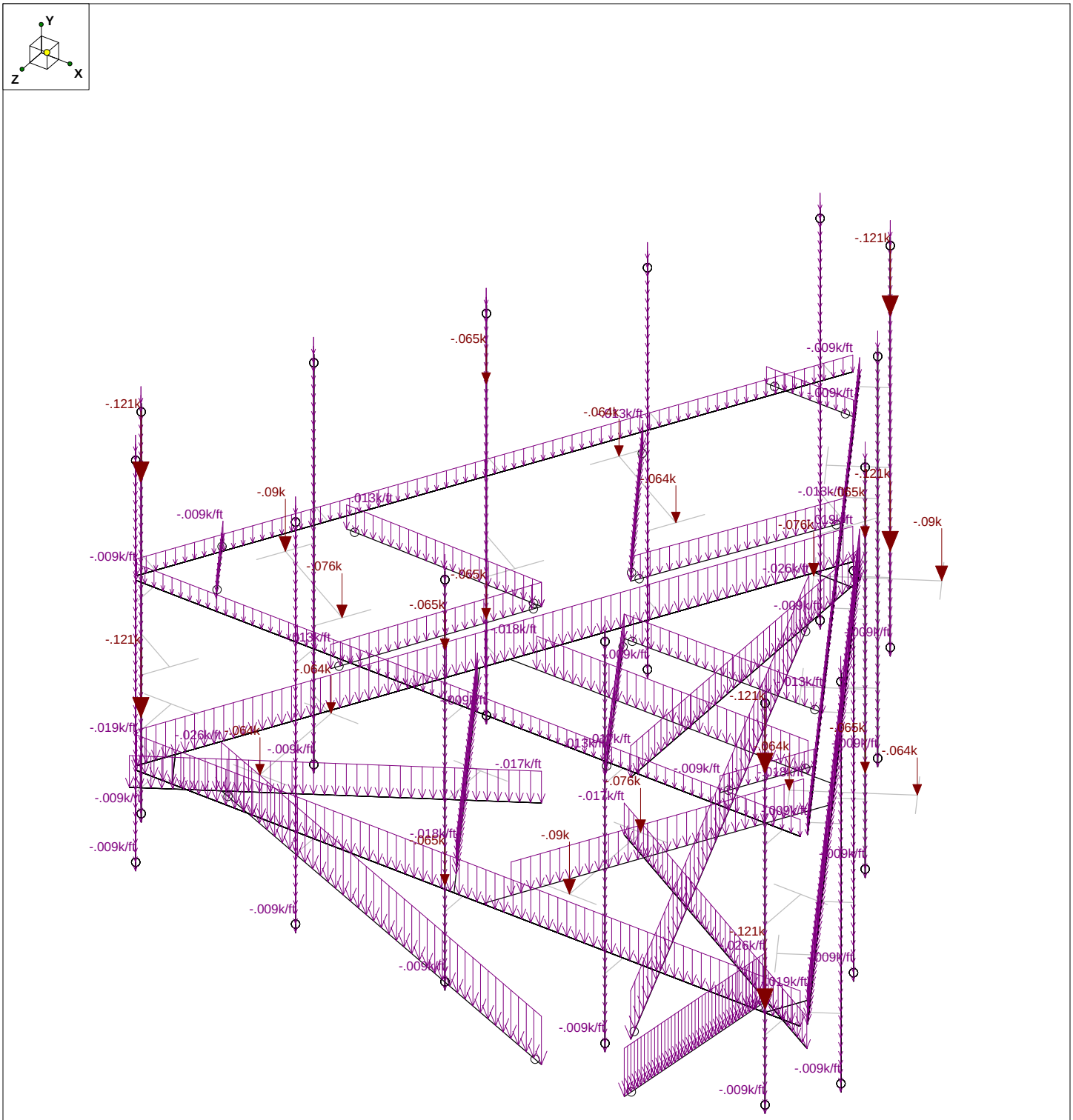

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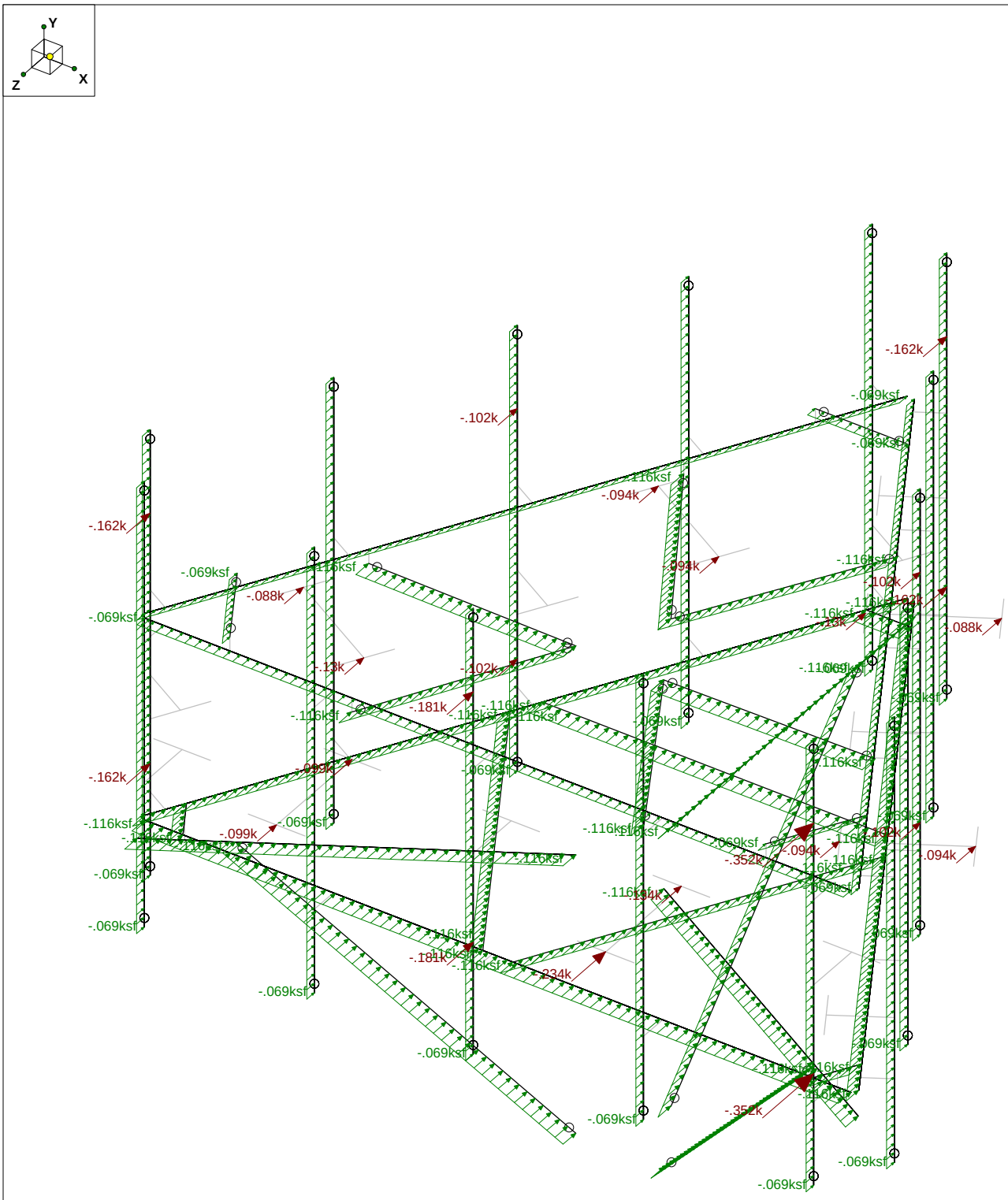

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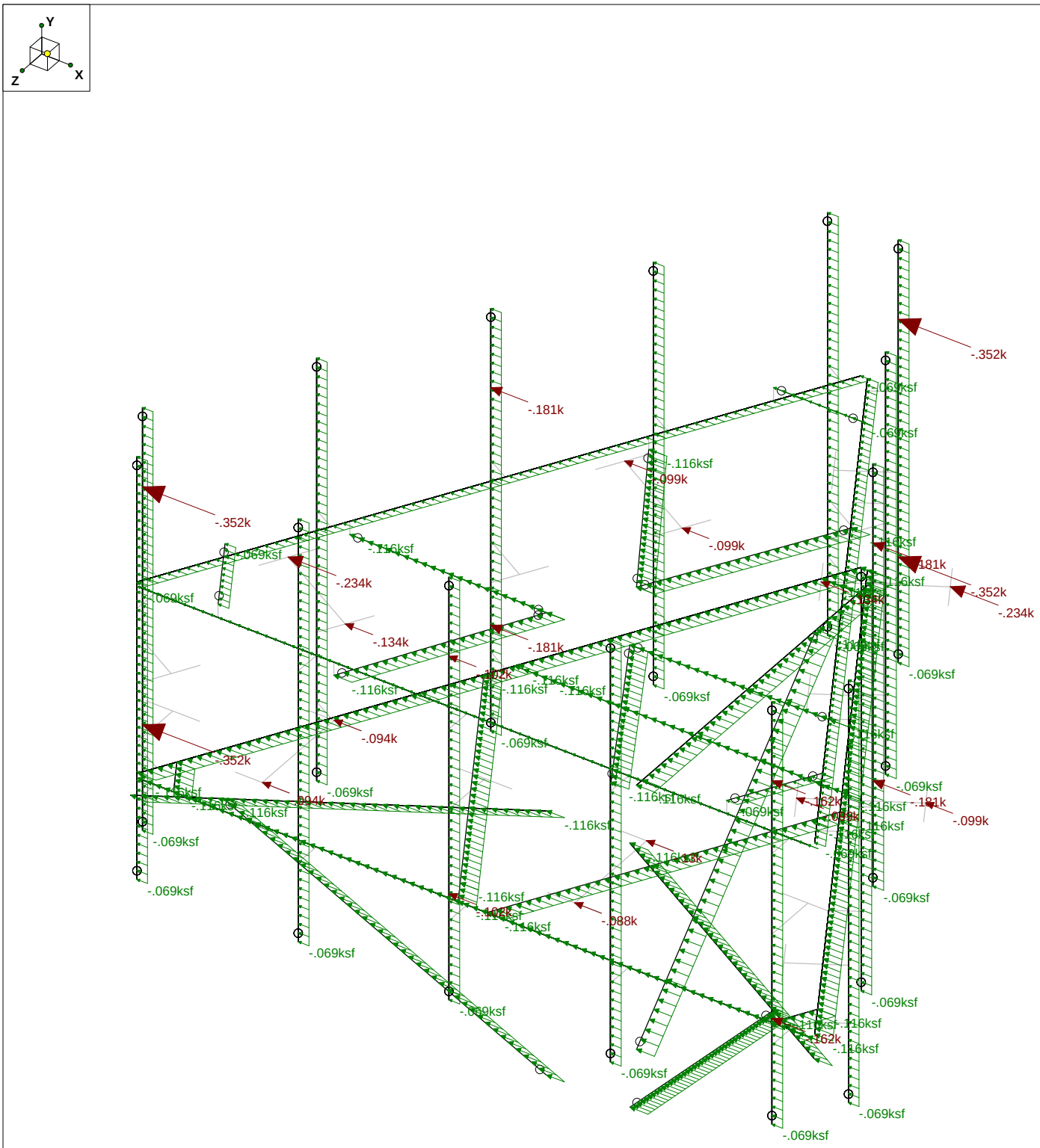

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Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	D	DL		-1		25		9		
2	Di	SL				25		42		
3	Lm [500]	LL				1				
4	Lv [250]	LL				2				
5	Woz	WL				25		48		
6	Wox	WL				25		48		
7	Wiz	WL				25		48		
8	Wix	WL				25		48		
9	Ez	EL				25				
10	Ex	EL				25				

Load Combination Design

	Description	ASIF	CD	Service	Hot Rol...	Cold Form...	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
1	1) 1.4D				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
27	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
30	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
31	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
33	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
34	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
41	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Load Combination Design (Continued)

	Description	ASIF	CD	Service	Hot Rol...	Cold Form...	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
42	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
45	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
47	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
48	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
49	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
50	6) 1.2D+1.5Lv				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
51	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
52	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
53	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
54	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
55	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
56	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
57	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
58	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
59	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
60	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
61	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
62	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
64	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
65	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
66	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
67	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
68	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
69	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
70	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
71	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
72	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
73	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
74	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
3	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.49	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.49	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	PIPE_1.5	PIPE_1.5	Beam	Pipe	A53 Gr.B	Typical	.749	.293	.293	.586
2	PIPE_2.0	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	PIPE_2.5	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
4	PIPE_3.0	PIPE_3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
5	PIPE_3.5	PIPE_3.5	Beam	Pipe	A53 Gr.B	Typical	2.5	4.52	4.52	9.04
6	PIPE_4.0	PIPE_4.0	Beam	Pipe	A53 Gr.B	Typical	2.96	6.82	6.82	13.6
7	PIPE_5.0	PIPE_5.0	Beam	Pipe	A53 Gr.B	Typical	4.01	14.3	14.3	28.6
8	HSS2x2x3	HSS2x2x3	Beam	Tube	A500 Gr.B R...	Typical	1.19	.641	.641	1.09
9	HSS3x3x3	HSS3x3x3	Beam	Tube	A500 Gr.B R...	Typical	1.89	2.46	2.46	4.03

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
10	HSS4x4x3	HSS4x4x3	Beam	Tube	A500 Gr.B R...	Typical	2.58	6.21	6.21	10
11	HSS4x4x4	HSS4x4x4	Beam	Tube	A500 Gr.B R...	Typical	3.37	7.8	7.8	12.8
12	HSS5x5x4	HSS5x5x4	Beam	Tube	A500 Gr.B R...	Typical	4.3	16	16	25.8
13	C3x3.5	C3x3.5	Beam	Channel	A36 Gr.36	Typical	1.09	.169	1.57	.023
14	C4x4.5	C4x4.5	Beam	Channel	A36 Gr.36	Typical	1.38	.289	3.65	.032
15	C5x6.7	C5x6.7	Beam	Channel	A36 Gr.36	Typical	1.97	.47	7.48	.055
16	L2.5x2.5x3	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical	.901	.535	.535	.011
17	L2.5x2.5x4	L2.5x2.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.19	.692	.692	.026
18	L3x3x3	L3x3x3	Beam	Single Angle	A36 Gr.36	Typical	1.09	.948	.948	.014
19	L3x3x4	L3x3x4	Beam	Single Angle	A36 Gr.36	Typical	1.44	1.23	1.23	.031
20	L3x3x6	L3x3x6	Beam	Single Angle	A36 Gr.36	Typical	2.11	1.75	1.75	.101
21	L4x4x4	L4x4x4	Beam	Single Angle	A36 Gr.36	Typical	1.93	3	3	.044
22	LL3x3x4x0	LL3x3x4x0	Beam	Double Angle (No ...	A36 Gr.36	Typical	2.88	4.5	2.46	.063
23	1/2"x6"	1/2"x6"	Beam	BAR	A36 Gr.36	Typical	3	.063	9	.237
24	1/2"x9"	1/2"x9"	Beam	BAR	A36 Gr.36	Typical	4.5	.094	30.375	.362
25	1/2"x3"	1/2"x3"	Beam	BAR	A36 Gr.36	Typical	1.5	.031	1.125	.112
26	L6x3.5x5	L6x3.5x5	Beam	Single Angle	A36 Gr.36	Typical	2.89	2.84	10.9	.099
27	L5x3.5x4	L5x3.5x4	Beam	Single Angle	A36 Gr.36	Typical	2.07	2.2	5.36	.046
28	LL2.5x2.5x3x3	LL2.5x2.5x3x3	Beam	Double Angle (3/8...	A36 Gr.36	Typical	1.8	2.46	1.07	.023

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M22	N7	N8		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
2	M34	N11	N12			RIGID	None	None	RIGID	DR1
3	M56	N15	N16		90	HSS4x4x4	Beam	Tube	A500 Gr.B...	Typical
4	M58	N19	N20		90	HSS4x4x4	Beam	Tube	A500 Gr.B...	Typical
5	M59	N42	N43		90	L5x3.5x4	Beam	Single Angle	A36 Gr.36	Typical
6	M60	N23	N24		90	HSS4x4x4	Beam	Tube	A500 Gr.B...	Typical
7	M73	N25	N26			RIGID	None	None	RIGID	DR1
8	M74	N28	N27			RIGID	None	None	RIGID	DR1
9	M79A	N29	N30		90	1/2"x9"	Beam	BAR	A36 Gr.36	Typical
10	M80B	N31	N32			RIGID	None	None	RIGID	DR1
11	M78C	N33	N34		90	1/2"x9"	Beam	BAR	A36 Gr.36	Typical
12	M79B	N35	N36			RIGID	None	None	RIGID	DR1
13	M80C	N37	N38		90	1/2"x9"	Beam	BAR	A36 Gr.36	Typical
14	M81B	N39	N40			RIGID	None	None	RIGID	DR1
15	M91	N22	N43			1/2"x3"	Beam	BAR	A36 Gr.36	Typical
16	M92	N21	N42			1/2"x3"	Beam	BAR	A36 Gr.36	Typical
17	M91A	N44	N45		90	L5x3.5x4	Beam	Single Angle	A36 Gr.36	Typical
18	M92A	N14	N45			1/2"x3"	Beam	BAR	A36 Gr.36	Typical
19	M93	N13	N44			1/2"x3"	Beam	BAR	A36 Gr.36	Typical
20	M94	N46	N47		90	L5x3.5x4	Beam	Single Angle	A36 Gr.36	Typical
21	M95	N17	N47			1/2"x3"	Beam	BAR	A36 Gr.36	Typical
22	M96	N18	N46			1/2"x3"	Beam	BAR	A36 Gr.36	Typical
23	M98	N49	N48		180	L6x3.5x5	Beam	Single Angle	A36 Gr.36	Typical
24	M98A	N50	N52		180	L6x3.5x5	Beam	Single Angle	A36 Gr.36	Typical
25	M99	N51	N53		180	L6x3.5x5	Beam	Single Angle	A36 Gr.36	Typical
26	M33	N56	N57		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
27	M35	N60	N61			RIGID	None	None	RIGID	DR1
28	M36	N62	N63			RIGID	None	None	RIGID	DR1
29	M37	N65	N64			RIGID	None	None	RIGID	DR1
30	M38	N68	N69		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
31	M40	N72	N73			RIGID	None	None	RIGID	DR1
32	M41	N74	N75			RIGID	None	None	RIGID	DR1
33	M42	N77	N76			RIGID	None	None	RIGID	DR1

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
34	M43	N80	N81		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
35	M45	N84	N85			RIGID	None	None	RIGID	DR1
36	M46	N86	N87			RIGID	None	None	RIGID	DR1
37	M47	N89	N88			RIGID	None	None	RIGID	DR1
38	M48	N92	N93		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
39	M50	N96	N97			RIGID	None	None	RIGID	DR1
40	M51	N98	N99			RIGID	None	None	RIGID	DR1
41	M52	N101	N100			RIGID	None	None	RIGID	DR1
42	M53	N104	N105		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
43	M55	N108	N109			RIGID	None	None	RIGID	DR1
44	M56A	N110	N111			RIGID	None	None	RIGID	DR1
45	M57	N113	N112			RIGID	None	None	RIGID	DR1
46	M58A	N116	N117		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
47	M60A	N120	N121			RIGID	None	None	RIGID	DR1
48	M61	N122	N123			RIGID	None	None	RIGID	DR1
49	M62	N125	N124			RIGID	None	None	RIGID	DR1
50	M63	N128	N129		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
51	M65	N132	N133			RIGID	None	None	RIGID	DR1
52	M66	N134	N135			RIGID	None	None	RIGID	DR1
53	M67	N137	N136			RIGID	None	None	RIGID	DR1
54	M68	N140	N141		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
55	M70	N144	N145			RIGID	None	None	RIGID	DR1
56	M71	N146	N147			RIGID	None	None	RIGID	DR1
57	M72	N149	N148			RIGID	None	None	RIGID	DR1
58	M73A	N152	N153		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
59	M75	N156	N157			RIGID	None	None	RIGID	DR1
60	M76	N158	N159			RIGID	None	None	RIGID	DR1
61	M77	N161	N160			RIGID	None	None	RIGID	DR1
62	M78	N164	N165		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
63	M80	N168	N169			RIGID	None	None	RIGID	DR1
64	M81	N170	N171			RIGID	None	None	RIGID	DR1
65	M82	N173	N172			RIGID	None	None	RIGID	DR1
66	M83	N176	N177		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
67	M85	N180	N181			RIGID	None	None	RIGID	DR1
68	M86	N182	N183			RIGID	None	None	RIGID	DR1
69	M87	N185	N184			RIGID	None	None	RIGID	DR1
70	M88	N188	N189		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
71	M90	N192	N193			RIGID	None	None	RIGID	DR1
72	M91B	N194	N195			RIGID	None	None	RIGID	DR1
73	M92B	N197	N196			RIGID	None	None	RIGID	DR1
74	M93A	N200	N201		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
75	M95A	N203	N204			RIGID	None	None	RIGID	DR1
76	M96A	N205	N206			RIGID	None	None	RIGID	DR1
77	M97	N208	N207			RIGID	None	None	RIGID	DR1
78	M98B	N211	N212		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
79	M100	N215	N216			RIGID	None	None	RIGID	DR1
80	M101	N217	N218			RIGID	None	None	RIGID	DR1
81	M102	N220	N219			RIGID	None	None	RIGID	DR1
82	M103	N226	N63			RIGID	None	None	RIGID	DR1
83	M104	N228	N227			RIGID	None	None	RIGID	DR1
84	M105	N229	N99			RIGID	None	None	RIGID	DR1
85	M106	N231	N230			RIGID	None	None	RIGID	DR1
86	M107	N232	N123			RIGID	None	None	RIGID	DR1
87	M108	N234	N233			RIGID	None	None	RIGID	DR1
88	M109	N235	N159			RIGID	None	None	RIGID	DR1
89	M110	N237	N236			RIGID	None	None	RIGID	DR1
90	M111	N238	N183			RIGID	None	None	RIGID	DR1

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
91	M112	N240	N239			RIGID	None	None	RIGID	DR1
92	M113	N241	N218			RIGID	None	None	RIGID	DR1
93	M114	N243	N242			RIGID	None	None	RIGID	DR1
94	M115	N244	N245			RIGID	None	None	RIGID	DR1
95	M116	N247	N246		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
96	M117	N248	N250		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
97	M118	N249	N251		180	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
98	M119	N252	N253			RIGID	None	None	RIGID	DR1
99	M120	N254	N255			RIGID	None	None	RIGID	DR1
100	M121	N256	N257			RIGID	None	None	RIGID	DR1
101	M122	N258	N259			RIGID	None	None	RIGID	DR1
102	M123	N260	N261			RIGID	None	None	RIGID	DR1
103	M124	N262	N263			RIGID	None	None	RIGID	DR1
104	M125	N264	N265			RIGID	None	None	RIGID	DR1
105	M126	N266	N267			RIGID	None	None	RIGID	DR1
106	M127	N268	N269			RIGID	None	None	RIGID	DR1
107	M128	N270	N271			RIGID	None	None	RIGID	DR1
108	M129	N272	N273			RIGID	None	None	RIGID	DR1
109	M130	N274	N275			RIGID	None	None	RIGID	DR1
110	M131	N276	N277			RIGID	None	None	RIGID	DR1
111	M132	N278	N279			RIGID	None	None	RIGID	DR1
112	M139	N287A	N286			LL2.5x2.5x3x3	Beam	Double Angle (...	A36 Gr.36	Typical
113	M140	N290	N289A			LL2.5x2.5x3x3	Beam	Double Angle (...	A36 Gr.36	Typical
114	M141	N293	N292			LL2.5x2.5x3x3	Beam	Double Angle (...	A36 Gr.36	Typical
115	M142	N297	N299		90	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical
116	M143	N292A	N299		180	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical
117	M144	N293A	N300		90	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical
118	M145	N294	N300		180	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical
119	M146	N295	N298		90	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical
120	M147	N296	N298		180	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical
121	M148	N280	N292A			RIGID	None	None	RIGID	DR1
122	M149	N285	N297			RIGID	None	None	RIGID	DR1
123	M144A	N282	N294			RIGID	None	None	RIGID	DR1
124	M145A	N281	N293A			RIGID	None	None	RIGID	DR1
125	M146A	N284	N296			RIGID	None	None	RIGID	DR1
126	M147A	N283	N295			RIGID	None	None	RIGID	DR1
127	M148A	N304	N298A			RIGID	None	None	RIGID	DR1
128	M149A	N305	N299A			RIGID	None	None	RIGID	DR1
129	M150	N306	N300A			RIGID	None	None	RIGID	DR1
130	M151	N307	N301			RIGID	None	None	RIGID	DR1
131	M152	N308	N302			RIGID	None	None	RIGID	DR1
132	M153	N309	N303			RIGID	None	None	RIGID	DR1
133	M154	N309	N304			PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
134	M155	N305	N306			PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
135	M156	N307	N308			PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N15	max	3.977	18	.453	24	2.636	12	.439	6	1.272	23	.626	6
2		min	-4.145	12	-.518	6	-2.558	18	-.364	24	-1.277	5	-.585	24
3	N19	max	3.993	4	.441	16	2.702	4	.235	11	1.654	22	.647	16
4		min	-3.835	22	-.507	10	-2.624	22	-.24	5	-1.674	4	-.738	10
5	N23	max	.621	5	.428	20	4.412	14	.652	20	2.201	22	.275	11
6		min	-.619	23	-.496	2	-4.58	8	-.73	2	-2.21	4	-.232	17
7	N286	max	.083	17	3.52	26	-.163	20	0	1	0	22	0	4

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
8		min	-.082	23	.062	20	-3.385	26	0	1	0	4	0	22
9	N289A	max	-.085	24	3.533	30	1.703	29	0	4	0	22	0	22
10		min	-2.939	30	-.029	24	.007	23	0	22	0	4	0	4
11	N292	max	2.935	34	3.528	34	1.696	34	0	23	0	23	0	23
12		min	.116	16	.006	16	.061	16	0	5	0	5	0	5
13	N298	max	.908	17	.063	26	1.05	2	0	24	0	1	0	23
14		min	-.922	11	.008	69	-1.019	20	0	30	0	1	0	5
15	N299	max	1.242	5	.063	30	.735	2	0	3	0	1	0	10
16		min	-1.197	23	.008	73	-.733	20	0	22	0	1	0	16
17	N300	max	.914	17	.063	34	1.052	14	0	2	0	1	0	25
18		min	-.929	11	.008	65	-1.088	8	0	20	0	1	0	7
19	Totals:	max	9.35	17	9.921	35	8.948	2						
20		min	-9.35	11	2.585	66	-8.948	8						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear...	Loc[ft]	Dir	LC	phi*Pnc...	phi*Pnt ...	phi*Mn ...	phi*Mn ...	Cb	Eqn
1	M117	PIPE_2.0	.533	8.687	12	.463	12.0...		5	6.349	32.13	1.872	1.872	1...	H1-1b
2	M118	PIPE_2.0	.517	9.206	11	.392	11.0...		10	6.349	32.13	1.872	1.872	1...	H3-6
3	M116	PIPE_2.0	.508	8.817	14	.455	11.0...		2	19.36	32.13	1.872	1.872	1	H1-1b
4	M78C	1/2"x9"	.442	.398	29	.180	.398	y	5	110.855	145.8	1.519	27.338	1...	H1-1b
5	M80C	1/2"x9"	.438	.398	33	.177	.796	y	13	110.855	145.8	1.519	27.338	1...	H1-1b
6	M79A	1/2"x9"	.438	.398	37	.174	.796	y	5	110.855	145.8	1.519	27.338	1...	H1-1b
7	M58A	PIPE_2.0	.399	1.5	3	.190	1.5		3	14.916	32.13	1.872	1.872	2...	H1-1b
8	M83	PIPE_2.0	.387	1.5	6	.181	5.083		6	14.916	32.13	1.872	1.872	2...	H1-1b
9	M73A	PIPE_2.0	.381	1.5	9	.178	1.5		9	14.916	32.13	1.872	1.872	1...	H1-1b
10	M93A	PIPE_2.0	.368	1.5	12	.115	1.5		12	14.916	32.13	1.872	1.872	2...	H1-1b
11	M98B	PIPE_2.0	.368	1.5	12	.173	1.5		12	14.916	32.13	1.872	1.872	2...	H1-1b
12	M53	PIPE_2.0	.358	1.5	4	.169	1.5		4	14.916	32.13	1.872	1.872	2...	H1-1b
13	M68	PIPE_2.0	.350	1.5	8	.116	1.5		9	14.916	32.13	1.872	1.872	1...	H1-1b
14	M22	PIPE_2.0	.324	1.5	36	.141	1.5		11	14.916	32.13	1.872	1.872	2...	H1-1b
15	M78	PIPE_2.0	.321	1.5	31	.173	1.5		6	14.916	32.13	1.872	1.872	1...	H1-1b
16	M33	PIPE_2.0	.321	1.5	11	.154	1.5		11	14.916	32.13	1.872	1.872	2...	H1-1b
17	M43	PIPE_2.0	.314	1.5	4	.102	1.5		5	14.916	32.13	1.872	1.872	2...	H1-1b
18	M88	PIPE_2.0	.312	5.083	11	.148	1.5		12	14.916	32.13	1.872	1.872	2...	H1-1b
19	M48	PIPE_2.0	.304	1.5	5	.148	1.5		5	14.916	32.13	1.872	1.872	2...	H1-1b
20	M63	PIPE_2.0	.276	5.083	6	.153	1.5		9	14.916	32.13	1.872	1.872	2...	H1-1b
21	M98A	L6x3.5x5	.276	5.835	33	.474	11.7...	z	5	17.215	93.636	3.395	9.224	1...	H2-1
22	M99	L6x3.5x5	.274	5.835	37	.420	11.7...	z	10	17.215	93.636	3.395	9.218	1...	H2-1
23	M38	PIPE_2.0	.266	5.083	2	.113	1.5		5	14.916	32.13	1.872	1.872	2...	H1-1b
24	M98	L6x3.5x5	.240	9.206	35	.468	11.7...	z	2	49.327	93.636	3.395	10.987	1	H2-1
25	M140	LL2.5x2.5x...	.234	3.536	5	.012	7.071	y	5	30.63	58.32	3.954	2.55	1...	H1-1b
26	M141	LL2.5x2.5x...	.230	3.536	11	.011	7.071	y	11	30.63	58.32	3.954	2.55	1...	H1-1b
27	M58	HSS4x4x4	.165	0	16	.087	5.029	z	33	117.309	139.518	16.181	16.181	2...	H1-1b
28	M60	HSS4x4x4	.163	0	4	.087	5.029	z	36	117.309	139.518	16.181	16.181	2...	H1-1b
29	M139	LL2.5x2.5x...	.159	7.071	26	.007	7.071	y	2	30.63	58.32	3.954	2.55	1	H1-1b*
30	M56	HSS4x4x4	.146	4.961	5	.086	5.029	z	29	117.309	139.518	16.181	16.181	1...	H1-1b
31	M92	1/2"x3"	.115	0	9	.006	0	y	35	44.374	48.6	.506	3.038	1...	H1-1b
32	M145	L2.5x2.5x3	.105	1.844	7	.011	0	z	2	18.554	29.192	.873	1.782	1...	H2-1
33	M93	1/2"x3"	.102	0	4	.006	0	y	28	44.374	48.6	.506	3.038	1...	H1-1b
34	M142	L2.5x2.5x3	.100	1.843	9	.009	3.687	y	2	18.557	29.192	.873	1.782	1...	H2-1
35	M147	L2.5x2.5x3	.100	1.882	11	.010	0	z	6	18.554	29.192	.873	1.782	1...	H2-1
36	M95	1/2"x3"	.096	0	4	.005	0	y	36	44.372	48.6	.506	3.038	1...	H1-1b
37	M146	L2.5x2.5x3	.096	1.882	5	.008	3.687	y	10	18.557	29.192	.873	1.782	1...	H2-1
38	M91	1/2"x3"	.093	0	7	.005	0	y	29	44.372	48.6	.506	3.038	1...	H1-1b
39	M144	L2.5x2.5x3	.087	1.843	13	.008	3.687	y	6	18.557	29.192	.873	1.782	1...	H2-1

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear...	Loc[ft]	Dir	LC	phi*Pnc...	phi*Pnt ...	phi*Mn ...	phi*Mn ...	Cb	Eqn
40	M96	1/2"x3"	.085	.5	5	.006	0	y	32	44.374	48.6	.506	3.038	1...	H1-1b
41	M156	PIPE_2.0	.080	.914	11	.275	1.626		11	31.128	32.13	1.872	1.872	1...	H3-6
42	M143	L2.5x2.5x3	.078	1.844	3	.009	0	z	10	18.554	29.192	.873	1.782	1...	H2-1
43	M92A	1/2"x3"	.074	.5	5	.005	0	y	33	44.372	48.6	.506	3.038	1...	H1-1b
44	M155	PIPE_2.0	.068	.999	7	.255	1.626		8	31.128	32.13	1.872	1.872	1...	H3-6
45	M59	L5x3.5x4	.066	0	10	.007	0	z	35	41.093	67.068	2.629	7.226	1...	H2-1
46	M94	L5x3.5x4	.062	0	6	.007	0	z	32	41.093	67.068	2.629	7.249	1...	H2-1
47	M91A	L5x3.5x4	.056	0	2	.007	0	z	27	41.093	67.068	2.629	7.465	1...	H2-1
48	M154	PIPE_2.0	.049	.948	4	.216	1.626		4	31.128	32.13	1.872	1.872	1...	H3-6

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SITE NAME:	DEEP RIVER WINTHROP RD
SITE NUMBER:	CT33XC544
AUGMENT ID:	CT33XC544Q17.2
SITE ADDRESS:	220 WINTHROP ROAD DEEP RIVER, CT 06417
JURISDICTION:	TOWN OF DEEP RIVER
SITE TYPE:	EXISTING 180' MONOPOLE
PROGRAM:	DO MACRO UPGRADE EQUIPMENT DEPLOYMENT

PROJECT INFORMATION

SITE INFORMATION

LATTITUDE: (PER SBA RECORD)	41° 21' 57.14" N (41.36587°)
LONGITUDE: (PER SBA RECORD)	72° 28' 29.46" W (-72.47485°)
GROUND ELEVATION:	250'± AMSL (PER GOOGLE EARTH)
STRUCTURE HEIGHT:	180'± AGL (FROM RECORD STRUCTURAL)
STRUCTURE TYPE:	MONOPOLE
ZONING JURISDICTION	TOWN OF DEEP RIVER/CT SITING COUNCIL
ZONING DISTRICT/ OCCUPANCY:	R-80 (VERY LOW DENSITY RESIDENTIAL)
COUNTY:	MIDDLESEX

APPLICANT

SPRINT
1 INTERNATIONAL BLVD. SUITE 800
MAHWAH, NJ 07495

PROPERTY OWNER:

N/F THE TOWN OF DEEP RIVER
174 MAIN STREET
DEEP RIVER, CT 06417

TOWER OWNER:

SBA 2012 TC ASSETS, LLC
8051 CONGRESS AVENUE
BOCA RATON, FL 33487
(561) 995-7670

SBA SITE ID:	CT46130-A
SBA SITE NAME:	DEEP RIVER-WINTHROP RD

SBA CONTACT:

STEPHEN ROTH
(860) 539-4920
SRoth@sbasite.com

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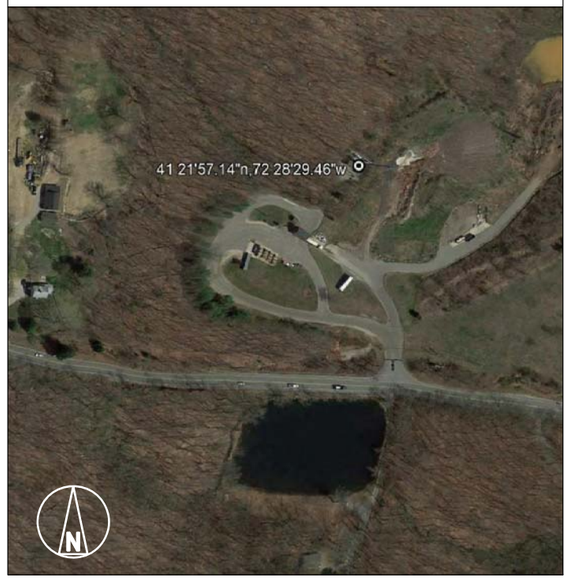
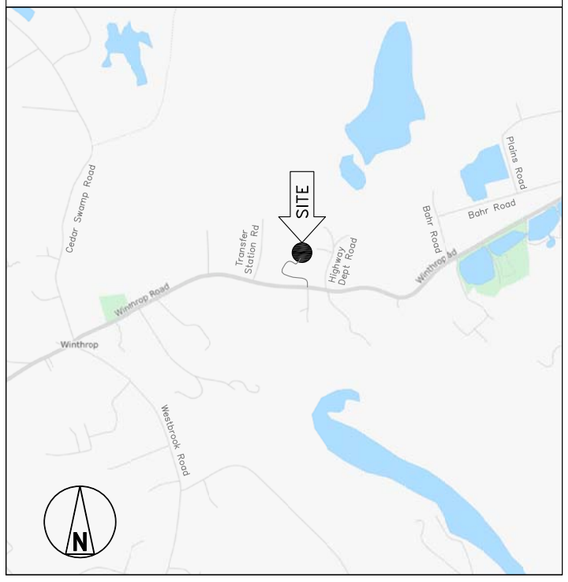
LOCATION MAP N.T.S.



AREA MAP N.T.S.



SCOPE OF WORK

1. REMOVE (6) EXISTING SPRINT ANTENNAS.
2. INSTALL (3) DUAL BAND ANTENNAS.
3. INSTALL (3) 2.5GHz ANTENNAS.
4. INSTALL (6) NEW SPRINT 800 MHz RRHS.
5. RELOCATE (3) EXISTING SPRINT 1900 MHz RRHS FROM GROUND LEVEL TO THE ANTENNA LEVEL.
6. INSTALL (3) NEW SPRINT 2500 MHz RRHS.

GENERAL NOTES

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION:
   - ADA COMPLIANCE NOT REQUIRED.
   - POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
   - NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.

DRAWING INDEX

SHEET NO.	SHEET DESCRIPTION	REV. NO.
T-1	TITLE SHEET	3
SP-1	OUTLINE SPECIFICATIONS	3
SP-2	OUTLINE SPECIFICATIONS	3
SP-3	OUTLINE SPECIFICATIONS	3
A-1	COMPOUND PLAN	3
A-2	ELEVATION AND ANTENNA PLANS	3
A-3	TOWER EQUIPMENT DETAILS	3
A-4	EQUIPMENT DETAILS	3
S-1	ANTENNA AND RRH MOUNTING DETAILS	3
E-1	ELECTRICAL AND GROUNDING DETAILS	3
RF-1	RF DATA SHEET	3
RF-2	PLUMBING DIAGRAM AND RAN WIRING	3

CODE COMPLIANCE

1. 2016 CONNECTICUT STATE BUILDING CODE WITH AMENDMENTS.
2. 2014 NATIONAL ELECTRICAL CODE WITH AMENDMENTS
3. TIA-EIA-222-G

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

APPROVALS

TITLE	SIGNATURE	DATE
PROJECT MANAGER:		
CONSTRUCTION:		
RF ENGINEER:		
ZONING/SITE ACQ:		
OPERATIONS:		
TOWER OWNER:		

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR MODIFICATIONS.

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

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

ProTerra DESIGN GROUP, LLC
4 Bay Road, Building A
Suite 200
Hadley, MA 01035 Ph: (413)320-4918

STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: 4/20/18 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	04/20/18	CONSTRUCTION REVISED	PN
2	04/04/18	CONSTRUCTION REVISED	JEB
1	02/06/18	ISSUED FOR CONSTRUCTION	JEB/PN
0	11/01/17	ISSUED FOR REVIEW	JEB/PN

SITE NUMBER:
CT33XC544
SITE NAME:
DEEP RIVER WINTHROP RD
SITE ADDRESS:
220 WINTHROP ROAD
DEEP RIVER, CT 06417

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

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

SECTION 01 100 - SCOPE OF WORK

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

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

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

A. THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:

1. GR–78–CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
2. GR–1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY –GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
3. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC") AND NFPA 101 (LIFE SAFETY CODE).
4. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
5. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
6. AMERICAN CONCRETE INSTITUTE (ACI)
7. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
8. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
9. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
10. PORTLAND CEMENT ASSOCIATION (PCA)
11. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
12. BRICK INDUSTRY ASSOCIATION (BIA)
13. AMERICAN WELDING SOCIETY (AWS)
14. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
15. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
16. DOOR AND HARDWARE INSTITUTE (DHI)
17. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
18. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

1.5 DEFINITIONS:

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

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

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

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

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

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

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

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

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

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

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

A. TOP HAT
B. HOW TO INSTALL A NEW CABINET
C. BASE BAND UNIT IN EXISTING UNIT
D. INSTALLATION OF BATTERIES
E. INSTALLATION OF HYBRID CABLE
F. INSTALLATION OF RRH'S
G. CABLING
H. TS–0200 REV 4 – ANTENNA LINE ACCEPTANCE STANDARDS
I. SPRINT CELL SITE ENGINEERING NOTICE – EN 2012–001, REV 1.
J. COMMISSIONING MOPS
K. SPRINT CELL SITE ENGINEERING NOTICE – EN–2013–002
L. SPRINT ENGINEERING LETTER – EL–0504
M. SPRINT ENGINEERING LETTER – EL–0568
N. SPRINT TECHNICAL SPECIFICATION – TS–0193

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

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

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

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

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

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

SECTION 01 200 - COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

A. COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.

B. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:

1. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
4. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY–FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
6. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF–LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

3.2 DELIVERABLES:

A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.

B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.

C. UPLOAD DOCUMENTATION INTO SPRINT SITE MANAGEMENT SYSTEM (SMS) AND/OR PROVIDE HARD COPY DOCUMENTATION AS REQUESTED.

SECTION 01 300 - CELL SITE CONSTRUCTION

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 NOTICE TO PROCEED:

A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF THE WORK ORDER.

B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. THE ACTIVITIES DESCRIBED ARE NOT EXHAUSTIVE, AND CONTRACTOR SHALL TAKE ANY AND ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.

B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
2. PREPARE GROUND SITES; PROVIDE DE–GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND TELCO BACKHAUL.
4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
5. INSTALL ABOVE GROUND GROUNDING SYSTEMS.
6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
7. INSTALL "H–FRAMES", CABINETS AND SHELTERS AS INDICATED.
8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER
15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
18. PERFORM, DOCUMENT, AND CLOSE OUT ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
19. PERFORM ANTENNAL AND COAX SWEEP TESTING AND MAKE ANY AND ALL NECESSARY CORRECTIONS.
20. REMAIN ON SITE MOBILIZED THROUGHOUT HAND–OFF AND INTEGRATION TO ASSIST AS NEEDED UNTIL SITE IS DEEMED SUBSTANTIALLY COMPLETE AND PLACED "ON AIR."

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.

1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

A. CONTRACTOR SHALL REVIEW, APPROVE, AND SUBMIT TO SPRINT SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND SIMILAR SUBMITTALS AS REQUIRED HEREINAFTER

B. PROVIDE DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.

1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
2. PROJECT PROGRESS REPORTS.
3. CIVIL CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
4. ELECTRICAL SERVICE COMPLETION DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
5. LINES AND ANTENNA INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
6. POWER INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
7. TELCO READY DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
8. PPC (OR SHELTER) INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
9. TOWER CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
10. TOWER CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
11. BTS AND RADIO EQUIPMENT DELIVERED AT SITE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
12. NETWORK OPERATIONS HANDOFF CHECKLIST (HOC WALK) COMPLETE (UPLOAD FORM IN SMS)
13. CIVIL CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
14. SITE CONSTRUCTION PROGRESS PHOTOS UNLOADED INTO SMS.

CONTINUE SHEET SP-2

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STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY: 4/25/18 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	04/20/18	CONSTRUCTION REVISED	PN
2	04/04/18	CONSTRUCTION REVISED	JEB
1	02/06/18	ISSUED FOR CONSTRUCTION	JEB, PN
0	11/01/17	ISSUED FOR REVIEW	JEB, PN

SITE NUMBER:
CT33XC544
SITE NAME:
DEEP RIVER WINTHROP RD
SITE ADDRESS:
220 WINTHROP ROAD
DEEP RIVER, CT 06417

SHEET TITLE
OUTLINE SPECIFICATIONS

SHEET NUMBER
SP–1

CONTINUED FROM SP-1:

SECTION 01 400 - SUBMITTALS, TESTS, AND INSPECTIONS

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 SUBMITTALS:

A. THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS.

B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.
1. CONCRETE MIX–DESIGNS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.
2. CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
3. SPECIAL FINISHES FOR INTERIOR SPACES, IF ANY.
4. ALL EQUIPMENT AND MATERIALS SO IDENTIFIED ON THE CONSTRUCTION DRAWINGS.
5. CHEMICAL GROUNDING DESIGN.

C. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

1.4 TESTS AND INSPECTIONS:

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.

B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. COAX SWEEPS AND FIBER TESTS PER SPRINT TS–0200 CURRENT VERSION ANTENNA LINE ACCEPTANCE STANDARDS.
2. AGL, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE–FOR–THE–PURPOSE ANTENNA ALIGNMENT TOOL.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING;
1. AZIMUTH, DOWNTILT, AGL – UPLOAD REPORT FROM ANTENNA ALIGNMENT TOOL TO SITERRA TASK 465. INSTALLED AZIMUTH, DOWNTILT, AND AGL MUST CONFORM TO THE RF DATA SHEETS. SWEEP AND FIBER TESTS
2. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
3. ALL AVAILABLE JURISDICTIONAL INFORMATION
4. PDF SCAN OF REDLINES PRODUCED IN FIELD
5. ELECTRONIC AS–BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS. ANY FIELD CHANGE MUST BE REFLECTED BY MODIFYING THE PLANS, ELEVATIONS, AND DETAILS IN THE DRAWING SETS. GENERAL NOTES INDICATING MODIFICATIONS WILL NOT BE ACCEPTED. CHANGES SHALL BE HIGHLIGHTED AS "CLOUDS" IDENTIFIED AS THE "AS–BUILT" CONDITION.
6. LIEN WAIVERS
7. FINAL PAYMENT APPLICATION
8. REQUIRED FINAL CONSTRUCTION PHOTOS
9. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
10. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD).

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

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

3.2 REQUIRED TESTS:

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

3.3 REQUIRED INSPECTIONS:

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

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

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

F. CONSTRUCTION INSPECTIONS AND CORRECTIVE MEASURES SHALL BE DOCUMENTED BY THE CONTRACTOR WITH WRITTEN REPORTS AND PHOTOGRAPHS. PHOTOGRAPHS MUST BE DIGITAL AND OF SUFFICIENT QUALITY TO CLEARLY SHOW THE SITE CONSTRUCTION. PHOTOGRAPHS MUST CLEARLY IDENTIFY THE PHOTOGRAPHED ITEM AND BE LABELED WITH THE SITE CASCADE NUMBER, SITE NAME, DESCRIPTION, AND DATE.

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

A. THE FOLLOWING TEST AND INSPECTION REPORTS SHALL BE PROVIDED AS APPLICABLE.
1. CONCRETE MIX AND CYLINDER BREAK REPORTS.
2. STRUCTURAL BACKFILL COMPACTION REPORTS.
3. SITE RESISTANCE TO EARTH TEST.
4. ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
5. TOWER ERECTION INSPECTIONS AND MEASUREMENTS DOCUMENTING TOWER INSTALLED PER SUPPLIER'S REQUIREMENTS AND THE APPLICABLE SECTIONS HEREIN.
6. COAX CABLE SWEEP TESTS PER COMPANY'S "ANTENNA LINE ACCEPTANCE STANDARDS".

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

SECTION 01 500 - PROJECT REPORTING

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 WEEKLY REPORTS:

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

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

3.2 PROJECT CONFERENCE CALLS:

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

3.3 PROJECT TRACKING IN SMS:

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

3.4 ADDITIONAL REPORTING:

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

3.5 PROJECT PHOTOGRAPHS:

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

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

SECTION 07 500 - ROOF CUTTING, PATCHING AND REPAIR

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

1.4 SUBMITTALS:

A. PRE–CONSTRUCTION ROOF PHOTOS: COMPLETE A ROOF INSPECTION PRIOR TO THE INSTALLATION OF SPRINT EQUIPMENT ON ANY ROOFTOP BUILD. AT A MINIMUM INSPECT AND PHOTOGRAPH (MINIMUM 3 EA.) ALL AREAS IMPACTED BY THE ADDITION OF THE SPRINT EQUIPMENT.

B. PROVIDE SIMILAR PHOTOGRAPHS SHOWING ROOF CONDITIONS AFTER CONSTRUCTION (MINIMUM 3 EA.)

C. ROOF INSPECTION PHOTOGRAPHS SHOULD BE UPLOADED WITH CLOSEOUT PHOTOGRAPHS.

SECTION 09 900 - PAINTING

QUALITY ASSURANCE:

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

B. COMPLY WITH ALL ENVIRONMENTAL REGULATIONS FOR VOLATILE ORGANIC COMPOUNDS.

CONTINUE SHEET SP-3

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STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY: 4/25/18 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	04/20/18	CONSTRUCTION REVISED	PN
2	04/04/18	CONSTRUCTION REVISED	JEB
1	02/06/18	ISSUED FOR CONSTRUCTION	JEB PN
0	11/01/17	ISSUED FOR REVIEW	JEB PN

SITE NUMBER:
CT33XC544
SITE NAME:
DEEP RIVER WINTHROP RD
SITE ADDRESS:
220 WINTHROP ROAD
DEEP RIVER, CT 06417

SHEET TITLE
OUTLINE SPECIFICATIONS

SHEET NUMBER
SP–2

CONTINUED FROM SP-2:

MATERIALS:

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

PAINT SCHEDULE:

A. EXTERIOR ANTENNAE AND ANTENNA MOUNTING HARDWARE: ONE COAT OF PRIMER AND TWO FINISH COATS. PAINT FOR ANTENNAE SHALL BE NON-METALLIC BASED AND CONTAIN NO METALLIC PARTICLES. PROVIDE COLORS AND PATTERNS AS REQUIRED TO MASK APPEARANCE OF ANTENNAE ON ADJACENT BUILDING SURFACES AND AS ACCEPTABLE TO THE OWNER. REFER TO ANTENNA MANUFACTURER'S INSTRUCTIONS WHENEVER POSSIBLE.

B. ROOF TOP CONSTRUCTION: TOUCH UP – PREPARE SURFACES TO BE REPAIRED. FOLLOW INDUSTRY STANDARDS AND REQUIREMENTS OF OWNER TO MATCH EXISTING COATING AND FINISH.

PAINTING APPLICATION:

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

TOUCHUP PAINTING:

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

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

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

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

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

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

REMOTE ELECTRICAL TILT (RET) CABLES:

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

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

A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.

B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

HYBRID CABLES INSTALLATION:

A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.

C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.

1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS.
2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBTS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
   a. FIBER: SUPPORT FIBER BUNDLES USING ½" VELCRO STRAPS OF THE REQUIRED LENGTH @ 18" OC. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.
   b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.
3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
4. CABLE INSTALLATION:
   a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER.
   b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.
   c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURES RECOMMENDED MAXIMUM BEND RADIUS.
5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED PER SPRINT TS 0200 CURRENT VERSION.
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE-EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.

B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.

1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.
3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

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

SUMMARY:

A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

DC CIRCUIT BREAKER LABELING

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

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

SUMMARY:

A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
   1. ALLIED TUBE AND CONDUIT
   2. B-LINE SYSTEM
   3. UNISTRUT DIVERSIFIED PRODUCTS
   4. THOMAS & BETTS

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

SUPPORTING DEVICES:

A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.

B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.

C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:

D. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.

E. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.

B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

CONDUIT:

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR ENCASED RUNS IN CONCRETE. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED – SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.

B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.

C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.

D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.

E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRE BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.

F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.

B. CABLE TERMINATION FITTINGS FOR CONDUIT
   1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL.
   2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO – CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.

C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.

D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKETED COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.

E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM

A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM AS INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS AS INDICATED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO OX.

C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

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

CONDUIT AND CONDUCTOR INSTALLATION:

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

B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.

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STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: 4/20/18 JMM/TEJ

APPROVED BY: JMM/TEJ

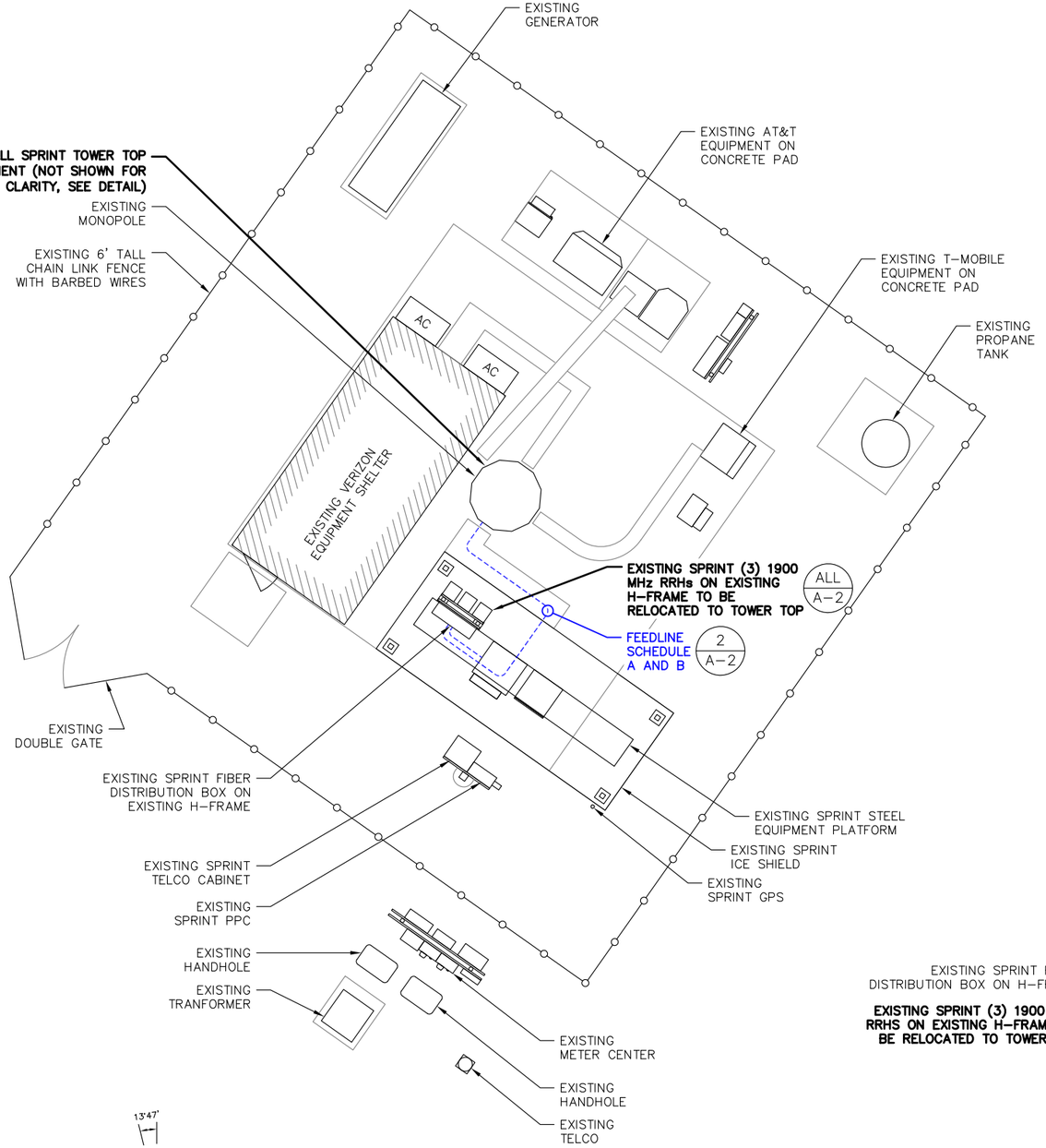
SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	04/20/18	CONSTRUCTION REVISED	PN
2	04/04/18	CONSTRUCTION REVISED	JEB
1	02/06/18	ISSUED FOR CONSTRUCTION	JEB/PN
0	11/01/17	ISSUED FOR REVIEW	JEB/PN

SITE NUMBER:
CT33XC544
SITE NAME:
DEEP RIVER WINTHROP RD
SITE ADDRESS:
220 WINTHROP ROAD
DEEP RIVER, CT 06417

SHEET TITLE
OUTLINE SPECIFICATIONS

SHEET NUMBER
SP-3



COMPOUND PLAN

1
A-1

SCALE: 1"=10' (11"x17")
1"=5' (22"x34")

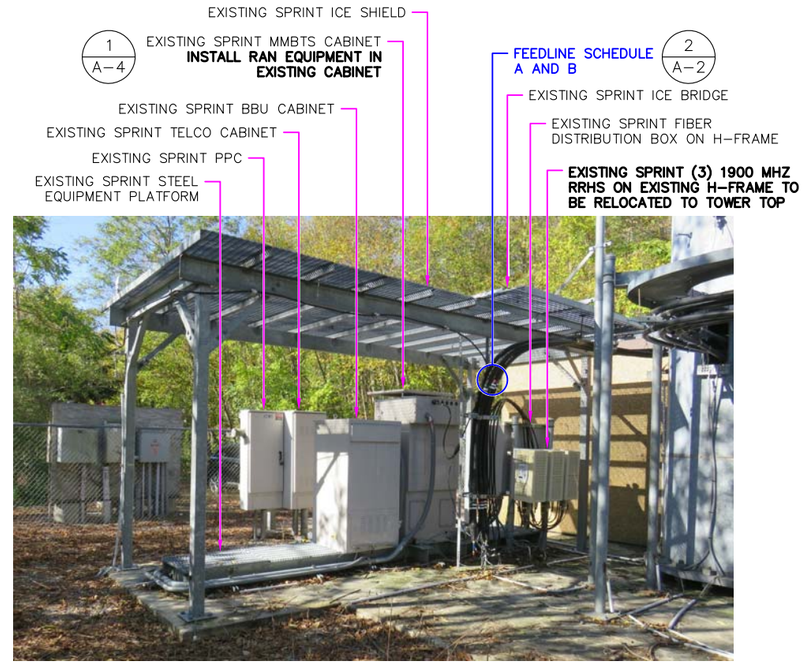


IMAGE SOURCE: PROTERRA 10/21/2017
(VIEW FROM NORTHEAST)

IMAGE SOURCE: PROTERRA 10/21/2017
(VIEW FROM SOUTHWEST)

EQUIPMENT PLAN PHOTO DETAIL

2
A-1

SCALE: N.T.S.

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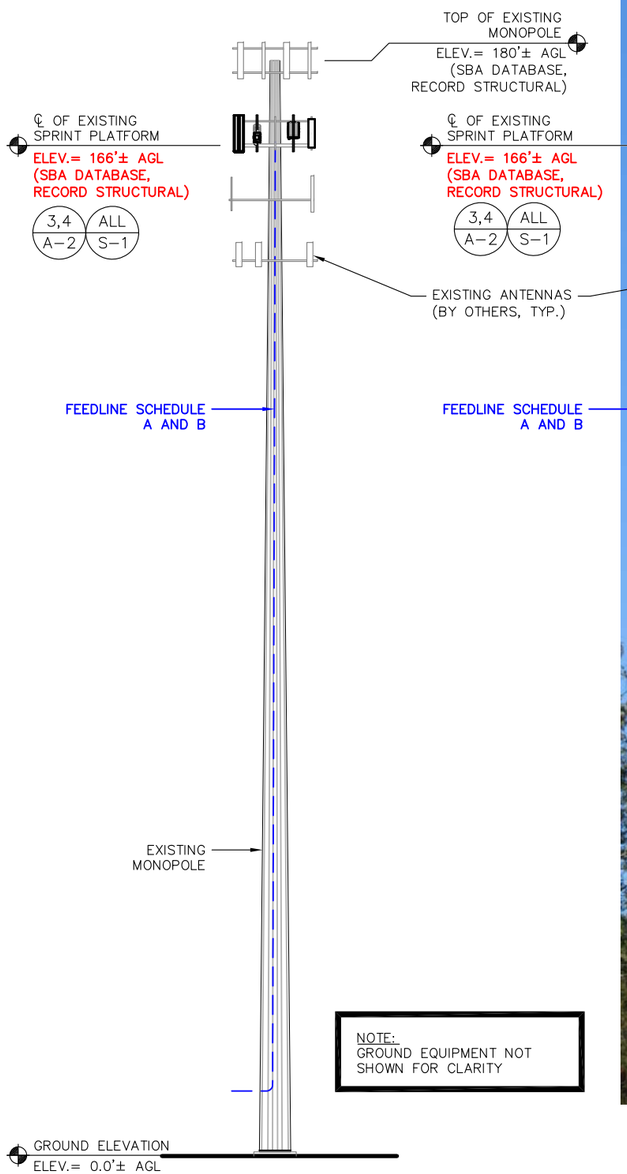
DEEP RIVER WINTHROP RD

SITE ADDRESS:
220 WINTHROP ROAD
DEEP RIVER, CT 06417

SHEET TITLE
COMPOUND PLAN

SHEET NUMBER
A-1



NOTE:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY

ELEVATION

1 / A-2

SCALE: 1"=25' (11"x17")
1"=12.5' (22"x34")

25 12.5 0 25

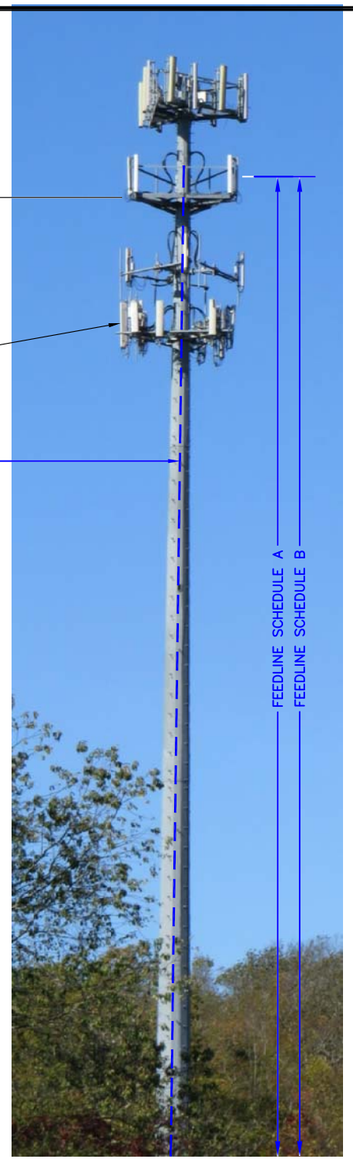


IMAGE SOURCE: PROTERRA 10/21/2017

TOWER ELEVATION PHOTO DETAIL

2 / A-2

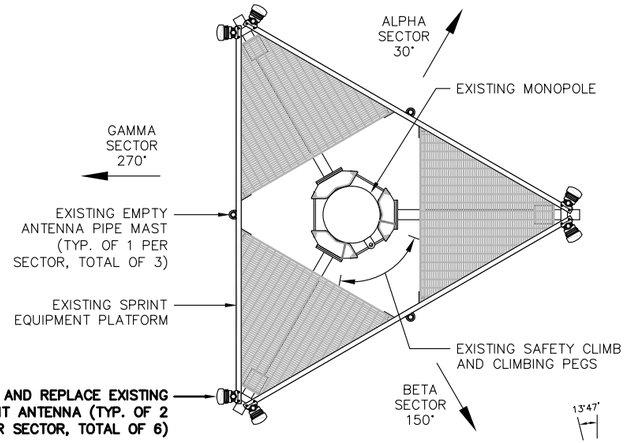
SCALE: N.T.S.

FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION
A	EXISTING TO BE REMOVED: (6) 1⅝" COAX TO 166' RAD	UP INSIDE MONOPOLE TO RAD
B	PROPOSED: (4) HYBRID TO 166' RAD;	UP INSIDE MONOPOLE TO RAD

NOTE:
EXISTING SPRINT EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER

SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.

SPECIAL CONSTRUCTION NOTE (SBA-PROVIDED ANTENNA MOUNT STRUCTURAL MOD SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS (STRUCTURAL MODIFICATIONS) AT THE SPRINT RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS).



EXISTING ANTENNA PLAN

3 / A-2

SCALE: N.T.S.

FEEDLINE SCHEDULE A AND B
(REFER TO SBA PROVIDED STRUCTURAL ANALYSIS FOR SPECIAL CABLE INSTALLATION REQUIREMENTS, BUNDLING, SHIELDING, MOUNTING, AND RELOCATION OF EXISTING CABLES)

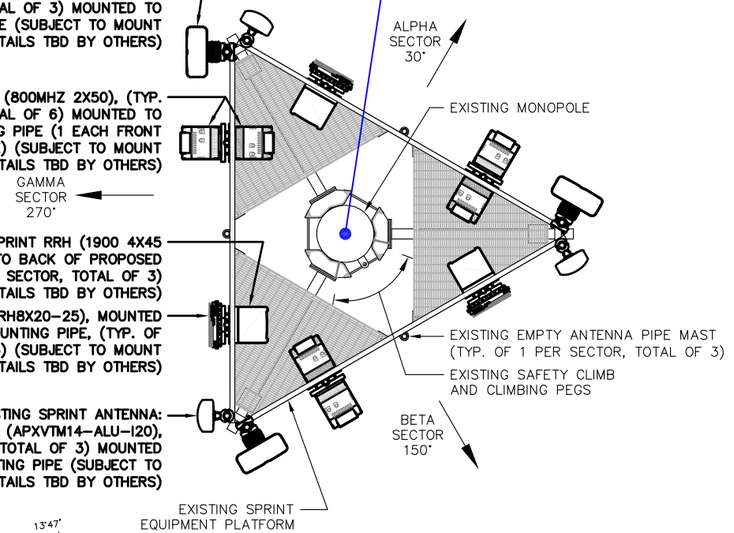
ALL S-1 / 2 A-3 — REMOVE AND REPLACE EXISTING SPRINT ANTENNA: INSTALL SPRINT ANTENNA (NNVV-65BR4), (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED TO PROPOSED MOUNTING PIPE (SUBJECT TO MOUNT AUGMENT DETAILS TBD BY OTHERS)

ALL S-1 / 3 A-3 — INSTALL SPRINT RRH (800MHZ 2X50), (TYP. OF 2 PER SECTOR, TOTAL OF 6) MOUNTED TO PROPOSED MOUNTING PIPE (1 EACH FRONT AND BACK OF PIPE) (SUBJECT TO MOUNT AUGMENT DETAILS TBD BY OTHERS)

ALL S-1 / 4 A-3 — REMOVE AND RELOCATE EXISTING SPRINT RRH (1900 4X45 65MHZ) FROM GROUND LEVEL TO BACK OF PROPOSED MOUNTING PIPE, (TYP. OF 1 PER SECTOR, TOTAL OF 3) (SUBJECT TO MOUNT AUGMENT DETAILS TBD BY OTHERS)

ALL S-1 / 5 A-3 — INSTALL SPRINT RRH (TD-RRH8X20-25), MOUNTED TO FRONT OF PROPOSED MOUNTING PIPE, (TYP. OF 1 PER SECTOR, TOTAL OF 3) (SUBJECT TO MOUNT AUGMENT DETAILS TBD BY OTHERS)

ALL S-1 / 1 A-3 — REMOVE AND REPLACE EXISTING SPRINT ANTENNA: INSTALL SPRINT ANTENNA (APXVTM14-ALU-I20), (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED TO PROPOSED MOUNTING PIPE (SUBJECT TO MOUNT AUGMENT DETAILS TBD BY OTHERS)



PROPOSED ANTENNA PLAN

4 / A-2

SCALE: N.T.S.

SPECIAL INSTALLATION NOTE:
JUMPERS FROM RRHs TO ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY DISCREPANCY

NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION

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

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

ProTerra DESIGN GROUP, LLC
4 Bay Road, Building A
Suite 200
Hadley, MA 01035 Ph: (413)320-4918

STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: 4/25/18 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	04/20/18	CONSTRUCTION REVISED	PN
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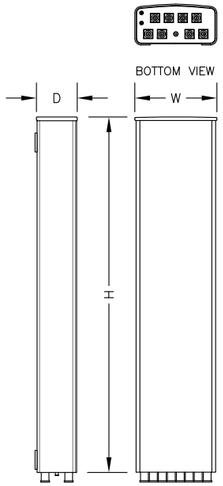
SITE NUMBER:
CT33XC544
SITE NAME:
DEEP RIVER WINTHROP RD
SITE ADDRESS:
220 WINTHROP ROAD
DEEP RIVER, CT 06417

SHEET TITLE
ELEVATION AND ANTENNA PLANS

SHEET NUMBER
A-2

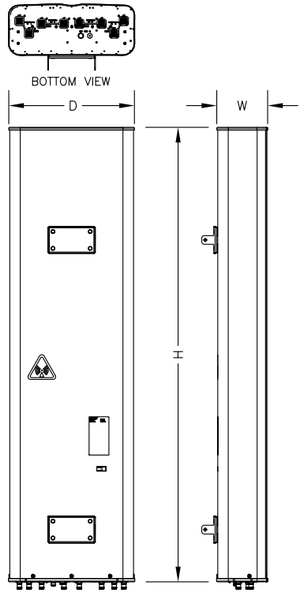


ANTENNA SPECIFICATIONS	
MANUF.	RFS
MODEL #	APXVTM14-ALU-I20
HEIGHT	56.3"
WIDTH	12.6"
DEPTH	6.3"
WEIGHT	56.2± LBS.

2.5 GHz ANTENNA DETAIL

1 / A-3

SCALE: N.T.S.

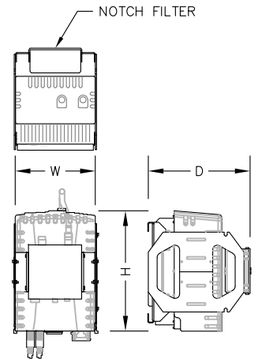


ANTENNA SPECIFICATIONS	
MANUF.	COMMSCOPE
MODEL #	NNVV-65B-R4
HEIGHT	72.0"
WIDTH	19.6"
DEPTH	7.8"
WEIGHT	77.4± LBS.

800 MHZ/1900 MHZ ANTENNA DETAIL

2 / A-3

SCALE: N.T.S.

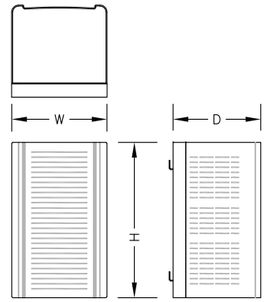


800 MHZ RRH SPECIFICATIONS	
MANUF.	NOKIA (ALU)
MODEL #	800MHZ 2X50W
HEIGHT	16"
WIDTH	13"
DEPTH	13.7" (INCLUDING FILTER)
WEIGHT	69.1± LBS (INCLUDING FILTER)

800 MHz RRH DETAIL

3 / A-3

SCALE: N.T.S.

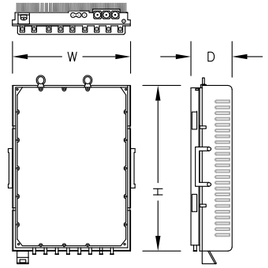


1900 MHZ RRH SPECIFICATIONS	
MANUF.	NOKIA (ALU)
MODEL #	1900 4X45 65MHZ
HEIGHT	25"
WIDTH	11.1"
DEPTH	11.4"
WEIGHT	60± LBS

EXISTING 1900 MHz RRH DETAIL

4 / A-3

SCALE: N.T.S.



2.5 GHZ RRH SPECIFICATIONS	
MANUF.	NOKIA (ALU)
MODEL #	TD-RRH8X20-25
HEIGHT	26.1"
WIDTH	18.6"
DEPTH	6.7"
WEIGHT	70± LBS

2.5 GHz RRH DETAIL

5 / A-3

SCALE: N.T.S.

MAJOR RF EQUIPMENT LIST

(GC SHALL FURNISH AND INSTALL ALL OTHER MATERIALS AND EQUIPMENT NOT SUPPLIED BY SPRINT)

DESCRIPTION	QUANTITY	UNITS	MAKE/MODEL/MATERIAL	PROVIDED BY
ANTENNA	3	EA	RFS APXVTM14-ALU-i20	SPRINT
ANTENNA	3	EA	COMMSCOPE NNVV-65B-R4	SPRINT
2500 RRH	3	EA	NOKIA (ALU) TD-RRH8x20-25	SPRINT
1900 RRH (RELOCATE EXISTING)	3	EA	NOKIA (ALU) 1900 4X45 65MHZ	SPRINT (EXISTING)
800 RRH	6	EA	NOKIA (ALU) 800MHz 2x50W	SPRINT
FIBER	4 @ 250'± FROM FIBER CABINET	LINEAR FEET LISTED [INCLUDES (2) 10' COILS]	1-1/4" HYBRIFLEX	SPRINT

SPRINT-PROVIDED EQUIPMENT SCHEDULE

6 / A-3

SCALE: N.T.S.

Sprint

1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
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SBA

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SITE NUMBER:
CT33XC544
SITE NAME:
DEEP RIVER WINTHROP RD

SITE ADDRESS:
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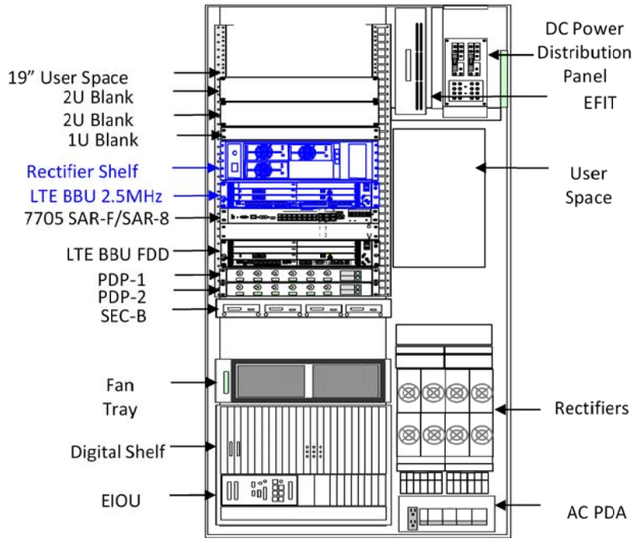
DEEP RIVER, CT 06417

SHEET TITLE
TOWER EQUIPMENT DETAILS

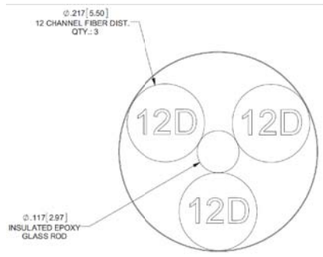
SHEET NUMBER
A-3



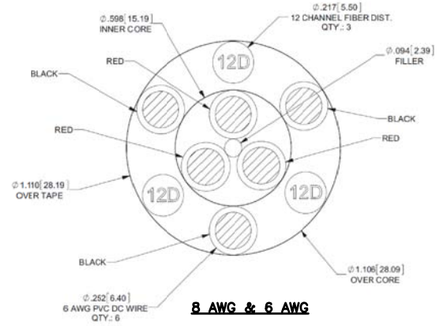
EXISTING MMBTS OUTDOOR CABINET WITH 2.5 EQUIPMENT

SCALE: N.T.S.

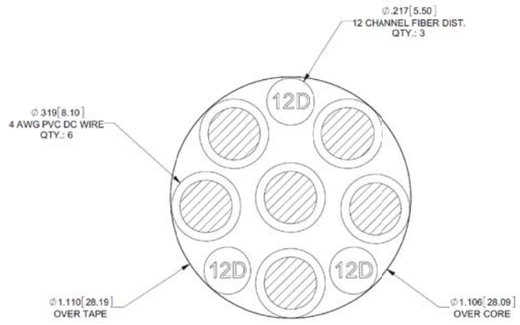
1 / A-4



FIBER ONLY



8 AWG & 6 AWG



4 AWG

HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE

MANUF: RFS

	CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
	FIBER ONLY	VARIES	USE NV HYBRIFLEX	7/8"
	HYBRIFLEX	<200'	8 AWG	1-1/4"
(*)	HYBRIFLEX	225-300'	6 AWG	1-1/4"
	HYBRIFLEX	325-375'	4 AWG	1-1/4"

RFS HYBRIFLEX RISER CABLE SCHEDULE

Fiber Only (Existing DC Power)	Hybrid cable MN: HB058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC Connectors, 5/8 cable, 50 ft	50 ft
	MN: HB058-M12-075F	75 ft
	MN: HB058-M12-100F	100 ft
	MN: HB058-M12-125F	125 ft
	MN: HB058-M12-150F	150 ft
	MN: HB058-M12-175F	175 ft
	MN: HB058-M12-200F	200 ft
8 AWG Power	Hybrid cable MN: HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50 ft	50 ft
	MN: HB114-08U3M12-075F	75 ft
	MN: HB114-08U3M12-100F	100 ft
	MN: HB114-08U3M12-125F	125 ft
	MN: HB114-08U3M12-150F	150 ft
	MN: HB114-08U3M12-175F	175 ft
	MN: HB114-08U3M12-200F	200 ft
6 AWG Power	Hybrid cable MN: HB114-13U3M12-225F 3x 6 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225 ft	225 ft
(*)	MN: HB114-13U3M12-250F	250 ft
	MN: HB114-13U3M12-275F	275 ft
	MN: HB114-13U3M12-300F	300 ft
4 AWG Power	Hybrid cable MN: HB114-21U3M12-325F 3x 4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 325 ft	325 ft
	MN: HB114-21U3M12-350F	350 ft
	MN: HB114-21U3M12-375F	375 ft

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

Fiber Only	Hybrid Jumper cable MN: HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN: HBF012-M3-10F1	10 ft
	MN: HBF012-M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CM OF ANY DISCREPANCY	
8 AWG Power	Hybrid Jumper cable MN: HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-08U1M3-10F1	10 ft
	MN: HBF058-08U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CM OF ANY DISCREPANCY	
6 AWG Power	Hybrid Jumper cable MN: HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-13U1M3-10F1	10 ft
(*)	MN: HBF058-13U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CM OF ANY DISCREPANCY	
4 AWG Power	Hybrid Jumper cable MN: HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 7/8 cable	5 ft
	MN: HBF078-21U1M3-10F1	10 ft
	MN: HBF078-21U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CM OF ANY DISCREPANCY	

2.5 HYBRID CABLE X-SECTION AND DATA

SCALE: N.T.S.

2 / A-4

* NOTE: SPRINT CM TO CONFIRM HYBRID RISER CABLE AND HYBRID JUMPER CABLE MODEL NUMBERS BEFORE PREPARING BOM.

Sprint

1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
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SBA

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SITE NAME:
DEEP RIVER WINTHROP RD

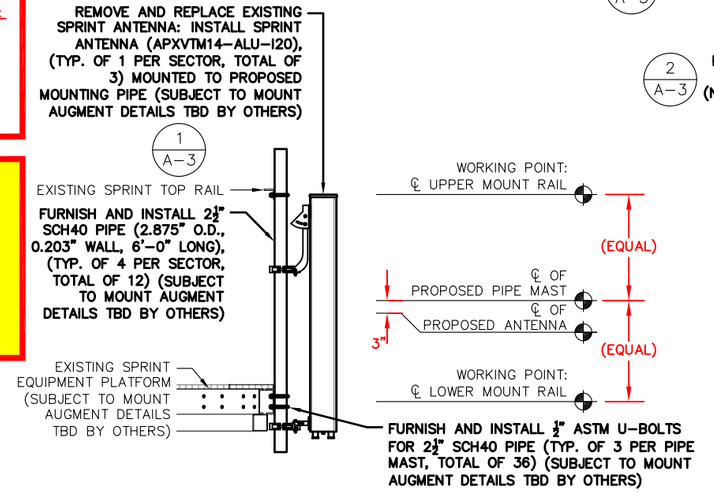
SITE ADDRESS:
220 WINTHROP ROAD
DEEP RIVER, CT 06417

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS): GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.

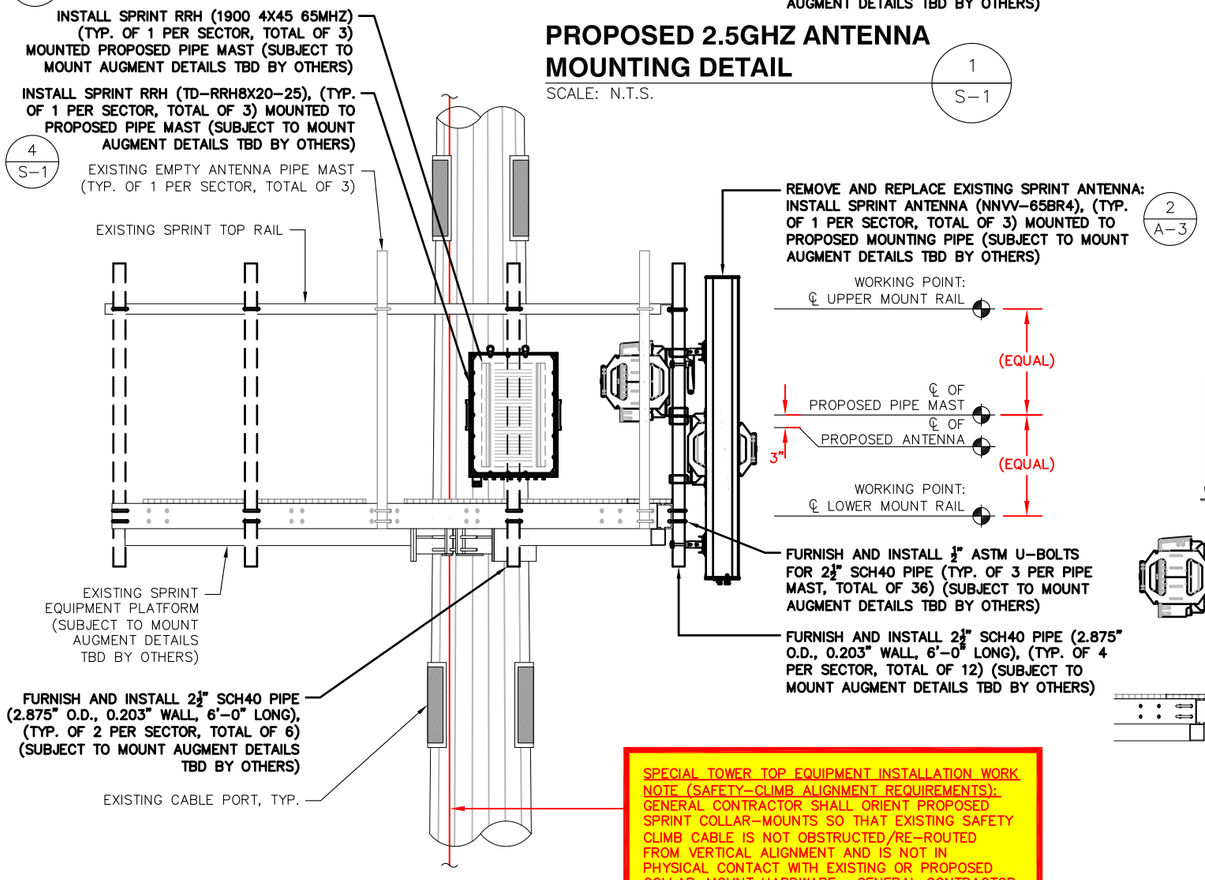
SPECIAL CONSTRUCTION NOTE (SBA-PROVIDED ANTENNA MOUNT STRUCTURAL MOD SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS): GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS (STRUCTURAL MODIFICATIONS) AT THE SPRINT RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS).



PROPOSED 2.5GHZ ANTENNA MOUNTING DETAIL

SCALE: N.T.S.

1 S-1



PROPOSED 800/1900 ANTENNA MOUNTING DETAIL

SCALE: N.T.S.

2 S-1

SPECIAL TOWER TOP EQUIPMENT INSTALLATION WORK NOTE (SAFETY-CLIMB ALIGNMENT REQUIREMENTS): GENERAL CONTRACTOR SHALL ORIENT PROPOSED SPRINT COLLAR-MOUNTS SO THAT EXISTING SAFETY CLIMB CABLE IS NOT OBSTRUCTED/RE-ROUTED FROM VERTICAL ALIGNMENT AND IS NOT IN PHYSICAL CONTACT WITH EXISTING OR PROPOSED COLLAR-MOUNT HARDWARE. GENERAL CONTRACTOR SHALL INSTALL NEW OR ADDITIONAL SAFETY-CLIMB CABLE GUIDES IF ADDITIONAL CLEARANCE IS REQUIRED. ADDITIONAL CABLE GUIDES SHALL BE ATTACHED SECURELY TO THE POLE USING MECHANICAL FASTENERS OR FIELD WELDED BY A CERTIFIED WELDING TECHNICIAN.

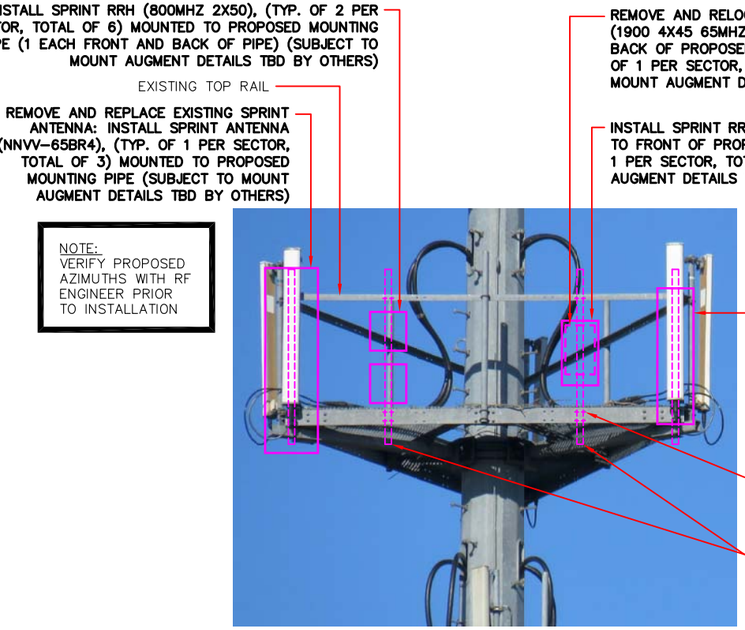
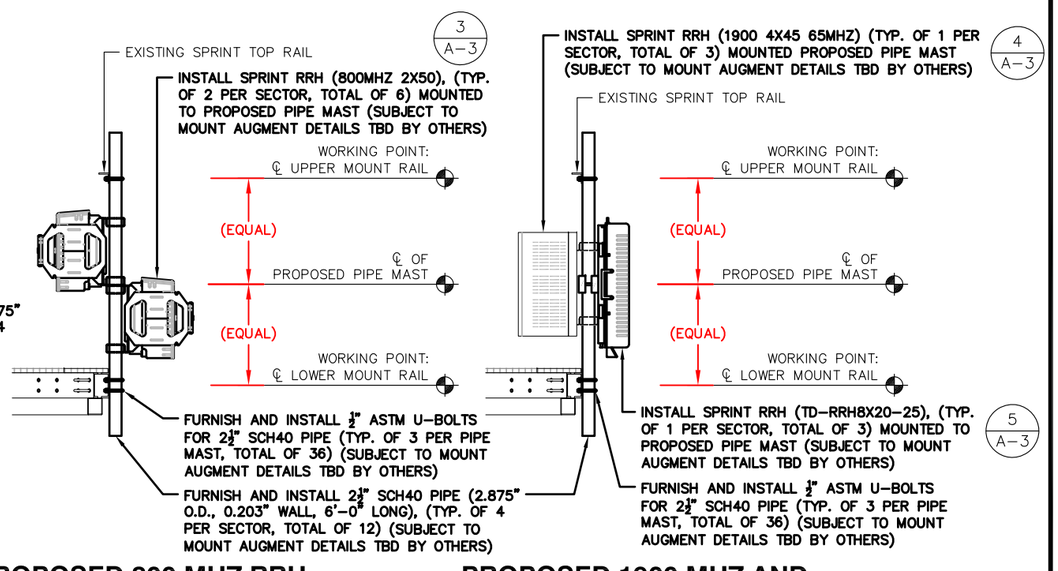


IMAGE SOURCE: PROTERRA 10/21/2017

ANTENNA AND RRH MOUNT PHOTO DETAIL

SCALE: N.T.S.

5 S-1



PROPOSED 800 MHZ RRH MOUNTING ELEVATION

SCALE: N.T.S.

3 S-1

PROPOSED 1900 MHZ AND 2.5GHZ RRH MOUNTING ELEVATION

SCALE: N.T.S.

4 S-1

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
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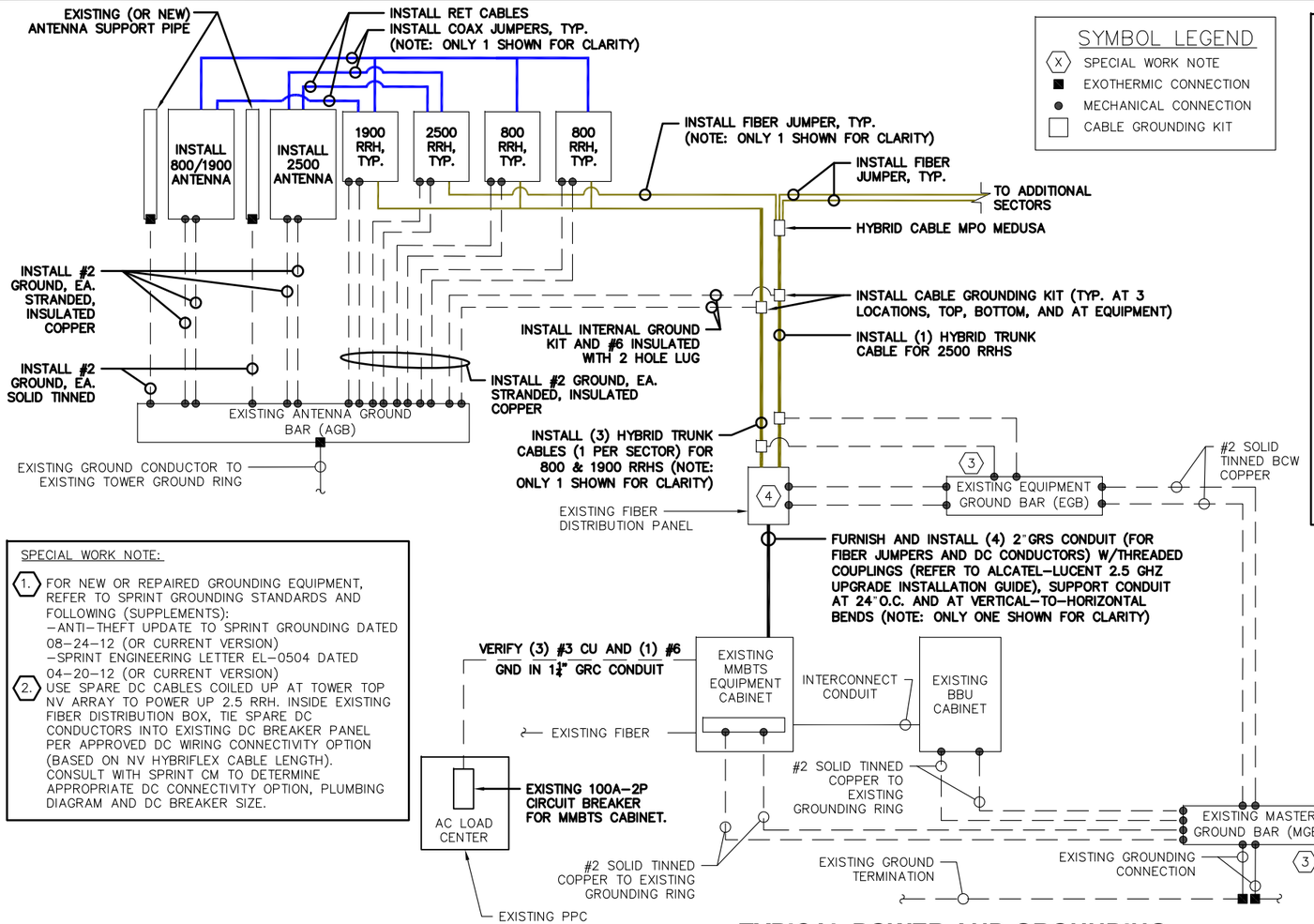
DEEP RIVER, CT 06417

SHEET TITLE
ANTENNA AND RRH MOUNTING DETAILS

SHEET NUMBER
S-1



SYMBOL LEGEND

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

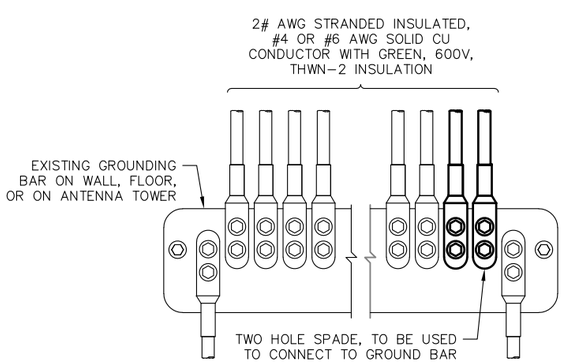
SPECIAL WORK NOTE:

1. FOR NEW OR REPAIRED GROUNDING EQUIPMENT, REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS):
   -ANTI-THEFT UPDATE TO SPRINT GROUNDING DATED 08-24-12 (OR CURRENT VERSION)
   -SPRINT ENGINEERING LETTER EL-0504 DATED 04-20-12 (OR CURRENT VERSION)
2. USE SPARE DC CABLES COILED UP AT TOWER TOP NV ARRAY TO POWER UP 2.5 RRH. INSIDE EXISTING FIBER DISTRIBUTION BOX, TIE SPARE DC CONDUCTORS INTO EXISTING DC BREAKER PANEL PER APPROVED DC WIRING CONNECTIVITY OPTION (BASED ON NV HYBRIFLEX CABLE LENGTH). CONSULT WITH SPRINT CM TO DETERMINE APPROPRIATE DC CONNECTIVITY OPTION, PLUMBING DIAGRAM AND DC BREAKER SIZE.

TYPICAL POWER AND GROUNDING ONE LINE DIAGRAMS

1 / E-1

SCALE: N.T.S.

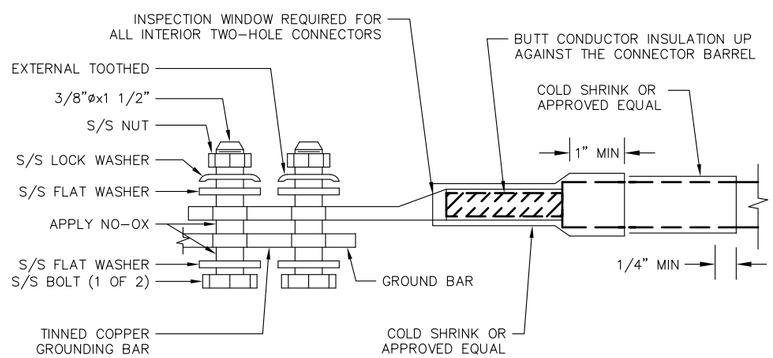


1. APPLY NO-OX TO LUG AND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.
2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR

2 / E-1

SCALE: N.T.S.



TWO HOLE LUG

3 / E-1

SCALE: N.T.S.

ELECTRICAL NOTES

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

PROTECTIVE GROUNDING SYSTEMS GENERAL NOTES:

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

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
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ProTerra
DESIGN GROUP, LLC
4 Bay Road, Building A
Suite 200
Hadley, MA 01035 Ph: (413)320-4918

STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER
FOR PERMITTING ONLY

CHECKED BY: 4/25/18 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	04/20/18	CONSTRUCTION REVISED	PN
2	04/04/18	CONSTRUCTION REVISED	JEB
1	02/06/18	ISSUED FOR CONSTRUCTION	JEB/PN
0	11/01/17	ISSUED FOR REVIEW	JEB/PN

SITE NUMBER:
CT33XC544
SITE NAME:
DEEP RIVER WINTHROP RD

SITE ADDRESS:
220 WINTHROP ROAD
DEEP RIVER, CT 06417

SHEET TITLE
ELECTRICAL AND GROUNDING DETAILS

SHEET NUMBER
E-1

Augment ID: CT33XC544Q17.2
RFDS ID: 45840

SprintVision **RF Design Sheet**

Site Identification	
Cascade	CT33XC544
SMS Schedule ID	1232350
SMS Schedule Name	DO Macro Upgrade
PID	DOM2_CT33XC544
RRU OEM	ALU
Switch OEM	Alcatel Lucent
RFDS Issue Date	
RFDS Revision Date	2017-11-16 12:45:16.0
RFDS Revision	3

Filter Analysis Complete	YES
RFDS - Issue Date	
Design Status	Complete
Project Description	

Contact Information	
Engineer Email	Bill.M.Hastings@Sprint.com
Sprint Badged RF Engineer	Bill Hastings
RF Engineer Email	Bill.M.Hastings@Sprint.com
RF Engineer Phone	978.590.9700
RF Manager	Jonathan Hall
RF Manager Email	Jonathan.E.Hall@Sprint.com
RF Manager Phone	617.233.2920

Carrier Count	
2500 LTE	3
1900 LTE	3
1900 EVDO	
1900 Voice	3
800 LTE	3
800 Voice	3

Location Details	
Latitude	41.36472
Longitude	-72.41472
Market	Northern Connecticut
Region	Northeast
City	Deep River
State	CT
Zip Code	C1006417
County	Middlesex

2500MHz	3
1900MHz	3
800MHz	3

Battery Backup Cabinet Model	
Model Number	
Weight (Lbs.)	
Dimensions (in.)	
Manufacturer	

UE Relay Model	
Model Number	
Weight (Lbs.)	
Dimensions (in.)	
UE Relay Azimuth	
Manufacturer	
UE Relay CL Height (meters)	

GPS Antenna Model	
Model Number	
Weight (Lbs.)	
Dimensions (in.)	
Manufacturer	
GPS Antenna needed at site	

Junction Box Model	
Model Number	
Weight (Lbs.)	
Dimensions (in.)	
Manufacturer	
Junction Boxes needed at site	

ALU Top Hat Model	
Model Number	
Weight (Lbs.)	
Dimensions (in.)	
Manufacturer	
Top Hat Quantity	

Repeater Model	
Model Number	
Weight (Lbs.)	
Dimensions (in.)	
Manufacturer	

BTS #2 Model	
Model Number	
Weight (Lbs.)	
Dimensions (in.)	
Manufacturer	
Needed at site	

Power Protection Cabinet Model	
Model Number	
Weight (Lbs.)	
Dimensions (in.)	
Manufacturer	
Power Protection Cabinet	

Growth Cabinet Model	
Model Number	
Weight (Lbs.)	
Dimensions (in.)	
Manufacturer	

BTS #1 Model	
Model Number	
Weight (Lbs.)	
Dimensions (in.)	
Manufacturer	
Number of BTS #1	

A&E Drawing Requirements
11/10/2017 (WR): CE team to populate 1900 RRHs and RFDS moved to Final RFDS.

Band: 2500	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	APXVTM14-ALU-I20	APXVTM14-ALU-I20	APXVTM14-ALU-I20			
Weight (lbs)	56.2	56.2	56.2	N/A	N/A	N/A
Dimensions	56.3 x 12.6 x 6.3	56.3 x 12.6 x 6.3	56.3 x 12.6 x 6.3	N/A	N/A	N/A
Manufacturer	RFS	RFS	RFS	N/A	N/A	N/A
Ant1 Top Jumper Make/Model/Qty	2.5 Jumper 8	2.5 Jumper 8	2.5 Jumper 8	N/A 0	N/A 0	N/A 0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	30	150	270	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	168	168	168	N/A	N/A	N/A
Antenna 1 Electrical DT	2	2	2	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A

Band: 1900	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	NNVV-65B-R4	NNVV-65B-R4	NNVV-65B-R4			
Weight (lbs)	84.7	84.7	84.7	N/A	N/A	N/A
Dimensions	72 x 19.6 x 7.8	72 x 19.6 x 7.8	72 x 19.6 x 7.8	N/A	N/A	N/A
Manufacturer	CommScope	CommScope	CommScope	N/A	N/A	N/A
Ant1 Top Jumper Make/Model/Qty	800/1900 Jumper 4	800/1900 Jumper 4	800/1900 Jumper 4	N/A 0	N/A 0	N/A 0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	30	150	270	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	168	168	168	N/A	N/A	N/A
Antenna 1 Electrical DT	3	3	3	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A

Band: 800	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	Antenna assigned on a different band	Antenna assigned on a different band	Antenna assigned on a different band			
Weight (lbs)	0	0	0	N/A	N/A	N/A
Dimensions	0 x 0 x 0	0 x 0 x 0	0 x 0 x 0	N/A	N/A	N/A
Manufacturer	-	-	-	N/A	N/A	N/A
Ant1 Top Jumper Make/Model/Qty	800/1900 Jumper 4	800/1900 Jumper 4	800/1900 Jumper 4	N/A 0	N/A 0	N/A 0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	30	150	270	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	168	168	168	N/A	N/A	N/A
Antenna 1 Electrical DT	5	5	5	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A

Band: 2500	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Radio Model						
Model Number	TD-RRH8x20-25	TD-RRH8x20-25	TD-RRH8x20-25	N/A	N/A	N/A
Weight (lbs)	76.2	76.2	76.2	N/A	N/A	N/A
Dimensions	26 x 18.6 x 6.7	26 x 18.6 x 6.7	26 x 18.6 x 6.7	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A
Number of RRUs needed	1	1	1	0	0	0
Trunk Cable 1						
Model Number	Hybriflex	Hybriflex	N/A	N/A	N/A	N/A
Weight (Lbs.)	1	1	N/A	N/A	N/A	N/A
Dimensions (in.)	1.54	1.54	N/A	N/A	N/A	N/A
Manufacturer	ALU	ALU	N/A	N/A	N/A	N/A
Trunk Cable 1 Qty						

Band: 1900	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Radio Model						
Model Number	RRH-4x45-1900	RRH-4x45-1900	RRH-4x45-1900	N/A	N/A	N/A
Weight (lbs)	69.5	69.5	69.5	N/A	N/A	N/A
Dimensions	25 x 12 x 12	25 x 12 x 12	25 x 12 x 12	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A
Number of RRUs needed	1	1	1	0	0	0
Trunk Cable 1						
Model Number	1900 Hybrid_ALU	1900 Hybrid_ALU	1900 Hybrid_ALU	N/A	N/A	N/A
Weight (Lbs.)	1.1	1.1	1.1	N/A	N/A	N/A
Dimensions (in.)	1.25	1.25	1.25	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A
Trunk Cable 1 Qty						

Band: 800	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Radio Model						
Model Number	RRH-2x50-800	RRH-2x50-800	RRH-2x50-800	N/A	N/A	N/A
Weight (lbs)	69.1	69.1	69.1	N/A	N/A	N/A
Dimensions	16 x 13 x 10	16 x 13 x 10	16 x 13 x 10	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A
Number of RRUs needed	2	2	2	0	0	0
Trunk Cable 1						
Model Number	Hybriflex	Hybriflex	Hybriflex	N/A	N/A	N/A
Weight (Lbs.)	1	1	1	N/A	N/A	N/A
Dimensions (in.)	1.54	1.54	1.54	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A
Trunk Cable 1 Qty						

RF DATA SHEET
SCALE: N.T.S.

1
RF–1

NOTE: RFDS PROVIDED BY SPRINT DATED 11/16/2017. EXCERPTS TAKEN DEPICT RELEVANT RF DESIGN INFORMATION.
A&E VENDOR SCOPE OF WORK LIMITED TO DESIGN OF MECHANICAL/STRUCUTRAL EQUIPMENT ATTACHMENTS.

SPRINT CONSTRUCTION STANDARDS:

GENERAL CONTRACTOR SHALL ADHERE TO THE FOLLOWING SPRINT CONSTRUCTION STANDARDS.

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

NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION

Sprint
1 INTERNATIONAL BLVD, SUITE 800
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STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: 4/20/18 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	04/20/18	CONSTRUCTION REVISED	PN
2	04/04/18	CONSTRUCTION REVISED	JEB
1	02/06/18	ISSUED FOR CONSTRUCTION	JEB, PN
0	11/01/17	ISSUED FOR REVIEW	JEB, PN

SITE NUMBER:
CT33XC544
SITE NAME:
DEEP RIVER WINTHROP RD
SITE ADDRESS:
220 WINTHROP ROAD
DEEP RIVER, CT 06417

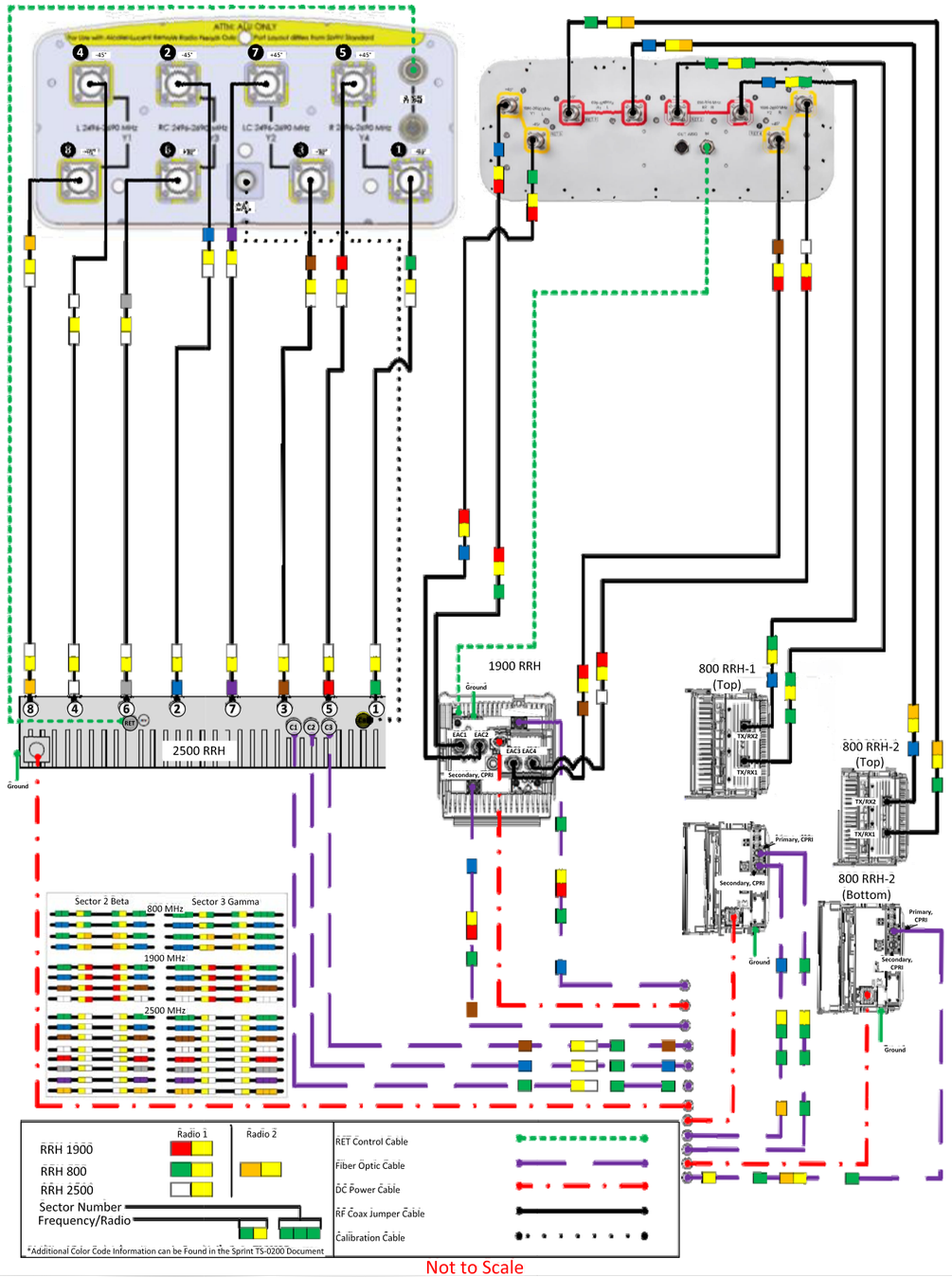
SHEET TITLE
RF DATA SHEET

SHEET NUMBER
RF–1

Prepared By	Revision Date	Revision Number
Mark Elliott	March 13, 2018	R1
Approved By	**Approval Date**	
RAN Hardware & Antenna Teams	Final-Macro Generated	

Sprint

ALU 211 APXVTM14-ALU-I20 & NNVV-65B-R4 wo Filters



Not to Scale

Prepared By	Creation Date	Revision Number
Mark Elliott	February 13, 2016	R-1
Approved By	**Approval Date**	
RAN Hardware & Antenna Teams	February 23, 2017	

Nokia-A Tri-Band Fiber Connections
(Nokia-A Two-800, One-1900, & One-2500 RRH)

Sprint

Nokia-A Site Upgrade: Adding 2500 and Second 800 RRH

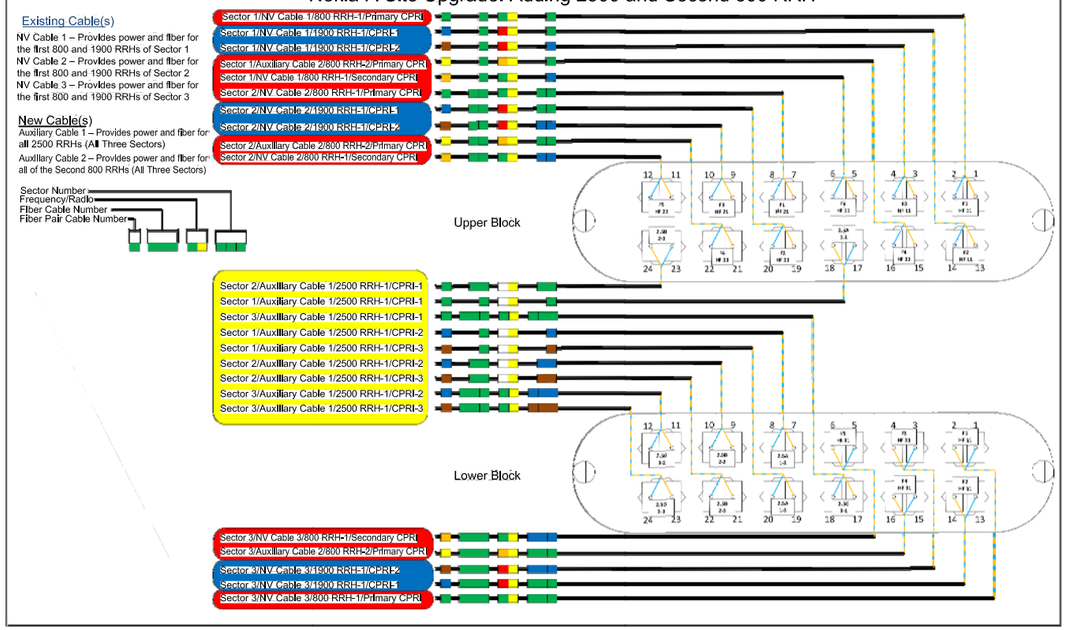
Existing Cable(s)

NV Cable 1 – Provides power and fiber for the first 800 and 1900 RRHs of Sector 1
NV Cable 2 – Provides power and fiber for the first 800 and 1900 RRHs of Sector 2
NV Cable 3 – Provides power and fiber for the first 800 and 1900 RRHs of Sector 3

New Cable(s)

Auxiliary Cable 1 – Provides power and fiber for all 2500 RRHs (All Three Sectors)
Auxiliary Cable 2 – Provides power and fiber for all of the Second 800 RRHs (All Three Sectors)

Sector Number
Frequency/Radio
Fiber Cable Number
Fiber Pair Cable Number



Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Blue	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Gray	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Blue	Blue	No Tape
2	3	Brown	Brown	No Tape
2	4	White	White	No Tape
2	5	Red	Red	No Tape
2	6	Gray	Gray	No Tape
2	7	Purple	Purple	No Tape
2	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
3	2	Blue	Blue	Blue
3	3	Brown	Brown	Brown
3	4	White	White	White
3	5	Red	Red	Red
3	6	Gray	Gray	Gray
3	7	Purple	Purple	Purple
3	8	Orange	Orange	Orange

Frequency/Radio	Indicator	ID
800 #1	Yellow	Green
800 #2	Yellow	Orange
1900 #1	Yellow	Red
1900 #2	Yellow	Brown
1900 #3	Yellow	Blue
1900 #4	Yellow	Grey
2500 #1	Yellow	White
2500 #2	Yellow	Purple

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SITE NUMBER:
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SITE ADDRESS:
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DEEP RIVER, CT 06417

SHEET TITLE
PLUMBING DIAGRAM AND RAN WIRING

SHEET NUMBER
RF-2

CT33XC544
DO MACRO EQUIPMENT DEPLOYMENT

MOUNT AUGMENTATION @ 166'

MONOPOLE TOWER

DEEP RIVER, CT
MIDDLESEX COUNTY

SITE INFORMATION

STRUCTURE TYPE:	MONOPOLE
MOUNT TYPE:	PLATFORM
LATITUDE:	41.36587222 (NAD 83)
LONGITUDE:	-72.47485 (NAD 83)
CITY, STATE:	DEEP RIVER, CT
COUNTY:	MIDDLESEX
SBA SITE:	CT46130-A Deep River-winthrop Rd

COORDINATES ARE FOR NAVIGATIONAL PURPOSES ONLY, NOT TO 1A ACCURACY.

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR THE LABOR & MATERIALS FOR THE DISCREPANCIES.

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.

BUILDING CODE AND DESIGN STANDARD: 2015 IBC (2016 CT) / TIA-222-G

RIGGING PLAN REQUIRED

THIS SET OF PLANS DOES "NOT" CONSTITUTE A RIGGING PLAN.

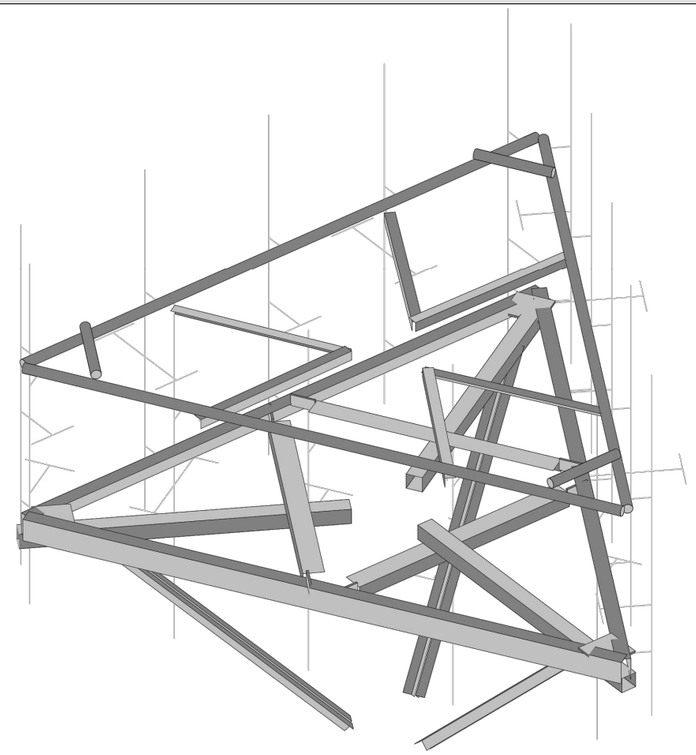
A PROPER RIGGING PLAN SHALL BE PERFORMED BY A LICENSED PROFESSIONAL ENGINEER PRIOR TO PROCEEDING ON ANY AUGMENTATIONS SHOWN HEREIN.

GENERAL DESIGN NOTES

1. THIS PLAN HAS BEEN DESIGNED UTILIZING THE CORRESPONDING MOUNT STRUCTURAL ANALYSIS.
2. THESE PLANS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF TIA/EIA-222, ASCE 7, AWS, ACI, AND AISC. MATERIALS AND SERVICES PROVIDED BY THE CONTRACTOR SHALL CONFORM TO THE ABOVE-MENTIONED CODES AND THE CONTRACT SPECIFICATIONS.
3. ALL STRUCTURE INFORMATION OBTAINED IN THE FORM OF FROM INFORMATION PROVIDED BY THE CLIENT. CONTRACTOR SHALL OBTAIN AND BECOME FAMILIAR WITH THE REFERENCED DOCUMENTS. CONTRACTOR SHALL ISSUE A REQUEST FOR INFORMATION (RFI) IN THE EVENT ANY DISCREPANCIES ARE DISCOVERED BETWEEN THESE DOCUMENTS AND THE AS-BUILT CONDITIONS IN THE FIELD IN A SITE VISIT THAT SHALL BE PERFORMED PRIOR TO STARTING FABRICATION OR CONSTRUCTION.
4. ALL MATERIALS UTILIZED FOR THIS PROJECT MUST BE NEW AND FREE OF ANY DEFECTS.
5. ALL PRODUCT OR MATERIAL SUBSTITUTIONS PROPOSED BY THE CONTRACTOR SHALL BE APPROVED IN WRITING BY THE ENGINEER. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER SUITABLE TO DETERMINE IF SUBSTITUTE IS ACCEPTABLE FOR USE AND MEETS THE ORIGINAL DESIGN CRITERIA. DIFFERENCES FROM THE ORIGINAL DESIGN, INCLUDING MAINTENANCE, REPAIR AND REPLACEMENT, SHALL BE NOTED. ESTIMATES OF COSTS/CREDITS ASSOCIATED WITH THE SUBSTITUTION (INCLUDING RE-DESIGN COSTS AND COSTS TO SUB-CONTRACTORS) SHALL BE PROVIDED TO THE ENGINEER. CONTRACTOR SHALL PROVIDE ADDITIONAL DOCUMENTATION AND/OR SPECIFICATIONS TO THE ENGINEER AS REQUESTED.
6. PROVIDE STRUCTURAL STEEL SHOP DRAWING(S) TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO FABRICATION (ONLY IF SPECIFICALLY REQUESTED BY ENGINEER).
7. UNLESS NOTED OTHERWISE, ALL NEW MEMBERS AND REINFORCING SHALL MAINTAIN THE EXISTING MEMBER WORK LINES AND NOT INTRODUCE ECCENTRICITIES INTO THE STRUCTURE.
8. ANY CONTRACTOR-CAUSED DAMAGE TO PROPERTY OF THE LAND OWNER, PROPERTY OF THE STRUCTURE OWNER, PROPERTY OF THE CUSTOMER, SITE FENCING OR GATES, ANY AND ALL UTILITY AND/OR SERVICE LINES, SHOWN OR NOT SHOWN ON THE PLANS, SHALL BE REPAIRED OR REPLACED AT THE SOLE COST OF THE CONTRACTOR AND SHALL BE ACCOMPLISHED BY THE CONTRACTOR OR SUBCONTRACTOR AS APPROVED BY THE ENGINEER OF RECORD AND LAND OWNER. DAMAGE TO EQUIPMENT OR PROPERTY OF ANY KIND BELONGING TO OTHER COMPANIES (BESIDES THE INDICATED CUSTOMER) SHALL BE ADDRESSED BY THE CONTRACTOR WITH THE COMPANIES THAT OWN THE DAMAGED ITEMS.

SHEET INDEX

MOUNT AUGMENTATION CONFIGURATION



AUGMENTATION SCOPE

AUGMENT ALL SECTORS OF CARRIER'S EXISTING MOUNT INSTALLATION AS REQUIRED (UNLESS NOTED OTHERWISE)

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REVISIONS:

1	05/09/18	REV'D LOADING & AUGMENT	JAD
0	01/16/18	ISSUE FOR CONSTRUCTION	JAD

CHECKED BY: DWG

STATE OF CONNECTICUT
GREGORY DURGIN
No. 32155
LICENSED
PROFESSIONAL ENGINEER

SITE INFORMATION:

MOUNT AUGMENTATION

CT33XC544

DEEP RIVER, CT

LATITUDE: 41.36587222
LONGITUDE: -72.47485

SHEET TITLE:

TITLE SHEET

SHEET NUMBER:

S1

CONTRACTOR NOTES

1. PRIOR TO BEGINNING CONSTRUCTION, ALL CONTRACTORS AND SUBCONTRACTORS MUST ACKNOWLEDGE IN WRITING TO TOWER OWNER THAT THEY HAVE OBTAINED, UNDERSTAND, AND WILL FOLLOW STRUCTURE OWNER STANDARDS OF PRACTICE, CONSTRUCTION GUIDELINES, ALL SITE AND STRUCTURE/TOWER SAFETY PROCEDURES, ALL PRODUCT LIMITATIONS AND INSTALLATION PROCEDURES USED ON SITE, AND PROPOSED AUGMENTATIONS DESCRIBED. RECEIPT OF ACKNOWLEDGEMENT MUST OCCUR PRIOR TO BEGINNING CONSTRUCTION OR CLIMBING. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE THIS DOCUMENTATION FOR STRUCTURE OWNER ON COMPANY LETTERHEAD AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN THIS DOCUMENTATION FROM ANY SUBCONTRACTORS (ON SUBCONTRACTOR LETTERHEAD) AND DELIVER IT TO THE STRUCTURE OWNER.
2. IF THE CONTRACTOR DISCOVERS ANY EXISTING CONDITIONS THAT ARE NOT REPRESENTED ON THESE DRAWINGS, OR ANY CONDITIONS THAT WOULD INTERFERE WITH THE INSTALLATION OF THE AUGMENTATIONS, THE ENGINEER OF RECORD SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE SIGNIFICANCE OF THE DEVIATION.
3. THE CONTRACTOR SHALL SOLICIT AND HIRE THE SERVICES OF A QUALIFIED AUGMENTATION INSPECTOR PRIOR TO BEGINNING CONSTRUCTION. THE AUGMENTATION INSPECTOR MAY BE AN EMPLOYEE OF THE CONTRACTOR'S FIRM, HOWEVER THE INSPECTOR'S ONLY DUTIES SHALL BE INSPECTION, TESTING, AND REPORT CREATION AS REQUIRED ON THE "AUGMENTATION INSPECTION NOTES" SHEET.
4. THE CONTRACTOR SHALL NOTIFY THE TOWER OWNER OF THE PLANNED CONSTRUCTION & INSPECTION SCHEDULE, AS WELL AS ANY CHANGES TO THE SCHEDULE, WITHIN TWO BUSINESS DAYS OF THE COMPLETION OF THE SCHEDULE OR SCHEDULE REVISION BOTH PRIOR TO BEGINNING CONSTRUCTION AND DURING CONSTRUCTION AS THE SCHEDULE CHANGES. THE STRUCTURE OWNER WHEN THE WORK HAS BEEN COMPLETED WITHIN 2 BUSINESS DAYS OF THE COMPLETION OF THE WORK AND ASSOCIATED AUGMENTATION INSPECTIONS & TESTING (WHEN APPLICABLE).
5. IT IS ASSUMED THAT ANY STRUCTURAL AUGMENTATION WORK SPECIFIED ON THESE PLANS WILL BE ACCOMPLISHED BY KNOWLEDGEABLE WORKMEN WITH TOWER CONSTRUCTION EXPERIENCE. THIS INCLUDES PROVIDING THE NECESSARY CERTIFICATIONS TO THE STRUCTURE OWNER AND ENGINEER INCLUDING BUT NOT LIMITED TO TOWER CLIMBER AND RESCUE CLIMBER CERTIFICATIONS, ET CETERA.
6. THESE DRAWINGS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES AND PROCEDURES.
7. CONTRACTOR SHALL WORK WITHIN THE LIMITS OF THE STRUCTURE OWNER'S PROPERTY OR LEASE AREA AND APPROVED EASEMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WORK IS WITHIN THESE BOUNDARIES. CONTRACTOR SHALL EMPLOY A SURVEYOR AS REQUIRED. ANY WORK OUTSIDE THESE BOUNDARIES SHALL BE APPROVED IN WRITING BY THE LAND OWNER PRIOR TO MOBILIZATION. CONSTRUCTION STAKING AND BOUNDARY MARKING IS THE RESPONSIBILITY OF THE CONTRACTOR.

STRUCTURAL ERECTION AND BRACING REQUIREMENTS

1. THE STRUCTURAL DRAWINGS ILLUSTRATE THE COMPLETED STRUCTURE WITH ALL ELEMENTS IN THEIR FINAL POSITIONS, PROPERLY SUPPORTED AND BRACED.
2. THE CONTRACTOR SHALL PROVIDE SHORING AND BRACING AS REQUIRED DURING CONSTRUCTION TO ENSURE STABILITY. DESIGN AND SEQUENCING OF CONSTRUCTION SHORING AND BRACING IS OUTSIDE THE SCOPE OF THIS WORK.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, GUYING, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS.

BOLTS

1. ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING SPECIFIED GALVANIZED HIGH STRENGTH ASTM A325 OR A490 BOLTS WITH THREADS EXCLUDED FROM SHEAR PLANE.
2. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES, WITH BOLT HEADS FACING DOWN WHERE APPLICABLE.
3. ALL BOLTS AT EVERY CONNECTION SHALL BE INSTALLED SNUG-TIGHT UNTIL THE SECTION IS FULLY COMPACTED AND ALL PLIES ARE JOINED, AND THEN TIGHTENED FURTHER BY AISC - "TURN OF THE NUT" METHOD. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.
4. BOLT LENGTHS UP TO AND INCLUDING 4 DIAMETERS SHALL BE TENSIONED 1/3 TURN BEYOND SNUG-TIGHT. BOLT LENGTHS OVER 4 DIAMETERS SHALL BE 1½ TURNS BEYOND SNUG-TIGHT.
5. ALL BOLTED CONNECTIONS SHALL USE LOCK WASHERS.

STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE CURRENT EDITION OF THE AISC STEEL CONSTRUCTION MANUAL AND SECTION 4 OF THE TIA CODE.
2. PRE-QUALIFIED STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING MINIMUM GRADES UNLESS OTHERWISE NOTED:
   - CHANNELS & ANGLES ..... ASTM A36, (Fy = 36 KSI)
   - PLATES ..... ASTM A36, (Fy = 36 KSI)
   - PIPES ..... ASTM A53 GR.B, (Fy = 35 KSI)
   - HSS ROUND ..... ASTM A500 GR.B, (Fy = 42 KSI)
   - HSS RECTANGULAR ..... ASTM A500 GR.B, (Fy = 46 KSI)
   - STRUCTURAL BOLTS ..... ASTM A325
   - U-BOLTS ..... ASTM A307 GR.A
   - NUTS FOR BOLTS ..... ASTM A563 (THREADING TO MATCH BOLT)
   - WASHERS FOR BOLTS ..... ASTM F436
   - SEE TABLE 5-1 OF THE TIA CODE FOR ADDITIONAL SHAPES AND STANDARDS THAT ARE NOT LISTED ABOVE.
3. NON PRE-QUALIFIED STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING STANDARDS PER THE TIA CODE:
   - THE CARBON EQUIVALENT OF STEEL SHALL NOT EXCEED 0.65 PER SECTION 5.4.2 OF THE TIA CODE
   - ELONGATION OF STEEL SHALL NOT BE LESS THAN 18%
   - TEST REPORTS SHALL BE IN ACCORDANCE WITH ASTM A6 OR A568
   - TOLERANCES SHALL BE IN ACCORDANCE WITH ASTM A6
4. FIELD CUT EDGES, EXCEPT DRILLED HOLES, SHALL BE GROUND SMOOTH AND COLD GALVANIZED.
5. ALL WELDING WORK SHALL CONFORM TO THE AWS D1.1 STRUCTURAL WELDING CODE. ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS ONLY. WELDING ELECTRODES SHALL BE E70XX.
6. ALL DETAILING, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO AISC SPECS AND CODES, LATEST EDITION.
7. UPON REQUEST, THE CONTRACTOR SHALL SUBMIT DETAILED, ENGINEERED, COORDINATED AND CHECKED SHOP DRAWINGS FOR ALL STRUCTURAL STEEL TO THE ENGINEER OF RECORD TO REVIEW FOR COMPLIANCE WITH DESIGN INTENT PRIOR TO THE START OF FABRICATION AND/OR ERECTION.
8. TORCH-CUTTING OF ANY KIND SHALL NOT BE PERMITTED.
9. ALL BOLT HOLES SHALL BE STANDARD SIZE BOLT HOLES PER AISC 360, UNLESS OTHERWISE NOTED. ALL HOLES SHALL BE SHOP DRILLED OR SUB-PUNCHED AND REAMED. BURNING OF HOLES IS NOT PERMITTED. WHERE SLOTTED OR OVERSIZE HOLES ARE SPECIFIED ON THE DRAWINGS, EXTRA-THICK ASTM F436 PLATE WASHERS SHALL BE USED (3/16" MINIMUM THICKNESS) WITH A DIAMETER SUITABLE TO COVER THE EXTENTS OF THE SLOT OR HOLE. BOLTS SHALL BE HEAVY-HEX WHERE AVAILABLE IN THE SIZE AND GRADE SPECIFIED, OTHERWISE BOLTS SHALL BE HEX HEAD CAP SCREWS.
10. ALL STEEL HARDWARE, INCLUDING ADHESIVE OR EMBEDDED ANCHOR BOLTS AND THEIR ACCESSORIES, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 (EXCEPT BOLTS SMALLER THAN ½" SHALL CONFORM TO FE/ZN 3 AT PER ASTM F1941 WHERE HOT-DIP GALVANIZED BOLTS ARE NOT AVAILABLE). ALL STEEL MEMBERS, INCLUDING WELDMENTS, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123. REPAIR DAMAGE TO GALVANIZED COATINGS USING ASTM A780 PROCEDURES WITH A ZINC RICH PAINT (SUCH AS ZINC GALVILITE) FOR GALVANIZING DAMAGED BY HANDLING, TRANSPORTING, CUTTING, WELDING, OR BOLTING. DO NOT HEAT SURFACES TO WHICH REPAIR PAINT HAS BEEN APPLIED. CALL OUT HOLES REQUIRED FOR HOT-DIP GALVANIZING ON SHOP DRAWINGS.
11. MEMBERS SHALL BE SHOP-FABRICATED AND WELDED TO THE EXTENT PRACTICABLE IN ORDER TO REDUCE FIELD INSTALLATION COSTS.

NOMINAL HOLE DIMENSIONS

BOLT Ø	STANDARD HOLE Ø
1/2"Ø	9/16"Ø
5/8"Ø	11/16"Ø
3/4"Ø	13/16"Ø
7/8"Ø	15/16"Ø
1"Ø	1 1/16"Ø

CONSTRUCTION INSPECTION CHECKLIST

CONSTRUCTION AND/OR INSTALLATION INSPECTIONS REQUIRED FOR REPORT? (CHECK=YES, BLANK=NO)	INSPECTION REPORT ITEM
√	CONSTRUCTION INSPECTIONS
	THIRD-PARTY CERTIFIED WELD INSPECTION (INCLUDING IBC SPECIAL INSPECTIONS)
√	GALVANIZING REPAIR MATERIAL PREPARATION, INSPECTION, & PAINT APPLICATION
√	PRIME CONTRACTOR'S AS-BUILT DOCUMENTS (SIGNED & DATED)
√	FABRICATION INSPECTION
√	MATERIAL TEST REPORT(S) / MILL CERTIFICATE(S)
√	PACKING SLIPS FOR STRUCTURAL MATERIALS

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CHECKED BY: DWG

SITE INFORMATION:

MOUNT AUGMENTATION

CT33XC544

DEEP RIVER, CT

LATITUDE: 41.36587222
LONGITUDE: -72.47485

SHEET TITLE:

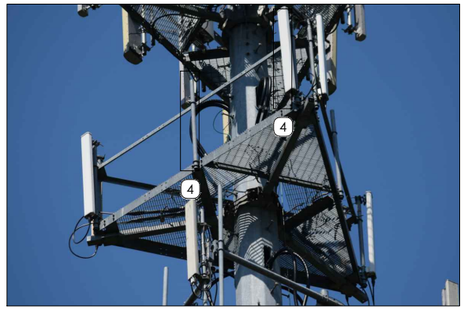
NOTES AND SPECIFICATIONS

SHEET NUMBER:

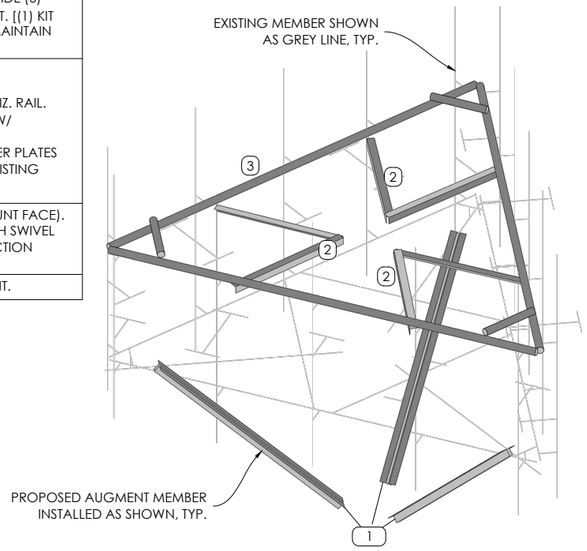
S2

NEW MOUNT AUGMENTATIONS

1	PLATFORM REINFORCEMENT KIT SITEPRO1 PART# PRK-1245L. ATTACH PRK COLLAR TO MONOPOLE SHAFT ~5.0' BELOW EXISTING STANDOFF CENTERLINE AND DOUBLE ANGLE KICKER BRACKET TO STANDOFF MEMBER ~5.0' OUT FROM THE STANDOFF-TO-COLLAR INTERFACE AS SHOWN PER MANUF. SPECS. [(1) KIT TOTAL]
2	HANDRAIL KIT COMPONENTS - V-BRACE KIT SITEPRO1 PART# PRK-SFS-H-L. ATTACH COLLAR MOUNT TO MONOPOLE SHAFT ~4.0' ABOVE EXISTING STANDOFF CENTERLINE. NOTE: IF THE PRK-SFS-H-L KIT IS NOT AVAILABLE, PROVIDE (6) TOTAL L2 1/2 X2½X3/16 X ~8' LONG REPLACEMENT ANGLES, FIELD-CUT AND DRILL TO SUIT. [(1) KIT TOTAL] ROTATE AND ORIENT SFS ANGLES AS GRAPHICALLY DISPLAYED IN ORDER TO MAINTAIN CLIMBING FACILITY PATHWAY THROUGH MOUNT.
3	HANDRAIL KIT COMPONENTS ▪ REMOVE & DISPOSE OF EXISTING SINGLE ANGLE TOP RAIL. ▪ PIPE2.0STD X 12.5' HORIZ. RAIL, [(3) TOTAL]. ATTACH SFS-H-L KIT ANGLES TO NEW HORIZ. RAIL. ▪ PIPE2.0STD X ~4' LONG CORNER BRACES, [(3) TOTAL]. ATTACH TO NEW HORIZ. RAIL W/ (6) SITEPRO1 PART# PUCK BRACKETS. ▪ PIPE2.0STD MOUNT PIPES, [(6) TOTAL] W/ SITEPRO1 SCX**x**-K, [(15) TOTAL] CROSS-OVER PLATES TO NEW PIPE RAIL. ATTACH ALL MOUNT PIPES TO NEW RAIL W/ SCX1-K PLATES AND EXISTING BOTTOM RAIL W/ (2) (1) ½"Ø OR ⅝"Ø U-BOLTS [(12) TOTAL], SIMILAR TO EXISTING.
4	· PANEL ANTENNAS TO BE INSTALLED IN POSITIONS 1 AND 3 (END AND MIDDLE OF MOUNT FACE). RRH UNITS TO BE INSTALLED ON NEW MOUNT PIPES IN POSITIONS 2 AND 4 ON DUAL RRH SWIVEL BRACKETS (MAXIMUM OF TWO RRH PER PANEL MOUNT PIPE) AS SHOWN IN CONSTRUCTION DRAWINGS.
AUGMENTATIONS SHALL BE COMPLETED PRIOR TO THE INSTALLATION OF ANY NEW EQUIPMENT.	



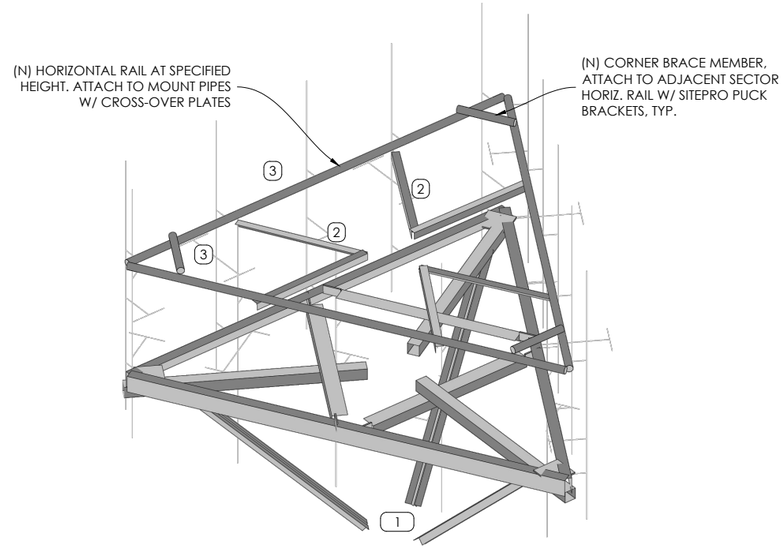
PLATFORM @ 166' AUGMENTATION



MOUNT AUGMENTATION ISOLATION
SCALE: N.T.S.

CONSTRUCTION NOTES

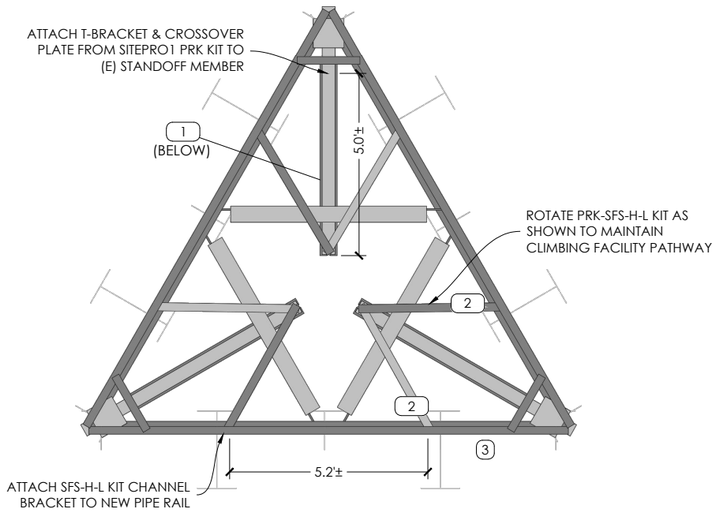
1. SCOPE OF WORK MUST BE COMPLETED AT WIND SPEEDS < 20 MPH.
2. ALL DIMENSIONS ARE APPROXIMATE. CONTRACTOR SHOULD FIELD-VERIFY ALL DIMENSIONS BEFORE FABRICATION OF STEEL AND COMMENCEMENT OF WORK. FIELD CUT MEMBERS AS REQUIRED.
3. CONTRACTOR TO COORDINATE THE TEMPORARY REMOVAL/RELOCATION/REPLACEMENT OF ELEMENTS (E.G. COAX, CLIPS, TMAs, ETC.) CONNECTED TO, OR IN THE DIRECT PATH, OF NEW AUGMENTATION MEMBERS.



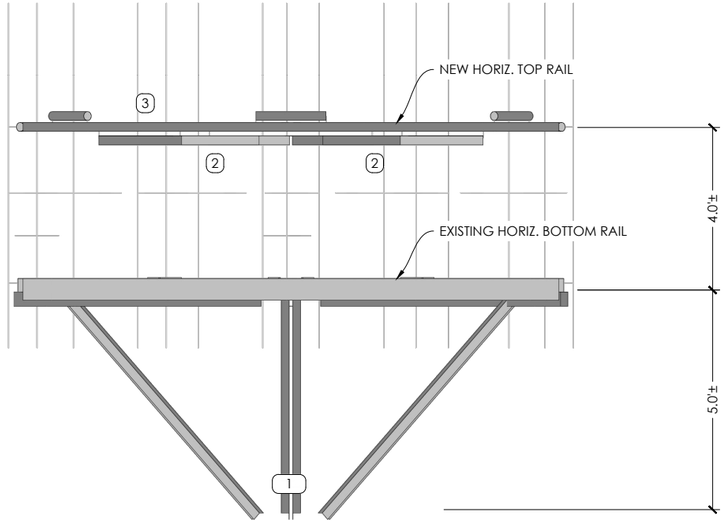
AUGMENTED MOUNT ISOMETRIC
SCALE: N.T.S.

INSTALLATION NOTES

1. AUGMENT MEMBER(S) MAY NEED TO BE FIELD-CUT TO LENGTH TO ACCOMMODATE THIS INSTALLATION. CONTRACTOR TO CUT AND DRILL TO SUIT AS REQUIRED AND APPLY (2) COATS OF COLD-GALV. COMPOUND TO CUT MEMBER ENDS.
2. CONTRACTOR TO CHECK ALL EXISTING MEMBER CONNECTION BOLTS, PARTICULARLY STANDOFF TO TOWER BOLTS, FOR PROPER INSTALLATION AND TIGHTNESS.
3. COORDINATE PLACEMENT OF NEW AUGMENT MEMBERS WITH EXISTING TOWER AND CLIMBING FACILITY ELEMENTS (E.G. STEP PEGS, COAX PORTS, ETC.)
4. REFER TO CONSTRUCTION DRAWINGS (BY OTHERS) AND MOUNT STRUCTURAL ANALYSIS FOR APPROVED INSTALLATION LOCATIONS AND QUANTITIES OF APPURTENANCES.



AUGMENTED MOUNT PLAN
SCALE: N.T.S.



AUGMENTED MOUNT FRONT ELEVATION
SCALE: N.T.S.

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AUGMENTATIONS, SECTIONS & DETAILS

SHEET NUMBER:

S3