Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

June 6, 2017

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

Notice of Exempt Modification
1201 Boston Post Road, Milford, CT 06460
Latitude- 41.23656000
Longitude- -73.03394400

Dear Ms. Bachman,

T-Mobile currently maintains (7) existing antennas at the 45' and 41' level above the existing 25' rooftop located at 1201 Boston Post Road in Milford, CT. The property is owned by Connecticut Post Limited Partnership. T-Mobile now intends to replace (4) existing antennas with (5) new 700/1900/2100 MHz antennas. The new antennas will be installed at the same height level as existing. T-Mobile also intends to add (8) DC cables.

This facility was approved by the Council on September 1, 2016 in Petition No. 1245. This modification complies with the listed conditions of the approval, and would not be violated by this modification.

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 Benjamin G. Blake, Mayor of the City of Milford, as well as the property owner.

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 modification will not result in an increase in the height of the existing structure

2. The proposed modifications 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, T-Mobile respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitute an exempt modification under R.C.S.A. 16-50j-72(b)(2).

Sincerely,

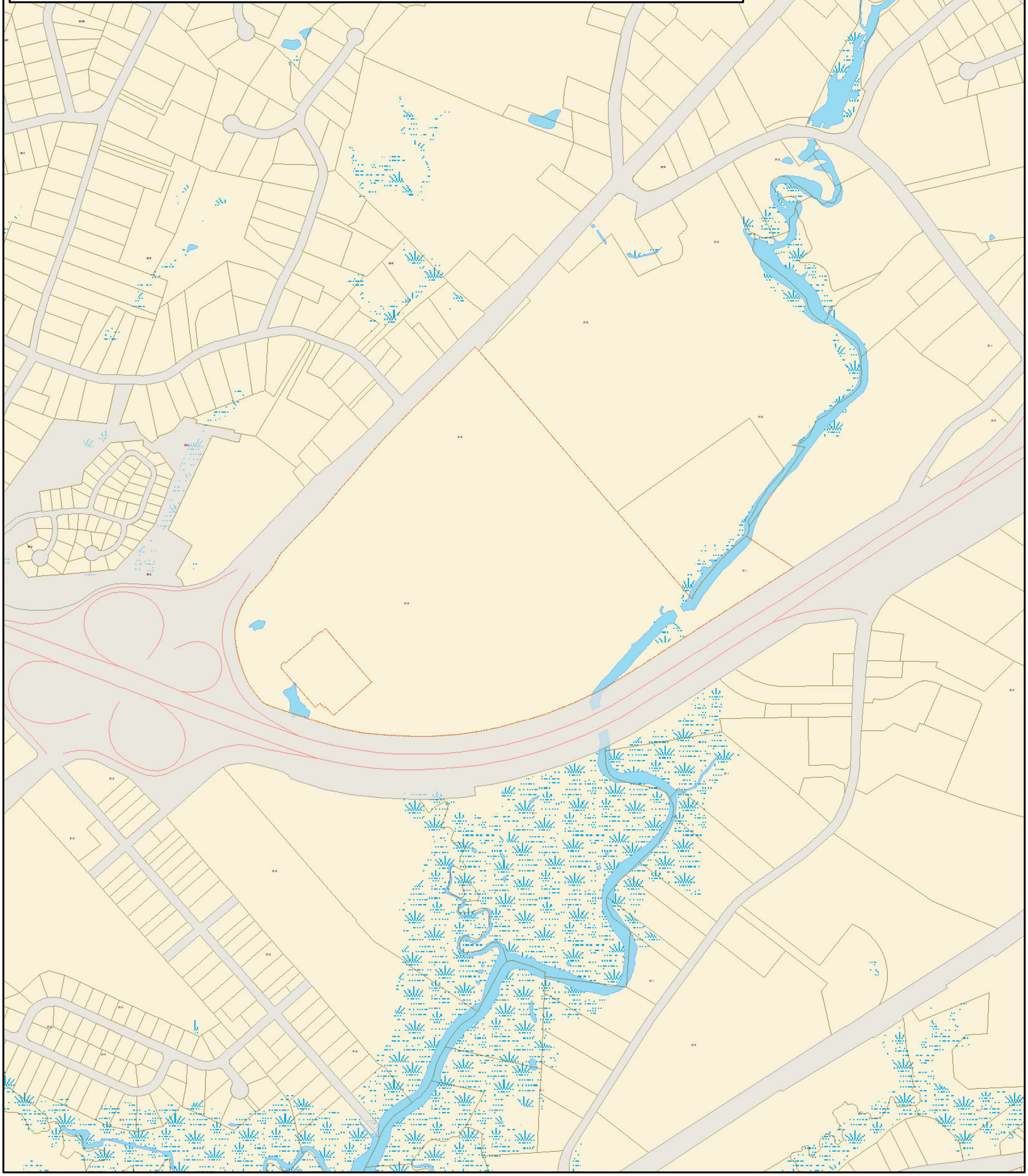
Kyle Richers

Kyle Richers
Transcend Wireless
10 Industrial Ave., Suite 3
Mahwah, New Jersey 07430
908-447-4716
krichers@transcendwireless.com

cc: Benjamin G. Blake- as elected official
Connecticut Post Limited Partnership- as property owner
Stephen H. Harris- as zoning official

City of Milford, Connecticut. Assessment Parcel Map

Parcel ID: **19189** Address: **1201 BOSTON POST RD**



1 inch = 700 feet

0 360 720 1,080 1,440 Feet

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

Map Produced: July 2016

1201 BOSTON POST RD

Location	1201 BOSTON POST RD	**Mblu**	89/ 812/ 40A/ACT /
Acct#	024362	**Owner**	CONNECTICUT POST LTD PARTNERSH
Assessment	$236,250	**Appraisal**	$337,500
PID	109963	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$337,500	$0	$337,500
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$236,250	$0	$236,250

Owner of Record

Owner CONNECTICUT POST LTD PARTNERSH
Other C/O MARVIN F POER & COMPANY
Address 3520 PIEDMONT RD NE STE 410
ATLANTA, GA 30305

Sale Price $0
Certificate
Book & Page 01044/0160
Sale Date 12/07/1979

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
CONNECTICUT POST LTD PARTNERSH	$0		01044/0160	12/07/1979

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: $0
Building Percent Good:
Replacement Cost Less Depreciation: $0

Building Attributes	
Field	**Description**

Style	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Description:	
Kitchen Descrip:	
Int Condition:	
Solar Panels	
House Generator	

Building Photo

(http://images.vgsi.com/photos/MilfordCTPhotos//default.jpg)

Building Layout

Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 434V
Description CELL TOWER MDL-00
Zone SCD
Neighborhood
Alt Land Appr No
Category

Land Line Valuation

Size (Acres) 0
Frontage
Depth
Assessed Value $0
Appraised Value $0

Outbuildings

Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
CEL1	CEL TWR SITE			1 UNITS	$337,500	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2013	$337,500	$0	$337,500
2012	$337,500	$0	$337,500

Assessment			
Valuation Year	Improvements	Land	Total
2013	$236,250	$0	$236,250
2012	$236,250	$0	$236,250

EBI Consulting

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

T-Mobile Existing Facility

Site ID: CT11002A

Milford / I-95 / 1
1201 Boston Post Road (CT Post Mall – Kitchen Etc)
Milford, CT 06460

May 25, 2017

EBI Project Number: 6217002216

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general public allowable limit:	**44.51 %**

May 25, 2017

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11002A – Milford / I-95 / 1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **1201 Boston Post Road (CT Post, Milford, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile 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 facility that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 700 MHz Band is approximately 467 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) 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 T-Mobile Wireless antenna facility located at **1201 Boston Post Road (CT Post Mall – Kitchen Etc), Milford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile 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 building. For this report the sample point is the top of a 6-foot person standing at the base of the building.

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

1) 2 GSM channels (PCS Band - 1900 MHz) were considered for Sectors A, B &C of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 UMTS channels (PCS Band - 1900 MHz) were considered for Sectors A, B &C of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 UMTS channels (AWS Band – 2100 MHz) were considered for Sectors A, B &C of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 LTE channels (PCS Band - 1900 MHz) were considered for all 4 sectors of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (AWS Band – 2100 MHz) were considered for all 4 sectors of the proposed installation. These Channels have a transmit power of 60 Watts per Channel

6) 1 LTE channel (700 MHz Band) was considered for all 4 sectors of the proposed installation. This channel has a transmit power of 30 Watts.

7) 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.

8) For the following calculations the sample point was the top of a 6-foot person standing at the base of the building. 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.

9) The antennas used in this modeling are the **Ericsson AIR21 B4A/B12P-8, Ericsson AIR32 B66A/B2A, and the Commscope LNX-6515DS-A1M** for transmission in the 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) 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

10) The antenna mounting height centerlines of the proposed antennas are **43 feet** above ground level (AGL) for sectors A, B & C and **41 feet** above ground level (AGL) for sector D.

11) 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.

12) All calculations were done with respect to uncontrolled / general public threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C	Sector:	D
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR21 B4A/B12P-8	Make / Model:	Ericsson AIR21 B4A/B12P-8	Make / Model:	Ericsson AIR21 B4A/B12P-8	Make / Model:	Ericsson AIR32 B66A/B2A
Gain:	15.9 / 13.6 dBd	Gain:	15.9 / 13.6 dBd	Gain:	15.9 / 13.6 dBd	Gain:	15.9 dBd
Height (AGL):	43	Height (AGL):	43	Height (AGL):	43	Height (AGL):	43
Frequency Bands	2100 MHz (AWS) / 700 MHz	Frequency Bands	2100 MHz (AWS) / 700 MHz	Frequency Bands	2100 MHz (AWS) / 700 MHz	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	240
ERP (W):	3,708.79	ERP (W):	3,708.79	ERP (W):	3,708.79	ERP (W):	9,337.08
Antenna A1 MPE%	13.86	Antenna B1 MP E%	13.86	Antenna C1 MPE %	13.86	Antenna D1 MPE %	24.52
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Commscope LNX-6515DS-A1M
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	14.6 dBd
Height (AGL):	43	Height (AGL):	43	Height (AGL):	43	Height (AGL):	43
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	700 MHz
Channel Count	6	Channel Count	6	Channel Count	6	Channel Count	1
Total TX Power(W):	300	Total TX Power(W):	300	Total TX Power(W):	300	Total TX Power(W):	30
ERP (W):	11,671.35	ERP (W):	11,671.35	ERP (W):	11,671.35	ERP (W):	865.21
Antenna A2 MPE%	30.65	Antenna B2 MPE%	30.65	Antenna C2 MPE %	30.65	Antenna D2 MPE %	4.87

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**44.51 %**
No Additional Carriers	NA
Site Total MPE %:	**44.51 %**

T-Mobile Sector A Total:	44.51 %
T-Mobile Sector B Total:	44.51 %
T-Mobile Sector C Total:	44.51 %
T-Mobile Sector D Total:	29.38 %
Site Total:	44.51 %

T-Mobile _Max Values per sector (Sectors A, B & C)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile AWS - 2100 MHz UMTS	2	1,167.14	43	61.30	AWS - 2100 MHz	1000	6.13%
T-Mobile 700 MHz LTE	2	687.26	43	36.10	700 MHz	467	7.73%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	43	122.60	AWS - 2100 MHz	1000	12.26%
T-Mobile PCS - 1900 MHz LTE	2	2,334.27	43	122.60	PCS - 1900 MHz	1000	12.26%
T-Mobile PCS - 1900 MHz GSM	2	1,167.14	43	61.30	PCS - 1900 MHz	1000	6.13%
						Total:	**44.51%**

EBI Consulting

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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 T-Mobile 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:

T-Mobile Sector	Power Density Value (%)
Sector A:	44.51 %
Sector B:	44.51 %
Sector C:	44.51 %
Sector D:	29.38 %
T-Mobile Per Sector Maximum:	44.51 %
Site Total:	44.51 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **44.51%** 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.

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Pipe Masts

Proposed T-Mobile
Antenna Upgrade

T-Mobile Site Ref: CT11002A

1201 Boston Post Road
Milford, CT

CENTEK Project No. 17012.23

Date: May 17, 2017

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by T-Mobile on the existing roof mounted antenna masts located in Milford, Connecticut.

The host structure is a roof mounted steel equipment platform with two (2) existing antenna pipe masts along with façade mounted pipe masts at the Delta sector.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- T-Mobile (Existing to Relocate – Alpha, Beta & Gamma Sectors):
  Antennas: Three (3) AIR21 B4A/B12P (8-ft) panel antennas and three (3) Ericsson RRUS-11 B12 remote radio units to be relocated to one (1) proposed pipe mast attached to the equipment platform steel dunnage frame with a RAD center elevation of +/- 41.5-ft AGL.
- T-Mobile (Existing to Remove – Alpha, Beta & Gamma Sectors):
  Antennas: Three (3) Ericsson KRC118023 (AIR21) panel antennas and three (3) TMAs mounted on one (1) pipe mast attached to the equipment platform steel dunnage frame with a RAD center elevation of +/- 43.2-ft AGL.
- **T-Mobile (Proposed – Alpha, Beta & Gamma Sectors):**
  Antennas: Three (3) Ericsson KRD901146 (AIR32) panel antennas mounted on one (1) pipe mast attached to the equipment platform steel dunnage frame with a RAD center elevation of +/- 43.2-ft AGL.
- T-Mobile (Existing to Remain – Delta Sector):
  Antennas: One (1) Ericsson RRUS-11 B12 remote radio unit mounted to the building façade with a RAD center elevation of +/- 41-ft AGL.
- T-Mobile (Existing to Remove – Delta Sector):
  Antennas: One (1) Ericsson AIR21 panel antenna mounted to the building façade with a RAD center elevation of +/- 41-ft AGL.
- **T-Mobile (Proposed – Delta Sector):**
  Antennas: One (1) Andrew LNX-6515DS panel antenna mounted on an existing pipe mast and one (1) Ericsson KRD901146 (AIR32) panel antenna mounted on a proposed pipe mast to the building façade with a RAD center elevation of +/- 41-ft AGL.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents or reinforcement drawings.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables to be installed as indicated in this report.

Analysis

The existing antenna support mounts were analyzed using a comprehensive computer program titled Risa3D. The program analyzes the antenna mounts, considering the worst case loading condition. The antenna support mounts were considered to be loaded by concentric forces along the pipe masts, and the model assumes that the members are subjected to bending, axial, and shear forces.

Structure Loading

Loading was determined per the requirements of the 2012 International Building Code as modified by the 2016 CT State Building Code and ASCE 7-10 "Minimum Design Loads for Buildings and Other Structures".

Wind Speed: Meriden; v = 125 mph (Risk Cat 2) *[Appendix N of the 2016 CSBC]*

Results

Antenna mast stresses were calculated utilizing the structural analysis software Risa-3D.

- Calculated stresses were found to be within allowable limits.

Component	Stress Ratio (percentage of capacity)	Result
South Antenna Mast	53.3%	**PASS**
Connection	52.0%	**PASS**
East Antenna Mast	86.4%	**PASS**
Connection	32.5%	**PASS**
Delta Antenna Mast	6.8%	**PASS**
Connection	15.0%	**PASS**

Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by T-Mobile. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the “as new” condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

Design Wind Load on Other Structures: (Based on IBC 2012, CSBC 2016 and ASCE 7-10)

Wind Speed =	$V := 125$ mph	(User Input)	(CSBC Appendix N)
Risk Category =	$BC := II$	(User Input)	(IBC Table 1604.5)
Exposure Category =	$Exp := C$	(User Input)	
Height Above Grade =	$Z := 42$ ft	(User Input)	
Structure Type =	Structuretype := Square_Chimney	(User Input)	
Structure Height =	$Height := 6$ ft	(User Input)	
Horizontal Dimension of Structure =	$Width := 1$ ft	(User Input)	

Terrain Exposure Constants:

Nominal Height of the Atmospheric Boundary Layer = $zg := \begin{cases} 1200 & \text{if } Exp = B \\ 900 & \text{if } Exp = C \\ 700 & \text{if } Exp = D \end{cases} = 900$ (Table 26.9-1)

3-Sec Gust Speed Power Law Exponent = $\alpha := \begin{cases} 7 & \text{if } Exp = B \\ 9.5 & \text{if } Exp = C \\ 11.5 & \text{if } Exp = D \end{cases} = 9.5$ (Table 26.9-1)

Integral Length Scale Factor = $l := \begin{cases} 320 & \text{if } Exp = B \\ 500 & \text{if } Exp = C \\ 650 & \text{if } Exp = D \end{cases} = 500$ (Table 26.9-1)

Integral Length Scale Power Law Exponent = $E := \begin{cases} \frac{1}{3} & \text{if } Exp = B \\ \frac{1}{5} & \text{if } Exp = C \\ \frac{1}{8} & \text{if } Exp = D \end{cases} = 0.2$ (Table 26.9-1)

Turbulence Intensity Factor = $c := \begin{cases} 0.3 & \text{if } Exp = B \\ 0.2 & \text{if } Exp = C \\ 0.15 & \text{if } Exp = D \end{cases} = 0.2$ (Table 26.9-1)

Exposure Constant = $Z_{min} := \begin{cases} 30 & \text{if } Exp = B \\ 15 & \text{if } Exp = C \\ 7 & \text{if } Exp = D \end{cases} = 15$ (Table 26.9-1)

Exposure Coefficient = $K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases} = 1.05$ (Table 29.3-1)

Topographic Factor =	$K_{zt} := 1$	(Eq. 26.8-2)
Wind Directionality Factor =	$K_d = 0.9$	(Table 26.6-1)
Velocity Pressure =	$q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 = 37.96$	(Eq. 29.3-1)
Peak Factor for Background Response =	$g_Q := 3.4$	(Sec 26.9.4)
Peak Factor for Wind Response =	$g_v := 3.4$	(Sec 26.9.4)
Equivalent Height of Structure =	$z := \begin{cases} z_{min} & \text{if } z_{min} > 0.6 \cdot Height \\ 0.6 \cdot Height & \text{otherwise} \end{cases} = 15$	(Sec 26.9.4)
Intensity of Turbulence =	$I_z := c \cdot \left(\frac{33}{z}\right)^{\left(\frac{1}{6}\right)} = 0.228$	(Eq. 26.9-7)
Integral Length Scale of Turbulence =	$L_z := l \cdot \left(\frac{z}{33}\right)^{E} = 427.057$	(Eq. 26.9-9)
Background Response Factor =	$Q := \sqrt{\frac{1}{1 + 0.63\left(\frac{Width + Height}{L_z}\right)^{0.63}}} = 0.977$	(Eq. 26.9-8)
Gust Response Factor =	$G := 0.925 \cdot \left[\frac{\left(1 + 1.7 \cdot g_Q \cdot I_z \cdot Q\right)}{1 + 1.7 \cdot g_v \cdot I_z}\right] = 0.913$	(Eq. 26.9-6)
Force Coefficient =	$C_f = 1.383$	(Fig 29.5-1 - 29.5-3)
Wind Force =	$F := q_z \cdot G \cdot C_f = 48$ psf	

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR21 B4A/B12P 8F		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 96$	in	(User Input)
Antenna Width =	$W_{ant} := 12.1$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 148$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Wind Load (Front)

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 8.1$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 8.1$ sf

Total Antenna Wind Force = $F_{ant} := F \cdot A_{ant} = 387$ lbs

Wind Load (Side)

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 5.8$ sf

Total Antenna Wind Force = $F_{ant} := F \cdot A_{ant} = 278$ lbs

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 148$ lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsssson AIR32		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 56.6$	in	(User Input)
Antenna Width =	$W_{ant} := 12.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 132$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Wind Load (Front)

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.1$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 5.1$ sf

Total Antenna Wind Force = $F_{ant} := F \cdot A_{ant} = 243$ lbs

Wind Load (Side)

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 3.4$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 3.4$ sf

Total Antenna Wind Force = $F_{ant} := F \cdot A_{ant} = 164$ lbs

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 132$ lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Andrew LNX6515DS		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 96.4$	in	(User Input)
Antenna Width =	$W_{ant} := 11.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.1$	in	(User Input)
Antenna Weight =	$WT_{ant} := 50$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Wind Load (Front)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 8$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 8$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 382$	lbs

Wind Load (Side)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 4.8$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 4.8$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 228$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 50$	lbs

Development of Wind & Ice Load on RRHs

RRH Data:

RRH Model =	Ericsson RRUS-11		
RRH Shape =	Flat		(User Input)
RRH Height =	$L_{RRH} := 17.8$	in	(User Input)
RRH Width =	$W_{RRH} := 17.3$	in	(User Input)
RRH Thickness =	$T_{RRH} := 7.2$	in	(User Input)
RRH Weight =	$WT_{RRH} := 50$	lbs	(User Input)
Number of RRHs =	$N_{RRH} := 1$		(User Input)

Wind Load (Front)

Surface Area for One RRH = $SA_{RRH} := \frac{L_{RRH} \cdot W_{RRH}}{144} = 2.1$ sf

RRH Projected Surface Area = $A_{RRH} := SA_{RRH} \cdot N_{RRH} = 2.1$ sf

Total RRH Wind Force = $F_{RRH} := F \cdot A_{RRH} = 103$ lbs

Wind Load (Side)

Surface Area for One RRH = $SA_{RRH} := \frac{L_{RRH} \cdot T_{RRH}}{144} = 0.9$ sf

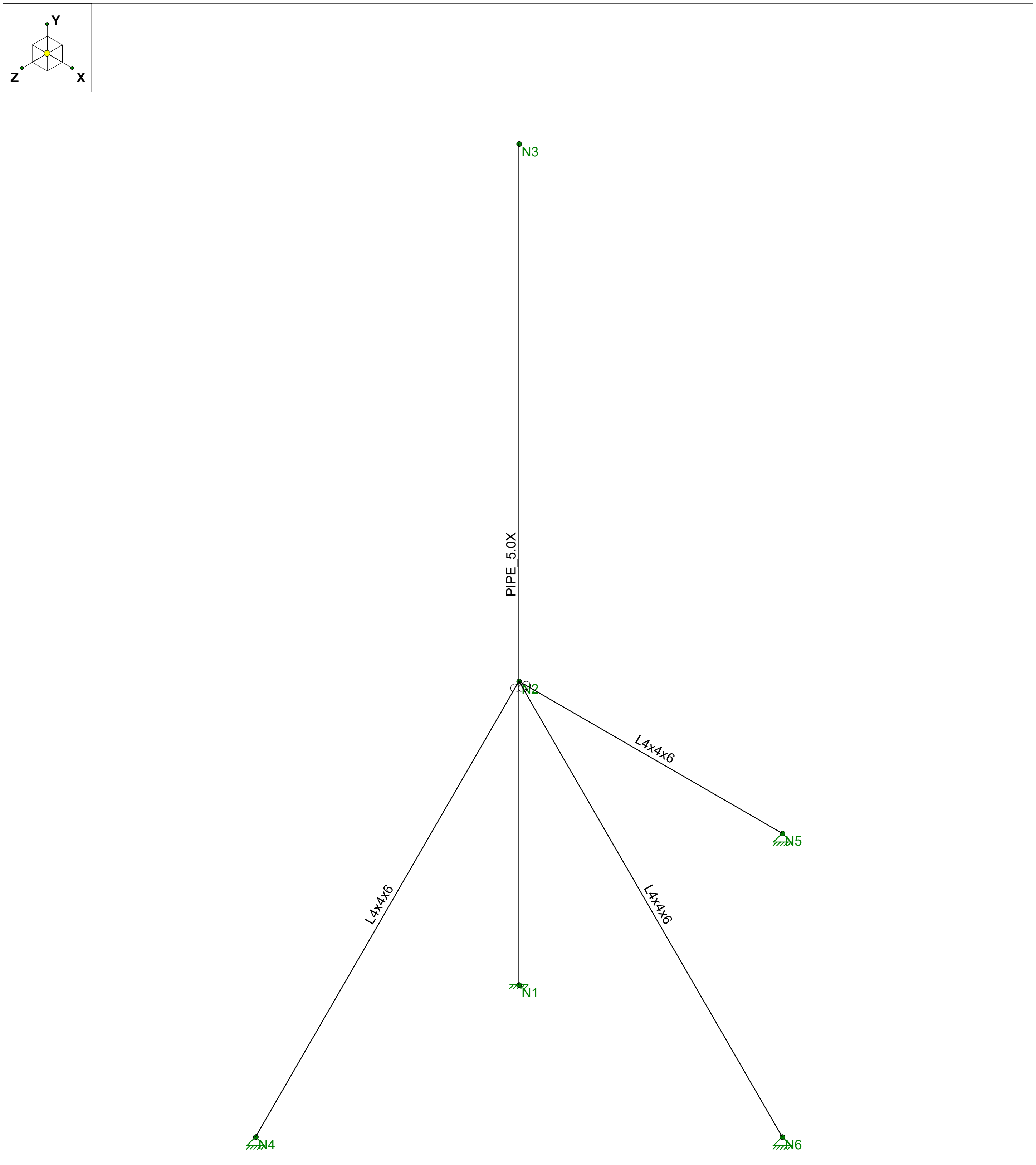
RRH Projected Surface Area = $A_{RRH} := SA_{RRH} \cdot N_{RRH} = 0.9$ sf

Total RRH Wind Force = $F_{RRH} := F \cdot A_{RRH} = 43$ lbs

Gravity Load (without ice)

Weight of All RRHs = $WT_{RRH} \cdot N_{RRH} = 50$ lbs

South Antenna Mast



Centek Engineering		
TJL	CT11002A - Antenna Mount (South)	May 17, 2017 at 9:08 AM
17012.23	Member Shapes	Antenna Mount.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

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	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Pipe Mast	PIPE_5.0X	Beam	Pipe	A53 Grade B	Typical	5.73	19.5	19.5	39
2	Brace	L4x4x6	Beam	Pipe	A36 Gr.36	Typical	2.86	4.32	4.32	.141

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Pipe Mast	24			Lbyy						Lateral
2	M2	Brace	12.261			Lbyy						Lateral
3	M3	Brace	12.261			Lbyy						Lateral
4	M4	Brace	12.261			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N3			Pipe Mast	Beam	Pipe	A53 Grade...	Typical
2	M2	N2	N4			Brace	Beam	Pipe	A36 Gr.36	Typical
3	M3	N2	N6			Brace	Beam	Pipe	A36 Gr.36	Typical
4	M4	N2	N5			Brace	Beam	Pipe	A36 Gr.36	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	8.67	0	0	
3	N3	0	24	0	0	
4	N4	0	0	8.67	0	
5	N5	0	0	-8.67	0	
6	N6	8.67	0	0	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N4	Reaction	Reaction	Reaction			
3	N6	Reaction	Reaction	Reaction			
4	N5	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Weight of Equipment)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.444	20
2	M1	Y	-.15	14

Member Point Loads (BLC 3 : Wind X-Direction)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	1.052	20
2	M1	X	.249	14

Member Point Loads (BLC 4 : Wind Z-Direction)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	1.052	20
2	M1	Z	.249	14

Member Distributed Loads (BLC 3 : Wind X-Direction)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.023	.023	0	16

Member Distributed Loads (BLC 4 : Wind Z-Direction)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.023	.023	0	16

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Self Weight	DL		-1						
2	Weight of Equipment	DL					2			
3	Wind X-Direction	WLX					2	1		
4	Wind Z-Direction	WLZ					2	1		

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	IBC 16-8	Yes	Y		DL	1																		
2	IBC 16-9	Yes	Y		DL	1	LL	1	LLS	1														
3	IBC 16-10 (a)	Yes	Y		DL	1	RLL	1																
4	IBC 16-10 (b)	Yes	Y		DL	1	SL	1	SLN	1														
5	IBC 16-10 (c)	Yes	Y		DL	1	RL	1																
6	IBC 16-11 (a)	Yes	Y		DL	1	LL	.75	LLS	.75	RLL	.75												
7	IBC 16-11 (b)	Yes	Y		DL	1	LL	.75	LLS	.75	SL	.75	SLN	.75										
8	IBC 16-11 (c)	Yes	Y		DL	1	LL	.75	LLS	.75	RL	.75												
9	IBC 16-12 (a) (a)	Yes	Y		DL	1	W...	.6																
10	IBC 16-12 (a) (b)	Yes	Y		DL	1	W...	.6																
11	IBC 16-12 (a) (c)	Yes	Y		DL	1	W...	-.6																
12	IBC 16-12 (a) (d)	Yes	Y		DL	1	W...	-.6																
13	IBC 16-13 (a) (a)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	RLL	.75										
14	IBC 16-13 (a) (b)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	RLL	.75										
15	IBC 16-13 (a) (c)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	RLL	.75										
16	IBC 16-13 (a) (d)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	RLL	.75										
17	IBC 16-13 (b) (a)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	SL	.75	SLN	.75								
18	IBC 16-13 (b) (b)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	SL	.75	SLN	.75								
19	IBC 16-13 (b) (c)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	SL	.75	SLN	.75								
20	IBC 16-13 (b) (d)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	SL	.75	SLN	.75								
21	IBC 16-13 (c) (a)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	RL	.75										
22	IBC 16-13 (c) (b)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	RL	.75										
23	IBC 16-13 (c) (c)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	RL	.75										
24	IBC 16-13 (c) (d)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	RL	.75										
25	IBC 16-15 (a)	Yes	Y		DL	.6	W...	.6																
26	IBC 16-15 (b)	Yes	Y		DL	.6	W...	.6																
27	IBC 16-15 (c)	Yes	Y		DL	.6	W...	-.6																

Load Combinations (Continued)

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
28	IBC 16-15 (d)	Yes	Y		DL	.6	W...	-.6																

Envelope Joint Reactions

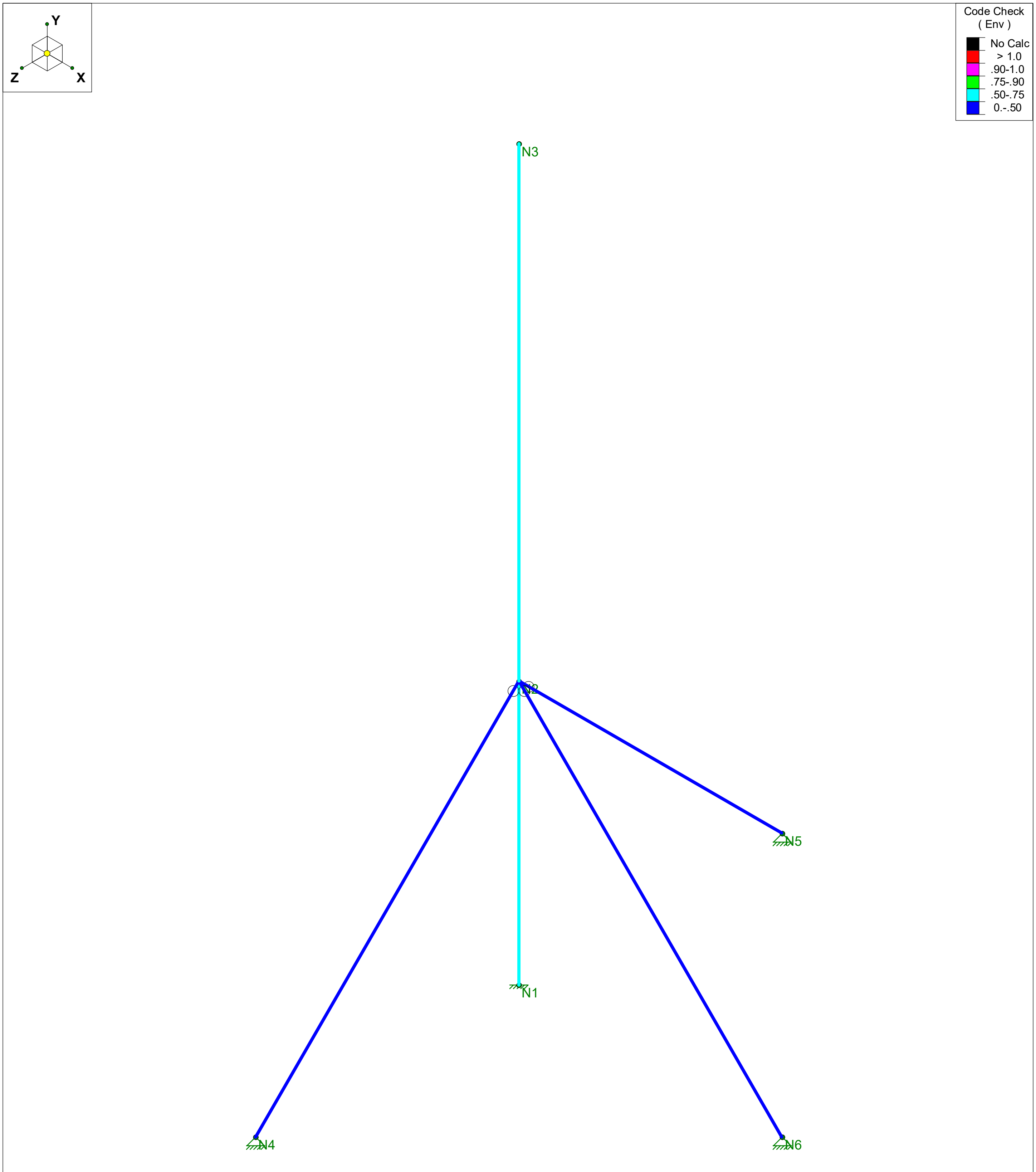
	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	1.377	9	2.697	11	1.385	10	4.02	10	0	26	3.945	11
2		min	-1.377	11	-1.185	25	-1.385	12	-4.02	12	0	28	-3.959	9
3	N4	max	0	12	1.403	10	1.096	28	0	1	0	1	0	1
4		min	0	11	-1.06	28	-1.344	10	0	1	0	1	0	1
5	N6	max	2.378	11	2.439	9	0	10	0	1	0	1	0	1
6		min	-2.379	9	-2.329	27	0	12	0	1	0	1	0	1
7	N5	max	0	10	1.403	12	1.344	12	0	1	0	1	0	1
8		min	0	11	-1.06	26	-1.096	26	0	1	0	1	0	1
9	Totals:	max	1.001	11	1.42	15	1.001	28						
10		min	-1.001	9	.852	25	-1.001	10						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	0	11	0	25	0	12	0	12	0	28	0	9
2		min	0	9	0	11	0	10	0	10	0	26	0	11
3	N2	max	.011	25	0	25	.005	10	5.946e-03	10	0	28	6.052e-03	11
4		min	-.013	11	-.002	11	-.005	12	-5.946e-03	12	0	26	-6.033e-03	9
5	N3	max	3.124	9	0	25	3.102	10	2.025e-02	10	0	28	2.036e-02	11
6		min	-3.129	11	-.003	11	-3.102	12	-2.025e-02	12	0	26	-2.034e-02	9
7	N4	max	0	11	0	28	0	10	-6.867e-04	26	2.636e-03	25	2.756e-03	27
8		min	0	12	0	10	0	28	-1.212e-03	12	-3.466e-03	11	-3.571e-03	9
9	N5	max	0	11	0	26	0	26	1.212e-03	10	2.638e-03	27	3.587e-03	11
10		min	0	10	0	12	0	12	6.867e-04	28	-3.463e-03	9	-2.746e-03	25
11	N6	max	0	9	0	27	0	12	2.672e-03	26	2.621e-03	28	1.254e-03	11
12		min	0	11	0	9	0	10	-3.499e-03	12	-3.448e-03	10	6.503e-04	25

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear...	Loc[ft]	Dir	LC	Pnc/om...	Pnt/om ...	Mnyy/o...	Mnzz/o...	Cb	Eqn
1	M1	PIPE_5.0X	.533	8.5	11	.042	8.5		10	35.337	120.09	16.592	16.592	1...	H1-1b
2	M2	L4x4x6	.206	6.386	10	.002	0	y	14	12.05	61.653	2.926	5.261	1...	H2-1
3	M3	L4x4x6	.328	6.386	9	.002	0	y	15	12.05	61.653	2.926	5.261	1...	H2-1
4	M4	L4x4x6	.206	6.386	12	.002	0	y	16	12.05	61.653	2.926	5.261	1...	H2-1



Envelope Only Solution

Centek Engineering	CT11002A - Antenna Mount (South)	
TJL		May 17, 2017 at 9:07 AM
17012.23	Unity Check	Antenna Mount.r3d

Mast Connection to Bottom Bracket:

Design Reactions:

Axial =	$Axial := -1.2 \cdot kips$	(User Input)
Shear =	$Shear := 1.4 \cdot kips$	(User Input)
Moment =	$Moment := 4 \cdot kips \cdot ft$	(User Input)

Bolt Data:

Use ASTM A325

Number of Bolts =	$N := 4$	(User Input)
Distance Between Bolts x-dir=	$S_x := 9 \cdot in$	(User Input)
Distance Between Bolts x-dir=	$S_y := 3.5 \cdot in$	(User Input)
Bolt Ultimate Strength =	$F_u := 120 \cdot ksi$	(User Input)
Bolt Yield Strength =	$F_y := 92 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Flange Bolts =	$D := 0.625 \cdot in$	(User Input)
Threads per Inch =	$n := 11$	(User Input)

Base Plate Data:

Base Plate Steel =	A36	(User Input)
Allowable Yield Stress =	$F_y := 36 \cdot ksi$	(User Input)
Base Plate Width =	$Pl_w := 12 \cdot in$	(User Input)
Base Plate Length =	$Pl_L := 6.5 \cdot in$	(User Input)
Base Plate Thickness =	$Pl_t := 0.75 \cdot in$	(User Input)
Pole Diameter =	$D_p := 5.625 \cdot in$	(User Input)

Base Plate Data:

Weld Grade	E70XX	(User Input)
Weld Yield Stress =	$F_{yw} := 70 \cdot ksi$	(User Input)
Weld Size =	$sw := 0.3125 \cdot in$	(User Input)

Bolt Analysis:

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 0.307 \cdot in^2$

Tensile Force Horizontal = $T_x := \frac{Moment}{S_x \cdot \frac{N}{2}} - \frac{Axial}{N} = 3 \cdot kips$

Tensile Force Horizontal = $T_y := \frac{Moment}{S_y \cdot \frac{N}{2}} - \frac{Axial}{N} = 7.2 \cdot kips$

Spacing Diagonal = $S_d := \sqrt{S_x^2 + S_y^2} = 9.7 \cdot in$

Tensile Force Diagonal = $T_D := \frac{Moment}{S_d} - \frac{Axial}{N} = 5.3 \cdot kips$

Maximum Tensile Force = $T_{Max} := \max(T_x, T_y, T_D) = 7.2 \cdot kips$

Allowable Tensile Force = $T_{ALL} := \frac{(0.75 \cdot F_u \cdot A_g)}{2} = 13.8 \cdot kips$

Bolt % of Capacity = $\frac{T_{Max}}{T_{ALL}} = 52 \cdot \%$

Condition1 = $Condition1 := if\left(\frac{T_{Max}}{T_{ALL}} \le 1.00, "OK", "Overstressed"\right)$

Condition1 = "OK"

Base Plate Check:

Allowable Bending Stress = $F_b := \frac{F_y}{1.67} = 21.557 \cdot ksi$

Moment Arm = $K := \frac{(S_x - D_p)}{2} = 1.69 \cdot in$

Moment in Base Plate = $M := K \cdot T_x \cdot 2 = 10.01 \cdot kips \cdot in$

Section Modulus = $S_Z := \frac{1}{4} \cdot Pl_L \cdot Pl_t^2 = 0.91 \cdot in^3$

Bending Stress = $f_b := \frac{M}{S_Z} = 10.95 \cdot ksi$

Condition2 := if($f_b < F_b$, "OK", "Overstressed")

Condition2 = "OK"

Base Plate to Mast Weld Check:

Allowable Weld Stress = $F_w := 0.3 \cdot F_{yw} = 21 \cdot ksi$

Weld Area = $A_w := \frac{\pi}{4} \cdot \left[(D_p + 2sw \cdot 0.707)^2 - D_p^2 \right] = 4.06 \cdot in^2$

Weld Moment of Inertia = $I_w := \frac{\pi}{64} \cdot \left[(D_p + 2sw \cdot 0.707)^4 - D_p^4 \right] = 17.36 \cdot in^4$

$c := \frac{D_p}{2} + sw \cdot 0.707 = 3.03 \cdot in$

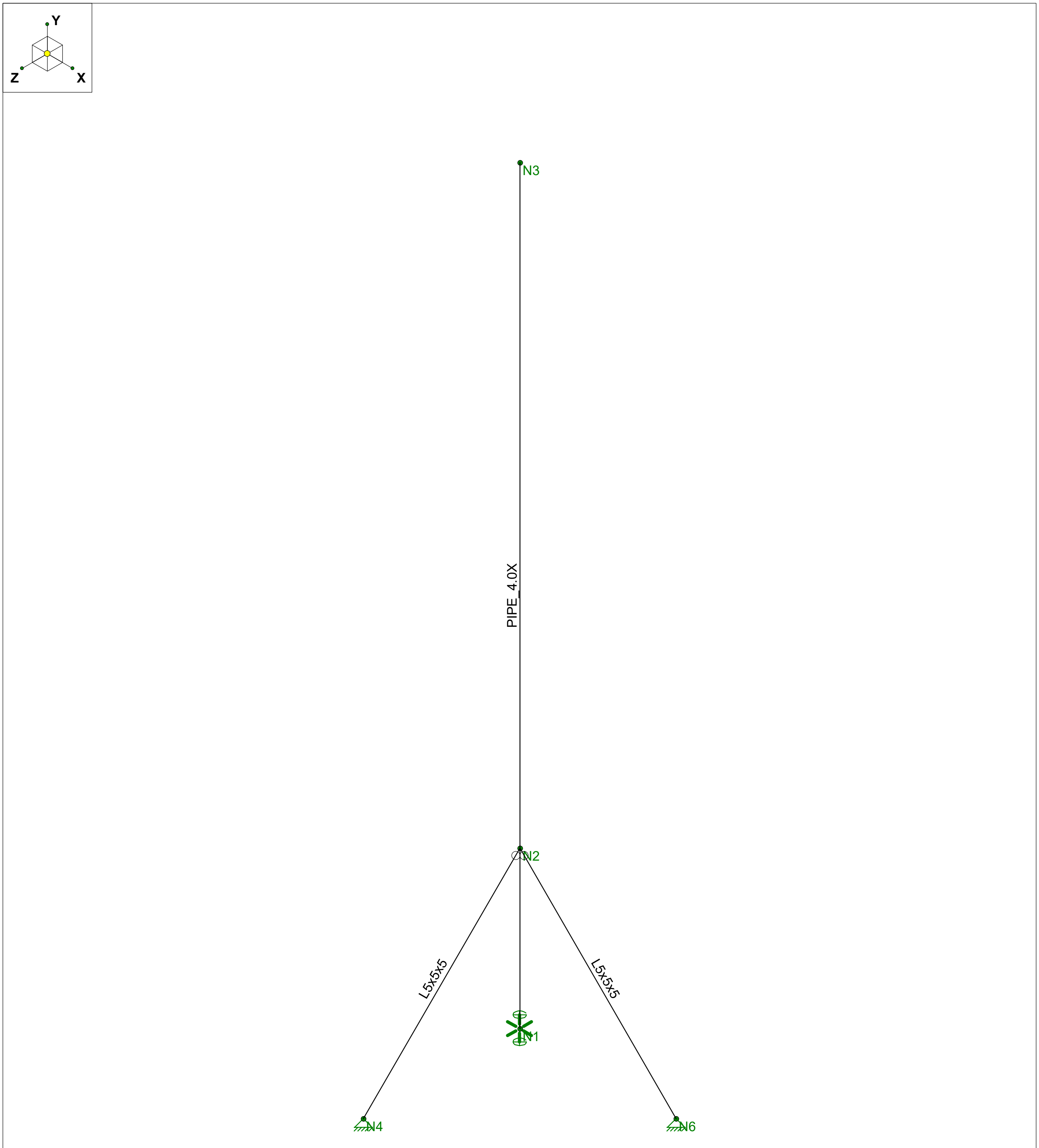
Section Modulus of Weld = $S_w := \frac{I_w}{c} = 5.72 \cdot in^3$

Weld Stress = $f_w := \frac{Moment}{S_w} + \frac{Shear}{A_w} = 8.73 \cdot ksi$

Condition3 := if($f_w < F_w$, "OK", "Overstressed")

Condition3 = "OK"

East Antenna Mast



Centek Engineering	CT11002A - Antenna Mount (East)	
TJL		May 17, 2017 at 9:56 AM
17012.23	Member Shapes	Antenna Mount.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

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	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Pipe Mast	PIPE_4.0X	Beam	Pipe	A53 Grade B	Typical	4.14	9.12	9.12	18.2
2	Brace	L5x5x5	Beam	Pipe	A36 Gr.36	Typical	3.07	7.44	7.44	.108

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Pipe Mast	24			Lbyy						Lateral
2	M2	Brace	7.071			Lbyy						Lateral
3	M3	Brace	7.071			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N3			Pipe Mast	Beam	Pipe	A53 Grade...	Typical
2	M2	N2	N4			Brace	Beam	Pipe	A36 Gr.36	Typical
3	M3	N2	N6			Brace	Beam	Pipe	A36 Gr.36	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	5	0	0	
3	N3	0	24	0	0	
4	N4	0	0	5	0	
5	N6	5	0	0	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction		Reaction	
2	N4	Reaction	Reaction	Reaction			
3	N6	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Weight of Equipment)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.396	21

Member Point Loads (BLC 3 : Wind X-Direction)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.65	21

Member Point Loads (BLC 4 : Wind Z-Direction)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.65	21

Member Distributed Loads (BLC 3 : Wind X-Direction)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.018	.018	0	18

Member Distributed Loads (BLC 4 : Wind Z-Direction)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.018	.018	0	18

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Self Weight	DL		-1						
2	Weight of Equipment	DL					1			
3	Wind X-Direction	WLX					1	1		
4	Wind Z-Direction	WLZ					1	1		

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	IBC 16-8	Yes	Y		DL	1																		
2	IBC 16-9	Yes	Y		DL	1	LL	1	LLS	1														
3	IBC 16-10 (a)	Yes	Y		DL	1	RLL	1																
4	IBC 16-10 (b)	Yes	Y		DL	1	SL	1	SLN	1														
5	IBC 16-10 (c)	Yes	Y		DL	1	RL	1																
6	IBC 16-11 (a)	Yes	Y		DL	1	LL	.75	LLS	.75	RLL	.75												
7	IBC 16-11 (b)	Yes	Y		DL	1	LL	.75	LLS	.75	SL	.75	SLN	.75										
8	IBC 16-11 (c)	Yes	Y		DL	1	LL	.75	LLS	.75	RL	.75												
9	IBC 16-12 (a) (a)	Yes	Y		DL	1	W...	.6																
10	IBC 16-12 (a) (b)	Yes	Y		DL	1	W...	.6																
11	IBC 16-12 (a) (c)	Yes	Y		DL	1	W...	-.6																
12	IBC 16-12 (a) (d)	Yes	Y		DL	1	W...	-.6																
13	IBC 16-13 (a) (a)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	RLL	.75										
14	IBC 16-13 (a) (b)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	RLL	.75										
15	IBC 16-13 (a) (c)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	RLL	.75										
16	IBC 16-13 (a) (d)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	RLL	.75										
17	IBC 16-13 (b) (a)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	SL	.75	SLN	.75								
18	IBC 16-13 (b) (b)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	SL	.75	SLN	.75								
19	IBC 16-13 (b) (c)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	SL	.75	SLN	.75								
20	IBC 16-13 (b) (d)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	SL	.75	SLN	.75								
21	IBC 16-13 (c) (a)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	RL	.75										
22	IBC 16-13 (c) (b)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	RL	.75										
23	IBC 16-13 (c) (c)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	RL	.75										
24	IBC 16-13 (c) (d)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	RL	.75										
25	IBC 16-15 (a)	Yes	Y		DL	.6	W...	.6																
26	IBC 16-15 (b)	Yes	Y		DL	.6	W...	.6																
27	IBC 16-15 (c)	Yes	Y		DL	.6	W...	-.6																
28	IBC 16-15 (d)	Yes	Y		DL	.6	W...	-.6																

Envelope Joint Reactions

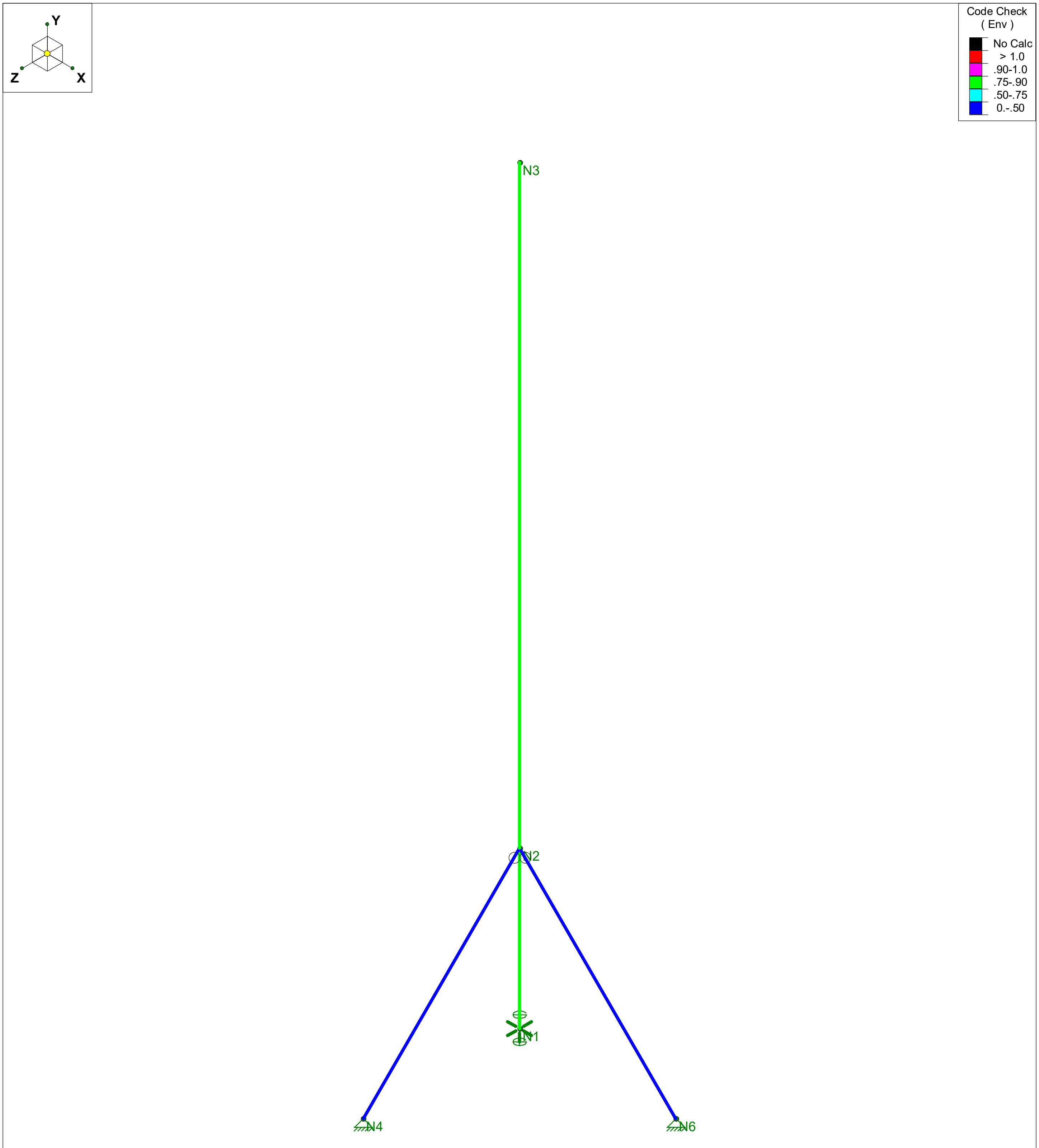
	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	1.478	9	2.87	11	1.478	10	0	1	0	10	0	1
2		min	-1.478	11	-1.547	25	-1.478	12	0	1	0	12	0	1
3	N4	max	0	12	2.1	10	2.063	12	0	1	0	1	0	1
4		min	0	1	-2.025	12	-2.062	10	0	1	0	1	0	1
5	N6	max	2.063	11	2.1	9	0	11	0	1	0	1	0	1
6		min	-2.062	9	-2.025	11	0	1	0	1	0	1	0	1
7	Totals:	max	.584	11	.882	15	.584	12						
8		min	-.584	9	.529	25	-.584	10						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	0	11	0	25	0	12	4.057e-03	12	0	12	4.073e-03	9
2		min	0	9	0	11	0	10	-4.073e-03	10	0	10	-4.057e-03	11
3	N2	max	.006	25	0	25	.006	26	8.654e-03	10	0	12	8.669e-03	11
4		min	-.007	11	-.002	11	-.007	12	-8.669e-03	12	0	10	-8.654e-03	9
5	N3	max	8.429	9	0	25	8.429	10	4.773e-02	10	0	12	4.774e-02	11
6		min	-8.433	11	-.003	11	-8.433	12	-4.774e-02	12	0	10	-4.773e-02	9
7	N4	max	0	1	0	12	0	10	-2.802e-05	26	4.22e-03	9	4.331e-03	11
8		min	0	12	0	10	0	12	-2.116e-04	12	-4.338e-03	11	-4.434e-03	9
9	N6	max	0	9	0	11	0	1	4.315e-03	10	4.219e-03	12	2.116e-04	11
10		min	0	11	0	9	0	11	-4.449e-03	12	-4.338e-03	10	2.802e-05	25

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear...	Loc[ft]	Dir	LC	Pnc/om...	Pnt/om ...	Mnyy/o...	Mnzz/o...	Cb	Eqn
1	M1	PIPE_4.0X	.864	5	11	.059	5		9	16.527	86.766	9.658	9.658	1...	H1-1b
2	M2	L5x5x5	.081	3.609	10	.001	7.071	y	10	42.404	66.18	4.247	7.866	1...	H2-1
3	M3	L5x5x5	.081	3.609	9	.001	7.071	y	11	42.404	66.18	4.247	7.866	1...	H2-1



Envelope Only Solution

Centek Engineering		
TJL	CT11002A - Antenna Mount (East)	May 17, 2017 at 9:56 AM
17012.23	Unity Check	Antenna Mount.r3d

CENTEK engineering
Centered on Solutions™ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	Antenna Mast Bolts and Baseplate
Location:	Milford, CT
Rev. 0: 5/17/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17012.23

Mast Connection to Bottom Bracket:

Design Reactions:

Axial =	$Axial := -1.6 \cdot kips$	(User Input)
Shear =	$Shear := 1.5 \cdot kips$	(User Input)
Moment =	$Moment := 0 \cdot kips \cdot ft$	(User Input)

Bolt Data:

Use ASTM A325

Number of Bolts =	$N := 4$	(User Input)
Distance Between Bolts x-dir=	$S_x := 8.5 \cdot in$	(User Input)
Distance Between Bolts x-dir=	$S_y := 4 \cdot in$	(User Input)
Bolt Ultimate Strength =	$F_u := 120 \cdot ksi$	(User Input)
Bolt Yield Strength =	$F_y := 92 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Flange Bolts =	$D := 0.5 \cdot in$	(User Input)
Threads per Inch =	$n := 13$	(User Input)

Base Plate Data:

Base Plate Steel =	A36	(User Input)
Allowable Yield Stress =	$F_y := 36 \cdot ksi$	(User Input)
Base Plate Width =	$Pl_w := 10.5 \cdot in$	(User Input)
Base Plate Length =	$Pl_L := 6.5 \cdot in$	(User Input)
Base Plate Thickness =	$Pl_t := 0.375 \cdot in$	(User Input)
Pole Diameter =	$D_p := 4.5 \cdot in$	(User Input)

Base Plate Data:

Weld Grade	E70XX	(User Input)
Weld Yield Stress =	$F_{yw} := 70 \cdot ksi$	(User Input)
Weld Size =	$sw := 0.1875 \cdot in$	(User Input)

Bolt Analysis:

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 0.196 \cdot in^2$

Tensile Force Horizontal = $T_x := \frac{Moment}{S_x \cdot \frac{N}{2}} - \frac{Axial}{N} = 0.4 \cdot kips$

Tensile Force Horizontal = $T_y := \frac{Moment}{S_y \cdot \frac{N}{2}} - \frac{Axial}{N} = 0.4 \cdot kips$

Spacing Diagonal = $S_d := \sqrt{{S_x}^2 + {S_y}^2} = 9.4 \cdot in$

Tensile Force Diagonal = $T_D := \frac{Moment}{S_d} - \frac{Axial}{N} = 0.4 \cdot kips$

Maximum Tensile Force = $T_{Max} := \max(T_x, T_y, T_D) = 0.4 \cdot kips$

Allowable Tensile Force = $T_{ALL} := \frac{(0.75 \cdot F_u \cdot A_g)}{2} = 8.8 \cdot kips$

Bolt % of Capacity = $\frac{T_{Max}}{T_{ALL}} = 5 \cdot \%$

Condition1 = $Condition1 := if\left(\frac{T_{Max}}{T_{ALL}} \le 1.00, \text{"OK"}, \text{"Overstressed"}\right)$

$Condition1 = \text{"OK"}$

Base Plate Check:

Allowable Bending Stress = $F_b := \frac{F_y}{1.67} = 21.557 \cdot ksi$

Moment Arm = $K := \frac{(S_x - D_p)}{2} = 2 \cdot in$

Moment in Base Plate = $M := K \cdot T_x \cdot 2 = 1.6 \cdot kips \cdot in$

Section Modulus = $S_Z := \frac{1}{4} \cdot Pl_L \cdot Pl_t^{\,2} = 0.23 \cdot in^3$

Bending Stress = $f_b := \frac{M}{S_Z} = 7 \cdot ksi$

Condition2 := if($f_b < F_b$, "OK", "Overstressed")

Condition2 = "OK"

Base Plate to Mast Weld Check:

Allowable Weld Stress = $F_w := 0.3 \cdot F_{yw} = 21 \cdot ksi$

Weld Area = $A_w := \frac{\pi}{4} \cdot \left[\left(D_p + 2sw \cdot 0.707\right)^2 - D_p^{\,2} \right] = 1.93 \cdot in^2$

Weld Moment of Inertia = $I_w := \frac{\pi}{64} \cdot \left[\left(D_p + 2sw \cdot 0.707\right)^4 - D_p^{\,4} \right] = 5.18 \cdot in^4$

$c := \frac{D_p}{2} + sw \cdot 0.707 = 2.38 \cdot in$

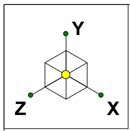
Section Modulus of Weld = $S_w := \frac{I_w}{c} = 2.17 \cdot in^3$

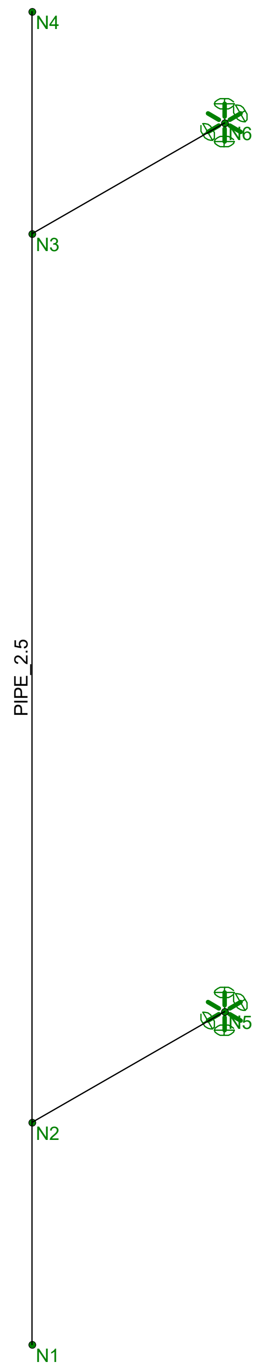
Weld Stress = $f_w := \frac{Moment}{S_w} + \frac{Shear}{A_w} = 0.78 \cdot ksi$

Condition3 := if($f_w < F_w$, "OK", "Overstressed")

Condition3 = "OK"

Delta Sector Antenna Mast





Centek Engineering		
TJL	CT11002A - Antenna Mount (Delta Sector)	May 17, 2017 at 10:33 AM
17012.23	Member Shapes	Antenna Mount.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

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	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Pipe Mast	PIPE_2.5	Beam	Pipe	A53 Grade B	Typical	1.61	1.45	1.45	2.89

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Pipe Mast	6			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N4			Pipe Mast	Beam	Pipe	A53 Grade...	Typical
2	M2	N3	N6			RIGID	None	None	RIGID	Typical
3	M3	N2	N5			RIGID	None	None	RIGID	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	1	0	0	
3	N3	0	5	0	0	
4	N4	0	6	0	0	
5	N5	0	1	-1	0	
6	N6	0	5	-1	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N5	Reaction	Reaction	Reaction		Reaction	Reaction
2	N6	Reaction	Reaction	Reaction		Reaction	Reaction

Member Point Loads (BLC 2 : Weight of Equipment)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.132	%50

Member Point Loads (BLC 3 : Wind X-Direction)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.164	%50

Member Point Loads (BLC 4 : Wind Z-Direction)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.243	%50

Member Distributed Loads (BLC 3 : Wind X-Direction)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.012	.012	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Self Weight	DL		-1						
2	Weight of Equipment	DL					1			
3	Wind X-Direction	WLX					1	1		
4	Wind Z-Direction	WLZ					1			

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	IBC 16-8	Yes	Y		DL	1																		
2	IBC 16-9	Yes	Y		DL	1	LL	1	LLS	1														
3	IBC 16-10 (a)	Yes	Y		DL	1	RLL	1																
4	IBC 16-10 (b)	Yes	Y		DL	1	SL	1	SLN	1														
5	IBC 16-10 (c)	Yes	Y		DL	1	RL	1																
6	IBC 16-11 (a)	Yes	Y		DL	1	LL	.75	LLS	.75	RLL	.75												
7	IBC 16-11 (b)	Yes	Y		DL	1	LL	.75	LLS	.75	SL	.75	SLN	.75										
8	IBC 16-11 (c)	Yes	Y		DL	1	LL	.75	LLS	.75	RL	.75												
9	IBC 16-12 (a) (a)	Yes	Y		DL	1	W...	.6																
10	IBC 16-12 (a) (b)	Yes	Y		DL	1	W...	.6																
11	IBC 16-12 (a) (c)	Yes	Y		DL	1	W...	-.6																
12	IBC 16-12 (a) (d)	Yes	Y		DL	1	W...	-.6																
13	IBC 16-13 (a) (a)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	RLL	.75										
14	IBC 16-13 (a) (b)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	RLL	.75										
15	IBC 16-13 (a) (c)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	RLL	.75										
16	IBC 16-13 (a) (d)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	RLL	.75										
17	IBC 16-13 (b) (a)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	SL	.75	SLN	.75								
18	IBC 16-13 (b) (b)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	SL	.75	SLN	.75								
19	IBC 16-13 (b) (c)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	SL	.75	SLN	.75								
20	IBC 16-13 (b) (d)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	SL	.75	SLN	.75								
21	IBC 16-13 (c) (a)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	RL	.75										
22	IBC 16-13 (c) (b)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75	RL	.75										
23	IBC 16-13 (c) (c)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	RL	.75										
24	IBC 16-13 (c) (d)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75	RL	.75										
25	IBC 16-15 (a)	Yes	Y		DL	.6	W...	.6																
26	IBC 16-15 (b)	Yes	Y		DL	.6	W...	.6																
27	IBC 16-15 (c)	Yes	Y		DL	.6	W...	-.6																
28	IBC 16-15 (d)	Yes	Y		DL	.6	W...	-.6																

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	N5	max	.071	27	.155	12	.114	12	0	1	.071	11	.055	9
2		min	-.071	25	-.023	26	-.048	26	0	1	-.071	9	-.055	11
3	N6	max	.071	11	.155	10	.048	28	0	1	.071	27	.055	27
4		min	-.071	9	-.023	28	-.114	10	0	1	-.071	25	-.055	25

Envelope Joint Reactions (Continued)

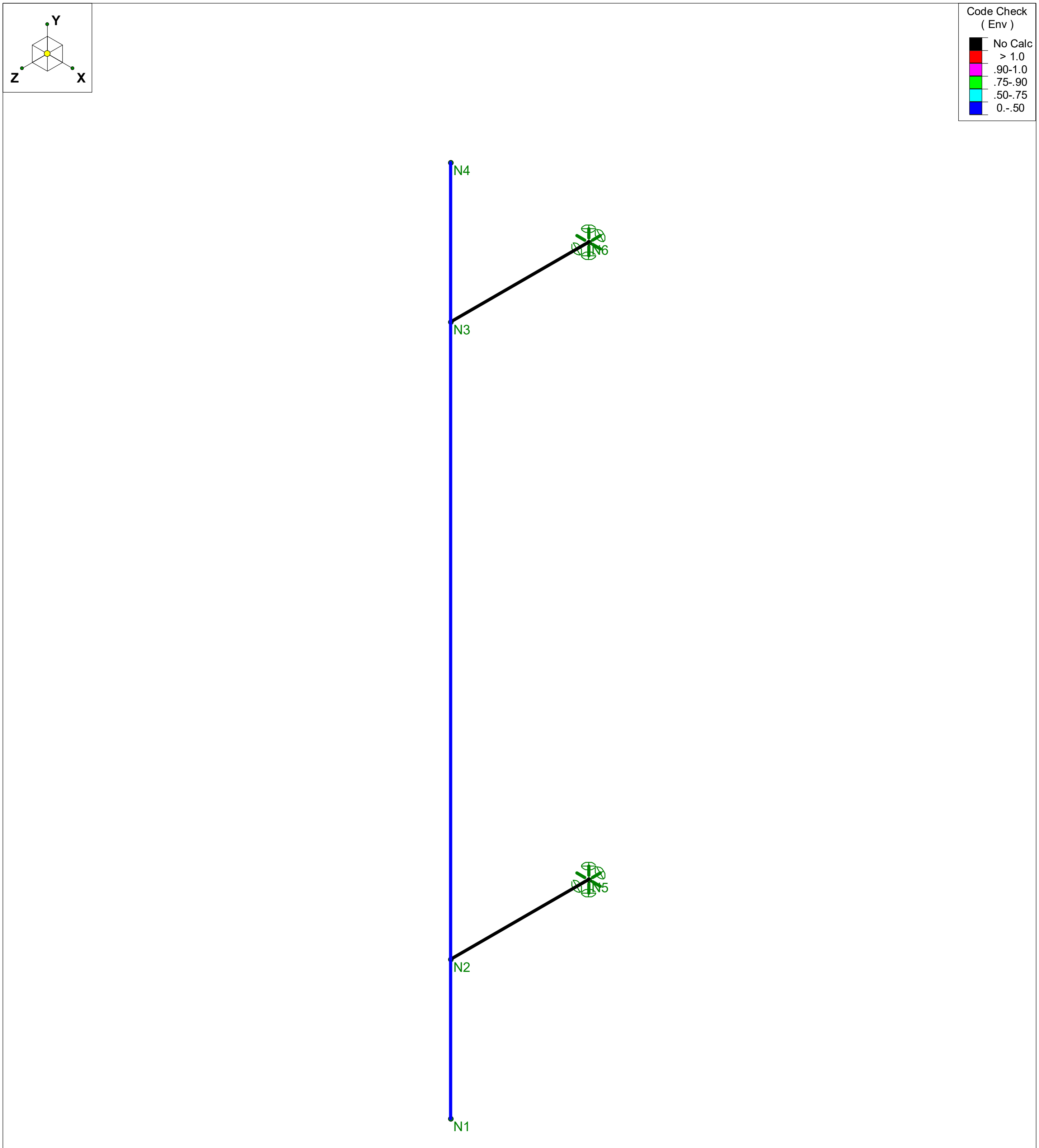
	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
5	Totals:	max	.142	11	.165	1	.146	12						
6		min	-.142	9	.099	28	-.146	10						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	0	25	-.002	28	-.002	28	2.433e-04	10	0	9	5.137e-06	25
2		min	0	27	-.003	10	-.003	10	1.399e-04	28	0	11	-5.137e-06	27
3	N2	max	0	9	-.002	28	0	26	2.433e-04	10	0	9	0	11
4		min	0	11	-.003	10	0	12	1.399e-04	28	0	11	0	9
5	N3	max	0	25	-.002	26	0	10	2.435e-04	12	0	25	0	25
6		min	0	27	-.003	12	0	28	1.398e-04	26	0	27	0	27
7	N4	max	0	9	-.002	26	.003	12	2.435e-04	12	0	25	5.137e-06	11
8		min	0	11	-.003	12	.002	26	1.398e-04	26	0	27	-5.137e-06	9
9	N5	max	0	25	0	26	0	26	2.433e-04	10	0	9	0	11
10		min	0	27	0	12	0	12	1.399e-04	28	0	11	0	9
11	N6	max	0	9	0	28	0	10	2.435e-04	12	0	25	0	25
12		min	0	11	0	10	0	28	1.398e-04	26	0	27	0	27

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear...	Loc[ft]	Dir	LC	Pnc/om...	Pnt/om ...	Mnyy/o...	Mnzz/o...	Cb	Eqn
1	M1	PIPE_2.5	.068	1	12	.011	1		12	25.132	33.743	2.393	2.393	1	H1-1b



Envelope Only Solution

Centek Engineering		
TJL	CT11002A - Antenna Mount (Delta Sector)	May 17, 2017 at 10:33 AM
17012.23	Unity Check	Antenna Mount.r3d

Mast Connection to Bottom Bracket:

Design Reactions:

Axial =	$Vertical := .155 \cdot kips$	(User Input)
Shear X =	$Shear_x := .071 \cdot kips$	(User Input)
Shear Z =	$Shear_z := .114 \cdot kips$	(User Input)
Moment X =	$Moment_x := 0 \cdot kips \cdot ft$	(User Input)
Moment Y =	$Moment_y := .071 \cdot kips \cdot ft$	(User Input)
Moment Z =	$Moment_z := .055 \cdot kips \cdot ft$	(User Input)

Bolt Data:

5/8" Threaded Rod w/ Hilty HY70 Adhesive

Number of Bolts =	$N := 2$	(User Input)
Distance Between Bolts x-dir=	$S_x := 12 \cdot in$	(User Input)
Diameter of Flange Bolts =	$D := 0.625 \cdot in$	(User Input)
Allowable Tensile Force =	$T_{ALL} := 2840 \cdot lb$	
Allowable Shear Force =	$V_{ALL} := 2615 \cdot lb$	
Load Reduction Factor Tension =	$T_{LRF} := 0.72$	
Load Reduction Factor Shear =	$V_{LRF} := 0.72$	

Bolt Analysis:

Max Tension Force =

$$T_{Max} := \frac{Shear_z}{N} + \frac{Moment_y}{S_x} = 128 lb$$

Max Shear Force =

$$V_{Max} := \frac{Shear_x + Vertical}{N} + \frac{Moment_z}{S_x} = 168 lb$$

Bolt % of Capacity =

$$\frac{T_{Max}}{T_{ALL} \cdot T_{LRF}} + \frac{V_{Max}}{V_{ALL} \cdot V_{LRF}} = 15 \cdot \%$$

Condition1 =

$$Condition1 := if\left(\frac{T_{Max}}{T_{ALL} \cdot T_{LRF}} + \frac{V_{Max}}{V_{ALL} \cdot V_{LRF}} \le 1.00, "OK", "Overstressed"\right)$$

Condition1 = "OK"

Section 1 - Site Information

Site ID: CT11002A
Status: Draft
Version: 1.1
Project Type: Capacity-L1900
Approved: Not Approved
Approved By: Not Approved
Last Modified: 3/10/2017 10:56:02 AM
Last Modified By: GSM1900\SCLEMONS

Site Name: Milford / I-95 /1
Site Class: Roof Top Mount
Site Type: Building
Solution Type:
Plan Year:
Market: CONNECTICUT
Vendor: Ericsson
Landlord: <undefined>

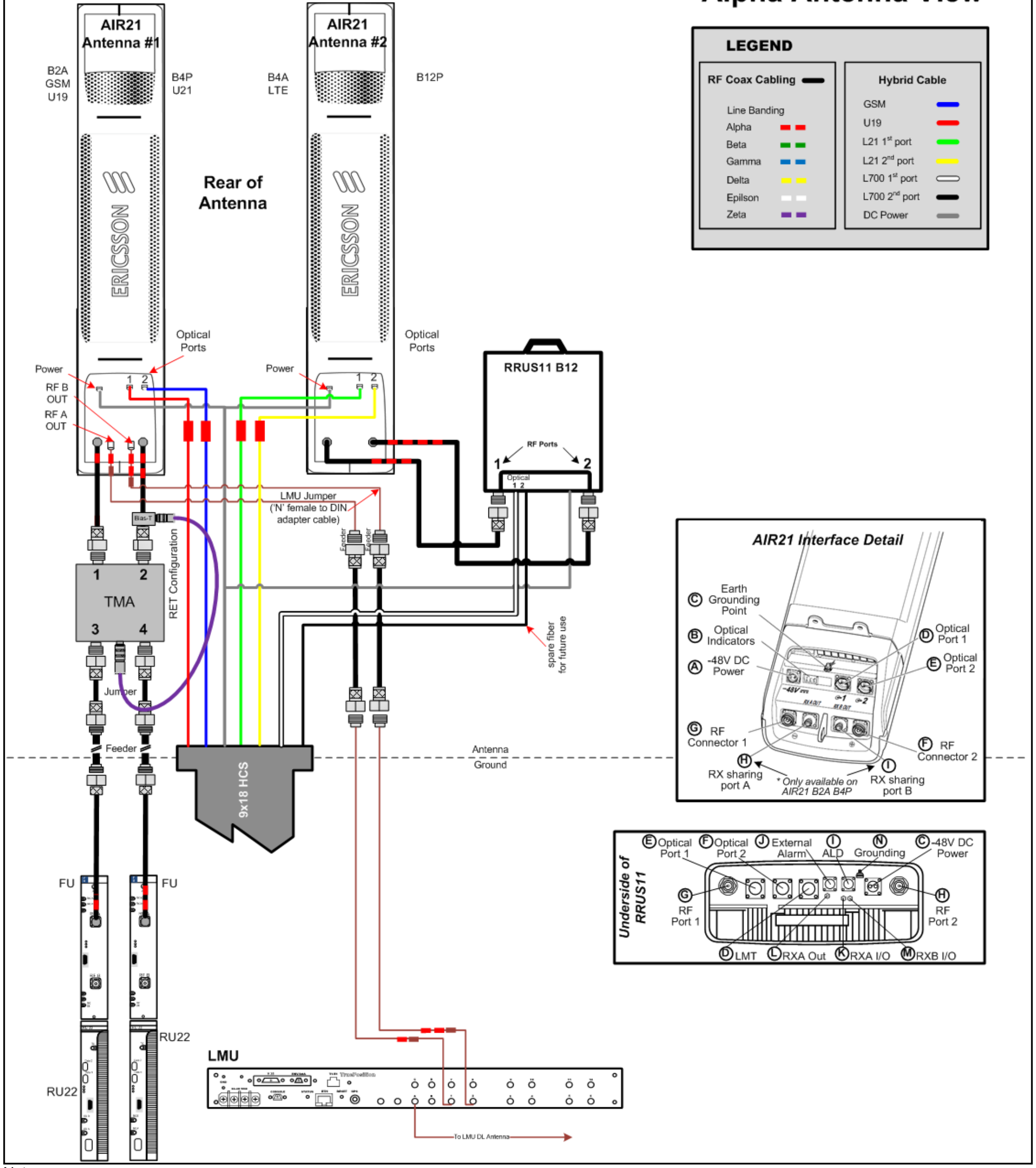
Latitude: 41.23656000
Longitude: -73.03394400
Address: 1201 Boston Post Road (CT Post Mall - Kitchen Etc)
City, State: Milford, CT
Region: NORTHEAST

RAN Template: 4Sec-792DBE Hybrid			**AL Template:** 4Sec-792DBE_2AIR	
Sector Count: 4	**Antenna Count:** 8	**Coax Line Count:** 6	**TMA Count:** 0	**RRU Count:** 4

Section 2 - Existing Template Images

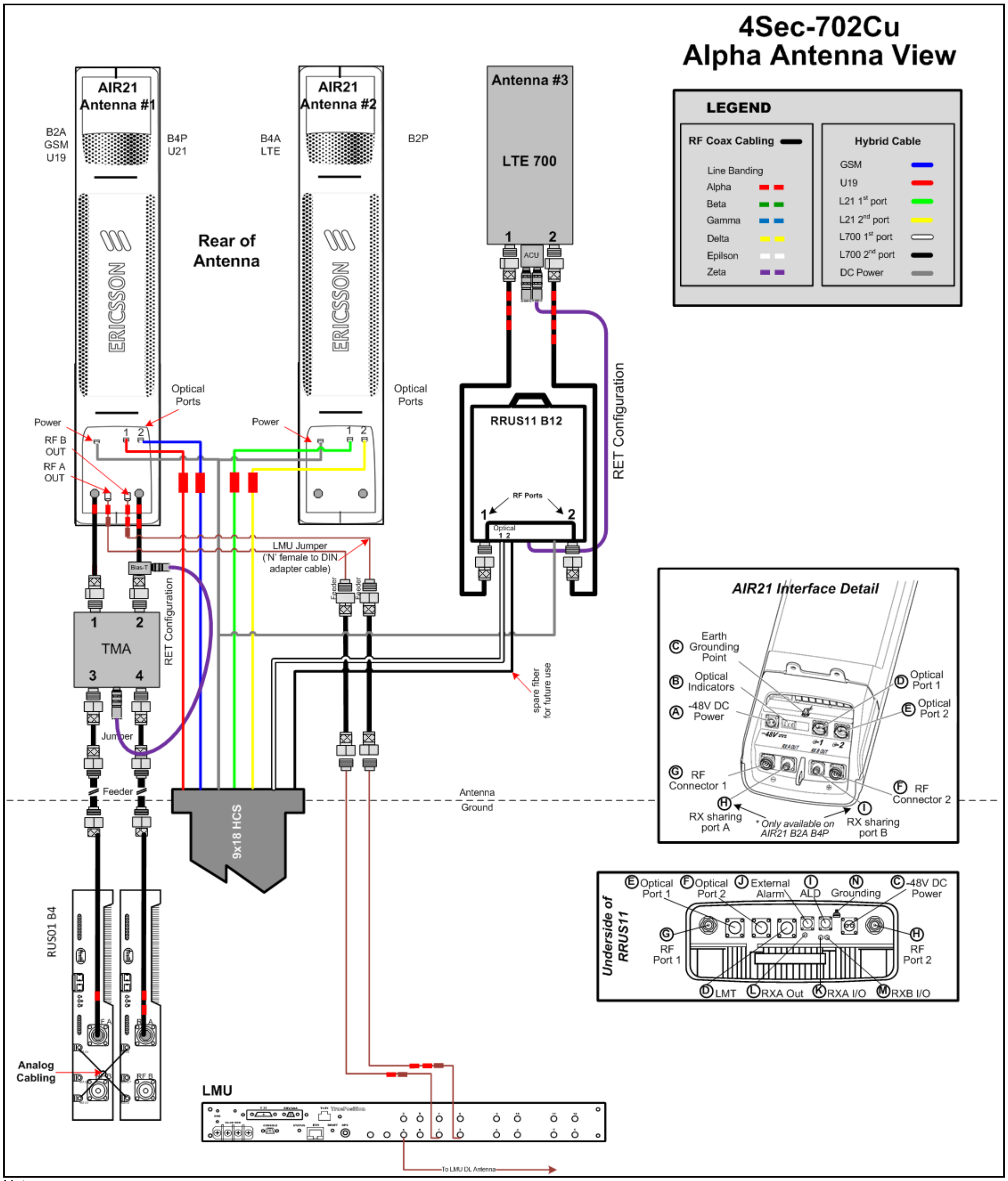
AL_702Cc.png

702Cc
Alpha Antenna View



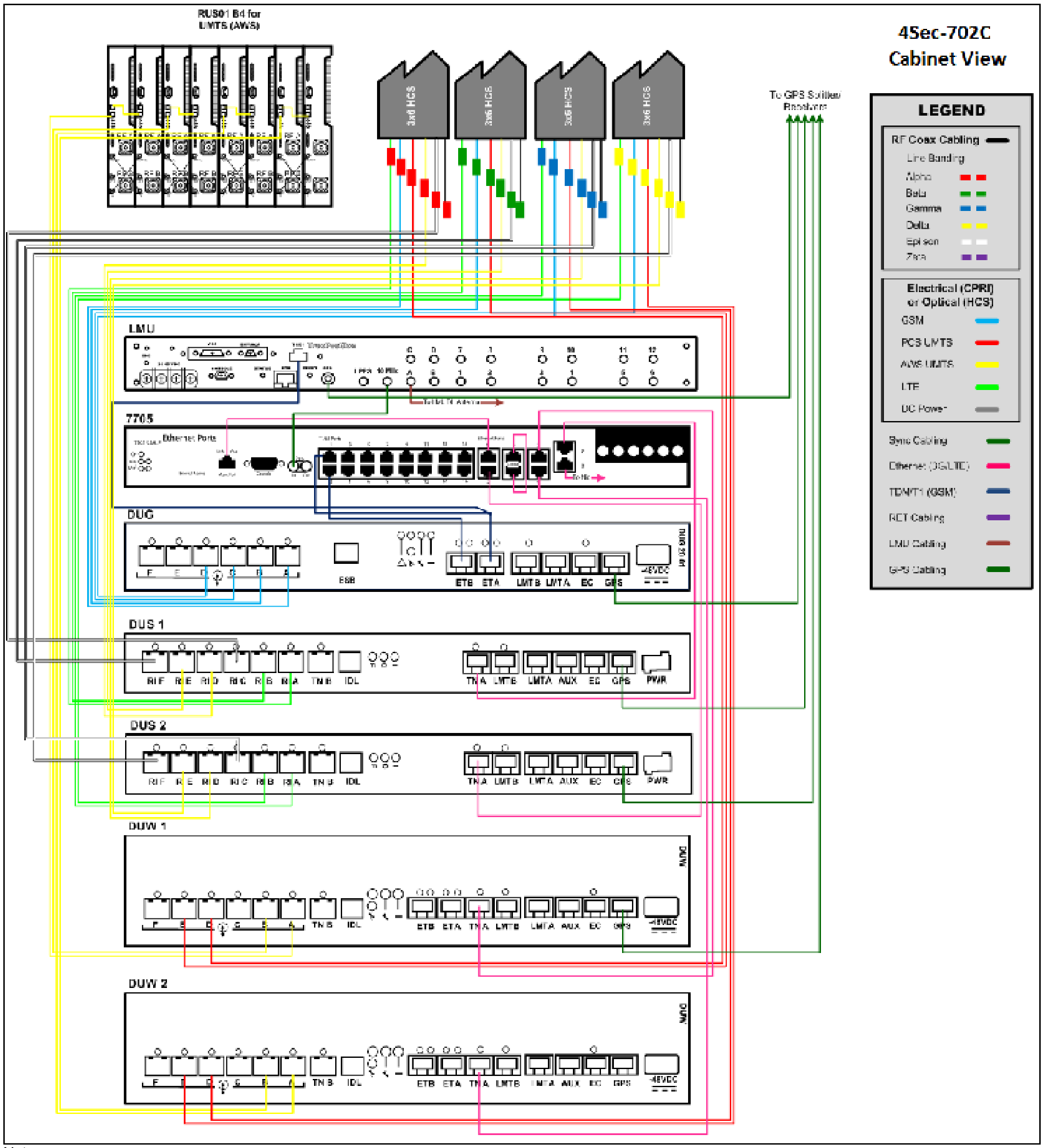
Notes:

AL_4Sec-702Cu.png



Notes:

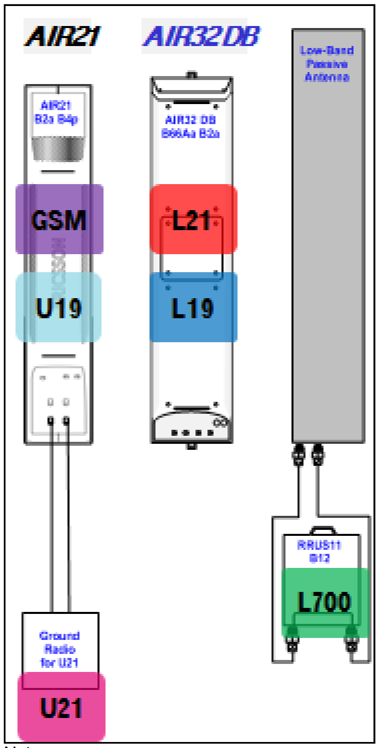
RAN_4Sec-702C.png



4Sec-702C
Cabinet View
LEGEND
RF Coax Cabling
Line Banding
Alpha
Beta
Gamma
Delta
Epsilon
Zeta
Electrical (CPRI) or Optical (HCS)
GSM
PCS UMTS
AWS UMTS
LTE
DC Power
Sync Cabling
Ethernet (3G/LTE)
TDM/T1 (GSM)
RET Cabling
LMU Cabling
GPS Cabling
To GPS Splitter Receivers
LMU
7705
DUG
DUS 1
DUS 2
DUW 1
DUW 2

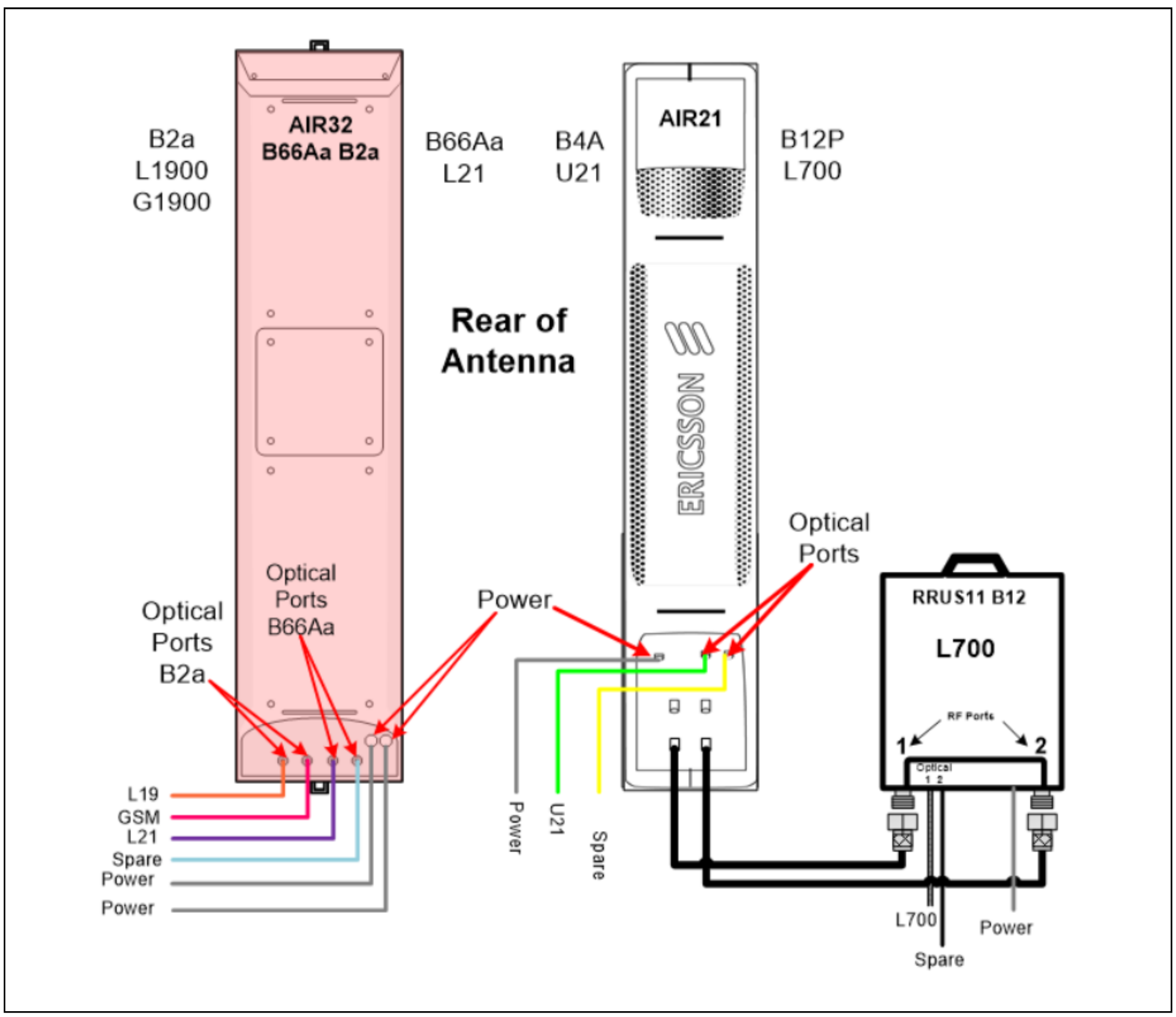
Notes:

4Sec-792DB_2xAIR+1DP.png



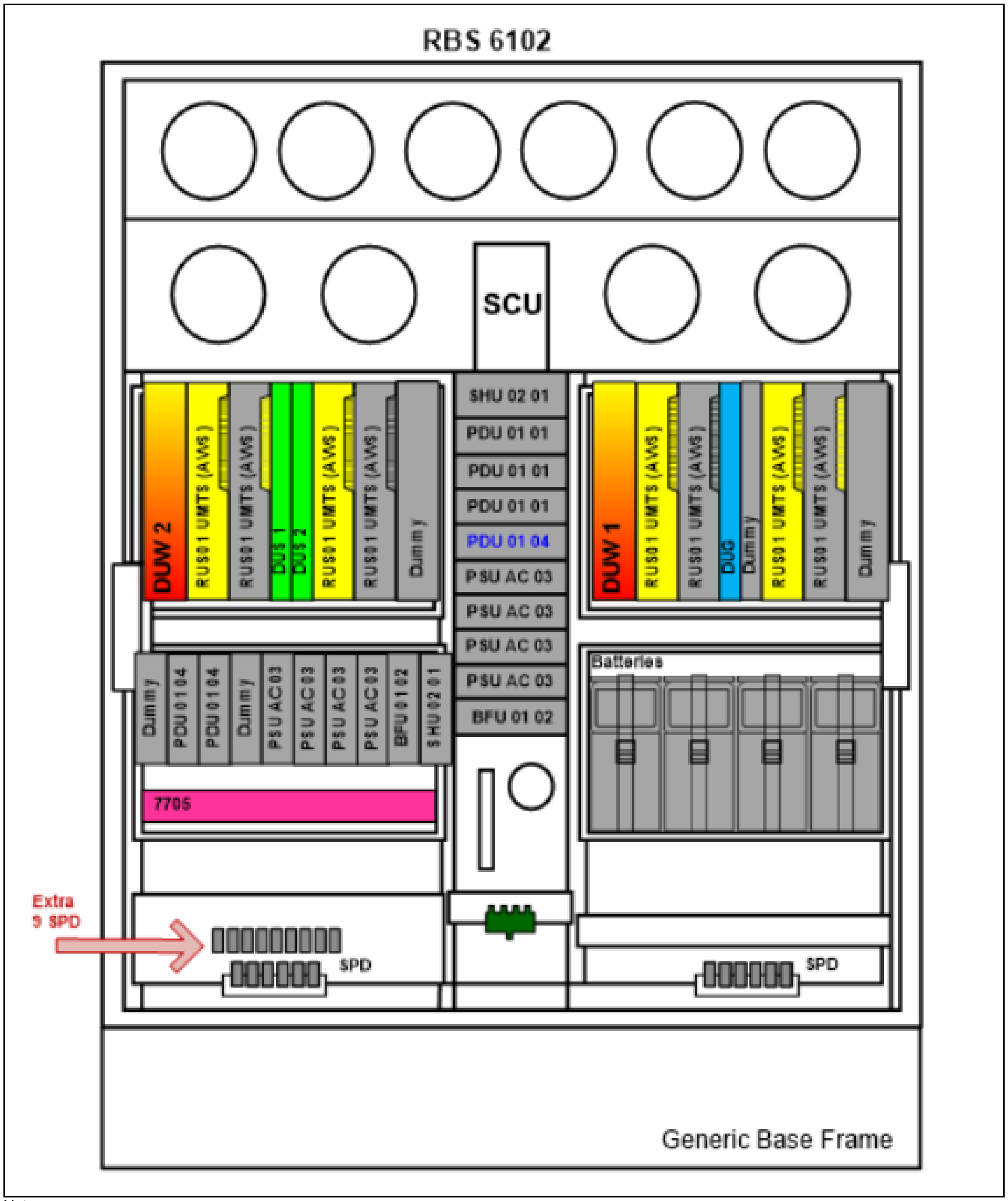
Notes:

4Sec-792DBE.PNG



Notes:

4Sec-792DB 6102 Cabinet.PNG



Notes:

Section 4 - Siteplan Images

----- This section is intentionally blank. -----

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 4Sec-702C

Enclosure	1	2
Enclosure Type	RBS 6102	Tower Top Mount
Baseband	DUS41 **(x2)** (L2100, L700); DUW30 (U2100); DUW30 (U1900); DUG20 (G1900)	
Hybrid Cable System		Ericsson 9x18 HCS *Select Length*; Ericsson 6x12 HCS *Select AWG & Length*
Multiplexer	XMU	
Radio	RU22 **(x6)** (U2100, U1900)	RRUS11 B12 **(x4)** (L700)

Proposed RAN Equipment

Template: 4Sec-792DBE Hybrid

Enclosure	1	2
Enclosure Type	RBS 6102	Ancillary Equipment
Baseband	DUG20 (G1900); DUW30 (U2100); DUW30 (U1900 (DARK)); DUS41 **(x2)**	
Hybrid Cable System		Ericsson 3x6 HCS *Select Length* **(x4)**; Ericsson 6x12 HCS *Select Length & AWG* **(x2)**
Multiplexer	XMU	
Radio	RUS01 B4 **(x6)** (U2100 (DARK))	

RAN Scope of Work:

Prep work:
Shutdown U19,
Conver AWS-UMTS RBB to RBB12 using only one B4 radio per sector.

RAN Template: 4Sec-792DBE Hybrid	A&L Template: 4Sec-792DBE_2AIR

Section 6 - A&L Equipment

Existing Template: 4Sec-702Cu_1DP_2xAir
Proposed Template: 4Sec-792DBE_2AIR

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro			
Antenna	1		2	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 B4A/B12P 8ft (Quad)	
Azimuth	75		75	
M. Tilt	0		0	
Height	43		43	
Ports	P1	P2	P3	P4
Active Tech.	U1900 G1900	U2100	L2100	L700
Dark Tech.				
Restricted Tech.				
Decomm. Tech.				
E. Tilt	2	2	2	2
Cables	Fiber Jumper Fiber Jumper	7/8" Coax - 48 ft. 7/8" Coax - 48 ft.	Fiber Jumper Fiber Jumper	Fiber Jumper Fiber Jumper
TMAs		Generic Style 1B - Twin AWS		
Diplexers / Combiners				
Radio				
Sector Equipment				

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
4Sec-792DBE Hybrid	4Sec-792DBE_2AIR

CT11002A_1.1_Capacity-L1900

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	Ericsson - AIR21 B4A/B12P 6ft (Quad)		Ericsson - AIR32 KRD901146-1_B66A_B2A (Octa)			
Azimuth	75		75			
M. Tilt	0		0			
Height	43		43			
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	U2100	L700	L2100	L2100	L1900 G1900	L1900
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2	2	2
Cables		Generic Feeder Coax Generic Feeder Coax				
TMAs						
Diplexers / Combiners						
Radio		RRUS11 B12				
Sector Equipment						

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
4Sec-792DBE Hybrid	4Sec-792DBE_2AIR

CT11002A_1.1_Capacity-L1900

Sector 2 (Existing) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1		2	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 B4A/B12P 8ft (Quad)	
Azimuth	190		190	
M. Tilt	0		0	
Height	43		43	
Ports	P1	P2	P3	P4
Active Tech.	U1900 G1900	U2100	L2100	L700
Dark Tech.				
Restricted Tech.				
Decomm. Tech.				
E. Tilt	2	2	2	2
Cables	Fiber Jumper Fiber Jumper	7/8" Coax - 48 ft. 7/8" Coax - 48 ft.	Fiber Jumper Fiber Jumper	Fiber Jumper Fiber Jumper
TMAs		Generic Style 1B - Twin AWS		
Diplexers / Combiners				
Radio				
Sector Equipment				

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
4Sec-792DBE Hybrid	4Sec-792DBE_2AIR

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	Ericsson - AIR21 B4A/B12P 6ft (Quad)		Ericsson - AIR32 KRD901146-1_B66A_B2A (Octa)			
Azimuth	190		190			
M. Tilt	0		0			
Height	43		43			
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	U2100	L700	L2100	L2100	L1900 G1900	L1900
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2	2	2
Cables		Generic Feeder Coax Generic Feeder Coax				
TMAs						
Diplexers / Combiners						
Radio		RRUS11 B12				
Sector Equipment						

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
4Sec-792DBE Hybrid	4Sec-792DBE_2AIR

CT11002A_1.1_Capacity-L1900

Sector 3 (Existing) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1		2	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 B4A/B12P 8ft (Quad)	
Azimuth	320		320	
M. Tilt	0		0	
Height	43		43	
Ports	P1	P2	P3	P4
Active Tech.	U1900 G1900	U2100	L2100	L700
Dark Tech.				
Restricted Tech.				
Decomm. Tech.				
E. Tilt	2	2	2	2
Cables	Fiber Jumper Fiber Jumper	7/8" Coax - 48 ft. 7/8" Coax - 48 ft.	Fiber Jumper Fiber Jumper	Fiber Jumper Fiber Jumper
TMAs		Generic Style 1B - Twin AWS		
Diplexers / Combiners				
Radio				
Sector Equipment				

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
4Sec-792DBE Hybrid	4Sec-792DBE_2AIR

Sector 3 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	Ericsson - AIR21 B4A/B12P 6ft (Quad)		Ericsson - AIR32 KRD901146-1_B66A_B2A (Octa)			
Azimuth	320		320			
M. Tilt	0		0			
Height	43		43			
Ports	P2	P1	P6	P5	P4	P3
Active Tech.	L700	U2100	L1900	L1900 G1900	L2100	L2100
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2	2	2
Cables	Generic Feeder Coax Generic Feeder Coax					
TMAs						
Diplexers / Combiners						
Radio	RRUS11 B12					
Sector Equipment						

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
4Sec-792DBE Hybrid	4Sec-792DBE_2AIR

CT11002A_1.1_Capacity-L1900

Sector 4 (Existing) view from behind		
Coverage Type	A - Outdoor Macro	
Antenna	1	
Antenna Model	Ericsson - AIR21 B4A/B12P 8ft (Quad)	
Azimuth	250	
M. Tilt	0	
Height	41	
Ports	P1	P2
Active Tech.	L2100	L700
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables	Fiber Jumper, Fiber Jumper	Fiber Jumper, Fiber Jumper
TMAs		
Diplexers / Combiners		
Radio		
Sector Equipment		

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
4Sec-792DBE Hybrid	4Sec-792DBE_2AIR

CT11002A_1.1_Capacity-L1900

Sector 4 (Proposed) view from behind					
Coverage Type	A - Outdoor Macro				
Antenna	1				2
Antenna Model	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octa)				Andrew - LNX-6515DS-A1M (Dual)
Azimuth	250				250
M. Tilt	0				0
Height	41				41
Ports	P1	P2	P3	P4	P5
Active Tech.	L2100	L2100	L1900	L1900	L700
Dark Tech.					
Restricted Tech.					
Decomm. Tech.					
E. Tilt	2	2	2	2	2
Cables	Fiber Jumper	Fiber Jumper	Fiber Jumper	Fiber Jumper	Fiber Jumper
TMAs					
Diplexers / Combiners					
Radio					RRUS11 B12
Sector Equipment					

Unconnected Equipment:

Scope of Work:

AIR-32 B4A/B2P & B2A/B66AA

ERICSSON ANTENNA INTEGRATED RADIO AIR-32

Radio		
	Single Band (B4a/B2p)	**Dual Band (B2a/B66Aa)**
Band 2 (1850-1910 / 1930-1990 MHz)	Passive frequency band	Active frequency band
Band 4 (1710-1755 / 2110-2155 MHz)	Active frequency band	Subset of Band 66A (AWS 1+3)
Band 66A (1710-1780 / 2110-2180 MHz)	N/A	Active frequency band
PA Output Power	4 x 30W	2 x (4 x 30) W
Downlink EIRP in bore-sight direction for each active band	4 x 62.5 dBmi	4 x 62.5 dBmi
Instantaneous bandwidth	45 MHz (W, L)	B2: 40 MHz (W, L) B2: 20 MHz (G) B66A: 70 MHz (W, L)
Capacity (single standard per unit)	6 GSM 6 WCDMA 2 x 20 MHz LTE	6 GSM (B2 only) 6 WCDMA per Active frequency band 2 x 20 MHz LTE per band
Multi-RAT capability	WCDMA and LTE on both PAs	WCDMA and GSM on both PAs (B2 only) WCDMA and LTE on both PAs (B2 and B4) GSM and LTE (B2 only)

Interfaces		
Optical CPRI	2 x 10 Gbps	2 x 10 Gbps per Active frequency band
DC Power	-48 VDC 3-wire or 2-wire	-48 VDC 3-wire or 2-wire (separate input for both radios)
AC power (Optional)	PSU-AC 08	PSU-AC 08
Passive antenna	4 RF connectors (7/16 female)	N/A
Environmental		
Operating Temperature Range	-40 to +55 °C	-40 to +55 °C
Solar Radiation	≤ 1,120 W/m²	≤ 1,120 W/m²
Relative Humidity	5 to 100%	5 to 100%
Absolute Humidity	0.26 to 40 g/m^3	0.26 to 40 g/m^3
Maximum temperature change	1.0°C/min	1.0°C/min
Antenna		
Electrical Tilt	2º – 12º (B4) 2º – 12º (B2)	2º – 12º (B66A) 2º – 12º (B2)
Bore-sight antenna gain	18 dBi (B4) 17.5 dBi (B2)	18 dBi (B66A) 17.5 dBi (B2)
Nominal beam-width, azimuth	65º (B4) 63º (B2)	65º (B66A) 63º (B2)
Nominal beam-width, elevation	6º (B4) 6º (B2)	6º (B66A) 6º (B2)
Mechanical		
Weight	48 Kg (105.8 lbs)	60 Kg (132.2 lbs)
Dimensions (H x W x D)	1439 x 327 x 220 mm (56.6" x 12.9" x 8.7")	1439 x 327 x 220 mm (56.6" x 12.9" x 8.7")
Wind load at 42 m/s (150 km/h) Front / Lateral / Rear	640N / 300N / 660N	640N / 300N / 660N

Product Specifications

COMMSCOPE®

LNX-6515DS-VTM | LNX-6515DS-A1M

Single Band Antenna, 698–896 MHz, 65° horizontal beamwidth, RET compatible

- Excellent choice to maximize both coverage and capacity in suburban and rural applications
- Fully compatible with Andrew remote electrical tilt system for greater OpEx savings
- Exceptional horizontal pattern roll-off and strong front-to-back ratio
- Extended bandwidth allows one antenna to serve multiple frequency allocations
- Great solution to maximize network coverage and capacity
- The RF connectors are designed for IP67 rating and the radome for IP56 rating

Electrical Specifications

Frequency Band, MHz	**698–806**	**806–896**
Gain, dBi	16.7	17.6
Beamwidth, Horizontal, degrees	65	64
Beamwidth, Vertical, degrees	9.7	8.6
Beam Tilt, degrees	0–8	0–8
USLS (First Lobe), dB	17	17
Front-to-Back Ratio at 180°, dB	32	27
CPR at Boresight, dB	24	27
CPR at Sector, dB	15	13
Isolation, dB	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153
Input Power per Port, maximum, watts	400	400
Polarization	±45°	±45°
Impedance	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	**698–806**	**806–896**
Gain by all Beam Tilts, average, dBi	16.6	16.9
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 16.6 4 ° | 16.6 8 ° | 16.4	0 ° | 17.0 4 ° | 17.0 8 ° | 16.8
Beamwidth, Horizontal Tolerance, degrees	±1	±0.9
Beamwidth, Vertical Tolerance, degrees	±0.6	±0.4
USLS, beampeak to 20° above beampeak, dB	18	18
Front-to-Back Total Power at 180° ± 30°, dB	25	23
CPR at Boresight, dB	24	27
CPR at Sector, dB	15	13

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

General Specifications

Antenna Type	Sector
Band	Single band
Brand	DualPol®
Operating Frequency Band	698 – 896 MHz

Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum
Radome Material	Fiberglass, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	2
Wind Loading, frontal	878.0 N @ 150 km/h 197.4 lbf @ 150 km/h
Wind Loading, lateral	273.0 N @ 150 km/h 61.4 lbf @ 150 km/h
Wind Loading, rear	1033.0 N @ 150 km/h 232.2 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Depth	180.5 mm | 7.1 in
Length	2453.0 mm | 96.6 in
Width	301.0 mm | 11.9 in
Net Weight, without mounting kit	19.8 kg | 43.7 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator	LNX-6515DS-A1M

Packed Dimensions

Depth	295.0 mm | 11.6 in
Length	2718.0 mm | 107.0 in
Width	392.0 mm | 15.4 in
Shipping Weight	36.9 kg | 81.4 lb

Regulatory Compliance/Certifications

Agency	**Classification**
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

DB380-3 — Pipe Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Used for wide panel antennas. Includes

RRUS 11

Frequency (AT&T)
- ✓ Band 12 (Lower 700 MHz)
- ✓ Band 4 (AWS, 17/2100 MHz) — 2Q2011

RF Characteristics
- ✓ Output power: 2x30 Watts
- ✓ 2x2 MIMO Capable
- ✓ IBW of 20 MHz
- ✓ Rx Sens.: Better than -105 dBm (5 MHz)

RET/TMA Support
- ✓ AISG 2.0 Compatible
- ✓ Via RET Port and Centre Conductor
- ✓ Cascading
- ✓ 30 VDC Bias

Environmental
- ✓ Self Convection
- ✓ Temperature -40 to 131 F

Power
- ✓ Input voltage: -48 VDC or AC (exemption)
- ✓ Fuse size: 13 – 32 A
  - Recommended: 25 A
- ✓ Power Consumption:
  - Typical 200 Watts
  - Max 310 Watts
  - Excl. RET and TMA load

RRUS 11 Mechanics

Wall and pole mounting brackets

- Reused from RRUW and RRU22
- Vertical Mount Only

Clearing distances:

- Above >= 16 in.
- Below >= 12 in.
- Side >= 0 mm

DC connector

- Bayonet
- Screw terminals in connector plug
- Supported outer cable diameter: 6-18 mm

CPRI connector

- LCD with proprietary cover
- Separate cover available from 1Q2011

Size & Weight

- Band 4: 44 lbs
- Band 12: 50 lbs
- 17.8” x 17.3” x 7.2” incl. sun shield

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

MILFORD / I-95 /1

SITE ID: CT11002A – L1900

1201 BOSTON POST ROAD

MILFORD, CT 06460

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2012 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2016 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA–222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2016 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD–OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS–BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T–MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON–SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1–800–922–4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM: 35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

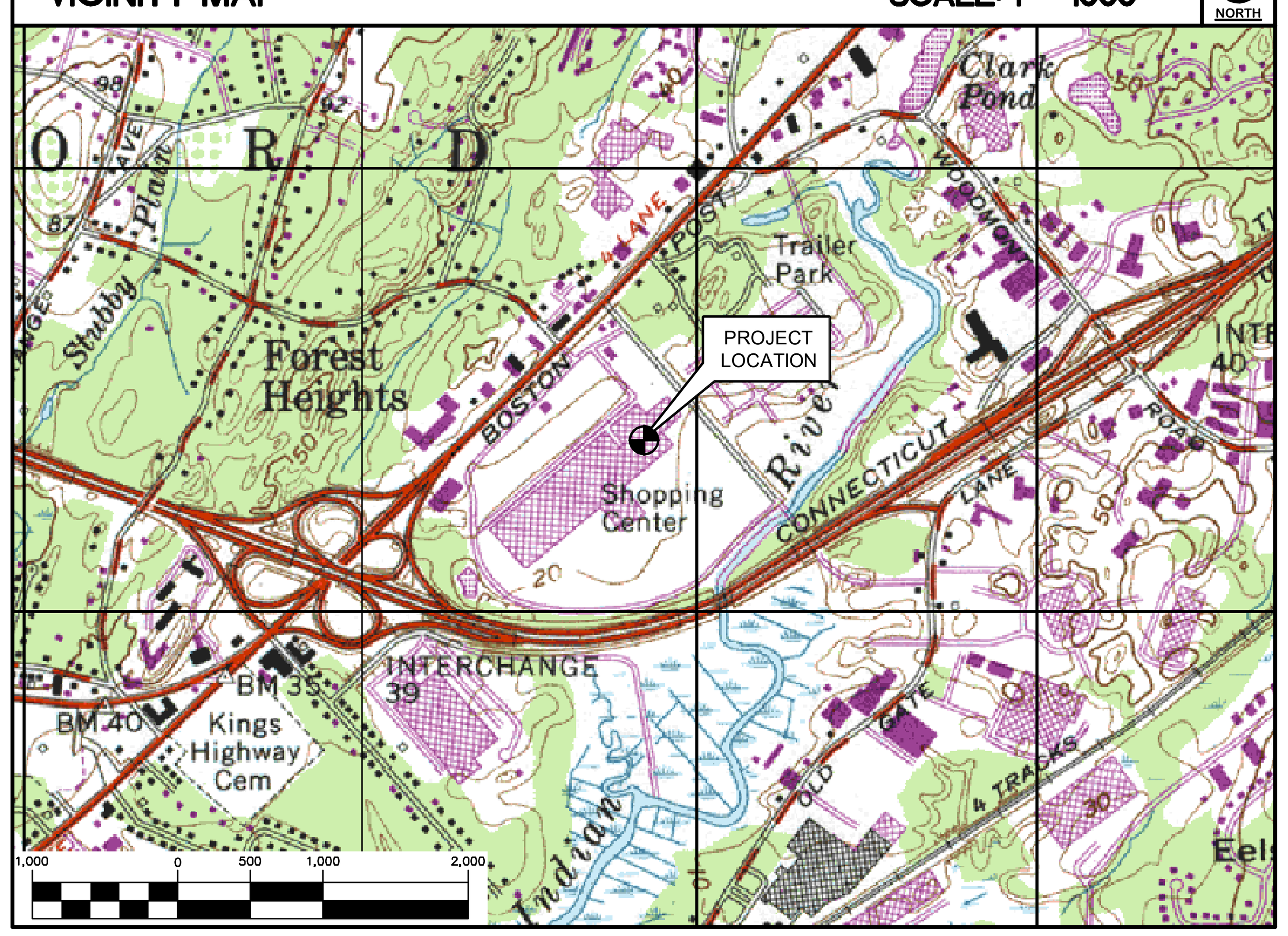
TO: 1201 BOSTON POST ROAD
MILFORD, CT 06460

1.	HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	0.21 MI.
2.	TAKE THE 2ND RIGHT ONTO DAY HILL RD.	3.64 MI.
3.	MERGE ONTO I–91 S TOWARD HARTFORD	45.80 MI.
4.	KEEP RIGHT TOWARD NY CITY	0.08 MI.
5.	MERGE ONTO I–95 S TOWARD NY CITY/NY CITY	8.50 MI.
6.	MERGE ONTO BOSTON POST RD/US–1 N via EXIT 39B	0.29 MI.
7.	1201 BOSTON POST ROAD IS ON THE RIGHT	0.00 MI.

VICINITY MAP

SCALE: 1" = 1000'

NORTH



T-MOBILE RF CONFIGURATION

4Sec-792DBE_2AIR

PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
   A. REMOVE AND REPLACE (4) EXISTING AIR 21 KRC118023–1_B2A_B4P FOR (4) NEW KRD AIR 32 ANTENNAS.
   B. REMOVE EXISTING BREAKER AND REPLACE WITH PROPOSED 100A BREAKER.
   C. INSTALL (8) PROPOSED DC CONDUCTOR CABLES FROM EQUIPMENT TO ANTENNA SECTOR LOCATIONS.
   D. INSTALL (1) NEW AIR 32 ANTENNA ON A NEW PIPE MAST. (DELTA SECTOR)

PROJECT INFORMATION

SITE NAME:	MILFORD / I–95 /1
SITE ID:	CT11002A – L1900
SITE ADDRESS:	1201 BOSTON POST ROAD MILFORD, CT 06460
APPLICANT:	T–MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	BRIAN PAUL (PROJECT MANAGER) (860) 550–5971 TRANSCEND WIRELESS, LLC
ENGINEER:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°–14'–11.60" N LONGITUDE: 73°–02'–02.59" W GROUND ELEVATION: 22'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T–1	TITLE SHEET	0
N–1	DESIGN BASIS AND SITE NOTES	0
C–1	SITE LOCATION PLAN	0
C–2	PARTIAL ROOF PLAN, ELEVATION & ANTENNA MOUNTING CONFIG.	0
C–3	TYPICAL DETAILS	0
S–1	ANTENNA MAST DETAILS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	06/06/17	KAWJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
0	05/18/17	KAWJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile

CENTEK engineering
Centered on Solutions™
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Branford, CT 06405
www.CentekEng.com

T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
MILFORD / I-95 /1
SITE ID: CT11002A – L1900
1201 BOSTON POST ROAD
MILFORD, CT 06460

DATE:	03/15/17
SCALE:	AS NOTED
JOB NO.	17012.23

TITLE SHEET

T–1

DESIGN BASIS:

GOVERNING CODE: 2012 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2016 CT STATE BUILDING CODE AND AMENDMENTS.

1. DESIGN CRITERIA:

- RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
- ULTIMATE DESIGN WIND SPEED (OTHER STRUCTURE): 125 MPH (Vult) (EXPOSURE C/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7–10) PER 2012 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2016 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7–10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF–SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325–N
   G. U–BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON–GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT–DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	06/06/17	KANJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
0	05/18/17	KANJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

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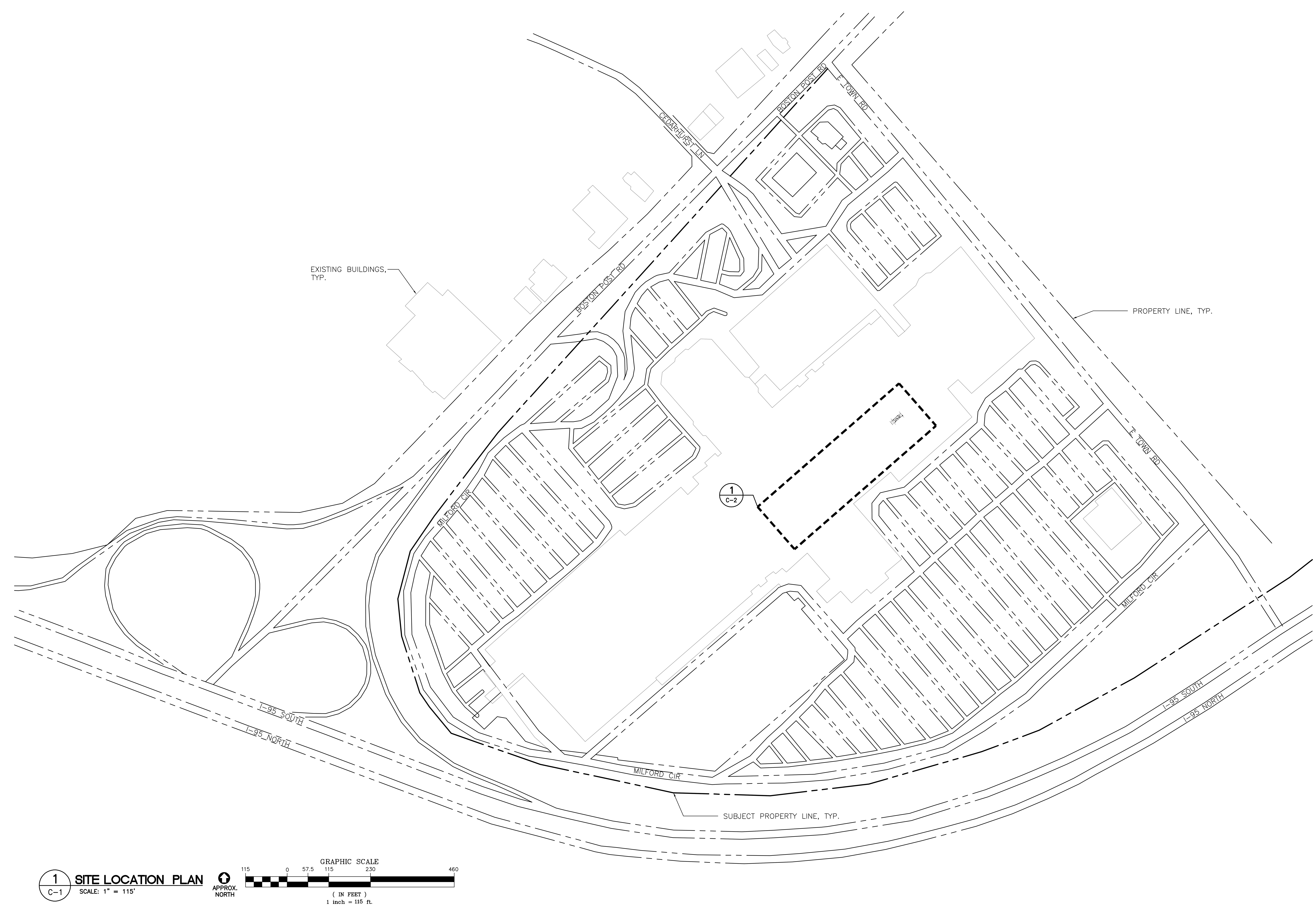
T–MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
MILFORD / I–95 /1
SITE ID: CT11002A – L1900
1201 BOSTON POST ROAD
MILFORD, CT 06460

DATE: 03/15/17
SCALE: AS NOTED
JOB NO. 17012.23

DESIGN BASIS AND SITE NOTES

N–1

Sheet No. 2 of 6



1
C-1
SITE LOCATION PLAN
SCALE: 1" = 115'

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	06/06/17	KAWJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
0	05/18/17	KAWJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

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T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
MILFORD / I-95 /1
SITE ID: CT11002A - L1900
1201 BOSTON POST ROAD
MILFORD, CT 06460

DATE: 03/15/17
SCALE: AS NOTED
JOB NO. 17012.23

SITE LOCATION PLAN

C-1

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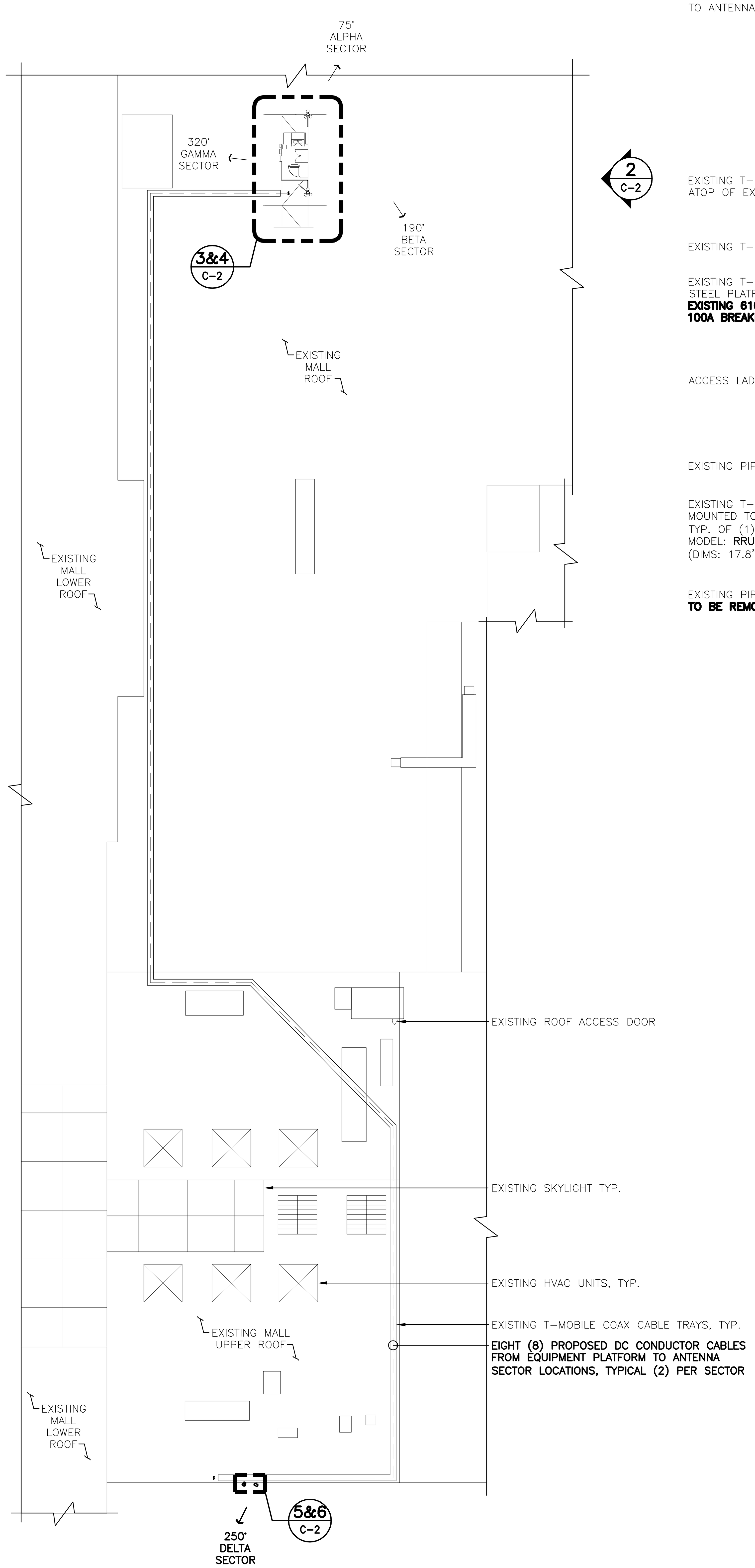
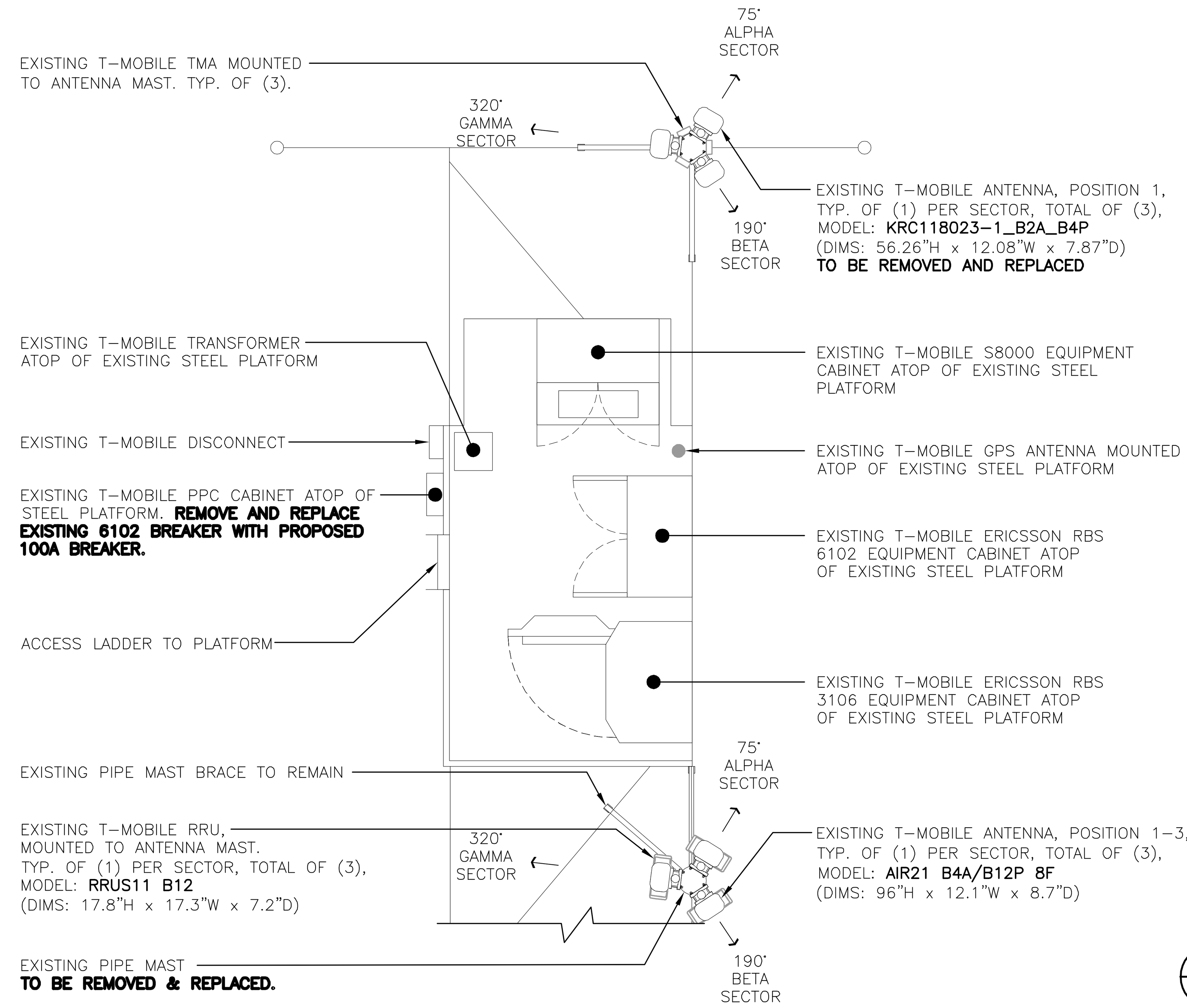
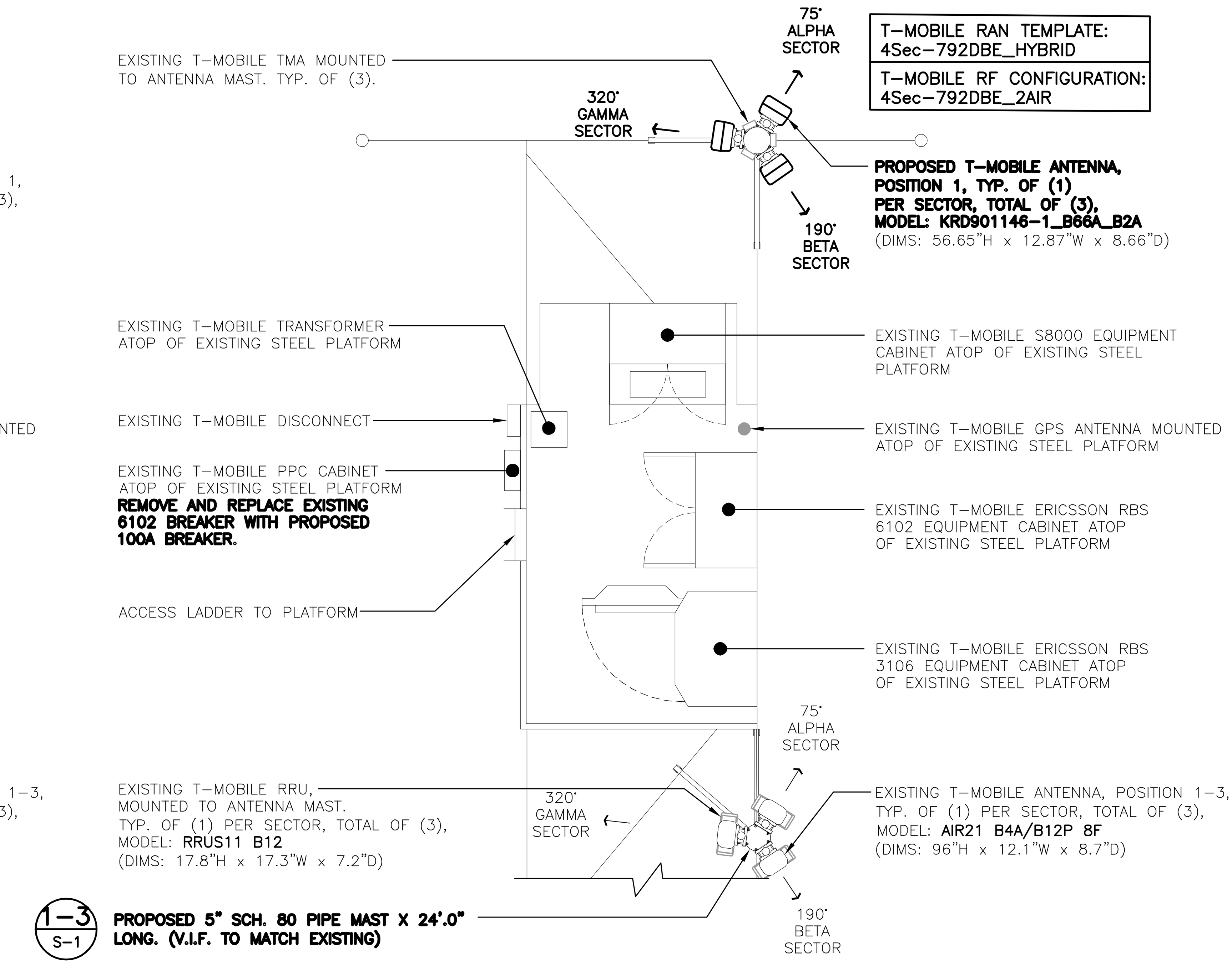


1 C-2 **PARTIAL ROOF PLAN**
SCALE: 1" = 15'
TRUE NORTH

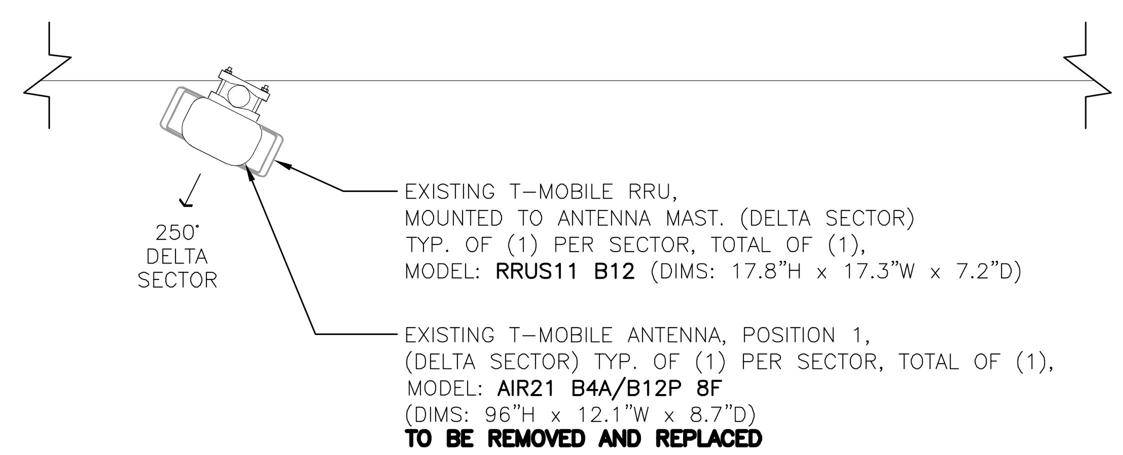
GRAPHIC SCALE
15 0 7.5 15 30 60
(IN FEET)
1 inch = 15 ft.



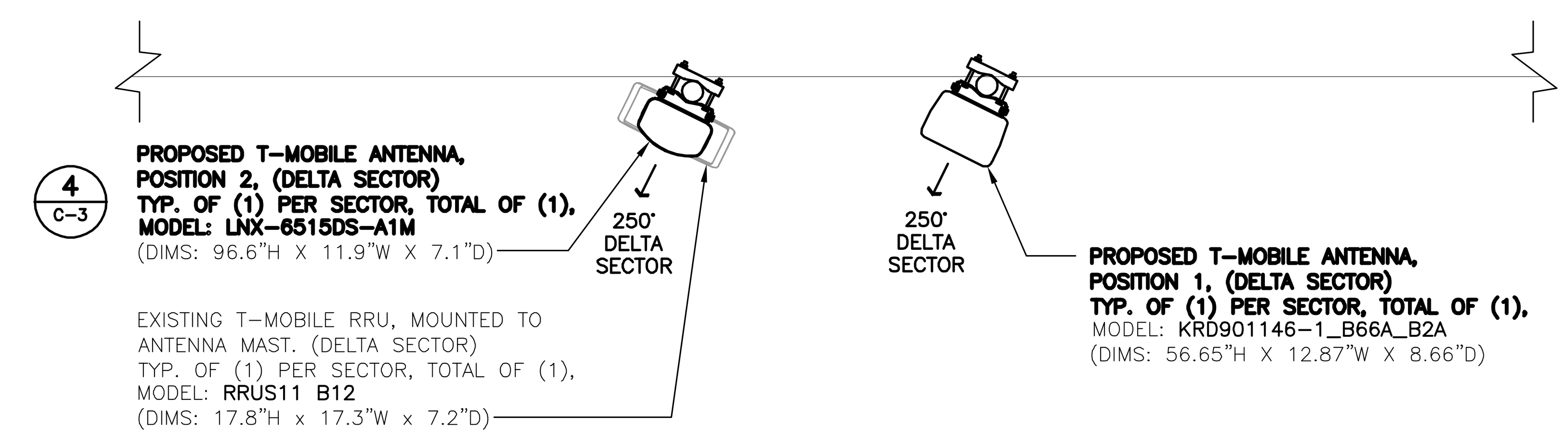
3 C-2 **EXISTING ANTENNA MOUNTING CONFIGURATION**
SCALE: 1/4" = 1'
TRUE NORTH



4 C-2 **PROPOSED ANTENNA MOUNTING CONFIGURATION**
SCALE: 1/4" = 1'
TRUE NORTH

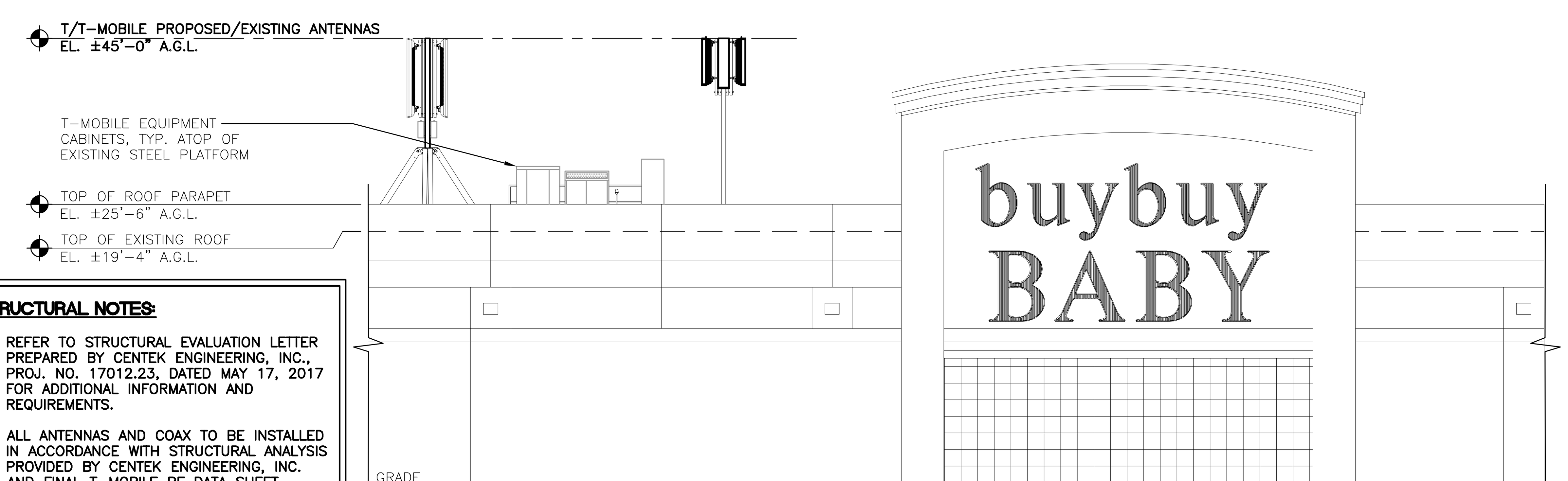


5 C-2 **EXISTING ANTENNA MOUNTING CONFIGURATION**
(DELTA SECTOR) 41' ELEVATION
SCALE: 1/2" = 1'
TRUE NORTH



6 C-2 **PROPOSED ANTENNA MOUNTING CONFIGURATION**
(DELTA SECTOR) 41' ELEVATION
SCALE: 1/2" = 1'
TRUE NORTH

T-MOBILE RAN TEMPLATE: 4Sec-792DBE_HYBRID
T-MOBILE RF CONFIGURATION: 4Sec-792DBE_2AIR



STRUCTURAL NOTES:

1. REFER TO STRUCTURAL EVALUATION LETTER PREPARED BY CENTEK ENGINEERING, INC., PROJ. NO. 17012.23, DATED MAY 17, 2017 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CENTEK ENGINEERING, INC. AND FINAL T-MOBILE RF DATA SHEET.

2 C-2 **NORTHERN WESTERN ELEVATION**
SCALE: 1" = 10'

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	06/06/17	KAWJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
0	05/18/17	KAWJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

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PARTIAL ROOF PLAN, ELEVATION AND ANTENNA MOUNTING CONFIG.

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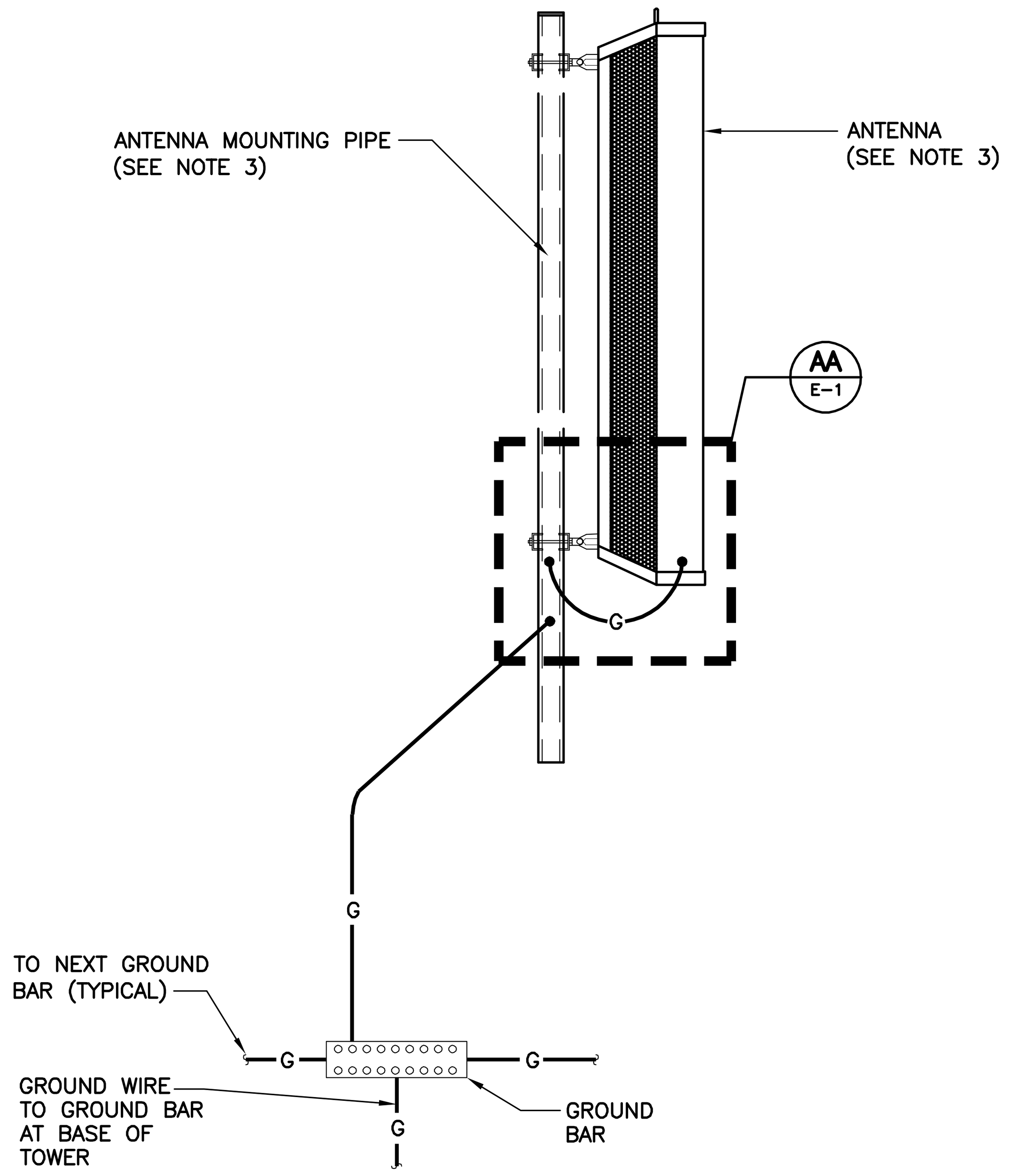
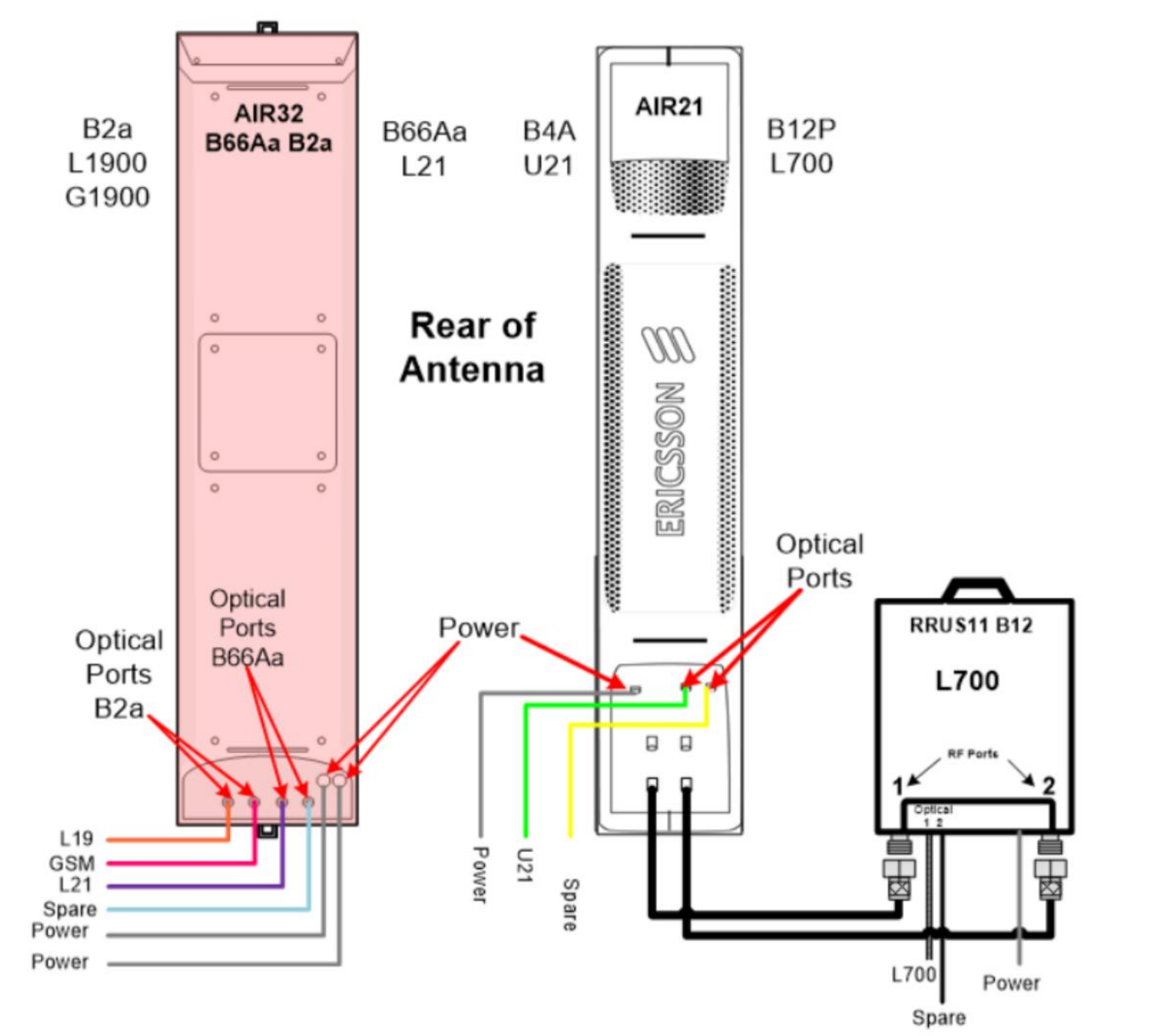


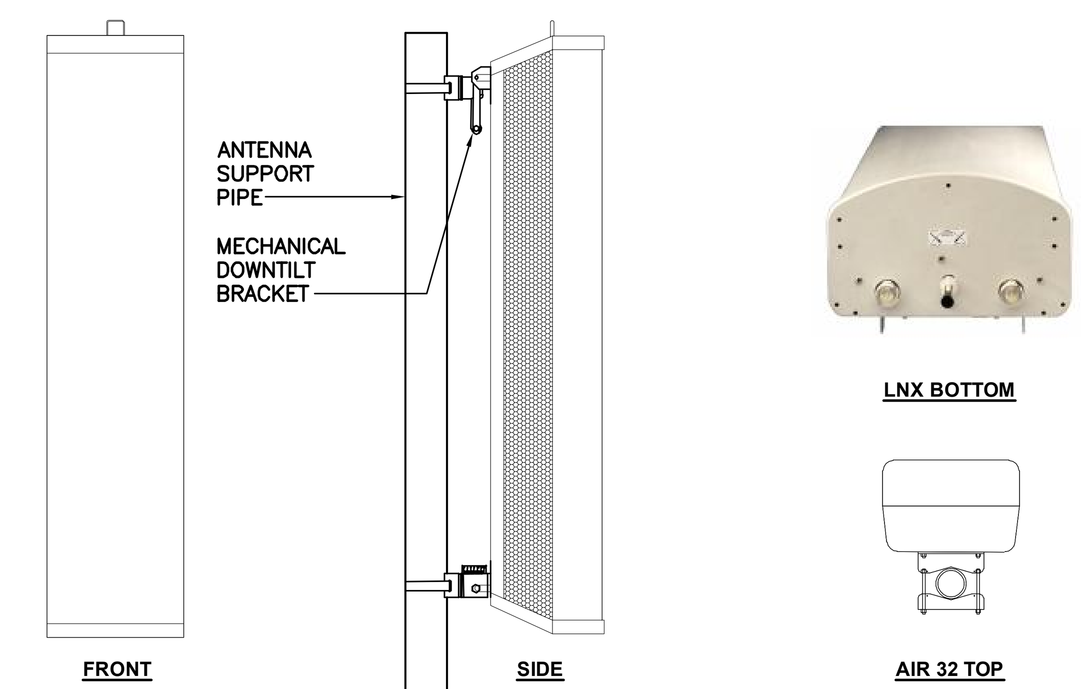
NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

1 C-3 **TYPICAL ANTENNA GROUNDING DETAIL**
SCALE: NONE

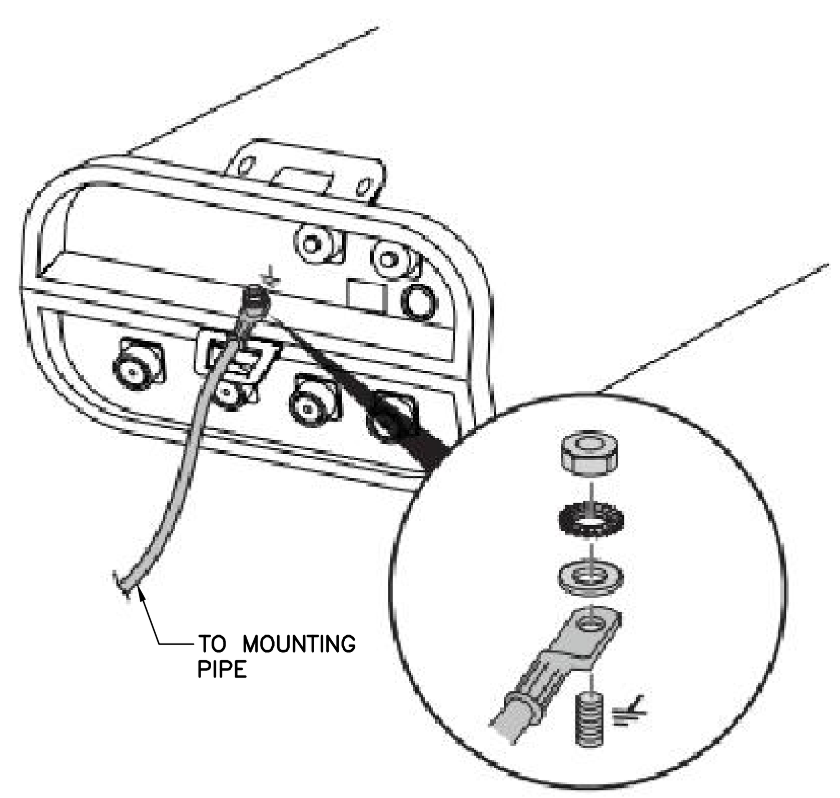


2 C-3 **PROPOSED PLUMBING DIAGRAM**
SCALE: NONE

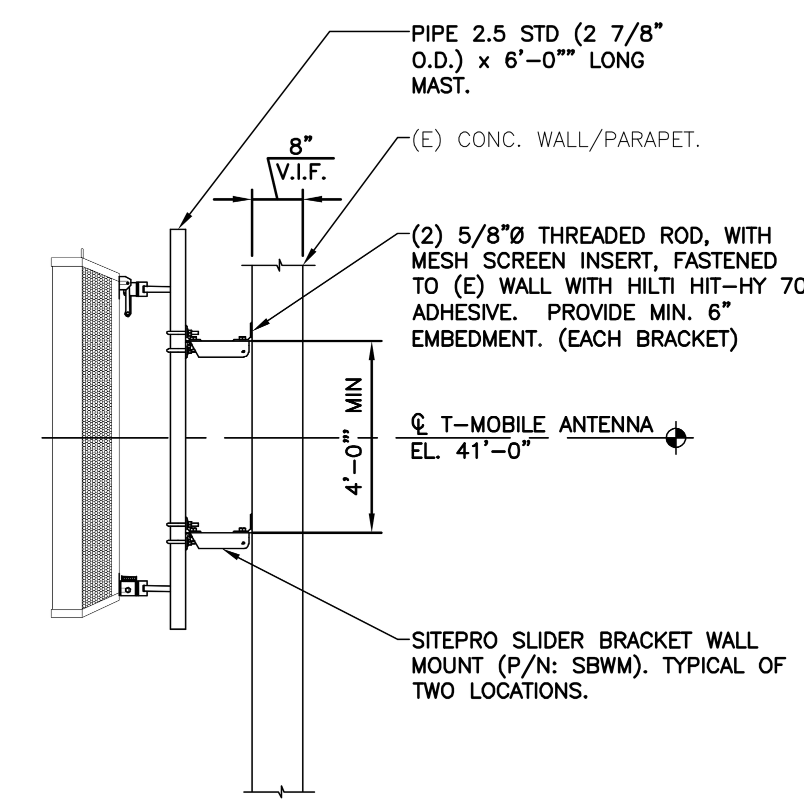


ALPHA/BETA/GAMMA/DELTA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: KRD901146-1_B66A_B2A	56.65"L x 12.87"W x 8.66"D	132.2 LBS.
MAKE: ANDREW MODEL: LNX-6515DS-A1M	96.6"L x 11.9"W x 7.1"D	43.7 LBS.

3 C-3 **PROPOSED ANTENNA DETAIL**
SCALE: NONE



AA C-3 **TYPICAL ANTENNA GROUNDING DETAIL**
SCALE: NONE



4 C-3 **PROPOSED DELTA SECTOR MAST CONNECTION DETAIL**
SCALE: 1/2" = 1'

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TYPICAL DETAILS

C-3

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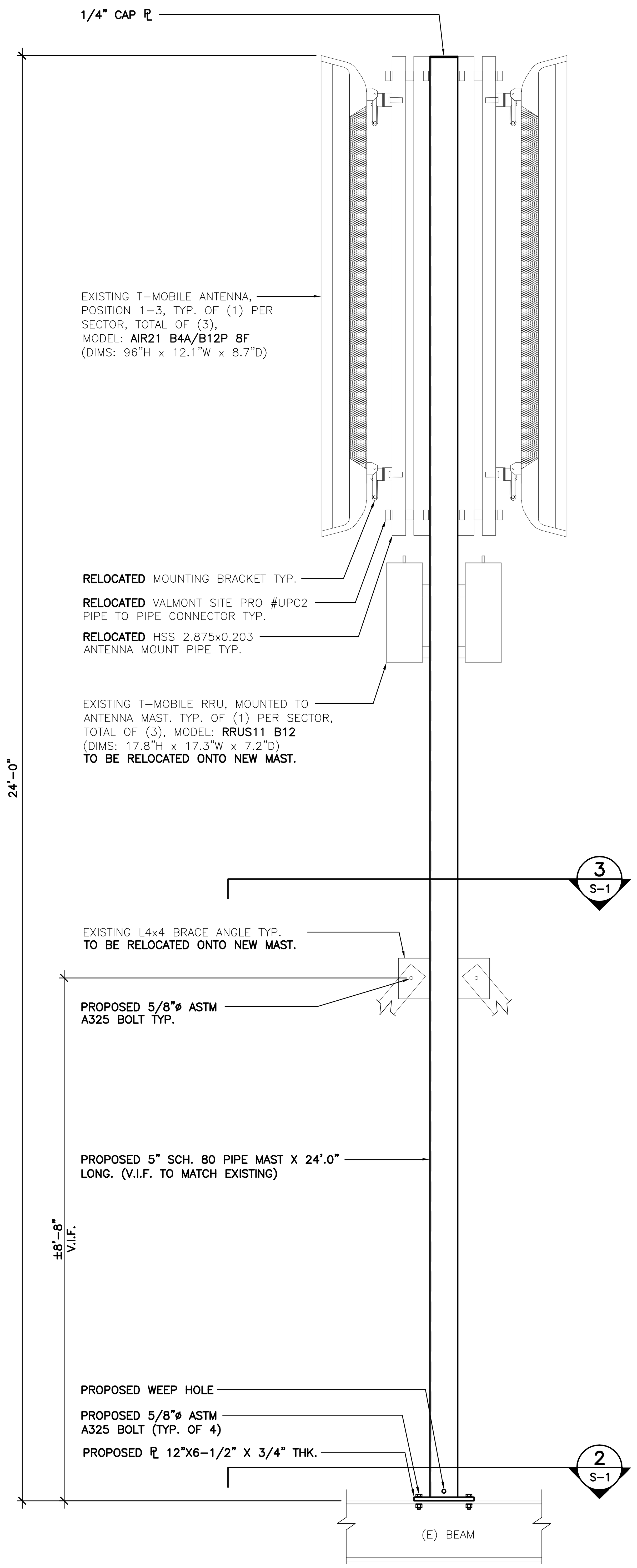
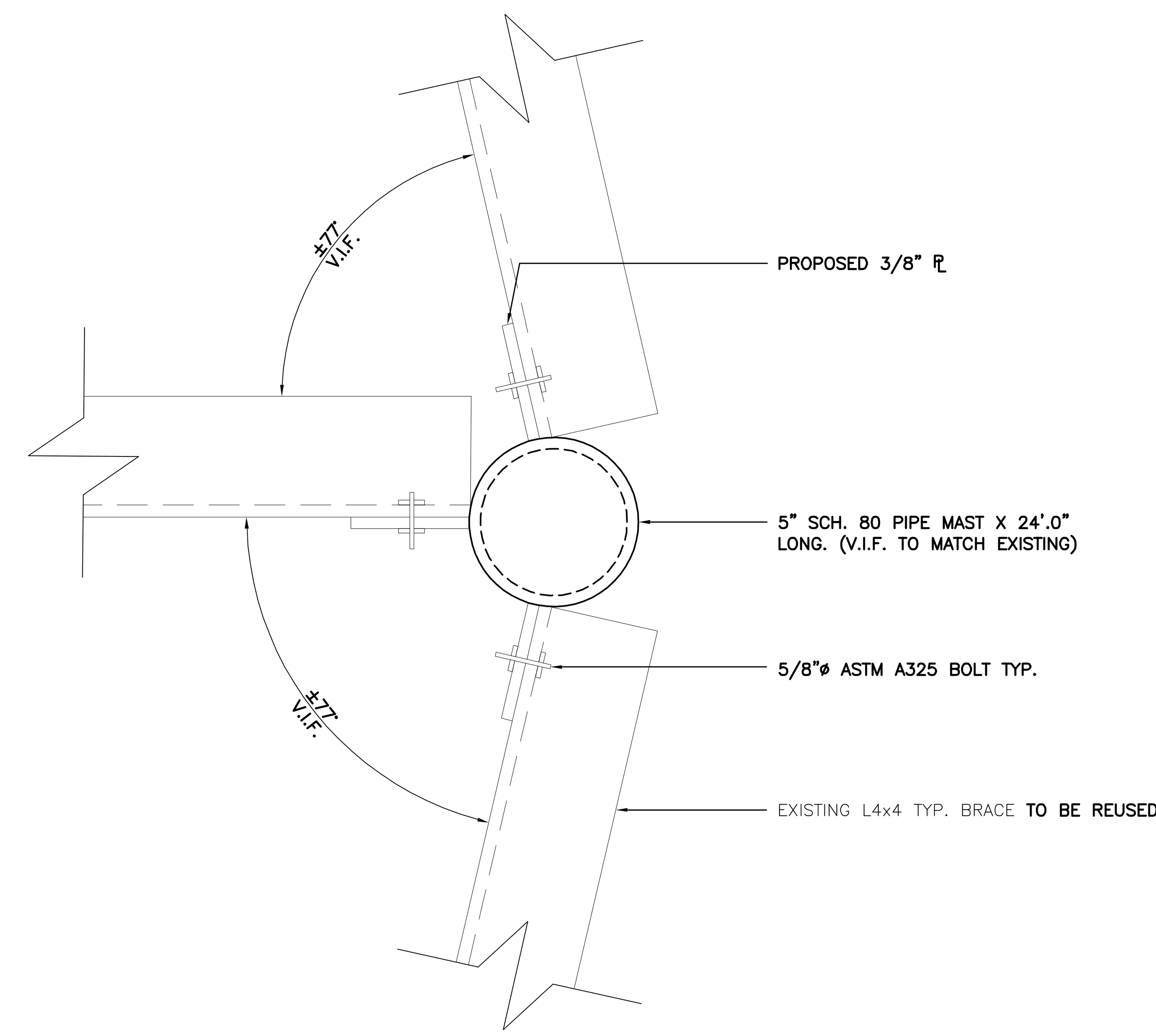
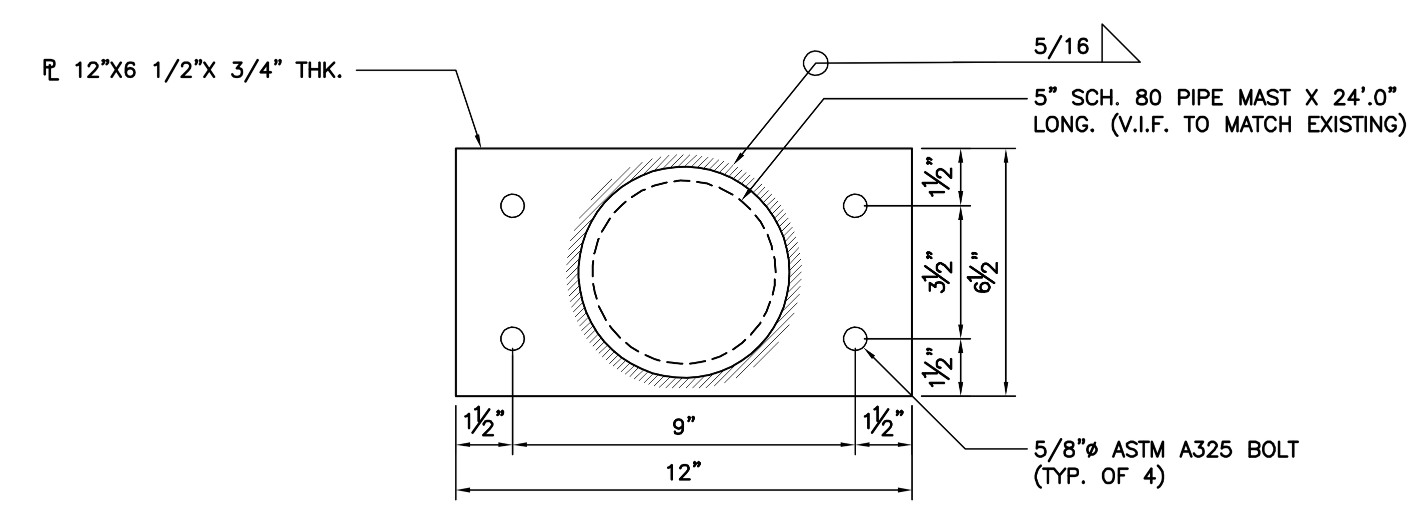


1 S-1 **ANTENNA PIPE MAST DETAIL**
SCALE: 3/4" = 1'



3 S-1 **PIPE MAST BRACING DETAIL**
SCALE: 3" = 1'



2 S-1 **BASE PLATE DETAIL**
SCALE: 3" = 1'

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ANTENNA MAST DETAILS

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