EMPIRE telecom
A QualTek Company

Jack Andrews
Zoning Manager, Empire Telecom
o/b/o AT&T Wireless
10130 Donleigh Drive
Columbia, MD 21046
443-286-4007
jandrews@empiretelecomm.com

April 18, 2018

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

NOTICE OF EXEMPT MODIFICATION

1030 NEW BRITAIN AVENUE, WEST HARTFORD, CT 06110

Lat: 41-43-52.69 (41.73130278)
Long. 72-43-25.82 (-72.72383889)

Dear Ms. Bachman:

AT&T Wireless currently maintains 9 antennas at the 180-foot level of an existing 185-foot lattice tower located at 1030 New Britain Avenue, in West Hartford, CT. The tower is owned by the Ten Thirty Tower Company, LLC. The property is owned by the Ten Thirty Tower Company, LLC. AT&T Wireless now seeks to install 3 additional antennas at the 180-foot level of the tower, as well as replace 3 existing Remote Radio Units ("RRU") with 3 new RRUS-32 B2 RRUs; install 3 new RRUS-B14 4478 RRUs; install 3 new RRUS-32 B66 RRUs; replace existing GSM line components with low band combiners; and install a single new surge suppressor, all at the 180-foot level of the tower. In addition, the applicant seeks to install 2 new DC power cables along the existing cable route on the side of the tower. AT&T also intends to install 3 new RRUS-E2 and 3 new RRU-12 units at grade on the existing mounting pipes. Five (5) equipment cabinets are currently on grade, 1 cabinet will be decommissioned. AT&T will replace 2 DUS with two (2) 5216 units and replace the IDL2 with an IDLE and add a second XMU within one of the existing at-grade cabinets.

The facility was approved by the Connecticut Siting Council in EM-CING-155-160503 on May 23, 2016. Six conditions were enumerated in the Council's decision: 1) Any deviation from the modification as specified in the Notice and supporting documentation shall render the acknowledgement invalid; 2) Any material changes to the modification as proposed shall require the filing of a new Notice with the Council; 3) Within 45 days after the completion of construction the Council shall be notified in writing that the construction has been completed; 4) Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by AT&T shall be removed within 60 days of the date the antenna ceased to function; 5)

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the validity of the action shall expire one year from the date of the letter; and 6) the applicant may file a request an extension of time beyond the one year deadline provided that such a request is submitted to the Council not less than 60 days prior to the expiration.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies section 16-50j-73 for construction that constitutes an exempt modification pursuant to RCSA section 16-50j-72(b)(2). In accordance with RCSA section 16-50j-73, a copy of this letter and attachments is being sent to the Honorable Shari Cantor, Mayor of West Hartford; Todd Dumais, the Town Planner; as well as to the Ten Thirty Tower Company, LLC, the tower owner, and to the Ten Thirty Tower Company, LLC, the property owner.

The planned modifications to the facility fall squarely within those activities expressly provided for in RCSA section 50j-72(b)(2).

1. The proposed modifications will not result in an increase in height of the existing structure.
2. The proposed modifications will not require an 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 will exceed state and local limits.
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 modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, AT&T Wireless respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under RCSA section 16-50j-72(b)(2).

Respectfully submitted,

Jack Andrews
Zoning Manager, Empire Telecom
o/b/o AT&T Wireless
10130 Donleigh Drive
Columbia, MD 21046
443-286-4007
jandrews@empiretelecomm.com

Enclosures

cc: Honorable Shari Cantor, Mayor of West Hartford
Todd Dumais, West Hartford Town Planner
Ten Thirty Company, LLC, the tower owner and property owner.

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April 18, 2018

Ten Thirty Tower Company, LLC, by Hirschfield Management, Inc.
1030 New Britain Ave.
West Hartford, CT 06110
ATTN: Ian Ormesher

RE: AT&T Wireless Modifications to Telecommunication Facility –
1030 NEW BRITAIN AVENUE, WEST HARTFORD, CT 06110

Dear Mr. Ormesher:

In order to accommodate technological changes, implement the Uniform Mobile Telecommunications System and enhance system performance in the State of Connecticut, AT&T Wireless ("AT&T") will be changing its equipment configuration at the above referenced telecommunications facility. AT&T Wireless currently maintains 9 antennas at the 180-foot level of an existing 185-foot lattice tower located at 1030 New Britain Avenue, in West Hartford, CT. The tower is owned by the Ten Thirty Company, LLC. The property is owned by the Ten Thirty Company, LLC.

AT&T Wireless now seeks to install 3 additional antennas at the 180-foot level of the tower, as well as replace 3 existing Remote Radio Units ("RRU") with 3 new RRUS-32 B2 RRUs; install 3 new RRUS-B14 4478 RRUs; install 3 new RRUS-32 B66 RRUs; replace existing GSM line components with low band combiners; and install a single new surge suppressor, all at the 180-foot level of the tower. In addition, the applicant seeks to install 2 new DC power cables along the existing cable route on the side of the tower. AT&T also intends to install 3 new RRUS-E2 and 3 new RRU-12 units at grade on the existing mounting pipes. Five (5) equipment cabinets are currently on grade, 1 cabinet will be decommissioned. AT&T will replace 2 DUS with 2 5216 units and replace the IDL2 with an IDLE and add a second XMU within one of the existing at-grade cabinets.

This letter is intended to serve as the required notice to the tower owner and the property owner. As required by the Regulations of Connecticut State Agencies ("RCSA") section 16-50j-73, the Connecticut Siting Council ("CSC") has been notified of the proposed changes and will review AT&T's proposal. Please accept this letter as notification under RCSA section 16-50j-73 of construction which constitutes an exempt modification pursuant to RCSA section 16-50j-72(b)(2).

10130 Donleigh Drive
Columbia, MD 21046
443-677-0144

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A QualTek Company

The enclosed letter and documents to the CSC fully describes AT&T's proposal for the above referenced site. However, if you have any questions or require any additional information concerning our plans or the CSC procedures, please contact me at 443-286-4006 or contact Melanie Bachman, Acting Executive Director of the CSC at 860-872-2935.

Respectfully submitted,

Jack Andrews
Zoning Manager, Empire Telecom
o/b/o AT&T Wireless
10130 Donleigh Drive
Columbia, MD 21046
443-677-0144
jandrews@empiretelecomm.com

Enclosures

cc: Melanie Bachman, Connecticut Siting Council

EMPIRE telecom
A QualTek Company

April 18, 2018

Todd Dumais
Town Hall, 50 South Main Street, Room 214
West Hartford, CT 06107

RE: AT&T Wireless Modifications to Telecommunication Facility –
1030 NEW BRITAIN AVENUE, WEST HARTFORD, CT 06110

Dear Mr. Dumais:

In order to accommodate technological changes, implement the Uniform Mobile Telecommunications System and enhance system performance in the State of Connecticut, AT&T Wireless ("AT&T") will be changing its equipment configuration at the above referenced telecommunications facility. AT&T Wireless currently maintains 9 antennas at the 180-foot level of an existing 185-foot lattice tower located at 1030 New Britain Avenue, in West Hartford, CT. The tower is owned by the Ten Thirty Company, LLC. The property is owned by the Ten Thirty Company, LLC.

AT&T Wireless now seeks to install 3 additional antennas at the 180-foot level of the tower, as well as replace 3 existing Remote Radio Units ("RRU") with 3 new RRUS-32 B2 RRUs; install 3 new RRUS-B14 4478 RRUs; install 3 new RRUS-32 B66 RRUs; replace existing GSM line components with low band combiners; and install a single new surge suppressor, all at the 180-foot level of the tower. In addition, the applicant seeks to install 2 new DC power cables along the existing cable route on the side of the tower. AT&T also intends to install 3 new RRUS-E2 and 3 new RRU-12 units at grade on the existing mounting pipes. Five (5) equipment cabinets are currently on grade, 1 cabinet will be decommissioned. AT&T will replace 2 DUS with 2 5216 units and replace the IDL2 with an IDLE and add a second XMU within one of the existing at-grade cabinets.

This letter is intended to serve as notice to the chief of planning for the municipality. As required by the Regulations of Connecticut State Agencies ("RCSA") section 16-50j-73, the Connecticut Siting Council ("CSC") has been notified of the proposed changes and will review AT&T's proposal. Please accept this letter as notification under RCSA section 16-50j-73 of construction which constitutes an exempt modification pursuant to RCSA section 16-50j-72(b)(2).

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The enclosed letter and documents to the CSC fully describes AT&T's proposal for the above referenced site. However, if you have any questions or require any additional information concerning our plans or the CSC procedures, please contact me at 443-677-0144 or contact Melanie Bachman, Acting Executive Director of the CSC at 860-872-2935.

Respectfully submitted,

Jack Andrews
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o/b/o AT&T Wireless
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Enclosures

cc: Melanie Bachman, Connecticut Siting Council

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A QualTek Company

April 18, 2018

The Honorable Shari Cantor
Town Hall, 50 South Main Street
West Hartford, CT 06107

RE: AT&T Wireless Modifications to Telecommunication Facility –
1030 NEW BRITAIN AVENUE, WEST HARTFORD, CT 06110

Dear Mayor Cantor:

In order to accommodate technological changes, implement the Uniform Mobile Telecommunications System and enhance system performance in the State of Connecticut, AT&T Wireless ("AT&T") will be changing its equipment configuration at the above referenced telecommunications facility. AT&T Wireless currently maintains 9 antennas at the 180-foot level of an existing 185-foot lattice tower located at 1030 New Britain Avenue, in West Hartford, CT. The tower is owned by the Ten Thirty Company, LLC. The property is owned by the Ten Thirty Company, LLC.

AT&T Wireless now seeks to install 3 additional antennas at the 180-foot level of the tower, as well as replace 3 existing Remote Radio Units ("RRU") with 3 new RRUS-32 B2 RRUs; install 3 new RRUS-B14 4478 RRUs; install 3 new RRUS-32 B66 RRUs; replace existing GSM line components with low band combiners; and install a single new surge suppressor, all at the 180-foot level of the tower. In addition, the applicant seeks to install 2 new DC power cables along the existing cable route on the side of the tower. AT&T also intends to install 3 new RRUS-E2 and 3 new RRU-12 units at grade on the existing mounting pipes. Five (5) equipment cabinets are currently on grade, 1 cabinet will be decommissioned. AT&T will replace 2 DUS with 2 5216 units and replace the IDL2 with an IDLE and add a second XMU within one of the existing at-grade cabinets.

This letter is intended to serve as the required notice to the chief elected official of the municipality. As required by the Regulations of Connecticut State Agencies ("RCSA") section 16-50j-73, the Connecticut Siting Council ("CSC") has been notified of the proposed changes and will review AT&T's proposal. Please accept this letter as notification under RCSA section 16-50j-73 of construction which constitutes an exempt modification pursuant to RCSA section 16-50j-72(b)(2).

10130 Donleigh Drive
Columbia, MD 21046
443-677-0144

EMPIRE telecom
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The enclosed letter and documents to the CSC fully describes AT&T's proposal for the above referenced site. However, if you have any questions or require any additional information concerning our plans or the CSC procedures, please contact me at 443-677-0144 or contact Melanie Bachman, Acting Executive Director of the CSC at 860-872-2935.

Respectfully submitted,

Jack Andrews
Zoning Manager, Empire Telecom
o/b/o AT&T Wireless
10130 Donleigh Drive
Columbia, MD 21046
443-677-0144
jandrews@empiretelecomm.com

Enclosures

cc: Melanie Bachman, Connecticut Siting Council

Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT5259
FA: 10071358

Hartford - Elmwood
1030 New Britain Avenue
West Hartford, CT 06110

February 1, 2018

Centerline Communications Project Number: 950006-092

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**7.00 %**

February 1, 2018

AT&T Mobility – New England
Attn: John Benedetto, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT5259 – Hartford - Elmwood**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **1030 New Britain Avenue, West Hartford, CT**, for the purpose of determining whether the emissions from the Proposed AT&T 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.

<u>General population/uncontrolled exposure</u> limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) 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 performed for the proposed AT&T Wireless antenna facility located at **1030 New Britain Avenue, West Hartford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS – Antenna 1	850 MHz	1	30
LTE – Antenna 2	700 MHz	2	60
LTE – Antenna 2	850 MHz	2	30
LTE – Antenna 2	2300 MHz (WCS)	4	30
LTE – Antenna 3	700 MHz (Band 14)	4	40
LTE – Antenna 3	2100 MHz (AWS)	4	30
LTE – Antenna 4	700 MHz	2	60
LTE – Antenna 4	1900 MHz (PCS)	4	80

Table 1: Channel Data Table (per sector)

The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave 7770	180
A	2	CCI OPA-65R-LCUU-H6	180
A	3	Kathrein 800-10965	180
A	4	CCI OPA-65R-LCUU-H6	180
B	1	Powerwave 7770	180
B	2	CCI OPA-65R-LCUU-H6	180
B	3	Kathrein 800-10965	180
B	4	CCI OPA-65R-LCUU-H6	180
C	1	Powerwave 7770	180
C	2	CCI OPA-65R-LCUU-H6	180
C	3	Kathrein 800-10965	180
C	4	CCI OPA-65R-LCUU-H6	180

Table 2: Antenna Data

All calculations were done with respect to uncontrolled / general population threshold limits.

RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Powerwave 7770	850 MHz	11.4	1	30	414.12	0.09
Antenna A2	CCI OPA-65R-LCUU-H6	700 MHz / 850 MHz / 2300 MHz (WCS)	11.65 / 12.45 / 15.45	8	300	7,018.39	1.17
Antenna A3	Kathrein 800-10965	700 MHz / 2100 MHz (AWS)	12.65 / 16.15	8	280	7,890.41	1.34
Antenna A4	CCI OPA-65R-LCUU-H6	700 MHz / 1900 MHz (PCS)	11.65 / 14.85	6	440	11,530.36	1.61
Sector A Composite MPE%							**4.20**
Antenna B1	Powerwave 7770	850 MHz	11.4	1	30	414.12	0.09
Antenna B2	CCI OPA-65R-LCUU-H6	700 MHz / 850 MHz / 2300 MHz (WCS)	11.65 / 12.45 / 15.45	8	300	7,018.39	1.17
Antenna B3	Kathrein 800-10965	700 MHz / 2100 MHz (AWS)	12.65 / 16.15	8	280	7,890.41	1.34
Antenna B4	CCI OPA-65R-LCUU-H6	700 MHz / 1900 MHz (PCS)	11.65 / 14.85	6	440	11,530.36	1.61
Sector B Composite MPE%							**4.20**
Antenna C1	Powerwave 7770	850 MHz	11.4	1	30	414.12	0.09
Antenna C2	CCI OPA-65R-LCUU-H6	700 MHz / 850 MHz / 2300 MHz (WCS)	11.65 / 12.45 / 15.45	8	300	7,018.39	1.17
Antenna C3	Kathrein 800-10965	700 MHz / 2100 MHz (AWS)	12.65 / 16.15	8	280	7,890.41	1.34
Antenna C4	CCI OPA-65R-LCUU-H6	700 MHz / 1900 MHz (PCS)	11.65 / 14.85	6	440	11,530.36	1.61
Sector C Composite MPE%							**4.20**

Table 3: AT&T Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max Sector Value	**4.20 %**
T-Mobile	2.45 %
Clearwire	0.08 %
Nextel	0.27 %
Site Total MPE %:	**7.00 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	4.20 %
AT&T Sector B Total:	4.20 %
AT&T Sector C Total:	4.20 %
Site Total:	7.00 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

AT&T _ Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	1	414.12	180	0.49	850 MHz	567	0.09%
AT&T 700 MHz LTE	2	877.31	180	2.08	700 MHz	467	0.45%
AT&T 850 MHz LTE	2	527.38	180	1.25	850 MHz	567	0.22%
AT&T 2300 MHz (WCS) LTE	4	1,052.26	180	5.00	2300 MHz (WCS)	1000	0.50%
AT&T 700 MHz LTE	4	736.31	180	3.50	700 MHz	467	0.75%
AT&T 2100 MHz (AWS) LTE	4	1,236.29	180	5.87	2100 MHz (AWS)	1000	0.59%
AT&T 700 MHz LTE	2	877.31	180	2.08	700 MHz	467	0.45%
AT&T 1900 MHz (PCS) LTE	4	2,443.94	180	11.61	1900 MHz (PCS)	1000	1.16%
						Total:	**4.20%**

Table 6: AT&T Maximum Sector MPE Power Values

Summary

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

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector A:	4.20 %
Sector B:	4.20 %
Sector C:	4.20 %
AT&T Maximum Total (per sector):	4.20 %
Site Total:	7.00 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **7.00 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767

at&t

SITE NAME: WEST HARTFORD-ELMWOOD
PROJECT: LTE - 4C/5C/6C/7C/RETROFIT
FA NUMBER: 10071358
SITE NUMBER: CTL05259
1030 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110
HARTFORD COUNTY
FIRSTNET

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY:	EMPIRE TELECOM
ADDRESS:	16 ESQUIRE ROAD
CITY, STATE, ZIP:	BILLERICA, MA 01862
CONTACT:	DAVID COOPER
E-MAIL:	DCOOPER@EMPIRETELCOMM.COM

ENGINEER

COMPANY:	MASER CONSULTING CONNECTICUT
ADDRESS:	331 NEWMAN SPRINGS ROAD, SUITE 203
CITY, STATE, ZIP:	RED BANK, NJ 07701
CONTACT:	MICHAEL CLEARY
PHONE:	(856) 717-0412 x4105
E-MAIL:	MCLEARY@MASERCONSULTING.COM

RF ENGINEER

COMPANY:	NEW CINGULAR WIRELESS PCS, LLC
ADDRESS:	550 COCHITUATE ROAD
CITY, STATE, ZIP:	FRAMINGHAM, MA 01701
CONTACT:	MOHAMMAD MINHAJ HUSSAIN
E-MAIL:	MH705R@ATT.COM

SITE INFORMATION

APPLICANT/LESSEE

at&t

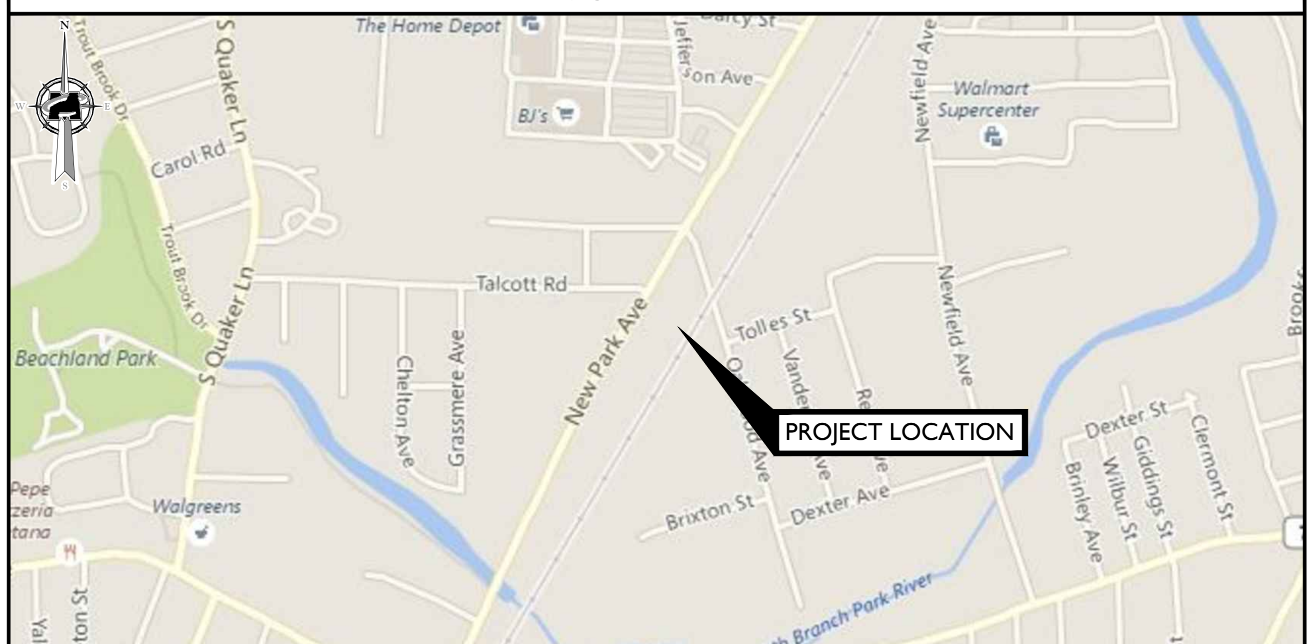
NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE RD.
FRAMINGHAM, MA 01701

TOWER OWNER:

NAME:	TEN THIRTY TOWER COMPANY, LLC
ADDRESS:	1030 NEW BRITAIN AVENUE
CITY, STATE, ZIP:	WEST HARTFORD, CT 06110

LATITUDE:	41.7360919° N
LONGITUDE:	72.7204989° W
LAT./LONG. TYPE:	NAD 83
AREA OF CONSTRUCTION:	EXISTING OUTDOOR EQUIPMENT AND LATTICE TOWER
ZONING/JURISDICTION:	CITY OF WEST HARTFORD
CURRENT USE/PROPOSED USE:	UNMANNED TELECOMMUNICATIONS FACILITY
HANDICAP REQUIREMENTS:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.
CONSTRUCTION TYPE:	IIB
USE GROUP:	U

VICINITY MAP



NOT TO SCALE
IMAGE SOURCE: GOOGLE MAPS

DRIVING DIRECTIONS

DIRECTIONS FROM AT&T OFFICE AT 550 COCHITUATE ROAD, FRAMINGHAM, MA:

DEPART RT-30 WEST/COCHITUATE ROAD TOWARD BURR STREET. TURN BACK ON RT-30 EAST/COCHITUATE ROAD. TAKE RAMP RIGHT FOR I-90 WEST TOWARD SPRINGFIELD/WORCESTER. AT EXIT 9, TAKE RAMP RIGHT FOR I-84 TOWARD HARTFORD/NEW YORK CITY. AT EXIT 45, TAKE RAMP LEFT AND FOLLOW SIGNS FOR FLATBUSH AVENUE. TURN RIGHT ONTO FLATBUSH AVENUE. TURN LEFT ONTO NEW PARK AVENUE. TURN LEFT ONTO OAKWOOD AVENUE.

CODE COMPLIANCE

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

1. 2016 CONNECTICUT STATE BUILDING CODE, INCORPORATING THE 2012 IBC
2. 2014 NATIONAL ELECTRICAL CODE-NFPA 70
3. 2012 NFPA 101
4. LIGHTNING PROTECTION CODE 2011
5. AMERICAN CONCRETE INSTITUTE 318
6. AMERICAN INSTITUTE OF STEEL CONSTRUCTION 360-10
7. EIA/TIA-222 REVISION G
8. TIA 607 FOR GROUNDING
9. INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81
10. IEEE C2 LATEST EDITION
11. TELCORDIA GR-1275
12. ANSI T1.311

GENERAL CONTRACTOR NOTES

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

PROJECT DESCRIPTION/SCOPE OF WORK

THIS PROJECT WILL BE COMPRISED OF:

- INSTALL (3) NEW AT&T ANTENNAS, (1) PER SECTOR
- INSTALL (3) NEW RRUS-E2 WITH SURGE ARRESTORS, AT GRADE
- INSTALL (3) NEW RRUS-12 WITH SURGE ARRESTORS, AT GRADE
- (3) NEW RRUS-32 B2 TO REPLACE (3) EXISTING RRUS12+A2, (1) PER SECTOR
- INSTALL (3) NEW RRUS-B14 4478, (1) PER SECTOR
- INSTALL (3) NEW RRUS-32 B66, (1) PER SECTOR
- INSTALL (1) NEW DC-6 SURGE SUPPRESSION DOME
- INSTALL (2) 6/C DC CABLES
- REMOVE EXISTING RXAIT
- REPLACE EXISTING GSM LINE COMPONENTS WITH LOW BAND COMBINERS
- REPLACE (2) DUS WITH (2) 5216
- REPLACE IDL2 WITH IDLe AND ADD 2ND XMU

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BILLERICA, MA 01862

SCALE :	JOB NUMBER :
AS SHOWN	17963019A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
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0	02/28/18	FOR CONSTRUCTION	AJC	PET
2	02/13/18	REVISED PER COMMENTS	AJC	PET
I	01/23/18	ISSUED FOR REVIEW	AJC	RA

STATE OF CONNECTICUT
PETROS E. TSOUKALAS
LICENSED PROFESSIONAL ENGINEER
32577

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577

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SITE NAME:

WEST HARTFORD-ELMWOOD
FA#:10071358
SITE #: CTL05259

1030 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110
HARTFORD COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE :

TITLE SHEET

SHEET NUMBER :

T-1

GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5O HMS OR LESS.
4. THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
5. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
6. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
7. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE EQUIPMENT GROUND RING WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK TO BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
10. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
11. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. ALL BENDS SHALL BE MADE WITH 12" RADIUS OR LARGER.
12. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
13. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS EXCEPT FOR GROUND BAR CONNECTION FROM MGB TO OUTSIDE EXTERIOR GROUND SHALL ALL BE CADWELD CONNECTIONS.
14. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
15. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED TO THE TOWER GROUND BAR.
16. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
17. ALL EXTERIOR AND INTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
18. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
19. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND WIRES WITH 1-#2 AWG TIN-PLATED COPPER GROUND CONDUCTOR.
20. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G. NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
21. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/4" IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50.
22. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

    CONTRACTOR - EMPIRE TELECOM
    SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
    OWNER - AT&T (NEW CINGULAR WIRELESS PCS, LLC)

23. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
24. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
25. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
26. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
27. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
28. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
29. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
30. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
31. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
32. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE RESPONSIBLE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING & EXCAVATION.
33. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
34. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY SHALL BE GRADED TO A UNIFORM SLOPE AND STABILIZED TO PREVENT EROSION.
35. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
36. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
37. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
38. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
39. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
40. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
41. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
42. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR.
43. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
44. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
45. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS.
46. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
47. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
48. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
49. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION, ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
50. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN ALERT OF DANGEROUS EXPOSURE LEVELS.

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0	02/28/18	FOR CONSTRUCTION	AJC	PET
2	02/13/18	REVISED PER COMMENTS	AJC	PET
1	01/23/18	ISSUED FOR REVIEW	AJC	RA
REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY

STATE OF CONNECTICUT
PETROS TSOUKALAS
32577
LICENSED PROFESSIONAL ENGINEER

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577

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SITE NAME:

WEST HARTFORD-ELMWOOD
FA#:10071358
SITE #: CTL05259

1030 NEW BRITAIN AVENUE
WEST HARTFORD, CT 06110
HARTFORD COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

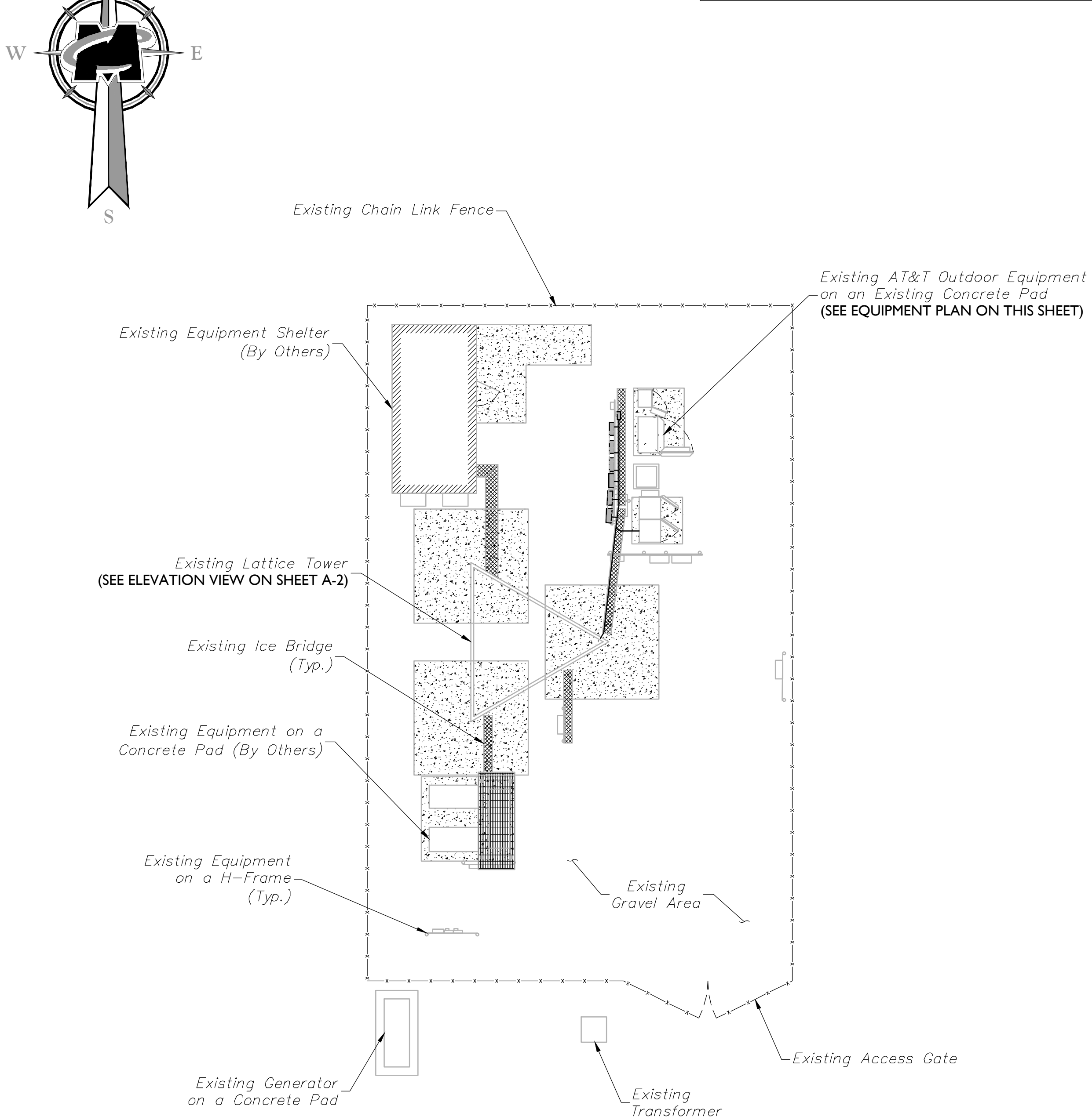
SHEET TITLE :
GENERAL NOTES

SHEET NUMBER :
GN-1

NOTE:

SITE INFORMATION OBTAINED FROM THE FOLLOWING:

A. PLAN ENTITLED "AVON - MONTEVIDEO ROAD" PREPARED BY COM EX CONSULTANTS, LAST REVISED 04/29/2016.



COMPOUND PLAN

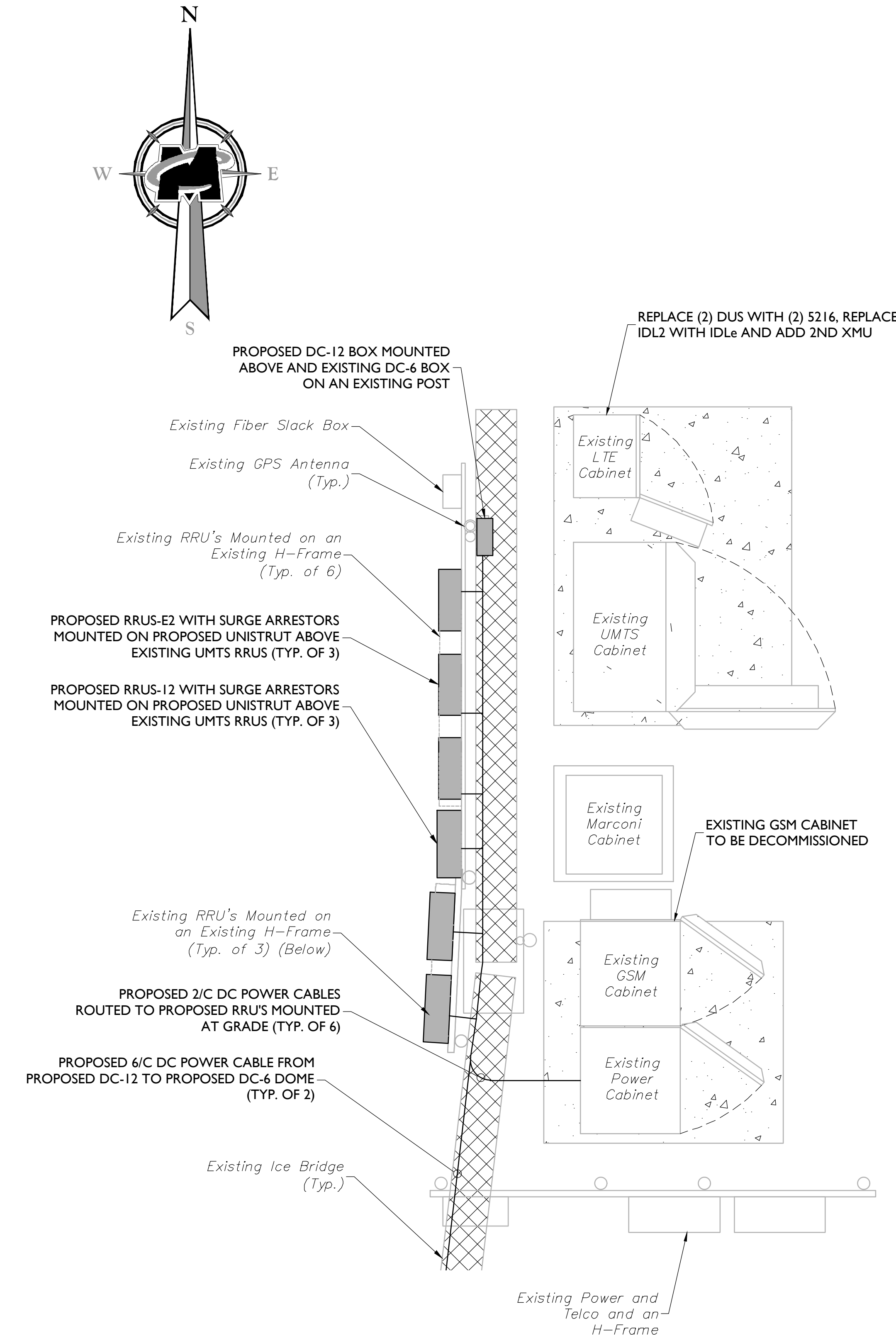
GRAPHIC SCALE

10 0 5 10 20

(IN FEET)

SCALE: 1" = 10' FOR 24"X36" DRAWINGS

(DO NOT SCALE 11"X17" DRAWINGS)



EQUIPMENT PLAN

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(IN FEET)

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STATE OF CONNECTICUT PETROS TSOUKALAS LICENSED PROFESSIONAL ENGINEER 32577

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577

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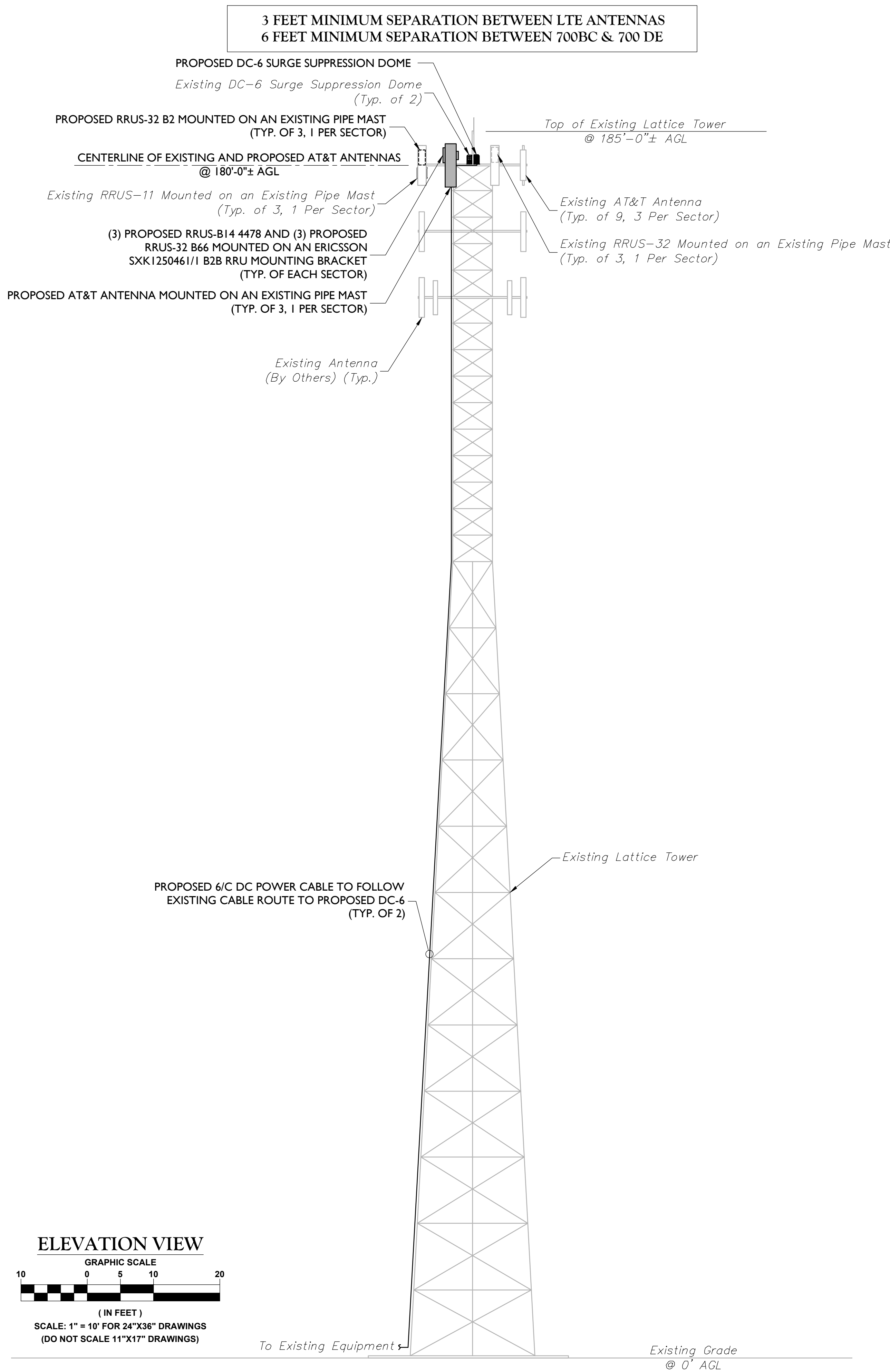
SHEET TITLE :
COMPOUND AND EQUIPMENT PLAN

SHEET NUMBER :
A-1



ELEVATION VIEW

GRAPHIC SCALE

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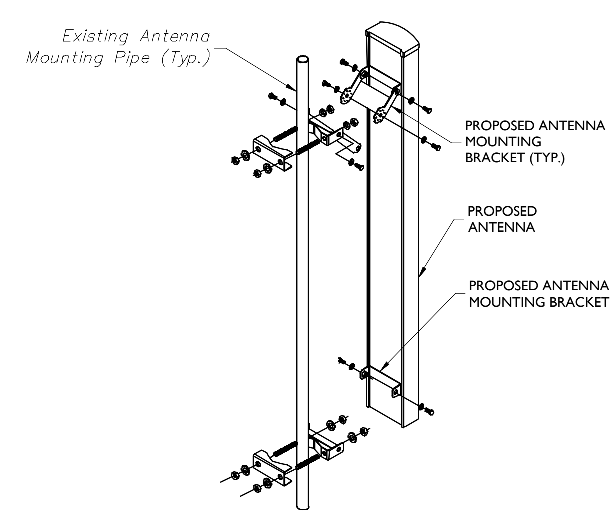
(IN FEET)

SCALE: 1" = 10' FOR 24"X36" DRAWINGS
(DO NOT SCALE 11"X17" DRAWINGS)

PROPOSED ANTENNA AND RRUS CONFIGURATION

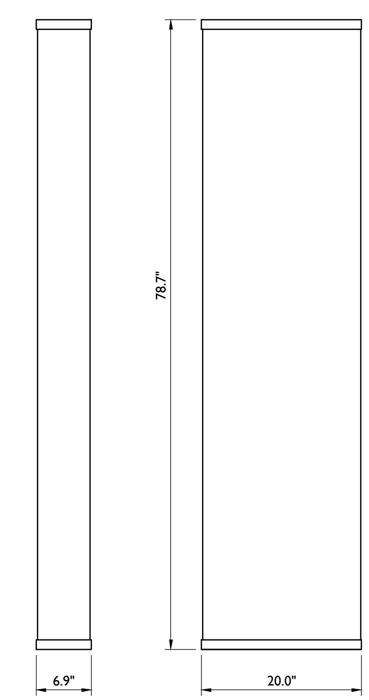
SECTOR		EXISTING ANTENNA CONFIGURATION	PROPOSED ANTENNA CONFIGURATION	TECHNOLOGY	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH	ANT. CL. ELEV (ft.)	RRUS/TMA CONFIGURATION	STATUS	FEEDER #	FEEDER TYPE	FEEDER STATUS
ALPHA	A1	Powerwave 7770	Powerwave 7770	UMTS	REMAIN	55.00	11.00	5.00	35.00	0°	180'	(2) LGP21401	-	2	1-5/8"COAX	REMAIN
	A2	CCI OPA-65R-LCUU-H6	CCI OPA-65R-LCUU-H6	LTE	REMAIN	72.00	14.80	7.40	73.00	0°	180'	(1) RRUS-32 (1) RRUS-E2 (AT GRADE) (1) RRUS-12 (AT GRADE)	REMAIN NEW NEW	2 1 2	1-5/8" COAX FIBER DC	REMAIN NEW NEW
	A3	-	Kathrein 800-10965	LTE	NEW	78.70	20.00	6.90	108.60	0°	180'	(1) RRUS-B14 4478 (1) RRUS-32 B66	NEW NEW		FIBER DC	REMAIN
	A4	CCI OPA-65R-LCUUUU-H6	CCI OPA-65R-LCUUUU-H6	LTE	REMAIN	72.00	14.80	7.40	73.00	0°	180'	(1) RRUS-11 (1)RRUS-32 B2	REMAIN NEW		FIBER DC	REMAIN
BETA	B1	Powerwave 7770	Powerwave 7770	UMTS	REMAIN	55.00	11.00	5.00	35.00	120°	180'	(2) LGP21401	-	2	1-5/8"COAX	REMAIN
	B2	CCI OPA-65R-LCUU-H6	CCI OPA-65R-LCUU-H6	LTE	REMAIN	72.00	14.80	7.40	73.00	120°	180'	(1) RRUS-32 (1) RRUS-E2 (AT GRADE) (1) RRUS-12 (AT GRADE)	REMAIN NEW NEW	2 1 2	1-5/8" COAX FIBER DC	REMAIN
	B3	-	Kathrein 800-10965	LTE	NEW	78.70	20.00	6.90	108.60	120°	180'	(1) RRUS-B14 4478 (1) RRUS-32 B66	NEW NEW		FIBER DC	REMAIN
	B4	CCI OPA-65R-LCUUUU-H6	CCI OPA-65R-LCUUUU-H6	LTE	REMAIN	72.00	14.80	7.40	73.00	120°	180'	(1) RRUS-11 (1)RRUS-32 B2	REMAIN NEW		FIBER DC	REMAIN
GAMMA	C1	Powerwave 7770	Powerwave 7770	UMTS	REMAIN	55.00	11.00	5.00	35.00	240°	180'	(2) LGP21401	-	2	1-5/8"COAX	REMAIN
	C2	CCI OPA-65R-LCUU-H6	CCI OPA-65R-LCUU-H6	LTE	REMAIN	72.00	14.80	7.40	73.00	240°	180'	(1) RRUS-32 (1) RRUS-E2 (AT GRADE) (1) RRUS-12 (AT GRADE)	REMAIN NEW NEW	2 1 2	1-5/8" COAX FIBER DC	REMAIN
	C3	-	Kathrein 800-10965	LTE	NEW	78.70	20.00	6.90	108.60	240°	180'	(1) RRUS-B14 4478 (1) RRUS-32 B66	NEW NEW		FIBER DC	REMAIN
	C4	CCI OPA-65R-LCUUUU-H6	CCI OPA-65R-LCUUUU-H6	LTE	REMAIN	72.00	14.80	7.40	73.00	240	180'	(1) RRUS-11 (1)RRUS-32 B2	REMAIN NEW		FIBER DC	REMAIN

ANTENNA SCHEDULE



ANTENNA MOUNTING DETAIL

NOT TO SCALE



WEIGHT = 108.6 LBS

KATHREIN 800-10965

ANTENNA DETAIL

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PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577

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SITE #: CTL05259

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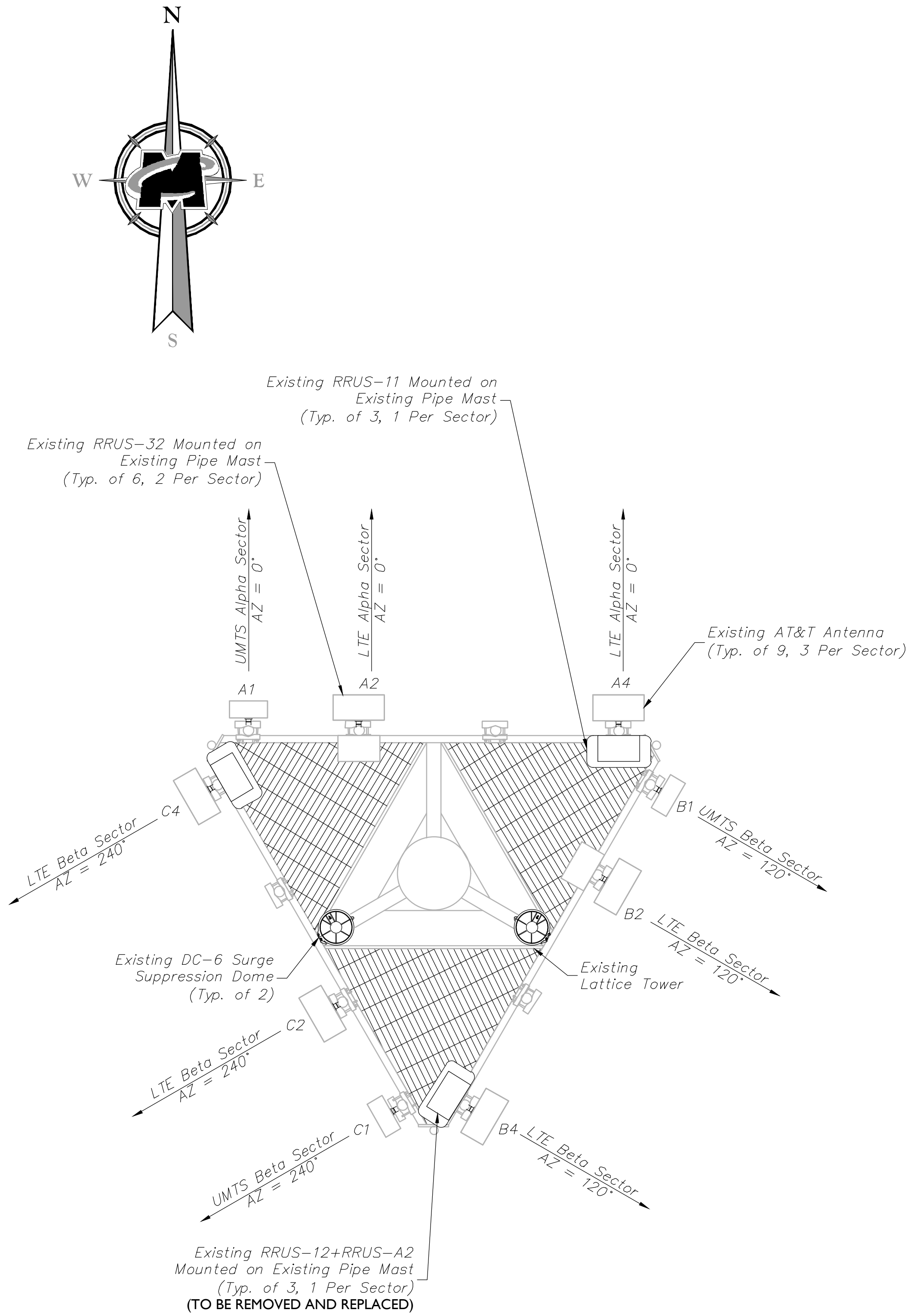
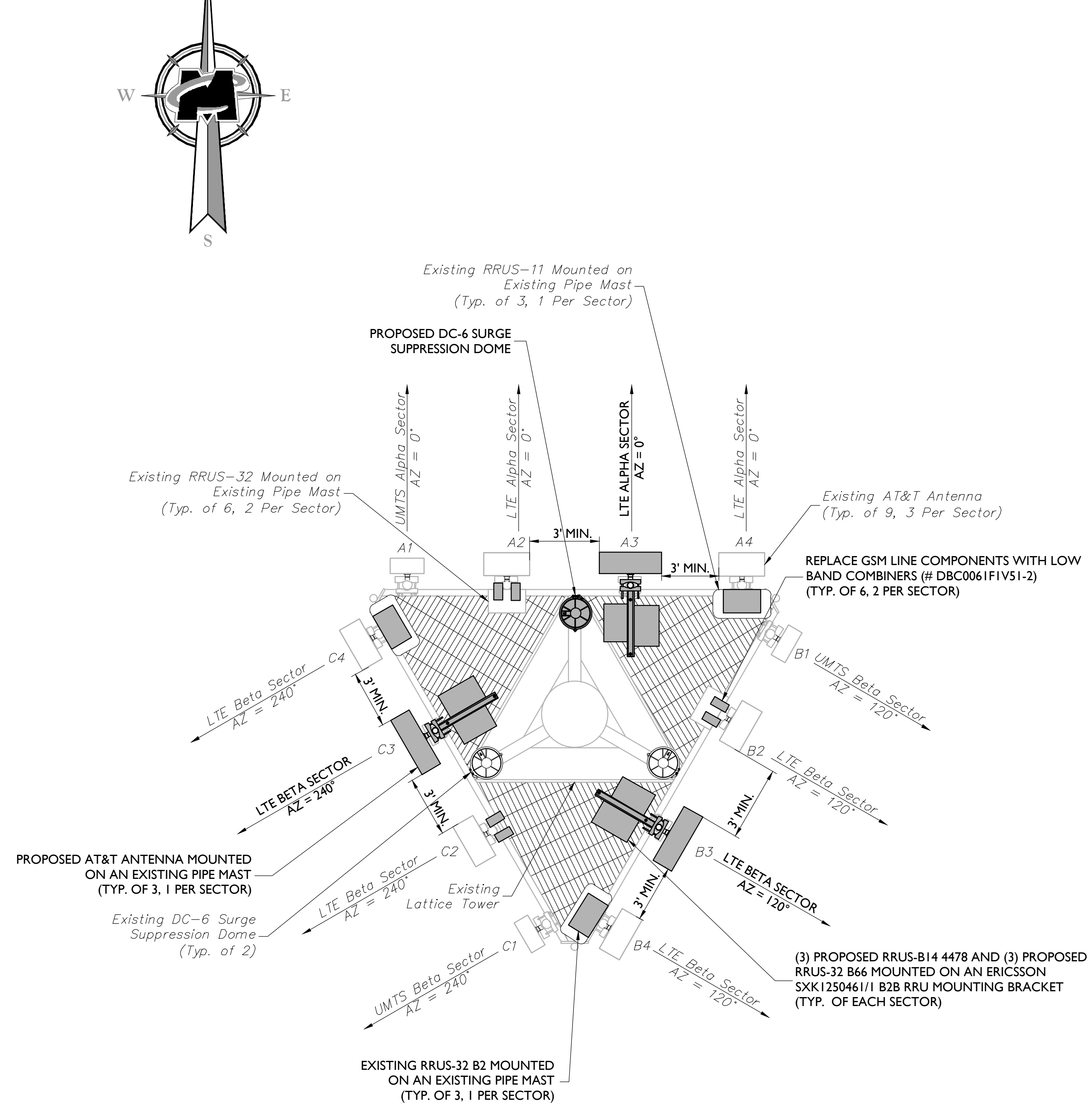
SHEET TITLE :
ELEVATION VIEW, DETAILS AND ANTENNA SCHEDULE

SHEET NUMBER :
A-2

3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE



EXISTING - ANTENNA LAYOUT
NOT TO SCALE



PROPOSED - ANTENNA LAYOUT
NOT TO SCALE

NOTE:

SITE INFORMATION OBTAINED FROM THE FOLLOWING:

A. PLAN ENTITLED "AVON - MONTEVIDEO ROAD" PREPARED BY COM EX CONSULTANTS, LAST REVISED 04/29/2016.

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JOB NUMBER: 17963019A

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STATE OF CONNECTICUT PETROS TSOUKALAS 32577 PROFESSIONAL LICENSED ENGINEER

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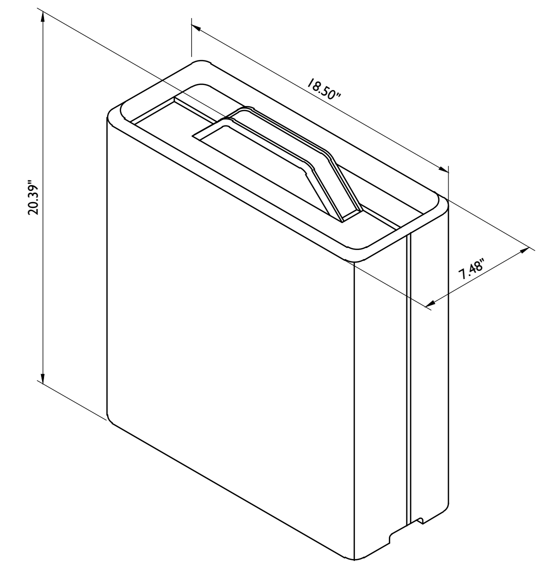
SHEET TITLE:
ANTENNA LAYOUTS

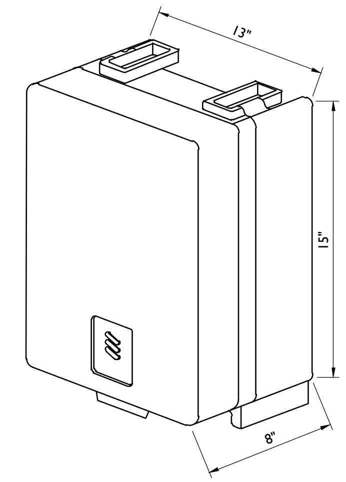
SHEET NUMBER:
A-3



RRUS-32 B66 DIMENSIONS (H X W X D): 20.39" X 18.5" X 7.48"
(INCLUDES HANDLES)

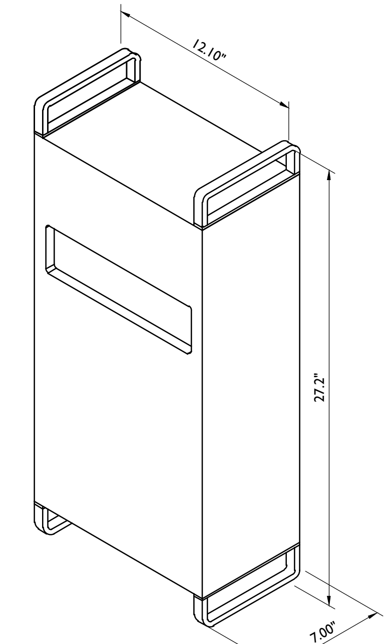
WEIGHT: 53 LBS

RRUS E2 DETAIL
NOT TO SCALE



DIMENSIONS (H X W X D): 15"H X 13"W X 8"D (INCLUDES SUNSHIELD)
WEIGHT: 60 LBS

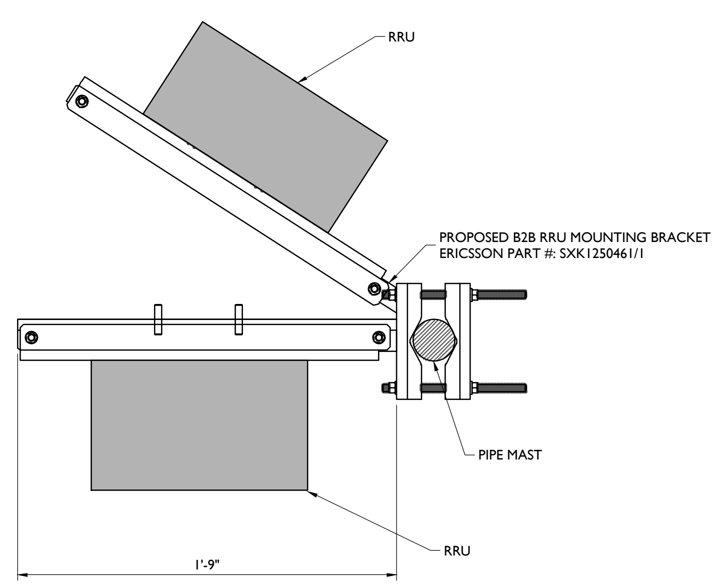
RRU-4478-B14 DETAIL
NOT TO SCALE



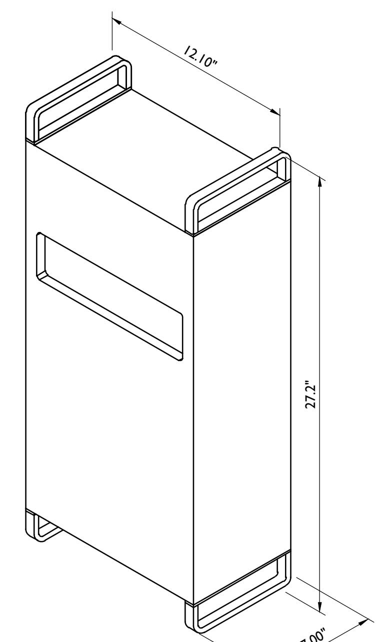
RRUS-32 B66 DIMENSIONS (H X W X D): 27.2" X 12.1" X 7.0"
(INCLUDES HANDLES, FEET AND SUNSHIELD)

WEIGHT: 53 LBS

RRUS-32 B66 DETAIL
NOT TO SCALE



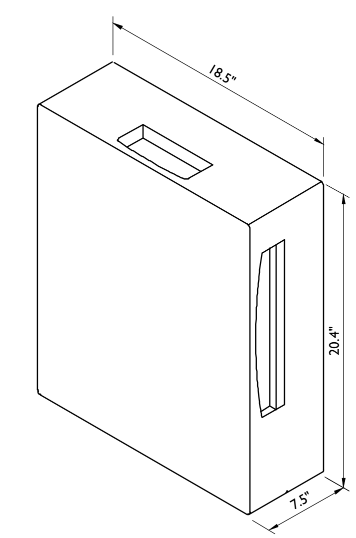
RRU MOUNTING DETAIL
NOT TO SCALE



RRUS-32 B2 DIMENSIONS (H X W X D): 27.2" X 12.1" X 7.0"
(INCLUDES HANDLES, FEET AND SUNSHIELD)

WEIGHT: 53 LBS

RRUS-32 B2 DETAIL
NOT TO SCALE



RRUS-12 DIMENSIONS (H X W X D): 20.4" X 18.5" X 7.5" (INCLUDES SUNSHIELD)
WEIGHT: 58 LBS

RRUS-12 DETAIL
NOT TO SCALE

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PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL
ENGINEER - LICENSE NUMBER: PEN.32577

STATE OF CONNECTICUT PETROS TSOUKALAS 32577 PROFESSIONAL ENGINEER LICENSED

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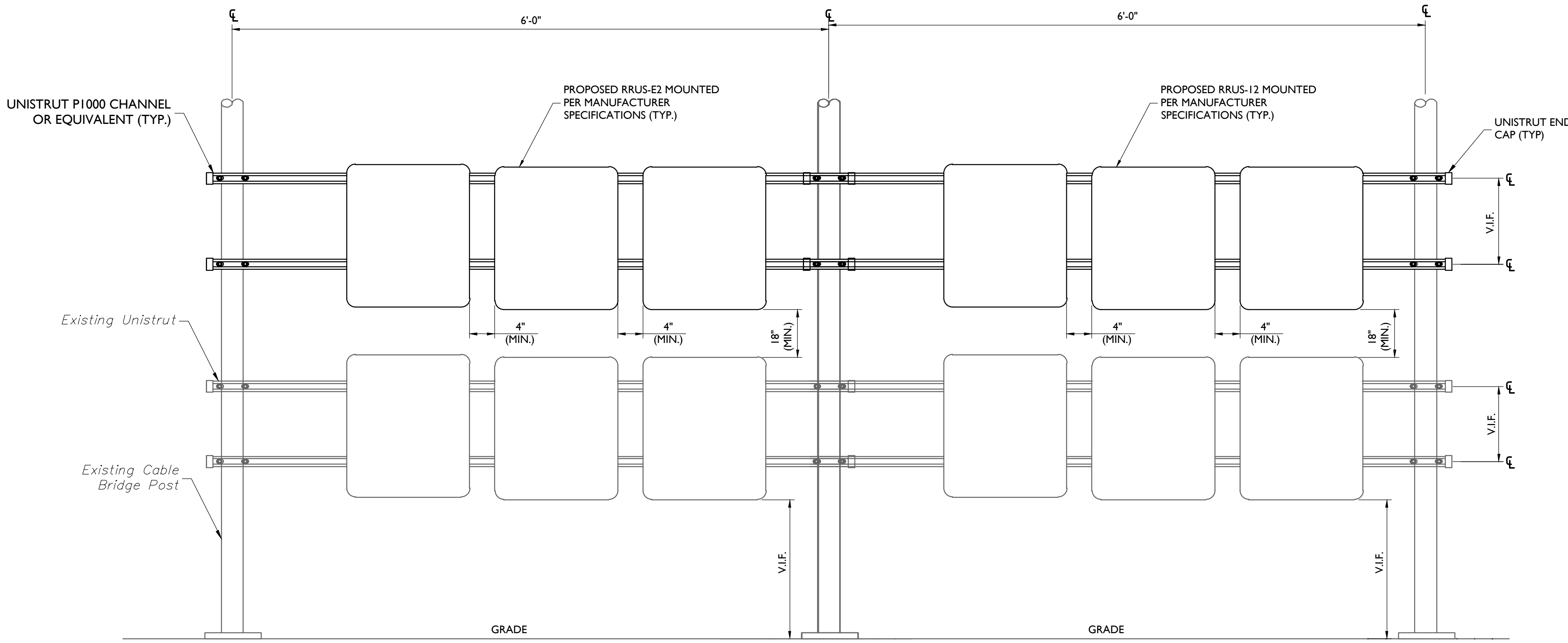
SHEET TITLE :
DETAILS

SHEET NUMBER :
A-4



NOTES:

1. INSTALL VERTICAL UNISTRUT CHANNELS AS REQUIRED TO ALIGN FRAME WITH EQUIPMENT MOUNTING HOLES. FASTEN UNISTRUT CHANNELS TOGETHER WITH 3/8" UNISTRUT BOLTING HARDWARE AND SPRING NUTS.
2. MOUNT RRU'S TO UNISTRUT PER MANUFACTURER'S SPECIFICATIONS.
3. MOUNT FRAME AS CLOSE TO PLATFORM AS POSSIBLE.
4. NO PAINTING OF THE RRUS IS ALLOWED.

RRUS DETAIL TO UNISTRUT FRAME DETAIL

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STATE OF CONNECTICUT PETROS TSOUKALAS 32577 LICENSED PROFESSIONAL ENGINEER

PETROS E. TSOUKALAS
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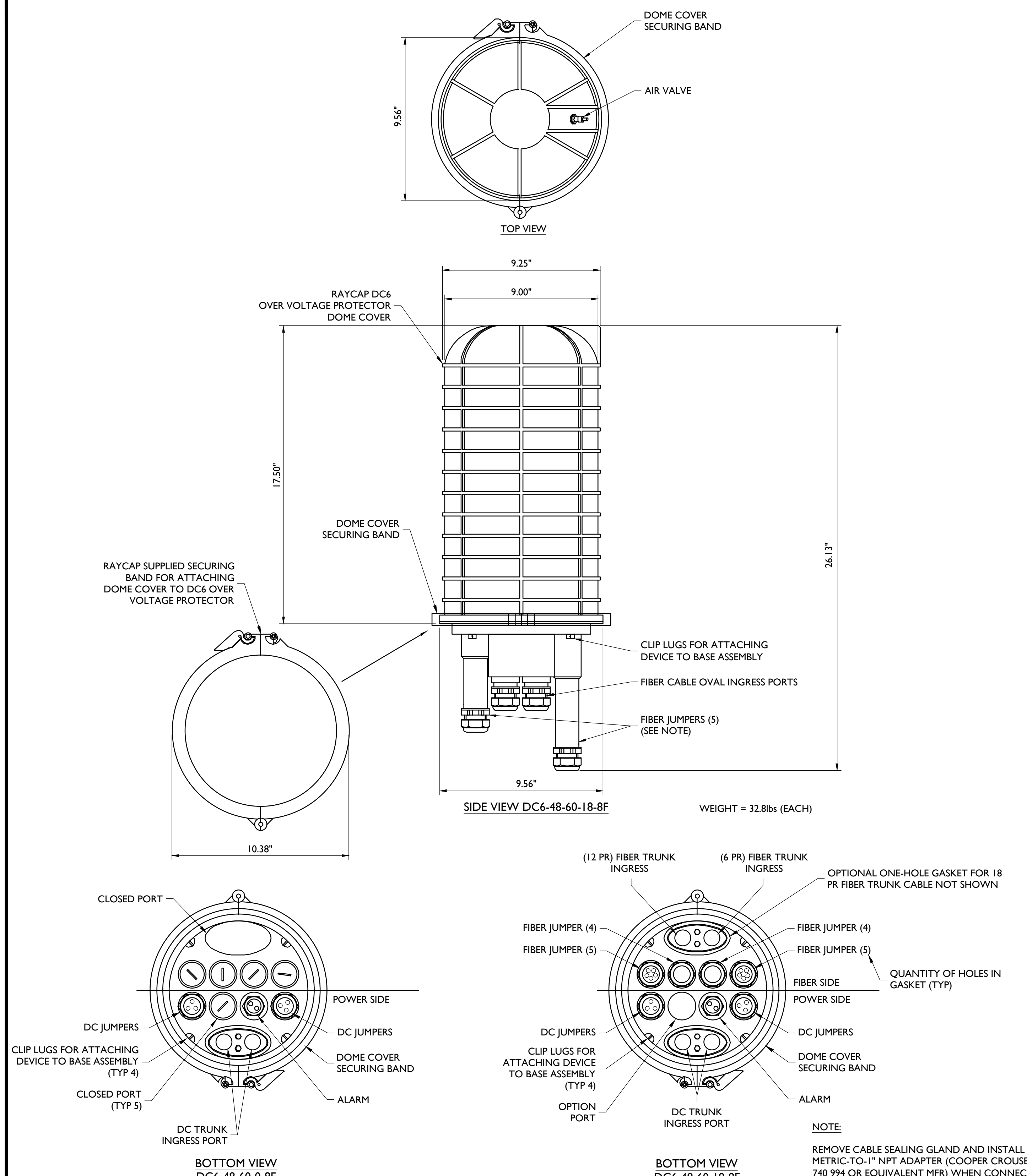
SHEET TITLE :
DETAILS

SHEET NUMBER :
A-5

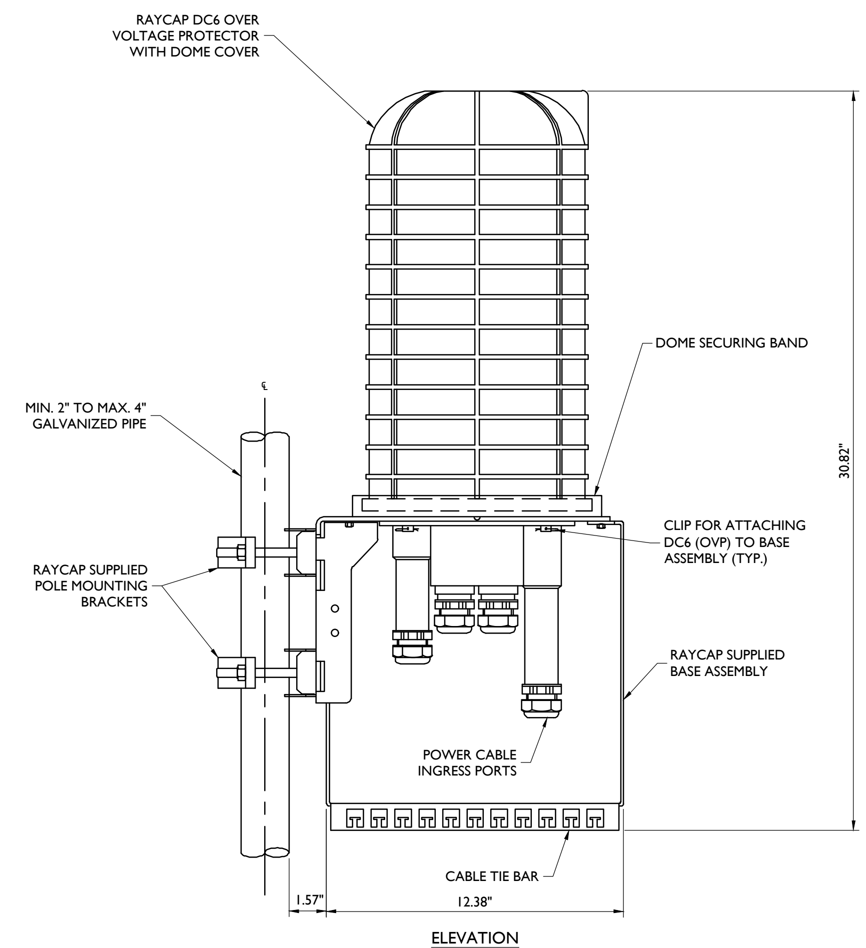


NOTE:

REMOVE CABLE SEALING GLAND AND INSTALL M32x1.5 METRIC-TO-1" NPT ADAPTER (COOPER CROUSE-HINES P/N CAP 740 994 OR EQUIVALENT MFR) WHEN CONNECTING CONDUIT TO OVP.

DC6 SURGE SUPPRESSION DOME DETAIL

NOT TO SCALE



NOTES:

RAYCAP VIA AT&T SUPPLIES THE DC6 OVER VOLTAGE PROTECTOR AND PIPE MOUNTING BRACKETS. SUBCONTRACTOR SHALL SUPPLY THE PIPE.

RAYCAP DC6-48-60-18-8F & DC6-48-60-0-8F DC POWER OVER VOLTAGE PROTECTOR (OVP) POLE MOUNT BASE ASSEMBLY

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STATE OF CONNECTICUT
PETROS TSOUKALAS
32577
LICENSED PROFESSIONAL ENGINEER

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL
ENGINEER - LICENSE NUMBER: PEN.32577

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DETAILS

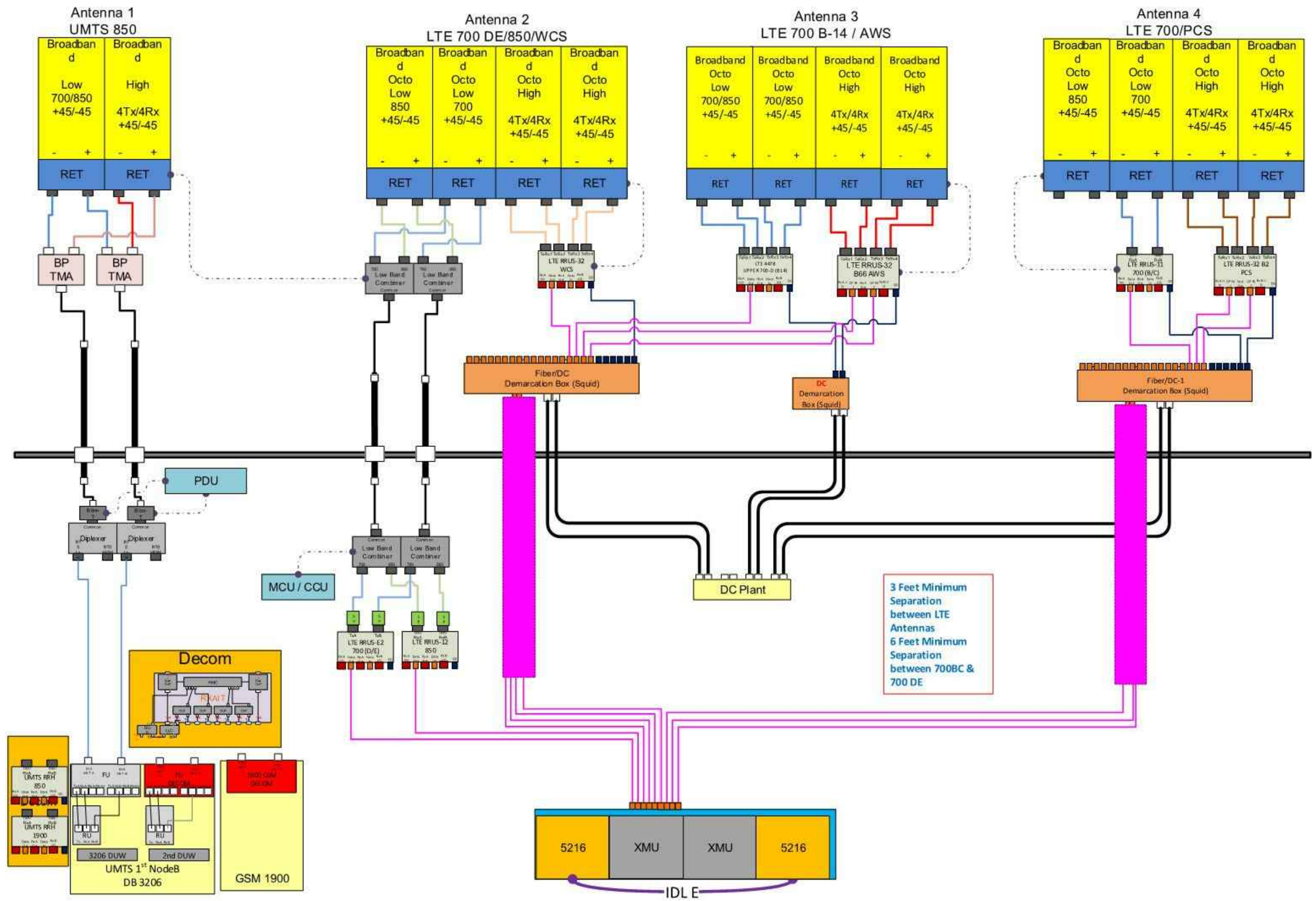
SHEET NUMBER :

A-6

Diagram - Sector A | Diagram File Name - CT5259_LTE_4C_5C_6C_7C_PCS_4T4R_Rev.1.vsd

Atoll Site Name - CTL05259 | Location Name - WEST HARTFORD-ELMWOOD | Market - CONNECTICUT | Market Cluster - NEW ENGLAND

Comments: "Important Note: For detailed radio to antenna wiring refer to the latest 4T4R Antenna/ radio Port connections Field Notice (RF-HW-2016-265)"



ALL SECTORS

BASED ON: "NEW-ENGLAND_CONNECTICUT_CTL05259_2018-LTE-Next-Carrier_LTE_dr701e_2051A0ACHR_10071358_25914_04-21-2017_Final-RF-Approval_v1.00" Last Updated: 10/09/2017.

RF PLUMBING DIAGRAMS

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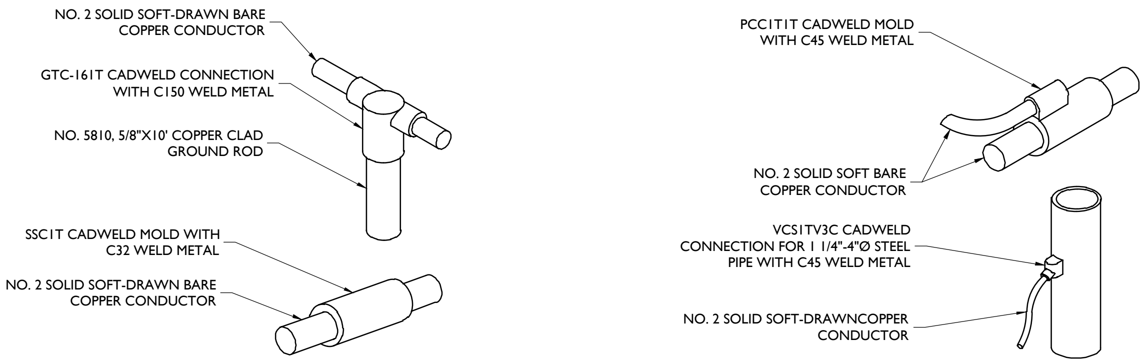
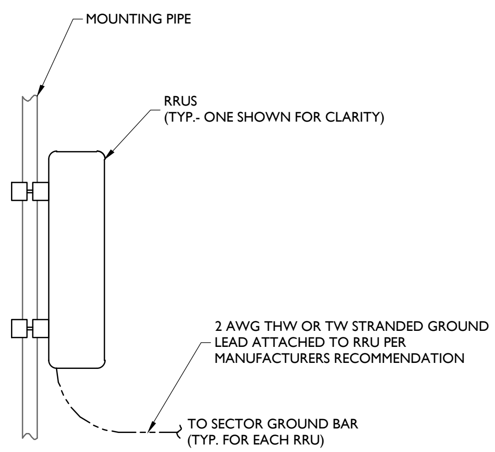
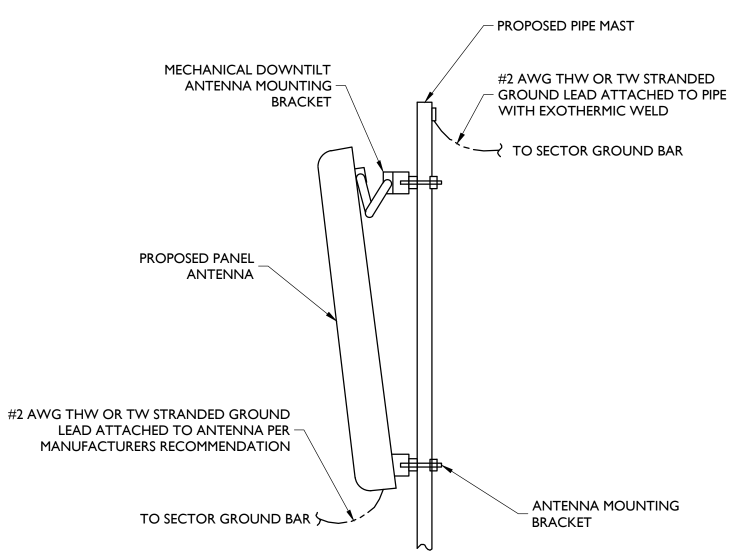


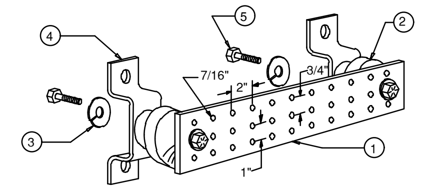
CADWELD DETAILS
NOT TO SCALE



RRU GROUNDING DETAIL
NOT TO SCALE



ANTENNA GROUNDING
NOT TO SCALE



LEGEND

1- TINNED COPPER GROUND BAR, 1/4"x4"x20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 OR EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.

2- INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4

3- 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8

4- WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-5056

5- 5/8-11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1

6- EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

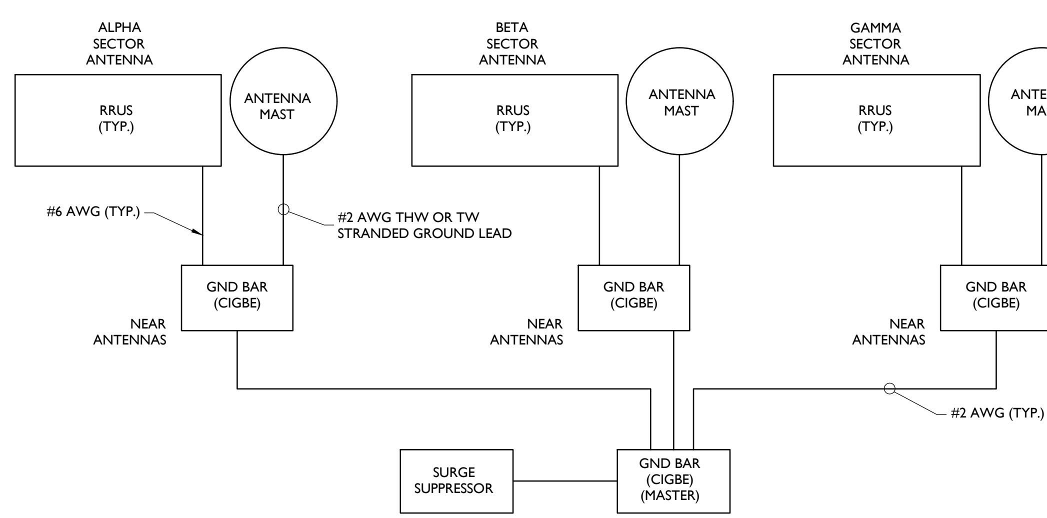
SECTION "P" - SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLY RETURN BAR (#2)
RECTIFIER FRAMES.

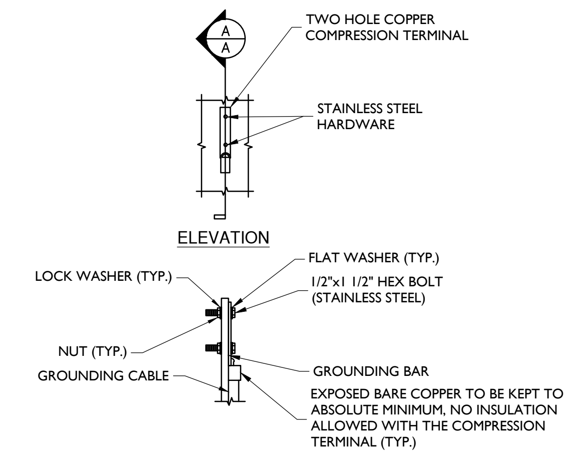
SECTION "A" - SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

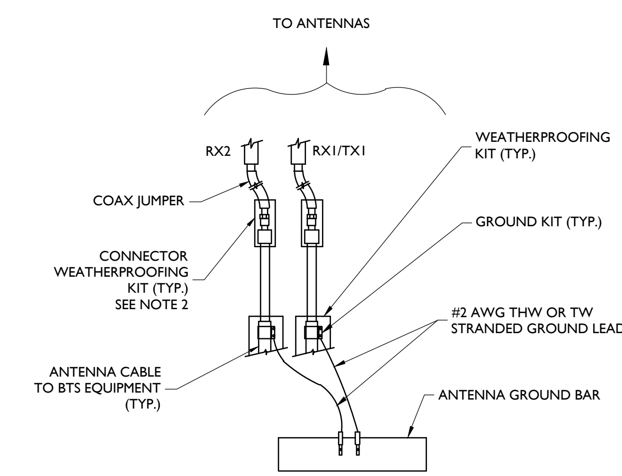
MASTER GROUND BAR
NOT TO SCALE



SCHEMATIC DIAGRAM GROUNDING SYSTEM



TYPICAL GROUND BAR CONNECTION DETAIL
NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

TYPICAL GROUND WIRE TO GROUNDING BAR
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SHEET TITLE :
GROUNDING DETAILS

SHEET NUMBER :
G-1

PJF PAUL J. FORD & COMPANY

Report Date:	March 27, 2018
Client:	Hirschfeld Communications LLC 1030 New Britain Avenue West Hartford, CT 06110 Attn: Ian Ormesher (703) 447-1350 iormesher@hirschfeldcos.com
Structure:	Existing 185-ft Self Support
Site Name:	WestHartford_DEXTERST
Site Reference #:	CT001
City, County, State:	West Hartford, Hartford County, CT
Latitude, Longitude:	41.736092, -72.720499
PJF Project:	A64118-0001.001.8700

Paul J. Ford and Company is pleased to submit this "**Structural Analysis Report**" to determine the tower stress level.

Analysis Criteria:

Reference Standard:	2016 Connecticut State Building Code with the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1.
Ultimate Wind Speed:	122 mph 3-second gust wind speed without ice
Nominal Wind Speed:	95 mph 3-second gust wind speed without ice
Ice Wind Speed:	50 mph 3-second gust wind speed with 1" ice
Service Wind Speed:	60.0 mph (Serviceability) without ice
IBC Site Criteria:	Risk Category II, Topographic Category 1, Exposure Category C

Proposed Appurtenance Loads:

The structure was analyzed with the addition of the proposed appurtenance loads shown in Table 1 combined with the existing and reserved loads shown in Table 2 of this report.

Summary of Analysis Results:

Existing Structure:	93.7%	Pass
Existing Foundation:	33.1%	Pass

We at Paul J. Ford and Company appreciate the opportunity of providing our continuing professional services to you and Hirschfeld Communications LLC. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully Submitted by:
Paul J. Ford and Company

Jonathan Sommer, EI
Structural Designer
jsommer@pjfweb.com

JBR

STATE OF CONNECTICUT JUSTIN T. KLINE No. 30301 LICENSED PROFESSIONAL ENGINEER

3.27.18

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 180 ft Self Support tower designed by PiRod in June of 1998. The tower was originally designed for a wind speed of 80 mph per EIA/TIA-222-F.

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 122 mph converted to a nominal 3-second gust wind speed of 95 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, “Structural Standard for Antenna Supporting Structures and Antennas”, with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1.0 with a maximum Topographic Factor, Kzt, of 1 were used in this analysis.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
180.0	180.0	3	ericsson	RRUS 32 B2	2	3/4	-
		3	ericsson	RRUS 32 B66			
		3	ericsson	RRUS 4478 B14			
		3	kathrein	80010965 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
180.0	180.0	6	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe	12 2 2	1-5/8 1/2 3/4	1
		3	ericsson	RRUS 11			
		3	ericsson	RRUS 12			
		3	ericsson	RRUS 32			
		3	ericsson	RRUS A2 MODULE			
		1	miscl	GPS			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		2	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 405-1]			
		6	powerwave technologies	LGP21901	-	-	2
		-	-	-	2	1/2	3

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
165.0	165.0	3	commscope	LNX-6515DS-A1M w/ Mount Pipe	6 2	1-5/8 Fiber	1
		3	ericsson	AIR 21 B2A/B4P w/ Mount Pipe			
		3	ericsson	AIR 32 B4A/B2P w/ Mount Pipe			
		3	ericsson	KRY 112 71			
		3	ericsson	RRUS 11 B12			
		1	tower mounts	Sector Mount [SM 402-3]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks
Manufacturer Drawings	PiROD Inc., 203949-B, 6/10/1998
Geotechnical Report	PiROD Inc., 6/5/1998
Pile Driving Report	Simeon Beer, 7/13/1998
Construction Drawings	AT&T, 2/13/2018

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) The existing base plate grout was considered in this analysis. Grout must be maintained and inspected periodically, and must be replaced if damaged or cracked.
5) Feedlines are stacked as shown in Appendix B of this report.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	180 - 170	Leg	1 1/2" solid	3	-18.97	54.43	34.9	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T2	170 - 150	Leg	2" solid	39	71.92	106.69	67.4	Pass
T3	150 - 130	Leg	2 1/4" solid	101	-132.48	148.69	89.1	Pass
T4	130 - 120	Leg	Pirod 105216 (12x1.25)	165	-133.47	142.49	93.7	Pass
T5	120 - 100	Leg	Pirod 105217 (12x1.5)	175	-160.20	214.86	74.6	Pass
T6	100 - 80	Leg	Pirod 105217 (12x1.5)	190	-182.81	214.86	85.1	Pass
T7	80 - 60	Leg	Pirod 105218 (12x1.75)	205	-206.10	300.68	68.5	Pass
T8	60 - 40	Leg	Pirod 105218 (12x1.75)	220	-229.38	300.68	76.3	Pass
T9	40 - 20	Leg	Pirod 105219 (12x2)	235	-253.59	399.87	63.4	Pass
T10	20 - 0	Leg	Pirod 105219 (12x2)	250	-276.44	399.87	69.1	Pass
T1	180 - 170	Diagonal	3/4" solid	15	-3.34	6.09	54.9	Pass
T2	170 - 150	Diagonal	7/8" solid	50	-5.48	9.34	58.8	Pass
T3	150 - 130	Diagonal	1" solid	164	-6.22	15.16	41.1	Pass
T4	130 - 120	Diagonal	L 2.5 x 2.5 x 3/16	172	-7.02	13.56	51.7 61.4 (b)	Pass
T5	120 - 100	Diagonal	L 2.5 x 2.5 x 3/16	188	-4.73	11.92	39.7 42.1 (b)	Pass
T6	100 - 80	Diagonal	L 2.5 x 2.5 x 3/16	196	-4.60	8.66	53.1	Pass
T7	80 - 60	Diagonal	L 3 x 3 x 3/16	210	-5.01	12.12	41.3	Pass
T8	60 - 40	Diagonal	L 3 x 3 x 3/16	225	-5.51	9.79	56.3	Pass
T9	40 - 20	Diagonal	L 3 x 3 x 5/16	240	-6.14	12.87	47.7	Pass
T10	20 - 0	Diagonal	L 3 x 3 x 5/16	255	-7.37	10.64	69.3	Pass
T1	180 - 170	Horizontal	7/8" solid	30	-0.55	6.14	9.0	Pass
T2	170 - 150	Horizontal	7/8" solid	59	-1.04	5.22	19.9	Pass
T3	150 - 130	Horizontal	7/8" solid	158	-1.84	4.79	38.5	Pass
T1	180 - 170	Top Girt	7/8" solid	6	-1.75	6.14	28.5	Pass
T2	170 - 150	Top Girt	7/8" solid	42	-1.92	6.22	30.8	Pass
T3	150 - 130	Top Girt	1" solid	105	-2.08	8.40	24.8	Pass
T1	180 - 170	Bottom Girt	7/8" solid	7	-1.49	6.14	24.3	Pass
T2	170 - 150	Bottom Girt	7/8" solid	43	-2.58	4.94	52.2	Pass
T3	150 - 130	Bottom Girt	1" solid	107	-2.72	6.83	39.9	Pass
							Summary	
						Leg (T4)	93.7	Pass
						Diagonal (T10)	69.3	Pass
						Horizontal (T3)	38.5	Pass
						Top Girt (T2)	30.8	Pass
						Bottom Girt (T2)	52.2	Pass
						Bolt Checks	65.5	Pass
						RATING =	93.7	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	42.2	Pass
1	Base Foundation Structural	0	9.1	Pass
1	Base Foundation Soil Interaction	0	33.1	Pass

Structure Rating (max from all components) =	93.1%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its foundations have sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 4.00 ft at the top and 18.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

1) Tower is located in Hartford County, Connecticut.
2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
3) Basic wind speed of 95.0 mph.
4) Structure Class II.
5) Exposure Category C.
6) Topographic Category 1.
7) Crest Height 0.00 ft.
8) Nominal ice thickness of 1.00 in.
9) Ice thickness is considered to increase with height.
10) Ice density of 56 pcf.
11) A wind speed of 50.0 mph is used in combination with ice.
12) Deflections calculated using a wind speed of 60.0 mph.
13) A non-linear (P-delta) analysis was used.
14) Pressures are calculated at each section.
15) Stress ratio used in tower member design is 1.
16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

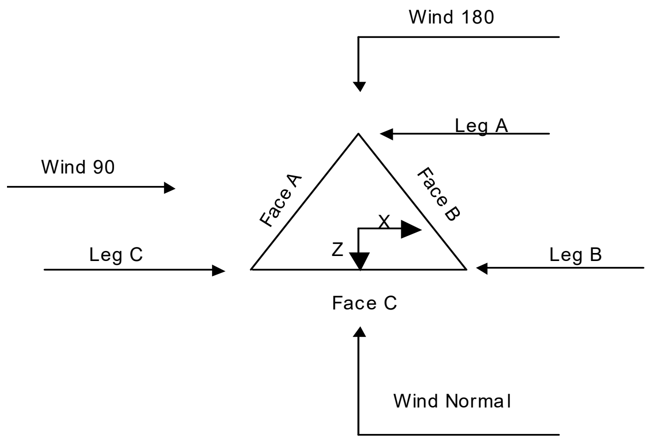
Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
√ Include Bolts In Member Capacity
Leg Bolts Are At Top Of Section
√ Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
√ SR Members Have Cut Ends
SR Members Are Concentric

Distribute Leg Loads As Uniform
Assume Legs Pinned
Assume Rigid Index Plate
√ Use Clear Spans For Wind Area
√ Use Clear Spans For KL/r
Retension Guys To Initial Tension
Bypass Mast Stability Checks
√ Use Azimuth Dish Coefficients
√ Project Wind Area of Appurt.
Autocalc Torque Arm Areas
Add IBC .6D+W Combination
√ Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder

Use ASCE 10 X-Brace Ly Rules
√ Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
√ SR Leg Bolts Resist Compression
All Leg Panels Have Same Allowable
Offset Girt At Foundation
√ Consider Feed Line Torque
√ Include Angle Block Shear Check
Use TIA-222-G Bracing Resist. Exemption
Use TIA-222-G Tension Splice Exemption

Poles

Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	180.00-170.00		106778 (48)	4.00	1	10.00
T2	170.00-150.00		100246 (48/54)	4.00	1	20.00
T3	150.00-130.00		119703 (54/60)	4.50	1	20.00
T4	130.00-120.00		U06 105218 [L2.5 x 3/16]	5.00	1	10.00
T5	120.00-100.00		U08 105217 [L2.5 x 3/16]	6.00	1	20.00
T6	100.00-80.00		U10 105217 [L2.5 x 3/16]	8.00	1	20.00
T7	80.00-60.00		U12 105218 [L3 x 3/16]	10.00	1	20.00
T8	60.00-40.00		U14 105218 [L3 x 3/16]	12.00	1	20.00
T9	40.00-20.00		U16 105219 [L3 x 5/16]	14.00	1	20.00
T10	20.00-0.00		U18 105219 [L3 x 5/16]	16.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	180.00-170.00	2.25	X Brace	No	Steps	6.00	6.00
T2	170.00-150.00	2.36	X Brace	No	Steps	6.80	6.80
T3	150.00-130.00	2.36	X Brace	No	Steps	6.80	6.80
T4	130.00-120.00	10.00	X Brace	No	No	0.00	0.00
T5	120.00-100.00	10.00	X Brace	No	No	0.00	0.00
T6	100.00-80.00	10.00	X Brace	No	No	0.00	0.00
T7	80.00-60.00	10.00	X Brace	No	No	0.00	0.00
T8	60.00-40.00	10.00	X Brace	No	No	0.00	0.00
T9	40.00-20.00	10.00	X Brace	No	No	0.00	0.00
T10	20.00-0.00	10.00	X Brace	No	No	0.00	0.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-170.00	Solid Round	1 1/2" solid	A572-50 (50 ksi)	Solid Round	3/4" solid	A572-50 (50 ksi)
T2 170.00-150.00	Solid Round	2" solid	A572-50 (50 ksi)	Solid Round	7/8" solid	A572-50 (50 ksi)
T3 150.00-130.00	Solid Round	2 1/4" solid	A572-50 (50 ksi)	Solid Round	1" solid	A572-50 (50 ksi)
T4 130.00-120.00	Truss Leg	Pirod 105216 (12x1.25)	A572-50 (50 ksi)	Single Angle	L 2.5 x 2.5 x 3/16	A36 (36 ksi)
T5 120.00-100.00	Truss Leg	Pirod 105217 (12x1.5)	A572-50 (50 ksi)	Single Angle	L 2.5 x 2.5 x 3/16	A36 (36 ksi)
T6 100.00-80.00	Truss Leg	Pirod 105217 (12x1.5)	A572-50 (50 ksi)	Single Angle	L 2.5 x 2.5 x 3/16	A36 (36 ksi)
T7 80.00-60.00	Truss Leg	Pirod 105218 (12x1.75)	A572-50 (50 ksi)	Single Angle	L 3 x 3 x 3/16	A36 (36 ksi)
T8 60.00-40.00	Truss Leg	Pirod 105218 (12x1.75)	A572-50 (50 ksi)	Single Angle	L 3 x 3 x 3/16	A36 (36 ksi)
T9 40.00-20.00	Truss Leg	Pirod 105219 (12x2)	A572-50 (50 ksi)	Single Angle	L 3 x 3 x 5/16	A36 (36 ksi)
T10 20.00-0.00	Truss Leg	Pirod 105219 (12x2)	A572-50 (50 ksi)	Single Angle	L 3 x 3 x 5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 180.00-170.00	Solid Round	7/8" solid	A572-50 (50 ksi)	Solid Round	7/8" solid	A572-50 (50 ksi)
T2 170.00-150.00	Solid Round	7/8" solid	A572-50 (50 ksi)	Solid Round	7/8" solid	A572-50 (50 ksi)
T3 150.00-130.00	Solid Round	1" solid	A572-50 (50 ksi)	Solid Round	1" solid	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 180.00-170.00	None	Solid Round		A572-50 (50 ksi)	Solid Round	7/8" solid	A572-50 (50 ksi)
T2 170.00-150.00	None	Solid Round		A36 (36 ksi)	Solid Round	7/8" solid	A572-50 (50 ksi)
T3 150.00-130.00	None	Solid Round		A572-50 (50 ksi)	Solid Round	7/8" solid	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 180.00-170.00	0.00	0.00	A36 (36 ksi)	1	1	1.02	Mid-Pt	Mid-Pt	Mid-Pt
T2 170.00-150.00	0.00	0.00	A36 (36 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T3 150.00-130.00	0.00	0.00	A36 (36 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T4 130.00-120.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T5 120.00-100.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T6 100.00-80.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T7 80.00-60.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T8 60.00-40.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T9 40.00-20.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T10 20.00-0.00	0.00	0.75	A36 (36 ksi)	1	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt

Tower Section Geometry *(cont'd)*

			K Factors[1]							
Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 180.00-170.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	0.7 0.7	1 1
T2 170.00-150.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	0.7 0.7	1 1
T3 150.00-130.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	0.7 0.7	1 1
T4 130.00-120.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 120.00-100.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 100.00-80.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 80.00-60.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 60.00-40.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 40.00-20.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 20.00-0.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

[1]Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.

Tower Section Geometry *(cont'd)*

	Truss-Leg K Factors					
	Truss-Legs Used As Leg Members			Truss-Legs Used As Inner Members		
Tower Elevation ft	Leg Panels	X Brace Diagonals	Z Brace Diagonals	Leg Panels	X Brace Diagonals	Z Brace Diagonals
T4 130.00-120.00	1	0.5	0.85	1	0.5	0.85
T5 120.00-100.00	1	0.5	0.85	1	0.5	0.85
T6 100.00-80.00	1	0.5	0.85	1	0.5	0.85
T7 80.00-60.00	1	0.5	0.85	1	0.5	0.85
T8 60.00-40.00	1	0.5	0.85	1	0.5	0.85
T9 40.00-20.00	1	0.5	0.85	1	0.5	0.85
T10 20.00-0.00	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 180.00-170.00	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1
T2 170.00-150.00	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1
T3 150.00-130.00	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1
T4 130.00-120.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T5 120.00-100.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T6 100.00-80.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T7 80.00-60.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T8 60.00-40.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T9 40.00-20.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T10 20.00-0.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 180.00-170.00	Sleeve DS	0.63 A325N	5	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.63 A325N	0	0.00 A325N	0	0.63 A325N	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T2 170.00-150.00	Sleeve DS	0.75 A325N	5	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0
T3 150.00-130.00	Flange	1.00 A325N	6	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.50 A325N	0	0.00 A325N	0	0.50 A325N	0
T4 130.00-120.00	Flange	1.00 A325N	6	1.00 A325N	1	0.00 A325N	0	0.00 A325N	0	1.00 A325N	0	1.00 A325N	0	1.00 A325N	0
T5 120.00-100.00	Flange	1.00 A325N	6	1.00 A325N	1	0.00 A325N	0	0.00 A325N	0	1.00 A325N	0	1.00 A325N	0	1.00 A325N	0
T6 100.00-80.00	Flange	1.00 A325N	6	1.00 A325N	1	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0
T7 80.00-60.00	Flange	1.00 A325N	6	1.00 A325N	1	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0
T8 60.00-40.00	Flange	1.00 A325N	6	1.00 A325N	1	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0
T9 40.00-20.00	Flange	1.25 A325N	6	1.25 A325N	1	0.00 A325N	0	0.00 A325N	0	1.25 A325N	0	1.25 A325N	0	1.25 A325N	0
T10 20.00-0.00	Flange	1.25 F1554-105	0	1.25 A325N	1	0.00 A325N	0	0.00 A325N	0	1.00 A325N	0	1.00 A325N	0	1.00 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A (1 5/8" foam)	A	No	Ar (CaAa)	180.00 - 8.00	0.00	0.2	12	6	1.00 0.50	1.98		0.92
FSJ4-50B(1/2")	A	No	Ar (CaAa)	180.00 - 8.00	0.00	0.2	2	2	2.00 0.50	0.52		0.14
9776(3/4")	A	No	Ar (CaAa)	180.00 - 8.00	0.00	0.2	4	4	2.00 0.50	0.73		0.31
***												
T-Brackets (Af)	C	No	Ar (CaAa)	165.00 - 8.00	0.00	-0.45	1	1	1.00	1.00		8.40
LDF7-50A (1 5/8" foam)	C	No	Ar (CaAa)	165.00 - 8.00	0.00	-0.45	8	6	1.00 0.50	1.98		0.92
LDF7-50A (1 5/8" foam)	C	No	Ar (CaAa)	165.00 - 8.00	0.00	-0.45	2	2	1.00 0.50	1.98		0.92
******												

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Platform Mount [LP 405-1]	C	None		0.000	180.00	No Ice 1/2" Ice 1" Ice	20.80 28.10 35.40	20.80 28.10 35.40	1.80 2.07 2.33
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770.00 w/ Mount Pipe	B	From Leg	4.00	0.000	180.00	No Ice	5.75	4.25	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	6.18	5.01	0.10
			0.00			1" Ice	6.61	5.71	0.16
7770.00 w/ Mount Pipe	C	From Leg	4.00	0.000	180.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			0.00			1" Ice	6.61	5.71	0.16
(2) OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Leg	4.00	0.000	180.00	No Ice	9.90	7.18	0.10
			0.00			1/2" Ice	10.47	8.36	0.18
			0.00			1" Ice	11.01	9.26	0.26
(2) OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Leg	4.00	0.000	180.00	No Ice	9.90	7.18	0.10
			0.00			1/2" Ice	10.47	8.36	0.18
			0.00			1" Ice	11.01	9.26	0.26
(2) OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.00	0.000	180.00	No Ice	9.90	7.18	0.10
			0.00			1/2" Ice	10.47	8.36	0.18
			0.00			1" Ice	11.01	9.26	0.26
(2) LGP21401	A	From Leg	4.00	0.000	180.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			0.00			1" Ice	1.38	0.54	0.03
(2) LGP21401	B	From Leg	4.00	0.000	180.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			0.00			1" Ice	1.38	0.54	0.03
(2) LGP21401	C	From Leg	4.00	0.000	180.00	No Ice	1.10	0.35	0.01
			0.00			1/2" Ice	1.24	0.44	0.02
			0.00			1" Ice	1.38	0.54	0.03
RRUS 32	A	From Leg	4.00	0.000	180.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			0.00			1" Ice	3.32	2.17	0.10
RRUS 32	B	From Leg	4.00	0.000	180.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			0.00			1" Ice	3.32	2.17	0.10
RRUS 32	C	From Leg	4.00	0.000	180.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			0.00			1" Ice	3.32	2.17	0.10
RRUS 11	A	From Leg	4.00	0.000	180.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			0.00			1" Ice	3.21	1.50	0.10
RRUS 11	B	From Leg	4.00	0.000	180.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			0.00			1" Ice	3.21	1.50	0.10
RRUS 11	C	From Leg	4.00	0.000	180.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			0.00			1" Ice	3.21	1.50	0.10
DC6-48-60-18-8F	A	From Leg	4.00	0.000	180.00	No Ice	0.92	0.92	0.02
			0.00			1/2" Ice	1.46	1.46	0.04
			0.00			1" Ice	1.64	1.64	0.06
DC6-48-60-18-8F	B	From Leg	4.00	0.000	180.00	No Ice	0.92	0.92	0.02
			0.00			1/2" Ice	1.46	1.46	0.04
			0.00			1" Ice	1.64	1.64	0.06
RRUS 12	A	From Leg	4.00	0.000	180.00	No Ice	3.15	1.29	0.06
			0.00				3.36	1.44	0.08

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* *ft²*	C_AA_A *Side* *ft²*	*Weight* *K*
			0.00			1/2" Ice 1" Ice	3.59	1.60	0.11
RRUS 12	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	0.06 0.08 0.11
RRUS 12	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	0.06 0.08 0.11
RRUS A2 MODULE	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	1.60 1.76 1.92	0.38 0.47 0.57	0.02 0.03 0.04
RRUS A2 MODULE	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	1.60 1.76 1.92	0.38 0.47 0.57	0.02 0.03 0.04
RRUS A2 MODULE	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	1.60 1.76 1.92	0.38 0.47 0.57	0.02 0.03 0.04
GPS	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	0.13 0.24 0.31	0.13 0.24 0.31	0.02 0.02 0.02
80010965 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	14.05 14.69 15.30	7.63 8.90 9.96	0.13 0.22 0.33
80010965 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	14.05 14.69 15.30	7.63 8.90 9.96	0.13 0.22 0.33
80010965 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	14.05 14.69 15.30	7.63 8.90 9.96	0.13 0.22 0.33
DC6-48-60-18-8F	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.02 0.04 0.06
RRUS 4478 B14	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	1.84 2.01 2.19	1.06 1.20 1.34	0.06 0.08 0.09
RRUS 4478 B14	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	1.84 2.01 2.19	1.06 1.20 1.34	0.06 0.08 0.09
RRUS 4478 B14	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	1.84 2.01 2.19	1.06 1.20 1.34	0.06 0.08 0.09
RRUS 32 B66	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B66	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B66	C	From Leg	4.00 0.00	0.000	180.00	No Ice	2.74 2.96	1.67 1.86	0.05 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice 1" Ice	3.19	2.05	0.10
RRUS 32 B2	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B2	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B2	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
(2) LGP21901	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	0.23 0.29 0.36	0.16 0.21 0.28	0.01 0.01 0.01
(2) LGP21901	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	0.23 0.29 0.36	0.16 0.21 0.28	0.01 0.01 0.01
(2) LGP21901	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	0.23 0.29 0.36	0.16 0.21 0.28	0.01 0.01 0.01
***									
Sector Mount [SM 402-3]	C	From Leg	0.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	18.91 26.78 34.65	18.91 26.78 34.65	0.85 1.23 1.62
AIR 21 B2A/B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	6.16 6.60 7.03	5.55 6.30 7.00	0.10 0.16 0.22
AIR 21 B2A/B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	6.16 6.60 7.03	5.55 6.30 7.00	0.10 0.16 0.22
AIR 21 B2A/B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	6.16 6.60 7.03	5.55 6.30 7.00	0.10 0.16 0.22
LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
AIR 32 B4A/B2P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	7.09 7.56 8.02	6.37 7.23 7.97	0.13 0.19 0.26
AIR 32 B4A/B2P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	7.09 7.56 8.02	6.37 7.23 7.97	0.13 0.19 0.26

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
AIR 32 B4A/B2P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	7.09 7.56 8.02	6.37 7.23 7.97	0.13 0.19 0.26
KRY 112 71	A	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	0.58 0.69 0.80	0.40 0.49 0.59	0.01 0.02 0.03
KRY 112 71	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	0.58 0.69 0.80	0.40 0.49 0.59	0.01 0.02 0.03
KRY 112 71	C	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	0.58 0.69 0.80	0.40 0.49 0.59	0.01 0.02 0.03
RRUS 11 B12	A	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	C	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
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Truss-Leg Properties

Section Designation	Area in²	Area Ice in²	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in²
Pirod 105216 (12x1.25)	2176.93	6534.58	0.60	2.48	7.56	22.69	3.68
Pirod 105217 (12x1.5)	2303.92	6585.93	0.71	2.51	8.00	22.87	5.30
Pirod 105217 (12x1.5)	2303.92	6554.05	0.71	2.49	8.00	22.76	5.30
Pirod 105218 (12x1.75)	2432.86	6587.02	0.85	2.51	8.45	22.87	7.22
Pirod 105218 (12x1.75)	2432.86	6536.27	0.85	2.47	8.45	22.70	7.22
Pirod 105219 (12x2)	2608.79	6534.42	1.22	2.45	9.06	22.69	9.42
Pirod 105219 (12x2)	2608.79	6387.80	1.22	2.28	9.06	22.18	9.42

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice

Comb. No.	Description
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	282.35	22.92	-13.20
	Max. H_x	18	282.35	22.92	-13.20
	Max. H_z	7	-250.94	-20.47	11.81
	Min. Vert	7	-250.94	-20.47	11.81
	Min. H_x	7	-250.94	-20.47	11.81
	Min. H_z	18	282.35	22.92	-13.20
Leg B	Max. Vert	10	283.27	-22.88	-13.31
	Max. H_x	23	-250.26	20.41	11.88
	Max. H_z	23	-250.26	20.41	11.88
	Min. Vert	23	-250.26	20.41	11.88
	Min. H_x	10	283.27	-22.88	-13.31
	Min. H_z	10	283.27	-22.88	-13.31
Leg A	Max. Vert	2	282.48	0.11	26.46
	Max. H_x	21	11.11	0.76	0.90

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H_z	2	282.48	0.11	26.46
	Min. Vert	15	-250.84	-0.09	-23.63
	Min. H_x	11	-122.43	-0.76	-11.75
	Min. H_z	15	-250.84	-0.09	-23.63

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 170	7.97	46	0.482	0.018
T2	170 - 150	6.91	44	0.470	0.017
T3	150 - 130	4.98	44	0.413	0.010
T4	130 - 120	3.38	44	0.320	0.003
T5	120 - 100	2.76	44	0.264	0.001
T6	100 - 80	1.79	44	0.196	0.001
T7	80 - 60	1.08	42	0.135	0.001
T8	60 - 40	0.59	42	0.094	0.001
T9	40 - 20	0.26	42	0.055	0.001
T10	20 - 0	0.07	43	0.027	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Platform Mount [LP 405-1]	46	7.97	0.482	0.018	35068
165.00	Sector Mount [SM 402-3]	44	6.40	0.460	0.016	16953

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 170	31.93	16	1.926	0.074
T2	170 - 150	27.69	12	1.878	0.071
T3	150 - 130	19.94	12	1.652	0.039
T4	130 - 120	13.54	12	1.281	0.015
T5	120 - 100	11.05	12	1.059	0.009
T6	100 - 80	7.16	12	0.784	0.004
T7	80 - 60	4.32	8	0.541	0.005
T8	60 - 40	2.34	8	0.376	0.004
T9	40 - 20	1.02	8	0.222	0.003
T10	20 - 0	0.28	10	0.109	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Platform Mount [LP 405-1]	16	31.93	1.926	0.074	8823
165.00	Sector Mount [SM 402-3]	12	25.64	1.838	0.065	4281

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Leg	A325N	0.63	5	4.36	24.85	0.175	1	Bolt DS
T2	170	Leg	A325N	0.75	5	15.67	35.78	0.438	1	Bolt DS
T3	150	Leg	A325N	1.00	6	21.37	53.01	0.403	1	Bolt Tension
T4	130	Leg	A325N	1.00	6	21.06	53.01	0.397	1	Bolt Tension
		Diagonal	A325N	1.00	1	6.55	10.66	0.614	1	Member Block Shear
T5	120	Leg	A325N	1.00	6	25.00	53.01	0.472	1	Bolt Tension
		Diagonal	A325N	1.00	1	4.49	10.66	0.421	1	Member Block Shear
T6	100	Leg	A325N	1.00	6	28.22	53.01	0.532	1	Bolt Tension
		Diagonal	A325N	1.00	1	4.06	10.66	0.381	1	Member Block Shear
T7	80	Leg	A325N	1.00	6	31.48	53.01	0.594	1	Bolt Tension
		Diagonal	A325N	1.00	1	4.64	11.68	0.397	1	Member Block Shear
T8	60	Leg	A325N	1.00	6	34.73	53.01	0.655	1	Bolt Tension
		Diagonal	A325N	1.00	1	5.11	11.68	0.437	1	Member Block Shear
T9	40	Leg	A325N	1.25	6	37.96	82.83	0.458	1	Bolt Tension
		Diagonal	A325N	1.25	1	5.80	20.30	0.285	1	Member Block Shear
T10	20	Diagonal	A325N	1.25	1	6.67	20.30	0.328	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio P_u / ϕP_n
T1	180 - 170	1 1/2" solid	10.00	2.25	72.0 K=1.00	1.77	-18.97	54.43	0.349 [1]
T2	170 - 150	2" solid	20.00	2.36	56.6 K=1.00	3.14	-73.80	111.84	0.660 [1]
T3	150 - 130	2 1/4" solid	20.00	2.36	50.3 K=1.00	3.98	-132.48	148.69	0.891 [1]
T4	130 - 120	Pirod 105216 (12x1.25)	10.02	10.02	45.4 K=1.00	3.68	-133.47	142.49	0.937 [1]
T5	120 - 100	Pirod 105217 (12x1.5)	20.03	10.02	37.8 K=1.00	5.30	-160.20	214.86	0.746 [1]
T6	100 - 80	Pirod 105217 (12x1.5)	20.03	10.02	37.8 K=1.00	5.30	-182.81	214.86	0.851 [1]
T7	80 - 60	Pirod 105218 (12x1.75)	20.03	10.02	32.4 K=1.00	7.22	-206.10	300.68	0.685 [1]
T8	60 - 40	Pirod 105218 (12x1.75)	20.03	10.02	32.4 K=1.00	7.22	-229.38	300.68	0.763 [1]
T9	40 - 20	Pirod 105219 (12x2)	20.03	10.02	28.4 K=1.00	9.42	-253.59	399.87	0.634 [1]
T10	20 - 0	Pirod 105219 (12x2)	20.03	10.02	28.4 K=1.00	9.42	-276.44	399.87	0.691 [1]

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T4	130 - 120	0.5	1.48	121.0	165.67	0.20	1.11	3.29	0.337
T5	120 - 100	0.5	1.47	120.0	238.57	0.20	0.88	3.34	0.265
T6	100 - 80	0.5	1.47	120.0	238.57	0.20	0.25	3.34	0.076
T7	80 - 60	0.5	1.46	119.0	324.71	0.20	0.21	3.38	0.062
T8	60 - 40	0.5	1.46	119.0	324.71	0.20	0.25	3.38	0.073
T9	40 - 20	0.625	1.45	94.4	424.12	0.31	0.25	6.96	0.037
T10	20 - 0	0.625	1.45	94.4	424.12	0.31	0.93	6.96	0.135

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	3/4" solid	4.59	2.22	128.0 K=0.90	0.44	-3.34	6.09	0.549 [1]
T2	170 - 150	7/8" solid	5.04	2.44	120.6 K=0.90	0.60	-5.48	9.34	0.588 [1]
T3	150 - 130	1" solid	5.12	2.47	107.6 K=0.91	0.79	-6.22	15.16	0.411 [1]
T4	130 - 120	L 2.5 x 2.5 x 3/16	11.42	4.98	120.8 K=1.00	0.90	-7.02	13.56	0.517 [1]
T5	120 - 100	L 2.5 x 2.5 x 3/16	11.93	5.38	130.5 K=1.00	0.90	-4.73	11.92	0.397 [1]
T6	100 - 80	L 2.5 x 2.5 x 3/16	13.80	6.33	153.4 K=1.00	0.90	-4.60	8.66	0.531 [1]
T7	80 - 60	L 3 x 3 x 3/16	15.24	7.08	142.5 K=1.00	1.09	-5.01	12.12	0.413 [1]
T8	60 - 40	L 3 x 3 x 3/16	16.80	7.88	158.6 K=1.00	1.09	-5.51	9.79	0.563 [1]
T9	40 - 20	L 3 x 3 x 5/16	18.45	8.68	176.8 K=1.00	1.78	-6.14	12.87	0.477 [1]
T10	20 - 0	L 3 x 3 x 5/16	20.16	9.54	194.4 K=1.00	1.78	-7.37	10.64	0.693 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	7/8" solid	4.00	3.88	148.8 K=0.70	0.60	-0.55	6.14	0.090 [1]
T2	170 - 150	7/8" solid	4.37	4.20	161.3 K=0.70	0.60	-1.04	5.22	0.199 [1]
T3	150 - 130	7/8" solid	4.57	4.39	168.4 K=0.70	0.60	-1.84	4.79	0.385 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	7/8" solid	4.00	3.88	148.8 K=0.70	0.60	-1.75	6.14	0.285 [1]
T2	170 - 150	7/8" solid	4.01	3.85	147.7 K=0.70	0.60	-1.92	6.22	0.308 [1]
T3	150 - 130	1" solid	4.51	4.33	145.4 K=0.70	0.79	-2.08	8.40	0.248 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	7/8" solid	4.00	3.88	148.8 K=0.70	0.60	-1.49	6.14	0.243 [1]
T2	170 - 150	7/8" solid	4.49	4.32	165.9 K=0.70	0.60	-2.58	4.94	0.522 [1]
T3	150 - 130	1" solid	4.99	4.80	161.2 K=0.70	0.79	-2.72	6.83	0.399 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	1 1/2" solid	10.00	0.50	16.0	1.77	18.59	79.52	0.234 [1]
T2	170 - 150	2" solid	20.00	0.57	13.6	2.19	71.92	106.69	0.674 [1] [#]
T3	150 - 130	2 1/4" solid	20.00	0.57	12.1	3.98	128.22	178.92	0.717 [1]
T4	130 - 120	Pirod 105216 (12x1.25)	10.02	10.02	45.4	3.68	126.33	165.67	0.763 [1]
T5	120 - 100	Pirod 105217 (12x1.5)	20.03	10.02	37.8	5.30	149.98	238.57	0.629 [1]
T6	100 - 80	Pirod 105217 (12x1.5)	20.03	10.02	37.8	5.30	169.34	238.57	0.710 [1]
T7	80 - 60	Pirod 105218 (12x1.75)	20.03	10.02	32.4	7.22	188.90	324.71	0.582 [1]
T8	60 - 40	Pirod 105218 (12x1.75)	20.03	10.02	32.4	7.22	208.41	324.71	0.642 [1]
T9	40 - 20	Pirod 105219 (12x2)	20.03	10.02	28.4	9.42	227.74	424.12	0.537 [1]
T10	20 - 0	Pirod 105219 (12x2)	20.03	10.02	28.4	9.42	245.69	424.12	0.579 [1]

[1] P_u / ϕP_n controls
[#] Based on net area of leg in section below

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T4	130 - 120	0.5	1.48	121.0	165.67	0.20	1.11	3.29	0.337

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T5	120 - 100	0.5	1.47	120.0	238.57	0.20	0.88	3.34	0.265
T6	100 - 80	0.5	1.47	120.0	238.57	0.20	0.25	3.34	0.076
T7	80 - 60	0.5	1.46	119.0	324.71	0.20	0.21	3.38	0.062
T8	60 - 40	0.5	1.46	119.0	324.71	0.20	0.25	3.38	0.073
T9	40 - 20	0.625	1.45	94.4	424.12	0.31	0.25	6.96	0.037
T10	20 - 0	0.625	1.45	94.4	424.12	0.31	0.93	6.96	0.135

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	3/4" solid	4.59	2.22	142.3	0.44	3.36	19.88	0.169 [1]
T2	170 - 150	7/8" solid	5.04	2.44	134.0	0.60	5.61	27.06	0.207 [1]
T3	150 - 130	1" solid	5.12	2.47	118.7	0.79	5.92	35.34	0.168 [1]
T4	130 - 120	L 2.5 x 2.5 x 3/16	11.42	4.98	80.0	0.52	6.55	22.55	0.290 [1]
T5	120 - 100	L 2.5 x 2.5 x 3/16	11.93	5.38	86.2	0.52	4.49	22.55	0.199 [1]
T6	100 - 80	L 2.5 x 2.5 x 3/16	13.80	6.33	100.7	0.52	4.06	22.55	0.180 [1]
T7	80 - 60	L 3 x 3 x 3/16	15.24	7.08	93.1	0.66	4.64	28.67	0.162 [1]
T8	60 - 40	L 3 x 3 x 3/16	16.80	7.88	103.4	0.66	5.11	28.67	0.178 [1]
T9	40 - 20	L 3 x 3 x 5/16	18.45	8.68	116.3	1.01	5.80	44.05	0.132 [1]
T10	20 - 0	L 3 x 3 x 5/16	20.16	9.54	127.6	1.01	6.67	44.05	0.151 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	7/8" solid	4.00	3.88	212.6	0.60	0.73	27.06	0.027 [1]
T2	170 - 150	7/8" solid	4.37	4.20	230.5	0.60	1.24	27.06	0.046 [1]
T3	150 - 130	7/8" solid	4.57	4.39	240.6	0.60	2.06	27.06	0.076 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	7/8" solid	4.00	3.88	212.6	0.60	1.74	27.06	0.064 [1]
T2	170 - 150	7/8" solid	4.01	3.85	211.1	0.60	1.98	27.06	0.073 [1]
T3	150 - 130	1" solid	4.51	4.33	207.7	0.79	2.28	35.34	0.064 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	7/8" solid	4.00	3.88	212.6	0.60	1.50	27.06	0.055 [1]
T2	170 - 150	7/8" solid	4.49	4.32	236.9	0.60	2.50	27.06	0.092 [1]
T3	150 - 130	1" solid	4.99	4.80	230.3	0.79	2.99	35.34	0.085 [1]

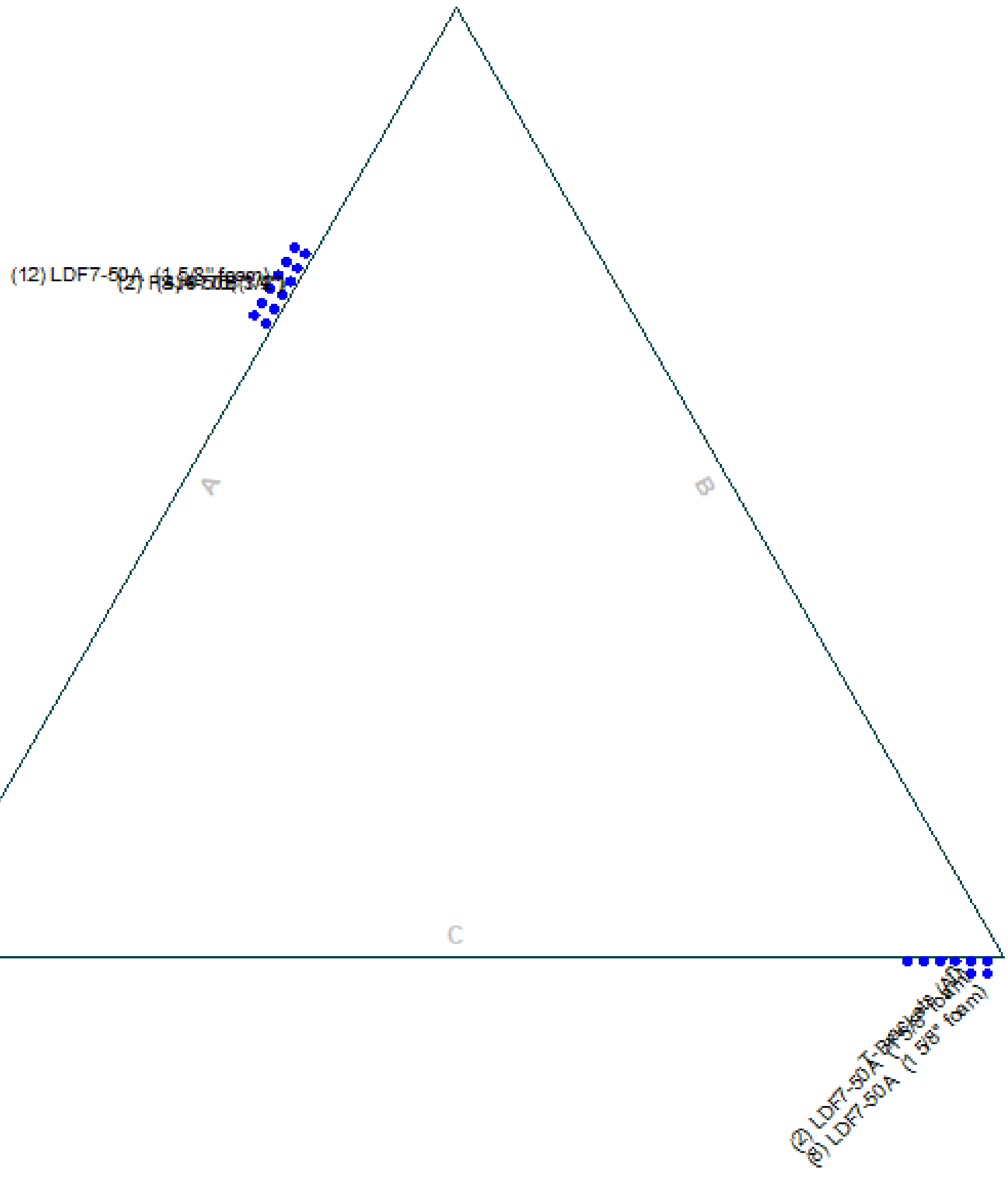
[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass Fail
T1	180 - 170	Leg	1 1/2" solid	3	-18.97	54.43	34.9	Pass
T2	170 - 150	Leg	2" solid	39	71.92	106.69	67.4	Pass
T3	150 - 130	Leg	2 1/4" solid	101	-132.48	148.69	89.1	Pass
T4	130 - 120	Leg	Pirod 105216 (12x1.25)	165	-133.47	142.49	93.7	Pass
T5	120 - 100	Leg	Pirod 105217 (12x1.5)	175	-160.20	214.86	74.6	Pass
T6	100 - 80	Leg	Pirod 105217 (12x1.5)	190	-182.81	214.86	85.1	Pass
T7	80 - 60	Leg	Pirod 105218 (12x1.75)	205	-206.10	300.68	68.5	Pass
T8	60 - 40	Leg	Pirod 105218 (12x1.75)	220	-229.38	300.68	76.3	Pass
T9	40 - 20	Leg	Pirod 105219 (12x2)	235	-253.59	399.87	63.4	Pass
T10	20 - 0	Leg	Pirod 105219 (12x2)	250	-276.44	399.87	69.1	Pass
T1	180 - 170	Diagonal	3/4" solid	15	-3.34	6.09	54.9	Pass
T2	170 - 150	Diagonal	7/8" solid	50	-5.48	9.34	58.8	Pass
T3	150 - 130	Diagonal	1" solid	164	-6.22	15.16	41.1	Pass
T4	130 - 120	Diagonal	L 2.5 x 2.5 x 3/16	172	-7.02	13.56	51.7 61.4 (b)	Pass
T5	120 - 100	Diagonal	L 2.5 x 2.5 x 3/16	188	-4.73	11.92	39.7 42.1 (b)	Pass
T6	100 - 80	Diagonal	L 2.5 x 2.5 x 3/16	196	-4.60	8.66	53.1	Pass
T7	80 - 60	Diagonal	L 3 x 3 x 3/16	210	-5.01	12.12	41.3	Pass
T8	60 - 40	Diagonal	L 3 x 3 x 3/16	225	-5.51	9.79	56.3	Pass
T9	40 - 20	Diagonal	L 3 x 3 x 5/16	240	-6.14	12.87	47.7	Pass
T10	20 - 0	Diagonal	L 3 x 3 x 5/16	255	-7.37	10.64	69.3	Pass
T1	180 - 170	Horizontal	7/8" solid	30	-0.55	6.14	9.0	Pass
T2	170 - 150	Horizontal	7/8" solid	59	-1.04	5.22	19.9	Pass
T3	150 - 130	Horizontal	7/8" solid	158	-1.84	4.79	38.5	Pass
T1	180 - 170	Top Girt	7/8" solid	6	-1.75	6.14	28.5	Pass
T2	170 - 150	Top Girt	7/8" solid	42	-1.92	6.22	30.8	Pass
T3	150 - 130	Top Girt	1" solid	105	-2.08	8.40	24.8	Pass
T1	180 - 170	Bottom Girt	7/8" solid	7	-1.49	6.14	24.3	Pass
T2	170 - 150	Bottom Girt	7/8" solid	43	-2.58	4.94	52.2	Pass
T3	150 - 130	Bottom Girt	1" solid	107	-2.72	6.83	39.9	Pass
							Summary	
						Leg (T4)	93.7	Pass
						Diagonal (T10)	69.3	Pass
						Horizontal (T3)	38.5	Pass
						Top Girt (T2)	30.8	Pass
						Bottom Girt (T2)	52.2	Pass
						Bolt Checks	65.5	Pass
						RATING =	**93.7**	**Pass**

APPENDIX B

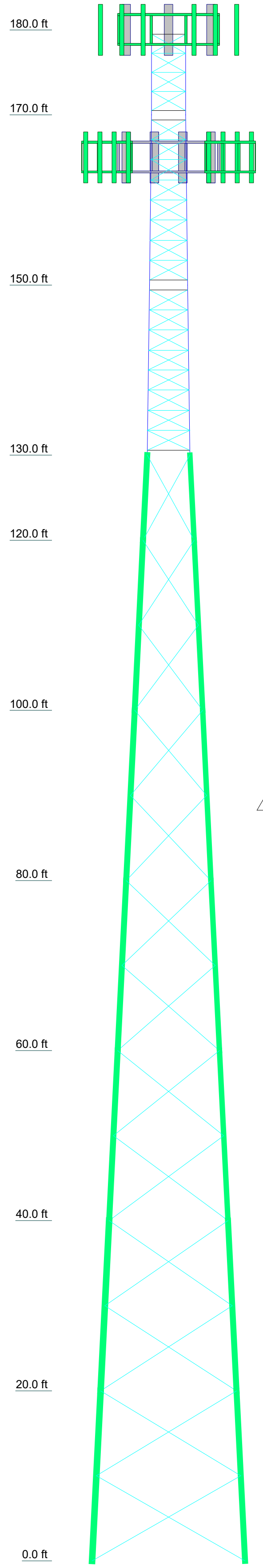
BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Bottom Girts	Horizontals	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	SR 1 1/2" solid	A572-50	SR 3/4" solid	A572-50			SR 7/8" solid	4	4 @ 2.25	0.4
T2	SR 2" solid	A572-50	SR 7/8" solid	A572-50	SR 7/8" solid	SR 7/8" solid	SR 7/8" solid	4.5	16 @ 2.35833	1.3
T3	SR 2 1/4" solid	A572-50	SR 1" solid	A572-50	SR 1" solid	SR 1" solid	SR 7/8" solid	5	16 @ 2.35833	1.7
T4	A	A572-50	L 2.5 x 2.5 x 3/16	A36	N.A.	N.A.	N.A.	6	13 @ 10	1.1
T5	Pirod 105217 (12x1.5)	A572-50	L 2.5 x 2.5 x 3/16	A36	N.A.	N.A.	N.A.	8	13 @ 10	2.6
T6	Pirod 105217 (12x1.5)	A572-50	L 2.5 x 2.5 x 3/16	A36	N.A.	N.A.	N.A.	10	13 @ 10	2.7
T7	Pirod 105218 (12x1.75)	A572-50	L 3 x 3 x 3/16	A36	N.A.	N.A.	N.A.	12	13 @ 10	3.2
T8	Pirod 105218 (12x1.75)	A572-50	L 3 x 3 x 3/16	A36	N.A.	N.A.	N.A.	14	13 @ 10	3.3
T9	Pirod 105219 (12x2)	A572-50	L 3 x 3 x 5/16	A36	N.A.	N.A.	N.A.	16	13 @ 10	5.0
T10	Pirod 105219 (12x2)	A572-50	L 3 x 3 x 5/16	A36	N.A.	N.A.	N.A.	18	13 @ 10	5.2
										26.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 405-1]	180	RRUS 4478 B14	180
7770.00 w/ Mount Pipe	180	RRUS 4478 B14	180
7770.00 w/ Mount Pipe	180	RRUS 4478 B14	180
7770.00 w/ Mount Pipe	180	RRUS 32 B66	180
(2) OPA-65R-LCUU-H6 w/ Mount Pipe	180	RRUS 32 B66	180
(2) OPA-65R-LCUU-H6 w/ Mount Pipe	180	RRUS 32 B66	180
(2) OPA-65R-LCUU-H6 w/ Mount Pipe	180	RRUS 32 B2	180
(2) LGP21401	180	RRUS 32 B2	180
(2) LGP21401	180	RRUS 32 B2	180
(2) LGP21401	180	(2) LGP21901	180
RRUS 32	180	(2) LGP21901	180
RRUS 32	180	(2) LGP21901	180
RRUS 32	180	Sector Mount [SM 402-3]	165
RRUS 11	180	AIR 21 B2A/B4P w/ Mount Pipe	165
RRUS 11	180	AIR 21 B2A/B4P w/ Mount Pipe	165
RRUS 11	180	AIR 21 B2A/B4P w/ Mount Pipe	165
DC6-48-60-18-8F	180	LNX-6515DS-A1M w/ Mount Pipe	165
DC6-48-60-18-8F	180	LNX-6515DS-A1M w/ Mount Pipe	165
RRUS 12	180	LNX-6515DS-A1M w/ Mount Pipe	165
RRUS 12	180	AIR 32 B4A/B2P w/ Mount Pipe	165
RRUS 12	180	AIR 32 B4A/B2P w/ Mount Pipe	165
RRUS A2 MODULE	180	AIR 32 B4A/B2P w/ Mount Pipe	165
RRUS A2 MODULE	180	KRY 112 71	165
RRUS A2 MODULE	180	KRY 112 71	165
GPS	180	KRY 112 71	165
80010965 w/ Mount Pipe	180	RRUS 11 B12	165
80010965 w/ Mount Pipe	180	RRUS 11 B12	165
80010965 w/ Mount Pipe	180	RRUS 11 B12	165
DC6-48-60-18-8F	180		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirod 105216 (12x1.25)		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 95.0 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.0 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.0 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 93.7%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 283 K
SHEAR: 26 K

UPLIFT: -251 K
SHEAR: 24 K

AXIAL 163 K
SHEAR 13 K
MOMENT 1494 kip-ft
TORQUE 0 kip-ft
50.0 mph WIND - 1.00 in ICE

AXIAL 45 K
SHEAR 39 K
MOMENT 4191 kip-ft
TORQUE 4 kip-ft
REACTIONS - 95.0 mph WIND

Paul J. Ford and Company
250 East Broad St., Suite 600
Columbus, OH 43215
Phone: (614) 221-6679
FAX:

Job: **180-ft Self-Support Tower / WESTHARTFORD_DEXTERS**			
Project: **PJF# 64118-0001 / CT0001**			
Client: Hirschfeld Communications, LLC	Drawn by: jsommer	App'd:	
Code: TIA-222-G	Date: 03/26/18	Scale: NTS	
Path: G:\TOWER\641_Hirschfeld Communications\2018\64118-0001 CT0001\64118-0001.001.8700_SA\TNX\64118-0001.001.8700.eri		Dwg No. E-1	

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

By: JRS Date: 3/26/2018
Project #: 64118-0001

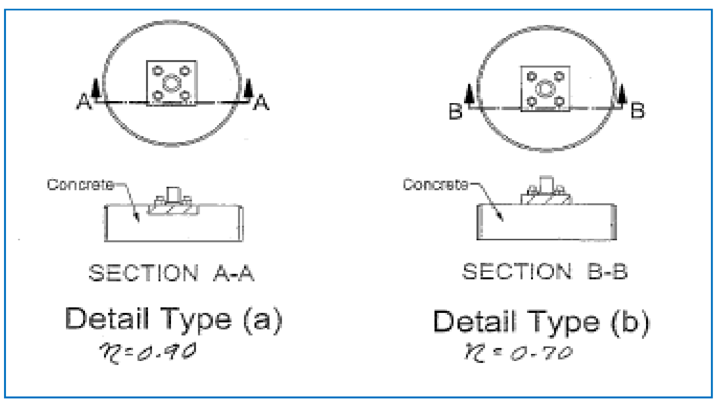
Self-Support Tower Anchor Rod Capacity - TIA-G

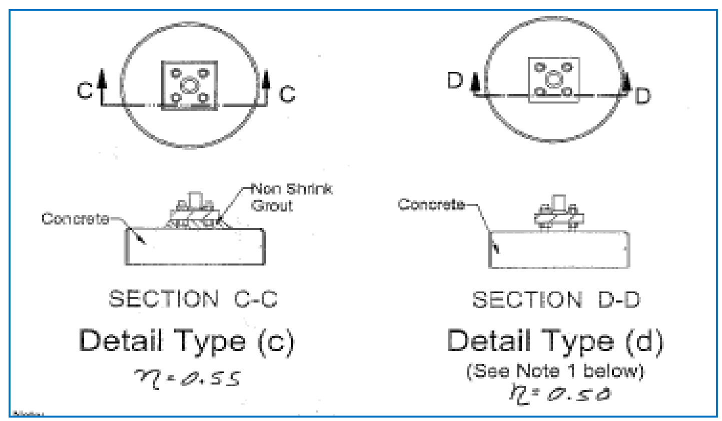
Loads

Uplift :	251	kips	1.00	Maximum Ratio
Shear :	24	kips		

Existing Anchor Rods

Anchor Rod Condition (n) :	0.55	
Anchor Rod ø :	1 1/4	in
Anchor Rod Quantity :	6	
Anchor Rod Grade :	A687	
F_y :	105	ksi
F_u :	150	ksi
Threads per Inch	7	
Total Net Tensile Area	5.81	in^2
ϕ :	0.8	
Total Anchor Rod Capacity ϕR_{nt} :	697.76	kip
Anchor Rod Ratio :	0.422	





PJF Job No. **64118-0001** Project Name: **West Hartford** Engineer: JRS

Factored Foundation Loads:

	Comp	Uplift	
Factored Axial Load (+Comp, -Ten) =	**283**	**-251**	kips
Factored Horiz. Load at Top of Pier =	**26**	**24**	kips
Factored OTM at Top of Pier =	**0**	**0**	k-ft

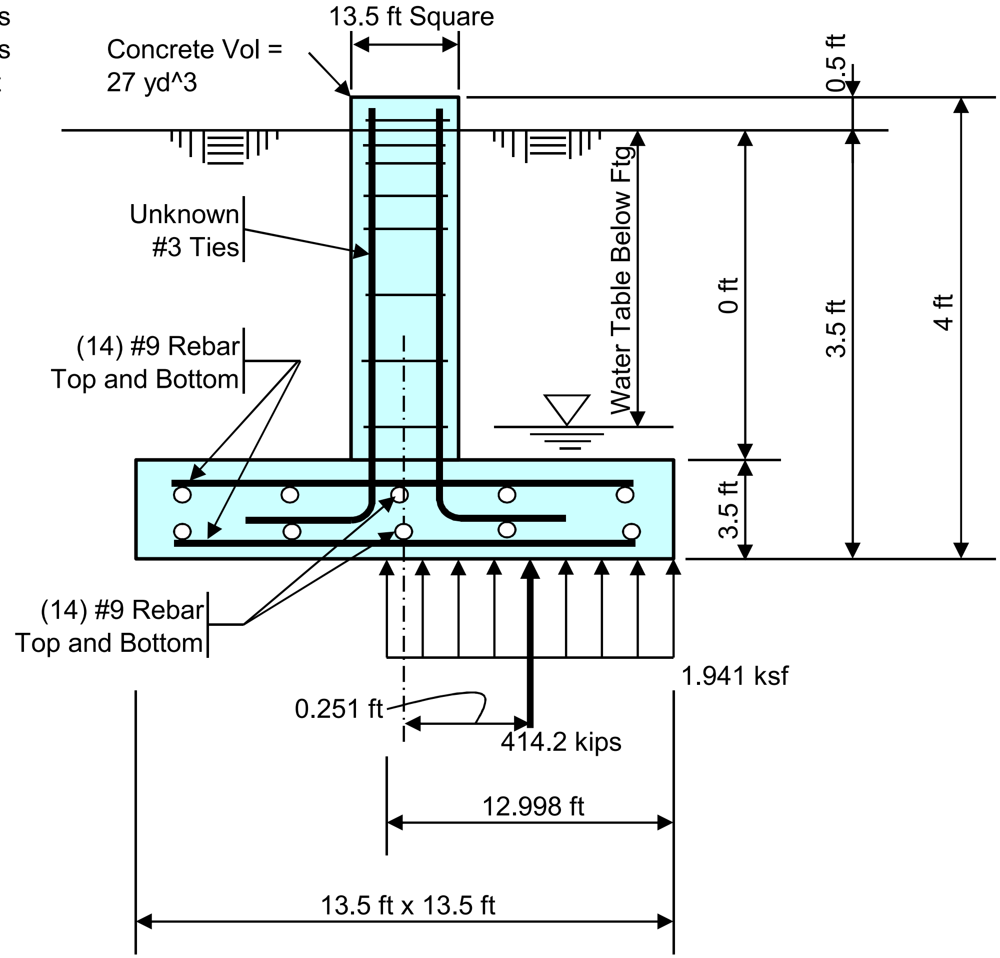
LRFD Resistance and Load Factors:

	Φ	Dead Load Factors	
Soil Bearing =	**0.75**		
Soil Weight =	**0.75**	1.2	0.9
Concrete Weight =	**0.75**	1.2	0.9

Soil Properties:

Depth to Water Table = **99** ft
Uplift Cone from **Top** of footing
Depth to Ignore for Uplift and PP = **3.33** ft

Layer Thk ft	Soil Density pcf	Cohesion ksf	Friction Angle degrees	Ult Bearing ksf	Depth ft
3.5	**100**	**0**	**28**	**12**	**3.50**



Dimensions:

Pier Shape = **Square**
Pier Width = **13.5** ft Square
Pier Height above Grade = **0.5** ft
Depth to Bottom of Footing = **3.5** ft
Footing Thickness = **3.5** ft
Footing Width, B = **13.5** ft
Footing Length, L = **13.5** ft

Concrete:

Concrete Strength = **3** ksi
Rebar Strength = **60** ksi

Total Pad Reinf Stl = **28.00** in^2 >= 12.25 in^2 = Min Stl, OK
Total Pier Reinf Stl =
Footing Thickness = **3.50** ft >= 0.75 ft = Min Ftg Thk, OK

Summary Results:

	Required		Available				
Maximum Net Soil Bearing =	**1.941**	ksf	**9.000**	ksf	Stress Ratio =	**21.6%**	in Soil Bearing
Punching Shear Stress =	**0.000**	ksi	**0.159**	ksi	Stress Ratio =	**0.0%**	in Punching Shear
Bending Shear Stress =	**-4.7**	kips	**496.6**	kips	Stress Ratio =	**0.9%**	in Bending Shear
Bending Moment =	**0.004**	in / in	**0.0**	in / in	Stress Ratio =	**9.1%**	in Bending Moment
Conc Pier Reinforcing Steel =				Rebar Unknown	Stress Ratio =		in Pier Rebar

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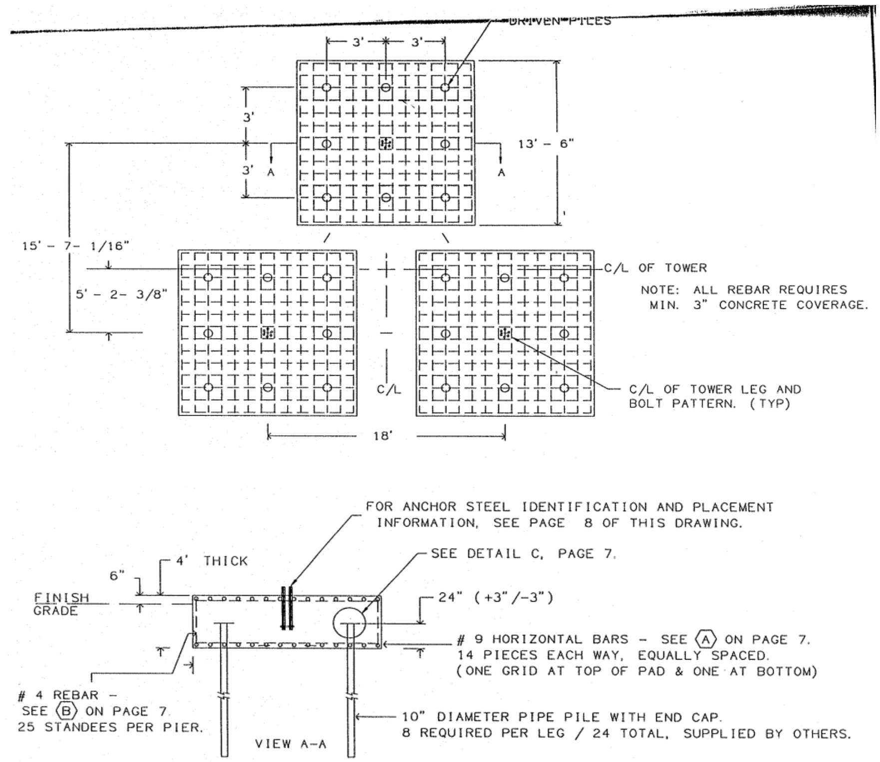
West Hartford Foundation Analysis

Uplift (kips):	251
Compression (kips):	283
Concrete Weight (kcf):	0.15
Mat Length/Width (ft):	13.5
Mat Depth (ft):	4
Mat Weight (kips):	109.4
Mat Bearing Area (ft^2):	182.3
Pile Quantity	8
Pile Diameter (in):	10
Pile Length (ft):	50
Depth to Ignore (ft):	8
Total Pile Surface Area (ft^2):	879.6
Ultimate Bearing Pressure (ksf):	12
Ultimate Skin Friction (ksf):	1
$Ø_{soil}$:	0.75
Mat Bearing Capacity (kips):	1640.3
Skin Friction Capcity (kips):	659.7
Total Uplift Load (kips):	251.0
Total Compression Load (kips):	414.2



Uplift Capacity (kips):	758.1
Compression Capacity (kips):	2300.0
Uplift Usage Capacity:	**33.1%**
Compression Usage Capacity:	**18.0%**

PAUL J. FORD & COMPANY

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES BY PAUL J. FORD AND COMPANY

1) Paul J. Ford and Company has not performed a site visit to verify the tower member sizes or the antenna/coax loading. If the existing conditions are not as represented on these drawings, we should be contacted immediately to evaluate the significance of the deviation.

2) No allowance was made for any damaged, missing, or rusted members. The analysis of this tower assumes that no physical deterioration has occurred in any of the structural components of the tower and that all the tower members have the same load carrying capacity as the day the tower was erected.

3) It is not possible to have all the detailed information to perform a thorough analysis of every structural sub-component of an existing tower. The structural analysis by Paul J. Ford and Company verifies the adequacy of the main structural members of the tower. Paul J. Ford and Company provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc.

4) This tower has been analyzed according to the minimum design wind loads recommended by the Telecommunications Industry Association Standard ANSI/TIA-222-G. If the owner or local or state agencies require a higher design wind load, Paul J. Ford and Company should be made aware of this requirement.

5) The attached sketches are a schematic representation of the tower that we have analyzed. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions and for the proper fit and clearance in the field.

6) Miscellaneous items such as antenna mounts etc. have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Engineers Planners Surveyors Landscape Architects Environmental Scientists

MASER CONSULTING
— CONNECTICUT —

Platform Mount Analysis

FOR

CT5259 – West Hartford-Elmwood

FA # 10071358
LTE – 4C/5C/6C/7C/Retrofit
1030 New Britain Avenue
West Hartford, CT 06110
Hartford County

Mount Utilization: 92.9%

April 5, 2018

Prepared For

AT&T
550 Cochituate Road
Framingham, MA 01701

Prepared By

Maser Consulting Connecticut
331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
T: 732.383.1950

STATE OF CONNECTICUT
PETROS TSOUKALAS
32577
LICENSED
PROFESSIONAL ENGINEER

Petros E. Tsoukalas, P.E.
Geographic Discipline Leader
Connecticut License No. 32557

MC Project No. 17963019A

Objective:

The objective of this report is to determine the capacity of the existing platform mount at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

Introduction:

Maser Consulting Connecticut has reviewed the following documents in completing this report:

• RFDS 1737849 provided by Empire Telecom, dated October 9, 2017.
• Mount Structural Analysis Report prepared by Destek Engineering, dated August 19, 2015.
• As-Built Construction Drawings provided by Empire Telecom, dated October 10, 2016.

The proposed **AT&T** equipment is to be supported on the existing platform mount constructed of structural steel antenna support pipes supported by pipes and tubes at a centerline of approximately 180’-0” above ground level. This report is based only upon this information.

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2016 Connecticut State Building Code
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - Ultimate Wind Speed – 125 mph (3 Second Gust)
    - Nominal Wind Speed – 97 mph (3 Second Gust)
    - Exposure Category – B
    - Structural Class – II
    - Topographic Category – 1
    - Ice Wind – 50 mph
    - Ice Thickness – 1”
- Specification for Structural Steel Buildings ANSI/AISC 360-10, American Institute of Steel Construction (AISC)

Loading used in this analysis is found in **Appendix A** of this report.

Analysis Approach & Assumptions:

The analysis approach used in this structural analysis is based on the premise that if the existing platform mount is structurally adequate to support the proposed equipment per the aforementioned codes and standards, or if the increase in the forces in the structure is deemed to be negligible or acceptable, then the proposed equipment can be installed as intended.

The existing platform mount has been modeled in RISA-3D, a comprehensive structural analysis program. The program performs design checks of structures under user specified loads. The user specified loads have been calculated separately based on the requirements of the above referenced codes. The program performs an analysis based on the steel code to determine the adequacy of the members, and produces the reactions at the connection points of the mounts to the existing structure. Additional calculations were then prepared to analyze the mount connection points with the proposed loading conditions.

General Site Design Assumption:

- All engineering services are performed on the basis that the information used is current and correct.
- It is assumed that the telecommunication equipment supports, antenna supports, and existing structure have been designed by a registered licensed professional engineer for the existing loads acting on the structure, as required by all applicable codes, prior to the proposed modifications listed within this report, if any.
- It is assumed that information provided by the client regarding the structure itself, the antenna models, feed lines, and other relevant information is current and correct.
- It is the responsibility of the client to ensure that the information provided to Maser Consulting Connecticut and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that the original design, material production, fabrication, and erection of the existing structure was performed in accordance with accepted industry design standards and in accordance with all applicable codes. Further, it is assumed that the existing structure and appurtenances have been properly maintained in accordance with all applicable codes and manufacturer's specifications and no structural defects and/or deterioration to the structural members has occurred.
- It is assumed all other existing appurtenances, antennas, cables, etc. belonging to others have been installed and supported per code and per specifications so as not to damage any existing structural support members, and that any contributing loads from adjacent equipment has been taken into consideration for their design.
- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Maser Consulting Connecticut is not responsible for the conclusion, opinions, and recommendations made by others based on the information we supply.

Site Specific Design Assumptions:

The following design parameters have been utilized in this report:

- *Structural Steel HSS Tubes are constructed of A500 Grade B Steel*
- *The existing antenna pipes are 7'-0" long 2.0 STD pipes, constructed of A53 Grade B Steel*

<u>Note about the Proposed Installation:</u>

- The proposed antennas shall be installed on existing antenna pipes in position 3 in all sectors.
- The proposed RRUS-32 B2 shall replace the existing RRUS-12+RRUS-A2, on the existing antenna pipe masts.
- The proposed RRUS-32 shall be installed on the existing antenna pipe masts, behind the antenna in position 2 in all sectors.
- The proposed RRUS-B14 4478 and RRUS-32 B66 shall be installed on proposed Ericsson SXK1250461/1 B2B RRU Mounting Brackets, which shall be attached to the existing antenna pipe masts in position 3 in all sectors.
- The proposed DC-6 shall be installed on a proposed 3'-0" long 2.0 STD pipe, which shall be attached to the existing bottom horizontals via crossover plates.

Please refer to the Final Construction Drawings for more details.

Calculations:

The calculations are found in Appendix A of this report.

Conclusion:

Maser Consulting Connecticut has determined the existing platform mount has **ADEQUATE** structural capacity to support the proposed loading. The existing platform mount has been determined to be stressed to a maximum of **92.9%** of its structural capacity with the maximum usage occurring at the antenna support pipes. Therefore, the proposed **AT&T** installation **CAN** be installed as intended.

The conclusions reached by Maser Consulting Connecticut in this evaluation are only applicable for the existing and proposed structural members supporting the proposed **AT&T** telecommunications installation described herein. Further, no structural qualifications are made or implied by this document for the existing structure.

Maser Consulting Connecticut reserves the right to amend this report if additional information about the existing members is provided. The conclusions reached by Maser Consulting Connecticut in this report are only valid for the appurtenances listed in this report. Any change to the installation will require a revision to this structural analysis.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.

Sincerely,

Maser Consulting Connecticut

Petros E. Tsoukalas, P.E.
Geographic Discipline Leader

Clara Basanti
Project Engineer

R:\Projects\2017\17963000A\17963019A\Structural\Platform Mount Analysis\Rev 0\Word\Antenna Mount Analysis - Maser Consulting Connecticut.docx

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— CONNECTICUT —

APPENDIX A

ANALYSIS AND DESIGN

1. LOADING SUMMARY

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector	
3	POWERWAVE	7770	Existing	Alpha, Beta, & Gamma	
6	CCI	OPA-65R-LCUU-H6	Existing	Alpha, Beta, & Gamma	
3	**KATHREIN**	**80010965**	**Proposed**	**Alpha, Beta, & Gamma**	
3	**RAYCAP**	**DC6-48-60-18-8F**	**Existing/Proposed**	**Alpha, Beta, & Gamma**	
6	POWERWAVE	LGP 21401 TMA	Existing	Alpha, Beta, & Gamma	
3	ERICSSON	RRUS 32	Existing	Alpha, Beta, & Gamma	
3	ERICSSON	RRUS 11	Existing	Alpha, Beta, & Gamma	
3	**ERICSSON**	**RRUS 4478 B14**	**Proposed**	**Alpha, Beta, & Gamma**	
3	**ERICSSON**	**RRUS 32 B66**	**Proposed**	**Alpha, Beta, & Gamma**	
3	**ERICSSON**	**RRUS 32 B2**	**Proposed**	**Alpha, Beta, & Gamma**	
3	**ERICSSON**	**RRUS E2 B29**	**Proposed**	**Alpha, Beta, & Gamma**	(At ground level)
3	**ERICSSON**	**RRUS 12**	**Proposed**	**Alpha, Beta, & Gamma**	(At ground level)
6	**KAELUS**	**DBC0061F1V51-2 Diplexer**	**Proposed**	**Alpha, Beta, & Gamma**	

I. DESIGN INPUTS

Calculations for gravity and lateral loading on equipment and support mounts are determined as per the ANSI/TIA-222-G Code, Addendum 2

Wind Load Inputs Parameters

				Reference	Equation
Antenna Centerline	z	180	ft		
Ultimate Wind Speed	V_U	125	mph		
Nominal Wind Speed (3 sec. Gust):	V	97	mph	Ref. 1, Eqn. 16-33	
Nominal Wind Speed with Ice (3 sec. gust):	V_i	50.0	mph	(Figure a5-2a, p. 233)	
Service Wind Speed:	V_s	60.0	mph	(Figure a5-2a, p. 233)	
Design Ice Thickness:	t_i	1.00	in	(Figure A1-2a, p. 233)	
Exposure Category:		B		Ref. 3, Section 2.6.5.1	
Structure Class:		II		Ref. 3, Table 2-1	
Gust Effect Factor:	G_h	0.85		Ref. 3, Section 2.6.7	
Wind Directionality Factor:	K_d	0.85		Ref. 3, Table 2-2	
Topographic Category:		1		Ref. 3, Section 2.6.6.2	

Wind Load Coefficients

Importance Factors:					
Non-Iced:	I	1		Ref. 3, Table 2-3	
Iced:	I_{ice}	1		(Table 2-3, P. 39)	
Exposure Category Coefficients:					
3-s Gust-Speed Power Law Exponent:	α	7.0		Ref. 3, Table 2-4	
Nominal Height of the Atmospheric Boundary Layer:	Z_g	1200	ft	Ref. 3, Table 2-4	
Min. Value for k_z:	Kz_{min}	0.70		Ref. 3, Table 2-4	
Terrain Constant:	K_e	0.90		Ref. 3, Table 2-4	
Velocity Pressure Exposure Coefficient:	K_z	1.169		Ref. 3, Section 2.6.5.2	$=2.01\cdot(z/z_g)^{2/\alpha}$
Topographic Category Coefficients:					
Topographic Constant:	K_t	N/A		Ref. 3, Table 2-5	
Height Attenuation Factor:	f	N/A		Ref. 3, Table 2-5	
Height Reduction Factor:	K_h	N/A		Ref. 3, Section 2.6.6.4	$=e^{(f\cdot z/H)}$
Topographic Factor:	K_{zt}	1.00		Ref.3, Section 2.6.6.4	$=[1+(K_e\cdot K_t/K_h)]^2$
Ice Accumulation:					
Ice Velocity Pressure Exposure Coefficient:	K_{iz}	1.18			$=(z/33)^{0.10}$
Factored Ice Thickness:	t_{iz}	2.37	in	(Section 2.6.8, p. 16)	$=2.0\cdot t_i\cdot I\cdot K_{iz}\cdot K_{zt}$
Ice Density:	ρ_i	56.00	pcf		
Design Wind Pressures:					
Velocity Pressure:	q_z	23.85	psf	Ref. 3, Section 2.6.9.6	$=0.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V^2\cdot I$
Velocity Pressure (With Ice):	q_{zi}	6.36	psf	(Section 2.6.9.6, P. 25)	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_i^2\cdot I$
Velocity Pressure (Service):	q_{zs}	9.16	psf	(Section 2.6.9.6, P. 25)	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_i^2\cdot I$

II. CALCULATIONS

▪ *Wind Load on Appurtenances*

Dimensions and Force Coefficients

Antenna/ Appurtenance	Non-Iced Condition: Mounting Pipe Length (in)	Mounting Pipe Diameter (in)	Mounting Pipe Force Coefficient C_a	Equipment Height (in)	Equipment Width (in)	Equipment Depth (in)	Force Coefficient $C_{a\,Front}$	Force Coefficient $C_{a\,Side}$	Iced Condition: Mounting Pipe Length (in)	Mounting Pipe Diameter (in)	Mounting Pipe Force Coefficient C_a	Equipment Height (in)	Equipment Width (in)	Equipment Depth (in)	Force Coefficient $C_{a\,Front}$	Force Coefficient $C_{a\,Side}$
7770	84.0	2.375	1.200	55.00	11.00	5.00	1.31	1.53	88.7	7.1	0.922	59.74	15.74	9.74	1.26	1.36
OPA-65R-LCUU-H6	84.0	2.375	1.200	72.30	14.40	7.30	1.31	1.50	88.7	7.1	0.922	77.04	19.14	12.04	1.27	1.37
80010965	84.0	2.375	1.200	78.70	20.00	6.90	1.26	1.55	88.7	7.1	0.922	83.44	24.74	11.64	1.24	1.41
DC6-48-60-18-8F	36.0	2.375	0.981	31.40	10.20	10.20	0.71	0.71	40.7	7.1	0.772	36.14	14.94	14.94	0.70	0.70
LGP 21401 TMA	0.0	0.000	0.000	13.80	14.40	3.70	1.20	1.25	0.0	0.0	0.000	18.54	19.14	8.44	1.20	1.20
RRUS 32	0.0	0.000	0.000	27.20	12.00	7.00	1.20	1.26	0.0	0.0	0.000	31.94	16.74	11.74	1.20	1.21
RRUS 11	0.0	0.000	0.000	19.70	2.60	7.20	1.42	1.21	0.0	0.0	0.000	24.44	7.34	11.94	1.24	1.20
RRUS 4478 B14	0.0	0.000	0.000	18.10	13.40	8.30	1.20	1.20	0.0	0.0	0.000	22.84	18.14	13.04	1.20	1.20
RRUS 32 B66	0.0	0.000	0.000	27.20	12.00	7.00	1.20	1.26	0.0	0.0	0.000	31.94	16.74	11.74	1.20	1.21
RRUS 32 B2	0.0	0.000	0.000	27.20	12.00	7.00	1.20	1.26	0.0	0.0	0.000	31.94	16.74	11.74	1.20	1.21
DBC0061F1V51-2 Diplexer	0.0	0.000	0.000	8.00	6.20	3.20	1.20	1.20	0.0	0.0	0.000	12.74	10.94	7.94	1.20	1.20

Antenna/ Appurtenance	# of Brackets	Non-Iced Condition: Wind Force (lbs.) F_N	Wind Force (lbs.) F_T	Controlling Wind Force (lbs.)	Gravity (lbs.)	Iced Condition: Wind Force (lbs.) F_N	Wind Force (lbs.) F_T	Controlling Wind Force (lbs.)	Gravity (lbs.)	
7770	2	61.6	46.5	**61.6**	**17.5**	26.8	25.8	**26.8**	**104.2**	
OPA-65R-LCUU-H6	2	98.5	72.4	**98.5**	**20.3**	37.0	34.8	**37.0**	**172.1**	
80010965	2	141.1	76.0	**141.1**	**54.3**	48.8	36.5	**48.8**	**236.8**	
DC6-48-60-18-8F	1	33.6	43.9	**43.9**	**26.2**	15.4	22.6	**22.6**	**109.6**	
LGP 21401 TMA	1	33.6	9.0	**33.6**	**30.0**	16.0	7.0	**16.0**	**77.1**	
RRUS 32	1	55.1	33.8	**55.1**	**52.9**	24.1	17.0	**24.1**	**125.3**	(Partially shielded by antenna)
RRUS 11	1	10.2	24.2	**24.2**	**55.7**	8.3	13.1	**13.1**	**59.1**	(Partially shielded by antenna)
RRUS 4478 B14	2	20.5	12.7	**20.5**	**29.7**	9.3	6.7	**9.3**	**50.0**	(Partially shielded by antenna)
RRUS 32 B66	2	27.6	16.9	**27.6**	**25.4**	12.0	8.5	**12.0**	**62.7**	(Partially shielded by antenna)
RRUS 32 B2	2	27.6	16.9	**27.6**	**26.5**	12.0	8.5	**12.0**	**62.7**	(Partially shielded by antenna)
DBC0061F1V51-2 Diplexer	1	8.4	4.3	**8.4**	**9.5**	6.3	4.6	**6.3**	**28.7**	

**** ALL CALCULATED LOADS ARE PER MOUNTING BRACKET. TO GET THE TOTAL EQUIPMENT LOAD, MULTIPLY THE INDIVIDUAL LOADS BY THE NUMBER OF BRACKETS***

▪ *Wind Load on Framing Members*

Member Category	Member Shape	Length (in)	Member Surface	Non-Iced Condition: Exposed Wind Height (in)	Force Coefficient C_a	Wind Load (plf)	Iced Condition: Exposed Wind Height (in)	Depth (in)	Length (in)	Force Coefficient C_a	Wind Load (plf)	Ice Weight (plf)	
Pipe	Pipe 3.5	192	Round	4.00	1.20	8.11	8.74	8.74	196.74	1.14	4.50	18.44	
Pipe	Pipe 2.0	84	Round	2.38	1.20	4.81	7.11	7.11	88.74	0.92	2.95	13.74	
Pipe	Pipe 2.0	192	Round	2.38	1.20	4.81	7.11	7.11	196.74	1.20	3.85	13.74	
Pipe	Pipe 2.0	72	Round	2.38	1.20	4.81	7.11	7.11	76.74	0.88	2.83	13.74	
Pipe	Pipe 2.0	36	Round	2.38	0.98	3.94	7.11	7.11	40.74	0.77	2.47	13.74	
Square HSS	HSS 5x5	56.5	Square	5.00	1.54	13.03	9.74	9.74	61.24	1.37	6.00	27.33	
											Grating	24.45	psf

BASIC EQUATIONS

ANSI/TIA-222-G Reference

Importance Factor: Table 2-3, Pg. 39

$$I := \begin{cases} 1.0 & \text{if } Class = "II" \\ 1.15 & \text{if } Class = "III" \end{cases}$$

Force Coefficient: (Square) Table 2-8, P. 42

$$C_{f\_square}(h,w) := \begin{cases} 1.2 & \text{if } \frac{h}{w} \le 2.5 \\ \left[1.2 + \frac{0.2}{4.5}\cdot\left(\frac{h}{w} - 2.5\right)\right] & \text{if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[1.4 + \frac{0.6}{18}\cdot\left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 2.0 & \text{otherwise} \end{cases}$$

Force Coefficient: (Round) Table 2-8, P. 42

$$C_{f\_round}(h,w) := \begin{cases} 0.7 & \text{if } \frac{h}{w} \le 2.5 \\ \left[0.7 + \frac{0.1}{4.5}\cdot\left(\frac{h}{w} - 2.5\right)\right] & \text{if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[0.8 + \frac{0.4}{18}\cdot\left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 1.2 & \text{otherwise} \end{cases}$$

Terrain Exposure Constants: Table 2-4, P. 40

$$\alpha := \begin{cases} 7.0 & \text{if } Exp = "B" \\ 9.5 & \text{if } Exp = "C" \\ 11.5 & \text{if } Exp = "D" \end{cases} \quad Z_g := \begin{cases} 1200ft & \text{if } Exp = "B" \\ 900ft & \text{if } Exp = "C" \\ 700ft & \text{if } Exp = "D" \end{cases} \quad K_{zmin} := \begin{cases} 0.70 & \text{if } Exp = "B" \\ 0.85 & \text{if } Exp = "C" \\ 1.03 & \text{if } Exp = "D" \end{cases}$$

BASIC EQUATIONS

ANSI/TIA-222-G Reference

Velocity Pressure Coefficient:

$$Kz(z) := \left| \begin{array}{l} K_z \leftarrow \max\left[2.01\cdot\left(\frac{z}{Z_g}\right)^{\frac{2}{\alpha}}, K_{zmin}\right] \\ K_z \leftarrow \min(K_z, 2.01) \end{array} \right.$$

$$K_z := Kz(z)$$

Section 2.6.5, P. 13

$$Kzt(z) := K_{zt} \leftarrow \left| \begin{array}{l} 1.0 \text{ if } Topo = \text{"1"} \\ \text{otherwise} \\ \quad \left| \begin{array}{l} K_e \leftarrow \left| \begin{array}{l} 0.90 \text{ if } Exp = \text{"B"} \\ 1.00 \text{ if } Exp = \text{"C"} \\ 1.10 \text{ if } Exp = \text{"D"} \end{array} \right. \\ K_t \leftarrow \left| \begin{array}{l} 0.43 \text{ if } Topo = \text{"2"} \\ 0.53 \text{ if } Topo = \text{"3"} \\ 0.72 \text{ if } Topo = \text{"4"} \end{array} \right. \\ f \leftarrow \left| \begin{array}{l} 1.25 \text{ if } Topo = \text{"2"} \\ 2.00 \text{ if } Topo = \text{"3"} \\ 1.50 \text{ if } Topo = \text{"4"} \end{array} \right. \\ K_h \leftarrow e^{\left(\frac{f\cdot z}{CH}\right)} \\ \left(1 + \frac{K_e\cdot K_t}{K_h}\right)^2 \end{array} \right. \end{array} \right.$$

Section 2.6.6.4, p. 14

Table 2-4 p. 40

Table 2-5 p. 40

Table 2-5 p. 40

Section 2.6.6.4, P. 14

Section 2.6.6.4, P. 14

$$K_{zt} := Kzt(z)$$

Velocity Pressure:

Section 2.6.9.6, P. 25

$$q_z := 0.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V^2\cdot I\cdot psf$$

LOAD EQUATIONS

WIND LOAD

Area (Normal):	$AN_{area} = H_{ant} \cdot Want$
Area (Side):	$AT_{area} = H_{ant} \cdot Dant$
Force Coefficient (Normal):	$C_{fn} = C_{fsquare}(H_{ant}, Want)$
Force Coefficient (Side):	$C_{fs} = C_{fsquare}(H_{ant}, Dant)$
Pipe Area (Normal):	$AN_p = \max[(L_p - H_{ant}) * Dp, 0]$
Pipe Area (Side):	$AT_p = L_p \cdot Dp$
Force Coefficient (Normal):	$C_{fp} = C_{fround}(Lp, Dp)$
Normal Effective Projected Area:	$E_{pan} = (C_{fn} \cdot ANarea) + (Cfp \cdot ANp)$
Side Effective Projected Area:	$E_{pat} = (C_{fs} \cdot ATarea) + (Cfp \cdot ATp)$
Effective Projected Area:	$EPA = max(E_{pan}, Epat)$
Wind Force:	$F_{ant} = q_z \cdot Gh \cdot EPA$

ICE DEAD LOAD

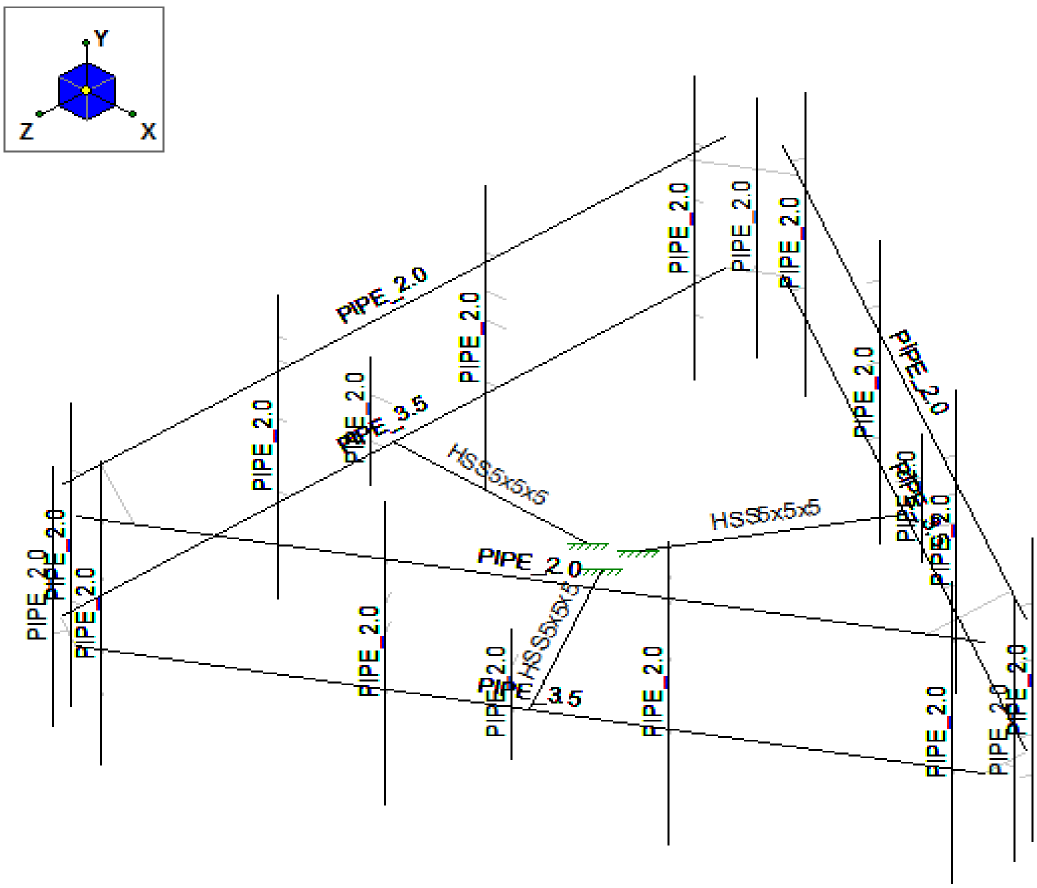
Largest Out-to-Out Dimension:	$D_{ant} = \sqrt{D_{ant}^2 + W_{ant}^2}$
Cross Sectional Area of Ice:	$A_{ice\_ant} = \pi \cdot tiz \cdot (Dant + tiz)$
Total Ice Dead Load:	$DL_{ice\_ant} = \rho_i \cdot (Aice_{\_ant} \cdot Hant)$

ICE WIND LOAD

Dimensions:	$H_{i_{ant}} = H_{ant} + 2tiz$ $W_{i_{ant}} = W_{ant} + 2tiz$ $D_{i_{ant}} = D_{ant} + 2tiz$
Area (Normal):	$AIN_{area} = H_{i\_ant} \cdot W_{i\_ant}$
Area (Side):	$AIT_{area} = H_{i\_ant} \cdot D_{i\_ant}$
Force Coefficient (Normal):	$Ci_{fn} = C_{fsquare}(H_{i\_ant}, W_{i\_ant})$
Force Coefficient (Side):	$Ci_{fs} = C_{fsquare}(H_{i\_ant}, D_{i\_ant})$
Pipe Area (Normal):	$AN_p = \max[(L_{ip} - H_{i\_ant}) * D_{ip}, 0]$
Pipe Area (Side):	$AT_p = L_{ip} \cdot Dip$
Force Coefficient (Normal):	$C_{fp} = C_{fround}(L_{ip}, D_{ip})$
Normal Effective Projected Area:	$E_{pain} = (Ci_{fn} \cdot ANarea) + (Cfp \cdot ANp)$
Side Effective Projected Area:	$E_{pait} = (Ci_{fs} \cdot ATarea) + (Cfp \cdot ATp)$
Effective Projected Area:	$EPA_i = max(E_{pain}, Epait)$
Wind Force:	$F_{i\_ant} = q_z \cdot Gh \cdot EPAi$

III. ATTACHMENTS

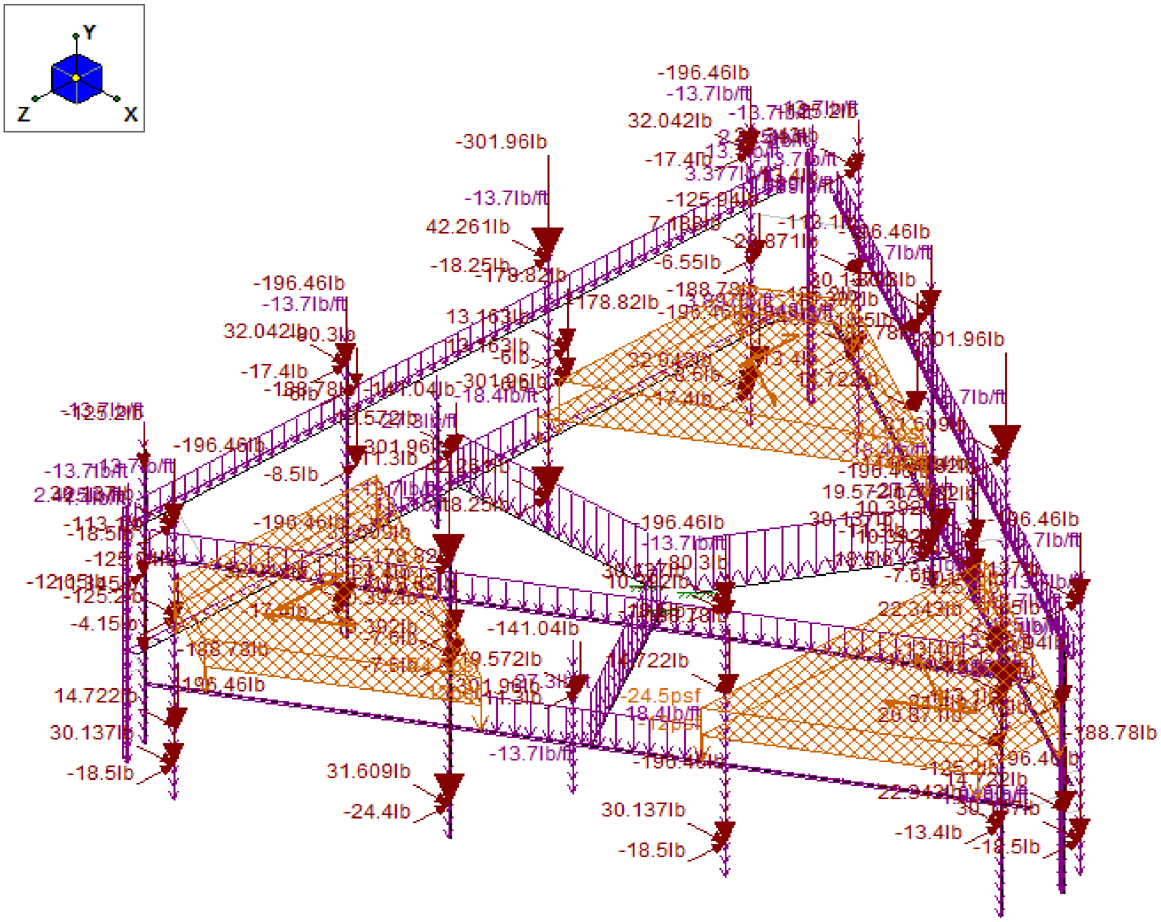
RISA MODEL



MASER

Client:	ATT	Computed By:	CB
Site Name:	CT05259 - West Hartford-Elmwood	Date:	4/5/2018
Project No.	17963019A	Verified By:	SMS
Title:	Antenna Mount Analysis	Page:	10

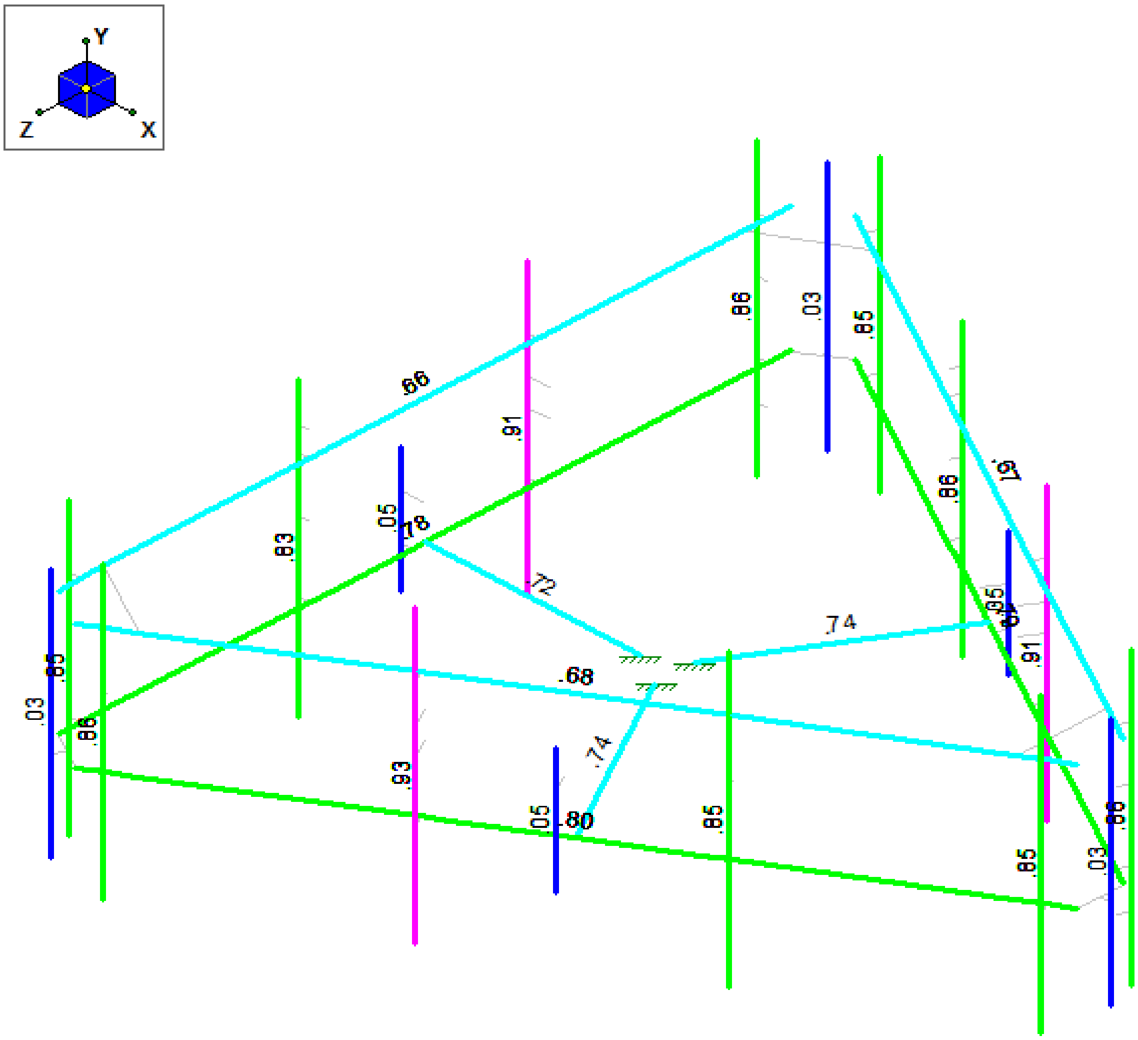
RISA WORST CASE LOADING



Loads: LC 26, 1.2D+1.0ICE+1.0W12ICE
Envelope Only Solution

Client:	ATT	Computed By:	CB
Site Name:	CT05259 - West Hartford-Elmwood	Date:	4/5/2018
Project No.	17963019A	Verified By:	SMS
Title:	Antenna Mount Analysis	Page:	11

RISA CODE CHECK



Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N8	N2			Pipe 3.5	Beam	Pipe	A53 Gr.B	Typical
2	M2	N7	N6			Pipe 3.5	Beam	Pipe	A53 Gr.B	Typical
3	M3	N5	N1			Pipe 3.5	Beam	Pipe	A53 Gr.B	Typical
4	M4	N1	N2			RIGID	None	None	RIGID	Typical
5	M6	N5	N6			RIGID	None	None	RIGID	Typical
6	M7	N7	N8			RIGID	None	None	RIGID	Typical
7	M8	N9	N10			RIGID	None	None	RIGID	Typical
8	M9	N11	N12			RIGID	None	None	RIGID	Typical
9	M10	N13	N14			RIGID	None	None	RIGID	Typical
10	M11	N15	N16			RIGID	None	None	RIGID	Typical
11	M12	N17	N18			RIGID	None	None	RIGID	Typical
12	M13	N19	N20			RIGID	None	None	RIGID	Typical
13	M14	N21	N22			RIGID	None	None	RIGID	Typical
14	M15	N23	N24			RIGID	None	None	RIGID	Typical
15	M16	N25	N26			RIGID	None	None	RIGID	Typical
16	M17	N27	N28			RIGID	None	None	RIGID	Typical
17	M18	N29	N30			RIGID	None	None	RIGID	Typical
18	M19	N31	N32			RIGID	None	None	RIGID	Typical
19	M20	N33	N34			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
20	M21	N35	N36			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
21	M22	N37	N38			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
22	M23	N39	N40			RIGID	None	None	RIGID	Typical
23	M24	N41	N42			RIGID	None	None	RIGID	Typical
24	M25	N43	N44			RIGID	None	None	RIGID	Typical
25	M26	N45	N46			RIGID	None	None	RIGID	Typical
26	M27	N47	N48			RIGID	None	None	RIGID	Typical
27	M28	N49	N50			RIGID	None	None	RIGID	Typical
28	M29	N51	N52			RIGID	None	None	RIGID	Typical
29	M30	N53	N54			RIGID	None	None	RIGID	Typical
30	M31	N55	N56			RIGID	None	None	RIGID	Typical
31	M32	N57	N58			RIGID	None	None	RIGID	Typical
32	M33	N59	N60			RIGID	None	None	RIGID	Typical
33	M34	N61	N62			RIGID	None	None	RIGID	Typical
34	M35	N63	N64			RIGID	None	None	RIGID	Typical
35	M36	N65	N66			RIGID	None	None	RIGID	Typical
36	M37	N67	N68			RIGID	None	None	RIGID	Typical
37	M38	N69	N70			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
38	M39	N71	N72			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
39	M40	N73	N74			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
40	M41	N75	N76			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
41	M42	N77	N78			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
42	M43	N79	N80			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
43	M44	N81	N82			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
44	M45	N83	N84			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
45	M46	N85	N86			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
46	M47	N87	N88			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
47	M48	N89	N90			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
48	M49	N91	N92			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
49	M50	N93	N94			RIGID	None	None	RIGID	Typical
50	M51	N95	N96			RIGID	None	None	RIGID	Typical
51	M52	N97	N98			RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
52	M53	N99	N100			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
53	M54	N101	N102			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
54	M55	N103	N104			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
55	M56	N105	N106			RIGID	None	None	RIGID	Typical
56	M57	N107	N108			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
57	M58	N109	N110			RIGID	None	None	RIGID	Typical
58	M59	N111	N112			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
59	M60	N113	N114			RIGID	None	None	RIGID	Typical
60	M61	N115	N116			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
61	M62	N117	N118			HSS5x5x5	Beam	SquareTube	A500 Gr.B...	Typical
62	M63	N119	N120			HSS5x5x5	Beam	SquareTube	A500 Gr.B...	Typical
63	M64	N121	N122			HSS5x5x5	Beam	SquareTube	A500 Gr.B...	Typical
64	M65	N123	N124			RIGID	None	None	RIGID	Typical
65	M66	N125	N126			RIGID	None	None	RIGID	Typical
66	M67	N127	N128			RIGID	None	None	RIGID	Typical
67	M68	N129	N130			RIGID	None	None	RIGID	Typical
68	M69	N131	N132			RIGID	None	None	RIGID	Typical
69	M70	N133	N134			RIGID	None	None	RIGID	Typical
70	M71	N135	N136			RIGID	None	None	RIGID	Typical
71	M72	N137	N138			RIGID	None	None	RIGID	Typical
72	M73	N139	N140			RIGID	None	None	RIGID	Typical
73	M74	N141	N142			RIGID	None	None	RIGID	Typical
74	M75	N143	N144			RIGID	None	None	RIGID	Typical
75	M76	N145	N146			RIGID	None	None	RIGID	Typical
76	M77	N147	N148			RIGID	None	None	RIGID	Typical
77	M78	N149	N150			RIGID	None	None	RIGID	Typical
78	M79	N151	N152			RIGID	None	None	RIGID	Typical
79	M80	N153	N154			RIGID	None	None	RIGID	Typical
80	M81	N155	N156			RIGID	None	None	RIGID	Typical
81	M82	N157	N158			RIGID	None	None	RIGID	Typical
82	M83	N159	N160			RIGID	None	None	RIGID	Typical
83	M84	N161	N162			RIGID	None	None	RIGID	Typical
84	M85	N163	N164			RIGID	None	None	RIGID	Typical

Joint Loads and Enforced Displacements (BLC 1 : Dead)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N194	L	Y	-17.5
2	N195	L	Y	-17.5
3	N196	L	Y	-17.5
4	N197	L	Y	-17.5
5	N198	L	Y	-17.5
6	N199	L	Y	-17.5
7	N132	L	Y	-26.2
8	N142	L	Y	-26.2
9	N164	L	Y	-26.2
10	N200	L	Y	-30
11	N201	L	Y	-30
12	N202	L	Y	-30
13	N176A	L	Y	-20.3
14	N178	L	Y	-20.3

Joint Loads and Enforced Displacements (BLC 1 : Dead) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
15	N179	L	Y	-20.3
16	N181	L	Y	-20.3
17	N182	L	Y	-20.3
18	N184	L	Y	-20.3
19	N185	L	Y	-20.3
20	N187	L	Y	-20.3
21	N188	L	Y	-20.3
22	N190	L	Y	-20.3
23	N191	L	Y	-20.3
24	N193	L	Y	-20.3
25	N177	L	Y	-54.3
26	N180	L	Y	-54.3
27	N183	L	Y	-54.3
28	N186	L	Y	-54.3
29	N189	L	Y	-54.3
30	N192	L	Y	-54.3
31	N134	L	Y	-52.9
32	N144	L	Y	-52.9
33	N156	L	Y	-52.9
34	N128	L	Y	-55.7
35	N138	L	Y	-55.7
36	N152	L	Y	-55.7
37	N124	L	Y	-55.1
38	N126	L	Y	-55.1
39	N148	L	Y	-55.1
40	N150	L	Y	-55.1
41	N160	L	Y	-55.1
42	N162	L	Y	-55.1
43	N130	L	Y	-52.9
44	N140	L	Y	-52.9
45	N154	L	Y	-52.9
46	N136	L	Y	-19
47	N146	L	Y	-19
48	N158	L	Y	-19

Joint Loads and Enforced Displacements (BLC 2 : Wx)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N195	L	X	46.515
2	N196	L	X	46.515
3	N198	L	X	46.515
4	N199	L	X	46.515
5	N132	L	X	43.995
6	N142	L	X	43.995
7	N164	L	X	43.995
8	N201	L	X	33.6
9	N202	L	X	33.6
10	N179	L	X	72.45
11	N181	L	X	72.45
12	N182	L	X	72.45
13	N184	L	X	72.45
14	N188	L	X	72.45

Joint Loads and Enforced Displacements (BLC 2 : Wx) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
15	N190	L	X	72.45
16	N191	L	X	72.45
17	N193	L	X	72.45
18	N176A	L	X	98.49
19	N178	L	X	98.49
20	N185	L	X	98.49
21	N187	L	X	98.49
22	N180	L	X	76.02
23	N183	L	X	76.02
24	N189	L	X	76.02
25	N192	L	X	76.02
26	N177	L	X	141.12
27	N186	L	X	141.12
28	N144	L	X	33.81
29	N156	L	X	33.81
30	N138	L	X	24.15
31	N152	L	X	24.15
32	N128	L	X	10.185
33	N148	L	X	27.615
34	N150	L	X	27.615
35	N160	L	X	27.615
36	N162	L	X	27.615
37	N124	L	X	29.61
38	N126	L	X	29.61
39	N140	L	X	33.81
40	N154	L	X	33.81
41	N146	L	X	8.4
42	N158	L	X	8.4

Joint Loads and Enforced Displacements (BLC 3 : Wz)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N195	L	Z	61.635
2	N196	L	Z	61.635
3	N198	L	Z	61.635
4	N199	L	Z	61.635
5	N132	L	Z	43.995
6	N142	L	Z	43.995
7	N164	L	Z	43.995
8	N200	L	Z	33.6
9	N179	L	Z	98.49
10	N181	L	Z	98.49
11	N182	L	Z	98.49
12	N184	L	Z	98.49
13	N188	L	Z	98.49
14	N190	L	Z	98.49
15	N191	L	Z	98.49
16	N193	L	Z	98.49
17	N176A	L	Z	72.45
18	N178	L	Z	72.45
19	N185	L	Z	72.45
20	N187	L	Z	72.45

Joint Loads and Enforced Displacements (BLC 3 : Wz) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
21	N180	L	Z	141.12
22	N183	L	Z	141.12
23	N189	L	Z	141.12
24	N192	L	Z	141.12
25	N177	L	Z	76.02
26	N186	L	Z	76.02
27	N134	L	Z	33.81
28	N138	L	Z	10.185
29	N152	L	Z	10.185
30	N128	L	Z	24.15
31	N148	L	Z	29.61
32	N150	L	Z	29.61
33	N160	L	Z	29.61
34	N162	L	Z	29.61
35	N124	L	Z	27.615
36	N126	L	Z	27.615
37	N130	L	Z	33.81
38	N136	L	Z	8.4

Joint Loads and Enforced Displacements (BLC 4 : Wx Ice)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N195	L	X	25.8
2	N196	L	X	25.8
3	N198	L	X	25.8
4	N199	L	X	25.8
5	N132	L	X	22.6
6	N142	L	X	22.6
7	N164	L	X	22.6
8	N201	L	X	24.1
9	N202	L	X	24.1
10	N179	L	X	34.8
11	N181	L	X	34.8
12	N182	L	X	34.8
13	N184	L	X	34.8
14	N188	L	X	34.8
15	N190	L	X	34.8
16	N191	L	X	34.8
17	N193	L	X	34.8
18	N176A	L	X	37
19	N178	L	X	37
20	N185	L	X	37
21	N187	L	X	37
22	N180	L	X	36.5
23	N183	L	X	36.5
24	N189	L	X	36.5
25	N192	L	X	36.5
26	N177	L	X	48.8
27	N186	L	X	48.8
28	N144	L	X	17
29	N156	L	X	17
30	N138	L	X	13.1

Joint Loads and Enforced Displacements (BLC 4 : Wx Ice) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
31	N152	L	X	13.1
32	N128	L	X	8.3
33	N148	L	X	12
34	N150	L	X	12
35	N160	L	X	12
36	N162	L	X	12
37	N124	L	X	15.2
38	N126	L	X	15.2
39	N140	L	X	17
40	N154	L	X	17
41	N146	L	X	12
42	N158	L	X	12

Joint Loads and Enforced Displacements (BLC 5 : Wz Ice)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N195	L	Z	26.8
2	N196	L	Z	26.8
3	N198	L	Z	26.8
4	N199	L	Z	26.8
5	N132	L	Z	22.6
6	N142	L	Z	22.6
7	N164	L	Z	22.6
8	N200	L	Z	24.1
9	N179	L	Z	37
10	N181	L	Z	37
11	N182	L	Z	37
12	N184	L	Z	37
13	N188	L	Z	37
14	N190	L	Z	37
15	N191	L	Z	37
16	N193	L	Z	37
17	N176A	L	Z	34.8
18	N178	L	Z	34.8
19	N185	L	Z	34.8
20	N187	L	Z	34.8
21	N180	L	Z	48.8
22	N183	L	Z	48.8
23	N189	L	Z	48.8
24	N192	L	Z	48.8
25	N177	L	Z	36.5
26	N186	L	Z	36.5
27	N134	L	Z	17
28	N138	L	Z	8.3
29	N152	L	Z	8.3
30	N128	L	Z	13.1
31	N148	L	Z	15.2
32	N150	L	Z	15.2
33	N160	L	Z	15.2
34	N162	L	Z	15.2
35	N124	L	Z	12
36	N126	L	Z	12

Joint Loads and Enforced Displacements (BLC 5 : Wz Ice) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
37	N130	L	Z	17
38	N136	L	Z	12

Joint Loads and Enforced Displacements (BLC 6 : Ice Weight)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N194	L	Y	-104.2
2	N195	L	Y	-104.2
3	N196	L	Y	-104.2
4	N197	L	Y	-104.2
5	N198	L	Y	-104.2
6	N199	L	Y	-104.2
7	N132	L	Y	-109.6
8	N142	L	Y	-109.6
9	N164	L	Y	-109.6
10	N200	L	Y	-77.1
11	N201	L	Y	-77.1
12	N202	L	Y	-77.1
13	N176A	L	Y	-172.1
14	N178	L	Y	-172.1
15	N179	L	Y	-172.1
16	N181	L	Y	-172.1
17	N182	L	Y	-172.1
18	N184	L	Y	-172.1
19	N185	L	Y	-172.1
20	N187	L	Y	-172.1
21	N188	L	Y	-172.1
22	N190	L	Y	-172.1
23	N191	L	Y	-172.1
24	N193	L	Y	-172.1
25	N177	L	Y	-236.8
26	N180	L	Y	-236.8
27	N183	L	Y	-236.8
28	N186	L	Y	-236.8
29	N189	L	Y	-236.8
30	N192	L	Y	-236.8
31	N134	L	Y	-125.3
32	N144	L	Y	-125.3
33	N156	L	Y	-125.3
34	N128	L	Y	-59.1
35	N138	L	Y	-59.1
36	N152	L	Y	-59.1
37	N124	L	Y	-112.7
38	N126	L	Y	-112.7
39	N148	L	Y	-112.7
40	N150	L	Y	-112.7
41	N160	L	Y	-112.7
42	N162	L	Y	-112.7
43	N130	L	Y	-125.3
44	N140	L	Y	-125.3
45	N154	L	Y	-125.3
46	N136	L	Y	-57.5

Joint Loads and Enforced Displacements (BLC 6 : Ice Weight) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
47	N146	L	Y	-57.5
48	N158	L	Y	-57.5

Member Point Loads

Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
No Data to Print ...			

Member Distributed Loads (BLC 2 : Wx)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M1	PX	8.11	8.11	0	0
2	M2	PX	8.11	8.11	0	0
3	M3	PX	8.11	8.11	0	0
4	M20	PX	4.81	4.81	0	0
5	M21	PX	4.81	4.81	0	0
6	M22	PX	4.81	4.81	0	0
7	M57	PX	4.81	4.81	0	0
8	M59	PX	4.81	4.81	0	0
9	M61	PX	4.81	4.81	0	0

Member Distributed Loads (BLC 3 : Wz)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M1	PZ	8.11	8.11	0	0
2	M2	PZ	8.11	8.11	0	0
3	M3	PZ	8.11	8.11	0	0
4	M20	PZ	4.81	4.81	0	0
5	M21	PZ	4.81	4.81	0	0
6	M22	PZ	4.81	4.81	0	0
7	M57	PZ	4.81	4.81	0	0
8	M59	PZ	4.81	4.81	0	0
9	M61	PZ	4.81	4.81	0	0

Member Distributed Loads (BLC 4 : Wx Ice)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M1	PX	4.5	4.5	0	0
2	M2	PX	4.5	4.5	0	0
3	M3	PX	4.5	4.5	0	0
4	M20	PX	3.9	3.9	0	0
5	M21	PX	3.9	3.9	0	0
6	M22	PX	3.9	3.9	0	0
7	M57	PX	2.8	2.8	0	0
8	M59	PX	2.8	2.8	0	0
9	M61	PX	2.8	2.8	0	0

Member Distributed Loads (BLC 5 : Wz Ice)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M1	PZ	4.5	4.5	0	0
2	M2	PZ	4.5	4.5	0	0

Member Distributed Loads (BLC 5 : Wz Ice) (Continued)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
3	M3	PZ	4.5	4.5	0	0
4	M20	PZ	3.9	3.9	0	0
5	M21	PZ	3.9	3.9	0	0
6	M22	PZ	3.9	3.9	0	0
7	M57	PZ	2.8	2.8	0	0
8	M59	PZ	2.8	2.8	0	0
9	M61	PZ	2.8	2.8	0	0

Member Distributed Loads (BLC 6 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M1	Y	-18.4	-18.4	72	120
2	M2	Y	-18.4	-18.4	72	120
3	M3	Y	-18.4	-18.4	72	120
4	M62	Y	-27.3	-27.3	0	0
5	M63	Y	-27.3	-27.3	0	0
6	M64	Y	-27.3	-27.3	0	0
7	M20	Y	-13.7	-13.7	0	0
8	M21	Y	-13.7	-13.7	0	0
9	M22	Y	-13.7	-13.7	0	0
10	M38	Y	-13.7	-13.7	0	0
11	M39	Y	-13.7	-13.7	0	0
12	M40	Y	-13.7	-13.7	0	0
13	M41	Y	-13.7	-13.7	0	0
14	M42	Y	-13.7	-13.7	0	0
15	M43	Y	-13.7	-13.7	0	0
16	M44	Y	-13.7	-13.7	0	0
17	M45	Y	-13.7	-13.7	0	0
18	M46	Y	-13.7	-13.7	0	0
19	M47	Y	-13.7	-13.7	0	0
20	M48	Y	-13.7	-13.7	0	0
21	M49	Y	-13.7	-13.7	0	0
22	M53	Y	-13.7	-13.7	0	0
23	M54	Y	-13.7	-13.7	0	0
24	M55	Y	-13.7	-13.7	0	0
25	M57	Y	-13.7	-13.7	0	0
26	M59	Y	-13.7	-13.7	0	0
27	M61	Y	-13.7	-13.7	0	0

Member Distributed Loads (BLC 7 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M1	Y	-.2	-8.208	115.2	130.56
2	M1	Y	-8.208	-18.686	130.56	145.92
3	M1	Y	-18.686	-28.024	145.92	161.28
4	M1	Y	-28.024	-32.891	161.28	176.64
5	M1	Y	-32.891	-34.826	176.64	192
6	M4	Y	-28.933	-29.003	0	2.451
7	M4	Y	-29.003	-29.595	2.451	4.901
8	M4	Y	-29.595	-21.217	4.901	7.352
9	M4	Y	-21.217	-19.413	7.352	9.802
10	M4	Y	-19.413	-33.676	9.802	12.253
11	M62	Y	-41.991	-35.478	0	7.91

Member Distributed Loads (BLC 7 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
12	M62	Y	-35.478	-26.827	7.91	15.82
13	M62	Y	-26.827	-15.951	15.82	23.73
14	M62	Y	-15.951	-5.736	23.73	31.64
15	M62	Y	-5.736	.205	31.64	39.55
16	M2	Y	-.304	-8.235	115.2	130.56
17	M2	Y	-8.235	-19.006	130.56	145.92
18	M2	Y	-19.006	-28.731	145.92	161.28
19	M2	Y	-28.731	-32.579	161.28	176.64
20	M2	Y	-32.579	-32.168	176.64	192
21	M6	Y	-27.946	-26.935	0	2.451
22	M6	Y	-26.935	-25.991	2.451	4.901
23	M6	Y	-25.991	-24.672	4.901	7.352
24	M6	Y	-24.672	-25.388	7.352	9.802
25	M6	Y	-25.388	-28.582	9.802	12.253
26	M1	Y	-32.168	-32.579	0	15.36
27	M1	Y	-32.579	-28.731	15.36	30.72
28	M1	Y	-28.731	-19.006	30.72	46.08
29	M1	Y	-19.006	-8.235	46.08	61.44
30	M1	Y	-8.235	-.304	61.44	76.8
31	M7	Y	-27.945	-26.935	0	2.451
32	M7	Y	-26.935	-25.991	2.451	4.901
33	M7	Y	-25.991	-24.672	4.901	7.352
34	M7	Y	-24.672	-25.388	7.352	9.802
35	M7	Y	-25.388	-28.582	9.802	12.253
36	M64	Y	-21.851	-17.837	0	7.91
37	M64	Y	-17.837	-13.095	7.91	15.82
38	M64	Y	-13.095	-7.989	15.82	23.73
39	M64	Y	-7.989	-3.072	23.73	31.64
40	M64	Y	-3.072	.135	31.64	39.55

Member Distributed Loads (BLC 8 : BLC 6 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M3	Y	-.744	-20.176	115.2	130.56
2	M3	Y	-20.176	-46.565	130.56	145.92
3	M3	Y	-46.565	-70.391	145.92	161.28
4	M3	Y	-70.391	-79.818	161.28	176.64
5	M3	Y	-79.818	-78.811	176.64	192
6	M4	Y	-70.027	-62.201	0	2.451
7	M4	Y	-62.201	-60.447	2.451	4.901
8	M4	Y	-60.447	-63.679	4.901	7.352
9	M4	Y	-63.679	-65.99	7.352	9.802
10	M4	Y	-65.99	-68.467	9.802	12.253
11	M63	Y	-92.453	-75.961	0	7.91
12	M63	Y	-75.961	-54.297	7.91	15.82
13	M63	Y	-54.297	-30.112	15.82	23.73
14	M63	Y	-30.112	-10.15	23.73	31.64
15	M63	Y	-10.15	.663	31.64	39.55
16	M3	Y	-85.324	-80.582	0	15.36
17	M3	Y	-80.582	-68.659	15.36	30.72
18	M3	Y	-68.659	-45.781	30.72	46.08
19	M3	Y	-45.781	-20.11	46.08	61.44

Member Distributed Loads (BLC 8 : BLC 6 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
20	M3	Y	-20.11	-.49	61.44	76.8
21	M6	Y	-82.507	-47.563	0	2.451
22	M6	Y	-47.563	-51.981	2.451	4.901
23	M6	Y	-51.981	-72.508	4.901	7.352
24	M6	Y	-72.508	-71.058	7.352	9.802
25	M6	Y	-71.058	-70.886	9.802	12.253
26	M64	Y	-49.343	-43.221	0	7.91
27	M64	Y	-43.221	-33.644	7.91	15.82
28	M64	Y	-33.644	-19.508	15.82	23.73
29	M64	Y	-19.508	-6.526	23.73	31.64
30	M64	Y	-6.526	.172	31.64	39.55
31	M2	Y	-79.434	-78.426	0	15.36
32	M2	Y	-78.426	-66.893	15.36	30.72
33	M2	Y	-66.893	-42.919	30.72	46.08
34	M2	Y	-42.919	-18.323	46.08	61.44
35	M2	Y	-18.323	-.561	61.44	76.8
36	M7	Y	-91.082	-62.031	0	2.451
37	M7	Y	-62.031	-57.837	2.451	4.901
38	M7	Y	-57.837	-64.32	4.901	7.352
39	M7	Y	-64.32	-68.416	7.352	9.802
40	M7	Y	-68.416	-84.304	9.802	12.253

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Mem...	Surface(Pl...
1	Dead	DL		-1.05		48			3	
2	Wx	WL				42		9		
3	Wz	WL				38		9		
4	Wx Ice	WL				42		9		
5	Wz Ice	WL				38		9		
6	Ice Weight	OL1				48		27	3	
7	BLC 1 Transient Area L...	None						40		
8	BLC 6 Transient Area L...	None						40		

Load Combinations

	Description	So...	PDelta	S...	BLC	Fac...	BLC	Fac...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.4D	Yes	Y		1	1.4														
2	1.2D+1.6W1	Yes	Y		1	1.2	2	1.6	3											
3	1.2D+1.6W2	Yes	Y		1	1.2	2	1.3...	3	.8										
4	1.2D+1.6W3	Yes	Y		1	1.2	2	.8	3	1.3...										
5	1.2D+1.6W4	Yes	Y		1	1.2	2		3	1.6										
6	1.2D+1.6W5	Yes	Y		1	1.2	2	-.8	3	1.3...										
7	1.2D+1.6W6	Yes	Y		1	1.2	2	-1.3...	3	.8										
8	1.2D+1.6W7	Yes	Y		1	1.2	2	-1.6	3											
9	1.2D+1.6W8	Yes	Y		1	1.2	2	-1.3...	3	-.8										
10	1.2D+1.6W9	Yes	Y		1	1.2	2	-.8	3	-1.3...										
11	1.2D+1.6W10	Yes	Y		1	1.2	2		3	-1.6										
12	1.2D+1.6W11	Yes	Y		1	1.2	2	.8	3	-1.3...										
13	1.2D+1.6W12	Yes	Y		1	1.2	2	1.3...	3	-.8										
14	1.2D+1.0 Ice	Yes	Y		1	1.2	6	1												

Load Combinations (Continued)

	Description	So...	PDelta	S...	BLC	Fac...	BLC	Fac...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
15	1.2D+1.0ICE+1.0W1ICE	Yes	Y		1	1.2	6	1	4	1	5									
16	1.2D+1.0ICE+1.0W2ICE	Yes	Y		1	1.2	6	1	4	.866	5	.5								
17	1.2D+1.0ICE+1.0W3ICE	Yes	Y		1	1.2	6	1	4	.5	5	.866								
18	1.2D+1.0ICE+1.0W4ICE	Yes	Y		1	1.2	6	1	4		5	1								
19	1.2D+1.0ICE+1.0W5ICE	Yes	Y		1	1.2	6	1	4	-.5	5	.866								
20	1.2D+1.0ICE+1.0W6ICE	Yes	Y		1	1.2	6	1	4	-.866	5	.5								
21	1.2D+1.0ICE+1.0W7ICE	Yes	Y		1	1.2	6	1	4	-1	5									
22	1.2D+1.0ICE+1.0W8ICE	Yes	Y		1	1.2	6	1	4	-.866	5	-.5								
23	1.2D+1.0ICE+1.0W9ICE	Yes	Y		1	1.2	6	1	4	-.5	5	-.866								
24	1.2D+1.0ICE+1.0W10ICE	Yes	Y		1	1.2	6	1	4		5	-1								
25	1.2D+1.0ICE+1.0W11ICE	Yes	Y		1	1.2	6	1	4	.5	5	-.866								
26	1.2D+1.0ICE+1.0W12ICE	Yes	Y		1	1.2	6	1	4	.866	5	-.5								

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N118	max	1491.532	7	5147.043	17	1675.732	11	-2594.454	10	6108.23	7	10891.094	16
2		min	-1440.813	13	997.25	10	-1586.973	5	-19181.701	17	-6108.62	13	1292.728	9
3	N120	max	1277.026	8	5084.028	21	1526.143	11	877.026	11	5126.496	11	-3361.67	2
4		min	-1381.544	2	1047.118	2	-1524.754	5	-720.052	5	-5125.249	5	-21633.63	21
5	N122	max	1768.308	8	5111.151	25	1510.556	11	18754.051	25	7192.648	3	11145.099	26
6		min	-1715.569	2	1010.036	6	-1600.709	5	2630.071	6	-7192.139	9	1501.093	7
7	Totals:	max	4520.367	8	14950.718	23	4712.431	11						
8		min	-4520.388	2	4315.275	4	-4712.436	5						

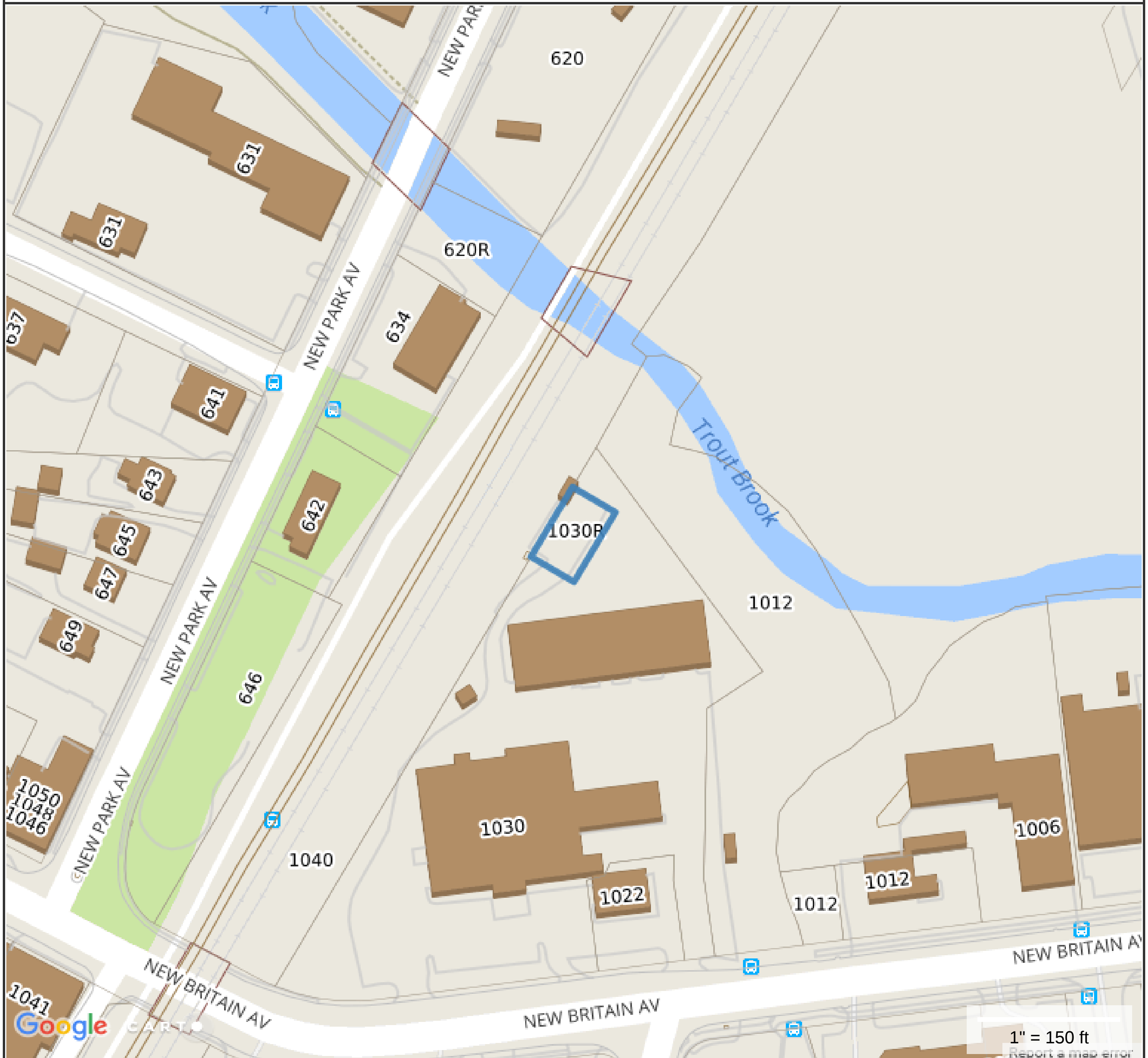
Envelope AISC 13th(360-05): LRFD Steel Code Checks

	Member	Shape	Code Check	Lo...	LC	Shear Check	Lo...	...	LC	phi*P...	phi*P...	phi*...	phi*...	...	Eqn
1	M48	PIPE_2.0	.929	53...	26	.186	37...		16	1785...	32130	1871...	1871...	...	H1-...
2	M44	PIPE_2.0	.908	53...	22	.184	37...		24	1785...	32130	1871...	1871...	...	H1-...
3	M40	PIPE_2.0	.907	53...	18	.184	37...		20	1785...	32130	1871...	1871...	...	H1-...
4	M43	PIPE_2.0	.860	53...	16	.179	34...		26	1785...	32130	1871...	1871...	...	H1-...
5	M45	PIPE_2.0	.858	53...	21	.102	18...		26	1785...	32130	1871...	1871...	...	H1-...
6	M41	PIPE_2.0	.857	53...	17	.102	34...		20	1785...	32130	1871...	1871...	...	H1-...
7	M49	PIPE_2.0	.857	53...	25	.106	18...		18	1785...	32130	1871...	1871...	...	H1-...
8	M46	PIPE_2.0	.852	53...	21	.105	18...		17	1785...	32130	1871...	1871...	...	H1-...
9	M38	PIPE_2.0	.852	53...	24	.105	36...		23	1785...	32130	1871...	1871...	...	H1-...
10	M42	PIPE_2.0	.850	53...	17	.106	36...		26	1785...	32130	1871...	1871...	...	H1-...
11	M47	PIPE_2.0	.847	53...	20	.179	18...		18	1785...	32130	1871...	1871...	...	H1-...
12	M39	PIPE_2.0	.830	53...	24	.178	34...		22	1785...	32130	1871...	1871...	...	H1-...
13	M3	PIPE_3.5	.798	96	18	.258	96		23	2769...	78750	7953...	7953...	...	H1-...
14	M2	PIPE_3.5	.788	96	26	.254	96		19	2769...	78750	7953...	7953...	...	H1-...
15	M1	PIPE_3.5	.777	96	22	.254	96		15	2769...	78750	7953...	7953...	...	H1-...
16	M62	HSS5x5x5	.739	56.5	19	.102	56.5	y	20	2051...	2177...	31602	31602	...	H1-...
17	M64	HSS5x5x5	.736	56.5	15	.101	56.5	y	15	2051...	2177...	31602	31602	...	H1-...
18	M63	HSS5x5x5	.717	56.5	19	.098	56.5	y	23	2051...	2177...	31602	31602	...	H1-...
19	M22	PIPE_2.0	.682	180	26	.377	180		22	3842...	32130	1871...	1871...	...	H3-6
20	M21	PIPE_2.0	.669	66	15	.372	180		18	3842...	32130	1871...	1871...	...	H1-...
21	M20	PIPE_2.0	.663	66	19	.371	10		26	3842...	32130	1871...	1871...	...	H1-...
22	M53	PIPE_2.0	.053	12	15	.028	12		5	2884...	32130	1871...	1871...	...	H1-...
23	M54	PIPE_2.0	.053	12	23	.028	12		7	2884...	32130	1871...	1871...	...	H1-...

Envelope AISC 13th(360-05): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Lo...	LC	Shear Check	Lo...	...	LC	phi*P...	phi*P...	phi*...	phi*...	...	Eqn
24	M55	PIPE_2.0	.051	12	19	.028	12		9	2884...	32130	1871...	1871...	...	H1-...
25	M61	PIPE_2.0	.030	45...	6	.003	45...		6	2086...	32130	1871...	1871...	...	H1-...
26	M59	PIPE_2.0	.030	45...	10	.003	45...		10	2086...	32130	1871...	1871...	...	H1-...
27	M57	PIPE_2.0	.030	45...	13	.003	45...		13	2086...	32130	1871...	1871...	...	H1-...

CT5259 1030 New Britain Ave., West Hartford CT



Property Information

Property ID	3771 2 1030R 0001
Location	1030R NEW BRITAIN AVENUE
Owner	TEN THIRTY TOWER COMPANY LLC

TOWN OF WEST HARTFORD

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Parcels updated 5/1/2016
Properties updated Daily