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

324 Montevideo Road, Avon, CT 06001

Lat:	41-48-42.45	(41.81179167)
Long.	72-47-55.45	(-72.79873611)

Dear Ms. Bachman:

AT&T Wireless currently maintains nine (9) antennas at the 70-foot level of an existing 60-foot lattice tower located at 324 Montevideo Road, in Avon, CT. The tower is owned by the Talcott Mountain Science Center for Student Involvement, Inc. The property is owned by the Talcott Mountain Science Center for Student Involvement, Inc. AT&T Wireless now seeks to install three (3) additional antennas, install six (6) new Remote Radio Units ("RRU"), repurpose three (3) existing UMTS RRUS-11 850 to LTE 850, install a new surge suppression dome, upgrade the DUS, add one (1) XMU, and install six (6) new DC cables. The proposed antennas, suppression dome, and RRUs will be mounted at the 70-foot level and completely enclosed within the existing Doppler Radar Dome, located atop the existing tower.

The tower is located within the Town of Bloomfield, CT. AT&T's prior building permit was issued by the Town of Bloomfield. The Bloomfield Building Department advised that they now use "0 Talcott Mountain Science Center Road" as the address of the tower.

AT&T recently filed a Notice of Exempt Modification for this site, which was denied by the CSC on March 12, 2018, because the proposed modifications would load the tower over its maximum capacity. Accordingly, the enclosed drawings and structural report propose modifications to this tower consisting of installing secondary horizontal members, which will render the structural integrity of the tower adequate for the proposed load.

The facility was approved by the Connecticut Siting Council in EM-AT&T-004-160128 on March 14, 2016. Six (6) conditions were enumerated in the Council's decision: 1) Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this 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 Mobility, LLC shall be removed within 60 days of the date the antenna ceased to function; 5) the validity of the action shall expire one year from the date of the letter; 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 Suzette DeBeatham-Brown, Mayor of Bloomfield; Jose Giner, the Director of the Bloomfield Planning & Zoning Department, as well as the Talcott Mountain Science Center for Student Involvement, Inc., the property owner and the tower 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.

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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 Suzette DeBeatham-Brown, Mayor of Bloomfield
Jose Giner, the Director of the Bloomfield Planning & Zoning Department
Talcott Mountain Science Center for Student Involvement, Inc., property owner and tower owner.

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April 18, 2018

Jose Giner, Director Planning & Zoning Department
Town Hall
800 Bloomfield Avenue
Bloomfield, CT 06002-0337

RE: AT&T Wireless Modifications to Telecommunication Facility – 324 Montevideo Road, Avon, CT 06001

Dear Mr. Giner:

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 nine (9) antennas at the 70-foot level of an existing 60-foot lattice tower located at 324 Montevideo Road, in Avon, CT. The tower is owned by the Talcott Mountain Science Center for Student Involvement, Inc. The property is owned by the Talcott Mountain Science Center for Student Involvement, Inc.

The tower is located within the Town of Bloomfield, CT. AT&T's prior building permit was issued by the Town of Bloomfield. AT&T recently filed a Notice of Exempt Modification for this site, which was denied by the CSC on March 12, 2018, because the proposed modifications would load the tower over its maximum capacity. Accordingly, the enclosed drawings and structural report propose modifications to this tower consisting of installing secondary horizontal members, which will render the structural integrity of the tower adequate for the proposed load.

AT&T Wireless now seeks to install three (3) additional antennas, install six (6) new Remote Radio Units ("RRU"), repurpose three (3) existing UMTS RRUS-11 850 to LTE 850, install a new surge suppression dome, upgrade the DUS, add one (1) XMU, and install six (6) new DC cables. The proposed antennas, suppression dome, and RRUs will be mounted at the 70-foot level and completely enclosed within the existing Doppler Radar Dome, located atop the existing tower.

This letter is intended to serve as the required notice to the municipality's Planning and Community Development Department. 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

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

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under RCSA section 16-50j-73 of construction which constitutes an exempt modification pursuant to RCSA section 16-50j-72(b)(2).

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
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443-677-0144
jandrews@empiretelecomm.com

Enclosures

cc: Melanie Bachman, Connecticut Siting Council

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April 18, 2018

The Honorable Suzette DeBeatham-Brown
Town Hall
800 Bloomfield Avenue
Bloomfield, CT 06002-0337

RE: AT&T Wireless Modifications to Telecommunication Facility – 324 Montevideo Road, Avon, CT 06001

Dear Mayor DeBeatham-Brown :

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 nine (9) antennas at the 70-foot level of an existing 60-foot lattice tower located at 324 Montevideo Road, in Avon, CT. The tower is owned by the Talcott Mountain Science Center for Student Involvement, Inc. The property is owned by the Talcott Mountain Science Center for Student Involvement, Inc.

The tower is located within the Town of Bloomfield, CT. AT&T's prior building permit was issued by the Town of Bloomfield. AT&T recently filed a Notice of Exempt Modification for this site, which was denied by the CSC on March 12, 2018, because the proposed modifications would load the tower over its maximum capacity. Accordingly, the enclosed drawings and structural report propose modifications to this tower consisting of installing secondary horizontal members, which will render the structural integrity of the tower adequate for the proposed load.

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This letter is intended to serve as the required notice to 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,

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o/b/o AT&T Wireless
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jandrews@empiretelecomm.com

Enclosures

cc: Melanie Bachman, Connecticut Siting Council

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April 18, 2018

The Talcott Mountain Science Center for Student Involvement Inc.
324 Montevideo Road
Avon, CT 06001
ATTN: Jonathan Craig

RE: AT&T Wireless Modifications to Telecommunication Facility –
324 Montevideo Road, Avon, CT 06001

Dear Mr. Craig:

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 nine (9) antennas at the 70-foot level of an existing 60-foot lattice tower located at 324 Montevideo Road, in Avon, CT. The tower is owned by the Talcott Mountain Science Center for Student Involvement, Inc. The property is owned by the Talcott Mountain Science Center for Student Involvement, Inc.

The tower is located within the Town of Bloomfield, CT. AT&T's prior building permit was issued by the Town of Bloomfield. AT&T recently filed a Notice of Exempt Modification for this site, which was denied by the CSC on March 12, 2018, because the proposed modifications would load the tower over its maximum capacity. Accordingly, the enclosed drawings and structural report propose modifications to this tower consisting of installing secondary horizontal members, which will render the structural integrity of the tower adequate for the proposed load.

AT&T Wireless now seeks to install three (3) additional antennas, install six (6) new Remote Radio Units ("RRU"), repurpose three (3) existing UMTS RRUS-11 850 to LTE 850, install a new surge suppression dome, upgrade the DUS, add one (1) XMU, and install six (6) new DC cables. The proposed antennas, suppression dome, and RRUs will be mounted at the 70-foot level and completely enclosed within the existing Doppler Radar Dome, located atop the existing tower.

This letter is intended to serve as the required notice to the property owner and to the tower 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).

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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: CT1330
FA: 10141394

Avon - Montevideo Road
324 Montevideo Road
Avon, CT 06001

February 1, 2018

Centerline Communications Project Number: 950006-091

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**52.10 %**

Centerline Communications, LLC 95 Ryan Drive, Suite 1 Raynham MA 02767

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: **CT1330 – Avon - Montevideo Road**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **324 Montevideo Road, Avon, 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.

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

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 **324 Montevideo Road, Avon, 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
UMTS – Antenna 1	1900 MHz (PCS)	1	30
LTE – Antenna 2	850 MHz	2	30
LTE - Antenna 2	2300 MHz (WCS)	4	30
LTE – Antenna 3	700 MHz (Band 14)	4	30
LTE – Antenna 3	2100 MHz (AWS)	4	30
LTE – Antenna 4	700 MHz	2	30
LTE – Antenna 4	1900 MHz (PCS)	4	30

Table 1: Channel Data Table

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	Commscope SBNH-1D6565C	70
A	2	CCI OPA-65R-LCUU-H8	70
A	3	Kathrein 800-10966	70
A	4	CCI TPA-65R-LCUUUU-H8	70
B	1	Commscope SBNH-1D6565C	70
B	2	CCI OPA-65R-LCUU-H8	70
B	3	Kathrein 800-10966	70
B	4	CCI TPA-65R-LCUUUU-H8	70
C	1	Commscope SBNH-1D6565C	70
C	2	CCI OPA-65R-LCUU-H8	70
C	3	Kathrein 800-10966	70
C	4	CCI TPA-65R-LCUUUU-H8	70

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	Commscope SBNH-1D6565C	850 MHz / 1900 MHz (PCS)	14.45 / 15.85	2	60	1,989.61	2.31
Antenna A2	CCI OPA-65R-LCUU-H8	850 MHz / 2300 MHz (WCS)	13.35 / 14.95	6	180	5,048.93	5.30
Antenna A3	Kathrein 800-10966	700 MHz / 2100 MHz (AWS)	13.55 / 16.15	8	240	7,662.74	9.45
Antenna A4	CCI TPA-65R-LCUUUU-H8	700 MHz / 1900 MHz (PCS)	12.95 / 13.75	6	180	4,029.10	4.72
Sector A Composite MPE%							**21.78**
Antenna B1	Commscope SBNH-1D6565C	850 MHz / 1900 MHz (PCS)	14.45 / 15.85	2	60	1,989.61	2.31
Antenna B2	CCI OPA-65R-LCUU-H8	850 MHz / 2300 MHz (WCS)	13.35 / 14.95	6	180	5,048.93	5.30
Antenna B3	Kathrein 800-10966	700 MHz / 2100 MHz (AWS)	13.55 / 16.15	8	240	7,662.74	9.45
Antenna B4	CCI TPA-65R-LCUUUU-H8	700 MHz / 1900 MHz (PCS)	12.95 / 13.75	6	180	4,029.10	4.72
Sector B Composite MPE%							**21.78**
Antenna C1	Commscope SBNH-1D6565C	850 MHz / 1900 MHz (PCS)	14.45 / 15.85	2	60	1,989.61	2.31
Antenna C2	CCI OPA-65R-LCUU-H8	850 MHz / 2300 MHz (WCS)	13.35 / 14.95	6	180	5,048.93	5.30
Antenna C3	Kathrein 800-10966	700 MHz / 2100 MHz (AWS)	13.55 / 16.15	8	240	7,662.74	9.45
Antenna C4	CCI TPA-65R-LCUUUU-H8	700 MHz / 1900 MHz (PCS)	12.95 / 13.75	6	180	4,029.10	4.72
Sector C Composite MPE%							**21.78**

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	**21.78 %**
Verizon Wireless	30.32 %
Site Total MPE %:	**52.10 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	21.78 %
AT&T Sector B Total:	21.78 %
AT&T Sector C Total:	21.78 %
Site Total:	52.10 %

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 (All Sectors)	**# Channels**	**Watts ERP (Per Channel)**	**Height (feet)**	**Total Power Density (μW/cm²)**	**Frequency (MHz)**	**Allowable MPE (μW/cm²)**	**Calculated % MPE**
AT&T 850 MHz UMTS	1	835.84	70	7.34	850 MHz	567	1.29%
AT&T 1900 MHz (PCS) UMTS	1	1,153.78	70	10.13	1900 MHz (PCS)	1000	1.01%
AT&T 850 MHz LTE	2	648.82	70	11.39	850 MHz	567	2.01%
AT&T 2300 MHz (WCS) LTE	4	937.82	70	32.93	2300 MHz (WCS)	1000	3.29%
AT&T 700 MHz LTE	4	679.39	70	23.85	700 MHz	467	5.11%
AT&T 2100 MHz (AWS) LTE	4	1,236.29	70	43.40	2100 MHz (AWS)	1000	4.34%
AT&T 700 MHz LTE	2	591.73	70	10.39	700 MHz	467	2.22%
AT&T 1900 MHz (PCS) LTE	4	711.41	70	24.98	1900 MHz (PCS)	1000	2.50%
						Total:	**21.78%**

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:	21.78 %
Sector B:	21.78 %
Sector C:	21.78 %
AT&T Maximum Total (per sector):	21.78 %
Site Total:	52.10 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **52.10 %** 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

SITE NAME: AVON - MONTEVIDEO ROAD
FA NUMBER: 10141394
SITE NUMBER: CTL01330
MULTI-CARRIER - MRCTB017054
RETROFIT - MRCTB019405
324 MONTEVIDEO ROAD
AVON, CT 06001
HARTFORD COUNTY

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY:	SMARTLINK, LLC
ADDRESS:	85 RANGEWAY ROAD, BUILDING 3, SUITE 102
CITY, STATE, ZIP:	NORTH BILLERICA, MA 02862-2105
CONTACT:	TODD OLIVER
PHONE:	(774) 369-3618
E-MAIL:	TODD.OLIVER@SMARTLINKLLC.COM

SITE ACQUISITION

COMPANY:	SMARTLINK, LLC
ADDRESS:	85 RANGEWAY ROAD, BUILDING 3, SUITE 102
CITY, STATE, ZIP:	NORTH BILLERICA, MA 02862-2105
CONTACT:	TODD OLIVER
PHONE:	(774) 369-3618
E-MAIL:	TODD.OLIVER@SMARTLINKLLC.COM

ENGINEER

COMPANY:	MASER CONSULTING CONNECTICUT
ADDRESS:	331 NEWMAN SPRINGS RD, SUITE 203
CITY, STATE, ZIP:	RED BANK, NJ 07701-5699
CONTACT:	FRANK PAZDEN
PHONE:	(973) 398-3110 x4505
E-MAIL:	FPAZDEN@MASERCONSULTING.COM

RF ENGINEER

COMPANY:	NEW CINGULAR WIRELESS PCS, LLC
ADDRESS:	550 COCHITUATE RD.
CITY, STATE, ZIP:	FRAMINGHAM, MA 01701
CONTACT:	CAMERON SYME
E-MAIL:	CS6970@ATT.COM

CONSTRUCTION MANAGER

COMPANY:	SMARTLINK, LLC.
ADDRESS:	85 RANGEWAY ROAD, BUILDING 3, SUITE 102
CITY, STATE, ZIP:	NORTH BILLERICA, MA 02862-2105
CONTACT:	MARK DONNELLY
PHONE:	(617) 515-2080
E-MAIL:	MARK.DONNELLY@SMARTLINKLLC.COM

SITE INFORMATION

APPLICANT/LESSEE

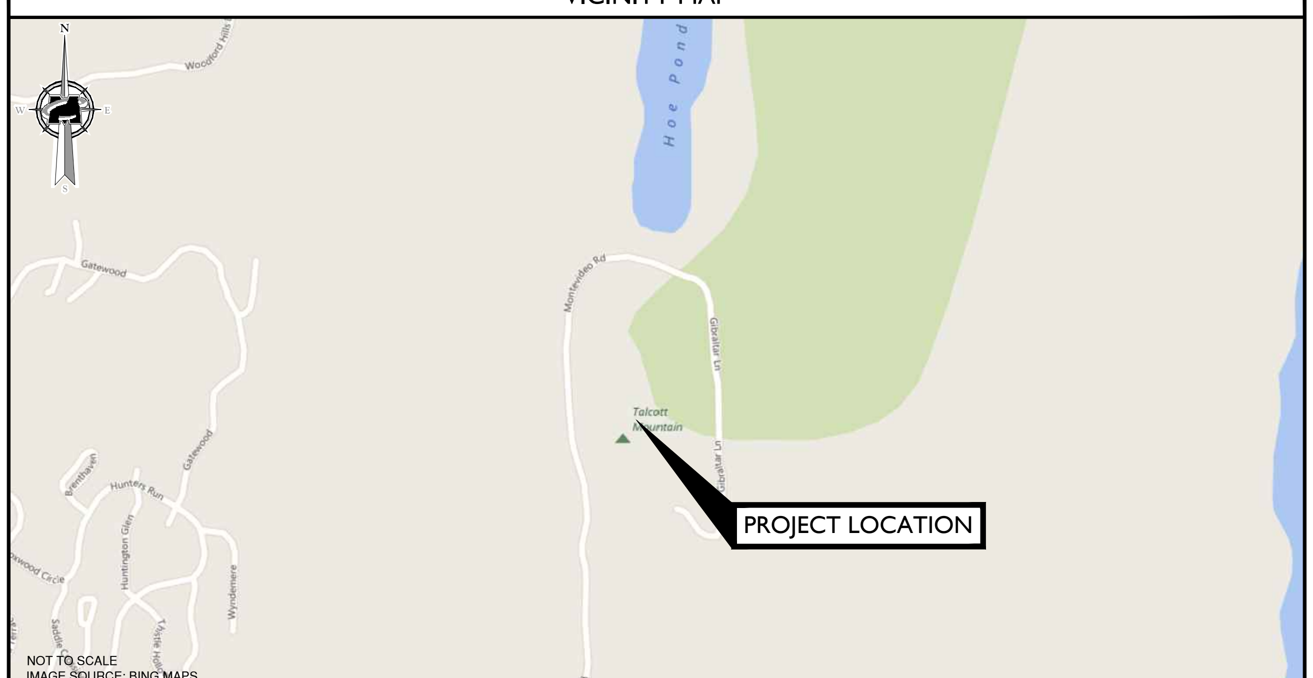
at&t

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

PROPERTY/TOWER OWNER:

NAME:	THE TALCOTT MOUNTAIN SCIENCE CENTER FOR STUDENT INVOLVEMENT, INC.
ADDRESS:	324 MONTEVIDEO ROAD
CITY, STATE, ZIP:	AVON, CT 06001
LATITUDE:	41.811797° N
LONGITUDE:	72.798767° W
LAT./LONG. TYPE:	NAD 83
AREA OF CONSTRUCTION:	EXISTING EQUIPMENT SHELTER AND LATTICE TOWER WITH DOPPLER RADAR DOME
ZONING/JURISDICTION:	TOWN OF AVON
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



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. 2015 NFPA 1
4. LIGHTNING PROTECTION CODE 201
5. AMERICAN CONCRETE INSTITUTE 318
6. AMERICAN INSTITUTE OF STEEL CONSTRICTION 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:

- (3) PROPOSED ANTENNAS TO REPLACE (3) EXISTING ANTENNAS, (1) PER SECTOR
- (3) PROPOSED RRUS TO REPLACE (3) EXISTING RRUS, (1) PER SECTOR
- ADD DUS AND 1DL2 TO LTE CABINET

PROPOSED PROJECT SCOPE BASED OFF RFDS ID# 1017786, VERSION 5.0, LAST UPDATED 10/31/16
MULTI-CARRIER - MRCTB017054
RETROFIT - MRCTB019405

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	17963018A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
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2	03/29/18	REVISED W/ TOWER MODS	AJC	RA
1	12/27/16	FOR CONSTRUCTION	RA	FEP
0	12/14/16	ISSUED FOR REVIEW	AJC	FEP

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:

AVON - MONTEVIDEO ROAD
FA# 10141394
SITE # CTL01330

324 MONTEVIDEO ROAD
AVON, CT 06001
HARTFORD COUNTY

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331 Newman Springs Road
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Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

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 - SMARTLINK
    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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SCALE :	JOB NUMBER :
AS SHOWN	17963018A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
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2	03/29/18	REVISED W/ TOWER MODS	AJC	RA
1	12/27/16	FOR CONSTRUCTION	RA	FEP
0	12/14/16	ISSUED FOR REVIEW	AJC	FEP

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:

AVON - MONTEVIDEO ROAD
FA# 10141394
SITE # CTL01330

324 MONTEVIDEO ROAD
AVON, CT 06001
HARTFORD COUNTY

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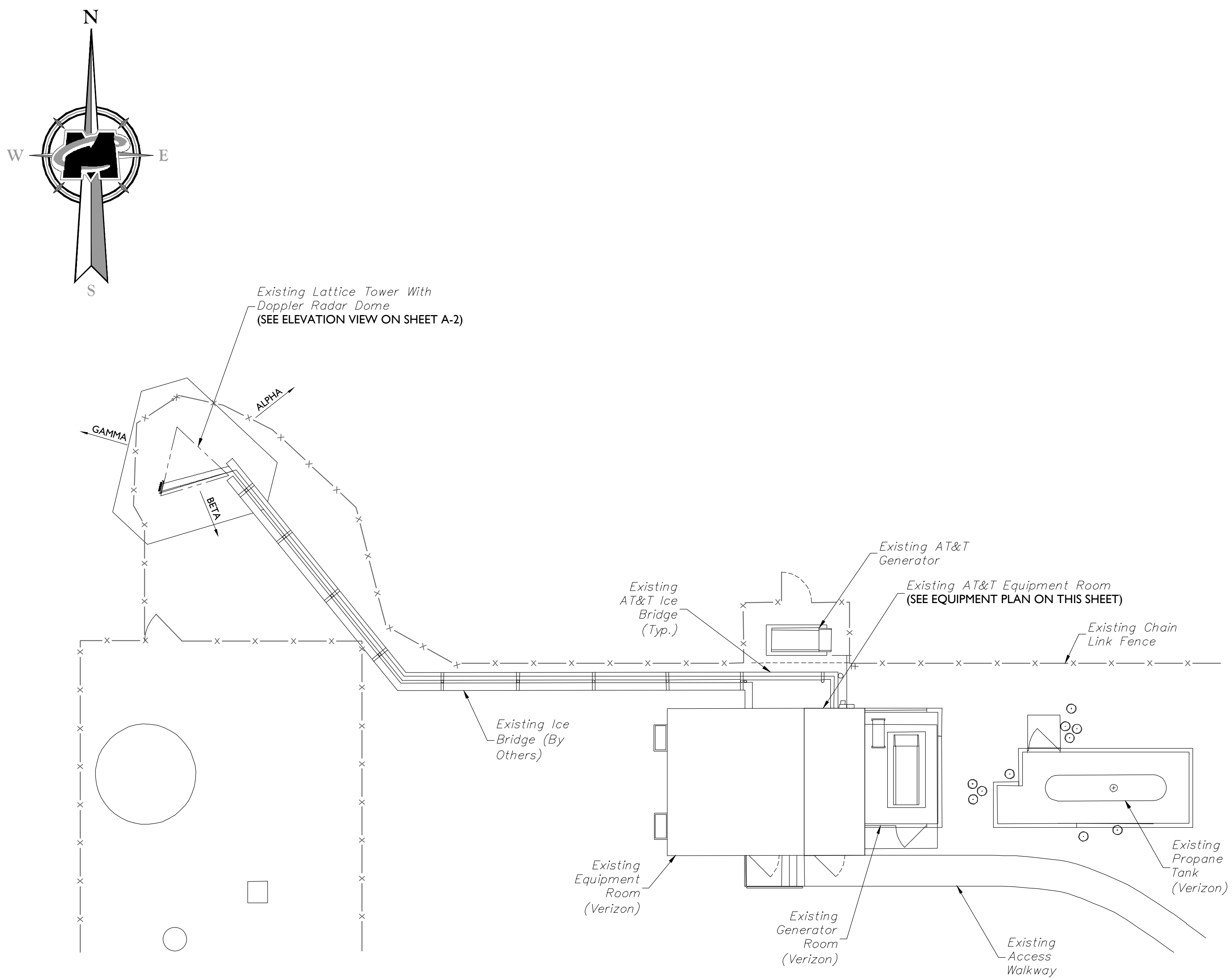
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE :
GENERAL NOTES

SHEET NUMBER :
GN-1



COMPOUND PLAN

GRAPHIC SCALE

10 0 5 10 20

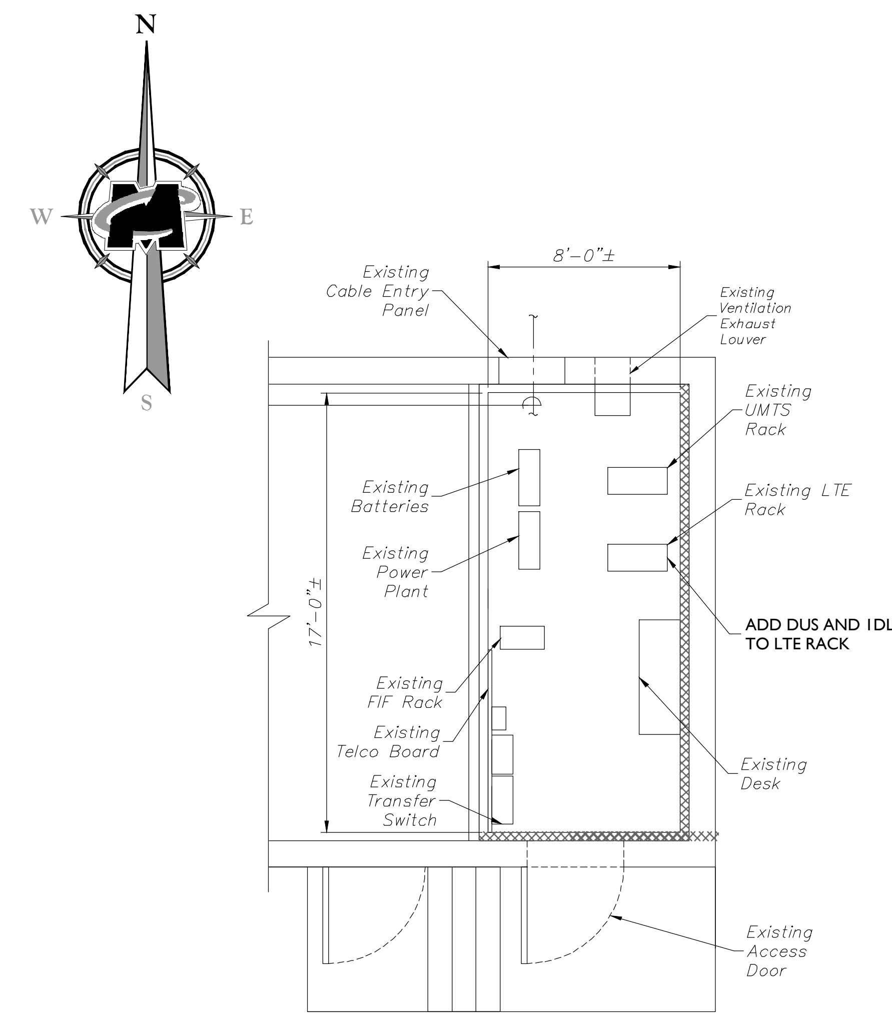
(IN FEET)

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

(DO NOT SCALE 11"X17" DRAWINGS)

NOTES:

1. THE CONDUIT ROUTING IS DIAGRAMMATICALLY SHOWN ON THE PLANS AND ARE ONLY APPROXIMATIONS. THE EXACT LOCATION AND ROUTING SHALL BE FIELD VERIFIED.
2. ALL DISCONNECTS AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED LAMICOID NAMEPLATES, INDICATING THE CIRCUITS ORIGINATION AND ALL EQUIPMENT TERMINATIONS.
3. SUBCONTRACTOR SHALL PROVIDE ALL CONDUITS AND CIRCUITS AS REQUIRED FOR A COMPLETED SYSTEM AND SHALL BE IN COMPLIANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
4. ALL NEW CABLING TO BE ROUTED ON EXISTING CABLE RACKS.
5. ALL INSTALLED GROUND LUGS MUST BE INSPECTION HOLE LUGS.
6. INSTALLED GROUND LEADS MUST TERMINATE AT MGB, NOT HALO.
7. NO OVERLAPPING GROUND HARDWARE.



EQUIPMENT PLAN

GRAPHIC SCALE

4 0 2 4 8

(IN FEET)

SCALE: 1" = 4' FOR 24"X36" DRAWINGS

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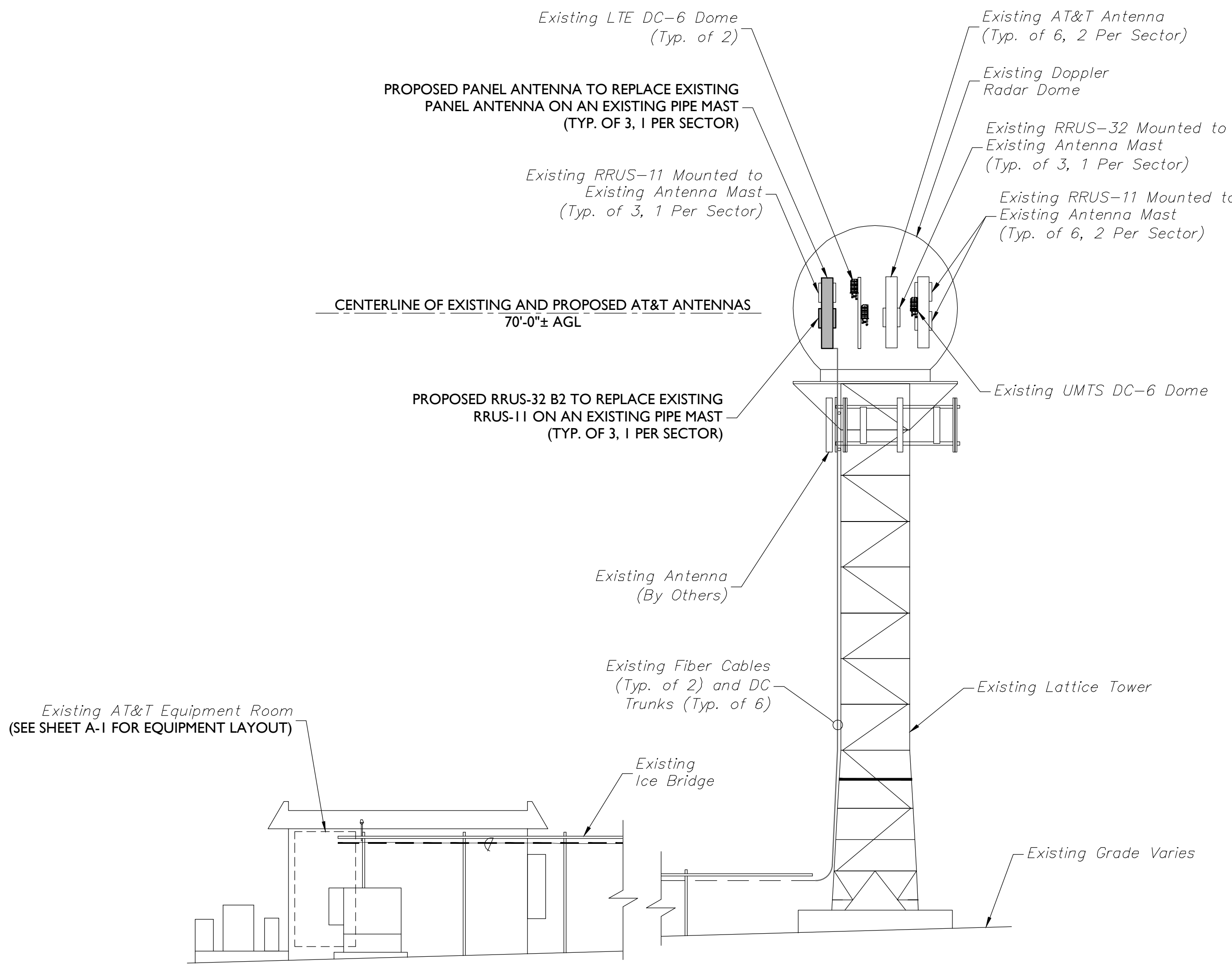
SHEET TITLE :
COMPOUND PLAN AND EQUIPMENT PLAN

SHEET NUMBER :
A-1

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 CONFIGURATION	STATUS
ALPHA	A1	Andrew SBNH-1D6565C	Andrew SBNH-1D6565C	UMTS	REMAIN	96.40	11.90	7.10	60.80	90°	70'	(2) RRUS-11	REMAIN
	A2	CCI OPA-65R-LCUU-H8	CCI OPA-65R-LCUU-H8	LTE WCS	REMAIN	92.70	14.40	7.00	88.00	90°	70'	(1) RRUS-32	REMAIN
	A3	VACANT MAST	VACANT MAST	-	-	-	-	-	-	-	-	-	-
	A4	Andrew SBNH-1D6565C	**TPA-65R-LCUUUU-H8**	**LTE 700/1900**	**NEW**	**96.00**	**14.40**	**8.60**	**75.00**	**90°**	**70'**	(1) RRUS-11 **(1) RRUS-32 B2**	REMAIN **NEW**
BETA	B1	Andrew SBNH-1D6565C	Andrew SBNH-1D6565C	UMTS	REMAIN	96.40	11.90	7.10	60.80	210°	70'	(2) RRUS-11	REMAIN
	B2	CCI OPA-65R-LCUU-H8	CCI OPA-65R-LCUU-H8	LTE WCS	REMAIN	92.70	14.40	7.00	88.00	210°	70'	(1) RRUS-32	REMAIN
	B3	VACANT MAST	VACANT MAST	-	-	-	-	-	-	-	-	-	-
	B4	Andrew SBNH-1D6565C	**TPA-65R-LCUUUU-H8**	**LTE 700/1900**	**NEW**	**96.00**	**14.40**	**8.60**	**75.00**	**210°**	**70'**	(1) RRUS-11 **(1) RRUS-32 B2**	REMAIN **NEW**
GAMMA	C1	Andrew SBNH-1D6565C	Andrew SBNH-1D6565C	UMTS	REMAIN	96.40	11.90	7.10	60.80	330°	70'	(2) RRUS-11	REMAIN
	C2	CCI OPA-65R-LCUU-H8	CCI OPA-65R-LCUU-H8	LTE WCS	REMAIN	92.70	14.40	7.00	88.00	330°	70'	(1) RRUS-32	REMAIN
	C3	VACANT MAST	VACANT MAST	-	-	-	-	-	-	-	-	-	-
	C4	Andrew SBNH-1D6565C	**TPA-65R-LCUUUU-H8**	**LTE 700/1900**	**NEW**	**96.00**	**14.40**	**8.60**	**75.00**	**330°**	**70'**	(1) RRUS-11 **(1) RRUS-32 B2**	REMAIN **NEW**

ANTENNA SCHEDULE



ELEVATION VIEW

GRAPHIC SCALE

10 0 5 10 20

(IN FEET)

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

(DO NOT SCALE 11"X17" DRAWINGS)

NOTE:

THESE PLANS WERE DESIGNED WITH THE ASSUMPTION THAT THE PREVIOUS PLANS PREPARED BY MASER CONSULTING CONNECTICUT DATED 02/15/16 WILL BE COMPLETED PRIOR TO THE CURRENT SCOPE OF WORK BEING INSTALLED. ANY CHANGES IN PREVIOUS DESIGN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.

STRUCTURAL NOTES:

1. NO CONSTRUCTION OF THE PROPOSED LOADING SHOWN SHALL PROCEED UNTIL ADEQUACY OF THE EXISTING STRUCTURE AND FOUNDATION, INCLUDING THE PROPOSED AT&T ANTENNA MOUNTING CONFIGURATION SHOWN HEREIN, HAS BEEN COMPLETED.
2. THE STRUCTURE ELEVATION IS SHOWN FOR INFORMATIONAL PURPOSES ONLY AND MAY NOT REFLECT AS-BUILT FIELD CONDITIONS FOR ALL EXISTING INVENTORY LOADING/ANTENNAS/APPURTENANCES ON STRUCTURE. REFER TO THE LATEST STRUCTURAL ANALYSIS FOR EXISTING STRUCTURE LOADING AND THE PROPOSED METHOD OF ATTACHMENT OF THE PROPOSED ANTENNAS/CABLES.
3. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY IMPROVEMENTS AND REINFORCEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, CABLES, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.

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AS SHOWN	17963018A

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2	03/29/18	REVISED W/ TOWER MODS	AJC	RA
1	12/27/16	FOR CONSTRUCTION	RA	FEP
0	12/14/16	ISSUED FOR REVIEW	AJC	FEP

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577
STATE OF CONNECTICUT · PETROS TSOUKALAS · 32577 · LICENSED PROFESSIONAL ENGINEER

SITE NAME:

AVON - MONTEVIDEO ROAD
FA# 10141394
SITE # CTL01330

324 MONTEVIDEO ROAD
AVON, CT 06001
HARTFORD COUNTY

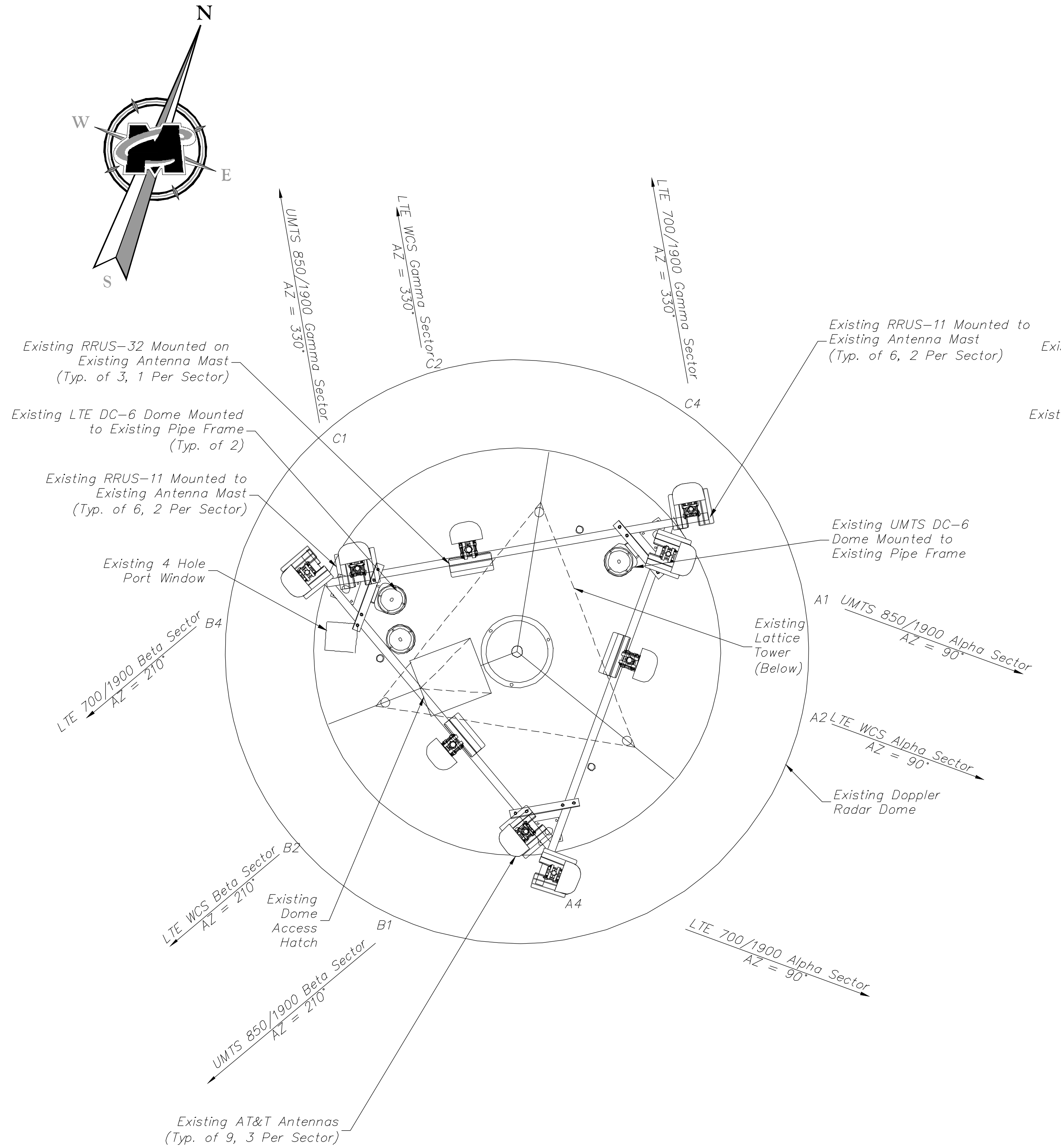
RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE :

ELEVATION VIEW AND ANTENNA SCHEDULE

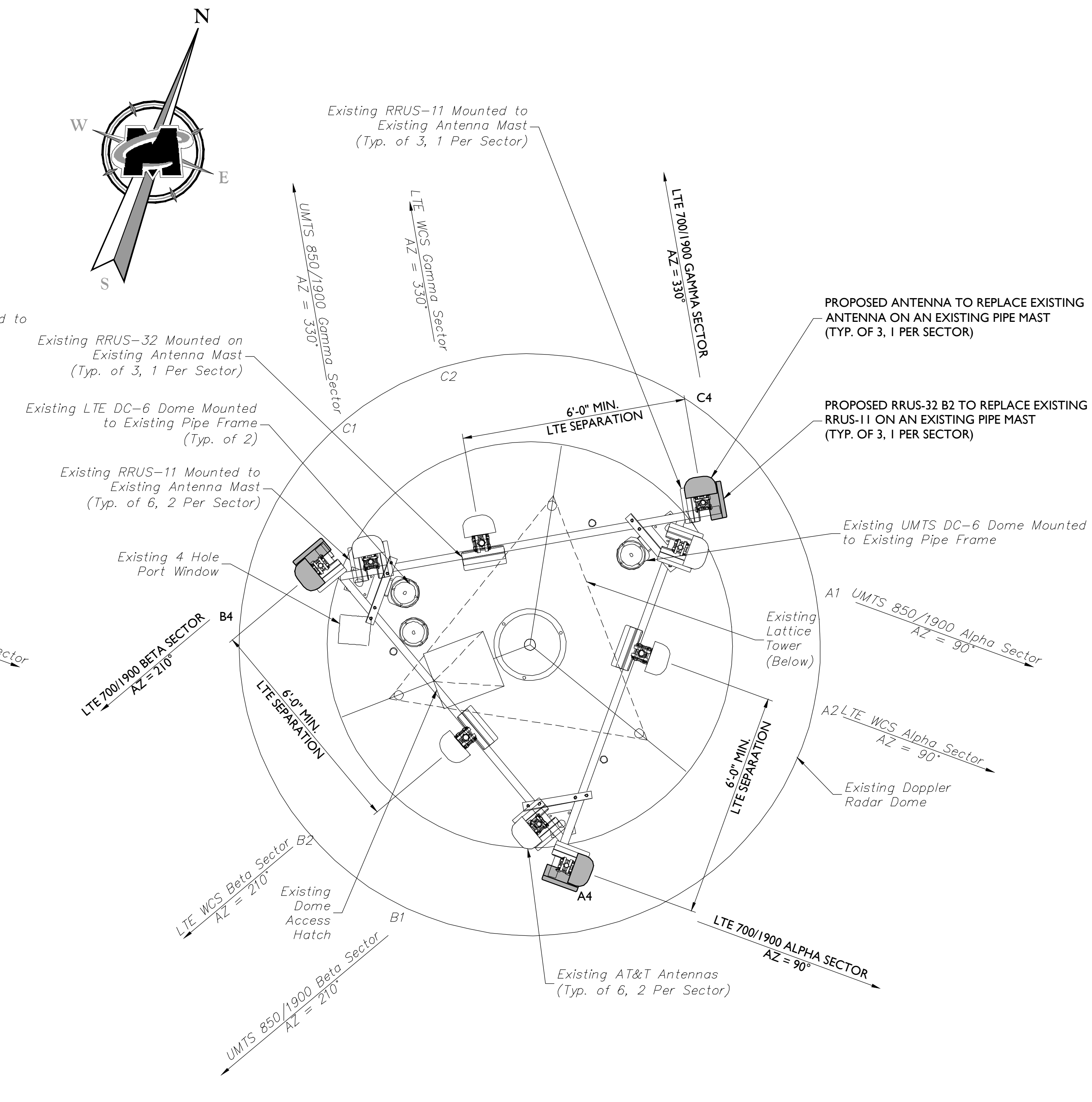
SHEET NUMBER :

A-2



EXISTING - ANTENNA LAYOUT

NOT TO SCALE



PROPOSED - ANTENNA LAYOUT

NOT TO SCALE

NOTES:

EXISTING ANTENNA LAYOUT WITHIN EXISTING RF-TRANSPARENT DOME STRUCTURE BASED ON PHOTOS BY OTHERS, AS-BUILT DRAWINGS BY EASTERN COMMUNICATIONS DATED 4/2/14, AS-BUILT DRAWINGS BY BERKSHIRE WIRELESS DATED 8/7/15, AND REDLINED RFDS REV. 2 BY EASTERN COMMUNICATIONS DATED 4/2/14. THE BASIS FOR EACH AS-BUILT DRAWING WAS A CONSTRUCTION DRAWING SET PREPARED BY CENTEK ENGINEERING DATED 01/24/14.

NOTE:

THESE PLANS WERE DESIGNED WITH THE ASSUMPTION THAT THE PREVIOUS PLANS PREPARED BY MASER CONSULTING CONNECTICUT DATED 02/15/16 WILL BE COMPLETED PRIOR TO THE CURRENT SCOPE OF WORK BEING INSTALLED. ANY CHANGES IN PREVIOUS DESIGN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.

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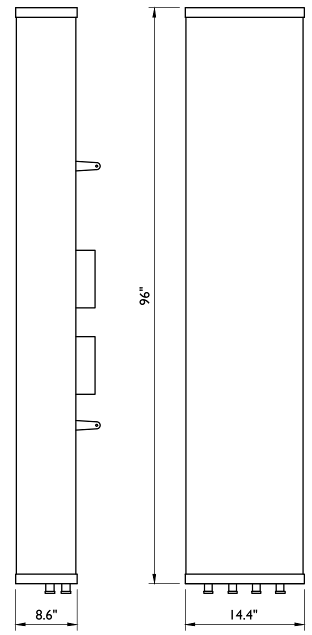
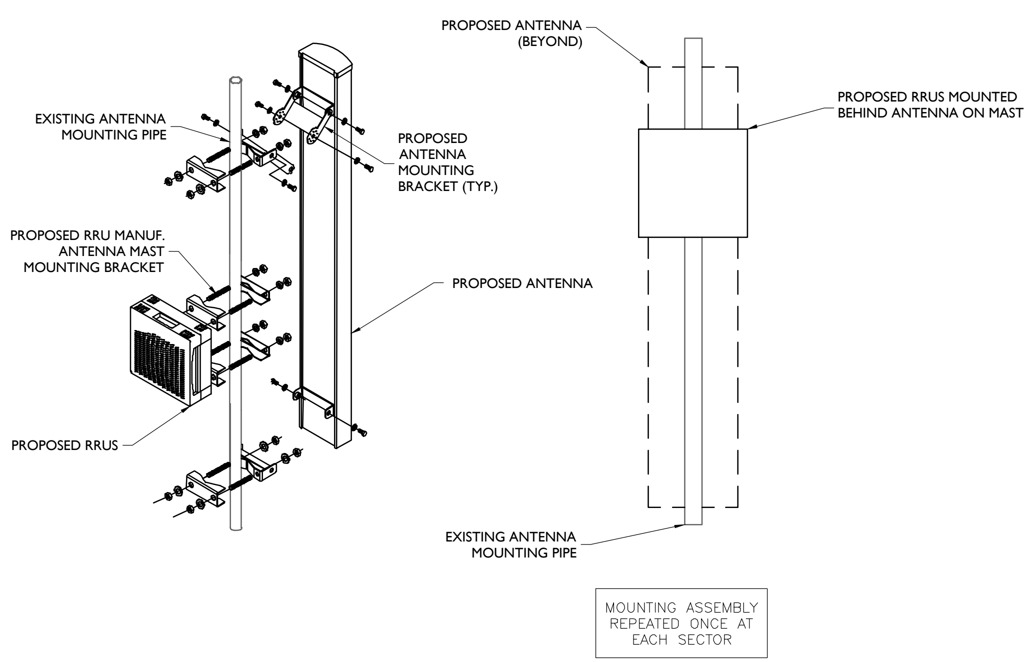
SHEET TITLE:
ANTENNA LAYOUTS

SHEET NUMBER:
A-3



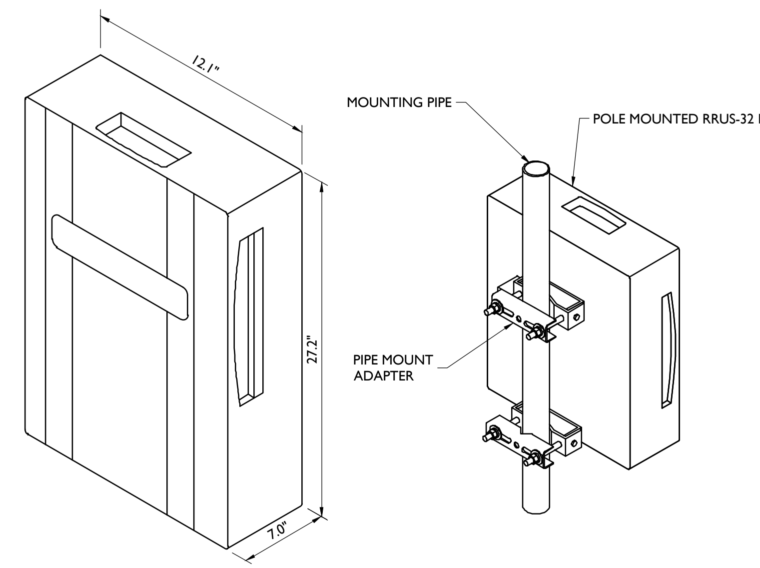
WEIGHT = 75 LBS

CCI TPA-65R-LCUUUU-H8



ANTENNA AND RRUS MOUNTING DETAILS

NOT TO SCALE



RRUS–32 B2 DIMENSIONS (H X W X D): 27.2" X 12.1" X 7.0" (INCLUDES SUNSHIELD)
WEIGHT: 53 LBS

RRUS-32 B2 DETAIL

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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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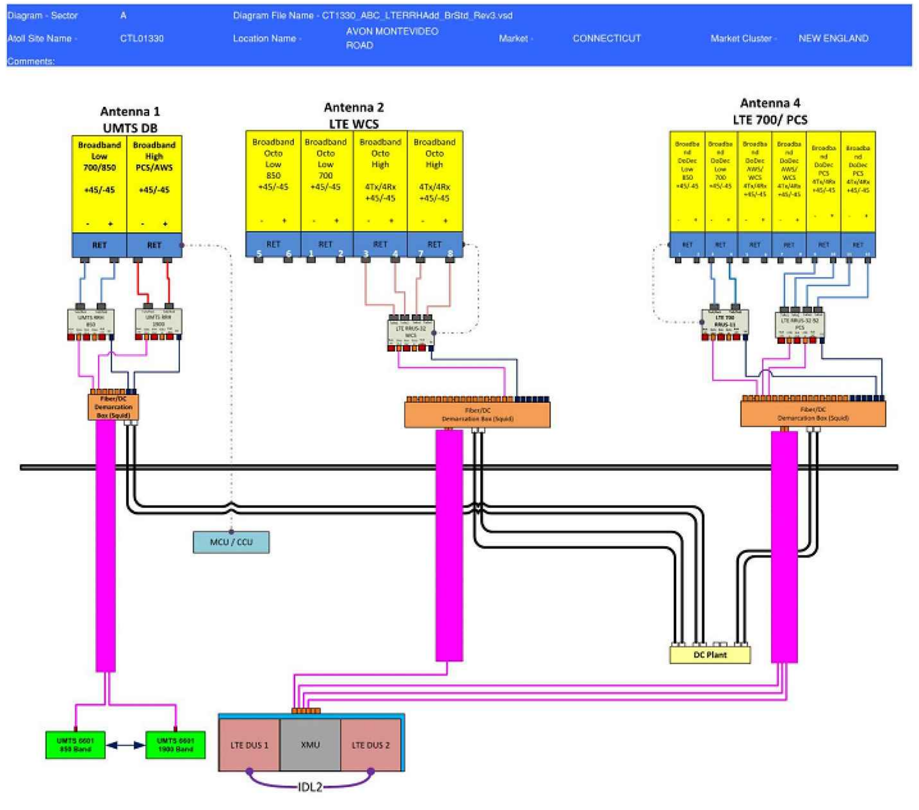
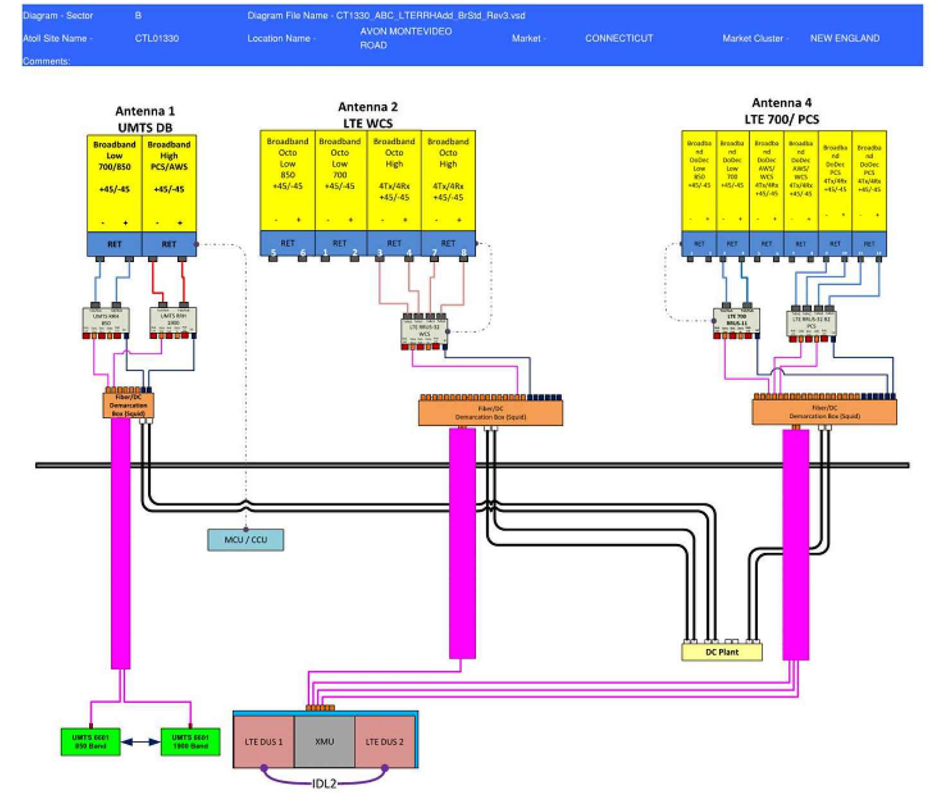
SHEET TITLE : DETAILS

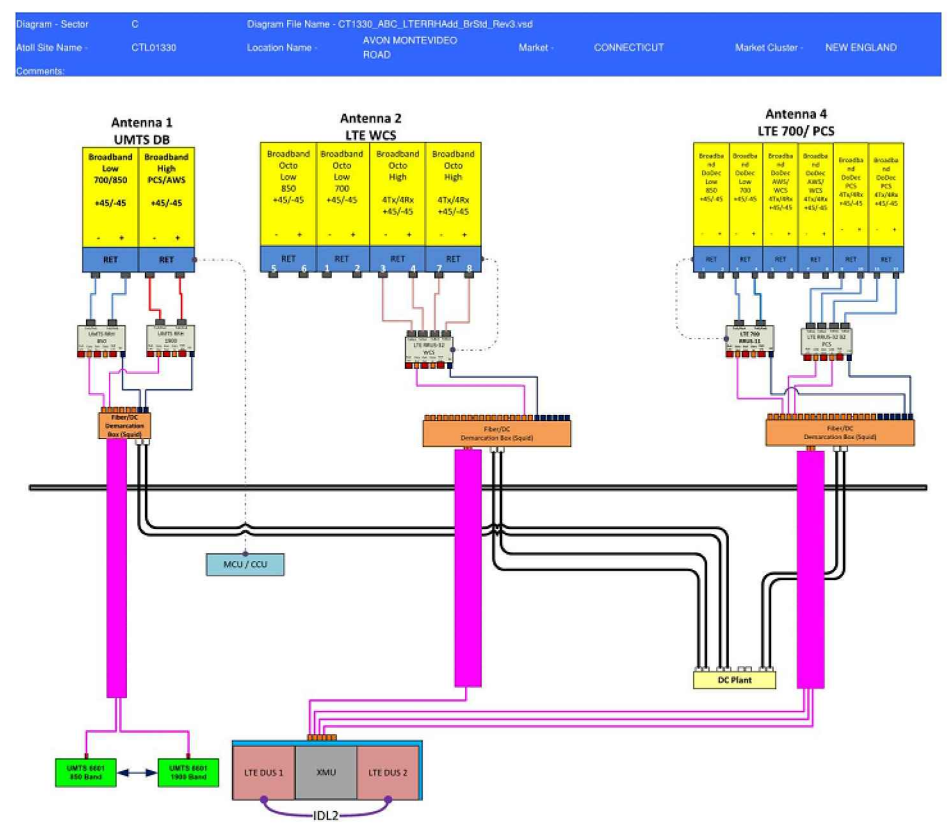
SHEET NUMBER : A-4



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR

BASED ON RF ENGINEERING DESIGN ENTITLED "NEW-ENGLAND_CONNECTICUT_CTL01330_2016-LTE-Extended-Carrier_RRH-Add_om636a_2051A048Z7_10141394_139386_01-11-2016_Final-Approved_v5.00"

RF PLUMBING DIAGRAMS

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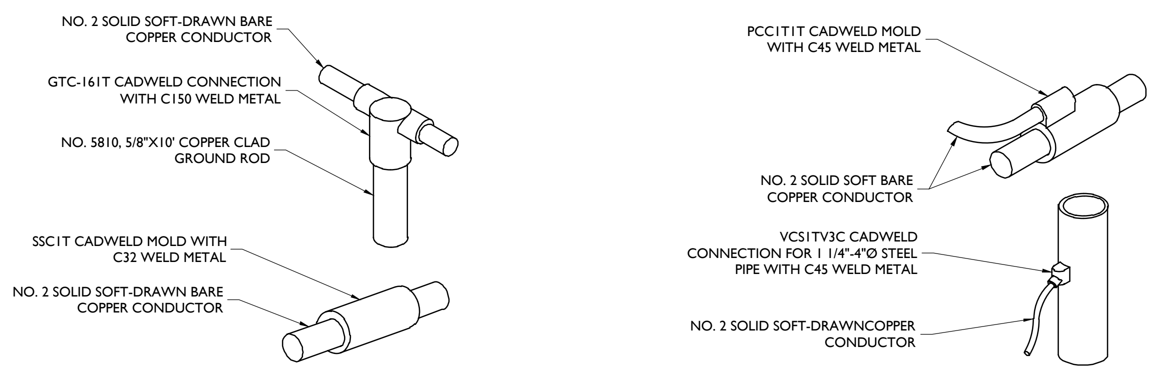
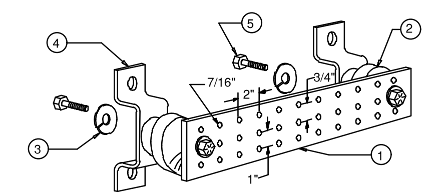
SHEET TITLE :
RF PLUMBING DIAGRAMS

SHEET NUMBER :
A-5



CADWELD DETAILS

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

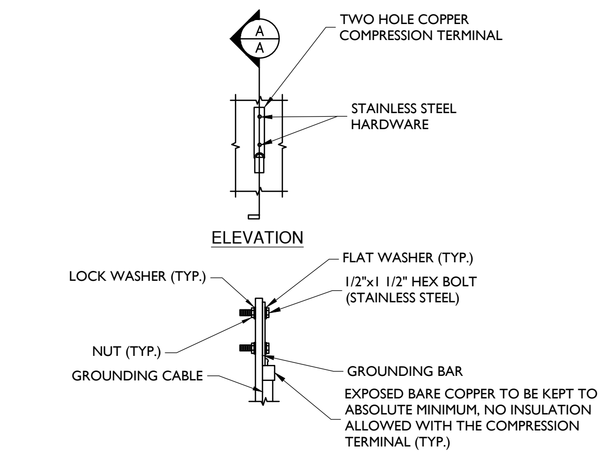
CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLY RETURN BAR (#2)
RECTIFIER FRAMES.

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)

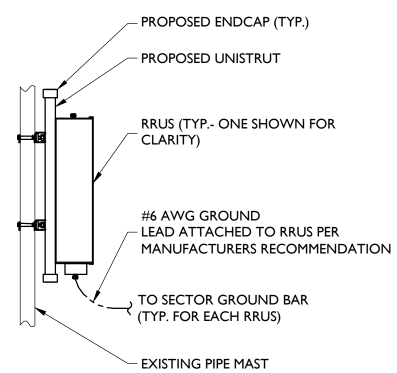
MASTER GROUND BAR

NOT TO SCALE



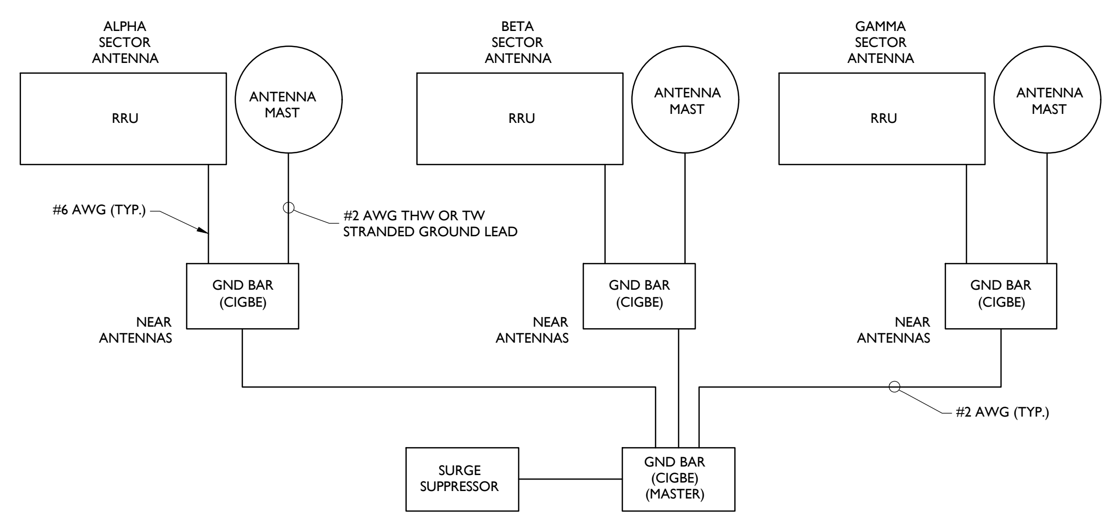
TYPICAL GROUND BAR CONNECTION DETAIL

NOT TO SCALE



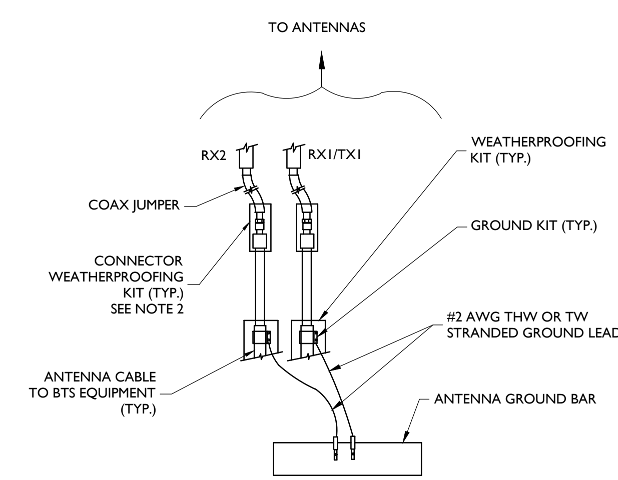
RRH GROUNDING

NOT TO SCALE



SCHEMATIC DIAGRAM GROUNDING SYSTEM

NOT TO SCALE

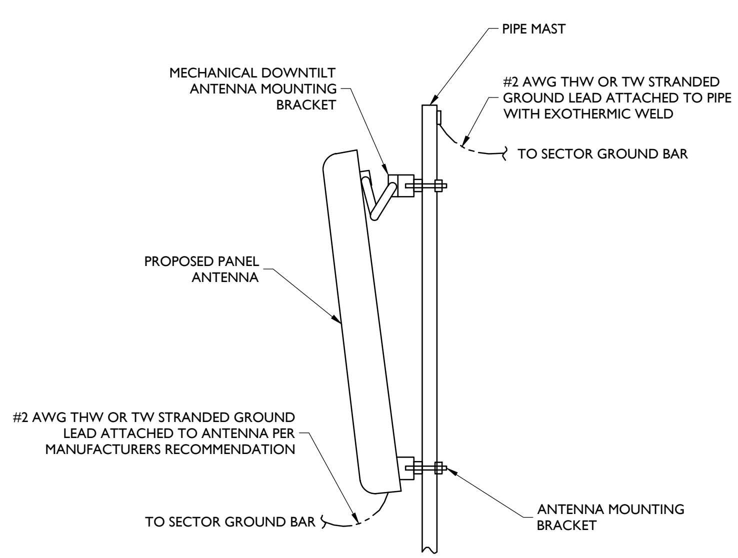


NOTES:

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

NOT TO SCALE



ANTENNA GROUNDING

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STATE OF CONNECTICUT
PETROS L. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577
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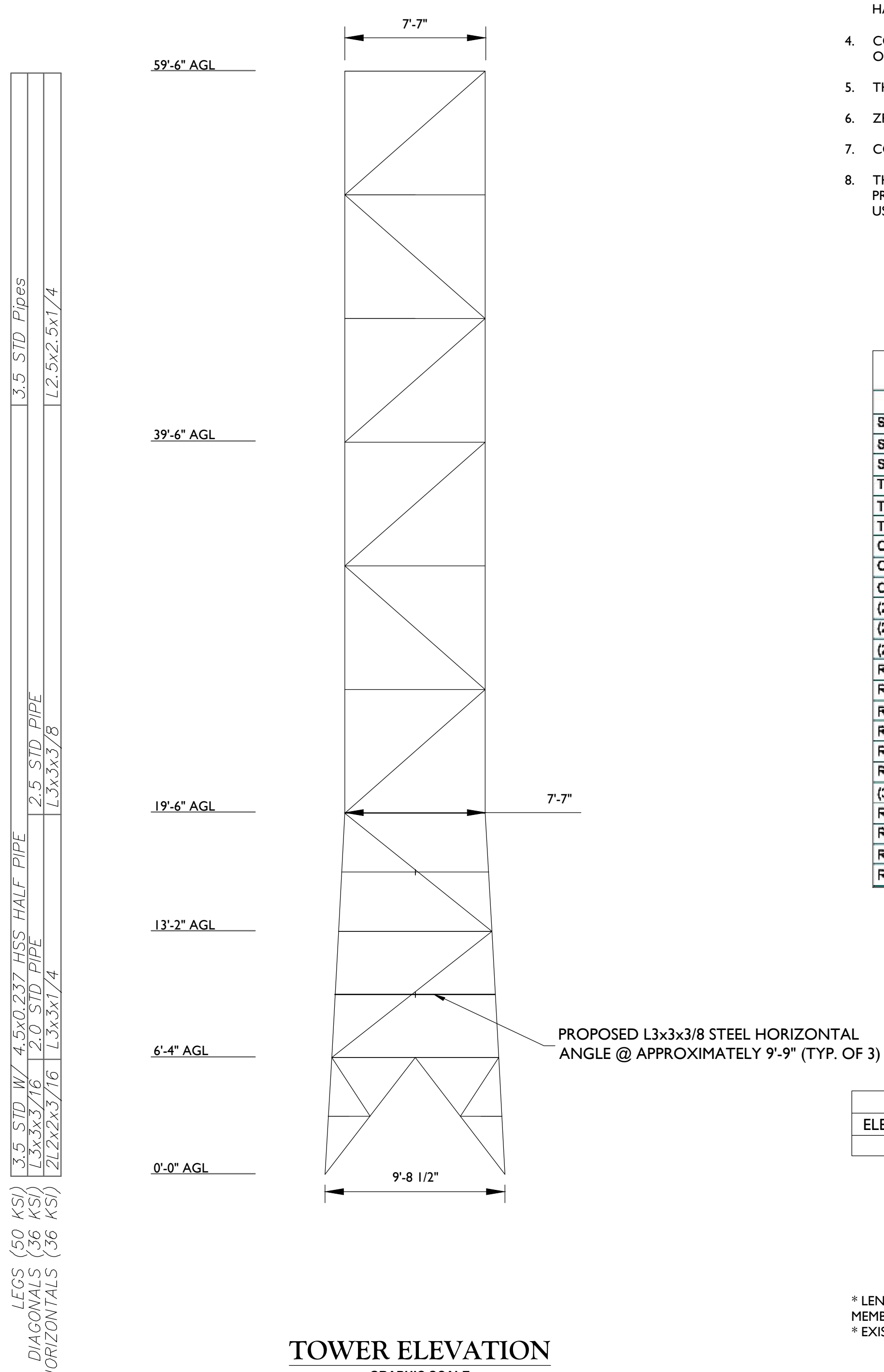
SHEET TITLE :
GROUNDING DETAILS

SHEET NUMBER :
G-1

NOTES:

1. YIELD STRENGTH OF EXISTING TOWER MEMBERS IS ASSUMED.
2. EXISTING TOWER MEMBERS WERE DETERMINED FROM A STRUCTURAL ANALYSIS REPORT PREPARED BY MASER CONSULTING P.A., PROJECT NO. 16946029, DATED MAY 2ND, 2017.
3. CONTRACTOR IS TO REMOVE AND REPLACE EXISTING APPURTENANCES, MOUNTS AND TOWER HARDWARE AS REQUIRED TO INSTALL THE PROPOSED REINFORCEMENTS.
4. CONTRACTOR SHALL PERFORM A TOWER INSPECTION PRIOR TO PURCHASE AND/OR FABRICATION OF MATERIAL.
5. THE MEANS AND METHODS OF INSTALLATION ARE THE RESPONSIBILITIES OF THE CONTRACTOR.
6. ZRC GALVANIZING COMPOUND OR EQUAL SHALL TREAT ALL WELDED AREAS.
7. CONTRACTOR SHALL NOT REUSE EXISTING BOLTS AND ASSOCIATED HARDWARE.
8. THE OVERALL TOWER USAGE HAS BEEN DETERMINED TO BE 87.2% FOR THE EXISTING AND PROPOSED LOADING, ONCE THE TOWER MODIFICATIONS HAVE BEEN COMPLETED. MAXIMUM USAGE OCCURS AT THE TOWER LEGS AT 13.1'-14.5' FEET ABOVE GROUND LEVEL.



TOWER ELEVATION

GRAPHIC SCALE

5 0 2.5 5 10

(IN FEET)

SCALE: 1" = 5' FOR 24"X36" DRAWINGS

(DO NOT SCALE 11"X17" DRAWINGS)

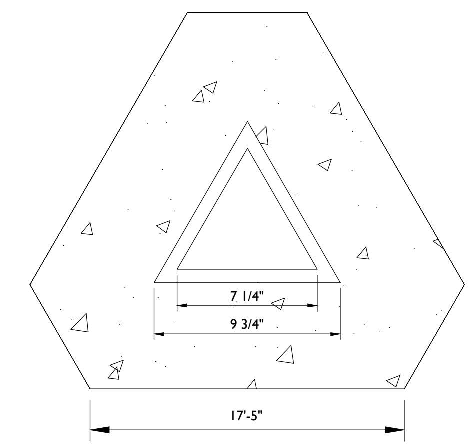
DESIGNED APPURTENANCE LOADING			
TYPE	ELEVATION	TYPE	ELEVATION
SBNH-1D6565C (att)	70	RRUS 32 B66 (att)	70
SBNH-1D6565C (att)	70	RRUS 32 B66 (att)	70
SBNH-1D6565C (att)	70	80010966 w/ 8' pipe (att)	70
TPA-65R-LCUUUU-H8 (att)	70	80010966 w/ 8' pipe (att)	70
TPA-65R-LCUUUU-H8 (att)	70	80010966 w/ 8' pipe (att)	70
TPA-65R-LCUUUU-H8 (att)	70	18-ft doppler	68.5
CCI OPA-65R-LCUU-H8 (att)	70	Andrew 10' Platform	68
CCI OPA-65R-LCUU-H8 (att)	70	SBNHH-1D65B (verizon)	55
CCI OPA-65R-LCUU-H8 (att)	70	(3) RRH 2x60 (verizon)	55
(2) RRUS-11 (att)	70	(3) RRH 2x60 (verizon)	55
(2) RRUS-11 (att)	70	LPA-80063-6CF-EDIN-5 (verizon)	55
(2) RRUS-11 (att)	70	SBNHH-1D65B (verizon)	55
RRUS 32 (att)	70	SBNHH-1D65B (verizon)	55
RRUS 32 (att)	70	SBNHH-1D65B (verizon)	55
RRUS 32 (att)	70	APX75-866514 (verizon)	55
RRUS 32 B2 (att)	70	BXA-70063-6CF-EDIN-X (verizon)	55
RRUS 32 B2 (att)	70	LPA-80063-6CF-EDIN-5 (verizon)	55
RRUS 32 B2 (att)	70	Verizon Sector Frame (verizon)	55
(3) DC6-48-06-18-8F (att)	70	Verizon Sector Frame (verizon)	55
RRUS 4478 (att)	70	LPA-80063-6CF-EDIN-5 (verizon)	55
RRUS 4478 (att)	70	LPA-80063-6CF-EDIN-5 (verizon)	55
RRUS 4478 (att)	70	RHSDC-3315-PF-48 (verizon)	51
RRUS 32 B66 (att)	70	RHSDC-3315-PF-48 (verizon)	51

TOWER MODIFICATION TABLE								
ELEVATION (FT)	MEMBER TYPE	EXISTING MEMBER SIZE	QTY	PROPOSED MEMBER SIZE	QTY	LENGTH *	END BOLT	QTY
9'-9"	HORIZONTAL	-	-	L3x3x3/8	3	± 9'-8"	U-BOLT	6

* LENGTH IS THEORETICAL. CONTRACTOR TO FIELD VERIFY THE LENGTH OF THE EXISTING MEMBERS IN THE FIELD PRIOR TO FABRICATION OF THE PROPOSED BRACING MEMBER

* EXISTING BOLTED CONNECTIONS ARE TO BE REMOVED AND WELDED

TOWER FOUNDATION REACTIONS	
REACTION TYPE	FORCE
COMPRESSION (MAX KIP PER LEG)	164
UPLIFT (MAX KIP PER LEG)	150
OVERTURNING MOMENT (KIP-FT)	1331
SHEAR (KIP)	30



TOWER PLAN

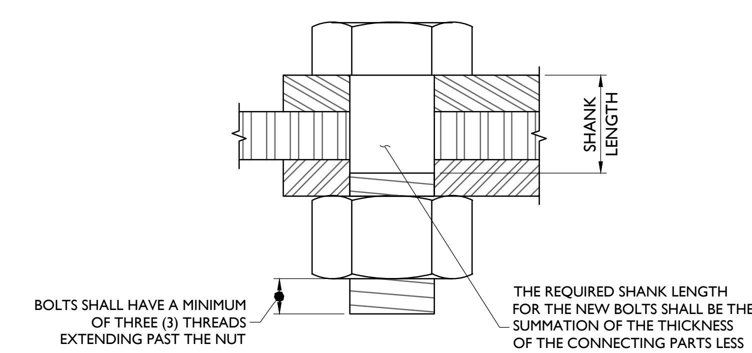
GRAPHIC SCALE

5 0 2.5 5 10

(IN FEET)

SCALE: 1" = 5' FOR 24"X36" DRAWINGS

(DO NOT SCALE 11"X17" DRAWINGS)



BOLT DETAIL

NOT TO SCALE

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CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577

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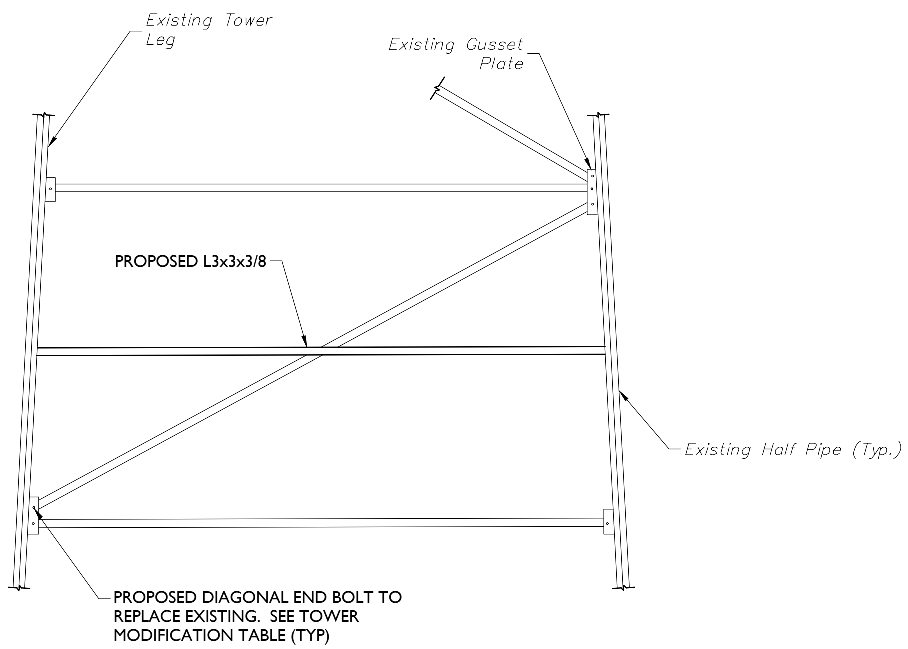
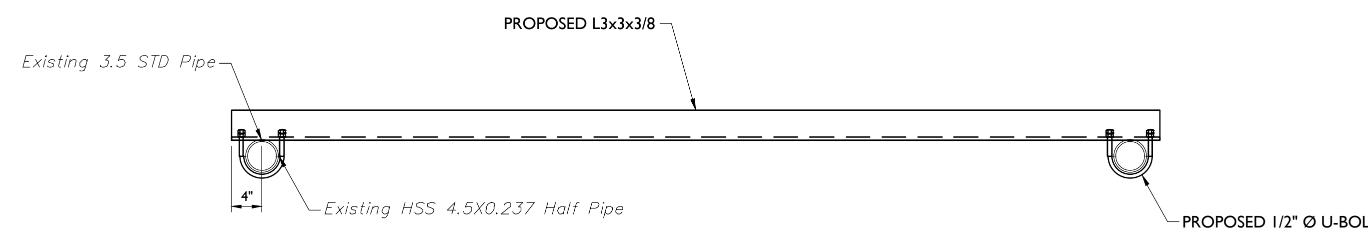
SHEET TITLE :
TOWER MODIFICATION DESIGN DETAILS

SHEET NUMBER :
S-1



TOWER HORIZONTAL REINFORCEMENT DETAILS

NOT TO SCALE



PLAN VIEW

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SCALE :	JOB NUMBER :
AS SHOWN	17963018A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
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2	03/29/18	REVISED W/ TOWER MODS	AJC	RA
1	12/27/16	FOR CONSTRUCTION	RA	FEP
0	12/14/16	ISSUED FOR REVIEW	AJC	FEP

STATE OF CONNECTICUT
PETROS TSOUKALAS
32577
LICENSED PROFESSIONAL ENGINEER

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

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SITE NAME:

AVON - MONTEVIDEO ROAD
FA# 10141394
SITE # CTL01330

324 MONTEVIDEO ROAD
AVON, CT 06001
HARTFORD COUNTY

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SHEET TITLE :
STRUCTURAL DETAILS

SHEET NUMBER :
S-2

Engineers Planners Surveyors Landscape Architects Environmental Scientists

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— CONNECTICUT —

Self-Support Tower Modification Analysis

FOR

CT1330 – Avon Montevideo Road

FA Number: 10141394
324 Montevideo Road
Avon, CT 06001
Hartford County

LTE 4C - MRCTB022434 / LTE 5C – MRCTB024053 / LTE 6C – MTCTB026596

Tower and Foundation Utilizations: 87.2 & 93.3%

April 3, 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

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

MC Project No. 17963018A

Objective:
The objective of this report is to determine the capacity of the existing 59.5' self-support tower structure with the proposed modifications at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

Introduction:
Maser Consulting Connecticut has performed limited field observations on April 16, 2016 to verify the existing condition of the structure and to locate and quantify the existing wireless appurtenances from the ground. This structural analysis is only valid for the appurtenances on the existing self-support tower at the time of the site visit. Additionally, Maser Consulting Connecticut has reviewed the following documents in completing this report:

- Previous Structural Analysis Tower Modification Report prepared by Maser Consulting Connecticut, dated May 2, 2017
- Previous Construction Drawings prepared by Maser Consulting Connecticut, dated April 10, 2017
- RFDS 1765191 provided by Empire, dated October 5, 2017

Maser Consulting Connecticut has included all **non-AT&T** loading in the previous referenced structural analysis report. No tower and appurtenance mapping has been conducted to confirm the loading presented in the previous structural analysis report. Also, the results of this analysis are only valid for the appurtenances installed on the tower at the time of the site visit by Maser Consulting Connecticut. This report is based upon this information, as well as the information obtained in the field.

Discrete and Linear Appurtenances:

Maser Consulting Connecticut understands the existing and proposed **AT&T** loading on the tower to be as follows:

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector
3	Commscope	SBNH-1D6565C	Existing	Alpha, Beta, & Gamma
3	CCI	OPA-65R-LCUU-H8	Existing	Alpha, Beta, & Gamma
3	**Kathrein**	**80010966**	**Proposed**	**Alpha, Beta, & Gamma**
3	CCI	TPA-65R-LCUUUU-H8	Existing	Alpha, Beta, & Gamma
6	Ericsson	RRUS 11	Existing	Alpha, Beta, & Gamma
3	Ericsson	RRUS 32	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	Existing	Alpha, Beta, & Gamma
3	Raycap	DC6-48-60-18-8F	Existing	Alpha, Beta, & Gamma

Note: The overall antenna loading is found in the appendix A of this report.

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2016 CT State Building Code and All Subsequent Amendments, Incorporating IBC 2012
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-EIA-222-G
  - Basic Wind Speed – 98 mph (3 Second Gust)
  - Service Wind Speed – 60 mph
  - Ice Wind Speed – 40 mph (1" Ice)
  - Topographic Category – 4
  - Crest Height – 742'
  - Exposure Category – B

Analysis Approach & Assumptions:

The analysis approach used in this structural analysis is based on the premise that if the existing self-support tower with the proposed modifications is structurally adequate to support the existing and proposed equipment per the aforementioned codes and standards, or if the increase in the forces in the structure are deemed to be negligible or acceptable, then the proposed equipment can be installed as intended. TNX, a 3D finite element modeling and analysis program, was used to determine the capacity and usage of the existing antenna support frame.

All the existing and proposed **AT&T** equipment is shielded from wind loading to the RF transparent dome on top of the tower. Only the dead load of the **AT&T** equipment was considered in this analysis.

The following assumptions were utilized in this report:

- Structural Steel Pipes are constructed of A53 Grade B Steel.
- The existing tower is constructed to plumb and is properly maintained with no structural deficiencies and deteriorations.
- 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.
- 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 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.
- The tower and foundation modifications have been installed as intended as shown in the referenced construction drawings

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Calculations:

The Tower Analysis calculations are found in **Appendix A** of this report.

Modifications:

The modification for this tower consists of installing secondary horizontal members at elevation 9'-9" AGL. The members should be L3x3x3/8 steel angles and shall be installed on all three sides of the tower.

Please see final construction drawings prepared by Maser Consulting Connecticut for more details.

Conclusion:

Maser Consulting Connecticut has determined that the existing 59.5' tall structural steel galvanized self-support tower with the proposed modifications is structurally **ADEQUATE** capacity to support the existing and proposed loading per the aforementioned codes and standards. It has been calculated that the maximum stress ratio is **87.2%**, which occurs in the tower legs, between elevations 13.1-19.5" above grade. Therefore, the proposed **AT&T** equipment **CAN** be installed on the existing self-support tower as intended once the proposed modifications are installed.

Additionally, the existing modified foundation has been determined to be structurally **ADEQUATE** to support the existing and proposed loading. The foundation has been determined to be stressed to a maximum of **93.3%** of its structural capacity.

Maser Consulting Connecticut reserves the right to amend this report if additional information about the self-support tower and foundation is provided. The conclusions reached by Maser Consulting Connecticut in this report are only valid for the discrete and linear 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.

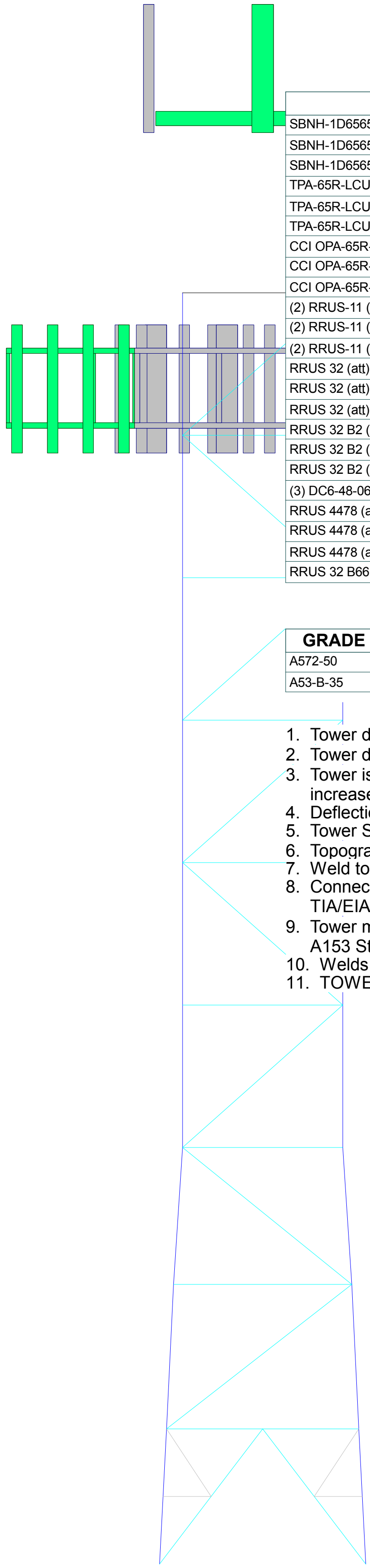
Sincerely,
Maser Consulting Connecticut

Petros E Tsoukalas P.E.
Geographic Discipline Leader

Lauren Luzier
Engineer

\\Maserconsulting.Com\Luj\Projects\2017\17963000A\17963018A\Structural\Tower Analysis\Rev 1\Word\10141394.DE113.CTL01330.Tower Analysis.Rev 0.Docx

APPENDIX A



Section	L1	L2	T1	T2	T3	
Elevation	59.5 ft – 39.5 ft	39.5 ft – 19.5 ft	19.5 ft – 13.1 ft	13.1 ft – 6.3 ft	6.3 ft – 0.0 ft	
Legs	Rohn 3.5 STD	3.5 STD with 4.5x0.237 HSS Half Pipe	3.5 STD with 4.5x0.237 HSS Half Pipe	3.5 STD with 4.5x0.237 HSS Half Pipe	3.5 STD with 4.5x0.237 HSS Half Pipe	
Leg Grade	A572-50	A572-50	A572-50	A572-50	A572-50	
Diagonals	P2.5x.203	P2.5x.203	ROHN 2.5 STD	ROHN 2.5 STD	L3x3x3/16	
Diagonal Grade	A53-B-35	A53-B-35	A53-B-35	A53-B-35	A36	
Top Girts	L3x5x1/4	N.A.	N.A.	N.A.	N.A.	
Horizontals	L2 1/2x2 1/2x1/4	L3x3x3/8	L3x3x1/4	L3x3x1/4	2L2x2x3/16	
Red. Horizontals	N.A.	N.A.	N.A.	N.A.	L2x2x3/16	
Red. Diagonals	N.A.	N.A.	N.A.	N.A.	L2x2x3/16	
Face Width (ft)	7.58333	7.58333	7.58333	8.28077	9.02179	9.70833
# Panels @ (ft)	6 @ 6.66667	6 @ 6.66667	1 @ 6.4	1 @ 6.8	1 @ 6.3	
Weight (K)	1.4	1.9	0.6	0.6	0.7	5.2

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
SBNH-1D6565C (att)	70	RRUS 32 B66 (att)	70
SBNH-1D6565C (att)	70	RRUS 32 B66 (att)	70
SBNH-1D6565C (att)	70	80010966 w/ 8' pipe (att)	70
TPA-65R-LCUUUU-H8 (att)	70	80010966 w/ 8' pipe (att)	70
TPA-65R-LCUUUU-H8 (att)	70	80010966 w/ 8' pipe (att)	70
TPA-65R-LCUUUU-H8 (att)	70	18-ft doppler	68.5
CCI OPA-65R-LCUU-H8 (att)	70	Andrew 10' Platform	68
CCI OPA-65R-LCUU-H8 (att)	70	SBNHH-1D65B (verizon)	55
CCI OPA-65R-LCUU-H8 (att)	70	(3) RRH 2x60 (verizon)	55
(2) RRUS-11 (att)	70	(3) RRH 2x60 (verizon)	55
(2) RRUS-11 (att)	70	LPA-80063-6CF-EDIN-5 (verizon)	55
(2) RRUS-11 (att)	70	SBNHH-1D65B (verizon)	55
RRUS 32 (att)	70	SBNHH-1D65B (verizon)	55
RRUS 32 (att)	70	SBNHH-1D65B (verizon)	55
RRUS 32 (att)	70	APX75-866514 (verizon)	55
RRUS 32 B2 (att)	70	BXA-70063-6CF-EDIN-X (verizon)	55
RRUS 32 B2 (att)	70	LPA-80063-6CF-EDIN-5 (verizon)	55
RRUS 32 B2 (att)	70	Verizon Sector Frame (verizon)	55
(3) DC6-48-06-18-8F (att)	70	Verizon Sector Frame (verizon)	55
RRUS 4478 (att)	70	LPA-80063-6CF-EDIN-5 (verizon)	55
RRUS 4478 (att)	70	LPA-80063-6CF-EDIN-5 (verizon)	55
RRUS 4478 (att)	70	RHSDC-3315-PF-48 (verizon)	51
RRUS 32 B66 (att)	70	RHSDC-3315-PF-48 (verizon)	51

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi
A53-B-35	35 ksi	63 ksi			

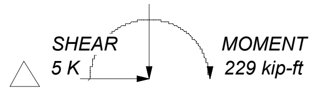
TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-G Standard.
2. Tower designed for a 98 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 4 with Crest Height of 742.00 ft
7. Weld together tower sections have flange connections.
8. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
9. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
10. Welds are fabricated with ER-70S-6 electrodes.
11. TOWER RATING: 87.2%

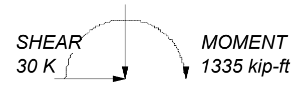
ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 165 K
SHEAR: 18 K

UPLIFT: -151 K
SHEAR: 17 K



TORQUE 2 kip-ft
40 mph WIND - 1.0000 in ICE



TORQUE 10 kip-ft
REACTIONS - 98 mph WIND

Maser Consulting
2000 Midlantic Drive, Suite 100
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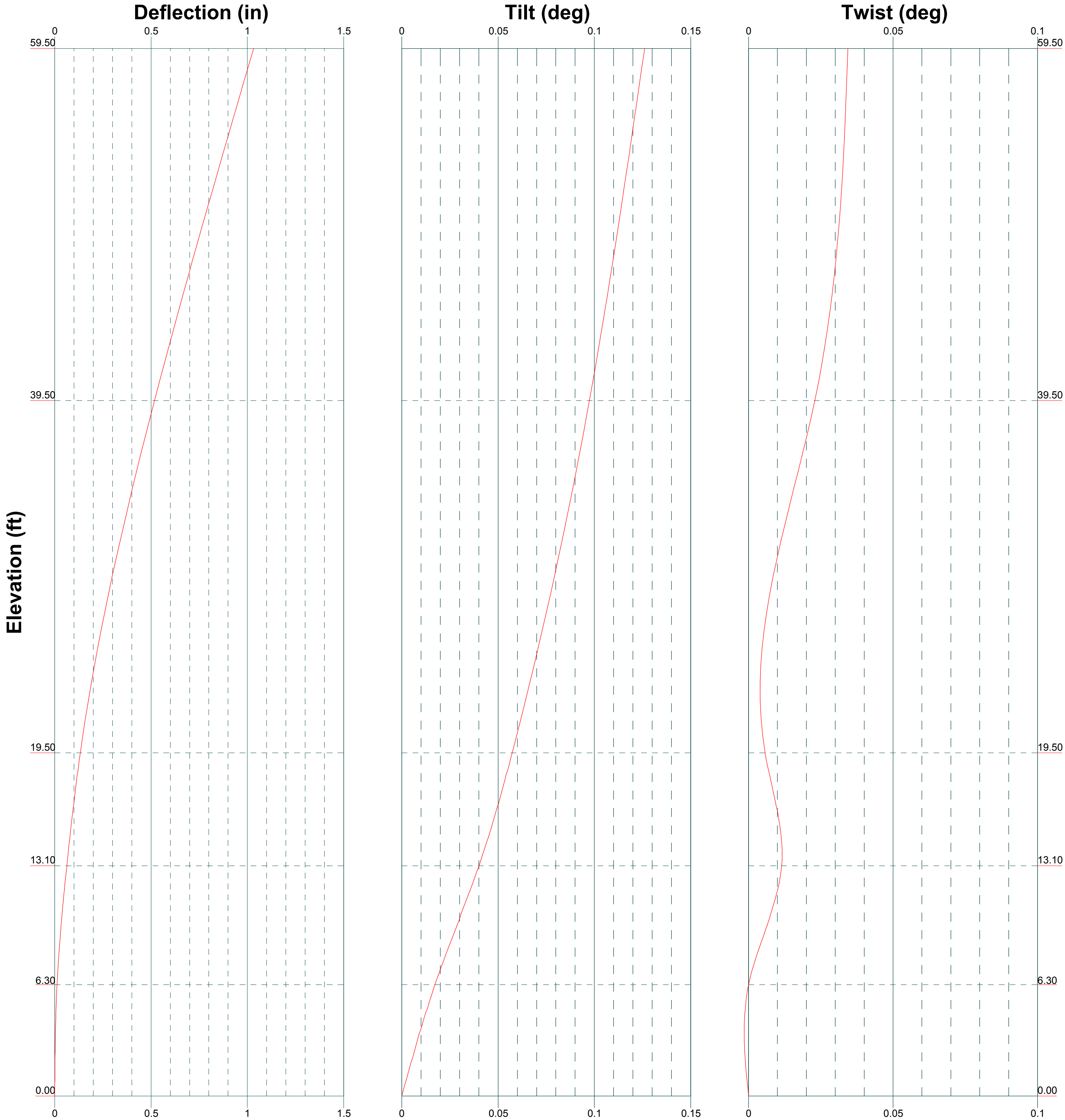
FAX: 856 722-1120

Job: **CTL01330 Avon - Montevideo Road**		
Project: **16946029A**		
Client: AT&T	Drawn by:	App'd:
Code: TIA-222-G	Date: 04/03/18	Scale: NTS
Path: \\maserconsulting.com\iu\Projects\2017\17963000A\17963018A\Structural\Tower Analysis\Rev 1\TNX\Self Support.eri		Dwg No. E-1

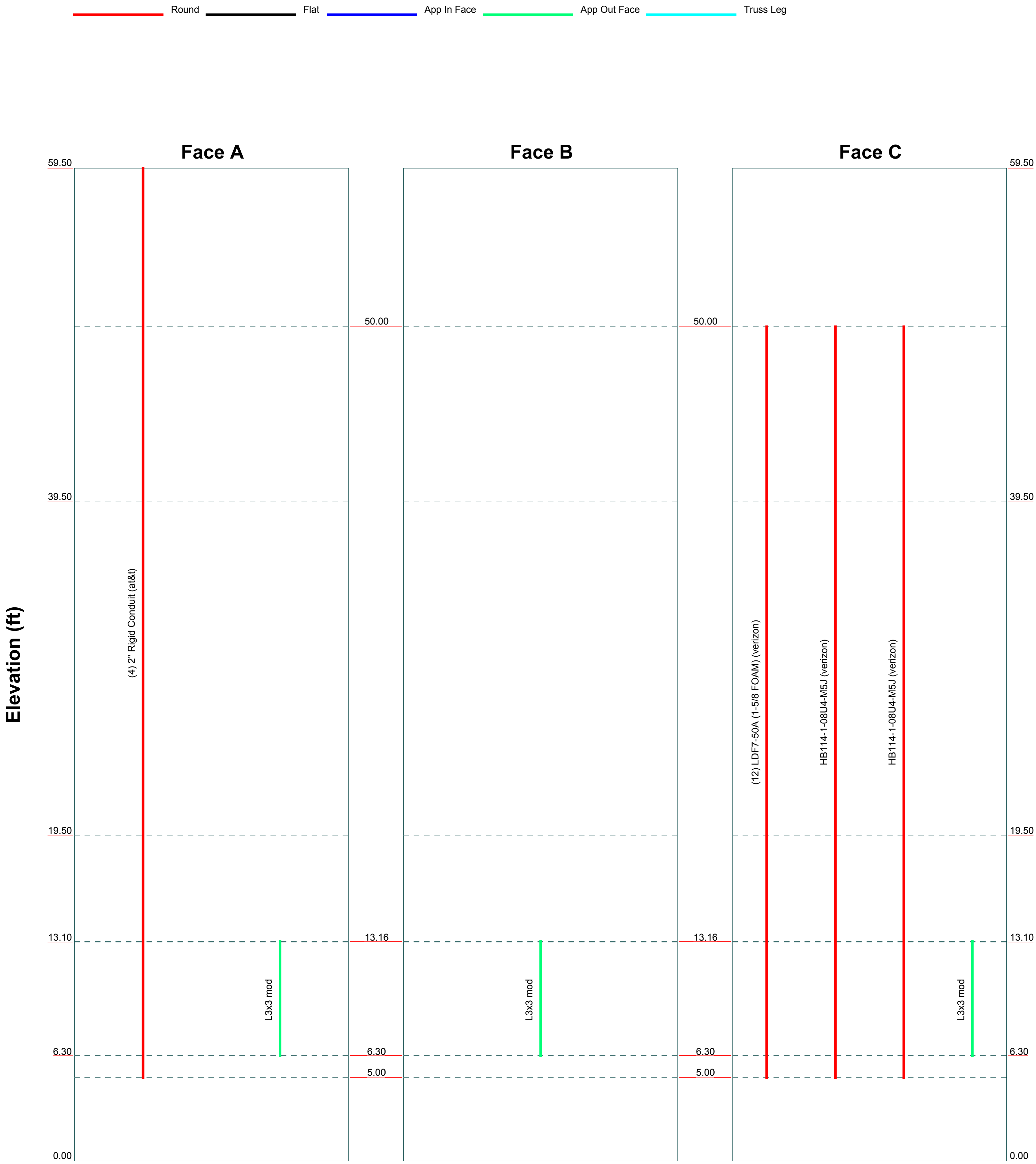
TIA-222-G - Service - 60 mph

Maximum Values



Maser Consulting 2000 Midlantic Drive, Suite 100 Mt. Laurel, NJ Phone: 856 797-0412 FAX: 856 722-1120	Job: ***CTL01330 Avon - Montevideo Road***		
	Project: ***16946029A***		
	Client: AT&T	Drawn by:	App'd:
	Code: TIA-222-G	Date: 04/03/18	Scale: NTS
	Path: \\maserconsulting.com\luj\Projects\2017\17963000A\17963018A\Structural\Tower Analysis\Rev 1\TNX\Self Support.eri		Dwg No. E-5

Feed Line Distribution Chart
0' - 59'6"



Maser Consulting	Job: CTL01330 Avon - Montevideo Road		
2000 Midlantic Drive, Suite 100	Project: 16946029A		
Mt. Laurel, NJ	Client: AT&T	Drawn by:	App'd:
Phone: 856 797-0412	Code: TIA-222-G	Date: 04/03/18	Scale: NTS
FAX: 856 722-1120	Path: \\maserconsulting.com\luj\Projects\2017\17963000A\17963018A\Structural\Tower Analysis\Rev 1\TNX\Self Support.eri		Dwg No. E-7

Structural analysis of existing tower foundation for supporting the existing and proposed AT&T discrete and linear appurenances, together with existing loading.

Standards:

- 2016 CT State Building Code and All Subsequent Amendments, Incorporating IBC 2012
- ANSI/TIA-222-G Code

Design Parameters:

Axial Load on Base Footing:	$P_{app} := 18\cdot kip$	
Shear Load on Base Footing:	$V_{app} := 30kip$	
Moment Load on Base Footing:	$M_{app} := 1335kip\cdot ft$	
Depth to Top of Footing:	$D_f := 0\cdot ft$	
Width of Pier:	$W_{pier} := 0\cdot ft$	**No Piers**
Area of Mat:	$A_{mat} := 310ft^2$	**Obtained from previous structural report**
Area of Proposed Mat:	$A_{mat.1} := 215.9ft^2$	
Thickness of Proposed Mat:	$D_1 := 2\cdot ft$	
Width of Mat:	$W_{mat} := 17.6\cdot ft$	**Width of a square mat of equivalent area**
Depth of Mat:	$D_{mat} := 17.6\cdot ft$	**Depth of a square mat of equivalent area**
Thickness of Exisiting Mat:	$D_2 := 3.5\cdot ft$	**Obtained from previous structural report**
Height of Pier Above Grade:	$D_{up} := 0.0\cdot ft$	

Concrete Volumes:

Square Pier Volume: $V_{pier} := \frac{W_{pier}^{2} \cdot \pi}{4} \cdot (D_f + D_{up})$ $V_{pier} = 0 \cdot ft^3$

Mat Volume: $V_{mat} := (A_{mat} \cdot D_2) + (A_{mat.1} \cdot D_1)$ $V_{mat} = 1516.8 \cdot ft^3$

Total Volume: $V_{conc} := 3 \cdot V_{pier} + V_{mat}$ $V_{conc} = 1516.8 \cdot ft^3$

Soil Volume:

Total Volume of Soil $V_{soil} := A_{mat} \cdot D_f - 3 \cdot V_{pier}$ $V_{soil} = 0 \cdot ft^3$

Concrete and Soil Weights:

Unit Weight of Soil: $\gamma_{soil} := 125pcf$

Unit Weight of Concrete: $\gamma_{conc} := 150pcf$ **Assume Normal weight concrete**

Total Concrete Weight: $W_{conc} := V_{conc} \cdot \gamma_{conc}$ $W_{conc} = 227.5 \cdot kip$

Total Soil Weight: $W_{soil} := V_{soil} \cdot \gamma_{soil}$ $W_{soil} = 0 \cdot kip$

Overturning Moment Check:

Total Applied Moment: $M_a := M_{app} + V_{app} \cdot (D_f + D_2)$ $M_a = 1440 \cdot kip \cdot ft$

Strength Reduction Factor: $\phi := 0.75$

Resisting Moment: $M_R := (8.38ft) \cdot (P_{app} + W_{conc} + W_{soil})$ $M_R = 2057.5 \cdot kip \cdot ft$

8.38 ft. :- Distance of centroid of the mat foundation to the edge of the foundation

Overturning Check: Test := "GOOD" if $M_a \le \phi \cdot M_R$; "No Good" otherwise Test = "GOOD"

Usage: $Usage := \frac{M_a}{(\phi \cdot M_R)}$ $Usage = 93.3 \cdot \%$

Bearing Capacity Check:

Total Applied Moment: $P_a := P_{app} + W_{conc} + W_{soil}$ $\quad P_a = 245.5 \cdot kip$

Bearing Area: $A_b := A_{mat}$ $\quad A_b = 310 \cdot ft^2$

Moment of Inertia: $I_{mat} := 8110ft^4$

Section Modulus: $S_{mat} := \frac{(I_{mat})}{11.25ft}$ $\quad S_{mat} = 720.9 \cdot ft^3$

Bearing Pressure: $\sigma_1 := \frac{P_a}{A_b} + \frac{M_a}{S_{mat}}$ $\quad \sigma_1 = 2.79 \cdot ksf$

$\sigma_2 := \frac{P_a}{A_b} - \frac{M_a}{S_{mat}}$ $\quad \sigma_2 = -1.206 \cdot ksf$

Ultimate Bearing Pressure: $\sigma_{ult} := 79.05 \cdot ksf$ (Per Geotechnical Investigation Report)

Factor of Safety: $FOS := 3$ (Minimum recommended FOS per Geotechnical Investigation Report is 2, 3 considered for consevative analysis)

Allowable Bearing Pressure: $\sigma_a := \frac{\sigma_{ult}}{FOS} = 26.35 \cdot ksf$ (Per Geotechnical Investigation Report)

Bearing Check: $Test := \begin{cases} \text{"GOOD"} & \text{if } \max(\sigma_1, \sigma_2) \le \sigma_a \\ \text{"No Good"} & \text{otherwise} \end{cases}$ $\quad Test = \text{"GOOD"}$

Usage: $Usage := \frac{\max(\sigma_1, \sigma_2)}{\sigma_a}$ $\quad Usage = 10.6 \cdot \%$

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 59.50 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 7.58 ft at the top and 9.71 ft at the base.
There is a 3 sided latticed pole with a face width of 7.58 ft.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

- Basic wind speed of 98 mph.
- Structure Class II.
- Exposure Category B.
- Topographic Category 4.
- Crest Height 742.00 ft.
- Nominal ice thickness of 1.0000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 40 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- Weld together tower sections have flange connections..
- Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
- Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
- Welds are fabricated with ER-70S-6 electrodes..
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in latticed pole member design is 1.
- Stress ratio used in tower member design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice		Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz		Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		**Poles**
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric				

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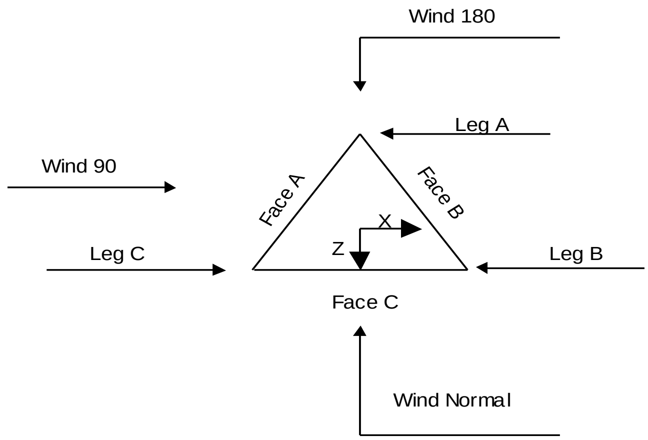

Triangular Tower

3 Sided Latticed Pole Section Geometry

Tower Section	*Tower Elevation* *ft*	*Assembly Database*	*Description*	*Section Width* *ft*	*Number of Sections*	*Section Length* *ft*
L1	59.50-39.50			7.58	1	20.00
L2	39.50-19.50			7.58	1	20.00

3 Sided Latticed Pole 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*
L1	59.50-39.50	6.67	K Brace Left	No	Yes	0.0000	0.0000
L2	39.50-19.50	6.67	K Brace Left	No	Yes	0.0000	0.0000

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation *ft*	*Leg Type*	*Leg Size*	*Leg Grade*	*Diagonal Type*	*Diagonal Size*	*Diagonal Grade*
L1 59.50-39.50	Pipe	Rohn 3.5 STD	A572-50	Pipe	P2.5x.203	A53-B-35

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
			(50 ksi)			(35 ksi)
L2 39.50-19.50	Arbitrary Shape	3.5 STD with 4.5x0.237 HSS Half Pipe	A572-50 (50 ksi)	Pipe	P2.5x.203	A53-B-35 (35 ksi)

3 Sided Latticed Pole 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
L1 59.50-39.50	Single Angle	L3x5x1/4	A36 (36 ksi)	Flat Bar		A36 (36 ksi)

3 Sided Latticed Pole 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
L1 59.50-39.50	None	Flat Bar		A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
L2 39.50-19.50	None	Flat Bar		A36 (36 ksi)	Equal Angle	L3x3x3/8	A36 (36 ksi)

3 Sided Latticed Pole 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
L1 59.50-39.50	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
L2 39.50-19.50	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] 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

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] 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
L1 59.50-39.50	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
L2 39.50-19.50	Yes	Yes	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.

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
L1 59.50-39.50	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
L2 39.50-19.50	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
L1 59.50-39.50	Flange	0.8750 A325N	4	0.7500 A325N	0	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.6250 A325N	0
L2 39.50-19.50	Flange	0.8750 A325N	4	0.5000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.7500 A325N	1	0.6250 A325N	0

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	19.50-13.10			7.58	1	6.40
T2	13.10-6.30			8.28	1	6.80
T3	6.30-0.00			9.02	1	6.30

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	19.50-13.10	6.40	K Brace Right	No	Yes	0.0000	0.0000
T2	13.10-6.30	6.80	K Brace Left	No	Yes	0.0000	0.0000
T3	6.30-0.00	6.30	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation *ft*	*Leg Type*	*Leg Size*	*Leg Grade*	*Diagonal Type*	*Diagonal Size*	*Diagonal Grade*
T1 19.50-13.10	Arbitrary Shape	3.5 STD with 4.5x0.237 HSS Half Pipe	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A53-B-35 (35 ksi)
T2 13.10-6.30	Arbitrary Shape	3.5 STD with 4.5x0.237 HSS Half Pipe	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A53-B-35 (35 ksi)
T3 6.30-0.00	Arbitrary Shape	3.5 STD with 4.5x0.237 HSS Half Pipe	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 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 19.50-13.10	None	Flat Bar		A36 (36 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T2 13.10-6.30	None	Flat Bar		A36 (36 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T3 6.30-0.00	None	Flat Bar		A36 (36 ksi)	Double Equal Angle	2L2x2x3/16	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation *ft*	*Redundant Bracing Grade*		*Redundant Type*	*Redundant Size*	*K Factor*
T3 6.30-0.00	A36 (36 ksi)	Horizontal (1)	Equal Angle	L2x2x3/16	1
		Diagonal (1)	Equal Angle	L2x2x3/16	1

Tower Section Geometry *(cont'd)*

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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 19.50-13.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 13.10-6.30	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 6.30-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] 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 19.50-13.10	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 13.10-6.30	Yes	Yes	0.5	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 6.30-0.00	Yes	Yes	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)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 19.50-13.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 13.10-6.30	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 6.30-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1 19.50-13.10	Flange	0.7500 A325N	0	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.6250 A325N	0

Tower Elevation ft	*Leg Connection Type*	*Leg Bolt Size in*	*Leg No.*	*Diagonal Bolt Size in*	*Diagonal No.*	*Top Girt Bolt Size in*	*Top Girt No.*	*Bottom Girt Bolt Size in*	*Bottom Girt No.*	*Mid Girt Bolt Size in*	*Mid Girt No.*	*Long Horizontal Bolt Size in*	*Long Horizontal No.*	*Short Horizontal Bolt Size in*	*Short Horizontal No.*
T2 13.10-6.30	Flange	0.7500 A325N	0	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.6250 A325N	0
T3 6.30-0.00	Flange	0.7500 A325N	0	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.6250 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) (verizon)	C	No	Ar (CaAa)	50.00 - 5.00	1.0000	-0.38	12	6	1.0000 1.9800	1.9800		0.82
2" Rigid Conduit (at&t)	A	No	Ar (CaAa)	59.50 - 5.00	0.0000	-0.41	4	4	1.0000 2.0000	2.0000		2.80
HB114-1-08U 4-M5J (verizon)	C	No	Ar (CaAa)	50.00 - 5.00	1.0000	-0.41	1	1	1.9800	2.0000		1.61
HB114-1-08U 4-M5J (verizon)	C	No	Ar (CaAa)	50.00 - 5.00	3.0000	-0.24	1	1	1.9800	2.0000		1.61

Feed Line/Linear Appurtenances - Entered As Area

Description	*Face or Leg*	*Allow Shield*	*Component Type*	*Placement ft*	*Total Number*		*C_AA_A ft²/ft*	*Weight plf*
L3x3 mod	A	No	CaAa (Out Of Face)	13.16 - 6.30	1	No Ice	0.50	30.00
						1/2" Ice	0.61	38.66
						1" Ice	0.72	47.67
L3x3 mod	B	No	CaAa (Out Of Face)	13.16 - 6.30	1	No Ice	0.50	30.00
						1/2" Ice	0.61	38.66
						1" Ice	0.72	47.67
L3x3 mod	C	No	CaAa (Out Of Face)	13.16 - 6.30	1	No Ice	0.50	30.00
						1/2" Ice	0.61	38.66
						1" Ice	0.72	47.67

Feed Line/Linear Appurtenances Section Areas

Tower Section	*Tower Elevation ft*	*Face*	*A_R ft²*	*A_F ft²*	*C_AA_A In Face ft²*	*C_AA_A Out Face ft²*	*Weight K*
L1	59.50-39.50	A	0.000	0.000	16.000	0.000	0.22
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	29.148	0.000	0.14
L2	39.50-19.50	A	0.000	0.000	16.000	0.000	0.22

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	55.520	0.000	0.26
T1	19.50-13.10	A	0.000	0.000	5.120	0.030	0.07
		B	0.000	0.000	0.000	0.030	0.00
		C	0.000	0.000	17.766	0.030	0.09
T2	13.10-6.30	A	0.000	0.000	5.440	3.400	0.28
		B	0.000	0.000	0.000	3.400	0.20
		C	0.000	0.000	18.877	3.400	0.29
T3	6.30-0.00	A	0.000	0.000	1.040	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.609	0.000	0.02

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	59.50-39.50	A	2.877	0.000	0.000	46.152	0.000	1.04
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	49.720	0.000	1.37
L2	39.50-19.50	A	2.761	0.000	0.000	45.383	0.000	1.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	92.995	0.000	2.52
T1	19.50-13.10	A	2.620	0.000	0.000	14.225	0.065	0.31
		B		0.000	0.000	0.000	0.065	0.00
		C		0.000	0.000	29.097	0.065	0.77
T2	13.10-6.30	A	2.497	0.000	0.000	14.838	7.173	0.84
		B		0.000	0.000	0.000	7.173	0.53
		C		0.000	0.000	30.298	7.173	1.31
T3	6.30-0.00	A	2.239	0.000	0.000	2.727	0.000	0.05
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	5.546	0.000	0.14

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	59.50-39.50	0.7978	3.7366	0.3278	2.1488
L2	39.50-19.50	2.6176	4.5457	1.5341	2.9756
T1	19.50-13.10	2.7067	4.6767	1.5765	3.0831
T2	13.10-6.30	1.9894	3.4058	1.1260	2.2090
T3	6.30-0.00	1.0834	1.8456	0.4949	0.9919

Shielding Factor Ka

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

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	K_a *No Ice*	K_a *Ice*
L1	1	LDF7-50A (1-5/8 FOAM)	39.50 - 50.00	0.6000	0.5915
L1	2	2" Rigid Conduit	39.50 - 59.50	0.6000	0.5915
L1	3	HB114-1-08U4-M5J	39.50 - 50.00	0.6000	0.5915
L1	4	HB114-1-08U4-M5J	39.50 - 50.00	0.6000	0.5915
L2	1	LDF7-50A (1-5/8 FOAM)	19.50 - 39.50	0.6000	0.6000
L2	2	2" Rigid Conduit	19.50 - 39.50	0.6000	0.6000
L2	3	HB114-1-08U4-M5J	19.50 - 39.50	0.6000	0.6000
L2	4	HB114-1-08U4-M5J	19.50 - 39.50	0.6000	0.6000
T1	1	LDF7-50A (1-5/8 FOAM)	13.10 - 19.50	0.6000	0.6000
T1	2	2" Rigid Conduit	13.10 - 19.50	0.6000	0.6000
T1	3	HB114-1-08U4-M5J	13.10 - 19.50	0.6000	0.6000
T1	4	HB114-1-08U4-M5J	13.10 - 19.50	0.6000	0.6000
T2	1	LDF7-50A (1-5/8 FOAM)	6.30 - 13.10	0.6000	0.6000
T2	2	2" Rigid Conduit	6.30 - 13.10	0.6000	0.6000
T2	3	HB114-1-08U4-M5J	6.30 - 13.10	0.6000	0.6000
T2	4	HB114-1-08U4-M5J	6.30 - 13.10	0.6000	0.6000
T3	1	LDF7-50A (1-5/8 FOAM)	5.00 - 6.30	0.6000	0.5593
T3	2	2" Rigid Conduit	5.00 - 6.30	0.6000	0.5593
T3	3	HB114-1-08U4-M5J	5.00 - 6.30	0.6000	0.5593
T3	4	HB114-1-08U4-M5J	5.00 - 6.30	0.6000	0.5593

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
Verizon Sector Frame	B	From Face	0.50	0.0000	55.00	No Ice	6.20	3.80	0.15
(verizon)			0.00			1/2" Ice	8.80	5.40	0.30
			0.00			1" Ice	11.40	7.00	0.45
Verizon Sector Frame	A	From Face	0.50	0.0000	55.00	No Ice	6.20	3.80	0.15
(verizon)			0.00			1/2" Ice	8.80	5.40	0.30
			0.00			1" Ice	11.40	7.00	0.45
LPA-80063-6CF-EDIN-5	B	From Face	0.50	0.0000	55.00	No Ice	9.57	8.55	0.03
(verizon)			6.00			1/2" Ice	10.03	9.01	0.10
			0.00			1" Ice	10.50	9.47	0.18
LPA-80063-6CF-EDIN-5	B	From Face	0.50	0.0000	55.00	No Ice	9.57	8.55	0.03
(verizon)			-6.00			1/2" Ice	10.03	9.01	0.10
			0.00			1" Ice	10.50	9.47	0.18
LPA-80063-6CF-EDIN-5	A	From Face	0.50	0.0000	55.00	No Ice	9.57	8.55	0.03
(verizon)			-8.75			1/2" Ice	10.03	9.01	0.10
			0.00			1" Ice	10.50	9.47	0.18
SBNHH-1D65B	B	From Face	0.50	0.0000	55.00	No Ice	8.20	6.89	0.07
(verizon)			4.00			1/2" Ice	8.70	7.95	0.14
			0.00			1" Ice	9.19	8.81	0.22
SBNHH-1D65B	B	From Face	0.50	0.0000	55.00	No Ice	8.20	6.89	0.07
(verizon)			-4.00			1/2" Ice	8.70	7.95	0.14
			0.00			1" Ice	9.19	8.81	0.22
SBNHH-1D65B	A	From Face	0.50	0.0000	55.00	No Ice	8.20	6.89	0.07
(verizon)			-6.75			1/2" Ice	8.70	7.95	0.14
			0.00			1" Ice	9.19	8.81	0.22
SBNHH-1D65B	A	From Face	0.50	0.0000	55.00	No Ice	8.20	6.89	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)
(verizon)			1.25			1/2" Ice	8.70	7.95	0.14
			0.00			1" Ice	9.19	8.81	0.22
APX75-866514	A	From Face	0.50	0.0000	55.00	No Ice	9.67	4.71	0.04
(verizon)			0.00			1/2" Ice	10.18	5.21	0.09
			0.00			1" Ice	10.70	5.71	0.15
BXA-70063-6CF-EDIN-X	A	From Face	0.50	0.0000	55.00	No Ice	14.41	5.72	0.04
(verizon)			-2.75			1/2" Ice	14.92	6.17	0.12
			0.00			1" Ice	15.44	6.63	0.21
LPA-80063-6CF-EDIN-5	B	From Face	0.50	0.0000	55.00	No Ice	9.57	8.55	0.03
(verizon)			3.25			1/2" Ice	10.03	9.01	0.10
			0.00			1" Ice	10.50	9.47	0.18
SBNH-1D6565C	A	From Face	4.00	0.0000	70.00	No Ice	11.45	7.70	0.07
(at&t)			0.00			1/2" Ice	12.06	8.29	0.13
			0.00			1" Ice	12.69	8.89	0.21
SBNH-1D6565C	B	From Face	4.00	0.0000	70.00	No Ice	11.45	7.70	0.07
(at&t)			0.00			1/2" Ice	12.06	8.29	0.13
			0.00			1" Ice	12.69	8.89	0.21
SBNH-1D6565C	C	From Face	4.00	0.0000	70.00	No Ice	11.45	7.70	0.07
(at&t)			0.00			1/2" Ice	12.06	8.29	0.13
			0.00			1" Ice	12.69	8.89	0.21
TPA-65R-LCUUUU-H8	A	From Face	4.00	0.0000	70.00	No Ice	12.75	7.25	0.11
(at&t)			0.00			1/2" Ice	13.33	7.82	0.18
			0.00			1" Ice	13.92	8.40	0.26
TPA-65R-LCUUUU-H8	B	From Face	4.00	0.0000	70.00	No Ice	12.75	7.25	0.11
(at&t)			0.00			1/2" Ice	13.33	7.82	0.18
			0.00			1" Ice	13.92	8.40	0.26
TPA-65R-LCUUUU-H8	C	From Face	4.00	0.0000	70.00	No Ice	12.75	7.25	0.11
(at&t)			0.00			1/2" Ice	13.33	7.82	0.18
			0.00			1" Ice	13.92	8.40	0.26
CCI OPA-65R-LCUU-H8	A	From Face	4.00	0.0000	70.00	No Ice	12.76	7.48	0.06
(at&t)			0.00			1/2" Ice	13.34	8.06	0.14
			0.00			1" Ice	13.93	8.64	0.22
CCI OPA-65R-LCUU-H8	B	From Face	4.00	0.0000	70.00	No Ice	12.76	7.48	0.06
(at&t)			0.00			1/2" Ice	13.34	8.06	0.14
			0.00			1" Ice	13.93	8.64	0.22
CCI OPA-65R-LCUU-H8	C	From Face	4.00	0.0000	70.00	No Ice	12.76	7.48	0.06
(at&t)			0.00			1/2" Ice	13.34	8.06	0.14
			0.00			1" Ice	13.93	8.64	0.22
(2) RRUS-11	A	From Face	4.00	0.0000	70.00	No Ice	2.52	1.02	0.06
(at&t)			0.00			1/2" Ice	2.72	1.16	0.07
			0.00			1" Ice	2.92	1.30	0.10
(2) RRUS-11	B	From Face	4.00	0.0000	70.00	No Ice	2.52	1.02	0.06
(at&t)			0.00			1/2" Ice	2.72	1.16	0.07
			0.00			1" Ice	2.92	1.30	0.10
(2) RRUS-11	C	From Face	4.00	0.0000	70.00	No Ice	2.52	1.02	0.06
(at&t)			0.00			1/2" Ice	2.72	1.16	0.07
			0.00			1" Ice	2.92	1.30	0.10
RRUS 32	A	From Face	4.00	0.0000	70.00	No Ice	3.31	2.42	0.09
(at&t)			0.00			1/2" Ice	3.56	2.64	0.12
			0.00			1" Ice	3.81	2.86	0.15
RRUS 32	B	From Face	4.00	0.0000	70.00	No Ice	3.31	2.42	0.09
(at&t)			0.00			1/2" Ice	3.56	2.64	0.12
			0.00			1" Ice	3.81	2.86	0.15
RRUS 32	C	From Face	4.00	0.0000	70.00	No Ice	3.31	2.42	0.09
(at&t)			0.00			1/2" Ice	3.56	2.64	0.12
			0.00			1" Ice	3.81	2.86	0.15
RRUS 32 B2	A	From Face	4.00	0.0000	70.00	No Ice	3.31	2.42	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
(at&t)			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.13
RRUS 32 B2	B	From Face	4.00	0.0000	70.00	No Ice	3.31	2.42	0.07
(at&t)			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.13
RRUS 32 B2	C	From Face	4.00	0.0000	70.00	No Ice	3.31	2.42	0.07
(at&t)			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.13
(3) DC6-48-06-18-8F	A	From Face	4.00	0.0000	70.00	No Ice	1.20	1.20	0.03
(at&t)			0.00			1/2" Ice	1.88	1.88	0.05
			0.00			1" Ice	2.09	2.09	0.08
(3) RRH 2x60	A	From Face	1.00	0.0000	55.00	No Ice	0.90	1.42	0.06
(verizon)			-4.00			1/2" Ice	0.95	1.58	0.08
			0.00			1" Ice	1.05	1.74	0.10
(3) RRH 2x60	C	From Face	1.00	0.0000	55.00	No Ice	0.90	1.42	0.06
(verizon)			-4.00			1/2" Ice	0.95	1.58	0.08
			0.00			1" Ice	1.05	1.74	0.10
RHSDC-3315-PF-48	A	From Face	0.00	0.0000	51.00	No Ice	4.33	2.56	0.03
(verizon)			0.00			1/2" Ice	4.61	2.79	0.06
			0.00			1" Ice	4.89	3.02	0.09
RHSDC-3315-PF-48	C	From Face	0.00	0.0000	51.00	No Ice	4.33	2.56	0.03
(verizon)			0.00			1/2" Ice	4.61	2.79	0.06
			0.00			1" Ice	4.89	3.02	0.09
18-ft doppler	C	None		0.0000	68.50	No Ice	127.00	127.00	2.00
						1/2" Ice	127.80	127.80	4.00
						1" Ice	128.40	128.40	6.00
Andrew 10' Platform	C	None		0.0000	68.00	No Ice	54.00	54.00	2.20
						1/2" Ice	72.00	72.00	3.30
						1" Ice	90.00	90.00	4.40
RRUS 4478	A	From Face	4.00	0.0000	70.00	No Ice	2.02	1.25	0.06
(at&t)			0.00			1/2" Ice	2.20	1.40	0.08
			0.00			1" Ice	2.39	1.55	0.10
RRUS 4478	B	From Face	4.00	0.0000	70.00	No Ice	2.02	1.25	0.06
(at&t)			0.00			1/2" Ice	2.20	1.40	0.08
			0.00			1" Ice	2.39	1.55	0.10
RRUS 4478	C	From Face	4.00	0.0000	70.00	No Ice	2.02	1.25	0.06
(at&t)			0.00			1/2" Ice	2.20	1.40	0.08
			0.00			1" Ice	2.39	1.55	0.10
RRUS 32 B66	A	From Face	4.00	0.0000	70.00	No Ice	3.01	2.18	0.07
(at&t)			0.00			1/2" Ice	3.24	2.38	0.09
			0.00			1" Ice	3.48	2.59	0.12
RRUS 32 B66	B	From Face	4.00	0.0000	70.00	No Ice	3.01	2.18	0.07
(at&t)			0.00			1/2" Ice	3.24	2.38	0.09
			0.00			1" Ice	3.48	2.59	0.12
RRUS 32 B66	C	From Face	4.00	0.0000	70.00	No Ice	3.01	2.18	0.07
(at&t)			0.00			1/2" Ice	3.24	2.38	0.09
			0.00			1" Ice	3.48	2.59	0.12
80010966 w/ 8' pipe	A	From Face	4.00	0.0000	70.00	No Ice	17.36	9.40	0.16
(at&t)			0.00			1/2" Ice	17.99	10.82	0.27
			0.00			1" Ice	18.63	12.09	0.40
80010966 w/ 8' pipe	B	From Face	4.00	0.0000	70.00	No Ice	17.36	9.40	0.16
(at&t)			0.00			1/2" Ice	17.99	10.82	0.27
			0.00			1" Ice	18.63	12.09	0.40
80010966 w/ 8' pipe	C	From Face	4.00	0.0000	70.00	No Ice	17.36	9.40	0.16
(at&t)			0.00			1/2" Ice	17.99	10.82	0.27
			0.00			1" Ice	18.63	12.09	0.40

Tower Pressures - No Ice

G_H = 0.850 (base tower), 0.850 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 59.50-39.50	49.50	0.808	43	158.333	A	4.833	20.272	13.333	53.11	16.000	0.000
					B	4.833	20.272		53.11	0.000	0.000
					C	4.833	20.272		53.11	29.148	0.000
L2 39.50-19.50	29.50	0.7	38	158.750	A	20.417	6.905	15.000	54.90	16.000	0.000
					B	20.417	6.905		54.90	0.000	0.000
					C	20.417	6.905		54.90	55.520	0.000
T1 19.50-13.10	16.30	0.7	39	53.035	A	6.612	2.327	4.809	53.81	5.120	0.030
					B	6.612	2.327		53.81	0.000	0.030
					C	6.612	2.327		53.81	17.766	0.030
T2 13.10-6.30	9.70	0.7	39	61.241	A	7.087	2.523	5.110	53.18	5.440	3.400
					B	7.087	2.523		53.18	0.000	3.400
					C	7.087	2.523		53.18	18.877	3.400
T3 6.30-0.00	3.15	0.7	40	61.234	A	11.835	0.000	4.734	40.00	1.040	0.000
					B	11.835	0.000		40.00	0.000	0.000
					C	11.835	0.000		40.00	3.609	0.000

Tower Pressure - With Ice

G_H = 0.850 (base tower), 0.850 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 59.50-39.50	49.50	0.808	7	2.8768	167.923	A	4.833	63.764	32.512	47.40	46.152	0.000
						B	4.833	63.764		47.40	0.000	0.000
						C	4.833	63.764		47.40	49.720	0.000
L2 39.50-19.50	29.50	0.7	6	2.7608	167.953	A	32.687	30.136	27.270	43.41	45.383	0.000
						B	32.687	30.136		43.41	0.000	0.000
						C	32.687	30.136		43.41	92.995	0.000
T1 19.50-13.10	16.30	0.7	6	2.6204	55.834	A	10.346	9.717	8.544	42.59	14.225	0.065
						B	10.346	9.717		42.59	0.000	0.065
						C	10.346	9.717		42.59	29.097	0.065
T2 13.10-6.30	9.70	0.7	7	2.4969	64.075	A	10.867	10.194	8.891	42.21	14.838	7.173
						B	10.867	10.194		42.21	0.000	7.173
						C	10.867	10.194		42.21	30.298	7.173
T3 6.30-0.00	3.15	0.7	7	2.2393	63.589	A	14.977	13.047	7.876	28.10	2.727	0.000
						B	14.977	13.047		28.10	0.000	0.000
						C	14.977	13.047		28.10	5.546	0.000

Tower Pressure - Service

G_H = 0.850 (base tower), 0.850 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 59.50-39.50	49.50	0.808	16	158.333	A	4.833	20.272	13.333	53.11	16.000	0.000
					B	4.833	20.272		53.11	0.000	0.000
					C	4.833	20.272		53.11	29.148	0.000
L2 39.50-19.50	29.50	0.7	14	158.750	A	20.417	6.905	15.000	54.90	16.000	0.000
					B	20.417	6.905		54.90	0.000	0.000
					C	20.417	6.905		54.90	55.520	0.000
T1 19.50-13.10	16.30	0.7	15	53.035	A	6.612	2.327	4.809	53.81	5.120	0.030
					B	6.612	2.327		53.81	0.000	0.030
					C	6.612	2.327		53.81	17.766	0.030
T2 13.10-6.30	9.70	0.7	15	61.241	A	7.087	2.523	5.110	53.18	5.440	3.400
					B	7.087	2.523		53.18	0.000	3.400
					C	7.087	2.523		53.18	18.877	3.400
T3 6.30-0.00	3.15	0.7	15	61.234	A	11.835	0.000	4.734	40.00	1.040	0.000
					B	11.835	0.000		40.00	0.000	0.000
					C	11.835	0.000		40.00	3.609	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1 59.50-39.50	0.36	1.41	A	0.159	2.74	43	1	1	15.427	2.51	125.31	C
			B	0.159	2.74		1	1	15.427			
			C	0.159	2.74		1	1	15.427			
L2 39.50-19.50	0.49	1.90	A	0.172	2.692	38	1	1	24.354	3.50	174.91	C
			B	0.172	2.692		1	1	24.354			
			C	0.172	2.692		1	1	24.354			
T1 19.50-13.10	0.16	0.57	A	0.169	2.704	39	1	1	7.937	1.16	181.49	C
			B	0.169	2.704		1	1	7.937			
			C	0.169	2.704		1	1	7.937			
T2 13.10-6.30	0.78	0.62	A	0.157	2.746	39	1	1	8.519	1.60	235.66	C
			B	0.157	2.746		1	1	8.519			
			C	0.157	2.746		1	1	8.519			
T3 6.30-0.00	0.03	0.68	A	0.193	2.619	40	1	1	11.835	1.14	180.18	C
			B	0.193	2.619		1	1	11.835			
			C	0.193	2.619		1	1	11.835			
Sum Weight:	1.82	5.18						OTM	265.31 kip-ft	9.90		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1 59.50-39.50	0.36	1.41	A	0.159	2.74	43	0.8	1	14.460	2.41	120.53	C
			B	0.159	2.74		0.8	1	14.460			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			C	0.159	2.74		0.8	1	14.460			
L2 39.50-19.50	0.49	1.90	A	0.172	2.692	38	0.8	1	20.270	3.14	157.18	C
			B	0.172	2.692		0.8	1	20.270			
			C	0.172	2.692		0.8	1	20.270			
T1 19.50-13.10	0.16	0.57	A	0.169	2.704	39	0.8	1	6.615	1.04	163.09	C
			B	0.169	2.704		0.8	1	6.615			
			C	0.169	2.704		0.8	1	6.615			
T2 13.10-6.30	0.78	0.62	A	0.157	2.746	39	0.8	1	7.101	1.47	216.62	C
			B	0.157	2.746		0.8	1	7.101			
			C	0.157	2.746		0.8	1	7.101			
T3 6.30-0.00	0.03	0.68	A	0.193	2.619	40	0.8	1	9.468	0.93	147.12	C
			B	0.193	2.619		0.8	1	9.468			
			C	0.193	2.619		0.8	1	9.468			
Sum Weight:	1.82	5.18						OTM	246.28 kip-ft	9.00		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1 59.50-39.50	0.36	1.41	A	0.159	2.74	43	0.85	1	14.702	2.43	121.72	C
			B	0.159	2.74		0.85	1	14.702			
			C	0.159	2.74		0.85	1	14.702			
L2 39.50-19.50	0.49	1.90	A	0.172	2.692	38	0.85	1	21.291	3.23	161.62	C
			B	0.172	2.692		0.85	1	21.291			
			C	0.172	2.692		0.85	1	21.291			
T1 19.50-13.10	0.16	0.57	A	0.169	2.704	39	0.85	1	6.945	1.07	167.69	C
			B	0.169	2.704		0.85	1	6.945			
			C	0.169	2.704		0.85	1	6.945			
T2 13.10-6.30	0.78	0.62	A	0.157	2.746	39	0.85	1	7.456	1.51	221.38	C
			B	0.157	2.746		0.85	1	7.456			
			C	0.157	2.746		0.85	1	7.456			
T3 6.30-0.00	0.03	0.68	A	0.193	2.619	40	0.85	1	10.060	0.98	155.38	C
			B	0.193	2.619		0.85	1	10.060			
			C	0.193	2.619		0.85	1	10.060			
Sum Weight:	1.82	5.18						OTM	251.04 kip-ft	9.22		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1 59.50-39.50	2.41	6.42	A	0.409	2.047	7	1	1	45.640	0.90	45.19	C
			B	0.409	2.047		1	1	45.640			
			C	0.409	2.047		1	1	45.640			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L2 39.50-19.50	3.52	6.85	A	0.374	2.118	6	1	1	51.534	1.03	51.62	C
			B	0.374	2.118		1	1	51.534			
			C	0.374	2.118		1	1	51.534			
T1 19.50-13.10	1.09	2.10	A	0.359	2.15	6	1	1	16.366	0.34	52.59	C
			B	0.359	2.15		1	1	16.366			
			C	0.359	2.15		1	1	16.366			
T2 13.10-6.30	2.67	2.16	A	0.329	2.222	7	1	1	17.069	0.48	70.51	C
			B	0.329	2.222		1	1	17.069			
			C	0.329	2.222		1	1	17.069			
T3 6.30-0.00	0.19	2.90	A	0.441	1.989	7	1	1	23.519	0.29	45.68	C
			B	0.441	1.989		1	1	23.519			
			C	0.441	1.989		1	1	23.519			
Sum Weight:	9.88	20.44						OTM	86.24 kip-ft	3.04		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1 59.50-39.50	2.41	6.42	A	0.409	2.047	7	0.8	1	44.673	0.89	44.60	C
			B	0.409	2.047		0.8	1	44.673			
			C	0.409	2.047		0.8	1	44.673			
L2 39.50-19.50	3.52	6.85	A	0.374	2.118	6	0.8	1	44.996	0.96	47.90	C
			B	0.374	2.118		0.8	1	44.996			
			C	0.374	2.118		0.8	1	44.996			
T1 19.50-13.10	1.09	2.10	A	0.359	2.15	6	0.8	1	14.297	0.31	48.78	C
			B	0.359	2.15		0.8	1	14.297			
			C	0.359	2.15		0.8	1	14.297			
T2 13.10-6.30	2.67	2.16	A	0.329	2.222	7	0.8	1	14.895	0.45	66.57	C
			B	0.329	2.222		0.8	1	14.895			
			C	0.329	2.222		0.8	1	14.895			
T3 6.30-0.00	0.19	2.90	A	0.441	1.989	7	0.8	1	20.524	0.25	40.39	C
			B	0.441	1.989		0.8	1	20.524			
			C	0.441	1.989		0.8	1	20.524			
Sum Weight:	9.88	20.44						OTM	82.69 kip-ft	2.87		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1 59.50-39.50	2.41	6.42	A	0.409	2.047	7	0.85	1	44.915	0.89	44.75	C
			B	0.409	2.047		0.85	1	44.915			
			C	0.409	2.047		0.85	1	44.915			
L2	3.52	6.85	A	0.374	2.118	6	0.85	1	46.631	0.98	48.83	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
39.50-19.50			B	0.374	2.118		0.85	1	46.631			
			C	0.374	2.118		0.85	1	46.631			
T1 19.50-13.10	1.09	2.10	A	0.359	2.15	6	0.85	1	14.814	0.32	49.73	C
			B	0.359	2.15		0.85	1	14.814			
			C	0.359	2.15		0.85	1	14.814			
T2 13.10-6.30	2.67	2.16	A	0.329	2.222	7	0.85	1	15.439	0.46	67.56	C
			B	0.329	2.222		0.85	1	15.439			
			C	0.329	2.222		0.85	1	15.439			
T3 6.30-0.00	0.19	2.90	A	0.441	1.989	7	0.85	1	21.273	0.26	41.71	C
			B	0.441	1.989		0.85	1	21.273			
			C	0.441	1.989		0.85	1	21.273			
Sum Weight:	9.88	20.44						OTM	83.58 kip-ft	2.91		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1 59.50-39.50	0.36	1.41	A	0.159	2.74	16	1	1	15.427	0.94	46.97	C
			B	0.159	2.74		1	1	15.427			
			C	0.159	2.74		1	1	15.427			
L2 39.50-19.50	0.49	1.90	A	0.172	2.692	14	1	1	24.354	1.31	65.56	C
			B	0.172	2.692		1	1	24.354			
			C	0.172	2.692		1	1	24.354			
T1 19.50-13.10	0.16	0.57	A	0.169	2.704	15	1	1	7.937	0.44	68.03	C
			B	0.169	2.704		1	1	7.937			
			C	0.169	2.704		1	1	7.937			
T2 13.10-6.30	0.78	0.62	A	0.157	2.746	15	1	1	8.519	0.60	88.33	C
			B	0.157	2.746		1	1	8.519			
			C	0.157	2.746		1	1	8.519			
T3 6.30-0.00	0.03	0.68	A	0.193	2.619	15	1	1	11.835	0.43	67.54	C
			B	0.193	2.619		1	1	11.835			
			C	0.193	2.619		1	1	11.835			
Sum Weight:	1.82	5.18						OTM	99.45 kip-ft	3.71		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1 59.50-39.50	0.36	1.41	A	0.159	2.74	16	0.8	1	14.460	0.90	45.18	C
			B	0.159	2.74		0.8	1	14.460			
			C	0.159	2.74		0.8	1	14.460			
L2 39.50-19.50	0.49	1.90	A	0.172	2.692	14	0.8	1	20.270	1.18	58.92	C
			B	0.172	2.692		0.8	1	20.270			

Section Elevation *ft*	*Add Weight* *K*	*Self Weight* *K*	*Face*	*e*	C_F	q_z *psf*	D_F	D_R	A_E ft^2	*F* *K*	*w* *plf*	*Ctrl. Face*
			C	0.172	2.692		0.8	1	20.270			
T1 19.50-13.10	0.16	0.57	A	0.169	2.704	15	0.8	1	6.615	0.39	61.13	C
			B	0.169	2.704		0.8	1	6.615			
			C	0.169	2.704		0.8	1	6.615			
T2 13.10-6.30	0.78	0.62	A	0.157	2.746	15	0.8	1	7.101	0.55	81.20	C
			B	0.157	2.746		0.8	1	7.101			
			C	0.157	2.746		0.8	1	7.101			
T3 6.30-0.00	0.03	0.68	A	0.193	2.619	15	0.8	1	9.468	0.35	55.15	C
			B	0.193	2.619		0.8	1	9.468			
			C	0.193	2.619		0.8	1	9.468			
Sum Weight:	1.82	5.18						OTM	92.32 kip-ft	3.37		

Tower Forces - Service - Wind 90 To Face

Section Elevation *ft*	*Add Weight* *K*	*Self Weight* *K*	*Face*	*e*	C_F	q_z *psf*	D_F	D_R	A_E ft^2	*F* *K*	*w* *plf*	*Ctrl. Face*
L1 59.50-39.50	0.36	1.41	A	0.159	2.74	16	0.85	1	14.702	0.91	45.63	C
			B	0.159	2.74		0.85	1	14.702			
			C	0.159	2.74		0.85	1	14.702			
L2 39.50-19.50	0.49	1.90	A	0.172	2.692	14	0.85	1	21.291	1.21	60.58	C
			B	0.172	2.692		0.85	1	21.291			
			C	0.172	2.692		0.85	1	21.291			
T1 19.50-13.10	0.16	0.57	A	0.169	2.704	15	0.85	1	6.945	0.40	62.86	C
			B	0.169	2.704		0.85	1	6.945			
			C	0.169	2.704		0.85	1	6.945			
T2 13.10-6.30	0.78	0.62	A	0.157	2.746	15	0.85	1	7.456	0.56	82.98	C
			B	0.157	2.746		0.85	1	7.456			
			C	0.157	2.746		0.85	1	7.456			
T3 6.30-0.00	0.03	0.68	A	0.193	2.619	15	0.85	1	10.060	0.37	58.24	C
			B	0.193	2.619		0.85	1	10.060			
			C	0.193	2.619		0.85	1	10.060			
Sum Weight:	1.82	5.18						OTM	94.10 kip-ft	3.46		

Force Totals

Load Case	*Vertical Forces* *K*	*Sum of Forces X* *K*	*Sum of Forces Z* *K*	*Sum of Overturning Moments,* M_x *kip-ft*	*Sum of Overturning Moments,* M_z *kip-ft*	*Sum of Torques* *kip-ft*
Leg Weight	2.30					
Bracing Weight	2.88					
Total Member Self-Weight	5.18			2.85	1.57	
Total Weight	14.91			2.85	1.57	
Wind 0 deg - No Ice		-0.19	-18.51	-800.94	11.85	-0.81
Wind 30 deg - No Ice		9.01	-15.35	-675.75	-398.34	2.25

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 60 deg - No Ice		15.59	-8.64	-380.63	-697.26	4.74
Wind 90 deg - No Ice		18.34	0.19	13.12	-816.06	6.10
Wind 120 deg - No Ice		16.57	9.42	413.64	-724.01	5.87
Wind 150 deg - No Ice		9.33	15.54	691.72	-416.14	3.85
Wind 180 deg - No Ice		0.19	17.61	787.60	-8.70	0.96
Wind 210 deg - No Ice		-9.01	15.35	681.45	401.49	-2.25
Wind 240 deg - No Ice		-16.38	9.09	395.84	716.88	-5.05
Wind 270 deg - No Ice		-18.34	-0.19	-7.43	819.21	-6.10
Wind 300 deg - No Ice		-15.78	-8.97	-398.43	710.68	-5.70
Wind 330 deg - No Ice		-9.33	-15.54	-686.03	419.29	-3.85
Member Ice	15.26					
Total Weight Ice	76.60			19.83	2.16	
Wind 0 deg - Ice		-0.03	-5.03	-189.24	3.74	-0.31
Wind 30 deg - Ice		2.46	-4.23	-158.13	-101.30	0.56
Wind 60 deg - Ice		4.26	-2.41	-81.55	-177.85	1.29
Wind 90 deg - Ice		4.97	0.03	21.42	-207.50	1.69
Wind 120 deg - Ice		4.43	2.54	125.74	-182.51	1.64
Wind 150 deg - Ice		2.51	4.26	199.38	-104.05	1.13
Wind 180 deg - Ice		0.03	4.86	225.35	0.57	0.33
Wind 210 deg - Ice		-2.46	4.23	197.79	105.61	-0.56
Wind 240 deg - Ice		-4.40	2.49	122.99	185.23	-1.33
Wind 270 deg - Ice		-4.97	-0.03	18.24	211.81	-1.69
Wind 300 deg - Ice		-4.28	-2.46	-84.31	183.75	-1.62
Wind 330 deg - Ice		-2.51	-4.26	-159.72	108.36	-1.13
Total Weight	14.91			2.85	1.57	
Wind 0 deg - Service		-0.07	-6.94	-300.94	4.91	-0.30
Wind 30 deg - Service		3.38	-5.75	-254.01	-148.85	0.84
Wind 60 deg - Service		5.85	-3.24	-143.39	-260.90	1.78
Wind 90 deg - Service		6.88	0.07	4.21	-305.43	2.28
Wind 120 deg - Service		6.21	3.53	154.34	-270.93	2.20
Wind 150 deg - Service		3.50	5.82	258.58	-155.53	1.44
Wind 180 deg - Service		0.07	6.60	294.52	-2.80	0.36
Wind 210 deg - Service		-3.38	5.75	254.73	150.96	-0.84
Wind 240 deg - Service		-6.14	3.41	147.67	269.18	-1.89
Wind 270 deg - Service		-6.88	-0.07	-3.50	307.54	-2.28
Wind 300 deg - Service		-5.92	-3.36	-150.06	266.86	-2.14
Wind 330 deg - Service		-3.50	-5.82	-257.87	157.63	-1.44

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	59.5 - 39.5	Latticed Pole Leg	Max Tension	23	45.63	-0.24	0.09
			Max. Compression	10	-52.16	-0.39	-0.03
			Max. Mx	20	12.15	-2.39	-0.19
			Max. My	2	6.90	0.22	-2.15
			Max. Vy	20	3.30	-0.00	-0.00
			Max. Vx	2	3.20	0.00	-0.00
		Latticed Pole Diagonal	Max Tension	8	16.94	0.00	0.00
			Max. Compression	20	-16.91	0.00	0.00
			Max. Mx	34	1.20	0.26	0.00
			Max. My	10	0.31	0.00	-0.00
			Max. Vy	34	-0.10	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
		Latticed Pole Horizontal	Max Tension	6	2.88	0.00	0.00
			Max. Compression	19	-2.87	0.00	0.00
			Max. Mx	35	0.13	-0.20	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	8	2.81	0.00	-0.00
			Max. Vy	35	0.10	0.00	0.00
			Max. Vx	8	0.00	0.00	0.00
		Latticed Pole Top Girt	Max Tension	22	4.00	0.00	0.00
			Max. Compression	10	-3.88	0.00	0.00
			Max. Mx	35	0.34	-0.28	0.00
			Max. My	8	-3.34	0.00	-0.00
			Max. Vy	35	0.15	0.00	0.00
			Max. Vx	8	-0.00	0.00	0.00
L2	39.5 - 19.5	Latticed Pole Leg	Max Tension	23	106.53	-0.27	-0.40
			Max. Compression	10	-115.98	0.65	-0.79
			Max. Mx	8	84.01	-0.80	0.04
			Max. My	8	-104.11	0.32	-1.04
			Max. Vy	10	0.20	-0.77	-0.42
			Max. Vx	8	0.28	0.32	-1.04
		Latticed Pole Diagonal	Max Tension	8	21.75	0.00	0.00
			Max. Compression	20	-21.76	0.00	0.00
			Max. Mx	34	2.74	0.25	0.00
			Max. My	10	1.44	0.00	-0.00
			Max. Vy	34	-0.10	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
		Latticed Pole Horizontal	Max Tension	20	13.26	0.00	0.00
			Max. Compression	8	-13.31	0.00	0.00
			Max. Mx	26	0.12	-0.23	0.00
			Max. My	8	-13.31	0.00	-0.00
			Max. Vy	26	0.12	0.00	0.00
			Max. Vx	8	0.00	0.00	0.00
T1	19.5 - 13.1	Leg	Max Tension	23	121.71	-0.63	0.58
			Max. Compression	10	-132.33	0.48	0.81
			Max. Mx	8	106.25	-0.80	0.04
			Max. My	8	-112.74	0.32	-1.03
			Max. Vy	10	-0.20	-0.77	-0.42
			Max. Vx	8	-0.32	0.32	-1.03
		Diagonal	Max Tension	21	12.58	0.00	0.00
			Max. Compression	8	-12.60	0.00	0.00
			Max. Mx	32	1.37	0.25	0.00
			Max. My	18	1.46	0.00	0.00
			Max. Vy	32	-0.10	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
		Horizontal	Max Tension	7	3.29	0.00	0.00
			Max. Compression	18	-4.03	0.00	0.00
			Max. Mx	26	-0.53	-0.20	0.00
			Max. My	35	-1.26	0.00	0.01
			Max. Vy	26	0.11	0.00	0.00
			Max. Vx	35	-0.00	0.00	0.00
T2	13.1 - 6.3	Leg	Max Tension	23	135.24	-0.44	-0.59
			Max. Compression	10	-147.47	-0.18	-0.69
			Max. Mx	11	67.85	-0.65	-0.07
			Max. My	6	-79.48	-0.38	-1.41
			Max. Vy	24	0.22	0.64	0.56
			Max. Vx	6	0.35	-0.38	-1.41
		Diagonal	Max Tension	9	13.01	0.00	0.00
			Max. Compression	20	-12.90	0.00	0.00
			Max. Mx	34	1.56	0.28	0.00
			Max. My	10	1.79	0.00	-0.00
			Max. Vy	34	-0.10	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
		Horizontal	Max Tension	20	0.69	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	9	-1.03	0.00	0.00
			Max. Mx	35	0.15	-0.23	0.00
			Max. My	32	0.28	0.00	0.01
			Max. Vy	35	0.11	0.00	0.00
			Max. Vx	32	-0.00	0.00	0.00
T3	6.3 - 0	Leg	Max Tension	23	138.62	0.07	0.53
			Max. Compression	10	-152.27	-0.00	0.00
			Max. Mx	10	-152.20	2.31	0.18
			Max. My	6	-78.59	-0.38	-1.41
			Max. Vy	10	-0.84	2.31	0.18
			Max. Vx	6	-0.67	-0.38	-1.41
		Diagonal	Max Tension	9	9.54	0.12	0.00
			Max. Compression	20	-9.51	0.00	0.00
			Max. Mx	18	-6.37	-0.20	-0.00
			Max. My	36	-1.69	-0.03	0.01
			Max. Vy	18	-0.06	0.00	0.00
			Max. Vx	36	0.00	0.00	0.00
		Horizontal	Max Tension	21	9.96	-0.01	-0.01
			Max. Compression	8	-10.56	-0.02	-0.01
			Max. Mx	22	0.67	-0.07	-0.01
			Max. My	30	-1.92	-0.06	-0.02
			Max. Vy	33	-0.07	-0.07	-0.02
			Max. Vx	30	0.01	0.00	0.00
		Redund Horz 1 Bracing	Max Tension	8	1.22	0.00	0.00
			Max. Compression	21	-1.45	0.00	0.00
			Max. Mx	28	0.33	-0.01	0.00
			Max. My	35	0.43	0.00	0.00
			Max. Vy	36	0.02	0.00	0.00
			Max. Vx	35	-0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	21	1.33	0.00	0.00
			Max. Compression	8	-1.09	0.00	0.00
			Max. Mx	35	-0.26	-0.02	0.00
			Max. My	31	0.18	0.00	0.00
			Max. Vy	35	-0.02	0.00	0.00
			Max. Vx	31	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	161.70	15.59	-8.37
	Max. H_x	18	161.70	15.59	-8.37
	Max. H_z	5	-125.69	-11.71	7.91
	Min. Vert	7	-146.89	-14.43	7.71
	Min. H_x	7	-146.89	-14.43	7.71
	Min. H_z	18	161.70	15.59	-8.37
Leg B	Max. Vert	10	164.71	-15.84	-8.55
	Max. H_x	23	-150.58	14.70	7.90
	Max. H_z	25	-129.90	12.10	8.05
	Min. Vert	23	-150.58	14.70	7.90
	Min. H_x	10	164.71	-15.84	-8.55
	Min. H_z	10	164.71	-15.84	-8.55
Leg A	Max. Vert	2	158.57	-0.11	17.46
	Max. H_x	21	6.14	1.91	0.47

Location	*Condition*	*Gov. Load Comb.*	*Vertical K*	*Horizontal, X K*	*Horizontal, Z K*
	Max. H_z	2	158.57	-0.11	17.46
	Min. Vert	15	-145.17	0.12	-16.15
	Min. H_x	9	2.22	-1.93	0.20
	Min. H_z	15	-145.17	0.12	-16.15

Tower Mast Reaction Summary

Load Combination	*Vertical K*	*$Shear_x$ K*	*$Shear_z$ K*	*Overturning Moment, M_x kip-ft*	*Overturning Moment, M_z kip-ft*	*Torque kip-ft*
Dead Only	14.91	0.00	-0.00	2.85	1.58	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	17.90	-0.30	-29.62	-1283.02	18.39	-1.32
0.9 Dead+1.6 Wind 0 deg - No Ice	13.42	-0.30	-29.62	-1282.86	17.90	-1.32
1.2 Dead+1.6 Wind 30 deg - No Ice	17.90	14.41	-24.56	-1083.05	-638.39	3.57
0.9 Dead+1.6 Wind 30 deg - No Ice	13.42	14.41	-24.56	-1083.04	-638.36	3.57
1.2 Dead+1.6 Wind 60 deg - No Ice	17.90	24.95	-13.82	-610.66	-1117.14	7.57
0.9 Dead+1.6 Wind 60 deg - No Ice	13.42	24.95	-13.82	-611.03	-1116.73	7.56
1.2 Dead+1.6 Wind 90 deg - No Ice	17.90	29.34	0.30	19.80	-1307.28	9.75
0.9 Dead+1.6 Wind 90 deg - No Ice	13.42	29.34	0.30	18.93	-1306.72	9.75
1.2 Dead+1.6 Wind 120 deg - No Ice	17.90	26.50	15.07	660.84	-1159.59	9.40
0.9 Dead+1.6 Wind 120 deg - No Ice	13.42	26.50	15.07	659.47	-1159.14	9.39
1.2 Dead+1.6 Wind 150 deg - No Ice	17.90	14.93	24.86	1106.34	-667.07	6.18
0.9 Dead+1.6 Wind 150 deg - No Ice	13.42	14.93	24.86	1104.61	-667.01	6.17
1.2 Dead+1.6 Wind 180 deg - No Ice	17.90	0.30	28.17	1260.03	-14.68	1.55
0.9 Dead+1.6 Wind 180 deg - No Ice	13.42	0.30	28.17	1258.17	-15.14	1.55
1.2 Dead+1.6 Wind 210 deg - No Ice	17.90	-14.41	24.56	1089.89	642.17	-3.60
0.9 Dead+1.6 Wind 210 deg - No Ice	13.42	-14.41	24.56	1088.17	641.19	-3.60
1.2 Dead+1.6 Wind 240 deg - No Ice	17.90	-26.20	14.55	632.34	1146.85	-8.12
0.9 Dead+1.6 Wind 240 deg - No Ice	13.42	-26.20	14.55	630.98	1145.47	-8.12
1.2 Dead+1.6 Wind 270 deg - No Ice	17.90	-29.34	-0.30	-13.13	1311.10	-9.79
0.9 Dead+1.6 Wind 270 deg - No Ice	13.42	-29.34	-0.30	-13.98	1309.58	-9.79
1.2 Dead+1.6 Wind 300 deg - No Ice	17.90	-25.25	-14.34	-639.20	1137.47	-9.15
0.9 Dead+1.6 Wind 300 deg - No Ice	13.42	-25.25	-14.35	-639.55	1136.08	-9.14
1.2 Dead+1.6 Wind 330 deg - No Ice	17.90	-14.93	-24.86	-1099.53	670.77	-6.18

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
0.9 Dead+1.6 Wind 330 deg - No Ice	13.42	-14.93	-24.86	-1099.51	669.75	-6.17
1.2 Dead+1.0 Ice+1.0 Temp	79.59	0.00	-0.00	20.73	2.59	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	79.59	-0.03	-5.03	-190.72	4.21	-0.32
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	79.59	2.46	-4.23	-159.32	-102.06	0.57
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	79.59	4.25	-2.41	-81.86	-179.54	1.30
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	79.59	4.97	0.03	22.33	-209.53	1.70
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	79.59	4.43	2.54	127.84	-184.20	1.66
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	79.59	2.51	4.26	202.37	-104.88	1.14
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	79.59	0.03	4.86	228.67	0.97	0.33
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	79.59	-2.46	4.23	200.77	107.24	-0.57
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	79.59	-4.40	2.49	125.06	187.76	-1.34
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	79.59	-4.97	-0.03	19.12	214.71	-1.70
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	79.59	-4.28	-2.46	-84.64	186.35	-1.64
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	79.59	-2.51	-4.26	-160.92	110.06	-1.14
Dead+Wind 0 deg - Service	14.91	-0.07	-6.94	-298.38	5.44	-0.31
Dead+Wind 30 deg - Service	14.91	3.38	-5.75	-251.55	-148.35	0.84
Dead+Wind 60 deg - Service	14.91	5.84	-3.24	-140.93	-260.46	1.78
Dead+Wind 90 deg - Service	14.91	6.87	0.07	6.71	-304.98	2.29
Dead+Wind 120 deg - Service	14.91	6.21	3.53	156.81	-270.39	2.20
Dead+Wind 150 deg - Service	14.91	3.50	5.82	261.12	-155.05	1.45
Dead+Wind 180 deg - Service	14.91	0.07	6.60	297.09	-2.29	0.36
Dead+Wind 210 deg - Service	14.91	-3.38	5.75	257.26	151.51	-0.84
Dead+Wind 240 deg - Service	14.91	-6.14	3.41	150.13	269.68	-1.90
Dead+Wind 270 deg - Service	14.91	-6.87	-0.07	-1.01	308.14	-2.29
Dead+Wind 300 deg - Service	14.91	-5.92	-3.36	-147.61	267.48	-2.14
Dead+Wind 330 deg - Service	14.91	-3.50	-5.82	-255.41	158.21	-1.45

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-14.91	0.00	-0.00	14.91	0.00	0.000%
2	-0.30	-17.90	-29.62	0.30	17.90	29.62	0.010%
3	-0.30	-13.42	-29.62	0.30	13.42	29.62	0.008%
4	14.41	-17.90	-24.56	-14.41	17.90	24.56	0.009%
5	14.41	-13.42	-24.56	-14.41	13.42	24.56	0.007%
6	24.95	-17.90	-13.82	-24.95	17.90	13.82	0.009%
7	24.95	-13.42	-13.82	-24.95	13.42	13.82	0.007%
8	29.35	-17.90	0.30	-29.34	17.90	-0.30	0.010%
9	29.35	-13.42	0.30	-29.34	13.42	-0.30	0.008%
10	26.51	-17.90	15.07	-26.50	17.90	-15.07	0.010%
11	26.51	-13.42	15.07	-26.50	13.42	-15.07	0.008%
12	14.93	-17.90	24.86	-14.93	17.90	-24.86	0.009%
13	14.93	-13.42	24.86	-14.93	13.42	-24.86	0.008%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	*PX K*	*PY K*	*PZ K*	*PX K*	*PY K*	*PZ K*	*% Error*
14	0.30	-17.90	28.17	-0.30	17.90	-28.17	0.009%
15	0.30	-13.42	28.17	-0.30	13.42	-28.17	0.007%
16	-14.41	-17.90	24.56	14.41	17.90	-24.56	0.010%
17	-14.41	-13.42	24.56	14.41	13.42	-24.56	0.008%
18	-26.20	-17.90	14.55	26.20	17.90	-14.55	0.010%
19	-26.20	-13.42	14.55	26.20	13.42	-14.55	0.008%
20	-29.35	-17.90	-0.30	29.34	17.90	0.30	0.009%
21	-29.35	-13.42	-0.30	29.34	13.42	0.30	0.007%
22	-25.25	-17.90	-14.35	25.25	17.90	14.34	0.009%
23	-25.25	-13.42	-14.35	25.25	13.42	14.35	0.007%
24	-14.93	-17.90	-24.86	14.93	17.90	24.86	0.010%
25	-14.93	-13.42	-24.86	14.93	13.42	24.86	0.008%
26	0.00	-79.59	0.00	-0.00	79.59	0.00	0.000%
27	-0.03	-79.59	-5.03	0.03	79.59	5.03	0.003%
28	2.46	-79.59	-4.23	-2.46	79.59	4.23	0.003%
29	4.26	-79.59	-2.41	-4.25	79.59	2.41	0.003%
30	4.97	-79.59	0.03	-4.97	79.59	-0.03	0.003%
31	4.43	-79.59	2.54	-4.43	79.59	-2.54	0.003%
32	2.51	-79.59	4.26	-2.51	79.59	-4.26	0.004%
33	0.03	-79.59	4.86	-0.03	79.59	-4.86	0.004%
34	-2.46	-79.59	4.23	2.46	79.59	-4.23	0.004%
35	-4.40	-79.59	2.49	4.40	79.59	-2.49	0.004%
36	-4.97	-79.59	-0.03	4.97	79.59	0.03	0.004%
37	-4.28	-79.59	-2.46	4.28	79.59	2.46	0.003%
38	-2.51	-79.59	-4.26	2.51	79.59	4.26	0.003%
39	-0.07	-14.91	-6.94	0.07	14.91	6.94	0.004%
40	3.38	-14.91	-5.75	-3.38	14.91	5.75	0.004%
41	5.85	-14.91	-3.24	-5.84	14.91	3.24	0.004%
42	6.88	-14.91	0.07	-6.87	14.91	-0.07	0.004%
43	6.21	-14.91	3.53	-6.21	14.91	-3.53	0.004%
44	3.50	-14.91	5.82	-3.50	14.91	-5.82	0.004%
45	0.07	-14.91	6.60	-0.07	14.91	-6.60	0.004%
46	-3.38	-14.91	5.75	3.38	14.91	-5.75	0.004%
47	-6.14	-14.91	3.41	6.14	14.91	-3.41	0.004%
48	-6.88	-14.91	-0.07	6.87	14.91	0.07	0.004%
49	-5.92	-14.91	-3.36	5.92	14.91	3.36	0.004%
50	-3.50	-14.91	-5.82	3.50	14.91	5.82	0.004%

Non-Linear Convergence Results

Load Combination	*Converged?*	*Number of Cycles*	*Displacement Tolerance*	*Force Tolerance*
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00029075
3	Yes	4	0.00000001	0.00022339
4	Yes	4	0.00000001	0.00025825
5	Yes	4	0.00000001	0.00019155
6	Yes	4	0.00000001	0.00024493
7	Yes	4	0.00000001	0.00017802
8	Yes	4	0.00000001	0.00028055
9	Yes	4	0.00000001	0.00021329
10	Yes	4	0.00000001	0.00029473
11	Yes	4	0.00000001	0.00022741
12	Yes	4	0.00000001	0.00026218
13	Yes	4	0.00000001	0.00019567
14	Yes	4	0.00000001	0.00024350

15	Yes	4	0.00000001	0.00017662
16	Yes	4	0.00000001	0.00027793
17	Yes	4	0.00000001	0.00021099
18	Yes	4	0.00000001	0.00028964
19	Yes	4	0.00000001	0.00022221
20	Yes	4	0.00000001	0.00025567
21	Yes	4	0.00000001	0.00018857
22	Yes	4	0.00000001	0.00024145
23	Yes	4	0.00000001	0.00017472
24	Yes	4	0.00000001	0.00027574
25	Yes	4	0.00000001	0.00020906
26	Yes	4	0.00000001	0.00008857
27	Yes	4	0.00000001	0.00058485
28	Yes	4	0.00000001	0.00057110
29	Yes	4	0.00000001	0.00058883
30	Yes	4	0.00000001	0.00062759
31	Yes	4	0.00000001	0.00066408
32	Yes	4	0.00000001	0.00067969
33	Yes	4	0.00000001	0.00068871
34	Yes	4	0.00000001	0.00069511
35	Yes	4	0.00000001	0.00069365
36	Yes	4	0.00000001	0.00067111
37	Yes	4	0.00000001	0.00064011
38	Yes	4	0.00000001	0.00060877
39	Yes	4	0.00000001	0.00022094
40	Yes	4	0.00000001	0.00021345
41	Yes	4	0.00000001	0.00021104
42	Yes	4	0.00000001	0.00021934
43	Yes	4	0.00000001	0.00022227
44	Yes	4	0.00000001	0.00021467
45	Yes	4	0.00000001	0.00021081
46	Yes	4	0.00000001	0.00021841
47	Yes	4	0.00000001	0.00022131
48	Yes	4	0.00000001	0.00021408
49	Yes	4	0.00000001	0.00021082
50	Yes	4	0.00000001	0.00021787

Maximum Tower Deflections - Service Wind

Section No.	*Elevation* *ft*	*Horz. Deflection* *in*	*Gov. Load Comb.*	*Tilt* °	*Twist* °
L1	59.5 - 39.5	1.032	43	0.1242	0.0337
L2	39.5 - 19.5	0.518	43	0.0994	0.0218
T1	19.5 - 13.1	0.133	43	0.0568	0.0081
T2	13.1 - 6.3	0.063	43	0.0381	0.0095
T3	6.3 - 0	0.012	43	0.0182	0.0025

Critical Deflections and Radius of Curvature - Service Wind

Elevation *ft*	*Appurtenance*	*Gov. Load Comb.*	*Deflection* *in*	*Tilt* °	*Twist* °	*Radius of Curvature* *ft*
70.00	SBNH-1D6565C	43	1.032	0.1242	0.0337	159905
68.50	18-ft doppler	43	1.032	0.1242	0.0337	159905
68.00	Andrew 10' Platform	43	1.032	0.1242	0.0337	159905

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
55.00	Verizon Sector Frame	43	0.912	0.1193	0.0317	159905
51.00	RHSDC-3315-PF-48	43	0.807	0.1147	0.0298	94062

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	59.5 - 39.5	4.413	10	0.5294	0.1147
L2	39.5 - 19.5	2.214	10	0.4254	0.0795
T1	19.5 - 13.1	0.570	10	0.2427	0.0349
T2	13.1 - 6.3	0.268	10	0.1629	0.0288
T3	6.3 - 0	0.050	11	0.0780	0.0107

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
70.00	SBNH-1D6565C	10	4.413	0.5294	0.1147	38070
68.50	18-ft doppler	10	4.413	0.5294	0.1147	38070
68.00	Andrew 10' Platform	10	4.413	0.5294	0.1147	38070
55.00	Verizon Sector Frame	10	3.901	0.5091	0.1082	38070
51.00	RHSDC-3315-PF-48	10	3.450	0.4903	0.1021	22394

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
L1	59.5	Latticed Pole Leg	A325N	0.8750	4	11.41	40.59	0.281 ✔	1	Bolt Tension
		Latticed Pole Horizontal	A325N	0.5000	1	2.88	7.95	0.362 ✔	1	Bolt Shear
		Latticed Pole Top Girt	A325N	0.6250	2	2.00	12.43	0.161 ✔	1	Bolt Shear
L2	39.5	Latticed Pole Leg	A325N	0.8750	4	26.63	40.59	0.656 ✔	1	Bolt Tension
		Latticed Pole Horizontal	A325N	0.7500	1	13.31	17.89	0.744 ✔	1	Bolt Shear
T1	19.5	Diagonal	A325N	0.7500	1	12.60	17.89	0.704 ✔	1	Bolt Shear
		Horizontal	A325N	0.5000	1	4.03	7.95	0.507 ✔	1	Bolt Shear
T2	13.1	Diagonal	A325N	0.7500	1	13.01	17.89	0.727 ✔	1	Bolt Shear
		Horizontal	A325N	0.5000	1	1.03	7.95	0.130 ✔	1	Bolt Shear
T3	6.3	Horizontal	A325N	0.5000	1	9.96	13.89	0.717 ✔	1	Member Bearing

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

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u K	ϕP_n K	Ratio $P_u / \phi P_n$
L1	59.5 - 39.5	Rohn 3.5 STD	20.00	6.67	59.8 K=1.00	2.6795	1.00	-52.16	92.80	0.562 [1] ✔
L2	39.5 - 19.5	3.5 STD with 4.5x0.237 HSS Half Pipe	20.00	6.67	61.4 K=1.00	4.3485	1.00	-115.97	148.60	0.780 [1] ✔
T1	19.5 - 13.1	3.5 STD with 4.5x0.237 HSS Half Pipe	6.41	6.41	59.0 K=1.00	4.3485	1.00	-132.33	151.69	0.872 [1] ✔
T2	13.1 - 6.3	3.5 STD with 4.5x0.237 HSS Half Pipe	6.81	6.81	31.4 K=0.50	4.3485	1.00	-147.47	182.11	0.810 [1] ✔
T3	6.3 - 0	3.5 STD with 4.5x0.237 HSS Half Pipe	6.31	3.16	29.0 K=1.00	4.3485	1.00	-152.27	183.98	0.828 [1] ✔

[1] P_u / ϕP_n controls

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 $P_u / \phi P_n$
L1	59.5 - 39.5	P2.5x.203	10.10	9.65	122.3 K=1.00	1.7040	-16.91	24.97	0.677 [1] ✔
L2	39.5 - 19.5	P2.5x.203	10.10	9.60	121.6 K=1.00	1.7040	-21.76	25.19	0.864 [1] ✔
T1	19.5 - 13.1	ROHN 2.5 STD	10.19	9.71	123.0 K=1.00	1.7040	-12.60	24.74	0.509 [1] ✔
T2	13.1 - 6.3	ROHN 2.5 STD	11.01	10.53	133.4 K=1.00	1.7040	-12.90	21.60	0.597 [1] ✔
T3	6.3 - 0	L3x3x3/16	7.96	7.65	108.9 K=1.11	1.0900	-9.51	18.67	0.509 [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 $\frac{P_u}{\phi P_n}$
L1	59.5 - 39.5	L2 1/2x2 1/2x1/4	7.58	7.04	172.1 K=1.00	1.1900	-2.87	9.08	0.316 [1] ✔
L2	39.5 - 19.5	L3x3x3/8	7.58	6.98	142.7 K=1.00	2.1100	-13.31	23.42	0.568 [1] ✔
T1	19.5 - 13.1	L3x3x1/4	7.58	7.00	141.9 K=1.00	1.4400	-4.03	16.16	0.250 [1] ✔
T2	13.1 - 6.3	L3x3x1/4	8.28	7.70	156.0 K=1.00	1.4400	-1.03	13.36	0.077 [1] ✔
T3	6.3 - 0	2L2x2x3/16	9.02	6.38	91.2 K=1.00	1.4300	-10.56	35.05	0.301 [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 $\frac{P_u}{\phi P_n}$
L1	59.5 - 39.5	L3x5x1/4	7.58	6.85	122.5 K=0.99	1.9400	-3.88	26.25	0.148 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) 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 $\frac{P_u}{\phi P_n}$
T3	6.3 - 0	L2x2x3/16	2.26	2.07	91.5 K=1.45	0.7150	-1.45	14.91	0.098 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) 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 $\frac{P_u}{\phi P_n}$
T3	6.3 - 0	L2x2x3/16	3.78	3.44	112.4 K=1.07	0.7150	-1.09	11.92	0.091 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$

[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 $\frac{P_u}{\phi P_n}$
L1	59.5 - 39.5	Rohn 3.5 STD	20.00	6.67	59.8	2.6795	45.63	120.58	0.378 [1] ✔
L2	39.5 - 19.5	3.5 STD with 4.5x0.237 HSS Half Pipe	20.00	6.67	61.4	4.3485	106.53	195.68	0.544 [1] ✔
T1	19.5 - 13.1	3.5 STD with 4.5x0.237 HSS Half Pipe	6.41	6.41	59.0	4.3485	121.71	195.68	0.622 [1] ✔
T2	13.1 - 6.3	3.5 STD with 4.5x0.237 HSS Half Pipe	6.81	6.81	62.7	4.3485	135.24	195.68	0.691 [1] ✔
T3	6.3 - 0	3.5 STD with 4.5x0.237 HSS Half Pipe	6.31	3.16	29.0	4.3485	138.62	195.68	0.708 [1] ✔

[1] P_u / ϕP_n controls

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 $\frac{P_u}{\phi P_n}$
L1	59.5 - 39.5	P2.5x.203	10.10	9.65	122.3	1.7040	16.94	53.68	0.316 [1] ✔
L2	39.5 - 19.5	P2.5x.203	10.10	9.60	121.6	1.7040	21.75	53.68	0.405 [1] ✔
T1	19.5 - 13.1	ROHN 2.5 STD	10.19	9.71	123.0	1.7040	12.58	53.68	0.234 [1] ✔
T2	13.1 - 6.3	ROHN 2.5 STD	11.01	10.53	133.4	1.7040	13.01	53.68	0.242 [1] ✔
T3	6.3 - 0	L3x3x3/16	7.96	7.65	97.7	1.0900	9.54	35.32	0.270 [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 $\frac{P_u}{\phi P_n}$
L1	59.5 - 39.5	L2 1/2x2 1/2x1/4	7.58	7.04	113.1	0.7753	2.88	33.73	0.085 [1] ✔
L2	39.5 - 19.5	L3x3x3/8	7.58	6.98	95.3	1.3364	13.26	58.13	0.228 [1] ✔
T1	19.5 - 13.1	L3x3x1/4	7.58	7.00	93.0	0.9628	3.29	46.94	0.070 [1] ✔
T2	13.1 - 6.3	L3x3x1/4	8.28	7.70	102.0	0.9628	0.69	46.94	0.015 [1] ✔
T3	6.3 - 0	2L2x2x3/16	9.02	6.38	92.6	0.8967	9.96	43.72	0.228 [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 $\frac{P_u}{\phi P_n}$
L1	59.5 - 39.5	L3x5x1/4	7.58	6.85	101.0	1.3144	4.00	57.18	0.070 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) 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 $\frac{P_u}{\phi P_n}$
T3	6.3 - 0	L2x2x3/16	2.26	2.07	40.2	0.7150	1.22	23.17	0.053 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) 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 $\frac{P_u}{\phi P_n}$
T3	6.3 - 0	L2x2x3/16	3.78	3.44	66.9	0.7150	1.33	23.17	0.057 [1] ✔

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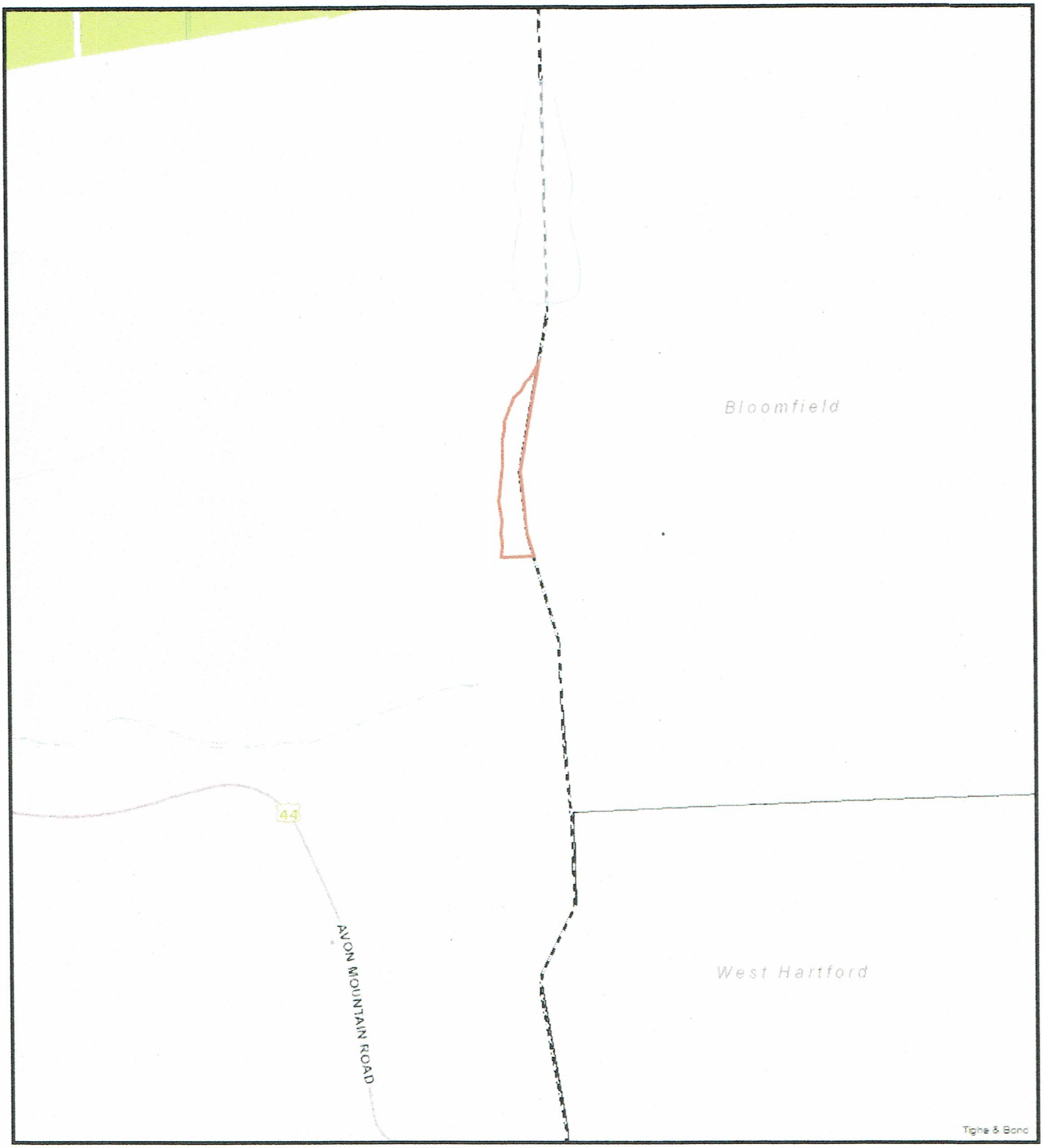
[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	øP_allow K	% Capacity	Pass Fail
L1	59.5 - 39.5	Latticed Pole Leg	Rohn 3.5 STD	2	-52.16	92.80	56.2	Pass
L2	39.5 - 19.5	Latticed Pole Leg	3.5 STD with 4.5x0.237 HSS Half Pipe	23	-115.97	148.60	78.0	Pass
L1	59.5 - 39.5	Latticed Pole Diagonal	P2.5x.203	7	-16.91	24.97	67.7	Pass
L2	39.5 - 19.5	Latticed Pole Diagonal	P2.5x.203	28	-21.76	25.19	86.4	Pass
L1	59.5 - 39.5	Latticed Pole Horizontal	L2 1/2x2 1/2x1/4	16	-2.87	9.08	31.6	Pass
L2	39.5 - 19.5	Latticed Pole Horizontal	L3x3x3/8	25	-13.31	23.42	56.8	Pass
L1	59.5 - 39.5	Latticed Pole Top Girt	L3x5x1/4	4	-3.88	26.25	14.8	Pass
T1	19.5 - 13.1	Leg	3.5 STD with 4.5x0.237 HSS Half Pipe	44	-132.33	151.69	87.2	Pass
T2	13.1 - 6.3	Leg	3.5 STD with 4.5x0.237 HSS Half Pipe	53	-147.47	182.11	81.0	Pass
T3	6.3 - 0	Leg	3.5 STD with 4.5x0.237 HSS Half Pipe	62	-152.27	183.98	82.8	Pass
T1	19.5 - 13.1	Diagonal	ROHN 2.5 STD	49	-12.60	24.74	50.9	Pass
T2	13.1 - 6.3	Diagonal	ROHN 2.5 STD	58	-12.90	21.60	59.7	Pass
T3	6.3 - 0	Diagonal	L3x3x3/16	65	-9.51	18.67	50.9	Pass
T1	19.5 - 13.1	Horizontal	L3x3x1/4	48	-4.03	16.16	25.0	Pass
T2	13.1 - 6.3	Horizontal	L3x3x1/4	55	-1.03	13.36	7.7	Pass
T3	6.3 - 0	Horizontal	2L2x2x3/16	64	-10.56	35.05	30.1	Pass
T3	6.3 - 0	Redund Horz 1 Bracing	L2x2x3/16	73	-1.45	14.91	9.8	Pass
T3	6.3 - 0	Redund Diag 1 Bracing	L2x2x3/16	74	-1.09	11.92	9.1	Pass
							Summary	
						Latticed Pole Leg (L2)	78.0	Pass
						Latticed Pole Diagonal (L2)	86.4	Pass
						Latticed Pole Horizontal (L2)	56.8	Pass
						Latticed Pole Top Girt (L1)	14.8	Pass
						Leg (T1)	87.2	Pass
						Diagonal (T2)	59.7	Pass
						Horizontal (T3)	30.1	Pass
						Redund Horz 1 Bracing (T3)	9.8	Pass
						Redund Diag 1 Bracing (T3)	9.1	Pass

Section No.	*Elevation ft*	*Component Type*	*Size*	*Critical Element*	*P K*	*øP_{allow} K*	*% Capacity*	*Pass Fail*
						Bolt Checks	74.4	Pass
						RATING =	**87.2**	**Pass**



324 Montevideo Rd., Avon

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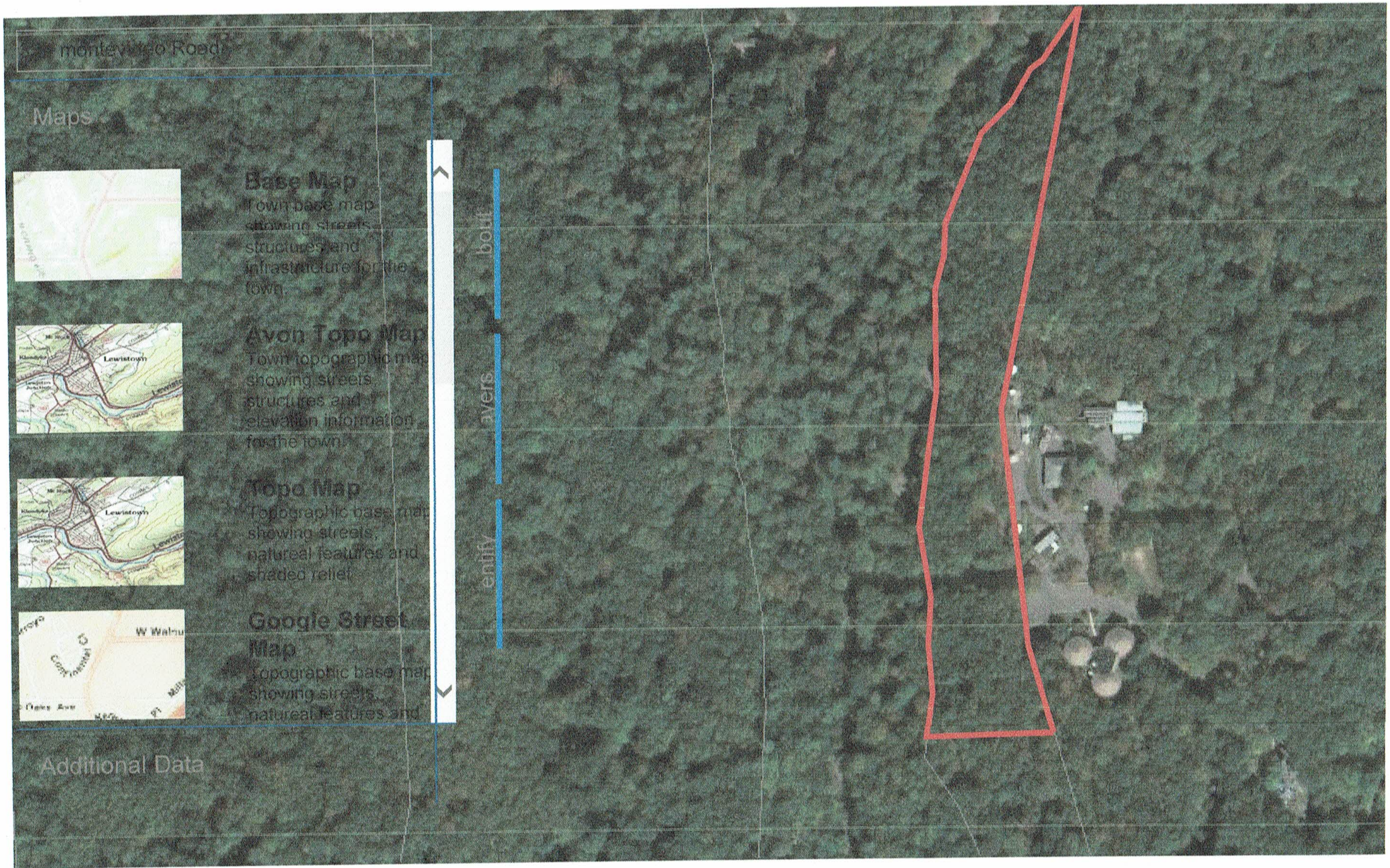

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