COHEN and WOLF P.C.
ATTORNEYS AT LAW

JULIE D. KOHLER

PLEASE REPLY TO: Bridgeport
WRITER'S DIRECT DIAL: (203) 337-4157
E-Mail Address: jkohler@cohenandwolf.com

February 26, 2015

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

Re: Notice of Exempt Modification
AT&T Towers/T-Mobile equipment upgrade
Site ID CT11349A
453 Loon Meadow Road, Norfolk Connecticut

Dear Attorney Bachman:

This office represents T-Mobile Northeast LLC ("T-Mobile") and has been retained to file exempt modification filings with the Connecticut Siting Council on its behalf.

In this case, AT&T Towers owns the existing guyed tower and related facility located at 453 Loon Meadow Road, Norfolk, Connecticut (Latitude: 42.009073; Longitude: -73.180934). T-Mobile intends to remove three (3) antennas and add three (3) antennas and related equipment at this existing telecommunications facility in Norfolk ("Norfolk Facility"). Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, copies of this letter are being sent to the First Selectman, Susan M. Dyer, and the property owner, AT&T Capital Services, Inc.

The existing Norfolk Facility consists of a 160 foot tall guyed tower, approved as a replacement tower by the Council in Petition No. 106.[1] T-Mobile plans to remove three (3) antennas and add three (3) antennas at a centerline of 120 feet. T-Mobile will replace an equipment cabinet and mount three (3) RRU's (remote radio units) inside the equipment shelter. T-Mobile will also add coax cable to follow the existing coax cable inside the cable tray. (See the plans revised to September 15, 2014 attached hereto as Exhibit A). The existing Norfolk Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated January 23, 2015 and attached hereto as Exhibit B.

The planned modifications to the Norfolk Facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modification will not increase the height of the tower. T-Mobile's proposed modifications will be installed at a centerline of 120 feet, merely modifying existing

[1] The Staff Report for this Petition does not contain any relevant limitations on the configuration of the Norfolk Facility.

antennas located at the same 120 foot elevation. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

2. The proposed modifications will not require an extension of the site boundaries. T-Mobile's modifications are all within the existing compound area as shown on Sheets A-1 and A-2.

3. The proposed modification to the Norfolk Facility will not increase the noise levels at the existing facility by six decibels or more.

4. The operation of the replacement antennas will not increase the total radio frequency (RF) power density, measured at the base of the tower, to a level at or above the applicable standard. According to a Radio Frequency Emissions Analysis Report prepared by EBI dated February 24, 2015, T-Mobile's operations would add 7.02% of the FCC Standard. Therefore, the calculated "worst case" power density for the planned combined operation at the site including all of the proposed antennas would be 29.96% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

For the foregoing reasons, T-Mobile respectfully submits that the proposed replacement/additional antennas and equipment at the Norfolk Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement by the Council of this proposed exempt modification, T-Mobile shall commence construction approximately sixty days from the date of the Council's notice of acknowledgement.

Sincerely,

Julie D. Kohler, Esq.

cc: Town of Norfolk, First Selectman Susan M. Dyer
AT&T Towers
AT&T Capital Services, Inc.
Elizabeth Jamieson, Transcend Wireless

EXHIBIT A

SITE NAME: NORFOLK SNET_1
453 LOON MEADOW ROAD
NORFOLK, CT 06058
LITCHFILED COUNTY

SITE NUMBER: CT11349A
L700 - 704G CONFIGURATION

GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T-MOBILE. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE NORTHEAST, LLC REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SPECIAL STRUCTURAL NOTES

1. STRUCTURAL DESIGNS AND DETAILS FOR ANTENNA MOUNTS COMPLETED BY HUDSON DESIGN ON BEHALF OF T-MOBILE ARE INCLUSIVE OF THE ENTIRE ANTENNA SUPPORT STRUCTURE (GLOBAL STRUCTURAL STABILITY ANALYSIS BY OTHERS), EXISTING TOWER PLATFORM, EXISTING ANTENNA MOUNTS AND ALL OTHER ASPECTS OF THE STRUCTURE THAT WILL SUPPORT THE T-MOBILE MODERNIZATION EQUIPMENT DEPLOYMENT AS DEPICTED HEREIN.
2. HUDSON DESIGN ASSUMES THAT THE TOWER IS PROPERLY CONSTRUCTED AND MAINTAINED. ALL STRUCTURAL MEMBERS AND THEIR CONNECTION ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES

T-MOBILE TECHNICIAN SITE SAFETY NOTES

LOCATION	SPECIAL RESTRICTIONS
SECTOR A:	ACCESS NOT PERMITTED
SECTOR B:	ACCESS NOT PERMITTED
SECTOR C:	ACCESS NOT PERMITTED
GPS/LMU:	UNRESTRICTED
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

CALL
BEFORE YOU DIG
CALL TOLL FREE 800-922-4455
OR CALL 811
UNDERGROUND SERVICE ALERT

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY T-MOBILE EQUIPMENT MODERNIZATION
ZONING JURISDICTION:	BASED ON INFORMATION PROVIDED BY T-MOBILE, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS AN ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW).
SITE ADDRESS:	453 LOON MEADOW ROAD NORFOLK, CT 06058
LATITUDE: LONGITUDE:	42° 0' 32.6" N -73° 10' 51.3" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

T-MOBILE NORTHEAST LLC

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BLOOMFIELD, CT 06002
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STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED
PROFESSIONAL ENGINEER

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APPROVALS

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SITE NUMBER: CT11349A
SITE NAME: NORFOLK SNET_1

453 LOON MEADOW ROAD,
NORFOLK, CT 06058
LITCHFIELD COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION 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 NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. 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.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 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

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

CONTRACTOR – TRANSCEND WIRELESS
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
OWNER – T-MOBILE

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. 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. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. 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.

9. 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.

10. 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.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. 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.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T-MOBILE SITES."

17. 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.

18. 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.

19. 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 TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. APPLICABLE BUILDING CODES:
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE: IBC 2003 W/ 2005 CT SUPPLEMENT + 2009 AMENDMENT
ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF	REFERENCE	TYP	TYPICAL
EGR	EQUIPMENT GROUND RING	REQ	REQUIRED		

T-MOBILE NORTHEAST LLC
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STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

APPROVALS

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TOWER OWNER	DATE
PROJECT NO:	CT11349A
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CHECKED BY:	DR

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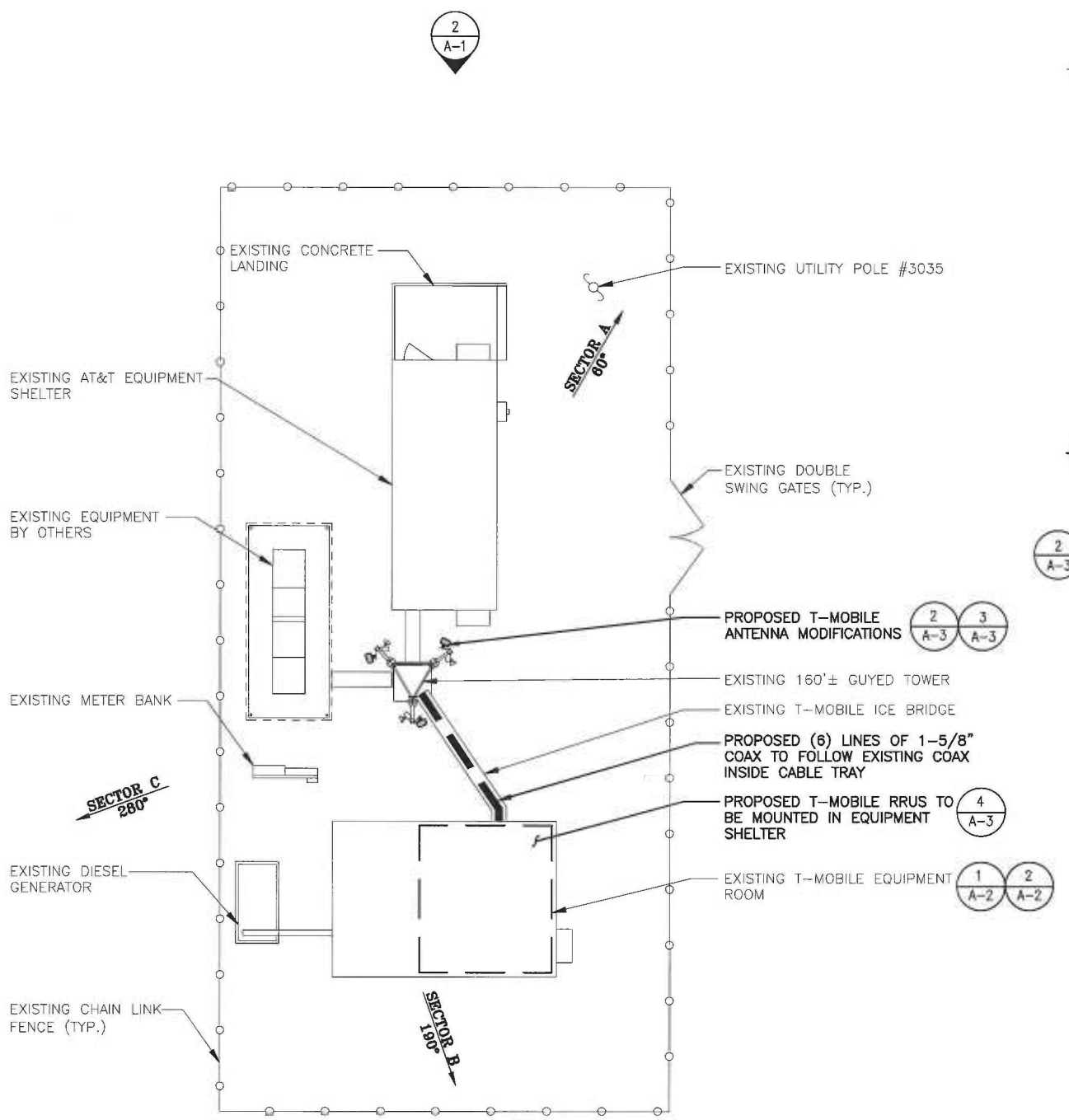
SITE NUMBER: CT11349A
SITE NAME: NORFOLK SNET_1

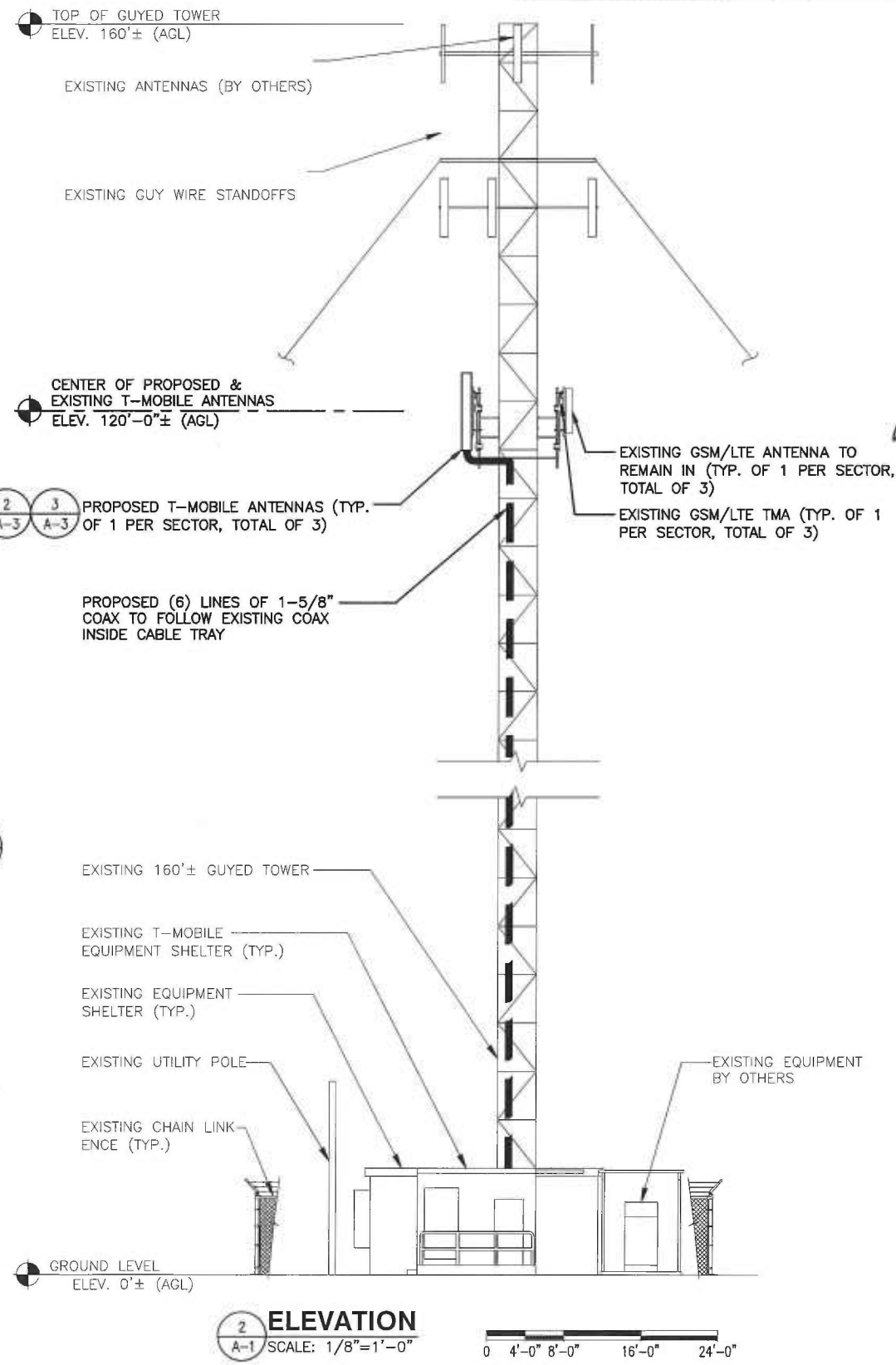
453 LOON MEADOW ROAD,
NORFOLK, CT 06058
LITCHFIELD COUNTY

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-1



1 A-1 **COMPOUND PLAN**
SCALE: 1/8"=1'-0"



2 A-1 **ELEVATION**
SCALE: 1/8"=1'-0"
0 4'-0" 8'-0" 16'-0" 24'-0"

L700 - 704G CONFIGURATION

NOTE:

GENERAL CONTRACTOR TO REFER TO THE STRUCTURAL ANALYSIS BY: GPD GROUP, DATED: JANUARY 23, 2015 AND EQUIPMENT INSTALLATION RECOMMENDATIONS PRIOR TO COMMENCING CONSTRUCTION

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COMPOUND PLAN & ELEVATION

SHEET NUMBER

A-1

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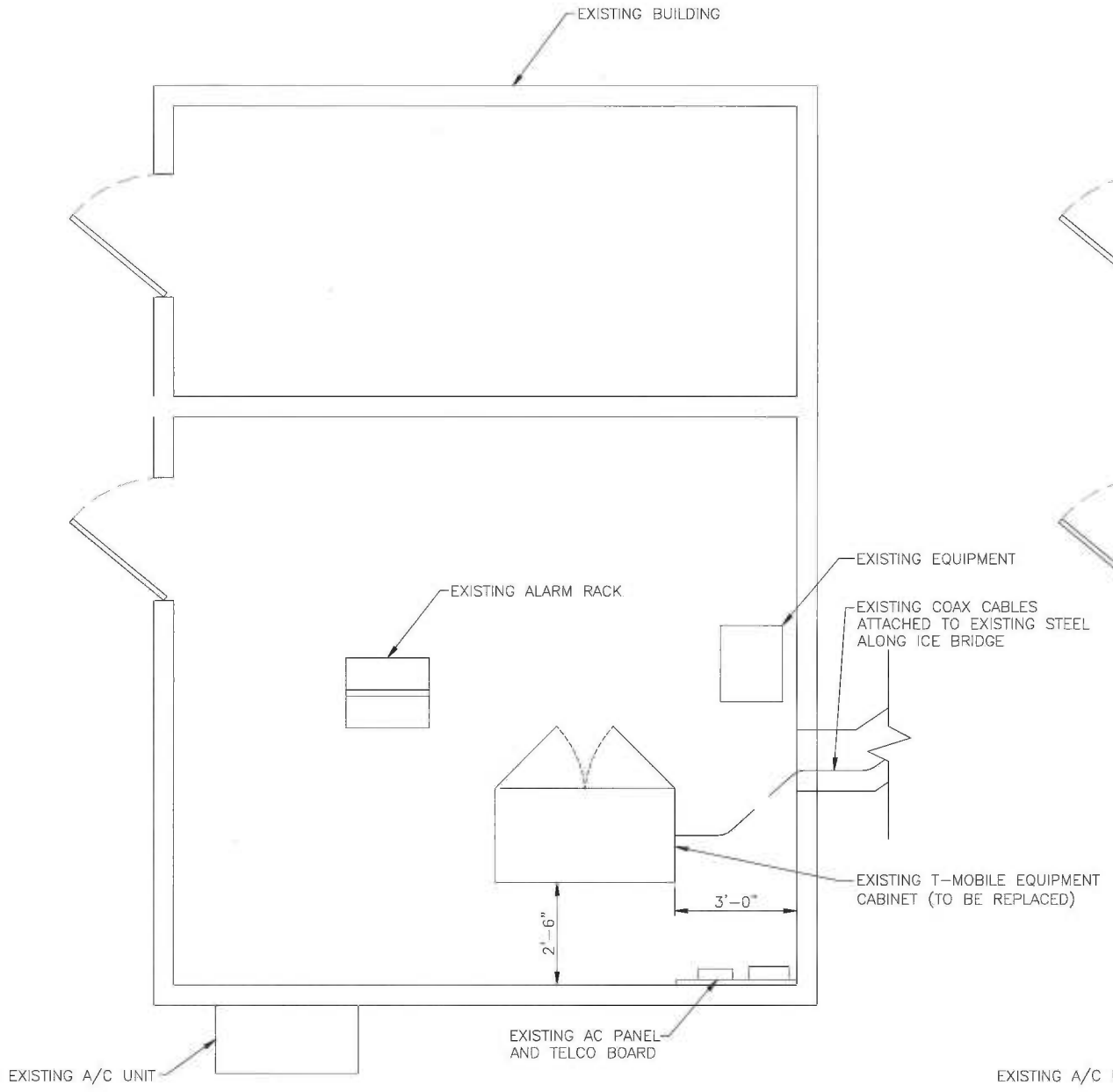
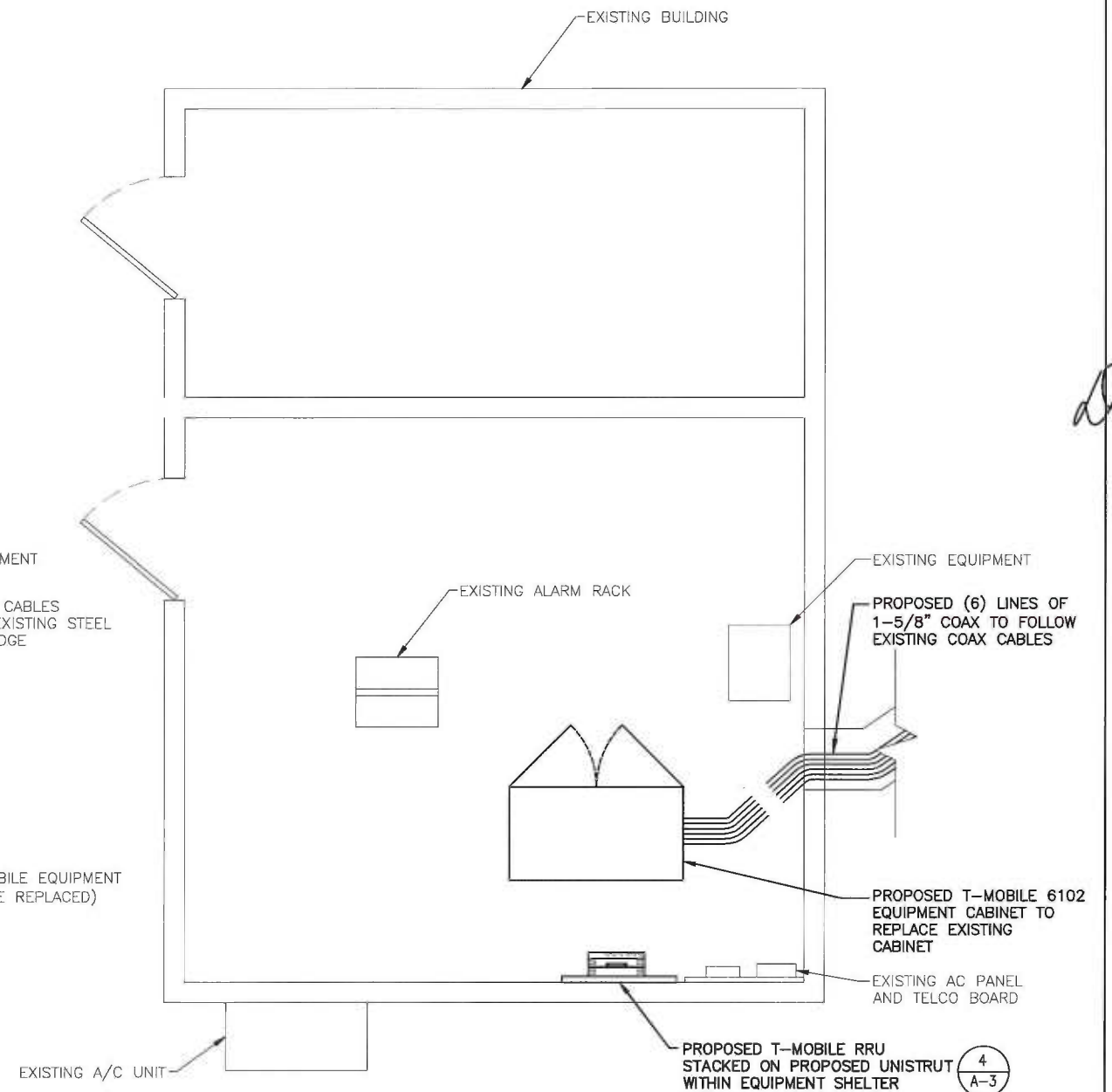
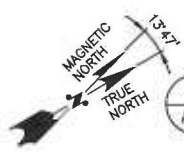


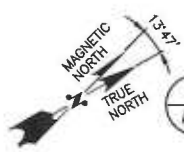




1 A-2 **EXISTING EQUIPMENT LAYOUT**

SCALE: 1/2"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"



2 A-2 **PROPOSED EQUIPMENT LAYOUT**

SCALE: 1/2"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

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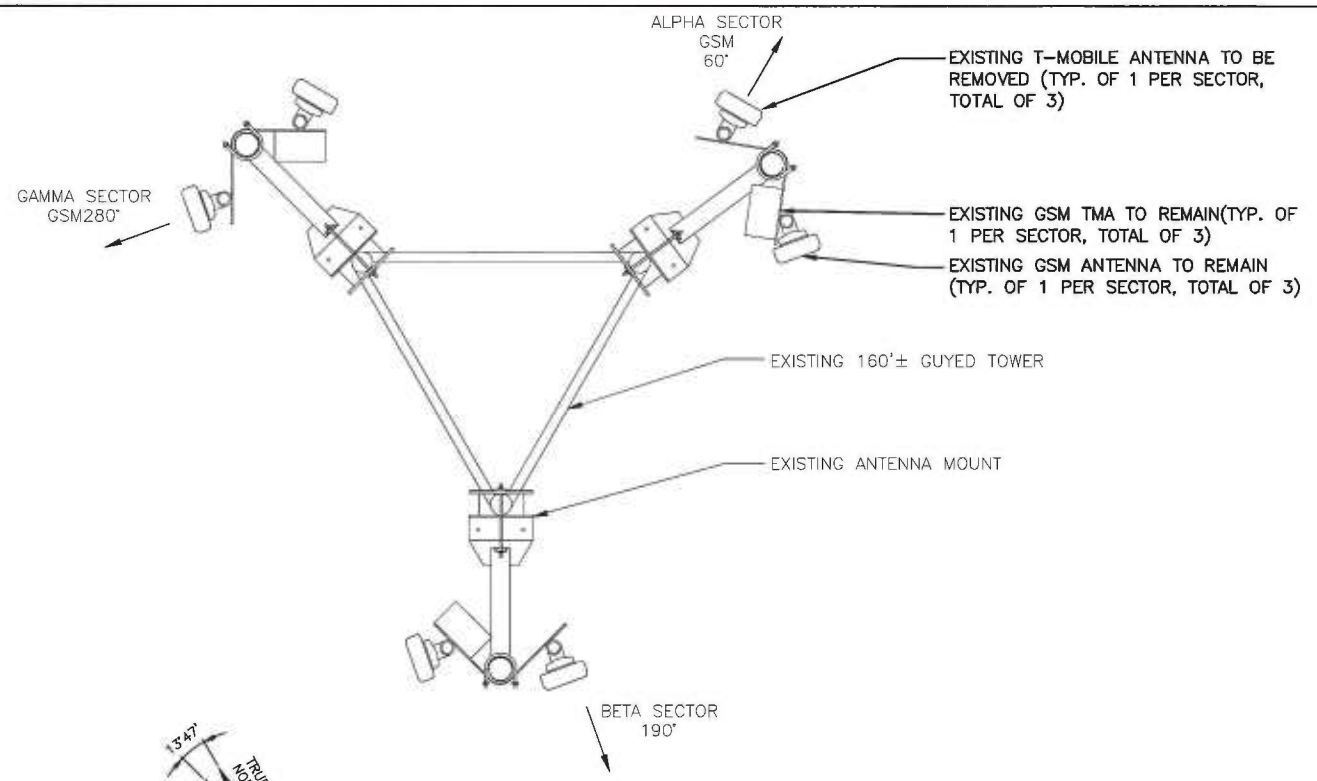
EXISTING & PROPOSED EQUIPMENT LAYOUT

SHEET NUMBER

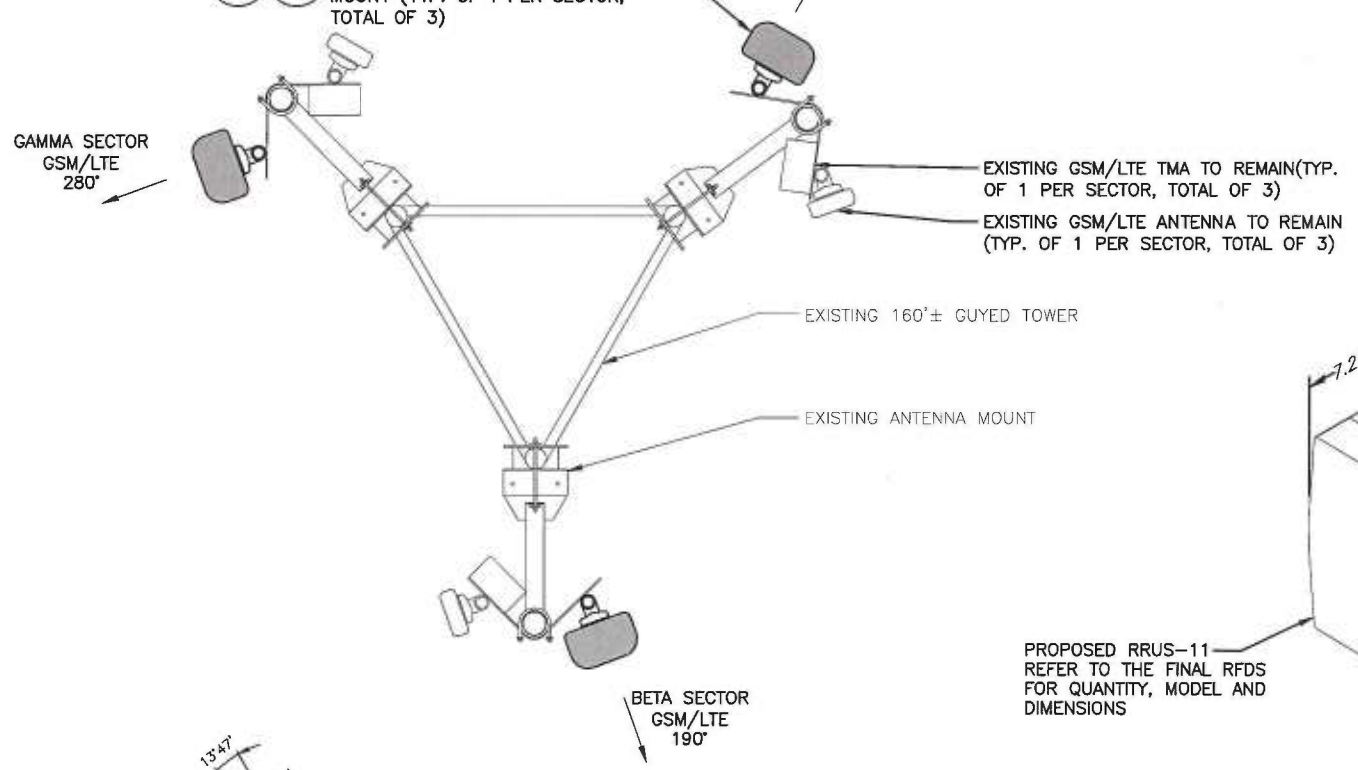
A-2



1 A-3 **EXISTING ANTENNA PLAN**
SCALE: N.T.S

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



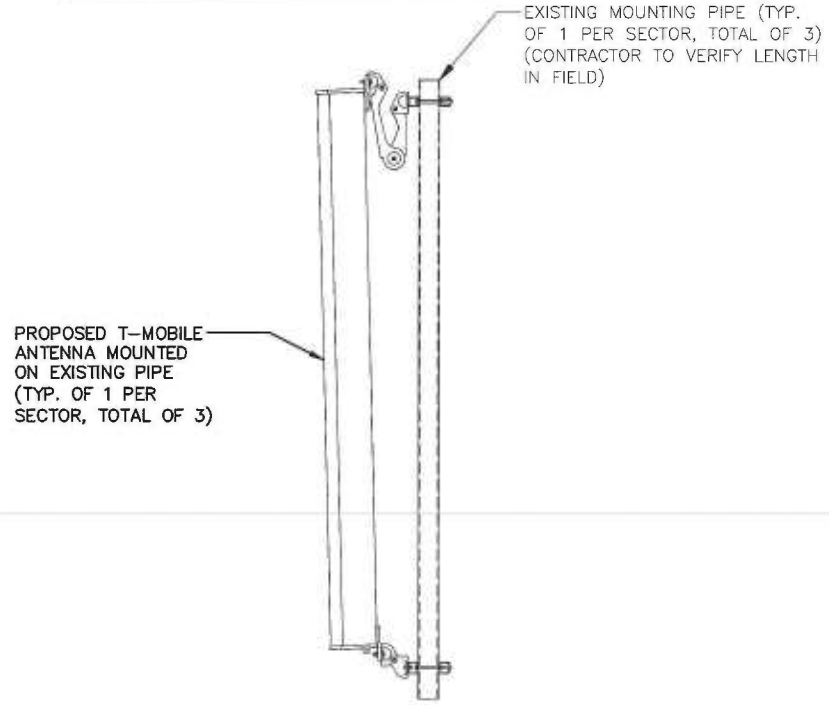
2 A-3 **PROPOSED ANTENNA PLAN**
SCALE: N.T.S

NOTE:

GENERAL CONTRACTOR TO REFER TO THE STRUCTURAL ANALYSIS BY: GPD GROUP, DATED: JANUARY 23, 2015 AND EQUIPMENT INSTALLATION RECOMMENDATIONS PRIOR TO COMMENCING CONSTRUCTION

PROPOSED ANTENNA SCHEDULE

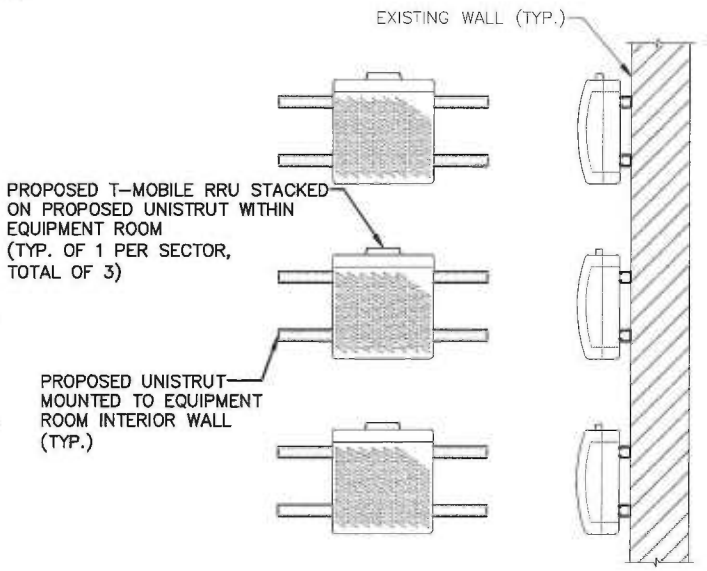
SECTOR	MAKE	MODEL#	SIZE (INCHES)
ALPHA:	COMMSCOPE	LNX-6515DS-VTM	96.4x11.9x7.1
BETA:	COMMSCOPE	LNX-6515DS-VTM	96.4X11.9X7.1
GAMMA:	COMMSCOPE	LNX-6515DS-VTM	96.4X11.9X7.1



3 A-3 **ANTENNA MOUNT (TYP.)**
SCALE: N.T.S.

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

RRU DETAIL
SCALE: N.T.S.



4 A-3 **RRU MOUNTING DETAIL**
SCALE: N.T.S.

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

Daniel P. Hamm

APPROVALS

CONSTRUCTION	DATE
RF ENGINEERING	DATE
ZONING/SITE ACQ.	DATE
OPERATIONS	DATE
TOWER OWNER	DATE

PROJECT NO:	CT11349A
DRAWN BY:	KMS
CHECKED BY:	DR

2	09/15/14	ISSUED FOR REVIEW
1	08/22/14	ISSUED FOR REVIEW
0	08/18/14	ISSUED FOR REVIEW

SITE NUMBER: CT11349A
SITE NAME: NORFOLK SNET_1

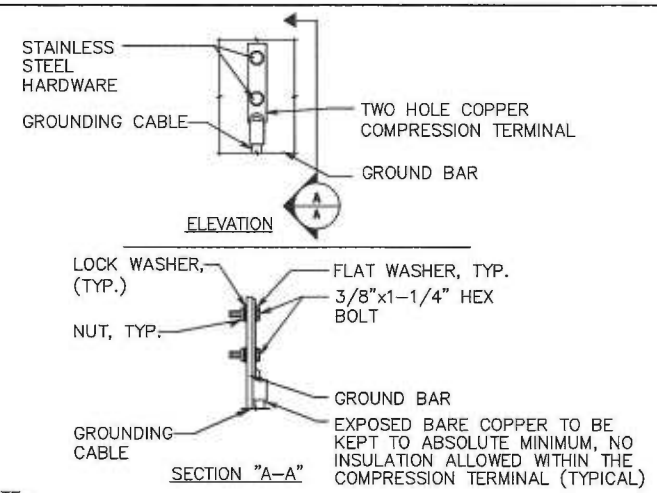
453 LOON MEADOW ROAD,
NORFOLK, CT 06058
LITCHFIELD COUNTY

SHEET TITLE

ANTENNA PLAN
& DETAILS

SHEET NUMBER

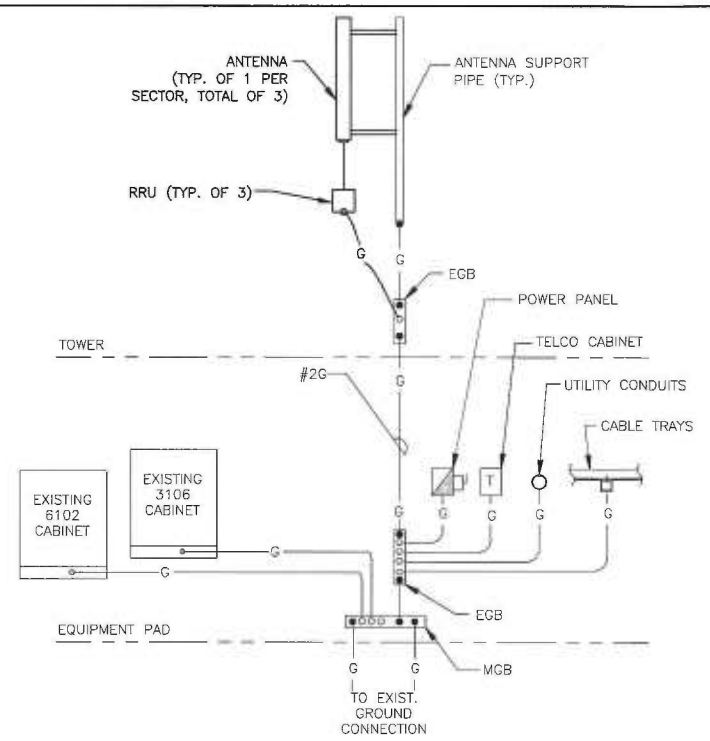
A-3



NOTE:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

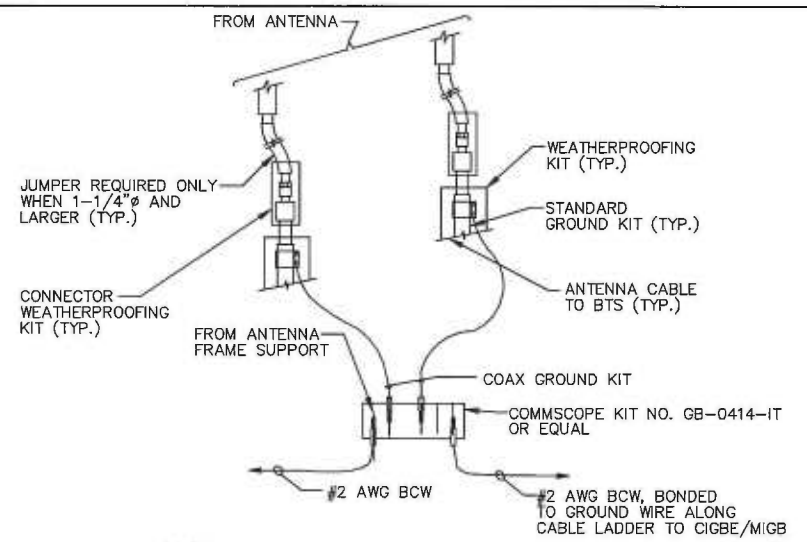
TYPICAL GROUND BAR CONNECTION DETAIL

1 / G-1 N.T.S.



GROUNDING RISER DIAGRAM

2 / G-1 N.T.S.



NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

GROUND WIRE TO GROUND BAR CONNECTION DETAIL

3 / G-1 N.T.S.

NOTE:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER. ANTENNA LOCATION AND CONNECTION ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

ANTENNA CABLE GROUNDING

5 / G-1 N.T.S.

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless

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APPROVALS

CONSTRUCTION	DATE
RF ENGINEERING	DATE
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TOWER OWNER	DATE
PROJECT NO:	CT11349A
DRAWN BY:	KMS
CHECKED BY:	DR

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1	08/22/14	ISSUED FOR REVIEW
0	08/18/14	ISSUED FOR REVIEW

SITE NUMBER: CT11349A
SITE NAME: NORFOLK SNET_1

453 LOON MEADOW ROAD,
NORFOLK, CT 06058
LITCHFIELD COUNTY

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

G-1

EXHIBIT B

AT&T Towers
2300 Northlake Center Dr. Ste 405
Tucker, GA 30084-4032
(770) 708-6130

Kevin Clements
520 South Main Street, Suite 2531
Akron, OH 44311
(330) 572-3546
kclements@gpdgroup.com

GPD# 2015723.01.SNET020.03
January 23, 2015

STRUCTURAL ANALYSIS REPORT

AT&T DESIGNATION:	**Site USID:**	**SNET020**
	Site FA:	**10137487**
	Site Name:	**NORFOLK**
	AT&T Project:	**1) Wireline T-Mobile Modification 09.10.2014**
ANALYSIS CRITERIA:	**Codes:**	**TIA/EIA-222-F, 2003 IBC, 2013 CTBC & ASCE 7-05** **80-mph (fastest-mile) with 0" ice** **28-mph (fastest-mile) with 0.75" ice**
SITE DATA:		**402 Loon Meadow Dr., Norfolk, CT 06058, Litchfield County** **Latitude 42° 0' 32.004" N, Longitude 73° 10' 51" W** **Market: NEW ENGLAND** **160' Guyed Tower**

Ms. Julie Overman,

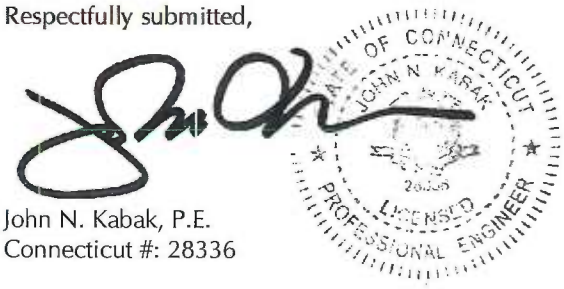
GPD is pleased to submit this Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

Analysis Results

Tower Stress Level with Proposed Equipment:	55.5%	Pass
Foundation Ratio with Proposed Equipment:	98.3%	Pass

We at GPD appreciate the opportunity of providing our continuing professional services to you and AT&T Towers. If you have any questions or need further assistance on this or any other projects please do not hesitate to call.

Respectfully submitted,



John N. Kabak, P.E.
Connecticut #: 28336

SUMMARY & RESULTS

The purpose of this analysis was to verify whether the existing structure is capable of carrying the proposed loading configuration as specified by AT&T Mobility to AT&T Towers. This report was commissioned by Ms. Julie Overman of AT&T Towers.

The proposed coax shall be installed in a 3 on 4 configuration along Face C for the results of this analysis to be valid. See Appendix C for the proposed coax layout.

TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Leg	43.2%	Pass
Diagonal	55.5%	Pass
Horizontal	33.9%	Pass
Top Girt	4.6%	Pass
Guy Wires	54.6%	Pass
Top Guy Pull-Off	28.2%	Pass
Bottom Guy Pull-Off	19.1%	Pass
Torque Arm Top	17.5%	Pass
Torque Arm Bottom	12.4%	Pass
Bolt Checks	52.0%	Pass
Guy Anchor Foundation	95.5%	Pass
Tower Foundation	98.3%	Pass

ANALYSIS METHOD

tnxTower (Version 6.1.4.1), a commercially available software program, was used to create a three-dimensional model of the tower and calculate primary member stresses for various dead, live, wind, and ice load cases. Selected output from the analysis is included in Appendix B. The following table details the information provided to complete this structural analysis. This analysis is solely based on this information and is being completed without the benefit of a detailed site visit.

DOCUMENTS PROVIDED

Document	Remarks	Source
Notice of Co-lo Form (Part 2)	AT&T Loading Document, uploaded 8/10/2014	Siterra
Site Lease Application	AT&T Application, uploaded 8/11/2014	Siterra
Tower Design	Not Provided	N/A
Foundation Design	Not Provided	N/A
Geotechnical Report	WEI Project # 2010-1212, dated 9/15/2010	Siterra
Previous Structural Analysis	GPD Job # 2013723.01.SNET020.02, dated 9/27/2013	Siterra
Tower Mapping	GPD & MTSI Northeast, dated 7/21/2010	Siterra
Foundation Mapping	WEI Project # 2010-1212, dated 9/15/2010	Siterra

ASSUMPTIONS

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1. The tower member sizes and shapes are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations.
6. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
7. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
8. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
9. All prior structural modifications are assumed to be as per data supplied/available and to have been properly installed.
10. Loading interpreted from photos is accurate to $\pm 5'$ AGL, antenna size accurate to ± 3.3 sf, and coax equal to the number of existing antennas without reserve.
11. The existing loading was obtained from the previous structural analysis by GPD (Job # 2013723.01.SNET020.02, dated 9/27/2013), the provided Site Lease Application, the provided Notice of Co-Location Form and site photos and is assumed to be accurate.
12. The proposed coax shall be installed in a 3 on 4 configuration along Face C for the results of this analysis to be valid. See Appendix C for the proposed coax layout.
13. The azimuth orientation of Leg A was assumed to be at 340 degrees based on the tower mapping performed by GPD & MTSI Northeast (dated 7/21/2010).
14. Foundation steel was not able to be determined through testing for the tower base. Therefore it was assumed that the foundation steel in place is equal to the minimum required steel per code specifications.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD Group should be allowed to review any new information to determine its effect on the structural integrity of the tower.

DISCLAIMER OF WARRANTIES

GPD GROUP has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD GROUP in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD GROUP does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD GROUP provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, but are beyond the scope of this report.

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

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD GROUP makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD GROUP will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD GROUP pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

Tower Analysis Summary Form

Tower Analysis Summary Form

General Info

Site Name	NORFOLK
Site Number	SNET020
FA Number	10137487
Date of Analysis	9/27/2013
Company Performing Analysis	GPD

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Tower Info	Description	Date
Tower Type (G, SST, MP)	G	
Tower Height (top of steel AGL)	160'	
Tower Manufacturer	n/a	
Tower Model	n/a	
Tower Design	n/a	
Foundation Design	n/a	
Geotech Report	WEI Project #: 2010-1212	9/15/2010
Tower Mapping	GPD & MTSI Northeast	7/21/2010
Previous Structural Analysis	GPD Job #: 2013723.01.SNET020.02	9/27/2013
Foundation Mapping	WEI Project #: 2010-1212	9/15/2010

Design Parameters

Design Code Used	TIA/EIA-222-F, 2003 IBC 2013 CTBC & ASCE 7-05
Location of Tower (County, State)	Litchfield, Connecticut
Basic Wind Speed (mph)	80 (fastest-mile)
Ice Thickness (in)	0.75
Structure Classification (I, II, III)	
Exposure Category (B, C, D)	
Topographic Category (1 to 5)	

Analysis Results (% Maximum Usage)

Existing/Reserved + Future + Proposed Condition	
Tower (%)	55.5%
Guy Wires (%)	54.6%
Foundation (%)	98.3%
Foundation Adequate?	Yes

Steel Yield Strength (ksi)

Legs	50
Braces	36
Member Bolts	A325
Guy Wires	EHS

Note: Steel grades assumed based on past experience with similar towers.

Existing / Reserved Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
AT&T Mobility	160	168	1	Dipole	Unknown	10' Dipole		1	Unknown	Pipe Mount	1	Unknown	7/8"	Face A
AT&T Mobility	160	160	1	Omni	Unknown	3' Omni				Flush Mount				
Sprint	158	158	6	Panel	Decibel	DB980H90E-M	30/150/270	3	Unknown	12' Boom Gate	6	Unknown	1-5/8"	Face A
Sprint	158	158	3	Panel	RFS	APXVSPP18-C-A20	50/170/250			on the same mounts	3	Hybriflex	1-1/4"	Face A
Sprint	154	154	3	RRU	Andrew	800MHz 2x50w				Flush Mounted				
Sprint	154	154	3	RRU	Panasonic	1900MHz 2x40w				Flush Mounted				
Sprint	154	154	3	Filter	Andrew	800MHz 2x50w Notch Filter				Flush Mounted				
AT&T Mobility	148	148	1	Yagi	Unknown	4' Yagi				Torque Arm Mount	1	Unknown	1/2"	Face A
AT&T Mobility	142	142	3	Panel	KMW	AM-X-CD-16-65-00T	30/150/270	3	Unknown	8' Frame	12	LDF7-50A	1-5/8"	Face B
AT&T Mobility	142	142	6	Panel	Powerwave	7770	30/150/270			on the same mounts	1	DC/Fiber Bundle	1-1/2"	Face B
AT&T Mobility	142	142	6	RRU	Ericsson	RRU 11				on the same mounts				
AT&T Mobility	142	142	1	Surge Unit	Andrew	ABT-DFDM-ADBH								
Unknown	137							2	Unknown	4' Sidearm				
T-Mobile	120	120	6	Panel	EMS	RR90-1700-P	60/180/300	3	Unknown	4' Standoff	6	Unknown	1-1/4"	Face A
T-Mobile	120	120	6	TMA	RFS	1412D-1A20				on the same mounts				
Sprint	75	75	1	GPS	PCTEL	GPS-TMG-HR-26NCM		1	Unknown	2' Sidearm	1	Unknown	1/4"	Face A
AT&T Mobility	13	13	1	GPS	Unknown	GPS		1	Unknown	1' Sidearm	1	Unknown	1/2"	Face B

Note: (6) RR90-1700-P panels shall be removed prior to the installation of the proposed loading and were not considered in this analysis.

Proposed Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
T-Mobile	120	120	3	Panel	EMS	RR90-17-02DP	60/190/280			on the existing mounts	6	Andrew	1-5/8"	Face B
T-Mobile	120	120	3	Panel	Commscope	LNX-6515DS-VTM	60/190/280			on the existing mounts	1	RET Cable	3/8"	Face B
T-Mobile	120	120	3	RRU	Ericsson	RRUS11-B12				on the existing mounts				

Note: The proposed loading shall be in addition to the remaining existing loading at the same elevation.

Note: The proposed coax shall be in installed in a 3 on 4 configuration on Face C for the results of this analysis to be valid. See Appendix C for the proposed coax layout.

Future Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face

APPENDIX B

tnxTower Output File

tnxTower	Job	Page
GPD Group 520 S. Main Street Akron, OH 44311 Phone: 330.572.2201 FAX:	SNET020 NORFOLK	1 of 9
	Project 2015723.01.SNET020.03	Date 14:20:23 01/28/15
	Client AT&T Towers	Designed by jdischinger

Tower Input Data

The main tower is a 3x guyed tower with an overall height of 160.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 4.00 ft at the top and tapered at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Litchfield County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 28 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Pressures are calculated at each section.
Safety factor used in guy design is 2.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

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*
Climbing Ladder	B	Yes	Af (CfAe)	160.00 - 8.00	-2.0000	0	1	1	3.8400	3.8400	15.3600	4.81
LDF5-50A (7/8 FOAM)	A	Yes	Ar (CfAe)	160.00 - 8.00	-2.0000	-0.35	1	1	1.0000	1.0900		0.33
LDF7-50A (1-5/8 FOAM)	A	Yes	Ar (CfAe)	158.00 - 8.00	0.0000	0.1	6	6	0.5000	1.9800		0.82
Hybriflex (1-1/4")	A	Yes	Ar (CfAe)	158.00 - 8.00	0.0000	-0.15	3	3	0.5000	1.5400		1.30
LDF4-50A (1/2 FOAM)	A	Yes	Ar (CfAe)	148.00 - 8.00	-2.0000	0.1	1	1	0.0000	0.0000		0.15
LDF6-50A (1-1/4 FOAM)	A	Yes	Ar (CfAe)	120.00 - 8.00	-3.0000	0	6	5	1.0000	0.0000		0.66
LDF1-50A (1/4 FOAM)	A	Yes	Ar (CfAe)	75.00 - 8.00	0.0000	-0.075	1	1	0.3500	0.3500		0.06
Coax Bracket 5/20' x 12"	A	Yes	Af (CfAe)	160.00 - 8.00	0.0000	0	1	1	0.5000	0.5000	1.5000	0.43
LDF4-50A (1/2 FOAM)	B	Yes	Ar (CfAe)	13.00 - 8.00	0.0000	-0.25	1	1	0.6300	0.6300		0.15
LDF7-50A (1-5/8 FOAM)	B	Yes	Ar (CfAe)	142.00 - 8.00	0.0000	0.4	6	3	1.0000	1.9800		0.82
1.5" DC/Fiber Bundle	B	Yes	Ar (CfAe)	142.00 - 8.00	0.0000	0.3	1	1	1.5000	1.5000		0.80
LDF7-50A (1-5/8 FOAM)	B	Yes	Ar (CfAe)	142.00 - 8.00	0.0000	-0.4	6	3	1.0000	1.9800		0.82
Coax Bracket 5/20' x 12"	C	Yes	Af (CfAe)	120.00 - 8.00	0.0000	0	1	1	0.5000	0.5000	1.5000	0.43
3/8" RET Cable	C	Yes	Ar (CfAe)	120.00 - 8.00	0.0000	0.1	1	1	0.3750	0.3750		0.10
LDF7-50A (1-5/8 FOAM)	C	Yes	Ar (CfAe)	120.00 - 8.00	0.0000	0	6	3	1.0000	1.9800		0.82

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
10' Dipole	A	From Leg	0.50 0.00 8.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.00 3.02 4.07 5.70 8.26	2.00 3.02 4.07 5.70 8.26	0.02 0.04 0.06 0.12 0.33
Pipe Mount 3'x2.375"	A	From Leg	0.25 0.00 1.50	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.58 0.77 0.97 1.42 2.54	0.58 0.77 0.97 1.42 2.54	0.01 0.02 0.02 0.05 0.13
3' Omni	B	From Face	0.50 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.52 0.71 0.90 1.33 2.44	0.52 0.71 0.90 1.33 2.44	0.02 0.02 0.03 0.05 0.12
Rohn 12' Boom Gate	A	From Leg	1.29 1.53 0.00	50.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	15.35 21.29 27.23 39.11 62.87	14.00 20.81 27.62 41.24 68.48	0.56 0.74 0.92 1.29 2.03
Rohn 12' Boom Gate	B	From Leg	1.29 1.53 0.00	50.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	15.35 21.29 27.23 39.11 62.87	14.00 20.81 27.62 41.24 68.48	0.56 0.74 0.92 1.29 2.03
Rohn 12' Boom Gate	C	From Leg	1.29 1.53 0.00	50.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	15.35 21.29 27.23 39.11 62.87	14.00 20.81 27.62 41.24 68.48	0.56 0.74 0.92 1.29 2.03
(2) DB980H90E-M w/ Mount Pipe	A	From Leg	2.57 3.06 0.00	50.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.07 0.11 0.22 0.55
(2) DB980H90E-M w/ Mount Pipe	B	From Leg	2.57 3.06 0.00	50.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.07 0.11 0.22 0.55
(2) DB980H90E-M w/ Mount Pipe	C	From Leg	2.57 3.06 0.00	50.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.07 0.11 0.22 0.55
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	2.57 3.05 0.00	70.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.50 12.88	6.71 7.66 8.49 10.20 13.98	0.08 0.14 0.22 0.39 0.87
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	2.57 3.05 0.00	70.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.26 8.81 9.36 10.50	6.71 7.66 8.49 10.20	0.08 0.14 0.22 0.39

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	12.88	13.98	0.87
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	2.57 3.05 0.00	30.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.50 12.88	6.71 7.66 8.49 10.20 13.98	0.08 0.14 0.22 0.39 0.87
800MHz 2x50w	A	From Leg	0.50 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
800MHz 2x50w	B	From Leg	0.50 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
800MHz 2x50w	C	From Leg	0.50 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
1900MHz 2x40w	A	From Leg	0.50 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	3.06 3.30 3.54 4.06 5.19	0.09 0.12 0.15 0.22 0.41
1900MHz 2x40w	B	From Leg	0.50 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	3.06 3.30 3.54 4.06 5.19	0.09 0.12 0.15 0.22 0.41
1900MHz 2x40w	C	From Leg	0.50 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	3.06 3.30 3.54 4.06 5.19	0.09 0.12 0.15 0.22 0.41
800MHz 2x50w Notch Filter	A	From Leg	0.50 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 0.97 1.11 1.40 2.09	0.37 0.46 0.56 0.78 1.33	0.01 0.02 0.03 0.05 0.12
800MHz 2x50w Notch Filter	B	From Leg	0.50 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 0.97 1.11 1.40 2.09	0.37 0.46 0.56 0.78 1.33	0.01 0.02 0.03 0.05 0.12
800MHz 2x50w Notch Filter	C	From Leg	0.50 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 0.97 1.11 1.40 2.09	0.37 0.46 0.56 0.78 1.33	0.01 0.02 0.03 0.05 0.12
4' Yagi	B	From Face	6.50 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.79 1.03 1.28 1.81 3.11	0.79 1.03 1.28 1.81 3.11	0.01 0.01 0.02 0.05 0.14
Pipe Mount 4'x2.375"	B	From Face	6.00	0.0000	148.00	No Ice	0.87	0.87	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1/2" Ice	1.11	1.11	0.03
			0.00				1" Ice	1.36	1.36	0.04
							2" Ice	1.90	1.90	0.07
							4" Ice	3.23	3.23	0.17
8' Frame	A	From Leg	0.48	0.57	50.0000	142.00	No Ice	14.48	3.61	0.31
							1/2" Ice	18.67	4.62	0.45
			0.00				1" Ice	22.86	5.62	0.60
							2" Ice	31.24	7.63	0.89
							4" Ice	48.00	11.65	1.46
8' Frame	B	From Leg	0.48	0.57	50.0000	142.00	No Ice	14.48	3.61	0.31
							1/2" Ice	18.67	4.62	0.45
			0.00				1" Ice	22.86	5.62	0.60
							2" Ice	31.24	7.63	0.89
							4" Ice	48.00	11.65	1.46
8' Frame	C	From Leg	0.48	0.57	50.0000	142.00	No Ice	14.48	3.61	0.31
							1/2" Ice	18.67	4.62	0.45
			0.00				1" Ice	22.86	5.62	0.60
							2" Ice	31.24	7.63	0.89
							4" Ice	48.00	11.65	1.46
AM-X-CD-16-65-00T w/ Mount Pipe	A	From Leg	0.96	1.15	50.0000	142.00	No Ice	8.55	6.65	0.09
							1/2" Ice	9.18	7.68	0.16
			0.00				1" Ice	9.79	8.56	0.23
							2" Ice	11.06	10.38	0.41
							4" Ice	13.71	14.23	0.91
AM-X-CD-16-65-00T w/ Mount Pipe	B	From Leg	0.96	1.15	50.0000	142.00	No Ice	8.55	6.65	0.09
							1/2" Ice	9.18	7.68	0.16
			0.00				1" Ice	9.79	8.56	0.23
							2" Ice	11.06	10.38	0.41
							4" Ice	13.71	14.23	0.91
AM-X-CD-16-65-00T w/ Mount Pipe	C	From Leg	0.96	1.15	50.0000	142.00	No Ice	8.55	6.65	0.09
							1/2" Ice	9.18	7.68	0.16
			0.00				1" Ice	9.79	8.56	0.23
							2" Ice	11.06	10.38	0.41
							4" Ice	13.71	14.23	0.91
(2) 7770.00 w/Mount Pipe	A	From Leg	0.96	1.15	50.0000	142.00	No Ice	5.88	4.10	0.06
							1/2" Ice	6.31	4.73	0.11
			0.00				1" Ice	6.75	5.37	0.16
							2" Ice	7.66	6.70	0.29
							4" Ice	9.58	9.87	0.65
(2) 7770.00 w/Mount Pipe	B	From Leg	0.96	1.15	50.0000	142.00	No Ice	5.88	4.10	0.06
							1/2" Ice	6.31	4.73	0.11
			0.00				1" Ice	6.75	5.37	0.16
							2" Ice	7.66	6.70	0.29
							4" Ice	9.58	9.87	0.65
(2) 7770.00 w/Mount Pipe	C	From Leg	0.96	1.15	50.0000	142.00	No Ice	5.88	4.10	0.06
							1/2" Ice	6.31	4.73	0.11
			0.00				1" Ice	6.75	5.37	0.16
							2" Ice	7.66	6.70	0.29
							4" Ice	9.58	9.87	0.65
(2) RRU-11	A	From Leg	0.96	1.15	50.0000	142.00	No Ice	1.91	1.47	0.04
							1/2" Ice	2.10	1.65	0.06
			0.00				1" Ice	2.30	1.83	0.08
							2" Ice	2.72	2.22	0.12
							4" Ice	3.68	3.10	0.25
(2) RRU-11	B	From Leg	0.96	1.15	50.0000	142.00	No Ice	1.91	1.47	0.04
							1/2" Ice	2.10	1.65	0.06
			0.00				1" Ice	2.30	1.83	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.72	2.22	0.12
						4" Ice	3.68	3.10	0.25
(2) RRU-11	C	From Leg	0.96 1.15 0.00	50.0000	142.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.91 2.10 2.30 2.72 3.68	1.47 1.65 1.83 2.22 3.10	0.04 0.06 0.08 0.12 0.25
ABT-DFDM-ADBH	A	From Leg	0.96 1.15 0.00	50.0000	142.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.03 0.05 0.08 0.18 0.47	0.05 0.09 0.13 0.25 0.58	0.00 0.00 0.00 0.01 0.03
4' Sidearm - Flat (GPD)	B	From Leg	2.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.80 1.05 1.30 1.80 2.80	3.20 4.00 4.80 6.40 9.60	0.06 0.07 0.09 0.12 0.18
4' Sidearm - Flat (GPD)	C	From Leg	2.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.80 1.05 1.30 1.80 2.80	3.20 4.00 4.80 6.40 9.60	0.06 0.07 0.09 0.12 0.18
RR90-17-02DP w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	60.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.59 5.09 5.58 6.59 8.73	3.32 4.09 4.78 6.23 9.31	0.03 0.07 0.12 0.22 0.56
RR90-17-02DP w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	-60.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.59 5.09 5.58 6.59 8.73	3.32 4.09 4.78 6.23 9.31	0.03 0.07 0.12 0.22 0.56
RR90-17-02DP w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	60.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.59 5.09 5.58 6.59 8.73	3.32 4.09 4.78 6.23 9.31	0.03 0.07 0.12 0.22 0.56
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	-60.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.64 12.34 13.04 14.48 17.71	9.79 11.30 12.80 15.12 19.94	0.08 0.17 0.27 0.50 1.14
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	60.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.64 12.34 13.04 14.48 17.71	9.79 11.30 12.80 15.12 19.94	0.08 0.17 0.27 0.50 1.14
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	-60.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.64 12.34 13.04 14.48 17.71	9.79 11.30 12.80 15.12 19.94	0.08 0.17 0.27 0.50 1.14
RRUS 11 B12	A	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRUS 11 B12	B	From Leg	4.00	0.00	0.0000	120.00	No Ice	3.31	1.36	0.05
			0.00				1/2" Ice	3.55	1.54	0.07
							1" Ice	3.80	1.73	0.10
							2" Ice	4.33	2.13	0.15
							4" Ice	5.50	3.04	0.31
RRUS 11 B12	C	From Leg	4.00	0.00	0.0000	120.00	No Ice	3.31	1.36	0.05
			0.00				1/2" Ice	3.55	1.54	0.07
							1" Ice	3.80	1.73	0.10
							2" Ice	4.33	2.13	0.15
							4" Ice	5.50	3.04	0.31
(2) 1412D-1A20	A	From Leg	4.00	0.00	0.0000	120.00	No Ice	0.00	0.47	0.01
			0.00				1/2" Ice	0.00	0.57	0.02
							1" Ice	0.00	0.69	0.03
							2" Ice	0.00	0.95	0.06
							4" Ice	0.00	1.57	0.14
(2) 1412D-1A20	B	From Leg	4.00	0.00	0.0000	120.00	No Ice	0.00	0.47	0.01
			0.00				1/2" Ice	0.00	0.57	0.02
							1" Ice	0.00	0.69	0.03
							2" Ice	0.00	0.95	0.06
							4" Ice	0.00	1.57	0.14
(2) 1412D-1A20	C	From Leg	4.00	0.00	0.0000	120.00	No Ice	0.00	0.47	0.01
			0.00				1/2" Ice	0.00	0.57	0.02
							1" Ice	0.00	0.69	0.03
							2" Ice	0.00	0.95	0.06
							4" Ice	0.00	1.57	0.14
4' Standoff - Flat (GPD)	A	From Leg	2.00	0.00	0.0000	120.00	No Ice	1.96	6.13	0.07
			0.00				1/2" Ice	3.08	8.58	0.11
							1" Ice	4.20	11.03	0.14
							2" Ice	6.44	15.93	0.20
							4" Ice	10.92	25.73	0.33
4' Standoff - Flat (GPD)	B	From Leg	2.00	0.00	0.0000	120.00	No Ice	1.96	6.13	0.07
			0.00				1/2" Ice	3.08	8.58	0.11
							1" Ice	4.20	11.03	0.14
							2" Ice	6.44	15.93	0.20
							4" Ice	10.92	25.73	0.33
4' Standoff - Flat (GPD)	C	From Leg	2.00	0.00	0.0000	120.00	No Ice	1.96	6.13	0.07
			0.00				1/2" Ice	3.08	8.58	0.11
							1" Ice	4.20	11.03	0.14
							2" Ice	6.44	15.93	0.20
							4" Ice	10.92	25.73	0.33
GPS-TMG-HR-26NCM	C	From Leg	2.00	0.00	0.0000	75.00	No Ice	0.80	0.93	0.03
			0.00				1/2" Ice	1.05	1.17	0.03
							1" Ice	1.30	1.41	0.04
							2" Ice	1.80	1.89	0.05
							4" Ice	2.80	2.85	0.08
2' Sidearm - Round (GPD)	C	From Leg	1.00	0.00	0.0000	75.00	No Ice	0.80	0.93	0.03
			0.00				1/2" Ice	1.05	1.17	0.03
							1" Ice	1.30	1.41	0.04
							2" Ice	1.80	1.89	0.05
							4" Ice	2.80	2.85	0.08
GPS	B	From Leg	1.00	0.00	0.0000	13.00	No Ice	0.17	0.17	0.00
			0.00				1/2" Ice	0.24	0.24	0.00
							1" Ice	0.32	0.32	0.01
							2" Ice	0.51	0.51	0.02
							4" Ice	1.02	1.02	0.06
1' Sidearm - Flat (GPD)	B	From Leg	0.50	0.00	0.0000	13.00	No Ice	0.80	0.80	0.02
							1/2" Ice	1.05	1.00	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	1.30	1.20	0.03
						2" Ice	1.80	1.60	0.04
						4" Ice	2.80	2.40	0.06

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	10' Dipole	27	1.364	0.0260	0.0213	302519
158.00	Rohn 12' Boom Gate	27	1.374	0.0277	0.0239	302519
154.00	800MHz 2x50w	27	1.395	0.0308	0.0292	252100
148.00	4' Yagi	27	1.428	0.0339	0.0368	126050
145.75	Guy	27	1.441	0.0344	0.0396	106151
142.00	8' Frame	27	1.464	0.0339	0.0442	95290
137.00	4' Sidearm - Flat (GPD)	27	1.496	0.0306	0.0498	498885
120.00	RR90-17-02DP w/ Mount Pipe	27	1.579	0.0135	0.0623	23428
86.00	Guy	27	1.437	0.0256	0.0964	30777
75.00	GPS-TMG-HR-26NCM	27	1.397	0.0246	0.1066	148739
13.00	GPS	27	0.394	0.1338	0.1176	53218

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	160	Leg	A325N	0.6250	12	2.49	12.89	0.193 ✔	1	Bolt DS
		Diagonal	A325N	0.6250	2	2.86	9.58	0.299 ✔	1.333	Member Block Shear
		Horizontal	A325N	0.6250	2	0.47	4.79	0.098 ✔	1.333	Member Block Shear
T2	141	Leg	A325N	0.6250	12	4.22	12.89	0.328 ✔	1.333	Bolt DS
		Diagonal	A325N	0.6250	1	4.27	6.44	0.662 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	1	1.23	4.55	0.270 ✔	1.333	Member Block Shear
T3	121	Leg	A325N	0.6250	12	3.11	12.89	0.241 ✔	1	Bolt DS
		Diagonal	A325N	0.6250	1	2.48	5.10	0.486 ✔	1.333	Member Bearing
		Horizontal	A325N	0.6250	1	1.23	4.55	0.269 ✔	1.333	Member Block Shear
T4	101	Leg	A325N	0.6250	12	3.27	12.89	0.254 ✔	1	Bolt DS
		Diagonal	A325N	0.6250	1	4.46	6.44	0.693 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	1	2.01	4.55	0.441 ✔	1.333	Member Block Shear
T5	86	Leg	A325N	0.6250	12	4.02	12.89	0.312 ✔	1	Bolt DS
		Diagonal	A325N	0.6250	1	4.23	6.44	0.657 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	1	0.63	4.55	0.139 ✔	1	Member Block Shear

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
T6	66	Leg	A325N	0.6250	12	5.73	12.89	0.445 ✔	1.333	Bolt DS
		Diagonal	A325N	0.6250	1	2.62	6.44	0.407 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	1	0.67	4.55	0.147 ✔	1	Member Block Shear
T7	46	Leg	A325N	0.6250	12	4.44	12.89	0.345 ✔	1	Bolt DS
		Diagonal	A325N	0.6250	1	2.09	6.44	0.325 ✔	1.333	Bolt Shear
		Horizontal	A325N	0.6250	1	0.70	4.55	0.155 ✔	1	Member Block Shear
T8	26	Leg	A325N	0.7500	3	0.00	19.44	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	2.55	5.10	0.501 ✔	1.333	Member Bearing
		Horizontal	A325N	0.6250	1	0.71	4.55	0.157 ✔	1	Member Block Shear

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	160 - 141	Leg	V5x5x5/16	2	-15.63	92.01	17.0	Pass
T2	141 - 121	Leg	V5x5x5/16	29	-25.32	90.67	27.9	Pass
T3	121 - 101	Leg	V5x5x5/16	57	-26.10	90.67	28.8	Pass
T4	101 - 86	Leg	V5x5x5/16	84	-19.65	68.02	28.9	Pass
T5	86 - 66	Leg	V5x5x5/16	105	-24.11	68.02	35.5	Pass
T6	66 - 46	Leg	V5x5x5/16	132	-34.39	90.67	37.9	Pass
T7	46 - 26	Leg	V5x5x5/16	159	-34.84	90.67	38.4	Pass
T8	26 - 6	Leg	V5x5x5/16	186	-28.40	68.02	41.7	Pass
T9	6 - 0	Leg	V5x5x5/16	213	-31.06	71.83	43.2	Pass
T1	160 - 141	Diagonal	2L2 1/2x2 1/2x3/16	9	-6.60	29.65	22.3	Pass
T2	141 - 121	Diagonal	L2 1/2x2 1/2x3/16	54	-4.27	8.04	53.1	Pass
T3	121 - 101	Diagonal	L2 1/2x2 1/2x3/16	61	-3.01	8.04	37.4	Pass
T4	101 - 86	Diagonal	L2 1/2x2 1/2x3/16	88	-4.46	8.04	55.5	Pass
T5	86 - 66	Diagonal	L2 1/2x2 1/2x3/16	129	-4.23	8.04	52.6	Pass
T6	66 - 46	Diagonal	L2 1/2x2 1/2x3/16	156	-2.62	8.04	32.6	Pass
T7	46 - 26	Diagonal	L2 1/2x2 1/2x3/16	163	-2.09	8.04	26.0	Pass
T8	26 - 6	Diagonal	L2 1/2x2 1/2x3/16	198	-3.16	8.04	39.3	Pass
T9	6 - 0	Diagonal	L2 1/2x2 1/2x3/16	222	-0.60	10.30	5.8	Pass
T1	160 - 141	Horizontal	L2 1/2x2 1/2x3/16	24	-0.91	15.04	6.0	Pass
T2	141 - 121	Horizontal	L2x2x3/16	31	1.23	16.65	7.4	Pass
T3	121 - 101	Horizontal	L2x2x3/16	60	1.23	16.65	7.4	Pass
T4	101 - 86	Horizontal	L2x2x3/16	85	-1.67	10.17	16.5	Pass
T5	86 - 66	Horizontal	L2x2x3/16	119	-0.42	7.63	5.5	Pass
T6	66 - 46	Horizontal	L2x2x3/16	134	-0.60	10.17	5.9	Pass
T7	46 - 26	Horizontal	L2x2x3/16	161	-0.46	7.63	6.1	Pass
T8	26 - 6	Horizontal	L2x2x3/16	188	-0.49	7.63	6.4	Pass
T9	6 - 0	Horizontal	L2 1/2x2 1/2x3/16	215	6.61	19.48	33.9	Pass
T1	160 - 141	Top Girt	L2 1/2x2 1/2x3/16	5	-0.66	14.28	4.6	Pass
T1	160 - 141	Guy A@145.75	3/4	236	12.34	29.15	42.3	Pass
T5	86 - 66	Guy A@86	5/8	243	10.79	21.20	50.9	Pass
T1	160 - 141	Guy B@145.75	3/4	230	12.95	29.15	44.4	Pass
T5	86 - 66	Guy B@86	5/8	242	11.58	21.20	54.6	Pass
T1	160 - 141	Guy C@145.75	3/4	223	12.82	29.15	44.0	Pass
T5	86 - 66	Guy C@86	5/8	241	11.31	21.20	53.4	Pass
T1	160 - 141	Top Guy Pull-Off@145.75	L2 1/2x2 1/2x3/16	17	-2.54	16.06	15.8	Pass
T5	86 - 66	Top Guy	L 2 x 2 x 3/16	106	5.81	20.59	28.2	Pass

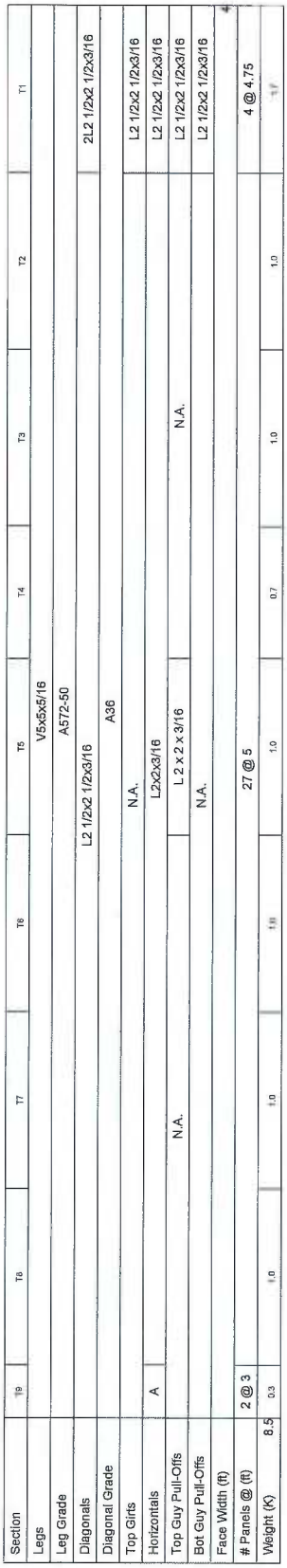
tnxTower	Job	Page
	SNET020 NORFOLK	9 of 9
GPD Group 520 S. Main Street Akron, OH 44311 Phone: 330.572.2201 FAX:	Project 2015723.01.SNET020.03	Date 14:20:23 01/28/15
	Client AT&T Towers	Designed by jdischinger

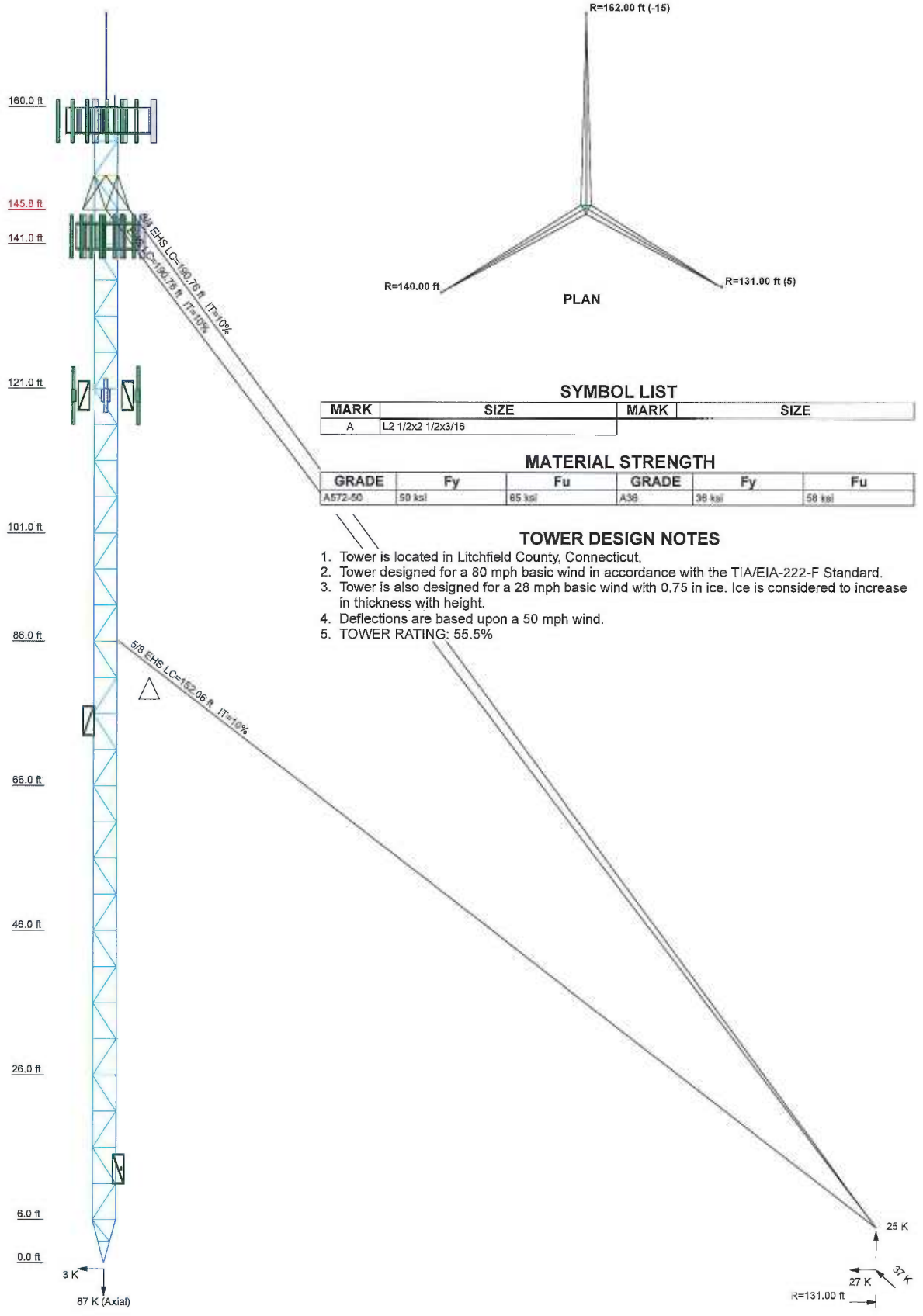
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	160 - 141	Pull-Off@86 Bottom Guy Pull-Off@145.75	L2 1/2x2 1/2x3/16	10	4.96	25.97	19.1	Pass
T1	160 - 141	Torque Arm Top@145.75	2L2 1/2x2x1/4	237	8.07	46.01	17.5	Pass
T1	160 - 141	Torque Arm Bottom@145.75	2L3x2 1/2x1/4	239	-7.98	64.09	12.4	Pass

Summary	ELC:	Existing/Proposed
Leg (T9)	43.2	Pass
Diagonal (T4)	55.5	Pass
Horizontal (T9)	33.9	Pass
Top Girt (T1)	4.6	Pass
Guy A (T5)	50.9	Pass
Guy B (T5)	54.6	Pass
Guy C (T5)	53.4	Pass
Top Guy Pull-Off (T5)	28.2	Pass
Bottom Guy Pull-Off (T1)	19.1	Pass
Torque Arm Top (T1)	17.5	Pass
Torque Arm Bottom (T1)	12.4	Pass
Bolt Checks	52.0	Pass
Rating =	55.5	Pass

APPENDIX C

Tower Elevation Drawing





PLAN

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x3/16		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

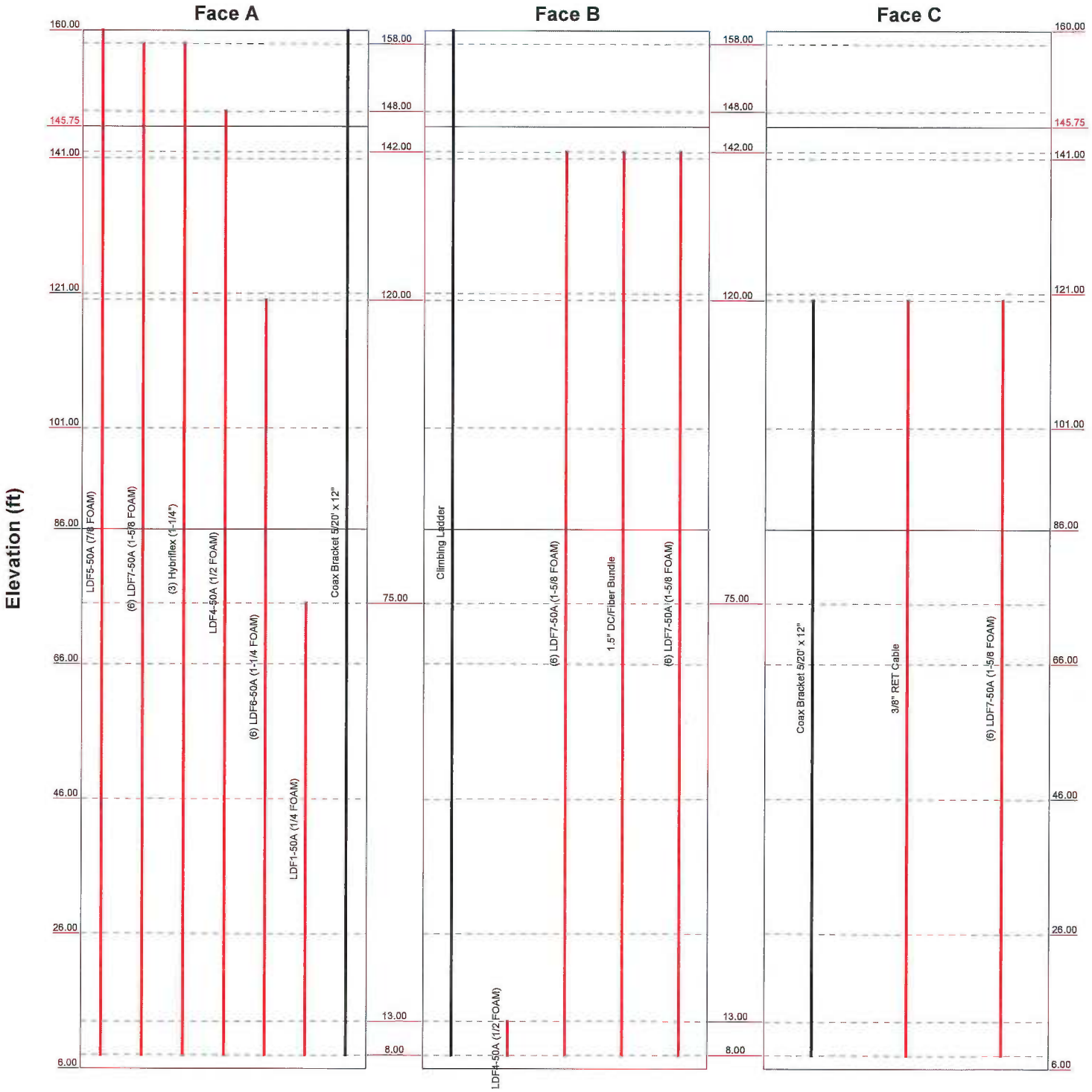
1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 55.5%

GPD Group
520 S. Main Street
Akron, OH 44311
Phone: 330.572.2201
FAX:

Job: SNET020 NORFOLK		
Project: 2015723.01.SNET020.03		
Client: AT&T Towers	Drawn by: jdischinger	App'd:
Code: TIA/EIA-222-F	Date: 01/28/15	Scale: NTS
Path: N:\2011\AT and T\SNET020\5 2015723.01.SNET020.03 AT&T SAITN\SNET020 Tower.gri		Dwg No. E-1

Feed Line Distribution Chart
6' - 160'

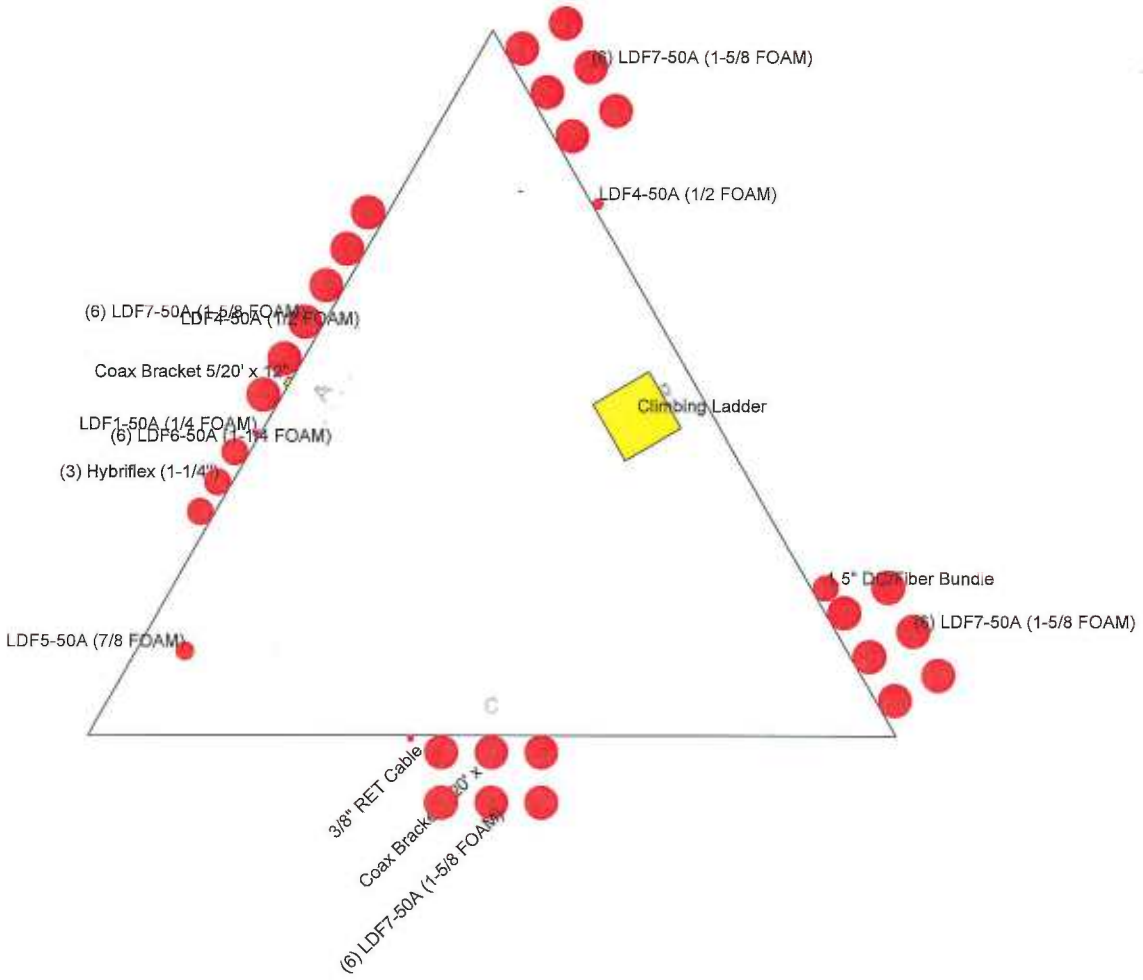
Round | Flat | App In Face | App Out Face | Truss Leg



GPD Group 520 S. Main Street Akron, OH 44311 Phone: 330.572.2201 FAX:	Job: SNET020 NORFOLK		
	Project: 2015723.01.SNET020.03		
	Client: AT&T Towers	Drawn by: jdischinger	App'd:
	Code: TIA/EIA-222-F	Date: 01/28/15	Scale: NTS
	Path: N:\2011\AT and T\SNET020\5 2015723.01 SNET020.03 AT&T SAT NX\SNET020 Tower.en		Dwg No. E-7

Feed Line Plan

Round Flat App In Face App Out Face



GPD Group 520 S. Main Street Akron, OH 44311 Phone: 330.572.2201 FAX:	Job: ***SNET020 NORFOLK***		
	Project: ***2015723.01.SNET020.03***		
	Client: AT&T Towers	Drawn by: jdischinger	App'd:
	Code: TIA/EIA-222-F	Date: 01/28/15	Scale: NTS
	Path: N:\2011\ATandT\SNET020\2015723.01.SNET020.03 AT&T SAVINX\SNET020 Tower.pri		Dwg No. E-7

APPENDIX D

Foundation Analysis

GPD GROUP

Mat Foundation Analysis
SNET020 / NORFOLK
2015723.01.SNET020.03

General Info	
Code	TIA/EIA-222-F (ASD)
Bearing On	Rock
Foundation Type	Guyed Pad
Pier Type	Square
Reinforcing Known	Yes
Max Capacity	1.05

Tower Reactions		
Moment, M	0	k-ft
Axial, P	87.42	k
Shear, V	3.05	k

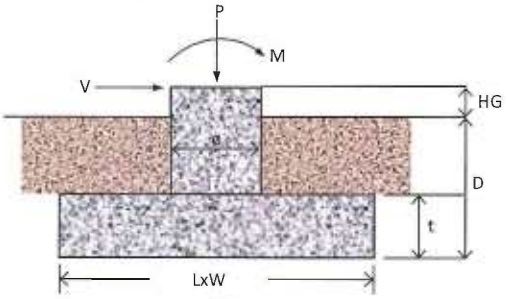
Pad & Pier Geometry		
Pier Width, ø	0	ft
Pad Length, L	4	ft
Pad Width, W	4	ft
Pad Thickness, t	4	ft
Depth, D	3.5	ft
Height Above Grade, HG	0.5	ft

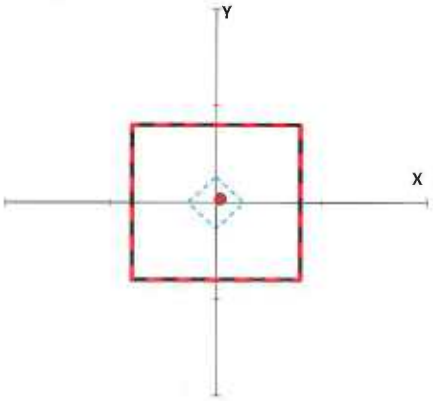
Pad & Pier Reinforcing		
Rebar Fy	60	ksi
Concrete Fc'	3	ksi
Clear Cover	3	in
Reinforced Top & Bottom?	Yes	
Pad Reinforcing Size	# 8	
Pad Quantity Per Layer	6	
Pier Rebar Size		
Pier Quantity of Rebar		

Soil Properties		
Soil Type	Cohesive	
Soil Unit Weight	135	pcf
Cohesion, Cu	2.5	ksf
Bearing Type	Net	
Ultimate Bearing	15	ksf
Water Table Depth	99	ft
Frost Depth	3.33	ft

Bearing Summary			Load Case
Qxmax	7.14	ksf	1D+1W
Qymax	7.14	ksf	1D+1W
Qmax @ 45°	7.61	ksf	1D+1W
$Q_{(all)\ Gross}$	7.74	ksf	
Controlling Capacity	**98.3%**	**Pass**	

Overturning Summary (Required FS=1.5)			Load Case
FS(ot)x	15.78	≥1.5	1D+1W
FS(ot)y	15.78	≥1.5	1D+1W
Controlling Capacity	**9.5%**	**Pass**	





GPD GROUP

Base Foundation Reinforcement Check
SNET020 / NORFOLK
2015723.1.SNET020.03

Code: TIA/EIA-222-F

Tower Reactions		
Moment	0	k-ft
Axial	87.42	k
Shear	3.05	k

Overall Capacities		
Reinforcement Capacity	15.4%	OK
As Min Met?	Yes	
Controlling Capacity	**15.4%**	**OK**

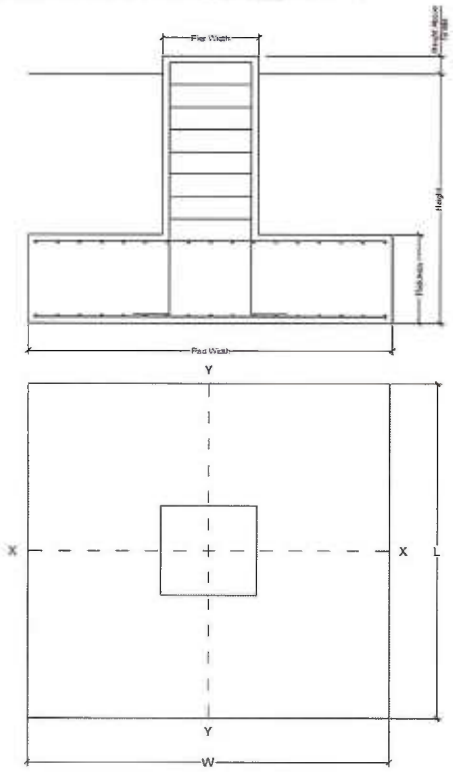
Pad & Pier Geometry		
Height	3.5	ft
Height above Grade	0.5	ft
Pad Length, L	4	ft
Pad Width, W	4	ft
Pad Thickness	4	ft
Pier Shape	Square	
Square Pier Width	0	ft

Pad & Pier Reinforcing		
Reinforcing Known	Yes	
f_c'	3	ksi
Clear Cover	3	in
Rebar Fy	60	ksi
Pad Rebar Size	# 8	
Pad Rebar Quantity	6	
Pier Rebar Size		
Pier Rebar Quantity		

Unit Weights		
Concrete Unit Weight	150	pcf
Soil Unit Weight	135	pcf

Orthogonal Bearing		
Q_{max}	7.14	ksf
Q_{min}	4.86	ksf

Pad Moment Capacity		
ϕ (bending)=	0.90	
M_u=	12.14	k-ft
ϕM_n=	225.77	k-ft
Moment Capacity	5.4%	OK
One-Way (Wide-Beam) Shear		
V_u=	2.30	psi
ϕV_n=	82.16	psi
Shear Capacity	2.8%	OK
Two-Way (Punching) Shear		
V_u=	25.25	psi
ϕV_n=	164.32	psi
Shear Capacity	15.4%	OK



GPD GROUP

Guyed Tower Anchor Foundation TIA/EIA-222-F
SNET020 NORFOLK
2015723.01.SNET020.03

Guy Anchor Location	
Azimuth/Leg	*A/B/C*
Radius	*131'*

Tower Reactions	
Vertical	24.67 k
Horizontal	27.31 k

Anchor Block Geometry	
Width	5 ft
Height	5 ft
Length	12.5 ft
Depth	4.5 ft

Soil Capacity Calcualtions		
W_s	-3.45 k	
W_c	42.19 k	
$(W_s+W_c)/1.5$	25.82 k	
$(W_s/2)+(W_c/1.25)$	32.02 k	
Uplift Resistance	25.82 k	
Horizontal Resistance	61.75 k	
Uplift Capacity=	95.5%	OK
Horizontal Capacity=	44.2%	OK

Anchor Block Reinformement	
Is Reinforcement Known?	yes
Fc'	4 ksi
Fy	60 ksi
Clear Cover	3 in
Top Bar Size	# 8
Top Bar Quantity	5
Front Bar Size	# 8
Front Bar Quantity	4
Back & Bottom Bar Size	# 8
Back & Bottom Bar Quantity	0

Reinforcement Capacity Calculations		
Moment Check		
M_u=	55.47 k-ft	
ϕM_n=	782.60 k-ft	
Moment Capacity	7.1%	OK
Minimum Reinforcment		
A_{smin} Requirements Met?	Yes	

Capacity Summary		
Soil Capacity=	95.5%	OK
Reinforcing Capacity=	7.1%	OK
Controlling Capacity=	**95.5%**	**OK**

Soil Properties						
Layer	C, psf	Ø, degrees	γ_{soil}, pcf	$\gamma_{concrete}$, pcf	μ	d, ft
1	0	0	120	150	0	2.5
2	2500	0	135	150	0.4	2.5
3						
4						
Add'l Horizontal Frictional Resistance (Ultimate)			0	k		

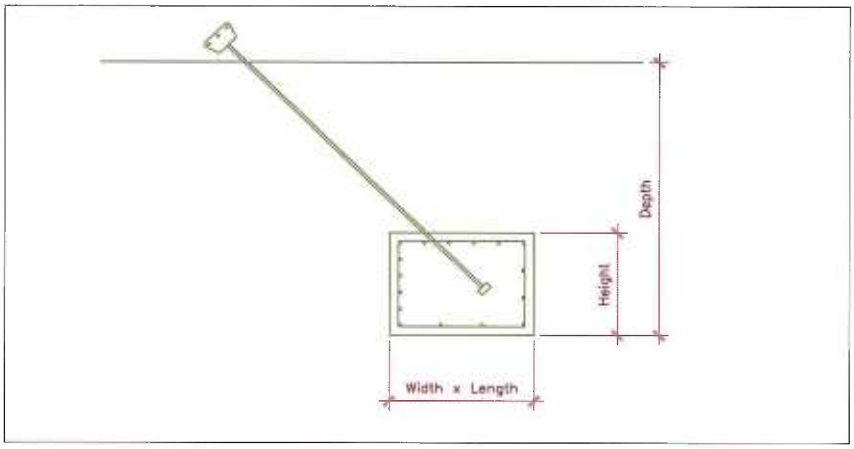


EXHIBIT C

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

T-Mobile Existing Facility

Site ID: CT11349A

Norfolk SNET
453 Loon Meadow Road
Norfolk, CT 06058

February 24, 2015

EBI Project Number: 6215001280

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	29.96 %

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

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February 24, 2015

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

Emissions Analysis for Site: **CT11349A – Norfolk SNET**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **453 Loon Meadow Road, Norfolk, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 700 MHz Band is 467 $\mu W/cm^2$, and the general population exposure limit for the PCS and AWS bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **453 Loon Meadow Road, Norfolk, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel

2) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

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

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

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

7) The antennas used in this modeling are the **EMS RR90_17_02DP** for 1900 MHz (PCS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **EMS RR90_17_02DP** has a maximum gain of **14.4 dBd** at its main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. 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.

8) The antenna mounting height centerline of the proposed antennas is **120 feet** above ground level (AGL).

9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	EMS RR90_17_02DP	Make / Model:	EMS RR90_17_02DP	Make / Model:	EMS RR90_17_02DP
Gain:	14.4 dBd	Gain:	14.4 dBd	Gain:	14.4 dBd
Height (AGL):	120	Height (AGL):	120	Height (AGL):	120
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	6	# PCS Channels:	6
Total TX Power:	240	Total TX Power:	240	# AWS Channels:	240
ERP (W):	6,610.15	ERP (W):	6,610.15	ERP (W):	6,610.15
Antenna A1 MPE%	1.83	Antenna B1 MPE%	1.83	Antenna C1 MPE%	1.83
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	120	Height (AGL):	120	Height (AGL):	120
Frequency Bands	700 Mhz	Frequency Bands	700 Mhz	Frequency Bands	700 Mhz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A2 MPE%	0.51	Antenna B2 MPE%	0.51	Antenna C2 MPE%	0.51

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**7.02**
AT&T	15.95 %
PageNet	3.38 %
Sprint	3.61 %
Site Total MPE %:	**29.96 %**

T-Mobile Sector 1 Total:	2.34 %
T-Mobile Sector 2 Total:	2.34 %
T-Mobile Sector 3 Total:	2.34 %
Site Total:	29.96 %

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Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector 1:	2.34 %
Sector 2:	2.34 %
Sector 3 :	2.34 %
T-Mobile Total:	7.02 %
Site Total:	29.96 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **29.96%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803`