EMPIRE telecom
A QualTek Company

November 11, 2016

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

RE: AT&T Wireless Modifications to Telecommunication Facility –
302 Ball Pond Rd., New Fairfield, CT 06812

Dear Ms. Bachman:

Enclosed please find and original and two (2) copies of a Notice of Exempt Modification including drawings and a check in the amount of six hundred twenty five ($625.00) for the filing fee. In addition, I have included a single copy of each notification letter mailed this day to the municipality, and the owners of both the property and tower. Copies of the RF study and structural reports (without calculations) are also included.

I will submit electronic copies of the filings including the complete structural analysis and the RF table to you via e mail today.

Please feel free to contact me with any questions or comments. Thank you for your kind cooperation in this matter.

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

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

November 11, 2016

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

NOTICE OF EXEMPT MODIFICATION

302 Ball Pond Rd., New Fairfield, CT 06812

Lat: 41-27-53.2 (41.46477778)
Long. 73-29-49 (-73.49694444)

Dear Ms. Bachman:

AT&T Wireless currently maintains nine (9) antennas at the 135 foot level of an existing 175 foot tall monopole tower located at 302 Ball Pond Rd., in New Fairfield, CT. The tower is owned by Town of New Fairfield. The property is owned by Town of New Fairfield. AT&T Wireless now seeks to replace three (3) existing RRU12 + A2 Remote Radio Units with three (3) new RRUS32B2 units. These replacement RRUs will be installed at the 135 foot level of the tower and be mounted on existing pipes next to the monopole, behind the antennas.

The facility was most recently approved by the Connecticut Siting Council in EM-CING-091-160310, dated March 28, 2016. Six (6) conditions were enumerated in the Council's decision:

1) Any deviation from the modification as specified in the Notice and supporting materials 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 antenna mounting equipment on this facility owned and operated by AT&T shall be removed within 60 days after the antenna ceased to function;
5) The validity of the action shall expire one year from the date of the letter; and
6) The applicant may 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.

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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 Susan Chapman, First Selectman of the Town of New Fairfield, and another letter to the Town of New Fairfield as both the tower owner and the property owner.

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

1. The proposed modifications will not result in an increase in height of the existing structure.

2. The proposed modifications will not require an extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that will exceed state and local limits.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

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

Respectfully submitted,

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

cc: Susan Chapman, First Selectman, Town of New Fairfield
Susan Chapman, First Selectman, Town of New Fairfield as Tower Owner and Property Owner

EMPIRE telecom
A QualTek Company

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

November 11, 2016

The Honorable Susan Chapman,
First Selectman, Town of New Fairfield
New Fairfield Town Hall
4 Brush Hill Road
New Fairfield, CT 06812

RE: AT&T Wireless Modifications to Telecommunication Facility –
302 Ball Pond Rd., New Fairfield, CT 06812

Dear Selectman Chapman:

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 135 foot level of an existing 175 foot tall monopole tower located at 302 Ball Pond Rd., in New Fairfield, CT. The tower and property are owned by Town of New Fairfield. AT&T Wireless now seeks to replace three (3) existing RRU12 + A2 Remote Radio Units with three (3) new RRUS32B2 units. These replacement RRUs will be installed at the 135 foot level of the tower and be mounted on existing pipes next to the monopole, behind the antennas.

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

EMPIRE telecom
A QualTek Company

The enclosed letter 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

EBI Consulting
environmental | engineering | due diligence

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

AT&T Existing Facility

Site ID: CT2070

New Fairfield Ctr
302 Ball Pond Road
New Fairfield, CT 06812

October 31, 2016

EBI Project Number: 6216004902

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	9.22 %

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

October 31, 2016

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

Emissions Analysis for Site: **CT2070 – New Fairfield Ctr**

EBI Consulting was directed to analyze the proposed AT&T facility located at **302 Ball Pond Road, New Fairfield, 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 public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 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 done for the proposed AT&T Wireless antenna facility located at **302 Ball Pond Road, New Fairfield, 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.

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

1) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

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

3) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 UMTS channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

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

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

8) The antennas used in this modeling are the **CCI HPA-65R-BUU-H6, CCI HPA-65R-BUU-H8 and the Powerwave 7770** for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed antennas are **135 feet** above ground level (AGL) for **Sector A**, **135 feet** above ground level (AGL) for **Sector B** and **135 feet** above ground level (AGL) for Sector C.

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

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

AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	CCI HPA-65R-BUU-H8	Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H6
Gain:	13.15 / 14.95 dBd	Gain:	13.15 / 14.95 dBd	Gain:	13.15 / 14.95 dBd
Height (AGL):	**135 feet**	Height (AGL):	**135 feet**	Height (AGL):	**135 feet**
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	6,229.75	ERP (W):	5,462.56	ERP (W):	5,462.56
Antenna A1 MPE%	**1.96 %**	Antenna B1 MPE%	**1.64 %**	Antenna C1 MPE%	**1.64 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	**135 feet**	Height (AGL):	**135 feet**	Height (AGL):	**135 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A2 MPE%	**0.60 %**	Antenna B2 MPE%	**0.60 %**	Antenna C2 MPE%	**0.60 %**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 dBd	Gain:	11.4 dBd	Gain:	11.4 dBd
Height (AGL):	**135 feet**	Height (AGL):	**135 feet**	Height (AGL):	**135 feet**
Frequency Bands	850 MHz	Frequency Bands	850 MHz	Frequency Bands	850 MHz
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts
ERP (W):	828.23	ERP (W):	828.23	ERP (W):	828.23
Antenna A3 MPE%	**0.32 %**	Antenna B3 MPE%	**0.32 %**	Antenna C3 MPE%	**0.32 %**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**2.87 %**
Town Fire Dept	0.23 %
Town Police Dept	0.15 %
Town Pub Wks Dept	0.21 %
Sprint	0.67 %
Clearwire	0.12 %
T-Mobile	2.08 %
Verizon Wireless	2.89 %
Site Total MPE %:	**9.22 %**

AT&T Sector A Total:	2.87 %
AT&T Sector B Total:	2.56 %
AT&T Sector C Total:	2.56 %
Site Total:	9.22 %

AT&T _ Frequency Band / Technology (Max for Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
AT&T 700 MHz LTE	2	1,239.23	135	5.35	700 MHz	467	1.15%
AT&T 1900 MHz (PCS) LTE	2	1,875.65	135	8.10	1900 MHz (PCS)	1000	0.81%
AT&T 850 MHz UMTS	2	414.12	135	1.79	850 MHz	567	0.32%
AT&T 1900 MHz (PCS) UMTS	2	656.33	135	2.84	1900 MHz (PCS)	1000	0.28%
AT&T 850 MHz GSM	2	414.12	135	1.79	850 MHz	567	0.32%
						Total*:	2.87%

*NOTE: Totals may vary by 0.01% due to summing of remainders

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 AT&T 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:

AT&T Sector	Power Density Value (%)
Sector A:	2.87 %
Sector B:	2.56 %
Sector C:	2.56 %
AT&T Maximum Total (per sector):	2.87 %
Site Total:	9.22 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **9.22 %** 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.

PROJECT INFORMATION

SCOPE OF WORK	UNMANNED COMMUNICATIONS FACILITY MODIFICATIONS INCLUDING THE REPLACEMENT OF EXISTING TOP MOUNTED (3) RRUS12+A2 WITH NEW (3) RRUS-32B2 UNITS, RE-USE EXISTING (1) FIBER TRUNK, EXISTING (2) DC TRUNKS, EXISTING (1) RAYCAP SURGE ARRESTOR AND ASSOCIATED JUMPER CABLES.
SITE NUMBER:	CT2070
SITE NAME:	NEW FAIRFIELD CTR
SITE ADDRESS:	302 BALL POND ROAD NEW FAIRFIELD, CT 06812
TOWER OWNER:	TOWN OF NEW FAIRFIELD 4 BRUSH HILL ROAD NEW FAIRFIELD, CT 06812
APPLICANT:	AT&T MOBILITY 550 COCHITUATE RD SUITES 13 & 14 FRAMINGHAM, MA 01701
NOC CONTACT:	TEL 866-915-5600
COORDINATES	LAT. N41°27'52.9" LONG. W73°29'49.0"
GROUND LEVEL:	±825'
DEED REFERENCE:	N/A
SITE PARCEL NO.:	N/A
CURRENT ZONING:	N/A
HORIZONTAL DATUM:	(NAD) 1983

DRAWING INDEX

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ONE CALL 1-800-922-4455

AT LEAST 2 WORKING DAYS PRIOR TO DIGGING, THE CONTRACTOR IS REQUIRED TO CONNECTICUT ONE CALL SYSTEM AT 1-800-922-4455

CONTACT & UTILITY INFORMATION

CONTACT	CONTACT	COMPANY	PHONE NO.
ENGINEERING:	MIGUEL NOBRE	VRG	(508) 981-9590
SITE ACQUISITION:	DAVID COOPER	EMPIRE	(484) 683-5349
CONSTRUCTION:	BILL DANIELS	EMPIRE	(484) 683-5349
UTILITIES			
POWER:	WORK REQUEST GROUP	NATIONAL GRID	(800) 375-7405
TELCO:	.	VERIZON	(800) 941-9900

at&t Mobility

SITE NUMBER: CT2070
SITE NAME: NEW FAIRFIELD CTR
PROJECT: LTE BWE Expansion

LOCATION MAP

DIRECTIONS: FROM ROCKY HILL, TAKE I-91 SOUTH. TAKE EXIT 18, PROCEED WEST ON I-691. CONTINUE ON I-84 WEST. TAKE I-84 WEST EXIT 6. PROCEED NORTH ON CT RT-37 NORTH (PADANARAM RD). CONTINUE ON PEMBROKE RD (RT-37). TURN LEFT ON BUSH HILL RD (RT-39). TURN RIGHT ON BALL POND RD. SITE WILL BE ON LEFT

SITE ACCESS: LOCKED GATE

APPLICABLE BUILDING CODES AND STANDARDS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH PROJECT STANDARDS AND SPECIFICATIONS. SUBCONTRACTOR 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:
CONNECTICUT STATE BUILDING CODE

ELECTRICAL CODE:
NATIONAL ELECTRICAL CODE LATEST EDITION
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
AMERICAN NATIONAL STANDARDS INSTITUTE/TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA) 222-F OR G AS APPLICABLE, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM
IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT

IEEE C62.41, RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" AND "HIGH SYSTEM EXPOSURE")

TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

ANSI T1.311, FOR TELECOM - DC POWER SYSTEMS - TELECOM, ENVIRONMENTAL PROTECTION

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.

VRG
VERTICAL RESOURCES GRP.
489 Washington Street
Auburn, MA 01501
Tel. (508) 981- 9590
Fax (508) 519 - 8939
mnobre@verticalresourcesgrp.com

EMPIRE telecom
EMPIRE TELECOM USA, LLC
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT2070
SITE NAME: NEW FAIRFIELD CENTER
302 BALL POND ROAD
NEW FAIRFIELD, CT 06812
FAIRFIELD COUNTY

at&t Mobility
550 COCHITUATE RD
SUITES 13 & 14
FRAMINGHAM, MA 01701

NO.	DATE	REVISION	BY	CHK	APP'D
2	10/31/16	GENERAL REVISIONS	E.L.P.	G.A.M.	
1	10/20/16	FOR CONSTRUCTION	E.L.P.	G.A.M.	
0	10/17/16	FOR REVIEW	E.L.P.	G.A.M.	

SCALE | DESIGNED BY: M.N. | DRAWN BY: G.A.M.

JAMES P. STRONE No. 8657 REGISTERED PROFESSIONAL ENGINEER

AT&T MOBILITY

TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
50-145	01	2

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR – PRIME CONTRACTOR
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T WIRELESS
   OEM – ORIGINAL EQUIPMENT MANUFACTURER

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

7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR.

8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND TI CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. ROUTING OF CONDUIT FOR POWER AND TELCO SHALL BE APPROVED BY OWNER OF SITE.

9. 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.

10. 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.

11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

SITE WORK GENERAL NOTES

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.

2. 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 CONTRACTOR. 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.

3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.

4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, TOP SOIL AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

5. 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, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.

6. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION.

7. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE OWNER SPECIFICATION FOR SITE SIGNAGE.

8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE TRANSMISSION EQUIPMENT AND TOWER AREAS.

9. 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.

10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION, SEE DETAIL 303.

11. THE AREAS OF THE OWNERS 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.

12. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL JURISDICTION'S GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

13. ALL EARTH WORK SHALL BE PERFORMED IN ACCORDANCE WITH TECHNICAL SPECIFICATION FOR CONSTRUCTION OF RADIO ACCESS NETWORK SITES.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 (HOT-DIP) UNLESS NOTED OTHERWISE. STRUCTURAL STEEL SHALL BE ASTM-A-36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE PERFORMED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".

2. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". PAINTED SURFACES SHALL BE TOUCHED UP.

3. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE. STEEL FASTENER HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 (HOT-DIP)

4. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.

5. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD, HILTI OR APPROVED EQUAL.

6. ALL STRUCTURAL STEEL SHALL BE SUPPLIED IN ACCORDANCE WITH TECHNICAL SPECIFICATION FOR CONSTRUCTION OF RADIO ACCESS NETWORK SITES.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.

2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000 PSI) MAY BE USED.

3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.

4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:

   #6 AND LARGER .....2 INCH
   #5 AND SMALLER & WWF.....1 1/2 INCH

   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:

   SLAB AND WALL .....3/4 INCH
   BEAMS AND COLUMNS.....1 1/2 INCH

5. A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD, HILTI OR APPROVED EQUAL.

7. CONCRETE CYLINDER TEST IS NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC 1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER;
   (A) RESULTS OF CONCRETE CYLINDER TESTS PERFORMED AT THE SUPPLIER'S PLANT,

   (B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.

   FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.

8. AS AN ALTERNATIVE TO ITEM 7, TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.

9. EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

10. ALL CONCRETE SHALL BE SUPPLIED IN ACCORDANCE WITH TECHNICAL SPECIFICATION FOR CONSTRUCTION OF RADIO ACCESS NETWORK SITES.

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

1. EXCAVATE AS REQUIRED TO REMOVE VEGETATION AND TOPSOIL, EXPOSE UNDISTURBED NATURAL SUBGRADE AND PLACE CRUSHED STONE AS REQUIRED.

2. COMPACTION CERTIFICATION: AN INSPECTION AND WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.

3. AS AN ALTERNATIVE TO INSPECTION AND WRITTEN CERTIFICATION, THE "UNDISTURBED SOIL" BASE SHALL BE COMPACTED WITH "COMPACTION EQUIPMENT", LISTED BELOW, TO AT LEAST 90% MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557 METHOD C.

4. COMPACTED SUBBASE SHALL BE UNIFORM AND LEVELED. PROVIDE 6" MINIMUM CRUSHED STONE OR GRAVEL COMPACTED IN 3" LIFTS ABOVE COMPACTED SOIL. GRAVEL SHALL BE NATURAL OR CRUSHED WITH 100% PASSING 1" SIEVE.

5. AS AN ALTERNATIVE TO ITEMS 2 AND 3 PROOF ROLL THE SUBGRADE SOILS WITH 5 PASSES OF A MEDIUM SIZED VIBRATORY PLATE COMPACTOR (SUCH AS BOMAG BPR 30/38) OR HAND-OPERATED SINGLE DRUM VIBRATORY ROLLER (SUCH AS BOMAG BW 55E). ANY SOFT AREAS THAT ARE ENCOUNTERED SHOULD BE REMOVED AND REPLACED WITH A WELL-GRADED GRANULAR FILL, AND COMPACTED AS STATED ABOVE.

6. COMPACTION CRITERIA FOR OTHER FILL AREAS ON SITE SHALL MEET THE SAME REQUIREMENTS AS NOTED ABOVE.

7. SOIL COMPACTION SHALL BE PERFORMED IN ACCORDANCE WITH TECHNICAL SPECIFICATION FOR CONSTRUCTION OF RADIO ACCESS NETWORK SITES.

COMPACTION EQUIPMENT:

HAND OPERATED DOUBLE DRUM, VIBRATORY ROLLER, VIBRATORY PLATE COMPACTOR OR JUMPING JACK COMPACTOR.

ELECTRICAL INSTALLATION NOTES

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.

2. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.

3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.

4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.

5. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.

6. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA.

7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH PERMANENT LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S). NO HAND WRITTEN LABELS ALLOWED.

8. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED. NO HAND WRITTEN LABELS ALLOWED.

9. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.

10. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.

11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (SIZE 6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.

12. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.

13. ALL POWER AND POWER GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).

14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.

ELECTRICAL INSTALLATION NOTES (cont.)

15. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

16. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.

17. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.

18. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.

19. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.

20. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.

21. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.

22. WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.

23. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS

24. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.

25. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.

26. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

27. THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

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FAIRFIELD COUNTY

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FRAMINGHAM, MA 01701

NO.	DATE	REVISION	BY	CHK	APP'D
3	10/31/16	GENERAL REVISIONS	E.L.P.	G.A.M.	
2	10/20/16	FOR CONSTRUCTION	E.L.P.	G.A.M.	
1	10/17/16	FOR REVIEW	E.L.P.	G.A.M.	

SCALE | DESIGNED BY: M.N. | DRAWN BY: G.A.M.

STATE OF CONNECTICUT — JAMES P. STRONE — No. 8657 — REGISTERED PROFESSIONAL ENGINEER

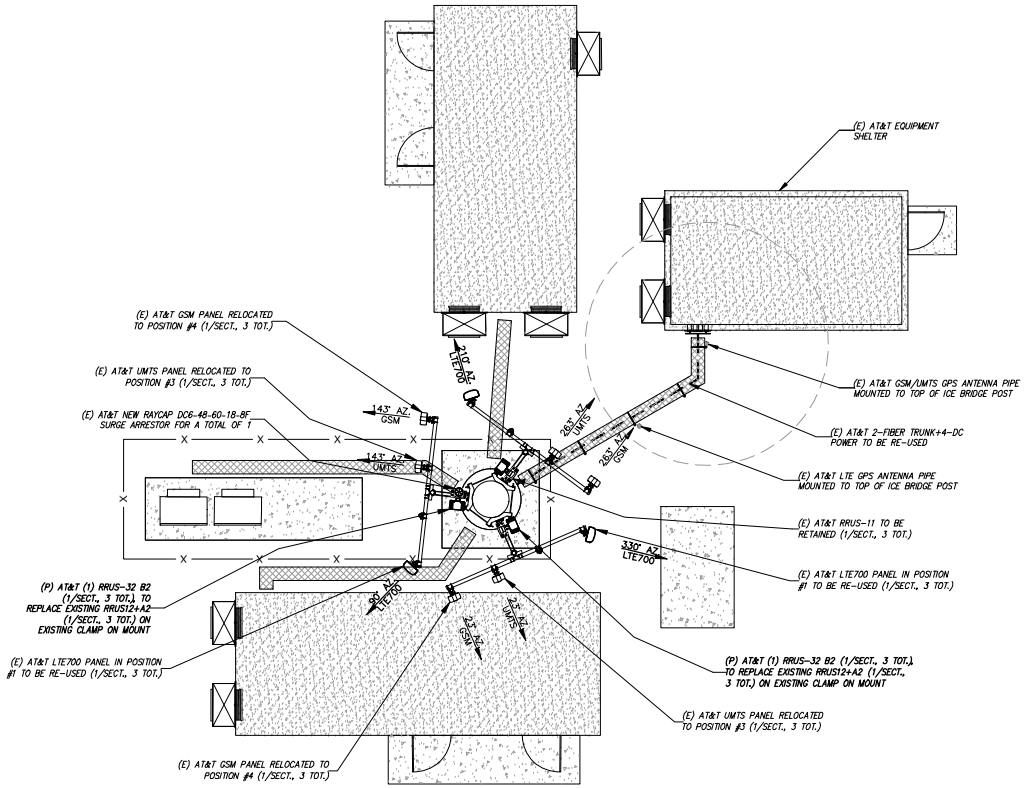
AT&T MOBILITY

NOTES

JOB NUMBER	DRAWING NUMBER	REV
50-145	02	2

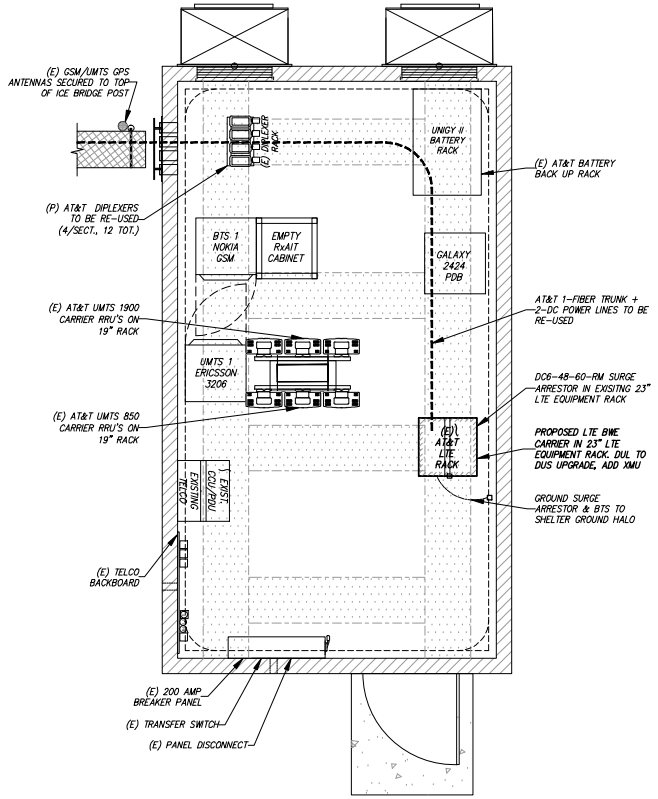
GENERAL NOTES

1. THE TYPE, DIMENSIONS, MOUNTING HARDWARE, AND THE POSITIONS OF ALL EQUIPMENT IN THE COMPOUND ARE SHOWN IN ILLUSTRATIVE FASHION. THESE DRAWINGS ARE NOT INTENDED FOR CONSTRUCTION. ACTUAL HARDWARE DETAILS AND FINAL LOCATIONS MAY DIFFER SLIGHTLY FROM WHAT IS SHOWN.
2. THE CELLULAR INSTALLATION IS AN UNMANNED PRIVATE AND SECURED COMPOUND. 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. CONSTRUCTION, MAINTENANCE & OPERATION OF PROPOSED TOWER FACILITY WILL BE HELD IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE & FEDERAL REGULATIONS AND GUIDELINES.



COMPOUND PLAN 1/03
SCALE: 1" = 8'

GRAPHIC SCALE
(IN FEET)
1 inch = 8 ft.



EQUIPMENT PLAN 2/03
SCALE: 1" = 2'

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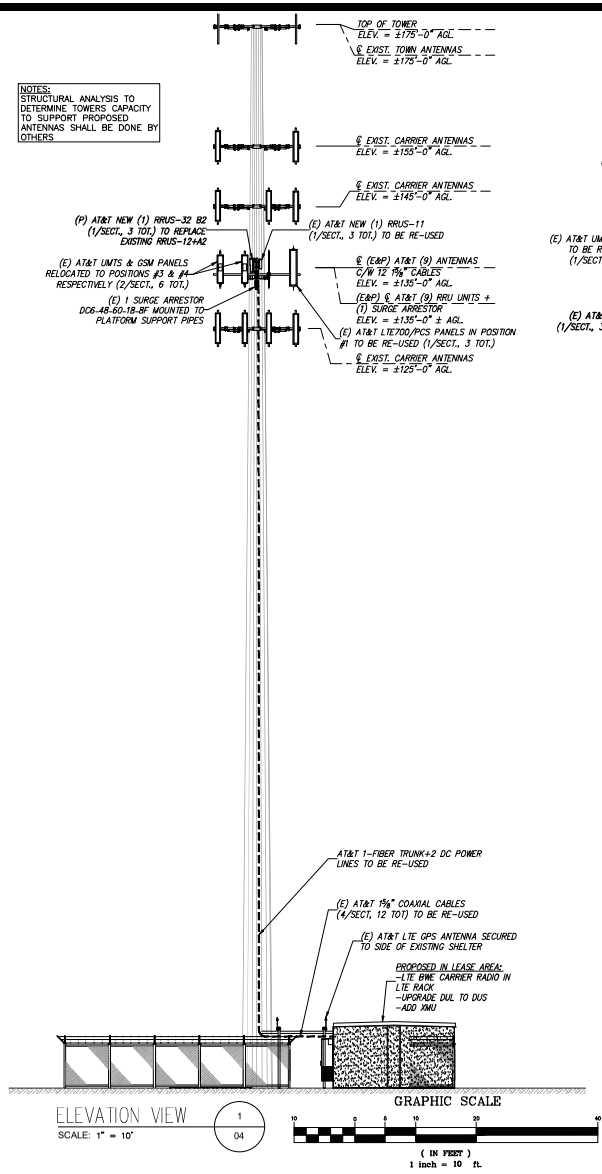
SCALE | DESIGNED BY: M.N. | DRAWN BY: G.A.M.

STATE OF CONNECTICUT — JAMES S. PRONE — No. 8657 — REGISTERED PROFESSIONAL ENGINEER

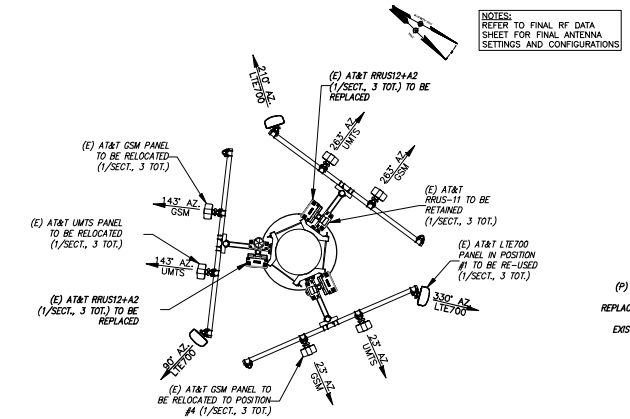
AT&T MOBILITY

SITE PLAN & EQUIPMENT PLAN

JOB NUMBER	DRAWING NUMBER	REV
50-145	03	2



ELEVATION VIEW 1/04
SCALE: 1" = 10'



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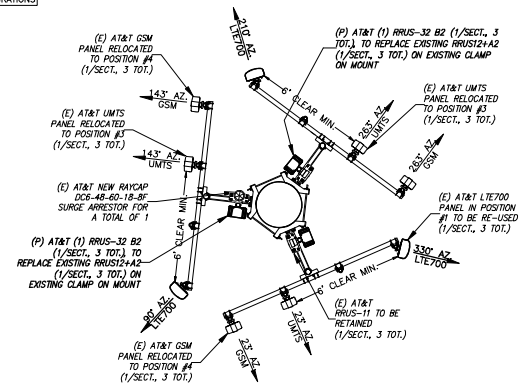
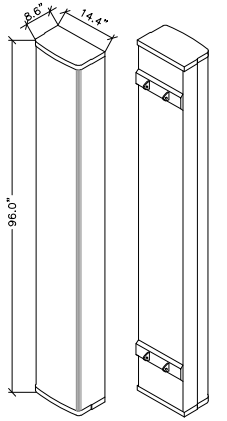


PROPOSED

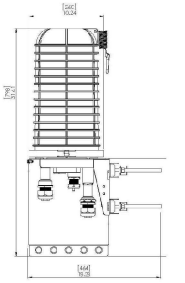
ANTENNA MOUNTING PLAN VIEW 2/04
SCALE: N.T.S.



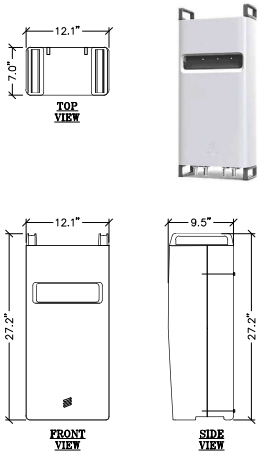
ISOMETRIC FRONT VIEW

ISOMETRIC REAR VIEW

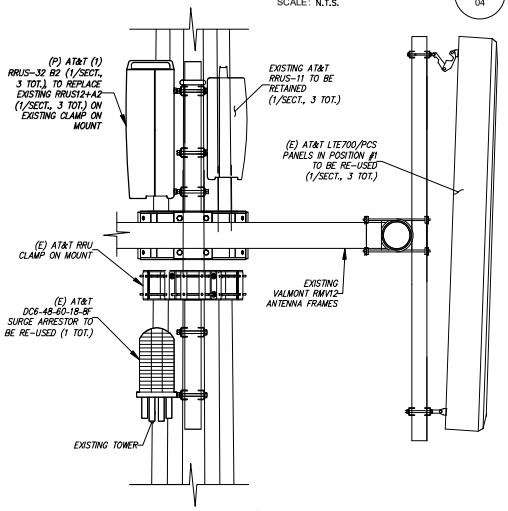
LTE CCI HEXPORT PANEL ANTENNA 3/04
SCALE: N.T.S.



RAYCAP SURGE SUPPRESSOR DC64860188F 5/04
SCALE: N.T.S.



PROPOSED ERICSSON DUAL PA RRH 6/04
SCALE: N.T.S.



PROPOSED RRU'S & SURGE ARRESTOR MOUNTING DETAIL 7/04
SCALE: N.T.S.

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SCALE | DESIGNED BY: M.N. | DRAWN BY: G.A.M.

JAMES P. ST. PIERRE No. 8657 REGISTERED PROFESSIONAL ENGINEER

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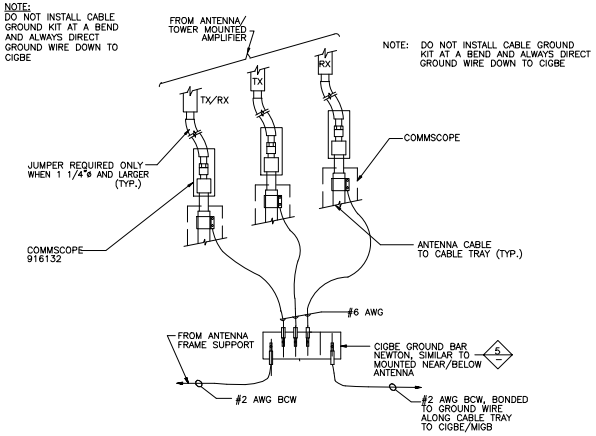
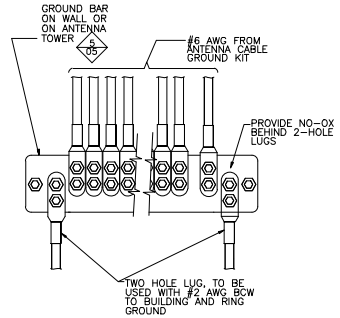
ELEVATION VIEW & ANTENNA LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
50-145	04	2



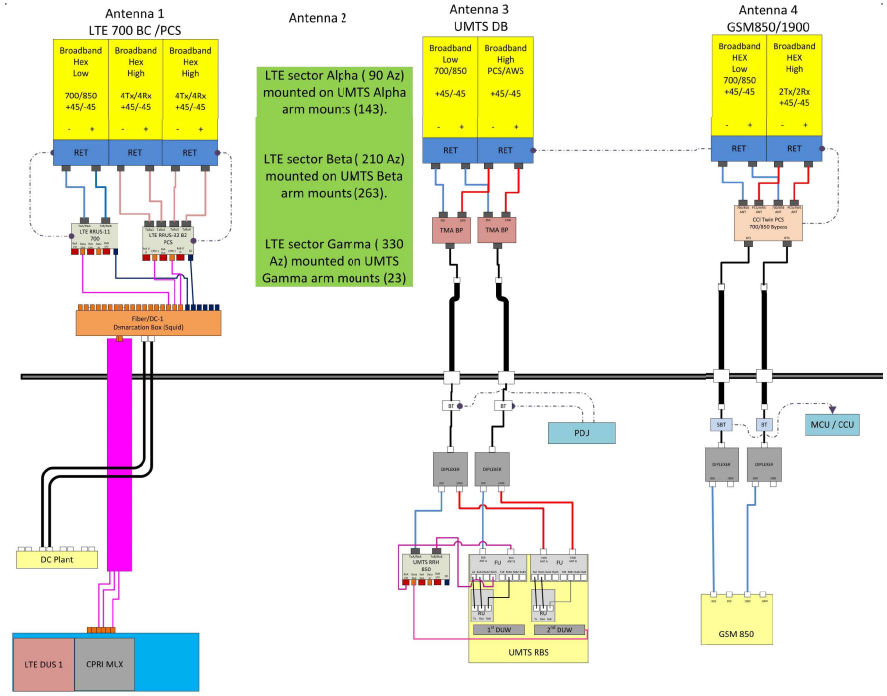
CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) 1/05

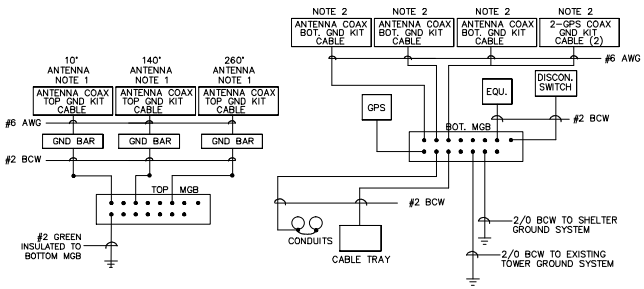
SCALE: N.T.S.



INSTALLATION OF GROUND WIRE TO GROUND BAR 2/05

SCALE: N.T.S.

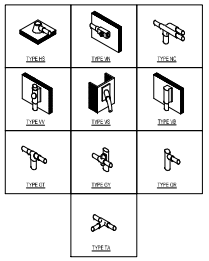




NOTE:
1. BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGBE
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGBE

SCHEMATIC GROUNDING DIAGRAM 4/05

SCALE: N.T.S.



GROUNDING CONNECTION DETAIL 5/05

SCALE: N.T.S.

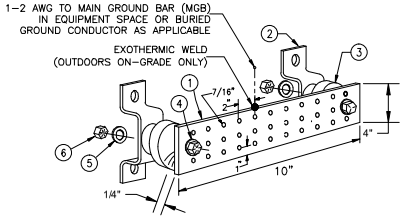
NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS
2. INSTALL ALL EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS

PLUMBING DIAGRAM FACE 3/05

SCALE: N.T.S.

NEWTON INSTRUMENT COMPANY, INC.
BUTNER, N.C. OR APPROVED EQUAL

ITEM	REQ.	PART NO.	DESCRIPTION
1	1	1/4"x4"x12"	PRE DRILLED GND. BAR
2	2	A-6056	WALL MTG. BRKT.
3	2	3061-4	INSULATORS
4	2	3012-13	5/8"-11x4" H.H.C.S.
5	4	3015-8	5/8 LOCKWASHER
6	2	3014-8	5/8"-11 HEX NUT



GROUND BAR DETAIL 6/05

SCALE: N.T.S.

VRG
VERTICAL RESOURCES GRP.
489 Washington Street
Auburn, MA 01501
Tel. (508) 981- 9590
Fax (508) 519 - 8939
mnobre@verticalresourcesgrp.com

EMPIRE telecom
EMPIRE TELECOM USA, LLC
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT2070
SITE NAME: NEW FAIRFIELD CENTER
302 BALL POND ROAD
NEW FAIRFIELD, CT 06812
FAIRFIELD COUNTY

at&t Mobility
550 COCHITUATE RD
SUITES 13 & 14
FRAMINGHAM, MA 01701

NO.	DATE	REVISION	BY	CHK	APP'D
3	10/31/16	GENERAL REVISIONS	E.L.P.	G.A.M.	
2	10/20/16	FOR CONSTRUCTION	E.L.P.	G.A.M.	
1	10/17/16	FOR REVIEW	E.L.P.	G.A.M.	

SCALE | DESIGNED BY: M.N. | DRAWN BY: G.A.M.

JAMES M. STRONE No. 8657 REGISTERED PROFESSIONAL ENGINEER

AT&T MOBILITY

GROUNDING DETAILS

JOB NUMBER	DRAWING NUMBER	REV
50-145	05	2

Rigorous Structural Analysis Report

AT&T - New Fairfield Center #CT2070 / FA #10035312

Owner: Town of New Fairfield

New Fairfield, Connecticut

November 02, 2016

MEI PROJECT ID: CT01113M-16V0

17950 PRESTON ROAD, SUITE 720 ▪ DALLAS, TEXAS 75252 ▪ TEL. 972-783-2578 FAX 972-783-2583

www.maloufengineering.com

MALOUF ENGINEERING INTL., INC.

STRUCTURAL CONSULTANTS

November 02, 2016

Mr. Miguel Nobre
Vertical Resources Group
Auburn, MA 01501

RIGOROUS STRUCTURAL ANALYSIS

Structure/Make/Model:	175 ft **Monopole**		Fredd A. Nudd / MJ-180	
Client/Site Name/#:	**Vertical Resources Group / AT&T**		**New Fairfield Center #CT2070 / FA #10035312**	
Owner/Site Name/#:	Town of Fairfield		New Fairfield Center	
MEI Project ID:	**CT01113M-16V0**			
Location:	302 Ball Pond Rd New Fairfield, CT 06812		Fairfield County FCC #N/A	
	LAT	41-27-52.98 N	LON	73-29-49.03 W

EXECUTIVE SUMMARY:

Malouf Engineering Int'l (MEI), as requested, has performed a rigorous structural analysis of the above mentioned structure to assess the impact of the changed condition as noted in Table 1.

Based on the stress analysis performed, the existing structure **is in conformance** with the Connecticut Building Code / Int'l Building Code (IBC) / ANSI/TIA-**222-G** Standard for the loading considered under the criteria listed and referenced in the report sections – tower rated at 73.7% - Pole.

The installation of the proposed changed condition as noted in Table 1 is structurally acceptable. Please refer to Appendix 1 for Schematic Lines Layout.

MEI appreciates the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or other projects please contact us.

Respectfully submitted,

MALOUF ENGINEERING INT'L, INC.

Analysis performed by:

Helder Lopez, PE
Sr. Project Engineer

Reviewed & Approved by:

E. Mark Malouf, PE
Connecticut #17715
972-783-2578 ext. 106
mmalouf@maloufengineering.com

11/2/2016

TABLE OF CONTENTS

1. INTRODUCTION & SCOPE

A rigorous structural analysis was performed by Malouf Engineering Int'l (MEI), as requested and authorized by Mr. Miguel Nobre, Vertical Resources Group, on behalf of AT&T, to determine the acceptance of the proposed changed conditions in conformance with the CT BC / IBC / ANSI/TIA-222-G Standard, "*Structural Standard for Antenna Supporting Structures and Antennas*". The scope of this independent analysis is to determine the overall stability and the adequacy of structural members, foundations, and member connections, as available and stated. This analysis considers the structure to have been properly installed and maintained with no structural defects. Installation procedures and related loading are not within the scope of this analysis and should be performed and evaluated by a competent person of the erection contractor.

The different report sections detail the applicable information used in this evaluation, relating to the tower data, the appurtenances configuration and the wind and ice loading considered.

2. SOURCE OF DATA

The following information has been used in this evaluation as source data that accurately represent the existing structure and the related appurtenances:

	Source	Information	Reference
STRUCTURE			
Tower	MEI Records	Previous Structural Analysis	ID CT01113M-08V0 Dated 05/09/2008
		Fredd A. Nudd Tower Design Drawing	Dated 03/19/2003 Rev. C
	Vertical Resources / Mr. Miguel Nobre	Infinigy Structural Analysis	Job #158-093 Dated 02/16/2016
Foundation	MEI Records	Previous Structural Analysis	ID CT01113M-08V0 Dated 05/09/2008
	MEI Records	Fredd A. Nudd Foundation Design Dwg	Dated 03/19/2003 Rev. C
	No geotechnical report provided – soil parameters as per URS analysis report.		
Material Grade	Available from supplied documents noted above-refer to Appendix		
CURRENT APPURTENANCES			
	Vertical Resources / Mr. Miguel Nobre	Infinigy Structural Analysis	Job #158-093 Dated 02/16/2016
		Tower Photos	Dated 10/15/2016
CHANGED CONDITION			
	Vertical Resources / Mr. Miguel Nobre	E-mail Instructions	Dated 10/31/2016
		AT&T RF Data Sheet	Dated 06/10/2016
		AT&T CDs	Dated 10/17/2016

Background Information:

Based on available information, the following is known regarding this structure:

DESIGNER / FABRICATOR	Fredd A. Nudd / MJ-180
ORIGINAL DESIGN CRITERIA	TIA/EIA 222-F– 85 Mph + 0.50" Ice
PRIOR STRUCTURAL MODIFICATIONS	As per Infinigy modification design Project #379-016 dated 04/24/2015 – considered properly installed.

3. ANALYSIS CRITERIA

The structural analysis performed used the following criteria:

CODE / STANDARD	2016 Connecticut Building Code / 2012 Int'l Bldg Code / ANSI/TIA-222-G-2 Standard	
LOADING CASES	*Full Wind*:	115 Mph ultimate gust [equiv. 90 Mph (3-sec gust)] w/No Radial Ice**
	Iced Case:	50 Mph + 3/4" Radial Ice
	Service:	60 Mph
STRUCTURE CRITERIA	*Structure Classification*: Class II	
	Exposure Category: 'C' – *Topographic Category:* 1	

Appurtenances Configuration

The following appurtenances configuration is denoted by the *summation of Tables 1 & 2*:

Table 1: Tenant with Changed Condition Appurtenances Configuration

Elev (ft)	Tenant	Ants Qty	Appurtenance Model / Description	Mount Description	Lines Qty	Line size & Location
135	*AT&T*	*3*	*RRUS-32 B2 Boxes*	*[Onto Close Contact Mount]*		
Current Appurtenances To Remain						
135	AT&T	6	7770.00 Panel Antennas	(3) LP T-Arm Mounts	12 2 1	1-5/8" 5/8" DC Power 3/8" Fiber-(I)
		1	HPA-65R-BUU-H8 Panel Antenna			
		2	HPA-65R-BUU-H6 Panel Antennas			
		6	LGP21401 TMAs			
		3	DTMABP7819VG12A Twin TMAs			
		3	RRUS-11 Boxes	Close Contact Mount		
		1	Raycap DC6-48-60-18-8F Suppressor			
Current Appurtenances To Be Removed						
135	AT&T	3	RRUS-12 w/ A2 Backpack			

Table 2: Remaining Tenants Current and Reserved/Future Appurtenances

Elev (ft)	Tenant	Ants Qty	Appurtenance Model / Description	Mount Description	Lines Qty	Line size & Location
175	Town	1	Lightning Rod	LP Platform Mount (w/ Empty Pipes)		
		4	PD220 Omni Antennas		4	1-5/8" -(I)
		1	1ft Square Panel Antenna		1	1/2" -(I)
		1	2ft Dia. Dish w/ Radome		1	1/2" -(I)
155	Sprint	2	RR65-18-02DP Panel Antennas	LP Platform Mount	4	Hybrid Cables-(I)
		1	RR45-19-02DPL4 Panel Antenna			
		1	APXVSPP18-C-A20 Panel Antenna			
		2	P40-16-XLPP-RR Panel Antennas			
		3	APXVTM14-C-120 Panel Antennas			
		3	ALU-RRH 8x20 Boxes	Close Contact Mount		
		3	1900 Mhz – RRH Boxes			
		3	800 Mhz – RRH Boxes			
145	T-Mobile	3	LNX-6515DS-VTM Panel Antennas	(3) LP T-Arm Mounts	18 1	1-5/8" HiCap Hybrid Cable-(I)
		3	AIR21 B2A B4P Panel Antennas			
		3	RRUS-11 Boxes			
		3	AIR21 B4A B2P Panel Antennas			
		3	TMAs			
125	VzW	6	BXA-171085-12CF-EDIN-X Panel Ants.	(3) LP T-Arm Mounts	18 1	1-5/8" 1-1/4" (6x12) Hybrid (HFT1206-24S49-xxx) or Equiv. -(I)
		6	LPA-80080-6CF-x Panel Antennas			
		3	BXA-70063-6CF Panel Antennas			
		3	ALU-RRH 2x60 Boxes			
		1	RxxDC-3315-PF-48 OVP Box			
100	Town	1	PD220 Omni Antenna	Standoff Arm w/ Collar Mount	1	1-5/8" -(I)
85	Sprint	3	GPS Antenna	Chain Collar Mount	3	1/2"-(I)

Notes:

1. **As per 2012 IBC for ultimate 3-sec gust wind speed converted to nominal 3-sec gust wind speed as per Sect. 1609.3.1 as required to be used in ANSI/TIA-222-G Standard per exception 5 of Sect. 1609.1.1.
2. All elevations are measured from tower base.
3. Please note appurtenances not listed above are to be removed/not present as per data supplied.
4. (I) = Internal; (E) = External; (FZ) = Within Face Zone; (OFZ) = Outside Face Zone - as per TIA-222-G.
5. The above appurtenances represent MEI's understanding of the appurtenances configuration. If different than above, the analysis is invalid. Please contact MEI if any discrepancies are found.

4. ANALYSIS PROCEDURE

The subject structure is analyzed for feasibility of the installation of the proposed changed condition previously noted. The data records furnished were reviewed and a computer stress analysis was performed in accordance with the TIA-222 Standard provisions and with the agreed scope of work terms and the results of this analysis are reported.

Analysis Program

The computer program used to model the structure is a rigorous Finite Element Analysis program, tnxTower (ver. 7.07), a commercially available program by Tower Numerics Inc. The latticed structures members are modeled using beam/truss and cable members and the pole members using tubular beam elements. The structural parameters and geometry of the members are included in the model. The dead and temperature loads and the wind loads are internally calculated by the program for the different wind directions and then applied as external loads on the structure. Any applicable exemptions, as per Section 15.6 of the TIA-222-G Standard for existing structures originally designed in accordance with a previous revision of the TIA-222 Standard, have been taken.

Assumptions

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

- This existing tower is assumed, for the purpose of this analysis, to have been properly maintained and to be in good condition with no structural defects and with no deterioration to its member capacities ('as-new' condition).
- The tower member sizes and configuration are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated.
- The appurtenances configuration is as supplied and/or as stated in the report. 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.
- Some assumptions are made regarding antennas and mounts sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type & industry practice.
- Mounts/Platforms are considered adequate to support the loading. No actual analysis of the platform/mount itself is performed, with the analysis being limited to analyzing the structure.
- The soil parameters are as per data supplied or as assumed and stated in the calculations. Refer to the Appendix. If no data is available, the foundation system is assumed to support the structure with its new reactions.
- All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
- All prior structural modifications, if any, are assumed to be as per data supplied/available, and to have been properly installed and to be fully effective.

If any of the above assumptions are not valid or have been made in error, this analysis results may be invalided, MEI should be contacted to review any contradictory information to determine its effect.

5. ANALYSIS RESULTS

The results of the structural stress analysis based on data available and with the previous listed criteria, indicated the following:

Table 3: Stress Analysis Results

Component Type	Maximum Stress Ratio	Controlling Elev. (ft) / Component	Pass/Fail	Comment
POLE	**73.7%**	**41 - 0**	**Pass**	
REINFORCING	68.9%	5 – 0	**Pass**	
BASE PLATE	71.5%	Bending	**Pass**	For effective Moment After reinforcement
ANCHOR RODS	52.8%	Combined	**Pass**	
FOUNDATION	56.3%	Overturning Moment	**Pass**	No geotechnical report provided – soil parameters as per URS 02/16/2004 analysis report.

Table 4: Serviceability Requirements

	Maximum Value	TIA Requirement (10dB)	Pass/Fail	Comment
TWIST/SWAY	1.1838 Deg.	1.8568 Deg.	**Pass**	2' Dia. Dish w/ Radome Elev. 175.00ft
	1.1838 Deg.	4 Deg. from Vert. or Horiz. Axis	**Pass**	
HORIZONTAL DISPLACEMENT	25.028 In./ 1.19% of Ht.	3.0% of Height	**Pass**	

Notes:
1. The Maximum Stress Ratio is the percentage that the maximum load in the member is relative to the allowable load as determined by Code requirements.
2. Refer to the Appendix 1 for more details on the member loads.
3. A maximum stress ratio between 100% and 105% may be considered as *Acceptable* according to industry standard practice.

6. FINDINGS & RECOMMENDATIONS

- Based on the rigorous stress analysis results, the subject structure is **rated at 73.7%** of its support capacity (controlling component: Pole) with the proposed changed condition considered. Please refer to Table 3 and to Appendix 1 for more details of the analysis results.
- Based on the stress analysis performed, the existing structure **is in conformance** with the IBC / ANSI/TIA **222-G** Standard for the loading considered under the criteria listed and referenced in the report sections.
- Please note that no geotechnical data is available. However based on soil parameters obtained from URS analysis report dated 02/16/2004 and comparison of new reactions with the design reactions, the foundation is considered acceptable.
- ***The installation of the proposed changed condition as noted in Table 1 is structurally acceptable***. Please refer to Appendix 1 for Schematic Lines Layout.
- This structure has limited additional support capacity for the appurtenances and loading criteria considered. However, no changes to the configuration considered should be made without performing a new proper evaluation.

Rigging and temporary supports required for the erection/modification shall be determined, documented, furnished and installed by the erector/contractor accounting for the loads imposed on the structure due to the proposed construction method.

7. REPORT DISCLAIMER

The engineering services rendered by ***M****alouf* ***E****ngineering* ***I****nternational, Inc. ('MEI') in connection with this Structural Analysis are limited to a computer analysis of the tower structure, size and capacity of its members. MEI does not analyze the fabrication, including welding and connection capacities, except as included in this Report.*

The analysis performed and the conclusions contained herein are based on the assumption that the tower has been properly installed and maintained, including, but not limited to the following:

1. Proper alignment and plumbness.
2. Correct guy tensions, as applicable.
3. Correct bolt tightness or slip jacking of sleeved connections.
4. No significant deterioration or damage to any structural component.

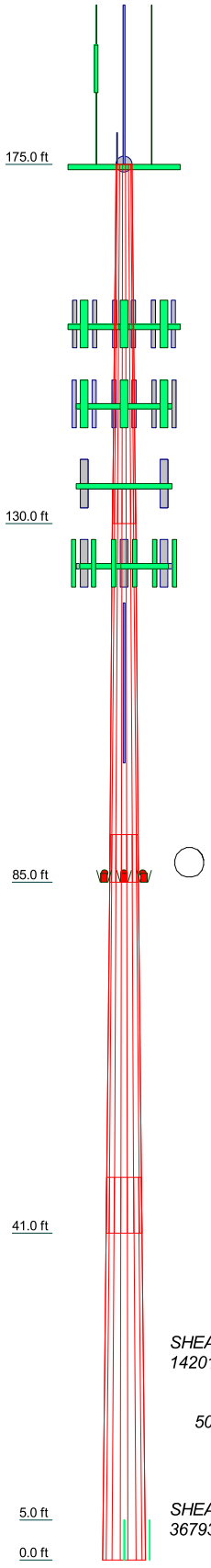
Furthermore, the information and conclusions contained in this Report were determined by application of the current "state-of-the-art" engineering and analysis procedures and formulae. MALOUF ENGINEERING INTERNATIONAL, INC. assumes no obligation to revise any of the information or conclusions contained in this Report in the event that such engineering and analysis procedures and formulae are hereafter modified or revised. In addition, under no circumstances will MALOUF ENGINEERING INTERNATIONAL, INC. have any obligation or responsibility whatsoever for or on account of consequential or incidental damages sustained by any person, firm or organization as a result of any information or conclusions contained in the Report, and the maximum liability of MALOUF ENGINEERING INTERNATIONAL, INC., if any, pursuant to this Report shall be limited to the total funds actually received by MALOUF ENGINEERING INTERNATIONAL, INC. for preparation of this Report.

Customer has requested MALOUF ENGINEERING INTERNATIONAL, INC. to prepare and submit to Customer an engineering analysis with respect to the Subject Tower and has further requested MALOUF ENGINEERING INTERNATIONAL, INC. to make appropriate recommendations regarding suggested structural modifications and changes to the Subject Tower. In making such request of MALOUF ENGINEERING INTERNATIONAL, INC., Customer has informed MALOUF ENGINEERING INTERNATIONAL, INC. that Customer will make a determination as to whether or not to implement any of the changes or modifications which may be suggested by MALOUF ENGINEERING INTERNATIONAL, INC. and that Customer will have any such changes or modifications made by riggers, erectors and other subcontractors of Customer's choice. MALOUF ENGINEERING INTERNATIONAL, INC. shall have the right to rely upon the accuracy of the information supplied by the customer and shall not be held responsible for the Customer's misrepresentation or omission of relevant fact whether intentional or otherwise.

Customer hereby agrees and acknowledges that MALOUF ENGINEERING INTERNATIONAL, INC. shall have no liability whatsoever to Customer or to others for any work or services performed by any persons other than MALOUF ENGINEERING INTERNATIONAL, INC. in connection with the implementation of services including but not limited to any services rendered for Customer or for others by riggers, erectors or other subcontractors. Customer acknowledges and agrees that any riggers, erectors or subcontractors retained or employed by Customer shall be solely responsible to Customer and to others for the quality of work performed by them and that MALOUF ENGINEERING INTERNATIONAL, INC. shall have no liability or responsibility whatsoever as a result of any negligence or breach of contract by any such rigger, erector or subcontractor and that Customer and rigger, erector, or subcontractor will provide MALOUF ENGINEERING INTERNATIONAL, INC. with a Certificate of Insurance naming MALOUF ENGINEERING INTERNATIONAL, INC. as additional insured.

APPENDIX 1 - ANALYSIS PRINTOUT & GRAPHICS

Section	1	2	3	4			
Length (ft)	45.00	50.00	50.00	48.00			3535.1
Number of Sides	18	18	18	18			
Thickness (in)	0.2500	0.3125	0.3750	0.3750			
Socket Length (ft)	5.00	6.00	7.00				
Top Dia (in)	24.0000	33.0004	42.6605	52.0925			
Bot Dia (in)	34.6880	44.6880	54.5000	64.5000			
Grade	A572-65						
Tube Length (ft)					5.00		
Reinf Size					1 3/4		
Reinf Grade					A		
Weight (lb)	31059.9	6502.5	9762.0	11260.4			



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod (E)	175	(2) 7770.00 Panels w/ Pipe Mount (ATI / E)	135
PD220 (Town / E)	175	HPA-65R-BUU-H8 w/ Pipe Mounts (ATI / E)	135
PD220 (Town / E)	175	HPA-65R-BUU-H6 w/ Pipe Mounts (ATI / E)	135
PD220 (Town / E)	175	HPA-65R-BUU-H6 w/ Pipe Mounts (ATI / E)	135
PD220 (Town / E)	175	(2) LGP21401 TMA'S (ATI / E)	135
1' Square Panel w / Pipe Mount (Town / E/F)	175	(2) LGP21401 TMA'S (ATI / E)	135
L.P. Platform Mount (w/ Empty Pipes) (E)	175	(2) LGP21401 TMA'S (ATI / E)	135
2' Dia. Dish w/ Radome (Town / E/F)	175	DTMABP7819VG12A Twin TMA (ATI / E)	135
RR45-19-02DPL4 w/Mount Pipe (Sprint / E)	155	DTMABP7819VG12A Twin TMA (ATI / E)	135
APXVSPP18-C-A20 w / Pipe Mount (Sprint / E)	155	DTMABP7819VG12A Twin TMA (ATI / E)	135
(2) P40-16-XLPP-RR w/ Pipe Mount (Sprint / E)	155	RRUS-11 (ATI / E)	135
APXVTM14-C-120 w/ Pipe Mount (Sprint / E)	155	RRUS-11 (ATI / E)	135
APXVTM14-C-120 w/ Pipe Mount (Sprint / E)	155	RRUS-11 (ATI / E)	135
APXVTM14-C-120 w/ Pipe Mount (Sprint / E)	155	Raycap DC6-48-60-18-8F SUPRESSOR (ATI / E)	135
ALU-RRH 8x20 (Sprint / E)	155	RRUS-32 B2 (ATI / P)	135
ALU-RRH 8x20 (Sprint / E)	155	RRUS-32 B2 (ATI / P)	135
ALU-RRH 8x20 (Sprint / E)	155	RRUS-32 B2 (ATI / P)	135
1900 Mhz - RRH (Sprint / E)	155	Close Contact Mount (E)	135
1900 Mhz - RRH (Sprint / E)	155	L.P. T-Arm Mount (E)	135
1900 Mhz - RRH (Sprint / E)	155	L.P. T-Arm Mount (E)	135
800 Mhz - RRH (Sprint / E)	155	L.P. T-Arm Mount (E)	135
800 Mhz - RRH (Sprint / E)	155	(2) 7770.00 Panels w/ Pipe Mount (ATI / E)	135
800 Mhz - RRH (Sprint / E)	155	(2) BXA-171085-12CF-EDIN-X w/ Pipe Mount (VzW / E)	125
Close Contact Mount (E)	155	(2) BXA-171085-12CF-EDIN-X w/ Pipe Mount (VzW / E)	125
L.P. Platform Mount (E)	155	(2) LPA-80080-6CF-2 w / Pipe Mount (VzW / E)	125
(2) RR65-18-02DP w/Mount Pipe (Sprint / E)	155	(2) LPA-80080-6CF-2 w / Pipe Mount (VzW / E)	125
LNX-6515DS-VTM w/ Pipe Mnt. (T-Mobile / E)	145	(2) LPA-80080-6CF-2 w / Pipe Mount (VzW / E)	125
LNX-6515DS-VTM w/ Pipe Mnt. (T-Mobile / E)	145	BXA-70063-6CF w/ Pipe Mount (VzW / E)	125
AIR21 B2A B4P w/ pipe Mount (T-Mobile / E)	145	BXA-70063-6CF w/ Pipe Mount (VzW / E)	125
AIR21 B2A B4P w/ pipe Mount (T-Mobile / E)	145	BXA-70063-6CF w/ Pipe Mount (VzW / E)	125
AIR21 B2A B4P w/ pipe Mount (T-Mobile / E)	145	ALU-RRH 2x60 (VzW / E)	125
RRUS-11 (T-Mobile / E)	145	ALU-RRH 2x60 (VzW / E)	125
RRUS-11 (T-Mobile / E)	145	ALU-RRH 2x60 (VzW / E)	125
RRUS-11 (T-Mobile / E)	145	Raycap RxxDC-3315-PF-48 (VzW / E)	125
AIR21 B4A B2P w/ pipe Mount (T-Mobile / E)	145	L.P. T-Arm Mount (E)	125
AIR21 B4A B2P w/ pipe Mount (T-Mobile / E)	145	L.P. T-Arm Mount (E)	125
AIR21 B4A B2P w/ pipe Mount (T-Mobile / E)	145	L.P. T-Arm Mount (E)	125
TMA's (T-Mobile / E)	145	(2) BXA-171085-12CF-EDIN-X w/ Pipe Mount (VzW / E)	125
TMA's (T-Mobile / E)	145	Standoff Arm w/ Collar Mount (E)	100
TMA's (T-Mobile / E)	145	PD220 (Town / E)	100
L.P. T-Arm Mount (E)	145	GPS (Sprint / E/F)	85
L.P. T-Arm Mount (E)	145	GPS (Sprint / E/F)	85
L.P. T-Arm Mount (E)	145	Chain Collar Mount (E)	85
LNX-6515DS-VTM w/ Pipe Mnt. (T-Mobile / E)	145	GPS (Sprint / E/F)	85
(2) 7770.00 Panels w/ Pipe Mount (ATI / E)	135		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	R7S - 150 ksi	120 ksi	150 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 90 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. IBC 2012 / 115 Mph (Ult.) = 90 Mph (3-Sec) as per CT Builidng Code
9. TOWER RATING: 73.7%

MALOUF ENGINEERING INTL., INC. STRUCTURAL CONSULTANTS
maloufengineering.com

MALOUF ENGINEERING INT'L. INC.
17950 PRESTON RD. SUITE 720
DALLAS, TEXAS - 75252
Phone: (972) 783-2578
FAX: (972) 783-2583

Job:	***175 ft. MNP. / New Fairfield Center Site #CT2070 (FA 10035312)***		
Project:	***CT01113M-16V0***		
Client: Vertical Resources Group / AT&T	Drawn by: HLopez	App'd:	
Code: TIA-222-G	Date: 11/02/16	Scale: NTS	
Path: C:\MEIProjects\16files\MNP\CT01113M-16V0\CT01113M-16V0_w-Anchor.eri		Dwg No. E-1	

No.	QTY.	DESCRIPTION	ELEV.	TENANT
1	4	1 5/8	175'	Town / E
2	2	1/2	175'	Town / E
3	4	Hybrid Cable	155'	Sprint / E
4	18	1 5/8	145'	T-Mobile / E
5	1	HiCap Hybrid Cable	145'	T-Mobile / E
6	12	1 5/8	135'	AT&T / E
7	1	3/8 Fiber Cable	135'	AT&T / E
8	2	7/8" DC Power Cable	135'	AT&T / E
9	18	1 5/8	125'	VzW / E
10	1	1-1/4" (6x12) Hybrid or Equiv.	125'	VzW / E
11	1	1 5/8	100'	E
12	3	1/2	85'	Sprint / E

LEGEND:

E = EXISTING — #X

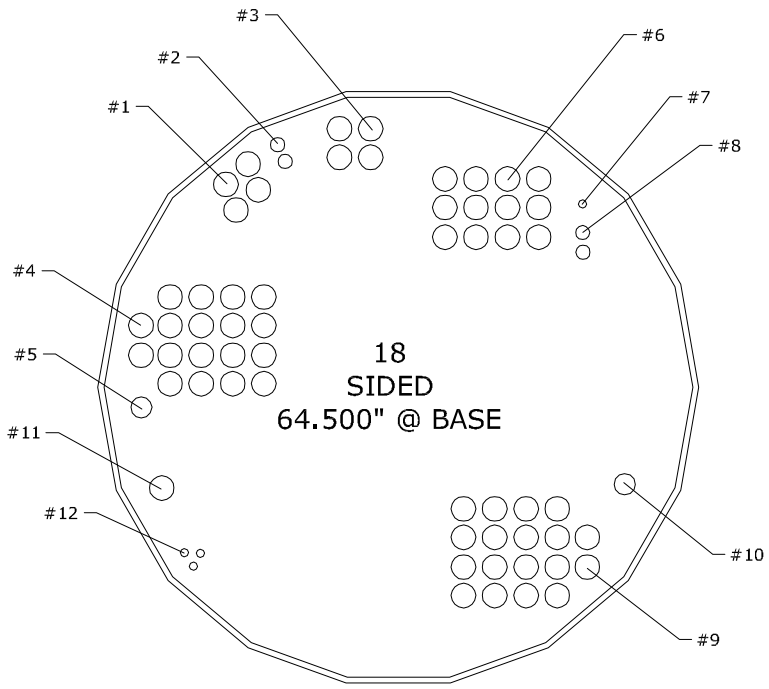
P = PROPOSED — #X

F = FUTURE — #X

R = REMOVE — #X

TO RELOCATE

NOTE: LINE LAYOUT IS SCHEMATIC AND FOR ILLUSTRATION PURPOSES ONLY. ACTUAL LINE LOCATIONS WILL VARY WITHIN POLE SHAFT.



101 PLAN: SCHEMATIC Tx-LINE LAYOUT

SCALE: NOT TO SCALE

NOTES:
1. Tx LINE LAYOUT IS SCHEMATIC ONLY, BASED UPON LIMITED DATA PROVIDED.
2. NEW BRACKET SUPPORT SPECIFICATION BY OTHERS.

NOV 02, 2016

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at&t

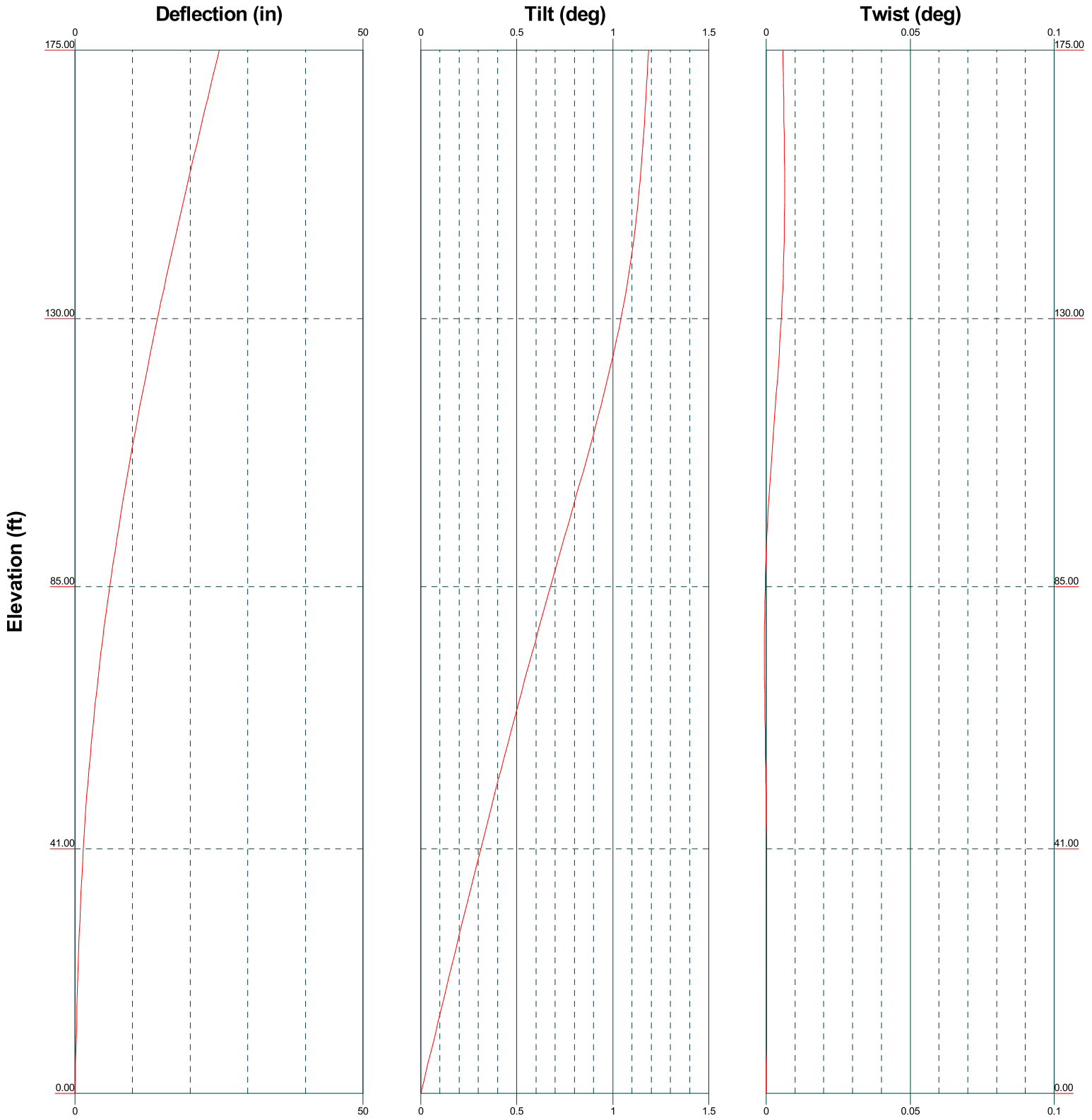
175 ft. MNP. / New Fairfield Center Site #CT2070 (FA 10035312)

MONOPOLE TxLINE LAYOUT

MEI PROJECT ID	SHEET NUMBER	REV.
CT01113M-16V0	**L01**	0

TIA-222-G - Service - 60 mph

Maximum Values



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Code: TIA-222-G	Date: 11/02/16	Scale: NTS	
Path: C:\MEIProjects\16files\MNP\CT01113M-16V0\CT01113M-16V0_w-Anchor.eri		Dwg No. E-5	

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 90 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
IBC 2012 / 115 Mph (Ult.) = 90 Mph (3-Sec) as per CT Builidng Code.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Pole Reinforcing Data

Height Above Base ft	*Segment Length ft*	*No. of Segments*	*Offset in*	*Grade*	*Type*	*Size*	*Unbraced Length ft*	*K*	*Bolt Hole Dia. in*	*Bolts per Row*	*Shear Lag Factor U*
0.00	5.00	4	6.0000	R7S - 150 ksi (120 ksi)	Solid Round	1 3/4	2.50	0.80	0.0000	0	0.000

Feed Line/Linear Appurtenances - Entered As Area

Description	*Component Type*	*Placement* *ft*	*Total Number*
Safety Line 3/8 (E)	CaAa (Out Of Face)	175.00 - 0.00	1
Step Bolts (E)	CaAa (Out Of Face)	175.00 - 0.00	1
1 5/8 (Town / E)	Inside Pole	175.00 - 0.00	4
1/2 (Town / E)	Inside Pole	175.00 - 0.00	2
Hybrid Cable (Sprint / E)	Inside Pole	155.00 - 0.00	4
1 5/8 (T-Mobile / E)	Inside Pole	145.00 - 0.00	18
HiCap Hybrid Cable (T-Mobile / E)	Inside Pole	145.00 - 0.00	1
1 5/8 (AT&T / E)	Inside Pole	135.00 - 0.00	12
3/8 Fiber Cable (AT&T / E)	Inside Pole	135.00 - 0.00	1
7/8" DC Power Cable (AT&T / E)	Inside Pole	135.00 - 0.00	2
1 5/8 (VzW / E)	Inside Pole	125.00 - 0.00	18
1-1/4" (6x12) Hybrid (HFT1206-24S49-xxx) or Equiv. (VzW / E)	Inside Pole	125.00 - 0.00	1
1 5/8 (E)	Inside Pole	100.00 - 0.00	1
1/2 (Sprint / E)	Inside Pole	85.00 - 0.00	3

Discrete Tower Loads

Description	Face or Leg	Offset Type	Placement ft
Lightning Rod (E)	A	From Face	175.00
PD220 (Town / E)	A	From Leg	175.00
PD220 (Town / E)	A	From Leg	175.00
PD220 (Town / E)	B	From Leg	175.00
PD220 (Town / E)	C	From Leg	175.00
1' Square Panel w / Pipe Mount (Town / E/F)	C	From Leg	175.00
L.P. Platform Mount (w/ Empty Pipes) (E)	A	None	175.00
***** Blank Line *****			
(2) RR65-18-02DP w/Mount Pipe (Sprint / E)	A	From Face	155.00
RR45-19-02DPL4 w/Mount Pipe (Sprint / E)	B	From Face	155.00
APXVSPP18-C-A20 w / Pipe Mount (Sprint / E)	B	From Face	155.00
(2) P40-16-XLPP-RR w/ Pipe Mount (Sprint / E)	C	From Face	155.00
APXVTM14-C-120 w/ Pipe Mount (Sprint / E)	A	From Face	155.00
APXVTM14-C-120 w/ Pipe Mount (Sprint / E)	B	From Face	155.00
APXVTM14-C-120 w/ Pipe Mount (Sprint / E)	C	From Face	155.00
ALU-RRH 8x20 (Sprint / E)	A	From Face	155.00
ALU-RRH 8x20 (Sprint / E)	B	From Face	155.00
ALU-RRH 8x20 (Sprint / E)	C	From Face	155.00
1900 Mhz - RRH (Sprint / E)	A	From Face	155.00
1900 Mhz - RRH (Sprint / E)	B	From Face	155.00
1900 Mhz - RRH (Sprint / E)	C	From Face	155.00
800 Mhz - RRH (Sprint / E)	A	From Face	155.00
800 Mhz - RRH (Sprint / E)	B	From Face	155.00
800 Mhz - RRH (Sprint / E)	C	From Face	155.00
Close Contact Mount (E)	A	None	155.00
L.P. Platform Mount (E)	A	None	155.00
***** Blank Line *****			
LNX-6515DS-VTM w/ Pipe Mnt. (T-Mobile / E)	A	From Face	145.00
LNX-6515DS-VTM w/ Pipe Mnt. (T-Mobile / E)	B	From Face	145.00
LNX-6515DS-VTM w/ Pipe Mnt. (T-Mobile / E)	C	From Face	145.00
AIR21 B2A B4P w/ pipe Mount (T-Mobile / E)	A	From Face	145.00
AIR21 B2A B4P w/ pipe Mount (T-Mobile / E)	B	From Face	145.00
AIR21 B2A B4P w/ pipe Mount (T-Mobile / E)	C	From Face	145.00
RRUS-11 (T-Mobile / E)	A	From Face	145.00
RRUS-11 (T-Mobile / E)	B	From Face	145.00
RRUS-11 (T-Mobile / E)	C	From Face	145.00
AIR21 B4A B2P w/ pipe Mount (T-Mobile / E)	A	From Face	145.00
AIR21 B4A B2P w/ pipe Mount (T-Mobile / E)	B	From Face	145.00
AIR21 B4A B2P w/ pipe Mount (T-Mobile / E)	C	From Face	145.00
TMA's (T-Mobile / E)	A	From Face	145.00
TMA's (T-Mobile / E)	B	From Face	145.00
TMA's (T-Mobile / E)	C	From Face	145.00
L.P. T-Arm Mount (E)	A	From Face	145.00
L.P. T-Arm Mount (E)	B	From Face	145.00
L.P. T-Arm Mount (E)	C	From Face	145.00
***** Blank Line *****			
(2) 7770.00 Panels w/ Pipe Mount (AT&T / E)	A	From Leg	135.00
(2) 7770.00 Panels w/ Pipe Mount (AT&T / E)	A	From Leg	135.00
(2) 7770.00 Panels w/ Pipe Mount (AT&T / E)	A	From Leg	135.00

Description	Face or Leg	Offset Type	Placement ft
HPA-65R-BUU-H8 w/ Pipe Mounts (AT&T / E)	A	From Leg	135.00
HPA-65R-BUU-H6 w/ Pipe Mounts (AT&T / E)	B	From Leg	135.00
HPA-65R-BUU-H6 w/ Pipe Mounts (AT&T / E)	C	From Leg	135.00
(2) LGP21401 TMA'S (AT&T / E)	A	From Leg	135.00
(2) LGP21401 TMA'S (AT&T / E)	B	From Leg	135.00
(2) LGP21401 TMA'S (AT&T / E)	C	From Leg	135.00
DTMABP7819VG12A Twin TMA (AT&T / E)	A	From Leg	135.00
DTMABP7819VG12A Twin TMA (AT&T / E)	B	From Leg	135.00
DTMABP7819VG12A Twin TMA (AT&T / E)	C	From Leg	135.00
RRUS-11 (AT&T / E)	A	From Face	135.00
RRUS-11 (AT&T / E)	B	From Face	135.00
RRUS-11 (AT&T / E)	C	From Face	135.00
Raycap DC6-48-60-18-8F SUPRESSOR (AT&T / E)	B	From Face	135.00
RRUS-32 B2 (AT&T / P)	A	From Face	135.00
RRUS-32 B2 (AT&T / P)	B	From Face	135.00
RRUS-32 B2 (AT&T / P)	C	From Face	135.00
Close Contact Mount (E)	A	None	135.00
L.P. T-Arm Mount (E)	A	From Face	135.00
L.P. T-Arm Mount (E)	B	From Face	135.00
L.P. T-Arm Mount (E)	C	From Face	135.00
***** Blank Line *****			
(2) BXA-171085-12CF-EDIN-X w/ Pipe Mount (VzW / E)	A	From Leg	125.00
(2) BXA-171085-12CF-EDIN-X w/ Pipe Mount (VzW / E)	B	From Leg	125.00
(2) BXA-171085-12CF-EDIN-X w/ Pipe Mount (VzW / E)	C	From Leg	125.00
(2) LPA-80080-6CF-2 w / Pipe Mount (VzW / E)	A	From Leg	125.00
(2) LPA-80080-6CF-2 w / Pipe Mount (VzW / E)	B	From Leg	125.00
(2) LPA-80080-6CF-2 w / Pipe Mount (VzW / E)	C	From Leg	125.00
BXA-70063-6CF w/ Pipe Mount (VzW / E)	A	From Leg	125.00
BXA-70063-6CF w/ Pipe Mount (VzW / E)	B	From Leg	125.00
BXA-70063-6CF w/ Pipe Mount (VzW / E)	C	From Leg	125.00
ALU-RRH 2x60 (VzW / E)	A	From Leg	125.00
ALU-RRH 2x60 (VzW / E)	B	From Leg	125.00
ALU-RRH 2x60 (VzW / E)	C	From Leg	125.00
Raycap RxxDC-3315-PF-48 (VzW / E)	A	From Leg	125.00
L.P. T-Arm Mount (E)	A	From Leg	125.00
L.P. T-Arm Mount (E)	B	From Leg	125.00
L.P. T-Arm Mount (E)	C	From Leg	125.00
***** Blank Line *****			
PD220 (Town / E)	A	From Leg	100.00
Standoff Arm w/ Collar Mount (E)	A	None	100.00
GPS (Sprint / E/F)	A	From Leg	85.00
GPS (Sprint / E/F)	B	From Leg	85.00
GPS (Sprint / E/F)	C	From Leg	85.00
Chain Collar Mount (E)	B	None	85.00

Dishes

Description	Dish Type	Elevation	Outside Diameter
		ft	ft
2' Dia. Dish w/ Radome (Town / E/F)	Paraboloid w/Radome	175.00	2.00

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead Only	51467.98	0.00	-0.00	-1340.41	-134.19	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	61761.34	32.76	-36764.90	-4393737.98	-6156.19	398.64
0.9 Dead+1.6 Wind 0 deg - No Ice	46321.03	32.77	-36766.42	-4348360.90	-6035.95	402.08
1.2 Dead+1.6 Wind 30 deg - No Ice	61761.57	18121.37	-31847.36	-3806669.44	-2159473.66	-2974.85
0.9 Dead+1.6 Wind 30 deg - No Ice	46321.18	18121.42	-31847.44	-3767104.97	-2137235.74	-2954.91
1.2 Dead+1.6 Wind 60 deg - No Ice	61761.58	31334.98	-18385.02	-2198136.21	-3730712.29	-5512.94
0.9 Dead+1.6 Wind 60 deg - No Ice	46321.18	31334.92	-18384.99	-2175098.97	-3692328.13	-5481.57
1.2 Dead+1.6 Wind 90 deg - No Ice	61761.55	36163.75	-12.19	-3889.10	-4304452.12	-6604.35
0.9 Dead+1.6 Wind 90 deg - No Ice	46321.13	36163.22	-12.19	-3418.18	-4260117.88	-6569.91
1.2 Dead+1.6 Wind 120 deg - No Ice	61761.57	31325.69	18367.54	2191601.06	-3729011.88	-5967.35
0.9 Dead+1.6 Wind 120 deg - No Ice	46321.18	31325.76	18367.59	2169508.09	-3690679.31	-5939.20
1.2 Dead+1.6 Wind 150 deg - No Ice	61761.58	18085.89	31852.27	3804177.11	-2152973.39	-3697.62
0.9 Dead+1.6 Wind 150 deg - No Ice	46321.18	18085.85	31852.21	3765483.73	-2130815.96	-3683.62
1.2 Dead+1.6 Wind 180 deg - No Ice	61761.34	-32.76	36791.54	4395169.19	5816.71	-362.41
0.9 Dead+1.6 Wind 180 deg - No Ice	46321.03	-32.76	36793.06	4350640.68	5786.09	-366.37
1.2 Dead+1.6 Wind 210 deg - No Ice	61761.58	-18142.65	31885.05	3810138.41	2162990.21	3056.66
0.9 Dead+1.6 Wind 210 deg - No Ice	46321.18	-18142.61	31884.98	3771370.83	2140791.94	3035.99
1.2 Dead+1.6 Wind 240 deg - No Ice	61761.57	-31358.46	18424.30	2201956.32	3734632.98	5568.94
0.9 Dead+1.6 Wind 240 deg - No Ice	46321.18	-31358.54	18424.35	2179733.15	3696316.28	5537.37
1.2 Dead+1.6 Wind 270 deg - No Ice	61761.49	-36162.62	53.34	8085.28	4303937.92	6569.10
0.9 Dead+1.6 Wind 270 deg - No Ice	46321.13	-36163.22	53.35	8405.54	4259864.70	6535.13
1.2 Dead+1.6 Wind 300 deg - No Ice	61761.58	-31302.21	-18328.26	-2187776.98	3724405.42	5876.43
0.9 Dead+1.6 Wind 300 deg -	46321.18	-31302.15	-18328.23	-2164870.96	3686186.54	5849.01

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
No Ice						
1.2 Dead+1.6 Wind 330 deg - No Ice	61761.57	-18064.61	-31814.59	-3800704.28	2148776.15	3652.47
0.9 Dead+1.6 Wind 330 deg - No Ice	46321.18	-18064.66	-31814.67	-3761214.93	2126758.82	3638.67
1.2 Dead+1.0 Ice+1.0 Temp	104314.65	-0.05	0.65	-9363.17	-650.33	-0.48
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	104314.63	5.44	-14194.55	-1772727.70	-1749.43	46.69
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	104314.63	7069.29	-12292.47	-1536459.62	-877961.24	-1525.38
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	104314.65	12234.50	-7095.19	-890814.20	-1518240.59	-2676.03
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	104314.63	14123.69	-0.26	-9754.81	-1752305.67	-3117.05
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	104314.63	12234.53	7095.39	871439.01	-1518212.96	-2736.20
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	104314.63	7065.20	12296.48	1517824.92	-877124.33	-1616.52
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	104314.63	-5.44	14201.26	1754625.77	401.91	-44.93
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	104314.63	-7074.62	12301.92	1518900.01	877639.57	1537.59
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	104314.63	-12239.97	7104.81	873301.90	1517940.63	2688.08
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	104314.63	-14123.69	10.62	-7603.46	1750958.57	3113.44
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	104314.65	-12229.07	-7085.77	-888951.63	1515818.25	2719.60
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	104314.63	-7059.88	-12287.03	-1535385.00	874751.16	1605.16
Dead+Wind 0 deg - Service	51467.97	8.14	-9137.70	-1086565.34	-1619.92	97.01
Dead+Wind 30 deg - Service	51467.97	4503.41	-7914.50	-941365.89	-533555.24	-745.55
Dead+Wind 60 deg - Service	51467.97	7787.13	-4568.90	-543997.57	-921678.55	-1375.26
Dead+Wind 90 deg - Service	51467.97	8987.29	-3.03	-1966.42	-1063421.32	-1643.35
Dead+Wind 120 deg - Service	51467.97	7784.86	4564.58	540377.33	-921270.26	-1484.24
Dead+Wind 150 deg - Service	51467.97	4494.57	7915.69	938742.81	-531955.68	-922.23
Dead+Wind 180 deg - Service	51467.97	-8.14	9144.32	1084924.11	1334.47	-94.82
Dead+Wind 210 deg - Service	51467.97	-4508.67	7923.83	940219.56	534228.55	757.19
Dead+Wind 240 deg - Service	51467.97	-7793.00	4578.69	542935.62	922461.49	1387.21
Dead+Wind 270 deg - Service	51467.97	-8987.29	13.26	987.98	1063135.65	1641.15
Dead+Wind 300 deg - Service	51467.97	-7778.99	-4554.80	-541439.10	919916.09	1470.09
Dead+Wind 330 deg - Service	51467.97	-4489.30	-7906.35	-939888.97	530711.36	912.78

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 130	25.028	39	1.1838	0.0072
L2	135 - 85	15.441	39	1.0692	0.0058
L3	91 - 41	6.948	39	0.7270	0.0024
L4	48 - 0	1.914	39	0.3694	0.0009

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	2' Dia. Dish w/ Radome	39	25.028	1.1838 (3 dB) 1.8568	0.0072 (3 dB) 1.8568	80278
155.00	(2) RR65-18-02DP w/Mount Pipe	39	20.115	1.1446	0.0067	20069
145.00	LNX-6515DS-VTM w/ Pipe Mnt.	39	17.733	1.1137	0.0063	13379
135.00	(2) 7770.00 Panels w/ Pipe Mount	39	15.441	1.0692	0.0058	10149
125.00	(2) BXA-171085-12CF-EDIN-X w/ Pipe Mount	39	13.266	1.0080	0.0051	9015
100.00	PD220	39	8.441	0.8062	0.0031	7189
85.00	GPS	39	6.033	0.6748	0.0021	6532

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	175 - 130 (1)	TP34.688x24x0.25	45.00	175.00	177.9	26.3842	-11667.00	188320.00	0.062
L2	130 - 85 (2)	TP44.688x33.0004x0.3125	50.00	175.00	137.7	42.6238	-26516.80	508161.00	0.052
L3	85 - 41 (3)	TP54.5x42.6605x0.375	50.00	175.00	112.7	62.4494	-41553.40	1109860.00	0.037
L4	41 - 0 (4)	TP64.5x52.0925x0.375	48.00	175.00	94.1	74.7864	-59523.20	1897630.00	0.031

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	175 - 130 (1)	TP34.688x24x0.25	314904.17	1229983.33	0.256	0.00	1229983.33	0.000
L2	130 - 85 (2)	TP44.688x33.0004x0.3125	1403516.67	2537016.67	0.553	0.00	2537016.67	0.000
L3	85 - 41 (3)	TP54.5x42.6605x0.375	2718825.00	4508725.00	0.603	0.00	4508725.00	0.000
L4	41 - 0 (4)	TP64.5x52.0925x0.375	4212158.33	5975166.67	0.705	0.00	5975166.67	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	175 - 130 (1)	TP34.688x24x0.25	14530.00	899151.00	0.016	225.15	2462975.00	0.000
L2	130 - 85 (2)	TP44.688x33.0004x0.3125	28269.10	1434670.00	0.020	399.71	5080233.33	0.000
L3	85 - 41 (3)	TP54.5x42.6605x0.375	32777.70	2088020.00	0.016	362.73	9028500.00	0.000
L4	41 - 0 (4)	TP64.5x52.0925x0.375	36438.90	2307960.00	0.016	362.42	11964916.00	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	175 - 130 (1)	0.062	0.256	0.000	0.016	0.000	0.318 ✔	1.000	4.8.2 ✔
L2	130 - 85 (2)	0.052	0.553	0.000	0.020	0.000	0.606 ✔	1.000	4.8.2 ✔
L3	85 - 41 (3)	0.037	0.603	0.000	0.016	0.000	0.641 ✔	1.000	4.8.2 ✔
L4	41 - 0 (4)	0.031	0.705	0.000	0.016	0.000	0.737 ✔	1.000	4.8.2 ✔

Reinforcing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L4	5 - 0	1 3/4	5.00	2.50	54.9 K=0.80	2.4053	-105532.00	153196.00	0.689 [1]

[1] P_u / ϕP_n controls

Reinforcing Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L4	5 - 0	1 3/4	0.00	8039.07	0.000	0.00	8039.07	0.000

Reinforcing Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L4	5 - 0	1 3/4	0.689	0.000	0.000	0.689 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Tension Checks

Reinforcing Design Data (Tension)

Section No.	Elevation (ft)	Size	L (ft)	L_u (ft)	Kl/r	A (in^2)	P_u (lb)	ϕP_n (lb)	Ratio $\frac{P_u}{\phi P_n}$
L4	5 - 0	1 3/4	5.00	2.50	68.6	2.4053	102083.00	259770.00	0.393 [1]

[1] P_u / ϕP_n controls

Reinforcing Bending Design Data

Section No.	Elevation (ft)	Size	M_{ux} (lb-ft)	ϕM_{nx} (lb-ft)	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} (lb-ft)	ϕM_{ny} (lb-ft)	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L4	5 - 0	1 3/4	66.72	8039.07	0.008	0.00	8039.07	0.000

Reinforcing Interaction Design Data

Section No.	Elevation (ft)	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L4	5 - 0	1 3/4	0.393	0.008	0.000	0.393 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Anchor Design Data

Plate Thickness (in)	Number of Anchor Bolts	Anchor Bolt Size (in)	Controlling Condition	Ratio
1.500	24	2.000	Bolt T	0.53 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	175 - 130	Pole	TP34.688x24x0.25	1	-11667.00	188320.00	31.8	Pass
L2	130 - 85	Pole	TP44.688x33.0004x0.3125	2	-26516.80	508161.00	60.6	Pass
L3	85 - 41	Pole	TP54.5x42.6605x0.375	3	-41553.40	1109860.00	64.1	Pass
L4	41 - 0	Pole	TP64.5x52.0925x0.375	4	-59523.20	1897630.00	73.7	Pass
L4	5 - 0	Reinforcing	1 3/4	8	-105532.00	153196.00	68.9	Pass
							Summary	
						Pole (L4)	73.7	Pass
						Base Plate	71.5	Pass
						Reinforcing (L4)	68.9	Pass
						RATING =	**73.7**	**Pass**

FOUNDATION DESIGN CALCULATIONS

Input:

Twr := 1 — Tower Type, 1 = Monopole, 2 = SST, 3 = GT

Fdn := 1 — Foundation Type, 1 = Spf, 2 = Mat, 3 = Caisson, 4 = Deadman Anchor, 5 = Pile Group w/ Head
6 = Single Pile or Anchoring Device, 7 = Non Battered Piles With Tapered Cross-Section

Class := 2 — Structure Class, 1, 2, 3, Table 2-1

SoilReport := 1 — Soil Report, 0 = Not Available, 1 = Available

SiteClass := "D" — Seismic Site class

Geotechnical Report Source: No Geotechnical Report / Assumed soil parameters

Foundation Source: Foundation Specs as per URS analysis Proj. #CW1021 dated 2/16/04.

Wind / Seismic: DESIGN BASE SHEAR IS GOVERNED BY WIND LOADING

Foundation Loads / Tower Base Reactions

Load Case I: 1.2D+1.0Dg+1.6Wo ; Load Case II: 0.9D+1.0Dg+1.6Wo ; Load Case III: 1.2D+1.0Dg+1.0Di+1.0Wi+1.0Ti

n := 3 — Number of load cases

k := 1 .. n

	Download P_k :=	Uplift U_k :=	Shear Sh_k :=	Moment M_k :=	Total Shear TSh_k :=	Tower Weight TWt_k :=	Dead Load Factors DL_k :=
Case I	61.761·kip	0.0·kip	36.793·kip	4395.17·kip·ft	0.0·kip	31.06·kip	1.2
Case II	46.321·kip	0.0·kip	36.793·kip	4350.64·kip·ft	0.0·kip	31.06·kip	0.9
Case III	0.00·kip	0.0·kip	0.00·kip	0.00·kip·ft	0.0·kip	0.00·kip	1.2

Anchor Bolt Details (Verify details with tower manufacturer)

n_{bolt} := 0 — No. of anchor bolts

L_{bolt} := 0.00·in — Anchor Bolt Length-Total

L_{proj} := 0.00·in — Projected length of anchor bolt

dia_{ancb} := 2.00·in — Anchor bolt dia.

$area_{ancb}$:= 3.1416·in^2 — Anchor bolt - Tensile Area

BC_{anc} := 0.00·in — Pole bolt circle

$f_{yancbolt}$:= 75·ksi — Anchor bolt, Yield Strength, A615-75

$f_{uancbolt}$:= 100·ksi — Anchor bolt, Ultimate Tensile Strength, A615-75

Foundation Dimensions

n_{ped} := 1 — Number of pedestals, 1, 3 or 4, Use 1 for isolated spread footings, 3 or 4 for mat

TW := 0·ft — Tower Face Width, ft - enter 0ft for Monopole, Guyed Tower, Isolated Footings

col_t := 0 — Pedestal, 0=Round, 1=Square

Ped_s := 7.00·ft — Ped diameter / side

E_g := 0.250·ft — Ped Extension above soil grade

D_f := 6.00·ft — Fdn Depth, grade to pad bottom

L := 27.50·ft — Length of pad

B := L — Width of pad

T_f := 4.00·ft — Thickness of pad

toe := 0 — Has Toe =1, No Toe = 0

$ecc := 0 \cdot ft$ Eccentricity, load & pad centroid

$cc := 3.0 \cdot in$ Concrete Cover

$n_{vbars} := 50$ No. vert. bars in pedestal

$vbar := 11$ Vert. Bar Size

$tbar := 4$ Tie Bar Size

$Sp_{tie} := 12 \cdot in$ Tie Bar Spacing

$n_{hbars} := 32$ No. Horiz bars in pad

$hbar := 10$ Horiz. Bar Size

Material Parameters

$\gamma_c := 0.145 \cdot \frac{kip}{ft^3}$ Unit Wt. of Concrete

$f_c := 3000 \cdot psi$ Concrete Compressive Strength

$f_y := 60000 \cdot psi$ Rebar yield strength

$\phi_{cshear} := 0.75$ as per ACI-05, 9.3.2.3

$\phi_{ccompr} := 0.65$ as per ACI-05, 9.3.2.2

$\phi_{caxten} := 0.9$ as per ACI-05, 9.3.2.1

Soil Properties

$\phi := 30 \cdot deg$ Internal angle of friction

$c_u := 0.0 \cdot ksf$ Cohesion

$\sigma_{adh} := 0.0 \cdot ksf$ Adhesion

$\sigma_p := 0.100 \cdot \frac{kip}{ft^3}$ Passive Pressure, -1 auto calculate

$\gamma_s := 0.100 \cdot \frac{kip}{ft^3}$ Unit weight of soil

$Brg_{ult} := 8.0 \cdot ksf$ Ultimate Bearing Capacity

$\mu_{soil} := 0.20$ Coefficient of friction Concrete to Soil

$\phi_{bg} := 0.6$ as per Rev. G, bearing, GT

$\phi_{bs} := 0.75$ as per Rev. G, bearing, SS, MP

$\phi_{up1} := 0.75$ as per Rev. G, uplift

$\phi_{up2} := 0.5$ as per Rev. G, uplift Single Rock/Soil Bolt or anchor

$\phi_{up3} := 0.4$ as per Rev. G, uplift Non-battered piles with tapered cross-section

$\phi_{sh} := 0.75$ as per Rev. G, Shear, Friction

$\phi_{lateral} := 0.75$ as per Rev. G, Lateral Resistance

$L_{neg} := 2.00 \cdot ft$ Depth of soil neglected for lateral resistance

$L_{water} := -1 \cdot ft$ Water Table, -1 No Water

$red_{up} := 1.0$ Uplift Reduction Factor

$flag_{up} := 0$ Flag to include Uplift reduction factor in the stability checks, 0 = No, 1 = Yes To Be Used When Ground Sloping

$\gamma_w := 0.062428 \cdot \frac{kip}{ft^3}$ Unit Weight of Water

Re-bar Properties

$No := ((0 \ \ 1 \ \ 2 \ \ 3 \ \ 4 \ \ 5 \ \ 6 \ \ 7 \ \ 8 \ \ 9 \ \ 10 \ \ 11 \ \ 12 \ \ 13 \ \ 14 \ \ 15 \ \ 16 \ \ 17 \ \ 18))^T$

$d_b := ((0 \ \ 0 \ \ 0 \ \ 0.375 \ \ 0.5 \ \ 0.625 \ \ 0.75 \ \ 0.875 \ \ 1.00 \ \ 1.128 \ \ 1.27 \ \ 1.41 \ \ 0 \ \ 0 \ \ 1.693 \ \ 0 \ \ 0 \ \ 0 \ \ 2.257))^T \cdot in$

$A_b := ((0 \ \ 0 \ \ 0 \ \ 0.11 \ \ 0.20 \ \ 0.31 \ \ 0.44 \ \ 0.60 \ \ 0.79 \ \ 1.00 \ \ 1.27 \ \ 1.56 \ \ 0 \ \ 0 \ \ 2.25 \ \ 0 \ \ 0 \ \ 0 \ \ 4.00))^T \cdot in^2$

Total Resisting Moment - Alternate Way

$$q_k := \frac{Tw_k}{B \cdot L} \qquad q_c := Brg_{ult} \cdot \phi_{brg} \qquad q_c = 6 \cdot ksf$$

$$Mralt_k := \frac{L \cdot Tw_k}{2} \cdot \left(1 - \frac{q_k}{q_c}\right)$$

Overturning Moment

$L_{hs} := D_f + E_g$ Lever Arm

$Mo_k := M_k + Sh_k \cdot L_{hs} + P_k \cdot ecc$

Eccentricity

$$ec_k := \frac{Mo_k}{Tw_k}$$

Bearing - Combined Compression and Moment

$$qmax_k := if\left[ec_k \le \frac{L}{6}, \left[\frac{Tw_k}{B \cdot L} \cdot \left(1 + \frac{6 \cdot ec_k}{L}\right)\right], \left[\frac{Tw_k}{B \cdot (L - 2 \cdot ec_k)}\right]\right]$$

$$qmin_k := if\left[ec_k \le \frac{L}{6}, \left[\frac{Tw_k}{B \cdot L} \cdot \left(1 - \frac{6\, ec_k}{L}\right)\right], 0 \cdot ksf\right]$$

$$qmaxalt_k := \frac{(Tw_k)^2}{Tw_k \cdot L^2 - 2 \cdot Mo_k \cdot B}$$

$$Lp_k := if\left[ec_k \le \frac{L}{6}, L, (L - 2 \cdot ec_k)\right]$$

Overturning Moment Mo_k =		Resisting Moment Mr_k =		Alternate Resisting Moment $Mralt_k$ =		Total Download Tw_k =		Eccentricity ec_k =		Contact Length Lp_k =	
$4.625 \cdot 10^3$	kip	$1.08 \cdot 10^4$	kip·ft	$8.84 \cdot 10^3$	kip·ft	775.441	kip	5.965	ft	15.571	ft
$4.581 \cdot 10^3$		$8.134 \cdot 10^3$		$6.972 \cdot 10^3$		581.581		7.876		11.748	
0		$9.951 \cdot 10^3$		$8.27 \cdot 10^3$		713.68		0		27.5	

Max Bearing $qmax_k$ =		Min Bearing $qmin_k$ =		Max Bearing-Alternative $qmaxalt_k$ =	
1.811	ksf	0	ksf	1.811	ksf
1.8		0		1.8	
0.944		0.944		0.944	

Bearing Ratios

$$Rbr_k := \frac{qmax_k}{Brg_{ult} \cdot \phi_{brg}}$$

OTM - Stability Ratios

$$Rmom_k := \frac{Mo_k}{Mr_k} \qquad Rmomalt_k := \frac{Mo_k}{Mralt_k}$$

Shear Check

Total Resisting Shear

$$Shr_k := \phi_{sh} \cdot \left(Tw_k \cdot \mu_{soil} + Pe_p \right)$$

$$Rsh_k := \frac{Sh_k}{Shr_k}$$

Combined Bearing and Moment - Ratios

Bearing Ratio

$Rbr_k =$

30.182	·%
30.003	
15.728	

Overturning Ratio

$Rmom_k =$

42.826	·%
56.312	
0	

Contact Length

$Lp_k =$

15.571	·ft
11.748	
27.5	

Shear Ratio

Total Shear

$Sh_k =$

36.793	·kip
36.793	
0	

Shear Resistance

$Shr_k =$

132.816	·kip
103.737	
123.552	

Shear Ratio

$Rsh_k =$

27.702	·%
35.468	
0	

APPENDIX 2 – SOURCE / CHANGED CONDITION

From: Vertical Resources Group <mnobre@verticalresourcesgrp.com>
Sent: Monday, October 31, 2016 9:19 AM
To: 'Malouf Engr - Liz Adkins'
Cc: 'Mark Malouf'
Subject: RE: AT&T Site CT2070 FA10035312 175' Pole

AT&T coax is RFS 1.625" (4/sec, 12 tot.) existing to remain in place, (2) 5/8" DC power, (1) 3/8" fiber.
…
Miguel Nobre
Vertical Resources Group
489 Washington Street
Auburn, MA 01501
P: 508-981-9590
F: 508-519-8939

From: Vertical Resources Group [mailto:mnobre@verticalresourcesgrp.com]
Sent: Sunday, October 30, 2016 10:16 AM
To: Mark Malouf
Subject: RE: AT&T Site CT2070 FA10035312 175' Pole

…
AT&T Existing Loading:
(6) Powerwave 7770 (UMTS & GSM existing to remain)
(1) CCI HPA65RBUUH8 (LTE to remain)
(2) CCI HPA65RBUUH6 (LTE to remain)
(6) CCI LGP21401 (UMTS TMA to remain)
(3) CCI DTMABP7819VG12A (GSM to remain)
(3) Ericsson RRUS-11 (LTE700 to remain)
(3) Ericsson RRUS-12+A2 (LTE PCS TO BE REPLACED)
(1) Raycap Surge arrestor DC6-48-60-18-8F (to remain)
Mount Valmont RMV12

AT&T Existing Loading:
(6) Powerwave 7770 (UMTS & GSM existing to remain)
(1) CCI HPA65RBUUH8 (LTE to remain)
(2) CCI HPA65RBUUH6 (LTE to remain)
(6) CCI LGP21401 (UMTS TMA to remain)
(3) CCI DTMABP7819VG12A (GSM to remain)
(3) Ericsson RRUS-11 (LTE700 to remain)
(3) Ericsson RRUS-32 B2 (LTE PCS NEW)
(1) Raycap Surge arrestor DC6-48-60-18-8F (to remain)
Mount Valmont RMV12

Miguel Nobre
Vertical Resources Group
489 Washington Street
Auburn, MA 01501
P: 508-981-9590
F: 508-519-8939

Section 17A - FINAL SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA COMMON FIELDS	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	HPA-65R-BUU-H8				7770		7770							
ANTENNA VENDOR	CCI Antennas				Powerwave		Powerwave							
ANTENNA SIZE (H x W x D)	92.4X14.8X7				55X11X5		55X11X5							
ANTENNA WEIGHT	68				35		35							
AZIMUTH	90				143		143							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	135				135		135							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0				0		0							
FEEDER AMOUNT					2		2							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Bulit in			2	Powerwave 7020	2	Powerwave 7020						
SURGE ARRESTOR (QTY/MODEL)	1	DC/Fiber Squid					1	POLYPHASER 1000860						
DIPLEXER (QTY/MODEL)					2	Powerwave / LGP 21901	2	Powerwave / LGP 21901						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH					1	Powerwave7070						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)					2	Powerwave / LGP 21401 (Dual Band - 850 Bypass)	1	DTMABP7819VG12A (Twin 700/850 Bypass)						
CURRENT INJECTORS FOR TMA (QTY/MODEL)					2	POLYPHASER 1000860	1	Kathrein 782-10253BTS						
PDU FOR TMAS (QTY/MODEL)					1	LGP 12104 (1900 AND 850 Bypass TMA)								
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)	1	RRUS-11												
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)	1	RRUS-32 B2												
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)							2	Pwav 1001983 (1) & 1001940 (1)						
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	LTE BWE 1900 A3-A4 & E // Replace existing LTE 1900 radio with RRUS-32 B2 on existing LTE Antenna // Add XMU.													
Local Market Note 2	LTE alpha is with UMTS Gamma Face // LTE Beta is with UMTS Alpha Face // LTE Gamma is with UMTS Beta Face													
Local Market Note 3	Baseband Config - 1 DUS + XMU DUS-1 - 7A:7B:7C:X1P1:X1P2:_ XMU-1 - PA:PA2A:PB:PA2B:PC:PA2C:_:_:_:_:_:_:_:D1E:D1													

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (AtoII)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	27009.A.700.4G.1	27009.A.700.4G.1	CTL02070_7A_1	CTL02070_7A_1		LTE 700	HPA-65R-BUU-H8_719MHz_03DT	15.3	90	3	Top	FIBER	0						1044.72		1	
	PORT 3	27009.A.1900.4G.1	27009.A.1900.4G.111	CTL02070_9A_1	CTL02070_9A_1		LTE 1900	HPA-65R-BUU-H8_1948MHz_07DT	17.4	90	7	Top	FIBER	0						3380.67		1	
ANTENNA POSITION 3	PORT 1	27009.A.850.3G.1	27009.A.850.3G.1	CTV20701	CTV20701		UMTS 850	7770.00.850.00	13	143	0	None	RFS 1-5/8	155						264.85		5	
	PORT 2	27009.A.850.3G.2	27009.A.850.3G.2	CTV20701	CTV2070A		UMTS 850	7770.00.850.00	13	143	0	BOTTOM	RFS 1-5/8	155						264.85		6	
	PORT 3	27009.A.1900.3G.1,27009.A.1900.3G.2	27009.A.1900.3G.2	CTU20707	CTU20707		UMTS 1900	7770.00.1900.00	15	143	0	None	RFS 1-5/8	155						592.93		5	
ANTENNA POSITION 4	PORT 1	27009.A.850.25G.1	27009.A.850.25G.1	321G20701	321G20701		GSM 850	7770.00.850.00	13	143	0	None	RFS 1-5/8	155						155		7	

Section 17B - FINAL SECTOR/CELL INFORMATION - SECTOR B

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	HPA-65R-BUU-H6		7770	7770			
ANTENNA VENDOR	CCI Antennas		Powerwave	Powerwave			
ANTENNA SIZE (H x W x D)	72X14.8X7.4		55X11X5	55X11X5			
ANTENNA WEIGHT	51		35	35			
AZIMUTH	210		263	263			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	135		135	135			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0		0	0			
FEEDER AMOUNT			2	2			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	Bulit in		2 Powerwave 7020	2 Powerwave 7020			
SURGE ARRESTOR (QTY/MODEL)				1 POLYPHASER 1000860			
DIPLEXER (QTY/MODEL)			2 Powerwave / LGP 21901	2 Powerwave / LGP 21901			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	LTE RRH						
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)			2 Powerwave / LGP 21401 (Dual Band - 850 Bypass)	1 DTMABP7819VG12A (Twin 700/850 Bypass)			
CURRENT INJECTORS FOR TMA (QTY/MODEL)			2 POLYPHASER 1000860	1 Kathrein 782-10253BTS			
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)	1 RRUS-11						
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)	1 RRUS-32 B2						
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)				2 Pwav 1001983 (1) & 1001940 (1)			
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	LTE BWE 1900 A3-A4 & E // Replace existing LTE 1900 radio with RRUS-32 B2 on existing LTE Antenna // Add XMU.						
Local Market Note 2	LTE alpha is with UMTS Gamma Face // LTE Beta is with UMTS Alpha Face // LTE Gamma is with UMTS Beta Face						
Local Market Note 3	Baseband Config - 1 DUS + XMU DUS-1 - 7A:7B:7C:X1P1:X1P2:_ XMU-1 - PA:PA2A:PB:PA2B:PC:PA2C:_:_:_:_:_:_:_:D1E:D1						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (AtoII)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	27009.B.700.4G.1	27009.B.700.4G.1	CTL02070_7B_1	CTL02070_7B_1		LTE 700	HPA-65R-BUU-H6_719MHz_03DT	14.22	210	3	Top	FIBER	0						827.94		9	
	PORT 3	27009.B.1900.4G.1	27009.B.1900.4G.111	CTL02070_9B_1	CTL02070_9B_1		LTE 1900	HPA-65R-BUU-H6_1930MHz_07DT	17.21	210	7	Top	FIBER	0						3258.37		9	
ANTENNA POSITION 3	PORT 1	27009.B.850.3G.1	27009.B.850.3G.1	CTV20702	CTV20702		UMTS 850	7770.00.850.00	13	263	0	None	RFS 1-5/8	155						264.85		13	
	PORT 2	27009.B.850.3G.2	27009.B.850.3G.2	CTV20702	CTV2070B		UMTS 850	7770.00.850.00	13	263	0	BOTTOM	RFS 1-5/8	155						264.85		14	
	PORT 3	27009.B.1900.3G.1,27009.B.1900.3G.2	27009.B.1900.3G.2	CTU20708	CTU20708		UMTS 1900	7770.00.1900.00	15	263	0	None	RFS 1-5/8	155						592.93		13	
ANTENNA POSITION 4	PORT 1	27009.B.850.25G.1	27009.B.850.25G.1	321G20702	321G20702		GSM 850	7770.00.850.00	13	263	0	None	RFS 1-5/8	155						347		15	

Section 17C - FINAL SECTOR/CELL INFORMATION - SECTOR C

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	HPA-65R-BUU-H6		7770	7770			
ANTENNA VENDOR	CCI Antennas		Powerwave	Powerwave			
ANTENNA SIZE (H x W x D)	72X14.8X7.4		55X11X5	55X11X5			
ANTENNA WEIGHT	51		35	35			
AZIMUTH	330		23	23			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	135		135	135			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0		0	0			
FEEDER AMOUNT			2	2			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	Bulit in		2 Powerwave 7020	2 Powerwave 7020			
SURGE ARRESTOR (QTY/MODEL)				1 POLYPHASER 1000860			
DIPLEXER (QTY/MODEL)			2 Powerwave / LGP 21901	2 Powerwave / LGP 21901			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	LTE RRH						
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)			2 Powerwave / LGP 21401 (Dual Band - 850 Bypass)	1 DTMABP7819VG12A (Twin 700/850 Bypass)			
CURRENT INJECTORS FOR TMA (QTY/MODEL)			2 POLYPHASER 1000860	1 Kathrein 782-10253BTS			
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)	1 RRUS-11						
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)	1 RRUS-32 B2						
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)				2 Pwav 1001983 (1) & 1001940 (1)			
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	LTE BWE 1900 A3-A4 & E // Replace existing LTE 1900 radio with RRUS-32 B2 on existing LTE Antenna // Add XMU.						
Local Market Note 2	LTE alpha is with UMTS Gamma Face // LTE Beta is with UMTS Alpha Face // LTE Gamma is with UMTS Beta Face						
Local Market Note 3	Baseband Config - 1 DUS + XMU DUS-1 - 7A:7B:7C:X1P1:X1P2:_ XMU-1 - PA:PA2A:PB:PA2B:PC:PA2C:_:_:_:_:_:_:_:D1E:D1						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (AtoII)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	27009.C.700.4G.1	27009.C.700.4G.1	CTL02070_7C_1	CTL02070_7C_1		LTE 700	HPA-65R-BUU-H6_719MHz_03DT	14.22	330	0	Top	FIBER	0						827.94		17	
	PORT 3	27009.C.1900.4G.1	27009.C.1900.4G.111	CTL02070_9C_1	CTL02070_9C_1		LTE 1900	HPA-65R-BUU-H6_1930MHz_03DT	17	330	3	Top	FIBER	0						3258.37		17	
ANTENNA POSITION 3	PORT 1	27009.C.850.3G.1	27009.C.850.3G.1	CTV20703	CTV20703		UMTS 850	7770.00.850.00	13	23	0	None	RFS 1-5/8	155						264.85		21	
	PORT 2	27009.C.850.3G.2	27009.C.850.3G.2	CTV20703	CTV2070C		UMTS 850	7770.00.850.00	13	23	0	BOTTOM	RFS 1-5/8	155						264.85		22	
	PORT 3	27009.C.1900.3G.1,27009.C.1900.3G.2	27009.C.1900.3G.2	CTU20709	CTU20709		UMTS 1900	7770.00.1900.00	15	23	0	None	RFS 1-5/8	155						592.93		21	
ANTENNA POSITION 4	PORT 1	27009.C.850.25G.1	27009.C.850.25G.1	321G20703	321G20703		GSM 850	7770.00.850.00	13	23	0	None	RFS 1-5/8	155						155		23	

Diagram - Sector	A	Diagram File Name - CT2070_A_B_C_BWE1900_Rev2.vsd					
Atoll Site Name -	CT2070	Location Name -	NEW FAIFIELD SR37-SR39	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments: