EMPIRE telecom

July 7, 2016

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

Regarding:	Notice of Exempt Modification – Swap of 3 Antennas and addition of 6 radios, 1 squid, and associated lines
Property Address:	75 Wells Road, Wethersfield, CT (the "Property")
Applicant:	AT&T Mobility ("AT&T")

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 101 foot 6 Inch Monopole tower ("tower") at the above-referenced address, latitude 41.705825, longitude -72.6634161. AT&T's facility consists of nine (9) wireless telecommunications antennas at 106 feet. The tower is controlled and owned by Frontier Communications. Assessor's information is attached hereto.

AT&T desires to modify its existing telecommunications facility by swapping three (3) antennas and adding (6) remote radios, (1) squid, and associated lines. The centerline height of said antennas is and will remain at 106 feet.

Please accept this application as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72 (b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Mayor of the Town of Wethersfield, The Building Director of the Town of Wethersfield and the Director of Planning and Economic Development of the Town of Wethersfield. A copy of this letter is also being sent to Frontier Communications, the owner of the structure that AT&T is located.

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The planned modifications will not result in an increase in the height of the existing structure. AT&T's antennas and associated lines will be installed at 106 foot level of the 101 foot 6 Inch Monopole tower.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore will not require an extension of the site boundary.
3. The proposed modification will not increase the noise level at the facility by six decibel or more, or to levels that exceed state and local criteria.

16 Esquire Road, Billerica, MA 01862 Phone 978-284-3906 Email: ncaplan@empiretelecomm.com

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. An RF emissions calculation is attached.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (Please see attached Structural analysis completed by Malouf Engineering Intl., Inc. dated June 17, 2016).

For the foregoing reasons AT&T respectfully requests that the proposed swap of 3 antennas, the addition of 6 radios and 1 squid and associated lines be allowed within the exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Nicole Caplan
Site Acquisition Specialist
Empire Telecom

CC: The Honorable Paul Montinieri, Mayor, Town of Wethersfield
Steve Lattarulo, Chief Building Official, Town of Wethersfield
Peter Gillespie, Director of Planning and Economic Development, Town of Wethersfield
Frontier Communications, c/o Elissa McOmber

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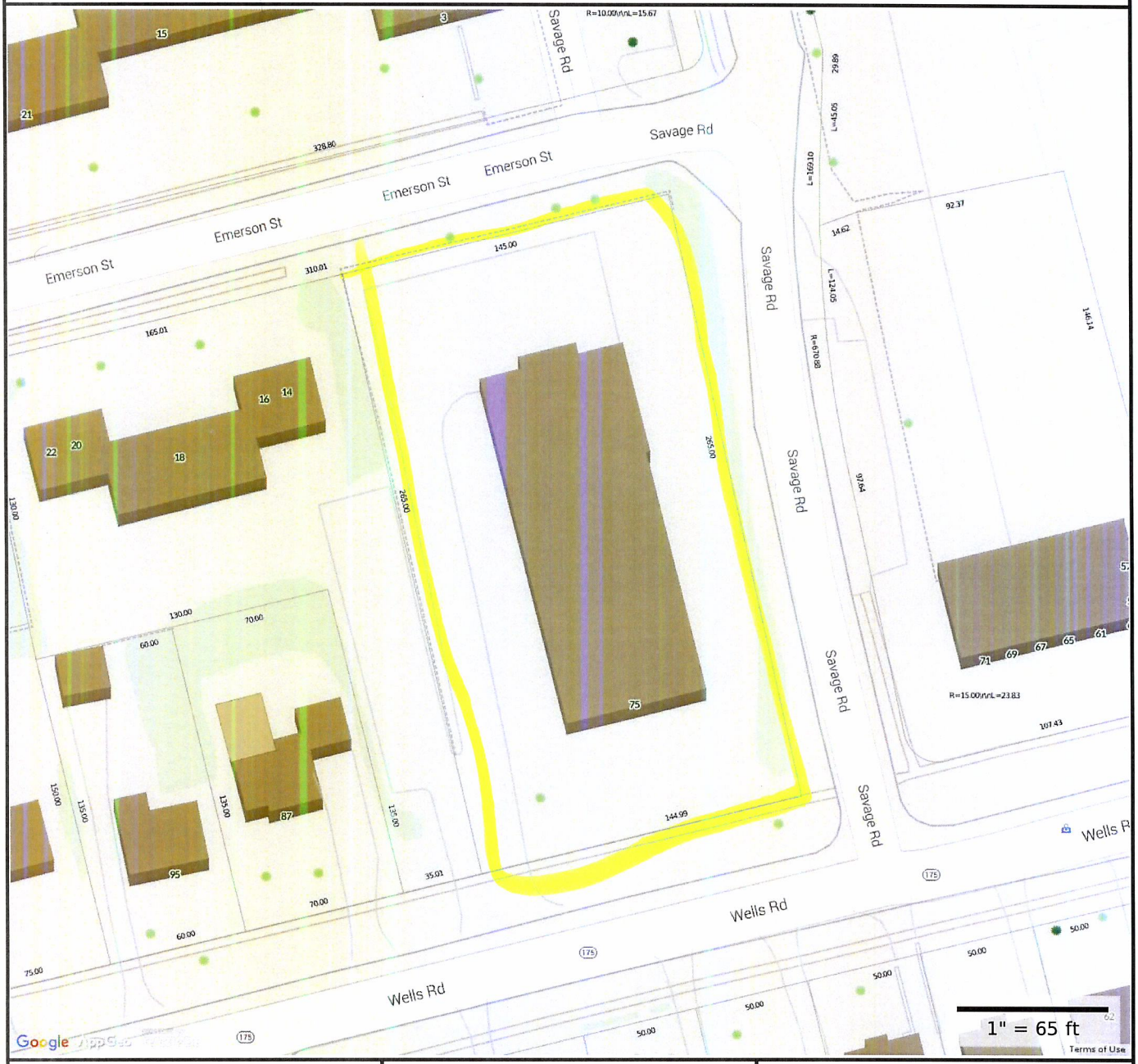

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of Wethersfield, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

PROJECT INFORMATION

SCOPE OF WORK:

- AT&T ANTENNAS: (1) NEW ANTENNA PER SECTOR, FOR A TOTAL (3) NEW ANTENNAS. (2) EXISTING ANTENNAS PER SECTOR FOR 3 SECTORS, FOR A TOTAL OF (6) EXISTING ANTENNAS TO REMAIN. (1) EXISTING ANTENNA PER SECTOR FOR (3) SECTORS, FOR A TOTAL OF (3) EXISTING ANTENNAS TO BE REMOVED.
- AT&T RRUs: (2) NEW RRUs PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (6) NEW RRUs; (1) EXISTING RRU PER SECTOR TO BE REUSED, FOR A TOTAL OF (3) EXISTING RRUs.
- AT&T SQUID: (1) NEW DC6 SURGE, FOR A TOTAL OF (1) NEW SQUID, (1) EXISTING DC-6 SURGE PROTECTOR, FOR A TOTAL OF (1) EXISTING SQUID TO REMAIN.

SITE ADDRESS:	75 WELLS ROAD WETHERSFIELD, CT 06109	
LATITUDE:	41.705825	41° 42' 20.97"N
LONGITUDE:	-72.6634161	-72° 39' 48.29796"W
USID:	59365	
TOWER OWNER:	TBD	
TYPE OF SITE:	MONOPOLE/INDOOR EQUIPMENT	
MONOPOLE HEIGHT:	101'-6"±	
RAD CENTER:	106'-0"±	
CURRENT USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY	
PROPOSED USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY	

DRAWING INDEX

APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN, ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AMD MAY IMPOSE CHANGES OR SITE MODIFICATIONS.

DISCIPLINE:	NAME:	
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		

at&t MOBILITY

FA CODE: 10035051
SITE NUMBER: CT1074
SITE NAME: WETHERSFIELD

VICINITY MAP

1. 128I-84 WEST TO EXIT 48 AND BEAR LEFT, IT IS A ROTARY YOU GO HALF WAY AROUND IT AND FOLLOW CAPITAL AVENUE. AT THE NEXT LIGHT TAKE A RIGHT ONTO WASHINGTON AVENUE. FOLLOW UNTIL IT INTERSECTS WITH RETREAT AVENUE. TURN LEFT ON RETREAT AVENUE AND SITE WILL BE DOWN ON YOUR RIGHT MEDICAL ARTS BUILDING.

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
BILLERICA, MA 01821
CONTACT: DAVID COOPER
PHONE: 617-639-4908
EMAIL: dcooper@empiretelecomm.com

SITE ACQUISITION:

COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
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CONTACT: DAVID COOPER
PHONE: 617-639-4908
EMAIL: dcooper@empiretelecomm.com

ENGINEERING:

COMPANY: COM-EX CONSULTANTS, LLC
ADDRESS: 115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
CONTACT: NICHOLAS D. BARILE, P.E.
PHONE: 862-209-4300
EMAIL: nbarile@comexconsultants.com

RF ENGINEER:

COMPANY: AT&T MOBILITY – NEW ENGLAND
ADDRESS: 550 COCHITUATE ROAD
SUITE 550 13 & 14
FRAMINGHAM, MA 01701
CONTACT: CAMERON SYME
PHONE: 508-596-7146
EMAIL: cs6970@att.com

CONSTRUCTION MANAGEMENT:

COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
BILLERICA, MA 01821
CONTACT: GRZEGORZ "GREG" DORMAN
PHONE: 484-683-1750
EMAIL: gdorman@empiretelecomm.com

GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY, AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.

2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.

3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CONNECTICUT ONE CALL SYSTEM, INC. 1-800-922-4455 STOP-CALL BEFORE YOU DIG!

CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811

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FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	04/28/16	ISSUED AS FINAL	KCD	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL: STATE OF CONNECTICUT NICHOLAS D. BARILE No. 28643 LICENSED PROFESSIONAL ENGINEER
NICHOLAS D. BARILE
PROFESSIONAL ENGINEER
CT LIC. NO. 28643

AT&T

DRAWING TITLE: TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
15098-EMP	T-1	0

GROUNDING NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE–SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL–OF–POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471–000–3PS–EG00–0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON–ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON–METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON–METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV–G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').
14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE ½" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES:

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

CONTRACTOR	–	EMPIRE TELECOM
SUBCONTRACTOR	–	GENERAL CONTRACTOR (CONSTRUCTION)
OWNER	–	AT&T MOBILITY
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 (EMPIRE TELECOM).
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. 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 SPACE FOR APPROVAL BY THE CONTRACTOR.
8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR
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 OFF 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.
12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
14. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741–000–3APS–A00Z–00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
17. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
18. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
   - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
   - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
   - FIRE/LIFE SAFETY CODE: NFPA–101 2009 WITH LOCAL & COUNTY AMENDMENTS
20. 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, THIRTEENTH EDITION
   - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
   - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA–222–G–1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
   - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
   - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
   - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
   - TELCORDIA GR–1503, COAXIAL CABLE CONNECTIONS
21. 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.
22. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.
23. INFORMATION SHOWN ON THIS SET OF PLANS TAKEN FROM DRAWINGS PREPARED BY HUDSON DESIGN GROUP FOR A RECENT UPGRADE DATED 10/03/2012. CONTRACTOR TO NOTIFY DESIGN ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.

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PHONE: 862.209.4300
FAX: 862.209.4301

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16 ESQUIRE ROAD
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SITE NUMBER: CT1074
SITE NAME: WETHERSFIELD

75 WELLS ROAD
WETHERSFIELD, CT 06109
HARTFORD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	04/28/16	ISSUED AS FINAL	KCD	NDB	NDB

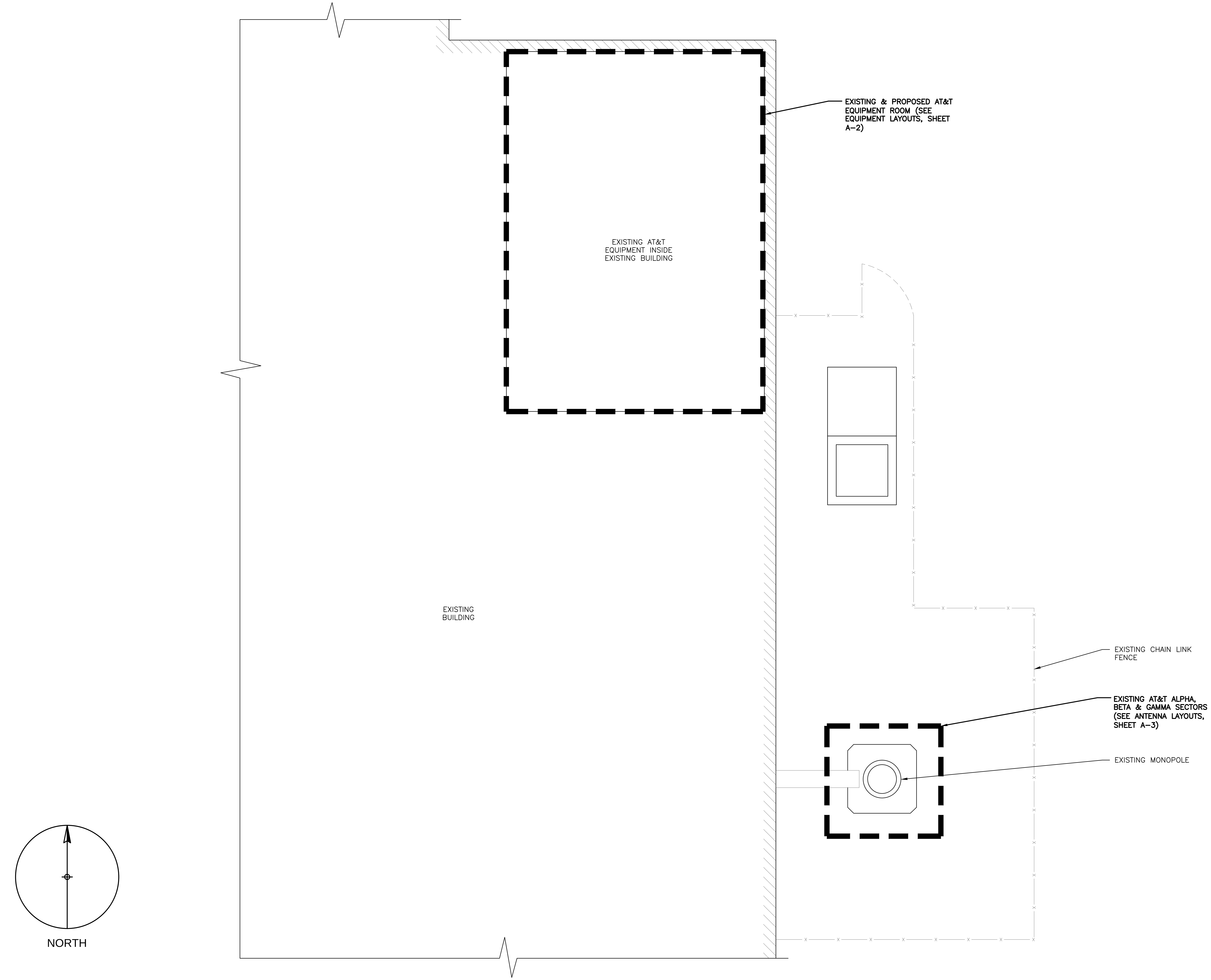
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL:
STATE OF CONNECTICUT — NICHOLAS D. BARILE — No. 28643 — LICENSED PROFESSIONAL ENGINEER
NICHOLAS D. BARILE
PROFESSIONAL ENGINEER
CT LIC. NO. 28643

AT&T

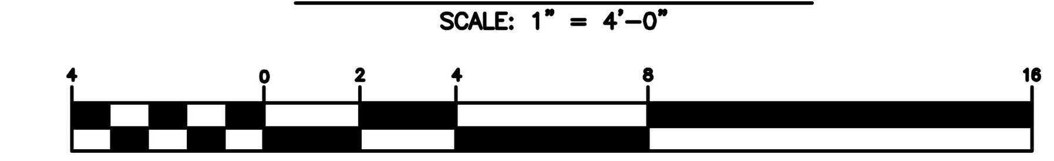
DRAWING TITLE:
GROUNDING & GENERAL NOTES

JOB NUMBER	DRAWING NUMBER	REV
15098–EMP	GN–1	0



COMPOUND LAYOUT

SCALE: 1" = 4'-0"



(IN FEET)
1/4 Inch = 1 Foot

NOTE:
CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

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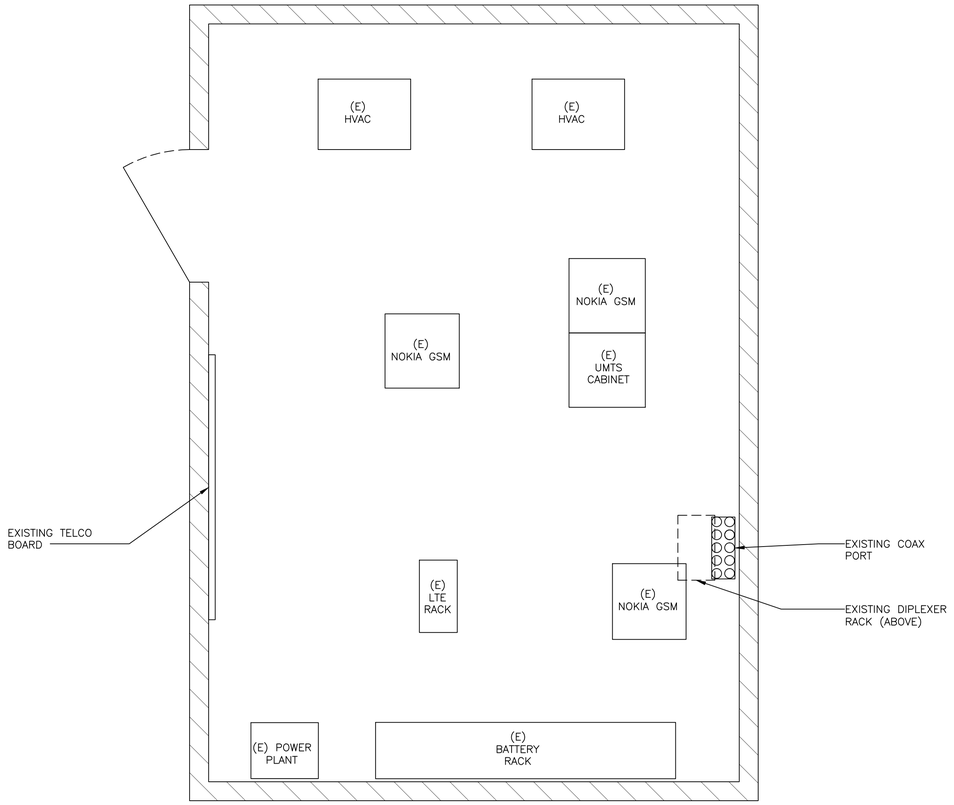
SEAL:
STATE OF CONNECTICUT NICHOLAS D. BARILE No. 28643 LICENSED PROFESSIONAL ENGINEER
NICHOLAS D. BARILE
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

DRAWING TITLE:
COMPOUND LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
15098-EMP	A-1	0



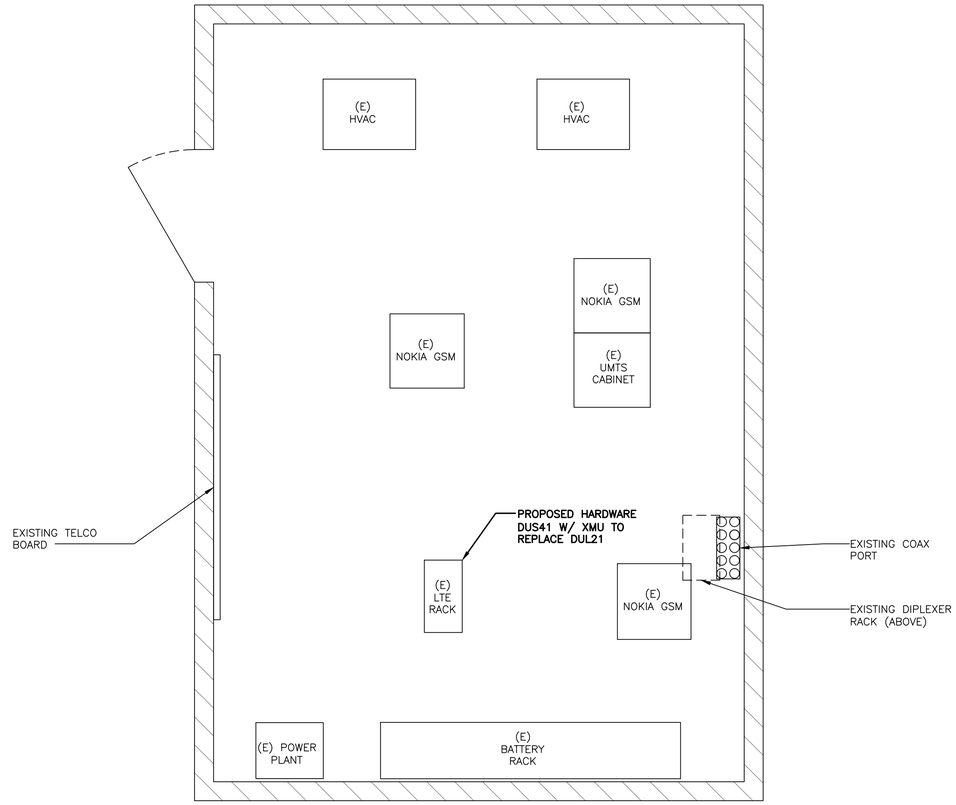
NORTH

EXISTING EQUIPMENT LAYOUT

SCALE: 1" = 2'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot



NORTH

PROPOSED EQUIPMENT LAYOUT

SCALE: 1" = 2'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot

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STATE OF CONNECTICUT
DOUGLAS G. BASILE
LICENSED PROFESSIONAL ENGINEER

DOUGLAS G. BASILE
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CT LICENSE NO. 23643

AT&T

DRAWING TITLE:
EQUIPMENT LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
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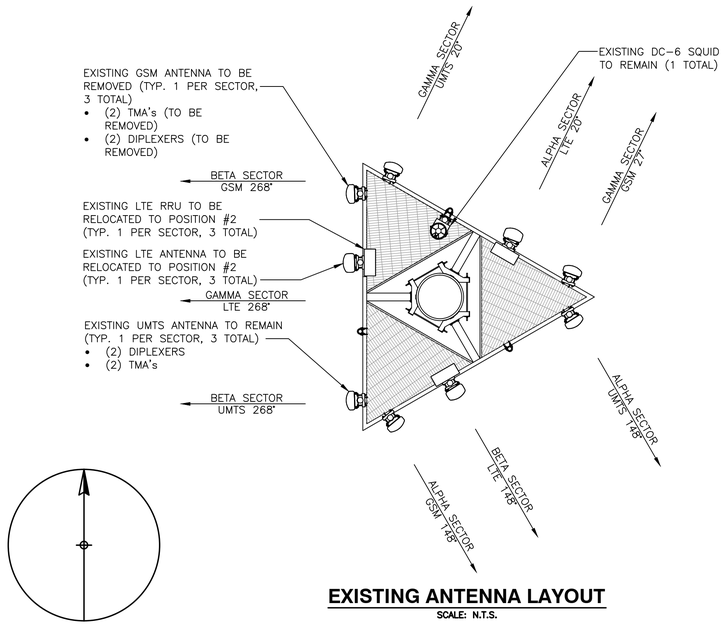
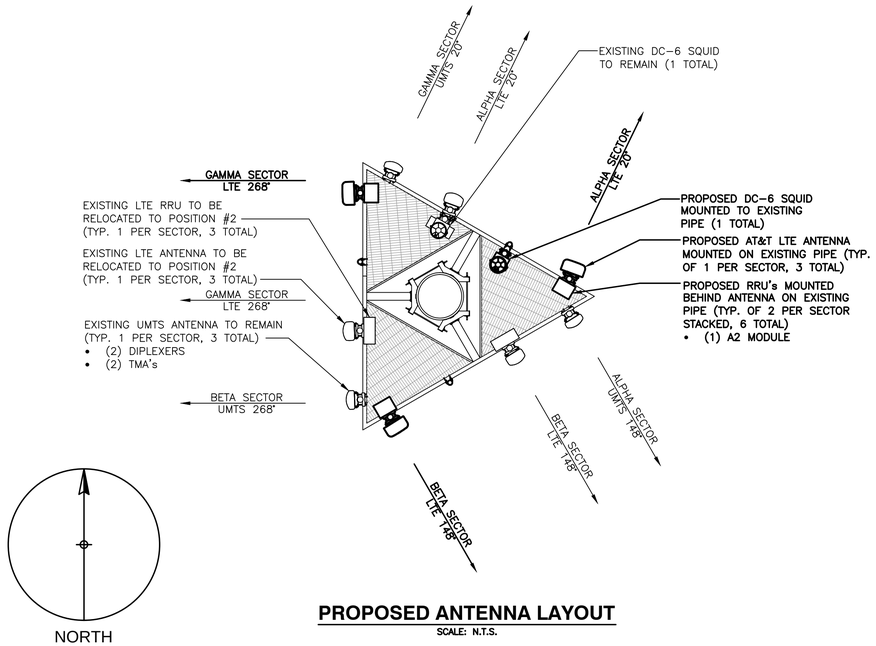


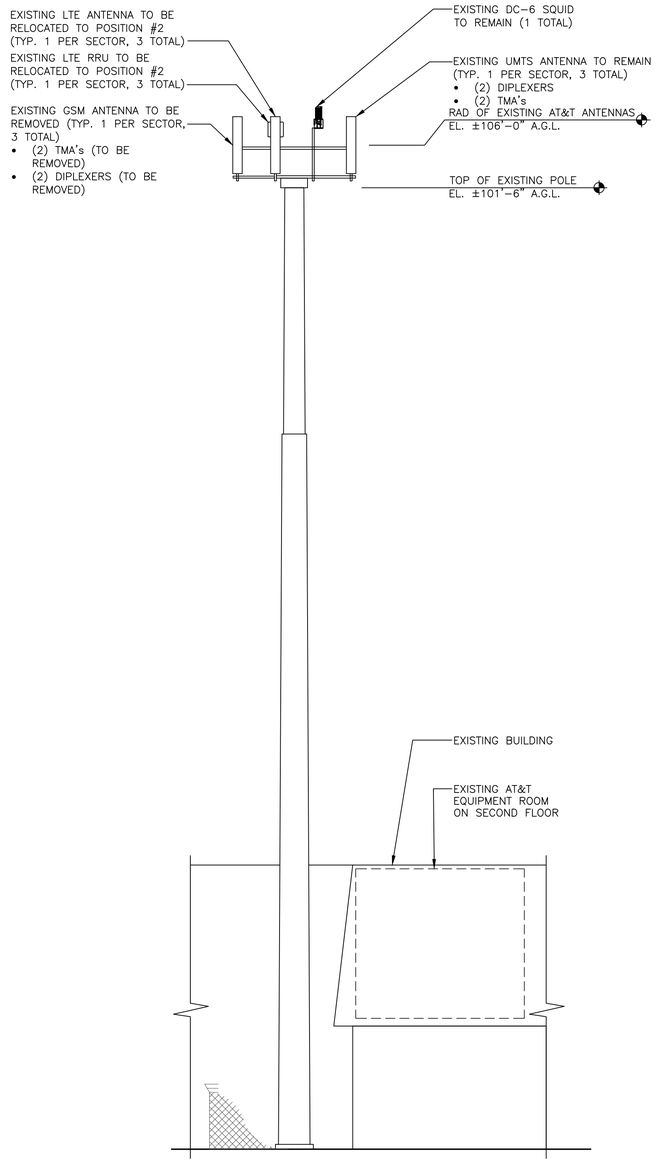
EXISTING ANTENNA LAYOUT

SCALE: N.T.S.



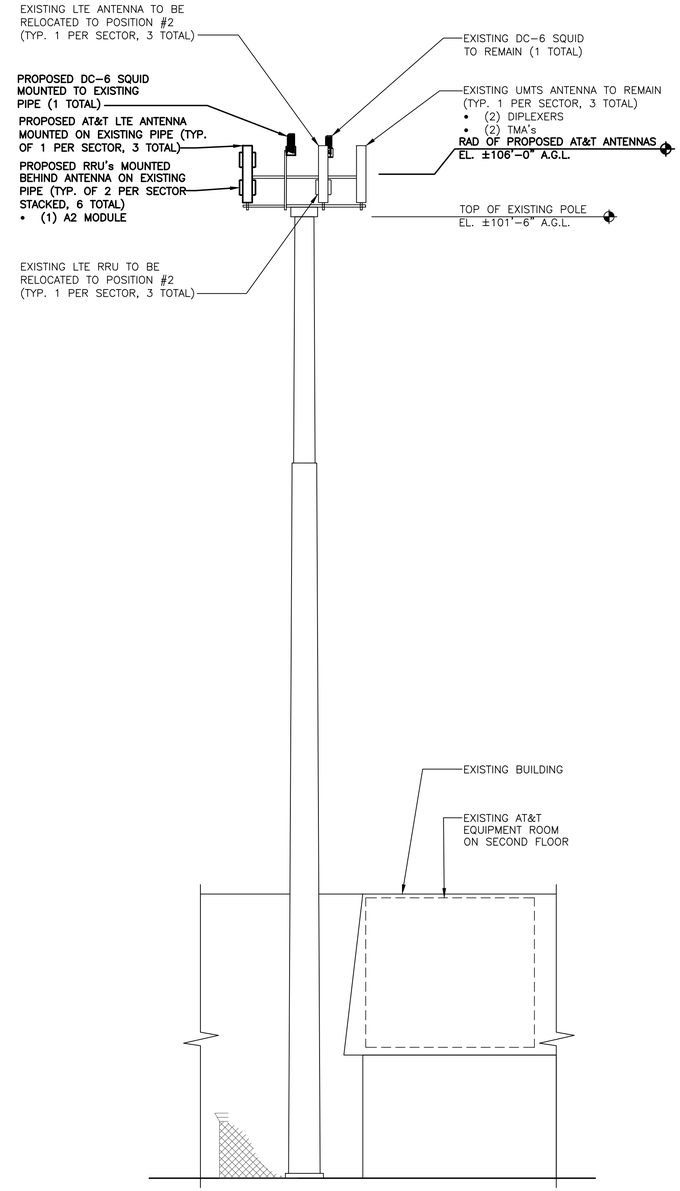
PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.



EXISTING TOWER ELEVATION

SCALE: NTS



PROPOSED TOWER ELEVATION

SCALE: NTS

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.

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FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	04/28/16	ISSUED AS FINAL	KCD	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL:

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CT LICENSE NO. 28643

AT&T

DRAWING TITLE:
ANTENNA LAYOUTS & ELEVATIONS

JOB NUMBER	DRAWING NUMBER	REV
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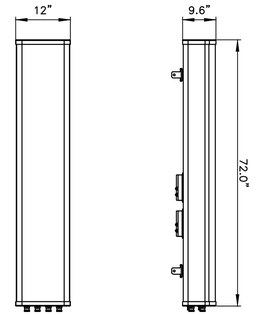


FRONT VIEW

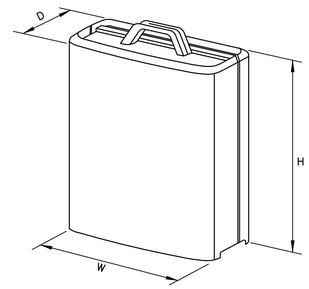
SIDE VIEW

BOTTOM VIEW

MANUFACTURER	QUINTEL
MODEL	QS66512-3
WEIGHT	105.0 LBS

LTE ANTENNA DETAIL

SCALE: N.T.S.

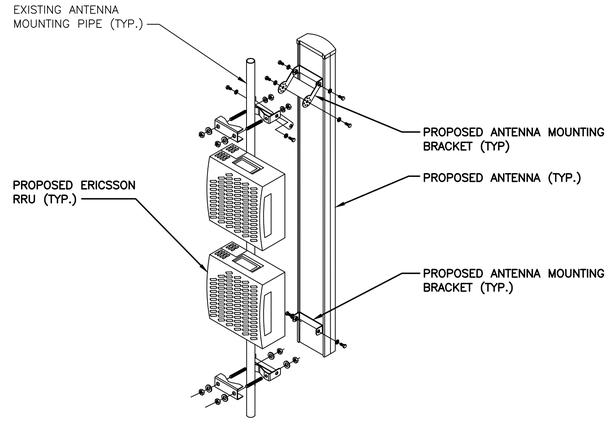


MODEL	L x W x H	WEIGHT
*RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-12	20.4"x18.5"x7.5"	58 LBS
RRUS-32	29.9"x13.3"x9.5"	77 LBS

*DENOTES EXISTING.

RRUS DETAIL

SCALE: N.T.S.



ANTENNA AND RRU MOUNTING DETAIL

SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770.00.850.06	55"x11"x5"
	A2	–	–	–
	A3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A4	POWERWAVE	7770.00.850.06	55"x11"x5"
BETA	B1	POWERWAVE	7770.00.850.06	55"x11"x5"
	B2	–	–	–
	B3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B4	POWERWAVE	7770.00.850.06	55"x11"x5"
GAMMA	G1	POWERWAVE	7770.00.850.06	55"x11"x5"
	G2	–	–	–
	G3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	G4	POWERWAVE	7770.00.850.06	55"x11"x5"

FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770.00.850.06	55"x11"x5"
	A2	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A3	–	–	–
	A4	**QUINTEL**	**QS66512-3**	**72"x12"x9.6"**
BETA	B1	POWERWAVE	7770.00.850.06	55"x11"x5"
	B2	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B3	–	–	–
	B4	**QUINTEL**	**QS66512-3**	**72"x12"x9.6"**
GAMMA	G1	POWERWAVE	7770.00.850.06	55"x11"x5"
	G2	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	G3	–	–	–
	G4	**QUINTEL**	**QS66512-3**	**72"x12"x9.6"**

PROPOSED RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	**ERICSSON**	**RRUS-32**	**29.9"x13.3"x9.5"**	**A2 MODULE**	**16.4"X15.2"X3.4"**
	ERICSSON	**RRUS-12**	**20.4"x18.5"x7.17"**	–	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
BETA	**ERICSSON**	**RRUS-32**	**29.9"x13.3"x9.5"**	**A2 MODULE**	**16.4"X15.2"X3.4"**
	ERICSSON	**RRUS-12**	**20.4"x18.5"x7.17"**	–	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
GAMMA	**ERICSSON**	**RRUS-32**	**29.9"x13.3"x9.5"**	**A2 MODULE**	**16.4"X15.2"X3.4"**
	ERICSSON	**RRUS-12**	**20.4"x18.5"x7.17"**	–	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		

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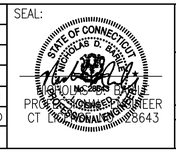
0	04/28/16	ISSUED AS FINAL	KCD	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL:



PROFESSIONAL ENGINEER
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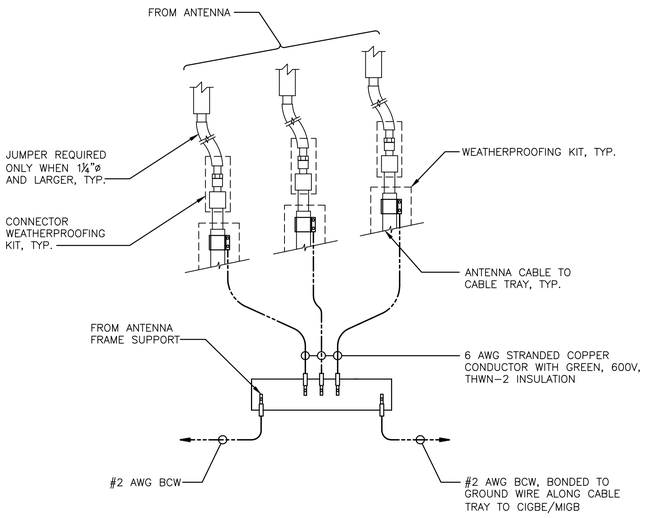
AT&T

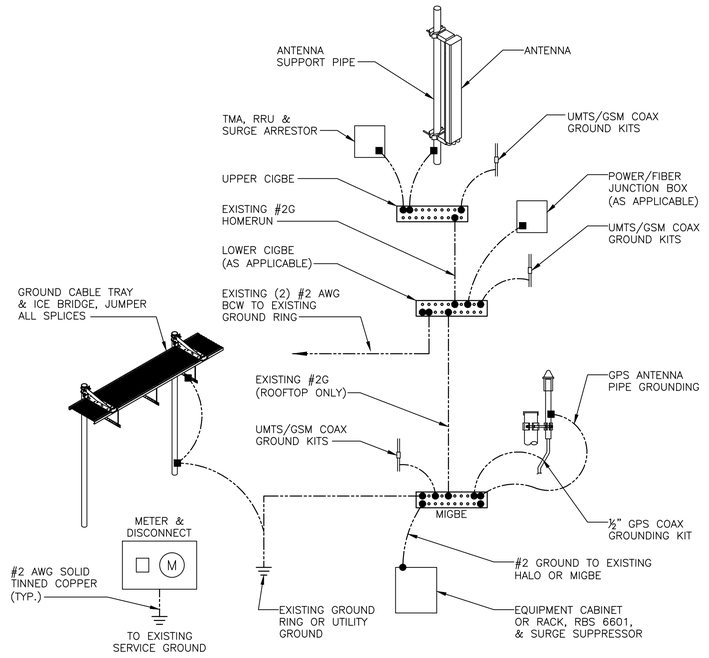
DRAWING TITLE:
DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15098-EMP	A-4	0



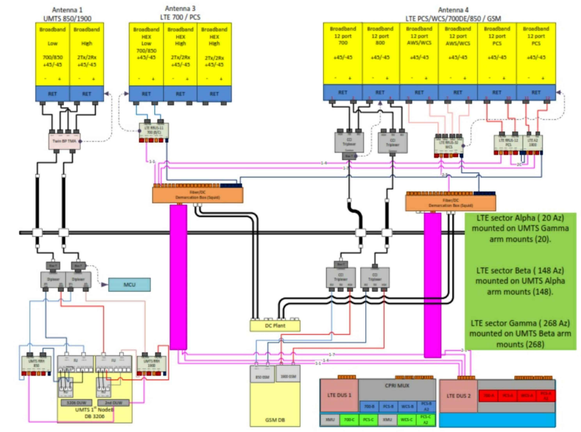
GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



GROUNDING RISER DIAGRAM

SCALE: N.T.S.



TYPICAL PLUMBING DIAGRAM (PER SECTOR)

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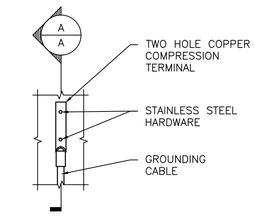
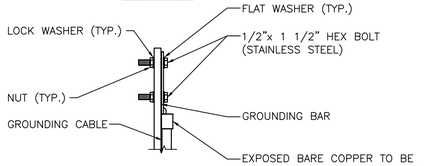


ELEVATION



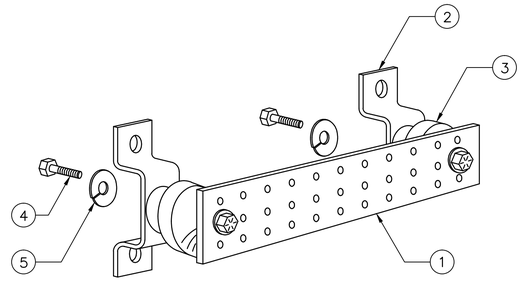
SECTION "A–A"

NOTE:

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

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x ¼")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	⅝"–11x1" H.H.C.S.
5	4	⅝" LOCK WASHER

NOTES:

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

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

SECTION "A" – SURGE ABSORBERS
- INTERIOR GROUND RING (#2)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
- BUILDING STEEL (IF AVAILABLE) (#2)

GROUND BAR DETAIL

SCALE: N.T.S.

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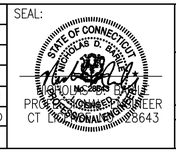


PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

DRAWING TITLE:
GROUNDING, ONE–LINE DIAGRAM & DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15098–EMP	G–1	0

Rigorous Structural Analysis Report

AT&T - Wethersfield Site #CT1074 / FA #10035051

Owner: Frontier Communications - Wethersfield CO Site

Wethersfield, Connecticut

June 17, 2016

MEI PROJECT ID: CT04861M-16V3

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

June 17, 2016

Ms. Lauren Groppi
Empire Telecom
Billerica, MA 01862

RIGOROUS STRUCTURAL ANALYSIS

Structure/Make/Model:	101 ft **Monopole**		Not Known / 18-Sided	
Client/Site Name/#:	**Empire Telecom / AT&T**		**Wethersfield #CT1074 / FA #10035051**	
Owner/Site Name/#:	Frontier Communications		Wethersfield CO	
MEI Project ID:	**CT04861M-16V3**			
Location:	75 Wells Rd Wethersfield, CT 06109		Hartford County FCC #1200438	
	LAT	41-42-21.2 N	LON	72-39-48.0 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 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 90.9% - Foundation.

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

6/17/2016

TABLE OF CONTENTS

1. INTRODUCTION & SCOPE

A rigorous structural analysis was performed by Malouf Engineering Int'l (MEI), as requested and authorized by Ms. Lauren Groppi, Empire Telecom, on behalf of AT&T, to determine the acceptance of the proposed changed conditions in conformance with the 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 CT04861M-16V2 Dated 06/01/2016
Foundation	MEI Records	Previous Structural Analysis	ID CT04861M-16V2 Dated 06/01/2016
Material Grade	Not available from supplied documents-Assumed based on typical towers of this type-refer to Appendix		
CURRENT APPURTENANCES			
	MEI Records	Previous Structural Analysis	ID CT04861M-16V2 Dated 06/01/2016
CHANGED CONDITION			
	Empire Telecom / Mr. Dave Cooper	Frontier PDQ	Dated 05/04/2016
		AT&T CDs	Dated 04/28/2016
		AT&T RF Data Sheet	Dated 09/22/2015
		E-mail Instructions	Dated 06/15/2016

Background Information:

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

DESIGNER / FABRICATOR	Not Known / 18-Sided
ORIGINAL DESIGN CRITERIA	TIA/EIA 222-Unknown
PRIOR STRUCTURAL MODIFICATIONS	As per GPD Group base plate and anchor rod modifications Job #2009264.50 dated 06/12/2009; pole shaft modifications by others as per B+T mapping report dated 07/17/2014 – considered properly installed.

3. ANALYSIS CRITERIA

The structural analysis performed used the following criteria:

CODE / STANDARD	2009 Int'l Building Code / ANSI/TIA-222-G-2 Standard	
LOADING CASES	*Full Wind*:	100 Mph (3-Sec Gust) - with No Radial Ice
	Iced Case:	40 Mph + 1.25" Radial Ice
	Service:	60 Mph
STRUCTURE CRITERIA	*Structure Classification*: Class II	
	Exposure Category: 'B' – *Topographic Category:* 1	

Appurtenances Configuration

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

Table 1: Proposed Changed Condition Appurtenances

Elev (ft)	Tenant	Ants Qty	Appurtenance Model / Description	Mount Description	Lines Qty	Line size & Location
103.5	AT&T	3	QS66512-3 Panel Antennas	[Existing Mounts]	1 2	5/8" Fiber-(I) 3/4" DC Power-(E)
		3	RRUS-12 *w/ A2 Backpacks*			
		3	RRUS-32 Boxes			
		6	TPX-070821 Triplexers			
		1	Raycap DC6 (Squid) Suppressor			
To Be Removed (See Below)						
103.5	AT&T	3	7770.00 Panel Antennas			
		3	LGP21401 Twin TMAs			
		6	LGP21901 Diplexers			

Table 2: Remaining Current and Reserved/Future Appurtenances

Elev (ft)	Tenant	Ants Qty	Appurtenance Model / Description	Mount Description	Lines Qty	Line size & Location
103.5	AT&T	3	AM-X-CD-16-65-00T-RET Panel Ants.	Top Platform w/ Rails (& Ladder)	12 1 2 1	1-5/8" 5/8" Fiber 3/4" DC Power ATCB-B01-xxx Homerun Cable-(I/E)
		3	7770.00 Panel Antennas			
		3	RRUS-11 Boxes			
		3	LGP21401 TMAs			
		1	Raycap DC6 (Squid) Suppressor			
101		1	5ft Lightning Rod			
		1	Beacon/Strobe		1	1/2"-(I)
95	T-Mobile	3	AIR21 Panel Antennas	*(3) 12.5 ft LP T-Arm Mounts (SitePro1 RMV12-3XX)*	*6* 1	*7/8"* 1-5/8" Hybrid Fiber-(I)
	T-Mobile [New]	*3*	*Ericsson KRC 118 057/1 Panel Ants.*			
		3	*RRUS-11 B12 Boxes*			
46.5		1	GPS Antenna	18in Approx. Standoff Arm	1	3/8"-(E)
37		1	GPS Antenna	18in Approx. Standoff Arm	1	3/8"-(E)

Notes:
1. All elevations are measured from tower base.
2. Please note appurtenances not listed above are to be removed/not present as per data supplied.
3. (I) = Internal; (E) = External; (FZ) = Within Face Zone; (OFZ) = Outside Face Zone - as per TIA-222-G.
4. 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. 7.0.5), 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	80.8%	88 – 61.25	**Pass**	
BASE PLATE	81.0%	Bending	**Pass**	
ANCHOR RODS	49.0%	Tension	**Pass**	
FOUNDATION	**90.9%**	**Moment**	**Pass**	

Table 4: Serviceability Requirements

	Maximum Value	TIA Requirement (10dB)	Pass/Fail	Comment
TWIST/SWAY	1.6513 Deg.	4 Deg. from Vert. or Horiz. Axis	**Pass**	
HORIZONTAL DISPLACEMENT	17.673 In./ 1.45% 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 90.9%** of its support capacity (controlling component: Foundation) 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.
- ***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 is near its support capacity for the appurtenances and loading criteria considered. Therefore, 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:

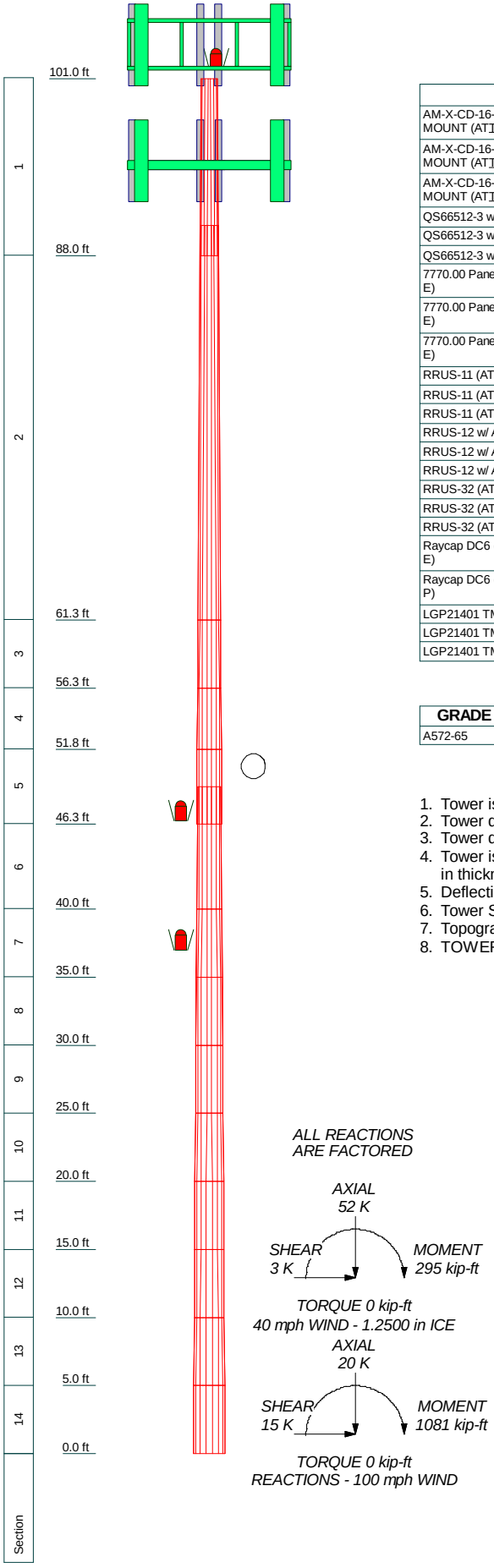
1. Proper alignment and plumbness.
2. Correct guy tensions, as applicable.
3. Correct bolt tightness or slip jacking of sleeved connections.
4. No significant deterioration or damage to any structural component.

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



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
AM-X-CD-16-65-00T-RET w/ PIPE MOUNT (AT⌶ / E)	103.5	(2) TPX-070821 Triplexer (AT⌶ / P)	103.5
AM-X-CD-16-65-00T-RET w/ PIPE MOUNT (AT⌶ / E)	103.5	(2) TPX-070821 Triplexer (AT⌶ / P)	103.5
AM-X-CD-16-65-00T-RET w/ PIPE MOUNT (AT⌶ / E)	103.5	(2) TPX-070821 Triplexer (AT⌶ / P)	103.5
QS66512-3 w/ Pipe Mount (AT⌶ / P)	103.5	Top Platform w/ Rails (_Ladder) (E)	103.5
QS66512-3 w/ Pipe Mount (AT⌶ / P)	103.5	Beacon/Strobe (E)	101
QS66512-3 w/ Pipe Mount (AT⌶ / P)	103.5	5' Lightning Rod (E)	101
7770.00 Panels w/ Pipe Mount (AT⌶ / E)	103.5	AIR21 w/ pipe Mount (T-Mobile / E (Relocated))	95
7770.00 Panels w/ Pipe Mount (AT⌶ / E)	103.5	AIR21 w/ pipe Mount (T-Mobile / E (Relocated))	95
7770.00 Panels w/ Pipe Mount (AT⌶ / E)	103.5	AIR21 w/ pipe Mount (T-Mobile / E (Relocated))	95
RRUS-11 (ATT) (AT⌶ / E)	103.5	Ericsson KRC 118 057/1 w/ pipe Mount (T-Mobile / New)	95
RRUS-11 (ATT) (AT⌶ / E)	103.5	Ericsson KRC 118 057/1 w/ pipe Mount (T-Mobile / New)	95
RRUS-11 (ATT) (AT⌶ / E)	103.5	Ericsson KRC 118 057/1 w/ pipe Mount (T-Mobile / New)	95
RRUS-12 w/ A2 Backpack (AT⌶ / P)	103.5	RRUS-11 B12 (T-Mobile / New)	95
RRUS-12 w/ A2 Backpack (AT⌶ / P)	103.5	RRUS-11 B12 (T-Mobile / New)	95
RRUS-12 w/ A2 Backpack (AT⌶ / P)	103.5	RRUS-11 B12 (T-Mobile / New)	95
RRUS-32 (AT⌶ / P)	103.5	12.5 ft. L.P. T-Arm Mount (SitePro1 RMV12-3XX) (New)	95
RRUS-32 (AT⌶ / P)	103.5	12.5 ft. L.P. T-Arm Mount (SitePro1 RMV12-3XX) (New)	95
RRUS-32 (AT⌶ / P)	103.5	12.5 ft. L.P. T-Arm Mount (SitePro1 RMV12-3XX) (New)	95
Raycap DC6 (Squid) Suppressor (AT⌶ / E)	103.5	GPS (E)	46.5
Raycap DC6 (Squid) Suppressor (AT⌶ / P)	103.5	18" Approx. Standoff Arm (E)	46.5
LGP21401 TMA'S (AT⌶ / E)	103.5	GPS (E)	37
LGP21401 TMA'S (AT⌶ / E)	103.5	18" Approx. Standoff Arm (E)	37
LGP21401 TMA'S (AT⌶ / E)	103.5		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	A572-60	60 ksi	75 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 100 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 1.25 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. TOWER RATING: 81%

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: ***101 ft. MNP. / Wethersfield Site #CT1074 / FA #10035051***			
Project: ***CT04861M-16V3***			
Client: Empire Telecom / AT&T	Drawn by: HLopez	App'd:	
Code: TIA-222-G	Date: 06/17/16	Scale: NTS	
Path: C:\MEIProjects\16files\MNP\CT04861M-16V3\CT04861M-16V3.eri		Dwg No. E-1	

No.	QTY.	DESCRIPTION	ELEV.	TENANT
1	1	1/2	101'	E (Lighting)
2	12	1 5/8	101'	AT&T / E
3	2	5/8" Fiber Cable	101'	AT&T / E+P
4	2	3/4" DC Power Cable	101'	AT&T / E
5	2	3/4" DC Power Cable	101'	AT&T / P
6	1	ATCB-B01-xxx Homerun Cable (Ext.)	62'-101'	AT&T / E
7	1	ATCB-B01-xxx Homerun Cable (Int.)	62'	AT&T / E
8	1	1 5/8 (Hybrid-Fiber)	95'	T-Mobile / E
9	6	7/8	95'	T-Mobile / New
10	1	3/8 (Shielded)	46'	E
11	1	3/8 (Shielded)	37'	E

LEGEND:

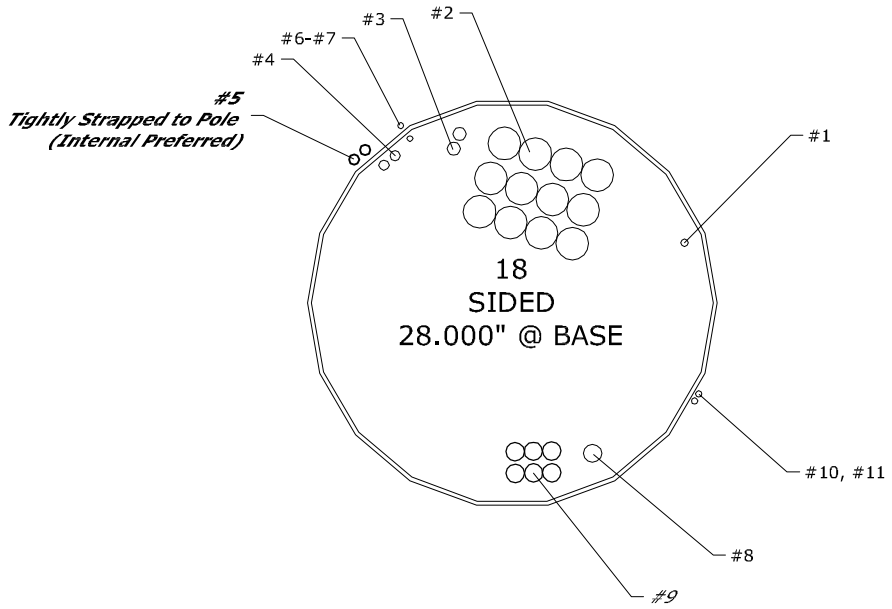
E = EXISTING #X

P = PROPOSED *#X*

F = FUTURE *#X*

R = REMOVE *#X*

TO RELOCATE



101 PLAN: SCHEMATIC Tx-LINE LAYOUT

SCALE: NOT TO SCALE

NOTES:

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

JUN 17, 2016

MALOUF ENGINEERING INTERNATIONAL, INC.
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www.maloufengineering.com

at&t

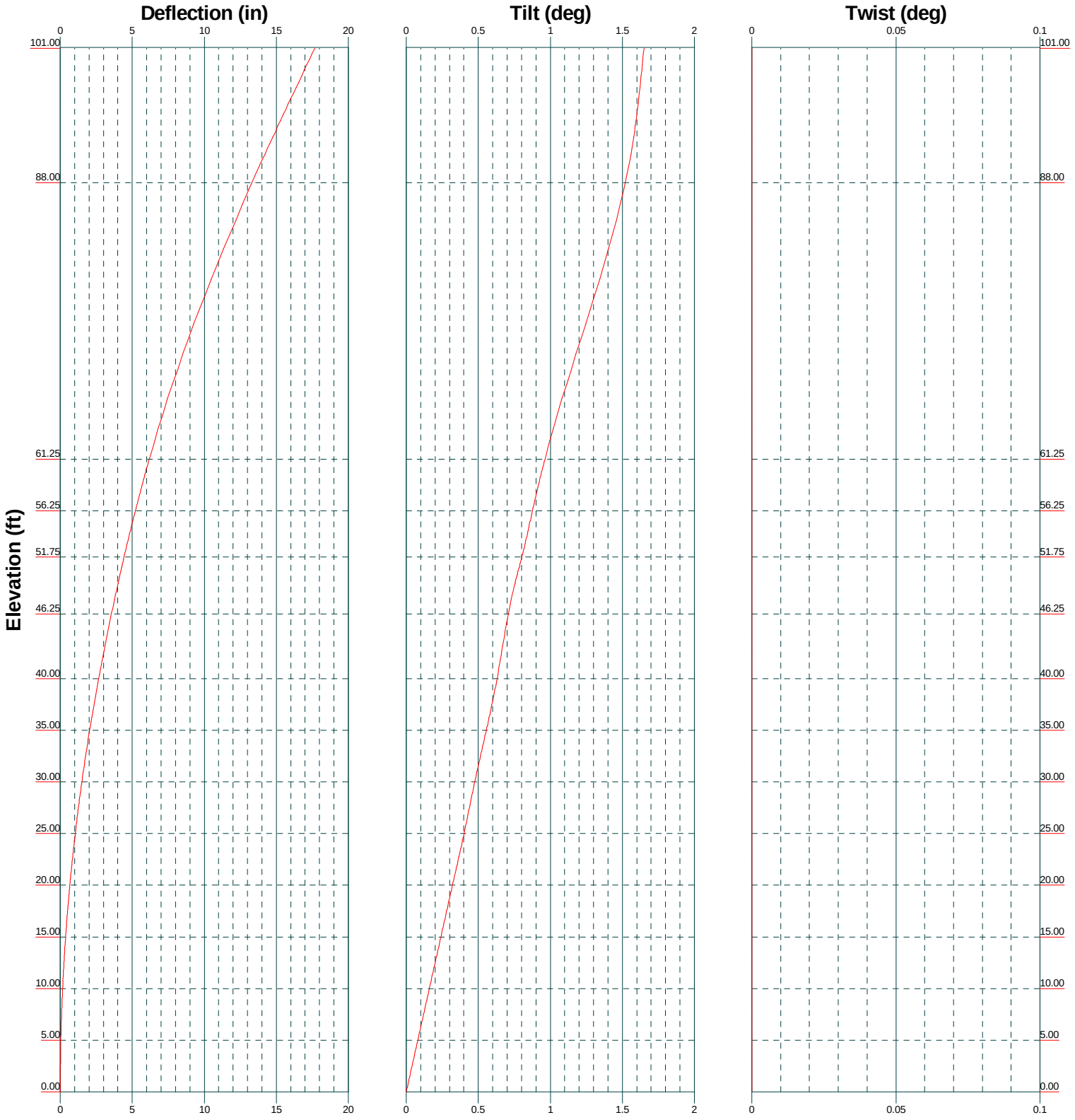
101 ft. MNP. / Wethersfield Site #CT1074 / FA #10035051

MONOPOLE TxLINE LAYOUT

MEI PROJECT ID	SHEET NUMBER	REV.
CT04861M-16V3	**L01**	0

TIA-222-G - Service - 60 mph

Maximum Values



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17950 PRESTON RD. SUITE 720
DALLAS, TEXAS - 75252
Phone: (972) 783-2578
FAX: (972) 783-2583

Job: ***101 ft. MNP. / Wethersfield Site #CT1074 / FA #10035051***			
Project: ***CT04861M-16V3***			
Client: Empire Telecom / AT&T	Drawn by: HLopez	App'd:	
Code: TIA-222-G	Date: 06/17/16	Scale: NTS	
Path: C:\MEIProjects\16files\MNP\CT04861M-16V3\CT04861M-16V3.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 Hartford County, Connecticut.
Basic wind speed of 100 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.2500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
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.

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	*Sector*	*Placement* *ft*	*Total Number*
3/4" DC Power Cable (AT&T / P)	A	101.00 - 0.00	2
ATCB-B01-xxx Homerun Cable (AT&T / E)	A	101.00 - 62.00	1
3/8 (Shielded) (E)	A	46.50 - 0.00	1
3/8 (Shielded) (E)	A	37.00 - 0.00	1

Feed Line/Linear Appurtenances - Entered As Area

Description	*Placement ft*	*Total Number*
Safety Line 3/8 (E)	101.00 - 0.00	1
Step Bolts (E)	101.00 - 0.00	1
1/2 (E (Lighting))	101.00 - 0.00	1
1 5/8 (AT&T / E)	101.00 - 0.00	12
5/8" Fiber Cable (AT&T / E+P)	101.00 - 0.00	2
3/4" DC Power Cable (AT&T / E)	101.00 - 0.00	2
ATCB-B01-xxx Homerun Cable (AT&T / E)	62.00 - 0.00	1
1 5/8 (Hybrid-Fiber) (T-Mobile / E)	95.00 - 0.00	1
7/8 (T-Mobile / New)	95.00 - 0.00	6
MP303 (Mods)	62.00 - 47.00	1
MP303 (Mods)	62.00 - 47.00	1
MP304 (Mods)	45.50 - 0.00	1
MP304 (Mods)	45.50 - 0.00	1

Discrete Tower Loads

Description	Placement ft
5' Lightning Rod (E)	101.00
Beacon/Strobe (E)	101.00
AM-X-CD-16-65-00T-RET w/ PIPE MOUNT (AT&T / E)	103.50
AM-X-CD-16-65-00T-RET w/ PIPE MOUNT (AT&T / E)	103.50
AM-X-CD-16-65-00T-RET w/ PIPE MOUNT (AT&T / E)	103.50
QS66512-3 w/ Pipe Mount (AT&T / P)	103.50
QS66512-3 w/ Pipe Mount (AT&T / P)	103.50
QS66512-3 w/ Pipe Mount (AT&T / P)	103.50
7770.00 Panels w/ Pipe Mount (AT&T / E)	103.50
7770.00 Panels w/ Pipe Mount (AT&T / E)	103.50
7770.00 Panels w/ Pipe Mount (AT&T / E)	103.50
RRUS-11 (AT&T) (AT&T / E)	103.50
RRUS-11 (AT&T) (AT&T / E)	103.50
RRUS-11 (AT&T) (AT&T / E)	103.50
RRUS-12 w/ A2 Backpack (AT&T / P)	103.50
RRUS-12 w/ A2 Backpack (AT&T / P)	103.50
RRUS-12 w/ A2 Backpack (AT&T / P)	103.50
RRUS-32 (AT&T / P)	103.50
RRUS-32 (AT&T / P)	103.50
RRUS-32 (AT&T / P)	103.50
Raycap DC6 (Squid) Suppressor (AT&T / E)	103.50
Raycap DC6 (Squid) Suppressor (AT&T / P)	103.50

Description	Placement ft
LGP21401 TMA'S (AT&T / E)	103.50
LGP21401 TMA'S (AT&T / E)	103.50
LGP21401 TMA'S (AT&T / E)	103.50
(2) TPX-070821 Triplexer (AT&T / P)	103.50
(2) TPX-070821 Triplexer (AT&T / P)	103.50
(2) TPX-070821 Triplexer (AT&T / P)	103.50
Top Platform w/ Rails (& Ladder) (E)	103.50
AIR21 w/ pipe Mount (T-Mobile / E (Relocated))	95.00
AIR21 w/ pipe Mount (T-Mobile / E (Relocated))	95.00
AIR21 w/ pipe Mount (T-Mobile / E (Relocated))	95.00
Ericsson KRC 118 057/1 w/ pipe Mount (T-Mobile / New)	95.00
Ericsson KRC 118 057/1 w/ pipe Mount (T-Mobile / New)	95.00
Ericsson KRC 118 057/1 w/ pipe Mount (T-Mobile / New)	95.00
RRUS-11 B12 (T-Mobile / New)	95.00
RRUS-11 B12 (T-Mobile / New)	95.00
RRUS-11 B12 (T-Mobile / New)	95.00
12.5 ft. L.P. T-Arm Mount (SitePro1 RMV12-3XX) (New)	95.00
12.5 ft. L.P. T-Arm Mount (SitePro1 RMV12-3XX) (New)	95.00
12.5 ft. L.P. T-Arm Mount (SitePro1 RMV12-3XX) (New)	95.00
GPS (E)	46.50
18" Approx. Standoff Arm (E)	46.50
GPS (E)	37.00
18" Approx. Standoff Arm (E)	37.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
103.50	AM-X-CD-16-65-00T-RET w/ PIPE MOUNT	40	17.673	1.6513	0.0010	8366
101.00	5' Lightning Rod	40	17.673	1.6513	0.0010	8366
95.00	AIR21 w/ pipe Mount	40	15.623	1.6050	0.0009	6972
46.50	GPS	40	3.593	0.7141	0.0003	4412
37.00	GPS	40	2.282	0.5871	0.0002	3670

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual Allowable Ratio Bolt Tension K	Actual Allowable Ratio Concrete Stress ksi	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Critical Ratio
2.500	8	1.7500	106.81 216.48 0.49	2.496 4.080 0.61	36.465 45.000 0.81		Plate	0.81 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	101 - 88	Pole	TP16.36x14.64x0.1875	1	-27.06	41.36	72.1	Pass
L2	88 - 61.25	Pole	TP19.7689x15.6873x0.25	2	-8.70	114.37	80.8	Pass
L3	61.25 - 56.25	Pole	TP20.4726x19.7689x0.250*	3	-9.39	195.73	59.6	Pass
L4	56.25 - 51.75	Pole	TP21.1059x20.4726x0.250*	4	-10.01	212.78	62.8	Pass
L5	51.75 - 46.25	Pole	TP21.88x21.1059x0.250*	5	-10.40	222.19	65.0	Pass
L6	46.25 - 40	Pole	TP22.28x20.725x0.3125*	6	-12.27	317.79	57.0	Pass
L7	40 - 35	Pole	TP22.995x22.28x0.3125*	7	-13.22	346.20	59.5	Pass
L8	35 - 30	Pole	TP23.71x22.995x0.3125*	8	-14.15	375.94	61.8	Pass
L9	30 - 25	Pole	TP24.425x23.71x0.3125*	9	-15.10	407.78	64.0	Pass
L10	25 - 20	Pole	TP25.14x24.425x0.3125*	10	-16.08	441.07	66.0	Pass
L11	20 - 15	Pole	TP25.855x25.14x0.3125*	11	-17.07	475.81	68.0	Pass
L12	15 - 10	Pole	TP26.57x25.855x0.3125*	12	-18.09	513.03	69.7	Pass
L13	10 - 5	Pole	TP27.285x26.57x0.3125*	13	-19.13	551.86	71.4	Pass
L14	5 - 0	Pole	TP28x27.285x0.3125*	14	-20.19	592.30	73.1	Pass
							Summary	
						Pole (L2)	80.8	Pass
						Base Plate	81.0	Pass
						RATING =	**81.0**	**Pass**

***Modified w/ MP304 & MP303 Channels**

APPENDIX 2 – SOURCE / CHANGED CONDITION

From: Dave Cooper <dcooper@empiretelecomm.com>
Sent: Wednesday, June 15, 2016 4:02 PM
To: 'Mark Malouf'; Kerry Sethares
Cc: Lauren Groppi; Nicole Caplan; Liz Adkins
Subject: RE: CT - Wethersfield CO - ATT - PDQ 032116 updated 4-26-2016 - PDQ stipulations

Please see below

From: Mark Malouf [mailto:MMalouf@maloufengineering.com]
Sent: Wednesday, June 15, 2016 3:49 PM
To: Dave Cooper <dcooper@empiretelecomm.com>
Cc: Lauren Groppi <lgroppi@empiretelecomm.com>; Nicole Caplan <ncaplan@empiretelecomm.com>; Liz Adkins <LAdkins@maloufengineering.com>
Subject: RE: CT - Wethersfield CO - ATT - PDQ 032116 updated 4-26-2016 - PDQ stipulations

Dave,

…

Existing:
(3) 7770.00 Panel Antennas 6 existing
(3) AM-X-CD-16-65-00T-RET Panel Antennas
(3) LGP21401 Twin TMAs 6 existing
(3) RRUS-11 Boxes
(1) DC-6 Squid
(12) 1-5/8”
(1) Fiber Cable
(2) DC Power Cables
(1) Homerun RET Cable (As per mapping)

To Be Removed:
(3) 7770.00 Panel Antennas
(3) LGP21401 Twin TMAs
(6) LGP21901 Diplexers

Proposed:
(3) QS66512-3 Panel Antennas
(6) TPX-07821 Triplexers
(3) RRUS-32 Boxes
(3) RRUS-12 w/A2 Backpacks
(1) DC-6 Squid
(1) Fiber C able
(2) DC Power Cables

Final AT&T Loading at Elev. 103.5ft:
(3) 7770.00 Panel Antennas

(3) AM-X-CD-16-65-00T-RET Panel Antennas
(3) QS66512-3 Panel Antennas
(6) TPX-07821 Triplexers
(3) LGP21401 Twin TMAs
(3) RRUS-11 Boxes
(3) RRUS-32 Boxes
(3) RRUS-12 w/A2 Backpacks
(2) DC-6 Squid
(12) 1-5/8”
(2) Fiber Cable
(4) DC Power Cables
(1) Homerun RET Cable (As per mapping)

Please verify for accuracy and mark up as needed.

Thanks,

Mark Malouf, PE, SECB, IPF
mmalouf@maloufengineering.com
(O) 972-783-2578 ext.106

Tower / Radio Information - Call Sign information needs to be tied to a specific antenna(s). Adjust letters as needed.

B	Call Sign	KNKA239
	Class of Station	CL
	Emission Type	cellular
	Transmit Frequency	880-890, 891.5-894
	Output Power (watts)	316
	Transmitter ERP (dBm)	55
	Receive Frequency	835-845, 846.5-849

B	Call Sign	WPSL626
	Class of Station	CW-PCS
	Emission Type	GSM / UMTS
	Transmit Frequency	1930-1935
	Output Power (watts)	632 per sector
	Transmitter ERP (dBm)	55
	Receive Frequency	1850-1855

B	Call Sign	KNLG441
	Class of Station	CW-PCS
	Emission Type	GSM / UMTS
	Transmit Frequency	1945-1950
	Output Power (watts)	632 per sector
	Transmitter ERP (dBm)	55
	Receive Frequency	1865-1870

A	Call Sign	WQJU451
	Class of Station	WY 700 MHz
	Emission Type	LTE
	Transmit Frequency	734-740
	Output Power (watts)	501 per sector
	Transmitter ERP (dBm)	57
	Receive Frequency	704-710

Please attach frequency coordination data (PCN)

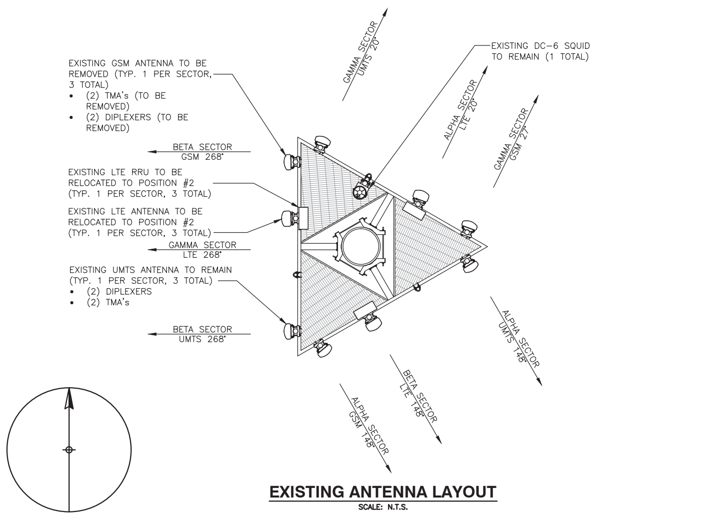
B	Call Sign	KNLG442
	Class of Station	CW-PCS
	Emission Type	GSM / UMTS
	Transmit Frequency	1965-1970
	Output Power (watts)	632 per sector
	Transmitter ERP (dBm)	55
	Receive Frequency	1885-1890

B	Call Sign	WPTF536
	Class of Station	CW-PCS
	Emission Type	GSM / UMTS
	Transmit Frequency	1982.5-1990
	Output Power (watts)	632 per sector
	Transmitter ERP (dBm)	55
	Receive Frequency	1902.5-1910

A	Call Sign	WPWV366
	Class of Station	WZ 700 MHz
	Emission Type	LTE
	Transmit Frequency	740-746
	Output Power (watts)	501 per sector
	Transmitter ERP (dBm)	57
	Receive Frequency	710-716

Coax / Waveguide / Cable Information	
Type:	Commscope
Size:	1 5/8"
Length:	170'
# of runs:	12
Type:	fiber
Size:	5/8"
Length:	170'
# of runs:	2
Type:	DC trunks
Size:	3/4"
Length:	170'
# of runs:	4

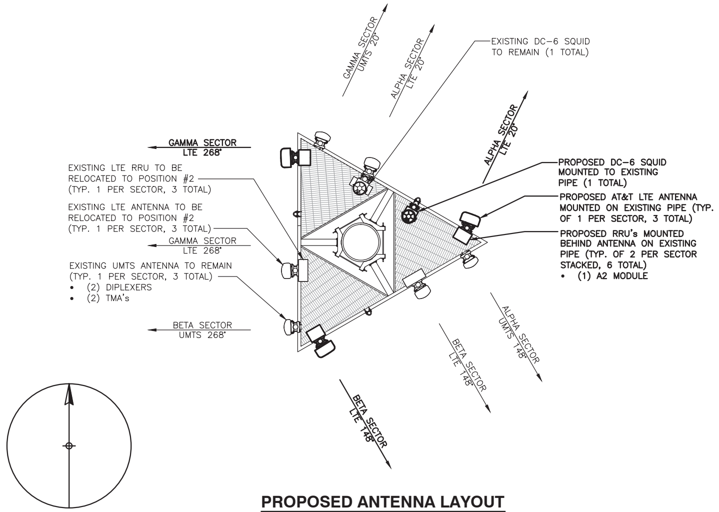
	Antenna & Ancillary Equipment Information		Check one					Heights - Above Ground Level (feet)			
#	Make	Model	Existing	Proposed	Size / Dimensions	Weight	Azimuth	RAD Center	Attachment	Tip	Notes
A	KMW	AM-X-CD-16-65-00T-RET	x		72"x12"x6"	49 lbs ea	20	106'	101'	109'	
A	KMW	AM-X-CD-16-65-00T-RET	x		72"x12"x6"	49 lbs ea	148	106'	101'	109'	
A	KMW	AM-X-CD-16-65-00T-RET	x		72"x12"x6"	49 lbs ea	268	106'	101'	109'	
B	Powerwave	7700	x		55"x11"x5"	35 lbs ea	148	106'	101'	109'	
	Powerwave	7700	x		55"x11"x5"	35 lbs ea	148	106'	101'	109'	To be Removed
B	Powerwave	7700	x		55"x11"x5"	35 lbs ea	268	106'	101'	109'	
	Powerwave	7700	x		55"x11"x5"	35 lbs ea	268	106'	101'	109'	To be Removed
B	Powerwave	7700	x		55"x11"x5"	35 lbs ea	20	106'	101'	109'	
	Powerwave	7700	x		55"x11"x5"	35 lbs ea	27	106'	101'	109'	To be Removed
B	Quintel	QS66512-3		x	72"x12"x10"	105 lbs ea	20	106'	101'	109'	
B	Quintel	QS66512-3		x	72"x12"x10"	105 lbs ea	148	106'	101'	109'	
B	Quintel	QS66512-3		x	72"x12"x10"	105 lbs ea	268	106'	101'	109'	
	Powerwave	LGP 21401	x		6"x 8" x 2"	7.7 lbs ea			101'		6 TMAs total, 2 per sector
	Ericsson	RRUS-11	x		17" x 17" x 6"	50 lbs ea	20, 148, 268	106'	101'		3 Radio heads 1 per sector
	Raycap	Squid	x		8.3" diameter X 26" Tall	25 lbs ea			101'		1 Fiber and DC Junction Box
	Raycap	Squid		x	8.3" diameter X 26" Tall	25 lbs ea			101'		Fiber and DC Junction Box quantity?
	Ericsson	RRUS-12		x	20" x 19" x 8"	50 lbs ea	20, 148, 268	106'	101'		3 Radio heads 1 per sector
	Ericsson	RRUS-32		x	23" x 11" x 6"	51 lbs ea	20, 148, 268	106'	101'		3 Radio heads 1 per sector
	Ericsson	RRUS-A2		x	16" x 15" x 3"	22 lbs ea	20, 148, 268	106'	101'		3 amplifiers added to RRUS-12, 1 per sector
	CCI	Triplexer TPX-070821		x	6" x 10" x 2"	7.5 lbs ea					6 total 2 per sector



NORTH

EXISTING ANTENNA LAYOUT

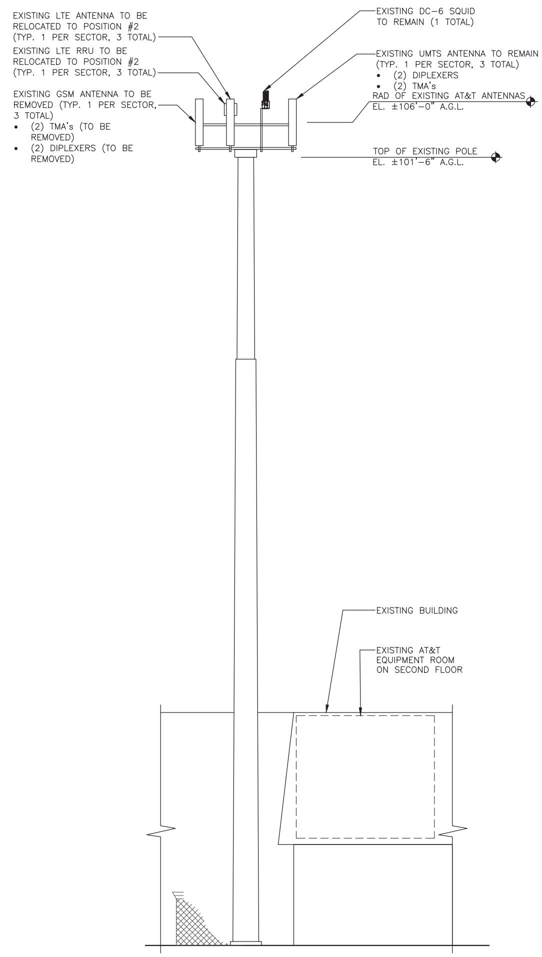
SCALE: N.T.S.



NORTH

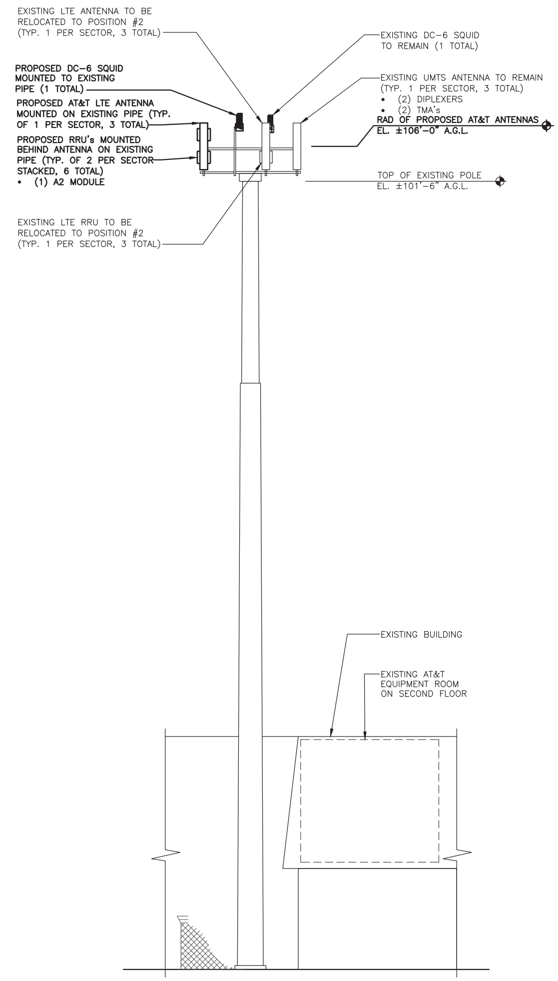
PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.



EXISTING TOWER ELEVATION

SCALE: NTS



PROPOSED TOWER ELEVATION

SCALE: NTS

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.

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SITE NUMBER: CT1074
SITE NAME: WETHERSFIELD

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NO.	DATE	REVISIONS	BY	CHK	APP'D
0	04/28/16	ISSUED AS FINAL	KCD	NDB	NDB

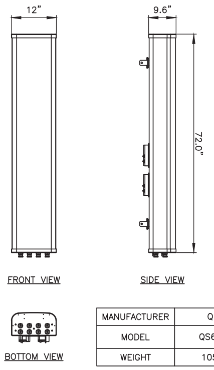
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL: STATE OF CONNECTICUT, NICHOLAS D. BARILE, No. 28643, LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER CT LIC. No. 28643

AT&T

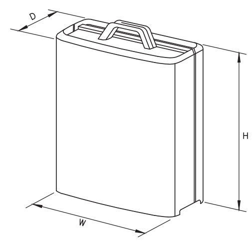
DRAWING TITLE: ANTENNA LAYOUTS & ELEVATIONS

JOB NUMBER	DRAWING NUMBER	REV
15098-EMP	A-3	0



MANUFACTURER	QUINTEL
MODEL	QS66512-3
WEIGHT	105.0 LBS

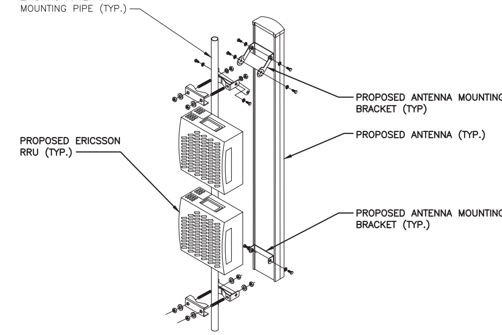
LTE ANTENNA DETAIL
SCALE: N.T.S.



MODEL	L x W x H	WEIGHT
*RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-12	20.4"x18.5"x7.5"	58 LBS
RRUS-32	29.9"x13.3"x9.5"	77 LBS

*DENOTES EXISTING.

RRUS DETAIL
SCALE: N.T.S.



ANTENNA AND RRU MOUNTING DETAIL
SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770.00.850.06	55"x11"x5"
	A2	–	–	–
	A3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A4	POWERWAVE	7770.00.850.06	55"x11"x5"
BETA	B1	POWERWAVE	7770.00.850.06	55"x11"x5"
	B2	–	–	–
	B3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B4	POWERWAVE	7770.00.850.06	55"x11"x5"
GAMMA	G1	POWERWAVE	7770.00.850.06	55"x11"x5"
	G2	–	–	–
	G3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	G4	POWERWAVE	7770.00.850.06	55"x11"x5"

FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770.00.850.06	55"x11"x5"
	A2	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A3	–	–	–
	A4	**QUINTEL**	**QS66512-3**	**72"x12"x9.6"**
BETA	B1	POWERWAVE	7770.00.850.06	55"x11"x5"
	B2	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B3	–	–	–
	B4	**QUINTEL**	**QS66512-3**	**72"x12"x9.6"**
GAMMA	G1	POWERWAVE	7770.00.850.06	55"x11"x5"
	G2	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	G3	–	–	–
	G4	**QUINTEL**	**QS66512-3**	**72"x12"x9.6"**

PROPOSED RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	**ERICSSON**	**RRUS-32**	**29.9"x13.3"x9.5"**	**A2 MODULE**	**16.4"X15.2"X3.4"**
	ERICSSON	**RRUS-12**	**20.4"x18.5"x7.17"**	–	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
BETA	**ERICSSON**	**RRUS-32**	**29.9"x13.3"x9.5"**	**A2 MODULE**	**16.4"X15.2"X3.4"**
	ERICSSON	**RRUS-12**	**20.4"x18.5"x7.17"**	–	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
GAMMA	**ERICSSON**	**RRUS-32**	**29.9"x13.3"x9.5"**	**A2 MODULE**	**16.4"X15.2"X3.4"**
	ERICSSON	**RRUS-12**	**20.4"x18.5"x7.17"**	–	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		

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HARTFORD COUNTY

at&t MOBILITY
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FRAMINGHAM, MA 01701

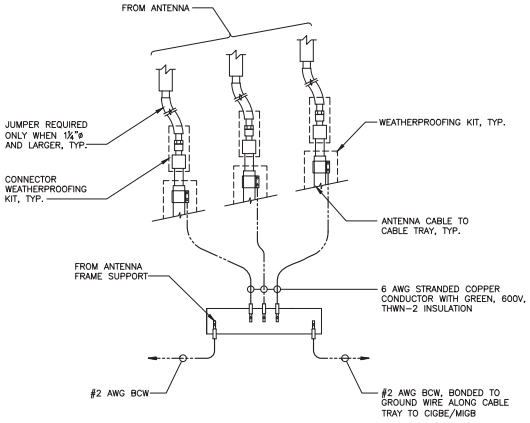
NO.	DATE	REVISIONS	BY	CHK	APP'D
0	04/28/16	ISSUED AS FINAL	KCD	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL: STATE OF CONNECTICUT NICHOLAS D. BARILE No. 28643 LICENSED PROFESSIONAL ENGINEER
NICHOLAS D. BARILE
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

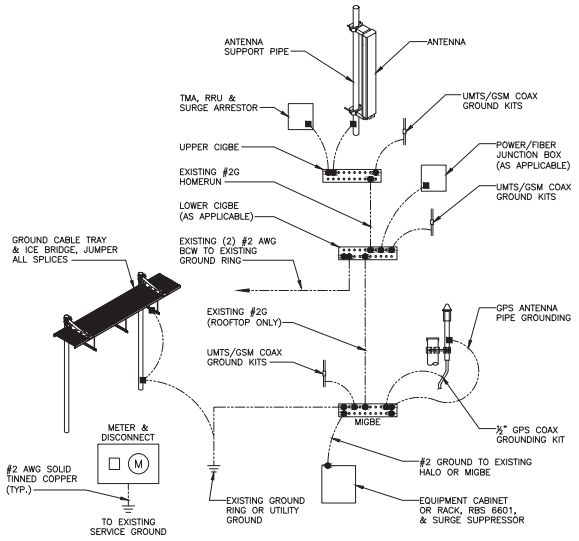
AT&T
DRAWING TITLE: DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15098-EMP	A-4	0



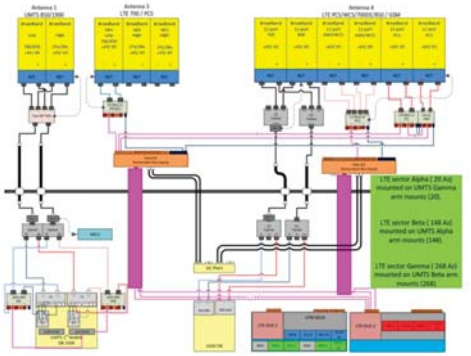
GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



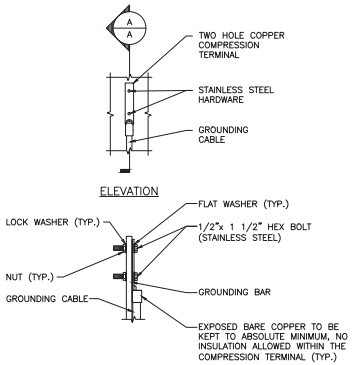
GROUNDING RISER DIAGRAM

SCALE: N.T.S.



TYPICAL PLUMBING DIAGRAM (PER SECTOR)

SCALE: N.T.S.

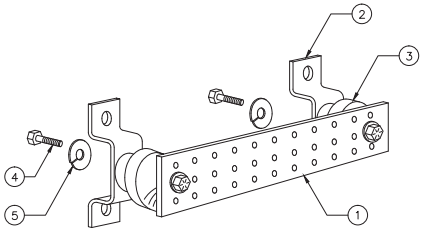


NOTE:

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

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x ¼")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	⅝"-11x1" H.H.C.S.
5	4	⅝" LOCK WASHER

NOTES:

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

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

SECTION "A" – SURGE ABSORBERS
- INTERIOR GROUND RING (#2)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
- BUILDING STEEL (IF AVAILABLE) (#2)

GROUND BAR DETAIL

SCALE: N.T.S.

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HARTFORD COUNTY

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FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	04/28/16	ISSUED AS FINAL	KCD	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL:

AT&T

DRAWING TITLE:
GROUNDING, ONE-LINE DIAGRAM & DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15098-EMP	G-1	0

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	7770.00.850.08				AM-X-CD-16-65-00T-RET		QS66512-3							
ANTENNA VENDOR	POWERWAVE				KMW		Quintel							
ANTENNA SIZE (H x W x D)					72X11.8X5.9		72X12X9.6							
ANTENNA WEIGHT					48.5		105							
AZIMUTH	148				20		20							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	106				106		106							
ANTENNA TIP HEIGHT	109				109		109							
MECHANICAL DOWNTILT	0				0		0							
FEEDER AMOUNT	2						2							
Antenna RET Motor (QTY/MODEL)						Built-in RET		Built-in RET						
SURGE ARRESTOR (QTY/MODEL)														
DIPLEXER (QTY/MODEL)	2	LGP 21901												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)						RRH Controlled		RRH Controlled						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Pwav LGP21401 Single 1900 w/ 850BP (850)												
CURRENT INJECTORS FOR TMA (QTY/MODEL)														
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)					1	RRUS-11								
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)							1	RRUS-12+RRUS-A2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)							1	RRUS-32						
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component1 (QTY/MODEL)					1	SQUID FIBER and DC	1	SQUID FIBER and DC						
Additional Component2 (QTY/MODEL)							4	CCI TRIPLEXER TPX-070821						
Additional Component3 (QTY/MODEL)							2	Polyphaser 1000860						
Local Market Note1	Replace GSM antenna with 12 Port ANTENNA adding PCS RRUS 12+A2 and WCS RRU32 to it along with SQUID, Fiber and DC trunks, change DUL21 to DUS41 with XMU, add 2nd DUS and move alpha sector to 2nd DUS. Pls maintain 6' separation between the 2 LTE antennas on each face.													
Local Market Note2	LTE sector Alpha (20 Az) mounted on UMTS Gamma arm mounts (20). LTE sector Beta (148 Az) mounted on UMTS Alpha arm mounts (148). LTE sector Gamma (268 Az) mounted on UMTS Beta arm mounts (268)													
Local Market Note3														

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59365.A.850.3G.1	59365.A.850.3G.1	CTV10741	CTV10741		UMTS 850	7770.00.850.08	13.5		8	BOTTOM	Commscope 1-5/8 (850)	170.04	NO			NO				
	PORT 3	59365.A.1900.3G.1	59365.A.1900.3G.1	CTU10747	CTU10747		UMTS 1900	7770.00.1900.06	15.5		6	BOTTOM	Commscope 1-5/8 (1900)	170.04	NO			NO				
ANTENNA POSITION 3	PORT 1	59365.A.700.4G.222	59365.A.700.4G.1	CTL01074_7A_1	CTL01074_7A_1		LTE 700	AM-X-CD-16-65-00T-RET_725MHz_03DT	15.6		3	TOP	FIBER	0	NO	0						
ANTENNA POSITION 4	PORT 1	59365.A.850.25G.1	59365.A.850.25G.1	184G10741			GSM 850	7770.00.850.08	13.5		8	BOTTOM	1-5/8 at 850 MHz	170.04	NO	0		NO	12.58	151.35		
	PORT 3	59365.A.1900.25G.1	59365.A.1900.25G.1	184P10741			GSM 1900	7770.00.1900.06	16.79		6	BOTTOM	1-5/8 at 1900 MHz	170.04	NO	0		NO	28.18	583.44		
	PORT 5	59365.A.1900.4G.222		CTL01074_9A_1	CTL01074_9A_1		LTE 1900	QS66512-3_1930MHz_07DT	15.9		7	TOP	FIBER	0	NO	0						
	PORT 7	59365.A.WCS.4G.222		CTL01074_3A_1	CTL01074_3A_1		LTE WCS	QS66512-3_2355MHz_03DT	17		3	TOP	FIBER	0	NO	0						

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	7770.00.850.06				AM-X-CD-16-65-00T-RET		QS66512-3							
ANTENNA VENDOR	POWERWAVE				KMW		Quintel							
ANTENNA SIZE (H x W x D)					72X11.8X5.9		72X12X9.6							
ANTENNA WEIGHT					48.5		105							
AZIMUTH	268				148		148							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	106				106		106							
ANTENNA TIP HEIGHT	109				109		109							
MECHANICAL DOWNTILT	0				0		0							
FEEDER AMOUNT	2						2							
Antenna RET Motor (QTY/MODEL)						Built-in RET		Built-in RET						
SURGE ARRESTOR (QTY/MODEL)														
DIPLEXER (QTY/MODEL)	2	LGP 21901												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)						RRH Controlled		RRH Controlled						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Pwav LGP21401 Single 1900 w/ 850BP (850)												
CURRENT INJECTORS FOR TMA (QTY/MODEL)														
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)					1	RRUS-11								
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)							1	RRUS-12+RRUS-A2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)							1	RRUS-32						
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component1 (QTY/MODEL)					1	SQUID FIBER and DC	1	SQUID FIBER and DC						
Additional Component2 (QTY/MODEL)							4	CCI TRIPLEXER TPX-070821						
Additional Component3 (QTY/MODEL)							2	Polyphaser 1000860						
Local Market Note1	Replace GSM antenna with 12 Port ANTENNA adding PCS RRUS 12+A2 and WCS RRU32 to it along with SQUID, Fiber and DC trunks, change DUL21 to DUS41 with XMU, add 2nd DUS and move alpha sector to 2nd DUS. Pls maintain 6' separation between the 2 LTE antennas on each face.													
Local Market Note2	LTE sector Alpha (20 Az) mounted on UMTS Gamma arm mounts (20). LTE sector Beta (148 Az) mounted on UMTS Alpha arm mounts (148). LTE sector Gamma (268 Az) mounted on UMTS Beta arm mounts (268)													
Local Market Note3														

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59365.B.850.3G.1	59365.B.850.3G.1	CTV10742	CTV10742		UMTS 850	7770.00.850.06	13.5		6	BOTTOM	Commscope 1-5/8 (850)	170.04	NO			NO				
	PORT 3	59365.B.1900.3G.1	59365.B.1900.3G.1	CTU10748	CTU10748		UMTS 1900	7770.00.1900.04	15.5		4	BOTTOM	Commscope 1-5/8 (1900)	170.04	NO			NO				
ANTENNA POSITION 3	PORT 1	59365.B.700.4G.1	59365.B.700.4G.1	CTL01074_7B_1	CTL01074_7B_1		LTE 700	AM-X-CD-16-65-00T-RET_725MHz_09DT	15.6		9	TOP	FIBER	0	NO							
ANTENNA POSITION 4	PORT 1	59365.B.850.25G.1	59365.B.850.25G.1	184G10742			GSM 850	7770.00.850.06	13.5		6	BOTTOM	1-5/8 at 850 MHz	170.04	NO	0		NO	11.22	134.89		
	PORT 3	59365.B.1900.25G.1	59365.B.1900.25G.1	184P10742			GSM 1900	7770.00.1900.04	16.79		4	BOTTOM	1-5/8 at 1900 MHz	170.04	NO	0		NO	28.18	583.44		
	PORT 5	59365.B.1900.4G.111		CTL01074_9B_1	CTL01074_9B_1		LTE 1900	QS66512-3_1930MHz_05DT	15.7		5	TOP	FIBER	0	NO	0						
	PORT 7	59365.B.WCS.4G.111		CTL01074_3B_1	CTL01074_3B_1		LTE WCS	QS66512-3_2355MHz_03DT	17		3	TOP	FIBER	0	NO	0						

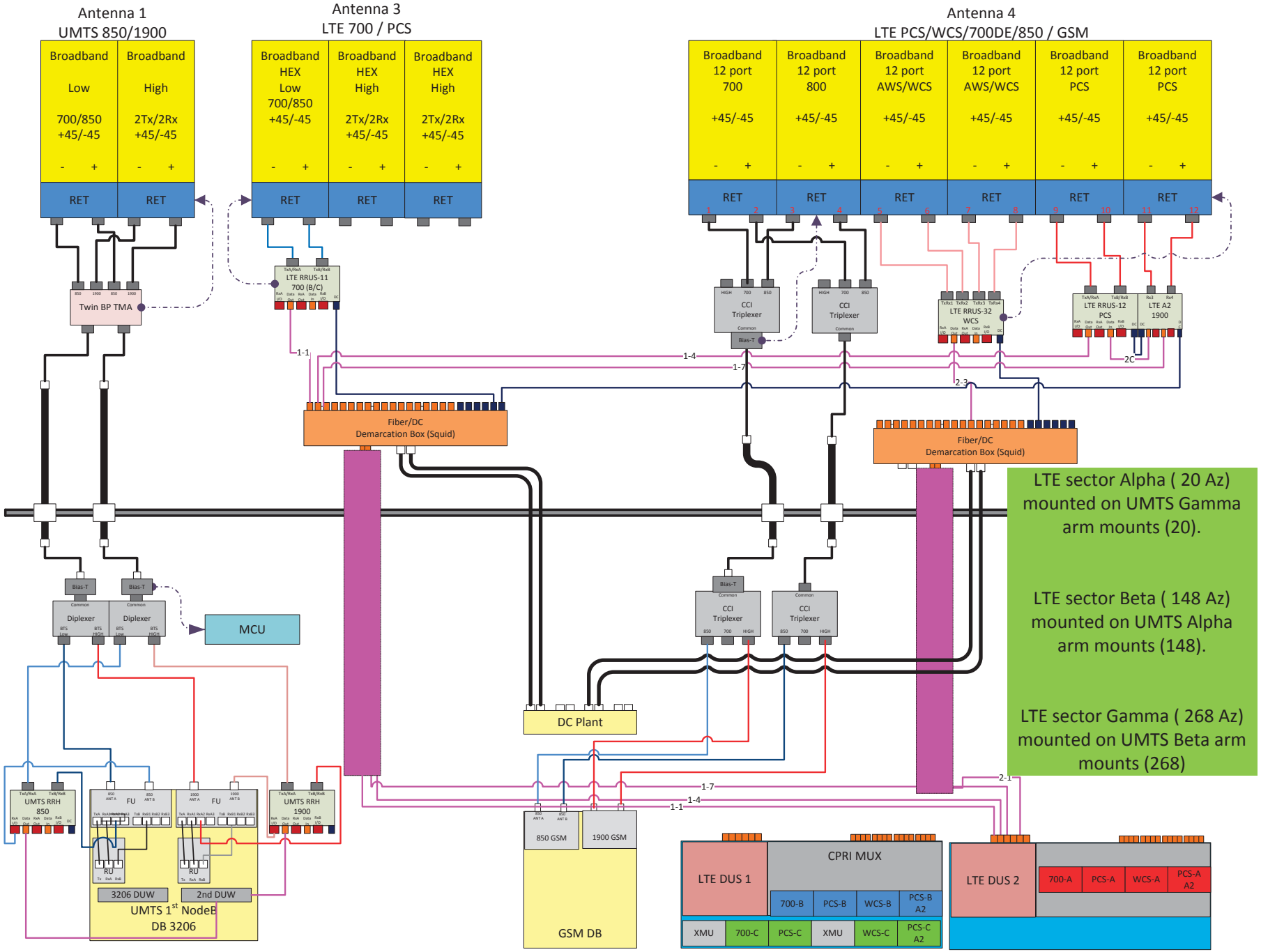
Section 17C - FINAL SECTOR/CELL INFORMATION - SECTOR C

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	7770.00.850.10				AM-X-CD-16-65-00T-RET		QS66512-3							
ANTENNA VENDOR	POWERWAVE				KMW		Quintel							
ANTENNA SIZE (H x W x D)					72X11.8X5.9		72X12X9.6							
ANTENNA WEIGHT					48.5		105							
AZIMUTH	20				268		268							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	106				106		106							
ANTENNA TIP HEIGHT	109				109		109							
MECHANICAL DOWNTILT	0				0		0							
FEEDER AMOUNT	2						2							
Antenna RET Motor (QTY/MODEL)						Built-in RET		Built-in RET						
SURGE ARRESTOR (QTY/MODEL)														
DIPLEXER (QTY/MODEL)	2	LGP 21901												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)						RRH Controlled		RRH Controlled						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Pwav LGP21401 Single 1900 w/ 850BP (850)												
CURRENT INJECTORS FOR TMA (QTY/MODEL)														
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)					1	RRUS-11								
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)							1	RRUS-12+RRUS-A2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)							1	RRUS-32						
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component1 (QTY/MODEL)					1	SQUID FIBER and DC	1	SQUID FIBER and DC						
Additional Component2 (QTY/MODEL)							4	CCI TRIPLEXER TPX-070821						
Additional Component3 (QTY/MODEL)							2	Polyphaser 1000860						
Local Market Note1	Replace GSM antenna with 12 Port ANTENNA adding PCS RRUS 12+A2 and WCS RRU32 to it along with SQUID, Fiber and DC trunks, change DUL21 to DUS41 with XMU, add 2nd DUS and move alpha sector to 2nd DUS. Pls maintain 6' separation between the 2 LTE antennas on each face.													
Local Market Note2	LTE sector Alpha (20 Az) mounted on UMTS Gamma arm mounts (20). LTE sector Beta (148 Az) mounted on UMTS Alpha arm mounts (148). LTE sector Gamma (268 Az) mounted on UMTS Beta arm mounts (268)													
Local Market Note3														

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59365.C.850.3G.1	59365.C.850.3G.1	CTV10743	CTV10743		UMTS 850	7770.00.850.10	13.5		10	BOTTOM	Commscope 1-5/8 (850)	170.04	NO			NO				
	PORT 3	59365.C.1900.3G.1	59365.C.1900.3G.1	CTU10749	CTU10749		UMTS 1900	7770.00.1900.06	15.5		6	BOTTOM	Commscope 1-5/8 (1900)	170.04	NO			NO				
ANTENNA POSITION 3	PORT 1	59365.C.700.4G.1	59365.C.700.4G.1	CTL01074_7C_1	CTL01074_7C_1		LTE 700	AM-X-CD-16-65-00T-RET_725MHz_06DT	15.6		6	TOP	FIBER	0	NO							
ANTENNA POSITION 4	PORT 1	59365.C.850.25G.1	59365.C.850.25G.1	184G10743			GSM 850	7770.00.850.10	13.5		10	BOTTOM	1-5/8 at 850 MHz	170.04	NO	0		NO	12.58	151.35		
	PORT 3	59365.C.1900.25G.1	59365.C.1900.25G.1	184P10743			GSM 1900	7770.00.1900.06	16.79		6	BOTTOM	1-5/8 at 1900 MHz	170.04	NO	0		NO	28.18	583.44		
	PORT 5	59365.C.1900.4G.111		CTL01074_9C_1	CTL01074_9C_1		LTE 1900	QS66512-3_1930MHz_06DT	15.8		6	TOP	FIBER	0	NO	0						
	PORT 7	59365.C.WCS.4G.111		CTL01074_3C_1	CTL01074_3C_1		LTE WCS	QS66512-3_2355MHz_03DT	17		3	TOP	FIBER	0	NO	0						

Diagram - Sector	A	Diagram File Name - CT1074 A.vsd					
Atoll Site Name -	CT1074	Location Name -	WETHERSFIELD	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND

Comments: Replace GSM antenna with 12 Port ANTENNA adding PCS RRUS 12+A2 and WCS RRU32 to it along with SQUID, Fiber and DC trunks, change DUL21 to DUS41 with XMU, add 2nd DUS and move alpha sector to 2nd DUS. Pls maintain 6' separation between the 2 LTE anten***



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

AT&T Existing Facility

Site ID: CT1074

Wethersfield
75 Wells Road
Wethersfield, CT 06109

June 10, 2016

EBI Project Number: 6216002777

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	6.23 %

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

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June 10, 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: **CT1074 – Wethersfield**

EBI Consulting was directed to analyze the proposed AT&T facility located at **75 Wells Road, Wethersfield, 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 **75 Wells Road, Wethersfield, 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 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

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

3) 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.

4) 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.

5) 2 GSM channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

6) 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.

7) 2 LTE channels (2300 MHz (WCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

8) 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.

9) 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.

10) The antennas used in this modeling are the **Kathrein 7770, KMW AM-X-CD-16-65-00T-RET and the Quintel QS66512-3** for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

11) The antenna mounting height centerlines of the proposed antennas are **106 feet** above ground level (AGL) for **Sector A**, **106 feet** above ground level (AGL) for **Sector B** and **106 feet** above ground level (AGL) for Sector C.

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

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

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AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Kathrein 7770	Make / Model:	Kathrein 7770	Make / Model:	Kathrein 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	**106 feet**	Height (AGL):	**106 feet**	Height (AGL):	**106 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 A1 MPE%	**1.00 %**	Antenna B1 MPE%	**1.00 %**	Antenna C1 MPE%	**1.00 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	KMW AM-X-CD-16-65-00T-RET
Gain:	13.35 dBd	Gain:	13.35 dBd	Gain:	13.35 dBd
Height (AGL):	**106 feet**	Height (AGL):	**106 feet**	Height (AGL):	**106 feet**
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,595.26	ERP (W):	2,595.26	ERP (W):	2,595.26
Antenna A2 MPE%	**2.00 %**	Antenna B2 MPE%	**2.00 %**	Antenna C2 MPE%	**2.00 %**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Quintel QS66512-3	Make / Model:	Quintel QS66512-3	Make / Model:	Quintel QS66512-3
Gain:	11.4 / 12.78 / / 15.15 dBd	Gain:	11.4 / 12.78 / / 15.15 dBd	Gain:	11.4 / 12.78 / / 15.15 dBd
Height (AGL):	**106 feet**	Height (AGL):	**106 feet**	Height (AGL):	**106 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS) / 2300 MHz (WCS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2300 MHz (WCS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2300 MHz (WCS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	360 Watts	Total TX Power(W):	360 Watts	Total TX Power(W):	360 Watts
ERP (W):	8,170.39	ERP (W):	8,170.39	ERP (W):	8,170.39
Antenna A3 MPE%	**3.16 %**	Antenna B3 MPE%	**3.16 %**	Antenna C3 MPE%	**3.16 %**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**6.16 %**
MetroPCS	0.07 %
Site Total MPE %:	**6.23 %**

AT&T Sector A Total:	6.16 %
AT&T Sector B Total:	6.16 %
AT&T Sector C Total:	6.16 %
Site Total:	6.23 %

AT&T _ Max Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	828.23	106	2.98	850 MHz	567	0.53%
AT&T 1900 MHz (PCS) UMTS	2	1,312.66	106	4.72	1900 MHz (PCS)	1000	0.47%
AT&T 700 MHz LTE	2	2,595.26	106	9.33	700 MHz	467	2.00%
AT&T 850 MHz GSM	2	828.23	106	2.98	850 MHz	567	0.53%
AT&T 1900 MHz (PCS) GSM	2	1,138.02	106	4.09	1900 MHz (PCS)	1000	0.41%
AT&T 1900 MHz (PCS) LTE	2	2,276.05	106	8.18	1900 MHz (PCS)	1000	0.82%
AT&T 2300 MHz (WCS) LTE	2	3,928.09	106	14.12	2300 MHz (WCS)	1000	1.41%
						Total*:	6.16 %

*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:	6.16 %
Sector B:	6.16 %
Sector C:	6.16 %
AT&T Maximum Total (per sector):	6.16 %
Site Total:	6.23 %
Site Compliance Status:	**Compliant**

The anticipated composite MPE value for this site assuming all carriers present is **6.23 %** 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.