



April 1, 2016

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

Regarding: Notice of Exempt Modification – Antenna Swap,
Addition of Three Radio Heads
Property Address: 53 Dayton Road Waterford, CT 06385

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 180-foot self-supported tower at the above-referenced address, latitude 41.37784167 longitude -72.13936111. Said self-supported tower is owned by American Tower Corporation. The existing equipment shelter is 432 square feet.

AT&T desires to modify its existing telecommunications facility by swapping three (3) antennas and adding three remote-radio heads (“RRHs”). The centerline height of said antennas is and will remain at 160 feet. Antennas are mounted utilizing a sector frame.

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 First Selectman of the Town of Waterford, Daniel M. Steward, the ground owner the Cohanzie Fire Department, and to the tower owner American Tower Corporation.

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). Specifically:

1. The planned modification will not result in an increase in the height of the existing structure. The antennas to be swapped will be installed at the existing height of 160 feet on the 180-foot self-supported 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.

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above Federal Communications Commission (FCC) safety standard. An RF emissions calculation (attached) for AT&T's modified facility is herein provided.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The self-supported tower and its foundation can support AT&T's proposed modifications (please see attached structural analysis completed by American Tower dated January 14, 2016).

For the foregoing reasons, AT&T respectfully requests that the proposed antenna swap and addition of remote radio heads be allowed within the exempt modifications under R.C.S.A. §16-50j-72 (b)(2).

Sincerely,

Sarah Snell

Sarah Snell
Site Acquisition Specialist

cc: Daniel M. Steward, First Selectman of the Town of Waterford
Cohanzie Fire Department, Landowner
American Tower Corporation, Tower Owner

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: (1) NEW RRUS PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) NEW RRUS. (2) EXISTING RRU PER SECTOR TO BE REUSED, FOR A TOTAL OF (6) EXISTING RRUS.
 • AT&T SQUID: (1) EXISTING DC-6 SQUID TO REMAIN.

SITE ADDRESS: 53 DAYTON ROAD
WATERFORD, CT 06385

LATITUDE: 41.3738919 41° 22' 26.01084"N
 LONGITUDE: -72.1392989 -72° 08' 21.47604"W

USID: 16725

TOWER OWNER: TBD

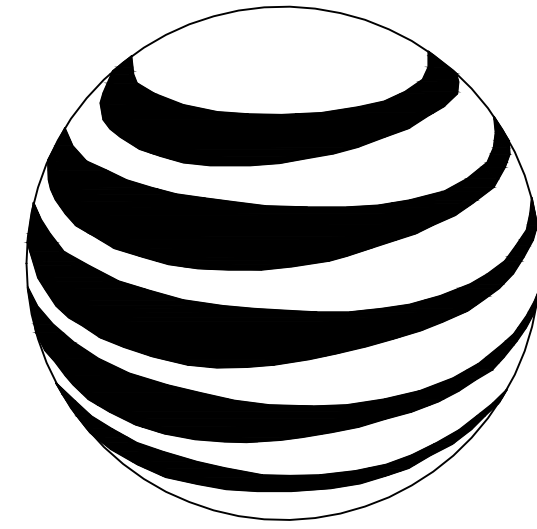
TYPE OF SITE: LATTICE TOWER/INDOOR EQUIPMENT

STRUCTURE HEIGHT: 180'-0"±

RAD CENTER: 154'-0"±

CURRENT USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

PROPOSED USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY



at&t
MOBILITY

FA CODE: 10071307
SITE NUMBER: CT5221
SITE NAME: WATERFORD EAST

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
BILLERICA, MA 01821
 CONTACT: DAVID COOPER
 PHONE: 617-639-4908
 EMAIL: dcooper@empiretelecomm.com

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

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:

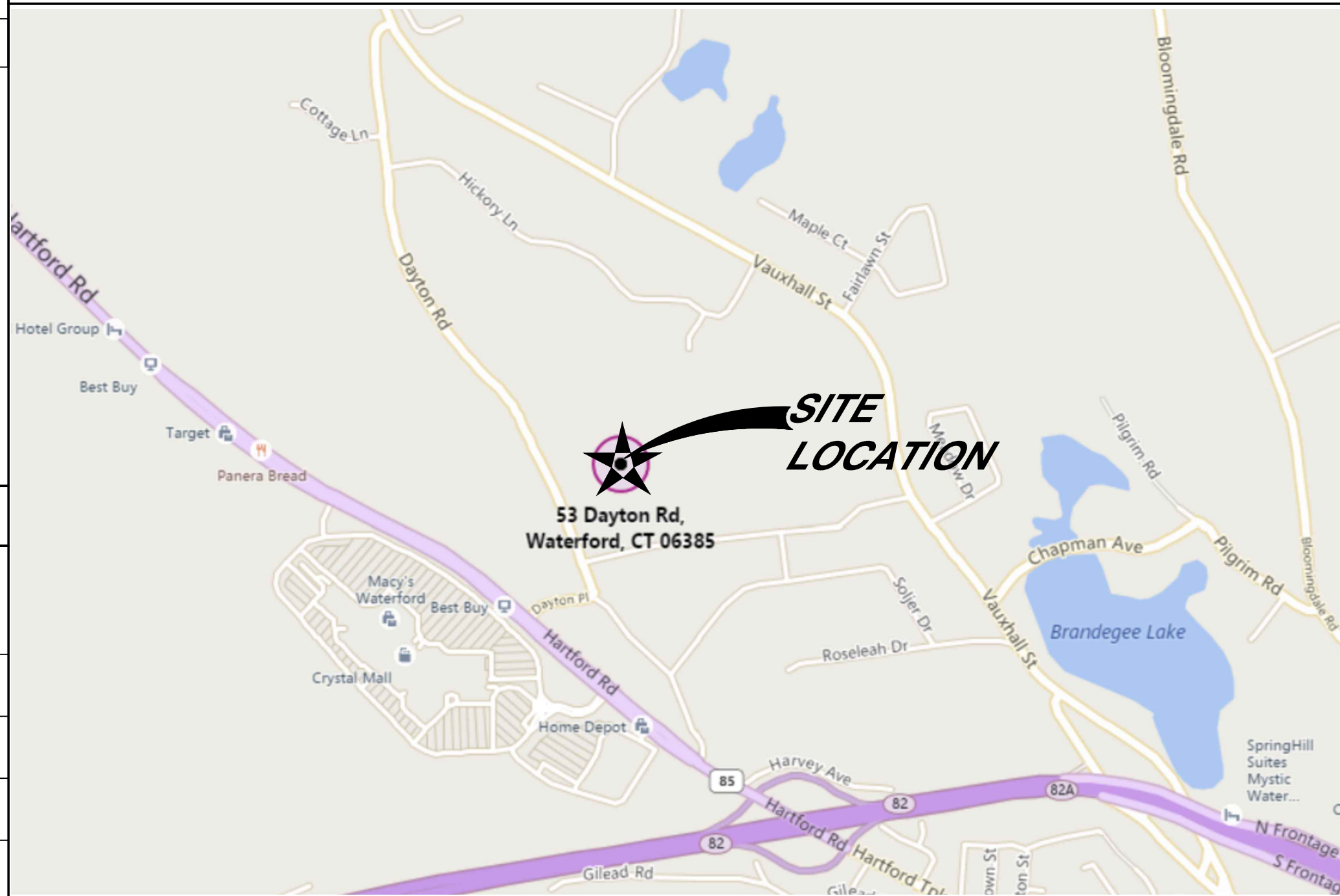
COMPANY: AT&T MOBILITY – NEW ENGLAND
 ADDRESS: 550 COCHITUATE ROAD
SUITE 550 13 & 14
FRAMINGHAM, MA 01701
 CONTACT: CAMERON SYME
 PHONE: 508-596-7146
 EMAIL: cs6970@att.com

CONSTRUCTION MANAGEMENT:

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

VICINITY MAP

START OUT GOING NE ON ENTERPRISE DR TOWARD CAPITOL BLVD, TURN LEFT ONTO CAPITOL BLVD, TURN LEFT ONTO WEST ST, MERGE ONTO I-91 N VIA THE RAMP ON THE LEFT TOWARD HARTFORD, TAKE EXIT 29/E. HARTFORD/BOSTON ONTO US-5 N. TAKE EXIT 90/MAIN ST/NORWICH/E. RIVER DR TOWARD US-5 N/MAIN ST, TURN LEFT ON MAIN ST. CONTINUE TO FOLLOW US-5, BEAR RIGHT ON GOODWIN ST, SITE WILL BE ON THE RIGHT.



DRAWING INDEX

REV.

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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.

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 AND MAY IMPOSE CHANGES OR SITE MODIFICATIONS.

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



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



SITE NUMBER: CT5221
SITE NAME: WATERFORD EAST
 53 DAYTON ROAD
 WATERFORD, CT 06385
 NEW LONDON COUNTY



NO.	DATE	REVISIONS	BY	CHK	APP'D
A	12/02/15	INITIAL SUBMISSION		NJM	NDB
SCALE: AS SHOWN		DESIGNED BY: NJM	DRAWN BY: NJM		

AT&T		
DRAWING TITLE: TITLE SHEET		
JOB NUMBER 15149-EMP	DRAWING NUMBER T-1	REV A

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 1/2" 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, LLC FOR A RECENT UPGRADE DATED 10/24/2012. CONTRACTOR TO NOTIFY DESIGN ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.



SITE NUMBER: CT5221
SITE NAME: WATFORD EAST
 53 DAYTON ROAD
 WATERFORD, CT 06385
 NEW LONDON COUNTY

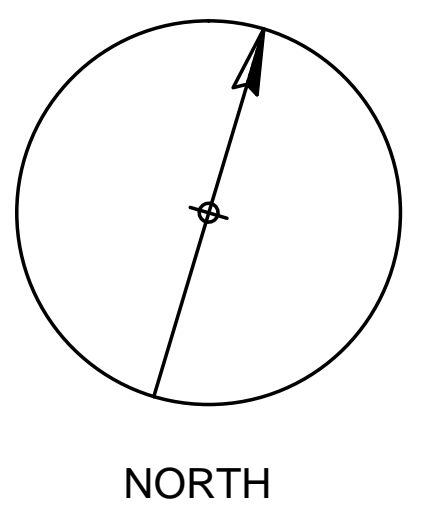
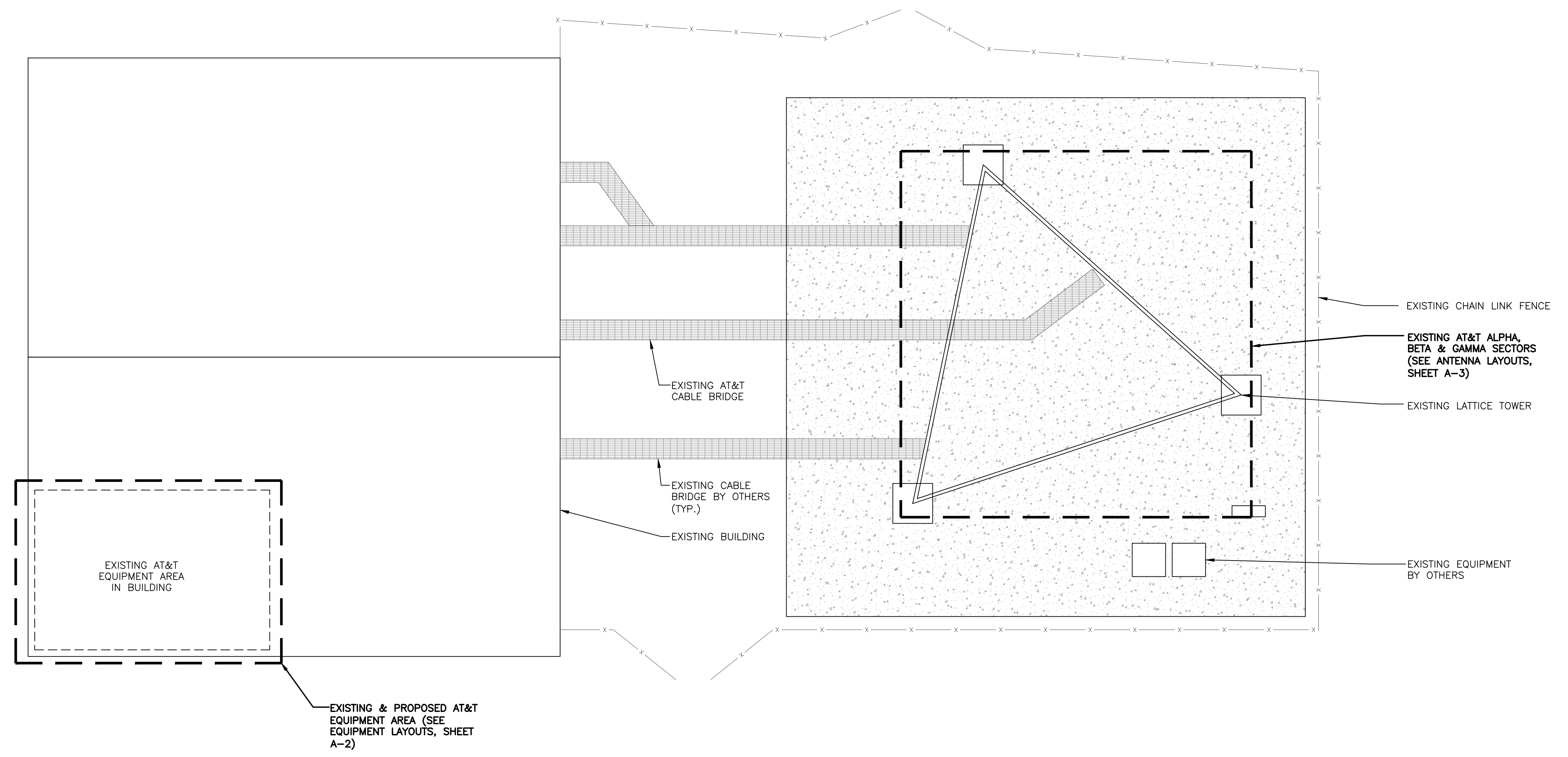


A	12/02/15	INITIAL SUBMISSION	NJM	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: NJM	DRAWN BY: NJM		

AT&T

DRAWING TITLE:
GROUNDING & GENERAL NOTES

JOB NUMBER	DRAWING NUMBER	REV
15149-EMP	GN-1	A



SITE LAYOUT
 SCALE: 3/16" = 1'-0"
 GRAPHIC SCALE: 3/16"=1'-0"

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.

COM-EX
 Consultants
 115 ROUTE 46
 SUITE E39
 MOUNTAIN LAKES, NJ 07046
 PHONE: 862.209.4300
 FAX: 862.209.4301

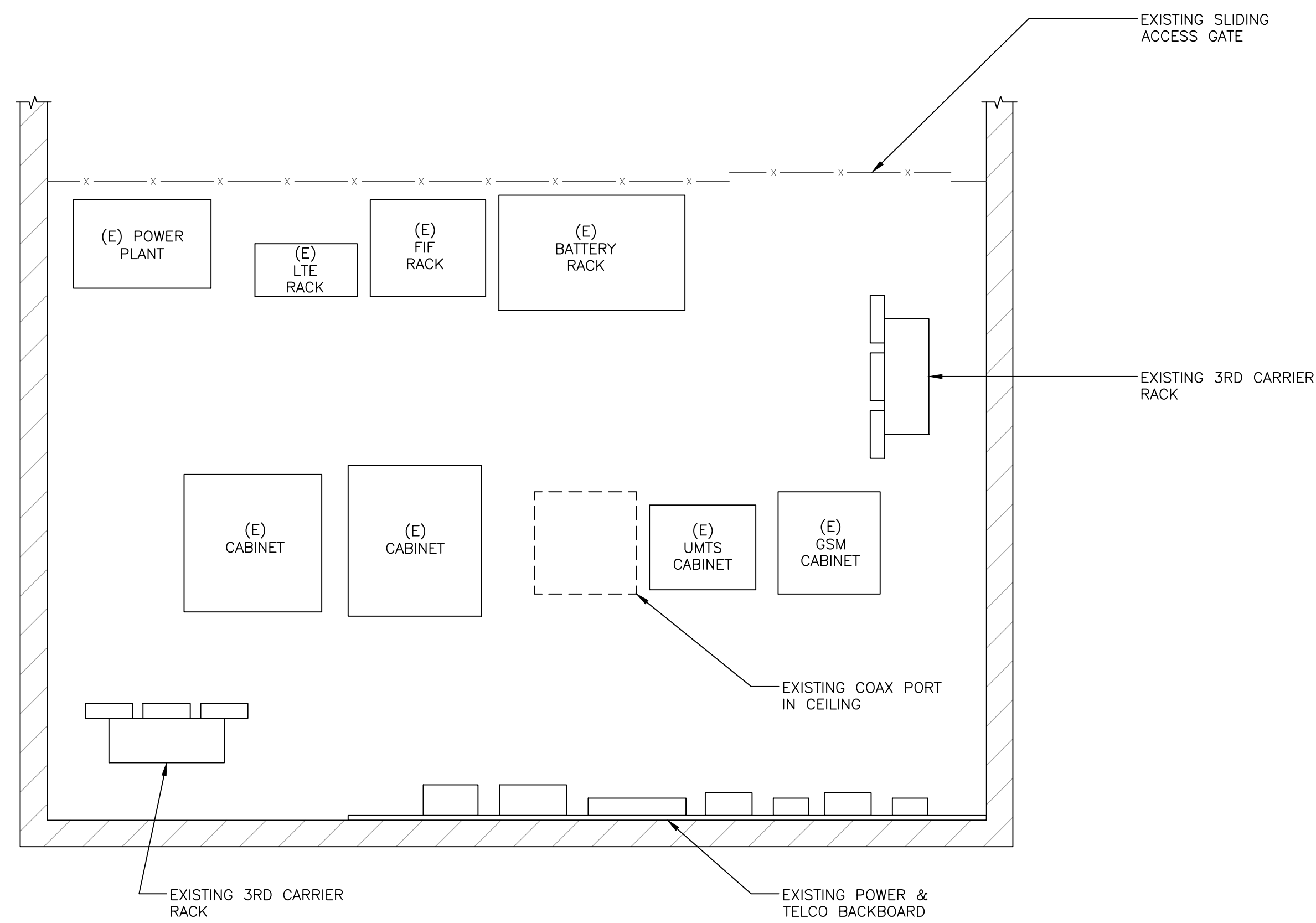
EMPIRE
 telecom
 16 ESQUIRE ROAD
 BILLERICA, MA 01821

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 FRAMINGHAM, MA 01701

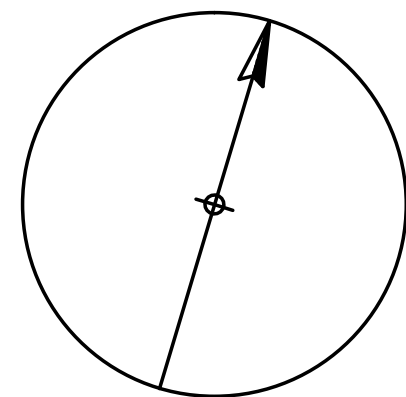
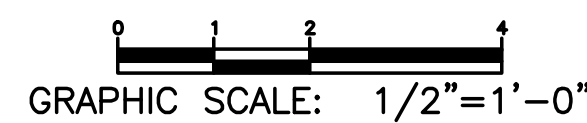
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AT&T		
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JOB NUMBER 15149-EMP	DRAWING NUMBER A-1	REV A

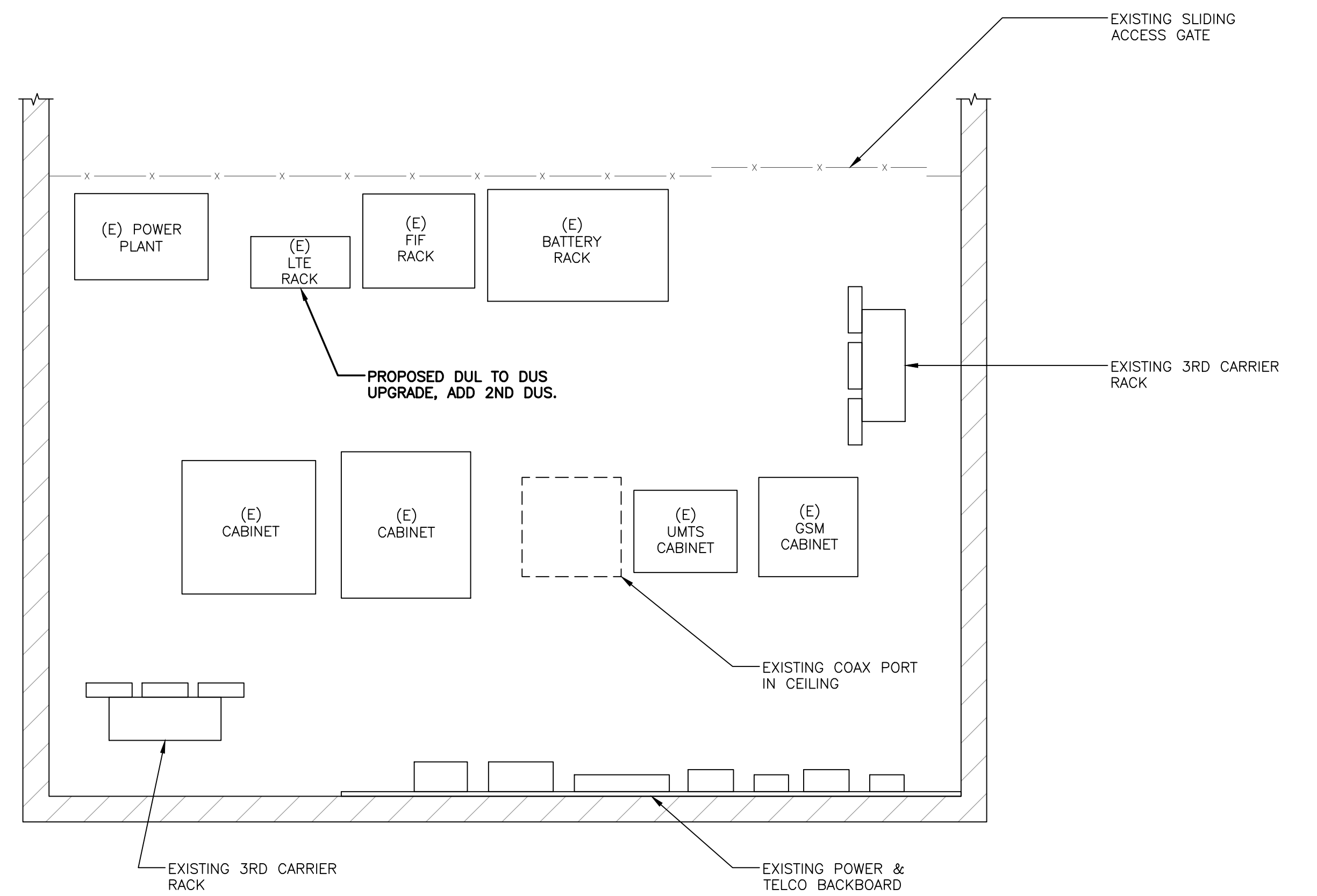


EXISTING EQUIPMENT LAYOUT

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

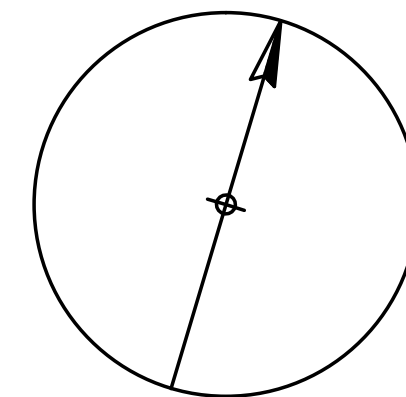
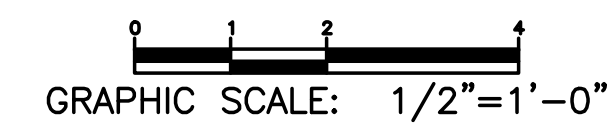


NORTH



PROPOSED EQUIPMENT LAYOUT

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



NORTH

COM-EX
Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

EMPIRE
telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

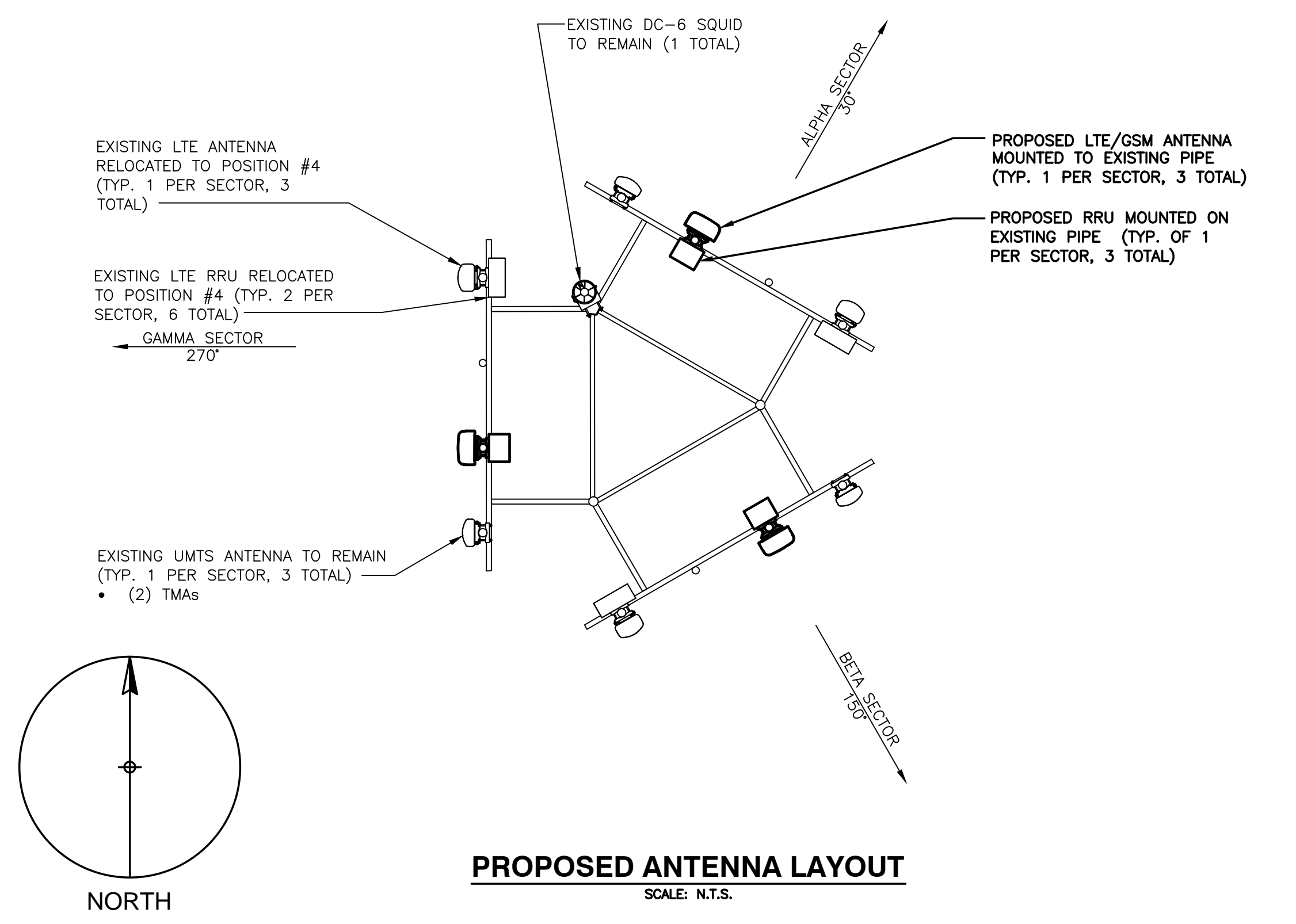
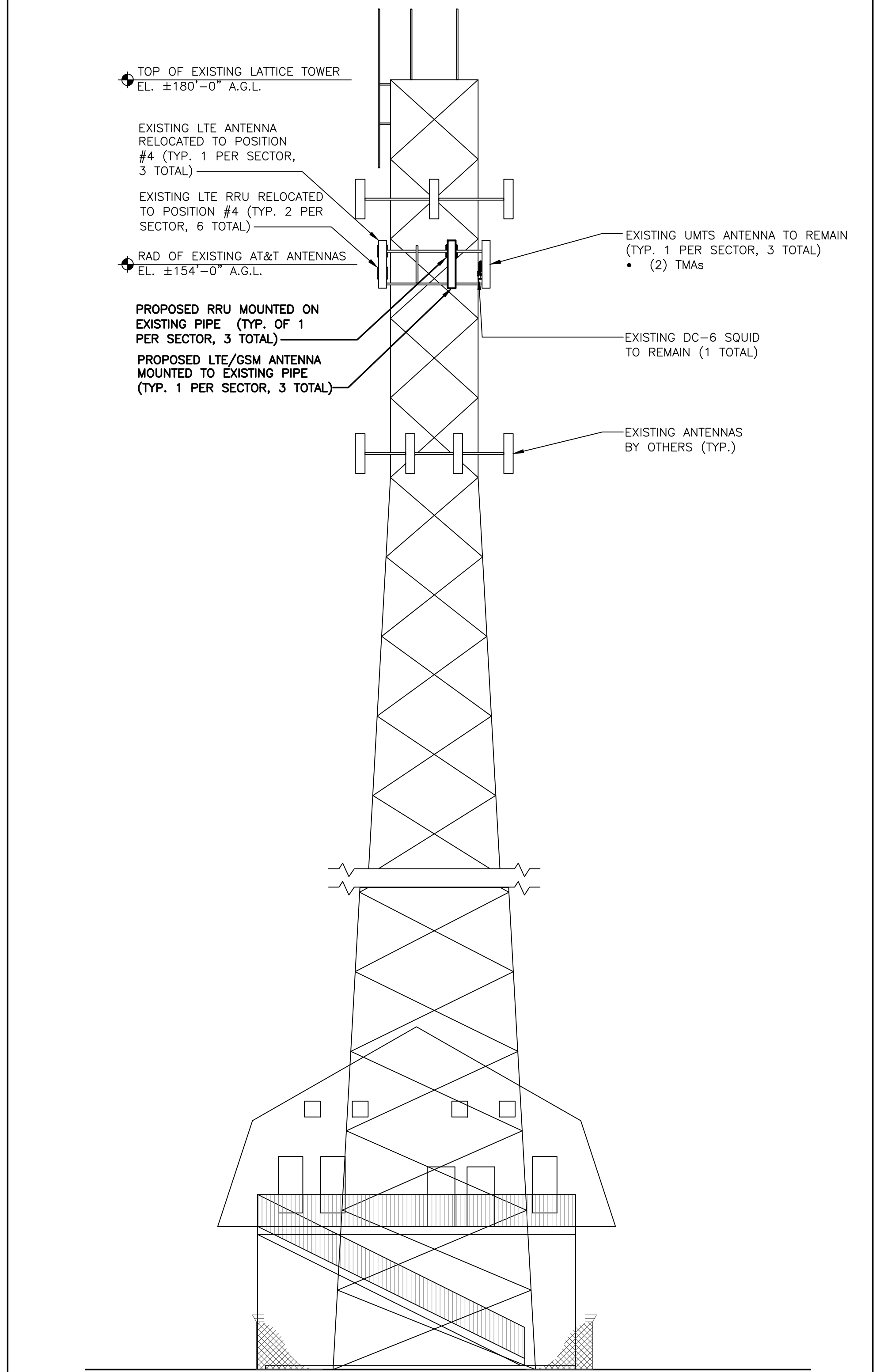
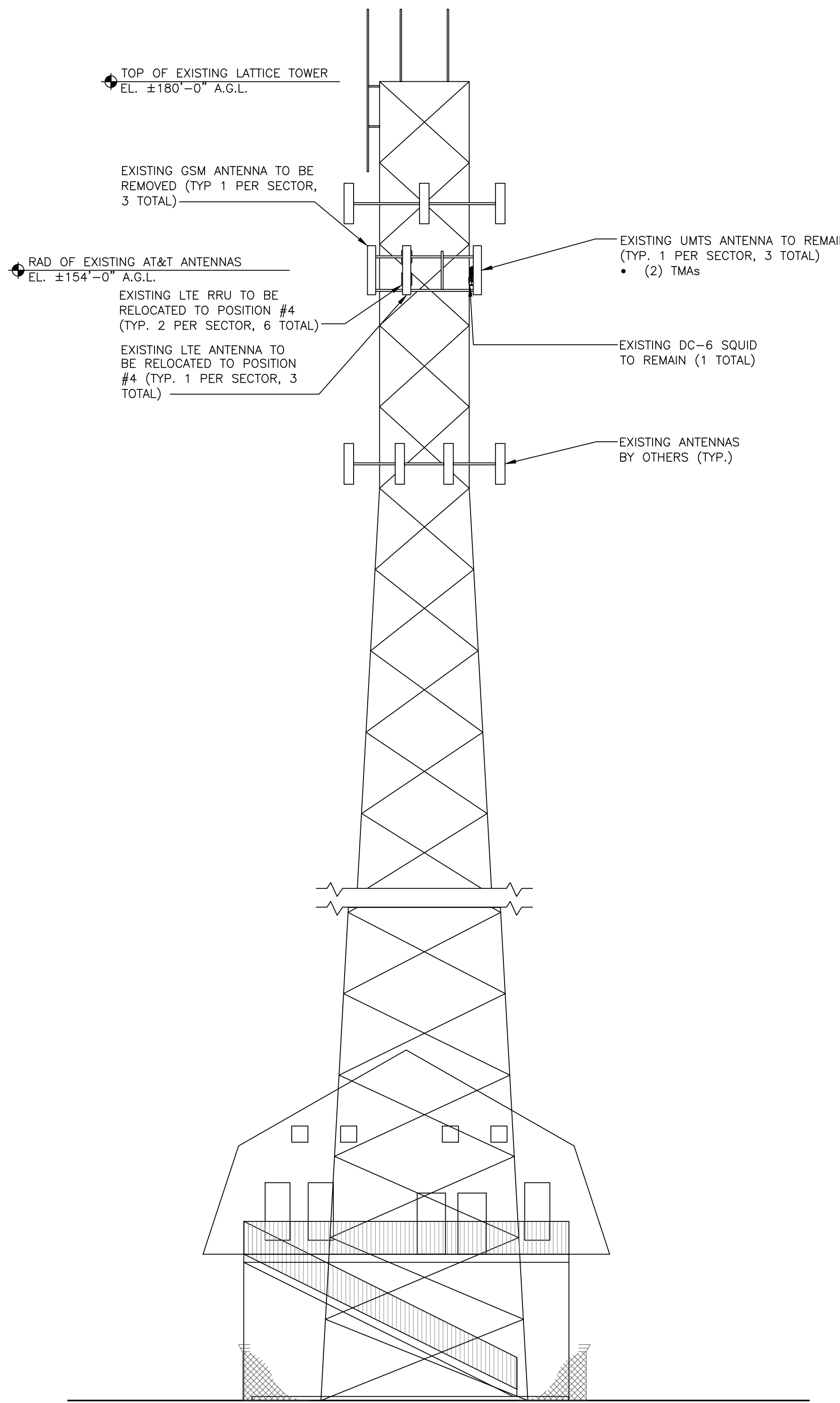
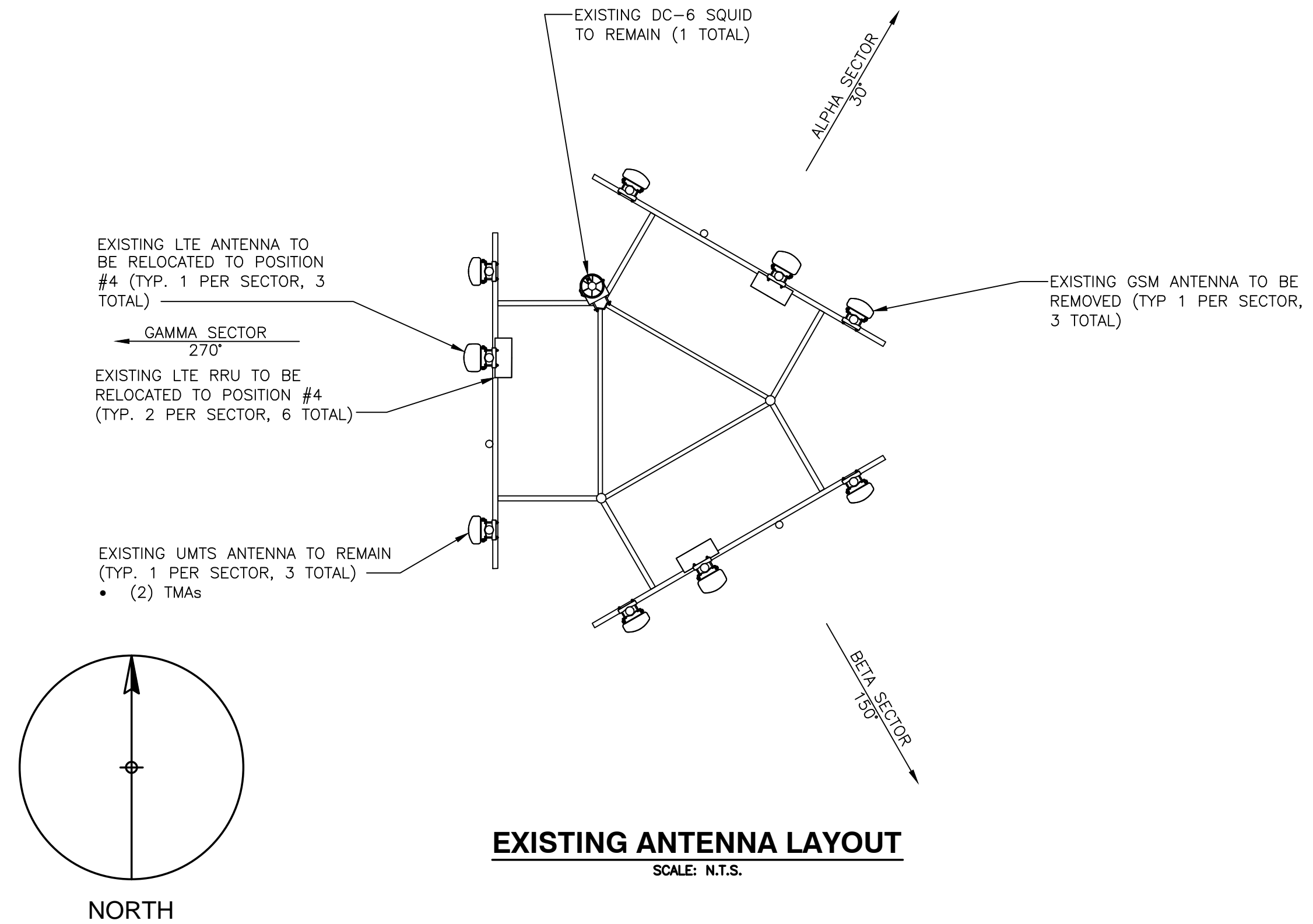
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 **at&t**
MOBILITY
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AT&T		
DRAWING TITLE: EQUIPMENT LAYOUT		
JOB NUMBER	DRAWING NUMBER	REV
15149-EMP	A-2	A

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.



COM-EX
Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

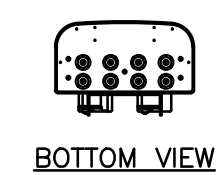
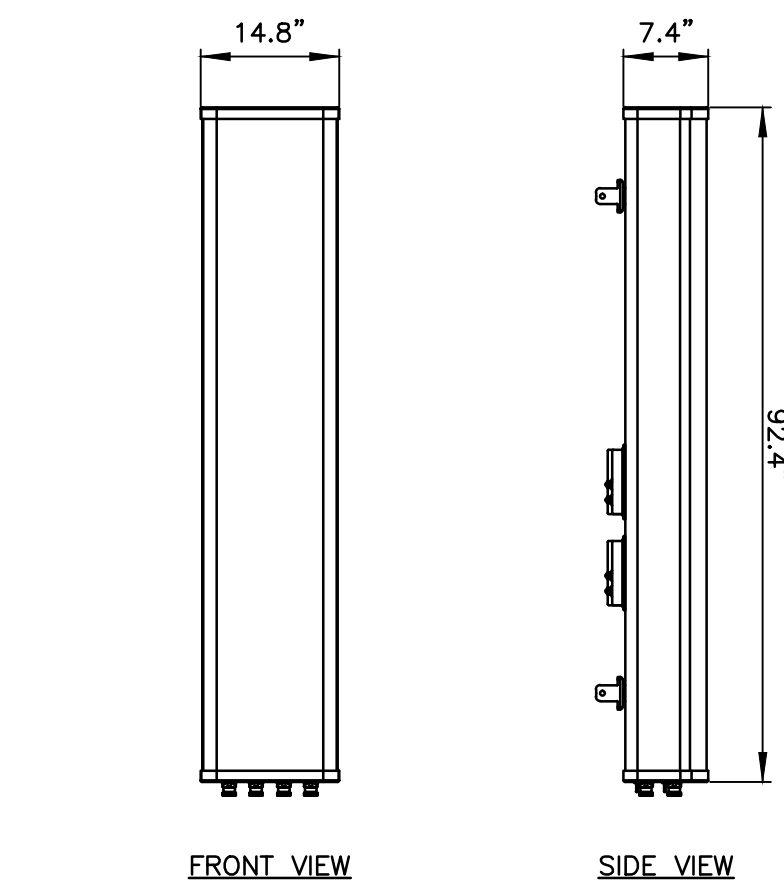
EMPIRE
telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT5221
SITE NAME: WATERFORD EAST
53 DAYTON ROAD
WATERFORD, CT 06385
NEW LONDON COUNTY

at&t
MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

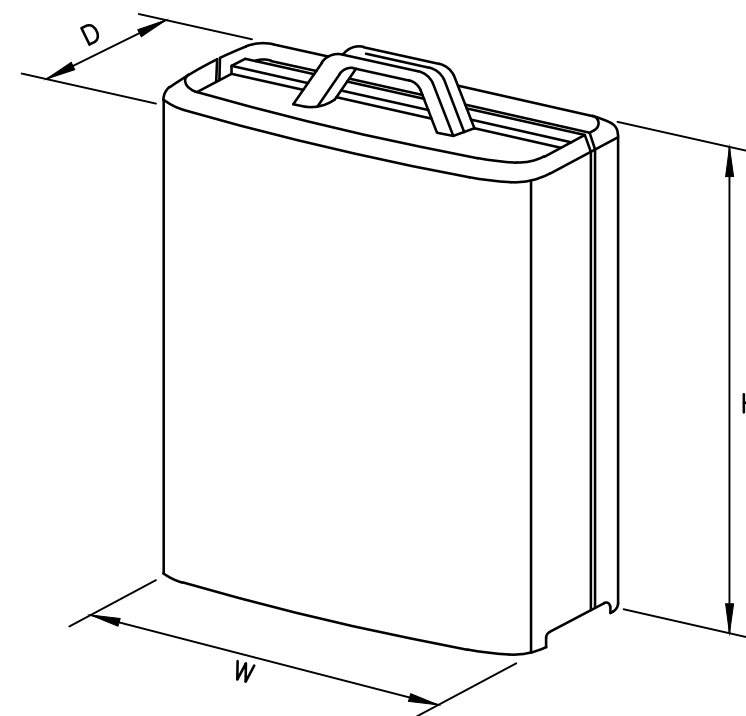
NO.	DATE	REVISIONS	BY	CHK	APP'D
A	12/02/15	INITIAL SUBMISSION	NJM	NDB	NDB
SCALE: AS SHOWN		DESIGNED BY: NJM	DRAWN BY: NJM		

AT&T		
DRAWING TITLE: ANTENNA LAYOUTS & ELEVATIONS		
JOB NUMBER 15149-EMP	DRAWING NUMBER A-3	REV A



MANUFACTURER	CCI
MODEL	HPA-65R-BUU-H8
WEIGHT	68 LBS

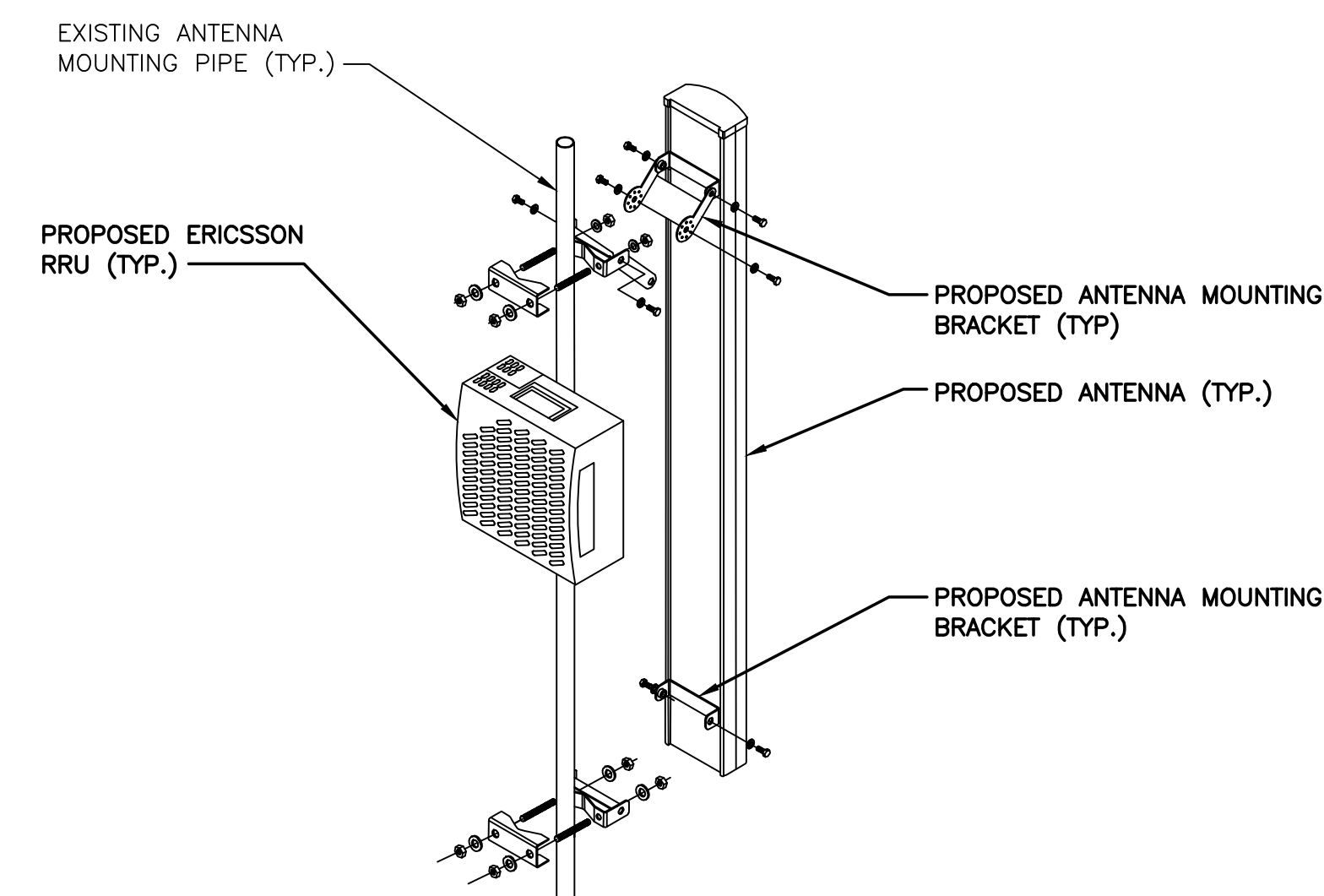
LTE ANTENNA DETAIL
SCALE: N.T.S.



MODEL	L x W x H	WEIGHT
*RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-32	29.9" x 13.3" x 9.5"	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	55"x11"x5"
	A2	-	-	-
	A3	KMW	AM-X-CD-17-65-OOT-RET	96"x12"x6"
	A4	POWERWAVE	7770	55"x11"x5"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	-	-	-
	B3	ANDREW	SBNH-1D6565C	96.4"x11.9"x7.1"
	B4	POWERWAVE	7770	55"x11"x5"
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	-	-	-
	G3	ANDREW	SBNH-1D6565C	96.4"x11.9"x7.1"
	G4	POWERWAVE	7770	55"x11"x5"

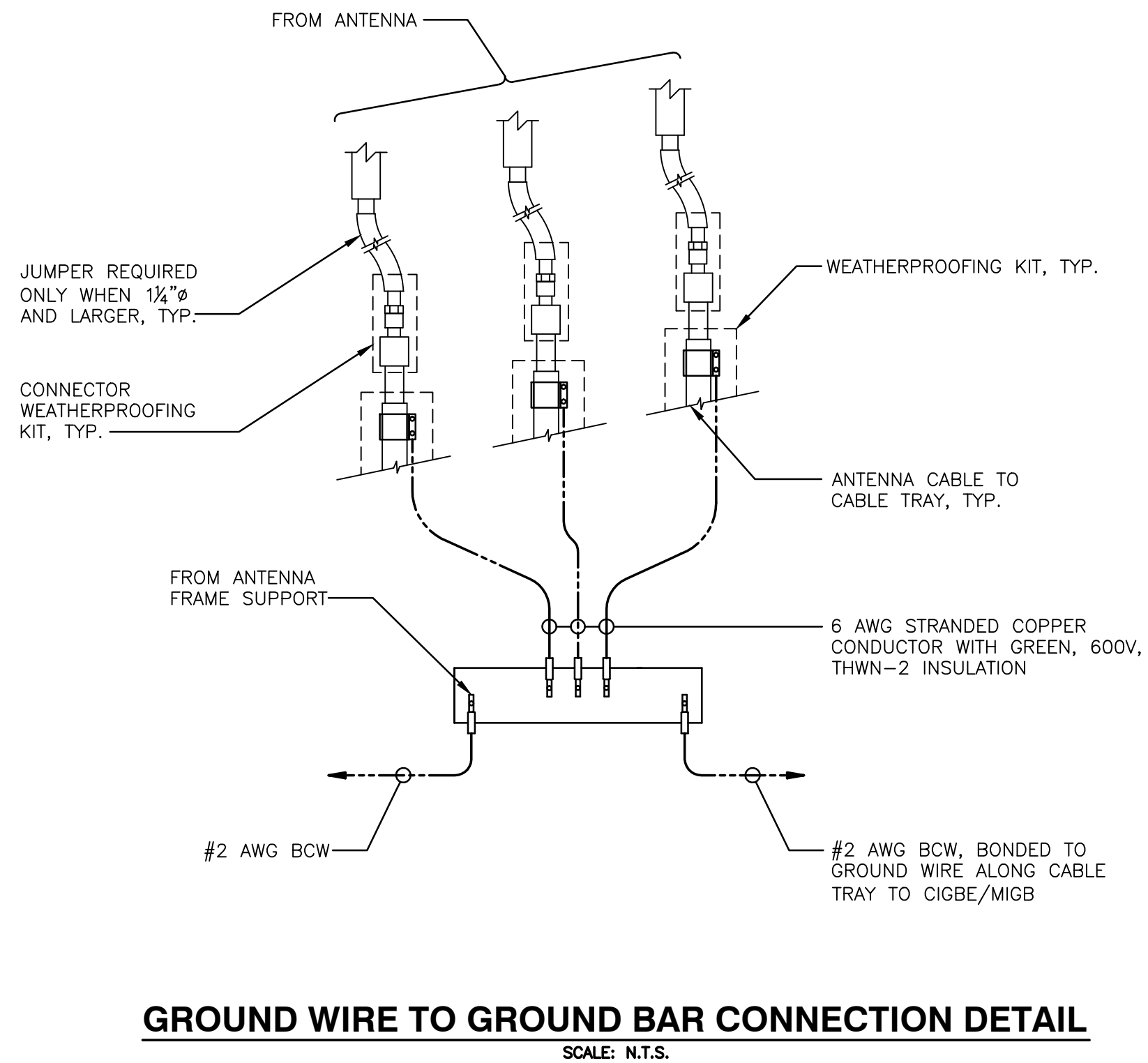
FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770	55"x11"x5"
	A2	CCI	HPA-65R-BUU-H8	72"x14.8"x7.4"
	A3	-	-	-
	A4	KMW	AM-X-CD-17-65-OOT-RET	96"x12"x6"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	CCI	HPA-65R-BUU-H8	72"x14.8"x7.4"
	B3	-	-	-
	B4	ANDREW	SBNH-1D6565C	96.4"x11.9"x7.1"
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	CCI	HPA-65R-BUU-H8	72"x14.8"x7.4"
	G3	-	-	-
	G4	ANDREW	SBNH-1D6565C	96.4"x11.9"x7.1"

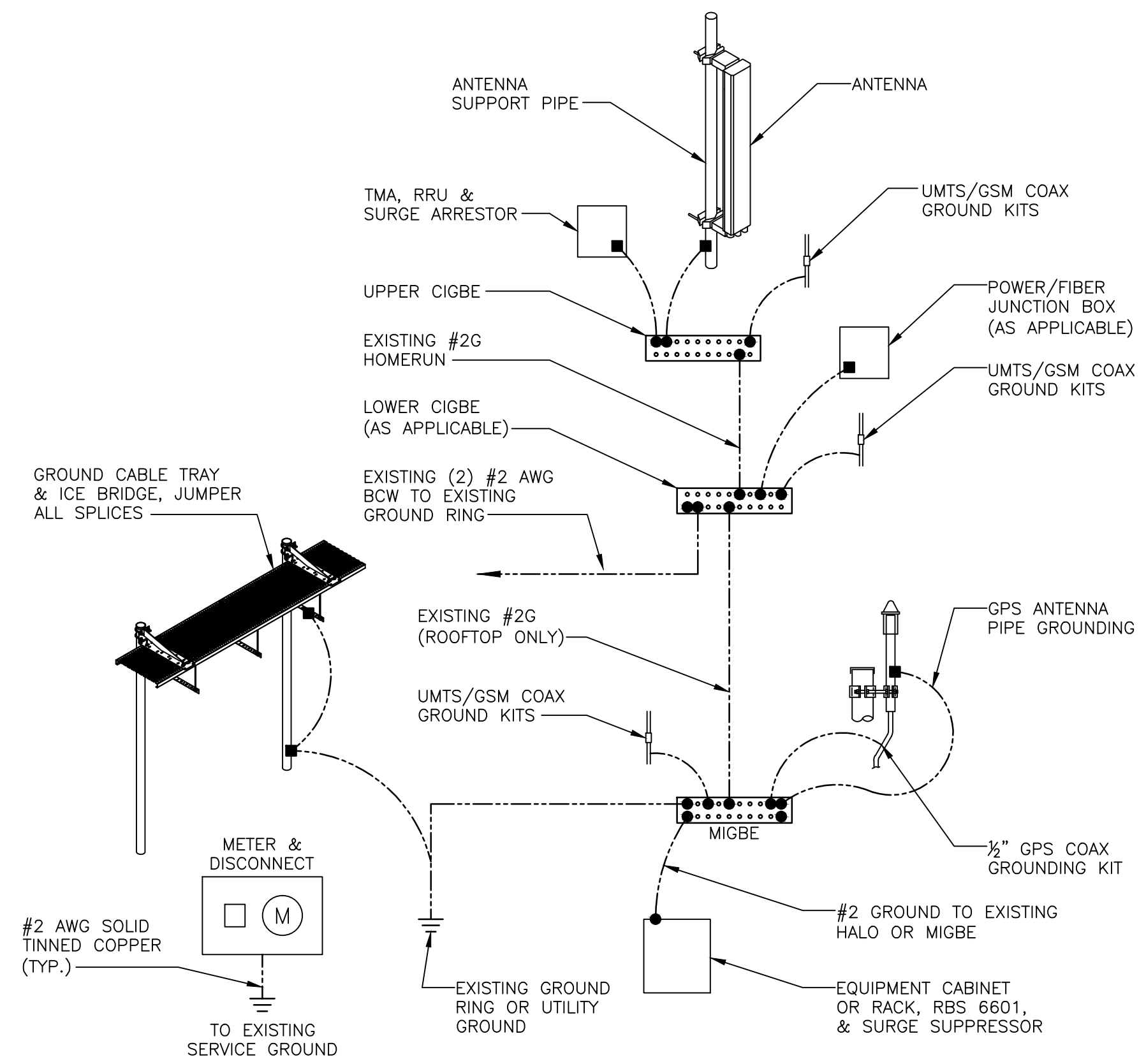
PROPOSED RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	ERICSSON	RRUS-32	29.9"x13.3"x9.5"	-	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	-	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	-	-
BETA	ERICSSON	RRUS-32	29.9"x13.3"x9.5"	-	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	-	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	-	-
GAMMA	ERICSSON	RRUS-32	29.9"x13.3"x9.5"	-	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	-	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	-	-

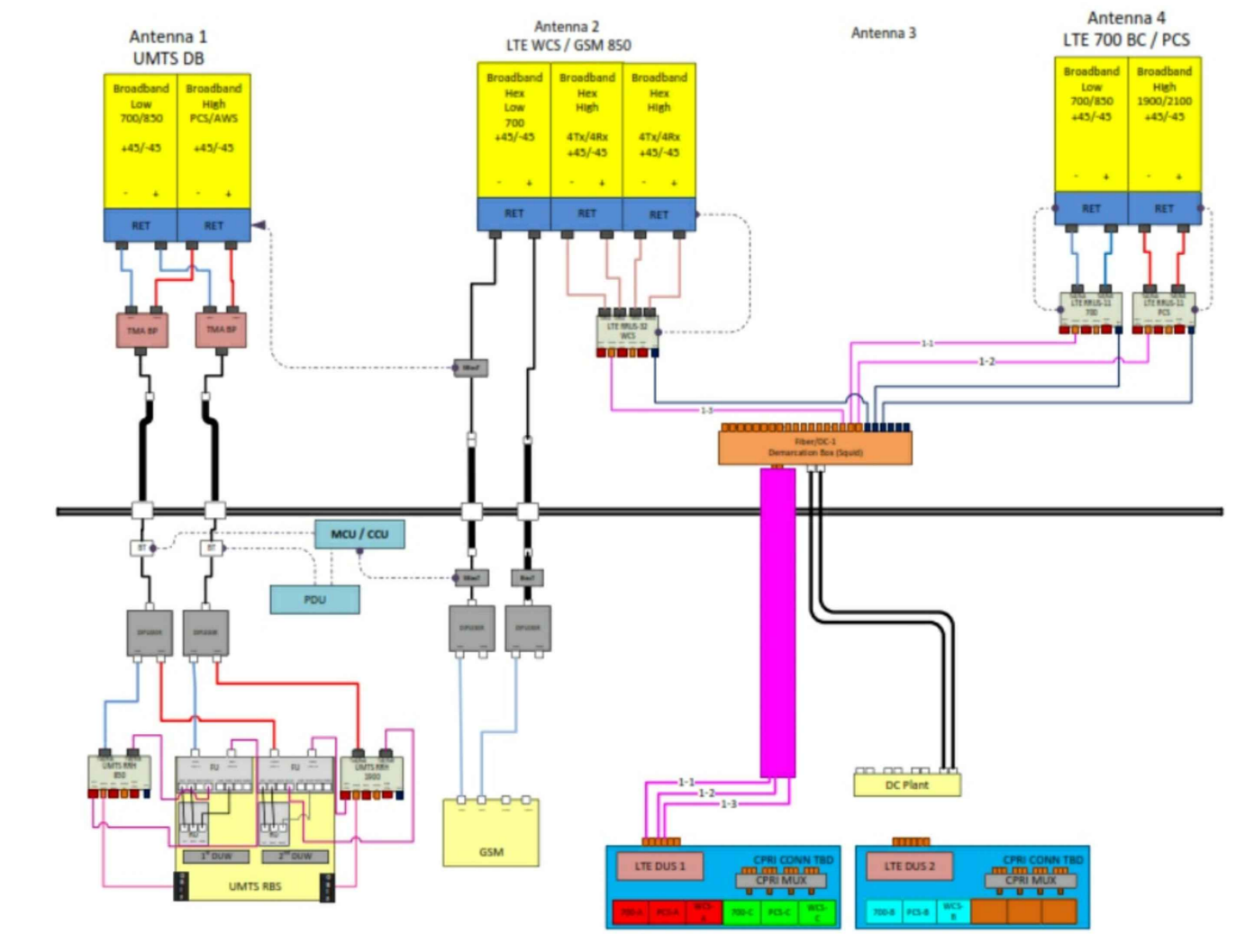
PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING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



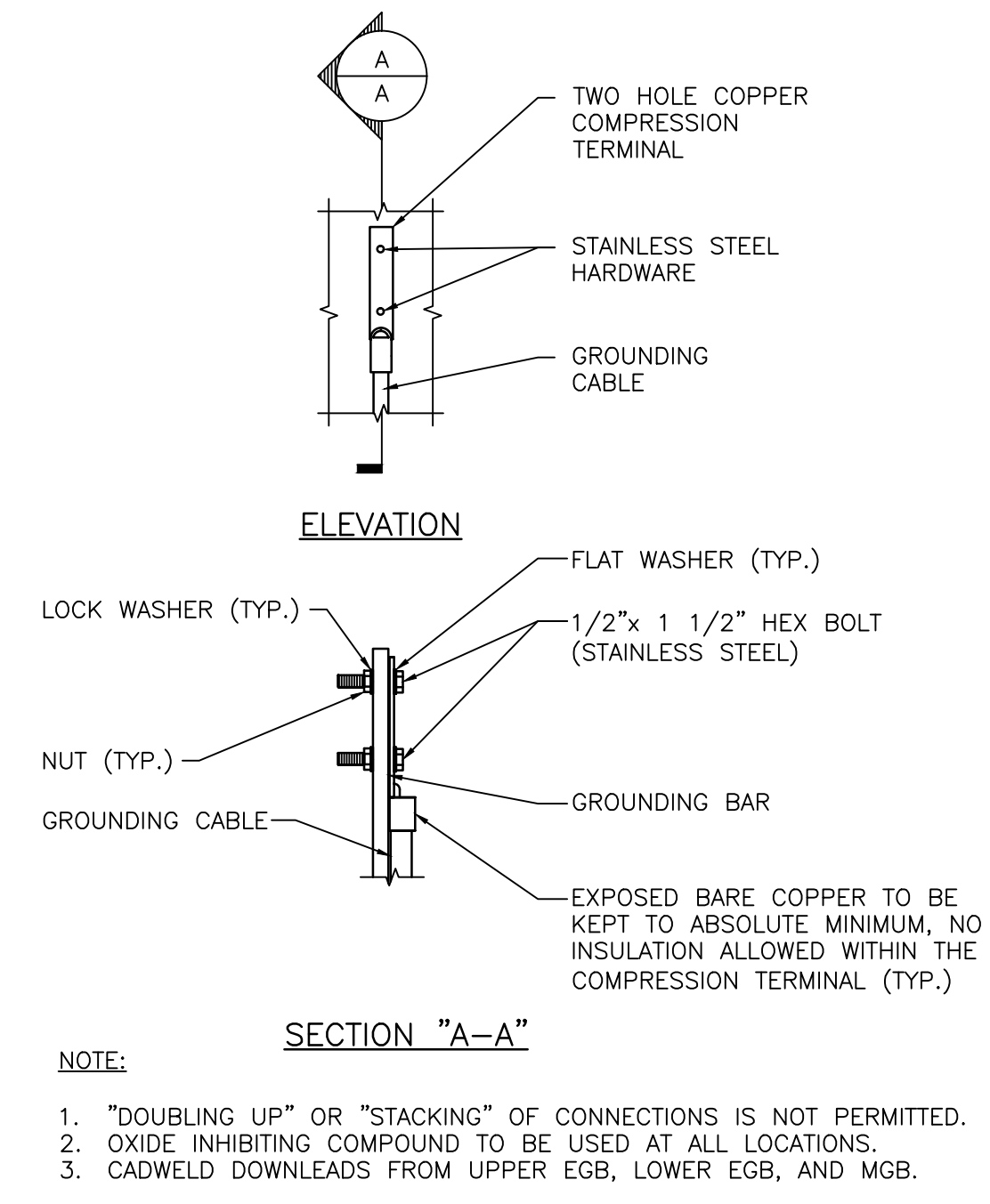
GROUND WIRE TO GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.



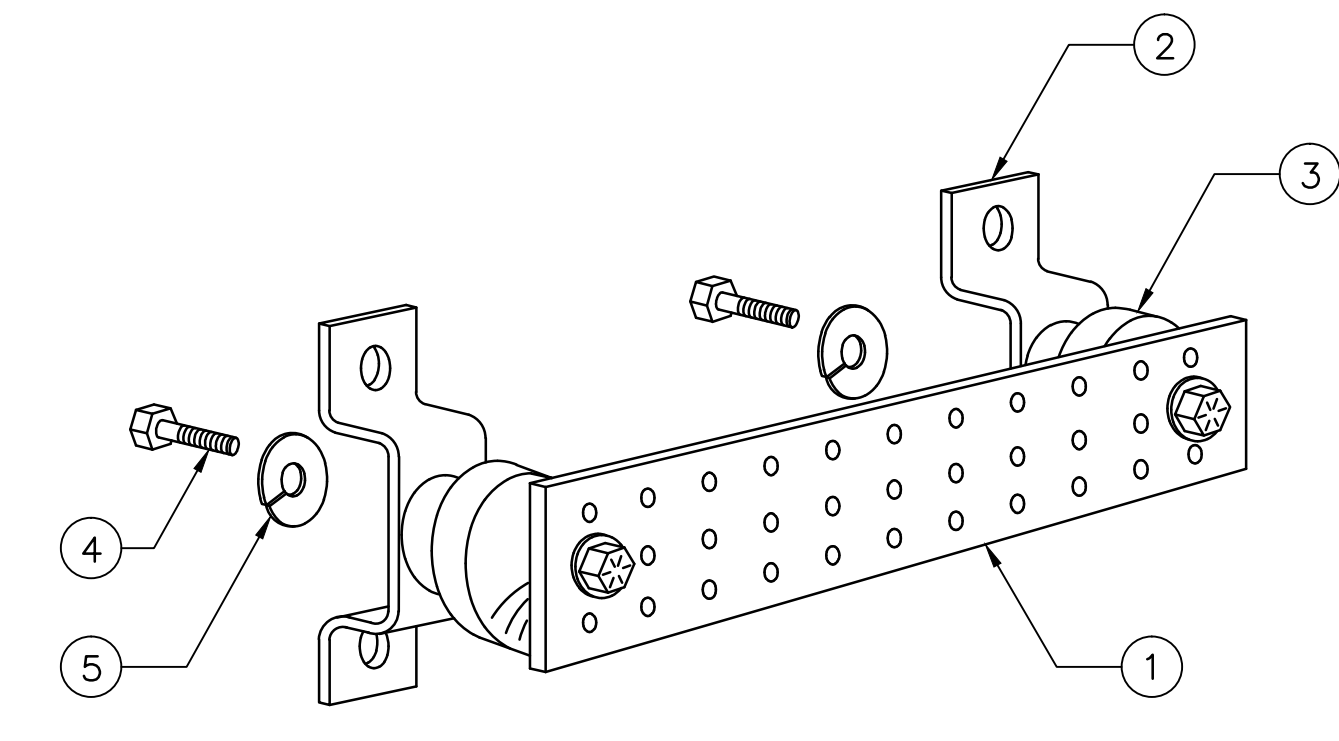
GROUNDING RISER DIAGRAM
SCALE: N.T.S.



TYPICAL PLUMBING DIAGRAM (PER SECTOR)
SCALE: N.T.S.



TYPICAL GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x 1/4")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	5/8"-11x1" H.H.C.S.
5	4	5/8" 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.



AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure : 180 ft Self Supported Tower
ATC Site Name : Waterford CT, CT
ATC Site Number : 411183
Engineering Number : 64723221
Proposed Carrier : AT&T Mobility
Carrier Site Name : Waterford East
Carrier Site Number : CT5221/FA#10071307
Site Location : 53 Dayton Rd.
Waterford, CT 06385-4274
41.377778,-72.141389
County : New London
Date : January 14, 2016
Max Usage : 68%
Result : Pass

Reviewed by:
William Garrett, PE
Chief Engineer

Prepared By:
Brendan M. Smith, E.I.
Structural Engineer I



Jan 15 2016 6:50 AM

COA: PEC.0001553



Table of Contents

Introduction	1
Supporting Documents	1
Analysis	1
Conclusion.....	1
Existing and Reserved Equipment.....	2
Equipment to be Removed.....	2
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Deflection, Twist, and Sway.....	3
Standard Conditions	4
Calculations	Attached



Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 180 ft self supported tower to reflect the change in loading by AT&T Mobility.

Supporting Documents

Tower Drawings	Rohn Drawing #A982166, dated August 20, 1998
Foundation Drawing	Rohn Drawing #A982167-1, dated August 20, 1998
Geotechnical Report	Clarence Welti Site Name Cohenzie Fire Station; Waterford, CT, dated March 24, 1997

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/EIA-222.

Basic Wind Speed:	95 mph (Fastest Mile)
Basic Wind Speed w/ Ice:	82 mph (Fastest Mile)w/ 1/2" radial ice concurrent
Code:	ANSI/TIA/EIA-222-F / 2003 IBC , Sec. 1609.1.1, Exception (5) & Sec. 3108.4 w/ 2005 CT Supplement & 2009 CT Amendment

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.



Existing and Reserved Equipment

Elevation ¹ (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
178.0	187.0	1	15' Omni	Side Arms	(6) 1 1/4" Coax	Town Of Waterford Police Dept
	182.0	2	8' Omni			
	181.0	2	5' Omni			
	170.0	1	13' Omni			
177.0	184.0	2	10' Omni	Sector Frame	(2) 1 1/4" Coax	
164.0	165.0	6	Ericsson AIR 21	Sector Frames	(18) 1 5/8" Coax (1) 1 5/8" Hybriflex	T-Mobile
		3	EMS RR90-17-02DP			
		3	RFS ATMAA1412D-1A20			
	164.0	3	Andrew LNX-6515DS-VTM (50.3 lbs)			
		3	Ericsson RRUS 11 B12			
157.0	161.0	1	Raycap DC6-48-60-0-8F	Sector Frames	(12) 1 5/8" Coax (2) 0.78" 8 AWG 6 (1) 0.39" Fiber Trunk	AT&T Mobility
	160.0	2	Andrew SBNH-1D6565C			
		6	Powerwave 7770.00			
	158.0	6	Ericsson RRUS-11 (50 lbs.)			
		6	Powerwave LGP21401			
		6	Powerwave LGP13519			
131.0	134.0	3	Raycap RRFDC-1064-PF-48	Sector Frames	(18) 1 5/8" Coax (3) 1 1/4" Hybriflex	Verizon
	133.0	1	Antel BXA-70063-6CF-EDIN-2			
		1	Swedcom SACP 2x5516			
	132.0	2	Swedcom SLCP 2x6015			
		2	Antel LPA-80063-4CF-EDIN-X			
		6	48" x 12" x 7" Panel			
		3	Antel BXA-171063-8CF-EDIN-X			
		3	RRH			
		3	Alcatel-Lucent RRH2x40-AWS			
125.0	125.0	6	Kathrein 800 10504	Sector Frames	(1) 1 5/8" Coax	Metro PCS
		1	MicroPulse GPS-QBW-26N			

Equipment to be Removed

Elevation ¹ (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
157.0	157.0	3	Powerwave RA21.7750.00	-	-	AT&T Mobility
		1	Powerwave P65-17-XLH-RR			

Proposed Equipment

Elevation ¹ (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
157.0	160.0	3	CCI HPA-65R-BUU-H8	Sector Frames	-	AT&T Mobility
		1	KMW AM-X-CD-16-65-00T-RET			
	158.0	3	Ericsson RRUS-32			

¹Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Legs	59%	Pass
Diagonals	68%	Pass
Horizontals	62%	Pass
Anchor Bolts	26%	Pass
Leg Bolts	41%	Pass

Foundations

Reaction Component	Original Design Reactions	Analysis Reactions	% of Design
Uplift (Kips)	621.3	310.7	50%
Axial (Kips)	732.9	429.6	59%
Shear (Kips)	141.8	49.1	35%

The structure base reactions resulting from this analysis are acceptable when compared to those shown on the original structure drawings, therefore no modification or reinforcement of the foundation will be required.

Deflection, Twist and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Twist (°)	Sway (Rotation) (°)
157.0	Ericsson RRUS-32	AT&T Mobility	0.200	0.021	0.208
	KMW AM-X-CD-16-65-00T-RET				
	CCI HPA-65R-BUU-H8				

*Deflection, Twist and Sway was evaluated considering a design wind speed of 50 mph (Fastest Mile) per ANSI/TIA/EIA-222-F.



Standard Conditions

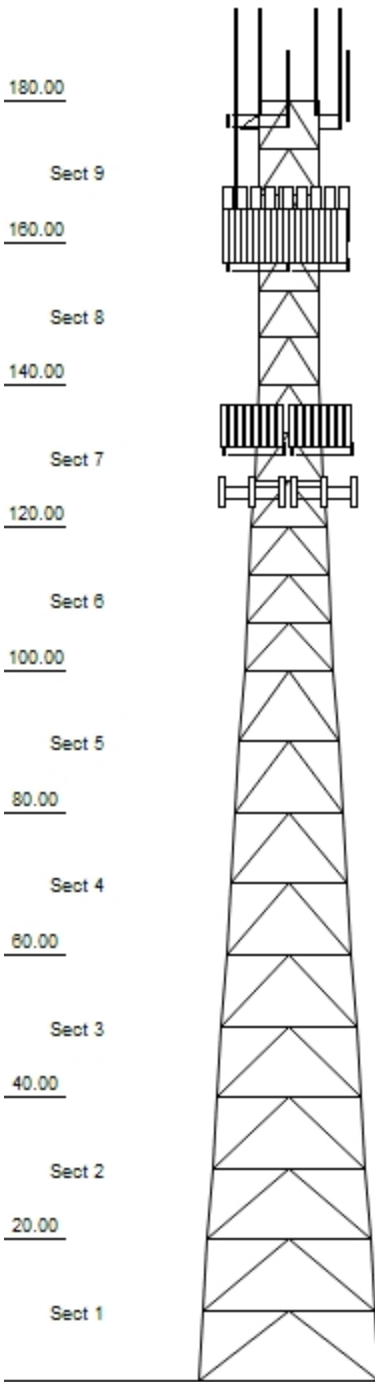
All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.
- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and American Tower Corporation, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.



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Loads: 95 mph no ice
82 mph w / 1/2" radial ice
50 mph no ice

Uplift 310.88 k Moment 8,121.46 k Moment Ice 8,161.24 k-ft
Vert 429.61 k Tot Down 155.22 k Tot Down Ice 182.31 k
Horiz 49.07 k Tot Shear 76.14 k Tot Shear Ice 77.87 k

Job Information

Tower : 411183 Location : Waterford CT, CT
Code : TIA/EIA-222-F Shape : Triangle Base Width : 25.55 ft
Client : AT&T Mobility Top Width : 8.50 ft

Sections Properties

Section	Leg Members	Diagonal Members	Horizontal Members
1 - 2	PX 50 ksi 12" DIA PIPE	PST 50 ksi 3-1/2" DIA PIPE	PST 50 ksi 3" DIA PIPE
3 - 4	PX 50 ksi 10" DIA PIPE	PX 50 ksi 3" DIA PIPE	PST 50 ksi 2-1/2" DIA PIPE
5	PX 50 ksi 8" DIA PIPE	PX 50 ksi 3" DIA PIPE	PX 50 ksi 2" DIA PIPE
6	PX 50 ksi 6" DIA PIPE	PST 50 ksi 2-1/2" DIA PIPE	PST 50 ksi 2" DIA PIPE
7	PX 50 ksi 5" DIA PIPE	PST 50 ksi 2-1/2" DIA PIPE	PST 50 ksi 1-1/2" DIA PIPE
8	PST 50 ksi 4" DIA PIPE	PST 50 ksi 2-1/2" DIA PIPE	PST 50 ksi 2" DIA PIPE
9	PST 50 ksi 3" DIA PIPE	PST 50 ksi 2" DIA PIPE	PST 50 ksi 1-1/2" DIA PIPE

Discrete Appurtenance

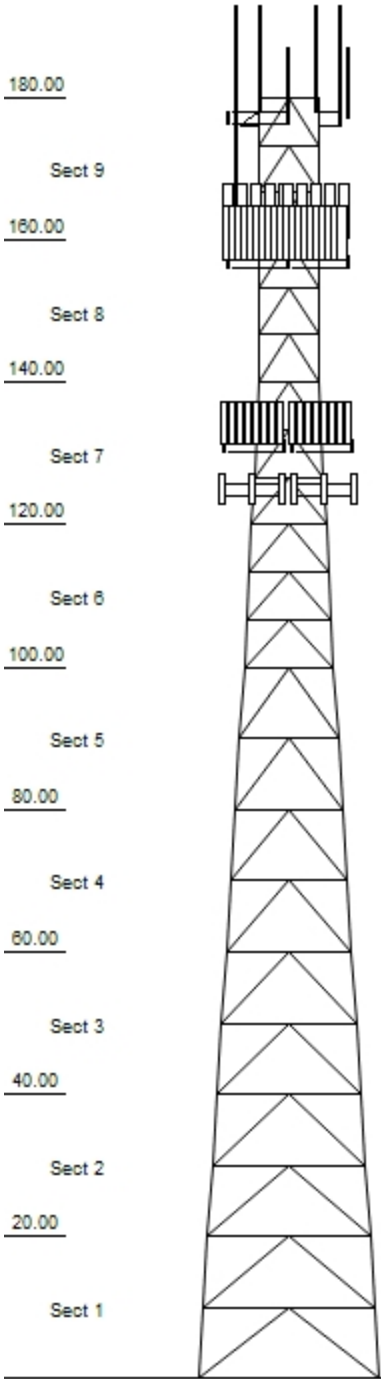
Elev (ft)	Type	Qty	Description
178.00	Whip	1	15' Omni
178.00	Whip	1	13' Omni
178.00	Straight Arm	3	Round Side Arm
178.00	Whip	2	8' Omni
178.00	Whip	2	5' Omni
177.00	Mounting Frame	1	Round Sector Frame
177.00	Whip	2	10' Omni
164.00	Panel	3	Andrew LNX-6515DS-VTM (50.3 lb)
164.00	Panel	3	Ericsson RRUS 11 B12
164.00	Mounting Frame	3	Round Sector Frame
164.00	Panel	6	Ericsson AIR 21
164.00	Panel	3	EMS RR90-17-02DP
164.00	Panel	3	RFS ATMAA1412D-1A20
157.00	Panel	3	CCI HPA-65R-BUU-H8
157.00	Panel	1	KMW AM-X-CD-16-65-00T-RET
157.00	Panel	3	Ericsson RRUS-32
157.00	Mounting Frame	3	Round Sector Frame
157.00	Panel	2	Andrew SBNH-1D6565C
157.00	Panel	6	Powerwave 7770.00
157.00	Panel	6	Ericsson RRUS-11 (50 lbs.)
157.00	Panel	1	Raycap DC6-48-60-0-8F
157.00	Panel	6	Powerwave Algon LGP21401
157.00	Panel	6	Powerwave Algon LGP13519
131.00	Mounting Frame	1	VZW Unused Reserve: 18,665 sq
131.00	Mounting Frame	3	Round Sector Frame
131.00	Panel	2	Swedcom SLCP 2x6015
131.00	Panel	1	Amphenol Antel BXA-70063-6CF-E
131.00	Panel	2	Amphenol Antel LPA-80063-4CF-E
131.00	Panel	6	48" x 12" x 7" Panel
131.00	Panel	1	Swedcom SACP 2x5516
131.00	Panel	3	Amphenol Antel BXA-171063-8CF-
131.00	Panel	3	RRH
131.00	Panel	3	Alcatel-Lucent RRH2x40-AWS
131.00	Panel	3	Raycap RRFDC-1064-PF-48
125.00	Mounting Frame	3	Flat Light Sector Frame
125.00	Panel	6	Kathrein 800 10504
125.00	Panel	1	MicroPulse GPS-QBW-26N

Linear Appurtenance

Elev (ft)		Qty	Description
From	To		
0.000	178.00	1	Waveguide
0.000	178.00	6	1 1/4" Coax
0.000	177.00	2	1 1/4" Coax
0.000	164.00	1	Waveguide
0.000	164.00	1	1 5/8" Hyvribflex Cab
0.000	164.00	18	1 5/8" Coax
0.000	157.00	1	Waveguide
0.000	157.00	12	1 5/8" Coax
0.000	157.00	2	0.78" 8 AWG 6

Job Information			
Tower : 411183	Location : Waterford CT, CT		
Code : TIA/EIA-222-F	Shape : Triangle	Base Width : 25.55 ft	
Client : AT&T Mobility		Top Width : 8.50 ft	
0.000	157.00	1	0.39" Fiber Trunk
0.000	131.00	18	1 5/8" Coax
0.000	131.00	3	1 1/4" Hybriflex Cab
0.000	125.00	6	1 5/8" Coax

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Uplift 310.88 k Moment 8,121.46 kMoment Ice 8,161.24 k-ft
 Vert 429.61 k Tot Down 155.22 k Tot Down Ice 182.31 k
 Horiz 49.07 k Tot Shear 76.14 k Tot Shear Ice 77.67 k

Site Number: 411183

Code: TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: 64723221

1/14/2016 5:40:45 PM

Customer: AT&T Mobility

Analysis Parameters

Location:	New London County, CT	Height:	180
Code:	TIA/EIA-222-F	Base Elevation:	0.00 ft
Shape:	Triangle	Base Face Width:	25.55 ft
Tower Manufacturer:	Rohn	Top Face Width:	8.50 ft
Tower Type:	Self Support		

Ice & Wind Parameters

Exposure Category:	C	Design Windspeed Without Ice:	95 mph
Design Ice Thickness:	0.50 in	Design Windspeed With Ice:	82 mph

Load Cases

Normal No Ice	95 mph Wind Normal To Face with No Ice
60 deg No Ice	95 mph Wind at 60 degree From Face with No Ice
90 deg No Ice	95 mph Wind at 90 degree From Face with No Ice
Normal Ice	82 mph Wind Normal To Face with Ice
60 deg Ice	82 mph Wind at 60 degree From Face with Ice
90 deg Ice	82 mph Wind at 90 degree From Face with Ice
Normal Twist/Sway	50 mph Wind Normal To Face with No Ice
60 deg Twist/Sway	50 mph Wind at 60 degree From Face with No Ice
90 deg Twist/Sway	50 mph Wind at 90 degree From Face with No Ice

Site Number: 411183

Code:

TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: 64723221

1/14/2016 5:40:45 PM

Customer: AT&T Mobility

Tower Loading

Discrete Appurtenance Properties Normal No Ice

Elevation (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Dist. From Face (ft)	X Angle (deg)	Vert Ecc (ft)	Mom (lb-ft)	Qz (psf)	Total Force (lb)	Pu (lb)
178.00	5' Omni	2	10	1.0	1.00	0.0	0.00	3.0	252.7	37.57	84	20
178.00	8' Omni	2	25	2.4	1.00	0.0	0.00	4.0	809.9	37.63	202	50
178.00	13' Omni	1	40	3.9	1.00	0.0	0.00	-8.0	1290.6	36.91	161	40
178.00	15' Omni	1	40	4.5	1.00	0.0	0.00	9.0	1721.6	37.92	191	40
178.00	Round Side Arm	3	150	5.2	0.67	0.0	0.00	0.0	0.0	37.39	438	450
177.00	10' Omni	2	25	3.0	1.00	0.0	0.00	7.0	1777.1	37.75	254	50
177.00	Round Sector Frame	1	300	14.4	1.00	0.0	0.00	0.0	0.0	37.33	603	300
164.00	RFS ATMAA1412D-	3	13	1.0	0.50	0.0	0.00	1.0	61.5	36.59	62	39
164.00	Ericsson RRUS 11 B12	3	51	3.3	0.67	0.0	0.00	0.0	0.0	36.53	267	152
164.00	EMS RR90-17-02DP	3	14	4.4	0.73	0.0	0.00	1.0	391.6	36.59	392	41
164.00	Ericsson AIR 21	6	91	6.1	0.83	0.0	0.00	1.0	1235.8	36.59	1236	546
164.00	Andrew LNX-6515DS-	3	50	11.4	0.84	0.0	0.00	0.0	0.0	36.53	1177	151
164.00	Round Sector Frame	3	300	14.4	0.75	0.0	0.00	0.0	0.0	36.53	1327	900
157.00	Powerwave Allgon	6	5	0.3	0.50	0.0	0.00	1.0	41.3	36.14	41	32
157.00	Powerwave Allgon	6	14	1.1	0.50	0.0	0.00	1.0	133.7	36.14	134	85
157.00	Raycap DC6-48-60-0-8F	1	33	1.2	1.00	0.0	0.00	4.0	193.9	36.34	48	33
157.00	Ericsson RRUS-11 (50	6	50	2.6	0.67	0.0	0.00	1.0	418.5	36.14	419	300
157.00	Ericsson RRUS-32	3	77	3.3	0.67	0.0	0.00	1.0	269.5	36.14	270	231
157.00	Powerwave 7770.00	6	35	5.5	0.77	0.0	0.00	3.0	3104.9	36.27	1035	210
157.00	KMW AM-X-CD-16-65-	1	49	8.0	0.79	0.0	0.00	3.0	772.8	36.27	258	49
157.00	Andrew SBNH-	2	66	11.4	0.84	0.0	0.00	3.0	2346.2	36.27	782	132
157.00	CCI HPA-65R-BUU-H8	3	68	13.0	0.79	0.0	0.00	3.0	3752.1	36.27	1251	204
157.00	Round Sector Frame	3	300	14.4	0.75	0.0	0.00	0.0	0.0	36.08	1310	900
131.00	Raycap RRFDC-1064-	3	14	1.2	0.50	0.0	0.00	3.0	201.7	34.48	67	42
131.00	Alcatel-Lucent	3	44	2.2	0.67	0.0	0.00	1.0	167.1	34.33	167	132
131.00	RRH	3	45	2.4	0.67	0.0	0.00	1.0	185.6	34.33	186	135
131.00	Amphenol Antel BXA-	3	11	2.9	0.87	0.0	0.00	1.0	295.3	34.33	295	32
131.00	48" x 12" x 7" Panel	6	35	5.1	0.79	0.0	0.00	1.0	924.8	34.33	925	210
131.00	Swedcom SACP	1	16	5.1	0.85	0.0	0.00	2.0	333.0	34.41	167	16
131.00	Amphenol Antel LPA-	2	20	6.1	0.93	0.0	0.00	1.0	439.5	34.33	439	40
131.00	Amphenol Antel BXA-	1	17	7.6	0.77	0.0	0.00	2.0	449.6	34.41	225	17
131.00	Swedcom SLCP	2	30	10.0	0.89	0.0	0.00	1.0	683.6	34.33	684	60
131.00	Round Sector Frame	3	300	14.4	0.75	0.0	0.00	0.0	0.0	34.26	1244	900
131.00	VZWS Unused	1	1817	129.7	1.00	0.0	0.00	0.0	0.0	34.26	4981	1817
125.00	MicroPulse GPS-QBW-	1	1	0.1	1.00	0.0	0.00	0.0	0.0	33.80	3	1
125.00	Kathrein 800 10504	6	18	3.3	0.78	0.0	0.00	0.0	0.0	33.80	594	106
125.00	Flat Light Sector	3	400	17.9	0.75	0.0	0.00	0.0	0.0	33.80	1526	1200
	Totals	108	9660	720.2								

Discrete Appurtenance Properties Normal Ice

Elevation (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Dist. From Face (ft)	X Angle (deg)	Vert Ecc (ft)	Mom (lb-ft)	Qz (psf)	Total Force (lb)	Pu (lb)
178.00	5' Omni	2	13	1.3	1.00	0.0	0.00	3.0	236.9	28.18	79	25
178.00	8' Omni	2	31	3.0	1.00	0.0	0.00	4.0	759.2	28.22	190	63
178.00	13' Omni	1	62	5.4	1.00	0.0	0.00	-8.0	1342.7	27.68	168	62
178.00	15' Omni	1	120	4.9	1.00	0.0	0.00	9.0	1405.9	28.44	156	120

Site Number: 411183

Code:

TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: 64723221

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Customer: AT&T Mobility

Tower Loading

178.00	Round Side Arm	3	175	5.9	0.67	0.0	0.00	0.0	0.0	28.04	373	525
177.00	10' Omni	2	31	3.8	1.00	0.0	0.00	7.0	1666.0	28.31	238	63
177.00	Round Sector Frame	1	415	19.2	1.00	0.0	0.00	0.0	0.0	28.00	603	415
164.00	RFS ATMAA1412D-	3	16	1.5	0.50	0.0	0.00	1.0	67.4	27.44	67	49
164.00	Ericsson RRUS 11 B12	3	0	0.0	0.67	0.0	0.00	0.0	0.0	27.40	0	0
164.00	EMS RR90-17-02DP	3	17	5.4	0.73	0.0	0.00	1.0	367.1	27.44	367	51
164.00	Ericsson AIR 21	6	114	8.2	0.83	0.0	0.00	1.0	1250.0	27.44	1250	683
164.00	Andrew LNX-6515DS-	3	0	0.0	0.84	0.0	0.00	0.0	0.0	27.40	0	0
164.00	Round Sector Frame	3	415	19.2	0.75	0.0	0.00	0.0	0.0	27.40	1327	1245
157.00	Powerwave Allgon	6	7	0.4	0.50	0.0	0.00	1.0	39.2	27.11	39	40
157.00	Powerwave Allgon	6	18	1.6	0.50	0.0	0.00	1.0	146.7	27.11	147	106
157.00	Raycap DC6-48-60-0-8F	1	41	1.7	1.00	0.0	0.00	4.0	207.7	27.25	52	41
157.00	Ericsson RRUS-11 (50	6	62	3.7	0.67	0.0	0.00	1.0	456.8	27.11	457	372
157.00	Ericsson RRUS-32	3	105	4.3	0.67	0.0	0.00	1.0	262.6	27.11	263	315
157.00	Powerwave 7770.00	6	68	6.5	0.77	0.0	0.00	3.0	2759.6	27.20	920	406
157.00	KMW AM-X-CD-16-65-	1	95	9.1	0.79	0.0	0.00	3.0	656.1	27.20	219	95
157.00	Andrew SBNH-	2	83	14.3	0.84	0.0	0.00	3.0	2199.1	27.20	733	165
157.00	CCI HPA-65R-BUU-H8	3	142	14.4	0.79	0.0	0.00	3.0	3110.9	27.20	1037	425
157.00	Round Sector Frame	3	415	19.2	0.75	0.0	0.00	0.0	0.0	27.06	1310	1245
131.00	Raycap RRFDC-1064-	3	18	1.7	0.50	0.0	0.00	3.0	220.4	25.86	73	53
131.00	Alcatel-Lucent	3	55	3.1	0.67	0.0	0.00	1.0	182.1	25.75	182	165
131.00	RRH	3	56	3.5	0.67	0.0	0.00	1.0	203.0	25.75	203	169
131.00	Amphenol Antel BXA-	3	13	3.7	0.87	0.0	0.00	1.0	277.2	25.75	277	39
131.00	48" x 12" x 7" Panel	6	44	7.0	0.79	0.0	0.00	1.0	957.6	25.75	958	263
131.00	Swedcom SACP	1	20	6.6	0.85	0.0	0.00	2.0	324.5	25.80	162	20
131.00	Amphenol Antel LPA-	2	25	8.8	0.93	0.0	0.00	1.0	469.7	25.75	470	50
131.00	Amphenol Antel BXA-	1	21	9.7	0.77	0.0	0.00	2.0	430.3	25.80	215	21
131.00	Swedcom SLCP	2	38	13.1	0.89	0.0	0.00	1.0	673.0	25.75	673	75
131.00	Round Sector Frame	3	415	19.2	0.75	0.0	0.00	0.0	0.0	25.69	1244	1245
131.00	VZW Unused	1	625	28.0	1.00	0.0	0.00	0.0	0.0	25.69	806	625
125.00	MicroPulse GPS-QBW-	1	13	1.6	1.00	0.0	0.00	0.0	0.0	25.35	47	13
125.00	Kathrein 800 10504	6	36	3.9	0.78	0.0	0.00	0.0	0.0	25.35	515	214
125.00	Flat Light Sector	3	510	22.2	0.75	0.0	0.00	0.0	0.0	25.35	1419	1530
	Totals	108	10990	732.4								

Discrete Appurtenance Properties Normal Twist/Sway

Elevation (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Dist. From Face (ft)	X Angle (deg)	Vert Ecc (ft)	Mom (lb-ft)	Qz (psf)	Total Force (lb)	Pu (lb)
178.00	5' Omni	2	10	1.0	1.00	0.0	0.00	3.0	70.0	10.41	23	20
178.00	8' Omni	2	25	2.4	1.00	0.0	0.00	4.0	224.3	10.42	56	50
178.00	13' Omni	1	40	3.9	1.00	0.0	0.00	-8.0	357.5	10.22	45	40
178.00	15' Omni	1	40	4.5	1.00	0.0	0.00	9.0	476.9	10.51	53	40
178.00	Round Side Arm	3	150	5.2	0.67	0.0	0.00	0.0	0.0	10.36	121	450
177.00	10' Omni	2	25	3.0	1.00	0.0	0.00	7.0	492.3	10.46	70	50
177.00	Round Sector Frame	1	300	14.4	1.00	0.0	0.00	0.0	0.0	10.34	167	300
164.00	RFS ATMAA1412D-	3	13	1.0	0.50	0.0	0.00	1.0	17.0	10.14	17	39
164.00	Ericsson RRUS 11 B12	3	51	3.3	0.67	0.0	0.00	0.0	0.0	10.12	74	152
164.00	EMS RR90-17-02DP	3	14	4.4	0.73	0.0	0.00	1.0	108.5	10.14	108	41
164.00	Ericsson AIR 21	6	91	6.1	0.83	0.0	0.00	1.0	342.3	10.14	342	546
164.00	Andrew LNX-6515DS-	3	50	11.4	0.84	0.0	0.00	0.0	0.0	10.12	326	151
164.00	Round Sector Frame	3	300	14.4	0.75	0.0	0.00	0.0	0.0	10.12	367	900
157.00	Powerwave Allgon	6	5	0.3	0.50	0.0	0.00	1.0	11.4	10.01	11	32
157.00	Powerwave Allgon	6	14	1.1	0.50	0.0	0.00	1.0	37.0	10.01	37	85

Site Number: 411183

Code: TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: 64723221

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Customer: AT&T Mobility

Tower Loading

157.00	Raycap DC6-48-60-0-8F	1	33	1.2	1.00	0.0	0.00	4.0	53.7	10.07	13	33
157.00	Ericsson RRUS-11 (50	6	50	2.6	0.67	0.0	0.00	1.0	115.9	10.01	116	300
157.00	Ericsson RRUS-32	3	77	3.3	0.67	0.0	0.00	1.0	74.7	10.01	75	231
157.00	Powerwave 7770.00	6	35	5.5	0.77	0.0	0.00	3.0	860.1	10.05	287	210
157.00	KMW AM-X-CD-16-65-	1	49	8.0	0.79	0.0	0.00	3.0	214.1	10.05	71	49
157.00	Andrew SBNH-	2	66	11.4	0.84	0.0	0.00	3.0	649.9	10.05	217	132
157.00	CCI HPA-65R-BUU-H8	3	68	13.0	0.79	0.0	0.00	3.0	1039.4	10.05	346	204
157.00	Round Sector Frame	3	300	14.4	0.75	0.0	0.00	0.0	0.0	9.99	363	900
131.00	Raycap RRFDC-1064-	3	14	1.2	0.50	0.0	0.00	3.0	55.9	9.55	19	42
131.00	Alcatel-Lucent	3	44	2.2	0.67	0.0	0.00	1.0	46.3	9.51	46	132
131.00	RRH	3	45	2.4	0.67	0.0	0.00	1.0	51.4	9.51	51	135
131.00	Amphenol Antel BXA-	3	11	2.9	0.87	0.0	0.00	1.0	81.8	9.51	82	32
131.00	48" x 12" x 7" Panel	6	35	5.1	0.79	0.0	0.00	1.0	256.2	9.51	256	210
131.00	Swedcom SACP	1	16	5.1	0.85	0.0	0.00	2.0	92.3	9.53	46	16
131.00	Amphenol Antel LPA-	2	20	6.1	0.93	0.0	0.00	1.0	121.7	9.51	122	40
131.00	Amphenol Antel BXA-	1	17	7.6	0.77	0.0	0.00	2.0	124.5	9.53	62	17
131.00	Swedcom SLCP	2	30	10.0	0.89	0.0	0.00	1.0	189.4	9.51	189	60
131.00	Round Sector Frame	3	300	14.4	0.75	0.0	0.00	0.0	0.0	9.49	345	900
131.00	VZW Unused	1	1817	129.7	1.00	0.0	0.00	0.0	0.0	9.49	1380	1817
125.00	MicroPulse GPS-QBW-	1	1	0.1	1.00	0.0	0.00	0.0	0.0	9.36	1	1
125.00	Kathrein 800 10504	6	18	3.3	0.78	0.0	0.00	0.0	0.0	9.36	165	106
125.00	Flat Light Sector	3	400	17.9	0.75	0.0	0.00	0.0	0.0	9.36	423	1200
	Totals	108	9660	720.2								

Site Number: 411183
 Site Name: Waterford CT, CT
 Customer: AT&T Mobility

Code: TIA/EIA-222-F
 Engineering Number: 64723221

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Tower Loading

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Wind	Spread On Faces	Bundling Arrangement
0.00	178.0	1 1/4" Coax	6	1.55	2.52	50.00	1	Separate
0.00	178.0	Waveguide	1	2.00	6.00	100.00	1	Separate
0.00	177.0	1 1/4" Coax	2	1.55	2.52	0.00	1	Separate
0.00	164.0	1 5/8" Coax	18	1.98	14.7	66.67	1	Separate
0.00	164.0	1 5/8" Hybriflex Cab	1	1.98	1.30	100.00	1	Separate
0.00	164.0	Waveguide	1	2.00	6.00	100.00	1	Separate
0.00	157.0	0.39" Fiber Trunk	1	0.39	0.06	0.00	2	Separate
0.00	157.0	0.78" 8 AWG 6	2	0.78	1.18	100.00	2	Bundled
0.00	157.0	1 5/8" Coax	12	1.98	9.84	100.00	2	Separate
0.00	157.0	Waveguide	1	2.00	6.00	100.00	2	Separate
0.00	131.0	1 1/4" Hybriflex Cab	3	1.54	3.00	0.00	1	Separate
0.00	131.0	1 5/8" Coax	18	1.98	14.7	50.00	1	Separate
0.00	125.0	1 5/8" Coax	6	1.98	0.82	33.30	1	Separate

Site Number: 411183

Code: TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: 64723221

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Customer: AT&T Mobility

Gh : 1.12

Section Forces

LoadCase Normal No Ice 95 mph Wind Normal To Face with No Ice

Allow Stress Inc: 1.333

Section	Elev. (ft)	qz (psf)	Af (sf)	Ar (sf)	Ice Ar (sf)	e	Cf	Df	Dr	Rr	Ae (sf)	EPAa (sf)	EPAai (sf)	Wt. (lb)	Ice Wt. (lb)	Fst (lb)	Fa (lb)	Force (lb)	Eff Face															
9	170.0	36.91	3.67	40.80	0.00	0.26	2.41	1.00	1.00	0.60	28.33	0.00	0.00	2848	0	2821	0	2821	1															
8	150.0	35.61	6.67	84.66	0.00	0.53	1.87	1.00	1.00	0.71	67.00	0.00	0.00	10035	0	4988	0	4988	1															
7	130.0	34.18	6.67	106.11	0.00	0.58	1.82	1.00	1.00	0.74	85.39	0.00	0.00	14023	0	5946	0	5946	1															
6	110.0	32.59	6.67	131.06	0.00	0.58	1.81	1.00	1.00	0.74	104.15	0.00	0.00	17328	0	6905	0	6905	1															
5	90.0	30.77	6.67	137.84	0.00	0.51	1.88	1.00	1.00	0.70	103.77	0.00	0.00	18850	0	6740	0	6740	1															
4	70.0	28.64	6.67	147.98	0.00	0.47	1.95	1.00	1.00	0.68	107.40	0.00	0.00	19854	0	6717	0	6717	1															
3	50.0	26.02	6.67	150.15	0.00	0.41	2.05	1.00	1.00	0.66	105.10	0.00	0.00	20093	0	6268	0	6268	1															
2	30.0	23.10	6.67	163.49	0.00	0.39	2.08	1.00	1.00	0.65	112.60	0.00	0.00	21125	0	6072	0	6072	1															
1	10.0	23.10	6.67	166.28	0.00	0.36	2.16	1.00	1.00	0.63	112.15	0.00	0.00	21407	0	6272	0	6272	1															
														145562	0																			52730

LoadCase 60 deg No Ice 95 mph Wind at 60 degree From Face with No Ice

Allow Stress Inc: 1.333

Section	Elev. (ft)	qz (psf)	Af (sf)	Ar (sf)	Ice Ar (sf)	e	Cf	Df	Dr	Rr	Ae (sf)	EPAa (sf)	EPAai (sf)	Wt. (lb)	Ice Wt. (lb)	Fst (lb)	Fa (lb)	Force (lb)	Eff Face																
9	170.0	36.91	3.67	40.80	0.00	0.26	2.41	0.80	1.00	0.60	27.60	0.00	0.00	2848	0	2748	0	2748	1																
8	150.0	35.61	6.67	84.66	0.00	0.53	1.87	0.80	1.00	0.71	65.67	0.00	0.00	10035	0	4889	0	4889	1																
7	130.0	34.18	6.67	106.11	0.00	0.58	1.82	0.80	1.00	0.74	84.05	0.00	0.00	14023	0	5853	0	5853	1																
6	110.0	32.59	6.67	131.06	0.00	0.58	1.81	0.80	1.00	0.74	102.82	0.00	0.00	17328	0	6817	0	6817	1																
5	90.0	30.77	6.67	137.84	0.00	0.51	1.88	0.80	1.00	0.70	102.44	0.00	0.00	18850	0	6654	0	6654	1																
4	70.0	28.64	6.67	147.98	0.00	0.47	1.95	0.80	1.00	0.68	106.06	0.00	0.00	19854	0	6634	0	6634	1																
3	50.0	26.02	6.67	150.15	0.00	0.41	2.05	0.80	1.00	0.66	103.77	0.00	0.00	20093	0	6189	0	6189	1																
2	30.0	23.10	6.67	163.49	0.00	0.39	2.08	0.80	1.00	0.65	111.26	0.00	0.00	21125	0	6000	0	6000	1																
1	10.0	23.10	6.67	166.28	0.00	0.36	2.16	0.80	1.00	0.63	110.81	0.00	0.00	21407	0	6197	0	6197	1																
														145562	0																				51980

LoadCase 90 deg No Ice 95 mph Wind at 90 degree From Face with No Ice

Allow Stress Inc: 1.333

Section	Elev. (ft)	qz (psf)	Af (sf)	Ar (sf)	Ice Ar (sf)	e	Cf	Df	Dr	Rr	Ae (sf)	EPAa (sf)	EPAai (sf)	Wt. (lb)	Ice Wt. (lb)	Fst (lb)	Fa (lb)	Force (lb)	Eff Face																
9	170.0	36.91	3.67	40.80	0.00	0.26	2.41	0.85	1.00	0.60	27.78	0.00	0.00	2848	0	2767	0	2767	1																
8	150.0	35.61	6.67	84.66	0.00	0.53	1.87	0.85	1.00	0.71	66.00	0.00	0.00	10035	0	4914	0	4914	1																
7	130.0	34.18	6.67	106.11	0.00	0.58	1.82	0.85	1.00	0.74	84.39	0.00	0.00	14023	0	5876	0	5876	1																
6	110.0	32.59	6.67	131.06	0.00	0.58	1.81	0.85	1.00	0.74	103.15	0.00	0.00	17328	0	6839	0	6839	1																
5	90.0	30.77	6.67	137.84	0.00	0.51	1.88	0.85	1.00	0.70	102.77	0.00	0.00	18850	0	6675	0	6675	1																
4	70.0	28.64	6.67	147.98	0.00	0.47	1.95	0.85	1.00	0.68	106.40	0.00	0.00	19854	0	6655	0	6655	1																
3	50.0	26.02	6.67	150.15	0.00	0.41	2.05	0.85	1.00	0.66	104.10	0.00	0.00	20093	0	6209	0	6209	1																
2	30.0	23.10	6.67	163.49	0.00	0.39	2.08	0.85	1.00	0.65	111.60	0.00	0.00	21125	0	6018	0	6018	1																
1	10.0	23.10	6.67	166.28	0.00	0.36	2.16	0.85	1.00	0.63	111.15	0.00	0.00	21407	0	6216	0	6216	1																
														145562	0																				52167

Site Number: 411183

Code: TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: 64723221

1/14/2016 5:40:45 PM

Customer: AT&T Mobility

Gh : 1.12

Section Forces

LoadCase Normal Ice 82 mph Wind Normal To Face with Ice

Allow Stress Inc: 1.333

Section	Elev. (ft)	qz (psf)	Af (sf)	Ar (sf)	Ice Ar (sf)	e	Cf	Df	Dr	Rr	Ae (sf)	EPAa (sf)	EPAai (sf)	Wt. (lb)	Ice Wt. (lb)	Fst (lb)	Fa (lb)	Force (lb)	Eff Face			
9	170.0	27.68	3.67	61.23	20.43	0.38	2.11	1.00	1.00	0.64	43.07	0.00	0.00	3787	939	2813	0	2813	1			
8	150.0	26.71	6.67	125.79	41.13	0.77	1.80	1.00	1.00	0.87	116.11	0.00	0.00	12052	2017	6240	0	6240	1			
7	130.0	25.64	6.67	156.72	50.61	0.84	1.85	1.00	1.00	0.93	152.52	0.00	0.00	16535	2512	8116	0	8116	1			
6	110.0	24.44	6.67	191.77	60.71	0.84	1.85	1.00	1.00	0.93	185.18	0.00	0.00	20405	3077	9397	0	9397	1			
5	90.0	23.08	6.67	197.56	59.72	0.73	1.78	1.00	1.00	0.84	172.35	0.00	0.00	21971	3121	7935	0	7935	1			
4	70.0	21.48	6.67	208.38	60.40	0.65	1.78	1.00	1.00	0.78	170.06	0.00	0.00	23160	3306	7297	0	7297	1			
3	50.0	19.51	6.67	211.26	61.12	0.57	1.83	1.00	1.00	0.74	162.01	0.00	0.00	23471	3379	6470	0	6470	1			
2	30.0	17.33	6.67	225.36	61.87	0.53	1.86	1.00	1.00	0.71	167.78	0.00	0.00	24781	3656	6063	0	6063	1			
1	10.0	17.33	6.67	228.91	62.63	0.48	1.92	1.00	1.00	0.69	164.47	0.00	0.00	25153	3746	6139	0	6139	1			
														171316	25754			60470				

LoadCase 60 deg Ice 82 mph Wind at 60 degree From Face with Ice

Allow Stress Inc: 1.333

Section	Elev. (ft)	qz (psf)	Af (sf)	Ar (sf)	Ice Ar (sf)	e	Cf	Df	Dr	Rr	Ae (sf)	EPAa (sf)	EPAai (sf)	Wt. (lb)	Ice Wt. (lb)	Fst (lb)	Fa (lb)	Force (lb)	Eff Face			
9	170.0	27.68	3.67	61.23	20.43	0.38	2.11	0.80	1.00	0.64	42.34	0.00	0.00	3787	939	2765	0	2765	1			
8	150.0	26.71	6.67	125.79	41.13	0.77	1.80	0.80	1.00	0.87	114.77	0.00	0.00	12052	2017	6168	0	6168	1			
7	130.0	25.64	6.67	156.72	50.61	0.84	1.85	0.80	1.00	0.93	151.19	0.00	0.00	16535	2512	8046	0	8046	1			
6	110.0	24.44	6.67	191.77	60.71	0.84	1.85	0.80	1.00	0.93	183.85	0.00	0.00	20405	3077	9329	0	9329	1			
5	90.0	23.08	6.67	197.56	59.72	0.73	1.78	0.80	1.00	0.84	171.01	0.00	0.00	21971	3121	7874	0	7874	1			
4	70.0	21.48	6.67	208.38	60.40	0.65	1.78	0.80	1.00	0.78	168.72	0.00	0.00	23160	3306	7239	0	7239	1			
3	50.0	19.51	6.67	211.26	61.12	0.57	1.83	0.80	1.00	0.74	160.68	0.00	0.00	23471	3379	6417	0	6417	1			
2	30.0	17.33	6.67	225.36	61.87	0.53	1.86	0.80	1.00	0.71	166.44	0.00	0.00	24781	3656	6015	0	6015	1			
1	10.0	17.33	6.67	228.91	62.63	0.48	1.92	0.80	1.00	0.69	163.14	0.00	0.00	25153	3746	6089	0	6089	1			
														171316	25754			59942				

LoadCase 90 deg Ice 82 mph Wind at 90 degree From Face with Ice

Allow Stress Inc: 1.333

Section	Elev. (ft)	qz (psf)	Af (sf)	Ar (sf)	Ice Ar (sf)	e	Cf	Df	Dr	Rr	Ae (sf)	EPAa (sf)	EPAai (sf)	Wt. (lb)	Ice Wt. (lb)	Fst (lb)	Fa (lb)	Force (lb)	Eff Face			
9	170.0	27.68	3.67	61.23	20.43	0.38	2.11	0.85	1.00	0.64	42.52	0.00	0.00	3787	939	2777	0	2777	1			
8	150.0	26.71	6.67	125.79	41.13	0.77	1.80	0.85	1.00	0.87	115.11	0.00	0.00	12052	2017	6186	0	6186	1			
7	130.0	25.64	6.67	156.72	50.61	0.84	1.85	0.85	1.00	0.93	151.52	0.00	0.00	16535	2512	8063	0	8063	1			
6	110.0	24.44	6.67	191.77	60.71	0.84	1.85	0.85	1.00	0.93	184.18	0.00	0.00	20405	3077	9346	0	9346	1			
5	90.0	23.08	6.67	197.56	59.72	0.73	1.78	0.85	1.00	0.84	171.35	0.00	0.00	21971	3121	7889	0	7889	1			
4	70.0	21.48	6.67	208.38	60.40	0.65	1.78	0.85	1.00	0.78	169.06	0.00	0.00	23160	3306	7254	0	7254	1			
3	50.0	19.51	6.67	211.26	61.12	0.57	1.83	0.85	1.00	0.74	161.01	0.00	0.00	23471	3379	6430	0	6430	1			
2	30.0	17.33	6.67	225.36	61.87	0.53	1.86	0.85	1.00	0.71	166.78	0.00	0.00	24781	3656	6027	0	6027	1			
1	10.0	17.33	6.67	228.91	62.63	0.48	1.92	0.85	1.00	0.69	163.47	0.00	0.00	25153	3746	6102	0	6102	1			
														171316	25754			60074				

Site Number: 411183

Code:

TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: 64723221

1/14/2016 5:40:45 PM

Customer: AT&T Mobility

Gh : 1.12

Section Forces

LoadCase Normal

50 mph Wind Normal To Face with No Ice

Allow Stress Inc: 1.333

Section	Elev. (ft)	qz (psf)	Af (sf)	Ar (sf)	Ice Ar (sf)	e	Cf	Df	Dr	Rr	Ae (sf)	EPAa (sf)	EPAai (sf)	Wt. (lb)	Ice Wt. (lb)	Fst (lb)	Fa (lb)	Force (lb)	Eff Face
9	170.0	10.22	3.67	40.80	0.00	0.26	2.41	1.00	1.00	0.60	28.33	0.00	0.00	2848	0	782	0	782	1
8	150.0	9.86	6.67	84.66	0.00	0.53	1.87	1.00	1.00	0.71	67.00	0.00	0.00	10035	0	1382	0	1382	1
7	130.0	9.47	6.67	106.11	0.00	0.58	1.82	1.00	1.00	0.74	85.39	0.00	0.00	14023	0	1647	0	1647	1
6	110.0	9.03	6.67	131.06	0.00	0.58	1.81	1.00	1.00	0.74	104.15	0.00	0.00	17328	0	1913	0	1913	1
5	90.0	8.52	6.67	137.84	0.00	0.51	1.88	1.00	1.00	0.70	103.77	0.00	0.00	18850	0	1867	0	1867	1
4	70.0	7.93	6.67	147.98	0.00	0.47	1.95	1.00	1.00	0.68	107.40	0.00	0.00	19854	0	1861	0	1861	1
3	50.0	7.21	6.67	150.15	0.00	0.41	2.05	1.00	1.00	0.66	105.10	0.00	0.00	20093	0	1736	0	1736	1
2	30.0	6.40	6.67	163.49	0.00	0.39	2.08	1.00	1.00	0.65	112.60	0.00	0.00	21125	0	1682	0	1682	1
1	10.0	6.40	6.67	166.28	0.00	0.36	2.16	1.00	1.00	0.63	112.15	0.00	0.00	21407	0	1737	0	1737	1
														145562	0			14607	

LoadCase 60 deg

50 mph Wind at 60 degree From Face with No Ice

Allow Stress Inc: 1.333

Section	Elev. (ft)	qz (psf)	Af (sf)	Ar (sf)	Ice Ar (sf)	e	Cf	Df	Dr	Rr	Ae (sf)	EPAa (sf)	EPAai (sf)	Wt. (lb)	Ice Wt. (lb)	Fst (lb)	Fa (lb)	Force (lb)	Eff Face
9	170.0	10.22	3.67	40.80	0.00	0.26	2.41	0.80	1.00	0.60	27.60	0.00	0.00	2848	0	761	0	761	1
8	150.0	9.86	6.67	84.66	0.00	0.53	1.87	0.80	1.00	0.71	65.67	0.00	0.00	10035	0	1354	0	1354	1
7	130.0	9.47	6.67	106.11	0.00	0.58	1.82	0.80	1.00	0.74	84.05	0.00	0.00	14023	0	1621	0	1621	1
6	110.0	9.03	6.67	131.06	0.00	0.58	1.81	0.80	1.00	0.74	102.82	0.00	0.00	17328	0	1888	0	1888	1
5	90.0	8.52	6.67	137.84	0.00	0.51	1.88	0.80	1.00	0.70	102.44	0.00	0.00	18850	0	1843	0	1843	1
4	70.0	7.93	6.67	147.98	0.00	0.47	1.95	0.80	1.00	0.68	106.06	0.00	0.00	19854	0	1838	0	1838	1
3	50.0	7.21	6.67	150.15	0.00	0.41	2.05	0.80	1.00	0.66	103.77	0.00	0.00	20093	0	1714	0	1714	1
2	30.0	6.40	6.67	163.49	0.00	0.39	2.08	0.80	1.00	0.65	111.26	0.00	0.00	21125	0	1662	0	1662	1
1	10.0	6.40	6.67	166.28	0.00	0.36	2.16	0.80	1.00	0.63	110.81	0.00	0.00	21407	0	1717	0	1717	1
														145562	0			14399	

LoadCase 90 deg

50 mph Wind at 90 degree From Face with No Ice

Allow Stress Inc: 1.333

Section	Elev. (ft)	qz (psf)	Af (sf)	Ar (sf)	Ice Ar (sf)	e	Cf	Df	Dr	Rr	Ae (sf)	EPAa (sf)	EPAai (sf)	Wt. (lb)	Ice Wt. (lb)	Fst (lb)	Fa (lb)	Force (lb)	Eff Face
9	170.0	10.22	3.67	40.80	0.00	0.26	2.41	0.85	1.00	0.60	27.78	0.00	0.00	2848	0	766	0	766	1
8	150.0	9.86	6.67	84.66	0.00	0.53	1.87	0.85	1.00	0.71	66.00	0.00	0.00	10035	0	1361	0	1361	1
7	130.0	9.47	6.67	106.11	0.00	0.58	1.82	0.85	1.00	0.74	84.39	0.00	0.00	14023	0	1628	0	1628	1
6	110.0	9.03	6.67	131.06	0.00	0.58	1.81	0.85	1.00	0.74	103.15	0.00	0.00	17328	0	1894	0	1894	1
5	90.0	8.52	6.67	137.84	0.00	0.51	1.88	0.85	1.00	0.70	102.77	0.00	0.00	18850	0	1849	0	1849	1
4	70.0	7.93	6.67	147.98	0.00	0.47	1.95	0.85	1.00	0.68	106.40	0.00	0.00	19854	0	1843	0	1843	1
3	50.0	7.21	6.67	150.15	0.00	0.41	2.05	0.85	1.00	0.66	104.10	0.00	0.00	20093	0	1720	0	1720	1
2	30.0	6.40	6.67	163.49	0.00	0.39	2.08	0.85	1.00	0.65	111.60	0.00	0.00	21125	0	1667	0	1667	1
1	10.0	6.40	6.67	166.28	0.00	0.36	2.16	0.85	1.00	0.63	111.15	0.00	0.00	21407	0	1722	0	1722	1
														145562	0			14451	

Force/Stress Summary

Section: 1 1 Bot Elev (ft): 0.00 Height (ft): 20.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing %				Fa (ksi)	Member			Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
				X	Y	Z	KL/R		Cap (kip)	Num Bolts	Num Holes				
LEG PX - 12" DIA PIPE	-410.75	Normal Ice	10.02	100	100	100	27.8	36.6	701.85	0	0	0.00	0.00	58	Member X
HORIZ PST - 3" DIA PIPE	-10.68	90 deg No Ice	12.17	100	100	100	125.9	12.6	27.99	2	0	0.00	33.69	38	Member X
DIAG PST - 3-1/2" DIA PIP	-18.40	90 deg Ice	15.75	100	100	100	141.1	10.0	26.79	3	0	0.00	52.87	68	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG PX - 12" DIA PIPE	298.49	60 deg No Ice	50	767.81	0	0	0.00	0.00	38	Member
HORIZ PST - 3" DIA PIPE	13.69	90 deg Ice	50	89.18	2	0	0.00	27.37	50	Bolt Bear
DIAG PST - 3-1/2" DIA PIP	15.75	90 deg Ice	50	107.17	3	0	0.00	46.26	34	Bolt Bear

Max Splice Forces	Force (kip)	Load Case	Capacity (kip)	Use %	Num Bolts	Bolt Type
Top Tension	282.18	60 deg No Ice	0.00	0		
Top Compression	387.10	Normal Ice	0.00	0		
Bot Tension	314.00	60 deg No Ice	1177.95	27	24	1" A354-BC
Bot Compression	430.28	Normal Ice	0.00	0		

Section: 2 1 Bot Elev (ft): 20.00 Height (ft): 20.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing %				Fa (ksi)	Member			Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
				X	Y	Z	KL/R		Cap (kip)	Num Bolts	Num Holes				
LEG PX - 12" DIA PIPE	-367.91	Normal Ice	10.03	100	100	100	27.8	36.6	701.79	0	0	0.00	0.00	52	Member X
HORIZ PST - 3" DIA PIPE	-10.01	90 deg Ice	10.88	100	100	100	112.6	15.7	35.03	2	0	0.00	33.69	29	Bolt Bear
DIAG PST - 3-1/2" DIA PIP	-16.70	90 deg Ice	15.29	100	100	100	137.0	10.6	28.43	3	0	0.00	52.87	58	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG PX - 12" DIA PIPE	270.56	60 deg No Ice	50	767.81	0	0	0.00	0.00	35	Member
HORIZ PST - 3" DIA PIPE	11.85	90 deg Ice	50	89.18	2	0	0.00	27.37	43	Bolt Bear
DIAG PST - 3-1/2" DIA PIP	13.53	90 deg Ice	50	107.17	3	0	0.00	46.26	29	Bolt Bear

Max Splice Forces	Force (kip)	Load Case	Capacity (kip)	Use %	Num Bolts	Bolt Type
Top Tension	256.57	60 deg No Ice	0.00	0		
Top Compression	344.96	Normal Ice	0.00	0		
Bot Tension	282.18	60 deg No Ice	737.10	38	16	1 A325
Bot Compression	387.10	Normal Ice	0.00	0		

Site Number: 411183

Code:

TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: 64723221

1/14/2016 5:40:46 PM

Customer: AT&T Mobility

Force/Stress Summary

Section: 3		1		Bot Elev (ft): 40.00				Height (ft): 20.000					
		Force	Len	Bracing %			Fa	Member	Shear	Bear	Use		
Max Compression Member		(kip)	(ft)	X	Y	Z	(ksi)	Cap Num	Num	Cap	Cap	%	Controls
		Load Case						(kip)	Holes	(kip)	(kip)		
LEG	PX - 10" DIA PIPE	-321.87	10.03	100	100	100	33.1	574.21	0	0.00	0.00	56	Member X
HORIZ	PST - 2-1/2" DIA PIP	-10.62	9.570	100	100	100	121.3	23.07	2	0.00	31.66	46	Member X
DIAG	PX - 3" DIA PIPE	-17.98	14.28	100	100	100	150.4	26.59	3	0.00	70.18	67	Member X

Max Tension Member		Force	Fy	Cap Num	Num	Shear	Bear	Use	Controls	
		(kip)	(ksi)	(kip)	Bolts	Cap (kip)	Cap (kip)	%		
		Load Case			Holes					
LEG	PX - 10" DIA PIPE	242.02	50	643.84	0	0	0.00	0.00	37	Member
HORIZ	PST - 2-1/2" DIA PIP	11.96	50	68.14	2	0	0.00	25.72	46	Bolt Bear
DIAG	PX - 3" DIA PIPE	15.37	50	120.77	3	0	0.00	61.41	25	Bolt Bear

Max Splice Forces		Force	Capacity	Use	Num	Bolt Type	
		(kip)	(kip)	%	Bolts		
		Load Case					
Top Tension		224.71	0.00	0			
Top Compression		295.73	0.00	0			
Bot Tension		256.57	737.10	35	16	1	A325
Bot Compression		344.96	0.00	0			

Section: 4		1		Bot Elev (ft): 60.00				Height (ft): 20.000					
		Force	Len	Bracing %			Fa	Member	Shear	Bear	Use		
Max Compression Member		(kip)	(ft)	X	Y	Z	(ksi)	Cap Num	Num	Cap	Cap	%	Controls
		Load Case						(kip)	Holes	(kip)	(kip)		
LEG	PX - 10" DIA PIPE	-271.77	10.03	100	100	100	33.2	574.19	0	0.00	0.00	47	Member X
HORIZ	PST - 2-1/2" DIA PIP	-9.81	8.297	100	100	100	105.1	30.65	2	0.00	31.66	32	Member X
DIAG	PX - 3" DIA PIPE	-17.78	13.42	100	100	100	141.3	30.12	3	0.00	70.18	59	Member X

Max Tension Member		Force	Fy	Cap Num	Num	Shear	Bear	Use	Controls	
		(kip)	(ksi)	(kip)	Bolts	Cap (kip)	Cap (kip)	%		
		Load Case			Holes					
LEG	PX - 10" DIA PIPE	209.26	50	643.84	0	0	0.00	0.00	32	Member
HORIZ	PST - 2-1/2" DIA PIP	10.94	50	68.14	2	0	0.00	25.72	42	Bolt Bear
DIAG	PX - 3" DIA PIPE	15.18	50	120.77	3	0	0.00	61.41	24	Bolt Bear

Max Splice Forces		Force	Capacity	Use	Num	Bolt Type	
		(kip)	(kip)	%	Bolts		
		Load Case					
Top Tension		191.13	0.00	0			
Top Compression		246.87	0.00	0			
Bot Tension		224.71	552.82	41	12	1	A325
Bot Compression		295.73	0.00	0			

Site Number: 411183

Code:

TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: 64723221

1/14/2016 5:40:46 PM

Customer: AT&T Mobility

Force/Stress Summary

Section: 5		1		Bot Elev (ft): 80.00				Height (ft): 20.000							
Max Compression Member		Force (kip)	Load Case	Len (ft)	Bracing %			Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	PX - 8" DIA PIPE	-222.02	Normal No Ice	10.03	100	100	100	41.8	34.1	436.47	0	0	0.00	0.00	50 Member X
HORIZ	PX - 2" DIA PIPE	-9.51	90 deg Ice	7.035	100	100	100	110.2	16.4	24.26	2	0	0.00	34.00	39 Member X
DIAG	PX - 3" DIA PIPE	-18.59	90 deg Ice	12.59	100	100	100	132.6	11.3	34.20	3	0	0.00	70.18	54 Member X

Max Tension Member		Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	PX - 8" DIA PIPE	172.69	60 deg No Ice	50	511.87	0	0	0.00	0.00	33	Member
HORIZ	PX - 2" DIA PIPE	10.34	90 deg Ice	50	59.19	2	0	0.00	27.62	37	Bolt Bear
DIAG	PX - 3" DIA PIPE	16.70	90 deg Ice	50	120.77	3	0	0.00	61.41	27	Bolt Bear

Max Splice Forces		Force (kip)	Load Case	Capacity (kip)	Use %	Num Bolts	Bolt Type
Top Tension		150.85	60 deg No Ice	0.00	0		
Top Compression		193.86	Normal No Ice	0.00	0		
Bot Tension		191.13	60 deg No Ice	552.82	35	12	1 A325
Bot Compression		246.87	Normal No Ice	0.00	0		

Section: 6		1		Bot Elev (ft): 100.0				Height (ft): 20.000							
Max Compression Member		Force (kip)	Load Case	Len (ft)	Bracing %			Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	PX - 6" DIA PIPE	-174.32	Normal No Ice	6.68	100	100	100	36.5	35.1	294.62	0	0	0.00	0.00	59 Member X
HORIZ	PST - 2" DIA PIPE	-9.24	90 deg No Ice	6.072	100	100	100	92.6	21.8	23.36	2	0	0.00	20.01	46 Bolt Bear
DIAG	PST - 2-1/2" DIA PIP	-15.39	90 deg Ice	9.257	100	100	100	117.3	14.5	24.65	3	0	0.00	39.58	62 Member X

Max Tension Member		Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	PX - 6" DIA PIPE	136.40	60 deg No Ice	50	335.92	0	0	0.00	0.00	40	Member
HORIZ	PST - 2" DIA PIPE	9.98	90 deg Ice	50	42.79	2	0	0.00	16.26	61	Bolt Bear
DIAG	PST - 2-1/2" DIA PIP	14.26	90 deg No Ice	50	68.14	3	0	0.00	34.63	41	Bolt Bear

Max Splice Forces		Force (kip)	Load Case	Capacity (kip)	Use %	Num Bolts	Bolt Type
Top Tension		101.09	60 deg No Ice	0.00	0		
Top Compression		131.30	Normal No Ice	0.00	0		
Bot Tension		150.85	60 deg No Ice	368.55	41	8	1 A325
Bot Compression		193.86	Normal No Ice	0.00	0		

Site Number: 411183

Code:

TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: 64723221

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Customer: AT&T Mobility

Force/Stress Summary

Section: 7		1		Bot Elev (ft): 120.0				Height (ft): 20.000							
Max Compression Member		Force (kip)	Load Case	Len (ft)	Bracing %			Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	PX - 5" DIA PIPE	-109.95	Normal No Ice	6.68	100	100	100	43.6	33.8	206.25	0	0	0.00	0.00	53 Member X
HORIZ	PST - 1-1/2" DIA PIP	-9.12	90 deg No Ice	5.030	100	100	100	96.9	20.6	16.42	2	0	0.00	18.85	55 Member X
DIAG	PST - 2-1/2" DIA PIP	-15.87	90 deg No Ice	8.566	100	100	100	108.5	16.9	28.79	3	0	0.00	39.58	55 Member X

Max Tension Member		Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	PX - 5" DIA PIPE	83.01	60 deg No Ice	50	244.34	0	0	0.00	0.00	33	Member
HORIZ	PST - 1-1/2" DIA PIP	9.51	90 deg No Ice	50	31.95	2	0	0.00	15.31	62	Bolt Bear
DIAG	PST - 2-1/2" DIA PIP	14.87	90 deg No Ice	50	68.14	3	0	0.00	34.63	42	Bolt Bear

Max Splice Forces		Force (kip)	Load Case	Capacity (kip)	Use %	Num Bolts	Bolt Type
Top Tension		53.96	60 deg No Ice	0.00	0		
Top Compression		71.04	Normal No Ice	0.00	0		
Bot Tension		101.09	60 deg No Ice	276.41	37	6	1 A325
Bot Compression		131.30	Normal No Ice	0.00	0		

Section: 8		1		Bot Elev (ft): 140.0				Height (ft): 20.000							
Max Compression Member		Force (kip)	Load Case	Len (ft)	Bracing %			Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	PST - 4" DIA PIPE	-52.47	Normal No Ice	6.67	100	100	100	53.0	31.8	100.91	0	0	0.00	0.00	52 Member X
HORIZ	PST - 2" DIA PIPE	-6.06	90 deg No Ice	4.325	100	100	100	65.9	28.9	30.92	2	0	0.00	20.01	30 Bolt Bear
DIAG	PST - 2-1/2" DIA PIP	-12.23	90 deg No Ice	7.955	100	100	100	100.8	19.4	32.98	3	0	0.00	39.58	37 Member X

Max Tension Member		Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	PST - 4" DIA PIPE	38.34	60 deg No Ice	50	126.77	0	0	0.00	0.00	30	Member
HORIZ	PST - 2" DIA PIPE	6.37	90 deg No Ice	50	42.79	2	0	0.00	16.26	39	Bolt Bear
DIAG	PST - 2-1/2" DIA PIP	11.57	90 deg No Ice	50	68.14	3	0	0.00	34.63	33	Bolt Bear

Max Splice Forces		Force (kip)	Load Case	Capacity (kip)	Use %	Num Bolts	Bolt Type
Top Tension		10.47	60 deg No Ice	0.00	0		
Top Compression		18.56	Normal No Ice	0.00	0		
Bot Tension		53.96	60 deg No Ice	184.27	29	4	1 A325
Bot Compression		71.04	Normal No Ice	0.00	0		

Site Number: 411183

Code:

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Site Name: Waterford CT, CT

Engineering Number: 64723221

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Customer: AT&T Mobility

Force/Stress Summary

Section: 9 1 Bot Elev (ft): 160.0 Height (ft): 20.000

	Force (kip)	Load Case	Len (ft)	Bracing %				Fa (ksi)	Member		Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
				X	Y	Z	KL/R		Cap (kip)	Num Bolts					
Max Compression Member															
LEG PST - 3" DIA PIPE	-8.31	Normal Ice	6.67	100	100	100	69.0	28.2	62.81	0	0	0.00	0.00	13 Member X	
HORIZ PST - 1-1/2" DIA PIP	-3.28	Normal No Ice	4.280	100	100	100	82.4	24.7	19.73	2	0	0.00	18.85	17 Bolt Bear	
DIAG PST - 2" DIA PIPE	-5.45	Normal No Ice	7.930	100	100	100	120.9	13.6	14.57	3	0	0.00	30.02	37 Member X	

	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG PST - 3" DIA PIPE	4.10	60 deg No Ice	50	89.18	0	0	0.00	0.00	4	Member
HORIZ PST - 1-1/2" DIA PIP	2.88	60 deg No Ice	50	31.95	2	0	0.00	15.31	18	Bolt Bear
DIAG PST - 2" DIA PIPE	5.26	Normal No Ice	50	42.79	3	0	0.00	26.27	20	Bolt Bear

	Force (kip)	Load Case	Capacity (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0		
Top Compression	0.63	60 deg Ice	0.00	0		
Bot Tension	10.47	60 deg No Ice	141.08	7	4	7/8 A325
Bot Compression	18.56	Normal No Ice	0.00	0		

Site Number: 411183
 Site Name: Waterford CT, CT
 Customer: AT&T Mobility

Code: TIA/EIA-222-F
 Engineering Number: 64723221

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Support Forces Summary

Load Case	Node	FX (kip)	FY (kip)	FZ (kip)	(-) = Uplift (+) = Down
60 deg Ice	1b	-34.35	-304.50	-19.82	
	1a	-26.29	242.78	8.08	
	1	-6.17	244.02	-26.83	
60 deg No Ice	1b	-33.30	-310.68	-19.21	
	1a	-26.03	232.27	8.16	
	1	-5.97	233.63	-26.65	
60 deg	1b	-6.02	-48.55	-3.47	
	1a	-10.38	101.70	4.07	
	1	-1.67	102.07	-11.03	
90 deg Ice	1b	-31.08	-255.71	-13.64	
	1a	-38.95	377.25	18.42	
	1	-7.25	60.77	-4.78	
90 deg No Ice	1b	-30.10	-262.44	-13.21	
	1a	-38.46	365.92	18.27	
	1	-7.02	51.74	-5.05	
90 deg	1b	-5.13	-35.20	-1.83	
	1a	-13.84	138.68	6.88	
	1	-1.94	51.74	-5.05	
Normal Ice	1b	-12.00	-123.65	-14.30	
	1a	12.00	-123.65	-14.30	
	1	0.00	429.61	-49.07	
Normal No Ice	1b	-11.51	-131.78	-13.80	
	1a	11.51	-131.78	-13.80	
	1	0.00	418.78	-48.55	
Normal	1b	-0.03	0.96	-1.97	
	1a	0.03	0.96	-1.97	
	1	0.00	153.30	-17.13	

Max Uplift:	310.68 (kip)	Moment:	8,121.46 (ft-kip)	Normal No Ice
Max Down:	429.61 (kip)	Total Down:	155.22 (kip)	
Max Shear:	49.07 (kip)	Total Shear:	76.14 (kip)	

Site Number: 411183

Code:

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Site Name: Waterford CT, CT

Engineering Number: 64723221

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Customer: AT&T Mobility

Deflections and Rotations

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
50 mph Wind at 60 degree From Face with No Ice	126.67	0.1188	0.0116	0.1209
	133.33	0.1331	0.0141	0.1221
	160.00	0.1969	0.0212	0.1328
	166.67	0.2144	0.0228	0.1477
	180.00	0.2487	0.0245	0.1308
50 mph Wind at 90 degree From Face with No Ice	126.67	0.1188	0.0085	0.1211
	133.33	0.1331	0.0096	0.1189
	160.00	0.1966	0.0115	0.0958
	166.67	0.2138	0.0119	0.1447
	180.00	0.2478	0.0123	0.0906
50 mph Wind Normal To Face with No Ice	126.67	0.1204	0.0050	0.1221
	133.33	0.1351	0.0073	0.1331
	160.00	0.2010	0.0113	0.2088
	166.67	0.2192	0.0122	0.1584
	180.00	0.2550	0.0131	0.2105
82 mph Wind at 60 degree From Face with Ice	126.67	0.4266	0.0565	0.4168
	133.33	0.4760	0.0691	0.4236
	160.00	0.6979	0.1209	0.4586
	166.67	0.7577	0.1333	0.5062
	180.00	0.8763	0.1453	0.4547
82 mph Wind at 90 degree From Face with Ice	126.67	0.4264	0.0313	0.4172
	133.33	0.4757	0.0357	0.4117
	160.00	0.6963	0.0426	0.3413
	166.67	0.7554	0.0441	0.4937
	180.00	0.8729	0.0455	0.3369
82 mph Wind Normal To Face with Ice	126.67	0.4312	0.0176	0.4200
	133.33	0.4818	0.0254	0.4620
	160.00	0.7098	0.0383	0.7033
	166.67	0.7720	0.0412	0.5464
	180.00	0.8949	0.0439	0.7000
95 mph Wind at 60 degree From Face with No Ice	126.67	0.4291	0.0596	0.4368
	133.33	0.4811	0.0729	0.4403
	160.00	0.7118	0.1332	0.4809
	166.67	0.7749	0.1478	0.5341
	180.00	0.8990	0.1629	0.4734
95 mph Wind at 90 degree From Face with No Ice	126.67	0.4293	0.0309	0.4377
	133.33	0.4812	0.0350	0.4288
	160.00	0.7106	0.0424	0.3467
	166.67	0.7729	0.0440	0.5232
	180.00	0.8958	0.0458	0.3281
95 mph Wind Normal To Face with No Ice	126.67	0.4353	0.0182	0.4413
	133.33	0.4885	0.0265	0.4803
	160.00	0.7266	0.0413	0.7546
	166.67	0.7925	0.0446	0.5724
	180.00	0.9217	0.0479	0.7607

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

AT&T Existing Facility

Site ID: CT5221

Waterford East
53 Dayton Road
Waterford, CT 06385

March 10, 2016

EBI Project Number: 6216000913

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	7.67 %

March 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: **CT5221 – Waterford East**

EBI Consulting was directed to analyze the proposed AT&T facility located at **53 Dayton Road, Waterford, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ 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 ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately $467 \mu\text{W}/\text{cm}^2$ and $567 \mu\text{W}/\text{cm}^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is $1000 \mu\text{W}/\text{cm}^2$. 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 **53 Dayton Road, Waterford, 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 (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 2 LTE channels (WCS Band – 2300 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 5) 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.
- 6) 2 LTE channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

- 7) 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.
- 8) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antennas used in this modeling are the **CCI HPA-65R-BUU-H8, KMW AM-X-CD-16-65-00T-RET, Andrew SBNH-1D6565C and the Powerwave 7770.00** 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.
- 10) The antenna mounting height centerline of the proposed antennas is **160 feet** above ground level (AGL).
- 11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

AT&T Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Powerwave 777.0	Make / Model:	Powerwave 777.0	Make / Model:	Powerwave 777.0
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	160 feet	Height (AGL):	160 feet	Height (AGL):	160 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	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A1 MPE%	0.42	Antenna B1 MPE%	0.42	Antenna C1 MPE%	0.42
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	CCI HPA-65R-BUU-H8	Make / Model:	CCI HPA-65R-BUU-H8	Make / Model:	CCI HPA-65R-BUU-H8
Gain:	13.15 / 15.55 dBd	Gain:	13.15 / 15.55 dBd	Gain:	13.15 / 15.55 dBd
Height (AGL):	160 feet	Height (AGL):	160 feet	Height (AGL):	160 feet
Frequency Bands	850 MHz / 2300 MHz (WCS)	Frequency Bands	850 MHz / 2300 MHz (WCS)	Frequency Bands	850 MHz / 2300 MHz (WCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	5,546.29	ERP (W):	5,546.29	ERP (W):	5,546.29
Antenna A2 MPE%	0.98	Antenna B2 MPE%	0.98	Antenna C2 MPE%	0.98
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	KMW AM-X-CD-16-65- 00T-RET	Make / Model:	Andrew SBNH-1D6565C	Make / Model:	Andrew SBNH-1D6565C
Gain:	13.35 / 15.25 dBd	Gain:	13.45 / 15.75 dBd	Gain:	13.45 / 15.75 dBd
Height (AGL):	160 feet	Height (AGL):	160 feet	Height (AGL):	160 feet
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	6,614.85	ERP (W):	7,165.76	ERP (W):	7,165.76
Antenna A3 MPE%	1.45	Antenna B3 MPE%	1.55	Antenna C3 MPE%	1.55

Site Composite MPE%	
Carrier	MPE%
AT&T – Max per sector	2.95 %
T-Mobile	1.61 %
Verizon	2.34 %
MetroPCS	0.55 %
Public Safety	0.22 %
Site Total MPE %:	7.67 %

AT&T Sector 1 Total:	2.86 %
AT&T Sector 2 Total:	2.95 %
AT&T Sector 3 Total:	2.95 %
Site Total:	7.67 %

AT&T_Sector Values (Sectors B & C)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	160	1.26	850	567	0.22 %
AT&T 1900 MHz (PCS) UMTS	2	656.33	160	1.99	1900	1000	0.20 %
AT&T 850 MHz GSM	2	619.61	160	1.88	850	567	0.33 %
AT&T 2300 MHz (WCS) LTE	2	2153.53	160	6.53	2300	1000	0.65 %
AT&T 700 MHz LTE	2	1327.86	160	3.93	700	467	0.86 %
AT&T 1900 MHz (PCS) LTE	2	2255.02	160	6.09	1900	1000	0.68 %
						Total:	2.95 %

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 1:	2.86 %
Sector 2:	2.95 %
Sector 3 :	2.95 %
AT&T Maximum Total (per sector):	2.95 %
Site Total:	7.67 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **7.67%** 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.



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