



September 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 Radio Heads & DC/Fiber Squid  
Property Address: 53 Dayton Road Waterford, CT 06385  
AT&T Site: CT5221 – Waterford East FA#10071307

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, adding six remote-radio heads (“RRHs”) with (3) A2 modules and a DC/Fiber Squid. 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 August 3, 2016).

For the foregoing reasons, AT&T respectfully requests that the proposed antenna swap and remote radio head, A2 module and DC/fiber squid installation 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

# 53 DAYTON ROAD

**Location** 53 DAYTON ROAD

**Assessment** \$1,294,780

**Mblu** 92/ / 1844/ /

**Appraisal** \$1,849,680

**Acct#** 00158300

**PID** 1844

**Building Count** 2

## Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2013	\$923,090	\$926,590	\$1,849,680
Assessment			
Valuation Year	Improvements	Land	Total
2013	\$646,170	\$648,610	\$1,294,780

## Building Information

### Building 1 : Section 1

**Year Built:** 1950  
**Living Area:** 8615  
**Replacement Cost:** \$755,799  
**Building Percent Good:** 68

Building Attributes	
Field	Description
STYLE	Fire Station
MODEL	Comm/Ind
Grade	Above Ave
Stories:	1.00
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	Brick Veneer
Roof Structure	Gambrel
Roof Cover	Asphalt
Interior Wall 1	Plaster
Interior Wall 2	Drywall
Interior Floor 1	Concrete
Interior Floor 2	Comp Tile
Heating Fuel	Oil

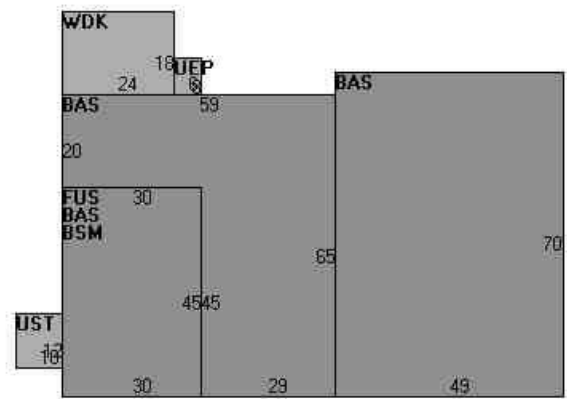
### Building Photo



(<http://images.vgsi.com/photos/WaterfordCTPhotos/\00\00\88>)

Heating Type	Hot Water
% Central Air	0
Foundation	Poured Conc
Bldg Use	Exempt Comm
Total Rooms	0
Total Bedrms	0
Total Fixtures	22
% Wet Sprinkler	100
% Dry Sprinkler	
1st Floor Use	
Heat/AC	Typical
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
% Finished	60
Class	C
Wall Height	11

## Building Layout



Building Sub-Areas			Legend	
Code	Description	Gross Area	Living Area	
BAS	First Floor	7265	7265	
FUS	Finished Upper Story	1350	1350	
BSM	Basement	1350	0	
UEP	Unfin. Enclosed Porch	48	0	
UST	Unfinished Utility Area	120	0	
WDK	Deck	432	0	
		10565	8615	

## Building 2 : Section 1

**Year Built:** 1950  
**Living Area:** 3360  
**Replacement Cost:** \$347,072  
**Building Percent Good:** 62

Building Attributes : Bldg 2 of 2	
Field	Description
STYLE	Fire Station
MODEL	Comm/Ind
Grade	Above Ave
Stories:	2.00
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	Brick Veneer
Roof Structure	Gambrel
Roof Cover	Asphalt
Interior Wall 1	Plaster
Interior Wall 2	Drywall
Interior Floor 1	Concrete

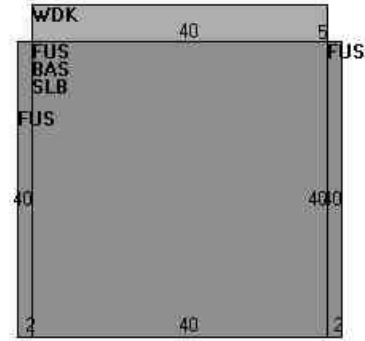
## Building Photo



(<http://images.vgsi.com/photos/WaterfordCTPhotos//default.jpg>)

Interior Floor 2	Comp Tile
Heating Fuel	Oil
Heating Type	Forced Hot Air
% Central Air	0
Foundation	Poured Conc
Bldg Use	Exempt Comm
Total Rooms	0
Total Bedrms	0
Total Fixtures	0
% Wet Sprinkler	
% Dry Sprinkler	
1st Floor Use	
Heat/AC	Typical
Frame Type	MASONRY
Baths/Plumbing	LIGHT
% Finished	0
Class	C
Wall Height	11

## Building Layout



Building Sub-Areas			Legend	
Code	Description	Gross Area	Living Area	
FUS	Finished Upper Story	1760	1760	
BAS	First Floor	1600	1600	
SLB	Slab	1600	0	
WDK	Deck	200	0	
		5160	3360	

## Extra Features

Extra Features					Legend
Code	Description	Size	Value	Bldg #	
FBM	Finished Bsmt	475 S.F.	\$3,230	1	

## Land

### Land Use

<b>Use Code</b>	920
<b>Description</b>	Exempt Comm
<b>Zone</b>	R-40
<b>Neighborhood</b>	200
<b>Alt Land Appr Category</b>	No

### Land Line Valuation

<b>Size (Acres)</b>	9.91
<b>Frontage</b>	0
<b>Depth</b>	0
<b>Assessed Value</b>	\$648,610
<b>Appraised Value</b>	\$926,590

## Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FN1	Fence			928 L.F.	\$7,660	2
FGR1	Garage	MS	Masonry	220 S.F.	\$3,300	1
LSUM	Lump Sum			120000 UNITS	\$90,000	2

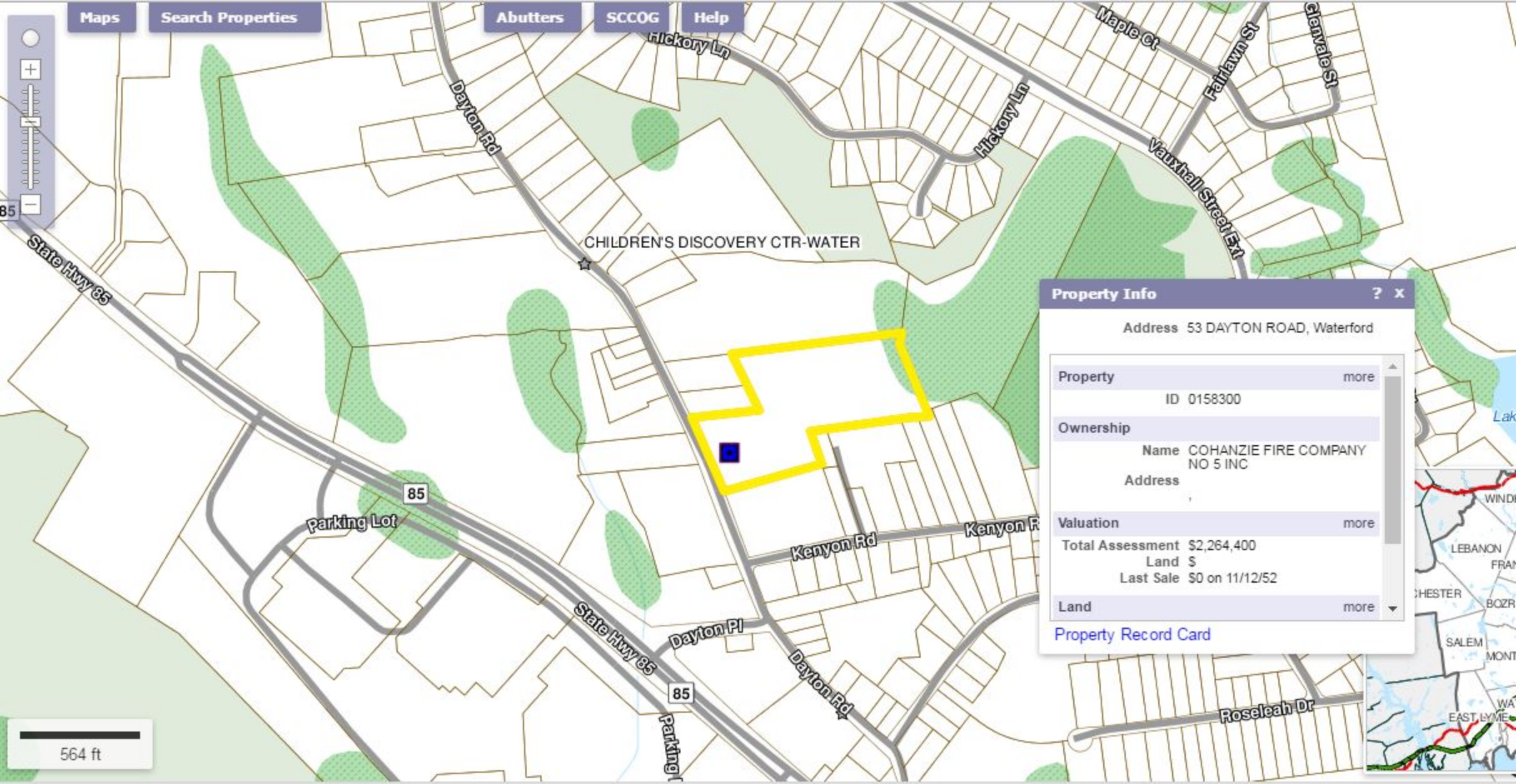
PAV1	Paving	AS	Asphalt	39900 S.F.	\$49,880	1
SHD1	Shed	FR	Frame	800 S.F.	\$6,000	1
FN1	Fence			1408 L.F.	\$7,740	1
FOP	Porch			1600 S.F.	\$24,000	1
LSUM	Lump Sum			4320 UNITS	\$2,160	1

**Valuation History**

<b>Appraisal</b>			
<b>Valuation Year</b>	<b>Improvements</b>	<b>Land</b>	<b>Total</b>
2010	\$0	\$0	\$3,234,857
2009	\$0	\$0	\$3,234,857
2008	\$0	\$0	\$3,234,857

<b>Assessment</b>			
<b>Valuation Year</b>	<b>Improvements</b>	<b>Land</b>	<b>Total</b>
2010	\$0	\$0	\$2,264,400
2009	\$0	\$0	\$2,264,400
2008	\$0	\$0	\$2,264,400

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CHILDREN'S DISCOVERY CTR-WATER

**Property Info** ? x

Address 53 DAYTON ROAD, Waterford

<b>Property</b>	more
ID	0158300
<b>Ownership</b>	
Name	COHANZIE FIRE COMPANY NO 5 INC
Address	
<b>Valuation</b>	more
Total Assessment	\$2,264,400
Land \$	
Last Sale	\$0 on 11/12/52
<b>Land</b>	more

[Property Record Card](#)

564 ft

**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) NEW A2 MODULE PER SECTOR FOR A TOTAL OF (3) NEW A2 MODULES. (2) EXISTING RRU PER SECTOR TO BE REUSED, FOR A TOTAL OF (6) EXISTING RRUS.
- AT&T SQUID: (2) EXISTING DC-6 SQUID TO REMAIN. ADD (1) DC-6 SQUID.
- AT&T CABLING: ADD (1) FIBER/DC SQUID. ADD (1) FIBER AND (2) DC TRUNKS

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

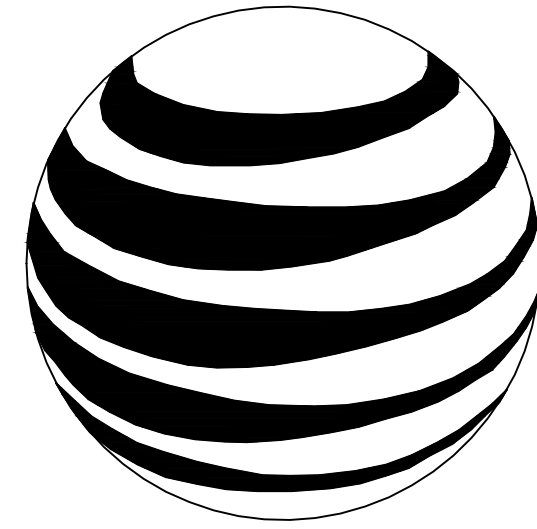
TYPE OF SITE: LATTICE TOWER/INDOOR EQUIPMENT

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

COMPANY: EMPIRE TELECOM  
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:**

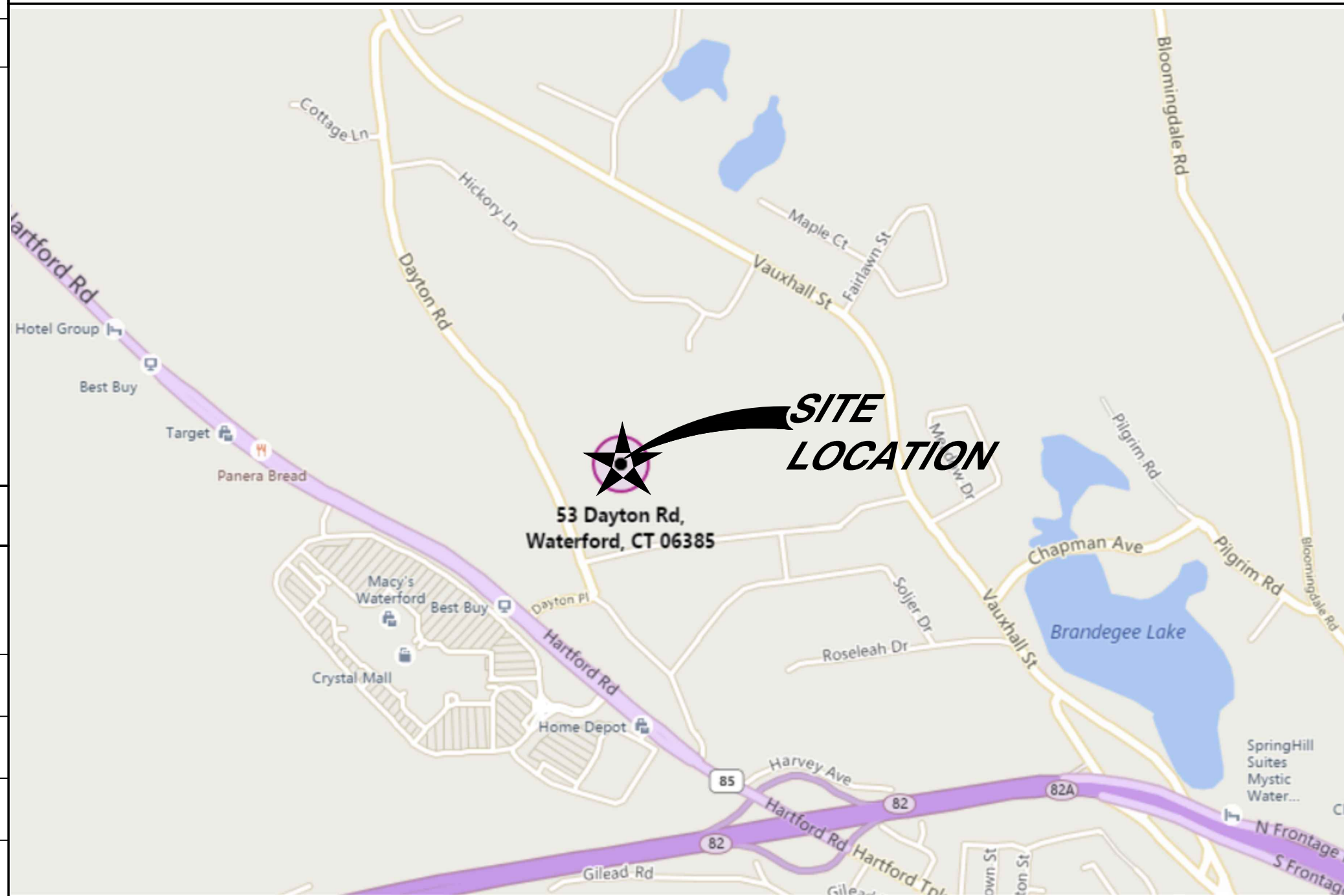
COMPANY: EMPIRE TELECOM  
ADDRESS: 16 ESQUIRE ROAD  
BILLERICA, MA 01821  
CONTACT: GRZEGORZ "GREG" DORMAN  
PHONE: 484-683-1750  
EMAIL: gdorman@empiretelecomm.com

**DRAWING INDEX**

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**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.



**GENERAL NOTES**

- 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.
- 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.
- 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

**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	06/30/16	INITIAL REVIEW	NJM	NDB	NDB
SCALE: AS SHOWN		DESIGNED BY: NJM	DRAWN BY: PAV		

SEAL:  
NICHOLAS D. BARILE  
PROFESSIONAL ENGINEER  
CT LICENSE NO. 28643

AT&T		
DRAWING TITLE:		
JOB NUMBER	DRAWING NUMBER	REV
16041-EMP	T-1	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.



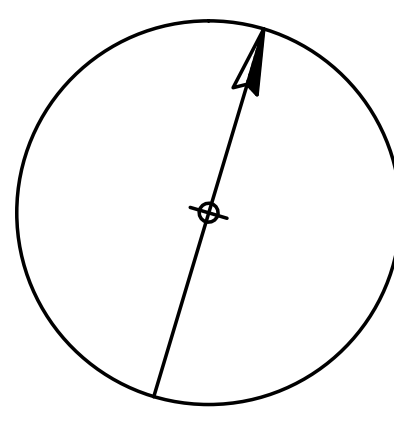
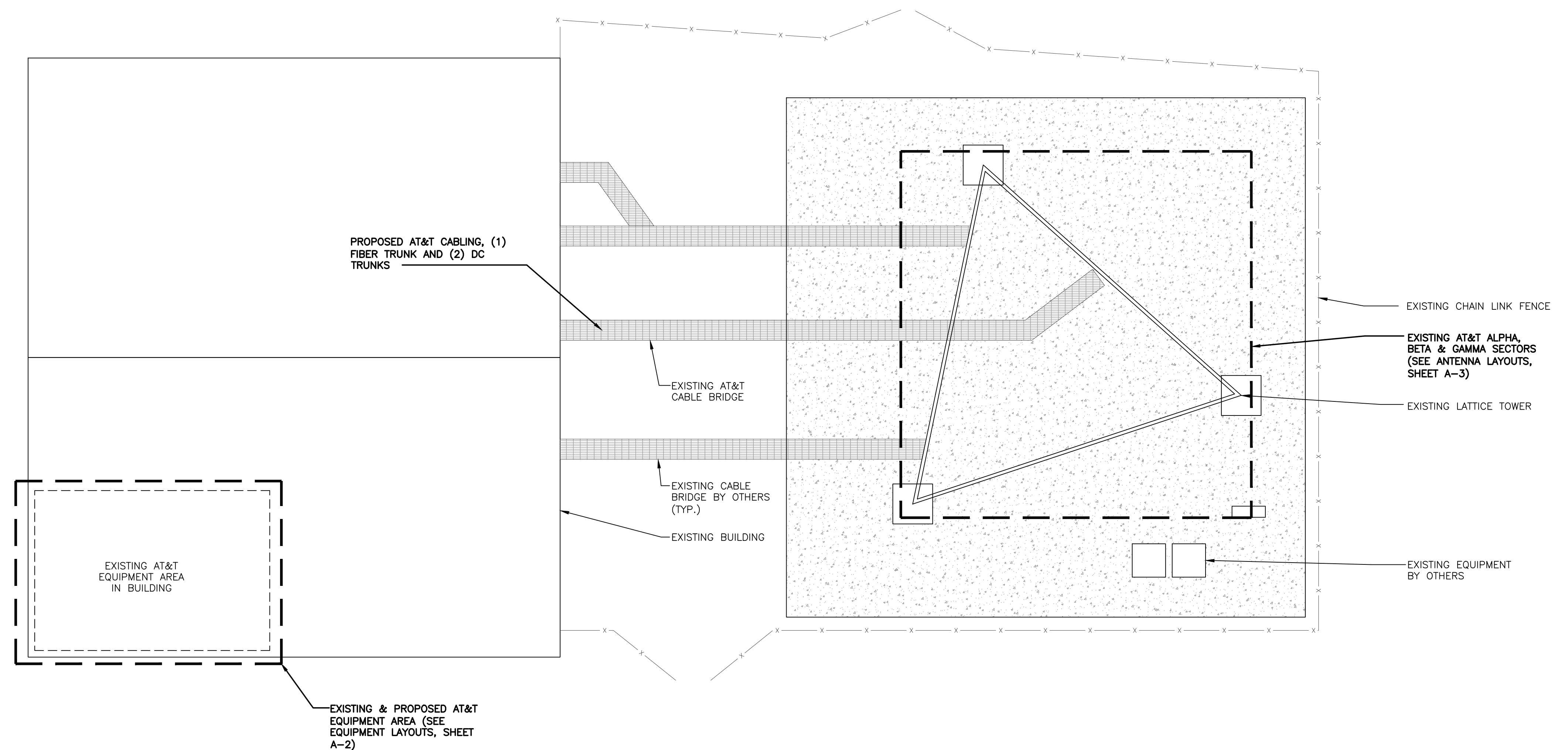
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**SITE NAME: WATERFORD EAST**  
 53 DAYTON ROAD  
 WATERFORD, CT 06385  
 NEW LONDON COUNTY



A	06/30/16	INITIAL REVIEW	NJM	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: NJM	DRAWN BY: PAV		

SEAL:  
 \_\_\_\_\_  
 NICHOLAS D. BARILE  
 PROFESSIONAL ENGINEER  
 CT LICENSE NO. 28643

<b>AT&amp;T</b>		
DRAWING TITLE: <b>GROUNDING &amp; GENERAL NOTES</b>		
JOB NUMBER 16041-EMP	DRAWING NUMBER GN-1	REV A



NORTH

**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

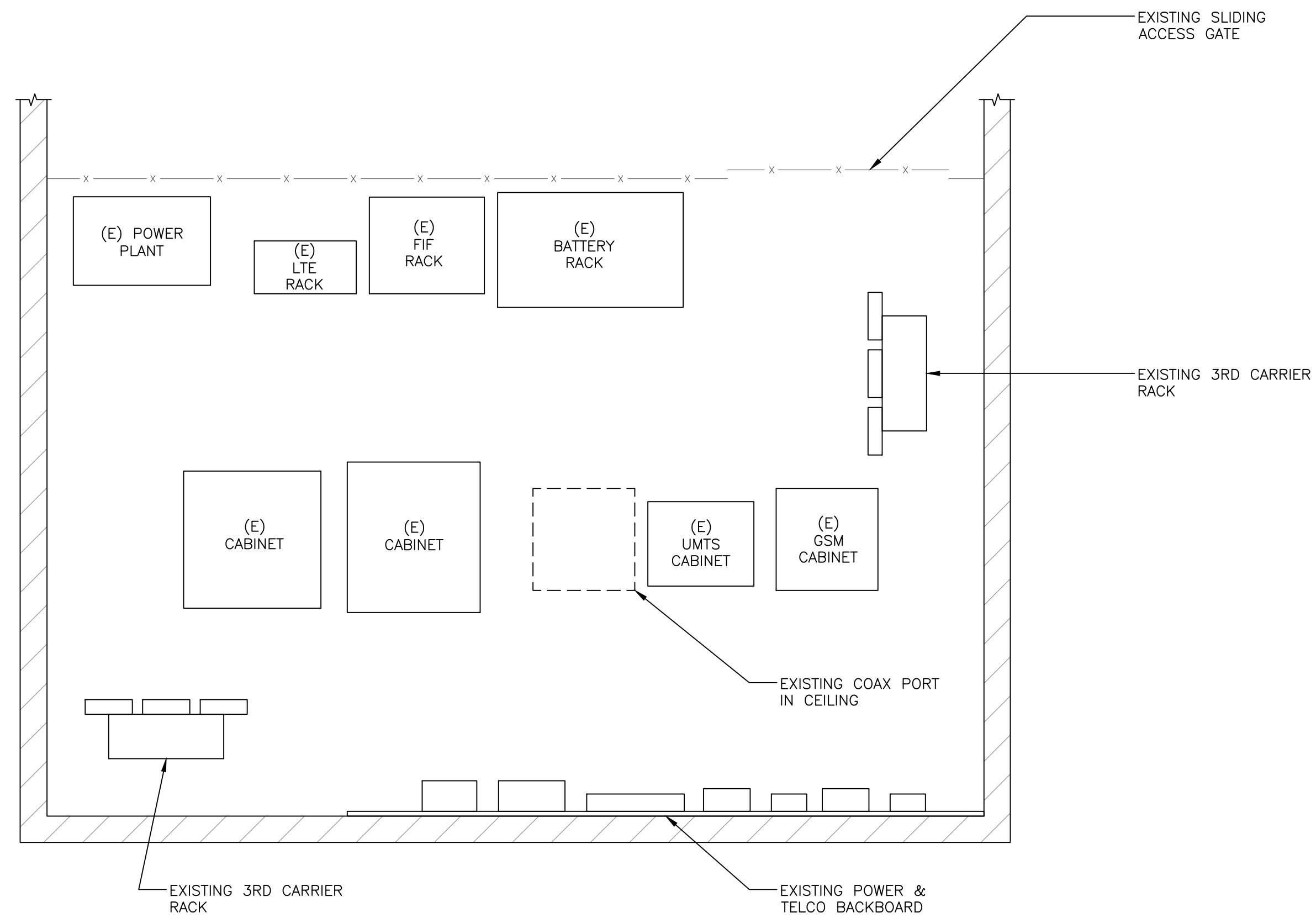
**SITE NUMBER: CT5221**  
**SITE NAME: WATERFORD EAST**  
53 DAYTON ROAD  
WATERFORD, CT 06385  
NEW LONDON COUNTY

**at&t**  
MOBILITY  
550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

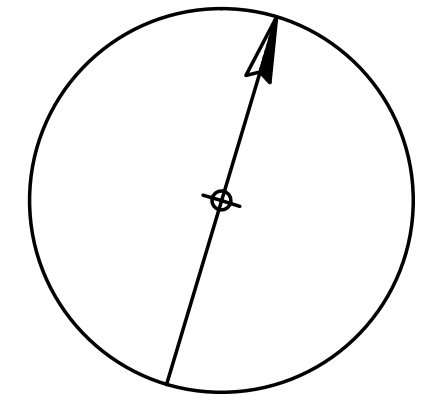
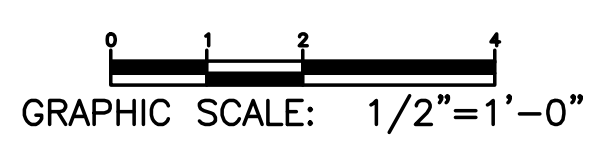
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A	06/30/16	INITIAL REVIEW	NJM	NDB	NDB
SCALE: AS SHOWN		DESIGNED BY: NJM	DRAWN BY: PAV		

SEAL:  
  
NICHOLAS D. BARILE  
PROFESSIONAL ENGINEER  
CT LICENSE NO. 28643

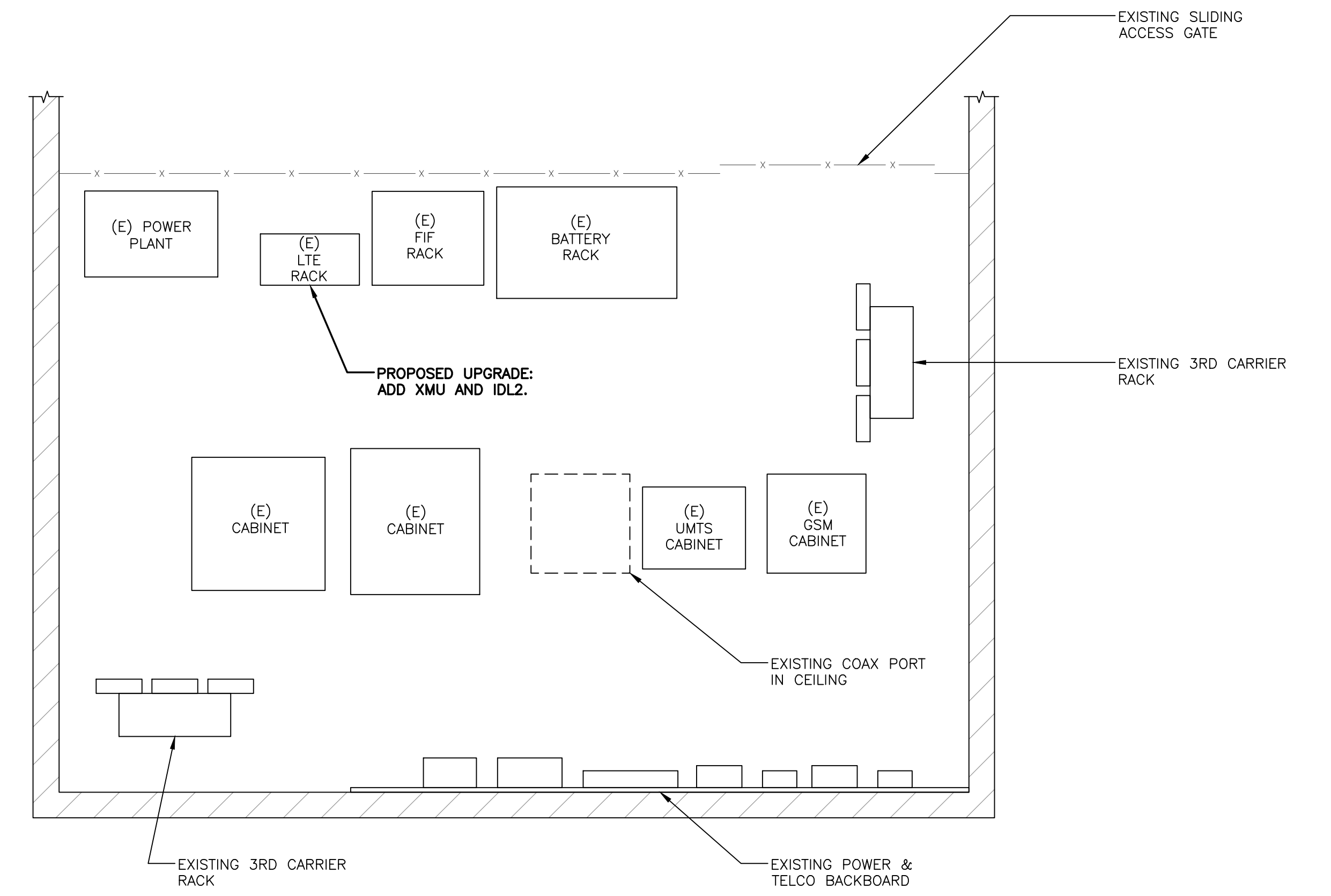
AT&T		
DRAWING TITLE: <b>SITE LAYOUT</b>		
JOB NUMBER 16041-EMP	DRAWING NUMBER A-1	REV A



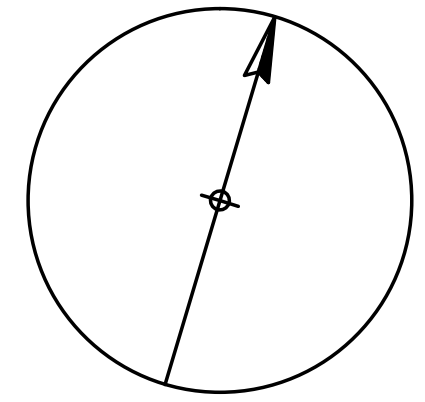
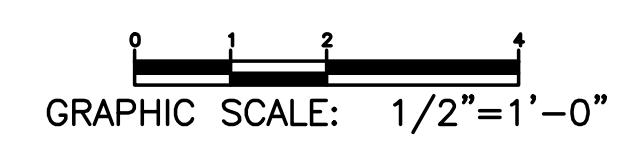
**EXISTING EQUIPMENT LAYOUT**  
SCALE: 1/2" = 1'-0"



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

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

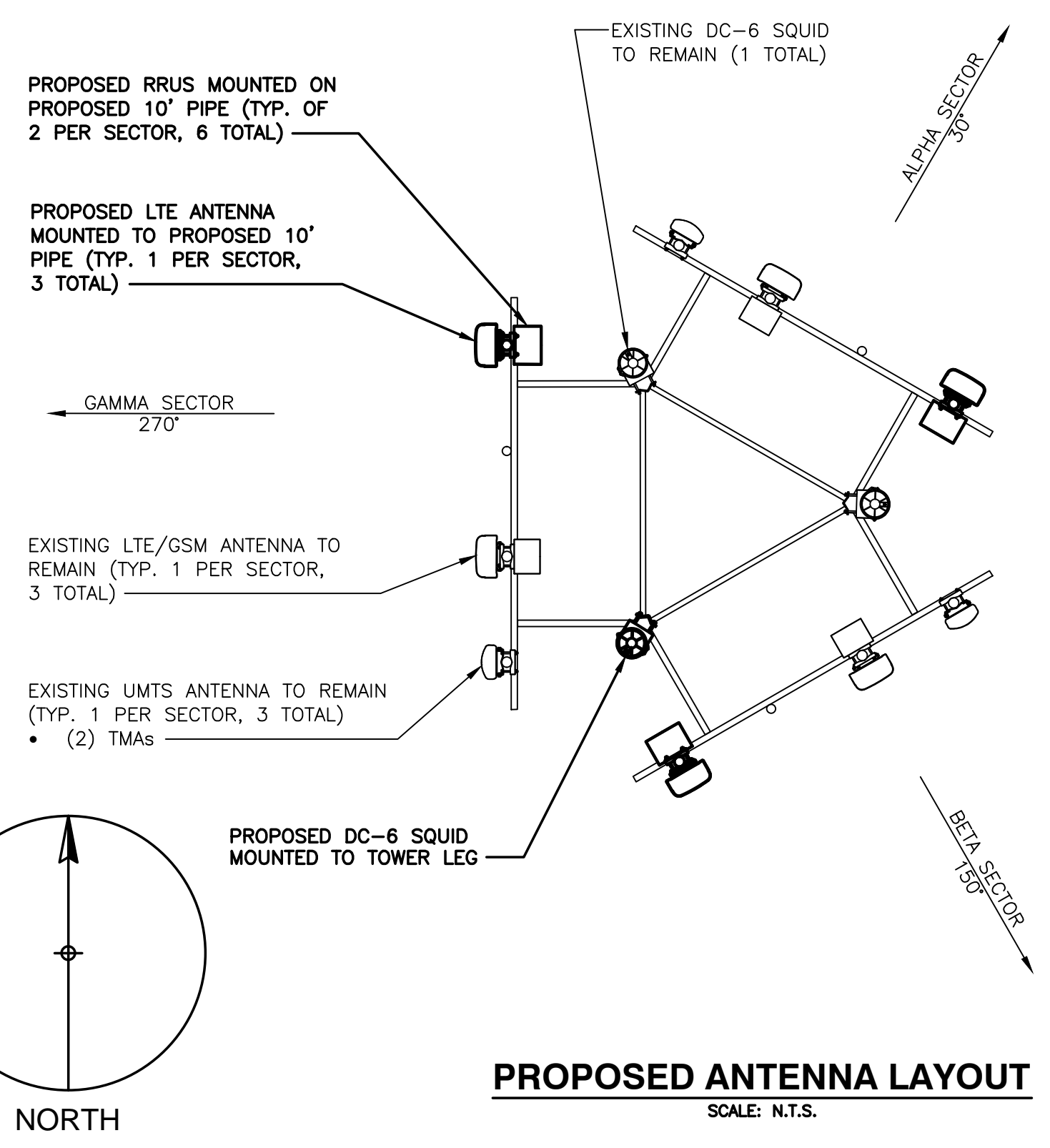
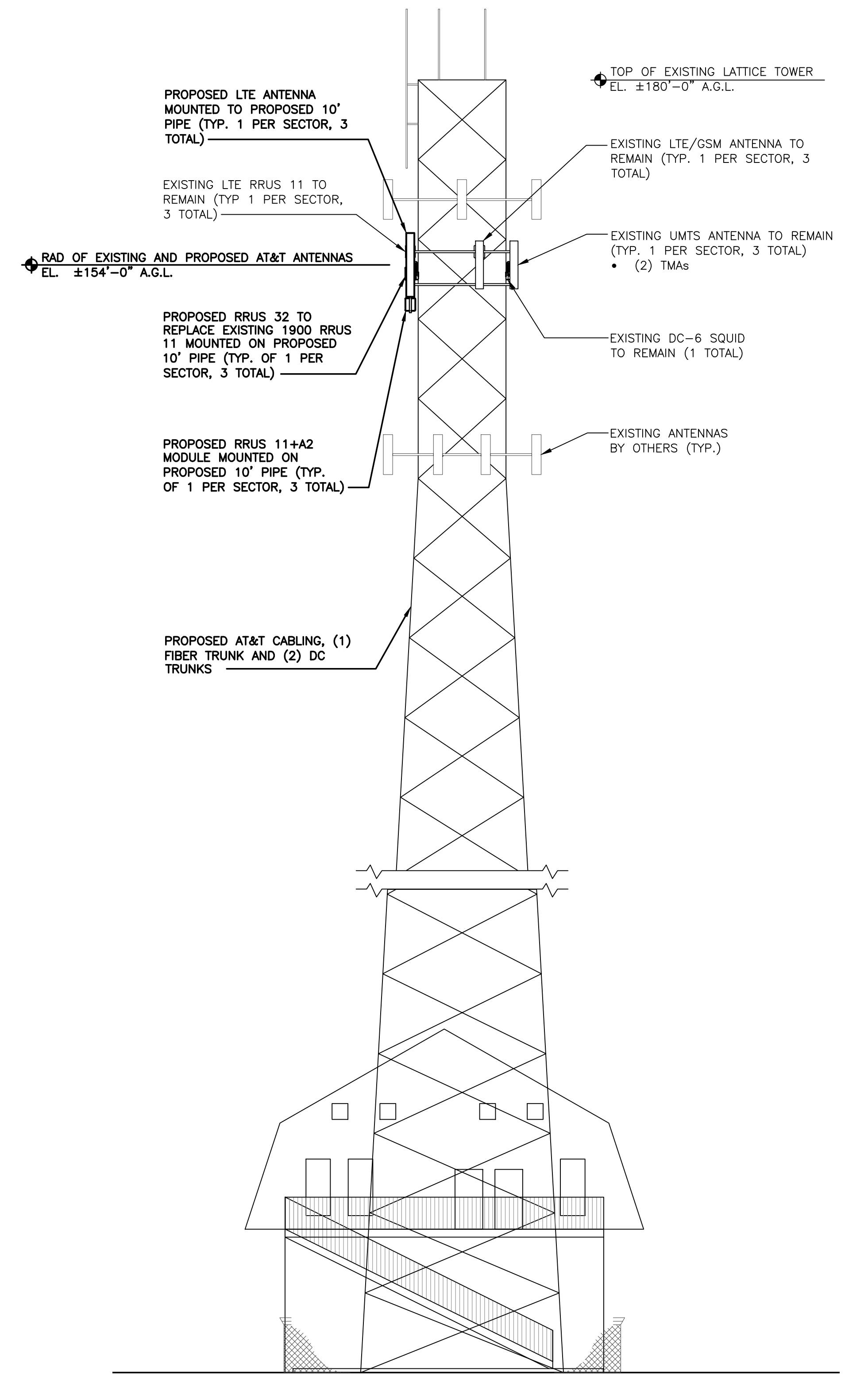
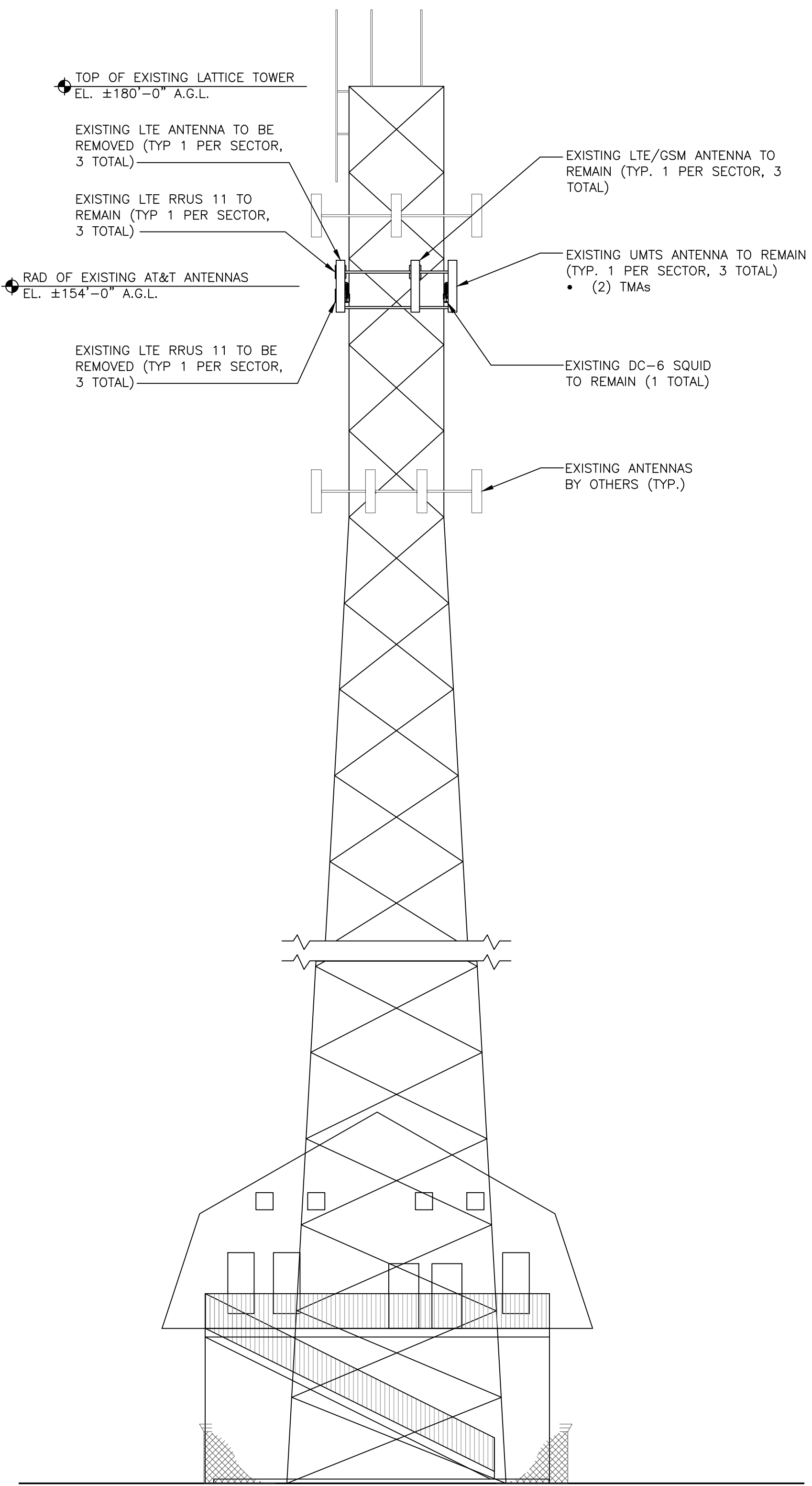
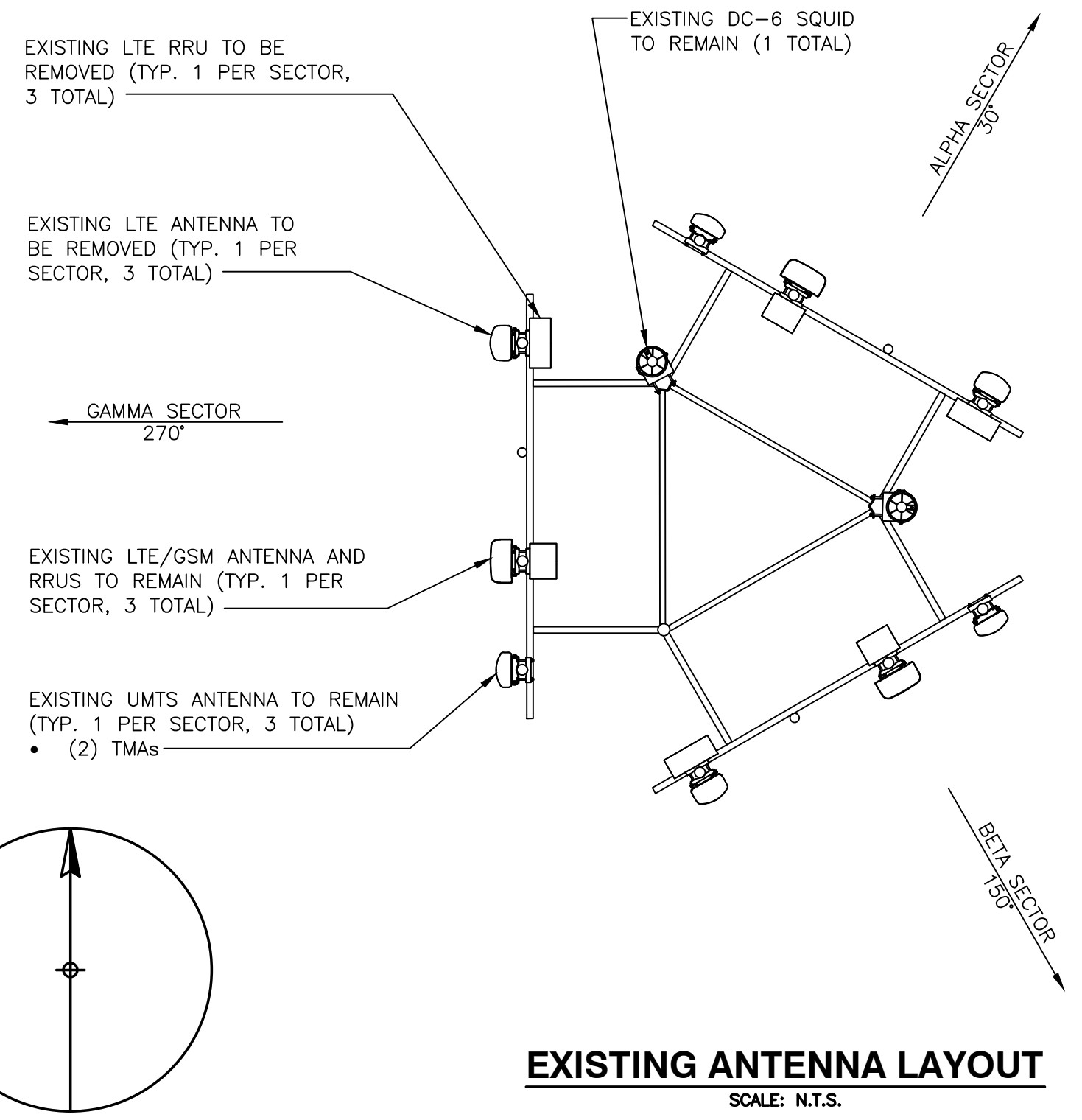
 **at&t**  
MOBILITY  
550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
A	06/30/16	INITIAL REVIEW	NJM	NDB	NDB
SCALE: AS SHOWN		DESIGNED BY: NJM	DRAWN BY: PAV		

SEAL:  
  
NICHOLAS D. BARILE  
PROFESSIONAL ENGINEER  
CT LICENSE NO. 28643

<b>AT&amp;T</b>		
DRAWING TITLE: EQUIPMENT LAYOUT		
JOB NUMBER 16041-EMP	DRAWING NUMBER A-2	REV 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  
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PHONE: 862.209.4300  
FAX: 862.209.4301

**EMPIRE**  
telecom  
16 ESQUIRE ROAD  
BILLERICA, MA 01821

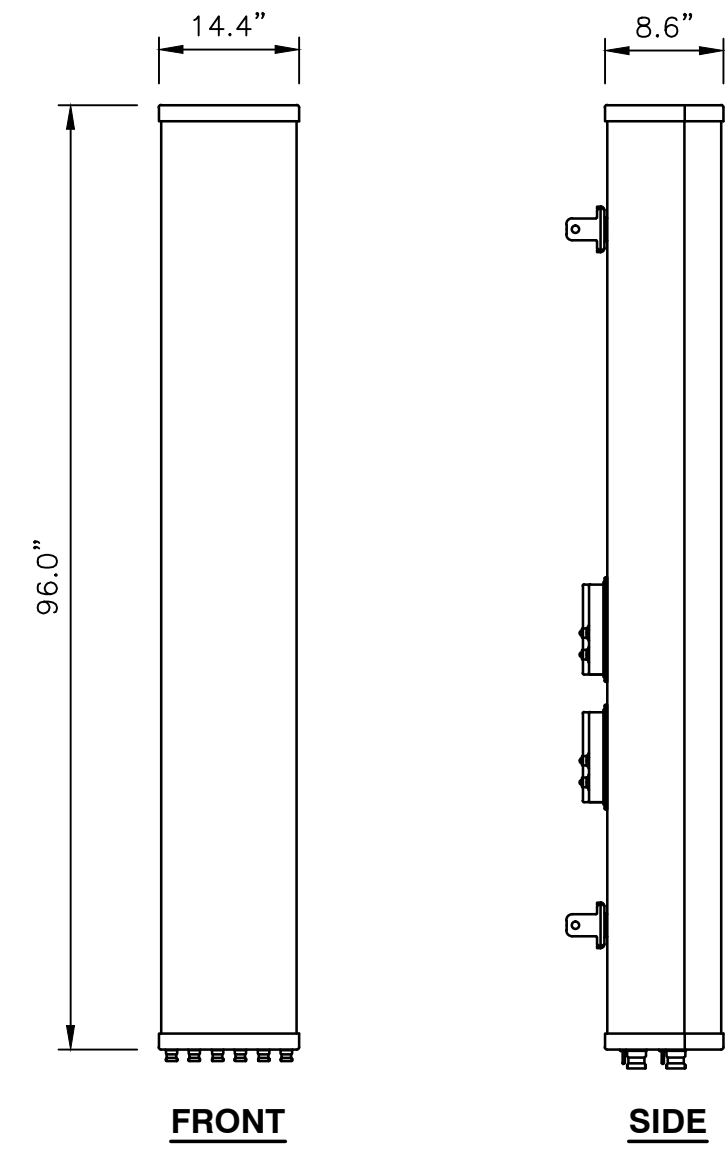
**SITE NUMBER: CT5221**  
**SITE NAME: WATERFORD EAST**  
53 DAYTON ROAD  
WATERFORD, CT 06385  
NEW LONDON COUNTY

**at&t**  
MOBILITY  
550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
A	06/30/16	INITIAL REVIEW	NJM	NDB	NDB
SCALE: AS SHOWN		DESIGNED BY: NJM	DRAWN BY: PAV		

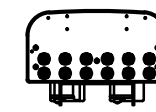
SEAL:  
NICHOLAS D. BARILE  
PROFESSIONAL ENGINEER  
CT LICENSE NO. 28643

<b>AT&amp;T</b>		
DRAWING TITLE: <b>ANTENNA LAYOUTS &amp; ELEVATIONS</b>		
JOB NUMBER 16041-EMP	DRAWING NUMBER A-3	REV A



**FRONT**

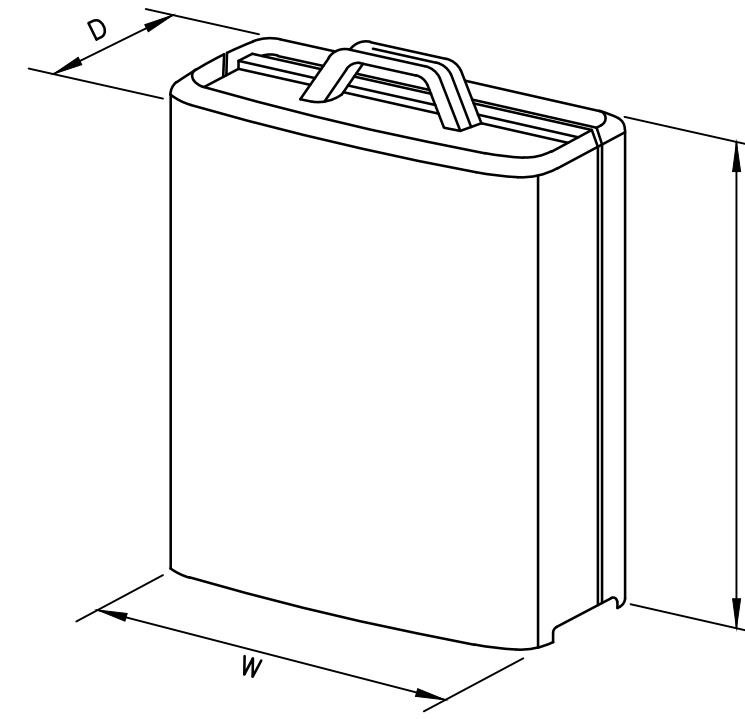
**SIDE**



**BOTTOM**

MANUFACTURER	CCI
MODEL	TPA-65R-LCUUUU-H8
WEIGHT	75 LBS

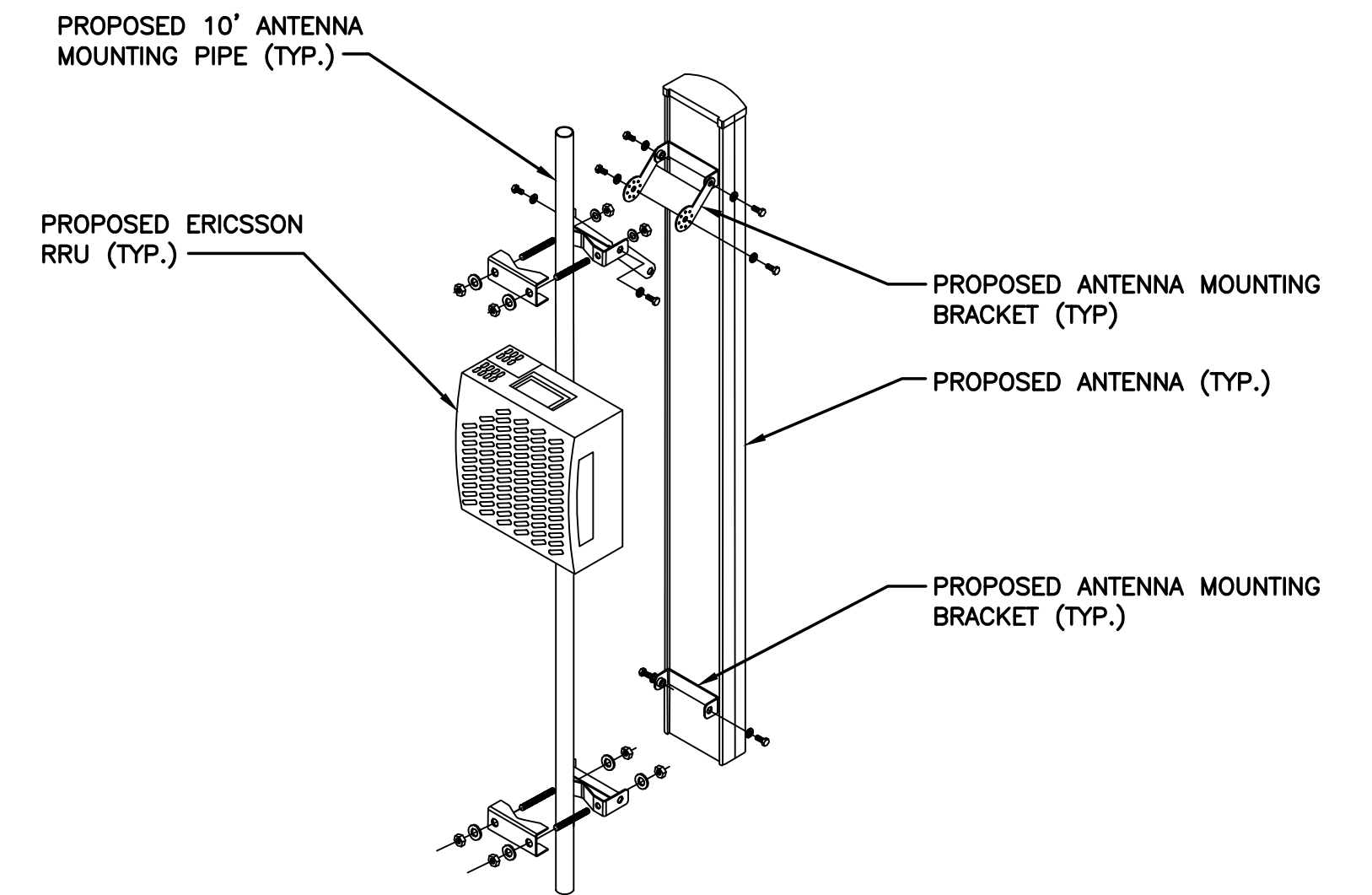
**TPA-65R-LCUUUU-H8**  
**ANTENNA DETAIL**  
SCALE: N.T.S.



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
A2 MODULE	16.4x15.2x3.4	22 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	CCI	HPA-65R-BUU-H8	92.4x14.8x7.4
	A3	-	-	-
	A4	KMW	AM-X-CD-17-65-00T-RET	96x12x6
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	CCI	HPA-65R-BUU-H8	92.4x14.8x7.4
	B3	-	-	-
	B4	KMW	AM-X-CD-17-65-00T-RET	96x12x6
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	CCI	HPA-65R-BUU-H8	92.4x14.8x7.4
	G3	-	-	-
	G4	KMW	AM-X-CD-17-65-00T-RET	96x12x6

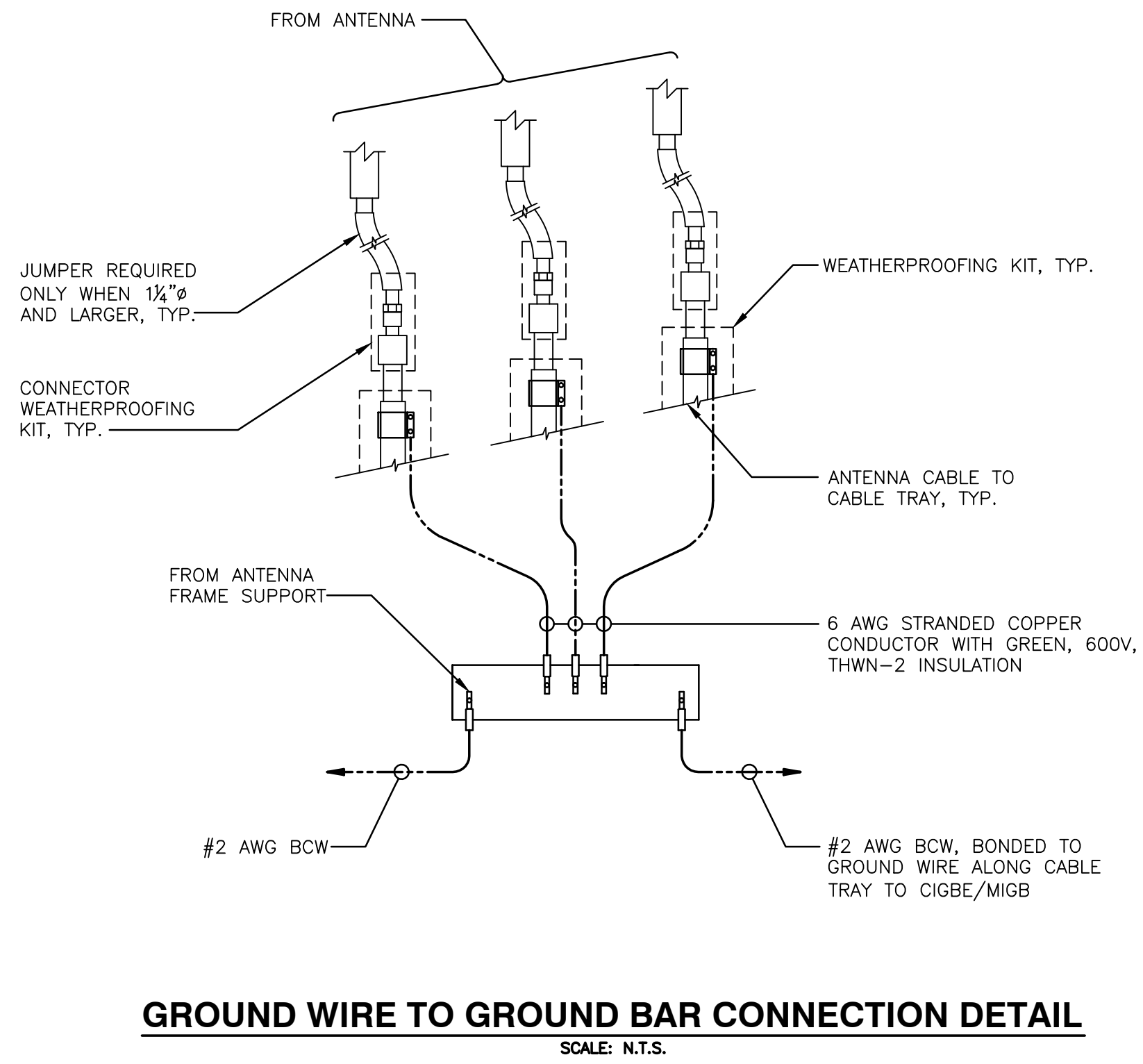
**FINAL ANTENNA SCHEDULE**

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770	55x11x5
	A2	CCI	HPA-65R-BUU-H8	92.4x14.8x7.4
	A3	-	-	-
	A4	CCI	TPA-65R-LCUUUU-H8	96x14.4x8.6
BETA	B1	POWERWAVE	7770	55x11x5
	B2	CCI	HPA-65R-BUU-H8	92.4x14.8x7.4
	B3	-	-	-
	B4	CCI	TPA-65R-LCUUUU-H8	96x14.4x8.6
GAMMA	G1	POWERWAVE	7770	55x11x5
	G2	CCI	HPA-65R-BUU-H8	92.4x14.8x7.4
	G3	-	-	-
	G4	CCI	TPA-65R-LCUUUU-H8	96x14.4x8.6

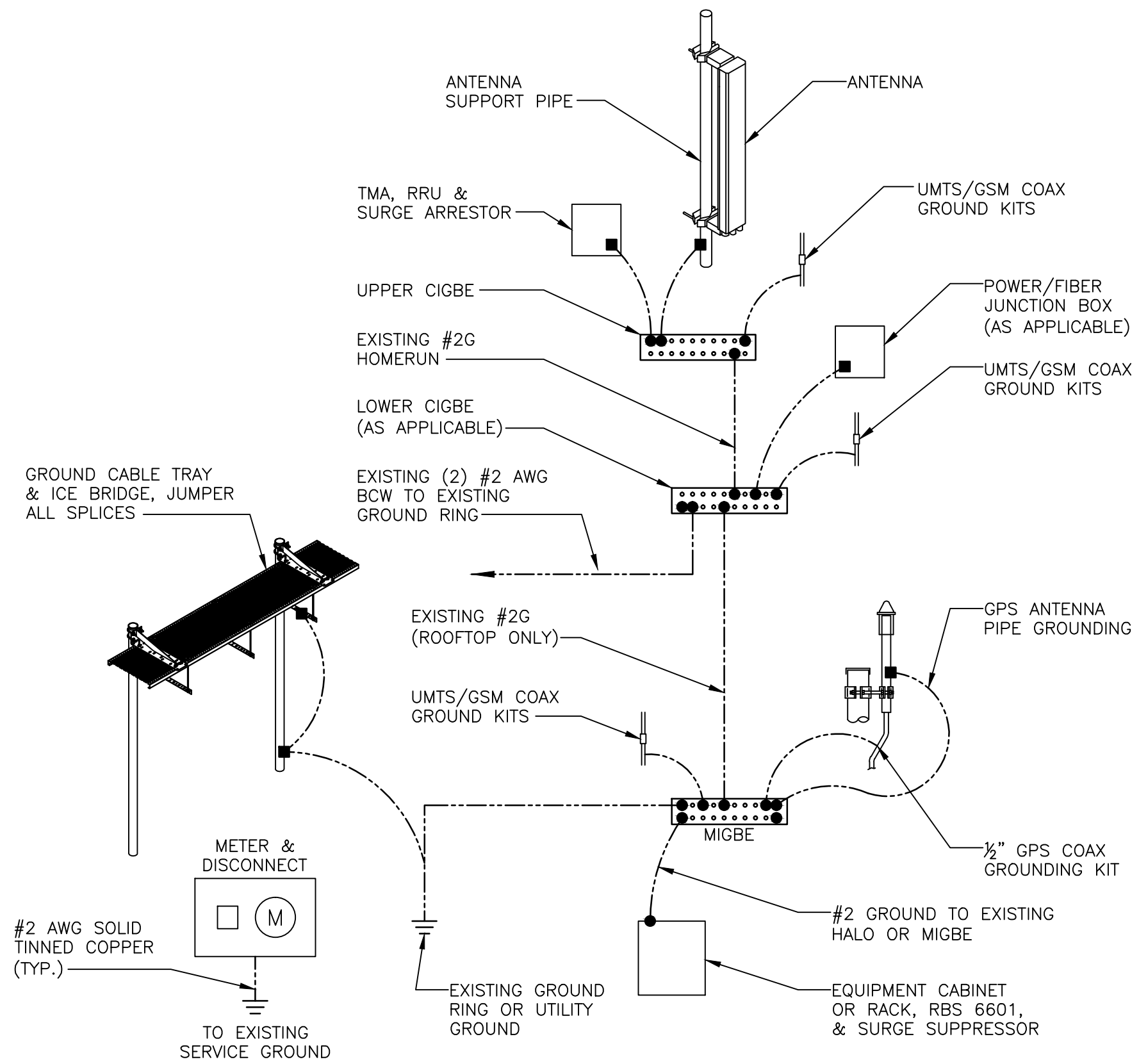
**PROPOSED RRU SCHEDULE**

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	ERICSSON	RRUS-32 B2	29.9"x13.3"x9.5"	-	-
	ERICSSON	RRUS-11	19.7"x16.9"x7.2"	A2 MODULE	16.4x15.2x3.4
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	-	-
	ERICSSON	RRUS-32 (EXISTING)	29.9"x13.3"x9.5"	-	-
BETA	ERICSSON	RRUS-32 B2	29.9"x13.3"x9.5"	-	-
	ERICSSON	RRUS-11	19.7"x16.9"x7.2"	A2 MODULE	16.4x15.2x3.4
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	-	-
	ERICSSON	RRUS-32 (EXISTING)	29.9"x13.3"x9.5"	-	-
GAMMA	ERICSSON	RRUS-32 B2	29.9"x13.3"x9.5"	-	-
	ERICSSON	RRUS-11	19.7"x16.9"x7.2"	A2 MODULE	16.4x15.2x3.4
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	-	-
	ERICSSON	RRUS-32 (EXISTING)	29.9"x13.3"x9.5"	-	-

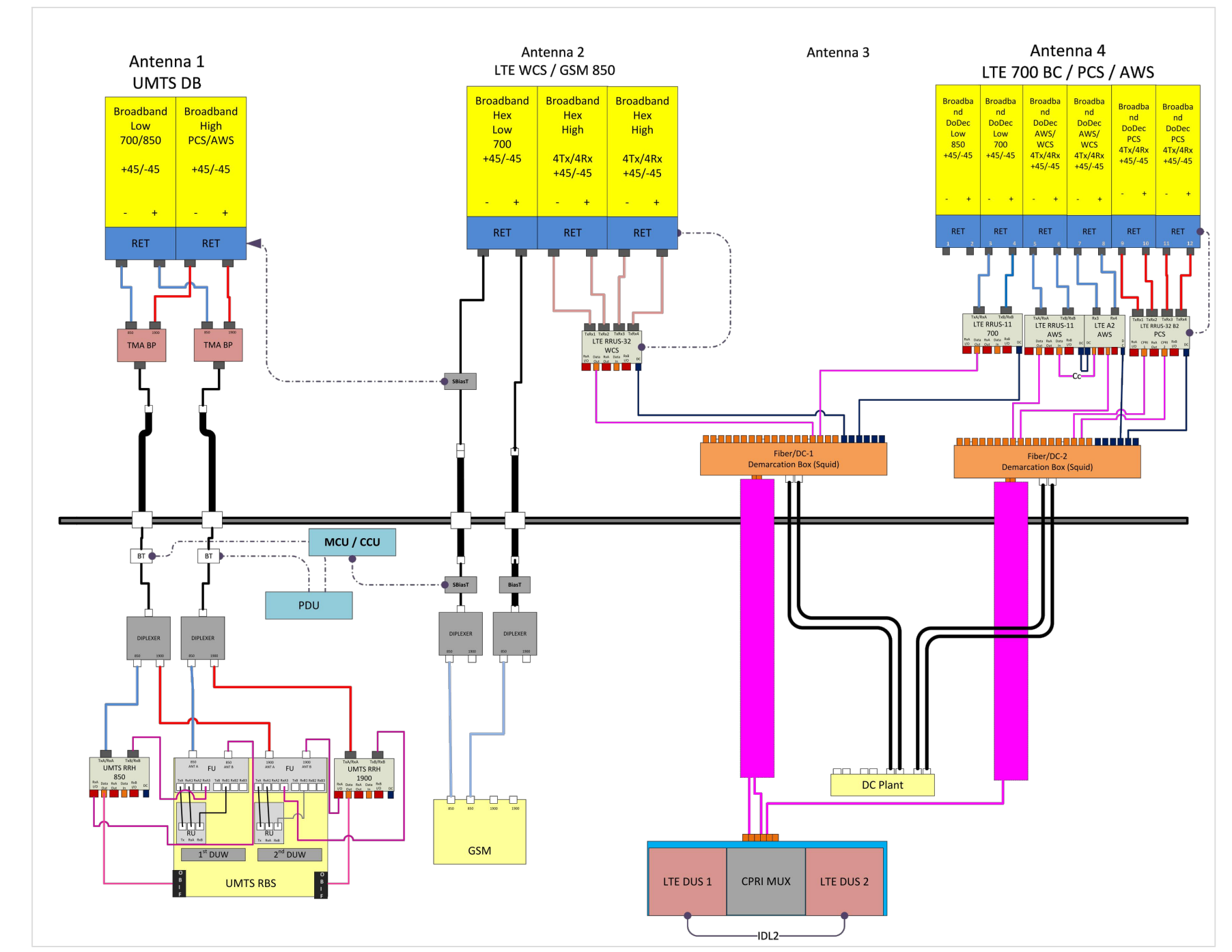
PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING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



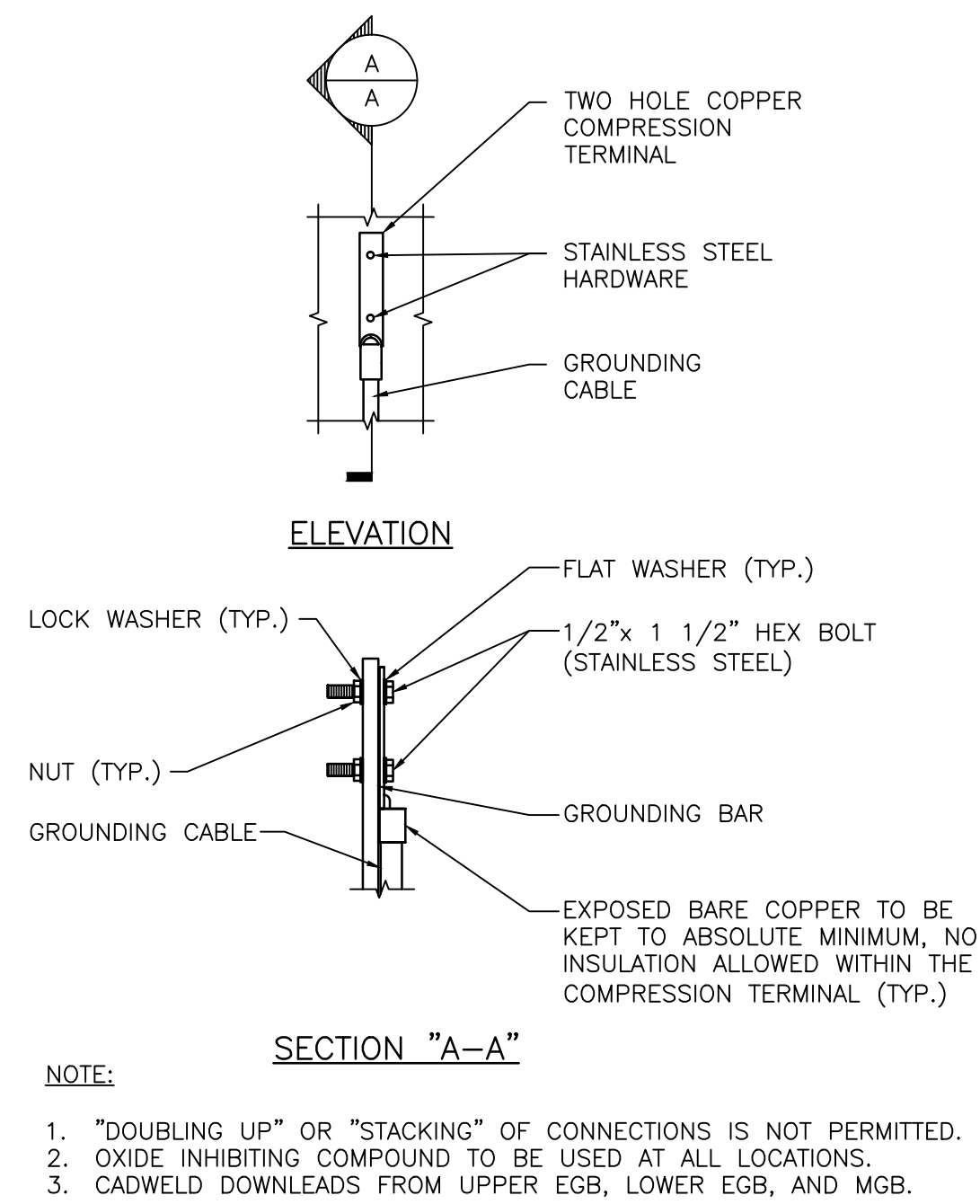
**GROUND WIRE TO GROUND BAR CONNECTION DETAIL**  
SCALE: N.T.S.



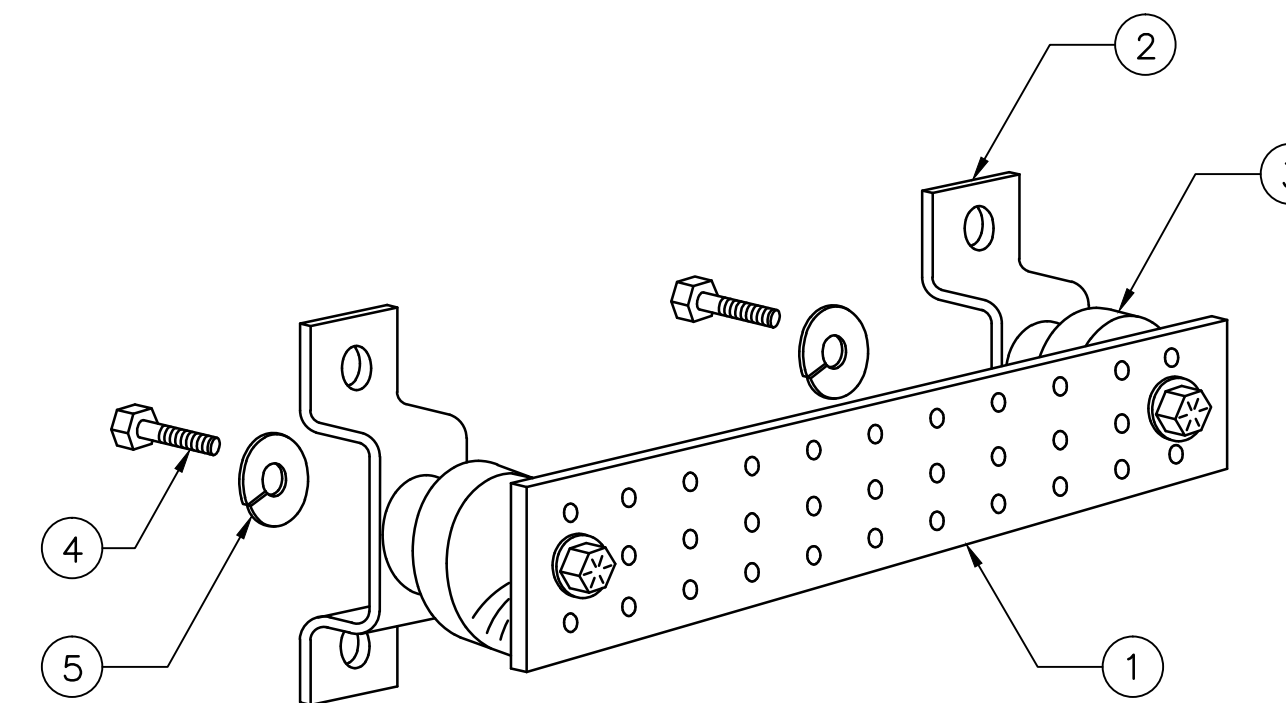
**GROUNDING RISER DIAGRAM**  
SCALE: N.T.S.



**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.

NO.	DATE	REVISIONS	BY	CHK	APP'D
A	06/30/16	INITIAL REVIEW	NJM	NDB	NDB
SCALE: AS SHOWN		DESIGNED BY: NJM	DRAWN BY: PAV		

SEAL:  
NICHOLAS D. BARILE  
PROFESSIONAL ENGINEER  
CT LICENSE NO. 28643

AT&T		
DRAWING TITLE: GROUNDING, ONE-LINE DIAGRAM & DETAILS		
JOB NUMBER	DRAWING NUMBER	REV
16041-EMP	G-1	A



**AMERICAN TOWER®**  
CORPORATION

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## Structural Analysis Report

**Structure** : 180 ft Self Supported Tower  
**ATC Site Name** : Waterford CT, CT  
**ATC Site Number** : 411183  
**Engineering Number** : OAA682429\_C3\_01  
**Proposed Carrier** : AT&T Mobility  
**Carrier Site Name** : Waterford East  
**Carrier Site Number** : CT5221  
**Site Location** : 53 Dayton Rd.  
Waterford, CT 06385-4274  
41.377778,-72.141389  
**County** : New London  
**Date** : August 3, 2016  
**Max Usage** : 64%  
**Result** : Pass

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

**COA: PEC.0001553**



**Table of Contents**

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Analysis .....	1
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Deflection, Twist, and Sway.....	4
Standard Conditions .....	5
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

<b>Tower Drawings</b>	Rohn Drawing #A982166, dated August 20, 1998
<b>Foundation Drawing</b>	Rohn Drawing #A982167-1, dated August 20, 1998
<b>Geotechnical Report</b>	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.

<b>Basic Wind Speed:</b>	95 mph (Fastest Mile)
<b>Basic Wind Speed w/ Ice:</b>	82 mph (Fastest Mile)w/ 1/2" radial ice concurrent
<b>Code:</b>	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](mailto: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 <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier	
Mount	RAD						
177.0	187.0	1	15' Omni	Sector Frame	(7) 7/8" Coax	Town Of Waterford Police Dept	
	184.0	2	10' Omni				
	182.0	2	8' Omni				
	181.0	2	5' Omni				
	170.0	1	13' Omni				
164.0	165.0	6	Ericsson AIR 21	Sector Frames	(18) 1 5/8" Coax (1) 1 5/8" Hybriflex	T-Mobile	
		3	RFS ATMAA1412D-1A20				
	164.0	3	Andrew LNX-6515DS-VTM (50.3 lbs)				
		3	Ericsson RRUS 11 B12				
157.0	157.0	3	CCI HPA-65R-BUU-H8	Sector Frames	(12) 1 5/8" Coax (4) 0.78" 8 AWG 6 (2) 0.39" Fiber Trunk	AT&T Mobility	
		3	Powerwave 7770.00				
		3	Ericsson RRUS-32 (77 lbs)				
		3	Ericsson RRUS-11 (50 lbs.)				
		2	Raycap DC6-48-60-0-8F				
		6	Powerwave LGP21401				
		6	Powerwave LGP13519				
143.0	156.0	1	20' Omni	Side Arm	(1) 1 5/8" Coax	Town Of Waterford Police Dept	
132.0	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	1	VZW Unused Reserve: 18,557 sq in				
		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	(6) 1 5/8" Coax	Metro PCS	
		1	MicroPulse GPS-QBW-26N				
51.0	51.0	1	GPS	Stand-Off	(1) 1/2" Coax	Verizon	



**Equipment to be Removed**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
157.0	157.0	1	KMW AM-X-CD-16-65-00T-RET	-	-	AT&T Mobility
		2	Andrew SBNH-1D6565C			
		3	Ericsson RRUS-11			

**Proposed Equipment**

Elevation <sup>1</sup> (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
157.0	157.0	3	CCI TPA-65R-LCUUUU-H8	Sector Frames	(2) 0.78" 8 AWG 6 (1) 0.39" Fiber Trunk (1) 2" Conduit	AT&T Mobility
		3	Ericsson RRUS 11 w/ RRUS A2			
		1	Raycap DC6-48-60-0-8F			
		3	Ericsson RRUS 32 B2			
		3	Kathrein 782 10253			

<sup>1</sup>Mount 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).

Install proposed coax stacked on top of existing AT&T Mobility coax.



**Structure Usages**

Structural Component	Controlling Usage	Pass/Fail
Legs	60%	Pass
Diagonals	64%	Pass
Horizontals	62%	Pass
Anchor Bolts	27%	Pass
Leg Bolts	40%	Pass

**Foundations**

Reaction Component	Original Design Reactions	Analysis Reactions	% of Design
Uplift (Kips)	621.3	313.2	50%
Axial (Kips)	732.9	425.7	58%
Shear (Kips)	141.8	47.4	33%

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	Kathrein Scala 782 10253	AT&T Mobility	0.208	0.018	0.199
	Raycap DC6-48-60-0-8F				
	Ericsson RRUS 32 B2				
	Ericsson RRUS 11 w/ RRUS A2				
	CCI TPA-65R-LCUUUU-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

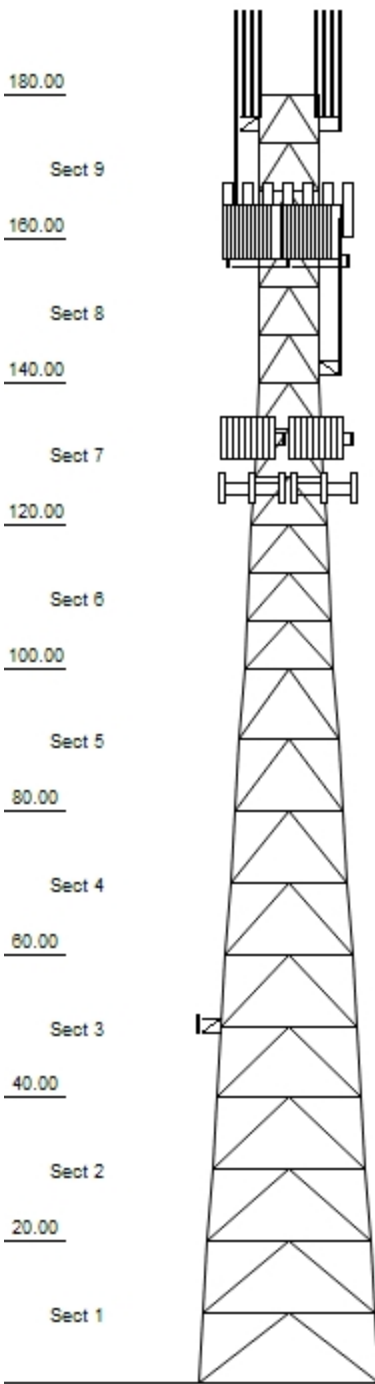
All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

- 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

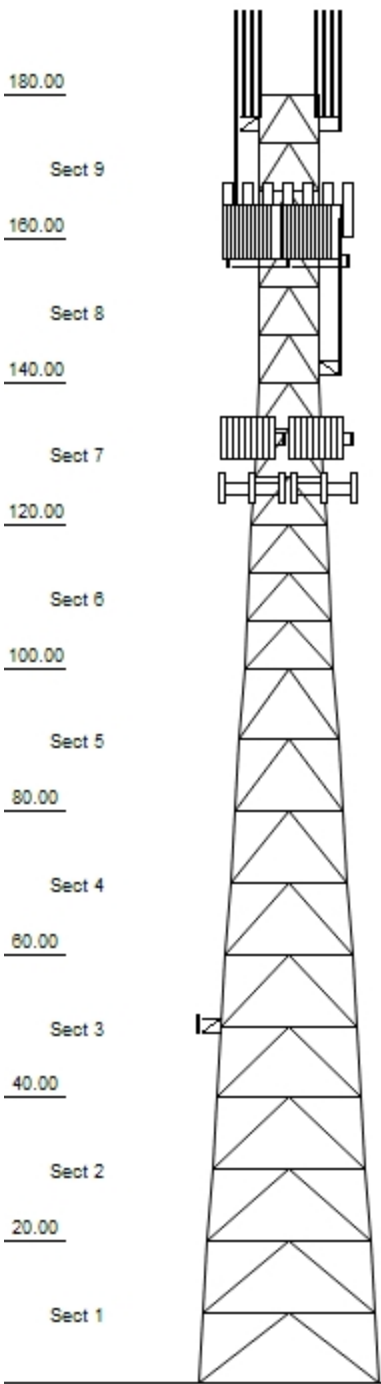
Uplift 313.21 k Moment 8,428.10 k Moment Ice 6,894.29 k-ft  
 Vert 425.71 k Tot Down 134.44 k Tot Down Ice 156.84 k  
 Horiz 47.40 k Tot Shear 76.00 k Tot Shear Ice 83.46 k

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

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
177.00	Straight Arm	2	Round Side Arm
177.00	Whip	1	15' Omni
177.00	Whip	1	13' Omni
177.00	Whip	2	8' Omni
177.00	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	RFS ATMAA1412D-1A20
157.00	Panel	3	Ericsson RRUS-32 (77 lbs)
157.00	Panel	3	Ericsson RRUS 11 w/ RRUS A2
157.00	Panel	1	Raycap DC6-48-60-0-8F
157.00	Panel	3	CCI HPA-65R-BUU-H8
157.00	Panel	3	CCI TPA-65R-LCUUUU-H8
157.00	Panel	3	Ericsson RRUS 32 B2
157.00	Mounting Frame	3	Round Sector Frame
157.00	Panel	3	Kathrein Scala 782 10253
157.00	Panel	3	Powerwave 7770.00
157.00	Panel	3	Ericsson RRUS-11 (50 lbs.)
157.00	Panel	2	Raycap DC6-48-60-0-8F
157.00	Panel	6	Powerwave Aligon LGP21401
157.00	Panel	6	Powerwave Aligon LGP13519
143.00	Whip	1	20' Omni
143.00	Straight Arm	1	Round Side Arm
132.00	Panel	1	VZW Unused Reserve: 18,557 sq
132.00	Mounting Frame	3	Round Sector Frame
132.00	Panel	2	Swedcom SLCP 2x6015
132.00	Panel	1	Amphenol Antel BXA-70063-6CF-E
132.00	Panel	2	Amphenol Antel LPA-80063-4CF-E
132.00	Panel	1	Swedcom SACP 2x5516
132.00	Panel	6	48" x 12" x 7" Panel
132.00	Panel	3	Amphenol Antel BXA-171063-8CF-
132.00	Panel	3	RRH
132.00	Panel	3	Alcatel-Lucent RRH2x40-AWS
132.00	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
51.00	Straight Arm	1	Stand-Off
51.00	Whip	1	GPS

Linear Appurtenance			
Elev (ft)		Qty	Description
From	To		
0.000	180.00	1	Empty Waveguide
30.000	177.00	1	Waveguide
30.000	177.00	7	7/8" Coax



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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	
30.000	164.00	1	1 5/8" Hybriflex Cab
30.000	164.00	18	1 5/8" Coax
0.000	164.00	1	Waveguide
30.000	157.00	1	Waveguide
30.000	157.00	1	2" Conduit
30.000	157.00	12	1 5/8" Coax
30.000	157.00	2	0.78" 8 AWG 6
30.000	157.00	4	0.78" 8 AWG 6
30.000	157.00	1	0.39" Fiber Trunk
30.000	157.00	2	0.39" Fiber Trunk
30.000	143.00	1	1 5/8" Coax
30.000	132.00	18	1 5/8" Coax
30.000	132.00	3	1 1/4" Hybriflex Cab
30.000	125.00	6	1 5/8" Coax
30.000	51.000	1	1/2" Coax

Uplift 313.21 k Moment 8,428.10 k Moment Ice 6,894.29 k-ft  
 Vert 425.71 k Tot Down 134.44 k Tot Down Ice 156.84 k  
 Horiz 47.40 k Tot Shear 76.00 k Tot Shear Ice 63.46 k

Site Number: 411183

Code: TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: OAA682429\_C3\_01

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Customer: AT&T Mobility

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### 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		

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### Ice & Wind Parameters

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

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### 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

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Site Number: 411183

Code:

TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: OAA682429\_C3\_01

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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)
177.00	5' Omni	2	10	1.0	1.00	0.0	0.00	4.0	336.9	37.57	84	20
177.00	8' Omni	2	25	2.4	1.00	0.0	0.00	5.0	1012.3	37.63	202	50
177.00	10' Omni	2	25	3.0	1.00	0.0	0.00	7.0	1777.1	37.75	254	50
177.00	13' Omni	1	40	3.9	1.00	0.0	0.00	-7.0	1129.3	36.91	161	40
177.00	15' Omni	1	40	4.5	1.00	0.0	0.00	10.0	1912.9	37.92	191	40
177.00	Round Side Arm	2	150	5.2	0.67	0.0	0.00	0.0	0.0	37.33	292	300
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	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	Kathrein Scala 782	3	3	0.1	0.50	0.0	0.00	0.0	0.0	36.08	7	9
157.00	Powerwave Allgon	6	5	0.3	0.50	0.0	0.00	0.0	0.0	36.08	41	32
157.00	Powerwave Allgon	6	14	1.1	0.50	0.0	0.00	0.0	0.0	36.08	133	85
157.00	Raycap DC6-48-60-0-8F	2	33	1.2	1.00	0.0	0.00	0.0	0.0	36.08	96	66
157.00	Raycap DC6-48-60-0-8F	1	33	1.2	1.00	0.0	0.00	0.0	0.0	36.08	48	33
157.00	Ericsson RRUS-11 (50	3	50	2.6	0.67	0.0	0.00	0.0	0.0	36.08	209	150
157.00	Ericsson RRUS 32 B2	3	53	2.7	0.67	0.0	0.00	0.0	0.0	36.08	223	159
157.00	Ericsson RRUS 11 w/	3	72	2.8	0.67	0.0	0.00	0.0	0.0	36.08	227	216
157.00	Ericsson RRUS-32 (77	3	77	3.3	0.67	0.0	0.00	0.0	0.0	36.08	269	231
157.00	Powerwave 7770.00	3	35	5.5	0.77	0.0	0.00	3.0	1552.4	36.27	517	105
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	CCI TPA-65R-LCUUUU-	3	82	13.3	0.69	0.0	0.00	3.0	3357.9	36.27	1119	246
157.00	Round Sector Frame	3	300	14.4	0.75	0.0	0.00	0.0	0.0	36.08	1310	900
143.00	Round Side Arm	1	150	5.2	1.00	0.0	0.00	0.0	0.0	35.13	205	150
143.00	20' Omni	1	55	6.0	1.00	0.0	0.00	13.0	3148.3	36.01	242	55
132.00	Raycap RRFDC-1064-	3	14	1.2	0.50	0.0	0.00	2.0	134.5	34.48	67	42
132.00	Alcatel-Lucent	3	44	2.2	0.67	0.0	0.00	0.0	0.0	34.33	167	132
132.00	RRH	3	45	2.4	0.67	0.0	0.00	0.0	0.0	34.33	186	135
132.00	Amphenol Antel BXA-	3	11	2.9	0.87	0.0	0.00	0.0	0.0	34.33	295	32
132.00	48" x 12" x 7" Panel	6	35	5.1	0.79	0.0	0.00	0.0	0.0	34.33	925	210
132.00	Swedcom SACP	1	16	5.1	0.85	0.0	0.00	1.0	166.5	34.41	167	16
132.00	Amphenol Antel LPA-	2	20	6.1	0.93	0.0	0.00	0.0	0.0	34.33	439	40
132.00	Amphenol Antel BXA-	1	17	7.6	0.77	0.0	0.00	1.0	224.8	34.41	225	17
132.00	Swedcom SLCP	2	30	10.0	0.89	0.0	0.00	0.0	0.0	34.33	684	60
132.00	Round Sector Frame	3	300	14.4	0.75	0.0	0.00	0.0	0.0	34.33	1247	900
132.00	VZW Unused	1	1807	129.0	1.00	0.0	0.00	0.0	0.0	34.33	4963	1807
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
51.00	GPS	1	10	1.0	1.00	0.0	0.00	0.0	0.0	26.16	29	10
51.00	Stand-Off	1	40	1.6	1.00	0.0	0.00	0.0	0.0	26.16	48	40
	<b>Totals</b>	<b>113</b>	<b>9974</b>	<b>719.0</b>								

Site Number: 411183

Code: TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: OAA682429\_C3\_01

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Customer: AT&T Mobility

### Tower Loading

#### 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)
177.00	5' Omni	2	13	1.3	1.00	0.0	0.00	4.0	315.8	28.18	79	25
177.00	8' Omni	2	31	3.0	1.00	0.0	0.00	5.0	949.0	28.22	190	63
177.00	10' Omni	2	31	3.8	1.00	0.0	0.00	7.0	1666.0	28.31	238	63
177.00	13' Omni	1	62	5.4	1.00	0.0	0.00	-7.0	1174.9	27.68	168	62
177.00	15' Omni	1	120	4.9	1.00	0.0	0.00	10.0	1562.1	28.44	156	120
177.00	Round Side Arm	2	175	5.9	0.67	0.0	0.00	0.0	0.0	28.00	248	350
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	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	Kathrein Scala 782	3	4	0.2	0.50	0.0	0.00	0.0	0.0	27.06	9	12
157.00	Powerwave Allgon	6	7	0.4	0.50	0.0	0.00	0.0	0.0	27.06	39	40
157.00	Powerwave Allgon	6	18	1.6	0.50	0.0	0.00	0.0	0.0	27.06	146	106
157.00	Raycap DC6-48-60-0-8F	2	41	1.7	1.00	0.0	0.00	0.0	0.0	27.06	103	82
157.00	Raycap DC6-48-60-0-8F	1	41	1.7	1.00	0.0	0.00	0.0	0.0	27.06	52	41
157.00	Ericsson RRUS-11 (50	3	62	3.7	0.67	0.0	0.00	0.0	0.0	27.06	228	186
157.00	Ericsson RRUS 32 B2	3	0	0.0	0.67	0.0	0.00	0.0	0.0	27.06	0	0
157.00	Ericsson RRUS 11 w/	3	0	0.0	0.67	0.0	0.00	0.0	0.0	27.06	0	0
157.00	Ericsson RRUS-32 (77	3	105	4.3	0.67	0.0	0.00	0.0	0.0	27.06	262	315
157.00	Powerwave 7770.00	3	68	6.5	0.77	0.0	0.00	3.0	1379.8	27.20	460	203
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	CCI TPA-65R-LCUUUU-	3	0	0.0	0.69	0.0	0.00	3.0	0.0	27.20	0	0
157.00	Round Sector Frame	3	415	19.2	0.75	0.0	0.00	0.0	0.0	27.06	1310	1245
143.00	Round Side Arm	1	175	5.9	1.00	0.0	0.00	0.0	0.0	26.34	174	175
143.00	20' Omni	1	0	0.0	1.00	0.0	0.00	13.0	0.0	27.01	0	0
132.00	Raycap RRFDC-1064-	3	18	1.7	0.50	0.0	0.00	2.0	146.9	25.86	73	53
132.00	Alcatel-Lucent	3	55	3.1	0.67	0.0	0.00	0.0	0.0	25.75	182	165
132.00	RRH	3	56	3.5	0.67	0.0	0.00	0.0	0.0	25.75	203	169
132.00	Amphenol Antel BXA-	3	13	3.7	0.87	0.0	0.00	0.0	0.0	25.75	277	39
132.00	48" x 12" x 7" Panel	6	44	7.0	0.79	0.0	0.00	0.0	0.0	25.75	958	263
132.00	Swedcom SACP	1	20	6.6	0.85	0.0	0.00	1.0	162.3	25.80	162	20
132.00	Amphenol Antel LPA-	2	25	8.8	0.93	0.0	0.00	0.0	0.0	25.75	470	50
132.00	Amphenol Antel BXA-	1	21	9.7	0.77	0.0	0.00	1.0	215.1	25.80	215	21
132.00	Swedcom SLCP	2	38	13.1	0.89	0.0	0.00	0.0	0.0	25.75	673	75
132.00	Round Sector Frame	3	415	19.2	0.75	0.0	0.00	0.0	0.0	25.75	1247	1245
132.00	VZW Unused	1	625	28.0	1.00	0.0	0.00	0.0	0.0	25.75	808	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
51.00	GPS	1	18	1.2	1.00	0.0	0.00	0.0	0.0	19.62	27	18
51.00	Stand-Off	1	54	2.0	1.00	0.0	0.00	0.0	0.0	19.62	43	54
	<b>Totals</b>	<b>113</b>	<b>10456</b>	<b>654.7</b>								

Site Number: 411183

Code: TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: OAA682429\_C3\_01

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Customer: AT&T Mobility

### Tower Loading

#### 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)
177.00	5' Omni	2	10	1.0	1.00	0.0	0.00	4.0	93.3	10.41	23	20
177.00	8' Omni	2	25	2.4	1.00	0.0	0.00	5.0	280.4	10.42	56	50
177.00	10' Omni	2	25	3.0	1.00	0.0	0.00	7.0	492.3	10.46	70	50
177.00	13' Omni	1	40	3.9	1.00	0.0	0.00	-7.0	312.8	10.22	45	40
177.00	15' Omni	1	40	4.5	1.00	0.0	0.00	10.0	529.9	10.51	53	40
177.00	Round Side Arm	2	150	5.2	0.67	0.0	0.00	0.0	0.0	10.34	81	300
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	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	Kathrein Scala 782	3	3	0.1	0.50	0.0	0.00	0.0	0.0	9.99	2	9
157.00	Powerwave Allgon	6	5	0.3	0.50	0.0	0.00	0.0	0.0	9.99	11	32
157.00	Powerwave Allgon	6	14	1.1	0.50	0.0	0.00	0.0	0.0	9.99	37	85
157.00	Raycap DC6-48-60-0-8F	2	33	1.2	1.00	0.0	0.00	0.0	0.0	9.99	27	66
157.00	Raycap DC6-48-60-0-8F	1	33	1.2	1.00	0.0	0.00	0.0	0.0	9.99	13	33
157.00	Ericsson RRUS-11 (50	3	50	2.6	0.67	0.0	0.00	0.0	0.0	9.99	58	150
157.00	Ericsson RRUS 32 B2	3	53	2.7	0.67	0.0	0.00	0.0	0.0	9.99	62	159
157.00	Ericsson RRUS 11 w/	3	72	2.8	0.67	0.0	0.00	0.0	0.0	9.99	63	216
157.00	Ericsson RRUS-32 (77	3	77	3.3	0.67	0.0	0.00	0.0	0.0	9.99	75	231
157.00	Powerwave 7770.00	3	35	5.5	0.77	0.0	0.00	3.0	430.0	10.05	143	105
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	CCI TPA-65R-LCUUUU-	3	82	13.3	0.69	0.0	0.00	3.0	930.2	10.05	310	246
157.00	Round Sector Frame	3	300	14.4	0.75	0.0	0.00	0.0	0.0	9.99	363	900
143.00	Round Side Arm	1	150	5.2	1.00	0.0	0.00	0.0	0.0	9.73	57	150
143.00	20' Omni	1	55	6.0	1.00	0.0	0.00	13.0	872.1	9.98	67	55
132.00	Raycap RRFDC-1064-	3	14	1.2	0.50	0.0	0.00	2.0	37.3	9.55	19	42
132.00	Alcatel-Lucent	3	44	2.2	0.67	0.0	0.00	0.0	0.0	9.51	46	132
132.00	RRH	3	45	2.4	0.67	0.0	0.00	0.0	0.0	9.51	51	135
132.00	Amphenol Antel BXA-	3	11	2.9	0.87	0.0	0.00	0.0	0.0	9.51	82	32
132.00	48" x 12" x 7" Panel	6	35	5.1	0.79	0.0	0.00	0.0	0.0	9.51	256	210
132.00	Swedcom SACP	1	16	5.1	0.85	0.0	0.00	1.0	46.1	9.53	46	16
132.00	Amphenol Antel LPA-	2	20	6.1	0.93	0.0	0.00	0.0	0.0	9.51	122	40
132.00	Amphenol Antel BXA-	1	17	7.6	0.77	0.0	0.00	1.0	62.3	9.53	62	17
132.00	Swedcom SLCP	2	30	10.0	0.89	0.0	0.00	0.0	0.0	9.51	189	60
132.00	Round Sector Frame	3	300	14.4	0.75	0.0	0.00	0.0	0.0	9.51	345	900
132.00	VZW Unused	1	1807	129.0	1.00	0.0	0.00	0.0	0.0	9.51	1375	1807
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
51.00	GPS	1	10	1.0	1.00	0.0	0.00	0.0	0.0	7.25	8	10
51.00	Stand-Off	1	40	1.6	1.00	0.0	0.00	0.0	0.0	7.25	13	40
	Totals	113	9974	719.0								

Site Number: 411183

Code:

TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: OAA682429\_C3\_01

8/3/2016 12:09:07 PM

Customer: AT&T Mobility

### 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	180.0	Empty Waveguide	1	2.00	6.00	100.00	3	Separate
30.00	177.0	7/8" Coax	7	1.09	0.33	14.30	1	Separate
30.00	177.0	Waveguide	1	2.00	6.00	100.00	1	Separate
0.00	164.0	Waveguide	1	2.00	6.00	100.00	1	Separate
30.00	164.0	1 5/8" Coax	18	1.98	14.7	66.67	1	Flat
30.00	164.0	1 5/8" Hybriflex Cab	1	1.98	1.30	100.00	1	Separate
30.00	157.0	0.39" Fiber Trunk	2	0.39	0.06	0.00	2	Separate
30.00	157.0	0.39" Fiber Trunk	1	0.39	0.06	0.00	2	Separate
30.00	157.0	0.78" 8 AWG 6	4	0.78	1.18	50.00	2	Bundled
30.00	157.0	0.78" 8 AWG 6	2	0.78	1.18	0.00	2	Separate
30.00	157.0	1 5/8" Coax	12	1.98	9.84	100.00	2	Separate
30.00	157.0	2" Conduit	1	2.38	3.65	100.00	2	Separate
30.00	157.0	Waveguide	1	2.00	6.00	100.00	2	Separate
30.00	143.0	1 5/8" Coax	1	1.98	0.82	100.00	1	Separate
30.00	132.0	1 1/4" Hybriflex Cab	3	1.54	3.00	0.00	1	Separate
30.00	132.0	1 5/8" Coax	18	1.98	14.7	50.00	1	Separate
30.00	125.0	1 5/8" Coax	6	1.98	0.82	33.30	3	Separate
30.00	51.00	1/2" Coax	1	0.63	0.15	100.00	1	Separate

Site Number: 411183

Code:

TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: OAA682429\_C3\_01

8/3/2016 12:09:07 PM

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	12.08	28.33	0.00	0.24	2.48	1.00	1.00	0.60	29.04	0.00	0.00	2643	0	2978	0	2978	1
8	150.0	35.61	49.57	38.14	0.00	0.51	1.89	1.00	1.00	0.70	76.32	0.00	0.00	9945	0	5758	0	5758	1
7	130.0	34.18	49.57	62.23	0.00	0.58	1.82	1.00	1.00	0.74	95.55	0.00	0.00	14247	0	6668	0	6668	1
6	110.0	32.59	49.57	80.74	0.00	0.55	1.84	1.00	1.00	0.73	108.16	0.00	0.00	17277	0	7274	0	7274	1
5	90.0	30.77	49.57	87.52	0.00	0.49	1.92	1.00	1.00	0.69	110.05	0.00	0.00	18799	0	7278	0	7278	1
4	70.0	28.64	49.57	97.66	0.00	0.44	1.98	1.00	1.00	0.67	115.03	0.00	0.00	19804	0	7327	0	7327	1
3	50.0	26.02	49.57	100.41	0.00	0.39	2.08	1.00	1.00	0.65	114.66	0.00	0.00	20043	0	6956	0	6956	1
2	30.0	23.10	26.45	93.73	0.00	0.28	2.36	1.00	1.00	0.61	83.52	0.00	0.00	14168	0	5108	0	5108	1
1	10.0	23.10	3.33	76.03	0.00	0.16	2.72	1.00	1.00	0.58	47.70	0.00	0.00	7543	0	3365	0	3365	1
														124468	0			52712	

#### 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	12.08	28.33	0.00	0.24	2.48	0.80	1.00	0.60	26.62	0.00	0.00	2643	0	2730	0	2730	1
8	150.0	35.61	49.57	38.14	0.00	0.51	1.89	0.80	1.00	0.70	66.41	0.00	0.00	9945	0	5010	0	5010	1
7	130.0	34.18	49.57	62.23	0.00	0.58	1.82	0.80	1.00	0.74	85.63	0.00	0.00	14247	0	5976	0	5976	1
6	110.0	32.59	49.57	80.74	0.00	0.55	1.84	0.80	1.00	0.73	98.24	0.00	0.00	17277	0	6608	0	6608	1
5	90.0	30.77	49.57	87.52	0.00	0.49	1.92	0.80	1.00	0.69	100.14	0.00	0.00	18799	0	6622	0	6622	1
4	70.0	28.64	49.57	97.66	0.00	0.44	1.98	0.80	1.00	0.67	105.12	0.00	0.00	19804	0	6696	0	6696	1
3	50.0	26.02	49.57	100.41	0.00	0.39	2.08	0.80	1.00	0.65	104.75	0.00	0.00	20043	0	6355	0	6355	1
2	30.0	23.10	26.45	93.73	0.00	0.28	2.36	0.80	1.00	0.61	78.23	0.00	0.00	14168	0	4784	0	4784	1
1	10.0	23.10	3.33	76.03	0.00	0.16	2.72	0.80	1.00	0.58	47.03	0.00	0.00	7543	0	3318	0	3318	1
														124468	0			48098	

#### 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	12.08	28.33	0.00	0.24	2.48	0.85	1.00	0.60	27.23	0.00	0.00	2643	0	2792	0	2792	1
8	150.0	35.61	49.57	38.14	0.00	0.51	1.89	0.85	1.00	0.70	68.89	0.00	0.00	9945	0	5197	0	5197	1
7	130.0	34.18	49.57	62.23	0.00	0.58	1.82	0.85	1.00	0.74	88.11	0.00	0.00	14247	0	6149	0	6149	1
6	110.0	32.59	49.57	80.74	0.00	0.55	1.84	0.85	1.00	0.73	100.72	0.00	0.00	17277	0	6774	0	6774	1
5	90.0	30.77	49.57	87.52	0.00	0.49	1.92	0.85	1.00	0.69	102.61	0.00	0.00	18799	0	6786	0	6786	1
4	70.0	28.64	49.57	97.66	0.00	0.44	1.98	0.85	1.00	0.67	107.60	0.00	0.00	19804	0	6854	0	6854	1
3	50.0	26.02	49.57	100.41	0.00	0.39	2.08	0.85	1.00	0.65	107.22	0.00	0.00	20043	0	6505	0	6505	1
2	30.0	23.10	26.45	93.73	0.00	0.28	2.36	0.85	1.00	0.61	79.55	0.00	0.00	14168	0	4865	0	4865	1
1	10.0	23.10	3.33	76.03	0.00	0.16	2.72	0.85	1.00	0.58	47.20	0.00	0.00	7543	0	3330	0	3330	1
														124468	0			49252	

Site Number: 411183

Code:

TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: OAA682429\_C3\_01

8/3/2016 12:09:07 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	12.08	43.01	14.68	0.32	2.24	1.00	1.00	0.62	38.88	0.00	0.00	3543	900	2699	0	2699	1													
8	150.0	26.71	49.57	57.85	19.71	0.62	1.79	1.00	1.00	0.77	93.96	0.00	0.00	11814	1869	5040	0	5040	1													
7	130.0	25.64	49.57	92.76	30.53	0.73	1.78	1.00	1.00	0.84	127.82	0.00	0.00	16680	2433	6543	0	6543	1													
6	110.0	24.44	49.57	118.12	37.38	0.71	1.78	1.00	1.00	0.83	147.34	0.00	0.00	20244	2967	7173	0	7173	1													
5	90.0	23.08	49.57	123.91	36.39	0.62	1.79	1.00	1.00	0.76	144.21	0.00	0.00	21810	3011	6695	0	6695	1													
4	70.0	21.48	49.57	134.73	37.07	0.56	1.84	1.00	1.00	0.73	147.55	0.00	0.00	23000	3196	6531	0	6531	1													
3	50.0	19.51	49.57	139.11	38.70	0.49	1.91	1.00	1.00	0.69	146.09	0.00	0.00	23320	3276	6101	0	6101	1													
2	30.0	17.33	26.45	120.60	26.87	0.34	2.20	1.00	1.00	0.63	102.21	0.00	0.00	16745	2577	4368	0	4368	1													
1	10.0	17.33	3.33	90.33	14.30	0.19	2.62	1.00	1.00	0.59	56.52	0.00	0.00	9225	1683	2878	0	2878	1													
														146381	21913																	48028

#### 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	12.08	43.01	14.68	0.32	2.24	0.80	1.00	0.62	36.46	0.00	0.00	3543	900	2532	0	2532	1														
8	150.0	26.71	49.57	57.85	19.71	0.62	1.79	0.80	1.00	0.77	84.05	0.00	0.00	11814	1869	4508	0	4508	1														
7	130.0	25.64	49.57	92.76	30.53	0.73	1.78	0.80	1.00	0.84	117.91	0.00	0.00	16680	2433	6036	0	6036	1														
6	110.0	24.44	49.57	118.12	37.38	0.71	1.78	0.80	1.00	0.83	137.42	0.00	0.00	20244	2967	6690	0	6690	1														
5	90.0	23.08	49.57	123.91	36.39	0.62	1.79	0.80	1.00	0.76	134.30	0.00	0.00	21810	3011	6235	0	6235	1														
4	70.0	21.48	49.57	134.73	37.07	0.56	1.84	0.80	1.00	0.73	137.64	0.00	0.00	23000	3196	6092	0	6092	1														
3	50.0	19.51	49.57	139.11	38.70	0.49	1.91	0.80	1.00	0.69	136.18	0.00	0.00	23320	3276	5687	0	5687	1														
2	30.0	17.33	26.45	120.60	26.87	0.34	2.20	0.80	1.00	0.63	96.92	0.00	0.00	16745	2577	4142	0	4142	1														
1	10.0	17.33	3.33	90.33	14.30	0.19	2.62	0.80	1.00	0.59	55.86	0.00	0.00	9225	1683	2844	0	2844	1														
														146381	21913																		44766

#### 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	12.08	43.01	14.68	0.32	2.24	0.85	1.00	0.62	37.06	0.00	0.00	3543	900	2574	0	2574	1														
8	150.0	26.71	49.57	57.85	19.71	0.62	1.79	0.85	1.00	0.77	86.52	0.00	0.00	11814	1869	4641	0	4641	1														
7	130.0	25.64	49.57	92.76	30.53	0.73	1.78	0.85	1.00	0.84	120.39	0.00	0.00	16680	2433	6163	0	6163	1														
6	110.0	24.44	49.57	118.12	37.38	0.71	1.78	0.85	1.00	0.83	139.90	0.00	0.00	20244	2967	6811	0	6811	1														
5	90.0	23.08	49.57	123.91	36.39	0.62	1.79	0.85	1.00	0.76	136.78	0.00	0.00	21810	3011	6350	0	6350	1														
4	70.0	21.48	49.57	134.73	37.07	0.56	1.84	0.85	1.00	0.73	140.11	0.00	0.00	23000	3196	6202	0	6202	1														
3	50.0	19.51	49.57	139.11	38.70	0.49	1.91	0.85	1.00	0.69	138.66	0.00	0.00	23320	3276	5790	0	5790	1														
2	30.0	17.33	26.45	120.60	26.87	0.34	2.20	0.85	1.00	0.63	98.24	0.00	0.00	16745	2577	4198	0	4198	1														
1	10.0	17.33	3.33	90.33	14.30	0.19	2.62	0.85	1.00	0.59	56.02	0.00	0.00	9225	1683	2853	0	2853	1														
														146381	21913																		45582

Site Number: 411183

Code: TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: OAA682429\_C3\_01

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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	12.08	28.33	0.00	0.24	2.48	1.00	1.00	0.60	29.04	0.00	0.00	2643	0	825	0	825	1														
8	150.0	9.86	49.57	38.14	0.00	0.51	1.89	1.00	1.00	0.70	76.32	0.00	0.00	9945	0	1595	0	1595	1														
7	130.0	9.47	49.57	62.23	0.00	0.58	1.82	1.00	1.00	0.74	95.55	0.00	0.00	14247	0	1847	0	1847	1														
6	110.0	9.03	49.57	80.74	0.00	0.55	1.84	1.00	1.00	0.73	108.16	0.00	0.00	17277	0	2015	0	2015	1														
5	90.0	8.52	49.57	87.52	0.00	0.49	1.92	1.00	1.00	0.69	110.05	0.00	0.00	18799	0	2016	0	2016	1														
4	70.0	7.93	49.57	97.66	0.00	0.44	1.98	1.00	1.00	0.67	115.03	0.00	0.00	19804	0	2030	0	2030	1														
3	50.0	7.21	49.57	100.41	0.00	0.39	2.08	1.00	1.00	0.65	114.66	0.00	0.00	20043	0	1927	0	1927	1														
2	30.0	6.40	26.45	93.73	0.00	0.28	2.36	1.00	1.00	0.61	83.52	0.00	0.00	14168	0	1415	0	1415	1														
1	10.0	6.40	3.33	76.03	0.00	0.16	2.72	1.00	1.00	0.58	47.70	0.00	0.00	7543	0	932	0	932	1														
														124468	0																		14602

#### 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	12.08	28.33	0.00	0.24	2.48	0.80	1.00	0.60	26.62	0.00	0.00	2643	0	756	0	756	1															
8	150.0	9.86	49.57	38.14	0.00	0.51	1.89	0.80	1.00	0.70	66.41	0.00	0.00	9945	0	1388	0	1388	1															
7	130.0	9.47	49.57	62.23	0.00	0.58	1.82	0.80	1.00	0.74	85.63	0.00	0.00	14247	0	1655	0	1655	1															
6	110.0	9.03	49.57	80.74	0.00	0.55	1.84	0.80	1.00	0.73	98.24	0.00	0.00	17277	0	1830	0	1830	1															
5	90.0	8.52	49.57	87.52	0.00	0.49	1.92	0.80	1.00	0.69	100.14	0.00	0.00	18799	0	1834	0	1834	1															
4	70.0	7.93	49.57	97.66	0.00	0.44	1.98	0.80	1.00	0.67	105.12	0.00	0.00	19804	0	1855	0	1855	1															
3	50.0	7.21	49.57	100.41	0.00	0.39	2.08	0.80	1.00	0.65	104.75	0.00	0.00	20043	0	1760	0	1760	1															
2	30.0	6.40	26.45	93.73	0.00	0.28	2.36	0.80	1.00	0.61	78.23	0.00	0.00	14168	0	1325	0	1325	1															
1	10.0	6.40	3.33	76.03	0.00	0.16	2.72	0.80	1.00	0.58	47.03	0.00	0.00	7543	0	919	0	919	1															
														124468	0																			13324

#### 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	12.08	28.33	0.00	0.24	2.48	0.85	1.00	0.60	27.23	0.00	0.00	2643	0	773	0	773	1															
8	150.0	9.86	49.57	38.14	0.00	0.51	1.89	0.85	1.00	0.70	68.89	0.00	0.00	9945	0	1440	0	1440	1															
7	130.0	9.47	49.57	62.23	0.00	0.58	1.82	0.85	1.00	0.74	88.11	0.00	0.00	14247	0	1703	0	1703	1															
6	110.0	9.03	49.57	80.74	0.00	0.55	1.84	0.85	1.00	0.73	100.72	0.00	0.00	17277	0	1877	0	1877	1															
5	90.0	8.52	49.57	87.52	0.00	0.49	1.92	0.85	1.00	0.69	102.61	0.00	0.00	18799	0	1880	0	1880	1															
4	70.0	7.93	49.57	97.66	0.00	0.44	1.98	0.85	1.00	0.67	107.60	0.00	0.00	19804	0	1899	0	1899	1															
3	50.0	7.21	49.57	100.41	0.00	0.39	2.08	0.85	1.00	0.65	107.22	0.00	0.00	20043	0	1802	0	1802	1															
2	30.0	6.40	26.45	93.73	0.00	0.28	2.36	0.85	1.00	0.61	79.55	0.00	0.00	14168	0	1348	0	1348	1															
1	10.0	6.40	3.33	76.03	0.00	0.16	2.72	0.85	1.00	0.58	47.20	0.00	0.00	7543	0	922	0	922	1															
														124468	0																			13643

Site Number: 411183

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Site Name: Waterford CT, CT

Engineering Number: OAA682429\_C3\_01

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Customer: AT&T Mobility

### 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	-410.15	Normal No 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	-10.58	90 deg No Ice	12.17	100	100	100	125.9	12.6	27.99	2	0	0.00	33.69	37	Member X
DIAG PST - 3-1/2" DIA PIP	-16.07	90 deg No Ice	15.75	100	100	100	141.1	10.0	26.79	3	0	0.00	52.87	59	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	300.39	60 deg No Ice	50	767.81	0	0	0.00	0.00	39	Member
HORIZ PST - 3" DIA PIPE	12.60	90 deg No Ice	50	89.18	2	0	0.00	27.37	46	Bolt Bear
DIAG PST - 3-1/2" DIA PIP	15.27	90 deg No Ice	50	107.17	3	0	0.00	46.26	33	Bolt Bear

Max Splice Forces	Force (kip)	Load Case	Capacity (kip)	Use %	Num Bolts	Bolt Type
Top Tension	283.25	60 deg No Ice	0.00	0		
Top Compression	389.54	Normal No Ice	0.00	0		
Bot Tension	315.58	60 deg No Ice	1177.95	27	24	1" A354-BC
Bot Compression	427.46	Normal No 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	-372.71	Normal No Ice	10.03	100	100	100	27.8	36.6	701.79	0	0	0.00	0.00	53	Member X
HORIZ PST - 3" DIA PIPE	-9.81	90 deg No 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	-15.04	90 deg No Ice	15.29	100	100	100	137.0	10.6	28.43	3	0	0.00	52.87	52	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	270.59	60 deg No Ice	50	767.81	0	0	0.00	0.00	35	Member
HORIZ PST - 3" DIA PIPE	10.75	90 deg No Ice	50	89.18	2	0	0.00	27.37	39	Bolt Bear
DIAG PST - 3-1/2" DIA PIP	13.22	90 deg No Ice	50	107.17	3	0	0.00	46.26	28	Bolt Bear

Max Splice Forces	Force (kip)	Load Case	Capacity (kip)	Use %	Num Bolts	Bolt Type
Top Tension	255.63	60 deg No Ice	0.00	0		
Top Compression	351.61	Normal No Ice	0.00	0		
Bot Tension	283.25	60 deg No Ice	737.10	38	16	1 A325
Bot Compression	389.54	Normal No Ice	0.00	0		



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Customer: AT&T Mobility

### Force/Stress Summary

Section: 3		1		Bot Elev (ft): 40.00				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 - 10" DIA PIPE	-329.41	Normal No Ice	10.03	100	100	100	33.1	35.7	574.21	0	0	0.00	0.00	57 Member X
HORIZ	PST - 2-1/2" DIA PIP	-10.31	90 deg No Ice	9.570	100	100	100	121.3	13.5	23.07	2	0	0.00	31.66	44 Member X
DIAG	PX - 3" DIA PIPE	-17.19	90 deg No Ice	14.28	100	100	100	150.4	8.8	26.59	3	0	0.00	70.18	64 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 - 10" DIA PIPE	240.36	60 deg No Ice	50	643.84	0	0	0.00	0.00	37	Member				
HORIZ	PST - 2-1/2" DIA PIP	11.43	90 deg No Ice	50	68.14	2	0	0.00	25.72	44	Bolt Bear				
DIAG	PX - 3" DIA PIPE	14.79	90 deg No Ice	50	120.77	3	0	0.00	61.41	24	Bolt Bear				
Max Splice Forces		Force (kip)	Load Case	Capacity (kip)	Use %	Num Bolts	Bolt Type								
Top Tension		222.98	60 deg No Ice	0.00	0										
Top Compression		303.70	Normal No Ice	0.00	0										
Bot Tension		255.63	60 deg No Ice	737.10	35	16	1 A325								
Bot Compression		351.61	Normal No Ice	0.00	0										

Section: 4		1		Bot Elev (ft): 60.00				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 - 10" DIA PIPE	-280.47	Normal No Ice	10.03	100	100	100	33.2	35.7	574.19	0	0	0.00	0.00	48 Member X
HORIZ	PST - 2-1/2" DIA PIP	-9.41	90 deg No Ice	8.297	100	100	100	105.1	18.0	30.65	2	0	0.00	31.66	30 Member X
DIAG	PX - 3" DIA PIPE	-16.79	90 deg No Ice	13.42	100	100	100	141.3	10.0	30.12	3	0	0.00	70.18	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 - 10" DIA PIPE	207.50	60 deg No Ice	50	643.84	0	0	0.00	0.00	32	Member				
HORIZ	PST - 2-1/2" DIA PIP	10.34	90 deg No Ice	50	68.14	2	0	0.00	25.72	40	Bolt Bear				
DIAG	PX - 3" DIA PIPE	14.57	90 deg No Ice	50	120.77	3	0	0.00	61.41	23	Bolt Bear				
Max Splice Forces		Force (kip)	Load Case	Capacity (kip)	Use %	Num Bolts	Bolt Type								
Top Tension		189.36	60 deg No Ice	0.00	0										
Top Compression		254.24	Normal No Ice	0.00	0										
Bot Tension		222.98	60 deg No Ice	552.82	40	12	1 A325								
Bot Compression		303.70	Normal No Ice	0.00	0										

Site Number: 411183

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Site Name: Waterford CT, CT

Engineering Number: OAA682429\_C3\_01

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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	-228.16	Normal No Ice	10.03	100	100	100	41.8	34.1	436.47	0	0	0.00	0.00	52 Member X
HORIZ	PX - 2" DIA PIPE	-9.22	90 deg No Ice	7.035	100	100	100	110.2	16.4	24.26	2	0	0.00	34.00	38 Member X
DIAG	PX - 3" DIA PIPE	-17.66	90 deg No Ice	12.59	100	100	100	132.6	11.3	34.20	3	0	0.00	70.18	51 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	170.94	60 deg No Ice	50	511.87	0	0	0.00	0.00	33	Member
HORIZ	PX - 2" DIA PIPE	9.89	90 deg No Ice	50	59.19	2	0	0.00	27.62	35	Bolt Bear
DIAG	PX - 3" DIA PIPE	16.31	90 deg No Ice	50	120.77	3	0	0.00	61.41	26	Bolt Bear

Max Splice Forces		Force (kip)	Load Case	Capacity (kip)	Use %	Num Bolts	Bolt Type
Top Tension		149.11	60 deg No Ice	0.00	0		
Top Compression		198.65	Normal No Ice	0.00	0		
Bot Tension		189.36	60 deg No Ice	552.82	34	12	1 A325
Bot Compression		254.24	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	-178.30	Normal No Ice	6.68	100	100	100	36.5	35.1	294.62	0	0	0.00	0.00	60 Member X
HORIZ	PST - 2" DIA PIPE	-9.35	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	-15.14	90 deg No Ice	9.257	100	100	100	117.3	14.5	24.65	3	0	0.00	39.58	61 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	134.67	60 deg No Ice	50	335.92	0	0	0.00	0.00	40	Member
HORIZ	PST - 2" DIA PIPE	9.96	90 deg No Ice	50	42.79	2	0	0.00	16.26	61	Bolt Bear
DIAG	PST - 2-1/2" DIA PIP	14.31	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		99.23	60 deg No Ice	0.00	0		
Top Compression		133.41	Normal No Ice	0.00	0		
Bot Tension		149.11	60 deg No Ice	368.55	40	8	1 A325
Bot Compression		198.65	Normal No Ice	0.00	0		

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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	-111.05	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	-9.22	90 deg No Ice	5.030	100	100	100	96.9	20.6	16.42	2	0	0.00	18.85	56 Member X
DIAG	PST - 2-1/2" DIA PIP	-16.07	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	81.06	60 deg No Ice	50	244.34	0	0	0.00	0.00	33	Member
HORIZ	PST - 1-1/2" DIA PIP	9.62	90 deg No Ice	50	31.95	2	0	0.00	15.31	62	Bolt Bear
DIAG	PST - 2-1/2" DIA PIP	15.05	90 deg No Ice	50	68.14	3	0	0.00	34.63	43	Bolt Bear

Max Splice Forces		Force (kip)	Load Case	Capacity (kip)	Use %	Num Bolts	Bolt Type
Top Tension		51.73	60 deg No Ice	0.00	0		
Top Compression		70.49	Normal No Ice	0.00	0		
Bot Tension		99.23	60 deg No Ice	276.41	36	6	1 A325
Bot Compression		133.41	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	-51.46	Normal No Ice	6.67	100	100	100	53.0	31.8	100.91	0	0	0.00	0.00	51 Member X
HORIZ	PST - 2" DIA PIPE	-5.88	90 deg No Ice	4.325	100	100	100	65.9	28.9	30.92	2	0	0.00	20.01	29 Bolt Bear
DIAG	PST - 2-1/2" DIA PIP	-11.93	90 deg No Ice	7.955	100	100	100	100.8	19.4	32.98	3	0	0.00	39.58	36 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	36.72	60 deg No Ice	50	126.77	0	0	0.00	0.00	28	Member
HORIZ	PST - 2" DIA PIPE	6.19	90 deg No Ice	50	42.79	2	0	0.00	16.26	38	Bolt Bear
DIAG	PST - 2-1/2" DIA PIP	11.27	90 deg No Ice	50	68.14	3	0	0.00	34.63	32	Bolt Bear

Max Splice Forces		Force (kip)	Load Case	Capacity (kip)	Use %	Num Bolts	Bolt Type
Top Tension		9.77	60 deg No Ice	0.00	0		
Top Compression		17.97	Normal No Ice	0.00	0		
Bot Tension		51.73	60 deg No Ice	184.27	28	4	1 A325
Bot Compression		70.49	Normal No Ice	0.00	0		

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Site Name: Waterford CT, CT

Engineering Number: OAA682429\_C3\_01

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Customer: AT&T Mobility

### Force/Stress Summary

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

Max Compression Member	Force		Len (ft)	Bracing %			Fa (ksi)	Member Cap		Num Holes	Shear Cap		Bear Cap	Use %	Controls
	(kip)	Load Case		X	Y	Z		KL/R	(kip)		Bolts	(kip)			
LEG PST - 3" DIA PIPE	-7.98	Normal No Ice	6.67	100	100	100	69.0	28.2	62.81	0	0	0.00	0.00	12	Member X
HORIZ PST - 1-1/2" DIA PIP	-3.07	Normal No Ice	4.280	100	100	100	82.4	24.7	19.73	2	0	0.00	18.85	16	Bolt Bear
DIAG PST - 2" DIA PIPE	-5.15	Normal No Ice	7.930	100	100	100	120.9	13.6	14.57	3	0	0.00	30.02	35	Member X

Max Tension Member	Force		Fy (ksi)	Cap		Num Bolts	Num Holes	Shear Cap		Bear Cap	Use %	Controls
	(kip)	Load Case		(kip)	Bolts			(kip)	(kip)			
LEG PST - 3" DIA PIPE	3.89	60 deg No Ice	50	89.18	0	0	0.00	0.00	4	Member		
HORIZ PST - 1-1/2" DIA PIP	2.71	60 deg No Ice	50	31.95	2	0	0.00	15.31	17	Bolt Bear		
DIAG PST - 2" DIA PIPE	4.98	Normal No Ice	50	42.79	3	0	0.00	26.27	18	Bolt Bear		

Max Splice Forces	Force		Capacity (kip)	Use %	Num Bolts	Bolt Type
	(kip)	Load Case				
Top Tension	0.00		0.00	0		
Top Compression	0.56	60 deg Ice	0.00	0		
Bot Tension	9.77	60 deg No Ice	141.08	7	4	7/8 A325
Bot Compression	17.97	Normal No Ice	0.00	0		

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Engineering Number: OAA682429\_C3\_01

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Customer: AT&T Mobility

### Support Forces Summary

Load Case	Node	FX (kip)	FY (kip)	FZ (kip)	(-) = Uplift (+) = Down
60 deg Ice	1b	-27.58	-243.25	-15.91	
	1a	-19.97	199.71	6.24	
	1	-4.59	200.38	-20.43	
60 deg No Ice	1b	-32.87	-313.21	-18.96	
	1a	-23.63	223.23	7.52	
	1	-5.32	224.43	-24.25	
60 deg	1b	-6.81	-54.26	-3.93	
	1a	-8.81	94.18	3.37	
	1	-1.49	94.52	-9.32	
90 deg Ice	1b	-25.25	-206.80	-11.36	
	1a	-30.32	311.35	14.44	
	1	-5.45	52.28	-3.07	
90 deg No Ice	1b	-30.15	-269.59	-13.64	
	1a	-36.04	359.22	17.24	
	1	-6.35	44.82	-3.61	
90 deg	1b	-6.06	-42.19	-2.47	
	1a	-12.26	131.81	6.07	
	1	-1.76	44.81	-3.60	
Normal Ice	1b	-10.77	-103.51	-11.95	
	1a	10.77	-103.51	-11.95	
	1	0.00	363.86	-39.57	
Normal No Ice	1b	-13.06	-145.64	-14.30	
	1a	13.06	-145.64	-14.30	
	1	0.00	425.71	-47.40	
Normal	1b	-1.36	-7.89	-2.63	
	1a	1.36	-7.89	-2.63	
	1	0.00	150.21	-15.77	

Max Uplift:	313.21 (kip)	Moment:	8,428.10 (ft-kip)	Normal No Ice
Max Down:	425.71 (kip)	Total Down:	134.44 (kip)	
Max Shear:	47.40 (kip)	Total Shear:	76.00 (kip)	

Site Number: 411183

Code:

TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: OAA682429\_C3\_01

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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	50.00	0.0192	0.0022	0.0389
	126.67	0.1179	0.0089	0.1193
	133.33	0.1322	0.0111	0.1237
	140.00	0.1465	0.0127	0.1236
	160.00	0.1950	0.0179	0.1323
	166.67	0.2121	0.0196	0.1445
	180.00	0.2458	0.0217	0.1274
50 mph Wind at 90 degree From Face with No Ice	50.00	0.0196	0.0017	0.0394
	126.67	0.1193	0.0072	0.1204
	133.33	0.1338	0.0081	0.1249
	140.00	0.1482	0.0087	0.1211
	160.00	0.1970	0.0101	0.1064
	166.67	0.2141	0.0106	0.1428
	180.00	0.2477	0.0111	0.0784
50 mph Wind Normal To Face with No Ice	50.00	0.0205	0.0013	0.0415
	126.67	0.1251	0.0022	0.1272
	133.33	0.1403	0.0042	0.1311
	140.00	0.1557	0.0058	0.1391
	160.00	0.2076	0.0084	0.1995
	166.67	0.2261	0.0093	0.1614
	180.00	0.2625	0.0104	0.2240
82 mph Wind at 60 degree From Face with Ice	50.00	0.0598	0.0073	0.1160
	126.67	0.3472	0.0238	0.3416
	133.33	0.3877	0.0258	0.3522
	140.00	0.4294	0.0276	0.3645
	160.00	0.5695	0.0486	0.3945
	166.67	0.6191	0.0594	0.4109
	180.00	0.7172	0.0730	0.3705
82 mph Wind at 90 degree From Face with Ice	50.00	0.0603	0.0041	0.1176
	126.67	0.3510	0.0128	0.3451
	133.33	0.3919	0.0136	0.3537
	140.00	0.4338	0.0139	0.3674
	160.00	0.5747	0.0177	0.3531
	166.67	0.6243	0.0192	0.3947
	180.00	0.7226	0.0212	0.2159
82 mph Wind Normal To Face with Ice	50.00	0.0622	0.0057	0.1226
	126.67	0.3653	0.0084	0.3587
	133.33	0.4081	0.0066	0.3761
	140.00	0.4520	0.0052	0.3815
	160.00	0.6003	0.0014	0.5250
	166.67	0.6532	0.0044	0.4846
	180.00	0.7580	0.0081	0.6601
95 mph Wind at 60 degree From Face with No Ice	50.00	0.0693	0.0098	0.1402
	126.67	0.4260	0.0475	0.4317
	133.33	0.4776	0.0594	0.4458
	140.00	0.5295	0.0688	0.4459
	160.00	0.7050	0.1139	0.4789
	166.67	0.7668	0.1286	0.5228
	180.00	0.8886	0.1468	0.4612
95 mph Wind at 90 degree From Face with No Ice	50.00	0.0704	0.0062	0.1422
	126.67	0.4314	0.0261	0.4352

Site Number: 411183

Code: TIA/EIA-222-F

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Site Name: Waterford CT, CT

Engineering Number: OAA682429\_C3\_01

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Customer: AT&T Mobility

	133.33	0.4836	0.0297	0.4504
	140.00	0.5358	0.0317	0.4370
	160.00	0.7120	0.0373	0.3849
	166.67	0.7738	0.0391	0.5163
	180.00	0.8957	0.0413	0.2838
95 mph Wind Normal To Face with No Ice	50.00	0.0738	0.0045	0.1496
	126.67	0.4524	0.0080	0.4597
	133.33	0.5071	0.0153	0.4733
	140.00	0.5626	0.0208	0.5035
	160.00	0.7507	0.0306	0.7209
	166.67	0.8174	0.0340	0.5835
	180.00	0.9489	0.0380	0.8093



## 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

**August 5, 2016**

**EBI Project Number: 6216003518**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general public allowable limit:	<b>8.15 %</b>





August 5, 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 (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 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 (2300 MHz (WCS)) 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 (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 (2100 MHz (AWS)) 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 **Powerwave 7770, CCI HPA-65R-BUU-H8 and the CCI TPA-65R-LCUUUU-H8** for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 11) The antenna mounting height centerlines of the proposed antennas are **154 feet** above ground level (AGL) for **Sector A**, **154 feet** above ground level (AGL) for **Sector B** and **154 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.



## AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	154 feet	Height (AGL):	154 feet	Height (AGL):	154 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%	0.46 %	Antenna B1 MPE%	0.46 %	Antenna C1 MPE%	0.46 %
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:	14.05 / 15.55 dBd	Gain:	14.05 / 15.55 dBd	Gain:	14.05 / 15.55 dBd
Height (AGL):	154 feet	Height (AGL):	154 feet	Height (AGL):	154 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 Watts	Total TX Power(W):	180 Watts	Total TX Power(W):	180 Watts
ERP (W):	5,831.65	ERP (W):	5,831.65	ERP (W):	5,831.65
Antenna A2 MPE%	1.15 %	Antenna B2 MPE%	1.15 %	Antenna C2 MPE%	1.15 %
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	CCI TPA-65R-LCUUUU-H8	Make / Model:	CCI TPA-65R-LCUUUU-H8	Make / Model:	CCI TPA-65R-LCUUUU-H8
Gain:	12.95 / 13.75 / 14.25 dBd	Gain:	12.95 / 13.75 / 14.25 dBd	Gain:	12.95 / 13.75 / 14.25 dBd
Height (AGL):	154 feet	Height (AGL):	154 feet	Height (AGL):	154 feet
Frequency Bands	700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	360 Watts	Total TX Power(W):	360 Watts	Total TX Power(W):	360 Watts
ERP (W):	8,405.43	ERP (W):	8,405.43	ERP (W):	8,405.43
Antenna A3 MPE%	1.82 %	Antenna B3 MPE%	1.82 %	Antenna C3 MPE%	1.82 %

Site Composite MPE%	
Carrier	MPE%
AT&T – Max per sector	3.43 %
T-Mobile	1.61 %
Verizon Wireless	2.34 %
MetroPCS	0.55 %
Public Safety	0.22 %
<b>Site Total MPE %:</b>	<b>8.15 %</b>

AT&T Sector A Total:	3.43 %
AT&T Sector B Total:	3.43 %
AT&T Sector C Total:	3.43 %
<b>Site Total:</b>	<b>8.15 %</b>

AT&T _ Max Values Per Sector	# 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	154	1.36	850 MHz	567	0.24%
AT&T 1900 MHz (PCS) UMTS	2	656.33	154	2.15	1900 MHz (PCS)	1000	0.22%
AT&T 850 MHz GSM	2	762.29	154	2.50	850 MHz	567	0.44%
AT&T 2300 MHz (WCS) LTE	2	2,153.53	154	7.07	2300 MHz (WCS)	1000	0.71%
AT&T 700 MHz LTE	2	1,183.45	154	3.88	700 MHz	467	0.83%
AT&T 1900 MHz (PCS) LTE	2	1,422.82	154	4.67	1900 MHz (PCS)	1000	0.47%
AT&T 2100 MHz (AWS) LTE	2	1,596.44	154	5.24	2100 MHz (AWS)	1000	0.52%
						<b>Total:</b>	<b>3.43%</b>



## 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:	3.43 %
Sector B:	3.43 %
Sector C:	3.43 %
AT&T Maximum Total (per sector):	3.43 %
Site Total:	8.15 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **8.15 %** 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.