



**QC Development**

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Storrs, CT 06268

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Mark.Roberts@QCDevelopment.net

April 27, 2018

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

**Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T) – CT2198**  
**72 Boggy Hole Road, Old Lyme, CT 06371**  
**N 41.32208056**  
**W 72.30746111**

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 145-foot level of the existing 175-foot Monopole Tower at 62-1 Boggy Hole Road, Old Lyme, CT (aka 72 Boggy Hole Road). The tower is owned by Wireless Solutions and property is owned by Michael W. Sanders. AT&T now intends to remove (3) Remote Radio Units (RRU) and install (3) RRUS- 4415 B25. These Remote Radio Units (RRU) will be installed at the 145-foot level of the tower.

This facility was approved by the Siting Council in Docket # 209 on June 5, 2002. The Decision and Order included a tower height limit of 175 feet. Since no change is proposed to the overall tower height, this modification complies with the aforementioned approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 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 Bonnie Reemsnyder, First Selectwoman of the Town of Old Lyme, as elected official and to the Old Lyme Planning and Zoning Department, as well as to the tower and property owner.

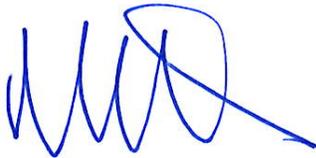
The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

Please feel free to call me at (860) 670-9068 with any questions regarding this matter. Thank you for your consideration.

Sincerely,



Mark Roberts  
QC Development  
Consultant for AT&T

#### Attachments

cc: Bonnie Reemsnyder - as Elected Official  
Keith Rosenfeld – Zoning Enforcement Officer  
Michael W. Sanders – as Property Owner  
Wireless Solutions - as Tower Owner

## Power Density

### Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm <sup>2</sup> )	Freq. Band (MHz <sup>**</sup> )	Limit S (mW/cm <sup>2</sup> )	%MPE
Other Carriers*							3.07%
AT&T GSM	2	414	145	0.0154	850	0.5667	0.27%
AT&T UMTS	2	728	145	0.0271	850	0.5667	0.48%
AT&T UMTS	2	656	145	0.0244	1900	1.0000	0.24%
AT&T LTE	2	940	145	0.0350	740	0.4667	0.75%
AT&T LTE	2	1791	145	0.0667	1900	1.0000	0.67%
Site Total							5.48%

\*Per CSC Records (available upon request, includes calculation formulas)

\*\* If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

### Proposed Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm <sup>2</sup> )	Freq. Band (MHz <sup>**</sup> )	Limit S (mW/cm <sup>2</sup> )	%MPE
Other Carriers*							3.07%
AT&T GSM	1	313	145	0.0058	850	0.5667	0.10%
AT&T UMTS	1	247	145	0.0046	850	0.5667	0.08%
AT&T LTE	1	1476	145	0.0275	740	0.4667	0.59%
AT&T LTE	2	2421	145	0.0901	1900	1.0000	0.90%
Site Total							4.74%

\*Per CSC Records (available upon request, includes calculation formulas)

\*\* If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Note: Proposed Loading may also include corrections to certain Existing Loading values

**PROJECT INFORMATION**

SCOPE OF WORK: ITEMS TO BE MOUNTED ON THE EXISTING MONOPOLE TOWER:

- NEW AT&T RRUS: RRUS B25 4415 (PCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3) TO REPLACE EXISTING.
- NEW JUMPER CABLES: COAX JUMPER (1) PER SECTOR FROM EACH RRU (TOTAL OF 3)
- NEW FIBER JUMPERS: FIBER JUMPERS (2) FROM THE SQUID TO EACH RRU (TOTAL OF 6)

ITEMS TO BE MOUNTED INSIDE EXISTING EQUIPMENT:

- ADD XMU

ITEMS TO REMAIN:

- (9) ANTENNAS, (3) RRU'S, (12) 1-5/8" COAX CABLES, (2) DC POWER CABLES, & (1) FIBER RUNS.

SITE ADDRESS: 62-1 BOGGY HOLE ROAD  
OLD LYME, CT 06371

LATITUDE: 41.3223111' N 41° 19' 20.32" N  
LONGITUDE: 72.3070239' W 72° 18' 25.28" W  
TYPE OF SITE: MONOPOLE TOWER/INDOOR EQUIPMENT  
STRUCTURE HEIGHT: 175'-0"± A.G.L  
RAD CENTER: 145'-0"± A.G.L  
CURRENT USE: TELECOMMUNICATIONS FACILITY  
PROPOSED USE: TELECOMMUNICATIONS FACILITY



**SITE NUMBER: CT2198**

**SITE NAME: OLD LYME BOGGY HOLE ROAD**

**PROJECT: LTE BWE 2018 UPGRADE**

**DRAWING INDEX**

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND & EQUIPMENT PLAN	1
A-2	ANTENNA LAYOUT & ELEVATION	1
A-3	DETAILS	1
G-1	GROUNDING DETAILS	1
RF-1	RF PLUMBING DIAGRAM	1

**VICINITY MAP**

**DIRECTIONS TO SITE:**  
HEAD EAST ON ENTERPRISE DR TOWARD CAPITOL BLVD..TURN LEFT AT CAPITOL BLVD..TURN LEFT AT WEST ST..TURN LEFT TO MERGE ONTO I-91 S TOWARD NEW HAVEN..TAKE EXIT 22S ON THE LEFT TO MERGE ONTO CT-9 S TOWARD MIDDLETOWN/OLD SAYBROOK..TAKE THE EXIT ONTO GOVERNOR JOHN DAVIS LODGE TURNPIKE/I-95 N/US-1 N TOWARD NEW LONDON/PROVIDENCE. TAKE EXIT 70 FOR US-1 N/CT-156 W. TURN LEFT AT CT-156/NECK RD/US-1. TURN RIGHT AT HALLS RD/US-1. TURN LEFT AT LYME ST/US-1. CONTINUE TO FOLLOW US-1. TAKE A RIGHT ON BOGGY HILL ROAD WHICH WILL TURN INTO A DIRT ROAD FOLLOW TO THE END!!!! PAST BRICK WALL AND GATE GUARDED BY GARGOYLES. CONTINUE ON DIRT ROAD AND FOLLOW UP HILL TO SITE COMPOUND.



**GENERAL NOTES**

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

**72 HOURS**

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CALL TOLL FREE 1-800-922-4455  
OR CALL 811

**UNDERGROUND SERVICE ALERT**



45 BEECHWOOD DRIVE  
NORTH ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5586



12 INDUSTRIAL WAY,  
SALEM, NH 03079

**SITE NUMBER: CT2198**  
**SITE NAME: OLD LYME BOGGY HOLE ROAD**  
62-1 BOGGY HOLE ROAD  
OLD LYME, CT 06371  
NEW LONDON COUNTY



500 ENTERPRISE DRIVE, SUITE 3A  
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/30/18	ISSUED FOR CONSTRUCTION	SF	AT	DJC
A	02/20/18	ISSUED FOR REVIEW	GA	AT	DJC

SCALE: AS SHOWN    DESIGNED BY: AT    DRAWN BY: GA



AT&T		
TITLE SHEET (LTE BWE)		
SITE NUMBER	DRAWING NUMBER	REV
CT2198	T-1	1

**GROUNDING NOTES**

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

**GENERAL NOTES**

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
 CONTRACTOR – SAI  
 SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)  
 OWNER – AT&T MOBILITY
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH LTE SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. APPLICABLE BUILDING CODES:  
 SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.  
 BUILDING CODE: IBC 2012 WITH 2016 CT BUILDING CODE AMENDMENTS  
 ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS  
 LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

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

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

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;

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

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

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

**ABBREVIATIONS**

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		



45 BEECHWOOD DRIVE  
NORTH ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5586



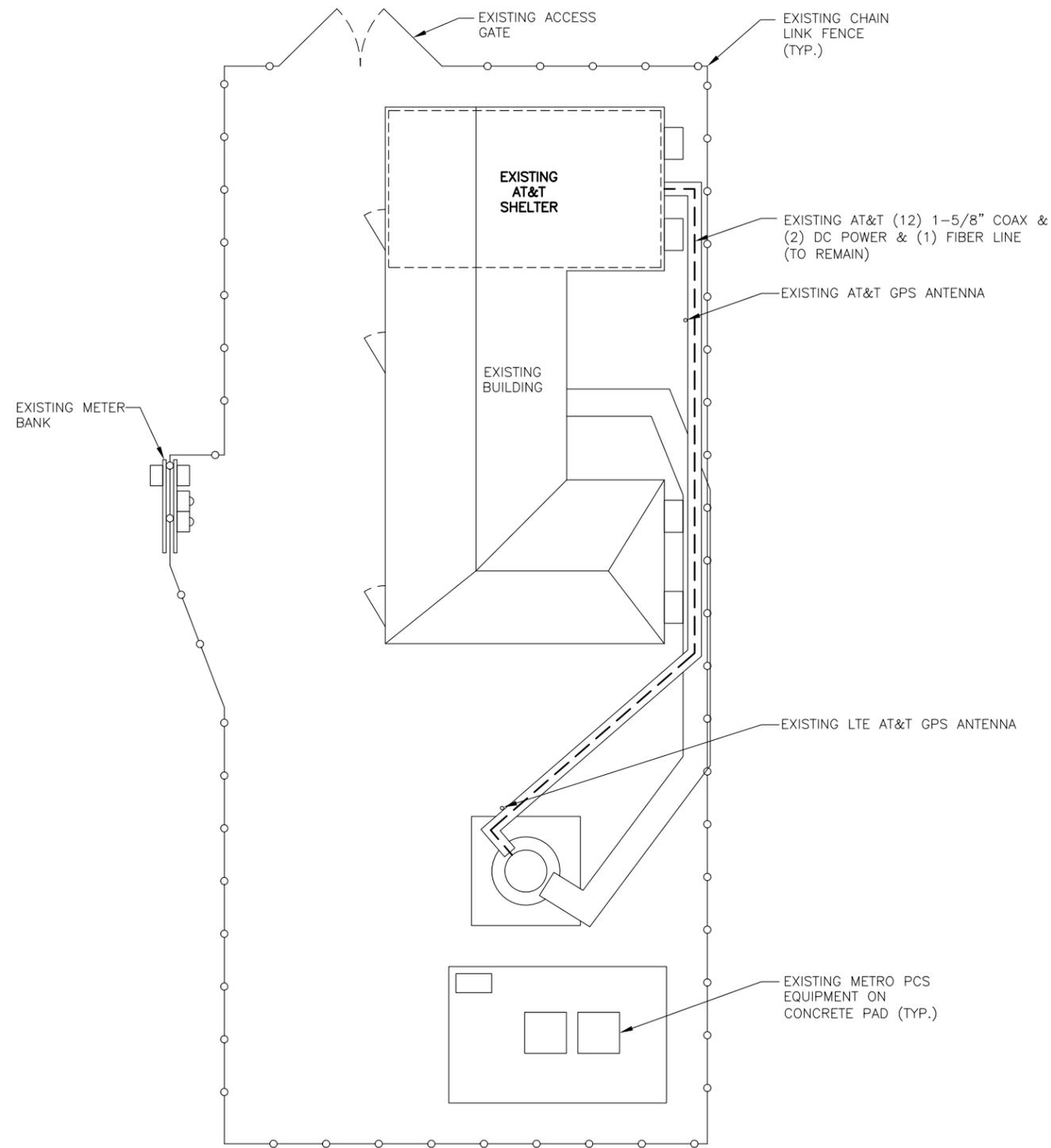
12 INDUSTRIAL WAY,  
SALEM, NH 03079

**SITE NUMBER: CT2198**  
**SITE NAME: OLD LYME BOGGY HOLE ROAD**  
 62-1 BOGGY HOLE ROAD  
 OLD LYME, CT 06371  
 NEW LONDON COUNTY



500 ENTERPRISE DRIVE, SUITE 3A  
ROCKY HILL, CT 06067

				AT&T	
				GENERAL NOTES (LTE BWE)	
				SITE NUMBER	
				DRAWING NUMBER	
				REV	
				CT2198	
				GN-1	
				1	

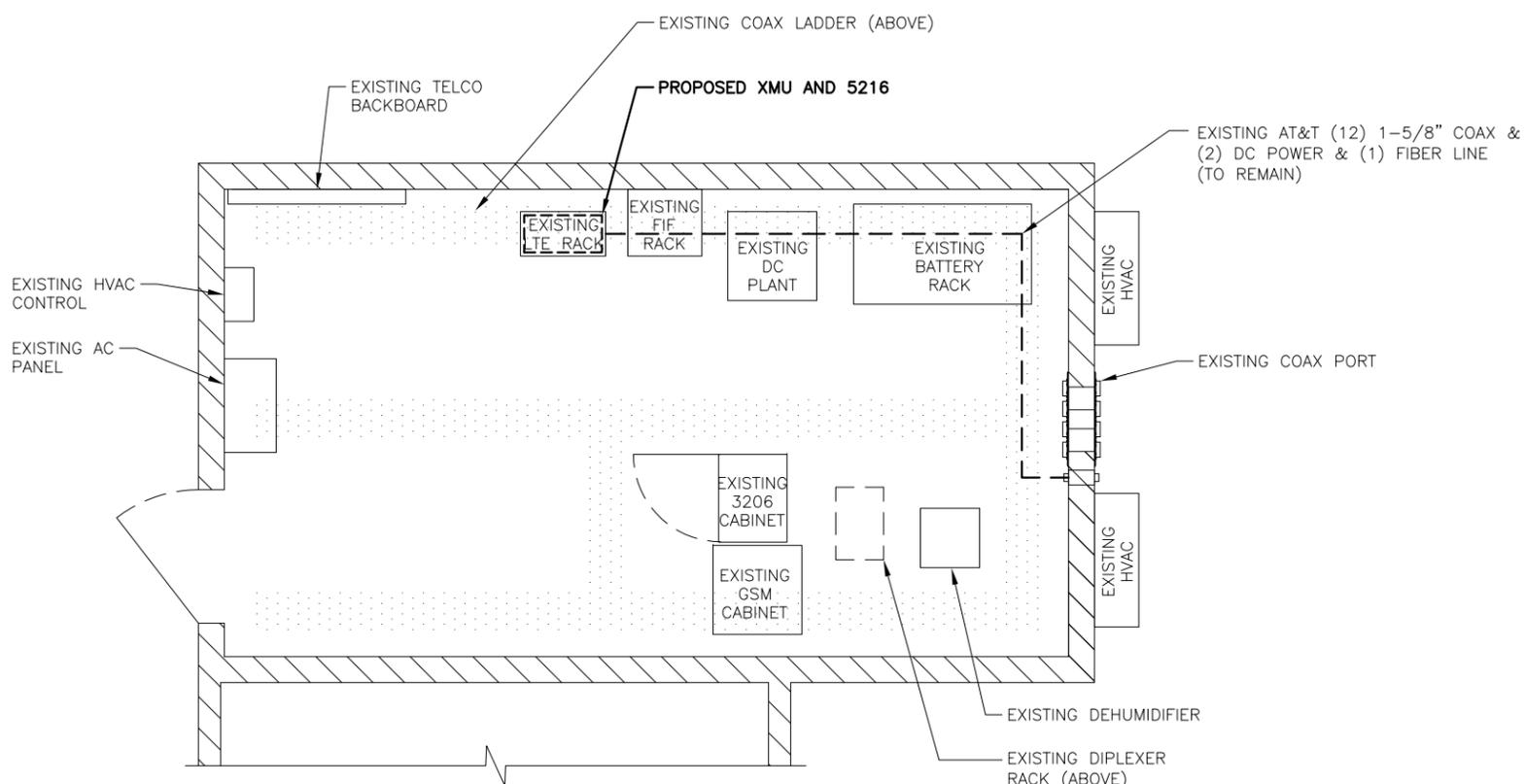


**COMPOUND PLAN**  
 22x34 SCALE: 3/16"=1'-0"  
 11x17 SCALE: 3/32"=1'-0"  
 1 A-1

**NOTE:**  
 REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

**NOTE:**  
 REFER TO STRUCTURAL ANALYSIS BY: HUDSON DESIGN GROUP, LLC, DATED: MARCH 30, 2018, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

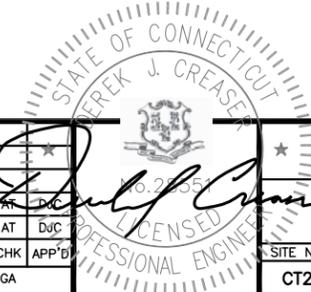
**NOTE:**  
 AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: MARCH 23, 2018

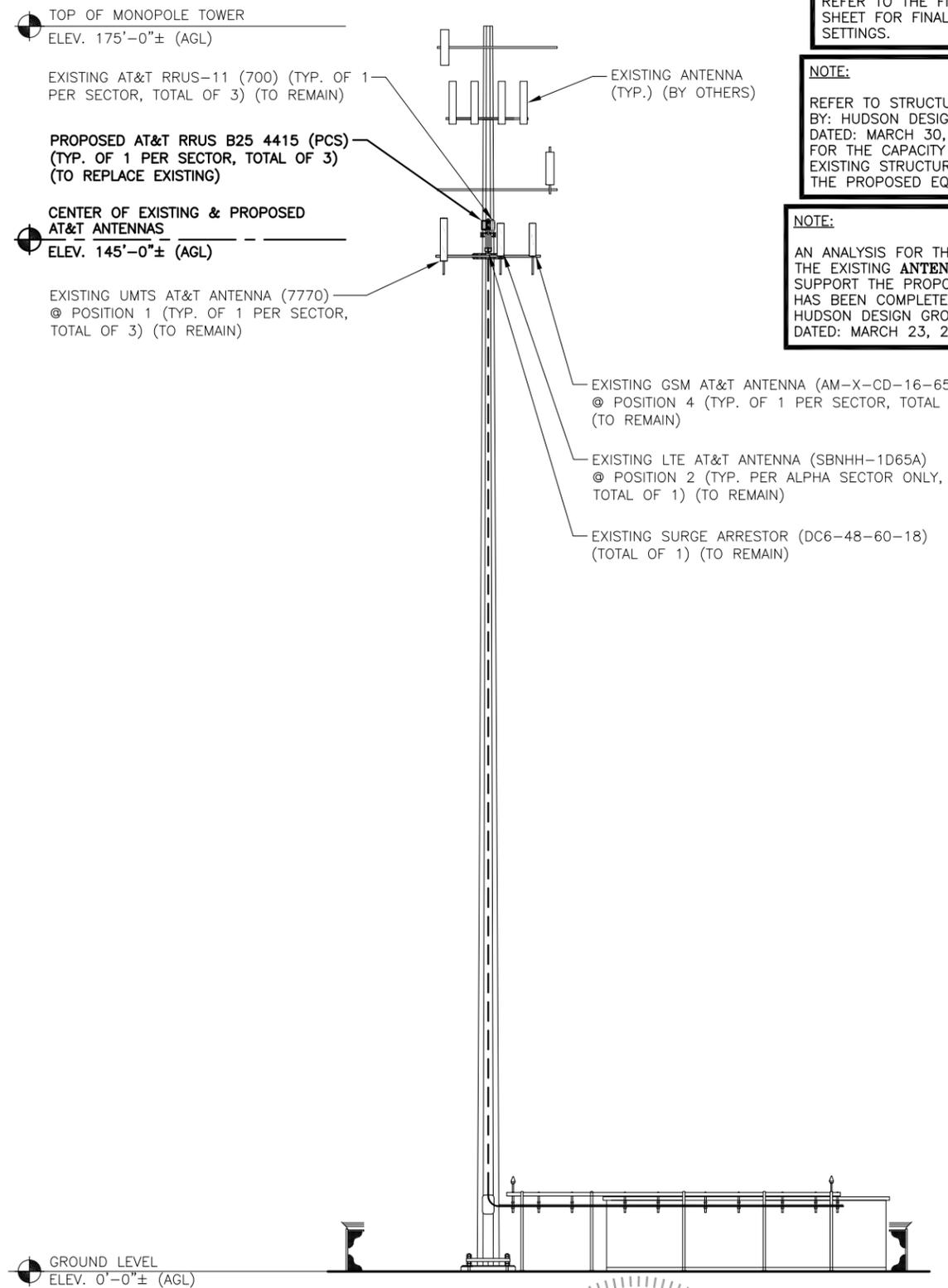
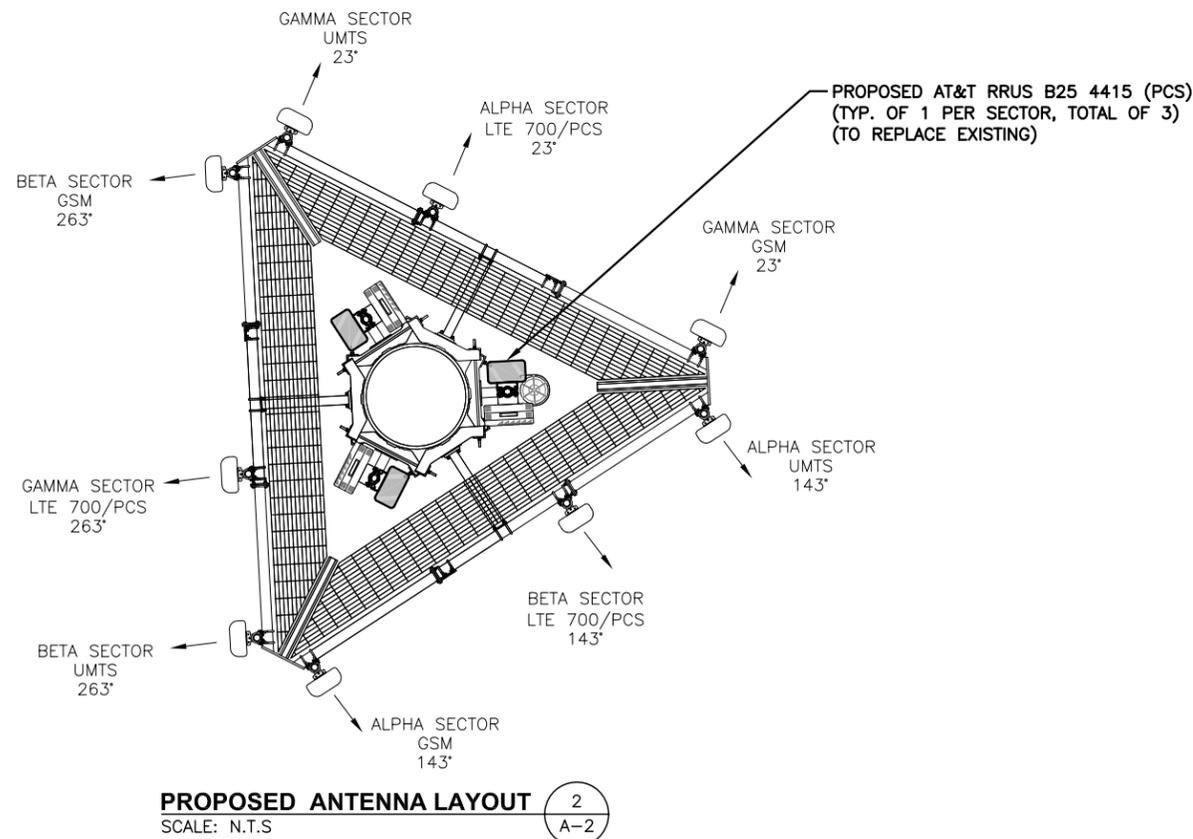
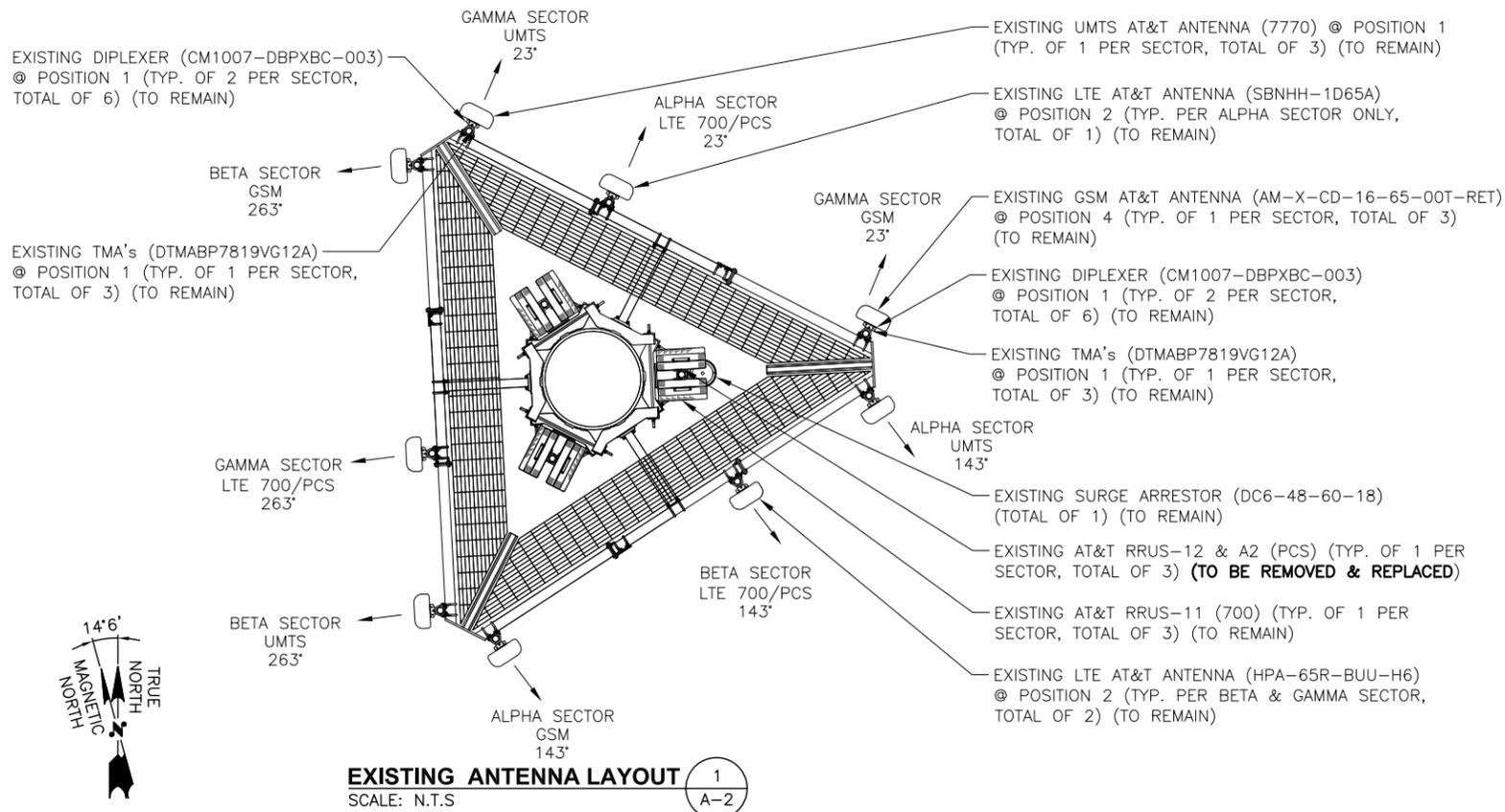


**EQUIPMENT PLAN**  
 22x34 SCALE: 1/2"=1'-0"  
 11x17 SCALE: 1/4"=1'-0"  
 2 A-1

NO.	DATE	REVISIONS	BY	CHK	APP'D
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A	02/20/18	ISSUED FOR REVIEW	GA	AT	DJC

SCALE: AS SHOWN    DESIGNED BY: AT    DRAWN BY: GA





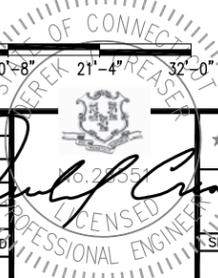
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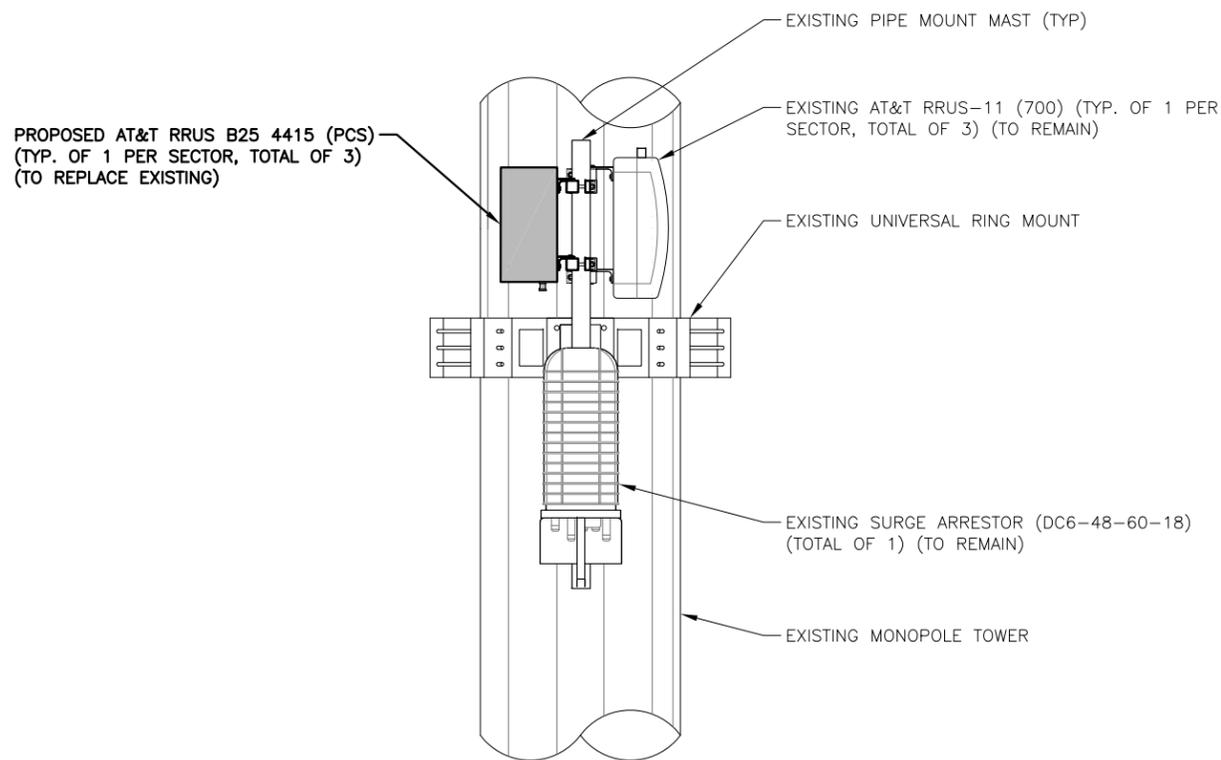
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FINAL ANTENNA SCHEDULE														
SECTOR	BAND	ANTENNA	SIZE (INCHES) (L X W X D)	RAD CENTER	AZIMUTH	TMA'S	RRU'S	SIZE (INCHES) (L X W X D)	DC JUMPERS	FIBER JUMPERS	COAX			
ALPHA	UMTS	EXISTING	7770	55X11X5	145'-0"±	143'	EXISTING	DTMABP7819VG12A	-	-	(2)1-5/8			
	LTE 700/PCS	EXISTING	SBNHH-1D65A	55X11.8X7.1	145'-0"±	23'	-	-	EXISTING PROPOSED	RRUS-11 (700) B25 4415 (PCS)	15.0X13.2X7.4	*1	**2	-
	GSM	EXISTING	AM-X-CD-16-65-00T-RET	72X11.8X5.9	145'-0"±	143'	EXISTING	DTMABP7819VG12A	-	-	(2)1-5/8			
BETA	UMTS	EXISTING	7770	55X11X5	145'-0"±	263'	EXISTING	DTMABP7819VG12A	-	-	(2)1-5/8			
	LTE 700/PCS	EXISTING	HPA-65R-BUU-H6	72X14.8X7.4	145'-0"±	143'	-	-	EXISTING PROPOSED	RRUS-11 (700) B25 4415 (PCS)	15.0X13.2X7.4	*1	**2	-
	GSM	EXISTING	AM-X-CD-16-65-00T-RET	72X14.8X7.4	145'-0"±	263'	EXISTING	DTMABP7819VG12A	-	-	(2)1-5/8			
GAMMA	UMTS	EXISTING	7770	55X11X5	145'-0"±	23'	EXISTING	DTMABP7819VG12A	-	-	(2)1-5/8			
	LTE 700/PCS	EXISTING	HPA-65R-BUU-H6	72X14.8X7.4	145'-0"±	263'	-	-	EXISTING PROPOSED	RRUS-11 (700) B25 4415 (PCS)	15.0X13.2X7.4	*1	**2	-
	GSM	EXISTING	AM-X-CD-16-65-00T-RET	72X14.8X7.4	145'-0"±	23'	EXISTING	DTMABP7819VG12A	-	-	(2)1-5/8			

FINAL ANTENNA CONFIGURATION TABLE 3  
A-3

\*DC JUMPER NOTE:  
DC JUMPERS (1) PER SECTOR, FROM EACH RRU (TOTAL OF 3).

\*\*FIBER JUMPER NOTE:  
FIBER JUMPERS (2) PER SECTOR, FROM THE SQUID TO EACH RRU (TOTAL OF 6).



PROPOSED RRUS MOUNT DETAIL 1  
A-3  
22x34 SCALE: 3/4"=1'-0"  
11x17 SCALE: 3/8"=1'-0"

RRU CHART				
QUANTITY	MODEL	L	W	D
3(E)	RRUS-11	19.7"	17.0"	7.2"
3(P)	B25 4415	15.0"	13.2"	7.4"

NOTE:  
MOUNT PER MANUFACTURER'S SPECIFICATIONS



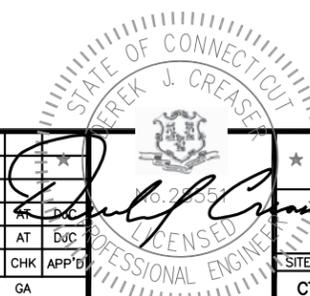
NOTE:  
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER  
PROPOSED RRU REFER TO THE FINAL RFDS AND CHART FOR QUANTITY, MODEL AND DIMENSIONS

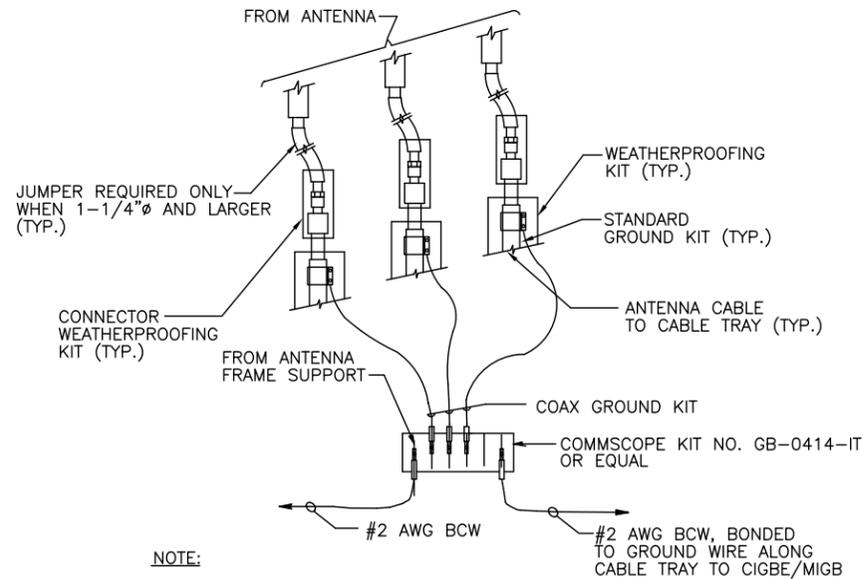
NOTE:  
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRU DETAIL 2  
A-3  
SCALE: N.T.S

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/30/18	ISSUED FOR CONSTRUCTION	SF	AT	DJC
A	02/20/18	ISSUED FOR REVIEW	GA	AT	DJC

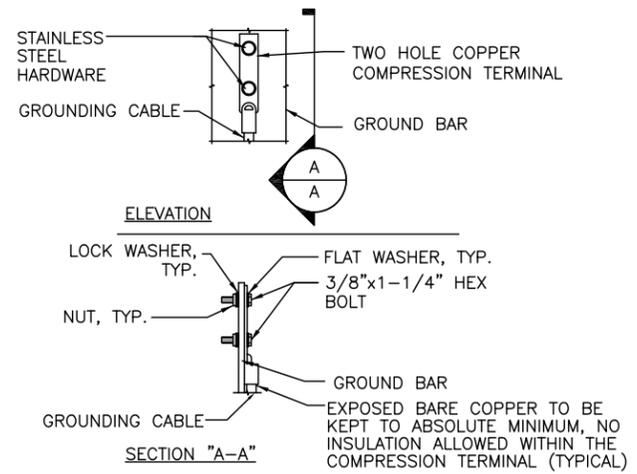
SCALE: AS SHOWN DESIGNED BY: AT DRAWN BY: GA





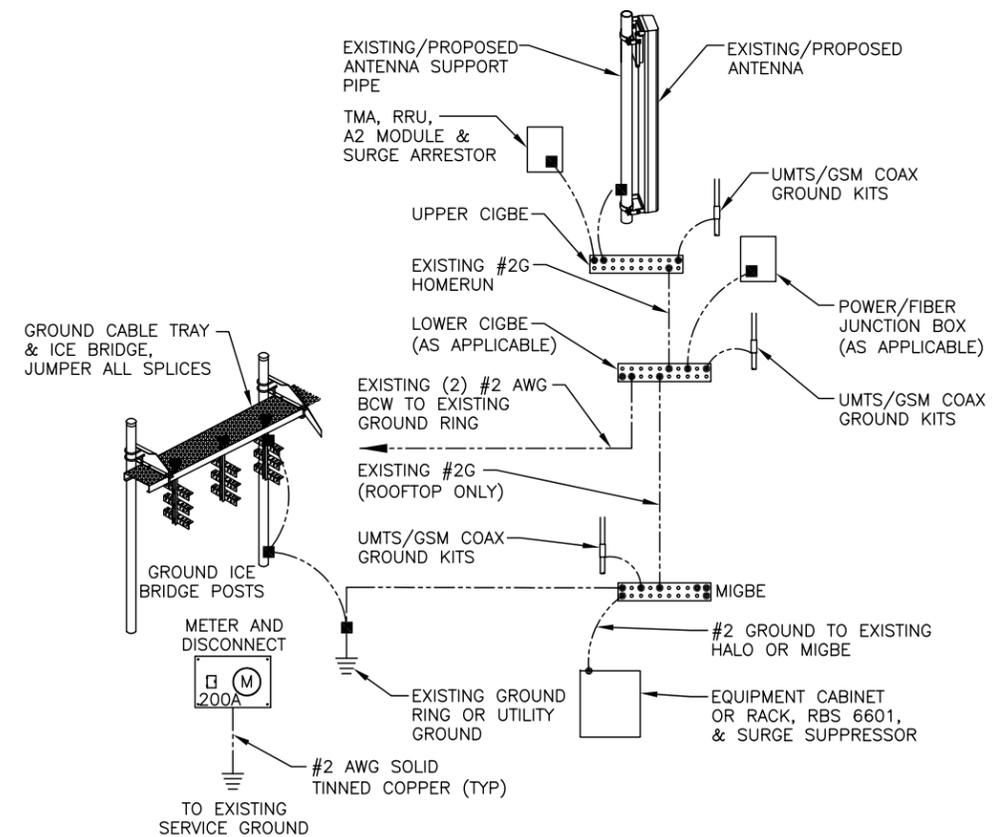
NOTE:  
 1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

**GROUND WIRE TO GROUND BAR CONNECTION DETAIL** 1  
 SCALE: N.T.S. G-1



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

**TYPICAL GROUND BAR CONNECTION DETAIL** 3  
 SCALE: N.T.S. G-1



**GROUNDING RISER DIAGRAM** 2  
 SCALE: N.T.S. G-1

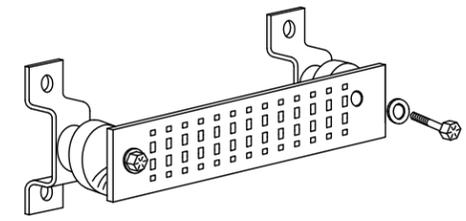
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

**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.

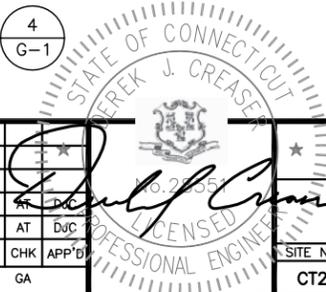
**SECTION "A" - SURGE ABSORBERS**

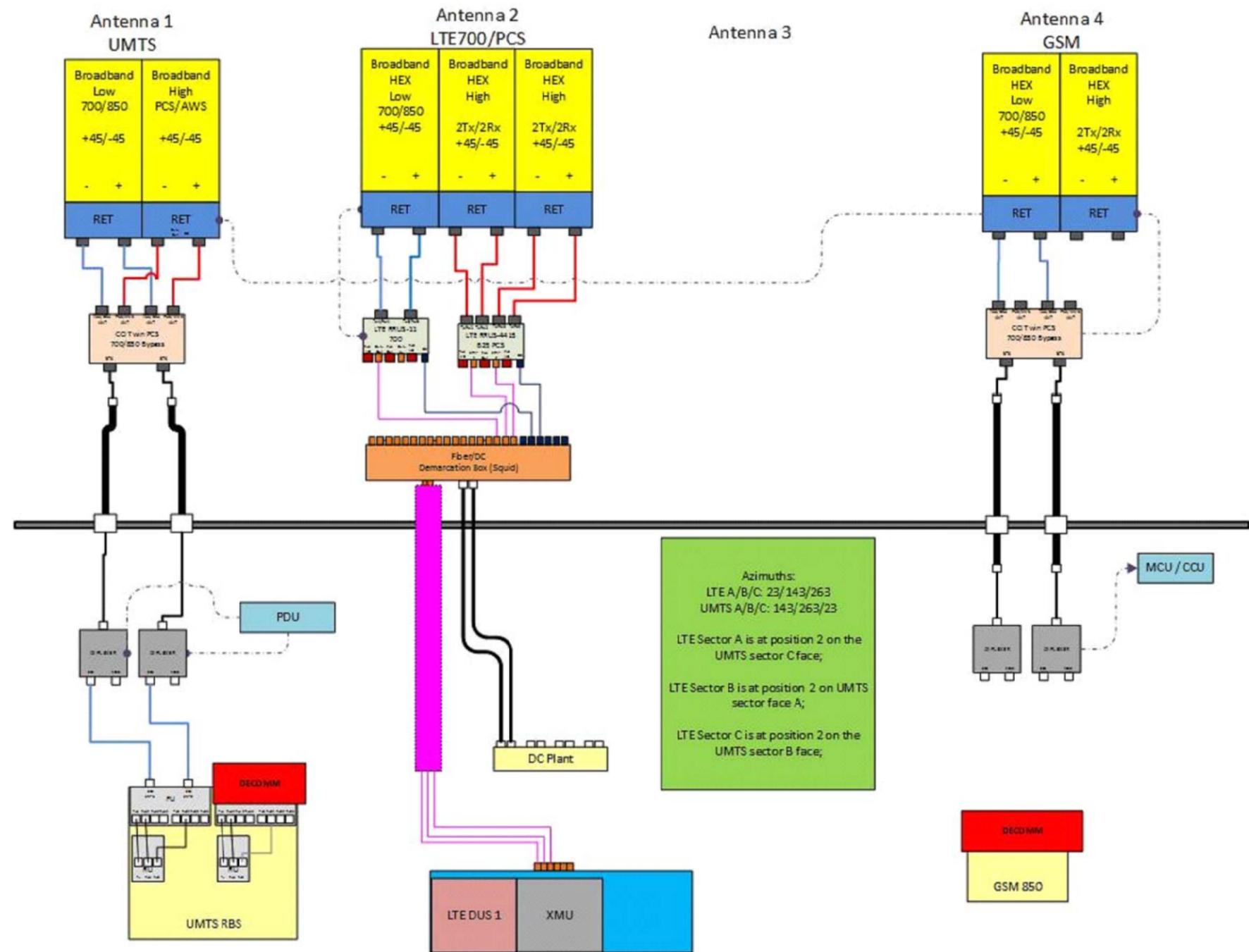
- INTERIOR GROUND RING (#2)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
- BUILDING STEEL (IF AVAILABLE) (#2)



**GROUND BAR - DETAIL** 4  
 SCALE: N.T.S. G-1

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/30/18	ISSUED FOR CONSTRUCTION	SF		
A	02/20/18	ISSUED FOR REVIEW	GA	AT	DJC
SCALE: AS SHOWN		DESIGNED BY: AT	DRAWN BY: GA		





Azimuths:  
 LTE A/B/C: 23/143/263  
 UMTS A/B/C: 143/263/23

LTE Sector A is at position 2 on the UMTS sector C face;  
 LTE Sector B is at position 2 on UMTS sector face A;  
 LTE Sector C is at position 2 on the UMTS sector B face;

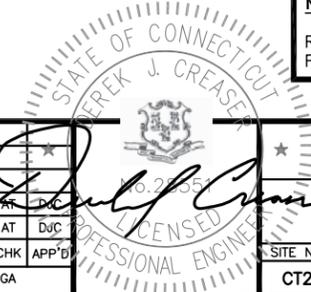
**RF PLUMBING DIAGRAM** 1  
 SCALE: N.T.S. RF-1

**NOTE:**  
 1. CONTRACTOR TO CONFIRM ALL PARTS.  
 2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS

**NOTE:**  
 REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/30/18	ISSUED FOR CONSTRUCTION	SF		
A	02/20/18	ISSUED FOR REVIEW	GA	AT	DJC

SCALE: AS SHOWN    DESIGNED BY: AT    DRAWN BY: GA



# STRUCTURAL ANALYSIS REPORT

For

**CT2198**

**OLD LYME BOGGY HOLE ROAD**

62-1 BOGGY HOLE ROAD  
OLD LYME, CT 06371

## Antennas Mounted to the Tower



Prepared for:



Dated: April 20, 2018

Prepared by:



**HUDSON**  
Design Group LLC



45 Beechwood Drive  
North Andover, MA 01845  
(P) 978.557.5553 (F) 978.336.5586  
[www.hudsondesigngroupllc.com](http://www.hudsondesigngroupllc.com)



**HUDSON**  
Design Group LLC

#### **SCOPE OF WORK:**

Hudson Design Group LLC (HDG) has been authorized by AT&T to conduct a structural evaluation of the 175' monopole supporting the proposed AT&T's antennas located at elevation 145' above the ground level.

This report represents this office's findings, conclusions and recommendations pertaining to the support of AT&T's existing and proposed antennas listed below.

Record drawings of the existing tower were not available for our use. The previous structural analysis report prepared by Destek Engineering, dated March 8, 2016, was available and obtained for our use.

#### **CONCLUSION SUMMARY:**

Based on our evaluation, we have determined that the existing monopole and foundation are in conformance with the ANSI/TIA-222-G Standard for the loading considered under the criteria listed in this report. The monopole structure is rated at 60.6% - (Base plate at EL.0' Controlling).



**APPURTENANCES CONFIGURATION:**

Tenant	Appurtenances	Elev.	Mount
	(6) AIR21 B2A/B4P Antennas	175'	Low Profile Platform
	(3) KRY 112 71/2	175'	Low Profile Platform
	(3) BXA-70063-6CF Antennas	162'	Low Profile Platform
	(3) LNX-6514DS-VTM Antennas	162'	Low Profile Platform
	(6) HBXX-6517DS-VTM Antennas	162'	Low Profile Platform
	(3) RRH2X60 PCS	162'	Low Profile Platform
	(3) RRH2X40-07-U	162'	Low Profile Platform
	(3) RRH2X40 AWS	162'	Low Profile Platform
	(2) DB-B1-6C-8AB-0Z	162'	Low Profile Platform
	(6) APXV18-206516S-C Antennas	152'	Low Profile Platform
AT&T	(3) 7770 Antennas	145'	Low Profile Platform
AT&T	(1) SBNHH-1D65A Antenna	145'	Low Profile Platform
AT&T	(2) HPA-65R-BUU-H6 Antennas	145'	Low Profile Platform
AT&T	(3) AM-X-CD-16-65-00T Antennas	145'	Low Profile Platform
AT&T	(3) RRUS-11	145'	Low Profile Platform
AT&T	(1) DC6-48-60-18-8F	145'	Low Profile Platform
AT&T	<b>(3) B25 4415</b>	145'	Low Profile Platform

*\* Proposed AT&T Appurtenances shown in Bold.*

*\*\* AT&T Appurtenances are based on RFDS, dated 1/25/2018.*

**AT&T EXISTING/PROPOSED COAX CABLES:**

Tenant	Coax Cables	Elev.	Mount
<b>AT&amp;T</b>	(12) 1 5/8" Cables	145'	Inside Monopole
<b>AT&amp;T</b>	(2) DC Power Cables	145'	Inside Monopole
<b>AT&amp;T</b>	(1) Fiber Cable	145'	Inside Monopole

*\*Proposed AT&T Coax Cables shown in Bold.*



**ANALYSIS RESULTS SUMMARY:**

<b>Component</b>	<b>Max. Stress Ratio</b>	<b>Elev. of Component (ft)</b>	<b>Pass/Fail</b>	<b>Comments</b>
Pole Section-L1	17.6 %	154.87 – 175	PASS	
Pole Section-L2	42.6 %	116.29 – 154.87	PASS	
Pole Section-L3	47.0 %	74.17 – 116.29	PASS	
Pole Section-L4	48.3 %	33.34 – 74.17	PASS	
Pole Section-L5	47.5 %	0 – 33.34	PASS	
Base Plate & Anchor Bolts	<b>60.6 %</b>	0	PASS	<b>Controlling</b>



**DESIGN CRITERIA:**

1. EIA/TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures  
County: New London  
Wind Load: 120 mph (3 second gust)  
Structural Class: II  
Exposure Category: B  
Topographic Category: 1  
Crest Height: 0 ft.  
Ice Thickness: 0.75 inch
2. Approximate height above grade to existing antennas: 145'

**\*Calculations and referenced documents are attached\***

**ASSUMPTIONS:**

1. The monopole dimensions, member sizes and material strength are as indicated in the previous structural analysis report prepared by Destek Engineering, dated March 8, 2016.
1. The appurtenances configuration is as stated in the previous structural analysis report prepared by Destek Engineering, dated March 8, 2016. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
2. The tower and foundation are properly constructed and maintained. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. The support mounts and platforms are not analyzed and are considered adequate to support the loading. The analysis is limited to the primary support structure itself.
4. All prior structural modification, if any, are assumed to be as per the data supplied (if available), and installed properly.

**SUPPORT RECOMMENDATIONS:**

HDG recommends that the proposed B25 4415 be mounted on the existing pipe mast supported by the monopole.

Reference HDG's Latest Construction Drawings for all component and connection requirements (attached).



**Photo 1:** Photo illustrating the Tower with Appurtenances shown.

## DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) ERICSSON AIR 21 B2A B4P w/ Mount Pipe	175	APXV18-206516S-C-A20 w/mount pipe	152
(2) ERICSSON AIR 21 B2A B4P w/ Mount Pipe	175	APXV18-206516S-C-A20 w/mount pipe	152
(2) ERICSSON AIR 21 B2A B4P w/ Mount Pipe	175	APXV18-206516S-C-A20 w/mount pipe	152
KRY 112 71/2	175	APXV18-206516S-C-A20 w/mount pipe	152
KRY 112 71/2	175	APXV18-206516S-C-A20 w/mount pipe	152
KRY 112 71/2	175	APXV18-206516S-C-A20 w/mount pipe	152
PIROD 15' Low Profile Platform	172	APXV18-206516S-C-A20 w/mount pipe	152
BXA-70063-6CF-EDIN w/mount pipe	162	PIROD 15' Low Profile Platform	152
BXA-70063-6CF-EDIN w/mount pipe	162	Powerwave 7770 w/mount pipe (ATI - existing)	145
BXA-70063-6CF-EDIN w/mount pipe	162	Powerwave 7770 w/mount pipe	145
Andrew LNX-6514DS-VTM w/mount pipe	162	Powerwave 7770 w/mount pipe	145
Andrew LNX-6514DS-VTM w/mount pipe	162	Powerwave 7770 w/mount pipe	145
Andrew LNX-6514DS-VTM w/mount pipe	162	SBNHH-1D65A w/ Mount Pipe	145
HBXX-6517DS-VTM w/ Mount Pipe	162	HPA-65R-BUU-H6 w/mount pipe	145
HBXX-6517DS-VTM w/ Mount Pipe	162	HPA-65R-BUU-H6 w/mount pipe	145
HBXX-6517DS-VTM w/ Mount Pipe	162	KMW AM-X-CD-16-65-00T-RET w/mount pipe	145
HBXX-6517DS-VTM w/ Mount Pipe	162	KMW AM-X-CD-16-65-00T-RET w/mount pipe	145
HBXX-6517DS-VTM w/ Mount Pipe	162	KMW AM-X-CD-16-65-00T-RET w/mount pipe	145
HBXX-6517DS-VTM w/ Mount Pipe	162	KMW AM-X-CD-16-65-00T-RET w/mount pipe	145
RRH2x60 PCS	162	Ericsson RRUS-11	145
RRH2x60 PCS	162	Ericsson RRUS-11	145
RRH2x60 PCS	162	Ericsson RRUS-11	145
RRH2X40-07-U	162	(2) TMA DTMAP7819VG12A	145
RRH2X40-07-U	162	(2) TMA DTMAP7819VG12A	145
RRH2X40-07-U	162	(2) TMA DTMAP7819VG12A	145
RRH2X40 AWS	162	DC6-48-60-18-8F	145
RRH2X40 AWS	162	PIROD 15' Low Profile Platform	145
RRH2X40 AWS	162	B25 4415 (ATI - proposed)	145
RFS DB-B1-6C-8AB-0Z	162	B25 4415	145
RFS DB-B1-6C-8AB-0Z	162	B25 4415	145
PIROD 15' Low Profile Platform	162		

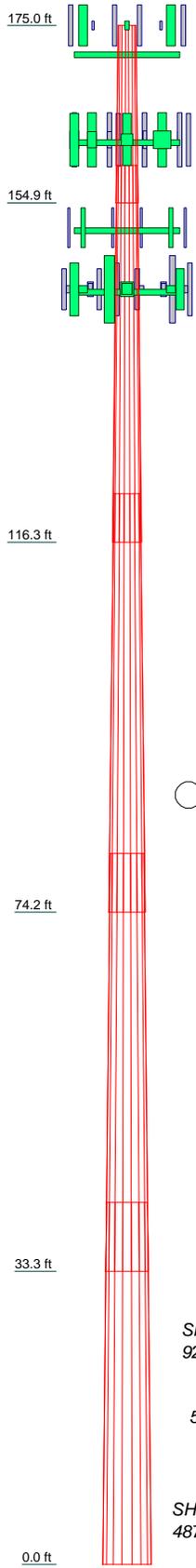
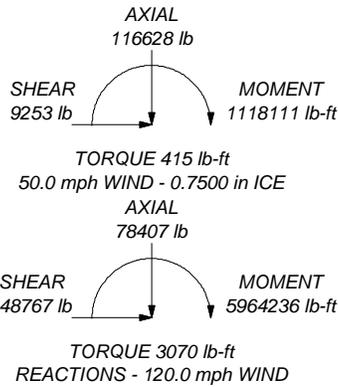
## MATERIAL STRENGTH

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

## TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 120.0 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.0 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.0 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 48.3%

ALL REACTIONS  
ARE FACTORED



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	20.13	18	0.1875	4.25	24.2100	29.4500	A572-65	1086.1
2	42.83	18	0.3750	5.42	27.9687	38.9900	A572-65	5742.6
3	47.54	18	0.5000	6.67	36.8453	49.0700	A572-65	10900.0
4	47.50	18	0.5630	7.83	46.3548	58.5800	A572-65	14991.6
5	41.17	18	0.6250	55.4388	66.0000		A572-65	16700.8
								49421.1

<b>Hudson Design Group LLC</b>			Job: <b>CT2198</b>		
45 Beechwood Drive			Project: <b>175 ft Monopole</b>		
North Andover, MA 01845			Client: AT&T		Drawn by: kw
Phone: (978) 557-5553			Code: TIA-222-G		Date: 04/20/18
FAX: (978) 336-5586			Path:		App'd: _____
					Scale: NTS
					Dwg No. E-1

<b>tnxTower</b>  <b>Hudson Design Group LLC</b> 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586	<b>Job</b>	CT2198	<b>Page</b>	1 of 9
	<b>Project</b>	175 ft Monopole	<b>Date</b>	10:05:33 04/20/18
	<b>Client</b>	AT&T	<b>Designed by</b>	kw

## Tower Input Data

There is a pole section.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Tower is located in New London County, Connecticut.

Basic wind speed of 120.0 mph.

Structure Class II.

Exposure Category B.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56.0 pcf.

A wind speed of 50.0 mph is used in combination with ice.

Temperature drop of 50.0 °F.

Deflections calculated using a wind speed of 60.0 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	175.00-154.87	20.13	4.25	18	24.2100	29.4500	0.1875	0.7500	A572-65 (65 ksi)
L2	154.87-116.29	42.83	5.42	18	27.9687	38.9900	0.3750	1.5000	A572-65 (65 ksi)
L3	116.29-74.17	47.54	6.67	18	36.8453	49.0700	0.5000	2.0000	A572-65 (65 ksi)
L4	74.17-33.34	47.50	7.83	18	46.3548	58.5800	0.5630	2.2520	A572-65 (65 ksi)
L5	33.34-0.00	41.17		18	55.4388	66.0000	0.6250	2.5000	A572-65 (65 ksi)

## Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A (1-5/8 FOAM)	B	Surface Ar (CaAa)	163.00 - 3.00	1	1	0.000 0.000	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	B	Surface Ar (CaAa)	163.00 - 3.00	1	1	0.000 0.000	1.9800		0.82

<b>tnxTower</b>  <b>Hudson Design Group LLC</b> 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586	<b>Job</b>	CT2198	<b>Page</b>	2 of 9
	<b>Project</b>	175 ft Monopole	<b>Date</b>	10:05:33 04/20/18
	<b>Client</b>	AT&T	<b>Designed by</b>	kw

**Feed Line/Linear Appurtenances - Entered As Area**

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C <sub>AA</sub>		Weight
						ft <sup>2</sup> /ft	plf	
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	173.00 - 3.00	13	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	163.00 - 3.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	153.00 - 3.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
*****								
LDF7-50A (1-5/8 FOAM) (AT&T - existing)	B	No	Inside Pole	145.00 - 3.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
WR-VG122ST-BRDA	B	No	Inside Pole	145.00 - 3.00	2	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
						1" Ice	0.00	0.25
FB-L98B-002	B	No	Inside Pole	145.00 - 3.00	1	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
						1" Ice	0.00	0.25

**Discrete Tower Loads**

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub>		Weight lb
			Horz ft	Vert ft			Front ft <sup>2</sup>	Side ft <sup>2</sup>	
(2) ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Face	3.50	0.0000	175.00	No Ice	6.37	5.78	104.90
			0.00			1/2" Ice	6.85	6.63	162.69
			0.00			1" Ice	7.30	7.35	227.28
(2) ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Face	3.50	0.0000	175.00	No Ice	6.37	5.78	104.90
			0.00			1/2" Ice	6.85	6.63	162.69
			0.00			1" Ice	7.30	7.35	227.28
(2) ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Face	3.50	0.0000	175.00	No Ice	6.37	5.78	104.90
			0.00			1/2" Ice	6.85	6.63	162.69
			0.00			1" Ice	7.30	7.35	227.28
KRY 112 71/2	A	From Face	3.50	0.0000	175.00	No Ice	0.58	0.45	13.20
			0.00			1/2" Ice	0.69	0.54	18.69
			0.00			1" Ice	0.80	0.64	25.81
KRY 112 71/2	B	From Face	3.50	0.0000	175.00	No Ice	0.58	0.45	13.20
			0.00			1/2" Ice	0.69	0.54	18.69
			0.00			1" Ice	0.80	0.64	25.81
KRY 112 71/2	C	From Face	3.50	0.0000	175.00	No Ice	0.58	0.45	13.20
			0.00			1/2" Ice	0.69	0.54	18.69
			0.00			1" Ice	0.80	0.64	25.81
PiROD 15' Low Profile Platform	A	None		0.0000	172.00	No Ice	17.30	17.30	1500.00
						1/2" Ice	22.10	22.10	2030.00
						1" Ice	26.90	26.90	2560.00
*****									
BXA-70063-6CF-EDIN w/mount pipe	A	From Face	3.50	0.0000	162.00	No Ice	7.83	5.82	42.55
			0.00			1/2" Ice	8.39	6.99	103.53
			0.00			1" Ice	8.91	7.87	172.25

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	<b>Project</b>	175 ft Monopole	<b>Date</b>	10:05:33 04/20/18
	<b>Client</b>	AT&T	<b>Designed by</b>	kw

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
BXA-70063-6CF-EDIN w/mount pipe	B	From Face	3.50	0.0000	162.00	No Ice	7.83	5.82	42.55
			0.00			1/2" Ice	8.39	6.99	103.53
			0.00			1" Ice	8.91	7.87	172.25
BXA-70063-6CF-EDIN w/mount pipe	C	From Face	3.50	0.0000	162.00	No Ice	7.83	5.82	42.55
			0.00			1/2" Ice	8.39	6.99	103.53
			0.00			1" Ice	8.91	7.87	172.25
Andrew LNX-6514DS-VTM w/mount pipe	A	From Face	3.50	0.0000	162.00	No Ice	8.40	7.07	63.95
			6.00			1/2" Ice	8.95	8.25	132.95
			0.00			1" Ice	9.48	9.15	209.97
Andrew LNX-6514DS-VTM w/mount pipe	B	From Face	3.50	0.0000	162.00	No Ice	8.40	7.07	63.95
			6.00			1/2" Ice	8.95	8.25	132.95
			0.00			1" Ice	9.48	9.15	209.97
Andrew LNX-6514DS-VTM w/mount pipe	C	From Face	3.50	0.0000	162.00	No Ice	8.40	7.07	63.95
			6.00			1/2" Ice	8.95	8.25	132.95
			0.00			1" Ice	9.48	9.15	209.97
HBXX-6517DS-VTM w/ Mount Pipe	A	From Face	3.50	0.0000	162.00	No Ice	8.71	6.91	66.35
			4.00			1/2" Ice	9.26	8.10	135.34
			0.00			1" Ice	9.79	9.01	212.45
HBXX-6517DS-VTM w/ Mount Pipe	B	From Face	3.50	0.0000	162.00	No Ice	8.71	6.91	66.35
			4.00			1/2" Ice	9.26	8.10	135.34
			0.00			1" Ice	9.79	9.01	212.45
HBXX-6517DS-VTM w/ Mount Pipe	C	From Face	3.50	0.0000	162.00	No Ice	8.71	6.91	66.35
			4.00			1/2" Ice	9.26	8.10	135.34
			0.00			1" Ice	9.79	9.01	212.45
HBXX-6517DS-VTM w/ Mount Pipe	A	From Face	3.50	0.0000	162.00	No Ice	8.71	6.91	66.35
			-4.00			1/2" Ice	9.26	8.10	135.34
			0.00			1" Ice	9.79	9.01	212.45
HBXX-6517DS-VTM w/ Mount Pipe	B	From Face	3.50	0.0000	162.00	No Ice	8.71	6.91	66.35
			-4.00			1/2" Ice	9.26	8.10	135.34
			0.00			1" Ice	9.79	9.01	212.45
HBXX-6517DS-VTM w/ Mount Pipe	C	From Face	3.50	0.0000	162.00	No Ice	8.71	6.91	66.35
			-4.00			1/2" Ice	9.26	8.10	135.34
			0.00			1" Ice	9.79	9.01	212.45
RRH2x60 PCS	A	From Face	3.50	0.0000	162.00	No Ice	2.15	1.35	55.00
			4.00			1/2" Ice	2.34	1.50	72.75
			0.00			1" Ice	2.54	1.67	93.35
RRH2x60 PCS	B	From Face	3.50	0.0000	162.00	No Ice	2.15	1.35	55.00
			4.00			1/2" Ice	2.34	1.50	72.75
			0.00			1" Ice	2.54	1.67	93.35
RRH2x60 PCS	C	From Face	3.50	0.0000	162.00	No Ice	2.15	1.35	55.00
			4.00			1/2" Ice	2.34	1.50	72.75
			0.00			1" Ice	2.54	1.67	93.35
RRH2X40-07-U	A	From Face	3.50	0.0000	162.00	No Ice	1.96	1.03	50.00
			0.00			1/2" Ice	2.14	1.17	66.78
			0.00			1" Ice	2.32	1.31	86.25
RRH2X40-07-U	B	From Face	3.50	0.0000	162.00	No Ice	1.96	1.03	50.00
			0.00			1/2" Ice	2.14	1.17	66.78
			0.00			1" Ice	2.32	1.31	86.25
RRH2X40-07-U	C	From Face	3.50	0.0000	162.00	No Ice	1.96	1.03	50.00
			0.00			1/2" Ice	2.14	1.17	66.78
			0.00			1" Ice	2.32	1.31	86.25
RRH2X40 AWS	A	From Face	3.50	0.0000	162.00	No Ice	2.16	1.42	44.00
			-4.00			1/2" Ice	2.36	1.59	61.40
			0.00			1" Ice	2.57	1.77	81.69
RRH2X40 AWS	B	From Face	3.50	0.0000	162.00	No Ice	2.16	1.42	44.00
			-4.00			1/2" Ice	2.36	1.59	61.40
			0.00			1" Ice	2.57	1.77	81.69

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	<b>Project</b>	175 ft Monopole	<b>Date</b>	10:05:33 04/20/18
	<b>Client</b>	AT&T	<b>Designed by</b>	kw

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb	
RRH2X40 AWS	C	From Face	3.50	0.0000		162.00	No Ice	2.16	1.42	44.00
			-4.00				1/2" Ice	2.36	1.59	61.40
			0.00				1" Ice	2.57	1.77	81.69
RFS DB-B1-6C-8AB-OZ	A	From Face	3.50	0.0000		162.00	No Ice	4.80	2.00	44.00
			-4.00				1/2" Ice	5.07	2.19	80.13
			0.00				1" Ice	5.35	2.39	120.22
RFS DB-B1-6C-8AB-OZ	C	From Face	3.50	0.0000		162.00	No Ice	4.80	2.00	44.00
			-4.00				1/2" Ice	5.07	2.19	80.13
			0.00				1" Ice	5.35	2.39	120.22
PiROD 15' Low Profile Platform	A	None		0.0000		162.00	No Ice	17.30	17.30	1500.00
							1/2" Ice	22.10	22.10	2030.00
							1" Ice	26.90	26.90	2560.00
*****										
APXV18-206516S-C-A20 w/mount pipe	A	From Face	3.50	0.0000		152.00	No Ice	4.00	3.45	41.50
			-5.00				1/2" Ice	4.47	4.28	77.56
			0.00				1" Ice	4.91	4.98	119.60
APXV18-206516S-C-A20 w/mount pipe	B	From Face	3.50	0.0000		152.00	No Ice	4.00	3.45	41.50
			-5.00				1/2" Ice	4.47	4.28	77.56
			0.00				1" Ice	4.91	4.98	119.60
APXV18-206516S-C-A20 w/mount pipe	C	From Face	3.50	0.0000		152.00	No Ice	4.00	3.45	41.50
			-5.00				1/2" Ice	4.47	4.28	77.56
			0.00				1" Ice	4.91	4.98	119.60
APXV18-206516S-C-A20 w/mount pipe	A	From Face	3.50	0.0000		152.00	No Ice	4.00	3.45	41.50
			5.00				1/2" Ice	4.47	4.28	77.56
			0.00				1" Ice	4.91	4.98	119.60
APXV18-206516S-C-A20 w/mount pipe	B	From Face	3.50	0.0000		152.00	No Ice	4.00	3.45	41.50
			5.00				1/2" Ice	4.47	4.28	77.56
			0.00				1" Ice	4.91	4.98	119.60
APXV18-206516S-C-A20 w/mount pipe	C	From Face	3.50	0.0000		152.00	No Ice	4.00	3.45	41.50
			5.00				1/2" Ice	4.47	4.28	77.56
			0.00				1" Ice	4.91	4.98	119.60
PiROD 15' Low Profile Platform	A	None		0.0000		152.00	No Ice	17.30	17.30	1500.00
							1/2" Ice	22.10	22.10	2030.00
							1" Ice	26.90	26.90	2560.00
*****										
Powerwave 7770 w/mount pipe (AT&T - existing)	A	From Face	3.50	0.0000		145.00	No Ice	5.65	4.10	57.25
			-6.00				1/2" Ice	6.03	4.75	103.17
			0.00				1" Ice	6.42	5.42	155.38
Powerwave 7770 w/mount pipe	B	From Face	3.50	0.0000		145.00	No Ice	5.65	4.10	57.25
			-6.00				1/2" Ice	6.03	4.75	103.17
			0.00				1" Ice	6.42	5.42	155.38
Powerwave 7770 w/mount pipe	C	From Face	3.50	0.0000		145.00	No Ice	5.65	4.10	57.25
			-6.00				1/2" Ice	6.03	4.75	103.17
			0.00				1" Ice	6.42	5.42	155.38
SBNHH-1D65A w/ Mount Pipe	A	From Face	3.50	0.0000		145.00	No Ice	6.28	5.34	55.90
			2.00				1/2" Ice	6.76	6.20	111.21
			0.00				1" Ice	7.22	6.93	173.23
HPA-65R-BUU-H6 w/mount pipe	B	From Face	3.50	0.0000		145.00	No Ice	13.28	9.65	100.85
			2.00				1/2" Ice	14.00	11.15	198.33
			0.00				1" Ice	14.73	12.68	305.71
HPA-65R-BUU-H6 w/mount pipe	C	From Face	3.50	0.0000		145.00	No Ice	13.28	9.65	100.85
			2.00				1/2" Ice	14.00	11.15	198.33
			0.00				1" Ice	14.73	12.68	305.71
KMW	A	From Face	3.50	0.0000		145.00	No Ice	8.26	6.30	74.05
AM-X-CD-16-65-00T-RET w/mount pipe			6.00				1/2" Ice	8.82	7.48	139.04
			0.00				1" Ice	9.35	8.37	211.91
KMW	B	From Face	3.50	0.0000		145.00	No Ice	8.26	6.30	74.05

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	<b>Client</b>	AT&T	<b>Designed by</b>	kw

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Lateral					
AM-X-CD-16-65-00T-RET			6.00			1/2" Ice	8.82	7.48	139.04
w/mount pipe			0.00			1" Ice	9.35	8.37	211.91
KMW	C	From Face	3.50	0.0000	145.00	No Ice	8.26	6.30	74.05
AM-X-CD-16-65-00T-RET			6.00			1/2" Ice	8.82	7.48	139.04
w/mount pipe			0.00			1" Ice	9.35	8.37	211.91
Ericsson RRUS-11	A	From Face	3.50	0.0000	145.00	No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.00	1.34	71.57
			0.00			1" Ice	3.21	1.50	95.48
Ericsson RRUS-11	B	From Face	3.50	0.0000	145.00	No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.00	1.34	71.57
			0.00			1" Ice	3.21	1.50	95.48
Ericsson RRUS-11	C	From Face	3.50	0.0000	145.00	No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.00	1.34	71.57
			0.00			1" Ice	3.21	1.50	95.48
(2) TMA	A	From Face	3.50	0.0000	145.00	No Ice	0.98	0.34	19.20
DTMABP7819VG12A			0.00			1/2" Ice	1.10	0.42	26.50
			0.00			1" Ice	1.23	0.51	35.65
(2) TMA	B	From Face	3.50	0.0000	145.00	No Ice	0.98	0.34	19.20
DTMABP7819VG12A			0.00			1/2" Ice	1.10	0.42	26.50
			0.00			1" Ice	1.23	0.51	35.65
(2) TMA	C	From Face	3.50	0.0000	145.00	No Ice	0.98	0.34	19.20
DTMABP7819VG12A			0.00			1/2" Ice	1.10	0.42	26.50
			0.00			1" Ice	1.23	0.51	35.65
DC6-48-60-18-8F	A	From Face	1.00	0.0000	145.00	No Ice	0.79	0.79	20.00
			0.00			1/2" Ice	1.27	1.27	35.12
			0.00			1" Ice	1.45	1.45	52.57
PiROD 15' Low Profile Platform	A	None		0.0000	145.00	No Ice	17.30	17.30	1500.00
						1/2" Ice	22.10	22.10	2030.00
						1" Ice	26.90	26.90	2560.00
*****									
B25 4415	A	From Face	3.50	0.0000	145.00	No Ice	1.65	0.93	60.00
(AT&T - proposed)			0.00			1/2" Ice	1.81	1.05	74.37
			0.00			1" Ice	1.98	1.19	91.23
B25 4415	B	From Face	3.50	0.0000	145.00	No Ice	1.65	0.93	60.00
			0.00			1/2" Ice	1.81	1.05	74.37
			0.00			1" Ice	1.98	1.19	91.23
B25 4415	C	From Face	3.50	0.0000	145.00	No Ice	1.65	0.93	60.00
			0.00			1/2" Ice	1.81	1.05	74.37
			0.00			1" Ice	1.98	1.19	91.23

## Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice

<p style="text-align: center;"><b>tnxTower</b></p> <p style="text-align: center;"><b>Hudson Design Group LLC</b>  45 Beechwood Drive  North Andover, MA 01845  Phone: (978) 557-5553  FAX: (978) 336-5586</p>	<b>Job</b>	CT2198	<b>Page</b>	6 of 9
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	<b>Client</b>	AT&T	<b>Designed by</b>	kw

Comb. No.	Description
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	26	116627.76	0.00	0.00
	Max. H <sub>x</sub>	20	78407.13	48392.91	6.22
	Max. H <sub>z</sub>	2	78407.13	6.22	48591.27
	Max. M <sub>x</sub>	2	5938765.93	6.22	48591.27
	Max. M <sub>z</sub>	8	5908180.11	-48392.91	-6.22
	Max. Torsion	21	3068.92	48392.90	6.22
	Min. Vert	23	58805.35	41912.59	24301.02
	Min. H <sub>x</sub>	8	78407.13	-48392.91	-6.22
	Min. H <sub>z</sub>	14	78407.13	-6.22	-48591.27
	Min. M <sub>x</sub>	14	-5939165.79	-6.22	-48591.27
	Min. M <sub>z</sub>	20	-5907019.07	48392.91	6.22

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Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. Torsion	9	-3069.59	-48392.90	-6.22

## Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>z</sub> lb	Overturning Moment, M <sub>x</sub> lb-ft	Overturning Moment, M <sub>z</sub> lb-ft	Torque lb-ft
Dead Only	65339.28	0.00	0.00	153.30	-471.14	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	78407.13	-6.22	-48591.27	-5938765.93	1944.45	775.13
0.9 Dead+1.6 Wind 0 deg - No Ice	58805.35	-6.22	-48591.26	-5896767.32	2063.24	775.65
1.2 Dead+1.6 Wind 30 deg - No Ice	78407.13	24191.06	-42078.16	-5141862.33	-2952172.79	2204.85
0.9 Dead+1.6 Wind 30 deg - No Ice	58805.35	24191.06	-42078.16	-5105506.88	-2931143.75	2206.77
1.2 Dead+1.6 Wind 60 deg - No Ice	78407.13	41906.37	-24290.24	-2967138.08	-5115442.58	3043.72
0.9 Dead+1.6 Wind 60 deg - No Ice	58805.35	41906.37	-24290.24	-2946184.75	-5079096.29	3046.55
1.2 Dead+1.6 Wind 90 deg - No Ice	78407.13	48392.91	6.22	2708.56	-5908180.11	3066.64
0.9 Dead+1.6 Wind 90 deg - No Ice	58805.35	48392.90	6.22	2629.72	-5866218.95	3069.59
1.2 Dead+1.6 Wind 120 deg - No Ice	78407.13	41912.59	24301.02	2971878.86	-5117964.19	2267.42
0.9 Dead+1.6 Wind 120 deg - No Ice	58805.35	41912.59	24301.02	2950774.07	-5081586.46	2269.74
1.2 Dead+1.6 Wind 150 deg - No Ice	78407.13	24311.98	42275.15	5171139.01	-2971773.15	860.80
0.9 Dead+1.6 Wind 150 deg - No Ice	58805.35	24311.98	42275.15	5134469.39	-2950587.25	861.87
1.2 Dead+1.6 Wind 180 deg - No Ice	78407.13	6.22	48591.27	5939165.79	-3099.83	-775.83
0.9 Dead+1.6 Wind 180 deg - No Ice	58805.35	6.22	48591.26	5897059.94	-2923.49	-776.33
1.2 Dead+1.6 Wind 210 deg - No Ice	78407.13	-24191.06	42078.16	5142252.99	2951027.88	-2204.45
0.9 Dead+1.6 Wind 210 deg - No Ice	58805.35	-24191.06	42078.16	5105792.72	2930291.22	-2206.39
1.2 Dead+1.6 Wind 240 deg - No Ice	78407.13	-41906.37	24290.24	2967515.14	5114294.83	-3042.68
0.9 Dead+1.6 Wind 240 deg - No Ice	58805.35	-41906.37	24290.24	2946460.56	5078241.66	-3045.51
1.2 Dead+1.6 Wind 270 deg - No Ice	78407.13	-48392.91	-6.22	-2335.83	5907019.07	-3065.96
0.9 Dead+1.6 Wind 270 deg - No Ice	58805.35	-48392.90	-6.22	-2357.12	5865354.52	-3068.92
1.2 Dead+1.6 Wind 300 deg - No Ice	78407.13	-41912.59	-24301.02	-2971497.01	5116792.69	-2267.78
0.9 Dead+1.6 Wind 300 deg - No Ice	58805.35	-41912.59	-24301.02	-2950494.72	5080714.32	-2270.11
1.2 Dead+1.6 Wind 330 deg - No Ice	78407.13	-24311.98	-42275.15	-5170743.62	2970604.48	-861.91
0.9 Dead+1.6 Wind 330 deg - No Ice	58805.35	-24311.98	-42275.15	-5134180.07	2949717.20	-862.95

<p style="text-align: center;"><b>tnxTower</b></p> <p style="text-align: center;"><b>Hudson Design Group LLC</b> 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586</p>	<b>Job</b>	CT2198	<b>Page</b>	8 of 9	
	<b>Project</b>	175 ft Monopole		<b>Date</b>	10:05:33 04/20/18
	<b>Client</b>	AT&T		<b>Designed by</b>	kw

Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>z</sub> lb	Overturning Moment, M <sub>x</sub> lb-ft	Overturning Moment, M <sub>z</sub> lb-ft	Torque lb-ft
1.2 Dead+1.0 Ice+1.0 Temp	116627.76	0.00	0.00	-789.73	-4848.84	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	116627.76	-5.72	-9252.94	-1116041.34	-4059.24	121.17
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	116627.76	4612.58	-8010.42	-966078.31	-560376.55	309.71
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	116627.76	7994.93	-4621.52	-557449.06	-967918.13	415.25
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	116627.76	9235.06	5.72	354.80	-1117483.41	409.50
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	116627.76	8000.65	4631.42	557870.16	-968996.28	294.03
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	116627.76	4622.48	8016.14	965711.13	-562243.67	99.77
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	116627.76	5.72	9252.94	1114596.96	-6214.59	-121.23
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	116627.76	-4612.58	8010.42	964633.67	550103.37	-309.76
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	116627.76	-7994.93	4621.52	556003.73	957645.03	-415.30
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	116627.76	-9235.06	-5.72	-1800.55	1107209.75	-409.58
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	116627.76	-8000.65	-4631.42	-559315.65	958721.99	-294.12
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	116627.76	-4622.48	-8016.14	-967155.94	551969.29	-99.85
Dead+Wind 0 deg - Service	65339.28	-0.87	-6793.19	-826844.49	-131.99	109.20
Dead+Wind 30 deg - Service	65339.28	3381.97	-5882.64	-715870.85	-411497.15	310.55
Dead+Wind 60 deg - Service	65339.28	5858.62	-3395.84	-413035.62	-712731.44	428.68
Dead+Wind 90 deg - Service	65339.28	6765.46	0.87	516.88	-823119.28	431.94
Dead+Wind 120 deg - Service	65339.28	5859.49	3397.35	413975.52	-713082.20	319.46
Dead+Wind 150 deg - Service	65339.28	3398.88	5910.18	720232.63	-414228.25	121.38
Dead+Wind 180 deg - Service	65339.28	0.87	6793.19	827177.49	-833.18	-109.21
Dead+Wind 210 deg - Service	65339.28	-3381.97	5882.64	716203.70	410532.15	-310.54
Dead+Wind 240 deg - Service	65339.28	-5858.62	3395.84	413368.25	711766.40	-428.67
Dead+Wind 270 deg - Service	65339.28	-6765.46	-0.87	-184.32	822154.02	-431.94
Dead+Wind 300 deg - Service	65339.28	-5859.49	-3397.35	-413642.81	712116.77	-319.47
Dead+Wind 330 deg - Service	65339.28	-3398.88	-5910.18	-719899.70	413262.88	-121.40

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 154.87	12.1210	44	0.6229	0.0017
L2	159.12 - 116.29	10.0666	44	0.6066	0.0016
L3	121.71 - 74.17	5.7340	44	0.4711	0.0007
L4	80.84 - 33.34	2.4241	44	0.2907	0.0003
L5	41.17 - 0	0.6178	44	0.1349	0.0001

### Critical Deflections and Radius of Curvature - Service Wind

<b>tnxTower</b>  <b>Hudson Design Group LLC</b> 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586	<b>Job</b>	CT2198	<b>Page</b>	9 of 9
	<b>Project</b>	175 ft Monopole	<b>Date</b>	10:05:33 04/20/18
	<b>Client</b>	AT&T	<b>Designed by</b>	kw

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	(2) ERICSSON AIR 21 B2A B4P w/ Mount Pipe	44	12.1210	0.6229	0.0018	94033
172.00	PiROD 15' Low Profile Platform	44	11.7298	0.6209	0.0017	94033
162.00	BXA-70063-6CF-EDIN w/mount pipe	44	10.4346	0.6112	0.0017	36230
152.00	APXV18-206516S-C-A20 w/mount pipe	44	9.1720	0.5903	0.0015	22987
145.00	Powerwave 7770 w/mount pipe	44	8.3182	0.5684	0.0013	18832

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$\phi P_{allow}$ lb	% Capacity	Pass Fail
L1	175 - 154.87	Pole	TP29.45x24.21x0.1875	1	-5987.49	1088510.00	17.6	Pass
L2	154.87 - 116.29	Pole	TP38.99x27.9687x0.375	2	-18422.70	3291380.00	42.6	Pass
L3	116.29 - 74.17	Pole	TP49.07x36.8453x0.5	3	-32973.80	5524470.00	47.0	Pass
L4	74.17 - 33.34	Pole	TP58.58x46.3548x0.563	4	-52414.50	7434930.00	48.3	Pass
L5	33.34 - 0	Pole	TP66x55.4388x0.625	5	-78388.90	9525500.00	47.5	Pass
Summary								
Pole (L4)							48.3	Pass
<b>RATING =</b>							<b>48.3</b>	<b>Pass</b>

## Stiffened or Unstiffened, UngROUTed, Circular Base Plate - Any Rod Material

**TIA Rev G** Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)\*(Rod Diameter)

### Site Data

BU#: CT2198
Site Name: 0
App #: 0
Pole Manufacturer: <i>Other</i>

### Anchor Rod Data

Qty:	32	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	75	in

### Plate Data

Diam:	81	in
Thick:	2.5	in
Grade:	60	ksi
Single-Rod B-eff:	6.55	in

### Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

### Pole Data

Diam:	66	in
Thick:	0.625	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

### Reactions

Mu:	5964	ft-kips
Axial, Pu:	78	kips
Shear, Vu:	49	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria: **AISC LRFD** <-Only Applicable to Unstiffened Cases

### Anchor Rod Results

Max Rod (Cu+ Vu/η): 124.8 Kips  
 Allowable Axial,  $\phi * F_u * A_{net}$ : 260.0 Kips  
 Anchor Rod Stress Ratio: 48.0% **Pass**

Rigid
AISC LRFD
$\phi * T_n$

### Base Plate Results

Base Plate Stress: 32.7 ksi  
 Allowable Plate Stress: 54.0 ksi  
 Base Plate Stress Ratio: 60.6% **Pass**

Flexural Check

Rigid
AISC LRFD
$\phi * F_y$
Y.L. Length:
35.62

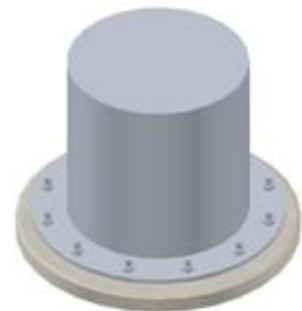
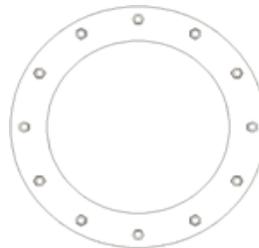
**n/a**

### Stiffener Results

Horizontal Weld : n/a  
 Vertical Weld: n/a  
 Plate Flex+Shear,  $f_b/F_b + (f_v/F_v)^2$ : n/a  
 Plate Tension+Shear,  $f_t/F_t + (f_v/F_v)^2$ : n/a  
 Plate Comp. (AISC Bracket): n/a

### Pole Results

Pole Punching Shear Check: n/a



\* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

\*\* Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

# Monopole Pier and Pad Foundation

**BU # :** CT2198

**Site Name:**

**App. Number:**

TIA-222 Revision: G

Design Reactions		
Shear, <b>S:</b>	49	kips
Moment, <b>M:</b>	5964	ft-kips
Tower Height, <b>H:</b>	175	ft
Tower Weight, <b>Wt:</b>	78	kips
Base Diameter, <b>BD:</b>	5.50	ft

Foundation Dimensions		
Depth, <b>D:</b>	4.5	ft
Pad Width, <b>W:</b>	34	ft
Neglected Depth, <b>N:</b>	3.3	ft
Thickness, <b>T:</b>	3.00	ft
Pier Diameter, <b>Pd:</b>	8.00	ft
Ext. Above Grade, <b>E:</b>	1.00	ft
BP Dist. Above Pier:	3	in.
Clear Cover, <b>Cc:</b>	3.0	in

Soil Properties		
Soil Unit Weight, <b>γ:</b>	0.100	kcf
Ult. Bearing Capacity, <b>Bc:</b>	12.0	ksf
Angle of Friction, <b>Φ:</b>	30	deg
Cohesion, <b>Co:</b>	0.000	ksf
Passive Pressure, <b>Pp:</b>	0.000	ksf
Base Friction, <b>μ:</b>	0.45	

Material Properties		
Rebar Yield Strength, <b>Fy:</b>	60000	psi
Concrete Strength, <b>F'c:</b>	4000	psi
Concrete Unit Weight, <b>δc:</b>	0.150	kcf
Seismic Zone, <b>z:</b>	2	

Rebar Properties		
Pier Rebar Size, <b>Sp:</b>	9	
Pier Rebar Quantity, <b>mp:</b>	60	37
Pad Rebar Size, <b>Spad:</b>	9	
Pad Rebar Quantity, <b>mpad:</b>	36	15
Pier Tie Size, <b>St:</b>	4	3
Tie Quantity, <b>mt:</b>	5	6

Design Checks			
	Capacity/ Availability	Demand/ Limits	Check
<i>Req'd Pier Diam.(ft)</i>	8	7.5	<b>OK</b>
<i>Overtuning (ft-kips)</i>	10895.93	5964.00	<b>54.7%</b>
<i>Shear Capacity (kips)</i>	267.26	49.00	<b>18.3%</b>
<i>Bearing (ksf)</i>	9.00	1.53	<b>17.1%</b>
<i>Pad Shear - 1-way (kips)</i>	1255.48	483.56	<b>38.5%</b>
<i>Pad Shear - 2-way (kips)</i>	2483.22	119.47	<b>4.8%</b>
<i>Pad Moment Capacity (k-ft)</i>	5128.51	2339.43	<b>45.6%</b>
<i>Pier Moment Capacity (k-ft)</i>	9815.92	6086.50	<b>62.0%</b>

## 62-1 BOGGY HOLE RD

**Location** 62-1 BOGGY HOLE RD

**Mblu** 22 / / 74 / /

**Acct#** 00113800

**Owner** SANDERS MICHAEL W

**Assessment** \$28,000

**Appraisal** \$40,000

**PID** 1293

**Building Count** 1

### Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2014	\$0	\$40,000	\$40,000

Assessment			
Valuation Year	Improvements	Land	Total
2014	\$0	\$28,000	\$28,000

### Owner of Record

**Owner** SANDERS MICHAEL W  
**Co-Owner**  
**Address** 72 BOGGY HOLE RD  
 OLD LYME, CT 06371

**Sale Price** \$75,000  
**Certificate**  
**Book & Page** 280 / 675  
**Sale Date** 03/01/2002

### Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
SANDERS MICHAEL W	\$75,000		280 / 675	03/01/2002
MACHNIK JOSEPH E	\$0		146 / 481	

### Building Information

#### Building 1 : Section 1

**Year Built:**  
**Living Area:** 0  
**Replacement Cost:** \$0  
**Building Percent Good:**  
**Replacement Cost Less Depreciation:** \$0

#### Building Photo

Building Attributes	
Field	Description
Style	Vacant Land

Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	



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

### Building Layout

Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

### Extra Features

Extra Features	Legend
No Data for Extra Features	

### Land

#### Land Use

**Use Code** 1300  
**Description** RES ACLNDV MDL-00  
**Zone** RU80  
**Neighborhood** 0050  
**Alt Land Appr Category** No

#### Land Line Valuation

**Size (Acres)** 10  
**Frontage** 0  
**Depth** 0  
**Assessed Value** \$28,000  
**Appraised Value** \$40,000

### Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

### Valuation History

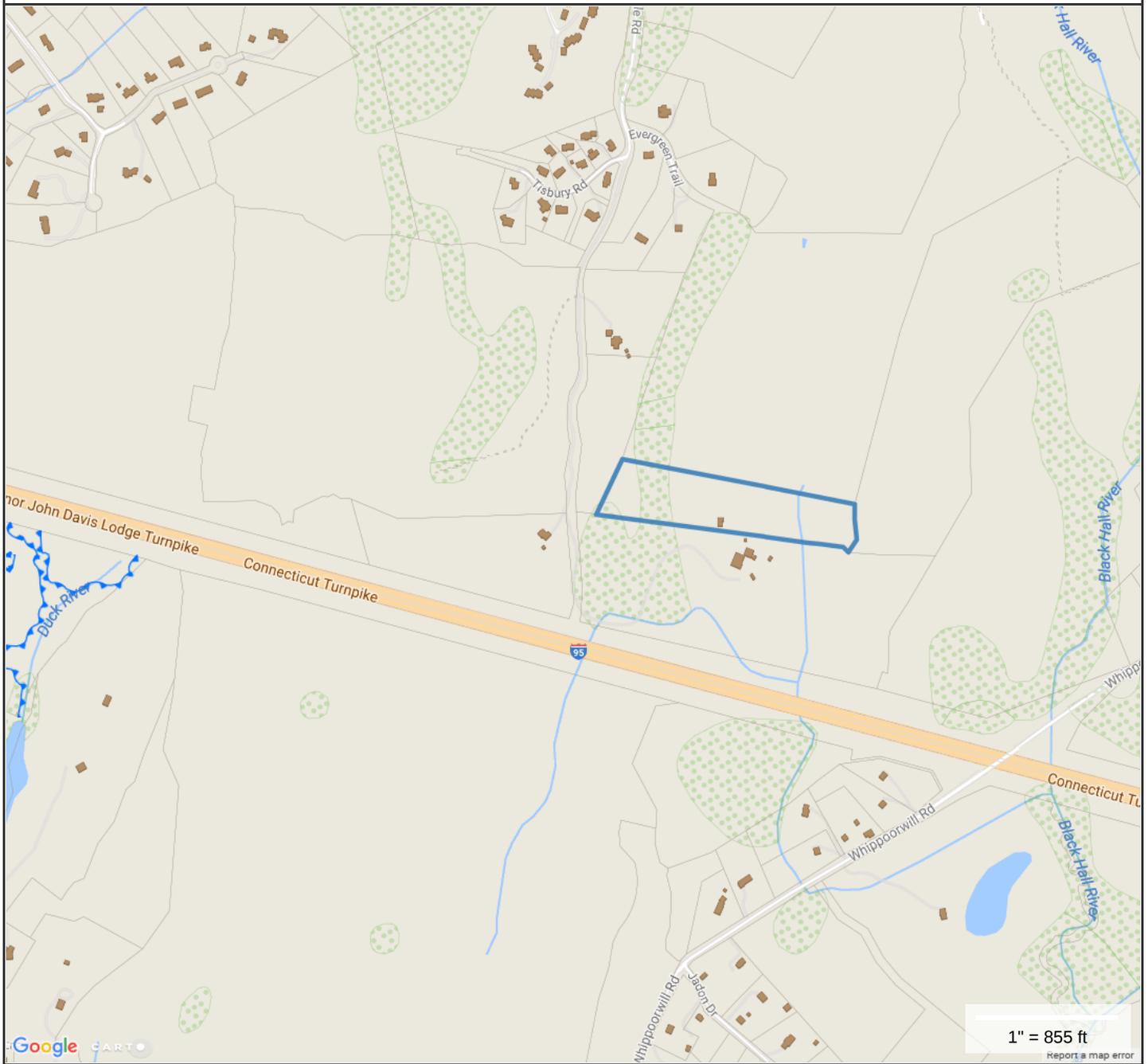
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<b>Appraisal</b>			
<b>Valuation Year</b>	<b>Improvements</b>	<b>Land</b>	<b>Total</b>
2011	\$0	\$40,000	\$40,000
2010	\$0	\$40,000	\$40,000
2009	\$0	\$40,000	\$40,000

<b>Assessment</b>			
<b>Valuation Year</b>	<b>Improvements</b>	<b>Land</b>	<b>Total</b>
2011	\$0	\$28,000	\$28,000
2010	\$0	\$28,000	\$28,000
2009	\$0	\$28,000	\$28,000

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# 62 - 1 BOGGY HOLE ROAD



**Property Information**

**Property ID** 22-74  
**Location** 62-1 BOGGY HOLE RD  
**Owner** SANDERS MICHAEL W



**MAP FOR REFERENCE ONLY  
NOT A LEGAL DOCUMENT**

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

Parcels updated 10/1/2016  
Properties updated 04/26/2018



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**P**

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**US POSTAGE** \$6.70  
 Flat Rate Env  
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04/28/2018

Mailed from 06268 062S0000001307

**PRIORITY MAIL 1-DAY™**

Expected Delivery Date: 04/30/18

MARK J ROBERTS  
 QC DEVELOPMENT  
 PO BOX 916  
 STORRS CT 06268-0916

**0024**

**R005**

SHIP TO: BONNIE REEMSNYDER  
 TOWN OF OLD LYME  
 52 LYME ST  
 OLD LYME CT 06371-2331

**USPS TRACKING #**



**9405 8036 9930 0628 6586 76**

Electronic Rate Approved #038555749



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### Instructions

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- Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
- To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
- Mail your package on the "Ship Date" you selected when creating this label.

### Click-N-Ship® Label Record

**USPS TRACKING # / Insurance Number:  
9405 8036 9930 0628 6586 76**

Trans. #:	433520825	Priority Mail® Postage:	<b>\$6.70</b>
Print Date:	04/26/2018	Insurance Fee	<b>\$0.00</b>
Ship Date:	04/28/2018	Total	<b>\$6.70</b>
Expected Delivery Date:	04/30/2018		
Insured Value:	\$50.00		

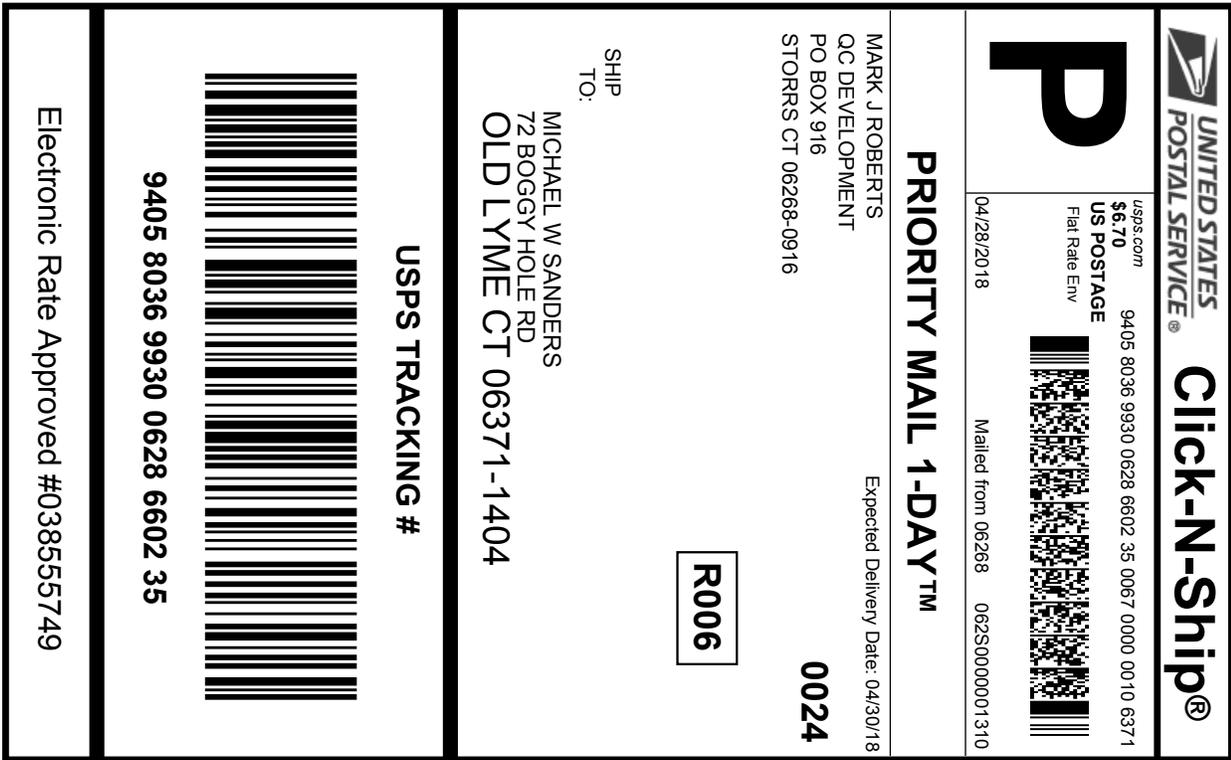
**From:** MARK J ROBERTS  
 QC DEVELOPMENT  
 PO BOX 916  
 STORRS CT 06268-0916

**To:** BONNIE REEMSNYDER  
 TOWN OF OLD LYME  
 52 LYME ST  
 OLD LYME CT 06371-2331

\* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.



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3. Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
5. Mail your package on the "Ship Date" you selected when creating this label.

### Click-N-Ship® Label Record

**USPS TRACKING # / Insurance Number:**  
**9405 8036 9930 0628 6602 35**

Trans. #:	433520499	Priority Mail® Postage:	<b>\$6.70</b>
Print Date:	04/26/2018	Insurance Fee	<b>\$0.00</b>
Ship Date:	04/28/2018	Total	<b>\$6.70</b>
Expected Delivery Date:	04/30/2018		
Insured Value:	\$50.00		

**From:** MARK J ROBERTS  
 QC DEVELOPMENT  
 PO BOX 916  
 STORRS CT 06268-0916

**To:** MICHAEL W SANDERS  
 72 BOGGY HOLE RD  
 OLD LYME CT 06371-1404

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