



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

May 11, 2012

John Lawrence
Real Estate Consultant
95 Ryan Drive, Suite #1
Raynham, MA 02767

RE: **EM-AT&T-007-120427B** – AT&T Mobility notice of intent to modify an existing telecommunications facility located at 1657 Wilbur Cross Highway, Berlin, Connecticut.

Dear Mr. Lawrence:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated April 27, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of

uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Handwritten signature of Linda Roberts in cursive, with the initials "LR" written at the end.

Linda Roberts
Executive Director

LR/cm

- c: The Honorable Adam P. Salina, Mayor, Town of Berlin
- Denise McNairHellyn Riggins, Town Planner, Town of Berlin



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April 27, 2012

The Honorable Adam P. Salina
Mayor
Town of Berlin
240 Kensington Road
Kensington, CT 06037

RE: **EM-AT&T-007-120427B** – AT&T Mobility notice of intent to modify an existing telecommunications facility located at 1657 Wilbur Cross Highway, Berlin, Connecticut.

Dear Mayor Salina:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by May 11, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/cm

Enclosure: Notice of Intent

c: Denise McNair, Town Manager, Town of Berlin
Hellyn Riggins, Town Planner, Town of Berlin



EM-AT&T-007-120427B

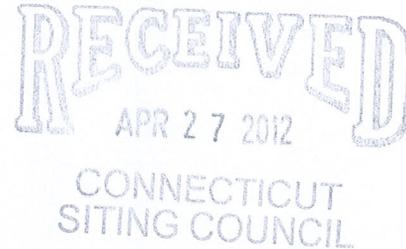
**New Cingular Wireless
PCS, LLC**
500 Enterprise Drive
Rocky Hill, Connecticut 06067

ORIGINAL

John Lawrence
Real Estate Consultant
95 Ryan Drive, Suite #1
Raynham, MA 02767
Phone: (781) 715-5532
jlawrence@clinellc.com

April 19, 2012

Honorable Robert Stein, Chairman,
and Members of the Connecticut Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051



**Re: Notice of Exempt Modification – Existing Telecommunications Facility at 1657
Wilbur Cross Highway**

Dear Chairman Stein and Members of the Council:

New Cingular Wireless PCS, LLC (“AT&T”) intends to modify the existing telecommunications antennas and associated equipment at an existing multicarrier telecommunications tower at 1657 Wilbur Cross Highway, Wethersfield, CT. AT&T operates under licenses issued by the Federal Communications Commission (“FCC”) to provide cellular and PCS mobile telephone service in Hartford County, which includes the area to be served by AT&T’s proposed installation.

In order to accommodate technological changes, implement Long Term Evolution (“LTE”) capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC (“AT&T”) plans to modify the equipment configurations at many of its existing cell sites. LTE is a new high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Please accept this letter as notification to the Council, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter is being sent to the Town Manager Denise McNair.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T’s operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

Existing Facility

The Berlin facility is located at 1657 Wilbur Cross Highway, Berlin CT.

The facility is owned by AT&T.

The existing facility consists of a 176 foot monopole tower. AT&T currently operates wireless communications equipment at the facility and has three (3) antennas mounted at the tower centerline height of 170 feet.

Statutory Considerations

The changes to the Berlin facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2) because they will not result in any substantial adverse environmental effect.

1. The height of the overall structure will be unaffected.
2. The proposed changes will not affect the property boundaries. All new construction will take place inside the existing fenced compound.
3. The proposed additions will not increase the noise level at the existing facility by six decibels or more.
4. LTE will utilize additional radio frequencies newly licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, New Cingular Wireless respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A Section §16-50j-72(b)(2).

Respectfully yours,



John Lawrence
Real Estate Consultant

Enclosures:

Denise McNair, Town Manager



**New Cingular Wireless
PCS, LLC**
500 Enterprise Drive
Rocky Hill, Connecticut 06067

John Lawrence
Real Estate Consultant
95 Ryan Drive, Suite #1
Raynham, MA 02767
Phone: (781) 715-5532
jlawrence@clinellc.com

April 19, 2012

Denise McNair, Town Manager
Berlin Town Hall
240 Kensington Road
Berlin, CT 06037

**Re: Notice of Exempt Modification – Existing Telecommunications Facility at 1657
Wilbur Cross Highway**

Dear Denise,

New Cingular Wireless PCS, LLC (“AT&T”) intends to replace telecommunications antennas and associated equipment at an existing telecommunications tower, owned and operated by AT&T.

A Notice of Exempt Modification has been filed with the Connecticut Siting Council as required by Regulations of Connecticut State Agencies (“R.C.S.A.”) Section 16-50j-73. Please accept this letter as notification to the Town of Farmington under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The attached letter fully sets forth the AT&T proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council’s procedures, please contact John Lawrence at (781) 715-5532 or Linda Roberts, Executive Director of the Connecticut Siting Council, at (860) 827-2935.

Sincerely,

John Lawrence
Real Estate Consultant

Enclosure

CC: Honorable Robert Stein, Chairmen of the Connecticut Siting Council

CT5375 – Berlin E Central – 1657 Wilbur Cross Hwy, CT

Aerial Location Map



Street Location Map

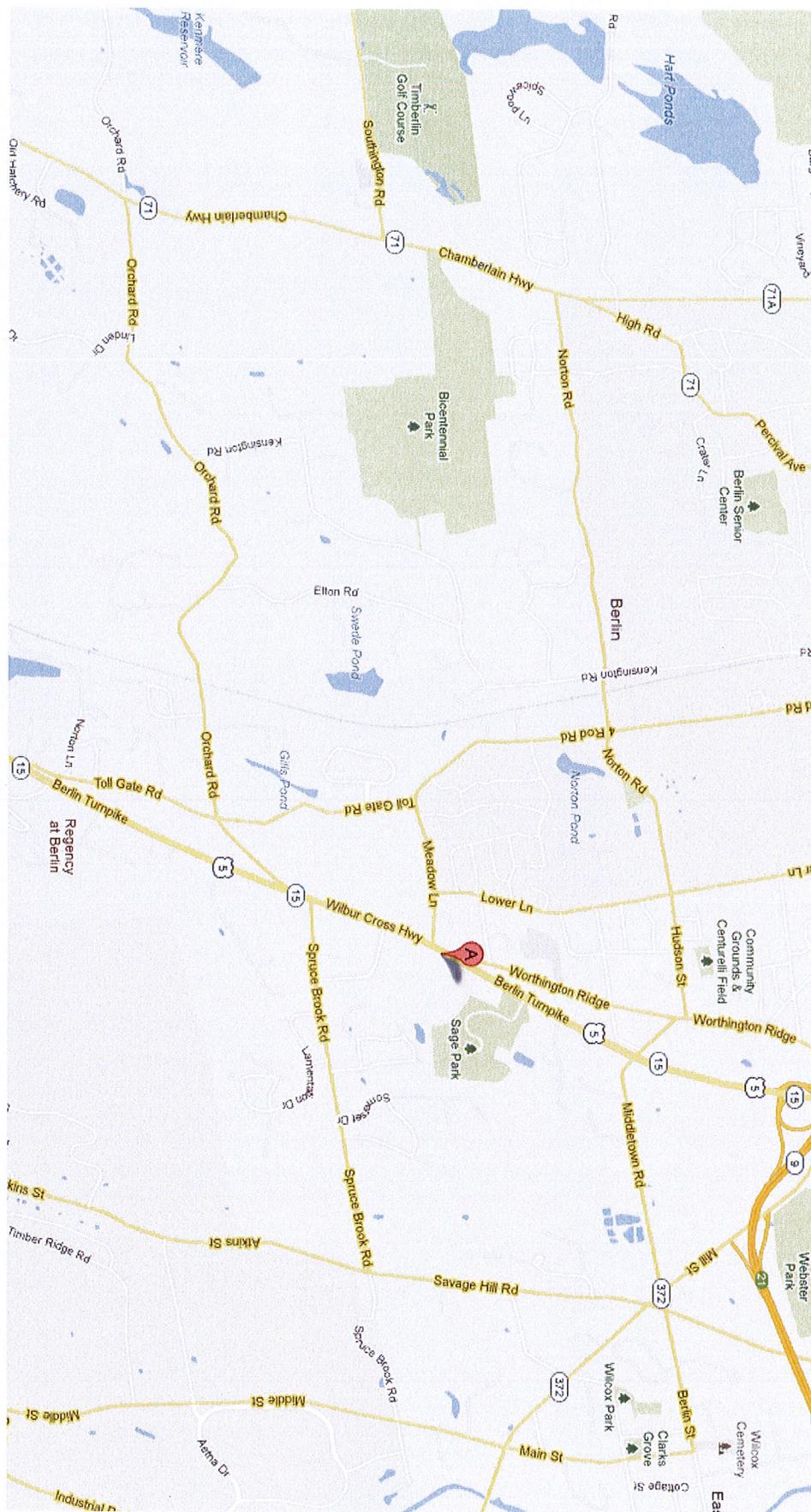


EXHIBIT 1

PROJECT INFORMATION

SCOPE OF WORK: UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
 SITE ADDRESS: 1657 WILBUR CROSS HIGHWAY
 BERLIN, CT 06037
 LATITUDE: 41.606300 N 41° 36' 22.7" N
 LONGITUDE: -72.749600 W -72° 44' 58.6" W
 JURISDICTION: NATIONAL, STATE & LOCAL CODES OR ORDINANCES
 CURRENT USE: TELECOMMUNICATIONS FACILITY
 PROPOSED USE: TELECOMMUNICATIONS FACILITY



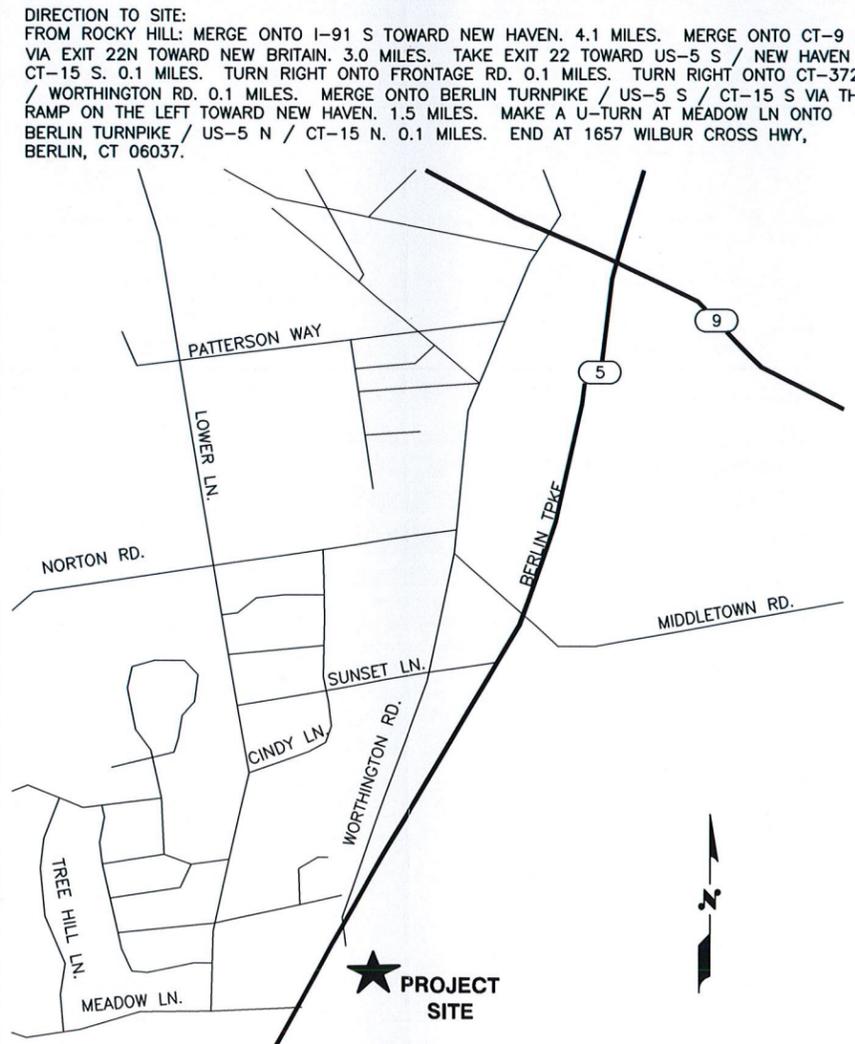
SITE NUMBER: CT5375
SITE NAME: BERLIN E CENTRAL

DRAWING INDEX

REV

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VICINITY MAP



DIRECTION TO SITE:
 FROM ROCKY HILL: MERGE ONTO I-91 S TOWARD NEW HAVEN. 4.1 MILES. MERGE ONTO CT-9 N VIA EXIT 22N TOWARD NEW BRITAIN. 3.0 MILES. TAKE EXIT 22 TOWARD US-5 S / NEW HAVEN / CT-15 S. 0.1 MILES. TURN RIGHT ONTO FRONTAGE RD. 0.1 MILES. TURN RIGHT ONTO CT-372 / WORTHINGTON RD. 0.1 MILES. MERGE ONTO BERLIN TURNPIKE / US-5 S / CT-15 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. 1.5 MILES. MAKE A U-TURN AT MEADOW LN ONTO BERLIN TURNPIKE / US-5 N / CT-15 N. 0.1 MILES. END AT 1657 WILBUR CROSS HWY, BERLIN, CT 06037.

GENERAL NOTES

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

72 HOURS



BEFORE YOU DIG



CALL TOLL FREE 800-922-4455

UNDERGROUND SERVICE ALERT

Hudson Design Group, Inc.



1400 OSGOOD STREET
 BUILDING 20 NORTH, SUITE 2-101
 N. ANDOVER, MA 01845
 TEL: (978) 557-5553
 FAX: (978) 336-5586



a UniTek GLOBAL SERVICES company
 800 MARSHALL PHELPS ROAD UNIT#: 2A
 WINDSOR, CT 06095

SITE NUMBER: CT5375
SITE NAME: BERLIN E CENTRAL
 1657 WILBUR CROSS HIGHWAY
 BERLIN, CT 06037
 HARTFORD COUNTY



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

						AT&T	
1	04/10/12	ISSUED FOR CONSTRUCTION	HC	DB	DPH	TITLE SHEET (LTE)	
0	03/08/12	ISSUED FOR REVIEW	DB	DC	DRY		
NO.	DATE	REVISIONS	BY	CHK	APP	JOB NUMBER	DRAWING NUMBER
						5375.01	T-1
SCALE: AS SHOWN		DESIGNED BY: DC	DRAWN BY: DB		REV		
						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 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 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 - NEXLINK
 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 UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY 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: 2003 IBC WITH 2005 CT SUPPLEMENT & 2009 CT 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, NINTH EDITION;

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

ANTENNA TOWER 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	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF	REFERENCE	TYP	TYPICAL
EGR	EQUIPMENT GROUND RING	CONNECTIONS REQUIRED			

1600 OSGOOD STREET
 BUILDING 20 NORTH, SUITE 2-101
 N. ANDOVER, MA 01845
 TEL: (978) 557-5553
 FAX: (978) 336-5586

a UniTek GLOBAL SERVICES company
 800 MARSHALL PHELPS ROAD UNIT#: 2A
 WINDSOR, CT 06095

SITE NUMBER: CT5375
SITE NAME: BERLIN E CENTRAL
 1657 WILBUR CROSS HIGHWAY
 BERLIN, CT 06037
 HARTFORD COUNTY

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

NO.		DATE	REVISIONS	BY	CHK	APP	DATE	JOB NUMBER	DRAWING NUMBER	REV	
1	04/10/12		ISSUED FOR CONSTRUCTION	HC	DC	DPH		0375.01	GN-1	1	
0	03/08/12		ISSUED FOR REVIEW	DC	DC	DPH					
SCALE:		AS SHOWN		DESIGNED BY:		DC		DRAWN BY:		DB	



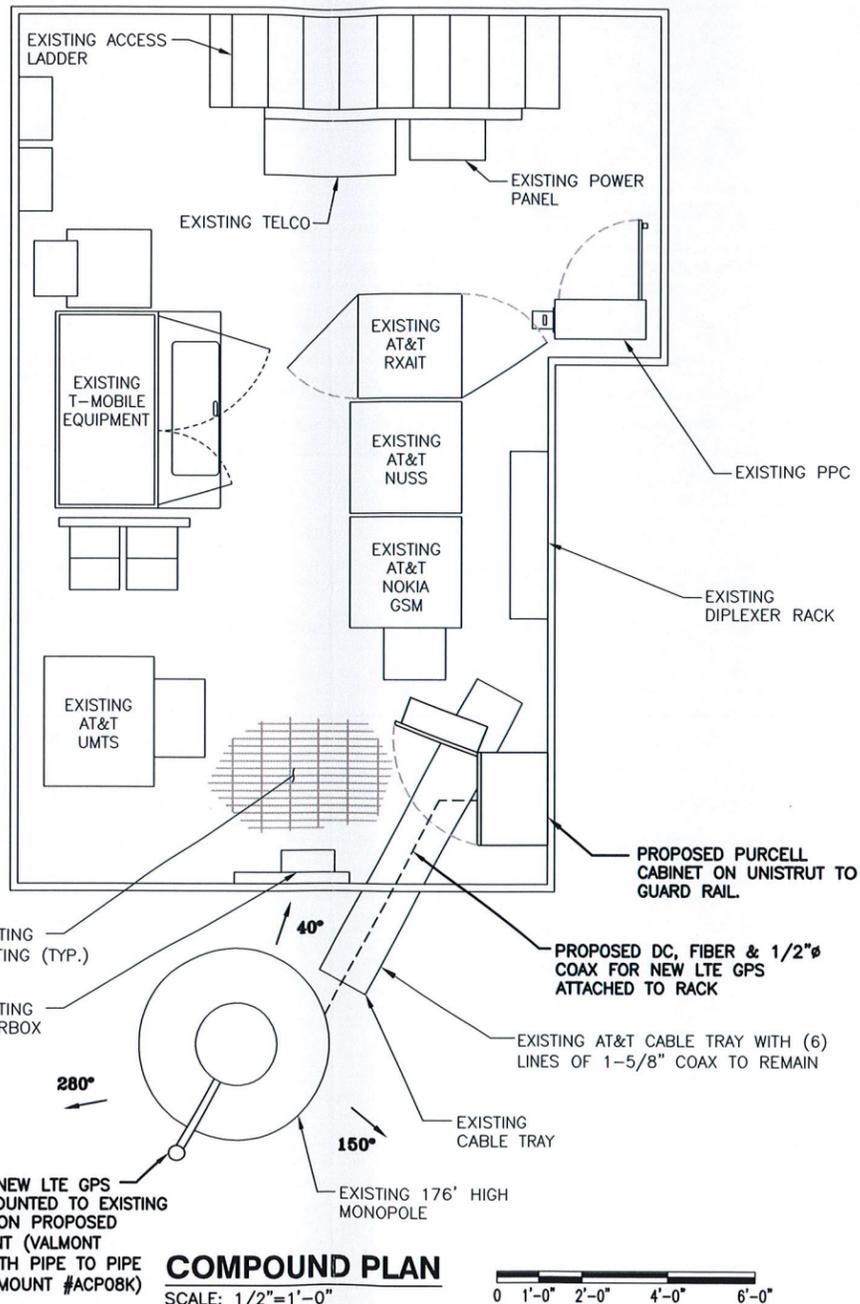
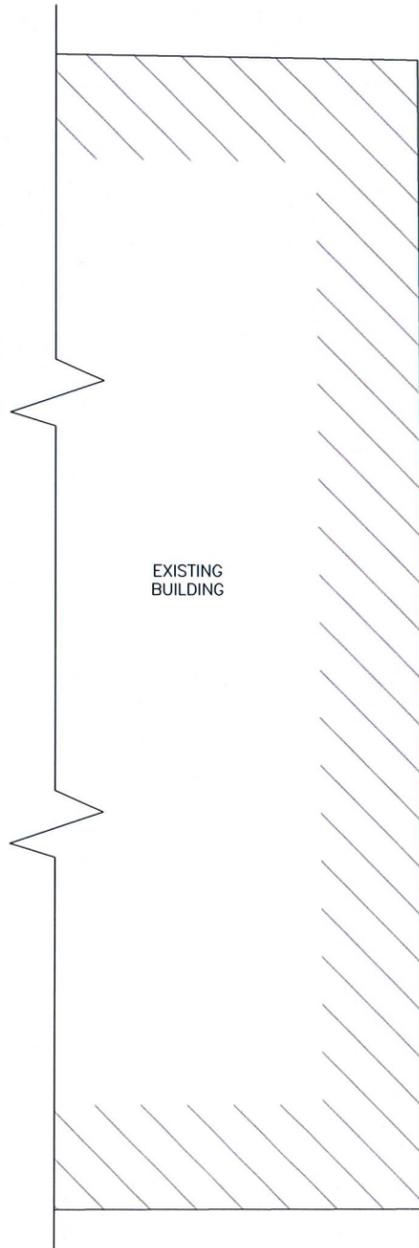
AT&T

GENERAL NOTES (LTE)



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

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION. REFER TO STRUCTURAL ANALYSIS BY: HUDSON DESIGN GROUP LLC, DATED: APRIL 05, 2012.



COMPOUND PLAN

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



Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

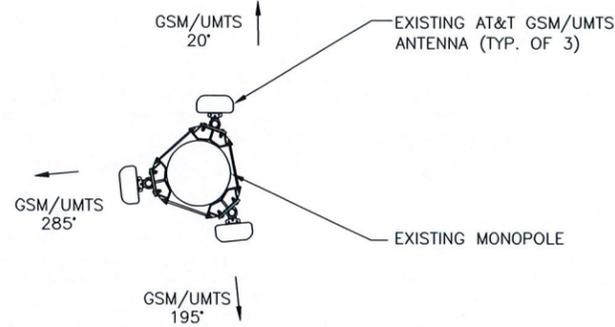
NEXLINK
GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT5375
SITE NAME: BERLIN E CENTRAL
1657 WILBUR CROSS HIGHWAY
BERLIN, CT 06037
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

			STATE OF CONNECTICUT			AT&T		
			DANIEL P. TRINIA			COMPOUND PLAN (LTE)		
1	04/10/12	ISSUED FOR CONSTRUCTION	HC	DC	DPH			
0	03/08/12	ISSUED FOR REVIEW	DB	DC	DPH			
NO.	DATE	REVISIONS	BY	CHK	APP	JOB NUMBER	DRAWING NUMBER	REV
SCALE: AS SHOWN			DESIGNED BY: DC	DRAWN BY: DB		5375.01	A-1	1



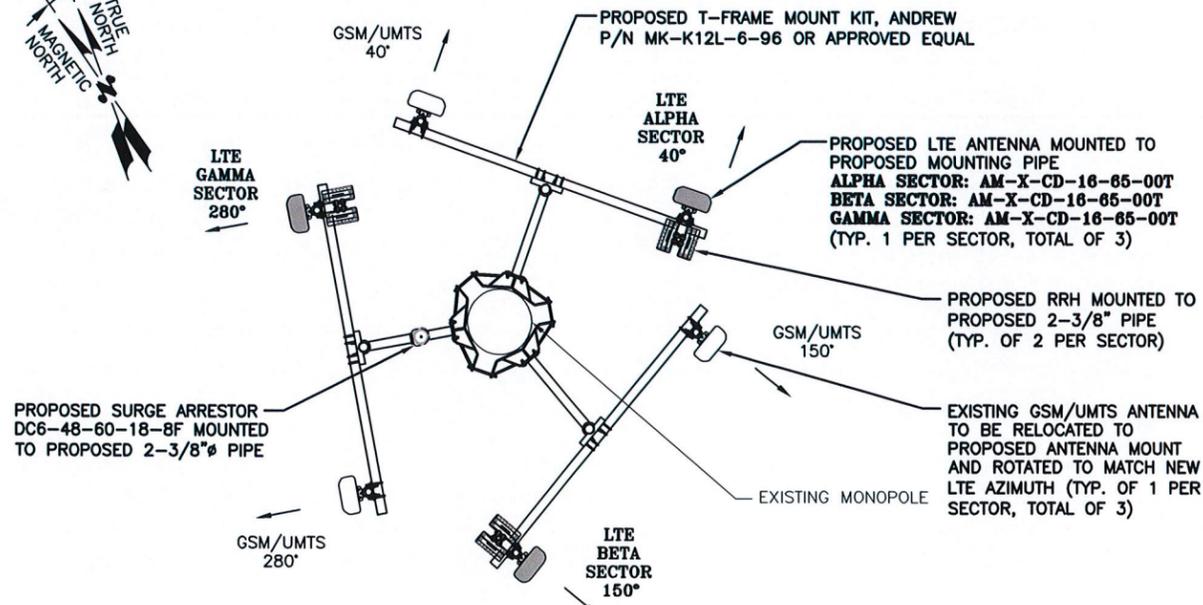


EXISTING GSM/UMTS ANTENNA PLAN

SCALE: N.T.S.

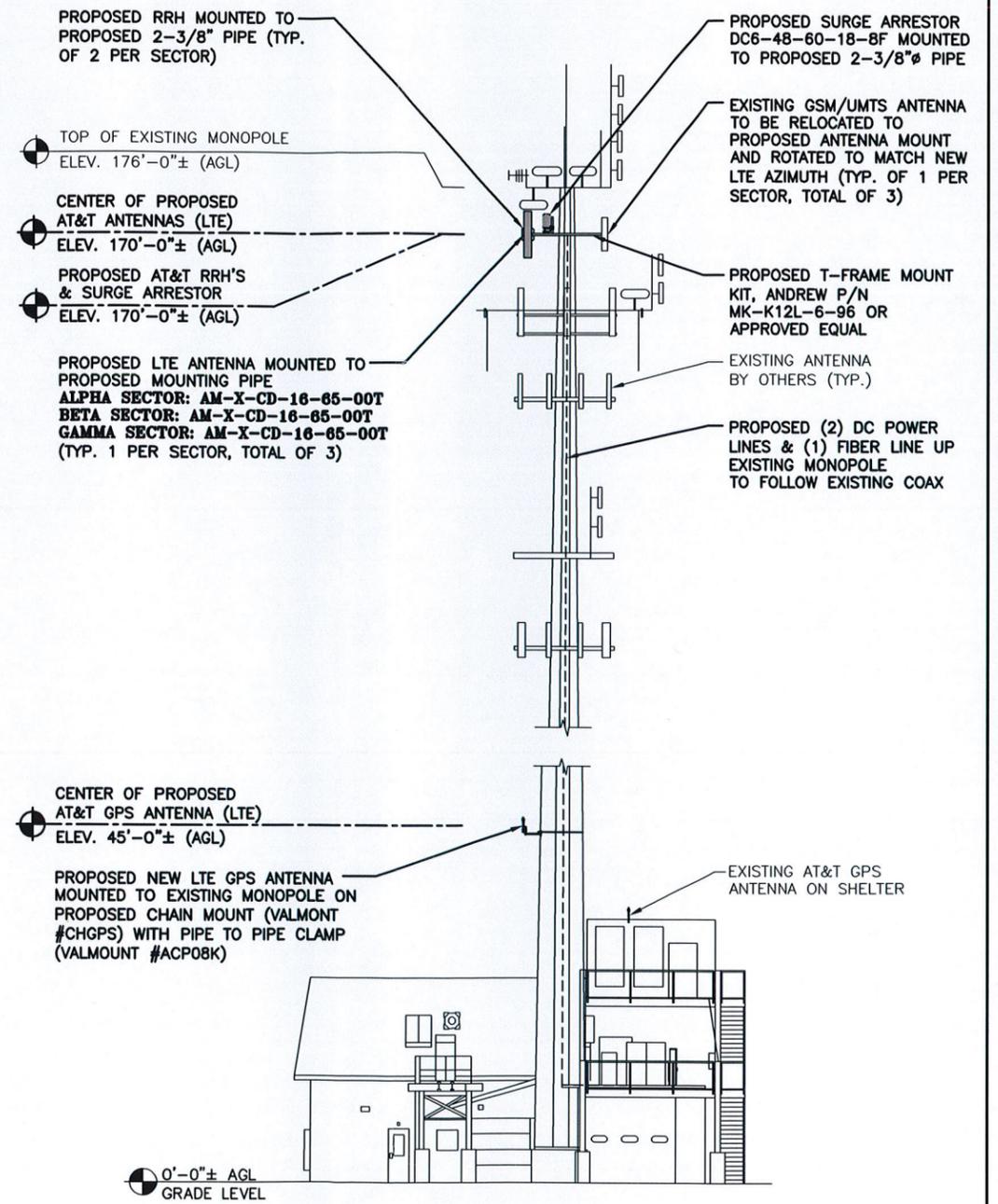
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PROPOSED LTE ANTENNA PLAN

SCALE: N.T.S.



EAST ELEVATION

SCALE: 3/32"=1'-0"



Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

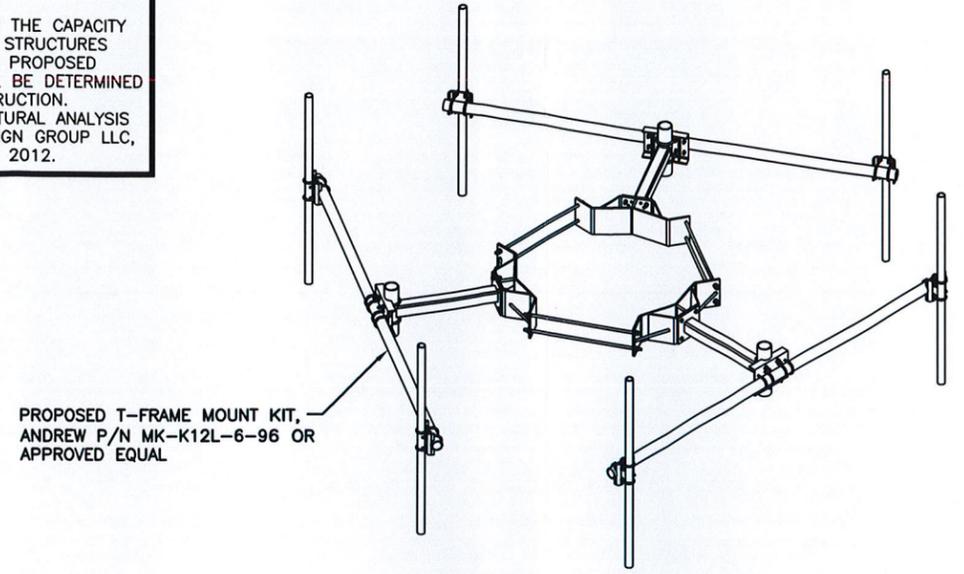
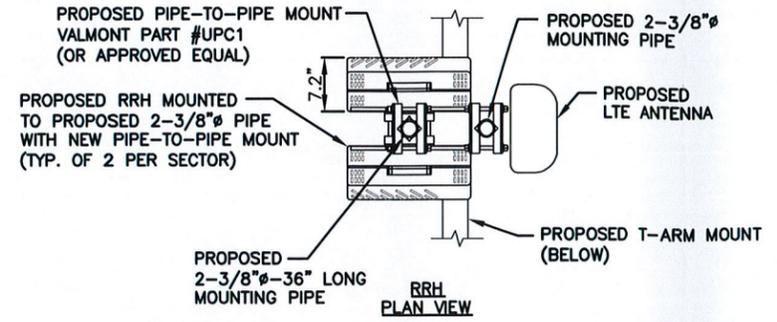
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SITE NAME: BERLIN E CENTRAL
1657 WILBUR CROSS HIGHWAY
BERLIN, CT 06037
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

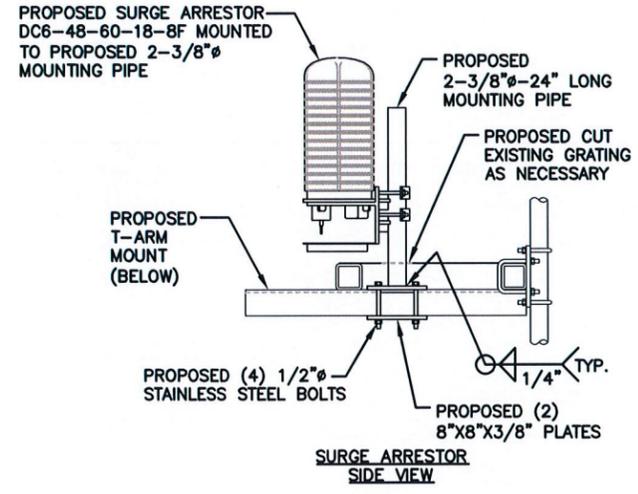
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				ANTENNA LAYOUT AND ELEVATION (LTE)	
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0	03/08/12	ISSUED FOR REVIEW	DB/DC/DPH		
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NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

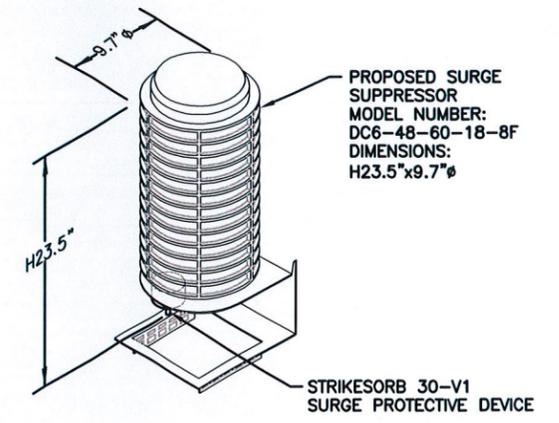
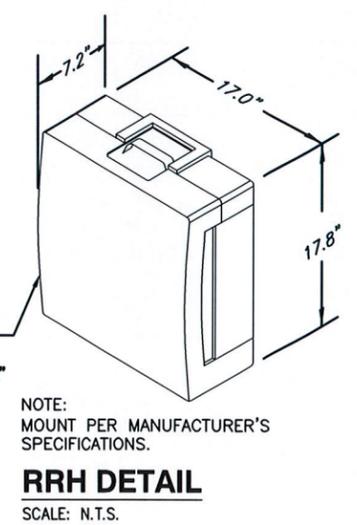
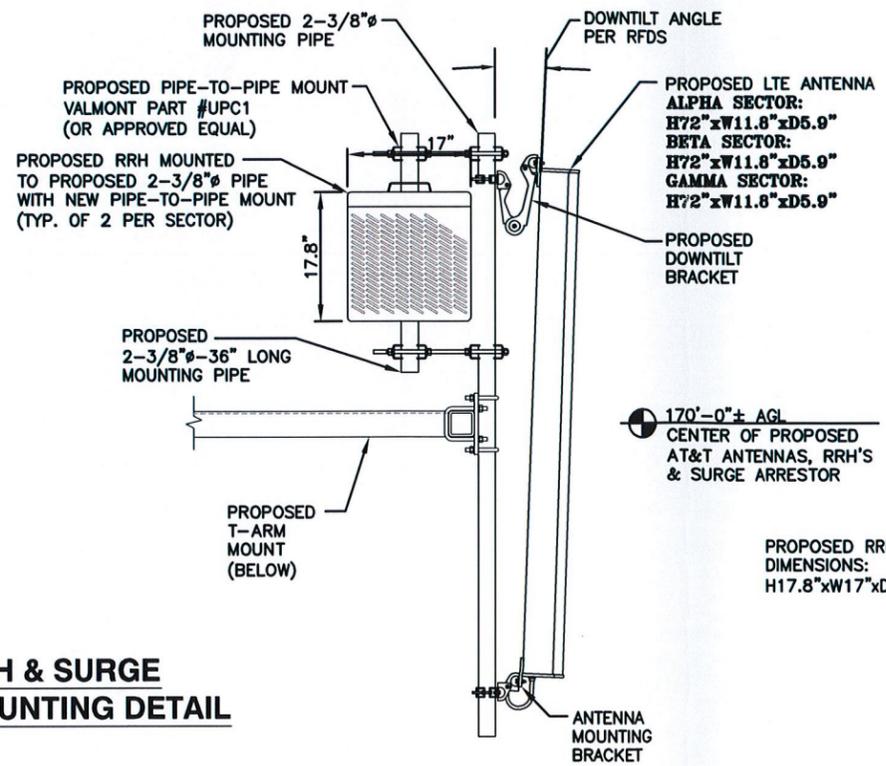
NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION. REFER TO STRUCTURAL ANALYSIS BY: HUDSON DESIGN GROUP LLC, DATED: APRIL 05, 2012.



ANTENNA MOUNT DETAIL
SCALE: N.T.S.



PROPOSED RRH & SURGE ARRESTOR MOUNTING DETAIL
SCALE: N.T.S.



Hudson Design Group

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GLOBAL SERVICES

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800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT5375
SITE NAME: BERLIN E CENTRAL

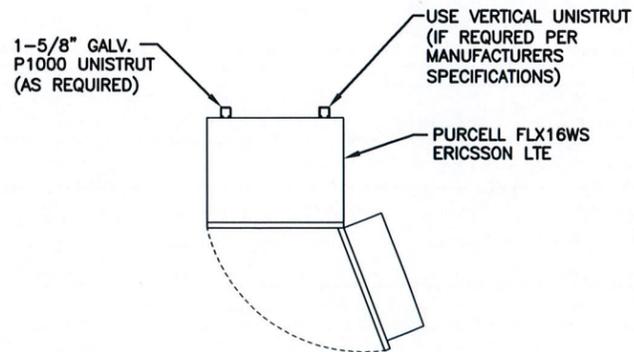
1657 WILBUR CROSS HIGHWAY
BERLIN, CT 06037
HARTFORD COUNTY

at&t

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

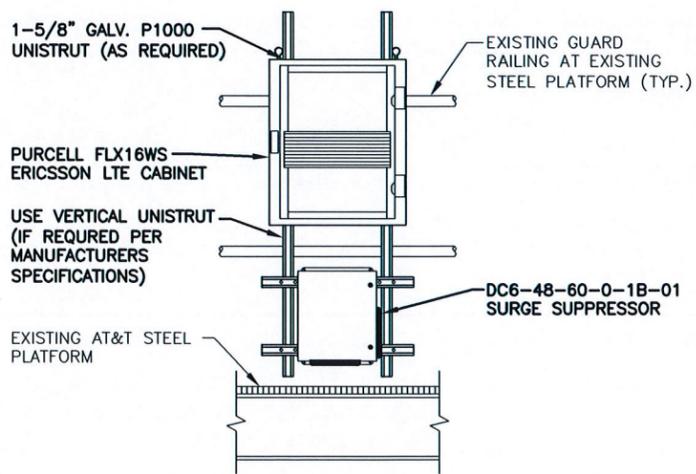
				AT&T	
				DETAILS (LTE)	
NO.	DATE	REVISIONS	BY	CHK	APP
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0	03/08/12	ISSUED FOR REVIEW	DB	DG	DPH
SCALE: AS SHOWN			DESIGNED BY: DC	DRAWN BY: DB	
				JOB NUMBER	DRAWING NUMBER
				5375.01	A-3
					1





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

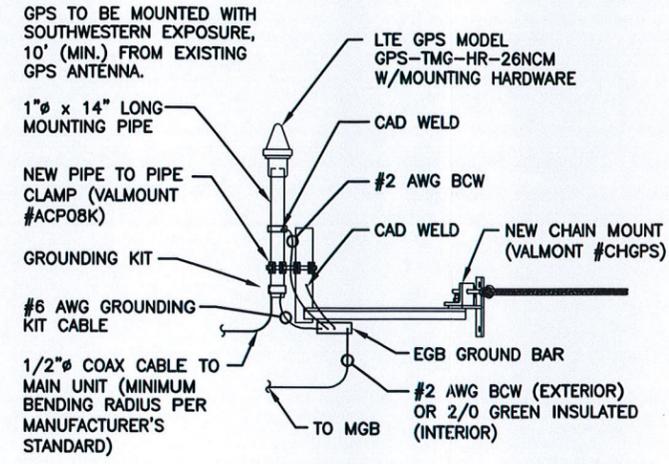
NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION. REFER TO STRUCTURAL ANALYSIS BY: HUDSON DESIGN GROUP LLC, DATED: APRIL 05, 2012.



NOTE:
MOUNT PROPOSED EQUIPMENT PER MANUFACTURERS SPECIFICATIONS

PROPOSED EQUIPMENT MOUNTING DETAIL
SCALE: N.T.S.

NOTE:



GPS MOUNTING DETAIL
SCALE: N.T.S.

Hudson Design Group LLC
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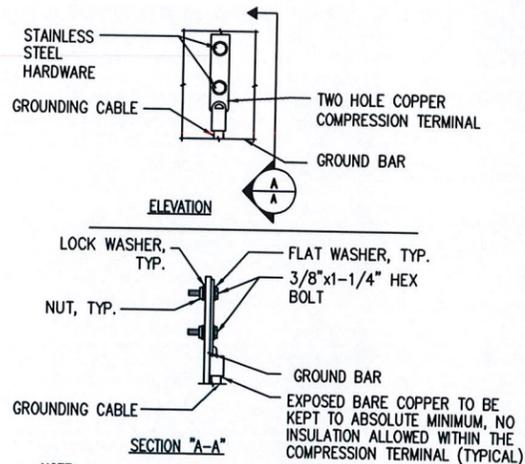
NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
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WINDSOR, CT 06095

SITE NUMBER: CT5375
SITE NAME: BERLIN E CENTRAL
1657 WILBUR CROSS HIGHWAY
BERLIN, CT 06037
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

				AT&T	
				DETAILS (LTE)	
NO.	DATE	REVISIONS	BY	CHK	APP
1	04/10/12	ISSUED FOR CONSTRUCTION	HC	DC	DPH
0	03/08/12	ISSUED FOR REVIEW	DB	DC	DPH
SCALE: AS SHOWN			DESIGNED BY: DC	DRAWN BY: DB	
				JOB NUMBER	DRAWING NUMBER
				5375.01	A-4
					1

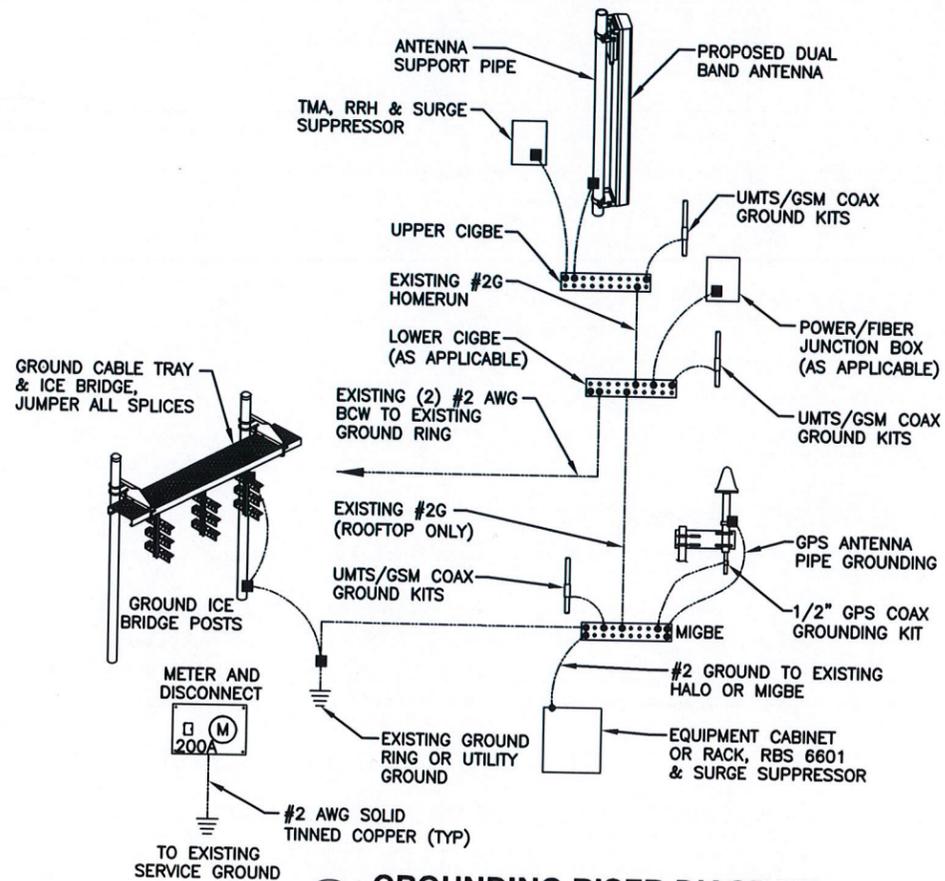




- NOTE:
- "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
 - OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
 - CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

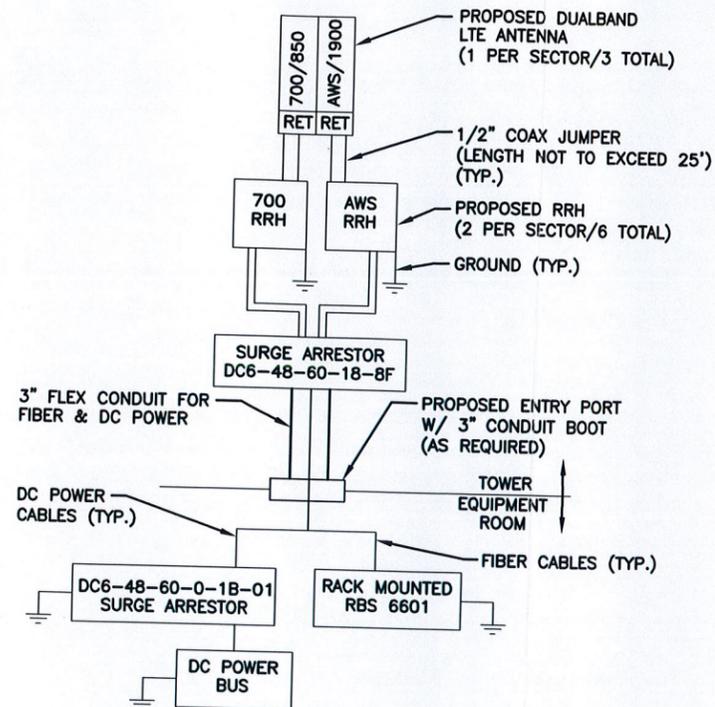
TYPICAL GROUND BAR CONNECTION DETAIL

1
-
N.T.S.



GROUNDING RISER DIAGRAM

3
-
N.T.S.



LTE PLUMBING DIAGRAM

2
-
N.T.S.

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.

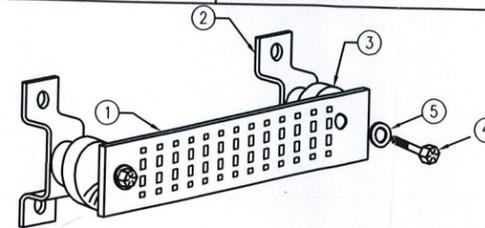
SECTION "A" - SURGE ABSORBERS

- 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
-
N.T.S.

WIRELESS SOLUTIONS INC.			
NO.	REQ.	PART NO.	DESCRIPTION
1	1	HLGB-0420-IS	SOLID GND. BAR (20"x4"x1/4")
2	2		WALL MTC. BRKT.
3	2		INSULATORS
4	4		5/8"-11x1" H.H.C.S.
5	4		5/8 LOCKWASHER



1600 OSGOOD STREET
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a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT5375
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BERLIN, CT 06037
HARTFORD COUNTY



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

		AT&T	
1 04/10/12 ISSUED FOR CONSTRUCTION		HC	DC/DRP
0 03/08/12 ISSUED FOR REVIEW		DB	DC/DRP
NO.	DATE	REVISIONS	BY
SCALE:	AS SHOWN	DESIGNED BY: DC	DRAWN BY: DB
JOB NUMBER		DRAWING NUMBER	
5375.01		G-1	
			REV
			1

EXHIBIT 2

STRUCTURAL ANALYSIS REPORT

For

CT5375

BERLIN E CENTRAL

1657 Wilbur Cross Highway
Berlin, CT 06037

Antennas Mounted to the Monopole



Prepared for:



at&t

500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

Dated:
April 5, 2012

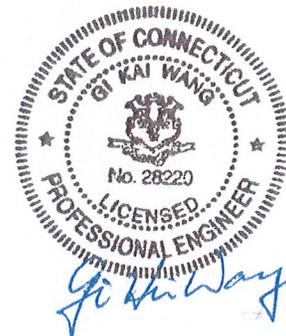
Prepared by:

HUDSON DESIGN GROUP, LLC.

1600 Osgood Street Building 20 North, Suite 2-101
North Andover, MA 01845

Phone: (978) 557-5553

www.hudsondesigngroupllc.com





SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by AT&T to conduct a structural evaluation of the 176' monopole supporting the proposed AT&T antennas located at elevation 170' 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 monopole were not available for our use. The previous structural analysis report prepared by URS Corporation, dated June 23, 2010, was available and obtained for our use.

CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing monopole is in conformance with the ANSI/TIA-222-F Standard for the loading considered under the criteria listed in this report. The monopole structure is rated at 95.7% - (Pole section L3 from EL. 43' to 86.13' Controlling).



APPURTENANCES CONFIGURATION:

Tenant	Appurtenances	Elev.	Mount
	(3) 20' Dipole	176'	Low Profile Platform
	(2) 20' Omni	176'	Low Profile Platform
	(2) Grid Dish	176'	Low Profile Platform
AT&T	(3) 800-10121 Antennas	170'	12' T-Frame
AT&T	(6) LGP 21401 TMA	170'	12' T-Frame
AT&T	(3) AM-X-CD-16-65 Antennas	170'	12' T-Frame
AT&T	(6)RRUs	170'	12' T-Frame
AT&T	Surge Arrestor DC6-48-60-18-8F	170'	12' T-Frame
	(9) DR65-19-00 Antennas	160'	12' T-Frame
	(12) TMA	160'	12' T-Frame
	10' Dipole	160'	12' T-Frame
	Grid Dish	160'	12' T-Frame
	(3) 2.5' Dish	154'	Low Profile Platform
	(6) Panel Antennas	150'	Low Profile Platform
	(3) 840-10054 Antennas	150'	Low Profile Platform
	(3) RRHs	150'	Low Profile Platform
	2.5' Dish	146'	Low Profile Platform
	10' Dipole	130'	6' Side Mount Standoff
	(3) 742 213 Antennas	124'	Collar Mount
	(4) LPA 80063/6CF Antennas	114'	Low Profile Platform
	(2) RWA 80013 Antennas	114'	Low Profile Platform
	BXA 185060/12CF Antennas	114'	Low Profile Platform
	(2) MGD3-900 Antennas	114'	Low Profile Platform
	(3) LNX 6514DS Antennas	114'	Low Profile Platform
	Grid Dish	100'	6' Side Mount Standoff
	20' Dipole	100'	6' Side Mount Standoff
	GPS	75'	3' Side Mount Standoff
	GPS	60'	3' Side Mount Standoff
	Scanner Antenna	60'	3' Side Mount Standoff
AT&T	GPS	45'	Chain Mount

*Proposed AT&T Appurtenances shown in Bold.



AT&T EXISTING/PROPOSED COAX CABLES:

Tenant	Coax Cables	Elev.	Mount
AT&T	(6) 1 5/8" Cables	170'	Inside Monopole
AT&T	Fiber Cable	170'	Inside Monopole
AT&T	(2) DC Power Cables	170'	Inside Monopole

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

ANALYSIS RESULTS SUMMARY:

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Pole Section-L1	61.9 %	130.76 – 176.01	PASS	
Pole Section-L2	90.4 %	86.13 – 130.76	PASS	
Pole Section-L3	95.7 %	43.0 – 86.13	PASS	
Pole Section-L4	92.4 %	1.0 – 43.0	PASS	



DESIGN CRITERIA:

1. EIA/TIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

County: Hartford

Wind Load: 80 mph (fastest mile)

100 mph (3 second gust)

Nominal Ice Thickness: 1/2 inch

2. Approximate height above grade to proposed antennas: 170'-0"

***Calculations and referenced documents are attached.**

ASSUMPTIONS:

1. The monopole dimensions, member sizes and strength of material are as indicated in the previous structural analysis report prepared by URS Corporation, dated June 23, 2010.
2. The appurtenances configuration is as stated in the previous structural analysis report prepared by URS Corporation, dated June 23, 2010.
3. The monopole 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.
4. All antennas, mounts coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer requirements.
5. 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.
6. All prior structural modification, if any, are assumed to be as per the data supplied (if available), and installed properly.
7. The foundation of the tower was not checked due to lack of information. As-built foundation drawings and geotechnical report would be required to determine whether the foundation is capable of supporting the proposed loadings.



SUPPORT RECOMMENDATIONS:

HDG recommends that the proposed antennas, RRHs and surge arrestor be mounted on the proposed T-frame supported by the existing monopole; the proposed GPS be mounted on the proposed chain mount supported by the existing monopole.

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

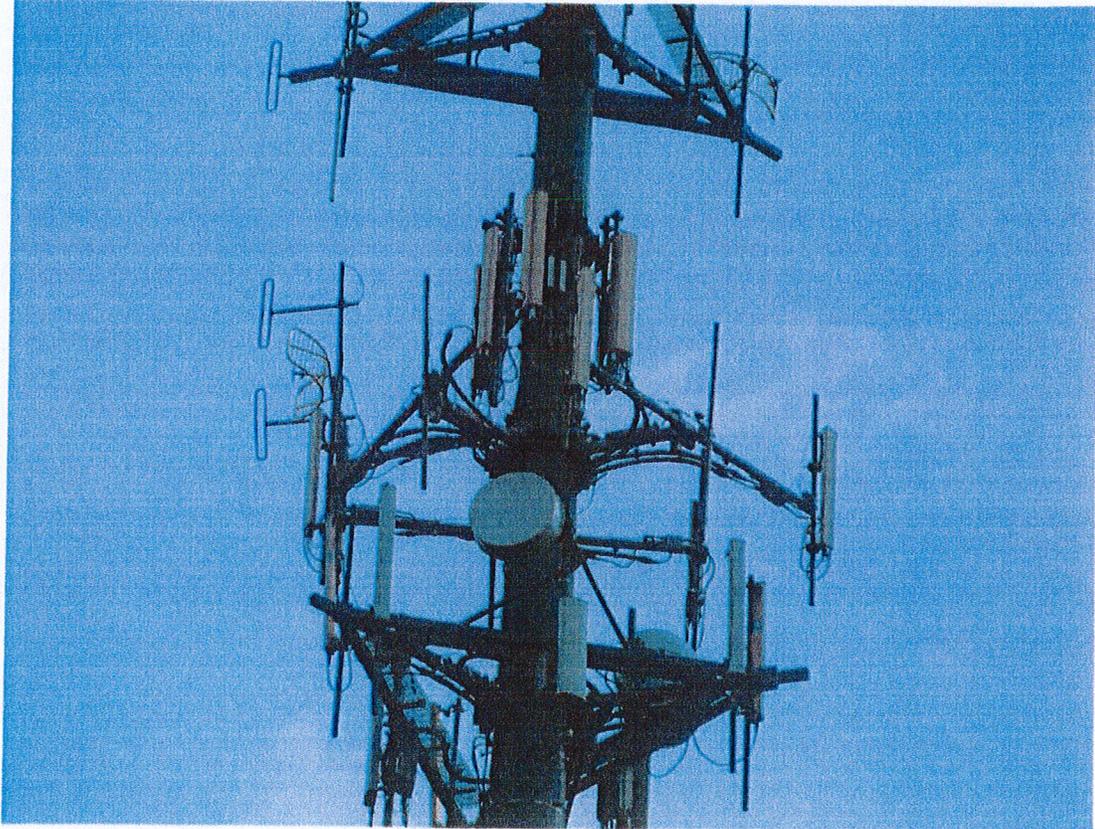


Photo 1: Photo illustrating the Monopole with Appurtenances shown.



CONSTRUCTION DRAWINGS

PROJECT INFORMATION

SCOPE OF WORK: UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
 SITE ADDRESS: 1657 WILBUR CROSS HIGHWAY
 BERLIN, CT 06037
 LATITUDE: 41.606300 N 41° 36' 22.7" N
 LONGITUDE: -72.749600 W -72° 44' 58.6" W
 JURISDICTION: NATIONAL STATE & LOCAL CODES OR ORDINANCES
 CURRENT USE: TELECOMMUNICATIONS FACILITY
 PROPOSED USE: TELECOMMUNICATIONS FACILITY



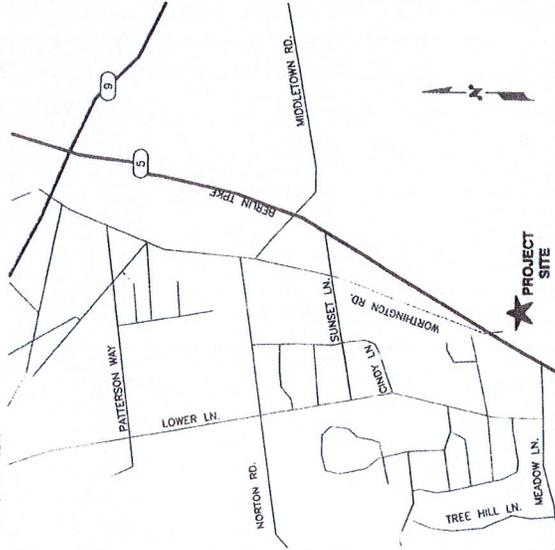
SITE NUMBER: CT5375
SITE NAME: BERLIN E CENTRAL

DRAWING INDEX

	REV
T-1 TITLE SHEET	0
GN-1 GENERAL NOTES	0
A-1 COMPOUND PLAN	0
A-2 ANTENNA LAYOUT AND ELEVATION	0
A-3 DETAILS	0
A-4 DETAILS	0
G-1 PLUMBING DIAGRAM & GROUNDING DETAILS	0

VICINITY MAP

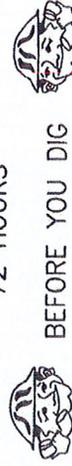
DIRECTION TO SITE: MERGE ONTO I-91 S TOWARD NEW HAVEN, 4.1 MILES. MERGE ONTO CT-9 N VIA EXIT 22N TOWARD NEW BRITAIN, 3.0 MILES. TAKE EXIT 22 TOWARD US-5 S / NEW HAVEN / CT-15 S, 0.1 MILES. TURN RIGHT ONTO FRONTAGE RD, 0.1 MILES. TURN RIGHT ONTO CT-372 / US-5 S, 0.1 MILES. MERGE ONTO BERLIN TURNPIKE / US-5 S / CT-15 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. MERGE ONTO MEADOW LN ONTO BERLIN TURNPIKE / US-5 N / CT-15 N, 0.1 MILES. END AT 1657 WILBUR CROSS HWY, BERLIN, CT 06037.



GENERAL NOTES

- THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. REPRODUCTION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. OUR LIABILITY IS LIMITED TO THE PURPOSES OF CONDUCTING THE PROJECT. ACCESS 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 TO BE USED BY AUTHORIZED PERSONNEL. PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE PUBLIC ACCESS. PUBLIC ACCESS PER ADA REQUIREMENTS 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.

72 HOURS



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a United Global Services Company
 800 MARSHALL PHELPS ROAD UNIT# 2A
 WINDSOR, CT 06095

SITE NUMBER: CT5375
SITE NAME: BERLIN E CENTRAL
 1657 WILBUR CROSS HIGHWAY
 BERLIN, CT 06037
 HARTFORD COUNTY

500 ENTERPRISE DRIVE, SUITE 3A
 ROCKY HILL, CT 06867

NO.	DATE	REVISIONS	DESIGNED BY	CHECKED BY	DATE
0	03/09/12	ISSUED FOR REVIEW	DC	DC	03/09/12

PROJECT NO:	5375.01
DATE:	T-1
SCALE:	AS SHOWN
DESIGNED BY:	DC
CHECKED BY:	DC
DATE:	03/09/12
PROJECT NAME:	AT&T
TITLE SHEET (LTE)	
JOB NUMBER:	
DATE:	

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 CITY OF BERLIN) AND ALL APPLICABLE LOCAL ORDERS, REGULATIONS, AND ORDINANCES. 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 GROUND) 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 1100 AND 911 FORS GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL PERFORM ALL NECESSARY INSTALLATION AND TESTING 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 BITS EQUIPMENT.
5. EACH BITS 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 BITS 2 AWG STRANDED COPPER FOR OUTDOOR BITS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTI-OXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRODIE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRODIE AND THE TOWER GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTORS SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUBMOUNTS 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 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF CONCRETE SHALL HAVE IT ELECTRICALLY CONDUCTIVE REINFORCING STEEL BARS BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE THINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR - MEXLINK
SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION) OWNER - AT&T MOBILITY
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL TO VERIFY THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED UNDER THE ATTENTION OF THE CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. THE SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL APPLICABLE LOCAL ORDERS, REGULATIONS, AND ORDINANCES. THE SUBCONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ORDERS FROM THE PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. THE WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY 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. "FITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND FITTING 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 T1 PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND CONDUIT AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PARALLEL WORKING 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, WHICH SHALL BE 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 418 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERRECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A572 TYPE F (50, 50, 50) UNLESS OTHERWISE NOTED. ALL WELDS SHALL BE MADE IN ACCORDANCE WITH AISC 308. ALL WELDS TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH-UP ALL SCRATCHES AND WELDS SHALL BE HOT DIPPED GALVANIZED. TOUCH-UP ALL SCRATCHES COMPATIBLE MARKS IN THE FIELD AFTER STEEL IS ERRECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH UNITS SPECIFICATIONS AND GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES.
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING STRUCTURES SHALL BE VERIFIED. THE SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR IMMEDIATELY PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL BE SCHEDULED FOR NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AFTER HOURS TO AVOID THE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN TO PROTECT THE WORKERS AND THE EQUIPMENT. ALL ELECTRICAL WORK THAT COULD EXPOSE THE WORKERS TO DANGER, PERSONNEL OR EQUIPMENT, 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 AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
AMERICAN CONCRETE INSTITUTE (ACI) 318: BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;
AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;
TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL
ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES, REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.
FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIALS, METHODS, OR PROCEDURES, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS A CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

ACL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWC	AMERICAN WIRE GAUGE	MCB	MASTER GROUND BUS	TBD	TO BE DETERMINED
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBR	TO BE REMOVED
BTS	BASE TRANSDUCER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBR	TO BE REMOVED
EG	EQUIPMENT GROUND	REF	REFERENCE	TBR	TO BE REMOVED
EQR	EQUIPMENT GROUND RING	REQ	REQUIRED	TYP	TYPICAL

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/09/12	ISSUED FOR REVIEW			

SCALE: AS SHOWN

DESIGNED BY: DC

DRAWN BY: DF



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

SITE NUMBER: CT5375
SITE NAME: BERLIN E CENTRAL
1657 WILBUR CROSS HIGHWAY
BERLIN, CT 06037
HARTFORD COUNTY



800 MARSHALL PHELPS ROAD UNIT# 2A
WINDSOR, CT 06095



100 CORPORATE DRIVE
HARTFORD, CT 06183
TEL: 860.264.4400
FAX: 860.264.4400

AT&T

GENERAL NOTES (LITE)

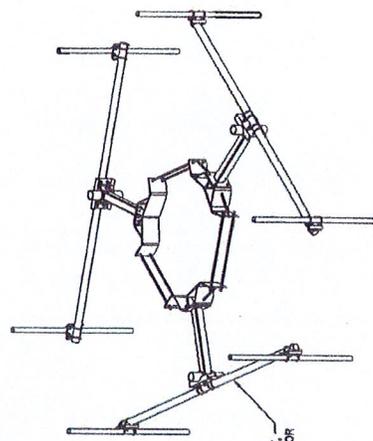
JOB NUMBER: 5375.01

GN-1

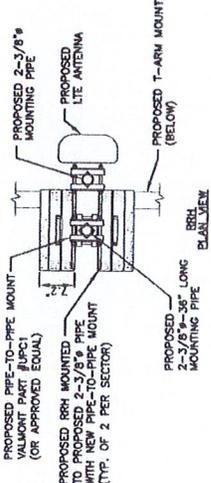
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NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

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

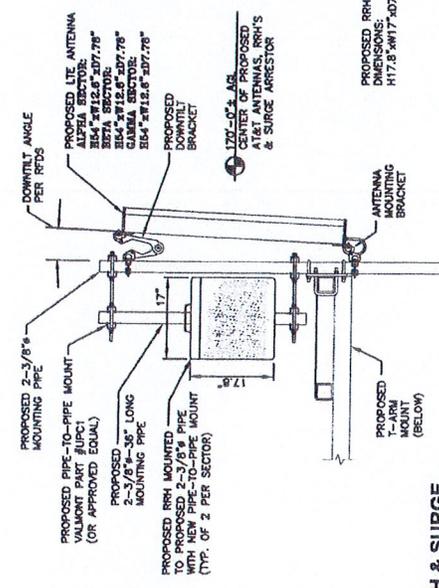


PROPOSED T-FRAME MOUNT KIT ANDREW P/N MK-K12L-0-BB OR APPROVED EQUAL



PROPOSED PIPE-TO-PIPE MOUNT VALVE PART #UPCT (OR APPROVED EQUAL)
PROPOSED RRH MOUNTED TO PROPOSED 2-3/8\"/>

PROPOSED T-ARM MOUNT (BELOW)



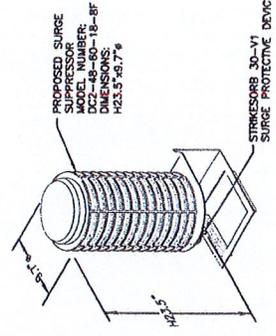
PROPOSED LITE ANTENNA ALPHA SECTOR: BE54-#112.6-007.78\"/>

PROPOSED RRH MOUNTED TO PROPOSED 2-3/8\"/>

PROPOSED SURGE ARRESTOR 8\"/>

PROPOSED RRH MOUNT (BELOW)

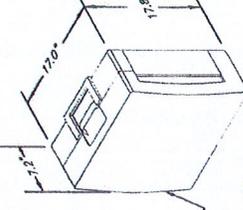
ANTENNA MOUNT DETAIL
SCALE: N.T.S.



PROPOSED SURGE SUPPRESSOR MODEL NUMBER: DC2-48-60-18-BF
H23.5-68.7-6

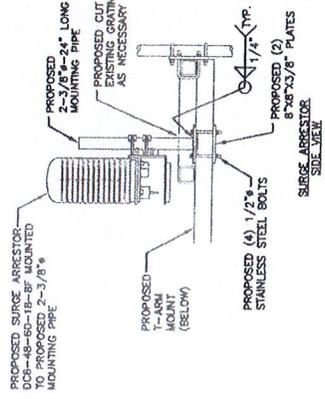
STRIKESORS 30-VI SURGE PROTECTIVE DEVICE

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.
DC SURGE SUPPRESSOR DETAIL
SCALE: N.T.S.



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.
RRH DETAIL
SCALE: N.T.S.

PROPOSED RRH & SURGE ARRESTOR MOUNTING DETAIL
SCALE: N.T.S.



PROPOSED SURGE ARRESTOR 18-18\"/>

PROPOSED T-ARM MOUNT (BELOW)

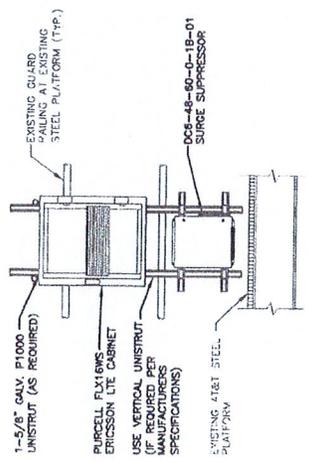
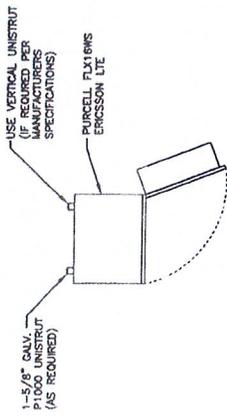
PROPOSED (2) 1/4\"/>

PROPOSED SURGE ARRESTOR 8\"/>

		SITE NUMBER: CTS5375 SITE NAME: BERLIN E CENTRAL 1657 WILBUR CROSS HIGHWAY BERLIN, CT 06037 HARTFORD COUNTY	
		a United GLOBAL SERVICES company 800 MARSHALL PHELPS ROAD UNIT # 2A WINDSOR, CT 06895	
		TEL: (878) 80-0000 FAX: (878) 80-0000 WWW.HUDSONDESIGN.COM	
500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06867		AT&T DETAILS (LITE)	
DATE: 01/29/12 DESIGNED BY: DC DRAWN BY: DB	REVISIONS BY: CHK-PPC DATE:	JOB NUMBER: 5375.01 DRAWING NUMBER: A-3	REV: 0

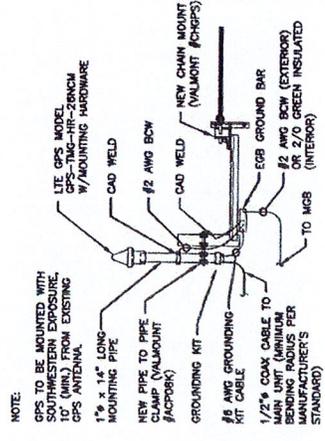
NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES AND FOUNDATIONS FOR THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.



NOTE:
MOUNT PROPOSED EQUIPMENT PER MANUFACTURERS SPECIFICATIONS

PROPOSED EQUIPMENT MOUNTING DETAIL
SCALE: N.T.S.



GPS MOUNTING DETAIL
SCALE: N.T.S.

Hudson Design Products
402 CROCODRIVER
LEWIS & CLARK BLVD. SUITE 100
WINDSOR, MA 01890

MEXLINK
a unitel global services company
900 MARSHALL PHELPS ROAD UNIT# 2A
WINDSOR, CT 06095

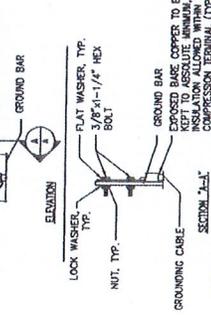
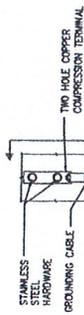
SITE NUMBER: CT5375
SITE NAME: BERLIN E CENTRAL
1657 WILBUR CROSS HIGHWAY
BERLIN, CT 06037
HARTFORD COUNTY

500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06867

NO.	DATE	BY	CHK	APP
0	03/29/12	ESQUID FOR REVIEW		
DESIGNED BY:	DO	DRAWN BY:	DR	
REVISIONS				

AT&T
DETAILS
(LIE)

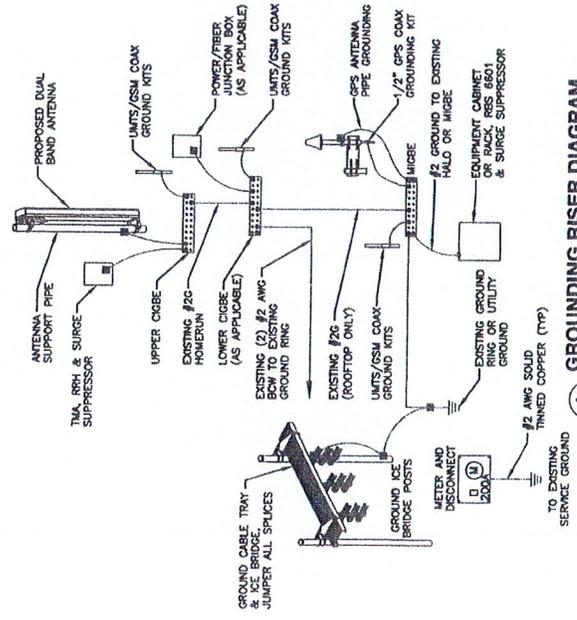
JOB NUMBER	5375.01
DWG NUMBER	A-4
REV	0



- NOTE:
1. "DOWBURNING UP" OR "STAIRDOWN" OF CONNECTION IS NOT PERMITTED.
 2. ODD INSULATING COMPONENTS TO BE USED AT ALL LOCATIONS.
 3. CABLED DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MOB.

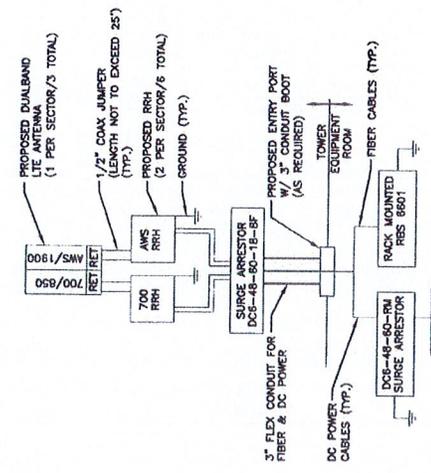
TYPICAL GROUND BAR CONNECTION DETAIL

N.T.S.



GROUNDING RISER DIAGRAM

N.T.S.



LTE PLUMBING DIAGRAM

N.T.S.

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

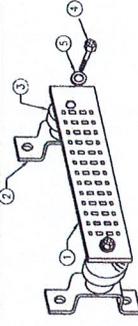
SECTION "1" - SURGE PROTECTORS

- CABLE ENTRY PORTS (HATCH PLATES) (#2)
- GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
- TELECOM GROUND BAR
- COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
- 48V POWER SUPPLY RETURN BAR (#2)
- RECTIFIER FRAMES.

SECTION "2" - SURGE ARRESTORS

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

NO.	REQ.	PART NO.	DESCRIPTION
1	1	HUB-0420-IS	SOLID CHD. BAR (20" x 4" x 1/4")
2	2		WALL MTC. BRKT.
3	2		INSULATORS
4	4		5/8" - 11x1" H.H.C.S.
5	4		5/8" LOCKWASHER



GROUND BAR - DETAIL

N.T.S.

SITE NUMBER: CTS575
SITE NAME: BERLIN E CENTRAL
 1857 MILLBURY CROSS HIGHWAY
 BERLIN, CT 06037
 HARTFORD COUNTY

NEWLINK
 A Unitel Global Services Company
 800 WASHINGTONS ROAD UNIT#F. 2A
 WINDSOR, CT 06895

Hudson Design Concepts
 140 COLUMBIAN BLVD
 SUITE 210
 WINDSOR, CT 06895

at&t
 500 ENTERPRISE DRIVE, SUITE 3A
 ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP
0	10/29/12	ISSUED FOR REVIEW			

SCALE: AS SHOWN REVISIONS BY: CHC/JPH
 DESIGNED BY: DC DRAWN BY: DR

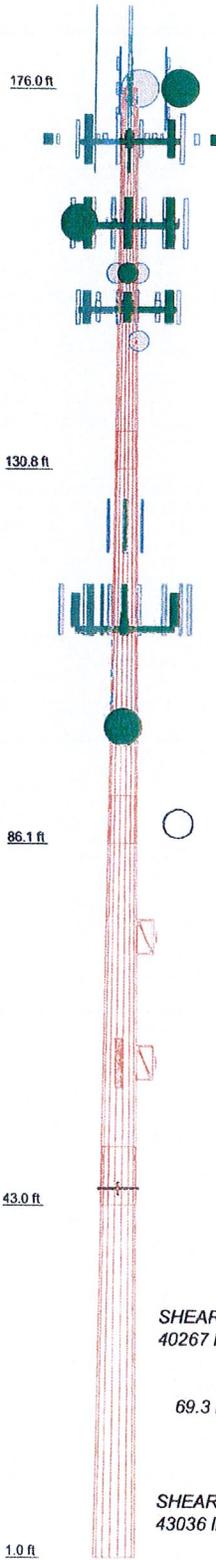
AT&T

PLUMBING DIAGRAM & GROUNDING DETAILS
 (LTE)
 JOB NUMBER: 5375.01
 DRAWING NUMBER: G-1
 REV: 0



CALCULATIONS

Section	1	2	3	4
Length (ft)	45.25	49.13	48.88	49.00
Number of Stages	18	18	18	18
Thickness (in)	0.2500	0.3125	0.3750	0.4375
Socket Length (ft)	4.50	5.75	7.00	
Top Dia (in)	21.0000	30.2260	39.8381	48.9600
Bot Dia (in)	31.8000	41.8200	51.3600	60.6000
Grade			A572-65	
Weight (lb)	3354.8	6217.6	9400.8	13211.3



DESIGNED APPURTENANCE LOADING

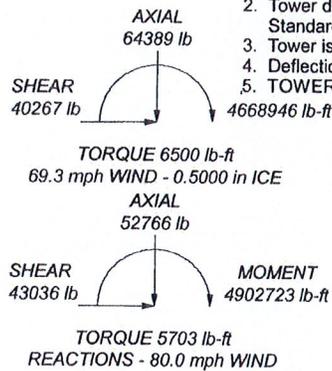
TYPE	ELEVATION	TYPE	ELEVATION
PIROD 13' Low Profile Platform	176	VHLP2.5-180	154
20'-4 Bay Dipole	176	VHLP2.5-180	154
Omni 3"x20"	176	840-10054 w/mount pipe	150
20'-4 Bay Dipole	176	RRH	150
Omni 3"x20"	176	RRH	150
20'-4 Bay Dipole	176	RRH	150
Kathrein PR-950	176	PIROD 15' Low Profile Platform	150
Kathrein PR-950	176	(2) Panel Antenna 4'x12'x3"	150
PIROD 12' T-Frame (ATI - proposed)	170	(2) Panel Antenna 4'x12'x3"	150
KMW AM-X-CD-16-65-00T-RET w/mount pipe (ATI - proposed)	170	(2) Panel Antenna 4'x12'x3"	150
KMW AM-X-CD-16-65-00T-RET w/mount pipe (ATI - proposed)	170	840-10054 w/mount pipe	150
KMW AM-X-CD-16-65-00T-RET w/mount pipe (ATI - proposed)	170	840-10054 w/mount pipe	150
KMW AM-X-CD-16-65-00T-RET w/mount pipe (ATI - proposed)	170	VHLP2.5-180	146
(2) Ericsson RRU (ATI - proposed)	170	Pirod 6' Side Mount Standoff (1)	130
(2) Ericsson RRU (ATI - proposed)	170	10'-4 Bay Dipole	130
(2) Ericsson RRU (ATI - proposed)	170	Collar Mount	125.5
Surge Arrestor (DC6-48-60-18-8F) (ATI - proposed)	170	Kathrein 742 213 w/mount pipe	124
Kathrein 800 10121 w/mount pipe (ATI - existing)	170	Kathrein 742 213 w/mount pipe	124
Kathrein 800 10121 w/mount pipe (ATI - existing)	170	Kathrein 742 213 w/mount pipe	124
Kathrein 800 10121 w/mount pipe (ATI - existing)	170	Collar Mount	122.5
Kathrein 800 10121 w/mount pipe (ATI - existing)	170	BXA-185060/12CF w/mount pipe	114
Kathrein 800 10121 w/mount pipe (ATI - existing)	170	LNx 6514DS-VTM w/mount pipe	114
Kathrein 800 10121 w/mount pipe (ATI - existing)	170	Ryma MGD3-900 w/mount pipe	114
(2) Powerwave TMA LGP21400 (ATI - existing)	170	LNx 6514DS-VTM w/mount pipe	114
(2) Powerwave TMA LGP21400 (ATI - existing)	170	Ryma MGD3-900 w/mount pipe	114
(2) Powerwave TMA LGP21400 (ATI - existing)	170	LNx 6514DS-VTM w/mount pipe	114
(2) Powerwave TMA LGP21400 (ATI - existing)	170	LPA-80063/6CF w/mount pipe	114
(2) Powerwave TMA LGP21400 (ATI - existing)	170	LPA-80063/6CF w/mount pipe	114
(2) Powerwave TMA LGP21400 (ATI - existing)	170	LPA-80063/6CF w/mount pipe	114
(2) Powerwave TMA LGP21400 (ATI - existing)	170	LPA-80063/6CF w/mount pipe	114
PIROD 12' T-Frame (ATI - proposed)	170	RWA-80013 w/Mount Pipe	114
PIROD 12' T-Frame (ATI - proposed)	170	RWA-80013 w/Mount Pipe	114
PIROD 12' Lightweight T-Frame	160	PIROD 13' Low Profile Platform	112
(3) DR65-19-00	160	Pirod 6' Side Mount Standoff (1)	100
(3) DR65-19-00	160	20'-4 Bay Dipole	100
(3) DR65-19-00	160	Kathrein PR-950	100
(4) Gen. TMA	160	3' Side Mount Standoff	75
(4) Gen. TMA	160	GPS	75
(4) Gen. TMA	160	Scanner Antenna	60
10'-4 Bay Dipole	160	3' Side Mount Standoff	60
PIROD 12' Lightweight T-Frame	160	3' Side Mount Standoff	60
PIROD 12' Lightweight T-Frame	160	GPS	60
Kathrein PR-950	160	Chain Mount	45
VHLP2.5-180	154	2' Side Mount Standoff	45
		GPS	45

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80.0 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69.3 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 60.0 mph wind.
5. TOWER RATING: 95.7%



Hudson Design Group, LLC 1600 Osgood Street, Building 20 North, Suite 2-101 North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 226-5586			Job: CT5375 Berlin, CT Project: 176 ft monopole Client: AT&T Code: TIA/EIA-222-F Path: <small>R:\STRUCTURAL DEPT\Analysis Software\Towers\Towers\Projects\CT_5375 Berlin CT\CT_5375.dwg</small>	Drawn by: kw Date: 04/05/12 App'd: Scale: NTS Dwg No: E-1
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tnxTower Hudson Design Group, LLC 1600 Osgood Street, Building 20 North, Suite 2-101 North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 226-5586	Job	CT5375 Berlin, CT	Page	1 of 10
	Project	176 ft monopole	Date	15:27:20 04/05/12
	Client	AT&T	Designed by	kw

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in Hartford County, Connecticut.

Basic wind speed of 80.0 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56.0 pcf.

A wind speed of 69.3 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 1.333.

Local bending stresses due to climbing loads, feedline 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	176.01-130.76	45.25	4.50	18	21.0000	31.8000	0.2500	1.0000	A572-65 (65 ksi)
L2	130.76-86.13	49.13	5.75	18	30.2260	41.8200	0.3125	1.2500	A572-65 (65 ksi)
L3	86.13-43.00	48.88	7.00	18	39.8381	51.3600	0.3750	1.5000	A572-65 (65 ksi)
L4	43.00-1.00	49.00		18	48.9600	60.6000	0.4375	1.7500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	21.3240	16.4651	895.6507	7.3663	10.6680	83.9568	1792.4800	8.2341	3.2560	13.024
	32.2906	25.0349	3148.3461	11.2003	16.1544	194.8909	6300.8349	12.5198	5.1568	20.627
L2	31.7706	29.6704	3354.2440	10.6193	15.3548	218.4493	6712.9015	14.8380	4.7698	15.263
	42.4651	41.1703	8961.3641	14.7352	21.2446	421.8192	17934.5198	20.5890	6.8103	21.793
L3	41.8289	46.9709	9241.6271	14.0094	20.2377	456.6531	18495.4146	23.4899	6.3515	16.937
	52.1523	60.6849	19929.7987	18.0997	26.0909	763.8607	39885.8215	30.3482	8.3794	22.345
L4	51.4038	67.3795	20042.4648	17.2255	24.8717	805.8353	40111.3021	33.6962	7.8470	17.936
	61.5349	83.5432	38203.2274	21.3577	30.7848	1240.9770	76456.7237	41.7795	9.8956	22.619

tnxTower Hudson Design Group, LLC 1600 Osgood Street, Building 20 North, Suite 2-101 North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 226-5586	Job	CT5375 Berlin, CT	Page	2 of 10
	Project	176 ft monopole	Date	15:27:20 04/05/12
	Client	AT&T	Designed by	kw

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _{AA}		Weight plf
						No Ice	1/2" Ice	
1 5/8	A	No	Inside Pole	176.00 - 21.00	7	No Ice	0.00	1.04
1 5/8	A	No	Inside Pole	171.00 - 9.00	6	1/2" Ice	0.00	1.04
(AT&T - existing)						No Ice	0.00	1.04
1 5/8	A	No	Inside Pole	161.00 - 9.00	24	1/2" Ice	0.00	1.04
						No Ice	0.00	1.04
1 5/8	A	No	Inside Pole	161.00 - 21.00	2	1/2" Ice	0.00	1.04
						No Ice	0.00	1.04
1 5/8	A	No	Inside Pole	151.00 - 9.00	12	1/2" Ice	0.00	1.04
						No Ice	0.00	1.04
1 5/8	A	No	Inside Pole	131.00 - 21.00	1	1/2" Ice	0.00	1.04
						No Ice	0.00	1.04
1 5/8	A	No	Inside Pole	101.00 - 21.00	2	1/2" Ice	0.00	1.04
						No Ice	0.00	1.04
1/2	A	No	Inside Pole	76.00 - 9.00	1	1/2" Ice	0.00	0.25
						No Ice	0.00	0.25
1/2	A	No	Inside Pole	61.00 - 21.00	1	1/2" Ice	0.00	0.25
						No Ice	0.00	0.25
1/2	A	No	Inside Pole	61.00 - 13.00	1	1/2" Ice	0.00	0.25
						No Ice	0.00	0.25
1 5/8	A	No	Inside Pole	111.00 - 21.00	12	1/2" Ice	0.00	1.04
						No Ice	0.00	1.04
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	CaAa (Out Of Face)	124.00 - 4.00	1	1/2" Ice	0.20	0.72
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	CaAa (Out Of Face)	124.00 - 4.00	5	1/2" Ice	0.30	2.23
						No Ice	0.20	0.72
1/2	A	No	Inside Pole	154.00 - 9.00	3	1/2" Ice	0.30	2.23
						No Ice	0.00	0.25
1/2	A	No	Inside Pole	146.00 - 9.00	1	1/2" Ice	0.00	0.25
						No Ice	0.00	0.25
1/2	A	No	Inside Pole	150.00 - 9.00	6	1/2" Ice	0.00	0.25
						No Ice	0.00	0.25
1 5/8	A	No	CaAa (Out Of Face)	111.00 - 21.00	1	1/2" Ice	0.00	0.25
						No Ice	0.20	1.04
1 5/8	A	No	CaAa (Out Of Face)	111.00 - 21.00	5	1/2" Ice	0.30	2.55
						No Ice	0.20	1.04
						1/2" Ice	0.30	2.55

FB-L98B-002 (AT&T - proposed)	A	No	Inside Pole	170.00 - 9.00	1	No Ice	0.00	0.25
WR-VG122ST-BRDA (AT&T - proposed)	A	No	Inside Pole	170.00 - 9.00	2	1/2" Ice	0.00	0.25
						No Ice	0.00	0.25
						1/2" Ice	0.00	0.25

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement ft	C _{AA}		Weight lb	
			Horz Lateral ft	Vert ft			Front ft ²	Side ft ²		
PiROD 13' Low Profile	A	None			0.0000	176.00	No Ice	15.70	15.70	1300.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
Platform								
20'-4 Bay Dipole	C	From Face	4.00 6.00 0.00	0.0000	176.00	1/2" Ice 20.10 No Ice 4.75 1/2" Ice 6.25	20.10 4.75 6.25	1765.00 50.00 80.00
Omni 3"x20'	C	From Face	4.00 0.00 0.00	0.0000	176.00	No Ice 6.00 1/2" Ice 8.03	6.00 8.03	50.00 93.17
20'-4 Bay Dipole	B	From Face	4.00 0.00 0.00	0.0000	176.00	No Ice 4.75 1/2" Ice 6.25	4.75 6.25	50.00 80.00
Omni 3"x20'	A	From Face	4.00 0.00 0.00	0.0000	176.00	No Ice 6.00 1/2" Ice 8.03	6.00 8.03	50.00 93.17
20'-4 Bay Dipole	A	From Face	4.00 6.00 0.00	0.0000	176.00	No Ice 4.75 1/2" Ice 6.25	4.75 6.25	50.00 80.00

PIROD 12' T-Frame (AT&T - proposed)	A	From Face	2.00 0.00 0.00	0.0000	170.00	No Ice 12.20 1/2" Ice 17.60	12.20 17.60	360.00 490.00
PIROD 12' T-Frame (AT&T - proposed)	B	From Face	2.00 0.00 0.00	0.0000	170.00	No Ice 12.20 1/2" Ice 17.60	12.20 17.60	360.00 490.00
PIROD 12' T-Frame (AT&T - proposed)	C	From Face	2.00 0.00 0.00	0.0000	170.00	No Ice 12.20 1/2" Ice 17.60	12.20 17.60	360.00 490.00
KMW AM-X-CD-16-65-00T-RET w/mount pipe (AT&T - proposed)	A	From Face	3.50 5.00 0.00	0.0000	170.00	No Ice 8.50 1/2" Ice 9.15	6.30 7.48	74.05 136.21
KMW AM-X-CD-16-65-00T-RET w/mount pipe (AT&T - proposed)	B	From Face	3.50 5.00 0.00	0.0000	170.00	No Ice 8.50 1/2" Ice 9.15	6.30 7.48	74.05 136.21
KMW AM-X-CD-16-65-00T-RET w/mount pipe (AT&T - proposed)	C	From Face	3.50 5.00 0.00	0.0000	170.00	No Ice 8.50 1/2" Ice 9.15	6.30 7.48	74.05 136.21
(2) Ericsson RRU (AT&T - proposed)	A	From Face	2.50 5.00 0.00	0.0000	170.00	No Ice 2.07 1/2" Ice 2.26	1.08 1.23	44.00 58.64
(2) Ericsson RRU (AT&T - proposed)	B	From Face	2.50 5.00 0.00	0.0000	170.00	No Ice 2.07 1/2" Ice 2.26	1.08 1.23	44.00 58.64
(2) Ericsson RRU (AT&T - proposed)	C	From Face	2.50 5.00 0.00	0.0000	170.00	No Ice 2.07 1/2" Ice 2.26	1.08 1.23	44.00 58.64
Surge Arrestor (DC6-48-60-18-8F) (AT&T - proposed)	C	From Face	1.50 0.00 0.00	0.0000	170.00	No Ice 1.27 1/2" Ice 1.46	1.27 1.46	20.00 35.12
Kathrein 800 10121 w/mount pipe (AT&T - existing)	A	From Face	3.50 -5.00 0.00	0.0000	170.00	No Ice 5.72 1/2" Ice 6.21	4.81 5.49	78.15 126.48
Kathrein 800 10121 w/mount pipe (AT&T - existing)	B	From Face	3.50 -5.00 0.00	0.0000	170.00	No Ice 5.72 1/2" Ice 6.21	4.81 5.49	78.15 126.48
Kathrein 800 10121 w/mount	C	From Face	3.50	0.0000	170.00	No Ice 5.72	4.81	78.15

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
pipe (AT&T - existing)			-5.00 0.00					
(2) Powerwave TMA LGP21400	A	From Face	3.50	0.0000	170.00	No Ice 1/2" Ice	6.21 1.23 0.41	126.48 14.10 21.29
(AT&T - existing)			-5.00 0.00					
(2) Powerwave TMA LGP21400	B	From Face	3.50	0.0000	170.00	No Ice 1/2" Ice	1.23 1.38 0.52	14.10 21.29
(AT&T - existing)			-5.00 0.00					
(2) Powerwave TMA LGP21400	C	From Face	3.50	0.0000	170.00	No Ice 1/2" Ice	1.23 1.38 0.52	14.10 21.29
(AT&T - existing)			-5.00 0.00					

PiROD 12' Lightweight T-Frame	A	From Face	2.00	0.0000	160.00	No Ice 1/2" Ice	10.20 16.20 16.20	253.00 355.00
PiROD 12' Lightweight T-Frame	B	From Face	2.00	0.0000	160.00	No Ice 1/2" Ice	10.20 16.20 16.20	253.00 355.00
PiROD 12' Lightweight T-Frame	C	From Face	2.00	0.0000	160.00	No Ice 1/2" Ice	10.20 16.20 16.20	253.00 355.00
(3) DR65-19-00	A	From Face	4.00	0.0000	160.00	No Ice 1/2" Ice	8.40 8.95 3.97	25.00 66.77
(3) DR65-19-00	B	From Face	4.00	0.0000	160.00	No Ice 1/2" Ice	8.40 8.95 3.97	25.00 66.77
(3) DR65-19-00	C	From Face	4.00	0.0000	160.00	No Ice 1/2" Ice	8.40 8.95 3.97	25.00 66.77
(4) Gen. TMA	A	From Face	3.00	0.0000	160.00	No Ice 1/2" Ice	0.68 0.80 0.56	13.20 18.38
(4) Gen. TMA	B	From Face	3.00	0.0000	160.00	No Ice 1/2" Ice	0.68 0.80 0.56	13.20 18.38
(4) Gen. TMA	C	From Face	3.00	0.0000	160.00	No Ice 1/2" Ice	0.68 0.80 0.56	13.20 18.38
10'-4 Bay Dipole	C	From Face	4.00	0.0000	160.00	No Ice 1/2" Ice	2.75 3.50 3.50	25.00 40.00

PiROD 15' Low Profile Platform	A	None		0.0000	150.00	No Ice 1/2" Ice	17.30 22.10 22.10	1500.00 2030.00
(2) Panel Antenna 4'x12"x3"	A	From Face	3.00	0.0000	150.00	No Ice 1/2" Ice	5.84 6.29 3.49	48.25 86.08
(2) Panel Antenna 4'x12"x3"	B	From Face	3.00	0.0000	150.00	No Ice 1/2" Ice	5.84 6.29 3.49	48.25 86.08
(2) Panel Antenna 4'x12"x3"	C	From Face	3.00	0.0000	150.00	No Ice 1/2" Ice	5.84 6.29 3.49	48.25 86.08
840-10054 w/mount pipe	A	From Face	3.00	0.0000	150.00	No Ice 1/2" Ice	5.41 5.83 2.92	46.43 80.72

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
840-10054 w/mount pipe	B	From Face	3.00 0.00 0.00	0.0000	150.00	No Ice 5.41 1/2" Ice 5.83	2.39 2.92	46.43 80.72
840-10054 w/mount pipe	C	From Face	3.00 0.00 0.00	0.0000	150.00	No Ice 5.41 1/2" Ice 5.83	2.39 2.92	46.43 80.72
RRH	A	From Face	3.00 0.00 0.00	0.0000	150.00	No Ice 2.79 1/2" Ice 3.02	1.69 1.87	51.00 72.75
RRH	B	From Face	3.00 0.00 0.00	0.0000	150.00	No Ice 2.79 1/2" Ice 3.02	1.69 1.87	51.00 72.75
RRH	C	From Face	3.00 0.00 0.00	0.0000	150.00	No Ice 2.79 1/2" Ice 3.02	1.69 1.87	51.00 72.75

Pirod 6' Side Mount Standoff (1)	C	From Face	3.00 0.00 0.00	0.0000	130.00	No Ice 4.97 1/2" Ice 6.12	4.97 6.12	70.00 130.00
10'-4 Bay Dipole	C	From Face	6.00 0.00 0.00	0.0000	130.00	No Ice 2.75 1/2" Ice 3.50	2.75 3.50	25.00 40.00

Collar Mount	A	None		0.0000	125.50	No Ice 1.40 1/2" Ice 2.40	1.40 2.40	20.00 35.00
Collar Mount	A	None		0.0000	122.50	No Ice 1.40 1/2" Ice 2.40	1.40 2.40	20.00 35.00
Kathrein 742 213 w/mount pipe	A	From Face	1.00 0.00 0.00	0.0000	124.00	No Ice 5.31 1/2" Ice 5.85	4.65 5.96	44.75 85.96
Kathrein 742 213 w/mount pipe	B	From Face	1.00 0.00 0.00	0.0000	124.00	No Ice 5.31 1/2" Ice 5.85	4.65 5.96	44.75 85.96
Kathrein 742 213 w/mount pipe	C	From Face	1.00 0.00 0.00	0.0000	124.00	No Ice 5.31 1/2" Ice 5.85	4.65 5.96	44.75 85.96

PiROD 13' Low Profile Platform	A	None		0.0000	112.00	No Ice 15.70 1/2" Ice 20.10	15.70 20.10	1300.00 1765.00
LPA-80063/6CF w/mount pipe	A	From Face	4.00 6.00 0.00	0.0000	114.00	No Ice 8.00 1/2" Ice 8.65	5.71 6.88	40.45 98.12
LPA-80063/6CF w/mount pipe	A	From Face	4.00 -6.00 0.00	0.0000	114.00	No Ice 8.00 1/2" Ice 8.65	5.71 6.88	40.45 98.12
LPA-80063/6CF w/mount pipe	B	From Face	4.00 6.00 0.00	0.0000	114.00	No Ice 8.00 1/2" Ice 8.65	5.71 6.88	40.45 98.12
LPA-80063/6CF w/mount pipe	B	From Face	4.00 -6.00 0.00	0.0000	114.00	No Ice 8.00 1/2" Ice 8.65	5.71 6.88	40.45 98.12
RWA-80013 w/Mount Pipe	C	From Face	4.00 6.00 0.00	0.0000	114.00	No Ice 6.14 1/2" Ice 6.85	4.66 5.70	39.85 88.02
RWA-80013 w/Mount Pipe	C	From Face	4.00 -6.00 0.00	0.0000	114.00	No Ice 6.14 1/2" Ice 6.85	4.66 5.70	39.85 88.02

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight	
			ft	°	ft	ft ²	ft ²	lb	
BXA-185060/12CF w/mount pipe	A	From Face	4.00 4.00 0.00	0.0000	114.00	No Ice 1/2" Ice	5.02 5.57	5.28 6.45	40.55 83.67
LNx 6514DS-VTM w/mount pipe	A	From Face	4.00 0.00 0.00	0.0000	114.00	No Ice 1/2" Ice	8.63 9.29	7.07 8.25	64.55 130.72
Rymsa MGD3-900 w/mount pipe	B	From Face	4.00 4.00 0.00	0.0000	114.00	No Ice 1/2" Ice	5.59 6.15	5.26 6.43	47.55 92.90
LNx 6514DS-VTM w/mount pipe	B	From Face	4.00 0.00 0.00	0.0000	114.00	No Ice 1/2" Ice	8.63 9.29	7.07 8.25	64.55 130.72
Rymsa MGD3-900 w/mount pipe	C	From Face	4.00 4.00 0.00	0.0000	114.00	No Ice 1/2" Ice	5.59 6.15	5.26 6.43	47.55 92.90
LNx 6514DS-VTM w/mount pipe	C	From Face	4.00 0.00 0.00	0.0000	114.00	No Ice 1/2" Ice	8.63 9.29	7.07 8.25	64.55 130.72

Pirod 6' Side Mount Standoff (1)	C	From Face	3.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice	4.97 6.12	4.97 6.12	70.00 130.00
20'-4 Bay Dipole	C	From Face	6.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice	4.75 6.25	4.75 6.25	50.00 80.00

3' Side Mount Standoff	B	From Face	1.50 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice	1.90 3.30	1.90 3.30	40.00 70.00
GPS	B	From Face	3.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice	0.21 0.32	0.21 0.32	5.00 7.52
3' Side Mount Standoff	B	From Face	1.50 0.00 0.00	0.0000	60.00	No Ice 1/2" Ice	1.90 3.30	1.90 3.30	40.00 70.00
GPS	B	From Face	3.00 0.00 0.00	0.0000	60.00	No Ice 1/2" Ice	0.21 0.32	0.21 0.32	5.00 7.52
3' Side Mount Standoff	C	From Face	1.50 0.00 0.00	0.0000	60.00	No Ice 1/2" Ice	1.90 3.30	1.90 3.30	40.00 70.00
Scanner Antenna	C	From Face	3.00 0.00 0.00	0.0000	60.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	15.00 30.00

Chain Mount	C	None		0.0000	45.00	No Ice 1/2" Ice	1.17 1.57	1.17 1.57	15.00 143.43
2' Side Mount Standoff	C	From Face	1.00 0.00 0.00	0.0000	45.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	30.00 50.00
GPS	C	From Face	2.00 0.00 0.00	0.0000	45.00	No Ice 1/2" Ice	0.21 0.32	0.21 0.32	5.00 7.52

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Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				Horz Lateral	Vert						
				ft	°	°	ft	ft	ft ²	lb	
Kathrein PR-950	C	Grid	From Face	4.00	0.0000		176.00	4.50	No Ice	6.00	38.00
				-6.00				1/2" Ice	9.00	98.00	
Kathrein PR-950	B	Grid	From Face	4.00	0.0000		176.00	4.50	No Ice	6.00	38.00
				-6.00				1/2" Ice	9.00	98.00	
Kathrein PR-950	C	Grid	From Face	4.00	0.0000		160.00	4.50	No Ice	6.00	38.00
				6.00				1/2" Ice	9.00	98.00	
Kathrein PR-950	C	Grid	From Face	6.00	0.0000		100.00	4.50	No Ice	6.00	38.00
				0.00				1/2" Ice	9.00	98.00	
VHLP2.5-180	A	Paraboloid w/o Radome	From Face	0.50	0.0000		154.00	2.50	No Ice	4.90	69.00
				0.00				1/2" Ice	5.24	95.89	
VHLP2.5-180	B	Paraboloid w/o Radome	From Face	0.50	0.0000		154.00	2.50	No Ice	4.90	69.00
				0.00				1/2" Ice	5.24	95.89	
VHLP2.5-180	C	Paraboloid w/o Radome	From Face	0.50	0.0000		154.00	2.50	No Ice	4.90	69.00
				0.00				1/2" Ice	5.24	95.89	
VHLP2.5-180	B	Paraboloid w/o Radome	From Face	0.50	0.0000		146.00	2.50	No Ice	4.90	69.00
				0.00				1/2" Ice	5.24	95.89	

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp

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Comb. No.	Description
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	15	64388.73	-90.13	40266.46
	Max. H _x	11	52766.44	42788.45	-404.72
	Max. H _z	2	52766.44	-72.73	42830.91
	Max. M _x	2	4868803.54	-72.73	42830.91
	Max. M _z	5	4845962.91	-42686.96	-171.52
	Max. Torsion	13	5702.54	21164.49	37044.12
	Min. Vert	1	52766.44	0.00	0.00
	Min. H _x	5	52766.44	-42686.96	-171.52
	Min. H _z	8	52766.44	312.78	-43034.78
	Min. M _x	8	-4902485.41	312.78	-43034.78
	Min. M _z	11	-4863158.31	42788.45	-404.72
	Min. Torsion	21	-6500.07	649.88	-40081.54

Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
Dead Only	52766.44	0.00	0.00	1171.76	935.12	0.00
Dead+Wind 0 deg - No Ice	52766.44	72.73	-42830.91	-4868803.54	-10488.78	-3429.58
Dead+Wind 30 deg - No Ice	52766.44	21316.82	-37196.91	-4232984.27	-2417494.82	-432.89
Dead+Wind 60 deg - No Ice	52766.44	37196.93	-21511.92	-2449242.24	-4232469.18	1866.32
Dead+Wind 90 deg - No Ice	52766.44	42686.96	171.52	28411.34	-4845962.91	3692.44
Dead+Wind 120 deg - No Ice	52766.44	37017.41	21350.91	2426121.56	-4204051.85	5378.22
Dead+Wind 150 deg - No Ice	52766.44	21466.10	36869.85	4183078.49	-2441886.25	5403.98
Dead+Wind 180 deg - No Ice	52766.44	-312.78	43034.78	4902485.41	48308.83	3568.74
Dead+Wind 210 deg - No Ice	52766.44	-21774.96	37049.46	4211891.98	2490719.92	730.32
Dead+Wind 240 deg - No Ice	52766.44	-37211.23	21546.80	2456432.22	4235575.01	-1941.02
Dead+Wind 270 deg - No Ice	52766.44	-42788.45	404.72	63694.60	4863158.31	-3917.29

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Load Combination	Vertical	Shear _x	Shear _y	Overturning Moment, M _x	Overturning Moment, M _y	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead+Wind 300 deg - No Ice	52766.44	-37276.76	-21196.85	-2400871.37	4245303.76	-5648.31
Dead+Wind 330 deg - No Ice	52766.44	-21164.49	-37044.12	-4208819.13	2394996.92	-5702.54
Dead+Ice+Temp	64388.73	-0.00	0.00	2304.99	2874.36	0.03
Dead+Wind 0 deg+Ice+Temp	64388.73	90.13	-40266.46	-4668929.27	-12332.93	-3431.16
Dead+Wind 30 deg+Ice+Temp	64388.73	19372.45	-35183.73	-4093217.88	-2214784.94	-2313.29
Dead+Wind 60 deg+Ice+Temp	64388.73	34149.93	-21055.06	-2477978.24	-3933665.18	131.10
Dead+Wind 90 deg+Ice+Temp	64388.73	39289.14	114.97	20944.70	-4518523.68	3402.53
Dead+Wind 120 deg+Ice+Temp	64388.73	34142.39	19770.52	2280990.92	-3930060.46	5797.58
Dead+Wind 150 deg+Ice+Temp	64388.73	19828.12	34128.24	3930213.53	-2284886.95	6449.47
Dead+Wind 180 deg+Ice+Temp	64388.73	-649.88	40081.54	4649472.53	115644.32	6500.07
Dead+Wind 210 deg+Ice+Temp	64388.73	-20421.65	34361.43	3970135.92	2393163.34	2124.28
Dead+Wind 240 deg+Ice+Temp	64388.73	-34503.46	20083.05	2334542.41	3998114.09	-1137.95
Dead+Wind 270 deg+Ice+Temp	64388.73	-39517.94	549.87	95829.53	4564126.59	-2982.83
Dead+Wind 300 deg+Ice+Temp	64388.73	-34454.15	-20480.28	-2378635.81	3993031.41	-2318.48
Dead+Wind 330 deg+Ice+Temp	64388.73	-19205.03	-34968.71	-4056395.70	2192336.47	-3715.05
Dead+Wind 0 deg - Service	52766.44	40.91	-24092.40	-2741322.42	-5469.56	-1946.29
Dead+Wind 30 deg - Service	52766.44	11990.71	-20923.26	-2383280.82	-1360989.26	-248.41
Dead+Wind 60 deg - Service	52766.44	20923.27	-12100.45	-1378764.71	-2383128.24	1055.59
Dead+Wind 90 deg - Service	52766.44	24011.42	96.48	16560.73	-2728536.57	2091.91
Dead+Wind 120 deg - Service	52766.44	20822.29	12009.89	1366824.70	-2367064.95	3048.51
Dead+Wind 150 deg - Service	52766.44	12074.68	20739.29	2356231.76	-1374696.33	3063.79
Dead+Wind 180 deg - Service	52766.44	-175.94	24207.07	2761445.97	27648.81	2025.40
Dead+Wind 210 deg - Service	52766.44	-12248.42	20840.32	2372521.17	1403113.85	417.04
Dead+Wind 240 deg - Service	52766.44	-20931.32	12120.08	1383922.91	2385740.93	-1098.17
Dead+Wind 270 deg - Service	52766.44	-24068.51	227.65	36434.26	2739107.94	-2219.66
Dead+Wind 300 deg - Service	52766.44	-20968.18	-11923.23	-1351500.31	2391201.66	-3201.97
Dead+Wind 330 deg - Service	52766.44	-11905.03	-20837.31	-2369617.73	1349164.68	-3233.25

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	176.01 - 130.76	73.5950	33	3.7414	0.0175
L2	135.26 - 86.13	43.1921	33	3.1841	0.0102
L3	91.88 - 43	19.0060	33	2.0466	0.0049
L4	50 - 1	5.3731	33	1.0045	0.0018

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
176.00	Kathrein PR-950	33	73.5871	3.7413	0.0196	18424
170.00	PiROD 12' T-Frame	33	68.8977	3.6786	0.0183	15328
160.00	Kathrein PR-950	33	61.1590	3.5670	0.0160	5753
154.00	VHLP2.5-180	33	56.6081	3.4917	0.0147	4183
150.00	PiROD 15' Low Profile Platform	33	53.6301	3.4364	0.0139	3539
146.00	VHLP2.5-180	33	50.7067	3.3762	0.0130	3067
130.00	PiROD 6' Side Mount Standoff (1)	33	39.7233	3.0712	0.0101	2255
125.50	Collar Mount	33	36.8730	2.9656	0.0093	2254

tnxTower Hudson Design Group, LLC 1600 Osgood Street, Building 20 North, Suite 2-101 North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 226-5586	Job CT5375 Berlin, CT	Page 10 of 10
	Project 176 ft monopole	Date 15:27:20 04/05/12
	Client AT&T	Designed by kw

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
124.00	Kathrein 742 213 w/mount pipe	33	35.9470	2.9288	0.0091	2253
122.50	Collar Mount	33	35.0330	2.8913	0.0089	2253
114.00	LPA-80063/6CF w/mount pipe	33	30.0809	2.6673	0.0077	2250
112.00	PiROD 13' Low Profile Platform	33	28.9718	2.6124	0.0075	2250
100.00	Kathrein PR-950	33	22.7672	2.2746	0.0060	2246
75.00	3' Side Mount Standoff	33	12.3280	1.5995	0.0036	2156
60.00	3' Side Mount Standoff	33	7.7244	1.2334	0.0025	2083
45.00	Chain Mount	33	4.4148	0.8942	0.0016	2269

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
L1	176.01 - 130.76	Pole	TP31.8x21x0.25	1	-14140.20	1257185.57	61.9	Pass
L2	130.76 - 86.13	Pole	TP41.82x30.226x0.3125	2	-20778.80	2070348.86	90.4	Pass
L3	86.13 - 43	Pole	TP51.36x39.8381x0.375	3	-33794.90	3052729.83	95.7	Pass
L4	43 - 1	Pole	TP60.6x48.96x0.4375	4	-52735.90	4343153.76	92.4	Pass
Summary								
Pole (L3)							95.7	Pass
RATING =							95.7	Pass



REFERENCE DOCUMENTS

CT 5375

**DETAILED STRUCTURAL ANALYSIS AND
EVALUATION OF AN EXISTING 176'
MONOPOLE FOR PROPOSED ANTENNA
ARRANGEMENT**

Site: Berlin Fire Department
Address: 1657 Wilbur Cross Parkway,
Berlin, CT

prepared for



**Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108**

prepared by

URS

**URS CORPORATION
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
TEL. 860-529-8882**

**36931194.00000
VZ5-047 (Rev 2)**

June 23, 2010

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1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing 176' steel tapered monopole structure, located at 1657 Wilbur Cross Parkway in Berlin, CT. The analysis was conducted in accordance with the 2005 Connecticut State Building Code and the TIA/EIA-222-F standard for a wind velocity of 80 mph (fastest mile) and 69 mph (fastest mile) concurrent with 0.5" ice. The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined in the Introduction Section of this report.

The proposed Verizon Wireless installation is as follows:

Proposed Antenna and Mount	Carrier	Antenna Center Elevation
<p><u>Remove:</u></p> <p>(6) LPA-185080 / 8CF 2 panel antennas (two per sector)</p>	<p>Verizon Wireless (Existing)</p>	
<p><u>Install:</u></p> <p>(3) LNX-6514DS-T4M-750_4 panel antennas (One per Sector) (1) BXA-185060/12CF 2 panel antenna (Alpha Sector) (2) MG D3-900T0 panel antenna (Beta and Gamma Sectors)</p> <p>Mounted on existing platform</p>	<p>Verizon Wireless (Proposed)</p>	<p>@ 114' (113' above base plate)</p>

The results of the analysis indicate that the tower structure has the capacity to support the proposed loading conditions. **The tower and its foundation are considered structurally adequate with the wind load classification specified above and the proposed antenna loading.**

This analysis is based on:

- 1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
- 2) Geotechnical investigation and report performed by Dr. Clarence Welti, P.E., P.C. dated June 11, 2002.
- 3) Tower geometry and structural member sizes utilized in the preparation of this report obtained from manufacturers original design documents for a 176' tapered steel monopole, prepared by Engineered Endeavors, Inc., EEI Job #: 11129, signed and sealed September 16, 2002.
- 4) Foundation geometry utilized in the preparation of this report obtained from manufacturers original design documents for a 176; tapered steel monopole, prepared by Engineered Endeavors, Inc., EEI Job # 11129, signed and sealed September 20, 2002.
- 5) Previous structural analysis performed by URS Corp, project number VS1-034 / 36922118, signed and sealed September 29, 2005.
- 6) Previous structural analysis performed by URS Corp, project number VZ1-005 / 36912556, signed and sealed February 21, 2006.
- 7) Previous structural analysis performed by Natcomm Consulting Engineers, Inc., project number 08007.C05, signed and sealed February 14, 2008.
- 8) Site documentation and visual verification of existing appurtenances conducted from grade by URS during July 2008.

1. EXECUTIVE SUMMARY - continued

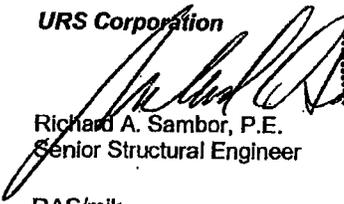
- 9) Previous structural analysis performed by URS Corp, project number PWS-002 / 36923532, signed and sealed July 18, 2008.
- 10) Previous structural analysis performed by URS Corp, project number MXN-003 / 36924391, signed and sealed April 7, 2010.
- 11) Antenna and mount configuration as specified within Section 2 and 6 of this report.

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the assumption of the antenna and mount configuration as well as the physical condition of the tower. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please call.

Sincerely,

URS Corporation



Richard A. Sambor, P.E.
Senior Structural Engineer



cc: RAS/mjk
MJE, ICA – URS, CF/Book

2. INTRODUCTION

The subject tower is located at 1657 Wilbur Cross Parkway in Berlin, CT. The structure is an existing 176' steel tapered monopole structure, designed and manufactured by Engineered Endeavors, Inc.

The inventory is summarized in the table below:

Antenna Type	Carrier	Mount	Antenna Centerline Elevation	Cable
(2) Dipole antennas	Town (existing)	Low-Profile Platform	176'	(2) 1 5/8" (within monopole)
(2) Grid Dishes				(2) 1 5/8" (within monopole)
(2) Omni antennas				(2) 1 5/8" (within monopole)
(1) 4-Bay Dipole antenna	Town (reserved)			(1) 1 5/8" (within monopole)
(3) Powerwave 7770 panel antennas and (6) Powerwave LGP21401 TMA's	AT&T/Cingular (existing)	Cluster/Pipe Mounted	170'	(6) 1 5/8" (within monopole)
(6) EMS DR65-19-00DPQ antennas and (6) Decibel PCS 1900 TMA's	T-Mobile (existing)	(3) T-Arms	160'	(12) 1 5/8" (within monopole)
(3) EMS DR65-19-00DPQ antennas and (6) Decibel PCS 1900 TMA's	T-Mobile (reserved)			(12) 1 5/8" (within monopole)
(1) 4-Bay Dipole antenna and (1) Grid Dish	Town (existing)	T-Arm (listed above)	160'	(2) 1.5/8" (within monopole)
(3) Andrew VHLP2.5 Dishes	Clearwire (existing)	Modified Low-Profile Platform	154'	(3) 1/2" (within monopole)
(6) Dapa 48000 antennas (6 existing)	Sprint/Nextel (existing)	Modified Low-Profile Platform	150'	(12) 1 5/8" (within monopole)
(3) Kathrein 840 10054 (3) Samsung Remote Radio Heads	Clearwire (existing)	Modified Low-Profile Platform	150'	(6) CAT 5 (within monopole)
(1) Andrew VHLP2.5 Dishes	Clearwire (existing)	Modified Low-Profile Platform	146'	(1) 1/2" (within monopole)
(1) 2-Bay Dipole antenna	Town (existing)	6' Extension Arm	130'	(1) 1 5/8" (within monopole)
(3) Kathrein 742 213 panel antennas	Pocket Wireless (existing)	Flush mount assembly	124'	(6) 1 5/8" (Andrew AVA7-50 exterior of monopole)
(4) Antel LPA 80063/6CF (2)RWA80013	Verizon (existing)	Low-Profile Platform (existing)	114'	(12) 1 5/8" (within monopole) (existing)
(3) LNX-6514DS-T4M-750_4 (1) BXA-185060/12CF 2 & (2) MG D3-900T0	Verizon (proposed)			(6) 1 5/8" (outside monopole) (proposed)
(1) 4-Bay Dipole antenna (1) Grid Dish	Town (existing)	6' Extension Arm	100'	(2) 1 5/8" (within monopole)
(1) GPS antenna	Sprint/Nextel (existing)	Standoff Mount	75'	(1) 1/2" (within monopole)
(1) VIC-100 GPS antenna	T-Mobile (reserved)	Standoff Mount	60'	(1) 1/2" (within monopole)
(1) Scanner antenna	Town (existing)	Standoff Mount	60'	(1) 1/2" (within monopole)

Note: Base of structure established as 1.0ft above average grade.

This structural analysis of the communications tower was performed by URS Corporation (URS) for Verizon Wireless. The purpose of this analysis was to investigate the structural integrity of the existing tower with its existing and proposed antenna loads. This analysis was conducted to evaluate stress on the tower and the effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangement.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was conducted in accordance with the 2005 Connecticut State Building Code, TIA/EIA-222-F - Structural Standard for Steel Antenna Towers and Antenna Supporting Structures, and the American Institute of Steel Construction (AISC) Manual of Steel Construction - Allowable Stress Design (ASD).

The analysis was conducted using RISA Tower 5.3. Two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA.

Load Condition 1 = 80 mph (fastest mile) Wind Load (without ice) + Tower Dead Load
 Load Condition 2 = 69 mph (fastest mile) Wind Load (with ice) + Ice Load + Tower Dead Load

Please note that wind pressure is a function of velocity squared. Under Load Condition 2, a 25 percent reduction in wind pressure is allowed by code to account for the unlikelihood of the full wind pressure and ice load occurring at the same time. The same results may be achieved by utilizing a lower wind pressure without taking the 25 percent reduction, as shown above.

The TIA/EIA standard permits a one-third increase in allowable stresses for towers and monopoles less than 700 feet tall. For the purposes of this analysis, in computing the load capacity the allowable stresses of the tower members were increased by one-third.

4. FINDINGS AND EVALUATION

Combined axial and bending stresses on the monopole structure were evaluated to compare with allowable stresses in accordance with AISC. The calculated stresses under the proposed loading were **BELOW** the allowable stresses (see table below). Detailed analysis and calculations for the proposed load condition are provided in section 6 of this report. Additionally, the anchor bolts, base plate and foundation were all found to be within the allowable limits.

TABLE 1: Proposed Tower Base Reactions vs. Original Design Reactions

Base Reactions	Proposed Reactions	Original Design Reactions
Axial Load (kips)	50	49.6
Shear (kips)	32	34.94
O.T. Moment (ft-kips)	3737	4306.5

Note: Original design reactions based on TIA/EIA 222-F with a wind speed of 85mph and 0.5in ice.

TABLE 2: Proposed Tower Component Stress vs. Capacity Summary

Component (Section No.)	Controlling Component / Elevation	Stress Ratio (% capacity)	Pass/Fail	Comments:
Pole Shaft (L3)	43'-86.13'	74.2%	Pass	
Anchor Bolts	Compression	75%	Pass	
Base Plate	Bending	74%	Pass	
Caisson Foundation	Flexure	59%	Pass	

5. CONCLUSIONS AND RECOMMENDATIONS

The results of the analysis indicate that the tower structure has the capacity to support the proposed loading conditions. **The tower and its foundation are considered structurally adequate with the wind load classification specified above and the proposed antenna loading.**

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report.
2. Tower is properly installed and maintained.
3. All members are as specified in the original design documents and are in good condition.
4. All required members are in place.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All member protective coatings are in good condition.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations were properly constructed to support original design loads as specified in the original design documents.
10. All coaxial cable is installed within the monopole unless specified otherwise.

URS is not responsible for any modifications completed prior to or hereafter in which URS is not or was not directly involved. Modifications include but are not limited to:

- A. Adding antennas
- B. Removing/replacing antennas
- C. Adding coaxial cables

URS hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact URS. URS disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Ongoing and Periodic Inspection and Maintenance:

After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

The owner shall refer to TIA/EIA-222-F for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. According to TIA/EIA-222-F section 14.1, Note 1: It is recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

RISA TOWER INPUT/OUTPUT SUMMARY

EXHIBIT 3



C Squared Systems, LLC
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Auburn, NH 03032
(603) 644-2800
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Calculated Radio Frequency Emissions



CT5375 (Berlin E Central)

1657 Wilbur Cross Highway, Berlin, CT

April 18, 2012

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1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the monopole located at 1657 Wilbur Cross Highway in Berlin, CT. The coordinates of the tower are: 41°36'22.68"N, 72°44'58.56"W.

AT&T is proposing the following modifications:

- 1) Install three new panel antenna for LTE
- 2) Add T-arms to accommodate 2 antennas per sector

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times \text{EIRP}}{4\pi \times R^2} \right) \times \text{Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the finished modifications.

4. Calculation Results

Table 1 below outlines the power density information for the site. Because the proposed AT&T antennas are directional in nature, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm ²)	Limit	%MPE
<i>Cingular UMTS</i>	<i>170</i>	<i>1900</i>	<i>1</i>	<i>787</i>	<i>0.0392</i>	<i>1.0000</i>	<i>3.92%</i>
<i>Cingular GSM</i>	<i>170</i>	<i>880</i>	<i>1</i>	<i>500</i>	<i>0.0062</i>	<i>0.5867</i>	<i>1.06%</i>
Police Channel	180	809	1	200	0.0022	0.5393	0.41%
Fire Main	180	154	1	100	0.0011	0.2000	0.55%
Fire Intercity	100	154	1	30	0.0011	0.2000	0.54%
Highway	160	156	1	50	0.0007	0.2000	0.35%
Fire Ground	130	156	1	5	0.0001	0.2000	0.05%
SP Hotline	180	45	1	80.77	0.0009	0.2000	0.45%
RAFS	180	465	1	30	0.0003	0.3100	0.11%
960 Link	100	960	1	20.5	0.0007	0.6400	0.12%
Sprint	147.5	1962.5	11	477.09	0.0867	1.0000	8.67%
Clearwire	150	2496	2	153	0.0049	1.0000	0.49%
Clearwire	150	11 GHz	1	211	0.0034	1.0000	0.34%
Pocket	124	2130	3	631	0.0443	1.0000	4.43%
T-Mobile GSM	160	1945	8	123	0.0138	1.0000	1.38%
T-Mobile UMTS	160	2100	2	490	0.0138	1.0000	1.38%
Verizon	114	869	9	426	0.1061	0.5793	18.31%
Verizon	114	1970	7	264	0.0511	1.0000	5.11%
Verizon	114	757	1	721	0.0199	0.5047	3.95%
AT&T UMTS	170	880	2	565	0.0014	0.5867	0.24%
AT&T UMTS	170	1900	2	1077	0.0027	1.0000	0.27%
AT&T LTE	170	734	1	1313	0.0016	0.4893	0.33%
AT&T GSM	170	880	1	283	0.0004	0.5867	0.06%
AT&T GSM	170	1900	4	646	0.0032	1.0000	0.32%
						Total	47.86%

Table 1: Carrier Information^{1,2}

¹ The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 3/29/2012. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not identically match the total value reflected in the table.

² In the case where antenna models are not uniform across all 3 sectors for the same frequency band, the antenna model with the highest gain was used for the calculations to present a worse-case scenario.

5. Conclusion

The above analysis verifies that emissions from the existing site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **47.86% of the FCC limit**.

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.



Daniel L. Goulet
C Squared Systems, LLC

April 18, 2012

Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure³

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure⁴

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

³ Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

⁴ General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

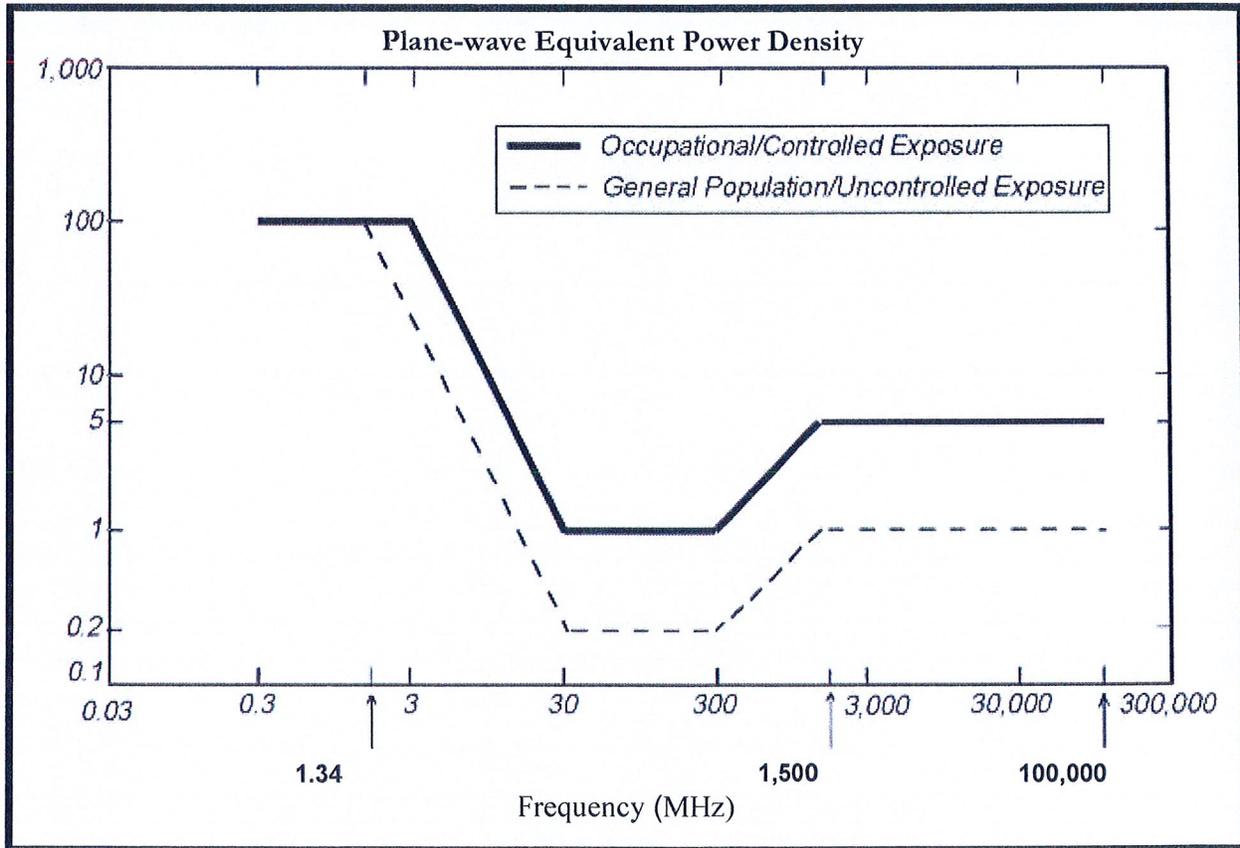
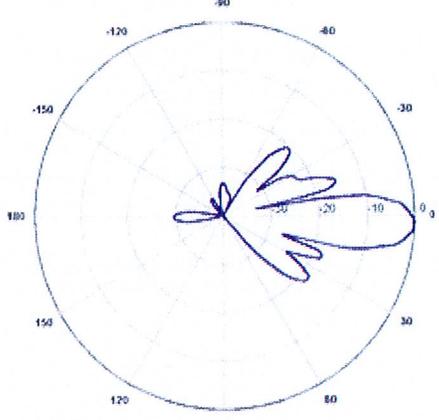
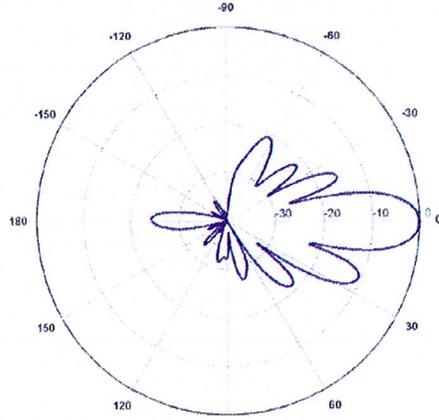


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

<p>700 MHz</p> <p>Manufacturer: KMW Model #: AM-X-CD-16-65-00T Frequency Band: 698-806 MHz Gain: 13.4 dBd Vertical Beamwidth: 12.3° Horizontal Beamwidth: 65° Polarization: Dual Linear ±45° Size L x W x D: 72" x 11.8" x 5.9"</p>	
<p>850 MHz</p> <p>Manufacturer: Kathrein Model #: 80010121 Frequency Band: 824-896 MHz Gain: 11.5 dBd Vertical Beamwidth: 14.5° Horizontal Beamwidth: 86° Polarization: Dual Linear ±45° Size L x W x D: 54.5 x 10.3 x 5.9</p>	
<p>1900 MHz</p> <p>Manufacturer: Kathrein Model #: 80010121 Frequency Band: 1850-1990 MHz Gain: 14.3 Vertical Beamwidth: 6.6° Horizontal Beamwidth: 85° Polarization: Dual Linear ±45° Size L x W x D: 54.5 x 10.3 x 5.9</p>	