



April 1, 2020

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

Regarding: Notice of Exempt Modification – T-Mobile Site #: CT11506A_L600
Address: 83 Windham Street, Willimantic, CT
T-Mobile Site #: CT11506A_L600

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 117-foot level of the existing 175-foot monopole tower at the above-referenced address, latitude 41.7204980000, longitude -72.2183500000. The 175-foot tower and property are located on the campus of Eastern Connecticut State University. They are both owned by the State of Connecticut.

T-Mobile now intends to replace three (3) of its existing antennas with three (3) new 600/700 MHz antennas at the 117-foot level of the tower. The existing antenna mounts can support the proposed modifications with reinforcements to the existing horizontal steel rotation plate with new steel angles. Typical of (2) per sector, total of (6). There are also (18) proposed stiffeners to be welded to existing pole base.

Planned Modifications:

Remove:

(2) Coax Lines

Remove and Replace:

(3) LNX6515 Antennas (**Remove**) – (3) APXVAARR24_43U-NA20 Antennas 600/700 MHz (**Replace**)

(3) RRUS11 B12 (**Remove**) – (3) 4449 B71+B12 (**Replace**)

Install New:

(1) Hybrid Coax Line

Existing to Remain:

(3) AIR21 B2A B4P Antennas (1900 MHz/2100 MHz)

(3) AIR21 B2P B4A Antenna (2100 MHz)

(3) Generic Twin Style 1B AWS TMA

(10) Coax Lines

(1) Hybrid Coax Line

This facility was approved by Connecticut Siting Council Petition **TS-T-MOBILE-163-030912** on September 24, 2003.

Please accept this letter as notification pursuant to R.C.S.A §16-50j-73 for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to James R. Howarth, VP of Finance and Administration,

Eastern Connecticut State University as the tower and property owner and the Office of the Connecticut State Building Inspector.

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

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require an extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. *Please see the RF emissions calculation for T-Mobile's modified facility dated May 21, 2019 and prepared by EBI Consulting enclosed herewith.*
5. The proposed modifications will not cause an ineligible change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading. *Please see the structural analysis dated July 2, 2019 and prepared by Hudson Design Group enclosed herewith.*

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

Respectfully submitted,



Jennifer Iliades
Site Acquisition Consultant
Centerline Communications, LLC
750 West Center Street, Suite 301
West Bridgewater, MA 02379
jiliades@clinellc.com

Enclosures: Exhibit A – Original Facility Approval
 Exhibit B – GIS and Property Card
 Exhibit C – Construction Drawings
 Exhibit D – Structural Analysis Report
 Exhibit E – Mount Analysis
 Exhibit F – Power Density/RF Emissions Report

cc: Eastern Connecticut State University, property and tower owner
 Office of the Connecticut State Building Inspector

Exhibit A

Original Facility Approval



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@po.state.ct.us

Web Site: www.state.ct.us/csc/index.htm

September 24, 2003

Stephen J. Humes
LeBoeuf, Lamb, Greene & MacRae
Goodwin Square
225 Asylum Street
Hartford, CT 06103

RE: **TS-T-MOBILE-163-030912** - Omnipoint Communications, Inc., request for an order to approve tower sharing of an existing telecommunications facility located at Eastern Road, Willimantic, Connecticut.

Dear Attorney Humes:

At a public meeting held September 23, 2003, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures. 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. Any additional change to this facility may require an explicit request to this agency pursuant to General Statutes § 16-50aa or notice pursuant to Regulations of Connecticut State Agencies Section 16-50j-73, as applicable. Such request or 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. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction.

The proposed shared use is to be implemented as specified in your letter dated September 12, 2003.

Thank you for your attention and cooperation.

Very truly yours,

Pamela B. Katz, P.E.
Chairman

PBK/laf

c: Honorable Michael T. Paulhus, First Selectman, Town of Windham
James E. Finger, Town Planner, Town of Windham
Thomas J. Regan, Esq., Brown Rudnick Berlack Israels
Michele G. Briggs, Southwestern Bell Mobile Systems
Sandy M. Carter, Verizon Wireless

STATE OF CONNECTICUT



DEPARTMENT OF PUBLIC SAFETY
 DIVISION OF FIRE, EMERGENCY & BUILDING SERVICES
 OFFICE OF THE STATE BUILDING INSPECTOR



BUILDING PERMIT #09-03

The Agency named below is hereby granted permission to perform work as described herein:

DATE: December 30, 2003
PROJECT: Omnipoint Communications (T-Mobile)
 Telecommunications Antennas and Equipment
LOCATION: Eastern Connecticut State University
 Willimantic, CT
USE GROUP: U
CONSTRUCTION TYPE: 1B
PROJECT #: CT-11-506A

In accordance with the Application for Building Permit dated December 30, 2003, and related plans dated August 13, 2003 as approved by the Office of the State Building Inspector.

TYPE OF WORK: (Permit will be valid only for the item(s) listed below)

Structural
 Electrical

AGENCY: Eastern Connecticut State University

AGENCY REPRESENTATIVE: Nancy Tinker

JOB DESCRIPTION: Erect telecommunications antenna and associated equipment to existing 175 foot monopole tower.

STIPULATIONS: Any changes to the approved plans shall be submitted to the Office of State Building Inspector for review.

NOTE: In no way does this permit relieve the designer of the ultimate responsibility for compliance of the entire project with requirements of the 1999 State Building Code and applicable referenced standards. The contractor must give seven (7) days advance notification to the State Building Inspector of the intention to start work and schedule all required on-site inspections during construction as hereafter required.

Christopher R. Laux, AIA
 State Building Inspector
 CRL:MG:jlc

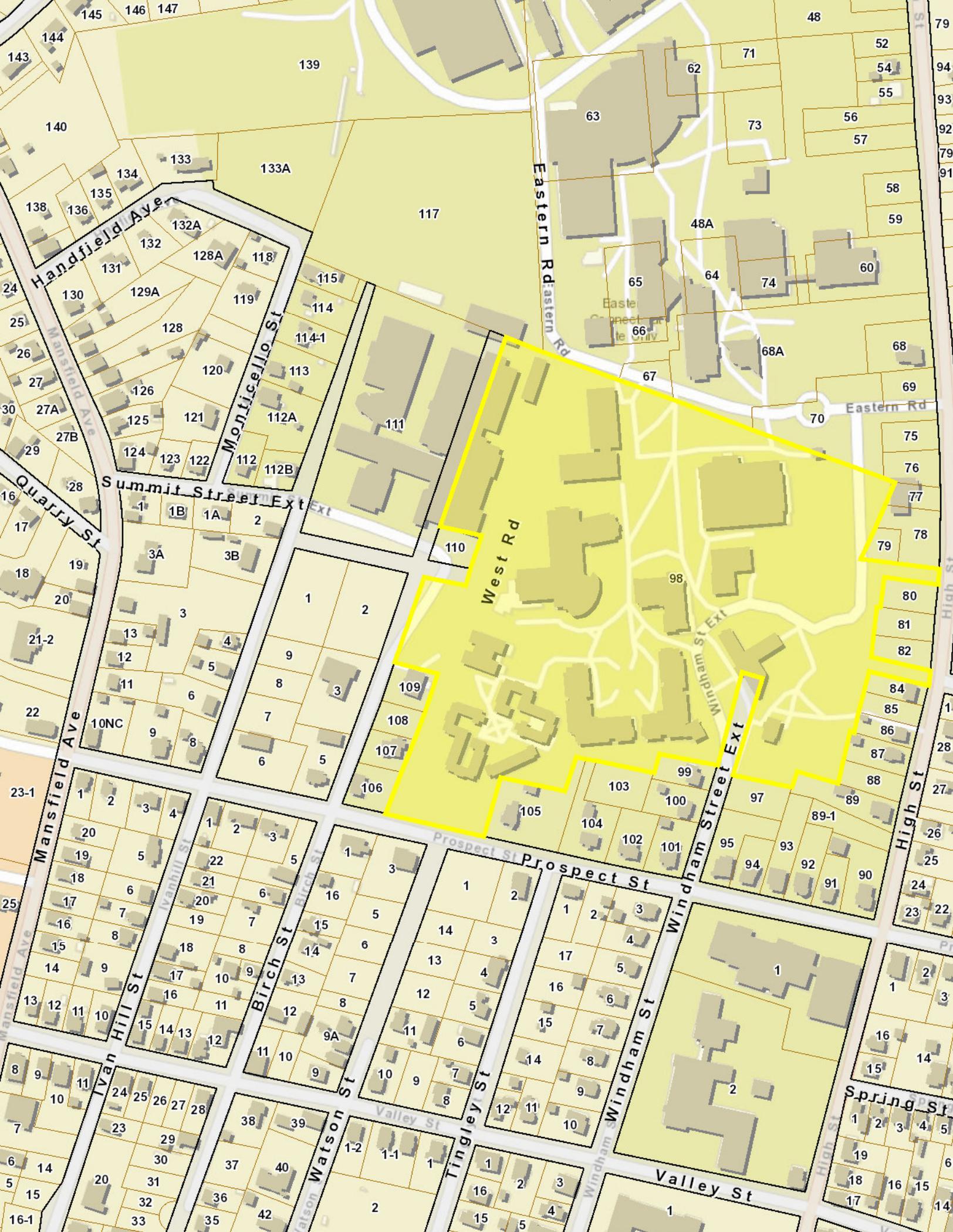
cc: Renee-Theroux Keech, ECSU
 Darren Cooke, OSFM
 Stephen Carey
 Karina Fournier, Omnipoint Communication

Post-it® Fax Note	7671	Date	1-6-04	# of pages	1
To	KARINA FOURNIER	From	MEGG GOULET		
Co./Dept.	OMNIPONT	Co.	OSBI		
Phone #	860 692 7145	Phone #	860 692 8310		
Fax #	860 692 7159	Fax #	860 692 8365		

Telephone (860)
 1111 Country Club Road P.O. Box 2794
 Middletown, CT 06457-9294
<http://www.state.ct.us/dps/dfebs>
 An Equal Opportunity Employer

Exhibit B

Property Card



CURRENT OWNER		TOPO.	UTILITIES	STRT./ROAD	LOCATION	CURRENT ASSESSMENT			
CONNECTICUT STATE OF ECSU HI RISE 83 WINDHAM ST WILLIMANTIC, CT 06226 Additional Owners:		2	Public Water			Description	Code	Appraised Value	Assessed Value
		3	Public Sewer			EX COM BL	22	11,575,500	8,102,850
		0	None						
SUPPLEMENTAL DATA									
Other ID:		12- 3/ 19/ 98X2		LCI	C				
Zoning		R6		ParcelStatus	UO				
Neighborhood		310 - 0		Cost Flag					
Living Units		0		Lot Number	0				
Census		8003		A_D					
District No		2		ASSOC PID#					
GIS ID: 6685						Total	11,575,500	8,102,850	

6163
WINDHAM, CT

VISION

RECORD OF OWNERSHIP		BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.	PREVIOUS ASSESSMENTS (HISTORY)								
CONNECTICUT STATE OF		149/ 42		U	I	0		Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
								2017	22	8,943,970	2016	22	8,943,970	2015	200	8,943,970
														2015	200	0
								Total:		8,943,970	Total:		8,943,970	Total:		8,943,970

EXEMPTIONS				OTHER ASSESSMENTS				
Year	Type	Description	Amount	Code	Description	Number	Amount	Comm. Int.
Total:								

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD				
NBHD/SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A			900	E

NOTES									

APPRAISED VALUE SUMMARY	
Appraised Bldg. Value (Card)	11,489,700
Appraised XF (B) Value (Bldg)	85,800
Appraised OB (L) Value (Bldg)	0
Appraised Land Value (Bldg)	0
Special Land Value	0
Total Appraised Parcel Value	11,575,500
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	11,575,500

BUILDING PERMIT RECORD									VISIT/ CHANGE HISTORY					
Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments	Date	Type	IS	ID	Cd.	Purpose/Result

LAND LINE VALUATION SECTION																					
B #	Use Code	Use Description	Zone	D	Front	Depth	Units	Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing	S Adj Fact	Adj. Unit Price	Land Value		
1	925	Exempt Comm	R6				0.00	AC	0.00	1.0000	0	1.0000	1.00	310	1.00			.00	0		
Total Card Land Units:							0.00	AC	Parcel Total Land Area:							0 AC	Total Land Value:				0

Exhibit C

Construction Drawings

SITE NAME: CT506/WILLIMANTIC ECSU

83 WINDHAM STREET
WILLIMANTIC, CT 06226
WINDHAM COUNTY

SITE NUMBER: CT11506A

RF DESIGN GUIDELINE: 67D02C OUTDOOR

T-MOBILE TECHNICIAN SITE SAFETY NOTES	
LOCATION	SPECIAL RESTRICTIONS
SECTOR A: ANTENNA/TMA/RADIO	ACCESS NOT PERMITTED
SECTOR B: ANTENNA/TMA/RADIO	ACCESS NOT PERMITTED
SECTOR C: ANTENNA/TMA/RADIO	ACCESS NOT PERMITTED
GPS/LMU:	UNRESTRICTED CAUTION: OSHA-APPROVED PORTABLE 8' STEP-LADDER REQUIRED
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

**T-MOBILE
NORTHEAST LLC**

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116



750 WEST CENTER STREET
SUITE #301
WEST BRIDGEWATER, MA 02379



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

GENERAL NOTES

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

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

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE NORTHEAST, LLC REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.



PROJECT SUMMARY

SCOPE OF WORK: UNMANNED TELECOMMUNICATIONS FACILITY T-MOBILE EQUIPMENT MODERNIZATION

ZONING JURISDICTION: BASED ON INFORMATION PROVIDED BY T-MOBILE, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS AN ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW).

SITE ADDRESS: 83 WINDHAM STREET
WILLIMANTIC, CT 06226

LATITUDE: 41° 43' 13.43" N

LONGITUDE: 72° 13' 5.879" W

JURISDICTION: (TOWN OF WINDHAM)

CURRENT USE: TELECOMMUNICATIONS FACILITY

PROPOSED USE: TELECOMMUNICATIONS FACILITY

Daniel P. Hamm
STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER
CONSTRUCTION DRAWINGS ARE VALID FOR ONE YEAR AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: RP

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	07/24/19	ISSUED FOR CONSTRUCTION	RB/VP
1	06/12/19	ISSUED FOR REVIEW	SG
0	05/16/19	ISSUED FOR REVIEW	TR

APPROVALS

	DATE
PROJECT MANAGER	
CONSTRUCTION	
RF ENGINEERING	
ZONING / SITE ACQ.	
OPERATIONS	
TOWER OWNER	

72 HOURS



CALL
BEFORE YOU DIG



CALL TOLL FREE 1-800-922-4455

OR CALL 811

UNDERGROUND SERVICE ALERT

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	2
GN-1	GENERAL NOTES	2
A-1	COMPOUND & EQUIPMENT PLANS	2
A-2	ANTENNA LAYOUTS & ELEVATION	2
A-3	DETAILS	2
SN-1	SPECIAL INSPECTIONS NOTES	2
S-1	MOUNT MODIFICATION STRUCTURAL DETAILS	2
S-2	MONOPOLE BASE PLATE STRUCTURAL DETAILS	2
S-3	MONOPOLE BASE PLATE STRUCTURAL DETAILS	2
E-1	ONE-LINE DIAGRAM AND GROUNDING DETAILS	2

SITE NUMBER:
CT11506A

SITE NAME:
CT506/WILLIMANTIC
ECSU

SITE ADDRESS:
83 WINDHAM STREET
WILLIMANTIC, CT 06226
WINDHAM COUNTY

SHEET TITLE

TITLE SHEET

(L600)

SHEET NUMBER

T-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) LIGHTNING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 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 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 – CENTERLINE COMMUNICATIONS
 SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
 OWNER – T-MOBILE
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 SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T-MOBILE SITES."
 17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
 18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
 19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
 20. APPLICABLE BUILDING CODES:
 SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
 BUILDING CODE: IBC 2015 WITH 2018 CT STATE BUILDING CODE AMENDMENTS
 ELECTRICAL CODE: 2017 NATIONAL ELECTRIC CODE (NFPA 70)
 LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS
- SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
- AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;
 - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;
 - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-G, STRUCTURAL STANDARDS FOR STEEL
 - EQUIPMENT AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.
- FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

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

**T-MOBILE
NORTHEAST LLC**

35 GRIFFIN ROAD SOUTH
 BLOOMFIELD, CT 06002
 OFFICE: (860) 648-1116



750 WEST CENTER STREET
 SUITE #301
 WEST BRIDGEWATER, MA 02379



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



CHECKED BY: RP

APPROVED BY: DPH

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
2	07/24/19	ISSUED FOR CONSTRUCTION	RB/VP
1	06/12/19	ISSUED FOR REVIEW	SG
0	05/16/19	ISSUED FOR REVIEW	TR

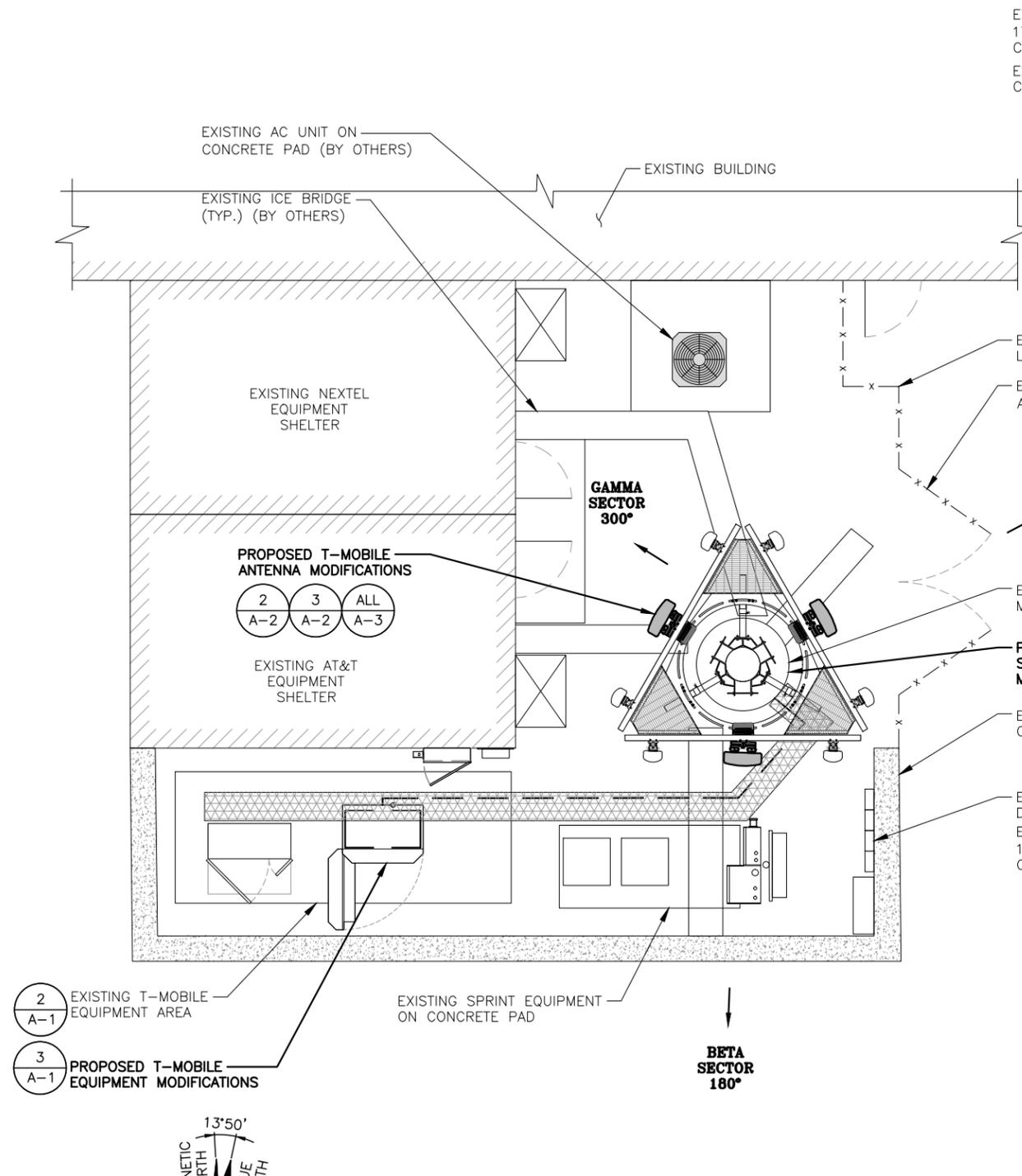
SITE NUMBER:
 CT11506A
 SITE NAME:
 CT506/WILLIMANTIC
 ECSU
 SITE ADDRESS:
 83 WINDHAM STREET
 WILLIMANTIC, CT 06226
 WINDHAM COUNTY

SHEET TITLE
 GENERAL NOTES
 (L600)

SHEET NUMBER
GN-1

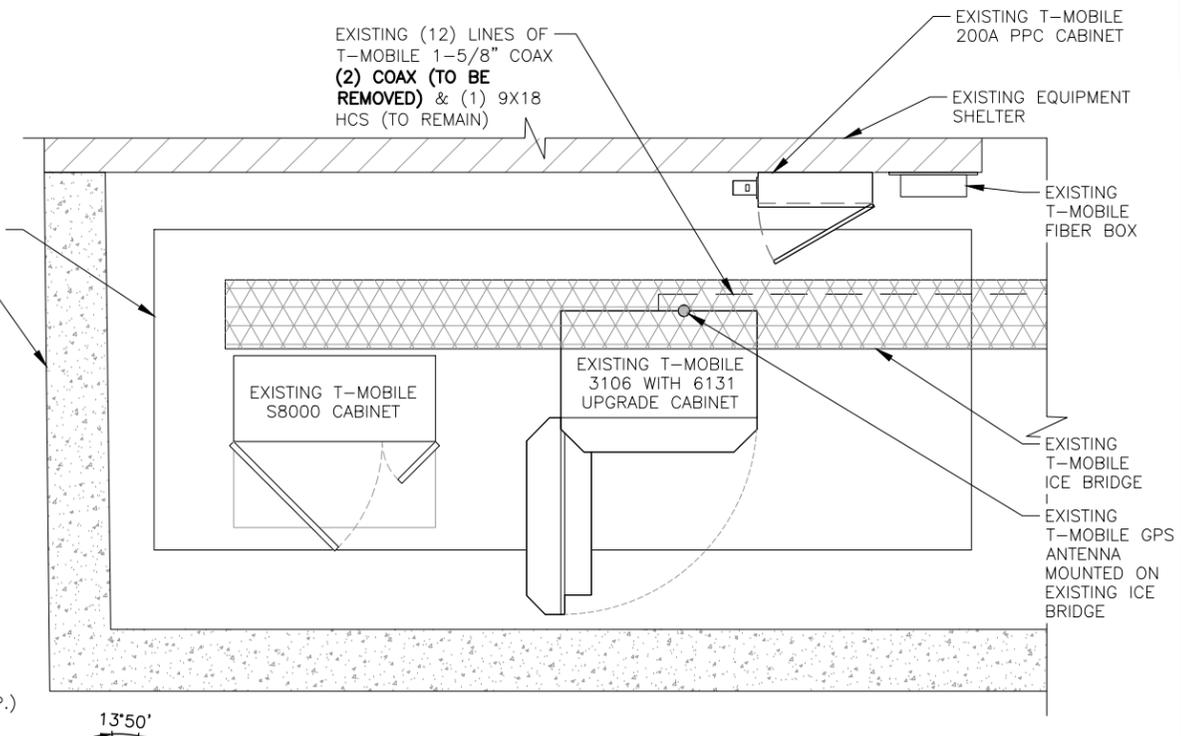
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NOTE:
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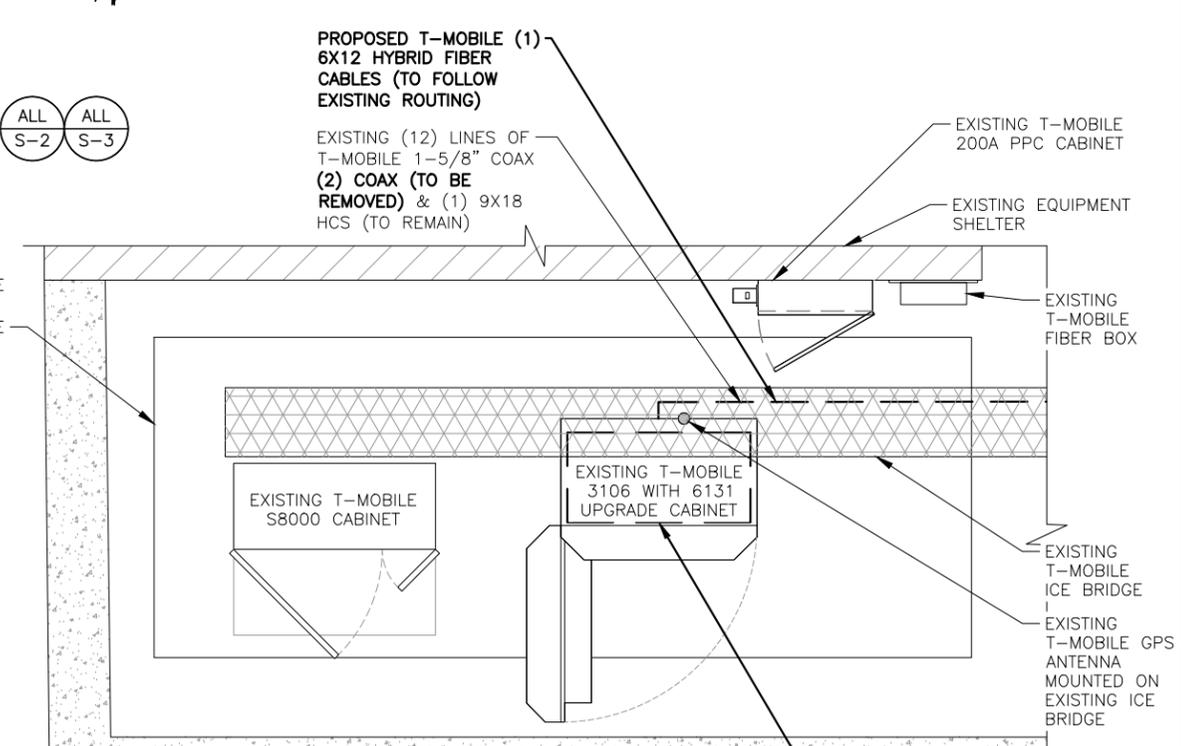


- 2 A-1 EXISTING T-MOBILE EQUIPMENT AREA
- 3 A-1 PROPOSED T-MOBILE EQUIPMENT MODIFICATIONS

COMPOUND PLAN 1 A-1
 22x34 SCALE: 3/8"=1'-0"
 11x17 SCALE: 3/16"=1'-0"



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



PROPOSED EQUIPMENT PLAN 3 A-1
 22x34 SCALE: 3/8"=1'-0"
 11x17 SCALE: 3/16"=1'-0"

T-MOBILE NORTHEAST LLC
 35 GRIFFIN ROAD SOUTH
 BLOOMFIELD, CT 06002
 OFFICE: (860) 648-1116

CENTERLINE COMMUNICATIONS
 750 WEST CENTER STREET
 SUITE #301
 WEST BRIDGEWATER, MA 02379

HDG HUDSON Design Group LLC
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STATE OF CONNECTICUT
 DANIEL P. HAMM
 No. 24178
 LICENSED PROFESSIONAL ENGINEER
 CONSTRUCTION DRAWINGS ARE VALID FOR ONE YEAR AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: RP

APPROVED BY: DPH

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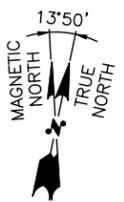
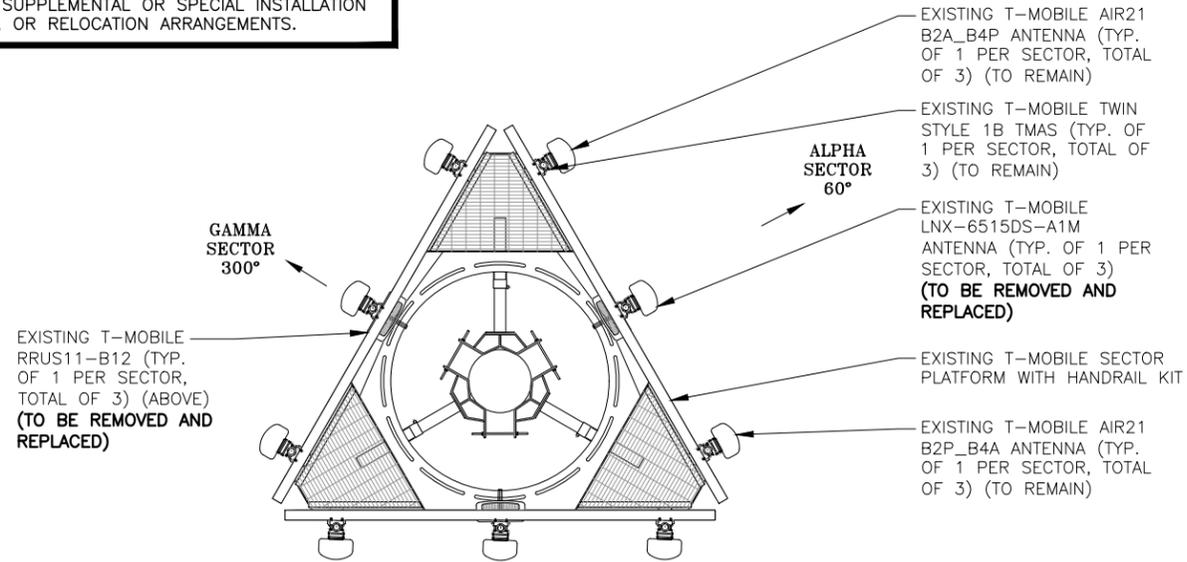
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SHEET TITLE
 COMPOUND & EQUIPMENT PLANS
 (L600)

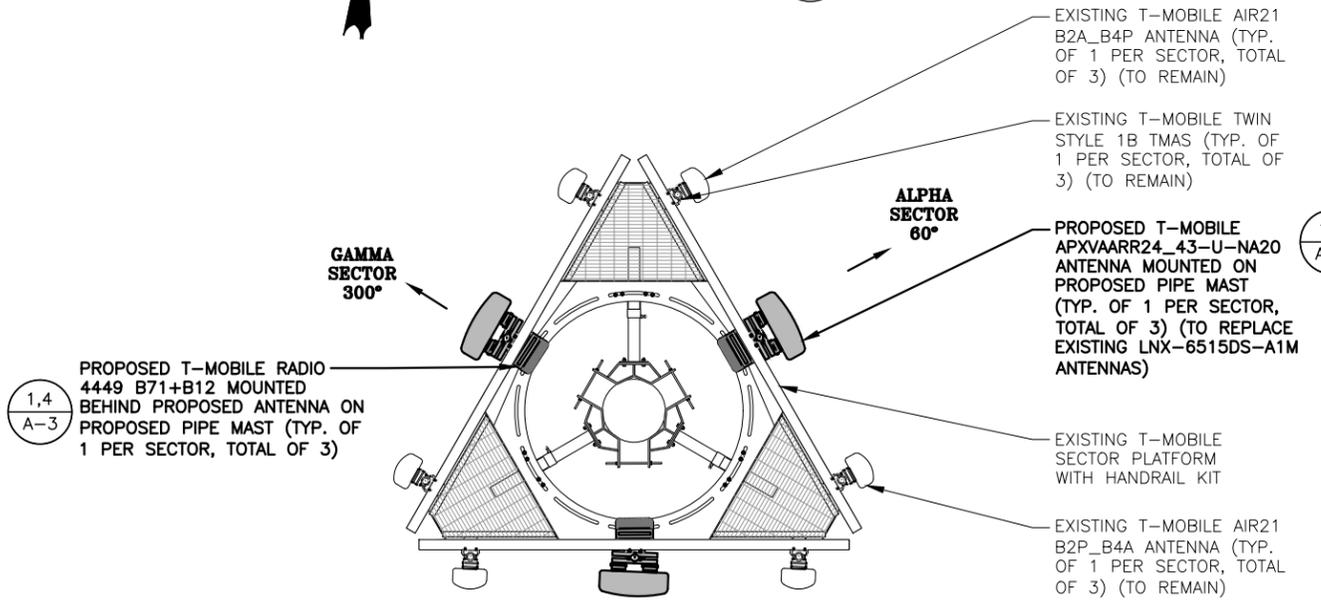
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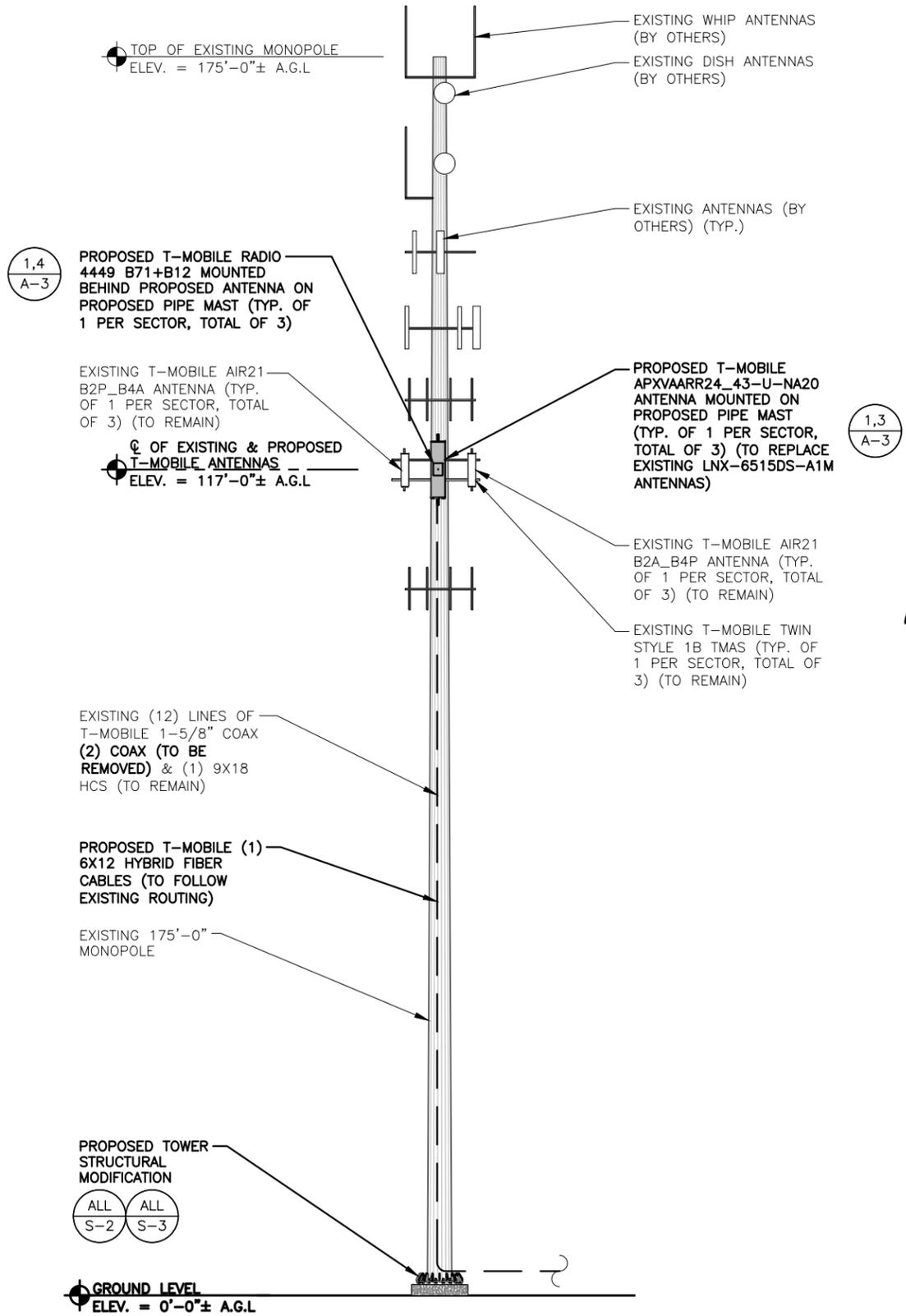
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EXISTING ANTENNA PLAN 1
 SCALE: N.T.S. A-2



PROPOSED ANTENNA PLAN 2
 SCALE: N.T.S. A-2



ALL S-2 ALL S-3

MONOPOLE ELEVATION 3
 22x34 SCALE: 3/32"=1'-0" A-2
 11x17 SCALE: 3/64"=1'-0" A-2
 0 5'-4" 10'-8" 21'-4" 32'-0"

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SHEET TITLE
 ANTENNA LAYOUTS & ELEVATION
 (L600)

SHEET NUMBER
A-2

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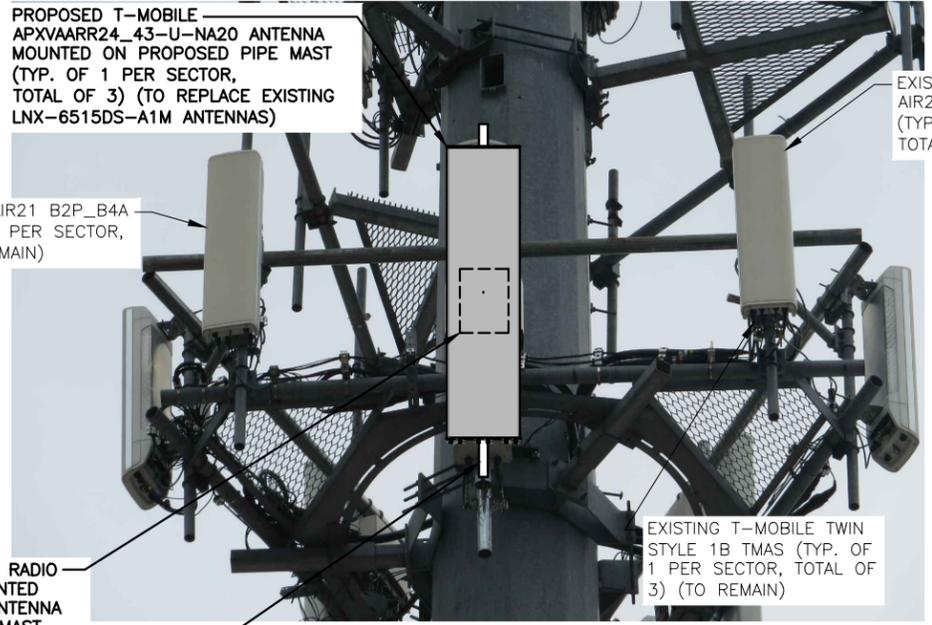
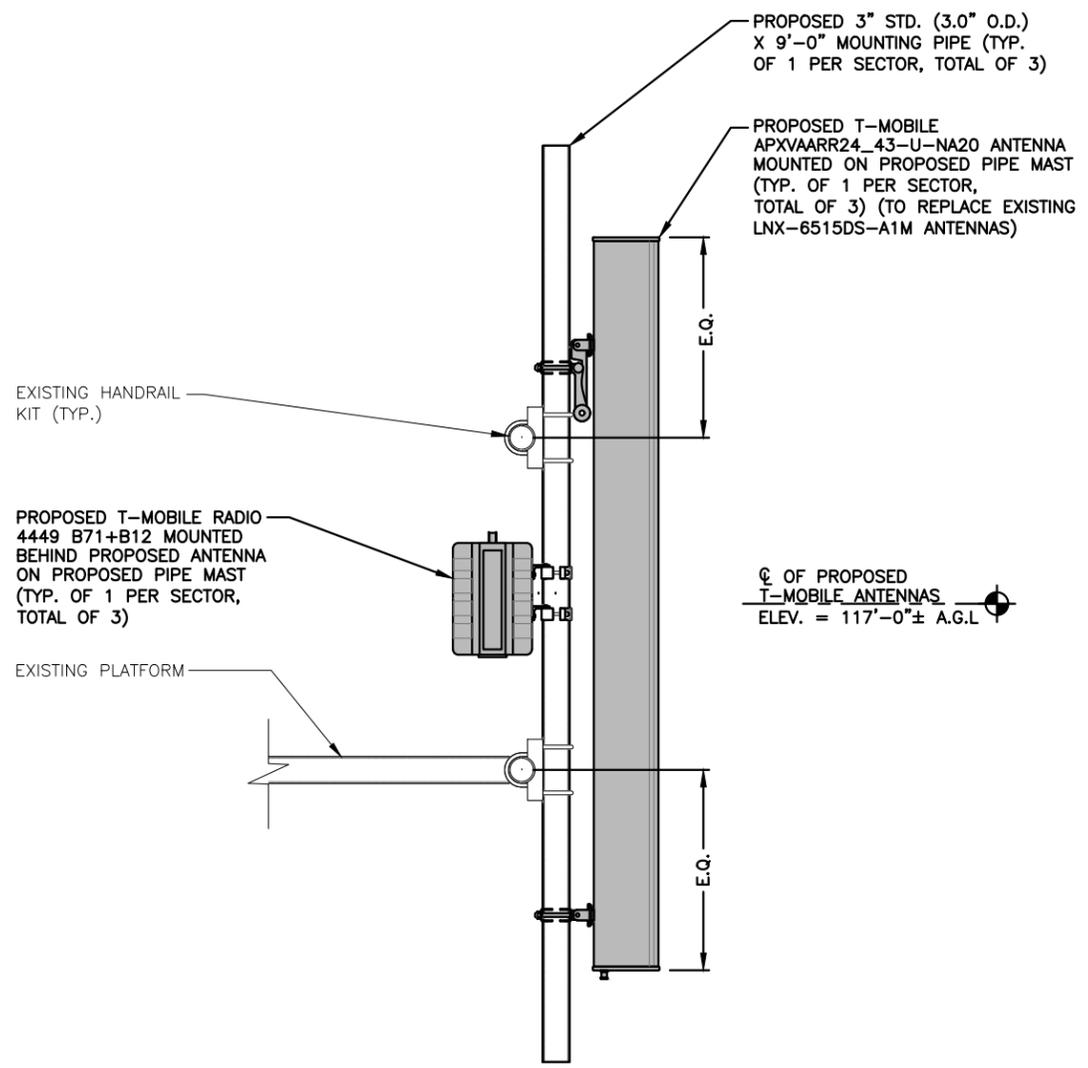
SHEET TITLE

DETAILS

(L600)

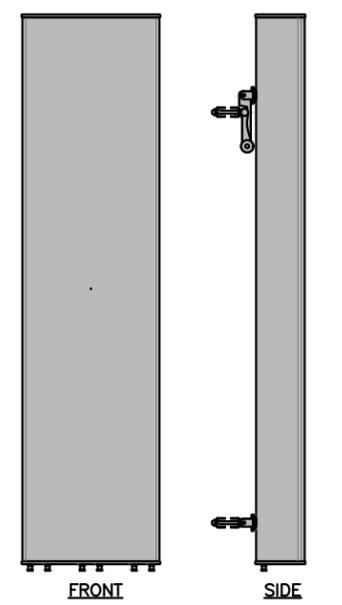
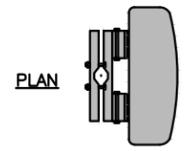
SHEET NUMBER

A-3



T-MOBILE ELEVATION PHOTO DETAIL 2
SCALE: N.T.S. A-3

L600 + L700 ANTENNA MOUNTING DETAIL 1
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0" A-3



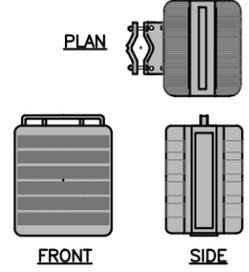
L600 + L700 ANTENNA DETAIL 3
SCALE: N.T.S. A-3

L600 + L700 ANTENNA DIMENSIONS

MODEL #	APXVAARR24_43-U-NA20 (OCTA)
MANUF.	RFS
HEIGHT	95.9"
WIDTH	24"
DEPTH	8.7"
WEIGHT	128 LBS

RADIO DIMENSIONS

MODEL #	RADIO 4449 B71+B12 (WITH FILTER)
MANUF.	ERICSSON
HEIGHT	14.9"
WIDTH	13.1"
DEPTH	9.2"
WEIGHT	74 LBS



RADIO DETAIL 4
SCALE: N.T.S. A-3

STRUCTURAL NOTES:

- DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-G STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.
- DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
- STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
- STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
- STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 TYPE-X "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.
- ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
- ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
- FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
- CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL". 14TH EDITION.
- INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
- UNISTRUT SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
- EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
- EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
- WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.
- ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.
- NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
- SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

GENERAL: WHERE APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THE INSPECTION CHECKLIST ABOVE.

THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS.

STATEMENT OF SPECIAL INSPECTIONS: THE APPLICANT SHALL SUBMIT A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IN ACCORDANCE WITH SECTION 107.1 AS A CONDITION FOR ISSUANCE. THIS STATEMENT SHALL BE IN ACCORDANCE WITH SECTION 1705.

REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS SHALL BE SUBMITTED.

SPECIAL INSPECTION CHECKLIST	
BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS ¹
N/A	MATERIAL SPECIFICATIONS REPORT ²
N/A	FABRICATOR NDE INSPECTION
N/A	PACKING SLIPS ³
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS ⁴
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION ⁵
N/A	GROUT VERIFICATION
REQUIRED	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
REQUIRED	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS ⁶
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTES:

- REQUIRED FOR ANY NEW SHOP FABRICATED FRP OR STEEL.
- PROVIDED BY MANUFACTURER, REQUIRED IF HIGH STRENGTH BOLTS OR STEEL.
- PROVIDED BY GENERAL CONTRACTOR; PROOF OF MATERIALS.
- HIGH WIND ZONE INSPECTION CATB 120MPH OR CAT C,D 110MPH INSPECT FRAMING OF WALLS, ANCHORING, FASTENING SCHEDULE.
- ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH HAS BEEN BASED ON ACI 355.4 TEMPERATURE CATEGORY B WITH INSTALLATIONS INTO DRY HOLES DRILLED USING A CARBIDE BIT INTO CRACKED CONCRETE THAT HAS CURED FOR AT LEAST 21 DAYS. ADHESIVE ANCHORS REQUIRING CERTIFIED INSTALLATIONS SHALL BE INSTALLED BY A CERTIFIED ADHESIVE ANCHOR INSTALLER PER ACI 318-11 D.9.2.2. INSTALLATIONS REQUIRING CERTIFIED INSTALLERS SHALL BE INSPECTED PER ACI 318-11 D.8.2.4.
- AS REQUIRED; FOR ANY FIELD CHANGES TO THE ITEMS IN THIS TABLE.

NOTES:

- ALL CONNECTIONS TO BE SHOP WELDED & FIELD BOLTED USING 3/4"Ø A325-X BOLTS, UNLESS OTHERWISE NOTIFIED.
- SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED BEFORE ORDERING MATERIAL.
- SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED PRIOR TO STEEL FABRICATION.
- VERIFICATION OF EXISTING ROOF CONSTRUCTION IS REQUIRED PRIOR TO THE INSTALLATION OF THE ROOF PLATFORM. ENGINEER OF RECORD IS TO APPROVE EXISTING CONDITIONS IN ORDER TO MOVE FORWARD.
- CENTERLINE OF PROPOSED STEEL PLATFORM SUPPORT COLUMNS TO BE CENTRALLY LOCATED OVER THE EXISTING BUILDING COLUMNS.
- EXISTING BRICK MASONRY COLUMNS/BEARING TO BE REPAIRED/REPLACED AT ALL PROPOSED PLATFORM SUPPORT POINTS. ENGINEER OF RECORD TO REVIEW AND APPROVE.

**T-MOBILE
NORTHEAST LLC**

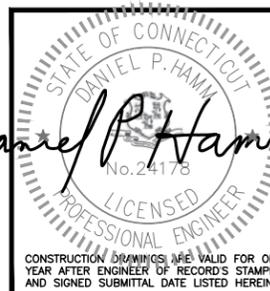
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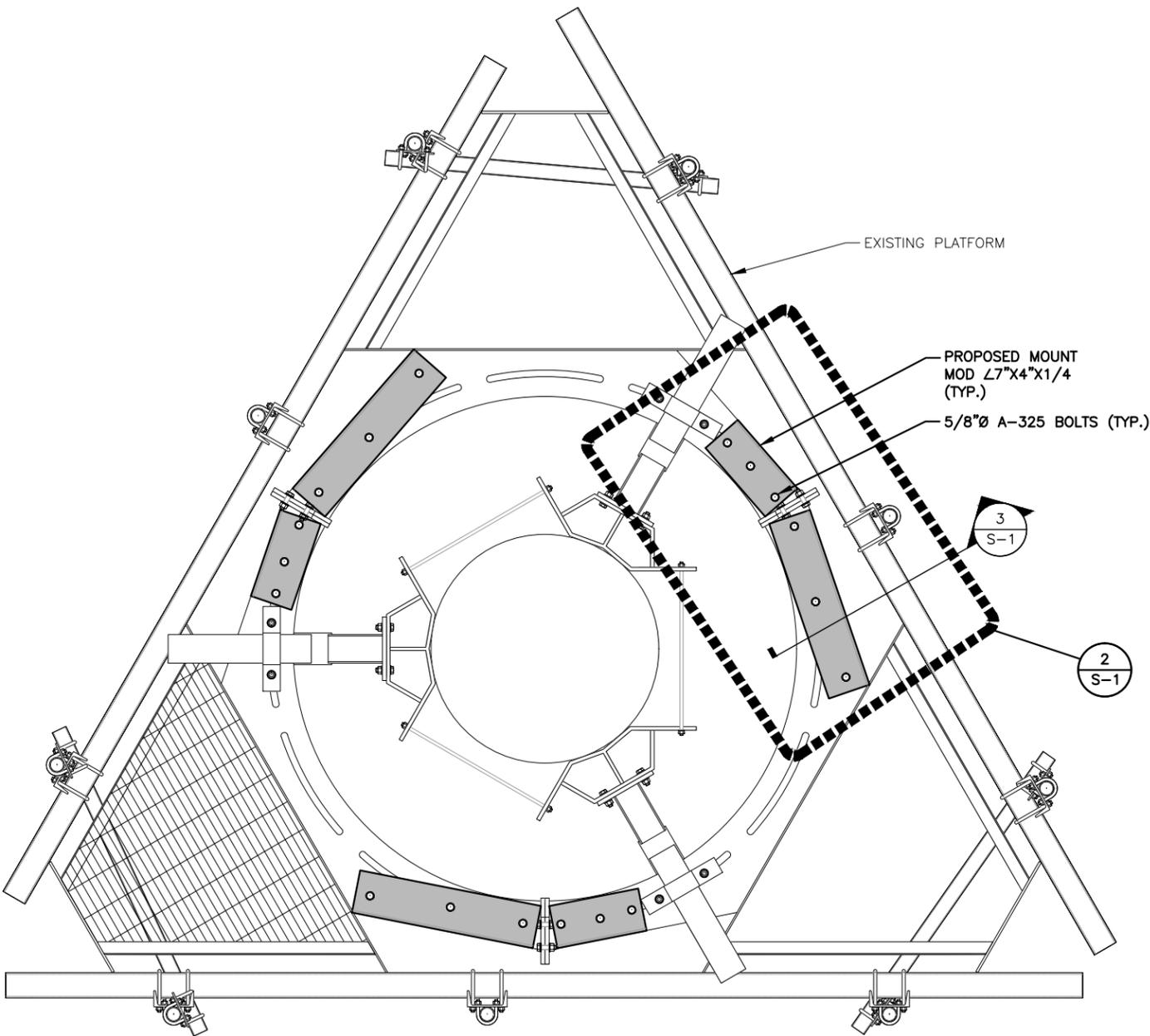
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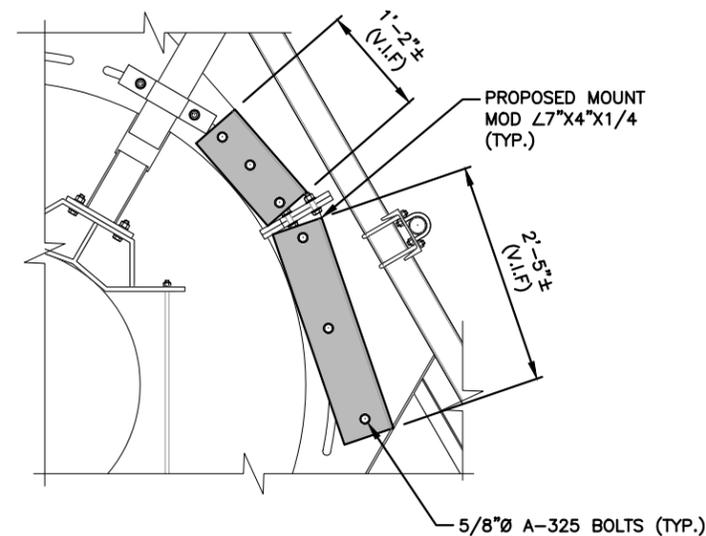
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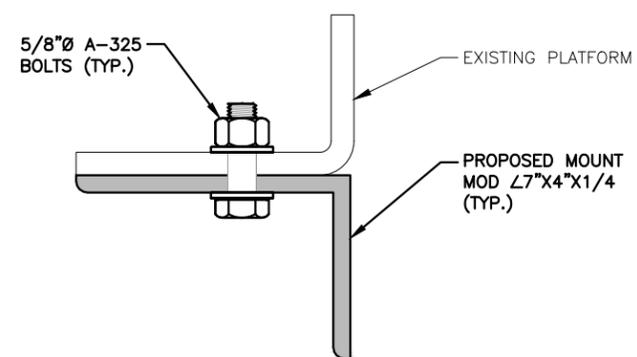
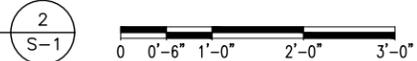
MOUNT MOD PLAN DETAIL 1
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 11x17 SCALE: 1/2"=1'-0"



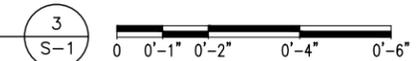
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MOUNT MOD CONNECTION DETAIL 2
 22x34 SCALE: 1"=1'-0"
 11x17 SCALE: 1/2"=1'-0"



MOUNT MOD CONNECTION DETAIL 3
 22x34 SCALE: 6"=1'-0"
 11x17 SCALE: 3"=1'-0"



**T-MOBILE
 NORTHEAST LLC**

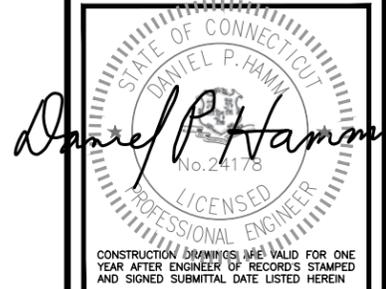
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SHEET TITLE
 MOUNT MODIFICATION
 STRUCTURAL DETAILS
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**CENTERLINE
 COMMUNICATIONS**
 750 WEST CENTER STREET
 SUITE #301
 WEST BRIDGEWATER, MA 02379

**HDG
 HUDSON
 Design Group LLC**
 45 BEECHWOOD DRIVE
 N. ANDOVER, MA 01845
 TEL: (978) 557-5553
 FAX: (978) 336-5586

STATE OF CONNECTICUT
 DANIEL P. HAMM
 No. 24178
 LICENSED PROFESSIONAL ENGINEER
 CONSTRUCTION DRAWINGS ARE VALID FOR ONE YEAR AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: RP
 APPROVED BY: DPH

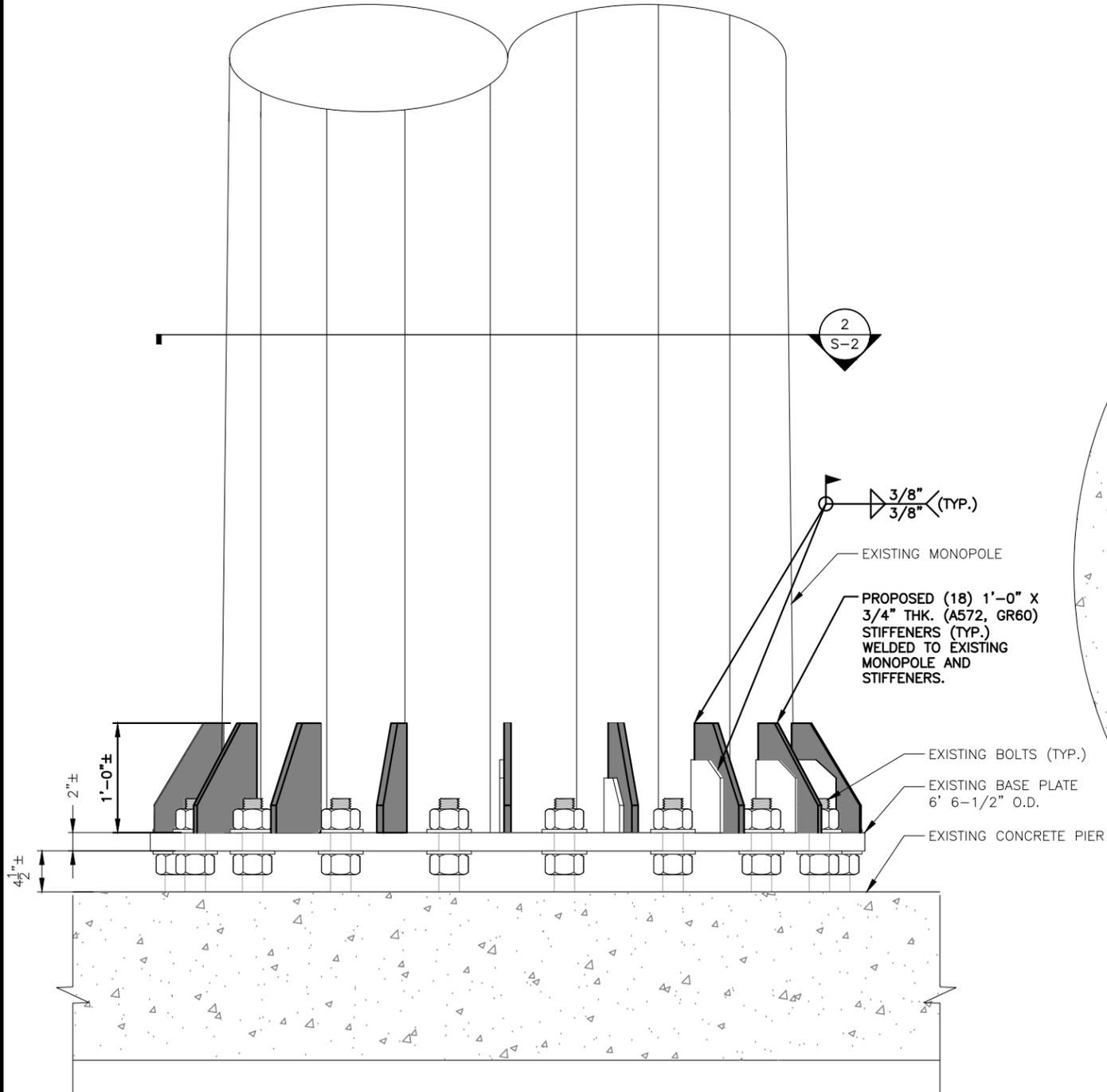
SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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1	06/12/19	ISSUED FOR REVIEW	SG
0	05/16/19	ISSUED FOR REVIEW	TR

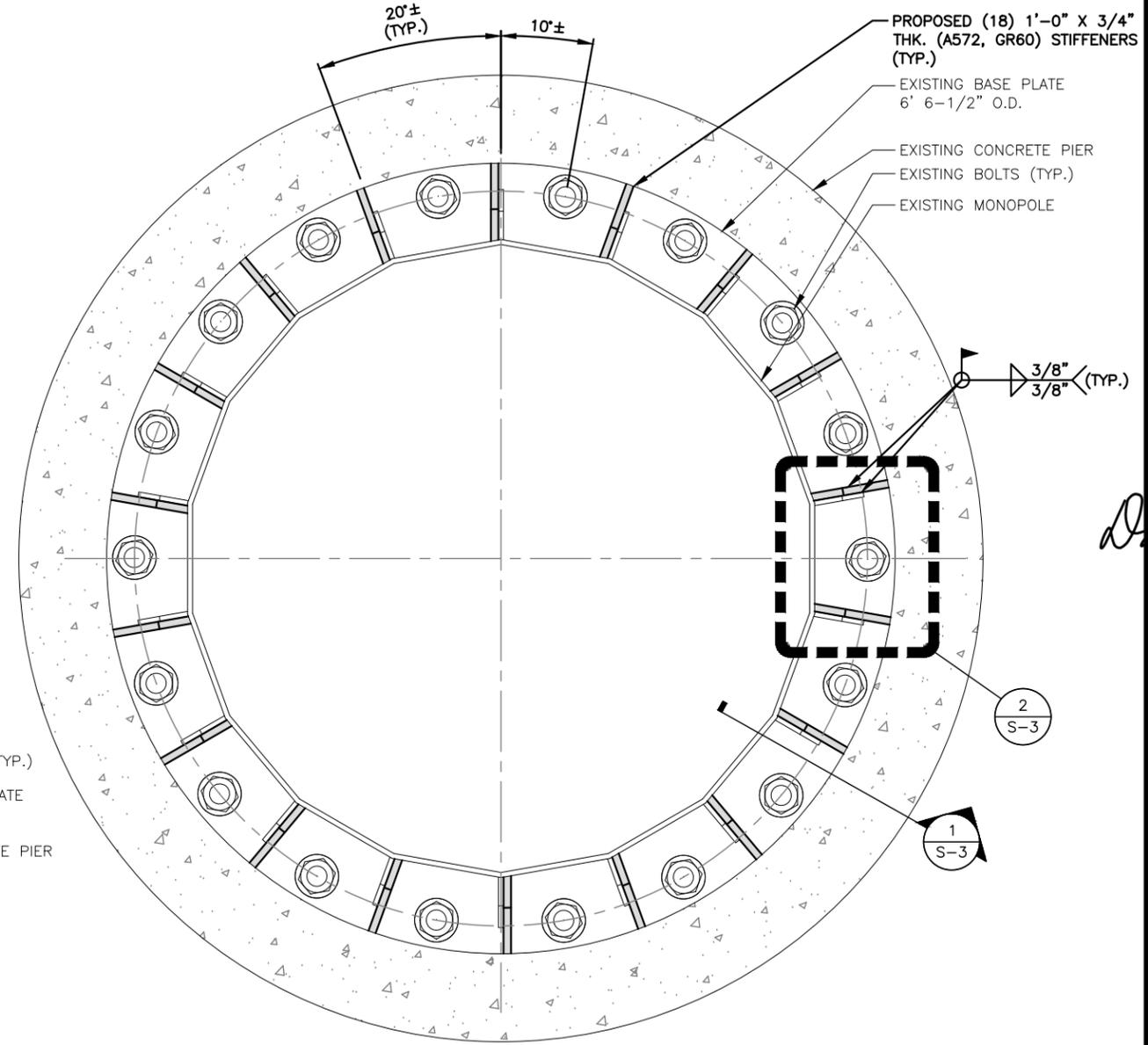
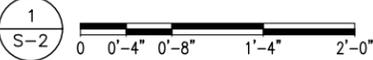
SITE NUMBER:
 CT11506A
 SITE NAME:
 CT506/WILLIMANTIC
 ECSU
 SITE ADDRESS:
 83 WINDHAM STREET
 WILLIMANTIC, CT 06226
 WINDHAM COUNTY

SHEET TITLE
 MONOPOLE BASE
 PLATE STRUCTURAL
 DETAILS
 (L600)

SHEET NUMBER
S-2



PROPOSED STIFFENER ELEVATION
 22x34 SCALE: 1-1/2"=1'-0"
 11x17 SCALE: 3/4"=1'-0"



PLAN

22x34 SCALE: 1-1/2"=1'-0"
 11x17 SCALE: 3/4"=1'-0"



STRUCTURAL NOTES:
 PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO MOUNT STRUCTURAL ANALYSIS PROVIDED BY HDG, DATED: MAY 28, 2019 & STRUCTURAL ANALYSIS PROVIDED BY HDG, DATED: JULY 02, 2019 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

**T-MOBILE
 NORTHEAST LLC**
 35 GRIFFIN ROAD SOUTH
 BLOOMFIELD, CT 06002
 OFFICE: (860) 648-1116

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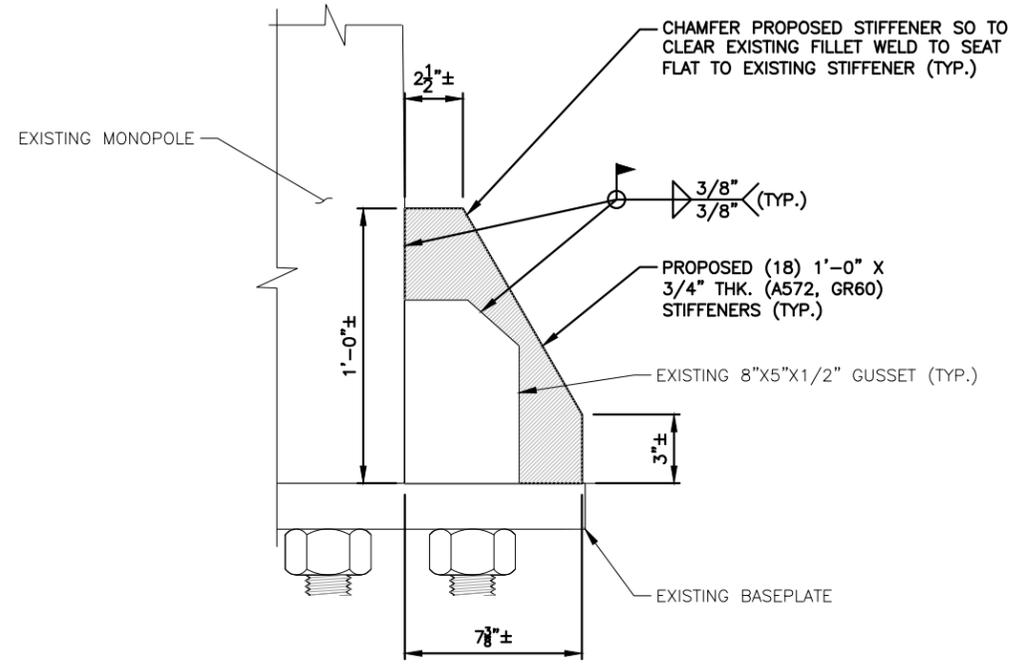
SUBMITTALS

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1	06/12/19	ISSUED FOR REVIEW	SG
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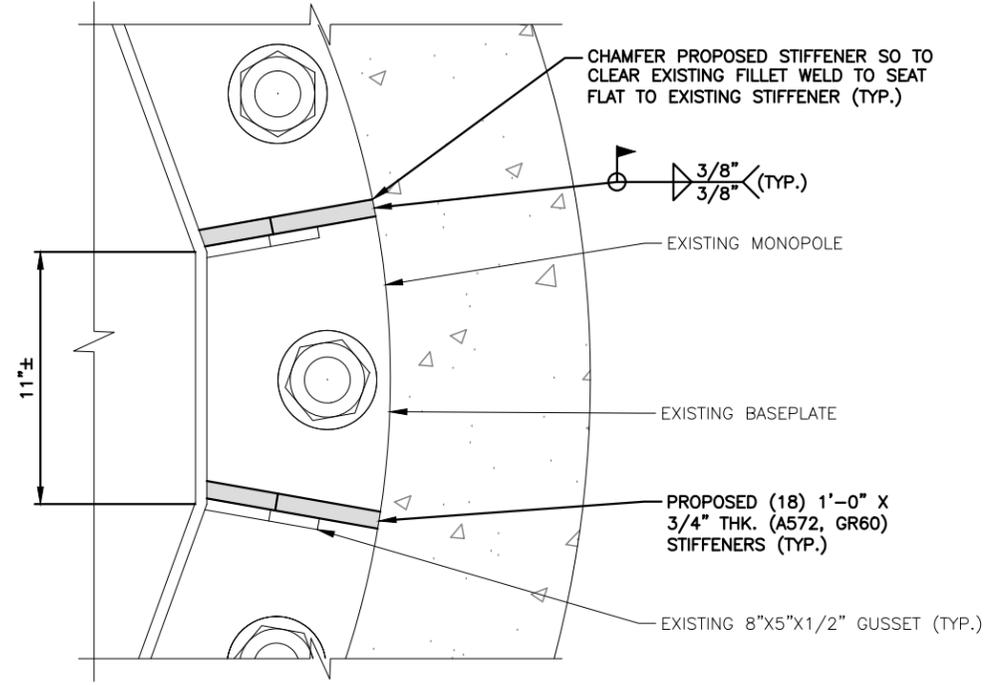
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SHEET TITLE
 MONOPOLE BASE
 PLATE STRUCTURAL
 DETAILS
 (L600)

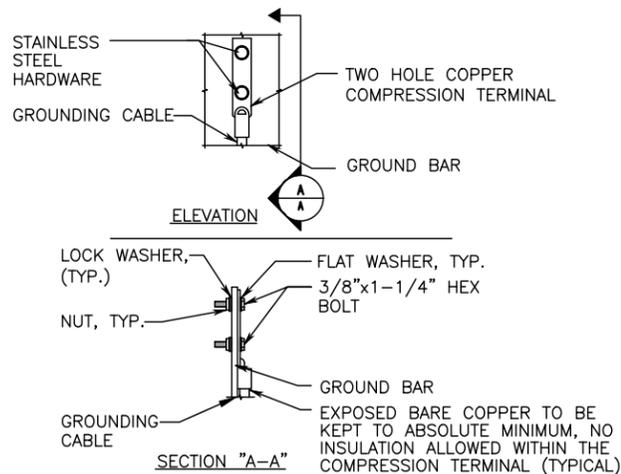
SHEET NUMBER
S-3



SECTION DETAIL
 22x34 SCALE: 3"=1'-0"
 11x17 SCALE: 1-1/2"=1'-0"
 1
 S-3



PLAN DETAIL
 22x34 SCALE: 3"=1'-0"
 11x17 SCALE: 1-1/2"=1'-0"
 2
 S-3



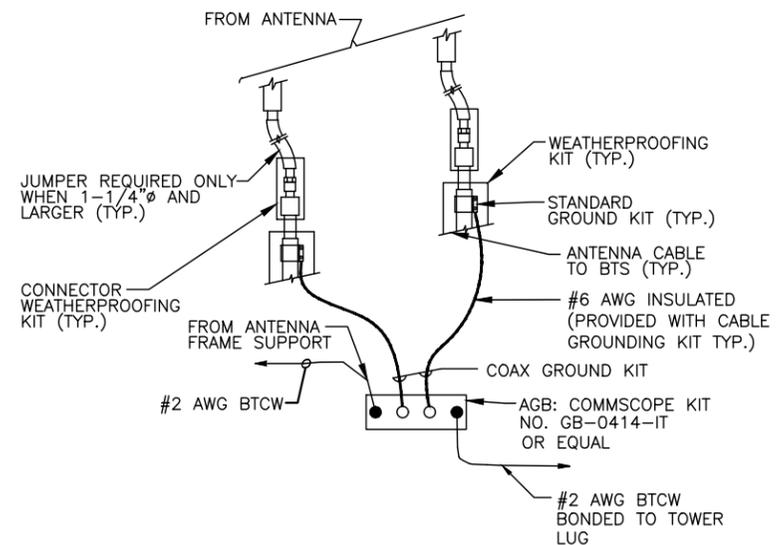
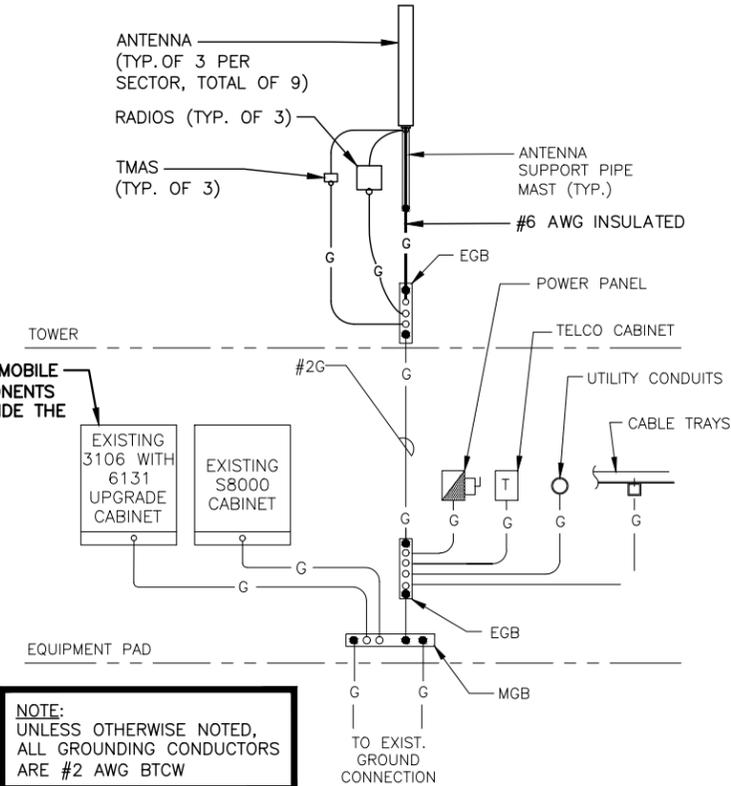
NOTE:
 1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
 2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
 3. CADWELD DOWNLEADS FROM UPPER AGB/EGB, LOWER EGB, AND MGB.

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

NOTE:
 G.C. TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.

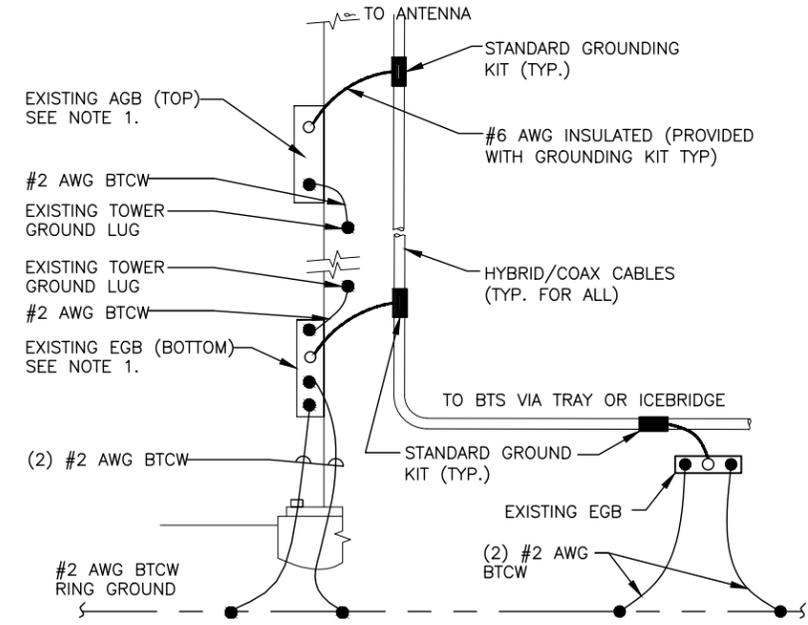
NOTE:
 UNLESS OTHERWISE NOTED, ALL GROUNDING CONDUCTORS ARE #2 AWG BTCW

GROUNDING RISER DIAGRAM
 SCALE: N.T.S.



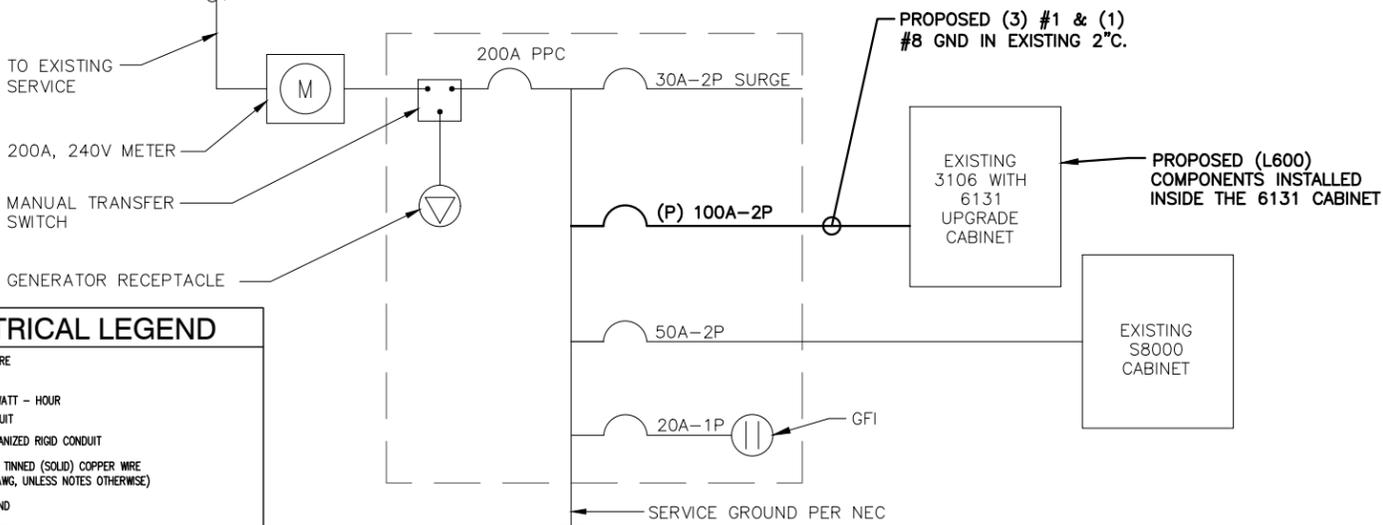
NOTE:
 INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB.

TOWER TOP CABLE GROUNDING DETAIL
 SCALE: N.T.S.



NOTE:
 1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE ADDITIONAL AGB/EGB AS REQUIRED.
 2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

TOWER BOTTOM CABLE GROUNDING DETAIL
 SCALE: N.T.S.



ONE LINE POWER DIAGRAM
 SCALE: N.T.S.

ELECTRICAL LEGEND

A	AMPERE
V	VOLT
KWH	KILOWATT - HOUR
C	CONDUIT
GRC	GALVANIZED RIGID CONDUIT
BTCW	BARE TINNED (SOLID) COPPER WIRE (#2 AWG, UNLESS NOTES OTHERWISE)
GN	GROUND
GN	GROUND
GFI	GROUND FAULT INTERRUPTER
H.P	HORSE POWER
MGB	MASTER GROUND BAR
AGB/EGB	EQUIPMENT GROUND BAR/ANTENNA GROUND BAR
○	MECHANICAL CONNECTION
●	CADWELD CONNECTION
○	GROUND COPPER WIRE, SIZE AS NOTED
—	EXPOSED WIRING
—	INSULATED GROUNDING CONDUCTOR (#6 AWG STRANDED, UNLESS NOTED OTHERWISE)
○	5/8" COPPER CLAD STAINLESS STEEL GROUND ROD
●	EXOTHERMIC (CAD WELD) OR MECHANICAL (COMPRESSION TYPE) CONNECTION
NEC	NATIONAL ELECTRIC CODE
Φ	PHASE
PPC	POWER PROTECTION CABINET
P	POLE
PVC	POLYVINYL CHLORIDE
UL	UNDERWRITER LABORATORIES
⊠	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL

- ELECTRICAL & GROUNDING NOTES**
1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
 2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
 3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
 4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
 5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
 6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
 7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
 8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
 9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON DRAWING A-1. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
 10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
 11. GROUNDING SHALL COMPLY WITH NEC ART. 250.
 12. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
 13. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
 14. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
 15. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
 16. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN BTS UNIT).
 17. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
 18. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
 19. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
 20. BOND ANTENNA EGB'S AND MGB TO WATER MAIN.
 21. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
 22. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
 23. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

T-MOBILE NORTHEAST LLC
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APPROVED BY: DPH

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SITE NUMBER:
 CT11506A
 SITE NAME:
 CT506/WILLIMANTIC ECSU
 SITE ADDRESS:
 83 WINDHAM STREET
 WILLIMANTIC, CT 06226
 WINDHAM COUNTY

SHEET TITLE
ONE-LINE DIAGRAM & GROUNDING DETAILS (L600)

SHEET NUMBER
E-1

Exhibit D

Structural Analysis Report

(Revised)
STRUCTURAL ANALYSIS REPORT

For

CT11506A
CT506/WILLIMANTIC ECSU

83 Windham Street
Willimantic, CT 06226

Antennas Mounted to the Monopole



Prepared for:



Dated: July 2, 2019 (Rev 1)

Dated: July 1, 2019

Prepared by:



HUDSON
Design Group LLC

45 Beechwood Drive
North Andover, MA 01845
(P) 978.557.5553 (F) 978.336.5586

www.hudsondesigngroupllc.com



Gi Kai Wang 7/2/2019



HUDSON
Design Group LLC

SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by T-MOBILE to conduct a structural evaluation of the 175' monopole supporting the proposed T-MOBILE's antennas located at elevation 117' above the ground level.

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

Record drawings of the existing monopole were not available for our use. Tower mapping report prepared by ProVertic LLC, dated June 15, 2019, was provided to this office.

CONCLUSION SUMMARY:

HDG performed structural analysis of the existing monopole with the following proposed modification:

Add steel stiffeners to the base plate of the monopole.

Based on our evaluation, we have determined that the existing monopole with proposed modification and foundation **are in conformance** with the ANSI/TIA-222-G Standard for the loading considered under the criteria listed in this report. The monopole structure is rated at 75.9% - (Base Plate at El.0' Controlling).



APPURTENANCES CONFIGURATION:

Tenant	Appurtenances	Elev.	Mount
	Lightning Rod	178'	Top of Monopole
	8' Dipole	178'	Low Profile Platform
	6' Omni	178'	Low Profile Platform
	2' Antenna	179'	Low Profile Platform
	2' Antenna	175'	Low Profile Platform
	8' Dish	167'	Side Mount Standoff
	20' Omni	165.5'	Side Mount Standoff
	Grid Dish	161'	Side Mount Standoff
	MF 900B Grid Dish	156.5'	Side Mount Standoff
	(3) APXVSP18-C Antennas	150'	Low Profile Platform
	(3) APXVTM14 Antennas	150'	Low Profile Platform
	(3) RRH-800	150'	Low Profile Platform
	(3) RRH-1900	150'	Low Profile Platform
	(3) TD-RRH8x20-25	150'	Low Profile Platform
	(6) Powerwave 7770 Antennas	139'	Low Profile Platform
	(3) AM-X-CD-17-65-00T Antennas	139'	Low Profile Platform
	(3) LGP13519	139'	Low Profile Platform
	(3) DBC0061F1V51-2	139'	Low Profile Platform
	(6) LGP17201	139'	Low Profile Platform
	(6) RRUS-11	139'	Low Profile Platform
	(1) DC6-48-60-18-8F	139'	Ring Mount
	(12) Mount Pipes	128'	Low Profile Platform
T-Mobile	(3) AIR 21 B2A B4P Antennas	117'	Low Profile Platform
T-Mobile	(3) AIR 21 B4A B2P Antennas	117'	Low Profile Platform
T-Mobile	(3) TMA	117'	Low Profile Platform
T-Mobile	(3) APXVAARR24_43-U-NA20 Antennas	117'	Low Profile Platform
T-Mobile	(3) Radio 4449	117'	Low Profile Platform
	5' Yagi	106'	Low Profile Platform
	(5) Mount Pipes	102'	Low Profile Platform
	GPS	79'	Side Mount Standoff

**Proposed T-Mobile Appurtenances shown in Bold.*

T-MOBILE EXISTING/PROPOSED COAX CABLES:

Tenant	Coax Cables	Elev.	Mount
T-Mobile	(10) 1 5/8" Cables	117'	Inside Monopole
T-Mobile	(1) Fiber Cable	117'	Inside Monopole
T-Mobile	(1) Fiber Cable	117'	Inside Monopole

**Proposed T-Mobile Coax Cables shown in Bold.*



ANALYSIS RESULTS SUMMARY:

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Pole Section-L1	34.9 %	130.5 – 175	PASS	
Pole Section-L2	60.2 %	86.75 – 130.5	PASS	
Pole Section-L3	67.6 %	43.5 – 86.75	PASS	
Pole Section-L4	66.0 %	0 – 43.5	PASS	
Base Plate	75.9 %	0	PASS	Controlling

FOUNDATION ANALYSIS RESULTS SUMMARY:

	Design Reactions	Proposed Reactions	Pass/Fail	Comments
MOMENT	5417 ft-k	4742 ft-k	PASS	
SHEAR	470 k	39.4 k	PASS	



HUDSON
Design Group LLC

DESIGN CRITERIA:

1. EIA/TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures
2. 2018 Connecticut State Building Code
 - City/Town: Windham
 - County: Windham
 - Wind Load: 101 mph
 - Structural Class: II
 - Exposure Category: B
 - Topographic Category: 1
 - Ice Thickness: 1.0 inch
3. Approximate height above grade to proposed antennas: 117'

ASSUMPTIONS:

1. 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.
2. The appurtenances configuration is as stated in this report. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
3. The support mounts and platforms are not analyzed and are considered adequate to support the loading. The analysis is limited to the primary support structure itself.
4. All prior structural modification, if any, are assumed to be as per the data supplied (if available), and installed properly.

SUPPORT RECOMMENDATIONS:

HDG recommends that the proposed antennas and radios be mounted on the existing steel platform supported by the monopole.

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



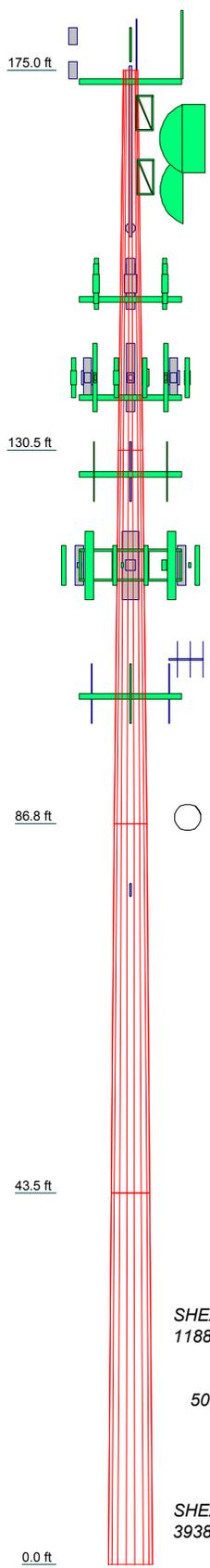
Photo 1: Photo illustrating the Tower with Appurtenances shown.



HUDSON
Design Group LLC

CALCULATIONS

Section	1	2	3	4	
Length (ft)	44.50	43.75	43.25	43.50	
Number of Sides	18	18	18	18	
Thickness (in)	0.2500	0.3125	0.3750	0.4375	
Top Dia (in)	19.8500	34.0300	45.3700	53.8800	
Bot Dia (in)	34.0300	45.3700	53.8800	62.3800	
Grade	A572-65				
Weight (lb)	3206.9	5816.1	8627.1	11858.5	29508.6



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Panel Antenna 2'X2'	179	(2) Ericsson RRUS-11	139
8' Dipole	178	(2) Ericsson RRUS-11	139
Omni 2"x6'	178	(2) Ericsson RRUS-11	139
Lightning Rod	178	DC6-48-60-18-8F	139
Panel Antenna 2'X2'	175	(2) Powerwave 7770 w/mount pipe	139
PIROD 13' Low Profile Platform	174	(2) Powerwave 7770 w/mount pipe	139
2' Side Mount Standoff	170	PIROD 13' Low Profile Platform (ATT)	137
HP8-107	167	(4) 2"x7" pipe	128
Omni 3"x20'	165.5	(4) 2"x7" pipe	128
2' Side Mount Standoff	162.5	PIROD 13' Low Profile Platform	128
KP8F-13	161	(4) 2"x7" pipe	128
MF-900B	156.5	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	117
Pirod 5' Side Mount Standoff	155.5	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	117
APXVSP18-C w/mount pipe	150	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	117
APXVTM14 w/mount pipe	150	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	117
APXVTM14 w/mount pipe	150	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	117
RRH-800	150	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	117
RRH-800	150	KRY 112 144/1	117
RRH-800	150	KRY 112 144/1	117
RRH-1900	150	KRY 112 144/1	117
RRH-1900	150	APXVAARR24_43-U-NA20 w/mount pipe (T-Mobile - proposed)	117
RRH-1900	150	APXVAARR24_43-U-NA20 w/mount pipe	117
TD-RRH8x20-25	150	APXVAARR24_43-U-NA20 w/mount pipe	117
TD-RRH8x20-25	150	APXVAARR24_43-U-NA20 w/mount pipe	117
TD-RRH8x20-25	150	APXVAARR24_43-U-NA20 w/mount pipe	117
APXVSP18-C w/mount pipe	150	Radio 4449	117
APXVSP18-C w/mount pipe	150	Radio 4449	117
PIROD 13' Low Profile Platform	148.5	Radio 4449	117
(2) Powerwave 7770 w/mount pipe	139	PIROD 13' Platform w/handrail (T-Mobile - existing)	117
KMW AM-X-CD-17-65-00T-RET w/mount pipe	139	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	117
KMW AM-X-CD-17-65-00T-RET w/mount pipe	139	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	117
KMW AM-X-CD-17-65-00T-RET w/mount pipe	139	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	117
Powerwave LGP13519 diplexer	139	5' Yagi	106
Powerwave LGP13519 diplexer	139	(2) 2"x7" pipe	102
Powerwave LGP13519 diplexer	139	PIROD 13' Low Profile Platform	102
DBC0061F1V51-2	139	2"x7" pipe	102
DBC0061F1V51-2	139	(2) 2"x7" pipe	102
DBC0061F1V51-2	139	GPS	79
(2) Powerwave TMA LGP17201	139	3' Side Mount Standoff	77
(2) Powerwave TMA LGP17201	139		
(2) Powerwave TMA LGP17201	139		

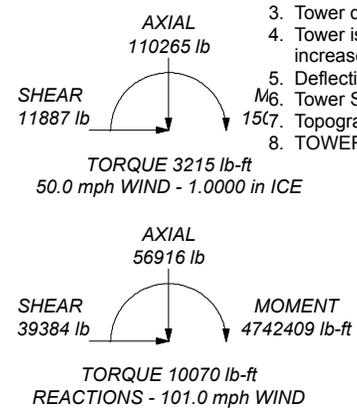
MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 101.0 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.0 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.0 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 75.9%

ALL REACTIONS ARE FACTORED



Hudson Design Group LLC
 45 Beechwood Drive
 North Andover, MA 01845
 Phone: (978) 557-5553
 FAX: (978) 336-5586

Job: **CT11506A**
 Project: **175 ft Monopole**
 Client: T-MOBILE
 Code: TIA-222-G
 Path: C:\Users\jwang\Documents\HUDSON DESIGN GROUP\AAACT11506A Mod - MP (T-Mobile - Cellfire)\CT11506A Mod\CT11506A Mod.dwg
 Drawn by: kw
 Date: 07/02/19
 App'd:
 Scale: NTS
 Dwg No. E-1

tnxTower Hudson Design Group LLC 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586	Job CT11506A	Page 1 of 10
	Project 175 ft Monopole	Date 08:52:51 07/02/19
	Client T-MOBILE	Designed by kw

Tower Input Data

The tower is a monopole.

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

The following design criteria apply:

Tower is located in Windham County, Connecticut.

Basic wind speed of 101.0 mph.

Structure Class II.

Exposure Category B.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56.0 pcf.

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

Temperature drop of 50.0 °F.

Deflections calculated using a wind speed of 60.0 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	175.00-130.50	44.50	0.00	18	19.8500	34.0300	0.2500	1.0000	A572-65 (65 ksi)
L2	130.50-86.75	43.75	0.00	18	34.0300	45.3700	0.3125	1.2500	A572-65 (65 ksi)
L3	86.75-43.50	43.25	0.00	18	45.3700	53.8800	0.3750	1.5000	A572-65 (65 ksi)
L4	43.50-0.00	43.50		18	53.8800	62.3800	0.4375	1.7500	A572-65 (65 ksi)

Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	18
Embedment length	60.0000 in
f_c	3.0 ksi
Grout space	4.5000 in
Base plate grade	A572-60
Base plate thickness	2.0000 in

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Base Plate Data	
Bolt circle diameter	72.0000 in
Outer diameter	78.5000 in
Inner diameter	60.0000 in
Base plate type	Stiffened Plate
Bolts per stiffener	1
Stiffener thickness	0.7500 in
Stiffener height	12.0000 in

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
1 1/4	A	No	No	Inside Pole	174.00 - 8.00	2	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
1 5/8	A	No	No	Inside Pole	174.00 - 8.00	1	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04
2	A	No	No	Inside Pole	170.00 - 8.00	1	No Ice	0.00	1.16
							1/2" Ice	0.00	1.16
							1" Ice	0.00	1.16
1/2	A	No	No	Inside Pole	162.50 - 8.00	1	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25
1 1/4	A	No	No	Inside Pole	155.50 - 8.00	2	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
1 1/4	C	No	No	Inside Pole	148.50 - 8.00	3	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
1/2	C	No	No	Inside Pole	148.50 - 8.00	2	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25
1 5/8	C	No	No	Inside Pole	137.00 - 8.00	12	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04
2" Conduit	C	No	No	Inside Pole	137.00 - 8.00	1	No Ice	0.00	2.80
							1/2" Ice	0.00	2.80
							1" Ice	0.00	2.80
1/2	A	No	No	Inside Pole	102.00 - 8.00	1	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25
1/2	A	No	No	Inside Pole	77.00 - 8.00	1	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25

1 5/8	B	No	No	Inside Pole	117.00 - 8.00	10	No Ice	0.00	1.04
(T-Mobile - existing)							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04
1 5/8 Fiber Cable	B	No	No	Inside Pole	117.00 - 8.00	1	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04

1 1/4 Fiber Cable	B	No	No	Inside Pole	117.00 - 8.00	1	No Ice	0.00	0.66
(T-Mobile - proposed)							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66

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Discrete Tower Loads

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert</i> <i>ft ft ft</i>	<i>Azimuth Adjustment</i> <i>°</i>	<i>Placement</i> <i>ft</i>	<i>C_{AA} Front</i> <i>ft²</i>	<i>C_{AA} Side</i> <i>ft²</i>	<i>Weight</i> <i>lb</i>
Lightning Rod	B	None		0.0000	178.00	No Ice 0.75 1/2" Ice 1.25 1" Ice 1.75	0.75 1.25 1.75	10.00 40.00 70.00
8' Dipole	C	From Face	3.50 -6.00 0.00	0.0000	178.00	No Ice 2.40 1/2" Ice 3.19 1" Ice 3.67	2.40 3.19 3.67	25.00 42.51 65.37
Omni 2"x6'	B	From Face	3.50 -6.00 0.00	0.0000	178.00	No Ice 1.20 1/2" Ice 1.80 1" Ice 2.17	1.20 1.80 2.17	25.00 34.39 47.81
Panel Antenna 2'X2'	A	From Face	3.50 -6.00 0.00	0.0000	179.00	No Ice 4.80 1/2" Ice 5.07 1" Ice 5.35	0.72 0.87 1.03	20.00 45.02 73.54
Panel Antenna 2'X2'	A	From Face	3.50 -6.00 0.00	0.0000	175.00	No Ice 4.80 1/2" Ice 5.07 1" Ice 5.35	0.72 0.87 1.03	20.00 45.02 73.54
PiROD 13' Low Profile Platform	A	None		0.0000	174.00	No Ice 15.70 1/2" Ice 20.10 1" Ice 24.50	15.70 20.10 24.50	1300.00 1765.00 2230.00

2' Side Mount Standoff	B	From Leg	1.00 0.00 0.00	0.0000	170.00	No Ice 1.00 1/2" Ice 1.50 1" Ice 2.00	1.00 1.50 2.00	30.00 50.00 70.00
2' Side Mount Standoff	B	From Leg	1.00 0.00 0.00	0.0000	162.50	No Ice 1.00 1/2" Ice 1.50 1" Ice 2.00	1.00 1.50 2.00	30.00 50.00 70.00
Omni 3"x20'	A	From Leg	5.00 0.00 0.00	0.0000	165.50	No Ice 6.00 1/2" Ice 8.03 1" Ice 10.08	6.00 8.03 10.08	50.00 93.17 149.01
PiROD 5' Side Mount Standoff	A	From Leg	3.00 0.00 0.00	0.0000	155.50	No Ice 3.85 1/2" Ice 5.20 1" Ice 6.55	3.85 5.20 6.55	60.00 110.00 160.00

PiROD 13' Low Profile Platform	A	None		0.0000	148.50	No Ice 15.70 1/2" Ice 20.10 1" Ice 24.50	15.70 20.10 24.50	1300.00 1765.00 2230.00
APXVSP18-C w/mount pipe	A	From Leg	3.50 0.00 0.00	0.0000	150.00	No Ice 8.26 1/2" Ice 8.82 1" Ice 9.35	7.47 8.66 9.56	87.55 158.03 236.54
APXVSP18-C w/mount pipe	B	From Leg	3.50 0.00 0.00	0.0000	150.00	No Ice 8.26 1/2" Ice 8.82 1" Ice 9.35	7.47 8.66 9.56	87.55 158.03 236.54
APXVSP18-C w/mount pipe	C	From Leg	3.50 0.00 0.00	0.0000	150.00	No Ice 8.26 1/2" Ice 8.82 1" Ice 9.35	7.47 8.66 9.56	87.55 158.03 236.54
APXVTM14 w/mount pipe	A	From Leg	3.50 0.00 0.00	0.0000	150.00	No Ice 6.65 1/2" Ice 7.14 1" Ice 7.60	5.03 5.89 6.63	91.90 147.31 209.47
APXVTM14 w/mount pipe	B	From Leg	3.50 0.00 0.00	0.0000	150.00	No Ice 6.65 1/2" Ice 7.14 1" Ice 7.60	5.03 5.89 6.63	91.90 147.31 209.47
APXVTM14 w/mount pipe	C	From Leg	3.50 0.00 0.00	0.0000	150.00	No Ice 6.65 1/2" Ice 7.14 1" Ice 7.60	5.03 5.89 6.63	91.90 147.31 209.47
RRH-800	A	From Leg	3.50	0.0000	150.00	No Ice 2.13	2.76	64.00

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
			0.00			1/2" Ice	2.32	2.96	91.74
			0.00			1" Ice	2.51	3.18	122.88
RRH-800	B	From Leg	3.50	0.0000	150.00	No Ice	2.13	2.76	64.00
			0.00			1/2" Ice	2.32	2.96	91.74
			0.00			1" Ice	2.51	3.18	122.88
RRH-800	C	From Leg	3.50	0.0000	150.00	No Ice	2.13	2.76	64.00
			0.00			1/2" Ice	2.32	2.96	91.74
			0.00			1" Ice	2.51	3.18	122.88
RRH-1900	A	From Leg	3.50	0.0000	150.00	No Ice	2.32	3.14	60.00
			0.00			1/2" Ice	2.53	3.36	88.32
			0.00			1" Ice	2.74	3.60	120.15
RRH-1900	B	From Leg	3.50	0.0000	150.00	No Ice	2.32	3.14	60.00
			0.00			1/2" Ice	2.53	3.36	88.32
			0.00			1" Ice	2.74	3.60	120.15
RRH-1900	C	From Leg	3.50	0.0000	150.00	No Ice	2.32	3.14	60.00
			0.00			1/2" Ice	2.53	3.36	88.32
			0.00			1" Ice	2.74	3.60	120.15
TD-RRH8x20-25	A	From Leg	3.50	0.0000	150.00	No Ice	4.05	1.53	70.00
			0.00			1/2" Ice	4.30	1.71	97.15
			0.00			1" Ice	4.56	1.90	127.83
TD-RRH8x20-25	B	From Leg	3.50	0.0000	150.00	No Ice	4.05	1.53	70.00
			0.00			1/2" Ice	4.30	1.71	97.15
			0.00			1" Ice	4.56	1.90	127.83
TD-RRH8x20-25	C	From Leg	3.50	0.0000	150.00	No Ice	4.05	1.53	70.00
			0.00			1/2" Ice	4.30	1.71	97.15
			0.00			1" Ice	4.56	1.90	127.83

PiROD 13' Low Profile Platform (AT&T)	A	None		0.0000	137.00	No Ice	15.70	15.70	1300.00
						1/2" Ice	20.10	20.10	1765.00
						1" Ice	24.50	24.50	2230.00
(2) Powerwave 7770 w/mount pipe	A	From Leg	3.50	0.0000	139.00	No Ice	5.65	4.10	57.25
			0.00			1/2" Ice	6.03	4.75	103.17
			0.00			1" Ice	6.42	5.42	155.38
(2) Powerwave 7770 w/mount pipe	B	From Leg	3.50	0.0000	139.00	No Ice	5.65	4.10	57.25
			0.00			1/2" Ice	6.03	4.75	103.17
			0.00			1" Ice	6.42	5.42	155.38
(2) Powerwave 7770 w/mount pipe	C	From Leg	3.50	0.0000	139.00	No Ice	5.65	4.10	57.25
			0.00			1/2" Ice	6.03	4.75	103.17
			0.00			1" Ice	6.42	5.42	155.38
KMW	A	From Leg	3.50	0.0000	139.00	No Ice	11.60	9.39	111.61
AM-X-CD-17-65-00T-RET w/mount pipe			0.00			1/2" Ice	12.32	10.90	200.94
			0.00			1" Ice	13.02	12.24	301.28
KMW	B	From Leg	3.50	0.0000	139.00	No Ice	11.60	9.39	111.61
AM-X-CD-17-65-00T-RET w/mount pipe			0.00			1/2" Ice	12.32	10.90	200.94
			0.00			1" Ice	13.02	12.24	301.28
KMW	C	From Leg	3.50	0.0000	139.00	No Ice	11.60	9.39	111.61
AM-X-CD-17-65-00T-RET w/mount pipe			0.00			1/2" Ice	12.32	10.90	200.94
			0.00			1" Ice	13.02	12.24	301.28
Powerwave LGP13519 diplexer	A	From Leg	3.50	0.0000	139.00	No Ice	1.05	0.38	14.10
			0.00			1/2" Ice	1.18	0.47	21.29
			0.00			1" Ice	1.32	0.57	30.37
Powerwave LGP13519 diplexer	B	From Leg	3.50	0.0000	139.00	No Ice	1.05	0.38	14.10
			0.00			1/2" Ice	1.18	0.47	21.29
			0.00			1" Ice	1.32	0.57	30.37
Powerwave LGP13519 diplexer	C	From Leg	3.50	0.0000	139.00	No Ice	1.05	0.38	14.10
			0.00			1/2" Ice	1.18	0.47	21.29
			0.00			1" Ice	1.32	0.57	30.37

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
DBC0061F1V51-2	A	From Leg	3.50	0.0000	139.00	No Ice	0.41	0.43	26.00
			0.00			1/2" Ice	0.50	0.52	31.30
			0.00			1" Ice	0.59	0.61	38.14
DBC0061F1V51-2	B	From Leg	3.50	0.0000	139.00	No Ice	0.41	0.43	26.00
			0.00			1/2" Ice	0.50	0.52	31.30
			0.00			1" Ice	0.59	0.61	38.14
DBC0061F1V51-2	C	From Leg	3.50	0.0000	139.00	No Ice	0.41	0.43	26.00
			0.00			1/2" Ice	0.50	0.52	31.30
			0.00			1" Ice	0.59	0.61	38.14
(2) Powerwave TMA LGP17201	A	From Leg	3.50	0.0000	139.00	No Ice	1.05	0.38	14.10
			0.00			1/2" Ice	1.18	0.47	21.29
			0.00			1" Ice	1.32	0.57	30.37
(2) Powerwave TMA LGP17201	B	From Leg	3.50	0.0000	139.00	No Ice	1.05	0.38	14.10
			0.00			1/2" Ice	1.18	0.47	21.29
			0.00			1" Ice	1.32	0.57	30.37
(2) Powerwave TMA LGP17201	C	From Leg	3.50	0.0000	139.00	No Ice	1.05	0.38	14.10
			0.00			1/2" Ice	1.18	0.47	21.29
			0.00			1" Ice	1.32	0.57	30.37
(2) Ericsson RRUS-11	A	From Leg	3.50	0.0000	139.00	No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.00	1.34	71.57
			0.00			1" Ice	3.21	1.50	95.48
(2) Ericsson RRUS-11	B	From Leg	3.50	0.0000	139.00	No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.00	1.34	71.57
			0.00			1" Ice	3.21	1.50	95.48
(2) Ericsson RRUS-11	C	From Leg	3.50	0.0000	139.00	No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.00	1.34	71.57
			0.00			1" Ice	3.21	1.50	95.48
DC6-48-60-18-8F	B	From Leg	1.00	0.0000	139.00	No Ice	0.79	0.79	20.00
			0.00			1/2" Ice	1.27	1.27	35.12
			0.00			1" Ice	1.45	1.45	52.57

PiROD 13' Low Profile Platform	A	None		0.0000	128.00	No Ice	15.70	15.70	1300.00
						1/2" Ice	20.10	20.10	1765.00
						1" Ice	24.50	24.50	2230.00
(4) 2"x7' pipe	A	From Leg	3.50	0.0000	128.00	No Ice	1.67	1.67	26.00
			0.00			1/2" Ice	2.39	2.39	38.61
			0.00			1" Ice	2.83	2.83	55.88
(4) 2"x7' pipe	B	From Leg	3.50	0.0000	128.00	No Ice	1.67	1.67	26.00
			0.00			1/2" Ice	2.39	2.39	38.61
			0.00			1" Ice	2.83	2.83	55.88
(4) 2"x7' pipe	C	From Leg	3.50	0.0000	128.00	No Ice	1.67	1.67	26.00
			0.00			1/2" Ice	2.39	2.39	38.61
			0.00			1" Ice	2.83	2.83	55.88

PiROD 13' Platform w/handrail (T-Mobile - existing)	A	None		0.0000	117.00	No Ice	31.30	31.30	1822.00
						1/2" Ice	40.20	40.20	2452.00
						1" Ice	49.10	49.10	3082.00
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00	0.0000	117.00	No Ice	6.37	5.78	104.90
			-6.00			1/2" Ice	6.85	6.63	162.69
			0.00			1" Ice	7.30	7.35	227.28
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.0000	117.00	No Ice	6.37	5.78	104.90
			-6.00			1/2" Ice	6.85	6.63	162.69
			0.00			1" Ice	7.30	7.35	227.28
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.0000	117.00	No Ice	6.37	5.78	104.90
			-6.00			1/2" Ice	6.85	6.63	162.69
			0.00			1" Ice	7.30	7.35	227.28
ERICSSON AIR 21 B4A	A	From Leg	4.00	0.0000	117.00	No Ice	6.43	5.75	112.30

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	Client		T-MOBILE				Designed by		kw

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
B2P w/ Mount Pipe			6.00			1/2" Ice	6.91	6.61	170.21
			0.00			1" Ice	7.37	7.33	234.94
ERICSSON AIR 21 B4A	B	From Leg	4.00		0.0000	No Ice	6.43	5.75	112.30
B2P w/ Mount Pipe			6.00			1/2" Ice	6.91	6.61	170.21
			0.00			1" Ice	7.37	7.33	234.94
ERICSSON AIR 21 B4A	C	From Leg	4.00		0.0000	No Ice	6.43	5.75	112.30
B2P w/ Mount Pipe			6.00			1/2" Ice	6.91	6.61	170.21
			0.00			1" Ice	7.37	7.33	234.94
KRY 112 144/1	A	From Leg	3.00		0.0000	No Ice	0.35	0.17	15.00
			-6.00			1/2" Ice	0.43	0.23	18.18
			0.00			1" Ice	0.51	0.30	22.58
KRY 112 144/1	B	From Leg	3.00		0.0000	No Ice	0.35	0.17	15.00
			-6.00			1/2" Ice	0.43	0.23	18.18
			0.00			1" Ice	0.51	0.30	22.58
KRY 112 144/1	C	From Leg	3.00		0.0000	No Ice	0.35	0.17	15.00
			-6.00			1/2" Ice	0.43	0.23	18.18
			0.00			1" Ice	0.51	0.30	22.58

APXVAARR24_43-U-NA20	A	From Leg	4.00		0.0000	No Ice	20.24	11.19	174.32
w/mount pipe			0.00			1/2" Ice	20.89	12.62	311.78
(T-Mobile - proposed)			0.00			1" Ice	21.55	13.71	460.89
APXVAARR24_43-U-NA20	B	From Leg	4.00		0.0000	No Ice	20.24	11.19	174.32
w/mount pipe			0.00			1/2" Ice	20.89	12.62	311.78
			0.00			1" Ice	21.55	13.71	460.89
APXVAARR24_43-U-NA20	C	From Leg	4.00		0.0000	No Ice	20.24	11.19	174.32
w/mount pipe			0.00			1/2" Ice	20.89	12.62	311.78
			0.00			1" Ice	21.55	13.71	460.89
Radio 4449	A	From Leg	3.00		0.0000	No Ice	1.65	1.16	74.00
			0.00			1/2" Ice	1.81	1.30	90.16
			0.00			1" Ice	1.98	1.45	108.95
Radio 4449	B	From Leg	3.00		0.0000	No Ice	1.65	1.16	74.00
			0.00			1/2" Ice	1.81	1.30	90.16
			0.00			1" Ice	1.98	1.45	108.95
Radio 4449	C	From Leg	3.00		0.0000	No Ice	1.65	1.16	74.00
			0.00			1/2" Ice	1.81	1.30	90.16
			0.00			1" Ice	1.98	1.45	108.95

PiROD 13' Low Profile Platform	A	None			0.0000	No Ice	15.70	15.70	1300.00
						1/2" Ice	20.10	20.10	1765.00
						1" Ice	24.50	24.50	2230.00
5' Yagi	B	From Face	3.50		0.0000	No Ice	4.00	4.00	30.00
			0.00			1/2" Ice	5.50	5.50	50.00
			0.00			1" Ice	7.00	7.00	70.00
(2) 2"x7' pipe	A	From Face	3.50		0.0000	No Ice	1.67	1.67	26.00
			0.00			1/2" Ice	2.39	2.39	38.61
			0.00			1" Ice	2.83	2.83	55.88
2"x7' pipe	B	From Face	3.50		0.0000	No Ice	1.67	1.67	26.00
			0.00			1/2" Ice	2.39	2.39	38.61
			0.00			1" Ice	2.83	2.83	55.88
(2) 2"x7' pipe	C	From Face	3.50		0.0000	No Ice	1.67	1.67	26.00
			0.00			1/2" Ice	2.39	2.39	38.61
			0.00			1" Ice	2.83	2.83	55.88

3' Side Mount Standoff	A	From Leg	1.50		0.0000	No Ice	1.50	1.50	45.00
			0.00			1/2" Ice	2.20	2.20	70.00
			0.00			1" Ice	2.90	2.90	95.00
GPS	A	From Leg	3.00		0.0000	No Ice	0.21	0.21	5.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	lb
			0.00		1/2" Ice	0.31	0.31	7.52
			0.00		1" Ice	0.42	0.42	11.31

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				ft ft ft	°	°	ft	ft	ft ²	lb	
MF-900B	A	Grid	From Leg	3.00 0.00 0.00	0.0000		156.50	1.33	No Ice 1/2" Ice 1" Ice	2.66 1.58 0.00	13.00 21.09 29.17
HP8-107	B	Paraboloid w/Shroud (HP)	From Leg	3.00 0.00 0.00	0.0000		167.00	8.00	No Ice 1/2" Ice 1" Ice	50.26 51.29 52.32	251.00 514.30 777.60
KP8F-13	B	Grid	From Leg	3.00 0.00 0.00	0.0000		161.00	8.00	No Ice 1/2" Ice 1" Ice	40.21 51.29 62.37	282.00 545.30 808.60

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	37	110264.64	10293.74	5945.12
	Max. H _x	20	56916.19	38981.70	1258.26
	Max. H _z	2	56916.19	1898.19	37572.48
	Max. M _x	2	4428103.42	1898.19	37572.48
	Max. M _z	8	4567911.32	-38355.72	-1116.26
	Max. Torsion	17	10054.47	18074.63	-32065.40
	Min. Vert	5	42687.14	-18721.59	31691.85
	Min. H _x	8	56916.19	-38355.72	-1116.26
	Min. H _z	14	56916.19	-1357.94	-37447.81
	Min. M _x	14	-4407448.36	-1357.94	-37447.81
	Min. M _z	20	-4671758.34	38981.70	1258.26
	Min. Torsion	5	-10069.79	-18721.59	31691.85

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	47430.16	0.00	0.00	408.49	-1920.89	-0.01
1.2 Dead+1.6 Wind 0 deg - No Ice	56916.19	-1898.19	-37572.48	-4428103.42	329362.26	6093.71

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Hudson Design Group LLC 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586</p>	Job	CT11506A	Page	8 of 10
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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
0.9 Dead+1.6 Wind 0 deg - No Ice	42687.14	-1898.19	-37572.47	-4388338.82	326340.23	6115.59
1.2 Dead+1.6 Wind 30 deg - No Ice	56916.19	18721.59	-31691.86	-3688354.52	-2205386.49	10049.53
0.9 Dead+1.6 Wind 30 deg - No Ice	42687.14	18721.59	-31691.85	-3655512.75	-2184926.67	10069.79
1.2 Dead+1.6 Wind 60 deg - No Ice	56916.19	33085.44	-17547.64	-1997464.95	-3933599.52	8671.02
0.9 Dead+1.6 Wind 60 deg - No Ice	42687.14	33085.44	-17547.64	-1980013.17	-3897344.99	8684.19
1.2 Dead+1.6 Wind 90 deg - No Ice	56916.19	38355.72	1116.26	196090.12	-4567911.32	4569.78
0.9 Dead+1.6 Wind 90 deg - No Ice	42687.14	38355.72	1116.26	193805.89	-4525865.97	4572.77
1.2 Dead+1.6 Wind 120 deg - No Ice	56916.19	33668.10	19447.68	2330008.55	-4034569.48	-409.33
0.9 Dead+1.6 Wind 120 deg - No Ice	42687.14	33668.10	19447.68	2308659.58	-3997219.70	-416.81
1.2 Dead+1.6 Wind 150 deg - No Ice	56916.19	20164.58	32688.35	3861347.87	-2457789.67	-5269.04
0.9 Dead+1.6 Wind 150 deg - No Ice	42687.14	20164.58	32688.35	3826373.92	-2434554.47	-5285.04
1.2 Dead+1.6 Wind 180 deg - No Ice	56916.19	1357.94	37447.81	4407448.36	-239649.64	-9076.66
0.9 Dead+1.6 Wind 180 deg - No Ice	42687.14	1357.94	37447.81	4367635.05	-236415.34	-9097.60
1.2 Dead+1.6 Wind 210 deg - No Ice	56916.19	-18074.63	32065.40	3753771.81	2089038.26	-10033.95
0.9 Dead+1.6 Wind 210 deg - No Ice	42687.14	-18074.63	32065.40	3719967.61	2071044.11	-10054.47
1.2 Dead+1.6 Wind 240 deg - No Ice	56916.19	-33457.42	17134.20	1926175.70	3993841.63	-5687.92
0.9 Dead+1.6 Wind 240 deg - No Ice	42687.14	-33457.41	17134.20	1909267.23	3958136.71	-5701.47
1.2 Dead+1.6 Wind 270 deg - No Ice	56916.19	-38981.70	-1258.26	-220076.49	4671758.34	-3017.78
0.9 Dead+1.6 Wind 270 deg - No Ice	42687.14	-38981.69	-1258.26	-217776.41	4629812.35	-3021.77
1.2 Dead+1.6 Wind 300 deg - No Ice	56916.19	-34101.85	-19702.47	-2373545.89	4105693.80	406.04
0.9 Dead+1.6 Wind 300 deg - No Ice	42687.14	-34101.85	-19702.47	-2351982.72	4068786.02	413.68
1.2 Dead+1.6 Wind 330 deg - No Ice	56916.19	-20585.49	-33168.12	-3943348.98	2526513.01	3699.99
0.9 Dead+1.6 Wind 330 deg - No Ice	42687.14	-20585.49	-33168.12	-3907755.25	2503735.82	3717.54
1.2 Dead+1.0 Ice+1.0 Temp	110264.64	0.04	0.01	3694.19	-11917.06	2.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	110264.64	-1210.97	-11278.05	-1405759.84	207717.87	829.25
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	110264.64	5399.81	-9245.13	-1122398.61	-673825.13	2725.13
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	110264.64	9651.92	-5210.23	-622425.01	-1212926.61	2513.62
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	110264.64	11242.15	202.65	41713.72	-1416320.60	1429.73
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	110264.64	9901.78	5732.62	726112.14	-1258497.22	-691.59
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	110264.64	5794.56	9647.78	1203140.97	-746733.71	-2627.67
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	110264.64	315.53	10973.63	1358470.45	-70535.23	-3214.75

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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
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	110264.64	-5301.31	9307.63	1141404.44	631384.72	-2739.71
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	110264.64	-10365.52	4602.05	520181.46	1317252.56	-154.36
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	110264.64	-11672.20	-762.61	-134906.80	1469996.85	870.45
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	110264.64	-10293.74	-5945.12	-757158.18	1305223.37	702.79
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	110264.64	-6498.73	-9732.17	-1211334.26	849411.26	340.05
Dead+Wind 0 deg - Service	47430.16	-374.61	-7414.89	-869083.40	63065.93	1224.74
Dead+Wind 30 deg - Service	47430.16	3694.69	-6254.36	-723803.41	-434513.13	1999.67
Dead+Wind 60 deg - Service	47430.16	6529.38	-3463.01	-391876.57	-773824.39	1719.07
Dead+Wind 90 deg - Service	47430.16	7569.47	220.29	38801.67	-898432.14	903.42
Dead+Wind 120 deg - Service	47430.16	6644.37	3837.98	457835.34	-793739.30	-81.96
Dead+Wind 150 deg - Service	47430.16	3979.46	6451.02	758510.03	-484091.32	-1043.47
Dead+Wind 180 deg - Service	47430.16	267.99	7390.29	865670.34	-48550.74	-1800.33
Dead+Wind 210 deg - Service	47430.16	-3567.01	6328.08	737300.40	408606.57	-1996.57
Dead+Wind 240 deg - Service	47430.16	-6602.79	3381.42	378568.76	782577.50	-1143.28
Dead+Wind 270 deg - Service	47430.16	-7693.00	-248.32	-42845.49	915797.92	-610.43
Dead+Wind 300 deg - Service	47430.16	-6729.97	-3888.27	-465745.11	804667.07	81.37
Dead+Wind 330 deg - Service	47430.16	-4062.53	-6545.70	-773995.48	494530.21	747.26

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 130.5	21.1796	49	1.0189	0.0197
L2	130.5 - 86.75	12.0922	49	0.8836	0.0071
L3	86.75 - 43.5	5.2407	49	0.5900	0.0028
L4	43.5 - 0	1.2716	49	0.2799	0.0010

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
179.00	Panel Antenna 2'X2'	49	21.1796	1.0189	0.0197	83471
178.00	Lightning Rod	49	21.1796	1.0189	0.0197	83471
175.00	Panel Antenna 2'X2'	49	21.1796	1.0189	0.0197	83471
174.00	PiROD 13' Low Profile Platform	49	20.9661	1.0168	0.0194	83471
170.00	2' Side Mount Standoff	49	20.1127	1.0083	0.0181	83471
167.00	HP8-107	49	19.4740	1.0019	0.0171	52169
165.50	Omni 3"x20'	49	19.1554	0.9986	0.0166	43932
162.50	2' Side Mount Standoff	49	18.5200	0.9918	0.0157	33388
161.00	KP8F-13	49	18.2034	0.9882	0.0152	29811
156.50	MF-900B	49	17.2595	0.9771	0.0138	22559
155.50	PiROD 5' Side Mount Standoff	49	17.0511	0.9745	0.0135	21402
150.00	APXVSP18-C w/mount pipe	49	15.9153	0.9591	0.0118	16694
148.50	PiROD 13' Low Profile Platform	49	15.6091	0.9545	0.0114	15749
139.00	(2) Powerwave 7770 w/mount pipe	49	13.7124	0.9212	0.0089	11592
137.00	PiROD 13' Low Profile Platform	49	13.3240	0.9131	0.0084	10982

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Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
128.00	PiROD 13' Low Profile Platform	49	11.6321	0.8709	0.0066	9329
117.00	PiROD 13' Platform w/handrail	49	9.7025	0.8068	0.0050	9022
106.00	5' Yagi	49	7.9327	0.7324	0.0039	8717
102.00	PiROD 13' Low Profile Platform	49	7.3302	0.7036	0.0036	8590
79.00	GPS	49	4.3093	0.5324	0.0024	7834
77.00	3' Side Mount Standoff	49	4.0837	0.5176	0.0023	7759

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	175 - 130.5	Pole	TP34.03x19.85x0.25	1	-11224.20	1816370.00	34.9	Pass
L2	130.5 - 86.75	Pole	TP45.37x34.03x0.3125	2	-27254.20	2952980.00	60.2	Pass
L3	86.75 - 43.5	Pole	TP53.88x45.37x0.375	3	-40261.60	4225790.00	67.6	Pass
L4	43.5 - 0	Pole	TP62.38x53.88x0.4375	4	-56891.90	5725120.00	66.0	Pass
Summary								
Pole (L3)							67.6	Pass
Base Plate							75.9	Pass
RATING =							75.9	Pass

Exhibit E

Mount Analysis

May 28, 2019



Centerline Communications
 750 West Center Street, Suite #301
 West Bridgewater, MA 02379

RE: T-Mobile Site Number: CT11506A (L600)
 Site Name: CT506/WILLIMANTIC ECSU
 Site Address: 83 Windham Street
 Willimantic, CT 06226

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by Centerline to perform a mount analysis on the existing T-Mobile antenna mounts to determine their capability of supporting the following equipment loading:

- (3) AIR 21 B2A_B4P Antennas (55.0"x12.0"x7.9" – Wt. = 83 lbs. /each)
- (3) AIR 21 B2P_B4A Antennas (55.0"x12.0"x7.9" – Wt. = 83 lbs. /each)
- (3) KRY 112 144/2 TMA's (6.9"x6.1"x2.8" – Wt. = 11 lbs. /each)
- **(3) APXVAARR24_43-U-NA20 Antennas (95.9"x24.0"x8.7" – Wt. = 128.0 lbs. /each)**
- **(3) 4449 B71+B12 RRH's (14.9"x13.2"x10.4" – Wt. = 73 lbs.)**

**Proposed equipment shown in bold.*

No original structural design documents or fabrication drawings were available for the existing mount. HDG's subconsultant, ProVertic LLC, conducted a survey climb and mapping of the existing T-Mobile antenna mounts on May 22, 2019.

Based on our analysis, we have determined that the existing antenna mounts **ARE CAPABLE** of supporting the proposed installation:

- **Reinforce existing horizontal L7x4x1/4 steel rotation plate with new L7x4x1/4 steel angles (typ. Of 2 per sector, total of 6)**

	Member	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Mount Rating	239	LC3	271%	FAIL
Proposed Modified Mount Rating	235	LC3	84%	PASS

This analysis was conducted in accordance with EIA/TIA-222-G, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the International Building Code 2015 and 2018 Connecticut State Building Code. (See the attached analysis)

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mounts have been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to T-Mobile's mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting structure.

Please feel free to contact our office should you have any questions.

Respectfully Submitted,
Hudson Design Group LLC



Michael Cabral
Structural Dept. Head



Daniel P. Hamm, PE
Principal

FIELD PHOTOS:





HUDSON
Design Group LLC

Wind & Ice Calculations

Date: 05/28/2019
 Project Name: CT11506A
 Project No.: CT11506A
 Designed By: KM Checked By: MSC



2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01 (z/z_g)^{2/\alpha}$
 z = 117 (ft)
 z_g = 1200 (ft)
 α = 7.0
K_z = 1.034

$K_{zmin} \leq K_z \leq 2.01$

Table 2-4

Exposure	Z _g	α	K _{zmin}	K _e
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.4 Topographic Factor:

Table 2-5

Topo. Category	K _t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1 + (K_e K_t / K_h)]^2$

$K_h = e^{(f \cdot z / H)}$

K_{zt} = 1

K_h = 1

K_e = 0.9 (from Table 2-4)

K_t = 0 (from Table 2-5)

f = 0 (from Table 2-5)

z = 117

H = 10 (Ht. of the crest above surrounding terrain)

K_{zt} = 1.00

K_{iz} = 1.13 (from Sec. 2.6.8)

(If Category 1 then K_{zt} = 1.0)

Category = 1

2.6.8 Design Ice Thickness

Max Ice Thickness =

t_i = 1.00 in

Importance Factor, I_{ice} =

I_{ice} = 1.00 (from Table 2-3)

$t_{iz} = 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot (K_{zt})^{0.35}$

t_{iz} = 2.27 in

Date: 05/28/2019
 Project Name: CT11506A
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 Designed By: KM Checked By: MSC



2.6.7 Gust Effect Factor

2.6.7.1 Self Supporting Lattice Structures

Gh = 1.0 Latticed Structures > 600 ft

Gh = 0.85 Latticed Structures 450 ft or less

Gh = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h= 175 Gh= 0.85

2.6.7.2 Guyed Masts

Gh= 0.85

2.6.7.3 Pole Structures

Gh= 1.1

2.6.9 Appurtenances

Gh= 1.0

2.6.7.4 Structures Supported on Other Structures

(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

Gh= 1.35 Gh= 1.00

2.6.9.2 Design Wind Force on Appurtenances

$F = q_z * Gh * (EPA)_A$

$q_z = 0.00256 * K_z * K_{zt} * K_d * V_{max}^2 * I$

q_z = 30.42

q_{z (ice)} = 6.28

K_z = 1.034

K_{zt} = 1.0

K_d = 0.95 (from Table 2-2)

V_{max} = 110

V_{max (ice)} = 50

I = 1.0 (from Table 2-3)

I_{wice} = 1.0 (from Table 2-3)

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95

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 Designed By: KM Checked By: MSC



Determine Ca:

Table 2-8

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Round	C < 32 (Subcritical)	0.7	0.8	1.2
	32 ≤ C ≤ 64 (Transitional)	$3.76/(C^{0.485})$	$3.37/(C^{0.415})$	$38.4/(C^{1.0})$
	C > 64 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
 (Aspect ratio is independent of the spacing between support points of a linear appurtenance, and the section length considered to have uniform wind load).

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = **2.27 in**

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ice)
AIR 21 B2A_B4P Antenna	55.0	12.0	7.9	4.58	4.58	1.29	180	56
AIR 21 B2P_B4A Antenna	55.0	12.0	7.9	4.58	4.58	1.29	180	56
APXVAARR24_43-U-NA20 Antenna	95.9	24.0	8.7	15.98	4.00	1.27	616	158
4449 B71+B12 RRH	14.9	13.1	9.2	1.36	1.14	1.20	49	18
4449 B71+B12 RRH (Shielded)	14.9	10.9	9.2	1.13	1.37	1.20	41	16
KRY 112 144/2 TMA	6.9	6.1	2.8	0.29	1.13	1.20	11	6
KRY 112 144/2 TMA (Shielded)	6.9	5.9	2.8	0.28	1.17	1.20	10	6
2" Pipe	2.4	12.0		0.20	0.20	1.20	7	6
3" Pipe	3.5	12.0		0.29	0.29	1.20	11	7
L 2x2 Angles	2.5	2.5		0.04	1.00	1.20	2	3
HSS 4x4	4.0	4.0		0.11	1.00	1.20	4	4
PL 4x3/8	4.0	0.4		0.01	10.67	1.52	0	3
PL 7x1/4	7.0	0.3		0.01	28.00	2.10	1	5

Date: 05/28/2019
 Project Name: CT11506A
 Project No.: CT11506A
 Designed By: KM Checked By: MSC



WIND LOADS

Angle = 60 (deg)

Ice Thickness = 2.27 in.

WIND LOADS WITH NO ICE:

Appurtenances

	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
AIR 21 B2A_B4P Antenna	55.0	12.0	7.9	4.58	3.02	4.58	6.96	1.29	1.40	180	128	141
AIR 21 B2P_B4A Antenna	55.0	12.0	7.9	4.58	3.02	4.58	6.96	1.29	1.40	180	128	141
APXVAARR24_43-U-NA20 Antenna	95.9	24.0	8.7	15.98	5.79	4.00	11.02	1.27	1.53	616	270	357
4449 B71+B12 RRH	14.9	13.1	9.2	1.36	0.95	1.14	1.62	1.20	1.20	49	35	38
4449 B71+B12 RRH (Shielded)	14.9	10.9	9.2	1.13	0.95	1.37	1.62	1.20	1.20	41	35	36
KRY 112 144/2 TMA	6.9	6.1	2.8	0.29	0.13	1.13	2.46	1.20	1.20	11	5	6
KRY 112 144/2 TMA (Shielded)	6.9	5.9	2.8	0.28	0.13	1.17	2.46	1.20	1.20	10	5	6

WIND LOADS WITH ICE:

AIR 21 B2A_B4P Antenna	57.3	14.3	10.2	5.68	4.04	4.01	5.63	1.27	1.34	45	34	37
AIR 21 B2P_B4A Antenna	57.3	14.3	10.2	5.68	4.04	4.01	5.63	1.27	1.34	45	34	37
APXVAARR24_43-U-NA20 Antenna	98.2	26.3	11.0	17.91	7.48	3.74	8.95	1.25	1.46	141	69	87
4449 B71+B12 RRH	17.2	15.4	11.5	1.83	1.37	1.12	1.50	1.20	1.20	14	10	11
4449 B71+B12 RRH (Shielded)	17.2	13.2	11.5	1.57	1.37	1.30	1.50	1.20	1.20	12	10	11
KRY 112 144/2 TMA	9.2	8.4	5.1	0.53	0.32	1.10	1.81	1.20	1.20	4	2	3
KRY 112 144/2 TMA (Shielded)	9.2	8.2	5.1	0.52	0.32	1.12	1.81	1.20	1.20	4	2	3

Date: 5/30/2019

Project Name: CT11506A

Project No.: CT11506A

Designed By: KM Checked By: MSC



HUDSON
Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 2.27 in.
Density of ice: 56 pcf

APXVAARR24_43-U-NA20 Antenna

Weight of ice based on total radial SF area:
Height (in): 95.9
Width (in): 24.0
Depth (in): 8.7
Total weight of ice on object: 616 lbs
Weight of object: 128.0 lbs
Combined weight of ice and object: 744 lbs

AIR 21 B2A_B4P Antenna

Weight of ice based on total radial SF area:
Height (in): 55.0
Width (in): 12.0
Depth (in): 7.9
Total weight of ice on object: 211 lbs
Weight of object: 83.0 lbs
Combined weight of ice and object: 294 lbs

4449 B71+B12 RRH

Weight of ice based on total radial SF area:
Height (in): 14.9
Width (in): 13.1
Depth (in): 9.2
Total weight of ice on object: 63 lbs
Weight of object: 74.0 lbs
Combined weight of ice and object: 137 lbs

KRY 112 144/2 TMA

Weight of ice based on total radial SF area:
Height (in): 6.9
Width (in): 6.1
Depth (in): 2.8
Total weight of ice on object: 14 lbs
Weight of object: 11.0 lbs
Combined weight of ice and object: 25 lbs

4449 B71+B12 RRH (Shielded)

Weight of ice based on total radial SF area:
Height (in): 14.9
Width (in): 10.9
Depth (in): 9.2
Total weight of ice on object: 57 lbs
Weight of object: 74.0 lbs
Combined weight of ice and object: 131 lbs

KRY 112 144/2 TMA (Shielded)

Weight of ice based on total radial SF area:
Height (in): 6.9
Width (in): 5.9
Depth (in): 2.8
Total weight of ice on object: 14 lbs
Weight of object: 11.0 lbs
Combined weight of ice and object: 25 lbs

2" pipe

Per foot weight of ice:
diameter (in): 2.38
Per foot weight of ice on object: 13 plf

2-1/2" pipe

Per foot weight of ice:
diameter (in): 2.88
Per foot weight of ice on object: 14 plf

3" Pipe

Per foot weight of ice:
diameter (in): 3.5
Per foot weight of ice on object: 16 plf

L 2x2 Angles

Weight of ice based on total radial SF area:
Height (in): 2
Width (in): 2
Per foot weight of ice on object: 14 plf

HSS 4x4

Weight of ice based on total radial SF area:
Height (in): 4
Width (in): 4
Per foot weight of ice on object: 22 plf

PL 4x3/8

Weight of ice based on total radial SF area:
Height (in): 4
Width (in): 3.75
Per foot weight of ice on object: 22 plf

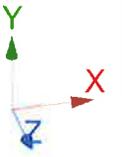
PL 7x1/4

Weight of ice based on total radial SF area:
Height (in): 7
Width (in): 0.25
Per foot weight of ice on object: 26 plf

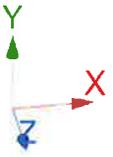
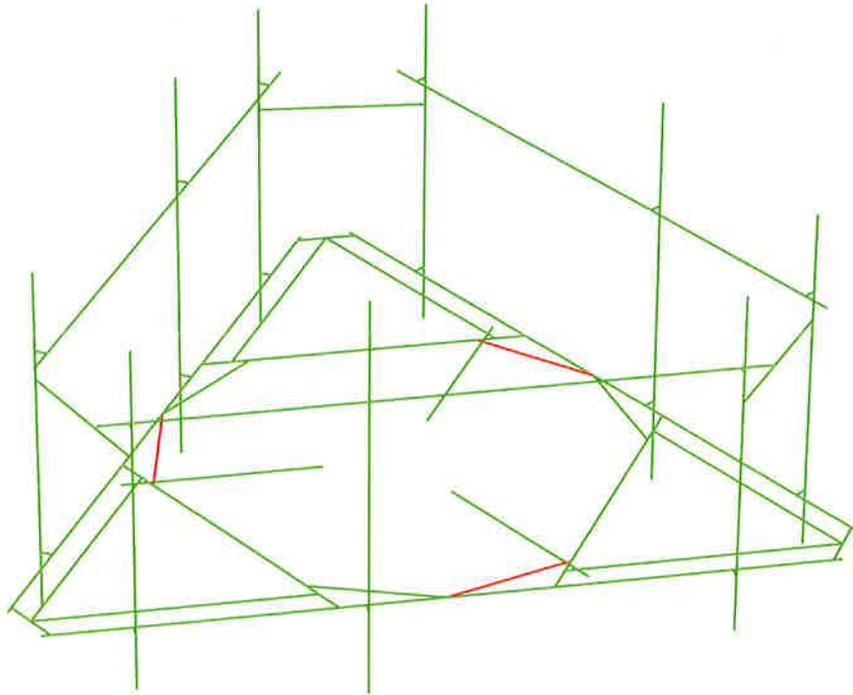


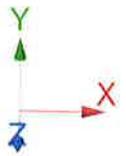
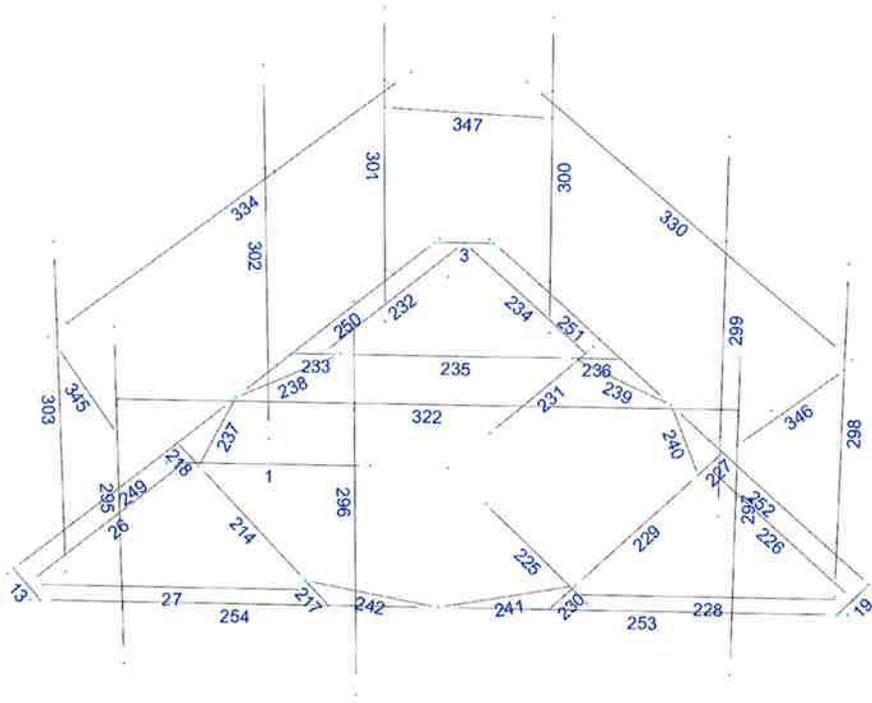
HUDSON
Design Group LLC

**Mount Calculations
(Existing Conditions)**



- Not designed
- Error on design
- Design O.K.
- With warnings





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Load data

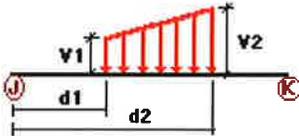
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wo	Wind Load (No Ice)	No	WIND
Wi	Wind Load (With Ice)	No	WIND
Di	Ice Load	No	LL

Distributed force on members

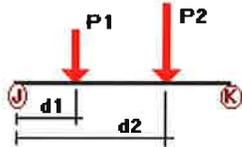


Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	1	Z	-0.004	-0.004	0.00	Yes	100.00	Yes
	19	Z	2	-0.001	-0.001	True	0	True
	0.00	No	0.00	No				100 0.00 0.00
	214	Z	-0.001	-0.001	0.00	Yes	100.00	Yes
	225	Z	-0.004	-0.004	0.00	Yes	100.00	Yes
	229	Z	-0.001	-0.001	0.00	Yes	100.00	Yes
	231	Z	-0.004	-0.004	0.00	Yes	100.00	Yes
	235	Z	-0.001	-0.001	0.00	Yes	100.00	Yes
	237	Z	-0.001	-0.001	0.00	Yes	100.00	Yes
	238	Z	-0.001	-0.001	0.00	Yes	100.00	Yes
	239	Z	-0.001	-0.001	0.00	Yes	100.00	Yes
	240	Z	-0.001	-0.001	0.00	Yes	100.00	Yes
	241	Z	-0.001	-0.001	0.00	Yes	100.00	Yes
	242	Z	-0.001	-0.001	0.00	Yes	100.00	Yes
	249	Z	-0.011	-0.011	0.00	Yes	100.00	Yes
	250	Z	-0.011	-0.011	0.00	Yes	100.00	Yes
	251	Z	-0.011	-0.011	0.00	Yes	100.00	Yes
	252	Z	-0.011	-0.011	0.00	Yes	100.00	Yes
	253	Z	-0.011	-0.011	0.00	Yes	100.00	Yes
	254	Z	-0.011	-0.011	0.00	Yes	100.00	Yes
	322	Z	-0.011	-0.011	0.00	Yes	100.00	Yes
	330	z	-0.011	-0.011	0.00	Yes	100.00	Yes
	334	Z	-0.011	-0.011	0.00	Yes	100.00	Yes
	345	Z	-0.007	-0.007	0.00	Yes	100.00	Yes

	346	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	347	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
Wi	1	Z	-0.004	-0.004	0.00	Yes	100.00	Yes
	3	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	13	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	19	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	26	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	27	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	214	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	217	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	218	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	225	Z	-0.004	-0.004	0.00	Yes	100.00	Yes
	226	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	227	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	228	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	229	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	230	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	231	Z	-0.004	-0.004	0.00	Yes	100.00	Yes
	232	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	233	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	234	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	235	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	236	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	237	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	238	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	239	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	240	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	241	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	242	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	249	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	250	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	251	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	252	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	253	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	254	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	322	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	330	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	334	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	345	Z	-0.006	-0.006	0.00	Yes	100.00	Yes
	346	Z	-0.006	-0.006	0.00	Yes	100.00	Yes
	347	Z	-0.006	-0.006	0.00	Yes	100.00	Yes
Di	1	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	3	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	13	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	19	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	26	Y	-0.007	-0.007	0.00	Yes	100.00	Yes
	27	Y	-0.007	-0.007	0.00	Yes	100.00	Yes
	214	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
	217	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	218	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	225	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	226	Y	-0.007	-0.007	0.00	Yes	100.00	Yes
	227	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	228	Y	-0.007	-0.007	0.00	Yes	100.00	Yes
	229	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
	230	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	231	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	232	Y	-0.007	-0.007	0.00	Yes	100.00	Yes
	233	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	234	Y	-0.007	-0.007	0.00	Yes	100.00	Yes

235	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
236	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
237	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
238	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
239	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
240	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
241	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
242	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
249	Y	-0.016	-0.016	0.00	Yes	100.00	Yes
250	Y	-0.016	-0.016	0.00	Yes	100.00	Yes
251	Y	-0.016	-0.016	0.00	Yes	100.00	Yes
252	Y	-0.016	-0.016	0.00	Yes	100.00	Yes
253	Y	-0.016	-0.016	0.00	Yes	100.00	Yes
254	Y	-0.016	-0.016	0.00	Yes	100.00	Yes
322	y	-0.016	-0.016	0.00	Yes	100.00	Yes
330	y	-0.016	-0.016	0.00	Yes	100.00	Yes
334	y	-0.016	-0.016	0.00	Yes	100.00	Yes
345	y	-0.013	-0.013	0.00	Yes	100.00	Yes
346	y	-0.013	-0.013	0.00	Yes	100.00	Yes
347	y	-0.013	-0.013	0.00	Yes	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	295	y	-0.0415	0.683	No
		y	-0.0415	5.317	No
		Y	-0.0055	3.00	No
	296	y	-0.064	0.458	No
		y	-0.064	6.542	No
		y	-0.0635	3.00	No
	297	y	-0.0415	0.683	No
		y	-0.0415	5.317	No
	298	y	-0.0415	0.683	No
		y	-0.0415	5.317	No
		Y	-0.0055	3.00	No
	299	y	-0.064	0.458	No
		y	-0.064	6.542	No
		y	-0.0635	3.00	No
	300	y	-0.0415	0.683	No
		y	-0.0415	5.317	No
	301	y	-0.0415	0.683	No
		y	-0.0415	5.317	No
		Y	-0.0055	3.00	No
	302	y	-0.064	0.458	No
y		-0.064	6.542	No	
y		-0.0635	3.00	No	
303	y	-0.0415	0.683	No	
	y	-0.0415	5.317	No	
Wo	295	z	-0.09	0.683	No

		z	-0.09	5.317	No
	296	z	-0.308	0.458	No
		z	-0.308	6.542	No
	297	z	-0.09	0.683	No
		z	-0.09	5.317	No
	298	z	-0.0705	0.683	No
		z	-0.0705	5.317	No
	299	z	-0.1785	0.458	No
		z	-0.1785	6.542	No
		z	-0.036	4.00	No
	300	z	-0.0705	0.683	No
		z	-0.0705	5.317	No
		z	-0.006	4.00	No
	301	z	-0.0705	0.683	No
		z	-0.0705	5.317	No
	302	z	-0.1785	0.458	No
		z	-0.1785	6.542	No
		z	-0.036	4.00	No
	303	z	-0.0705	0.683	No
		z	-0.0705	5.317	No
		z	-0.006	4.00	No
Wi	295	z	-0.028	0.683	No
		z	-0.028	5.317	No
	296	z	-0.079	0.683	No
		z	-0.079	5.317	No
	297	z	-0.028	0.683	No
		z	-0.028	5.317	No
	298	z	-0.0185	0.683	No
		z	-0.0185	5.317	No
	299	z	-0.0435	0.683	No
		z	-0.0435	5.317	No
		z	-0.011	4.00	No
	300	z	-0.0185	0.683	No
		z	-0.0185	5.317	No
		z	-0.003	4.00	No
	301	z	-0.0185	0.683	No
		z	-0.0185	5.317	No
	302	z	-0.0435	0.683	No
		z	-0.0435	5.317	No
		z	-0.011	4.00	No
	303	z	-0.0185	0.683	No
		z	-0.0185	5.317	No
		z	-0.003	4.00	No
Di	295	y	-0.1055	0.683	No
		y	-0.1055	5.317	No
		y	-0.014	3.00	No
	296	y	-0.308	0.458	No
		y	-0.308	6.542	No
		y	-0.057	3.00	No
	297	y	-0.1055	0.708	No
		y	-0.1055	5.292	No
	298	y	-0.1055	0.683	No
		y	-0.1055	5.317	No
		y	-0.014	3.00	No
	299	y	-0.308	0.458	No
		y	-0.308	6.542	No
		y	-0.057	3.00	No
	300	y	-0.1055	0.708	No
		y	-0.1055	5.292	No
	301	y	-0.1055	0.683	No

	y	-0.1055	5.317	No
	y	-0.014	3.00	No
302	y	-0.308	0.458	No
	y	-0.308	6.542	No
	y	-0.0315	1.50	No
303	y	-0.1055	0.708	No
	y	-0.1055	5.292	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (No Ice)	No	0.00	-1.00	0.00
Wi	Wind Load (With Ice)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
Wo	0.00	0.00	0.00
Wi	0.00	0.00	0.00
Di	0.00	0.00	0.00

Current Date: 5/30/2019 2:21 PM

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File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\T-MOBILE\CT\CT11506A\L600\CT11506A (L600) (Rev.0).retxl

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

- LC1=1.2DL+1.6Wo
- LC2=0.9DL+1.6Wo
- LC3=1.2DL+Wi+Di
- LC4=1.2DL
- LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
<i>HSS_SQR 4X4X1_4</i>		1	LC3 at 0.00%	0.36	OK	Eq. H1-1b
		225	LC3 at 0.00%	0.28	OK	Eq. H1-1b
		231	LC1 at 0.00%	0.46	OK	Eq. H1-1b
<i>L 2X2X3_16</i>		26	LC1 at 3.13%	0.52	OK	Eq. H3-8
		27	LC1 at 100.00%	0.12	OK	Eq. H2-1
		226	LC2 at 56.25%	0.11	OK	Eq. H2-1
		228	LC2 at 0.00%	0.42	OK	Eq. H3-8
		232	LC3 at 100.00%	0.08	OK	Eq. H2-1
		234	LC1 at 3.13%	0.45	OK	Eq. H3-8
<i>LU 7x4x1/4</i>		214	LC3 at 0.00%	0.80	OK	Eq. H2-1
		229	LC3 at 0.00%	0.72	OK	Eq. H2-1
		235	LC3 at 0.00%	0.83	OK	Eq. H2-1
		237	LC3 at 96.88%	2.52	N.G.	Eq. H3-8
		238	LC2 at 0.00%	0.18	OK	Eq. H2-1
		239	LC3 at 96.88%	2.71	N.G.	Eq. H3-8
		240	LC3 at 0.00%	0.16	OK	Eq. H2-1
		241	LC3 at 96.88%	2.37	N.G.	Eq. H3-8
<i>PIPE 2x0.154</i>		242	LC1 at 0.00%	0.29	OK	Eq. H2-1
		295	LC2 at 29.69%	0.36	OK	Eq. H1-1b
		296	LC1 at 77.08%	0.52	OK	Eq. H1-1b
		297	LC1 at 29.69%	0.36	OK	Eq. H1-1b
		298	LC1 at 76.56%	0.60	OK	Eq. H1-1b
		299	LC1 at 22.92%	0.72	OK	Eq. H1-1b
		300	LC2 at 68.75%	0.36	OK	Eq. H1-1b
		301	LC2 at 17.19%	0.28	OK	Eq. H1-1b
		302	LC2 at 22.92%	0.38	OK	Eq. H1-1b
		303	LC1 at 17.19%	0.49	OK	Eq. H1-1b
		345	LC1 at 100.00%	0.55	OK	Eq. H1-1b
		346	LC2 at 0.00%	0.45	OK	Eq. H1-1b
<i>PIPE 3x0.216</i>		347	LC1 at 0.00%	0.30	OK	Eq. H1-1b
		249	LC3 at 28.13%	0.24	OK	Eq. H1-1b
		250	LC3 at 0.00%	0.16	OK	Eq. H1-1b
		251	LC1 at 71.88%	0.39	OK	Eq. H1-1b
		252	LC3 at 0.00%	0.19	OK	Eq. H1-1b
		253	LC3 at 71.88%	0.25	OK	Eq. H1-1b
		254	LC3 at 0.00%	0.15	OK	Eq. H1-1b
		322	LC2 at 60.94%	0.16	OK	Eq. H1-1b
		330	LC1 at 39.06%	0.25	OK	Eq. H1-1b
334	LC1 at 59.38%	0.21	OK	Eq. H1-1b		

PL 4x3/8

3	LC3 at 50.00%	0.12	OK	Eq. H1-1b
13	LC3 at 50.00%	0.13	OK	Eq. H1-1b
19	LC3 at 100.00%	0.14	OK	Eq. H1-1b
217	LC1 at 100.00%	0.30	OK	Eq. H1-1b
218	LC3 at 0.00%	0.25	OK	Eq. H1-1b
227	LC2 at 59.38%	0.16	OK	Eq. H1-1b
230	LC1 at 39.58%	0.31	OK	Eq. H1-1b
233	LC3 at 0.00%	0.14	OK	Eq. H1-1b
236	LC3 at 0.00%	0.25	OK	Eq. H1-1b

Current Date: 5/30/2019 2:21 PM

Units system: English

File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\T-MOBILE\CT\CT11506A\L600\CT11506A (L600) (Rev.0).retx\

Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
3	-1.25	0.00	1.25	0
4	0.00	0.00	-2.25	0
5	-6.348	0.00	4.915	0
6	-1.6766	0.00	5.3461	0
7	-4.3856	0.00	0.6539	0
8	-0.50	0.00	-6.08	0
9	0.50	0.00	-6.08	0
10	-4.1371	0.00	1.0844	0
11	-1.9251	0.00	4.9156	0
15	0.00	0.00	1.25	0
33	-6.098	0.00	5.348	0
34	-6.598	0.00	4.482	0
44	6.598	0.00	4.482	0
45	6.098	0.00	5.348	0
636	3.5473	0.00	-0.798	0
644	-3.5473	0.00	-0.798	0
648	0.00	0.00	5.3461	0
758	-4.50	0.00	1.25	0
759	-2.0751	0.00	4.6558	0
760	-3.9871	0.00	1.3442	0
771	0.625	0.00	2.3325	0

772	2.25	0.00	5.1471	0
773	4.1371	0.00	1.0844	0
774	3.9871	0.00	1.3442	0
775	1.9251	0.00	4.9156	0
776	2.0751	0.00	4.6558	0
777	4.3856	0.00	0.6539	0
778	1.6766	0.00	5.3461	0
779	6.348	0.00	4.915	0
780	0.625	0.00	0.1675	0
781	2.25	0.00	-2.6471	0
782	-2.212	0.00	-2.25	0
783	-1.912	0.00	-2.25	0
784	2.212	0.00	-2.25	0
785	1.912	0.00	-2.25	0
786	-2.709	0.00	-2.25	0
787	2.709	0.00	-2.25	0
788	0.00	0.00	-6.08	0
801	6.673	0.00	4.6119	0
802	0.425	0.00	-6.2099	0
807	-0.425	0.00	-6.2099	0
808	-6.673	0.00	4.6119	0
809	-6.248	0.00	5.348	0
810	6.248	0.00	5.348	0
868	0.00	3.50	1.25	0
893	-4.832	5.00	5.548	0
894	-4.832	-1.00	5.548	0
895	-1.25	5.50	5.5461	0
896	-1.25	-1.50	5.5461	0
897	4.498	5.00	5.548	0
898	4.498	-1.00	5.548	0
899	6.1382	-1.00	3.2856	0
900	6.1382	5.00	3.2856	0
901	4.3455	-1.50	0.1845	0
902	4.3455	5.50	0.1845	0
903	1.4732	-1.00	-4.7944	0
904	1.4732	5.00	-4.7944	0
905	-1.3062	-1.00	-5.0836	0
906	-1.3062	5.00	-5.0836	0
907	-3.0955	-1.50	-1.9806	0
908	-3.0955	5.50	-1.9806	0
909	-5.9712	-1.00	2.9963	0
910	-5.9712	5.00	2.9963	0
926	-4.832	3.125	5.548	0
927	4.498	3.125	5.548	0
929	-5.9712	3.125	2.9963	0
930	6.1382	3.125	3.2856	0
935	4.998	3.625	5.348	0
936	-5.332	3.625	5.348	0
951	1.05	3.625	-5.1274	0
952	6.215	3.625	3.8186	0
956	-0.883	3.625	-5.4166	0
957	-6.048	3.625	3.5294	0
958	-1.3062	3.125	-5.0836	0
959	1.4732	3.125	-4.7944	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
3	1	1	1	1	1	1
771	1	1	1	1	1	1
780	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
1	3	758		HSS_SQR 4X4X1_4	A500 GrC rectangular	0.00	0.00	0.00
3	8	9		PL 4x3/8	A36	0.00	0.00	0.00
13	33	34		PL 4x3/8	A36	0.00	0.00	0.00
19	44	45		PL 4x3/8	A36	0.00	0.00	0.00
26	10	5		L 2X2X3_16	A36	0.00	0.00	0.00
27	11	5		L 2X2X3_16	A36	0.00	0.00	0.00
214	760	759		LU 7x4x1/4	A36	0.00	0.00	0.00
217	6	759		PL 4x3/8	A36	0.00	0.00	0.00
218	760	7		PL 4x3/8	A36	0.00	0.00	0.00
225	771	772		HSS_SQR 4X4X1_4	A500 GrC rectangular	0.00	0.00	0.00
226	773	779		L 2X2X3_16	A36	0.00	0.00	0.00
227	777	774		PL 4x3/8	A36	0.00	0.00	0.00
228	775	779		L 2X2X3_16	A36	0.00	0.00	0.00
229	776	774		LU 7x4x1/4	A36	0.00	0.00	0.00
230	776	778		PL 4x3/8	A36	0.00	0.00	0.00
231	780	781		HSS_SQR 4X4X1_4	A500 GrC rectangular	0.00	0.00	0.00
232	782	788		L 2X2X3_16	A36	0.00	0.00	0.00
233	786	783		PL 4x3/8	A36	0.00	0.00	0.00
234	784	788		L 2X2X3_16	A36	0.00	0.00	0.00
235	785	783		LU 7x4x1/4	A36	0.00	0.00	0.00
236	785	787		PL 4x3/8	A36	0.00	0.00	0.00
237	644	760		LU 7x4x1/4	A36	0.00	0.00	0.00
238	783	644		LU 7x4x1/4	A36	0.00	0.00	0.00
239	636	785		LU 7x4x1/4	A36	0.00	0.00	0.00
240	774	636		LU 7x4x1/4	A36	0.00	0.00	0.00
241	648	776		LU 7x4x1/4	A36	0.00	0.00	0.00
242	759	648		LU 7x4x1/4	A36	0.00	0.00	0.00
249	644	808		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
250	644	807		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
251	802	636		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
252	636	801		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
253	810	648		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
254	648	809		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
295	893	894		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
296	895	896		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
297	897	898		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
298	899	900		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
299	901	902		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
300	903	904		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
301	905	906		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
302	907	908		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
303	909	910		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
322	935	936		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
330	952	951		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
334	957	956		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
345	929	926		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
346	927	930		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
347	959	958		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
26	270.00	0	0.00	0.00	0.00
214	270.00	0	0.00	0.00	0.00
228	270.00	0	0.00	0.00	0.00
229	270.00	0	0.00	0.00	0.00
234	270.00	0	0.00	0.00	0.00
235	270.00	0	0.00	0.00	0.00
237	270.00	0	0.00	0.00	0.00
238	270.00	0	0.00	0.00	0.00
239	270.00	0	0.00	0.00	0.00
240	270.00	0	0.00	0.00	0.00
241	270.00	0	0.00	0.00	0.00
242	270.00	0	0.00	0.00	0.00
295	0.00	2	-1.00	0.00	0.00
296	0.00	2	-1.00	0.00	0.00
297	0.00	2	-1.00	0.00	0.00

Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
1	0.00	-3.00	0.00	0.00	-3.00	0.00
26	-1.7321	0.00	1.00	0.00	0.00	0.00
27	-1.7321	0.00	1.00	0.00	0.00	0.00
217	-1.7321	1.00	1.00	-1.7321	1.00	1.00
218	-1.7321	1.00	1.00	-1.7321	1.00	1.00
225	0.00	-3.00	0.00	0.00	-3.00	0.00
226	1.7321	0.00	1.00	0.00	0.00	0.00
227	1.7321	1.00	1.00	1.7321	1.00	1.00
228	1.7321	0.00	1.00	0.00	0.00	0.00
230	1.7321	1.00	1.00	1.7321	1.00	1.00
231	0.00	-3.00	0.00	0.00	-3.00	0.00
232	0.00	0.00	-2.00	0.00	0.00	0.00
233	0.00	1.00	-2.00	0.00	1.00	-2.00
234	0.00	0.00	-2.00	0.00	0.00	0.00
236	0.00	1.00	-2.00	0.00	1.00	-2.00
237	4.00	-0.50	0.00	0.00	-0.50	2.00
238	2.00	-0.50	-1.00	4.00	-0.50	0.00
239	-4.00	-0.50	0.00	-2.00	-0.50	-1.00
240	0.00	-0.50	2.00	-4.00	-0.50	0.00
241	0.00	-0.50	-3.50	1.50	-0.50	-1.00
242	-1.50	-0.50	-1.00	0.00	-0.50	-3.50
345	2.00	0.00	0.00	2.00	0.00	0.00
346	-2.00	0.00	0.00	-2.00	0.00	0.00
347	0.00	0.00	2.00	0.00	0.00	2.00



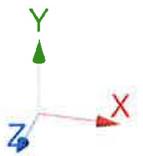
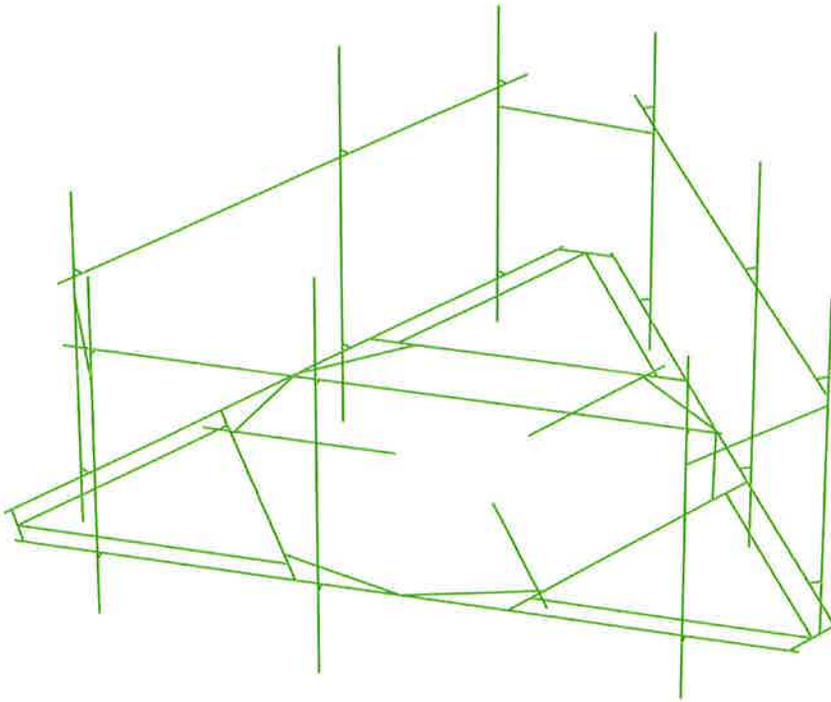
HUDSON
Design Group LLC

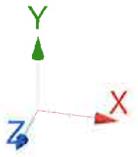
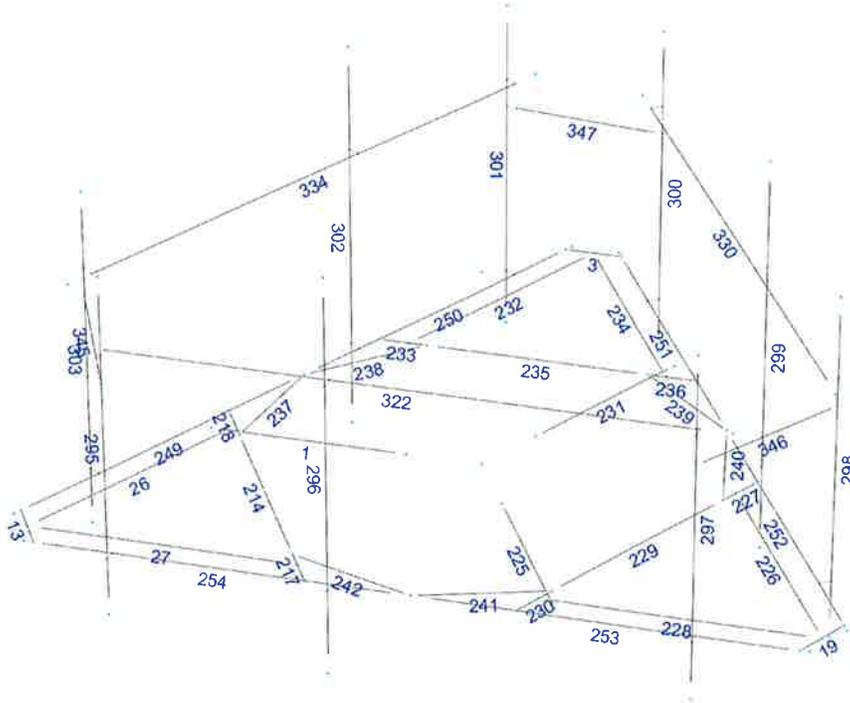
**Mount Calculations
(Modified Conditions)**



Reinforce existing horizontal
L7x4x1/4 steel rotation plate
with new L7x4x1/4 steel
angles (typ. Of 2 per sector,
total of 6)

- Not designed
- Error on design
- Design O.K.
- With warnings





Current Date: 5/30/2019 2:28 PM

Units system: English

File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\T-MOBILE\CT\CT11506A\L600\CT11506A (L600) (Rev.0) (MOD).retx\

Load data

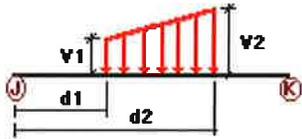
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wo	Wind Load (No Ice)	No	WIND
Wi	Wind Load (With Ice)	No	WIND
Di	Ice Load	No	LL

Distributed force on members

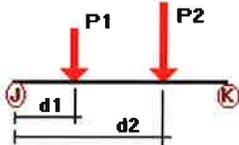


Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%			
Wo	1	Z	-0.004	-0.004	0.00	Yes	100.00	Yes			
	19	Z	2	-0.001	-0.001	True	0	True	100	0.00	0.00
	0.00	No	0.00	No							
	214	Z	-0.001	-0.001	0.00	Yes	100.00	Yes			
	225	Z	-0.004	-0.004	0.00	Yes	100.00	Yes			
	229	Z	-0.001	-0.001	0.00	Yes	100.00	Yes			
	231	Z	-0.004	-0.004	0.00	Yes	100.00	Yes			
	235	Z	-0.001	-0.001	0.00	Yes	100.00	Yes			
	237	Z	-0.001	-0.001	0.00	Yes	100.00	Yes			
	238	Z	-0.001	-0.001	0.00	Yes	100.00	Yes			
	239	Z	-0.001	-0.001	0.00	Yes	100.00	Yes			
	240	Z	-0.001	-0.001	0.00	Yes	100.00	Yes			
	241	Z	-0.001	-0.001	0.00	Yes	100.00	Yes			
	242	Z	-0.001	-0.001	0.00	Yes	100.00	Yes			
	249	Z	-0.011	-0.011	0.00	Yes	100.00	Yes			
	250	Z	-0.011	-0.011	0.00	Yes	100.00	Yes			
	251	Z	-0.011	-0.011	0.00	Yes	100.00	Yes			
	252	Z	-0.011	-0.011	0.00	Yes	100.00	Yes			
	253	Z	-0.011	-0.011	0.00	Yes	100.00	Yes			
	254	Z	-0.011	-0.011	0.00	Yes	100.00	Yes			
	322	Z	-0.011	-0.011	0.00	Yes	100.00	Yes			
	330	z	-0.011	-0.011	0.00	Yes	100.00	Yes			
	334	Z	-0.011	-0.011	0.00	Yes	100.00	Yes			
	345	Z	-0.007	-0.007	0.00	Yes	100.00	Yes			

	346	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	347	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
Wi	1	Z	-0.004	-0.004	0.00	Yes	100.00	Yes
	3	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	13	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	19	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	26	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	27	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	214	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	217	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	218	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	225	Z	-0.004	-0.004	0.00	Yes	100.00	Yes
	226	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	227	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	228	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	229	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	230	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	231	Z	-0.004	-0.004	0.00	Yes	100.00	Yes
	232	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	233	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	234	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	235	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	236	Z	-0.003	-0.003	0.00	Yes	100.00	Yes
	237	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	238	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	239	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	240	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	241	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	242	Z	-0.005	-0.005	0.00	Yes	100.00	Yes
	249	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	250	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	251	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	252	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	253	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	254	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	322	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	330	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	334	Z	-0.007	-0.007	0.00	Yes	100.00	Yes
	345	Z	-0.006	-0.006	0.00	Yes	100.00	Yes
	346	Z	-0.006	-0.006	0.00	Yes	100.00	Yes
	347	Z	-0.006	-0.006	0.00	Yes	100.00	Yes
Di	1	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	3	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	13	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	19	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	26	Y	-0.007	-0.007	0.00	Yes	100.00	Yes
	27	Y	-0.007	-0.007	0.00	Yes	100.00	Yes
	214	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
	217	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	218	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	225	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	226	Y	-0.007	-0.007	0.00	Yes	100.00	Yes
	227	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	228	Y	-0.007	-0.007	0.00	Yes	100.00	Yes
	229	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
	230	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	231	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	232	Y	-0.007	-0.007	0.00	Yes	100.00	Yes
	233	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
	234	Y	-0.007	-0.007	0.00	Yes	100.00	Yes

235	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
236	Y	-0.011	-0.011	0.00	Yes	100.00	Yes
237	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
238	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
239	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
240	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
241	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
242	Y	-0.013	-0.013	0.00	Yes	100.00	Yes
249	Y	-0.016	-0.016	0.00	Yes	100.00	Yes
250	Y	-0.016	-0.016	0.00	Yes	100.00	Yes
251	Y	-0.016	-0.016	0.00	Yes	100.00	Yes
252	Y	-0.016	-0.016	0.00	Yes	100.00	Yes
253	Y	-0.016	-0.016	0.00	Yes	100.00	Yes
254	Y	-0.016	-0.016	0.00	Yes	100.00	Yes
322	y	-0.016	-0.016	0.00	Yes	100.00	Yes
330	y	-0.016	-0.016	0.00	Yes	100.00	Yes
334	y	-0.016	-0.016	0.00	Yes	100.00	Yes
345	y	-0.013	-0.013	0.00	Yes	100.00	Yes
346	y	-0.013	-0.013	0.00	Yes	100.00	Yes
347	y	-0.013	-0.013	0.00	Yes	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	295	y	-0.0415	0.683	No
		y	-0.0415	5.317	No
		Y	-0.0055	3.00	No
	296	y	-0.064	0.458	No
		y	-0.064	6.542	No
		y	-0.0635	3.00	No
	297	y	-0.0415	0.683	No
		y	-0.0415	5.317	No
	298	y	-0.0415	0.683	No
		y	-0.0415	5.317	No
		Y	-0.0055	3.00	No
	299	y	-0.064	0.458	No
		y	-0.064	6.542	No
		y	-0.0635	3.00	No
	300	y	-0.0415	0.683	No
		y	-0.0415	5.317	No
	301	y	-0.0415	0.683	No
		y	-0.0415	5.317	No
		Y	-0.0055	3.00	No
	302	y	-0.064	0.458	No
		y	-0.064	6.542	No
		y	-0.0635	3.00	No
	303	y	-0.0415	0.683	No
		y	-0.0415	5.317	No
Wo	295	z	-0.09	0.683	No

		z	-0.09	5.317	No
	296	z	-0.308	0.458	No
		z	-0.308	6.542	No
	297	z	-0.09	0.683	No
		z	-0.09	5.317	No
	298	z	-0.0705	0.683	No
		z	-0.0705	5.317	No
	299	z	-0.1785	0.458	No
		z	-0.1785	6.542	No
		z	-0.036	4.00	No
	300	z	-0.0705	0.683	No
		z	-0.0705	5.317	No
		z	-0.006	4.00	No
	301	z	-0.0705	0.683	No
		z	-0.0705	5.317	No
	302	z	-0.1785	0.458	No
		z	-0.1785	6.542	No
		z	-0.036	4.00	No
	303	z	-0.0705	0.683	No
		z	-0.0705	5.317	No
		z	-0.006	4.00	No
Wi	295	z	-0.028	0.683	No
		z	-0.028	5.317	No
	296	z	-0.079	0.683	No
		z	-0.079	5.317	No
	297	z	-0.028	0.683	No
		z	-0.028	5.317	No
	298	z	-0.0185	0.683	No
		z	-0.0185	5.317	No
	299	z	-0.0435	0.683	No
		z	-0.0435	5.317	No
		z	-0.011	4.00	No
	300	z	-0.0185	0.683	No
		z	-0.0185	5.317	No
		z	-0.003	4.00	No
	301	z	-0.0185	0.683	No
		z	-0.0185	5.317	No
	302	z	-0.0435	0.683	No
		z	-0.0435	5.317	No
		z	-0.011	4.00	No
	303	z	-0.0185	0.683	No
		z	-0.0185	5.317	No
		z	-0.003	4.00	No
Di	295	y	-0.1055	0.683	No
		y	-0.1055	5.317	No
		y	-0.014	3.00	No
	296	y	-0.308	0.458	No
		y	-0.308	6.542	No
		y	-0.057	3.00	No
	297	y	-0.1055	0.708	No
		y	-0.1055	5.292	No
	298	y	-0.1055	0.683	No
		y	-0.1055	5.317	No
		y	-0.014	3.00	No
	299	y	-0.308	0.458	No
		y	-0.308	6.542	No
		y	-0.057	3.00	No
	300	y	-0.1055	0.708	No
		y	-0.1055	5.292	No
	301	y	-0.1055	0.683	No

	y	-0.1055	5.317	No
	y	-0.014	3.00	No
302	y	-0.308	0.458	No
	y	-0.308	6.542	No
	y	-0.0315	1.50	No
303	y	-0.1055	0.708	No
	y	-0.1055	5.292	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (No Ice)	No	0.00	-1.00	0.00
Wi	Wind Load (With Ice)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
Wo	0.00	0.00	0.00
Wi	0.00	0.00	0.00
Di	0.00	0.00	0.00

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+1.6Wo

LC2=0.9DL+1.6Wo

LC3=1.2DL+Wi+Di

LC4=1.2DL

LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
<i>HSS_SQR 4X4X1_4</i>		1	LC3 at 0.00%	0.35	OK	Eq. H1-1b
		225	LC3 at 0.00%	0.28	OK	Eq. H1-1b
		231	LC1 at 0.00%	0.45	OK	Eq. H1-1b
<i>L 2X2X3_16</i>		26	LC1 at 3.13%	0.46	OK	Eq. H3-8
		27	LC1 at 100.00%	0.13	OK	Eq. H2-1
		226	LC2 at 62.50%	0.12	OK	Eq. H2-1
		228	LC2 at 0.00%	0.38	OK	Eq. H3-8
		232	LC3 at 100.00%	0.08	OK	Eq. H2-1
		234	LC1 at 6.25%	0.39	OK	Sec. F1
<i>LU 7x4x1/4</i>		214	LC3 at 0.00%	0.81	OK	Eq. H2-1
		229	LC3 at 0.00%	0.72	OK	Eq. H2-1
		235	LC3 at 0.00%	0.84	OK	Eq. H2-1
		238	LC2 at 0.00%	0.19	OK	Eq. H2-1
		240	LC3 at 0.00%	0.15	OK	Eq. H2-1
<i>PIPE 2x0.154</i>		242	LC1 at 0.00%	0.27	OK	Eq. H2-1
		295	LC2 at 29.69%	0.36	OK	Eq. H1-1b
		296	LC1 at 77.08%	0.52	OK	Eq. H1-1b
		297	LC1 at 29.69%	0.35	OK	Eq. H1-1b
		298	LC1 at 76.56%	0.59	OK	Eq. H1-1b
		299	LC1 at 22.92%	0.68	OK	Eq. H1-1b
		300	LC2 at 68.75%	0.34	OK	Eq. H1-1b
		301	LC2 at 17.19%	0.26	OK	Eq. H1-1b
		302	LC2 at 22.92%	0.40	OK	Eq. H1-1b
		303	LC1 at 17.19%	0.50	OK	Eq. H1-1b
<i>PIPE 3x0.216</i>		345	LC1 at 100.00%	0.55	OK	Eq. H1-1b
		346	LC2 at 0.00%	0.46	OK	Eq. H1-1b
		347	LC1 at 0.00%	0.26	OK	Eq. H1-1b
		249	LC3 at 28.13%	0.22	OK	Eq. H1-1b
		250	LC3 at 0.00%	0.18	OK	Eq. H1-1b
		251	LC1 at 71.88%	0.36	OK	Eq. H1-1b
		252	LC3 at 0.00%	0.20	OK	Eq. H1-1b
<i>PL 4x3/8</i>		253	LC3 at 71.88%	0.23	OK	Eq. H1-1b
		254	LC3 at 0.00%	0.16	OK	Eq. H1-1b
		322	LC2 at 60.94%	0.16	OK	Eq. H1-1b
		330	LC1 at 39.06%	0.25	OK	Eq. H1-1b
		334	LC1 at 59.38%	0.22	OK	Eq. H1-1b
		3	LC3 at 50.00%	0.13	OK	Eq. H1-1b
13	LC3 at 50.00%	0.14	OK	Eq. H1-1b		

19	LC3 at 100.00%	0.12	OK	Eq. H1-1b
217	LC1 at 100.00%	0.29	OK	Eq. H1-1b
218	LC3 at 0.00%	0.26	OK	Eq. H1-1b
227	LC2 at 59.38%	0.17	OK	Eq. H1-1b
230	LC1 at 39.58%	0.24	OK	Eq. H1-1b
233	LC3 at 0.00%	0.14	OK	Eq. H1-1b
236	LC3 at 0.00%	0.26	OK	Eq. H1-1b

T2LU 7x4x1/4LLBB

237	LC3 at 93.75%	0.36	OK	Eq. H2-1
239	LC3 at 93.75%	0.41	OK	Eq. H2-1
241	LC3 at 93.75%	0.40	OK	Eq. H2-1

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Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
3	-1.25	0.00	1.25	0
4	0.00	0.00	-2.25	0
5	-6.348	0.00	4.915	0
6	-1.6766	0.00	5.3461	0
7	-4.3856	0.00	0.6539	0
8	-0.50	0.00	-6.08	0
9	0.50	0.00	-6.08	0
10	-4.1371	0.00	1.0844	0
11	-1.9251	0.00	4.9156	0
15	0.00	0.00	1.25	0
33	-6.098	0.00	5.348	0
34	-6.598	0.00	4.482	0
44	6.598	0.00	4.482	0
45	6.098	0.00	5.348	0
636	3.5473	0.00	-0.798	0
644	-3.5473	0.00	-0.798	0
648	0.00	0.00	5.3461	0
758	-4.50	0.00	1.25	0
759	-2.0751	0.00	4.6558	0
760	-3.9871	0.00	1.3442	0
771	0.625	0.00	2.3325	0

772	2.25	0.00	5.1471	0
773	4.1371	0.00	1.0844	0
774	3.9871	0.00	1.3442	0
775	1.9251	0.00	4.9156	0
776	2.0751	0.00	4.6558	0
777	4.3856	0.00	0.6539	0
778	1.6766	0.00	5.3461	0
779	6.348	0.00	4.915	0
780	0.625	0.00	0.1675	0
781	2.25	0.00	-2.6471	0
782	-2.212	0.00	-2.25	0
783	-1.912	0.00	-2.25	0
784	2.212	0.00	-2.25	0
785	1.912	0.00	-2.25	0
786	-2.709	0.00	-2.25	0
787	2.709	0.00	-2.25	0
788	0.00	0.00	-6.08	0
801	6.673	0.00	4.6119	0
802	0.425	0.00	-6.2099	0
807	-0.425	0.00	-6.2099	0
808	-6.673	0.00	4.6119	0
809	-6.248	0.00	5.348	0
810	6.248	0.00	5.348	0
868	0.00	3.50	1.25	0
894	-4.832	-1.00	5.548	0
895	-1.25	5.50	5.5461	0
896	-1.25	-1.50	5.5461	0
897	4.498	5.00	5.548	0
898	4.498	-1.00	5.548	0
899	6.1382	-1.00	3.2856	0
900	6.1382	5.00	3.2856	0
901	4.3455	-1.50	0.1845	0
902	4.3455	5.50	0.1845	0
903	1.4732	-1.00	-4.7944	0
904	1.4732	5.00	-4.7944	0
905	-1.3062	-1.00	-5.0836	0
906	-1.3062	5.00	-5.0836	0
907	-3.0955	-1.50	-1.9806	0
908	-3.0955	5.50	-1.9806	0
909	-5.9712	-1.00	2.9963	0
910	-5.9712	5.00	2.9963	0
926	-4.832	3.125	5.548	0
927	4.498	3.125	5.548	0
929	-5.9712	3.125	2.9963	0
930	6.1382	3.125	3.2856	0
935	4.998	3.625	5.348	0
936	-5.332	3.625	5.348	0
951	1.05	3.625	-5.1274	0
952	6.215	3.625	3.8186	0
956	-0.883	3.625	-5.4166	0
957	-6.048	3.625	3.5294	0
958	-1.3062	3.125	-5.0836	0
959	1.4732	3.125	-4.7944	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
3	1	1	1	1	1	1
771	1	1	1	1	1	1
780	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
1	3	758		HSS_SQR 4X4X1_4	A500 GrC rectangular	0.00	0.00	0.00
3	8	9		PL 4x3/8	A36	0.00	0.00	0.00
13	33	34		PL 4x3/8	A36	0.00	0.00	0.00
19	44	45		PL 4x3/8	A36	0.00	0.00	0.00
26	10	5		L 2X2X3_16	A36	0.00	0.00	0.00
27	11	5		L 2X2X3_16	A36	0.00	0.00	0.00
214	760	759		LU 7x4x1/4	A36	0.00	0.00	0.00
217	6	759		PL 4x3/8	A36	0.00	0.00	0.00
218	760	7		PL 4x3/8	A36	0.00	0.00	0.00
225	771	772		HSS_SQR 4X4X1_4	A500 GrC rectangular	0.00	0.00	0.00
226	773	779		L 2X2X3_16	A36	0.00	0.00	0.00
227	777	774		PL 4x3/8	A36	0.00	0.00	0.00
228	775	779		L 2X2X3_16	A36	0.00	0.00	0.00
229	776	774		LU 7x4x1/4	A36	0.00	0.00	0.00
230	776	778		PL 4x3/8	A36	0.00	0.00	0.00
231	780	781		HSS_SQR 4X4X1_4	A500 GrC rectangular	0.00	0.00	0.00
232	782	788		L 2X2X3_16	A36	0.00	0.00	0.00
233	786	783		PL 4x3/8	A36	0.00	0.00	0.00
234	784	788		L 2X2X3_16	A36	0.00	0.00	0.00
235	785	783		LU 7x4x1/4	A36	0.00	0.00	0.00
236	785	787		PL 4x3/8	A36	0.00	0.00	0.00
237	644	760		T2LU 7x4x1/4LLBB	A36	0.00	0.00	0.00
238	783	644		LU 7x4x1/4	A36	0.00	0.00	0.00
239	636	785		T2LU 7x4x1/4LLBB	A36	0.00	0.00	0.00
240	774	636		LU 7x4x1/4	A36	0.00	0.00	0.00
241	648	776		T2LU 7x4x1/4LLBB	A36	0.00	0.00	0.00
242	759	648		LU 7x4x1/4	A36	0.00	0.00	0.00
249	644	808		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
250	644	807		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
251	802	636		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
252	636	801		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
253	810	648		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
254	648	809		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
295	893	894		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
296	895	896		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
297	897	898		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
298	899	900		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
299	901	902		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
300	903	904		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
301	905	906		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
302	907	908		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
303	909	910		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
322	935	936		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
330	952	951		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
334	957	956		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
345	929	926		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
346	927	930		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
347	959	958		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
26	270.00	0	0.00	0.00	0.00
214	270.00	0	0.00	0.00	0.00
228	270.00	0	0.00	0.00	0.00
229	270.00	0	0.00	0.00	0.00
234	270.00	0	0.00	0.00	0.00
235	270.00	0	0.00	0.00	0.00
237	90.00	0	0.00	0.00	0.00
238	270.00	0	0.00	0.00	0.00
239	90.00	0	0.00	0.00	0.00
240	270.00	0	0.00	0.00	0.00
241	90.00	0	0.00	0.00	0.00
242	270.00	0	0.00	0.00	0.00
295	0.00	2	-1.00	0.00	0.00
296	0.00	2	-1.00	0.00	0.00
297	0.00	2	-1.00	0.00	0.00

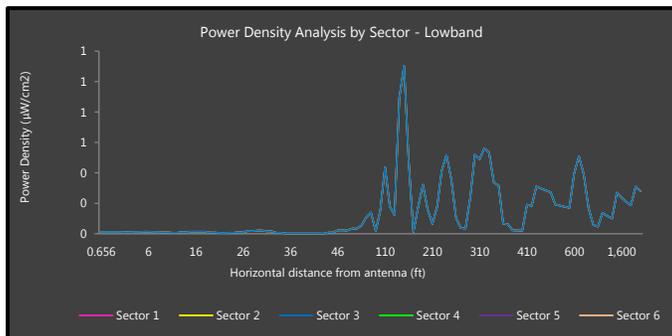
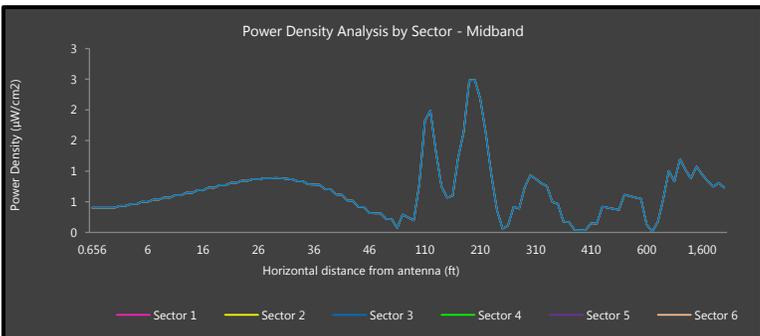
Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
1	0.00	-3.00	0.00	0.00	-3.00	0.00
26	-1.7321	0.00	1.00	0.00	0.00	0.00
27	-1.7321	0.00	1.00	0.00	0.00	0.00
217	-1.7321	1.00	1.00	-1.7321	1.00	1.00
218	-1.7321	1.00	1.00	-1.7321	1.00	1.00
225	0.00	-3.00	0.00	0.00	-3.00	0.00
226	1.7321	0.00	1.00	0.00	0.00	0.00
227	1.7321	1.00	1.00	1.7321	1.00	1.00
228	1.7321	0.00	1.00	0.00	0.00	0.00
230	1.7321	1.00	1.00	1.7321	1.00	1.00
231	0.00	-3.00	0.00	0.00	-3.00	0.00
232	0.00	0.00	-2.00	0.00	0.00	0.00
233	0.00	1.00	-2.00	0.00	1.00	-2.00
234	0.00	0.00	-2.00	0.00	0.00	0.00
236	0.00	1.00	-2.00	0.00	1.00	-2.00
237	4.00	-0.50	0.00	0.00	-0.50	2.00
238	2.00	-0.50	-1.00	4.00	-0.50	0.00
239	-4.00	-0.50	0.00	-2.00	-0.50	-1.00
240	0.00	-0.50	2.00	-4.00	-0.50	0.00
241	0.00	-0.50	-3.50	1.50	-0.50	-1.00
242	-1.50	-0.50	-1.00	0.00	-0.50	-3.50
345	2.00	0.00	0.00	2.00	0.00	0.00
346	-2.00	0.00	0.00	-2.00	0.00	0.00
347	0.00	0.00	2.00	0.00	0.00	2.00

Exhibit F

Power Density/RF Emissions Report

REGION : North East	MARKET : Connecticut	SITE ID : CT11506A	SITE TYPE : Pole	COLOCATED : Yes
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Distance (ft)	Midband Frequencies - Calculated Power Density (µW/cm ²)						Lowband Frequencies - Calculated Power Density (µW/cm ²)						Midband Limit	Lowband Limit
	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6		
0.656	0.4035	0.4035	0.4035				0.0122	0.0122	0.0122				1000	400
0.6561	0.4035	0.4035	0.4035				0.0122	0.0122	0.0122				1000	400
0.7	0.4035	0.4035	0.4035				0.0122	0.0122	0.0122				1000	400
0.8	0.4035	0.4035	0.4035				0.0122	0.0122	0.0122				1000	400
0.9	0.4035	0.4035	0.4035				0.0122	0.0122	0.0122				1000	400
1	0.4315	0.4315	0.4315				0.0105	0.0105	0.0105				1000	400
2	0.4314	0.4314	0.4314				0.0105	0.0105	0.0105				1000	400
3	0.4640	0.4640	0.4640				0.0115	0.0115	0.0115				1000	400
4	0.4637	0.4637	0.4637				0.0115	0.0115	0.0115				1000	400
5	0.4989	0.4989	0.4989				0.0128	0.0128	0.0128				1000	400
6	0.4984	0.4984	0.4984				0.0128	0.0128	0.0128				1000	400
7	0.5341	0.5341	0.5341				0.0119	0.0119	0.0119				1000	400
8	0.5335	0.5335	0.5335				0.0119	0.0119	0.0119				1000	400
9	0.5699	0.5699	0.5699				0.0086	0.0086	0.0086				1000	400
10	0.5690	0.5690	0.5690				0.0086	0.0086	0.0086				1000	400
11	0.6076	0.6076	0.6076				0.0070	0.0070	0.0070				1000	400
12	0.6065	0.6065	0.6065				0.0070	0.0070	0.0070				1000	400
13	0.6483	0.6483	0.6483				0.0101	0.0101	0.0101				1000	400
14	0.6469	0.6469	0.6469				0.0101	0.0101	0.0101				1000	400
15	0.6910	0.6910	0.6910				0.0139	0.0139	0.0139				1000	400
16	0.6893	0.6893	0.6893				0.0139	0.0139	0.0139				1000	400
17	0.7335	0.7335	0.7335				0.0129	0.0129	0.0129				1000	400
18	0.7314	0.7314	0.7314				0.0129	0.0129	0.0129				1000	400
19	0.7741	0.7741	0.7741				0.0081	0.0081	0.0081				1000	400
20	0.7717	0.7717	0.7717				0.0081	0.0081	0.0081				1000	400
21	0.8115	0.8115	0.8115				0.0051	0.0051	0.0051				1000	400
22	0.8087	0.8087	0.8087				0.0050	0.0050	0.0050				1000	400
23	0.8441	0.8441	0.8441				0.0060	0.0060	0.0060				1000	400
24	0.8410	0.8410	0.8410				0.0060	0.0060	0.0060				1000	400
25	0.8697	0.8697	0.8697				0.0108	0.0108	0.0108				1000	400
26	0.8662	0.8662	0.8662				0.0108	0.0108	0.0108				1000	400
27	0.8855	0.8855	0.8855				0.0181	0.0181	0.0181				1000	400
28	0.8818	0.8818	0.8818				0.0180	0.0180	0.0180				1000	400
29	0.8881	0.8881	0.8881				0.0215	0.0215	0.0215				1000	400
30	0.8842	0.8842	0.8842				0.0214	0.0214	0.0214				1000	400
31	0.8738	0.8738	0.8738				0.0155	0.0155	0.0155				1000	400
32	0.8697	0.8697	0.8697				0.0154	0.0154	0.0154				1000	400
33	0.8394	0.8394	0.8394				0.0061	0.0061	0.0061				1000	400
34	0.8353	0.8353	0.8353				0.0060	0.0060	0.0060				1000	400
35	0.7846	0.7846	0.7846				0.0016	0.0016	0.0016				1000	400
36	0.7805	0.7805	0.7805				0.0016	0.0016	0.0016				1000	400
37	0.7763	0.7763	0.7763				0.0016	0.0016	0.0016				1000	400
38	0.7075	0.7075	0.7075				0.0014	0.0014	0.0014				1000	400
39	0.7036	0.7036	0.7036				0.0014	0.0014	0.0014				1000	400
40	0.6195	0.6195	0.6195				0.0007	0.0007	0.0007				1000	400
41	0.6159	0.6159	0.6159				0.0007	0.0007	0.0007				1000	400
42	0.5212	0.5212	0.5212				0.0005	0.0005	0.0005				1000	400
43	0.5181	0.5181	0.5181				0.0005	0.0005	0.0005				1000	400
44	0.4171	0.4171	0.4171				0.0075	0.0075	0.0075				1000	400
45	0.4146	0.4146	0.4146				0.0075	0.0075	0.0075				1000	400
46	0.3147	0.3147	0.3147				0.0223	0.0223	0.0223				1000	400
47	0.3126	0.3126	0.3126				0.0222	0.0222	0.0222				1000	400
48	0.3106	0.3106	0.3106				0.0220	0.0220	0.0220				1000	400
49	0.2196	0.2196	0.2196				0.0337	0.0337	0.0337				1000	400
50	0.2182	0.2182	0.2182				0.0334	0.0334	0.0334				1000	400
60	0.0764	0.0764	0.0764				0.0536	0.0536	0.0536				1000	400
70	0.2913	0.2913	0.2913				0.1067	0.1067	0.1067				1000	400
80	0.2453	0.2453	0.2453				0.1392	0.1392	0.1392				1000	400
90	0.1969	0.1969	0.1969				0.0175	0.0175	0.0175				1000	400
100	0.7959	0.7959	0.7959				0.1532	0.1532	0.1532				1000	400
110	1.8243	1.8243	1.8243				0.4378	0.4378	0.4378				1000	400
120	1.9872	1.9872	1.9872				0.1787	0.1787	0.1787				1000	400
130	1.3178	1.3178	1.3178				0.1251	0.1251	0.1251				1000	400
140	0.7487	0.7487	0.7487				0.8911	0.8911	0.8911				1000	400
150	0.5668	0.5668	0.5668				1.1020	1.1020	1.1020				1000	400
160	0.5976	0.5976	0.5976				0.4843	0.4843	0.4843				1000	400
170	1.2130	1.2130	1.2130				0.0117	0.0117	0.0117				1000	400
180	1.6358	1.6358	1.6358				0.1756	0.1756	0.1756				1000	400
190	2.4808	2.4808	2.4808				0.3214	0.3214	0.3214				1000	400
200	2.4900	2.4900	2.4900				0.1590	0.1590	0.1590				1000	400
210	2.1860	2.1860	2.1860				0.0645	0.0645	0.0645				1000	400

Distance (ft)	Midband Frequencies - Calculated Power Density ($\mu\text{W}/\text{cm}^2$)						Lowband Frequencies - Calculated Power Density ($\mu\text{W}/\text{cm}^2$)						Midband Limit	Lowband Limit
	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6		
220	1.6174	1.6174	1.6174				0.1793	0.1793	0.1793				1000	400
230	0.9381	0.9381	0.9381				0.4137	0.4137	0.4137				1000	400
240	0.3608	0.3608	0.3608				0.5181	0.5181	0.5181				1000	400
250	0.0612	0.0612	0.0612				0.3598	0.3598	0.3598				1000	400
260	0.1080	0.1080	0.1080				0.1041	0.1041	0.1041				1000	400
270	0.4151	0.4151	0.4151				0.0375	0.0375	0.0375				1000	400
280	0.3900	0.3900	0.3900				0.0352	0.0352	0.0352				1000	400
290	0.7363	0.7363	0.7363				0.2387	0.2387	0.2387				1000	400
300	0.9277	0.9277	0.9277				0.5189	0.5189	0.5189				1000	400
310	0.8755	0.8755	0.8755				0.4897	0.4897	0.4897				1000	400
320	0.8015	0.8015	0.8015				0.5628	0.5628	0.5628				1000	400
330	0.7585	0.7585	0.7585				0.5327	0.5327	0.5327				1000	400
340	0.4928	0.4928	0.4928				0.3350	0.3350	0.3350				1000	400
350	0.4676	0.4676	0.4676				0.3179	0.3179	0.3179				1000	400
360	0.1760	0.1760	0.1760				0.0661	0.0661	0.0661				1000	400
370	0.1673	0.1673	0.1673				0.0628	0.0628	0.0628				1000	400
380	0.0416	0.0416	0.0416				0.0227	0.0227	0.0227				1000	400
390	0.0396	0.0396	0.0396				0.0216	0.0216	0.0216				1000	400
400	0.0378	0.0378	0.0378				0.0206	0.0206	0.0206				1000	400
410	0.1501	0.1501	0.1501				0.1909	0.1909	0.1909				1000	400
420	0.1435	0.1435	0.1435				0.1825	0.1825	0.1825				1000	400
430	0.4199	0.4199	0.4199				0.3105	0.3105	0.3105				1000	400
440	0.4022	0.4022	0.4022				0.2974	0.2974	0.2974				1000	400
450	0.3855	0.3855	0.3855				0.2851	0.2851	0.2851				1000	400
460	0.3699	0.3699	0.3699				0.2735	0.2735	0.2735				1000	400
470	0.6142	0.6142	0.6142				0.1915	0.1915	0.1915				1000	400
480	0.5902	0.5902	0.5902				0.1840	0.1840	0.1840				1000	400
490	0.5675	0.5675	0.5675				0.1770	0.1770	0.1770				1000	400
500	0.5461	0.5461	0.5461				0.1703	0.1703	0.1703				1000	400
600	0.1279	0.1279	0.1279				0.3982	0.3982	0.3982				1000	400
700	0.0142	0.0142	0.0142				0.5094	0.5094	0.5094				1000	400
800	0.1695	0.1695	0.1695				0.3904	0.3904	0.3904				1000	400
900	0.5390	0.5390	0.5390				0.1702	0.1702	0.1702				1000	400
1,000	1.0029	1.0029	1.0029				0.0578	0.0578	0.0578				1000	400
1,100	0.8306	0.8306	0.8306				0.0478	0.0478	0.0478				1000	400
1,200	1.1961	1.1961	1.1961				0.1368	0.1368	0.1368				1000	400
1,300	1.0205	1.0205	1.0205				0.1167	0.1167	0.1167				1000	400
1,400	0.8808	0.8808	0.8808				0.1007	0.1007	0.1007				1000	400
1,500	1.0753	1.0753	1.0753				0.2701	0.2701	0.2701				1000	400
1,600	0.9457	0.9457	0.9457				0.2375	0.2375	0.2375				1000	400
1,700	0.8382	0.8382	0.8382				0.2105	0.2105	0.2105				1000	400
1,800	0.7480	0.7480	0.7480				0.1879	0.1879	0.1879				1000	400
1,900	0.8089	0.8089	0.8089				0.3091	0.3091	0.3091				1000	400
2,000	0.7302	0.7302	0.7302				0.2790	0.2790	0.2790				1000	400

MPE ANALYSIS RESULTS		Midband Frequencies						Lowband Frequencies				Max. power density dist. (ft)		Pass or Fail
SECTOR	TECH	RAD CENTER (ft)	TOTAL PCS EIRP (W)	TOTAL AWS EIRP (W)	CATEGORICAL EXCLUSION RESULT	MAX POWER DENSITY ($\mu\text{W}/\text{cm}^2$)	NEXT STEPS	TOTAL 600 MHz EIRP (W)	TOTAL 700 MHz EIRP (W)	MAX POWER DENSITY ($\mu\text{W}/\text{cm}^2$)	NEXT STEPS	Midband	Lowband	
1	GSM,U21,L21,L19,L6,L7	117	5,392	8,523	Not Categorical Excluded	9.5491	No further action needed	4,396	2,198	3.6395	No further action needed	100.000	70.000	PASS
2	GSM,U21,L21,L19,L6,L7	117	5,392	8,523	Not Categorical Excluded	9.5491	No further action needed	4,396	2,198	3.6395	No further action needed	100.000	70.000	PASS
3	GSM,U21,L21,L19,L6,L7	117	5,392	8,523	Not Categorical Excluded	9.5491	No further action needed	4,396	2,198	3.6395	No further action needed	100.000	70.000	PASS

MPE RESULT : The site PASSED on the power density modelling.

NEXT STEP : Generate and save the MPE site report (PDF format) and no further action needed.

SIGN REQUIREMENTS (Note: The sign requirements below are from the result of the MPE analysis. Ability of an individual to come near the antenna can result in requiring signs also)

BLUE NOTICE AND YELLOW GUIDELINE None Required	YELLOW CAUTION None Required	RED WARNING None Required
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RADIO FREQUENCY EMISSIONS ANALYSIS REPORT EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11506A

CT506/Willimantic ECSU
83 Windham Street
Willimantic, Connecticut 06226

May 21, 2019

EBI Project Number: 6219001721

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	12.04%

May 21, 2019

T-Mobile

Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CT11506A - CT506/Willimantic ECSU

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **83 Windham Street** in **Willimantic, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 83 Windham Street in Willimantic, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

- 1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 GSM/UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 2 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 5) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

- 6) 1 microwave backhaul channel (6.8 GHz) was considered for the proposed facility. This channel has an unlisted transmit power.
- 7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 8) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antennas used in this modeling are the Ericsson AIR21 B2A_B4P for the 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s), the Ericsson AIR21 B2P_B4A for the 2100 MHz channel(s) in Sector A, the Ericsson AIR21 B2A_B4P for the 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s), the Ericsson AIR21 B2P_B4A for the 2100 MHz channel(s) in Sector B, the Ericsson AIR21 B2A_B4P for the 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s), the Ericsson AIR21 B2P_B4A for the 2100 MHz channel(s) in Sector C. Modeling also included calculations for the existing 6.8 GHz microwave backhaul antenna. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 10) The antenna mounting height centerline of the proposed/existing antennas (both panel antennas and microwave dish) is 117 feet above ground level (AGL).
- 11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 12) All calculations were done with respect to uncontrolled / general population threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B2A_B4P	Make / Model:	Ericsson AIR21 B2A_B4P	Make / Model:	Ericsson AIR21 B2A_B4P
Frequency Bands:	1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 2100 MHz
Gain:	15.35 dBd / 15.35 dBd	Gain:	15.35 dBd / 15.35 dBd	Gain:	15.35 dBd / 15.35 dBd
Height (AGL):	117 feet	Height (AGL):	117 feet	Height (AGL):	117 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	4,113.21	ERP (W):	4,113.21	ERP (W):	4,113.21
Antenna A1 MPE %:	1.08%	Antenna B1 MPE %:	1.08%	Antenna C1 MPE %:	1.08%
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 700 MHz	Frequency Bands:	600 MHz / 700 MHz	Frequency Bands:	600 MHz / 700 MHz
Gain:	12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 13.35 dBd
Height (AGL):	117 feet	Height (AGL):	117 feet	Height (AGL):	117 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	2,481.08	ERP (W):	2,481.08	ERP (W):	2,481.08
Antenna A2 MPE %:	1.51%	Antenna B2 MPE %:	1.51%	Antenna C2 MPE %:	1.51%
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Ericsson AIR21 B2P_B4A	Make / Model:	Ericsson AIR21 B2P_B4A	Make / Model:	Ericsson AIR21 B2P_B4A
Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz
Gain:	15.35 dBd	Gain:	15.35 dBd	Gain:	15.35 dBd
Height (AGL):	117 feet	Height (AGL):	117 feet	Height (AGL):	117 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	4,113.21	ERP (W):	4,113.21	ERP (W):	4,113.21
Antenna A3 MPE %:	1.08%	Antenna B3 MPE %:	1.08%	Antenna C3 MPE %:	1.08%

Microwave Backhaul Data									
Sector	Antenna Make	Antenna Model	Frequency (MHz)	Transmitter Power (W)	Channel Count	Antenna Centerline (feet) AGL	Gain (dBd)	Total ERP (W)	MPE %
CPTV Microwave	Unknown	Unknown	6815	Unknown	Unknown	156	Unknown	Unknown	0.09%

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	3.67%
Sprint	0.75%
AT&T	1.75%
Nextel	0.52%
FM Broadcast	5.28%
UHP and VHF Whips	0.06%
Parabolic Dish	0.01%
Site Total MPE % :	12.04%

T-Mobile Sector A Total:	3.67%
T-Mobile Sector B Total:	3.67%
T-Mobile Sector C Total:	3.67%
Site Total:	12.04%

T-Mobile Maximum MPE Power Values (Sector A)							
T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile 1900 MHz UMTS/GSM	2	1028.30	117.0	5.40	1900 MHz UMTS/GSM	1000	0.54%
T-Mobile 2100 MHz UMTS	2	1028.30	117.0	5.40	2100 MHz UMTS	1000	0.54%
T-Mobile 600 MHz LTE	2	591.73	117.0	3.11	600 MHz LTE	400	0.78%
T-Mobile 700 MHz LTE	2	648.82	117.0	3.41	700 MHz LTE	467	0.73%
T-Mobile 2100 MHz LTE AWS	2	2056.61	117.0	10.80	2100 MHz LTE AWS	1000	1.08%
						Total:	3.67%

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	3.67%
Sector B:	3.67%
Sector C:	3.67%
T-Mobile Maximum MPE % (Sector A):	3.67%
Site Total:	12.04%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **12.04%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Exhibit G

Mailing Receipts/Proof of Notice

UPS CampusShip: View/Print Label

- 1. Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.
- 2. Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.
- 3. GETTING YOUR SHIPMENT TO UPS**
Customers with a Daily Pickup
 Your driver will pickup your shipment(s) as usual.

Customers without a Daily Pickup

Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the Resources area of CampusShip and select UPS Locations.

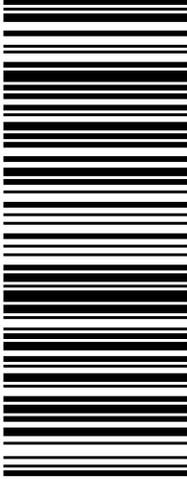
Schedule a same day or future day Pickup to have a UPS driver pickup all your CampusShip packages. Hand the package to any UPS driver in your area.

UPS Access Point™
CVS STORE # 972
555 WASHINGTON ST
SOUTH EASTON ,MA 02375

UPS Access Point™
CVS STORE # 7232
689 DEPOT ST
NORTH EASTON ,MA 02356

UPS Access Point™
TOWN LINE GENERAL STORE
450 E CENTER ST
WEST BRIDGEWATER ,MA 02379

FOLD HERE

<p>1 LBS</p> <p>JENNIFER ILIADIS 978-944-1804 CENTERLINE COMMUNICATIONS 750 W CENTER ST WEST BRIDGEWATER MA 02379</p> <p>SHIP TO: JAMES R. HOGWARTH, VP OF FINANCE EASTERN CONNECTICUT STATE UNIVERSIT 83 WINDHAM STREET WILLIMANTIC CT 06226-2211</p>	<p>1 OF 1</p> <p>CT 063 0-01</p> 	<p>UPS GROUND</p> <p>TRACKING #: 1Z 9Y4 503 03 1332 2589</p> 	<p>BILLING: P/P</p> <p>Reference # 1: CTT1506A- CSC to owner</p> <p>CS 22.0.11. WNTNVS0 83.0A.12/2019</p> 
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Jennifer Iliades

From: UPS Quantum View <pkginfo@ups.com>
Sent: Thursday, April 2, 2020 11:08 AM
To: Jennifer Iliades
Subject: UPS Delivery Notification, Tracking Number 1Z9Y45030313322589



Your package has been delivered.

Delivery Date: Thursday, 04/02/2020
Delivery Time: 11:00 AM

At the request of CENTERLINE SITE ACQUISITION this notice alerts you that the status of the shipment listed below has changed.

Shipment Detail

Tracking Number:	<u>1Z9Y45030313322589</u>
Ship To:	James R. Hogwarth, VP of Finance Eastern Connecticut State Universit 83 WINDHAM ST WILLIMANTIC, CT 06226 US
UPS Service:	UPS GROUND
Number of Packages:	1
Weight:	0.2 LBS
Delivery Location:	DOCK RIVERA
Reference Number 1:	CT11506A- CSC to owner



[Download the UPS mobile app](#)

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[For Questions, Visit Our Help and Support Center](#)

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- 1. Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.
- 2. Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.
- 3. GETTING YOUR SHIPMENT TO UPS**
Customers with a Daily Pickup
 Your driver will pickup your shipment(s) as usual.

Customers without a Daily Pickup

Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the Resources area of CampusShip and select UPS Locations.

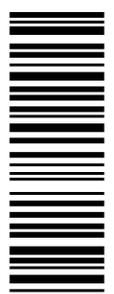
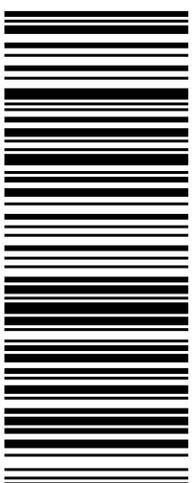
Schedule a same day or future day Pickup to have a UPS driver pickup all your CampusShip packages. Hand the package to any UPS driver in your area.

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TOWN LINE GENERAL STORE
450 E CENTER ST
WEST BRIDGEWATER ,MA 02379

FOLD HERE

<p>1 LBS</p> <p>JENNIFER ILIADES 978-944-1804 CENTERLINE COMMUNICATIONS 750 W CENTER ST WEST BRIDGEWATER MA 02379</p> <p>SHIP TO: OFFICE OF CT BUILDING INSPECTOR 450 COLUMBUS BLVD. HARTFORD CT 06103-1801</p>	<p>CT 061 9-03</p> 	<p>UPS GROUND</p> <p>TRACKING #: 1Z 9Y4 503 03 1784 1592</p> 	<p>BILLING: P/P</p> <p>Reference # 1: CTT11506A - CSC to BLDG</p> <p>CS 22.0.11. WNTNVS0 83.0A.12/2019</p> 
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Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number

1Z9Y45030317841592

Weight

0.20 LBS

Service

UPS Ground

Shipped / Billed On

04/01/2020

Delivered On

04/02/2020 10:06 A.M.

Delivered To

450 COLUMBUS BLVD
HARTFORD, CT, 06103, US

Received By

SIG ON FILE

UPS
UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS
UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS
UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS
Signature is not available at this time.
UPS
UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS
UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS UPS

Left At

Mail Room

Reference Number(s)

CT11506A - CSC TO BLDG

Thank you for giving us this opportunity to serve you. Details are only available for shipments delivered within the last 120 days. Please print for your records if you require this information after 120 days.

Sincerely,

UPS

Tracking results provided by UPS: 04/02/2020 1:47 P.M. EST