

Northeast Site Solutions Denise Sabo 199 Brickyard Rd Farmington, CT 06032 860-209-4690 denise@northeastsitesolutions.com

June 20, 2016

Members of the Siting Council Connecticut Siting Council Ten Franklin Square New Britain, CT 06051

RE: Notice of Exempt Modification

120 Universal Drive, North Haven CT 06473

Latitude: 41.34444700 Longitude: -72.87085600

T-Mobile Site#: CTNH037A_L1900

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 84-foot level of the existing 120-foot monopole at 120 Universal Drive, North Haven CT 06473. The tower is owned by Crown Castle. The property is owned by 120 Universal Drive Associates LLC. T-Mobile now intends to replace three (3) of its existing antennas with three (3) new 1900/2100 MHz antenna and add (1) hybrid cable. The new antennas would be installed at the 84-foot level of the tower.

Planned Modifications:

Remove: NONE

Remove and Replace:

(3)AIR21 B4A /B2P (REMOVE) - (3)AIR32 B66Aa/B2a (**REPLACE**)

Install New: (1) 1-1/4" Hybrid Cable

Existing to Remain:

- (3)AIR21 B2A /B4P
- (3) Commscope LNX-6515 Antenna
- (3) RRUS11 B12
- (3) Twin TMA
- (12) 7/8" Coax
- (1) 1-1/4" Hybrid Cable

This facility was approved by the Town of North Haven PZC. File No.P2000-45 – The site plan relative to 120 Universal Drive approved a 120' Monopole – No special conditions are mentioned. Please see attached.



Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16- SOj-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-SOj-73, a copy of this letter is being sent to First Selectman Michael J. Freda, Elected Official for the Town of North Haven, as well as the property owner and the tower owner.

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

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

For the foregoing reasons, 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).

Sincerely,

Denise Sabo

Mobile: 860-209-4690 Fax: 413-521-0558

Office: 199 Brickyard Rd, Farmington, CT 06032 Email: denise@northeastsitesolutions.com

Attachments

cc: Michael J. Freda- First Selectman - as elected official Crown Castle - as tower owner 120 Universal Drive Associates LLC - as property owner

Exhibit A



TOWN OF NORTH HAVEN

MEMORIAL TOWN HALL / 18 CHURCH STREET NORTH HAVEN, CONNECTICUT 06473



REPLY TO:

PLANNING & ZONING COMMISSION

Tel. (203) 239-5321 Fax (203) 234-2130

November 20, 2000

Mr. Stephen Longobardi Candid Communications of North Haven, II LLC 110 Washington Avenue North Haven, CT 06473

Re: #P2000-44 Special Permit application, (as authorized by Section 3A.6.), of Candid Communications of North Haven, II LLC, relative to 120 Universal Drive South, (Map 11, Route 1). Plan Entitled: Candid Communications, LLC, Multi-User Wireless Communications Facility, North Haven Tower Site, Universal Drive, North Haven, Connecticut, Prepared By URS Greiner Woodward Clyde A-E-S, Dated 9-8-00, Rev. 11-1-00 Scale I" = 30'. IL-30 Zoning District.

Dear Mr. Longobardi:

Please be advised that during the deliberation session of the Planning & Zoning Commission meeting held on Monday, November 13, 2000, the Commission unanimously voted to approve the above referenced application subject to the following conditions:

- 1. Submit three (3) revised plans which include:
 - a.) Revised plans must address/include all comments and conditions of this approval and the related Site Plan approval #P2000-45.
 - b.) Live certification.

In accordance with the Connecticut State Statutes, Section 8-3d, the Special Permit is not effective until a certified copy of the Commission's decision has been recorded on the Land Records, at the owner's expense. Accordingly, you must record this certified decision letter at the Town Clerk's Office, 18 Church Street, North Haven, CT. Immediately after filing with the Town Clerk, please submit a copy of the decision letter, stamped as recorded, to the Land Use Office, for our permanent record.

#P2000-44 Page 2

Please note that one (1) set of revised drawings should be submitted for review after <u>all</u> outstanding issues (conditions of approval as set forth above), are adequately addressed. If there are any questions relative to the conditions of approval, please call the Town prior to submitting the revised plans. This will avoid costly and time consuming revisions and reviews, therefore expediting the process for you as the applicant.

This approval is subject to compliance with any and all Zoning Regulations of the Town of North Haven.

You may not proceed with this approval until you have received a signed plan from the Land Use Office.

Very truly yours, Jeanne Rulleyn

Jeanne Pulleyn, Secretary

Planning & Zoning Commission

JP/ts

cc: First Selectman
Engineering Dept.
Building Dept.
CERTIFIED MAIL R/R

TOWN CLERKS OFFICE NORTH HAVEN, CONN.

MAR 2 0 2001 @ 1:15 PM

TOWN CLERK



TOWN OF NORTH HAVEN

MEMORIAL TOWN HALL / 18 CHURCH STREET NORTH HAVEN, CONNECTICUT 06473



REPLY TO:

PLANNING & ZONING COMMISSION

Tel. (203) 239-5321 Fax (203) 234-2130

November 20, 2000

Mr. Stephen Longobardi Candid Communications of North Haven, II LLC 110 Washington Avenue North Haven, CT 06473

Re: #P2000-45 Site Plan application of Candid Communications of North Haven, II LLC, relative to 120 Universal Drive South, (Map 11, Route 1). Plan Entitled: Candid Communications, LLC, Multi-User Wireless Communications Facility, North Haven Tower Site, Universal Drive, North Haven, Connecticut, Prepared By URS Greiner Woodward Clyde A-E-S, Dated 9-8-00, Rev. 11-1-00 Scale 1" = 30'. IL-30 Zoning District.

Dear Mr. Longobardi:

Please be advised that during the deliberation session of the Planning & Zoning Commission meeting held on Monday, November 13, 2000, the Commission unanimously voted to approve the above referenced application subject to the following conditions:

- 1. Submit eight (8) revised plans which include:
 - a.) The zoning table must reference the following:

Minimum lot area (sq ft)

30,000 (reg'd column).

130,929 (existing column)

Minimum lot width (ft.)

100 (req'd column)

Building height

12' (proposed column)

Minimum side yard setback 30'

(existing column), 52' (proposed column)

Minimum rear yard setback 27'

(existing column)

- Minimum side yard tower setback 90' (proposed column) b.) Plans must be numbered to indicate a submission set of 5 sheets (1 of 5 through 5 of 5).
- c.) The boundary/survey plan must be referenced in the sheet index on Sheet T-1. d.) Provide all the information required by Section 3A.6. (b) (1) (iii) and (xi).
- e.) Siltation control must be provided along the rear property line.
- f.) The remaining access drive off the rear of the existing building must be marked as a fire lane.

- g.) The proposed parking area must be permanently marked with signage and curbing/islands so that the area does not remain open for use as spillover storage of vehicles, etc.
- h.) Limits of green (lawn or non-impervious) areas need to be more clearly indicated. Note, said areas must be protected by curbing.

i.) The relocated scrap metal recycle dumpster must include respective enclosure and island protection with landscaping.

- j.) Curbing and grass/landscaped areas along the rear property line must be provided in order to discourage continuance of unapproved outside storage activities.
- 2. The property owner and/or applicant must remove all outside storage (several trailer bodies, steel hoist, debris) located at the west side of the property as well as on the railroad property. All outside storage must be removed from the site. No building permit will be issued until the cleanup of this area occurs.
- 3. Proposed contours and/or spot elevations must be provided.
- 4. Parking spaces must be line striped.
- Proposed fencing must be reviewed by the Zoning Enforcement Officer prior to installation to insure zoning compliance.
- Soil and erosion controls must be inspected by the Zoning Enforcement Officer before work may commence.
- The property owner must maintain (repair/replace when necessary) the siltation control until all development activity is completed and all disturbed areas are permanently stabilized.
- 8. Submit an as-built prior to bond release.
- 9. Submit a bond in the amount of \$15,000.00 (forms are enclosed). Note, two separate bonds (for \$10,000.00 and \$5,000.00) are recommended, considering that the \$5,000.00 amount covering the required site cleanup work can be released prior to issuance of a building permit, contingent on completion and acceptance of said cleanup.

Please note that one (1) set of revised drawings should be submitted for review after <u>all</u> outstanding issues (conditions of approval as set forth above), are adequately addressed. If there are any questions relative to the conditions of approval, please call the Town prior to submitting the revised plans. This will avoid costly and time consuming revisions and reviews, therefore expediting the process for you as the applicant.

This approval is subject to compliance with any and all Zoning Regulations of the Town of North Haven.

You may not proceed with this approval until you have received a signed plan from the Land Use Office.

Very truly yours,

Jeanne Pulleyn, Secretary

Planning & Zoning Commission

JP/ts

cc: First Selectman
Engineering Dept.
Building Dept.
CERTIFIED MAIL R/R
Enclosures

Exhibit B

120 UNIVERSAL DR

Location 120 UNIVERSAL DR Mblu 011//001//

Acct# 027540 Owner 120 UNIVERSAL DRIVE

ASSOCIATES LLC

Assessment \$996,030 Appraisal \$1,422,900

PID 8457 Building Count 1

Current Value

Appraisal				
Valuation Year	Improvements	Land	Total	
2014	\$1,025,400	\$397,500	\$1,422,900	
Assessment				
Valuation Year	Improvements	Land	Total	
2014	\$717,780	\$278,25	\$996,030	

Certificate

Owner of Record

Owner 120 UNIVERSAL DRIVE ASSOCIATES LLC Sale Price \$0

Co-Owner
Address 120 UNIVERSAL DR

120 UNIVERSAL DR Book & Page 799/46

NORTH HAVEN, CT 06473 Sale Date 10/28/2008

Ownership History

Own arehin History				
	Ownership Histor	У		
Owner	Sale Price	Certificate	Book & Page	Sale Date
120 UNIVERSAL DRIVE ASSOCIATES LLC	\$0		799/ 46	10/28/2008
BERLUTI MARIO	\$0	1	482/ 458	07/18/1995
BERLUTI, MARIO & HELEN	\$0	3		09/01/1990
BERLUTI MARIO & HELEN & SURV	\$0	4	305/ 427	12/06/1978

Building Information

Building 1 : Section 1

Year Built: 1985 Living Area: 19,180 Replacement Cost: \$1,089,079

78

Building Percent

Good:

Replacement Cost

Less Depreciation: \$849,500

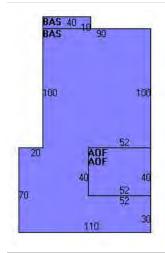
Less Depreciation: \$849,500 Building Attributes			
Field	Description		
STYLE	Service Shop		
MODEL	Comm/Ind		
Grade	C +		
Stories:	1		
Occupancy	1		
Exterior Wall 1	Metal		
Exterior Wall 2			
Roof Structure	Flat		
Roof Cover	Metal/Tin		
Interior Wall 1	Drywall		
Interior Wall 2			
Interior Floor 1	Average		
Interior Floor 2			
Heating Fuel	Gas		
Heating Type	Hot Air-no Duc		
AC Type	None		
Bldg Use	AUTO REPAIR		
Total Rooms			
Total Bedrms			
Total Baths			
1st Floor Use:			
Heat/AC	NONE		
Frame Type	WOOD FRAME		
Baths/Plumbing	AVERAGE		
Ceiling/Wall	SUS-CEIL/MN WL		
Rooms/Prtns	AVERAGE		
Wall Height	20		
% Comn Wall			

Building Photo



(./CTNH037A-Property Card_files/42.jpg)

Building Layout



Building Sub-Areas (sq ft) <u>LegendLegend</u>			<u>endLegend</u>
Code	Code Description		Living Area
BAS	First Floor	15,020	15,020
AOF	AOF Office		4,160
		19,180	19,180

Extra Features

Extra Features <u>LegendLege</u>				
Code	Description	Size	Value	Bldg #
A/C	AIR CONDITION	6612 S.F.	\$10,300	1
SPR1	SPRINKLERS-WET	19220 S.F.	\$13,500	1
MEZ1	MEZZANINE-UNF	2500 S.F.	\$17,600	1

Land

Luna OSC

Luna Line Valuation

Use Code 3320

Description A

AUTO REPAIR

Zone IL30 Neighborhood 305

Alt Land Appr No

Category

Size (Acres) 3

Frontage Depth

Assessed Value \$278,250 Appraised Value \$397,500

Outbuildings

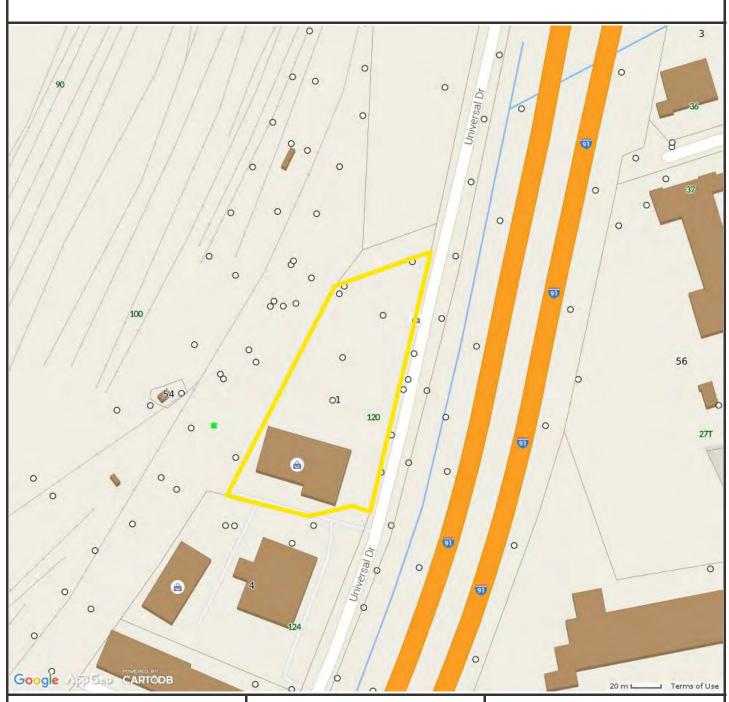
Outbuildings <u>Legendl</u>					endLegend	
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FN3	FENCE-6' CHAIN			640 L.F.	\$2,900	1
PAV1	PAVING-ASPHALT			52000 S.F.	\$35,100	1
SHD7	COMM GOOD			240 S.F.	\$9,900	1
TWR1	COMMU-TOWER			1 UNITS	\$112,500	1
SHD7	COMM GOOD			240 S.F.	\$9,900	1

Valuation History

Appraisal				
Valuation Year	Improvements	Land	Total	
2013	\$1,238,100	\$450,000	\$1,688,100	
2008	\$733,900	\$450,000	\$1,183,900	
2007		\$315,000	\$828,730	

Assessment				
Valuation Year	Improvements	Land	Total	
2013	\$866,670	\$315,000	\$1,181,670	
2008	\$513,730	\$315,000	\$828,730	
2007		\$315,000	\$828,730	

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Property Information

Property ID 11/1

Location Owner 120 UNIVERSAL DR 120 UNIVERSAL DRIVE ASSOCIATES LLC



MAP FOR REFERENCE ONLY NOT A LEGAL DOCUMENT

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

Exhibit C

T - Mobile -

T-MOBILE NORTHEAST LLC

SITE #: CTNH037A

SITE NAME: CTNH037/CANDID N. HAVEN

SITE ADDRESS: 120 UNIVERSAL DRIVE NORTH HAVEN CT, 06473 WIRELESS BROADBAND FACILITY **CONSTRUCTION DRAWINGS** (792DB CONFIGURATION)

CROWN CASTLE BU NUMBER: 881536 CROWN CASTLE SITE NAME: NORTH HAVEN TOWER

VICINITY MAP



DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

> CALL BEFORE YOU DIG: WWW CRYD COM

CALL 800 922 4455, OR 811

CALL THREE WORKING DAYS PRIOR TO DIGGING SAFETY PRECAUTIONS SHALL BE IMPLEMENTED BY CONTRACTOR(S) AT AL TRENCHING IN ACCORDANCE WITH CURRENT OSHA STANDARDS.

COLOR CODE FOR UTILITY LOCATIONS

ELECTRIC - RED GAS/OIL - YELLOW PROPOSED EXCAVATION - WHITE TEL/CATV - ORANGE RECLAIMED WATER

GENERAL NOTES

- . THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES. RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES.
- THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONSTRUCT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE
- THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE T-MOBILE REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF THE CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES. THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXPENSIVE WORK, UNLESS DIRECTED IN
- THE SCOPE OF WORK SHALL INCLUDE FURNISHING OF ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN
- . THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- . THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT
- . THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
- . THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS. AND ADDENDUM OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.

- 9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS METHODS TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT.
- 10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY PERMITS AND INSPECTIONS WHICH ARE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY, OR LOCAL GOVERNMENT AUTHORITY
- 11. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING ETC., DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY
- 12. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT. DEBRIS. RUBBISH AND REMOVE FOUIPMENT NOT SPECIFIED AS REMAINING ON PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE
- 13. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS. AS WELL AS THE LATEST EDITIONS OF ANY PERTINENT STATE SAFFTY REGULATIONS.
- 14. THE CONTRACTOR SHALL NOTIFY THE T-MOBILE REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE T-MOBILE REPRESENTATIVE.
- 15. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC., ON THE JOB.
- 16. THE CONTRACTOR SHALL RETURN ALL DISTURBED AREAS TO THEIR ORIGINAL CONDITION AT THE COMPLETION OF WORK.
- 17. ATLANTIS DESIGN GROUP, INC. HAS NOT CONDUCTED A STRUCTURAL ANALYSIS FOR THIS PROJECT AND DOES NOT ASSUME ANY LIABILITY FOR THE ADEQUACY OF THE STRUCTURE AND COMPONENTS
- 18. REFER TO STRUCTURAL DOCUMENT ENTITLED, "STRUCTURAL ANALYSIS REPORT PREPARED BY CROWN CASTLE
- "T-MOBILE SITE ID CTNH037A", DATED MAY 05, 2016.

SITE INFORMATION

SITE NUMBER: CTNH037A

CTNH037/CANDID N. HAVEN SITE NAME: 120 UNIVERSAL DRIVE SITE ADDRESS:

LAT./LONG.: N 41.34444700 / W -72.87085600

NORTH HAVEN CT, 06473

JURISDICTION: TOWN OF NORTH HAVEN, CT

PROPERTY OWNER: CANDID COMMUNICATION

PROJECT SUB-CONTRACTORS

T-MOBILE NORTHEAST, LLC. APPLICANT:

35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 (860) 692-7100

PROJECT MANAGER

LISA LIN ALLEN NORTHEAST SITE SOLUTIONS 54 MAIN STREET STURBRIDGE, MA 01566 (508) 434-5237

ATLANTIS DESIGN GROUP INC.

54 JACQUELINE ROAD, SUITE #7 WALTHAM, MA 02452

(617) - 852 - 3611

CODE COMPLIANCE

CONNECTICUT STATE BUILDING CODE

2005 CONNECTICUT BUILDING CODE WITH 2013 AMENDMENT 2011 NATIONAL ELECTRICAL CODE

CONSTRUCTION TYPE: 2B USE GROUP:

SHEET INDEX DESCRIPTION SHEET T-1 TITLE SHEET N-1 GENERAL AND ELECTRICAL NOTES A-1 KEY PLAN AND COMPOUND PLAN A-2 ELEVATION

A-3 ANTENNA PLAN AND DETAILS E-1 GROUNDING AND POWER ONE LINE DIAGRAM

E-2 GROUNDING DETAILS

T - Mobile

T-MOBILE NORTHEAST, LLC

BLOOMFIELD, CT 06002

TLANTIS DESIGN GROUP, INC.

54 Jacqueline Road, Suite #7 Waltham, MA 02452 Phone number: 617-852-3611 Fax Number : 781-742-2247

	SUBMITTALS	
DATE	DESCRIPTION	REVISION
06/02/16	ISSUED FOR REVIEW	A
	·	

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO:	CTNH037A
DRAWN BY:	MB
CHECKED BY:	KM

PROFESSIONAL SEAL

THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHT WORK OF T-MOBILE ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED

> SITE NAME CTNH037A

CTNH037/CANDID N. HAVEN

120 UNIVERSAL DRIVE NORTH HAVEN CT. 06473

SHEET TITLE

TITLE SHEET

SHEET NUMBER

| - |

ELECTRICAL NOTES:

- 1. INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, PLANT SERVICES AND ADMINISTRATIVE TASKS REQUIRED TO COMPLETE AND MAKE OPERABLE THE ELECTRICAL WORK SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
- A. PREPARE AND SUBMIT SHOP DRAWINGS, DIAGRAMS AND ILLUSTRATIONS.
- B. PROCURE ALL NECESSARY PERMITS AND APPROVALS AND PAY ALL REQUIRED FEES AND CHARGES IN CONNECTION WITH
- C SUBMIT AS-BUILT DRAWINGS OPERATING AND MAINTENANCE
- D. EXECUTE ALL CUTTING, DRILLING, ROUGH AND FINISH PATCHING OF EXISTING OR NEWLY INSTALLED CONSTRUCTION REQUIRED FOR THE WORK OF THIS CONTRACT. FOR SLAB PENETRATIONS THROUGH POST TENSION SLABS, X-RAY EXACT AREA OF PENETRATION PRIOR TO PERFORMING WORK
- E. PROVIDE HANGERS, SUPPORTS, FOUNDATIONS, STRUCTURAL FRAMING SUPPORTS, AND BASES FOR CONDUIT AND FOUIPMENT PROVIDED OR INSTALLED LINDER THE WORK OF HIS CONTRACT. PROVIDE COUNTER FLASHING, SLEEVES AND SEALS FOR FLOOR AND WALL PENETRATIONS.
- F. MAINTAIN ALL EXISTING ELECTRICAL SERVICES IN THE BUILDING AREAS NOT AFFECTED BY THE ALTERATION DURING TEMPORARY JUMPERS, CONDUITS, CAPS, PROTECTIVE DEVICES. CONNECTIONS AND EQUIPMENT REQUIRED. PROVIDE TEMPORARY LIGHT AND POWER FOR CONSTRUCTION
- 2. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO CALL FOR AN INSTALLATION THAT IS COMPLETE IN EVERY RESPECT. IT IS NOT THE INTENT TO GIVE EVERY DETAIL ON THE DRAWINGS AND IN THE SPECIFICATIONS. IF AN ITEM OF WORK IS INDICATED IN THE DRAWINGS IT IS CONSIDERED SLIFFICIENT MATERIAL AND FOLIPMENT USUALLY FURNISHED OR NEEDED TO MAKE A COMPLETE INSTALLATION WHETHER OR NO SPECIFICALLY MENTIONED IN THE CONTRACT DOCUMENTS.

GENERAL REQUIREMENTS

- 1. PROVIDE ALL WORK IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND LOCAL AND STATE ELECTRICAL
- 2 THE FLECTRICAL PLANS ARE DIAGRAMMATIC ONLY REFER TO THE ARCHITECTURAL PLANS FOR THE EXACT DIMENSIONS OF THE BUILDING.
- 3. LOAD CALCULATIONS ARE BASED ON EXISTING BUILDING INFORMATION/DRAWINGS PROVIDED TO ENGINEERING. CONTRACTOR IS TO VERIFY ALL EXISTING RATINGS AND LOADS PRIOR TO PURCHASING OF SPECIFIED FOLIPMENT FOR COMPLIANCE TO NEC. CONTRACTOR TO NOTIFY ENGINEER OF ANY DISCREPANCIES AND REQUEST FURTHER DIRECTION BY
- 4. EXISTING BUILDING EQUIPMENT IS NOTED ON THE DRAWINGS. NEW OR RELOCATED EQUIPMENT IS SHOWN WITH SOLID LINES. FUTURE FOUIPMENT (NOT IN THIS CONTRACT) IS DEPICTED WITH SHADED LINES. REQUEST CLARIFICATION OF DRAWINGS OR OF SPECIFICATIONS PRIOR TO PRICING OR INSTALLATION.
- A. AFTER CAREFULLY STUDYING THE DRAWINGS AND SPECIFICATIONS, AND BEFORE SUBMITTING THE PROPOSAL, MAKE A MANDATORY SITE VISIT TO ASCERTAIN CONDITIONS OF THE SITE, AND THE NATURE AND EXACT QUANTITY OF WORK TO BE PERFORMED NO EXTRA COMPENSATION WILL BE ALLOWED FOR FAILURE TO NOTIFY THE OWNER, IN WRITING, OF ANY DISCREPANCIES THAT MAY HAVE BEEN NOTED BETWEEN THE EXISTING CONDITIONS AND THE DRAWINGS AND
- B. VERIFY ALL MEASUREMENTS AT THE SITE AND BE RESPONSIBLE FOR CORRECTNESS OF SAME QUALITY, WORKMANSHIP, MATERIALS AND SAFETY

SPECIFICATIONS.

- A. PROVIDE NEW MATERIALS AND EQUIPMENT OF A DOMESTIC PRODUCTION AND MANUFACTURE OF SPECIFIED MATERIALS AND EQUIPMENT. WHERE UL, OR OTHER AGENCY, HAS ESTABLISHED STANDARDS FOR MATERIALS, PROVIDE MATERIALS WHICH ARE LISTED AND LABELED ACCORDINGLY. THE COMMERCIALLY STANDARD ITEMS OF EQUIPMENT AND THE SPECIFIC NAMES MENTIONED HEREIN ARE INTENDED FOR THE PROPER FUNCTIONING OF THE WORK
- B. WORK SHALL BE PERFORMED BY WORKMEN SKILLED IN THE TRADE REQUIRED FOR THE WORK. INSTALL MATERIALS AND EQUIPMENT TO PRESENT A NEAT APPEARANCE WHEN COMPLETED AND IN ACCORDANCE WITH THE APPROVED RECOMMENDATIONS OF THE MANUFACTURER AND IN ACCORDANCE WITH CONTRACT DOCUMENTS.
- C. PROVIDE LABOR, MATERIALS, APPARATUS AND APPLIANCES
 ESSENTIAL TO THE FUNCTIONING OF THE SYSTEMS DESCRIBED OR INDICATED HEREIN, OR WHICH MAY BE REASONABLY IMPLIED AS ESSENTIAL WHENEVER MENTIONED IN THE
- D. MAKE WRITTEN REQUESTS FOR SUPPLEMENTARY AS TO WORK INTENDED OR IN EVENT OF NEED FOR E. PERFORMANCE AND MATERIAL REQUIREMENTS SCHEDULED OR
- SPECIFIED ARE MINIMUM STANDARD ACCEPTABLE. THE RIGHT TO JUDGE THE QUALITY OF EQUIPMENT THAT DEVIATES FROM ARCHITECT/ENGINEER. CONTRACT DOCUMENT OR NOT.

GUARANTEE
1. GUARANTEE MATERIALS, PARTS AND LABOR FOR WORK FOR ONE YEAR FROM THE DATE OF ISSUANCE OF OCCUPANCY PERMIT.
DURING THAT PERIOD. MAKE GOOD FAULTS OR IMPERFECTIONS THAT MAY ARISE DUE TO DEFECTS OR OMISSIONS IN MATERIALS OR WORKMANSHIP WITH NO ADDITIONAL COMPENSATION AND AS

- 1. REMOVE ALL CONSTRUCTION DEBRIS RESULTING FROM THE
- 2. CLEAN EQUIPMENT AND SYSTEMS FOLLOWING THE COMPLETION OF THE PROJECT TO THE SATISFACTION OF THE ENGINEER.

COORDINATION AND SUPERVISION

 CAREFULLY LAY OUT ALL WORK IN ADVANCE TO AVOID UNNECESSARY CUTTING, CHANNELING, CHASING OR DRILLING OF FLOORS, WALLS, PARTITIONS, CEILINGS OR OTHER SURFACES. REPAIR THE WORK IN AN APPROVED MANNER BY SKILLED MECHANICS AT NO ADDITIONAL COST TO THE OWNER. RENDER FULL COOPERATION TO OTHER TRADES WHERE WORK WILL BE ASSIST IN WORKING OUT SPACE CONDITIONS IF WORK IS INSTALLED BEFORE COORDINATION WITH OTHER TRADES, OR CAUSES INTERFERENCE, MAKE CHANGES NECESSARY TO CORRECT CONDITIONS WITHOUT EXTRA CHARGE

- 1 AS-BUILT DRAWINGS:
- A. UPON COMPLETION OF THE WORK, FURNISH TO THE OWNER "AS-BUILT" DRAWINGS.
- A. UPON COMPLETION OF THE WORK, FULLY INSTRUCT T-MOBILE AS TO THE OPERATION AND MAINTENANCE OF ALL MATERIAL, FOUIPMENT AND SYSTEMS.
- B. PROVIDE 3 COMPLETE BOUND SETS OF INSTRUCTIONS FOR OPERATING AND MAINTAINING ALL SYSTEMS AND EQUIPMENT.

CUTTING AND PATCHING

- . PROVIDE ALL CUTTING, DRILLING, ROUGH AND FINISH PATCHING
- REQUIRED TO COMPLETE THE WORK.
 2. OBTAIN OWNER APPROVAL PRIOR TO CUTTING THROUGH FLOORS OR WALLS FOR PIPING OR CONDUIT.

TESTS, INSPECTION AND APPROVAL

- IS, INSPECTION AND APPROVAL

 BEFORE ENERGIZING ANY ELECTRICAL INSTALLATION, INSPECT
 EACH UNIT IN DETAIL. TIGHTEN ALL BOLTS AND CONNECTIONS
 (TORQUE—TIGHTEN WHERE REQUIRED) AND DETERMINE THAT ALL COMPONENTS ARE ALIGNED, AND THE EQUIPMENT IS IN SAFE,
- 2. PROVIDE THE COMPLETE ELECTRICAL SYSTEM FREE OF GROUND OPERATE SATISFACTORILY LINDER FULL LOAD CONDITIONS WITHOUT EXCESSIVE HEATING AT ANY POINT IN THE SYSTEM.

- 1. DO NOT LEAVE ANY WORK INCOMPLETE NOR ANY HAZARDOUS SITUATIONS CREATED WHICH WILL AFFECT THE LIFE OR SAFETY OF THE PUBLIC AND/OR BUILDING OCCUPANTS DO NOT WITHOUT THE OWNER'S WRITTEN PERMISSION.
- 2. WHEN NECESSARY TO TEMPORARILY DISCONNECT ANY EXISTING BUILDING UTILITIES AND SERVICE SYSTEMS, INCLUDING FEEDER OR BRANCH CIRCUITING SUPPLYING EXISTING FACILITIES, CONFER WITH THE OWNER AND ARRANGE THE PERIOD OF SHUTDOWN NOTE: SCHEDULE AND NOTIFY OWNER 48 HOURS PRIOR TO SHUTDOWN. ALL SHUTDOWN WORK TO BE SCHEDULED AT A TIME CONVENIENT TO OWNER.

- 1. ROUTE ALL GROUNDING CONDUCTORS AS SHOWN ON CONDUIT/GROUNDING RISER
- 2. ROUTE 500 KCMIL CU. THHN CONDUCTOR FROM THE MGB LOCATION TO BUILDING STEEL, VERIEY BUILDING STEEL IS EFFECTIVELY GROUNDED PER NEC TO THE MAIN SERVICE
- GROUNDING ELECTRODE CONDUCTOR (GEC).

 3. MAKE ALL GROUND CONNECTIONS FROM MGB TO ELECTRICAL EQUIPMENT WITH 2 HOLE, CRIMP TYPE, BURNDY COMPRESSION
- ERMINATIONS, SIZED AS REQUIRED. 4. USE 1 HOLE, CRIMP TYPE, BURNDY COMPRESSIONS ERMINATIONS, SIZED AS REQUIRED, AT EQUIPMENT GROUND CONNECTIONS
- 5. HIRE AN INDEPENDENT LAB TO PERFORM THE SPECIFIED OHMS TESTING. PROVIDE 4 SETS OF THE CERTIFIED DOCUMENTS TO THE OWNER FOR VERIFICATION PRIOR TO THE PROJECT COMPLETION.

- 1. ALL WIRING TO BE INSTALLED IN CONDUIT SYSTEMS IN
- ACCORDANCE WITH THE FOLLOWING: A. EXTERIOR FEEDERS AND CONTROL, WHERE UNDERGROUND, TO
- BE IN SCH 40 PVC.
 B. EXTERIOR, ABOVE GROUND POWER CONDUITS TO BE GALVANIZED RIGID STEEL (RGS).

 C. ALL TELECOMMUNICATION CONDUITS, INTERIOR/EXTERIOR, TO
- D. INSTALL PULL ROPES IN ALL NEW EMPTY CONDUITS INSTALLED
- ON THIS PROJECT.

 E. ALL TELECOM CONDUITS AND PULL BOXES INSTALLED ON THIS PROJECT TO BE LABELED "T—MOBILE". OWNER WILL PROVIDE LABELS FOR CONTRACTOR TO INSTALL.
- F. INTERIOR FEEDERS TO BE INSTALLED IN E.M.T. WITH STEEL COMPRESSION FITTINGS
- G. MINIMUM SIZE CONDUIT TO BE 34" TRADE SIZE UNLESS OTHERWISE INDICATED ON THE DRAWINGS. H. FINAL CONNECTIONS TO MOTORS AND VIBRATING EQUIPMENT
- TO BE INSTALLED IN LIQUID-TIGHT FLEXIBLE METAL CONDUIT. I. CONDUIT TO BE RUN CONCEALED IN CEILINGS, FINISHED AREAS OR DRYWALL PARTITIONS, UNLESS OTHERWISE NOTED
- J. THE ROUTING OF CONDUITS INDICATED ON THE DRAWINGS IS DIAGRAMMATIC. BEFORE INSTALLING ANY WORK, EXAMINE THE WORKING LAYOUTS AND SHOP DRAWINGS OF THE OTHER TRADES TO DETERMINE THE EXACT LOCATIONS AND
- K. ALL EXTERIOR MOUNTING HARDWARE TO BE GALVANIZED STEEL. COORDINATE WITH BUILDING ENGINEER PRIOR TO ATTACHING TO BUILDING STRUCTURE.

- RACEWAYS CONT'D

 L. PENETRATIONS OF WALLS, FLOORS AND ROOFS, FOR THE PASSAGE OF ELECTRICAL RACEWAYS, TO BE PROPERLY SEALED AFTER INSTALLATION OF RACEWAYS SO AS TO THE WALL FLOOR OR ROOF SYSTEM TO BE PENETRATED. SEAL ALL CONDUIT PENETRATIONS THROUGH FIRE OR SMOKE RATED WALLS, CEILINGS OR SMOKE TIGHT CORRIDOR PARTITIONS TO MAINTAIN PROPER RATING OF WALL OR
- M. PROVIDE ALL CONDUIT ENDS WITH INSULATED METALLIC GROUNDING BUSHINGS
- N. CONDUIT TO BE SUPPORTED AT MAXIMUM DISTANCE OF 8'-0", OR AS REQUIRED BY NEC, IN HORIZONTAL AND VERTICAL DIRECTIONS.
 O. PROVIDE STAINLESS STEEL BLANK COVER PLATES FOR ALL
- JUNCTION BOXES AND/OR OUTLET BOXES NOT USED IN EXPOSED AREAS. PROVIDE ALL OTHER UNUSED BOXES WITH STANDARD STEEL COVER PLATES.
- P. WHERE APPLICABLE, PROVIDE ROOFTOP CONDUIT SUPPORT SYSTEM, CONFORMING TO ROOFTOP WARRANTY REQUIREMENTS,

WIRES AND CABLES

- 1. CONTRACTOR TO COORDINATE WITH EQUIPMENT SUPPLIER AND VENDOR FOR EXACT FOLLIPMENT OVER-CURRENT PROTECTION VOLTAGE, WIRE SIZE AND PLUG CONFIGURATION, IF APPLICABLE, PRIOR TO RID.
- 2. ALL EQUIPMENT/DEVICES TO BE PROVIDED WITH INSULATED GROUND CONDUCTOR 3. ALL WIRE AND CABLE TO BE 600VOLT, COPPER, WITH THWN/
- THHN INSULATION, EXCEPT AS NOTED. 4. WIRE FOR POWER AND LIGHTING WILL NOT BE LESS THAN NO.
- 12AWG. ALL WIRE NO. 8 AND LARGER TO BE STRANDED. 5. CONTROL WIRING IS NOT TO BE LESS THAN NO. 14AWG, FLEXIBLE IN SINGLE CONDUCTORS OR MULTI-CONDUCTOR CABLES. CONTROL WIRING WILL CONSIST OF MULTI-CONDUCTOR CABLES WHEREVER POSSIBLE. CABLES TO BE PROVIDED WITH AN OVERALL FLAME-RETARDANT, EXTRUDED JACKET AND RATED
- FOR PLENUM USE, ALL CONTROL WIRE TO BE 600VOLT RATED. 6. WIRE PREVIOUSLY PULLED INTO CONDUIT IS CONSIDERED USED
- AND IS NOT TO BE RE-PULLED 7. HOME RUNS AND BRANCH CIRCUIT WIRING FOR 20A, 120V

JIRCUITS:	
LENGTH (FT.)	HOME RUN WIRE SIZE
0 TO 50	NO. 12
51 TO 100	NO. 10
101 TO 150	NO. 8

- 8. VOLTAGE DROP IS NOT TO EXCEED 3%. 9. MAKE ALL CONNECTIONS WITH UL APPROVED, SOLDERLESS, PRESSURE TYPE INSULATED CONNECTORS: SCOTCHLOK OR AND
- APPROVED EQUAL. 1. ALL RECEPTACLES INSTALLED IN THIS PROJECT TO BE GROUNDING TYPE, WITH GROUNDING PIN SLOT CONNECTED TO DEVICE GROUND SCREW FOR GROUND WIRE CONNECTION.
- DISCONNECT SWITCHES AND FUSES

 1. DISCONNECT SWITCHES TO BE VOLTAGE—RATED TO SUIT THE CHARACTERISTICS OF THE SYSTEM FROM WHICH THEY ARE
- 2. PROVIDE HEAVY-DUTY, METAL-ENCLOSED, EXTERNALLY-OPERATED DISCONNECT SWITCHES, FUSED OR UNFUSED, OF SUCH TYPE AND SIZE AS REQUIRED TO PROPERLY PROTECT OR DISCONNECT THE LOAD FOR WHICH THEY ARE INTENDED.
- 3. PROVIDE NEMA 1 DISCONNECT SWITCHES FOR INTERIOR INSTALLATION. NEMA 3R FOR EXTERIOR INSTALLATION.
- 4. DISCONNECT SWITCHES TO BE MANUFACTURED BY A. GENERAL ELECTRIC COMPANY
- 5. PROVIDE RK-1 TYPE FUSES, UNLESS NOTED OTHERWISE.
- 1. INSTALL DISCONNECT SWITCHES WHERE INDICATED ON
- 2. INSTALL FUSES IN FUSIBLE DISCONNECT SWITCHES. FUSES MUST MATCH IN TYPE AND RATING.

 3. FUSES TO BE MOUNTED SO THAT THE LABELS SHOWING THEIR
- RATINGS CAN BE READ WITHOUT REQUIRING FUSE REMOVAL.

 4. FURNISH AND DEPOSIT SPARE FUSES AT THE JOB SITE AS
- A. THREE SPARES FOR EACH TYPE AND SIZE, IN EXCESS OF
- 60A, USED FOR INITIAL FUSING.

 B. TEN PERCENT SPARES FOR EACH TYPE AND SIZE, UP TO
- AND INCLUDING 60A, USED FOR INITIAL FUSING. IN NO CASE WILL LESS THAN THREE FUSES OF ONE PARTICULAR TYPE AND

GENERAL NOTES:

INTENT

- THESE SPECIFICATIONS AND CONSTRUCTION DRAWINGS
 ACCOMPANYING THEM DESCRIBE THE WORK TO BE DONE AND
- THE MATERIALS TO BE FURNISHED FOR CONSTRUCTION.
 2. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY. HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED, OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH
- 3. THE INTENTION OF THE DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT
- 4. THE PURPOSE OF THE SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.
- IO COMPLEIE HE WORK.

 5. MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED AS PART OF THE WORK. NO CHANGES THAT ALTER THE CHARACTER OF THE WORK WILL BE MADE OR PERMITTED BY THE OWNER WITHOUT ISSUING A

- 1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATIONS OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK, NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO THE OWNER FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREAS.
- 2. THE BIDDER, IF AWARDED THE CONTRACT, WILL NOT ALLOWED ANY EXTRA COMPENSATION BY REASON OF ANY FULLY INFORMED THEMSELVES PRIOR TO THE BIDDING
- 3. NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST, OR OF DIFFICULTIES OR CONDITIONS THAT MAY BE ENCOUNTERED OR ANY OTHER RELEVANT MATTER CONCERNING THE WORK TO BE PERFORMED IN THE EXECUTION OF THE WORK WILL BE ACCEPTED AS AN EXCUSE FOR ANY FAILURE OR OMISSION ON THE PART OF THE CONTRACTOR TO FULFILL EVERY DETAIL OF THE REQUIREMENTS OF THE CONTRACT DOCUMENTS

CONTRACTS AND WARRANTIFS

- 1. CONTRACTOR IS RESPONSIBLE FOR APPLICATION AND PAYMENT OF CONTRACTOR LICENSES AND BONDS
- 2. SEE MASTER CONTRACTION SERVICES AGREEMENT FOR ADDITIONAL DETAILS.

 ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION
 AND IN A MANNER THAT DOES NOT NECESSARILY OBSTRUCT THE FLOW OF OTHER WORK. ANY STORAGE METHOD MUST MEET ALL RECOMMENDATIONS OF THE ASSOCIATED MANUFACTURER.

- TO THE CONTRACTORS SHALL, AT ALL TIMES, KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH CAUSED BY THEIR EMPLOYEES AT WORK AND AT THE COMPLETION OF THE WORK. THEY SHALL REMOVE ALL RUBBISH FROM AND ABOUT THE BUILDING AREA, INCLUDING ALL THEIR TOOLS, SCAFFOLDING AND SURPLUS MATERIALS AND SHALL LEAVE THEIR WORK CLEAN AND READY TO USE.
- EXTERIOR A. VISUALLY INSPECT EXTERIOR SURFACES AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER
- B. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM
- ADJACENT SURFACES.
 C. IF NECESSARY, TO ACHIEVE A UNIFORM DEGREE OF CLEANLINESS, HOSE DOWN THE EXTERIOR OF THE STRUCTURE.
- 3 INTERIOR A. VISUALLY INSPECT INTERIOR SURFACE AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER FROM WALLS, FLOOR, AND CEILING.
- B. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES.
 C. REMOVE PAINT DROPPINGS, SPOTS, STAINS, AND DIRT FROM FINISHED SURFACES.

CHANGE ORDER PROCEDURE:
1. REFER TO SECTION 17 OF SIGNED MCSA: SEE PROFESSIONAL SERVICE AGREEMENT FOR MCSA.

RELATED DOCUMENTS AND COORDINATION

- GENERAL CAPPENTRY, ELECTRICAL AND ANTENNA DRAWINGS ARE INTERRELATED. IN PERFORMANCE OF THE WORK, THE CONTRACTOR MUST REFER TO ALL DRAWINGS. ALL COORDINATION TO BE THE RESPONSIBILITY OF THE CONTRACTOR.

 DRAWINGS. SHOP DRAWINGS
- . CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AS REQUIRED AND LISTED IN THESE SPECIFICATIONS TO THE OWNER FOR
- ALL SHOP DRAWINGS SHALL BE REVIEWED, CHECKED AND CORRECTED BY CONTRACTOR PRIOR TO SUBMITTAL TO THE OWNER

PRODUCTS AND SUBSTITUTIONS

- 1. SUBMIT 3 COPIES OF EACH REQUEST FOR SUBSTITUTION. IN EACH REQUEST, IDENTIFY THE PRODUCT OR FABRICATION OR INSTALLATION METHOD TO BE REPLACED BY THE SUBSTITUTION INCLUDE RELATED SPECIFICATION SECTION AND DRAWING NUMBERS AND COMPLETE DOCUMENTATION SHOWING COMPLIANCE WITH THE REQUIREMENTS FOR SUBSTITUTIONS
- COMPLIANCE WITH THE REQUIREMENTS FOR SUBSTITUTIONS.

 2. SUBMIT ALL NECESSARY PRODUCT DATA AND CUT SHEETS

 WHICH PROPERLY INDICATE AND DESCRIBE THE ITEMS, PRODUCTS AND MATERIALS BEING INSTALLED. THE CONTRACTOR SHALL IF DEFMED NECESSARY BY THE OWNER. SUBMIT ACTUAL SAMPLES TO THE OWNER FOR APPROVAL IN LIEU OF CUT

QUALITY ASSURANCE

 ALLI WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL,
 STATE AND FEDERAL REGULATIONS. THESE SHALL INCLUDE, BUT
 NOT BE LIMITED TO THE APPLICABLE CODES SET FORTH BY THE LOCAL GOVERNING BODY. SEE "CODE COMPLIANCE" T-1. ADMINISTRATION

1. BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER WHO WILL ACT AS A SINGLE POINT OF CONTACT FOR ALL PERSONNEL INVOLVED IN THIS PROJECT, THIS PROJECT MANAGER WILL DEVELOP A MASTER SCHEDULE FOR THE PROJECT WHICH WILL BE SUBMITTED TO THE OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK.

- 2. SUBMIT A BAR TYPE PROGRESS CHART, NOT MORE THAN 3
 DAYS AFTER THE DATE ESTABLISHED FOR COMMENCEMENT OF
 THE WORK ON THE SCHEDULE, INDICATING A TIME BAR FOR EACH MAJOR CATEGORY OR UNIT OF WORK TO BE PERFORMED AT THE SITE, PROPERLY SEQUENCED AND COORDINATED WITH OTHER ELEMENTS OF WORK AND SHOWING COMPLETION OF THE WORK SUFFICIENTLY IN ADVANCE OF THE DATE ESTABLISHED FOR SUBSTANTIAL COMPLETION OF THE WORK.
- 3. PRIOR TO COMMENCING CONSTRUCTION, THE OWNER SHALL SCHEDULE AN ON-SITE MEETING WITH ALL MAJOR PARTIES. THIS WOULD INCLUDE, BUT NOT LIMITED TO, THE OWNER, PROJECT MANAGER, CONTRACTOR, LAND OWNER REPRESENTATIVE, LOCAL TELEPHONE COMPANY, TOWER ERECTION FOREMAN (IF SLIBCONTRACTED)
- 4. CONTRACTOR SHALL BE EQUIPPED WITH SOME MEANS OF CONSTANT COMMUNICATIONS, SUCH AS A MOBILE PHONE OR A
 BEEPER. THIS EQUIPMENT WILL NOT BE SUPPLIED BY THE OWNER, NOR WILL WIRELESS SERVICE BE ARRANGED.
- 5. DURING CONSTRUCTION, CONTRACTOR MUST ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES. CONTRACTOR WILL COMPLY WITH ALL WPCS SAFETY REQUIREMENTS IN THEIR AGREEMENT.
- 6. PROVIDE WRITTEN DAILY UPDATES ON SITE PROGRESS TO THE
- 7. COMPLETE INVENTORY OF CONSTRUCTION MATERIALS AND EQUIPMENT IS REQUIRED PRIOR TO START OF CONSTRUCTION EQUIPMENT IS REQUIRED PRIOR TO START OF CONSTRUCTION.

 8. NOTIFY THE OWNER/PROJECT MANAGER IN WRITING NO LESS
 THAN 48 HOURS IN ADVANCE OF CONCRETE POURS, TOWER ERECTIONS, AND EQUIPMENT CABINET PLACEMENTS.

INSURANCE AND BONDS

1. CONTRACTOR, AT THEIR OWN EXPENSE, SHALL CARRY AND MAINTAIN, FOR THE DURATION OF THE PROJECT, ALL INSURANCE, AS REQUIRED AND LISTED, AND SHALL NOT COMMENCE WITH THEIR WORK UNTIL THEY HAVE PRESENTED AN ORIGINAL CERTIFICATE OF INSURANCE STATING ALL COVERAGES TO THE OWNER. REFER TO THE MASTER AGREEMENT FOR REQUIRED INSURANCE LIMITS.

ADJ

AGI

BTS CAB

CLG

CONC

CONT

DWG

ELEC

ELEV

EQUIP EGB

EQ

(E) EXT

FF

GALV GC GRND LG MAX

MECH

MFR

MGB

MIN

MTL

(N) NIC NTS

OC

OPP

(P) PCS PPC SF SHT SIM SS STL TOC

TOM TYP VIF UON

DIA OR Ø

APPROX

THE OWNER SHALL BE NAMED AS AN ADDITIONAL INSURED ON ALL POLICIES. 3. CONTRACTOR MUST PROVIDE PROOF OF INSURANCE

ABBREVIATIONS

ADJUSTABLE

APPROXIMATE

CFILING

CONCRETE

DIAMETER

ELECTRICAL

ELEVATION

FXISTING

EXTERIOR

GAUGE

GROUND

LONG MAXIMUM

MINIMUM

MECHANICAL

MICROWAVE DISH

NOT IN CONTRACT

PERSONAL COMMUNICATION SYSTEM

POWER PROTECTION CABINET

NOT TO SCALE

SQUARE FOOT

STAINLESS STEEL

TOP OF CONCRETE

TOP OF MASONRY

UNLESS OTHERWISE NOTED

WELDED WIRE FABRIC

TYPICAL VERIFY IN FIELD

ON CENTER

OPPOSITE

PROPOSED

SHFFT

SIMILAR

STEEL

MASTER GROUND BAR

MANUFACTURER

GAI VANIZED

FINISHED FLOOR

GENERAL CONTRACTOR

DRAWING

FACH

CONTINUOUS

ABOVE GROUND LINE

BASE TRANSMISSION STATION CABINET

EQUAL EQUIPMENT EQUIPMENT GROUND BAR

DESCRIPTION

T - Mobile -

T-MOBILE NORTHEAST, LLC

BLOOMFIELD, CT 06002

OFFICE: (860) 692-7100

FAX:(860) 692-7159

↓\TLANTIS DESIGN

GROUP, INC.

54 Jacqueline Road, Suite #7 Waltham, MA 02452

SUBMITTALS

Number : 781-742-2247

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO: CTNH037A DRAWN BY MB CHECKED BY

PROFESSIONAL SEAL

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> SITE NAME CTNH037A

CTNH037/CANDID

N. HAVEN 120 UNIVERSAL DRIVE NORTH HAVEN CT. 06473

SHEET TITLE **GENERAL** AND ELECTRICAL NOTES

SHEET NUMBER

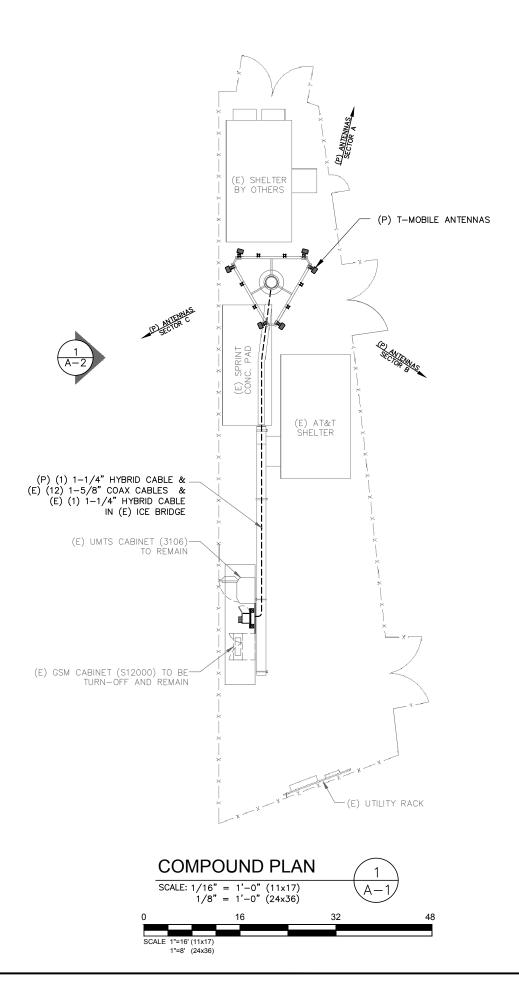
ARCHITECTURAL SYMBOLS STORAGE 38

DETAIL REFERENCE KEY

REFER TO - DRAWING DETAIL NUMBER-EXISTING N.I.C. RE: 2/A-3 LSHEET NUMBER OF DETAIL-

(3)-





GENERAL SITE NOTES:

- 1. SITE INFORMATION WAS OBTAINED FROM A FIELD INVESTIGATION PERFORMED BY ATLANTIS DESIGN GROUP, INC. CONTRACTOR TO FIELD VERIFY DIMENSIONS AS NECESSARY BEFORE CONSTRUCTION.
- 2. THE PROPOSED DEVELOPMENT DOES NOT INCLUDE SIGNS OF ADVERTISING.
- 3. THE PROPOSED DEVELOPMENT IS UNMANNED AND THEREFORE DOES NOT REQUIRE A MEANS OF WATER SUPPLY OR SEWAGE DISPOSAL.
- 4. NO LANDSCAPING WORK IS PROPOSED IN CONJUNCTION WITH THIS DEVELOPMENT OTHER THAN THAT WHICH IS SHOWN.
- 5. THE PROPOSED DEVELOPMENT DOES NOT INCLUDE OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES.
- 6. UTILITIES SHOWN ON PLAN ARE TAKEN FROM OWNERS RECORDS AND FIELD LOCATION OF VISIBLE SURFACE FEATURES. THE EXISTENCE, EXTENT AND EXACT HORIZONTAL AND VERTICAL LOCATIONS OF UTILITIES HAS NOT BEEN VERIFIED. ANY CONTRACTOR PERFORMING WORK ON THIS SITE MUST CONTACT CALL BEFORE YOU DIG THREE WORKING DAYS PRIOR TO COMMENCING WORK.
- 7. ALL OBSOLETE OR UNUSED FACILITIES SHALL BE REMOVED WITHIN 12 MONTHS OF CESSATION OF OPERATIONS.

SITE LEGEND

--- SITE PROPERTY LINE

_____ STREET OR ROAD

-x-x-- CHAIN LINK FENCE

OPAQUE WOODEN FENCE
BOARD ON BOARD FENCE

DECIDUOUS TREES/SHRUBS

EVERGREEN TREES/SHRUBS

TREE LINE

₩ UTILITY POLE

(E) EXISTING

(N) NEW

(P) PROPOSED

(F) FUTURE

—

PROP. LTE ANTENNA

EX. GSM ANTENNA

EX. UMTS ANTENNA

PROP. UMTS/GSM ANTENNA

T - Mobile -

T-MOBILE NORTHEAST, LLC

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TLANTIS DESIGN GROUP, INC.

54 Jacqueline Road, Suite #7 Waltham, MA 02452 Phone number: 617-852-3611 Fax Number : 781-742-2247

SUBMITTALS				
DATE	DESCRIPTION	REVISION		
06/02/16	ISSUED FOR REVIEW	A		

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			
	RFE RF MAN. ZONING OPS CONSTR.	RFE RF MAN. ZONING OPS CONSTR.	RFE RF MAN. ZONING OPS CONSTR.

PROJECT NO:	CTNH037A
DRAWN BY:	MB
CHECKED BY:	KM

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SITE NAME
CTNH037A

CTNH037/CANDID

120 UNIVERSAL DRIVE NORTH HAVEN CT, 06473

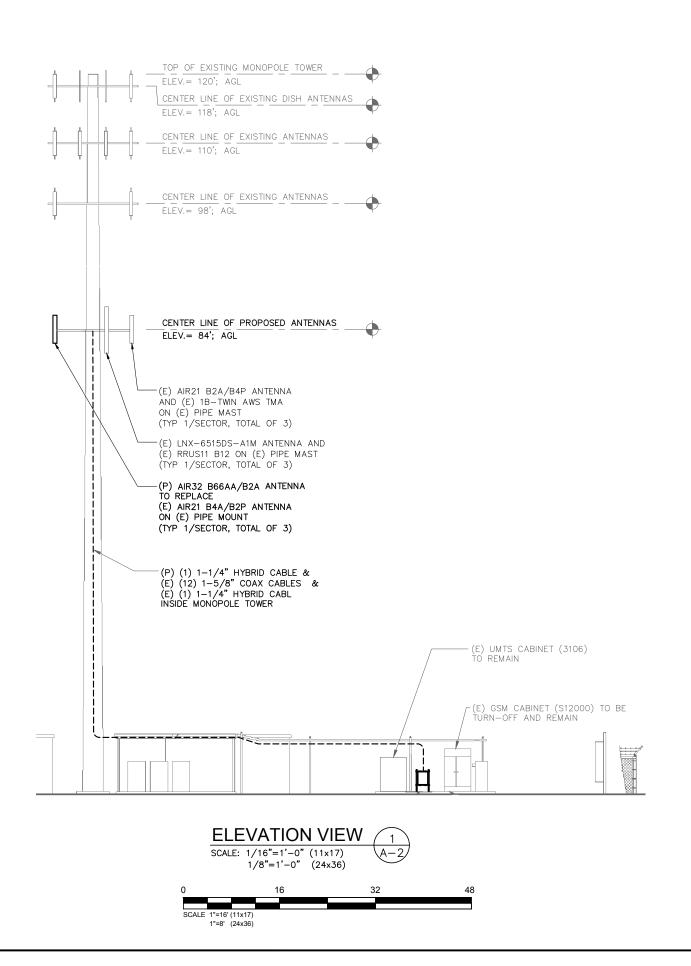
N. HÁVEN

SHEET TITLE

COMPOUND PLAN

SHEET NUMBER

A-1



T - Mobile -

T-MOBILE NORTHEAST, LLC
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BLOOMFIELD, CT 06002
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	DESCRIPTION			

DEPT.	DATE	APP'D	REVISIONS
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RF MAN.			
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OPS			
CONSTR.			
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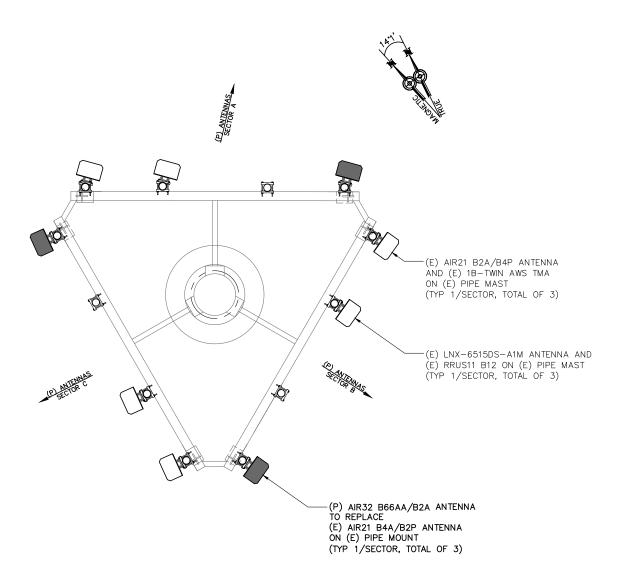
120 UNIVERSAL DRIVE NORTH HAVEN CT, 06473

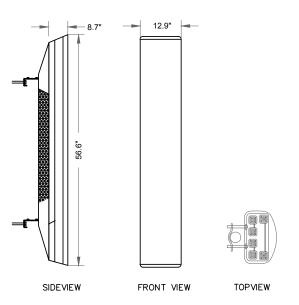
SHEET TITLE

ELEVATION AND ANTENNA PLAN

SHEET NUMBER

A-2

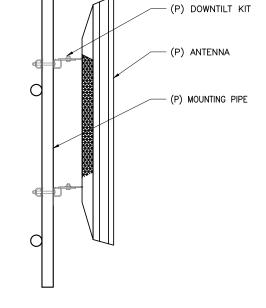




MANUFACTURER: ERICSSON MODEL NO.:ERICSSON AIR32 AIR32 B66Aa/B2a DIMENSIONS - HxWxD, (IN) 56.6"x12.9"x8.7"

ERICSSON AIR32 B66Aa/B2a **ANTENNA DETAILS**

SCALE: N.T.S



ANTENNA MOUNT DETAILS

3
A-3



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SITE NAME

CTNH037A

CTNH037/CANDID N. HÁVEN

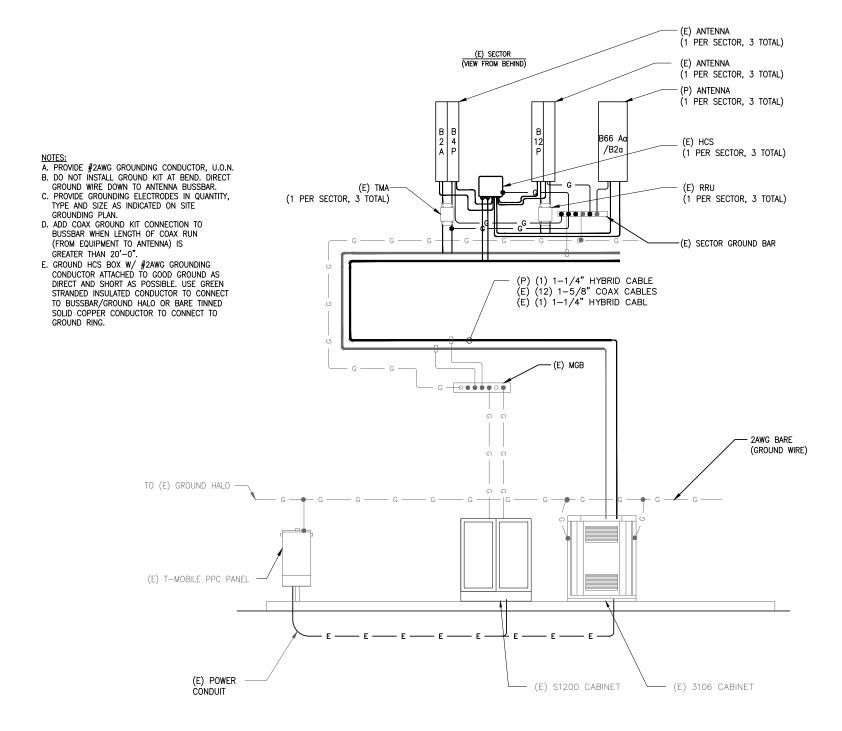
120 UNIVERSAL DRIVE NORTH HAVEN CT, 06473

> SHEET TITLE ANTENNA PLAN AND **DETAILS**

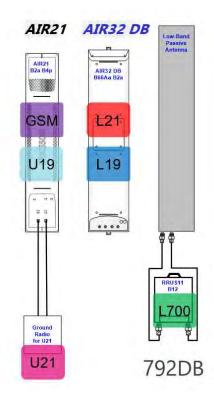
> > SHEET NUMBER

A-3









TRUNK FIBER NOTES:

- I. IN GENERAL THIS CABLE WILL HANDLE SIMILARLY TO 3/4" COAXIAL CABLE, AND SIMILAR INSTALLATION TECHNIQUES APPLY. ALL CABLES ARE INDIVIDUALLY SERIALIZED, BE SURE TO WRITE DOWN THE CABLE SERIAL NUMBER FOR FUTURE REFERENCE.
- 2. THE TERMINATED FIBER ENDS (THE BROKEN OUT FIBERS PLUS CONNECTORS) HOWEVER ARE FRAGILE, AND THESE MUST BE PROTECTED DURING THE INSTALLATION PROCESS.
- 3. LEAVE THE PROTECTIVE TUBE AND SOCK AROUND THE FIBER TAILS AND CONNECTORS IN PLACE DURING HOISTING AND SECURING THE CABLE. REMOVE THIS ONLY JUST PRIOR TO MAKING THE FINAL CONNECTIONS TO THE OVP BOX.
- 4. DO NOT BEND THE FIBER ENDS (IN THE ORANGE FURCATION TUBES) TIGHTER THAN ¾" (19MM) BEND RADIUS, ELSE THERE IS A RISK OF BREAKING THE GLASS FIBERS.
- 5. BE SURE THAT THE LACE UP ENDS AND FIBER CONNECTORS ARE NOT DAMAGED BY ATTACHMENT OF A HOISTING GRIP OR DURING THE HOISTING PROCESS. ATTACH A HOISTING GRIP ON THE JACKETED CABLE NO LESS THAN 6 INCHES BELOW THE FIBER BREAKOUT POINT. IF A HOISTING GRIP IS NOT EASILY ATTACHED, USE A SIMPLE LINE ATTACHED BELOW THE FIBER BREAK-OUT POINT (I.E. AT THE CABLE OUTER JACKET). PREVENT THE FIBER TAILS (IN PROTECTIVE TUBE) AT THE CABLE END FROM UNDUE MOVEMENT DURING HOISTING BY SECURING THE PROTECTIVE TUBE (WITH OUTER SOCK) TO THE HOISTING LINE.
- 6. DURING HOISTING ENSURE THAT THERE IS A FREE PATH AND THAT THE CABLE, AND ESPECIALLY THE FIBER ENDS, WILL NOT BE SNAGGED ON TOWER MEMBERS OR OTHER OBSTACLES.
- 7. INSTALLATION TEMPERATURE RANGE IS -22F TO 158F (-30C TO +70C).
- 8. MINIMUM CABLE BEND RADII ARE 22.2" (565MM) LOADED (WITH TENSION ON THE CABLE) AND 11.1" (280MM) UNLOADED.

 9. MAXIMUM CABLE TENSILE LOAD IS 3560 N (800 LB) SHORT TERM (DURING INSTALLATION) AND 1070 N (240 LB) LONG TERM.

 10. COMMSCOPE NON LACE UP GRIP RECOMMENDED FOR MONOPOLE INSTALLATIONS.
- 11. MAXIMUM HANGER SPACING 3FT (0.9 M).

HYBRID FIBER/POWER JUMPER NOTES:

- 1. IN GENERAL THIS CABLE WILL HANDLE SIMILARLY TO A 3/8" COAXIAL CABLE.
- 2. THE TERMINATED FIBER ENDS HOWEVER ARE FRACILE AND MUST BE PROTECTED DURING INSTALLATION. LEAVE
 THE PACKAGING AROUND THE FIBER ENDS IN PLACE UNTIL READY TO CONNECT THE JUMPER BETWEEN OVP AND RRU OR BBU.
- 3. DO NOT BEND THE FIBER BREAKOUT CABLE (BETWEEN THE MAIN CABLE AND THE FIBER CONNECTOR) TIGHTER THAN 3/4" (19MM) RADIUS, ELSE THERE IS A RISK OF BREAKING THE GLASS.
- 4. ATTACH THE MAIN CABLE SECURELY TO THE STRUCTURE OR EQUIPMENT USING HANGERS AND/OR CABLE TIES TO PREVENT STRAIN ON CONNECTIONS FROM MOVEMENT IN WIND OR SNOW/ICE CONDITIONS.
- 5. ENSURE THE LC FIBER CONNECTORS ARE SEATED FIRMLY IN PANEL IN OVP OR IN EQUIPMENT.
- 6. INSTALLATION TEMPERATURE RANGE IS -22F TO 158F (-30C TO 70C).
- 7. MINIMUM CABLE BEND RADII ARE 10.3 INCH (265MM) LOADED (WITH TENSION ON THE CABLE) AND 5.2 INCH (130MM) UNLOADED.
- 8. MAXIMUM CABLE TENSILE LOAD IS 350 LB (1560N) SHORT TERM (DURING INSTALLATION) AND 105 LB (470N) LONG TERM.
- 9. STANDARD LENGTHS AVAILABLE ARE 6 FEET, 15 FEET AND 20 FEET

SCALE: N.T.S

792DB CONFIGURATION COAX/FIBER PLUMBING DIAGRAM

	35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 OFFICE: (860) 692-7100 FAX:(860) 692-7159	
54 Pho	TLANTIS DES GROUP, INC. Jacqueline Road, Suite Waitham, MA 02452 ne number: 617–852- Number: 781–742-	#7 -3611
	CLIDMITTALO	
	SUBMITTALS	
DATE	DESCRIPTION	REVISION
06/02/16	ISSUED FOR REVIEW	A

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	SUBMITTALS	
DATE	DESCRIPTION	REVISIO
06/02/16	ISSUED FOR REVIEW	A

T - Mobile -

T-MOBILE NORTHEAST, LLC

DATE	APP'D	REVISIONS
	DATE	DATE APP'D

PROJECT NO:	CTNH037A
DRAWN BY:	MB
CHECKED BY:	KM

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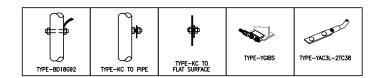
> SITE NAME CTNH037A

CTNH037/CANDID N. HÁVEN

120 UNIVERSAL DRIVE NORTH HAVEN CT, 06473

SHEET TITLE **GROUNDING AND** POWER ONE LINE DIAGRAM

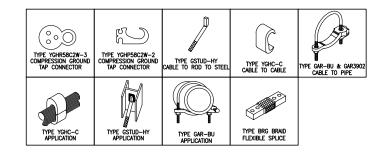
SHEET NUMBER



BURNDY GROUNDING DETAILS

SCALE: N.T.S.

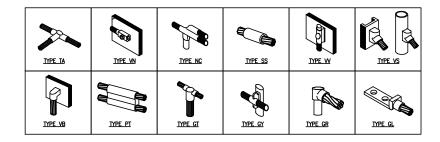




BURNDY GROUNDING PRODUCTS

SCALE: N.T.S.





CADWELD GROUNDING CONNECTION PRODUCTS

SCALE: N.T.S.

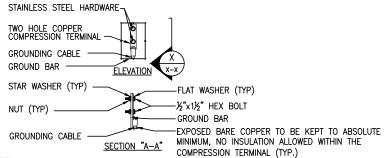


	IERMINATION TYPES:	/	/	/		/ _ /	15	• / /
	A. MECHANICAL COMPRESSION	LUG SION	₽ /	Z Z)	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- /\$\bar{2}	. / /
	B. DOUBLE BARRELL COMPRESS	SION / 🧟	• / .	¥ / § .		/5/	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	%
	CONNECTOR			/ 2 ⁵ 2 ⁵	· 5			\$
1	C. EXOTHERMIC TERMINATION	/ ** C	. / 👌	1,00	S' / i			
Į	D. BEAM CLAMP	/ 38		\ \%\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	3 / 8		18293	\$ /
		\$ 200 \$ 200	/ 🖋	35 SAMOS SAM	2 /2	2 3 00 00 00 00 00 00 00 00 00 00 00 00 0		/
	SOLID #2 TINNED COPPER	B OR C	B OR C		C	A, C, OR D	// c	
	#6 GROUND LEAD	B OR C			Α	A, C, OR D		
	#2/O STRANDED GRNDG		/////			4 0 00 0	, 7//	
	ELECTRODE CONDUCTOR		////	<i>////</i>	Ι Α	A, C, OR D	A ///	
	MASTER GROUND BAR	C	Α	A				
	STRUCTURAL OR TOWER STEEL	A, C, OR D	A, C, OR D	A, C, OR D	VZ			
	GROUND RING	С	/////	С	VZ		// c	

GROUNDING TERMINATION MARTIX

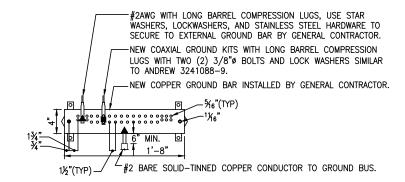
SCALE: N.T.S.





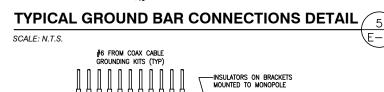
NOTES:

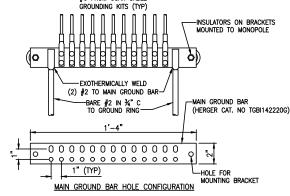
1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.



NOTES

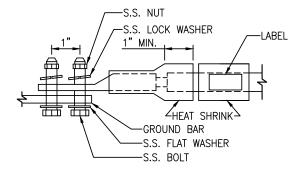
- 1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
- FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
- 3. ALL HOLES ARE COUNTERSUNK 1/6".





GROUND BAR DETAIL

SCALE: N.T.S.



- LUG NOTES:

 1. ALL HARDWARE IS 18-8 STAINLESS STEEL, INCLUDING LOCK WASHERS.
- 2. ALL HARDWARE SHALL BE S.S. ¾"ø OR LARGER.
- 3. FOR GROUND BOND TO STEEL ONLY:
 INSERT A DRAGON TOOTH WASHER
 BETWEEN LUG AND STEEL. COAT ALL
 SURFACES WITH ANTI-OXIDIZATION
 COMPOUND PRIOR TO MATING.

GROUND BAR DETAIL

SCALE: N.T.S.

T - Mobile -

T-MOBILE NORTHEAST, LLC

35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 OFFICE: (860) 692-7100 FAX:(860) 692-7159

TLANTIS DESIGN GROUP, INC.

54 Jacqueline Road, Suite #7 Waltham, MA 02452 Phone number: 617-852-3611 Fax Number: 781-742-2247

	·								
SUBMITTALS									
DATE	DESCRIPTION	REVISION							
06/02/16	ISSUED FOR REVIEW	A							

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO:	CTNH037A
DRAWN BY:	MB
CHECKED BY:	KM

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SITE NAME

CTNH037A

CTNH037/CANDID N. HAVEN

120 UNIVERSAL DRIVE NORTH HAVEN CT, 06473

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

Exhibit D

Date: May 05, 2016

Subject:

Structural Analysis Report

Carrier Designation:

T-Mobile Co-Locate Carrier Site Number: Carrier Site Name:

CTNH037A CTNH037/Candid N. Haven

Crown Castle Designation:

Crown Castle BU Number: Crown Castle Site Name:

881536

NORTH HAVEN TOWER

Crown Castle JDE Job Number: Crown Castle Work Order Number:

375214 1229954

Crown Castle Application Number:

343401 Rev. 0

Engineering Firm Designation:

Crown Castle Project Number:

Site Data:

120 Universal Drive, North Haven, New Haven County, CT

Latitude 41° 20' 40.01", Longitude -72° 52' 14.92"

120 Foot - Monopole Tower

Dear Sean Dempsey,

Crown Castle is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1229954, in accordance with application 343401, revision 0.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Existing + Reserved + Proposed Equipment

Sufficient Capacity

Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 85 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at Crown Castle appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Ian E. Miller, E.I.T. / MD

Respectfully submitted by:

Maham Barimani, P.E. Sr. Project Engineer



TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA

Table 1 - Proposed Antenna and Cable Information

Table 2 - Existing and Reserved Antenna and Cable Information

Table 3 - Design Antenna and Cable Information

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Table 6 – Tower Components vs. Capacity

4.1) Recommendations

5) APPENDIX A

tnxTower Output

6) APPENDIX B

Base Level Drawing

7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in February of 2001. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	F14!	Number of Antennas	Antenna Manufacturer		Number of Feed Lines	Feed Line Size (in)	Note
83.0	84.0	3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe	1	1-1/4	-

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note			
		2	powerwave technologies	LGP2140X	40	4.5/0				
		3	powerwave technologies	7770.00 w/ Mount Pipe	12 2 1	1-5/8 3/4 3/8	1			
	404.0	3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	'	370				
118.0	121.0	3	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe		3/8 3/4				
		6	powerwave technologies	LGP21401	1 2		2			
		3	ericsson	RRUS 32						
		2 raycap DC2-48-60-0-9E								
	118.0	1	tower mounts	Platform Mount [LP 712-1]	-	-	1			
	117.0	3 ericsson RRUS-12		-	-	2				
116.0	117.0	3	ericsson	TME-RRUS-11						
110.0	116.0	116.0	116.0	116.0	1	raycap	DC6-48-60-18-8F	-	-	1
	110.0	1	tower mounts	Side Arm Mount [SO 102-3]						
108.0	110.0	12	decibel	844G65VTZASX w/ Mount Pipe	12	1-1/4	3			
	108.0	1	tower mounts	Platform Mount [LP 303-1]						
400.0	100.0	100.0 3 alcatel lucent 1900MHz RRH (65MHz) w/Mount pipe								
100.0		1	tower mounts	Side Arm Mount [SO 102-3]	-	- 	1			
	99.0	3	alcatel lucent	TME-800MHZ RRH						
97.0	98.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER	1 3	1-5/8 1-1/4	1			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antonna		Number of Feed Lines	Feed Line Size (in)	Note													
		3	alcatel lucent	TD-RRH8x20-25																
		2	powerwave technologies	P40-16-XLPP-RR-A w/ Mount Pipe																
		9	rfs celwave	ACU-A20-N																
		1	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe																
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe																
	97.0	1	tower mounts	Platform Mount [LP 601-1]																
	84.0	84.0	84.0	3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	1	1-5/8	4											
				84.0	84.0	04.0	04.0	04.0	04.0	04.0		04.0	04.0	04.0	3	commscope	LNX-6515DS-A1M w/ Mount Pipe			
83.0						ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	Pipe 11		1										
		3	ericsson	RRUS 11 B12	1	1-1/4														
		3	rfs celwave	ATMAA1412D-1A20																
	83.0	1	tower mounts	Platform Mount [LP 303-1]																
51.0	51.0	1	lucent	KS24019-L112A	1	1/2	1													
31.0	31.0	1	tower mounts	Side Arm Mount [SO 701-1]	1	1/2	1													

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Abandoned Equipment
- 4) To be Removed Equipment ;Not Considered in this analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
118.0	118.0	12	allgon	7120.16	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E., P.C.	1405753	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineering Endeavors, Inc.	1405795	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineering Endeavors, Inc.	1405788	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
- 5) The existing base plate grout was not considered in this analysis.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	120 - 84.7161	Pole	TP32.5458x24.09x0.375	1	-10.56	1922.92	29.0	Pass
L2	84.7161 - 41.6224	Pole	TP42.0347x30.7011x0.4375	2	-22.33	2904.13	55.7	Pass
L3	41.6224 - 0	Pole	TP51x39.7912x0.5	3	-37.25	4166.42	61.6	Pass
							Summary	
						Pole (L3)	61.6	Pass
						Rating =	61.6	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	52.8	Pass
1	Base Plate	0	69.1	Pass
1	Base Foundation	0	55.1	Pass
1	Base Foundation Soil Interaction	0	19.7	Pass

Structure Rating (max from all components) =	69.1%
--	-------

Notes:

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing and proposed loads. No modifications are required at this time.

¹⁾ See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

APPENDIX A TNXTOWER OUTPUT

35.28 8 4.57 7 6. 41.6 ft 47.38 39.7912 51.0000 18 0.0 ft 23.6 Number of Sides Thickness (in) Top Dia (in) Bot Dia (in) Weight (K) Length (ft)

DESIGNED APPURTENANCE LOADING

DEGI	TYPE ELEVATION TYPE ELEVAT									
TYPE	ELEVATION	TYPE	ELEVATION							
Lighting Rod 3/4" x 3'	120	1900MHz RRH (65MHz) w/Mount pipe	100							
7770.00 w/ Mount Pipe	118	Side Arm Mount [SO 102-3]	100							
7770.00 w/ Mount Pipe	118	P40-16-XLPP-RR-A w/ Mount Pipe	97							
7770.00 w/ Mount Pipe	118	APXVTM14-C-120 w/ Mount Pipe	97							
AM-X-CD-16-65-00T-RET w/ Mount	118	APXVSPP18-C-A20 w/ Mount Pipe	97							
Pipe		APXVTM14-C-120 w/ Mount Pipe	97							
AM-X-CD-16-65-00T-RET w/ Mount Pipe	118	P40-16-XLPP-RR-A w/ Mount Pipe	97							
AM-X-CD-16-65-00T-RET w/ Mount	118	APXVTM14-C-120 w/ Mount Pipe	97							
Pipe	110	(3) ACU-A20-N	97							
(2) LGP2140X	118	(3) ACU-A20-N	97							
OPA-65R-LCUU-H6 w/ Mount Pipe	118	(3) ACU-A20-N	97							
OPA-65R-LCUU-H6 w/ Mount Pipe	118	800 EXTERNAL NOTCH FILTER	97							
OPA-65R-LCUU-H6 w/ Mount Pipe	118	800 EXTERNAL NOTCH FILTER	97							
RRUS 32	118	800 EXTERNAL NOTCH FILTER	97							
RRUS 32	118	TD-RRH8x20-25	97							
RRUS 32	118	TD-RRH8x20-25	97							
(2) LGP21401	118	TD-RRH8x20-25	97							
(2) LGP21401	118	Transition Ladder	97							
(2) LGP21401	118	6' x 2" Mount Pipe	97							
DC2-48-60-0-9E	118	6' x 2" Mount Pipe	97							
DC2-48-60-0-9E	118	6' x 2" Mount Pipe	97							
8'x2" Antenna Mount Pipe	118	Platform Mount [LP 601-1]	97							
8'x2" Antenna Mount Pipe	118	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	83							
8'x2" Antenna Mount Pipe	118	ERICSSON AIR 21 B2A B4P w/ Mount	83							
Transition Ladder	118	Pipe	03							
Platform Mount [LP 712-1]	118	ERICSSON AIR 21 B2A B4P w/ Mount	83							
TME-RRUS-11	116	Pipe								
TME-RRUS-11	116	LNX-6515DS-A1M w/ Mount Pipe	83							
TME-RRUS-11	116	LNX-6515DS-A1M w/ Mount Pipe	83							
RRUS-12	116	LNX-6515DS-A1M w/ Mount Pipe	83							
RRUS-12	116	ATMAA1412D-1A20	83							
RRUS-12	116	ATMAA1412D-1A20	83							
DC6-48-60-18-8F	116	ATMAA1412D-1A20	83							
(2) 4' x 2" Pipe Mount	116	RRUS 11 B12	83							
(2) 4' x 2" Pipe Mount	116	RRUS 11 B12	83							
(2) 4' x 2" Pipe Mount	116	RRUS 11 B12	83							
Side Arm Mount [SO 102-3]	116	AIR -32 B2A/B66AA w/ Mount Pipe	83							
(4) 844G65VTZASX w/ Mount Pipe	108	AIR -32 B2A/B66AA w/ Mount Pipe	83							
(4) 844G65VTZASX w/ Mount Pipe	108	AIR -32 B2A/B66AA w/ Mount Pipe	83							
(4) 844G65VTZASX w/ Mount Pipe	108	8'x2" Antenna Mount Pipe	83							
Platform Mount [LP 303-1]	108	8'x2" Antenna Mount Pipe	83							
TME-800MHZ RRH	100	8'x2" Antenna Mount Pipe	83							
TME-800MHZ RRH	100	Platform Mount [LP 303-1]	83							
TME-800MHZ RRH	100	KS24019-L112A	51							
1900MHz RRH (65MHz) w/Mount pipe	100	Side Arm Mount [SO 701-1]	51							
1900MHz RRH (65MHz) w/Mount pipe	100									

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

- Tower is located in New Haven County, Connecticut.
 Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
 Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
- 4. Deflections are based upon a 50 mph wind.
- 5. TOWER RATING: 61.6% MOMENT



AXIAL 51 K

TORQUE 2 kip-ft REACTIONS - 85 mph WIND



Tower Input Data

There is a pole section.

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

The following design criteria apply:

- 1) Tower is located in New Haven County, Connecticut.
- 2) Basic wind speed of 85 mph.
- 3) Nominal ice thickness of 0.7500 in.
- 4) Ice thickness is considered to increase with height.
- 5) Ice density of 56 pcf.
- 6) A wind speed of 38 mph is used in combination with ice.
- 7) Temperature drop of 50 °F.
- 8) Deflections calculated using a wind speed of 50 mph.
- 9) A non-linear (P-delta) analysis was used.
- 10) Pressures are calculated at each section.
- 11) Stress ratio used in pole design is 1.333.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification

- √ Use Code Stress Ratios
- √ Use Code Safety Factors Guys
- ✓ Escalate Ice
 Always Use Max Kz
 Use Special Wind Profile

Include Bolts In Member Capacity

Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric Distribute Leg Loads As Uniform Assume Legs Pinned

- √ Assume Rigid Index Plate
- √ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension
- √ Bypass Mast Stability Checks
- √ Use Azimuth Dish Coefficients
- √ Project Wind Area of Appurt.

Autocalc Torque Arm Areas

Add IBC .6D+W Combination

✓ Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder

Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation

 ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice

Exemption

Poles

Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets

Tapered Pole Section Geometry

Section	Elevation	Section	Splice	Number	Тор	Bottom	Wall	Bend	Pole Grade
		Length	Length	of	Diameter	Diameter	Thickness	Radius	
	ft	ft	ft	Sides	in	in	in	in	
L1	120.00-84.72	35.28	4.57	18	24.0900	32.5458	0.3750	1.5000	A572-65 (65 ksi)
L2	84.72-41.62	47.66	5.76	18	30.7011	42.0347	0.4375	1.7500	A572-65 (65 ksi)
L3	41.62-0.00	47.38		18	39.7912	51.0000	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Castian	Tin Din	A	,			1/0	,	14/0		/4
Section	l ip Dia.	Area	1	Γ	C	1/0	J	IT/Q	W	W/T
	in	in²	in⁴	in	in	in ³	in⁴	in²	in	

Section	Tip Dia.	Area	1	r	С	I/C	J	It/Q	W	w/t
	in	in²	in⁴	in	in	in ³	in⁴	in²	in	
L1	24.4616	28.2268	2005.6033	8.4188	12.2377	163.8870	4013.8455	14.1161	3.5798	9.546
	33.0479	38.2913	5006.8113	11.4206	16.5333	302.8326	10020.210	19.1493	5.0681	13.515
							7			
L2	32.2777	42.0249	4862.7974	10.7436	15.5962	311.7941	9731.9934	21.0164	4.6334	10.591
	42.6832	57.7629	12627.422	14.7670	21.3536	591.3479	25271.461	28.8869	6.6281	15.15
			9				2			
L3	41.7876	62.3551	12161.823	13.9484	20.2139	601.6563	24339.649	31.1835	6.1232	12.246
			5				9			
	51.7868	80.1435	25821.918	17.9275	25.9080	996.6774	51677.814	40.0794	8.0960	16.192
			8				8			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing	Double Angle Stitch Bolt Spacing	Double Angle Stitch Bolt Spacing
	•2					Diagonals	Horizontals	Redundants
ft	†ŧ⁼	in				in	in	ın
L1 120.00-			1	1	1			
84.72								
L2 84.72-			1	1	1			
41.62								
L3 41.62-0.00			1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or	Allow Shield	Component Type	Placement	Total Number	Number Per Row	Clear Spacing		Perimete r	Weight
	Leg			ft			in	r		plf
	•							in	in	

Feed Line/Linear Appurtenances - Entered As Area

Description	Face		Component	Placement	Total		C_AA_A	Weight
	or	Shield	Type		Number		r,2 /r,	16
1.555.50474.57911	Leg			ft			ft²/ft	plf
LDF7-50A(1-5/8")	С	No	Inside Pole	118.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
	_					4" Ice	0.00	0.82
2" Rigid Conduit	С	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
						2" Ice	0.00	2.80
						4" Ice	0.00	2.80
FB-L98B-002-75000(С	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	0.06
3/8")						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG86ST-BRD(С	No	Inside Pole	118.00 - 0.00	2	No Ice	0.00	0.59
3/4)						1/2" Ice	0.00	0.59
						1" Ice	0.00	0.59
						2" Ice	0.00	0.59
						4" Ice	0.00	0.59
FB-L98B-002-75000(С	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	0.06
3/8")						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG86ST-	С	No	Inside Pole	118.00 - 0.00	2	No Ice	0.00	0.58
BRD(3/4")						1/2" Ice	0.00	0.58
, ,						1" Ice	0.00	0.58

Description	Face or	Allow Shield	Component Type	Placement	Total Number		$C_A A_A$	Weight
	Leg		. , , , ,	ft			ft²/ft	plf
						2" Ice	0.00	0.58
						4" Ice	0.00	0.58

LDF6-50A(1-1/4")	В	No	Inside Pole	108.00 - 0.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
						2" Ice	0.00	0.66
						4" Ice	0.00	0.66
HB114-13U3M12-	Α	No	CaAa (Out Of	97.00 - 0.00	3	No Ice	0.15	0.99
XXXF(1-1/4")			Face)			1/2" Ice	0.25	2.24
						1" Ice	0.35	4.10
						2" Ice	0.55	9.64
						4" Ice	0.95	28.07
HYBRIFLEX RRH 1-	Α	No	CaAa (Out Of	97.00 - 0.00	1	No Ice	0.00	0.15
SECTOR(1/2")			Face)			1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
MLE Hybrid	Α	No	Inside Pole	83.00 - 0.00	1	No Ice	0.00	0.46
3Power/6Fiber RL 2						1/2" Ice	0.00	0.46
10AWG(1-1/4")						1" Ice	0.00	0.46
						2" Ice	0.00	0.46
						4" Ice	0.00	0.46
MLE Hybrid	Α	No	Inside Pole	83.00 - 0.00	1	No Ice	0.00	0.46
3Power/6Fiber RL 2						1/2" Ice	0.00	0.46
10AWG(1-1/4")						1" Ice	0.00	0.46
						2" Ice	0.00	0.46
						4" Ice	0.00	0.46
HCC 158-50J(1-5/8")	Α	No	Inside Pole	83.00 - 0.00	11	No Ice	0.00	0.86
						1/2" Ice	0.00	0.86
						1" Ice	0.00	0.86
						2" Ice	0.00	0.86
						4" Ice	0.00	0.86
* LDF4-50A(1/2")	Α	No	CaAa (Out Of	51.00 - 0.00	1	No Ice	0.00	0.15
LDI 4-50A(1/2)	~	INU	Face)	31.00 - 0.00	ı	1/2" Ice	0.00	0.15
			race)			1/2 ice 1" lce		0.84 2.14
						2" Ice	0.00 0.00	2.14 6.58
						4" Ice	0.00	6.58 22.78
*****						4 ICE	0.00	22.10

Feed Line/Linear Appurtenances Section Areas

Tower Sectio	Tower Elevation	Face	A_R	A_F	C _A A _A In Face	C _A A _A Out Face	Weight
n	ft		ft ²	ft²	ft ²	ft ²	K
L1	120.00-84.72	Α	0.000	0.000	0.000	5.675	0.04
		В	0.000	0.000	0.000	0.000	0.18
		С	0.000	0.000	0.000	0.000	0.50
L2	84.72-41.62	Α	0.000	0.000	0.000	19.909	0.57
		В	0.000	0.000	0.000	0.000	0.34
		С	0.000	0.000	0.000	0.000	0.65
L3	41.62-0.00	Α	0.000	0.000	0.000	19.229	0.57
		В	0.000	0.000	0.000	0.000	0.33
		С	0.000	0.000	0.000	0.000	0.63

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Sectio	Tower Elevation	Face or	Ice Thickness	A_R	A_F	C _A A _A In Face	C _A A _A Out Face	Weight
n	ft	Leg	in	ft ²	ft ²	ft ²	ft ²	K
L1	120.00-84.72	Α	0.858	0.000	0.000	0.000	12.002	0.13
		R		0.000	0.000	0.000	0.000	በ 18

Tower Sectio	Tower Elevation	Face or	Ice Thickness	A_R	A_F	C _A A _A In Face	C _A A _A Out Face	Weight
n	ft	Leg	in	ft ²	ft ²	ft ²	ft ²	K
		С		0.000	0.000	0.000	0.000	0.50
L2	84.72-41.62	Α	0.810	0.000	0.000	0.000	42.106	0.91
		В		0.000	0.000	0.000	0.000	0.34
		С		0.000	0.000	0.000	0.000	0.65
L3	41.62-0.00	Α	0.750	0.000	0.000	0.000	39.460	0.92
		В		0.000	0.000	0.000	0.000	0.33
		С		0.000	0.000	0.000	0.000	0.63

Feed Line Center of Pressure

Section	Elevation	CP _X	CPz	CP _X Ice	CP _Z Ice
	ft	in	in	in	in
L1	120.00-84.72	0.0000	-0.2478	0.0000	-0.4647
L2	84.72-41.62	0.0000	-0.6025	0.0000	-1.0744
L3	41.62-0.00	0.0000	-0.6186	0.0000	-1.1092

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustmen t	Placement		$C_A A_A$ Front	C _A A _A Side	Weight
			ft ft ft	0	ft		ft ²	ft ²	К
Lighting Rod 3/4" x 3'	С	From Leg	0.00 0.00 1.50	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.23 0.50 0.69 1.10 2.14	0.23 0.50 0.69 1.10 2.14	0.03 0.03 0.04 0.05 0.12
7770.00 w/ Mount Pipe	Α	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	В	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	С	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
AM-X-CD-16-65-00T-RET w/ Mount Pipe	Α	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
AM-X-CD-16-65-00T-RET w/ Mount Pipe	В	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	8.50 9.15 9.77 11.03	6.30 7.48 8.37 10.18	0.07 0.14 0.21 0.38

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustmen t	Placement		C _A A _A Front	C _A A _A Side	Weight
			ft ft ft	o	ft		ft ²	ft ²	K
						2" Ice 4" Ice	13.68	14.02	0.87
AM-X-CD-16-65-00T-RET w/ Mount Pipe	С	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
(2) LGP2140X	В	From Leg	4.00 0.00 3.00	0.0000	118.00	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice	1.26 1.42 1.58 1.94 2.75	0.38 0.49 0.62 0.89 1.54	0.02 0.03 0.04 0.06 0.14
OPA-65R-LCUU-H6 w/ Mount Pipe	Α	From Leg	4.00 0.00 3.00	0.0000	118.00	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.60 11.27 11.91 13.21 15.93	7.18 8.36 9.26 11.09 15.15	0.10 0.18 0.26 0.46 1.00
OPA-65R-LCUU-H6 w/ Mount Pipe	В	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.60 11.27 11.91 13.21 15.93	7.18 8.36 9.26 11.09 15.15	0.10 0.18 0.26 0.46 1.00
OPA-65R-LCUU-H6 w/ Mount Pipe	С	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.60 11.27 11.91 13.21 15.93	7.18 8.36 9.26 11.09 15.15	0.10 0.18 0.26 0.46 1.00
RRUS 32	Α	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.33 3.60 3.87 4.44 5.68	1.98 2.21 2.45 2.96 4.07	0.06 0.08 0.10 0.16 0.34
RRUS 32	В	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.33 3.60 3.87 4.44 5.68	1.98 2.21 2.45 2.96 4.07	0.06 0.08 0.10 0.16 0.34
RRUS 32	С	From Leg	4.00 0.00 3.00	0.0000	118.00	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice	3.33 3.60 3.87 4.44 5.68	1.98 2.21 2.45 2.96 4.07	0.06 0.08 0.10 0.16 0.34
(2) LGP21401	Α	From Leg	4.00 0.00 3.00	0.0000	118.00	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	В	From Leg	4.00 0.00 3.00	0.0000	118.00	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	С	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice 1/2" Ice	1.29 1.45 1.61	0.23 0.31 0.40	0.01 0.02 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustmen t	Placement		C _A A _A Front	C _A A _A Side	Weight
			Vert ft ft ft	0	ft		ft ²	ft ²	K
						1" Ice 2" Ice 4" Ice	1.97 2.79	0.61 1.12	0.05 0.14
DC2-48-60-0-9E	Α	From Leg	4.00	0.0000	118.00	No Ice	1.08	0.66	0.02
		3	0.00			1/2"	1.23	0.77	0.02
			3.00			Ice	1.38	0.90	0.04
						1" Ice	1.70	1.17	0.06
						2" Ice 4" Ice	2.46	1.82	0.15
DC2-48-60-0-9E	Α	From Leg	4.00	0.0000	118.00	No Ice	1.08	0.66	0.02
202 10 00 0 02	•		0.00	0.000		1/2"	1.23	0.77	0.02
			3.00			Ice	1.38	0.90	0.04
						1" Ice	1.70	1.17	0.06
						2" Ice	2.46	1.82	0.15
8'x2" Antenna Mount Pipe	Α	From Leg	4.00	0.0000	118.00	4" Ice No Ice	1.90	1.90	0.03
0 X2 Antenna Wount i ipe		i ioni Leg	0.00	0.0000	110.00	1/2"	2.73	2.73	0.03
			0.00			Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice	6.50	6.50	0.30
Ob Oll Australia Marriet Diag	-	E	4.00	0.0000	110.00	4" Ice	4.00	4.00	0.00
8'x2" Antenna Mount Pipe	В	From Leg	4.00 0.00	0.0000	118.00	No Ice 1/2"	1.90 2.73	1.90 2.73	0.03 0.04
			0.00			Ice	3.40	3.40	0.04
			0.00			1" Ice	4.40	4.40	0.12
						2" Ice	6.50	6.50	0.30
						4" Ice			
8'x2" Antenna Mount Pipe	С	From Leg	4.00	0.0000	118.00	No Ice	1.90	1.90	0.03
			0.00 0.00			1/2" Ice	2.73 3.40	2.73 3.40	0.04 0.06
			0.00			1" Ice	4.40	4.40	0.00
						2" Ice	6.50	6.50	0.30
						4" Ice			
Transition Ladder	В	From Leg	4.00	0.0000	118.00	No Ice	6.00	6.00	0.16
			0.00			1/2"	8.00	8.00	0.24
			-6.00			Ice 1" Ice	10.00 14.00	10.00 14.00	0.32 0.48
						2" Ice	22.00	22.00	0.48
						4" Ice			0.00
Platform Mount [LP 712-1]	Α	None		0.0000	118.00	No Ice	24.53	24.53	1.34
						1/2"	29.94	29.94	1.65
						lce	35.35	35.35	1.96
						1" Ice 2" Ice	46.17 67.81	46.17 67.81	2.58 3.82
						4" Ice	07.01	07.01	0.02

TME-RRUS-11	Α	From Leg	1.00	0.0000	116.00	No Ice	3.42	1.85	0.06
			0.00			1/2"	3.72	2.19	0.08
			1.00			Ice 1" Ice	4.04 4.72	2.55 3.38	0.12 0.19
						2" Ice	6.25	5.29	0.43
						4" Ice			
TME-RRUS-11	В	From Leg	1.00	0.0000	116.00	No Ice	3.42	1.85	0.06
			0.00			1/2"	3.72	2.19	0.08
			1.00			Ice 1" Ice	4.04	2.55	0.12
						2" Ice	4.72 6.25	3.38 5.29	0.19 0.43
						4" Ice	0.20	0.20	0.70
TME-RRUS-11	С	From Leg	1.00	0.0000	116.00	No Ice	3.42	1.85	0.06
		-	0.00			1/2"	3.72	2.19	0.08
			1.00			Ice	4.04	2.55	0.12
						1" Ice 2" Ice	4.72 6.25	3.38 5.29	0.19 0.43
						4" Ice	0.20	5.28	0.43
RRUS-12	Α	From Leg	1.00	0.0000	116.00	No Ice	3.67	1.49	0.05
		J							

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustmen t	Placement		C _A A _A Front	C _A A _A Side	Weight
			Vert ft ft ft	o	ft		ft ²	ft ²	К
			0.00			1/2"	3.93	1.67	0.07
			1.00			Ice	4.19	1.87	0.10
						1" Ice	4.75	2.28	0.16
						2" Ice 4" Ice	5.96	3.21	0.34
RRUS-12	В	From Leg	1.00	0.0000	116.00	No Ice	3.67	1.49	0.05
			0.00			1/2"	3.93	1.67	0.07
			1.00			Ice	4.19	1.87	0.10
						1" Ice	4.75	2.28	0.16
						2" Ice	5.96	3.21	0.34
						4" Ice			
RRUS-12	С	From Leg	1.00	0.0000	116.00	No Ice	3.67	1.49	0.05
			0.00			1/2"	3.93	1.67	0.07
			1.00			Ice	4.19	1.87	0.10
						1" Ice	4.75	2.28	0.16
						2" Ice	5.96	3.21	0.34
500 10 00 10 05	_				440.00	4" Ice			
DC6-48-60-18-8F	В	From Leg	1.00	0.0000	116.00	No Ice	1.27	1.27	0.02
			0.00			1/2"	1.46	1.46	0.04
			0.00			Ice 1" Ice	1.66	1.66	0.05
						2" Ice	2.09 3.10	2.09 3.10	0.10 0.21
						4" Ice	3.10	3.10	0.21
(2) 4' x 2" Pipe Mount	Α	From Leg	1.00	0.0000	116.00	No Ice	0.79	0.79	0.03
(2) 4 X 2 Tipe Mount	^	i ioiii Leg	0.00	0.0000	110.00	1/2"	1.03	1.03	0.03
			0.00			Ice	1.28	1.28	0.04
			0.00			1" Ice	1.81	1.81	0.07
						2" Ice	3.11	3.11	0.17
						4" Ice			
(2) 4' x 2" Pipe Mount	В	From Leg	1.00	0.0000	116.00	No Ice	0.79	0.79	0.03
		_	0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice	1.81	1.81	0.07
						2" Ice	3.11	3.11	0.17
	_					4" Ice			
(2) 4' x 2" Pipe Mount	С	From Leg	1.00	0.0000	116.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice 1" Ice	1.28	1.28	0.04
						2" Ice	1.81 3.11	1.81 3.11	0.07 0.17
						4" Ice	3.11	3.11	0.17
Side Arm Mount [SO 102-	Α	None		0.0000	116.00	No Ice	3.00	3.00	0.08
3]	,,	140110		0.0000	110.00	1/2"	3.48	3.48	0.11
91						lce	3.96	3.96	0.14
						1" Ice	4.92	4.92	0.20
						2" Ice	6.84	6.84	0.32
						4" Ice			

(4) 844G65VTZASX w/	Α	From Face	4.00	20.0000	108.00	No Ice	6.13	5.21	0.03
Mount Pipe			0.00			1/2"	6.59	5.89	0.09
			2.00			Ice	7.06	6.59	0.14
						1" Ice	8.04	8.04	0.28
						2" Ice 4" Ice	10.12	11.19	0.67
(4) 844G65VTZASX w/	В	From Face	4.00	20.0000	108.00	No Ice	6.13	5.21	0.03
Mount Pipe	ט	i ioiii i ace	0.00	20.0000	100.00	1/2"	6.59	5.89	0.03
Would Tipe			2.00			Ice	7.06	6.59	0.14
			2.00			1" Ice	8.04	8.04	0.28
						2" Ice	10.12	11.19	0.67
						4" Ice		-	-
(4) 844G65VTZASX w/	С	From Face	4.00	20.0000	108.00	No Ice	6.13	5.21	0.03
Mount Pipe			0.00			1/2"	6.59	5.89	0.09
			2.00			Ice	7.06	6.59	0.14
						1" Ice	8.04	8.04	0.28
						2" Ice	10.12	11.19	0.67

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustmen t	Placement		C _A A _A Front	C _A A _A Side	Weight
			ft ft ft	0	ft		ft ²	ft ²	K
Platform Mount [LP 303-1]	Α	None		0.0000	108.00	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	14.66 18.87 23.08 31.50 48.34	14.66 18.87 23.08 31.50 48.34	1.25 1.48 1.71 2.18 3.10
TME-800MHZ RRH	Α	From Leg	1.00 0.00 -1.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
TME-800MHZ RRH	В	From Leg	1.00 0.00 -1.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
TME-800MHZ RRH	С	From Leg	1.00 0.00 -1.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
1900MHz RRH (65MHz) w/Mount pipe	Α	From Leg	1.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.93 3.25 3.60 4.35 6.09	0.06 0.09 0.12 0.20 0.41
1900MHz RRH (65MHz) w/Mount pipe	В	From Leg	1.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.93 3.25 3.60 4.35 6.09	0.06 0.09 0.12 0.20 0.41
1900MHz RRH (65MHz) w/Mount pipe	С	From Leg	1.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.93 3.25 3.60 4.35 6.09	0.06 0.09 0.12 0.20 0.41
Side Arm Mount [SO 102-3]	Α	None		0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
P40-16-XLPP-RR-A w/ Mount Pipe	Α	From Face	4.00 0.00 1.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.74 11.29 11.85 12.99 15.39	4.83 5.57 6.27 7.80 11.11	0.07 0.14 0.22 0.39 0.86
APXVTM14-C-120 w/ Mount Pipe	Α	From Face	4.00 0.00 1.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.07 0.13 0.19 0.34 0.75
APXVSPP18-C-A20 w/ Mount Pipe	В	From Face	4.00 0.00	0.0000	97.00	No Ice 1/2"	8.50 9.15	6.95 8.13	0.08 0.15

Description	Face	Offset	Offsets:	Azimuth	Placement		C_AA_A	C_AA_A	Weight
	or Leg	Туре	Horz Lateral Vert	Adjustmen t			Front	Side	
			ft ft ft	o	ft		ft ²	ft ²	K
			1.00			Ice	9.77	9.02	0.23
						1" Ice 2" Ice 4" Ice	11.03 13.68	10.84 14.85	0.41 0.91
APXVTM14-C-120 w/	В	From Face	4.00	0.0000	97.00	No Ice	7.13	4.96	0.07
Mount Pipe			0.00			1/2"	7.66	5.75	0.13
			1.00			Ice 1" Ice	8.18	6.47	0.19
						2" Ice 4" Ice	9.26 11.53	8.01 11.41	0.34 0.75
P40-16-XLPP-RR-A w/	С	From Face	4.00	0.0000	97.00	No Ice	10.74	4.83	0.07
Mount Pipe			0.00			1/2"	11.29	5.57	0.14
			1.00			lce 1" Ice	11.85 12.99	6.27 7.80	0.22 0.39
						2" Ice 4" Ice	15.39	11.11	0.86
APXVTM14-C-120 w/	С	From Face	4.00	0.0000	97.00	No Ice	7.13	4.96	0.07
Mount Pipe			0.00			1/2"	7.66	5.75	0.13
			1.00			lce 1" lce	8.18	6.47	0.19
						2" Ice 2" Ice 4" Ice	9.26 11.53	8.01 11.41	0.34 0.75
(3) ACU-A20-N	Α	From Face	4.00	0.0000	97.00	No Ice	0.08	0.14	0.00
			0.00			1/2"	0.12	0.19	0.00
			1.00			Ice	0.17	0.25	0.00
						1" Ice	0.30	0.40	0.01
(3) ACU-A20-N	В	From Face	4.00	0.0000	97.00	2" Ice 4" Ice No Ice	0.67 0.08	0.80 0.14	0.04
(3) A00-A20-N	В	1 TOTT I doc	0.00	0.0000	37.00	1/2"	0.00	0.19	0.00
			1.00			lce	0.17	0.25	0.00
						1" Ice	0.30	0.40	0.01
(0) A OUL A OO N	0	F F	4.00	0.0000	07.00	2" Ice 4" Ice	0.67	0.80	0.04
(3) ACU-A20-N	С	From Face	4.00	0.0000	97.00	No Ice 1/2"	0.08	0.14	0.00
			0.00 1.00			lce	0.12 0.17	0.19 0.25	0.00 0.00
			1.00			1" Ice	0.17	0.23	0.00
						2" Ice 4" Ice	0.67	0.80	0.04
800 EXTERNAL NOTCH	Α	From Face	4.00	0.0000	97.00	No Ice	0.77	0.37	0.01
FILTER			0.00			1/2"	0.89	0.46	0.02
			1.00			Ice	1.02	0.56	0.02
						1" Ice 2" Ice 4" Ice	1.30 1.97	0.79 1.34	0.04 0.11
800 EXTERNAL NOTCH	В	From Face	4.00	0.0000	97.00	No Ice	0.77	0.37	0.01
FILTER			0.00			1/2"	0.89	0.46	0.02
			1.00			Ice	1.02	0.56	0.02
						1" Ice 2" Ice 4" Ice	1.30 1.97	0.79 1.34	0.04 0.11
800 EXTERNAL NOTCH	С	From Face	4.00	0.0000	97.00	No Ice	0.77	0.37	0.01
FILTER			0.00			1/2"	0.89	0.46	0.02
			1.00			Ice	1.02	0.56	0.02
						1" Ice 2" Ice 4" Ice	1.30 1.97	0.79 1.34	0.04 0.11
TD-RRH8x20-25	Α	From Face	4.00	0.0000	97.00	No Ice	4.72	1.70	0.07
10-111110020-20	^	i ioni i ace	0.00	0.0000	31.00	1/2"	5.01	1.70	0.07
			1.00			Ice	5.32	2.15	0.13
						1" Ice	5.95	2.62	0.20
						2" Ice	7.31	3.68	0.40
TD-RRH8x20-25	В	From Face	4.00	0.0000	97.00	4" Ice No Ice	4.72	1.70	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustmen t	Placement		C _A A _A Front	C _A A _A Side	Weight
			Vert ft ft ft	0	ft		ft ²	ft ²	К
			0.00 1.00			1/2" Ice 1" Ice 2" Ice	5.01 5.32 5.95 7.31	1.92 2.15 2.62 3.68	0.10 0.13 0.20 0.40
TD-RRH8x20-25	С	From Face	2.00 0.00 1.00	0.0000	97.00	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40
Transition Ladder	A	From Face	4.00 2.00 -6.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.00 8.00 10.00 14.00 22.00	6.00 8.00 10.00 14.00 22.00	0.16 0.24 0.32 0.48 0.80
6' x 2" Mount Pipe	Α	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
6' x 2" Mount Pipe	В	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
6' x 2" Mount Pipe	С	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
Platform Mount [LP 601-1]	A	None		0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.47 33.59 38.71 48.95 69.43	28.47 33.59 38.71 48.95 69.43	1.12 1.51 1.91 2.69 4.26
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	В	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	С	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
LNX-6515DS-A1M w/ Mount Pipe	Α	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	0.08 0.17 0.27 0.51 1.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustmen t	Placement		C _A A _A Front	C _A A _A Side	Weight
	-		Vert ft ft ft	0	ft		ft ²	ft ²	К
LNX-6515DS-A1M w/ Mount Pipe	В	From Leg	4.00 0.00 1.00	0.0000	83.00	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	0.08 0.17 0.27 0.51 1.15
LNX-6515DS-A1M w/ Mount Pipe	С	From Leg	4.00 0.00 1.00	0.0000	83.00	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	0.08 0.17 0.27 0.51 1.15
ATMAA1412D-1A20	Α	From Leg	4.00 0.00 1.00	0.0000	83.00	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.47 0.57 0.69 0.95 1.57	1.17 1.31 1.47 1.81 2.58	0.01 0.02 0.03 0.06 0.14
ATMAA1412D-1A20	В	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.47 0.57 0.69 0.95 1.57	1.17 1.31 1.47 1.81 2.58	0.01 0.02 0.03 0.06 0.14
ATMAA1412D-1A20	С	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.47 0.57 0.69 0.95 1.57	1.17 1.31 1.47 1.81 2.58	0.01 0.02 0.03 0.06 0.14
RRUS 11 B12	Α	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	В	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	С	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
AIR -32 B2A/B66AA w/ Mount Pipe	Α	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.34 7.87 8.39 9.47 11.76	6.15 7.01 7.80 9.43 12.91	0.15 0.21 0.28 0.44 0.89
AIR -32 B2A/B66AA w/ Mount Pipe	В	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.34 7.87 8.39 9.47 11.76	6.15 7.01 7.80 9.43 12.91	0.15 0.21 0.28 0.44 0.89
AIR -32 B2A/B66AA w/ Mount Pipe	С	From Leg	4.00 0.00 1.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	7.34 7.87 8.39 9.47	6.15 7.01 7.80 9.43	0.15 0.21 0.28 0.44

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustmen t	Placement		C _A A _A Front	C _A A _A Side	Weight
			Vert ft ft ft	0	ft		ft ²	ft ²	K
			<u> </u>			2" Ice 4" Ice	11.76	12.91	0.89
3'x2" Antenna Mount Pipe	Α	From Leg	4.00	0.0000	83.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice 4" Ice	6.50	6.50	0.30
3'x2" Antenna Mount Pipe	В	From Leg	4.00	0.0000	83.00	No Ice	1.90	1.90	0.03
		_	0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice 4" Ice	6.50	6.50	0.30
3'x2" Antenna Mount Pipe	С	From Leg	4.00	0.0000	83.00	No Ice	1.90	1.90	0.03
		•	0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice 4" Ice	6.50	6.50	0.30
Platform Mount [LP 303-1]	Α	None		0.0000	83.00	No Ice	14.66	14.66	1.25
						1/2"	18.87	18.87	1.48
						Ice	23.08	23.08	1.71
						1" Ice	31.50	31.50	2.18
						2" Ice 4" Ice	48.34	48.34	3.10

KS24019-L112A	В	From Face	2.00	0.0000	51.00	No Ice	0.10	0.10	0.01
			0.00			1/2"	0.18	0.18	0.01
			0.00			Ice	0.26	0.26	0.01
						1" Ice	0.42	0.42	0.01
						2" Ice	0.74	0.74	0.02
						4" Ice			
Side Arm Mount [SO 701-	В	From Face	0.00	0.0000	51.00	No Ice	0.85	1.67	0.07
1]			0.00			1/2"	1.14	2.34	0.08
			0.00			Ice	1.43	3.01	0.09
						1" Ice	2.01	4.35	0.12
						2" Ice	3.17	7.03	0.18
						4" Ice			
*									

Load Combinations

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

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

Maximum Member Forces

Sectio	Elevation	Component	Condition	Gov.	Force	Major Axis	Minor Axis
n	ft	Type		Load		Moment	Moment
No.				Comb.	K	kip-ft	kip-ft
L1	120 -	Pole	Max Tension	21	0.00	0.00	0.00
	84.7161						
			Max. Compression	14	-18.54	-0.65	1.05
			Max. Mx	5	-10.57	-346.25	-1.30
			Max. My	2	-10.56	1.51	347.26
			Max. Vy	5	17.38	-346.25	-1.30
			Max. Vx	2	-17.48	1.51	347.26
			Max. Torque	9			1.46
L2	84.7161 - 41.6224	Pole	Max Tension	1	0.00	0.00	0.00
	11.0221		Max. Compression	14	-33.96	-0.79	1.80
			Max. Mx	5	-22.33	-1306.55	-6.01
			Max. My	2	-22.33	6.37	1311.70
			Max. Vv	5	25.38	-1306.55	-6.01
			Max. Vx	2	-25.49	6.37	1311.70
			Max. Torque	6			1.57
L3	41.6224 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-50.97	-0.79	2.84
			Max. Mx	5	-37.25	-2601.38	-11.85
			Max. My	2	-37.25	12.50	2611.91
			Max. Vy	5	29.26	-2601.38	-11.85
			Max. Vx	2	-29.37	12.50	2611.91
			Max. Torque	6	-23.31	12.50	1.77

Maximum Reactions

Location	Condition	Gov.	Vertical	Horizontal, X	Horizontal, 2
		Load	K	K	K
		Comb.			
Pole	Max. Vert	26	50.97	3.57	6.18
	Max. H _x	11	37.27	29.24	0.13
	Max. H _z	2	37.27	0.13	29.35
	Max. M _x	2	2611.91	0.13	29.35
	Max. M _z	5	2601.38	-29.24	-0.13
	Max. Torsion	6	1.77	-25.39	-14.78
	Min. Vert	1	37.27	0.00	0.00

Location	Condition	Gov.	Vertical	Horizontal, X	Horizontal, Z
		Load	Κ	K	Κ
		Comb.			
	Min. H _x	5	37.27	-29.24	-0.13
	Min. H _z	8	37.27	-0.13	-29.35
	Min. M _x	8	-2609.64	-0.13	-29.35
	$Min. M_z$	11	-2600.41	29.24	0.13
	Min. Torsion	12	-1.77	25.39	14.78

Tower Mast Reaction Summary

Dead Only	Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M₂	Torque
Dead Only Dead Holl O deg - No Ice 37.27	Combination	K	K	K			kip-ft
Dead+Wind 0 deg - No Ice	Dead Only		0.00	0.00			0.00
Dead+Wind 30 deg - No loc							1.0
Dead+Wind 60 deg - No loc							0.1
Dead+Wind 90 deg - No Ice							-0.7
Dead+Wind 120 deg - No loc 37.27 25.39 14.78 1315.49 -2259.40 -1.20							-1.4
Dead+Wind 150 deg - No loe Dead+Wind 180 deg - No loe 37.27							-1.7
Dead+Wind 180 deg - No loc Dead+Wind 210 deg - No loc Dead+Wind 210 deg - No loc 37.27							-1.6
Dead+Wind 210 deg							-1.0
Dead+Wind 240 deg - No Ice							-0.1
Dead+Wind 270 deg - No Ice							0.7
Dead+Wind 300 deg							1.4
Dead+Wind 330 deg - No Ice Dead+Wind 30 deg - No Ice Dead+lec+Temp							1.7
Dead+Wind 100	o o						1.6
Dead+Wind 0 So.97 -0.03 -7.11 -645.48 2.05 0	· ·						-0.0
Degat + Wind 30 So.97 So	•						0.2
Dead+Wind 30 So.97 3.52 -6.15 -557.95 -318.47 Obed+g+lce+Temp		50.91	-0.03	-7.11	-043.40	2.03	0.2
Dead+Wind 60 So.97 6.13 -3.53 -321.71 -553.88 -0	•	50.07	2.52	6 1 5	557.05	210 47	0.0
Dead+Wind 60 50.97 6.13 -3.53 -321.71 -553.88 -0		50.97	3.32	-0.13	-557.95	-310.47	0.0
Dead+Wind 90 So.97 7.09 0.03 -0.05 -641.11 -0.04 Dead+Wind 90 So.97 7.09 0.03 -0.05 -641.11 -0.04 Dead+Wind 120 So.97 6.15 3.58 320.83 -556.77 -0.04 Dead+Wind 150 So.97 3.57 6.18 So.496 -323.48 -0.04 Dead+Wind 150 So.97 3.57 6.18 So.496 -323.48 -0.04 Dead+Wind 180 So.97 0.03 7.11 Go.960 -3.73 -0.04 Dead+Wind 210 So.97 -3.52 Go.15 So.207 316.79 -0.04 Dead+Wind 240 So.97 -6.13 3.53 315.82 So.221 0.04 Dead+Wind 270 Dead+Wind 270 So.97 -7.09 -0.03 -5.83 Go.943 O.04 Dead+Wind 300 So.97 -6.15 -3.58 -326.72 So.55.10 Dead+Wind 300 So.97 -3.57 -6.18 -560.84 321.80 O.04 Dead+Wind 300 deg - Service 37.27 -0.04 -10.16 -904.86 4.01 O.04 Dead+Wind 30 deg - Service 37.27 5.02 -8.77 -781.54 -446.74 O.04 Dead+Wind 30 deg - Service 37.27 8.74 -5.04 -449.11 -777.92 -0.04 Dead+Wind 30 deg - Service 37.27 8.78 5.12 454.61 -782.41 -0.04 Service Service Service Service Service Service Service 37.27 5.10 8.82 783.75 -454.52 -0.06 Dead+Wind 150 deg - Service 37.27 5.10 8.82 783.75 -454.52 -0.06 Dead+Wind 150 deg - Service 37.27 5.10 8.82 783.75 -454.52 -0.06 Dead+Wind 150 deg - Service 37.27 5.10 8.82 783.75 -454.52 -0.06 Dead+Wind 150 deg - Service 37.27 5.10 8.82 783.75 -454.52 -0.06 Dead+Wind 150 deg - Service 37.27 5.10 8.82 783.75 -454.52 -0.06 Dead+Wind 150 deg - Service 37.27 5.10 8.82 783.75 -454.52 -0.06 Dead+Wind 150 deg - Service 37.27 5.02 8.77 779.26 445.77 -0.06 Dead+Wind 150 deg - Service 37.27 -5.02 8.77 779.26 445.77 -0.06 Dead+Wind 150 deg - Service 37.27 -5.02 8.77 779.26 445.77 -0.06 Dead+Wind 150 deg - Service 37.27 -5.02 8.77 779.26 445.77 -0.06 Dead+Wind 150 deg - Service 37.27 -5.02 8.77 779.26 445.77 -0.06 Dead+Wind 15	•	E0 07	6.12	2.52	224 74	EE2 00	0.0
Dead+Wind 90		50.97	0.13	-3.53	-321./1	-333.00	-0.2
Dead+Wind 120 50.97 6.15 3.58 320.83 -556.77 -0 -0 -0 -0 -0 -0 -0		F0 07	7.00	0.00	0.05	C44 44	0.4
Dead + Wind 120 50.97 6.15 3.58 320.83 -556.77 -0		50.97	7.09	0.03	-0.05	-041.11	-0.4
Dead+Wind 150 Dead+Wind 150 Dead+Wind 150 Dead+Wind 150 Dead+Wind 180 Dead+Wind 180 Dead+Wind 210 Dead+Wind 210 Dead+Wind 210 Dead+Wind 240 Dead+Wind 240 Dead+Wind 270 Dead+Wind 270 Dead+Wind 300 Dead+Wind 30		50.07	0.45	0.50	000.00	550 77	0.5
Dead+Wind 150 50.97 3.57 6.18 554.96 -323.48 -0 deg+lce+Temp Dead+Wind 180 50.97 0.03 7.11 639.60 -3.73 -0 deg+lce+Temp Dead+Wind 210 50.97 -3.52 6.15 552.07 316.79 -0 deg+lce+Temp Dead+Wind 240 50.97 -6.13 3.53 315.82 552.21 0 deg+lce+Temp Dead+Wind 270 50.97 -7.09 -0.03 -5.83 639.43 0 deg+lce+Temp Dead+Wind 300 50.97 -6.15 -3.58 -326.72 555.10 0 deg+lce+Temp Dead+Wind 330 50.97 -3.57 -6.18 -560.84 321.80 0 deg+lce+Temp Dead+Wind 330 69 - Service 37.27 -0.04 -10.16 -904.86 4.01 0 Dead+Wind 30 deg - Service 37.27 5.02 8.77 -781.54 -446.74 0 Dead+Wind 90 deg - Service 37.27 10.12 0.04 3.36 -900.78 -0 Dead+Wind 120 deg - Service 37.27 5.10 8.82 783.75 -454.52 -0 Service Dead+Wind 180 deg - Service 37.27 5.02 8.77 779.26 445.77 -0 Service Dead+Wind 180 deg - Service 37.27 5.02 8.77 779.26 445.77 -0 Service Dead+Wind 180 deg - Service 37.27 5.02 8.77 779.26 445.77 -0 Dead+Wind 180 deg - Service 37.27 5.02 8.77 779.26 445.77 -0 Dead+Wind 180 deg - Service 37.27 5.02 8.77 779.26 445.77 -0 Dead+Wind 180 deg - Service 37.27 5.02 8.77 779.26 445.77 -0 Dead+Wind 180 deg - 37.27 5.02 8.77 779.26 445.77 -0 Dead+Wind 180 deg - 37.27 5.02 8.77 779.26 445.77 -0 Dead+Wind 180 deg - 37.27 5.02 8.77 779.26 445.77 -0 Dead+Wind 210 deg - 37.27 5.02 8.77 779.26 445.77 -0 Dead+Wind 210 deg - 37.27 5.02 8.77 779.26 445.77 -0 Dead+Wind 220 deg - 37.27 5.02 8.77 779.26 445.77 -0 Dead+Wind 240 deg - 37.27 5.02 8.77 779.26 445.77 -0 Dead+Wind 240 deg - 37.27 5.02 8.77 779.26 445.77 -0 Dead+Wind 240 deg - 37.27 5.02 8.77 779.26 445.77 -0		50.97	6.15	3.58	320.83	-556.77	-0.5
Dead+Wind 180 50.97 0.03 7.11 639.60 -3.73 -0	- 3			0.40		202.42	
Dead+Wind 180 50.97 0.03 7.11 639.60 -3.73 -0 deg+ ce+Temp		50.97	3.57	6.18	554.96	-323.48	-0.4
Dead+Wind 210 S0.97 -3.52 6.15 S52.07 316.79 -0.04							
Dead+Wind 210 50.97 -3.52 6.15 552.07 316.79 -0 deg+ ce+Temp		50.97	0.03	7.11	639.60	-3.73	-0.2
Dead+Wind 240 50.97 -6.13 3.53 315.82 552.21 0							
Dead+Wind 240 50.97 -6.13 3.53 315.82 552.21 0 deg+lce+Temp		50.97	-3.52	6.15	552.07	316.79	-0.0
Dead+Wind 270 S0.97 -7.09 -0.03 -5.83 G39.43 O							
Dead+Wind 270 50.97 -7.09 -0.03 -5.83 639.43 0 deg+lce+Temp Dead+Wind 300 50.97 -6.15 -3.58 -326.72 555.10 0 deg+lce+Temp Dead+Wind 330 50.97 -3.57 -6.18 -560.84 321.80 0 deg+lce+Temp Dead+Wind 0 deg - Service 37.27 -0.04 -10.16 -904.86 4.01 0 Dead+Wind 30 deg - Service 37.27 5.02 -8.77 -781.54 -446.74 0 Dead+Wind 60 deg - Service 37.27 8.74 -5.04 -449.11 -777.92 -0 Dead+Wind 90 deg - Service 37.27 10.12 0.04 3.36 -900.78 -0 Dead+Wind 120 deg - 37.27 8.78 5.12 454.61 -782.41 -0 Service Dead+Wind 150 deg - 37.27 5.10 8.82 783.75 -454.52 -0 Service Dead+Wind 180 deg - 37.27 0.04 10.16 902.58 -4.98 -0 Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service	Dead+Wind 240	50.97	-6.13	3.53	315.82	552.21	0.2
Dead+Wind 300 S0.97 General Structure Solution Solution	deg+lce+Temp						
Dead+Wind 300 50.97 -6.15 -3.58 -326.72 555.10 0 deg+lce+Temp Dead+Wind 330 50.97 -3.57 -6.18 -560.84 321.80 0 deg+lce+Temp Dead+Wind 0 deg - Service 37.27 -0.04 -10.16 -904.86 4.01 0 Dead+Wind 30 deg - Service 37.27 5.02 -8.77 -781.54 -446.74 0 Dead+Wind 60 deg - Service 37.27 10.12 0.04 3.36 -900.78 -0 Dead+Wind 90 deg - Service 37.27 10.12 0.04 3.36 -900.78 -0 Dead+Wind 120 deg - 37.27 8.78 5.12 454.61 -782.41 -0 Service Dead+Wind 150 deg - 37.27 5.10 8.82 783.75 -454.52 -0 Service Dead+Wind 180 deg - 37.27 0.04 10.16 902.58 -4.98 -0 Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 210 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0	Dead+Wind 270	50.97	-7.09	-0.03	-5.83	639.43	0.4
Dead+Wind 330 So.97 -3.57 -6.18 -560.84 321.80 O	deg+lce+Temp						
Dead+Wind 330 50.97 -3.57 -6.18 -560.84 321.80 0 deg+lce+Temp Dead+Wind 0 deg - Service 37.27 -0.04 -10.16 -904.86 4.01 0 Dead+Wind 30 deg - Service 37.27 5.02 -8.77 -781.54 -446.74 0 Dead+Wind 60 deg - Service 37.27 8.74 -5.04 -449.11 -777.92 -0 Dead+Wind 90 deg - Service 37.27 10.12 0.04 3.36 -900.78 -0 Dead+Wind 120 deg - 37.27 8.78 5.12 454.61 -782.41 -0 Service Dead+Wind 150 deg - 37.27 5.10 8.82 783.75 -454.52 -0 Service Dead+Wind 180 deg - 37.27 0.04 10.16 902.58 -4.98 -0 Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service	Dead+Wind 300	50.97	-6.15	-3.58	-326.72	555.10	0.5
deg+Ice+Temp Dead+Wind 0 deg - Service 37.27 -0.04 -10.16 -904.86 4.01 0 Dead+Wind 30 deg - Service 37.27 5.02 -8.77 -781.54 -446.74 0 Dead+Wind 60 deg - Service 37.27 8.74 -5.04 -449.11 -777.92 -0 Dead+Wind 90 deg - Service 37.27 10.12 0.04 3.36 -900.78 -0 Dead+Wind 120 deg - Service 37.27 8.78 5.12 454.61 -782.41 -0 Service Dead+Wind 150 deg - Service 37.27 5.10 8.82 783.75 -454.52 -0 Dead+Wind 180 deg - Service 37.27 0.04 10.16 902.58 -4.98 -0 Service Dead+Wind 210 deg - Service 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - Service 37.27 -8.74 5.04 446.83 776.95 0	deg+lce+Temp						
Dead+Wind 0 deg - Service 37.27 -0.04 -10.16 -904.86 4.01 0 Dead+Wind 30 deg - Service 37.27 5.02 -8.77 -781.54 -446.74 0 Dead+Wind 60 deg - Service 37.27 8.74 -5.04 -449.11 -777.92 -0 Dead+Wind 90 deg - Service 37.27 10.12 0.04 3.36 -900.78 -0 Dead+Wind 120 deg - 37.27 8.78 5.12 454.61 -782.41 -0 Service Dead+Wind 150 deg - 37.27 5.10 8.82 783.75 -454.52 -0 Service Dead+Wind 180 deg - 37.27 0.04 10.16 902.58 -4.98 -0 Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service	Dead+Wind 330	50.97	-3.57	-6.18	-560.84	321.80	0.4
Dead+Wind 30 deg - Service 37.27 5.02 -8.77 -781.54 -446.74 0 Dead+Wind 60 deg - Service 37.27 8.74 -5.04 -449.11 -777.92 -0 Dead+Wind 90 deg - Service 37.27 10.12 0.04 3.36 -900.78 -0 Dead+Wind 120 deg - 37.27 8.78 5.12 454.61 -782.41 -0 Service Dead+Wind 150 deg - 37.27 5.10 8.82 783.75 -454.52 -0 Service Dead+Wind 180 deg - 37.27 0.04 10.16 902.58 -4.98 -0 Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service	deg+lce+Temp						
Dead+Wind 30 deg - Service 37.27 5.02 -8.77 -781.54 -446.74 0 Dead+Wind 60 deg - Service 37.27 8.74 -5.04 -449.11 -777.92 -0 Dead+Wind 90 deg - Service 37.27 10.12 0.04 3.36 -900.78 -0 Dead+Wind 120 deg - 37.27 8.78 5.12 454.61 -782.41 -0 Service Dead+Wind 150 deg - 37.27 5.10 8.82 783.75 -454.52 -0 Service Dead+Wind 180 deg - 37.27 0.04 10.16 902.58 -4.98 -0 Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service	Dead+Wind 0 deg - Service	37.27	-0.04	-10.16	-904.86	4.01	0.3
Dead+Wind 90 deg - Service 37.27 10.12 0.04 3.36 -900.78 -0 Dead+Wind 120 deg - 37.27 8.78 5.12 454.61 -782.41 -0 Service Dead+Wind 150 deg - 37.27 5.10 8.82 783.75 -454.52 -0 Service Dead+Wind 180 deg - 37.27 0.04 10.16 902.58 -4.98 -0 Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service	Dead+Wind 30 deg - Service	37.27	5.02	-8.77	-781.54	-446.74	0.0
Dead+Wind 90 deg - Service 37.27 10.12 0.04 3.36 -900.78 -0 Dead+Wind 120 deg - 37.27 8.78 5.12 454.61 -782.41 -0 Service Dead+Wind 150 deg - 37.27 5.10 8.82 783.75 -454.52 -0 Service Dead+Wind 180 deg - 37.27 0.04 10.16 902.58 -4.98 -0 Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service	· ·						-0.2
Dead+Wind 120 deg - 37.27 8.78 5.12 454.61 -782.41 -0 Service Dead+Wind 150 deg - 37.27 5.10 8.82 783.75 -454.52 -0 Service Dead+Wind 180 deg - 37.27 0.04 10.16 902.58 -4.98 -0 Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service	•						-0.5
Service Dead+Wind 150 deg - 37.27 5.10 8.82 783.75 -454.52 -0 Service Dead+Wind 180 deg - 37.27 0.04 10.16 902.58 -4.98 -0 Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service	<u> </u>						-0.6
Dead+Wind 150 deg - 37.27 5.10 8.82 783.75 -454.52 -0 Service Dead+Wind 180 deg - 37.27 0.04 10.16 902.58 -4.98 -0 Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service	· ·	01.21	0.70	0.12	101.01	702.11	0.0
Service Dead+Wind 180 deg - 37.27 0.04 10.16 902.58 -4.98 -0 Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service		37 27	5 10	8 82	783 75	-454 52	-0.5
Dead+Wind 180 deg - 37.27 0.04 10.16 902.58 -4.98 -0 Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service	•	01.21	0.10	0.02	700.70	404.02	0.0
Service Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service		37 27	0 04	10 16	QN2 58	_1 02	-0.3
Dead+Wind 210 deg - 37.27 -5.02 8.77 779.26 445.77 -0 Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service	· ·	31.21	0.04	10.10	302.30	-7.30	-0.3
Service Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service		37 27	5.02	Q 77	770.26	115 77	0.0
Dead+Wind 240 deg - 37.27 -8.74 5.04 446.83 776.95 0 Service	· ·	31.21	-5.02	0.11	119.20	440.77	-0.0
Service		27.07	0.74	E 0.4	446.00	776 05	0.0
	•	31.21	-8.74	5.04	440.83	770.95	0.2
Dead+wind 270 deg - 37.27 -10.12 -0.04 -5.63 899.81 0		27.07	10.10	0.04	F 00	000.04	٥.
Service	S	31.21	-10.12	-0.04	-5.63	899.81	0.5

Load Combination	Vertical	Shear _x	Shearz	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 300 deg - Service	37.27	-8.78	-5.12	-456.89	781.44	0.61
Dead+Wind 330 deg - Service	37.27	-5.10	-8.82	-786.03	453.55	0.56

Solution	Summary
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	Sun	n of Applied Force	25		Sum of Reactio	ns	
Load	PX PX	PY	PZ	PX	PY	PZ	% Erro
Comb.	K	K	ĸ	K	K	K	70 =
1	0.00	-37.27	0.00	0.00	37.27	0.00	0.000%
2	-0.13	-37.27	-29.35	0.13	37.27	29.35	0.0009
3	14.51	-37.27	-25.35	-14.51	37.27	25.35	0.0009
4	25.26	-37.27	-14.56	-25.26	37.27	14.56	0.000
5	29.24	-37.27	0.13	-29.24	37.27	-0.13	0.000
6	25.39	-37.27	14.78	-25.39	37.27	-14.78	0.000
7	14.73	-37.27	25.48	-14.73	37.27	-25.48	0.000
8	0.13	-37.27	29.35	-0.13	37.27	-29.35	0.000
9	-14.51	-37.27	25.35	14.51	37.27	-25.35	0.000
10	-25.26	-37.27	14.56	25.26	37.27	-14.56	0.000
11	-29.24	-37.27	-0.13	29.24	37.27	0.13	0.000
12	-25.39	-37.27	-14.78	25.39	37.27	14.78	0.000
13	-14.73	-37.27	-25.48	14.73	37.27	25.48	0.000
14	0.00	-50.97	0.00	0.00	50.97	0.00	0.000
15	-0.03	-50.97	-7.11	0.03	50.97	7.11	0.000
16	3.52	-50.97	-6.15	-3.52	50.97	6.15	0.000
17	6.13	-50.97	-3.53	-6.13	50.97	3.53	0.000
18	7.09	-50.97	0.03	-7.09	50.97	-0.03	0.000
19	6.15	-50.97	3.58	-6.15	50.97	-3.58	0.000
20	3.57	-50.97	6.18	-3.57	50.97	-6.18	0.000
21	0.03	-50.97	7.11	-0.03	50.97	-7.11	0.000
22	-3.52	-50.97	6.15	3.52	50.97	-6.15	0.000
23	-6.13	-50.97	3.53	6.13	50.97	-3.53	0.000
24	-7.09	-50.97	-0.03	7.09	50.97	0.03	0.000
25	-6.15	-50.97	-3.58	6.15	50.97	3.58	0.000
26	-3.57	-50.97	-6.18	3.57	50.97	6.18	0.000
27	-0.04	-37.27	-10.16	0.04	37.27	10.16	0.000
28	5.02	-37.27	-8.77	-5.02	37.27	8.77	0.000
29	8.74	-37.27	-5.04	-8.74	37.27	5.04	0.000
30	10.12	-37.27	0.04	-10.12	37.27	-0.04	0.000
31	8.78	-37.27	5.12	-8.78	37.27	-5.12	0.000
32	5.10	-37.27	8.82	-5.10	37.27	-8.82	0.000
33	0.04	-37.27	10.16	-0.04	37.27	-10.16	0.000
34	-5.02	-37.27	8.77	5.02	37.27	-8.77	0.000
35	-8.74	-37.27	5.04	8.74	37.27	-5.04	0.000
36	-10.12	-37.27	-0.04	10.12	37.27	0.04	0.0009
37	-8.78	-37.27	-5.12	8.78	37.27	5.12	0.0009
38	-5.10	-37.27	-8.82	5.10	37.27	8.82	0.000

Non-Linear Convergence Results

Load	Converged?	Number	Displacement	Force
Combination		of Cycles	Tolerance	Tolerance
1	Yes	4	0.0000001	0.0000001
2	Yes	4	0.0000001	0.00010504
3	Yes	5	0.0000001	0.00003546
4	Yes	5	0.0000001	0.00003525
5	Yes	4	0.0000001	0.00009177
6	Yes	5	0.0000001	0.00003393
7	Yes	5	0.0000001	0.00003765
8	Yes	4	0.0000001	0.00014128
9	Yes	5	0.0000001	0.00003412

10	Yes	5	0.0000001	0.00003429
11	Yes	4	0.0000001	0.00012847
12	Yes	5	0.0000001	0.00003759
13	Yes	5	0.0000001	0.00003391
14	Yes	4	0.0000001	0.0000001
15	Yes	4	0.0000001	0.00046471
16	Yes	4	0.0000001	0.00050905
17	Yes	4	0.0000001	0.00050796
18	Yes	4	0.0000001	0.00046184
19	Yes	4	0.0000001	0.00050754
20	Yes	4	0.0000001	0.00051060
21	Yes	4	0.0000001	0.00045968
22	Yes	4	0.0000001	0.00050070
23	Yes	4	0.0000001	0.00050035
24	Yes	4	0.0000001	0.00045947
25	Yes	4	0.0000001	0.00051223
26	Yes	4	0.0000001	0.00051056
27	Yes	4	0.0000001	0.00002163
28	Yes	4	0.0000001	0.00010224
29	Yes	4	0.0000001	0.00010068
30	Yes	4	0.0000001	0.00001952
31	Yes	4	0.0000001	0.00009093
32	Yes	4	0.0000001	0.00011493
33	Yes	4	0.0000001	0.00002353
34	Yes	4	0.0000001	0.00009315
35	Yes	4	0.0000001	0.00009408
36	Yes	4	0.0000001	0.00002145
37	Yes	4	0.0000001	0.00011439
38	Yes	4	0.0000001	0.00009097

Maximum Tower Deflections - Service Wind

Section	Elevation	Horz.	Gov.	Tilt	Twist
No.		Deflection	Load		
	ft	in	Comb.	0	0
L1	120 - 84.7161	14.531	38	0.9811	0.0026
L2	89.2839 - 41.6224	8.464	38	0.8653	0.0015
L3	47.3776 - 0	2.420	38	0.4673	0.0005

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load	Deflection	Tilt	Twist	Radius of Curvature
ft		Comb.	in	0	0	ft
120.00	Lighting Rod 3/4" x 3'	38	14.531	0.9811	0.0026	52643
118.00	7770.00 w/ Mount Pipe	38	14.122	0.9759	0.0025	52643
116.00	TME-RRUS-11	38	13.713	0.9707	0.0024	52643
108.00	(4) 844G65VTZASX w/ Mount Pipe	38	12.088	0.9485	0.0021	21934
100.00	TME-800MHZ RRH	38	10.498	0.9203	0.0018	13160
97.00	P40-16-XLPP-RR-A w/ Mount Pipe	38	9.916	0.9072	0.0016	11443
83.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	38	7.341	0.8210	0.0013	7458
51.00	KS24019-L112A	38	2.784	0.5059	0.0006	4480

Maximum Tower Deflections -	Design	Wind
------------------------------------	--------	------

Section No.	Elevation	Horz. Deflection	Gov. Load	Tilt	Twist
740.	ft	in	Comb.	0	٥
L1	120 - 84.7161	41.929	13	2.8328	0.0074
L2	89.2839 - 41.6224	24.425	13	2.4973	0.0042
L3	47.3776 - 0	6.987	13	1.3490	0.0015

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load	Deflection	Tilt	Twist	Radius of Curvature
ft		Comb.	in	0	0	ft
120.00	Lighting Rod 3/4" x 3'	13	41.929	2.8328	0.0074	18386
118.00	7770.00 w/ Mount Pipe	13	40.749	2.8181	0.0072	18386
116.00	TME-RRUS-11	13	39.569	2.8032	0.0069	18386
108.00	(4) 844G65VTZASX w/ Mount	13	34.882	2.7388	0.0060	7660
	Pipe					
100.00	TME-800MHZ RRH	13	30.295	2.6566	0.0051	4595
97.00	P40-16-XLPP-RR-A w/ Mount Pipe	13	28.615	2.6187	0.0047	3995
83.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	13	21.186	2.3691	0.0038	2598
51.00	KS24019-L112A	13	8.036	1.4604	0.0017	1554

Compression Checks

	Pole Design Data										
Section No.	Elevation	Size	L	Lu	KI/r	Fa	Α	Actual P	Allow. P _a	Ratio P	
	ft		ft	ft		ksi	in ²	K	K	Pa	
L1	120 - 84.7161 (1)	TP32.5458x24.09x0.375	35.28	0.00	0.0	39.000	36.9884	-10.56	1442.55	0.007	
L2	84.7161 - 41.6224 (2)	TP42.0347x30.7011x0.437 5	47.66	0.00	0.0	39.000	55.8625	-22.33	2178.64	0.010	
L3	41.6224 - 0 (3)	TP51x39.7912x0.5	47.38	0.00	0.0	39.000	80.1435	-37.25	3125.60	0.012	

Pole Bending Design Data

Section	Elevation	Size	Actual	Actual	Allow.	Ratio	Actual	Actual	Allow.	Ratio
No.			M_{x}	f_{bx}	F_{bx}	f_{bx}	M_y	f_{by}	F_{by}	f_{by}
	ft		kip-ft	ksi	ksi	F_{bx}	kip-ft	ksi	ksi	F _{by}
L1	120 - 84.7161 (1)	TP32.5458x24.09x0.375	348.40	14.802	39.000	0.380	0.00	0.000	39.000	0.000
L2	84.7161 - 41.6224 (2)	TP42.0347x30.7011x0.43 75	1316.0 8	28.565	39.000	0.732	0.00	0.000	39.000	0.000
L3	41.6224 - 0	TP51x39.7912x0.5	2620.2 8	31.548	39.000	0.809	0.00	0.000	39.000	0.000

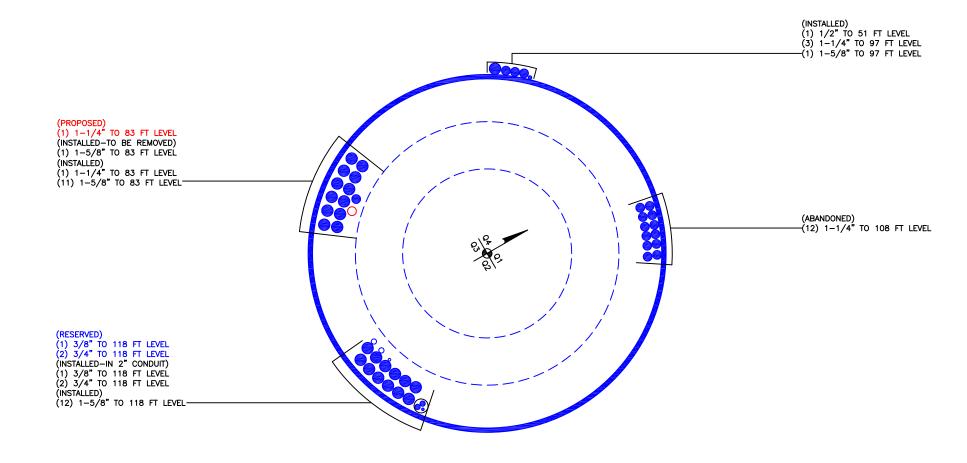
	Pole Shear Design Data									
Section No.	Elevation ft	Size	Actual V K	Actual f _v ksi	Allow. F _v ksi	Ratio f _v	Actual T kip-ft	Actual f _{vt} ksi	Allow. F _{vt} ksi	Ratio f _{vt}
L1	120 - 84.7161 (1)	TP32.5458x24.09x0.375	17.55	0.475	26.000	0.036	1.29	0.027	26.000	0.001
L2	84.7161 - 41.6224 (2)	TP42.0347x30.7011x0.43 75	25.57	0.458	26.000	0.035	1.49	0.016	26.000	0.001
L3	41.6224 - 0 (3)	TP51x39.7912x0.5	29.45	0.368	26.000	0.028	1.60	0.009	26.000	0.000

Section No.	Elevation	Ratio P	Ratio f _{bx}	Ratio f _{by}	Ratio f _v	Ratio f _{vt}	Comb. Stress	Allow. Stress	Criteria
	ft	Pa	F_{bx}	F _{by}	F_{v}	- F _{vt}	Ratio	Ratio	
L1	120 - 84.7161 (1)	0.007	0.380	0.000	0.036	0.001	0.387	1.333	H1-3+VT 🗸
L2	84.7161 - 41.6224 (2)	0.010	0.732	0.000	0.035	0.001	0.743	1.333	H1-3+VT 🗸
L3	41.6224 - 0 (3)	0.012	0.809	0.000	0.028	0.000	0.821	1.333	H1-3+VT 🖊

Section Capacity Table								
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
L1	120 - 84.7161	Pole	TP32.5458x24.09x0.375	1	-10.56	1922.92	29.0	Pass
L2	84.7161 - 41.6224	Pole	TP42.0347x30.7011x0.4375	2	-22.33	2904.13	55.7	Pass
L3	41.6224 - 0	Pole	TP51x39.7912x0.5	3	-37.25	4166.42	61.6	Pass
							Summary	
						Pole (L3)	61.6	Pass
						RATING =	61.6	Pass

APPENDIX B BASE LEVEL DRAWING





APPENDIX C ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#: 881536 Site Name: NORTH HAVEN TOWER

App #: 343401 Rev. 0

Pole Manufacturer: Other

Reactions		
Moment:	2620	ft-kips
Axial:	37	kips
Shear:	29	kips

If No	stiffeners,	Criteria:

AISC ASD

<-Only Applcable to Unstiffened Cases

Anchor Rod Data					
Qty:	20				
Diam:	2.25	in			
Rod Material:	A615-J				
Strength (Fu):	100	ksi			
Yield (Fy):	75	ksi			
Bolt Circle:	60	lin			

Plate Data				
Diam:	66	in		
Thick:	2.25	in		
Grade:	60	ksi		
Single-Rod B-eff:	8.09	in		

Stiffener Data (Stiffener Data (Welding at both sides)				
Config:	0	*			
Weld Type:					
Groove Depth:		< Disregard			
Groove Angle:		< Disregard			
Fillet H. Weld:		in			
Fillet V. Weld:		in			
Width:		in			
Height:		in			
Thick:		in			
Notch:		in			
Grade:		ksi			
Weld str.:		ksi			

Anchor Rod Results		
Maximum Rod Tension:		
Allowable Tension:		
Anchor Rod Stress Ratio:		

195.0 Kips 52.8% Pass

102.9 Kips

Rigid		
Service, ASD		
Fty*ASIF		

Base Plate ResultsFlexural CheckBase Plate Stress:41.4 ksiAllowable Plate Stress:60.0 ksiBase Plate Stress Ratio:69.1% Pass

Rigid		
Service ASD		
0.75*Fy*ASIF		
Y.L. Length:		
31.61		

<u>n/a</u>

Stiffener Results

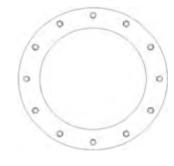
Horizontal Weld: n/a
Vertical Weld: n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2: n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2: n/a
Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data				
Diam:	51	in		
Thick:	0.5	in		
Grade:	65	ksi		
# of Sides:	18	"0" IF Round		
Fu	80	ksi		
Reinf. Fillet Weld	0	"0" if None		

Stress Increase Factor				
ASIF:	1.333			





CCIplate v2.0 Analysis Date: <u>5/6/2016</u>

^{* 0 =} none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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

CCIFTS 1.2.108.14286 - Phase 1-2 Date: 5/5/2016

BU:	881536	
Site Name:	NORTH HAVEN TOWER	
App Number:	343401 Rev. 0	
Work Order:	12229954	

39 ft



Monopole Drilled Pier

Input
Criteria
TIA Revision: F
ACI 318 Revision: 2002
Seismic Category: B

 Forces
 37 kips

 Compression
 37 kips

 Shear
 28 kips

 Moment
 2620 k-ft

 Swelling Force
 0 kips

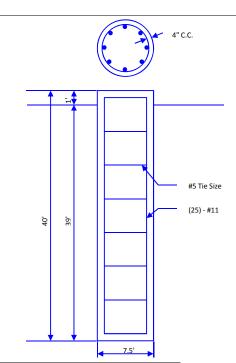
Foundation Dimensions
Pier Diameter: 7.5 ft
Ext. above grade: 1 ft

Depth below grade:

Material Properties

Number of Rebar: 25
Rebar Size: 11
Tie Size 5
Rebar tensile strength: 60 ksi
Concrete Strength: 4000 psi
Ultimate Concrete Strain
Clear Cover to Ties: 4 in

Soil Profile: 1



Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Skin Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
3.75	0	3.75	120	0	0	0	0	0	
1.25	3.75	5	120	0	32	0	0	0	
2	5	7	120	0	32	1.4	1.4	0	
32	7	39	60	0	32	1.4	1.4	16	
	(ft) 3.75 1.25 2	(ft) (ft) 3.75 0 1.25 3.75 2 5	(ft) (ft) (ft) 3.75 0 3.75 1.25 3.75 5 2 5 7	(ft) (ft) (ft) (pcf) 3.75 0 3.75 120 1.25 3.75 5 120 2 5 7 120	(ft) (ft) (ft) (pcf) (psf) 3.75 0 3.75 120 0 1.25 3.75 5 120 0 2 5 7 120 0	Thickness (ft) From (ft) To (ft) Unit Weight (pcf) Cohesion (psf) Angle (deg) 3.75 0 3.75 120 0 0 1.25 3.75 5 120 0 32 2 5 7 120 0 32	Thickness (ft) From (ft) To (ft) Unit Weight (pcf) Cohesion (psf) Friction (deg) Priction (ksf) 3.75 0 3.75 120 0 0 0 1.25 3.75 5 120 0 32 0 2 5 7 120 0 32 1.4	Thickness (ft) From (ft) To (ft) Unit Weight (pcf) Cohesion (psf) Angle (deg) Friction (ksf) Friction (ksf) Friction (ksf) Friction (ksf) Friction (ksf) O (ksf)<	Thickness (ft) From (ft) To (ft) Unit Weight (pcf) Cohesion (psf) Home (psf) Friction (deg) Uplift Skin (priction (Friction (Psriction (ksf))) Bearing (Capacity (ksf)) 3.75 0 3.75 120 0 0 0 0 0 1.25 3.75 5 120 0 32 0 0 0 2 5 7 120 0 32 1.4 1.4 0

Analysis Results

Soil Lateral Capacity

 Depth to Zero Shear:
 8.98 ft

 Max Moment, Mu:
 2858.39 k-ft

 Soil Safety Factor:
 10.13

 Safety Factor Req'd:
 2

 RATING:
 19.7%

Soil Axial Capacity

 Skin Friction (k):
 560.77 kips

 End Bearing (k):
 353.43 kips

 Comp. Capacity (k), φCn:
 914.20 kips

 Comp. (k), Cu:
 48.10 kips

 RATING:
 5.3%

Concrete/Steel Check

Mu (from soil analysis) 3715.91 k-ft φMn 6738.18 k-ft RATING: 55.1%

rho provided 0.61
rho required 0.33 OK

Rebar Spacing 8.56
Spacing required 22.56 OK

Dev. Length required 29.69
Dev. Length provided 53.51 OK

Overall Foundation Rating: 55.1%

ASCE 7 Windspeed

ASCE 7 Ground Snow Load

Related Resources

Sponsors

About ATC

Contact

Search Results

Query Date: Wed May 04 2016

Latitude: 41.3444 Longitude: -72.8708

ASCE 7-10 Windspeeds (3-sec peak gust in mph*):

Risk Category I: 115 Risk Category II: 125 Risk Category III-IV: 135 MRI** 10-Year: 77 MRI** 25-Year: 87 MRI** 50-Year: 94 MRI** 100-Year: 101

ASCE 7-05 Windspeed: 111 (3-sec peak gust in mph) ASCE 7-93 Windspeed: 82 (fastest mile in mph)

*Miles per hour **Mean Recurrence Interval

QUEBEC INESOTA ILLINOIS oPhiladelphia INDIANA MDDENJ MISSOURI KENTUCKY VIRGINIA
TENNESSEE NORTH
CAROLINA SSIPPI SOUTH CAROLINA MISSISSIPPI Google FLORIDA Map data ©2016 Google, INEGI

Users should consult with local building officials to determine if there are community-specific wind speed requirements that govern.



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Exhibit E



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

T-Mobile Existing Facility

Site ID: CTNH037A

CTNH037/Candid N. Haven 120 Universal Drive North Haven, CT 06473

June 8, 2016

EBI Project Number: 6216002746

Site Compliance Summary				
Compliance Status:	COMPLIANT			
Site total MPE% of FCC general public allowable limit:	78.36 %			



June 8, 2016

T-Mobile USA Attn: Jason Overbey, RF Manager 35 Griffin Road South Bloomfield, CT 06002

Emissions Analysis for Site: CTNH037A – CTNH037/Candid N. Haven

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **120 Universal Drive**, **North Haven**, **CT**, 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μ W/cm²). The number of μ W/cm² calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter (μ W/cm²). The general population exposure limit for the 700 MHz Band is approximately 467 μ W/cm², and the general population exposure limit for the PCS and AWS bands is 1000 μ W/cm². 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 **120 Universal Drive, North Haven, CT**, 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 manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

- 1) 2 GSM 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.
- 2) 2 UMTS channels (PCS Band 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 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.
- 4) 2 LTE channels (PCS Band 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 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 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.



- 7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 8) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antennas used in this modeling are the Ericsson AIR32 B2A/B66Aa & Ericsson AIR21B2A/B4P for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the Commscope LNX-6515DS-VTM for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The Ericsson AIR32 B2A/B66Aa & Ericsson AIR21B2A/B4P have a maximum gain of 15.9 dBd at their main lobe at 1900 MHz and 2100 MHz. The Commscope LNX-6515DS-VTM has a maximum gain of 14.6 dBd at its main lobe at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 10) The antenna mounting height centerline of the proposed antennas is **83 feet** above ground level (AGL).
- 11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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



T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	В	Sector:	С
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR32 B2A/B66Aa	Make / Model:	Ericsson AIR32 B2A/B66Aa	Make / Model:	Ericsson AIR32 B2A/B66Aa
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	83	Height (AGL):	83	Height (AGL):	83
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	9,337.08	ERP (W):	9,337.08	ERP (W):	9,337.08
Antenna A1 MPE%	5.66	Antenna B1 MPE%	5.66	Antenna C1 MPE%	5.66
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	83	Height (AGL):	83	Height (AGL):	83
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	7,002.81	ERP (W):	7,002.81	ERP (W):	7,002.81
Antenna A2 MPE%	4.25	Antenna B2 MPE%	4.25	Antenna C2 MPE%	4.25
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX- 6515DS-VTM	Make / Model:	Commscope LNX- 6515DS-VTM	Make / Model:	Commscope LNX- 6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	83	Height (AGL):	83	Height (AGL):	83
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	1.12	Antenna B3 MPE%	1.12	Antenna C3 MPE%	1.12

Site Composite MPE%				
Carrier	MPE%			
T-Mobile (Per Sector Max)	11.03 %			
MetroPCS	24.20 %			
Sprint	12.96 %			
Nextel	6.29 %			
AT&T	23.88 %			
Site Total MPE %:	78.36 %			

T-Mobile Sector 1 Total:	11.03 %
T-Mobile Sector 2 Total:	11.03 %
T-Mobile Sector 3 Total:	11.03 %
Site Total:	78.36 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	2	2334.27	83	28.31	2100	1000	2.83 %
T-Mobile 2100 MHz (AWS) LTE	2	2334.27	83	28.31	2100	1000	2.83 %
T-Mobile 1900 MHz (PCS) GSM	2	1167.14	83	14.15	1900	1000	1.42 %
T-Mobile 1900 MHz (PCS) UMTS	2	1167.14	83	14.15	1900	1000	1.42 %
T-Mobile 2100 MHz (AWS) UMTS	2	1167.14	83	14.15	2100	1000	1.42 %
T-Mobile 700 MHz LTE	1	865.21	83	5.25	700	467	1.12 %
						Total: *	11.03 %



Summary

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

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

T-Mobile Sector	Power Density Value (%)		
Sector 1:	11.03 %		
Sector 2:	11.03 %		
Sector 3:	11.03 %		
T-Mobile Per Sector	11.03 %		
Maximum:			
Site Total:	78.36 %		
Site Compliance Status:	COMPLIANT		

The anticipated composite MPE value for this site assuming all carriers present is **78.36%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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