NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

December 28, 2016

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

RE: Notice of Exempt Modification
26 So. Orange Center Road, Orange CT 06477
Latitude: 41.25572
Longitude: -73.01082
T-Mobile Site#: CT11720A_L1900

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 145.5-foot level of the existing 177-foot monopole at 26 So. Orange Center Road, Orange CT 06477. The tower is owned by the Town of Orange. The property is owned by the Town of Orange. 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 145.5-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) 1-5/8" Hybrid Cable

Existing to Remain:
(3)AIR21 B2A /B4P
(3) Commscope LNX-6515 Antenna
(3) RRUS11 B12
(3) Twin TMA
(12) 1-5/8" Coax
(1) 1-5/8" Hybrid

This facility was approved by the Connecticut Siting Council. Tower Share No.TS-T-MOBILE-107-050713: T-Mobile received approval to locate on the tower at the 148-foot level. Please note a mapping was performed on this tower. Tower height and RAD centers were confirmed. Please see attached.

NORTHEAST SITE SOLUTIONS

Turnkey Wireless Development

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.SA. § 16-SOj-73, a copy of this letter is being sent to First Selectman James Zeoli, Elected Official for the Town of Orange, 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: James Zeoli- First Selectman - as elected official
Town of Orange - as tower owner
Town of Orange - as property owner

Exhibit A

T-Mobile®

CT11720A-26 S Orange

TS-T-MOBILE-107-050713

July 13, 2005

BY HAND

Pamela B. Katz, Chairman and
Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Tower Sharing Request by T-Mobile
Municipal Tower Facility - Orange
South Orange Center Road, Orange, CT
Latitude: 41-15-19 / Longitude 73-00-41:

Dear Ms. Katz and Members of the Siting Council:

Pursuant to Connecticut General Statutes (C.G.S.) § 16-50aa, T-Mobile USA, Inc. acting through its wholly owned subsidiary Omnipoint Communications, Inc. ("T-Mobile") hereby requests an order from the Connecticut Siting Council ("Council") to approve the proposed shared use of a municipal communications tower, located at South Orange Center Road in the Town of Orange ("Town of Orange Facility"), owned by the Town of Orange ("Tower Owner"). T-Mobile and the Tower Owner have agreed to the shared use of the Town of Orange Facility, as detailed below.

TOWN OF ORANGE FACILITY

The Town of Orange Facility consists of a one hundred eighty (180) foot high monopole tower ("Tower"). T-Mobile will be at a mounting height of One Hundred Forty Eight (148') feet. A chain link fence surrounds the Town of Orange Facility. AT&T is approved to locate at the One Hundred Seventy Eight (178) foot level, Nextel at the One Hundred Thirty Eight (138) foot level, Sprint at the One Hundred Twenty Eight (128) foot level and Verizon at the One Hundred Eighteen (118) foot level.

T-Mobile USA, Inc.
Office: (860) 692-7100
Fax: (860) 692-7159
100 Filley Street
Bloomfield, CT 06002

T-MOBILE FACILITY

As shown on the enclosed plans prepared by Diversified Technology Consultants, including a site plan and tower elevation of the Town of Orange Facility, annexed hereto as Exhibit A, T-Mobile proposes a shared use of the Facility by placing antennas on the Tower and equipment needed to provide personal communications services ("PCS") within the existing fenced compound. T-Mobile will install up to nine (9) antennas at approximately the One Hundred Forty Eight (148) foot level of the Tower. Associated unmanned equipment cabinets will be located on a concrete pad near the base of the tower within the existing compound.

Connecticut General Statutes § 16-50aa provides that, upon written request for shared use approval, an order approving such use shall be issued, "if the council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns." (C.G.S. § 16-50aa(c)(1).) Further, upon approval of such shared use, it is exclusive and no local zoning or land use approvals are required C.G.S. §16-50x. Shared use of the Town of Orange Facility satisfies the approval criteria set forth in C.G.S. § 16-50aa as follows:

A. Technical Feasibility The existing Tower and compound were designed to accommodate multiple carriers. A structural analysis of the Tower with multiply carriers has been performed and is attached as Exhibit B. The structural analysis concludes that the existing tower can safely accommodate the proposed T-Mobile antennas. The proposed shared use of this Tower is technically feasible. Further there is sufficient room in the fenced compound for our facility, thus the site plan will not have to be altered.

B. Legal Feasibility Pursuant to C.G.S. § 16-50aa, the Council has been authorized to issue an order approving shared use of the Facility. (C.G.S. § 16-50aa (C)(1)). Under the authority vested in the Council by C.G.S. § 16-50aa, an order by the Council approving the shared use of a tower would permit the Applicant to obtain a building permit for the proposed installation.

C. Environmental Feasibility The proposed shared use would have a minimal environmental effect, for the following reasons:

1.) The proposed installation would have a de minimis visual impact, and would not cause any significant change or alteration in the physical or environmental characteristics of the existing facility;

2.) The proposed installation by T-Mobile would not increase the height of the tower or extend the boundaries of the Town of Orange Facility;

3.) The proposed installation would not increase the noise levels at the existing facility boundaries by six decibels or more;

4.) Operation of T-Mobile's antennas at this site would not exceed the total radio frequency electromagnetic radiation power density level adopted by the FCC and Connecticut Department of Health. The "worst case" exposure calculated for the operation of this facility for all carriers, would be approximately 30.5% of the standard. See Cumulative Emissions Compliance Report dated February, 2004, prepared by Hassan Syed, T-Mobile Radio Frequency Engineer, annexed hereto as Exhibit C;

5.) The proposed shared use of the Town of Orange Facility would not require any water or sanitary facilities, or generate any air emissions or discharges to water bodies. Further, the installation will not generate any traffic other than for periodic maintenance visits.

D. Economic Feasibility The Applicant and the tower owner have agreed to share use of the Town of Orange Facility on terms agreeable to both parties. The proposed tower sharing is therefore economically feasible.

E. Public Safety As stated above and evidenced in the Cumulative Emissions Compliance Report annexed hereto as Exhibit C, the operation of T-Mobile's antennas at this site would not exceed the total radio frequency electromagnetic radiation power density level adopted by the FCC and Connecticut Department of Health. Further, the addition of T-Mobile's telecommunications service in the Orange area through shared use of the Town of Orange Facility is expected to enhance the safety and welfare of local residents and travelers through the area resulting in an improvement to public safety in this area.

Conclusion

As delineated above, the proposed shared use of the Town of Orange Facility satisfies the criteria set forth in C.G.S. § 16-50aa, and advances the General Assembly's and the Siting Council's goal of preventing the proliferation of tower in the State of Connecticut. T-Mobile therefore requests the Siting Council issue an order approving the proposed shared use of the Town of Orange Facility.

Respectfully submitted,

Christine Farrell
T-Mobile
100 Filley St.
Bloomfield, CT 06002
(860) 6794-6427

cc: Mitchell Goldblatt, First Selectman

Exhibit B

Property Location: 100 RED CEDAR RD | MAP ID: 13/ 7/ 1A/ / | Bldg Name: | State Use: 512E

Vision ID: 555 | Account #34500 | Bldg #: 1 of 1 | Sec #: 1 of 1 | Card 1 of 1 | Print Date: 06/13/2016 09:43

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION
ORANGE TOWN OF	1 Level	1 All Public	1 Paved	1 Average
TOWN DUMP AND OTHER TOWN OV		2 Water	2 Private	3 3
617 ORANGE CENTER RD		7 Septic		0 N/A
ORANGE, CT 06477				
Additional Owners:				

SUPPLEMENTAL DATA

Other ID:	13-7-1A	CB	
Class	EXEMPT	DM	
Type	Commercial	Builder's lo	
Nbhd	Town	SFLA	46959
Zoning	Residential	Lot Size	43.3
Census	1572		
GIS ID: 13-7-1A		ASSOC PID#	

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
EX VC R L	51	3,092,900	2,165,000
EX VC OTB	55	12,900	9,000
	Total	3,105,800	2,174,000

6108
Orange, CT

VISION

RECORD OF OWNERSHIP	BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.
ORANGE TOWN OF	232/ 655	02/11/1971	Q		0	00

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2015	51	2,165,000	2015	51	2,165,000	2014	51	2,165,000
2015	55	9,000	2015	55	9,000	2014	55	9,000
	Total:	2,174,000		Total:	2,174,000		Total:	2,174,000

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

This signature acknowledges a visit by a Data Collector or Assessor

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	0
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	12,900
Appraised Land Value (Bldg)	3,092,900
Special Land Value	0
Total Appraised Parcel Value	3,105,800
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	3,105,800

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A				

NOTES

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments
1963	04/27/2016	BP	Permit	20,000		0		ATT PROPOSES TO SV
1339	11/19/2014	BP	Permit	20,000		0		3 NEW ANTENNAS MC
1242	10/29/2014	BP	Permit	15,000		0		MODIFY EXISTING TE
1264	10/02/2014	BP	Permit	20,000		0		CHANGE OUT (3) ANT
891	10/23/2013	BP	Permit	1,700,000		0		OVERHAUL BUILDIN(

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
08/27/2013	6	6	MBB	99	Vacant Land - Inspected
08/16/2012			ES	00	Measure & Listed

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units	Unit Price	I. Factor	S.A.		C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing Spec Use	Special Pricing Spec Calc	S Adj Fact	Adj. Unit Price	Land Value
1	512E	Exempt Vac w/ OB	RES				7.31 AC	162,000.00	1.0000	C		1.20	C20	1.75	SEE NOTES			1.00		2,486,900
1	512E	Exempt Vac w/ OB	RES				33.30 AC	180,000.00	0.0674	5		1.50	010	1.00				1.00		606,000

Total Card Land Units: 40.61 AC | Parcel Total Land Area: 40.61 AC | Total Land Value: 3,092,900

Property Location: 100 RED CEDAR RD | **MAP ID:** 13/ 7/ 1A/ / | **Bldg Name:** | **State Use:** 512E

Vision ID: 555 | **Account #**34500 | **Bldg #:** 1 of 1 | **Sec #:** 1 of 1 | **Card** 1 of 1 | **Print Date:** 06/13/2016 09:43

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Model	00		Vacant

CONSTRUCTION DETAIL (CONTINUED)

Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
512E	Exempt Vac w/ OB	100

COST/MARKET VALUATION

Adj. Base Rate:	0.00
AYB	
Dep Code	
Remodel Rating	
Year Remodeled	
Dep %	
Functional Obslnc	
External Obslnc	
Cost Trend Factor	
Condition	
% Complete	
Overall % Cond	
Apprais Val	
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	

OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
FGR3	Garage w/Base			L	510	28.00	1995	2		2	75	12,900

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
	Ttl. Gross Liv/Lease Area:	0	0			

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.

1:4692
1"=391'

6/13/2016 9:48:37 AM

Exhibit C

T-MOBILE NORTHEAST LLC

SITE #: CT11720A

SITE NAME: CT720/TOWN OF ORANGE_MP

SITE ADDRESS:
26 SO. ORANGE CENTER ROAD
ORANGE, CT 06477

WIRELESS BROADBAND FACILITY
CONSTRUCTION DRAWINGS
(792DB CONFIGURATION)

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.CBYD.COM

CALL 800 922 4455, OR 811

CALL THREE WORKING DAYS PRIOR TO DIGGING

SAFETY PRECAUTIONS SHALL BE IMPLEMENTED BY CONTRACTOR(S) AT ALL TRENCHING IN ACCORDANCE WITH CURRENT OSHA STANDARDS.

COLOR CODE FOR UTILITY LOCATIONS

ELECTRIC – RED		**SEWER**	**– GREEN**
GAS/OIL	– YELLOW	**SURVEY**	**– PINK**
TEL/CATV – ORANGE		PROPOSED EXCAVATION	**– WHITE**
WATER	– BLUE	**RECLAIMED WATER**	**– PURPLE**

GENERAL NOTES

1. 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.
2. 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 DOCUMENTS.
3. 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 WRITING OTHERWISE.
4. 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.
5. 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.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
7. 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.
8. 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 EQUIPMENT 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 SAFETY 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 ANALYSIS DOCUMENT ENTITLED, "STRUCTURAL ANALYSIS REPORT – REV.2, MONOPOLE" PREPARED BY DESTEK ENGINEERING, LLC., "T-MOBILE SITE ID CT11720A", DATED DECEMBER 21, 2016.

SITE INFORMATION

SITE NUMBER:	CT11720A
SITE NAME:	CT720/TOWN OF ORANGE_MP
SITE ADDRESS:	26 SO. ORANGE CENTER ROAD ORANGE, CT 06477
LAT./LONG.:	N 41.25572/ W –73.01082
JURISDICTION:	TOWN OF ORANGE , CT
PROPERTY OWNER:	TOWN OF ORANGE JAMES ZEOLI, FIRST SELECTMAN ORANGE TOWN HALL 617 ORANGE CENTER ROAD ORANGE, CT 06477 PHONE: (203) 891-4737 FAX: (203) 891-2185 EMAIL: JZEOLI@ORANGE-CT.GOV

CODE COMPLIANCE

CONNECTICUT STATE BUILDING CODE

2016 CONNECTICUT STATE BUILDING CODE
2012 INTERNATIONAL BUILDING CODE
2012 INTERNATIONAL EXISTING BUILDING CODE
2012 INTERNATIONAL PLUMBING CODE
2012 INTERNATIONAL MECHANICAL CODE
2012 INTERNATIONAL RESIDENTIAL CODE
2012 INTERNATIONAL ENERGY CONSERVATION CODE
2014 NATIONAL ELECTRICAL CODE (NFPA 70)

CONSTRUCTION TYPE: 2B USE GROUP:

PROJECT SUB-CONTRACTORS

APPLICANT:	T-MOBILE NORTHEAST, LLC. 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
A&E:	ATLANTIS DESIGN GROUP INC. 3210 MAIN CAMPUS DRIVE LEXINGTON, MA 02421 (617)-852-3611

SHEET INDEX

SHEET	DESCRIPTION
T-1	TITLE SHEET
N-1	GENERAL AND ELECTRICAL NOTES
A-1	SITE LAYOUT, SITE PLAN AND ELEVATION
A-2	ANTENNA PLAN AND DETAILS
E-1	GROUNDING AND COAX/FIBER DIAGRAM
E-2	GROUNDING DETAILS

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

ATLANTIS DESIGN GROUP, INC.
3210 MAIN CAMPUS DRIVE
LEXINGTON, MA 02421
Phone number: 617-852-3611
Fax Number : 781-742-2247

SUBMITTALS

DATE	DESCRIPTION	REVISION
09/12/16	ISSUED FOR REVIEW	A
12/15/16	FINAL CD	0
12/21/16	REVISED AS PER MAPPING FORM	1
12/23/16	REVISION	2

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

PROJECT NO:	CT11720A
DRAWN BY:	FG
CHECKED BY:	KM

STATE OF CONNECTICUT
HOSSEIN VAHEDI
NO. ARI. 11162
LICENSED ARCHITECT

PROFESSIONAL SEAL

SITE NUMBER
CT11720A
SITE NAME
CT720/TOWN OF ORANGE_MP
SITE ADDRESS
26 SO. ORANGE CENTER ROAD
ORANGE, CT 06477

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

ELECTRICAL NOTES:

WORK INCLUDED

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 THE WORK OF THIS CONTRACT.
   C. SUBMIT AS-BUILT DRAWINGS, OPERATING AND MAINTENANCE INSTRUCTIONS AND MANUALS.
   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. COORDINATE ALL X-RAY WORK WITH BUILDING ENGINEER.
   E. PROVIDE HANGERS, SUPPORTS, FOUNDATIONS, STRUCTURAL FRAMING SUPPORTS, AND BASES FOR CONDUIT AND EQUIPMENT PROVIDED OR INSTALLED UNDER 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 THE PROGRESS OF THE WORK INCLUDING PROVIDING ALL TEMPORARY JUMPERS, CONDUITS, CAPS, PROTECTIVE DEVICES, CONNECTIONS AND EQUIPMENT REQUIRED. PROVIDE TEMPORARY LIGHT AND POWER FOR CONSTRUCTION PURPOSES.
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 SUFFICIENT FOR INCLUSION IN THE CONTRACT. FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT USUALLY FURNISHED OR NEEDED TO MAKE A COMPLETE INSTALLATION WHETHER OR NOT 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 CODES.
2. THE ELECTRICAL 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 EQUIPMENT FOR COMPLIANCE TO NEC. CONTRACTOR TO NOTIFY ENGINEER OF ANY DISCREPANCIES AND REQUEST FURTHER DIRECTION BY ENGINEER.
4. EXISTING BUILDING EQUIPMENT IS NOTED ON THE DRAWINGS. NEW OR RELOCATED EQUIPMENT IS SHOWN WITH SOLID LINES. FUTURE EQUIPMENT (NOT IN THIS CONTRACT) IS DEPICTED WITH SHADED LINES. REQUEST CLARIFICATION OF DRAWINGS OR OF SPECIFICATIONS PRIOR TO PRICING OR INSTALLATION.
5. GENERAL
   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 SPECIFICATIONS.
   B. VERIFY ALL MEASUREMENTS AT THE SITE AND BE RESPONSIBLE FOR CORRECTNESS OF SAME.
6. QUALITY, WORKMANSHIP, MATERIALS AND SAFETY
   A. PROVIDE NEW MATERIALS AND EQUIPMENT OF A DOMESTIC MANUFACTURER BY THOSE REGULARLY ENGAGED IN THE 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 CONTRACT DOCUMENT OR NOT.
   D. MAKE WRITTEN REQUESTS FOR SUPPLEMENTARY INSTRUCTIONS TO ARCHITECT/ENGINEER IN CASE OF DOUBT AS TO WORK INTENDED OR IN EVENT OF NEED FOR EXPLANATION THEREOF.
   E. PERFORMANCE AND MATERIAL REQUIREMENTS SCHEDULED OR SPECIFIED ARE MINIMUM STANDARD ACCEPTABLE. THE RIGHT TO JUDGE THE QUALITY OF EQUIPMENT THAT DEVIATES FROM THE CONTRACT DOCUMENT REMAINS SOLELY WITH 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 DIRECTED BY ARCHITECT.

CLEANING

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

COORDINATION AND SUPERVISION

1. CAREFULLY LAY OUT ALL WORK IN ADVANCE TO AVOID UNNECESSARY CUTTING, CHANNELING, CHASING OR DRILLING OF FLOORS, WALLS, PARTITIONS, CEILINGS OR OTHER SURFACES. WHERE SUCH WORK IS NECESSARY, HOWEVER, PATCH AND 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 INSTALLED IN CLOSE PROXIMITY TO WORK OF OTHER TRADES. 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.

SUBMITTALS

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

CUTTING AND PATCHING

1. 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

1. 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, OPERATIONAL CONDITION.
2. PROVIDE THE COMPLETE ELECTRICAL SYSTEM FREE OF GROUND FAULTS AND SHORT CIRCUITS SUCH THAT THE SYSTEM WILL OPERATE SATISFACTORILY UNDER FULL LOAD CONDITIONS, WITHOUT EXCESSIVE HEATING AT ANY POINT IN THE SYSTEM.

SPECIAL REQUIREMENTS

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 INTERFERE WITH OR CUTOFF ANY OF THE EXISTING SERVICES 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 INTERRUPTION FOR A TIME MUTUALLY AGREED UPON. SHUTDOWN NOTE: SCHEDULE AND NOTIFY OWNER 48 HOURS PRIOR TO SHUTDOWN. ALL SHUTDOWN WORK TO BE SCHEDULED AT A TIME CONVENIENT TO OWNER.

GROUNDING

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. VERIFY 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 TERMINATIONS, SIZED AS REQUIRED.
4. USE 1 HOLE, CRIMP TYPE, BURNDY COMPRESSIONS TERMINATIONS, 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.

RACEWAYS

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 BE EMT.
   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 "metroPCS". 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 ¾" 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 CLEARANCES.
   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 MAINTAIN THE STRUCTURAL OR WATERPROOF INTEGRITY OF 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 CEILING.
   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, PER BUILDING.

WIRES AND CABLES

1. CONTRACTOR TO COORDINATE WITH EQUIPMENT SUPPLIER AND VENDOR FOR EXACT EQUIPMENT OVER-CURRENT PROTECTION VOLTAGE, WIRE SIZE AND PLUG CONFIGURATION, IF APPLICABLE, PRIOR TO BID.
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 CIRCUITS:

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.

WIRING DEVICES

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 SUPPLIED.
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
   B. SQUARE-D
5. PROVIDE RK-1 TYPE FUSES, UNLESS NOTED OTHERWISE.

INSTALLATION

1. INSTALL DISCONNECT SWITCHES WHERE INDICATED ON DRAWINGS.
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 FOLLOWS:
   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 SIZE BE FURNISHED.

GENERAL NOTES:

INTENT

1. 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.
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 CHANGE ORDER.

CONFLICTS

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 BE ALLOWED ANY EXTRA COMPENSATION BY REASON OF ANY MATTER OR THING CONCERNING SUCH BIDDER MIGHT HAVE 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 OF 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 ALL THE REQUIREMENTS OF THE CONTRACT DOCUMENTS GOVERNING THE WORK.

CONTRACTS AND WARRANTIES

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

STORAGE

1. 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.

CLEANUP

1. 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.
2. EXTERIOR
   A. VISUALLY INSPECT EXTERIOR SURFACES AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER.
   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

1. GENERAL CARPENTRY, 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.

SHOP DRAWINGS

1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AS REQUIRED AND LISTED IN THESE SPECIFICATIONS TO THE OWNER FOR APPROVAL.
2. 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.
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 DEEMED NECESSARY BY THE OWNER, SUBMIT ACTUAL SAMPLES TO THE OWNER FOR APPROVAL IN LIEU OF CUT SHEETS.

QUALITY ASSURANCE

1. ALL 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

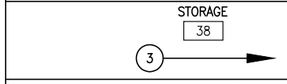
1. BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER WHO WILL ACT AS A SINGLE POINT OF CONTACT FOR ALL PERSONNEL INVOLVED IN THIS PROJECT. THIS PROJECT MANAGER WILL DEVELOP A MASTER SCHEDULE FOR THE PROJECT WHICH WILL BE SUBMITTED TO THE OWNER PRIOR TO THE COMMENCEMENT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

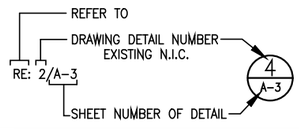
1. CONTRACTOR, AT THEIR OWN EXPENSE, SHALL CARRY AND MAINTAIN, FOR THE DURATION OF THE PROJECT, ALL INSURANCE, AS REQUIRED AND LISTED, AND SHALL NOT COMMENCE WITH THEIR WORK UNTIL THEY HAVE PRESENTED AN ORIGINAL CERTIFICATE OF INSURANCE STATING ALL COVERAGES TO THE OWNER. REFER TO THE MASTER AGREEMENT FOR REQUIRED INSURANCE LIMITS.
2. THE OWNER SHALL BE NAMED AS AN ADDITIONAL INSURED ON ALL POLICIES.
3. CONTRACTOR MUST PROVIDE PROOF OF INSURANCE.

ARCHITECTURAL SYMBOLS

STORAGE



DETAIL REFERENCE KEY



ABBREVIATIONS

ADJ	ADJUSTABLE
AGL	ABOVE GROUND LINE
&	AND
APPROX	APPROXIMATE
@	AT
BTS	BASE TRANSMISSION STATION
CAB	CABINET
CLG	CEILING
CONC	CONCRETE
CONT	CONTINUOUS
DIA OR ø	DIAMETER
DWG	DRAWING
EA	EACH
ELEC	ELECTRICAL
ELEV	ELEVATION
EQ	EQUAL
EQUIP	EQUIPMENT
EGB	EQUIPMENT GROUND BAR
(E)	EXISTING
EXT	EXTERIOR
FF	FINISHED FLOOR
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GRND	GROUND
LG	LONG
MAX	MAXIMUM
MECH	MECHANICAL
MW	MICROWAVE DISH
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTL	METAL
(N)	NEW
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
OPP	OPPOSITE
(P)	PROPOSED
PCS	PERSONAL COMMUNICATION SYSTEM
PPC	POWER PROTECTION CABINET
SF	SQUARE FOOT
SHT	SHEET
SIM	SIMILAR
SS	STAINLESS STEEL
STL	STEEL
TOC	TOP OF CONCRETE
TOM	TOP OF MASONRY
TYP	TYPICAL
VIF	VERIFY IN FIELD
UON	UNLESS OTHERWISE NOTED
WWF	WELDED WIRE FABRIC
W/	WITH

T-MOBILE NORTHEAST, LLC
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3210 MAIN CAMPUS DRIVE
LEXINGTON, MA 02421
Phone number: 617-852-3611
Fax Number : 781-742-2247

SUBMITTALS		
DATE	DESCRIPTION	REVISION
09/12/16	ISSUED FOR REVIEW	A
12/16/16	FINAL CD	0
12/21/16	REVISED AS PER MAPPING FORM	1
12/23/16	REVISION	2

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

PROJECT NO:	CT11720A
DRAWN BY:	FG
CHECKED BY:	KM

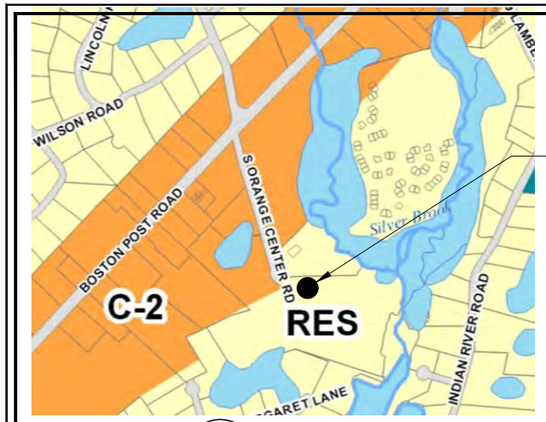
STATE OF CONNECTICUT
HOSSEIN VAHEDI
NO. ARI. 11162
LICENSED ARCHITECT

PROFESSIONAL SEAL

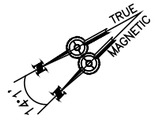
SITE NUMBER
CT11720A
SITE NAME
CT720/TOWN OF ORANGE_MP
SITE ADDRESS
26 SO. ORANGE CENTER ROAD
ORANGE, CT 06477

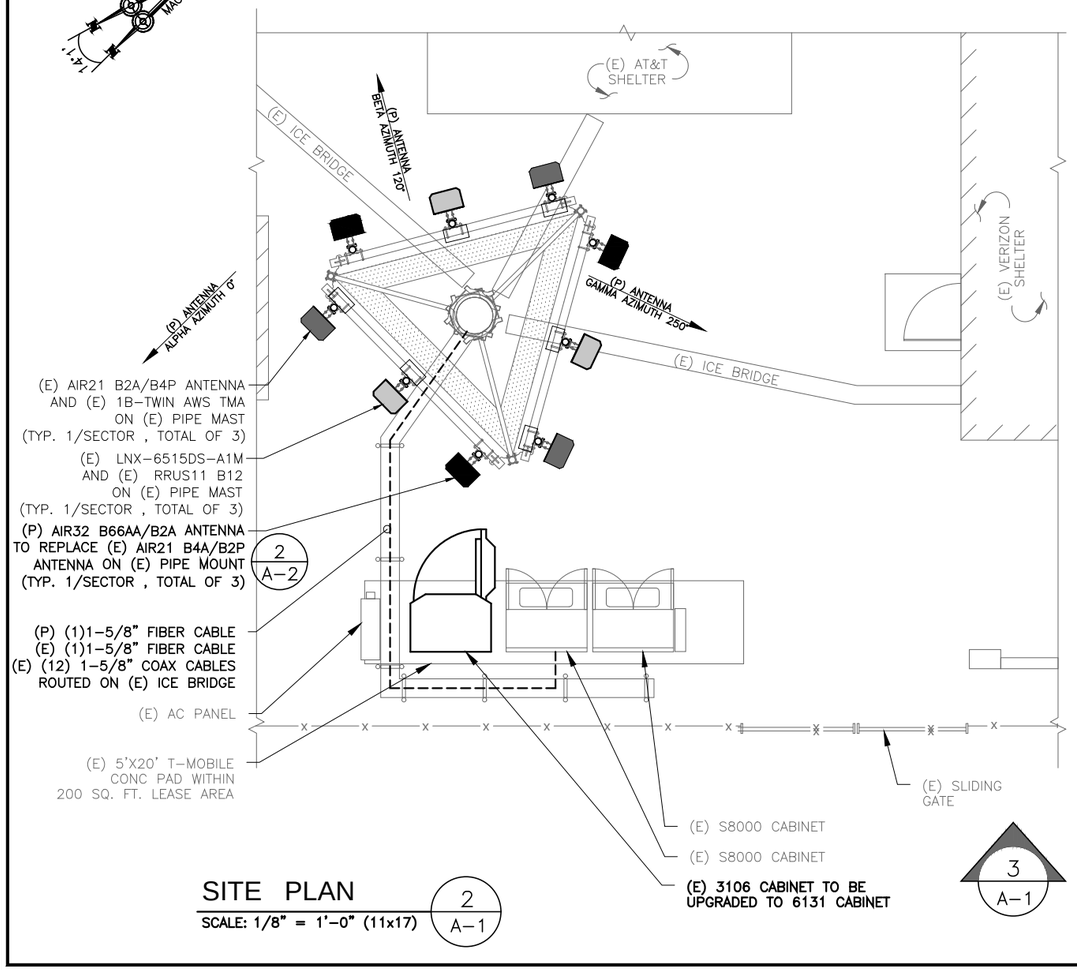
SHEET TITLE
GENERAL AND ELECTRICAL NOTES

SHEET NUMBER
N-1

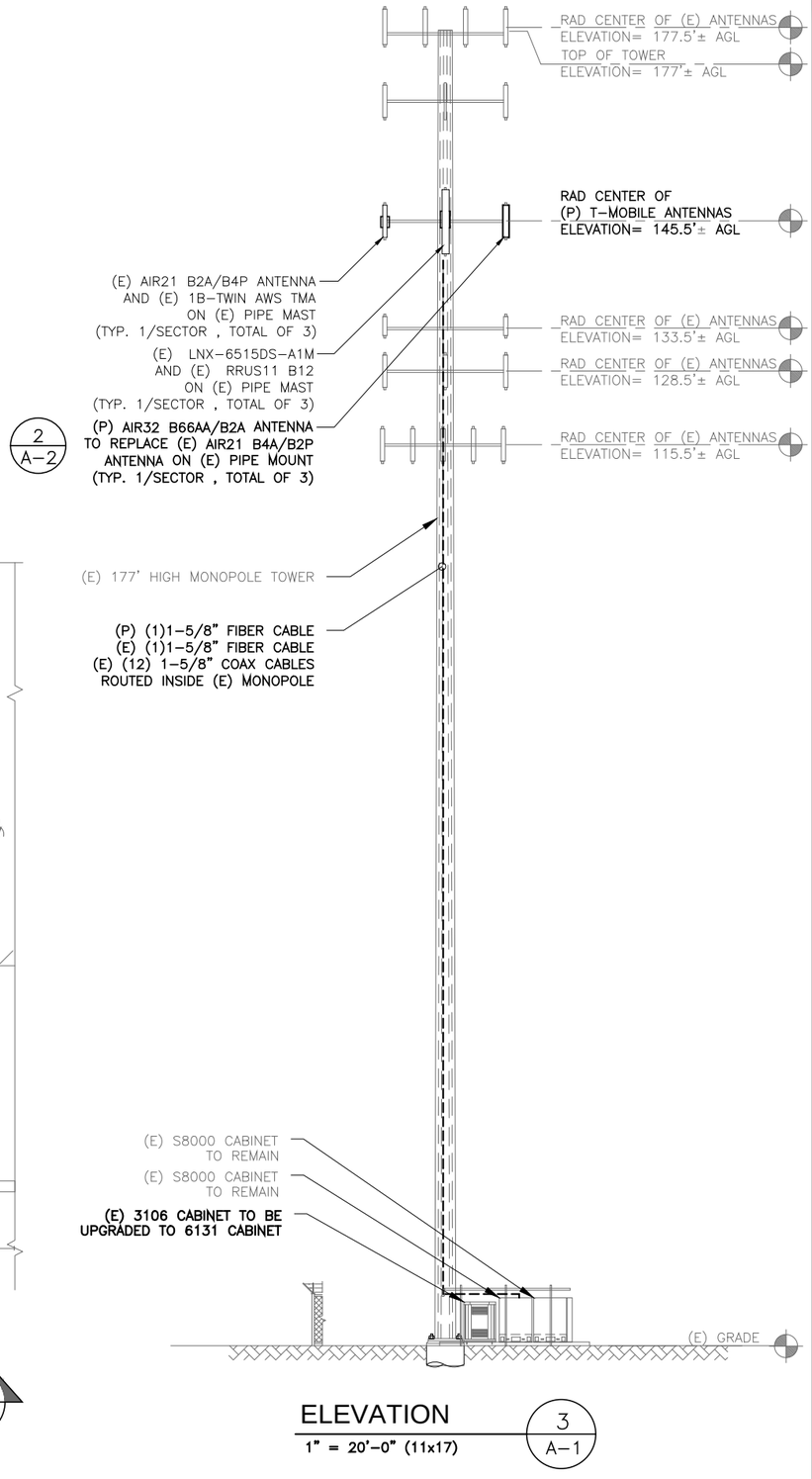


KEY PLAN 1/A-1
SCALE: N.T.S.





SITE PLAN 2/A-1
SCALE: 1/8" = 1'-0" (11x17)



ELEVATION 3/A-1
1" = 20'-0" (11x17)

STRUCTURAL REFERENCE

REFER TO STRUCTURAL ANALYSIS DOCUMENT ENTITLED, "STRUCTURAL ANALYSIS REPORT – REV.2, MONOPOLE" PREPARED BY DESTEK ENGINEERING, LLC., "T-MOBILE SITE ID CT11720A", DATED DECEMBER 21, 2016.

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
- 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
- PROP. UMTS/GSM ANTENNA
- EX. GSM ANTENNA
- EX. UMTS ANTENNA

T-MOBILE NORTHEAST, LLC
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3210 MAIN CAMPUS DRIVE
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Phone number: 617-852-3611
Fax Number : 781-742-2247

SUBMITTALS

DATE	DESCRIPTION	REVISION
09/12/16	ISSUED FOR REVIEW	A
12/16/16	FINAL CD	0
12/21/16	REVISED AS PER MAPPING FORM	1
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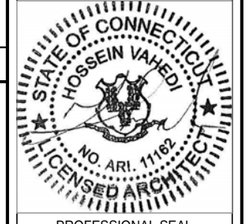
DEPT.	DATE	APP'D	REVISIONS
RFE.			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO:	CT11720A
DRAWN BY:	FG
CHECKED BY:	KM

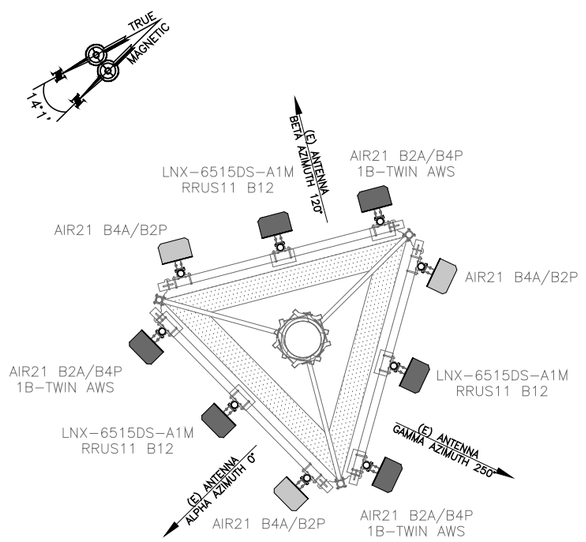


PROFESSIONAL SEAL

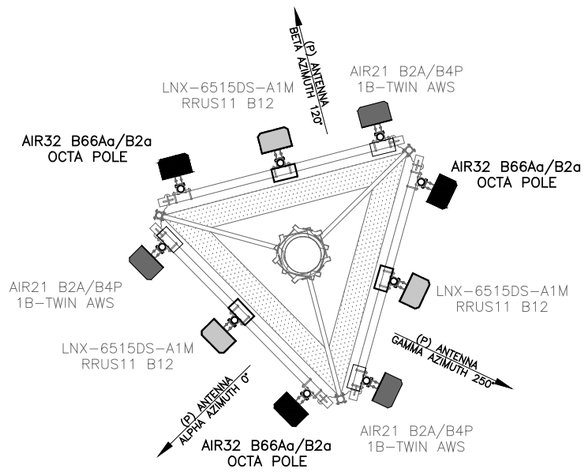
SITE NUMBER
CT11720A
SITE NAME
CT720/TOWN OF ORANGE_MP
SITE ADDRESS
26 SO. ORANGE CENTER ROAD
ORANGE, CT 06477

SHEET TITLE
SITE PLAN AND ELEVATION

SHEET NUMBER
A-1



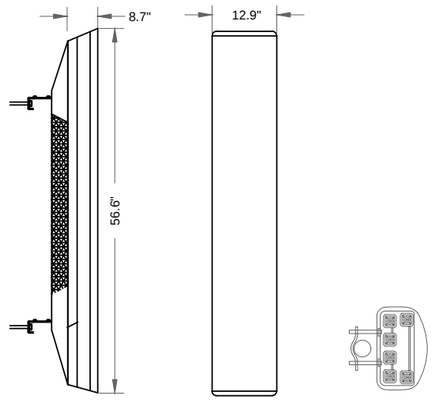
EXISTING ANTENNA CONFIGURATION



PROPOSING ANTENNA CONFIGURATION

ANTENNA PLAN (1 / A–2)

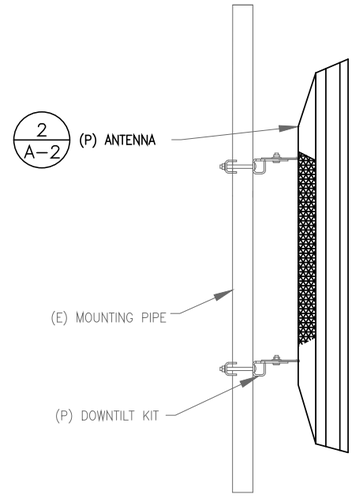
SCALE: N.T.S



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 (2 / A–2)



ANTENNA MOUNT DETAILS

SCALE: N.T.S (3 / A–2)

REFER TO STRUCTURAL ANALYSIS DOCUMENT ENTITLED, "STRUCTURAL ANALYSIS REPORT – REV.2, MONOPOLE" PREPARED BY DESTEK ENGINEERING, LLC., "T–MOBILE SITE ID CT11720A", DATED DECEMBER 21, 2016.

T-MOBILE NORTHEAST, LLC
35 GRIFFIN ROAD SOUTH
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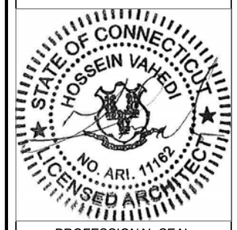


PROFESSIONAL SEAL

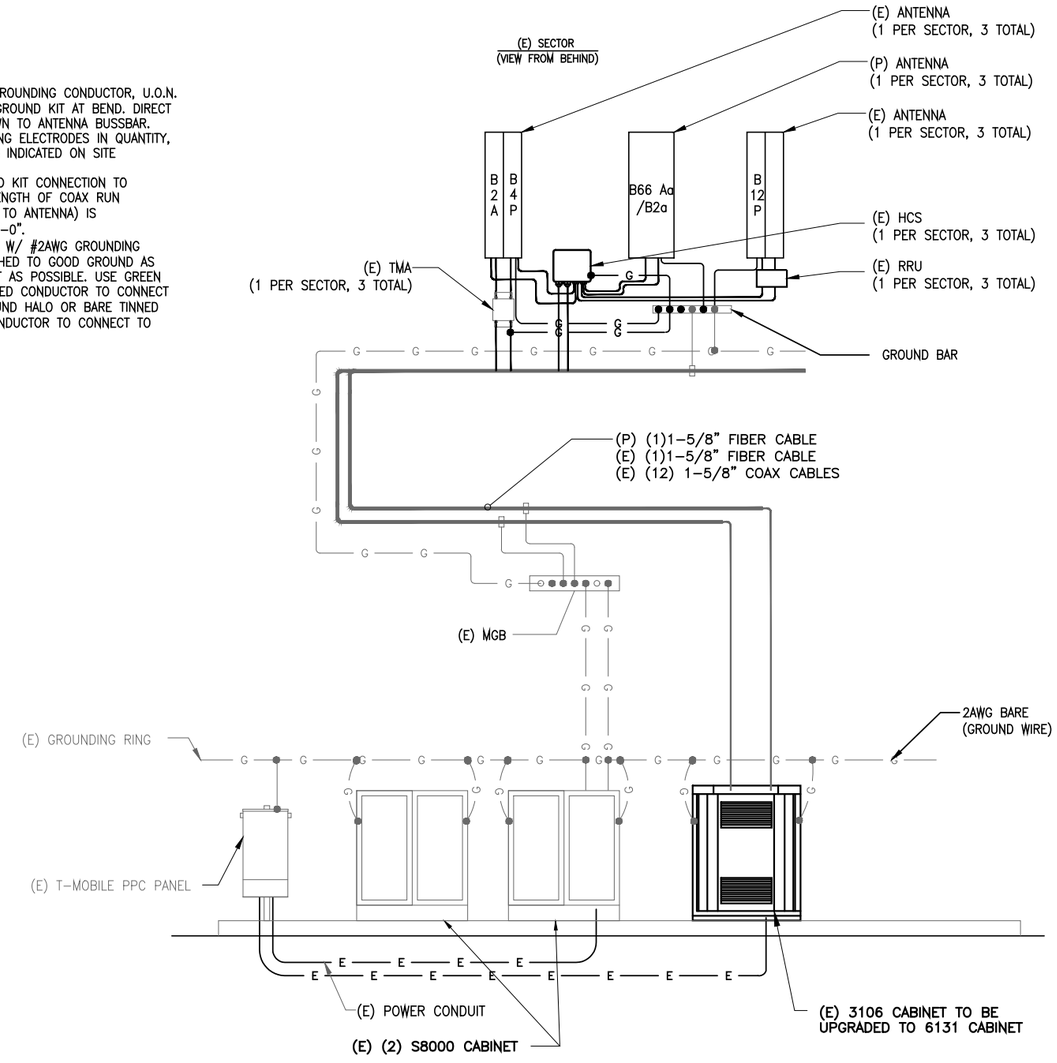
SITE NUMBER
CT11720A
SITE NAME
CT720/TOWN OF ORANGE_MP
SITE ADDRESS
26 SO. ORANGE CENTER ROAD
ORANGE, CT 06477

SHEET TITLE
ANTENNA PLAN AND DETAILS

SHEET NUMBER
A-2

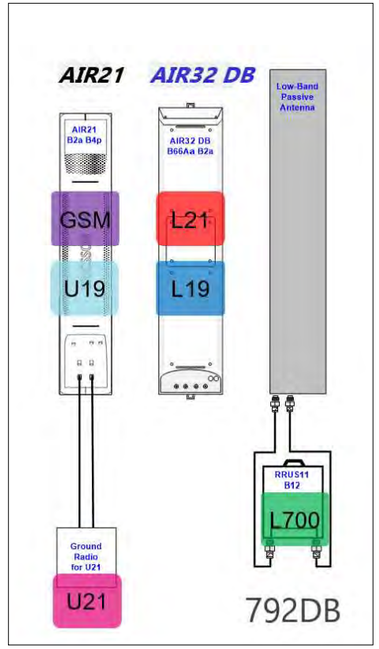
NOTES:

A. PROVIDE #2AWG GROUNDING CONDUCTOR, U.O.N.
B. DO NOT INSTALL GROUND KIT AT BEND. DIRECT GROUND WIRE DOWN TO ANTENNA BUSSBAR.
C. PROVIDE GROUNDING ELECTRODES IN QUANTITY, TYPE AND SIZE AS INDICATED ON SITE GROUNDING PLAN.
D. ADD COAX GROUND KIT CONNECTION TO BUSSBAR WHEN LENGTH OF COAX RUN (FROM EQUIPMENT TO ANTENNA) IS GREATER THAN 20'-0".
E. GROUND HCS BOX W/ #2AWG GROUNDING CONDUCTOR ATTACHED TO GOOD GROUND AS DIRECT AND SHORT AS POSSIBLE. USE GREEN STRANDED INSULATED CONDUCTOR TO CONNECT TO BUSSBAR/GROUND HALO OR BARE TINNED SOLID COPPER CONDUCTOR TO CONNECT TO GROUND RING.



GROUNDING DIAGRAM 1 / E-1

SCALE: N.T.S



TRUNK FIBER NOTES:

1. IN GENERAL THIS CABLE WILL HANDLE SIMILARLY TO 7/8" 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 3/4" (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 FRAGILE 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

792DB CONFIGURATION
COAX/FIBER PLUMBING DIAGRAM 2 / E-1

SCALE: N.T.S

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

PROJECT NO:	CT11720A
DRAWN BY:	FG
CHECKED BY:	KM

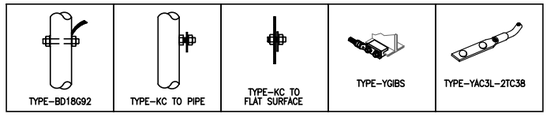
STATE OF CONNECTICUT
HOSSEIN VAHEDI
NO. ARI. 11162.
LICENSED ARCHITECT

PROFESSIONAL SEAL

SITE NUMBER
CT11720A
SITE NAME
CT720/TOWN OF ORANGE_MP
SITE ADDRESS
26 SO. ORANGE CENTER ROAD
ORANGE, CT 06477

SHEET TITLE
GROUNDING AND ONE LINE DIAGRAM
COAX/FIBER DIAGRAM

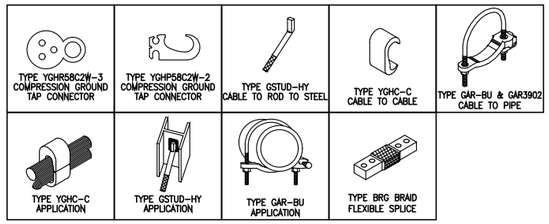
SHEET NUMBER
E-1



BURNDY GROUNDING DETAILS

1 E-2

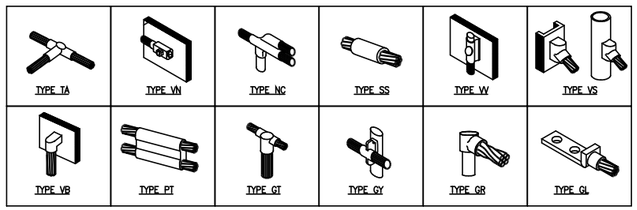
SCALE: N.T.S



BURNDY GROUNDING PRODUCTS

2 E-2

SCALE: N.T.S



CADWELD GROUNDING CONNECTION PRODUCTS

3 E-2

SCALE: N.T.S

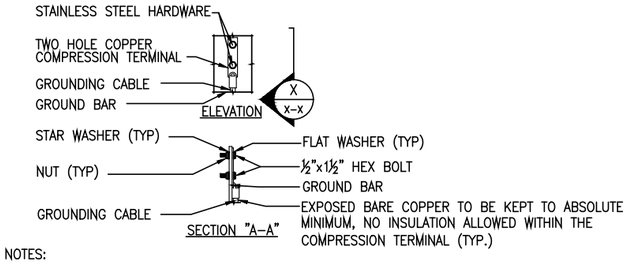
TERMINATION TYPES:
A. MECHANICAL COMPRESSION LUG
B. DOUBLE BARRELL COMPRESSION CONNECTOR
C. EXOTHERMIC TERMINATION
D. BEAM CLAMP

	SOLID #2 TINNED COPPER	#6 GROUND LEAD	#2/0 STRANDED MAIN DOWN CONDUCTOR	MASTER GRND BAR	STRUCTURAL OR TOWER STEEL	BLDG SERVICE ENTR OR GRND RING	GROUND ROD
SOLID #2 TINNED COPPER	B OR C	B OR C		C	A, C, OR D		C
#6 GROUND LEAD	B OR C			A	A, C, OR D		
#2/0 STRANDED GRNDG ELECTRODE CONDUCTOR				A	A, C, OR D	A	
MASTER GROUND BAR	C	A	A				
STRUCTURAL OR TOWER STEEL	A, C, OR D	A, C, OR D	A, C, OR D				
GROUND RING	C		C				C

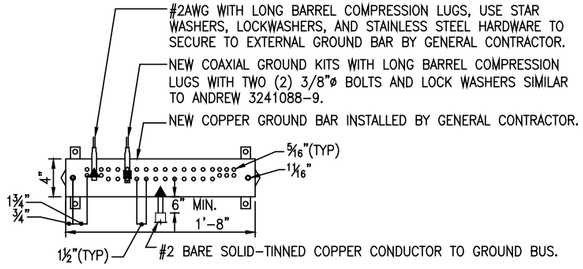
GROUNDING TERMINATION MATRIX

7 E-2

SCALE: N.T.S



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

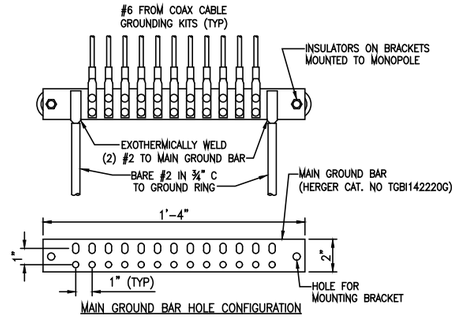


NOTES:
1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. ALL HOLES ARE COUNTERSUNK 1/16".

TYPICAL GROUND BAR CONNECTIONS DETAIL

4 E-2

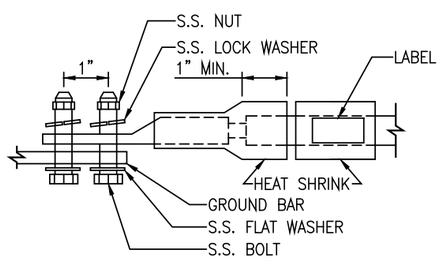
SCALE: N.T.S



GROUND BAR DETAIL

5 E-2

SCALE: N.T.S



LUG NOTES:
1. ALL HARDWARE IS 18-8 STAINLESS STEEL, INCLUDING LOCK WASHERS.
2. ALL HARDWARE SHALL BE S.S. ⅜"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

6 E-2

SCALE: N.T.S

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3210 MAIN CAMPUS DRIVE
LEXINGTON, MA 02421
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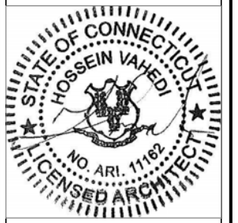


PROFESSIONAL SEAL

SITE NUMBER
CT11720A
SITE NAME
CT720/TOWN OF ORANGE_MP
SITE ADDRESS
26 SO. ORANGE CENTER ROAD
ORANGE, CT 06477

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
E-2

Exhibit D

Structural Analysis report

Date: December 21, 2016

Site Number: CT11720A
Site Name: CT720/Town of Orange_MP

Site Address:
20 S. Orange Center Road
Orange, CT 06477

PREPARED FOR:

T-MOBILE NORTHEAST LLC

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

CONSULTANT:

FORESITE LLC
Architects . Engineers . Surveyors

462 Walnut street
Newton, MA 02460
Contact: Saeed Mossavat
email:smossavat@Foresitellc.com
617-527-3031

TURNKEY DEVELOPER:

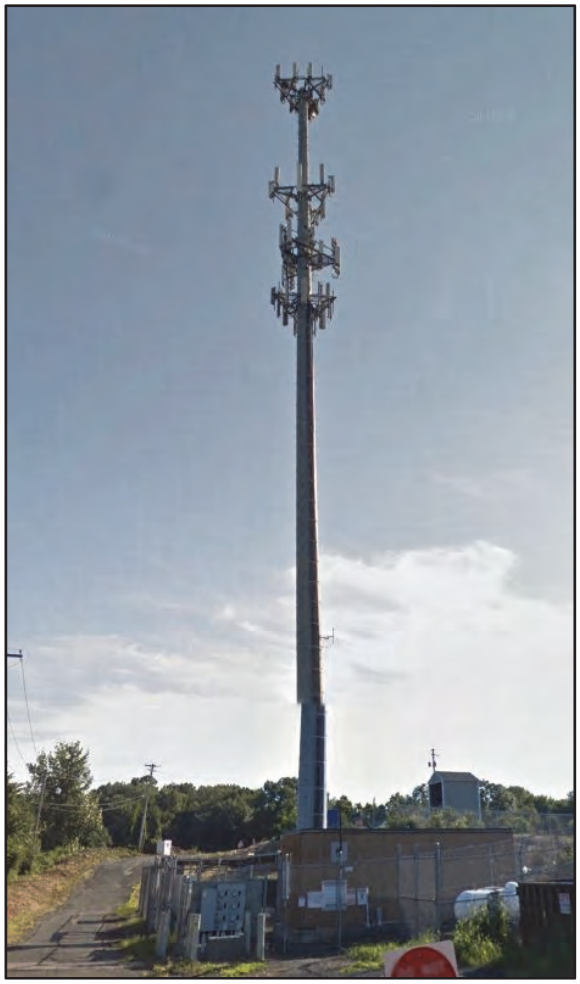
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

199 Brickyard road
Farmington, CT 06032
Contact: Sheldon Freincle
sheldon@northeastsitesolution.com
203-275-6669

STRUCTURAL ANALYSIS REPORT – REV. 2
MONOPOLE

Prepared For:

T-Mobile Northeast, LLC
35 Griffin Road South
Bloomfield, CT 06002



Structure Rating	
Monopole:	**Pass (83.2%)**
Foundation:	**Pass (66.2%)**

Sincerely,
Destek Engineering, LLC
License No: PEC0001429

12/21/2016

Ahmet Colakoglu, PE
Connecticut Professional Engineer
License No: 27057

Site Name: CT720/Town of Orange_MP
Site ID: CT11720A
26 South Orange Center Road
Orange, CT 06477

Destek Job No: 1675002

December 21, 2016

CONTENTS

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Suite 100, Marietta, GA 30066 -Tel: (770) 693-0835

1.0 SUBJECT AND REFERENCES

The purpose of this analysis is to evaluate the structural capacity of the existing 180' monopole located at 26 South Orange Center Road, Orange, CT 06477 for the additions and alterations proposed by T-Mobile.

The structural analysis is based on the following documentation provided to Destek Engineering, LLC (Destek):

- RFDS provided by T-Mobile, dated 4/19/2016.
- Monopole Tower Mapping Form prepared by Northeast Tower, Inc., dated 9/9/2016.
- Foundation Drawings prepared by Paul J. Ford and Company, dated 7/12/2005.

1.1 STRUCTURE

The structure is a 177' monopole consisting of (5) 18-sided, slip-jointed bent plate tubes. Flat-to-flat dimensions range from 2.069 feet at the top to 5.398 feet at the base. The monopole tower is attached to the foundation with a base plate and anchor bolts. It is formed by the following sections:

Section Length (Feet)	Splice Elevation (Feet)	Shaft Thickness (Inches)	Top Diameter (Inches)	Bottom Diameter (Inches)	Yield Strength (ksi)
50.58	177.00	0.1875	24.828	40.310	65
47.92	126.42	0.2500	38.481	51.830	65
48.04	83.25	0.3750	49.659	59.020	65
48.46	41.21	0.3750	56.857	64.780	65

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Suite 100, Marietta, GA 30066 -Tel: (770) 693-0835

2.0 EXISTING AND PROPOSED APPURTENANCES

Existing Configuration of T-Mobile Appurtenances:

Rad Center (ft.)	Antennas & Equipment	Coax	Mount
145.5	(3) AIR21 B4A/B2P (3) LNX-6515DS-A1M (3) AIR21 B2A/B4P (3) RRUS11 B12 (3) TMA - 1B - Twin AWS	(12) 1-5/8* (1) 1-5/8 Hybrid*	(1) 12.5' Platform Mount

***Cables are located inside the monopole.**

Proposed and Final Configuration of T-Mobile Appurtenances:

Rad Center (ft.)	Antennas & Equipment	Coax	Mount
145.5	(3) AIR32 B66Aa/B2a (3) LNX-6515DS-A1M (3) AIR21 B2A/B4P (3) RRUS11 B12 (3) TMA - 1B - Twin AWS	(12) 1-5/8* (2) 1-5/8 Hybrid*	(1) 12.5' Platform Mount

***Cables are located inside the monopole.**

DESTEK ENGINEERING, LLC
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Existing Configuration of Appurtenances by Others:

Rad Center (ft.)	Antennas & Equipment	Coax	Mount
178.0	Lightning Rod	-	-
177.5	(6) 55" x 11" x 5" Panel Antennas	(1) 3/8 RET* (1) 3/8 Fiber* (2) 7/8 DC* (12) 1-5/8*	(1) 12.5' Platform Mount
177.0	(3) 47" x 12" x 6.5" Panel Antennas (6) Powerwave TMA (3) Ericsson RRUS11 B32 (3) Ericsson RRUS11 B2 (1) Raycap DC6-48-60-0-8F		
133.5	(6) RRH	-	(1) Collar Mount
128.5	(3) 56.5" x 13" x 6.75" Panel Antennas (3) 70.5" x 12.25" x 8.25" Panel Antennas (3) 42" x 12" x 4.75" Panel Antennas (1) 26" Dish	(1) 1/2* (3) 1-1/4 Hybrid*	(1) 13' Platform Mount
115.5	(3) 47" x 11" x 5.25" Panel Antennas (6) 73" x 6" x 4.5" Panel Antennas (3) 77" x 14" x 11" Panel Antennas	(1) 1-1/4 Hybrid* (6) 1-5/8 (12) 1-5/8*	(1) 13' Platform Mount
42.7	(1) GPS	(1) 1/2*	-

***Cables are located inside the monopole.**

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Suite 100, Marietta, GA 30066 -Tel: (770) 693-0835

3.0 CODES AND LOADING

The monopole was analyzed per *TIA/EIA-222-G* as referenced by the *2016 State Building Code* with all of the adopted Addendums and Supplements. The following wind loading was used in compliance with the standard for Orange, CT:

- Ultimate wind speed 125 mph converted to a Basic wind speed 97 mph without ice (W_0)
- Basic wind speed 50 mph with 3/4" escalating ice (W_i)
- Exposure Category C
- Topographic Category 1
- Structure Class II (I_w = 1.0)

The following load combinations were used with wind blowing at 0°, 30°, 45°, 60°, and 90° measured from a line normal to the face of the tower.

- 1.2 D + 1.6 W_0
- 0.9 D + 1.6 W_0
- 1.2 D + 1.0 D_i + 1.0 W_i

D: Dead Load of structure and appurtenances
W_0: Wind Load, without ice
W_i: Wind Load, with ice
D_i: Weight of Ice

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Suite 100, Marietta, GA 30066 -Tel: (770) 693-0835

4.0 STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

The analysis is based on the information provided and is assumed to be current and correct. Unless otherwise noted, the structure is assumed to be in good condition, free of defects and can achieve theoretical strength.

It is assumed that the structure has been maintained and shall be maintained during its service. The superstructure and the foundation system are assumed to be designed with proper engineering practice and fabricated, constructed and erected in accordance with the design documents. Destek will accept no liability which may arise due to any existing deficiency in design, material, fabrication, erection, construction, etc. or lack of maintenance.

The analysis does not include a qualification of the mounts attached on the structure or their connections. The analysis is performed to verify the capacity of the main structural members, which is the current practice in the tower industry.

The analysis results presented in this report are only applicable for the previously mentioned existing and proposed appurtenances. Any deviation of the appurtenances and placement, etc., will require Destek to generate an additional structural analysis.

5.0 ANALYSIS AND ASSUMPTIONS

The tower was analyzed by utilizing tnxTower, a 3-Dimensional finite element software, a product of Tower Numerics, Inc. Software output for this analysis is provided in Appendix-A of this report.

6.0 CONCLUSION AND RESULTS

Based on an analysis per *TIA/EIA-222-G*, the existing tower has **adequate** structural capacity for the proposed modifications by T-Mobile. For the code specified load combinations and as a maximum, the anchor rods are stressed to **83.2%** of capacity. The monopole shaft is stressed to **78.4%** of capacity. The base plate is stressed to **36.1%** of capacity.

The foundation **has adequate** capacity for the proposed loading by T-Mobile. For the code specified load combinations and as a maximum, the foundation is stressed to **66.2%** of capacity.

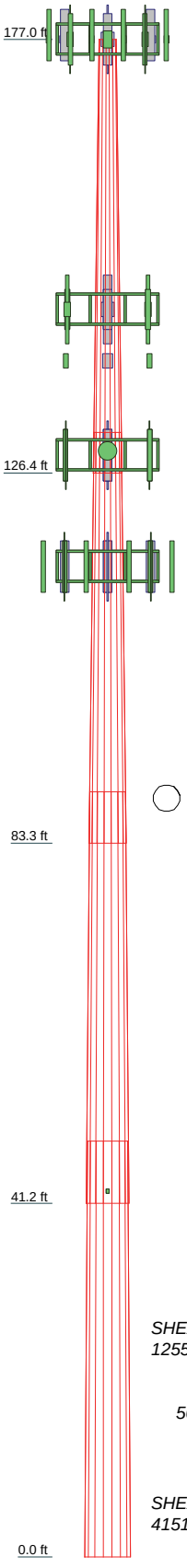
Therefore, the proposed additions and alterations by T-Mobile **can** be implemented as intended with the conditions outlined in this report.

Should you have any questions about this report, please contact us at (770) 693-0835.

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Suite 100, Marietta, GA 30066 -Tel: (770) 693-0835

APPENDIX A
SOFTWARE OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	50.58	18	0.1875	4.75	24.8280	40.3100		3316.8
2	47.92	18	0.2500	6.00	38.4811	51.8300		5810.3
3	48.04	18	0.3750	7.25	49.6586	59.0200		10499.9
4	48.46	18	0.3750		56.8572	64.7800		11863.4
							A572-65	31490.3



ALL REACTIONS ARE FACTORED

AXIAL 94633 lb

SHEAR 12556 lb *MOMENT 1466543 lb-ft*

TORQUE 146 lb-ft
50 mph WIND - 0.7500 in ICE

AXIAL 58227 lb

SHEAR 41518 lb *MOMENT 4780588 lb-ft*

TORQUE 722 lb-ft
REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
3/4"x5' Lightning Rod	178	Platform Mount [LP 303-1]	145.5
(2) 55" x 11" x 5" Panel Antenna	177.5	RRH-2WB	133.5
(2) 55" x 11" x 5" Panel Antenna	177.5	RRH-2WB	133.5
(2) 55" x 11" x 5" Panel Antenna	177.5	RRH-2WB	133.5
47" x 12" x 6.5" Panel Antenna	177	RRH1900-4x45	133.5
47" x 12" x 6.5" Panel Antenna	177	RRH1900-4x45	133.5
47" x 12" x 6.5" Panel Antenna	177	RRH1900-4x45	133.5
(2) LGP21401	177	Collar Mount [SO 102-3]	133.5
(2) LGP21401	177	26" Dish	129
(2) LGP21401	177	42" x 12" x 4.75" Panel Antenna	128.5
RRUS 11 B32	177	56.5" x 13" x 6.75" Panel Antenna	128.5
RRUS 11 B32	177	56.5" x 13" x 6.75" Panel Antenna	128.5
RRUS 11 B32	177	56.5" x 13" x 6.75" Panel Antenna	128.5
RRUS 11 B2	177	70.5" x 12.25" x 8.25" Panel Antenna	128.5
RRUS 11 B2	177	70.5" x 12.25" x 8.25" Panel Antenna	128.5
RRUS 11 B2	177	70.5" x 12.25" x 8.25" Panel Antenna	128.5
DC6-48-60-0-8F	177	(3) 8'x2" Antenna Mount Pipe	128.5
(4) 8'x2" Antenna Mount Pipe	177	(3) 8'x2" Antenna Mount Pipe	128.5
(4) 8'x2" Antenna Mount Pipe	177	(3) 8'x2" Antenna Mount Pipe	128.5
(4) 8'x2" Antenna Mount Pipe	177	Platform Mount [LP 402-1]	128.5
Platform Mount [LP 303-1]	177	42" x 12" x 4.75" Panel Antenna	128.5
AIR 32 B2a/B66Aa w/ Mount Pipe	145.5	42" x 12" x 4.75" Panel Antenna	128.5
AIR 32 B2a/B66Aa w/ Mount Pipe	145.5	47" x 11" x 5.25" Panel Antenna	115.5
AIR 32 B2a/B66Aa w/ Mount Pipe	145.5	47" x 11" x 5.25" Panel Antenna	115.5
AIR 21 B2A/B4P w/ Mount Pipe	145.5	(2) 73" x 6" x 4.5" Panel Antenna	115.5
AIR 21 B2A/B4P w/ Mount Pipe	145.5	(2) 73" x 6" x 4.5" Panel Antenna	115.5
AIR 21 B2A/B4P w/ Mount Pipe	145.5	(2) 73" x 6" x 4.5" Panel Antenna	115.5
LNX-6515DS-A1M w/ Mount Pipe	145.5	77" x 14" x 11" Panel Antenna	115.5
LNX-6515DS-A1M w/ Mount Pipe	145.5	77" x 14" x 11" Panel Antenna	115.5
LNX-6515DS-A1M w/ Mount Pipe	145.5	77" x 14" x 11" Panel Antenna	115.5
RRUS 11 B12	145.5	(4) 8'x2" Antenna Mount Pipe	115.5
RRUS 11 B12	145.5	(4) 8'x2" Antenna Mount Pipe	115.5
RRUS 11 B12	145.5	(4) 8'x2" Antenna Mount Pipe	115.5
TMA - 1B - Twin AWS	145.5	Platform Mount [LP 401-1]	115.5
TMA - 1B - Twin AWS	145.5	47" x 11" x 5.25" Panel Antenna	115.5
TMA - 1B - Twin AWS	145.5	GPS	42.7

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 78.4%

Destek Engineering, LLC
1281 Kennestone Circle, Ste. 100
Marietta, GA 30066
Phone: (770) 693-0835
FAX:

Job: **1675002**			
Project: ***CT11720A***			
Client: T-Mobile	Drawn by: Ahmet Colakoglu		App'd:
Code: TIA-222-G	Date: 12/21/16		Scale: NTS
Path: Z:\Projects\2016\75 - Foresite LLC\002 - CT11720A\Calcs\Rev. 2\CT11720A - Rev. 2.eri			Dwg No. E-1

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	177.00-126.42	50.58	4.75	18	24.8280	40.3100	0.1875	0.7500	A572-65 (65 ksi)
L2	126.42-83.25	47.92	6.00	18	38.4811	51.8300	0.2500	1.0000	A572-65 (65 ksi)
L3	83.25-41.21	48.04	7.25	18	49.6586	59.0200	0.3750	1.5000	A572-65 (65 ksi)
L4	41.21-0.00	48.46		18	56.8572	64.7800	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	*Tip Dia.* *in*	*Area* *in²*	*I* *in⁴*	*r* *in*	*C* *in*	*I/C* *in³*	*J* *in⁴*	*It/Q* *in²*	*w* *in*	*w/t*
L1	25.2110	14.6642	1124.8489	8.7474	12.6126	89.1844	2251.1779	7.3335	4.0397	21.545
	40.9318	23.8779	4856.3458	14.2435	20.4775	237.1554	9719.0817	11.9412	6.7646	36.078
L2	40.4183	30.3364	5601.8816	13.5720	19.5484	286.5649	11211.1344	15.1711	6.3327	25.331
	52.6296	40.9287	13757.1475	18.3109	26.3296	522.4966	27532.3971	20.4683	8.6821	34.728
L3	51.6119	58.6598	18000.4300	17.4957	25.2266	713.5505	36024.5455	29.3355	8.0799	21.546
	59.9305	69.8022	30329.7348	20.8190	29.9822	1011.5927	60699.3781	34.9077	9.7275	25.94
L4	58.9379	67.2280	27096.3513	20.0512	28.8835	938.1267	54228.3567	33.6204	9.3469	24.925
	65.7793	76.6581	40173.0120	22.8638	32.9082	1220.7584	80398.8846	38.3363	10.7413	28.643

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 177.00-126.42				1	1	1			
L2 126.42-83.25				1	1	1			
L3 83.25-41.21				1	1	1			
L4 41.21-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A(1-5/8")	C	Surface Ar (CaAa)	115.50 - 0.00	6	6	0.000 0.000	1.9800		0.82

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF2-50A(3/8")	C	No	Inside Pole	177.00 - 0.00	2	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
LDF5-50A(7/8")	C	No	Inside Pole	177.00 - 0.00	2	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
LDF7-50A(1-5/8")	C	No	Inside Pole	177.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
*****								
LDF7-50A(1-5/8")	C	No	Inside Pole	145.50 - 0.00	14	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
*****								
LDF4-50A(1/2")	C	No	Inside Pole	128.50 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
AVA6-50(1-1/4")	C	No	Inside Pole	128.50 - 0.00	3	No Ice	0.00	0.45
						1/2" Ice	0.00	0.45
						1" Ice	0.00	0.45
******								
AVA6-50(1-1/4")	C	No	Inside Pole	115.50 - 0.00	1	No Ice	0.00	0.45
						1/2" Ice	0.00	0.45
						1" Ice	0.00	0.45
LDF7-50A(1-5/8")	C	No	Inside Pole	115.50 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
********								
LDF4-50A(1/2")	C	No	Inside Pole	42.70 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	177.00-126.42	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	761.34
L2	126.42-83.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	38.313	0.000	1511.06
L3	83.25-41.21	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	49.944	0.000	1633.48
L4	41.21-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	48.957	0.000	1607.19

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	177.00-126.42	A	1.745	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	761.34
L2	126.42-83.25	A	1.683	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	61.961	0.000	2253.32
L3	83.25-41.21	A	1.598	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	80.114	0.000	2563.48
L4	41.21-0.00	A	1.434	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	77.659	0.000	2469.47

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	177.00-126.42	0.0000	0.0000	0.0000	0.0000
L2	126.42-83.25	0.0000	1.1483	0.0000	1.4472
L3	83.25-41.21	0.0000	1.4480	0.0000	1.8069
L4	41.21-0.00	0.0000	1.4744	0.0000	1.8679

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	12	LDF7-50A(1-5/8")	126.42 - 115.50	1.0000	1.0000
L2	12	LDF7-50A(1-5/8")	83.25 - 115.50	1.0000	1.0000
L3	12	LDF7-50A(1-5/8")	41.21 - 83.25	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
3/4"x5' Lightning Rod	C	None		0.0000	178.00	No Ice	0.38	0.38	15.00
						1/2" Ice	0.89	0.89	18.90
						1" Ice	1.36	1.36	26.08
*****									
(2) 55" x 11" x 5" Panel Antenna	A	From Leg	4.00 0.00 0.00	0.0000	177.50	No Ice 1/2" Ice 1" Ice	5.51 6.05 6.59	2.93 3.45 3.97	70.00 100.00 130.00
(2) 55" x 11" x 5" Panel Antenna	B	From Leg	4.00 0.00 0.00	0.0000	177.50	No Ice 1/2" Ice 1" Ice	5.51 6.05 6.59	2.93 3.45 3.97	70.00 100.00 130.00
(2) 55" x 11" x 5" Panel Antenna	C	From Leg	4.00 0.00 0.00	0.0000	177.50	No Ice 1/2" Ice 1" Ice	5.51 6.05 6.59	2.93 3.45 3.97	70.00 100.00 130.00
47" x 12" x 6.5" Panel Antenna	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	4.95 5.43 5.91	2.99 3.43 3.88	70.00 100.00 130.00
47" x 12" x 6.5" Panel Antenna	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	4.95 5.43 5.91	2.99 3.43 3.88	70.00 100.00 130.00
47" x 12" x 6.5" Panel Antenna	C	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	4.95 5.43 5.91	2.99 3.43 3.88	70.00 100.00 130.00
(2) LGP21401	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	14.10 21.26 30.32
(2) LGP21401	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	14.10 21.26 30.32
(2) LGP21401	C	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	14.10 21.26 30.32
RRUS 11 B32	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	3.31 3.55 3.80	1.36 1.54 1.73	50.70 71.57 95.49
RRUS 11 B32	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	3.31 3.55 3.80	1.36 1.54 1.73	50.70 71.57 95.49
RRUS 11 B32	C	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	3.31 3.55 3.80	1.36 1.54 1.73	50.70 71.57 95.49
RRUS 11 B2	A	From Leg	4.00	0.0000	177.00	No Ice	2.83	1.18	50.70

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00				1/2" Ice	3.04	1.33	71.57
			0.00				1" Ice	3.26	1.48	95.49
RRUS 11 B2	B	From Leg	4.00		0.0000	177.00	No Ice	2.83	1.18	50.70
			0.00				1/2" Ice	3.04	1.33	71.57
			0.00				1" Ice	3.26	1.48	95.49
RRUS 11 B2	C	From Leg	4.00		0.0000	177.00	No Ice	2.83	1.18	50.70
			0.00				1/2" Ice	3.04	1.33	71.57
			0.00				1" Ice	3.26	1.48	95.49
DC6-48-60-0-8F	C	None			0.0000	177.00	No Ice	2.20	2.20	18.90
							1/2" Ice	2.40	2.40	41.46
							1" Ice	2.60	2.60	67.19
(4) 8'x2" Antenna Mount Pipe	A	From Leg	4.00		0.0000	177.00	No Ice	1.90	1.90	30.00
			0.00				1/2" Ice	2.73	2.73	44.34
			0.00				1" Ice	3.40	3.40	63.96
(4) 8'x2" Antenna Mount Pipe	B	From Leg	4.00		0.0000	177.00	No Ice	1.90	1.90	30.00
			0.00				1/2" Ice	2.73	2.73	44.34
			0.00				1" Ice	3.40	3.40	63.96
(4) 8'x2" Antenna Mount Pipe	C	From Leg	4.00		0.0000	177.00	No Ice	1.90	1.90	30.00
			0.00				1/2" Ice	2.73	2.73	44.34
			0.00				1" Ice	3.40	3.40	63.96
Platform Mount [LP 303-1]	C	None			0.0000	177.00	No Ice	14.66	14.66	1250.00
							1/2" Ice	18.87	18.87	1481.33
							1" Ice	23.08	23.08	1712.66
**********										
AIR 32 B2a/B66Aa w/ Mount Pipe	A	From Leg	4.00		0.0000	145.50	No Ice	6.75	6.07	153.07
			0.00				1/2" Ice	7.20	6.87	214.04
			0.00				1" Ice	7.65	7.58	281.89
AIR 32 B2a/B66Aa w/ Mount Pipe	B	From Leg	4.00		0.0000	145.50	No Ice	6.75	6.07	153.07
			0.00				1/2" Ice	7.20	6.87	214.04
			0.00				1" Ice	7.65	7.58	281.89
AIR 32 B2a/B66Aa w/ Mount Pipe	C	From Leg	4.00		0.0000	145.50	No Ice	6.75	6.07	153.07
			0.00				1/2" Ice	7.20	6.87	214.04
			0.00				1" Ice	7.65	7.58	281.89
AIR 21 B2A/B4P w/ Mount Pipe	A	From Leg	4.00		0.0000	145.50	No Ice	6.16	5.55	103.38
			0.00				1/2" Ice	6.60	6.30	159.18
			0.00				1" Ice	7.03	7.00	221.63
AIR 21 B2A/B4P w/ Mount Pipe	B	From Leg	4.00		0.0000	145.50	No Ice	6.16	5.55	103.38
			0.00				1/2" Ice	6.60	6.30	159.18
			0.00				1" Ice	7.03	7.00	221.63
AIR 21 B2A/B4P w/ Mount Pipe	C	From Leg	4.00		0.0000	145.50	No Ice	6.16	5.55	103.38
			0.00				1/2" Ice	6.60	6.30	159.18
			0.00				1" Ice	7.03	7.00	221.63
LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.00		0.0000	145.50	No Ice	11.68	9.84	83.27
			0.00				1/2" Ice	12.40	11.37	172.93
			0.00				1" Ice	13.14	12.91	272.55
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.00		0.0000	145.50	No Ice	11.68	9.84	83.27
			0.00				1/2" Ice	12.40	11.37	172.93
			0.00				1" Ice	13.14	12.91	272.55
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.00		0.0000	145.50	No Ice	11.68	9.84	83.27
			0.00				1/2" Ice	12.40	11.37	172.93
			0.00				1" Ice	13.14	12.91	272.55
RRUS 11 B12	A	From Leg	4.00		0.0000	145.50	No Ice	2.83	1.18	50.70
			0.00				1/2" Ice	3.04	1.33	71.57
			0.00				1" Ice	3.26	1.48	95.49
RRUS 11 B12	B	From Leg	4.00		0.0000	145.50	No Ice	2.83	1.18	50.70
			0.00				1/2" Ice	3.04	1.33	71.57
			0.00				1" Ice	3.26	1.48	95.49

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
RRUS 11 B12	C	From Leg	4.00 0.00 0.00	0.0000	145.50	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	50.70 71.57 95.49
TMA - 1B - Twin AWS	A	From Leg	4.00 0.00 0.00	0.0000	145.50	No Ice 1/2" Ice 1" Ice	0.58 0.67 0.78	0.26 0.34 0.42	11.00 15.83 22.16
TMA - 1B - Twin AWS	B	From Leg	4.00 0.00 0.00	0.0000	145.50	No Ice 1/2" Ice 1" Ice	0.58 0.67 0.78	0.26 0.34 0.42	11.00 15.83 22.16
TMA - 1B - Twin AWS	C	From Leg	4.00 0.00 0.00	0.0000	145.50	No Ice 1/2" Ice 1" Ice	0.58 0.67 0.78	0.26 0.34 0.42	11.00 15.83 22.16
Platform Mount [LP 303-1]	C	None		0.0000	145.50	No Ice 1/2" Ice 1" Ice	14.66 18.87 23.08	14.66 18.87 23.08	1250.00 1481.33 1712.66
**********									
56.5" x 13" x 6.75" Panel Antenna	A	From Leg	4.00 0.00 0.00	0.0000	128.50	No Ice 1/2" Ice 1" Ice	6.54 7.11 7.68	3.83 4.38 4.92	70.00 100.00 130.00
56.5" x 13" x 6.75" Panel Antenna	B	From Leg	4.00 0.00 0.00	0.0000	128.50	No Ice 1/2" Ice 1" Ice	6.54 7.11 7.68	3.83 4.38 4.92	70.00 100.00 130.00
56.5" x 13" x 6.75" Panel Antenna	C	From Leg	4.00 0.00 0.00	0.0000	128.50	No Ice 1/2" Ice 1" Ice	6.54 7.11 7.68	3.83 4.38 4.92	70.00 100.00 130.00
70.5" x 12.25" x 8.25" Panel Antenna	A	From Leg	4.00 0.00 0.00	0.0000	128.50	No Ice 1/2" Ice 1" Ice	8.06 8.74 9.42	5.86 6.54 7.22	70.00 100.00 130.00
70.5" x 12.25" x 8.25" Panel Antenna	B	From Leg	4.00 0.00 0.00	0.0000	128.50	No Ice 1/2" Ice 1" Ice	8.06 8.74 9.42	5.86 6.54 7.22	70.00 100.00 130.00
70.5" x 12.25" x 8.25" Panel Antenna	C	From Leg	4.00 0.00 0.00	0.0000	128.50	No Ice 1/2" Ice 1" Ice	8.06 8.74 9.42	5.86 6.54 7.22	70.00 100.00 130.00
42" x 12" x 4.75" Panel Antenna	A	From Leg	4.00 0.00 0.00	0.0000	128.50	No Ice 1/2" Ice 1" Ice	4.36 4.80 5.24	2.02 2.43 2.84	70.00 100.00 130.00
42" x 12" x 4.75" Panel Antenna	B	From Leg	4.00 0.00 0.00	0.0000	128.50	No Ice 1/2" Ice 1" Ice	4.36 4.80 5.24	2.02 2.43 2.84	70.00 100.00 130.00
42" x 12" x 4.75" Panel Antenna	C	From Leg	4.00 0.00 0.00	0.0000	128.50	No Ice 1/2" Ice 1" Ice	4.36 4.80 5.24	2.02 2.43 2.84	70.00 100.00 130.00
RRH-2WB	A	From Leg	4.00 0.00 6.00	0.0000	133.50	No Ice 1/2" Ice 1" Ice	2.30 2.50 2.69	0.78 0.92 1.06	44.00 59.06 76.79
RRH-2WB	B	From Leg	4.00 0.00 6.00	0.0000	133.50	No Ice 1/2" Ice 1" Ice	2.30 2.50 2.69	0.78 0.92 1.06	44.00 59.06 76.79
RRH-2WB	C	From Leg	4.00 0.00 6.00	0.0000	133.50	No Ice 1/2" Ice 1" Ice	2.30 2.50 2.69	0.78 0.92 1.06	44.00 59.06 76.79
RRH1900-4x45	A	From Leg	4.00 0.00 2.00	0.0000	133.50	No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.38 2.58 2.79	59.50 83.40 110.58
RRH1900-4x45	B	From Leg	4.00 0.00	0.0000	133.50	No Ice 1/2" Ice	2.31 2.52	2.38 2.58	59.50 83.40

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			2.00			1" Ice	2.73	2.79	110.58
RRH1900-4x45	C	From Leg	4.00	0.0000	133.50	No Ice	2.31	2.38	59.50
			0.00			1/2" Ice	2.52	2.58	83.40
			2.00			1" Ice	2.73	2.79	110.58
(3) 8'x2" Antenna Mount Pipe	A	From Leg	4.00	0.0000	128.50	No Ice	1.90	1.90	30.00
			0.00			1/2" Ice	2.73	2.73	44.34
			0.00			1" Ice	3.40	3.40	63.96
(3) 8'x2" Antenna Mount Pipe	B	From Leg	4.00	0.0000	128.50	No Ice	1.90	1.90	30.00
			0.00			1/2" Ice	2.73	2.73	44.34
			0.00			1" Ice	3.40	3.40	63.96
(3) 8'x2" Antenna Mount Pipe	C	From Leg	4.00	0.0000	128.50	No Ice	1.90	1.90	30.00
			0.00			1/2" Ice	2.73	2.73	44.34
			0.00			1" Ice	3.40	3.40	63.96
Platform Mount [LP 402-1]	C	None		0.0000	128.50	No Ice	33.04	33.04	2166.00
						1/2" Ice	43.38	43.38	2677.27
						1" Ice	53.72	53.72	3188.54
Collar Mount [SO 102-3]	C	None		0.0000	133.50	No Ice	3.00	3.00	81.00
						1/2" Ice	3.48	3.48	111.00
						1" Ice	3.96	3.96	141.00
**********									
47" x 11" x 5.25" Panel Antenna	A	From Leg	4.00	0.0000	115.50	No Ice	4.59	2.51	70.00
			0.00			1/2" Ice	5.07	2.96	100.00
			0.00			1" Ice	5.54	3.42	130.00
47" x 11" x 5.25" Panel Antenna	B	From Leg	4.00	0.0000	115.50	No Ice	4.59	2.51	70.00
			0.00			1/2" Ice	5.07	2.96	100.00
			0.00			1" Ice	5.54	3.42	130.00
47" x 11" x 5.25" Panel Antenna	C	From Leg	4.00	0.0000	115.50	No Ice	4.59	2.51	70.00
			0.00			1/2" Ice	5.07	2.96	100.00
			0.00			1" Ice	5.54	3.42	130.00
(2) 73" x 6" x 4.5" Panel Antenna	A	From Leg	4.00	0.0000	115.50	No Ice	4.78	3.90	70.00
			0.00			1/2" Ice	5.46	4.57	100.00
			0.00			1" Ice	6.15	5.24	130.00
(2) 73" x 6" x 4.5" Panel Antenna	B	From Leg	4.00	0.0000	115.50	No Ice	4.78	3.90	70.00
			0.00			1/2" Ice	5.46	4.57	100.00
			0.00			1" Ice	6.15	5.24	130.00
(2) 73" x 6" x 4.5" Panel Antenna	C	From Leg	4.00	0.0000	115.50	No Ice	4.78	3.90	70.00
			0.00			1/2" Ice	5.46	4.57	100.00
			0.00			1" Ice	6.15	5.24	130.00
77" x 14" x 11" Panel Antenna	A	From Leg	4.00	0.0000	115.50	No Ice	9.98	8.23	70.00
			0.00			1/2" Ice	10.73	8.96	100.00
			0.00			1" Ice	11.47	9.68	130.00
77" x 14" x 11" Panel Antenna	B	From Leg	4.00	0.0000	115.50	No Ice	9.98	8.23	70.00
			0.00			1/2" Ice	10.73	8.96	100.00
			0.00			1" Ice	11.47	9.68	130.00
77" x 14" x 11" Panel Antenna	C	From Leg	4.00	0.0000	115.50	No Ice	9.98	8.23	70.00
			0.00			1/2" Ice	10.73	8.96	100.00
			0.00			1" Ice	11.47	9.68	130.00
(4) 8'x2" Antenna Mount Pipe	A	From Leg	4.00	0.0000	115.50	No Ice	1.90	1.90	30.00
			0.00			1/2" Ice	2.73	2.73	44.34
			0.00			1" Ice	3.40	3.40	63.96
(4) 8'x2" Antenna Mount Pipe	B	From Leg	4.00	0.0000	115.50	No Ice	1.90	1.90	30.00
			0.00			1/2" Ice	2.73	2.73	44.34
			0.00			1" Ice	3.40	3.40	63.96
(4) 8'x2" Antenna Mount Pipe	C	From Leg	4.00	0.0000	115.50	No Ice	1.90	1.90	30.00
			0.00			1/2" Ice	2.73	2.73	44.34
			0.00			1" Ice	3.40	3.40	63.96
Platform Mount [LP 401-1]	C	None		0.0000	115.50	No Ice	24.33	24.33	1645.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						1/2" Ice	30.22	30.22	2029.77
						1" Ice	36.11	36.11	2414.54
****									
GPS	C	None		0.0000	42.70	No Ice	0.15	0.15	0.00
						1/2" Ice	0.20	0.20	1.88
						1" Ice	0.26	0.26	4.73

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
26" Dish	C	Paraboloid w/Shroud (HP)	From Face	4.00 0.00 0.00	0.0000		129.00	2.17	No Ice 1/2" Ice 1" Ice	3.69 3.98 4.26	100.00 120.00 140.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp

Comb. No.	Description
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	177 - 126.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22173.50	0.00	-55.83
			Max. Mx	8	-9992.77	-426715.07	-36.68
			Max. My	14	-9990.12	0.00	-426758.75
			Max. Vy	8	15399.80	-426715.07	-36.68
			Max. Vx	14	15401.51	0.00	-426758.75
			Max. Torque	9			-502.60
L2	126.42 - 83.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49427.78	0.00	-2831.91
			Max. Mx	8	-24937.31	-1507251.67	-1940.69
			Max. My	14	-24930.15	0.00	-1511501.13
			Max. Vy	8	30696.51	-1507251.67	-1940.69
			Max. Vx	2	-30825.97	0.00	1511418.31
			Max. Torque	9			-724.38
L3	83.25 - 41.21	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68858.60	0.00	-5372.31
			Max. Mx	8	-38760.28	-2874310.23	-3428.65
			Max. My	2	-38754.14	0.00	2883220.22
			Max. Vy	8	36234.84	-2874310.23	-3428.65
			Max. Vx	2	-36364.12	0.00	2883220.22
			Max. Torque	9			-723.31
L4	41.21 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-94633.08	0.00	-8723.70
			Max. Mx	8	-58200.72	-4766211.5	-5258.25

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
						1	
			Max. My	2	-58200.55	0.00	4780588.29
			Max. Vy	8	41427.33	-4766211.5	-5258.25
						1	
			Max. Vx	2	-41553.68	0.00	4780588.29
			Max. Torque	9			-722.49

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	26	94633.08	0.00	0.94
	Max. H_x	21	43670.43	41391.34	-21.69
	Max. H_z	3	43670.43	0.00	41517.58
	Max. M_x	2	4780588.29	0.00	41516.30
	Max. M_z	8	4766211.51	-41390.06	-21.68
	Max. Torsion	21	722.06	41391.34	-21.69
	Min. Vert	3	43670.43	0.00	41517.58
	Min. H_x	9	43670.43	-41391.34	-21.69
	Min. H_z	15	43670.43	0.00	-41468.79
	Min. M_x	14	-4778863.11	0.00	-41467.51
	Min. M_z	20	-4766211.51	41390.06	-21.68
	Min. Torsion	9	-722.06	-41391.34	-21.69

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	48522.84	0.00	0.00	1916.68	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	58227.22	0.00	-41516.30	-4780588.29	0.00	0.00
0.9 Dead+1.6 Wind 0 deg - No Ice	43670.43	0.00	-41517.58	-4744116.62	0.00	0.00
1.2 Dead+1.6 Wind 30 deg - No Ice	58227.40	20681.61	-35981.21	-4143437.24	-2381339.98	229.09
0.9 Dead+1.6 Wind 30 deg - No Ice	43670.55	20681.64	-35981.25	-4111743.61	-2362783.80	231.80
1.2 Dead+1.6 Wind 60 deg - No Ice	58227.40	35813.91	-20822.57	-2397704.60	-4123592.14	388.26
0.9 Dead+1.6 Wind 60 deg - No Ice	43670.55	35813.95	-20822.60	-2379613.90	-4091459.70	392.95
1.2 Dead+1.6 Wind 90 deg - No Ice	58227.22	41390.06	21.68	5258.11	-4766211.51	716.59
0.9 Dead+1.6 Wind 90 deg - No Ice	43670.43	41391.34	21.69	4626.22	-4729258.52	722.06
1.2 Dead+1.6 Wind 120 deg - No Ice	58227.40	35827.85	20776.10	2396282.47	-4125445.22	512.59
0.9 Dead+1.6 Wind 120 deg - No Ice	43670.55	35827.90	20776.13	2377019.49	-4093298.95	517.32
1.2 Dead+1.6 Wind 150 deg - No Ice	58227.40	20669.99	35930.86	4141506.09	-2379798.79	210.95

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
0.9 Dead+1.6 Wind 150 deg - No Ice	43670.55	20670.02	35930.91	4108644.46	-2361254.98	213.68
1.2 Dead+1.6 Wind 180 deg - No Ice	58227.22	0.00	41467.51	4778863.11	0.00	0.00
0.9 Dead+1.6 Wind 180 deg - No Ice	43670.43	0.00	41468.79	4741222.25	0.00	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice	58227.40	-20669.99	35930.86	4141506.09	2379798.79	-210.95
0.9 Dead+1.6 Wind 210 deg - No Ice	43670.55	-20670.02	35930.91	4108644.46	2361254.98	-213.68
1.2 Dead+1.6 Wind 240 deg - No Ice	58227.40	-35827.85	20776.10	2396282.47	4125445.22	-512.59
0.9 Dead+1.6 Wind 240 deg - No Ice	43670.55	-35827.90	20776.13	2377019.49	4093298.95	-517.32
1.2 Dead+1.6 Wind 270 deg - No Ice	58227.22	-41390.06	21.68	5258.11	4766211.51	-716.59
0.9 Dead+1.6 Wind 270 deg - No Ice	43670.43	-41391.34	21.69	4626.22	4729258.52	-722.06
1.2 Dead+1.6 Wind 300 deg - No Ice	58227.40	-35813.91	-20822.57	-2397704.60	4123592.14	-388.26
0.9 Dead+1.6 Wind 300 deg - No Ice	43670.55	-35813.95	-20822.60	-2379613.90	4091459.70	-392.95
1.2 Dead+1.6 Wind 330 deg - No Ice	58227.40	-20681.61	-35981.21	-4143437.24	2381339.98	-229.09
0.9 Dead+1.6 Wind 330 deg - No Ice	43670.55	-20681.64	-35981.25	-4111743.61	2362783.80	-231.80
1.2 Dead+1.0 Ice+1.0 Temp	94633.08	0.00	-0.94	8723.70	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	94633.08	0.00	-12556.19	-1449515.08	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	94633.08	6261.52	-10878.92	-1254757.32	-727102.03	45.58
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	94633.08	10843.65	-6291.24	-721944.55	-1259156.09	77.17
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	94633.08	12529.58	4.57	9842.55	-1455095.81	146.20
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	94633.08	10846.59	6281.44	739041.30	-1259556.78	103.82
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	94633.08	6259.07	10868.31	1271741.60	-726766.49	41.97
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	94633.08	0.00	12545.90	1466543.43	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	94633.08	-6259.07	10868.31	1271741.60	726766.49	-41.97
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	94633.08	-10846.59	6281.44	739041.30	1259556.78	-103.82
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	94633.08	-12529.58	4.57	9842.55	1455095.81	-146.20
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	94633.08	-10843.65	-6291.24	-721944.55	1259156.09	-77.17
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	94633.08	-6261.52	-10878.92	-1254757.32	727102.03	-45.58
Dead+Wind 0 deg - Service	48522.83	0.00	-8883.03	-1016852.17	0.00	0.00
Dead+Wind 30 deg - Service	48522.83	4424.69	-7697.94	-881019.24	-507187.49	49.53
Dead+Wind 60 deg - Service	48522.83	7662.15	-4454.85	-509204.50	-878256.96	83.98
Dead+Wind 90 deg - Service	48522.83	8856.02	4.64	2587.07	-1015251.92	154.96
Dead+Wind 120 deg - Service	48522.83	7665.13	4444.91	511835.47	-878651.54	111.07
Dead+Wind 150 deg - Service	48522.83	4422.21	7687.17	883540.57	-506858.59	45.88
Dead+Wind 180 deg - Service	48522.83	0.00	8872.58	1019417.31	0.00	0.00
Dead+Wind 210 deg - Service	48522.83	-4422.21	7687.17	883540.57	506858.59	-45.88
Dead+Wind 240 deg - Service	48522.83	-7665.13	4444.91	511835.47	878651.54	-111.07
Dead+Wind 270 deg - Service	48522.83	-8856.02	4.64	2587.07	1015251.92	-154.96

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead+Wind 300 deg - Service	48522.83	-7662.15	-4454.85	-509204.50	878256.96	-83.98
Dead+Wind 330 deg - Service	48522.83	-4424.69	-7697.94	-881019.24	507187.49	-49.53

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-48522.84	0.00	0.00	48522.84	-0.00	0.000%
2	0.00	-58227.41	-41520.60	0.00	58227.22	41516.30	0.006%
3	0.00	-43670.56	-41520.60	0.00	43670.43	41517.58	0.005%
4	20681.69	-58227.41	-35981.34	-20681.61	58227.40	35981.21	0.000%
5	20681.69	-43670.56	-35981.34	-20681.64	43670.55	35981.25	0.000%
6	35814.05	-58227.41	-20822.65	-35813.91	58227.40	20822.57	0.000%
7	35814.05	-43670.56	-20822.65	-35813.95	43670.55	20822.60	0.000%
8	41394.35	-58227.41	21.69	-41390.06	58227.22	-21.68	0.006%
9	41394.35	-43670.56	21.69	-41391.34	43670.43	-21.69	0.005%
10	35827.99	-58227.41	20776.18	-35827.85	58227.40	-20776.10	0.000%
11	35827.99	-43670.56	20776.18	-35827.90	43670.55	-20776.13	0.000%
12	20670.07	-58227.41	35931.00	-20669.99	58227.40	-35930.86	0.000%
13	20670.07	-43670.56	35931.00	-20670.02	43670.55	-35930.91	0.000%
14	0.00	-58227.41	41471.81	0.00	58227.22	-41467.51	0.006%
15	0.00	-43670.56	41471.81	0.00	43670.43	-41468.79	0.005%
16	-20670.07	-58227.41	35931.00	20669.99	58227.40	-35930.86	0.000%
17	-20670.07	-43670.56	35931.00	20670.02	43670.55	-35930.91	0.000%
18	-35827.99	-58227.41	20776.18	35827.85	58227.40	-20776.10	0.000%
19	-35827.99	-43670.56	20776.18	35827.90	43670.55	-20776.13	0.000%
20	-41394.35	-58227.41	21.69	41390.06	58227.22	-21.68	0.006%
21	-41394.35	-43670.56	21.69	41391.34	43670.43	-21.69	0.005%
22	-35814.05	-58227.41	-20822.65	35813.91	58227.40	20822.57	0.000%
23	-35814.05	-43670.56	-20822.65	35813.95	43670.55	20822.60	0.000%
24	-20681.69	-58227.41	-35981.34	20681.61	58227.40	35981.21	0.000%
25	-20681.69	-43670.56	-35981.34	20681.64	43670.55	35981.25	0.000%
26	0.00	-94633.08	0.00	0.00	94633.08	0.94	0.001%
27	0.00	-94633.08	-12556.49	0.00	94633.08	12556.19	0.000%
28	6261.67	-94633.08	-10879.19	-6261.52	94633.08	10878.92	0.000%
29	10843.92	-94633.08	-6291.39	-10843.65	94633.08	6291.24	0.000%
30	12529.88	-94633.08	4.57	-12529.58	94633.08	-4.57	0.000%
31	10846.86	-94633.08	6281.59	-10846.59	94633.08	-6281.44	0.000%
32	6259.22	-94633.08	10868.57	-6259.07	94633.08	-10868.31	0.000%
33	0.00	-94633.08	12546.21	0.00	94633.08	-12545.90	0.000%
34	-6259.22	-94633.08	10868.57	6259.07	94633.08	-10868.31	0.000%
35	-10846.86	-94633.08	6281.59	10846.59	94633.08	-6281.44	0.000%
36	-12529.88	-94633.08	4.57	12529.58	94633.08	-4.57	0.000%
37	-10843.92	-94633.08	-6291.39	10843.65	94633.08	6291.24	0.000%
38	-6261.67	-94633.08	-10879.19	6261.52	94633.08	10878.92	0.000%
39	0.00	-48522.84	-8883.78	0.00	48522.83	8883.03	0.002%
40	4425.07	-48522.84	-7698.60	-4424.69	48522.83	7697.94	0.002%
41	7662.80	-48522.84	-4455.23	-7662.15	48522.83	4454.85	0.002%
42	8856.77	-48522.84	4.64	-8856.02	48522.83	-4.64	0.002%
43	7665.79	-48522.84	4445.29	-7665.13	48522.83	-4444.91	0.002%
44	4422.59	-48522.84	7687.83	-4422.21	48522.83	-7687.17	0.002%
45	0.00	-48522.84	8873.34	0.00	48522.83	-8872.58	0.002%
46	-4422.59	-48522.84	7687.83	4422.21	48522.83	-7687.17	0.002%
47	-7665.79	-48522.84	4445.29	7665.13	48522.83	-4444.91	0.002%
48	-8856.77	-48522.84	4.64	8856.02	48522.83	-4.64	0.002%
49	-7662.80	-48522.84	-4455.23	7662.15	48522.83	4454.85	0.002%
50	-4425.07	-48522.84	-7698.60	4424.69	48522.83	7697.94	0.002%

Non-Linear Convergence Results

Load Combination	*Converged?*	*Number of Cycles*	*Displacement Tolerance*	*Force Tolerance*
1	Yes	6	0.00000001	0.00000001
2	Yes	12	0.00009225	0.00010968
3	Yes	12	0.00006393	0.00009697
4	Yes	15	0.00000001	0.00010880
5	Yes	15	0.00000001	0.00008306
6	Yes	15	0.00000001	0.00010805
7	Yes	15	0.00000001	0.00008247
8	Yes	12	0.00009226	0.00011658
9	Yes	12	0.00006394	0.00010223
10	Yes	15	0.00000001	0.00010941
11	Yes	15	0.00000001	0.00008350
12	Yes	15	0.00000001	0.00010810
13	Yes	15	0.00000001	0.00008246
14	Yes	12	0.00009224	0.00010973
15	Yes	12	0.00006393	0.00009701
16	Yes	15	0.00000001	0.00010810
17	Yes	15	0.00000001	0.00008246
18	Yes	15	0.00000001	0.00010941
19	Yes	15	0.00000001	0.00008350
20	Yes	12	0.00009226	0.00011658
21	Yes	12	0.00006394	0.00010223
22	Yes	15	0.00000001	0.00010805
23	Yes	15	0.00000001	0.00008247
24	Yes	15	0.00000001	0.00010880
25	Yes	15	0.00000001	0.00008306
26	Yes	6	0.00000001	0.00001367
27	Yes	14	0.00000001	0.00007150
28	Yes	14	0.00000001	0.00008407
29	Yes	14	0.00000001	0.00008399
30	Yes	14	0.00000001	0.00007180
31	Yes	14	0.00000001	0.00008502
32	Yes	14	0.00000001	0.00008498
33	Yes	14	0.00000001	0.00007234
34	Yes	14	0.00000001	0.00008498
35	Yes	14	0.00000001	0.00008502
36	Yes	14	0.00000001	0.00007180
37	Yes	14	0.00000001	0.00008399
38	Yes	14	0.00000001	0.00008407
39	Yes	12	0.00000001	0.00003143
40	Yes	12	0.00000001	0.00002527
41	Yes	12	0.00000001	0.00002434
42	Yes	12	0.00000001	0.00003148
43	Yes	12	0.00000001	0.00002564
44	Yes	12	0.00000001	0.00002477
45	Yes	12	0.00000001	0.00003153
46	Yes	12	0.00000001	0.00002477
47	Yes	12	0.00000001	0.00002564
48	Yes	12	0.00000001	0.00003148
49	Yes	12	0.00000001	0.00002434
50	Yes	12	0.00000001	0.00002527

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	177 - 126.42	19.776	45	0.9484	0.0004
L2	131.17 - 83.25	11.280	45	0.7819	0.0004
L3	89.25 - 41.21	5.387	45	0.5317	0.0002
L4	48.46 - 0	1.711	45	0.3104	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.00	3/4"x5' Lightning Rod	45	19.776	0.9484	0.0004	87010
177.50	(2) 55" x 11" x 5" Panel Antenna	45	19.776	0.9484	0.0004	87010
177.00	47" x 12" x 6.5" Panel Antenna	45	19.776	0.9484	0.0004	87010
145.50	AIR 32 B2a/B66Aa w/ Mount Pipe	45	13.776	0.8457	0.0005	13810
133.50	RRH-2WB	45	11.670	0.7934	0.0004	10033
129.00	26" Dish	45	10.923	0.7707	0.0004	9584
128.50	56.5" x 13" x 6.75" Panel Antenna	45	10.841	0.7681	0.0004	9582
115.50	47" x 11" x 5.25" Panel Antenna	45	8.831	0.6936	0.0003	9920
42.70	GPS	45	1.386	0.2770	0.0001	8584

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	177 - 126.42	92.733	2	4.4499	0.0020
L2	131.17 - 83.25	52.909	2	3.6676	0.0020
L3	89.25 - 41.21	25.274	2	2.4951	0.0008
L4	48.46 - 0	8.028	2	1.4565	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.00	3/4"x5' Lightning Rod	2	92.733	4.4499	0.0020	18729
177.50	(2) 55" x 11" x 5" Panel Antenna	2	92.733	4.4499	0.0020	18729
177.00	47" x 12" x 6.5" Panel Antenna	2	92.733	4.4499	0.0020	18729
145.50	AIR 32 B2a/B66Aa w/ Mount Pipe	2	64.609	3.9673	0.0022	2969
133.50	RRH-2WB	2	54.738	3.7217	0.0020	2155
129.00	26" Dish	2	51.233	3.6152	0.0020	2058
128.50	56.5" x 13" x 6.75" Panel Antenna	2	50.851	3.6028	0.0019	2057
115.50	47" x 11" x 5.25" Panel Antenna	2	41.425	3.2536	0.0016	2127
42.70	GPS	2	6.500	1.2997	0.0003	1830

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	177 - 126.42 (1)	TP40.31x24.828x0.1875	50.58	0.00	0.0	23.0126	-9990.29	1254540.00	0.008
L2	126.42 - 83.25 (2)	TP51.83x38.4811x0.25	47.92	0.00	0.0	39.6025	-24930.10	2207620.00	0.011
L3	83.25 - 41.21 (3)	TP59.02x49.6586x0.375	48.04	0.00	0.0	68.1206	-38754.10	4394020.00	0.009
L4	41.21 - 0 (4)	TP64.78x56.8572x0.375	48.46	0.00	0.0	76.6581	-58200.60	4671540.00	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	177 - 126.42 (1)	TP40.31x24.828x0.1875	426823.33	1000541.67	0.427	0.00	1000541.67	0.000
L2	126.42 - 83.25 (2)	TP51.83x38.4811x0.25	1511500.00	2272075.00	0.665	0.00	2272075.00	0.000
L3	83.25 - 41.21 (3)	TP59.02x49.6586x0.375	2883216.67	5177958.33	0.557	0.00	5177958.33	0.000
L4	41.21 - 0 (4)	TP64.78x56.8572x0.375	4780591.67	6199416.67	0.771	0.00	6199416.67	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	177 - 126.42 (1)	TP40.31x24.828x0.1875	15405.40	627270.00	0.025	0.17	2003525.00	0.000
L2	126.42 - 83.25 (2)	TP51.83x38.4811x0.25	30776.90	1103810.00	0.028	0.00	4549700.00	0.000
L3	83.25 - 41.21 (3)	TP59.02x49.6586x0.375	36364.10	2197010.00	0.017	0.00	10368583.33	0.000
L4	41.21 - 0 (4)	TP64.78x56.8572x0.375	41553.70	2335770.00	0.018	0.00	12414000.00	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	177 - 126.42 (1)	0.008	0.427	0.000	0.025	0.000	0.435 ✔	1.000	4.8.2 ✔
L2	126.42 - 83.25 (2)	0.011	0.665	0.000	0.028	0.000	0.677 ✔	1.000	4.8.2 ✔
L3	83.25 - 41.21 (3)	0.009	0.557	0.000	0.017	0.000	0.566 ✔	1.000	4.8.2 ✔
L4	41.21 - 0 (4)	0.012	0.771	0.000	0.018	0.000	0.784 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	177 - 126.42	Pole	TP40.31x24.828x0.1875	1	-9990.29	1254540.00	43.5	Pass
L2	126.42 - 83.25	Pole	TP51.83x38.4811x0.25	2	-24930.10	2207620.00	67.7	Pass
L3	83.25 - 41.21	Pole	TP59.02x49.6586x0.375	3	-38754.10	4394020.00	56.6	Pass
L4	41.21 - 0	Pole	TP64.78x56.8572x0.375	4	-58200.60	4671540.00	78.4	Pass
							Summary	
						Pole (L4)	78.4	Pass
						RATING =	**78.4**	**Pass**

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

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

Site Data	
BU#:	
Site Name:	
App #:	
Pole Manufacturer:	*Other*

Reactions		
Mu:	4781	ft-kips
Axial, Pu:	58.2	kips
Shear, Vu:	41.5	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

Anchor Rod Data		
Qty:	20	
Diam:	2.125	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	72	in

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

Anchor Rod Results

		Rigid
Max Rod (Cu+ Vu/ή):	166.4 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	200.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	83.2% **Pass**	

Plate Data		
Diam:	77.25	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	10.28	in

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	19.5 ksi	AISC LRFD
Allowable Plate Stress:	54.0 ksi	φ*Fy
Base Plate Stress Ratio:	36.1% **Pass**	Y.L. Length: 31.43

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.3125	in
Width:	5	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

n/a

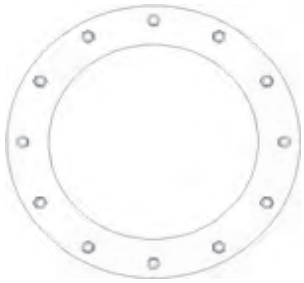
Stiffener Results

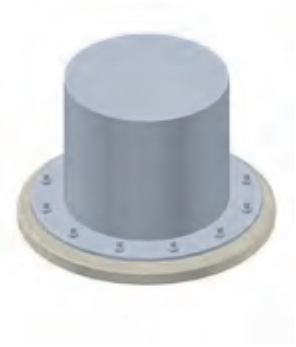
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Diam:	64.78	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None





* 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

CCI Foundation Tool Suite - Monopole Pier

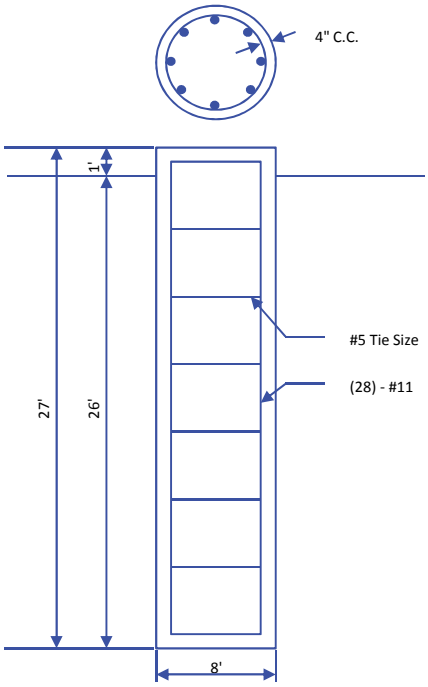
CCIFTS 1.2.108.14286 - Phase 1-2 Date: 12/21/2016

BU:	
Site Name:	CT11720A
App Number:	
Work Order:	

Monopole Drilled Pier

Input

Criteria		
TIA Revision:	G	
ACI 318 Revision:	2008	
Seismic Category:	D	
Forces		
Compression	58.2	kips
Shear	41.5	kips
Moment	4781	k-ft
Swelling Force	0	kips
Foundation Dimensions		
Pier Diameter:	8	ft
Ext. above grade:	1	ft
Depth below grade:	26	ft
Material Properties		
Number of Rebar:	28	
Rebar Size:	11	
Tie Size	5	
Rebar tensile strength:	60	ksi
Concrete Strength:	3000	psi
Ultimate Concrete Strain	0.003	in/in
Clear Cover to Ties:	4	in



Soil Profile: CT11720A

Layer	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
1	6	0	6	100	0	0	0	0	0	
2	2	6	8	130	0	34	0	0	0	
3	16	8	24	70	0	34	0	0	0	
4	2	24	26	70	0	34	0	0	20	

Analysis Results

Soil Lateral Capacity

Depth to Zero Shear:	7.42	ft
Max Moment, Mu:	5102.18	k-ft
Soil Safety Factor:	2.01	
Safety Factor Req'd:	1.33	
RATING:	66.2%	

Soil Axial Capacity

Skin Friction (k):	0.00	kips
End Bearing (k):	753.98	kips
Comp. Capacity (k), ϕCn:	753.98	kips
Comp. (k), Cu:	58.20	kips
RATING:	7.7%	

Concrete/Steel Check

Mu (from soil analysis)	5102.18	k-ft
ϕMn	7903.34	k-ft
RATING:	64.6%	

rho provided	0.60	
rho required	0.50	OK

Rebar Spacing	8.17	
Spacing required	22.56	OK

Dev. Length required	18.25	
Dev. Length provided	61.78	OK

Overall Foundation Rating: 66.2%

Exhibit E

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11720A

CT720/Town of Orange_MP
26 So. Orange Center Road
Orange, CT 06477

December 27, 2016

EBI Project Number: 6216004490

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	8.98 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

December 27, 2016

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

Emissions Analysis for Site: **CT11720A – CT720/Town of Orange_MP**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **26 So. Orange Center Road, Orange, 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 (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **26 So. Orange Center Road, Orange, 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 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antennas used in this modeling are the **Ericsson AIR32 B66Aa/B2A** & **Ericsson AIR21 B2A/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 B66Aa/B2A** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Ericsson AIR21 B2A/B4P** has a maximum gain of **15.9 dBd** at its 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 **145.5 feet** above ground level (AGL).

11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 B66Aa/B2A	Make / Model:	Ericsson AIR32 B66Aa/B2A	Make / Model:	Ericsson AIR32 B66Aa/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	145.5	Height (AGL):	145.5	Height (AGL):	145.5
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%	1.72	Antenna B1 MPE%	1.72	Antenna C1 MPE%	1.72
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):	145.5	Height (AGL):	145.5	Height (AGL):	145.5
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%	1.29	Antenna B2 MPE%	1.29	Antenna C2 MPE%	1.29
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):	145.5	Height (AGL):	145.5	Height (AGL):	145.5
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%	0.34	Antenna B3 MPE%	0.34	Antenna C3 MPE%	0.34

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**3.36 %**
Sprint	1.04 %
Clearwire	0.13 %
AT&T	0.67 %
Verizon Wireless	3.34 %
Nextel	0.44 %
Site Total MPE %:	**8.98 %**

T-Mobile Sector A Total:	3.36 %
T-Mobile Sector B Total:	3.36 %
T-Mobile Sector C Total:	3.36 %
Site Total:	8.98 %

T-Mobile _per sector	**# Channels**	**Watts ERP (Per Channel)**	**Height (feet)**	**Total Power Density ($\mu W/cm^2$)**	**Frequency (MHz)**	**Allowable MPE ($\mu W/cm^2$)**	**Calculated % MPE**
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	145.5	8.62	AWS - 2100 MHz	1000	0.86%
T-Mobile PCS - 1900 MHz LTE	2	2,334.27	145.5	8.62	PCS - 1900 MHz	1000	0.86%
T-Mobile AWS - 2100 MHz UMTS	2	1,167.14	145.5	4.31	AWS - 2100 MHz	1000	0.43%
T-Mobile PCS - 1950 MHz UMTS	2	1,167.14	145.5	4.31	PCS - 1950 MHz	1000	0.43%
T-Mobile PCS - 1950 MHz GSM	2	1,167.14	145.5	4.31	PCS - 1950 MHz	1000	0.43%
T-Mobile 700 MHz LTE	1	865.21	145.5	1.60	700 MHz	467	0.34%
						Total:	**3.36%**

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 A:	3.36 %
Sector B:	3.36 %
Sector C:	3.36 %
T-Mobile Per Sector Maximum:	3.36 %
Site Total:	8.98 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **8.98%** 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.

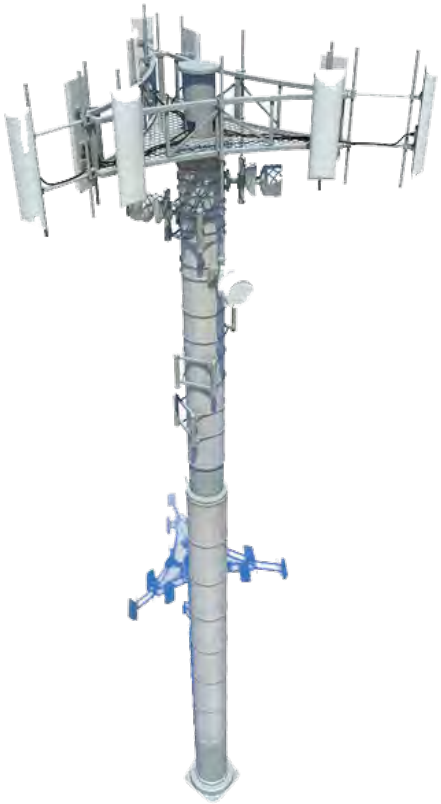
FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100%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

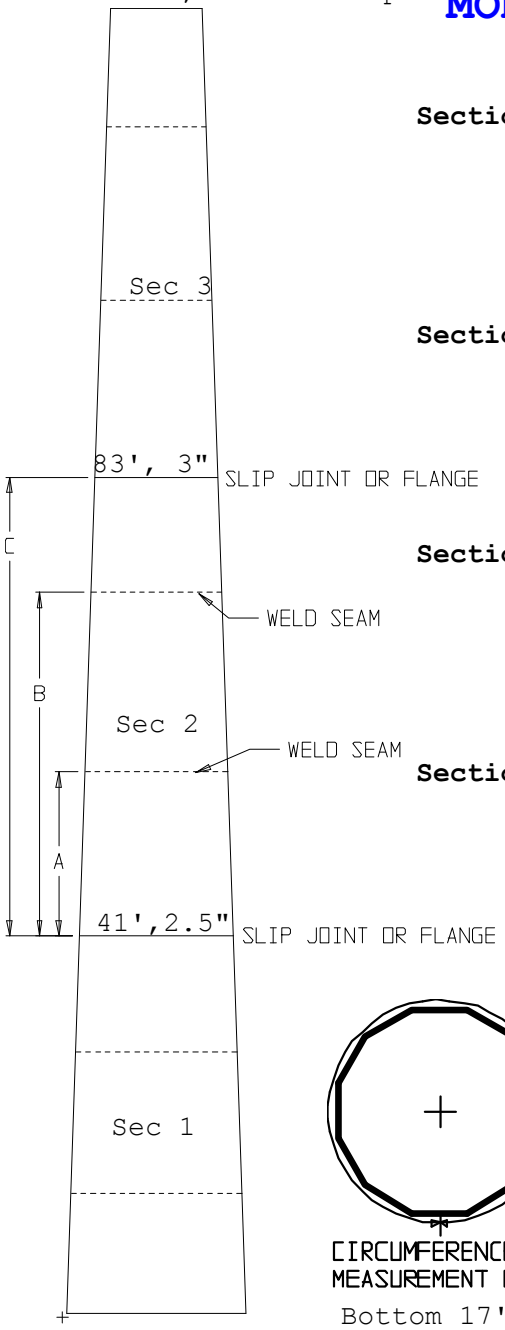
Exhibit F

NORTHEAST TOWERS, INC. | THE COMMUNICATION ANTENNA & TOWER SPECIALIST

Atlantis Design Group
Site CT 11720,
Orange CT

Monopole Tower Mapping Form





MONOPOLE DATASHEET

		Dimensions:	Thickness Tests: Test 1	Test 2	Test 3	Circumference:	
Section 1:	A:	10-1/4"	3/8"			Bottom: 17',1.5"	inches
	B:	Above Splice					
	C:						
	D:	Below					
	E:	9-1/2"				Top: 10-1/4"	inches
Section 2:	A:	7"	3/8"			Bottom: 9-1/2"	inches
	B:	Above Splice					
	C:						
	D:	Below					
	E:	8-3/4"				Top: 9"	inches
Section 3:	A:	7"	1/4"			Bottom: 8-3/4"	inches
	B:	Above Splice					
	C:						
	D:	Below					
	E:	6-3/4"				Top: 7"	inches
Section 4:	A:	5-1/4"	3/16"			Bottom: 6-3/4"	inches
	B:	Top					
	C:						
	D:	Bottom					
	E:	5"				Top: 5-1/4"	inches

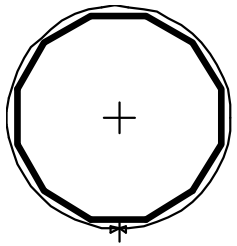
Overall Height of Pole: 177' ft

# of sides on Pole: 18,

DRAW BASE FLANGE WITH DIMENSIONS:

Plate thickness:	2-3/4"	inches
Bolt Quantity:	20	
C-C of Bolts:	11-1/4"	inches
Bolt Diameter:	2-1/8"	inches

Tower to center of bolt 3-1/2"
Tower to edge of flange 6-1/4"
Foundation height 12"



CIRCUMFERENCE MEASUREMENT OF POLE

Bottom 17', 1.5" Top 6'-6"

Foundation Circumference 25', 3.5" No Grout
Base Plate Circumference 20', 3"
Base Plate Face Width 11 and 1/4 "

ANTENNA DATA SHEET

No.	QTY	Antenna Type	Make/ Model	Orientation	Bottom Elevation	Centerline Elevation	Top Elevation	Aximuth	Transmission Line	Antenna Mount (Draw on Back)
A	1					175.5'				Low Profile Platform 12.5'
B	6	Panel	55"x11"x5"	Above	175.5	177.5'	179.5'			
C	3	Panel	47"x12"x6.5"	Above	175.5	177	179'			
D	6	TMA	Powerwave	Above						Located on pipe behind antenna
E	3	RRU	Ericsson RRUS11 B32	Collar. Above platform						
F	3	RRU	Ericsson RRUS11 B2	Above on empty antenna pipe						
G	1	Squid/ OVP	Raycap DC6-48-60-0-8F	Below on equipment Collar						
H	12					175.5			1-5/8" Andrew	
I	1					175.5			3/8" RET control Cable	
J	2					175.5			7/8" DC Cables in 2" inner duct	
K	1					175.5			3/8" Fiber in 2" in Inner Duct	
L	1					175.5			#2 Tinned Ground down	
M	.	Lightening Rod	Lightening Rod		175.5'		180.5'			
N	1					176' 8"			Equipment Collar	
O										
P										
Q										
R										
S										
T										
U										
V										
W										
X										
Y										
Z										

Antenna **Type:** **Whip/Omni, Panel, Dipole, Yagi, Dish, GridDish**
Orientation: **Upright, Centered, Inverted**
NOTE: If antenna model is not known, describe antenna (Length Width/Diameter # of elements Diameter . Elevation is tape drop from the antenna to the bottom of the tower.

ANTENNA DATA SHEET

No.	QTY	Antenna Type	Make/ Model	Orientation	Bottom Elevation	Centerline Elevation	Top Elevation	Aximuth	Transmission Line	Antenna Mount (Draw on Back)
A	1					145.5'				12.5' face Low Profile Platform
B	6	Panel	55"11"x7.5"	Above	145'		150'			
C	3	Panel	96"x11.75"x6"	Above	143		151'			
D	3	TMA		Above			149.5'			Mounted behind Antenna
E	3	RRH	RRUS B11	Below	141'		143'			
F	12					145.5'			1-5/8 Andrews	
G	1					145.5'			3/8 RET Control cable	
H	1								1-1/4' Hybird DC/Fiber	
I										
J										
K										
L										
M										
N										
O										
P										
Q										
R										
S										
T										
U										
V										
W										
X										
Y										
Z										

Antenna **Type:** **Whip/Omni, Panel, Dipole, Yagi, Dish, GridDish**
Orientation: **Upright, Centered, Inverted**
NOTE: If antenna model is not known, describe antenna (Length Width/Diameter # of elements Diameter. Elevation is tape drop from the antenna to the bottom of the tower.

ANTENNA DATA SHEET

No.	QTY	Antenna Type	Make/ Model	Orientation	Bottom Elevation	Centerline Elevation	Top Elevation	Aximuth	Transmission Line	Antenna Mount (Draw on Back)
A	1	Platform				128.6'				13' Low profile Platform w/ Hand rails
B	3	Panel	56.5"x13"x6.75"	Above			131'			
C	3	Panel	70.5"x12.25"x8.25	Above			132'			
D	3	Panel	42"x12'x4.75"	Above			131'			
E	1	Dish	26" diameter				130'		1/2" andrews	Mounted to flange pipe bolted to platform
F	3								1-1/4 Hybrid	
G	3	RRH					135'			Mounted above equipment collar
H	3	RRH					131'			Mounted below equipment collar
I	1					133.6'				Equipment Collar
J	1	GPS				42' 8"			1/2" Andrews	Mounted to Jack Bolt nut
K										
L										
M										
N										
O										
P										
Q										
R										
S										
T										
U										
V										
W										
X										
Y										
Z										

Antenna **Type:** **Whip/Omni, Panel, Dipole, Yagi, Dish, GridDish**
Orientation: **Upright, Centered, Inverted**
NOTE: If antenna model is not known, describe antenna (Length Width/Diameter # of elements Diameter . Elevation is tape drop from the antenna to the bottom of the tower.

ANTENNA DATA SHEET

No.	QTY	Antenna Type	Make/ Model	Orientation	Bottom Elevation	Centerline Elevation	Top Elevation	Aximuth	Transmission Line	Antenna Mount (Draw on Back)
A	1	Platform				115.6				Low profile w/ 13' face
B	3	Panel	47"x11"x5.25"	Centered	113'	115'	118.5'			
C	6	Panel	73"x6"x4.5"	Centered	112'	115'	118..5'			
D	3	Panel	77"X14"x11"	Crnterd	112'	115'	119'			
E	6						115.6'		1-5/8 Andrews	Outside of monopole
F	12						115.6'		1-5/8 Andrews	
G	1						115.6'		1-1/4" Hybird	
H										
I										
J										
K										
L										
M										
N										
O										
P										
Q										
R										
S										
T										
U										
V										
W										
X										
Y										
Z										

Antenna **Type:** **Whip/Omni, Panel, Dipole, Yagi, Dish, GridDish**
Orientation: **Upright, Centered, Inverted**
NOTE: If antenna model is not known, describe antenna (Length Width/Diameter # of elements Diameter . Elevation is tape drop from the antenna to the bottom of the tower.