STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

VIA ELECTRONIC MAIL

August 31, 2018

Denise Sabo
Northeast Site Solutions
420 Main Street
Sturbridge, MA 01566-1359

RE: **EM-T-MOBILE-104-180822** – T-Mobile notice of intent to modify an existing telecommunications facility located at 2 Hinckley Hill Road, Norwich, Connecticut.

Dear Ms. Sabo:

The Connecticut Siting Council (Council) is in receipt of your correspondence of August 27, 2018 submitted in response to the Council's August 23, 2018 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/FC/emr

Robidoux, Evan

From:	Deborah Chase <deborah@northeastsitesolutions.com>
Sent:	Tuesday, August 21, 2018 2:25 PM
To:	CSC-DL Siting Council; Bachman, Melanie; Mathews, Lisa A
Cc:	Denise Sabo; Sheldon Freincle; victoria@northeastsitesolutions.com
Subject:	2 Hinckley Road, Norwich, CT 06360 T-Mobile EM Application (CT11254B-L700 4x2 NHP18)
Attachments:	2 Hinckley Road, Norwich,CT 06360 T-Mobile EM Application (CT11254B-L700 4x2, NHP18)).pdf

Siting Council-
Enclosed please find the Exempt Modification Application package from Northeast Site Solutions on behalf of T-Mobile for the above referenced site.
We are mailing the original and two (2) copies to your office.
Please let me know if you have any questions or problems with the attachment.
Thank you

Deborah Chase
Senior Project Coordinator & Analyst
Mobile: 860-490-8839

NSS
NORTHEAST
SITE SOLUTIONS

Save a tree. Refuse.Reduce. Reuse. Recycle.

NORTHEAST SITE SOLUTIONS

Turnkey Wireless Development

Northeast Site Solutions
Denise Sabo
420 Main Street, Sturbridge, MA 01655
860-209-4690
denise@northeastsitesolutions.com

August 20, 2018

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

RE: Notice of Exempt Modification
2 Hinckley Road, Norwich CT 06360
Latitude: 41.6488
Longitude: -72.9474
T-Mobile Site#: CT11254B_L700 4x2 – NHP18

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 148-foot level of the existing 150-foot lattice tower at 2 Hinckley Road, Norwich CT 06360. The 150-foot lattice tower is owned by Cordless Data Transfer, Inc. The property is owned by James C Irwin. T-Mobile now intends to replace six (6) of its existing antennas with three (3) new 1900 MHz antenna and three(3) new 700 MHz antenna. The new antennas would be installed at the 148-foot level of the tower.

Planned Modifications:

Tower:

Remove:
(6) 1-5/8" Coax

Remove and Replace:
(3) DBXNH-6565B-A2M Antenna (REMOVE) - (3) RFS-APXVAARR24_43U-NA20 Antenna 1900/600/700 MHz **(REPLACE)**

Install New:
(3) RRU 4449 B71+B12
(1) Fiber Hybrid Line

Existing to Remain:
(6) 1-5/8" Coax
(1) Fiber Hybrid Line
(3) KRY 112 144/2 TMA
(3)AIR32 B66A/B2A 1900/2100 MHz

Ground:

Install New:
(3) Polar Power 15KW DC Generator – 54 gallon double walled self-contained tank with fuel sensor.
Requires two (2) 20 minute run cycles annually.

This facility was approved by the CT Siting Council. Petition No.579 –on August 27, 2002 Cordless Data Transfer was approved for to expand the height of the existing 140ft tower to 153-foot AGL. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Mayor Peter Nystrom, Elected Official and Richard Shuck, Zoning Official for the City of Norwich, 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: Peter Nystrom- Mayor - Norwich elected official
Richard Shuck – Norwich Zoning Enforcement Officer
Cordless Data Transfer, Inc - as tower owner
James C Irwin - as property owner

3628

NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST. BUILDING #4, 2nd FLOOR
STURBRIDGE, MA 01566

WEBSTER BANK
FARMINGTON, CT 06032
51-7010/2111

08/20/2018

PAY TO THE ORDER OF Connecticut Siting Council

$ *625.00

EXACTLY SIX HUNDRED TWENTY-FIVE DOLLARS

DOLLARS

Connecticut Siting Council
10 Franklin Square
New Britain CT 06051

MEMO

AUTHORIZED SIGNATURE

⑈003628⑈ ⑆211170101⑆10 0010608887⑈

3628

NORTHEAST SITE SOLUTIONS, LLC

Check#: 3628 **Date: 08/20/2018** **Vendor#: 10023 Connecticut Siting Co** **Check Total: *625.00**

Invoice#	*Job/Description*	*Balance*	*Retain*	*Discount*	*This Check*
CT11254B CSC Zonin	7 TMO L700 4x2	625.00			625.00

3628

NORTHEAST SITE SOLUTIONS, LLC

Check#: 3628 **Date: 08/20/2018** **Vendor#: 10023 Connecticut Siting Co** **Check Total: *625.00**

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LMP100 M/P CHECK

Exhibit A

Petition No. 579
Cordless Data Transfer
Norwich, Connecticut
Staff Report
September 5, 2002

On August 27, 2002, Connecticut Siting Council member Gerald Heffernan and staff Robert Mercier conducted an inspection of an existing 140-foot lattice tower owned and operated by Cordless Data Transfer and located at 2 Hinckley Hill Road in Norwich, Connecticut. T-Mobile is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for a proposed 10- foot tower extension.

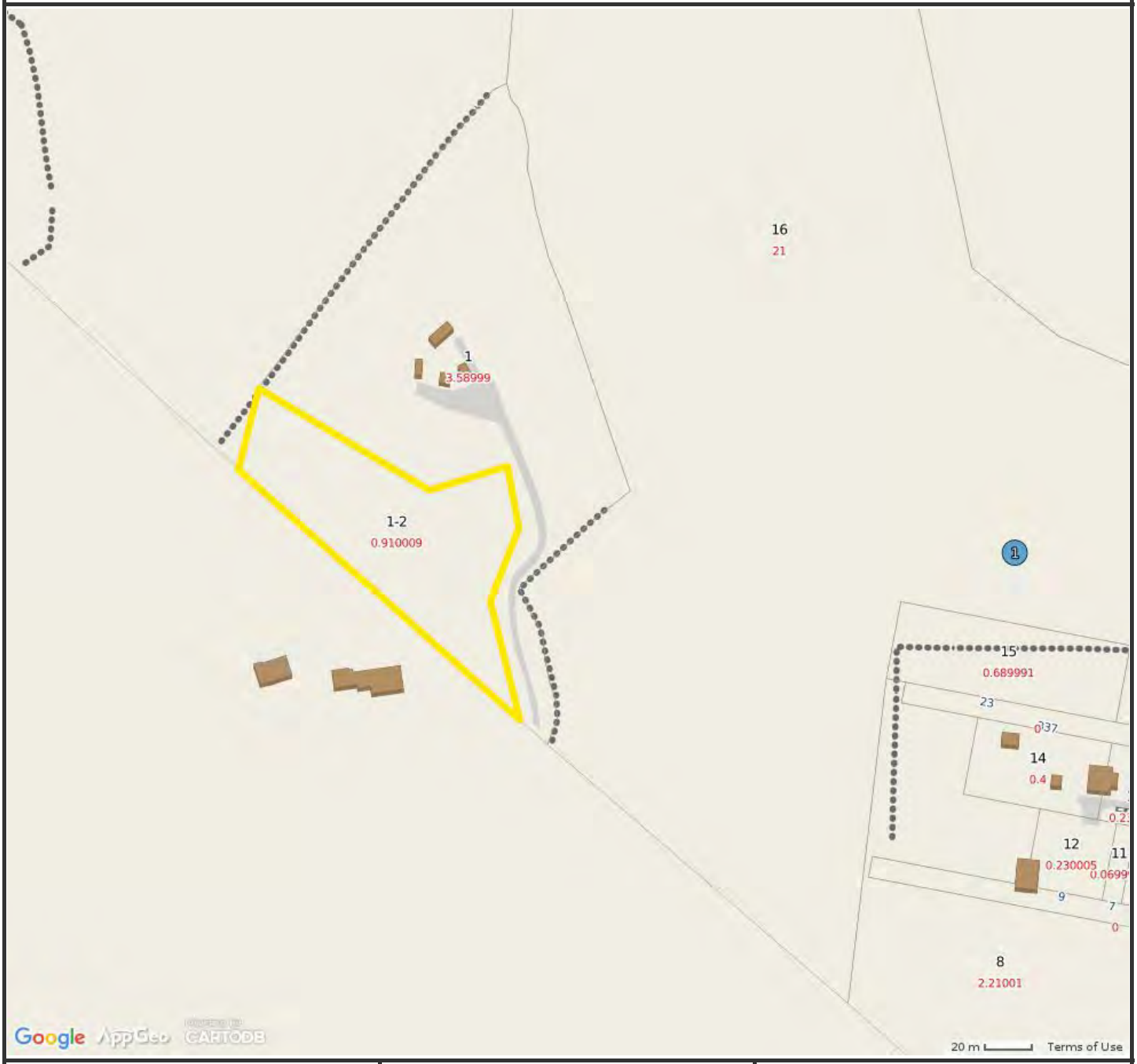
T-Mobile proposes to install twelve panel antennas at the top of the proposed 10-foot extension. The total height of the structure would be 153 feet above ground level including antennas. Three cabinets would be placed within the existing compound. Locating antennas at the 150-foot level will provide T-Mobile with adequate coverage on Route 12 and would allow call handoff to an existing facility at the Preston Town Hall.

The proposed site is located on a wooded ridge and is screened from surrounding residential areas by existing vegetation.

A structural analysis of the existing 140-foot tower performed by a professional engineer from Fred A. Nudd Corporation indicates that the tower and foundation can support the proposed modifications. The worst-case power density for the telecommunications operations at the site has been calculated to be 3.7% of the applicable standard for uncontrolled environments.

T-Mobile contends that the proposed extension of the structure would not cause a substantial adverse environmental effect, and therefore, a certificate would not be required.

Exhibit B



Property Information

Property ID	119-001-001.002-0000
Location	2 HINCKLEY HILL RD
Owner	SIEDLIK PAUL H +

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

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

Parcels updated 10/30/2014
Properties updated daily

2 HINCKLEY HILL RD

Location	2 HINCKLEY HILL RD	**Mblu**	119/ 1/ 1/ 2/
Acct#	1190010011	**Owner**	SIEDLIK PAUL H +
Assessment	$5,800	**Appraisal**	$8,300
PID	109831	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$0	$8,300	$8,300
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$0	$5,800	$5,800

Parcel Addreses

Additional Addresses
No Additional Addresses available for this parcel

Owner of Record

Owner SIEDLIK PAUL H +
BURGER PAULA J
Address 2 HINCKLEY HILL RD
PRESTON, CT 06365

Sale Price $6,531
Certificate
Book & Page 2432/0041
Sale Date 10/16/2007
Instrument 1N

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
SIEDLIK PAUL H +	$6,531		2432/0041	1N	10/16/2007
IRWIN JAMES C +	$0		2379/0091	1A	05/08/2007

Building Information

Building 1 : Section 1

Year Built:

Building Photo

Living Area: 0
Replacement Cost: $0
Building Percent Good:
Replacement Cost Less Depreciation: $0

Building Attributes	
Field	**Description**
Style	Vacant Land
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Fireplace (s)	
Whirlpool	
park	

(./CT11254B-Property Card_files/default.jpg)

Building Layout

Building Layout

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

Extra Features

Extra Features	LegendLegend
No Data for Extra Features	

Land

Land Use

Land Line Valuation

Use Code	1301	**Size (Acres)**	0.91
Description	Unbuildable lot	**Frontage**	
Zone	R40	**Depth**	
Neighborhood	0060	**Assessed Value**	$5,800
Alt Land Appr	No	**Appraised Value**	$8,300
Category			

Outbuildings

Outbuildings	LegendLegend
No Data for Outbuildings	

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$0	$8,300	$8,300
2012	$0	$0	$0
2011	$0	$23,000	$23,000

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$0	$5,800	$5,800
2012	$0	$0	$0
2011	$0	$16,000	$16,000

Exhibit C

MODIFICATION OF EXISTING WIRELESS FACILITY BY

T-Mobile

T-MOBILE NORTHEAST LLC

PROJECT: L700 4X2 & NHP18

SITE NUMBER: CT11254B
SITE NAME: CDT NORWICH
SITE ADDRESS: HINCLEY HILL ROAD
NORWICH, CT 06360

PROJECT SCOPE:

UPGRADE OF EXISTING WIRELESS FACILITY AS FOLLOWS:
REPLACE (3) EXISTING ANTENNAS,
ADD (3) REMOTE RADIO UNITS AT ANTENNAS,
ADD (1) FIBER HYBRID CABLE,
INSTALL NEW 15 KW DC DIESEL GENERATOR AND TANK FOR AN EXISTING TELECOM BASE STATION.

PROJECT NOTES:

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION:
   HANDICAPPED ACCESS IS NOT REQUIRED.
   POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
   NO OUTDOOR STORAGE OR ANY
   SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACES THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
3. DEVELOPMENT AND USE OF THE SITE WILL CONFORM TO ALL APPLICABLE CODES, ORDINANCES AND SPECIFICATIONS.
4. REFER TO STRUCTURAL ANALYSIS REPORT TITLED " STRUCTURAL ANALYSIS OF A 150 FT SELF-SUPPORTING TOWER " SITE ID: CT11254B, DATED JUNE 11, 2018, PREPARED BY FRED A. NUDD CORPORATION.

APPLICABLE STATE ADOPTION CODES:

2016 CONNECTICUT STATE BUILDING CODE (CSBC).

ANSI/TIA-222-G-2005 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

2014 NATIONAL ELECTRICAL CODE (NFPA 70) FOR POWER AND GROUNDING REQUIREMENTS.

APPROVALS:

FSA CM	DATE
RF ENGINEER	DATE
FOPS	DATE
T-MOBILE ENGINEERING AND DEVELOPMENT	DATE
	DATE
	DATE

SITE IMAGE:

VICINITY MAP:

PROJECT INFORMATION:

ADDRESS:	HINCLEY HILL ROAD NORWICH, CT 06360
STRUCTURE TYPE:	LATTICE TOWER
COORDINATES:	41.51480 N, -72.06180 W
TOWER HEIGHT:	150'-0" AGL
TOP OF T-MOBILE ANTENNAS ELEV:	152'-0" AGL

PROJECT TEAM:

APPLICANT:	T-MOBILE NORTHEAST, LLC. 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 860-692-7100
LANDLORD:	MARK LEGAULT CORDLESS DATA TRANSFER, INC. (860) 729-9399 MLEGAULT1@AOL.COM CORDLESS DATA TRANSFER 600 OLD HARTFORD RD COLCHESTER, CT 064152417
PROJECT MANAGER:	NORTHEAST SITE SOLUTIONS 420 MAIN STREET, BLDG 4 STURBRIDGE, MA 01566 SHELDON FREINCLE SHELDON@NORTHEASTSITE SOLUTIONS.COM 201-776-8521
CONSULTANTS:	FORESITE LLC 462 WALNUT ST NEWTON, MA 02460 SAEED MOSSAVAT SMOSSAVAT@FORESITELLC.COM 617-212-3123

SHEET INDEX:

APPLICANT:

T-Mobile

T-MOBILE NORTHEAST LLC

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

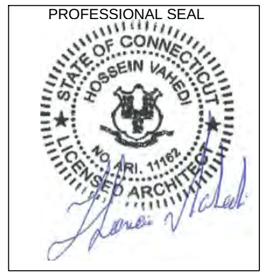
PROJECT MANAGER

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:

FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL



REV	DESCRIPTION	DATE
A	PRELIMINARY	08/14/18
0	SIGNED AND SEALED	08/16/18

SITE NUMBER: CT11254B
SITE NAME: CDT NORWICH
SITE ADDRESS: HINCLEY HILL ROAD
NORWICH, CT 06360

SHEET TITLE:

T-1: TITLE SHEET

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 HAS MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT 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 CLIENT'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK.

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 CONSTRUCTION DOCUMENTS.

6. 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.

7. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS DURING CONSTRUCTION.

8. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT SECTIONS OF THE BASIC STATE BUILDING CODE, LATEST EDITION, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJEC

9. THE CONTRACTOR SHALL NOTIFY THE CLIENT'S REPRESENTATIVE IN WRITING 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 CLIENT'S REPRESENTATIVE.

10. THE WORK SHALL CONFORM TO THE CODES AND STANDARDS OF THE FOLLOWING AGENCIES AS FURTHER CITED HEREIN:

A. ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS, AS PUBLISHED IN "COMPILATION OF ASTM STANDARDS BUILDING CODES" OR LATEST EDITION.

B. AWS: AMERICAN WELDING SOCIETY INC. AS PUBLISHED IN "STANDARD D1.1–08, STRUCTURAL WELDING CODE" OR LATEST EDITION.

C. AISC: AMERICAN INSTITUTE FOR STEEL CONSTRUCTION AS PUBLISHED IN "CODE FOR STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"; "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" (LATEST EDITION).

11. BOLTING:

A. BOLTS SHALL BE CONFORMING TO ASTM A325 HIGH STRENGTH, HOT DIP GALVANIZED WITH ASTM A153 HEAVY HEX TYPE NUTS.

B. BOLTS SHALL BE 3/4"ø MINIMUM (UNLESS OTHERWISE NOTED)

C. ALL CONNECTIONS SHALL BE 2 BOLTS MINIMUM.

12. FABRICATION:

A. FABRICATION OF STEEL SHALL CONFORM TO THE AISC AND AWS STANDARDS AND CODES (LATEST EDITION).

B. ALL STRUCTURAL STEEL SHALL BE HOT–DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 (LATEST EDITION), UNLESS OTHERWISE NOTED.

13. ERECTION OF STEEL:

A. PROVIDE ALL ERECTION EQUIPMENT, BRACING, PLANKING, FIELD BOLTS, NUTS, WASHERS, DRIFT PINS, AND SIMILAR MATERIALS WHICH DO NOT FORM A PART OF THE COMPLETED CONSTRUCTION BUT ARE NECESSARY FOR ITS PROPER ERECTION.

B. ERECT AND ANCHOR ALL STRUCTURAL STEEL IN ACCORDANCE WITH AISC REFERENCE STANDARDS. ALL WORK SHALL BE ACCURATELY SET TO ESTABLISHED LINES AND ELEVATIONS AND RIGIDLY FASTENED IN PLACE WITH SUITABLE ATTACHMENTS TO THE CONSTRUCTION OF THE BUILDING.

C. TEMPORARY BRACING, GUYING AND SUPPORT SHALL BE PROVIDED TO KEEP THE STRUCTURE SAFE AND ALIGNED AT ALL TIMES DURING CONSTRUCTION, AND TO PREVENT DANGER TO PERSONS AND PROPERTY. CHECK ALL TEMPORARY LOADS AND STAY WITHIN SAFE CAPACITY OF ALL BUILDING COMPONENTS.

14. ANTENNA INSTALLATION:

A. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND CLIENT'S REPRESENTATIVE SPECIFICATIONS.

B. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.

C. INSTALL COAXIAL / FIBER CABLES AND TERMINATIONS BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS.

15. ANTENNA AND COAXIAL / FIBER CABLE GROUNDING:

A. ALL EXTERIOR #6 GREEN GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED WITH ANDREWS CONNECTOR/SPLICE WEATHERPROOFING KIT TYPE #221213 OR EQUAL.

B. ALL COAXIAL / FIBER CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL / FIBER CABLE (NOT WITHIN BENDS).

16. RELATED WORK, FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO BID:

A. FLASHING OF OPENING INTO OUTSIDE WALLS

B. SEALING AND CAULKING ALL OPENINGS

C. PAINTING

D. CUTTING AND PATCHING

17. REQUIREMENTS OF REGULATORY AGENCIES:

A. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE. INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.

B. INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATION IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES, AND SPECIAL CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:

C. TIA–EIA – 222 (LATEST EDITION). STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

D. FAA – FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7460–IH, OBSTRUCTION MARKING AND LIGHTING.

E. FCC – FEDERAL COMMUNICATIONS COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATION FOR ANTENNA STRUCTURES AND FORM 715A, HIGH INTENSITY OBSTRUCTION LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES.

F. AISC – AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 BOLTS (LATEST EDITION).

G. NEC – NATIONAL ELECTRICAL CODE – ON TOWER LIGHTING KITS.

H. UL – UNDERWRITER'S LABORATORIES APPROVED ELECTRICAL PRODUCTS.

I. IN ALL CASES, PART 77 OF THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.

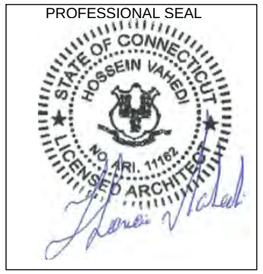
J. 2009 LIFE SAFETY CODE NFPA – 101.

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

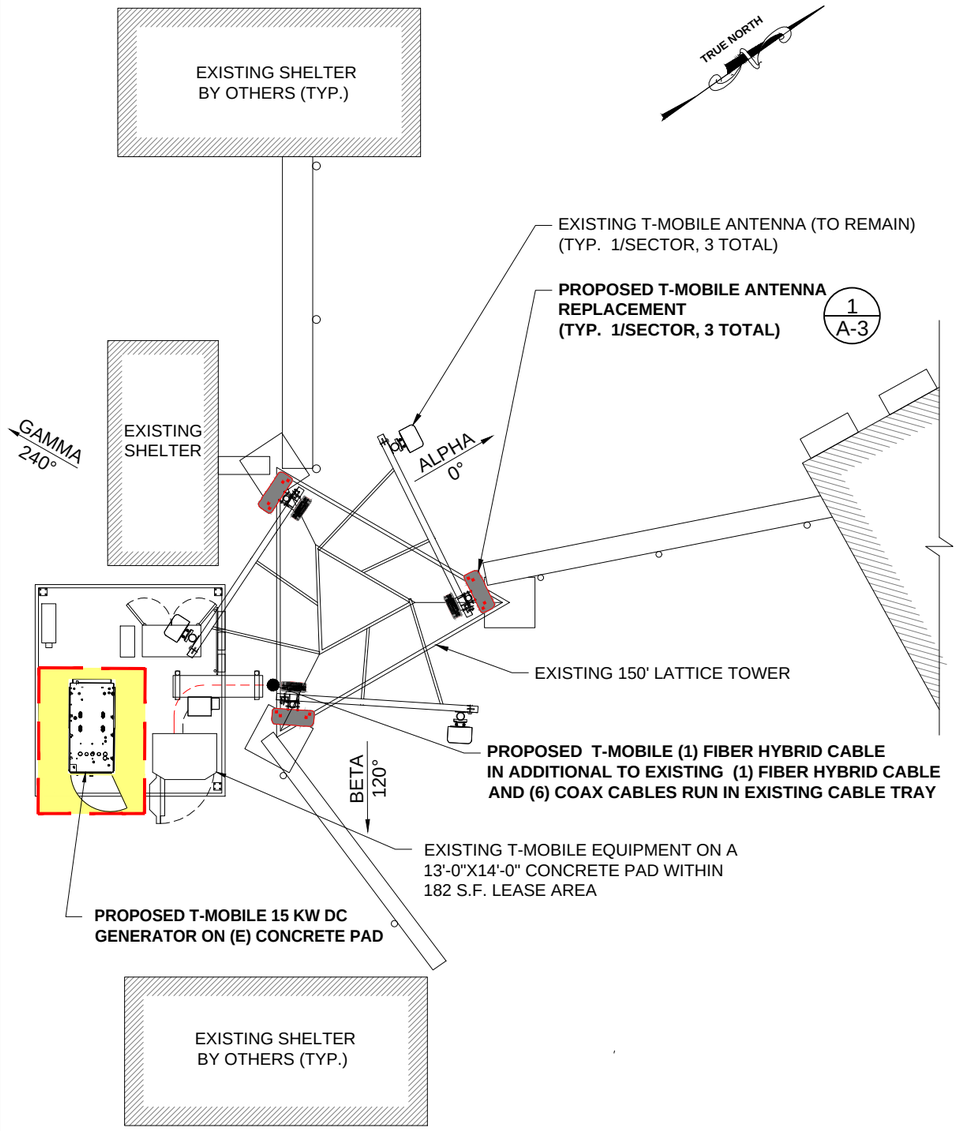
PROFESSIONAL SEAL



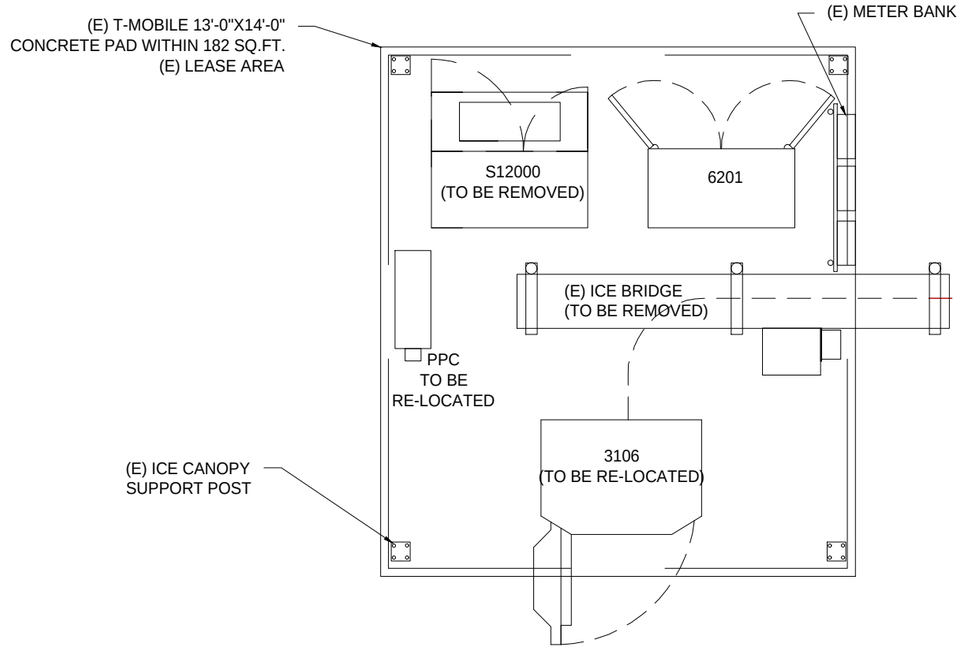
REV	DESCRIPTION	DATE
A	PRELIMINARY	08/14/18
0	SIGNED AND SEALED	08/16/18

SITE NUMBER: CT11254B
SITE NAME: CDT NORWICH
SITE ADDRESS: HINCLEY HILL ROAD
NORWICH, CT 06360

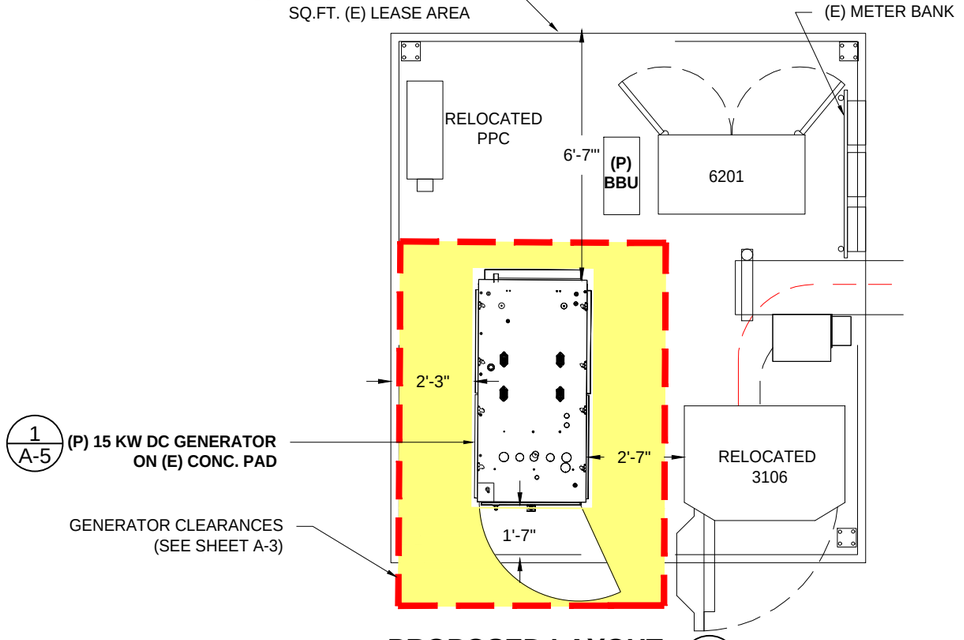
SHEET TITLE:
N-1: NOTES AND DISCLAIMERS



SITE PLAN
SCALE: 1" = 10'-0" 1/A-1



EXISTING LAYOUT
SCALE: 1/4" = 1'-0" 2/A-1



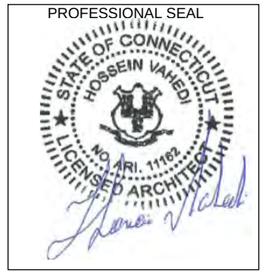
PROPOSED LAYOUT
SCALE: 1/4" = 1'-0" 3/A-1

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL



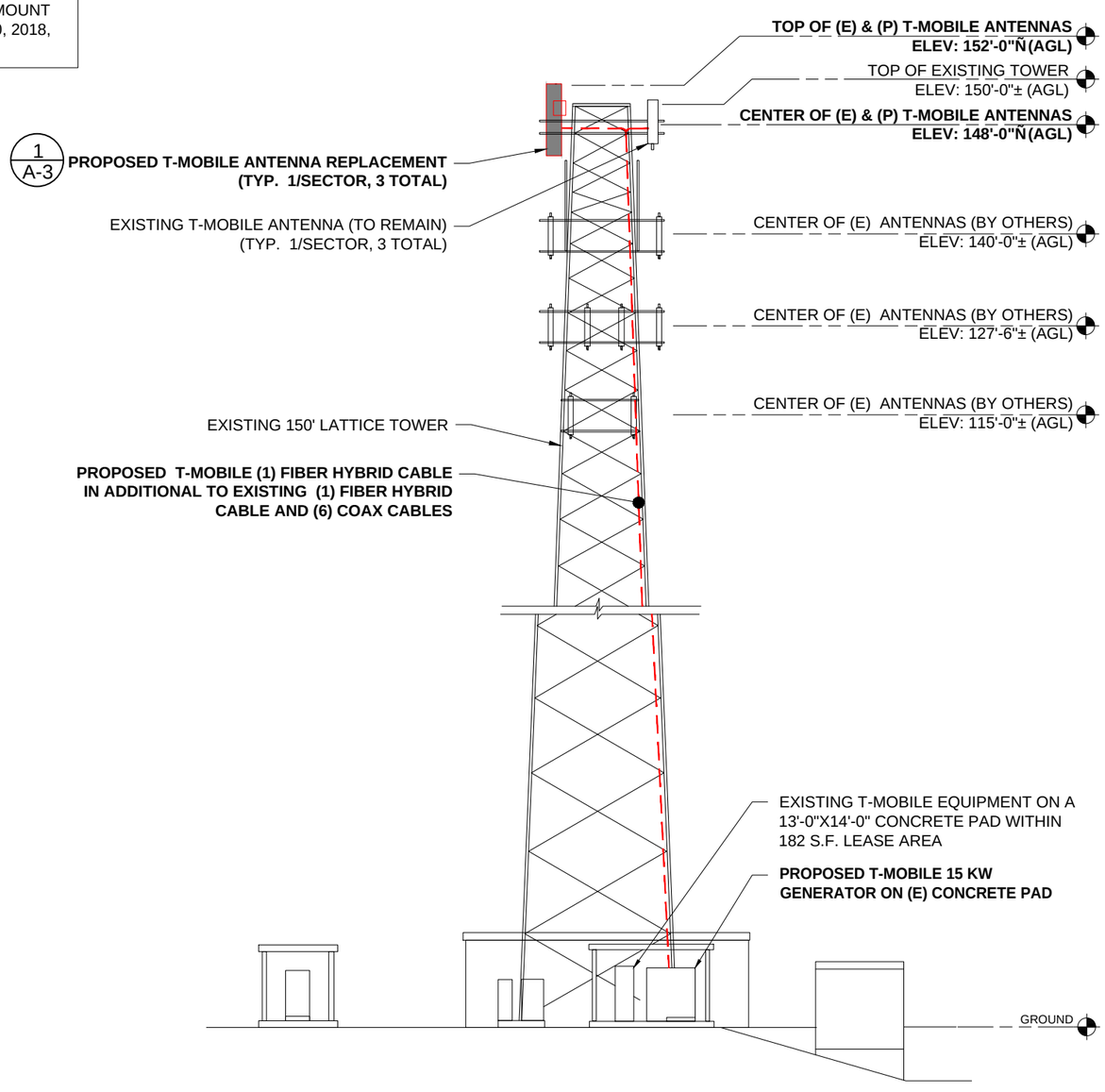
REV	DESCRIPTION	DATE
A	PRELIMINARY	08/14/18
0	SIGNED AND SEALED	08/16/18

SITE NUMBER: CT11254B
SITE NAME: CDT NORWICH
SITE ADDRESS: HINCLEY HILL ROAD
NORWICH, CT 06360

SHEET TITLE:
A-1: PLAN

STRUCTURAL NOTES:
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS PROVIDED BY OTHERS TO DETERMINE IF THERE ARE ANY SUPPLEMENTAL OR SPECIAL REQUIREMENTS FOR TOWER TOP EQUIPMENT AND FOR CABLE BUNDLING, SHIELDING, MOUNTING OR RELOCATION ARRANGEMENTS.

REFER TO STRUCTURAL ANALYSIS REPORT TITLED " MOUNT ANALYSIS REPORT " SITE ID: CT11254B, DATED MAY 20, 2018, PREPARED BY INFINIGY.



ELEVATION (1 / A-2)
SCALE: 1/16" = 1'-0"

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

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

REV	DESCRIPTION	DATE
A	PRELIMINARY	08/14/18
0	SIGNED AND SEALED	08/16/18

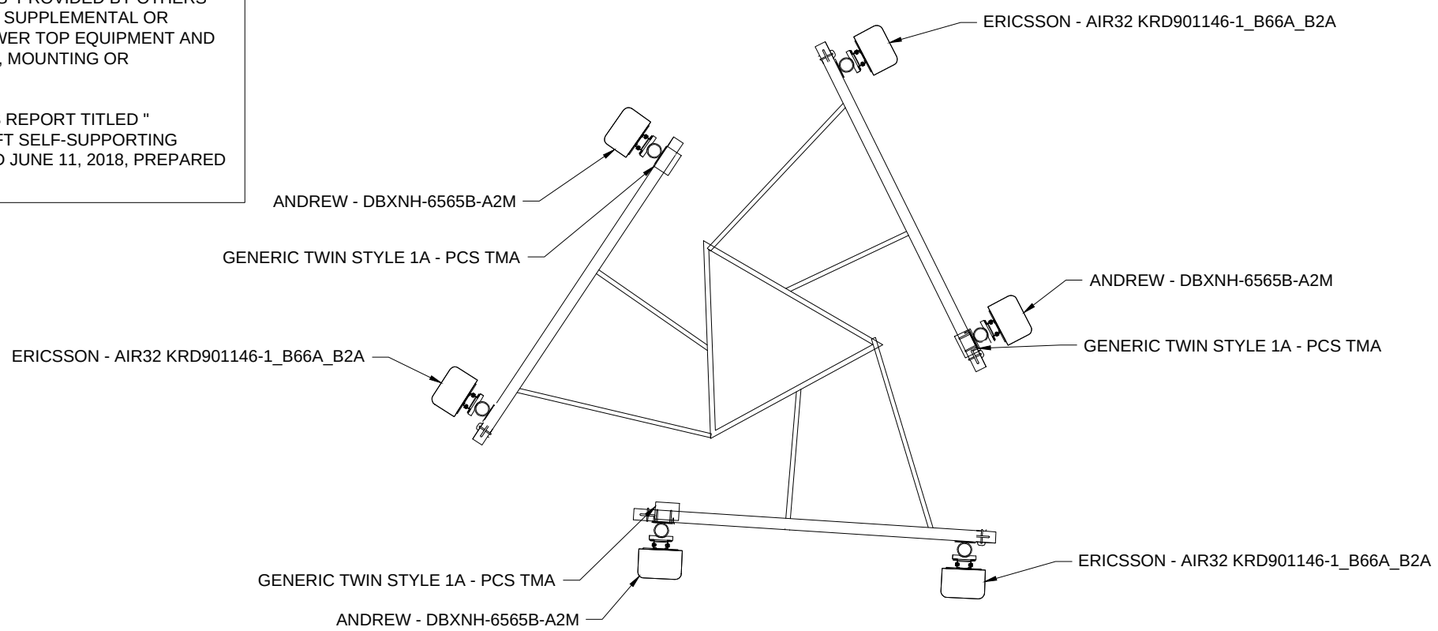
SITE NUMBER: CT11254B
SITE NAME: CDT NORWICH
SITE ADDRESS: HINCLEY HILL ROAD
NORWICH, CT 06360

SHEET TITLE:
A-2: ELEVATION

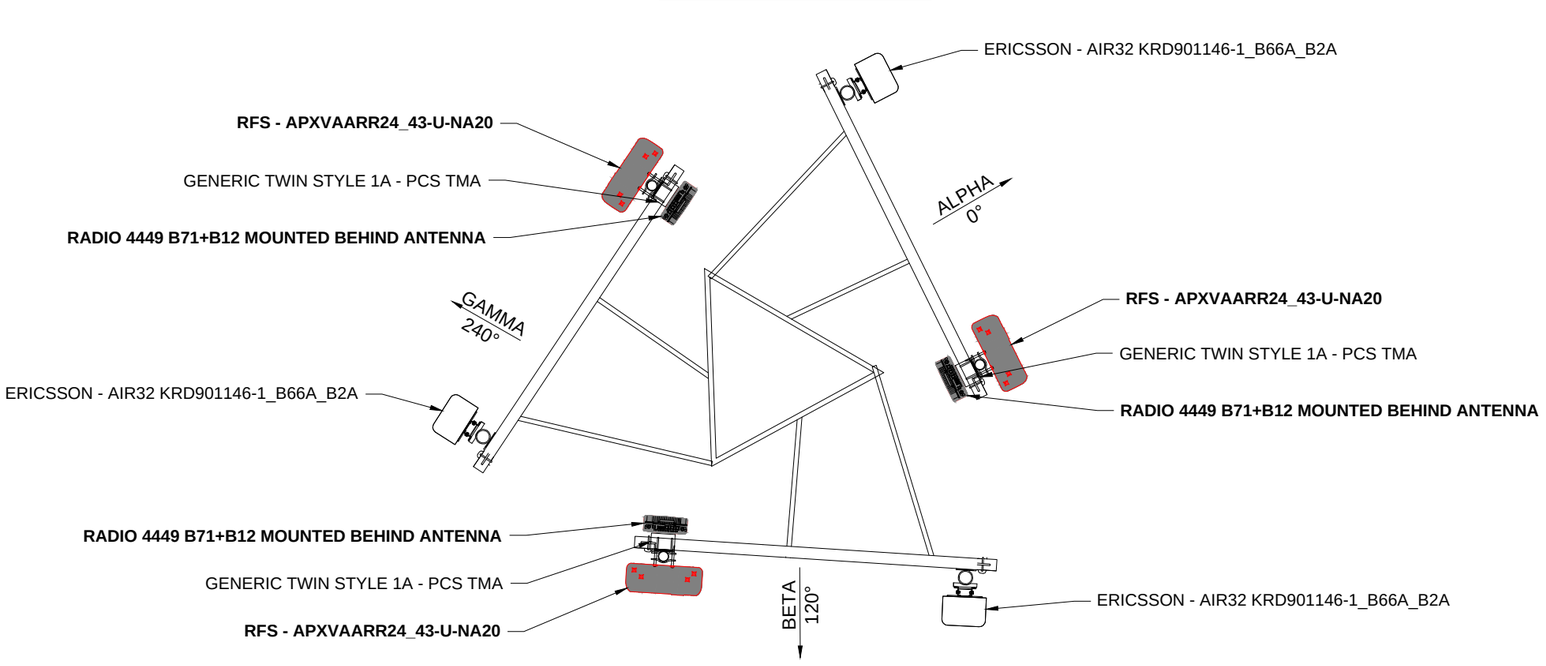
STRUCTURAL NOTES:
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS PROVIDED BY OTHERS TO DETERMINE IF THERE ARE ANY SUPPLEMENTAL OR SPECIAL REQUIREMENTS FOR TOWER TOP EQUIPMENT AND FOR CABLE BUNDLING, SHIELDING, MOUNTING OR RELOCATION ARRANGEMENTS.

REFER TO STRUCTURAL ANALYSIS REPORT TITLED " STRUCTURAL ANALYSIS OF A 150 FT SELF-SUPPORTING TOWER " SITE ID: CT11254B, DATED JUNE 11, 2018, PREPARED BY FRED A. NUDD CORPORATION.

EXISTING ANTENNA PLAN



FINAL ANTENNA PLAN



ANTENNA PLAN 1
SCALE: NTS A-3

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NORTHEAST SITE SOLUTIONS
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
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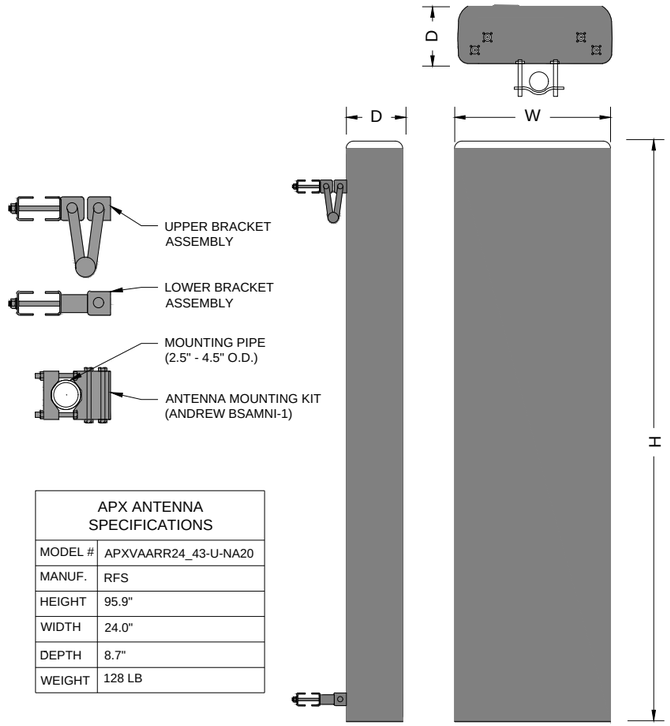
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL
STATE OF CONNECTICUT · HOSSEIN VAHEDI · NO. ARI. 11462 · LICENSED ARCHITECT

REV	DESCRIPTION	DATE
A	PRELIMINARY	08/14/18
0	SIGNED AND SEALED	08/16/18

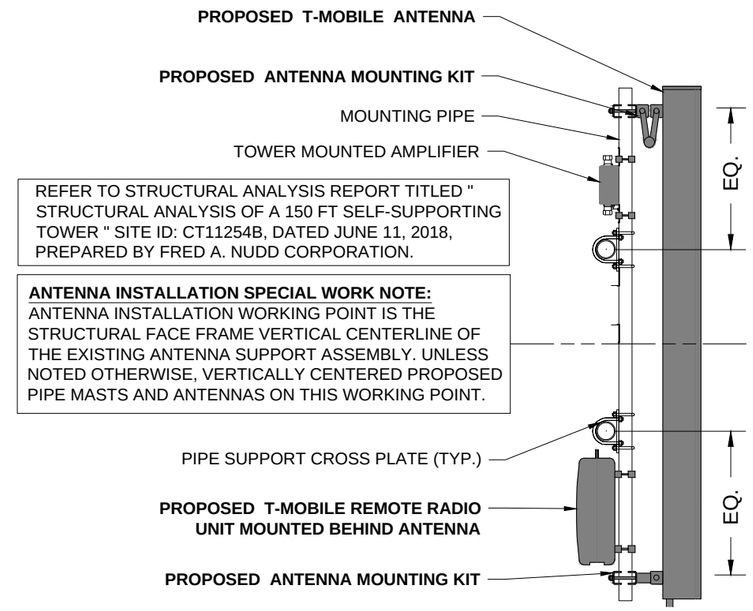
SITE NUMBER: CT11254B
SITE NAME: CDT NORWICH
SITE ADDRESS: HINCLEY HILL ROAD
NORWICH, CT 06360

SHEET TITLE:
A-3: ANTENNA PLAN AND DETAILS



APX ANTENNA SPECIFICATIONS	
MODEL #	APXVAARR24_43-U-NA20
MANUF.	RFS
HEIGHT	95.9"
WIDTH	24.0"
DEPTH	8.7"
WEIGHT	128 LB

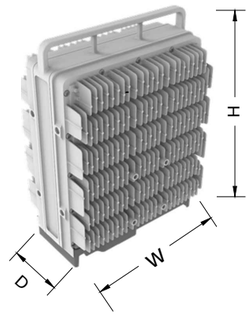
RFS ANTENNA
N.T.S
1 A-4



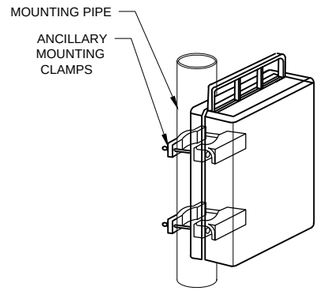
REFER TO STRUCTURAL ANALYSIS REPORT TITLED " STRUCTURAL ANALYSIS OF A 150 FT SELF-SUPPORTING TOWER " SITE ID: CT11254B, DATED JUNE 11, 2018, PREPARED BY FRED A. NUDD CORPORATION.

ANTENNA INSTALLATION SPECIAL WORK NOTE:
ANTENNA INSTALLATION WORKING POINT IS THE STRUCTURAL FACE FRAME VERTICAL CENTERLINE OF THE EXISTING ANTENNA SUPPORT ASSEMBLY. UNLESS NOTED OTHERWISE, VERTICALLY CENTERED PROPOSED PIPE MASTS AND ANTENNAS ON THIS WORKING POINT.

ANTENNA MOUNTING DETAIL
N.T.S
2 A-4



REMOTE RADIO UNIT SPECIFICATIONS	
MODEL #	RADIO 4449 B71+B12
MANUF.	ERICSSON
HEIGHT	14.9"
WIDTH	13.2"
DEPTH	10.4"
WEIGHT	74 LB



REMOTE RADIO UNIT MOUNTING DETAIL

RADIO 4449 B71+B12 REMOTE RADIO UNIT
N.T.S
2 A-4

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
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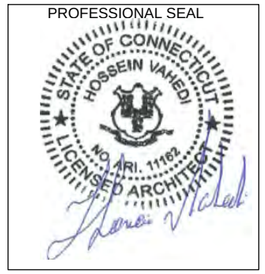
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL



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SITE NUMBER: CT11254B
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SITE ADDRESS: HINCLEY HILL ROAD
NORWICH, CT 06360

SHEET TITLE:
A-4: ANTENNA DETAILS

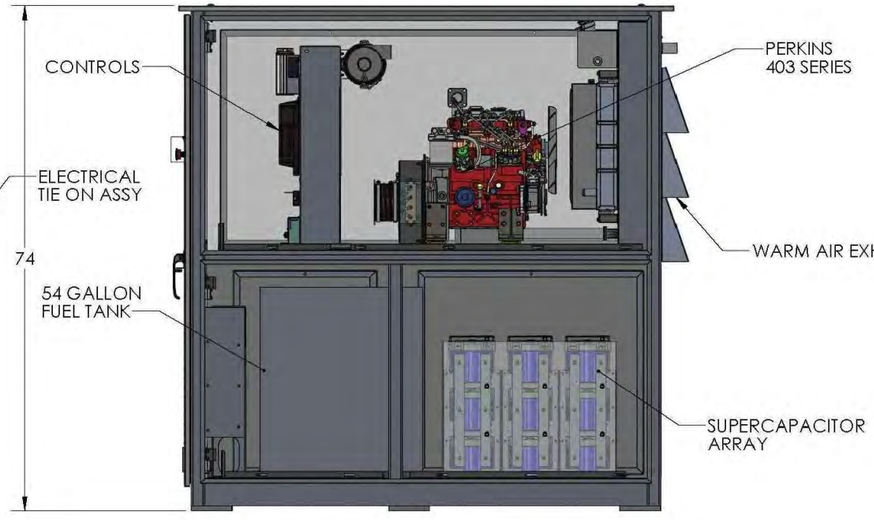
15 KW DC GENERATOR

POLAR POWER INC.

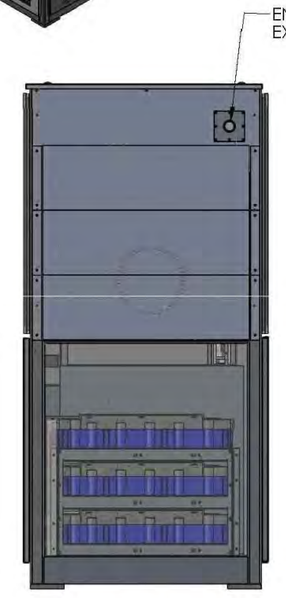
SPECIFICATIONS
PN 8220-801-D-15-05

Engine Model	Perkins 403F-11
Cylinders	3 In-line
Displacement (L)	1.1
Bore (in./mm)	3/77
Stroke (in./mm)	3.2/81
Intake Air System	Naturally Aspirated
Engine HP	18

FRONT
(INTAKE AND CONTROLS)



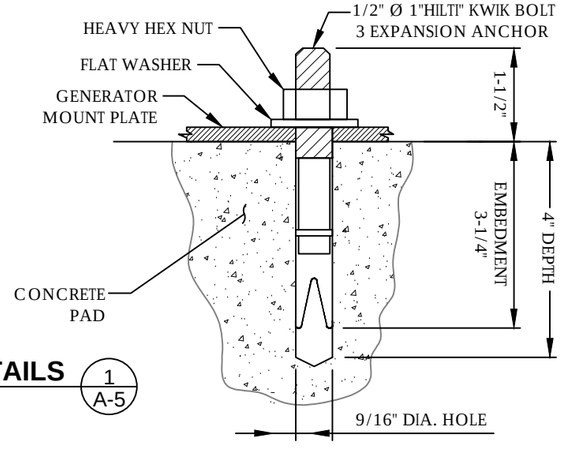
SIDE (DOORS AND PANELS REMOVED)

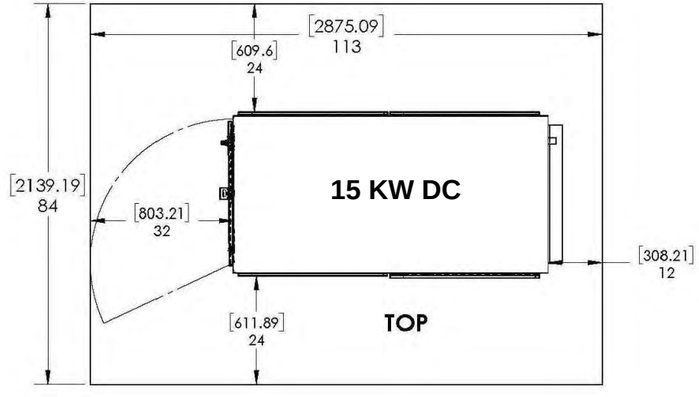


BACK
(EXHAUST SIDE)

NOTES:

1. BOLTS CAN BE INSTALLED 2 DAYS AFTER POURING CONCRETE PROVIDED THE KWIK BOLTS ARE ONLY TIGHTENED TO A SNUG TIGHT CONDITION.
2. APPLY "HILTI" HIT-RE 500-SD EPOXY TO ALL GAPS TO PREVENT WATER/MOISTURE BUILD-UP.
3. PROVIDE 6 (SEE MANUFACTURERS INSTALLATION DRAWINGS) ANCHOR BOLTS PER SIDE.





15 KW DC GENERATOR DETAILS
SCALE: N.T.S.

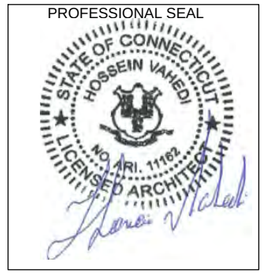
1 / A-5

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL



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A	PRELIMINARY	08/14/18
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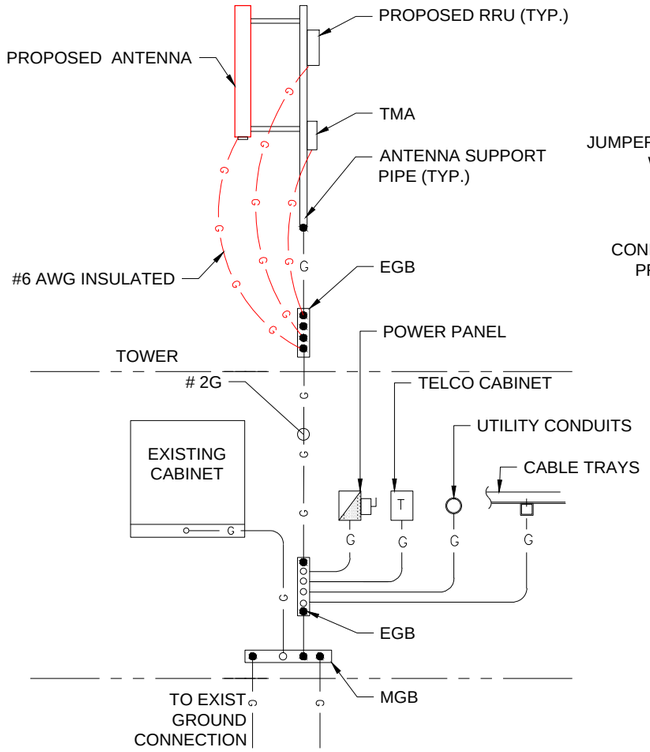
SITE NUMBER: CT11254B
SITE NAME: CDT NORWICH
SITE ADDRESS: HINCLEY HILL ROAD
NORWICH, CT 06360

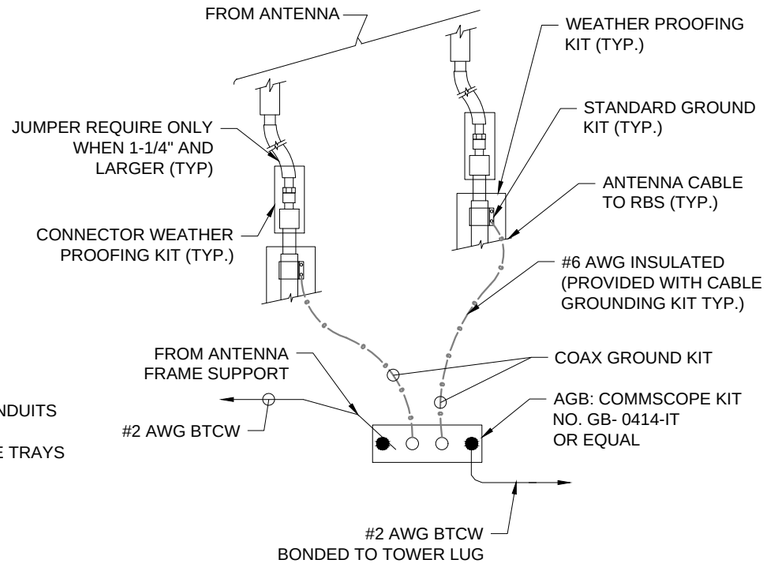
SHEET TITLE:
A-5: GENERATOR DETAILS

ELECTRICAL & GROUNDING NOTES

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

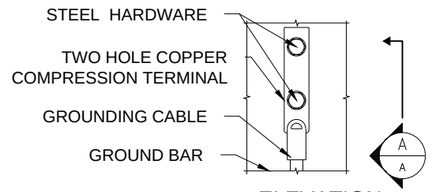


GROUNDING RISER DIAGRAM (1 / E-1)
SCALE: N.T.S

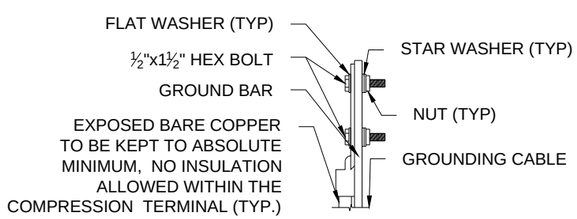


NOTES:
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB

TOWER TOP CABLE GROUNDING DETAIL (2 / E-1)
SCALE: N.T.S



ELEVATION



SECTION A-A

NOTES:
1. "DOUBLING UP" OR "STACKING " OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

TYPICAL GROUND BAR CONNECTIONS DETAIL (3 / E-1)
SCALE: N.T.S

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
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Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
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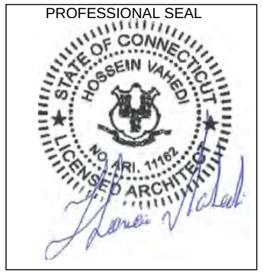
PROFESSIONAL SEAL



REV	DESCRIPTION	DATE
A	PRELIMINARY	08/14/18
0	SIGNED AND SEALED	08/16/18

SITE NUMBER: CT11254B
SITE NAME: CDT NORWICH
SITE ADDRESS: HINCLEY HILL ROAD
NORWICH, CT 06360

SHEET TITLE:
E-1: GROUNDING AND ELECTRICAL DETAILS

ELECTRICAL & GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.

2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PRODUCED PER SPECIFICATION REQUIREMENTS.

3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.

4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.

5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) ND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.

6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.

7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.

8. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NAME 3R ENCLOSURE.

9. GROUNDING SHALL COMPLY WITH NEC ART. 250.

10. GROUNDING COAX CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURES COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.

11. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSTALLATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE GROUND.

12. ALL GROUND CONNECTION TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.

13. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AS RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY BOND ANY METER OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.

14. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PROCEDURES (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN RBS UNIT).

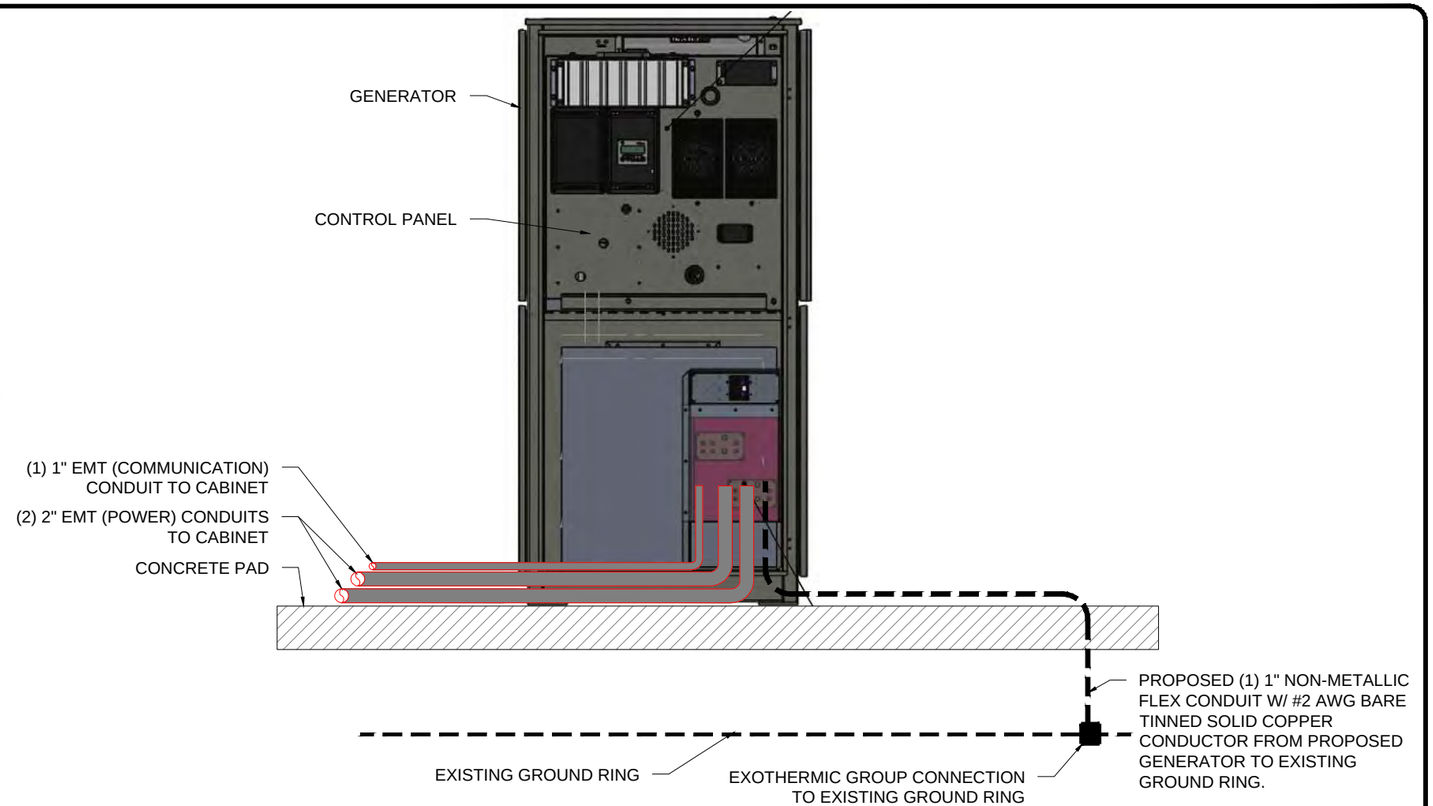
15. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.

16. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTION.

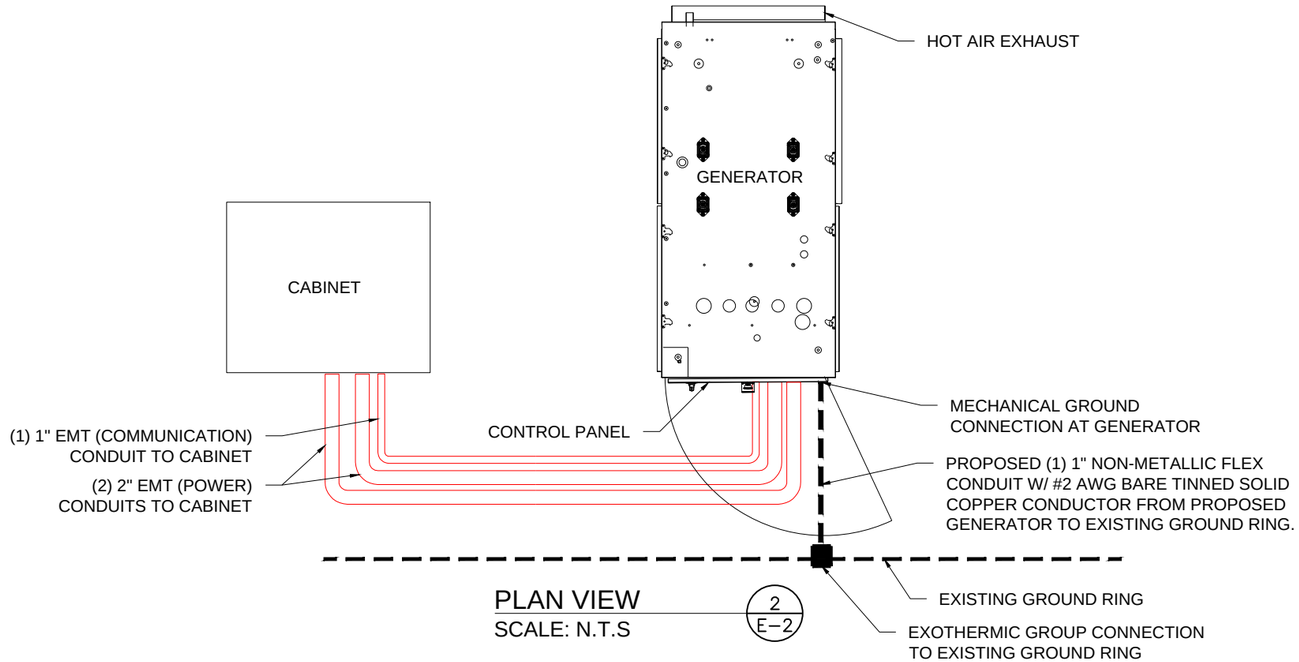
17. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.

18. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.

19. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.



GROUNDING AND ELECTRIC RISER DIAGRAM (1 / E–2)
SCALE: N.T.S



PLAN VIEW (2 / E–2)
SCALE: N.T.S

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NSS NORTHEAST SITE SOLUTIONS
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PROFESSIONAL SEAL
STATE OF CONNECTICUT · HOSSEIN VAHEDI · NO. ARI. 11162. · LICENSED ARCHITECT

REV	DESCRIPTION	DATE
A	PRELIMINARY	08/14/18
0	SIGNED AND SEALED	08/16/18

SITE NUMBER: CT11254B
SITE NAME: CDT NORWICH
SITE ADDRESS: HINCLEY HILL ROAD
NORWICH, CT 06360

SHEET TITLE:
E-2: GROUNDING AND ELECTRICAL DETAILS

Exhibit D

FRED A. NUDD CORPORATION

1743 ROUTE 104, BOX 577
ONTARIO, NY 14519
(315) 524-2531 FAX (315) 524-4249

www.nuddtowers.com

Mark LeGault
Cordless Data Transfer, Inc.
600 Old Hartford Road
Colchester, CT 06415
June 11, 2018

Fred A. Nudd Job Number: 118-23067

Location: 2 Hinkley Hill Road, Norwich, CT 06360, New London County (Lat. & Long: 41-30-53.45, -72-03-42.08)

Subject: Structural Analysis of a 150 ft Self-Supporting Tower

Fred A. Nudd Corporation has completed a three-dimensional, finite element model structural analysis of the above noted self-supporting tower. This tower was analyzed considered appurtenance loads noted in the appurtenance loading table on the following page. The design loading criteria and strength design are per the ANSI/TIA-222-G standard, which is the recommended design standard per the 2012 International Building Code (Sec. 1609 & 3108), , and the 2016 Connecticut State Building Code. Tower and foundation dimensions have been taken from original design drawings by Fred A. Nudd Corporation (Drawing Number 99-6864-1 & 99-6864-2R, dated July 22, 1999 & November 20, 1999). Onsite subsurface conditions were taken from a geotechnical report by Coneco (Project Number C104.0CDT, dated November 15, 1999). The tower is assumed to be in good, undamaged and equivalent to as new condition and has been maintained / inspected per criteria by TIA-222.

The purpose of this analysis is to determine the structure's ability to support new T-Mobile equipment installed at a rad center of 150 ft above ground level (AGL) The new equipment to be installed, which included antennas, coax, mounts and associated hardware are listed on the following page in the appurtenance loading table.

Results of the analysis indicate the tower will be able to the support the design loads noted in the appurtenance loading table on the following page. Specific section design loads, capacities and stress ratios are provided on the following pages. Maximum member usage was found to be 77%. Detailed calculation of the applied forces and member capacities, considering combinations of existing and proposed equipment, are provided in the following pages.

The tower base foundation was analyzed using soil properties from the aforementioned geotechnical report. Based on this analysis, the foundation is capable of supporting the existing and proposed equipment. Detailed calculation of the applied forces and member capacities are provided in the following pages.

In conclusion, the tower superstructure and substructure can support the listed existing and proposed appurtenance loading.

We trust this report satisfies your needs. Please contact us with any questions or concerns regarding this report.

Best Regards,

Code Design Criteria

ANSI/TIA-222-G
Windspeed = 104 mph, 3-second gust, V_{asd} / 132 mph, 3-second gust, V_{ult}
Exposure = B
Radial Ice = 0.75 inch
Ice Windspeed = 50 mph, 3-second gust
Structure Class = II
Topographic Category = 1
S_s < 1.0, thus seismic loading does not need to be considered

Appurtenance Loading – Existing Installed Equipment

Height (ft)	Carrier	Appurtenance	Mount	Coax (in)
140	Sprint	(3) RFS APXV9ERR18-C-A20 (6) Alcatel Lucent 4x45W, 1900 MHz (3) Alcatel Lucent TD-RRH8x200-25 (6) Alcatel Lucent RRH 2x50, 800 Mhz (3) Commscope DT465B-2XR	(3) 12 ft Boom / Frame	(4) 1-1/4 Hybrid
127.5	Verizon	(4) RFS APL868013 (6) RFS FD9R6004/2C-3L (2) RFS APL866513 (1) RFS DB-T1-6Z-8AB-0Z (3) Commscope LNX-6514DS-1AM (3) Commscope HBXX-9014DS-VTM (3) Commscope HBXX-6517DS-A2M (3) Alcatel Lucent RH_2x60-AWS (3) Alcatel Lucent RH_2x60-70OU (3) Alcatel Lucent RH_2x60-PCS	(3) 12 ft Boom / Frame	(6) 1-5/8 (2) 1-5/8 Fiber Cable
115	AT&T Mobility	(3) Powerwave 7770 (3) KMW EPBQ-654L8H8-L2 (3) CCI OPA-65R-LCUU-H8 (3) Ericsson RRUS-11 (9) Ericsson RRUS-32 (3) Ericsson B14 4478 (6) Powerwave LGP21401 (2) Raycap DC6-48-60-18-8F (1) Raycap DC6-48-60-0-8F	(3) 12 ft Boom / Frame	(12) 1-1/4 (6) 3/4 DC (2) 3/8 Fiber

- *Height measurement taken as distance from top of base foundation to center of appurtenance.*

Appurtenance Loading – Proposed T-Mobile Equipment Configuration

Height (ft)	Carrier	Appurtenance	Mount	Coax (in)
150	T-Mobile	(3) Ericsson KRY112 144/2 (3) Ericsson AIR 32 B66A/B2A (3) RFS APXVAARR24_43-U-NA20 (3) Ericsson 4449 B12/B71	(3) 12 ft Boom / Frame	(6) 1-5/8 (2) 1-1/4 Fiber

- *Height measurement taken as distance from top of base foundation to center of appurtenance.*
- *Additional coax to be installed anywhere on the tower.*

Maximum Member Usage

Member	Existing	Existing + Proposed
Leg	73	73
Diagonal	83	77
Horizontal	2	3
Splice/Connection Bolts	83	77

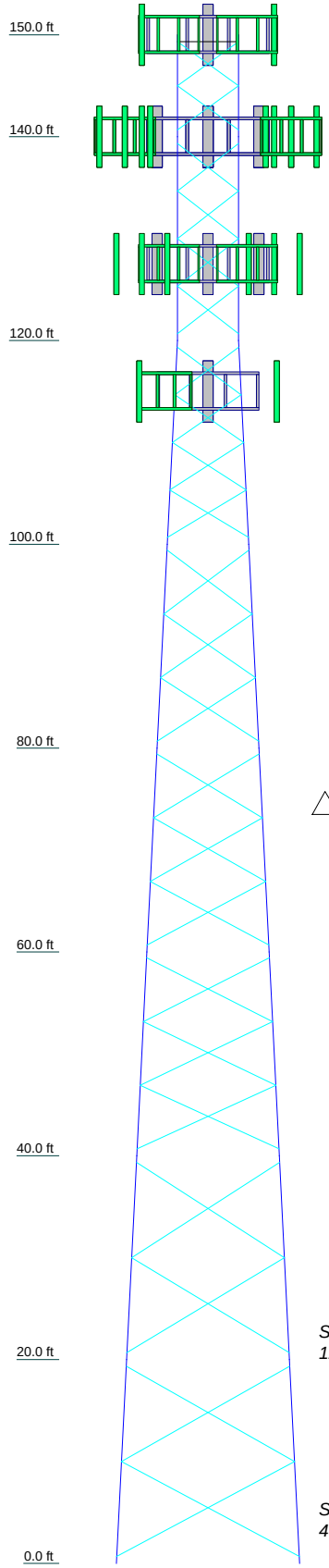
- *Percentage equal to or less than 100% denote member stress levels are satisfactory for loading.*
- *Percentage greater than 100% indicates member strengthening is required.*

Foundation Reaction Usage

Reaction	Existing	Existing + Proposed
Compression / Leg	63	62
Uplift / Leg	51	49
Shear / Leg	38	33

- *Percentage equal to or less than 100% denote member stress levels are satisfactory for loading.*
- *Percentage greater than 100% indicates member strengthening is required.*

Section	T1	T2	T3	T4	T5	T6	T7	T8
Legs	P2.5x.203		P4x.237	P5x.258	P6x.28	P8x.322	P8x.5	
Leg Grade	A500M-54							
Diagonals	A	L2x2x3/16		L2 1/2x2 1/2x3/16	L3x3x3/16		L3 1/2x3 1/2x1/4	
Diagonal Grade	A36							
Top Girts	L3x3x1/4	N.A.						
Face Width (ft)	6	8		10	12		14	16
# Panels @ (ft)	2 @ 4.33333	8 @ 4.66667		9 @ 6.25			4 @ 9.33333	
Weight (lb) 16284.4	421.5	791.8	1140.7	1485.0	1986.3	2680.9	3829.5	3948.6



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Nudd 12' boom	150	(2) RFS FD9R6004/2C-3L (Verizon)	127.5
Nudd 12' boom	150	RFS DB-T1-6Z-8AB-0Z (Verizon)	127.5 - 12.75
Nudd 12' boom	150	Commscope LNX-6514DS-VTM (Verizon)	127.5
Ericsson AIR 32 B66AA/B2A (T-Mobile)	150	Commscope LNX-6514DS-VTM (Verizon)	127.5
Ericsson AIR 32 B66AA/B2A (T-Mobile)	150	Commscope LNX-6514DS-VTM (Verizon)	127.5
Ericsson AIR 32 B66AA/B2A (T-Mobile)	150	Commscope HBXX-9014DS-VTM (Verizon)	127.5
Ericsson KRY112 (T-Mobile)	150	Commscope HBXX-9014DS-VTM (Verizon)	127.5
Ericsson KRY112 (T-Mobile)	150	Commscope HBXX-9014DS-VTM (Verizon)	127.5
Ericsson KRY112 (T-Mobile)	150	Commscope HBXX-6517DS-A2M (Verizon)	127.5
RFS APXVAA24_43-U-A20 (T-Mobile)	150	Commscope HBXX-6517DS-A2M (Verizon)	127.5
RFS APXVAA24_43-U-A20 (T-Mobile)	150	Commscope HBXX-6517DS-A2M (Verizon)	127.5
RFS APXVAA24_43-U-A20 (T-Mobile)	150	Alcatel Lucent RH_2x60-AWS (Verizon)	127.5
Ericsson 4449 (T-Mobile)	150	Alcatel Lucent RH_2x60-AWS (Verizon)	127.5
Ericsson 4449 (T-Mobile)	150	Alcatel Lucent RH_2x60-AWS (Verizon)	127.5
Ericsson 4449 (T-Mobile)	150	Alcatel Lucent RH_2x60-70OU (Verizon)	127.5
RFS IBC1900BB-3 (Sprint)	140	Alcatel Lucent RH_2x60-70OU (Verizon)	127.5
RFS IBC1900BB-3 (Sprint)	140	KMW EPBQ-654L8H8-L2 (ATI)	115
RFS IBC1900BB-3 (Sprint)	140	CCI OPA-65R-LCUU-H8 (ATI)	115
Commscope DT465B-2XR (Sprint)	140	CCI OPA-65R-LCUU-H8 (ATI)	115
Commscope DT465B-2XR (Sprint)	140	CCI OPA-65R-LCUU-H8 (ATI)	115
Commscope DT465B-2XR (Sprint)	140	Ericsson RRUS11 (ATI)	115
(2) Alcatel Lucent 4x45 (Sprint)	140	Ericsson RRUS11 (ATI)	115
(2) Alcatel Lucent 4x45 (Sprint)	140	Ericsson RRUS11 (ATI)	115
(2) Alcatel Lucent 4x45 (Sprint)	140	(3) Ericsson RRUS32 (ATI)	115
Alcatel Lucent 8x200-25 (Sprint)	140	(3) Ericsson RRUS32 (ATI)	115
Alcatel Lucent 8x200-25 (Sprint)	140	(3) Ericsson RRUS32 (ATI)	115
Alcatel Lucent 8x200-25 (Sprint)	140	Ericsson B14 4478 (ATI)	115
RFS APXV9ERR18-C-A20 (Sprint)	140	Ericsson B14 4478 (ATI)	115
RFS APXV9ERR18-C-A20 (Sprint)	140	Ericsson B14 4478 (ATI)	115
RFS APXV9ERR18-C-A20 (Sprint)	140	(2) Powerwave LGP21401 (ATI)	115
(2) Alcatel Lucent RRH2x50 (Sprint)	140	(2) Powerwave LGP21401 (ATI)	115
(2) Alcatel Lucent RRH2x50 (Sprint)	140	(2) Powerwave LGP21401 (ATI)	115
(2) Alcatel Lucent RRH2x50 (Sprint)	140	Nudd 10' boom	115
Nudd 12' boom (Sprint)	140	Nudd 10' boom	115
Nudd 12' boom (Sprint)	140	Raycap DC6-48-60 (ATI)	115
Nudd 12' boom (Sprint)	140	Raycap DC6-48-60 (ATI)	115
Alcatel Lucent 1900 MHz RRH (Sprint)	140	Raycap DC6-48-60 (ATI)	115
Alcatel Lucent 1900 MHz RRH (Sprint)	140	Nudd 10' boom	115
Alcatel Lucent 1900 MHz RRH (Sprint)	140	Powerwave 7770.00 (ATI)	115
Alcatel Lucent RH_2x60-70OU (Verizon)	127.5	Powerwave 7770.00 (ATI)	115
Alcatel Lucent RH_2x60-PCS (Verizon)	127.5	Powerwave 7770.00 (ATI)	115
Alcatel Lucent RH_2x60-PCS (Verizon)	127.5	KMW EPBQ-654L8H8-L2 (ATI)	115
Alcatel Lucent RH_2x60-PCS (Verizon)	127.5	KMW EPBQ-654L8H8-L2 (ATI)	115
Nudd 12' boom	127.5		
Nudd 12' boom	127.5		
Nudd 12' boom	127.5		
(2) RFS APL868013 (Verizon)	127.5		
(2) RFS APL868013 (Verizon)	127.5		
(2) RFS APL866513 (Verizon)	127.5		
(2) RFS FD9R6004/2C-3L (Verizon)	127.5		
(2) RFS FD9R6004/2C-3L (Verizon)	127.5		

AL
AR

MA

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L1 1/2x1 1/2x3/16		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500M-54	54 ksi	70 ksi	A36	36 ksi	58 ksi

SHEAR
12862 lb

TOI
50 mph

SHEAR
43086 lb

TORQUE 10506 lb-ft
REACTIONS - 104 mph WIND

Phone: FAX:	Job: ***150' SS Tower Norwich, CT. Analysis***		
	Project: ***118-23067***		
	Client: CDT	Drawn by: FAN	App'd:
	Code: TIA-222-G	Date: 06/11/18	Scale: NTS
	Path:		Dwg No. E-1

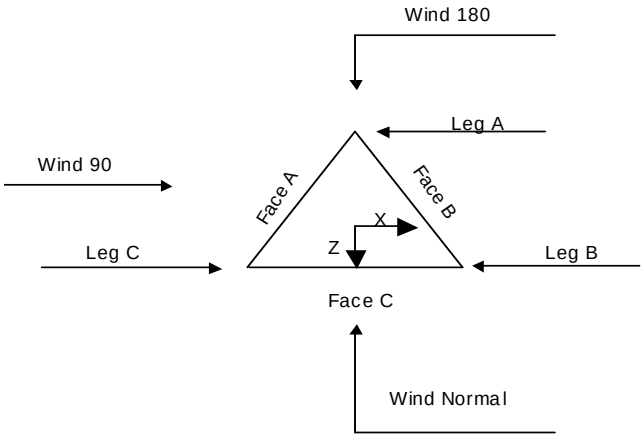
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 150.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.00 ft at the top and 18.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New London County, Connecticut.
Basic wind speed of 104 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 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.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Treat Feedline Bundles As Cylinder
	Consider Moments - Horizontals		Assume Legs Pinned		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Calculate Redundant Bracing Forces
	Use Moment Magnification	√	Use Clear Spans For Wind Area		Ignore Redundant Members in FEA
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r		SR Leg Bolts Resist Compression
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		All Leg Panels Have Same Allowable
	Escalate Ice		Bypass Mast Stability Checks		Offset Girt At Foundation
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Consider Feedline Torque
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Include Angle Block Shear Check
√	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section		SR Members Have Cut Ends		Include Shear-Torsion Interaction
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination				



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	150.00-140.00			6.00	1	10.00
T2	140.00-120.00			6.00	1	20.00
T3	120.00-100.00			6.00	1	20.00
T4	100.00-80.00			8.00	1	20.00
T5	80.00-60.00			10.00	1	20.00
T6	60.00-40.00			12.00	1	20.00
T7	40.00-20.00			14.00	1	20.00
T8	20.00-0.00			16.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	150.00-140.00	4.33	X Brace	No	No	8.0000	8.0000
T2	140.00-120.00	4.67	X Brace	No	No	8.0000	8.0000
T3	120.00-100.00	4.67	X Brace	No	No	8.0000	8.0000
T4	100.00-80.00	6.25	X Brace	No	No	7.5000	7.5000
T5	80.00-60.00	6.25	X Brace	No	No	7.5000	7.5000
T6	60.00-40.00	6.25	X Brace	No	No	7.5000	7.5000
T7	40.00-20.00	9.33	X Brace	No	No	8.0000	8.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T8	20.00-0.00	9.33	X Brace	No	No	8.0000	8.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 150.00-140.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T2 140.00-120.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T3 120.00-100.00	Pipe	P4x.237	A500M-54 (54 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 100.00-80.00	Pipe	P5x.258	A500M-54 (54 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 80.00-60.00	Pipe	P6x.28	A500M-54 (54 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T6 60.00-40.00	Pipe	P8x.322	A500M-54 (54 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T7 40.00-20.00	Pipe	P8x.5	A500M-54 (54 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T8 20.00-0.00	Pipe	P8x.5	A500M-54 (54 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 150.00-140.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T2 140.00-120.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T3 120.00-100.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T4 100.00-80.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T5 80.00-60.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T6 60.00-40.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T7 40.00-20.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T8 20.00-0.00	Solid Round		A572-50 (50 ksi)	Solid Round	9/16	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

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
T1 150.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	No	1	1	1	1	1	1	1	1
150.00-140.00				1	1	1	1	1	1	1
T2	Yes	No	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T3	Yes	No	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T4	Yes	No	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T5	Yes	No	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T6	Yes	No	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T7	Yes	No	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T8 20.00-0.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 150.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 150.00-140.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 140.00-120.00	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 120.00-100.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 100.00-80.00	Flange	1.0000 A325N	8	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 80.00-60.00	Flange	1.2500 A325N	8	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 60.00-40.00	Flange	1.2500 A325N	8	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 40.00-20.00	Flange	1.2500 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 20.00-0.00	Flange	1.5000 F1554-36	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A (1-5/8 FOAM) (T-Mobile)	C	No	Ar (CaAa)	150.00 - 5.00	0.0000	0.25	6	6	1.9800	1.9800		0.82
1 1/4 (Sprint)	A	No	Ar (CaAa)	140.00 - 5.00	0.0000	0.25	4	4	1.5500	1.5500		0.66
LDF7-50A	B	No	Ar (CaAa)	127.50 - 5.00	0.0000	0.25	6	6	1.9800	1.9800		0.82

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(1-5/8 FOAM) (Verizon)												
LDF6-50A (1-1/4 FOAM) (AT&T)	C	No	Ar (CaAa)	115.00 - 5.00	0.0000	0.25	12	6	1.5500	1.5500		0.66
Safety Line 3/8	C	No	Ar (CaAa)	150.00 - 0.00	0.0000	0	1	1	0.3750	0.3750		0.22
Feedline Ladder (Af)	C	No	Ar (CaAa)	150.00 - 0.00	0.0000	0.25	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af)	C	No	Ar (CaAa)	115.00 - 0.00	0.0000	0.25	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af)	B	No	Ar (CaAa)	127.50 - 0.00	0.0000	0.25	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af)	A	No	Ar (CaAa)	140.00 - 0.00	0.0000	0.25	1	1	3.0000	3.0000		8.40
DC (AT&T)	C	No	Ar (CaAa)	115.00 - 5.00	0.0000	0.25	6	6	0.7500 0.6300	0.0000		0.15
Fiber (AT&T)	C	No	Ar (CaAa)	115.00 - 5.00	0.0000	0.25	2	2	0.3750 0.6300	0.0000		0.15
3" Rigid Conduit (AT&T)	C	No	Ar (CaAa)	115.00 - 0.00	0.0000	0.25	1	1	2.0000	3.0000		2.80
LDF7-50A (1-5/8 FOAM) (Verizon)	B	No	Ar (CaAa)	127.50 - 5.00	0.0000	0.25	2	2	1.9800	1.9800		0.82
1-1/4 Fiber (T-Mobile)	C	No	Ar (CaAa)	150.00 - 5.00	0.0000	0.25	2	2	1.9800	1.4000		0.82

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
T1	150.00-140.00	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	18.055	0.000	151.80
T2	140.00-120.00	A	0.000	0.000	18.400	0.000	220.80
		B	0.000	0.000	14.130	0.000	112.20
		C	0.000	0.000	36.110	0.000	303.60
T3	120.00-100.00	A	0.000	0.000	18.400	0.000	220.80
		B	0.000	0.000	37.680	0.000	299.20
		C	0.000	0.000	73.010	0.000	608.40
T4	100.00-80.00	A	0.000	0.000	18.400	0.000	220.80
		B	0.000	0.000	37.680	0.000	299.20
		C	0.000	0.000	85.310	0.000	710.00
T5	80.00-60.00	A	0.000	0.000	18.400	0.000	220.80
		B	0.000	0.000	37.680	0.000	299.20
		C	0.000	0.000	85.310	0.000	710.00
T6	60.00-40.00	A	0.000	0.000	18.400	0.000	220.80
		B	0.000	0.000	37.680	0.000	299.20
		C	0.000	0.000	85.310	0.000	710.00
T7	40.00-20.00	A	0.000	0.000	18.400	0.000	220.80
		B	0.000	0.000	37.680	0.000	299.20
		C	0.000	0.000	85.310	0.000	710.00
T8	20.00-0.00	A	0.000	0.000	15.300	0.000	207.60
		B	0.000	0.000	29.760	0.000	266.40

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
		C	0.000	0.000	68.670	0.000	631.60

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
T1	150.00-140.00	A	1.739	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	54.624	0.000	861.76
T2	140.00-120.00	A	1.720	0.000	0.000	50.725	0.000	873.69
		B		0.000	0.000	39.172	0.000	625.06
		C		0.000	0.000	108.856	0.000	1707.21
T3	120.00-100.00	A	1.692	0.000	0.000	50.429	0.000	861.65
		B		0.000	0.000	103.982	0.000	1644.32
		C		0.000	0.000	192.871	0.000	3259.87
T4	100.00-80.00	A	1.658	0.000	0.000	50.081	0.000	847.54
		B		0.000	0.000	103.419	0.000	1617.93
		C		0.000	0.000	219.427	0.000	3725.08
T5	80.00-60.00	A	1.617	0.000	0.000	49.655	0.000	830.43
		B		0.000	0.000	102.730	0.000	1585.83
		C		0.000	0.000	217.413	0.000	3651.66
T6	60.00-40.00	A	1.564	0.000	0.000	49.102	0.000	808.42
		B		0.000	0.000	101.835	0.000	1544.48
		C		0.000	0.000	214.797	0.000	3557.32
T7	40.00-20.00	A	1.486	0.000	0.000	48.299	0.000	776.89
		B		0.000	0.000	100.535	0.000	1485.05
		C		0.000	0.000	210.994	0.000	3422.28
T8	20.00-0.00	A	1.331	0.000	0.000	37.863	0.000	614.27
		B		0.000	0.000	76.302	0.000	1104.50
		C		0.000	0.000	162.609	0.000	2590.21

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	150.00-140.00	-2.6270	3.2487	-1.8972	2.5415
T2	140.00-120.00	-1.1413	0.9852	-0.8774	0.8774
T3	120.00-100.00	-0.8262	2.4178	-0.4924	1.7447
T4	100.00-80.00	-1.3639	3.2456	-0.8552	2.3833
T5	80.00-60.00	-1.5791	3.7124	-1.0186	2.8135
T6	60.00-40.00	-1.7659	4.1167	-1.1717	3.2208
T7	40.00-20.00	-2.0515	4.7528	-1.3776	3.7811
T8	20.00-0.00	-2.1902	4.8153	-1.5776	4.0850

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	LDF7-50A (1-5/8 FOAM)	140.00 - 150.00	0.6000	0.6000
T1	5	Safety Line 3/8	140.00 - 150.00	0.6000	0.6000
T1	6	Feedline Ladder (Af)	140.00 - 150.00	0.6000	0.6000
T1	14	1-1/4 Fiber	140.00 - 150.00	0.6000	0.6000
T2	1	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T2	2	1 1/4	120.00 - 140.00	0.6000	0.6000
T2	3	LDF7-50A (1-5/8 FOAM)	120.00 - 127.50	0.6000	0.6000
T2	5	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T2	6	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T2	8	Feedline Ladder (Af)	120.00 - 127.50	0.6000	0.6000
T2	9	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T2	13	LDF7-50A (1-5/8 FOAM)	120.00 - 127.50	0.6000	0.6000
T2	14	1-1/4 Fiber	120.00 - 140.00	0.6000	0.6000
T3	1	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T3	2	1 1/4	100.00 - 120.00	0.6000	0.6000
T3	3	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T3	4	LDF6-50A (1-1/4 FOAM)	100.00 - 115.00	0.6000	0.6000
T3	5	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T3	6	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T3	7	Feedline Ladder (Af)	100.00 - 115.00	0.6000	0.6000
T3	8	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T3	9	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T3	10	DC	100.00 - 115.00	0.6000	0.6000
T3	11	Fiber	100.00 - 115.00	0.6000	0.6000
T3	12	3" Rigid Conduit	100.00 - 115.00	0.6000	0.6000
T3	13	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T3	14	1-1/4 Fiber	100.00 - 120.00	0.6000	0.6000
T4	1	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T4	2	1 1/4	80.00 - 100.00	0.6000	0.6000
T4	3	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T4	4	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.6000
T4	5	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T4	6	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T4	7	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T4	8	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	9	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T4	10	DC	80.00 - 100.00	0.6000	0.6000
T4	11	Fiber	80.00 - 100.00	0.6000	0.6000
T4	12	3" Rigid Conduit	80.00 - 100.00	0.6000	0.6000
T4	13	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T4	14	1-1/4 Fiber	80.00 - 100.00	0.6000	0.6000
T5	1	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T5	2	1 1/4	60.00 - 80.00	0.6000	0.6000
T5	3	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T5	4	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.6000
T5	5	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T5	6	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T5	7	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T5	8	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T5	9	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T5	10	DC	60.00 - 80.00	0.6000	0.6000
T5	11	Fiber	60.00 - 80.00	0.6000	0.6000
T5	12	3" Rigid Conduit	60.00 - 80.00	0.6000	0.6000
T5	13	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T5	14	1-1/4 Fiber	60.00 - 80.00	0.6000	0.6000
T6	1	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T6	2	1 1/4	40.00 - 60.00	0.6000	0.6000
T6	3	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T6	4	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.6000
T6	5	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T6	6	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T6	7	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T6	8	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T6	9	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T6	10	DC	40.00 - 60.00	0.6000	0.6000
T6	11	Fiber	40.00 - 60.00	0.6000	0.6000
T6	12	3" Rigid Conduit	40.00 - 60.00	0.6000	0.6000
T6	13	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T6	14	1-1/4 Fiber	40.00 - 60.00	0.6000	0.6000
T7	1	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T7	2	1 1/4	20.00 - 40.00	0.6000	0.6000
T7	3	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T7	4	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.6000
T7	5	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T7	6	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T7	7	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T7	8	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T7	9	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T7	10	DC	20.00 - 40.00	0.6000	0.6000
T7	11	Fiber	20.00 - 40.00	0.6000	0.6000
T7	12	3" Rigid Conduit	20.00 - 40.00	0.6000	0.6000
T7	13	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T7	14	1-1/4 Fiber	20.00 - 40.00	0.6000	0.6000
T8	1	LDF7-50A (1-5/8 FOAM)	5.00 - 20.00	0.6000	0.6000
T8	2	1 1/4	5.00 - 20.00	0.6000	0.6000
T8	3	LDF7-50A (1-5/8 FOAM)	5.00 - 20.00	0.6000	0.6000
T8	4	LDF6-50A (1-1/4 FOAM)	5.00 - 20.00	0.6000	0.6000
T8	5	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T8	6	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T8	7	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T8	8	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T8	9	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T8	10	DC	5.00 - 20.00	0.6000	0.6000
T8	11	Fiber	5.00 - 20.00	0.6000	0.6000
T8	12	3" Rigid Conduit	0.00 - 20.00	0.6000	0.6000
T8	13	LDF7-50A (1-5/8 FOAM)	5.00 - 20.00	0.6000	0.6000
T8	14	1-1/4 Fiber	5.00 - 20.00	0.6000	0.6000

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
Nudd 12' boom	C	From Leg	1.00	0.0000	150.00	No Ice	17.10	9.30	254.00
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00			1" Ice	26.00	26.00	534.00
Nudd 12' boom	A	From Leg	1.00	0.0000	150.00	No Ice	17.10	9.30	254.00
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00			1" Ice	26.00	26.00	534.00
Nudd 12' boom	B	From Leg	1.00	0.0000	150.00	No Ice	17.10	9.30	254.00
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00			1" Ice	26.00	26.00	534.00
Nudd 12' boom	C	From Leg	1.00	0.0000	127.50	No Ice	17.10	9.30	254.00
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00			1" Ice	26.00	26.00	534.00
Nudd 12' boom	A	From Leg	1.00	0.0000	127.50	No Ice	17.10	9.30	254.00
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00			1" Ice	26.00	26.00	534.00
Nudd 12' boom	B	From Leg	1.00	0.0000	127.50	No Ice	17.10	9.30	254.00
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00			1" Ice	26.00	26.00	534.00
Nudd 10' boom	C	From Leg	1.00	0.0000	115.00	No Ice	15.50	9.30	255.00
			0.00			1/2" Ice	19.60	19.60	367.00
			0.00			1" Ice	24.00	24.00	512.00
Nudd 10' boom	C	From Leg	1.00	0.0000	115.00	No Ice	15.50	9.30	255.00
			0.00			1/2" Ice	19.60	19.60	367.00
			0.00			1" Ice	24.00	24.00	512.00
Nudd 10' boom	A	From Leg	1.00	0.0000	115.00	No Ice	15.50	9.30	255.00
			0.00			1/2" Ice	19.60	19.60	367.00
			0.00			1" Ice	24.00	24.00	512.00
Nudd 12' boom (Sprint)	A	From Leg	1.00	0.0000	140.00	No Ice	17.10	9.30	254.00
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00			1" Ice	26.00	26.00	534.00
Nudd 12' boom (Sprint)	B	From Leg	1.00	0.0000	140.00	No Ice	17.10	9.30	254.00
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00			1" Ice	26.00	26.00	534.00
Nudd 12' boom (Sprint)	C	From Leg	1.00	0.0000	140.00	No Ice	17.10	9.30	254.00
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00			1" Ice	26.00	26.00	534.00
Alcatel Lucent 1900 MHz RRH (Sprint)	A	From Leg	4.00	0.0000	140.00	No Ice	2.58	2.54	60.00
			0.00			1/2" Ice	2.77	2.73	86.50
			0.00			1" Ice	2.96	1.00	110.20
Alcatel Lucent 1900 MHz RRH (Sprint)	B	From Leg	4.00	0.0000	140.00	No Ice	2.91	3.80	60.00
			0.00			1/2" Ice	3.11	4.03	86.50
			0.00			1" Ice	3.33	4.27	110.20
Alcatel Lucent 1900 MHz RRH (Sprint)	C	From Leg	4.00	0.0000	140.00	No Ice	2.91	3.80	60.00
			0.00			1/2" Ice	3.11	4.03	68.50
			0.00			1" Ice	3.33	4.27	110.20
RFS IBC1900BB-3 (Sprint)	A	From Leg	4.00	0.0000	140.00	No Ice	1.41	0.63	22.00
			0.00			1/2" Ice	1.55	0.74	31.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00				1" Ice	1.71	0.87	42.20
RFS IBC1900BB-3	B	From Leg	4.00		0.0000	140.00	No Ice	1.41	0.63	22.00
(Sprint)			0.00				1/2" Ice	1.55	0.74	31.00
			0.00				1" Ice	1.71	0.87	42.20
RFS IBC1900BB-3	C	From Leg	4.00		0.0000	140.00	No Ice	1.41	0.63	22.00
(Sprint)			0.00				1/2" Ice	1.55	0.74	31.00
			0.00				1" Ice	1.71	0.87	42.20
(2) RFS APL868013	C	From Leg	4.00		0.0000	127.50	No Ice	2.87	3.61	8.20
(Verizon)			0.00				1/2" Ice	3.17	3.92	33.60
			0.00				1" Ice	3.52	4.48	64.96
(2) RFS APL868013	A	From Leg	4.00		0.0000	127.50	No Ice	2.87	3.61	8.20
(Verizon)			0.00				1/2" Ice	3.17	3.92	33.60
			0.00				1" Ice	3.52	4.48	64.96
(2) RFS APL866513	B	From Leg	4.00		0.0000	127.50	No Ice	4.29	3.73	15.70
(Verizon)			0.00				1/2" Ice	4.62	4.05	47.00
			0.00				1" Ice	4.95	4.38	82.70
(2) RFS FD9R6004/2C-3L	C	From Leg	4.00		0.0000	127.50	No Ice	0.31	0.08	3.10
(Verizon)			0.00				1/2" Ice	0.38	0.12	5.40
			0.00				1" Ice	3.52	4.48	64.96
(2) RFS FD9R6004/2C-3L	A	From Leg	4.00		0.0000	127.50	No Ice	0.31	0.08	3.10
(Verizon)			0.00				1/2" Ice	0.38	0.12	5.40
			0.00				1" Ice	3.52	4.48	64.96
(2) RFS FD9R6004/2C-3L	B	From Leg	4.00		0.0000	127.50	No Ice	0.31	0.08	3.10
(Verizon)			0.00				1/2" Ice	0.38	0.12	5.40
			0.00				1" Ice	3.52	4.48	64.96
RFS DB-T1-6Z-8AB-0Z	C	From Leg	4.00		0.0000	12.75 - 127.50	No Ice	4.80	2.00	10.00
(Verizon)			0.00				1/2" Ice	5.04	2.17	46.10
			0.00				1" Ice	5.28	2.34	82.20
Commscope	A	From Leg	4.00		0.0000	127.50	No Ice	8.17	5.41	38.80
LNX-6514DS-VTM			0.00				1/2" Ice	8.63	5.88	89.30
(Verizon)			0.00				1" Ice	3.52	4.48	64.96
Commscope	B	From Leg	4.00		0.0000	127.50	No Ice	8.17	5.41	38.80
LNX-6514DS-VTM			0.00				1/2" Ice	8.63	5.88	89.30
(Verizon)			0.00				1" Ice	3.52	4.48	64.96
Commscope	C	From Leg	4.00		0.0000	127.50	No Ice	8.17	5.41	38.80
LNX-6514DS-VTM			0.00				1/2" Ice	8.63	5.88	89.30
(Verizon)			0.00				1" Ice	3.52	4.48	64.96
Commscope	A	From Leg	4.00		0.0000	127.50	No Ice	5.42	3.28	29.80
HBXX-9014DS-VTM			0.00				1/2" Ice	5.74	3.60	65.10
(Verizon)			0.00				1" Ice	3.52	4.48	64.96
Commscope	B	From Leg	4.00		0.0000	127.50	No Ice	5.42	3.28	29.80
HBXX-9014DS-VTM			0.00				1/2" Ice	5.74	3.60	65.10
(Verizon)			0.00				1" Ice	3.52	4.48	64.96
Commscope	C	From Leg	4.00		0.0000	127.50	No Ice	5.42	3.28	29.80
HBXX-9014DS-VTM			0.00				1/2" Ice	5.74	3.60	65.10
(Verizon)			0.00				1" Ice	3.52	4.48	64.96
Commscope	A	From Leg	4.00		0.0000	127.50	No Ice	8.53	5.24	43.00
HBXX-6517DS-A2M			0.00				1/2" Ice	9.00	5.74	93.50
(Verizon)			0.00				1" Ice	3.52	4.48	64.96
Commscope	B	From Leg	4.00		0.0000	127.50	No Ice	8.53	5.24	43.00
HBXX-6517DS-A2M			0.00				1/2" Ice	9.00	5.74	93.50
(Verizon)			0.00				1" Ice	3.52	4.48	64.96
Commscope	C	From Leg	4.00		0.0000	127.50	No Ice	8.53	5.24	43.00
HBXX-6517DS-A2M			0.00				1/2" Ice	9.00	5.74	93.50
(Verizon)			0.00				1" Ice	3.52	4.48	64.96
Alcatel Lucent	A	From Leg	4.00		0.0000	127.50	No Ice	1.88	1.24	44.00
RH_2x60-AWS			0.00				1/2" Ice	2.03	1.37	60.00

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
(Verizon)			0.00			1" Ice	3.52	4.48	64.96
Alcatel Lucent	B	From Leg	4.00	0.0000	127.50	No Ice	1.88	1.24	44.00
RH_2x60-AWS			0.00			1/2" Ice	2.03	1.37	60.00
(Verizon)			0.00			1" Ice	3.52	4.48	64.96
Alcatel Lucent	C	From Leg	4.00	0.0000	127.50	No Ice	1.88	1.24	44.00
RH_2x60-AWS			0.00			1/2" Ice	2.03	1.37	60.00
(Verizon)			0.00			1" Ice	3.52	4.48	64.96
Alcatel Lucent	A	From Leg	4.00	0.0000	127.50	No Ice	2.16	1.62	44.00
RH_2x60-70OU			0.00			1/2" Ice	2.33	1.77	63.60
(Verizon)			0.00			1" Ice	3.52	4.48	64.96
Alcatel Lucent	B	From Leg	4.00	0.0000	127.50	No Ice	2.16	1.62	44.00
RH_2x60-70OU			0.00			1/2" Ice	2.33	1.77	63.60
(Verizon)			0.00			1" Ice	3.52	4.48	64.96
Alcatel Lucent	C	From Leg	4.00	0.0000	127.50	No Ice	2.16	1.62	44.00
RH_2x60-70OU			0.00			1/2" Ice	2.33	1.77	63.60
(Verizon)			0.00			1" Ice	3.52	4.48	64.96
Alcatel Lucent	A	From Leg	4.00	0.0000	127.50	No Ice	1.84	1.34	46.00
RH_2x60-PCS			0.00			1/2" Ice	2.00	1.48	62.60
(Verizon)			0.00			1" Ice	3.52	4.48	64.96
Alcatel Lucent	B	From Leg	4.00	0.0000	127.50	No Ice	1.84	1.34	46.00
RH_2x60-PCS			0.00			1/2" Ice	2.00	1.48	62.60
(Verizon)			0.00			1" Ice	3.52	4.48	64.96
Alcatel Lucent	C	From Leg	4.00	0.0000	127.50	No Ice	1.84	1.34	46.00
RH_2x60-PCS			0.00			1/2" Ice	2.00	1.48	62.60
(Verizon)			0.00			1" Ice	3.52	4.48	64.96
Ericsson AIR 32	A	From Leg	4.00	0.0000	150.00	No Ice	6.51	4.71	100.00
B66AA/B2A			0.00			1/2" Ice	6.87	5.07	145.80
(T-Mobile)			0.00			1" Ice	7.24	5.43	196.90
Ericsson AIR 32	B	From Leg	4.00	0.0000	150.00	No Ice	6.51	4.71	100.00
B66AA/B2A			0.00			1/2" Ice	6.87	5.07	145.80
(T-Mobile)			0.00			1" Ice	7.24	5.43	196.90
Ericsson AIR 32	C	From Leg	4.00	0.0000	150.00	No Ice	6.51	4.71	100.00
B66AA/B2A			0.00			1/2" Ice	6.87	5.07	145.80
(T-Mobile)			0.00			1" Ice	7.24	5.43	196.90
Ericsson KRY112	A	From Leg	4.00	0.0000	150.00	No Ice	0.35	0.16	11.00
(T-Mobile)			0.00			1/2" Ice	0.42	0.21	14.10
			0.00			1" Ice	0.50	0.27	18.40
Ericsson KRY112	B	From Leg	4.00	0.0000	150.00	No Ice	0.35	0.16	11.00
(T-Mobile)			0.00			1/2" Ice	0.42	0.21	14.10
			0.00			1" Ice	0.50	0.27	18.40
Ericsson KRY112	C	From Leg	4.00	0.0000	150.00	No Ice	0.35	0.16	11.00
(T-Mobile)			0.00			1/2" Ice	0.42	0.21	14.10
			0.00			1" Ice	0.50	0.27	18.40
Commscope DT465B-2XR	A	From Leg	4.00	0.0000	140.00	No Ice	9.22	5.87	50.00
(Sprint)			0.00			1/2" Ice	10.14	6.79	172.40
			0.00			1" Ice	11.07	7.70	320.70
Commscope DT465B-2XR	B	From Leg	4.00	0.0000	140.00	No Ice	9.22	5.87	50.00
(Sprint)			0.00			1/2" Ice	10.14	6.79	172.40
			0.00			1" Ice	11.07	7.70	320.70
Commscope DT465B-2XR	C	From Leg	4.00	0.0000	140.00	No Ice	9.22	5.87	50.00
(Sprint)			0.00			1/2" Ice	10.14	6.79	172.40
			0.00			1" Ice	11.07	7.70	320.70
(2) Alcatel Lucent 4x45	A	From Leg	4.00	0.0000	140.00	No Ice	2.54	1.61	51.00
(Sprint)			0.00			1/2" Ice	2.92	1.96	94.30
			0.00			1" Ice	3.35	2.33	150.90
(2) Alcatel Lucent 4x45	B	From Leg	4.00	0.0000	140.00	No Ice	2.54	1.61	51.00
(Sprint)			0.00			1/2" Ice	2.92	1.96	94.30

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Offsets: ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00					1" Ice	3.35	2.33	150.90
(2) Alcatel Lucent 4x45 (Sprint)	C	From Leg	4.00			0.0000	140.00	No Ice	2.54	1.61	51.00
			0.00					1/2" Ice	2.92	1.96	94.30
			0.00					1" Ice	3.35	2.33	150.90
Alcatel Lucent 8x200-25 (Sprint)	A	From Leg	4.00			0.0000	140.00	No Ice	4.05	1.53	70.00
			0.00					1/2" Ice	4.50	1.88	127.80
			0.00					1" Ice	4.99	2.26	200.50
Alcatel Lucent 8x200-25 (Sprint)	B	From Leg	4.00			0.0000	140.00	No Ice	4.05	1.53	70.00
			0.00					1/2" Ice	4.50	1.88	127.80
			0.00					1" Ice	4.99	2.26	200.50
Alcatel Lucent 8x200-25 (Sprint)	C	From Leg	4.00			0.0000	140.00	No Ice	4.05	1.53	70.00
			0.00					1/2" Ice	4.50	1.88	127.80
			0.00					1" Ice	4.99	2.26	200.50
RFS APXV9ERR18-C-A20 (Sprint)	A	From Leg	4.00			0.0000	140.00	No Ice	8.02	5.81	62.00
			0.00					1/2" Ice	8.93	6.73	172.10
			0.00					1" Ice	9.86	7.64	307.60
RFS APXV9ERR18-C-A20 (Sprint)	B	From Leg	4.00			0.0000	140.00	No Ice	8.02	5.81	62.00
			0.00					1/2" Ice	8.93	6.73	172.10
			0.00					1" Ice	9.86	7.64	307.60
RFS APXV9ERR18-C-A20 (Sprint)	C	From Leg	4.00			0.0000	140.00	No Ice	8.02	5.81	62.00
			0.00					1/2" Ice	8.93	6.73	172.10
			0.00					1" Ice	9.86	7.64	307.60
(2) Alcatel Lucent RRH2x50 (Sprint)	A	From Leg	4.00			0.0000	140.00	No Ice	2.27	1.35	42.00
			0.00					1/2" Ice	2.64	1.68	79.60
			0.00					1" Ice	3.05	2.04	129.60
Powerwave 7770.00 (AT&T)	A	From Leg	4.00			0.0000	115.00	No Ice	5.51	2.93	35.00
			0.00					1/2" Ice	6.21	3.64	105.10
			0.00					1" Ice	6.93	4.33	195.10
Powerwave 7770.00 (AT&T)	B	From Leg	4.00			0.0000	115.00	No Ice	5.51	2.93	35.00
			0.00					1/2" Ice	6.21	3.64	105.10
			0.00					1" Ice	6.93	4.33	195.10
Powerwave 7770.00 (AT&T)	C	From Leg	4.00			0.0000	115.00	No Ice	5.51	2.93	35.00
			0.00					1/2" Ice	6.21	3.64	105.10
			0.00					1" Ice	6.93	4.33	195.10
KMW EPBQ-654L8H8-L2 (AT&T)	A	From Leg	4.00			0.0000	115.00	No Ice	18.09	7.03	200.00
			0.00					1/2" Ice	19.31	8.35	394.70
			0.00					1" Ice	20.55	9.57	622.90
KMW EPBQ-654L8H8-L2 (AT&T)	B	From Leg	4.00			0.0000	115.00	No Ice	18.09	7.03	200.00
			0.00					1/2" Ice	19.31	8.35	394.70
			0.00					1" Ice	20.55	9.57	622.90
KMW EPBQ-654L8H8-L2 (AT&T)	C	From Leg	4.00			0.0000	115.00	No Ice	18.09	7.03	200.00
			0.00					1/2" Ice	19.31	8.35	394.70
			0.00					1" Ice	20.55	9.57	622.90
CCI OPA-65R-LCUU-H8 (AT&T)	A	From Leg	4.00			0.0000	115.00	No Ice	12.76	7.48	70.90
			0.00					1/2" Ice	13.94	8.72	223.30
			0.00					1" Ice	15.11	9.90	47.00
CCI OPA-65R-LCUU-H8 (AT&T)	B	From Leg	4.00			0.0000	115.00	No Ice	12.76	7.48	70.90
			0.00					1/2" Ice	13.94	8.72	223.30
			0.00					1" Ice	15.11	9.90	47.00
CCI OPA-65R-LCUU-H8 (AT&T)	C	From Leg	4.00			0.0000	115.00	No Ice	12.76	7.48	70.90
			0.00					1/2" Ice	13.94	8.72	223.30
			0.00					1" Ice	15.11	9.90	47.00
Ericsson RRUS11 (AT&T)	A	From Leg	4.00			0.0000	115.00	No Ice	2.78	1.19	55.00
			0.00					1/2" Ice	3.16	1.47	99.60
			0.00					1" Ice	3.57	1.79	157.10
Ericsson RRUS11 (AT&T)	B	From Leg	4.00			0.0000	115.00	No Ice	2.78	1.19	55.00
			0.00					1/2" Ice	3.16	1.47	99.60

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* °	*Placement* *ft*		*C_AA_A Front* *ft²*	*C_AA_A Side* *ft²*	*Weight* *lb*
			0.00			1" Ice	3.57	1.79	157.10
Ericsson RRUS11	C	From Leg	4.00	0.0000	115.00	No Ice	2.78	1.19	55.00
(AT&T)			0.00			1/2" Ice	3.16	1.47	99.60
			0.00			1" Ice	3.57	1.79	157.10
(3) Ericsson RRUS32	A	From Leg	4.00	0.0000	115.00	No Ice	2.06	0.50	22.00
(AT&T)			0.00			1/2" Ice	2.39	0.72	49.80
			0.00			1" Ice	2.75	0.97	88.20
(3) Ericsson RRUS32	B	From Leg	4.00	0.0000	115.00	No Ice	2.06	0.50	22.00
(AT&T)			0.00			1/2" Ice	2.39	0.72	49.80
			0.00			1" Ice	2.75	0.97	88.20
(3) Ericsson RRUS32	C	From Leg	4.00	0.0000	115.00	No Ice	2.06	0.50	22.00
(AT&T)			0.00			1/2" Ice	2.39	0.72	49.80
			0.00			1" Ice	2.75	0.97	88.20
Ericsson B14 4478	A	From Leg	4.00	0.0000	115.00	No Ice	1.84	1.06	50.00
(AT&T)			0.00			1/2" Ice	2.15	1.31	84.40
			0.00			1" Ice	2.50	1.61	130.10
Ericsson B14 4478	B	From Leg	4.00	0.0000	115.00	No Ice	1.84	1.06	50.00
(AT&T)			0.00			1/2" Ice	2.15	1.31	84.40
			0.00			1" Ice	2.50	1.61	130.10
Ericsson B14 4478	C	From Leg	4.00	0.0000	115.00	No Ice	1.84	1.06	50.00
(AT&T)			0.00			1/2" Ice	2.15	1.31	84.40
			0.00			1" Ice	2.50	1.61	130.10
(2) Powerwave LGP21401	A	From Leg	4.00	0.0000	115.00	No Ice	1.67	0.47	31.00
(AT&T)			0.00			1/2" Ice	1.96	0.67	55.30
			0.00			1" Ice	2.30	0.90	89.40
(2) Powerwave LGP21401	A	From Leg	4.00	0.0000	115.00	No Ice	1.67	0.47	31.00
(AT&T)			0.00			1/2" Ice	1.96	0.67	55.30
			0.00			1" Ice	2.30	0.90	89.40
(2) Powerwave LGP21401	A	From Leg	4.00	0.0000	115.00	No Ice	1.67	0.47	31.00
(AT&T)			0.00			1/2" Ice	1.96	0.67	55.30
			0.00			1" Ice	2.30	0.90	89.40
(2) Alcatel Lucent RRH2x50	B	From Leg	4.00	0.0000	140.00	No Ice	2.27	1.35	42.00
(Sprint)			0.00			1/2" Ice	2.64	1.68	79.60
			0.00			1" Ice	3.05	2.04	129.60
(2) Alcatel Lucent RRH2x50	C	From Leg	4.00	0.0000	140.00	No Ice	2.27	1.35	42.00
(Sprint)			0.00			1/2" Ice	2.64	1.68	79.60
			0.00			1" Ice	3.05	2.04	129.60
Raycap DC6-48-60	A	From Leg	4.00	0.0000	115.00	No Ice	1.28	1.28	31.80
(AT&T)			0.00			1/2" Ice	1.64	1.64	80.10
			0.00			1" Ice	2.04	2.04	141.90
Raycap DC6-48-60	B	From Leg	4.00	0.0000	115.00	No Ice	1.28	1.28	31.80
(AT&T)			0.00			1/2" Ice	1.64	1.64	80.10
			0.00			1" Ice	2.04	2.04	141.90
Raycap DC6-48-60	C	From Leg	4.00	0.0000	115.00	No Ice	1.28	1.28	31.80
(AT&T)			0.00			1/2" Ice	1.64	1.64	80.10
			0.00			1" Ice	2.04	2.04	141.90
RFS APXVAA24_43-U-A20	A	From Leg	4.00	0.0000	150.00	No Ice	20.27	8.74	149.90
(T-Mobile)			0.00			1/2" Ice	20.88	9.38	261.80
			0.00			1" Ice	21.50	10.00	382.30
RFS APXVAA24_43-U-A20	B	From Leg	4.00	0.0000	150.00	No Ice	20.27	8.74	149.90
(T-Mobile)			0.00			1/2" Ice	20.88	9.38	261.80
			0.00			1" Ice	21.50	10.00	382.30
RFS APXVAA24_43-U-A20	C	From Leg	4.00	0.0000	150.00	No Ice	20.27	8.74	149.90
(T-Mobile)			0.00			1/2" Ice	20.88	9.38	261.80
			0.00			1" Ice	21.50	10.00	382.30
Ericsson 4449	A	From Leg	4.00	0.0000	150.00	No Ice	1.64	1.02	50.00
(T-Mobile)			0.00			1/2" Ice	1.78	1.14	66.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00				1" Ice	1.93	1.26	84.80
Ericsson 4449 (T-Mobile)	B	From Leg	4.00	0.0000	0.0000	150.00	No Ice	1.64	1.02	50.00
			0.00				1/2" Ice	1.78	1.14	66.10
			0.00				1" Ice	1.93	1.26	84.80
Ericsson 4449 (T-Mobile)	C	From Leg	4.00	0.0000	0.0000	150.00	No Ice	1.64	1.02	50.00
			0.00				1/2" Ice	1.78	1.14	66.10
			0.00				1" Ice	1.93	1.26	84.80

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	145.00	1.099	26	62.396	A	4.993	4.792	4.792	48.97	0.000	0.000
150.00-140.00					B	4.993	4.792		48.97	0.000	0.000
					C	4.993	4.792		48.97	18.055	0.000
T2	130.00	1.065	25	124.792	A	9.730	9.583	9.583	49.62	18.400	0.000
140.00-120.00					B	9.730	9.583		49.62	14.130	0.000
					C	9.730	9.583		49.62	36.110	0.000
T3	110.00	1.016	24	147.509	A	10.623	15.025	15.025	58.58	18.400	0.000
120.00-100.00					B	10.623	15.025		58.58	37.680	0.000
					C	10.623	15.025		58.58	73.010	0.000
T4	90.00	0.959	23	189.283	A	12.997	18.574	18.574	58.83	18.400	0.000
100.00-80.00					B	12.997	18.574		58.83	37.680	0.000
					C	12.997	18.574		58.83	85.310	0.000
T5 80.00-60.00	70.00	0.892	21	231.055	A	18.030	22.120	22.120	55.09	18.400	0.000
					B	18.030	22.120		55.09	37.680	0.000
					C	18.030	22.120		55.09	85.310	0.000
T6 60.00-40.00	50.00	0.811	19	274.393	A	20.444	28.798	28.798	58.48	18.400	0.000
					B	20.444	28.798		58.48	37.680	0.000
					C	20.444	28.798		58.48	85.310	0.000
T7 40.00-20.00	30.00	0.701	16	314.393	A	19.628	28.798	28.798	59.47	18.400	0.000
					B	19.628	28.798		59.47	37.680	0.000
					C	19.628	28.798		59.47	85.310	0.000
T8 20.00-0.00	10.00	0.7	16	354.393	A	21.673	28.798	28.798	57.06	15.300	0.000
					B	21.673	28.798		57.06	29.760	0.000
					C	21.673	28.798		57.06	68.670	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	145.00	1.099	6	1.7393	65.295	A	4.993	20.499	10.589	41.54	0.000	0.000
150.00-140.00						B	4.993	20.499		41.54	0.000	0.000
						C	4.993	20.499		41.54	54.624	0.000
T2	130.00	1.065	6	1.7204	130.526	A	9.730	37.793	21.053	44.30	50.725	0.000
140.00-120.00						B	9.730	37.793		44.30	39.172	0.000
						C	9.730	37.793		44.30	108.856	0.000
T3	110.00	1.016	6	1.6919	153.156	A	10.623	44.297	26.323	47.93	50.429	0.000
120.00-100.00						B	10.623	44.297		47.93	103.982	0.000
						C	10.623	44.297		47.93	192.871	0.000
T4 100.00-80.00	90.00	0.959	5	1.6583	194.818	A	12.997	46.890	29.648	49.51	50.081	0.000
						B	12.997	46.890		49.51	103.419	0.000
						C	12.997	46.890		49.51	219.427	0.000
T5 80.00-60.00	70.00	0.892	5	1.6171	236.453	A	18.030	52.357	32.919	46.77	49.655	0.000
						B	18.030	52.357		46.77	102.730	0.000
						C	18.030	52.357		46.77	217.413	0.000
T6 60.00-40.00	50.00	0.811	4	1.5636	279.612	A	20.444	60.551	39.240	48.45	49.102	0.000
						B	20.444	60.551		48.45	101.835	0.000
						C	20.444	60.551		48.45	214.797	0.000
T7 40.00-20.00	30.00	0.701	4	1.4858	319.352	A	19.628	55.384	38.720	51.62	48.299	0.000
						B	19.628	55.384		51.62	100.535	0.000
						C	19.628	55.384		51.62	210.994	0.000
T8 20.00-0.00	10.00	0.7	4	1.3312	358.836	A	21.673	54.173	37.687	49.69	37.863	0.000
						B	21.673	54.173		49.69	76.302	0.000
						C	21.673	54.173		49.69	162.609	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	145.00	1.099	9	62.396	A	4.993	4.792	4.792	48.97	0.000	0.000
150.00-140.00					B	4.993	4.792		48.97	0.000	0.000
					C	4.993	4.792		48.97	18.055	0.000
T2	130.00	1.065	8	124.792	A	9.730	9.583	9.583	49.62	18.400	0.000
140.00-120.00					B	9.730	9.583		49.62	14.130	0.000
					C	9.730	9.583		49.62	36.110	0.000
T3	110.00	1.016	8	147.509	A	10.623	15.025	15.025	58.58	18.400	0.000
120.00-100.00					B	10.623	15.025		58.58	37.680	0.000
					C	10.623	15.025		58.58	73.010	0.000
T4	90.00	0.959	8	189.283	A	12.997	18.574	18.574	58.83	18.400	0.000
100.00-80.00					B	12.997	18.574		58.83	37.680	0.000
					C	12.997	18.574		58.83	85.310	0.000
T5 80.00-60.00	70.00	0.892	7	231.055	A	18.030	22.120	22.120	55.09	18.400	0.000
					B	18.030	22.120		55.09	37.680	0.000
					C	18.030	22.120		55.09	85.310	0.000
T6 60.00-40.00	50.00	0.811	6	274.393	A	20.444	28.798	28.798	58.48	18.400	0.000
					B	20.444	28.798		58.48	37.680	0.000
					C	20.444	28.798		58.48	85.310	0.000
T7 40.00-20.00	30.00	0.701	5	314.393	A	19.628	28.798	28.798	59.47	18.400	0.000
					B	19.628	28.798		59.47	37.680	0.000
					C	19.628	28.798		59.47	85.310	0.000
T8 20.00-0.00	10.00	0.7	5	354.393	A	21.673	28.798	28.798	57.06	15.300	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					B	21.673	28.798		57.06	29.760	0.000
					C	21.673	28.798		57.06	68.670	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	151.80	421.53	A	0.157	2.747	26	1	1	7.716	704.05	70.40	C
150.00-140.00			B	0.157	2.747		1	1	7.716			
			C	0.157	2.747		1	1	7.716			
T2	636.60	791.76	A	0.155	2.754	25	1	1	15.174	1768.06	88.40	C
140.00-120.00			B	0.155	2.754		1	1	15.174			
			C	0.155	2.754		1	1	15.174			
T3	1128.40	1140.72	A	0.174	2.686	24	1	1	18.716	2594.66	129.73	C
120.00-100.00			B	0.174	2.686		1	1	18.716			
			C	0.174	2.686		1	1	18.716			
T4	1230.00	1485.02	A	0.167	2.711	23	1	1	22.320	2788.07	139.40	C
100.00-80.00			B	0.167	2.711		1	1	22.320			
			C	0.167	2.711		1	1	22.320			
T5	1230.00	1986.33	A	0.174	2.686	21	1	1	28.506	2881.71	144.09	C
80.00-60.00			B	0.174	2.686		1	1	28.506			
			C	0.174	2.686		1	1	28.506			
T6	1230.00	2680.91	A	0.179	2.666	19	1	1	32.950	2800.50	140.02	C
60.00-40.00			B	0.179	2.666		1	1	32.950			
			C	0.179	2.666		1	1	32.950			
T7	1230.00	3829.48	A	0.154	2.757	16	1	1	31.934	2422.84	121.14	C
40.00-20.00			B	0.154	2.757		1	1	31.934			
			C	0.154	2.757		1	1	31.934			
T8 20.00-0.00	1105.60	3948.61	A	0.142	2.8	16	1	1	33.820	2281.49	114.07	C
			B	0.142	2.8		1	1	33.820			
			C	0.142	2.8		1	1	33.820			
Sum Weight:	7942.40	16284.35						OTM	1305519.06 lb-ft	18241.39		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	151.80	421.53	A	0.157	2.747	26	0.8	1	6.717	643.75	64.38	C
150.00-140.00			B	0.157	2.747		0.8	1	6.717			
			C	0.157	2.747		0.8	1	6.717			
T2	636.60	791.76	A	0.155	2.754	25	0.8	1	13.228	1653.86	82.69	C
140.00-120.00			B	0.155	2.754		0.8	1	13.228			
			C	0.155	2.754		0.8	1	13.228			
T3	1128.40	1140.72	A	0.174	2.686	24	0.8	1	16.592	2478.74	123.94	C
120.00-100.00			B	0.174	2.686		0.8	1	16.592			
			C	0.174	2.686		0.8	1	16.592			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T4	1230.00	1485.02	A	0.167	2.711	23	0.8	1	19.721	2652.90	132.64	C
100.00-80.00			B	0.167	2.711		0.8	1	19.721			
			C	0.167	2.711		0.8	1	19.721			
T5	1230.00	1986.33	A	0.174	2.686	21	0.8	1	24.900	2708.79	135.44	C
80.00-60.00			B	0.174	2.686		0.8	1	24.900			
			C	0.174	2.686		0.8	1	24.900			
T6	1230.00	2680.91	A	0.179	2.666	19	0.8	1	28.861	2623.71	131.19	C
60.00-40.00			B	0.179	2.666		0.8	1	28.861			
			C	0.179	2.666		0.8	1	28.861			
T7	1230.00	3829.48	A	0.154	2.757	16	0.8	1	28.009	2271.17	113.56	C
40.00-20.00			B	0.154	2.757		0.8	1	28.009			
			C	0.154	2.757		0.8	1	28.009			
T8 20.00-0.00	1105.60	3948.61	A	0.142	2.8	16	0.8	1	29.485	2111.56	105.58	C
			B	0.142	2.8		0.8	1	29.485			
			C	0.142	2.8		0.8	1	29.485			
Sum Weight:	7942.40	16284.35						OTM	1229819.6 3 lb-ft	17144.48		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	151.80	421.53	A	0.157	2.747	26	0.85	1	6.967	658.82	65.88	C
150.00-140.00			B	0.157	2.747		0.85	1	6.967			
			C	0.157	2.747		0.85	1	6.967			
T2	636.60	791.76	A	0.155	2.754	25	0.85	1	13.714	1682.41	84.12	C
140.00-120.00			B	0.155	2.754		0.85	1	13.714			
			C	0.155	2.754		0.85	1	13.714			
T3	1128.40	1140.72	A	0.174	2.686	24	0.85	1	17.123	2507.72	125.39	C
120.00-100.00			B	0.174	2.686		0.85	1	17.123			
			C	0.174	2.686		0.85	1	17.123			
T4	1230.00	1485.02	A	0.167	2.711	23	0.85	1	20.371	2686.69	134.33	C
100.00-80.00			B	0.167	2.711		0.85	1	20.371			
			C	0.167	2.711		0.85	1	20.371			
T5	1230.00	1986.33	A	0.174	2.686	21	0.85	1	25.802	2752.02	137.60	C
80.00-60.00			B	0.174	2.686		0.85	1	25.802			
			C	0.174	2.686		0.85	1	25.802			
T6	1230.00	2680.91	A	0.179	2.666	19	0.85	1	29.883	2667.91	133.40	C
60.00-40.00			B	0.179	2.666		0.85	1	29.883			
			C	0.179	2.666		0.85	1	29.883			
T7	1230.00	3829.48	A	0.154	2.757	16	0.85	1	28.990	2309.09	115.45	C
40.00-20.00			B	0.154	2.757		0.85	1	28.990			
			C	0.154	2.757		0.85	1	28.990			
T8 20.00-0.00	1105.60	3948.61	A	0.142	2.8	16	0.85	1	30.569	2154.04	107.70	C
			B	0.142	2.8		0.85	1	30.569			
			C	0.142	2.8		0.85	1	30.569			
Sum Weight:	7942.40	16284.35						OTM	1248744.4 8 lb-ft	17418.71		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	861.76	1673.10	A	0.39	2.083	6	1	1	17.951	356.57	35.66	C
150.00-140.00			B	0.39	2.083		1	1	17.951			
			C	0.39	2.083		1	1	17.951			
T2	3205.96	3115.53	A	0.364	2.139	6	1	1	33.216	937.37	46.87	C
140.00-120.00			B	0.364	2.139		1	1	33.216			
			C	0.364	2.139		1	1	33.216			
T3	5765.84	3797.93	A	0.359	2.152	6	1	1	38.057	1362.99	68.15	C
120.00-100.00			B	0.359	2.152		1	1	38.057			
			C	0.359	2.152		1	1	38.057			
T4	6190.55	4440.73	A	0.307	2.277	5	1	1	41.190	1407.93	70.40	C
100.00-80.00			B	0.307	2.277		1	1	41.190			
			C	0.307	2.277		1	1	41.190			
T5	6067.92	5602.28	A	0.298	2.302	5	1	1	49.350	1384.53	69.23	C
80.00-60.00			B	0.298	2.302		1	1	49.350			
			C	0.298	2.302		1	1	49.350			
T6	5910.22	6731.16	A	0.29	2.324	4	1	1	56.519	1314.94	65.75	C
60.00-40.00			B	0.29	2.324		1	1	56.519			
			C	0.29	2.324		1	1	56.519			
T7	5684.22	7409.58	A	0.235	2.484	4	1	1	51.831	1116.42	55.82	C
40.00-20.00			B	0.235	2.484		1	1	51.831			
			C	0.235	2.484		1	1	51.831			
T8 20.00-0.00	4308.98	7299.43	A	0.211	2.558	4	1	1	52.907	975.65	48.78	C
			B	0.211	2.558		1	1	52.907			
			C	0.211	2.558		1	1	52.907			
Sum Weight:	37995.46	40069.74						OTM	656116.06 lb-ft	8856.40		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	861.76	1673.10	A	0.39	2.083	6	0.8	1	16.952	346.00	34.60	C
150.00-140.00			B	0.39	2.083		0.8	1	16.952			
			C	0.39	2.083		0.8	1	16.952			
T2	3205.96	3115.53	A	0.364	2.139	6	0.8	1	31.270	916.87	45.84	C
140.00-120.00			B	0.364	2.139		0.8	1	31.270			
			C	0.364	2.139		0.8	1	31.270			
T3	5765.84	3797.93	A	0.359	2.152	6	0.8	1	35.932	1341.52	67.08	C
120.00-100.00			B	0.359	2.152		0.8	1	35.932			
			C	0.359	2.152		0.8	1	35.932			
T4	6190.55	4440.73	A	0.307	2.277	5	0.8	1	38.591	1381.69	69.08	C
100.00-80.00			B	0.307	2.277		0.8	1	38.591			
			C	0.307	2.277		0.8	1	38.591			
T5	6067.92	5602.28	A	0.298	2.302	5	0.8	1	45.744	1350.27	67.51	C
80.00-60.00			B	0.298	2.302		0.8	1	45.744			
			C	0.298	2.302		0.8	1	45.744			
T6	5910.22	6731.16	A	0.29	2.324	4	0.8	1	52.430	1279.32	63.97	C
60.00-40.00			B	0.29	2.324		0.8	1	52.430			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.29	2.324		0.8	1	52.430			
T7	5684.22	7409.58	A	0.235	2.484	4	0.8	1	47.905	1084.84	54.24	C
40.00-20.00			B	0.235	2.484		0.8	1	47.905			
			C	0.235	2.484		0.8	1	47.905			
T8 20.00-0.00	4308.98	7299.43	A	0.211	2.558	4	0.8	1	48.573	939.76	46.99	C
			B	0.211	2.558		0.8	1	48.573			
			C	0.211	2.558		0.8	1	48.573			
Sum Weight:	37995.46	40069.74						OTM	641708.87 lb-ft	8640.26		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	861.76	1673.10	A	0.39	2.083	6	0.85	1	17.202	348.64	34.86	C
150.00-140.00			B	0.39	2.083		0.85	1	17.202			
			C	0.39	2.083		0.85	1	17.202			
T2	3205.96	3115.53	A	0.364	2.139	6	0.85	1	31.757	921.99	46.10	C
140.00-120.00			B	0.364	2.139		0.85	1	31.757			
			C	0.364	2.139		0.85	1	31.757			
T3	5765.84	3797.93	A	0.359	2.152	6	0.85	1	36.463	1346.88	67.34	C
120.00-100.00			B	0.359	2.152		0.85	1	36.463			
			C	0.359	2.152		0.85	1	36.463			
T4	6190.55	4440.73	A	0.307	2.277	5	0.85	1	39.240	1388.25	69.41	C
100.00-80.00			B	0.307	2.277		0.85	1	39.240			
			C	0.307	2.277		0.85	1	39.240			
T5	6067.92	5602.28	A	0.298	2.302	5	0.85	1	46.646	1358.83	67.94	C
80.00-60.00			B	0.298	2.302		0.85	1	46.646			
			C	0.298	2.302		0.85	1	46.646			
T6	5910.22	6731.16	A	0.29	2.324	4	0.85	1	53.452	1288.22	64.41	C
60.00-40.00			B	0.29	2.324		0.85	1	53.452			
			C	0.29	2.324		0.85	1	53.452			
T7	5684.22	7409.58	A	0.235	2.484	4	0.85	1	48.886	1092.73	54.64	C
40.00-20.00			B	0.235	2.484		0.85	1	48.886			
			C	0.235	2.484		0.85	1	48.886			
T8 20.00-0.00	4308.98	7299.43	A	0.211	2.558	4	0.85	1	49.656	948.73	47.44	C
			B	0.211	2.558		0.85	1	49.656			
			C	0.211	2.558		0.85	1	49.656			
Sum Weight:	37995.46	40069.74						OTM	645310.66 lb-ft	8694.29		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	151.80	421.53	A	0.157	2.747	9	1	1	7.716	234.34	23.43	C
150.00-140.00			B	0.157	2.747		1	1	7.716			
			C	0.157	2.747		1	1	7.716			
T2	636.60	791.76	A	0.155	2.754	8	1	1	15.174	588.48	29.42	C
140.00-120.00			B	0.155	2.754		1	1	15.174			
			C	0.155	2.754		1	1	15.174			
T3	1128.40	1140.72	A	0.174	2.686	8	1	1	18.716	863.61	43.18	C
120.00-100.00			B	0.174	2.686		1	1	18.716			
			C	0.174	2.686		1	1	18.716			
T4	1230.00	1485.02	A	0.167	2.711	8	1	1	22.320	927.98	46.40	C
100.00-80.00			B	0.167	2.711		1	1	22.320			
			C	0.167	2.711		1	1	22.320			
T5	1230.00	1986.33	A	0.174	2.686	7	1	1	28.506	959.15	47.96	C
80.00-60.00			B	0.174	2.686		1	1	28.506			
			C	0.174	2.686		1	1	28.506			
T6	1230.00	2680.91	A	0.179	2.666	6	1	1	32.950	932.12	46.61	C
60.00-40.00			B	0.179	2.666		1	1	32.950			
			C	0.179	2.666		1	1	32.950			
T7	1230.00	3829.48	A	0.154	2.757	5	1	1	31.934	806.42	40.32	C
40.00-20.00			B	0.154	2.757		1	1	31.934			
			C	0.154	2.757		1	1	31.934			
T8 20.00-0.00	1105.60	3948.61	A	0.142	2.8	5	1	1	33.820	759.37	37.97	C
			B	0.142	2.8		1	1	33.820			
			C	0.142	2.8		1	1	33.820			
Sum Weight:	7942.40	16284.35						OTM	434529.27 lb-ft	6071.47		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	151.80	421.53	A	0.157	2.747	9	0.8	1	6.717	214.27	21.43	C
150.00-140.00			B	0.157	2.747		0.8	1	6.717			
			C	0.157	2.747		0.8	1	6.717			
T2	636.60	791.76	A	0.155	2.754	8	0.8	1	13.228	550.47	27.52	C
140.00-120.00			B	0.155	2.754		0.8	1	13.228			
			C	0.155	2.754		0.8	1	13.228			
T3	1128.40	1140.72	A	0.174	2.686	8	0.8	1	16.592	825.03	41.25	C
120.00-100.00			B	0.174	2.686		0.8	1	16.592			
			C	0.174	2.686		0.8	1	16.592			
T4	1230.00	1485.02	A	0.167	2.711	8	0.8	1	19.721	882.99	44.15	C
100.00-80.00			B	0.167	2.711		0.8	1	19.721			
			C	0.167	2.711		0.8	1	19.721			
T5	1230.00	1986.33	A	0.174	2.686	7	0.8	1	24.900	901.59	45.08	C
80.00-60.00			B	0.174	2.686		0.8	1	24.900			
			C	0.174	2.686		0.8	1	24.900			
T6	1230.00	2680.91	A	0.179	2.666	6	0.8	1	28.861	873.28	43.66	C
60.00-40.00			B	0.179	2.666		0.8	1	28.861			
			C	0.179	2.666		0.8	1	28.861			
T7	1230.00	3829.48	A	0.154	2.757	5	0.8	1	28.009	755.94	37.80	C
40.00-20.00			B	0.154	2.757		0.8	1	28.009			
			C	0.154	2.757		0.8	1	28.009			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T8 20.00-0.00	1105.60	3948.61	A	0.142	2.8	5	0.8	1	29.485	702.81	35.14	C
			B	0.142	2.8		0.8	1	29.485			
			C	0.142	2.8		0.8	1	29.485			
Sum Weight:	7942.40	16284.35						OTM	409333.46 lb-ft	5706.37		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	151.80	421.53	A	0.157	2.747	9	0.85	1	6.967	219.28	21.93	C
150.00-140.00			B	0.157	2.747		0.85	1	6.967			
			C	0.157	2.747		0.85	1	6.967			
T2	636.60	791.76	A	0.155	2.754	8	0.85	1	13.714	559.97	28.00	C
140.00-120.00			B	0.155	2.754		0.85	1	13.714			
			C	0.155	2.754		0.85	1	13.714			
T3	1128.40	1140.72	A	0.174	2.686	8	0.85	1	17.123	834.67	41.73	C
120.00-100.00			B	0.174	2.686		0.85	1	17.123			
			C	0.174	2.686		0.85	1	17.123			
T4	1230.00	1485.02	A	0.167	2.711	8	0.85	1	20.371	894.24	44.71	C
100.00-80.00			B	0.167	2.711		0.85	1	20.371			
			C	0.167	2.711		0.85	1	20.371			
T5	1230.00	1986.33	A	0.174	2.686	7	0.85	1	25.802	915.98	45.80	C
80.00-60.00			B	0.174	2.686		0.85	1	25.802			
			C	0.174	2.686		0.85	1	25.802			
T6	1230.00	2680.91	A	0.179	2.666	6	0.85	1	29.883	887.99	44.40	C
60.00-40.00			B	0.179	2.666		0.85	1	29.883			
			C	0.179	2.666		0.85	1	29.883			
T7	1230.00	3829.48	A	0.154	2.757	5	0.85	1	28.990	768.56	38.43	C
40.00-20.00			B	0.154	2.757		0.85	1	28.990			
			C	0.154	2.757		0.85	1	28.990			
T8 20.00-0.00	1105.60	3948.61	A	0.142	2.8	5	0.85	1	30.569	716.95	35.85	C
			B	0.142	2.8		0.85	1	30.569			
			C	0.142	2.8		0.85	1	30.569			
Sum Weight:	7942.40	16284.35						OTM	415632.41 lb-ft	5797.65		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	10129.62					
Bracing Weight	6154.73					
Total Member Self-Weight	16284.35			9433.22	8944.14	
Total Weight	32102.15			9433.22	8944.14	

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 0 deg - No Ice		81.10	-26928.12	-2438355.63	634.01	-3851.25
Wind 30 deg - No Ice		13076.62	-22648.52	-2065400.95	-1187918.21	-705.29
Wind 60 deg - No Ice		23280.74	-13534.29	-1221657.99	-2104940.34	2670.44
Wind 90 deg - No Ice		26012.78	-81.10	1123.09	-2370386.98	5061.06
Wind 120 deg - No Ice		23199.64	13393.83	1226130.86	-2096630.21	6521.69
Wind 150 deg - No Ice		12936.16	22567.43	2075957.26	-1173524.64	5766.35
Wind 180 deg - No Ice		-81.10	26928.12	2457222.07	17254.26	3851.25
Wind 210 deg - No Ice		-13076.62	22648.52	2084267.39	1205806.48	705.29
Wind 240 deg - No Ice		-23280.74	13534.29	1240524.43	2122828.61	-2670.44
Wind 270 deg - No Ice		-26012.78	81.10	17743.35	2388275.25	-5061.06
Wind 300 deg - No Ice		-23199.64	-13393.83	-1207264.42	2114518.48	-6521.69
Wind 330 deg - No Ice		-12936.16	-22567.43	-2057090.82	1191412.91	-5766.35
Member Ice	23785.39					
Total Weight Ice	113889.79			50264.91	36009.07	
Wind 0 deg - Ice		2.86	-12862.55	-1133836.24	35892.71	-1793.12
Wind 30 deg - Ice		6329.41	-11000.34	-965897.21	-547920.71	-913.81
Wind 60 deg - Ice		11100.39	-6433.75	-541886.44	-984628.36	220.79
Wind 90 deg - Ice		12653.87	-2.86	50148.55	-1131648.95	1251.33
Wind 120 deg - Ice		11097.53	6428.80	642214.72	-984512.00	2013.91
Wind 150 deg - Ice		6324.46	10997.48	1066310.67	-547719.17	2165.14
Wind 180 deg - Ice		-2.86	12862.55	1234366.07	36125.43	1793.12
Wind 210 deg - Ice		-6329.41	11000.34	1066427.03	619938.85	913.81
Wind 240 deg - Ice		-11100.39	6433.75	642416.26	1056646.50	-220.79
Wind 270 deg - Ice		-12653.87	2.86	50381.27	1203667.09	-1251.33
Wind 300 deg - Ice		-11097.53	-6428.80	-541684.90	1056530.14	-2013.91
Wind 330 deg - Ice		-6324.46	-10997.48	-965780.85	619737.31	-2165.14
Total Weight	32102.15			9433.22	8944.14	
Wind 0 deg - Service		26.99	-8962.76	-816056.87	-674.03	-1281.85
Wind 30 deg - Service		4352.43	-7538.34	-691922.54	-396272.03	-234.75
Wind 60 deg - Service		7748.77	-4504.76	-411090.94	-701493.90	888.83
Wind 90 deg - Service		8658.10	-26.99	-4100.19	-789845.22	1684.52
Wind 120 deg - Service		7721.77	4458.01	403631.68	-698727.95	2170.68
Wind 150 deg - Service		4305.67	7511.35	686488.10	-391481.28	1919.27
Wind 180 deg - Service		-26.99	8962.76	813388.37	4857.86	1281.85
Wind 210 deg - Service		-4352.43	7538.34	689254.05	400455.86	234.75
Wind 240 deg - Service		-7748.77	4504.76	408422.44	705677.72	-888.83
Wind 270 deg - Service		-8658.10	26.99	1431.70	794029.04	-1684.52
Wind 300 deg - Service		-7721.77	-4458.01	-406300.18	702911.78	-2170.68
Wind 330 deg - Service		-4305.67	-7511.35	-689156.60	395665.10	-1919.27

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

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

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	265849.54	22882.56	-13057.33
	Max. H_x	18	265849.54	22882.56	-13057.33
	Max. H_z	7	-233662.21	-20865.06	11896.49
	Min. Vert	7	-233662.21	-20865.06	11896.49
	Min. H_x	7	-233662.21	-20865.06	11896.49
	Min. H_z	18	265849.54	22882.56	-13057.33
Leg B	Max. Vert	10	263169.28	-22854.75	-12792.76
	Max. H_x	23	-233078.51	20860.80	11660.65
	Max. H_z	23	-233078.51	20860.80	11660.65
	Min. Vert	23	-233078.51	20860.80	11660.65
	Min. H_x	10	263169.28	-22854.75	-12792.76
	Min. H_z	10	263169.28	-22854.75	-12792.76
Leg A	Max. Vert	2	264320.42	-215.16	26317.27
	Max. H_x	21	8228.61	2749.71	567.64
	Max. H_z	2	264320.42	-215.16	26317.27

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. Vert	15	-235090.83	202.15	-24043.73
	Min. H_x	9	9938.84	-2768.02	725.54
	Min. H_z	15	-235090.83	202.15	-24043.73

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	32102.15	0.00	-0.00	9434.21	8944.45	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	38522.58	129.76	-43084.38	-3920178.36	-2535.38	-6235.01
0.9 Dead+1.6 Wind 0 deg - No Ice	28891.93	129.76	-43084.55	-3919209.95	-5228.65	-6216.29
1.2 Dead+1.6 Wind 30 deg - No Ice	38522.58	20922.25	-36237.10	-3321222.99	-1911587.21	-1166.86
0.9 Dead+1.6 Wind 30 deg - No Ice	28891.93	20922.34	-36237.24	-3320823.00	-1912422.40	-1155.92
1.2 Dead+1.6 Wind 60 deg - No Ice	38522.58	35728.69	-20777.01	-1905220.22	-3279229.45	4270.24
0.9 Dead+1.6 Wind 60 deg - No Ice	28891.93	35728.84	-20777.10	-1906195.65	-3278728.80	4270.91
1.2 Dead+1.6 Wind 90 deg - No Ice	38522.58	41619.81	-129.73	-1973.94	-3810864.39	8132.12
0.9 Dead+1.6 Wind 90 deg - No Ice	28891.93	41619.98	-129.73	-4804.23	-3809850.88	8122.34
1.2 Dead+1.6 Wind 120 deg - No Ice	38522.58	37118.90	21429.81	1965585.65	-3371080.22	10506.17
0.9 Dead+1.6 Wind 120 deg - No Ice	28891.93	37119.04	21429.90	1960847.95	-3370507.33	10488.04
1.2 Dead+1.6 Wind 150 deg - No Ice	38522.58	20697.56	36107.31	3330588.91	-1888458.74	9312.48
0.9 Dead+1.6 Wind 150 deg - No Ice	28891.93	20697.64	36107.46	3324515.55	-1889314.96	9291.73
1.2 Dead+1.6 Wind 180 deg - No Ice	38522.58	-129.75	41329.27	3821385.93	24148.45	6233.56
0.9 Dead+1.6 Wind 180 deg - No Ice	28891.93	-129.75	41329.45	3814830.18	21431.91	6215.39
1.2 Dead+1.6 Wind 210 deg - No Ice	38522.58	-20922.30	36237.07	3343908.16	1933167.15	1166.65
0.9 Dead+1.6 Wind 210 deg - No Ice	28891.93	-20922.38	36237.22	3337823.58	1928593.43	1155.75
1.2 Dead+1.6 Wind 240 deg - No Ice	38522.58	-37248.65	21654.56	1988670.18	3405997.00	-4271.12
0.9 Dead+1.6 Wind 240 deg - No Ice	28891.93	-37248.80	21654.64	1983913.03	3400002.81	-4271.73
1.2 Dead+1.6 Wind 270 deg - No Ice	38522.58	-41619.81	129.78	24708.47	3832426.68	-8132.69
0.9 Dead+1.6 Wind 270 deg - No Ice	28891.93	-41619.98	129.78	21855.53	3826003.60	-8122.94
1.2 Dead+1.6 Wind 300 deg - No Ice	38522.58	-35598.93	-20552.27	-1882092.06	3287462.54	-10503.77
0.9 Dead+1.6 Wind 300 deg - No Ice	28891.93	-35599.08	-20552.36	-1883087.14	3281563.91	-10486.28
1.2 Dead+1.6 Wind 330 deg - No Ice	38522.58	-20697.50	-36107.34	-3307861.75	1910076.80	-9311.65
0.9 Dead+1.6 Wind 330 deg -	28891.93	-20697.59	-36107.49	-3307473.18	1905522.45	-9290.90

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
No Ice						
1.2 Dead+1.0 Ice+1.0 Temp	120310.22	0.04	-0.02	52457.35	38345.32	0.26
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	120310.22	2.90	-12861.68	-1148655.31	38355.04	-1872.42
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	120310.22	6329.00	-10999.58	-978313.31	-553930.85	-955.38
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	120310.22	10912.47	-6325.25	-540846.38	-984329.30	227.22
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	120310.22	12653.01	-2.87	52479.26	-1146132.93	1304.07
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	120310.22	11096.80	6428.33	653122.48	-996832.58	2099.79
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	120310.22	6324.06	10996.67	1083389.66	-553730.28	2259.39
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	120310.22	-2.82	12645.48	1239277.79	38585.98	1871.49
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	120310.22	-6328.93	10999.54	1083504.74	630869.72	955.27
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	120310.22	-11099.57	6433.28	653323.40	1073884.97	-227.42
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	120310.22	-12652.93	2.85	52713.90	1223068.47	-1304.06
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	120310.22	-10909.52	-6320.30	-540640.83	1061150.90	-2098.76
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	120310.22	-6323.96	-10996.72	-978193.64	630670.47	-2259.40
Dead+Wind 0 deg - Service	32102.15	26.99	-8962.65	-807896.25	6205.26	-1294.58
Dead+Wind 30 deg - Service	32102.15	4352.37	-7538.24	-683372.12	-390673.94	-244.98
Dead+Wind 60 deg - Service	32102.15	7432.49	-4322.15	-388992.80	-674997.78	888.40
Dead+Wind 90 deg - Service	32102.15	8657.99	-26.99	6680.62	-785523.39	1694.19
Dead+Wind 120 deg - Service	32102.15	7721.68	4457.95	415726.44	-694100.30	2183.11
Dead+Wind 150 deg - Service	32102.15	4305.62	7511.25	699504.47	-385869.24	1930.92
Dead+Wind 180 deg - Service	32102.15	-26.99	8597.55	801540.39	11753.15	1294.16
Dead+Wind 210 deg - Service	32102.15	-4352.37	7538.24	702277.34	408631.91	244.77
Dead+Wind 240 deg - Service	32102.15	-7748.67	4504.70	420529.78	714831.21	-888.56
Dead+Wind 270 deg - Service	32102.15	-8657.99	26.99	12228.15	803479.82	-1694.14
Dead+Wind 300 deg - Service	32102.15	-7405.49	-4275.40	-384187.74	690180.69	-2182.60
Dead+Wind 330 deg - Service	32102.15	-4305.61	-7511.25	-680597.40	403827.92	-1930.89

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	-32102.15	-0.00	-0.00	32102.15	0.00	0.000%
2	129.76	-38522.58	-43085.00	-129.76	38522.58	43084.38	0.001%
3	129.76	-28891.94	-43085.00	-129.76	28891.93	43084.55	0.001%
4	20922.60	-38522.58	-36237.64	-20922.25	38522.58	36237.10	0.001%
5	20922.60	-28891.94	-36237.64	-20922.34	28891.93	36237.24	0.001%
6	35729.26	-38522.58	-20777.34	-35728.69	38522.58	20777.01	0.001%
7	35729.26	-28891.94	-20777.34	-35728.84	28891.93	20777.10	0.001%
8	41620.45	-38522.58	-129.76	-41619.81	38522.58	129.73	0.001%
9	41620.45	-28891.94	-129.76	-41619.98	28891.93	129.73	0.001%
10	37119.43	-38522.58	21430.13	-37118.90	38522.58	-21429.81	0.001%
11	37119.43	-28891.94	21430.13	-37119.04	28891.93	-21429.90	0.001%
12	20697.85	-38522.58	36107.88	-20697.56	38522.58	-36107.31	0.001%
13	20697.85	-28891.94	36107.88	-20697.64	28891.93	-36107.46	0.001%
14	-129.76	-38522.58	41329.94	129.75	38522.58	-41329.27	0.001%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
15	-129.76	-28891.94	41329.94	129.75	28891.93	-41329.45	0.001%
16	-20922.60	-38522.58	36237.64	20922.30	38522.58	-36237.07	0.001%
17	-20922.60	-28891.94	36237.64	20922.38	28891.93	-36237.22	0.001%
18	-37249.18	-38522.58	21654.87	37248.65	38522.58	-21654.56	0.001%
19	-37249.18	-28891.94	21654.87	37248.80	28891.93	-21654.64	0.001%
20	-41620.45	-38522.58	129.76	41619.81	38522.58	-129.78	0.001%
21	-41620.45	-28891.94	129.76	41619.98	28891.93	-129.78	0.001%
22	-35599.50	-38522.58	-20552.60	35598.93	38522.58	20552.27	0.001%
23	-35599.50	-28891.94	-20552.60	35599.08	28891.93	20552.36	0.001%
24	-20697.85	-38522.58	-36107.88	20697.50	38522.58	36107.34	0.001%
25	-20697.85	-28891.94	-36107.88	20697.59	28891.93	36107.49	0.001%
26	0.00	-120310.22	-0.00	-0.04	120310.22	0.02	0.000%
27	2.86	-120310.22	-12862.55	-2.90	120310.22	12861.68	0.001%
28	6329.41	-120310.22	-11000.34	-6329.00	120310.22	10999.58	0.001%
29	10913.20	-120310.22	-6325.68	-10912.47	120310.22	6325.25	0.001%
30	12653.87	-120310.22	-2.86	-12653.01	120310.22	2.87	0.001%
31	11097.53	-120310.22	6428.80	-11096.80	120310.22	-6428.33	0.001%
32	6324.46	-120310.22	10997.48	-6324.06	120310.22	-10996.67	0.001%
33	-2.86	-120310.22	12646.41	2.82	120310.22	-12645.48	0.001%
34	-6329.41	-120310.22	11000.34	6328.93	120310.22	-10999.54	0.001%
35	-11100.39	-120310.22	6433.75	11099.57	120310.22	-6433.28	0.001%
36	-12653.87	-120310.22	2.86	12652.93	120310.22	-2.85	0.001%
37	-10910.34	-120310.22	-6320.73	10909.52	120310.22	6320.30	0.001%
38	-6324.46	-120310.22	-10997.48	6323.96	120310.22	10996.72	0.001%
39	26.99	-32102.15	-8962.76	-26.99	32102.15	8962.65	0.000%
40	4352.43	-32102.15	-7538.34	-4352.37	32102.15	7538.24	0.000%
41	7432.58	-32102.15	-4322.21	-7432.49	32102.15	4322.15	0.000%
42	8658.10	-32102.15	-26.99	-8657.99	32102.15	26.99	0.000%
43	7721.77	-32102.15	4458.01	-7721.68	32102.15	-4457.95	0.000%
44	4305.67	-32102.15	7511.35	-4305.62	32102.15	-7511.25	0.000%
45	-26.99	-32102.15	8597.67	26.99	32102.15	-8597.55	0.000%
46	-4352.43	-32102.15	7538.34	4352.37	32102.15	-7538.24	0.000%
47	-7748.77	-32102.15	4504.76	7748.67	32102.15	-4504.70	0.000%
48	-8658.10	-32102.15	26.99	8657.99	32102.15	-26.99	0.000%
49	-7405.59	-32102.15	-4275.46	7405.49	32102.15	4275.40	0.000%
50	-4305.67	-32102.15	-7511.35	4305.61	32102.15	7511.25	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00012328
3	Yes	4	0.00000001	0.00008934
4	Yes	4	0.00000001	0.00012721
5	Yes	4	0.00000001	0.00009314
6	Yes	4	0.00000001	0.00013087
7	Yes	4	0.00000001	0.00009667
8	Yes	4	0.00000001	0.00012733
9	Yes	4	0.00000001	0.00009328
10	Yes	4	0.00000001	0.00012328
11	Yes	4	0.00000001	0.00008939
12	Yes	4	0.00000001	0.00012740
13	Yes	4	0.00000001	0.00009332
14	Yes	4	0.00000001	0.00013090
15	Yes	4	0.00000001	0.00009670

16	Yes	4	0.00000001	0.00012711
17	Yes	4	0.00000001	0.00009308
18	Yes	4	0.00000001	0.00012307
19	Yes	4	0.00000001	0.00008919
20	Yes	4	0.00000001	0.00012728
21	Yes	4	0.00000001	0.00009320
22	Yes	4	0.00000001	0.00013109
23	Yes	4	0.00000001	0.00009681
24	Yes	4	0.00000001	0.00012745
25	Yes	4	0.00000001	0.00009330
26	Yes	4	0.00000001	0.00003542
27	Yes	4	0.00000001	0.00047384
28	Yes	4	0.00000001	0.00046857
29	Yes	4	0.00000001	0.00046542
30	Yes	4	0.00000001	0.00046360
31	Yes	4	0.00000001	0.00046605
32	Yes	4	0.00000001	0.00047133
33	Yes	4	0.00000001	0.00047732
34	Yes	4	0.00000001	0.00048038
35	Yes	4	0.00000001	0.00048241
36	Yes	4	0.00000001	0.00048352
37	Yes	4	0.00000001	0.00048331
38	Yes	4	0.00000001	0.00047922
39	Yes	4	0.00000001	0.00010294
40	Yes	4	0.00000001	0.00010350
41	Yes	4	0.00000001	0.00010405
42	Yes	4	0.00000001	0.00010322
43	Yes	4	0.00000001	0.00010244
44	Yes	4	0.00000001	0.00010336
45	Yes	4	0.00000001	0.00010416
46	Yes	4	0.00000001	0.00010351
47	Yes	4	0.00000001	0.00010284
48	Yes	4	0.00000001	0.00010381
49	Yes	4	0.00000001	0.00010467
50	Yes	4	0.00000001	0.00010394

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 140	3.107	47	0.2020	0.0130
T2	140 - 120	2.662	47	0.1997	0.0125
T3	120 - 100	1.831	47	0.1658	0.0108
T4	100 - 80	1.172	47	0.1249	0.0077
T5	80 - 60	0.695	47	0.0859	0.0055
T6	60 - 40	0.376	47	0.0529	0.0038
T7	40 - 20	0.171	47	0.0304	0.0021
T8	20 - 0	0.054	47	0.0152	0.0010

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	Nudd 12' boom	47	3.107	0.2020	0.0130	183994

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	Nudd 12' boom	47	2.662	0.1997	0.0125	89159
127.50	Nudd 12' boom	47	2.127	0.1814	0.0116	33234
122.28	RFS DB-T1-6Z-8AB-0Z	47	1.918	0.1706	0.0111	26377
117.07	RFS DB-T1-6Z-8AB-0Z	47	1.722	0.1596	0.0105	24380
115.00	Nudd 10' boom	47	1.648	0.1553	0.0101	24552
111.85	RFS DB-T1-6Z-8AB-0Z	47	1.539	0.1489	0.0096	24913
106.64	RFS DB-T1-6Z-8AB-0Z	47	1.369	0.1383	0.0088	25537
101.42	RFS DB-T1-6Z-8AB-0Z	47	1.212	0.1278	0.0079	26191
96.20	RFS DB-T1-6Z-8AB-0Z	47	1.068	0.1174	0.0072	26871
90.99	RFS DB-T1-6Z-8AB-0Z	47	0.935	0.1070	0.0066	27581
85.77	RFS DB-T1-6Z-8AB-0Z	47	0.815	0.0968	0.0061	28330
80.56	RFS DB-T1-6Z-8AB-0Z	47	0.706	0.0869	0.0056	29322
75.34	RFS DB-T1-6Z-8AB-0Z	47	0.608	0.0774	0.0051	31742
70.13	RFS DB-T1-6Z-8AB-0Z	47	0.520	0.0685	0.0047	35155
64.91	RFS DB-T1-6Z-8AB-0Z	47	0.442	0.0601	0.0042	39391
59.69	RFS DB-T1-6Z-8AB-0Z	47	0.372	0.0525	0.0038	44056
54.48	RFS DB-T1-6Z-8AB-0Z	47	0.309	0.0456	0.0033	46897
49.26	RFS DB-T1-6Z-8AB-0Z	47	0.254	0.0395	0.0028	49494
44.05	RFS DB-T1-6Z-8AB-0Z	47	0.205	0.0341	0.0024	52394
38.83	RFS DB-T1-6Z-8AB-0Z	47	0.162	0.0294	0.0020	55406
33.61	RFS DB-T1-6Z-8AB-0Z	47	0.125	0.0251	0.0017	58191
28.40	RFS DB-T1-6Z-8AB-0Z	47	0.094	0.0212	0.0014	61196
23.18	RFS DB-T1-6Z-8AB-0Z	47	0.068	0.0175	0.0011	64627
17.97	RFS DB-T1-6Z-8AB-0Z	47	0.047	0.0137	0.0009	74872
12.75	RFS DB-T1-6Z-8AB-0Z	47	0.030	0.0098	0.0007	104701

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 140	14.768	18	0.9580	0.0626
T2	140 - 120	12.655	18	0.9469	0.0600
T3	120 - 100	8.708	18	0.7859	0.0523
T4	100 - 80	5.579	18	0.5929	0.0372
T5	80 - 60	3.312	18	0.4078	0.0266
T6	60 - 40	1.794	18	0.2511	0.0182
T7	40 - 20	0.817	18	0.1443	0.0099
T8	20 - 0	0.260	18	0.0723	0.0048

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	Nudd 12' boom	18	14.768	0.9580	0.0626	39433
140.00	Nudd 12' boom	18	12.655	0.9469	0.0600	19005
127.50	Nudd 12' boom	18	10.115	0.8601	0.0560	7014
122.28	RFS DB-T1-6Z-8AB-0Z	18	9.124	0.8089	0.0536	5562
117.07	RFS DB-T1-6Z-8AB-0Z	18	8.192	0.7567	0.0504	5141
115.00	Nudd 10' boom	18	7.841	0.7364	0.0489	5179
111.85	RFS DB-T1-6Z-8AB-0Z	18	7.324	0.7058	0.0465	5258

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
106.64	RFS DB-T1-6Z-8AB-0Z	18	6.518	0.6558	0.0424	5394
101.42	RFS DB-T1-6Z-8AB-0Z	18	5.772	0.6063	0.0383	5537
96.20	RFS DB-T1-6Z-8AB-0Z	18	5.085	0.5569	0.0346	5678
90.99	RFS DB-T1-6Z-8AB-0Z	18	4.456	0.5078	0.0318	5820
85.77	RFS DB-T1-6Z-8AB-0Z	18	3.882	0.4596	0.0292	5970
80.56	RFS DB-T1-6Z-8AB-0Z	18	3.364	0.4127	0.0268	6171
75.34	RFS DB-T1-6Z-8AB-0Z	18	2.898	0.3676	0.0246	6681
70.13	RFS DB-T1-6Z-8AB-0Z	18	2.481	0.3250	0.0225	7405
64.91	RFS DB-T1-6Z-8AB-0Z	18	2.109	0.2854	0.0203	8305
59.69	RFS DB-T1-6Z-8AB-0Z	18	1.775	0.2491	0.0181	9294
54.48	RFS DB-T1-6Z-8AB-0Z	18	1.477	0.2166	0.0158	9883
49.26	RFS DB-T1-6Z-8AB-0Z	18	1.212	0.1877	0.0135	10413
44.05	RFS DB-T1-6Z-8AB-0Z	18	0.978	0.1621	0.0114	11004
38.83	RFS DB-T1-6Z-8AB-0Z	18	0.774	0.1394	0.0095	11626
33.61	RFS DB-T1-6Z-8AB-0Z	18	0.597	0.1193	0.0080	12226
28.40	RFS DB-T1-6Z-8AB-0Z	18	0.448	0.1009	0.0067	12880
23.18	RFS DB-T1-6Z-8AB-0Z	18	0.324	0.0831	0.0055	13628
17.97	RFS DB-T1-6Z-8AB-0Z	18	0.224	0.0653	0.0044	15807
12.75	RFS DB-T1-6Z-8AB-0Z	18	0.144	0.0468	0.0032	22106

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	150	Leg	A325N	0.7500	4	1558.65	29820.60	0.052 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	2011.90	7952.16	0.253 ✔	1	Bolt Shear
T2	140	Leg	A325N	1.0000	4	10639.90	53014.40	0.201 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	6377.56	9787.50	0.652 ✔	1	Member Bearing
T3	120	Leg	A325N	1.0000	6	14074.90	53014.40	0.265 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	6440.01	9787.50	0.658 ✔	1	Member Bearing
T4	100	Leg	A325N	1.0000	8	15134.10	53014.40	0.285 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	6923.71	9787.50	0.707 ✔	1	Member Bearing
T5	80	Leg	A325N	1.2500	8	19154.90	82835.00	0.231 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	6982.15	9787.50	0.713 ✔	1	Member Bearing
T6	60	Leg	A325N	1.2500	8	22879.80	82835.00	0.276 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	7552.42	9787.50	0.772 ✔	1	Member Bearing
T7	40	Leg	A325N	1.2500	8	26315.20	82835.00	0.318 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	8356.28	14355.00	0.582 ✔	1	Member Bearing
T8	20	Leg	F1554-36	1.5000	8	29515.50	57653.10	0.512 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	8774.07	14355.00	0.611 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	P2.5x.203	10.00	0.67	8.4 K=1.00	1.7040	-7889.51	82351.90	0.096 [1] ✔
T2	140 - 120	P2.5x.203	20.00	4.67	59.1 K=1.00	1.7040	-42028.60	62849.30	0.669 [1] ✔
T3	120 - 100	P4x.237	20.03	4.67	37.2 K=1.00	3.1741	-89005.80	138323.00	0.643 [1] ✔
T4	100 - 80	P5x.258	20.03	6.26	40.0 K=1.00	4.2999	-134448.00	184163.00	0.730 [1] ✔
T5	80 - 60	P6x.28	20.03	6.26	33.5 K=1.00	5.5813	-170049.00	248307.00	0.685 [1] ✔
T6	60 - 40	P8x.322	20.03	6.26	25.6 K=1.00	8.3993	-203916.00	387660.00	0.526 [1] ✔
T7	40 - 20	P8x.5	20.03	9.35	39.0 K=1.00	12.7627	-228009.00	550137.00	0.414 [1] ✔
T8	20 - 0	P8x.5	20.03	9.35	39.0 K=1.00	12.7627	-258457.00	550137.00	0.470 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	L1 1/2x1 1/2x3/16	7.40	3.42	139.8 K=1.00	0.5273	-1932.43	6096.07	0.317 [1] ✔
T2	140 - 120	L2x2x3/16	7.60	3.51	110.3 K=1.03	0.7150	-6326.97	12215.70	0.518 [1] ✔
T3	120 - 100	L2x2x3/16	9.00	4.28	130.5 K=1.00	0.7150	-6395.94	9453.47	0.677 [1] ✔
T4	100 - 80	L2 1/2x2 1/2x3/16	11.48	5.51	133.7 K=1.00	0.9020	-6752.53	11410.90	0.592 [1] ✔
T5	80 - 60	L3x3x3/16	13.20	6.33	127.4 K=1.00	1.0900	-7017.50	14941.00	0.470 [1] ✔
T6	60 - 40	L3x3x3/16	14.99	7.14	143.7 K=1.00	1.0900	-7662.42	11926.10	0.642 [1] ✔
T7	40 - 20	L3 1/2x3 1/2x1/4	18.07	8.74	151.1 K=1.00	1.6900	-8466.51	16715.90	0.506 [1] ✔
T8	20 - 0	L3 1/2x3 1/2x1/4	19.81	9.61	166.2 K=1.00	1.6900	-8945.58	13815.30	0.648 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	L3x3x1/4	6.00	5.76	118.4 K=1.01	1.4400	-563.23	22309.60	0.025 [1] ✔

[1] $P_u / \phi P_n$ controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	P2.5x.203	10.00	0.67	8.4	1.7040	6234.59	82816.80	0.075 [1] ✔
T2	140 - 120	P2.5x.203	20.00	0.67	8.4	1.7040	42559.60	82816.80	0.514 [1] ✔
T3	120 - 100	P4x.237	20.03	0.67	5.3	3.1741	84449.70	154259.00	0.547 [1] ✔
T4	100 - 80	P5x.258	20.03	0.63	4.0	4.2999	121073.00	208974.00	0.579 [1] ✔
T5	80 - 60	P6x.28	20.03	0.63	3.3	5.5813	153239.00	271254.00	0.565 [1] ✔
T6	60 - 40	P8x.322	20.03	0.63	2.6	8.3993	183039.00	408204.00	0.448 [1] ✔
T7	40 - 20	P8x.5	20.03	0.67	2.8	12.7627	210522.00	620268.00	0.339 [1] ✔
T8	20 - 0	P8x.5	20.03	0.67	2.8	12.7627	236124.00	620268.00	0.381 [1] ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	L1 1/2x1 1/2x3/16	7.40	3.42	93.4	0.3076	2011.90	13381.30	0.150 [1] ✔
T2	140 - 120	L2x2x3/16	7.60	3.51	71.0	0.4308	6377.56	18739.00	0.340 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T3	120 - 100	L2x2x3/16	9.00	4.28	86.0	0.4308	6440.01	18739.00	0.344 [1] ✔
T4	100 - 80	L2 1/2x2 1/2x3/16	10.45	5.01	79.3	0.5710	6923.71	24839.90	0.279 [1] ✔
T5	80 - 60	L3x3x3/16	12.11	5.79	75.7	0.7120	6982.15	30973.40	0.225 [1] ✔
T6	60 - 40	L3x3x3/16	14.99	7.14	92.9	0.7120	7552.42	30973.40	0.244 [1] ✔
T7	40 - 20	L3 1/2x3 1/2x1/4	18.07	8.74	97.8	1.1034	8356.28	47999.50	0.174 [1] ✔
T8	20 - 0	L3 1/2x3 1/2x1/4	19.81	9.61	107.4	1.1034	8774.07	47999.50	0.183 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 140	L3x3x1/4	6.00	5.76	74.3	1.4400	532.64	46656.00	0.011 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	150 - 140	Leg	P2.5x.203	1	-7889.51	82351.90	9.6	Pass
		Diagonal	L1 1/2x1 1/2x3/16	8	-1932.43	6096.07	31.7	Pass
		Top Girt	L3x3x1/4	4	-563.23	22309.60	2.5	Pass
T2	140 - 120	Leg	P2.5x.203	19	-42028.60	62849.30	66.9	Pass
		Diagonal	L2x2x3/16	23	-6326.97	12215.70	51.8	Pass
							65.2 (b)	
T3	120 - 100	Leg	P4x.237	46	-89005.80	138323.00	64.3	Pass
		Diagonal	L2x2x3/16	53	-6395.94	9453.47	67.7	Pass
T4	100 - 80	Leg	P5x.258	73	-134448.00	184163.00	73.0	Pass
		Diagonal	L2 1/2x2 1/2x3/16	80	-6752.53	11410.90	59.2	Pass
							70.7 (b)	
T5	80 - 60	Leg	P6x.28	94	-170049.00	248307.00	68.5	Pass
		Diagonal	L3x3x3/16	98	-7017.50	14941.00	47.0	Pass
							71.3 (b)	
T6	60 - 40	Leg	P8x.322	115	-203916.00	387660.00	52.6	Pass
		Diagonal	L3x3x3/16	119	-7662.42	11926.10	64.2	Pass
							77.2 (b)	
T7	40 - 20	Leg	P8x.5	136	-228009.00	550137.00	41.4	Pass
		Diagonal	L3 1/2x3 1/2x1/4	140	-8466.51	16715.90	50.6	Pass
							58.2 (b)	

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T8	20 - 0	Leg	P8x.5	151	-258457.00	550137.00	47.0	Pass
							51.2 (b)	
		Diagonal	L3 1/2x3 1/2x1/4	155	-8945.58	13815.30	64.8	Pass
							Summary	
							Leg (T4) 73.0	Pass
							Diagonal (T6) 77.2	Pass
							Top Girt (T1) 2.5	Pass
							Bolt Checks 77.2	Pass
							RATING = 77.2	**Pass**

Site Name:	**Norwich, CT**
Client:	**CDT**
Project Number:	**118-23067**
Date:	**6/11/2018**

Design Base Loads (Factored) - Design per TIA-222-G Standard

Moment (Overturning) (M_u):	0.0	k-ft
Shear/Leg (V_u):	26.3	k
Compression/Leg (P_u):	265.9	k
Uplift/Leg (T_u):	235.1	k

Diameter of Caisson (d):	3.5	ft
Length of Caisson (l):	4.3	ft
Caisson Height Above Ground (h):	0.5	ft
Depth Below Ground Surface to Water Table (w):	100.0	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil:	135.0	pcf
Unit Weight of Water:	62.4	pcf
Ultimate Compressive Bearing Pressure:	60000	psf
Pullout Angle:	30.0	degrees
Rod Diameter:	1.00	in
Rod Ultimate Strength:	150	ksi
Rod Net Area:	0.85	in^2
Number of Rods:	5	
Diameter of Cored Hole:	3.00	in
Ultimate Grout / Rock Interface Bond Strength:	250	psi
Rod Embedment Length:	228	in
Rod Exposure Above Lock Off Nut in Foundation:	60	in
Rod Embedment Circle:	26	in
Free Stress Length:	150	in
Volume of Concrete:	41.7	ft^3
Weight of Concrete (Buoyancy Effect Considered):	6.3	k
Compressive Bearing Resistance:	577.3	k
Pullout Weight:	711.9	k
Rod Bond Strength:	918.9	k
Williams Rod Strength:	637.5	k
Maximum Lock Off Load:	95.6	k > Design Lock Off Load, OK
Nominal Uplift Capacity per Leg ($\phi_s T_n$):	478.1	k
Nominal Compressive Capacity per Leg ($\phi_s P_n$):	433.0	k
T_u:	235.1	k
P_u:	266.5	k
$T_u/\phi_s T_n$:	0.49	Result: OK
$P_u/\phi_s P_n$:	0.62	Result: OK

Lateral Capacity

Depth (ft) Top	Depth (ft) Bottom	Ultimate Lateral Bearing Pressure (psf)	Increment (psf/ft)	γ_{Soil} (pcf)	Cohesion (psf)	ϕ (degree)
0.0	0.5	0.0	100.0	100	0	0
0.5	1.0	47.9	100.0	100	0	0
1.0	1.5	100.0	100.0	100	0	0
1.5	2.5	41636.6	567.5	135	10000	38
2.5	3.0	42204.1	567.5	135	10000	38
3.0	3.5	42274.6	567.5	135	10000	38
3.5	3.9	42327.6	567.5	135	10000	38
3.9	3.8	42389.4	567.5	135	10000	38

Total Lateral Resistance:	461.1	k
Inflection Point (Below Ground Surface):	3.8	ft
Design Overturning Moment At Inflection Point (M_{uip}):	114.2	k-ft
Nominal Moment Capacity per Leg ($\phi_s M_n$):	310.4	k-ft
$M_{uip}/\phi_s M_n$:	0.37	Result: OK

Caisson Strength Capacity

Concrete Compressive Strength (f'_c):	3000	psi
Vertical Steel Rebar Size #:	6	
Vertical Steel Rebar Area:	0.44	in^2
# of Vertical Steel Rebars:	23	Minimum # of vertical rebar met
Vertical Steel Rebar Yield Strength (F_y):	60	ksi
Horizontal Tie / Stirrup Size #:	4	
Horizontal Tie / Stirrup Area:	0.20	in^2
Horizontal Tie / Stirrup Spacing:	12.0	in
Horizontal Tie / Stirrup Steel Yield Strength (F_y):	40	ksi
Rebar Cage Diameter:	34.0	in
Strength Bending/Tension Reduction Factor (ϕ_B):	0.90	ACI318-05 - 9.3.2.1
Strength Shear Reduction Factor (ϕ_V):	0.75	ACI318-05 - 9.3.2.3
Strength Compression/Bearing Reduction Factor ($\phi_{P/B}$):	0.65	ACI318-05 - 9.3.2.2
Steel Elastic Modulus:	29000	ksi
Design Moment (M_u):	114.2	k-ft
Nominal Moment Capacity ($\phi_B M_n$):	692.9	k-ft - ACI318-005 - 10.2
$M_u/\phi_B M_n$:	0.16	Result: OK
Design Shear (V_u):	26.3	k
Nominal Shear Capacity ($\phi_V V_n$):	158.6	k - ACI318-05 - 11.3.1.1 or 11.5.7.2
$V_u/\phi_V V_n$:	0.17	Result: OK
Design Tension (T_u):	235.1	k
Nominal Tension Capacity ($\phi_T T_n$):	546.5	k - ACI318-05 - 10.2
$T_u/\phi_T T_n$:	0.43	Result: OK
Design Compression (P_u):	265.9	k
Nominal Compression Capacity ($\phi_P P_n$):	2145.5	k - ACI318-05 - 10.3.6.2
$P_u/\phi_P P_n$:	0.12	Result: OK
Bending Reinforcement Ratio:	0.007	Reinforcement Ratio is Satisfactory - ACI318-05 - 10.8.4 & 10.9.1

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: CT11254B

CDT Norwich
Hinckley Hill Road
Norwich, CT 06360

July 13, 2018

EBI Project Number: 6218005052

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**15.18 %**

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

EBI Consulting
environmental | engineering | due diligence

July 13, 2018

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

Emissions Analysis for Site: **CT11254B – CDT Norwich**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **Hincley Hill Road, Norwich, 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 population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz Band are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) 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 **Hinckley Hill Road, Norwich, 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 for directional panel antennas, 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 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.

4) 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.

5) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These channels have a transmit power of 30 Watts.

6) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These channels have 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 for directional panel antennas, 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 B66A/B2A** & **RFS APXVAARR24_43-U-NA20** for 1900 MHz (PCS), 2100 MHz (AWS), 600 MHz and 700 MHz channels. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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 **150 feet** above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	150	Height (AGL):	150	Height (AGL):	150
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%	**1.62**	Antenna B1 MPE%	**1.62**	Antenna C1 MPE%	**1.62**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	15.65 / 12.95 / 13.35 dBd	Gain:	15.65 / 12.95 / 13.35 dBd	Gain:	15.65 / 12.95 / 13.35 dBd
Height (AGL):	150	Height (AGL):	150	Height (AGL):	150
Frequency Bands	1900 MHz (PCS) / 600 MHz / 700 MHz	Frequency Bands	1900 MHz (PCS) / 600 MHz / 700 MHz	Frequency Bands	1900 MHz (PCS) / 600 MHz / 700 MHz
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	6,888.47	ERP (W):	6,888.47	ERP (W):	6,888.47
Antenna A2 MPE%	**1.76**	Antenna B2 MPE%	**1.76**	Antenna C2 MPE%	**1.76**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**3.38 %**
Sprint	0.28%
Verizon Wireless	3.41%
AT&T	7.73%
TSR Paging	0.20%
Aquis Paging	0.18%
Site Total MPE %:	**15.18 %**

T-Mobile Sector A Total:	3.38 %
T-Mobile Sector B Total:	3.38 %
T-Mobile Sector C Total:	3.38 %
Site Total:	15.18 %

T-Mobile Max Power Values (Per Sector)

T-Mobile _Max Power Values (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	150	8.09	AWS - 2100 MHz	1000	0.81%
T-Mobile PCS - 1900 MHz LTE	2	2,334.27	150	8.09	PCS - 1900 MHz	1000	0.81%
T-Mobile PCS - 1900 MHz UMTS	2	1,101.85	150	3.82	PCS - 1900 MHz	1000	0.38%
T-Mobile PCS - 1900 MHz GSM	2	1,101.85	150	3.82	PCS - 1900 MHz	1000	0.38%
T-Mobile 600 MHz LTE	2	591.73	150	2.05	600 MHz	1000	0.52%
T-Mobile 700 MHz LTE	2	648.82	150	2.25	700 MHz	467	0.48%
						Total:	**3.38%**

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	3.38 %
Sector B:	3.38 %
Sector C:	3.38 %
T-Mobile Per Sector Maximum (Per Sector):	3.38 %
Site Total:	15.18 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **15.18%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Exhibit F

POLAR POWER INC.

T · ·Mobile

CUTOVER APU/BATTERY REPLACEMENT PROGRAM 15 KW DC PART NUMBER 8220-801-D-15-05

All APUs include:

- 12 V starter battery
- 54 gal. UL142 rated double walled diesel tank with fuel level sensor
- Ethernet module with SNMP
- Powder coated aluminum enclosure
- V-belt driven radiator fan
- 5 Year Warranty

Options available:

- Transitional supercap energy storage bank
- Electric radiator fans
- Level 2 sound enclosure
- 8-alarm relay board
- Oil refining kit

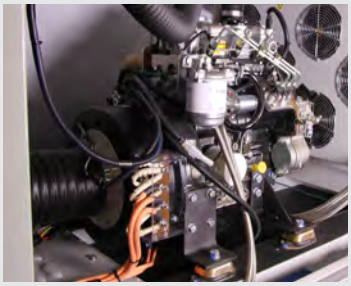
Made in USA

Founded in 1979 Polar Power specialized in solar photovoltaic systems, solar air conditioning and refrigeration. We developed and provided photovoltaic charging controls for telecommunications in the 1980s along with DC generators for the military. In 1994 we were first to provide DC generators with remote control and monitoring to the telecommunications industry.

Polar's success is based on engineering generators to meet the very specific needs of each application. Telecom site optimization is best met with the DC generator technology as the loads and batteries are DC. It makes no sense to install an AC generator and convert the output to DC. The AC generators are designed for a wide range of applications and they are not specifically produced for telecom applications so there are issues with reliability, space, and fuel efficiency.

Polar can save you considerable time and cost in permitting, installing, purchasing, and maintaining a backup generator. We reduce CAPEX and OPEX costs while improving backup reliability.

DC Generator



Easy Service wiring harness

H - 74”

Supra controller

Optional transition supercap energy storage

W - 68”

L - 34”

UL 142 rated 54 gallon fuel tank

LOW MAINTENANCE.

LOW ACOUSTIC NOISE. <66 dBA @ 7 meters for diesel, and low vibration so as not to disturb the local residents or building landlords.

CORROSION RESISTANT. All-aluminum enclosure with stainless hardware for low maintenance, and long service life.

FUEL EFFICIENT. Up to 85% fuel savings due to smaller engine displacement, high efficiency alternator, and variable speed operation.

RODENT RESISTANT. Small animals can quickly destroy a generator set by gnawing on wires, fuel lines, radiator hoses, etc. Cooling air inlets and outlets have perforated aluminum screens to keep small rodents and large insects out. Stainless steel wire braid is placed over fuel and radiator lines to prevent damage.

LONG LIFE. Controls and wire harnesses are designed to exceed a 20 year life. Higher grade, longer life electrical wire (UL 3173), weather tight connectors, gold plated connector pins on signal circuits. No transfer switches are required.

ADVANCED MONITORING. Remote diagnostics, control, and monitoring. Ethernet and RS232 standard, with SNMP.

SPECIFICATIONS PN 8220-801-D-15-05

Engine

Engine Model	Perkins 403F-11
Cylinders	3 In-line
Displacement (L)	1.1
Bore (in./mm)	3/77
Stroke (in./mm)	3.2/81
Intake Air System	Naturally Aspirated
Engine HP	18
Emissions	U.S. EPA Tier 4 Interim
Emissions Compliance	EPA and CARB Certified
Variable RPM	2300 to 2800

Engine lubrication system

Oil Filter Type	Full flow spin-on canister
Oil Capacity	4.4 L
Oil Pressure Switch	Yes
Oil Pressure Transducer	Optional

Fuel tank

UL Rated Capacity (gal/L)	54/204
Run Time (hrs)	50 to 60
Tank Alarms	Yes
Visual Gages	Yes
Catch Basin (gal/L)	5/19
Listings	UL 142 (double wall)

Fuel tank reserve time

Load (kW)	**Reserve Time (hrs.)**
3	99
6	72
9	56
10	55
11	48
12	46
13	44
14	40
15	38

Engine cooling system

Type	Pressurized Aluminum Radiator
Water Pump	Belt-driven, Pre-lubed, self-sealing
Fan Type	Belt -driven
Airflow CFM	1300
Fan Mode	Pusher
Temperature Sensor	Yes

Environmental

Operating Temperature (°C/°F)	-23 to 50 / -10 to 122
Operating Humidity %	100
Cold Start Aids	Glow Plugs

Optional: manifold heater available for temperatures < -10 ºF

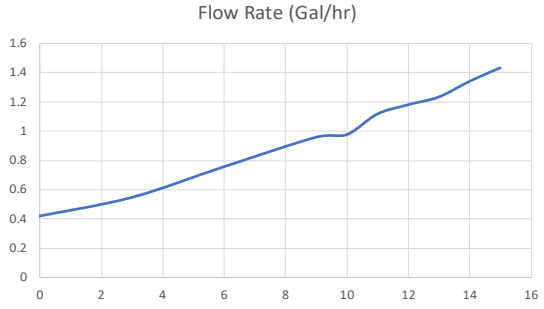
Power adjustment for conditions

Temperature Deration	1% derate for every 5.6 ºC (10 ºF) above 25 ºC (77 ºF)
Altitude Deration	3% derate for every 300 m (1000 ft) above 91 m (300 ft)

Diesel fuel system

Type	Diesel
Fuel Pump Type	Electrical
Injector Type	Mechanical
Fuel Filtering	Paper element

Diesel fuel consumption



Engine cooling

System coolant capacity (gal/L)	2.2/8.3
Maximum operation air temperature on radiator (°C/°F)	50/122
Maximum ambient temperature (°C/°F)	50/122

Exhaust

Exhaust flow at rated output (cfm/cmm)	110/3.11
Exhaust temperature at rated output (°C/°F)	400/752

Alternator

Alternator Model	8220
Type	Permanent Magnets, NdFeB
Weight (lb/kg)	46.5/21
Regulation Type	Variable engine speed
Stator	3 phase/32 poles
Overcurrent Protection (A)	15 kW - 500
Disconnect Means	Pull fuse block or Circuit breaker
Voltage Range (VDC)	44 to 62
Alternator Exhaust Flow (cfm/cmm)	130 to 180 / 3.68 to 5.1
MTBF (hr)	100,000+

Enclosure

Model	88-25-0800
Type	Weather Protective
Materials	Powder coated aluminum
Door Hardware	Three Point with Padlock Hasp, and Removable Side Panels
Mounting	Secure Mounting Tabs
Dims.	L 34” x W 68” x H 74”

Optional: L2 option

Starter battery

Model	00-53-0007
Rating CCA	590
Rating CA	735
Rating RC	100
Voltage (VDC)	12
Weight (lb/kg)	33/15

Charger

Model	00-10-0015
Input Voltage (VDC)	28 to 60
Output Voltage (VDC)	14 to 14.4
Recharge time from 0 VDC (min)	10
Recharge time from 8 VDC (min)	2
Weight (lb/kg)	2.2/1

Transition supercapacitor (optional)

Model	20-16-0003
Storage Rating (Farads)	130
Stored Energy (Wh)	57
Voltage (VDC)	56 to 62
Connected in parallel	up to 9
Weight (lb/kg)	39.7/18
Operating Temperature (°C/°F)	-40 to 40 / -40 to 104
Service Life (year)	10 to 15

Controller features

Controller Type.....Supra Model 250
4-Line Plain Text OLED Display.....Simple user interface for ease of operation
Engine Run Hours Indication.....Standard
Programmable Start Delay.....Standard
Run/Alarm/Maintenance Logs.....Standard
Engine Start Sequence.....Cyclic cranking: 5 sec on, 45 sec rest (3 attempts maximum)
Starter Battery Charger.....Standard
Automatic Voltage Regulation with Over and Under Voltage Protection.....Standard
Automatic Low Oil Pressure/High Oil Temperature Shutdown.....Standard
Overcrank/Overspeed.....Standard
Automatic High Engine Temperature Shutdown.....Standard
Field Upgradeable Firmware.....Standard
Glow Plug Delay .....Automatic With Temperature
Engine Start Delay.....Adjustable, Set at 60 sec
Return to Utility Delay.....Adjustable, Set at 60 sec
Engine Cool-down.....Adjustable, Set at 60 sec
Exerciser.....Programmable

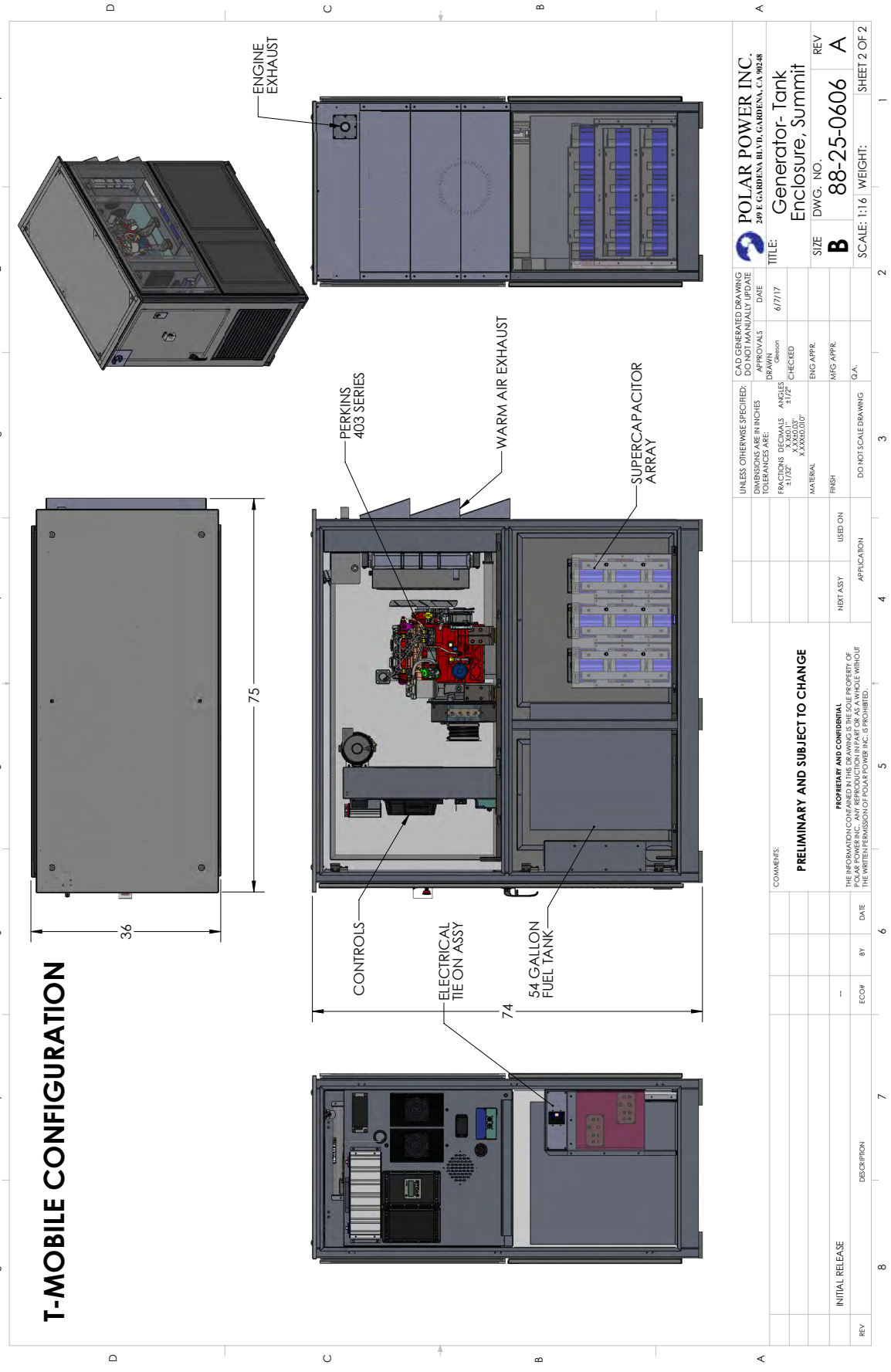
Monitoring

Alarm monitoring and remote control through Ethernet.

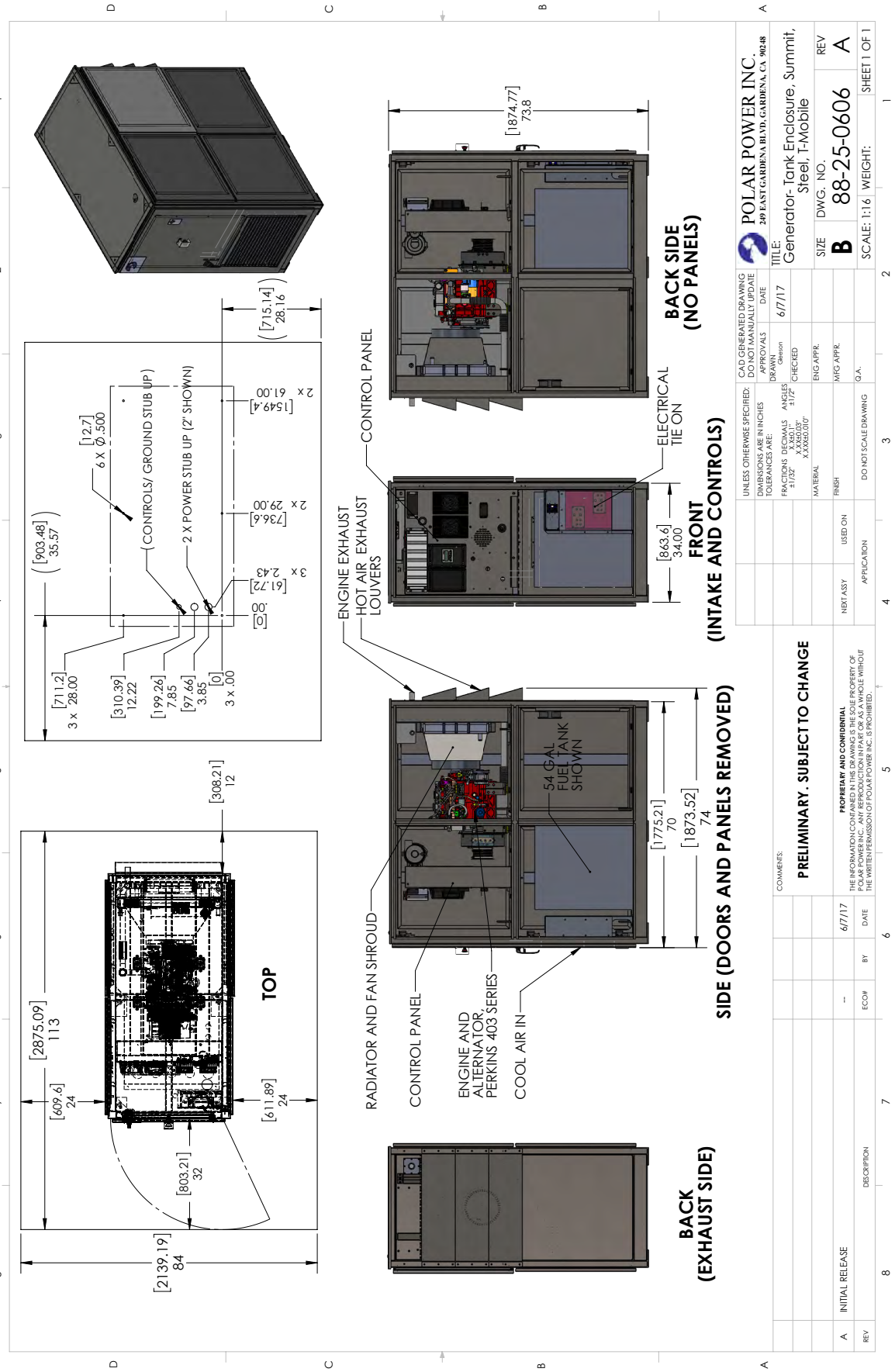
Contact closure alarm board (optional)

Shutdown Alarm.....Optional
Warning Alarm.....Optional
Engine Run.....Optional
Low Diesel Fuel Level.....Optional
Diesel Fuel Leak.....Optional
E-Stop Depressed.....Optional
Fuel Level Over 90%.....Optional

DRAWING FOR PN 8220-801-D-15-05



PLANNING FOR PN 8220-801-D-15-05



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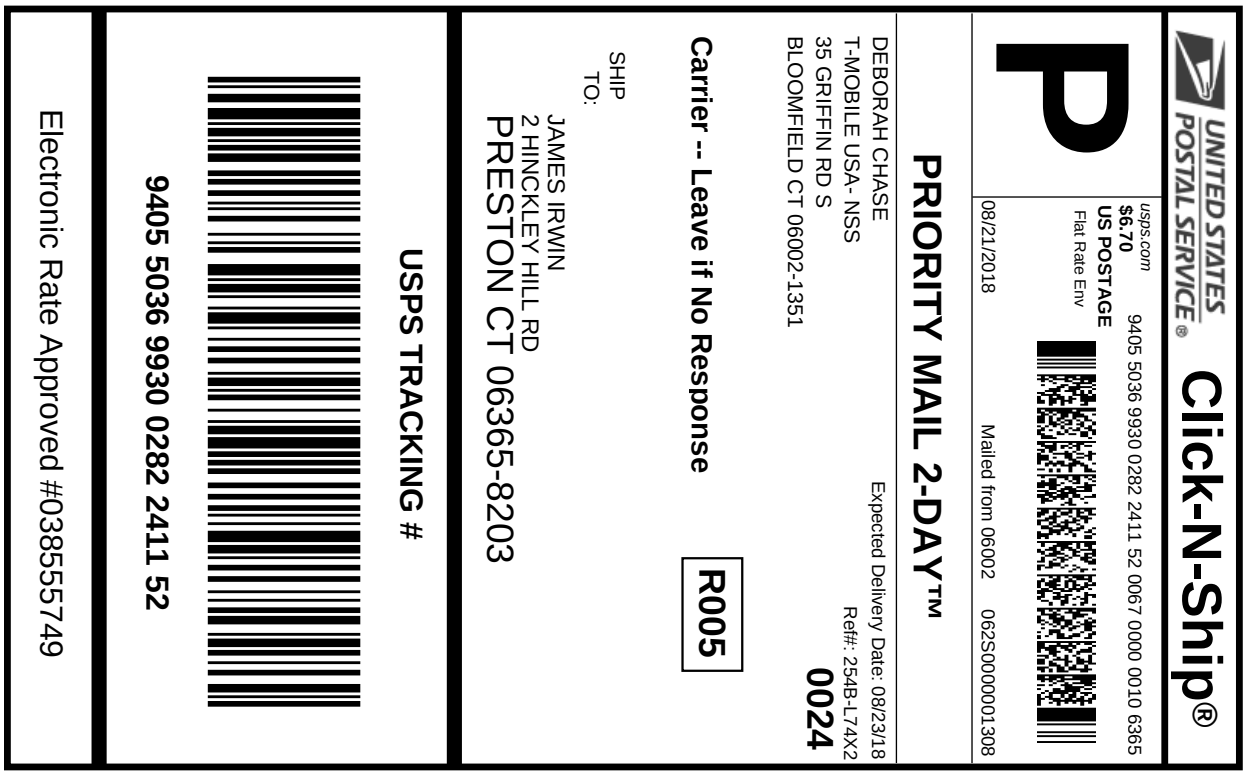
Tel.: +1(310)8309153 • Fax: +1(310)7192385
info@polarpowerinc.com • www.polarpower.com

Exhibit G



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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0282 2411 52

Trans. #:	442202267
Print Date:	08/20/2018
Ship Date:	08/21/2018
Expected Delivery Date:	08/23/2018

Priority Mail® Postage:	**$6.70**
Total	**$6.70**

From: DEBORAH CHASE
T-MOBILE USA- NSS
35 GRIFFIN RD S
BLOOMFIELD CT 06002-1351

Ref#: 254B-L74X2

To: JAMES IRWIN
2 HINCKLEY HILL RD
PRESTON CT 06365-8203

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

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Click-N-Ship®

9405 5036 9930 0282 2411 69 0067 0000 0010 6360

usps.com
$6.70
US POSTAGE
Flat Rate Env

08/21/2018 Mailed from 01566 062S0000001309

PRIORITY MAIL 2-DAY™

DEBORAH CHASE
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

Expected Delivery Date: 08/23/18
Ref#: 254B-L74X2

0006

Carrier -- Leave if No Response

C004

SHIP TO: PETER NYSTROM
MAYOR-CITY OF NORWICH
100 BROADWAY
NORWICH CT 06360-4431

USPS TRACKING #

9405 5036 9930 0282 2411 69

Electronic Rate Approved #038555749

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Ship Date:	08/21/2018
Expected Delivery Date:	08/23/2018

Priority Mail® Postage:	**$6.70**
Total	**$6.70**

From: DEBORAH CHASE Ref#: 254B-L74X2
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

To: PETER NYSTROM
MAYOR-CITY OF NORWICH
100 BROADWAY
NORWICH CT 06360-4431

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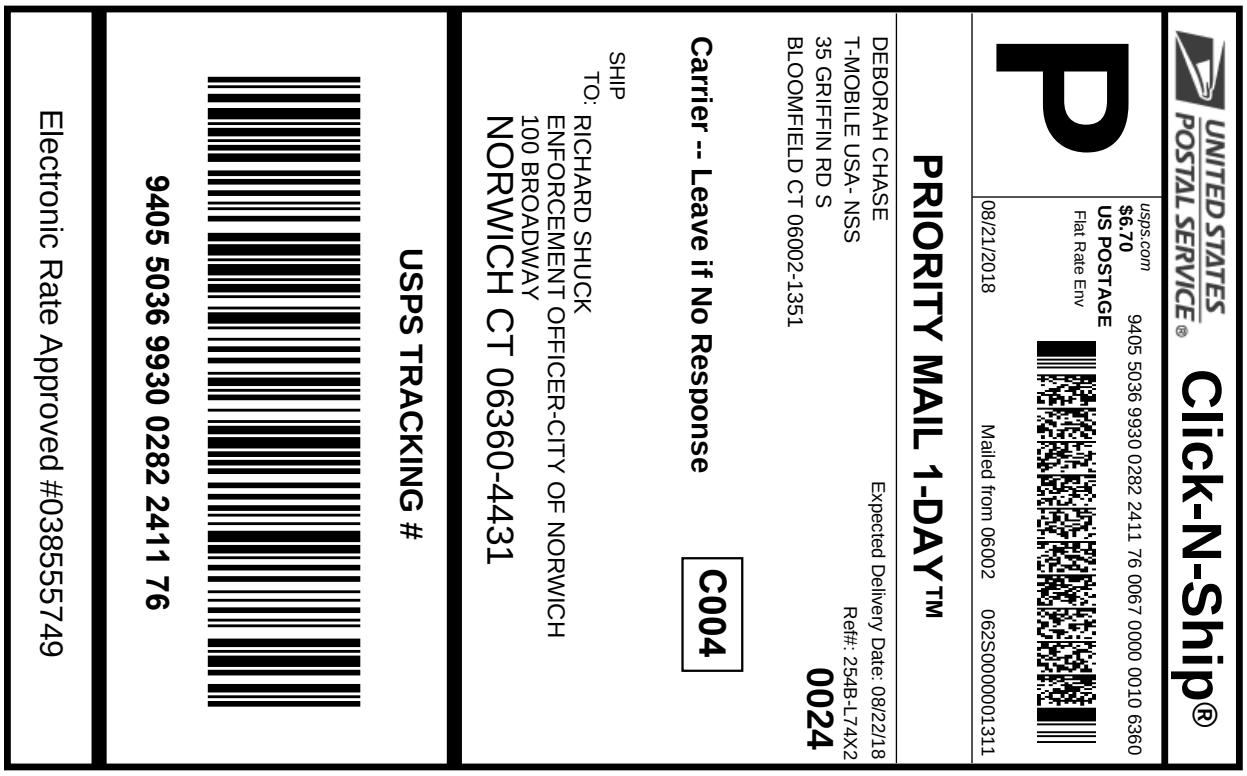

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9405 5036 9930 0282 2411 76

Trans. #:	442202267
Print Date:	08/20/2018
Ship Date:	08/21/2018
Expected Delivery Date:	08/22/2018

Priority Mail® Postage:	**$6.70**
Total	**$6.70**

From: DEBORAH CHASE
T-MOBILE USA- NSS
35 GRIFFIN RD S
BLOOMFIELD CT 06002-1351

Ref#: 254B-L74X2

To: RICHARD SHUCK
ENFORCEMENT OFFICER-CITY OF NORWICH
100 BROADWAY
NORWICH CT 06360-4431

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usps.com
$6.70
US POSTAGE
Flat Rate Env

08/21/2018 Mailed from 01566 062S0000001308

P

PRIORITY MAIL 2-DAY™

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NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

Expected Delivery Date: 08/23/18
Ref#: 254B-L74X2

0006

Carrier -- Leave if No Response

R006

SHIP TO: MARK LEGAULT
CORDLESS DATA TRANSFER
600 OLD HARTFORD RD
COLCHESTER CT 06415-2417

USPS TRACKING #

9405 5036 9930 0282 2411 83

Electronic Rate Approved #038555749

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Priority Mail® Postage:	**$6.70**
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From: DEBORAH CHASE Ref#: 254B-L74X2
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

To: MARK LEGAULT
CORDLESS DATA TRANSFER
600 OLD HARTFORD RD
COLCHESTER CT 06415-2417

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