NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Denise Sabo
4 Angela's Way, Burlington CT 06013
203-435-3640
denise@northeastsitesolutions.com

July 20, 2022

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

RE: Exempt Modification Application
382 Colebrook River Road, Colebrook, CT 06098
Latitude: 41.991833
Longitude: -73.040027
Site #: CT13613-A_CTNH549B_SBA/T-Mobile

Dear Ms. Bachman:

T-Mobile is requesting to file an exempt modification for an existing tower located at 382 Colebrook River Road, Colebrook, CT 06098. T-Mobile currently maintains twelve (12) antennas at the 117-foot level of the existing 150-foot monopole tower. The property is owned by 382 Colebrook LLC, and the tower is owned by SBA. T-Mobile now intends to add four (4) remote radio units (RRU). The new radios would be installed at the 117-foot level of the tower. This modification includes B2, B5 hardware that is both 4G (LTE), and 5G capable.

T-Mobile Planned Modifications:
Remove:
None

Remove and Replace:
None

Install New:
(4) ERICSSON 4480 B71+B85 RRU

Existing to Remain:
(4) ERICSSON AIR32 B66_B2A Antennas
(4) RFS APXVAALL24_43-U_A20 Antennas
(4) RFS APXVAALL18_206517S_A20 Antennas
(4) ERICSSON RRU 2217 B2
(4) Hybrid Line – 1-5/8"

NSS NORTHEAST SITE SOLUTIONS

Turnkey Wireless Development

The facility was approved by the Connecticut Siting Council, Docket No. 296 on February 2, 2005. 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 Christopher Johnstone, First Selectman and Marc Melanson, Building Official for the Town of Colebrook, 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: 203-435-3640
Fax: 413-521-0558
Office: 4 Angela's Way, Burlington CT 06013
Email: denise@northeastsitesolutions.com

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Attachments

Cc: Christopher Johnstone, First Selectman
Town of Colebrook
562 Colebrook Road
PO Box 5
Colebrook, CT 06021

Marc Melanson, Building Official
Town of Colebrook
562 Colebrook Road
PO Box 5
Colebrook, CT 06021

382 Colebrook LLC - Property Owners
202 Hang Dog Lane
Wethersfield, CT 06109

SBA - Tower Owner

Exhibit A

Original Facility Approval

DOCKET NO. 296 – Tower Ventures II, LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at one of two sites located at 382 Colebrook River Road, Colebrook, Connecticut.	}	Connecticut Siting Council

February 2, 2005

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Pubic Need, as provided by General Statutes § 16-50k, be issued to Tower Ventures II, LLC for the construction, maintenance and operation of a wireless telecommunications facility at the site identified as A-1 at 382 Colebrook River Road in Colebrook, Connecticut. The Council denies certification of the site identified as A-2 at 382 Colebrook River Road.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be designed as a monopole and shall be constructed no taller than 150 feet above ground level to provide telecommunications services to both public and private entities.

2. The location of the tower shall be moved to the north to maintain a minimum distance of 150 feet to property line of the adjacent property to the south.

3. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on all parties and intervenors, as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:

    a) a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas mountings, equipment building, access road, utility line, and landscaping; and

    b) construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

4. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of electromagnetic radio frequency power density is submitted to the Council in the event other carriers locate at this facility or if circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

5. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

6. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

7. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

8. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

9. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.

10. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved. Any request for extensions of the period shall be filed with the Council not later than sixty days prior to expiration date of the Certificate and shall be served on all parties and intervenors, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

11. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction and the commencement of site operation.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the Waterbury Republican-American and the Winsted Journal.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

Applicant	**Its Representative**
Tower Ventures II, LLC	Benjamin S. Proto, Jr., Esq. 2090 Cutspring Road Stratford, CT 06614 (203) 378-9595 Kenneth I. Spigle, Esq. Tower Ventures II, LLC 170 Westminster Street, Suite 701 Providence, RI 02903
Intervenor	**Its Representative**
Nextel Communications, Inc.	Thomas F. Flynn III Nextel Zoning Manager 100 Corporate Place Rocky Hill, CT 06067 860-513-5458 860-513-5444 – fax
Intervenor	**Its Representative**
Colebrook Planning and Zoning Commission	Betsy Little, Chairperson P.O. Box 5 Colebrook, CT 06021 860-379-3359 860-379-7215 – fax

Exhibit B

Property Card

qPublic.net™ Town of Colebrook, CT

Summary

Account Number	100423
Parcel ID	698
Property Address	382 COLEBROOK RIVER ROAD
Use Class/Description	1-3 1 Family
Map/Lot/Lot Cut	23/13
Zoning	GB
Acres	18.9

View Map

Owner

382 COLEBROOK LLC
202 HANG DOG LANE
WETHERSFIELD, CT 06109

Valuation

Assessed Year	2021	2020
Appraised Building Value	$188,000.00	$188,000.00
Appraised XF/OB Value	$0.00	$0.00
Appraised Land Value	$168,600.00	$168,600.00
Appraised Total Value	**$356,600.00**	**$356,600.00**
Assessed Building Value	$131,600.00	$131,600.00
Assessed XF/OB Value	$0.00	$0.00
Assessed Land Value	$118,100.00	$118,100.00
Assessed Total Value	**$249,700.00**	**$249,700.00**

Land

Building Number	1	**Land Units**	1 AC
Land Use	2-2 - Comm Bldg.	**Value**	85,500
Building Number	1	**Land Units**	1 AC
Land Use	1-3 - 1 Family	**Value**	45,100
Building Number	1	**Land Units**	16.9 AC
Land Use	1-2 - Acreage	**Value**	38,000

Building Information

Building #	1	**Notes**	2008 TOWER/OUTB UNDER GROUND LEASE SBA TOWERS II LLC 2015 CORR TOWER/OUTB TO REAL ESTATE 2020 MOVED TOWER AND CELL SHEDS TO PID 100625 FOR 2020 PER JOHN OLIVERI OF 382 COLEBROOK LLC HOUSE VACANT APPX 7 YEARS. BUSTED PIPES AND MOLD. = FUNC
Style	Ranch		
Occupancy			
Actual Year Built	1975		
Effective Year Built	1984		
Living Area	2,565		
Stories	1		
Grade	04 Average +10		
Condition		**Fireplaces**	
Exterior Wall	Clapboard	**Roof Cover**	Standing Seam
Interior Wall	Drywall/Sheet	**Roof Structure**	Gable/Hip
		Floor Type	Concr-Finished
		Heat Type	Forced Air-Duc
		Fuel Type	Oil
		AC	None
		Bdrms/Full Bth/Hlf Bth/Ttl Rm	02/1/0/5
		Basement Finished Area	
		Basement Sq. Ft.	

Code	Description	Living Area	Gross Area	Effective Area
BAS	First Floor	2,565	2,565	2,565

FGR	Garage	0	1,692	592
UHS	Unfinished Half Story	0	1,692	508
UST	Unfinished Storage	0	1,092	328
WDK	Wood Deck	0	400	40
	Totals	**2,565**	**7,441**	**4,033**

Sales History

Sales Date	Instrument Type	Grantor	Grantee	Book/Page
11/16/2015	Intercorporation	OLIVERI JOHN	382 COLEBROOK LLC	0087-0269
11/16/2015	Sale of foreclosed property	US BANK TRUST NA TRUSTEE FOR	OLIVERI JOHN	0087-0266
10/26/2015	Sale of foreclosed property	US BANK TRUST NA TRUSTEE	US BANK TRUST NA TRUSTEE FOR LSF9 MASTER PART TRUST	0087-0205
9/30/2015	Sale of foreclosed property	JOHNSON LEONARD D ESTATE OF &	US BANK TRUST NA TRUSTEE C/O CALIBER HOME LOANS INC	0087-0161
4/18/2013	Partial Interest	JOHNSON LEONARD D & SANDRA A	JOHNSON LEONARD D ESTATE OF & JOHNSON SANDRA A	0084-0667
2/9/2012	Transfer of Convenience	JOHNSON LEONARD D & SANDRA A	JOHNSON LEONARD D & SANDRA A	0083-0143
12/30/2003		JOHNSON LEONARD D	JOHNSON LEONARD D & SANDRA A	0070-0668
1/16/1989			JOHNSON LEONARD D	0050-0387

Recent Sales In Area

Sale date range:

From:

07/20/2012

To:

07/20/2022

Sales by Neighborhood

1500

Feet

Sales by Distance

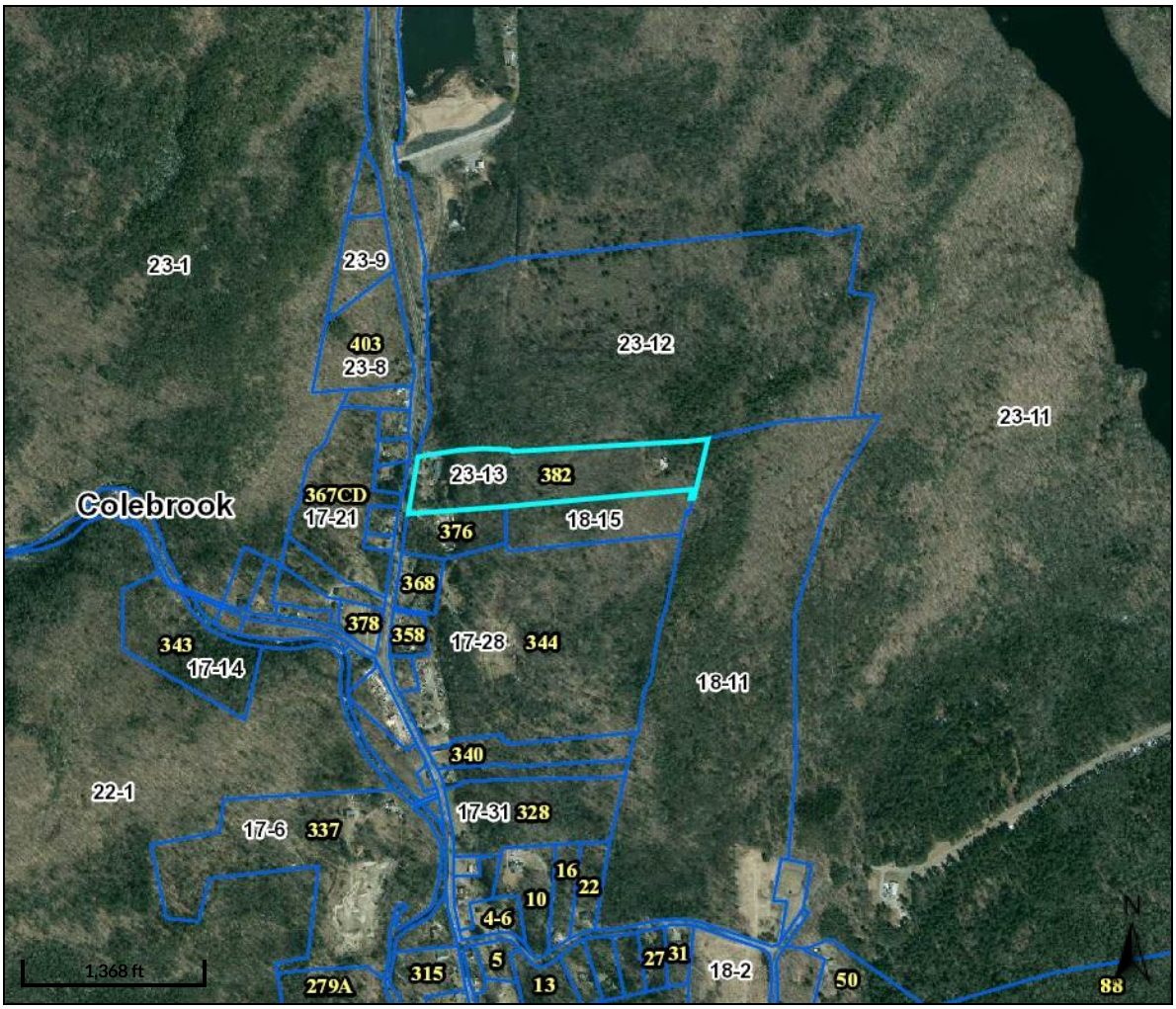
Permits

Permit ID	Issue Date	Type	Description	Amount	Inspection Date	% Complete	Date Complete	Comments
18-202	10-29-2018	CM	Commercial	$65,000		100		TWELVE NEW ANTENNAE
12-147	12-13-2012	CM	Commercial	$25,000		100		3 NEW ANTENNAS
06-134	12-18-2006		Verizon 12x30 equip	$100,000		100		
06/19	03-27-2006		INST ANTENNA ON EXIS	$50,000	10/1/2006 12:00:00 AM	100		N/C PP
05/88	08-22-2005		BLDG FOR CELL TOWER	$40,000	12/28/2005 12:00:00 AM	100		
05-69	07-18-2005		CELL TOWER	$190,000		100		
03-117	11-26-2003		metal roof over ex r	$20,000	9/25/2004 12:00:00 AM	100	10-01-2004	

Photos

Sketches

qPublic.net™ Town of Colebrook, CT



Overview

Legend

- Parcels
- Map-Block-Lot
- Address Numbers

Parcel ID	698	**Alternate ID**	100423	**Owner Address**	382 COLEBROOK LLC
Sec/Twp/Rng	23-13-	**Class**	R		202 HANG DOG LANE
Property Address	382 COLEBROOK RIVER ROAD	**Acreage**	18.9		WETHERSFIELD CT 06109
District	0001A				
Brief Tax Description	n/a				
	(Note: Not to be used on legal documents)				

Date created: 7/20/2022
Last Data Uploaded: 7/19/2022 10:46:06 PM

Developed by Schneider GEOSPATIAL

Exhibit C

Construction Drawings

SPECIAL CONSTRUCTION NOTE:
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS (STRUCTURAL MODIFICATIONS) AT T-MOBILE'S RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS).

CTNH549B

382 COLEBROOK RIVER ROAD
WINSTED, CT 06098
LITCHFIELD COUNTY

SITE NO.: CTNH549B

SITE TYPE: 150'± MONOPOLE

RF DESIGN GUIDELINE: 4SEC-67E97DB2

SCOPE OF WORK

REMOVE:
- 4 RRUs

INSTALL:
- 4 RRUs

SITE NOTES

1. THIS IS AN UNMANNED AND RESTRICTED ACCESS TELECOMMUNICATION FACILITY, AND IS NOT FOR HUMAN HABITATION. IT WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNAL FOR THE PURPOSE OF PROVIDING PUBLIC CELLULAR SERVICE.
   - ADA COMPLIANCE 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 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 PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
3. NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
   - BUILDING CODE: 2018 CONNECTICUT STATE BUILDING CODE
   - ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE
   - STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

APPROVALS

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

T-MOBILE TECHNICIAN SITE SAFETY NOTES

LOCATION	SPECIAL RESTRICTIONS
SECTOR A:	ACCESS BY CERTIFIED CLIMBER
SECTOR B:	ACCESS BY CERTIFIED CLIMBER
SECTOR C:	ACCESS BY CERTIFIED CLIMBER
GPS/LMU:	UNRESTRICTED
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

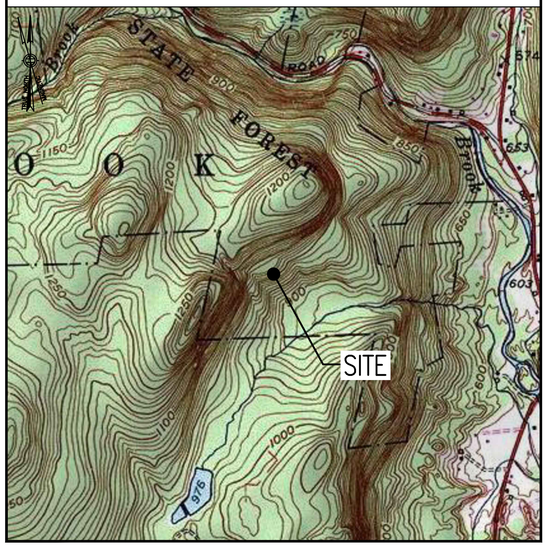
GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND 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 OMNIPOINT REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
10. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS, ESTABLISHING AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS AS SHOWN HEREIN.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
12. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
13. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
14. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
15. THE CONTRACTOR SHALL NOTIFY THE PROJECT OWNER'S REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE LESSEE/LICENSEE REPRESENTATIVE.
16. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
17. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK.

AT LEAST 72 HOURS PRIOR TO DIGGING, THE CONTRACTOR IS REQUIRED TO CALL DIG SAFE AT 811

VICINITY MAP

SCALE: 1" = 1000'-0"



DIRECTIONS

MERGE ONTO I-495 NORTH TOWARD MANSFIELD/MARLBORO. TAKE EXIT 58 FOR I-90 WEST TOWARD ALBANY. TAKE EXIT 41 TOWARD US-202. TURN RIGHT ONTO FRANKLIN STREET. CONTINUE ONTO RUSSELL ROAD. TURN LEFT ONTO LLOYDS HILL ROAD. TURN RIGHT ONTO WESTERN AVENUE. TURN LEFT ONTO BROADWAY. TURN RIGHT ONTO GRANVILLE ROAD. TURN RIGHT TO STAY ON GRANVILLE ROAD. CONTINUE ONTO OLD WESTFIELD ROAD. TURN RIGHT ONTO MA-57 WEST. TURN LEFT ONTO MA-8 SOUTH. SITE IS LOCATED ON THE LEFT HAND SIDE.

SHEET INDEX

SHT. NO.	DESCRIPTION	VER.
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND & EQUIPMENT PLAN	1
A-2	TOWER ELEVATIONS & ANTENNA PLAN	1
A-3	SITE DETAILS, ANTENNA & FEEDLINE CHARTS	1
E-1	ELECTRIC & GROUNDING DETAILS	1

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

PROJECT SUMMARY

SITE NUMBER:	CTNH549B
SITE NAME:	CTNH549B
SBA SITE NUMBER:	CT13613-A
SBA SITE NAME:	JOHNSON
SITE ADDRESS:	382 COLEBROOK RIVER ROAD WINSTED, CT 06098
PROPERTY OWNER:	382 COLEBROOK LLC 202 HANG DOG LANE WETHERSFIELD, CT 06109
TOWER OWNER:	SBA TOWERS II, LLC 8501 CONGRESS AVENUE BOCA RATON, FL 33487 PHONE: 561-226-9523
COUNTY:	LICHFIELD
ZONING DISTRICT:	N/A
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	150'±
APPLICANT:	T-MOBILE NORTHEAST LLC 15 COMMERCE WAY, SUITE B NORTON, MA 02766
ARCHITECT:	CHAPPELL ENGINEERING ASSOCIATES, LLC. 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
STRUCTURAL ENGINEER:	CHAPPELL ENGINEERING ASSOCIATES, LLC. 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
SITE CONTROL POINT:	LATITUDE: 41.992195° N41°59'31.90" LONGITUDE: -73.039683° W73°02'22.86"

SPECIAL ZONING NOTE:
BASED ON INFORMATION PROVIDED BY T-MOBILE REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AN ELIGIBLE FACILITY UNDER THE MIDDLE CLASS TAX RELIEF AND JOB CREATION ACT OF 2012, 47 USC 1455(A), SECTION 6409(A), AND IS SUBJECT TO AN ELIGIBLE FACILITY REQUEST, EXPEDITED REVIEW, AND LIMITED/PARTIAL ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW, OR ADMINISTRATIVE REVIEW).

T-MOBILE NORTHEAST LLC
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
(508) 286-2700

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
(508) 251-0720

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil ·Structural ·Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

STATE OF CONNECTICUT
JAMES M. FITZGERALD
No. 25997
LICENSED
PROFESSIONAL CIVIL ENGINEER
5/16/2022

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	05/16/22	ISSUED FOR CONSTRUCTION	JRV
0	04/25/22	ISSUED FOR REVIEW	JRV

SITE NUMBER:
CTNH549B

SITE ADDRESS:
382 COLEBROOK RIVER ROAD
WINSTED, CT 06098

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

1815.484

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR – T–MOBILE
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – T–MOBILE
   OEM – ORIGINAL EQUIPMENT MANUFACTURER

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.

4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL, STATE AND FEDERAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

5. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER, T1 CABLES AND GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR AND/OR LANDLORD PRIOR TO CONSTRUCTION.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION AND RETURN DISTURBED AREAS TO ORIGINAL CONDITIONS.

13. THE SUBCONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE SUBCONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.

14. SUBCONTRACTOR SHALL NOTIFY CHAPPELL ENGINEERING ASSOCIATES, LLC 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS AND POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEERING REVIEW.

15. CONSTRUCTION SHALL COMPLY WITH ALL T–MOBILE STANDARDS AND SPECIFICATIONS.

16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

17. THE EXISTING CELL SITES ARE IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

18. IF THE EXISTING CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

SITE WORK GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.

2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION.

3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.

4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

5. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.

6. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

7. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.

8. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEERING, OWNER AND/OR LOCAL UTILITIES.

9. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE AND STABILIZED TO PREVENT EROSION AS SPECIFIED IN THE PROJECT SPECIFICATIONS.

10. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

11. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE T–MOBILE SPECIFICATION FOR SITE SIGNAGE.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST–IN–PLACE CONCRETE.

2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000PSI) MAY BE USED. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 381 CODE REQUIREMENTS

3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.

4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER .....2 IN.
   #5 AND SMALLER & WWF .....1½ IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER
   OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALL .....¾ IN.
   BEAMS AND COLUMNS .....1½ IN.

5. A CHAMFER ¾" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHORS SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO THE MANUFACTURERS RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY SIMPSON OR APPROVED EQUAL.

7. CONCRETE CYLINDER TIES ARE NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER;
   (A) RESULTS OF CONCRETE CYLINDER TEST PERFORMED AT THE SUPPLIERS PLANT.
   (B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.
FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.

8. AS AN ALTERNATIVE TO ITEM 7. TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.

9. EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS AND T–MOBILE SPECIFICATIONS UNLESS OTHERWISE NOTED. STRUCTURAL STEEL SHALL BE ASTM–A–36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".

2. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 9TH EDITION. PAINTED SURFACES SHALL BE TOUCHED UP.

3. BOLTED CONNECTIONS SHALL USE BEARING TYPE ASTM A325 BOLTS (¾"ø) AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE. ALL BOLTS SHALL BE GALVANIZED OR STAINLESS STEEL.

4. NON–STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE ⅝" DIA. ASTM A 307 BOLTS (GALV) UNLESS NOTED OTHERWISE.

5. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL

6. ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

1. EXCAVATE AS REQUIRED TO REMOVE VEGETATION AND TOPSOIL TO EXPOSE NATURAL SUBGRADE AND PLACE CRUSHED STONE AS REQUIRED.

2. COMPACTION CERTIFICATION: AN INSPECTION AND WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.

3. AS AN ALTERNATE TO INSPECTION AND WRITTEN CERTIFICATION, THE "UNDISTURBED SOIL" BASE SHALL BE COMPACTED WITH "COMPACTION EQUIPMENT", LISTED BELOW, TO AT LEAST 90% MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557 METHOD C.

4. COMPACTED SUBBASE SHALL BE UNIFORM AND LEVELED. PROVIDE 6" MINIMUM CRUSHED STONE OR GRAVEL COMPACTED IN 3" LIFTS ABOVE COMPACTED SOIL. GRAVEL SHALL BE NATURAL OR CRUSHED WITH 100% PASSING #1 SIEVE.

5. AS AN ALTERNATE TO ITEMS 2 AND 3, THE SUBGRADE SOILS WITH 5 PASSES OR A MEDIUM SIZED VIBRATORY PLATE COMPACTOR (SUCH AS BOMAG BPR 30/38) OR HAND–OPERATED SINGLE DRUM VIBRATORY ROLLER (SUCH AS BOMAG BW 55E). AND SOFT AREAS THAT ARE ENCOUNTERED SHOULD BE REMOVED AND REPLACED WITH A WELL–GRADED GRANULAR FILL AND COMPACTED AS STATED ABOVE.

COMPACTION EQUIPMENT:

1. HAND OPERATED DOUBLE DRUN, VIBRATORY ROLLER, VIBRATORY PLATE COMPACTOR OR JUMPING JACK COMPACTOR.

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
SUBCONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, T–MOBILE ANTENNA PLATFORM LOCATION AND UTILITY TRENCHWORK.

2. COORDINATION OF WORK:
SUBCONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH CONTRACTOR.

3. CABLE LADDER RACK:
SUBCONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY AND/OR ICE BRIDGE, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.

ELECTRICAL INSTALLATION NOTES:

1. WIRING, RACEWAY, AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.

2. SUBCONTRACTOR SHALL MODIFY OR INSTALL CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLING TO THE NEW BTS EQUIPMENT. SUBCONTRACTOR SHALL SUBMIT MODIFICATIONS TO CONTRACTOR FOR APPROVAL.

3. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.

4. CABLES SHALL NOT BE ROUTED THROUGH LADDER–STYLE CABLE TRAY RUNGS.

5. EACH END OF EVERY POWER, GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA, AND MATCH INSTALLATION REQUIREMENTS.

6. POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, ½ INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC AND OSHA.

7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).

8. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.

9. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.

10. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#34 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.

11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#6 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN–2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.

12. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.

13. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (#34 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.

14. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY HARGER (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).

15. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.

16. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.

17. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

18. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.

19. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.

20. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.

21. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.

22. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.

23. CABINETS, BOXES AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.

24. CABINETS, BOXES AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.

25. WIREWAYS SHALL BE EPOXY–COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.

26. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.

27. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY–COATED, OR NON–CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.

28. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.

29. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

30. THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

31. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.

32. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.

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JAMES M. FITZGERALD
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PROFESSIONAL CIVIL ENGINEER
5/16/2022

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	05/16/22	ISSUED FOR CONSTRUCTION	JRV
0	04/25/22	ISSUED FOR REVIEW	JRV

SITE NUMBER:
CTNH549B

SITE ADDRESS:
382 COLEBROOK RIVER ROAD
WINSTED, CT 06098

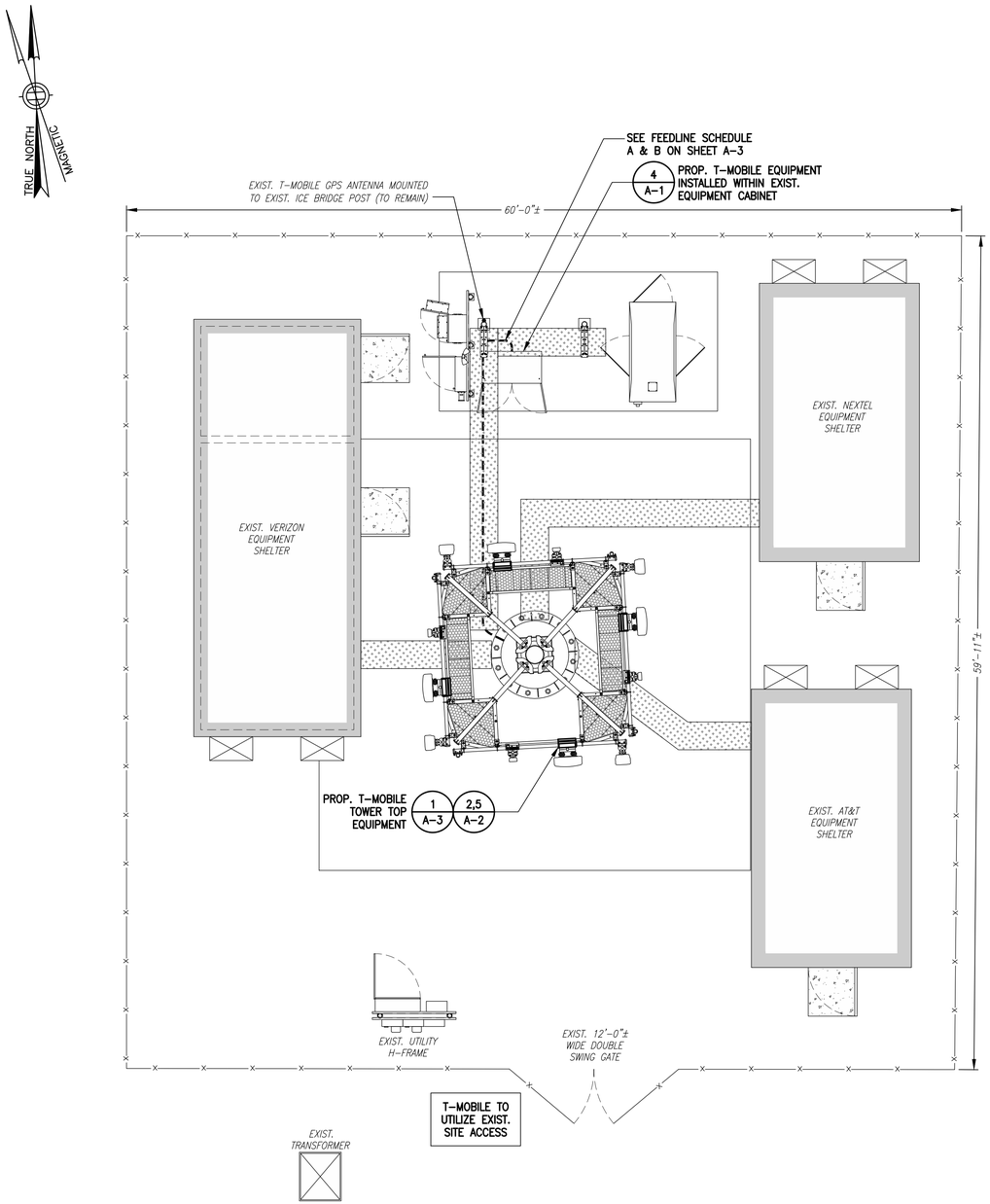
SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-1

1815.484

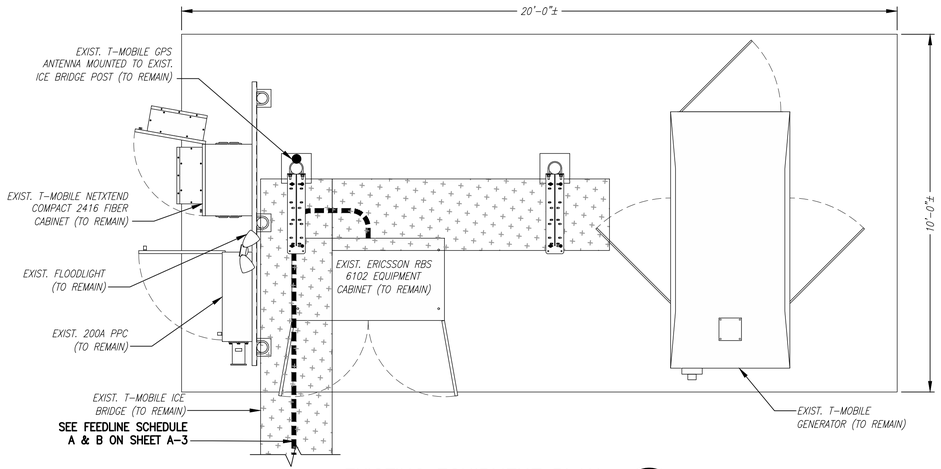
SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.

SPECIAL CONSTRUCTION NOTE:
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS (STRUCTURAL MODIFICATIONS) AT T-MOBILE'S RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS).

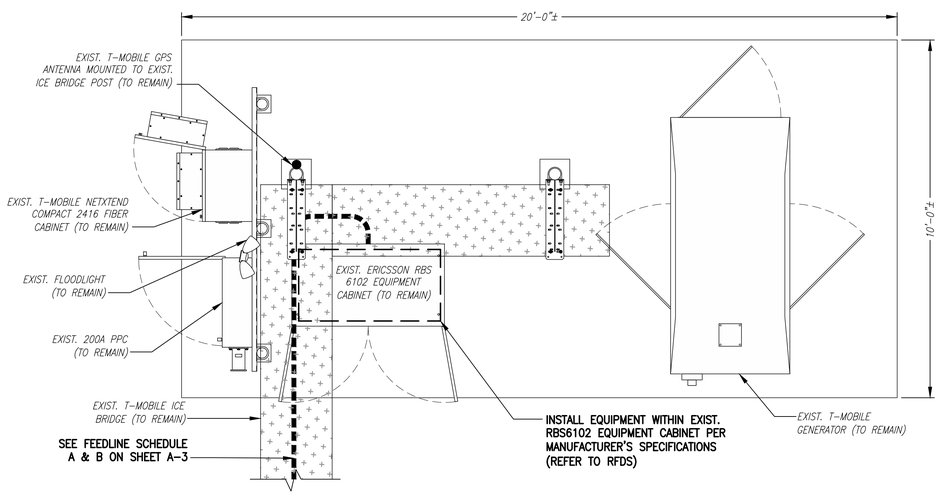


COMPOUND PLAN 1 A-1
SCALE: 1" = 5'-0"
0 5'-0" 10'-0 15'-0"

EXISTING EQUIPMENT PHOTO 2 A-1
SCALE: N.T.S.



EXISTING EQUIPMENT PLAN 3 A-1
SCALE: 1/2" = 1'-0"
0 2'-0" 4'-0" 6'-0"



PROPOSED EQUIPMENT PLAN 4 A-1
SCALE: 1/2" = 1'-0"
0 2'-0" 4'-0" 6'-0"

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WINSTED, CT 06098

SHEET TITLE
COMPOUND & EQUIPMENT PLANS

SHEET NUMBER
A-1

1815.484

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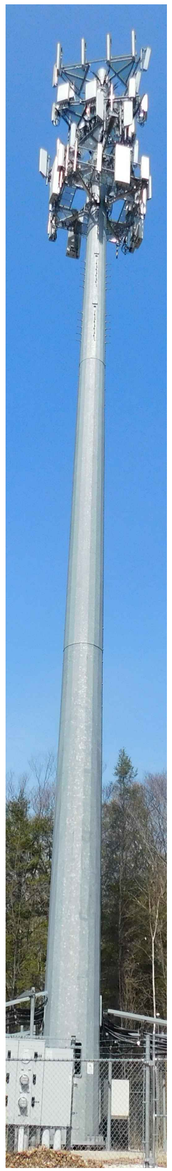
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.

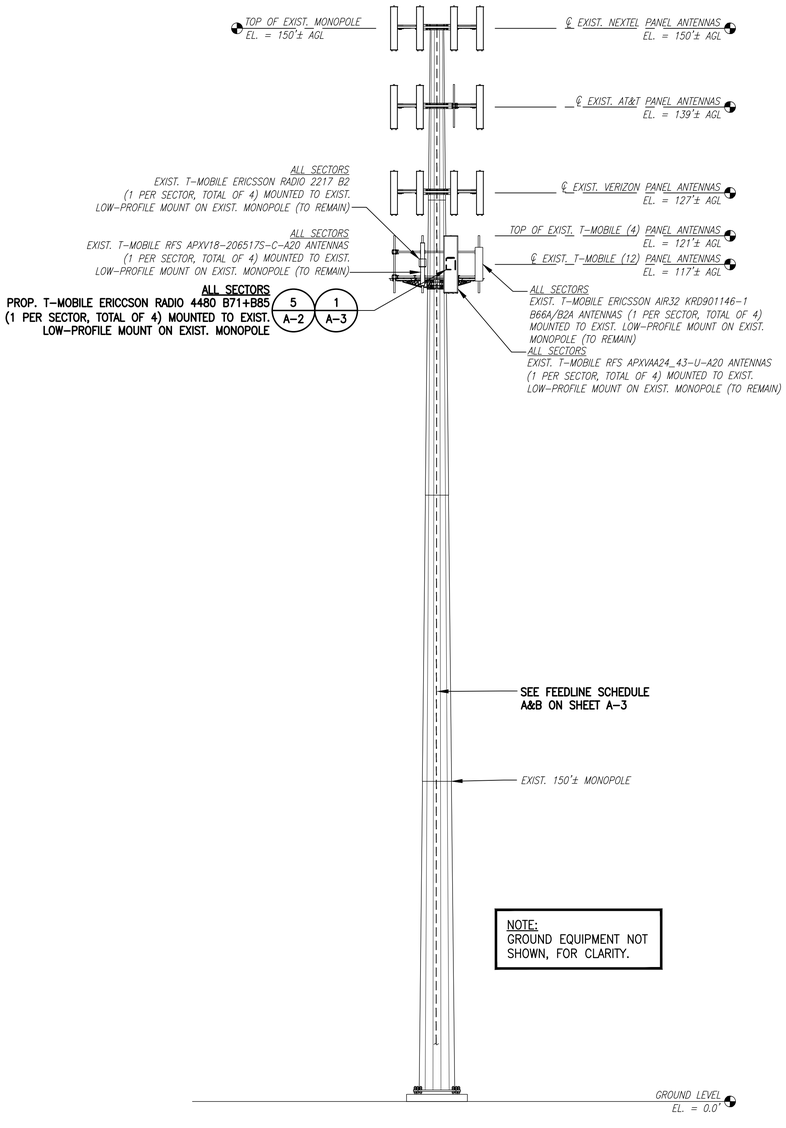
SPECIAL CONSTRUCTION NOTE:
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS (STRUCTURAL MODIFICATIONS) AT T-MOBILE'S RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS).

RAD CENTER NOTE:
T-MOBILE RAD CENTER SHOWN IN RED TEXT BASED ON SBA-PROVIDED CO-LOCATION APPLICATION, EQUIPMENT DATABASE, AND STRUCTURAL ANALYSIS. THE SBA-PROVIDED ANTENNA RAD CENTER SHALL SUPERSEDE ANY CONFLICTING INFORMATION DERIVED FROM THE T-MOBILE RFDS.



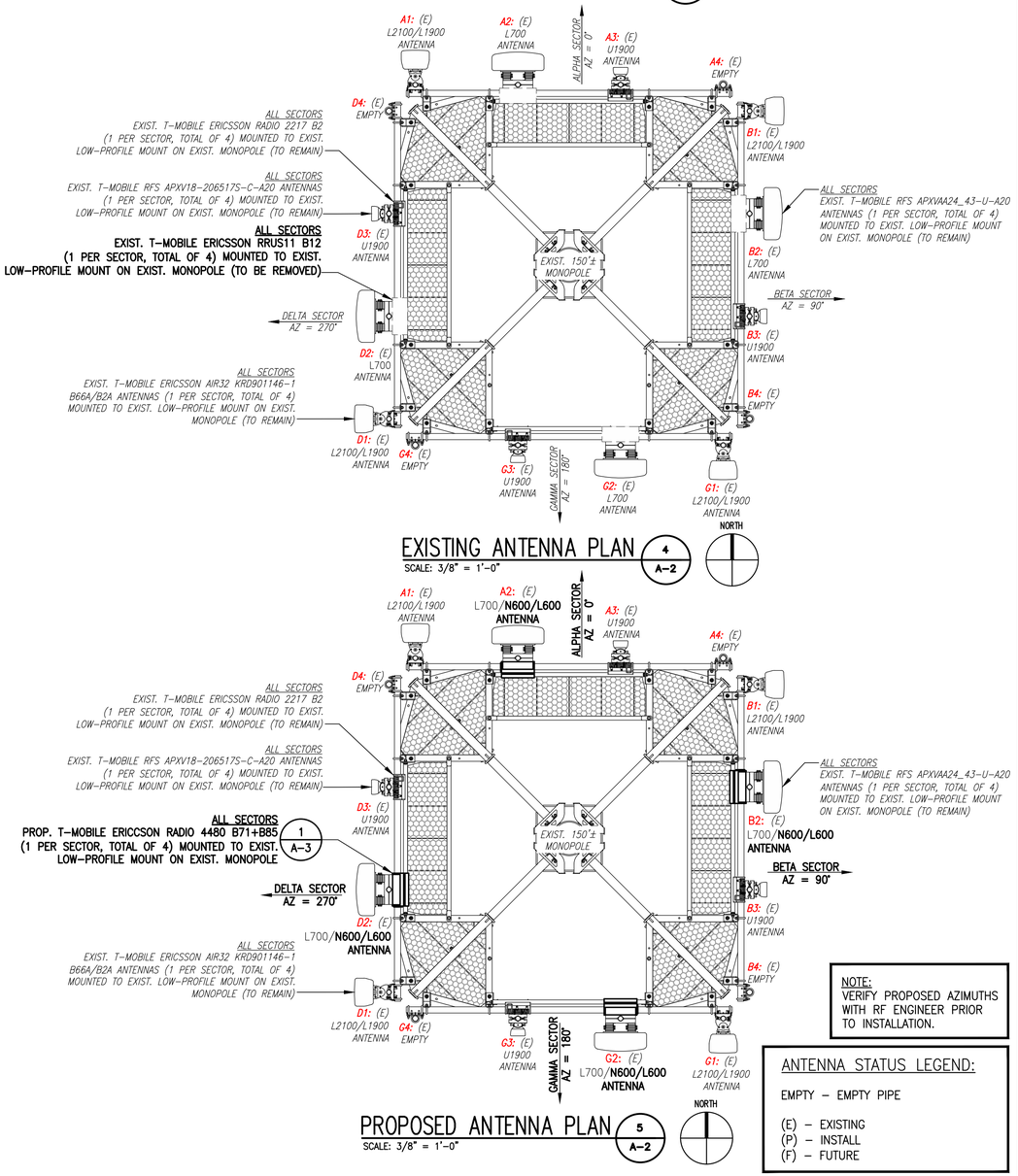
EXISTING TOWER PHOTO 1 A-2
N.T.S.

EXISTING ANTENNA PHOTO 3 A-2
N.T.S.



TOWER ELEVATION 2 A-2
SCALE: 1" =10'-0"
0 10' 20' 30'

NOTE:
GROUND EQUIPMENT NOT SHOWN, FOR CLARITY.



EXISTING ANTENNA PLAN 4 A-2
SCALE: 3/8" = 1'-0"

PROPOSED ANTENNA PLAN 5 A-2
SCALE: 3/8" = 1'-0"

NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION.

ANTENNA STATUS LEGEND:

EMPTY – EMPTY PIPE

(E) – EXISTING
(P) – INSTALL
(F) – FUTURE

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www.chappellengineering.com

STATE OF CONNECTICUT
JAMES M. FITZGERALD
No. 25997
LICENSED
PROFESSIONAL CIVIL ENGINEER
5/16/2022

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	05/16/22	ISSUED FOR CONSTRUCTION	JRV
0	04/25/22	ISSUED FOR REVIEW	JRV

SITE NUMBER:
CTNH549B

SITE ADDRESS:
382 COLEBROOK RIVER ROAD
WINSTED, CT 06098

SHEET TITLE
TOWER ELEVATIONS & ANTENNA PLANS

SHEET NUMBER
A-2

1815.484

FINAL ANTENNA CONFIGURATION

SECTOR		ANTENNA	RAD CENTER	AZIMUTH (TRUE NORTH)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	BAND	TMA/RADIOS	SIGNAL CABLES
ALPHA	A1	ERICSSON AIR32 KRD901146-1 B66A/B2A	117'± AGL	0°	0°	2°	L2100/L1900	–	(4) 1-5/8" (6x12) HCS FIBER CABLE
	A2	RFS APXVAA24_43-U-A20	117'± AGL	0°	0°	2°	L700/**L600/N600**	**RADIO 4480 B71+B85**	
	A3	RFS APXV18-206517S-C-A20	117'± AGL	0°	0°	2°	U1900	RADIO 2217 B2	
	A4	EMPTY PIPE	–	–	–	–	–	–	
BETA	B1	ERICSSON AIR32 KRD901146-1 B66A/B2A	117'± AGL	90°	0°	2°	L2100/L1900	–	
	B2	RFS APXVAA24_43-U-A20	117'± AGL	90°	0°	2°	L700/**L600/N600**	**RADIO 4480 B71+B85**	
	B3	RFS APXV18-206517S-C-A20	117'± AGL	90°	0°	2°	U1900	RADIO 2217 B2	
	B4	EMPTY PIPE	–	–	–	–	–	–	
GAMMA	G1	ERICSSON AIR32 KRD901146-1 B66A/B2A	117'± AGL	180°	0°	2°	L2100/L1900	–	
	G2	RFS APXVAA24_43-U-A20	117'± AGL	180°	0°	2°	L700/**L600/N600**	**RADIO 4480 B71+B85**	
	G3	RFS APXV18-206517S-C-A20	117'± AGL	180°	0°	2°	U1900	RADIO 2217 B2	
	G4	EMPTY PIPE	–	–	–	–	–	–	
DELTA	D1	ERICSSON AIR32 KRD901146-1 B66A/B2A	117'± AGL	270°	0°	2°	L2100/L1900	–	
	D2	RFS APXVAA24_43-U-A20	117'± AGL	270°	0°	2°	L700/**L600/N600**	**RADIO 4480 B71+B85**	
	D3	RFS APXV18-206517S-C-A20	117'± AGL	270°	0°	2°	U1900	RADIO 2217 B2	
	D4	EMPTY PIPE	–	–	–	–	–	–	

CABLE NOTE: SEE FEEDLINE SCHEDULE A & B BELOW.

NOTE: RFDS REV2 – 03/09/22

FEEDLINE SCHEDULE

SCHEDULE	FEEDLINES	LOCATION
A	EXISTING TO REMAIN: (1) ½" COAX CABLE FOR GPS ANTENNA (4) 1-5/8" (6x12) HCS FIBER CABLES	ROUTED PER STRUCTURAL ANALYSIS
	EXISTING TO BE REMOVED: NONE	
B	PROPOSED: NONE	

NOTE:
EXISTING T-MOBILE EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER.

ERICSSON RADIO 4480 B71+B85
DIMENSIONS: 19.2"H x 15.1"W x 7.5"D
WEIGHT: 92.6 lbs
QUANTITY: 1 PER SECTOR, TOTAL OF 4

RADIO DETAILS (1 / A-3)
SCALE: N.T.S.

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WINSTED, CT 06098

SHEET TITLE
SITE DETAILS, ANTENNA & FEEDLINE CHARTS

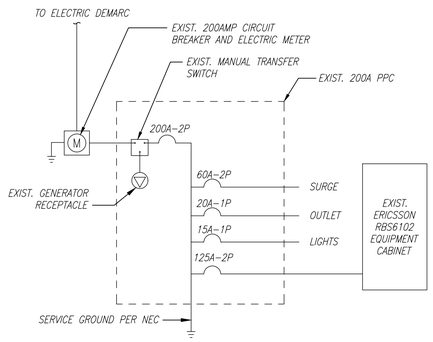
SHEET NUMBER
A-3

1815.484

EXISTING POWER PANEL PHOTOS

SCALE: NOT TO SCALE

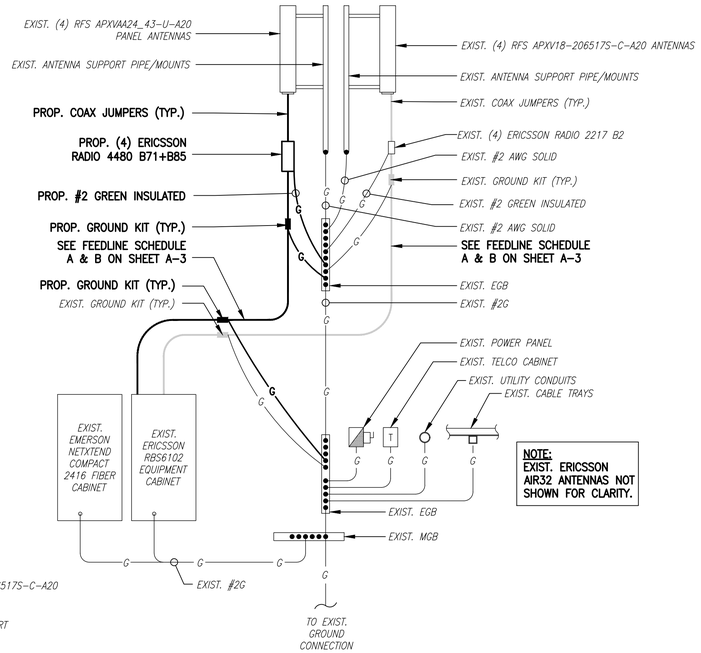
1 E-1



ONE LINE DIAGRAM

SCALE: NOT TO SCALE

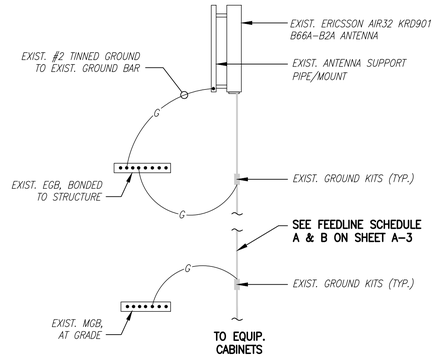
2 E-1



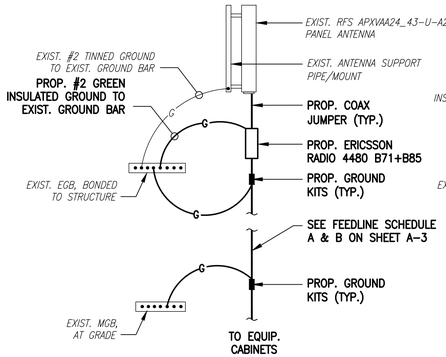
GROUNDING RISER DIAGRAM

SCALE: NOT TO SCALE

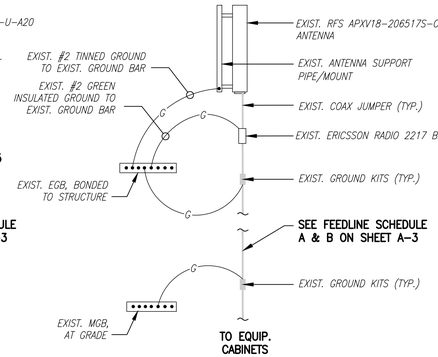
3 E-1



L2100/L1900 ANTENNA



L700/L600/N600 ANTENNA

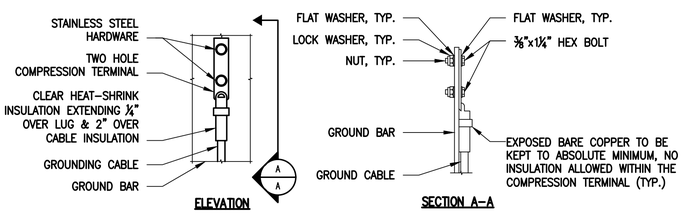


U1900 ANTENNA

COAX CABLE CONNECTION AND GROUNDING DETAIL

SCALE: NOT TO SCALE

4 E-1

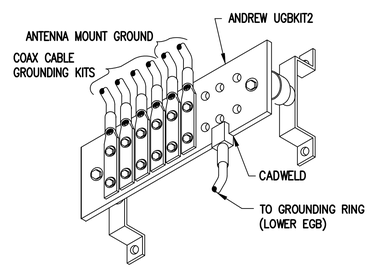


NOTES:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELL DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.

TYPICAL GROUND BAR CONNECTIONS DETAIL

SCALE: NOT TO SCALE

5 E-1



GROUND BAR (EGB)

SCALE: NOT TO SCALE

6 E-1

ELECTRICAL AND GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHNINSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE PPC 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 PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT. ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
11. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
12. PPC SUPPLIED BY PROJECT OWNER.
13. GROUNDING SHALL COMPLY WITH NEC ART. 250. ADDITIONALLY, GROUNDING, BONDING AND LIGHTNING PROTECTION SHALL BE DONE IN ACCORDANCE WITH "T-MOBILE BTS SITE GROUNDING STANDARDS".
14. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
15. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
16. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
17. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 8" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
18. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
19. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
20. CONTRACTOR SHALL PROVIDE AND INSTALL OMNI DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALLS OVER EACH GROUND ROD AND BONDING POINT BETWEEN EXIST. TOWER/ MONOPOLE GROUNDING RING AND EQUIPMENT GROUNDING RING.
21. CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMNS MINIMUM RESISTANCE REQUIRED.
22. CONTRACTOR SHALL CONDUCT ANTENNA, COAX, AND LNA RETURN-LOSS AND DISTANCE- TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.

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CTNH549B

SITE ADDRESS:
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WINSTED, CT 06098

SHEET TITLE
ELECTRIC & GROUNDING DETAILS

SHEET NUMBER
E-1

1815.484

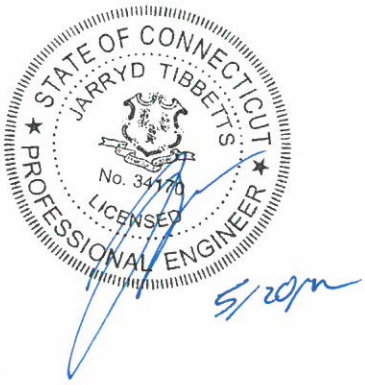
Exhibit D

Structural Analysis Report

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 150 ft PennSummit Monopole
Customer Name: SBA Communications Corp
Customer Site Number: CT13613-A
Customer Site Name: Johnson
Carrier Name: T-Mobile (App#: 193384-1)
Carrier Site ID / Name: CTNH549B / CTNH549B
Site Location: 382 Colebrook River Rd
Colebrook, Connecticut
Litchfield County
Latitude: 41.992083
Longitude: -73.039805



Analysis Result:

Max Structural Usage: 55.6% [Pass]
Max Foundation Usage: 33.0% [Pass]
Additional Usage Caused by New Mount/Mount Modification: N/A

Report Prepared By: Kevin Azisllari

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 150 ft PennSummit Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT13613-A

Customer Site Name: Johnson

Carrier Name: T-Mobile (App#: 193384-1)

Carrier Site ID / Name: CTNH549B / CTNH549B

Site Location: 382 Colebrook River Rd

Colebrook, Connecticut

Litchfield County

Latitude: 41.992083

Longitude: -73.039805

Analysis Result:

Max Structural Usage: 55.6% [Pass]

Max Foundation Usage: 33.0% [Pass]

Additional Usage Caused by New Mount/Mount Modification: N/A

Report Prepared By: Kevin Azisllari

Introduction

The purpose of this report is to summarize the analysis results on the 150 ft PennSummit Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Paul J. Ford; Job #29205-0113; 5/24/2005
Foundation Drawing	Paul J. Ford; Job #29205-0113; 5/24/2005
Geotechnical Report	JGI Eastern, Inc; Project #05268G; 5/16/2005
Modification Drawings	N/A
Mount Analysis	TES 128399, dated 05/16/2022

Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the TIA-222-G-2**.** In accordance with this standard, the structure was analyzed using **TESPoles,** a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 120.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 93.0 mph (3-Sec. Gust)
Wind Speed with Ice:	40 mph (3-Sec. Gust) with 1" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	TIA-222-G-2 / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.174, S_1 = 0.065

This structural analysis is based upon the tower being classified as a Structure Class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	150.0	12	Decibel DB846G90A-XY	Low Profile Platform	(12) 1 5/8"	Nextel*
2	139.0	6	Powerwave 7770	Low Profile Platform	(12) 1 5/8" (1) 3/4" DC (1) 7/16" Fiber	AT&T
3		1	Kathrein 800 10764			
4		2	KMW AM-X-CD-16-65-00T-RET			
5		6	Powerwave LGP 21401			
6		6	Powerwave LGP 13519			
7		6	Ericsson RRUS 11			
8		1	Raycap DC6-48-60-18-8F - SP			
9		1	Commscope ABT-DFDM-ADBH - Bias T			
10	127.0	6	Commscope NHH-85B-R2B - Panel	Low Profile Platform	(11) 1 5/8" (1) 1 5/8" Hybrid	Verizon
11		3	Samsung MT6407-77A - Panel			
12		3	Commscope TD-850B-LTE78-43-Diplexer / Dual Coupler			
13		3	Samsung RFV01U-D2A RRU			
14		3	Samsung RFV01U-D1A RRU			
15		1	RFS DB-C1-12C-24ab-0Z-OVP			
-	117.0	4	Ericsson Air 32 KRD901146-1_B66A_B2A	SitePro F4P-10W w/ F4P-HRK10 Handrail Kit	(4) 1 5/8" Fiber	T-Mobile
-		4	RFS APXVAA24_43-U-A20			
-		4	RFS APXV18-206517S-A20			
-		4	Ericsson S11B12			
-		4	Ericsson RRU 2217 B2			
21	65.0	2	Motorola RRA4905A	Direct	(2) 1/2"	Verizon

*Terminated but not yet removed.

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
16	117.0	4	Ericsson 4480 B71 + B85	SitePro F4P-10W w/ F4P-HRK10 Handrail Kit	(4) 1 5/8" Fiber	T-Mobile
17		4	Ericsson Air 32 KRD901146-1_B66A_B2A - Panel			
18		4	RFS APXVAA24_43-U-A20 - Panel			
19		4	RFS APXV18-206517S-A20 - Panel			
20		4	Ericsson RRU 2217 B2 - RRU			

See the attached coax layout for the line placement considered in the analysis.

Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**55.6%**	**41.7%**	**47.7%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	4200.0	39.0
Analysis Reactions	2834.5	25.9
Factored Reactions*	5670.0	52.7
% of Design Reactions	50.0%	49.2%

* Per section 15.5.1 of the TIA-222-G standard, factored reactions were obtained by multiplying a 1.35 factor to the original design reactions.

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by TIA-222 for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.8692 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the TIA-222 Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.

3. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the ANSI/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

4. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

5. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

6. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

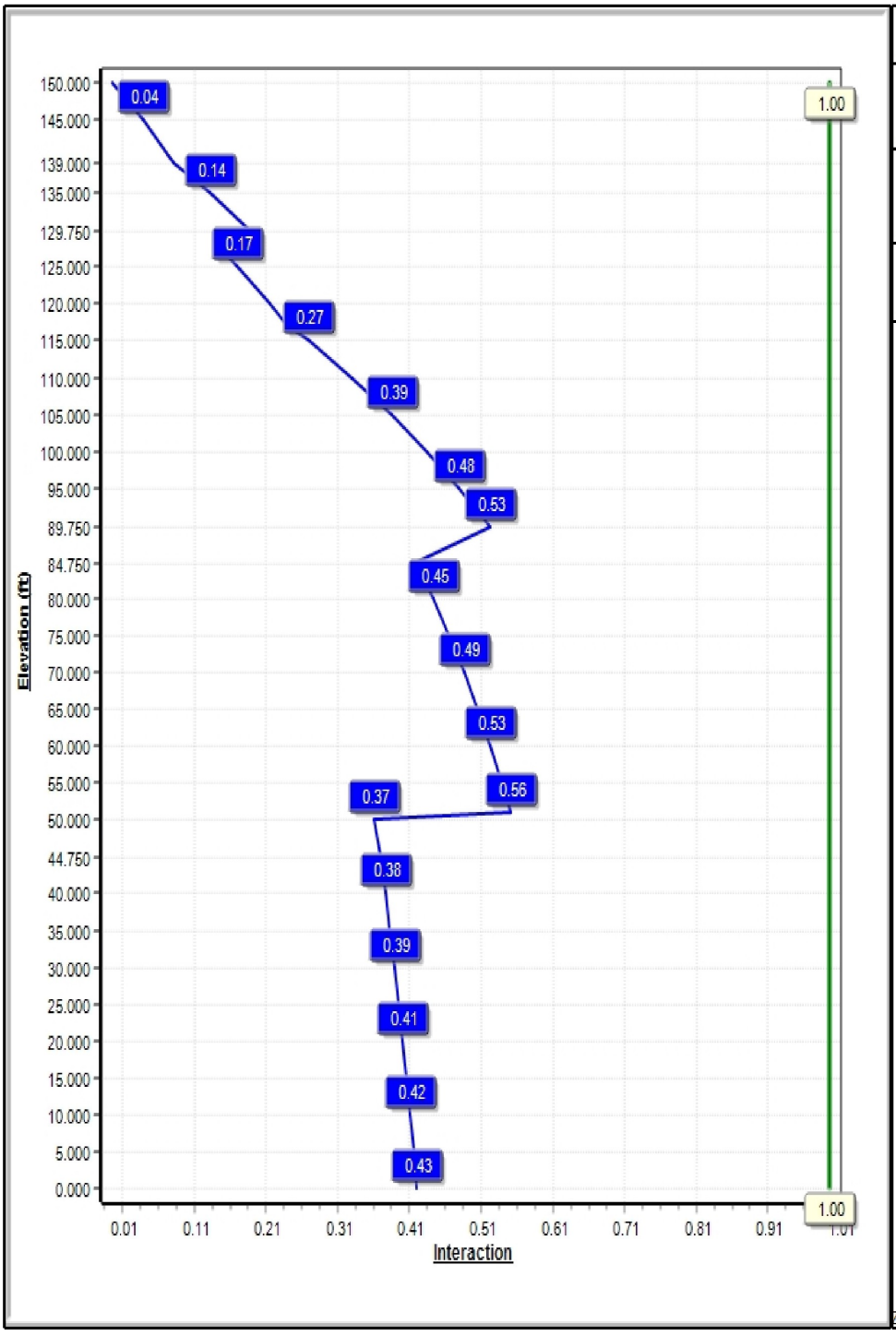
Usage Diagram - Max Ratio 55.60% at 51.0ft

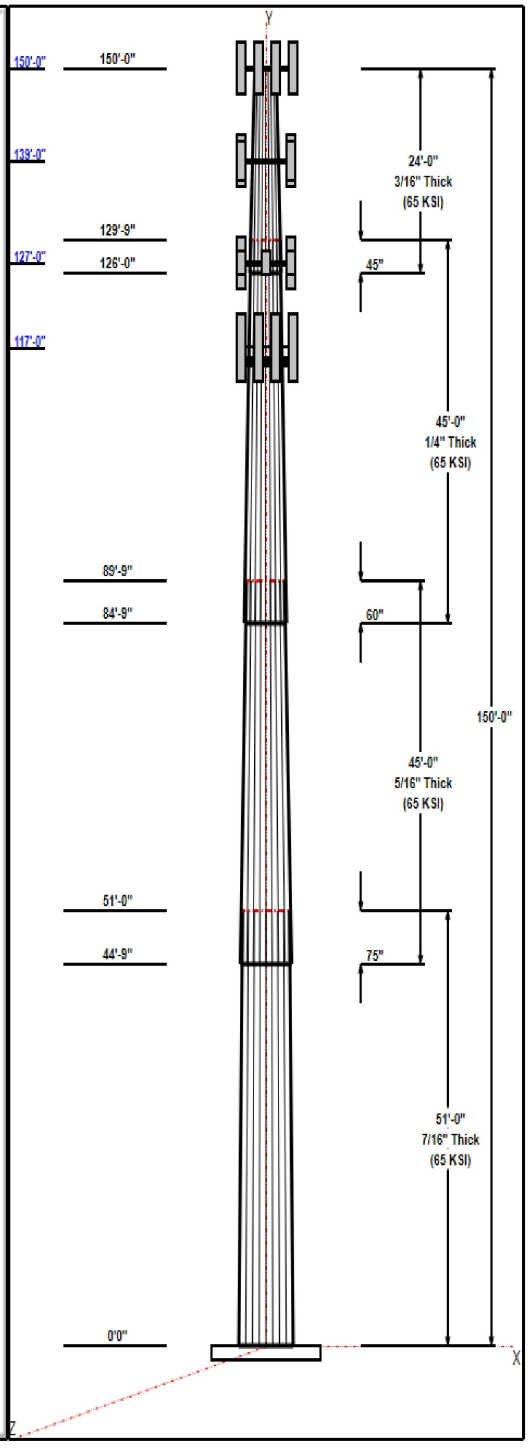
Structure:	CT13613-A-SBA	**Code:**	EIA/TIA-222-G	5/20/2022
Site Name:	Johnson	**Exposure:**	B	
Height:	150.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

Tower Engineering Solutions

Dead Load Factor:	1.20	**Iterations:**	22
Wind Load Factor:	1.60		

Load Case : 1.2D + 1.6W 93 mph Wind





Structure: CT13613-A-SBA

Type: Tapered
Site Name: Johnson
Height: 150.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.26000

5/20/2022

Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	51.00	46.74	60.00	0.438		0.26000	65
2	45.00	37.29	48.99	0.313	Slip	0.26000	65
3	45.00	27.39	39.09	0.250	Slip	0.26000	65
4	24.00	22.50	28.74	0.188	Slip	0.26000	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
150.00	150.00	1	Low Profile Platform	Nextel
150.00	150.00	12	Decibel DB846G90A-XY	Nextel
139.00	139.00	1	Low Profile Platform	AT&T
139.00	139.00	6	Powerwave 7770	AT&T
139.00	139.00	1	Kathrein 800 10764	AT&T
139.00	139.00	2	KMW	AT&T
139.00	139.00	6	Powerwave LGP 21401	AT&T
139.00	139.00	6	Powerwave LGP 13519	AT&T
139.00	139.00	6	Ericsson RRUS 11	AT&T
139.00	139.00	1	Raycap DC6-48-60-18-8F -	AT&T
139.00	139.00	1	Commscope	AT&T
127.00	127.00	1	Low Profile Platform	Verizon
127.00	127.00	6	Commscope	Verizon
127.00	127.00	3	Samsung MT6407-77A	Verizon
127.00	127.00	3	Commscope	Verizon
127.00	127.00	3	Samsung RFV01U-D2A	Verizon
127.00	127.00	3	Samsung RFV01U-D1A	Verizon
127.00	127.00	1	RFS	Verizon
117.00	117.00	4	Ericsson 4480 B71 + B85	T-Mobile
117.00	117.00	1	SitePro F4P-10W	T-Mobile
117.00	117.00	1	F4P-HRK10	T-Mobile
117.00	117.00	4	Ericsson Air 32	T-Mobile
117.00	117.00	4	RFS	T-Mobile
117.00	117.00	4	RFS	T-Mobile
117.00	117.00	4	Ericsson RRU 2217 B2	T-Mobile
65.00	65.00	2	Motorola RRA4905A	Verizon

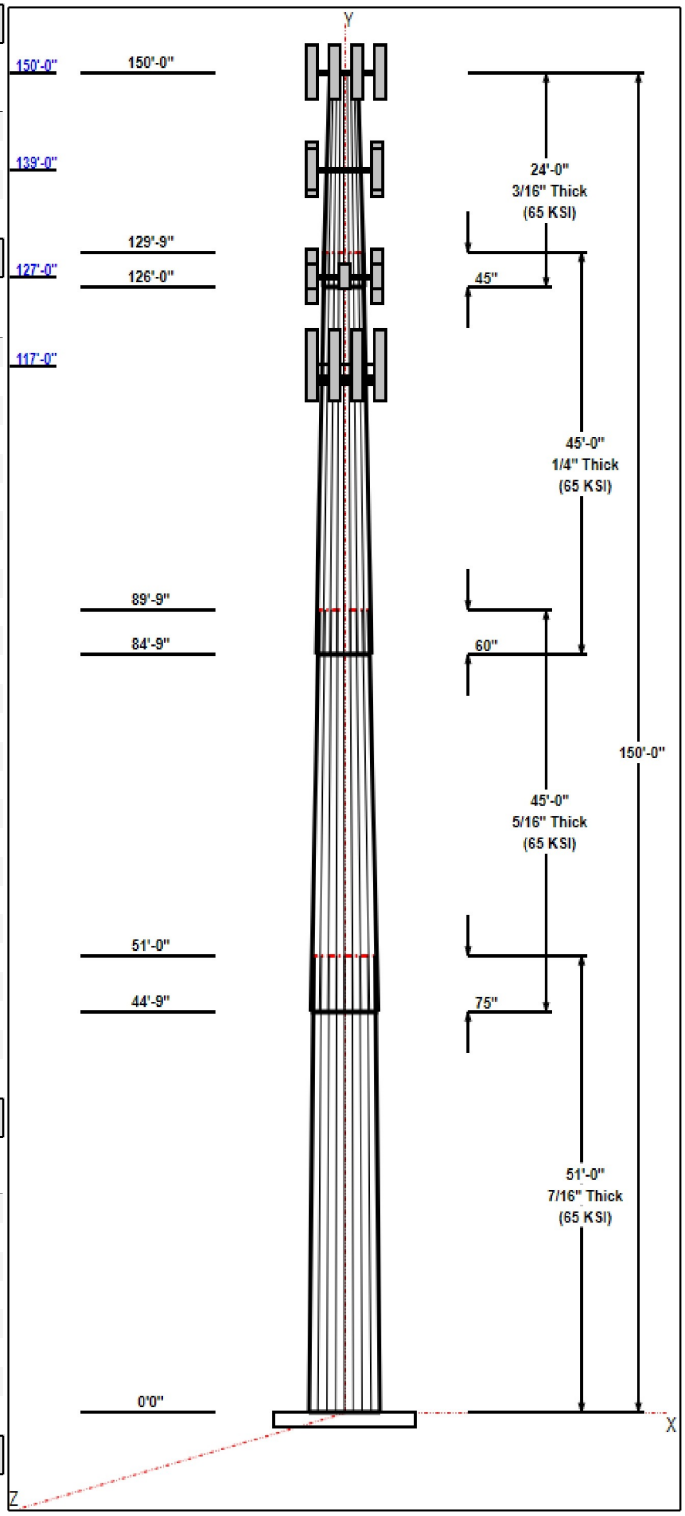
Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	150.00	Inside	1 5/8" Coax	Nextel
0.00	139.00	Inside	1 5/8" Coax	AT&T
0.00	139.00	Inside	3/4" DC	AT&T
0.00	139.00	Inside	7/16" Fiber	AT&T
0.00	127.00	Inside	1 5/8" Coax	Verizon
0.00	127.00	Inside	1 5/8" Hybrid	Verizon
0.00	117.00	Inside	1 5/8" Fiber	T-Mobile
0.00	65.00	Outside	1/2" Coax	Verizon

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
20	2.25" 18J	75.0	Cluster

Base Plate



Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.7500	66.0	50.0	Clipped

Reactions

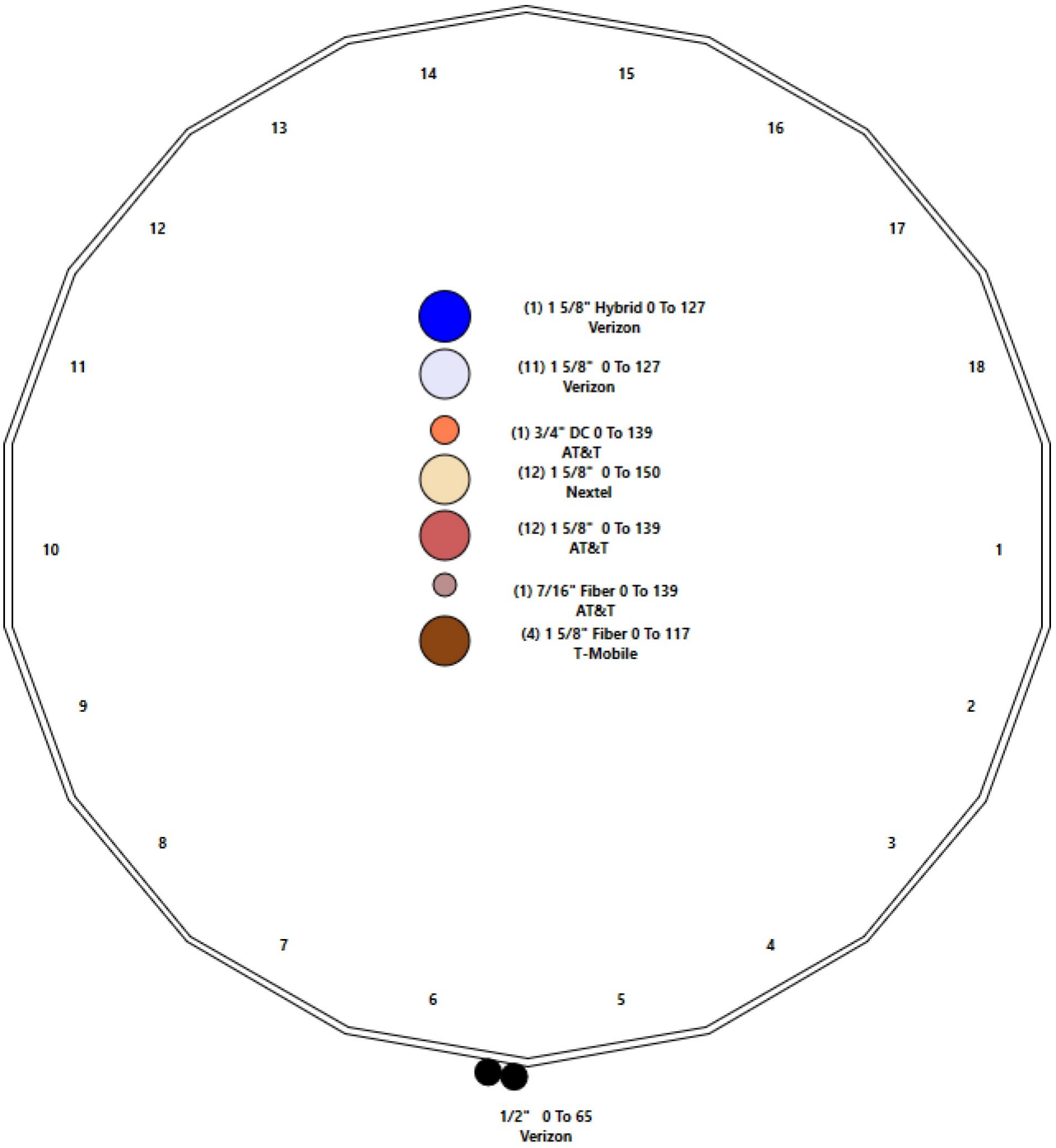
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 93 mph Wind	2834.5	25.9	49.5
0.9D + 1.6W 93 mph Wind	2810.9	25.9	37.1
1.2D + 1.0Di + 1.0Wi 40 mph Wind	603.5	5.5	86.5
1.2D + 1.0E	176.0	1.6	49.5
0.9D + 1.0E	174.4	1.6	37.1
1.0D + 1.0W 60 mph Wind	733.6	6.7	41.2

Structure: CT13613-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Johnson
Height: 150.00 (ft)

5/20/2022

Tower Engineering Solutions



Shaft Properties

Structure:	CT13613-A-SBA		**Code:**	TIA-222-G	5/20/2022
Site Name:	Johnson		**Exposure:**	B	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	51.000	0.4375	65		0.00	12,755
2	18	45.000	0.3125	65	Slip	75.00	6,504
3	18	45.000	0.2500	65	Slip	60.00	4,008
4	18	24.000	0.1875	65	Slip	45.00	1,236
					Total Shaft Weight:		**24,504**

	Bottom						Top						
Sec. No.	**Dia (in)**	**Elev (ft)**	**Area (sqin)**	**Ix (in^4)**	**W/t Ratio**	**D/t Ratio**	**Dia (in)**	**Elev (ft)**	**Area (sqin)**	**Ix (in^4)**	**W/t Ratio**	**D/t Ratio**	**Taper**
1	60.00	0.00	82.71	37071.59	22.77	137.14	46.74	51.00	64.29	17415.4	17.43	106.8	0.260000
2	48.99	44.75	48.28	14453.71	26.23	156.77	37.29	89.75	36.68	6335.88	19.63	119.3	0.260000
3	39.09	84.75	30.82	5873.84	26.16	156.36	27.39	129.75	21.53	2004.07	17.91	109.5	0.260000
4	28.74	126.0	16.99	1750.16	25.62	153.28	22.50	150.00	13.28	835.20	19.75	120.0	0.260000

Load Summary

Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

Tower Engineering Solutions

Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	150.00	Low Profile Platform	1	1500.00	22.00	1.00	3245.22	45.549	1.00	0.00	0.00
2	150.00	Decibel DB846G90A-XY	12	15.40	5.01	1.12	244.68	6.674	1.12	0.00	0.00
3	139.00	Low Profile Platform	1	1500.00	22.00	1.00	3231.97	45.370	1.00	0.00	0.00
4	139.00	Powerwave 7770	6	35.00	5.50	0.73	221.12	6.928	0.73	0.00	0.00
5	139.00	Kathrein 800 10764	1	40.80	5.88	1.00	209.53	8.715	1.00	0.00	0.00
6	139.00	KMW AM-X-CD-16-65-00T-RET	2	48.50	8.02	0.90	263.23	11.717	0.90	0.00	0.00
7	139.00	Powerwave LGP 21401	6	17.50	0.00	0.67	49.83	0.000	0.67	0.00	0.00
8	139.00	Powerwave LGP 13519	6	5.30	0.34	0.67	17.87	0.941	0.67	0.00	0.00
9	139.00	Ericsson RRUS 11	6	50.70	2.52	0.67	144.37	3.684	0.67	0.00	0.00
10	139.00	Raycap DC6-48-60-18-8F - SP	1	31.80	0.92	1.00	113.61	1.500	1.00	0.00	0.00
11	139.00	Commscope ABT-DFDM-ADBH -	1	1.10	0.05	1.00	4.05	0.305	1.00	0.00	0.00
12	127.00	Low Profile Platform	1	1500.00	22.00	1.00	3216.41	45.160	1.00	0.00	0.00
13	127.00	Commscope NHH-85B-R2B	6	43.70	8.17	0.85	327.19	9.947	0.85	0.00	0.00
14	127.00	Samsung MT6407-77A	3	79.40	4.69	0.70	246.60	5.950	0.70	0.00	0.00
15	127.00	Commscope TD-850B-LTE78-43	3	7.90	1.48	0.50	62.85	2.640	0.50	0.00	0.00
16	127.00	Samsung RFV01U-D2A RRU	3	82.00	1.88	0.67	156.39	2.603	0.67	0.00	0.00
17	127.00	Samsung RFV01U-D1A RRU	3	97.50	1.88	0.67	175.15	2.603	0.67	0.00	0.00
18	127.00	RFS DB-C1-12C-24AB-0Z-OVP	1	32.00	4.06	1.00	181.40	5.138	1.00	0.00	0.00
19	117.00	Ericsson 4480 B71 + B85	4	93.00	2.85	0.67	186.56	3.727	0.67	0.00	0.00
20	117.00	SitePro F4P-10W	1	2396.00	58.98	1.00	5441.59	50.016	1.00	0.00	0.00
21	117.00	F4P-HRK10	1	478.27	9.00	1.00	1086.21	22.892	1.00	0.00	0.00
22	117.00	Ericsson Air 32	4	105.80	6.51	0.87	340.86	7.994	0.87	0.00	0.00
23	117.00	RFS APXVAA24_43-U-A20	4	99.00	20.24	0.73	711.39	22.739	0.73	0.00	0.00
24	117.00	RFS APXV18-206517S-A20	4	26.40	5.17	0.73	147.16	8.259	0.73	0.00	0.00
25	117.00	Ericsson RRU 2217 B2	4	44.00	2.57	0.67	126.30	3.410	0.67	0.00	0.00
26	65.00	Motorola RRA4905A	2	1.00	0.14	1.00	12.56	0.616	1.00	0.00	0.00
		Totals:	**87**	**10,950.17**			**32,752.02**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	150.00	(12) 1 5/8" Coax	0.00	Inside
0.00	139.00	(12) 1 5/8" Coax	0.00	Inside
0.00	139.00	(1) 3/4" DC	0.00	Inside
0.00	139.00	(1) 7/16" Fiber	0.00	Inside
0.00	127.00	(11) 1 5/8" Coax	0.00	Inside
0.00	127.00	(1) 1 5/8" Hybrid	0.00	Inside
0.00	117.00	(4) 1 5/8" Fiber	0.00	Inside
0.00	65.00	(2) 1/2" Coax	0.65	Outside

Shaft Section Properties

Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 7	

Increment Length: **5 (ft)**

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.4375	60.000	82.707	37071.6	22.77	137.14	74.6	1216.	0.0
5.00		0.4375	58.700	80.902	34696.8	22.25	134.17	75.2	1164.	1391.8
10.00		0.4375	57.400	79.097	32425.7	21.72	131.20	75.8	1112.	1361.1
15.00		0.4375	56.100	77.292	30255.9	21.20	128.23	76.5	1062.	1330.4
20.00		0.4375	54.800	75.486	28185.2	20.68	125.26	77.1	1013.	1299.7
25.00		0.4375	53.500	73.681	26211.1	20.15	122.29	77.7	965.0	1269.0
30.00		0.4375	52.200	71.876	24331.5	19.63	119.31	78.3	918.1	1238.2
35.00		0.4375	50.900	70.071	22543.9	19.10	116.34	78.9	872.4	1207.5
40.00		0.4375	49.600	68.266	20846.1	18.58	113.37	79.5	827.8	1176.8
44.75	Bot - Section 2	0.4375	48.365	66.551	19314.2	18.08	110.55	80.1	786.6	1089.5
45.00		0.4375	48.300	66.461	19235.7	18.06	110.40	80.2	784.4	97.6
50.00		0.4375	47.000	64.656	17710.5	17.53	107.43	80.8	742.2	1924.8
51.00	Top - Section 1	0.3125	47.365	46.669	13054.0	25.31	151.57	0.0	0.0	378.6
55.00		0.3125	46.325	45.637	12207.4	24.73	148.24	72.3	519.0	628.2
60.00		0.3125	45.025	44.348	11201.6	23.99	144.08	73.2	490.0	765.5
65.00		0.3125	43.725	43.058	10252.7	23.26	139.92	74.0	461.8	743.6
70.00		0.3125	42.425	41.769	9359.0	22.53	135.76	74.9	434.5	721.6
75.00		0.3125	41.125	40.479	8518.7	21.79	131.60	75.8	408.0	699.7
80.00		0.3125	39.825	39.190	7730.3	21.06	127.44	76.6	382.3	677.7
84.75	Bot - Section 3	0.3125	38.590	37.965	7027.9	20.36	123.49	77.4	358.7	623.5
85.00		0.3125	38.525	37.901	6992.2	20.33	123.28	77.5	357.5	58.5
89.75	Top - Section 2	0.2500	37.790	29.787	5303.6	25.24	151.16	0.0	0.0	1092.1
90.00		0.2500	37.725	29.735	5276.1	25.20	150.90	71.8	275.5	25.3
95.00		0.2500	36.425	28.704	4745.8	24.28	145.70	72.8	256.6	497.1
100.00		0.2500	35.125	27.672	4252.3	23.36	140.50	73.9	238.4	479.6
105.00		0.2500	33.825	26.641	3794.3	22.45	135.30	75.0	220.9	462.0
110.00		0.2500	32.525	25.609	3370.4	21.53	130.10	76.1	204.1	444.5
115.00		0.2500	31.225	24.578	2979.3	20.61	124.90	77.2	187.9	426.9
117.00		0.2500	30.705	24.165	2831.8	20.25	122.82	77.6	181.6	165.9
120.00		0.2500	29.925	23.546	2619.7	19.70	119.70	78.2	172.4	243.5
125.00		0.2500	28.625	22.515	2290.3	18.78	114.50	79.3	157.6	391.8
126.00	Bot - Section 4	0.2500	28.365	22.308	2227.9	18.60	113.46	79.5	154.7	76.3
127.00		0.2500	28.105	22.102	2166.7	18.41	112.42	79.7	151.8	133.1
129.75	Top - Section 3	0.1875	27.765	16.411	1576.9	24.70	148.08	0.0	0.0	359.7
130.00		0.1875	27.700	16.373	1565.8	24.64	147.73	72.4	111.3	13.9
135.00		0.1875	26.400	15.599	1354.2	23.42	140.80	73.9	101.0	272.0
139.00		0.1875	25.360	14.980	1199.3	22.44	135.25	75.0	93.1	208.1
140.00		0.1875	25.100	14.826	1162.5	22.19	133.87	75.3	91.2	50.7
145.00		0.1875	23.800	14.052	989.9	20.97	126.93	76.7	81.9	245.7
150.00		0.1875	22.500	13.278	835.2	19.75	120.00	78.2	73.1	232.5
										24504.2

Wind Loading - Shaft

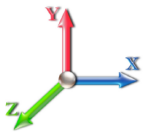
Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 22

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	14.724	16.20	395.05	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	14.724	16.20	386.49	0.650	0.000	5.00	25.111	16.32	423.0	0.0	1670.2
10.00		1.00	0.70	14.724	16.20	377.93	0.650	0.000	5.00	24.561	15.96	413.7	0.0	1633.3
15.00		1.00	0.70	14.724	16.20	369.37	0.650	0.000	5.00	24.011	15.61	404.4	0.0	1596.5
20.00		1.00	0.70	14.724	16.20	360.81	0.650	0.000	5.00	23.461	15.25	395.2	0.0	1559.6
25.00		1.00	0.70	14.724	16.20	352.25	0.650	0.000	5.00	22.911	14.89	385.9	0.0	1522.8
30.00		1.00	0.70	14.736	16.21	343.84	0.650	0.000	5.00	22.361	14.53	377.0	0.0	1485.9
35.00		1.00	0.73	15.400	16.94	342.74	0.650	0.000	5.00	21.811	14.18	384.2	0.0	1449.0
40.00		1.00	0.76	15.999	17.60	340.42	0.650	0.000	5.00	21.260	13.82	389.1	0.0	1412.2
44.75	Bot - Section 2	1.00	0.79	16.520	18.17	337.31	0.650	0.000	4.75	19.688	12.80	372.1	0.0	1307.4
45.00		1.00	0.79	16.546	18.20	337.12	0.650	0.000	0.25	1.036	0.67	19.6	0.0	117.1
50.00		1.00	0.81	17.052	18.76	333.02	0.650	0.000	5.00	20.425	13.28	398.4	0.0	2309.7
51.00	Top - Section 1	1.00	0.82	17.149	18.86	332.12	0.650	0.000	1.00	4.019	2.61	78.8	0.0	454.4
55.00		1.00	0.83	17.523	19.28	332.74	0.650	0.000	4.00	15.856	10.31	317.9	0.0	753.8
60.00		1.00	0.85	17.964	19.76	327.45	0.650	0.000	5.00	19.325	12.56	397.1	0.0	918.6
65.00	Appurtenance(s)	1.00	0.87	18.380	20.22	321.65	0.650	0.000	5.00	18.775	12.20	394.8	0.0	892.3
70.00		1.00	0.89	18.773	20.65	315.41	0.650	0.000	5.00	18.225	11.85	391.4	0.0	865.9
75.00		1.00	0.91	19.147	21.06	308.77	0.650	0.000	5.00	17.675	11.49	387.1	0.0	839.6
80.00		1.00	0.93	19.503	21.45	301.78	0.650	0.000	5.00	17.125	11.13	382.1	0.0	813.3
84.75	Bot - Section 3	1.00	0.94	19.827	21.81	294.84	0.650	0.000	4.75	15.759	10.24	357.4	0.0	748.2
85.00		1.00	0.94	19.844	21.83	294.47	0.650	0.000	0.25	0.826	0.54	18.8	0.0	70.2
89.75	Top - Section 2	1.00	0.96	20.154	22.17	287.25	0.650	0.000	4.75	15.437	10.03	355.9	0.0	1310.5
90.00		1.00	0.96	20.170	22.19	290.72	0.650	0.000	0.25	0.799	0.52	18.4	0.0	30.4
95.00		1.00	0.97	20.484	22.53	282.88	0.650	0.000	5.00	15.686	10.20	367.6	0.0	596.6
100.00		1.00	0.99	20.787	22.87	274.79	0.650	0.000	5.00	15.136	9.84	359.9	0.0	575.5
105.00		1.00	1.00	21.079	23.19	266.47	0.650	0.000	5.00	14.586	9.48	351.7	0.0	554.4
110.00		1.00	1.02	21.361	23.50	257.93	0.650	0.000	5.00	14.036	9.12	343.0	0.0	533.4
115.00		1.00	1.03	21.634	23.80	249.20	0.650	0.000	5.00	13.486	8.77	333.8	0.0	512.3
117.00	Appurtenance(s)	1.00	1.03	21.741	23.91	245.66	0.650	0.000	2.00	5.240	3.41	130.3	0.0	199.0
120.00		1.00	1.04	21.898	24.09	240.28	0.650	0.000	3.00	7.696	5.00	192.8	0.0	292.2
125.00		1.00	1.05	22.155	24.37	231.19	0.650	0.000	5.00	12.386	8.05	313.9	0.0	470.2
126.00	Bot - Section 4	1.00	1.06	22.206	24.43	229.35	0.650	0.000	1.00	2.411	1.57	61.3	0.0	91.5
127.00	Appurtenance(s)	1.00	1.06	22.256	24.48	227.51	0.650	0.000	1.00	2.421	1.57	61.6	0.0	159.7
129.75	Top - Section 3	1.00	1.06	22.393	24.63	222.40	0.650	0.000	2.75	6.544	4.25	167.6	0.0	431.7
130.00		1.00	1.07	22.405	24.65	224.98	0.650	0.000	0.25	0.587	0.38	15.0	0.0	16.7
135.00		1.00	1.08	22.648	24.91	215.58	0.650	0.000	5.00	11.445	7.44	296.5	0.0	326.4
139.00	Appurtenance(s)	1.00	1.09	22.838	25.12	207.95	0.650	0.000	4.00	8.760	5.69	228.9	0.0	249.7
140.00		1.00	1.09	22.884	25.17	206.03	0.650	0.000	1.00	2.135	1.39	55.9	0.0	60.9
145.00		1.00	1.10	23.115	25.43	196.34	0.650	0.000	5.00	10.345	6.72	273.5	0.0	294.8
150.00	Appurtenance(s)	1.00	1.11	23.340	25.67	186.52	0.650	0.000	5.00	9.795	6.37	261.5	0.0	279.0
								Totals:	**150.00**			**10,877.5**		**29,405.0**

Discrete Appurtenance Forces

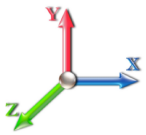
Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 22

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	150.00	Decibel DB846G90A-XY	12	23.340	25.674	1.01	0.90	60.60	221.76	0.000	0.000	2489.38	0.00	0.00
2	150.00	Low Profile Platform	1	23.340	25.674	1.00	1.00	22.00	1800.00	0.000	0.000	903.72	0.00	0.00
3	139.00	Low Profile Platform	1	22.838	25.121	1.00	1.00	22.00	1800.00	0.000	0.000	884.27	0.00	0.00
4	139.00	Powerwave 7770	6	22.838	25.121	0.58	0.80	19.27	252.00	0.000	0.000	774.62	0.00	0.00
5	139.00	Kathrein 800 10764	1	22.838	25.121	1.00	1.00	5.88	48.96	0.000	0.000	236.34	0.00	0.00
6	139.00	KMW	2	22.838	25.121	0.81	0.90	12.99	116.40	0.000	0.000	522.22	0.00	0.00
7	139.00	Powerwave LGP 21401	6	22.838	25.121	0.54	0.80	0.00	126.00	0.000	0.000	0.00	0.00	0.00
8	139.00	Powerwave LGP 13519	6	22.838	25.121	0.54	0.80	1.09	38.16	0.000	0.000	43.95	0.00	0.00
9	139.00	Ericsson RRUS 11	6	22.838	25.121	0.54	0.80	8.10	365.04	0.000	0.000	325.75	0.00	0.00
10	139.00	Raycap DC6-48-60-18-8F	1	22.838	25.121	1.00	1.00	0.92	38.16	0.000	0.000	36.98	0.00	0.00
11	139.00	Commscope	1	22.838	25.121	1.00	1.00	0.05	1.32	0.000	0.000	2.01	0.00	0.00
12	127.00	RFS	1	22.256	24.482	1.00	1.00	4.06	38.40	0.000	0.000	159.03	0.00	0.00
13	127.00	Samsung RFV01U-D1A	3	22.256	24.482	0.54	0.80	3.02	351.00	0.000	0.000	118.41	0.00	0.00
14	127.00	Samsung RFV01U-D2A	3	22.256	24.482	0.54	0.80	3.02	295.20	0.000	0.000	118.41	0.00	0.00
15	127.00	Samsung MT6407-77A	3	22.256	24.482	0.56	0.80	7.88	285.84	0.000	0.000	308.63	0.00	0.00
16	127.00	Commscope	6	22.256	24.482	0.68	0.80	33.33	314.64	0.000	0.000	1305.69	0.00	0.00
17	127.00	Low Profile Platform	1	22.256	24.482	1.00	1.00	22.00	1800.00	0.000	0.000	861.75	0.00	0.00
18	127.00	Commscope	3	22.256	24.482	0.40	0.80	1.78	28.44	0.000	0.000	69.57	0.00	0.00
19	117.00	F4P-HRK10	1	21.741	23.915	1.00	1.00	9.00	573.92	0.000	0.000	344.37	0.00	0.00
20	117.00	Ericsson 4480 B71 + B85	4	21.741	23.915	0.50	0.75	5.73	446.40	0.000	0.000	219.19	0.00	0.00
21	117.00	SitePro F4P-10W	1	21.741	23.915	1.00	1.00	58.98	2875.20	0.000	0.000	2256.77	0.00	0.00
22	117.00	RFS	4	21.741	23.915	0.55	0.75	11.32	126.72	0.000	0.000	433.23	0.00	0.00
23	117.00	Ericsson Air 32	4	21.741	23.915	0.65	0.75	16.99	507.84	0.000	0.000	650.14	0.00	0.00
24	117.00	RFS	4	21.741	23.915	0.55	0.75	44.33	475.20	0.000	0.000	1696.04	0.00	0.00
25	117.00	Ericsson RRU 2217 B2	4	21.741	23.915	0.50	0.75	5.17	211.20	0.000	0.000	197.66	0.00	0.00
26	65.00	Motorola RRA4905A	2	18.380	20.217	1.00	1.00	0.28	2.40	0.000	0.000	9.06	0.00	0.00
							Totals:		**13,140.20**			**14,967.19**		

Total Applied Force Summary

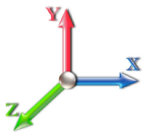
Structure:	CT13613-A-SBA		**Code:**	TIA-222-G	5/20/2022
Site Name:	Johnson		**Exposure:**	B	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 10

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 22

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		422.97	1925.41	0.00	0.00
10.00		413.71	1888.56	0.00	0.00
15.00		404.44	1851.70	0.00	0.00
20.00		395.18	1814.85	0.00	0.00
25.00		385.91	1777.99	0.00	0.00
30.00		376.97	1741.14	0.00	0.00
35.00		384.25	1704.28	0.00	0.00
40.00		389.13	1667.43	0.00	0.00
44.75		372.09	1549.92	0.00	0.00
45.00		19.60	129.91	0.00	0.00
50.00		398.44	2564.96	0.00	0.00
51.00		78.85	505.41	0.00	0.00
55.00		317.85	958.02	0.00	0.00
60.00		397.14	1173.83	0.00	0.00
65.00	(2) attachments	403.82	1149.91	0.00	0.00
70.00		391.40	1119.26	0.00	0.00
75.00		387.14	1092.94	0.00	0.00
80.00		382.08	1066.61	0.00	0.00
84.75		357.45	988.90	0.00	0.00
85.00		18.76	82.82	0.00	0.00
89.75		355.94	1551.14	0.00	0.00
90.00		18.43	43.05	0.00	0.00
95.00		367.59	849.89	0.00	0.00
100.00		359.94	828.83	0.00	0.00
105.00		351.73	807.77	0.00	0.00
110.00		343.00	786.71	0.00	0.00
115.00		333.77	765.65	0.00	0.00
117.00	(22) attachments	5927.73	5516.85	0.00	0.00
120.00		192.79	429.25	0.00	0.00
125.00		313.93	698.57	0.00	0.00
126.00		61.25	137.19	0.00	0.00
127.00	(20) attachments	3003.14	3318.93	0.00	0.00
129.75		167.64	515.90	0.00	0.00
130.00		15.04	24.39	0.00	0.00
135.00		296.52	479.50	0.00	0.00
139.00	(30) attachments	3054.99	3158.27	0.00	0.00
140.00		55.89	75.83	0.00	0.00
145.00		273.55	369.67	0.00	0.00
150.00	(13) attachments	3654.63	2375.64	0.00	0.00
	Totals:	**25,844.67**	**49,486.84**	**0.00**	**0.00**

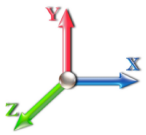
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 22

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.011	0.000	14.724	0.00	1.92
10.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.011	0.000	14.724	0.00	1.92
15.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.011	0.000	14.724	0.00	1.92
20.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	14.724	0.00	1.92
25.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	14.724	0.00	1.92
30.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	14.736	0.00	1.92
35.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	15.400	0.00	1.92
40.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	15.999	0.00	1.92
44.75	1/2" Coax	Yes	4.75	0.000	0.65	0.26	0.00	0.013	0.000	16.520	0.00	1.82
45.00	1/2" Coax	Yes	0.25	0.000	0.65	0.01	0.00	0.013	0.000	16.546	0.00	0.10
50.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	17.052	0.00	1.92
51.00	1/2" Coax	Yes	1.00	0.000	0.65	0.05	0.00	0.014	0.000	17.149	0.00	0.38
55.00	1/2" Coax	Yes	4.00	0.000	0.65	0.22	0.00	0.014	0.000	17.523	0.00	1.54
60.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.014	0.000	17.964	0.00	1.92
65.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.014	0.000	18.380	0.00	1.92
									Totals:		**0.0**	**25.0**

Calculated Forces

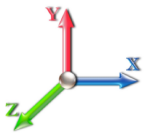
Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 22

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-49.46	-25.89	0.00	-2834.5	0.00	2834.51	5554.25	2777.13	13600.6	6810.41	0.00	0.000	0.000	0.425
5.00	-47.49	-25.55	0.00	-2705.0	0.00	2705.05	5477.89	2738.95	13118.7	6569.12	0.06	-0.106	0.000	0.421
10.00	-45.55	-25.22	0.00	-2577.2	0.00	2577.28	5399.54	2699.77	12640.4	6329.59	0.23	-0.215	0.000	0.416
15.00	-43.66	-24.89	0.00	-2451.1	0.00	2451.17	5319.17	2659.59	12165.9	6092.00	0.51	-0.325	0.000	0.411
20.00	-41.80	-24.57	0.00	-2326.7	0.00	2326.70	5236.81	2618.40	11695.6	5856.50	0.91	-0.437	0.000	0.405
25.00	-39.97	-24.25	0.00	-2203.8	0.00	2203.85	5152.44	2576.22	11229.8	5623.26	1.43	-0.552	0.000	0.400
30.00	-38.19	-23.93	0.00	-2082.6	0.00	2082.61	5066.07	2533.04	10768.8	5392.43	2.07	-0.668	0.000	0.394
35.00	-36.44	-23.60	0.00	-1962.9	0.00	1962.95	4977.70	2488.85	10313.0	5164.19	2.84	-0.786	0.000	0.388
40.00	-34.73	-23.26	0.00	-1844.9	0.00	1844.95	4887.33	2443.67	9862.71	4938.68	3.72	-0.906	0.000	0.381
44.75	-33.16	-22.90	0.00	-1734.4	0.00	1734.46	4799.62	2399.81	9440.25	4727.14	4.68	-1.022	0.000	0.374
45.00	-33.00	-22.91	0.00	-1728.7	0.00	1728.74	4794.96	2397.48	9418.17	4716.08	4.74	-1.029	0.000	0.374
50.00	-30.42	-22.50	0.00	-1614.1	0.00	1614.18	4700.58	2350.29	8979.75	4496.55	5.88	-1.152	0.000	0.366
51.00	-29.89	-22.45	0.00	-1591.6	0.00	1591.67	3008.41	1504.20	5823.48	2916.07	6.13	-1.178	0.000	0.556
55.00	-28.89	-22.18	0.00	-1501.8	0.00	1501.88	2970.26	1485.13	5621.72	2815.04	7.16	-1.279	0.000	0.543
60.00	-27.66	-21.84	0.00	-1390.9	0.00	1390.99	2920.78	1460.39	5370.82	2689.40	8.59	-1.448	0.000	0.527
65.00	-26.46	-21.48	0.00	-1281.8	0.00	1281.81	2869.29	1434.64	5121.68	2564.65	10.20	-1.617	0.000	0.509
70.00	-25.29	-21.13	0.00	-1174.4	0.00	1174.41	2815.80	1407.90	4874.61	2440.93	11.98	-1.788	0.000	0.490
75.00	-24.14	-20.78	0.00	-1068.7	0.00	1068.76	2760.31	1380.15	4629.95	2318.41	13.95	-1.958	0.000	0.470
80.00	-23.03	-20.43	0.00	-964.86	0.00	964.86	2702.81	1351.41	4388.01	2197.26	16.09	-2.128	0.000	0.448
84.75	-22.03	-20.06	0.00	-867.84	0.00	867.84	2646.34	1323.17	4160.98	2083.58	18.29	-2.288	0.000	0.425
85.00	-21.92	-20.07	0.00	-862.82	0.00	862.82	2643.31	1321.66	4149.11	2077.64	18.41	-2.297	0.000	0.424
89.75	-20.36	-19.68	0.00	-767.47	0.00	767.47	1922.43	961.22	2968.94	1486.68	20.77	-2.454	0.000	0.527
90.00	-20.28	-19.70	0.00	-762.55	0.00	762.55	1920.55	960.27	2960.86	1482.63	20.90	-2.463	0.000	0.525
95.00	-19.38	-19.36	0.00	-664.06	0.00	664.06	1881.78	940.89	2799.79	1401.97	23.59	-2.655	0.000	0.484
100.00	-18.51	-19.02	0.00	-567.27	0.00	567.27	1841.02	920.51	2640.02	1321.97	26.47	-2.840	0.000	0.440
105.00	-17.67	-18.68	0.00	-472.19	0.00	472.19	1798.25	899.12	2481.89	1242.79	29.54	-3.014	0.000	0.390
110.00	-16.85	-18.33	0.00	-378.82	0.00	378.82	1753.48	876.74	2325.70	1164.58	32.78	-3.173	0.000	0.335
115.00	-16.08	-17.98	0.00	-287.15	0.00	287.15	1706.70	853.35	2171.78	1087.50	36.18	-3.314	0.000	0.274
117.00	-10.90	-11.76	0.00	-251.18	0.00	251.18	1687.43	843.72	2110.92	1057.03	37.58	-3.365	0.000	0.244
120.00	-10.47	-11.55	0.00	-215.91	0.00	215.91	1657.93	828.96	2020.46	1011.73	39.72	-3.436	0.000	0.220
125.00	-9.78	-11.21	0.00	-158.13	0.00	158.13	1607.15	803.57	1872.06	937.42	43.37	-3.537	0.000	0.175
126.00	-9.64	-11.14	0.00	-146.93	0.00	146.93	1596.75	798.38	1842.76	922.75	44.12	-3.556	0.000	0.165
127.00	-6.51	-7.94	0.00	-135.78	0.00	135.78	1586.28	793.14	1813.59	908.14	44.86	-3.574	0.000	0.154
129.75	-6.01	-7.75	0.00	-113.94	0.00	113.94	1068.62	534.31	1212.20	607.00	46.93	-3.619	0.000	0.194
130.00	-5.98	-7.73	0.00	-112.01	0.00	112.01	1067.16	533.58	1207.67	604.73	47.12	-3.623	0.000	0.191
135.00	-5.51	-7.41	0.00	-73.34	0.00	73.34	1036.93	518.46	1117.63	559.65	50.96	-3.707	0.000	0.137
139.00	-2.55	-4.16	0.00	-43.69	0.00	43.69	1011.29	505.65	1046.45	524.00	54.09	-3.757	0.000	0.086
140.00	-2.48	-4.10	0.00	-39.53	0.00	39.53	1004.68	502.34	1028.80	515.16	54.88	-3.767	0.000	0.079
145.00	-2.13	-3.80	0.00	-19.02	0.00	19.02	970.44	485.22	941.49	471.44	58.84	-3.802	0.000	0.043
150.00	0.00	-3.65	0.00	0.00	0.00	0.00	934.20	467.10	856.03	428.65	62.83	-3.816	0.000	0.000

Wind Loading - Shaft

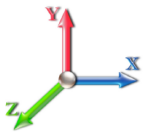
Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 22

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	14.724	16.20	395.05	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	14.724	16.20	386.49	0.650	0.000	5.00	25.111	16.32	423.0	0.0	1252.6
10.00		1.00	0.70	14.724	16.20	377.93	0.650	0.000	5.00	24.561	15.96	413.7	0.0	1225.0
15.00		1.00	0.70	14.724	16.20	369.37	0.650	0.000	5.00	24.011	15.61	404.4	0.0	1197.3
20.00		1.00	0.70	14.724	16.20	360.81	0.650	0.000	5.00	23.461	15.25	395.2	0.0	1169.7
25.00		1.00	0.70	14.724	16.20	352.25	0.650	0.000	5.00	22.911	14.89	385.9	0.0	1142.1
30.00		1.00	0.70	14.736	16.21	343.84	0.650	0.000	5.00	22.361	14.53	377.0	0.0	1114.4
35.00		1.00	0.73	15.400	16.94	342.74	0.650	0.000	5.00	21.811	14.18	384.2	0.0	1086.8
40.00		1.00	0.76	15.999	17.60	340.42	0.650	0.000	5.00	21.260	13.82	389.1	0.0	1059.1
44.75	Bot - Section 2	1.00	0.79	16.520	18.17	337.31	0.650	0.000	4.75	19.688	12.80	372.1	0.0	980.6
45.00		1.00	0.79	16.546	18.20	337.12	0.650	0.000	0.25	1.036	0.67	19.6	0.0	87.9
50.00		1.00	0.81	17.052	18.76	333.02	0.650	0.000	5.00	20.425	13.28	398.4	0.0	1732.3
51.00	Top - Section 1	1.00	0.82	17.149	18.86	332.12	0.650	0.000	1.00	4.019	2.61	78.8	0.0	340.8
55.00		1.00	0.83	17.523	19.28	332.74	0.650	0.000	4.00	15.856	10.31	317.9	0.0	565.4
60.00		1.00	0.85	17.964	19.76	327.45	0.650	0.000	5.00	19.325	12.56	397.1	0.0	688.9
65.00	Appurtenance(s)	1.00	0.87	18.380	20.22	321.65	0.650	0.000	5.00	18.775	12.20	394.8	0.0	669.2
70.00		1.00	0.89	18.773	20.65	315.41	0.650	0.000	5.00	18.225	11.85	391.4	0.0	649.5
75.00		1.00	0.91	19.147	21.06	308.77	0.650	0.000	5.00	17.675	11.49	387.1	0.0	629.7
80.00		1.00	0.93	19.503	21.45	301.78	0.650	0.000	5.00	17.125	11.13	382.1	0.0	610.0
84.75	Bot - Section 3	1.00	0.94	19.827	21.81	294.84	0.650	0.000	4.75	15.759	10.24	357.4	0.0	561.2
85.00		1.00	0.94	19.844	21.83	294.47	0.650	0.000	0.25	0.826	0.54	18.8	0.0	52.6
89.75	Top - Section 2	1.00	0.96	20.154	22.17	287.25	0.650	0.000	4.75	15.437	10.03	355.9	0.0	982.9
90.00		1.00	0.96	20.170	22.19	290.72	0.650	0.000	0.25	0.799	0.52	18.4	0.0	22.8
95.00		1.00	0.97	20.484	22.53	282.88	0.650	0.000	5.00	15.686	10.20	367.6	0.0	447.4
100.00		1.00	0.99	20.787	22.87	274.79	0.650	0.000	5.00	15.136	9.84	359.9	0.0	431.6
105.00		1.00	1.00	21.079	23.19	266.47	0.650	0.000	5.00	14.586	9.48	351.7	0.0	415.8
110.00		1.00	1.02	21.361	23.50	257.93	0.650	0.000	5.00	14.036	9.12	343.0	0.0	400.0
115.00		1.00	1.03	21.634	23.80	249.20	0.650	0.000	5.00	13.486	8.77	333.8	0.0	384.2
117.00	Appurtenance(s)	1.00	1.03	21.741	23.91	245.66	0.650	0.000	2.00	5.240	3.41	130.3	0.0	149.3
120.00		1.00	1.04	21.898	24.09	240.28	0.650	0.000	3.00	7.696	5.00	192.8	0.0	219.2
125.00		1.00	1.05	22.155	24.37	231.19	0.650	0.000	5.00	12.386	8.05	313.9	0.0	352.7
126.00	Bot - Section 4	1.00	1.06	22.206	24.43	229.35	0.650	0.000	1.00	2.411	1.57	61.3	0.0	68.6
127.00	Appurtenance(s)	1.00	1.06	22.256	24.48	227.51	0.650	0.000	1.00	2.421	1.57	61.6	0.0	119.8
129.75	Top - Section 3	1.00	1.06	22.393	24.63	222.40	0.650	0.000	2.75	6.544	4.25	167.6	0.0	323.8
130.00		1.00	1.07	22.405	24.65	224.98	0.650	0.000	0.25	0.587	0.38	15.0	0.0	12.6
135.00		1.00	1.08	22.648	24.91	215.58	0.650	0.000	5.00	11.445	7.44	296.5	0.0	244.8
139.00	Appurtenance(s)	1.00	1.09	22.838	25.12	207.95	0.650	0.000	4.00	8.760	5.69	228.9	0.0	187.3
140.00		1.00	1.09	22.884	25.17	206.03	0.650	0.000	1.00	2.135	1.39	55.9	0.0	45.6
145.00		1.00	1.10	23.115	25.43	196.34	0.650	0.000	5.00	10.345	6.72	273.5	0.0	221.1
150.00	Appurtenance(s)	1.00	1.11	23.340	25.67	186.52	0.650	0.000	5.00	9.795	6.37	261.5	0.0	209.2
								Totals:	**150.00**			**10,877.5**		**22,053.8**

Discrete Appurtenance Forces

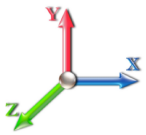
Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 22

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	150.00	Decibel DB846G90A-XY	12	23.340	25.674	1.01	0.90	60.60	166.32	0.000	0.000	2489.38	0.00	0.00
2	150.00	Low Profile Platform	1	23.340	25.674	1.00	1.00	22.00	1350.00	0.000	0.000	903.72	0.00	0.00
3	139.00	Low Profile Platform	1	22.838	25.121	1.00	1.00	22.00	1350.00	0.000	0.000	884.27	0.00	0.00
4	139.00	Powerwave 7770	6	22.838	25.121	0.58	0.80	19.27	189.00	0.000	0.000	774.62	0.00	0.00
5	139.00	Kathrein 800 10764	1	22.838	25.121	1.00	1.00	5.88	36.72	0.000	0.000	236.34	0.00	0.00
6	139.00	KMW	2	22.838	25.121	0.81	0.90	12.99	87.30	0.000	0.000	522.22	0.00	0.00
7	139.00	Powerwave LGP 21401	6	22.838	25.121	0.54	0.80	0.00	94.50	0.000	0.000	0.00	0.00	0.00
8	139.00	Powerwave LGP 13519	6	22.838	25.121	0.54	0.80	1.09	28.62	0.000	0.000	43.95	0.00	0.00
9	139.00	Ericsson RRUS 11	6	22.838	25.121	0.54	0.80	8.10	273.78	0.000	0.000	325.75	0.00	0.00
10	139.00	Raycap DC6-48-60-18-8F	1	22.838	25.121	1.00	1.00	0.92	28.62	0.000	0.000	36.98	0.00	0.00
11	139.00	Commscope	1	22.838	25.121	1.00	1.00	0.05	0.99	0.000	0.000	2.01	0.00	0.00
12	127.00	RFS	1	22.256	24.482	1.00	1.00	4.06	28.80	0.000	0.000	159.03	0.00	0.00
13	127.00	Samsung RFV01U-D1A	3	22.256	24.482	0.54	0.80	3.02	263.25	0.000	0.000	118.41	0.00	0.00
14	127.00	Samsung RFV01U-D2A	3	22.256	24.482	0.54	0.80	3.02	221.40	0.000	0.000	118.41	0.00	0.00
15	127.00	Samsung MT6407-77A	3	22.256	24.482	0.56	0.80	7.88	214.38	0.000	0.000	308.63	0.00	0.00
16	127.00	Commscope	6	22.256	24.482	0.68	0.80	33.33	235.98	0.000	0.000	1305.69	0.00	0.00
17	127.00	Low Profile Platform	1	22.256	24.482	1.00	1.00	22.00	1350.00	0.000	0.000	861.75	0.00	0.00
18	127.00	Commscope	3	22.256	24.482	0.40	0.80	1.78	21.33	0.000	0.000	69.57	0.00	0.00
19	117.00	F4P-HRK10	1	21.741	23.915	1.00	1.00	9.00	430.44	0.000	0.000	344.37	0.00	0.00
20	117.00	Ericsson 4480 B71 + B85	4	21.741	23.915	0.50	0.75	5.73	334.80	0.000	0.000	219.19	0.00	0.00
21	117.00	SitePro F4P-10W	1	21.741	23.915	1.00	1.00	58.98	2156.40	0.000	0.000	2256.77	0.00	0.00
22	117.00	RFS	4	21.741	23.915	0.55	0.75	11.32	95.04	0.000	0.000	433.23	0.00	0.00
23	117.00	Ericsson Air 32	4	21.741	23.915	0.65	0.75	16.99	380.88	0.000	0.000	650.14	0.00	0.00
24	117.00	RFS	4	21.741	23.915	0.55	0.75	44.33	356.40	0.000	0.000	1696.04	0.00	0.00
25	117.00	Ericsson RRU 2217 B2	4	21.741	23.915	0.50	0.75	5.17	158.40	0.000	0.000	197.66	0.00	0.00
26	65.00	Motorola RRA4905A	2	18.380	20.217	1.00	1.00	0.28	1.80	0.000	0.000	9.06	0.00	0.00
							Totals:		**9,855.15**			**14,967.19**		

Total Applied Force Summary

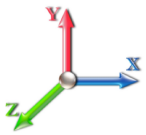
Structure:	CT13613-A-SBA		**Code:**	TIA-222-G	5/20/2022
Site Name:	Johnson		**Exposure:**	B	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 15

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 22

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		422.97	1444.06	0.00	0.00
10.00		413.71	1416.42	0.00	0.00
15.00		404.44	1388.78	0.00	0.00
20.00		395.18	1361.14	0.00	0.00
25.00		385.91	1333.49	0.00	0.00
30.00		376.97	1305.85	0.00	0.00
35.00		384.25	1278.21	0.00	0.00
40.00		389.13	1250.57	0.00	0.00
44.75		372.09	1162.44	0.00	0.00
45.00		19.60	97.43	0.00	0.00
50.00		398.44	1923.72	0.00	0.00
51.00		78.85	379.06	0.00	0.00
55.00		317.85	718.52	0.00	0.00
60.00		397.14	880.37	0.00	0.00
65.00	(2) attachments	403.82	862.43	0.00	0.00
70.00		391.40	839.45	0.00	0.00
75.00		387.14	819.70	0.00	0.00
80.00		382.08	799.96	0.00	0.00
84.75		357.45	741.67	0.00	0.00
85.00		18.76	62.12	0.00	0.00
89.75		355.94	1163.35	0.00	0.00
90.00		18.43	32.29	0.00	0.00
95.00		367.59	637.41	0.00	0.00
100.00		359.94	621.62	0.00	0.00
105.00		351.73	605.82	0.00	0.00
110.00		343.00	590.03	0.00	0.00
115.00		333.77	574.23	0.00	0.00
117.00	(22) attachments	5927.73	4137.63	0.00	0.00
120.00		192.79	321.94	0.00	0.00
125.00		313.93	523.92	0.00	0.00
126.00		61.25	102.89	0.00	0.00
127.00	(20) attachments	3003.14	2489.20	0.00	0.00
129.75		167.64	386.92	0.00	0.00
130.00		15.04	18.29	0.00	0.00
135.00		296.52	359.63	0.00	0.00
139.00	(30) attachments	3054.99	2368.70	0.00	0.00
140.00		55.89	56.87	0.00	0.00
145.00		273.55	277.25	0.00	0.00
150.00	(13) attachments	3654.63	1781.73	0.00	0.00
	Totals:	**25,844.67**	**37,115.13**	**0.00**	**0.00**

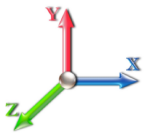
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 22

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.011	0.000	14.724	0.00	1.44
10.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.011	0.000	14.724	0.00	1.44
15.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.011	0.000	14.724	0.00	1.44
20.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	14.724	0.00	1.44
25.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	14.724	0.00	1.44
30.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	14.736	0.00	1.44
35.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	15.400	0.00	1.44
40.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	15.999	0.00	1.44
44.75	1/2" Coax	Yes	4.75	0.000	0.65	0.26	0.00	0.013	0.000	16.520	0.00	1.37
45.00	1/2" Coax	Yes	0.25	0.000	0.65	0.01	0.00	0.013	0.000	16.546	0.00	0.07
50.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	17.052	0.00	1.44
51.00	1/2" Coax	Yes	1.00	0.000	0.65	0.05	0.00	0.014	0.000	17.149	0.00	0.29
55.00	1/2" Coax	Yes	4.00	0.000	0.65	0.22	0.00	0.014	0.000	17.523	0.00	1.15
60.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.014	0.000	17.964	0.00	1.44
65.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.014	0.000	18.380	0.00	1.44
									Totals:		**0.0**	**18.7**

Calculated Forces

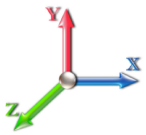
Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 22

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-37.09	-25.88	0.00	-2810.9	0.00	2810.92	5554.25	2777.13	13600.6	6810.41	0.00	0.000	0.000	0.420
5.00	-35.60	-25.52	0.00	-2681.5	0.00	2681.53	5477.89	2738.95	13118.7	6569.12	0.06	-0.105	0.000	0.415
10.00	-34.14	-25.17	0.00	-2553.9	0.00	2553.93	5399.54	2699.77	12640.4	6329.59	0.23	-0.213	0.000	0.410
15.00	-32.70	-24.82	0.00	-2428.1	0.00	2428.10	5319.17	2659.59	12165.9	6092.00	0.51	-0.322	0.000	0.405
20.00	-31.30	-24.48	0.00	-2304.0	0.00	2304.00	5236.81	2618.40	11695.6	5856.50	0.90	-0.433	0.000	0.399
25.00	-29.92	-24.14	0.00	-2181.6	0.00	2181.62	5152.44	2576.22	11229.8	5623.26	1.42	-0.546	0.000	0.394
30.00	-28.57	-23.81	0.00	-2060.9	0.00	2060.93	5066.07	2533.04	10768.8	5392.43	2.05	-0.662	0.000	0.388
35.00	-27.25	-23.46	0.00	-1941.9	0.00	1941.90	4977.70	2488.85	10313.0	5164.19	2.81	-0.779	0.000	0.382
40.00	-25.95	-23.11	0.00	-1824.5	0.00	1824.59	4887.33	2443.67	9862.71	4938.68	3.69	-0.897	0.000	0.375
44.75	-24.77	-22.74	0.00	-1714.8	0.00	1714.83	4799.62	2399.81	9440.25	4727.14	4.64	-1.012	0.000	0.368
45.00	-24.65	-22.75	0.00	-1709.1	0.00	1709.15	4794.96	2397.48	9418.17	4716.08	4.69	-1.018	0.000	0.368
50.00	-22.71	-22.34	0.00	-1595.4	0.00	1595.40	4700.58	2350.29	8979.75	4496.55	5.83	-1.141	0.000	0.360
51.00	-22.31	-22.28	0.00	-1573.0	0.00	1573.06	3008.41	1504.20	5823.48	2916.07	6.07	-1.166	0.000	0.547
55.00	-21.54	-22.00	0.00	-1483.9	0.00	1483.94	2970.26	1485.13	5621.72	2815.04	7.09	-1.266	0.000	0.535
60.00	-20.61	-21.64	0.00	-1373.9	0.00	1373.95	2920.78	1460.39	5370.82	2689.40	8.50	-1.432	0.000	0.518
65.00	-19.69	-21.27	0.00	-1265.7	0.00	1265.74	2869.29	1434.64	5121.68	2564.65	10.10	-1.600	0.000	0.501
70.00	-18.81	-20.91	0.00	-1159.3	0.00	1159.38	2815.80	1407.90	4874.61	2440.93	11.86	-1.768	0.000	0.482
75.00	-17.94	-20.55	0.00	-1054.8	0.00	1054.83	2760.31	1380.15	4629.95	2318.41	13.80	-1.937	0.000	0.462
80.00	-17.10	-20.19	0.00	-952.07	0.00	952.07	2702.81	1351.41	4388.01	2197.26	15.92	-2.104	0.000	0.440
84.75	-16.34	-19.83	0.00	-856.17	0.00	856.17	2646.34	1323.17	4160.98	2083.58	18.10	-2.262	0.000	0.417
85.00	-16.25	-19.83	0.00	-851.22	0.00	851.22	2643.31	1321.66	4149.11	2077.64	18.22	-2.271	0.000	0.416
89.75	-15.07	-19.45	0.00	-757.02	0.00	757.02	1922.43	961.22	2968.94	1486.68	20.56	-2.426	0.000	0.517
90.00	-15.01	-19.45	0.00	-752.16	0.00	752.16	1920.55	960.27	2960.86	1482.63	20.68	-2.435	0.000	0.516
95.00	-14.33	-19.11	0.00	-654.89	0.00	654.89	1881.78	940.89	2799.79	1401.97	23.34	-2.624	0.000	0.475
100.00	-13.66	-18.76	0.00	-559.36	0.00	559.36	1841.02	920.51	2640.02	1321.97	26.18	-2.806	0.000	0.431
105.00	-13.02	-18.42	0.00	-465.57	0.00	465.57	1798.25	899.12	2481.89	1242.79	29.22	-2.978	0.000	0.382
110.00	-12.41	-18.07	0.00	-373.49	0.00	373.49	1753.48	876.74	2325.70	1164.58	32.42	-3.135	0.000	0.328
115.00	-11.82	-17.73	0.00	-283.13	0.00	283.13	1706.70	853.35	2171.78	1087.50	35.78	-3.274	0.000	0.268
117.00	-8.02	-11.58	0.00	-247.68	0.00	247.68	1687.43	843.72	2110.92	1057.03	37.16	-3.324	0.000	0.239
120.00	-7.69	-11.38	0.00	-212.94	0.00	212.94	1657.93	828.96	2020.46	1011.73	39.28	-3.394	0.000	0.215
125.00	-7.18	-11.04	0.00	-156.04	0.00	156.04	1607.15	803.57	1872.06	937.42	42.88	-3.494	0.000	0.171
126.00	-7.08	-10.98	0.00	-145.00	0.00	145.00	1596.75	798.38	1842.76	922.75	43.62	-3.513	0.000	0.162
127.00	-4.77	-7.83	0.00	-134.02	0.00	134.02	1586.28	793.14	1813.59	908.14	44.36	-3.530	0.000	0.151
129.75	-4.39	-7.64	0.00	-112.50	0.00	112.50	1068.62	534.31	1212.20	607.00	46.40	-3.575	0.000	0.190
130.00	-4.37	-7.63	0.00	-110.59	0.00	110.59	1067.16	533.58	1207.67	604.73	46.59	-3.579	0.000	0.187
135.00	-4.02	-7.31	0.00	-72.45	0.00	72.45	1036.93	518.46	1117.63	559.65	50.38	-3.662	0.000	0.134
139.00	-1.85	-4.11	0.00	-43.20	0.00	43.20	1011.29	505.65	1046.45	524.00	53.47	-3.711	0.000	0.084
140.00	-1.80	-4.05	0.00	-39.09	0.00	39.09	1004.68	502.34	1028.80	515.16	54.25	-3.720	0.000	0.078
145.00	-1.54	-3.76	0.00	-18.82	0.00	18.82	970.44	485.22	941.49	471.44	58.17	-3.756	0.000	0.042
150.00	0.00	-3.65	0.00	0.00	0.00	0.00	934.20	467.10	856.03	428.65	62.11	-3.769	0.000	0.000

Wind Loading - Shaft

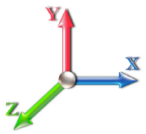
Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	2.724	3.00	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	2.724	3.00	0.00	1.200	1.656	5.00	26.491	31.79	95.2	626.1	2296.3
10.00		1.00	0.70	2.724	3.00	0.00	1.200	1.775	5.00	26.040	31.25	93.6	657.9	2291.2
15.00		1.00	0.70	2.724	3.00	0.00	1.200	1.848	5.00	25.551	30.66	91.9	670.9	2267.4
20.00		1.00	0.70	2.724	3.00	0.00	1.200	1.902	5.00	25.046	30.06	90.1	675.6	2235.2
25.00		1.00	0.70	2.724	3.00	0.00	1.200	1.945	5.00	24.532	29.44	88.2	675.5	2198.3
30.00		1.00	0.70	2.726	3.00	0.00	1.200	1.981	5.00	24.011	28.81	86.4	672.3	2158.2
35.00		1.00	0.73	2.849	3.13	0.00	1.200	2.012	5.00	23.487	28.18	88.3	666.7	2115.7
40.00		1.00	0.76	2.960	3.26	0.00	1.200	2.039	5.00	22.960	27.55	89.7	659.4	2071.6
44.75	Bot - Section 2	1.00	0.79	3.056	3.36	0.00	1.200	2.062	4.75	21.320	25.58	86.0	618.6	1926.0
45.00		1.00	0.79	3.061	3.37	0.00	1.200	2.063	0.25	1.122	1.35	4.5	32.9	150.1
50.00		1.00	0.81	3.155	3.47	0.00	1.200	2.085	5.00	22.162	26.59	92.3	649.0	2958.8
51.00	Top - Section 1	1.00	0.82	3.172	3.49	0.00	1.200	2.089	1.00	4.367	5.24	18.3	129.4	583.8
55.00		1.00	0.83	3.242	3.57	0.00	1.200	2.105	4.00	17.259	20.71	73.9	510.7	1264.5
60.00		1.00	0.85	3.323	3.66	0.00	1.200	2.123	5.00	21.094	25.31	92.5	626.9	1545.5
65.00	Appurtenance(s)	1.00	0.87	3.400	3.74	0.00	1.200	2.140	5.00	20.558	24.67	92.3	614.7	1507.0
70.00		1.00	0.89	3.473	3.82	0.00	1.200	2.156	5.00	20.022	24.03	91.8	601.9	1467.9
75.00		1.00	0.91	3.542	3.90	0.00	1.200	2.171	5.00	19.484	23.38	91.1	588.6	1428.2
80.00		1.00	0.93	3.608	3.97	0.00	1.200	2.185	5.00	18.946	22.73	90.2	574.8	1388.1
84.75	Bot - Section 3	1.00	0.94	3.668	4.03	0.00	1.200	2.198	4.75	17.499	21.00	84.7	533.2	1281.5
85.00		1.00	0.94	3.671	4.04	0.00	1.200	2.198	0.25	0.918	1.10	4.4	28.4	98.5
89.75	Top - Section 2	1.00	0.96	3.728	4.10	0.00	1.200	2.210	4.75	17.187	20.62	84.6	525.9	1836.4
90.00		1.00	0.96	3.731	4.10	0.00	1.200	2.211	0.25	0.891	1.07	4.4	27.6	58.0
95.00		1.00	0.97	3.789	4.17	0.00	1.200	2.223	5.00	17.539	21.05	87.7	537.9	1134.5
100.00		1.00	0.99	3.845	4.23	0.00	1.200	2.234	5.00	16.998	20.40	86.3	522.7	1098.2
105.00		1.00	1.00	3.899	4.29	0.00	1.200	2.245	5.00	16.457	19.75	84.7	507.1	1061.5
110.00		1.00	1.02	3.952	4.35	0.00	1.200	2.256	5.00	15.916	19.10	83.0	491.2	1024.6
115.00		1.00	1.03	4.002	4.40	0.00	1.200	2.266	5.00	15.374	18.45	81.2	475.1	987.4
117.00	Appurtenance(s)	1.00	1.03	4.022	4.42	0.00	1.200	2.270	2.00	5.997	7.20	31.8	187.4	386.5
120.00		1.00	1.04	4.051	4.46	0.00	1.200	2.276	3.00	8.833	10.60	47.2	275.2	567.5
125.00		1.00	1.05	4.099	4.51	0.00	1.200	2.285	5.00	14.290	17.15	77.3	442.1	912.3
126.00	Bot - Section 4	1.00	1.06	4.108	4.52	0.00	1.200	2.287	1.00	2.792	3.35	15.1	87.7	179.3
127.00	Appurtenance(s)	1.00	1.06	4.117	4.53	0.00	1.200	2.289	1.00	2.802	3.36	15.2	88.2	247.9
129.75	Top - Section 3	1.00	1.06	4.142	4.56	0.00	1.200	2.293	2.75	7.595	9.11	41.5	237.3	669.0
130.00		1.00	1.07	4.145	4.56	0.00	1.200	2.294	0.25	0.682	0.82	3.7	21.5	38.3
135.00		1.00	1.08	4.190	4.61	0.00	1.200	2.303	5.00	13.364	16.04	73.9	413.7	740.0
139.00	Appurtenance(s)	1.00	1.09	4.225	4.65	0.00	1.200	2.309	4.00	10.299	12.36	57.4	319.9	569.7
140.00		1.00	1.09	4.233	4.66	0.00	1.200	2.311	1.00	2.520	3.02	14.1	79.3	140.1
145.00		1.00	1.10	4.276	4.70	0.00	1.200	2.319	5.00	12.277	14.73	69.3	379.1	673.9
150.00	Appurtenance(s)	1.00	1.11	4.318	4.75	0.00	1.200	2.327	5.00	11.734	14.08	66.9	361.5	640.5
								Totals:	**150.00**			**2,571.0**		**46,199.2**

Discrete Appurtenance Forces

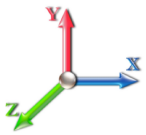
Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	150.00	Decibel DB846G90A-XY	12	4.318	4.749	1.01	0.90	80.73	2973.14	0.000	0.000	383.41	0.00	0.00
2	150.00	Low Profile Platform	1	4.318	4.749	1.00	1.00	45.55	3245.22	0.000	0.000	216.33	0.00	0.00
3	139.00	Low Profile Platform	1	4.225	4.647	1.00	1.00	45.37	3231.97	0.000	0.000	210.85	0.00	0.00
4	139.00	Powerwave 7770	6	4.225	4.647	0.58	0.80	24.27	1578.75	0.000	0.000	112.81	0.00	0.00
5	139.00	Kathrein 800 10764	1	4.225	4.647	1.00	1.00	8.72	181.19	0.000	0.000	40.50	0.00	0.00
6	139.00	KMW	2	4.225	4.647	0.81	0.90	18.98	452.86	0.000	0.000	88.21	0.00	0.00
7	139.00	Powerwave LGP 21401	6	4.225	4.647	0.54	0.80	0.00	424.98	0.000	0.000	0.00	0.00	0.00
8	139.00	Powerwave LGP 13519	6	4.225	4.647	0.54	0.80	3.03	97.36	0.000	0.000	14.06	0.00	0.00
9	139.00	Ericsson RRUS 11	6	4.225	4.647	0.54	0.80	11.85	835.23	0.000	0.000	55.06	0.00	0.00
10	139.00	Raycap DC6-48-60-18-8F	1	4.225	4.647	1.00	1.00	1.50	102.27	0.000	0.000	6.97	0.00	0.00
11	139.00	Commscope	1	4.225	4.647	1.00	1.00	0.30	3.57	0.000	0.000	1.42	0.00	0.00
12	127.00	RFS	1	4.117	4.529	1.00	1.00	5.14	159.20	0.000	0.000	23.27	0.00	0.00
13	127.00	Samsung RFV01U-D1A	3	4.117	4.529	0.54	0.80	4.19	517.65	0.000	0.000	18.95	0.00	0.00
14	127.00	Samsung RFV01U-D2A	3	4.117	4.529	0.54	0.80	4.19	518.67	0.000	0.000	18.95	0.00	0.00
15	127.00	Samsung MT6407-77A	3	4.117	4.529	0.56	0.80	10.00	787.43	0.000	0.000	45.27	0.00	0.00
16	127.00	Commscope	6	4.117	4.529	0.68	0.80	40.58	2015.56	0.000	0.000	183.79	0.00	0.00
17	127.00	Low Profile Platform	1	4.117	4.529	1.00	1.00	45.16	3216.41	0.000	0.000	204.53	0.00	0.00
18	127.00	Commscope	3	4.117	4.529	0.40	0.80	3.17	157.30	0.000	0.000	14.35	0.00	0.00
19	117.00	F4P-HRK10	1	4.022	4.424	1.00	1.00	22.89	1660.13	0.000	0.000	101.27	0.00	0.00
20	117.00	Ericsson 4480 B71 + B85	4	4.022	4.424	0.50	0.75	7.49	752.63	0.000	0.000	33.14	0.00	0.00
21	117.00	SitePro F4P-10W	1	4.022	4.424	1.00	1.00	150.02	5229.79	0.000	0.000	663.67	0.00	0.00
22	117.00	RFS	4	4.022	4.424	0.55	0.75	18.09	503.36	0.000	0.000	80.02	0.00	0.00
23	117.00	Ericsson Air 32	4	4.022	4.424	0.65	0.75	20.86	1283.68	0.000	0.000	92.30	0.00	0.00
24	117.00	RFS	4	4.022	4.424	0.55	0.75	49.80	2510.78	0.000	0.000	220.31	0.00	0.00
25	117.00	Ericsson RRU 2217 B2	4	4.022	4.424	0.50	0.75	6.85	481.98	0.000	0.000	30.32	0.00	0.00
26	65.00	Motorola RRA4905A	2	3.400	3.740	1.00	1.00	1.23	20.13	0.000	0.000	4.61	0.00	0.00
							Totals:		**32,941.22**			**2,864.38**		

Total Applied Force Summary

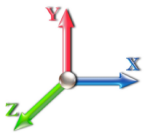
Structure:	CT13613-A-SBA		**Code:**	TIA-222-G	5/20/2022
Site Name:	Johnson		**Exposure:**	B	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 20

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		95.25	2577.00	0.00	0.00
10.00		93.63	2575.02	0.00	0.00
15.00		91.87	2553.16	0.00	0.00
20.00		90.05	2522.53	0.00	0.00
25.00		88.20	2486.82	0.00	0.00
30.00		86.41	2447.73	0.00	0.00
35.00		88.32	2406.22	0.00	0.00
40.00		89.70	2362.86	0.00	0.00
44.75		86.01	2203.43	0.00	0.00
45.00		4.53	164.68	0.00	0.00
50.00		92.28	3251.45	0.00	0.00
51.00		18.29	642.32	0.00	0.00
55.00		73.85	1499.17	0.00	0.00
60.00		92.53	1839.36	0.00	0.00
65.00	(2) attachments	96.88	1821.52	0.00	0.00
70.00		91.78	1721.21	0.00	0.00
75.00		91.10	1681.56	0.00	0.00
80.00		90.23	1641.44	0.00	0.00
84.75		84.72	1522.14	0.00	0.00
85.00		4.45	111.20	0.00	0.00
89.75		84.59	2077.08	0.00	0.00
90.00		4.39	70.69	0.00	0.00
95.00		87.73	1387.83	0.00	0.00
100.00		86.28	1351.49	0.00	0.00
105.00		84.71	1314.84	0.00	0.00
110.00		83.02	1277.91	0.00	0.00
115.00		81.22	1240.72	0.00	0.00
117.00	(22) attachments	1252.87	12910.13	0.00	0.00
120.00		47.24	704.47	0.00	0.00
125.00		77.31	1140.66	0.00	0.00
126.00		15.14	224.94	0.00	0.00
127.00	(20) attachments	524.34	7665.78	0.00	0.00
129.75		41.53	753.22	0.00	0.00
130.00		3.73	45.92	0.00	0.00
135.00		73.91	893.16	0.00	0.00
139.00	(30) attachments	587.31	7600.34	0.00	0.00
140.00		14.08	155.12	0.00	0.00
145.00		69.30	748.74	0.00	0.00
150.00	(13) attachments	666.62	6933.74	0.00	0.00
	Totals:	**5,435.38**	**86,527.61**	**0.00**	**0.00**

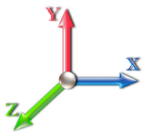
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 21	

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1/2" Coax	Yes	5.00	0.000	0.65	1.65	0.00	0.011	0.000	2.724	0.00	27.40
10.00	1/2" Coax	Yes	5.00	0.000	0.65	1.75	0.00	0.011	0.000	2.724	0.00	30.49
15.00	1/2" Coax	Yes	5.00	0.000	0.65	1.81	0.00	0.011	0.000	2.724	0.00	32.49
20.00	1/2" Coax	Yes	5.00	0.000	0.65	1.86	0.00	0.012	0.000	2.724	0.00	34.00
25.00	1/2" Coax	Yes	5.00	0.000	0.65	1.89	0.00	0.012	0.000	2.724	0.00	35.22
30.00	1/2" Coax	Yes	5.00	0.000	0.65	1.92	0.00	0.012	0.000	2.726	0.00	36.26
35.00	1/2" Coax	Yes	5.00	0.000	0.65	1.95	0.00	0.012	0.000	2.849	0.00	37.17
40.00	1/2" Coax	Yes	5.00	0.000	0.65	1.97	0.00	0.013	0.000	2.960	0.00	37.97
44.75	1/2" Coax	Yes	4.75	0.000	0.65	1.89	0.00	0.013	0.000	3.056	0.00	36.73
45.00	1/2" Coax	Yes	0.25	0.000	0.65	0.10	0.00	0.013	0.000	3.061	0.00	1.94
50.00	1/2" Coax	Yes	5.00	0.000	0.65	2.01	0.00	0.013	0.000	3.155	0.00	39.36
51.00	1/2" Coax	Yes	1.00	0.000	0.65	0.40	0.00	0.014	0.000	3.172	0.00	7.90
55.00	1/2" Coax	Yes	4.00	0.000	0.65	1.62	0.00	0.014	0.000	3.242	0.00	31.98
60.00	1/2" Coax	Yes	5.00	0.000	0.65	2.04	0.00	0.014	0.000	3.323	0.00	40.54
65.00	1/2" Coax	Yes	5.00	0.000	0.65	2.05	0.00	0.014	0.000	3.400	0.00	41.08
									Totals:		**0.0**	**470.5**

Calculated Forces

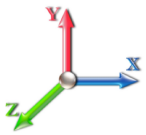
Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-86.53	-5.45	0.00	-603.46	0.00	603.46	5554.25	2777.13	13600.6	6810.41	0.00	0.000	0.000	0.104
5.00	-83.95	-5.39	0.00	-576.20	0.00	576.20	5477.89	2738.95	13118.7	6569.12	0.01	-0.023	0.000	0.103
10.00	-81.37	-5.33	0.00	-549.25	0.00	549.25	5399.54	2699.77	12640.4	6329.59	0.05	-0.046	0.000	0.102
15.00	-78.81	-5.27	0.00	-522.61	0.00	522.61	5319.17	2659.59	12165.9	6092.00	0.11	-0.069	0.000	0.101
20.00	-76.29	-5.21	0.00	-496.28	0.00	496.28	5236.81	2618.40	11695.6	5856.50	0.19	-0.093	0.000	0.099
25.00	-73.80	-5.14	0.00	-470.25	0.00	470.25	5152.44	2576.22	11229.8	5623.26	0.31	-0.118	0.000	0.098
30.00	-71.35	-5.08	0.00	-444.53	0.00	444.53	5066.07	2533.04	10768.8	5392.43	0.44	-0.142	0.000	0.097
35.00	-68.94	-5.02	0.00	-419.12	0.00	419.12	4977.70	2488.85	10313.0	5164.19	0.60	-0.168	0.000	0.095
40.00	-66.58	-4.95	0.00	-394.02	0.00	394.02	4887.33	2443.67	9862.71	4938.68	0.79	-0.193	0.000	0.093
44.75	-64.37	-4.87	0.00	-370.51	0.00	370.51	4799.62	2399.81	9440.25	4727.14	1.00	-0.218	0.000	0.092
45.00	-64.21	-4.88	0.00	-369.29	0.00	369.29	4794.96	2397.48	9418.17	4716.08	1.01	-0.219	0.000	0.092
50.00	-60.96	-4.79	0.00	-344.88	0.00	344.88	4700.58	2350.29	8979.75	4496.55	1.25	-0.246	0.000	0.090
51.00	-60.31	-4.79	0.00	-340.09	0.00	340.09	3008.41	1504.20	5823.48	2916.07	1.31	-0.251	0.000	0.137
55.00	-58.81	-4.74	0.00	-320.94	0.00	320.94	2970.26	1485.13	5621.72	2815.04	1.53	-0.273	0.000	0.134
60.00	-56.97	-4.67	0.00	-297.26	0.00	297.26	2920.78	1460.39	5370.82	2689.40	1.83	-0.309	0.000	0.130
65.00	-55.15	-4.60	0.00	-273.91	0.00	273.91	2869.29	1434.64	5121.68	2564.65	2.17	-0.345	0.000	0.126
70.00	-53.42	-4.53	0.00	-250.92	0.00	250.92	2815.80	1407.90	4874.61	2440.93	2.56	-0.382	0.000	0.122
75.00	-51.74	-4.46	0.00	-228.28	0.00	228.28	2760.31	1380.15	4629.95	2318.41	2.98	-0.418	0.000	0.117
80.00	-50.10	-4.39	0.00	-205.98	0.00	205.98	2702.81	1351.41	4388.01	2197.26	3.43	-0.454	0.000	0.112
84.75	-48.57	-4.30	0.00	-185.15	0.00	185.15	2646.34	1323.17	4160.98	2083.58	3.90	-0.488	0.000	0.107
85.00	-48.46	-4.31	0.00	-184.07	0.00	184.07	2643.31	1321.66	4149.11	2077.64	3.93	-0.490	0.000	0.107
89.75	-46.38	-4.23	0.00	-163.58	0.00	163.58	1922.43	961.22	2968.94	1486.68	4.43	-0.524	0.000	0.134
90.00	-46.31	-4.24	0.00	-162.52	0.00	162.52	1920.55	960.27	2960.86	1482.63	4.46	-0.526	0.000	0.134
95.00	-44.92	-4.17	0.00	-141.33	0.00	141.33	1881.78	940.89	2799.79	1401.97	5.03	-0.567	0.000	0.125
100.00	-43.57	-4.10	0.00	-120.48	0.00	120.48	1841.02	920.51	2640.02	1321.97	5.65	-0.606	0.000	0.115
105.00	-42.25	-4.03	0.00	-99.99	0.00	99.99	1798.25	899.12	2481.89	1242.79	6.30	-0.643	0.000	0.104
110.00	-40.97	-3.95	0.00	-79.87	0.00	79.87	1753.48	876.74	2325.70	1164.58	7.00	-0.677	0.000	0.092
115.00	-39.73	-3.87	0.00	-60.12	0.00	60.12	1706.70	853.35	2171.78	1087.50	7.72	-0.706	0.000	0.079
117.00	-26.84	-2.46	0.00	-52.39	0.00	52.39	1687.43	843.72	2110.92	1057.03	8.02	-0.717	0.000	0.065
120.00	-26.13	-2.41	0.00	-45.01	0.00	45.01	1657.93	828.96	2020.46	1011.73	8.48	-0.732	0.000	0.060
125.00	-24.99	-2.33	0.00	-32.95	0.00	32.95	1607.15	803.57	1872.06	937.42	9.25	-0.753	0.000	0.051
126.00	-24.77	-2.31	0.00	-30.62	0.00	30.62	1596.75	798.38	1842.76	922.75	9.41	-0.757	0.000	0.049
127.00	-17.11	-1.69	0.00	-28.31	0.00	28.31	1586.28	793.14	1813.59	908.14	9.57	-0.760	0.000	0.042
129.75	-16.36	-1.63	0.00	-23.68	0.00	23.68	1068.62	534.31	1212.20	607.00	10.01	-0.770	0.000	0.054
130.00	-16.31	-1.63	0.00	-23.27	0.00	23.27	1067.16	533.58	1207.67	604.73	10.05	-0.771	0.000	0.054
135.00	-15.42	-1.55	0.00	-15.10	0.00	15.10	1036.93	518.46	1117.63	559.65	10.87	-0.788	0.000	0.042
139.00	-7.83	-0.86	0.00	-8.90	0.00	8.90	1011.29	505.65	1046.45	524.00	11.53	-0.798	0.000	0.025
140.00	-7.67	-0.84	0.00	-8.04	0.00	8.04	1004.68	502.34	1028.80	515.16	11.70	-0.800	0.000	0.023
145.00	-6.92	-0.76	0.00	-3.82	0.00	3.82	970.44	485.22	941.49	471.44	12.54	-0.807	0.000	0.015
150.00	0.00	-0.67	0.00	0.00	0.00	0.00	934.20	467.10	856.03	428.65	13.39	-0.810	0.000	0.000

Seismic Segment Forces (Factored)

Structure:	CT13613-A-SBA		**Code:**	TIA-222-G	5/20/2022
Site Name:	Johnson		**Exposure:**	B	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 23

IES Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	20
Gust Response Factor	1.10				**Sds**	0.19		**Ss**	0.17
Dead Load Factor	1.20	**Seismic Load Factor**		1.00	**Sd1**	0.10		**S1**	0.07
Wind Load Factor	0.00	**Structure Frequency (f1)**		0.41	**SA**	0.04	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1391.8	0.00	0.03	0.02	21.33	
10.00		1361.1	0.01	0.05	0.03	31.08	
15.00		1330.3	0.02	0.06	0.04	35.52	
20.00		1299.6	0.03	0.07	0.04	37.37	
25.00		1268.9	0.05	0.07	0.04	38.04	
30.00		1238.2	0.08	0.07	0.04	38.23	
35.00		1207.5	0.10	0.07	0.04	38.27	
40.00		1176.8	0.13	0.07	0.03	38.19	
44.75	Bot - Section 2	1089.5	0.17	0.07	0.03	35.93	
45.00		97.62	0.17	0.07	0.03	3.22	
50.00		1924.7	0.21	0.06	0.02	63.53	
51.00	Top - Section 1	378.64	0.22	0.06	0.02	12.46	
55.00		628.19	0.25	0.05	0.02	20.13	
60.00		765.49	0.30	0.04	0.01	22.66	
65.00	Appurtenance(s)	745.56	0.35	0.03	0.01	18.74	
70.00		721.62	0.41	0.01	0.01	13.23	
75.00		699.68	0.47	-0.01	0.01	6.53	
80.00		677.74	0.54	-0.03	0.01	-0.75	
84.75	Bot - Section 3	623.54	0.60	-0.05	0.01	-6.89	
85.00		58.46	0.61	-0.06	0.02	-0.67	
89.75	Top - Section 2	1092.0	0.68	-0.08	0.03	-21.70	
90.00		25.32	0.68	-0.08	0.03	-0.51	
95.00		497.14	0.76	-0.10	0.04	-12.78	
100.00		479.59	0.84	-0.12	0.07	-12.92	
105.00		462.04	0.93	-0.12	0.10	-10.83	
110.00		444.49	1.02	-0.11	0.14	-6.67	
115.00		426.94	1.11	-0.06	0.19	-0.67	
117.00	Appurtenance(s)	4512.9	1.15	-0.04	0.22	23.52	
120.00		243.53	1.21	0.01	0.26	4.11	
125.00		391.84	1.31	0.14	0.35	15.81	
126.00	Bot - Section 4	76.26	1.33	0.17	0.37	3.48	
127.00	Appurtenance(s)	2727.7	1.35	0.20	0.39	139.53	
129.75	Top - Section 3	359.73	1.41	0.31	0.45	24.23	
130.00		13.94	1.42	0.32	0.45	0.96	
135.00		271.98	1.53	0.58	0.58	27.90	
139.00	Appurtenance(s)	2529.8	1.62	0.85	0.70	337.25	
140.00		50.71	1.65	0.93	0.73	7.18	
145.00		245.66	1.77	1.39	0.92	45.64	
150.00	Appurtenance(s)	1917.3	1.89	1.98	1.14	451.50	
	Totals:	**35,454.4**				**1,481.2**	**Total Wind:** **25,844.7**

Calculated Forces

Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E

Iterations 20

Gust Response Factor	1.10			**Sds**	0.19			**Ss**	0.17
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10			**S1**	0.07
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.41	**SA**	0.04	**Seismic Importance Factor**			1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-49.49	-1.56	0.00	-175.96	0.00	175.96	5554.25	2777.13	13600.6	6810.41		0.00	0.00	0.035
5.00	-47.56	-1.54	0.00	-168.17	0.00	168.17	5477.89	2738.95	13118.7	6569.12		0.00	-0.01	0.034
10.00	-45.67	-1.52	0.00	-160.47	0.00	160.47	5399.54	2699.77	12640.4	6329.59		0.01	-0.01	0.034
15.00	-43.82	-1.48	0.00	-152.89	0.00	152.89	5319.17	2659.59	12165.9	6092.00		0.03	-0.02	0.033
20.00	-42.01	-1.45	0.00	-145.46	0.00	145.46	5236.81	2618.40	11695.6	5856.50		0.06	-0.03	0.033
25.00	-40.23	-1.42	0.00	-138.21	0.00	138.21	5152.44	2576.22	11229.8	5623.26		0.09	-0.03	0.032
30.00	-38.49	-1.38	0.00	-131.12	0.00	131.12	5066.07	2533.04	10768.8	5392.43		0.13	-0.04	0.032
35.00	-36.78	-1.35	0.00	-124.20	0.00	124.20	4977.70	2488.85	10313.0	5164.19		0.18	-0.05	0.031
40.00	-35.11	-1.31	0.00	-117.46	0.00	117.46	4887.33	2443.67	9862.71	4938.68		0.23	-0.06	0.031
44.75	-33.56	-1.28	0.00	-111.22	0.00	111.22	4799.62	2399.81	9440.25	4727.14		0.29	-0.06	0.031
45.00	-33.43	-1.28	0.00	-110.90	0.00	110.90	4794.96	2397.48	9418.17	4716.08		0.30	-0.06	0.030
50.00	-30.87	-1.21	0.00	-104.51	0.00	104.51	4700.58	2350.29	8979.75	4496.55		0.37	-0.07	0.030
51.00	-30.36	-1.20	0.00	-103.30	0.00	103.30	3008.41	1504.20	5823.48	2916.07		0.38	-0.07	0.046
55.00	-29.41	-1.19	0.00	-98.49	0.00	98.49	2970.26	1485.13	5621.72	2815.04		0.45	-0.08	0.045
60.00	-28.23	-1.17	0.00	-92.56	0.00	92.56	2920.78	1460.39	5370.82	2689.40		0.54	-0.09	0.044
65.00	-27.08	-1.15	0.00	-86.72	0.00	86.72	2869.29	1434.64	5121.68	2564.65		0.64	-0.10	0.043
70.00	-25.96	-1.14	0.00	-80.97	0.00	80.97	2815.80	1407.90	4874.61	2440.93		0.76	-0.11	0.042
75.00	-24.87	-1.14	0.00	-75.26	0.00	75.26	2760.31	1380.15	4629.95	2318.41		0.88	-0.13	0.041
80.00	-23.80	-1.14	0.00	-69.57	0.00	69.57	2702.81	1351.41	4388.01	2197.26		1.02	-0.14	0.040
84.75	-22.81	-1.14	0.00	-64.15	0.00	64.15	2646.34	1323.17	4160.98	2083.58		1.17	-0.15	0.039
85.00	-22.73	-1.14	0.00	-63.87	0.00	63.87	2643.31	1321.66	4149.11	2077.64		1.17	-0.15	0.039
89.75	-21.18	-1.14	0.00	-58.44	0.00	58.44	1922.43	961.22	2968.94	1486.68		1.33	-0.16	0.050
90.00	-21.14	-1.14	0.00	-58.16	0.00	58.16	1920.55	960.27	2960.86	1482.63		1.34	-0.16	0.050
95.00	-20.29	-1.15	0.00	-52.44	0.00	52.44	1881.78	940.89	2799.79	1401.97		1.52	-0.18	0.048
100.00	-19.46	-1.15	0.00	-46.71	0.00	46.71	1841.02	920.51	2640.02	1321.97		1.71	-0.19	0.046
105.00	-18.65	-1.15	0.00	-40.96	0.00	40.96	1798.25	899.12	2481.89	1242.79		1.92	-0.21	0.043
110.00	-17.86	-1.15	0.00	-35.21	0.00	35.21	1753.48	876.74	2325.70	1164.58		2.15	-0.22	0.040
115.00	-17.10	-1.15	0.00	-29.45	0.00	29.45	1706.70	853.35	2171.78	1087.50		2.39	-0.24	0.037
117.00	-11.58	-1.11	0.00	-27.15	0.00	27.15	1687.43	843.72	2110.92	1057.03		2.49	-0.24	0.033
120.00	-11.15	-1.10	0.00	-23.83	0.00	23.83	1657.93	828.96	2020.46	1011.73		2.65	-0.25	0.030
125.00	-10.45	-1.08	0.00	-18.32	0.00	18.32	1607.15	803.57	1872.06	937.42		2.91	-0.26	0.026
126.00	-10.31	-1.08	0.00	-17.23	0.00	17.23	1596.75	798.38	1842.76	922.75		2.97	-0.26	0.025
127.00	-6.99	-0.93	0.00	-16.15	0.00	16.15	1586.28	793.14	1813.59	908.14		3.02	-0.26	0.022
129.75	-6.48	-0.90	0.00	-13.60	0.00	13.60	1068.62	534.31	1212.20	607.00		3.18	-0.27	0.028
130.00	-6.45	-0.90	0.00	-13.38	0.00	13.38	1067.16	533.58	1207.67	604.73		3.19	-0.27	0.028
135.00	-5.98	-0.87	0.00	-8.87	0.00	8.87	1036.93	518.46	1117.63	559.65		3.48	-0.28	0.022
139.00	-2.82	-0.52	0.00	-5.39	0.00	5.39	1011.29	505.65	1046.45	524.00		3.72	-0.29	0.013
140.00	-2.74	-0.51	0.00	-4.87	0.00	4.87	1004.68	502.34	1028.80	515.16		3.78	-0.29	0.012
145.00	-2.37	-0.46	0.00	-2.32	0.00	2.32	970.44	485.22	941.49	471.44		4.08	-0.29	0.007
150.00	0.00	-0.45	0.00	0.00	0.00	0.00	934.20	467.10	856.03	428.65		4.39	-0.29	0.000

Seismic Segment Forces (Factored)

Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

IES Tower Engineering Solutions

Load Case: 0.9D + 1.0E

Gust Response Factor	1.10			**Sds**	0.19	**Iterations**	20
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10	**Ss**	0.17
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.41	**SA**	0.04	**S1**	0.07
						Seismic Importance Factor	1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1391.8	0.00	0.03	0.02	21.33	
10.00		1361.1	0.01	0.05	0.03	31.08	
15.00		1330.3	0.02	0.06	0.04	35.52	
20.00		1299.6	0.03	0.07	0.04	37.37	
25.00		1268.9	0.05	0.07	0.04	38.04	
30.00		1238.2	0.08	0.07	0.04	38.23	
35.00		1207.5	0.10	0.07	0.04	38.27	
40.00		1176.8	0.13	0.07	0.03	38.19	
44.75	Bot - Section 2	1089.5	0.17	0.07	0.03	35.93	
45.00		97.62	0.17	0.07	0.03	3.22	
50.00		1924.7	0.21	0.06	0.02	63.53	
51.00	Top - Section 1	378.64	0.22	0.06	0.02	12.46	
55.00		628.19	0.25	0.05	0.02	20.13	
60.00		765.49	0.30	0.04	0.01	22.66	
65.00	Appurtenance(s)	745.56	0.35	0.03	0.01	18.74	
70.00		721.62	0.41	0.01	0.01	13.23	
75.00		699.68	0.47	-0.01	0.01	6.53	
80.00		677.74	0.54	-0.03	0.01	-0.75	
84.75	Bot - Section 3	623.54	0.60	-0.05	0.01	-6.89	
85.00		58.46	0.61	-0.06	0.02	-0.67	
89.75	Top - Section 2	1092.0	0.68	-0.08	0.03	-21.70	
90.00		25.32	0.68	-0.08	0.03	-0.51	
95.00		497.14	0.76	-0.10	0.04	-12.78	
100.00		479.59	0.84	-0.12	0.07	-12.92	
105.00		462.04	0.93	-0.12	0.10	-10.83	
110.00		444.49	1.02	-0.11	0.14	-6.67	
115.00		426.94	1.11	-0.06	0.19	-0.67	
117.00	Appurtenance(s)	4512.9	1.15	-0.04	0.22	23.52	
120.00		243.53	1.21	0.01	0.26	4.11	
125.00		391.84	1.31	0.14	0.35	15.81	
126.00	Bot - Section 4	76.26	1.33	0.17	0.37	3.48	
127.00	Appurtenance(s)	2727.7	1.35	0.20	0.39	139.53	
129.75	Top - Section 3	359.73	1.41	0.31	0.45	24.23	
130.00		13.94	1.42	0.32	0.45	0.96	
135.00		271.98	1.53	0.58	0.58	27.90	
139.00	Appurtenance(s)	2529.8	1.62	0.85	0.70	337.25	
140.00		50.71	1.65	0.93	0.73	7.18	
145.00		245.66	1.77	1.39	0.92	45.64	
150.00	Appurtenance(s)	1917.3	1.89	1.98	1.14	451.50	
	Totals:	**35,454.4**				**1,481.2**	**Total Wind:** **25,844.7**

Calculated Forces

Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E

Iterations 20

Gust Response Factor	1.10			**Sds**	0.19			**Ss**	0.17
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10			**S1**	0.07
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.41	**SA**	0.04	**Seismic Importance Factor**			1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-37.12	-1.56	0.00	-174.39	0.00	174.39	5554.25	2777.13	13600.6	6810.41		0.00	0.00	0.032
5.00	-35.67	-1.54	0.00	-166.60	0.00	166.60	5477.89	2738.95	13118.7	6569.12		0.00	-0.01	0.032
10.00	-34.25	-1.51	0.00	-158.91	0.00	158.91	5399.54	2699.77	12640.4	6329.59		0.01	-0.01	0.031
15.00	-32.87	-1.48	0.00	-151.34	0.00	151.34	5319.17	2659.59	12165.9	6092.00		0.03	-0.02	0.031
20.00	-31.50	-1.45	0.00	-143.94	0.00	143.94	5236.81	2618.40	11695.6	5856.50		0.06	-0.03	0.031
25.00	-30.17	-1.41	0.00	-136.71	0.00	136.71	5152.44	2576.22	11229.8	5623.26		0.09	-0.03	0.030
30.00	-28.86	-1.38	0.00	-129.66	0.00	129.66	5066.07	2533.04	10768.8	5392.43		0.13	-0.04	0.030
35.00	-27.59	-1.34	0.00	-122.78	0.00	122.78	4977.70	2488.85	10313.0	5164.19		0.17	-0.05	0.029
40.00	-26.34	-1.30	0.00	-116.08	0.00	116.08	4887.33	2443.67	9862.71	4938.68		0.23	-0.06	0.029
44.75	-25.17	-1.27	0.00	-109.89	0.00	109.89	4799.62	2399.81	9440.25	4727.14		0.29	-0.06	0.028
45.00	-25.08	-1.27	0.00	-109.57	0.00	109.57	4794.96	2397.48	9418.17	4716.08		0.29	-0.06	0.028
50.00	-23.15	-1.20	0.00	-103.23	0.00	103.23	4700.58	2350.29	8979.75	4496.55		0.36	-0.07	0.028
51.00	-22.77	-1.19	0.00	-102.03	0.00	102.03	3008.41	1504.20	5823.48	2916.07		0.38	-0.07	0.043
55.00	-22.05	-1.17	0.00	-97.26	0.00	97.26	2970.26	1485.13	5621.72	2815.04		0.44	-0.08	0.042
60.00	-21.17	-1.15	0.00	-91.39	0.00	91.39	2920.78	1460.39	5370.82	2689.40		0.53	-0.09	0.041
65.00	-20.31	-1.14	0.00	-85.62	0.00	85.62	2869.29	1434.64	5121.68	2564.65		0.63	-0.10	0.040
70.00	-19.47	-1.13	0.00	-79.93	0.00	79.93	2815.80	1407.90	4874.61	2440.93		0.75	-0.11	0.040
75.00	-18.65	-1.12	0.00	-74.29	0.00	74.29	2760.31	1380.15	4629.95	2318.41		0.87	-0.13	0.039
80.00	-17.85	-1.12	0.00	-68.68	0.00	68.68	2702.81	1351.41	4388.01	2197.26		1.01	-0.14	0.038
84.75	-17.11	-1.12	0.00	-63.33	0.00	63.33	2646.34	1323.17	4160.98	2083.58		1.15	-0.15	0.037
85.00	-17.05	-1.13	0.00	-63.05	0.00	63.05	2643.31	1321.66	4149.11	2077.64		1.16	-0.15	0.037
89.75	-15.88	-1.13	0.00	-57.70	0.00	57.70	1922.43	961.22	2968.94	1486.68		1.32	-0.16	0.047
90.00	-15.85	-1.13	0.00	-57.42	0.00	57.42	1920.55	960.27	2960.86	1482.63		1.32	-0.16	0.047
95.00	-15.21	-1.13	0.00	-51.78	0.00	51.78	1881.78	940.89	2799.79	1401.97		1.50	-0.18	0.045
100.00	-14.59	-1.13	0.00	-46.14	0.00	46.14	1841.02	920.51	2640.02	1321.97		1.69	-0.19	0.043
105.00	-13.99	-1.13	0.00	-40.48	0.00	40.48	1798.25	899.12	2481.89	1242.79		1.90	-0.21	0.040
110.00	-13.39	-1.13	0.00	-34.82	0.00	34.82	1753.48	876.74	2325.70	1164.58		2.13	-0.22	0.038
115.00	-12.82	-1.13	0.00	-29.15	0.00	29.15	1706.70	853.35	2171.78	1087.50		2.36	-0.23	0.034
117.00	-8.68	-1.09	0.00	-26.89	0.00	26.89	1687.43	843.72	2110.92	1057.03		2.46	-0.24	0.031
120.00	-8.36	-1.09	0.00	-23.61	0.00	23.61	1657.93	828.96	2020.46	1011.73		2.62	-0.25	0.028
125.00	-7.84	-1.07	0.00	-18.16	0.00	18.16	1607.15	803.57	1872.06	937.42		2.88	-0.26	0.024
126.00	-7.73	-1.07	0.00	-17.09	0.00	17.09	1596.75	798.38	1842.76	922.75		2.93	-0.26	0.023
127.00	-5.25	-0.92	0.00	-16.02	0.00	16.02	1586.28	793.14	1813.59	908.14		2.99	-0.26	0.021
129.75	-4.86	-0.89	0.00	-13.49	0.00	13.49	1068.62	534.31	1212.20	607.00		3.14	-0.27	0.027
130.00	-4.84	-0.89	0.00	-13.27	0.00	13.27	1067.16	533.58	1207.67	604.73		3.15	-0.27	0.026
135.00	-4.48	-0.86	0.00	-8.81	0.00	8.81	1036.93	518.46	1117.63	559.65		3.44	-0.28	0.020
139.00	-2.11	-0.51	0.00	-5.35	0.00	5.35	1011.29	505.65	1046.45	524.00		3.68	-0.28	0.012
140.00	-2.06	-0.51	0.00	-4.84	0.00	4.84	1004.68	502.34	1028.80	515.16		3.74	-0.28	0.011
145.00	-1.78	-0.46	0.00	-2.30	0.00	2.30	970.44	485.22	941.49	471.44		4.04	-0.29	0.007
150.00	0.00	-0.45	0.00	0.00	0.00	0.00	934.20	467.10	856.03	428.65		4.34	-0.29	0.000

Wind Loading - Shaft

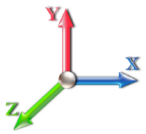
Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.70	6.129	6.74	254.87	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	6.129	6.74	249.35	0.650	0.000	5.00	25.111	16.32	110.0	0.0	1391.8
10.00		1.00	0.70	6.129	6.74	243.83	0.650	0.000	5.00	24.561	15.96	107.6	0.0	1361.1
15.00		1.00	0.70	6.129	6.74	238.30	0.650	0.000	5.00	24.011	15.61	105.2	0.0	1330.4
20.00		1.00	0.70	6.129	6.74	232.78	0.650	0.000	5.00	23.461	15.25	102.8	0.0	1299.7
25.00		1.00	0.70	6.129	6.74	227.26	0.650	0.000	5.00	22.911	14.89	100.4	0.0	1269.0
30.00		1.00	0.70	6.134	6.75	221.83	0.650	0.000	5.00	22.361	14.53	98.1	0.0	1238.2
35.00		1.00	0.73	6.410	7.05	221.12	0.650	0.000	5.00	21.811	14.18	100.0	0.0	1207.5
40.00		1.00	0.76	6.659	7.33	219.62	0.650	0.000	5.00	21.260	13.82	101.2	0.0	1176.8
44.75	Bot - Section 2	1.00	0.79	6.876	7.56	217.62	0.650	0.000	4.75	19.688	12.80	96.8	0.0	1089.5
45.00		1.00	0.79	6.887	7.58	217.50	0.650	0.000	0.25	1.036	0.67	5.1	0.0	97.6
50.00		1.00	0.81	7.098	7.81	214.85	0.650	0.000	5.00	20.425	13.28	103.7	0.0	1924.8
51.00	Top - Section 1	1.00	0.82	7.138	7.85	214.27	0.650	0.000	1.00	4.019	2.61	20.5	0.0	378.6
55.00		1.00	0.83	7.294	8.02	214.67	0.650	0.000	4.00	15.856	10.31	82.7	0.0	628.2
60.00		1.00	0.85	7.477	8.22	211.26	0.650	0.000	5.00	19.325	12.56	103.3	0.0	765.5
65.00	Appurtenance(s)	1.00	0.87	7.650	8.42	207.52	0.650	0.000	5.00	18.775	12.20	102.7	0.0	743.6
70.00		1.00	0.89	7.814	8.60	203.49	0.650	0.000	5.00	18.225	11.85	101.8	0.0	721.6
75.00		1.00	0.91	7.969	8.77	199.21	0.650	0.000	5.00	17.675	11.49	100.7	0.0	699.7
80.00		1.00	0.93	8.118	8.93	194.70	0.650	0.000	5.00	17.125	11.13	99.4	0.0	677.7
84.75	Bot - Section 3	1.00	0.94	8.253	9.08	190.22	0.650	0.000	4.75	15.759	10.24	93.0	0.0	623.5
85.00		1.00	0.94	8.260	9.09	189.98	0.650	0.000	0.25	0.826	0.54	4.9	0.0	58.5
89.75	Top - Section 2	1.00	0.96	8.389	9.23	185.32	0.650	0.000	4.75	15.437	10.03	92.6	0.0	1092.1
90.00		1.00	0.96	8.396	9.24	187.56	0.650	0.000	0.25	0.799	0.52	4.8	0.0	25.3
95.00		1.00	0.97	8.526	9.38	182.50	0.650	0.000	5.00	15.686	10.20	95.6	0.0	497.1
100.00		1.00	0.99	8.652	9.52	177.28	0.650	0.000	5.00	15.136	9.84	93.6	0.0	479.6
105.00		1.00	1.00	8.774	9.65	171.91	0.650	0.000	5.00	14.586	9.48	91.5	0.0	462.0
110.00		1.00	1.02	8.891	9.78	166.41	0.650	0.000	5.00	14.036	9.12	89.2	0.0	444.5
115.00		1.00	1.03	9.005	9.91	160.78	0.650	0.000	5.00	13.486	8.77	86.8	0.0	426.9
117.00	Appurtenance(s)	1.00	1.03	9.049	9.95	158.49	0.650	0.000	2.00	5.240	3.41	33.9	0.0	165.9
120.00		1.00	1.04	9.115	10.03	155.02	0.650	0.000	3.00	7.696	5.00	50.2	0.0	243.5
125.00		1.00	1.05	9.222	10.14	149.15	0.650	0.000	5.00	12.386	8.05	81.7	0.0	391.8
126.00	Bot - Section 4	1.00	1.06	9.243	10.17	147.97	0.650	0.000	1.00	2.411	1.57	15.9	0.0	76.3
127.00	Appurtenance(s)	1.00	1.06	9.264	10.19	146.78	0.650	0.000	1.00	2.421	1.57	16.0	0.0	133.1
129.75	Top - Section 3	1.00	1.06	9.321	10.25	143.48	0.650	0.000	2.75	6.544	4.25	43.6	0.0	359.7
130.00		1.00	1.07	9.326	10.26	145.15	0.650	0.000	0.25	0.587	0.38	3.9	0.0	13.9
135.00		1.00	1.08	9.427	10.37	139.08	0.650	0.000	5.00	11.445	7.44	77.1	0.0	272.0
139.00	Appurtenance(s)	1.00	1.09	9.506	10.46	134.16	0.650	0.000	4.00	8.760	5.69	59.5	0.0	208.1
140.00		1.00	1.09	9.525	10.48	132.92	0.650	0.000	1.00	2.135	1.39	14.5	0.0	50.7
145.00		1.00	1.10	9.621	10.58	126.67	0.650	0.000	5.00	10.345	6.72	71.2	0.0	245.7
150.00	Appurtenance(s)	1.00	1.11	9.715	10.69	120.33	0.650	0.000	5.00	9.795	6.37	68.0	0.0	232.5
								Totals:	**150.00**			**2,829.7**		**24,504.2**

Discrete Appurtenance Forces

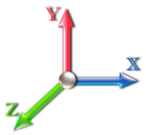
Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	150.00	Decibel DB846G90A-XY	12	9.715	10.686	1.01	0.90	60.60	184.80	0.000	0.000	647.60	0.00	0.00
2	150.00	Low Profile Platform	1	9.715	10.686	1.00	1.00	22.00	1500.00	0.000	0.000	235.10	0.00	0.00
3	139.00	Low Profile Platform	1	9.506	10.456	1.00	1.00	22.00	1500.00	0.000	0.000	230.04	0.00	0.00
4	139.00	Powerwave 7770	6	9.506	10.456	0.58	0.80	19.27	210.00	0.000	0.000	201.51	0.00	0.00
5	139.00	Kathrein 800 10764	1	9.506	10.456	1.00	1.00	5.88	40.80	0.000	0.000	61.48	0.00	0.00
6	139.00	KMW	2	9.506	10.456	0.81	0.90	12.99	97.00	0.000	0.000	135.85	0.00	0.00
7	139.00	Powerwave LGP 21401	6	9.506	10.456	0.54	0.80	0.00	105.00	0.000	0.000	0.00	0.00	0.00
8	139.00	Powerwave LGP 13519	6	9.506	10.456	0.54	0.80	1.09	31.80	0.000	0.000	11.43	0.00	0.00
9	139.00	Ericsson RRUS 11	6	9.506	10.456	0.54	0.80	8.10	304.20	0.000	0.000	84.74	0.00	0.00
10	139.00	Raycap DC6-48-60-18-8F	1	9.506	10.456	1.00	1.00	0.92	31.80	0.000	0.000	9.62	0.00	0.00
11	139.00	Commscope	1	9.506	10.456	1.00	1.00	0.05	1.10	0.000	0.000	0.52	0.00	0.00
12	127.00	RFS	1	9.264	10.190	1.00	1.00	4.06	32.00	0.000	0.000	41.37	0.00	0.00
13	127.00	Samsung RFV01U-D1A	3	9.264	10.190	0.54	0.80	3.02	292.50	0.000	0.000	30.80	0.00	0.00
14	127.00	Samsung RFV01U-D2A	3	9.264	10.190	0.54	0.80	3.02	246.00	0.000	0.000	30.80	0.00	0.00
15	127.00	Samsung MT6407-77A	3	9.264	10.190	0.56	0.80	7.88	238.20	0.000	0.000	80.29	0.00	0.00
16	127.00	Commscope	6	9.264	10.190	0.68	0.80	33.33	262.20	0.000	0.000	339.67	0.00	0.00
17	127.00	Low Profile Platform	1	9.264	10.190	1.00	1.00	22.00	1500.00	0.000	0.000	224.18	0.00	0.00
18	127.00	Commscope	3	9.264	10.190	0.40	0.80	1.78	23.70	0.000	0.000	18.10	0.00	0.00
19	117.00	F4P-HRK10	1	9.049	9.954	1.00	1.00	9.00	478.27	0.000	0.000	89.59	0.00	0.00
20	117.00	Ericsson 4480 B71 + B85	4	9.049	9.954	0.50	0.75	5.73	372.00	0.000	0.000	57.02	0.00	0.00
21	117.00	SitePro F4P-10W	1	9.049	9.954	1.00	1.00	58.98	2396.00	0.000	0.000	587.09	0.00	0.00
22	117.00	RFS	4	9.049	9.954	0.55	0.75	11.32	105.60	0.000	0.000	112.70	0.00	0.00
23	117.00	Ericsson Air 32	4	9.049	9.954	0.65	0.75	16.99	423.20	0.000	0.000	169.13	0.00	0.00
24	117.00	RFS	4	9.049	9.954	0.55	0.75	44.33	396.00	0.000	0.000	441.22	0.00	0.00
25	117.00	Ericsson RRU 2217 B2	4	9.049	9.954	0.50	0.75	5.17	176.00	0.000	0.000	51.42	0.00	0.00
26	65.00	Motorola RRA4905A	2	7.650	8.415	1.00	1.00	0.28	2.00	0.000	0.000	2.36	0.00	0.00
							Totals:		**10,950.17**			**3,893.65**		

Total Applied Force Summary

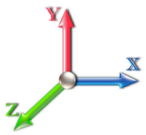
Structure:	CT13613-A-SBA		**Code:**	TIA-222-G	5/20/2022
Site Name:	Johnson		**Exposure:**	B	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 29

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		110.03	1604.51	0.00	0.00
10.00		107.62	1573.80	0.00	0.00
15.00		105.21	1543.09	0.00	0.00
20.00		102.80	1512.37	0.00	0.00
25.00		100.39	1481.66	0.00	0.00
30.00		98.07	1450.95	0.00	0.00
35.00		99.96	1420.24	0.00	0.00
40.00		101.23	1389.52	0.00	0.00
44.75		96.80	1291.60	0.00	0.00
45.00		5.10	108.26	0.00	0.00
50.00		103.65	2137.47	0.00	0.00
51.00		20.51	421.18	0.00	0.00
55.00		82.69	798.35	0.00	0.00
60.00		103.31	978.19	0.00	0.00
65.00	(2) attachments	105.05	958.26	0.00	0.00
70.00		101.82	932.72	0.00	0.00
75.00		100.71	910.78	0.00	0.00
80.00		99.40	888.84	0.00	0.00
84.75		92.99	824.08	0.00	0.00
85.00		4.88	69.02	0.00	0.00
89.75		92.60	1292.61	0.00	0.00
90.00		4.79	35.87	0.00	0.00
95.00		95.63	708.24	0.00	0.00
100.00		93.64	690.69	0.00	0.00
105.00		91.50	673.14	0.00	0.00
110.00		89.23	655.59	0.00	0.00
115.00		86.83	638.04	0.00	0.00
117.00	(22) attachments	1542.07	4597.37	0.00	0.00
120.00		50.15	357.71	0.00	0.00
125.00		81.67	582.14	0.00	0.00
126.00		15.93	114.32	0.00	0.00
127.00	(20) attachments	781.25	2765.78	0.00	0.00
129.75		43.61	429.91	0.00	0.00
130.00		3.91	20.32	0.00	0.00
135.00		77.14	399.58	0.00	0.00
139.00	(30) attachments	794.74	2631.89	0.00	0.00
140.00		14.54	63.19	0.00	0.00
145.00		71.16	308.06	0.00	0.00
150.00	(13) attachments	950.74	1979.70	0.00	0.00
	Totals:	**6,723.38**	**41,239.03**	**0.00**	**0.00**

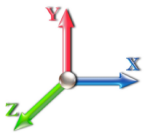
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 30	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.011	0.000	6.129	0.00	1.60
10.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.011	0.000	6.129	0.00	1.60
15.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.011	0.000	6.129	0.00	1.60
20.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	6.129	0.00	1.60
25.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	6.129	0.00	1.60
30.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	6.134	0.00	1.60
35.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.012	0.000	6.410	0.00	1.60
40.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	6.659	0.00	1.60
44.75	1/2" Coax	Yes	4.75	0.000	0.65	0.26	0.00	0.013	0.000	6.876	0.00	1.52
45.00	1/2" Coax	Yes	0.25	0.000	0.65	0.01	0.00	0.013	0.000	6.887	0.00	0.08
50.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.013	0.000	7.098	0.00	1.60
51.00	1/2" Coax	Yes	1.00	0.000	0.65	0.05	0.00	0.014	0.000	7.138	0.00	0.32
55.00	1/2" Coax	Yes	4.00	0.000	0.65	0.22	0.00	0.014	0.000	7.294	0.00	1.28
60.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.014	0.000	7.477	0.00	1.60
65.00	1/2" Coax	Yes	5.00	0.000	0.65	0.27	0.00	0.014	0.000	7.650	0.00	1.60
									Totals:		**0.0**	**20.8**

Calculated Forces

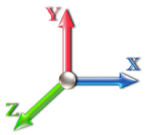
Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 31	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-41.24	-6.73	0.00	-733.58	0.00	733.58	5554.25	2777.13	13600.6	6810.41	0.00	0.000	0.000	0.115
5.00	-39.63	-6.64	0.00	-699.92	0.00	699.92	5477.89	2738.95	13118.7	6569.12	0.01	-0.028	0.000	0.114
10.00	-38.05	-6.55	0.00	-666.71	0.00	666.71	5399.54	2699.77	12640.4	6329.59	0.06	-0.056	0.000	0.112
15.00	-36.51	-6.46	0.00	-633.96	0.00	633.96	5319.17	2659.59	12165.9	6092.00	0.13	-0.084	0.000	0.111
20.00	-34.99	-6.37	0.00	-601.65	0.00	601.65	5236.81	2618.40	11695.6	5856.50	0.24	-0.113	0.000	0.109
25.00	-33.51	-6.29	0.00	-569.77	0.00	569.77	5152.44	2576.22	11229.8	5623.26	0.37	-0.143	0.000	0.108
30.00	-32.05	-6.20	0.00	-538.33	0.00	538.33	5066.07	2533.04	10768.8	5392.43	0.54	-0.173	0.000	0.106
35.00	-30.63	-6.12	0.00	-507.31	0.00	507.31	4977.70	2488.85	10313.0	5164.19	0.73	-0.203	0.000	0.104
40.00	-29.24	-6.02	0.00	-476.74	0.00	476.74	4887.33	2443.67	9862.71	4938.68	0.96	-0.234	0.000	0.103
44.75	-27.94	-5.93	0.00	-448.12	0.00	448.12	4799.62	2399.81	9440.25	4727.14	1.21	-0.264	0.000	0.101
45.00	-27.83	-5.93	0.00	-446.64	0.00	446.64	4794.96	2397.48	9418.17	4716.08	1.23	-0.266	0.000	0.101
50.00	-25.70	-5.83	0.00	-416.98	0.00	416.98	4700.58	2350.29	8979.75	4496.55	1.52	-0.298	0.000	0.098
51.00	-25.27	-5.81	0.00	-411.15	0.00	411.15	3008.41	1504.20	5823.48	2916.07	1.58	-0.305	0.000	0.149
55.00	-24.47	-5.74	0.00	-387.91	0.00	387.91	2970.26	1485.13	5621.72	2815.04	1.85	-0.331	0.000	0.146
60.00	-23.49	-5.65	0.00	-359.21	0.00	359.21	2920.78	1460.39	5370.82	2689.40	2.22	-0.374	0.000	0.142
65.00	-22.53	-5.55	0.00	-330.97	0.00	330.97	2869.29	1434.64	5121.68	2564.65	2.64	-0.418	0.000	0.137
70.00	-21.59	-5.46	0.00	-303.21	0.00	303.21	2815.80	1407.90	4874.61	2440.93	3.10	-0.462	0.000	0.132
75.00	-20.68	-5.37	0.00	-275.90	0.00	275.90	2760.31	1380.15	4629.95	2318.41	3.61	-0.506	0.000	0.127
80.00	-19.79	-5.28	0.00	-249.06	0.00	249.06	2702.81	1351.41	4388.01	2197.26	4.16	-0.550	0.000	0.121
84.75	-18.96	-5.18	0.00	-224.00	0.00	224.00	2646.34	1323.17	4160.98	2083.58	4.73	-0.591	0.000	0.115
85.00	-18.89	-5.18	0.00	-222.71	0.00	222.71	2643.31	1321.66	4149.11	2077.64	4.76	-0.593	0.000	0.114
89.75	-17.60	-5.08	0.00	-198.09	0.00	198.09	1922.43	961.22	2968.94	1486.68	5.37	-0.634	0.000	0.142
90.00	-17.56	-5.09	0.00	-196.82	0.00	196.82	1920.55	960.27	2960.86	1482.63	5.40	-0.636	0.000	0.142
95.00	-16.85	-5.00	0.00	-171.39	0.00	171.39	1881.78	940.89	2799.79	1401.97	6.10	-0.686	0.000	0.131
100.00	-16.15	-4.91	0.00	-146.40	0.00	146.40	1841.02	920.51	2640.02	1321.97	6.84	-0.734	0.000	0.120
105.00	-15.48	-4.82	0.00	-121.87	0.00	121.87	1798.25	899.12	2481.89	1242.79	7.64	-0.778	0.000	0.107
110.00	-14.82	-4.73	0.00	-97.77	0.00	97.77	1753.48	876.74	2325.70	1164.58	8.47	-0.820	0.000	0.092
115.00	-14.18	-4.64	0.00	-74.12	0.00	74.12	1706.70	853.35	2171.78	1087.50	9.35	-0.856	0.000	0.076
117.00	-9.61	-3.03	0.00	-64.84	0.00	64.84	1687.43	843.72	2110.92	1057.03	9.71	-0.869	0.000	0.067
120.00	-9.25	-2.98	0.00	-55.75	0.00	55.75	1657.93	828.96	2020.46	1011.73	10.27	-0.887	0.000	0.061
125.00	-8.67	-2.89	0.00	-40.85	0.00	40.85	1607.15	803.57	1872.06	937.42	11.21	-0.914	0.000	0.049
126.00	-8.55	-2.87	0.00	-37.95	0.00	37.95	1596.75	798.38	1842.76	922.75	11.40	-0.918	0.000	0.047
127.00	-5.80	-2.05	0.00	-35.08	0.00	35.08	1586.28	793.14	1813.59	908.14	11.60	-0.923	0.000	0.042
129.75	-5.37	-2.00	0.00	-29.44	0.00	29.44	1068.62	534.31	1212.20	607.00	12.13	-0.935	0.000	0.054
130.00	-5.35	-2.00	0.00	-28.94	0.00	28.94	1067.16	533.58	1207.67	604.73	12.18	-0.936	0.000	0.053
135.00	-4.95	-1.91	0.00	-18.96	0.00	18.96	1036.93	518.46	1117.63	559.65	13.17	-0.958	0.000	0.039
139.00	-2.33	-1.08	0.00	-11.30	0.00	11.30	1011.29	505.65	1046.45	524.00	13.98	-0.970	0.000	0.024
140.00	-2.27	-1.06	0.00	-10.23	0.00	10.23	1004.68	502.34	1028.80	515.16	14.18	-0.973	0.000	0.022
145.00	-1.96	-0.98	0.00	-4.92	0.00	4.92	970.44	485.22	941.49	471.44	15.21	-0.982	0.000	0.012
150.00	0.00	-0.95	0.00	0.00	0.00	0.00	934.20	467.10	856.03	428.65	16.24	-0.986	0.000	0.000

Final Analysis Summary

Structure:	CT13613-A-SBA	**Code:**	TIA-222-G	5/20/2022	
Site Name:	Johnson	**Exposure:**	B		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 32	

Tower Engineering Solutions

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 93 mph Wind	25.9	0.00	49.46	0.00	0.00	2834.51
0.9D + 1.6W 93 mph Wind	25.9	0.00	37.09	0.00	0.00	2810.92
1.2D + 1.0Di + 1.0Wi 40 mph Wind	5.5	0.00	86.53	0.00	0.00	603.46
1.2D + 1.0E	1.6	0.00	49.49	0.00	0.00	175.96
0.9D + 1.0E	1.6	0.00	37.12	0.00	0.00	174.39
1.0D + 1.0W 60 mph Wind	6.7	0.00	41.24	0.00	0.00	733.58

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 93 mph Wind	-29.89	-22.45	0.00	-1591.6	0.00	-1591.6	3008.41	1504.2	5823.48	2916.07	51.00	0.556
0.9D + 1.6W 93 mph Wind	-22.31	-22.28	0.00	-1573.0	0.00	-1573.0	3008.41	1504.2	5823.48	2916.07	51.00	0.547
1.2D + 1.0Di + 1.0Wi 40 mph Wind	-60.31	-4.79	0.00	-340.09	0.00	-340.09	3008.41	1504.2	5823.48	2916.07	51.00	0.137
1.2D + 1.0E	-21.18	-1.14	0.00	-58.44	0.00	-58.44	1922.43	961.22	2968.94	1486.68	89.75	0.050
0.9D + 1.0E	-15.88	-1.13	0.00	-57.70	0.00	-57.70	1922.43	961.22	2968.94	1486.68	89.75	0.047
1.0D + 1.0W 60 mph Wind	-25.27	-5.81	0.00	-411.15	0.00	-411.15	3008.41	1504.2	5823.48	2916.07	51.00	0.149

Base Plate Summary

Structure:	CT13613-A-SB		**Code:**	TIA-222-G	5/20/2022
Site Name:	Johnson		**Exposure:**	B	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 33

Tower Engineering Solutions

Reactions	
Original Design	
Moment (kip-ft):	4200.00
Axial (kip):	36.00
Shear (kip):	39.00
Analysis (1.2D + 1.6W)	
Moment (kip-ft):	2834.51
Axial (kip):	49.46
Shear (kip):	25.89

Base Plate	
Yield (ksi):	50.00
Width (in):	66.00
Style:	Clipped
Polygon Sides:	0.00
Clip Length (in):	14.00
Effective Len (in):	9.14
Moment (kip-in):	370.51
Allow Stress (ksi):	67.50
Applied Stress (ksi):	32.40
Stress Ratio:	0.48

Anchor Bolts	
Bolt Circle:	67.00
Number Bolts:	20.00
Bolt Type:	2.25" 18J
Bolt Diameter (in):	2.25
Yield (ksi):	75.00
Ultimate (ksi):	100.00
Arrangement:	Clustered
Cluster Dist (in):	6.00
Start Angle (deg):	45.00
Compression	
Force (kip):	105.86
Allowable (kip):	260.00
Ratio:	0.42
Tension	
Force (kip):	97.21
Allowable (kip):	260.00
Ratio:	0.38

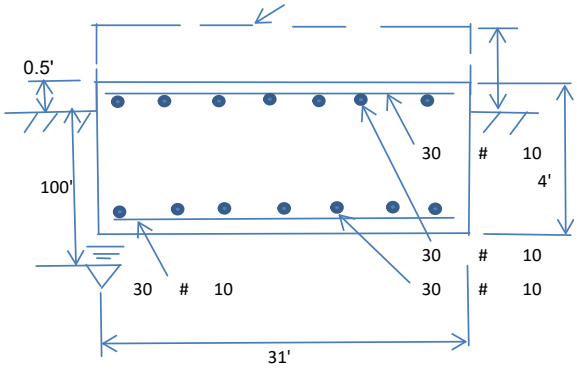
Monopole Mat Foundation Design

				Date
				5/20/2022
Customer Name:		**EIA/TIA Standard:**	EIA-222-G	
Site Name:		**Structure Height (Ft.):**	300	
Site Number:	194213-VZW	**Engineer Name:**	J. Tibbetts	
Engr. Number:		**Engineer Login ID:**		

Foundation Info Obtained from: Mapping Operation

Structure Type: Monopole

Analysis or Design? Analysis

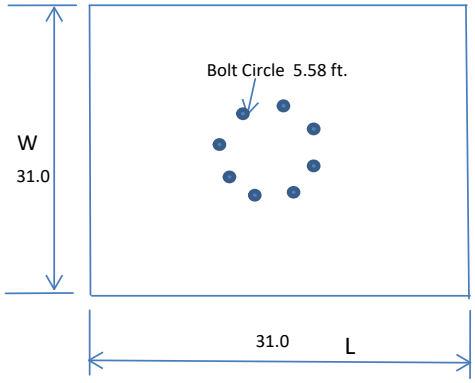


Base Reactions (Factored):

Axial Load (Kips):	49.5	Shear Force (Kips):	25.9
Uplift Force (Kips):	0.0	Moment (Kips-ft):	2834.5
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Anchor Bolt Circle (ft.):	5.58	Depth of Base BG (ft.):	3.50
Thickness of Pad (ft):	4.00		
Length of Pad (ft.):	31	Width of Pad (ft.):	31
Final Length of pad (ft)	31.0	Final width of pad (ft):	31.0



Material Properties and Reabr Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Pad Rebar Yield (Ksi):	60	Tie Spacing (in):	12.0	
Pad Steel Rebar Size (#):	10			
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	30	Qty. of Rebar in Pad (W):	30	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	30	Qty. of Rebar in Pad (W):	30	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Water Table B.G.S. (ft):	100.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	8000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

Foundation Analysis and Design: Uplift Strength Reduction Factor: 0.75 — Compression Strength Reduction Factor: 0.75

Total Dry Soil Volume (cu. Ft.):	0.00	Total Dry Soil Weight (Kips):	0.00
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	0.00	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	3844.00	Total Dry Concrete Weight (Kips):	576.60
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	576.60	Total Vertical Load on Base (Kips):	626.06

Check Soil Capacities:

				Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	1471	<	Allowable Factored Soil Bearing (psf): 6000	0.25	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	8810.2	>	Design Factored Momont (kips-ft): 2939	0.33	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	3.00	OK!			

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.00

Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	1356.2	>	One-Way Factored Shear (L-D. Kips):	279.4	0.21	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1356.2	>	One-Way Factored Shear (W-D., Kips)	279.4	0.21	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	1652.0	>	One-Way Factored Shear (C-C, Kips):	412.1	0.25	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0023	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0023		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	7401.5	>	Moment at Bottom (L-Direct. K-Ft):	1224.1	0.17	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	7401.5	>	Moment at Bottom (W-Direct. K-Ft):	1224.1	0.17	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	10420.3	>	Moment at Bottom (C-C Dir. K-Ft):	1731.1	0.17	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0023	OK!	Upper Steel Reinf. Ratio (W-Direct.):	0.0023		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	7401.5	>	Moment at the top (L-Dir Kips-Ft):	354.1	0.05	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	7401.5	>	Moment at the top (W-Dir Kips-Ft):	354.1	0.05	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	10420.3	>	Moment at the top (C-C Direc. K-Ft):	449.2	0.04	OK!

Exhibit E

Mount Analysis

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Antenna Mount Analysis Report

Existing Monopole Tower
Customer Name: SBA Communications Corp
Customer Site Number: CT13613-A-SBA
Customer Site Name: Johnson
Carrier Name: T-Mobile (App#: 193384, v1)
Carrier Site ID / Name: CTNH549B / CTNH549B
Site Location: 382 Colebrook River Rd
Colebrook, Connecticut
Litchfield County
Latitude: 41.992083
Longitude: -73.039805

Analysis Result:

Max Structural Usage: 37.7% [Pass]

Report Prepared By : Andrew Weissenberger

Introduction

The purpose of this report is to summarize the analysis results on the (1) F4P-10W + (1) F4P-HRK10 at 117.00' elevation to support the proposed antenna configuration. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Mount Mapping	SGS Towers, dated 05/03/2022
Antenna Loading	SBA Application #: 1933284, v1, dated 06/16/2022
Modification Drawings	N/A

Analysis Criteria

Basic Wind Speed Used in the Analysis: V_{ULT} = 120 mph (3-Sec. Gust) / Equivalent to
V_{ASD} = 93 mph (3-Sec. Gust)
Basic Wind Speed with Ice: 50 mph (3-Sec. Gust) with 0.75" radial ice concurrent
Operational Wind Speed: 60 mph +0" Radial ice
Standard/Codes: ANSI/TIA/EIA 222-G / 2015 IBC
Exposure Category: C
Structure Class: II
Topographic Category: 1
Crest Height (Ft): 860

The site is a Risk Category II structure per IBC Table 1604.5. This site does not support emergency communication equipment for first responders such as fire departments, police, hospitals, ambulance services or any of the facilities listed for Risk Categories III and IV. The scope of work detailed in this structural analysis does not include items that are a part of emergency service as the 911 or essential facility service of an emergency response system.

Mount Information

(1) F4P-10W + (1) F4P-HRK10 at 117.00' elevation

Final Antenna Configuration

4 Ericsson AIR 32 KRD901146-1_B66A_B2A
4 RFS APXVAA24_43-U-A20
4 RFS APXV18-206517S-A20
4 Ericsson 4480 B71 + B85
4 Ericsson RRU 2217 B2

In addition to the proposed equipment loading, a 500 lb serviceability load was also considered in this analysis in accordance with TIA requirements.

Analysis Results

Our calculations have determined that under design wind load the existing mount will be structurally adequate to support the proposed antenna configuration. The maximum structural usage is 37.7%, which occurs in the mount pipe. The proposed equipment must be installed as stipulated in the Final Antenna Configuration section of this report. The analysis results are void if the proposed equipment is not installed in accordance with this report.

Attachments

1. Mount Photos
2. Antenna Placement Diagram
3. Mount Mapping Information
4. Analysis Calculations

Standard Conditions

1. The loading configuration as analyzed in this report is as provided from the customer. Any deviation from this design shall be communicated to TES to verify deviation will not adversely impact the analysis.

2. The analysis is based on the presumption that the antenna mount members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.

3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion. The mount analysis is not a condition assessment of the mount.

4. The mount analysis was performed in accordance with the loading provided, and if applicable the modification required to support the additional loading.

5. If the mount is modified, installation must adhere to the configuration communicated in the modification drawings.

6. The modification drawings are not intended to convey means or methods. These are the responsibility of the installing contractor.

7. Rigging plan review is available if the contractor requires for a construction class IV or other if required. Review fee would apply.

8. The mount modification package was created based upon information provided for the mount loading. The underlying tower is assumed to provide support and sufficient rigidity to support the mount loads as a tower analysis was not part of the mount analysis.

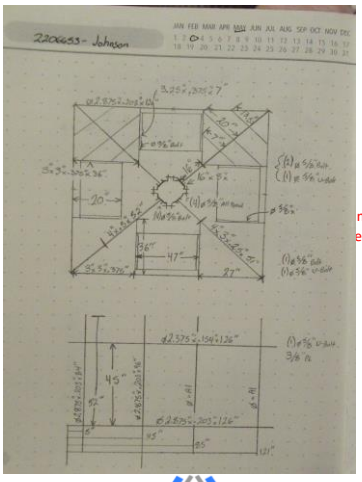
9. TES is not responsible for modifications to climbing facilities unless communicated to TES in writing.

V4.1 Updated on 12-17-2021

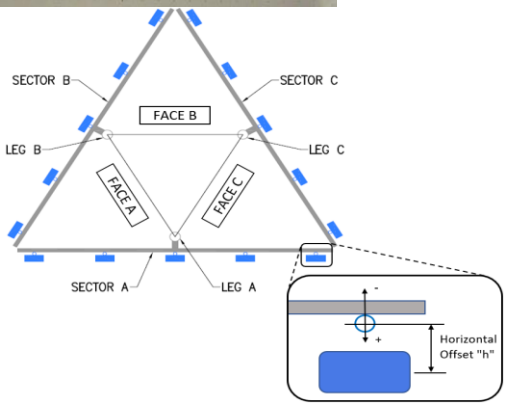
Antenna Mount Mapping Form (PATENT PENDING)

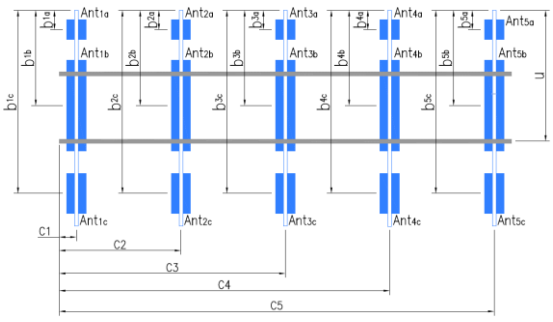
FCC #

Tower Owner:	SBA	**Mapping Date:**	5/3/2022
Site Name:	Johnson	**Tower Type:**	Monopole
Site Number or ID:	CT13613-A	**Tower Height (Ft.):**	UNKN
Mapping Contractor:	SGS Towers	**Mount Elevation (Ft.):**	118



mount from the
embers here.





Antenna Layout (Looking Out From Tower)

Mount Pipe Configuration and Geometries [Unit = Inches]

Sector / Position	Mount Pipe Size & Length	Vertical Offset Dimension "u"	Horizontal Offset "C1, C2, C3, etc."	Sector / Position	Mount Pipe Size & Length	Vertical Offset Dimension "u"	Horizontal Offset "C1, C2, C3, etc."
A1	2.9x3/16x84	52.00	5.00	C1	2.9x3/16x84	52.00	5.00
A2	2.9x3/16x96	52.00	45.00	C2	2.9x3/16x96	52.00	45.00
A3	2.9x3/16x84	52.00	85.00	C3	2.9x3/16x84	52.00	85.00
A4	2.9x3/16x84	52.00	121.00	C4	2.9x3/16x84	52.00	121.00
A5				C5			
A6				C6			
B1	2.9x3/16x84	52.00	5.00	D1			
B2	2.9x3/16x96	52.00	45.00	D2			
B3	2.9x3/16x84	52.00	85.00	D3			
B4	2.9x3/16x84	52.00	121.00	D4			
B5				D5			
B6				D6			

Distance from top of bottom support rail to lowest tip of ant./eqpt. of Carrier above. (N/A if > 10 ft.) :	
Distance from top of bottom support rail to highest tip of ant./eqpt. of Carrier below. (N/A if > 10 ft.) :	

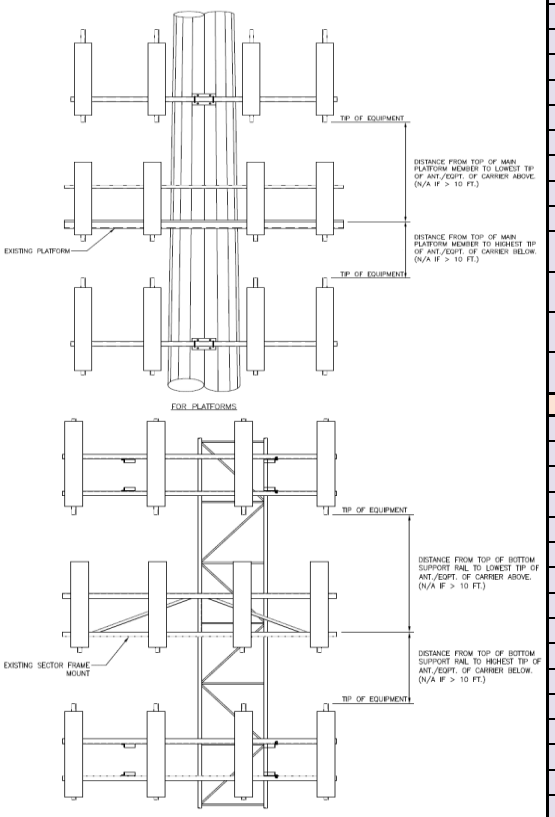
Please enter additional infomation or comments below.

Tower Face Width at Mount Elev. (ft.):		Tower Leg Size or Pole Shaft Diameter at Mount Elev. (in.):	32.9

	Enter antenna model. If not labeled, enter "Unknown".						Mounting Locations [Units are inches and degrees]			Photos of antennas
Ants. Items	Antenna Models if Known	Width (in.)	Depth (in.)	Height (in.)	Coax Size and Qty	Antenna Center-line (Ft.)	Vertical Distances"b_{1a}, b_{2a}, b_{3a}, b_{1b}...." (Inches)	Horiz. Offset "h" (Use "-" if Ant. is behind)	Antenna Azimuth (Degrees)	Photo Numbers
Sector A										
Ant_{1a}				(4) 1 1/4" Hyb						
Ant_{1b}	UNKN ANT	13.00	9.00	56.00		120	39.00	7.00	0.00	222
Ant_{1c}										
Ant_{2a}										
Ant_{2b}	UNKN ANT	24.00	9.00	96.00		120	55.00	7.00	0.00	244
Ant_{2c}	RRUS 11 B12	17.00	7.20	19.70			22.00	7.00		253
Ant_{3a}										
Ant_{3b}	UNKN ANT	7.00	3.00	73.00		120	41.00	6.00	0.00	264
Ant_{3c}	Radio 4415	13.47	6.29	16.54			24.00	4.00		276
Ant_{4a}										
Ant_{4b}										
Ant_{4c}										
Ant_{5a}										
Ant_{5b}										
Ant_{5c}										
Ant on Standoff										
Ant on Standoff										
Ant on Tower										
Ant on Tower										

Mount Azimuth (Degree) for Each Sector				Tower Leg Azimuth (Degree) for Each Sector	
Sector A:	0.00	Deg	Leg A:		Deg
Sector B:	90.00	Deg	Leg B:		Deg
Sector C:	180.00	Deg	Leg C:		Deg
Sector D:	270.00	Deg	Leg D:		Deg

Climbing Facility Information			
Location:	340.00	Deg	Sector D
Climbing Facility	Corrosion Type:		Good condition.
	Access:		Climbing path was unobstructed.
	Condition:		Good condition.



Sector B										
Ant_{1a}										
Ant_{1b}	UNKN ANT	13.00	9.00	56.00		120	39.00	7.00	90.00	288
Ant_{1c}										
Ant_{2a}										
Ant_{2b}	UNKN ANT	24.00	9.00	96.00		120	55.00	7.00	90.00	290
Ant_{2c}	RRUS 11 B12	17.00	7.20	19.70			22.00	7.00		295
Ant_{3a}										
Ant_{3b}	UNKN ANT	7.00	3.00	73.00		120	41.00	6.00	90.00	302
Ant_{3c}	Radio 4415	13.47	6.29	16.54			24.00	4.00		305
Ant_{4a}										
Ant_{4b}										
Ant_{4c}										
Ant_{5a}										
Ant_{5b}										
Ant_{5c}										
Ant on Standoff										
Ant on Standoff										
Ant on Tower										
Ant on Tower										
Sector C										
Ant_{1a}										
Ant_{1b}	UNKN ANT	13.00	9.00	56.00		120	39.00	7.00	180.00	314
Ant_{1c}										
Ant_{2a}										
Ant_{2b}	UNKN ANT	24.00	9.00	96.00		120	55.00	7.00	180.00	319
Ant_{2c}	RRUS 11 B12	17.00	7.20	19.70			22.00	7.00		321
Ant_{3a}										
Ant_{3b}	UNKN ANT	7.00	3.00	73.00		120	41.00	6.00	180.00	327
Ant_{3c}	Radio 4415	13.47	6.29	16.54			24.00	4.00		331
Ant_{4a}										
Ant_{4b}										
Ant_{4c}										
Ant_{5a}										
Ant_{5b}										
Ant_{5c}										
Ant on Standoff										
Ant on Standoff										
Ant on Tower										
Ant on Tower										
Sector D										
Ant_{1a}										
Ant_{1b}	UNKN ANT	13.00	9.00	56.00		120	39.00	7.00	270.00	337
Ant_{1c}										
Ant_{2a}										
Ant_{2b}	UNKN ANT	24.00	9.00	96.00		120	55.00	7.00	270.00	342
Ant_{2c}	RRUS 11 B12	17.00	7.20	19.70			22.00	7.00		346
Ant_{3a}										
Ant_{3b}	UNKN ANT	7.00	3.00	73.00		120	41.00	6.00	270.00	352
Ant_{3c}	Radio 4415	13.47	6.29	16.54			24.00	4.00		356
Ant_{4a}										
Ant_{4b}										
Ant_{4c}										
Ant_{5a}										
Ant_{5b}										
Ant_{5c}										
Ant on Standoff										
Ant on Standoff										
Ant on Tower										
Ant on Tower										

Observed Safety and Structural Issues During the Mount Mapping		
Issue #	Description of Issue	Photo #
1		
2		
3		
4		
5		
6		
7		
8		

Mapping Notes
1. Please report any visible structural or safety issues observed on the antenna mounts (Damaged members, loose connections, tilting mounts, safety climb issues, etc.)
2. If the thickness of the existing pipes or tubing can't be obtained from a general tool (such as Caliper), please use an ultrasonic measurement tool (thickness gauge) to measure the thickness.
3. Please create all required detail sketches of the mounts and insert them into the "Sketches" tab.
4. Please measure and enter the bolt sizes and types under the Members Box in the spreadsheet of the mount type.
5. Take and label the photos of the tower, mounts, connections, antennas and all measurements. Minimum 50 photos are required.
6. Please measure and report the size and length of all existing antenna mounting pipes.
7. Please measure and report the antenna information for all sectors.
8. Don't delete or rearrange any sheet or contents of any sheet from this mapping form.

Standard Conditions
1. Obvious safety and structural issues/deficiencies noticed at the time of the mount mapping are to be reported in this mapping. However, this mount mapping is not a condition assessment of the mount.

Structure: CT13613-A-SBA - Johnson

Sector: **A**

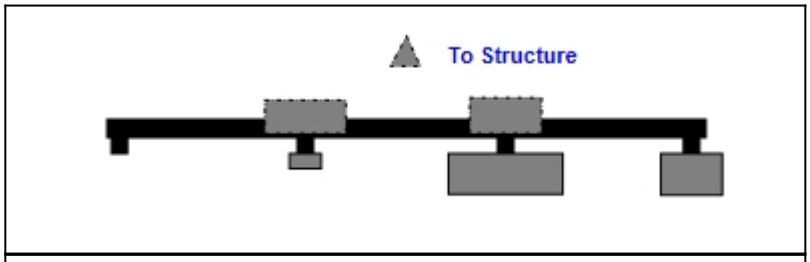
Structure Type: Monopole

Mount Elev: 117.00

5/16/2022

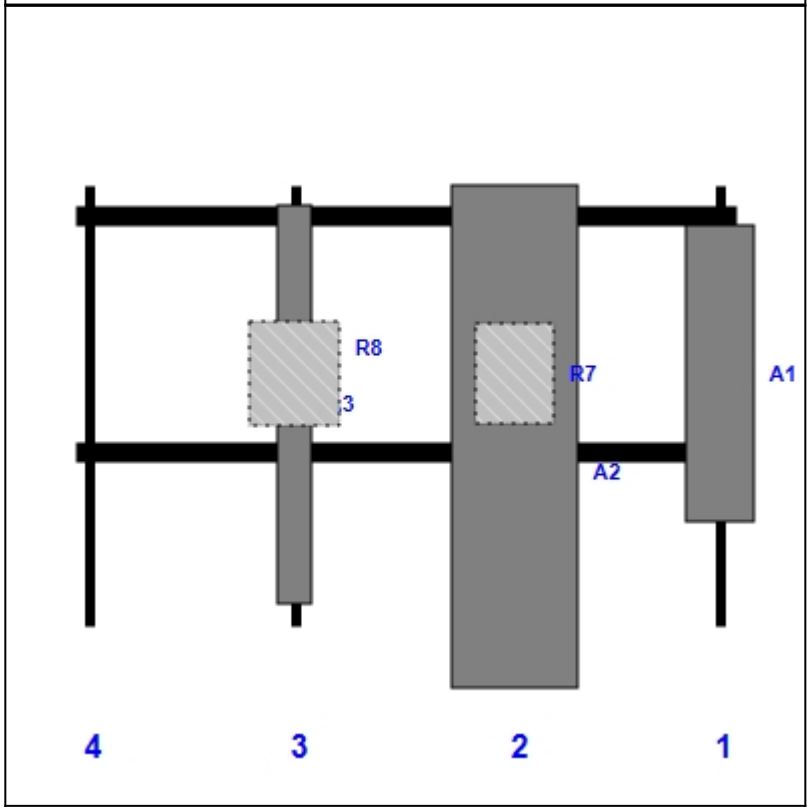
IES Tower Engineering Solutions

Plan View



Front View

Looking Toward Structure



Ref	Model	Height (in)	Width (in)	H Dist Left	Pipe	Pipe Pos V	Pos	From Top	H Offset	Status	Validation
A1	AIR 32 KRD901146-1_B66A_B2A	56.60	12.90	123.00	1	a	Front	36.00		Retained	
A2	APXVAA24_43-U-A20	96.00	24.00	84.00	2	a	Front	48.00		Retained	
R7	4480 B71 + B85	19.20	15.10	84.00	2	a	Behind	36.00		Added	
A3	APXV18-206517S-A20	76.00	6.65	42.00	3	a	Front	42.00		Retained	
R8	RRU 2217 B2	20.00	17.00	42.00	3	a	Behind	36.00		Retained	

Structure: CT13613-A-SBA - Johnson

Sector: B

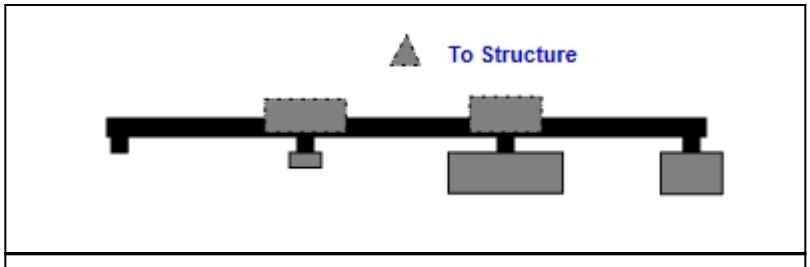
Structure Type: Monopole

Mount Elev: 117.00

5/16/2022

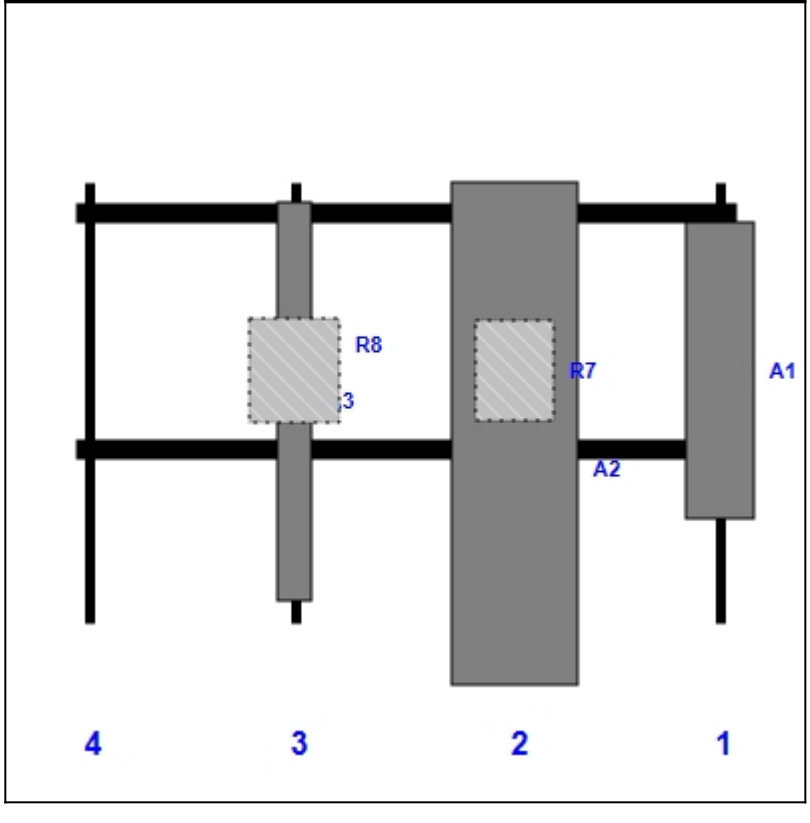
Tower Engineering Solutions

Plan View



Front View

Looking Toward Structure



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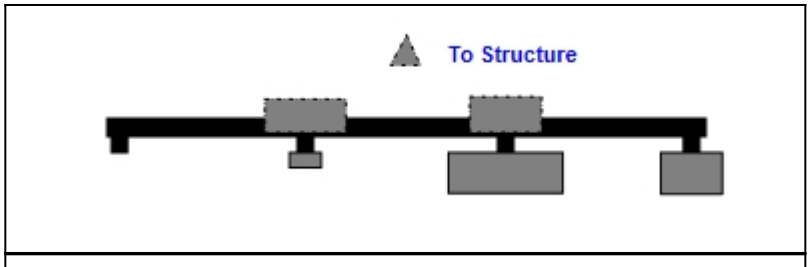
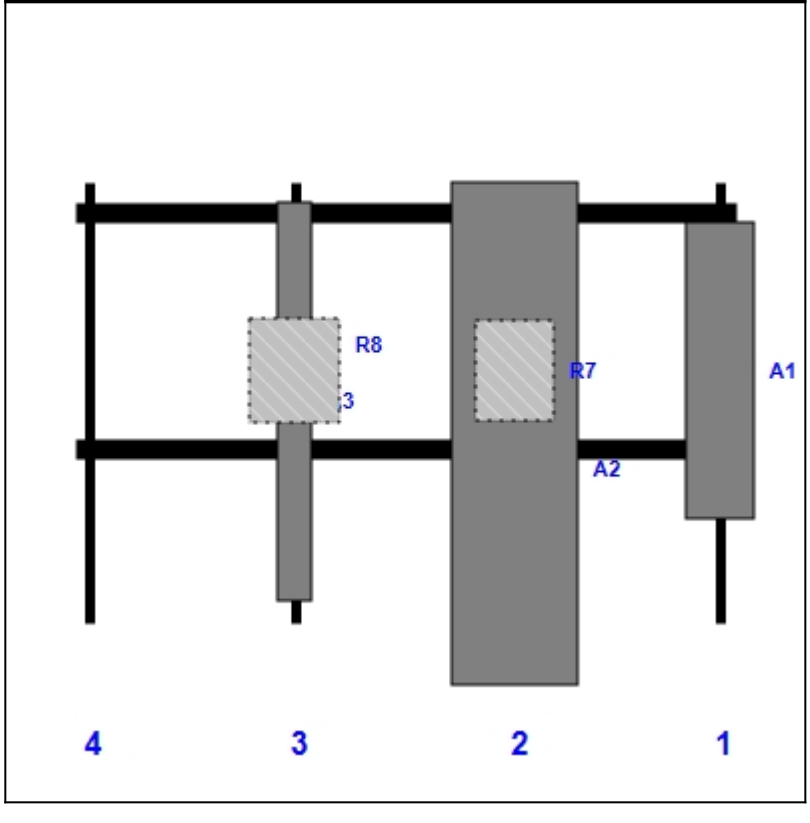
A1	AIR 32 KRD901146-1_B66A_B2A	56.60	12.90	123.00	1	a	Front	36.00		Retained	
A2	APXVAA24_43-U-A20	96.00	24.00	84.00	2	a	Front	48.00		Retained	
R7	4480 B71 + B85	19.20	15.10	84.00	2	a	Behind	36.00		Added	
A3	APXV18-206517S-A20	76.00	6.65	42.00	3	a	Front	42.00		Retained	
R8	RRU 2217 B2	20.00	17.00	42.00	3	a	Behind	36.00		Retained	

Plan View



Front View

Looking Toward Structure



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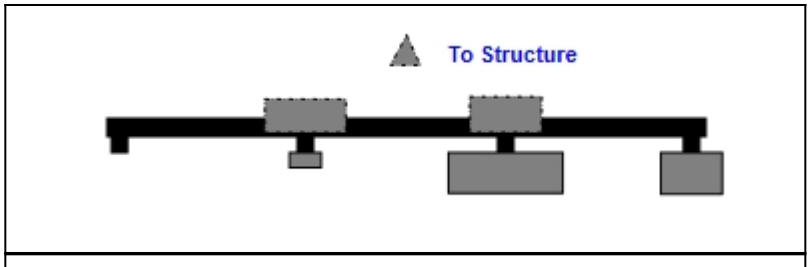
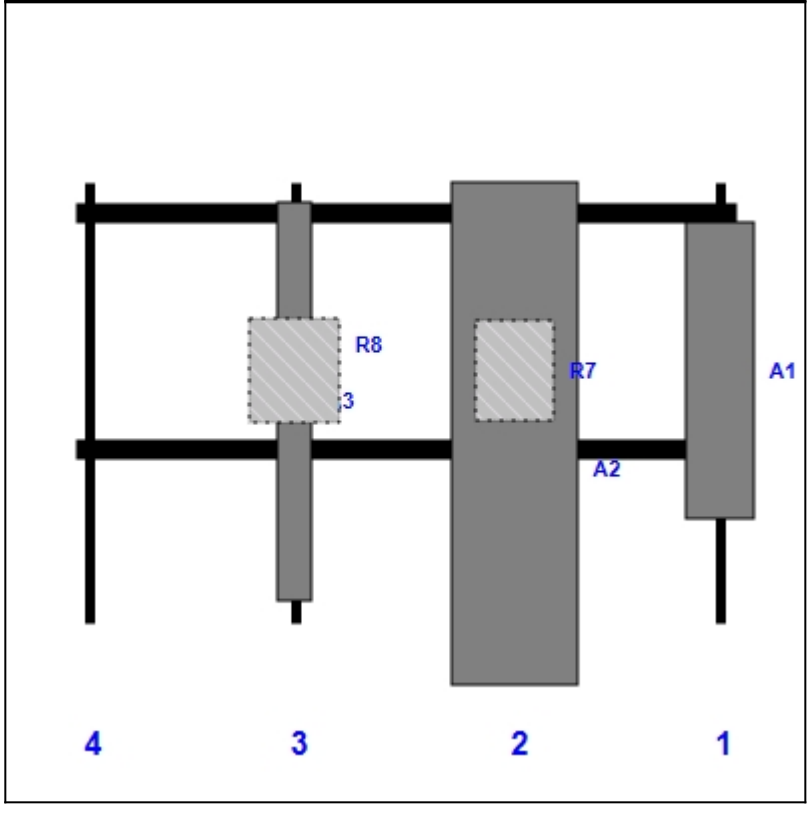
R7	4480 B71 + B85	19.20	15.10	84.00	2	a	Behind	36.00		Added	
A3	APXV18-206517S-A20	76.00	6.65	42.00	3	a	Front	42.00		Retained	
R8	RRU 2217 B2	20.00	17.00	42.00	3	a	Behind	36.00		Retained	

Plan View



Front View

Looking Toward Structure



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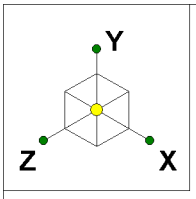
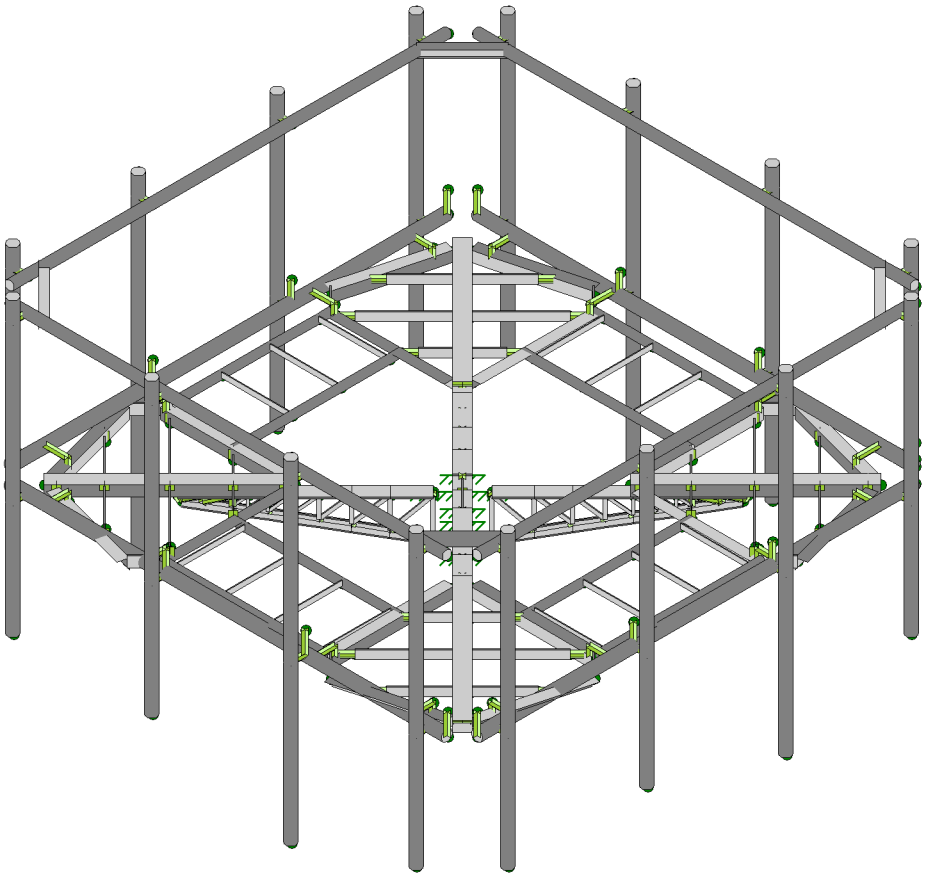
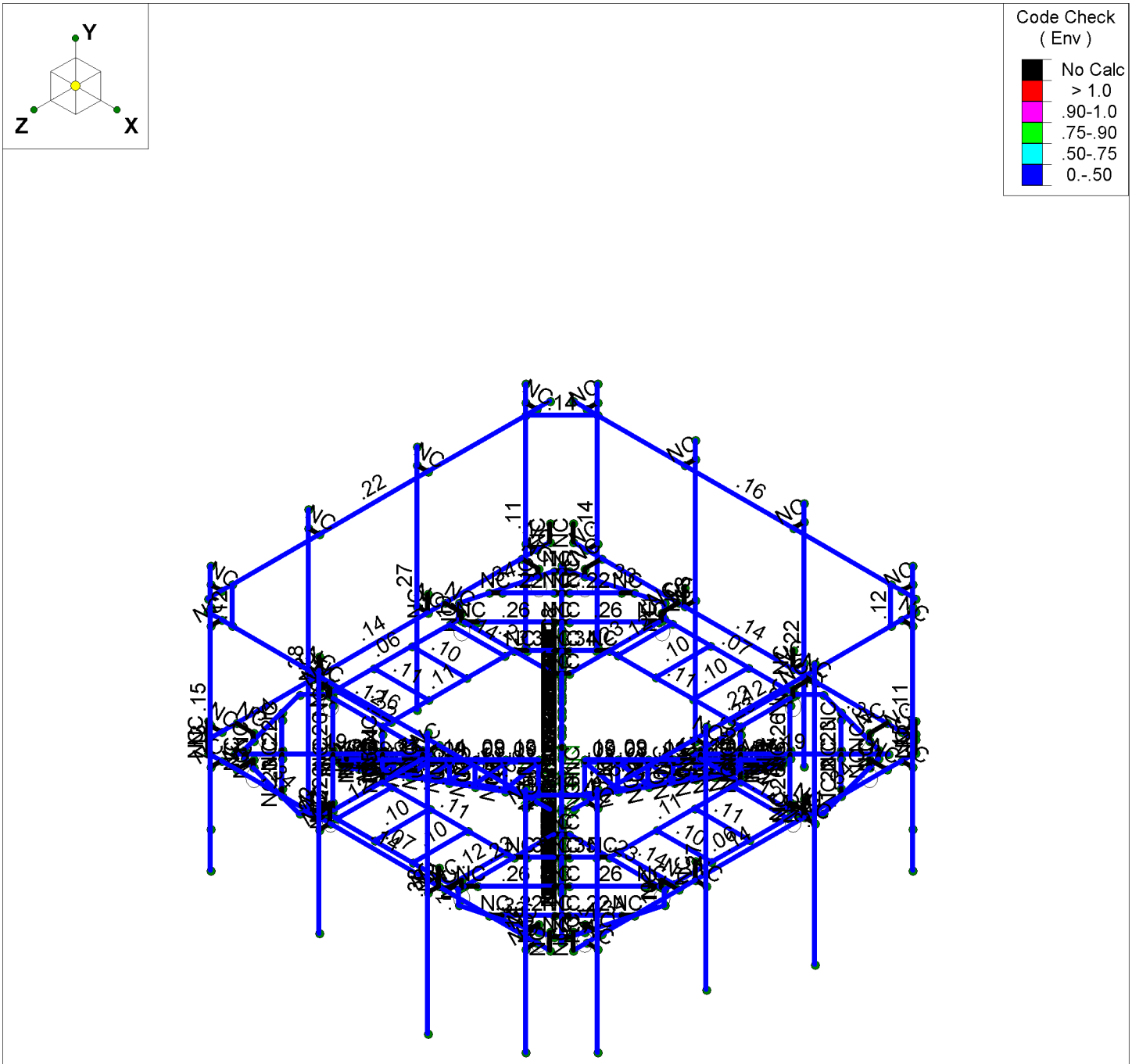


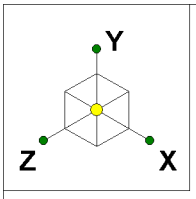


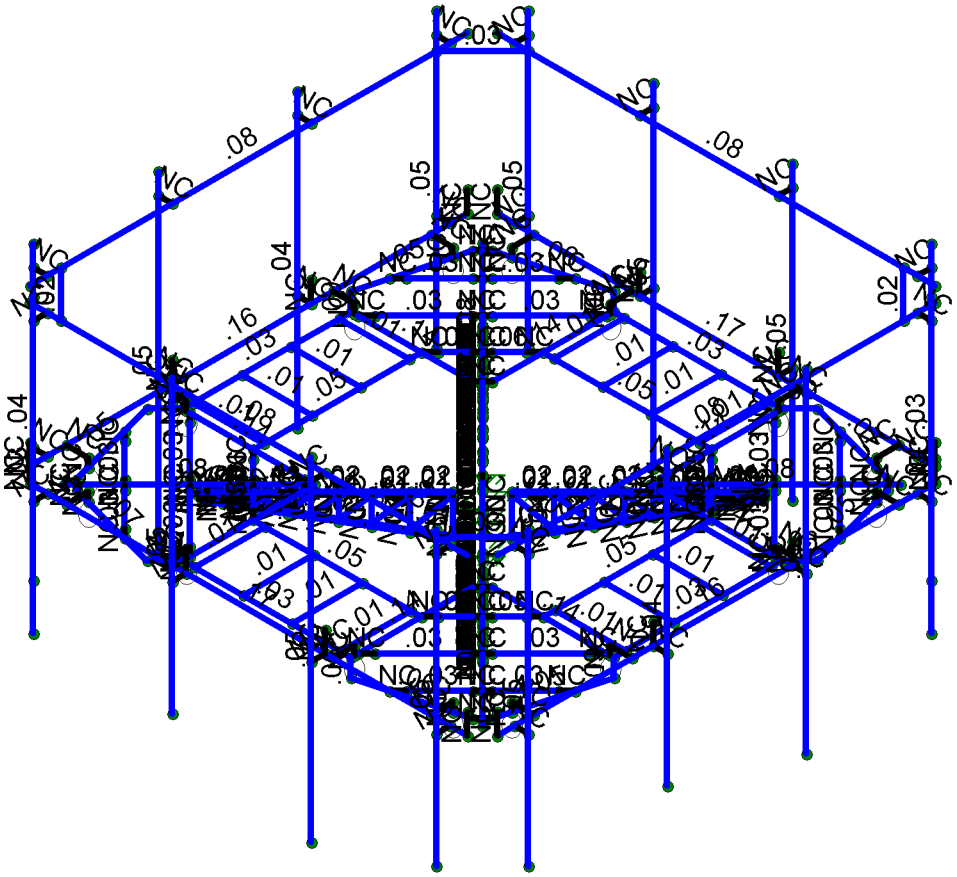
Tower Engineering Solutio...	CT13613-A-SBA_MT_LO_Loads Only_G	SK - 4
JET		May 16, 2022 at 11:05 AM
TES Project No. 128399		CT13613-A-SBA_128399_G_RISA_...



Member Code Checks Displayed (Enveloped)
Results for LC 1, 1.2D+1.6W (Front)

Tower Engineering Solutio...	CT13613-A-SBA_MT_LO_Loads Only_G	SK - 5
JET		May 16, 2022 at 11:06 AM
TES Project No. 128399		CT13613-A-SBA_128399_G_RISA_...





Member Shear Checks Displayed (Enveloped)
Results for LC 1, 1.2D+1.6W (Front)

Tower Engineering Solutio...	CT13613-A-SBA_MT_LO_Loads Only_G	SK - 6
JET		May 16, 2022 at 11:06 AM
TES Project No. 128399		CT13613-A-SBA_128399_G_RISA_...

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Antenna D	None					32			
2	Antenna Di	None					32			
3	Antenna W Front	None					32			
4	Antenna Wi Front	None					32			
5	Antenna W Side	None					32			
6	Antenna Wi Side	None					32			
7	Service Lm1	None					1			
8	Service Lm2	None					1			
9	Structure D	None		-1						
10	Structure Di	None						240		
11	Structure W Front	None						240		
12	Structure Wi Front	None						240		
13	Structure W Side	None						240		
14	Structure Wi Side	None						240		

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	1.2D+1.6...	Yes	Y		1	1.2	9	1.2	3	1.6	11	1.6														
2	1.2D+1.6...	Yes	Y		1	1.2	9	1.2	3	-1.6	11	-1.6														
3	1.2D+1.6...	Yes	Y		1	1.2	9	1.2	5	1.6	13	1.6														
4	1.2D+1.6...	Yes	Y		1	1.2	9	1.2	5	-1.6	13	-1.6														
5	1.2D+1.0...	Yes	Y		1	1.2	9	1.2	2	1	10	1	4	1	12	1										
6	1.2D+1.0...	Yes	Y		1	1.2	9	1.2	2	1	10	1	4	-1	12	-1										
7	1.2D+1.0...	Yes	Y		1	1.2	9	1.2	2	1	10	1	6	1	14	1										
8	1.2D+1.0...	Yes	Y		1	1.2	9	1.2	2	1	10	1	6	-1	14	-1										
9	1.2D+1.5L...	Yes	Y		1	1.2	9	1.2	7	1.5	3	.16	11	.16												
10	1.2D+1.5L...	Yes	Y		1	1.2	9	1.2	8	1.5	3	.16	11	.16												
11	1.4D	Yes	Y		1	1.4	9	1.4																		

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design Li...	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Face Horizontal	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
2	Support Rail	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	Mount Pipes	PIPE_2.5	Column	Wide Fla...	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
4	Standoff Top Flange	PL1/2x4	Beam	RECT	A36 Gr.36	Typical	2	.042	2.667	.154
5	Standoff Bottom Flange	PL3/8x4	Beam	RECT	A36 Gr.36	Typical	1.5	.018	2	.066
6	Standoff Bracing 1	PL3/8x1	Beam	RECT	A36 Gr.36	Typical	.375	.004	.031	.013
7	Standoff Bracing 2	PL3/8x7/8	Beam	RECT	A36 Gr.36	Typical	.328	.004	.021	.011
8	Standoff Bracing 3	PL3/8x3/4	Beam	RECT	A36 Gr.36	Typical	.281	.003	.013	.009
9	Standoff Bracing 4	PL3/8x5/8	Beam	RECT	A36 Gr.36	Typical	.234	.003	.008	.007
10	Grating Support Plate 1	PL3/8x2.375	Beam	RECT	A36 Gr.36	Typical	.891	.01	.419	.038
11	Grating Support Plate 2	PL3/8X3	Beam	RECT	A36 Gr.36	Typical	1.125	.013	.844	.049
12	Grating Support Angle	L3X3X6	Beam	Single A...	A36 Gr.36	Typical	2.11	1.75	1.75	.101
13	Walkway Plate	PL3/16x1.5	Beam	RECT	A36 Gr.36	Typical	.282	.000831	.053	.003
14	Walkway Pipe	PIPE_1.5	Beam	Pipe	A53 Gr.B	Typical	.749	.293	.293	.586

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design Li...	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
15	Standoff Tube	HSS4X3X4	Beam	Tube	A500 Gr...	Typical	2.91	3.91	6.15	7.96
16	Top Corner Brace	WT4x3.4375x3/8x3/8	Beam	W_Tee	A36 Gr.36	Typical	2.203	2.008	.829	.104

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N250B	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N255B	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N271B	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N276B	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N314	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
6	N319	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
7	N357	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
8	N362	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N250B	max	6480.257	2	563.591	5	3327.002	1	.053	2	.403	4	.054	2
2		min	-2862.658	1	18.543	2	-6940.304	2	-.032	1	-.391	3	-.034	1
3	N255B	max	-1113.211	1	2623.834	6	9814.273	6	.104	8	.077	4	.11	6
4		min	-9870.931	6	326.861	1	1195.76	1	.005	3	-.088	3	0	1
5	N271B	max	2865.501	1	559.607	5	3606.858	1	.052	2	.597	2	.037	1
6		min	-6476.353	2	38.79	2	-7230.869	2	-.032	1	-.587	1	-.058	2
7	N276B	max	9847.947	6	2623.398	6	9832.882	6	.108	7	.091	2	.005	1
8		min	1106.771	1	328.881	1	1222.801	1	.007	4	-.103	1	-.106	6
9	N314	max	2862.824	2	563.568	6	6940.153	1	.032	2	.403	3	.034	2
10		min	-6480.114	1	18.529	1	-3327.151	2	-.053	1	-.391	4	-.054	1
11	N319	max	9870.499	5	2623.72	5	-1195.684	2	-.005	4	.077	3	0	2
12		min	1113.141	2	326.842	2	-9813.842	5	-.104	7	-.088	4	-.11	5
13	N357	max	6476.56	1	559.654	6	7231.085	1	.032	2	.597	1	.058	1
14		min	-2865.607	2	38.785	1	-3606.973	2	-.052	1	-.587	2	-.037	2
15	N362	max	-1106.757	2	2623.442	5	-1222.794	2	-.007	3	.091	1	.106	5
16		min	-9848.105	5	328.88	2	-9833.046	5	-.108	8	-.103	2	-.005	2
17	Totals:	max	8895.663	4	11933.709	8	12162.993	1						
18		min	-8895.662	3	4415.712	3	-12162.989	2						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	L...	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn...	...	Eqn
1	MP2A	PIPE_2.5	.377	4.421	2	.054	4.211		2	30038...	50715	3.596	3.596	1...	H1-1b
2	MP2C	PIPE_2.5	.377	4.421	1	.054	4.211		1	30038...	50715	3.596	3.596	1...	H1-1b
3	MP2B	PIPE_2.5	.377	4.421	1	.050	4.211		1	30038...	50715	3.596	3.596	1...	H1-1b
4	MP2D	PIPE_2.5	.377	4.421	2	.050	4.211		2	30038...	50715	3.596	3.596	1...	H1-1b
5	M392	PL1/2x4	.376	.149	5	.090	0	z	5	56574...	64800	.675	5.4	2...	H1-1b
6	M272	PL1/2x4	.376	.149	6	.090	0	z	6	56574...	64800	.675	5.4	2...	H1-1b
7	M215B	PL1/2x4	.372	.149	6	.088	0	z	8	56574...	64800	.675	5.4	2...	H1-1b
8	M332	PL1/2x4	.372	.149	5	.088	0	z	7	56574...	64800	.675	5.4	2...	H1-1b
9	M226B	PL3/8x1	.356	0	6	.053	.265	y	6	8968.3...	12150	.092	.254	1...	H1-1a
10	M343	PL3/8x1	.356	0	5	.053	.265	y	5	8968.3...	12150	.092	.254	1...	H1-1a

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	L...	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn.....		Eqn
11	M283	PL3/8x1	.355	0	6	.052	.265	y	7	8968.3...	12150	.092	.254	1...	H1-1a
12	M403	PL3/8x1	.355	0	5	.052	.265	y	8	8968.3...	12150	.092	.254	1...	H1-1a
13	M105	PL3/8x2.3...	.350	0	6	.048	0	y	7	26880...	28868.4	.224	1.428	1...	H1-1b
14	M261	PL3/8x2.3...	.350	0	5	.048	0	y	8	26880...	28868.4	.224	1.428	1...	H1-1b
15	M34A	PL3/8x2.3...	.345	0	8	.048	0	y	6	26880...	28868.4	.224	1.428	1...	H1-1b
16	M183	PL3/8x2.3...	.345	0	7	.048	0	y	5	26880...	28868.4	.224	1.428	1...	H1-1b
17	M75B	L3X3X6	.343	0	6	.067	0	y	1	68266...	68364	2.307	5.322	2...	H2-1
18	M228	L3X3X6	.343	0	5	.067	0	y	2	68266...	68364	2.307	5.322	2...	H2-1
19	M62	PL3/8x2.3...	.341	0	6	.059	0	y	8	26880...	28868.4	.224	1.428	1...	H1-1b
20	M216	PL3/8x2.3...	.341	0	5	.059	0	y	7	26880...	28868.4	.224	1.428	1...	H1-1b
21	M306	L3X3X6	.340	0	8	.052	1.632	z	5	68266...	68364	2.307	5.322	2...	H2-1
22	M150	L3X3X6	.340	0	7	.052	1.632	z	6	68266...	68364	2.307	5.322	2...	H2-1
23	M138	PL3/8x2.3...	.337	0	7	.060	0	y	6	26880...	28868.4	.224	1.428	1...	H1-1b
24	M294	PL3/8x2.3...	.337	0	8	.060	0	y	5	26880...	28868.4	.224	1.428	1...	H1-1b
25	M74B	L3X3X6	.335	0	8	.049	0	z	3	68266...	68364	2.307	5.322	1...	H2-1
26	M226	L3X3X6	.335	0	7	.049	0	z	4	68266...	68364	2.307	5.322	1...	H2-1
27	M304	L3X3X6	.335	0	5	.064	0	z	2	68266...	68364	2.307	5.322	1...	H2-1
28	M148	L3X3X6	.335	0	6	.064	0	z	1	68266...	68364	2.307	5.322	1...	H2-1
29	M279	PL3/8x4	.322	1.045	6	.013	1.045	y	2	36054...	48600	.38	4.05	1...	H1-1a
30	M399	PL3/8x4	.322	1.045	5	.013	1.045	y	1	36054...	48600	.38	4.05	1...	H1-1a
31	M222B	PL3/8x4	.321	1.045	6	.009	1.045	y	4	36054...	48600	.38	4.05	1...	H1-1a
32	M339	PL3/8x4	.321	1.045	5	.009	1.045	y	3	36054...	48600	.38	4.05	1...	H1-1a
33	M393	PL1/2x4	.319	.885	1	.027	.885	z	1	55825...	64800	.675	5.4	3...	H1-1b
34	M284	PL3/8x1	.314	1.045	6	.016	1.045	y	1	8751.93	12150	.092	.254	2...	H1-1a
35	M404	PL3/8x1	.314	1.045	5	.016	1.045	y	2	8751.93	12150	.092	.254	2...	H1-1a
36	M273	PL1/2x4	.314	.888	2	.027	.888	z	2	55753...	64800	.675	5.4	3...	H1-1b
37	M227B	PL3/8x1	.313	1.045	6	.014	.468	y	1	8751.93	12150	.092	.254	2...	H1-1a
38	M344	PL3/8x1	.313	1.045	5	.014	.468	y	2	8751.93	12150	.092	.254	2...	H1-1a
39	M221A	PL3/8x4	.309	1.006	6	.008	.265	z	6	36864...	48600	.38	3.979	1...	H1-1a
40	M338	PL3/8x4	.309	1.006	5	.008	.265	z	5	36864...	48600	.38	3.979	1...	H1-1a
41	M398	PL3/8x4	.306	1.006	5	.008	.265	z	8	36864...	48600	.38	4.05	1...	H1-1a
42	M278	PL3/8x4	.306	1.006	6	.009	.582	y	10	36864...	48600	.38	4.05	1...	H1-1a
43	M224B	PL3/8x4	.297	.742	6	.009	.742	y	3	41807...	48600	.38	4.05	1...	H1-1a
44	M341	PL3/8x4	.297	.742	5	.009	.742	y	4	41807...	48600	.38	4.05	1...	H1-1a
45	M401	PL3/8x4	.293	.742	8	.011	.742	y	2	41807...	48600	.38	4.05	1...	H1-1a
46	M281	PL3/8x4	.293	.742	7	.011	.742	y	1	41807...	48600	.38	4.05	1...	H1-1a
47	M229B	PL3/8x1	.285	.731	6	.008	.731	y	1	10349...	12150	.092	.254	2...	H1-1a
48	M346	PL3/8x1	.285	.731	5	.008	.731	y	2	10349...	12150	.092	.254	2...	H1-1a
49	M406	PL3/8x1	.284	.731	5	.010	.731	y	2	10349...	12150	.092	.254	2...	H1-1a
50	M286A	PL3/8x1	.284	.731	6	.010	.731	y	1	10349...	12150	.092	.254	2...	H1-1a
51	M223B	PL3/8x4	.280	.667	6	.009	.667	y	4	43042...	48600	.38	4.05	2...	H1-1a
52	M340	PL3/8x4	.280	.667	5	.009	.667	y	3	43042...	48600	.38	4.05	2...	H1-1a
53	M400	PL3/8x4	.279	.667	5	.013	.667	y	1	43042...	48600	.38	4.05	1...	H1-1a
54	M280	PL3/8x4	.279	.667	6	.013	.667	y	2	43042...	48600	.38	4.05	1...	H1-1a
55	M405	PL3/8x1	.273	.667	5	.013	.667	y	2	10632...	12150	.092	.254	2...	H1-1a
56	M285	PL3/8x1	.273	.667	6	.013	.667	y	1	10632...	12150	.092	.254	2...	H1-1a
57	M228B	PL3/8x1	.272	.667	6	.010	.667	y	1	10632...	12150	.092	.254	2...	H1-1a
58	M345	PL3/8x1	.272	.667	5	.010	.667	y	2	10632...	12150	.092	.254	2...	H1-1a
59	MP3D	PIPE_2.5	.269	4.237	2	.042	4.237		2	33961...	50715	3.596	3.596	1...	H1-1b
60	MP3B	PIPE_2.5	.269	4.237	1	.042	4.237		1	33961...	50715	3.596	3.596	1...	H1-1b
61	M216A	PL1/2x4	.267	.888	2	.025	.888	z	2	55753...	64800	.675	5.4	3...	H1-1b
62	M333	PL1/2x4	.267	.888	1	.025	.888	z	1	55753...	64800	.675	5.4	3...	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	L..	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn.....	Eqn
63	M60	PL3/8x2.3...	.263	0	6	.028	0	y	6	26880...	28868.4	.224	1.428	1... H1-1b
64	M214	PL3/8x2.3...	.263	0	5	.028	0	y	5	26880...	28868.4	.224	1.428	1... H1-1b
65	M136	PL3/8x2.3...	.261	0	6	.027	0	y	7	26880...	28868.4	.224	1.428	1... H1-1b
66	M292	PL3/8x2.3...	.261	0	5	.027	0	y	8	26880...	28868.4	.224	1.428	1... H1-1b
67	M31	PL3/8x2.3...	.257	0	6	.028	0	y	8	26880...	28868.4	.224	1.428	1... H1-1b
68	M181	PL3/8x2.3...	.257	0	5	.028	0	y	7	26880...	28868.4	.224	1.428	1... H1-1b
69	M103	PL3/8x2.3...	.256	0	6	.028	0	y	6	26880...	28868.4	.224	1.428	1... H1-1b
70	M259	PL3/8x2.3...	.256	0	5	.028	0	y	5	26880...	28868.4	.224	1.428	1... H1-1b
71	M45A	L3X3X6	.231	0	5	.138	2.914	z	8	67393...	68364	2.307	5.322	1... H2-1
72	M188	L3X3X6	.231	0	6	.138	2.914	z	7	67393...	68364	2.307	5.322	1... H2-1
73	M266	L3X3X6	.229	0	7	.143	2.914	z	5	67393...	68364	2.307	5.322	1... H2-1
74	M110	L3X3X6	.229	0	8	.143	2.914	z	6	67393...	68364	2.307	5.322	1... H2-1
75	M300	L3X3X6	.228	0	6	.139	2.761	y	6	67393...	68364	2.307	5.322	1... H2-1
76	M144	L3X3X6	.228	0	5	.139	2.761	y	5	67393...	68364	2.307	5.322	1... H2-1
77	M33	PL3/8x2.3...	.227	0	6	.029	0	y	8	26880...	28868.4	.224	1.428	1... H1-1b
78	M182	PL3/8x2.3...	.227	0	5	.029	0	y	7	26880...	28868.4	.224	1.428	1... H1-1b
79	M260	PL3/8x2.3...	.224	0	8	.030	0	y	5	26880...	28868.4	.224	1.428	1... H1-1b
80	M104	PL3/8x2.3...	.224	0	7	.030	0	y	6	26880...	28868.4	.224	1.428	1... H1-1b
81	M222	L3X3X6	.223	0	8	.141	2.761	y	8	67393...	68364	2.307	5.322	1... H2-1
82	M68	L3X3X6	.223	0	7	.141	2.761	y	7	67393...	68364	2.307	5.322	1... H2-1
83	M293	PL3/8x2.3...	.220	0	5	.026	0	y	8	26880...	28868.4	.224	1.428	1... H1-1b
84	M137	PL3/8x2.3...	.220	0	6	.026	0	y	7	26880...	28868.4	.224	1.428	1... H1-1b
85	M61	PL3/8x2.3...	.220	0	8	.027	0	y	6	26880...	28868.4	.224	1.428	1... H1-1b
86	M215	PL3/8x2.3...	.220	0	7	.027	0	y	5	26880...	28868.4	.224	1.428	1... H1-1b
87	M459	PIPE_2.0	.219	3.868	2	.084	9.947		5	8922.0...	32130	1.872	1.872	2... H1-1b
88	M477A	PIPE_2.0	.219	3.868	1	.084	9.947		6	8922.0...	32130	1.872	1.872	2... H1-1b
89	MP3A	PIPE_2.5	.216	4.237	1	.049	4.237		2	33961...	50715	3.596	3.596	2... H1-1b
90	MP3C	PIPE_2.5	.216	4.237	2	.049	4.237		1	33961...	50715	3.596	3.596	2... H1-1b
91	M54	HSS4X3X4	.186	1.899	6	.076	1.899	z	8	10580...	120474	10.764	13.144	1... H1-1b
92	M208	HSS4X3X4	.186	1.899	5	.076	1.899	z	7	10580...	120474	10.764	13.144	1... H1-1b
93	M394	PL1/2x4	.185	0	1	.033	1.028	y	1	55159...	64800	.675	5.4	1... H1-1b
94	M274	PL1/2x4	.185	0	2	.033	1.023	y	2	55234...	64800	.675	5.4	1... H1-1b
95	M130	HSS4X3X4	.182	1.899	6	.077	1.899	z	6	10580...	120474	10.764	13.144	1... H1-1b
96	M286	HSS4X3X4	.182	1.899	5	.077	1.899	z	5	10580...	120474	10.764	13.144	1... H1-1b
97	M396	PL1/2x4	.180	.718	1	.031	.718	y	1	59896...	64800	.675	5.4	1... H1-1b
98	M276	PL1/2x4	.180	.718	2	.031	.718	y	2	59896...	64800	.675	5.4	1... H1-1b
99	M477	PIPE_2.0	.157	7.184	2	.084	9.947		7	8922.0...	32130	1.872	1.872	2... H1-1b
100	M468	PIPE_2.0	.157	7.184	1	.084	9.947		8	8922.0...	32130	1.872	1.872	2... H1-1b
101	M232A	PL3/8x5/8	.156	.334	6	.018	.334	y	6	7373.7...	7581.6	.059	.1	2... H1-1b
102	M322	PL3/8x5/8	.156	.334	5	.018	.334	y	5	7373.7...	7581.6	.059	.1	2... H1-1b
103	M262A	PL3/8x5/8	.154	.334	6	.018	.334	y	7	7373.7...	7581.6	.059	.1	2... H1-1b
104	M382	PL3/8x5/8	.154	.334	5	.018	.334	y	8	7373.7...	7581.6	.059	.1	2... H1-1b
105	M234A	PL3/8x5/8	.154	.272	6	.025	.272	y	6	7443.1...	7581.6	.059	.1	2... H1-1b
106	M324	PL3/8x5/8	.154	.272	5	.025	.272	y	5	7443.1...	7581.6	.059	.1	2... H1-1b
107	M264A	PL3/8x5/8	.153	.272	6	.024	.272	y	7	7443.1...	7581.6	.059	.1	2... H1-1b
108	M384	PL3/8x5/8	.153	.272	5	.024	.272	y	8	7443.1...	7581.6	.059	.1	2... H1-1b
109	MP1B	PIPE_2.5	.151	4.237	1	.044	4.237		1	33961...	50715	3.596	3.596	2... H1-1b
110	MP1D	PIPE_2.5	.151	4.237	2	.044	4.237		2	33961...	50715	3.596	3.596	2... H1-1b
111	MP1C	PIPE_2.5	.145	4.237	6	.051	.553		1	33961...	50715	3.596	3.596	1... H1-1b
112	MP1A	PIPE_2.5	.145	4.237	5	.051	.553		2	33961...	50715	3.596	3.596	1... H1-1b
113	M487	WT4x3.4...	.143	0	2	.026	0	y	2	67958...	71381...	4.228	2.104	2... H1-1b
114	M485	WT4x3.4...	.143	0	1	.026	0	y	1	67958...	71381...	4.228	2.104	2... H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	L...	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn.....	Eqn
115	M313	PIPE_2.5	.139	5.25	10	.174	7.184		2	34640...	50715	3.596	3.596	1... H1-1b
116	M315	PIPE_2.5	.138	1.105	6	.174	7.184		1	34640...	50715	3.596	3.596	1... H1-1b
117	M334	PL1/2x4	.138	0	1	.022	1.023	y	3	55234...	64800	.675	5.4	1... H1-1b
118	M217A	PL1/2x4	.138	0	2	.022	1.023	y	4	55234...	64800	.675	5.4	1... H1-1b
119	M432	PL3/16x1.5	.137	0	2	.011	0	y	8	1877.3...	9136.8	.035	.286	2... H1-1b
120	M424	PL3/16x1.5	.137	0	1	.011	0	y	7	1877.3...	9136.8	.035	.286	2... H1-1b
121	M314	PIPE_2.5	.137	7.461	2	.163	7.184		5	34640...	50715	3.596	3.596	2... H1-1b
122	M316	PIPE_2.5	.137	7.461	1	.163	7.184		6	34640...	50715	3.596	3.596	2... H1-1b
123	M219A	PL1/2x4	.134	.718	2	.020	.718	y	4	59896...	64800	.675	5.4	1... H1-1b
124	M336	PL1/2x4	.134	.718	1	.020	.718	y	3	59896...	64800	.675	5.4	1... H1-1b
125	M287	PL3/8x1	.131	.989	6	.032	.26	y	6	9059.7...	12150	.092	.254	2... H1-1b
126	M227C	PL3/8x1	.130	.989	6	.031	.26	y	6	9059.7...	12150	.092	.254	2... H1-1b
127	M347	PL3/8x1	.130	.989	5	.031	.26	y	5	9059.7...	12150	.092	.254	2... H1-1b
128	M407	PL3/8x1	.130	.989	5	.032	.26	y	5	9059.7...	12150	.092	.254	2... H1-1b
129	MP4A	PIPE_2.5	.127	4.237	9	.034	4.237		3	33961...	50715	3.596	3.596	2... H1-1b
130	M428	PL3/16x1.5	.123	0	4	.011	0	y	5	1877.3...	9136.8	.035	.286	2... H1-1b
131	M436	PL3/16x1.5	.123	0	3	.011	0	y	6	1877.3...	9136.8	.035	.286	2... H1-1b
132	M421	PL3/16x1.5	.119	0	2	.008	0	y	5	1877.3...	9136.8	.035	.286	1... H1-1b
133	M429	PL3/16x1.5	.119	0	1	.008	0	y	6	1877.3...	9136.8	.035	.286	1... H1-1b
134	M425	PL3/16x1.5	.117	0	3	.008	0	y	5	1877.3...	9136.8	.035	.286	2... H1-1b
135	M433	PL3/16x1.5	.117	0	4	.008	0	y	6	1877.3...	9136.8	.035	.286	2... H1-1b
136	M486	WT4x3.4...	.117	1.562	2	.020	1.562	y	2	67958...	71381...	4.228	1.315	1... H1-1b
137	M484	WT4x3.4...	.117	1.562	1	.020	1.562	y	1	67958...	71381...	4.228	1.315	1... H1-1b
138	M142	PL3/8X3	.114	0	5	.057	.605	y	7	32979...	36450	.285	2.278	1... H1-1b
139	M298	PL3/8X3	.114	0	6	.057	.605	y	8	32979...	36450	.285	2.278	1... H1-1b
140	M430	PL3/16x1.5	.112	0	2	.005	0	y	6	1877.3...	9136.8	.035	.286	2... H1-1b
141	M422	PL3/16x1.5	.112	0	1	.005	0	y	5	1877.3...	9136.8	.035	.286	2... H1-1b
142	MP4B	PIPE_2.5	.112	4.237	6	.048	4.237		2	33961...	50715	3.596	3.596	1... H1-1b
143	MP4D	PIPE_2.5	.112	4.237	5	.048	4.237		1	33961...	50715	3.596	3.596	1... H1-1b
144	M66	PL3/8X3	.111	0	7	.062	.605	y	2	32979...	36450	.285	2.278	1... H1-1b
145	M220	PL3/8X3	.111	0	8	.062	.605	y	1	32979...	36450	.285	2.278	1... H1-1b
146	M417	PIPE_1.5	.110	0	5	.051	0		6	17365...	23593.5	1.105	1.105	2... H1-1b
147	M416	PIPE_1.5	.110	0	6	.051	0		5	17365...	23593.5	1.105	1.105	2... H1-1b
148	M395	PL1/2x4	.110	.655	1	.033	.655	y	1	60691...	64800	.675	5.4	2... H1-1b
149	M275	PL1/2x4	.110	.655	2	.033	.655	y	2	60691...	64800	.675	5.4	2... H1-1b
150	MP4C	PIPE_2.5	.109	4.237	8	.034	4.237		4	33961...	50715	3.596	3.596	2... H1-1b
151	M420	PIPE_1.5	.107	0	8	.051	0		6	17365...	23593.5	1.105	1.105	2... H1-1b
152	M414	PIPE_1.5	.107	0	7	.051	0		5	17365...	23593.5	1.105	1.105	2... H1-1b
153	M434	PL3/16x1.5	.104	0	3	.005	0	y	7	1877.3...	9136.8	.035	.286	2... H1-1b
154	M426	PL3/16x1.5	.104	0	4	.005	0	y	8	1877.3...	9136.8	.035	.286	2... H1-1b
155	M431	PL3/16x1.5	.104	0	2	.008	0	y	6	1877.3...	9136.8	.035	.286	2... H1-1b
156	M423	PL3/16x1.5	.104	0	1	.008	0	y	5	1877.3...	9136.8	.035	.286	2... H1-1b
157	M233A	PL3/8x5/8	.102	0	6	.007	0	y	10	7239.5...	7581.6	.059	.1	2... H1-1b
158	M323	PL3/8x5/8	.102	0	5	.004	0	y	5	7239.5...	7581.6	.059	.1	2... H1-1b
159	M263A	PL3/8x5/8	.100	0	6	.008	0	y	10	7239.5...	7581.6	.059	.1	2... H1-1b
160	M383	PL3/8x5/8	.100	0	5	.004	0	y	6	7239.5...	7581.6	.059	.1	2... H1-1b
161	M227	PL3/8X3	.100	0	6	.086	.605	y	7	32979...	36450	.285	2.278	2... H1-1b
162	M74C	PL3/8X3	.100	0	5	.086	.605	y	8	32979...	36450	.285	2.278	2... H1-1b
163	M427	PL3/16x1.5	.100	0	4	.007	0	y	8	1877.3...	9136.8	.035	.286	2... H1-1b
164	M435	PL3/16x1.5	.100	0	3	.007	0	y	7	1877.3...	9136.8	.035	.286	2... H1-1b
165	M149	PL3/8X3	.099	0	8	.087	.605	y	6	32979...	36450	.285	2.278	2... H1-1b
166	M305	PL3/8X3	.099	0	7	.087	.605	y	5	32979...	36450	.285	2.278	2... H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	L...	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn.....	Eqn
167	M231A	PL3/8x3/4	.098	.517	6	.009	.517	y	10	8403.07	9104.4	.069	.143	1...	H1-1b
168	M321	PL3/8x3/4	.098	.517	5	.004	0	y	1	8403.07	9104.4	.069	.143	1...	H1-1b
169	M380	PL3/8x3/4	.097	.407	6	.012	0	y	7	8663.1...	9104.4	.069	.143	2...	H1-1b
170	M260A	PL3/8x3/4	.097	.407	5	.012	0	y	8	8663.1...	9104.4	.069	.143	2...	H1-1b
171	M261A	PL3/8x3/4	.095	.517	6	.010	.517	y	10	8403.07	9104.4	.069	.143	1...	H1-1b
172	M408	PL3/8x1	.095	0	2	.014	.46	y	2	8848.3...	12150	.092	.254	2...	H1-1b
173	M230A	PL3/8x3/4	.095	.407	7	.012	0	y	5	8663.1...	9104.4	.069	.143	2...	H1-1b
174	M320	PL3/8x3/4	.095	.407	8	.012	0	y	6	8663.1...	9104.4	.069	.143	2...	H1-1b
175	M381	PL3/8x3/4	.095	.517	5	.004	0	y	2	8403.07	9104.4	.069	.143	1...	H1-1b
176	M288	PL3/8x1	.094	0	1	.013	.46	y	1	8848.3...	12150	.092	.254	2...	H1-1b
177	M218A	PL1/2x4	.092	.655	2	.022	.655	y	4	60691....	64800	.675	5.4	2...	H1-1b
178	M335	PL1/2x4	.092	.655	1	.022	.655	y	3	60691....	64800	.675	5.4	2...	H1-1b
179	M348	PL3/8x1	.091	1.028	2	.014	.46	y	6	8848.3...	12150	.092	.254	2...	H1-1b*
180	M228C	PL3/8x1	.091	1.028	1	.014	.46	y	5	8848.3...	12150	.092	.254	2...	H1-1b*
181	M369	PL3/8x1	.089	0	5	.010	0	y	2	10406....	12150	.092	.254	2...	H1-1b
182	M249	PL3/8x1	.089	0	6	.010	0	y	1	10406....	12150	.092	.254	2...	H1-1b
183	M235	PL3/8x5/8	.089	0	6	.003	.343	y	6	7361.8...	7581.6	.059	.1	2...	H1-1b
184	M325	PL3/8x5/8	.089	0	5	.003	.343	y	5	7361.8...	7581.6	.059	.1	2...	H1-1b
185	M265A	PL3/8x5/8	.088	0	6	.003	.343	y	10	7361.8...	7581.6	.059	.1	2...	H1-1b
186	M385	PL3/8x5/8	.088	0	5	.003	.343	y	6	7361.8...	7581.6	.059	.1	2...	H1-1b
187	M210	PL3/8x1	.088	0	6	.008	0	y	5	10406....	12150	.092	.254	2...	H1-1b
188	M309A	PL3/8x1	.088	0	5	.008	0	y	6	10406....	12150	.092	.254	2...	H1-1b
189	M258A	PL3/8x7/8	.079	.494	5	.017	0	y	1	9967.3...	10627.2	.084	.194	2...	H1-1b
190	M378	PL3/8x7/8	.078	.494	6	.017	0	y	2	9967.3...	10627.2	.084	.194	2...	H1-1b
191	M228A	PL3/8x7/8	.077	.494	7	.014	0	y	1	9967.3...	10627.2	.084	.194	2...	H1-1b
192	M318	PL3/8x7/8	.077	.494	8	.014	0	y	2	9967.3...	10627.2	.084	.194	2...	H1-1b
193	M370	PL3/8x1	.076	0	5	.012	0	y	2	10680....	12150	.092	.254	2...	H1-1b
194	M250	PL3/8x1	.076	0	6	.012	0	y	1	10680....	12150	.092	.254	2...	H1-1b
195	M211A	PL3/8x1	.076	0	6	.009	0	y	1	10680....	12150	.092	.254	2...	H1-1b
196	M310A	PL3/8x1	.076	0	5	.009	0	y	2	10680....	12150	.092	.254	2...	H1-1b
197	M419	PIPE_1.5	.066	0	2	.032	0		1	17366....	23593.5	1.105	1.105	1...	H1-1b
198	M413A	PIPE_1.5	.066	0	1	.032	0		2	17366....	23593.5	1.105	1.105	1...	H1-1b
199	M226A	PL3/8x7/8	.063	0	5	.013	0	y	1	9674.8...	10627.2	.084	.194	2...	H1-1b*
200	M316A	PL3/8x7/8	.063	0	6	.013	0	y	2	9674.8...	10627.2	.084	.194	2...	H1-1b*
201	M376	PL3/8x7/8	.062	0	6	.018	0	y	2	9674.8...	10627.2	.084	.194	2...	H1-1b*
202	M256A	PL3/8x7/8	.062	0	5	.018	0	y	1	9674.8...	10627.2	.084	.194	2...	H1-1b*
203	M379	PL3/8x3/4	.058	.621	6	.004	.621	y	1	8110.6...	9104.4	.069	.143	1...	H1-1b
204	M259A	PL3/8x3/4	.058	0	5	.007	0	y	10	8110.6...	9104.4	.069	.143	1...	H1-1b
205	M229A	PL3/8x3/4	.058	0	7	.006	0	y	10	8110.6...	9104.4	.069	.143	1...	H1-1b
206	M319	PL3/8x3/4	.058	0	8	.003	0	y	5	8110.6...	9104.4	.069	.143	1...	H1-1b
207	M415	PIPE_1.5	.056	0	1	.035	.212		1	17366....	23593.5	1.105	1.105	1...	H1-1b
208	M418	PIPE_1.5	.056	0	2	.035	.212		2	17366....	23593.5	1.105	1.105	1...	H1-1b
209	M373	PL3/8x1	.056	0	6	.006	0	y	2	8907.7...	12150	.092	.254	2...	H1-1b
210	M253	PL3/8x1	.056	0	5	.006	0	y	1	8907.7...	12150	.092	.254	2...	H1-1b
211	M223A	PL3/8x1	.056	0	5	.005	0	y	3	8907.7...	12150	.092	.254	2...	H1-1b
212	M313A	PL3/8x1	.056	0	6	.005	0	y	4	8907.7...	12150	.092	.254	2...	H1-1b
213	M224A	PL3/8x1	.053	0	5	.009	0	y	1	10400....	12150	.092	.254	2...	H1-1b*
214	M314A	PL3/8x1	.053	0	6	.009	0	y	2	10400....	12150	.092	.254	2...	H1-1b*
215	M374	PL3/8x1	.052	0	6	.012	0	y	2	10400....	12150	.092	.254	2...	H1-1b*
216	M254	PL3/8x1	.052	0	5	.012	0	y	1	10400....	12150	.092	.254	2...	H1-1b*
217	M257A	PL3/8x7/8	.052	.746	5	.005	.746	y	10	9182.1...	10627.2	.084	.194	2...	H1-1b
218	M377	PL3/8x7/8	.052	.746	6	.003	.746	y	1	9182.1...	10627.2	.084	.194	2...	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	L..	phi*Pn...	phi*Pn...	phi*Mn..	phi*Mn.....		Eqn
219	M227A	PL3/8x7/8	.051	.746	5	.005	.746	y	10	9182.1..	10627.2	.084	.194	2..	H1-1b
220	M317	PL3/8x7/8	.051	.746	6	.003	.746	y	8	9182.1..	10627.2	.084	.194	2..	H1-1b
221	M225A	PL3/8x1	.048	.887	5	.003	.887	y	10	9592.9..	12150	.092	.254	2..	H1-1b
222	M315A	PL3/8x1	.048	.887	6	.003	.887	y	8	9592.9..	12150	.092	.254	2..	H1-1b
223	M375	PL3/8x1	.047	.887	7	.003	.887	y	6	9592.9..	12150	.092	.254	2..	H1-1b
224	M255	PL3/8x1	.047	.887	8	.003	.887	y	10	9592.9..	12150	.092	.254	2..	H1-1b
225	M222A	PL3/8x1	.005	0	4	.001	0	y	4	9754.3..	12150	.092	.254	2..	H1-1b
226	M372	PL3/8x1	.005	0	4	.001	0	y	4	9754.3..	12150	.092	.254	2..	H1-1b
227	M312A	PL3/8x1	.005	0	4	.001	.855	y	4	9754.3..	12150	.092	.254	2..	H1-1b
228	M252	PL3/8x1	.005	0	4	.001	.855	y	4	9754.3..	12150	.092	.254	2..	H1-1b
229	M342	PL3/8x1	.001	.872	7	.000	.872	y	7	9667.4..	12150	.092	.254	2..	H1-1b
230	M225B	PL3/8x1	.001	.872	8	.000	.872	y	8	9667.4..	12150	.092	.254	2..	H1-1b
231	M402	PL3/8x1	.001	.872	8	.000	.872	y	8	9667.4..	12150	.092	.254	2..	H1-1b
232	M282	PL3/8x1	.001	.872	7	.000	.872	y	7	9667.4..	12150	.092	.254	2..	H1-1b
233	M371	PL3/8x1	.001	0	7	.000	0	y	8	9300.4..	12150	.092	.254	1..	H1-1b
234	M251	PL3/8x1	.001	0	8	.000	0	y	8	9300.4..	12150	.092	.254	1..	H1-1b
235	M215A	PL3/8x1	.001	0	7	.000	0	y	8	9300.4..	12150	.092	.254	1..	H1-1b
236	M311A	PL3/8x1	.001	0	8	.000	0	y	8	9300.4..	12150	.092	.254	1..	H1-1b
237	M337	PL3/8x4	.001	.874	7	.000	.874	y	4	39445...	48600	.38	4.05	2..	H1-1b
238	M220A	PL3/8x4	.001	.874	8	.000	.874	y	4	39445...	48600	.38	4.05	2..	H1-1b
239	M397	PL3/8x4	.001	.874	8	.000	.874	y	4	39445...	48600	.38	4.05	2..	H1-1b
240	M277	PL3/8x4	.001	.874	7	.000	.874	y	4	39445...	48600	.38	4.05	2..	H1-1b

Exhibit F

Power Density/RF Emissions Report

Fox Hill Telecom

Radio Frequency Emissions Analysis Report

T-Mobile

Site ID: CTNH549B

382 Colebrook River Rd
Winstead, CT 06098

July 14, 2022

Fox Hill Telecom Project Number: 221486

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**21.02 %**

Fox Hill Telecom

July 14, 2022

T-MOBILE
Attn: RF Manager
35 Griffin Road South
Bloomfield, CT 06009

Emissions Analysis for Site: **CTNH549B**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **382 Colebrook River Rd, Winstead, 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.

General population 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 & 700 MHz bands 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) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **382 Colebrook River Rd, Winstead, 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.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE / 5G NR	600 MHz	2	40
LTE	700 MHz	2	20
LTE	1900 MHz (PCS)	4	40
LTE	2100 MHz (AWS)	4	40
UMTS	1900 MHz (PCS)	1	40

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	RFS APXVAA24_43-U-A20	117
A	2	Ericsson AIR32 B66A / B2A	117
A	3	RFS APXV18-206517S-C-A20	117
B	1	RFS APXVAA24_43-U-A20	117
B	2	Ericsson AIR32 B66A / B2A	117
B	3	RFS APXV18-206517S-C-A20	117
C	1	RFS APXVAA24_43-U-A20	117
C	2	Ericsson AIR32 B66A / B2A	117
C	3	RFS APXV18-206517S-C-A20	117
D	1	RFS APXVAA24_43-U-A20	117
D	2	Ericsson AIR32 B66A / B2A	117
D	3	RFS APXV18-206517S-C-A20	117

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed T-MOBILE configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	RFS APXVAA24_43-U-A20	600 MHz / 700 MHz	13.75 / 14.05	4	120	2,913.49	2.02
Antenna A2	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85 / 15.85	8	320	12,306.94	3.60
Antenna A3	RFS APXV18-206517S-C-A20	1900 MHz (PCS)	16.65	1	40	1,849.52	0.54
						Sector A Composite MPE%	**6.16**
Antenna B1	RFS APXVAA24_43-U-A20	600 MHz / 700 MHz	13.75 / 14.05	4	120	2,913.49	2.02
Antenna B2	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85 / 15.85	8	320	12,306.94	3.60
Antenna B3	RFS APXV18-206517S-C-A20	1900 MHz (PCS)	16.65	1	40	1,849.52	0.54
						Sector B Composite MPE%	**6.16**
Antenna C1	RFS APXVAA24_43-U-A20	600 MHz / 700 MHz	13.75 / 14.05	4	120	2,913.49	2.02
Antenna C2	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85 / 15.85	8	320	12,306.94	3.60
Antenna C3	RFS APXV18-206517S-C-A20	1900 MHz (PCS)	16.65	1	40	1,849.52	0.54
						Sector C Composite MPE%	**6.16**
Antenna D1	RFS APXVAA24_43-U-A20	600 MHz / 700 MHz	13.75 / 14.05	4	120	2,913.49	2.02
Antenna D1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85 / 15.85	8	320	12,306.94	3.60
Antenna D1	RFS APXV18-206517S-C-A20	1900 MHz (PCS)	16.65	1	40	1,849.52	0.54
						Sector D Composite MPE%	**6.16**

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all four sectors have the same configuration yielding the same results on all four sectors. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Per Sector Value	**6.16 %**
Nextel	0.38 %
AT&T	5.33 %
Verizon Wireless	9.15 %
Site Total MPE %:	**21.02 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	6.16 %
T-MOBILE Sector B Total:	6.16 %
T-MOBILE Sector C Total:	6.16 %
T-MOBILE Sector D Total:	6.16 %
Site Total:	21.02 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, all four sectors have the same configuration yielding the same results on all four sectors.

T-MOBILE _ Frequency Band / Technology 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 600 MHz LTE / 5G NR	2	948.55	117	5.54	600 MHz	400	1.38%
T-Mobile 700 MHz LTE	2	508.19	117	2.97	700 MHz	467	0.64%
T-Mobile 1900 MHz (PCS) LTE	4	1,538.37	117	17.95	1900 MHz (PCS)	1000	1.80%
T-Mobile 2100 MHz (AWS) LTE	4	1,538.37	117	17.95	2100 MHz (AWS)	1000	1.80%
T-Mobile 1900 MHz (PCS) UMTS	1	1,849.52	117	5.40	1900 MHz (PCS)	1000	0.54%
						Total:	**6.16%**

Table 6: T-MOBILE Maximum Sector MPE Power Values

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:	6.16 %
Sector B:	6.16 %
Sector C:	6.16 %
Sector D:	6.16 %
T-MOBILE Maximum Total (per sector):	6.16 %
Site Total:	21.02 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **21.02 %** 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.

Scott Heffernan
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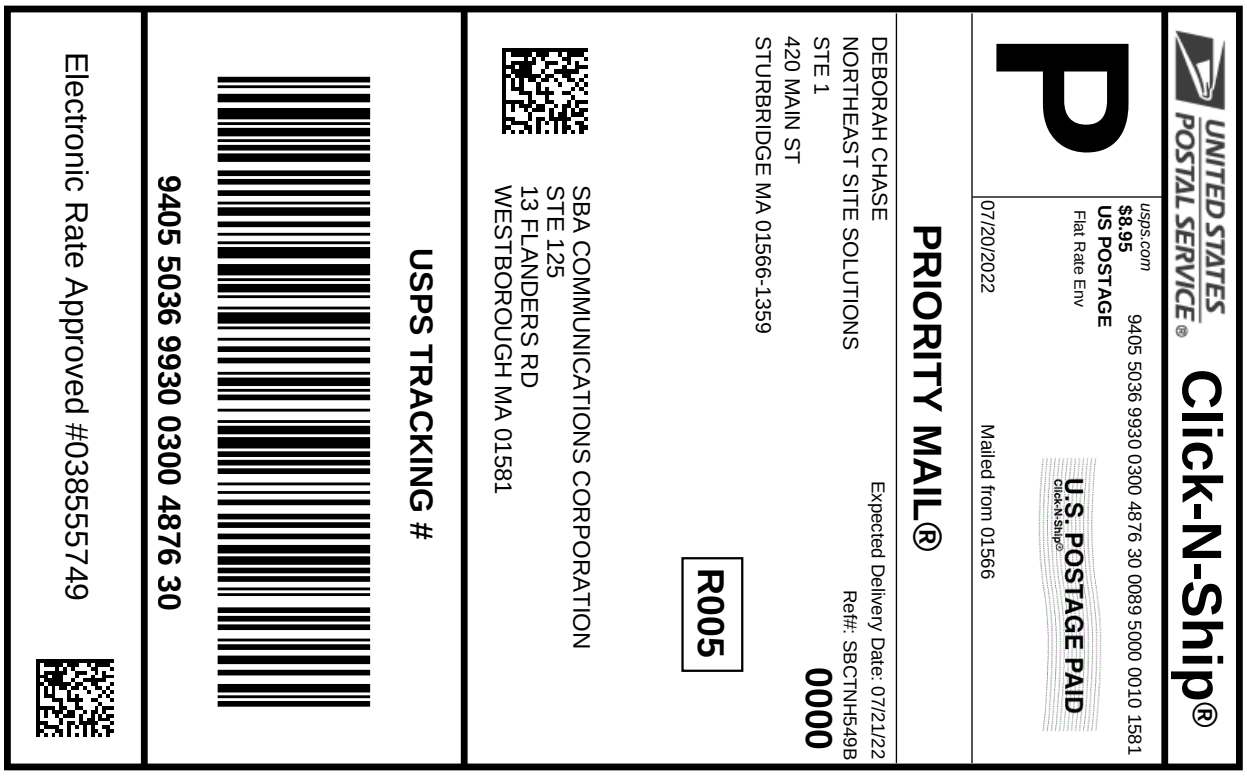
Exhibit G

Recipient Mailings



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Expected Delivery Date:	07/21/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

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Ref#: SBCTNH549B

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WESTBOROUGH MA 01581

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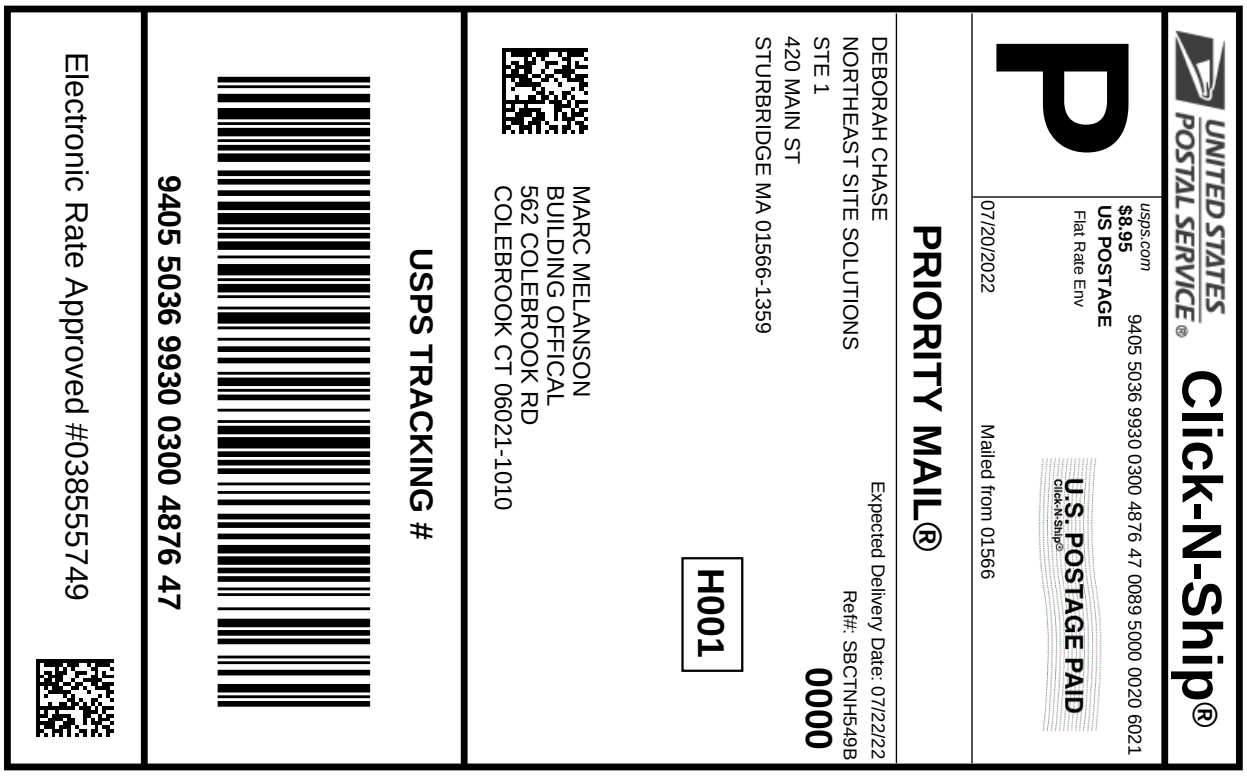

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5. **Mail your package on the "Ship Date" you selected when creating this label.**

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USPS TRACKING # :
9405 5036 9930 0300 4876 47

Trans. #:	567945051
Print Date:	07/20/2022
Ship Date:	07/20/2022
Expected Delivery Date:	07/22/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
STE 1
420 MAIN ST
STURBRIDGE MA 01566-1359

Ref#: SBCTNH549B

To: MARC MELANSON
BUILDING OFFICAL
562 COLEBROOK RD
COLEBROOK CT 06021-1010

* 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.

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

9405 5036 9930 0300 4876 54 0089 5000 0010 6109

usps.com
$8.95
US POSTAGE
Flat Rate Env

U.S. POSTAGE PAID
Click-N-Ship®

07/20/2022 Mailed from 01566

PRIORITY MAIL®

DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
STE 1
420 MAIN ST
STURBRIDGE MA 01566-1359

Expected Delivery Date: 07/22/22
Ref#: SBCTNH549B

0000

C034

382 COLEBROOK LLC
382 COLEBROOK LLC
202 HANG DOG LN
WETHERSFIELD CT 06109-4025

USPS TRACKING #

9405 5036 9930 0300 4876 54

Electronic Rate Approved #038555749

Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0300 4876 54

Trans. #:	567945051
Print Date:	07/20/2022
Ship Date:	07/20/2022
Expected Delivery Date:	07/22/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
STE 1
420 MAIN ST
STURBRIDGE MA 01566-1359

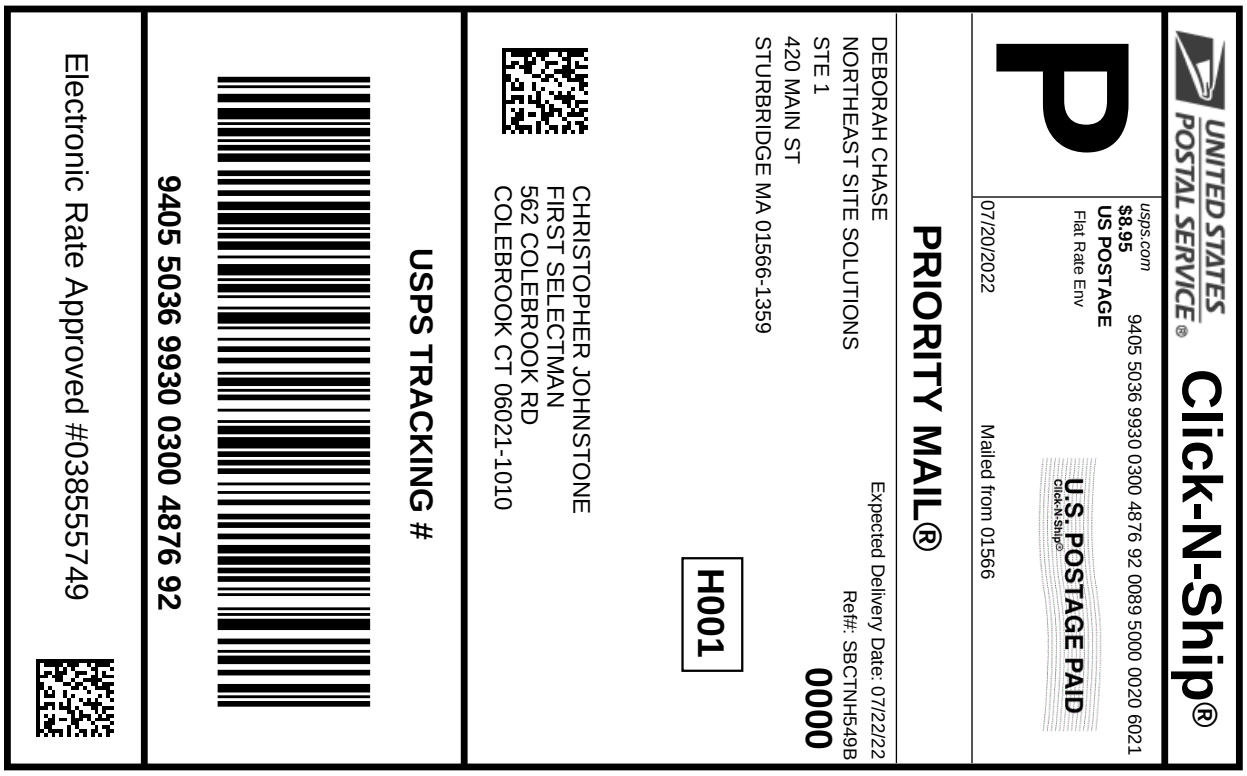
Ref#: SBCTNH549B

To: 382 COLEBROOK LLC
382 COLEBROOK LLC
202 HANG DOG LN
WETHERSFIELD CT 06109-4025

* 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.

UNITED STATES POSTAL SERVICE®

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com



Cut on dotted line.

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5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0300 4876 92

Trans. #:	567945051
Print Date:	07/20/2022
Ship Date:	07/20/2022
Expected Delivery Date:	07/22/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
STE 1
420 MAIN ST
STURBRIDGE MA 01566-1359

Ref#: SBCTNH549B

To: CHRISTOPHER JOHNSTONE
FIRST SELECTMAN
562 COLEBROOK RD
COLEBROOK CT 06021-1010

* 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.

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com

NH549B
[illegible]A-SBA-TMO

LINCOLN MALL
560 LINCOLN ST STE 8
WORCESTER, MA 01605-1925
(800)275-8777

07/20/2022 03:21 PM

Product	Qty	Unit Price	Price
Prepaid Mail Westborough, MA 01581 Weight: 0 lb 2.00 oz Acceptance Date: Wed 07/20/2022 Tracking #: 9405 5036 9930 0300 4876 30	1		$0.00
Prepaid Mail Wethersfield, CT 06109 Weight: 0 lb 12.70 oz Acceptance Date: Wed 07/20/2022 Tracking #: 9405 5036 9930 0300 4876 54	1		$0.00
Prepaid Mail Colebrook, CT 06021 Weight: 0 lb 12.20 oz Acceptance Date: Wed 07/20/2022 Tracking #: 9405 5036 9930 0300 4876 92	1		$0.00
Prepaid Mail Colebrook, CT 06021 Weight: 0 lb 12.20 oz Acceptance Date: Wed 07/20/2022	1		$0.00